

z/OS



# Summary of Message and Interface Changes

*Version 2 Release 2*

**Note**

Before using this information and the product it supports, read the information in "Notices" on page 589.

This edition applies to Version 2 Release 2 of z/OS (5650-ZOS) and to all subsequent releases and modifications until otherwise indicated in new editions.

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# Abstract for z/OS Summary of Message and Interface Changes

This document is divided into five parts.

Part 1 contains a summary of new and changed interfaces for z/OS® V2R2, V2R1, and z/OS V1R13. It is divided into sections where each section is devoted to a selected system-level data set (SYS1) interface or to a specific z/OS element or feature. Within each section, information is presented in tables grouped by component (where applicable), by type of interface (for example, commands, environment variables), and by the release in which the interface was added or changed.

Part 2 contains a summary of new, changed, and deleted messages for each element in z/OS V2R2. Within each section, you find information about new, changed, and deleted messages.

Part 3 contains a summary of new, changed, and deleted messages for each element in z/OS V2R1. Within each section, you find information about new, changed, and deleted messages.

Part 4 contains a summary of new, changed, and deleted messages for each element in z/OS V1R13. Within each section, you find information about new, changed, and deleted messages.

Part 5 contains appendices.

For purposes of this document, “interfaces” refer to software that allows a user to interact with and perform operations on a system, program, or device.

## Intended audience

z/OS Summary of Message and Interface Changes is for anyone who needs to know which messages and interfaces are new and changed for z/OS V2R2, V2R1, and z/OS V1R13.

## Where to find more information

This document references information in other documents, using shortened versions of the document title. For complete titles and order numbers of the documents for z/OS elements and features, see *z/OS V2R2 Information Roadmap*.

This document does not contain information about new, changed, or deleted checks for IBM® Health Checker for z/OS. For check information, see *IBM Health Checker for z/OS User's Guide*.



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Include the following information:

- Your name and address
- Your email address
- Your phone or fax number
- The publication title and order number:
  - z/OS Summary of Message and Interface Changes
  - SA23-2300-13
- The topic and page number or URL of the specific information to which your comment relates
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## Summary of changes

This information includes terminology, maintenance, and editorial changes. Technical changes or additions to the text and illustrations for the current edition are indicated by a vertical line to the left of the change.

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### Summary of changes for z/OS Summary of Message and Interface Changes for z/OS Version 2 Release 2 (V2R2) as updated June 2017

In this revision, all technical changes are indicated by a vertical line to the left of the change.

#### New

- Communications Server has updates for the following functions. See Communications Server summary of interface changes.
  - AIMON enhancement
  - Improved control over VTAM VIT options
  - Improved CSSMTP code page compatibility with target servers
  - Sendmail to CSSMTP
  - SMF 119 TCP connection termination record (subtype 2) enhanced to provide IP filter information
  - z/OS Configuration Assistant for Communications Server support for import of TCP/IP configuration
  - 3270 Intrusion Detection Services
- New Communications Server messages have been added. See New
- z/OSMF has updates to the REST APIs. See Table 219 on page 367.
- z/OSMF messages have been added. See Chapter 55, “z/OSMF summary of message changes,” on page 449.

#### Changed

- Communications Server messages have been changed. See Changed.
- z/OSMF messages have been changed. See Chapter 55, “z/OSMF summary of message changes,” on page 449.

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### Summary of changes for z/OS Summary of Message and Interface Changes for z/OS Version 2 Release 2 (V2R2) as updated March 2017

In this revision, all technical changes are indicated by a vertical line to the left of the change.

#### New

- Cryptographic Services PKI Services has updates to the following interface:
  - “Code samples” on page 184
- z/OSMF has updates to the REST APIs:
  - Table 219 on page 367.

### **Changed**

- BCP has updates to the following interface:
  - “SMF records” on page 44.

### **Deleted**

- Nothing.

---

## **Summary of changes for z/OS Summary of Message and Interface Changes for z/OS Version 2 Release 2 (V2R2) as updated December 2016**

In this revision, all technical changes are indicated by a vertical line to the left of the change.

### **New**

- New SDSF panels and related changes. See Chapter 23, “SDSF summary of interface changes,” on page 317.
- New z/OSMF Representational State Transfer (REST) services. See Chapter 30, “z/OSMF summary of interface changes,” on page 367.

### **Changed**

- Nothing.

### **Deleted**

- Nothing.

---

## **Summary of changes for z/OS Summary of Message and Interface Changes for z/OS Version 2 Release 2 (V2R2) as updated September 2016**

In this revision, all technical changes are indicated by a vertical line to the left of the change.

### **New**

- New BCP have been added. See “New” on page 375.
- New MVS system codes have been added. See “MVS system codes” on page 382.
- New HCD messages have been added. See Chapter 38, “HCD summary of message changes for z/OS V2R2,” on page 405.
- New z/OSMF Representational State Transfer (REST) services. See Chapter 30, “z/OSMF summary of interface changes,” on page 367.
- New macro IEAMSXMP is added. See “Services and macros” on page 37.
- New SYS1.MACLIB macros have been added to Chapter 1, “Summary of changes to SYS1.MACLIB,” on page 3.

### **Changed**

- BCP messages have changed. See “Changed” on page 379.
- MVS system codes have changed. See “MVS system codes” on page 382.
- Changes to PARMLIB member ISFPRMxx for SDSF. See Chapter 2, “Summary of changes to SYS1.PARMLIB,” on page 7.



- Changed HCD messages have been added. See Chapter 38, “HCD summary of message changes for z/OS V2R2,” on page 405.

### Deleted

- For the list of BCP messages that are no longer issued in z/OS Version 2 Release 2, see “Deleted” on page 382

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## Summary of changes for z/OS Summary of Message and Interface Changes for z/OS Version 2 Release 2 (V2R2) as updated June 2016

In this revision, all technical changes are indicated by a vertical line to the left of the change.

### New

- For BCP:
  - New SMF record type 124. See “SMF records” on page 44.
  - New messages. See Chapter 31, “BCP and DFSMS summary of message changes for z/OS V2R2 and its updates,” on page 375.
- New SDSF panels and related changes. See Chapter 23, “SDSF summary of interface changes,” on page 317.
- For Security Server RACF:
  - For callable service updates, see “Callable services” on page 326.
  - For updates in the class descriptor table (CDT), see “Class descriptor table (CDT)” on page 329.
  - For updated commands, see “Commands” on page 330.
  - For updated data areas, see “Data areas” on page 333.
  - For updated database templates, see “Database templates” on page 336.
  - For updated SMF records, see “SMF records” on page 340.
  - For new utilities, see “Utilities” on page 341.
  - For new and changed messages, see Chapter 49, “Security Server RACF summary of message changes for z/OS V2R2,” on page 431.
- New SMP/E messages. See New SMP/E messages
- New z/OSMF Representational State Transfer (REST) services. See Chapter 30, “z/OSMF summary of interface changes,” on page 367.

### Changed

- Enhancements made to the D M=DEV command. See “MVS (BCP) system commands” on page 47.
- Enhancements made to the SMP/E ZONEMERGE command. See SMP/E commands.
- Enhanced z/OSMF Representational State Transfer (REST) services. See Chapter 30, “z/OSMF summary of interface changes,” on page 367.

### Deleted

- Nothing.

---

## Summary of changes for z/OS Summary of Message and Interface Changes for z/OS Version 2 Release 2 (V2R2) as updated March 2016

In this revision, all technical changes are indicated by a vertical line to the left of the change.

## New

- New z/OSMF Representational State Transfer (REST) API's for Files and Data sets have been added. See Chapter 30, “z/OSMF summary of interface changes,” on page 367.

## Changed

- Information about the SECURITY and NOSECURITY parameters of the BPXPRMxx parmlib member was missing. They have been added. See “New and changed SYS1.PARMLIB members for z/OS V2R2” on page 7.
- Several new parameters were added to the MODIFY AXR command. See “MVS (BCP) system commands” on page 47. The AXRxx SYS1.PARMLIB member was also updated. See “New and changed SYS1.PARMLIB members for z/OS V2R2” on page 7.
- With APAR OA48775, various updates were made.
  - The \_smf\_record() and \_smf\_record2() functions were updated. See “Functions” on page 351.
  - The smf\_record callable service was updated. See “Callable services” on page 355.
  - The BPX.SMF resource profile in the FACILITY class was updated. See “FACILITY class profiles” on page 357.
  - Message BXP014I was updated.
- With APAR PI49962, DEVICE and LINK PROFILE.TCPIP statement was updated. See “PROFILE.TCPIP statement and parameter changes” on page 56.
- With APARs OA48411 and PI45028, various updates were made in z/OS Communications Server topics:
  - GLOBALCONFIG, INTERFACE, IPCONFIG, IPCONFIG6, PORT, and PORTRANGE statements were updated, see “PROFILE.TCPIP statement and parameter changes” on page 56.
  - ALL, ALLCONN, CONFIG, CONN DEvlinks, PORTLIST, and STATS Netstat operator commands were updated, see “Netstat operator commands (DISPLAY TCPIP,,NETSTAT)” on page 76.
  - DISPLAY TCPIP,,STOR commande was updated, see “General updates of IP operator commands” on page 87.
  - ALL, ALLCONN, CONFIG, CONN, DEvlinks, PORTLIST, and STATS Netstat TSO commands were updated, see “NETSTAT TSO commands” on page 92.
  - -A, -a, -c, -d, -f, -o, and -S Netstat UNIX commands were updated, see “Netstat UNIX commands” on page 100.
  - GetConnectionDetail, GetGlobalStats, GetIfs, GetIsms, GetProfile, GetSmcDLinks, GetStorageStatistics, and GetTCPLListeners requests were updated, see “TCP/IP callable NMI (EZBNMIFR)” on page 116.
  - TCP/IP profile record (subtype 4) was updated, see “TCP/IP stack records” on page 148.
  - Behavior of AIMON, INOPDUMP, and TNSTAT start options was updated, see “Start option behavior changes” on page 163.
  - DISPLAY TRL command was updated, see SNA commands.
  - Behavior of DISPLAY ID, DISPLAY INOPDUMP, DISPLAY TRL, MODIFY NOTNSTATS, MODIFY TNSTATS, and MODIFY VTAMOPTS commands was updated, see SNA command behavior changes.
  - AFSM, IOSP, IOS2, IOS3, ISPX, ISP2, ISP3, IUTX, IUT6, PCIX, PCIR, and QSRB VTAM internal trace entries were updated, see “VTAM internal trace entries” on page 170.

- z/OSMF Representational State Transfer (REST) services for z/OS jobs now include data for active job steps. See Chapter 30, “z/OSMF summary of interface changes,” on page 367.
- z/OSMF Representational State Transfer (REST) API's for Files and Data sets have been modified. See Chapter 30, “z/OSMF summary of interface changes,” on page 367.

### Deleted

- Nothing.

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## Summary of changes for z/OS Summary of Message and Interface Changes for z/OS Version 2 Release 2 (V2R2) as updated December 2015

In this revision, all technical changes are indicated by a vertical line to the left of the change.

### New

- z/OS OpenSSH
  - Support added for GSSAPI (Kerberos only) authentication and key exchange, including the addition of several GSSAPI options to **ssh\_config** and **sshd\_config**. See “Configuration files” on page 353.
  - zEnterprise Data Compression (zEDCCompression) option was added to **zos\_ssh\_config**, **zos\_ssh\_user\_config**, and **zos\_sshd\_config**. See “Configuration files” on page 353.
  - **ChannelConvert** option was added to **zos\_ssh\_config**, **zos\_ssh\_user\_config**, and **zos\_sshd\_config**. See “Configuration files” on page 353.
  - **ProxyUseFdPass** option was added to **ssh\_config**. See “Configuration files” on page 353.
  - Support added to meet FIPS 140-2 specifications, including the addition of options to **zos\_ssh\_config**, **zos\_ssh\_user\_config**, and **zos\_sshd\_config**. See “Configuration files” on page 353.
  - A new environment variable was added. See “Environment variables” on page 354.
  - New messages were added. See Chapter 53, “z/OS OpenSSH summary of message changes for z/OS V2R2,” on page 441.

### Changed

- For BCP, the following topics were updated:
  - “Callable services for high-level languages” on page 29
  - “Installation exits” on page 33
  - “Services and macros” on page 37
  - “SMF records” on page 44
  - “MVS (BCP) system commands” on page 47
  - Chapter 2, “Summary of changes to SYS1.PARMLIB,” on page 7
- For DFSMSHsm, these topics were updated:
  - “Commands” on page 223
  - “Macros” on page 227
- z/OS OpenSSH
  - Updates were made to the command **ssh**. See “Commands” on page 353.

- OpenSSH configuration files were updated. See “Configuration files” on page 353.
- Chapter 53, “z/OS OpenSSH summary of message changes for z/OS V2R2,” on page 441 was updated.

### Deleted

- Nothing.

---

## Summary of changes for z/OS Summary of Message and Interface Changes for z/OS Version 2 Release 2 (V2R2)

The following changes are made for z/OS Version 2 Release 2 (V2R2). In this revision, all technical changes for z/OS V2R2 are listed in chapters, tables, or table rows labeled as applying to V2R2.

### New

- Chapter 8, “Cryptographic Services summary of interface changes,” on page 175
- Chapter 31, “BCP and DFSMS summary of message changes for z/OS V2R2 and its updates,” on page 375
- Chapter 33, “Communications Server summary of message changes for z/OS V2R2,” on page 387
- Chapter 37, “Distributed File System summary of message changes for z/OS V2R2,” on page 401
- Chapter 38, “HCD summary of message changes for z/OS V2R2,” on page 405
- Chapter 40, “Infoprint Server summary of message changes for z/OS V2R2,” on page 411
- Chapter 43, “JES2 summary of message changes for z/OS V2R2,” on page 417
- Chapter 44, “JES3 summary of message changes for z/OS V2R2,” on page 421
- Chapter 45, “Language Environment summary of message changes for z/OS V2R2,” on page 423
- Chapter 34, “Cryptographic Services ICSF summary of message changes for z/OS V2R2,” on page 391
- Chapter 35, “Cryptographic Services PKI Services summary of message changes for z/OS V2R2,” on page 397
- Chapter 49, “Security Server RACF summary of message changes for z/OS V2R2,” on page 431
- Chapter 48, “RMF summary of message changes for z/OS V2R2,” on page 429
- Chapter 50, “SMP/E V3R6 summary of message changes for z/OS V2R2,” on page 435
- Chapter 39, “IBM Tivoli Directory Server summary of message changes for z/OS V2R2,” on page 409
- Chapter 51, “TSO/E summary of message changes for z/OS V2R2,” on page 437
- Chapter 52, “XL C/C++ summary of message changes for z/OS V2R2,” on page 439
- Chapter 40, “Infoprint Server summary of message changes for z/OS V2R2,” on page 411

### Changed

- The tables used in these topics have been simplified:
  - Chapter 1, “Summary of changes to SYS1.MACLIB,” on page 3

- Chapter 2, "Summary of changes to SYS1.PARMLIB," on page 7
- Chapter 3, "Summary of changes to SYS1.PROCLIB," on page 21
- Chapter 4, "Summary of changes to SYS1.SAMPLIB," on page 23

### Deleted

- Nothing.

---

## Summary of changes for z/OS Summary of Message and Interface Changes as updated February 2015

The following changes are made for z/OS Version 2 Release 1 (V2R1) as updated February 2015. In this revision, all technical changes for z/OS V2R1 are indicated by a vertical line to the left of the change.

### New

- BCP (MVS):
  - The HCSAByASID, HCSANoOwner, and HCSASysOwner options for SVC dump were added to the SDUMPX macro.
  - The REP (replace) dump mode was added to the CHNGDUMP command, as was HCSAByASID, HCSANoOwner, and HCSASysOwner keyword support for SDUMP.
  - The SDATA options HCAS, HCNO, and HCSY were added to the DUMP command.
  - The SDATA options HCSAByASID, HCSANoOwner, and HCSASysOwner were added to the SLIP command.
  - The default value of the zAAPZIIP statement of the IEASYSxx parmlib member was updated.
- Communications Server:
  - The SSLV3, APPLNAME statements were added to the FTP server configuration statements.
  - The SSLV3 statement was added to the FTP client configuration statements.
  - The SSLV3 and NOSSLV3 statement was added to the TN3270 Telnet server TELNETGLOBALS information block configuration statements and TN3270 Telnet server TELNETPARMS information block configuration statements.
  - The GetTnProfile request was added to the TCP/IP callable NMI (EZBNMIFR).
  - The Sendmail configuration file: /etc/mail/zOS.cf and Policy client configuration file were added.
  - The CCR, CCR2, VHCR, VHC2, VHC3, VHC4, and VHC5 VIT records were added to VTAM internal trace entries.
  - The following messages are new.
    - EZZ6062I
    - IST2417I
    - ISTM015I
    - ISTM016I
- Cryptographic Services Integrated Cryptographic Service Facility (ICSF)
  - See "ICSF summary of interface changes" on page 175 for the new and changed services for FMID HCR77B0.

- See Chapter 58, “Cryptographic Services ICSF summary of message changes for z/OS V2R1,” on page 481 for the new and changed messages.
- Language Environment
  - For the vector registers support, these messages were added:
    - CEE3235S
    - CEE3236S
    - CEE3237S
    - CEE3238S
    - CEE3239S
    - CEE3240S
- z/OS UNIX
  - For the vector registers support, new constant options and new parameter attributes were added to BPX1PTR,BPX4PTR callable service. New return values and return codes were added for the request options.
  - For dbx support of vector-enabled programs, a new variable, *\$novregs*, was added to the set subcommand of **dbx**. The usage note for the registers subcommand was also updated with information about displaying and assigning vector registers.
  - With APAR OA46568, a usage note was added to the **ls** command about issuing the **ls** command against a large directory structure.
  - With APAR OA46394, to comply with UNIX specifications, an addition was added to **sh** information.
  - The following messages are new.
    - FDBX0557
    - FDBX0823
    - FDBX0824
    - FDBX0826
  - The following reason codes are new.
    - 065C (JrPtInvVRNumber)
    - 065D (JrPtVRNotSupported)

## Changed

- Communications Server:
  - The TCPCONFIG PROFILE.TCPIP statement was updated.
  - The CSDUMP start option was updated.
  - The MODIFY CSDUMP, DISPLAY ID, and DISPLAY TRL commands were updated.
  - The DCAS configuration file was updated.
  - The GetFTPDaemonConfig request was updated.
  - The FTP Daemon Configuration record (subtype 71) and TN3270E Telnet server profile event record (subtype 24) were updated.
  - The following messages were updated.
    - EZD1024I - Replaced by EZD1795I
    - EZA1532I
    - EZA1533I
    - EZA1545I
    - EZA1546I

- EZA1548I
- EZA1549I
- EZA1555I
- EZA1556I
- EZZ6238I
- EZZ7453I
- EZZ7839I
- EZZ8128I
- EZZ9675E
- IST1884I
- IST2361I
- IST2362I
- IST2389I
- IST2396I
- IST2397I
- IST2398I
- IST2406I
- Language Environment:
  - For the vector registers support, the following interfaces were updated.
    - Compiler-writer interfaces (CWI)
      - CEEGOTO
      - CEEYPPAF
      - \_\_far\_jump()
    - Data areas
      - CEEMCH
      - CEEPCB
    - Macros
      - CEEPPA

---

## Summary of changes for z/OS V2R1 as updated September 2014

The following changes are made for z/OS Version 2 Release 1 (V2R1) as updated September 2014. In this revision, all technical changes for z/OS V2R1 are indicated by a vertical line to the left of the change.

### New

- BCP (MVS):
  - For the DEVSUP $xx$  parmlib member, a restriction was added to the TAPEPBLKSZLIM= parameter to indicate that DFSMSdss only supports BLKSZLIM of 65,520 and higher.
  - With APAR OA44049, diagnostic CTRACE data was added to VSAM RLS BMF GET/FREE requests. With the new parameter CSRPOOLDIAG in the DIAG $xx$  parmlib member, the get and free services of the CSR cellpool return diagnostic data.
  - With APAR OA41968, a new keyword, INCLUDE1MAFC, was added to the LFAREA parameter in the IEASYS $xx$  parmlib member. It specifies that the 1 MB pages are to be included in the available frame count (RCEAFC), and improves paging.

- The following messages are new:
  - ADR530I
  - ADR531E
  - ADR532E
  - ADR533I

## Changed

- BCP (MVS):
  - The BPXPRMxx parmlib member was updated to clarify that the value of the SHRLIBRGNSIZE parameter must be evenly divisible by 1048576.
  - Clarification was added to the TIMEZONE parameter of the CLOCK parmlib member about applications that are required to run with local time equal to UTC.
  - An explanation was added to the CONFIGxx parmlib section that the deprecated ESTOR parameter is tolerated.
  - With APAR OA44526, the lower limit for the IEAOPTxx keyword BLWLINTHD was changed.
  - The documentation for the BreakPointValue parameter for the IGDSMSxx parmlib member was clarified and made more complete.
  - The IBM-supplied program properties table (PPT) in the SCHEDxx parmlib had several updates.
    - With APAR OA42165, the PPT table was updated to include CRITICALPAGING for the BCPii address space program, HWIAMIN2.
    - With APAR OA43256, additional support of zEDC Express update and fixes for z/OS PCIE support were included. IQPINIT for PCIE services was added to the PPT table.
    - With APAR OA44695, support was added for IOSVROUT and programs attached to it to obtain 64-bit virtual storage. The "No honor IEFUSI region settings" value was added to IOSVROUT in the PPT table.
  - The following messages are changed:
    - ADR285E - New return code 16
    - ADR439E - New return code 146
    - ADR707E - New ZCOMPRESS keyword
    - ADR778E - New return code 22
    - ADRY501I - Updated explanation
    - ADRY503E - Updated explanation
    - ADRY3501I - Updated explanation
    - ARC0216I - New return code 48
    - ARC0336I - Mention of new ZCOMPRESS parameter
    - ARC0340I - New ZCOMPRESS options

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## Summary of changes for z/OS V2R1 as updated June 2014

The following changes are made for z/OS Version 2 Release 1 (V2R1) as updated June 2014. In this revision, all technical changes for z/OS V2R1 are indicated by a vertical line to the left of the change.



## Changed

- Communications Server:
  - The following PROFILE.TCPIP statements are updated:  
ATMARPSV, ATMLIS, ATMPVC  
DEVICE and LINK
- DFSORT:
  - The following messages were changed in V2R1, but not included in the prior version of this information:  
ICE000I  
ICE118I
  - The following interfaces were changed in V2R1, but not included in the prior version of this information:  
The following are new DFSORT/ICETOOL reserved words which are no longer allowed as symbols: LC, LN, MC, MN, UC and UN.  
The IBM-supplied default for the existing EXPOLD installation option has been changed to EXPOLD=50%.  
The IBM-supplied default for the existing EXPRES installation option has been changed to EXPRES=10%.  
The IBM-supplied default for the new TUNE installation option is TUNE=STOR.  
A new TUNE installation default allows you to specify whether DFSORT should allocate storage in increments, or to allocate all storage at initialization.

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## Summary of changes for z/OS V2R1 as updated March 2014

The following changes are made for z/OS Version 2 Release 1 (V2R1) as updated March 2014. In this revision, all technical changes for z/OS V2R1 are indicated by a vertical line to the left of the change.

### New

- DFSMSdfp:
  - The ZEDC\_R (“zEDC Required”) and ZEDC\_P (“zEDC Preferred”) options are added to the COMPRESS parameter in the IGDSMSxx member of SYS1.PARMLIB.
  - The ZR (“zEDC Required”) and ZP (“zEDC Preferred”) options are added to the Compaction field of the Data Class Define and Alter ISMF panels.
  - New fields to indicate zEDC compression are added to the SMF type 14 record, in the compressed format data set section.
  - New option fields are added in the FPZ4RZV and FPZ4PRB compression services.
  - The following messages are added for zEDC compression:  
IGD17167I  
IGD17168I  
IGD17169I

**Note:** For more information on the zEDC compression enhancements, see *z/OS DFSMS Using the New Functions*.

- BCP (MVS) messages:  
The following messages are new:

ADR984W  
IGD17167I  
IGD17168I  
IGD17169I  
ILRH0112I  
IXC592I  
IXC593I  
IXC594I  
IXCH0265E  
IXCH0266I  
IXCH0930I

- SDSF:  
The following message is new:  
ISF794W

## Changed

- BCP (MVS) parmlib members:  
Updates were made to the following parmlib members:
  - In the ALLOCxx member, missing keywords are added back from V1R13. In addition, for V2R1, two additional SYSTEM keywords are added:  
    BATCH\_RCLMIGDS(SERIAL | PARALLEL)  
    OPTCDB\_SPLIT(EXPLICIT | CATALOG)
  - BPXPRMxx is updated.
  - CEEPRM00 has changed.
  - CLOCKxx has a new parameter, ACCURACY.
  - For CNGRPxx, only HMCS is added.
  - The description of COFVLFxx includes changes to the action that VLF performs from writing a SYS1.LOGREC record to passing a return code.
  - CONFIGxx has new parameters (STANDARD, ZAAP, ZIIP, and ANY) for the CPU/CPUAD statement.
  - CONSOLxx has new parameters, SUPSBY for V2R1 and MSGFLD for V1R13.
  - For CUNUNIxx, the REPLACE FROM and REPLACE CASE statements now allow VOLSER. REPLACE CASE now allows a value of UNI600. ADD CASE and DELETE CASE now add a value of ACA600.
  - DEVSUPxx has new statements for MEDIA11, MEDIA12, and MEDIA13.
  - DIAGxx is updated to include additional information about HyperSwap environments.
  - GRSCNFxx has a new MONITOR statement.
  - HZSPRMxx is not new for V2R1 but has two new statements for V2R1, HZSPDATA and SET,OPTION.
  - For IEAFIXxx, the VOLUME keyword is added to allow uncataloged data sets.
  - For IEALPAXx, VOLUME is defined.
  - For IEAOPTxx, the parameter STORAGESERVERMGT with a default of NO was added in V1R13.
  - In IEASVCxx, a new value EPNAME specifies the entry point name of the SVC and forces an abend if a specific SVC is issued.

- IECIOSxx has a new RECOVERY option of DCCF=MESSAGE or DCCF=WAIT\_STATE.
- BCP (MVS) messages:
  - BHI000I was changed in V2R1, but not included in the prior version of this information.
  - IOS450E was mistakenly added as a changed message, but the message did not change in V2R1.
  - BPXTF107I replaces BPXTF007I. The F was missing from BPXTF007I in the prior version of this information.

The following messages are changed:

IEA383I  
 IEA911E  
 IEC143I  
 IEE399I  
 IEE459I (form 1 of 3)  
 IEE459I (form 2 of 3)  
 IXC531I  
 IXC574I  
 IXC582I  
 IXC583I  
 IXC584I  
 IXG3101I  
 IXL015I

- Communications Server:
  - EZY1387E, EZZ8139I were deleted in z/OS Version 1
  - IST1371I was replaced by IST1797I
- DFSMSdfp:
  - The following messages are changed for zEDC compression (new reason codes):
    - ADR285E
    - ADR439E
    - ADR778E
    - IEC036I
    - IEC143I
    - IEC214I
  - The new PS\_EXT\_VERSION parameter of the IGDSMSxx member of PARMLIB was incorrectly listed as PS\_EXT\_FORMAT and attributed to the BCP in Chapter 2, “Summary of changes to SYS1.PARMLIB,” on page 7. The information has been corrected.
- TSO
  - The LINK command has been updated with a new PRIV parameter of the STRIPSEC option replacing the incorrectly listed OPERAND command which does not exist. See “Commands” on page 347.

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## Summary of changes for z/OS V2R1 as updated December 2013

This information summarizes the interface and message changes for z/OS V2R1 as updated December 2013.

## New

### DFSMS:

- The following message for storage management subsystem (SMS) continues to be issued by z/OS. In the prior edition of this publication, the message was listed as deleted.

IGW702I

- The DFSMS table of “Utilities” on page 221 now identifies an addition change to IEBCOPY not mentioned in the prior release of this information.

**Communications Server:** The following Communications Server message is new for V2R1, but missing from the SA23-2300-00 edition of this publication:

EZD2029I

**HCD:** The following HCD messages are new for V2R1:

CBDA691I CBDA901I CBDA902I CBDA903I CBDA904I CBDC096I CBDC097I  
CBDG375I CBDG347I CBDG348I CBDG376I CBDG422I CBDG547I CBDG548I  
CBDG573I CBDG574I CBDG575I CBDG576I CBDG577I CBDG578I CBDG579I  
CBDG580I CBDG581I CBDG582I CBDG583I CBDG584I CBDG585I CBDG586I  
CBDG587I CBDG588I CBDG589I CBDG590I CBDG591I CBDG592I CBDG593I  
CBDG594I CBDG595I CBDG596I CBDG597I CBDG598I CBDG599I CBDG609I  
CBDG740I CBDG741I CBDG742I CBDG925I CBDG926I CBDG970I CBDG971I  
CBDG972I

## Changed

### BCP (MVS):

- The following new parameters are added to SMFPRMxx in Chapter 2, “Summary of changes to SYS1.PARMLIB,” on page 7:
  - **AUTHSETSMF:** Authorize changes to the SMF parameter options using the **SETSMF** command.
  - **COMPRESS(PERMFIX):** Compression of SMF records before writing to the log stream.
  - **PERMFIX:** Specify the default amount of storage that SMF can keep permanently fixed.
  - **NOAUTHSETSMF, NOSMF30COUNT, SMF30COUNT** are added to enable counter sets.
  - **SWT** specifies the maximum amount of time that a started task address space is allowed to wait continuously, in hours and minutes.
  - **TWT** specifies the maximum amount of time that a TSO/E user address space is allowed to wait continuously, in hours and minutes.
- For the SYS1.PARMLIB members:
  - The DIAGxx information incorrectly listed the **CBLOC** parameter as CBCLOC. The correct parameter is **CBLOC**.
  - The COFVLFxx member has a new parameter, **ALERTAGE**, that was previously listed as changed.

**Communications Server:** Multiple changes in Chapter 7, “Communications Server summary of interface changes,” on page 55 are made to the following elements:

- “General updates for the non-PROFILE.TCPIP IP configuration files” on page 68
- “SNMP MIB modules” on page 134
- “z/OS UNIX /etc files” on page 155.

**GRS:** The following new parameter is added to SMFPRMxx in Chapter 2, "Summary of changes to SYS1.PARMLIB," on page 7:

- **MONITOR:** Turns GRS monitoring on or off.

**HCD:** The following HCD messages are changed in V2R1, but missing from the prior edition of this publication:

CBDA099I CBDA121I CBDA159I CBDA196I CBDA241I CBDA270I CBDA374I  
CBDA425I CBDA435I CBDA449I CBDA599I CBDA605I CBDA630I CBDA698I  
CBDA854I CBDA848I CBDA854I CBDA880I CBDA950I CBDC099I CBDD793I  
CBDD814I CBDD816I CBDG180I CBDG300I CBDG302I CBDG303I CBDG304I  
CBDG307I CBDG320I CBDG321I CBDG338I CBDG522I CBDG661I CBDG700I  
CBDG701I CBDG708I CBDG726I CBDG735I CBDG753I CBDG754I CBDG905I

**JES2:** The following JES2 messages were changed from all uppercase characters to mixed-case characters. For details, see *z/OS JES2 Messages*:

\$HASP107  
\$HASP108  
\$HASP110  
\$HASP111  
\$HASP112  
\$HASP113  
\$HASP114  
\$HASP115  
\$HASP116  
\$HASP118



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## Part 1. Summary of interface changes for z/OS

This section describes the new and changed interfaces for z/OS V2R2, z/OS V2R1, and z/OS V1R13 elements and features.

Selected system-level data set (SYS1) interfaces are aggregated in:

- Chapter 1, “Summary of changes to SYS1.MACLIB,” on page 3
- Chapter 2, “Summary of changes to SYS1.PARMLIB,” on page 7
- Chapter 3, “Summary of changes to SYS1.PROCLIB,” on page 21
- Chapter 4, “Summary of changes to SYS1.SAMPLIB,” on page 23





# Chapter 1. Summary of changes to SYS1.MACLIB

## New and changed members in SYS1.MACLIB for z/OS V2R2

Table 1. z/OS V2R2 summary of new and changed members in SYS1.MACLIB

Member	Element or feature	Description
EZASMF77	Communications Server	New SMF119TN_CTNJENode field is added to replace SMF191TN_CTNJENode for the SMF 119 subtype 23 record. <b>Reason for change:</b> Release update
HWTHICOB	z/OS Client Web Enablement Toolkit	New COBOL copybook file for HTTP applications. <b>Reason for change:</b> APAR OA46622
HWTHIPLI	z/OS Client Web Enablement Toolkit	New PL/I include file for HTTP applications. <b>Reason for change:</b> APAR OA46622
HWTHIASM	z/OS Client Web Enablement Toolkit	New Assembler include file for HTTP applications. <b>Reason for change:</b> APAR OA46622
HWTJICOB	z/OS Client Web Enablement Toolkit	New COBOL copybook file for JSON parser applications. <b>Reason for change:</b> APAR OA46575
HWTJIPLI	z/OS Client Web Enablement Toolkit	New PL/I include file for JSON parser applications. <b>Reason for change:</b> APAR OA46575
HWTJIASM	z/OS Client Web Enablement Toolkit	New Assembler include file for JSON parser applications. <b>Reason for change:</b> APAR OA46575
HWISMF6A	BCPii	New SMF record type 106 to record successful HWISET and HWICMD requests. <b>Reason for change:</b> Release update
IEANTRTR	BCP	New macro. <b>Reason for change:</b> Enable name/token retrieval without user storage.
IHDRDWRA	Communications Server	Support for OPTCD=IDS3270 <b>Reason for change:</b> VTAM 3270 intrusion detection services, APAR OA49911
IMDMEDIT	Communications Server	Add GTF event ID IMDVTMDS (X'F90') <b>Reason for change:</b> VTAM 3270 intrusion detection services, APAR OA49911
ISTAMSVL	Communications Server	Define flag AMS05B62 for IDS3270 support <b>Reason for change:</b> VTAM 3270 intrusion detection services, APAR OA49911
ISTGLBAL	Communications Server	Define flag ISTGL62 for IDS3270 support <b>Reason for change:</b> VTAM 3270 intrusion detection services, APAR OA49911
ISTRPLEX	Communications Server	Define RPLS3270 API flag <b>Reason for change:</b> VTAM 3270 intrusion detection services, APAR OA49911
ISTSMF77	Communications Server	Define SMF type 119, subtype 81 SMF record <b>Reason for change:</b> VTAM 3270 intrusion detection services, APAR OA49911
IXCJOIN	XCF	Changed macro. <b>Reason for change:</b> Release update

## SYS1.MACLIB

Table 1. z/OS V2R2 summary of new and changed members in SYS1.MACLIB (continued)

Member	Element or feature	Description
IXCMSSGO	XCF	Changed macro. <b>Reason for change:</b> Release update
IXCMSSGOX	XCF	Changed macro. <b>Reason for change:</b> Release update
IXCQUERY	XCF	Changed macro. <b>Reason for change:</b> Release update

## New and changed members in SYS1.MACLIB for z/OS V2R1

Table 2. z/OS V2R1 summary of new and changed members in SYS1.MACLIB

Member	Element or feature	Description
EZASMF77	Communications Server	<ul style="list-style-type: none"> <li>Changed member provides programming mappings for the new SMF 119 FTP subtype 71 record for FTP daemon configuration data. <b>Reason for change:</b> NMI and SMF enhancements for TCP/IP applications</li> <li>New field and new values are added to SMF 119 subtypes 2,3,49, 70, and 72 to show the four character negotiated cipher for AT-TLS secure connections and TLS v1.2 protocol level. <b>Reason for change:</b> AT-TLS support for TLS v1.2 and related features</li> <li>New fields are added to TCP/IP statistics SMF 119 subtype 5 record for ephemeral port usage. <b>Reason for change:</b> User control of Ephemeral Port Ranges</li> <li>New SMF119ML_CF_DateHdr field is added to CSSMTP SMF 119 subtype 48 record. <b>Reason for change:</b> CSSMTP mail message date header handling option</li> <li>Provides programming mappings for new SMC-R SMF 119 records of subtypes 41 - 44. SMC-R information is added to SMF 119 records of subtypes 2, 4, 5, and 6. <b>Reason for change:</b> Shared Memory Communications over Remote Direct Memory Access</li> </ul>
HWTHICOB	z/OS Client Web Enablement Toolkit	New COBOL copybook file for HTTP applications. <b>Reason for change:</b> APAR OA46622
HWTHIPLI	z/OS Client Web Enablement Toolkit	New PL/I include file for HTTP applications. <b>Reason for change:</b> APAR OA46622
HWTHIASM	z/OS Client Web Enablement Toolkit	New Assembler include file for HTTP applications. <b>Reason for change:</b> APAR OA46622
HWTJICOB	z/OS Client Web Enablement Toolkit	New COBOL copybook file for JSON parser applications. <b>Reason for change:</b> APAR OA46575
HWTJIPLI	z/OS Client Web Enablement Toolkit	New PL/I include file for JSON parser applications. <b>Reason for change:</b> APAR OA46575
HWTJIASM	z/OS Client Web Enablement Toolkit	New Assembler include file for JSON parser applications. <b>Reason for change:</b> APAR OA46575
IFGSMF14	DFSMS	New fields are added to the SMF type 14 record, in the compressed format data set section. <b>Reason for change:</b> zEDC Compression

Table 2. z/OS V2R1 summary of new and changed members in SYS1.MACLIB (continued)

Member	Element or feature	Description
IHBRDWRA	Communications Server	Support for OPTCD=IDS3270 <b>Reason for change:</b> VTAM 3270 intrusion detection services, APAR OA48802
IMDMEDIT	Communications Server	Add GTF event ID IMDVTMDS (X'F90') <b>Reason for change:</b> VTAM 3270 intrusion detection services, APAR OA48802
ISTAMSVL	Communications Server	Define flag AMS05B62 for IDS3270 support <b>Reason for change:</b> VTAM 3270 intrusion detection services, APAR OA48802
ISTGLBAL	Communications Server	Define flag ISTGL62 for IDS3270 support <b>Reason for change:</b> VTAM 3270 intrusion detection services, APAR OA48802
ISTRPLEX	Communications Server	Define RPLS3270 API flag <b>Reason for change:</b> VTAM 3270 intrusion detection services, APAR OA48802
ISTSMP77	Communications Server	Define SMF type 119, subtype 81 SMF record <b>Reason for change:</b> VTAM 3270 intrusion detection services, APAR OA48802

### New and changed members in SYS1.MACLIB for z/OS V1R13

Table 3. SYS1.MACLIB summary of new and changed members in SYS1.MACLIB

Member	Element or feature	Description
EZASMF77	Communications Server	Changed member: New fields added to SMF 119 subtypes 4 and 6 to show the associated dynamic IQDX information. <b>Reason for change:</b> HiperSockets optimization for intraensemble data networks



## Chapter 2. Summary of changes to SYS1.PARMLIB

### New and changed SYS1.PARMLIB members for z/OS V2R2

Table 4 lists the new and changed members of SYS1.PARMLIB for z/OS V2R2.

Table 4. Summary of new and changed SYS1.PARMLIB members for z/OS V2R2

Member	Element or feature	Description
AXRxx	BCP	<ul style="list-style-type: none"> <li>New parameter: MAXTSOSERVERS, which specifies the maximum number of TSO server address spaces.</li> <li>New parameter: TIMEINTxx, which specifies the default time limit on REXX execs, overriding the current default of 30 seconds.</li> <li>Changed parameter: MaxWorkerTasks now has a maximum of 32. Previously, the maximum was 64.</li> </ul> <p><b>Reason for change:</b> System REXX enhancement</p>
BLSCECT	BCP	<p>Changed: Now recognizes system symbols in parmlib processing. <b>Reason for change:</b> System symbol support</p> <p>Changed: Now includes IXGIPCSP parmlib member for logger control block models. <b>Reason for change:</b> Release update.</p>
BLSCUSER	BCP	<p>Changed: Now recognizes system symbols in parmlib processing. <b>Reason for change:</b> System symbol support</p> <p>Changed: The syntax of the ENVIRONMENT keyword of the DATA statement is ENVIRONMENT(<i>program</i> [,<i>arch</i>]). The ENVIRONMENT option for some of the other statements was clarified to indicate the correct selections. <b>Reason for change:</b> Correction.</p>
BPXPRMxx	z/OS UNIX	<ul style="list-style-type: none"> <li>New statement: BUFFERMONITOR starts the virtual storage monitor. <b>Reason for change:</b> APAR OA47493</li> <li>New statement: KERNELSTACKS specifies whether the kernel is to use above-the-bar or below-the-bar storage for space switched stacks (stack storage when running in the kernel address space). <b>Reason for change:</b> Stacks above the bar support</li> <li>The value range for SHRLIBRGNSIZE has been updated to indicated that the specified value, if within range, is rounded up to a megabyte boundary. Because the shared library region is allocated in megabytes, the value for SHRLIBRGNSIZE must be evenly divisible by 1048576. <b>Reason for change:</b> APAR OA44841</li> <li>Two new optional parameters were added to the FILESYSTEM statement, RNODEWAIT(t) and WAITABEND. <b>Reason for change:</b> APAR OA46056</li> <li>Information about the SECURITY and NOSECURITY parameters were added. <b>Reason for change:</b> Missing information.</li> </ul>
CEAPRMxx	BCP	<p>Two new operands, MAXSESSIONS and MAXSESSPERUSER, were added to the TSOASMGR statement. <b>Reason for change:</b> Added ability to control the limits on the number of TSO/E address spaces available for the z/OSMF ISPF task and the number of concurrent TSO/E spaces.</p>
CONFIGxx	BCP	<p>Changed statement: The PFID statement for the CONFIGxx parmlib member can be 00-x'FFFF'. <b>Reason for change:</b> Release update; also APAR OA44791.</p>

## SYS1.PARMLIB

Table 4. Summary of new and changed SYS1.PARMLIB members for z/OS V2R2 (continued)

Member	Element or feature	Description
CONSOLxx	BCP	New keyword for the CONSOLxx statement: The system automatically issues a LOGOFF command for the console after the number of minutes specified by the TIMEOUT keyword has occurred without any console input activity. <b>Reason for change:</b> Release update
COUPLExx	BCP	New statement: CFRMTAKEOVERCF allows the installation to request operator prompting to control usage of coupling facilities that are owned by a different sysplex. <b>Reason for change:</b> Gain ownership processing enhancement
CTIDMPxx	BCP	New member <b>Reason for change:</b> Release update
CTIRES00	Communications Server	Changed member:  Added the OPTIONS(TRACERES) option to collect Trace Resolver output as Resolver CTRACE records. <b>Reason for change:</b> Activate Resolver trace without restarting applications
DEVSUPxx	BCP	<ul style="list-style-type: none"> <li>New keyword: EOSV2 erases either one track at a time, or up to 255 tracks in a single-channel program. <b>Reason for change:</b> Exploitation of the new EOS channel program for PPRC devices; also APAR OA43696 in z/OS V2R1.</li> <li>New keyword: The PPRCMT value was added for the ENABLE and DISABLE keywords. It enables or disables the Multi-Target PPRC support. <b>Reason for change:</b> Multi-Target PPRC support; also APAR OA43661</li> <li>New keyword: GREATER_253 specifies, in a system managed tape environment, whether SMS on a scratch allocation request can return more than 253 tape subsystems (device pools) to MVS™ Allocation. <b>Reason for change:</b> Release update; also APAR OA44351</li> <li>New value: The SSR value was added for the ENABLE and DISABLE keywords. It enables or disables the secondary space reduction support of the Device Manager. <b>Reason for change:</b> RAS enhancements</li> <li>The default for REFUCB was changed from DISABLE to ENABLE. <b>Reason for change:</b> Release update</li> <li>New keyword: MULTINCRFLC, which enables or disables Multiple Incremental FlashCopy® or Change Recording Version 2 function. <b>Reason for change:</b> APAR OA45412</li> </ul>
DIAGxx	BCP	New keyword: FREEMAINEDFRAMES controls the use of the freemained frames feature. <b>Reason for change:</b> APAR OA46291  Starting in z/OS V2R2, the IeaSlipConfirm trap which was introduced in z/OS V2R1 with APAR OA45297 is obsolete. In V2R2, SLIP always issues message IEE088D when MODE=HOME is specified without JOBNAME and ASID. <b>Reason for change:</b> APAR OA46291
EZAIPCSP	Communications Server	Added additional control block formatters. <b>Reason for change:</b> Release update
GRSMONxx	BCP	New member. <b>Reason for change:</b> Added to support the new GRS SMF 87 Monitor.
GTZPRMxx	BCP	New statement: The PERSIST statement specifies whether to persist GTZ data. <b>Reason for change:</b> Enhancement to Generic Tracker

Table 4. Summary of new and changed SYS1.PARMLIB members for z/OS V2R2 (continued)

Member	Element or feature	Description
IEAOPTxx	BCP	The MCCFXTPR=xxx parameter was updated as part of performance enhancements for LPARs with large amounts of real storage, especially LPARs with more than 320GB of central storage. <b>Reason for change:</b> Release update
		The value range for the BLWLINTHD statement was changed from 5-65535 seconds to 1-65535 seconds. <b>Reason for change:</b> Release update
IEASYMxx	BCP	Changed statement: SYMDEF reflects support for longer system symbol names and longer symbol substitution values. <b>Reason for change:</b> Release update
IEASYsxx	BCP	<ul style="list-style-type: none"> <li>New option: Specify a LOGREC log stream name with LOGREC=LOGSTREAM=log.stream.name. <b>Reason for change:</b> Release update.</li> <li>The INCLUDE1MAFC option on the LFAREA parameter now allows you to specify YES or NO, and the default is now INCLUDE1MAFC(YES). <b>Reason for change:</b> Release update.</li> <li>A new option, LOGSTREAM=lsname, was added to the LOGREC parameter. <b>Reason for change:</b> Release update.</li> </ul>
IECIOSxx	BCP I/O	New keyword for the MIH statement: IOTTAPE specifies the I/O timing limit to be used for all TAPE devices. <b>Reason for change:</b> Release update
IEFOPZxx	BCP	New parmlib member. <b>Reason for change:</b> OA47689
IGDSMSxx	DFSMSdfp	<ul style="list-style-type: none"> <li>New parameter: USER_ACSVAR specifies values that SMS uses to initialize the ACS read-only variable &amp;USER_ACSVAR. <b>Reason for change:</b> Release update</li> </ul>
IGGCATxx	DFSMSdfp	<ul style="list-style-type: none"> <li>New parameter: GDGEXTENDED specifies whether GDG Extended is allowed or not on DEFINE of a GDG. <b>Reason for change:</b> Release update</li> <li>New parameter: GDGSCRATCH specifies that the default when defining a base GDG should be SCRATCH, rather than NOSCRATCH. <b>Reason for change:</b> Release update</li> <li>New parameter: GDGPURGE specifies what the default for DEFINE GDG should be when neither the PURGE nor the NOPURGE parameter is specified. <b>Reason for change:</b> Release update</li> </ul>
IKJTSOxx	TSO/E	<ul style="list-style-type: none"> <li>New keyword: PASSWORDPREPROMPT on LOGON parameter specifies whether the user will be prompted to enter both the user ID and password prior to the presentation of any other information. <b>Reason for change:</b> APAR OA44855</li> <li>Updated parameter: OPERSEWAIT default on SEND parameter changed from ON to OFF. <b>Reason for change:</b> OPERSEWAIT Default enhancement</li> </ul>
IPCSPRxx	BCP	Changed: Now recognizes system symbols in parmlib processing. <b>Reason for change:</b> System symbol support

## SYS1.PARMLIB

Table 4. Summary of new and changed SYS1.PARMLIB members for z/OS V2R2 (continued)

Member	Element or feature	Description
ISFPRMxx or ISFPARMS	SDSF	<p>New parameters:</p> <ul style="list-style-type: none"> <li>FLD statement (and the ISFFLD macro) now accept APFFLDS, APFFLD2, ENQFLDS, ENQFLD2, LNKFLDS, LNKFLD2, LPAFLDS, LPAFLD2, PAGFLDS, PAGFLD2, PARMFLDS, PARMFLD2, SRCHFLDS, SRCHFLD2, SYMFLDS, SYMFLD2, SYSFLDS, and SYSFLD2. These define customized field lists for the new panels.</li> <li>FLD statement (and the ISFFLD macro) now accept JDDFLDS, JDDFLD, JDMFLDS, JDMFLD2, JDYFLDS, JDYFLD2, JSFLDS, JSFLD2, JGFLDS, JGFLD2, JDPFLDS and JDPFLD2. These define customized field lists for the new panels.</li> </ul> <p>Changed parameters:</p> <p>The CONNECT statement can now be use to control the automatic start of SDSFAUX.</p> <p>New values for the PROPERTY statement:</p> <ul style="list-style-type: none"> <li>Panel.JM.NoUseAux and Panel.JDD.NoUseAux, to control whether SDSFAUX is used to gather data for the JM and JD panels</li> <li>Panel.All.JESplexScope, Panel.APF.JESplexScope, Panel.ENQ.JESplexScope, Panel.LNK.JESplexScope, Panel.LPA.JESplexScope, Panel.PAG.JESplexScope, Panel.PARM.JESplexScope, Panel.SYM.JESplexScope, and Panel.SYS.JESplexScope control the scope of the APF, ENQ, LNK, LPA, PAG, PARM, SYM, and SYS panels</li> <li>Command.SLASH.CommandLimit controls how many commands are stored between sessions</li> <li>Command.SLASH.NoDynamicPanels controls whether the size of the System Command Extension pop-up varies with the screen size</li> </ul> <p>The HASPINDX data set is no longer used. As a result, these statements are ignored: IDBLKS, INDEX, INDXVOL, and NIDBUF. In addition, this custom property is ignored: Log.Syslog.UseHaspIndx.  <b>Reason for change:</b> Release update</p>
ISTSMF77	Communications Server	<p><b>Reason for change:</b> VTAM 3270 intrusion detection services record, APAR OA49911</p>
IVTPRM00	Communications Server	<p>The default value for FIXED MAX was changed from 100 M to 200 M. The FIXED MAX value in IVTPRM00 was changed to 240 M.  <b>Reason for change:</b> Added support for 64-bit addressing.</p>
		<p>A new statement, HVCOMM MAX, was added to support 64-bit enablement of the TCP/IP stack, strategic DLCs, and CSM.  <b>Reason for change:</b> Added support for 64-bit addressing.</p>
IXGCNFxx	BCP	<ul style="list-style-type: none"> <li>Changed member: MANAGE statement with ALLOCAHEAD keyword added.  <b>Reason for change:</b> Release update</li> <li>Changed member: LOGRCDS ALLOWACCESS keyword added to the MANAGE statement.  <b>Reason for change:</b> Release update</li> </ul>
IXGIPCSP	BCP	<p>New parmlib member: Provides the IPCS control block model formatters for logger.  <b>Reason for change:</b> Release update</p>
LOADxx	BCP	<p>Updated statement: The PROCVIEW statement was updated.  <b>Reason for change:</b> APAR OA43366</p> <p>New keyword: The MACHMIG statement of the LOADxx parmlib member was added.  <b>Reason for change:</b> Release update</p>



Table 4. Summary of new and changed SYS1.PARMLIB members for z/OS V2R2 (continued)

Member	Element or feature	Description
PROGxx	BCP	<ul style="list-style-type: none"> <li>New keyword: DELETEFORCE on EXIT statement. <b>Reason for change:</b> Control whether any deletion of an exit routine (by CSVDYNEX, SETPROG, or an EXIT DELETE statement in PROGxx) must specify FORCE=YES.</li> <li>New keyword: SERVICEMASK on EXIT statement. <b>Reason for change:</b> Control whether an exit routine will be called for a given caller.</li> </ul>
SMFLIMxx	BCP	<p>New parmlib member.</p> <p>The SMFLIMxx member allows installations to specify region and memlimit values similar to the output fields in the IEFUSI SMF exit. <b>Reason for change:</b> Improved management of region sizes.</p>
SMFPRMxx	BCP	<ul style="list-style-type: none"> <li>New statement: The RECSIGN statement enables digital signatures for SMF records. <b>Reason for change:</b> Improves the security of SMF records.</li> <li>New statement: The INMEM statement defines SMF in-memory resources. <b>Reason for change:</b> APAR OA49263</li> <li>New statement: The HFTSINTVL statement enables high-frequency throughput statistics. <b>Reason for change:</b> APAR OA48570</li> </ul>

### New and changed SYS1.PARMLIB members for z/OS V2R1

Table 5 lists the new and changed members of SYS1.PARMLIB for z/OS V2R1.

Table 5. Summary of new and changed SYS1.PARMLIB members for z/OS V2R1

Member	Element or feature	Description
ALLOCxx	BCP	<p>New parameter: BATCH_RCLMIGDS specifies how migrated data sets will be recalled. <b>Reason for change:</b> Release update</p>
AUTOR00	BCP	<p>New parameter: RATELIMIT sets the rate limit value to indicate the number of replies for a specific message ID that can be issued per second. <b>Reason for change:</b> Release update</p>

## SYS1.PARMLIB

Table 5. Summary of new and changed SYS1.PARMLIB members for z/OS V2R1 (continued)

Member	Element or feature	Description
BPXPRMxx	z/OS UNIX	<ul style="list-style-type: none"> <li>Changed statement: AUTOCVT activates and deactivates automatic conversion of I/O data using coded character sets. <b>Reason for change:</b> Release update</li> <li>New statement: MAXIOBUFUSER specifies the user of persistent kernel storage for I/O buffers by each process when used in a Unicode conversion environment. <b>Reason for change:</b> Unicode exploitation</li> <li>New statement: MAXPIPEUSER specifies the maximum number of named or unnamed pipes that a user can open and use concurrently. <b>Reason for change:</b> Pipes enhancement</li> <li>New statement: The PWT parameter indicates whether processes that are waiting for terminal input should be timed out. <b>Reason for change:</b> Automatically logging off inactive terminals</li> <li>New options for the PARM parameter. Two parameter key options were added as part of the TFS configuration options: <ul style="list-style-type: none"> <li>-ea <i>count</i> allows the TFS file system to automatically grow <i>count</i> times</li> <li>-em <i>count</i> allows the TFS file system to manually grow <i>count</i> times</li> </ul> The parameter key options are documented in the TFS section of <i>z/OS UNIX System Services Planning</i>. <b>Reason for change:</b> Early warning of full file systems</li> <li>Updated information: The LOSTMSG parameter was updated with additional information. <b>Reason for change:</b> Clarifications</li> <li>A restriction has been added that zFS does not support DDNAME. Use the FILESYSTEM keyword instead. <b>Reason for change:</b> Clarifications</li> </ul>
CBROAMxx	OAM	<p>New statement: SETTLIB statement overrides the default behavior for some of the main cartridge entry messages in a system managed tape library environment. <b>Reason for change:</b> System-Managed Tape Enhancement</p>
CEAPRMxx	BCP	<p>New parameter: HLQLONG(CEA) specifies the high-level qualifier for all log snapshot data sets. <b>Reason for change:</b> Release update</p>
CLOCKxx	BCP	<p>Changed member: ACCURACY is added to specify an acceptable time deviation <b>Reason for change:</b> Release update.</p>
CNGRPxx	BCP	<p>New support: Hardware management multiple console support (HMCS) can now be members of a console. <b>Reason for change:</b> Release update</p>
COFVLFxx	BCP	<p>New member: ALERTAGE specifies the age, in seconds, for objects in the specified class. <b>Reason for change:</b> Release update</p>
COMMNDxx	BCP	<p>Changed member: Lines that begin with an asterisk in column 1 are comments. <b>Reason for change:</b> Release update; also APAR OA38328.</p>
CONFIGxx	BCP	<p>Changed member: PFID specifies the configuration of the PCIE function identifiers (PFIDs). <b>Reason for change:</b> Release update</p>
CONSOLxx	BCP	<p>Changed member: DEVNUM added HMCS to support the consoles. <b>Reason for change:</b> Release update</p>
CTIRES00	Communications Server	<p>Changed member:</p> <p>Added the OPTIONS(TRACERES) option to collect Trace Resolver output as Resolver CTRACE records. <b>Reason for change:</b> Activate Resolver trace without restarting applications</p>

Table 5. Summary of new and changed SYS1.PARMLIB members for z/OS V2R1 (continued)

Member	Element or feature	Description
CUNUNlxx	Unicode	<p>Changed member:</p> <p>ADD BLDLOCALE adds locales to the Unicode environment.</p> <p>REPLACE BLDLOCALE replaces locales in the Unicode environment.</p> <p>DELETE BLDLOCALE deletes locales from the Unicode environment.</p> <p><b>Reason for change:</b> Release update</p>
DEVSUPxx	BCP	<p>New parameter:</p> <p>JES3_ALLOC_ASSIST specifies that the allocation assist support is enabled for use with JES3.</p> <p><b>Reason for change:</b> Release update</p>
DIAGxx	BCP	<p>New parameter:</p> <p>CBLOC adds subparameter IHAASVT. IEARTSGNL TRACE turns on system tracing of RISGNL.</p> <p>The IBM-supplied Program Properties Table (PPT) values are updated with BHII1TPC, Basic Hyperswap BHIHSRV address space.</p> <p><b>Reason for change:</b> Release update</p> <hr/> <p>New keyword: FREEMAINEDFRAMES controls the use of the freemained frames feature.</p> <p><b>Reason for change:</b> APAR OA46291, which was rolled back to z/OS V2R1.</p>
EDGRMMxx	DFSMSrmm	<p>New parameter: OPTION parameter MCATTR enables the use of DFSMS Management Class (MC) attributes for DFSMSrmm that are relevant for tape management.</p> <p>Changed parameter: OPTION parameter RETENTIONMETHOD updated with new EXPDT retention options LASTREF   NOLASTREF, to specify the number of days that the data set will be retained after the data set was last referenced, and RETAINBY, to specify whether DFSMSrmm retains multi-volume sets as individual volumes, as a set of one or more volumes, or to base expiration information on the first file in the volume set.</p> <p><b>Reason for change:</b> Release update</p>
EZAIPCSP	Communications Server	<ul style="list-style-type: none"> <li>• Changed member: <ul style="list-style-type: none"> <li>Provides formatting support for SMC-R control blocks.</li> <li><b>Reason for change:</b> Shared Memory Communications over Remote Direct Memory Access</li> </ul> </li> <li>• Changed member: <ul style="list-style-type: none"> <li>Provides formatting support for the real-time application-controlled TCP/IP trace NMI.</li> <li><b>Reason for change:</b> Real-time application-controlled TCP/IP trace NMI</li> </ul> </li> </ul>
GRSCNFxx	GRS	<p>New parameter:</p> <p>MONITOR parameter turns GRS monitoring on or off.</p> <p><b>Reason for change:</b> Release update; also APAR OA42221.</p>
GTFPARAM	BCP	<p>Changed member:</p> <p>Lines that begin with an asterisk in column 1 are comments.</p> <p><b>Reason for change:</b> Release update; also APAR OA38328.</p>
HZSPRMxx	BCP	<p>New member:</p> <p>Added for the automatic start of Health Checker for z/OS.</p> <p><b>Reason for change:</b> Health Checker for z/OS</p>
IEAABD00	BCP	<p>Changed member:</p> <p>Lines that begin with an asterisk in column 1 are comments.</p> <p><b>Reason for change:</b> Release update; also APAR OA38328.</p>

## SYS1.PARMLIB

Table 5. Summary of new and changed SYS1.PARMLIB members for z/OS V2R1 (continued)

Member	Element or feature	Description
IEAAP00	BCP	<p>Changed member:</p> <p>Now allows comments, indicated by an asterisk in the first column or a combination of /* and */ between columns 1 and 71. Comments are allowed at the start of the member or interspersed throughout the member.  <b>Reason for change:</b> Release update</p>
IEACMD00	BCP	<p>Changed member:</p> <p>Lines that begin with an asterisk in column 1 are comments.  <b>Reason for change:</b> Release update; also APAR OA38328.</p>
IEADMP00	BCP	<p>Changed member:</p> <p>Lines that begin with an asterisk in column 1 are comments.  <b>Reason for change:</b> Release update; also APAR OA38328.</p>
IEADMR00	BCP	<p>Changed member:</p> <p>Lines that begin with an asterisk in column 1 are comments.  <b>Reason for change:</b> Release update; also APAR OA38328.</p>
IEAPAKxx	BCP	<p>Changed member:</p> <p>Lines that begin with an asterisk in column 1 are comments.  <b>Reason for change:</b> Release update; also APAR OA38328.</p>
IEAOPTxx	BCP	<p>The MCCFXTPR=xxx parameter was updated as part of performance enhancements for LPARs with large amounts of real storage, especially LPARs with more than 320 GB of central storage.  <b>Reason for change:</b> APAR OA44668.</p>
		<p>The value range for the BLWLINTHD statement was changed from 5-65535 seconds to 1-65535 seconds.  <b>Reason for change:</b> APAR OA44526.</p>
IEASYSxx	BCP	<p>Changed member:</p> <p>New parameters are GTZ, HZS, HZSPROC, and IQP.</p> <p>Lines that begin with an asterisk in column 1 are comments.  <b>Reason for change:</b> Release update; also APAR OA38328.</p>
		<p>The new value INCLUDE1MAFC in the LFAREA parameter specifies that the 1 MB pages are to be included in the available frame count (RCEAFC).  <b>Reason for change:</b> APAR OA41968.</p>
IECIOSxx	BCP I/O	<p>New parameters:</p> <ul style="list-style-type: none"> <li>• A new RECOVERY option of DCCF=MESSAGE or DCCF=WAIT_STATE</li> <li>• A new FABRICPRTY parameter on the FICON<sup>®</sup> statement to enable or disable fabric I/O priority</li> <li>• A new HYPERWRITE parameter to enable or disable IBM zHyperWrite data replication</li> </ul> <p><b>Reason for change:</b> APAR OA43674.</p>
		<p>New keyword for the MIH statement: IOTTAPE specifies the I/O timing limit to be used for all TAPE devices.  <b>Reason for change:</b> Release update</p>

Table 5. Summary of new and changed SYS1.PARMLIB members for z/OS V2R1 (continued)

Member	Element or feature	Description
IGDSMSxx	DFSMSdfp	<ul style="list-style-type: none"> <li>New parameter: HONOR_DSNTYPE_PDSE can specify that a partitioned data set be created regardless of the values for other data set attributes, such as data set organization or directory blocks. <b>Reason for change:</b> Release update</li> <li>New parameter: PDSE_VERSION specifies a default version number (1 or 2) for data sets that are allocated with a DSNTYPE value of LIBRARY. <b>Reason for change:</b> PDSE version support</li> <li>New parameter: SUPPRESS_SMSMSG specifies an option to suppress certain messages. The messages that you can suppress are IGD17054I, IGD17227I and IGD17395I. <b>Reason for change:</b> Release update</li> <li>New parameter: MAXGENS_LIMIT specifies an upper limit for the MAXGENS parameter on the DD statement in JCL. MAXGENS specifies the number of generations for version 2 PDSEs. <b>Reason for change:</b> PDSE member generation support</li> <li>New parameter: PS_EXT_VERSION indicates the format in which the system should create extended format data sets. The default is PS_EXT_VERSION(1) to denote the version 1 format. <b>Reason for change:</b> Extended format data set version support</li> <li>.</li> </ul>
IKJTSOxx	Communications Server	<ul style="list-style-type: none"> <li>Changed member: FTP is added to the AUTHCMD and AUTHPGM NAMES sections of IKJTSOxx to enable the z/OS FTP client to determine whether the user has installed the optional FTP client user exits EZAFCCMD and EZAFCREP. <b>Reason for change:</b> Release update</li> </ul>
IOEPRMzz	zFS	<p>New parameters:</p> <ul style="list-style-type: none"> <li>FORMAT_AGGRVERSION specifies the version of the aggregate that will be formatted when you use the <b>zfsadm format</b> command or the Format Aggregate API.</li> <li>CHANGE_AGGRVERSION_ON_MOUNT specifies whether a version 1.4 aggregate should be changed to a version 1.5 aggregate on a primary read-write mount.</li> <li>CONVERTTOV5 specifies whether a version 1.4 aggregate should be changed to a version 1.5 aggregate on a primary read-write mount and each v4 directory is converted to an extended (v5) directory as it is referenced.</li> </ul> <p>The existing CONVERT_AUDITFID default is changed from off to on. <b>Reason for change:</b> Improved large directory performance</p>
IQPPRMxx	BCP	<p>New member:</p> <p>The IQPPRMxx parmlib member specifies parameters that are used for managing PCIE related devices. <b>Reason for change:</b> Release update</p>

## SYS1.PARMLIB

Table 5. Summary of new and changed SYS1.PARMLIB members for z/OS V2R1 (continued)

Member	Element or feature	Description
ISFPRMxx or ISFPARMS	SDSF	<p>New parameters:</p> <ul style="list-style-type: none"> <li>• FLD statement (and the ISFFLD macro) now accept APFFLDS, APFFLD2, ENQFLDS, ENQFLD2, LNKFLDS, LNKFLD2, LPAFLDS, LPAFLD2, PAGFLDS, PAGFLD2, PARMFLDS, PARMFLD2, SRCHFLDS, SRCHFLD2, SYMFLDS, SYMFLD2, SYSFLDS, and SYSFLD2. These define customized field lists for the new panels.</li> </ul> <p>Changed parameters:</p> <p>New values for the PROPERTY statement:</p> <ul style="list-style-type: none"> <li>• Panel.All.JESPLexScope, Panel.APF.JESPLexScope, Panel.ENQ.JESPLexScope, Panel.LNK.JESPLexScope, Panel.LPA.JESPLexScope, Panel.PAG.JESPLexScope, Panel.PARM.JESPLexScope, Panel.SYM.JESPLexScope, and Panel.SYS.JESPLexScope control the scope of the APF, ENQ, LNK, LPA, PAG, PARM, SYM, and SYS panels</li> <li>• Browse.Suppress.DupDS controls whether duplicate SYSOUT data sets are included when you browse or print a job</li> <li>• Command.FILTER.SymbolsDisabled controls the use of system symbols with filtering</li> <li>• Console.EMCS.ConModChars names the list of suffixes to use when modifying the console name when the console activation fails due to the console being in use</li> <li>• Console.EMCS.NoConMod disables modification of the console name when console activation fails due to the console being in use</li> <li>• Panel.CK.JESPLexScope, Panel.DA.JESPLexScope, Panel.ENC.JESPLexScope, Panel.PS.JESPLexScope and Panel.All.JESPLexScope control the scope of the CK, DA, ENC, and PS panels</li> <li>• Panel.DA.CPUPctBasedLPAR affects normalization of the CPU% column on the DA panel</li> <li>• Print.CCTL.AlwaysUseASA specifies how SDSF's print function handles carriage control.</li> </ul> <p><b>Reason for change:</b> Release update</p>
ISTSMF77	Communications Server	<p><b>Reason for change:</b> VTAM 3270 intrusion detection services record, APAR OA48802</p>
IXGCNFxx	BCP	<p>Changed member:</p> <p>LSPRIMARY and CONSUMPTIONALERT statements are added.</p> <p><b>Reason for change:</b> Release update</p>
LOADxx	BCP	<p>Changed statement:</p> <p>DYNCPADD is updated.</p> <p><b>Reason for change:</b> Release update</p>
LPALSTxx	BCP	<p>Changed member:</p> <p>Lines that begin with an asterisk in column 1 are comments.</p> <p><b>Reason for change:</b> Release update; also APAR OA38328.</p>
PROGxx	BCP	<p>New parameters:</p> <p>TRACKDIRLOAD and NOTRACKDIRLOAD are added to enable or disable system-wide tracking of directed load modules.</p> <p><b>Reason for change:</b> Release update</p>

Table 5. Summary of new and changed SYS1.PARMLIB members for z/OS V2R1 (continued)

Member	Element or feature	Description
SMFPRMxx	System Management Facilities (SMF)	<p>New parameters:</p> <ul style="list-style-type: none"> <li>AUTHSETSMF specifies whether changes are authorized to be made to the SMF parameter options using the SETSMF command.</li> <li>COMPRESS(PERMFIX) specifies compression of SMF records before writing to the log stream. PERMFIX specifies the default amount of storage that SMF can keep permanently fixed.</li> <li>NOAUTHSETSMF</li> <li>NOSMF30COUNT</li> <li>SMF30COUNT is added to enable counter sets.</li> <li>SWT specifies the maximum amount of time that a started task address space is allowed to wait continuously, in hours and minutes.</li> <li>TWT specifies the maximum amount of time that a TSO/E user address space is allowed to wait continuously, in hours and minutes.</li> <li>New statement: The INMEM statement defines SMF in-memory resources (APAR OA49263).</li> </ul> <p><b>Reason for change:</b> Release update</p>
VATLSTxx	BCP	<p>Changed member:</p> <p>Lines that begin with an asterisk in column 1 are comments.</p> <p><b>Reason for change:</b> Release update; also APAR OA38328.</p>

## New and changed SYS1.PARMLIB members for z/OS V1R13

Table 6 lists the new and changed members of SYS1.PARMLIB for z/OS V1R13.

Table 6. Summary of new and changed SYS1.PARMLIB members for z/OS V1R13

Member	Element or feature	Description
ALLOCxx	z/OS UNIX	<p>Changed parameters:</p> <ul style="list-style-type: none"> <li>The CATLG_ERR parameter has changed.</li> <li>The VERIFY_UNCAT parameter has a new option LOGTRACK.</li> </ul> <p><b>Reason for change:</b> Release update</p>
ANTMIN00	z/OS DFSMS	<p>New parameters: CCATTNTHROTTLE and CCREADAHEAD set tuning values for Concurrent Copy.</p> <p><b>Reason for change:</b> System Data Mover RAS</p>
ANTXIN00	z/OS DFSMS	<p>New parameter:</p> <p>SUPPRESSTIMESTAMP controls channel program timestamping on XRC system data mover systems.Changed parameter:</p> <p>MAXTOTALREADERTASKS now defaults to 40 when ALLOWENHANCEDREADERS(NO) is specified. Previously, the default was 80.</p> <p><b>Reason for change:</b> System Data Mover RAS</p>
BPXPRMxx	z/OS UNIX	<p>New statements:</p> <p>MAXUSERMOUNTSYS specifies the maximum number of nonprivileged user mounts in the system.</p> <p>MAXUSERMOUNTUSER specifies the maximum number of nonprivileged user mounts allowed for each nonprivileged user.</p> <p>NONEMPTYMOUNTPT controls the mounting of file systems on non-empty mount point directories.</p> <p><b>Reason for change:</b> Mount granularity</p>

## SYS1.PARMLIB

Table 6. Summary of new and changed SYS1.PARMLIB members for z/OS V1R13 (continued)

Member	Element or feature	Description
CBROAMxx	OAM	<ul style="list-style-type: none"> <li>• New statement: SETDISK statement configures the file system sublevel of the disk level in the OAM storage hierarchy.</li> <li>• New parameter: ABFSERROR on SETOAM statement specifies action when an error occurs while OAM is retrieving an object from the file system.</li> <li>• New parameter: RECALLDISKSUBLEVEL on SETOSMC statement specifies objects will be recalled to disk sublevel 1 (DB2<sup>®</sup>) or sublevel 2 (file system).</li> </ul> <p><b>Reason for change:</b> File system support</p>
CSVLLAxx	BCP	<p>Changed member:</p> <p>CSVLLA00 specifies which libraries (in addition to the LNKLST concatenation) library lookaside (LLA) is to manage. A change occurs for V1R13 in the way the member behaves if you don't specify the member on the LLA=xx parameter of the LLA procedure or specify LLA=NONE. In those cases, LLA will, by default, manage only the libraries that are accessed through the LNKLST concatenation.</p> <p><b>Reason for change:</b> Release update</p>
CTICBR00	OAM	<p>New member:</p> <p>CTICBR00 defines OAM default trace options.</p> <p><b>Reason for change:</b> Release update</p>
DIAGxx	BCP	<p>New keyword: FREEMAINEDFRAMES controls the use of the freemained frames feature.</p> <p><b>Reason for change:</b> APAR OA46291, which was rolled back to z/OS V1R13.</p>
EDGRMMxx	DFSMSrmm	<p>New parameters:</p> <p>OPTION parameter RETENTIONMETHOD sets the system-wide retention method for new tape volume sets created during OCE processing, and for tape volumes added to the DFSMSrmm CDS.</p> <p>OPTION parameter TVEXTPURGE specifies how DFSMSrmm processes volumes to be purged by callers of EDGTVEXT or EDGDFHSM.</p> <p>LOCDEF parameter AUTOMOVE specifies whether a library or storage location that holds tape volumes is eligible for automated movement initiated by inventory management.</p> <p>Changed parameter:</p> <p>The maximum value of OPTION parameters MAXRETPD and RETPD is increased to 93000.</p> <p><b>Reason for change:</b> Release update</p>
EZAIPCSP	Communications Server	<p>Changed member:</p> <p>Provides support for the NSPT (Name Server Polling Task) control block.</p> <p><b>Reason for change:</b> System resolver autonomic quiescing of unresponsive name servers</p>
IEAOPTxx	BCP	<p>New parameters:</p> <ul style="list-style-type: none"> <li>• The new parameter FULLPRESYSTEM allows you to specify full preemption for the system address spaces.</li> <li>• The new parameter STORAGE_SERVER_MANAGEMENT_SUPPORT=YES NO specifies whether or not to pass importance and achievement information in the new IHAASSB and IRAENCB fields. The default is YES.</li> </ul> <p><b>Reason for change:</b> Release update</p>



Table 6. Summary of new and changed SYS1.PARMLIB members for z/OS V1R13 (continued)

Member	Element or feature	Description
IEASYSxx	BCP	New parameter:  The new parameter CATALOG identifies the IGGCATxx members to use during the current IPL. <b>Reason for change:</b> Release update
IECIOSxx	BCP I/O	New parameter:  The new parameter PATH_RECOVERY on the RECOVERY statement allows you to enable the path recovery function for an LSS. <b>Reason for change:</b> Release update
IGDMSxx	DFSMSdfp	New parameters: <ul style="list-style-type: none"> <li>SAM_USE_HPF allows you to specify whether or not you want BAM to use HPF when it is available.</li> <li>SMA_RESERVE_STORAGE_POOL_DSN specifies the name of a PDSE that will contain reserve storage pools (RSPs).</li> <li>SUPPRESS_DRMSGs specifies whether you want SMS to suppress DELETE/RENAME messages issued to the hardcopy log and job log.</li> </ul> <b>Reason for change:</b> Release update
IGGCATxx	DFSMSdfp	New parameters: <ul style="list-style-type: none"> <li>CATMAX specifies the maximum number of catalogs that can be opened concurrently in CAS.</li> <li>TASKMAX specifies the CAS user service task upper limit, which is the maximum number of non-CAS catalog service requests that can run concurrently.</li> </ul> <b>Reason for change:</b> Release update
ISFPRMxx or ISFPARMS	SDSF	New parameters:  New parameters of the ISGRP macro or GROUP statement define customized lists of columns on new SDSF panels: J0FLDS and J0FLD2 (J0 panel), NCFLDS and NCFLD2 (NC panel), NSFLDS and NSFLD2 (NS panel).  Changed parameters:  A new value for CONNECT, XCFSRVNM, defines the XCF server name, or requests that XCF should not be used to provide sysplex data.  New values for the PROPERTY statement: <ul style="list-style-type: none"> <li>Comm.Release.Mode sets the mode that SDSF uses for communication to provide sysplex-wide data on SDSF panels</li> <li>Command.SLASH.Name specifies a character to use for system commands, instead of the slash (/)</li> <li>Panel.PUN.DevNameAlwaysShort and Panel.RDR.DevNameAlwaysShort control how device names are formatted on the PUN and RDR panels.</li> </ul> Changed member:  New CKHFLDS and CKHFLD2 parameters of the ISGRP macro or GROUP statement define customized lists of columns on the CK history panel. <b>Reason for change:</b> Release update
MSGFLDxx	Consoles	New parameters:  The DEFAULTCMD statement in MSGFLDxx parmlib member has a new ASID substitution character. <b>Reason for change:</b> Release update
SMFPRMxx	System Management Facilities (SMF)	Default clarification:  On the LSNAME parameter, there is no default for the TYPE option. <b>Reason for change:</b> Release update



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## Chapter 3. Summary of changes to SYS1.PROCLIB

### New and changed members of SYS1.PROCLIB and SYS1.IBM.PROCLIB for z/OS V2R2

Table 7 lists the new and changed members of SYS1.PROCLIB and SYS1.IBM.PROCLIB for z/OS V2R2.

Table 7. New and changed SYS1.PROCLIB and SYS1.IBM.PROCLIB members for z/OS V2R2

Member	Element or feature	Description
AOPDEMON	Infoprint Server	<b>New member:</b> Added to start one Infoprint Server daemon when the ISPF <b>Operating mode</b> field is z/OS 2.2. <b>Reason for change:</b> Individually started daemons
AOPSTAR2	Infoprint Server	<b>New member:</b> Added to start one or multiple Infoprint Server daemons when the ISPF <b>Operating mode</b> field is z/OS 2.2. <b>Reason for change:</b> Individually started daemons
AOPSTAT	Infoprint Server	<b>New member:</b> Added to display the status of Infoprint Server daemons when the dynamic configuration is set. <b>Reason for change:</b> Dynamic configuration
AOPSTOP2	Infoprint Server	<b>New member:</b> Added to stop one or all Infoprint Server daemons when the ISPF <b>Operating mode</b> field is z/OS 2.2. <b>Reason for change:</b> Individually started daemons
HKCSVR1	IBM Knowledge Center for z/OS	<b>New member:</b> Added to start a Knowledge Center instance of the Websphere Liberty Profile server. <b>Reason for change:</b> Required to run the new Knowledge Center element.

### New and changed members of SYS1.PROCLIB and SYS1.IBM.PROCLIB for z/OS V2R1

Table 8 lists the new and changed members of SYS1.PROCLIB and SYS1.IBM.PROCLIB for z/OS V2R1.

Table 8. New and changed SYS1.PROCLIB and SYS1.IBM.PROCLIB members for z/OS V2R1

Member	Element or feature	Description
HZSPROC	BCP	<b>New member:</b> Added to optionally specify the name of the procedure to be used for the automatic start. <b>Reason for change:</b> IBM Health Checker for z/OS

### New and changed members of SYS1.PROCLIB and SYS1.IBM.PROCLIB for z/OS V1R13

Table 9 lists the new and changed members of SYS1.PROCLIB and SYS1.IBM.PROCLIB for z/OS V1R13.

Table 9. New and changed SYS1.PROCLIB and SYS1.IBM.PROCLIB members for z/OS V1R13

Member	Element or feature	Description
AOPSTART	Infoprint Server	<b>Changed member:</b> Added the REGION=512M parameter to the EXEC statement of AOPSTART. <b>Reason for change:</b> Release enhancements



## Chapter 4. Summary of changes to SYS1.SAMPLIB

### New and changed members of SYS1.SAMPLIB for z/OS V2R2

Table 10 lists the new and changed members of SYS1.SAMPLIB for z/OS V2R2.

Table 10. Summary of new and changed SYS1.SAMPLIB members for z/OS V2R2

Member	Element or feature	Description
CBROSR2	OAM	<b>Updated:</b> Information added for 64-bit buffer support. <b>Reason for change:</b> 64-bit buffer support
GTZPRMxx	BCP	<b>New statement:</b> The PERSIST statement specifies whether to persist GTZ data. <b>Reason for change:</b> Enhancement to Generic Tracker.
HKCCFGFZ	IBM Knowledge Center for z/OS	<b>New Member:</b> Sample job to define, format and mount a zFS linear sequential VSAM cluster file system for the Knowledge Center server configuration files. <b>Reason for change:</b> Required to run the new Knowledge Center element.
HKCDATFZ	IBM Knowledge Center for z/OS	<b>New Member:</b> Sample job to define, format and mount a zFS linear sequential VSAM cluster file system for Knowledge Center content-related data files. <b>Reason for change:</b> Required to run the new Knowledge Center element.
HKCLOGFZ	IBM Knowledge Center for z/OS	<b>New Member:</b> Sample job to define, format and mount a zFS linear sequential VSAM cluster file system for Knowledge Center log files. <b>Reason for change:</b> Required to run the new Knowledge Center element.
HKCMNTFS	IBM Knowledge Center for z/OS	<b>New Member:</b> Sample Rexx Exec called by the HKCCFGFZ, HKCDATFZ and HKCLOGFZ sample jobs to define a mount point and mount the file system there. <b>Reason for change:</b> Required to run the new Knowledge Center element automatically at IPL time.
HKCMOUNZ	IBM Knowledge Center for z/OS	<b>New Member:</b> Sample mount commands to be copied into the BPXPRMxx member of the system parmlib for automatically mounting at IPL time the filesystems created by the HKCCFGFZ, HKCDATFZ and HKCLOGFZ sample jobs. <b>Reason for change:</b> Required to run the new Knowledge Center element.
HWTHXC1	z/OS Client Web Enablement Toolkit	<b>New member:</b> C and C++ sample program using the HTTP enabler callable services that are available in the toolkit. <b>Reason for change:</b> Support for developing HTTP applications.
HWTHXCB1	z/OS Client Web Enablement Toolkit	<b>New member:</b> COBOL sample program using the HTTP enabler callable services that are available in the toolkit. <b>Reason for change:</b> Support for developing HTTP applications.
HWTHXPL1	z/OS Client Web Enablement Toolkit	<b>New member:</b> PL/I sample program using the HTTP enabler callable services that are available in the toolkit. <b>Reason for change:</b> Support for developing HTTP applications.
HWTHXAS1	z/OS Client Web Enablement Toolkit	<b>New member:</b> Assembly language sample program using the HTTP enabler callable services that are available in the toolkit. <b>Reason for change:</b> Support for developing HTTP applications.

## SYS1.SAMPLIB

Table 10. Summary of new and changed SYS1.SAMPLIB members for z/OS V2R2 (continued)

Member	Element or feature	Description
HWTJXC1	z/OS Client Web Enablement Toolkit	<b>New member:</b> C and C++ sample program using the JSON parser callable services that are available in the toolkit. <b>Reason for change:</b> Support for developing JSON parser applications.
HWTJXCB1	z/OS Client Web Enablement Toolkit	<b>New member:</b> COBOL sample program using the JSON parser callable services that are available in the toolkit. <b>Reason for change:</b> Support for developing JSON parser applications.
HWTJXPL1	z/OS Client Web Enablement Toolkit	<b>New member:</b> PL/I sample program using the JSON parser callable services that are available in the toolkit. <b>Reason for change:</b> Support for developing JSON parser applications.
ICKSADSF	ICKDSF	The ICKSADSF member was updated to the latest level, which is PTF UK71587. <b>Reason for change:</b> APAR PI38768
IKJTSO00	TSO/E	<b>Updated parameter:</b> FTP has been removed from the AUTHCMD, AUTHPGM, and AUTHTSF lists of the IKJTSO00 samplib member. This reverses the change from V2R1 to add FTP to those lists. <b>Reason for change:</b> APAR OA45541 <b>Updated parameter:</b> Program ADYOPCMD has been added to the AUTHCMD list. Program AOPCMND has been added to the AUTHPGM list. <b>Reason for change:</b> Release update.
IRRADULD	RACF®	<b>Updated:</b> The sample SMF Unload DB2 load and table statements are updated for the KDFAES and SPECIALCHARS settings. <b>Reason for change:</b> Password security enhancements
IRRADUTB	RACF	<b>Updated:</b> The sample SMF Unload DB2 load and table statements are updated for the KDFAES and SPECIALCHARS settings. <b>Reason for change:</b> Password security enhancements
IRRICE	RACF	<b>Updated:</b> Added a sample program to find the certificate labels that result to the same string after folding to uppercase and the conversion of blanks and special characters to an underscore (_). <b>Reason for change:</b> R_datalib callable service enhancement.
IXGLOGRF	BCP	<b>New:</b> Sample JCL to format the primary and alternate couple data sets for system logger (LOGR CDS). <b>Reason for change:</b> Release update.
IXGLOGRP	BCP	<b>New:</b> Sample JCL to run the utility to create or update the administrative policy in the primary and alternate couple data sets for system logger (LOGR CDS). <b>Reason for change:</b> Release update.
RACDBULD	RACF	<b>Updated:</b> Information added for sample Database Unload DB2 load and table statements to include new fields, SPECIALCHARS and KDFAES. <b>Reason for change:</b> Password security enhancements
RACDBUTB	RACF	<b>Updated:</b> Information added for sample Database Unload DB2 load and table statements to include new fields, SPECIALCHARS and KDFAES. <b>Reason for change:</b> Password security enhancements

Table 10. Summary of new and changed SYS1.SAMPLIB members for z/OS V2R2 (continued)

Member	Element or feature	Description
RACINSTL	RACF	<b>Updated:</b> RACINSTL and RACPARM members contain references to the ICHDEX01 sample that is no longer shipped in z/OS V2R2. <b>Reason for change:</b> Password security enhancements
RACJCL	RACF	<b>Updated:</b> Added information in the prolog comments about an owning node/system. <b>Reason for change:</b> RACF Remote Sharing Facility (RRSF) allowing dynamic MAIN switching
SPPACK	BCP	<b>Changed member:</b> Maintenance. <b>Reason for change:</b> Changed in every release for release updates

### New and changed members of SYS1.SAMPLIB for z/OS V2R1

Table 11 lists the new and changed members of SYS1.SAMPLIB for z/OS V2R1.

Table 11. Summary of new and changed SYS1.SAMPLIB members for z/OS V2R1

Member	Element or feature	Description
HWTXHC1	z/OS Client Web Enablement Toolkit	<b>New member:</b> C and C++ sample program using the HTTP enabler callable services that are available in the toolkit. <b>Reason for change:</b> APAR OA46622, support for developing HTTP applications.
HWTXCB1	z/OS Client Web Enablement Toolkit	<b>New member:</b> COBOL sample program using the HTTP enabler callable services that are available in the toolkit. <b>Reason for change:</b> APAR OA46622, support for developing HTTP applications.
HWTXPL1	z/OS Client Web Enablement Toolkit	<b>New member:</b> PL/I sample program using the HTTP enabler callable services that are available in the toolkit. <b>Reason for change:</b> APAR OA46622, support for developing HTTP applications.
HWTXAS1	z/OS Client Web Enablement Toolkit	<b>New member:</b> Assembly language sample program using the HTTP enabler callable services that are available in the toolkit. <b>Reason for change:</b> APAR OA46622, support for developing HTTP applications.
HWTJXC1	z/OS Client Web Enablement Toolkit	<b>New member:</b> C and C++ sample program using the JSON parser callable services that are available in the toolkit. <b>Reason for change:</b> APAR OA46575, support for developing JSON parser applications.
HWTJCB1	z/OS Client Web Enablement Toolkit	<b>New member:</b> COBOL sample program using the JSON parser callable services that are available in the toolkit. <b>Reason for change:</b> APAR OA46575, support for developing JSON parser applications.
HWTJXPL1	z/OS Client Web Enablement Toolkit	<b>New member:</b> PL/I sample program using the JSON parser callable services that are available in the toolkit. <b>Reason for change:</b> APAR OA46575, support for developing JSON parser applications.
HZSPROC	BCP	<b>Deleted:</b> Moved to SYS1.PROCLIB. <b>Reason for change:</b> Health Checker for z/OS
ICKSADSF	ICKDSF	The ICKSADSF member was updated to the latest level, which is PTF UK71587. <b>Reason for change:</b> APAR PI38768

## SYS1.SAMPLIB

Table 11. Summary of new and changed SYS1.SAMPLIB members for z/OS V2R1 (continued)

Member	Element or feature	Description
IKJTSO00	TSO/E	<b>Updated:</b> The FTP entry is added in the AUTHCMD and AUTHPGM NAMES section. <b>Reason for change:</b> TSO/E enhancement
IKYCDB2	Cryptographic Services	<b>Updated:</b> Remove the grant for the DBADM privilege on the database, and remove the grant for EXECUTE privilege on the package. <b>Reason for change:</b> DB2 enhancements
IKYSBIND	Cryptographic Services	<b>Updated:</b> Removed the BIND PLAN statement. <b>Reason for change:</b> DB2 enhancements
IKYSGRNT	Cryptographic Services	<b>New:</b> A sample job to grant execute privilege on the DB2 package for PKI Services to the PKI Services daemon user ID. <b>Reason for change:</b> DB2 enhancements
IKYSETUP	Cryptographic Services	<ul style="list-style-type: none"> <li><b>Updated:</b> Includes setup for granular control of administrative functions. <b>Reason for change:</b> Granular control of administrative functions</li> <li><b>Updated:</b> The variable that determines the key type of the private key generated for the PKI CA certificate supports additional values for secure keys in the token data set (TKDS) <b>Reason for change:</b> Enterprise PKCS #11 secure key support</li> </ul>
RACDBULD	RACF	<ul style="list-style-type: none"> <li><b>Updated:</b> Information added for DB2 Load Utility statements to process new general resource certificate information (1560) records. <b>Reason for change:</b> Database Unload of Certificate DNs support</li> <li><b>Updated:</b> Added information for GENREQ certificate deletion. <b>Reason for change:</b> RACDCERT GENREQ certificate deletion support</li> </ul>
RACDBUTB	RACF	<ul style="list-style-type: none"> <li><b>Updated:</b> Added information for DB2 CREATE INDEX / CREATE TABLE statements. <b>Reason for change:</b> Database Unload of Certificate DNs support</li> <li><b>Updated:</b> Added information for GENREQ certificate deletion. <b>Reason for change:</b> RACDCERT GENREQ certificate deletion support</li> </ul>
SPPACK	BCP	<b>Changed member:</b> Maintenance. <b>Reason for change:</b> Changed in every release for release updates

## New and changed members of SYS1.SAMPLIB for z/OS V1R13

Table 12 on page 27 lists the new and changed members of SYS1.SAMPLIB for z/OS V1R13.



Table 12. Summary of new and changed SYS1.SAMPLIB members for z/OS V1R13

Member	Element or feature	Description
BPMKDIR	z/OS UNIX	<b>Updated:</b> BPMKDIR was updated to redirect the usr/spool, usr/mail, and usr/lib/cron directories to /var directories if setup work has not already been done. <b>Reason for change:</b> Symbolic link support
CBRSR1D	OAM	<b>New:</b> Required migration job. <b>Reason for change:</b> File system support.
EDGMM01	DFSMrmm	<b>Updated:</b> Information added for RMTAB and VXTAB tables. <b>Reason for change:</b> Selection of the retention method and VRSEL exclusion.
ICKSADSF	ICKDSF	The ICKSADSF member was updated to the latest level, which is PTF UK71587. <b>Reason for change:</b> APAR PI38768
IKYCDB2	Cryptographic Services	<b>New:</b> Creates DB2 objects for the object store and issued certificate list (ICL). <b>Reason for change:</b> DB2 repository for object store and issued certificate list (ICL)
IKYCVSAM	Cryptographic Services	<b>Updated:</b> Changed the CISZ values on DEFINE CLUSTER statements to minimize contention. <b>Reason for change:</b> Release update
IKYSBIND	Cryptographic Services	<b>New:</b> A sample job to create the DB2 package and plan for the object store and issued certificate list (ICL). <b>Reason for change:</b> DB2 repository for object store and issued certificate list (ICL)
IKYSETUP	Cryptographic Services	<b>Updated:</b> Allow hardware-generated elliptic curve cryptography (ECC) keys for the CA's private key. <b>Reason for change:</b> Support for hardware-genera
		<b>Updated:</b> Authorize PKI Services daemon to use DB2 Resource Recovery Services Access Facility (RRSAF). <b>Reason for change:</b> DB2 repository for object store and issued certificate list (ICL) ECC keys
SPPACK	BCP	<b>Changed member:</b> Maintenance. <b>Reason for change:</b> Changed in every release for release updates



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## Chapter 5. BCP (MVS) summary of interface changes

In addition to the interface changes included in this topic, updates to the BCP resulted in SYS1.PARMLIB and SYS1.SAMPLIB member changes. See Chapter 2, “Summary of changes to SYS1.PARMLIB,” on page 7 and Chapter 4, “Summary of changes to SYS1.SAMPLIB,” on page 23 for those changes.

The BCP interfaces described in this topic are:

- “Callable services for high-level languages”
- “Installation exits” on page 33
- “Control blocks” on page 34
- “IPCS Subcommands” on page 35
- “Services and macros” on page 37
- “Messages” on page 36
- “SMF records” on page 44
- “MVS (BCP) system commands” on page 47

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### Callable services for high-level languages

There are many documents in the z/OS library that contain callable services. For details about the callable services for high-level languages (HLL) that are listed here, see *z/OS MVS Programming: Callable Services for High-Level Languages*.

#### New and changed callable services in z/OS V2R2

Table 13 lists the new and changed callable services.

Table 13. Summary of new and changed callable services for high-level languages in z/OS V2R2

Service name	Description	Reason for change
FPZ4RZV	<b>New:</b> New RmrEntriesExact option	APAR OA45054
HWICMD	<b>New:</b> Information about the use of SMF record type 106 has been added	Release update
HWIQUERY	<b>New:</b> New constant values for the QueryParm_Ptr (QueryParm.) parameter	Release update
HWIREXX	<b>New:</b> Information about the HWIREXX helper program has been added	APAR OA45932
HWISET	<b>New:</b> Information about the use of SMF record type 106 has been added	Release update
HWTCONST	<b>New:</b> <ul style="list-style-type: none"><li>• New callable service</li><li>• New REXX-only support for HWTJSON and HWTHTTP</li></ul>	APAR OA50659
HWTHCONN	<b>New:</b> New REXX support <b>Updated:</b> Updated callable service	APAR OA50659
HWTHDISC	<b>New:</b> New REXX support <b>Updated:</b> Updated callable service	APAR OA50659

## BCP

Table 13. Summary of new and changed callable services for high-level languages in z/OS V2R2 (continued)

Service name	Description	Reason for change
HWTHINIT	<b>New:</b> New REXX support <b>Updated:</b> Updated callable service	APAR OA50659
HWTHRQST	<b>New:</b> New REXX support <b>Updated:</b> Updated callable service	APAR OA50659
HWTHRSET	<b>New:</b> New REXX support <b>Updated:</b> Updated callable service	APAR OA50659
HWTHSET	<b>New:</b> New REXX support <b>Updated:</b> Updated callable service	APAR OA50659
HWTHSLST	<b>New:</b> New REXX support <b>Updated:</b> Updated callable service	APAR OA50659
HWTHTERM	<b>New:</b> New REXX support <b>Updated:</b> Updated callable service	APAR OA50659
HWTJCREN	<b>New:</b> New REXX support <b>Updated:</b> Updated callable service	APAR OA50659
HWTJESCT	<b>New:</b> New REXX support <b>Updated:</b> Updated callable service	APAR OA50659
HWTJGAEN	<b>New:</b> New REXX support <b>Updated:</b> Updated callable service	APAR OA50659
HWTJGBOV	<b>New:</b> New REXX support <b>Updated:</b> Updated callable service	APAR OA50659
HWTJGJST	<b>New:</b> New REXX support <b>Updated:</b> Updated callable service	APAR OA50659
HWTJGNUE	<b>New:</b> New REXX support <b>Updated:</b> Updated callable service	APAR OA50659
HWTJGOEN	<b>New:</b> New REXX support <b>Updated:</b> Updated callable service	APAR OA50659
HWTJGVAL	<b>New:</b> New REXX support <b>Updated:</b> Updated callable service	APAR OA50659
HWTJINIT	<b>New:</b> New REXX support <b>Updated:</b> Updated callable service	APAR OA50659
HWTJPARS	<b>New:</b> New REXX support <b>Updated:</b> Updated callable service	APAR OA50659
HWTJSERI	<b>New:</b> New REXX support <b>Updated:</b> Updated callable service	APAR OA50659

Table 13. Summary of new and changed callable services for high-level languages in z/OS V2R2 (continued)

Service name	Description	Reason for change
HWTJSRCH	<b>New:</b> New REXX support <b>Updated:</b> Updated callable service	APAR OA50659
HWTJTERM	<b>New:</b> New REXX support <b>Updated:</b> Updated callable service	APAR OA50659
IEAVAPE	<b>Updated:</b> Updated callable service	Restriction
IEAVAPE2	<b>Updated:</b> Updated callable service	Restriction
IEAVPME2	<b>New:</b> New callable service	Multiple pause elements
IEA4APE	<b>Updated:</b> Updated callable service	Restriction
IEA4APE2	<b>Updated:</b> Updated callable service	Restriction
IEA4PME2	<b>New:</b> New callable service	Multiple pause elements
IFAMCON	<b>New:</b> New callable service	APAR OA49263
IFAMDSC	<b>New:</b> New callable service	APAR OA49263
IFAMGET	<b>New:</b> New callable service	APAR OA49263
IFAMQRY	<b>New:</b> New callable service	APAR OA49263

## New and changed callable services in z/OS V2R1

Table 14 lists the new and changed callable services.

Table 14. Summary of new and changed callable services for high-level languages in z/OS V2R1

Service name	Description	Reason for change
FPZ4PRB	<b>New:</b> New options <b>Changed:</b> Changes to parameter field descriptions	zEDC compression service
FPZ4RMR	<b>Changed:</b> Changes to parameter field descriptions	zEDC compression service
RPZ4RZV	<b>New:</b> New options <b>Changed:</b> Changes to parameter field descriptions	zEDC compression service
HWTCONST	<b>New:</b> <ul style="list-style-type: none"> <li>New callable service</li> <li>New REXX-only support for HWTJSON and HWTHTTP</li> </ul>	APAR OA50659
HWTHCONN	<b>New:</b> <ul style="list-style-type: none"> <li>New callable service</li> <li>New REXX support</li> </ul>	APAR OA46575, APAR OA50659
HWTHDISC	<b>New:</b> <ul style="list-style-type: none"> <li>New callable service</li> <li>New REXX support</li> </ul>	APAR OA46575, APAR OA50659
HWTHINIT	<b>New:</b> <ul style="list-style-type: none"> <li>New callable service</li> <li>New REXX support</li> </ul>	APAR OA46575, APAR OA50659

## BCP

Table 14. Summary of new and changed callable services for high-level languages in z/OS V2R1 (continued)

Service name	Description	Reason for change
HWTHRQST	<b>New:</b> <ul style="list-style-type: none"> <li>• New callable service</li> <li>• New REXX support</li> </ul>	APAR OA46575, APAR OA50659
HWTHRSET	<b>New:</b> <ul style="list-style-type: none"> <li>• New callable service</li> <li>• New REXX support</li> </ul>	APAR OA46575, APAR OA50659
HWTHSET	<b>New:</b> <ul style="list-style-type: none"> <li>• New callable service</li> <li>• New REXX support</li> </ul>	APAR OA46575, APAR OA50659
HWTHSLST	<b>New:</b> <ul style="list-style-type: none"> <li>• New callable service</li> <li>• New REXX support</li> </ul>	APAR OA46575, APAR OA50659
HWTHTERM	<b>New:</b> <ul style="list-style-type: none"> <li>• New callable service</li> <li>• New REXX support</li> </ul>	APAR OA46575, APAR OA50659
HWTJCREN	<b>New:</b> <ul style="list-style-type: none"> <li>• New callable service</li> <li>• New REXX support</li> </ul>	APAR OA46575, APAR OA50659
HWTJGAEN	<b>New:</b> <ul style="list-style-type: none"> <li>• New callable service</li> <li>• New REXX support</li> </ul>	APAR OA46575, APAR OA50659
HWTJGBOV	<b>New:</b> <ul style="list-style-type: none"> <li>• New callable service</li> <li>• New REXX support</li> </ul>	APAR OA46575, APAR OA50659
HWTJGJST	<b>New:</b> <ul style="list-style-type: none"> <li>• New callable service</li> <li>• New REXX support</li> </ul>	APAR OA46575, APAR OA50659
HWTJGNUE	<b>New:</b> <ul style="list-style-type: none"> <li>• New callable service</li> <li>• New REXX support</li> </ul>	APAR OA46575, APAR OA50659
HWTJGNUV	<b>New:</b> <ul style="list-style-type: none"> <li>• New callable service</li> <li>• New REXX support</li> </ul>	APAR OA46575, APAR OA50659
HWTJGOEN	<b>New:</b> <ul style="list-style-type: none"> <li>• New callable service</li> <li>• New REXX support</li> </ul>	APAR OA46575, APAR OA50659
HWTJGVAL	<b>New:</b> <ul style="list-style-type: none"> <li>• New callable service</li> <li>• New REXX support</li> </ul>	APAR OA46575, APAR OA50659
HWTJINIT	<b>New:</b> <ul style="list-style-type: none"> <li>• New callable service</li> <li>• New REXX support</li> </ul>	APAR OA46575, APAR OA50659

Table 14. Summary of new and changed callable services for high-level languages in z/OS V2R1 (continued)

Service name	Description	Reason for change
HWTJPARS	<b>New:</b> • New callable service • New REXX support	APAR OA46575, APAR OA50659
HWTJSERI	<b>New:</b> • New callable service • New REXX support	APAR OA46575, APAR OA50659
HWTJSRCH	<b>New:</b> • New callable service • New REXX support	APAR OA46575, APAR OA50659
HWTJTERM	<b>New:</b> • New callable service • New REXX support	APAR OA46575, APAR OA50659
IFAMCON	<b>New:</b> New callable service	APAR OA49263
IFAMDSC	<b>New:</b> New callable service	APAR OA49263
IFAMGET	<b>New:</b> New callable service	APAR OA49263
IFAMQRY	<b>New:</b> New callable service	APAR OA49263

## New and changed callable services in z/OS V1R13

Table 15 lists the new and changed callable services.

Table 15. Summary of new and changed callable services for high-level languages in z/OS V1R13

Service name	Description	Reason for change
HWICMD	<b>Changed:</b> Updated parameters	Release update
HWICONN	<b>Changed:</b> Updated parameters	Release update
HWIDISC	<b>Changed:</b> Updated parameters	Release update
HWILIST	<b>Changed:</b> Updated parameters	Release update
HWIQUERY	<b>Changed:</b> Updated parameters	Release update
HWISET	<b>Changed:</b> Updated parameters	Release update

## Installation exits

Table 16 lists the new and changed installation exits. You can find detailed information for a particular installation exit in *z/OS MVS Installation Exits*.

Table 16. Summary of new and changed BCP installation exits

Installation exit	Release	Description	Reason for change
ASREXIT	V2R2	All preexisting references to SYS1.LOGREC now instead reference "the logrec recording medium."	Release update
IEFUSI	V2R2	Optional IEFUSI exit changes to support the SMFLIMxx parmlib member for REGION and MEMLIMIT control, as well as changes to support the JCL REGIONX keyword.	Release update

## Control blocks

There have been no new or changed control blocks.

- For information about new and deleted BCP control blocks, see the Data Areas Web site.

Before using a control block as part of a programming interface, verify that you are using it as intended.

### Possible actions resulting from changed control blocks

If you have a program that is using a mapping macro, a change to the mapping macro might require one of the following actions:

- **Reassemble the program:** To accommodate the change, simply reassemble the program.
- **Rewrite the program:** To accommodate the change, rewrite the program. This can be necessary if fields were moved, or changed their meaning or use.
- **Use a supported service instead of the mapping macro:** Use a supported service (such as a macro or callable service) to obtain the needed information.

Make sure to test your applications in the new release before going to production.

### A method for finding changes to MVS control blocks

When you order z/OS, IBM supplies data sets containing the mapping macros for many control blocks. After SMP/E RECEIVE processing, the new mapping macros are in the SMPTLIB data sets. After SMP/E APPLY processing, the new mapping macros are in the target libraries.

To find mapping macros for MVS control blocks, look in the MODGEN, MACLIB, and ATSOMAC libraries. Mapping macros for JES2, VTAM®, and other elements and products might be in the same libraries, or in other libraries specific to the element or product.

You might want to use ISPF's SuperCE (Compare data sets Extended) dialog, which has the following advantages:

- You can concatenate several data sets together for both the old and the new data.
- You can specify a set of SELECT statements that name the mapping macros you are interested in. Make sure to specify the name of the mapping macro. This is not always the same as the control block name. For example, to check for changes to the PSA, compare old and new copies of the IHAPSA mapping macro.

This method works better if the old data has the same level of service as the system from which you are migrating.



## IPCS Subcommands

Table 17 lists the new and updated IPCS subcommands. See *z/OS MVS IPCS Commands* and *z/OS MVS System Commands* for more information.

Table 17. Summary of new and changed MVS IPCS subcommands

IPCS subcommand	Release	Description	Reason for change
COPYDUMP	z/OS V2R1	<b>New option:</b> The COPYDUMP subcommand contains a new option for appending dump directories to the dump data set.	Service aids enhancements
DOCPU	z/OS V1R13	<b>New subcommand:</b> A new IPCS subcommand, DOCPU, allows you to obtain processor-related diagnostic data from a stand-alone dump with one command rather than repeating a command for each processor.	Service aids enhancements
RSMDATA	z/OS V2R2	<b>New report data:</b> Information about freemained frames is now displayed in the Real Storage Frame Report (RSMDATA REALFRAME) and the Summary Report (RSMDATA SUMMARY).	Service aids enhancements and APAR OA46291
	z/OS V1R13	<b>New option:</b> The RSMDATA subcommand contains a new option for specifying high virtual common.	Service aids enhancements
SSIDATA	z/OS V2R2	<b>New dump title:</b> A new SVC dump title has been added for errors encountered while invoking a subsystem event notification routine.	Service aids enhancements
		<b>New report data:</b> The output of the SSIDATA subcommand now indicates whether a subsystem has an event notification routine (EVENTRTN).	
SYSTRACE	z/OS V2R1	<b>New option:</b> The SYSTRACE subcommand contains a new data selection parameter.	Service aids enhancements
	z/OS V1R13	<b>New option:</b> The SYSTRACE subcommand contains new options for specifying CPUMASK(cpu-hexadecimal-mask) and CPUTYPE(ZAAP ZIIP STANDARD).	Service aids enhancements

## JCL parameters

You can find complete information about JCL in the following publications:

- *z/OS MVS JCL User's Guide*
- *z/OS MVS JCL Reference*

Beginning in z/OS V2R2:

- Use the REGIONX parameter on the EXEC statement to specify the amount of central or virtual storage that the step requires below and above the 16 MB line.
- Use the REGIONX parameter on the JOB statement to specify the amount of central or virtual storage that the step requires below and above the 16 MB line.

Beginning in z/OS V2R1:

- Use the DDNAME parameter on the OUTPUT JCL statement to specify the DD statements to apply the specifications on the OUTPUT statement to.
- Use the DSNTYPE parameter on the DD statement to specify a new partitioned data set extended (PDSE), or *library*, and an optional version level for the new PDSE.
- Use the GDGORDER parameter on the DD statement to specify an order in which the generation data sets are processed.
- Use the MERGE parameter on the OUTPUT JCL statement to specify whether to merge OUTPUT JCL statement parameters with the job output statement.
- Use the REFDD parameter on the DD statement to specify a DSNTYPE for a new data set.
- Use the RLSE subparameter on the SPACE parameter, with a multi-volume sequential data set, to release both unused space on the current volume and allocated space for the data set on subsequent volumes.
- Use the SYMBOLS parameter on the DD statement to request for JES to perform symbol substitution within in-stream data.
- Use the SYMLIST parameter on the DD statement to list the symbols to pass to the internal reader (INTRDR).
- Use the SYMLIST parameter on the EXPORT statement to make specific JCL symbols available to the job step program.
- Use the SYSAFF parameter on the JOB statement to indicate the JES2 members and JES3 systems that are eligible to process the job.
- Use the SYSTEM parameter on the JOB statement to indicate the systems that are eligible to process the job.

Beginning in z/OS V1R13, you can use the FREEVOL parameter to allow different systems in the sysplex to read multivolume tape files more efficiently. The FREEVOL parameter lets you specify whether to allow other jobs to read freed volumes of a multivolume tape file as the volume is dismounted by the job.

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## Messages

Information on new, changed and deleted messages is necessary to migrate automated operations. Information about new, changed, and deleted BCP messages can be found in Chapter 31, “BCP and DFSMS summary of message changes for z/OS V2R2 and its updates,” on page 375.

### **A method for finding changes to MVS and TSO/E message texts**

Automation routines are sensitive to changes to message text in new releases. You can find changes to message texts in the following places:

- Part 2, “Summary of message and code changes for z/OS V2R2,” on page 373. This topic is useful during migration.
- Data set SYS1.MSGENU contains information to help you identify changes to message texts more accurately. Using the method described in “Find message text changes with SYS1.MSGENU” on page 37, you can find message text changes in one or more releases.

## Find message text changes with SYS1.MSGENU

IBM supplies a data set, SYS1.MSGENU, containing the text of system messages that are translated. The SYS1.MSGENU data set contains the text of system messages in the form of message skeletons. (For more information, see *z/OS MVS Planning: Operations*.)

This method cannot show changes to the following message types:

- MVS system messages that are not translated, such as IPL and NIP messages (which are issued before the MVS message service is available)
- Other product messages that are not translated, such as DFSMS messages, and JES3 messages.
- For JES2 messages, use the appropriate SYS1.VnRnMn.SHASMENU data set.

Also, this method works better if the old copy of SYS1.VnRnMn.SHASMENU has the same level of service as the system from which you migrate.

After you install the data set, you can compare the new data set with the data set on the prior system. Depending on how you do the comparison, you can get output like the following.

For new messages, the output might show an I (for insert) on the left:

```
I - IEA403I VALUE OF RMAX HAS BEEN CHANGED TO 99
```

For messages text changes, the output might show both I and a D, indicating the replacement of a record in the message.

```
I - IEE162I 46 &NNN ROLL &A MESSAGES (DEL=R OR RD)
D - IEE162I 46 &NNN ROLL &A MESSAGES (DEL=R, RD)
```

The example denotes that, in message IEE1621, (DEL=R, RD) was replaced by (DEL=R OR RD).

Using this information, you can decide whether to change your automation routines.

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## REXX execs

The following changes were made to REXX execs:

Table 18. Summary of new and changed BCP REXX execs.

REXX exec	Release	Description	Reason for change
GTZLQRY	V2R2	Allows REXX programs to access data that is provided by the macro service GTZQUERY.	Release update

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## Services and macros

Table 19 on page 38 lists the new and updated macros. See the following books for more detailed information:

- *z/OS MVS Programming: Authorized Assembler Services Reference ALE-DYN*
- *z/OS MVS Programming: Authorized Assembler Services Reference EDT-IXG*
- *z/OS MVS Programming: Authorized Assembler Services Reference LLA-SDU*
- *z/OS MVS Programming: Authorized Assembler Services Reference SET-WTO*
- *z/OS MVS Programming: Assembler Services Reference ABE-HSP*
- *z/OS MVS Programming: Assembler Services Reference IAR-XCT*

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- *z/OS MVS Programming: Sysplex Services Reference*
- *z/OS MVS Programming: Workload Management Services*
- *z/OS MVS Programming: Resource Recovery*

Table 19. Summary of new and changed MVS macros

Macro	Release	Description	Reason for change
ASASYMBF	z/OS V2R2	<b>New:</b> The ASASYMBF macro is added.	Release update
ASASYMBM	z/OS V2R2	<b>Update:</b> The ASASYMBM macro is updated.	Release update
BLSQMFLD	z/OS V2R1	<b>Update:</b> The BLSQMFLD macro is updated.	Release update
BPXEKDA	z/OS V2R1	<b>Update:</b> The BPXEKDA macro is updated.	Release update
CALL	z/OS V2R1	<b>Update:</b> The CALL macro is updated.	Release update
CALLRTM	z/OS V2R1	<b>Update:</b> The TYPE=SRBTERM parameter is added.	Release update
CNZCONV	z/OS V2R1	<b>Update:</b> The CNZCONV macro is updated.	Release update
CPOOL	z/OS V2R2	<b>New:</b> The following parameters are added to the authorized macro: CONTRACT CONTRACTABLE AUTOCONTRACT FREECELLS FREECELLSDIVISOR FREECELLSPERCPU CONTINTVL  <b>Update:</b> The MULTIHDR parameter has a new COND option.	Contractable multi-header cell pool support
CSVDYNEX	z/OS V2R2	<b>Update:</b> The CSVDYNEX macro is updated to add the DELETEFORCE, DISABLEDCALL, SERVICEID, SERVICEMASK parameters.	Release update
CSVINFO	z/OS V2R1	<b>Update:</b> The CSVINFO macro is updated.	Release update
CSVDYNEX	z/OS V2R2	<b>Update:</b> The CSVDYNEX macro is updated.	Release update
CTRACE	z/OS V2R1	<b>Update:</b> The CTRACE macro is updated.	Release update

Table 19. Summary of new and changed MVS macros (continued)

Macro	Release	Description	Reason for change
DSPSERV	z/OS V2R1	Update: The DSPSERV macro is updated.	Release update
DYNALLOC	z/OS V2R2	<b>New:</b> <ul style="list-style-type: none"> <li>Verb code 01 has new text unit keys DALINSDD (key 0079) and DALNOSEC (key 007A).</li> <li>Verb code 02 has new text unit keys DUNINSDD (key 0079) and DUNNOSEC (key 007A).</li> <li>Verb code 03 has new text unit key DCCINSDD (key 0079).</li> <li>Verb code 04 has new text unit key DDCINSDD (key 0079).</li> </ul>	APAR OA47824
DYNALLOC	z/OS V2R1	Update: Support for fields DALMAXG and DINRMAXG in the SVC99 parameter list that is input to DYNALLOC is provided with APAR OA42358. <b>New:</b> <ul style="list-style-type: none"> <li>Verb code 01 has new text unit keys DALINSDD (key 0079) and DALNOSEC (key 007A).</li> <li>Verb code 02 has new text unit keys DUNINSDD (key 0079) and DUNNOSEC (key 007A).</li> <li>Verb code 03 has new text unit key DCCINSDD (key 0079).</li> <li>Verb code 04 has new text unit key DDCINSDD (key 0079).</li> </ul>	Release update and APAR OA47824
ENFREQ	z/OS V2R1	Update: ENF event code 33 is now also issued to signal a change in device monitoring.	APAR OA45662
ESPIE	z/OS V2R1	Update: The ESPIE macro is updated.	Release update
ESPIE	z/OS V1R13	The minimum authorization of the ESPIE macro is updated.	Release update
ETDEF	z/OS V2R1	Update: The ETDEF macro is updated to the architectural limit of 256 entries in an entry table.	Release update
HISSERV	z/OS V2R1	<b>New:</b> <ul style="list-style-type: none"> <li>The HISSERV macro is introduced to configure and retrieve system instrumentation data.</li> </ul>	Release update
IARBRVEA	z/OS V2R2	New callable service. Support is also rolled back to z/OS V2R1 and z/OS V1R13 (HBB778H).	APAR OA46291

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Table 19. Summary of new and changed MVS macros (continued)

Macro	Release	Description	Reason for change
IARBRVER	z/OS V2R2	New callable service. Support is also rolled back to z/OS V2R1 and z/OS V1R13 (HBB778H).	APAR OA46291
IARST64	z/OS V1R13	<b>New:</b> LOCALSYSAREA parameter.	Release update
IARV64	z/OS V2R2	<b>New:</b> SADMP parameter for REQUEST=GETSTOR, REQUEST=GETSHARED, and REQUEST=GETCOMMON	APAR OA48539
IARV64	z/OS V1R13	<b>Updated:</b> <ul style="list-style-type: none"> <li>• Provided IARV64 REQUEST=LIST options for returning common owner diagnostic data.</li> <li>• Removed the restriction that the IARV64 services cannot be issued in subspace mode.</li> </ul>	Release update
IDENTIFY	z/OS V2R1	<b>Updated:</b> <ul style="list-style-type: none"> <li>• The IDENTIFY service is updated.</li> </ul>	Release update
IEAMSCHD	z/OS V2R2	<b>New:</b> <ul style="list-style-type: none"> <li>• The TRANSFER parameter is added.</li> </ul>	Release update
IEAMSCHD	z/OS V2R1	New parameter: <ul style="list-style-type: none"> <li>• SRBIDTOKEN=token</li> </ul>	Release update
IEAMSXMP	z/OS V2R2	reason code x'000001C' is now documented for completion code 3C4.	
IEAN4CR	z/OS V2R1	<b>New:</b> <ul style="list-style-type: none"> <li>• The IEAN4CR service is added.</li> </ul>	Release update
IEAN4DL	z/OS V2R1	<b>New:</b> <ul style="list-style-type: none"> <li>• The IEAN4DL service is added.</li> </ul>	Release update
IEAN4NT	z/OS V2R1	<b>New:</b> <ul style="list-style-type: none"> <li>• The IEAN4NT service is added.</li> </ul>	Release update
IEARST64	z/OS V2R1	<b>Updated:</b> <ul style="list-style-type: none"> <li>• The IEARST64 service is updated to indicate that the maximum size is 128K bytes.</li> </ul>	Release update
IEATDUMP	z/OS V2R1	<b>Updated:</b> <ul style="list-style-type: none"> <li>• The IEATDUMP service is updated.</li> </ul>	
IEATEDS	z/OS V1R13	The IEATEDS macro is updated for clarification.	Release update
IEATXDC	z/OS V2R1	<b>New:</b> <ul style="list-style-type: none"> <li>• The IEATXDC service is added.</li> </ul>	Release update
IEAVRPI2	z/OS V2R1	<b>Changed:</b> The IEAVRPI2 macro is updated.	Release update
IEAVXFR	z/OS V2R1	<b>Updated:</b> <ul style="list-style-type: none"> <li>• The IEAVXFR service is updated.</li> </ul>	Release update
IEA4RPI2	z/OS V2R1	<b>New:</b> The IEA4RPI2 macro is updated.	Release update
IEA4XFR	z/OS V2R1	<b>Updated:</b> <ul style="list-style-type: none"> <li>• The IEA4XFR service is updated.</li> </ul>	Release update

Table 19. Summary of new and changed MVS macros (continued)

Macro	Release	Description	Reason for change
IEFDDSRV	z/OS V2R1	Updated: The IEFDDSRV service is updated; see restrictions.	Release update
IEFOPZQ	z/OS V2R2	New macro.	APAR OA47689
IEFPRMLB	z/OS V2R1	Updated: The IEFPRMLB service is updated.	Release update
IEFSJSYM	z/OS V2R1	New: <ul style="list-style-type: none"> <li>The IEFSJSYM service is added.</li> </ul>	Release update
IEFSSI	z/OS V2R2	New parameter: <ul style="list-style-type: none"> <li>REQUEST=OPTIONS has a new EVENTRTN parameter to specify whether the subsystem has an event notification routine.</li> </ul>	Release update
IOSCHPD	z/OS V2R1	New parameter: <ul style="list-style-type: none"> <li>ND=xnd (node descriptor) parameter</li> </ul>	Release update
IOSCUINF	z/OS V2R1	New parameter: <ul style="list-style-type: none"> <li>PATHINFO parameter</li> </ul>	Release update
IOSODS	z/OS V2R2	New parameter: <ul style="list-style-type: none"> <li>BYONLINEFENCE parameter is added.</li> </ul>	APAR OA42773
IOSSCM	z/OS V2R2	New macro: The IOSSCM macro retrieves storage class memory (SCM) related information, such as the number of SCM resources and performance statistics.	Release update
IOSSPOF	z/OS V2R1	<ul style="list-style-type: none"> <li>The IOSSPOF service is updated.</li> </ul>	Release update
IOSZHPF	z/OS V2R1	<b>Updated:</b> The IOSZHPF macro is updated.	Release update
IQPINFO	z/OS V2R1	New macro: The IQPINFO macro provides PCIe-related information, including any performance statistics.	Release update
ISGLREL	z/OS V1R13	The ISGLREL_UNCOND and ISGLREL_COND parameters are updated.	Release update
IWMEJOIN	z/OS V1R13	New parameter: The IWMEJOIN macro supports the new SUBTASKS=NO YES parameter. It specifies whether subtasks of the joining task are to be processed. The default is NO.	Release update
IWMPACT	z/OS V2R2	New parameter: The IWMPACT macro supports a new CHECKHISTORY parameter, which specifies the criteria that WLM applies to decide whether or not to discard historical data for service class periods, due to changes that come into effect with a reactivated WLM policy	OA49802
IWMRCOLL	z/OS V2R1	New special reporting supports mobile pricing, which lets you classify transactions so that they can benefit from mobile application pricing.	APAR OA47042
IWM4MNTF	z/OS V2R1	New parameters, CPUTIME, TIMEONCP, and OFFLOADONCP, support mobile pricing, which lets you classify transactions so that they can benefit from mobile application pricing.	APAR OA47042

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Table 19. Summary of new and changed MVS macros (continued)

Macro	Release	Description	Reason for change
IWM4RPT	z/OS V2R1	New parameters, CPU TIME, TIMEONCP, and OFFLOADONCP, support mobile pricing, which lets you classify transactions so that they can benefit from mobile application pricing.	APAR OA47042
IWM4STBG	z/OS V1R13	New parameter: The IWM4STBG macro supports the new SUBTASKS=NO YES parameter. It specifies whether subtasks of the requesting task are to be processed. The default is NO.	Release update
IXCJOIN	z/OS V2R2	New MSGISO keyword.	Release update
IXCJMG	z/OS V2R2	Now supports AMDALEVEL of 3	Release update
IXCMSGC	z/OS V1R13	The CLIENTSRVRTKN parameter is new.  The REQUEST parameter includes a new option RELEASEMSG.	Release update
IXCMSGOX	z/OS V2R2	New and updated reason code explanations.	Release update
IXCQUERY	z/OS V2R2	New REQINFO types: CDS and CDS_ALLDATA.	Release update
	z/OS V1R13	The parameter SERVERNAME is new.  The REQINFO parameter has a new request option SERVERS.	Release update
IXCRECV	z/OS V1R13	The IXCRECV macro is new. It allows you to use XCF signaling and messaging services to help an XCF client receive communications from a server in a sysplex.	Release update
IXCSEND	z/OS V1R13	The IXCSEND macro is new. It allows you to use XCF signaling and messaging services to help an XCF server send data to one or more clients in a sysplex.	Release update
IXCSRVR	z/OS V1R13	The IXCSRVR macro is new. It allows you to use XCF signaling and messaging services to allow an authorized caller to start or stop an instance of a server for communication with clients in a sysplex.	Release update
IXGCONN	z/OS V2R1	Update:  Connecting to and disconnecting from a log stream is updated.	Release update
IXGINVNT	z/OS V2R2	Update: <ul style="list-style-type: none"> <li>• Option REQUEST=CHECKDEF is added.</li> <li>• Attribute LOGSTREAM LS_ALLOCAHEAD is updated.</li> </ul>	Release update
	z/OS V2R1	Update:  The IXGINVNT service is updated.	Release update
IXGQUERY	z/OS V2R1	Update:  Getting information about a log stream or system logger is updated.	Release update



Table 19. Summary of new and changed MVS macros (continued)

Macro	Release	Description	Reason for change
IXLCONN	z/OS V2R2	New MONITOR keyword.	APAR OA40933 (rolled down to V1R12)
IXLREBLD	z/OS V2R2	New REQUEST types POPULATING and WAITING.	APAR OA40933 (rolled down to V1R12)
IXLYLAA	z/OS V2R2	Report both list entry and list element counts using select IXLLIST, IXLSTE, and IXLSTC List Structure service requests for list structures residing in a coupling facility of CFLEVEL=21 or higher.	Release update
LXRES	z/OS V2R1	Update: The LXRES service is updated.	Release update
MGCRE	z/OS V2R1	The MGCRE service is updated.	Release update
POST	z/OS V2R1	The POST service changed. The SERRET keyword is no longer documented. Use the ERRET keyword instead.	Release update
SDUMP	z/OS V1R13	The macro is updated for clarity.	Release update
SDUMPX	z/OS V2R1	The macros are updated.  <b>New options:</b> • HCSABYASID • HCSANoOwner • HCSASysOwner	APAR OA45912
	z/OS V1R13	The macro is updated for clarity.	Release update
SJFREQ	z/OS V2R1	Update: The SJFREQ service is updated.	Release update
STATUS	z/OS V2R1	Update: The STATUS service is updated.	Release update
STCKSYNC	z/OS V2R1	Update: The STCKSYNC service is updated.	Release update
SUSPEND	z/OS V1R13	The example is updated.	Release update
SVCUPDTE	z/OS V2R1	Update: The SVCUPDTE service is updated.	Release update
SYSSTATE	z/OS V2R1	Update: The SYSSTATE service is updated.	Release update
TIMEUSED	z/OS V2R1	Update: The TIMEUSED service is updated.	Release update
VSMLIST	z/OS V1R13	New parameter: REALPGFMSZ.	Release update
WTO	z/OS V2R1	Update: The WTO service is updated.	Release update

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Table 19. Summary of new and changed MVS macros (continued)

Macro	Release	Description	Reason for change
WTOR	z/OS V2R1	Update: The WTOR service is updated.	Release update

## SMF records

In addition to the record updates listed in the following tables, updates to z/OS MVS System Management Facilities (SMF) include these topics:

- The topic about “SMF record general information and best practices” contains more guidance information that is useful when building an SMF record.
- Specifying parameters for the SMF dump programs, IFASMFDP and IFASMF DL.

See the “Summary of changes” topics in z/OS MVS System Management Facilities (SMF) for more information.

Table 20 lists the new and updated SMF records. See z/OS MVS System Management Facilities (SMF) for more detailed information.

Table 20. Summary of new and changed SMF records

SMF record	Release	Description	Reason for change
Type 2	z/OS V2R2	Added new subtypes 1 and 2	Digital signatures for SMF
Type 6	z/OS V1R13	Updates to File Transfer Section for PSF	Release update
Type 14	z/OS V2R2	<ul style="list-style-type: none"> <li>• New fields in Step Information Section (Type 3)</li> <li>• New flags in the SMF14DSVER field</li> </ul>	APAR OA43798 APAR OA49627
Type 14	z/OS V2R1	New offset SMF14DSTYPE for Additional data set Characteristics Section (Type 5), new field SMF14CMPTYPE (Type 1)	Release update
Type 14	z/OS V1R13	<ul style="list-style-type: none"> <li>• Updates to File Transfer Section for PSF</li> <li>• RAS Section (Type 8)</li> </ul>	Release update
Type 21	z/OS V1R13	Multiple updates	Release update
Type 22	z/OS V2R1	New and changed fields in the Storage Control Section	APAR OA43664
Type 23	z/OS V2R1	Updated for log stream statistics.	Release update
Type 23	z/OS V1R13	Multiple updates	Release update
Type 30	z/OS V2R2	Multiple updates	APAR OA46968 APAR OA46971
Type 30	z/OS V2R2	New SMF30SLM field in Storage and Paging Section	SMFLIM (APAR OA47062)
	z/OS V2R1	<ul style="list-style-type: none"> <li>• Fields are updated in the Counter section. New fields include: SMF30_RMCTADJN_Nominal, SMF30_Highest_Task_CPU_Percent, and SMF30_Highest_Task_CPU_Program.</li> <li>• The zEDC usage statistics section is added.</li> </ul>	Release update and APAR OA45767

Table 20. Summary of new and changed SMF records (continued)

SMF record	Release	Description	Reason for change
Type 30	z/OS V1R13	<ul style="list-style-type: none"> <li>• Correction of offset values for Processor Accounting Section</li> <li>• Updates to the description for fields SMF30OST and SMF30OSC</li> <li>• Multiple other updates</li> </ul>	Release update
Type 41	z/OS V2R1	Updated subtype information in Record Environment.	Release update
Type 42	z/OS V2R2	<ul style="list-style-type: none"> <li>• New fields in subtypes 15, 16, and 17</li> <li>• Field description changes in subtype 17</li> <li>• New subtype 27</li> </ul>	VSAM RLS index record locking support, RAS enhancements, and APAR OA45944
Type 42	z/OS V2R1	<ul style="list-style-type: none"> <li>• Multiple updates, including new fields added for subtypes 15 and 16</li> <li>• For subtype 5, new fields added to the following sections: <ul style="list-style-type: none"> <li>– Storage class response time</li> <li>– Volume header section - VTOC data component I/O statistics</li> <li>– Volume header section - VTOC index component I/O statistics</li> <li>– Volume header section - VVDS component I/O statistics</li> </ul> </li> <li>• For subtype 6, new fields added to the Data set I/O statistics section</li> </ul>	Release update and APAR OA45662
Type 42	z/OS V1R13	Multiple updates	Release update
Type 60	z/OS V2R1	Multiple updates	Release update
Type 62	z/OS V2R1	Multiple updates	Release update
Type 64	z/OS V2R2	Multiple updates	Release update
	z/OS V2R1	Multiple updates	Release update
	z/OS V1R13	Multiple updates	Release update
Type 70	z/OS V2R1	Multiple updates; see the “Summary of changes” topic in <i>z/OS MVS System Management Facilities (SMF)</i> for details.	Release update
	z/OS V1R13	Multiple updates	Release update
Type 71	z/OS V2R1	Multiple updates	Release update
	z/OS V1R13	Multiple updates	Release update
Type 72	z/OS V2R1	Multiple updates; see the “Summary of changes” topic in <i>z/OS MVS System Management Facilities (SMF)</i> for details.	Release update
	z/OS V1R13	Multiple updates	Release update
Type 73	z/OS V2R1	Multiple updates	Release update
Type 74	z/OS V2R1	Multiple updates	Release update
Type 75	z/OS V2R1	Multiple updates	Release update
	z/OS V1R13	Multiple updates	Release update

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Table 20. Summary of new and changed SMF records (continued)

SMF record	Release	Description	Reason for change
Type 78		Multiple updates; see the “Summary of changes” topic in <i>z/OS MVS System Management Facilities (SMF)</i> for details.	Release update
Type 79	z/OS V2R1	Multiple updates	Release update
	z/OS V1R13	Multiple updates	Release update
Type 82	z/OS V1R13	Multiple updates	Release update
Type 87	z/OS V2R1	Added	Release update
Type 89	z/OS V1R13	Multiple updates	Release update
Type 90	z/OS V2R2	New subtypes: 37, 38, and 39	Dynamic APF  APAR OA47689 APAR OA47062
	z/OS V2R1	Multiple updates, including new fields: SMF90T34_RMCTADJN_Nominal, SMF90TSS, SMF90NSS, SMF90ESWT, SMF90ETWT, and SMF90 bit for SMF30COUNT, and new subtype 35	Release update
	z/OS V1R13	New subtypes: 33 and 34	Release update
Type 91	z/OS V2R1	Multiple updates	Release update
Type 98	z/OS V2R2	New record type and new HFTSINTVL parameter	APAR OA48570
Type 99	z/OS V2R2	Multiple updates	APAR OA50845
Type 99	z/OS V2R1	Multiple updates in subtype 2	APAR OA47042
Type 99	z/OS V2R2	New and changed fields in subtypes 12 and 14	Release update and APAR OA47968
Type 99	z/OS V2R1	Multiple updates, including new subtypes 12 and 14	Release update
Type 99	z/OS V1R13	Multiple updates	Release update
Type 104	z/OS V2R2	Multiple updates to record descriptions	
Type 104	z/OS V2R1	Multiple updates	Release update
Type 105	z/OS V2R2	New information about type 105 records	GDPS/Global Mirror
Type 106	z/OS V2R2	New SMF record to record successful BCPii HWISET and HWICMD requests.	Release update
Type 109	z/OS V1R13	References for more information about TCP/IP Statistics and this record are in: <i>z/OS Communications Server: IP Configuration Reference</i>	Consolidation
Type 111	z/OS V2R1	Multiple updates	Release update
Type 113	z/OS V2R1	Multiple updates; see the “Summary of changes” topic in <i>z/OS MVS System Management Facilities (SMF)</i> for details.	Release update
	z/OS V1R13	New subtype	Release update
Type 118	z/OS V1R13	New reference information	Release update

Table 20. Summary of new and changed SMF records (continued)

SMF record	Release	Description	Reason for change
Type 119	z/OS V2R2	New subtypes 94 (Client connection started) and 95 (Server connection started), which are documented in <i>z/OS Communications Server: IP Programmer's Guide and Reference</i>	Release update
	z/OS V1R13	New reference information	Release update
Type 121	z/OS V2R2	New record type	Java runtime performance statistics
Type 124	z/OS V2R2	New record type	APAR OA49089
Type 125	z/OS V2R2	New SMF record to persist data across system restarts.	APAR OA51475

## MVS (BCP) system commands

Table 21 lists the new and updated MVS system commands. See *z/OS MVS System Commands* for more detailed information.

Table 21. Summary of new and changed MVS system commands

System Command	Release	Description	Reason for change
ACTIVATE	z/OS V2R1	New option: FORCE	Channel path/PCIe function
	z/OS V1R13	New option: TEST	Release update
CHNGDUMP	z/OS V2R1	New dump mode: REP (replace)  New SDUMP keywords: <ul style="list-style-type: none"> <li>• HCSAByASID</li> <li>• HCSANoOwner</li> <li>• HCSASysOwner</li> </ul>	APAR OA45912
CMDS	z/OS V1R13	New option: FORCE	Release update
CONFIG	z/OS V2R1	New option: <ul style="list-style-type: none"> <li>• ONLINE and OFFLINE parameters validate and bring resources online and offline.</li> </ul>	Release update
CONTROL	z/OS V2R1	New parameters to control display consoles, including HMCS: <ul style="list-style-type: none"> <li>• V,DISPLAY</li> <li>• V,LOGON</li> </ul>	Release update

Table 21. Summary of new and changed MVS system commands (continued)

System Command	Release	Description	Reason for change
DISPLAY	z/OS V2R2	<p>New options:</p> <ul style="list-style-type: none"> <li>• IEFOPZ was added to display data set optimization configuration defined by IEFOPZxx parmlib members.</li> <li>• SMFLIM was added to display the storage limits that are specified in the SMFLIMxx parmlib members.</li> <li>• MANAGE was added to the IXGCNF parameter of the DISPLAY LOGGER command</li> <li>• SUMMARY parameter was added to the DISPLAY SYMBOLS command</li> <li>• LINKINFO parameter was added to the DISPLAY M=DEV command.</li> <li>• M parameter was added to the DISPLAY SMF command</li> </ul> <p>Updated options:</p> <ul style="list-style-type: none"> <li>• SUMMARY is now allowed on the D LOGGER,LOGSTREAM and STRUCTURE commands to obtain summary counts</li> <li>• The example output for DISPLAY GTZ,STATUS was updated for SETGTZ PERSIST.</li> </ul>	<p>Release update and APARs:</p> <ul style="list-style-type: none"> <li>• OA47689</li> <li>• OA47062</li> <li>• OA49089</li> <li>• OA49263</li> </ul>
	z/OS V2R1	<p>New commands and option:</p> <ul style="list-style-type: none"> <li>• The PIPES option was updated to include display summary about z/OS UNIX pipe usage. ALL displays all UIDs with a pipe create count.</li> <li>• The CONSOLES option displays the new HMCS console.</li> <li>• For GRS, the SYSTEM option is added.</li> <li>• The GTZ option is added, which displays Generic Tracker.</li> <li>• The HIS option is added, which displays hardware event data.</li> <li>• The DISPLAY HS,CONFIG command has a new NAME parameter to specify a configuration name for HyperSwap®.</li> <li>• For IOS, the HYPERWRITE option is added to enable or disable IBM zHyperWrite data replication.</li> <li>• For IPLINFO, the LOADXX,MACHMIG option is added, which displays the MACHMIG statement(s) from the LOADxx parmlib member.</li> <li>• The IQP option is added, which display IQP information.</li> <li>• The PCIE option is added, which display PCIe device information.</li> <li>• The PPT option is added to display program properties table (PPT) information.</li> <li>• The TRACKDIRLOAD parameter is added to DISPLAY,PROG to display the status of the TRACKDIRLOAD option.</li> <li>• For SLIP, the PER parameter is added to display status of PER traps. For SMS, the PDSE VSTOR parameter is added to display PDSE virtual storage usage.</li> <li>• LINKINFO parameter was added to the DISPLAY M=DEV command.</li> <li>• M parameter was added to the DISPLAY SMF command</li> </ul> <p>Deleted commands:</p> <ul style="list-style-type: none"> <li>• DISPLAY OPDATA,TRACKING</li> <li>• SETCON TRACKING</li> <li>• SET CNIDTR</li> </ul>	<p>Release update and APARs:</p> <ul style="list-style-type: none"> <li>• OA44240</li> <li>• OA45662</li> <li>• OA49089</li> <li>• OA49263</li> </ul>

Table 21. Summary of new and changed MVS system commands (continued)

System Command	Release	Description	Reason for change
DISPLAY (continued)	z/OS V1R13	New options: <ul style="list-style-type: none"> <li>• DISPLAY MSGFLD supports the MSGRATE[,m] option.</li> <li>• DISPLAY GRS supports the CONTENTION option.</li> <li>• DISPLAY SMS supports SMSMOD and SMSVSAM,QUIESCE options.</li> <li>• DISPLAY VIRTSTOR supports LFAREA option.</li> <li>• DISPLAY XCF supports CONNECT and SERVERS options.</li> </ul>	Release update
DUMP	z/OS V2R1	New SDATA options: <ul style="list-style-type: none"> <li>• HCAS</li> <li>• HCNO</li> <li>• HCSY</li> </ul>	APAR OA45912
DUMPDS	z/OS V2R1	New options for dump data set allocation: <ul style="list-style-type: none"> <li>• ADD,DSN</li> <li>• ADD,VOL</li> </ul>	Release update
FORCE	z/OS V2R1	New option: <ul style="list-style-type: none"> <li>• The TCB option is added for TCB address support.</li> </ul>	Release update
MODIFY	z/OS V2R2	New options: <ul style="list-style-type: none"> <li>• The CANCEL, REQTOKEN, STARTTSO, STOPTSO, and OREQTOKEN options were added to the MODIFY AXR command.</li> <li>• The LIBRARY and MEMBER options were added to the MODIFY LLA command to update an entire LLA managed library or to update specific members of that library.</li> <li>• The PFS option was added. With it, the MODIFY command string can be passed to a physical file system (PFS) through a logical file system (LFS).</li> </ul> <p>Changed output:</p> <ul style="list-style-type: none"> <li>• HIS033I is no longer displayed in response to a MODIFY HIS,BEGIN command that does not request sampling.</li> </ul>	Release update and APAR OA47689
	z/OS V2R1	New option: <ul style="list-style-type: none"> <li>• Hardware event data collection support is added.</li> </ul>	Release update
RESET	z/OS V2R1	New option: <ul style="list-style-type: none"> <li>• HMCS console options are added to support the new HMCS console.</li> </ul>	Release update
SET	z/OS V2R2	New options: <ul style="list-style-type: none"> <li>• IEFOPZ parameter is added.</li> <li>• SMFLIM parameter is added.</li> </ul>	APARs: <ul style="list-style-type: none"> <li>• OA47689</li> <li>• OA47062</li> </ul>
	z/OS V2R1	New options: <ul style="list-style-type: none"> <li>• Generic Tracker (GTZ) parameters are added to support GTZ parmlib members.</li> <li>• IQP parameter is added.</li> </ul>	Release update
	z/OS V1R13	New option: <ul style="list-style-type: none"> <li>• IXGCNF</li> </ul>	Release update
SETALLOC	z/OS V2R1	New option: <ul style="list-style-type: none"> <li>• The UNITAFF option is added to specify SYSTEMDEFAULT.</li> </ul>	Release update
	z/OS V1R13	New option: LOGTRACK	Release update
SETCEE	z/OS V2R1	New option: <ul style="list-style-type: none"> <li>• Specifies a Language Environment® runtime option.</li> </ul>	Release update

Table 21. Summary of new and changed MVS system commands (continued)

System Command	Release	Description	Reason for change
SETCON	z/OS V2R1	New option: • Specifies new HMCS console options.	Release update
SETGRS	z/OS V2R1	New parameter: A new MONITOR parameter that indicates whether to write SMF 87 monitoring records.	Release update
	z/OS V2R2	New keyword: GRSMON=xx specifies a GRSMON:xx parmlib member.	Release update
SETGTZ	z/OS V2R1	New command: Use this command for Generic Tracker settings.	Release update
SETGTZ PERSIST	z/OS V2R2	New sub-command of operator command SETGTZ enables or disables the persistence of tracking facility data.	Release update
SETHS	z/OS V2R1	New options: • Specifies security for console authority support. • The SETHS SWAP command has a new NAME parameter to specify a configuration name for HyperSwap.	Release update and APAR OA44240
SETIOS	z/OS V2R2	New options: • IOTTAPE is a new valid class on the SETIOS MIH command.	I/O timing for tape (APAR OA43674)
	z/OS V2R1	New options: • The RECOVERY,DCCF parameter supports MESSAGE and WAIT_STATE options. • The new FABRICPRTY option on the FICON parameter allows you to enable or disable fabric I/O priority.  New parameter: The HYPERWRITE parameter enables or disables IBM zHyperWrite data replication.	Release update; also APARs: • OA44529 • OA45662
	z/OS V1R13	Guidance: • Supports recovery for a channel path at the CU or device level.	Release update
SETLOAD	z/OS V2R1	New option: • The IEASM option supports static system symbol definitions.	Release update
SETLOGR	z/OS V2R2	New command: • MANAGE  New parameters: • DEALLOCURDS, on SETLOGR FORCE • DEALLOC, on SETLOGR FORCE	Release update
	z/OS V2R1	New option: • The TRACE CT and DISPLAY LOGGER options support SAF authority.	Release update
	z/OS V1R13	New commands: • CTRACE command • MONITOR command	New function
SETLOGRC	z/OS V2R2	New functionality: • Specify a data set name or log stream name. • Switch to using a new data set without issuing an IPL.	Release update



Table 21. Summary of new and changed MVS system commands (continued)

System Command	Release	Description	Reason for change
SETOMVS	z/OS V2R1	New option: <ul style="list-style-type: none"> <li>The AUTOCVT and MAXIOBUFUSER options provide Unicode Services updates.</li> </ul>	Release update
	z/OS V1R13	New options: <ul style="list-style-type: none"> <li>LOSTMSG</li> <li>MAXUSERMOUNTSYS</li> <li>MAXUSERMOUNTUSER</li> <li>NONEMPTYMOUNTPT</li> </ul>	Release update
SETPROG	z/OS V2R2	New options: <ul style="list-style-type: none"> <li>The DELETEFORCE option specifies whether any deletion of an exit routine (by CSVDYNEX, SETPROG, or an EXIT DELETE statement in PROGxx) must specify FORCE=YES.</li> <li>The SERVICEMASK option specifies a service mask for the exit routine that is used to determine whether the exit routine will be called for a given caller.</li> </ul>	Release update
	z/OS V2R1	New option: <ul style="list-style-type: none"> <li>The TRACKDIRLOAD option enables tracking of directed load modules.</li> </ul>	Release update
	z/OS V1R13	New guidance: <ul style="list-style-type: none"> <li>SVCNUMDEC=svcnm</li> </ul>	Release update
SETSMF	z/OS V2R2	New option: <ul style="list-style-type: none"> <li>RECSIGN specifies whether SMF is to digitally sign the records that are being recorded.</li> </ul>	Release update
SETSMS	z/OS V2R1	New options: <ul style="list-style-type: none"> <li>HONOR_DSNTYPE_PDSE can specify that a partitioned data set be created regardless of the values for other data set attributes, such as data set organization or directory blocks.</li> <li>PDSE_SYSEVENT_DONTSWAP specifies that a task in the SMSPDSE or SMSPDSE1 address space must be prevented from getting swapped out while its holding internal PDSE latches or locks.</li> <li>SUPPRESS_SMSMSG specifies whether SMS suppresses IGD17054I, IGD17227I, or IGD17395I messages.</li> </ul>	Release updates
	z/OS V1R13	New option: <ul style="list-style-type: none"> <li>New SUPPRESS_DRMSGS option to specify whether SMS suppresses DELETE/RENAME messages that are issued to the hardcopy log and job log.</li> </ul>	Release update
SETSSI	z/OS V2R2	New parameters: <ul style="list-style-type: none"> <li>The DELETE,...,FORCE parameters have been added to dynamically deactivate and delete a subsystem.</li> </ul>	Release update
SETUNI	z/OS V2R1	New options: <ul style="list-style-type: none"> <li>New Unicode 6.0 options support the new Unicode standard 6.0.</li> </ul>	Release update
SETXCF	z/OS V2R1	New option: <ul style="list-style-type: none"> <li>The STOP REBUILD parameter is updated to stop structure duplexing.</li> </ul>	Release update

Table 21. Summary of new and changed MVS system commands (continued)

System Command	Release	Description	Reason for change
SLIP	z/OS V2R2	New action: <ul style="list-style-type: none"> <li>• CMD enhancement for issuing console commands. For example: SLIP SET, . . . , ACTION=CMD, CMD= 'command1', END</li> </ul>	Release update
	z/OS V2R1	New options: <ul style="list-style-type: none"> <li>• For security FACILITY class entity IEASLIP.REFRESH, UPDATE access is added.</li> <li>• For SDATA: HCSAByASID, HCSANoOwner, and HCSASysOwner</li> </ul>	Release update and APAR OA45912
START	z/OS V2R1	New option: <ul style="list-style-type: none"> <li>• The LLA option is added to specify the CSVLLAnn parmlib member.</li> <li>• Consider not using the SYSTEM or SYSAFF keywords.</li> </ul>	Release update
TRACE	z/OS V2R1	New option: <ul style="list-style-type: none"> <li>• A SYSTRACE_MODE check is added to ensure that your installation does not run with MODE=ON for longer than appropriate.</li> </ul>	Release update
VARY	z/OS V2R2	New option: <ul style="list-style-type: none"> <li>• The TIMEOUT option is added to the VARY CN command along with information about automatic timeout for consoles.</li> </ul>	Release update
	z/OS V2R1	New option and parameter: <ul style="list-style-type: none"> <li>• With the SPACE option, you can update space statistics in the ACDS for a pool storage group or a DASD volume.</li> <li>• The STANDBY parameter is added for the HMCS console.</li> </ul>	Release update

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## Chapter 6. CIM summary of interface changes

This topic describes the Common Information Model (CIM) interface changes.

For more detailed information, see *z/OS Common Information Model User's Guide*.

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### APIs

- Version 2.2 of the CIM client for Java™ (SBLIM CIM client) programming API is now included.
- Version 1 of the CIM client for Java (SBLIM CIM client) programming API was removed.

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### Classes

- Attribute MaxCpusSinCore was added to the IBMzOS\_Process class.

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### Configuration options

- Configuration options NumberOfTraceFiles and TraceFileSizeKBytes were added.

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### Environment variables

- Environment variables \_BPXK\_GPSENT\_SECURITY and PEGASUS\_MAX\_BACKLOG\_CONNECTION\_QUEUE were added.

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### Jobs

- Step PECEA of the CFZSEC job was updated with explanations.



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## Chapter 7. Communications Server summary of interface changes

In addition to the interface changes included in this topic, refer to the following links for additional information.

- Chapter 1, "Summary of changes to SYS1.MACLIB," on page 3
- Chapter 2, "Summary of changes to SYS1.PARMLIB," on page 7

The Communications Server interface changes described in this topic are:

- "Communications Server IP summary of interface changes"
- "Communications Server SNA summary of interface changes" on page 162

The tables in this topic contain a "Reason for change" column that provides the name of the topic in *z/OS Communications Server: New Function Summary* that describes the related functional enhancement.

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### Communications Server IP summary of interface changes

This topic describes the updates to the following Communications Server IP interfaces:

- "PROFILE.TCPIP configuration file" on page 56
  - "PROFILE.TCPIP statement and parameter changes" on page 56
- Configuration Files (other than PROFILE.TCPIP)
  - "FTP client configuration statements" on page 65
  - "FTP server configuration statements" on page 66
  - "TN3270E Telnet server PROFILE configuration file" on page 66
    - "BEGINVTAM information block" on page 66
    - "TELNETGLOBALS information block" on page 67
    - "TELNETPARMS information block" on page 67
  - "General updates for the non-PROFILE.TCPIP IP configuration files" on page 68
- "RACF interfaces" on page 75
- "Operator commands" on page 76
  - "Netstat operator commands (DISPLAY TCPIP,,NETSTAT)" on page 76
  - "TN3270E Telnet server operator commands" on page 86
  - "General updates of IP operator commands" on page 87
- "TSO commands" on page 92
  - "NETSTAT TSO commands" on page 92
  - "FTP TSO and z/OS UNIX commands" on page 98
    - "FTP subcommands" on page 98
  - "General updates of TSO commands" on page 99
- "z/OS UNIX commands" on page 100
  - "Netstat UNIX commands" on page 100
  - "General updates of z/OS UNIX commands" on page 106
- "Application programming interfaces and network management interfaces" on page 111
  - "FTP client API FCAI control block" on page 111
  - "FTP client API for REXX predefined variables" on page 111
  - "Local IPsec NMI" on page 112
  - "Network security services NMI" on page 113
  - "Real-time application-controlled TCP/IP trace NMI (EZBRCIFR)" on page 113

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- “Real-time network monitoring TCP/IP NMI” on page 113
- “Resolver callable NMI (EZBREIFR)” on page 115
- “SNMP manager API” on page 116
- “Syslog daemon name/token pair” on page 116
- “TCP/IP callable NMI (EZBNMIFR)” on page 116
- “Trace formatting NMI (EZBCTAPI)” on page 129
- “Trusted TCP connections API for Java” on page 130
- “Environment variables” on page 130
- “Socket APIs” on page 130
  - “General updates of socket APIs” on page 131
- “IPCS subcommands” on page 132
  - “CTTRACE COMP(SYSTCPDA) subcommand” on page 132
  - “CTTRACE COMP(SYSTCPIS) subcommand” on page 132
  - “CTTRACE COMP(SYSTCPOT) subcommand” on page 132
  - “CTTRACE COMP(SYSTCPRE) subcommand” on page 132
  - “TCPIPCS subcommand” on page 132
  - “General updates to IPCS subcommands” on page 134
- “SNMP MIB modules” on page 134
- “User exits” on page 137
- “Application data” on page 137
- “FTP client error codes” on page 139
- “SMF record type 119 enhancements” on page 139
  - “CSSMTP records” on page 140
  - “FTP records” on page 141
  - “IPSec records” on page 145
  - “SMC-R records” on page 146
  - “TCP connection records” on page 147
  - “TCP/IP stack records” on page 148
  - “TN3270E Telnet server records” on page 155
- “General updates of IP interfaces” on page 155
- “Samples provided in MVS data set SEZAINST” on page 157
- “Samples provided in z/OS UNIX TCPIP directory” on page 161

### PROFILE.TCPIP configuration file

This topic contains the PROFILE.TCPIP statement and parameter changes. The TN3270E Telnet server profile statements are accepted but ignored by the TCP/IP stack. The statements must be specified in a data set configured to the TN3270E Telnet server running in its own address space. Therefore, the Telnet configuration statements are moved from this PROFILE.TCPIP configuration file topic to a general IP configuration file topic: see “TN3270E Telnet server PROFILE configuration file” on page 66.

### PROFILE.TCPIP statement and parameter changes

Table 22 on page 57 lists the new and updated Communications Server PROFILE.TCPIP configuration statements and parameters. See *z/OS Communications Server: IP Configuration Reference* for more detailed information.

Table 22. Summary of new and changed Communications Server PROFILE.TCPIP configuration statements and parameters

Statement	Release	Description	Reason for change
ATMARPSV, ATMLIS, ATMPVC	V2R2	Support for these profile statements is removed because the ATM device type is no longer supported.	Removal of support for legacy devices
	V2R1	Because support for the ATM device type will be dropped in a future release, these profile statements will no longer be supported then.	IBM Health Checker for legacy device types
AUTOLOG	V2R1	Message EZZ0621I or EZZ0622I will be issued on the first cancel of an autologged procedure.	Release update
DELETE PORT DELETE PORTRANGE	V2R1	For TCP ports, if no reservation is found for the port or the reservation was deleted in the current profile processing, error message EZZ0328I is issued instead of message EZZ0395I. Message EZZ0395I will continue to be issued for other errors. Update your message automation for this change.	Release update
DEVICE	V2R2	The following DEVICE types and their corresponding LINK profile statements are no longer supported: <ul style="list-style-type: none"> <li>• ATM</li> <li>• CDLC</li> <li>• CLAW</li> <li>• HYPERchannel</li> <li>• SNALINK (LU0 and LU6.2)</li> <li>• X.25</li> </ul>	Removal of support for legacy devices
DEVICE and LINK	V2R2	Support for the DEVICE and LINK profile statements for the following TCP/IP legacy device types will be dropped in a future release: <ul style="list-style-type: none"> <li>• FDDI and Token Ring (LCS with LINKs FDDI and IBMTR)</li> <li>• Token Ring (MPCIPA with LINK IPAQTR)</li> <li>• Ethernet and FDDI (MPCOSA with LINKs OSAENET and OSAFDDI)</li> </ul>	IBM Health Checker for additional z/OS legacy device types
	V2R1	Support for the DEVICE and LINK profile statements for the following TCP/IP legacy device types will be dropped in a future release: <ul style="list-style-type: none"> <li>• ATM</li> <li>• CDLC</li> <li>• CLAW</li> <li>• HYPERchannel</li> <li>• SNALINK (LU0 and LU6.2)</li> <li>• X.25</li> </ul>	IBM Health Checker for legacy device types

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Table 22. Summary of new and changed Communications Server PROFILE.TCPIP configuration statements and parameters (continued)

Statement	Release	Description	Reason for change
GATEWAY	V2R2	Support for this profile statement is removed. The BEGINROUTES statement can be used to configure static routes.	Removed support for the GATEWAY statement in the TCP/IP profile
	V2R1	Support for this profile statement will be dropped in a future release. Use the BEGINROUTES/ENDROUTES configuration block to replace your GATEWAY statements. To assist in converting your GATEWAY statements to BEGINROUTES statements, you can take a dump of the TCP/IP stack address space and use the CONVERT parameter on the IPCS TCPIP PROFILE subcommand. The TCPIP command output will contain the information that is specified on the GATEWAY statements converted to the equivalent BEGINROUTES/ENDROUTES statements. See "TCPIP PROFILE" in the IP Diagnosis Guide for more information.	IBM Health Checker for z/OS GATEWAY statement check



Table 22. Summary of new and changed Communications Server PROFILE.TCPIP configuration statements and parameters (continued)

Statement	Release	Description	Reason for change
GLOBALCONFIG	V2R2	The SMCD parameter is defined to enable and configure the Shared Memory Communications - Direct Memory Access (SMC-D) function. The SMCD parameter includes the FIXEDMEMORY and TCPKEEPMININTERVAL subparameters. The NOSMCD parameter is defined to disable SMC-D function.	Shared Memory Communications - Direct Memory Access
	V2R2	The ADJUSTVIPAMSS parameter is added to control whether TCP/IP adjusts the Maximum Segment Size for TCP connections.	VIPAROUTE fragmentation avoidance
	V2R2	For the SMCR parameter, a new value of 4096 can be specified for the MTU subparameter.	Shared Memory Communications over RDMA enhancements
	V2R2	Added SMCGLOBAL parameter to provide global settings for the Shared Memory Communications over Remote Direct Memory Access (SMC-R) function and Shared Memory Communications - Direct Memory Access (SMC-D) function. The following subparameters can be specified: <ul style="list-style-type: none"> <li>AUTOCACHE and NOAUTOCACHE Control caching of unsuccessful attempts to use SMC-R or SMC-D.</li> <li>AUTOSMC and NOAUTOSMC Control monitoring incoming TCP connections to determine whether they would benefit from SMC-R or SMC-D.</li> </ul>	<ul style="list-style-type: none"> <li>Shared Memory Communications over RDMA enhancements</li> <li>Shared Memory Communications - Direct Memory Access (SMC-D)</li> </ul>
	V2R1	The PFID operand on the SMCR statement is changed to accept a range of values between X'0000' and X'0FFF'.	Shared Memory Communications over RDMA adapter (RoCE) virtualization
	V2R1	The SMCR parameter is defined to enable and configure Shared Memory Communications over Remote Direct Memory Access (SMC-R) function. The SMCR parameter includes the PFID, PORTNUM, MTU, FIXEDMEMORY, and TCPKEEPMININTERVAL sub-parameters. The NOSMCR parameter is defined to disable SMC-R function.	Shared Memory Communications over Remote Direct Memory Access
	GLOBALCONFIG	V1R13	Deprecated the SEGMENTATIONOFFLOAD and NOSEGMENTATIONOFFLOAD parameters.
V1R13		Added the AUTOIQDX and NOAUTOIQDX parameters. The AUTOIQDX parameter includes the ALLTRAFFIC and NOLARGEDATA sub-parameters.	HiperSockets optimization for intraensemble data networks

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Table 22. Summary of new and changed Communications Server PROFILE.TCPIP configuration statements and parameters (continued)

Statement	Release	Description	Reason for change
INTERFACE	V2R2	The SMCD parameter is defined to enable the SMC-D function for the following statements: <ul style="list-style-type: none"> <li>• IPAQENET, when CHPIDTYPE OSD is specified</li> <li>• IPAQENET6, when CHPIDTYPE OSD is specified</li> <li>• IPAQIDIO</li> <li>• IPAQIDIO6</li> </ul> The NOSMCD parameter is defined to disable the SMC-D function.	Shared Memory Communications - Direct Memory Access
	V2R1	Can be used to configure IPv4 HiperSockets interfaces (IPAQIDIO) instead of the DEVICE, LINK, and HOME statements.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	V2R1	Can be used to configure IPv4 static VIPA interfaces (VIRTUAL) instead of the DEVICE, LINK, and HOME statements.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	V2R1	For IPAQENET interface types, added new TEMPIP parameter to allow an interface to activate without an IP address assigned. Applications which implement DHCP client support can communicate over the interface to obtain an IP address.	Enable DHCP clients on OSA Interfaces
	V2R1	The SMCR parameter is defined to enable Shared Memory Communications - RDMA (SMC-R) function for IPAQENET and IPAQENET6 statements. The SMCR parameter is valid only for CHPIDTYPE OSD definitions. The NOSMCR parameter is defined to disable SMC-R function.	Shared Memory Communications over Remote Direct Memory Access
IPCONFIG	V2R2	The SMCD subparameter is defined on this statement for the DYNAMICXCF parameter to enable the SMC-D function. The NOSMCD subparameter is defined to disable SMC-D function.	Shared Memory Communications - Direct Memory Access
	V2R2	Support for the CLAWUSEDDOUBLENOP and STOPONCLAWERROR parameters is removed because the CLAW device type is no longer supported.	Removal of support for legacy devices
	V2R1	You can enable QDIOACCELERATOR when IPSECURITY is enabled.	QDIO acceleration coexistence with IP filtering
	V2R1	The SOURCEVIPAINTERFACE parameter is added for IPv4 DYNAMICXCF interfaces.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	V1R13	Added CHECKSUMOFFLOAD and NOCHECKSUMOFFLOAD and SEGMENTATIONOFFLOAD and NOSEGMENTATIONOFFLOAD parameters.	OSA-Express4S QDIO IPv6 checksum and segmentation offload

Table 22. Summary of new and changed Communications Server PROFILE.TCPIP configuration statements and parameters (continued)

Statement	Release	Description	Reason for change
IPCONFIG6	V2R2	The SMCD subparameter is defined on this statement for the DYNAMICXCF parameter to enable the SMC-D function. The NOSMCD subparameter is defined to disable SMC-D function.	Shared Memory Communications - Direct Memory Access
	V1R13	Added CHECKSUMOFFLOAD and NOCHECKSUMOFFLOAD and SEGMENTATIONOFFLOAD and NOSEGMENTATIONOFFLOAD parameters.	OSA-Express4S QDIO IPv6 checksum and segmentation offload
	V1R13	If you do not specify the IGNOREREDIRECT parameter and you are using Intrusion Detection Services (IDS) policy to detect and discard Redirect packets, ICMPv6 Redirect packets are discarded while the policy is active.	Expanded Intrusion Detection Services
IPSEC	V2R2	The IPSECRULE and IPSEC6RULE statements support new and modified parameters that can be used to configure enhanced default IP filter policy.	TCPIP profile IP security filter enhancements
	V2R2	A new parameter, DVLOCALFLTR, is added to the IPSEC statement. DVLOCALFLTR enables IP filtering of TCP traffic between a client and an IPv4 dynamic VIPA defined on the same TCP/IP stack, when the traffic is forwarded to another TCP/IP stack.	APAR PI44865
	V2R1		APAR PI40291
	V2R1	The DVIPSEC parameter enables the support for Sysplex-Wide Security Associations (SWSA) for IPv6 on a stack that also has the IPSECURITY parameter specified on the IPCONFIG6 statement.	Sysplex-Wide Security Associations for IPv6
NETACCESS	V2R1	The CACHEALL, CACHEPERMIT, and CACHESAME parameters are added to control the level of caching that is used for the results of network access control checks.	Improve auditing of NetAccess rules
NETMONITOR	V2R1	The PROFILE and NOPROFILE subparameters control the creation of both the TCP/IP stack SMF 119 profile record (subtype 4) and the new TN3270E Telnet server SMF 119 profile record (subtype 24).	NMI and SMF enhancements for TCP/IP applications

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Table 22. Summary of new and changed Communications Server PROFILE.TCPIP configuration statements and parameters (continued)

Statement	Release	Description	Reason for change
PORT	V2R2	<ul style="list-style-type: none"> <li>The SMC parameter is enhanced to enable SMC-D function for the specified port.</li> <li>The NOSMC parameter is enhanced to disable SMC-D function for the specified port.</li> </ul>	Shared Memory Communications - Direct Memory Access
	V2R2	<ul style="list-style-type: none"> <li>The SMC parameter is defined to enable SMC-R function for the specified port. This parameter applies only to TCP ports and is required only when AUTOSMC monitoring is in effect.</li> <li>The NOSMCR parameter has been deprecated but will still be accepted. The NOSMC parameter is the preferred parameter to disable SMC-R function for the specified port.</li> </ul>	Shared Memory Communications over RDMA enhancements
	V2R1	The NOSMCR parameter is defined to disable SMC-R function for the specified port.	Shared Memory Communications over Remote Direct Memory Access
PORTRANGE	V2R2	<ul style="list-style-type: none"> <li>The SMC parameter is enhanced to enable the SMC-D function.</li> <li>The NOSMC parameter is enhanced to disable the SMC-D function.</li> </ul>	Shared Memory Communications - Direct Memory Access
	V2R2	<ul style="list-style-type: none"> <li>The SMC parameter is defined to enable SMC-R function for the specified port. This parameter applies only to TCP ports and is required only when AUTOSMC monitoring is in effect.</li> <li>The NOSMCR parameter has been deprecated but will still be accepted. The NOSMC parameter is the preferred parameter to disable SMC-R function for the specified port.</li> </ul>	Shared Memory Communications over RDMA enhancements
	V2R1	The NOSMCR parameter is defined to disable SMC-R function for the specified port range.	Shared Memory Communications over Remote Direct Memory Access
	V1R13	The <i>jobname</i> parameter can now include a 1-7 character prefix followed by a wildcard character (*), enabling all job names that match the prefix to access the ports in the range.	Wildcard support for the PORTRANGE statement

Table 22. Summary of new and changed Communications Server PROFILE.TCPIP configuration statements and parameters (continued)

Statement	Release	Description	Reason for change
SMFCONFIG	V2R1	The SMCRGROUPSTATISTICS and the NOSMCRGROUPSTATISTICS parameters are defined to create SMF 119 subtype 41 interval records for SMC-R link group and link statistics.	Shared Memory Communications over Remote Direct Memory Access
	V2R1	The SMCLINKEVENT and the NOSMCLINKEVENT parameters are defined to create SMF 119 subtype 42 and subtype 43 event records for SMC-R link start and end events.	Shared Memory Communications over Remote Direct Memory Access
	V2R1	The IFSTATISTICS and the NOIFSTATISTICS parameters are updated to control the creation of the SMF 119 subtype 44 interval records for IBM 10 GbE RoCE Express interface statistics.	Shared Memory Communications over Remote Direct Memory Access
SOMAXCONN	V2R1	Default changed from 10 to 1024.	Enhanced TCP protocol configuration options and default settings

## Communications Server

Table 22. Summary of new and changed Communications Server PROFILE.TCPIP configuration statements and parameters (continued)

Statement	Release	Description	Reason for change
TCPCONFIG	V2R2	<ul style="list-style-type: none"> <li>• AUTODELAYACKS New parameter added to the existing DELAYACKS and NODELAYACKS parameters. Specification of this parameter causes the TCP/IP stack to autonomically determine whether to delay or immediately transmit an acknowledgment when a packet is received with the PUSH bit on in the TCP header.</li> <li>• QUEUEDRTT parameter The default value for the QUEUEDRTT parameter has changed from 20 to 0 milliseconds.</li> <li>• TCPMAXSENDBUFRSIZE parameter Ignored if Outbound right sizing (ORS) is active for a connection.</li> </ul>	TCP autonomic tuning enhancements
	V2R1	Added the following new parameters: <ul style="list-style-type: none"> <li>• CONNECTTIMEOUT</li> <li>• CONNECTINITINTERVAL</li> <li>• FRRTHRESHOLD</li> <li>• KEEPALIVEPROBES</li> <li>• KEEPALIVEPROBEINTERVAL</li> <li>• MAXIMUMRETRANSMITTIME</li> <li>• NAGLE and NONAGLE</li> <li>• QUEUEDRTT</li> <li>• RETRANSMITATTEMPTS</li> <li>• TCPMAXSENDBUFRSIZE</li> <li>• TIMEWAITINTERVAL</li> </ul>	Enhanced TCP protocol configuration options and default settings
	V2R1	SELECTIVEACK and NOSELECTIVEACK parameters are added.	TCP support for selective acknowledgements
	V2R1	The EPHEMERALPORTS parameter is added.	User control of Ephemeral Port Ranges
TRANSLATE	V2R2	Support for the HCH and NSAP parameters is removed because the HCH and ATM device types are no longer supported.	Removal of support for legacy devices
UDPCONFIG	V2R1	The EPHEMERALPORTS parameter is added.	User control of Ephemeral Port Ranges

Table 22. Summary of new and changed Communications Server PROFILE.TCPIP configuration statements and parameters (continued)

Statement	Release	Description	Reason for change
VIPARANGE	V2R2	The TCP/IP stack can support up to 4096 configured and target DVIPA interfaces instead of 1024. Therefore, more dynamically created DVIPAs can be defined by using a VIPARANGE profile statement.	Increase single stack DVIPA limit to 4096
	V1R13	A new SAF parameter and its associated <i>resname</i> value are supported. You can use the SAF parameter to restrict the creation of a dynamic VIPA in the specified VIPARANGE subnet to permitted applications.  The maximum number of VIPARANGE statements for one stack is now 1024; prior to V1R13, the maximum number was 256.	Improved security granularity for VIPARANGE DVIPAs

## Configuration files

This topic includes information about the following configuration statements and files:

- Table 24 on page 66, "FTP server configuration statements"
- Table 23, "FTP client configuration statements"
- "TN3270E Telnet server PROFILE configuration file" on page 66
- "General updates for the non-PROFILE.TCPIP IP configuration files" on page 68

The Communications Server PROFILE.TCPIP configuration file updates are in a separate topic; see "PROFILE.TCPIP configuration file" on page 56.

See *z/OS Communications Server: IP Configuration Reference* for more detailed information about all of the Communications Server IP configuration files and statements.

## FTP client configuration statements

Table 23 lists the new and updated FTP client configuration statements. See *z/OS Communications Server: IP Configuration Reference* for more detailed information.

Table 23. Summary of new and changed Communications Server FTP client configuration statements

Statement	Release	Description	Reason for change
DSNTYPE	V1R13	Specifies whether newly created physical sequential data sets in the client file system are large or basic format.	FTP support for large-format data sets
EATTR	V1R13	Specifies whether newly created data sets can have extended attributes.	Enhanced FTP support for extended address volumes
PASSIVEONLY	V2R1	Controls whether data connections for the client are passive mode only.	APAR PI36683
SECURE_SESSION_REUSE	V2R2	Specifies whether the client requires session reuse when SSL/TLS is used to protect the connections.	TLS session reuse support for FTP and AT-TLS applications
SSLV3	V2R1	Controls whether SSLV3 is enabled for connections that are secured using TLS implemented by FTP.	APAR PI28679

### FTP server configuration statements

Table 24 lists the new and updated FTP server configuration statements. See *z/OS Communications Server: IP Configuration Reference* for more detailed information.

Table 24. Summary of new and changed Communications Server FTP server configuration statements

Statement	Release	Description	Reason for change
APPLNAME	V2R1	New statement that can be used to specify the FTP server application name (applid).	Release update
DSNTYPE	V1R13	Specifies whether newly created physical sequential data sets in the server file system are large or basic format.	FTP support for large-format data sets
EATTR	V1R13	Specifies whether newly created data sets can have extended attributes.	Enhanced FTP support for extended address volumes
SECURE_SESSION_REUSE	V2R2	Specifies whether the server requires session reuse when SSL/TLS is used to protect the connections.	TLS session reuse support for FTP and AT-TLS applications
SMFDCFG	V2R1	Specifies whether an SMF 119 record for FTP daemon configuration data should be created when starting of the FTP daemon.	NMI and SMF enhancements for TCP/IP applications
SSLV3	V2R1	Controls whether SSLV3 is enabled for connections that are secured using TLS implemented by FTP.	APAR PI28679

### TN3270E Telnet server PROFILE configuration file

During initialization of the TN3270E Telnet server (Telnet) address space, configuration parameters are read from a configuration PROFILE data set. The PROFILE data set is used to configure Telnet to accept or reject connection requests. You can update the PROFILE data set to change or add statements to support new functions, or to change or add usage rules.

This topic includes tables with the descriptions of the new and changed Telnet PROFILE configuration statements. Refer to *z/OS Communications Server: IP Configuration Reference* for complete information on configuration statements and the PROFILE statement.

**BEGINVTAM information block:** Table 25 includes the PROFILE.TCPIP statements for the BEGINVTAM information block.

Table 25. Summary of new and changed Communications Server Telnet configuration file - BEGINVTAM block

Statement	Release	Description	Reason for change
MAXTCPSENDQ	V2R1	The new MAXTCPSENDQ parameter is introduced to the PARMSGROUP to allow the customer the ability to limit the amount of storage consumed by a single non-responsive telnet client.	TN3270 client-bound data queueing limit



Table 25. Summary of new and changed Communications Server Telnet configuration file - BEGINVTAM block (continued)

Statement	Release	Description	Reason for change
PASSWORDPHRASE and NOPASSWORDPHRASE as a statement in the PARMSGROUP block.	V1R13	New PASSWORDPHRASE statement provides additional entry space on the solicitor screen for end users to enter either a password or a password phrase. If NOPASSWORDPHRASE is specified, the solicitor screen continues to provide space for a password only.	Enhancements to the TN3270E server

**TELNETGLOBALS information block:** The TELNETGLOBALS information block is a Telnet configuration block used to provide definitions that apply to all Telnet ports.

Table 26. Summary of new and changed Communications Server Telnet configuration file - TELNETGLOBALS block

Statement	Release	Description	Reason for change
MAXTCPSENDQ	V2R1	The new MAXTCPSENDQ parameter is introduced to allow the customer the ability to limit the amount of storage consumed by a single non-responsive telnet client.	TN3270 client-bound data queueing limit
PASSWORDPHRASE and NOPASSWORDPHRASE	V1R13	New PASSWORDPHRASE statement provides additional entry space on the solicitor screen for end users to enter either a password or a password phrase. If NOPASSWORDPHRASE is specified, the solicitor screen continues to provide space for a password only.	Enhancements to the TN3270E server
SMFPROFILE and NOSMFPROFILE	V2R1	New SMFPROFILE and NOSMFPROFILE parameter statements control the creation of the Telnet SMF 119 configuration record (subtype 24).	NMI and SMF enhancements for TCP/IP applications
SSLV3 and NOSSLV3	V2R1	New SSLV3 and NOSSLV3 parameter statements control the enablement and disablement of the SSLV3 protocol to be used on SECUREPORT connections.	APAR PI28679

**TELNETPARMS information block:**

Table 27. Summary of new and changed Communications Server Telnet configuration file - TELNETPARMS block

Statement	Release	Description	Reason for change
MAXTCPSENDQ	V2R1	The new MAXTCPSENDQ parameter is introduced to allow the customer the ability to limit the amount of storage consumed by a single non-responsive telnet client.	TN3270 client-bound data queueing limit

## Communications Server

Table 27. Summary of new and changed Communications Server Telnet configuration file - TELNETPARMS block (continued)

Statement	Release	Description	Reason for change
PASSWORDPHRASE and NOPASSWORDPHRASE	V1R13	New PASSWORDPHRASE statement provides additional entry space on the solicitor screen for end users to enter either a password or a password phrase. If NOPASSWORDPHRASE is specified, the solicitor screen continues to provide space for a password only.	Enhancements to the TN3270E server
SSLV3 and NOSSLV3	V2R1	New SSLV3 and NOSSLV3 parameter statements control the enablement and disablement of the SSLV3 protocol to be used on SECUREPORT connections.	APAR PI28679

### General updates for the non-PROFILE.TCPIP IP configuration files

Table 28 on page 69 lists the general updates for the Communications Server IP configuration files.

Table 28. Summary of new and changed non-PROFILE.TCPIP configuration files

File	Statement / Entry	Release	Description	Reason for change
Communications Server SMTP (CSSMTP) configuration file	OPTIONS • AtSign	V2R2 with APAR PI52704  V2R1 with APAR PI52704	The AtSign option is used to specify the at sign symbol that is used in SMTP mail message commands and headers.	CSSMTP customizable ATSIGN character for mail addresses (APAR PI52704)
	OPTIONS • TLSEhlo	V2R2 with APAR PI56614  V2R1 with APAR PI56614	The TLSEhlo option is used for requesting an EHLO SMTP command after successful TLS negotiation.	Improved CSSMTP TLS compatibility with mail servers (APAR PI56614)
	TargetServer • Charset	V2R2 with APAR PI73909  V2R1 with APAR PI73909	The code page is used by target server to translate mail messages.	Improved CSSMTP code page compatibility with target servers (APAR PI73909)
	OPTIONS	V2R2	The DataLineTrunc option modifies CSSMTP behavior when a mail message contains data lines that are longer than the limit specified in RFC 2821.	CSSMTP migration enablement
	TIMEOUT	V2R2	The ConnectIdle option causes CSSMTP to keep connections with mail gateways for a configured amount of time after it sends the last mail message in a spool file.	CSSMTP migration enablement
	OPTIONS NULLTRNC	V2R1	Specifies whether SMTP control commands are edited to remove trailing null characters.	APAR PM94506
	Header	V2R1	Use the Header statement to change the behavior of CSSMTP when creating RFC 2822 Mail headers.	CSSMTP mail message date header handling option
	ExtendedRetry	V1R13	New statement to describe the extended retry function.	CSSMTP extended retry
	JESSyntaxErrLimit	V1R13	New statement to set the maximum number of syntax errors to be tolerated in a JES spool file.	CSSMTP enhancements

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Table 28. Summary of new and changed non-PROFILE.TCPIP configuration files (continued)

File	Statement / Entry	Release	Description	Reason for change
dcas.conf	KEYRING	V2R1	The existing KEYRING keyword is used to define the z/OS UNIX file containing the certificate to be used during the SSL handshake. This keyword is ignored if TLSMECHANISM is ATTLS.	AT-TLS enablement for DCAS
	LDAPPOR	V2R1	The existing LDAPPOR keyword is used to allow authentication of the client certificate by an X.500 host. LDAPPOR is used in combination with LDAPSERVER. This keyword is ignored if TLSMECHANISM is ATTLS.	AT-TLS enablement for DCAS
	LDAPSERVER	V2R1	The existing LDAPSERVER keyword is used to allow authentication of the client certificate by an X.500 host. LDAPSERVER is used in combination with LDAPPOR. This keyword is ignored if TLSMECHANISM is ATTLS.	AT-TLS enablement for DCAS
	SAFKEYRING	V2R1	The existing SAFKEYRING keyword is used to define the RACF-defined key ring containing the certificate to be used during the SSL handshake. This keyword is ignored if TLSMECHANISM is ATTLS.	AT-TLS enablement for DCAS
	STASHFILE	V2R1	The existing STASHFILE keyword is used to specify the key ring password file to the associated key ring file. This password file contains the encrypted password. This keyword is ignored if TLSMECHANISM is ATTLS.	AT-TLS enablement for DCAS
	TLSMECHANISM	V2R1	This new keyword can be used to select whether to use AT-TLS policies or call IBM System SSL directly. See <i>Customizing DCAS for TLS/SSL</i> in <i>z/OS Communications Server: IP Configuration Guide</i> to use either AT-TLS policies (ATTLS) or IBM System SSL (DCAS). The default is DCAS.	AT-TLS enablement for DCAS
	TLSV1ONLY	V2R1	New parameter to control whether the supported SSL version is limited to TLSv1.0 for connections that are secured using SSL implemented by DCAS.	APAR PI28679
	V3CIPHER	V2R1	The existing V3CIPHER keyword is used to specify a subset of the supported SSL V3 cipher algorithms. This keyword is ignored if TLSMECHANISM is ATTLS.	AT-TLS enablement for DCAS
DMD configuration file	DmStackConfig	V2R1	New parameter, DefaultLogLimit, can be used to limit the number of filter-match log messages generated for a defensive filter.	Limit defensive filter logging
ezatmail.cf	N/A	V2R2	New configuration file for sendmail to CSSMTP bridge. See <i>z/OS Communications Server: IP Configuration Reference</i> /OS Communications Server: IP Configuration Reference for more information.	sendmail to CSSMTP bridge (APAR PI71175)
IKE daemon configuration	IkeConfig	V2R2	New value of 128 is supported for the IkeSyslogLevel parameter. Specifying this value results in log messages that show additional information regarding primary thread pool scheduling.	Enhanced IKED scalability
inetd configuration file	otelnetd	V1R13	The z/OS UNIX Telnet server (otelnetd) supports a new parameter, -g. If it is specified, it will not issue gethostbyaddr or getnameinfo for the client IP address.	Support for bypassing host name lookup in otelnetd
NETRC	N/A	V1R13	Single quotation marks to enclose a password phrase of more than one token are now allowed.	FTP support for password phrases
OSNMP.CONF	N/A	V2R1	New privacy protocol value AESCFB128 can be specified in the privProto field of a statement for an SNMPv3 user, to request AES 128-bit encryption.	Network security enhancements for SNMP

Table 28. Summary of new and changed non-PROFILE.TCPIP configuration files (continued)

File	Statement / Entry	Release	Description	Reason for change
pagent.conf (main Policy Agent configuration file)	Serverconnection ServerSSL ServerSSLV3CipherSuites	V2R1	z/OS V2R1 Communications Server Policy Agent, centralized Policy Agent now supports TLSv1.1 and TLSv1.2 2-byte ciphers. For detailed information, see the <i>ServerSSLV3CipherSuites</i> parameter of the <i>ServerConnection</i> statement in <i>z/OS Communications Server: IP Configuration Reference</i> .	TLS security enhancements for Policy Agent
	ServicesConnection/Security Basic	V2R1	In z/OS V2R1 Communications Server, the import services between Policy Agent and IBM Configuration Assistant for z/OS Communications Server can have user defined AT-TLS policies to create a secure SSL connection.	TLS security enhancements for Policy Agent
Policy client configuration file	Serverconnection ServerSSL ServerSSLv3	V2R1	New parameter to control whether SSLv3 is enabled for the policy client that connects to the server.	APAR PI28679
Policy Agent configuration files	IDSAttackCondition	V2R1	You can configure attack detection by using the IP_FRAGMENT value on the AttackType parameter. It detects suspicious fragmented packets for both IPv4 and IPv6, such as fragments that overlay and change the data in the packet, including changes to the length of the packet.	Enhanced IDS IP fragment attack detection
	RouteTable	V2R1	Changed to allow the specification of IPv6 routes and IPv6 dynamic routing parameters. Three parameters are added: <ul style="list-style-type: none"> <li>• Multipath6 can be used to indicate whether the multipath routing selection algorithm is enabled for outbound IPv6 traffic by using the policy-based route table.</li> <li>• DynamicXCFRoutes6 can be used to indicate whether direct routes to IPv6 dynamic XCF addresses on other TCP/IP stacks should be added to the route table.</li> <li>• IgnorePathMtuUpdate6 can be used to indicate whether IPv6 ICMP Packet Too Big messages should be ignored for this route table.</li> </ul>	IPv6 support for policy-based routing
	RoutingRule	V2R1	Changed to allow IPv6 addresses.	IPv6 support for policy-based routing

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Table 28. Summary of new and changed non-PROFILE.TCPIP configuration files (continued)

File	Statement / Entry	Release	Description	Reason for change
Policy Agent configuration files (continued)	IDSAction	V1R13	The following new values are provided on the ActionType Attack parameter: <ul style="list-style-type: none"> <li>ResetConn</li> <li>NoResetConn</li> </ul>	Expanded Intrusion Detection Services
	IDSAttackCondition	V1R13	New attack detection can be configured using the following new values on the ActionType parameter: <ul style="list-style-type: none"> <li>DATA_HIDING</li> <li>GLOBAL_TCP_STALL</li> <li>OUTBOUND_RAW_IPV6</li> <li>RESTRICTED_IPV6_DST_OPTIONS</li> <li>RESTRICTED_IPV6_HOP_OPTIONS</li> <li>RESTRICTED_IPV6_NEXT_HDR</li> <li>TCP_QUEUE_SIZE</li> </ul> <p>The following new parameters can be configured for the new attack detection:</p> <ul style="list-style-type: none"> <li>OptionPadChk and IcmpEmbedPktChk - for the DATA_HIDING attack type</li> <li>RestrictedIPv6OptionRange, RestrictedIPv6OptionRangeRef, and RestrictedIPv6OptionGroupRef - for the RESTRICTED_IPV6_DST_OPTIONS and the RESTRICTED_IPV6_HOP_OPTIONS attack types</li> <li>IPv6NextHdrRange, IPv6NextHdrRangeRef, and IPv6NextHdrGroupRef - for the RESTRICTED_IPV6_NEXT_HDR attack type</li> <li>TcpQueueSize - for the TCP_QUEUE_SIZE attack type</li> <li>IDSExclusion and IDSExclusionRef - for the TCP_QUEUE_SIZE attack type</li> </ul>	Expanded Intrusion Detection Services
		V1R13	New attack detection can be configured using the following new values on the ActionType parameter: <ul style="list-style-type: none"> <li>EE_MALFORMED_PACKET</li> <li>EE_PORT_CHECK</li> <li>EE_LDLC_CHECK</li> <li>EE_XID_FLOOD</li> </ul> <p>The following new parameters can be configured for the new attack detection:</p> <ul style="list-style-type: none"> <li>EEXIDTimeout - for the EE_XID_FLOOD attack type</li> <li>IDSExclusion and IDSExclusionRef - for the EE_MALFORMED_PACKET, EE_PORT_CHECK, EE_LDLC_CHECK, and EE_XID_FLOOD attack types</li> </ul>	Intrusion Detection Services support for Enterprise Extender
	IDSExclusion	V1R13	IDSExclusion is a new statement that can be used to exclude remote peers from attack detection.	Expanded Intrusion Detection Services

Table 28. Summary of new and changed non-PROFILE.TCPIP configuration files (continued)

File	Statement / Entry	Release	Description	Reason for change
Policy Agent configuration files (continued)	IDSScanEventcondition	V1R13	Scan detection for ICMPv6 events can be configured using the new Icmpv6 value on the protocol parameter. IPv6 addresses can be configured for the LocalHostAddr parameter.	Expanded Intrusion Detection Services
	IDSScanExclusion	V1R13	IPv6 addresses can be configured for the ExcludedAddrPort parameter, allowing remote peers using those addresses to be excluded from scan detection.	Expanded Intrusion Detection Services
	IDSTRCondition	V1R13	IPv6 addresses can be configured for the LocalHostAddr parameter.	Expanded Intrusion Detection Services
	IpAddr and IpAddrSet	V1R13	IPv6 addresses can be configured.	Expanded Intrusion Detection Services
	IpDataOffer	V1R13	When the Integrated Cryptographic Services Facility (ICSF) is started in FIPS 140 compatibility mode and FIPS 140 is not enabled for the TCP/IP stack, the following conditions are no longer required when HowToEncrypt AES_GCM_16, HowToAuth AES_GMAC_128 or HowToAuth AES_GMAC_256 is configured: <ul style="list-style-type: none"> <li>The CRYPTOZ class is active.</li> <li>A SAF profile exist for the FIPSEXEMPT.SYSTOK-SESSIONONLY resource in the CRYPTOZ class.</li> <li>All users of the tunnel have READ access to the SAF resource FIPSEXEMPT.SYSTOK-SESSION-ONLY.</li> </ul> Also for HowToEncrypt AES_GCM_16 and HowToAuth AES_GMAC_128 and AES_GMAC_256, the restriction for tunnel traffic is removed. As of V1R13, when FIPS 140 mode is enabled for TCP/IP, tunnels that use the AES-GCM or AES-GMAC combined-mode algorithm are eligible for distribution of traffic using sysplex-wide security associations (SWSA).	Enhanced IPsec support for FIPS 140 cryptographic mode
Policy Agent configuration files (continued)	IPv6NextHdrGroup and IPv6NextHdrRange	V1R13	IPv6NextHdrGroup and IPv6NextHdrRange are new statements that can be referenced by the RESTRICTED_IPV6_NEXT_HDR attack type to restrict certain next header values in an inbound packet.	Expanded Intrusion Detection Services
	KeyExchangeAction	V1R13	Removed the restriction for AllowNAT that stated that AllowNat is ignored when the IKE version 2 protocol is being used.	Network address translation traversal support for IKE version 2
Policy Agent configuration files (continued)	KeyExchangePolicy	V1R13	Removed the restriction for AllowNAT that stated that AllowNat is ignored when the IKE version 2 protocol is being used.	Network address translation traversal support for IKE version 2
	TTLSGskAdvancedParms statement	V2R2	This statement supports the new TTLSGskHttpCdpParms statement, the new TTLSGskOcpParms statement, and the new SSL global certificate revocation list (CRL) retrieval parameters.	AT-TLS certificate processing enhancements
	TTLSGskLdapParms	V2R2	Supports new parameters for use in retrieving CRLs from LDAP servers.	AT-TLS certificate processing enhancements
	TTLSGskHttpCdpParms	V2R2	New statement for use in retrieving CRLs from HTTP servers.	AT-TLS certificate processing enhancements
	TTLSGskOcpParms	V2R2	New statement for use in retrieving CRLs from OCSF servers.	AT-TLS certificate processing enhancements

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Table 28. Summary of new and changed non-PROFILE.TCPIP configuration files (continued)

File	Statement / Entry	Release	Description	Reason for change
Policy Agent configuration files (continued)	TTLSSignatureParms statement	V2R1	New ClientECurves and SignaturePairs parameters	AT-TLS support for TLS v1.2 and related features
	TTLSCipherParms	V2R1	<ul style="list-style-type: none"> <li>New cipher codes and cipher name constants supported on V3CipherSuites.</li> <li>New V3CipherSuites4Char parameter with support for new four character cipher codes.</li> </ul>	AT-TLS support for TLS v1.2 and related features
	TTLSEnvironmentAction	V2R1	New SuiteBProfile parameter	AT-TLS support for TLS v1.2 and related features
	TTLSEnvironmentAction and TLSConnectionAction	V2R1	New TTLSSignatureParms or TTLSSignatureParmsRef parameter	AT-TLS support for TLS v1.2 and related features
	TTLSEnvironmentAdvancedParms	V2R2	New value, RFC5280, added to the CertValidationMode parameter.	AT-TLS certificate processing enhancements
	TTLSEnvironmentAdvancedParms	V2R1	New Renegotiation, RenegotiationCertCheck, and RenegotiationIndicator parameters	AT-TLS support for TLS v1.2 and related features
	TTLSEnvironmentAdvancedParms and TLSConnectionAdvancedParms	V2R1	New TLSv1.2 parameter	AT-TLS support for TLS v1.2 and related features
Resolver Setup File SEZAINST(RESETUP)	CACHEREORDER	V2R2	Added the new configuration statement to indicate that system-wide cache reordering is used.	Reordering of cached Resolver results
	NOCACHEREORDER	V2R2	Added the new configuration statement to indicate that system-wide cache reordering is not used. This is the default value.	Reordering of cached Resolver results
	All statements	V2R1	<p>The resolver handles syntax errors differently depending on when the error is detected:</p> <ul style="list-style-type: none"> <li>If the error is detected during the resolver address space initialization, the resolver issues a warning message but continues processing the setup file. The resolver address space initialization continues despite the error.</li> <li>If the error is detected while processing a MODIFY RESOLVER,REFRESH,SETUP command, the resolver issues a warning message and stops processing the setup file. The MODIFY command fails.</li> </ul>	Resolver initialization resiliency
	UNRESPONSIVETHRESHOLD	V1R13	New AUTOQUIESCE operand specifies whether resolver should automatically stop forwarding DNS queries generated by an application to an unresponsive name server. You must code the GLOBALTCPIPDATA statement if using the AUTOQUIESCE operand.	System resolver autonomic quiescing of unresponsive name servers
Sendmail configuration file: zOS.cf	CipherLevel	V2R1	z/OS UNIX sendmail CipherLevel statement now supports TLSv1.2 2-byte ciphers.	TLS Security enhancements for Sendmail
	SSLV3	V2R1	New parameter to control whether SSLV3 is enabled for connections that are secured using System SSL.	APAR PI28679
SNMP Manager API configuration file	N/A	V2R1	New privacy protocol value AESCFB128 can be specified in the privProto field of a statement for an SNMPv3 user, to request AES 128-bit encryption.	Network security enhancements for SNMP
SNMPD.CONF	USM_USER	V2R1	New privacy protocol value AESCFB128 can be specified in the privProto field of the statement to request AES 128-bit encryption.	Network security enhancements for SNMP



Table 28. Summary of new and changed non-PROFILE.TCPIP configuration files (continued)

File	Statement / Entry	Release	Description	Reason for change
TCPIP.Data	NOCACHEREORDER	V2R2	New configuration statement indicates that system-wide cache reordering is not used on resolver API calls that are issued by applications by using this configuration file.	Reordering of cached Resolver results
zOS.cf	CipherLevel	V2R1	z/OS UNIX sendmail CipherLevel statement now supports TLSv1.2 2-byte ciphers. See the <i>CipherLevel</i> statement in the <i>Creating the z/OS specific file</i> topic in <i>z/OS Communications Server: IP Configuration Guide</i> .	TLS security enhancements for sendmail

## RACF interfaces

Table 29 lists the functions for which new or changed RACF support is available. Sample RACF commands to change the RACF configuration can be found in one of the following members member EZARACF of the installation data set, SEZAINST:

- EZARACF - Contains sample commands for environments where multilevel security is not configured.
- EZARACFM - Contains sample commands for environments where multilevel security is configured.

You can use the function name from the table to search EZARACF for all the commands necessary for the function. See *z/OS Communications Server: IP Configuration Guide* for more information for each function.

Table 29. Summary of new and changed Communications Server RACF interfaces

Function name	Rel.	Description	Reason for change
BINDDVIPARANGE, MODDVIPA	V1R13	<ul style="list-style-type: none"> <li>• New resource in the SERVAUTH class, EZB.BINDDVIPARANGE.<i>sysname.tcpname.resname</i>, controls whether an application can issue a bind socket call to create a specific dynamic VIPA in a VIPARANGE subnet.</li> <li>• New resource in the SERVAUTH class, EZB.MODDVIPA.<i>sysname.tcpname.resname</i>, controls whether an application can do the following actions:                             <ul style="list-style-type: none"> <li>– Create an application-specific DVIPA, specified by a specific VIPARANGE statement, using the SIOCSVIPA ioctl call, the SIOCSVIPA6 ioctl call, or the MODDVIPA utility</li> <li>– Delete a DVIPA that was created using the same profile and the SIOCSVIPA ioctl call, the SIOCSVIPA6 ioctl call, or the MODDVIPA utility</li> </ul> </li> </ul>	Improved security granularity for VIPARANGE DVIPAs
IPSec	V2R2	Networking applications, that send and receive IPSec protected traffic, are no longer required to have access to certain CSFSERV resource profiles when the CSFSERV class is activated.	Simplified access permissions to ICSF cryptographic functions for IPSec
named	V2R1	This application is no longer supported. Remove the application started procedure name from the RACF STARTED class. Remove it from the RACF facility class for resources BPX.SUPERUSER and BPX.STOR.SWAP. Remove it from the RACF SERVAUTH class for facility EZB.INITSTACK. <i>sysname.tcpprocname</i> .	Removal of BIND DNS Name Server from z/OS
Network Management Interface	V2R1	New RACF resource names added for access to the new Real-time application-controlled TCP/IP trace NMI.	Real-time application-controlled TCP/IP trace NMI

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Table 29. Summary of new and changed Communications Server RACF interfaces (continued)

Function name	Rel.	Description	Reason for change
Setup Profile for VARY Commands	V2R2	New MVS.VARY.TCPIP.SMCAT resource profile in class OPERCMDS can be used to control access to the new VARY TCPIP,,SMCAT command.	SMC Applicability Tool (SMCAT)
	V2R1	New MVS.VARY.TCPIP.SYNTAXCHECK resource profile in class OPERCMDS can be used to control access to the VARY TCPIP,,SYNTAXCHECK command.	Check TCP/IP profile syntax without applying configuration changes

## Operator commands

This topic includes information about the following Communications Server IP operator commands:

- “Netstat operator commands (DISPLAY TCPIP,,NETSTAT)”
- “TN3270E Telnet server operator commands” on page 86
- “General updates of IP operator commands” on page 87

See *z/OS Communications Server: IP System Administrator’s Commands* for more detailed information.

### Netstat operator commands (DISPLAY TCPIP,,NETSTAT)

Table 30 lists the new and updated Communications Server IP Netstat operator command DISPLAY TCPIP,,NETSTAT. See Table 32 on page 87 for the other Communications Server IP operator command entries.

See *z/OS Communications Server: IP System Administrator’s Commands* for more detailed information about the Communications Server IP operator commands.

All parameters in the following table are for the DISPLAY TCPIP,,NETSTAT operator command.

Table 30. Summary of new and changed Communications Server Netstat operator commands (DISPLAY TCPIP,,NETSTAT)

Parameters	Release	Description	Reason for change
ACCESS,NETWORK	V2R1	The report displays the setting of the new CACHEALL, CACHEPERMIT, and CACHESAME parameters on the NETACCESS statement.	Improve auditing of NetAccess rules

Table 30. Summary of new and changed Communications Server Netstat operator commands (DISPLAY TCPIP,,NETSTAT) (continued)

Parameters	Release	Description	Reason for change
ALL	V2R2	<ul style="list-style-type: none"> <li>Displays Shared Memory Communications - Direct Memory Access (SMC-D) information for TCP connections.</li> <li>Accepts the SMCID filter to display the TCP connections that are associated with a specific local SMC-D link identifier.</li> </ul>	Shared Memory Communications - Direct Memory Access
	V2R2	Displays new field TcpPrf3. This field is to be used only for diagnostic purposes under the direction of IBM Service personnel.	VIPAROUTE fragmentation avoidance
	V2R2	<ul style="list-style-type: none"> <li>Updated the TcpPrf field by adding the description of the dynamic right sizing (DRS) eligible flag bit.</li> <li>Added new TcpPrf2 field, which describes outbound right sizing (ORS) flag bits.</li> <li>Added new DelayAck field, which indicates how the TCP/IP stack controls the transmission of acknowledgments for packets received with the PUSH bit on in the TCP header.</li> </ul>	TCP autonomic tuning enhancements
	V2R2	New SMC Information section displayed for connections in Listen state.	Shared Memory Communications over RDMA enhancements

## Communications Server

Table 30. Summary of new and changed Communications Server Netstat operator commands (DISPLAY TCPIP,,NETSTAT) (continued)

Parameters	Release	Description	Reason for change
ALL (continued)	V2R1	Added new StartDate and StartTime fields. These fields provide the date and time for the last of one of the following events: <ul style="list-style-type: none"> <li>• UDP bind</li> <li>• TCP bind</li> <li>• TCP listen</li> <li>• TCP connection establishment</li> </ul>	Socket establishment time for Netstat ALL/-A
	V2R1	Displays the names of the routing policy rule and the policy-based routing table used by IP routing for an IPv6 connection.	IPv6 support for policy-based routing
	V2R1	<ul style="list-style-type: none"> <li>• Displays Shared Memory Communications through Remote Direct Memory Access (SMC-R) information for TCP connections.</li> <li>• Accepts a new SMCID filter to display only the TCP connections associated with a specific SMC-R link group or SMC-R link identifier.</li> </ul>	Shared Memory Communications over Remote Direct Memory Access
	V1R13	The output line that begins with the Last Touched field is now displayed after the output lines for the Bytes, Segments, and Dgram In and Out counters	Release update
	V1R13	Report is enhanced to display the following indicators: <ul style="list-style-type: none"> <li>• An indicator of whether a TCP connection's send data flow is stalled, SendStalled</li> <li>• An indicator of whether a TCP server is experiencing a potential connection flood attack, ConnectionFlood</li> </ul>	Expanded Intrusion Detection Services
ALLCONN	V2R2	Accepts the SMCID filter to display the TCP connections that are associated with a specific local SMC-D link identifier.	Shared Memory Communications - Direct Memory Access
	V2R1	Accepts a new SMCID filter to display only the TCP connections that are associated with a specific SMC-R link group or SMC-R link identifier.	Shared Memory Communications over Remote Direct Memory Access

Table 30. Summary of new and changed Communications Server Netstat operator commands (DISPLAY TCPIP,,NETSTAT) (continued)

Parameters	Release	Description	Reason for change
ARp	V1R13	Displays ARP cache information for an IQDX interface	HiperSockets optimization for intraensemble data networks
CONFIG	V2R2	<ul style="list-style-type: none"> <li>• Displays new SMCD parameter information in the GLOBALCONFIG section.</li> <li>• Displays new DYNAMICXCF SMCD subparameter information in the IPCONFIG and IPCONFIG6 section.</li> </ul>	Shared Memory Communications - Direct Memory Access

## Communications Server

Table 30. Summary of new and changed Communications Server Netstat operator commands (DISPLAY TCPIP,,NETSTAT) (continued)

Parameters	Release	Description	Reason for change
CONFIG (continued)	V2R2	New field, AdjustDVIPAMSS, under the Global Configuration Information section, displays the setting of the new ADJUSTDVIPAMSS parameter from the GLOBALCONFIG statement.	VIPAROUTE fragmentation avoidance
	V2R2	New SMCGlobal, AutoCache, and AutoSMC fields under the Global Configuration Information section, display the setting of the new SMCGLOBAL parameter and its subparameters from the GLOBALCONFIG statement.	Shared Memory Communications over RDMA enhancements
	V2R2	A new value of Auto can be displayed for the DelayAck field under the TCP Configuration Table section to support the new AUTODELACKS parameter from the TCPCONFIG statement.	TCP autonomic tuning enhancements
	V2R1	Added the following fields to the TCP CONFIGURATION TABLE section: <ul style="list-style-type: none"> <li>• TimeWaitInterval</li> <li>• RetransmitAttempt</li> <li>• ConnectTimeOut</li> <li>• ConnectInitInterval</li> <li>• Nagle</li> <li>• KeepAliveProbes</li> <li>• KAProbeInterval</li> <li>• QueuedRTT</li> <li>• FRRTreshold</li> <li>• DefltMaxSndBufSize</li> </ul>	Enhanced TCP protocol configuration options and default settings
	V2R1	The QDIOAccel indicator reflects "Yes" or "SD only" when IP Security is operational. IP Security introduces additional reasons that QDIOAccel might run in the "SD only" mode.	QDIO acceleration coexistence with IP filtering
	V2R1	The SELECTIVEACK field is added to the TCP CONFIGURATION TABLE section.	TCP support for selective acknowledgements

Table 30. Summary of new and changed Communications Server Netstat operator commands (DISPLAY TCPIP,,NETSTAT) (continued)

Parameters	Release	Description	Reason for change
CONFIG (continued)	V2R1	This report displays information about the EPHEMERALPORTS parameter on TCPCONFIG and UDPCONFIG.	User control of Ephemeral Port Ranges
	V2R1	This report displays information about the SOURCEVIPINTERFACE parameter on IPCONFIG.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	V2R1	<ul style="list-style-type: none"> <li>Displays new SMCR parameter information in the GLOBALCONFIG section.</li> <li>New SmcrGrpStats field in the Type 119 portion of the SMF parameters section indicates whether SMC-R link group statistics records (SMF subtype 41) are collected.</li> <li>New SmcrLnkEvent field in the Type 119 portion of the SMF parameters section indicates whether the following SMF records are collected:                             <ul style="list-style-type: none"> <li>SMC-R link start (SMF subtype 42)</li> <li>SMC-R link end (SMF subtype 43)</li> </ul> </li> </ul>	Shared Memory Communications over Remote Direct Memory Access
	V1R13	New field AutoIQDX added to the Global Configuration section	HiperSockets optimization for intraensemble data networks
	V1R13	<ul style="list-style-type: none"> <li>Displays whether checksum offload is globally enabled for IPv4 or IPv6 OSA-Express QDIO interfaces.</li> <li>Displays whether segmentation offload is globally enabled for IPv4 or IPv6 OSA-Express QDIO interfaces.</li> </ul>	OSA-Express4S QDIO IPv6 checksum and segmentation offload
	V1R13	The IgRedirect field in the IPv6 Configuration Table section of the report is enhanced. A value of Yes can now indicate that Intrusion Detection Services (IDS) policy is in effect to detect and discard ICMP Redirects.	Expanded Intrusion Detection Services

## Communications Server

Table 30. Summary of new and changed Communications Server Netstat operator commands (DISPLAY TCPIP,,NETSTAT) (continued)

Parameters	Release	Description	Reason for change
CONN	V2R2	Accepts the SMCID filter to display the TCP connections that are associated with a specific local SMC-D link identifier.	Shared Memory Communications - Direct Memory Access
	V2R1	Accepts a new SMCID filter to display only the TCP connections that are associated with a specific SMC-R link group or SMC-R link identifier.	Shared Memory Communications over Remote Direct Memory Access
DEvlinks	V2R2	<ul style="list-style-type: none"> <li>Displays SMC-D information for OSD and HiperSockets interfaces.</li> <li>Accepts the SMCID filter to display devices that are associated with a specific SMC-D local link identifier.</li> <li>Accepts the SMC modifier to display detailed SMC-D information about active internal shared memory (ISM) interfaces and their associated SMC-D links.</li> <li>Accepts the new PNETID modifier to display information about interfaces with a PNETID value, or information about interfaces with a specific PNETID value.</li> </ul>	Shared Memory Communications - Direct Memory Access
	V2R2	<p>The following new values can be displayed in the Redundancy field in the SMC Link Group Information section:</p> <ul style="list-style-type: none"> <li>Partial (Single local PCHID and port)</li> <li>Partial (Single local PCHID, unique ports)</li> </ul>	Shared Memory Communications over RDMA adapter (RoCE) virtualization



Table 30. Summary of new and changed Communications Server Netstat operator commands (DISPLAY TCPIP,,NETSTAT) (continued)

Parameters	Release	Description	Reason for change
DEvlinks (continued)	V2R1	Displays an IP address of 0.0.0.0 for IPAQENET interfaces that are defined with the TEMPIP parameter.	Enable DHCP clients on OSA Interfaces
	V2R1	<ul style="list-style-type: none"> <li>• Displays Shared Memory Communications over Remote Direct Memory Access information for OSD interfaces.</li> <li>• Accepts a new SMCID filter to display only the devices that are associated with a specific SMC-R link group or SMC-R link identifier.</li> <li>• Accepts a new SMC modifier to display detailed SMC-R information about active RNIC interfaces and their associated SMC-R links and link groups.</li> </ul>	Shared Memory Communications over Remote Direct Memory Access
	V2R1	<ul style="list-style-type: none"> <li>• This report displays information about IPv4 HiperSockets interfaces that are configured with the INTERFACE statement for IPAQIDIO.</li> <li>• This report displays the datapath address and TRLE name for IPAQIDIO6 interfaces, and IPAQIDIO interfaces defined by the INTERFACE statement.</li> <li>• This report displays information about IPv4 static VIPA interfaces that are configured with the INTERFACE statement for VIRTUAL.</li> <li>• The INTFNAME/-K filter accepts a HiperSockets TRLE name that allows for the display of all interfaces for a HiperSockets TRLE.</li> </ul>	IPv4 INTERFACE statement for HiperSockets and Static VIPAs

## Communications Server

Table 30. Summary of new and changed Communications Server Netstat operator commands (DISPLAY TCPIP,,NETSTAT) (continued)

Parameters	Release	Description	Reason for change
DEvlinks (continued)	V1R13	<ul style="list-style-type: none"> <li>Displays whether checksum offload is enabled for an IPAQENET or IPAQENET6 interface.</li> <li>Displays whether segmentation offload is enabled for an IPAQENET or IPAQENET6 interface.</li> </ul>	OSA-Express4S QDIO IPv6 checksum and segmentation offload
	V1R13	Displays information about IQDX interfaces.	HiperSockets optimization for intraensemble data networks
HOMe	V2R1	Displays a flag value of I/Internal for IPAQENET interfaces that are defined with the TEMPIP parameter.	Enable DHCP clients on OSA Interfaces
	V2R1	The INTFNAME/-K filter accepts a HiperSockets TRLE name that allows for the display of all interfaces for a HiperSockets TRLE.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
IDS	V1R13	<p>Report is enhanced to display the following items:</p> <ul style="list-style-type: none"> <li>The ICMPv6 scan rule name in the Scan Detection section</li> <li>Information about new attack types</li> <li>The number of TCP servers under a potential connection flood attack, ServersInConnFlood</li> <li>The number of TCP connections whose send data flow is stalled, TCPStalledConns</li> <li>The percentage of TCP connections whose send data flow is stalled, TCPStalledConnsPct</li> <li>An indicator of whether a TCP server is experiencing a potential connection flood attack, ConnFlood in the Intrusion Detection Services TCP Port List section</li> <li>Both IPv4 and IPv6 addresses in the IP address fields</li> </ul>	Expanded Intrusion Detection Services
	V1R13	Report is enhanced to display information about new attack types.	Intrusion Detection Services support for Enterprise Extender

Table 30. Summary of new and changed Communications Server Netstat operator commands (DISPLAY TCPIP,,NETSTAT) (continued)

Parameters	Release	Description	Reason for change
ND	V1R13	Displays neighbor cache information for an IQDX interface.	HiperSockets optimization for intraensemble data networks
PORTLIST	V2R2	Displays a new flag, M, to indicate whether the port or port range is explicitly enabled for SMC-R and SMC-D.	<ul style="list-style-type: none"> <li>Shared Memory Communications over RDMA enhancements</li> <li>Shared Memory Communications - Direct Memory Access</li> </ul>
	V2R2	Flag N is enhanced to indicate whether the port or the port range is explicitly disabled for SMC-R and SMC-D.	Shared Memory Communications - Direct Memory Access
	V2R1	Displays a new flag, N, to indicate whether the port or the port range is explicitly disabled for SMC-R.	Shared Memory Communications over Remote Direct Memory Access
ROUTE	V2R1	When the PR=ALL or PR=prname modifier is used to display a policy-based routing table, IPv6 routes are included in the report.	IPv6 support for policy-based routing
STATS	V2R2	Displays a new SMCD statistics section. The SMC-D statistics are displayed when no PROTOCOL modifier is specified, or when PROTOCOL=TCP is specified as the modifier value.	Shared Memory Communications - Direct Memory Access
	V2R1	Displays a new SMCR statistics section. The SMC-R statistics are displayed when no PROTOCOL modifier is specified, or when PROTOCOL=TCP is specified as the modifier value.	Shared Memory Communications over Remote Direct Memory Access
	V2R1	This report displays statistics about the usage of ephemeral ports for both TCP and UDP.	User control of Ephemeral Port Ranges
	V1R13	Report is enhanced to display the following information: <ul style="list-style-type: none"> <li>The number of TCP connections whose send data flow is stalled, Current Stalled Connections</li> <li>The number of TCP servers under a potential connection flood attack, Current Servers in Connection Flood</li> </ul>	Expanded Intrusion Detection Services

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Table 30. Summary of new and changed Communications Server Netstat operator commands (DISPLAY TCPIP,,NETSTAT) (continued)

Parameters	Release	Description	Reason for change
TTLS	V2R2	The report output can have a new value of RFC5280 for CertValidationMode.	AT-TLS certificate processing enhancements
	V2R2	Displays values pertaining to certificate revocation for the new AT-TLS policy agent statements and parameters.	AT-TLS certificate processing enhancements
	V2R2	New fields SessionID and SIDReuseReq provide the session ID and reuse required indicator for FTP connections.	TLS session reuse support for FTP and AT-TLS applications
	V2R1	Reports are updated to show four-character cipher code, TLSv1.2 protocol, and new policy attributes	AT-TLS support for TLS v1.2 and related features
VIPADCFG	V2R2	Report is enhanced to enable the following functions: <ul style="list-style-type: none"> <li>• Support the MAX= parameter</li> <li>• Display the "n of m records displayed" message.</li> </ul>	Release update
	V1R13	The new SAF name field is displayed if the SAF parameter is configured on the VIPARANGE statement.	Improved security granularity for VIPARANGE DVIPAs
VIPADyn	V2R1	When displaying information about DVIPAs with an origin of VIPARANGE IOCTL, an additional field indicates if the DVIPA was created with affinity.	Affinity for application-instance DIVPAs

### TN3270E Telnet server operator commands

Table 31 includes the descriptions of the new and changed TN3270E Telnet server operator commands. Refer to *z/OS Communications Server: IP System Administrator's Commands* for complete information on Telnet operator commands.

Table 31. Summary of new and changed Communications Server TN3270E Telnet server operator commands

Command	Release	Description	Reason for change
DISPLAY TCPIP,tnproc,CONNECTION	V2R1	Reports are updated to show four-character cipher code, TLSv1.2 protocol, and new policy attributes	AT-TLS support for TLS v1.2 and related features
DISPLAY TCPIP,tnproc,CONNECTION,CONN=xx	V1R13	A new column is added to show if PASSWORDPHRASE is specified.	Enhancements to the TN3270E server

Table 31. Summary of new and changed Communications Server TN3270E Telnet server operator commands (continued)

Command	Release	Description	Reason for change
DISPLAY TCPIP, <i>tnproc</i> , PROFILE	Every release	Displays information about what profile-wide parameters are in effect for each profile, which profiles are still being used, and how many users are on each profile. Summary and Detail displays are updated with the latest parameters. See message EZZ6060I for details.	Release update
	V1R13	A new column is added to show if PASSWORDPHRASE is specified.	Enhancements to the TN3270E server
DISPLAY TCPIP,TELNET	V1R13	A summary display showing the name, version, and state of the TN3270E Telnet servers that are or were running.	Enhancements to the TN3270E server
DISPLAY TCPIP, <i>tnproc</i> , <TELNET>, PROFILE	V2R1	The value of MAXTCPSENDQ is added to the output of this command.	TN3270 client-bound data queuing limit

### General updates of IP operator commands

Table 32 lists the new and updated Communications Server IP operator commands, **except** the Netstat operator command DISPLAY TCPIP,,NETSTAT and the Telnet operator commands. See the following tables for those commands:

- Table 30 on page 76, IP Netstat operator commands (DISPLAY TCPIP,,NETSTAT)
- Table 31 on page 86, Telnet operator commands

Table 32. General summary of new and changed Communications Server operator commands

Command	Parameters	Release	Description	Reason for change
DISPLAY TCPIP,,HELP	EXPORTPROF	V2R2 with APAR PI63449	New parameter that provides a help message for the new VARY TCPIP,,EXPORTPROF command syntax.	z/OS Configuration Assistant for Communications Server support for import of TCP/IP configuration
	SMCAT	V2R2	New parameter that provides a help message for the new VARY TCPIP,,SMCAT command syntax.	SMC Applicability Tool (SMCAT)
	TRACE	V2R1	New parameter that provides a help message for the new DISPLAY TCPIP,,TRACE command syntax.	Real-time application-controlled TCP/IP trace NMI

## Communications Server

Table 32. General summary of new and changed Communications Server operator commands (continued)

Command	Parameters	Release	Description	Reason for change
DISPLAY TCPIP,OMPROUTE	IPV6OSPF,IF,NAME= <i>if_name</i>	V2R1	The report is enhanced to display the number of IPv6 OSPF packets that are received on the interface that contained errors (# ERR PKTS RCVD), such as bad packet type, bad length, or bad checksum.	Fix OMPROUTE vulnerability to malformed packets
	IPV6OSPF,NBR,ID= <i>router-id</i>	V2R1	The report is enhanced to display the number of IPv6 link state advertisements received (# ERR LS RCVD) from the neighbor that were unexpected or contained errors, such as bad advertisement type, bad length, or bad checksum.	Fix OMPROUTE vulnerability to malformed packets
	OSPF,IF,NAME= <i>if_name</i>	V2R1	The report is enhanced to display the number of IPv4 OSPF packets that were received on the interface that contained errors (# ERR PKTS RCVD), such as bad packet type, bad length, or bad checksum.	Fix OMPROUTE vulnerability to malformed packets
	OSPF,NBR,IPADDR= <i>ip_addr</i>	V2R1	The report is enhanced to display the number of IPv4 link state advertisements received (# ERR LS RCVD) from the neighbor that were unexpected or contained errors, such as bad advertisement type, bad length, or bad checksum.	Fix OMPROUTE vulnerability to malformed packets
	OPTIONS	V2R1	Added new report to display the OMPROUTE GLOBAL_OPTIONS configuration information. Ignore_Undefined_Interfaces is the only one global option.	OMPROUTE adjacency preservation improvements
	RT6TABLE	V2R1	<ul style="list-style-type: none"> <li>Added the PRTABLE=ALL parameter to display routes in all OMPROUTE IPv6 policy-based routing tables.</li> <li>Added the PRTABLE=tablename parameter to display routes in a single OMPROUTE IPv6 policy-based routing table</li> </ul>	IPv6 support for policy-based routing

Table 32. General summary of new and changed Communications Server operator commands (continued)

Command	Parameters	Release	Description	Reason for change
DISPLAY TCPIP,,OMPROUTE (continued)	IPV6OSPF,ALL	V1R13	Report includes the new RouterID configuration source definition from an OSPF configuration statement or the assigned interface name. The source is displayed after the RouterID value.	TCP/IP serviceability enhancements
	OSPE,STATISTICS	V1R13	Report includes the new RouterID configuration source definition from an OSPF configuration statement or the assigned interface name. The source is displayed after the RouterID value.	TCP/IP serviceability enhancements
DISPLAY TCPIP,,STOR	N/A	V2R2	Displays the 64-bit storage that is allocated for Shared Memory Communications - Direct Memory Access (SMC-D) processing.	Shared Memory Communications - Direct Memory Access
	N/A	V2R1	Displays the 64-bit storage that is allocated for Shared Memory Communications over Remote Direct Memory Access (SMC-R) processing.	Shared Memory Communications over Remote Direct Memory Access
	N/A	V1R13	Output display is restructured to reflect the 31-bit storage and 64-bit storage usage. See message EZZ8453I for details.	Increased CTRACE and VIT capacity
DISPLAY TCPIP,,TRACE	N/A	V2R1	New command that provides information about applications that are using the Real-time application-controlled TCP/IP trace NMI.	Real-time application-controlled TCP/IP trace NMI

## Communications Server

Table 32. General summary of new and changed Communications Server operator commands (continued)

Command	Parameters	Release	Description	Reason for change	
MODIFY CSSMTP	DISPLAY,CONFIG	V2R2 with APAR PI73909	Display the new Charset parameter on the TargetServer statement	Improved CSSMTP code page compatibility with target servers	
		V2R1 with APAR PI73909			
		V2R2 with APAR PI52704	Display the new AtSign parameter of Options statement	CSSMTP customizable ATSIGN character for mail addresses	
	DISPLAY,CONFIG	V2R1 with APAR PI52704			
		V2R2 with APAR PI56614	Display the new TLSEhlo parameter of Options statement	Improved CSSMTP TLS compatibility with mail servers	
		V2R1 with APAR PI56614			
DISPLAY,CONFIG	V2R2	Additional fields in the displayed command output: <ul style="list-style-type: none"> <li>• DATALINETRUNC</li> <li>• TESTMODE</li> <li>• CONNECTIDLE</li> </ul>	CSSMTP migration enablement		
DISPLAY,CONFIG	V2R1	Displays the Header configuration statement	CSSMTP mail message date header handling option		
FLUSHRetry,AGE= <i>day</i>	V1R13	Flush extended retry mail over AGE= days old.	CSSMTP extended retry		
DISPLAY,CONFIG	V1R13	Displays the new JESSyntaxErrLimit statement value.	CSSMTP enhancements		
MODIFY DMD	DISPLAY	V2R1	The display output includes the setting of the new DefaultLogLimit parameter.	Limit defensive filter logging	
	REFRESH	V2R1	The value of the new DefaultLogLimit parameter can be changed by updating the DMD configuration file and issuing MODIFY DMD,REFRESH.	Limit defensive filter logging	



Table 32. General summary of new and changed Communications Server operator commands (continued)

Command	Parameters	Release	Description	Reason for change
MODIFY OMPROUTE	IPV6OSPF,ALL	V1R13	Report includes the new RouterID configuration source definition from an OSPF configuration statement or the assigned interface name. The source is displayed after the RouterID value.	TCP/IP serviceability enhancements
	OSPF,STATISTICS	V1R13	Report includes the new RouterID configuration source definition from an OSPF configuration statement or the assigned interface name. The source is displayed after the RouterID value.	TCP/IP serviceability enhancements
MODIFY omproute_procname	RT6TABLE	V2R1	<ul style="list-style-type: none"> <li>Added the PRTABLE=ALL parameter to display routes in all OMPROUTE IPv6 policy-based routing tables.</li> <li>Added the PRTABLE=tablename parameter to display routes in a single OMPROUTE IPv6 policy-based routing table</li> </ul>	IPv6 support for policy-based routing
MODIFY RESOLVER	DISPLAY	V2R2	When system caching is active, an additional instance of message EZZ9304I is included to display the current system-wide cache reordering setting. One of the following values is displayed: <ul style="list-style-type: none"> <li>CACHEREORDER</li> <li>NOCACHEREORDER</li> </ul>	Reordering of cached Resolver results
	DISPLAY	V1R13	When the autonomic quiesce of unresponsive name servers function is active, message EZD2035I is displayed for each name server in the global TCPIP.DATA file.	System resolver autonomic quiescing of unresponsive name servers
	REFRESH[SETUP=]	V2R2	Changed to display the new system-wide cache reordering setting. One of the following values is displayed: <ul style="list-style-type: none"> <li>CACHEREORDER</li> <li>NOCACHEREORDER</li> </ul>	Reordering of cached Resolver results
	REFRESH[SETUP=]	V1R13	When the autonomic quiesce of unresponsive name servers function is active after completion of the MODIFY command processing, message EZD2035I is displayed for each name server in the global TCPIP.DATA file.	System resolver autonomic quiescing of unresponsive name servers

## Communications Server

Table 32. General summary of new and changed Communications Server operator commands (continued)

Command	Parameters	Release	Description	Reason for change
VARY TCPIP,EXPORTPROF	N/A	V2R2 with APAR PI63449	New command used to export a TCP/IP stack profile for use by the Configuration Assistant.	z/OS Configuration Assistant for Communications Server support for import of TCP/IP configuration
VARY TCPIP,SMCAT	N/A	V2R2	New command used to turn the SMC Applicability Tool on or off. The SMC Applicability Tool monitors TCP connections to determine their eligibility to use SMC communications.	SMC Applicability Tool (SMCAT)
VARY TCPIP,SYNTAXCHECK	N/A	V2R1	New command that can be used to check the syntax of TCP/IP profile configuration statements without affecting the system operation or network configuration.	Check TCP/IP profile syntax without applying configuration changes

### TSO commands

This topic includes information about the following TSO commands:

- “NETSTAT TSO commands”
- “FTP TSO and z/OS UNIX commands” on page 98
- “General updates of IP operator commands” on page 87

See *z/OS Communications Server: IP System Administrator's Commands* for more detailed information about the Communications Server TSO commands.

#### NETSTAT TSO commands

Table 33 on page 93 lists the new and updated Communications Server NETSTAT TSO command.

See *z/OS Communications Server: IP System Administrator's Commands* for more detailed information about the Communications Server TSO commands.

Table 33. Summary of new and changed Communications Server NETSTAT TSO commands

Parameter	Release	Description	Reason for change
ALL	V2R2	<ul style="list-style-type: none"> <li>Displays Shared Memory Communications - Direct Memory Access (SMC-D) information for TCP connections.</li> <li>Accepts the SMCID filter to display the TCP connections that are associated with a specific local SMC-D link identifier.</li> </ul>	Shared Memory Communications - Direct Memory Access
	V2R2	Displays new field TcpPrf3. This field is to be used only for diagnostic purposes under the direction of IBM Service personnel.	VIPAROUTE fragmentation avoidance
	V2R2	New SMC Information section displayed for connections in Listen state.	Shared Memory Communications over RDMA enhancements
	V2R2	<ul style="list-style-type: none"> <li>Updated the TcpPrf field by adding the description of the dynamic right sizing (DRS) eligible flag bit.</li> <li>Added new TcpPrf2 field, which describes outbound right sizing (ORS) flag bits.</li> <li>Added new DelayAck field, which indicates how the TCP/IP stack controls the transmission of acknowledgments for packets received with the PUSH bit on in the TCP header.</li> </ul>	TCP autonomic tuning enhancements
ALL (continued)	V2R1	Added new StartDate and StartTime fields. These fields provide the date and time for the last of one of the following events: <ul style="list-style-type: none"> <li>UDP bind time</li> <li>TCP bind time</li> <li>TCP listen time</li> <li>TCP connection establishment time</li> </ul>	Socket establishment time for Netstat ALL/-A
	V2R1	Displays the names of the routing policy rule and the policy-based routing table used by IP routing for an IPv6 connection	IPv6 support for policy-based routing
	V2R1	<ul style="list-style-type: none"> <li>Displays Shared Memory Communications over Remote Direct Memory Access (SMC-R) information for TCP connections.</li> <li>Accepts a new SMCLID filter to display only the TCP connections associated with a specific SMC-R link group or SMC-R link identifier.</li> </ul>	Shared Memory Communications over Remote Direct Memory Access
	V1R13	The output line that begins with the Last Touched field is now displayed after the output lines for the Bytes, Segments, and Dgram In and Out counters	Release update
	V1R13	Report is enhanced to display the following indicators: <ul style="list-style-type: none"> <li>The number of TCP connections whose send data flow is stalled, Current Stalled Connections</li> <li>The number of TCP servers under a potential connection flood attack, Current Servers in Connection Flood</li> </ul>	Expanded Intrusion Detection Services

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Table 33. Summary of new and changed Communications Server NETSTAT TSO commands (continued)

Parameter	Release	Description	Reason for change
ALLCONN	V2R2	Accepts the SMCID filter to display the TCP connections that are associated with a specific local SMC-D link identifier.	Shared Memory Communications - Direct Memory Access
	V2R1	Accepts a new SMCID filter to display only the TCP connections that are associated with a specific SMC-R link group or SMC-R link identifier.	Shared Memory Communications over Remote Direct Memory Access
ARp	V1R13	Displays ARP cache information for an IQDX interface.	HiperSockets optimization for intraensemble data networks
CONFIG	V2R2	<ul style="list-style-type: none"> <li>Displays new SMCD parameter information in the GLOBALCONFIG section.</li> <li>Displays new DYNAMICXCF SMCD subparameter information in the IPCONFIG and IPCONFIG6 section.</li> </ul>	Shared Memory Communications - Direct Memory Access
	V2R2	New field, AdjustDVIPAMSS, under the Global Configuration Information section, displays the setting of the new ADJUSTDVIPAMSS parameter from the GLOBALCONFIG statement.	VIPAROUTE fragmentation avoidance
	V2R2	New SMCGlobal, AutoCache, and AutoSMC fields under the Global Configuration Information section, display the setting of the new SMCGLOBAL parameter and its subparameters from the GLOBALCONFIG statement.	Shared Memory Communications over RDMA enhancements
	V2R2	A new value of Auto can be displayed for the DelayAck field under the TCP Configuration Table section to support the new AUTODELACKS parameter from the TCPCONFIG statement.	TCP autonomic tuning enhancements

Table 33. Summary of new and changed Communications Server NETSTAT TSO commands (continued)

Parameter	Release	Description	Reason for change
CONFIG (continued)	V2R1	Added the following fields to the TCP CONFIGURATION TABLE section: <ul style="list-style-type: none"> <li>• TimeWaitInterval</li> <li>• RetransmitAttempt</li> <li>• ConnectTimeOut</li> <li>• ConnectInitInterval</li> <li>• Nagle</li> <li>• KeepAliveProbes</li> <li>• KAProbeInterval</li> <li>• QueuedRTT</li> <li>• FRRThreshold</li> <li>• DefltMaxSndBufSize</li> </ul>	Enhanced TCP protocol configuration options and default settings
	V2R1	<ul style="list-style-type: none"> <li>• Displays new SMCR parameter information in the GLOBALCONFIG section.</li> <li>• New SmcrGrpStats field in the Type 119 portion of the SMF parameters section indicates whether SMC-R link group statistics records (SMF subtype 41) are collected.</li> <li>• New SmcrLnkEvent field in the Type 119 portion of the SMF parameters section indicates whether the following SMF records are collected: <ul style="list-style-type: none"> <li>– SMC-R link start (SMF subtype 42)</li> <li>– SMC-R link end (SMF subtype 43)</li> </ul> </li> </ul>	Shared Memory Communications over Remote Direct Memory Access
	V2R1	The QDIOAccel indicator reflects "Yes" or "SD only" when IP Security is operational. IP Security introduces additional reasons that QDIOAccel might run in the "SD only" mode.	QDIO acceleration coexistence with IP filtering
	V2R1	The SELECTIVEACK field is added to the TCP Configuration Table section.	TCP support for selective acknowledgements
	V2R1	This report displays information about the EPHEMERALPORTS parameter on TCPCONFIG and UDPCONFIG.	User control of Ephemeral Port Ranges
	V2R1	This report displays information about the SOURCEVIPAINTERFACE parameter on IPCONFIG.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	V1R13	New field AutoIQDX added to the Global Configuration section.	HiperSockets optimization for intraensemble data networks
	V1R13	<ul style="list-style-type: none"> <li>• Displays whether checksum offload is globally enabled for IPv4 or IPv6 OSA-Express QDIO interfaces.</li> <li>• Displays whether segmentation offload is globally enabled for IPv4 or IPv6 OSA-Express QDIO interfaces.</li> </ul>	OSA-Express4S QDIO IPv6 checksum and segmentation offload
	V1R13	The IgRedirect field in the IPv6 Configuration Table section of the report is enhanced. A value of Yes can now indicate that Intrusion Detection Services (IDS) policy is in effect to detect and discard ICMP Redirects.	Expanded Intrusion Detection Services

## Communications Server

Table 33. Summary of new and changed Communications Server NETSTAT TSO commands (continued)

Parameter	Release	Description	Reason for change
CONN	V2R2	Accepts the SMCID filter to display the TCP connections that are associated with a specific local SMC-D link identifier.	Shared Memory Communications - Direct Memory Access
	V2R1	Accepts a new SMCID filter to display only the TCP connections that are associated with a specific SMC-R link group or SMC-R link identifier.	Shared Memory Communications over Remote Direct Memory Access
DEvlinks	V2R2	<ul style="list-style-type: none"> <li>Displays SMC-D information for OSD and HiperSockets interfaces.</li> <li>Accepts the SMCID filter to display devices that are associated with a specific SMC-D local link identifier.</li> <li>Accepts the SMC modifier to display detailed SMC-D information about active internal shared memory (ISM) interfaces and their associated SMC-D links.</li> <li>Accepts the new PNETID modifier to display information about interfaces with a PNETID value, or information about interfaces with a specific PNETID value.</li> </ul>	Shared Memory Communications - Direct Memory Access
	V2R2	<p>The following new values can be displayed in the Redundancy field in the SMC Link Group Information section:</p> <ul style="list-style-type: none"> <li>Partial (Single local PCHID and port)</li> <li>Partial (Single local PCHID, unique ports)</li> </ul>	Shared Memory Communications over RDMA adapter (RoCE) virtualization
	V2R1	Displays an IP address of 0.0.0.0 for IPAQENET interfaces that are defined with the TEMPIP parameter.	Enable DHCP clients on OSA Interfaces
	V2R1	<ul style="list-style-type: none"> <li>This report displays information about IPv4 HiperSockets interfaces that are configured with the INTERFACE statement for IPAQIDIO.</li> <li>This report displays information about IPv4 static VIPA interfaces that are configured with the INTERFACE statement for VIRTUAL.</li> <li>The INTFNAME/-K filter accepts a HiperSockets TRLE name that allows for the display of all interfaces for a HiperSockets TRLE.</li> </ul>	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	V2R1	<ul style="list-style-type: none"> <li>Displays Shared Memory Communications over Remote Direct Memory Access (SMC-R) information for OSD interfaces.</li> <li>Accepts a new SMCID filter to display only the devices that are associated with a specific SMC-R link group or SMC-R link identifier.</li> <li>Accepts a new SMC modifier to display detailed SMC-R information about active RNIC interfaces and their associated SMC-R links and link groups.</li> </ul>	Shared Memory Communications over Remote Direct Memory Access
DEvlinks (continued)	V1R13	Displays information about IQDX interfaces.	HiperSockets optimization for intraensemble data networks
	V1R13	<ul style="list-style-type: none"> <li>Displays whether checksum offload is enabled for an IPAQENET or IPAQENET6 interface.</li> <li>Displays whether segmentation offload is enabled for an IPAQENET or IPAQENET6 interface.</li> </ul>	OSA-Express4S QDIO IPv6 checksum and segmentation offload

Table 33. Summary of new and changed Communications Server NETSTAT TSO commands (continued)

Parameter	Release	Description	Reason for change
HOMe	V2R1	Displays a flag value of I/Internal for IPAQENET interfaces that are defined with the TEMPIP parameter.	Enable DHCP clients on OSA Interfaces
	V2R1	The INTFNAME/-K filter accepts a HiperSockets TRLE name that allows for the display of all interfaces for a HiperSockets TRLE.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
IDS	V1R13	Report is enhanced to display the following information: <ul style="list-style-type: none"> <li>• The ICMPv6 scan rule name in the Scan Detection section</li> <li>• Information about new attack types</li> <li>• The number of TCP servers under a potential connection flood attack, ServersInConnFlood</li> <li>• The number of TCP connections whose send data flow is stalled, TCPStalledConns</li> <li>• The percentage of TCP connections whose send data flow is stalled, TCPStalledConnsPct</li> <li>• An indicator of whether a TCP server is experiencing a potential connection flood attack, ConnFlood in the Intrusion Detection Services TCP Port List section</li> <li>• Both IPv4 and IPv6 addresses in the IP address fields</li> </ul>	Expanded Intrusion Detection Services
	V1R13	Report is enhanced to display information about new attack types.	Intrusion Detection Services support for Enterprise Extender
ND	V1R13	Displays Neighbor cache information for an IQDX interface.	HiperSockets optimization for intraensemble data networks
PORTLIST	V2R2	Displays a new flag, M, to indicate whether the port or port range is explicitly enabled for SMC-R and SMC-D.	<ul style="list-style-type: none"> <li>• Shared Memory Communications over RDMA enhancements</li> <li>• Shared Memory Communications - Direct Memory Access</li> </ul>
	V2R2	Flag N is enhanced to indicate whether the port or the port range is explicitly disabled for SMC-R and SMC-D.	Shared Memory Communications - Direct Memory Access
	V2R1	Displays a new flag, N, to indicate whether the port or the port range is explicitly disabled for SMC-R.	Shared Memory Communications over Remote Direct Memory Access
ROUTE	V2R1	When the PR=ALL or PR=prname modifier is used to display a policy-based routing table, IPv6 routes are included in the report.	IPv6 support for policy-based routing

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Table 33. Summary of new and changed Communications Server NETSTAT TSO commands (continued)

Parameter	Release	Description	Reason for change
STATS	V2R2	Displays a new SMCD statistics section. The SMC-D statistics are displayed when no PROTOCOL modifier is specified, or when PROTOCOL=TCP is specified as the modifier value.	Shared Memory Communications - Direct Memory Access
	V2R1	Displays a new SMCR statistics section. The SMC-R statistics are displayed when no PROTOCOL modifier is specified, or when PROTOCOL=TCP is specified as the modifier value.	Shared Memory Communications over Remote Direct Memory Access
	V2R1	This report displays statistics about the usage of ephemeral ports for both TCP and UDP.	User control of Ephemeral Port Ranges
	V1R13	Report is enhanced to display the following information: <ul style="list-style-type: none"> <li>The number of TCP connections whose send data flow is stalled, Current Stalled Connections</li> <li>The number of TCP servers under a potential connection flood attack, Current Servers in Connection Flood</li> </ul>	Expanded Intrusion Detection Services
TTLS	V2R2	The report output can have a new value of RFC5280 for CertValidationMode.	AT-TLS certificate processing enhancements
	V2R2	Displays values pertaining to certificate revocation for the new AT-TLS policy agent statements and parameters.	AT-TLS certificate processing enhancements
	V2R2	New fields SessionID and SIDReuseReq provide the session ID and reuse required indicator for FTP connections.	TLS session reuse support for FTP and AT-TLS applications
	V2R1	Reports are updated to show four-character cipher code, TLSv1.2 protocol, and new policy attributes.	AT-TLS support for TLS v1.2 and related features
VIPADCFG	V1R13	The new SAF name field is displayed if the SAF parameter is configured on the VIPARANGE statement.	Improved security granularity for VIPARANGE DVIPAs
VIPADyn	V2R1	When displaying information about DVIPAs with an origin of VIPARANGE IOCTL, an additional field indicates if the DVIPA was created with affinity.	Affinity for application-instance DIVPAs

### FTP TSO and z/OS UNIX commands

This topic describes changes to the FTP TSO and z/OS UNIX commands. For more information about these commands, see *z/OS Communications Server: IP User's Guide and Commands*.

**FTP subcommands:** Table 34 lists the changes made to the FTP subcommands. For more information, see the *z/OS Communications Server: IP User's Guide and Commands*.

Table 34. Summary of new and changed Communications Server FTP subcommands

Subcommand	Release	Description	Reason for change
LOCSite	V1R13	The LOCSite subcommand now supports the DSNTYPE option.	FTP support for large-format data sets
	V1R13	The LOCSite subcommand now supports the EATTR option.	Enhanced FTP support for extended address volumes



Table 34. Summary of new and changed Communications Server FTP subcommands (continued)

Subcommand	Release	Description	Reason for change
LOCStat	V1R13	The LOCStat subcommand now supports the DSNTYPE option.	FTP support for large-format data sets
	V1R13	The LOCStat subcommand now supports the EATTR option.	Enhanced FTP support for extended address volumes
MVSGet	V2R1	The new MVSGet subcommand now supports getting MVS data sets from z/OS FTP server to z/OS FTP client without knowing the detail information of the MVS data set. The MVS data set can be a physical sequential data set, a PDS or library, or a generation data set reference.	Simplify FTP transfer of data sets between z/OS systems
MVSPut	V2R1	The new MVSPut subcommand now supports sending MVS data sets from z/OS FTP client to z/OS FTP server without knowing the detail information of the MVS data sets. The MVS data set can be a physical sequential data set, a PDS or library, or a generation data set reference.	Simplify FTP transfer of data sets between z/OS systems
PAss	V1R13	You can now specify a password phrase instead of a password on the PAss subcommand. When you are logged into a V1R13 or later z/OS FTP server, you can specify a password phrase instead of a password.	FTP support for password phrases
SIte	V1R13	The SIte subcommand now supports the DSNTYPE option.	FTP support for large-format data sets
	V1R13	The SIte subcommand now supports the EATTR option.	Enhanced FTP support for extended address volumes
STATus	V1R13	The STATus subcommand now supports the DSNTYPE option.	FTP support for large-format data sets
	V1R13	The STATus subcommand now supports the EATTR option.	Enhanced FTP support for extended address volumes
User	V1R13	You can now specify a password phrase instead of a password on the User subcommand. When you are logged into a V1R13 or later z/OS FTP server, you can specify a password phrase instead of a password.	FTP support for password phrases

### General updates of TSO commands

Table 35 lists the new and updated Communications Server TSO commands, **except** the NETSTAT TSO commands and the FTP subcommands. See the following tables for information about the updates to those TSO commands:

- Table 33 on page 93, Netstat TSO commands
- Table 34 on page 98, FTP z/OS UNIX and TSO commands

Table 35. Summary of new and changed Communications Server TSO commands

Command	Parameter	Release	Description	Reason for change
rpcinfo	-p	V1R13	The program version column is wider than in prior releases. The offsets of all columns following the first column are different.	Release update

## z/OS UNIX commands

Table 37 on page 106 lists the new and updated z/OS UNIX commands, except the z/OS UNIX FTP commands, and the z/OS UNIX netstat commands. See the following tables for those commands:

- Table 34 on page 98, FTP TSO and z/OS UNIX commands
- Table 36, z/OS UNIX netstat commands

See *z/OS Communications Server: IP System Administrator's Commands* for more detailed information about the Communications Server UNIX commands.

### Netstat UNIX commands

Table 36 lists the new and updated Communications Server z/OS UNIX netstat command. See Table 37 on page 106 for the other (the non-netstat) z/OS UNIX command entries.

See *z/OS Communications Server: IP System Administrator's Commands* for more detailed information about the z/OS UNIX commands.

All parameters in the following table are for the z/OS UNIX netstat command.

Table 36. Summary of new and changed Communications Server z/OS UNIX netstat commands

Parameter	Release	Description	Reason for change
-A	V2R2	<ul style="list-style-type: none"> <li>• Displays Shared Memory Communications - Direct Memory Access (SMC-D) information for TCP connections.</li> <li>• Accepts the SMCID filter to display the TCP connections that are associated with a specific local SMC-D link identifier.</li> </ul>	Shared Memory Communications - Direct Memory Access
	V2R2	Displays new field TcpPrf3. This field is to be used only for diagnostic purposes under the direction of IBM Service personnel.	VIPARROUTE fragmentation avoidance
	V2R2	New SMC Information section displayed for connections in Listen state.	Shared Memory Communications over RDMA enhancements
	V2R2	<ul style="list-style-type: none"> <li>• Updated TcpPrf field by adding the description of the dynamic right sizing (DRS) eligible flag bit.</li> <li>• Added new TcpPrf2 field, which describes outbound right sizing (ORS) flag bits.</li> <li>• Added new DelayAck field, which indicates how the TCP/IP stack controls the transmission of acknowledgments for packets received with the PUSH bit on in the TCP header.</li> </ul>	TCP autonomic tuning enhancements

Table 36. Summary of new and changed Communications Server z/OS UNIX netstat commands (continued)

Parameter	Release	Description	Reason for change
-A (continued)	V2R1	Added new StartDate and StartTime fields. These fields provide the date and time for the last of one of the following events: <ul style="list-style-type: none"> <li>• UDP bind time</li> <li>• TCP bind time</li> <li>• TCP listen time</li> <li>• TCP connection establishment time</li> </ul>	Socket establishment time for Netstat ALL/-A
	V2R1	Displays the names of the routing policy rule and the policy-based routing table used by IP routing for an IPv6 connection	IPv6 support for policy-based routing
	V2R1	<ul style="list-style-type: none"> <li>• Displays Shared Memory Communications over Remote Direct Memory Access (SMC-R) information for TCP connections.</li> <li>• Accepts a new -U filter to display only the TCP connections associated with a specific SMC-R link group or SMC-R link identifier.</li> </ul>	Shared Memory Communications over Remote Direct Memory Access
	V1R13	The output line that begins with the Last Touched field is now displayed after the output lines for the Bytes, Segments, and Dgram In and Out counters	Release update
	V1R13	Report is enhanced to display the following indicators: <ul style="list-style-type: none"> <li>• An indicator of whether a TCP connection's send data flow is stalled, SendStalled</li> <li>• An indicator of whether a TCP server is experiencing a potential connection flood attack, ConnectionFlood</li> </ul>	Expanded Intrusion Detection Services
-a	V2R2	Accepts the SMCID filter to display the TCP connections that are associated with a specific local SMC-D link identifier.	Shared Memory Communications - Direct Memory Access
	V2R1	Accepts a new -U filter to display only the TCP connections that are associated with a specific SMC-R link group or SMC-R link identifier.	Shared Memory Communications over Remote Direct Memory Access
-c	V2R2	Accepts the SMCID filter to display the TCP connections that are associated with a specific local SMC-D link identifier.	Shared Memory Communications - Direct Memory Access
	V2R1	Accepts a new -U filter to display only the TCP connections that are associated with a specific SMC-R link group or SMC-R link identifier.	Shared Memory Communications over Remote Direct Memory Access

## Communications Server

Table 36. Summary of new and changed Communications Server z/OS UNIX netstat commands (continued)

Parameter	Release	Description	Reason for change
-d	V2R2	<ul style="list-style-type: none"> <li>Displays SMC-D information for OSD and HiperSockets interfaces.</li> <li>Accepts the SMCID filter to display devices that are associated with a specific SMC-D local link identifier.</li> <li>Accepts the SMC modifier to display detailed SMC-D information about active internal shared memory (ISM) interfaces and their associated SMC-D links.</li> <li>Accepts the new PNETID modifier to display information about interfaces with a PNETID value, or information about interfaces with a specific PNETID value.</li> </ul>	Shared Memory Communications - Direct Memory Access
	V2R2	<p>The following new values can be displayed in the Redundancy field in the SMC Link Group Information section:</p> <ul style="list-style-type: none"> <li>Partial (Single local PCHID and port)</li> <li>Partial (Single local PCHID, unique ports)</li> </ul>	Shared Memory Communications over RDMA adapter (RoCE) virtualization
	V2R1	Displays an IP address of 0.0.0.0 for IPAQENET interfaces that are defined with the TEMPIP parameter.	Enable DHCP clients on OSA Interfaces
	V2R1	<ul style="list-style-type: none"> <li>Displays Shared Memory Communications over Remote Direct Memory Access information for OSD interfaces.</li> <li>Accepts a new -U filter to display only the devices associated with a specific SMC-R link group or SMC-R link identifier.</li> <li>Accepts a new SMC modifier to display detailed SMC-R information about active RNIC interfaces and their associated SMC-R links and link groups.</li> </ul>	Shared Memory Communications over Remote Direct Memory Access
	V2R1	<ul style="list-style-type: none"> <li>This report displays information about IPv4 HiperSockets interfaces that are configured with the INTERFACE statement for IPAQIDIO.</li> <li>This report displays the datapath address and TRLE name for IPAQIDIO6 interfaces, and IPAQIDIO interfaces defined by the INTERFACE statement.</li> <li>This report displays information about IPv4 static VIPA interfaces that are configured with the INTERFACE statement for VIRTUAL.</li> <li>The INTFNAME/-K filter accepts a HiperSockets TRLE name that allows for the display of all interfaces for a HiperSockets TRLE.</li> </ul>	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	V1R13	<ul style="list-style-type: none"> <li>Displays whether checksum offload is globally enabled for IPv4 or IPv6 OSA-Express QDIO interfaces.</li> <li>Displays whether segmentation offload is globally enabled for IPv4 or IPv6 OSA-Express QDIO interfaces.</li> </ul>	OSA-Express4S QDIO IPv6 checksum and segmentation offload
	V1R13	Displays information about IQDX interfaces	HiperSockets optimization for intraensemble data networks
-F	V1R13	The new SAF name field is displayed if the SAF parameter is configured on the VIPARANGE statement.	Improved security granularity for VIPARANGE DVIPAs

Table 36. Summary of new and changed Communications Server z/OS UNIX netstat commands (continued)

Parameter	Release	Description	Reason for change
-f	V2R2	<ul style="list-style-type: none"> <li>Displays new SMCD parameter information in the GLOBALCONFIG section.</li> <li>Displays new DYNAMICXCF SMCD subparameter information in the IPCONFIG and IPCONFIG6 section.</li> </ul>	Shared Memory Communications - Direct Memory Access
	V2R2	New field, AdjustDVIPAMSS, under the Global Configuration Information section, displays the setting of the new ADJUSTDVIPAMSS parameter from the GLOBALCONFIG statement.	VIPAROUTE fragmentation avoidance
	V2R2	New SMCGlobal, AutoCache, and AutoSMC fields under the Global Configuration Information section, display the setting of the new SMCGLOBAL parameter and its subparameters from the GLOBALCONFIG statement.	Shared Memory Communications over RDMA enhancements
	V2R2	A new value of Auto can be displayed for the DelayAck field under the TCP Configuration Table section to support the new AUTODELACKS parameter from the TCPCONFIG statement.	TCP autonomic tuning enhancements
	V2R1	Added the following fields to the TCP CONFIGURATION TABLE section: <ul style="list-style-type: none"> <li>TimeWaitInterval</li> <li>RetransmitAttempt</li> <li>ConnectTimeOut</li> <li>ConnectInitInterval</li> <li>Nagle</li> <li>KeepAliveProbes</li> <li>KAProbeInterval</li> <li>QueuedRTT</li> <li>FRRThreshold</li> <li>DefltMaxSndBufSize</li> </ul>	Enhanced TCP protocol configuration options and default settings

## Communications Server

Table 36. Summary of new and changed Communications Server z/OS UNIX netstat commands (continued)

Parameter	Release	Description	Reason for change
-f (continued)-h	V2R1	<ul style="list-style-type: none"> <li>Displays new SMCR parameter information in the GLOBALCONFIG section.</li> <li>New SmcrGrpStats field in the Type 119 portion of the SMF parameters section indicates whether SMC-R link group statistics records (SMF subtype 41) are collected.</li> <li>New SmcrLnkEvent field in the Type 119 portion of the SMF parameters section indicates whether the following SMF records are collected:                             <ul style="list-style-type: none"> <li>SMC-R link start (SMF subtype 42)</li> <li>SMC-R link end (SMF subtype 43)</li> </ul> </li> </ul>	Shared Memory Communications over Remote Direct Memory Access
	V2R1	The QDIOAccel indicator reflects "Yes" or "SD only" when IP Security is operational. IP Security introduces additional reasons that QDIOAccel might run in the "SD only" mode.	QDIO acceleration coexistence with IP filtering
	V2R1	This report displays information about the EPHEMERALPORTS parameter on TCPCONFIG and UDPCONFIG.	User control of Ephemeral Port Ranges
	V2R1	The SELECTIVEACK field is added to the TCP Configuration Table section.	TCP support for selective acknowledgements
	V2R1	This report displays information about the SOURCEVIPAINTERFACE parameter on IPCONFIG.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	V1R13	<ul style="list-style-type: none"> <li>Displays whether checksum offload is globally enabled for IPv4 or IPv6 OSA-Express QDIO interfaces.</li> <li>Displays whether segmentation offload is globally enabled for IPv4 or IPv6 OSA-Express QDIO interfaces.</li> </ul>	OSA-Express4S QDIO IPv6 checksum and segmentation offload
	V1R13	New field AutoIQDX added to the Global Configuration section.	HiperSockets optimization for intraensemble data networks
	V1R13	The IgRedirect field in the IPv6 Configuration Table section of the report is enhanced. A value of Yes can now indicate that Intrusion Detection Services (IDS) policy is in effect to detect and discard ICMP Redirects.	Expanded Intrusion Detection Services
	V2R1	Displays a flag value of I/Internal for IPAQENET interfaces that are defined with the TEMPIP parameter.	Enable DHCP clients on OSA Interfaces
V2R1	The INTFNAME/-K filter accepts a HiperSockets TRLE name that allows for the display of all interfaces for a HiperSockets T-RLE.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs	

Table 36. Summary of new and changed Communications Server z/OS UNIX netstat commands (continued)

Parameter	Release	Description	Reason for change
-k	V1R13	Report is enhanced to display the following information: <ul style="list-style-type: none"> <li>• The ICMPv6 scan rule name in the Scan Detection section</li> <li>• Information about new attack types</li> <li>• The number of TCP servers under a potential connection flood attack, ServersInConnFlood</li> <li>• The number of TCP connections whose send data flow is stalled, TCPStalledConns</li> <li>• The percentage of TCP connections whose send data flow is stalled, TCPStalledConnsPct</li> <li>• An indicator of whether a TCP server is experiencing a potential connection flood attack, ConnFlood in the Intrusion Detection Services TCP Port List section</li> <li>• Both IPv4 and IPv6 addresses in the IP address fields</li> </ul>	Expanded Intrusion Detection Services
	V1R13	Report is enhanced to display information about new attack types.	Intrusion Detection Services support for Enterprise Extender
-n	V1R13	Displays neighbor cache information for an IQDX interface.	HiperSockets optimization for intraensemble data networks
-o	V2R2	Displays a new flag, M, to indicate whether the port or port range is explicitly enabled for SMC-R and SMC-D.	<ul style="list-style-type: none"> <li>• Shared Memory Communications over RDMA enhancements</li> <li>• Shared Memory Communications - Direct Memory Access</li> </ul>
	V2R2	Flag N is enhanced to indicate whether the port or the port range is explicitly disabled for SMC-R and SMC-D.	Shared Memory Communications - Direct Memory Access
	V2R1	Displays a new flag, N, to indicate whether the port or the port range is explicitly disabled for SMC-R.	Shared Memory Communications over Remote Direct Memory Access
-r	V2R1	When the PR=ALL or PR=pname modifier is used to display a policy-based routing table, IPv6 routes are included in the report.	IPv6 support for policy-based routing
	V1R13	Displays ARP cache information for an IQDX interface.	HiperSockets optimization for intraensemble data networks

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Table 36. Summary of new and changed Communications Server z/OS UNIX netstat commands (continued)

Parameter	Release	Description	Reason for change
-S	V2R2	Displays a new SMCD statistics section. The SMC-D statistics are displayed when no PROTOCOL modifier is specified, or when PROTOCOL=TCP is specified as the modifier value.	Shared Memory Communications - Direct Memory Access
	V2R1	Displays a new SMCR statistics section. The SMC-R statistics are displayed when no PROTOCOL modifier is specified, or when PROTOCOL=TCP is specified as the modifier value.	Shared Memory Communications over Remote Direct Memory Access
	V2R1	This report displays statistics about the usage of ephemeral ports for both TCP and UDP.	User control of Ephemeral Port Ranges
	V1R13	Report is enhanced to display the following information: <ul style="list-style-type: none"> <li>The number of TCP connections whose send data flow is stalled, Current Stalled Connections</li> <li>The number of TCP servers under a potential connection flood attack, Current Servers in Connection Flood</li> </ul>	Expanded Intrusion Detection Services
-v	V2R1	When displaying information about DVIPAs with an origin of VIPARANGE IOCTL, an additional field indicates if the DVIPA was created with affinity.	Affinity for application-instance DIVPAs
-x	V2R2	The report output can have a new value of RFC5280 for CertValidationMode.	AT-TLS certificate processing enhancements
	V2R2	Displays values pertaining to certificate revocation for the new AT-TLS policy agent statements and parameters.	AT-TLS certificate processing enhancements
	V2R2	New fields SessionID and SIDReuseReq provide the session ID and reuse required indicator for FTP connections.	TLS session reuse support for FTP and AT-TLS applications
	V2R1	Reports are updated to show four-character cipher code, TLSv1.2 protocol, and new policy attributes	AT-TLS support for TLS v1.2 and related features

## General updates of z/OS UNIX commands

Table 37. Summary of new and changed Communications Server z/OS UNIX commands

Command	Parm	Release	Description	Reason for change
dnsmigrate		V2R1	This command is no longer supported.	Removal of BIND DNS Name Server from z/OS
dnssec-keygen		V2R1	This command is no longer supported.	Removal of BIND DNS Name Server from z/OS
dnssec-makekeyset		V2R1	This command is no longer supported.	Removal of BIND DNS Name Server from z/OS
dnssec-signkey		V2R1	This command is no longer supported.	Removal of BIND DNS Name Server from z/OS
dnssec-signzone		V2R1	This command is no longer supported.	Removal of BIND DNS Name Server from z/OS



Table 37. Summary of new and changed Communications Server z/OS UNIX commands (continued)

Command	Parm	Release	Description	Reason for change
ezatmail	N/A	V2R2	New command for sendmail to CSSMTP bridge. See z/OS <i>Communications Server: IP User's Guide and Commands</i> for more information.	sendmail to CSSMTP bridge (APAR PI71175)
ipsec	-F add	V2R1	The loglimit keyword is a new keyword that you can use to limit the number of filter-match log messages generated for the defensive filter being added.	Limit defensive filter logging
	-F update	V2R1	The loglimit keyword is a new keyword that you can use to limit the number of filter-match log messages generated for the defensive filter being added.	Limit defensive filter logging
	-F display -f display -t	V2R1	A new field, LogLimit, is included in filters displayed with the ipsec command. For defensive filters, it indicates whether filter-match messages are being limited. For all other filter types, it has a value of N/A.	Limit defensive filter logging
	-k display	V1R13	The NATSupportLevel field is changed to support two additional values: IKEv2 and IKEv2_zOS.  The following fields previously reported N/A for all IKEv2 tunnels because NAT traversal was not supported for IKEv2. They are now populated appropriately when an IKEv2 tunnel traverses one or more NAT devices: <ul style="list-style-type: none"> <li>• NATInFrntLclScEndPt</li> <li>• NATInFrntRmtScEndPt</li> <li>• zOSCanInitiateP1SA</li> <li>• AllowNAT</li> <li>• RmtNAPTDetected</li> <li>• RmtUdpEncapPort</li> </ul>	Network address translation traversal support for IKE version 2

## Communications Server

Table 37. Summary of new and changed Communications Server z/OS UNIX commands (continued)

Command	Parm	Release	Description	Reason for change
ipsec (continued)	-y display -b	V1R13	The following fields previously reported N/A for all IKEv2 tunnels because NAT traversal was not supported for IKEv2. They are now populated appropriately when an IKEv2 tunnel traverses one or more NAT devices: <ul style="list-style-type: none"> <li>• RmtIsGw</li> <li>• RmtIsZOS</li> <li>• zOSCanInitP2SA</li> <li>• RmtUdpEncapPort</li> <li>• SrcNATOARcvd</li> <li>• DstNATOARcvd</li> <li>• LclIpSpecExIDPayload</li> <li>• RmtIpSpecExIDPayload</li> </ul>	Network address translation traversal support for IKE version 2
	-y display	V1R13	The following fields previously reported N/A for all IKEv2 tunnels because NAT traversal was not supported for IKEv2. They are now populated appropriately when an IKEv2 tunnel traverses one or more NAT devices: <ul style="list-style-type: none"> <li>• RmtIsGw</li> <li>• RmtIsZOS</li> <li>• zOSCanInitP2SA</li> <li>• RmtUdpEncapPort</li> <li>• SrcNATOARcvd</li> <li>• DstNATOARcvd</li> </ul>	Network address translation traversal support for IKE version 2
named		V2R1	This command is no longer supported.	Removal of BIND DNS Name Server from z/OS
orpcinfo or rpcinfo <sup>1</sup>	-p	V1R13	The program version column is wider than in prior releases. The offsets of all columns following the first column are different.	Release update

Table 37. Summary of new and changed Communications Server z/OS UNIX commands (continued)

Command	Parm	Release	Description	Reason for change
pasearch	-i	V1R13	The display is changed to include the settings for new IDS configuration fields.	Expanded Intrusion Detection Services
		V1R13	The display is changed to include the settings for new IDS configuration fields.	Intrusion Detection Services support for Enterprise Extender
	-R	V2R1	IPv6 policy is included in the display of all Routing policy entries that match the input options for pasearch.	IPv6 support for policy-based routing
	-T	V2R1	IPv6 routes and dynamic routing parameters are included in the display of all Routing tables that match the input options for pasearch.	IPv6 support for policy-based routing
	-t	V2R2	The report output can have a new value of RFC5280 for CertValidationMode.	AT-TLS certificate processing enhancements
		V2R2	Displays values pertaining to certificate revocation for the new AT-TLS policy agent statements and parameters.	AT-TLS certificate processing enhancements
		V2R1	Displays new parameters on AT-TLS configuration statements.	AT-TLS support for TLS v1.2 and related features
rndc		V2R1	This command is no longer supported.	Removal of BIND DNS Name Server from z/OS
rndc-confgen		V2R1	This command is no longer supported.	Removal of BIND DNS Name Server from z/OS

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Table 37. Summary of new and changed Communications Server z/OS UNIX commands (continued)

Command	Parm	Release	Description	Reason for change
trmdstat	All of report options	V1R13	The following changes were made: <ul style="list-style-type: none"> <li>All reports are updated to support IPv6 addresses</li> <li>The heading of all reports is updated to display the trmdstat command that was entered and to remove fields that displayed filters that were entered on the command.</li> <li>The default report (if there is no report option specified) is changed to IDS summary (-I) report</li> </ul>	Expanded Intrusion Detection Services
	-A	V1R13	The summary (-A), detail (-A -D), and statistics (-A -S) displays are changed to include information for the following new attack types: DATA_HIDING, OUTBOUND_RAW_IPV6, RESTRICTED_IPV6_DST_OPTIONS, RESTRICTED_IPV6_HOP_OPTIONS, and RESTRICTED_IPV6_NEXT_HDR.  The statistics display (-A -S) is changed to also include information for the GLOBAL_TCP_STALL and TCP_QUEUE_SIZE attack types.	Expanded Intrusion Detection Services
		V1R13	The summary (-A), detail (-A -D), and statistics (-A -S) displays are changed to include information for the following new attack types: EE_MALFORMED_PACKET, EE_PORT_CHECK, and EE_LDLC_CHECK.  The statistics display (-A -S) is changed to also include information for the EE_XID_FLOOD attack type.	Intrusion Detection Services support for Enterprise Extender
	-F	V1R13	The summary (-F), detail (-F -D), and statistics (-F -S) displays are changed to include information for the new EE_XID_FLOOD attack type.	Intrusion Detection Services support for Enterprise Extender
	-I	V1R13	This report is changed to include information for the GLOBAL_TCP_STALL and TCP_QUEUE_SIZE attack types.	Expanded Intrusion Detection Services
	-G	V1R13	This new option can be used to display summary (-G) or detail (-G -D) information for the new Global TCP Stall attack type.	Expanded Intrusion Detection Services
	-Q	V1R13	This new option can be used to display summary (-Q) or detail (-Q -D) information for the new TCP Queue Size attack type.	Expanded Intrusion Detection Services

**Note:**

1. In the z/OS UNIX shell, rpcinfo is a synonym for the orpcinfo command.

## Application programming interfaces and network management interfaces

This topic includes updates made to the application programming interfaces (APIs) and network management interfaces (NMIs) documented in *z/OS Communications Server: IP Programmer's Guide and Reference*. The following programming interfaces were updated:

- "Local IPsec NMI" on page 112
- "Network security services NMI" on page 113
- "Real-time network monitoring TCP/IP NMI" on page 113
- "TCP/IP callable NMI (EZBNMIFR)" on page 116
- "SNMP manager API" on page 116
- "Resolver callable NMI (EZBREIFR)" on page 115
- "Trusted TCP connections API for Java" on page 130

See *z/OS Communications Server: IP Programmer's Guide and Reference* for more detailed API information.

### FTP client API FCAI control block

Table 38 lists the FCAI control block updates to the Communications Server application interface for FTP Client Application Programming Interface.

Table 38. Summary of new Communications Server FTP client API FCAI control block

Name	Rel.	Description	Reason for change
ezaftpka.macro-FTP Client Application Interfaces (FCAI) control block	V2R1	FCAI_SCMD_MVSGET and FCAI_SCMD_MVSPUT are added to the list of equates defining possible values for the FCAI control block field FCAI_SCMD.	Simplify FTP transfer of data sets between z/OS systems
EZAFTP KC-Cobol Map for FACI-Map (FACI Client API)	V2R1	FCAI_SCMD_MVSGET and FCAI_SCMD_MVSPUT are added to the list of constants defining possible values for the control block field FCAI_SCMD.	Simplify FTP transfer of data sets between z/OS systems
EZAFTP KP-PL/I Map for FACI-Map	V2R1	FCAI_SCMD_MVSGET and FCAI_SCMD_MVSPUT are added to the list of subcommand codes for the FACI control block field FCAI_SCMD.	Simplify FTP transfer of data sets between z/OS systems
EZAFTP KR-REXX function package	V2R1	FCAI_SCMD_MVSGET and FCAI_SCMD_MVSPUT are added to the predefined variables to represent the MVSGET and MVSPUT subcommands respectively.	Simplify FTP transfer of data sets between z/OS systems
ftpcapi.h	V2R1	FCAI_SCMD_MVSGET and FCAI_SCMD_MVSPUT are added to the list of FCAI_RequestCompletionValue FCAI_SCMD (subcommand) values.	Simplify FTP transfer of data sets between z/OS systems
FTPClientErrorException.java	V2R1	The fields SUBCOMMAND_MVSGET and SUBCOMMAND_MVSPUT are added to FTPClientErrorException.	Simplify FTP transfer of data sets between z/OS systems

### FTP client API for REXX predefined variables

Table 39 on page 112 lists the updates to the Communications Server application interface for FTP Client Application Programming Interface for REXX.

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Table 39. Summary of new Communications Server predefined REXX variables

Request / Response	Rel.	Description	Reason for change
<ul style="list-style-type: none"> <li>FCAL_CEC_EXIT_EZAFCCMD_WRONG_RC</li> <li>FCAL_CEC_EXIT_EZAFCCMD_TERM</li> <li>FCAL_CEC_EXIT_EZAFCREP_WRONG_RC</li> <li>FCAL_CEC_EXIT_EZAFCREP_RC</li> <li>FCAL_CEC_EXIT_EZAFCREP_TERM</li> </ul>	V2R1	New predefined REXX variables for FTP client error codes	FTP client security user exits

### Local IPsec NMI

Table 40 lists the updates to the Communications Server application interface for local IPsec network management interface (NMI).

Table 40. Summary of new Communications Server IP Local IPsec NMI

Request / Response	Rel.	Description	Reason for change
<ul style="list-style-type: none"> <li>NMsec_GET_IKETUN</li> <li>NMsec_GET_IKETUNCASCADE</li> </ul>	V1R13	<p>The NMsiKETunNATTLevel field is changed to support two additional values: NMsec_IKETUN_NATTV2 (6) and NMsec_IKETUN_NATTV2ZOS (7).</p> <p>The following fields previously reported 0 for all IKEv2 tunnels because NAT traversal was not supported for IKEv2. They are now set appropriately when an IKEv2 tunnel traverses one or more NAT devices:</p> <ul style="list-style-type: none"> <li>NMsiKETunLclNAT</li> <li>NMsiKETunRmtNAT</li> <li>NMsiKETunRmtNAPT</li> <li>NMsiKETunCanInitP1</li> <li>NMsiKETunRmtUDPPort</li> </ul>	Network address translation traversal support for IKE version 2
<ul style="list-style-type: none"> <li>NMsec_GET_IKETUNCASCADE</li> <li>NMsec_GET_IPTUNDYNSTACK</li> <li>NMsec_GET_IPTUNDYNIKE</li> </ul>	V1R13	<p>The following fields previously reported 0 for all IKEv2 tunnels because NAT traversal was not supported for IKEv2. They are now set appropriately when an IKEv2 tunnel traverses one or more NAT devices:</p> <ul style="list-style-type: none"> <li>NMsiPDynLclNAT</li> <li>NMsiPDynRmtNAT</li> <li>NMsiPDynRmtNAPT</li> <li>NMsiPDynRmtGW</li> <li>NMsiPDynRmtZOS</li> <li>NMsiPDynCanInitP2</li> <li>NMsiPDynRmtUDPPort</li> <li>NMsiPDynSrcNATOA</li> <li>NMsiPDynDstNATOA</li> </ul>	Network address translation traversal support for IKE version 2
<ul style="list-style-type: none"> <li>NMsec_GET_IPFLTcurr</li> <li>NMsec_GET_IPFLTdefault</li> <li>NMsec_GET_IPFLTPOLICY</li> </ul>	V2R1	A new field, NMsiPFltLogLimit, is defined. For defensive filters it indicates whether filter-match messages are being limited. For all other filter types, it has a value of 0.	Limit defensive filter logging
<ul style="list-style-type: none"> <li>NMsec_GET_STACKINFO</li> </ul>	V2R1	The following changes are made to IPsec NMI response message NMsec_GET_STACKINFO:	APAR PI40291
	V2R2	<ul style="list-style-type: none"> <li>A new field, NMStackDVLclFltr, is added to the NMsecStack structure at offset 0, bit 7.</li> <li>The reserved field NMStackRsvd1 is updated to begin at offset 0, bit 8 with a length of 24 bits.</li> </ul>	APAR PI44865

### Network security services NMI

Table 41 lists the updates to the Communications Server application interface for network security services (NSS) network management interface (NMI).

Table 41. Summary of new Communications Server NSS NMI

Request / Response	Rel.	Description	Reason for change
<ul style="list-style-type: none"> <li>NMsec_GET_IKETUN</li> <li>NMsec_GET_IKETUNCASCADE</li> </ul>	V1R13	<p>The NMsiKETunNATTLevel field is changed to support two additional values: NMsec_IKETUN_NATTV2 (6) and NMsec_IKETUN_NATTV2ZOS (7).</p> <p>The following fields previously reported 0 for all IKEv2 tunnels because NAT traversal was not supported for IKEv2. They are now set appropriately when an IKEv2 tunnel traverses one or more NAT devices:</p> <ul style="list-style-type: none"> <li>NMsiKETunLclNAT</li> <li>NMsiKETunRmtNAT</li> <li>NMsiKETunRmtNAPT</li> <li>NMsiKETunCanInitP1</li> <li>NMsiKETunRmtUDPPort</li> </ul>	Network address translation traversal support for IKE version 2
<ul style="list-style-type: none"> <li>NMsec_GET_IKETUNCASCADE</li> <li>NMsec_GET_IPTUNDYNSTACK</li> <li>NMsec_GET_IPTUNDYNIKE</li> </ul>	V1R13	<p>The following fields previously reported 0 for all IKEv2 tunnels because NAT traversal was not supported for IKEv2. They are now set appropriately when an IKEv2 tunnel traverses one or more NAT devices:</p> <ul style="list-style-type: none"> <li>NMsiPDynLclNAT</li> <li>NMsiPDynRmtNAT</li> <li>NMsiPDynRmtNAPT</li> <li>NMsiPDynRmtGW</li> <li>NMsiPDynRmtZOS</li> <li>NMsiPDynCanInitP2</li> <li>NMsiPDynRmtUDPPort</li> <li>NMsiPDynSrcNATOA</li> <li>NMsiPDynDstNATOA</li> </ul>	Network address translation traversal support for IKE version 2
<ul style="list-style-type: none"> <li>NMsec_GET_IPFLTCURR</li> <li>NMsec_GET_IPFLTDEFAULT</li> <li>NMsec_GET_IPFLTPOLICY</li> </ul>	V2R1	A new field, NMsiPFltLogLimit, is defined. For defensive filters it indicates whether filter-match messages are being limited. For all other filter types, it has a value of 0.	Limit defensive filter logging

### Real-time application-controlled TCP/IP trace NMI (EZBRCIFR)

Table 42 lists the updates to the Communications Server Real-time application-controlled TCP/IP trace NMI.

Table 42. Summary of new Real-time application-controlled TCP/IP trace NMI (EZBRCIFR)

Request	Release	Description	Reason of change
N/A	V2R1	New callable NMI that can be used to obtain packet and data trace data in the form of trace records.	Real-time application-controlled TCP/IP trace NMI

### Real-time network monitoring TCP/IP NMI

Table 43 on page 114 lists the updates to the Communications Server real-time TCP/IP network monitoring NMI. For changes to SMF 119 records provided by the real-time SMF data NMI (SYSTCPSM) function, see “SMF record type 119 enhancements” on page 139.

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Table 43. Summary of new Communications Server real-time TCP/IP NMI

NMI	Request/response	Rel.	Description	Reason for change
Real-time packet and data trace NMI (SYSTCPDA)	PTHDR_T packet trace header	V2R1	A #pragma pack() directive was added to EZBYPTHH, the C header file that defines the packet trace header. This directive ensures that the structure mappings will not be padded.	Release update
	PTHDR_T packet trace header	V2R1	The following changes were made for SMC-R packets: <ul style="list-style-type: none"> <li>• New SMC trace section was added to the packet trace header for SMC-R packets.</li> <li>• New PTHIdSmc constant was added for SMC-R packets. This value sets in the CTEFMTID field of the trace record.</li> </ul>	Shared Memory Communications over Remote Direct Memory Access
	PTHDR_T packet trace header	V1R13	The following two new types are added for Pth_devty to indicate IPv4 and IPv6 IQDX interfaces: <ul style="list-style-type: none"> <li>• Pth_IQDX</li> <li>• Pth_IQDX6</li> </ul>	HiperSockets optimization for intraensemble data networks
	PTHDR_T packet trace header	V1R13	A new Pth_IQDX field is added to indicate a packet was received over an IQDX interface.	HiperSockets optimization for intraensemble data networks
Real-time SMF data NMI (SYSTCPDM)	FTP client login failure record (subtype 102)	V2R2	<ul style="list-style-type: none"> <li>• A new SMF119FT_FCSSLsessReuse field that contains the SSL session reuse flag.</li> <li>• A new SMF119FT_FCCSSLsessIDLen field that contains the length of the SSL Session ID of the FTP control connection.</li> <li>• A new SMF119FT_FCCSSLsessID field that contains the SSL Session ID of the FTP control connection.</li> <li>• A new SMF119FT_FCDSSLsessIDLen field that contains the length of the SSL Session ID of the FTP data connection.</li> <li>• A new SMF119FT_FCDSSLsessID field that contains the SSL Session ID of the FTP data connection.</li> </ul>	TLS session reuse support for FTP and AT-TLS applications



Table 43. Summary of new Communications Server real-time TCP/IP NMI (continued)

NMI	Request/response	Rel.	Description	Reason for change
Real-time SMF data NMI (SYSTCPSM)	FTP client session record (subtype 103)	V2R2	<ul style="list-style-type: none"> <li>• A new SMF119FT_FCSSLsessReuse field that contains the SSL session reuse flag.</li> <li>• A new SMF119FT_FCCSSLsessIDLen field that contains the length of the SSL Session ID of the FTP control connection.</li> <li>• A new SMF119FT_FCCSSLsessID field that contains the SSL Session ID of the FTP control connection.</li> <li>• A new SMF119FT_FCDSSLsessIDLen field that contains the length of the SSL Session ID of the FTP data connection.</li> <li>• A new SMF119FT_FCDSSLsessID field that contains the SSL Session ID of the FTP data connection.</li> </ul>	TLS session reuse support for FTP and AT-TLS applications
	FTP server session record (subtype 104)	V2R2	<ul style="list-style-type: none"> <li>• A new SMF119FT_FSSessReuse field that contains the SSL session reuse flag.</li> <li>• A new SMF119FT_FSCSSLsessIDLen field that contains the length of the SSL Session ID of the FTP control connection.</li> <li>• A new SMF119FT_FSCSSLsessID field that contains the SSL Session ID of the FTP control connection.</li> <li>• A new SMF119FT_FSDSSLsessIDLen field that contains the length of the SSL Session ID of the FTP data connection.</li> <li>• A new SMF119FT_FSDSSLsessID field that contains the SSL Session ID of the FTP data connection.</li> </ul>	TLS session reuse support for FTP and AT-TLS applications
Real-time SMF data NMI (SYSTCPSM)	N/A	V2R1	A new FTP SMF 119 record with subtype 71.	NMI and SMF enhancements for TCP/IP applications
Real-time TCP connection SMF NMI (SYSTCPCN)	TCP connection termination record (subtype 2)	V2R2	<ul style="list-style-type: none"> <li>• A new field, SMF119AP_TTTTLSSID, contains the AT-TLS session ID.</li> <li>• A new field, SMF119AP_TTTTLSSRU, indicates whether session reuse is in effect.</li> </ul>	TLS session reuse support for FTP and AT-TLS applications
Real-time TCP connection SMF NMI (SYSTCPCN)	TCP connection termination record (subtype 2)	V2R2 with APAR PI69920	<ul style="list-style-type: none"> <li>• New field SMF119AP_TTIPsecurityFlags. Indicates whether IP security is enabled for this TCP/IP stack and whether IP filtering was done for this connection.</li> <li>• New IP filter section. Indicates the inbound and outbound IP filters associated with the connection.</li> </ul>	SMF 119 TCP connection termination record (subtype 2) enhanced to provide IP filter information
TMI copy buffer interfaces (EZBTMIC1, EZBTMIC4, and TMI_Copybuffer())	N/A	V1R13	An application no longer needs to be APF authorized to invoke the interface. Instead, for applications that are not APF-authorized, the security product profile must be defined for the real-time service interface and the user ID that is associated with the application must be permitted for READ access to the profile.	Simplified authorization requirements for real-time TCP/IP network monitoring NMI

**Resolver callable NMI (EZBREIFR)**

The Communications Server resolver callable NMI (EZBREIFR) is new V1R13; see Table 44 on page 116.

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Table 44. Summary of new Communications Server resolver callable NMI (EZBREIFR)

Request	Rel.	Description	Reason for change
GetResolverConfig	V2R2	<ul style="list-style-type: none"> <li>• New values NMSSOCACHEREORDER and NMSSONOCACHEREORDER can be returned in the NMSSOptions field.</li> <li>• New values NMSSFACHEREORDER and NMSSFNOACHEREORDER can be returned in the NMSSFlags field.</li> <li>• New value NMSSDNOCACHEREORDER can be returned in the NMSSDefaults field.</li> <li>• New value NMSGONOCACHEREORDER can be returned in the NMSGOptions field.</li> <li>• New value NMSGFNOCACHEREORDER can be returned in the NMSGFlags field.</li> <li>• New value NMSGDNOCACHEREORDER can be returned in the NMSGDefaults field.</li> </ul>	Reordering of cached Resolver results
N/A	V1R13	New callable NMI that enables network management applications to obtain resolver configuration information.	NMI for retrieving system resolver configuration information

### SNMP manager API

Table 45 lists the updates to the Communications Server SNMP manager network management interface (NMI).

Table 45. Summary of new Communications Server IP SNMP manager API

Function	Parameters	Release	Description	Reason for change
snmpSetLogLevel()	logLevel	V1R13	The input parameter logLevel, as defined in snmpmgr.h, is changed to include a new value, SNMP_LOG_INTERNAL(8). Specification of this value, alone or in combination with any of the existing values, will trigger the logging of the SNMP packet processing traces under the SNMP Manager API.	TCP/IP serviceability enhancements

### Syslog daemon name/token pair

Table 46 lists the updates to the Communications Server application interface for syslog daemon name/token pair.

Table 46. Summary of new syslog daemon name/token pair

Parameter	Release	Description	Reason of change
Syslog daemon name/token pair	V2R1	During the initialization, the syslog daemon (syslogd) creates a name/token pair that provides the syslogd configuration file location and related information.	API to locate SYSLOGD configuration file

### TCP/IP callable NMI (EZBNMIFR)

Table 47 on page 117 lists the updates to the Communications Server TCP/IP callable NMI.

Table 47. Summary of new Communications Server TCP/IP callable NMI (EZBNMIFR)

Request	Parameter/output	Rel.	Description	Reason for change
GetConnectionDetail	<ul style="list-style-type: none"> <li>• NWMCConnFlag01                             <ul style="list-style-type: none"> <li>– NWMCConnSMCDCfg</li> </ul> </li> <li>• NWMCConnSMCDStatus</li> <li>• NWMCConnSMCDReason</li> <li>• NWMCConnSMCFlags                             <ul style="list-style-type: none"> <li>– NWMCConnSMCDRsnRmt</li> </ul> </li> <li>• NWMCConnSMCFlags                             <ul style="list-style-type: none"> <li>– NWMCConnSMCDCached</li> </ul> </li> <li>• NWMCConnLclSMCLinkId</li> <li>• NWMCConnRmtSMCLinkId</li> </ul>	V2R2	<ul style="list-style-type: none"> <li>• New flag bit NWMCConnSMCDCfg is set in the NWMCConnFlag01 field to indicate whether the SMCD parameter is configured on the GLOBALCONFIG statement.</li> <li>• New NWMCConnSMCDStatus field that indicates whether this connection is traversing an SMC-D link.</li> <li>• New NWMCConnSMCDReason field that indicates why a connection is not using an SMC-D link.</li> <li>• New flag bit NWMCConnSMCDRsnRmt is set in the NWMCConnSMCFlags field to indicate whether the NWMCConnSMCDReason is set by the remote peer.</li> <li>• New flag bit NWMCConnSMCDCached is set in the NWMCConnSMCFlags field to indicate whether this connection is cached to not use SMC-D.</li> <li>• Existing NWMCConnLclSMCLinkId field that indicates the local stack link ID for the SMC-R or SMC-D link that this connection traverses.</li> <li>• Existing NWMCConnRmtSMCLinkId field that indicates the remote stack link ID for the SMC-R or SMC-D link that this connection traverses.</li> </ul>	Shared Memory Communications - Direct Memory Access

## Communications Server

Table 47. Summary of new Communications Server TCP/IP callable NMI (EZBNMIFR) (continued)

Request	Parameter/output	Rel.	Description	Reason for change
GetConnectionDetail (continued)	NWMCConnFlag01	V2R2	Added the following new flag bits to field NWMCConnFlag01: <ul style="list-style-type: none"> <li>NWMCConnDRSEligible</li> <li>NWMCConnDRSActive</li> </ul>	TCP autonomic tuning enhancements
	NWMCConnFlag02	V2R2	Added a new flag byte field, NWMCConnFlag02, with the following flag bits: <ul style="list-style-type: none"> <li>NWMCConnORSEligible</li> <li>NWMCConnORSActive</li> <li>NWMCConnORSSndBufExp</li> <li>NWMCConnAutoDelayAck</li> <li>NWMCConnDelayAck</li> </ul>	TCP autonomic tuning enhancements
	NWMCConnLclSMCBufSz	V2R2	Existing NWMCConnLclSMCBufSz field that indicates the size of the RMB or DMB element that the local host uses to receive data on this connection from the remote host.	<ul style="list-style-type: none"> <li>Shared Memory Communications over RDMA enhancements</li> <li>Shared Memory Communications - Direct Memory Access</li> </ul>
	NWMCConnRmtSMCBufSz	V2R2	Existing NWMCConnRmtSMCBufSz field that indicates the size of the RMB or DMB element that the remote host uses to receive data on this connection from the local host.	<ul style="list-style-type: none"> <li>Shared Memory Communications over RDMA enhancements</li> <li>Shared Memory Communications - Direct Memory Access</li> </ul>
	NWMCConnSMCFlags	V2R2	Added a new flag bit NWMCConnSMCCached.	Shared Memory Communications over RDMA enhancements
	NWMCConnSMCReason	V2R2	Added a new constant NWMSMCRSNAUTOSMCR.	Shared Memory Communications over RDMA enhancements
	NWMCConnLclSMCLinkId	V2R1	New NWMCConnLclSMCLinkId field that indicates the local stack link ID for the SMC-R link that this connection traverses.	Shared Memory Communications over Remote Direct Memory Access
	NWMCConnRmtSMCLinkId	V2R1	New NWMCConnRmtSMCLinkId field that indicates the remote stack link ID for the SMC-R link that this connection traverses.	Shared Memory Communications over Remote Direct Memory Access
	NWMCConnSMCRCfg	V2R1	New flag bit NWMCConnSMCRCfg is set in the NWMCConnFlag01 field to indicate whether the SMCR parameter is configured on the GLOBALCONFIG statement.	Shared Memory Communications over Remote Direct Memory Access
	NWMCConnSMCReason	V2R1	New NWMCConnSMCReason field that indicates why a connection is not using an SMC-R link.	Shared Memory Communications over Remote Direct Memory Access
	NWMCConnSMCStatus	V2R1	New NWMCConnSMCStatus field that indicates whether this connection is traversing an SMC-R link.	Shared Memory Communications over Remote Direct Memory Access
	NWMCConnTTLSSSLProt	V2R1	New NWMTTLSPROTTLV1_2 value (X'0303').	AT-TLS support for TLS v1.2 and related features
	NWMCConnTTLSSSLNegCiph	V2R1	New NWMTTLSENEGIPH4X value (X'4X') is added to indicate four-character cipher.	AT-TLS support for TLS v1.2 and related features
	NWMCConnTTLSSSLNegCiph4	V2R1	New field containing four-character negotiated cipher code.	AT-TLS support for TLS v1.2 and related features
	NWMCConnStall	V1R13	New bit defined that indicates whether the connection's send data flow is stalled.	Expanded Intrusion Detection Services

Table 47. Summary of new Communications Server TCP/IP callable NMI (EZBNMIFR) (continued)

Request	Parameter/output	Rel.	Description	Reason for change
GetDVIPAList	NWMDvListFlags	V2R1	A new flag, NWMDVLISTFLAGS_DVRAFFINITY (0x04), is added. The flag means that an application instance DVIPA was created with affinity. Applications are permitted to dynamically create DVIPAs that are within the range defined by a VIPARANGE statement.	Affinity for application-instance DIVPAs
GetFTPDaemonConfig	SMF119FT_FDCFSecSessReuse	V2R2	New SMF119FT_FDCFSecSessReuse field contains the value of the statement SECURE_SESSION_REUSE in the server FTP.DATA.	TLS session reuse support for FTP and AT-TLS applications
	SMF119FT_FDCFApplname	V2R1	New SMF119FT_FDCFApplname field contains 8-character FTP server application name from the APPLNAME statement.	Release update
	SMF119FT_FDCFSslv3	V2R1	New field to enable or disable SSLV3	APAR PI28679
	N/A	V2R1	New poll-type request to provide FTP daemon configuration information.	NMI and SMF enhancements for TCP/IP applications

## Communications Server

Table 47. Summary of new Communications Server TCP/IP callable NMI (EZBNMIFR) (continued)

Request	Parameter/output	Rel.	Description	Reason for change
GetGlobalStats	NWMTCPSTSMCDCfg	V2R2	<ul style="list-style-type: none"> <li>New flag bit NWMTCPSTSMCDCfg is set in the NWMTCPSTFlags field to indicate whether SMC-D processing is or has been in effect.</li> <li>When the NWMTCPSTSMCDCfg flag is set, the listed TCP counters reflect all TCP connections, including connections over SMC-D links.</li> <li>The listed SMC-D statistics are added.</li> </ul>	Shared Memory Communications - Direct Memory Access
	Existing TCP stats changed:			
	NWMTCPSTCurrEstab			
	NWMTCPSTActiveOpened			
	NWMTCPSTPassiveOpened			
	NWMTCPSTConnClosed			
	NWMTCPSTInSegs			
	NWMTCPSTOutSegs			
NWMTCPSTOutRsts				
NWMTCPSTEstabResets				
NWMTCPSTAcceptCount				
NWMTCPSTKeepAliveProbes				
NWMTCPSTKeepAliveDrop				
NWMTCPSTFinwait2Drops				
New SMC-D stats:				
NWMTCPSTSMCDCurrEstabLnks				
NWMTCPSTSMCDActLnkOpened				
NWMTCPSTSMCDPasLnkOpened				
NWMTCPSTSMCDLnksClosed				
NWMTCPSTSMCDCurrEstab				
NWMTCPSTSMCDActiveOpened				
NWMTCPSTSMCDPassiveOpened				
NWMTCPSTSMCDConnClosed				
NWMTCPSTSMCRInSegs				
NWMTCPSTSMCROutSegs				
NWMTCPSTSMCRInRsts				
NWMTCPSTSMCROutRsts				
NWMTCPSTCfgEphemDef	V2R1	Contains the number of configured ephemeral ports to be assigned for TCP applications.	User control of Ephemeral Port Ranges	
NWMTCPSTEphemInUse	V2R1	Contains the current number of configured ephemeral ports in use by TCP applications.	User control of Ephemeral Port Ranges	
NWMTCPSTEphemHiWater	V2R1	Contains the highest number of configured ephemeral ports in use by TCP applications at any time.	User control of Ephemeral Port Ranges	
NWMTCPSTEphemExhaust	V2R1	Contains the number of bind() requests that failed because no TCP ephemeral port was available.	User control of Ephemeral Port Ranges	
NWMUDPSTCfgEphemDef	V2R1	Contains the number of configured ephemeral ports to be assigned for UDP applications.	User control of Ephemeral Port Ranges	
NWMUDPSTEphemInUse	V2R1	Contains the current number of configured ephemeral ports in use by UDP applications.	User control of Ephemeral Port Ranges	
NWMUDPSTEphemHiWater	V2R1	Contains the highest number of configured ephemeral ports in use by UDP applications at any time.	User control of Ephemeral Port Ranges	
NWMUDPSTEphemExhaust	V2R1	Contains the number of bind() requests that failed because no UDP ephemeral port was available.	User control of Ephemeral Port Ranges	

Table 47. Summary of new Communications Server TCP/IP callable NMI (EZBNMIFR) (continued)

Request	Parameter/output	Rel.	Description	Reason for change
GetGlobalStats (continued)	NWMTCPSTSMCRCfg  Existing TCP stats changed:  NWMTCPSTCurrEstab NWMTCPSTActiveOpened NWMTCPSTPassiveOpened NWMTCPSTConnClosed NWMTCPSTInSegs NWMTCPSTOutSegs NWMTCPSTOutRsts NWMTCPSTEstabResets NWMTCPSTAcceptCount NWMTCPSTKeepAliveProbes NWMTCPSTKeepAliveDrop NWMTCPSTFinwait2Drops  New SMC-R stats:  NWMTCPSTSMCRCurrEstabLnks NWMTCPSTSMCRLnkActTimeOut NWMTCPSTSMCRActLnkOpened NWMTCPSTSMCRPasLnkOpened NWMTCPSTSMCRLnksClosed NWMTCPSTSMCRCurrEstab NWMTCPSTSMCRActiveOpened NWMTCPSTSMCRPassiveOpened NWMTCPSTSMCRConnClosed NWMTCPSTSMCRInSegs NWMTCPSTSMCROutSegs NWMTCPSTSMCRInRsts NWMTCPSTSMCROutRsts	V2R1	<ul style="list-style-type: none"> <li>New flag bit NWMTCPSTSMCRCfg is set in the NWMTCPSTFlags field to indicate whether the SMCR parameter is configured on the GLOBALCONFIG statement.</li> <li>When the SMCR parameter is configured on the GLOBALCONFIG statement, the listed TCP counters reflect all TCP connections, including connections over SMC-R links.</li> <li>The listed SMC-R statistics are added.</li> </ul>	Shared Memory Communications over Remote Direct Memory Access
	NWMTCPSTConnFloods	V1R13	New field defined - The number of TCP servers under a potential connection flood attack.	Expanded Intrusion Detection Services
	NWMTCPSTConnStalls	V1R13	New field defined -The number of TCP connections whose send data flow is stalled.	Expanded Intrusion Detection Services
GetIfs	<ul style="list-style-type: none"> <li>NWMIIfFlags                             <ul style="list-style-type: none"> <li>NWMIIfNetIDFlg</li> </ul> </li> <li>NWMIIfFlags2                             <ul style="list-style-type: none"> <li>NWMIIfSMCDFlg</li> <li>NWMIIfISMAssoc</li> </ul> </li> <li>NWMIIfType</li> <li>NWMIIfAssocName</li> <li>NWMIIfPFID</li> <li>NWMIIfSMCRStatus</li> <li>NWMIIfSMCDStatus</li> <li>NWMIIfGID</li> <li>NWMIIfPNetID</li> </ul>	V2R2	<ul style="list-style-type: none"> <li>New NWMIIfSMCDFlg flag bit is set in the NWMIIfFlags2 field for OSD and HiperSockets interfaces that have SMCD specified on the INTERFACE statement.</li> <li>New NWMIIfISMAssoc is set in the NWMIIfFlags2 field to indicate that this ISM is associated with an OSD or HiperSockets interface.</li> <li>Listed fields are updated to include information for SMC-D.</li> <li>The NWMIIfSMCRVLAN value is obsolete from the NWMIIfSMCRStatus field.</li> </ul>	Shared Memory Communications - Direct Memory Access
	NWMIIfFlags	V2R1	<ul style="list-style-type: none"> <li>The NWMIIfDefIntf flag bit is set in the NWMIIfFlags field for IPv4 IPAQIDIO and VIRTUAL interfaces that are defined by the INTERFACE statement.</li> <li>The NWMIIfBcast flag bit is set in the NWMIIfFlags field for IPv4 IPAQIDIO interfaces defined by the INTERFACE statement with the IPBCAST parameter specified.</li> </ul>	IPv4 INTERFACE statement for HiperSockets and Static VIPAs

## Communications Server

Table 47. Summary of new Communications Server TCP/IP callable NMI (EZBNMIFR) (continued)

Request	Parameter/output	Rel.	Description	Reason for change
Getlfs (continued)	NWMIIfRouteMask	V2R1	The NWMIIfRouteMask provides the configured subnet mask for IPv4 IPAQIDIO interfaces defined by the INTERFACE statement.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	NWMIIfChpID	V2R1	The NWMIIfChpID provides the CHPID value for IPv4 IPAQIDIO interfaces defined by the INTERFACE statement.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	NWMIIfCfgMtu	V2R1	The NWMIIfCfgMtu provides the configured MTU value for IPv4 IPAQIDIO interfaces defined by the INTERFACE statement.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	NWMIIfDatapathNum	V2R1	The NWMIIfDatapathNum provides the datapath address for IPv4 IPAQIDIO interfaces defined by the INTERFACE statement, and for IPv6 IPAQIDIO6 interfaces.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	NWMIIfAssocName	V2R1	The NWMIIfAssocName provides the TRLE name for IPv4 IPAQIDIO interfaces defined by the INTERFACE statement, and for IPv6 IPAQIDIO6 interfaces.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	NWMIIfSrcVipaIntfName	V2R1	The NWMIIfSrcVipaIntfName provides the SOURCEVIPAINTERFACE name for IPv4 IPAQIDIO interfaces defined by the INTERFACE statement.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	NWMIIfpadAddr	V2R1	The NWMIIfpadAddr provides the IP address for IPv4 IPAQIDIO and VIRTUAL interfaces defined by the INTERFACE statement.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	NWMIIfFlags	V2R1	<ul style="list-style-type: none"> <li>The NWMIIfSMCRFlg flag bit is set in the NWMIIfFlags field for OSD interfaces that have SMCR specified on the INTERFACE statement</li> <li>The NWMIIfPNetIDFlg flag bit is set in the NWMIIfFlags field for OSD, OSX and RNIC interfaces to indicate the NWMIIfPNetID field contains the Physical network ID.</li> </ul>	Shared Memory Communications over Remote Direct Memory Access
	NWMIIfType	V2R1	The NWMIIfType field can have a new NWMIIfTRNIC type for 10 GbE RoCE Express interfaces, which are represented as RNIC interfaces.	Shared Memory Communications over Remote Direct Memory Access
	NWMIIfMacAddr	V2R1	The NWMIIfMacAddr field contains the VMAC address generated by the VTAM DLC layer for 10 GbE RoCE Express interfaces.	Shared Memory Communications over Remote Direct Memory Access
NWMIIfAssocName	V2R1	The NWMIIfAssocName field contains the TRLE name for 10 GbE RoCE Express interfaces.	Shared Memory Communications over Remote Direct Memory Access	



Table 47. Summary of new Communications Server TCP/IP callable NMI (EZBNMIFR) (continued)

Request	Parameter/output	Rel.	Description	Reason for change
GetIfs (continued)	NWMIfPFID	V2R1	The new NWMIfPFID field contains the PFID for 10 GbE RoCE Express interfaces.	Shared Memory Communications over Remote Direct Memory Access
	NWMIfGID	V2R1	The new NWMIfGID field contains the GID for 10 GbE RoCE Express interfaces.	Shared Memory Communications over Remote Direct Memory Access
	NWMIfSMCRStatus	V2R1	The new NWMIfSMCRStatus field contains the SMCR status for OSD interfaces.	Shared Memory Communications over Remote Direct Memory Access
	NWMIfPNetID	V2R1	The new NWMIfPNetID field contains the Physical network ID for active OSD, OSX and 10 GbE RoCE Express interfaces.	Shared Memory Communications over Remote Direct Memory Access
	NWMIfFlags2	V2R1	The NWMIfRnicAssoc is set in the NWMIfFlags2 field to indicate that this 10 GbE RoCE Express interface is associated with an OSD interface.	Shared Memory Communications over Remote Direct Memory Access
	NWMIfChksumOffload and NWMIfTcpSegOffload parameters	V1R13	These flags are now valid for IPAQENET6 interfaces.	OSA-Express4S QDIO IPv6 checksum and segmentation offload
	NWMIfTHIPERIQDX	V1R13	New interface type for IQDX (for interface types of either IPAQIQX or IPAQIQX6).	HiperSockets optimization for intraensemble data networks
	NWMIfIQDXFlg	V1R13	For an OSX interface, an indicator if an associated dynamic IQDX interface name field is provided.	HiperSockets optimization for intraensemble data networks
	NWMIfIQDXName	V1R13	For an OSX interface, the associated dynamic IQDX interface name.	HiperSockets optimization for intraensemble data networks
GetIfStats	NWMIfTHIPERIQDX	V1R13	New interface type for IQDX (for interface types of either IPAQIQX or IPAQIQX6).	HiperSockets optimization for intraensemble data networks
	NWMIfStIQDXFlg	V1R13	For an OSX interface, an indicator if statistics for an associated dynamic IQDX interface exists.	HiperSockets optimization for intraensemble data networks
	NWMIfStInIQDXBytes NWMIfStInIQDXUcastPkts NWMIfStOutIQDXBytes NWMIfStOutIQDXUcastPkts	V1R13	For an OSX interface, statistics for bytes and unicast packets sent and received over the associated dynamic IQDX interface.	HiperSockets optimization for intraensemble data networks
GetIfStatsExtended	NWMIfTHIPERIQDX	V1R13	New interface type for IQDX (for interface types of either IPAQIQDX or IPAQIQDX6)	HiperSockets optimization for intraensemble data networks
GetIfSms	N/A	V2R2	New poll-type request that obtains information for ISM interfaces.	Shared Memory Communications - Direct Memory Access

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Table 47. Summary of new Communications Server TCP/IP callable NMI (EZBNMIFR) (continued)

Request	Parameter/output	Rel.	Description	Reason for change
GetProfile	IPv4 configuration section: NMTP_V4CFDynXcfSMCD	V2R2	New NMTP_V4CFDynXcfSMCD value that indicates whether the dynamically generated XCF interface can be used for new TCP connections with SMC-D.	Shared Memory Communications - Direct Memory Access
	IPv6 configuration section: NMTP_V6CFDynXcfSMCD	V2R2	New NMTP_V6CFDynXcfSMCD value that indicates whether the dynamically generated XCF interface can be used for new TCP connections with SMC-D.	Shared Memory Communications - Direct Memory Access
	Global configuration section: NMTP_GBCFFlags - NMTP_GBCFSMCD NMTP_GBCFFixedMemoryD NMTP_GBCFTcpKeepMinIntD	V2R2	<ul style="list-style-type: none"> <li>New NMTP_GBCFSMCD flag bit is set in the NMTP_GBCFFlags field to indicate that the SMCD operand was specified on the GLOBALCONFIG statement.</li> <li>New NMTP_GBCFFixedMemoryD field that specifies the SMCD FIXEDMEMORY value. FIXEDMEMORY is specified in megabyte increments.</li> <li>New NMTP_GBCFTcpKeepMinIntD field that specifies the SMCD TCPKEEPMININTERVAL value.</li> </ul>	Shared Memory Communications - Direct Memory Access
	Interface section: NMTP_INTFFlags - NMTP_INTFSMCD	V2R2	New NMTP_INTFSMCD flag bit is set in the NMTP_INTFFlags field for OSD and HiperSockets interfaces that have SMCD specified or that take the SMCD default on the INTERFACE statement.	Shared Memory Communications - Direct Memory Access
	NMTP_GBCFAdjDVMSS	V2R2	Provides the value of the GLOBLACONFIG ADJUSTDVIPAMSS parameter.	VIPAROUTE fragmentation avoidance
	NMTP_GBCFSMCGFlags	V2R2	New flag byte field NMTP_GBCFSMCGFlags with the following flag bits: <ul style="list-style-type: none"> <li>NMTP_GBCFAutoCache</li> <li>NMTP_GBCFAutoSMC</li> </ul>	<ul style="list-style-type: none"> <li>Shared Memory Communications over RDMA enhancements</li> <li>Shared Memory Communications - Direct Memory Access</li> </ul>
	NMTP_IPSecRule	V2R2	New flags and fields to support the new and modified parameters on the IPSECRULE and IPSEC6RULE profile statements.	TCPIP profile IP security filter enhancements
	NMTP_PORTRsvOptions	V2R2	<ul style="list-style-type: none"> <li>New flag bit NMTP_PORTRSMC that indicates this port or port range is enabled for SMC-R and SMC-D.</li> <li>New flag bit NMTP_PORTRNoSMC that indicates this port or port range is disabled for SMC-R and SMC-D.</li> </ul>	<ul style="list-style-type: none"> <li>Shared Memory Communications over RDMA enhancements</li> <li>Shared Memory Communications - Direct Memory Access</li> </ul>
	NMTP_TCCFFlags	V2R2	New flag NMTP_TCCFAutoDelayAcks that indicates the setting of TCPCONFIG AUTODELAYACKS.	TCP Autonomic Tuning
	NMTP_PIDSEye	V2R1	In the C header file, EZBNMMP, eyecatcher constant, NMTP_PIDSEYEC has been corrected.	Release update
	NMTP_V6CFDynXcfAddr	V2R1	In the C header file, EZBNMMP, this IPv6 address field has been redefined from char to struct in6_addr.	Release update
NMTP_IPA6Addr	V2R1	In the C header file, EZBNMMP, this IPv6 address field has been redefined from char to struct in6_addr.	Release update	

Table 47. Summary of new Communications Server TCP/IP callable NMI (EZBNMIFR) (continued)

Request	Parameter/output	Rel.	Description	Reason for change
GetProfile (continued)	NMTP_INTFFlags	V2R1	New flag NMTP_INTFTempIP in field NMTP_INTFFlags that indicates the Interface is configured with the TEMPIP parameter.	Enable DHCP clients on OSA Interfaces
	NMTP_TCCFConnectTimeOut NMTP_TCCFConnectInitInterval NMTP_TCCFFRRThreshold NMTP_TCCFKeepAliveProbes NMTP_TCCFKAPProbeInterval NMTP_TCCFMaxRetransmit NMTP_TCCFNagle NMTP_TCCFQueuedRTT NMTP_TCCFRetransmitAttempts NMTP_TCCFMaxSndBufSize NMTP_TCCFTimeWaitInterval	V2R1	New fields that indicates the setting of new TCPCONFIG parameters: <ul style="list-style-type: none"> <li>• CONNECTTIMEOUT</li> <li>• CONNECTINITINTERVAL</li> <li>• FRRTHRESHOLD</li> <li>• KEEPALIVEPROBES</li> <li>• KEEPALIVEPROBEINTERVAL</li> <li>• MAXIMUMRETRANSMITTIME</li> <li>• NAGLE and NONAGLE</li> <li>• QUEUEDRTT</li> <li>• RETRANSMITATTEMPTS</li> <li>• TCPMAXSENDBUFRSIZE</li> <li>• TIMEWAITINTERVAL</li> </ul>	Enhanced TCP protocol configuration options and default settings
	NMTP_GBCFFlags NMTP_GBCFPFidCnt NMTP_GBCFFixedMemory NMTP_GBCFTcpKeepMinInt NMTP_GBCFPFs array	V2R1	<ul style="list-style-type: none"> <li>• The new NMTP_GBCFSMCR flag bit is set in the NMTP_GBCFFlags field to indicate that the SMCR operand was specified on the GLOBALCONFIG statement.</li> <li>• The new NMTP_GBCFPFidCnt field indicates the current number of configured PCI-function ID (PFID) and Port number entries in the NMTP_GBCFPFs array.</li> <li>• The new NMTP_GBCFFixedMemory field specifies the SMCR FIXEDMEMORY value. FIXEDMEMORY is specified in megabyte increments.</li> <li>• The new NMTP_GBCFTcpKeepMinInt field specifies the SMCR TCPKEEPMININTERVAL value.</li> <li>• The new NMTP_GBCFPFs array contains a maximum of 16 PFID and port number paired entries:                             <ul style="list-style-type: none"> <li>– NMTP_GBCFPFid is the 2-byte hexadecimal PFID value.</li> <li>– NMTP-GBCFPFport is the 1-byte decimal port number.</li> <li>– NMTP_GBCFPFmtu is a 2-byte decimal maximum transmission unit (MTU) value.</li> </ul> </li> </ul>	Shared Memory Communications over Remote Direct Memory Access

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Table 47. Summary of new Communications Server TCP/IP callable NMI (EZBNMIFR) (continued)

Request	Parameter/output	Rel.	Description	Reason for change
GetProfile (continued)	NMTP_PORTFlags	V2R1	The NMTP_PORTRNoSMCR flag bit is set in the NMTP_PORTFlags field to indicate this port or port range is disabled for SMC-R.	Shared Memory Communications over Remote Direct Memory Access
	NMTP_INTFFlags	V2R1	The NMTP_INTFSMCR flag bit is set in the NMTP_INTFFlags field for OSA interfaces that have SMCR specified or that take the SMCR default on the INTERFACE statement.	Shared Memory Communications over Remote Direct Memory Access
	NMTP_MGMTSmf119Types	V2R1	<ul style="list-style-type: none"> <li>The new NMTP_MGMT119SmcrGrpStats flag bit is set in the NMTP_MGMTSmf119Type field to indicate that the new SMC-R link group statistics records were requested on the SMFCONFIG profile statement.</li> <li>The new NMTP_MGMT119SmcrLnkEvent flag bit is set in the NMTP_MGMTSmf119Type field to indicate that the new SMC-R link state start and end records were requested on the SMFCONFIG profile statement.</li> </ul>	Shared Memory Communications over Remote Direct Memory Access
	NMTP_V4CFFlags	V2R1	The description of flag NMTP_V4CFQDIOAcc is updated. The restriction of the QDIO Accelerator to sysplex distributor traffic is no longer determined only by whether IP datagram forwarding is enabled.	QDIO acceleration coexistence with IP filtering
	NMTP_TCCFSelectiveACK	V2R1	New flag is added to indicate the setting of TCPCONFIG SELECTIVEACK.	TCP support for selective acknowledgements
	NMTP_NETACache	V2R1	New field is added to indicate the setting of the CACHEALL, CACHEPERMIT, and CACHESAME parameters on the NETACCESS statement.	Improve auditing of NetAccess rules
	NMTP_TCCFEphemPortLow	V2R1	New field is added to indicate the low and high port values for TCP ephemeral ports.	User control of Ephemeral Port Ranges
	NMTP_TCCFEphemPortHighNum	V2R1	New fields is added to indicate the low and high port values for TCP ephemeral ports.	User control of Ephemeral Port Ranges
	NMTP_UDCFEphemPortLow	V2R1	New fields is added to indicate the low and high port values for UDP ephemeral ports	User control of Ephemeral Port Ranges
NMTP_UDCFEphemPortHighNum	V2R1	New fields is added to indicate the low and high port values for UDP ephemeral ports	User control of Ephemeral Port Ranges	

Table 47. Summary of new Communications Server TCP/IP callable NMI (EZBNMIFR) (continued)

Request	Parameter/output	Rel.	Description	Reason for change
GetProfile (continued)	NMTP_V4CFDynXcfSrcVipalFNameFlg	V2R1	New flag is added to indicate if the dynamic XCF source VIPA interface name is specified.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	NMTP_V4CFDynXcfSrcVipalFName	V2R1	New field is added to indicate the configured dynamic XCF source VIPA interface name.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	NMTP_INTFDefIntf NMTP_INTFFlags	V2R1	The NMTP_INTFDefIntf flag bit is set in the NMTP_INTFFlags field for IPv4 IPAQIDIO and VIRTUAL interfaces that are defined by the INTERFACE statement.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	NMTP_INTFIPbcast	V2R1	The NMTP_INTFIPbcast flag bit is set in the NMTP_INTFFlags field for IPv4 IPAQIDIO interfaces that are defined by the INTERFACE statement with the IPBCAST parameter specified.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	NMTP_INTFChpID	V2R1	The NMTP_INTFChpID provides the CHPID value for IPv4 IPAQIDIO interfaces that are defined by the INTERFACE statement.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	NMTP_INTFIPv4Mask	V2R1	The NMTP_INTFIPv4Mask provides the configured subnet mask for IPv4 IPAQIDIO interfaces that are defined by the INTERFACE statement.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	NMTP_INTFMtu	V2R1	The NMTP_INTFMtu provides the configured MTU value for IPv4 IPAQIDIO interfaces that are defined by the INTERFACE statement.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	NMTP_INTFIPv4Addr	V2R1	The NMTP_INTFIPv4Addr provides the IP address for IPv4 IPAQIDIO and VIRTUAL interfaces that are defined by the INTERFACE statement.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	NMTP_INTFSrcVipaIntfName	V2R1	The NMTP_INTFSrcVipaIntfName provides the SOURCEVIPAINTERFACE name for IPv4 IPAQIDIO interfaces that are defined by the INTERFACE statement.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	NMTP_GBCFSegOffload	V1R13	Use of this flag is deprecated. Use NMTP_V4CFSegOffload.	OSA-Express4S QDIO IPv6 checksum and segmentation offload
	NMTP_V4CFChkOffload	V1R13	New flag that indicates setting of IPCONFIG CHECKSUMOFFLOAD.	OSA-Express4S QDIO IPv6 checksum and segmentation offload
	NMTP_V4CFSegOffload	V1R13	New flag that indicates setting of IPCONFIG SEGMENTATIONOFFLOAD.	OSA-Express4S QDIO IPv6 checksum and segmentation offload
	NMTP_V6CFChkOffload	V1R13	New flag that indicates setting of IPCONFIG6 CHECKSUMOFFLOAD.	OSA-Express4S QDIO IPv6 checksum and segmentation offload
	NMTP_V6CFSegOffload	V1R13	New flag that indicates setting of IPCONFIG6 SEGMENTATIONOFFLOAD.	OSA-Express4S QDIO IPv6 checksum and segmentation offload
NMTP_GBCFAutoIQDX	V1R13	New flags that indicates setting of GLOBALCONFIG AUTOIQDX	HiperSockets optimization for intraensemble data networks	
GetProfile (continued)	NMTP_DVCFSAFNameSet	V1R13	New flag in field NMTP_DVCFFlags that indicates if the SAF parameter is specified on the VIPARANGE statement.	Improved security granularity for VIPARANGE DVIPAs
	NMTP_DVCFSAFName	V1R13	New field that indicates the name that is specified on the SAF parameter of the VIPARANGE statement.	Improved security granularity for VIPARANGE DVIPAs
	NMTP_PORTJobName	V1R13	This field can now contain a job name consisting of a 1-7 character prefix followed by an asterisk.	Wildcard support for the PORTRANGE statement

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Table 47. Summary of new Communications Server TCP/IP callable NMI (EZBNMIFR) (continued)

Request	Parameter/output	Rel.	Description	Reason for change
GetRnics	N/A	V2R1	New poll-type request to obtain information for SMC-R link groups and the SMC-R links in each group.	Shared Memory Communications over Remote Direct Memory Access
GetSmcDLinks	N/A	V2R2	New poll-type request to obtain information for SMC-D links.	Shared Memory Communications - Direct Memory Access
GetSmcLinks	N/A	V2R1	New poll-type request to obtain information for 10 GbE RoCE Express interfaces.	Shared Memory Communications over Remote Direct Memory Access
GetStorageStatistics	<ul style="list-style-type: none"> <li>• NWMStgFlags               <ul style="list-style-type: none"> <li>- NWMStgSMCDCfg</li> </ul> </li> <li>• New SMC-D storage utilization               <ul style="list-style-type: none"> <li>- NWMStg64SMCDFixedCurrent</li> <li>- NWMStg64SMCDFixedMax</li> <li>- NWMStg64SMCDFixedLimit</li> </ul> </li> </ul>	V2R2	<ul style="list-style-type: none"> <li>• New flag bit NWMStgSMCDCfg is set in the NWMStgFlags field to indicate whether the SMCD parameter is configured on the GLOBALCONFIG statement.</li> <li>• The SMC-D storage utilization information is added when the SMCD parameter is configured on the GLOBALCONFIG statement</li> </ul>	Shared Memory Communications - Direct Memory Access
	NWMStgSMCRCfg  New SMC-R storage utilization:  NWMStg64SMCRFixedCurrent NWMStg64SMCRFixedMax NWMStg64SMCRFixedLimit NWMStg64SMCRSendCurrent NWMStg64SMCRSendMax NWMStg64SMCRRecvCurrent NWMStg64SMCRRecvMax	V2R1	<ul style="list-style-type: none"> <li>• New flag bit NWMStgSMCRCfg is set in the NWMStgFlags field to indicate whether the SMCR parameter is configured on the GLOBALCONFIG statement.</li> <li>• The SMC-R storage utilization information is added when the SMCR parameter is configured on the GLOBALCONFIG statement.</li> </ul>	Shared Memory Communications over Remote Direct Memory Access
	NWMStg64PrivateCurrent NWMStg64PrivateMax NWMStg64PrivateFree NWMStg64PrivateTrace NWMStg64ComTrace	V1R13	New parameters to return the storage usage information for 64-bit private storage and 64-bit storage used for tracing.	Increased CTRACE and VIT capacity

Table 47. Summary of new Communications Server TCP/IP callable NMI (EZBNMIFR) (continued)

Request	Parameter/output	Rel.	Description	Reason for change
GetTCPListeners	<ul style="list-style-type: none"> <li>NWMTCPListmcdCfg</li> <li>NWMTCPListmcdCurrConn</li> <li>NWMTCPListmcdTotalConn</li> </ul>	V2R2	<ul style="list-style-type: none"> <li>New NWMTCPListmcdCfg flag set in the NWMTCPListmcdFlags field that indicates whether the SMC-D processing is or has been in effect.</li> <li>New field NWMTCPListmcdCurrConn that indicates the number of active connections to this server that use SMC-D.</li> <li>New field NWMTCPListmcdTotalConn that indicates the number of connections that this server has accepted using SMC-D.</li> </ul>	Shared Memory Communications - Direct Memory Access
	NWMTCPListmcdAutoPct	V2R2	New field NWMTCPListmcdAutoPct that indicates percentage of connections that request SMC-R whose workload pattern matched SMC-R criteria during the last AutoSMCR function interval.	Shared Memory Communications over RDMA enhancements
	NWMTCPListmcdCurrConn	V2R2	New field NWMTCPListmcdCurrConn that indicates the number of active connections to this server that use SMC-R.	Shared Memory Communications over RDMA enhancements
	NWMTCPListmcdFlags	V2R2	New flag byte NWMTCPListmcdFlags with the following flag bits: <ul style="list-style-type: none"> <li>NWMTCPListmcdSmcrCfg</li> <li>NWMTCPListmcdAutoSMC</li> <li>NWMTCPListmcdUseSMCR</li> <li>NWMTCPListmcdCfgPort</li> </ul>	Shared Memory Communications over RDMA enhancements
	NWMTCPListmcdTotalConn	V2R2	New field NWMTCPListmcdTotalConn that indicates the number of connections that this server has accepted using SMC-R.	Shared Memory Communications over RDMA enhancements
	NWMTCPListConnFlood	V1R13	New bit defined that indicates whether the server is under a potential connection flood attack.	Expanded Intrusion Detection Services
GetTnProfile	SMF119TN_HGHName	V2R2	In the C header, ezasmf.h, the length of this field was changed from zero to the maximum length of 255, in order to resolve a compiler warning message.	Release update
	SMF119TN_TPSSLV3	V2R1	New field to enable or disable SSLV3	APAR PI28679

### Trace formatting NMI (EZBCTAPI)

Table 48 lists the updates to the Communications Server the updates to the Communications Server trace formatting network management interface (NMI).

Table 48. Summary of new Communications Server trace formatting NMI (EZBCTAPI)

Request / Response	Release	Description	Reason of change
COMP	V2R1	The NMI supports formatting trace records that are obtained from the new real-time application-controlled TCP/IP trace NMI. For these trace records, this parameter is ignored.	Real-time application-controlled TCP/IP trace NMI
OPTIONS	V1R13	New HPRDIAG option can be specified to format statistics on HPR traffic.	HPR packet trace analyzer for Enterprise Extender

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Table 48. Summary of new Communications Server trace formatting NMI (EZBCTAPI) (continued)

Request / Response	Release	Description	Reason of change
TABLE	V2R1	The NMI supports formatting trace records that are obtained from the new real-time application-controlled TCP/IP trace NMI. For these trace records, you must specify the new EZBRCFMT table name.	Real-time application-controlled TCP/IP trace NMI

### Trusted TCP connections API for Java

The Communications Server trusted TCP connections API for Java are not changed in V1R13, V2R1, and V2R2.

## Environment variables

Table 49 lists the new and updated Communications Server environment variables. See *z/OS Communications Server: IP Configuration Reference* for more detailed information.

Table 49. Summary of new and changed Communications Server environment variables

Environment Variables	Appl	Release	Description	Reason for change
EZATMAIL_CSSMTP_EXTWRRTNAME= <i>external_writer_name</i>	sendmail to CSSMTP bridge	V2R2	New environment variable for new command	sendmail to CSSMTP bridge (APAR PI71175)
OMPROUTE_OPTIONS	OMPROUTE	V2R1	The OMPROUTE_OPTIONS variable is ignored	OMPROUTE adjacency preservation improvements
SNMP_MGR_LOG_LEVEL	SNMP Manager API	V1R13	Add the value SNMP_LOG_INTERNAL (8) to the list of valid values for this environment variable.	TCP/IP serviceability enhancements

## Socket APIs

This topic includes information about Communications Server socket APIs.

Refer to the following documents for more information about socket APIs:

- For complete documentation of the z/OS UNIX C sockets APIs, refer to *z/OS XL C/C++ Runtime Library Reference*
- For information about z/OS UNIX Assembler Callable Services, refer to *z/OS UNIX System Services Programming: Assembler Callable Services Reference*
- For information about TCP/IP socket APIs, refer to *z/OS Communications Server: IP Sockets Application Programming Interface Guide and Reference*
- For information about TCP/IP CICS® sockets, refer to *z/OS Communications Server: IP CICS Sockets Guide*



## General updates of socket APIs

Table 50 lists the general updates made to the IP socket APIs.

Table 50. Summary of new and changed Communications Server socket APIs

Socket API	Function call/Parameter	Rel.	Description	Reason for change
<ul style="list-style-type: none"> <li>• Call instruction</li> <li>• CICS C</li> <li>• CICS sockets extended</li> <li>• MACRO</li> <li>• REXX socket</li> <li>• UNIX assembler callable services</li> <li>• XL C/C++</li> </ul>	SIOCTLSSL iocctl - TTLSTOP_CONNECTION request	V2R1	<p>The TTLSTOP_CONNECTION request returns errno EPROTO in these conditions:</p> <ul style="list-style-type: none"> <li>• If the application has not read all the data received on the secure connection, the request fails with return code of -1, errno of EPROTO, and errno junior of JrTTLStopReadDataPending.</li> <li>• If the application has outstanding write requests on the connection, the request fails with return code of -1, errno of EPROTO, and errno junior of JrTTLStopWriteDataPending.</li> </ul>	Data security issue with AT-TLS stopped connection
<ul style="list-style-type: none"> <li>• Call instruction</li> <li>• CICS C socket calls</li> <li>• CICS call instruction</li> <li>• Language Environment C/C++ socket</li> <li>• Macro</li> <li>• UNIX System Services Assembler Callable Service</li> </ul>	SIOCTLSSL iocctl	V2R1	<p><b>TTLSSL_SSL_Prot</b> New value TTLSSL_PROT_TLSSV1_2 (X'0303')</p> <p><b>TTLSSL_Neg_Cipher</b> New value TTLSSL_4CHAR_CIPHER (X'4X')</p> <p><b>TTLSSL_Neg_Cipher4</b> New field containing four character negotiated cipher</p>	AT-TLS support for TLS v1.2 and related features
REXX Socket	SIOCTLSSL	V2R1	A new four byte cipher field is returned. The existing two character cipher contains "4X" if the cipher cannot be represented with two bytes. A new value of X'0303' can be returned to identify the SSL protocol that is in use as TLS v1.2.	AT-TLS support for TLS v1.2 and related features
LE C/C++	Recv(), recvfrom(), recvmsg()	V2R1	Add new MSG_CONNTERM value in msg_flags of sys/socket.h to indicate the receive request completes only when a TCP connection is terminated.	Enhanced Fast Path socket support
UNIX assembler callable services	recv (BPX1RCV, BPX4RCV), recvfrom (BPX1RFM, BPX4RFM), recvmsg (BPX2RMS, BPX4RMS) Asyncio(BPX1AIO or BPX4AIO): AioCmd=Aio#Recv, AioCmd=Aio#RecvFrom, AioCmd=Aio#RecvMsg)	V2R1	Add new MSG_CONNTERM value in msg_flags of BPXYMSGF.macro to indicate the receive request completes only when a TCP connection is terminated.	Enhanced Fast Path socket support
<ul style="list-style-type: none"> <li>• XL C/C++</li> <li>• UNIX assembler callable services</li> </ul>	SIOCSVIP, SIOCSVIP6	V2R1	New option: DVR_DEFINE_AFFINITY - Create DVIPA with affinity	Affinity for application-instance DIVPAs

## IPCS subcommands

This topic includes information about the following IPCS subcommands:

- “CTRACE COMP(SYSTCPDA) subcommand”
- “CTRACE COMP(SYSTCPIS) subcommand”
- “CTRACE COMP(SYSTCPOT) subcommand”
- “TCPIPCS subcommand”
- “General updates to IPCS subcommands” on page 134

See *z/OS Communications Server: IP Diagnosis Guide* for more detailed IPCS subcommands information.

### CTRACE COMP(SYSTCPDA) subcommand

The CTRACE COMP(SYSTCPDA) subcommand is the component name for packet data traces. Table 51 lists the CTRACE COMP(SYSTCPDA) subcommand options.

Table 51. Summary of new and changed Communications Server CTRACE COMP(SYSTCPDA) subcommand options

Option	Release	Description	Reason for change
HPRDIAG	V1R13	New option to show a summary view of HPR statistics in the packet trace.	HPR packet trace analyzer for Enterprise Extender

### CTRACE COMP(SYSTCPIS) subcommand

Table 52 lists the CTRACE COMP(SYSTCPIS) subcommand options.

Table 52. Summary of new and changed Communications Server CTRACE COMP(SYSTCPIS) subcommand options

Option	Release	Description	Reason for change
N/A	V1R13	Updated to support tracing and formatting IPv6 packets.	Expanded Intrusion Detection Services

### CTRACE COMP(SYSTCPOT) subcommand

The CTRACE COMP(SYSTCPOT) subcommand options are not changed in V1R13, V2R1, and V2R2.

### CTRACE COMP(SYSTCPRE) subcommand

Table 53 lists the CTRACE COMP(SYSTCPRE) subcommand options.

Table 53. Summary of new and changed Communications Server CTRACE COMP(SYSTCPRE) subcommand options

Option	Release	Description	Reason for change
CID(X'hhhhhhh')	V2R2	Added to select trace records that are associated with a specific resinit() function call.	Activate Resolver trace without restarting applications
TRACERES	V2R2	Added to collect Trace Resolver output as Resolver CTRACE records.	Activate Resolver trace without restarting applications

### TCPIPCS subcommand

Table 54 on page 133 lists the TCPIPCS subcommand options.

The TCPIPCS command contains the OPTLOCAL specification in some displays.

Table 54. Summary of new and changed Communications Server TCPIPSC subcommand

Option	Release	Description	Reason for change
CONFIG	V2R2	Supports new ISM interface type.	Shared Memory Communications - Direct Memory Access
	V2R1	Supports new RNIC interface type.	
	V1R13	Supports new IPAQIQDX and IPAQIQDX6 interface types.	HiperSockets optimization for intraensemble data networks
HASH	V2R1	Displays information about the structure of IPv6 dynamic VIPA shadow tunnel hash tables.	Sysplex-Wide Security Associations for IPv6
IPSEC	V2R1	Displays information about IPv6 IP security shadow tunnels.	Sysplex-Wide Security Associations for IPv6
	V2R1	Includes log limit value of the filter in the formatted information.	Limit defensive filter logging
MAP	V2R1	Includes the storage that is used for the IPv6 policy-based route tables.	IPv6 support for policy-based routing
	V2R1	Displays storage usage information for IPv6 dynamic VIPA shadow tunnel hash tables.	Sysplex-Wide Security Associations for IPv6
POLICY	V2R1	IPv6 policy is included in the display of policy-based routing rules and actions.	IPv6 support for policy-based routing
PROFILE	Every release	Displays the current TCP/IP stack configuration from information in the dump by creating the profile statements that represent the configuration. See "PROFILE.TCPIP statement and parameter changes" on page 56 for information about the profile statement changes for a specific release.	Release update
ROUTE	V2R1	<ul style="list-style-type: none"> <li>When the PR parameter is used to display all search tree and update tree routes for all active policy-based route tables, IPv6 routes are included in the report.</li> <li>When the PD parameter is used to display all search tree and update tree routes for all policy-based route tables that have been marked for deletion , IPv6 routes are included in the report.</li> </ul>	IPv6 support for policy-based routing
STATE	V2R2	Supports new ISM interface type.	Shared Memory Communications - Direct Memory Access
	V2R1	Supports new RNIC interface type.	Shared Memory Communications over Remote Direct Memory Access
	V1R13	Supports new IPAQIQDX and IPAQIQDX6 interface types.	HiperSockets optimization for intraensemble data networks
TIMER	V2R1	For timers that are configured to do a cross-memory post, the target address space ASCB and ASID values are displayed.	Real-time application-controlled TCP/IP trace NMI
TRACE	V2R1	Displays each CTE header in a CTRACE buffer	Support for additional diagnostic information about Ctrace
	V2R1	New ALL and RCC subparameters are added. The RCC subparameter formats information about applications using the Real-time application-controlled TCP/IP trace NMI.	Real-time application-controlled TCP/IP trace NMI
TREE	V2R1	Includes the search and update trees for IPv6 policy-based route tables.	IPv6 support for policy-based routing

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Table 54. Summary of new and changed Communications Server TCPIPSC subcommand (continued)

Option	Release	Description	Reason for change
TTLS	V2R2	The report output can have a new value of RFC5280 for CertValidationMode.	AT-TLS certificate processing enhancements
	V2R2	When the CONN parameter is specified, the command displays values that pertain to certificate revocation lists (CRLs) for the new AT-TLS policy agent statements and parameters.	AT-TLS certificate processing enhancements
	V2R1	Displays new parameters on AT-TLS configuration statements.	AT-TLS support for TLS v1.2 and related features
XCF	V1R13	Displays the dynamic VIPA that was created using the bind socket call, the SIOCSVIPA or SIOCSVIPA6 ioctl call, or the MODDVIPA utility, including the new SAF resource name if it is configured.	Improved security granularity for VIPARANGE DVIPAs

### General updates to IPCS subcommands

Table 55 lists the general IPCS subcommand updates.

Table 55. Summary of new and changed Communications Server IP - General updates to IPCS subcommands

Subcommand	Release	Description	Reason for change
RESOLVER	V2R2	The command output displays the current system-wide cache reordering setting. One of the following values is displayed: <ul style="list-style-type: none"> <li>• CACHEREORDER</li> <li>• NOCACHEREORDER</li> </ul>	Reordering of cached Resolver results
	V1R13	Displays information about the Name Server Polling Table (NSPT) used for monitoring unresponsive name servers.	System resolver autonomic quiescing of unresponsive name servers

### SNMP MIB modules

This topic lists updates to Communications Server's support for SNMP MIB modules. For a complete list of supported SNMP MIB objects, refer to *z/OS Communications Server: IP System Administrator's Commands*.

Table 56 lists the changes to the SNMP MIB module support.

Table 56. Summary of new and changed Communications Server SNMP MIB module support

MIB module name	Rel.	Description	Reason for change
IBMTCPIMVMS-MIB	V2R2	New ibmMvsPortSmc MIB object is added to the ibmTcpipMvsPortTable.	Shared Memory Communications over RDMA enhancements
	V2R2	The following new MIB objects are added to the ibmTcpipMvsTcpConnectionTable: <ul style="list-style-type: none"> <li>• ibmMvsTcpConnectionTtlsReuseReq</li> <li>• ibmMvsTcpConnectionTtlsSessionID</li> <li>• ibmMvsTcpConnectionTtlsFIPS140</li> </ul>	TLS session reuse support for FTP and AT-TLS applications
	V2R1	For IPv6 routes, the MIB object ibmMvsRouteFlags reflects the route source, main or PBR route table.	IPv6 support for policy-based routing

Table 56. Summary of new and changed Communications Server SNMP MIB module support (continued)

MIB module name	Rel.	Description	Reason for change
IBMTCPIPMVS-MIB (continued)	V2R1	<ul style="list-style-type: none"> <li>• The flag definedByInterface(14), in the ibmMvsIfFlag MIB object, is set for IPv4 IPAQIDIO and VIRTUAL interfaces that are defined by the INTERFACE statement.</li> <li>• The ibmMvsIfSrcVipaIntfName MIB object provides the SOURCEVIPAINTERFACE name for IPv4 IPAQIDIO interfaces that are defined by the INTERFACE statement.</li> <li>• The ibmMvsIfChpid MIB object provides the CHPID value for IPv4 IPAQIDIO interfaces that are defined by the INTERFACE statement.</li> <li>• The ibmMvsIfDatapath MIB object provides the datapath address for IPv4 IPAQIDIO interfaces that are defined by the INTERFACE statement, and for IPv6 IPAQIDIO6 interfaces.</li> <li>• The ibmMvsIfConfigMtu MIB object provides the configured MTU value for IPv4 IPAQIDIO interfaces that are defined by the INTERFACE statement.</li> <li>• The ibmMvsIfTrleName MIB object provides the TRLE name for IPv4 IPAQIDIO interfaces that are defined by the INTERFACE statement, and for IPv6 IPAQIDIO6 interfaces.</li> <li>• The ipAdEntNetMask provides the configured subnet mask for IPv4 IPAQIDIO interfaces that are defined by the INTERFACE statement.</li> </ul>	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	V2R1	<ul style="list-style-type: none"> <li>• Support added for new scalar MIB objects for new TCPCONFIG profile statement parameters: <ul style="list-style-type: none"> <li>– ibmMvsTcpConnectInitInterval</li> <li>– ibmMvsTcpConnectTimeout</li> <li>– ibmMvsTcpFrrThreshold</li> <li>– ibmMvsTcpKeepAliveProbeInterval</li> <li>– ibmMvsTcpKeepAliveProbesNum</li> <li>– ibmMvsTcpNagle</li> <li>– ibmMvsTcpQueuedRtt</li> <li>– ibmMvsTcpRetransmitAttempts</li> <li>– ibmMvsTcpMaxSendBufferSize</li> <li>– ibmMvsTcpTimewaitInterval</li> </ul> </li> <li>• The existing ibmMvsMaximumRetransmitTime MIB object's value is now configurable via a new parameter on the TCPCONFIG profile statement.</li> </ul>	Enhanced TCP protocol configuration options and default settings

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Table 56. Summary of new and changed Communications Server SNMP MIB module support (continued)

MIB module name	Rel.	Description	Reason for change
IBMTCPiPMVS-MIB (continued)	V2R1	<ul style="list-style-type: none"> <li>The <code>ibmMvsIfType</code> MIB object supports a new value, <code>rnice(39)</code>, to indicate an entry in the table is a 10 GbE RoCE Express interface, which is represented as an RNIC interface.</li> <li>The <code>ibmMvsIfFlag</code> MIB object supports a new flag bit, <code>smcr(17)</code>, to indicate that the SMCR parameter is in effect for the interface.</li> <li>The <code>ibmMvsIfTrleName</code> MIB object is now supported for RNIC interfaces.</li> <li>The new <code>ibmMvsIfPNetID</code> MIB object provide the physical network (PNet) ID for active OSD and OSX interfaces.</li> <li>The new <code>ibmMvsPortNoSmcr</code> MIB object indicates whether the NOSMCR parameter is in effect for the port or port range.</li> </ul>	Shared Memory Communications over Remote Direct Memory Access
	V2R1	The new scalar MIB object <code>ibmMvsTcpSelectiveAck</code> is added to provide the setting of the SELECTIVEACK and NOSELECTIVEACK parameters from the TCPCONFIG profile statement.	TCP support for selective acknowledgements
	V2R1	<ul style="list-style-type: none"> <li>The <code>ibmMvsTcpEphemeralPortsLow</code> MIB object provides the low port range value for TCP ephemeral ports.</li> <li>The <code>ibmMvsTcpEphemeralPortsHigh</code> MIB object provides the high port range value for TCP ephemeral ports. The <code>ibmMvsUdpEphemeralPortsLow</code> MIB object will provide the low port range value for UDP ephemeral ports.</li> <li>The <code>ibmMvsUdpEphemeralPortsHigh</code> MIB object provides the high port range value for UDP ephemeral ports.</li> </ul>	User control of Ephemeral Port Ranges
	V2R1	<ul style="list-style-type: none"> <li>Added the <code>v2r1</code> value to the <code>ibmMvsTcpipSubagentVersion</code> object</li> <li>Added the <code>tlsVer1Dot2(6)</code> value to the <code>ibmMvsTcpConnectionTtlsSslProt</code> MIB object</li> <li>Changed the description of the <code>ibmMvsTcpConnectionTtlsNegCipher</code> MIB object</li> <li>Added <code>ibmTCPiPMvsTcpGroup11</code> to support the new <code>ibmMvsTcpConnectionTtlsNegCipher4</code> MIB object in the <code>ibmTcpipMvsTcpConnectionTable</code></li> </ul>	AT-TLS support for TLS v1.2 and related features

Table 56. Summary of new and changed Communications Server SNMP MIB module support (continued)

MIB module name	Rel.	Description	Reason for change
IBMTCPIPMVS-MIB (continued)	V1R13	The following values of the <code>ibmMvsIfflagType</code> MIB object now apply to <code>IPAQENET6</code> interfaces: <ul style="list-style-type: none"> <li>• <code>checksumOffloadEnabled(4)</code></li> <li>• <code>tcpSegOffloadEnabled(6)</code></li> </ul>	OSA-Express4S QDIO IPv6 checksum and segmentation offload
	V1R13	The <code>ibmMvsIfType</code> MIB object supports the following new values to indicate IQDX interfaces: <ul style="list-style-type: none"> <li>• <code>ipaqidx(37)</code></li> <li>• <code>ipaqidx6(38)</code></li> </ul>	HiperSockets optimization for intraensemble data networks
SNMP-USM-AES-MIB	V2R1	Added support for this MIB module from RFC3826 for SNMPv3 AES 128-bit encryption support.	Network security enhancements for SNMP

## User exits

This topic lists updates to Communications Server user exits. For a complete list of supported user exits, refer to *z/OS Communications Server: IP Configuration Reference*.

Table 57 lists the updates made to the user exits.

Table 57. Summary of new and changed Communications Server user exits

Exit	Release	Description	Reason for change
EZAFCCMD user exit	V2R1	The FTP client calls this user exit before the FTP command is sent to the FTP server.	FTP client security user exits
EZAFCREP user exit	V2R1	The FTP client calls this user exit when the client receives a reply from the FTP server. For server replies that are comprised of more than one line, this user exit is called once for each line of the reply.	FTP client security user exits
FTP server user exit FTCHKPWD	V1R13	An additional parameter is passed to this user exit interface. The parameter represents the password or password phrase used to log into the FTP server.	FTP support for password phrases

## Application data

Application data is data that is associated with a connection through the use of the `SIOCSAPPLDATA ioctl` socket command. The `SIOCSAPPLDATA IOCTL` enables applications to associate 40 bytes of application-specific information with TCP sockets the applications own. This application data can also be used to identify socket endpoints in interfaces such as Netstat, SMF, or network management applications. See the Application data appendix in *z/OS Communications Server: IP Programmer's Guide and Reference* for detailed information about all supported application data.

Table 58 on page 138 lists new and changed application data.

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Table 58. Summary of new and changed application data

Record type	Record field	Release	Description	Reason for change
FTP client application data for the control connection	Bytes 24-25: Security level	V2R1	A new value, 12, indicates the TLS protocol is TLSV1.2.	AT-TLS support for TLS v1.2 and related features
	Bytes 26-27: Cipher	V2R1	A new cipher value of 4X indicates that the cipher is four bytes and must be obtained from offset 30.	AT-TLS support for TLS v1.2 and related features
	Bytes 26-27: Cipher	V2R1	A new cipher value of 4X indicates that the cipher is four bytes and must be obtained from offset 35.	AT-TLS support for TLS v1.2 and related features
	Bytes 30-33: Four byte cipher	V2R1	The four byte cipher value.	AT-TLS support for TLS v1.2 and related features
	Bytes 35-38: Four byte cipher	V2R1	The four byte cipher value.	AT-TLS support for TLS v1.2 and related features
FTP server application data for the control connection	Bytes 24-25: Security level	V2R1	A new value, 12, indicates that the TLS protocol is TLSV1.2.	AT-TLS support for TLS v1.2 and related features
	Bytes 26-27: Cipher	V2R1	A new cipher value of 4X indicates that the cipher is four bytes and must be obtained from offset 29.	AT-TLS support for TLS v1.2 and related features
	Bytes 26-27: Cipher	V2R1	A new cipher value of 4X indicates that the cipher is four bytes and must be obtained from offset 33.	AT-TLS support for TLS v1.2 and related features
	Bytes 29-33: Four byte cipher	V2R1	The four byte cipher value.	AT-TLS support for TLS v1.2 and related features
	Bytes 33-36: Four byte cipher	V2R1	The four byte cipher value.	AT-TLS support for TLS v1.2 and related features
Application data format for Telnet	Bytes 32-33: Security level	V2R1	A new value, 12, indicates that the TLS protocol is TLSV1.2.	AT-TLS support for TLS v1.2 and related features
	Bytes 34-35: Cipher	V2R1	A new cipher value of 4X indicates that the cipher is four bytes and must be obtained from offset 33.	AT-TLS support for TLS v1.2 and related features
	Bytes 37-40: Four byte cipher	V2R1	The four byte cipher value.	AT-TLS support for TLS v1.2 and related features
Application data format for CSSMTP	Bytes 21-22: Security level	V2R1	A new value, 12, indicates that the TLS protocol is TLSV1.2.	AT-TLS support for TLS v1.2 and related features
	Bytes 23-24: Cipher	V2R1	A new cipher value of 4X indicates that the cipher is four bytes and must be obtained from offset 33.	AT-TLS support for TLS v1.2 and related features
	Bytes 26-29: Four byte cipher	V2R1	The four byte cipher value.	AT-TLS support for TLS v1.2 and related features



## FTP client error codes

This section describes new client error codes for the FTP client. For more information about FTP client error codes, see FTP client error codes in *z/OS Communications Server: IP User's Guide and Commands*.

Table 59 lists the changes made to the FTP client error codes.

Table 59. Summary of new and changed FTP client error codes

Error code	Release	Description	Reason of change
27	V2R1	New error code indicates that user exit EZAFCCMD rejected the command.	FTP client security user exits
28	V2R1	New error code indicates that user exit EZAFCCMD ended the client.	FTP client security user exits
29	V2R1	New error code indicates that the FTP client ended because the user exit EZAFCCMD returned a return code that was not valid.	FTP client security user exits
30	V2R1	New error code indicates that user exit EZAFCREP ended the client.	FTP client security user exits
31	V2R1	New error code indicates that the FTP client ended because the user exit EZAFCREP returned a return code that was not valid.	FTP client security user exits

## SMF record type 119 enhancements

This topic describes the following SMF record type 119 enhancements:

- "CSSMTP records" on page 140
- "FTP records" on page 141
- "IPSec records" on page 145
- "SMC-R records" on page 146
- "TCP connection records" on page 147
- "TCP/IP stack records" on page 148
- "TN3270E Telnet server records" on page 155
- "VTAM 3270 intrusion detection services records" on page 155

See the *SMF type 119 records* topic in *z/OS Communications Server: IP Programmer's Guide and Reference* for more information.

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### CSSMTP records

Table 60 lists the changes made to the CSSMTP SMF type 119 records.

Table 60. Summary of new and changed Communications Server SMF type 119 record - CSSMTP records

Record type	Record field	Rel.	Description	Reason for change
CSSMTP configuration change (subtype 48)	SMF119ML_CF_TestMode	V2R2	Specifies value of TestMode option.	CSSMTP migration enablement
	SMF119ML_CF_DataTrnc	V2R2	Specifies value of DataLineTrunc option.	CSSMTP migration enablement
	SMF119ML_CF_ConnIdle	V2R2	Specifies value of ConnectIdle timeout value.	CSSMTP migration enablement
	Subtype 48 event record has a new field: • SMF119ML_CF_DateHdr .	V2R1	The Header configuration statement	CSSMTP mail message date header handling option
	Subtype 48 event record has following new fields: • SMF119ML_CF_ErtAge • SMF119ML_CF_ErtIntvl • SMF119ML_CD_MailDir	V1R13	<ul style="list-style-type: none"> <li>Extended retry age</li> <li>Extended retry interval</li> <li>Extended retry mail directory</li> </ul>	CSSMTP extended retry
	Subtype 48 event record has a new field, SMF119ML_CF_JESSynMax.	V1R13	New field that provides the maximum number of syntax errors to be tolerated in a JES spool file from the JESSyntaxErrLimit statement.	CSSMTP enhancements
CSSMTP connection identification (subtype 49)	SMF119ML_CN_TLSSSP	V2R1	New value SMF119ML_CN_TTLSSPTV1_2 (X'0303')	AT-TLS support for TLS v1.2 and related features
	SMF119ML_CN_TLSSNC	V2R1	New value SMF119ML_CN_TTLSNC4X (X'4X')	AT-TLS support for TLS v1.2 and related features
	SMF119ML_CN_TLSSNC4	V2R1	New field containing four character negotiated cipher code	AT-TLS support for TLS v1.2 and related features
CSSMTP interval statistics	Subtype 52 event record has following new fields: • SMF119ML_ST_ErtCount • SMF119ML_ST_ErtQCount • SMF119ML_ST_ErtUndvl • SMF119ML_ST_ErtError • SMF119ML_JS_EMail • SMF119ML_JS_ERcpt • SMF119ML_HC_MDirPFree • SMF119ML_HC_MDirPUsed	V1R13	<ul style="list-style-type: none"> <li>Current number of mail message for extended retry</li> <li>Cumulative total number of mails message for extended retry</li> <li>Number of mail messages made undeliverable by extended retry</li> <li>Number of mail messages dropped by extended retry due to file system errors</li> <li>Number of mail messages saved for extended retry</li> <li>Number of recipients to be retried in mail messages saved for extended retry</li> <li>System wide FS percent free which can be used to store extended retry mail messages</li> <li>System wide FS percent used</li> </ul>	CSSMTP extended retry
CSSMTP mail message ended	Subtype 50 event record has new field: SMF119ML_MI_ERetry	V1R13	Mail saved for extended retry.	CSSMTP extended retry

Table 60. Summary of new and changed Communications Server SMF type 119 record - CSSMTP records (continued)

Record type	Record field	Rel.	Description	Reason for change
CSSMTP spool file ended	Subtype 51 event record has following new fields: <ul style="list-style-type: none"> <li>SMF119ML_SS_EMail</li> <li>SMF119ML_SS_ERcpt</li> </ul>	V1R13	<ul style="list-style-type: none"> <li>Number of mail messages saved for extended retry.</li> <li>Number of recipients to be retried in mail messages for extended retry.</li> </ul>	CSSMTP extended retry

### FTP records

Table 61 lists the changes made to the FTP records of SMF type 119. The SMF records of subtype 100 - 104 are available only from the real-time TCP/IP network monitoring NMI. They are not written to the MVS SMF SYS1.MANx data sets.

Table 61. Summary of new and changed Communications Server SMF record type 119 - FTP records

Record type	Record field	Release	Description	Reason for change
FTP Client Transfer Complete record (subtype 3)	<ul style="list-style-type: none"> <li>SMF119FT_FCSessionReuse</li> <li>SMF119FT_FCCSSLSessionIDLen</li> <li>SMF119FT_FCCSSLSessionID</li> <li>SMF119FT_FCDSSLSessionIDLen</li> <li>SMF119FT_FCDSSLSessionID</li> </ul>	V2R2	<ul style="list-style-type: none"> <li>New SMF119FT_FCSessionReuse field that contains the SSL session reuse flag.</li> <li>New SMF119FT_FCCSSLSessionIDLen field that contains the length of the SSL Session ID of the FTP control connection.</li> <li>New SMF119FT_FCCSSLSessionID field that contains the SSL Session ID of the FTP control connection.</li> <li>New SMF119FT_FCDSSLSessionIDLen field that contains the length of the SSL Session ID of the FTP data connection.</li> <li>New SMF119FT_FCDSSLSessionID field that contains the SSL Session ID of the FTP data connection.</li> </ul>	TLS session reuse support for FTP and AT-TLS applications
	<ul style="list-style-type: none"> <li>SMF119FT_FCProtoLevel</li> <li>SMF119FT_FSPProtoLevel</li> <li>SMF119FT_FFProtoLevel</li> </ul>	V2R1	New value SMF119FT_FxProtoLevelTV1_2 ('TLSV1.2')	AT-TLS support for TLS v1.2 and related features

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Table 61. Summary of new and changed Communications Server SMF record type 119 - FTP records (continued)

Record type	Record field	Release	Description	Reason for change
FTP Server Transfer Complete record (subtype 70)	<ul style="list-style-type: none"> <li>SMF119FT_FSSessReuse</li> <li>SMF119FT_FSCSSLsessIDLen</li> <li>SMF119FT_FSCSSLsessID</li> <li>SMF119FT_FSDSSLsessIDLen</li> <li>SMF119FT_FSDSSLsessID</li> </ul>	V2R2	<ul style="list-style-type: none"> <li>New SMF119FT_FSSessReuse field that contains the SSL session reuse flag.</li> <li>New SMF119FT_FSCSSLsessIDLen field that contains the length of the SSL Session ID of the FTP control connection.</li> <li>New SMF119FT_FSCSSLsessID field that contains the SSL Session ID of the FTP control connection.</li> <li>New SMF119FT_FSDSSLsessIDLen field that contains the length of the SSL Session ID of the FTP data connection.</li> <li>New SMF119FT_FSDSSLsessID field that contains the SSL Session ID of the FTP data connection.</li> </ul>	TLS session reuse support for FTP and AT-TLS applications
	<ul style="list-style-type: none"> <li>SMF119FT_FCCipher</li> <li>SMF119FT_FSCipher</li> <li>SMF119FT_FFCipher</li> </ul>	V2R1	New value SMF119FT_FxCipher4X ('4X')	AT-TLS support for TLS v1.2 and related features
FTP Daemon Configuration record (subtype 71) (see Note 1)	SMF119FT_FDCCSecSessReuse	V2R2	New SMF119FT_FDCCSecSessReuse field that contains the value of the statement SECURE_SESSION_REUSE in the server FTP.DATA.	TLS session reuse support for FTP and AT-TLS applications
	SMF119FT_FDCFApplname	V2R1	New SMF119FT_FDCFApplname field that contains 8-character FTP server application name from the APPLNAME statement.	Release update
	SMF119FT_FDCFSSLv3	V2R1	New field to enable or disable SSLV3	APAR PI28679
	N/A	V2R1	New SMF 119 subtype 71 record that collects FTP daemon configuration data when the z/OS FTP daemon successfully listens on the listening port for the first time.	NMI and SMF enhancements for TCP/IP applications

Table 61. Summary of new and changed Communications Server SMF record type 119 - FTP records (continued)

Record type	Record field	Release	Description	Reason for change
FTP Server Login Failure record (subtype 72)	<ul style="list-style-type: none"> <li>SMF119FT_FFSSessReuse</li> <li>SMF119FT_FFCSSLSessIDLen</li> <li>SMF119FT_FFCSSLSessID</li> <li>SMF119FT_FFDSSSLSessIDLen</li> <li>SMF119FT_FFDSSSLSessID</li> </ul>	V2R2	<ul style="list-style-type: none"> <li>New SMF119FT_FFSSessReuse field that contains the SSL session reuse flag.</li> <li>New SMF119FT_FFCSSLSessIDLen field that contains the length of the SSL Session ID of the FTP control connection.</li> <li>New SMF119FT_FFCSSLSessID field that contains the SSL Session ID of the FTP control connection.</li> <li>New SMF119FT_FFDSSSLSessIDLen field that contains the length of the SSL Session ID of the FTP data connection.</li> <li>New SMF119FT_FFDSSSLSessID field that contains the SSL Session ID of the FTP data connection.</li> </ul>	TLS session reuse support for FTP and AT-TLS applications
	<ul style="list-style-type: none"> <li>SMF119FT_FCCipher4</li> <li>SMF119FT_FSCipher4</li> <li>SMF119FT_FFCipher4</li> </ul>	V2R1	Contains four character cipher code	AT-TLS support for TLS v1.2 and related features
FTP server transfer initialization record (subtype 100)	<ul style="list-style-type: none"> <li>SMF119FT_FSSessReuse</li> <li>SMF119FT_FSCSSLSessIDLen</li> <li>SMF119FT_FSCSSLSessID</li> <li>SMF119FT_FSDSSLSessIDLen</li> <li>SMF119FT_FSDSSLSessID</li> </ul>	V2R2	<ul style="list-style-type: none"> <li>New SMF119FT_FSSessReuse field that contains the SSL session reuse flag.</li> <li>New SMF119FT_FSCSSLSessIDLen field that contains the length of the SSL Session ID of the FTP control connection.</li> <li>New SMF119FT_FSCSSLSessID field that contains the SSL Session ID of the FTP control connection.</li> <li>New SMF119FT_FSDSSLSessIDLen field that contains the length of the SSL Session ID of the FTP data connection.</li> <li>New SMF119FT_FSDSSLSessID field that contains the SSL Session ID of the FTP data connection.</li> </ul>	TLS session reuse support for FTP and AT-TLS applications

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Table 61. Summary of new and changed Communications Server SMF record type 119 - FTP records (continued)

Record type	Record field	Release	Description	Reason for change
FTP client transfer initialization record (subtype 101)	<ul style="list-style-type: none"> <li>SMF119FT_FCSSLReuse</li> <li>SMF119FT_FCCSSLsessIDLen</li> <li>SMF119FT_FCCSSLsessID</li> <li>SMF119FT_FCDSSLsessIDLen</li> <li>SMF119FT_FCDSSLsessID</li> </ul>	V2R2	<ul style="list-style-type: none"> <li>New SMF119FT_FCSSLReuse field that contains the SSL session reuse flag.</li> <li>New SMF119FT_FCCSSLsessIDLen field that contains the length of the SSL Session ID of the FTP control connection.</li> <li>New SMF119FT_FCCSSLsessID field that contains the SSL Session ID of the FTP control connection.</li> <li>New SMF119FT_FCDSSLsessIDLen field that contains the length of the SSL Session ID of the FTP data connection.</li> <li>New SMF119FT_FCDSSLsessID field that contains the SSL Session ID of the FTP data connection.</li> </ul>	TLS session reuse support for FTP and AT-TLS applications
FTP client login failure record (subtype 102)	<ul style="list-style-type: none"> <li>SMF119FT_FCSSLReuse</li> <li>SMF119FT_FCCSSLsessIDLen</li> <li>SMF119FT_FCCSSLsessID</li> <li>SMF119FT_FCDSSLsessIDLen</li> <li>SMF119FT_FCDSSLsessID</li> </ul>	V2R2	<ul style="list-style-type: none"> <li>New SMF119FT_FCSSLReuse field that contains the SSL session reuse flag.</li> <li>New SMF119FT_FCCSSLsessIDLen field that contains the length of the SSL Session ID of the FTP control connection.</li> <li>New SMF119FT_FCCSSLsessID field that contains the SSL Session ID of the FTP control connection.</li> <li>New SMF119FT_FCDSSLsessIDLen field that contains the length of the SSL Session ID of the FTP data connection.</li> <li>New SMF119FT_FCDSSLsessID field that contains the SSL Session ID of the FTP data connection.</li> </ul>	TLS session reuse support for FTP and AT-TLS applications

Table 61. Summary of new and changed Communications Server SMF record type 119 - FTP records (continued)

Record type	Record field	Release	Description	Reason for change
FTP client session record (subtype 103)	<ul style="list-style-type: none"> <li>SMF119FT_FCSSLSessReuse</li> <li>SMF119FT_FCCSSLSessIDLen</li> <li>SMF119FT_FCCSSLSessID</li> <li>SMF119FT_FCDSSLSessIDLen</li> <li>SMF119FT_FCDSSLSessID</li> </ul>	V2R2	<ul style="list-style-type: none"> <li>New SMF119FT_FCSSLSessReuse field that contains the SSL session reuse flag.</li> <li>New SMF119FT_FCCSSLSessIDLen field that contains the length of the SSL Session ID of the FTP control connection.</li> <li>New SMF119FT_FCCSSLSessID field that contains the SSL Session ID of the FTP control connection.</li> <li>New SMF119FT_FCDSSLSessIDLen field that contains the length of the SSL Session ID of the FTP data connection.</li> <li>New SMF119FT_FCDSSLSessID field that contains the SSL Session ID of the FTP data connection.</li> </ul>	TLS session reuse support for FTP and AT-TLS applications
FTP server session record (subtype 104)	<ul style="list-style-type: none"> <li>SMF119FT_FSSessReuse</li> <li>SMF119FT_FSCSSLSessIDLen</li> <li>SMF119FT_FSCSSLSessID</li> <li>SMF119FT_FSDSSLSessIDLen</li> <li>SMF119FT_FSDSSLSessID</li> </ul>	V2R2	<ul style="list-style-type: none"> <li>New SMF119FT_FSSessReuse field that contains the SSL session reuse flag.</li> <li>New SMF119FT_FSCSSLSessIDLen field that contains the length of the SSL Session ID of the FTP control connection.</li> <li>New SMF119FT_FSCSSLSessID field that contains the SSL Session ID of the FTP control connection.</li> <li>New SMF119FT_FSDSSLSessIDLen field that contains the length of the SSL Session ID of the FTP data connection.</li> <li>New SMF119FT_FSDSSLSessID field that contains the SSL Session ID of the FTP data connection.</li> </ul>	TLS session reuse support for FTP and AT-TLS applications
<p><b>Note:</b></p> <p>1. Record is available in the MVS SMF data sets and from the NMI.</p>				

### IPSec records

Table 62 on page 146 lists the changes made to the IPSec SMF record type 119 in z/OS V1R13.

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Table 62. Summary of new and changed Communications Server SMF record type 119 - IPSec records in z/OS V1R13

Record type	Record field	Release	Description	Reason for change
IPSec IKE tunnel activation and refresh, IPSec IKE tunnel deactivation and expire	IPSec common IKE tunnel specific section	V1R13	<p>Subtype 73 is updated; offset 206(x'CE') for the field SMF119IS_IKETunNATTLevel supports two additional values:</p> <ul style="list-style-type: none"> <li>• SMF119IS_IKETUN_NATTV2 (6)</li> <li>• SMF119IS_IKETUN_NATTV2ZOS (7)</li> </ul> <p>The following fields previously reported 0 for all IKEv2 tunnels because NAT traversal was not supported for IKEv2. They are now set appropriately when an IKEv2 tunnel traverses one or more NAT devices:</p> <ul style="list-style-type: none"> <li>• SMF119IS_IKETunLclNAT</li> <li>• SMF119IS_IKETunRmtNAT</li> <li>• SMF119IS_IKETunRmtNAPT</li> <li>• SMF119IS_IKETunCanInitP1</li> <li>• SMF119IS_IKETunRmtUDPPort</li> </ul>	Network address translation traversal support for IKE version 2
IPSec dynamic tunnel activation and refresh, IPSec dynamic tunnel deactivation, IPSec dynamic tunnel added, and IPSec dynamic tunnel removed	Dynamic tunnel section	V1R13	<p>The following fields previously reported 0 for all IKEv2 tunnels because NAT traversal was not supported for IKEv2. They are now set appropriately when an IKEv2 tunnel traverses one or more NAT devices:</p> <ul style="list-style-type: none"> <li>• SMF119IS_IPDynLclNAT</li> <li>• SMF119IS_IPDynRmtNAT</li> <li>• SMF119IS_IPDynRmtNAPT</li> <li>• SMF119IS_IPDynRmtGW</li> <li>• SMF119IS_IPDynRmtZOS</li> <li>• SMF119IS_IPDynCanInitP2</li> <li>• SMF119IS_IKETunRmtUDPPort</li> <li>• SMF119IS_IPDynSrcNATOA</li> <li>• SMF119IS_IPDynDstNATOA</li> </ul>	Network address translation traversal support for IKE version 2

### SMC-R records

Table 63 lists the new records created for Shared Memory Communications - RDMA (SMC-R) processing.

Table 63. Summary of new and changed Communications Server SMF record type 119 - SMC-R records

Record type	Record field	Release	Description	Reason for change
SMC-R link group statistics (subtype 41)	N/A	V2R1	New SMF 119 subtype 41 interval record that provides statistics about SMC-R link groups and the SMC-R links within each SMC-R link group.	Shared Memory Communications over Remote Direct Memory Access
SMC-R link state start (subtype 42)	N/A	V2R1	New SMF 119 subtype 42 event record that provides statistics for an SMC-R link at the time that the link is started.	
SMC-R link state end (subtype 43)	N/A	V2R1	New SMF 119 subtype 43 event record that provides statistics for an SMC-R link at the time that the link is ended.	
RDMA network interface card (RNIC) interface statistics ((subtype 44)	N/A	V2R1	New SMF 119 subtype 44 interval record that provides statistics about 10 GbE RoCE Express interfaces.	



### TCP connection records

Table 64 on page 148 lists the changes made to the TCP connection SMF record type 119 records.

Table 64. Summary of new and changed Communications Server SMF record type 119 - TCP connection termination records

Record type	Record field	Release	Description	Reason for change
TCP connection termination record (subtype 2)	New IP filter section	V2R2 with APAR PI69920	New IP filter section. Indicates the inbound and outbound IP filters associated with this connection.	SMF 119 TCP connection termination record (subtype 2) enhanced to provide IP filter information
	SMF119AP_TTIPsecurityFlags	V2R2 with APAR PI69920	New field SMF119AP_TTIPsecurityFlags. Indicates whether IP security is enabled for this TCP/IP stack and whether IP filtering was done for this connection.	SMF 119 TCP connection termination record (subtype 2) enhanced to provide IP filter information
	<ul style="list-style-type: none"> <li>SMF119AP_TTLclSMCBufSz</li> <li>SMF119AP_TTRmtSMCBufSz</li> </ul>	V2R2	<ul style="list-style-type: none"> <li>New SMF119AP_TTLclSMCBufSz field that indicates the size of the RMB element that the local host uses for receiving data on this connection from the remote host.</li> <li>New SMF119AP_TTRmtSMCBufSz field that indicates the size of the RMB element that the remote host uses for receiving data on this connection from the local host.</li> </ul>	Shared Memory Communications over RDMA enhancements
	<ul style="list-style-type: none"> <li>SMF119AP_TTSMCFlags</li> <li>SMF119AP_TTSMCReason</li> </ul>	V2R2	<ul style="list-style-type: none"> <li>New flag bit SMF119AP_TTSMCCached.</li> <li>New constant SMF119AP_TTSMCAUTOSMCR as a value.</li> </ul>	Shared Memory Communications over RDMA enhancements
	<ul style="list-style-type: none"> <li>SMF119AP_TTTLSSESSIDLEN</li> <li>SMF119AP_TTTLSSESSID</li> <li>SMF119AP_TTTLSSRU</li> </ul>	V2R2	<ul style="list-style-type: none"> <li>New SMF119AP_TTTLSSESSIDLEN field that contains the length of the SSL Session ID.</li> <li>New SMF119AP_TTTLSSESSID field that contains the SSL Session ID.</li> <li>New SMF119AP_TTTLSSRU field that contains the SSL session reuse flag.</li> </ul>	TLS session reuse support for FTP and AT-TLS applications
	<ul style="list-style-type: none"> <li>SMF119AP_TTTTLSSP</li> <li>SMF119AP_TTTTLSNC</li> <li>SMF119AP_TTTTLSNC4</li> </ul>	V2R1	<ul style="list-style-type: none"> <li>New value SMF119AP_TTTTLSSPTV1_2 (X'0303').</li> <li>New value SMF119AP_TTTTLSNC4X (X'4X').</li> <li>New field containing four character negotiated cipher code.</li> </ul>	AT-TLS support for TLS v1.2 and related features

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Table 64. Summary of new and changed Communications Server SMF record type 119 - TCP connection termination records

Record type	Record field	Release	Description	Reason for change
TCP connection termination record (subtype 2) (continued)	<ul style="list-style-type: none"> <li>SMF119AP_TTSMCStatus</li> <li>SMF119AP_TTLclSMCLinkId</li> <li>SMF119AP_TTRmtSMCLinkId</li> <li>SMF119AP_TTSMCReason</li> </ul>	V2R1	<ul style="list-style-type: none"> <li>New SMF119AP_TTSMCStatus field that indicates whether an SMC-R link established for this connection is active or inactive. If SMF119AP_TTSMCReason is also X'0000', then SMC-R link establishment has not been attempted.</li> <li>New SMF119AP_TTLclSMCLinkId field that indicates the local stack link ID for the SMC-R link that this connection traverses.</li> <li>New SMF119AP_TTRmtSMCLinkId field that indicates the remote stack link ID for the SMC-R link that this connection traverses.</li> <li>New SMF119AP_TTSMCReason field that indicates why the connection is not using an SMC-R link.</li> </ul>	Shared Memory Communications over Remote Direct Memory Access
	SMF119AP_TTTermCode	V1R13	The following new values are defined for the connection termination reason code: <ul style="list-style-type: none"> <li>SMF119AP_TTTermCode_GlobalStall</li> <li>SMF119AP_TTTermCode_QueueSize</li> </ul>	Expanded Intrusion Detection Services

## TCP/IP stack records

Table 65 lists the changes made to the TCP/IP stack SMF type 119 records.

Table 65. Summary of new and changed Communications Server SMF type 119 record - TCP/IP stack records

Record type	Record field	Release	Description	Reason for change
Interface statistics (subtype 6)	SMF119IS_IFDesc SMF119IS_IFFlags SMF119IS_IFPNetID	V2R1	<ul style="list-style-type: none"> <li>The SMF119IS_IFDesc field can have a new SMF119IS_IFLink_RNIC type for 10 GbE RoCE Express interfaces, which are represented as RNIC interfaces.</li> <li>New SMF119IS_IFFlags field contains information, related to the SMC-R characteristics, if any, for the reported interface.</li> <li>New SMF119IS_IFPNetID field contains the Physical network ID for active OSD, OSX and RNIC interfaces.</li> </ul>	Shared Memory Communications over Remote Direct Memory Access
	SMF119IS_IFLink_IPAQIDX SMF119IS_IFLink_IPQIQX6	V1R13	New interface types IPAQIDX and IPAQIQX6	HiperSockets optimization for intraensemble data networks
	SMF119IS>IfIQDXName SMF119IS>IfInIQDXBytes SMF119IS>IfInIQDXUniC SMF119IS>IfOutIQDXBytes SMF119IS>IfOutInIQDXUniC	V1R13	New fields to show the associated dynamic IQDX for an OSX interface and the number of bytes and unicast packets that traversed it.	HiperSockets optimization for intraensemble data networks

Table 65. Summary of new and changed Communications Server SMF type 119 record - TCP/IP stack records (continued)

Record type	Record field	Release	Description	Reason for change
TCP/IP profile record (subtype 4)	IPv4 configuration section • NMTP_V4CFDynXcfSMCD  IPv6 configuration section • NMTP_V6CFDynXcfSMCD  Global configuration section • NMTP_GBCFFlags – NMTP_GBCFSMCD • NMTP_GBCFFixedMemoryD • NMTP_GBCFTcpKeepMinIntD  Interface section • NMTP_INTFFlags – NMTP_INTFSMCD	V2R2	IPv4 configuration section • The new NMTP_V4CFDynXcfSMCD value is specified whether the dynamically generated XCF interface can be used for new TCP connections with SMC-D.  IPv6 configuration section • The new NMTP_V6CFDynXcfSMCD value is specified whether the dynamically generated XCF interface can be used for new TCP connections with SMC-D.  Global configuration section: • The new NMTP_GBCFSMCD flag bit is set in the NMTP_GBCFFlags field to indicate that the SMCD operand was specified on the GLOBALCONFIG statement. • The new NMTP_GBCFFixedMemoryD field specifies the SMCD FIXEDMEMORY value. FIXEDMEMORY is specified in megabyte increments. • The new NMTP_GBCFTcpKeepMinIntD field specifies the SMCD TCPKEEPMININTERVAL value.  Interface section: • The new NMTP_INTFSMCD flag bit is set in the NMTP_INTFFlags field for OSA or HiperSocket interfaces that have SMCD specified or that take the SMCD default on the INTERFACE statement.	Shared Memory Communications – Direct Memory Access
	NMTP_GBCFAadjVMSS	V2R2	Provides the value of the GLOBALCONFIG ADJUSTDVIPAMSS parameter.	VIPAROUTE fragmentation avoidance
	NMTP_GBCFSMCGFlags	V2R2	New flag byte field NMTP_GBCFSMCGFlags with the following flag bits: • NMTP_GBCFAutoCache • NMTP_GBCFAutoSMC	• Shared Memory Communications over RDMA enhancements • Shared Memory Communications - Direct Memory Access
	NMTP_IPSecRule	V2R2	New flags and fields to support the new and modified parameters on the IPSECRULE and IPSEC6RULE profile statements.	TCPIP profile IP security filter enhancements
	NMTP_PORTRsvOptions	V2R2	New flag bits NMTP_PORTRSMC and NMTP_PORTRNoSMC in field NMTP_PORTRsvOptions.	• Shared Memory Communications over RDMA enhancements • Shared Memory Communications - Direct Memory Access
	NMTP_TCCFFlags	V2R2	New flag NMTP_TCCFAutoDelayAcks that indicates the setting of TCPCONFIG AUTODELAYACKS.	TCP Autonomic Tuning

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Table 65. Summary of new and changed Communications Server SMF type 119 record - TCP/IP stack records (continued)

Record type	Record field	Release	Description	Reason for change
TCP/IP profile record (subtype 4) (continued)	NMTP_INTFFlags	V2R1	New flag NMTP_INTFTempIP in field NMTP_INTFFlags that indicates the Interface is configured with the TEMPIP parameter.	Enable DHCP clients on OSA Interfaces
	NMTP_TCCFTimeWaitInterval	V2R1	New field that provides the setting of the TCPCONFIG TIMEWAITINTERVAL value.	Enhanced TCP protocol configuration options and default settings
	NMTP_TCCFRetransmitAttempts	V2R1	New field that provides the setting of the TCPCONFIG RETRANSMITATTEMPTS value.	Enhanced TCP protocol configuration options and default settings
	NMTP_TCCFConnectTimeOut	V2R1	New field that provides the setting of the TCPCONFIG CONNECTTIMEOUT value.	Enhanced TCP protocol configuration options and default settings
	NMTP_TCCFConnectInitInterval	V2R1	New field that provides the setting of the TCPCONFIG CONNECTINITINTERVAL value.	Enhanced TCP protocol configuration options and default settings
	NMTP_TCCFNagle	V2R1	New field that provides the setting of the TCPCONFIG NAGLE value.	Enhanced TCP protocol configuration options and default settings
	NMTP_TCCFKeepAliveProbes	V2R1	New field that provides the setting of the TCPCONFIG KEEPALIVEPROBES value.	Enhanced TCP protocol configuration options and default settings
	NMTP_TCCFKAProbeInterval	V2R1	New field that provides the setting of the TCPCONFIG KEEPALIVEPROBEINTERVAL value.	Enhanced TCP protocol configuration options and default settings
	NMTP_TCCFQueuedRTT	V2R1	New field that provides the setting of the TCPCONFIG QUEUEDRTT value.	Enhanced TCP protocol configuration options and default settings
	NMTP_TCCFFRRThreshold	V2R1	New field that provides the setting of the TCPCONFIG FRRTHRESHOLD value.	Enhanced TCP protocol configuration options and default settings
	NMTP_TCCFSelectiveACK	V2R1	New flag to indicate the setting of SELECTIVEACK/NOSELECTIVEACK.	TCP support for selective acknowledgments
	NMTP_TCCFDefltMaxSndBufSize	V2R1	New field that provides the setting of the TCPCONFIG TCPMAXSENDBUFSIZE value.	Enhanced TCP protocol configuration options and default settings

Table 65. Summary of new and changed Communications Server SMF type 119 record - TCP/IP stack records (continued)

Record type	Record field	Release	Description	Reason for change
TCP/IP profile record (subtype 4) (continued)	NMTP_TCCFEphemPortBegNum	V2R1	The NMTP_TCCFEphemPortBegNum field contains the beginning port range value for TCP ephemeral ports.	User control of Ephemeral Port Ranges
	NMTP_TCCFEphemPortEndNum	V2R1	The NMTP_TCCFEphemPortEndNum field contains the ending port range value for TCP ephemeral ports.	User control of Ephemeral Port Ranges
	NMTP_UDCFEphemPortBegNum	V2R1	The NMTP_UDCFEphemPortBegNum field contains the beginning port range value for UDP ephemeral ports.	User control of Ephemeral Port Ranges
	NMTP_UDCFEphemPortEndNum	V2R1	The NMTP_UDCFEphemPortEndNum field contains the ending port range value for UDP ephemeral ports.	User control of Ephemeral Port Ranges
	NMTP_V4CFDynXcfSrcVipalfNameFlg	V2R1	New flag is added to indicate if the dynamic XCF source VIPA interface name is specified.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	NMTP_V4CFDynXcfSrcVipalfName	V2R1	New field is added to provide the configured dynamic XCF source VIPA interface name	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	<ul style="list-style-type: none"> <li>• NMTP_INTFFlags</li> <li>• NMTP_INTFChpID</li> <li>• NMTP_INTFIPv4MaskNMTP_INTFMtu</li> <li>• NMTP_INTFSrcVipaIntfName</li> </ul>	V2R1	<ul style="list-style-type: none"> <li>• The NMTP_INTFDefIntf bit is set in the NMTP_INTFFlags field for IPv4 IPAQIDIO and VIRTUAL interfaces that are defined by the INTERFACE statement.</li> <li>• The NMTP_INTFIPbcast is set in the NMTP_INTFFlags field for IPv4 IPAQIDIO interfaces that are defined by the INTERFACE statement with the IPBCAST parameter specified.</li> <li>• The NMTP_INTFChpID provides the CHIPID value for IPv4 IPAQIDIO interfaces that are defined by the INTERFACE statement.</li> <li>• The NMTP_INTFIPv4Mask provides the configured subnet mask for IPv4 IPAQIDIO interfaces that are defined by the INTERFACE statement.</li> <li>• The NMTP_INTFMtu provides the configured MTU value for IPv4 IPAQIDIO interfaces that are defined by the INTERFACE statement.</li> <li>• The NMTP_INTFSrcVipaIntfName provides the SOURCEVIPAINTERFACE name for IPv4 IPAQIDIO interfaces that are defined by the INTERFACE statement.</li> </ul>	IPv4 INTERFACE statement for HiperSockets and Static VIPAs

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Table 65. Summary of new and changed Communications Server SMF type 119 record - TCP/IP stack records (continued)

Record type	Record field	Release	Description	Reason for change
TCP/IP profile record (subtype 4) (continued)	NMTP_NETACache	V2R1	New field is added to indicate the setting of the CACHEALL, CACHEPERMIT, and CACHESAME parameters on the NETACCESS statement.	Improve auditing of NetAccess rules
	NMTP_TCCFSelectiveACK	V2R1	New flag is added to indicate the setting of SELECTIVEACK/NOSELECTIVEACK.	TCP support for selective acknowledgements
	NMTP_V4CFFlags	V2R1	The description of flag NMTP_V4CFQDIOAcc is updated. The restriction of QDIO Accelerator to sysplex distributor traffic is no longer determined only by whether IP datagram forwarding is enabled.	QDIO acceleration coexistence with IP filtering
	NMTP_GBCFFlags NMTP_GBCFPFidCnt NMTP_GBCFFixedMemory NMTP_GBCFTcpKeepMinInt NMTP_GBCFPFs array	V2R1	<ul style="list-style-type: none"> <li>The new NMTP_GBCFSMCR flag bit is set in the NMTP_GBCFFlags field to indicate that the SMCR operand was specified on the GLOBALCONFIG statement.</li> <li>The new NMTP_GBCFPFidCnt field indicates the current number of configured PCI-function ID (PFID) and Port number entries in the NMTP_GBCFPFs array.</li> <li>The new NMTP_GBCFFixedMemory field specifies the SMCR FIXEDMEMORY value. FIXEDMEMORY is specified in megabyte increments.</li> <li>The new NMTP_GBCFTcpKeepMinInt field specifies the SMCR TCPKEEPMININTERVAL value.</li> <li>The new NMTP_GBCFPFs array contains a maximum of 16 PFID and port number paired entries: <ul style="list-style-type: none"> <li>NMTP_GBCFPFid is the 2-byte hexadecimal PFID.</li> <li>NMTP_GBCFPFport is the 1-byte decimal port number.</li> <li>NMTP_GBCFPFmtu is a 2-byte maximum transmission unit (MTU) decimal value.</li> </ul> </li> </ul>	Shared Memory Communications over Remote Direct Memory Access
	NMTP_PORTFlags	V2R1	The NMTP_PORTRNoSMCR flag bit is set in the NMTP_PORTFlags field to indicate this port or port range is disabled for SMC-R.	Shared Memory Communications over Remote Direct Memory Access
	NMTP_INTFFlags	V2R1	The NMTP_INTFSMCR flag bit is set in the NMTP_INTFFlags field for OSA interfaces that have SMCR specified or that take the SMCR default on the INTERFACE statement.	Shared Memory Communications over Remote Direct Memory Access
	NMTP_MGMTSmf119Types	V2R1	<ul style="list-style-type: none"> <li>The new NMTP_MGMT119SmcrGrpStats flag bit is set in the NMTP_MGMTSmf119Type field to indicate that the new SMC-R link group statistics records were requested on the SMFCONFIG profile statement.</li> <li>The new NMTP_MGMT119SmcrLnkEvent flag bit is set in the NMTP_MGMTSmf119Type field to indicate that the new SMC-R link state start and end records were requested on the SMFCONFIG profile statement.</li> </ul>	Shared Memory Communications over Remote Direct Memory Access

Table 65. Summary of new and changed Communications Server SMF type 119 record - TCP/IP stack records (continued)

Record type	Record field	Release	Description	Reason for change
TCP/IP profile record (subtype 4) (continued)	NMTP_PIDSEye	V2R1	In the C header file, EZBNMMPC, eyecatcher constant, NMTP_PIDSEYEC has been corrected.	Release update
	NMTP_V6CFDynXcfAddr	V2R1	In the C header file, EZBNMMPC, this IPv6 address field has been redefined from char to struct in6_addr.	Release update
	NMTP_IPA6Addr	V2R1	In the C header file, EZBNMMPC, this IPv6 address field has been redefined from char to struct in6_addr.	Release update
	NMTP_GBCFAutoIQDX	V1R13	Subtype 4. New flags to indicate setting of GLOBALCONFIG AUTOIQDX.	HiperSockets optimization for intraensemble data networks
	NMTP_GBCFSegOffload	V1R13	Use of this flag is deprecated. See NMTP_V4CFSegOffload.	OSA-Express4S QDIO IPv6 checksum and segmentation offload
	NMTP_V4CFChkOffload	V1R13	New flag to indicate setting of IPCONFIG CHECKSUMOFFLOAD.	OSA-Express4S QDIO IPv6 checksum and segmentation offload
	NMTP_V4CFSegOffload	V1R13	New flag to indicate setting of IPCONFIG SEGMENTATIONOFFLOAD.	OSA-Express4S QDIO IPv6 checksum and segmentation offload
	NMTP_V6CFChkOffload	V1R13	New flag to indicate setting of IPCONFIG6 CHECKSUMOFFLOAD.	OSA-Express4S QDIO IPv6 checksum and segmentation offload
	NMTP_V6CFSegOffload	V1R13	New flag to indicate setting of IPCONFIG6 SEGMENTATIONOFFLOAD.	OSA-Express4S QDIO IPv6 checksum and segmentation offload
	NMTP_DVCFSAFNameSet	V1R13	New flag in field NMTP_DVCFFlags to indicate if the SAF parameter is specified on the VIPARANGE statement.	Improved security granularity for VIPARANGE DVIPAs
	NMTP_DVCFSAFName	V1R13	New field to indicate the name specified on the SAF parameter of the VIPARANGE statement.	Improved security granularity for VIPARANGE DVIPAs
	NMTP_PORTJobName	V1R13	This field can now contain a job name prefix (1-7 character job name followed by an asterisk) for entries that represent a PORTRANGE profile statement.	Wildcard support for the PORTRANGE statement

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Table 65. Summary of new and changed Communications Server SMF type 119 record - TCP/IP stack records (continued)

Record type	Record field	Release	Description	Reason for change
TCP/IP statistics record (subtype 5)	SMF119AP_TSTCEphPortExh	V2R1	SMF119AP_TSTCEphPortExh contains the interval count of number of bind() failures because no TCP ephemeral ports were available.	User control of Ephemeral Port Ranges
	SMF119AP_TSTCEphPortAvail	V2R1	SMF119AP_TSTCEphPortAvail contains the total number of TCP ephemeral ports that are available to use for bind() requests	User control of Ephemeral Port Ranges
	SMF119AP_TSTCEphPortInUse	V2R1	SMF119AP_TSTCEphPortInUse contains the current number of TCP ephemeral ports in use	User control of Ephemeral Port Ranges
	SMF119AP_TSTCEphPortMxUse	V2R1	SMF119AP_TSTCEphPortMxUse contains the maximum number of TCP ephemeral ports used	User control of Ephemeral Port Ranges
	SMF119AP_TSUDEphPortExh	V2R1	SMF119AP_TSUDEphPortExh contains the interval count of number of bind() failures because no UDP ephemeral ports were available.	User control of Ephemeral Port Ranges
	SMF119AP_TSUDEphPortAvail	V2R1	SMF119AP_TSUDEphPortAvail contains the total number of UDP ephemeral ports that are available to use for bind() requests.	User control of Ephemeral Port Ranges
	SMF119AP_TSUDEphPortInUse	V2R1	SMF119AP_TSUDEphPortInUse contains the current number of UDP ephemeral ports in use.	User control of Ephemeral Port Ranges
	SMF119AP_TSUDEphPortMxUse	V2R1	SMF119AP_TSUDEphPortMxUse contains the maximum number of UDP ephemeral ports used	User control of Ephemeral Port Ranges
	Existing TCP stats changed:  SMF119AP_TSTCEstab SMF119AP_TSTCOpenConn SMF119AP_TSTCPassConn SMF119AP_TSTCConCls SMF119AP_TSTCInSegs SMF119AP_TSTCOSegs SMF119AP_TSTCReset SMF119AP_TSTCConReset SMF119AP_TSTCOKApr SMF119AP_TSTCDropKA SMF119AP_TSTCDropF2  New SMC-R stats:  SMF119AP_TSSMCRCurrEstabLnks SMF119AP_TSSMCRLnkActTimeOut SMF119AP_TSSMCRActLnkOpened SMF119AP_TSSMCRPasLnkOpened SMF119AP_TSSMCRLnksClosed SMF119AP_TSSMCRCurrEstab SMF119AP_TSSMCRActiveOpened SMF119AP_TSSMCRPassiveOpened SMF119AP_TSSMCRConnClosed SMF119AP_TSTSMCRInSegs SMF119AP_TSTSMCROutSegs SMF119AP_TSSMCRInRsts SMF119AP_TSSMCROutRsts  New SMC-R storage stats:  SMF119AP_TSSTSMCRFixedCurrent SMF119AP_TSSTSMCRFixedMax SMF119AP_TSSTSMCRSendCurrent SMF119AP_TSSTSMCRSendMax SMF119AP_TSSTSMCRRecvCurrent SMF119AP_TSSTSMCRRecvMax	V2R1	<ul style="list-style-type: none"> <li>When the SMCR parameter is configured on the GLOBALCONFIG statement, the listed TCP counters reflect all TCP connections, including connections over SMC-R links.</li> <li>The listed SMC-R stats are added at the end of the TCP statistics section.</li> <li>The listed SMC-R storage stats are added in the storage statistics section.</li> </ul>	Shared Memory Communications over Remote Direct Memory Access



### TN3270E Telnet server records

Table 66 lists the changes made to the TN3270E Telnet server SMF type 119 records.

Table 66. Summary of new and changed Communications Server SMF type 119 record - TN3270 Telnet server records

Record type	Record field	Release	Description	Reason for change
Telnet profile record (subtype 24)	SMF119TN_HGHName	V2R2	In the C header, ezasmf.h, the length of this field was changed from zero to the maximum length of 255, in order to resolve a compiler warning message.	Release update
	SMF119TN_TPFlag04	V2R1	New SMF119TN_TPDisPPhrase flag that indicates whether DISABLEPASSWORDPHRASE was specified for the PASSWORDPHRASE statement.	APAR PI14661
	SMF119TN_TPSSLV3	V2R1	New field to enable or disable SSLV3	APAR PI28679
	N/A	V2R1	New SMF 119 subtype 24 record that provides TN3270E Telnet server configuration information.	NMI and SMF enhancements for TCP/IP applications

### VTAM 3270 intrusion detection services records

Table 67 lists the changes made to the VTAM 3270 intrusion detection services records.

Table 67. Summary of new and changed Communications Server SMF type 119 record - VTAM 3270 intrusion detection services records

Record type	Release	Description	Reason for change
VTAM 3270 intrusion detection services record (subtype 81)	V2R2 with APAR OA49911	New record in response to VTAM 3270 intrusion detection services	VTAM 3270 intrusion detection services
	V2R1 with APAR OA48802		

### z/OS UNIX /etc files

Changes to z/OS UNIX /etc files are listed in IP Services: Update /etc configuration files in *z/OS Migration*.

### General updates of IP interfaces

Table 68 lists the general IP interfaces updates.

Table 68. Summary of new and changed Communications Server IP - General updates to IP interfaces

Interface	Release	Description	Reason for change
CICS IBM listener	V2R2	The standard and enhanced listener will now provide the management information about each session between a client and CICS server.	CICS transaction tracking support for CICS TCP/IP IBM Listener

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Table 68. Summary of new and changed Communications Server IP - General updates to IP interfaces (continued)

Interface	Release	Description	Reason for change
ENF signal 80	V2R1	<p>Changed ENF interface to allow z/OS to signal events. The ENF signal 80 has one qualifier:</p> <ul style="list-style-type: none"> <li>• A rpcbind server event occurred</li> </ul> <p>The rpcbind server issue the event when the server starts or stops. The EZAENF80 macro maps the ENF signal.</p> <p><b>Guideline:</b> RPC applications that want awareness of the rpcbind server availability can write ENF listening user exit routines to react to Communications Server ENF signal with the rpcbind event qualifier.</p>	RPCBIND recycle notification
FFST probes	V2R2	TCP/IP no longer creates FFST probes for certain error conditions. Instead, an ABEND dump is created with system code 4C5.	64-bit enablement of the TCP/IP stack, strategic DLCs, and CSM
IKE daemon	V2R2	<p>All of the IKE daemon messages written through syslogd contain the internal IKE daemon thread identifier immediately preceding the IKE daemon message identifier. In the following example, the thread identifier is in indicated bold type:</p> <pre>Jul 28 15:11:06 mvs046 IKE: Message instance 0: <b>(00000001)</b> EZD0967I IKE release CS V2R2 Service Level CS140728 Created on Jul 28 2014</pre>	Enhanced IKED scalability
MODDVIPA	V2R1	New option added: -a - Create dvipa with affinity	Affinity for application-instance DIVPAs
NCROUTE	V2R2	The server application is no longer supported.	Removal of support for legacy devices
SMF 118 TCPIPSTATISTICS record	V2R2	New STATLEN macro variable can be used to define field SMFSTLen in the SMFTriple structure instead of field SMF3Len. SMF3Len has the same name as the SMF Type 3 record length field in macro IFASMFR.	Release update
SMF 119 subtype 4 record	V2R1	For record type TCP/IP Profile Record and record field NMTP_TCCFSelectiveACK added a flag to indicate the setting of SELECTIVEACK/NOSELECTIVEACK.	TCP support for selective acknowledgements
SNALINK LU0	V2R2	The server application is no longer supported.	Removal of support for legacy devices
SNALINK LU6.2	V2R2	The server application is no longer supported.	Removal of support for legacy devices
SYSTCPRE	V2R2	Added the TRACERES option for the MVS TRACE CT command to collect Trace Resolver output as Resolver CTRACE records.	Activate Resolver trace without restarting applications
TRACE RESOLVER	V2R2	<p>If the CACHE setting is in effect, one of the following values is displayed to indicate the current system-wide cache reordering setting:</p> <ul style="list-style-type: none"> <li>• CacheReorder</li> <li>• NoCacheReorder</li> </ul>	Reordering of cached Resolver results

Table 68. Summary of new and changed Communications Server IP - General updates to IP interfaces (continued)

Interface	Release	Description	Reason for change
X.25 NPSI	V2R2	The server application is no longer supported.	Removal of support for legacy devices

## Samples provided in MVS data set SEZAINST

Table 69 lists the changes to the samples that are provided in MVS data set SEZAINST.

Table 69. IP samples provided in MVS data set SEZAINST

Member	Rel.	Description	Reason for change
CSSMTP	V2R1	In the PARM field of the EXEC JCL statement, changed the _CEE_ENVFILE environment variable to _CEE_ENVFILE_S so that trailing blanks are removed from each record in the reference data set or file.	Release update
EZADMD	V2R1	In the PARM field of the EXEC JCL statement, changed the _CEE_ENVFILE environment variable to _CEE_ENVFILE_S so that trailing blanks are removed from each record in the reference data set or file.	Release update
EZAFCEXT	V2R1	The JCL file EZAFCEXT contains the sample client user exit routines. If the JCL is submitted, it creates four load modules. EZAFCCMD and EZAFCREP are user exit routines. EZAFCCOM and ASMTSYSL are assistant load modules that are called by the EZAFCCMD and EZAFCREP user exit routines.	FTP client security user exits
EZAFCREP	V2R1	The user exit routine of EZAFCREP controls the FTP replies that are sent from the FTP server.	FTP client security user exits
EZAFTPAC	V1R13	Sample FTP.DATA for the FTP client; includes a sample DSNTYPE statement and a sample EATTR statement.	<ul style="list-style-type: none"> <li>• FTP support for large-format data sets</li> <li>• Enhanced FTP support for extended address volumes</li> </ul>
EZAFTPAS	V1R13	Sample FTP.DATA for the FTP server; includes a sample DSNTYPE statement and a sample EATTR statement.	<ul style="list-style-type: none"> <li>• FTP support for large-format data sets</li> <li>• Enhanced FTP support for extended address volumes</li> </ul>
EZANSR9	V2R1	This is a sample procedure for the named application, which is no longer supported.	Removal of BIND DNS Name Server from z/OS
EZANSSSI	V2R1	This is a sample procedure for the named application, which is no longer supported.	Removal of BIND DNS Name Server from z/OS
EZAPOLPR	V2R1	In the PARM field of the EXEC JCL statement, changed the _CEE_ENVFILE environment variable to _CEE_ENVFILE_S so that trailing blanks are removed from each record in the reference data set or file.	Release update

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Table 69. IP samples provided in MVS data set SEZAINST (continued)

Member	Rel.	Description	Reason for change
EZARACF	V2R1	New MVS.VARY.TCPIP.SYNTAXCHECK resource in the OPERCMD5 class is provided for the new VARY TCPIP,,SYNTAXCHECK command.	Check TCP/IP profile syntax without applying configuration changes
	V2R1	The following new resource profiles in the SERVAUTH class are provided for the real-time application-controlled TCP/IP trace NMI: <ul style="list-style-type: none"> <li>EZB.TRCCTL.sysname.tcpname.OPEN</li> <li>EZB.TRCCTL.sysname.tcpname.DATTRACE</li> <li>EZB.TRCCTL.sysname.tcpname.PKTTRACE</li> <li>EZB.TRCSEC.sysname.tcpname.ATTLS</li> <li>EZB.TRCSEC.sysname.tcpname.IPSEC</li> </ul>	Real-time application-controlled TCP/IP trace NMI
	V1R13	<ul style="list-style-type: none"> <li>New resource in the SERVAUTH class, EZB.BINDDVIPARANGE. <i>sysname.tcpname.resname</i>, controls if an application can issue a bind socket call to create a specific dynamic VIPA in a VIPARANGE subnet.</li> <li>New resource in the SERVAUTH class, EZB.MODDVIPA. <i>sysname.tcpname.resname</i>, controls if an application can do the following actions: <ul style="list-style-type: none"> <li>Create an application-specific DVIPA, specified by a specific VIPARANGE statement, using the SIOCSVIPA ioctl call, the SIOCSVIPA6 ioctl call, or the MODDVIPA utility</li> <li>Delete a DVIPA that was created using the same profile and the SIOCSVIPA ioctl call, the SIOCSVIPA6 ioctl call, or the MODDVIPA utility</li> </ul> </li> </ul>	Improved security granularity for VIPARANGE DVIPAs
EZASNPRO	V1R13	SNTP sample MVS started procedure - the Language Environment parameters no longer need to be specified on the PARM parameter of the EXEC JCL statement.	Release update
FTCHKPWD	V1R13	Now demonstrates the changed user exit interface.	FTP support for password phrases
IKED	V2R1	In the PARM field of the EXEC JCL statement, changed the _CEE_ENVFILE environment variable to _CEE_ENVFILE_S so that trailing blanks are removed from each record in the reference data set or file.	Release update

Table 69. IP samples provided in MVS data set SEZAINST (continued)

Member	Rel.	Description	Reason for change
IOBSNMP	V2R2	This is the sample MVS started procedure for the OSA-Express Direct SNMP subagent. The following changes were made to this sample: <ul style="list-style-type: none"> <li>The -o parameter was added to the list of parameters. Support for this parameter was added in z/OS V1R10 but the sample was not updated to reflect this.</li> <li>Added information about using the MVS JCL PARMDD parameter. This parameter can be used to reference a data set that contains all the IOBSNMP parameters. By using PARMDD, the community name value for the -c parameter does not have to be exposed in the started procedure.</li> </ul>	Release update
MIBDESC	V2R1	This SNMP Query Engine input sample has been updated with all the new SNMP MIB objects that are described in "SNMP MIB modules" on page 134.	Release update
NAMED9	V2R1	This is a sample procedure for the named application, which is no longer supported.	Removal of BIND DNS Name Server from z/OS
NSSD	V2R1	In the PARM field of the EXEC JCL statement, changed the _CEE_ENVFILE environment variable to _CEE_ENVFILE_S so that trailing blanks are removed from each record in the reference data set or file.	Release update
NSSIG	V2R1	This is a sample procedure for sending signals to the named application, which is no longer supported.	Removal of BIND DNS Name Server from z/OS
OMPROUTE	V2R1	In the PARM field of the EXEC JCL statement, changed the _CEE_ENVFILE environment variable to _CEE_ENVFILE_S so that trailing blanks are removed from each record in the reference data set or file.	Release update
OSMPDPR	V2R1	In the PARM field of the EXEC JCL statement, changed the _CEE_ENVFILE environment variable to _CEE_ENVFILE_S so that trailing blanks are removed from each record in the reference data set or file.	Release update
OSNMPDPR	V2R1	The following changes were made to the sample SNMP agent cataloged procedure: <ul style="list-style-type: none"> <li>A sample SYSTCPD DD statement was added. This DD statement can be used to specify the TCPIP.DATA data set containing the TCP/IP stack name of the TCP/IP stack name with which the SNMP agent should associate itself.</li> <li>An example of specifying the -s start parameter was added.</li> </ul>	Release update
PAGENT	V2R1	In the PARM field of the EXEC JCL statement, changed the _CEE_ENVFILE environment variable to _CEE_ENVFILE_S so that trailing blanks are removed from each record in the reference data set or file.	Release update

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Table 69. IP samples provided in MVS data set SEZAINST (continued)

Member	Rel.	Description	Reason for change
RESSETUP	V2R2	The new CACHEREORDER and NOCACHEREORDER statements are added to the sample Resolver setup file.	Reordering of cached Resolver results
RSVPD	V2R1	In the PARM field of the EXEC JCL statement, changed the _CEE_ENVFILE environment variable to _CEE_ENVFILE_S so that trailing blanks are removed from each record in the reference data set or file.	Release update
SAMPPROF	V2R2	Improved the IPSEC6RULE profile statement examples by adding some of the new parameters and range values.	TCPIP profile IP security filter enhancements
	V2R1	Added examples of using the INTERFACE profile statement to define IPv4 HiperSockets (IPAQIDIO) and IPV4 VIPA (VIRTUAL) interfaces.	IPv4 INTERFACE statement for HiperSockets and Static VIPAs
	V2R1	This is the sample configuration file for the TCPIP address space. Named is removed from the example AUTOLOG statement and from the example PORT statement.	Removal of BIND DNS Name Server from z/OS
	V2R1	Added information about specifying the new CACHEALL, CACHEPERMIT, and CACHESAME parameters on the NETACCESS profile statement.	Improve auditing of NetAccess rules
	V1R13	A new SAF parameter and its associated <i>rename</i> value are added to the VIPARANGE statement.	Improved security granularity for VIPARANGE DVIPAs
	V1R13	The <i>jobname</i> parameter of the PORTRANGE statement can now include a 1-7 character prefix followed by a wildcard character (*), enabling all job names that match the prefix to access the ports in the range.	Wildcard support for the PORTRANGE statement
SERVICES	V2R2	The NCPROUT entry is removed because NCPROUTE is no longer supported.	Removed support for legacy devices
SNTPD	V2R2	Corrected the specification of the value for the PARM= parameter on the EXEC JCL statement	Release update
SYSLOGD	V2R1	In the PARM field of the EXEC JCL statement, changed the _CEE_ENVFILE environment variable to _CEE_ENVFILE_S so that trailing blanks are removed from each record in the reference data set or file.	Release update
TCPDATA	V2R2	Added a description of the new NOCACHEREORDER configuration statement.	Reordering of cached Resolver results
	V2R1	This is the sample TCPIP.DATA configuration data set. The example NSINTERADDR statements are updated to specify IP addresses that do not loop back for IPv4 and IPv6.	Removal of BIND DNS Name Server from z/OS
TRMD	V2R1	In the PARM field of the EXEC JCL statement, changed the _CEE_ENVFILE environment variable to _CEE_ENVFILE_S so that trailing blanks are removed from each record in the reference data set or file.	Release update

## Samples provided in z/OS UNIX TCPIP directory

Table 70 lists the changes to the samples that are provided in z/OS UNIX directory /usr/lpp/tcpip/samples.

Table 70. IP samples provided in z/OS UNIX directory /usr/lpp/tcpip/samples

File name	Rel.	Description	Reason for change
caching.conf	V2R1	This configuration file can be deleted. It was used by the named application, which is no longer supported.	Removal of BIND DNS Name Server from z/OS
db.loopback.v9	V2R1	This configuration file can be deleted. It was used by the named application, which is no longer supported.	Removal of BIND DNS Name Server from z/OS
db.mycorp.v9	V2R1	This configuration file can be deleted. It was used by the named application, which is no longer supported.	Removal of BIND DNS Name Server from z/OS
db.34.37.9.v9	V2R1	This configuration file can be deleted. It was used by the named application, which is no longer supported.	Removal of BIND DNS Name Server from z/OS
dmd.conf	V2R1	The DMD configuration sample is updated to include the new DefaultLogLimit parameter.	Limit defensive filter logging
named.conf	V2R1	This configuration file can be deleted. It was used by the named application, which is no longer supported.	Removal of BIND DNS Name Server from z/OS
osnmp.conf	V2R1	New privacy protocol value AESCFB128 can be specified on a statement for an SNMPv3 user to request AES 128-bit encryption.	Network Security enhancements for SNMP
pagent_IDS.conf	V1R13	Intrusion Detection Services (IDS) policy sample updated to include new attack types and IPv6 examples.	Expanded Intrusion Detection Services
	V1R13	Intrusion Detection Services (IDS) policy sample updated to include new attack types.	Intrusion Detection Services support for Enterprise Extender
pagent_TTLS.conf	V2R1	Updated for new statements, parameters and values.	AT-TLS support for TLS v1.2 and related features
services	V2R2	Removed the NCPROUTE entry because NCPROUTE is no longer supported.	Removed support for legacy devices
slave.conf	V2R1	This configuration file can be deleted. It was used by the named application, which is no longer supported.	Removal of BIND DNS Name Server from z/OS
snmpd.conf	V2R1	New privacy protocol value AESCFB128 can be specified on a USM_USER statement to request AES 128-bit encryption.	Network Security enhancements for SNMP
snmpSMgr.c	V2R2	The object identifier (OID) for the snmpTrapOID varbind is corrected. The snmpTrapOID varbind is used only when it generates SNMP traps or informs.	Release update

## Communications Server SNA summary of interface changes

This topic describes the updates to the following Communications Server SNA interfaces:

- "Start options"
- "Start option behavior changes" on page 163
- "Definition statements" on page 164
- "Commands" on page 165
- "Command behavior changes" on page 166
- "VTAM internal trace entries" on page 170
- "VTAMMAP Formatted Dump changes" on page 174
- "Tuning statistics reports" on page 174

### Start options

Table 71 lists the new or changed SNA start options.

Refer to *z/OS Communications Server: SNA Resource Definition Reference* for more information on start options.

Table 71. Summary of new and changed Communications Server start options

Start option	Release	Description of update	Reason for change
AIMON	V2R2	The AIMON start option determines whether VTAM monitors interfaces for overdue adapter interrupts.	Release update
DSACTION	V2R2 with APAR OA49911 V2R1 with APAR OA48802	New start option for VTAM 3270 intrusion detection services.	VTAM 3270 intrusion detection services
DSCOUNT	V2R2 with APAR OA49911 V2R1 with APAR OA48802	New start option for VTAM 3270 intrusion detection services.	VTAM 3270 intrusion detection services
DSMONITR	V2R2 with APAR OA49911 V2R1 with APAR OA48802	New start option for VTAM 3270 intrusion detection services.	VTAM 3270 intrusion detection services
DSTRUST	V2R2 with APAR OA49911 V2R1 with APAR OA48802	New start option for VTAM 3270 intrusion detection services.	VTAM 3270 intrusion detection services



Table 71. Summary of new and changed Communications Server start options (continued)

Start option	Release	Description of update	Reason for change
CSDUMP	V2R1	The RNICTRLE operand is changed to accept the value MSGVALUE.	Shared Memory Communications over RDMA adapter (RoCE) virtualization
	V2R1	Changed to accept a new value RNICTRLE as part of a message trigger.	Shared Memory Communications over Remote Direct Memory Access
IPADDR	V2R1	Changed to accept an IPv6 address or an IPv4 address.	Enterprise Extender IPv6 address configuration
PSRETRY	V2R1	Changed to accept a new IMMED operand value to trigger immediate path switch attempts when a TG is activated or changes status.	Enterprise Extender IPv6 address configuration
TRACE	V1R13	Existing start option. The VIT operand DSPSIZE was used to set the size of the VIT data space when TYPE=VTAM was specified; it is not supported in V1R13 and later.	Increased CTRACE and VIT capacity
	V1R13	Existing start option. The VIT operand SIZE, used when TYPE=VTAM is specified, is changed to specify the number of megabytes of HVCommon instead of the number of pages of ECSA. The new valid range of values is 4M to 2048M, inclusive.	Increased CTRACE and VIT capacity

## Start option behavior changes

Table 72 lists the SNA start options that have changed behavior.

For complete information about all SNA start options, refer to *z/OS Communications Server: SNA Resource Definition Reference*.

Table 72. Summary of new and changed Communications Server start option behavior changes

Start option with changed behavior	Release	Description of update	Reason for change
AIMON	V2R2	The AIMON start option is enhanced to enable VTAM to monitor overdue adapter interrupts for internal shared memory (ISM) interfaces that are associated with Shared Memory Communications – Direct Memory Access (SMC-D) and OSA-Express QDIO interfaces.	Shared Memory Communications - Direct Memory Access
INOPDUMP	V2R2	New INOPDUMP control groups enable more granular control on which resources are eligible to initiate inoperative diagnostic dumps.	Shared Memory Communications - Direct Memory Access
TNSTAT	V2R2	The TNSTAT start option has no effect on a TRLE that represents an ISM device.	Shared Memory Communications - Direct Memory Access

## Communications Server

Table 72. Summary of new and changed Communications Server start option behavior changes (continued)

Start option with changed behavior	Release	Description of update	Reason for change
TRACE	V1R13	The VIT operand DSPSIZE is no longer supported. Coding the DSPSIZE operand results in message IST448I DSPSIZE OPTION IGNORED - NO LONGER SUPPORTED.	Increased CTRACE and VIT capacity
	V1R13	The VIT operand SIZE specifies the number of megabytes of HVCOMMON storage to be used for the VIT table. Previously, it specified the number of pages of ECSA to be used for the VIT table. If you do not specify M (for megabyte), a default of 4M is used.	Increased CTRACE and VIT capacity

## Definition statements

Table 73 lists the changes to SNA definition statements.

For complete information about all changed and new definition statements, see *z/OS Communications Server: SNA Resource Definition Reference*.

Table 73. Summary of new and changed Communications Server definition statements

Definition statement	Release	Description of update	Reason for change
APPL	V2R2 with APAR OA49911	Update to support the DSACTION, DSCOUNT, DSMONITR, and DSTRUST operands.	VTAM 3270 intrusion detection services
	V2R1 with APAR OA48802		
GROUP	V2R2 with APAR OA49911	Update to support the DSACTION, DSCOUNT, DSMONITR, and DSTRUST operands.	VTAM 3270 intrusion detection services
	V2R1 with APAR OA48802		
	V2R1	In an Enterprise Extender (EE) XCA major node (MEDIUM=HPRIP), the IPADDR parameter is changed to accept an IPv6 address or an IPv4 address.	Enterprise Extender IPv6 address configuration
	V2R1	In a switched major node, the HPREEARB parameter is accepted on the GROUP definition statement. HPREEARB accepts a value of HPRARB or a value of PROGRESS for EE connections.	Simplified Configuration for Progressive Mode ARB
PATH	V2R1	In a switched major node for an EE connection, the IPADDR parameter is changed to accept either an IPv6 address or an IPv4 address.	Enterprise Extender IPv6 address configuration

Table 73. Summary of new and changed Communications Server definition statements (continued)

Definition statement	Release	Description of update	Reason for change
PU	V2R1	In a switched major node, the HPREEARB parameter is accepted on the PU definition statement. HPREEARB accepts a value of HPRARB or a value of PROGRESS for EE connections.	Simplified Configuration for Progressive Mode ARB

## Commands

Table 74 lists the new and changed SNA commands.

For complete information about SNA commands, refer to the *z/OS Communications Server: SNA Operation*.

Table 74. Summary of new and changed Communications Server commands

Command	Release	Description	Reason for change
DISPLAY EE	V2R1	Added a new CPNAME filter.	Serviceability Enhancements
DISPLAY TRL	V2R2	A new value is defined for the CONTROL parameter. Specifying CONTROL=ISM displays all the internal shared memory (ISM) TRLEs.	Shared Memory Communications - Direct Memory Access
	V2R1	If the TRLE represents an OSA-Express in QDIO mode or in Hipersockets device, the display includes an additional message (IST2386I).	QDIO outbound flood prevention
	V2R1	A new value is defined for the CONTROL parameter. Specifying CONTROL=RoCE displays all the 10 GbE RoCE Express TRLEs.	Shared Memory Communications over Remote Direct Memory Access
	V2R1	A new DEVSTATS operand is accepted. Specifying DEVSTATS=YES requests that VTAM obtain and display operational statistics for a 10 GbE RoCE Express TRLE.	Shared Memory Communications over Remote Direct Memory Access

## Communications Server

Table 74. Summary of new and changed Communications Server commands (continued)

Command	Release	Description	Reason for change
MODIFY CSDUMP	V2R1	The RNICTRLE operand is changed to accept the value MSGVALUE. Specifying RNICTRLE=MSGVALUE requests that VTAM take a diagnostic dump of the 10 GbE RoCE Express interface identified in message IST2391I, IST2406I, or IST2419I. This diagnostic dump is taken in addition to any other requested diagnostic information.	Shared Memory Communications over RDMA adapter (RoCE) virtualization
	V2R1	A new RNICTRLE operand is accepted. Specifying RNICTRLE requests that VTAM take a 10 GbE RoCE Express diagnostic dump of the 10 GbE RoCE Express interface represented by RNICTRLE in addition to any other diagnostic information requested.	Shared Memory Communications over Remote Direct Memory Access
MODIFY TOPO	V1R13	A new value, FUNCTION=CLRTREES, clears APPN routing trees. You should use this function only when advised by IBM service to do so.	Improved APPN routing resilience
MODIFY TRACE	V2R1	The maximum value of the BFRNUM operand when TYPE=ROUTE is specified is increased from 100 to 500 to allow up to 500 40K buffers for the APPN route selection trace.	SNA serviceability enhancements
MODIFY VTAMOPTS	V2R2 with APAR OA49911 V2R1 with APAR OA48802	You can modify the values for DSACTION, DSCOUNT, DSMONITR, and DSTRUST start options.	VTAM 3270 intrusion detection services
MODIFY VTAMOPTS	V2R1	Changed to accept an IPv6 address or an IPv4 address for the IPADDR start option.	Enterprise Extender IPv6 address configuration

## Command behavior changes

Table 75 on page 167 lists the SNA commands that have changed behavior.

For complete information about SNA commands, refer to the *z/OS Communications Server: SNA Operation*.

Table 75. Summary of new and changed Communications Server commands with changed behavior

Command	Release	Description of behavior change	Reason for change
DISPLAY BRFUUSE	V2R1	Message group IST2403I is added to the command output. The message group provides details about VTAM's current usage of 64-bit storage, the maximum amount of 64-bit storage used, and any configured limit on the amount available to be used. The following messages are included in the message group to identify different types of 64-bit storage: <ul style="list-style-type: none"> <li>• IST2404I describes VTAM's usage of HVCOMMON storage</li> <li>• IST2405I describes VTAM's usage of HVCOMMON storage for TRACE purposes</li> <li>• IST2412I describes VTAM's usage of FIXED HVCOMMON storage</li> <li>• IST2413I describes VTAM's usage of PRIVATE 64-bit storage</li> <li>• IST2414I describes VTAM's usage of FIXED PRIVATE 64-bit storage</li> <li>• IST2415I provides a total amount for all 64-bit storage usage</li> </ul>	Shared Memory Communications over RDMA enhancements
DISPLAY EE	V2R1	IST2346I is added to output that contains information about a remote IP address or a remote host name.	Serviceability Enhancements
DISPLAY EEDIAG	V1R13	When TEST=YES and LIST=SUMMARY are specified together, messages IST2137I and IST2138I now have *NA for the hop count. Previously, IST2137I and IST2138I were displayed with the actual hop count.	Enterprise Extender firewall-friendly connectivity test
DISPLAY ID	V2R2 with APAR OA49911	This command adds VTAM 3270 intrusion detection services information to the display.	VTAM 3270 intrusion detection services
	V2R1 with APAR OA48802		
	V2R2	If the resource that is being displayed is an internal shared memory (ISM) TRLE, a new message group (IST2418I) is generated to display information unique to the ISM interface.	Shared Memory Communications - Direct Memory Access
	V2R1	If ID= <i>rnictrle_name</i> is specified and the 10 GbE RoCE Express feature that <i>rnictrle_name</i> represents is operating in a shared RoCE environment, message IST2417I appears in the command output to display the associated virtual function number (VFN).	Shared Memory Communications over RDMA adapter (RoCE) virtualization
	V2R1	If the resource that is being displayed is a RNIC TRLE, a new message group (IST2361I) is generated to display information that is unique to the 10 GbE RoCE Express interface.	Shared Memory Communications over Remote Direct Memory Access
	V2R1	When the ID represents a high performance routing (HPR) physical unit name, IST2395I is issued if the base mode adaptive rate-based (ARB) pacing algorithm is used.	Serviceability Enhancements

## Communications Server

Table 75. Summary of new and changed Communications Server commands with changed behavior (continued)

Command	Release	Description of behavior change	Reason for change
DISPLAY ID	V1R13	When ID= <i>trlename</i> is specified for an active QDIO TRLE, messages IST2331I, IST2332 and one or more IST2333I are issued. For messages IST2331I, IST2332I, and IST2333I, a new QUEUE STATUS column now shows the current status of each read queue.	Performance improvements for Enterprise Extender traffic
	V1R13	The command is enhanced in the following ways: <ul style="list-style-type: none"> <li>• Displays information about IQDX TRLEs</li> <li>• Includes the associated interface name on message IST1717I</li> </ul>	HiperSockets optimization for intraensemble data networks
DISPLAY INOPDUMP	V2R2	If you enabled one or more of the new INOPDUMP control groups, you will get the following results: <ul style="list-style-type: none"> <li>• Message IST1865I displays a new status of ON BY CONTROL GROUP.</li> <li>• Message IST1904I is issued immediately after message IST1865I to display the current value of the INOPDUMP start option.</li> </ul>	Shared Memory Communications - Direct Memory Access
DISPLAY SESSIONS	V2R2 with APAR OA49911  V2R1 with APAR OA48802	This command adds VTAM 3270 intrusion detection services information to the display.	VTAM 3270 intrusion detection services
DISPLAY STATS	V2R2 with APAR OA49911  V2R1 with APAR OA48802	This command adds VTAM 3270 intrusion detection services statistics to the display.	VTAM 3270 intrusion detection services
	V2R1	When you specify TYPE=CFS,STRNAME=EZBDVIPA, entries can also be displayed for IPv6 addresses.	Sysplex-Wide Security Associations for IPv6
	V1R13	When TYPE=VTAM is specified, existing message IST1227I displays the VIT size in megabytes. Message IST1227I for the status value 2 displays the VIT size. IST1227I for the status value 163 is retired.	Increased CTRACE and VIT capacity
DISPLAY TOPO	V1R13	When LIST=SUMMARY is specified and APPN routing trees were cleared, new message IST2360I displays the date and time of the last clear operation.	Improved APPN routing resilience

Table 75. Summary of new and changed Communications Server commands with changed behavior (continued)

Command	Release	Description of behavior change	Reason for change
DISPLAY TRL	V2R2	If the TRLE operand specifies an ISM TRLE, a new message group (IST2418I) is generated to display information that is unique to the ISM interface.	Shared Memory Communications - Direct Memory Access
	V2R1	If TRLE= <i>rnictrle_name</i> is specified and the 10 GbE RoCE Express feature that <i>rnictrle_name</i> represents is operating in a shared RoCE environment, message IST2417I appears in the command output to display the associated virtual function number (VFN).	Shared Memory Communications over RDMA adapter (RoCE) virtualization
	V2R1	When the TRLE operand specifies a RNIC TRLE, a new message group (IST2361I) is generated to display information that is unique to the 10 GbE RoCE Express interface.	Shared Memory Communications over Remote Direct Memory Access
	V1R13	When TRLE= <i>trlename</i> is specified for an active QDIO TRLE, messages IST2331I, IST2332 and one or more IST2333I are issued. For messages IST2331I, IST2332I, and IST2333I a new QUEUE STATUS column now shows the current status of each read queue.	Performance improvements for Enterprise Extender traffic
	V1R13	The command is enhanced in the following ways: <ul style="list-style-type: none"> <li>• Displays information about IQDX TRLEs</li> <li>• Includes the associated interface name on message IST1717I</li> </ul>	HiperSockets optimization for intraensemble data networks
DISPLAY VTAMOPTS	V2R2 with APAR OA49911	This command adds start options DSACTION, DSCOUNT, DSMONITR, and DSTRUST to the display.	VTAM 3270 intrusion detection services
	V2R1 with APAR OA48802		
	V2R1	When FORMAT=CURRENT is specified and the current IPADDR start option value is larger than 17 characters, message IST1904I is displayed instead of IST1189I.	Enterprise Extender IPv6 address configuration
	V2R1	When FORMAT=COMPLETE or FORMAT=MODIFIED is specified, and the IPADDR start option value is currently larger than 17 characters or was larger than 17 characters when VTAM was started, messages IST1905I, IST1906I, IST1907I, and IST1908I are displayed instead of IST1310I.	Enterprise Extender IPv6 address configuration
MODIFY NOTNSTAT MODIFY TNSTAT	V2R2	If you specify TRLE= <i>ISM_trle</i> , VTAM issues message IST1451I with <i>status</i> value set to FAILED. z/OS Communications Server supplies only tuning information for ISM devices as part of the Netstat DEvlinks/-d report or the Getlsms NMI.	Shared Memory Communications - Direct Memory Access
MODIFY TRACE	V1R13	A SIZE specification that is not specified in the valid range of 4M - 2048M inclusive is rejected. DSPSIZE is rejected.	Increased CTRACE and VIT capacity

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Table 75. Summary of new and changed Communications Server commands with changed behavior (continued)

Command	Release	Description of behavior change	Reason for change
MODIFY VTAMOPTS	V2R2	If you enabled one or more of the new INOPDUMP control groups on this command, you will get the following results: <ul style="list-style-type: none"> <li>• Message IST1865I displays a new status of ON BY CONTROL GROUP.</li> <li>• Message IST1867I might display a new status of SELECTIVELY PROCESSED.</li> </ul>	Shared Memory Communications - Direct Memory Access
	V2R1	When you specify the new PSRETRY IMMED operand value, activation of a TG or a change in the status of a TG triggers immediate path switch processing of HPR pipes.	HPR PSRETRY Enhancement

### VTAM internal trace entries

In V1R13, the VTAM internal trace (VIT) table is relocated to 64-bit common (HCOMMON) storage. As a result, the IPCS subcommand VERBEXIT VTAMMAP functions are changed. VITAL does not support the ALL and ECSA operands and VITVIT does not set the DVIT, DVITC, DVITE, DVITL, and DVITO symbols. See Increased CTRACE and VIT capacity in *z/OS Communications Server: New Function Summary* for more information.

For complete information about VIT entries, see *z/OS Communications Server: SNA Diagnosis Vol 2, FFST Dumps and the VIT*.

Table 76 lists the new and changed VIT entries.

Table 76. Summary of new and changed Communications Server VTAM internal trace (VIT) entries

VIT entry	Release	Description	Related support
3270	V2R2 with APAR OA49911	<b>New:</b> VIT record, internal information for a VTAM 3270 intrusion detection services event	VTAM 3270 intrusion detection services
	V2R1 with APAR OA48802		
3271	V2R2 with APAR OA49911	<b>New:</b> VIT record, additional information for a VTAM 3270 intrusion detection services event	VTAM 3270 intrusion detection services
	V2R1 with APAR OA48802		
AFSM	V2R2	<b>Changed:</b> VIT record, SMC-D information added.	Shared Memory Communications - Direct Memory Access
	V2R1	<b>Changed:</b> VIT record, SMC-R information added.	Shared Memory Communications over Remote Direct Memory Access
ASN6	V2R2	<b>New:</b> VIT record, a continuation of the ASNB record.	64-bit enablement of the TCP/IP stack
CCR and CCR2	V2R1	<b>New:</b> VIT records to trace communication channel operations of 10 GbE RoCE Express feature.	Shared Memory Communications over RDMA adapter (RoCE) virtualization



Table 76. Summary of new and changed Communications Server VTAM internal trace (VIT) entries (continued)

VIT entry	Release	Description	Related support
CHG6	V2R2	<b>New:</b> VIT record, a continuation of the CHGO record.	64-bit enablement of the TCP/IP stack
COPY and COP2	V1R13	<b>Deleted:</b> COPY and COP2 records are replaced with TOD record.	Increased CTRACE and VIT capacity
CPY6	V2R2	<b>New:</b> VIT record, a continuation of the CPYB record.	64-bit enablement of the TCP/IP stack
C64Q	V2R1	<b>New:</b> VIT record for IUTC64QM macro invocations.	Shared Memory Communications over Remote Direct Memory Access
C642	V2R1	<b>New:</b> VIT record, a continuation of the C64Q record.	Shared Memory Communications over Remote Direct Memory Access
DRBx	V2R1	<b>New:</b> VIT record for RoCE doorbell operations.	Shared Memory Communications over Remote Direct Memory Access
FB64	V2R2 with APAR OA49911 V2R1 with APAR OA48802	<b>New:</b> VIT record for freeing of 64 bit storage.	VTAM 3270 intrusion detection services
FIX6	V2R2	<b>New:</b> VIT record, a continuation of the FIXB record.	64-bit enablement of the TCP/IP stack
FRB6	V2R2	<b>New:</b> VIT record, a continuation of the FRBF record.	64-bit enablement of the TCP/IP stack
FR64	V2R2	<b>New:</b> VIT record for FRE64COMM or FRE64PVT requests.	Shared Memory Communications over RDMA enhancements
GB64	V2R2 with APAR OA49911 V2R1 with APAR OA48802	<b>New:</b> VIT record for allocation of 64 bit storage.	VTAM 3270 intrusion detection services
GTB6	V2R2	<b>New:</b> VIT record, a continuation of the GTBF record.	64-bit enablement of the TCP/IP stack
GT64	V2R2	<b>New:</b> VIT record for GET64COMM or GET64PVT requests.	Shared Memory Communications over RDMA enhancements
HCR	V2R1	<b>New:</b> VIT record for RoCE hardware command operations when the 10 GbE RoCE Express feature operates in a dedicated RoCE environment.	Shared Memory Communications over Remote Direct Memory Access
HCR2	V2R1	<b>New:</b> VIT record, a continuation of the HCR record.	Shared Memory Communications over Remote Direct Memory Access
HCR3	V2R1	<b>New:</b> VIT record, a continuation of the HCR record.	Shared Memory Communications over Remote Direct Memory Access
HCR4	V2R1	<b>New:</b> VIT record, a continuation of the HCR record.	Shared Memory Communications over Remote Direct Memory Access
HCR5	V2R1	<b>New:</b> VIT record, a continuation of the HCR record.	Shared Memory Communications over Remote Direct Memory Access

## Communications Server

Table 76. Summary of new and changed Communications Server VTAM internal trace (VIT) entries (continued)

VIT entry	Release	Description	Related support
ICR, ICR2, and ICR3	V2R2	<b>New:</b> VIT record for internal shared memory (ISM) control register operations.	Shared Memory Communications - Direct Memory Access
IOSP	V2R2	<b>Changed:</b> The VIT record can be displayed for internal shared memory (ISM) interfaces.	Shared Memory Communications - Direct Memory Access
	V2R1	<b>New:</b> VIT record for invocations of z/OS Peripheral Component Interconnect Express (PCIe) services.	Shared Memory Communications over Remote Direct Memory Access
IOS2	V2R2	<b>Changed:</b> The VIT record can be displayed for ISM interfaces.	Shared Memory Communications - Direct Memory Access
	V2R1	<b>New:</b> VIT record, a continuation of the IOSP record.	Shared Memory Communications over Remote Direct Memory Access
IOS3	V2R2	<b>Changed:</b> The VIT record can be displayed for ISM interfaces.	Shared Memory Communications - Direct Memory Access
	V2R1	<b>New:</b> VIT record, a continuation of the IOSP record.	Shared Memory Communications over Remote Direct Memory Access
IPLx and IPLA	V2R2	<b>New:</b> VIT record for an ISM polling operation.	Shared Memory Communications - Direct Memory Access
ISPx, ISP2, and ISP3	V2R2	<b>New:</b> VIT record for ISM operations.	Shared Memory Communications - Direct Memory Access
IUTR	V2R1	<b>New:</b> A variation of the IUTx VIT record, specifically for IUTIL-R invocations.	Shared Memory Communications over Remote Direct Memory Access
IUTX	V2R2	<b>Changed:</b> Added SMC-D information in existing VIT record.	Shared Memory Communications - Direct Memory Access
	V2R1	<b>Changed:</b> Added SMC-R information in existing VIT record.	Shared Memory Communications over Remote Direct Memory Access
IUT6	V2R2	<b>Changed:</b> Added SMC-D information in existing VIT record.	Shared Memory Communications - Direct Memory Access
	V2R2	<b>New:</b> VIT record, a continuation of the IUTx record.	64-bit enablement of the TCP/IP stack
ODTE	V2R1	<b>Changed:</b> Added SMC-R information in existing VIT record.	Shared Memory Communications over Remote Direct Memory Access
PAG6	V2R2	<b>New:</b> VIT record, a continuation of the PAGB record.	64-bit enablement of the TCP/IP stack
PCIx	V2R2	<b>Changed:</b> Added PCII variation that is defined for SMC-D processing	Shared Memory Communications - Direct Memory Access
PCIR	V2R2	<b>Changed:</b> Added SMC-D information in existing VIT record.	Shared Memory Communications - Direct Memory Access
	V2R2	<b>Changed:</b> Updated the Interrupt reason under offset 0x07 with new reason C'V'.	Release update
	V2R1	<b>New:</b> A variation of the PCIx record, specifically for interrupts of the 10 GbE RoCE Express feature.	Shared Memory Communications over Remote Direct Memory Access
P64Q	V2R1	<b>New:</b> VIT record for IUTP64QM macro invocations.	Shared Memory Communications over Remote Direct Memory Access

Table 76. Summary of new and changed Communications Server VTAM internal trace (VIT) entries (continued)

VIT entry	Release	Description	Related support
P642	V2R1	<b>New:</b> VIT record, a continuation of the P64Q record.	Shared Memory Communications over Remote Direct Memory Access
QAP6	V2R2	<b>New:</b> VIT record, a continuation of the QAPL record.	64-bit enablement of the TCP/IP stack
QSRB	V2R2	<b>Changed:</b> Added SMC-D information in existing VIT record.	Shared Memory Communications - Direct Memory Access
	V2R1	<b>Changed:</b> Added SMC-R information in existing VIT record.	Shared Memory Communications over Remote Direct Memory Access
RAPB	V2R1	<b>New:</b> VIT record for RoCE anchor cell operations.	Shared Memory Communications over Remote Direct Memory Access
RAP2	V2R1	<b>New:</b> VIT record, a continuation of the RAPB record.	Shared Memory Communications over Remote Direct Memory Access
RCPI	V2R1	<b>New:</b> VIT record for RoCE input parameter list information.	Shared Memory Communications over Remote Direct Memory Access
RCPO	V2R1	<b>New:</b> VIT record for RoCE output parameter list information.	Shared Memory Communications over Remote Direct Memory Access
RCP2	V2R1	<b>New:</b> VIT record, a continuation of the RCPI and RCPO records.	Shared Memory Communications over Remote Direct Memory Access
RCP3	V2R1	<b>New:</b> VIT record, a continuation of the RCPO record.	Shared Memory Communications over Remote Direct Memory Access
RPLx	V2R1	<b>New:</b> VIT record for RoCE Poll operation completion.	Shared Memory Communications over Remote Direct Memory Access
RPLA	V2R1	<b>New:</b> VIT record, a continuation of the RPLx record.	Shared Memory Communications over Remote Direct Memory Access
RPLI	V2R1	<b>New:</b> VIT record, a continuation of the RPLA record.	Shared Memory Communications over Remote Direct Memory Access
RPLP	V2R1	<b>New:</b> VIT record, a continuation of the RPLx record.	Shared Memory Communications over Remote Direct Memory Access
RPSA	V2R2	<b>Changed:</b> Updated record bytes for SMC-D.	Shared Memory Communications - Direct Memory Access
	V2R1	<b>New:</b> VIT record, a continuation of the RPST record.	Shared Memory Communications over Remote Direct Memory Access
RPSI	V2R1	<b>New:</b> VIT record, a continuation of the RPSA record.	Shared Memory Communications over Remote Direct Memory Access
RPSP	V2R1	<b>New:</b> VIT record, a continuation of the RPST record.	Shared Memory Communications over Remote Direct Memory Access
RPST	V2R2	<b>Changed:</b> Updated record bytes for SMC-D.	Shared Memory Communications - Direct Memory Access
	V2R1	<b>New:</b> VIT record for RoCE Post operation completion.	Shared Memory Communications over Remote Direct Memory Access
RPS2	V2R1	<b>New:</b> VIT record, a continuation of the RPSA record.	Shared Memory Communications over Remote Direct Memory Access
RSLK	V2R1	<b>New:</b> VIT record for RoCE shared lock operations.	Shared Memory Communications over Remote Direct Memory Access
TOD	V2R1	<b>Changed:</b> Added CPU ID information.	Shared Memory Communications over Remote Direct Memory Access
	V1R13	<b>New:</b> Time of day snapshot.	Increased CTRACE and VIT capacity

## Communications Server

Table 76. Summary of new and changed Communications Server VTAM internal trace (VIT) entries (continued)

VIT entry	Release	Description	Related support
VHCR, VHC2, VHC3, VHC4 and VHC5	V2R1	<b>New:</b> VIT records to trace VHCR commands of the 10 GbE RoCE Express feature when the feature operates in a shared RoCE environment.	Shared Memory Communications over RDMA adapter (RoCE) virtualization
XB61	V2R2	<b>New:</b> VIT record for extended buffer list SPAC.	64-bit enablement of the TCP/IP stack
XB62	V2R2	<b>New:</b> VIT record, a continuation of the XB61 record.	64-bit enablement of the TCP/IP stack
XB63	V2R2	<b>New:</b> VIT record, a continuation of the XB61 record.	64-bit enablement of the TCP/IP stack

## VTAMMAP Formatted Dump changes

Table 77 lists the new and changed VTAMMAP formatted dump functions.

Table 77. Summary of new and changed Communications Server VTAMMAP Formatted Dump changes

VTAMMAP function	Release	Description	Reason for change
SES	V2R2 with APAR OA49911  V2R1 with APAR OA48802	Updated to contain information related to 3270 intrusion detection services.	VTAM 3270 intrusion detection services
SMCR	V2R1	New VTAMMAP function to display control blocks that are related to Shared Memory Communications over RDMA (SMC-R) processing. The following two options are defined: <ul style="list-style-type: none"> <li>• SNASMCR, which displays VTAM SMC-R control blocks that are used for IUTIL communications with the TCP/IP stack.</li> <li>• SNAROCE, which displays VTAM SMC-R control blocks that are used for RoCE communications with the 10 GbE Express port.</li> </ul>	Shared Memory Communications over Remote Direct Memory Access

## Tuning statistics reports

Table 78 lists the new and changed SNA tuning statistics reports.

Table 78. Summary of new and changed Communications Server SNA tuning statistics reports

Tuning statistics report	Release	Description	Reason for change
RoCE Connections	V2R1	New report providing tuning statistics for 10 GbE RoCE Express interfaces.	Shared Memory Communications over Remote Direct Memory Access

## Chapter 8. Cryptographic Services summary of interface changes

In addition to the interface changes included in this topic, updates to Cryptographic Services resulted in SYS1.SAMPLIB member changes. See Chapter 4, “Summary of changes to SYS1.SAMPLIB,” on page 23 for those changes.

Interface changes for the following Cryptographic Services components are included in this topic:

- “ICSF summary of interface changes”
- “PKI Services summary of interface changes” on page 183
- “System SSL summary of interface changes” on page 189

### ICSF summary of interface changes

The following tables describe new and changed services for Cryptographic Support for z/OS.

Table 79. Summary of new and changed ICSF callable services for z/OS V2R2

Callable service	FMID, Release	Description
Authentication Parameter Generate	z/OS V2R2 (FMID HCR77A1)	New: Generate an authentication parameter (AP) and return it encrypted under a supplied encrypting key.
Field level decipher	z/OS V2R2 (FMID HCR77B0)	New: Decrypts payment related data base fields that have been previously encrypted using the field level encipher callable service.
Field level encipher	z/OS V2R2 (FMID HCR77B0)	New: Encrypts payment related data base fields, preserving the format of the fields.
FPE decipher	z/OS V2R2 (FMID HCR77B0)	New: Decrypts payment card data for the Visa Data Secure Platform (Visa DSP) processing.
FPE encipher	z/OS V2R2 (FMID HCR77B0)	New: Encrypts payment card data for the Visa Data Secure Platform (Visa DSP) processing.
FPE translate	z/OS V2R2 (FMID HCR77B0)	New: Translates payment data from encryption under one key to encryption under another key with a possibly different format.
ICSF Multi-Purpose Service	z/OS V2R2 (FMID HCR77B0)	New: Validates the keys in the active CKDS or PKDS.
ICSF Query Algorithm	z/OS V2R2 (FMID HCR77B0)	Changed: Usage notes have been updated.
ICSF Query Facility	z/OS V2R2 (FMID HCR77B0)	Changed: The <i>returned_data</i> parameter has been updated.
ICSF Query Facility 2	z/OS V2R2 (FMID HCR77A1)	New: Provides information on the cryptographic environment as currently known by ICSF.
Key Data Set List	z/OS V2R2 (FMID HCR77B0)	New: Generates a list or count of CKDS and PKDS labels or TKDS object handles.
Key Data Set Metadata Read	z/OS V2R2 (FMID HCR77B0)	New: Use to obtain metadata of a CKDS, PKDS, or TKDS record.
Key Data Set Metadata Write	z/OS V2R2 (FMID HCR77B0)	New: Adds, deletes, or modifies metadata of a set of records in the active CKDS, PKDS, or TKDS.

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Table 79. Summary of new and changed ICSF callable services for z/OS V2R2 (continued)

Callable service	FMID, Release	Description
PCI Interface callable service	z/OS V2R2 (FMID HCR77B0)	Changed: The <i>rule_array</i> parameter has been updated.
PKA Key Token Change	z/OS V2R2 (FMID HCR77B0)	Changed: Usage notes have been updated.
PKCS #11 One-way hash generate	z/OS V2R2 (FMID HCR77B0)	Changed: Legacy hash rules added.
PKCS11 One-way hash, sign, or verify	z/OS V2R2 (FMID HCR77B0)	Changed: Legacy hash rules added.
Recover PIN From Offset	z/OS V2R2 (FMID HCR77A1)	New: Calculate an encrypted customer-entered PIN from a PIN generating key, account information, and an offset, returning the PIN properly formatted and encrypted under a PIN encryption key.
Symmetric Key Export with Data	z/OS V2R2 (FMID HCR77A1)	New: Export a symmetric key encrypted using an RSA key, inserted in a PKCS#1 block type 2, with some extra data supplied by the application.

Table 80. Summary of new and changed ICSF callable services for z/OS V2R1

Callable service	FMID, Release	Description
Cipher Text Translate2 and Cipher Text Translate2 with alet	z/OS V2R1 (FMID HCR77A0)	New: Translates the user-supplied ciphertext from one key to another key.
Clear PIN Generate	z/OS V2R1 (FMID HCR7790)	Changed: Increased X9.8 PIN block security, stored PIN decimalization tables support.
Clear PIN Generate Alternate	z/OS V2R1 (FMID HCR7790)	Changed: Increased X9.8 PIN block security, stored PIN decimalization tables support.
Control Vector Generate	z/OS V2R1 (FMID HCR77A0)	Changed: <ul style="list-style-type: none"> <li>• Support CIPHERXI, CIPHERXL and CIPHERXO key types.</li> <li>• Support DOUBLE-O <i>rule_array</i> keyword.</li> </ul>
	z/OS V2R1 (FMID HCR7790)	Changed: ANSI TR-31 key block support.
Coordinated KDS Administration	z/OS V2R1 (FMID HCR7790)	New: Support for a coordinated CKDS refresh or a coordinated CKDS reencipher and master key change.
CVV Key Combine	z/OS V2R1 (FMID HCR7790)	New: Double-length CVV key support.
Digital Signature Verify	z/OS V2R1 (FMID HCR7790)	Changed: 4096-bit RSA clear key hardware support.
ECC Diffie-Hellman	z/OS V2R1 (FMID HCR77A0)	Changed: <ul style="list-style-type: none"> <li>• Support CIPHERXI, CIPHERXL and CIPHERXO key types.</li> <li>• Support creation of DES keys with guaranteed unique key halves.</li> </ul>
	z/OS V2R1 (FMID HCR7790)	New: Creation of: <ul style="list-style-type: none"> <li>• Symmetric key material from a pair of ECC keys using the Elliptic Curve Diffie-Hellman protocol using the Static Unified Model.</li> <li>• "Z" - The "secret" material output from D-H process.</li> </ul>

Table 80. Summary of new and changed ICSF callable services for z/OS V2R1 (continued)

Callable service	FMID, Release	Description
Encrypted PIN Generate	z/OS V2R1 (FMID HCR7790)	Changed: Increased X9.8 PIN block security, stored PIN decimalization tables support.
Encrypted PIN Verify	z/OS V2R1 (FMID HCR7790)	Changed: Increased X9.8 PIN block security, stored PIN decimalization tables support.
ICSF Query Algorithm	z/OS V2R1 (FMID HCR7790)	Changed: 4096-bit RSA clear key hardware support.
ICSF Query Facility	z/OS V2R1 (FMID HCR7790)	Changed: <ul style="list-style-type: none"> <li>Increased X9.8 PIN block security, stored PIN decimalization tables support.</li> <li>ECC Diffie-Hellman (ECCDH) and ECC key wrapping support.</li> <li>4096-bit RSA clear key hardware support.</li> </ul>
Key Export	z/OS V2R1 (FMID HCR77A0)	Changed: Support CIPHERXI, CIPHERXL and CIPHERXO key types.
Key Generate	z/OS V2R1 (FMID HCR77A0)	Changed: <ul style="list-style-type: none"> <li>Support CIPHERXI, CIPHERXL and CIPHERXO key types.</li> <li>Support DOUBLE-O key_length.</li> </ul>
Key Generate2	z/OS V2R1 (FMID HCR77A0)	Changed: Support generating AES CIPHER keys for use in Cipher Text Translate2 callable service.
	z/OS V2R1 (FMID HCR7790)	Changed: AES key type support.
Key Import	z/OS V2R1 (FMID HCR77A0)	Changed: Support CIPHERXI, CIPHERXL and CIPHERXO key types.
Key Part Import2	z/OS V2R1 (FMID HCR7790)	Changed: AES key type support.
Key Test2	z/OS V2R1 (FMID HCR7790)	Changed: <ul style="list-style-type: none"> <li>AES key type support.</li> <li>ANSI TR-31 key block support.</li> </ul>
Key Token Build	z/OS V2R1 (FMID HCR77A0)	Changed: <ul style="list-style-type: none"> <li>Support CIPHERXI, CIPHERXL and CIPHERXO key types.</li> <li>Support DOUBLE-O rule_array keyword.</li> </ul>
	z/OS V2R1 (FMID HCR7790)	Changed: ANSI TR-31 key block support.
Key Token Build2	z/OS V2R1 (FMID HCR77A0)	Changed: Support C-XLATE keyword for AES CIPHER key type.
	z/OS V2R1 (FMID HCR7790)	Changed: AES key type support.
Key Translate2	z/OS V2R1 (FMID HCR7790)	Changed: AES key type support.
Multiple Secure Key Import	z/OS V2R1 (FMID HCR77A0)	Changed: Support CIPHERXI, CIPHERXL and CIPHERXO key types.
PKA Decrypt	z/OS V2R1 (FMID HCR7790)	Changed: 4096-bit RSA clear key hardware support.
PKA Encrypt	z/OS V2R1 (FMID HCR7790)	Changed: 4096-bit RSA clear key hardware support.

Table 80. Summary of new and changed ICSF callable services for z/OS V2R1 (continued)

Callable service	FMID, Release	Description
PKA Key Generate	z/OS V2R1 (FMID HCR77A0)	Changed: Support generating RSA keys that can be wrapped by AES keys.
	z/OS V2R1 (FMID HCR7790)	Changed: Support for External ECC Keys (ECC Keys encrypted by an AES KEK).
PKA Key Import	z/OS V2R1 (FMID HCR77A0)	Changed: Support importing RSA keys that are wrapped by an AES key-encrypting key.
	z/OS V2R1 (FMID HCR7790)	Changed: Support for External ECC Keys (ECC Keys encrypted by an AES KEK).
PKA Key Token Build	z/OS V2R1 (FMID HCR77A0)	Changed: Support building RSA-AESC and RSA-AESM skeleton tokens.
PKA Key Token Change	z/OS V2R1 (FMID HCR77A0)	Changed: Support reenciphering RSA keys wrapped by an ECC master key.
PKA Key Translate	z/OS V2R1 (FMID HCR77A0)	Changed: Support translating the object protection key (OPK) in a RSA private key token from a DES key to an AES key.
PKCS #11 Derive key	z/OS V2R1 (FMID HCR7790)	Changed: Support for hardware generated "z" value.
PKCS #11 Derive multiple keys	z/OS V2R1 (FMID HCR7790)	Changed: Support for hardware generated "z" value.
PKCS #11 Private key sign	z/OS V2R1 (FMID HCR7790)	Changed: 4096-bit RSA clear key hardware support.
PKCS #11 Public key verify	z/OS V2R1 (FMID HCR7790)	Changed: 4096-bit RSA clear key hardware support.
PKCS #11 Unwrap key	z/OS V2R1 (FMID HCR7790)	Changed: 4096-bit RSA clear key hardware support.
Restrict Key Attribute	z/OS V2R1 (FMID HCR77A0)	Changed: <ul style="list-style-type: none"> <li>• Support C-XLATE rule_array keyword for AES CIPHER keys.</li> <li>• Support DOUBLE-O rule_array keyword for DES keys.</li> </ul>
	z/OS V2R1 (FMID HCR7790)	Changed: <ul style="list-style-type: none"> <li>• AES key type support.</li> <li>• ANSI TR-31 key block support.</li> </ul>
Secure Key Import	z/OS V2R1 (FMID HCR77A0)	Changed: Support CIPHERXI, CIPHERXL and CIPHERXO key types.
Secure Key Import2	z/OS V2R1 (FMID HCR7790)	Changed: AES key type support.
Symmetric Algorithm Decipher	z/OS V2R1 (FMID HCR7790)	Changed: AES key type support.
Symmetric Algorithm Encipher	z/OS V2R1 (FMID HCR7790)	Changed: AES key type support.
Symmetric Key Export	z/OS V2R1 (FMID HCR7790)	Changed: <ul style="list-style-type: none"> <li>• AES key type support.</li> <li>• Support for PKCS#1 OAEP data block formatting with the SHA-256 hash method.</li> </ul>
Symmetric Key Generate	z/OS V2R1 (FMID HCR7790)	Changed: Support for PKCS#1 OAEP data block formatting with the SHA-256 hash method.
Symmetric Key Import	z/OS V2R1 (FMID HCR7790)	Changed: Support for PKCS#1 OAEP data block formatting with the SHA-256 hash method.



Table 80. Summary of new and changed ICSF callable services for z/OS V2R1 (continued)

Callable service	FMID, Release	Description
Symmetric Key Import2	z/OS V2R1 (FMID HCR7790)	Changed: AES key type support.
TR-31 Export	z/OS V2R1 (FMID HCR7790)	New: ANSI TR-31 key block support.
TR-31 Import	z/OS V2R1 (FMID HCR7790)	New: ANSI TR-31 key block support.
TR-31 Optional Data Build	z/OS V2R1 (FMID HCR7790)	New: ANSI TR-31 key block support.
TR-31 Optional Data Read	z/OS V2R1 (FMID HCR7790)	New: ANSI TR-31 key block support.
TR-31 Parse	z/OS V2R1 (FMID HCR7790)	New: ANSI TR-31 key block support.
Unique Key Derive	z/OS V2R1 (FMID HCR77A0)	New: Use the Unique Key Derive callable service to derive a key using the Base Derivation Key and the Derivation Data. The following key types can be derived: <ul style="list-style-type: none"> <li>• CIPHER</li> <li>• ENCIPHER</li> <li>• DECIPHER</li> <li>• MAC</li> <li>• MACVER</li> <li>• IPINENC</li> <li>• OPINENC</li> <li>• DATA token containing a PIN Key</li> </ul>
VISA CVV Service Verify	z/OS V2R1 (FMID HCR7790)	Changed: Double-length CVV key support.
VISA CVV Service Generate	z/OS V2R1 (FMID HCR7790)	Changed: Double-length CVV key support.

Table 81. Summary of new and changed ICSF callable services for z/OS V1R13

Callable service	FMID, Release	Description
ANSI X9.17 EDC Generate	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
ANSI X9.17 Key Export	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
ANSI X9.17 Key Import	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
ANSI X9.17 Key Translate	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
ANSI X9.17 Transport Key Partial Notarize	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Ciphertext Translate	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Clear PIN Encrypt	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Clear PIN Generate	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).

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Table 81. Summary of new and changed ICSF callable services for z/OS V1R13 (continued)

Callable service	FMID, Release	Description
Clear PIN Generate Alternate	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Control Vector Generate	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Control Vector Translate	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Cryptographic Variable Encipher	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Data Key Export	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Data Key Import	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Decipher	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Decode	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Digital Signature Generate	z/OS V1R13 (FMID HCR7780)	Changed: Elliptic Curve Cryptography (ECC) support.
Digital Signature Verify	z/OS V1R13 (FMID HCR7780)	Changed: Elliptic Curve Cryptography (ECC) support.
Diversified Key Generate	z/OS V1R13 (FMID HCR7780)	Changed: <ul style="list-style-type: none"> <li>• Support for invocation in AMODE(64).</li> <li>• New rule array keywords to support enhanced key wrapping method.</li> </ul>
Encipher	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Encode	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Encrypted PIN Generate	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Encrypted PIN Translate	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Encrypted PIN Verify	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
HMAC Generate	z/OS V1R13 (FMID HCR7780)	New: Support for CCA key management of HMAC keys.
HMAC Verify	z/OS V1R13 (FMID HCR7780)	New: Support for CCA key management of HMAC keys.
Key Export	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Key Generate2	z/OS V1R13 (FMID HCR7780)	New: Support for CCA key management of HMAC keys.
Key Import	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).

Table 81. Summary of new and changed ICSF callable services for z/OS V1R13 (continued)

Callable service	FMID, Release	Description
Key Part Import	z/OS V1R13 (FMID HCR7780)	Changed: <ul style="list-style-type: none"> <li>• Support for invocation in AMODE(64).</li> <li>• New rule array keywords to support enhanced key wrapping method.</li> </ul>
Key Part Import2	z/OS V1R13 (FMID HCR7780)	New: Support for CCA key management of HMAC keys.
Key Record Create	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Key Record Create2	z/OS V1R13 (FMID HCR7780)	New: Support for CCA key management of HMAC keys.
Key Record Delete	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Key Record Read	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Key Record Read2	z/OS V1R13 (FMID HCR7780)	New: Support for CCA key management of HMAC keys.
Key Record Write	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Key Record Write2	z/OS V1R13 (FMID HCR7780)	New: Support for CCA key management of HMAC keys.
Key Test	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Key Test Extended	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Key Test2	z/OS V1R13 (FMID HCR7780)	New: Support for CCA key management of HMAC keys.
Key Token Build	z/OS V1R13 (FMID HCR7780)	Changed: <ul style="list-style-type: none"> <li>• Support for invocation in AMODE(64).</li> <li>• New rule array keywords to support enhanced key wrapping method.</li> </ul>
Key Token Build2	z/OS V1R13 (FMID HCR7780)	New: Support for CCA key management of HMAC keys.
Key Translate	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Key Translate2	z/OS V1R13 (FMID HCR7780)	New: Support for CCA key management of HMAC keys.
MAC Generate	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
MAC Verify	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
MDC Generate	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Multiple Clear Key Import	z/OS V1R13 (FMID HCR7780)	Changed: New rule array keywords to support enhanced key wrapping method.

Table 81. Summary of new and changed ICSF callable services for z/OS V1R13 (continued)

Callable service	FMID, Release	Description
Multiple Secure Key Import	z/OS V1R13 (FMID HCR7780)	Changed: <ul style="list-style-type: none"> <li>• Support for invocation in AMODE(64).</li> <li>• New rule array keywords to support enhanced key wrapping method.</li> </ul>
One-Way Hash Generate	z/OS V1R13 (FMID HCR7780)	New: Support for invocation in AMODE(64).
PIN Change/Unblock	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
PKA Key Generate	z/OS V1R13 (FMID HCR7780)	Changed: Elliptic Curve Cryptography (ECC) support.
PKA Key Import	z/OS V1R13 (FMID HCR7780)	Changed: Elliptic Curve Cryptography (ECC) support.
PKA Key Token Build	z/OS V1R13 (FMID HCR7780)	Changed: Elliptic Curve Cryptography (ECC) support.
PKA Key Token Change	z/OS V1R13 (FMID HCR7780)	Changed: <ul style="list-style-type: none"> <li>• Elliptic Curve Cryptography (ECC) support.</li> <li>• Support for invocation in AMODE(64).</li> </ul>
PKA Public Key Extract	z/OS V1R13 (FMID HCR7780)	Changed: Elliptic Curve Cryptography (ECC) support.
PKDS Record Create	z/OS V1R13 (FMID HCR7780)	Changed: Elliptic Curve Cryptography (ECC) support.
PKDS Record Delete	z/OS V1R13 (FMID HCR7780)	Changed: Elliptic Curve Cryptography (ECC) support.
PKDS Record Read	z/OS V1R13 (FMID HCR7780)	Changed: <ul style="list-style-type: none"> <li>• Elliptic Curve Cryptography (ECC) support.</li> <li>• Support for invocation in AMODE(64).</li> </ul>
PKDS Record Write	z/OS V1R13 (FMID HCR7780)	Changed: <ul style="list-style-type: none"> <li>• Elliptic Curve Cryptography (ECC) support.</li> <li>• Support for invocation in AMODE(64).</li> </ul>
Prohibit Export	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Prohibit Export Extended	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Remote Key Export	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Restrict Key Attribute	z/OS V1R13 (FMID HCR7780)	New: Support for CCA key management of HMAC keys.
Secure Key Import	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Secure Key Import2	z/OS V1R13 (FMID HCR7780)	New: Support for CCA key management of HMAC keys.
Secure Messaging for Keys	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Secure Messaging for PINS	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).

Table 81. Summary of new and changed ICSF callable services for z/OS V1R13 (continued)

Callable service	FMID, Release	Description
SET Block Compose	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
SET Block Decompose	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Symmetric Key Decipher	z/OS V1R13 (FMID HCR7780)	Changed: Additional modes of operation for protecting data.
Symmetric Key Encipher	z/OS V1R13 (FMID HCR7780)	Changed: Additional modes of operation for protecting data.
Symmetric Key Export	z/OS V1R13 (FMID HCR7780)	Changed: Support for CCA key management of HMAC keys.
Symmetric Key Generate	z/OS V1R13 (FMID HCR7780)	Changed: <ul style="list-style-type: none"> <li>• Support for invocation in AMODE(64).</li> <li>• New rule array keywords to support enhanced key wrapping method.</li> </ul>
Symmetric Key Import	z/OS V1R13 (FMID HCR7780)	Changed: New rule array keywords to support enhanced key wrapping method.
Symmetric Key Import2	z/OS V1R13 (FMID HCR7780)	New: Support for CCA key management of HMAC keys.
Transaction Validation	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Transform CDMF Key	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
Trusted Block Create	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
User Derived Key	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
VISA CVV Service Generate	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).
VISA CVV Service Verify	z/OS V1R13 (FMID HCR7780)	Changed: Support for invocation in AMODE(64).

## PKI Services summary of interface changes

In addition to the PKI Services interfaces described in this topic, you should also review Chapter 4, “Summary of changes to SYS1.SAMPLIB,” on page 23 for changes to SYS1.SAMPLIB.

The PKI Services interfaces described in this topic are:

- “Code samples” on page 184
- “Internet protocol standards” on page 187
- “Sample forms” on page 187
- “Substitution variables” on page 187
- “Utilities” on page 188
- “RACF security classes” on page 188
- “Web pages” on page 189

## Code samples

Table 82 lists new and updated PKI Services code samples. For more detailed information, see *z/OS Cryptographic Services PKI Services Guide and Reference*.

Table 82. Summary of new and changed code samples for PKI Services.

File name	Release	Description	Reason for change
businesscat.jsp jurcountry.jsp jurlocality.jsp jurstateprov.jsp	z/OS V2R1	<b>New:</b> The HTML and JavaScript for defining the businesscat, jurcountry, jurlocality, and jurstateprov fields.	Support for Extended Validation (EV) certificates
httpd.conf	z/OS V2R2	<b>Updated:</b> Sample virtual host configuration files for client authentication SSL/TLS processing are removed because IBM HTTP Server 5.3 is no longer available. IBM HTTP Server - Powered by Apache is used. New virtual host configuration files in the /usr/lpp/pkiserv/samples directory are added. The new files are vhost80.conf, vhost443.conf, and vhost1443.conf.	Support for HTTP Server
	z/OS V2R1	<b>New:</b> The main configuration file for HTTP Server V7.0.	Support for HTTP Server V7.0
	z/OS V1R13	<b>Updated:</b> Added 2 new Pass statements for the PKIXEnroll and PKICEnroll ActiveX installation programs.	Ensure that renewal of certificates works with Internet Explorer on Microsoft Windows systems
httpd2.conf	z/OS V2R2	<b>Deleted:</b> Removed because IBM HTTP Server 5.3 is no longer available.	Support for HTTP Server
	z/OS V1R13	<b>Updated:</b> Added two new Pass and two new Protect statements for the PKIXEnroll and PKICEnroll ActiveX installation programs.	Ensure that renewal of certificates works with Internet Explorer on Microsoft Windows systems

Table 82. Summary of new and changed code samples for PKI Services. (continued)

File name	Release	Description	Reason for change
pkiserv.conf	z/OS V2R2 as updated March 2017	<ul style="list-style-type: none"> <li><b>New:</b> The keyword CRLEnhancements is added.</li> </ul>	<ul style="list-style-type: none"> <li>To enable performance enhancements for CRL processing</li> </ul>
	z/OS V2R2	<ul style="list-style-type: none"> <li><b>New:</b> Signing algorithms for DSA are added.</li> <li><b>New:</b> The keywords AdminNotifyModForm and PKCS12Content are added.</li> </ul>	<ul style="list-style-type: none"> <li>Online Certificate Status Protocol (OCSP)</li> <li>Administrator web pages support</li> </ul>
	z/OS V2R1	<b>Updated:</b> Added new OIDs for BUSINESSCATEGORY, JURISDICTIONCOUNTRY, JURISDICTIONSTATEPROV, and JURISDICTIONLOCALITY	Support for Extended Validation (EV) certificates
	z/OS V2R1	<b>Updated:</b> Added a keyword SecureKey that allows PKI Services to generate secure key keys in the token data set (TKDS) instead of clear keys.	Enterprise PKCS #11 secure key support
	z/OS V2R1	<b>Updated:</b> Added a keyword, AdminGranularControl, that determines whether granular control of administration functions is in effect	Granular control of administration functions
	z/OS V2R1	<b>Updated:</b> Added a keyword CRLWTONotification to specify whether a console message is issued when CRL processing is complete.	CRL notification
	z/OS V2R1	<b>Updated:</b> Added a keyword EnablePathLenConstraint to specify whether certificate path length constraint is enforced by the CA	Path length constraint
	z/OS V2R1	<b>Updated:</b> The keywords Policy10rg, Policy1Notice1, and Policy1Notice2 are now commented out, and are not created by default.	CertificatePolicies extension
	z/OS V2R1	<b>Updated:</b> Added a keyword PathLength to specify the path length constraint value to be included in the basic constraints extension of intermediate CA certificates that are created by the CA.	Path length constraint
	z/OS V2R1	<b>Updated:</b> Added a keyword UseBinaryAttr1 to specify whether the CA posts certificates and CRLs to the LDAP server with the binary attribute.	Conformance with RFC 4523
	z/OS V1R13	<b>Updated:</b> Added a keyword to specify whether the repository for the object store and issued certificate list (ICL) is DB2 or VSAM. Added new keywords to specify the DB2 subsystem and package name if the repository is DB2.	DB2 repository for object store and issued certificate list (ICL)
	z/OS V1R13	<b>Updated:</b> Renamed the SharedVSAM keyword to SharedPLEX. It now applies to both VSAM and DB2 repositories.	DB2 repository for object store and issued certificate list (ICL)
	z/OS V1R13	<b>Updated:</b> Added a keyword to indicate whether posting of large CRLs is enabled, and a keyword to specify the directory where CRLs are saved before they are posted to LDAP	Support for large CRLs

## PKI Services

Table 82. Summary of new and changed code samples for PKI Services. (continued)

File name	Release	Description	Reason for change
pkiserv.tmp1	z/OS V2R2	<ul style="list-style-type: none"> <li><b>New:</b> Support for requiring multiple administrators to approve a certificate request (&lt;ADMINNUM&gt; tag added).</li> <li><b>Updated:</b> Web accessibility update</li> <li><b>Updated:</b> Browser currency updates</li> </ul>	Administrator web pages support
	z/OS V2R1	<b>Updated:</b> Added the template "2-Year EV SSL Server Certificate".	Support for Extended Validation (EV) certificates
	z/OS V2R1	<b>Updated:</b> Added 4 INSERTs: BusinessCat, JurLocality, JurStateProv, and JurCountry.	Support for Extended Validation (EV) certificates
	z/OS V2R1	<b>Updated:</b> A new RECOVERCONTENT subsection was added to recover a previously issued certificate whose key was generated by PKI Services.	Release update
	z/OS V2R1	<b>Updated:</b> Points to the new cagetcrt2.rexx instead of cagetcrt.rexx in the action URLs for the recovery form and retrieval form that is used for returning a PKCS #12 package on the Customer Application section and the 1-Year PKI Generated Key certificate template.	Support for HTTP Server V7.0
	z/OS V1R13	<b>Updated:</b> In the Customers application, added a link on the Customers Certificate Generation Application web page to install the PKI Services ActiveX control, and added code to determine which ActiveX control to install. On the Customers Renew or Revoke a Browser Certificate web page, added code to prompt the user to load the ActiveX control if it is not already installed and CAPICOM is not installed.	Ensure that renewal of certificates works with Internet Explorer on Microsoft Windows systems
	z/OS V1R13	<b>Updated:</b> The RenewKeySetIE INSERT calls the new ActiveX control, and if it is not installed, calls CAPICOM. If neither is installed, the user is prompted to install the ActiveX control.	Ensure that renewal of certificates works with Internet Explorer on Microsoft Windows systems
	z/OS V1R13	<b>Updated:</b> The Two-year PKI Windows logon certificate supports requests from Mozilla-based browsers.	Allow Mozilla-based browsers to support smart cards to generate certificates
PKIServ.xsd	z/OS V1R13	<b>Updated:</b> Added PKIXEnroll and PKICEnroll ActiveX Install Tags.	Ensure that renewal of certificates works with Internet Explorer on Microsoft Windows systems
pkitmp1.xml	z/OS V2R2	<b>New:</b> The AdminNum indicator is added for the value to set the number of administrators that are required to approve a certificate request.	Administrator web pages support
	z/OS V2R1	<b>Updated:</b> Added the template "2-Year EV SSL Server Certificate".	Support for Extended Validation (EV) certificates
	z/OS V1R13	<b>Updated:</b> Added tags for the PKIXEnroll and PKICEnroll ActiveX URLs for installation programs, and updated the CA certificate URL tag to include additional URL elements.	Ensure that renewal of certificates works with Internet Explorer on Microsoft Windows systems
vhost80.conf	z/OS V2R2	<b>New:</b> A sample virtual host configuration file for non-SSL/TLS processing for the IBM HTTP Server - powered by Apache is used.	Support for HTTP Server
	z/OS V2R1	<b>New:</b> The configuration file for non-SSL processing for HTTP Server V7.0.	Support for HTTP Server V7.0



Table 82. Summary of new and changed code samples for PKI Services. (continued)

File name	Release	Description	Reason for change
vhost443.conf	z/OS V2R2	<b>New:</b> A sample virtual host configuration file for server authentication SSL/TLS processing for the IBM HTTP Server - powered by Apache is used.	Support for HTTP Server
	z/OS V2R1	<b>New:</b> The configuration file for server authentication in SSL processing for HTTP Server V7.0.	Support for HTTP Server V7.0
vhost1443.conf	z/OS V2R2	<b>New:</b> A sample virtual host configuration file for client authentication SSL/TLS processing for the IBM HTTP Server - powered by Apache is used.	Support for HTTP Server
	z/OS V2R1	<b>New:</b> The configuration file for client authentication in SSL processing for HTTP Server V7.0,	Support for HTTP Server V7.0

## Internet protocol standards

Table 83 lists changes made to support for internet protocol standards for PKI Services. For more detailed information, see *z/OS Cryptographic Services PKI Services Guide and Reference*.

Table 83. Summary of changes to support for internet protocol standards for PKI Services

Protocol name	Release	Description	Reason for change
	z/OS V1R13	<ol style="list-style-type: none"> <li><b>Updated:</b> The <code>_PKISERV_CMP_AUTHINFOACC_domain</code> environment variable has been deprecated and replaced by the <code>_PKISERV_CMP_AUTHINFOACCn_domain</code> environment variable.</li> <li><b>Updated:</b> Support is added for the 06 error code.</li> </ol>	<ol style="list-style-type: none"> <li>Release update</li> <li>Release update</li> </ol>

## Sample forms

Table 84 lists changes made to sample forms for PKI Services. For more detailed information, see *z/OS Cryptographic Services PKI Services Guide and Reference*.

Table 84. Summary of new and changed sample forms for PKI Services

File name	Release	Description	Reason for change
pendingmsg2.form	z/OS V2R2	<b>New:</b> Added to include when a request is modified.	Administrator web pages support
renewcertmsg.form	z/OS V1R13	<b>Updated:</b> Added a link to install an automatically renewed certificate for Internet Explorer browsers.	Ensure that renewal of certificates works with Internet Explorer on Microsoft Windows systems

## Substitution variables

Table 85 on page 188 lists changes made to PKI Services substitution variables. For more detailed information, see *z/OS Cryptographic Services PKI Services Guide and Reference*.

## PKI Services

Table 85. Summary of new and changed substitution variables for PKI Services

Variable name	Release	Description	Reason for change
%%modreqlist%%	z/OS V2R2	<b>New:</b> Added to list pending approval requests (or a single request) that are modified by an administrator. Valid only in the pendingmsg2.form.	Administrator web pages support

## Utilities

Table 86 lists the changes made to PKI Services utilities. For more detailed information, see *z/OS Cryptographic Services PKI Services Guide and Reference*.

Table 86. Summary of new and changed PKI Services utilities

Utility name	Release	Description	Reason for change
TemplateTool	z/OS V2R2	<b>Updated:</b> Updated support to handle multiple approvers.	Release update
pkiprereg	z/OS V2R1	<b>Updated:</b> Accepts four new RDNs: BUSINESSCATEGORY, JURISDICTIONCOUNTRY, JURISDICTIONSTATEPROV, and JURISDICTIONLOCALITY.	Support for Extended Validation (EV) certificates
iclview	z/OS V2R1	<b>Updated:</b> The validity period and the location of the revocation information is displayed for each certificate.	Release update
	z/OS V1R13	<b>Updated:</b> Added support for viewing entries in the issued certificate list (ICL) when it is implemented using DB2.	DB2 repository for object store and issued certificate list (ICL)
vosview	z/OS V2R1	<b>Updated:</b> Information that is not applicable to the first three records in the object store is no longer displayed.	Release update
	z/OS V1R13	<b>Updated:</b> Added support for viewing entries in the object store when it is implemented using DB2.	DB2 repository for object store and issued certificate list (ICL)
vsam2db2	z/OS V1R13	<b>New:</b> Copies data from the issued certificate list (ICL) and object store VSAM data sets into DB2 tables.	DB2 repository for object store and issued certificate list (ICL)

## RACF security classes

Table 87 lists changes to RACF security classes for PKI Services. For more detailed information, see *z/OS Cryptographic Services PKI Services Guide and Reference*.

Table 87. Summary of changes to RACF security classes for PKI Services

RACF class	Release	Description	Reason for change
PKISERV	z/OS V2R1	<b>New:</b> Resources in the PKISERV class control authorization to PKI Services administration functions. These resources are checked in addition to resources in the FACILITY class and provide a more granular level of control than the FACILITY class resources provide.	Granular authorization to administration functions

## Web pages

Table 88 lists changes to PKI Services web pages. For more detailed information, see *z/OS Cryptographic Services PKI Services Guide and Reference*.

Table 88. Summary of changes to PKI Services web pages

Web page	Release	Description	Reason for change
Key generation	z/OS V2R1	<b>Updated:</b> The option for 512-bit RSA keys was removed because it is not valid for secure TKDS keys. It can be added back if needed for clear keys.	Enterprise PKCS #11 secure key support
Multiple Requests	z/OS V2R2	<b>Updated:</b> Display approval has changed to include multiple number of approvers.	Administrator web pages support
Processing requests after searching	z/OS V2R2	<b>Updated:</b> Display approval has changed to include multiple number of approvers.	Administrator web pages support
Recover previously issued certificate	z/OS V2R1	<b>New:</b> A web page that is displayed when the user clicks <b>Recover Certificate</b> , on which the user can provide the information that is needed to recover a previously issued certificate for which PKI Services generated the key	Release update
Single Request	z/OS V2R2	<b>Updated:</b> Administrator approval has changed to include multiple number of approvers.	Administrator web pages support
	z/OS V2R1	<b>Updated:</b> The key type, key size, and signature algorithm are shown for certificate requests.	Release update
Single Issued Certificate	z/OS V2R1	<b>Updated:</b> The public key size, key type, and signature algorithm that is used to sign the certificate are shown.	Release update

## System SSL summary of interface changes

The System SSL interfaces described in this topic are:

- “SSL/TLS APIs”
- “Certificate Management APIs” on page 193
- “ASN.1 status codes” on page 200
- “CMS status codes” on page 200
- “Environment variables” on page 202
- “Function return codes” on page 205
- “gskkyman command” on page 209

## System SSL application programming interfaces

This topic includes updates made to System SSL application programming interfaces (APIs). For detailed information about these functions, see *z/OS Cryptographic Services System SSL Programming*.

## SSL/TLS APIs

Table 89 on page 190 lists the updates to the System SSL application interface for SSL/TLS application programming interfaces (APIs).

## System SSL

Table 89. Summary of changes to z/OS SSL/TLS APIs

API	Release	Description	Reason for change
gsk_attribute_get_buffer()	z/OS V2R2	Changed: 1. Updates to GSK_KEYRING_FILE. 2. Added support for GSK_PEER_ID and GSK_SID_VALUE. 3. Added support for timely revocation checking and revocation flexibility.	1. PKCS #12 certificate storage 2. Client session resumption enhancement 3. Certificate revocation enhancement
	z/OS V2R1	Changed:  Added support for new buffer attribute GSK_SUITE_B_CIPHERS.	Suite B for TLS
	z/OS V1R13 with APAR OA39422	Changed:  Added support for new buffer attribute GSK_TLS_SIG_ALG_PAIRS.  Enhanced existing buffer value, GSK_CONNECT_SEC_TYPE, to return TLSV12 when TLS V1.2 secure connection is established.	TLS V1.2
	z/OS V1R13	Changed:  Added support for new buffer attributes GSK_CLIENT_ECURVE_LIST and GSK_V3_CIPHER_SPECS_EXPANDED.  Enhanced existing buffer value, GSK_CONNECT_CIPHER_SPEC, to return 4-byte cipher values when 4-byte cipher support is enabled.	Elliptic Curve Cryptography for TLS
gsk_attribute_get_data()	z/OS V1R13	Changed:  Enhanced GSK_DATA_ID_SUPPORTED_KEYS to return certificate list that is tailored for TLS V1.2.	TLS V1.2
gsk_attribute_get_enum()	z/OS V2R2	Changed: 1. Added support for GSK_REQ_CACHED_SESSION and GSK_ENABLE_CLIENT_SET_PEERID. 2. Added support for timely revocation checking and revocation flexibility.	1. Client session resumption enhancement 2. Certificate revocation enhancement
	z/OS V2R1	Changed: 1. Added support for new enum attribute GSK_CERT_VALIDATE_KEYRING_ROOT. Enhanced existing enum value, GSK_CERT_VALIDATION_MODE, to support mode setting to validate certificates according to RFC 5280. 2. Added support for new enum attribute GSK_SUITE_B_PROFILE.	1. x.509 certificate validation enhancement 2. Suite B for TLS
	z/OS V1R13 with APAR OA39422	Changed:  Added support for new enum attribute GSK_PROTOCOL_TLSV1_2 and GSK_V3_CIPHERS.  Existing enum GSK_PROTOCOL_USED enhanced to return TLSV1.2.	TLS V1.2
gsk_attribute_get_numeric_value()	z/OS V2R2	Added support for timely revocation checking and revocation flexibility.	Certificate revocation enhancement

Table 89. Summary of changes to z/OS SSL/TLS APIs (continued)

API	Release	Description	Reason for change
gsk_attribute_set_buffer()	z/OS V2R2	Changed: 1. Updates to GSK_KEYRING_FILE and GSK_KEYRING_PW. 2. Added support for GSK_PEER_ID and GSK_SID_VALUE. 3. Added support for timely revocation checking and revocation flexibility.	1. PKCS #12 certificate storage 2. Client session resumption enhancement 3. Certificate revocation enhancement
	z/OS V1R13 with APAR OA39422	Changed: Added support for new buffer attribute GSK_TLS_SIG_ALG_PAIRS	TLS V1.2
	z/OS V1R13	Changed: Added support for new buffer attributes GSK_CLIENT_ECURVE_LIST and GSK_V3_CIPHER_SPECS_EXPANDED.	Elliptic Curve Cryptography for TLS
gsk_attribute_set_callback()	z/OS V2R2	Changed: Updates to GSK_SNI_CALLBACK.	PKCS #12 certificate storage
	z/OS V1R13	Changed: GSK_SESSION_RESET_CALLBACK updated for TLS V1.2.	TLS V1.2
gsk_attribute_set_enum()	z/OS V2R2	Changed: 1. Updates to GSK_CERT_VALIDATE_KEYRING_ROOT. 2. Added support for GSK_REQ_CACHED_SESSION and GSK_ENABLE_CLIENT_SET_PEERID. 3. Added support for timely revocation checking and revocation flexibility.	1. PKCS #12 certificate storage 2. Client session resumption enhancement 3. Certificate revocation enhancement
	z/OS V2R1	Changed: 1. Added support for new enum attribute GSK_CERT_VALIDATE_KEYRING_ROOT. Enhanced existing enum value, GSK_CERT_VALIDATION_MODE, to support mode setting to validate certificates according to RFC 5280. 2. Added support for new enum attribute GSK_SUITE_B_PROFILE.	1. x.509 certificate validation enhancements 2. Suite B for TLS
	z/OS V1R13 with APAR OA39422	Changed: Added support for new enum attribute GSK_PROTOCOL_TLSV1_2.	TLS V1.2
	z/OS V1R13	Changed: Added support for new enum attribute GSK_V3_CIPHERS.	Elliptic Curve Cryptography for TLS
	z/OS V2R2	Added support for timely revocation checking and revocation flexibility.	Certificate revocation enhancement
gsk_attribute_set_tls_extension()	z/OS V2R2	Changed: Updates to GSK_TLS_EXTID_SNI_SERVER_LABELS.	PKCS #12 certificate storage

## System SSL

Table 89. Summary of changes to z/OS SSL/TLS APIs (continued)

API	Release	Description	Reason for change
<code>gsk_environment_init()</code>	z/OS V2R2	Changed: Added information on PKCS #12 files.	PKCS #12 certificate storage
<code>gsk_environment_open()</code>	z/OS V2R2	Changed: 1. Updates to GSK_KEYRING_FILE and GSK_KEYRING_PW. 2. Added support for timely revocation checking and revocation flexibility.	1. PKCS #12 certificate storage 2. Certificate revocation enhancement
	z/OS V2R1	Changed: During establishment of the SSL environment, support added for processing environment variable GSK_SUITE_B_PROFILE.	Suite B for TLS
	z/OS V1R13 with APAR OA39422	Changed: During establishment of the SSL environment support was added for processing environment variables GSK_PROTOCOL_TLSV1_2 and GSK_TLS_SIG_ALG_PAIRS.	TLS V1.2
	z/OS V1R13	Changed: During establishment of the SSL environment support was added for process environment variable GSK_V3_CIPHER_SPECS_EXPANDED.	Elliptic Curve Cryptography for TLS
<code>gsk_get_all_cipher_suites()</code>	z/OS V2R2	Changed: Updated SSL run time level.	Release update
	z/OS V2R1	Changed: Updated SSL run time level.	Release update
	z/OS V1R13	New: Returns the available SSL cipher suites.	Support for returning 2-byte and 4-bytes cipher lists
<code>gsk_get_cipher_suites()</code>	z/OS V2R2	Changed: Updated SSL run time level.	Release update
	z/OS V2R1	Changed: Updated SSL run time level.	Release update
	z/OS V1R13	Changed: Updated SSL run time level.	Release update
<code>gsk_get_ssl_vector()</code>	z/OS V1R13	Changed: Added GSK_SSL_LVL3 function mask.	Release update
<code>gsk_get_update</code>	z/OS V2R2	Changed: Added information on PKCS #12 files.	PKCS #12 certificate storage

Table 89. Summary of changes to z/OS SSL/TLS APIs (continued)

API	Release	Description	Reason for change
gsk_secure_socket_init()	z/OS V2R2	Changed: 1. Added information on PKCS #12 files. 2. Added information on specifying a cached session. 3. Added support for timely revocation checking and revocation flexibility.	1. PKCS #12 certificate storage 2. Client session resumption enhancement 3. Certificate revocation enhancement
	z/OS V2R1	Changed: TLS V1.2 handshake performed according to Suite B profile definition.	Suite B for TLS
	z/OS V1R13 with APAR OA39422	Changed: Updated to support TLS V1.2 secure connections.	TLS V1.2
	z/OS V1R13	Changed: Updated to support elliptic curve based TLS secure connections.	Elliptic Curve Cryptography for TLS
gsk_secure_socket_misc()	z/OS V2R2	Changed: Added information on using this function when re-using cached sessions.	Client session resumption enhancement
	z/OS V1R13 with APAR OA39422	Changed: Updated to support TLS V1.2 secure connections.	TLS V1.2
gsk_secure_socket_read()	z/OS V1R13 with APAR OA39422	Changed: Updated to support TLS V1.2 secure connections.	TLS V1.2
gsk_secure_socket_shutdown()	z/OS V1R13 with APAR OA39422	Changed: Updated to support TLS V1.2 secure connections.	TLS V1.2
gsk_secure_socket_write()	z/OS V1R13 with APAR OA39422	Changed: Updated to support TLS V1.2 secure connections.	TLS V1.2

## Certificate Management APIs

Table 90 lists the updates to the System SSL application interface for SSL/TLS APIs.

Table 90. Summary of changes to z/OS Certificate Management APIs

API	Release	Description	Reason for change
gsk_construct_certificate()	z/OS V2R1	Changed: Added support for generating signed DSA certificates with key size of 2048-bits and signed certificates with DSA with SHA-224 or SHA-256 digital signatures.	Enhanced DSA support
	z/OS V1R13	Changed: Added support for generating signed ECDSA certificates.	ECDSA certificate support

## System SSL

Table 90. Summary of changes to z/OS Certificate Management APIs (continued)

API	Release	Description	Reason for change
<code>gsk_construct_renewal_certificate()</code>	z/OS V2R1	Changed:  Added support for generating certificate requests with DSA key size of 2048-bits and certificate requests that are signed with DSA with SHA-224 or SHA-256 digital signatures.	Enhanced DSA support
<code>gsk_construct_self_signed_certificate()</code>	z/OS V2R1	Changed:  Added support for generating self-signed DSA certificates with key size of 2048-bits and DSA with SHA-224 or SHA-256 digital signatures.	Enhanced DSA support
	z/OS V1R13	Changed:  Added support for generating self-signed ECDSA certificates.	ECDSA certificate support
<code>gsk_construct_signed_certificate()</code>	z/OS V2R1	Changed:  Added support for signing certificate requests using DSA 2048-bit keys and DSA with SHA-224 or SHA-256 digital signatures.	Enhanced DSA support
<code>gsk_create_certification_request()</code>	z/OS V2R1	Changed:  Added support for generating certificate requests with DSA key size of 2048-bits and certificate requests that are signed with DSA with SHA-224 or SHA-256 digital signatures.	Enhanced DSA support
	z/OS V1R13	Changed:  Added support for generating ECDSA certificate requests.	ECDSA certificate support
<code>gsk_create_database_renewal_request()</code>	z/OS V2R1	Changed:  Added support for generating certificate renewal requests with DSA key size of 2048-bits and certificate requests that are signed with DSA with SHA-224 or SHA-256 digital signatures.	Enhanced DSA support
<code>gsk_create_database_signed_certificate()</code>	z/OS V2R1	Changed:  Added support for signing certificate requests using DSA 2048-bit keys and certificate requests that are signed with DSA SHA-224 or SHA-256 digital signatures.	Enhanced DSA support
	z/OS V1R13	Changed:  Added support for creating a signed ECDSA certificate.	ECDSA certificate support
<code>gsk_create_renewal_request()</code>	z/OS V2R1	Changed:  Added support for generating certificate requests with DSA key size of 2048-bits and certificate requests that are signed with DSA with SHA-224 or SHA-256 digital signatures.	Enhanced DSA support
<code>gsk_create_revocation_source()</code>	z/OS V2R2	New:  Create an OCSP, HTTP CRL, or an extended LDAP CRL revocation source.	Certificate revocation enhancement



Table 90. Summary of changes to z/OS Certificate Management APIs (continued)

API	Release	Description	Reason for change
gsk_create_self_signed_certificate()	z/OS V2R1	Changed: Added support for generating self-signed DSA certificates with key size of 2048-bits and DSA with SHA-224 or SHA-256 digital signatures.	Enhanced DSA support
	z/OS V1R13	Changed: Added support for generating self-signed ECDSA certificates.	ECDSA certificate support
gsk_create_signed_certificate_record()	z/OS V2R1	Changed: Added support for generating signed DSA certificates with key size of 2048-bits and DSA certificates with DSA with SHA-224 or SHA-256 digital signatures.	Enhanced DSA support
gsk_create_signed_certificate_set()	z/OS V2R1	Changed: Added support for generating signed DSA certificates with key size of 2048-bits and signed certificates with DSA with SHA-224 or SHA-256 digital signatures.	Enhanced DSA support
	z/OS V1R13	Changed: Added support for generating signed ECDSA certificates.	ECDSA certificate support
gsk_create_signed_crl_record()	z/OS V2R1	Changed: Added support for generating a signed CRL using DSA with SHA-224 or SHA-256 digital signatures.	Enhanced DSA support
gsk_decode_certificate_extension()	z/OS V2R2	Changed: Added support for ocsNoCheck extension.	Certificate revocation enhancement
	z/OS V2R1	Changed: Added support for decoding HostIDMapping extension.	Enhanced x.509 certificate support
gsk_decode_issuer_and_serial_number()	z/OS V2R2	New: Decodes a PKCS #7 <i>IssuerAndSerialNumber</i> .	PKCS #7 support
gsk_decode_signer_identifier()	z/OS V2R2	New: Decodes a PKCS #7 signer identifier.	PKCS #7 support
gsk_encode_certificate_extension()	z/OS V2R2	Changed: Added support for ocsNoCheck extension.	Certificate revocation enhancement
	z/OS V2R1	Changed: Added support for encoding HostIDMapping extension.	Enhanced x.509 certificate support
gsk_encode_ec_parameters()	z/OS V1R13	New: Encodes the EC domain parameters for an ECC key.	ECDSA certificate support
gsk_encode_export_key()	z/OS V2R1	Changed: Added support for exporting RSA and ECDSA certificates with their private keys when the private keys are stored as extractable secure private keys in the TKDS.	Support for secure private keys in a PKCS #11 token

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Table 90. Summary of changes to z/OS Certificate Management APIs (continued)

API	Release	Description	Reason for change
<code>gsk_encode_issuer_and_serial_number()</code>	z/OS V2R2	New: Encodes a PKCS #7 <i>IssuerAndSerialNumber</i> .	PKCS #7 support
<code>gsk_encode_signer_identifier()</code>	z/OS V2R2	New: Encodes a PKCS #7 <i>SignerIdentifier</i> from a signer certificate.	PKCS #7 support
<code>gsk_export_key()</code>	z/OS V2R1	Changed: Added support for exporting RSA and ECDSA certificates with their private keys when the private keys are stored as extractable secure private keys in the TKDS.	Support for secure private keys in a PKCS #11 token
<code>gsk_free_issuer_and_serial_number()</code>	z/OS V2R2	New: Releases storage allocated for PKCS #7 issuer and serial number information.	PKCS #7 support
<code>gsk_free_oid()</code>	z/OS V2R2	New: Releases storage allocated for OID information.	PKCS #7 support
<code>gsk_free_revocation_source()</code>	z/OS V2R2	New: Frees the revocation source initialized and allocated by <code>gsk_create_revocation_source()</code> .	Certificate revocation enhancement
<code>gsk_free_signer_identifier()</code>	z/OS V2R2	New: Releases storage allocated for PKCS #7 signer identifier information.	PKCS #7 support
<code>gsk_generate_key_pair()</code>	z/OS V2R1	Changed: Added support for generation of DSA 2048-bit key pairs.	Enhanced DSA support
	z/OS V1R13	Changed: Added support for generating ECC key pairs.	Base elliptic curve support
<code>gsk_generate_key_parameters()</code>	z/OS V1R13	Changed: Added support for generating ECC key parameters.	Base elliptic curve support
<code>gsk_get_cms_vector()</code>	z/OS V2R2	Changed: Added GSKCMS_API_LVL10.	Certificate revocation enhancement
	z/OS V2R1	Changed: Added GSKCMS_API_LVL9.	Release update
	z/OS V1R13	Changed: Added GSKCMS_API_LVL8.	Release update
<code>gsk_get_content_type_and_cms_version()</code>	z/OS V2R2	New: Extracts the PKCS #7 <i>content_info_type</i> , <i>content_info_oid</i> , and <i>cms_version</i> from the <code>pkcs_content_info</code> structure.	PKCS #7 support
<code>gsk_get_directory_certificates()</code>	z/OS V2R2	Changed: Added support for timely revocation checking and revocation flexibility.	Certificate revocation enhancement

Table 90. Summary of changes to z/OS Certificate Management APIs (continued)

API	Release	Description	Reason for change
<code>gsk_get_directory_crls()</code>	z/OS V2R2	Changed: Added support for timely revocation checking and revocation flexibility.	Certificate revocation enhancement
<code>gsk_get_directory_enum()</code>	z/OS V2R2	Changed: Added support for timely revocation checking and revocation flexibility.	Certificate revocation enhancement
<code>gsk_get_directory_numeric_value()</code>	z/OS V2R2	New: Gets an integer value from an LDAP directory.	Certificate revocation enhancement
<code>gsk_make_enveloped_data_content()</code>	z/OS V2R2	Changed: Updated the <i>version</i> parameter.	PKCS #7 support
	z/OS V2R1	Changed: Added support for encrypting the message content using AES CBC (128-bit and 256-bit).	Enhanced PKCS#7 support
<code>gsk_make_enveloped_data_content_extended()</code>	z/OS V2R2	Changed: Updated the <i>version</i> parameter.	PKCS #7 support
	z/OS V2R1	Changed: Added support for encrypting the message content using AES CBC (128-bit and 256-bit).	Enhanced PKCS#7 support
<code>gsk_make_enveloped_data_msg()</code>	z/OS V2R2	Changed: Updated the <i>version</i> parameter.	PKCS #7 support
	z/OS V2R1	Changed: Added support for encrypting the message content using AES CBC (128-bit and 256-bit).	Enhanced PKCS#7 support
<code>gsk_make_enveloped_data_msg_extended()</code>	z/OS V2R2	Changed: Updated the <i>version</i> parameter.	PKCS #7 support
	z/OS V2R1	Changed: Added support for encrypting the message content using AES CBC (128-bit and 256-bit).	Enhanced PKCS#7 support
<code>gsk_make_enveloped_private_key_msg()</code>	z/OS V2R1	New: Create a PKCS#7 EnvelopedData message containing an RSA or ECDSA private key. Private key is a secure key stored in a PKCS #11 token.	Enhanced PKCS#7 support
<code>gsk_make_signed_data_content()</code>	z/OS V2R2	Changed: Updated the <i>version</i> parameter.	PKCS #7 support
	z/OS V2R1	Changed: Added support for signing using digital signatures DSA with SHA-224 and SHA-256.	Enhanced DSA support
<code>gsk_make_signed_data_content_extended()</code>	z/OS V2R2	Changed: Updated the <i>version</i> parameter.	PKCS #7 support
	z/OS V2R1	Changed: Added support for signing using digital signatures DSA with SHA-224 and SHA-256.	Enhanced DSA support

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Table 90. Summary of changes to z/OS Certificate Management APIs (continued)

API	Release	Description	Reason for change
gsk_make_signed_data_msg()	z/OS V2R2	Changed: Updated the <i>version</i> parameter.	PKCS #7 support
	z/OS V2R1	Changed: Added support for signing using digital signatures DSA with SHA-224 and SHA-256.	Enhanced DSA support
gsk_make_signed_data_msg_extended()	z/OS V2R2	Changed: Updated the <i>version</i> parameter.	PKCS #7 support
	z/OS V2R1	Changed: Added support for signing using digital signatures DSA with SHA-224 and SHA-256.	Enhanced DSA support
gsk_modify_pkcs11_key_label()	z/OS V2R1	New: Returns a <i>gsk_buffer</i> containing a TKDS key token label with either an "=" added or removed from the first position.	Support for secure private keys in a PKCS #11 token
gsk_open_directory()	z/OS V2R2	Changed: Added support for timely revocation checking and revocation flexibility.	Certificate revocation enhancement
gsk_perform_kat()	z/OS V2R2	Changed: Enhanced to run TLS V1.0, TLS V1.1, and TLS V1.2 key derivation function known answer tests.	FIPS 140-2 support
	z/OS V1R13	Changed: Enhanced to run HMAC-SHA-256 and HMAC-SHA-384 known answer tests.	FIPS 140-2 support
gsk_query_crypto_level()	z/OS V2R1	Changed: Updated SSL run time level.	Release update
	z/OS V1R13	Changed: Updated SSL run time level.	Release update
gsk_read_enveloped_data_content()	z/OS V2R1	Changed: Added support for decrypting the message content using AES CBC (128-bit and 256-bit).	Enhanced PKCS#7 support
gsk_read_enveloped_data_content_extended()	z/OS V2R1	Changed: Added support for decrypting the message content using AES CBC (128-bit and 256-bit).	Enhanced PKCS#7 support
gsk_read_enveloped_data_msg()	z/OS V2R1	Changed: Added support for decrypting the message content using AES CBC (128-bit and 256-bit).	Enhanced PKCS#7 support
gsk_read_enveloped_data_msg_extended()	z/OS V2R1	Changed: Added support for decrypting the message content using AES CBC (128-bit and 256-bit).	Enhanced PKCS#7 support
gsk_read_signed_data_content()	z/OS V2R1	Changed: Added support for verifying DSA with SHA-224 or SHA-256 digital signatures.	Enhanced DSA support

Table 90. Summary of changes to z/OS Certificate Management APIs (continued)

API	Release	Description	Reason for change
<code>gsk_read_signed_data_content_extended()</code>	z/OS V2R1	Changed: Added support for verifying DSA with SHA-224 or SHA-256 digital signatures.	Enhanced DSA support
<code>gsk_read_signed_data_msg()</code>	z/OS V2R1	Changed: Added support for verifying DSA with SHA-224 or SHA-256 digital signatures.	Enhanced DSA support
<code>gsk_read_signed_data_msg_extended()</code>	z/OS V2R1	Changed: Added support for verifying DSA with SHA-224 or SHA-256 digital signatures.	Enhanced DSA support
<code>gsk_set_directory_enum()</code>	z/OS V2R2	Changed: Added support for timely revocation checking and revocation flexibility.	Certificate revocation enhancement
<code>gsk_set_directory_numeric_value()</code>	z/OS V2R2	New: Sets an integer value for an LDAP directory.	Certificate revocation enhancement
<code>gsk_sign_certificate()</code>	z/OS V2R1	Changed: Added support for verifying DSA with SHA-224 or SHA-256 digital signatures.	Enhanced DSA support
<code>gsk_sign_crl()</code>	z/OS V2R1	Changed: Added support for verifying DSA with SHA-224 or SHA-256 digital signatures.	Enhanced DSA support
<code>gsk_sign_data()</code>	z/OS V2R1	Changed: Added support for verifying DSA with SHA-224 or SHA-256 digital signatures.	Enhanced DSA support
<code>gsk_validate_certificate()</code>	z/OS V2R2	Changed: Added support for timely revocation checking and revocation flexibility.	Certificate revocation enhancement
	z/OS V1R13	Changed: Added support for <code>gskdb_source_crl_callback</code> .	Enhanced certificate support
<code>gsk_validate_certificate_mode()</code>	z/OS V2R2	Changed: Added support for timely revocation checking and revocation flexibility.	Certificate revocation enhancement
	z/OS V2R1	Changed: Added support for validating certificates and certificate chain according to RFC 5280.	Enhanced x.509 certificate support
	z/OS V1R13	Changed: Added support for <code>gskdb_source_crl_callback</code> .	Enhanced certificate support
<code>gsk_validate_extended_key_usage()</code>	z/OS V2R2	New: Validate a certificate's extended key usage extension against the supplied extended key usage list.	PKCS #7 support
<code>gsk_verify_certificate_signature()</code>	z/OS V2R1	Changed: Added support for verifying DSA with SHA-224 or SHA-256 digital signatures.	Enhanced DSA support

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Table 90. Summary of changes to z/OS Certificate Management APIs (continued)

API	Release	Description	Reason for change
gsk_verify_crl_signature()	z/OS V2R1	Changed: Added support for verifying DSA with SHA-224 or SHA-256 digital signatures.	Enhanced DSA support
gsk_verify_data_signature()	z/OS V2R1	Changed: Added support for verifying DSA with SHA-224 or SHA-256 digital signatures.	Enhanced DSA support

### ASN.1 status codes

There are no new or changed status codes.

### CMS status codes

Table 91 lists the new and updated status codes. See *z/OS Cryptographic Services System SSL Programming* for more detailed information.

Table 91. Summary of changes to CMS status codes

Status code	Release	Description	Reason for change
03353007	z/OS V1R13	Changed: Input/Output request failed.	Documentation clarification
03353009	z/OS V2R1	Changed: File or keyring no found.	Documentation clarification
03353016	z/OS V2R1	Changed: The password is not correct.	Support for secure private keys in a PKCS #11 token
0335301A	z/OS V2R1	Changed: No private key.	Documentation clarification
0335301C	z/OS V1R13	Changed: Record label is not unique.	Documentation clarification
03353020	z/OS V1R13	Changed: Unrecognized file or message encoding.	Documentation clarification
03353034	z/OS V2R1	Changed: Encryption key size is not supported.	Enhanced DSA support
03353060	z/OS V2R2	Changed: Certificate revocation list cannot be found.	Certificate revocation enhancement
0335306F	z/OS V2R2	Changed: Required certificate extension is missing.	PKCS #7 support
0335307F	z/OS V1R13	Changed: EC Parameters not supplied.	Base elliptic curve support
03353084	z/OS V2R1	Changed: ICSF callable service returned an error.	Documentation clarification
03353088	z/OS V1R13	New: Cryptographic hardware does not support service or algorithm.	Base elliptic curve support
03353089	z/OS V2R1	New: ICSF PKCS #11 services are disabled.	Release update
0335308A	z/OS V2R1	New: Known Answer Test has failed when attempting to use ICSF.	Release update
0335308B	z/OS V2R1	New: Variable argument validate root is not valid.	Enhanced x.509 certificate support
0335308C	z/OS V2R1	New: PKCS #11 label name not valid.	Support for secure private keys in a PKCS #11 token
0335308D	z/OS V2R1	New: Incorrect key attribute.	Support for secure private keys in a PKCS #11 token
0335308E	z/OS V2R1	New: PKCS #11 object was not found.	Support for secure private keys in a PKCS #11 token

Table 91. Summary of changes to CMS status codes (continued)

Status code	Release	Description	Reason for change
0335308F	z/OS V2R1	New: An algorithm or key size is not FIPS approved for an ICSF operation.	Release update
03353090	z/OS V2R1	New: PKCS #11 key cannot be extracted	Support for secure private keys in a PKCS #11 token
03353093	z/OS V2R1	New: Clear key support not available because of ICSF key policy.	Release update
03353094	z/OS V2R2	New: OCSP responder requires a signed request	Certificate revocation enhancement
03353095	z/OS V2R2	New: HTTP response is not valid	Certificate revocation enhancement
03353096	z/OS V2R2	New: OCSP response is not valid	Certificate revocation enhancement
03353097	z/OS V2R2	New: OCSP request failed with internal responder error	Certificate revocation enhancement
03353098	z/OS V2R2	New: OCSP response is expired	Certificate revocation enhancement
03353099	z/OS V2R2	New: Numeric value is not valid	Certificate revocation enhancement
0335309A	z/OS V2R2	New: A PKCS #7 CMS Version is not supported	PKCS #7 support
0335309B	z/OS V2R2	New: Input certificate not supplied	PKCS #7 support
0335309C	z/OS V2R2	New: Error creating OCSP request	Certificate revocation enhancement
0335309D	z/OS V2R2	New: Maximum response size exceeded	Certificate revocation enhancement
0335309E	z/OS V2R2	New: HTTP server communication error	Certificate revocation enhancement
0335309F	z/OS V2R2	New: Variable argument security level is not valid	Certificate revocation enhancement
033530A0	z/OS V2R2	New: Extended key usage input count is not valid	PKCS #7 support
033530A1	z/OS V2R2	New: Extended key usage input is not supplied	PKCS #7 support
033530A2	z/OS V2R2	New: Extended key usage comparison failed	PKCS #7 support
033530A3	z/OS V2R2	New: Extended key usage type is not supported for this operation	PKCS #7 support
033530A4	z/OS V2R2	New: Certificate does not have an extended key usage extension	PKCS #7 support
033530A5	z/OS V2R2	New: Nonce in OCSP response does not match value in OCSP request	Certificate revocation enhancement
033530A6	z/OS V2R2	New: OCSP response not received within configured time limit	Certificate revocation enhancement
033530A7	z/OS V2R2	New: Revocation information is not yet valid	Certificate revocation enhancement
033530A8	z/OS V2R2	New: HTTP server host name is not valid	Certificate revocation enhancement
033530A9	z/OS V2R2	New: An internal error has occurred.	Release update

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Table 91. Summary of changes to CMS status codes (continued)

Status code	Release	Description	Reason for change
033530AA	z/OS V2R2	New: Required basic constraints certificate extension is missing	Release update
033530AB	z/OS V2R2	New: PKCS #12 input certificate has no subject DN or friendly name	PKCS#12 certificate storage
033530AC	z/OS V2R2	New: PKCS #12 file name may not end with .kdb, .rdb or .sth	PKCS#12 certificate storage
033530AD	z/OS V2R2	New: Required parameter is not set	Certificate revocation enhancement
033530AE	z/OS V2R2	New: Maximum number of locations allowed to be contacted during certificate validation has been reached	Certificate revocation enhancement
033530AF	z/OS V2R2	New: HTTP response not received within configured time limit	Certificate revocation enhancement
033530B0	z/OS V2R2	New: LDAP response not received within configured time limit	Certificate revocation enhancement
033530B1	z/OS V2R2	New: An unknown error has occurred	Release update
033530B2	z/OS V2R2	New: OCSP request failed with try later error	Certificate revocation enhancement

## Environment variables

Table 92 identifies changes to environment variables used by System SSL. For detailed information about these environment variables, see *z/OS Cryptographic Services System SSL Programming*.

Table 92. Summary of changes to System SSL environment variables

Environment variable	Release	Description	Reason for change
GSK_AIA_CDP_PRIORITY	z/OS V2R2	New: Specifies the priority order that the AIA and the CDP extensions are checked for certificate revocation information.	Certificate revocation enhancement
GSK_CERT_VALIDATE_KEYRING_ROOT	z/OS V2R1	New: Specifies whether validation to the root CA is required for certificates that are connected to a SAF key ring.	Enhanced certificate support
GSK_CLIENT_ECURVE_LIST	z/OS V1R13	New: Specifies the list of elliptic curves that are supported by the client. The list is used by the client to guide the server as to which elliptic curves are preferred when using ECC-based cipher suites.	Elliptic Curve Cryptography for TLS
GSK_CRL_CACHE_ENTRY_MAXSIZE	z/OS V2R2	New: Specifies the maximum size in bytes of a CRL to be kept in the LDAP CRL cache.	Certificate revocation enhancement
GSK_CRL_CACHE_EXTENDED	z/OS V2R2	New: Specifies that LDAP extended CRL cache support is enabled.	Certificate revocation enhancement



Table 92. Summary of changes to System SSL environment variables (continued)

Environment variable	Release	Description	Reason for change
GSK_CRL_CACHE_SIZE	z/OS V2R2	New: Specifies the maximum number of CRLs that are allowed to be stored in the LDAP CRL cache.	Certificate revocation enhancement
GSK_CRL_CACHE_TEMP_CRL	z/OS V2R2	New: Specifies if a temporary LDAP CRL cache entry is added to the LDAP CRL cache when the CRL does not reside on the LDAP server.	Certificate revocation enhancement
GSK_CRL_CACHE_TEMP_CRL_TIMEOUT	z/OS V2R2	New: Specifies the time in hours that a temporary CRL cache entry resides in the LDAP extended CRL cache when caching of temporary CRLs is enabled.	Certificate revocation enhancement
GSK_CRL_SECURITY_LEVEL	z/OS V2R2	Changed: Updated to support timely revocation checking and revocation flexibility.	Certificate revocation enhancement
GSK_HTTP_CDP_CACHE_ENTRY_MAXSIZE	z/OS V2R2	New: Specifies the maximum size in bytes of a CRL that is allowed to be stored in the HTTP CDP CRL cache.	Certificate revocation enhancement
GSK_HTTP_CDP_CACHE_SIZE	z/OS V2R2	New: Specifies the maximum number of CRLs that are allowed to be stored in the HTTP CDP CRL cache.	Certificate revocation enhancement
GSK_HTTP_CDP_ENABLE	z/OS V2R2	New: Specifies if certificate revocation checking with the HTTP URI values in the CDP extension is enabled.	Certificate revocation enhancement
GSK_HTTP_CDP_MAX_RESPONSE_SIZE	z/OS V2R2	New: Specifies the maximum size in bytes accepted as a response from an HTTP server when retrieving a CRL.	Certificate revocation enhancement
GSK_HTTP_CDP_PROXY_SERVER_NAME	z/OS V2R2	New: Specifies the DNS name or IP address of the HTTP proxy server for HTTP CDP CRL retrieval.	Certificate revocation enhancement
GSK_HTTP_CDP_PROXY_SERVER_PORT	z/OS V2R2	New: Specifies the HTTP proxy server port for HTTP CDP CRL retrieval.	Certificate revocation enhancement
GSK_HTTP_CDP_RESPONSE_TIMEOUT	z/OS V2R2	New: Specifies the time in seconds to wait for a response from the HTTP server.	Certificate revocation enhancement
GSK_KEYRING_FILE	z/OS V2R2	Changed: Updated to specify the name of the key database file, PKCS #12 file, SAF key ring, or z/OS PKCS #11 token.	PKCS#12 certificate storage
GSK_KEYRING_PW	z/OS V2R2	Changed: Updated to specify the password for the key database or PKCS #12 file.	PKCS#12 certificate storage
GSK_LDAP_RESPONSE_TIMEOUT	z/OS V2R2	New: Specifies the time in seconds to wait for a response from the LDAP server.	Certificate revocation enhancement

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Table 92. Summary of changes to System SSL environment variables (continued)

Environment variable	Release	Description	Reason for change
GSK_MAX_SOURCE_REV_EXT_LOC_VALUES	z/OS V2R2	New: Specifies the maximum number of location values that are contacted per data source when attempting validation of a certificate.	Certificate revocation enhancement
GSK_MAX_VALIDATION_REV_EXT_LOC_VALUES	z/OS V2R2	New: Specifies the maximum number of locations values that are contacted when performing validation of a certificate.	Certificate revocation enhancement
GSK_OCSP_CLIENT_CACHE_ENTRY_MAXSIZE	z/OS V2R2	New: Specifies the maximum number of OCSP responses or cached certificate statuses that are allowed to be kept in the OCSP response cache for an issuing CA certificate.	Certificate revocation enhancement
GSK_OCSP_CLIENT_CACHE_SIZE	z/OS V2R2	New: Specifies the maximum number of OCSP responses or cached certificate statuses to be kept in the OCSP response cache.	Certificate revocation enhancement
GSK_OCSP_ENABLE	z/OS V2R2	New: Specifies whether the AIA extensions are to be used for revocation checking.	Certificate revocation enhancement
GSK_OCSP_MAX_RESPONSE_SIZE	z/OS V2R2	New: Specifies the maximum size in bytes that is accepted as a response from an OCSP responder.	Certificate revocation enhancement
GSK_OCSP_NONCE_CHECK_ENABLE	z/OS V2R2	New: Specifies if OCSP response nonce checking is enabled.	Certificate revocation enhancement
GSK_OCSP_NONCE_GENERATION_ENABLE	z/OS V2R2	New: Specifies if OCSP requests include a generated nonce.	Certificate revocation enhancement
GSK_OCSP_NONCE_SIZE	z/OS V2R2	New: Specifies the size in bytes for the value of the nonce to be sent in OCSP requests.	Certificate revocation enhancement
GSK_OCSP_PROXY_SERVER_NAME	z/OS V2R2	New: Specifies the DNS name or IP address of the OCSP proxy server	Certificate revocation enhancement
GSK_OCSP_PROXY_SERVER_PORT	z/OS V2R2	New: Specifies the OCSP responder proxy server port.	Certificate revocation enhancement
GSK_OCSP_REQUEST_SIGALG	z/OS V2R2	New: Specifies the hash and signature algorithm pair used to sign OCSP requests.	Certificate revocation enhancement
GSK_OCSP_REQUEST_SIGKEYLABEL	z/OS V2R2	New: Specifies the label of the key used to sign OCSP requests.	Certificate revocation enhancement
GSK_OCSP_RESPONSE_TIMEOUT	z/OS V2R2	New: Specifies the time in seconds to wait for a response from the OCSP responder server.	Certificate revocation enhancement
GSK_OCSP_RETRIEVE_VIA_GET	z/OS V2R2	New: Specifies if the HTTP GET method should be used when sending an OCSP request.	Certificate revocation enhancement

Table 92. Summary of changes to System SSL environment variables (continued)

Environment variable	Release	Description	Reason for change
GSK_OCSP_URL	z/OS V2R2	New: Specifies the URI of an OCSP responder.	Certificate revocation enhancement
GSK_OCSP_URL_PRIORITY	z/OS V2R2	New: Specifies the priority order for contacting OCSP responder locations if both GSK_OCSP_URL and GSK_OCSP_ENABLE are active.	Certificate revocation enhancement
GSK_PROTOCOL_SSLV2	z/OS V2R2	Changed: Protocol disabled by default.	Release update
GSK_PROTOCOL_SSLV3	z/OS V2R2	Changed: Protocol disabled by default.	Release update
GSK_PROTOCOL_TLSV1_2	z/OS V1R13 with APAR OA39422	New: Specifies whether the TLS V1.2 protocol is supported.	TLS V1.2
GSK_REVOCATION_SECURITY_LEVEL	z/OS V2R2	New: Specifies the level of security to be used when contacting an OCSP responder or an HTTP server specified in a URI value of the CDP extension.	Certificate revocation enhancement
GSK_SUITE_B_PROFILE	z/OS V2R1	New: Specifies the Suite B profile to be applied to TLS sessions.	Suite B for TLS
GSK_TLS_CBC_PROTECTION_METHOD	z/OS V2R2	New: Specifies an optional SSL V3.0 or TLS V1.0 CBC IV protection method when writing application data.	Release update
GSK_TLS_SIG_ALG_PAIRS	z/OS V1R13 with APAR OA39422	New: Specifies the list of hash and signature algorithm pair specifications that are supported by the client and servers in order of preference.	TLS V1.2
GSK_V2_CIPHER_SPECS	z/OS V2R2	Changed: Default cipher list modified.	Release update
GSK_V3_CIPHER_SPECS	z/OS V2R2	Changed: Default cipher list modified.	Release update
GSK_V3_CIPHER_SPECS_EXPANDED	z/OS V2R2	Changed: Default cipher list modified.	Release update
	z/OS V1R13 with APAR OA39422	Changed: Updated to support new ciphers added for TLS V1.2.	TLS V1.2
	z/OS V1R13	New: Specifies the SSL V3 cipher specifications in order of preference as a string consisting of 1 or more 4-character values. The SSL v3 cipher specifications are used for the SSL V3, TLS V1.0, and TLS V1.1 protocols.	Elliptic Curve Cryptography for TLS

## Function return codes

Table 93 on page 206 lists the new and updated function return codes. See *z/OS Cryptographic Services System SSL Programming* for more detailed information.

## System SSL

Table 93. Summary of changes to function return codes

Function code	Release	Description	Reason for change
6	z/OS V2R2	Changed: Key label is not found.	PKCS#12 certificate storage
7	z/OS V2R2	Changed: No certificates available.	PKCS#12 certificate storage
8	z/OS V2R2	Changed: Certificate validation error.	PKCS#12 certificate storage
13	z/OS V1R13	New: Size specified for supplied structure is too small.	Release update
14	z/OS V1R13	New: Required gsk_all_cipher_suites structure not supplied.	Elliptic Curve Cryptography for TLS
102	z/OS V2R2	Changed: Error detected while reading certificate database	PKCS#12 certificate storage
202	z/OS V2R2	Changed: Error detected while opening the certificate database.	PKCS#12 certificate storage
	z/OS V2R1	Changed: Error detected while opening the certificate database.	Documentation clarification
402	z/OS V2R2	Changed: No SSL cipher specifications.	Documentation clarification
	z/OS V2R1	Changed: No SSL cipher specifications.	Documentation clarification
	z/OS V1R13	Changed: No SSL cipher specifications.	Documentation clarification
407	z/OS V2R2	Changed: Key label does not exist.	Documentation clarification
	z/OS V2R1	Changed: Key label does not exist.	Documentation clarification
417	z/OS V2R2	Changed: Self-signed certificate cannot be validated.	Documentation clarification
421	z/OS V2R2	Changed: SSL V2 cipher is not valid.	Documentation clarification
422	z/OS V2R2	Changed: SSL V3 cipher is not valid.	Documentation clarification
	z/OS V1R13	Changed: SSL V3 cipher is not valid.	Elliptic Curve Cryptography for TLS
428	z/OS V1R13	Changed: Key entry does not contain a private key.	Documentation clarification
432	z/OS V1R13	Changed: Session renegotiation is not allowed.	Documentation clarification
436	z/OS V2R2	Changed: Certificate revocation list cannot be found.	Documentation clarification
440	z/OS V2R2	Changed: Incorrect key usage.	Documentation clarification
	z/OS V2R1	Changed: Incorrect key usage.	gskkyman menu restructuring - updated menu titles
	z/OS V1R13	Changed: Incorrect key usage.	Elliptic Curve Cryptography for TLS
442	z/OS V2R2	Changed: Multiple certificates exist for label.	PKCS#12 certificate storage
451	z/OS V1R13	New: Elliptic Curve is not supported.	Elliptic Curve Cryptography for TLS
452	z/OS V1R13	New: EC Parameters not supplied.	Elliptic Curve Cryptography for TLS
453	z/OS V1R13	New: Signature not supplied.	Elliptic Curve Cryptography for TLS
454	z/OS V1R13	New: Elliptic curve parameters are not valid.	Elliptic Curve Cryptography for TLS

Table 93. Summary of changes to function return codes (continued)

Function code	Release	Description	Reason for change
455	z/OS V2R1	Changed: ICSF services are not available.	Documentation clarification
	z/OS V1R13	New: ICSF services are not available.	Elliptic Curve Cryptography for TLS
456	z/OS V1R13	New: ICSF callable service returned an error.	Elliptic Curve Cryptography for TLS
457	z/OS V1R13	New: ICSF PKCS #11 not operating in FIPS mode.	Elliptic Curve Cryptography for TLS
458	z/OS V1R13	New: The SSL V3 expanded cipher is not valid.	Elliptic Curve Cryptography for TLS
459	z/OS V1R13	New: Elliptic Curve is not supported in FIPS mode.	Elliptic Curve Cryptography for TLS
461	z/OS V1R13	New: EC domain parameter format is not supported.	Elliptic Curve Cryptography for TLS
462	z/OS V1R13	New: Elliptic curve point format is not supported.	Elliptic Curve Cryptography for TLS
463	z/OS V1R13	New: Cryptographic hardware does not support service or algorithm.	Elliptic Curve Cryptography for TLS
464	z/OS V1R13	New: Elliptic curve list is not valid.	Elliptic Curve Cryptography for TLS
465	z/OS V2R1	New: ICSF PKCS #11 services are disabled.	FIPS 140-2 Support
466	z/OS V1R13 with APAR OA39422	New: Signature algorithm pairs list is not valid.	TLS V1.2
467	z/OS V1R13 with APAR OA39422	New: Signature algorithm not in signature algorithm pairs list.	TLS V1.2
468	z/OS V1R13 with APAR OA39422	New: Certificate key algorithm not in signature algorithm pairs list.	TLS V1.2
469	z/OS V2R1	New: Incorrect key attribute.	Support for secure private keys in a PKCS #11 token
470	z/OS V2R1	New: Certificate does not meet Suite B requirements.	Suite B for TLS
471	z/OS V2R1	New: Secure private key cannot be used with a fixed ECDH key exchange.	Support for secure private keys in a PKCS #11 token
472	z/OS V2R1	New: Clear key support not available because of ICSF key policy.	Release update
473	z/OS V2R2	New: OCSP responder requires a signed request	Certificate revocation enhancement
474	z/OS V2R2	New: HTTP response is not valid	Certificate revocation enhancement
475	z/OS V2R2	New: OCSP response is not valid	Certificate revocation enhancement
476	z/OS V2R2	New: Session ID entry does not exist	Client session resumption enhancement
477	z/OS V2R2	New: Client session identifier does not match the server session identifier	Client session resumption enhancement

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Table 93. Summary of changes to function return codes (continued)

Function code	Release	Description	Reason for change
478	z/OS V2R2	New: Client session cache attributes do not agree	Client session resumption enhancement
479	z/OS V2R2	New: SID VALUE is not valid	Client session resumption enhancement
480	z/OS V2R2	New: PEER ID is not valid	Client session resumption enhancement
481	z/OS V2R2	New: OCSP request failed with internal responder error	Certificate revocation enhancement
482	z/OS V2R2	New: OCSP response is expired	Certificate revocation enhancement
483	z/OS V2R2	New: Error creating OCSP request	Certificate revocation enhancement
484	z/OS V2R2	New: Maximum response size exceeded	Certificate revocation enhancement
485	z/OS V2R2	New: HTTP server communication error	Certificate revocation enhancement
486	z/OS V2R2	New: Nonce in OCSP response does not match value in OCSP request	Certificate revocation enhancement
487	z/OS V2R2	New: OCSP response not received within configured time limit	Certificate revocation enhancement
488	z/OS V2R2	New: Revocation information is not yet valid	Certificate revocation enhancement
489	z/OS V2R2	New: HTTP server host name is not valid	Certificate revocation enhancement
490	z/OS V2R2	New: PKCS #12 file content not valid	PKCS#12 certificate storage
491	z/OS V2R2	New: Required basic constraints certificate extension is missing	Release update
492	z/OS V2R2	New: Maximum number of locations allowed to be contacted during certificate validation has been reached	Certificate revocation enhancement
493	z/OS V2R2	New: HTTP response not received within configured time limit	Certificate revocation enhancement
494	z/OS V2R2	New: LDAP response not received within configured time limit	Certificate revocation enhancement
495	z/OS V2R2	New: OCSP request failed with try later error	Certificate revocation enhancement
601	z/OS V1R13 with APAR OA39422	Changed: Protocol is not SSL V3, TLS V1.0, TLS V1.1, or TLS V1.2.	TLS V1.2

### Deprecated function return codes

Table 94 on page 209 lists the new and updated deprecated function return codes. See *z/OS Cryptographic Services System SSL Programming* for more detailed information.

Table 94. Summary of changes to deprecated function return codes

Function code	Release	Description	Reason for change
1	z/OS V2R2	Changed: Error detected while reading certificate database	PKCS#12 certificate storage
2	z/OS V2R2	Changed: Error detected while opening the certificate database.	PKCS#12 certificate storage
9	z/OS V2R2	Changed: Key label does not exist.	PKCS#12 certificate storage
12	z/OS V2R2	Changed: Key label is not found.	PKCS#12 certificate storage
18	z/OS V2R2	Changed: No certification authority certificates.	PKCS#12 certificate storage
19	z/OS V2R2	Changed: No certificates available.	PKCS#12 certificate storage
-7	z/OS V1R13	Changed: Session renegotiation is not allowed.	Documentation clarification
-15	z/OS V2R2	Changed: Certificate is not valid	PKCS#12 certificate storage
-18	z/OS V2R2	Changed: Self-signed certificate cannot be validated.	PKCS#12 certificate storage
-27	z/OS V1R13	Changed: Key entry does not contain a private key.	Documentation clarification
-35	z/OS V2R2	Changed: Certificate validation error.	PKCS#12 certificate storage
-55	z/OS V2R2	Changed: Incorrect key usage.	Documentation clarification
	z/OS V2R1	Changed: Incorrect key usage.	gskkyman menu restructuring. Updated menu titles.
-56	z/OS V2R2	Changed: Multiple certificates exist for label.	PKCS#12 certificate storage
-107	z/OS V2R1	New: ICSF services are unavailable.	Release update
-108	z/OS V2R1	New: ICSF callable service returned an error.	Release update
-109	z/OS V2R1	New: ICSF PKCS #11 not operating in FIPS mode.	Release update
-110	z/OS V2R1	New: ICSF PKCS #11 services are disabled.	Release update
-111	z/OS V2R1	New: ICSF clear key support not available.	Release update
-112	z/OS V2R2	New: LDAP Response not received within configured time limit	Certificate revocation enhancement
-124	z/OS V2R2	New: PKCS #12 file content not valid	PKCS#12 certificate storage
-125	z/OS V2R2	New: Required basic constraints certificate extension is missing	Release update

## gskkyman command

Table 95 identifies changes to the gskkyman command used by System SSL to manage certificates in the key database file. See *z/OS Cryptographic Services System SSL Programming* for more information about the gskkyman command.

Table 95. Summary of changes to gskkyman command

Release	Description	Reason for change
z/OS V2R2	Support for displaying certificates within a PKCS #12 file.	PKCS#12 files as a certificate store
z/OS V2R1	Support for creating x.509 certificates with DSA 2048-bit key sizes.	Enhanced DSA support
z/OS V2R1	Menus for creating certificates and certificate requests are refined to guide the user through the creation process.	gskkyman menu restructuring

## System SSL

Table 95. Summary of changes to gskkyman command (continued)

Release	Description	Reason for change
z/OS V1R13	Support for creating X.509 ECDSA certificates and certificate requests.	ECDSA Certificate Support



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## Chapter 9. DFSMS summary of interface changes

In addition to the interface changes included in this topic, updates to DFSMS resulted in SYS1.PARMLIB and SYS1.SAMPLIB member changes. See Chapter 2, “Summary of changes to SYS1.PARMLIB,” on page 7 and Chapter 4, “Summary of changes to SYS1.SAMPLIB,” on page 23 for those changes. See *z/OS MVS Initialization and Tuning Reference* for more information about these members. See *z/OS DFSMS OAM Planning, Installation, and Storage Administration Guide for Object Support* for information about the changes to the CBROAMxx member of SYS1.SAMPLIB.

The DFSMS interfaces described in this topics are:

- “DFSMSdfp summary of interface changes”
- “DFSMSdss summary of interface changes” on page 222
- “DFSMSshsm summary of interface changes” on page 223
- “DFSMSrmm summary of interface changes” on page 228
- “DFSMSstvs summary of interface changes” on page 234

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### DFSMSdfp summary of interface changes

This topic summarizes new and changed interfaces, commands, and panels for DFSMSdfp, OAM, and Advanced Copy Services. It also includes changes resulting from service updates and small programming enhancements.

#### Access method services

Table 96 on page 212 lists new and changed access method services (IDCAMS) commands and report types. See *z/OS DFSMS Access Method Services Commands* for more specific information about these commands.

## DFSMSdfp

Table 96. DFSMSdfp: Summary of new and changed IDCAMS commands

Command name	Release	Description	Reason for change
ALTER	z/OS V2R1	New Keywords: <b>EXTENDEDADDRESSABLE</b> Specifies that the non SMS VSAM LDS will be made eligible for Extended Addressability.	VSAM enhancements
	z/OS V2R1	New Keywords: <b>FIFO</b> Specifies the order is the oldest GDS defined to the newest GDS. <b>LIFO</b> Specifies the order is the newest GDS defined to the oldest GDS. This is the default value.	Release support
	z/OS V2R1	New Keywords: <b>LOGREPLICATE</b> Specifies that the VSAM data set is eligible for VSAM replication. <b>NOLOGREPLICATE</b> Specifies that the VSAM data set is not eligible for VSAM replication.	Release support
	z/OS V2R1	New Keywords: <b>RLSQUIESCE</b> Specifies that the cluster component will be defined in RLS QUIESCE mode. This is the default value. <b>RLSENABLE</b> Specifies that the cluster will be defined in RLS ENABLE mode.	RLS support for catalogs
	z/OS V2R1	New Keywords: <b>SUSPEND</b> Specifies that requests for this catalog will be suspended until a RESUME is issued via the F CATALOG,RECOVER,RESUME or ALTER RESUME command is issued. <b>RESUME</b> Specifies that requests for this catalog resume following an ALTER RESUME or F CATALOG,RECOVER,RESUME command.	Catalog enhancements
DCOLLECT	z/OS V2R2	New fields in the output	Storage group space alert messages and SMS space constraint relief enhancements

Table 96. DFSMSdfp: Summary of new and changed IDCAMS commands (continued)

Command name	Release	Description	Reason for change
DEFINE CLUSTER	z/OS V2R1	New Keywords: <b>LOGREPLICATE</b> Specifies that the VSAM data set is eligible for VSAM replication. <b>NOLOGREPLICATE</b> Specifies that the VSAM data set is not eligible for VSAM replication.	Release support
	z/OS V2R1	New Keywords: <b>RLSQUIESCE</b> Specifies the cluster component is defined in RLS quiesce mode, which is the default. <b>RLSENABLE</b> Specifies the cluster component is defined in RLS enable mode.	RLS support for catalogs
DEFINE GENERATIONDATAGROUP	z/OS V2R1	New Keywords: <b>FIFO</b> Specifies the order is the oldest GDS defined to the newest GDS. <b>LIFO</b> .Specifies the order is the newest GDS defined to the oldest GDS. This is the default value.	Release support
	z/OS V2R2	New Keywords: <b>PURGE</b> Specifies to override expiration dates when a generation data set (GDS) is rolled off and the SCRATCH parameter is set. <b>NOPURGE</b> Specifies to not override expiration dates when a generation data set (GDS) is rolled off. This is the default value.	RLS support for catalogs

## DFSMSdfp

Table 96. DFSMSdfp: Summary of new and changed IDCAMS commands (continued)

Command name	Release	Description	Reason for change
DEFINE USERCATALOG	z/OS V2R1	New Keywords: <b>LOG(NONE)</b> Specifies that the catalog is eligible to be accessed with VSAM record-level sharing (RLS) as a non-recoverable catalog.	VSAM enhancements
	z/OS V2R1	New Keywords: <b>RLSQUIESE</b> Specifies that the catalog will be accessed with NSR following the define of the catalog. This is the default value. <b>RLSENABLE</b> Specifies that the cluster will be accessed with RLS following the define of the catalog.	RLS support for catalogs
	z/OS V2R1	New Keywords: <b>RECONNECT</b> Specifies that the catalog being defined use existing alias information.	Release support
	z/OS V2R1	New Keywords: <b>SUSPEND</b> Specifies that requests for this catalog be suspended until a RESUME is issued via the F CATALOG,RECOVER,RESUME or ALTER RESUME command is issued. <b>RESUME</b> Specifies that requests for this catalog execute immediately. RESUME is the default.	Catalog enhancements
DELETE	z/OS V1R13	New Keywords: <b>MASK</b> Specifies that the entryname is a filter key. <b>NOMASK</b> Specifies that the entryname can be fully qualified or a generic name. When using a generic name, the asterisk(*) will only replace one single qualifier.	Release support
LISTCAT	z/OS V2R1	New Keywords: <b>LOGREPLICATE</b> On LISTCAT output, shows whether or not the VSAM data set is eligible for VSAM replication.	Release support

## APIs

### New and changed DFSMS APIs for z/OS V2R2

Table 97. Summary of new and changed DFSMS APIs for z/OS V2R2

API	Feature	Description
OSREQ RETRIEVE OSREQ STORE	OAM	Support for 64-bit virtual address buffers (BUFFER64, LENGTH64, OFFSET64, and SIZE64 on OSREQ RETRIEVE and OSREQ STORE) <b>Reason for change:</b> Release update

### New and changed DFSMS APIs for z/OS V2R1

Table 98. Summary of new and changed DFSMS APIs for z/OS V2R1

API	Feature	Description
STOREBEG	OAM	New minimum value of 50 megabytes for the SIZE parameter of the STOREBEG statement for objects being written anywhere other than an optical volume <b>Reason for change:</b> Release update.

## Callable services

The existing Catalog Search Interface (CSI) is enhanced in V2R2 with 3 new field names (CATACT, CATFLAGS and CATUCB) and a new entry type that can be used to retrieve control block data for catalogs. For more information, see *z/OS DFSMS Managing Catalogs*.

## Commands

Table 99 lists new and changed system-level commands related to DFSMSdfp support. See *z/OS DFSMS OAM Planning, Installation, and Storage Administration Guide for Object Support* and *z/OS MVS System Commands* for more specific information about these commands.

Table 99. DFSMSdfp: Summary of new and changed system-level commands

Command name	Release	Description	Reason for change
DISPLAY SMS	z/OS V2R2	<b>Changed:</b> New parameters to display the pool storage groups in the SMS configuration that have reached a space alert threshold.	Storage group space alert support
MODIFY CATALOG,CONTENTION	z/OS V2R1	<b>New:</b> New parameters to specify a new wait time or action (or both) for one of the reason classes or Catalog resources for which contention detection is available.	Resource contention detection
MODIFY OAM,DISPLAY	z/OS V2R1	<b>New:</b> New SETTLIB parameter displays the current setting of the SETTLIB statement for the OAM address space.	Tape library support

## DFSMSdfp

Table 99. DFSMSdfp: Summary of new and changed system-level commands (continued)

Command name	Release	Description	Reason for change
SETALLOC	z/OS V2R1	<b>New:</b> New BATCH_RCLMIGDS parameter specifies how migrated data sets will be recalled.	Catalog enhancement
SETSMS	z/OS V2R2	<b>New:</b> New USER_ACSVAR parameter specifies new values for the ACS read-only variable &USER_ACSVAR.	Release support
	z/OS V2R1	<b>New:</b> New PS_EXT_VERSION(1 2) parameter allows the system to support a version number for extended format data sets.	FlashCopy support
	z/OS V2R1	<b>New:</b> New CA_RECLAIM parameter enables or disables the CA reclaim function for the system. When enabled, CA reclaim causes empty CA space be reclaimed automatically for key-sequenced data sets.	CA reclaim support

## Data areas

There are no new or changed data areas for DFSMSdfp.

## Exits and mapping macros

Table 100. DADSM: Summary of new and changed exits

Exit Name	Release	Description	Reason for change
IGGPREE0_EXIT	z/OS V1R13	DADSM pre-processing dynamic exit.	DADSM/CVAF Device Support Simplification
IGGPOST0_EXIT	z/OS V1R13	DADSM post-processing dynamic exit.	DADSM/CVAF Device Support Simplification

Table 101 lists the changes to exit parameter list mapping macros for DFSMSdfp. For more exit information, see *z/OS DFSMS Installation Exits*.

Table 101. DFSMSdfp: Summary of new and changed mapping macros

Macro name	Release	Description	Reason for change
IFGTPEP mapping macro for the Label Anomaly Exit	z/OS V1R13	<b>Added:</b> The new bits TEPAVOLLST and TEPAPREVL have been added.	Recovery for missing and out of order tape volumes
IGDACERO	z/OS V2R1	<b>Added:</b> Bits have been added.	Release support

## ISMF panels

Table 102 lists changes to ISMF panels for DFSMSdfp. For more information about these panels, see *z/OS DFSMSdfp Storage Administration* and *z/OS DFSMS Using the Interactive Storage Management Facility*.

Table 102. DFSMSdfp: Summary of new and changed ISMF panels

Panel and application name	Release	Description	Reason for change
Pool Storage Group Define panel	z/OS V2R2	New: Total Space Alert Threshold % and Track-Managed Space Alert Threshold % fields	Support for storage group space alert messages
Storage Class Define panel	z/OS V1R13	New: Disconnect Sphere at CLOSE field controls how the record level sharing (RLS) sphere is disconnected after the data set last closed.	VSAM RLS buffer management facility enhancement.
Storage Group Application Selection panel	z/OS V1R13	New: Space in GB field, with the List option, lets you display space information in gigabytes (GB).	Release support.
Data Class Define and Alter panels	z/OS V2R2	New: Guaranteed Space Reduction field, to specify whether or not space reduction on guaranteed space allocations is permitted.	SMS space constraint relief enhancements
	z/OS V2R1	New: Options for the Compaction field, ZR ("zEDC Required") and ZP ("zEDC Preferred")	zEDC Compression
	z/OS V2R1	New: Log Replicate field, to specify eligibility for VSAM replication; new values for the Record Access Bias field; new RMODE31 field.	Release support.
	z/OS V1R13	Changed: The maximum data set retention period is now 93000 days rather than 9999 days.	Release support.
Management Class Define panel	z/OS V1R13	Changed: The maximum data set retention period is now 93000 days rather than 9999 days.	Release support.
Data Class List panel	z/OS V2R1	New: Log Replicate column.	Release support.
Data Class Print panel	z/OS V2R1	New: Log Replicate field.	Release support.
Data Class Sort Entry panel	z/OS V2R1	New: Log Replicate field.	Release support.
Data Class View Entry panel	z/OS V2R1	New: Log Replicate field.	Release support.

## Macros

Table 103 lists new and changed executable macros for DFSMSdfp.

Table 103. DFSMSdfp: Summary of new and changed executable macros

Macro name	Release	Description	Reason for change
ANTRQST	z/OS V2R1	<b>New:</b> REQUEST=PSETCHAR for ILK=PPRC: Set characteristics of a PPRC primary and secondary volume pair, including whether the pair is to be used for a Preserve Mirror function in a Multi-Target Mirror configuration.	Multi-Target Mirror support

## DFSMSdfp

Table 103. DFSMSdfp: Summary of new and changed executable macros (continued)

Macro name	Release	Description	Reason for change
ANTRQST	z/OS V2R1	<b>New:</b> MTFAILOVER subparameter for REQUEST=PESTPAIR.	Multi-Target Mirror support
ANTRQST	z/OS V2R1	<b>New:</b> MTVOLLIST and MTVOLRANGE parameters, on REQUEST=RVOLUME, for multi-target volume list and multi-target volume range.	Multi-Target Mirror support
ANTRQST	z/OS V2R1	<b>New:</b> XFEATURES parameter, on REQUEST=XQUERY, specifies that the requested report display the Licensed Internal Code (LIC) features available to the storage control.	Workload-based write pacing support
ANTRQST	z/OS V2R1	<b>Updated:</b> VOLUME PACE report is expanded when workload-based write pacing is in effect.	Workload-based write pacing support
ANTRQST	z/OS V2R1	<b>Updated:</b> The DVCBLOCK parameter, on REQUEST=XADD and REQUEST=XSET, is handled differently with workload-based write pacing.	Workload-based write pacing support
ANTRQST	z/OS V1R13	<b>New:</b> SDEVN, SWWNN and PATHS=LNK subparameters for REQUEST=PQUERY.	System Data Mover RAS
LSPACE	z/OS V2R1	<b>New:</b> ENQHELD keyword specifies whether or not the LSPACE caller's address space has already obtained the SYSVTOC resource.	Release update

## NaviQuest panels

Table 104 identifies new and changed NaviQuest panels. The NaviQuest panels provide sample JCL for various tasks, such as creating a copy pool report. See *z/OS DFSMSdfp Storage Administration* for more information about NaviQuest.

Table 104. DFSMSdfp: Summary of new and changed NaviQuest panels

NaviQuest panel	Release	Description	Reason for change
ACBQVAR1	z/OS V1R13	<b>Changed:</b> now supports sorting on a field.	NaviQuest enhancement.
ACBJBAS1	z/OS V1R13	<b>Changed:</b> new field, Disconnect Sphere at CLOSE.	SAM RLS buffer management facility enhancement.

## Programming interfaces

Table 105 lists new and changed programming interfaces for DFSMSdfp.

Table 105. DFSMSdfp: Summary of new and changed programming interfaces

Programming Interface	Release	Description	Reason for change
ANTTREXX	z/OS V2R1	<b>New:</b> PSETCHAR request type: Set characteristics of a PPRC primary and secondary volume pair, including whether the pair is to be used for a Preserve Mirror function in a Multi-Target Mirror configuration.	Multi-Target Mirror support.



Table 105. DFSMSdfp: Summary of new and changed programming interfaces (continued)

Programming Interface	Release	Description	Reason for change
ANTTREXX	z/OS V2R1	<b>New:</b> MTFAILOVER subparameter for PESTPAIR request type, to convert a cascaded configuration to a multi-target configuration.	Multi-Target Mirror support.
ANTTREXX	z/OS V2R1	<b>New:</b> MTVOLLIST and MTVOLRANGE parameters, on RVOLUME requests, for multi-target volume list and multi-target volume range.	Multi-Target Mirror support.
ANTTREXX	z/OS V2R1	<b>New:</b> XFEATURES parameter, on XQUERY requests, specifies that the requested report display the Licensed Internal Code (LIC) features available to the storage control.	Workload-based write pacing support.
ANTTREXX	z/OS V2R1	<b>Updated:</b> VOLUME PACE report is expanded when workload-based write pacing is in effect.	Workload-based write pacing support.
ANTTREXX	z/OS V2R1	<b>Updated:</b> The DVCBLOCK parameter, on XADD and XSET requests, is handled differently with workload-based write pacing.	Workload-based write pacing support.

## RACF commands and FACILITY class profiles

Table 106 identifies new and changed RACF FACILITY CLASS profiles for DFSMSdfp. See *z/OS Security Server RACF Security Administrator's Guide* for information about RACF. See *z/OS DFSMS Managing Catalogs* for further information about using this Facility Class to restrict access to MODIFY CATALOG commands.

Table 106. DFSMSdfp: Summary of changes to RACF FACILITY class profiles

RACF Function	Release	Description	Reason for change
OPERCMD MVS.MODIFY.STC.CATALOG.CATALOG.SECURE	z/OS V2R2	<b>New:</b> This Profile in the OPERCMDS Class determines whether a user can access CATALOG MODIFY commands that alter the catalog environment, or only those commands that report on Catalog Activity.	To provide enhanced security for the MODIFY CATALOG command.

## SMF and LOGREC records

Table 107 lists changes to SMF records used by DFSMS. For more detailed SMF information, see *z/OS MVS System Management Facilities (SMF)*. For more LOGREC information, see *z/OS MVS Diagnosis: Reference*. For information about the SMF Type 85 records, see *z/OS DFSMS OAM Planning, Installation, and Storage Administration Guide for Object Support*. For information about other SMF Type records, see *z/OS MVS System Management Facilities (SMF)*.

Table 107. DFSMSdfp: Summary of new and changed SMF records

Event code or record type	Release	Description	Reason for change
SMF Type 85	z/OS V2R2	<b>New:</b>	64-bit buffer support

## DFSMSdfp

Table 107. DFSMSdfp: Summary of new and changed SMF records (continued)

Event code or record type	Release	Description	Reason for change
SMF Type 42	z/OS V2R2	<b>New:</b> Subtype 27	VTOC Event Log

## SMS ACS read-only variables

Table 108 lists new and changed ACS read-only variables for DFSMSdfp.

Table 108. DFSMSdfp: Summary of new and changed ACS read-only variables

Variable name	Release	Description	Reason for change
&EATTR	z/OS V2R1	<b>New:</b> Contains the value of the EATTR keyword specified with JCL, dynamic allocation, AMS DEFINE or the data class.	Release support
&USER_ACSVAR	z/OS V2R2	<b>New:</b> Is a user-defined variable. The values are derived from the USER_ACSVAR parameter, which is defined in the IGDSMSxx member of PARMLIB. They can be altered by the SETSMS USER_ACSVAR command.	Release support

## SMS Constructs

There are no new or changed SMS Constructs for DFSMSdfp for z/OS V2R2.

Table 109 identifies changes to the SMS constructs, such as data class, management class, storage class, and storage group. See *z/OS DFSMSdfp Storage Administration* for more information about SMS constructs.

Table 109. DFSMSdfp: Summary of changes to SMS constructs

Construct	Release	Description	Reason for change
Storage class	z/OS V1R13	<b>New field:</b> Disconnect Sphere at CLOSE, which controls how the record level sharing (RLS) sphere is disconnected after the data set last closed.	VSAM RLS buffer management facility enhancement.
Data Class	z/OS V1R13	<b>Changed field:</b> The maximum data set retention period is now 93000 days rather than 9999 days.	Release support.
Management Class	z/OS V1R13	<b>Changed field:</b> The maximum data set retention period is now 93000 days rather than 9999 days.	Release support.

## SYS1.NUCLEUS members

There are no new or changed SYS1.NUCLEUS members for DFSMSdfp.

## TSO/E commands for Advanced Copy Services

Table 110. Summary of new and changed TSO/E commands for Advanced Copy Services

Command name	Release	Description	Reason for change
CESTPAIR	z/OS V2R1	<b>New:</b> MTFAILOVER parameter, to convert a cascaded configuration to a multi-target configuration.	Multi-Target Mirror support.

Table 110. Summary of new and changed TSO/E commands for Advanced Copy Services (continued)

Command name	Release	Description	Reason for change
CQUERY	z/OS V2R1	<b>New:</b> The value for STATE in formatted output for CQUERY now shows MTIR to indicate Multi-Target Internal Relationship (MTIR). In addition, the output for CQUERY VOLUME and CQUERY PATHS is expanded.	Multi-Target Mirror support.
PSETCHAR	z/OS V2R1	<b>New:</b> Set characteristics of a PPRC primary and secondary volume pair, including whether the pair is to be used for a Preserve Mirror function in a Multi-Target Mirror configuration.	Multi-Target Mirror support.
RVOLUME	z/OS V2R1	<b>New:</b> MTVOLLIST and MTVOLRANGE parameters, for multi-target volume list and multi-target volume range.	Multi-Target Mirror support.
XADDPAIR	z/OS V2R1	<b>Updated:</b> The DVCBLOCK parameter is handled differently with workload-based write pacing.	Workload-based write pacing support.
XQUERY	z/OS V2R1	<b>New:</b> OFL and ONL options for the STATUS filtering parameter of the XQUERY command show offline or online volumes.	Release update.
	z/OS V2R1	<b>New:</b> XFEATURES with STORAGECONTROL specifies that the requested report display the Licensed Internal Code (LIC) features available to the storage controls.	Workload-based write pacing support.
	z/OS V2R1	<b>Updated:</b> VOLUME PACE report is expanded when workload-based write pacing is in effect.	Workload-based write pacing support.
XSET	z/OS V2R1	<b>Updated:</b> The DVCBLOCK parameter is handled differently if workload-based write pacing is in use.	Workload-based write pacing support.
CQUERY	z/OS V1R13	<b>New:</b> SDEVN, SWWNN and LINKINFO parameters on the CQUERY command display information about linkage between the primary and secondary storage controllers.	System Data Mover RAS.
XQUERY	z/OS V1R13	<b>New:</b> A BK2 option for the STATUS filtering parameter of the XQUERY VOLUME command shows all volumes that are contributing to high residual counts and application impact.	System Data Mover RAS.
XQUERY	z/OS V1R13	<b>Updated:</b> The VOLUME_PACE report generated by the XQUERY command now uses the WrtPacingResidualCnt value in PARMLIB member ANTXIN00 when determining whether to flag a volume as blocked.	System Data Mover RAS.

## Utilities

Table 111 on page 222 identifies changes to the DFSMS utilities. For detailed information about DFSMS utilities, refer to *z/OS DFSMS Utilities*.

## DFSMSdfp

Table 111. DFSMSdfp: Summary of changes to utilities

Utility name	Release	Description	Reason for change
IEBCOPY	V2R1	Changed AMODE from 24 to ANY IEBCOPY	IEBCOPY improvements
IEBCOPY	V2R1	New COPYGROUP statement	IEBCOPY improvements
IEBCOPY	V2R1	SELECT statement supports wildcard characters	IEBCOPY improvements
IEBCOPY	V2R1	Supports user exits from calling programs, for control statements and member selection.	IEBCOPY improvements
IEBCOPY	V2R1	Provides ABEND and reason codes for certain ABENDs.	IEBCOPY improvements
IEBCOPY	V1R13	Removal of the APF-authorization requirement, other performance improvements	IEBCOPY improvements
IEBPDSE	V1R13	PDSE Validation utility	new

## DFSMSdss summary of interface changes

This topic summarizes new and changed interfaces, commands, and panels for DFSMSdss.

### APIs

There are no new or changed application programming interfaces for DFSMSdss.

### Commands

Table 112 lists new and changed commands for DFSMSdss. For descriptions and syntax of the DFSMSdss commands, see *z/OS DFSMSdss Storage Administration*.

Table 112. DFSMSdss: Summary of changed commands

Command name	Release	Description	Reason for change
CGCREATED	z/OS V2R1	<b>Updated:</b> New FCCGVERIFY keyword.	Release support.
CONVERTV, COPY, RESTORE	z/OS V2R1	<b>Updated:</b> New DEBUG(SMSMSG) option.	Release support.
COPY, RESTORE	z/OS V2R1	<b>Updated:</b> The RENAMEUNCONDITIONAL keyword now works for VSAM data sets.	Release support.
RESTORE	z/OS V2R1	<b>Updated:</b> The REPLACEUNCONDITIONAL keyword now works for physical data sets.	Release support.
	z/OS V2R1	<b>Updated:</b> New RESET keyword for RESTORE FULL and RESTORE TRACKS.	Release support.
COPY, DUMP, PRINT and RESTORE	z/OS V1R13	<b>Updated:</b> Specifying X'FFFFFFF' (or 268435455) as the value for high cylinder on the TRACKS parameter causes DFSMSdss to use the end of the volume for the high cylinder value.	Release support.

### Data areas

Table 113. DFSMSdss: Summary of changed data areas

Data area names	Release	Description	Reason for change
ADREID0	z/OS V2R1	<b>Updated:</b> Various changes.	Release support.

## EXEC PARM values

There are no changes to DFSMSdss EXEC PARM values for z/OS V2R2, V2R1, or V1R13.

## Exits

Table 114 lists new and changed exits for DFSMSdss. For descriptions of the DFSMSdss exits, see *z/OS DFSMSdss Storage Administration*.

Table 114. DFSMSdss: Summary of changed exits

Exit Name	Release	Description	Reason for change
ADRDYEXT_EXIT1	z/OS V2R1	<b>New:</b> New installation exit	Release update
Eioption 30	z/OS V2R1	Indicates to the UIM that allocation to the specified SMS volume failed during physical data set RESTORE or COPY.	Release support.
ADRUIXIT	z/OS V2R1	<b>Changed:</b> Bits are added to the ADRUFO parameter list.	Release support.

## ISMF panels

There are no new or changed ISMF panels for DFSMSdss.

## RACF FACILITY class profiles

There are no changes to RACF FACILITY class profiles for DFSMSdss for z/OS V2R2, V2R1, or V1R13.

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## DFSMSHsm summary of interface changes

This topic summarizes new and changed interfaces for DFSMSHsm. It also includes changes resulting from service updates and small programming enhancements.

## Commands

This topic identifies the new and changed DFSMSHsm commands. DFSMSHsm commands are documented in *z/OS DFSMSHsm Storage Administration* and *z/OS DFSMSHsm Managing Your Own Data*.

### DFSMSHsm command changes in z/OS V2R2

Table 115. DFSMSHsm: Summary of changed commands in z/OS V2R2

Command name	Description and reason for change
BACKVOL	<ul style="list-style-type: none"> <li>The new DUMPCLASS parameter now allows a MINSTACK keyword, to define the minimum number of dump copies that can be placed on a tape volume.</li> <li>MAXSTACK has been added as an alias for the STACK parameter.</li> </ul> <p><b>Reason for change:</b> Distributed tape processing enhancements</p>
DEFINE	<ul style="list-style-type: none"> <li>The new DUMPCLASS parameter now allows a MINSTACK keyword, to define the minimum number of dump copies that can be placed on a tape volume.</li> <li>MAXSTACK has been added as an alias for the STACK parameter.</li> </ul> <p><b>Reason for change:</b> Distributed tape processing enhancements</p>

## DFSMSHsm

Table 115. DFSMSHsm: Summary of changed commands in z/OS V2R2 (continued)

Command name	Description and reason for change
FRBACKUP	The MESSAGEDATASET parameter has been added, allowing you to specify the date and time used in the name of the fast replication message data set. <b>Reason for change:</b> Message simplification
FRRECOV COPYPOOL	The MESSAGEDATASET parameter has been added, allowing you to specify the date and time used in the name of the fast replication message data set. <b>Reason for change:</b> Message simplification
HMIGRATE	<ul style="list-style-type: none"> <li>The TRANSITION and MOVE parameters have been added to allow you to specify whether the data set should go through transition or move processing.</li> <li>Optional MANAGEMENTCLASS, STORAGECLASS, STORAGEGROUP subparameters have been added to the TRANSITION parameter.</li> </ul> <b>Reason for change:</b> Storage tiers enhancements
LIST	The LIST DUMPCLASS command now shows the minimum and maximum stack values for both DEFINE and BACKVOL. <b>Reason for change:</b> Distributed tape processing enhancements
MIGRATE	<ul style="list-style-type: none"> <li>BOTH, MIGRATIONONLY, and TRANSITIONONLY parameters are added for VOLUME processing to indicate that only migrations should be processed, only transitions should be processed, or that both should be processed.</li> <li>Optional MANAGEMENTCLASS, STORAGECLASS, STORAGEGROUP subparameters have been added to the TRANSITION and TRANSITIONONLY parameters.</li> <li>STORAGEGROUP parameter is added to request that migrations or class transitions be performed at the storage group level.</li> <li>MOVE parameter is added for the MIGRATE DATASETNAME, MIGRATE STORAGEGROUP and MIGRATE VOLUME commands, to indicate that the data set should go through move processing.</li> </ul> <b>Reason for change:</b> Storage tiers enhancements
QUERY	The DUMP parameter has been added to the QUERY COMMONQUEUE command to display active and queued requests in the DFSMSHsm common dump queue. <b>Reason for change:</b> Distributed tape processing enhancements

Table 115. DFSMSHsm: Summary of changed commands in z/OS V2R2 (continued)

Command name	Description and reason for change
SETSUS	<p>New parameters have been added for use with COMMONQUEUE to allow DFSMSHsm hosts to participate in a common dump queue.  <b>Reason for change:</b> Distributed tape processing enhancements</p> <p>The MAXDUMPTASKS parameter now accepts a value of 0, which allows a host running in a common dump queue to submit requests, while preventing the common dump queue from using its available dump tasks for processing.  <b>Reason for change:</b> Distributed tape processing enhancements</p> <p>The MESSAGEDATASET parameter has been added for use with FASTREPLICATION to allow messages for fast replication backup, dump, and recover to be recorded in a unique data set.  <b>Reason for change:</b> Message simplification</p>
UPDTCDS	<p>The UPDTCDS command has been added to let you update the expiration date of copy pool dump copies.  <b>Reason for change:</b> Serviceability and usability enhancements</p>

### DFSMSHsm command changes in z/OS V2R1

Table 116. DFSMSHsm: Summary of changed commands in z/OS V2R1

Command name	Description and reason for change
DEFINE	<p>The DUMPCLASS parameter now allows a RECOVERRESET keyword, which specifies whether or not the data-set-changed indicator in the VTOC is reset for all data sets that are restored during full-volume recover processing.  <b>Reason for change:</b> Serviceability and usability enhancements</p>
FRBACKUP	<p>The ALL subparameter has been added for FCINCREMENTAL and FCINCREMENTALLAST, to specify that an incremental copy pool version is to be created and all subsequent copy pool backup copies should also be incremental.  <b>Reason for change:</b> Multiple Incremental FlashChopy target support</p>
FRRECOV	<p>The NEWNAME(<i>newsname</i>) parameter has been added, allowing DFSMSHsm to use a new, fully-qualified data set name for the recovered backup version or dump copy.  <b>Reason for change:</b> Fast replication enhancements</p>
LIST	<p>The SELECT(RECYCLETAKEAWAY) subparameter has been added to the LIST TAPETABLEOFCONTENTS command, to display the volumes that were not completely recycled because they were taken away by recall or another DFSMSHsm task.  <b>Reason for change:</b> Serviceability and usability enhancements</p>
QUERY	<p>The output returned from the QUERY ACTIVE(TCBADDRESS) command has been changed to include the tape volser, device address, and task name.  <b>Reason for change:</b> Serviceability and usability enhancements</p>

## DFSMSHsm

Table 116. DFSMSHsm: Summary of changed commands in z/OS V2R1 (continued)

Command name	Description and reason for change
SETSYS	<p>The CLASSTRANSTION(EVENTDRIVENMIGRATION(Y N)) parameter has been added, to specify settings for class transitions during interval migration and on-demand migration windows. The additional SERIALIZATIONEXITS(Y N) subparameter indicates whether the user data set serialization error exits will be used during event driven migration.</p> <p><b>Reason for change:</b> Storage tiers support</p> <p>The MIGRATIONSUBTASKS(YES NO) parameter had been added, allowing DFSMSHsm to run multiple subtasks concurrently under each migration task. The additional ADDITIONALSUBTASKS(nn) subparameter allows you to dynamically change the number of additional subtasks that the system can use.</p> <p><b>Reason for change:</b> Migration subtasking support</p> <p>The RECYCLETAKEAWAYRETRY(YES   NO) parameter has been added, allowing DFSMSHsm to automatically generate a new RECYCLE command for a tape when the original recycle must terminate due to the takeaway process, or when the tape is in use by the another DFSMSHsm task. Two additional subparameters, MAXRETRYATTEMPTS(<i>nn</i>) and DELAY(<i>ssss</i>), allow you to set the maximum number of recycle retry attempts and to set the delay interval in seconds between recycle attempts, respectively.</p> <p><b>Reason for change:</b> Serviceability and usability enhancements</p> <p>The (TAPECOPY   RECYCLE) subparameter has been added to both the BACKUP and the MIGRATION parameters of the SETSYS DUPLEX command. It specifies whether, after an error occurs on the duplex alternate tape and the alternate tape is demounted and discarded so that DFSMSHsm can continue to write to the original tape, a tapecopy or a recycle will be immediately attempted.</p> <p><b>Reason for change:</b> Serviceability and usability enhancements</p>

## DFSMSHsm command changes in z/OS V1R13

Table 117. DFSMSHsm: Summary of changed commands in z/OS V1R13

Command name	Description and reason for change
ONLYIF	<p>More than one value for <i>hostid</i> can be specified, each separated by a comma. Also, a group of commands can be conditionally executed when surrounded by the new BEGIN and END operators.</p> <p><b>Reason for change:</b> DFSMSHsm usability enhancements</p>



Table 117. DFSMSHsm: Summary of changed commands in z/OS V1R13 (continued)

Command name	Description and reason for change
SETSYS	<p>ONDEMANDMIGRATION parameter indicating that the On Demand Migration function should be used instead of Interval Migration on SMS volumes.  <b>Reason for change:</b> DFSMSHsm space management performance improvements</p> <p>FASTREPLICATION (VOLUMEPAIRMESSAGES(YES NO)) parameter is added to suppress or display ARC1801 messages.  <b>Reason for change:</b> An easier way to control the ARC1809I messages</p> <p>RELEASE RECALL(DASD) parameter, used to release recalls from DASD volumes while continuing to hold recalls on tape volumes.  <b>Reason for change:</b> Enhancement to RELEASE RECALL</p> <p>The default on FASTREPLICATION(PREFERRED   REQUIRED   NONE) has been changed to NONE.  <b>Reason for change:</b> DFSMSHsm usability enhancements</p>

## Data areas

DFSMSHsm control blocks and data areas are documented in *z/OS DFSMSHsm Data Areas*, which is from the z/OS Internet library ([www.ibm.com/systems/z/os/zos/library/bkserv](http://www.ibm.com/systems/z/os/zos/library/bkserv)).

## Event codes

Table 118 identifies new and changed DFSMSHsm event codes, which are documented in *z/OS MVS Programming Authorized Assembler Services Reference Volume 2* and *z/OS MVS Programming Authorized Assembler Services Guide*.

Table 118. DFSMSHsm: Summary of new and changed event codes

Event code	Release	Description	Reason for change
ENF72	z/OS V1R13	<b>New:</b> ENFREQ event code providing Volume Status information.	DFSMSHsm space management performance improvements

## Exits

Table 119 identifies the new and changed DFSMSHsm exits. DFSMSHsm exits are documented in *z/OS DFSMS Installation Exits*.

Table 119. DFSMSHsm: Summary of changed exits

Exit name	Release	Description	Reason for change
ARCMDEXT	z/OS V2R1	<b>Changed:</b> Space management exit, updated to reflect the new concept of class transition.	Storage tiers support

## Macros

### DFSMSHsm macro changes in z/OS V2R2

Table 120 on page 228 identifies the new and changed DFSMSHsm macros. DFSMSHsm macros are documented in *z/OS DFSMSHsm Managing Your Own Data*.

## DFSMSHsm

Table 120. DFSMSHsm: Summary of changed executable macros in z/OS V2R2

Macro name	Description
ARCHMIG	<ul style="list-style-type: none"> <li>TRANSITION and MOVE parameters have been added to allow you to specify whether the data set should go through transition or moving processing.</li> <li>The ARCHMIG macro has a new SMSAREA parameter and new optional SMS subparameters for the TRANSITION parameter.</li> </ul> <p><b>Reason for change:</b> Storage tiers enhancements</p>

## RACF FACILITY class profiles

Table 121 identifies the new and changed RACF FACILITY class profiles for DFSMSHsm. See *z/OS Security Server RACF Security Administrator's Guide* for information about RACF.

Table 121. DFSMSHsm: Summary of changes to RACF FACILITY class profiles

FACILITY class profile	Release	Description	Reason for change
STGADMIN.ARC.UPDTCDS	z/OS V2R2	<b>New:</b> Controls access to the DFSMSHsm UPDATECDS command	Serviceability and usability enhancements

## DFSMSrmm summary of interface changes

### Commands

Table 122 lists new and changed commands for DFSMSrmm. See *z/OS DFSMSrmm Managing and Using Removable Media* for more specific information about these commands.

Table 122. DFSMSrmm: Summary of changed commands

Command name	Release	Description	Reason for change
CHANGEDATASET	z/OS V2R2	<b>New:</b> EXPTM and WHILECATALOG operands are added.	V2R2 function.
CHANGEVOLUME	z/OS V2R2	<b>New:</b> EXPTM operand is added.	V2R2 function.
SEARCHDATASET	z/OS V2R2	<b>New:</b> <i>start_time</i> and <i>end_time</i> suboperands added to CRDATE operand	V2R2 function
SEARCHVOLUME	z/OS V2R2	<b>New:</b> <i>start_time</i> and <i>end_time</i> suboperands added to CRDATE operand	V2R2 function
ADDDATASET	z/OS V2R1	<b>New:</b> LASTREF/NOLASTREF operands are added.	V2R1 function.
ADDVOLUME	z/OS V2R1	<b>New:</b> RETAINBY operand is added.	V2R1 function.
CHANGEDATASET	z/OS V2R1	<b>New:</b> LASTREF/NOLASTREF operands are added.	V2R1 function.
CHANGEVOLUME	z/OS V2R1	<b>New:</b> RETAINBY operand is added.	V2R1 function.
SEARCHVOLUME	z/OS V2R1	<b>New:</b> RETAINBY operand is added.	V2R1 function.
ADDDATASET	z/OS V1R13	<b>Changed:</b> The maximum allowable value for the BLKCOUNT parameter has increased	V1R13 function.

Table 122. DFSMSrmm: Summary of changed commands (continued)

Command name	Release	Description	Reason for change
ADDDVOLUME	z/OS V1R13	<b>New:</b> RETENTIONMETHOD operand is added.	Enhanced data set retention support.
CHANGEDATASET	z/OS V1R13	<b>New:</b> VRSELEXCLUDE operand is added. <b>Changed:</b> The maximum allowable value for the BLKCOUNT parameter has increased	<ul style="list-style-type: none"> <li>Enhanced data set retention support.</li> <li>V1R13 function.</li> </ul>
CHANGEVOLUME	z/OS V1R13	<b>New:</b> RETENTIONMETHOD operand is added.	Enhanced data set retention support.
SEARCHDATASET	z/OS V1R13	<b>New:</b> CATALOG, CRDATE, DATACLASS, EXPDT, FORCE, LASTCHANGEDATE, LASTREFDATE, MANAGEMENTCLASS, NODATACLASS, NOMANAGEMENTCLASS, NOOEXPDT, NOSTORAGECLASS, NOSTORAGEGROUP, OEXPDT, READDATE, RETDATE, STORAGECLASS, STORAGEGROUP, VRSELEXCLUDE, and WRITEDATE operands are added.	Enhanced search capabilities.
SEARCHVOLUME	z/OS V1R13	<b>New:</b> EXPDT and RETENTIONMETHOD operands are added.	Enhanced data set retention support.
SEARCHVRS	z/OS V1R13	<b>New:</b> LASTCHANGEDATE and LASTREFDATE operands are added.	Enhanced search capabilities.

## Data areas

Table 123 lists new and changed data areas. For more information about DFSMSrmm data areas, see *z/OS DFSMSrmm Reporting*.

Table 123. DFSMSrmm: Summary of new and changed data areas

Data area name	Release	Description	Reason for change
EDGRVEXT	z/OS V2R2	<b>Changed:</b> Extract Data Set Volume Report Record.	Support for V2R2 function.
EDGRXEXT	z/OS V2R2	<b>Changed:</b> Extract Data Set Extended Data Set Name Record.	Support for V2R2 function.
EDGSDREC	z/OS V2R2	<b>Changed:</b> SMF Data Set Information.	Support for V2R2 function.
EDGSVREC	z/OS V2R2	<b>Changed:</b> SMF Volume Information.	Support for V2R2 function.
EDGACTSY	z/OS V2R1	<b>Changed:</b> Activity File Symbols.	Support for V2R1 function.
EDGCLREC	z/OS V2R1	<b>Changed:</b> Conversion Library Information.	Support for V2R1 function.
EDGLCSUP	z/OS V2R1	<b>Changed:</b> OAM Interface.	Support for V2R1 function.
EDGEXTSY	z/OS V2R1	<b>Changed:</b> Extract Data Set Symbols.	Support for V2R1 function.

## DFSMSrmm

Table 123. DFSMSrmm: Summary of new and changed data areas (continued)

Data area name	Release	Description	Reason for change
EDGPL100	z/OS V2R1	<b>Changed:</b> Installation Exit Mapping Macro.	Support for V2R1 function.
EDGPL200	z/OS V2R1	<b>Changed:</b> Installation Exit Mapping Macro.	Support for V2R1 function.
EDGPL300	z/OS V2R1	<b>Changed:</b> Installation Exit Mapping Macro.	Support for V2R1 function.
EDGRVEXT	z/OS V2R1	<b>Changed:</b> Extract Data Set Volume Report Record.	Support for V2R1 function.
EDGRXEXT	z/OS V2R1	<b>Changed:</b> Extract Data Set Extended Data Set Name Record.	Support for V2R1 function.
EDGSLAB	z/OS V2R1	<b>Changed:</b> Sticky Label Data.	Support for V2R1 function.
EDGSRC SY	z/OS V2R1	<b>Changed:</b> Inventory Management SMF Record	Support for V2R1 function.
EDGSVREC	z/OS V2R1	<b>Changed:</b> SMF Volume Information.	Support for V2R1 function.
EDGACTSY	z/OS V1R13	<b>Changed:</b> Activity File Symbols.	Support for Release 13 function.
EDGCLREC	z/OS V1R13	<b>Changed:</b> Conversion Library Information.	Support for Release 13 function.
EDGLCSUP	z/OS V1R13	<b>Changed:</b> OAM Interface.	Support for Release 13 function.
EDGEXTSY	z/OS V1R13	<b>Changed:</b> Extract Data Set Symbols.	Support for Release 13 function.
EDGPL100	z/OS V1R13	<b>Changed:</b> Installation Exit Mapping Macro.	Support for Release 13 function.
EDGPL200	z/OS V1R13	<b>Changed:</b> Installation Exit Mapping Macro.	Support for Release 13 function.
EDGPL300	z/OS V1R13	<b>Changed:</b> Installation Exit Mapping Macro.	Support for Release 13 function.
EDGRVEXT	z/OS V1R13	<b>Changed:</b> Extract Data Set Volume Report Record.	Support for Release 13 function.
EDGRXEXT	z/OS V1R13	<b>Changed:</b> Extract Data Set Extended Data Set Name Record.	Support for Release 13 function.
EDGSLAB	z/OS V1R13	<b>Changed:</b> Sticky Label Data.	Support for Release 13 function.
EDGSRC SY	z/OS V1R13	<b>Changed:</b> Inventory Management SMF Record	Support for Release 13 function.
EDGSVREC	z/OS V1R13	<b>Changed:</b> SMF Volume Information.	Support for Release 13 function.

## ISPF panels

Table 124 lists new and changed DFSMSrmm ISPF panels.

Table 124. DFSMSrmm: Summary of new and changed ISPF panels

Panel name	Release	Description	Reason for change
EDGHT01H	z/OS V2R2	<b>Changed:</b> Creation start time, creation end time	Search volumes by date/time ranges
EDGPD010	z/OS V2R2	<b>Changed:</b> Creation start time, creation end time	Search volumes by date/time ranges
EDGPT010	z/OS V2R2	<b>Changed:</b> Creation start time, creation end time	Search volumes by date/time ranges

Table 124. DFSMSrmm: Summary of new and changed ISPF panels (continued)

Panel name	Release	Description	Reason for change
EDGPT010	z/OS V2R1	<b>Changed:</b> RetainBy	EXPDT retention method
EDGPT020	z/OS V2R1	<b>Changed:</b> Ret	EXPDT retention method
EDGPT030	z/OS V2R1	<b>Changed:</b> LRef XDays	EXPDT retention method
EDGHT11S	z/OS V2R1	<b>New:</b> Retainby	EXPDT retention method
EDGHT02I	z/OS V2R1	<b>New:</b> Ret (6)	EXPDT retention method
EDGHD02I	z/OS V2R1	<b>New:</b> LASTREF Extra Days (6)	EXPDT retention method
EDGHT11H	z/OS V2R1	<b>Changed:</b> SET RETAINED	EXPDT retention method
EDGHT020	z/OS V2R1	<b>Changed:</b> LASTREF Extra Days (6)	EXPDT retention method
EDGHD030	z/OS V2R1	<b>Changed:</b> SET RETAINED	EXPDT retention method
EDGPC200	z/OS V1R13	<b>New:</b> Retention method	Enhanced data set retention.
EDGPT110	z/OS V1R13	<b>New:</b> Retention method Set by	Enhanced data set retention.
EDGPT210	z/OS V1R13	<b>New:</b>	Enhanced data set retention.
EDGPT240	z/OS V1R13	<b>New:</b>	Add Stacked Volume
EDGPT410	z/OS V1R13	<b>New:</b> VRSEL exclude	Enhanced data set retention.

## REXX variables

Table 125 lists new and changed REXX variables that you can use when you write REXX execs to obtain information about DFSMSrmm resources. See *z/OS DFSMSrmm Managing and Using Removable Media* for more detailed information.

Table 125. DFSMSrmm TSO subcommand REXX variables

Variable name	Release	Subcommands	Contents
EDG@CTLD	z/OS V2R2	LC	Catalog days
EDG@DKBC	z/OS V2R2	LV	Data sets kept by catalog
EDG@GDRP	z/OS V2R2	LC	Default retention period for RM=EXPDT GDG data sets
EDG@GWCT	z/OS V2R2	LC	Default WHILECATALOG setting for RM=EXPDT GDG data sets
EDG@NDRP	z/OS V2R2	LC	Default retention period for RM=EXPDT non-GDG data sets
EDG@NWCT	z/OS V2R2	LC	Default WHILECATALOG setting for RM=EXPDT non-GDG data sets
EDG@WCTL	z/OS V2R2	LD	WHILECATALOG setting for data set
EDG@XDSB	z/OS V2R2	LD, LV VOL	Expiration date set by
EDG@XTM	z/OS V2R2	LD LV	Expiration time
EDG@EXRB	z/OS V2R1	LC OPT, LV VOL	Retention method EXPDT RETAINBY
EDG@LRED	z/OS V2R1	LC OPT, LD	Last reference extra days
EDG@MCAT	z/OS V2R1	LC OPT	SMS Management class attributes enabling

## DFSMSrmm

Table 125. DFSMSrmm TSO subcommand REXX variables (continued)

Variable name	Release	Subcommands	Contents
EDG@XDSB	z/OS V2R1	LV VOL, LD	Expiration date set by
EDG@BLK6	z/OS V1R13	LD	Total block count
EDG@BLKT	z/OS V1R13	LD	Total block count
EDG@CRAT	z/OS V1R13	LD LV	Compression ratio
EDG@CRID	z/OS V1R13	LV	Create user ID
EDG@DLR	z/OS V1R13	LD LS SS	Date data set on
EDG@DLRJ	z/OS V1R13	SS	Last reference date
EDG@DRP	z/OS V1R13	LC	Default retention period
EDG@DSEQ	z/OS V1R13	LD LV	Data set
EDG@LCDT	z/OS V1R13	LB LD LO LP LR LS LV	Last change date
EDG@LCID	z/OS V1R13	LB LD LO LP LR LS LV	Last change user ID
EDG@LCSI	z/OS V1R13	LB LD LO LP LR LS LV	Last change system ID
EDG@LCTM	z/OS V1R13	LB LD LO LP LR LS LV	Last change time
EDG@LCUD	z/OS V1R13	LB LD LO LP LR LS LV	Last user change date
EDG@LCUT	z/OS V1R13	LB LD LO LP LR LS LV	Last user change time
EDG@LDAM	z/OS V1R13	LC	Automove
EDG@MEDR	z/OS V1R13	LC LV SV	Recording technology
EDG@MEDT	z/OS V1R13	LC LV SV	Media type
EDG@MRP	z/OS V1R13	LC	Maximum retention period
EDG@OLON	z/OS V1R13	LV	Old loan location
EDG@RLPR	z/OS V1R13	LV	Required location priority
EDG@RM	z/OS V1R13	LC LV	Retention method
EDG@RMSB	z/OS V1R13	LV VOL	Retention method set by
EDG@RTDJ	z/OS V1R13	SD SV	Retention date
EDG@RTDT	z/OS V1R13	LD LV SD SV	Retention date
EDG@SEQ	z/OS V1R13	LV	Volume sequence number
EDG@TLR	z/OS V1R13	LS SS	Time last referenced
EDG@TVXD	z/OS V1R13	LC	TVEXTPURGE days
EDG@VEX	z/OS V1R13	LD	VRSEL exclude
EDG@XDSB	z/OS V1R13	LV LD	Expiration date
EDG@XDTJ	z/OS V1R13	SD SV	Volume expiration date

## Structured field introducers

Table 126 lists new and changed DFSMSrmm structured field introducers that you can use with the DFSMSrmm application programming interface. For more information, see *z/OS DFSMSrmm Application Programming Interface*.

Table 126. Structured field introducers

Release	SFI name	SFI number	Data Description	Subcommands
z/OS V2R2	CTLD	X'819785'	Catalog days	LC
z/OS V2R2	DKBC	X'822500'	Data sets kept by catalog	LV

Table 126. Structured field introducers (continued)

Release	SFI name	SFI number	Data Description	Subcommands
z/OS V2R2	GDRP	X'837900'	Default retention period for RM=EXPDT GDG data sets	LC
z/OS V2R2	GWCT	X'837940'	Default WHILECATALOG setting for RM=EXPDT GDG data sets	LC
z/OS V2R2	NDRP	X'864500'	Default retention period for RM=EXPDT non-GDG data sets	LC
z/OS V2R2	NWCT	X'868500'	Default WHILECATALOG setting for RM=EXPDT non-GDG data sets	LC
z/OS V2R2	WCTL	X'8C4150'	WHILECATALOG setting for data set	LD
z/OS V2R2	XDSB	X'8C6100'	Expiration date set by	LD, LV VOL
z/OS V2R2	XTM	X'8C7000'	Expiration time	LD LV
z/OS V2R1	EXRB	X'830800'	Retained by	LC OPT, LV VOL, SV(e)
z/OS V2R1	LRED	X'84F800'	Last reference extra days	LC, LD,SD(e)
z/OS V2R1	MCAT	X'851200'	SMS Management class attributes enabling	LC
z/OS V2R1	XDSB	X'8C6100'	Expiration date set by	LV VOL, SV(e), LD, SD(e)
z/OS V1R13	CRID	X'817900'	File 1 create user ID	LV VOL,SV(e)
z/OS V1R13	DLR/DLRJ	X'823000'	Date last referenced/read	LD LV LS SD(e) SS SV(e)
z/OS V1R13	DRP	X'827000'	Default retention period	LC
z/OS V1R13	DSEQ	X'829000'	Data set sequence	LD LV SD(e) SV(e)
z/OS V1R13	LCDJ	X'841500'	Last change date	LB LD LO LP LR LV LS SD(e) SP(e) SS(e)
z/OS V1R13	LCID	X'842000'	Character (variable length)	LB LD LO LP LR LS LV SD(e) SP(e) SS(e) SV(e)
z/OS V1R13	LCSI	X'842500'	Last change system ID	LB LD LO LP LR LS LV SD(e) SP(e) SS(e) SV(e)
z/OS V1R13	LCTM	X'843500'	Last change time	LB LD LO LP LR LS LV SD(e) SP(e) SS(e) SV(e)
z/OS V1R13	LCUD	X'843600'	Last user change date	LB LD LO LP LR LS LV SD(e) SP(e) SS(e) SV(e)
z/OS V1R13	LCUT	X'843700'	Last user change time	LB LD LO LP LR LS LV SD(e) SP(e) SS(e) SV(e)
z/OS V1R13	LDAM	X'84A100'	Automove	LC
z/OS V1R13	MEDR	X'857000'	Recording technology	LV SV LC
z/OS V1R13	MEDT	X'858000'	Media type	LV SV LC
z/OS V1R13	MRP	X'85D000'	Maximum retention period	LC
z/OS V1R13	OLON	X'86C100'	Old loan location	LV SV(e)
z/OS V1R13	RLPR	X'888500'	Required location priority	LV SV(e)
z/OS V1R13	RM	X'888800'	Retention method	LC OPT, LV VOL, SV(e)
z/OS V1R13	RMSB	X'888A00'	Retention method set by	LV VOL SV(e)
z/OS V1R13	RTDJ	X'88C000'	Retention date	LD LV SD SV
z/OS V1R13	SEQ	X'898000'	Volume sequence	LV

## DFSMSrmm

Table 126. Structured field introducers (continued)

Release	SFI name	SFI number	Data Description	Subcommands
z/OS V1R13	TLR	X'8A6800'	Time in hours, minutes, seconds, and tenths of seconds	LS SS
z/OS V1R13	TVXD	X'8A7800'	TVEXTPURGE days	LC OPT
z/OS V1R13	XDSB	X'8C6100'	Expiration date set by	LV VOL, SV(e), LD, SD(e)
z/OS V1R13	VEX	X'8B4100'	VRSEL exclude	LD SD(e)

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## DFSMSStvs summary of interface changes

There are no new or changed interfaces for DFSMSStvs.



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## Chapter 10. DFSORT summary of interface changes

This topic summarizes the new and changed interface components of DFSORT.

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### DFSORT interface changes for z/OS V2R2

There are no DFSORT interface changes for z/OS V2R2.

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### DFSORT interface changes for z/OS V2R1

#### New reserved words for symbols

The following are new DFSORT/ICETOOL reserved words which are no longer allowed as symbols: LC, LN, MC, MN, UC and UN.

If you used any of these words as a symbol previously, you must change them. For example, if you used MC, you can change it to mc.

#### Central storage controls

The IBM-supplied default for the existing EXPOLD installation option has been changed to EXPOLD=50%. If you want DFSORT to use EXPOLD, as in previous releases, you can set EXPOLD=MAX.

The IBM-supplied default for the existing EXPRES installation option has been changed to EXPRES=10%. If you want DFSORT to use EXPRES, as in previous releases, you can set EXPRES=0.

The IBM-supplied default for the new TUNE installation option is TUNE=STOR which specifies allocation of available central storage as needed in increments sized to balance resource usage for concurrent sorts. If you want DFSORT to allocate available central storage using fixed sized increments, as in previous releases, you can set TUNE=OLD.

#### TUNE installation option

A new TUNE installation default allows you to specify whether DFSORT should allocate storage in increments with additional disk work space to minimize the risk of failure, or to allocate all storage at initialization so disk work space allocation can be reduced.

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### DFSORT interface changes for z/OS V1R13

There are no DFSORT interface changes for z/OS V1R13.



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## Chapter 11. Distributed File Service summary of interface changes

In addition to the Distributed File Service interfaces described in this topic, you should also review Chapter 2, “Summary of changes to SYS1.PARMLIB,” on page 7 and Chapter 4, “Summary of changes to SYS1.SAMPLIB,” on page 23. This topic summarizes the new and changed interface components of Distributed File Service (DFS/SMB and zFS).

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### zFS

The zFS interfaces described in this topic are:

- “zFS APIs”
- “zFS commands” on page 239
- “zFS system commands” on page 241
- “zFS data sets” on page 243

#### zFS APIs

Table 127 lists new or changed zFS APIs.

**Important note for V2R2:** The application programming interfaces (APIs) were reformatted in V2R2. One of the changes was that long was changed to int because the length of a long can be 4 bytes or 8 bytes, depending on compiler options.

Table 127. Summary of new and changed zFS APIs

API	Release	Description	Reason for change
pfsctl (BPX1PCT)	V2R2	<b>New command:</b> The ZFSCALL_FSINFO command was added.	Query performance APIs
Attach Aggregate	z/OS V1R13	<b>Changed:</b> No longer supports the ATT_NONBS flag; if specified, it is ignored.	Release update
Clone File System	z/OS V2R1	Removed.	Removal of the zFS clone function
Create File System	z/OS V2R1	Removed.	Removal of multi-file system aggregates
Delete File System	z/OS V2R2	Removed.	No longer supported
Format Aggregate	z/OS V2R1	<b>New flag:</b> The af_aggrversion flag was added.	Improved large directory performance
Grow Aggregate	z/OS V2R1	<b>Changed:</b> Supports version 1.5 aggregates by using AGGR_ID version 3.	Improved large directory performance
List Aggregate Status	z/OS V2R1	<b>Changed:</b> Supports version 1.5 aggregates by using AGGR_STATUS3.	Improved large directory performance
List Detailed File System Information	z/OS V2R2	<b>New:</b> Returns detailed information for one or more file systems.	Query performance APIs
List File Information	z/OS V2R1	<b>Changed:</b> Lists detailed file or directory information.	Improved large directory performance

## Distributed File Service

Table 127. Summary of new and changed zFS APIs (continued)

API	Release	Description	Reason for change
List File System Status	z/OS V1R13	<b>Changed:</b> The <code>fsid_len</code> parameter must be specified as a data type of <code>char</code> , rather than <code>short</code> .	Release update
	z/OS V2R1	<b>Changed:</b> Supports version 1.5 aggregate by using <code>FS_STATUS2</code> . Also, a new aggregate size greater than 4TB can be specified by using <code>AGGR_ID3</code> .	Improved large directory performance
Query Config Option	z/OS V2R1	<b>New:</b> <ul style="list-style-type: none"> <li>Query <code>change_aggrversion_on_mount</code></li> <li>Query <code>converttov5</code></li> <li>Query <code>format_aggrversion</code></li> </ul> <b>Removed:</b> <ul style="list-style-type: none"> <li>Query <code>auto_attach</code> setting</li> <li>Query <code>and set nbs</code></li> <li>Query <code>user_cache_readahead</code></li> </ul>	Improved large directory performance
	V2R2	<b>New:</b> Query <code>modify_cmd_threads</code>	64-bit updates
Rename File System	z/OS V1R13	<b>Changed:</b> The <code>fsid_len</code> parameter must be specified as a data type of <code>char</code> , rather than <code>short</code> .	Release update
	z/OS V2R1	Removed.	Removal of multi-file system aggregates
Reset Backup Flag	z/OS V2R1	<b>New:</b> Resets the backup bit after a backup completes.	Improved large directory performance
Set Config Option	z/OS V2R1	<b>New:</b> <ul style="list-style-type: none"> <li>Set query <code>change_aggrversion_on_mount</code></li> <li>Set query <code>converttov5</code></li> <li>Set query <code>format_aggrversion</code></li> </ul> <b>Removed:</b> <ul style="list-style-type: none"> <li>Set query <code>auto_attach</code> setting</li> <li>Set query <code>and set nbs</code></li> <li>Set <code>user_cache_readahead</code></li> </ul>	Improved large directory performance
	z/OS V2R2	<b>New:</b> Set <code>modify_cmd_threads</code>	64-bit updates
Set File System Quota	z/OSV1R13	<b>Change in status:</b> The <code>fsid_len</code> parameter must be specified as a data type of <code>char</code> , rather than <code>short</code> .	Release update
	z/OS V2R1	Removed.	Removal of multi-file system aggregates
Statistics Log Cache Information	z/OS V2R2	<b>Changed:</b> Because a new log cache facility is used in V2R2, new statistics are returned pertaining to this new logging method.	Release update
Statistics Server Token Management information	z/OS V2R2	<b>New:</b> Returns statistics for the server token manager.	Query performance APIs
Statistics Storage information	z/OS V2R2	<b>Changed:</b> Returns information for storage above the 2 G addressing bar.	Query performance APIs
Statistics Sysplex Client Operations Information	z/OS V2R2	<b>New:</b> Returns information about the number of local operations that required the sending of a message to another system.	Query performance APIs

Table 127. Summary of new and changed zFS APIs (continued)

API	Release	Description	Reason for change
Statistics Sysplex Owner Operations Information	z/OS V2R2	<b>New:</b> Returns information about the number of calls that are processed on the local system as a result of a message that was sent from another system.	Query performance APIs
Statistics Transaction Cache Information	z/OS V2R2	<b>Change in status:</b> Is no longer used but documentation about it was kept.	Release update

## zFS commands

Table 128 identifies changes to zFS commands. For detailed information about these commands, see *z/OS Distributed File Service zFS Administration*.

Table 128. Summary of new and changed zFS commands

zFS command	Release	Description	Reason for change
ioeagfmt	z/OS V2R1	<b>Changed:</b> -newauditfid is now the default. <b>New options:</b> <ul style="list-style-type: none"> <li>-nonewauditfid specifies that the aggregate should not be formatted with a zFS auditfid stored in it.</li> <li>-version4 specifies that the aggregate should be a version 1.4 aggregate. -version5 specifies that the aggregate should be a version 1.5 aggregate. If neither option is specified, the IOEFSPRM option format_aggrversion is honored.</li> </ul>	Improved large directory performance
	z/OS V2R1	<b>New requirement:</b> zFS must be active if <b>ioeagfmt</b> is used.	Improved large directory performance
ioeagslv	z/OS V2R1	<b>Changed:</b> Now does not allow salvage of aggregates with more than one file system. It also does not allow salvage with a .bak file system in aggregate.	Salvager enhancement
ioefsutl converttov4	z/OS V2R1	<b>New:</b> Converts a version 1.5 aggregate to a version 1.4 aggregate.	Improved large directory performance
ioefsutl converttov5	z/OS V2R1	<b>New:</b> Converts a version 1.4 aggregate to a version 1.5 aggregate.	Improved large directory performance
ioefsutl format	z/OS V2R1	<b>New:</b> Formats a VSAM linear data set to become a zFS compatibility mode aggregate.	Improved large directory performance
ioefsutl salvage	z/OS V2R1	<b>New:</b> Scans an aggregate and reports inconsistencies.	Improved large directory performance
MOUNT	z/OS V1R13	<b>Changed:</b> The NONBS parameter is no longer supported; if specified, it is ignored. zFS always runs with new block security (NBS) support on.	Release update
	z/OS V2R1	<b>Changed:</b> The READAHEAD, FSGROW, NBS, and RW parameters are now ignored. AGGREGATE and FILESYSTEM are now invalid in a non-sysplex environment.	Removal of multi-file system aggregates and the zFS clone function
	z/OS V2R1	<b>New options:</b> The CONVERTTOV5 and NOCONVERTTOV5 options specify whether a zFS read/write file system is to be assigned the converttov5 attribute. They override the IOEFSPRM options converttov5 and change_aggrversion_on_mount.	Improved large directory performance

## Distributed File Service

Table 128. Summary of new and changed zFS commands (continued)

zFS command	Release	Description	Reason for change
zfsadm	z/OS V1R13	<b>Changed:</b> When the command displays help text or a syntax error message, it will show the name of the command as IOEZADM.	Release update
zfsadm aggrinfo	z/OS V2R1	<b>Changed:</b> When a zFS file system is quiesced, the -long option now displays the job name, system, and time stamp that issued the quiesce. It also displays the aggregate version and the converttov5 attribute.	Enhanced zFS quiescing and improved large directory performance
zfsadm attach	z/OS V1R13	<b>Changed:</b> No longer supports the -nonbs option; if specified, it is ignored. zFS always runs with -nbs support on.	Release update
zfsadm clone	z/OS V2R1	Removed.	Removal of multi-file system aggregates and the zFS clone function
zfsadm clonesys	z/OS V2R1	Removed.	Removal of multi-file system aggregates and the zFS clone function
zfsadm config	z/OS V1R13	<b>Changed:</b> No longer supports the -nonbs off option; if specified, it is ignored. zFS always runs with -nbs support on.	Release update
	z/OS V2R1	<b>New options:</b> <ul style="list-style-type: none"> <li>• -change_aggrversion_on_mount</li> <li>• -converttov5</li> <li>• -format_aggrversion</li> </ul>	Improved large directory performance
	z/OS V2R2	<b>New option:</b> The -modify_cmd_threads option specifies the current number of threads that are defined to handle zFS modify commands.	64-bit updates
	z/OS V2R2	<b>Changed keywords:</b> These keywords are no longer supported. If they are specified, they are accepted but are not used. <ul style="list-style-type: none"> <li>• -client_cache_size</li> <li>• -tran_cache_size</li> </ul>	Release changes
zfsadm configquery	z/OS V1R13	<b>Changed option:</b> The -nbs option is always on. zFS always runs with new block security (NBS) support.	Release update
	z/OS V2R1	<b>New options:</b> <ul style="list-style-type: none"> <li>• -change_aggrversion_on_mount</li> <li>• -converttov5</li> <li>• -format_aggrversion</li> </ul>	Improved large directory performance
	z/OS V2R2	<b>New option:</b> The -modify_cmd_threads option specifies the current number of threads that are defined to handle zFS modify commands.	64-bit updates
	z/OS V2R2	<b>Changed keywords:</b> These keywords are no longer supported. If they are specified, they are accepted but are not used. <ul style="list-style-type: none"> <li>• -client_cache_size</li> <li>• -tran_cache_size</li> <li>• -client_cache_size</li> </ul>	Release changes
zfsadm convert	z/OS V2R1	<b>New:</b> Converts a read/write aggregate to version 1.5 or a directory to an extended (v5) directory.	Improved large directory performance

Table 128. Summary of new and changed zFS commands (continued)

zFS command	Release	Description	Reason for change
zfsadm create	z/OS V2R1	Removed.	Removal of multi-file system aggregates and the zFS clone function
zfsadm delete	z/OS V2R1	<b>Changed:</b> You can only delete .bak file systems.	Improved large directory performance
zfsadm fileinfo	z/OS V2R1	<b>New:</b> Displays detailed information about a file or directory.	Improved large directory performance
zfsadm format	z/OS V2R1	<b>New options:</b> <ul style="list-style-type: none"> <li>-version4 specifies that the aggregate should be a version 1.4 aggregate</li> <li>-version5 specifies that the aggregate should be a version 1.5 aggregate.</li> </ul> If neither option is specified, the default is the IOEFSPRM option format_aggrversion.	Improved large directory performance
	z/OS V2R1	<b>Changed option:</b> The -long option now displays the version.	Improved large directory performance
zfsadm fsinfo	z/OS V2R2	<b>New:</b> Displays detailed information for one or more file systems.	Query performance APIs
zfsadm lsquota	z/OS V2R1	Removed.	Removal of multi-file system aggregates and the zFS clone function
zfsadm query	z/OS V1R13	<b>Changed:</b> The -dircache option will now only report zeros. Also, the statistics directory cache subcommand is no longer used and reports zeros.	Release update
	z/OS V2R2	<b>New reports available:</b> Using the keywords -stkm, -ctkc, and -svi, new reports can be generated.	64-bit updates
	z/OS V2R2	<b>Changed output report:</b> The format of the output report from <b>zfsadm query -logcache</b> has changed.	64-bit updates
zfsadm rename	z/OS V2R1	Removed.	Removal of multi-file system aggregates and the zFS clone function
zfsadm setquota	z/OS V2R1	Removed.	Removal of multi-file system aggregates and the zFS clone function

## zFS system commands

Table 129 identifies changes to system commands for zFS. For detailed information about these changes to system commands, see *z/OS Distributed File Service zFS Administration*.

Table 129. Summary of new and changed zFS system commands

System command	Release	Description	Reason for change
MODIFY ZFS ABORT	z/OS V1R13	<b>Changed:</b> Now causes zFS to produce a dump and then execute an internal restart.	Release update
MODIFY ZFS HANGBREAK	z/OS V1R13	<b>Changed:</b> Now causes zFS to execute an internal restart.	Release update

## Distributed File Service

Table 129. Summary of new and changed zFS system commands (continued)

System command	Release	Description	Reason for change
MODIFY ZFS PROCESS	z/OS V1R13	<b>New:</b> The status and dataset keywords have been added.	Release update
	z/OS V2R2	<b>New:</b> A new parameter, <b>fsinfo</b> , was added. It displays detailed information about zFS file systems. Usage notes and examples for displaying file system information were also added.	Release update
MODIFY ZFS QUERY	z/OS V1R13	<b>Changed:</b> The output of the following reports was enhanced to provide more file system information and statistical data. <ul style="list-style-type: none"> <li>• VM</li> <li>• LFS (Directory Cache Statistics information was also removed)</li> <li>• LOCK</li> <li>• STKM</li> <li>• STOR</li> <li>• CTKC</li> <li>• SVI</li> </ul>	Release update



## zFS data sets

Table 130 lists new and changed zFS data sets.

Table 130. Summary of new and changed zFS data sets

zFS data sets	Release	Description	Reason for change
IOESFSPRM	z/OS V2R1	<b>New option:</b> The <code>quiesce_message_delay</code> option controls how long it takes in seconds for message IOEZ00581E to be displayed when an RWSHARE aggregate is quiesced.	Enhanced zFS quiescing
	z/OS V2R1	<b>New options:</b> <ul style="list-style-type: none"> <li><code>format_aggreversion</code> specifies the default version of the aggregate when formatting it. The default version is 4. This option is also honored in ISHELL and AUTOMOUNT.</li> <li><code>change_aggrversion_on_mount</code> changes the aggregate version to 1.5 on read/write mount.</li> <li><code>converttov5</code> changes the aggregate version to 1.5 and converts the root directory at mount time. Each v4 directory is converted to v5 when first accessed.</li> </ul> <b>Changed options:</b> <ul style="list-style-type: none"> <li>The default for <code>convert_auditfid</code> was changed to ON.</li> <li>The default for <code>meta_cache_size</code> was changed, depending on whether <code>metaback_cache_size</code> and <code>meta_cache_size</code> is specified.</li> <li>The default value for <code>user_cache_size</code> is calculated according to the real storage available during zFS initialization.</li> </ul>	Improved large directory performance
	z/OS V2R1	<b>New option:</b> The <code>max_errors</code> option specifies the maximum number of errors that the salvager program allows before it stops.	Improved salvager performance
	z/OS V2R1	<b>Changed:</b> These options are ignored: <ul style="list-style-type: none"> <li><code>auto_attach</code></li> <li><code>fsgrow</code></li> <li><code>define_aggr</code></li> <li><code>nbs</code></li> <li><code>user_cache_readahead</code></li> </ul>	Removal of multi-file system aggregates and the zFS clone function.
	z/OS V1R13	<b>Deleted:</b> The following options were removed: <ul style="list-style-type: none"> <li><code>dir_cache_size</code></li> <li><code>nbs</code></li> <li><code>sysplex_admin_level</code></li> </ul> <b>Changed:</b> The default values for the following options have changed: <ul style="list-style-type: none"> <li><code>agrgrow</code></li> <li><code>client_cache_size</code></li> <li><code>client_reply_storage</code></li> <li><code>file_threads</code></li> <li><code>meta_cache_size</code></li> <li><code>sysplex</code></li> <li><code>sysplex_filesys_sharemode</code></li> </ul>	Release update

### SMB

The SMB interfaces described in this topic are:

- “SMB commands”
- “SMB system commands”
- “SMB environment variables”
- “SMB operating system support”

#### SMB commands

Table 131 lists new or changed SMB commands. For detailed information about these commands, see *z/OS Distributed File Service SMB Administration*.

There were no new or changed SMB commands in V2R1.

Table 131. Summary of new and changed SMB commands

SMB command	Release	Description	Reason for change
dfsexport	z/OS V1R13	<b>Changed:</b> The <b>-force</b> parameter is no longer supported; the <b>-type</b> parameter no longer exports DCE files.	Removal of DCE support

#### SMB system commands

Table 132 lists new or changed SMB system commands. For detailed information about these commands, see *z/OS Distributed File Service SMB Administration*.

Table 132. Summary of new and changed SMB system commands.

There are no new or changed SMB system commands in V2R1.

System command	Release	Description	Reason for change
modify dfs query	z/OS V1R13	<b>Changed:</b> The FILESETS and TKM reports no longer contain RPC information.	Removal of DCE support
		<b>Deleted:</b> The AFS4INT and LFS reports are no longer supported.	

#### SMB environment variables

Table 133 lists the new or changed environment variables. For details, see *z/OS Distributed File Service SMB Administration*.

There were no new or changed SMB environment variables in V2R1.

Table 133. Summary of new and changed SMB environment variables

SMB environment variable	Release	Description	Reason for change
_EUV_AUTOLOG	z/OS V1R13	<b>Changed:</b> This environment variable should always be set to <b>NO</b> .	Removal of DCE support
_IOE_PROTOCOL_RPC	z/OS V1R13	<b>Changed:</b> This environment variable has been disabled and is no longer used.	Removal of DCE support

#### SMB operating system support

Table 134 on page 245 lists the new operating systems supported by SMB. For details, see *z/OS Distributed File Service SMB Administration*.

Table 134. Summary of new operating systems supported by SMB

Operating System	Release	Description	Reason for change
Windows 7 platforms	z/OS V1R13	<b>New:</b> SMB now supports Microsoft Windows 7 Professional, Microsoft Windows 7 Enterprise, and Microsoft Windows 7 Ultimate Editions (32- and 64-bit)	New operating system support for V1R13
Windows Server 2008	z/OS V2R1	<b>New:</b> SMB now supports Microsoft Windows Server 2008 acting as a domain controller for pass-through authentication.	New domain controller support for V2R1.

## Distributed File Service

## Chapter 12. IBM Tivoli Directory Server summary of interface changes

This topic contains new and changed interfaces for:

- “Configuration options”
- “Utilities” on page 249
- “Client application programming routines” on page 249
- “Environment variables” on page 250

### Configuration options

Table 135 lists the new and changed IBM Tivoli® Directory Server (IBM TDS) configuration options. See *z/OS IBM Tivoli Directory Server Administration and Use for z/OS* for more detailed information.

Table 135. Summary of new and changed IBM Tivoli Directory Server (IBM TDS) configuration options

Configuration option	Release	Description	Reason for change
db2Terminate	z/OS V2R2	<b>Updated:</b> To support the LDAP server transition mode.	Supports server compatibility level upgrade which provides no downtime.
db2StartUpRetryLimit	z/OS V2R2	<b>Updated:</b> To support the LDAP server transition mode.	Supports server compatibility level upgrade which provides no downtime.
fileTerminate	z/OS V2R2	<b>Updated:</b> To support the LDAP server transition mode.	Supports server compatibility level upgrade which provides no downtime.
logFileMicroseconds	z/OS V2R2	<b>New:</b> Added to control all generated log records that contain microseconds in the time stamps.	Activity logging enhancements added to eliminate the use of environment variables.
logFileMsgs	z/OS V2R2	<b>New:</b> Added to control log records that are generated when messages are created by the LDAP server.	Activity logging enhancements added to eliminate the use of environment variables.
logFileOps	z/OS V2R2	<b>New:</b> Added to control which operations generate log records.	Activity logging enhancements added to eliminate the use of environment variables.

## Tivoli Directory Server

Table 135. Summary of new and changed IBM Tivoli Directory Server (IBM TDS) configuration options (continued)

Configuration option	Release	Description	Reason for change
logFileRecordType	z/OS V2R2	<b>New:</b> Added to control when log records are generated.	Activity logging enhancements added to eliminate the use of environment variables.
logFileRolloverDirectory	z/OS V2R2	<b>Updated:</b> Updated to support activity logging enhancements.	Additional data is provided in existing log records to support activity logging enhancements.
logFileRolloverSize	z/OS V2R2	<b>Updated:</b> Updated to support activity logging enhancements.	Additional data is provided in existing log records to support activity logging enhancements.
logFileVersion	z/OS V2R2	<b>New:</b> Added to specify the activity log version.	Activity logging enhancements added to eliminate the use of environment variables.
plugin	z/OS V2R1	<b>Updated:</b> To support ICTX and remote crypto plug-ins	ICTX and remote crypto support.
sslCipherSpecs	z/OS V2R1	<b>Updated:</b> To support TLS (Transport Layer Security) V1.2	TLS (Transport Layer Security) V1.2 support
srvStartUpError	z/OS V2R2	<b>Updated:</b> To support the LDAP server transition mode.	Supports server compatibility level upgrade which provides no downtime.
serverCompatLevel	z/OS V2R2	<b>Updated:</b> <ol style="list-style-type: none"> <li>Value 8 is added to enable usage of the read-only replica password policy replication support.</li> <li>To support the LDAP server transition mode.</li> </ol>	<ol style="list-style-type: none"> <li>Supports replication of password policy operational attributes from read-only replica to supplier server.</li> <li>Supports server compatibility level upgrade which provides no downtime.</li> </ol>
tcpTerminate	z/OS V2R2	<b>Updated:</b> To support the LDAP server transition mode.	Supports server compatibility level upgrade which provides no downtime.

## Utilities

There are no new or changed utilities.

Table 136. Summary of new and changed IBM TDS utilities

Utility	Release	Description	Reason for change
ds2ldif	z/OS V2R2	<b>Updated:</b> The LDAP server and the <b>ds2ldif</b> utility are updated to check the schema and database files and directories before opening them.	Release update
ldapsearch	z/OS V2R2	<b>Updated:</b> The <b>-L</b> option is updated.	Release update
ldif2ds	z/OS V2R2	<b>Updated:</b> The LDAP server and the <b>ldif2ds</b> utility are updated to check the schema and database files and directories before opening them.	Release update

## Client application programming routines

Table 137 lists the new and changed LDAP client application programming routines. See *z/OS IBM Tivoli Directory Server Client Programming for z/OS* for more detailed information.

Table 137. Summary of new and changed LDAP client application programming routines

Routine name	Release	Description	Reason for change
ldap_get_function_vector()	z/OS V2R2	Updated to support current release	Release update
	z/OS V2R1	Updated to support current release	Release update
ldap_get_option()	z/OS V2R1	Updated to support TLS (Transport Layer Security) V1.2	TLS (Transport Layer Security) V1.2 support
ldap_set_option()	z/OS V2R1	Updated to support TLS (Transport Layer Security) V1.2	TLS (Transport Layer Security) V1.2 support
ldap_set_option_np()	z/OS V2R1	Updated to support TLS (Transport Layer Security) V1.2	TLS (Transport Layer Security) V1.2 support
ldap_ssl_client_init()	z/OS V2R2	LDAP no longer supports SSL V2 protocol and that SSL V3, TLS V1.0, TLS V1.1, and TLS V1.2 protocols are supported.	TLS security enhancements
ldap_ssl_start()	z/OS V2R2	LDAP no longer supports SSL V2 protocol and that SSL V3, TLS V1.0, TLS V1.1, and TLS V1.2 protocols are supported.	TLS security enhancements

## Tivoli Directory Server

Table 137. Summary of new and changed LDAP client application programming routines (continued)

Routine name	Release	Description	Reason for change
ldap_version()	z/OS V2R1	<ol style="list-style-type: none"><li>1. Updated to support current release</li><li>2. Updated to support TLS (Transport Layer Security) V1.2</li></ol>	<ol style="list-style-type: none"><li>1. Release update</li><li>2. TLS (Transport Layer Security) V1.2 support</li></ol>

## Environment variables

Table 138 lists the new and changed environment variables used by Tivoli Directory Server. For detailed information about these environment variables, see *z/OS IBM Tivoli Directory Server Client Programming for z/OS*.

Table 138. Summary of new and changed IBM Tivoli Directory Server (IBM TDS) environment variables

Environment variable	Release	Description	Reason for change
GLDLOG_MICROSECONDS	z/OS V2R2	Use of this environmental variable is deprecated.	Activity log enhancements
GLDLOG_MSG	z/OS V2R2	Use of this environmental variable is deprecated.	Activity log enhancements
GLDLOG_OPS	z/OS V2R2	Use of this environmental variable is deprecated.	Activity log enhancements
GLDLOG_TIME	z/OS V2R2	Use of this environmental variable is deprecated.	Activity log enhancements
LDAP_SSL_CIPHER_FORMAT	z/OS V2R1	<b>New:</b> Specifies the SSL cipher suites format.	TLS V1.2



## Chapter 13. ICKDSF summary of interface changes

This topic describes the ICKDSF interface “Commands.”

### Commands

Command name	Release	Description	Reason for change
INIT and REFORMAT	z/OS V2R2	<p><b>Updated:</b> The handling of the default has changed. If the UNIT parameter is specified for the INIT and REFORMAT command, and the required storage control microcode support and software support exists, and the device is not a minidisk, the VERIFYOFFLINE parameter is now the default, meaning that verification that the device is offline occurs even if VERIFYOFFLINE is not specified. Previously, verification occurred only when VERIFYOFFLINE was specified. A new NOVERIFYOFFLINE parameter lets you specify that verification should not occur.</p> <p>If the VERIFYOFFLINE parameter is processed as the default, and the device is online to another system, the command terminates, with message ICK31306I in the job output.</p>	Prevent the accidental initialization of volumes that may be online to other systems
CONTROL	z/OS V2R1	<p><b>Updated:</b> CONFIGURE(DISPLAY) now displays the microcode LIC and bundle level if available.</p>	Multi-Target Mirror support.
FLASHCPY ESTABLISH	z/OS V2R1	<p><b>Updated:</b> Restrictions for PRESERVEMIRROR have been updated to indicate that PREFERRED is not valid if the devices specified are in a peer-to-peer multi-target relationship.</p>	Multi-Target Mirror support.
FLASHCPY ESTABLISH	z/OS V2R1	<p><b>Updated:</b> New optional value, V2, for the CHANGERECORDING parameter, to allow multiple incremental Flashcopy relationships.</p>	Multiple Incremental FlashCopy support.
FLASHCPY QUERY RELATIONS	z/OS V2R1	<p><b>Updated:</b> Response updated to indicate that the volume allows multiple incremental relationships.</p>	Multiple Incremental FlashCopy support.
PPRCOPY ESTPAIR	z/OS V2R1	<p><b>Updated:</b> New FAILOVERMT parameter, to request that a multi-target configuration should be created rather than the existing cascaded failover state when doing a failover.</p>	Multi-Target Mirror support.

## ICKDSF

Command name	Release	Description	Reason for change
PPRCOPY POPULATESESSION	z/OS V2R1	<b>Updated:</b> For JOIN, new MTIVOLLIST and MTRVOLLIST subparameters, for lists of individual volumes or ranges of volumes for a multi-target configuration.	Multi-Target Mirror support.
PPRCOPY QUERY	z/OS V2R1	<b>Updated:</b> Responses updated for multi-target configuration.	Multi-Target Mirror support.
PPRCOPY SETCHARACTERISTICS	z/OS V2R1	<b>New:</b> Allows management software to designate a Metro Mirror pair in a multi-target PPRC configuration that must remain full duplex when performing a Remote Pair FlashCopy (Preserve Mirror) operation.	Multi-Target Mirror support.
INIT	z/OS V1R13	<b>Updated:</b> New keyword RESERVED marks a volume as reserved. Specify the name of the reserve storage pool with the OWNERID keyword, in the form IBMRSPrsname, where <i>rsname</i> is the name of the reserved storage pool.	Support for z/OSMF.

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## Chapter 14. Infoprint Server summary of interface changes

The Infoprint Server interfaces described in this topic are:

- “Application programming interface”
- “Configuration files” on page 254
- “Environment variables” on page 255
- “Exits” on page 257
- “Filters” on page 257
- “Infoprint Central” on page 257
- “ISPF panels” on page 259
- “JCL parameters” on page 261
- “Job attributes” on page 261
- “Printer Inventory attributes” on page 262
- “RACF profiles” on page 268
- “SMF type 6 record for IP PrintWay” on page 268
- “/usr/lpp/Printsrv/samples directory” on page 269
- “z/OS UNIX commands for Infoprint Server” on page 269
- “TSO/E commands for Infoprint Server” on page 270

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### Application programming interface

There are no changes to the Infoprint Server application programming interface.

## Configuration files

Table 139 lists the new and changed configuration files that Infoprint Server uses. For more information, see *z/OS Infoprint Server Customization*.

Table 139. Summary of new and changed Infoprint Server configuration files

Configuration file	Release	Description	Reason for change
aopd.conf	z/OS V2R2	Deleted: These attributes are deleted in the aopd.conf file: <ul style="list-style-type: none"> <li>aophinvd_max_thread_tasks</li> <li>aopsdbd_max_thread_tasks</li> <li>snmp-community</li> </ul>	Daemon consolidation and SNMP daemon elimination
	z/OS V2R1	Updated: These attributes are new in the aopd.conf file: <ul style="list-style-type: none"> <li>dynamic-configuration lets you enable dynamic configuration.</li> <li>xcf-group-name lets you specify a unique qualifier for the Cross-system coupling facility (XCF) group name.</li> </ul>	Dynamic configuration
		Updated: If dynamic configuration is enabled, you must specify the following attributes in the system configuration definition instead of in the aopd.conf file: <ul style="list-style-type: none"> <li>ascii-codepage specifies the name of an IBM-supplied or custom ASCII code page supported by the z/OS iconv utility.</li> <li>console-name specifies the name of the extended MCS console that Infoprint Central uses to send commands to the z/OS system.</li> <li>ebcdic-codepage specifies the name of an IBM-supplied or custom EBCDIC code page supported by the z/OS iconv utility.</li> <li>ipp-port-number specifies the number of the port at which the IPP Server waits for print requests.</li> <li>job-prefix specifies a prefix that Print Interface and NetSpool use for the job IDs of output data sets that they allocate on the JES spool.</li> <li>log-retention specifies the number of days worth of messages that Infoprint Server retains in the common message log.</li> <li>lpd-port-number specifies the number of the port at which the Infoprint Server LPD waits for print requests.</li> <li>max-historical-inventory-size specifies the maximum size in megabytes (MBs) of the Historical Inventory, /var/Printsrv/hinv.</li> <li>smf-recording indicates whether IP PrintWay extended mode writes SMF type 6 records for data sets that it sends to a printer or email destination.</li> <li>snmp-community specifies the name assigned to the SNMP community for making SNMP requests to the z/OS system.</li> </ul>	Dynamic configuration
z/OS V1R13	Updated: The jes-name attribute is new in the aopd.conf file. It specifies the name of a secondary JES2 system.	Secondary JES2 support	
aopmsg.conf	z/OS V2R1	Deleted: If dynamic configuration is enabled, Infoprint Server ignores this file if it exists. You must specify these attributes in the system configuration definition instead of in the aopmsg.conf file: <ul style="list-style-type: none"> <li>hardcopy-messages specifies which additional messages Infoprint Server sends to the hardcopy log.</li> <li>hardcopy-message-list specifies the message IDs of the messages that Infoprint Server sends to the hardcopy log.</li> </ul>	Dynamic configuration

## Environment variables

Table 140 lists the new and changed environment variables that Infoprint Server uses. For more information, see *z/OS Infoprint Server Customization*.

Table 140. Summary of new and changed Infoprint Server environment variables

Environment variable	Release	Description	Reason for change
AOP_ALLOW_ALL_CHARACTERS_IN_LINE_DATA	z/OS V2R1	Deleted: If dynamic configuration is enabled, Infoprint Server no longer uses this environment variable. The allow-all-characters-in-line-data attribute in the system configuration definition replaces it.	Dynamic configuration
AOP_APPLID	z/OS V2R1	Deleted: If dynamic configuration is enabled, Infoprint Server no longer uses this environment variable. The applid attribute in the system configuration definition replaces it.	Dynamic configuration
AOP_BLANK_TRUNCATION_CLASSES	z/OS V2R1	Deleted: If dynamic configuration is enabled, Infoprint Server no longer uses this environment variable. The blank-truncation-classes attribute in the system configuration definition replaces it.	Dynamic configuration
AOP_IGNORE_DCF_ROUTING_ERRORS	z/OS V2R1	Deleted: If dynamic configuration is enabled, Infoprint Server no longer uses this environment variable. The ignore-dcf-routing-errors attribute in the system configuration definition replaces it.	Dynamic configuration
AOP_MAIL_DO_NOT_ADD_SUFFIX	z/OS V2R1	Deleted: If you run IP PrintWay extended mode and dynamic configuration is enabled, Infoprint Server no longer uses this environment variable. The mail-do-not-add-suffixes attribute in the system configuration definition replaces it. If you run IP PrintWay basic mode, continue to specify the AOP_MAIL_DO_NOT_ADD_SUFFIX environment variable in the IP PrintWay basic mode startup procedure.	Dynamic configuration
AOP_MAIL_PRESERVE_SUFFIXES	z/OS V2R1	Deleted: If you run IP PrintWay extended mode and dynamic configuration is enabled, Infoprint Server no longer uses this environment variable. The mail-preserve-suffixes attribute in the system configuration definition replaces it. If you run IP PrintWay basic mode, continue to specify the AOP_MAIL_PRESERVE_SUFFIXES environment variable in the IP PrintWay basic mode startup procedure.	Dynamic configuration
AOP_MAIL_USE_FIRST_ADDRESS	z/OS V2R1	Deleted: If dynamic configuration is enabled, Infoprint Server no longer uses this environment variable. The mail-use-first-address attribute in the system configuration definition replaces it.	Dynamic configuration
	z/OS V1R13	New: IP PrintWay extended mode sends all documents in an output group to the email addresses for the first document in the output group. IP PrintWay basic mode does not support this variable.	Email enhancements
AOP_MAXTHREADTASKS	z/OS V2R1	Deleted: If dynamic configuration is enabled, Infoprint Server no longer uses this environment variable. The max-thread-tasks attribute in the system configuration definition replaces it.	Dynamic configuration
AOP_SELECT_WORK_FROM_HOLD_QUEUE	z/OS V2R1	Deleted: If dynamic configuration is enabled, Infoprint Server no longer uses this environment variable. The select-work-from-hold-queue attribute in the system configuration definition replaces it.	Dynamic configuration

## Infoprint Server

Table 140. Summary of new and changed Infoprint Server environment variables (continued)

Environment variable	Release	Description	Reason for change
AOP_SUPPRESS_POST_UNIX_FILTER_FORMATTING	z/OS V2R1	Deleted: If dynamic configuration is enabled, Infoprint Server no longer uses this environment variable. The suppress-post-unix-filter-formatting attribute in the system configuration definition replaces it.	Dynamic configuration
AOPHINVD_MAXTHREADTASKS	z/OS V2R2	Deleted	Daemon consolidation
	z/OS V2R1	Deleted: If dynamic configuration is enabled, Infoprint Server no longer uses this environment variable. The aophinvd-max-thread-tasks attribute in the system configuration definition replaces it.	Dynamic configuration
AOPIPPD_MAXTHREADTASKS	z/OS V2R1	Deleted: If dynamic configuration is enabled, Infoprint Server no longer uses this environment variable. The aopiipd-max-thread-tasks attribute in the system configuration definition replaces it.	Dynamic configuration
AOPLPD_MAXTHREADTASKS	z/OS V2R1	Deleted: If dynamic configuration is enabled, Infoprint Server no longer uses this environment variable. The aoplpd-max-thread-tasks attribute in the system configuration definition replaces it.	Dynamic configuration
AOPMAILER	z/OS V2R1	Deleted: If you run IP PrintWay extended mode and dynamic configuration is enabled, Infoprint Server no longer uses this environment variable. The mailer-path-name attribute in the system configuration definition replaces it. If you run IP PrintWay basic mode, continue to specify the AOPMAILER environment variable in the IP PrintWay basic mode startup procedure.	Dynamic configuration
AOPMAILER_OPTIONS	z/OS V2R1	Deleted: If you run IP PrintWay extended mode and dynamic configuration is enabled, Infoprint Server no longer uses this environment variable. The mailer-options attribute in the system configuration definition replaces it. If you run IP PrintWay basic mode, continue to specify the AOPMAILER_OPTIONS environment variable in the IP PrintWay basic mode startup procedure.	Dynamic configuration
AOPNETD_MAXTHREADTASKS	z/OS V2R1	Deleted: If dynamic configuration is enabled, Infoprint Server no longer uses this environment variable. The aopnetd-max-thread-tasks attribute in the system configuration definition replaces it.	Dynamic configuration
AOPNETD_USE_FIXED_JOBID	z/OS V2R1	Deleted: If dynamic configuration is enabled, Infoprint Server no longer uses this environment variable. The netspool-use-fixed-jobid attribute in the system configuration definition replaces it.	Dynamic configuration
AOPNETD_USE_UNALTERED_JOBID	z/OS V2R1	Deleted: If dynamic configuration is enabled, Infoprint Server no longer uses this environment variable. The netspool-use-unaltered-jobid attribute in the system configuration definition replaces it.	Dynamic configuration
AOPOUTD_MAXTHREADTASKS	z/OS V2R1	Deleted: If dynamic configuration is enabled, Infoprint Server no longer uses this environment variable. The aopoutd-max-thread-tasks attribute in the system configuration definition replaces it.	Dynamic configuration
AOPSDBD_MAXTHREADTASKS	z/OS V2R2	Deleted	Daemon consolidation
	z/OS V2R1	Deleted: If dynamic configuration is enabled, Infoprint Server no longer uses this environment variable. The aopsdbd-max-thread-tasks attribute in the system configuration definition replaces it.	Dynamic configuration
AOPSSID_MAXTHREADTASKS	z/OS V2R1	Deleted: If dynamic configuration is enabled, Infoprint Server no longer uses this environment variable. The aopssid-max-thread-tasks attribute in the system configuration definition replaces it.	Dynamic configuration

Table 140. Summary of new and changed Infoprint Server environment variables (continued)

Environment variable	Release	Description	Reason for change
AOPSUBD_MAXTHREADTASKS	z/OS V2R1	Deleted: If dynamic configuration is enabled, Infoprint Server no longer uses this environment variable. The aopsubd-max-thread-tasks attribute in the system configuration definition replaces it.	Dynamic configuration
AOPWSMD_MAXTHREADTASKS	z/OS V2R1	Deleted: If dynamic configuration is enabled, Infoprint Server no longer uses this environment variable. The aopwsmd-max-thread-tasks attribute in the system configuration definition replaces it.	Dynamic configuration
JAVA_HOME	z/OS V2R2	Updated: For Infoprint Central and the IPP Server, specifies the location of Java 7.1.	Java 7.1 support
	z/OS V2R1	Updated: For Infoprint Central and the IPP Server, specifies the location of Java 7.0.	Java 7.0 support

## Exits

There are no new or changed Infoprint Server exits.

## Filters

There are no new or changed Infoprint Server filters.

## Infoprint Central

Table 141 lists the new and changed fields in Infoprint Central. For more information, see the Infoprint Central help system.

Table 141. Summary of new and changed Infoprint Central fields

Field	Release	Description	Reason for change
Age	z/OS V1R13	New: Displays the age of print jobs on the JES spool.	Infoprint Central enhancements
Auxiliary files MO:DCA level	z/OS V2R2	New: Displays the MO:DCA Interchange Set level that auxiliary pages support.	Printer Inventory enhancements for PSF
Direct download	z/OS V1R13	New: Displays whether PSF sends MO:DCA-P data directly to the AFP Download Plus receiver.	Printer Inventory enhancements for PSF
Display status	z/OS V1R13	New: Displays whether PSF displays status information for the AFP Download Plus receiver.	Printer Inventory enhancements for PSF
Email embedded headers	z/OS V1R13	New: Displays whether documents with line-data format can contain email headers.	Email enhancements
Email inline message	z/OS V1R13	New: Displays data that is included inline at the beginning of each email.	Email enhancements
Email inline text and line data	z/OS V1R13	New: Displays whether data in text and line-data documents is included inline in the body of the email.	Email enhancements
Email inline text attribute	z/OS V2R2	New: Displays a text job attribute that is included inline as a text string value at the beginning of each email.	Email enhancements
Include TSO output	z/OS V2R2	New: Displays TSO output jobs for JES print jobs when the ISPF <b>Operating mode</b> field is z/OS 2.2.	Infoprint Central enhancements

## Infoprint Server

Table 141. Summary of new and changed Infoprint Central fields (continued)

Field	Release	Description	Reason for change
Job Name	z/OS V2R2	New: Displays the descriptive name of an Infoprint Server daemon or a NetSpool task when the ISPF <b>Operating mode</b> field is z/OS 2.2.	Infoprint Central enhancements
No response action	z/OS V1R13	Updated: Displays the action that PSF takes when the response timeout value expires for an AFP Download Plus receiver.	Printer Inventory enhancements for PSF
No response notify	z/OS V1R13	New: Displays the user ID to which PSF sends a message when a response is not received from the AFP Download Plus receiver.	Printer Inventory enhancements for PSF
Page limit (AFP-only): Lower	z/OS V1R13	New: Displays the total number of AFP pages used as the lower limit for selecting print jobs from the JES spool.	IP PrintWay job-selection by records and AFP pages
Page limit (AFP-only): Upper	z/OS V1R13	New: Displays the total number of AFP pages used as the upper limit for selecting print jobs from the JES spool.	IP PrintWay job-selection by records and AFP pages
Paper length	z/OS V1R13	New: Displays the length of the paper.	Printer Inventory enhancements for PSF
Paper width	z/OS V1R13	New: Displays the width of the paper.	Printer Inventory enhancements for PSF
Presentation text objects (PTOCA)	z/OS V1R13	New: Displays whether PSF includes PTOCA objects inline.	Printer Inventory enhancements for PSF
Record limit: Lower	z/OS V1R13	New: Displays the total number of records used as the lower limit for selecting print jobs from the JES spool.	IP PrintWay job-selection by records and AFP pages
Record limit: Upper	z/OS V1R13	New: Displays the total number of records used as the upper limit for selecting print jobs from the JES spool.	IP PrintWay job-selection by records and AFP pages
Recovery pages	z/OS V1R13	New: Displays how often PSF synchronizes with the AFP Download Plus receiver.	Printer Inventory enhancements for PSF
Report Line-Mode Conversion paper-length errors	z/OS V1R13	New: Displays whether the 3800 Line-Mode Conversion function reports paper-length errors.	Printer Inventory enhancements for PSF
Save auxiliary files	z/OS V2R2	New: Displays whether all auxiliary files are saved in the job submitter's default message directory.	Printer Inventory enhancements for PSF
Save printer information	z/OS V1R13	Deleted: Deleted because PSF V4 does not use it.	Printer Inventory enhancements for PSF
Response timeout	z/OS V1R13	New: Displays the maximum number of seconds PSF waits for a response from the AFP Download Plus receiver.	Printer Inventory enhancements for PSF
SNMP subagent	z/OS V2R2	Deleted	SNMP daemon elimination
State	z/OS V2R2	New: Displays the state a daemon or task is in after it is started when the ISPF <b>Operating mode</b> field is z/OS 2.2.	Infoprint Central enhancements
Submitted within	z/OS V1R13	Updated: Field <b>Submitted within</b> on the Work with Print Jobs panel is now called <b>Submitted</b> and lets you select two new options: <b>More than</b> and <b>Less than</b> .	Infoprint Central enhancements



Table 141. Summary of new and changed Infoprint Central fields (continued)

Field	Release	Description	Reason for change
System	z/OS V2R2	New: Displays the name of the Infoprint Server system when the ISPF <b>Operating mode</b> field is z/OS 2.2.	Infoprint Central enhancements
Use Line-Mode Migration LINECT	z/OS V1R13	New: Displays whether the Line-Mode Migration function uses the number of lines specified in the LINECT parameter.	Printer Inventory enhancements for PSF
XCF Member Name	z/OS V2R2	New: Displays a cross-system coupling facility (XCF) member name that is used with the AOPSEND command when the ISPF <b>Operating mode</b> field is z/OS 2.2.	Infoprint Central enhancements

## ISPF panels

Table 142 lists the new and changed Infoprint Server ISPF panels. For more information, see the ISPF help system.

Table 142. Summary of new and changed Infoprint Server ISPF panels

ISPF panel	Release	Description	Reason for change
Email Protocol (printer definition)	z/OS V2R2	Updated: New field <b>Inline text attribute</b> specifies a text job attribute that is included inline as a text string value at the beginning of each email.	Email enhancements
	z/OS V1R13	Updated: Displays new fields: <ul style="list-style-type: none"> <li>• <b>Embedded headers:</b> Specifies whether documents with line-data format can contain email headers.</li> <li>• <b>Inline message:</b> Specifies data that is included inline at the beginning of each email.</li> <li>• <b>Inline text and line data:</b> Specifies whether data in text and line-data documents is included inline in the body of the email.</li> </ul>	Email enhancements
Infoprint Server: System Configuration	z/OS V2R2	Updated: New field <b>Operating mode</b> specifies the product function level that you want Infoprint Server to operate with.	Daemon consolidation
		Deleted fields: <ul style="list-style-type: none"> <li>• <b>SNMP Subagent: Community name</b></li> <li>• <b>Started daemons: snmpd</b></li> </ul>	SNMP daemon elimination
	z/OS V2R1	New: This panel lets authorized administrators customize Infoprint Server. To view and edit fields on this panel, select <b>Option 8 System</b> on the Infoprint Server: Printer Inventory Manager ISPF panel.  The <b>Log stream name</b> field lets you specify the name of a system logger log stream that Infoprint Server uses for messages.	Dynamic configuration System logger

## Infoprint Server

Table 142. Summary of new and changed Infoprint Server ISPF panels (continued)

ISPF panel	Release	Description	Reason for change
Job Selection Rule	z/OS V1R13	Updated: Contains new fields: <ul style="list-style-type: none"> <li>• <b>Page limit (AFP-only):</b> Specifies the total number of AFP pages used as the lower and upper limits for selecting print jobs from the JES spool.</li> <li>• <b>Record limit:</b> Specifies the total number of records used as the lower and upper limits for selecting print jobs from the JES spool.</li> </ul>	IP PrintWay job-selection by records and AFP pages
PSF FSA, AFP Download Plus	z/OS V2R2	Updated: Deleted field <b>Close libraries when idle.</b>	Printer Inventory enhancements for PSF
		Updated: New fields: <ul style="list-style-type: none"> <li>• <b>Auxiliary files MO:DCA level:</b> Specifies the MO:DCA Interchange Set level that auxiliary files support.</li> <li>• <b>Save auxiliary files:</b> Specifies whether all auxiliary files are saved in the job submitter's default message directory.</li> </ul>	Printer Inventory enhancements for PSF
	z/OS V1R13	Updated: Contains new fields: <ul style="list-style-type: none"> <li>• <b>Direct download:</b> Specifies whether PSF sends MO:DCA-P data directly to the AFP Download Plus receiver.</li> <li>• <b>Display status:</b> Specifies whether PSF displays status information.</li> <li>• <b>No response action:</b> Specifies the action that PSF takes when the response timeout value expires.</li> <li>• <b>No response notify:</b> Specifies the user ID to which PSF sends a message when a response is not received from the AFP Download Plus receiver.</li> <li>• <b>Paper length:</b> Specifies the length of the paper.</li> <li>• <b>Paper width:</b> Specifies the width of the paper.</li> <li>• <b>Presentation text objects (PTOCA):</b> Specifies whether PSF includes PTOCA objects inline.</li> <li>• <b>Recovery pages:</b> Specifies how often PSF synchronizes with the AFP Download Plus receiver.</li> <li>• <b>Report Line-Mode Conversion paper-length errors:</b> Specifies whether the 3800 Line-Mode Conversion function reports paper-length errors.</li> <li>• <b>Response timeout:</b> Specifies the maximum number of seconds to wait for a response.</li> <li>• <b>Use Line-Mode Migration LINECT:</b> Specifies whether the Line-Mode Migration function uses the LINECT parameter.</li> </ul>	Printer Inventory enhancements for PSF

Table 142. Summary of new and changed Infoprint Server ISPF panels (continued)

ISPF panel	Release	Description	Reason for change
PSF FSA	z/OS V2R2	Updated: New field <b>Auxiliary files MO:DCA level</b> specifies the MO:DCA Interchange Set level that auxiliary files support.	Printer Inventory enhancements for PSF
		Updated: Deleted field <b>SNMP reporting</b> .	SNMP daemon elimination
	z/OS V1R13	Updated: Field <b>Save printer information</b> field was deleted because PSF V4 does not support it.	Printer Inventory enhancements for PSF
PSF FSS	z/OS V2R2	Updated: New field <b>PINST trace dsname</b> specifies the name of the data set that PSF or AFP Download Plus directs a Printer Inventory notify subtask (PINST) trace to.	Tracing enhancements for PSF
	z/OS V1R13	Updated: New field <b>Log messages</b> specifies whether PSF writes messages in the Infoprint Server common message log.	Common message log enhancements for PSF

## JCL parameters

There are no new and changed JCL parameters for Infoprint Server.

## Job attributes

Table 143 lists the new and changed Infoprint Server job attributes. For more information, see *z/OS Infoprint Server Operation and Administration*.

Table 143. Summary of new and changed Infoprint Server job attributes

Attribute	Release	Description	Reason for change
mail-embedded-headers	z/OS V1R13	New: Specifies whether the document with line-data format contain email headers.	Email enhancements
mail-inline-message	z/OS V2R2	New: Specifies data that IP PrintWay extended mode includes inline at the beginning of each email.	Email enhancements
mail-inline-text	z/OS V1R13	New: Specifies whether data in text and line-data documents is included inline in the body of the email.	Email enhancements
mail-inline-text-attribute	z/OS V2R2	New: Specifies a text job attribute that IP PrintWay extended mode includes inline as a text string at the beginning of each email.	Email enhancements

## Printer Inventory attributes

Table 144 lists the new and changed attributes that can be specified in the Printer Inventory. For more information, see *z/OS Infoprint Server Operation and Administration*.

Table 144. Summary of new and changed Infoprint Server Printer Inventory attributes

Attribute	Release	Description	Reason for change
allow-all-characters-in-line-data	z/OS V2R1	New: This attribute determines how Infoprint Server detects the data format of documents that contain line data. This attribute is equivalent to the AOP_ALLOW_ALL_CHARACTERS_IN_LINE_DATA environment variable that you can specify in the aopstart EXEC when dynamic configuration is not enabled.	Dynamic configuration
aophinvd-max-thread-tasks	z/OS V2R2	Deleted	Daemon consolidation
	z/OS V2R1	New: This attribute specifies the maximum number of MVS tasks that aophinvd can have concurrently active. This attribute is equivalent to the AOPIPPD_MAXTHREADTASKS environment variable that you can specify in the aopstart EXEC when dynamic configuration is not enabled.	Dynamic configuration
aopipdpd-max-thread-tasks	z/OS V2R1	New: This attribute specifies the maximum number of MVS tasks that aopipdpd can have concurrently active. This attribute is equivalent to the AOPIPPD_MAXTHREADTASKS environment variable that you can specify in the aopstart EXEC when dynamic configuration is not enabled.	Dynamic configuration
aoplpd-max-thread-tasks	z/OS V2R1	New: This attribute specifies the maximum number of MVS tasks that aoplpd can have concurrently active. This attribute is equivalent to the AOPLPD_MAXTHREADTASKS environment variable that you can specify in the aopstart EXEC when dynamic configuration is not enabled.	Dynamic configuration
aopnetd-max-thread-tasks	z/OS V2R1	New: This attribute specifies the maximum number of MVS tasks that aopnetd can have concurrently active. This attribute is equivalent to the AOPNETD_MAXTHREADTASKS environment variable that you can specify in the aopstart EXEC when dynamic configuration is not enabled.	Dynamic configuration
aopoutd-max-thread-tasks	z/OS V2R1	New: This attribute specifies the maximum number of MVS tasks that aopoutd can have concurrently active. This attribute is equivalent to the AOPOUTD_MAXTHREADTASKS environment variable that you can specify in the aopstart EXEC when dynamic configuration is not enabled.	Dynamic configuration
aopsdbd-max-thread-tasks	z/OS V2R2	Deleted	Daemon consolidation
	z/OS V2R1	New: This attribute specifies the maximum number of MVS tasks that aopsdbd can have concurrently active. This attribute is equivalent to the AOPSDBD_MAXTHREADTASKS environment variable that you can specify in the aopstart EXEC when dynamic configuration is not enabled.	Dynamic configuration

Table 144. Summary of new and changed Infoprint Server Printer Inventory attributes (continued)

Attribute	Release	Description	Reason for change
aopsubd-max-thread-tasks	z/OS V2R1	New: This attribute specifies the maximum number of MVS tasks that aopsubd can have concurrently active. This attribute is equivalent to the AOPSUBD_MAXTHREADTASKS environment variable that you can specify in the aopstart EXEC when dynamic configuration is not enabled.	Dynamic configuration
aopssid-max-thread-tasks	z/OS V2R1	New: This attribute specifies the maximum number of MVS tasks that aopssid can have concurrently active. This attribute is equivalent to the AOPSSID_MAXTHREADTASKS environment variable that you can specify in the aopstart EXEC when dynamic configuration is not enabled.	Dynamic configuration
aopwsmd-max-thread-tasks	z/OS V2R1	New: This attribute specifies the maximum number of MVS tasks that aopwsmd can have concurrently active. This attribute is equivalent to the AOPWSMD_MAXTHREADTASKS environment variable that you can specify in the aopstart EXEC when dynamic configuration is not enabled.	Dynamic configuration
applid	z/OS V2R1	New: This attribute specifies the application program ID that IP PrintWay extended mode uses to establish a VTAM session with printers. This attribute is equivalent to the AOP_APPLID environment variable that you can specify in the aopstart EXEC when dynamic configuration is not enabled.	Dynamic configuration
ascii-codepage	z/OS V2R1	New: This attribute specifies The name of an IBM-supplied or custom ASCII code page supported by the z/OS iconv utility. This attribute is equivalent to the <b>ascii-codepage</b> attribute that you can specify in the aopd.conf file when dynamic configuration is not enabled.	Dynamic configuration
auxiliary-files-modca-level	z/OS V2R2	New: This attribute indicates the MO:DCA Interchange Set level that auxiliary files, such as separator pages and message files, support.	Printer Inventory enhancements for PSF
blank-truncation-classes	z/OS V2R1	New: This attribute specifies the list of JES output classes for which IP PrintWay removes blanks from the end of records or lines. This attribute is equivalent to the AOP_BLANK_TRUNCATION_CLASSES environment variable that you can specify in the aopstart EXEC when dynamic configuration is not enabled.	Dynamic configuration
configuration-version	z/OS V2R1	New: This attribute specifies the level of the system configuration definition.	Dynamic configuration
console-name	z/OS V2R1	New: This attribute specifies the name of the extended MCS console that Infoprint Central uses to send commands to the z/OS system. This attribute is equivalent to the <b>console-name</b> attribute that you can specify in the aopd.conf file when dynamic configuration is not enabled.	Dynamic configuration
direct-download	z/OS V1R13	New: This attribute specifies whether PSF sends MO:DCA-P data directly to the AFP Download Plus receiver.	Printer Inventory enhancements for PSF
display-status	z/OS V1R13	New: This attribute specifies whether PSF displays status information.	Printer Inventory enhancements for PSF

## Infoprint Server

Table 144. Summary of new and changed Infoprint Server Printer Inventory attributes (continued)

Attribute	Release	Description	Reason for change
ebcdic-codepage	z/OS V2R1	New: This attribute specifies the name of an IBM-supplied or custom EBCDIC code page supported by the z/OS iconv utility. This attribute is equivalent to the <b>ebcdic-codepage</b> attribute that you can specify in the aopd.conf file when dynamic configuration is not enabled.	Dynamic configuration
hardcopy-messages	z/OS V2R1	New: This attribute specifies which additional messages Infoprint Server sends to the hardcopy log. This attribute is equivalent to the <b>hardcopy-messages</b> attribute that you can specify in the aopmsg.conf file when dynamic configuration is not enabled.	Dynamic configuration
hardcopy-message-list	z/OS V2R1	New: This attribute specifies the message IDs of the messages that Infoprint Server sends to the hardcopy log. This attribute is equivalent to the <b>hardcopy-message-list</b> attribute that you can specify in the aopmsg.conf file when dynamic configuration is not enabled.	Dynamic configuration
ignore-dcf-routing-errors	z/OS V2R1	New: This attribute indicates whether IP PrintWay extended mode writes an error message when it cannot find a printer definition in the Printer Inventory that matches the specified DEST, CLASS, and FORMS JCL parameters. This attribute is equivalent to the AOP_IGNORE_DCF_ROUTING_ERRORS environment variable that you can specify in the aopstart EXEC when dynamic configuration is not enabled.	Dynamic configuration
inline-ptoca-objects	z/OS V1R13	New: This attribute specifies whether PSF includes PTOCA objects inline.	Printer Inventory enhancements for PSF
ipp-port-number	z/OS V2R1	New: This attribute specifies the number of the port at which the IPP Server waits for print requests. This attribute is equivalent to the <b>ipp-port-number</b> attribute that you can specify in the aopd.conf file when dynamic configuration is not enabled.	Dynamic configuration
ipsmode	z/OS V2R2	New: This attribute indicates the product function level that you want Infoprint Server to operate with.	Avoid migration actions
job-prefix	z/OS V2R1	New: This attribute specifies a prefix that Print Interface and NetSpool use for the job IDs of output data sets that they allocate on the JES spool. This attribute is equivalent to the <b>job-prefix</b> attribute that you can specify in the aopd.conf file when dynamic configuration is not enabled.	Dynamic configuration
log-messages	z/OS V1R13	New: This attribute specifies whether PSF writes messages in the Infoprint Server common message log.	Printer Inventory enhancements for PSF

Table 144. Summary of new and changed Infoprint Server Printer Inventory attributes (continued)

Attribute	Release	Description	Reason for change
log-retention	z/OS V2R1	New: This attribute specifies the number of days worth of messages that Infoprint Central displays for print jobs and printers. Also, the number of days for which Infoprint Central displays print jobs that have been removed from the JES spool. This attribute is equivalent to the <b>log-retention</b> attribute that you can specify in the aopd.conf file when dynamic configuration is not enabled.  If dynamic configuration is enabled, the default value changes to 1 day. If dynamic configuration is not enabled, the default value is 0 unless the Infoprint Central daemon is started, in which case the default value is 1 day.	Dynamic configuration
logstream-name	z/OS V2R1	New: This attribute specifies the name of the log stream that is defined to the MVS system logger for Infoprint Server messages. This attribute is only available if dynamic configuration is enabled.	System logger
lower-page-limit	z/OS V1R13	New: This attribute specifies the total number of AFP pages used as the lower limit for selecting print jobs from the JES spool.	IP PrintWay job-selection by records and AFP pages
lower-record-limit	z/OS V1R13	New: This attribute specifies the total number of records used as the lower limit for selecting print jobs from the JES spool.	IP PrintWay job-selection by records and AFP pages
lpd-port-number	z/OS V2R1	New: This attribute specifies the number of the port at which the Infoprint Server LPD waits for print requests. This attribute is equivalent to the <b>lpd-port-number</b> attribute that you can specify in the aopd.conf file when dynamic configuration is not enabled.	Dynamic configuration
mail-do-not-add-suffixes	z/OS V2R1	New: This attribute indicates whether IP PrintWay extended mode appends a suffix to file names specified in the MAILFILE JCL parameter or the <b>mail-file-name</b> job attribute. This attribute is equivalent to the AOP_MAIL_DO_NOT_ADD_SUFFIX environment variable that you can specify in the aopstart EXEC when dynamic configuration is not enabled.	Dynamic configuration
mail-embedded-headers	z/OS V1R13	New: This attribute specifies whether documents with line-data format can contain email headers.	Email enhancements
mail-inline-message	z/OS V1R13	New: This attribute specifies data that is included inline at the beginning of each email.	Email enhancements
mail-inline-text	z/OS V1R13	New: This attribute specifies whether data in text and line-data documents is included inline in the body of the email.	Email enhancements
mail-inline-text-attribute	z/OS V2R2	New: This attribute specifies a text job attribute that IP PrintWay extended mode includes inline as a text string at the beginning of each email.	Email enhancements
mail-preserve-suffixes	z/OS V2R1	New: This attribute specifies the suffixes that IP PrintWay extended mode preserves in file names specified in the MAILFILE JCL parameter or in the mail-file-name job attribute. This attribute is equivalent to the AOP_MAIL_PRESERVE_SUFFIXES environment variable that you can specify in the aopstart EXEC when dynamic configuration is not enabled.	Dynamic configuration

## Infoprint Server

Table 144. Summary of new and changed Infoprint Server Printer Inventory attributes (continued)

Attribute	Release	Description	Reason for change
mail-use-first-address	z/OS V2R1	New: When the print job contains more than one document, this attribute indicates whether IP PrintWay extended mode sends each document to the email address or addresses specified for the first document in the print job. This attribute is equivalent to the AOP_MAIL_USE_FIRST_ADDRESS environment variable that you can specify in the aopstart EXEC when dynamic configuration is not enabled.	Dynamic configuration
mailer-options	z/OS V2R1	New: This attribute specifies options for the z/OS UNIX sendmail command. This attribute is equivalent to the AOPMAILER_OPTIONS environment variable that you can specify in the aopstart EXEC when dynamic configuration is not enabled.	Dynamic configuration
mailer-path-name	z/OS V2R1	New: This attribute specifies the full path name of the z/OS UNIX sendmail command that IP PrintWay extended mode uses to send output to email destinations. This attribute is equivalent to the AOPMAILER environment variable that you can specify in the aopstart EXEC when dynamic configuration is not enabled.	Dynamic configuration
max-historical-inventory-size	z/OS V2R1	New: This attribute specifies the maximum size in megabytes (MBs) of the Historical Inventory, /var/Printsrv/hinv. This attribute is equivalent to the <b>max-historical-inventory-size</b> attribute that you can specify in the aopd.conf file when dynamic configuration is not enabled.	Dynamic configuration
max-thread-tasks	z/OS V2R1	New: This attribute specifies limit is the maximum number of MVS tasks that a single process (daemon) can have concurrently active. This attribute is equivalent to the AOP_MAXTHREADTASKS environment variable that you can specify in the aopstart EXEC when dynamic configuration is not enabled.	Dynamic configuration
netspool-use-fixed-jobid	z/OS V2R1	New: This attribute indicates whether NetSpool assigns the same job ID to all output data sets that it creates on the JES spool. This attribute is equivalent to the AOPNETD_USE_FIXED_JOBID environment variable that you can specify in the aopstart EXEC when dynamic configuration is not enabled.	Dynamic configuration
netspool-use-unaltered-jobid	z/OS V2R1	New: This attribute indicates whether NetSpool assigns a job ID to output data sets that it creates on the JES spool. This attribute is equivalent to the AOPNETD_USE_UNALTERED_JOBID environment variable that you can specify in the aopstart EXEC when dynamic configuration is not enabled.	Dynamic configuration
paper-length	z/OS V1R13	New: This attribute specifies the length of the paper.	Printer Inventory enhancements for PSF
paper-width	z/OS V1R13	New: This attribute specifies the width of the paper.	Printer Inventory enhancements for PSF
pinst-trace-dsname	z/OS V2R2	New: This attribute specifies the name of the data set that PSF or AFP Download Plus directs a Printer Inventory notify subtask (PINST) trace to.	Tracing enhancements for PSF
report-line-mode-conversion-paper-length-errors	z/OS V1R13	New: This attribute specifies whether the 3800 Line-Mode Conversion function reports paper length errors.	Printer Inventory enhancements for PSF



Table 144. Summary of new and changed Infoprint Server Printer Inventory attributes (continued)

Attribute	Release	Description	Reason for change
response-timeout	z/OS V1R13	New: This attribute specifies the maximum number of seconds PSF waits for a response from the AFP Download Plus receiver.	Printer Inventory enhancements for PSF
save-auxiliary-files	z/OS V2R2	New: This attribute specifies whether all auxiliary files are saved in the job submitter's default message directory.	Printer Inventory enhancements for PSF
select-work-from-hold-queue	z/OS V2R1	New: This attribute indicates whether IP PrintWay extended mode selects new held output groups from the JES spool. This attribute is equivalent to the AOP_SELECT_WORK_FROM_HOLD_QUEUE environment variable that you can specify in the aopstart EXEC when dynamic configuration is not enabled.	Dynamic configuration
smf-recording	z/OS V2R1	New: This attribute indicates whether IP PrintWay extended mode writes SMF type 6 records for data sets that it sends to a printer or email destination. SMF type 6 records contain accounting information. This attribute is equivalent to the <b>smf-recording</b> attribute that you can specify in the aopd.conf file when dynamic configuration is not enabled.	Dynamic configuration
snmp-community	z/OS V2R2	Deleted	SNMP daemon elimination
	z/OS V2R1	New: This attribute specifies the name assigned to the SNMP community for making SNMP requests to the z/OS system. This attribute is equivalent to the <b>snmp-community</b> attribute that you can specify in the aopd.conf file when dynamic configuration is not enabled.	Dynamic configuration
snmp-reporting	z/OS V2R2	Deleted	SNMP daemon elimination
suppress-post-unix-filter-formatting	z/OS V2R1	New: This attribute indicates whether IP PrintWay extended mode formats line or text data after a UNIX filter processes it. This attribute is equivalent to the AOP_SUPPRESS_POST_UNIX_FILTER_FORMATTING environment variable that you can specify in the aopstart EXEC when dynamic configuration is not enabled.	Dynamic configuration
transmit-recovery-pages	z/OS V1R13	New: This attribute specifies how often PSF synchronizes with the AFP Download Plus receiver.	Printer Inventory enhancements for PSF
upper-page-limit	z/OS V1R13	New: This attribute specifies the total number of AFP pages used as the upper limit for selecting print jobs from the JES spool.	IP PrintWay job-selection by records and AFP pages
upper-record-limit	z/OS V1R13	New: This attribute specifies the total number of records used as the upper limit for selecting print jobs from the JES spool.	IP PrintWay job-selection by records and AFP pages
use-line-mode-migration-linect	z/OS V1R13	New: This attribute specifies whether the Line-Mode Migration function uses the LINECT parameter.	Printer Inventory enhancements for PSF

## RACF profiles

Table 145 lists the new and changed RACF resource profiles that Infoprint Server uses. For more information, see *z/OS Infoprint Server Customization*.

Table 145. Summary of new and changed Infoprint Server RACF resource profiles

Resource profile	Release	Description	Reason for change
AOP.CONFIGURATION	z/OS V2R1	<p>New: This profile in the PRINTSRV class lets you control access to the new system configuration definition in the Printer Inventory:</p> <ul style="list-style-type: none"> <li>• READ access lets you view the system configuration definition.</li> <li>• UPDATE access lets you view and edit the system configuration definition.</li> </ul> <p>READ or UPDATE access to the AOP.ADMINISTRATOR profile in the PRINTSRV class also lets you view the system configuration definition.</p> <p>If the AOP.CONFIGURATION profile does not exist, users who have UPDATE access to the AOP.ADMINISTRATOR profile in the PRINTSRV class can view and edit the system configuration definition.</p>	Dynamic configuration

## SMF type 6 record for IP PrintWay

Table 146 lists the new and changed fields in the SMF type 6 record for IP PrintWay extended mode. For more information, see *z/OS MVS System Management Facilities (SMF)*.

Table 146. Summary of new and changed SMF type 6 record for Infoprint Server

Field in Type 6 record	Release	Description	Reason for change
SMF6ACCT	z/OS V2R1	New: Contains accounting information from the JOB JCL statement.	SMF enhancements
SMF6ACTL	z/OS V2R1	New: Contains the length of the accounting information in the SMF6ACCT field.	SMF enhancements
SMF6FTL	z/OS V2R1	Updated: Indicates whether fields SMF6ACTL and SMF6ACCT are present in the record.	SMF enhancements
SMF6PGE	z/OS V2R2	Updated: Contains either the total number of pages that actually printed or zero.	SMF enhancements

## /usr/lpp/Printsrv/samples directory

Table 147 lists the new and changed files in the Infoprint Server /usr/lpp/Printsrv/samples directory. For more information, see *z/OS Infoprint Server Customization*.

Table 147. Summary of new and changed Infoprint Server files in /usr/lpp/Printsrv/samples directory

File	Release	Description	Reason for change
aopd.conf	z/OS V2R2	Deleted: These attributes are deleted in the aopd.conf file: <ul style="list-style-type: none"> <li>aophinvd_max_thread_tasks</li> <li>aopsdbd_max_thread_tasks</li> <li>snmp-community</li> </ul>	Daemon consolidation and SNMP daemon elimination
	z/OS V2R1	Updated: The comments in the aopd.conf sample file were updated to identify the attributes that are ignored when dynamic configuration is enabled.	Dynamic configuration
aopmsg.conf	z/OS V2R1	Updated: The comments in the aopmsg.conf sample file were updated to say that the aopmsg.conf file is ignored when dynamic configuration is enabled.	Dynamic configuration
aopxfd.conf	z/OS V2R1	Updated: The comments in the aopxfd.conf sample file were updated to: <ul style="list-style-type: none"> <li>Remove information about the IBM Infoprint transforms from AFP to PCL, PDF, and PostScript because these products are out of service</li> <li>Add information for V2R3 of IBM Infoprint Transforms to AFP</li> <li>Update information for IBM Print Transforms from AFP for Infoprint Server for z/OS</li> </ul>	Support for IBM transform products
httpd.conf	z/OS V2R2	Updated: Changes because Infoprint Central uses IBM HTTP Server - Powered by Apache instead of IBM HTTP Server powered by Domino.	HTTP Server migration

## z/OS UNIX commands for Infoprint Server

Table 148 lists the new and changed z/OS UNIX commands provided by Infoprint Server. For more information, see *z/OS Infoprint Server Operation and Administration*.

In addition to the commands included in this topic, updates to UNIX commands might have resulted in SYS1.PROCLIB member changes. See Chapter 3, "Summary of changes to SYS1.PROCLIB," on page 21 for those changes.

Table 148. Summary of new and changed z/OS UNIX commands for Infoprint Server

Command	Release	Description	Reason for change
aopdemon	z/OS V2R2	New: Starts one Infoprint Server daemon when the ISPF <b>Operating mode</b> field is z/OS 2.2.	Individually started daemons
aopsend	z/OS V2R2	New: Stops one or all Infoprint Server daemons when the ISPF <b>Operating mode</b> field is z/OS 2.2.	Individually started daemons

## Infoprint Server

Table 148. Summary of new and changed z/OS UNIX commands for Infoprint Server (continued)

Command	Release	Description	Reason for change
aopstat	z/OS V2R2	New: Displays the status of Infoprint Server daemons when the dynamic configuration is set.	Dynamic configuration

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## TSO/E commands for Infoprint Server

Table 149 lists the new and changed commands provided by Infoprint Server. For more information, see *z/OS Infoprint Server Customization* and *z/OS Infoprint Server Operation and Administration*.

Table 149. Summary of new and changed commands for Infoprint Server

Command	Release	Description	Reason for change
AOPCMND	z/OS V2R2	New: Starts and stops IP PrintWay extended mode printers from TSO instead of from Infoprint Central.	TSO/E command to start and stop IP PrintWay extended mode printers

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## Chapter 15. Integrated Security Services summary of interface changes

This topic contains new and changed interfaces for:

- Enterprise Identity Mapping (EIM)
  - “Utilities”
- Network Authentication Service
  - “APIs”
  - “Configuration options” on page 272
  - “Environment variables” on page 273

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### Enterprise Identity Mapping (EIM) summary of interface changes

This topic summarizes the new and changed EIM interfaces.

#### Commands

There are no new or changed commands.

#### Utilities

There are no new or changed utilities.

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### Network Authentication Service summary of interface changes

#### Commands

Updates to the Network Authentication Services commands are documented in *z/OS Integrated Security Services Network Authentication Service Administration*.

Table 150. Summary of changes to z/OS Network Authentication Service Commandss

Command	Release	Description
kinit	z/OS V2R2	New: A new option, -X, was added to allow specification of PKINIT attributes

#### APIs

Table 89 on page 190 lists the updates to the Network Authentication Services application interface for Network Authentication Service application programming interfaces (APIs).

Table 151. Summary of changes to z/OS Network Authentication Service APIs

API	Release	Description	Reason for change
krb5_get_in_tkt_with_pkinit	z/OS V2R2	New: Gets an initial ticket using a public private key pair.	Support for getting an initial ticket using public private key pair

## Integrated security services

Table 151. Summary of changes to z/OS Network Authentication Service APIs (continued)

API	Release	Description	Reason for change
krb5_init_context_pkinit	z/OS V2R2	New: Add to a Kerberos context with values specified in the configuration file for public private key authentication.	Support for updating Kerberos context with pkinit values
krb5_set_value_pkinit	z/OS V2R2	New: Add to a Kerberos context for public private key authentication from values specified in the input attribute / value pair parameter.	Support for setting pkinit value

## Configuration options

New and changed configuration options for Network Authentication Services are documented in *z/OS Integrated Security Services Network Authentication Service Administration*.

Table 152. Summary of new and changed Network Authentication Service configuration options

Configuration option	Release	Description	Reason for change
pkinit_keyring	z/OS V2R2	<b>New:</b> Specifies the RACF key ring name value.	Supports Public Key Cryptography for Initial Authentication (PKINIT).
pkinit_keyring_stash	z/OS V2R2	<b>New:</b> Specifies the stash file name.	Supports Public Key Cryptography for Initial Authentication (PKINIT).
pkinit_require_revocation_checking	z/OS V2R2	<b>New:</b> Indicates whether revocation checking is needed and what checking methods are used during the verification of the certificate.	Supports Public Key Cryptography for Initial Authentication (PKINIT).
pkinit_ldap_server	z/OS V2R2	<b>New:</b> Indicates the LDAP server location for checking certificate revocation status.	Supports Public Key Cryptography for Initial Authentication (PKINIT).
pkinit_rsa_protocol	z/OS V2R2	<b>New:</b> Indicates if the request uses the Diffie-Hellman exchange method or the RSA public key encryption to encrypt the reply.	Supports Public Key Cryptography for Initial Authentication (PKINIT).
pkinit_dh_min_bits	z/OS V2R2	<b>New:</b> Indicates the minimum key size, in bits, of the Diffie-Hellman key to be generated.	Supports Public Key Cryptography for Initial Authentication (PKINIT).

Table 152. Summary of new and changed Network Authentication Service configuration options (continued)

Configuration option	Release	Description	Reason for change
pkinit_kdc_hostname	z/OS V2R2	<b>New:</b> Indicates whether the client is willing to accept a KDC certificate with a dNSName SAN (Subject Alternative Name) rather than requiring the id-pkinit-san as defined in RFC 4556.	Supports Public Key Cryptography for Initial Authentication (PKINIT).

## Environment variables

Table 153 identifies changes to environment variables used by Network Authentication Services.

Table 153. Summary of changes to Network Authentication Service environment variables

Environment variable	Release	Description	Reason for change
SKDC_PKINIT_REQUIRED	z/OS V2R2	New: Specifies whether the Public Key authentication method (PKINIT) in the Authentication Service (AS) exchange is required.	New SKDC_PKINIT support
SKDC_PKINIT_KEYRING	z/OS V2R2	New: Specifies the key store to be used for PKINIT. The value is in the format of owner id>/<ring name> or token name in the format of *TOKEN*/token name, or key database name in the format of full path key database name.	New SKDC_PKINIT support
SKDC_PKINIT_KEYRING_STASH	z/OS V2R2	New: Specifies the full path name of the key database stash file that contains the password of the key database.	New SKDC_PKINIT support
SKDC_PKINIT_REQUIRE_EKU	z/OS V2R2	New: Specifies whether the KDC requires the client certificate used for PKINIT to have the extended keyusage extension.	New SKDC_PKINIT support
SKDC_PKINIT_REQUIRE_REVOCATION_CHECKING	z/OS V2R2	New: Specifies whether revocation checking is needed and what checking methods to use in PKINIT during the verification of the client certificate.	New SKDC_PKINIT support
SKDC_PKINIT_LDAP_SERVER	z/OS V2R2	New: Specifies the LDAP server location where the LDAP directory entry containing the certificate revocation list (CRL) is stored.	New SKDC_PKINIT support
SKDC_PKINIT_DH_MIN_BITS	z/OS V2R2	New: Specifies the KDC policy for the minimum Diffie-Hellman key size (in bits) to be allowed on inbound AS requests by using PKINIT.	New SKDC_PKINIT support

## Integrated security services

Table 153. Summary of changes to Network Authentication Service environment variables (continued)

Environment variable	Release	Description	Reason for change
SKDC_TKT_ENCTYPES	z/OS V2R2	New: Specifies the encryption types to be used for ticket-granting tickets and for service tickets.	New SKDC_PKINIT support



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## Chapter 16. ISPF summary of interface changes

The ISPF interfaces described in this topic are:

- “ISPF system commands”
- “ISPF primary commands” on page 276
- “ISPF line commands” on page 276
- “ISPF installation-wide exits” on page 277
- “ISPF file-tailoring skeletons” on page 277
- “ISPF configuration table keywords” on page 277
- “ISPF panel language” on page 277
- “ISPF panels” on page 277
- “ISPF services” on page 279
- “ISPF load modules” on page 280
- “ISPF environment variables” on page 281
- “ISPF variables” on page 281
- “ISPF DTL tags” on page 281

The Software Configuration and Library Manager (SCLM) interfaces described in this topic are:

- “SCLM line commands” on page 281
- “SCLM macros” on page 281
- “SCLM panels” on page 281
- “SCLM services” on page 281
- “SCLM translators” on page 281
- “SCLM variables” on page 281

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### ISPF system commands

Table 154 lists the new and updated ISPF system commands. See *z/OS V2R2 ISPF Dialog Tag Language Guide and Reference* and *z/OS V2R2 ISPF Dialog Developer’s Guide and Reference* for more detailed information.

*Table 154. Summary of new and changed ISPF system commands*

Primary Command	Release	Description	Reason for change
ISPD TLC	V2R2	Added new parameters ZISPFRC and NOZISPFRC to specify whether the compiler places the final return code into the ISPF shared pool variable ZISPFRC.	DTL compiler enhancement to use the system variable ZISPFRC
ISPSTART	V2R2	Updated the command to allow an initial command stack variable to be specified using the OPT parameter.	ISPSTART command enhancement to support an initial command stack on the OPT parameter

## ISPF primary commands

Table 155 lists the new and updated ISPF primary commands. See *z/OS V2R2 ISPF User's Guide Vol II* for more detailed information.

*Table 155. Summary of new and changed ISPF primary commands*

Primary Command	Release	Description	Reason for change
Browse DISPLAY	V2R2	Added the RDW and NORDW operands to control whether the record descriptor word (RDW) is displayed for variable length records.	Browse enhancement to display the RDW of variable records
Browse LOCATE	V2R2	The maximum value allowed for the line-number parameter, which indicates the line to be moved to the top of the display, is increased to 2147483647.	Browse enhancement to increase the record number limit
z/OS UNIX mounted file systems primary commands: <ul style="list-style-type: none"> <li>• FIND</li> <li>• LEFT</li> <li>• MOUNT</li> <li>• RFIND</li> <li>• RIGHT</li> <li>• XA</li> </ul>	V2R2	Added new primary commands for use with the z/OS UNIX mounted file systems list.	z/OS UNIX file system support in ISPF

## ISPF line commands

Table 156 lists the new and updated ISPF line commands. See *z/OS V2R2 ISPF User's Guide Vol II* for more detailed information.

*Table 156. Summary of new and changed ISPF line commands*

Line Command	Release	Description	Reason for change
z/OS UNIX mounted file systems line commands: <ul style="list-style-type: none"> <li>• I - information</li> <li>• L - directory list</li> <li>• M - modify attributes</li> <li>• R - release from quiesce</li> <li>• U - unmount</li> <li>• X - expand</li> <li>• XA - expand all</li> </ul>	V2R2	Added new line commands for use with the entries in the z/OS UNIX mounted file systems list.	z/OS UNIX file system support in ISPF
Attached zFS aggregates line commands: <ul style="list-style-type: none"> <li>• A - attributes</li> <li>• E - extend</li> <li>• L - list file systems</li> </ul>	V2R2	Added new line commands for use with the entries in the Attached zFS aggregates list.	z/OS UNIX file system support in ISPF

Table 156. Summary of new and changed ISPF line commands (continued)

Line Command	Release	Description	Reason for change
File systems line commands: • A - attributes	V2R2	Added new line commands for use with the entries in the File systems list.	z/OS UNIX file system support in ISPF

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## ISPF installation-wide exits

There are no new or changed ISPF installation-wide exits.

---

## ISPF file-tailoring skeletons

There are no new or changed ISPF file-tailoring skeletons.

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## ISPF configuration table keywords

Table 157 lists the new and updated ISPF configuration table keywords. See *z/OS V2R2 ISPF Planning and Customizing* for more detailed information.

Table 157. Summary of new and changed ISPF configuration table keywords

Keyword	Release	Description	Reason for change
GLOBAL_DISABLE_PACK	V2R2	Added new keyword to disable the PACK operation used by the editor.	Global configuration option to disable the editor PACK operation
GLOBAL_LINE_COMMAND_TABLE	V2R2	Added new keyword to define a global line command table that is active when a line command table is not otherwise specified.	Global configuration option to define a default line command table

---

## ISPF panel language

There are no new or changed ISPF panel language statements.

---

## ISPF panels

Table 158 lists the new and updated ISPF panels. See *z/OS V2R2 ISPF Planning and Customizing* for more detailed information.

Table 158. Summary of new and changed ISPF panels

Keyword	Release	Description	Reason for change
z/OS UNIX Directory List Utility (ISRUULP)	V2R2	Added the File_Systems pull-down to the action bar.	z/OS UNIX file system support in ISPF
z/OS UNIX Mounted File Systems (ISRUUMT0)	V2R2	Added new panel for displaying z/OS UNIX mounted file systems.	z/OS UNIX file system support in ISPF

Table 158. Summary of new and changed ISPF panels (continued)

Keyword	Release	Description	Reason for change
Mounted File Systems List Actions (ISRUUABC)	V2R2	Added new panel for selecting the line command to be invoked for an entry in the mounted file systems list.	z/OS UNIX file system support in ISPF
z/OS UNIX Mount Table List Options (ISRUMNO1)	V2R2	Added new panel for defining the width of the leftmost column on the z/OS UNIX Mounted File Systems panel.	z/OS UNIX file system support in ISPF
Mount Table Column Arrangement (ISRUMNO2)	V2R2	Added new panel for modifying the order and width of the columns displayed on the z/OS UNIX Mounted File Systems panel.	z/OS UNIX file system support in ISPF
Select the Attribute to Change (ISRUMATR)	V2R2	Added new panel for modifying file system attributes.	z/OS UNIX file system support in ISPF
Mode Change Confirmation (ISRUCHGM)	V2R2	Added new panel for providing confirmation before a file system is unmounted and then remounted in a different mode.	z/OS UNIX file system support in ISPF
Set Automove Attribute (ISRUSAMA)	V2R2	Added new panel for specifying the action that is to be taken for the file system when the system is in sysplex mode and the owning system fails.	z/OS UNIX file system support in ISPF
Release From Quiesce Status (ISRURFQS)	V2R2	Added new panel for providing confirmation before a file system is released from quiesced status.	z/OS UNIX file system support in ISPF
Unmount a z/OS UNIX File System (ISRUMNUM)	V2R2	Added new panel for entering the information needed to unmount a file system.	z/OS UNIX file system support in ISPF
Mount z/OS UNIX File System (ISRUMNMT)	V2R2	Added new panel for entering the information needed to mount a file system.	z/OS UNIX file system support in ISPF
Create a zFS Aggregate and File System (ISRUUFS4)	V2R2	Added new panel for allocating a data set for an aggregate, formatting the aggregate, and creating a file system in that aggregate.	z/OS UNIX file system support in ISPF

Table 158. Summary of new and changed ISPF panels (continued)

Keyword	Release	Description	Reason for change
Attached zFS Aggregates (ISRUUZ01)	V2R2	Added new panel for displaying the name of each attached zFS aggregate, along with the associated free space and total space values.	z/OS UNIX file system support in ISPF
Aggregate Attributes (ISRUUZ11)	V2R2	Added new panel for displaying information about a zFS aggregate.	z/OS UNIX file system support in ISPF
Extend Aggregate (ISRUUZ07)	V2R2	Added new panel for entering the information needed to extend a zFS aggregate.	z/OS UNIX file system support in ISPF
File System List (ISRUUZ03)	V2R2	Added new panel for displaying the name of each file system in a zFS aggregate, along with the associated space used and total space values.	z/OS UNIX file system support in ISPF
File System Attributes (ISRUUZ10)	V2R2	Added new panel for displaying information about a file system in a zFS aggregate.	z/OS UNIX file system support in ISPF
Modify PDF Edit Configuration Settings (ISPPMOD1)	V2R2	Updated panel to allow for changing the configuration to disable the editor PACK operation.	Global configuration option to disable the editor PACK operation
		Updated panel to allow for configuring a global line command table.	Global configuration option to define a default line command table

## ISPF services

Table 159 lists the new and updated ISPF services. See *z/OS V2R2 ISPF Services Guide* for more detailed information.

Table 159. Summary of new and changed ISPF services

Service	Release	Description	Reason for change
BRIF - Browse interface	V2R2	Added new parameter, EXTEND, to increase the number of records that can be processed beyond 99,999,999.	Browse enhancement to increase the record number limit
CONTROL - set processing modes	V2R2	Added the PASSTHRU LRSCROLL processing option to control whether the left and right scroll commands are processed by ISPF or passed through to the dialog for processing.	CONTROL service enhancement for left and right scroll commands

Table 159. Summary of new and changed ISPF services (continued)

Service	Release	Description	Reason for change
EDIT - Edit interface	V2R2	Added new parameter, tabname, for specifying the name of a user line command table to be used for the edit session.	EDIF and VIIF services enhancement to support an edit line command table
VIIF - View interface	V2R2	Added new parameter, tabname, for specifying the name of a user line command table to be used for the view session.	EDIF and VIIF services enhancement to support an edit line command table

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## ISPF load modules

Table 160 lists the new and updated load modules for the TSO/ISPF Client Gateway. See *z/OS V2R2 ISPF Planning and Customizing* for more detailed information.

Table 160. Summary of new and changed load modules for the TSO/ISPF Client Gateway

Load Module	Release	Description	Reason for change
ISPZINL	V2R2	Updated the load module to provide the Interactive ISPF Gateway. The Interactive ISPF Gateway supports interactive communication and manages the TSO/E sessions using z/OS CEA TSO/E address space services.	Interactive ISPF Gateway
	V2R1	Added new load module, ISPZINL, which is distributed in the system SIEALNKE data set. This load module is required to be available for gateway operations.	Preparation for Interactive ISPF Gateway
ISPZINO	V2R1	Added new load module, ISPZINO, which is distributed in the ISPF LPA data set. This load module is required to be available for gateway operations.	Preparation for Interactive ISPF Gateway

---

## ISPF environment variables

Table 161 lists the new and updated environment variables for the TSO/ISPF Client Gateway. See *z/OS V2R2 ISPF Planning and Customizing* for more detailed information.

*Table 161. Summary of new and changed environment variables for the TSO/ISPF Client Gateway*

Environment Variable	Release	Description	Reason for change
CGI_CEATSO	V2R2	Added new environment variable, CGI_CEATSO, for indicating whether the Legacy ISPF Gateway or the Interactive ISPF Gateway is invoked.	Interactive ISPF Gateway

---

## ISPF variables

There are no new or changed ISPF variables.

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## ISPF DTL tags

There are no new or changed SCLM line commands.

---

## SCLM line commands

There are no new or changed SCLM line commands.

---

## SCLM macros

There are no new or changed SCLM macros.

---

## SCLM panels

There are no new or changed SCLM panels.

---

## SCLM services

There are no new or changed SCLM services.

---

## SCLM translators

There are no new or changed SCLM translators.

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## SCLM variables

There are no new or changed SCLM variables.





## Chapter 17. JES2 summary of interface changes

In addition to the interface changes included in this topic, updates to JES2 might have resulted in SYS1.PARMLIB and SYS1.SAMPLIB member changes. See Chapter 2, “Summary of changes to SYS1.PARMLIB,” on page 7 and Chapter 4, “Summary of changes to SYS1.SAMPLIB,” on page 23 for those changes.

The JES2 interfaces described in this topic are:

- “Commands”
- “ENF records” on page 289
- “Initialization statements” on page 290
- “Installation exits” on page 291
- “Executable macros” on page 292
- “SSI function codes” on page 295

### Commands

Table 162 lists the new and changed JES2 commands. See *z/OS JES2 Commands* for more detailed information.

Table 162. Summary of new and changed JES2 Commands

Interface_type	Release	Description	Reason for change
\$A G, A GROUP, A GRP	z/OS V2R2	<b>New command:</b> Release held job group.	Release a held job group.
\$ACTIVATE	z/OS V2R2	<b>Changed command:</b> Removed LEVEL=z2 and added LEVEL=z22.	Dropped support for z2 checkpoint mode and added support for z22 mode.
\$C G, C GROUP, C GRP	z/OS V2R2	<b>New command:</b> Cancels all jobs in a job group.	Cancels a job group and all jobs that have not completed in the job group.
\$C O Group	z/OS V2R2	<b>New command:</b> Cancels specific output groups or individual job output elements created by a group.	Cancels specific output groups or individual job output elements created by a group.
\$D ACTIVATE	z/OS V2R2	<b>Changed command:</b> Removed LEVEL=z2 and added LEVEL=z22.	Dropped support for z2 checkpoint mode and added support for z22 mode.
\$D CKPTSPACE	z/OS V2R2	<b>Changed command:</b> Added new keyword TRACKS= for checkpoint on DASD and new keyword SIZE= for checkpoint on CF.	New display of the current size of the checkpoint data sets.
\$D DEBUG	z/OS V2R2	<b>Changed command:</b> Added new keywords QVERIFY= and TIMECLOCK.	Displays new debug options.
\$D DUPJOB	z/OS V2R2	<b>New command:</b> New command to display information on duplicate job families.	An improved way to manage duplicate jobs and to look for process looping when submitting the same job.

## JES2

Table 162. Summary of new and changed JES2 Commands (continued)

Interface_type	Release	Description	Reason for change
\$D G, D GROUP, D GRP	z/OS V2R2	<b>New command:</b> Display information about a job group, jobs in a job group, and job group dependencies.	Display information about a job group.
\$D GROUP	z/OS V2R2	<b>Changed command:</b> SYSAFF parameter description is changed.	Job groups do not support independent mode.
\$D GRPDEF	z/OS V2R2	<b>New command:</b> Displays information about job execution control limits.	Display job group limits and processing characteristics.
\$D INPUTDEF	z/OS V2R2	<b>New command:</b> Displays information about input phase processing rules.	Enables support to recognize JES3 JECL and alter how the null JCL statement works.
\$D J	z/OS V2R2	<b>Changed command:</b> Added new keywords HOLDUNTIL=, STARTBY=, WITH=, JOBGROUP=, and CONJOBS. For job group logging jobs, added keywords JOBS, JOBFULL, DEPLIST, DEPFULL, CONJOBS, and INERROR.	Displays new attributes used to schedule a job and the job execution control values.
\$D JECLDEF	z/OS V2R2	<b>New command:</b> Displays information about how JECL statements are processed.	Displays how JES2 and JES3 JECL statements are processed.
\$D JOBCLASS	z/OS V2R2	<b>Changed command:</b> Displays new keyword PROMO_RATE.	Displays STARTBY promotion rate.
\$D JOBDEF	z/OS V2R2	<b>Changed command:</b> Displays new keyword SUP_EVENTLOG_SMF.	Displays whether SMF records are written to the new EVENTLOG data set.
\$D JOBDEF	z/OS V2R2	<b>Changed command:</b> Displays new keyword DEF_CLASS via APAR OA44178.	Displays the default job class to use when a job class error is encountered.
\$D JOBDEF	z/OS V2R2	<b>Changed command:</b> 1. Added new keyword LOGMSG= via APAR OA42427. 2. Removed LEVEL=z2 and added LEVEL=z22.	1. Displays whether JCL error messages in a job's JOBLIST are folded to upper case. 2. Dropped support for z2 checkpoint mode and added support for z22 mode.
\$D MASDEF	z/OS V2R2	<b>Changed command:</b> Displays new keyword CYCLEMGT.	Displays whether JES2 is setting the tuning parameters HOLD and DORMANCY or if they are being set manually.
\$D MASDEF	z/OS V2R2	<b>Changed command:</b> Displays new keyword ENFScope via APAR OA41698.	Displays whether JES2 ENFs are sent to the MAS or to the SYSPLEX.
\$DO G	z/OS V2R2	<b>New command:</b> Displays the job group logging job's output.	Displays the output elements associated with a job group logging job.
\$D OUTDEF	z/OS V2R2	<b>Changed command:</b> Displays new keyword LDEV_OPT=.	Displays whether \$#POST optimization is active for local devices.
\$H G, H GROUP, H GRP	z/OS V2R2	<b>New command:</b> Marks a job group held.	Marks a job group as held.
\$P G, P GROUP, P GRP	z/OS V2R2	<b>New command:</b> Purges a job group and all related jobs.	Purges a job group logging job and all jobs in the job group.

Table 162. Summary of new and changed JES2 Commands (continued)

Interface_type	Release	Description	Reason for change
\$P O Group	z/OS V2R2	<b>New command:</b> Purges a job group's output and remove all traces of the output from the system.	Cancels a job group's output and remove all traces of the output from the system.
\$T CKPTDEF	z/OS V2R2	<b>Changed command:</b> Added support to alter DSNAME=, VOLSER=, and STRNAME=. Added new keywords SPACE= and SIZE= to change the size of the checkpoint.	Provides a simplified way to reconfigure the checkpoint specifications. Also allows the size of the checkpoint data set or structure to be increased.
\$T CKPTSPACE	z/OS V2R2	<b>Changed command:</b> Increased limit for BERTNUM=.	Relieve JES2 processing constraints.
\$T DEBUG	z/OS V2R2	<b>Changed command:</b> Added new keywords QVERIFY= and TIMECLOCK.	Allows enabling of new debug options.
\$T G, T GROUP, T GRP	z/OS V2R2	<b>New command:</b> Modifies attributes of a job group.	Modifies attributes of a job group.
\$T GROUP	z/OS V2R2	<b>Changed command:</b> SYSAFF parameter description is changed.	Job groups do not support independent mode.
\$T GRPDEF	z/OS V2R2	<b>New command:</b> Modifies information about job execution control limits.	Updates the limits associated with job execution controls.
\$T INPUTDEF	z/OS V2R2	<b>New command:</b> Modifies input phase processing rules.	Enables support to recognize JES3 JECL and alter how the null JCL statement works.
\$T JECLDEF	z/OS V2R2	<b>New command:</b> Modifies how JECL statements are processed.	Alters how JES2 and JES3 JECL statements are processed.
\$T JOBCLASS	z/OS V2R2	<b>Changed command:</b> Modifies new keyword PROMO_RATE.	Controls STARTBY promotion rate.
\$T JOBDEF	z/OS V2R2	<b>Changed command:</b> Increased the limit for JOBNUM=, added new keyword SUP_EVENTLOG_SMF=.	Relieves JES2 processing constraints. Controls whether SMF records are written to the new EVENTLOG data set.
\$T JOBDEF	z/OS V2R2	<b>Changed command:</b> Added new keyword LOGMSG= via APAR OA42427.	Controls whether the JCL error messages in a job's JOBLOG are folded to upper case.
\$T JOBDEF	z/OS V2R2	<b>Changed command:</b> Modifies new keyword DEF_CLASS= via APAR 44178.	Modified the default job class to use when a job class error is encountered.
\$T MASDEF	z/OS V2R2	<b>Changed command:</b> Modifies new keyword CYCLEMGT.	Controls whether JES2 is setting the tuning parameters HOLD and DORMANCY or they are being set manually.
\$T MASDEF	z/OS V2R2	<b>Changed command:</b> Modifies new keyword ENFScope via APAR OA41698.	Controls whether JES2 ENFs are sent to the MAS or the SYSPLEX.
\$T O Group	z/OS V2R2	<b>New command:</b> Sets the output characteristics for one or more job group output elements belonging to one or more specified job groups.	Sets the output characteristics for one or more job group output elements belonging to one or more specified job groups.

Table 162. Summary of new and changed JES2 Commands (continued)

Interface_type	Release	Description	Reason for change
\$T OUTDEF	z/OS V2R2	<b>Changed command:</b> Increased limit for JOENUM=. Added new keyword LDEV_OPT.	Relieves JES2 processing constraints. Controls whether \$#POST optimization is active for local devices.
\$A Job	z/OS V2R1	<b>Changed command:</b> New parameter JOBCORR added.	Releases a subset of jobs by a matching job correlator parameter value.
\$ADD JOBCLASS	z/OS V2R1	<b>New command:</b> New command for defining a new job class.	Creates a new job class.
\$C Job	z/OS V2R1	<b>Changed command:</b> New parameter JOBCORR added.	Cancels a subset of jobs by a matching job correlator parameter value.
\$C O Job	z/OS V2R1	<b>Changed command:</b> New parameter JOBCORR added.	Cancels output for a subset of jobs by a matching job correlator parameter value.
\$D CKPTDEF	z/OS V2R1	<b>Changed command:</b> Changed parameter INUSE.	Displays checkpoint data set multi-access spool configuration.
\$D CLASSGRP	z/OS V2R1	<b>New command:</b> Display class groups.	Displays job class groups for the member.
\$D DEBUG	z/OS V2R1	<b>Changed command:</b> New command for displaying debug settings.	Displays JES2 monitoring and recording activity settings.
\$D I(nnnmm)	z/OS V2R1	<b>Changed command:</b> CClass parameter updated.	CClass parameter supports up to eight characters.
\$D INITINFO	z/OS V2R1	<b>New command:</b> New command for displaying initialization information.	Displays JES2 initialization information.
\$D Job	z/OS V2R1	<b>Changed command:</b> New parameters JOBCORR and REQUIRES_zos added. CClass parameter updated.	Displays information about a subset of jobs by a matching job correlator parameter value. Displays the required z/OS level. CClass parameter supports up to eight characters.
\$D JOBCLASS	z/OS V2R1	<b>Changed command:</b> New parameters DSENQSHR and SYSSYM added. Updated jobclass parameter.	Displays the setting for shared control of data set serialization. Displays system symbols setting. Jobclass supports up to eight characters.
\$D JOBDEF	z/OS V2R1	<b>Changed command:</b> New parameters CISUB_PER_AS, CNVT_ENQ, CNVT_SCHENV, INTERPRET added.	Displays the settings for subtasks, ENQ, scheduling environment and interpreter parameters.
\$DEL JOBCLASS	z/OS V2R1	<b>New command:</b> New command for deleting a job class.	Deletes a user-defined job class.
\$D O Job	z/OS V2R1	<b>Changed command:</b> New parameter JOBCORR added.	Displays output characteristics for a subset of jobs by a matching job correlator parameter value.
\$D OFF(n).JR	z/OS V2R1	<b>Changed command:</b> CClass parameter changed.	Multiple job class names up to eight characters in length can be specified.

Table 162. Summary of new and changed JES2 Commands (continued)

Interface_type	Release	Description	Reason for change
\$D OFF(n).JT	z/OS V2R1	<b>Changed command:</b> CLass parameter changed.	Multiple job class names up to eight characters in length can be specified.
\$D OUTDEF	z/OS V2R1	<b>Changed command:</b> New parameters JOEUSE, SAPI_OPT and WS_OPT added. Removed BROADCAST parameter.	Displays number of JOES and settings for SAPI work selection optimization.
\$D RDR(nn)	z/OS V2R1	<b>Changed command:</b> CLass parameter changed.	Multiple job class names up to eight characters in length can be specified.
\$D SPOOL	z/OS V2R1	<b>Changed command:</b> New parameter ABSTR added.	Displays the size and starting track for each SPOOL data set on the volume.
\$E Job	z/OS V2R1	<b>Changed command:</b> New parameter JOBCORR added. CLass parameter updated.	Restarts a subset of jobs by a matching job correlator parameter value. CLass parameter supports up to eight characters.
\$H Job	z/OS V2R1	<b>Changed command:</b> New parameter JOBCORR added. CLass parameter updated.	Holds a subset of jobs by a matching job correlator parameter value. CLass parameter supports up to eight characters.
\$L Job	z/OS V2R1	<b>Changed command:</b> New parameter JOBCORR added.	Lists job output information for a subset of jobs by a matching job correlator parameter value.
\$O Job	z/OS V2R1	<b>Changed command:</b> New parameter JOBCORR added.	Releases or cancels held output groups for a subset of jobs by a matching job correlator parameter value.
\$P Job	z/OS V2R1	<b>Changed command:</b> New parameter JOBCORR added. CLass parameter updated.	Purges a subset of jobs by a matching job correlator parameter value. CLass parameter supports up to eight characters.
\$P O Job	z/OS V2R1	<b>Changed command:</b> New parameter JOBCORR added.	Purges output for a subset of jobs by a matching job correlator parameter value.
\$P TRACE	z/OS V1R13	<b>Changed command:</b> Reserved trace IDs changed.	Trace IDs 48-255 are available for customer use.
\$S Job	z/OS V2R1	<b>Changed command:</b> New parameter JOBCORR added.	Initiates a subset of batch jobs into execution by a matching job correlator parameter value.
\$S TRACE	z/OS V1R13	<b>Changed command:</b> Reserved trace IDs changed.	Trace IDs 48-255 are available for customer use.
\$T CKPTDEF	z/OS V2R1	<b>Changed command:</b> Changed parameter MODE.	MODE=DUPLEX does not affect the checkpoint INUSE setting for multi-access spool configuration.

Table 162. Summary of new and changed JES2 Commands (continued)

Interface_type	Release	Description	Reason for change
\$T Init	z/OS V2R1	<b>Changed command:</b> New parameter JOBCORR added.	Multiple job class names up to 8 characters in length can now be specified.
\$T INTRDR	z/OS V2R1	<b>Changed command:</b> New parameters ASID_TRACE, JOBNAME_TRACE and JOB_NUMBER_TRACE added. CLass parameter changed.	Specifies ASID, job name and job number to use for filtering JES2 INTRDR trace points. Specifies the default execution job class for internal readers that are not specified on the JOB statement.
\$T Job	z/OS V2R1	<b>Changed command:</b> New parameter JOBCORR added. CLass parameter updated.	Changes a subset of jobs' class, priority or affinity by a matching job correlator parameter value. CLass parameter supports up to eight characters.
\$T JOBCLASS	z/OS V2R1	<b>Changed command:</b> New parameters ACTIVE, DSENQSHR, GROUP, SYSSYM added. CLass parameter changed.	Sets active, data set serialization, group and system symbol job class characteristics. Multiple job class names up to 8 characters in length can now be specified.
\$T JOBDEF	z/OS V2R1	<b>Changed command:</b> New parameters CISUB_PER_AS, CNVT_ENQ, CNVT_SCHENV, INTERPRET added.	Sets job processing characteristics for subtasks, ENQ, scheduling environment and interpreter parameters.
\$T L(nnnn).ST(n)	z/OS V2R1	<b>Changed command:</b> LIMit and PLIM parameters changed.	Variable size range is 0-4294967295.
\$T L(nn).JT(nn)	z/OS V2R1	<b>Changed command:</b> LIMit and PLIM parameters changed.	Variable size range is 0-4294967295.
\$T O Job	z/OS V2R1	<b>Changed command:</b> New parameter JOBCORR added.	Sets output characteristics for ha subset of jobs by a matching job correlator parameter value.
\$T OFF(n).JR	z/OS V2R1	<b>Changed command:</b> CLass parameter changed.	Multiple job class names up to 8 characters in length can now be specified.
\$T OFF(n).JT	z/OS V2R1	<b>Changed command:</b> CLass and LIMit parameters changed.	Multiple job class names up to 8 characters in length can now be specified. Variable size range is 0-4294967295.
\$T OFF(n).SR	z/OS V2R1	<b>Changed command:</b> SYSOUT work selection processing.	Specifies work selection and processing characteristics of offload SYSOUT receivers.
\$T OFF(n).ST	z/OS V2R1	<b>Changed command:</b> LIMit and PLIM parameters changed.	Variable size range is 0-4294967295.
\$T OUTDEF	z/OS V2R1	<b>Changed command:</b> New parameters SAPI_OPT and WS_OPT added. Removed BROADCAST parameter.	Enables or disables SAPI work selection optimization.
\$T PROCLIB	z/OS V2R1	<b>Changed command:</b> Function updated.	\$T PROCLIB functional update.

Table 162. Summary of new and changed JES2 Commands (continued)

Interface_type	Release	Description	Reason for change
\$T PRT(nnnnn) and \$T R(nnnnn).PR(m)	z/OS V2R1	<b>Changed command:</b> LIMit parameter changed.	Output size range is 0-4294967295.
\$T PUN(nn) and \$T R(nnnnn).PU(m)	z/OS V2R1	<b>Changed command:</b> LIMit parameter changed.	Output size range is 0-4294967295.
\$T TRACE	z/OS V1R13	<b>Changed command:</b> Reserved trace IDs changed.	Trace IDs 48-255 are available for customer use.
\$D SPOOL	z/OS V1R13	<b>Changed command:</b> New parameters MIGDATA, MPERCENT, PHASE, and TARGET added.	Displays spool migration information
\$D SPOOLDEF	z/OS V1R13	<b>Changed command:</b> New parameter DSNMASK added.	Displays data set mask name
\$E JOB	z/OS V1R13	<b>Changed command:</b> New parameter STEP added.	Restarts job at next step once current step completes
\$MSPL	z/OS V1R13	<b>New command:</b> Migrate a spool volume.	Migrates spool volume to new or existing spool volume
\$S SPOOL	z/OS V1R13	<b>Changed command:</b> New parameter DSNAME added.	Specifies a data set name for a new spool volume
\$T JOB	z/OS V1R13	<b>Changed command:</b> New parameter SPIN added.	SPINs JESLOG data sets or a SYSOUT DD
\$T JOBCLASS	z/OS V1R13	<b>Changed command:</b> New parameter JOBRC added.	Sets method JES2 will use to determine job return codes for class
\$T SPOOL	z/OS V1R13	<b>Changed command:</b> New parameter SPACE added.	Expands a spool volume data set
\$T SPOOLDEF	z/OS V1R13	<b>Changed command:</b> New parameter VOLUME added.	Sets prefix for JES2 spool volumes

## ENF records

Table 163 lists the new and changed ENF records for JES2. See *z/OS JES2 Initialization and Tuning Reference* for more information.

Table 163. Summary of new and changed ENF codes for JES2

ENF Code	Release	Description	Reason for change
58, 70, 78	z/OS V2R2	<b>Changed code:</b> Changed process of ENF issued via SYNC request.	ENF had been issued via ASYNC, but changed to SYNC via APAR OA47827.
70, 78	z/OS V2R2	<b>Changed code:</b> New value, MAXCC, can now be ENFxx_CFLU.	A new MAXCC value was added to indicate a dependent job was flushed.
70, 78	z/OS V2R2	<b>Changed code:</b> Changed process of allowing ENFs to be called for job group logging job.	Logging jobs have a JOBID (ENFxx_JOBID) that starts with a "G".
78	z/OS V2R1	<b>New code:</b> New ENF code 78	Indicates that a job is no longer eligible for execution
70	z/OS V2R1	<b>Changed parameter:</b> New TRACE IDs	New Trace IDs 45 and 46

## Initialization statements

Table 164 lists the new and changed JES2 initialization statements. See *z/OS JES2 Initialization and Tuning Reference* for more information.

Table 164. Summary of new and changed JES2 Initialization Statements

Initialization Statement	Release	Description	Reason for change
CKPTSPACE	z/OS V2R2	<b>Changed parameter:</b> Increased limit for BERTNUM=.	Relieve JES2 processing constraints.
DEBUG	z/OS V2R2	<b>New parameter:</b> Added QVERIFY= and TIMECLOCK= keywords.	Allows enabling new debug options.
GRPDEF	z/OS V2R2	<b>New statement:</b> Specify information about job execution control limits.	Update the limits associated with job execution controls.
INPUTDEF	z/OS V2R2	<b>New statement:</b> Specify input phase processing rules.	Enables support to recognize JES3 JECL and alter how the null JCL statement works.
JECLDEF	z/OS V2R2	<b>New statement:</b> Specify how JECL statements are processed.	Alters how JES2 and JES3 JECL statements are processed.
JOBCLASS	z/OS V2R2	<b>New parameter:</b> Added keyword PROMO_RATE.	Controls STARTBY promotion rate.
JOBDEF	z/OS V2R2	<b>Changed parameter:</b> Increased limit for JOBNUM=.	Relieve JES2 processing constraints.
JOBDEF	z/OS V2R2	<b>New parameter:</b> Added new keyword SUP_EVENTLOG_SMF=.	Controls whether SMF records are written to the new EVENTLOG data set.
JOBDEF	z/OS V2R2	<b>New parameter:</b> Added new keyword LOGMSG= via APAR OA42427.	Controls whether JCL error messages in a job's JOBLOG are folded to upper case.
JOBDEF	z/OS V2R2	<b>New parameter:</b> Added new keyword DEF_CLASS= via APAR OA44178.	Controls the default job class to use when a job class error is encountered.
MASDEF	z/OS V2R2	<b>New parameter:</b> Added new keyword CYCLEMGT.	Controls whether JES2 is setting the tuning parameters HOLD and DORMANCY or if they are being set manually.
MASDEF	z/OS V2R2	<b>New parameter:</b> Added new keyword ENFScope via APAR OA41698.	Controls whether JES2 ENFs are sent to the MAS or the SYSPLEX.
OUTDEF	z/OS V2R2	<b>Changed parameter:</b> Increased limit for JOENUM=.	Relieve JES2 processing constraints.
OUTDEF	z/OS V2R2	<b>New parameter:</b> Added new keyword LDEV_OPT.	Controls whether \$#POST optimization is active for local devices.
CKPTDEF	z/OS V2R1	<b>Changed parameter:</b> INUSE	Release update for checkpoint data set support.



Table 164. Summary of new and changed JES2 Initialization Statements (continued)

Initialization Statement	Release	Description	Reason for change
CKPTSPACE	z/OS V2R1	Changed parameter: BERTNUM	Release update for CATs support.
DEBUG	z/OS V2R1	New parameter: MEMBER_STATUS	Member status change notification.
OFF(n).JR	z/OS V2R1	Changed parameter: CLASS	Release updates for jobclass function.
OFF(n).JT	z/OS V2R1	Changed parameters: CLASS, LIMIT	Release updates for jobclass and job limits function.
INIT(nnnn)	z/OS V2R1	Changed parameter: CLASS	Release updates for jobclass function.
JOBCLASS	z/OS V2R1	New parameters: ACTIVE, DSEQSHR, SYSSYM Changed parameters: CLASS, GROUP	Release updates for jobclass function and system symbols.
JOBDEF	z/OS V2R1	New parameters: CISUB_PER_AS, CNVT_ENQ, CNVT_SCHENV, INTERPRET	Release updates for converter/interpreter subtasks.
NETSERV	z/OS V2R1	Changed parameter: STACK	INET configuration updates.
NJEDEF	z/OS V2R1	Changed parameter: OWNNODE	Parameter value requirements updates.
OUTDEF	z/OS V2R1	New parameter: SAPI_OPT Changed parameters: BROADCAST, DSLIMIT	Release updates for SAPI work selection optimization. BROADCAST obsoleted.
PROCLIB(xxxxxxxx)	z/OS V2R1	Changed parameter: xxxxxxxx	Dynamic PROCLIB support updates.
SPOOLDEF	z/OS V2R1	Changed parameter: DSNMASK	Naming requirements updates.
TRACE(n)	z/OS V2R1	Changed parameter: START	Reserved trace IDs changed to 1-47.
JOBCLASS	z/OS V1R13	New parameter: JOBRC.	Specify method for determining job return code
SPOOL	z/OS V1R13	New statement: SPOOL.	Binds the specified spool volumes

## Installation exits

Table 165 lists the new and changed JES2 installation exits. See *z/OS JES2 Installation Exits* for more information.

Table 165. Summary of new and changed JES2 Installation Exits

Exit	Release	Description	Reason for change
Exits 2, 3, 4, 20, 52, 53, 54, 60	z/OS V2R2	Changed installation exit: Exits can be driven for new JOBGROUP logging job and job group JCL statements.	A new set of JCL was created for job execution control processing. These exits can be driven for this new job group logging job.

## JES2

Table 165. Summary of new and changed JES2 Installation Exits (continued)

Exit	Release	Description	Reason for change
Exits 2, 3, 52, 53	z/OS V2R2	<b>Changed installation exit:</b> New parameter indicator that controls if JES2 or JES3 JECL is recognized.	A new set of JECL was created that will be processed for the current job.
Exit 32	z/OS V2R2	<b>Changed installation exit:</b> Via APAR OA45138 a new XPL mapped parameter list is passed to the exit.	R0 on entry to the exit is now a parameter list mapped by the \$XPL.
Exit 32	z/OS V2R2	<b>Changed installation exit:</b> A new restriction that this exit cannot block execution of a job that is part of a concurrent set.	If X032IND is set to X032ICON, then the job is part of a concurrent set and can not be terminated by this exit.
Exit 51	z/OS V2R2	<b>Changed installation exit:</b> This exit can get control for jobs moved onto and off of the SETUP queue. It also gets control for the job group logging job.	The SETUP queue is after the conversion phase and before execution. Jobs are on the SETUP queue until all dependencies are satisfied.
Exit 60	z/OS V2R1	<b>New installation exit:</b> JES2 converter exit (subtask)	Controls conversion processing in the JES2CI address space
Exit 59	z/OS V2R1	<b>New installation exit:</b> Post interpretation	Controls the interpreter when called after the converter is called in the JES2CI address space
Exit 53	z/OS V2R1	<b>Changed installation exit:</b> Programming considerations	Subpool usage limitations
Exit 6	z/OS V2R1	<b>Changed installation exit:</b> Use in conjunction with Exit 60	Only gets control when the converter is called in the JES2 address space
Exit 58	z/OS V1R13	<b>New installation exit:</b> Subsystem interface (SSI) end-of-step	Controls step return code and job continuation

## Executable macros

Table 166 lists the new and changed JES2 executable macros. See *z/OS JES2 Macros* for more information.

Table 166. Summary of new and changed JES2 executable macros

Macro	Release	Description	Reason for change
##GET	z/OS V2R2	<b>Changed macro:</b> New parameter BESTJOE.	When OPTIMI=YES, best JOE processing is required.
##REM	z/OS V2R2	<b>Changed macro:</b> New parameter option LOCK=(YES,FREE) via APAR OA45349.	Indicates the caller owns the job lock and that ##REM should free it when no longer required.
\$BLDMSG	z/OS V2R2	<b>Changed macro:</b> New parameter JOBGROUP.	When JOBGROUP=YES, the message is to be placed in the job group log.

Table 166. Summary of new and changed JES2 executable macros (continued)

Macro	Release	Description	Reason for change
\$BLDTGB	z/OS V2R2	<b>Changed macro:</b> New parameter value ID=MQTR via APAR OA45088.	Indicates ADDR= is an MQTR.
\$DISTERR	z/OS V2R2	<b>Changed macro:</b> New parameter value DUMP=MAS.	Indicates that a MAS dump should be taken for this error.
\$DOGCAT	z/OS V2R2	<b>Changed macro:</b> GETCOPY=YES support for FETCHNEXT calls via APAR OA46266.	Allows FETCHNEXT loop to return a copy of a CAT.
\$ENTRY	z/OS V2R2	<b>Changed macro:</b> New parameter SUP_AMODE64. New parameter value SAVE=(...NOWAIT).	Passes SUP_AMODE64 and NOWAIT values to the invoked \$SAVE macro.
\$FIFOBLK	z/OS V2R2	<b>Changed macro:</b> New parameter PTRSIZE.	Indicates if pointers are 31 or 64 bit in length.
\$FIFODEQ	z/OS V2R2	<b>Changed macro:</b> New parameters COUNT and PTRSIZE.	Indicates address of the count field and if pointers are 31 or 64 bit in length.
\$FIFOENQ	z/OS V2R2	<b>Changed macro:</b> New parameters COUNT and PTRSIZE.	Indicates address of the count field and if pointers are 31 or 64 bit in length.
\$FIFOGTQ	z/OS V2R2	<b>Changed macro:</b> New parameters CHAINOFF, COUNT, and PTRSIZE.	Indicates offset to chain pointers, address of count field, and if pointers are 31 or 64 bit in length.
\$FREJLOK	z/OS V2R2	<b>New macro:</b> Replaces \$FRELOK TYPE=JOB via APAR OA42433.	Replacement macro to manage job lock.
\$FRELOK	z/OS V2R2	<b>Deleted macro:</b> Replaced by \$FREJLOK and \$FREMLOK via APAR OA42433.	Separate macros for job and CMS locks.
\$FREMLOK	z/OS V2R2	<b>New macro:</b> Replaces \$FRELOK TYPE=CMS via APAR OA42433.	Replacement macro to manage CMS lock.
\$GETJLOK	z/OS V2R2	<b>New macro:</b> Replaces \$GETLOK TYPE=JOB via APAR OA42433.	Replacement macro to manage job lock.
\$GETLOK	z/OS V2R2	<b>Deleted macro:</b> Replaced by \$GETJLOK and \$GETMLOK via APAR OA42433.	Separate macros for job and CMS locks.
\$GETMLOK	z/OS V2R2	<b>New macro:</b> Replaces \$GETLOK TYPE=CMS via APAR OA42433.	Replacement macro to manage CMS lock.
\$JCAN	z/OS V2R2	<b>Changed macro:</b> New parameter CALLER.	Indicates the cancel function requested.
\$PCETAB	z/OS V2R2	<b>Changed macro:</b> New parameter PAINADJ.	Pain adjustment value used in checkpoint tuning.
\$QSUSE	z/OS V2R2	<b>Changed macro:</b> New parameter value TYPE=WAITNOIO.	Wait until the queues are owned and no checkpoint I/O is in progress.
\$SAVE	z/OS V2R2	<b>Changed macro:</b> New parameter SUP_AMODE64 and WAIT.	Indicates if 64 bit callers are supported and if a \$WAIT in this service should generate \$ERROR (main task only).

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Table 166. Summary of new and changed JES2 executable macros (continued)

Macro	Release	Description	Reason for change
\$WTO	z/OS V2R2	<b>Changed macro:</b> New keyword ASJSAB=.	Indicates the message associated with the address space (not current task or transaction).
##BUSY	z/OS V2R1	<b>Changed macro:</b> New parameter JOA	Specifies the address of the JOA to use for processing
##JOE	z/OS V2R1	<b>Changed macro:</b> New parameter NXPREG	Specifies work register to use to store the next pre-fetched JOE
\$DOGBERT	z/OS V2R1	<b>Changed macro:</b> New parameter GETCOUNT	Support counting control blocks of a particular type
\$DOGCAT	z/OS V2R1	<b>Changed macro:</b> New parameters BATCHONLY and GETCOPY	Process only batch job execution queues, and obtain a copy of a CAT
\$DSERV	z/OS V2R1	<b>Changed macro:</b> New parameter OPTIONS	Support for serializing checkpoint versions
\$ESTAE	z/OS V2R1	<b>Changed macro:</b> New parameter DUMP added	Support capturing a dump in the user environment
\$FREEBUF	z/OS V2R1	<b>Changed macro:</b> New TYPE value SUBST	Support symbol substitution
\$FREJLOK	z/OS V2R2	<b>New macro:</b> New macro \$FREJLOK	Replaces macro \$FRELOK TYPE=JOB.
\$FREMLOK	z/OS V2R2	<b>New macro:</b> New macro \$FREMLOK	Replaces macro \$FRELOK TYPE=CMS.
\$GETBUF	z/OS V2R1	<b>Changed macro:</b> New parameter BUFL for TYPE=SUBST	Support symbol substitution
\$GETHP	z/OS V2R1	<b>Changed macro:</b> New parameter FIX	Support page fixing storage
\$GETJLOK	z/OS V2R2	<b>New macro:</b> New macro \$GETJLOK	Replaces macro \$GETLOK TYPE=JOB.
\$GETMAIN	z/OS V2R1	<b>Changed macro:</b> New TCB value CURRENT	Support associating GETMAINed storage with the current TCB
\$GETMLOK	z/OS V2R2	<b>New macro:</b> New macro \$GETMLOK	Replaces macro \$GETLOK TYPE=CMS.
\$GETRTN	z/OS V2R1	<b>Changed macro:</b> New parameter MISSING	Label to branch to if the routine cannot be located
\$JBIDBLD	z/OS V2R1	<b>Changed macro:</b> New parameter JID1CHR	Force the macro to return a job ID with a single character prefix followed by a 7 digit job number
\$JCORBLD	z/OS V2R1	<b>New macro:</b> New job correlator macro	Build a job correlator for the supplied job
\$JQESERV	z/OS V2R1	<b>Changed macro:</b> New parameter POSTRTN	Support logical association of a series of \$JQESERV requests, treating them as one request
\$PDBFIND	z/OS V2R1	<b>Changed macro:</b> New DSKEY value LASTSYS	Support locating the last system data set

Table 166. Summary of new and changed JES2 executable macros (continued)

Macro	Release	Description	Reason for change
\$QJQE	z/OS V2R1	<b>Changed macro:</b> New parameter NXPREG	Specifies work register to use to store the next pre-fetched JOE
\$RETURN	z/OS V2R1	<b>Changed macro:</b> New parameter RCG	Support returning a 64-bit return code
\$SCANTAB	z/OS V2R1	<b>Changed macro:</b> Updated character set support	Support for 8 character job class character set
\$SEAS	z/OS V2R1	<b>Changed macro:</b> New parameters ERRET and OKRET	Label to branch to if the macro returns an error (ERRET) or returns an okay return code (OKRET)
\$SJBLOCK	z/OS V2R1	<b>Changed macro:</b> New parameter ACCEPT	Support nested SSI calls
\$TRACE	z/OS V2R1	<b>Changed macro:</b> New optional second parameter NOFILTER added to TYPE=TEST parameter	Supports skipping the trace filter tests and returning only the TEDE control block
\$WSTAB	z/OS V2R1	<b>Changed macro:</b> New parameter POS	Supports a work selection criteria that has the same significance before and after the "/".
##JOE	z/OS V1R13	<b>Changed macro:</b> New parameter CBADDR added	Specifies the address of JOA to use for processing
\$DOGJOE	z/OS V1R13	<b>Changed macro:</b> New operand KEEP added to parameter ACTION=FETCHNEXT	Specifies to not release the memory for the JOA
\$DOGJOE	z/OS V1R13	<b>Changed macro:</b> New operand JOETIME added to parameter #POST.	Updates JOECRTME if OUTDEF OUTTIME=UPDATE has been specified

## SSI function codes

Table 167 lists the new and changed JES2 function codes. See *z/OS MVS Using the Subsystem Interface* for more information.

Table 167. Summary of new and changed JES2 Function Codes

SSI Function Code	Release	Description	Reason for change
80	z/OS V2R2	<b>Changed SSI function code.</b> Support for processing job groups.	Filter on job group logging job. Return data on job dependencies and job group status.
82	z/OS V2R2	<b>Changed SSI function code.</b> New option to obtain PROCLIB information.	Uses new IAZJPROC macro to obtain PROCLIB information.
85	z/OS V2R2	<b>Changed SSI function code.</b> Support for processing job groups.	Uses new IAZJPROC macro to obtain PROCLIB information.
85	z/OS V2R1	<b>New SSI function code.</b> New modify job SSI 85.	New modify job function call SSI function code 85.
82	z/OS V2R1	<b>Changed SSI function code:</b> Job class fields updated.	Job class and job class group updates.

## JES2

Table 167. Summary of new and changed JES2 Function Codes (continued)

SSI Function Code	Release	Description	Reason for change
80	z/OS V2R1	<b>Changed SSI function code:</b> STAT, STTR, STJQ, STSC, STVB, STVO new and changed fields.	Element updates for 64 bit support. Job execution support.
71	z/OS V2R1	<b>Changed SSI function code:</b> Checkpoint version fields updated.	Checkpoint version support.
54	z/OS V2R1	<b>Changed SSI function code:</b> SSVISLVL field updated.	Service level field updates.
20	z/OS V2R1	<b>Changed SSI function code:</b> SSRRJCRP parameter added.	New job correlator support.
1	z/OS V2R1	<b>Changed SSI function code:</b> SSOUFLG field updated.	User selection flags updates.
83	z/OS V1R13	<b>Changed SSI function code:</b> Fields and descriptions added.	JES device information services

## Chapter 18. JES3 summary of interface changes

In addition to the interface changes included in this topic, updates to JES3 might have resulted in SYS1.PARMLIB and SYS1.SAMPLIB member changes. See Chapter 2, “Summary of changes to SYS1.PARMLIB,” on page 7 and Chapter 4, “Summary of changes to SYS1.SAMPLIB,” on page 23 for those changes.

The JES3 interfaces described in this topic are:

- “Commands”
- “Diagnostic codes” on page 298
- “Executable macros” on page 298
- “Initialization statements” on page 300
- “SMF records” on page 301
- “SSI function codes” on page 301

### Commands

Table 168 lists the new and changed JES3 commands. See *z/OS JES3 Commands* for more detailed information.

Table 168. Summary of new and changed JES3 commands

Command	Release	Description	Reason for change
*INQUIRY,SC	z/OS V2R2	<b>Changed command:</b> ALL parameter updated.	OUTDISP support.
*INQUIRY,C	z/OS V2R2	<b>Changed command:</b> (none), C, cpid, N, and U parameters updated.	OUTDISP support.
*INQUIRY,PROCLIB	z/OS V2R2	<b>Changed command:</b> ID and DDNAME parameters updated.	Common JCL support.
*INQUIRY,U	z/OS V2R2	<b>Changed command:</b> New OUTDISP parameter.	OUTDISP support.
*MODIFY,U	z/OS V2R2	<b>Changed command:</b> New NOUTDISP and OUTDISP parameters.	OUTDISP support.
*RESTART,devname	z/OS V2R2	<b>Changed command:</b> New G and J parameters.	OUTDISP support.
*START,DC	z/OS V2R2	<b>Changed command:</b> SOURCE parameter updated.	JES3 workload scaling support.
*FAIL	z/OS V2R1	<b>Changed command:</b> DUMP parameter updated.	NETSERV update.
*INQUIRY,J	z/OS V2R1	<b>Changed command:</b> U parameter updated.	Spool data set support.
*INQUIRY,JOBTRACK	z/OS V2R1	<b>Changed command:</b> JOBTRACK parameter updated.	ENF 70 events update.
*INQUIRY,Q	z/OS V2R1	<b>Changed command:</b> U parameter updated.	Spool data set support.
*MODIFY,C=class	z/OS V2R1	<b>Changed command:</b> New SYSSYM parameter.	Job class system symbols support
*MODIFY,CONFIG	z/OS V2R1	<b>Changed command:</b> New M parameter.	Member name update.

## JES3

Table 168. Summary of new and changed JES3 commands (continued)

Command	Release	Description	Reason for change
*MODIFY,JOBTRACK	z/OS V2R1	<b>Changed command:</b> JOBTRACK parameter updated.	ENF 70 events update.
*MODIFY,M	z/OS V2R1	<b>Changed command:</b> JES3DLOG updated.	JES3DLOG impact.
*MODIFY,NETSERV	z/OS V2R1	<b>Changed command:</b> STACK parameter updated. Start rules updated.	INET configuration. NETSERV start rules.
*START,DJdevnum	z/OS V2R1	<b>Changed command:</b> New DD parameter added and parameters updated.	Spool data set support..
*CALL,JU	z/OS V1R13	<b>New command:</b> Calls JESJCLIN Utility	Release update.
Operator activities for particular starts: spool data sets	z/OS V1R13	Spool data set updates.	Release update.
*START,main	z/OS V1R13	<b>Changed command:</b> Recovery of work from a failed or stopped processor.	Release update.

## Diagnostic codes

Table 169 lists the new and changed JES3 diagnostic codes. See *z/OS JES3 Diagnosis Reference* for a complete list and explanation of JES3 dump codes. See *z/OS MVS System Codes* for a complete list and explanation of system codes.

Table 169. Summary of new and changed JES3 diagnostic codes

Code	Release	Description	Reason for change
1FB	z/OS V2R2	<b>New codes:</b> New reason codes added.	JES3 symbolics support.
4FB	z/OS V2R2	<b>New codes:</b> New reason codes added.	JES3 symbolics support.
DM100	z/OS V2R2	<b>New codes:</b> New reason codes added.	JES3 workload scaling support.
DM768	z/OS V2R2	<b>New codes:</b> New DM code added.	APAR OA45584.
DM801	z/OS V2R2	<b>Changed code:</b> New modules added.	JES3 symbolics support.
DM029	z/OS V2R1	<b>New codes:</b> New reason code added.	APAR OA38883
DM200	z/OS V2R1	<b>Changed code:</b> Additional information.	In-stream data
DM766	z/OS V2R1	<b>New codes:</b> New reason code added.	Spool delete support
DM767	z/OS V2R1	<b>New codes:</b> New reason code added.	Spool delete support
U0015	z/OS V1R13	<b>New codes:</b> New reason codes added.	Description update

## Executable macros

Table 170 lists the new and changed executable macros. See *z/OS JES3 Customization* for more detailed information.

Table 170. Summary of new and changed JES3 executable macros

Executable macro	Release	Description	Reason for change
IATUX58	z/OS V2R2	<b>Changed macro:</b> New programming considerations label added.	OUTDISP support
IATUX59	z/OS V2R2	<b>Changed macro:</b> New programming considerations label added.	OUTDISP support



Table 170. Summary of new and changed JES3 executable macros (continued)

Executable macro	Release	Description	Reason for change
AOPEN	z/OS V2R2	<b>Changed macro:</b> Modified parameter and usage notes.	APAR OA45004.
ATRACK	z/OS V2R2	<b>Changed macro:</b> Modified parameter and usage notes.	APAR OA45004.
AWRITE	z/OS V2R2	<b>Changed macro:</b> New parameter and modified parameter and usage notes.	APAR OA45004.
IATXBPL	z/OS V2R2	<b>Changed macro:</b> Modified parameters and example of use.	JES3 workload scaling support.
IATXCPYF	z/OS V2R2	<b>Changed macro:</b> Modified parameter and usage notes.	APAR OA45004.
IATXJCT	z/OS V2R2	<b>Changed macro:</b> New parameter, modified parameters, and new return code.	JES3 workload scaling support.
IATXJDS	z/OS V2R2	<b>Changed macro:</b> Modified parameter and usage notes.	APAR OA45004.
WRTCHAIN	z/OS V2R2	<b>Changed macro:</b> New parameters and usage notes.	APAR OA45004.
AOPEN	z/OS V2R1	<b>Changed macro:</b> New parameter JOBNUM added.	Spool delete support
APURGE	z/OS V2R1	<b>Changed macro:</b> New parameter STTRELB added.	Spool delete support
ATRACK	z/OS V2R1	<b>Changed macro:</b> New parameter JOBNUM added.	Spool delete support
AWRITE	z/OS V2R1	<b>Changed macro:</b> New parameters JOBNUM and TATUPDWR added.	Spool delete support
IATXCPYF	z/OS V2R1	<b>Changed macro:</b> New parameter JOBNUM added.	Spool delete support
IATXFSS	z/OS V2R1	<b>Changed macro:</b> New AUTOREST value for TYPE parameter.	Auto restart support
IATXJDS	z/OS V2R1	<b>Changed macro:</b> New parameters JOBNUM and JETUPD added.	Spool delete support
IATXEUR	z/OS V2R1	<b>New macro:</b> Extent utilization data retrieval macro	Spool data set support
IATXJCT	z/OS V2R1	<b>Changed macro:</b> New parameter AWAIT added.	ENF 70 support
IATXSEC	z/OS V2R1	<b>Changed macro:</b> New parameter ENTITYX added. New VERIFY keyword for ENCRYPT parameter, and new FACILITY keyword for CLASS parameter.	Job class security checking
JDSGET	z/OS V2R1	<b>Changed macro:</b> New parameters TYPE=SYSINDS and UPDATE added .	In-stream data and MVS Cancel support
WRTCHAIN	z/OS V2R1	<b>Changed macro:</b> New parameter JOBNUM added.	Spool delete support
ADEBLOCK	z/OS V1R13	<b>Changed macro:</b> Added new DATCC parameter.	Release update

## ENF records

Table 171 lists the new and changed ENF records for JES3. See *z/OS MVS Programming: Assembler Services Guide* and *z/OS JES3 Initialization and Tuning Reference* for more information.

Table 171. Summary of new and changed ENF codes for JES3

ENF Code	Release	Description	Reason for change
78	z/OS V2R2	<b>New support:</b> JES3 signals an ENF 78.	Indicates that a job is no longer eligible for execution.
70	z/OS V2R1	<b>New parameter:</b> JES3 signals an ENF 70 event for job status changes.	ENF 70 support

## Initialization statements

Table 172 lists the new and changed initialization statements. See *z/OS JES3 Initialization and Tuning Reference* for more detailed information.

Table 172. Summary of new and changed JES3 initialization statements

Statement	Release	Description	Reason for change
OPTIONS	z/OS V2R2	<b>New parameters:</b> New parameters DOTPOOL, JETPOOL, OSTPOOL, and SEEPOOL added.	JES3 workload scaling support.
SELECT	z/OS V2R2	<b>New example:</b> New multiline SELECT statement example added.	SELECT example update.
SYSOUT	z/OS V2R2	<b>New parameter:</b> New OUTDISP parameter added.	OUTDISP support.
CLASS	z/OS V2R1	<b>New parameter:</b> The SYSSYM parameter has been added.	Job class system symbols support
NETSERV	z/OS V2R1	<b>Changed parameter:</b> STACK updated	INET update
OPTIONS	z/OS V2R1	<b>Changed parameters:</b> The default for the DUMP parameter has been changed to PRDMP. The JES and MVS values for DUMP have been deleted.	DUMP updates
OPTIONS	z/OS V2R1	<b>Deleted parameter:</b> The SDI parameter has been deleted.	Spool delete support
OPTIONS	z/OS V2R1	<b>New parameter:</b> The DUPLOGON parameter has been added.	Duplicate logon support
OPTIONS	z/OS V2R1	<b>New parameter:</b> The JOBTRACK parameter has been added.	ENF 70 support
OUTSERV	z/OS V2R1	<b>Changed parameter:</b> CARRIAGE updated	FCB update
SYSOUT	z/OS V2R1	<b>Changed parameter:</b> CARR updated	FCB update
BUFFER	z/OS V1R13	<b>Changed statement:</b> Restart or Command Modification updated.	*MODIFY CONFIG update
FORMAT	z/OS V1R13	<b>Changed statement:</b> Restart or Command Modification updated.	*MODIFY CONFIG update
INCLUDE	z/OS V1R13	<b>Changed statement:</b> DYNALLOC statement location.	*MODIFY CONFIG update
OPTIONS	z/OS V1R13	<b>Changed statement:</b> Restart or Command Modification updated.	*MODIFY CONFIG update

Table 172. Summary of new and changed JES3 initialization statements (continued)

Statement	Release	Description	Reason for change
SPART	z/OS V1R13	<b>Changed statement:</b> Restart or Command Modification updated.	*MODIFY CONFIG update
SYSOUT	z/OS V1R13	<b>Changed statement:</b> Restart or Command Modification updated.	*MODIFY CONFIG update
TRACK	z/OS V1R13	<b>Changed statement:</b> Restart or Command Modification updated.	*MODIFY CONFIG update

## SMF records

There are no new or changed JES3 SMF records. See *z/OS MVS System Management Facilities (SMF)* for a complete explanation of SMF records.

## SSI function codes

Table 173 lists the new and changed JES3 function codes. See *z/OS MVS Using the Subsystem Interface* for more information.

Table 173. Summary of new and changed JES3 Function Codes

SSI Function Code	Release	Description	Reason for change
79	z/OS V2R2	<b>Changed SSI function codes:</b> Description, SAPI disposition in SSS2, Input-only fields, and output-only fields updated.	OUTDISP support.
80	z/OS V2R2	<b>Changed SSI function code:</b> Input fields, job queue element sections, and SYSOUT information elements.	OUTDISP support.
82	z/OS V2R1	<b>Changed SSI function code:</b> Job class fields updated.	Job class and job class group updates.
80	z/OS V2R1	<b>Changed SSI function code:</b> STAT, STTR, STJQ, STSC, STVB, STVO new and changed fields.	Element updates for 64 bit support. Job execution support.
71	z/OS V2R1	<b>Changed SSI function code:</b> Checkpoint version fields updated.	Checkpoint version support.
54	z/OS V2R1	<b>Changed SSI function code:</b> SSVISLVL field updated.	Service level field updates.
1	z/OS V2R1	<b>Changed SSI function code:</b> SSOUFLG field updated.	User selection flags updates.
82	z/OS V1R13	<b>Changed SSI function code:</b> Parameters descriptions are updated.	Descriptions updated
83	z/OS V1R13	<b>Changed SSI function code:</b> Fields and descriptions added.	JES device information services



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## Chapter 19. Language Environment summary of interface changes

The following Language Environment interfaces are described in this topic:

- “Application-writer interfaces”
- “C/C++ runtime library APIs”
- “C/C++ runtime library feature test macros”
- “Callable services”
- “Compiler-writer interfaces” on page 304
- “Data areas” on page 304
- “Environment variables” on page 305
- “Event handler calls” on page 305
- “Macros” on page 305
- “Runtime options” on page 306
- “Utilities” on page 306

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### Application-writer interfaces

There are no new or changed Language Environment application-writer interfaces (AWIs). For general information about AWIs, see *z/OS Language Environment Programming Reference*.

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### Callable services

Table 180 on page 306 lists the new or changed Language Environment callable services. For more information, see *z/OS Language Environment Programming Reference*.

Table 174. Summary of new and changed Language Environment callable services

Callable service	Release	Description	Reason for change
CEE3INF	z/OS V1R13	<b>Reason for change:</b> The <i>sys/subsys</i> parameter no longer supports 31 bit.	Release updates
CEEGPID	z/OS V1R13	<b>Reason for change:</b> Updated to reflect the current version and platform ID for Language Environment.	Release updates
CEEGTJS	z/OS V2R1	<b>New:</b> Retrieve a JCL symbol values by specifying a JCL symbol name.	Enhanced use of JCL symbolics

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### C/C++ runtime library APIs

For more information about C/C++ runtime library APIs, see New and updated information in *z/OS XL C/C++ Runtime Library Reference*.

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### C/C++ runtime library feature test macros

For more information about C/C++ runtime library feature test macros, see New and updated information in *z/OS XL C/C++ Runtime Library Reference*.

### Compiler-writer interfaces

Table 175 lists the new or changed Language Environment compiler-writer interfaces (CWIs). For more information, see *z/OS Language Environment Vendor Interfaces*.

Table 175. Summary of new and changed Language Environment CWIs

CWI	Release	Description	Reason for change
__far_jump()	z/OS V1R13	<b>Changed:</b> Parameter descriptions have been updated.	Release update
	z/OS V2R1	<b>Changed:</b> Parameter descriptions have been updated.	Vector support
__stack_info()	z/OS V1R13	<b>Changed:</b>	Release update
CEEYPPAF	z/OS V2R1	<b>Changed:</b> The Parameter description was updated.	Vector support
CEEGOTO	z/OS V2R1	<b>Changed:</b> Displays vector register information in the XPLINK extended format label variable-resume area.	Vector support
CEEKRGPM	z/OS V1R13	<b>New:</b> Registers a pattern matching routine to support deferred debugging.	Deferred debugging support

### Data areas

Table 176 lists the new or changed Language Environment data areas. For more information, see *z/OS Language Environment Vendor Interfaces*.

Table 176. Summary of new and changed Language Environment data areas

Data area	Release	Description	Reason for change
CEECAA	z/OS V1R13	<b>Changed:</b> Includes new fields to support enhanced I/O abend recovery and to support initializing multiple CEEPIPI environments.	I/O abend recovery
CEEMCH	z/OS V2R1	<b>Changed:</b> Support for vectors has been added.	Vector support
CEEOCB	z/OS V2R1	<b>Changed:</b> Support for the RTLS function has been removed.	HEAPZONES runtime option support
CEEPCB	z/OS V2R1	<b>Changed:</b> Support for vectors has been added.	Vector support
CEERCB	z/OS V1R13	<b>Changed:</b> Includes a new field to support a pattern match routine to enable deferred debugging and to display current release information.	Deferred debugging support and release updates
	z/OS V2R1	<b>Changed:</b> Updated to display current release information.	Release updates.

## Environment variables

Table 177 lists the new or changed Language Environment environment variables. For more information, see *z/OS XL C/C++ Programming Guide*.

Table 177. Summary of new and changed Language Environment environment variables

Environment variable	Release	Description	Reason for change
_EDC_IO_ABEND	z/OS V1R13	<b>New:</b> Provides enhanced I/O abend recovery support.	I/O abend recovery
_BPXK_AUTOCVT	z/OS V2R1	<b>Changed:</b> A new option activates the automatic conversion of files that are supported by Unicode Services.	Unicode exploitation
_EDC_PTHREAD_BACKOUT	z/OS V2R1	<b>New:</b> Determines the Language Environment quiesce term behavior.	Enhanced signal handling
_EDC_STRPTM_STD	z/OS V2R1	<b>New:</b> Indicates changes to strptime() that are provided for UNIX standard compliance.	UNIX standard compliance
_EDC_SUSV3	z/OS V2R1	<b>New value:</b> When the new value, 2, is set, all the behaviors protected by _EDC_SUSV3=1 is exposed and pole error-related behaviors specified by SUSV3 is enabled.	Conformance with the latest C language standard (C11)

## Event handler calls

Table 178 lists the new or changed Language Environment event handler calls. For more information, see *z/OS Language Environment Vendor Interfaces*.

Table 178. Summary of new and changed Language Environment event handler calls

Event	Release	Description	Reason for change
Event Code 18	z/OS V1R13	<b>Changed:</b> Parameter descriptions have been updated.	Release update
Event Code 44	z/OS V1R13	<b>New:</b> The code has been added to allow member languages to report back their program mask requirements.	Release update

## Macros

For information about macros, see *z/OS Language Environment Vendor Interfaces*, *z/OS Language Environment Programming Guide* and *z/OS Language Environment Customization*.

Table 179. Summary of new and changed Language Environment runtime options

Macro	Release	Description	Reason for change
CEEPPA	z/OS V2R1	<b>Changed:</b> Support added for vector registers.	Vector support
CEEXOPT	z/OS V2R1	<b>Changed:</b> No longer allows processing of CEECOPT, CEEDOPT, or CELQDOPT.	Support for creating usermods to modify runtime option defaults at the installation level was removed.

### Runtime options

Table 180 lists the new or changed Language Environment runtime options. For more information, see *z/OS Language Environment Customization*, *z/OS Language Environment Programming Guide*, and *z/OS Language Environment Programming Reference*.

Table 180. Summary of new and changed Language Environment runtime options

Runtime option	Release	Description	Reason for change
All runtime options	z/OS V2R1	<b>Changed:</b> Runtime options can no longer be set at the installation level.	Support for creating usermods to modify runtime option defaults at the installation level was removed.
HEAP64	z/OS V2R1	<b>New parameter:</b> The FILL parameter specifies that an increment to user heap storage is released when the last of the storage within that increment is freed.	Improved allocation of user heap storage for AMODE 64 applications
HEAPZONES	z/OS V2R1	<b>New runtime option:</b> Controls user heap overlay toleration and checking. When activated, the runtime option affects any obtained storage that can be controlled by the HEAP or HEAP64 runtime options.	Support of heap zone check toleration and checking
PAGEFRAMESIZE	z/OS V2R1	<b>New runtime option:</b> Allows users to request storage to be backed by either 4K or 1M pages for user heap, library heap, I/O heap, and stack for Language Environment AMODE 64 applications.	AMODE 64 support for 1M and 2G large pages
PAGEFRAMESIZE64	z/OS V2R1	<b>New runtime option:</b> Specifies the preferred frame size in virtual storage for HEAP64, LIBHEAP64, IOHEAP64, and STACK64 storage that was obtained during application initialization and runtime.	AMODE 64 support for 1M and 2G large pages
USERMODS	z/OS V2R1	<b>Removed:</b> Use the CEEPRMxx parmlib member to set the system-default Language Environment options	Usability

### Utilities

No Language Environment utilities were added or changed. For more information about utilities, see *z/OS Language Environment Customization*, *z/OS Language Environment Programming Guide*, and *z/OS Language Environment Debugging Guide*.



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## Chapter 20. Library Server

For z/OS V2R2, the release of Library Server (FMID HBKQ400) that is shipped on both V2R1 and V2R2, member EPHHTTPD of the SEPHSAMP MVS data set has been modified by APAR PI24806. This change was made to include HTTPD sample configuration directives needed for Library Server on V2R2 where the HTTP Server is now IBM HTTP Server - Powered by Apache.

For z/OS V2R1, EPHHTTPD still contains the original sample directives needed on V2R1, where the IBM HTTP Server is still Domino-based.



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## Chapter 21. NFS summary of interface changes

There are no new or changed interfaces for NFS.



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## Chapter 22. RMF summary of interface changes

This topic describes the Resource Measurement Facility (RMF™) interface changes to the SMF records in section “SMF records.”

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### SMF records

Table 181, Table 182 on page 313, and Table 183 on page 314 list the new and updated SMF records. See *z/OS MVS System Management Facilities (SMF)* for more detailed information.

#### New and changed RMF SMF records for z/OS V2R2

Table 181. Summary of new and changed RMF SMF records for z/OS V2R2

SMF record	Description
Type 70 (RMF Processor Activity)	<p>Multiple updates to Subtype 1:</p> <ul style="list-style-type: none"><li>• New: SMF70HWGr_Name added by APAR OA48688 to PR/SM Partition Data section to specify the name of the hardware group to which the partition belongs.</li><li>• Changed: SMF70VPF updated by APAR OA48688 in PR/SM Logical Processor Data section to change bit 7 to indicate SMF70HWGr_Name or SMF70HWGr_Cap_Limit has changed during the interval.</li><li>• New: SMF70HWGr_Cap_Limit added by APAR OA48688 to PR/SM Logical Processor Data section to specify absolute limit on partition usage of all CPUs of the type indicated in SMF70CIX that are members of the same hardware group.</li><li>• Changed: SMF70HHF updated by APAR OA48688 in CPU Control section to change bit 4 to indicate Absolute MSU capping is active for this partition.</li><li>• New: SMF70LACM, SMF70LACA, and SMF70LACB added by APAR OA48466 to CPU Control section to indicate long-term average of CPU service (millions of service units) consumed by transactions classified with reporting attribute MOBILE, CATEGORYA, or CATEGORYB, respectively.</li></ul>
Type 71 (RMF Paging Activity)	<ul style="list-style-type: none"><li>• New fields in Paging Data Section to support Shared Pageable Large Pages</li></ul>
Type 72 (RMF Workload Activity, Storage Data, and Serialization Delay)	<ul style="list-style-type: none"><li>• New fields added by APAR OA48466 for Subtype 3 (Workload Activity) in Service/Report Class Period Data Section to add Transaction Resource Consumption Data.</li></ul>
Type 73 (RMF Channel Path Activity)	<ul style="list-style-type: none"><li>• New physical-network identifier (PNET ID) fields SMF73NT1 and SMF73NT2 are added by APAR OA49113.</li><li>• Changed: SMF73FG4 updated APAR OA49113 to change bit 7 to indicate that physical-network identifiers SMF73NT1 and SMF73NT2 are valid.</li></ul>

## RMF

Table 181. Summary of new and changed RMF SMF records for z/OS V2R2 (continued)

SMF record	Description
Type 74 (RMF Activity of Several Resources)	<ul style="list-style-type: none"> <li>• Subtype 1: Changes to support devices in alternate subchannel sets</li> <li>• Subtype 1:               <ul style="list-style-type: none"> <li>– Changes to support devices in alternate subchannel sets</li> <li>– Changes by APAR OA49415 to Device Data Section to support SuperPAV measurements.</li> </ul> </li> <li>• Subtype 4: New field in Request Data Section</li> <li>• Subtype 4:               <ul style="list-style-type: none"> <li>– New field added by APAR OA45421 in Request Data Section</li> <li>– The Channel Path data section is updated by APAR OA49148 to add information about sender and receiver Channel Path data sections for remote coupling facilities.</li> <li>– A new Asynchronous CF Duplexing data section is added by APAR OA49148.</li> <li>– The individual header extension for subtype 4 is updated by APAR OA49148 with new fields SMF744AO, SMF744AL, and SMF744AN.</li> </ul> </li> <li>• Subtype 5: New fields in Cache Control Section</li> <li>• Subtype 8: New bit and field in Rank Statistics Data Section</li> <li>• Subtype 9 updated by APAR OA49113:               <ul style="list-style-type: none"> <li>– New fields R749FLAG, R749NET1, and R749NET2 in PCIE Function Data Section for physical-network identifiers (PNET IDs).</li> <li>– New information provided for format x'03' in PCIE Function Type Data Section.</li> </ul> </li> <li>• Subtype 10: New subtype 10 for Storage Class Memory (SCM) Statistics</li> </ul>
Type 78 (RMF Virtual Storage and I/O Queuing Activity)	<ul style="list-style-type: none"> <li>Subtype 2: New field in Virtual Storage Private Area Data Section to support Shared Pageable Large Pages</li> <li>• Subtype 2: New field in Virtual Storage Private Area Data Section to support Shared Pageable Large Pages.</li> <li>• Subtype 3: Updates by APAR OA49415 to I/O Queuing Global Section, I/O Queuing Configuration Control Section, I/O Queuing Data section and HyperPAV/SuperPAV Data Section to support SuperPAV measurements.</li> </ul>

## New and changed RMF SMF records for z/OS V2R1

Table 182. Summary of new and changed RMF SMF records for z/OS V2R1

SMF record	Description
Type 70 (RMF Processor Activity)	<p>Multiple updates:</p> <ul style="list-style-type: none"> <li>• Subtype 1: New Logical Core data section; also changes to the CPU control section, CPU data section, ASID Data Area Section, PR/SM Partition Data Section, and PR/SM Logical Processor Data Section. <b>Reason for change:</b> APAR OA44101</li> <li>• Subtype 1: Changes in the CPU data section to support group capacity enhancements and absolute LPAR, and to support warning-track interruption <b>Reason for change:</b> Release update</li> <li>• Subtype 2: Changes to the Cryptographic CCA Coprocessor and Cryptographic Accelerator data sections <b>Reason for change:</b> Release update</li> <li>• Subtype 2: Changes to the Cryptographic CCA Coprocessor, Cryptographic Accelerator, and Cryptographic PKCS11 Coprocessor data sections. <b>Reason for change:</b> APAR OA43493</li> </ul>
Type 71 (RMF Paging Activity)	<p>Multiple updates:</p> <ul style="list-style-type: none"> <li>• New fields to support 4 TB real storage <b>Reason for change:</b> APAR OA44503</li> <li>• New field in Paging Data Section <b>Reason for change:</b> APAR OA44101</li> <li>• Changes to support pageable large pages activity <b>Reason for change:</b> Release update</li> </ul>
Type 72 (RMF Workload Activity and Storage Data)	<p>Multiple updates:</p> <ul style="list-style-type: none"> <li>• Subtype 3: Changes to support I/O priority groups <b>Reason for change:</b> Release update</li> <li>• Subtype 3: Changes to Workload Manager Control Data Section <b>Reason for change:</b> APAR OA44101</li> <li>• Subtype 5: New GRS QScan Statistics data section added to monitor QScan requests <b>Reason for change:</b> Release update</li> </ul>
Type 74 (RMF Activity of Several Resources)	<p>Multiple updates:</p> <ul style="list-style-type: none"> <li>• Subtype 1: Changes to support devices in alternate subchannel sets <b>Reason for change:</b> Release update</li> <li>• Subtype 4: Changes to existing data sections and addition of the new Storage Class Memory data section to support exploitation of the Flash Express feature; changes to support THIN interrupts <b>Reason for change:</b> Release update</li> <li>• Subtype 4: Changes to existing data sections to support CS5 path operating at 8x bandwidth using the PCIe third generation protocol, adapter type PCIe-O. <b>Reason for change:</b> APAR OA44502</li> <li>• Subtype 5: New fields in the RAID Rank/Extent Pool data section <b>Reason for change:</b> Release update</li> <li>• Subtype 9: New subtype for PCI Express Based Function Activity <b>Reason for change:</b> Release update</li> <li>• Subtype 9: Changes to existing data sections to support PCIE enhancements. <b>Reason for change:</b> APAR OA44524</li> </ul>

## RMF

Table 182. Summary of new and changed RMF SMF records for z/OS V2R1 (continued)

SMF record	Description
Type 75 (RMF Page Data Set Activity)	<p>Multiple updates:</p> <ul style="list-style-type: none"> <li>New field to support 4 TB real storage <b>Reason for change:</b> APAR OA44503</li> <li>One changed field: a bitmap record is changed to indicate page space type storage-class memory (SCM). <b>Reason for change:</b> Release update</li> </ul>
Type 78 (RMF Virtual Storage and I/O Queuing Activity)	<p>Multiple updates:</p> <ul style="list-style-type: none"> <li>Subtype 2: the virtual storage private area data section is extended. <b>Reason for change:</b> Release update</li> <li>Subtype 3: the I/O Queuing configuration data section and I/O Queuing data section are extended. <b>Reason for change:</b> APAR OA44525</li> </ul>
Type 79 (RMF Monitor II Activity)	<p>Multiple updates:</p> <ul style="list-style-type: none"> <li>Subtype 1: Changes to support I/O priority groups <b>Reason for change:</b> Release update</li> <li>Subtype 2: Changes to support I/O priority groups <b>Reason for change:</b> Release update</li> <li>Subtype 9: Changes to support devices in alternate subchannel sets and changes to support the interrupt delay time facility <b>Reason for change:</b> Release update</li> <li>Subtype 11: a bitmap record has been changed to indicate page space type storage-class memory (SCM). <b>Reason for change:</b> Release update</li> <li>Subtype 14: the I/O Queuing configuration data section and I/O Queuing data section are extended. <b>Reason for change:</b> APAR OA44525</li> </ul>
Type 104 (RMF Distributed Platform Performance Data)	<p>New SMF record type: Support of long-term performance analysis and capacity planning of AIX, Linux, and Windows systems. <b>Reason for change:</b> Release update</p>

## New and changed RMF SMF records for z/OS V1R13

Table 183. Summary of new and changed RMF SMF records for z/OS V1R13

SMF record	Description
Type 71 (RMF Paging Activity)	<p>Multiple updates:</p> <ul style="list-style-type: none"> <li>no more data is collected for the <i>swap placement section</i> <b>Reason for change:</b> Release update</li> <li>New fields have been added to support storage-class memory (SCM) and pageable large pages. <b>Reason for change:</b> Release update</li> </ul>
Type 72 (RMF Workload Activity and Storage Data)	<p>Multiple updates:</p> <ul style="list-style-type: none"> <li>Subtype 3 has been extended to collect: <ul style="list-style-type: none"> <li>CPU time used by work units while promoted by the z/OS supervisor (<i>report class period data section</i>)</li> <li>response-time distribution data for service and report class periods that have defined execution velocity goals (<i>response time distribution data section</i>).</li> </ul> <b>Reason for change:</b> Release update</li> <li>New Subtype 5 introduced to support serialization delay measurements. <b>Reason for change:</b> Release update</li> </ul>



Table 183. Summary of new and changed RMF SMF records for z/OS V1R13 (continued)

SMF record	Description
Type 75 (RMF Page Data Set Activity)	One changed field: a bitmap record is changed to indicate page space type storage-class memory (SCM). <b>Reason for change:</b> Release update
Type 79 (RMF Monitor II Activity)	One changed field: a bitmap record is changed to indicate page space type storage-class memory (SCM). <b>Reason for change:</b> Release update



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## Chapter 23. SDSF summary of interface changes

In addition to the interface changes included in this topic, updates to SDSF might have resulted in SYS1.PARMLIB and SYS1.SAMPLIB member changes. See Chapter 2, “Summary of changes to SYS1.PARMLIB,” on page 7 and Chapter 4, “Summary of changes to SYS1.SAMPLIB,” on page 23 for those changes.

The SDSF interfaces described in this topic are:

- “Programming interfaces”
- “Commands and action characters” on page 319
- “Panels” on page 321
- “User exits” on page 322
- “SAF resources” on page 323

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### Programming interfaces

This topic describes new and changed programming interfaces.

#### Java

Table 184 describes the changes for SDSF's support of the Java programming language. See *z/OS SDSF Operation and Customization* for more detailed information.

Table 184. Summary of changes for Java

Change	Release	Description	Reason for change
Support for address space memory	z/OS V2R2	<b>Change:</b> New runner for the AS command, and new methods for address space memory	Release update
Support for dynamic exits	z/OS V2R2	<b>Change:</b> New runner for the DYNX command, and new methods for dynamic exits	Release update
Support for proclib data sets	z/OS V2R2	<b>Change:</b> New runner for the PROC command, and new methods for proclib data sets	Release update
Support for JES2 job groups	z/OS V2R2	<b>Change:</b> New runner for the JG command, and new methods for job groups	Release update
Support for job delay information	z/OS V2R2	<b>Change:</b> New methods to request job delay information	Release update
Support for job device information	z/OS V2R2	<b>Change:</b> New methods to request job device information, and new methods for job devices	Release update
Support for job memory information	z/OS V2R2	<b>Change:</b> New methods to request job memory information	Release update
Support for job steps	z/OS V2R2	<b>Change:</b> New methods to request job step information, and new methods for job steps	Release update

## SDSF

Table 184. Summary of changes for Java (continued)

Change	Release	Description	Reason for change
Enhanced support for browse	z/OS V2R1	<b>Change:</b> Support for browsing job output, check output and the system log without the need for EXECIO or similar utility.	Release update
Console name modification	z/OS V2R1	<b>Change:</b> Control activation of an extended console with a unique name.	Release update
Support for the OPERLOG	z/OS V1R13	<b>Change:</b> The operlog() method in the ISFLogRunner class accesses the sysplex-wide system log, OPERLOG.	Release update
Sublists to request SDSF panel data	z/OS V1R13	<b>Change:</b> New methods allow you to request a subset of the data. Refer to the Javadoc for more information.	Release update

## REXX

Table 185 and Table 186 list the changes for SDSF's support of the REXX programming language. See *z/OS SDSF Operation and Customization* for more detailed information.

Table 185. Summary of changes for REXX commands

Command	Release	Description	Reason for change
ISFACT, ISFEXEC, and ISFGET	z/OS V2R2	<b>Changed command:</b> COMPACT option causes data for an entire row to be returned in a new SDSFROW stem variable, rather than in a separate stem variable for each column.	Release update
ISFQUERY	z/OS V2R2	<b>New command:</b> Query the environment and return the associated REXX special variables.	Release update
ISFBROWSE	z/OS V2R1	<b>Changed command:</b> Support for browsing job output, check output and the system log without the need for EXECIO or similar utility.	Release update
ISFLOG	z/OS V1R13	<b>Changed command:</b> New option TYPE(OPERLOG) accesses the sysplex-wide system log, OPERLOG.	Release update

Table 186. Summary of changes for REXX special variables

Special Variable	Release	Description	Reason for change
SDSFCOLSTART, SDSFCOLLEN, SDSFCOLCOUNT, and SDSFROW	z/OS V2R2	<b>New special variables:</b> For use with the COMPACT option, to access the data	Release update
Various, with names starting with SDSF	z/OS V2R2	<b>New special variables:</b> For use with secondary panels, these variables are affected by the PREFIX option	Release update
ISFDISPLAYMODE	z/OS V2R1	<b>Changed special variable:</b> Now accepts LONG, which shows the full sort and filter criteria.	Release update
ISFSECTRACE	z/OS V2R1	<b>New special variable:</b> Controls security tracing.	Release update

Table 186. Summary of changes for REXX special variables (continued)

Special Variable	Release	Description	Reason for change
ISFPRTWRITER	z/OS V2R1	<b>New special variable:</b> Specifies a writer name, for printing.	Release update
ISFPRTSOURCEATTS	z/OS V2R1	<b>New special variable:</b> Indicates whether source attributes are to be used for printing.	Release update
ISFCNMOD	z/OS V2R1	<b>New special variable:</b> Controls the modification of the extended console name to obtain a unique name.	Release update
ISFDUPDS	z/OS V2R1	<b>New special variable:</b> Controls whether SDSF displays duplicate SYSOUT data sets.	Release update
ISFCMODE	z/OS V1R13	<b>New special variable:</b> Sets the mode for sysplex communication.	Release update

## Commands and action characters

Table 187 lists the new and changed commands and action characters. See the SDSF online help for more detailed information. For commands that are specific to SDSF REXX execs, see “REXX” on page 318.

Table 187. Summary of new and changed SDSF commands and action characters

Function	Release	Description	Reason for change
APF	z/OS V2R2 and V2R1	<b>New command:</b> Displays the Authorized Program Facility panel.	Release update
AS	z/OS V2R2 and V2R1	<b>New command:</b> Displays the Address Space Memory panel.	Release update
DYNX	z/OS V2R2 and V2R1	<b>New command:</b> Displays the Dynamic Exits panel.	Release update
DALO, DEM, DIQP, DPCD, DPCI	z/OS V2R2 and V2R1	<b>New command:</b> New actions for the SYS panel, as described in the SDSF online help.	Release update
LPA	z/OS V2R2 and V2R1	<b>New command:</b> Displays the Link Pack Area panel.	Release update
LNK	z/OS V2R2 and V2R1	<b>New command:</b> Displays the Link List panel.	Release update
PAG	z/OS V2R2 and V2R1	<b>New command:</b> Displays the Page panel.	Release update
PARM	z/OS V2R2 and V2R1	<b>New command:</b> Displays the PARMLIB panel.	Release update
SRCH	z/OS V2R2 and V2R1	<b>New command:</b> Search command to locate members in the LNK, LPA, APF, and PARM data sets.	Release update
SYS	z/OS V2R2 and V2R1	<b>New command:</b> Displays the System panel.	Release update
Action characters and overtypeable fields from the command line	z/OS V2R2	You can issue action characters against rows on a tabular panel from the command line, and overtype the values in columns from the command line.	Release update
%	z/OS V2R2	<b>New action character:</b> Invokes a REXX exec.	Release update

## SDSF

Table 187. Summary of new and changed SDSF commands and action characters (continued)

Function	Release	Description	Reason for change
/	z/OS V2R2	<b>Changed command:</b> Using the System Command Extension pop-up, you can assign system commands to groups and add comments to describe them. New pop-ups, filtering and sorting help you work with saved commands. The size of the pop-up now reflects the screen size of your emulator session. The number of commands saved in the ISPF profile has been increased, and if you allocate ISPF table library ISFTABL, the number is increased further.	Release update
PROC	z/OS V2R2	<b>New command:</b> Displays the Proclib panel.	Release update
RGEN	z/OS V2R2	<b>New command:</b> Generates a REXX exec that reflects the current context.	Release update
SET ROWNUM	z/OS V2R2	<b>New command:</b> Displays row numbers on tabular panels.	Release update
SNAPSHOT	z/OS V2R2	<b>New command:</b> Display the data that is displayed on a tabular panel (such as DA or ST) with SDSF's browse function or with ISPF Browse or Edit.	Release update
PRINT	z/OS V2R1	<b>Changed command:</b> Now uses the record format value to determine how to handle carriage control for all printing.	Release update
SET CONMOD	z/OS V2R1	<b>New command:</b> Controls the modification of extended console names, used to obtain unique names.	Release update
SET DISPLAY	z/OS V2R1	<b>Changed command:</b> Now accepts LONG, to display the full sort and filter criteria.	Release update
SET DUPDS	z/OS V2R1	<b>New command:</b> Controls whether SDSF displays duplicate SYSOUT data sets.	Release update
SET SECTRACE	z/OS V2R1	<b>New command:</b> Turns security tracing on and off.	Release update
SORT	z/OS V2R1	<b>Changed command:</b> Now accepts up to 10 columns.	Release update
J0	z/OS V1R13	<b>New command:</b> Displays the Job 0 (J0) panel (JES3 only).	Release update
NC	z/OS V1R13	<b>New command:</b> Displays the Network Connections (NC) panel.	Release update
NS	z/OS V1R13	<b>New command:</b> Displays the Network Servers (NS) panel.	Release update
INIT, LI, NO, PUN, RDR, H, O	z/OS V1R13	<b>Changed command:</b> Now available in the JES3 environment. New action characters, as described in the SDSF online help.	Release update
SET CMODE	z/OS V1R13	<b>New command:</b> Controls the mode that SDSF uses for communication to provide sysplex-wide data on SDSF panels.	Release update

## Panels

Table 188 lists the changes to SDSF panels. See *z/OS SDSF Operation and Customization* for more detailed information.

Table 188. Summary of new and changed SDSF panels

Panel	Release	Description	Reason for change
AS	z/OS V2R2 and V2R1	<b>New panel:</b> Address space memory.	Release update
DYNX	z/OS V2R2 and V2R1	<b>New panel:</b> Dynamic exits.	Release update
JG	z/OS V2R2	<b>New panel:</b> JES2 job groups.	Release update
Job Delay	z/OS V2R2	<b>New panel:</b> Reasons that a job might be delayed.	Release update
Job Dependency	z/OS V2R2	<b>New panel:</b> For a job group, dependencies within it. For a job, jobs that it is dependent on and jobs that have dependencies on it.	Release update
Job Device	z/OS V2R2	<b>New panel:</b> Devices being used by a job.	Release update
Job Memory	z/OS V2R2	<b>New panel:</b> System memory being used by a job.	Release update
Job Step	z/OS V2R2	<b>New panel:</b> Steps for a job.	Release update
PROC	z/OS V2R2	<b>New panel:</b> Proclib data sets.	Release update
J0	z/OS V1R13	<b>New panel:</b> JES3-only panel that shows information about JES3 Job 0.	Release update
NC	z/OS V1R13	<b>New panel:</b> Network Connect (NC), shows information about networking connections to an adjacent node.	Release update
NS	z/OS V1R13	<b>New panel:</b> Network Server (NS), shows information about server-type networking devices on the node.	Release update
INIT, LI, NO, PUN, RDR, H, O	z/OS V1R13	<b>Changed panel:</b> Now available in the JES3 environment.	Release update
CK, ENC, LI, NO, PS, PUN, RDR, RM, SO	z/OS V1R13	<b>Changed panel:</b> Now can show sysplex-wide data without WebSphere MQ.	Release update
OPERLOG	z/OS V1R13	<b>Changed panel:</b> Now shows messages with the color and highlighting that were assigned to them when they were issued.	Release update

## User exits

Table 189 lists the changes to the SDSF user exit routine. See *z/OS SDSF Operation and Customization* for more detailed information.

Table 189. Summary of changes to the SDSF user exit routine

User exit	Release	Description	Reason for change
Initialization	z/OS V2R1	<b>New fields:</b> UPROFLG4.UPRO4JAP, UPROFLG4.UPRO4JLN, UPROFLG4.UPRO4JLP, UPROFLG4.UPRO4JPA, UPROFLG4.UPRO4JPM, UPROFLG4.UPRO4JSM, UPROFLG4.UPRO4JSY, and UPROFLG5.UPRO5JEN control the scope of the APF, CK, DA, ENC, ENQ, LNK, LPA, PAG, PARM, PS, SYM, and SYS panels.	Release update
Authorization	z/OS V1R13	<b>New field:</b> UPRCMODE sets the mode that SDSF uses for communication to provide sysplex-wide data on SDSF panels.	Release update
Initialization	z/OS V2R2	<b>New field:</b> UPRCMDLM sets the number of system commands entered with the / command that SDSF stores.	Release update
Initialization	z/OS V2R2	<b>New field:</b> UPROFLG4.UPRO4CDP controls whether the size of the System Command Extension pop-up varies with the screen size of the emulator session.	Release update
Initialization	z/OS V2R1	<b>New field:</b> UPROFLG2.UPRO2DNL affects normalization of the CPU% column on the DA panel.	Release update
Initialization	z/OS V2R1	<b>New field:</b> UPROFLG2.UPRO2NMD disables modification of the extended console name to obtain a unique name.	Release update
Initialization	z/OS V2R1	<b>New fields:</b> UPROFLG3.UPRO3JPC, UPROFLG3.UPRO3JPD, UPROFLG3.UPRO3JPE and UPROFLG3.UPRO3JPP control the scope of the CK, DA, ENC and PS panels.	Release update
Initialization	z/OS V2R1	<b>New fields:</b> UPROFLG3.UPRO3NOD controls whether SDSF includes duplicate SYSOUT data sets.	Release update
Initialization	z/OS V2R1	<b>New fields:</b> UPRS6FSY controls the use of system symbols with filtering.	Release update
Initialization	z/OS V2R1	<b>New fields:</b> UPXCONSF specifies the suffixes to use for modifying the extended console name.	Release update
Initialization	z/OS V1R13	<b>New fields:</b> UPRSLCMD, UPRSLCIC and UPRSLCWC allow you to specify a character to use when issuing system commands through SDSF instead of the slash (/).	Release update



Table 189. Summary of changes to the SDSF user exit routine (continued)

User exit	Release	Description	Reason for change
Initialization	z/OS V1R13	<b>Changed flag:</b> UPROFLG2.UPRO2DU8 now controls how device names are formatted on the PUN and RDR panels, in addition to the PR panel.	Release update

## SAF resources

Table 190 lists the new and changed SAF resources related to SDSF. See *z/OS Planning for Multilevel Security and the Common Criteria* and *z/OS SDSF Operation and Customization* for more detailed information.

Table 190. Summary of new and changed SAF resources

SAF resource	Release	Description	Reason for change
Miscellaneous	z/OS V2R2 and V2R1	<b>New panels:</b> New resources are introduced with the APF, AS, DYNX, ENQ, LNK, LPA, PAG, PARM, PROC, SYM, and SYS panels.	Release update
Miscellaneous	z/OS V2R2	<b>New panels:</b> New resources are introduced with the JG, Job Delay, Job Device, Job Group, and Job Step panels.	Release update
Miscellaneous	z/OS V1R13	<b>Changes for JES3:</b> The INIT, LI, NO, PUN, RDR, O and H panels now show JES3 data. When running SDSF in the JES3 environment, you must use SAF to provide SDSF security. In addition, some resources that are unique to the JES3 environment are introduced.  New resources are introduced with the J0, NC and NS panels.	Release update



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## Chapter 24. Security Server summary of interface changes

In addition to the interface changes included in this topic, updates to Security Server have resulted in SYS1.SAMPLIB member changes. See Chapter 4, "Summary of changes to SYS1.SAMPLIB," on page 23 for those changes.

The Security Server interfaces described in this topic are:

- "Callable services" on page 326
- "Class descriptor table (CDT)" on page 329
- "Commands" on page 330
- "Data areas" on page 333
- "Database templates" on page 336
- "Exits" on page 337
- "Macros" on page 337
- "Panels" on page 338
- "SMF records" on page 340
- "Utilities" on page 341

## Callable services

Table 191 lists the new and changed RACF callable services. See *z/OS Security Server RACF Callable Services* for more detailed information.

Table 191. Summary of new and changed RACF callable services

Callable service name	Release	Description	Reason for change
IRRSDL00 (R_data lib)	z/OS V2R2	<ul style="list-style-type: none"> <li>• The following function-specific parameters have been added for DataAlter:                             <ul style="list-style-type: none"> <li>– Label_length: A 4 byte value containing the length of the input certificate label.</li> <li>– Label_ptr: A value containing the address of the input certificate label.</li> <li>– New_Label_length: A 4 byte value containing the length of the new label which will be assigned to the certificate.</li> <li>– New_Label_ptr: A value containing the address of the new certificate label.</li> <li>– CERT_user_ID: A 9-byte area containing a one-byte length of the user ID, followed by the user ID. CERT_user_ID indicates the owner of the certificate.</li> </ul> </li> <li>• The following function-specific parameters have been added for GetRingInfo:                             <ul style="list-style-type: none"> <li>– Search_type and sub parameters: A 4-byte integer input value which identifies more rings to be returned when both ring owner and ring name are specified.</li> <li>– Ring_result_length: A 4-byte value containing the size of the field pointed to by Ring_result_ptr.</li> <li>– Ring_result_ptr and sub parameters: An input value containing the address of the ring result output area.</li> </ul> </li> <li>• New return and reason codes have been added for:                             <ul style="list-style-type: none"> <li>– DataAlter</li> <li>– DataRemove</li> <li>– GetRingInfo</li> </ul> </li> </ul>	New support for R_DATA LIB
	z/OS V1R13	<ul style="list-style-type: none"> <li>• A new private key type X'00000009' for Elliptic Curve Crypto (ECC) key stored in PKDS will be handled by functions DataGetFirst and DataGetNext in R_data lib callable service.</li> </ul>	<ul style="list-style-type: none"> <li>• Extend the ECC support on hardware from RACF and PKI Services to enhance the key security and to enhance the RACDCERT command to handle the growing number of key types</li> </ul>

Table 191. Summary of new and changed RACF callable services (continued)

Callable service name	Release	Description	Reason for change
IRRSC00 (R_cacheserv)	z/OS V1R13	<ul style="list-style-type: none"> <li>Function code X'0007' provides support for an extended read/write cache containing both RACF and distributed user information. The function is further defined by the Option parameter.</li> </ul>	<ul style="list-style-type: none"> <li>Enhance z/OS Identity Propagation support by eliminating the need to go to the RACF database for the retrieval of security relevant information.</li> </ul>
IRRSCO00 (R_chown)	z/OS V2R1	<ul style="list-style-type: none"> <li>The R_chown service RACF authorization section has been updated.</li> </ul>	<ul style="list-style-type: none"> <li>Clarify the user authority when CHOWN.UNRESTRICTED exists and does not exist.</li> </ul>
IRRSDL00 or IRRSDL64 (R_data lib)	z/OS V2R2	Updated topics: <ul style="list-style-type: none"> <li>RACF authorization</li> <li>Format</li> <li>General parameter list for R_data lib function codes:               <ul style="list-style-type: none"> <li>DataGetFirst, X'01'</li> <li>DataPut, X'08'</li> <li>DataRemove, X'09'</li> </ul> </li> </ul>	Updated to provide a programmable interface to manage certificates and key rings in RACF
	z/OS V2R1	Two new functions have been added, with return and reason codes: <ul style="list-style-type: none"> <li>Function-specific parameter list for DataAlter</li> <li>Function-specific parameter list for GetRingInfo</li> </ul>	New functions to support the SAF program interface to RACDCERT key management enablement.
	z/OS V2R1	<ul style="list-style-type: none"> <li>Function code X'08', DataPut, adds a certificate to the RACF database (if it does not already exist), and connect it to a key ring.</li> <li>Multiple private_key_types have been updated for secure PKCS11 support.</li> </ul>	<ul style="list-style-type: none"> <li>If the private key associated with the certificate is specified in a DER-encoded format or as a key label, the certificate will be added with the specified key types accordingly in the RACF database.</li> <li>Prevent the deletion of the private key and the certificate that has been used to generate a request.</li> </ul>
IRRSEQ00 (R_admin)	z/OS V2R2	The R-admin service is updated to include the new MFA fields for input and output.	New support for Multi-Factor Authentication for z/OS.
	z/OS V2R2	Function code X'21', ADMN_XTR_RRSF returns the mapping of the output message block	Extracts a snapshot of information from an active, running RRSF configuration.
			Updated to include the new Read Only Auditor function.
z/OS V2R1	<ul style="list-style-type: none"> <li>The R_admin service, Profile extract parameter list (input and output) table is updated for length X'04000000'.</li> </ul>	<ul style="list-style-type: none"> <li>The length X'04000000' description has been enhanced for clarity.</li> </ul>	

## Security Server

Table 191. Summary of new and changed RACF callable services (continued)

Callable service name	Release	Description	Reason for change
IRRSEFA64 (R_factor)	z/OS V2R2	The R_factor service has been updated to include the IBM touch token factor and IBM MFA out-of-band authentication.	Enhanced support for Multi-Factor Authentication for z/OS.
	z/OS V2R2	The R_factor service has been added to provide functions required by multi-factor authentication applications.	New support for Multi-Factor Authentication for z/OS.
IRRSGL00 (R_getinfo)	z/OS V1R13	Update the R_getInfo service to return the value of the APPLDATA fields of the caller specified profile in the REALM class.	The r_getinfo service is updated to support an additional function to retrieve certain information from the RACF database.
IRRSGL00 (getGMAP)	z/OS V2R1	<ul style="list-style-type: none"> <li>Update the getGMAP service usage notes when a new GID is assigned and SETROPTS AUDIT(GROUP) is in effect.</li> </ul>	<ul style="list-style-type: none"> <li>Determine if an SMF type 80 record is to be generated.</li> </ul>
IRRSGL00 (r_gensec)	z/OS V2R2	The R_GenSec service has been updated to include PassTicket subfunction codes.	New support for Multi-Factor Authentication for z/OS.
IRRSIA00 (InitACEE)	z/OS V2R1	<ul style="list-style-type: none"> <li>initACEE register and deregister return codes with reason code 28.</li> </ul>	<ul style="list-style-type: none"> <li>The certificate cannot be deregistered because it has been used to generate a request through RACDCERT GENREQ.</li> </ul>
IRRSIM00 (R_usermap)	z/OS V1R13	<ul style="list-style-type: none"> <li>Function code X'0008' returns the RACF user ID associated with the supplied user's Distinguished Name and Registry/Realm Name.</li> </ul>	<ul style="list-style-type: none"> <li>The R_usermap support of Identity Propagation enables a user's Distinguished Name and a Registry/Realm Name to be used to determine the associated RACF user ID,</li> </ul>
IRRSKA00 (ck_access)	z/OS V2R2	RACF authorization	Updated to include the new Read Only Auditor function.
	z/OS V2R1	<ul style="list-style-type: none"> <li>If the user does not have the RACF Auditor attribute, and a file system name was specified in the CRED, and the FSACCESS class is active and RACLISTed, RACF will check for a profile in the FSACCESS class that covers the file system name. If a matching profile is found and the user does not have at least UPDATE authority, access is denied. Otherwise, authorization is determined by subsequent checks.</li> </ul>	<ul style="list-style-type: none"> <li>Check for proper authority.</li> </ul>
IRRSKI00 (ck_IPC_access)	z/OS V2R1	<ul style="list-style-type: none"> <li>An audit record is optionally written, depending on the audit options in effect for the system. If the audit function code in the CREDIPC is AFC_WGETIPC, no audit record is written.</li> </ul>	<ul style="list-style-type: none"> <li>Check audit function code to determine if an audit record is to be written.</li> </ul>

Table 191. Summary of new and changed RACF callable services (continued)

Callable service name	Release	Description	Reason for change
IRRSKP00 (ck_priv)	z/OS V2R1	<ul style="list-style-type: none"> <li>If the caller is not superuser and the audit function code is listed, an authorization check is performed on the corresponding resource name in the UNIXPRIV class. If the authorization check is successful, the caller is treated as a superuser.</li> </ul>	<ul style="list-style-type: none"> <li>Check for proper authority.</li> </ul>
	z/OS V1R13	<ul style="list-style-type: none"> <li>Update the UNIXPRIV class resource names used in ck_priv table</li> </ul>	<ul style="list-style-type: none"> <li>Check for proper authority.</li> </ul>
IRRSXP00 (R_PKIServ)	z/OS V2R2	Requirements, Linkage conventions, and Format topics are updated.	Support for 64 bit enablement.
		Paramameter tables <ul style="list-style-type: none"> <li>ResultsList for QUERYREQS</li> <li>SumList for REQDETAILS</li> </ul>	Updated to benefit PKI Services customers who need to have multiple administrators to approve the issuance of a certificate.
	z/OS V2R1	<ul style="list-style-type: none"> <li>The R_PKIServ SAF callable service Parmlist_version parameter is updated.</li> <li>CertPlist for GENCERT and REQCERT table is updated with new field names.</li> </ul>	<ul style="list-style-type: none"> <li>Provide granular authorization on PKI functions.</li> <li>PKI Services supports the creation of Extended Validation certificates.</li> </ul>
IRRSXP00 (R_proxyserv)	z/OS V2R2	Linkage conventions are updated.	Support for 64 bit enablement.
IRRSXP00 (R_password)	z/OS V2R2	Functions to: <ul style="list-style-type: none"> <li>Evaluate a clear-text password or password phrase (regardless of the encryption algorithm in effect).</li> <li>Encrypt a clear-text password or password phrase under the KDFAES algorithm.</li> </ul>	New callable service for support of enhanced RACF password security.
IRRSQF00 (query_file_security_options)	z/OS V2R1	<ul style="list-style-type: none"> <li>The query_file_security_options service Output_value parameter note is updated with a new condition.</li> </ul>	<ul style="list-style-type: none"> <li>If all conditions are true, then _POSIX_CHOWN _RESTRICTED is not in effect.</li> </ul>
IRRSUM00 (getUMAP)	z/OS V2R1	<ul style="list-style-type: none"> <li>Update the getUMAP service Flag parameter to search by user ID, return z/OS UNIX user identifier (UID).</li> </ul>	<ul style="list-style-type: none"> <li>The getUMAP service flag parameter is updated to not create a new UID even if BPX.UNIQUE.USER is defined.</li> </ul>

## Class descriptor table (CDT)

Table 192 on page 330 lists new and changed RACF classes in the class descriptor table (CDT), ICHRRCDX, which is supplied by IBM. To find the details associated with the CDT entry for each class, see *z/OS Security Server RACROUTE Macro Reference*.

The class name is part of the programming interface for the RACROUTE and ICHEINTY macros. For more information about these macros, see *z/OS Security Server RACROUTE Macro Reference* and *z/OS Security Server RACF Macros and Interfaces*.

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Table 192. Summary of new and changed classes

Class name	Release	Description	Reason for change
DSNADM	z/OS V2R1	Updated for RACF support for DB2 V11	RACF support for DB2 V11
FSACCESS	z/OS V2R1	Added for z/OS UNIX System Services mutex and condition variables	z/OS UNIX System Services mutex and condition variables support
FSEXEC	z/OS V2R2	Added for z/OS UNIX administrator authority to read or search directories.	Support for z/OS UNIX administrator authority to read or search directories.
GDSNGV	z/OS V2R1	Added for RACF support for DB2 V11	RACF support for DB2 V11
GDSNPK	z/OS V2R1	Updated for RACF support for DB2 V11	RACF support for DB2 V11
GDSNSM	z/OS V2R1	Updated for RACF support for DB2 V11	RACF support for DB2 V11
GDSNSP	z/OS V2R1	Updated for RACF support for DB2 V11	RACF support for DB2 V11
GDSNSQ	z/OS V2R1	Updated for RACF support for DB2 V11	RACF support for DB2 V11
GDSNTB	z/OS V2R1	Updated for RACF support for DB2 V11	RACF support for DB2 V11
GDSNUF	z/OS V2R1	Updated for RACF support for DB2 V11	RACF support for DB2 V11
GZMFAPLA	z/OS V1R13	Added as the grouping class for z/OSMF authorization roles.	Support for z/OSMF
LDAP	z/OS V1R13	Added to control authorization roles for LDAP administration.	Support for Tivoli Directory Server for z/OS
MDSNGV	z/OS V2R1	Added for RACF support for DB2 V11	RACF support for DB2 V11
MDSNPK	z/OS V2R1	Updated for RACF support for DB2 V11	RACF support for DB2 V11
MDSNSM	z/OS V2R1	Updated for RACF support for DB2 V11	RACF support for DB2 V11
MDSNSP	z/OS V2R1	Updated for RACF support for DB2 V11	RACF support for DB2 V11
MDSNSQ	z/OS V2R1	Updated for RACF support for DB2 V11	RACF support for DB2 V11
MDSNTB	z/OS V2R1	Updated for RACF support for DB2 V11	RACF support for DB2 V11
MDSNUF	z/OS V2R1	Updated for RACF support for DB2 V11	RACF support for DB2 V11
MFADEF	z/OS V2R2	Added for RACF support for IBM Multi-Factor Authentication for z/OS	RACF support for IBM Multi-Factor Authentication for z/OS
SYSAUTO	z/OS V2R1	Added for APAR OA41282	APAR OA41282
VMDEV	z/OS V1R13	Controls access to z/VM real devices.	Support for z/VM
ZMFAPLA	z/OS V1R13	Added as the member class for z/OSMF authorization roles.	Support for z/OSMF

## Commands

Table 193 lists the new and changed RACF commands. See *z/OS Security Server RACF Command Language Reference* for more detailed information.

Table 193. Summary of changed RACF commands

Command name	Release	Description	Reason for change
ALTDSD	z/OS V2R2	The description of the AUDIT operand has been update	Improved clarity.



Table 193. Summary of changed RACF commands (continued)

Command name	Release	Description	Reason for change
ALTUSER	z/OS V2R2	New keywords added for MFA.	Updates for Multi-Factor Authentication for z/OS.
	z/OS V2R2	A cautionary statement has been added with regards to changing UID's and the potential to lose access to resources.	Improved clarity.
SETROPTS	z/OS V2R2	A new note has been added indicating the LIST keyword performs a read of the RACF database.	Improved clarity.
RACDCERT	z/OS V2R2	Authorization required has been updated to include granular authorization using the RDATA LIB class.	Updates for granular certificate administration.
Multiple commands: ALTUSER LISTUSER RDEFINE RALTER RLIST	z/OS V2R2	New keywords added for MFA.	Updates for Multi-Factor Authentication for z/OS.
Multiple commands: ADDUSER ALTUSER PASSWORD RACLINK SETROPTS	z/OS V2R2	<ul style="list-style-type: none"> <li>Strengthen the encryption of RACF passwords in the RACF database</li> <li>Enhanced password quality by supporting additional special characters</li> <li>Provide enhancements in the form of phrase-only, password-expire, and removal of default password processing.</li> </ul>	Updates for enhanced RACF password security.
Multiple commands: ADDUSER ALTUSER CONNECT LISTUSER LISTGROUP LISTDSD RLIST SEARCH SETROPTS	z/OS V2R2	A new role of a read-only auditor to monitor audit information for a system, but have no additional authority over the system or the RACF database, has been created for this release.	Support for new Read-Only Auditor role.
Multiple commands: RESTART SET TARGET	z/OS V2R2	New keywords added: <ul style="list-style-type: none"> <li>SIGNAL</li> <li>FULLRRSFCOMM</li> <li>DENYINBOUND</li> <li>ALLOWINBOUND</li> <li>NEWMAN</li> <li>PLEXNEWMAN</li> <li>RESETDENYINBOUND</li> </ul>	Support for RRSF Dynamic main node reassignment.
SET	z/OS V2R2	SET has been updated to display the FULLRRSFCOMM setting.	
Multiple commands: ADDUSER ALTUSER RDEFINE	z/OS V2R1	<ul style="list-style-type: none"> <li>Commands have been updated to reflect the removal of the BPX.DEFAULT.USER UNIX profile.</li> </ul>	<ul style="list-style-type: none"> <li>The removal of RACF support for default OMVS segments.</li> </ul>

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Table 193. Summary of changed RACF commands (continued)

Command name	Release	Description	Reason for change
ALTUSER	z/OS V2R1	When NOEXPIRED is specified, the password or password phrase value you supply is subject to certain rules. Those rules include the basic RACF rules for password phrase syntax and any password syntax rules set by the installation through the SETROPTS PASSWORD(RULEn) command.	The NOEXPIRED parameter has been clarified for password and password phrase syntax rules.
DELGROUP	z/OS V2R1	Has been modified to issue a new ENF signal, ENF 79, for classes that have been defined in the RACF Class Descriptor Table with the SIGNAL=YES option	Alert listeners to a possible change in a user's or group's authorizations to resources.
DELUSER	z/OS V2R1	Has been modified to issue a new ENF signal, ENF 79, for classes that have been defined in the RACF Class Descriptor Table with the SIGNAL=YES option	Alert listeners to a possible change in a user's or group's authorizations to resources.
PERMIT	z/OS V2R1	Has been modified to issue a new ENF signal, ENF 79, for classes that have been defined in the RACF Class Descriptor Table with the SIGNAL=YES option	Alert listeners to a possible change in a user's or group's authorizations to resources.
RACDCERT	z/OS V2R1	<ul style="list-style-type: none"> <li>• The Re-adding a certificate sub-function conditions are updated for the RACDCERT ADD function.</li> <li>• The ADD function, PKCS #7 and PKCS #12 processing details.</li> <li>• The BIND function, TOKEN(token-name) sub-function is updated</li> <li>• The CHECKCERT, DELETE, GENCERT, REKEY, ROLLOVER functions are updated. A new LISTCHAIN function is added.</li> </ul>	<ul style="list-style-type: none"> <li>• Re-adding a certificate sub-function conditions are updated for clarity.</li> <li>• The known signature algorithms to RACF are enhanced.</li> <li>• TOKEN(token-name) sub-function is enhanced for clarity.</li> <li>• Support for reporting certificates in the chain when added and listed.</li> </ul>
	z/OS V1R13	<p>The following new command options are added:</p> <ul style="list-style-type: none"> <li>• The PKDS operand is added to the ADD and IMPORT functions.</li> <li>• The PKDS suboperand of the NISTECC and BPECC operands is added to the GENCERT and REKEY functions.</li> <li>• The RSA operand and PKDS suboperand are added to the GENCERT and REKEY functions.</li> </ul>	Hardware keys generated with elliptic curve cryptography (ECC) algorithms
RACMAP	z/OS V1R13	The QUERY function is added.	Distributed identity filters

Table 193. Summary of changed RACF commands (continued)

Command name	Release	Description	Reason for change
RALTER	z/OS V2R1	Has been modified to issue a new ENF signal, ENF 79, for classes that have been defined in the RACF Class Descriptor Table with the SIGNAL=YES option	Alert listeners to a possible change in a user's or group's authorizations to resources.
	z/OS V1R13	The CHECKADDRS and NOCHECKADDRS options of the KERB operand are added.	Support for Network Authentication Service
RDEFINE	z/OS V2R1	Has been modified to issue a new ENF signal, ENF 79, for classes that have been defined in the RACF Class Descriptor Table with the SIGNAL=YES option	Alert listeners to a possible change in a user's or group's authorizations to resources.
	z/OS V1R13	The CHECKADDRS option of the KERB operand is added.	Support for Network Authentication Service
RDELETE	z/OS V2R1	Has been modified to issue a new ENF signal, ENF 79, for classes that have been defined in the RACF Class Descriptor Table with the SIGNAL=YES option	Alert listeners to a possible change in a user's or group's authorizations to resources.
TARGET	z/OS V2R1	<ul style="list-style-type: none"> <li>The TCP Address parameter has been updated.</li> </ul>	<ul style="list-style-type: none"> <li>TCP/IP was added as a communication protocol for RACF Remote Sharing Facility (RRSF) in z/OS V1R13, for IPv4. In z/OS V2R1 support is added for IPv6.</li> </ul>
	z/OS V1R13	<ul style="list-style-type: none"> <li>The following new command options are added: <ul style="list-style-type: none"> <li>LISTPROTOCOL</li> <li>PROTOCOL(TCP)</li> </ul> </li> <li>The several TARGET operands are updated to support the new PROTOCOL(TCP) option.</li> </ul>	TCP/IP support for RACF remote sharing facility (RRSF)

## Data areas

Table 194 lists the new and changed RACF data areas. For more detailed information, see *z/OS Security Server RACF Data Areas* in the z/OS Internet library ([www.ibm.com/systems/z/os/zos/library/bkserv](http://www.ibm.com/systems/z/os/zos/library/bkserv)).

Table 194. Summary of new and changed RACF data areas

Data area name	Release	Description	Reason for change
ACEE	z/OS V2R2	New flag, ACEEROA, is added.	Read-only auditor
	z/OS V2R2	New fields, ACEEMFAA and ACEEMFA, are added.	User authenticated with MFA (Multi-factor Authentication).

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Table 194. Summary of new and changed RACF data areas (continued)

Data area name	Release	Description	Reason for change
AFC	z/OS V2R2	New constant, AFC_FSEXEC, is added.	UNIX search authority
	z/OS V2R1	New fields, AFC_FSACCESS and AFC_SHMMCV are added.	z/OS UNIX System Services mutex and condition variables support
	z/OS V1R13	New constants, AFC_MOUNT_NA, AFC_MOUNT_U, AFC_MOUNT_UNA, AFC_UNMOUNT_U, and AFC_UNMOUNT_UNA are added.	z/OS UNIX System Services user mount support
COMP	z/OS V2R2	<ol style="list-style-type: none"> <li>1. New field, PKIS_MODR_TSTAMP@, is added.</li> <li>2. New constants for 31 bit, CDDL_DATA_ALTER and CDDL_GET_RING_INFO, are added.</li> <li>3. New parameter added to DataGetFirst and DataGetNext for 31 bit, CDDL_STATUS, is added.</li> <li>4. New attributes in 31 bit, CDDL_ATT_NOTRUST, CDDL_ATT_DEL_CERT_ALLRINGS, and CDDL_ATT_DEL_CERT_FORCE are added for R_Datalib callable service.</li> <li>5. A new section in 31 bit, DataAlter function specific parameters, is added.</li> <li>6. A new section in 31 bit, GetRingInfo function specific parameters, is added.</li> </ol>	<ol style="list-style-type: none"> <li>1. Support of multiple number of administrators to approve certificate requests.</li> <li>2. R_datalib callable service is enhanced to manage certificates and key rings.</li> <li>3. R_datalib callable service is enhanced to manage certificates and key rings.</li> <li>4. R_datalib callable service is enhanced to manage certificates and key rings.</li> <li>5. R_datalib callable service is enhanced to manage certificates and key rings.</li> <li>6. R_datalib callable service is enhanced to manage certificates and key rings.</li> </ol>
	z/OS V2R1	New fields, PKIS_MODR_ERRL_LEN, PKIS_MODR_ERRL@, PKIS_MODC_ERRL_LEN, and PKIS_MODC_ERRL@, are added.	z/OS PKI Services certificate administration support.
	z/OS V1R13	<p>New constants, UMAP_ID_PROPAGATION_LEN and UMAP_TOTAL_LEN are added.</p> <p>New function code, UMAP_DID_TO_R is added.</p> <p>New fields, UMAP_DISTINGUISHED_NAME and UMAP_DISTINGUISHED_NAME_LEN are added for distinguished name mapping.</p> <p>New fields, UMAP_REGISTRY_NAME and UMAP_REGISTRY_NAME_LEN are added for registry or realm name mapping.</p>	z/OS identity propagation support

Table 194. Summary of new and changed RACF data areas (continued)

Data area name	Release	Description	Reason for change
COMX	z/OS V2R2	R_datalib callable service is enhanced to manage certificates and key rings, which includes new information: <ul style="list-style-type: none"> <li>New constants for 64 bit, CDDLX_DATA_ALTER and CDDLX_GET_RING_INFO, are added.</li> <li>New parameter added to DataGetFirst and DataGetNext for 64 bit, CDDLX_STATUS, is added.</li> <li>New attributes in 64 bit, CDDLX_ATT_NOTRUST, CDDLX_ATT_DEL_CERT_ALLRINGS, and CDDLX_ATT_DEL_CERT_FORCE are added for R_Datalib callable service.</li> <li>A new section in 64 bit, DataAlter function specific parameters, is added.</li> <li>A new section in 64 bit, GetRingInfo function specific parameters, is added.</li> </ul>	R_datalib callable service enhancement.
COMY	z/OS V2R2	New parameter, PKIS64, is added.	PKI services enabled for 64-bit mode.
CRED	z/OS V2R1	New fields, CREFS, CREFSALET, and CREFSADDR are added.	RACF support for access control administration of z/OS UNIX System Services file systems
ENF2	z/OS V2R1	New field, ENF2GROUP, is added.	RACF support for DB2 V11.
ENF3	z/OS V2R1	New data area, IRRPENF3, is added.	RACF support for DB2 V11.
FXAP	z/OS V1R13	ARFXPVER, ARFXPLEN, ARFXUSED, ARFXNORM, ARFXOPER, ARFXEXIT, ARFXTRST, and ARFXPRIV are added.	RACF exit enhancement
ICRX	z/OS V1R13	New programming interface, ICRXMULT, is added.	z/OS identity propagation support
ISP	z/OS V1R13	New fields, RPEDIDCT, RPEDIDLN, and RPEDIDOF, are added for RACRPE.	z/OS identity propagation support
PWXP	z/OS V2R2	PWXPWHST is changed to add that it contains zeros when RCVTPALG is not 0.	RACF password syntax rules enhancements
RCVT	z/OS V2R2	<ol style="list-style-type: none"> <li>New fields, RCVTPALG, RCVTPSC, and RCVTPWD, are added.</li> <li>New field, RCVTLNOD, is added.</li> <li>RCVTVRMN is changed to contain 7791 as a pseudo-FMID.</li> <li>New field, RCVTMFA, is added.</li> </ol>	<ol style="list-style-type: none"> <li>RACF password syntax rules enhancements</li> <li>RACF remote sharing facility changes</li> <li>Release update</li> <li>PKI services enabled for 64-bit mode</li> <li>User authenticated with MFA (Multi-factor Authentication).</li> </ol>
	z/OS V1R13	<ol style="list-style-type: none"> <li>New programming interface, RCVTIDPV, is added.</li> <li>RCVTAUTU is added in RCVTFLG3.</li> </ol>	<ol style="list-style-type: none"> <li>z/OS identity propagation support</li> <li>RACF exit enhancement</li> </ol>

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Table 194. Summary of new and changed RACF data areas (continued)

Data area name	Release	Description	Reason for change
RCXP	z/OS V1R13	New fields RCXAUSED, RCXANORM, RCXAOPER, RCXAEXIT, and RCXABYPS are added.	RACF exit enhancement
RDXP	z/OS V1R13	RDXAUSED, RDXANORM, RDXASPEC, RDXAOPER, and RDXAEXIT are added.	RACF exit enhancement
RLX2P	z/OS V2R2	A new flag, RLX2MAPN, is added to flag byte RLX2FLAG.	APAR OA49204
SAFP	z/OS V2R2	A new constant, SAFPRLA0 (with a value of 23) is added. SAFPCURR is changed to the same value (23).	Release update
	z/OS V2R1	Constant, SAFPRL90 (with a value of 22) is added. SAFPCURR is changed to the same value (22).	Release update
	z/OS V1R13	Constant, SAFPRL80 (with a value of 21) is added. SAFPCURR is changed to the same value (21).	Release update

## Database templates

Table 195 lists the new and changed RACF database templates. See *z/OS Security Server RACROUTE Macro Reference* or *z/OS Security Server RACF Macros and Interfaces* for more detailed information.

Table 195. Summary of RACF database template changes

Segment name	Release	Description of change	Reason for change
<b>User template</b>			
BASE	z/OS V2R2	Added OPWDXCT, OPWDXGEN, OPWDX, OLDPHRNX, OLDPHRX, OLDPWDX, OLDPHREX, PASSWORD, PASSDATE, PHRASEX, PHRCNTX, PHRASE, and PWDX fields	Password security enhancements
	z/OS V2R2	Added: FACACDT, FACINFO, FACTAGS, FACTOR, FACTORN, MFAFLBK, MFAPOLN, MFAPOLNM	Multi-Factor Authentication for z/OS support
TSO	z/OS V1R13	The description of the 4-byte TPERFORM field is updated to indicate that the performance group value is stored as a 2-byte value.	APAR OA35112
<b>General template</b>			

Table 195. Summary of RACF database template changes (continued)

Segment name	Release	Description of change	Reason for change
CERTDATA	z/OS V2R2	Added CERTGREQ to indicate whether a certificate is used for generating a request.	Release update
	z/OS V2R1	Updated to include updated and new associated key types for the CERTPRVT field in the CERTDATA segment.	Enterprise PKCS #11 secure key support
	z/OS V2R1	Updated to include the CERTGREQ field that is added to indicate whether the certificate is used for generating a request.	RACDCERT GENREQ certificate deletion support
	z/OS V1R13	The CERTPRVT field is updated to include additional key types.	Hardware keys generated with elliptic curve cryptography (ECC) algorithms
KERB	z/OS V1R13	The CHECKADDRS field is added.	Support for Network Authentication Service
MFA	z/OS V2R2	The MFA and MFDATA fields have been added.	Multi-Factor Authentication for z/OS support
MFPOLICY	z/OS V2R2	MFPOLICY, MFFCTRN, MFFCTRS, MFTIMEO, and MFREUSE fields ave been added.	Multi-Factor Authentication for z/OS support

## Exits

Table 196 lists the new and changed RACF exits. See *z/OS Security Server RACF System Programmer's Guide* for more detailed information.

Table 196. Summary of new and changed RACF exits

Exit name	Release	Description	Reason for change

## Macros

Table 197 lists the new and changed RACF macros. See *z/OS Security Server RACF Macros and Interfaces* or *z/OS Security Server RACROUTE Macro Reference* for more detailed information.

Table 197. Summary of changed executable RACF macros

Macro name	Release	Description	Reason for change
ICHEACTN	z/OS V2R2	Updated to accept the RELEASE=77A0 keyword.	Release update
	z/OS V2R1	Updated to accept the RELEASE=7790 keyword.	Release update
	z/OS V1R13	Updated to accept the RELEASE=7780 keyword.	Release update

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Table 197. Summary of changed executable RACF macros (continued)

Macro name	Release	Description	Reason for change
ICHEINTY	z/OS V2R2	1. Added return code 88 (136) 2. Updated to accept the RELEASE=77A0 keyword.	1. Password security enhancements support 2. Release update
	z/OS V2R1	Updated to accept the RELEASE=7790 keyword.	Release update
	z/OS V1R13	Updated to accept the RELEASE=7780 keyword.	Release update
ICHETEST	z/OS V2R2	Updated to accept the RELEASE=77A0 keyword.	Release update
	z/OS V2R1	Updated to accept the RELEASE=7790 keyword.	Release update
	z/OS V1R13	Updated to accept the RELEASE=7780 keyword.	Release update
RACROUTE	z/OS V2R2	Updated to accept the RELEASE=77A0 keyword.	Release update
	z/OS V2R1	Updated to accept the RELEASE=7790 keyword.	Release update
	z/OS V1R13	Updated to accept the RELEASE=7780 keyword.	Release update

## Panels

Table 198 lists the new and changed RACF panels. Some panels might be updated by more than one release enhancement. The first part of the panel number indicates the type of panel that is affected:

**ICHH** Displays help information that is related to a panel or a task that you are performing

**ICHM** Displays message information that is related to a panel or a task that you are performing

**ICHP** Allows you to enter information such as a user ID or profile name

Table 198. Summary of new and changed RACF panels

Panel number	Release	Description	Reason for change
<b>ICHH41A</b> ICHH42 ICHP41A ICHP42 ICHS41 ICHS42	z/OS V2R2	<b>Updated:</b> Enhanced to include ROAUDIT.	The ADDUSER and ALTUSER commands are enhanced to enable a user with AUDITOR in a READ-ONLY mode with the ROAUDIT attribute.
<b>ICHR51</b> ICHP22P	z/OS V2R2	<b>New:</b> Added to include information about the ROAUDIT user attribute.	Read-only auditor



Table 198. Summary of new and changed RACF panels (continued)

Panel number	Release	Description	Reason for change
<b>ICHP41A</b> ICHP54A	z/OS V2R2	<b>New:</b> Added to support additional special characters.	RACF password syntax rules are enhanced to support additional special characters.
<b>ICHP42</b> ICHP42A2	z/OS V2R2	<b>Updated:</b> Changed to support additional special characters.	Enhanced RACF password security
<b>ICHHB0</b> ICHPB0	z/OS V2R1	<b>Updated:</b> Updated to support reporting certificates in the chain when added and listed	Support for reporting certificates in the chain when added and listed.
<b>ICHCB02</b> ICHH771 <b>ICHHB03B</b> ICHPB03B	z/OS V2R1	<b>Updated:</b> Updated to support GENREQ certificate deletion	RACDCERT GENREQ certificate deletion support
<b>ICHH21F</b> ICHH22F <b>ICHP21F</b> ICHP22F	z/OS V1R13	<b>New:</b> Added for hardware support of generating Elliptic Curve Crypto (ECC) keys	Hardware support for generating Elliptic Curve Crypto (ECC) keys
<b>ICHC76</b> ICHCB02 <b>ICHCB71</b> ICHCB71A <b>ICHH716</b> ICHH716A <b>ICHP76</b> ICHPB02 <b>ICHPB03B</b> ICHPB04 <b>ICHPB71</b> ICHPB71A	z/OS V1R13	<b>Updated:</b> To support the hardware support of generating Elliptic Curve Crypto (ECC) keys	Hardware support for generating Elliptic Curve Crypto (ECC) keys
<b>ICHH21F</b> ICHH22F <b>ICHP21F</b> ICHP22F	z/OS V1R13	<b>Updated:</b> To support the KERB segment of REALM class profiles	KERB segment of REALM class profiles

## SMF records

Table 199 lists the new and changed RACF SMF records. See *z/OS Security Server RACF Macros and Interfaces* and *z/OS Security Server RACF Auditor's Guide* for more detailed information.

Table 199. Summary of new and changed RACF SMF records

Record type	Event code/field name	Release	Description	Reason for change
Type 80	Event code 13(D)	z/OS V2R2	Added new bits for the MFA and NOMFA keywords.	Multi-Factor Authentication for z/OS service.
	Event code 66(42)	z/OS V2R1	Added the following bit definitions for byte 2:  <b>Bit</b> <b>Keyword specified</b> 5            TOKEN	Enterprise PKCS #11 secure key support
		z/OS V1R13	Added the following bit definitions for byte 2:  <b>Bit</b> <b>Keyword specified</b> 2            KUKEYAGREE 3            RSA 4            PKDS	<ul style="list-style-type: none"> <li>• APAR OA33703</li> <li>• Hardware keys generated with elliptic curve cryptography (ECC) algorithms</li> </ul>
	Event code 72(48)	z/OS V2R1	Added relocate sections 422, 426, and 429.	PKI Services certificate administration support
	Event code 87(57)	z/OS V1R13	Added the following bit definition for byte 0:  <b>Bit</b> <b>Keyword specified</b> 2            QUERY	Distributed identity filters
	SMF80VRM	z/OS V2R2	Updated for FMID 77A0.	Release update
		z/OS V2R1	Updated for FMID 7790.	Release update
z/OS V1R13		Updated for FMID 7780.	Release update	
Type 81	SMF81VRM	z/OS V2R2	Updated for FMID 77A0.	Release update
		z/OS V2R1	Updated for FMID 7790.	Release update
		z/OS V1R13	Updated for FMID 7780.	Release update
	SMF81OP6	z/OS V2R2	Added to indicate that SPECIALCHARS is active, and the content keyword abbreviation for SPECIAL ("s") and MIXEDALL ("x") appear in the password rules specified.	RACF password security enhancements
	SMF81ALG	z/OS V2R2	Is added to indicate that password encryption algorithm is in effect.	RACF password security enhancements
Type 83	SMF83VRM	z/OS V2R2	Updated for FMID 77A0.	Release update
		z/OS V2R1	Updated for FMID 7790.	Release update
		z/OS V1R13	Updated for FMID 7780.	Release update

## Utilities

Table 200 lists the new and changed RACF utilities. For information about the IRRDBU00 and IRRRID00 utilities, see *z/OS Security Server RACF Security Administrator's Guide*. For information about the IRRADU00 utility, see *z/OS Security Server RACF Auditor's Guide*. For more information about other RACF utilities, see *z/OS Security Server RACF System Programmer's Guide*.

Table 200. Summary of new and changed RACF utilities

Utility name	Release	Description	Reason for change
IRRDBU00	z/OS V2R2	The following records have been updated or added to the database unload utility to include the new MFA segment fields: <ul style="list-style-type: none"> <li>• The user basic data record (0200) has been updated.</li> <li>• The user MFA factor data record (020A) has been added.</li> <li>• The user MFA factor tags data record (1210) has been added.</li> <li>• The general resource MFA Definition record (05H0) has been added.</li> </ul>	Multi-Factor Authentication for z/OS support.
	z/OS V2R1	<ul style="list-style-type: none"> <li>• The database unload utility is able to extend processing for fields such as the certificate field in profiles in the DIGTCERT class. The certificate is processed to extract the subject's distinguished name, the issuer's distinguished name, and the signature algorithm in readable text format.</li> <li>• Record 0560 is updated to support GRCERT_KEY_TYPE.</li> </ul>	<ul style="list-style-type: none"> <li>• Database Unload of Certificate DNs support</li> <li>• Enterprise PKCS #11 secure key support</li> </ul>
	z/OS V1R13	<ul style="list-style-type: none"> <li>• Record 0560 is updated to support the updated CERTPRVT field of the CERTDATA segment in the general template.</li> <li>• Record 0580 is updated to support the new CHKADDRS field of the KERB segment in the general template.</li> </ul>	<ul style="list-style-type: none"> <li>• Hardware keys generated with elliptic curve cryptography (ECC) algorithms</li> <li>• Support for Network Authentication Service</li> </ul>
IRRIRA00	z/OS V2R2	Updated with additional information.	Updated for clarity.
IRRUT100	z/OS V2R2	Updated with the addition of the ROAUDIT attribute.	Updated for Read Only Auditor

## Security Server

## Chapter 25. SMP/E summary of interface changes

In addition to the interface changes included in this topic, updates to SMP/E might have resulted in SYS1.SAMPLIB member changes. See Chapter 4, “Summary of changes to SYS1.SAMPLIB,” on page 23 for those changes.

The SMP/E interfaces described in this topic are:

- “Commands”
- “Data sets and files” on page 344
- “Exits” on page 344
- “Macros” on page 344
- “Modification control statements (MCS)” on page 344
- “Panels” on page 344
- “Programming interfaces” on page 345
- “Service routines” on page 345

### Commands

Table 201 lists the new and changed SMP/E commands. See *SMP/E for z/OS Commands* for more detailed information about these commands.

Table 201. Summary of new and changed SMP/E commands

Command	Release	Description	Reason for change
ACCEPT	SMP/E V3R6	<b>Changed:</b> Added support for multi-tasking using the SYSPRINT definition in the GIMDDALC data set	Multi-tasking using GIMDDALC SYSPRINT allocation
	SMP/E V3R6	<b>Changed:</b> Retains all HOLDDATA when SYSMOD is deleted from the global zone.	SYSMOD Comparison HOLDDATA report
APPLY	SMP/E V3R6	<b>New:</b> Added support for multi-tasking using the SYSPRINT definition in the GIMDDALC data set	Multi-tasking using GIMDDALC SYSPRINT allocation
JCLIN	SMP/E V3R6	<b>Changed:</b> Added support for the RMODE(31) Binder option	Release update.
REJECT	SMP/E V3R6	<b>Changed:</b> HOLDDATA, PURGE and TARGETZONE operands. Deletes HOLDDATA only during the NOFMID and select modes of REJECT processing, and only when the HOLDDATA operand is specified.	SYSMOD Comparison HOLDDATA Report
REPORT CROSSZONE	SMP/E V3R6	<b>New:</b> ZONES operand to allow the specification of target and DLIB zones that are defined in different global zones.	Cross Global Zone Reporting

Table 201. Summary of new and changed SMP/E commands (continued)

Command	Release	Description	Reason for change
REPORT SYSMODS	SMP/E V3R6	<b>Changed:</b> COMPAREDTO operand. Allows the specification of target and DLIB zones that are defined in different global zones.	Cross Global Zone Reporting
	SMPE V3R6	<b>New:</b> SYSMOD Comparison HOLDDATA Report' to identify SYSTEM and USER HOLDS that must be resolved before installing SYSMODs identified in the SYSMOD Comparison Report.	SYSMOD Comparison HOLDDATA Report
RESTORE	SMPE/V3R6	<b>Changed:</b> Retains any internal ++HOLD information when a SYSMOD is deleted from the global zone.	SYSMOD Comparison HOLDDATA Report
UCLIN	SMP/E V3R6	<b>Changed:</b> Retain any internal ++HOLD information when a SYSMOD is deleted from the global zone.	SYSMOD Comparison HOLDDATA Report
ZONEMERGE	SMP/E V3R6	<b>New:</b> BYPASS(IFREQ), CHECK, and VERIFY operands. The processing instructions section was also updated.	Function enhancements.

## Data sets and files

There are no new or changed SMP/E data sets for SMP/E V3R6.

## Exits

There are no new or changed SMP/E exits for SMP/E V3R6.

## Macros

There are no new or changed SMP/E macros for SMP/E V3R6.

## Modification control statements (MCS)

Table 202 lists the changes to the SMP/E modification control statements (MCSs).

Table 202. Summary of new and changed SMP/E MCSs

Macro	Release	Description	Reason for change
++MOD MCS	SMP/E V3R6	<b>Changed:</b> Support for the RMODE(31) Binder option	Release update

## Panels

Table 203 lists the new and changed SMP/E panels. Some panels may be updated by more than one release enhancement.

Table 203. Summary of new and changed SMP/E panels

Panel name	Release	Description	Reason for change
GIMCGND2	SMP/E V3R6	<b>Updated</b>	Release update
GIMCGNDH	SMP/E V3R6	<b>Deleted</b>	Release update
GIMCGRJM	SMP/E V3R6	<b>Updated</b>	Release update

Table 203. Summary of new and changed SMP/E panels (continued)

Panel name	Release	Description	Reason for change
GIMCGRJP	SMP/E V3R6	Updated	Release update
GIMCGRPA	SMP/E V3R6	Updated	Release update
GIMCGRPC	SMP/E V3R6	Updated	Release update
GIMCGRPX	SMP/E V3R6	New	Release update
GIMCGZNM	SMP/E V3R6	Deleted	Release update
GIMDFHC1	SMP/E V3R6	Updated	Release update
GIMDFHC	SMP/E V3R6	Updated	Release update
GIMDFOC	SMP/E V3R6	Updated	Release update
GIMHCNM	SMP/E V3R6	Deleted	Release update
GIMHCRJ2	SMP/E V3R6	Updated	Release update
GIMHCRJ4	SMP/E V3R6	Updated	Release update
GIMHCRJB	SMP/E V3R6	Updated	Release update
GIMHCRJC	SMP/E V3R6	Updated	Release update
GIMHCRJD	SMP/E V3R6	Updated	Release update
GIMHCRPA	SMP/E V3R6	Updated	Release update
GIMHCRPM	SMP/E V3R6	Updated	Release update
GIMHCRPX	SMP/E V3R6	New	Release update
GIMHDFHC	SMP/E V3R6	Updated	Release update
GIMHDHC	SMP/E V3R6	Updated	Release update
GIMHQ1H	SMP/E V3R6	Updated	Release update
GIMWCGZR	SMP/E V3R6	Updated	Release update
GIMWCSCH	SMP/E V3R6	Updated	Release update
GIMWT360	SMP/E V3R6	New	Release update

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## Programming interfaces

There are no new or changed SMP/E programming interfaces for SMP/E V3R6.

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## Service routines

There are no new or changed SMP/E service routines for SMP/E V3R6.





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## Chapter 26. TSO/E summary of interface changes

In addition to the message and interface changes included in this topic, updates to TSO/E might have resulted in SYS1.MACLIB, SYS1.PARMLIB and SYS1.SAMPLIB member changes. See Chapter 1, “Summary of changes to SYS1.MACLIB,” on page 3, Chapter 2, “Summary of changes to SYS1.PARMLIB,” on page 7 and Chapter 4, “Summary of changes to SYS1.SAMPLIB,” on page 23 for those changes.

The TSO/E interfaces described in this topic are:

- “Commands”
- “Macros”
- “Panels”

---

### Commands

Table 204 lists the updated commands. See *z/OS TSO/E Command Reference* for more detailed information.

Table 204. Summary of changed TSO/E commands

Command	Release	Description	Reason for change
ALLOCATE	z/OSV2R1	<b>Updated:</b> The operand DSNTYPE has been updated for the ALLOCATE command.	Release update
	z/OS V1R13	<b>Updated:</b> The operand RETPD has been updated for the ALLOCATE command.	Release update
ATTRIB	z/OS V1R13	<b>Updated:</b> The operands BUFNO and RETPD have been updated for the ATTRIB command.	Release update
LISTDS	z/OSV2R1	<b>Updated:</b> The operand STATUS has been updated for DDNAMES for the LISTDS command.	Release update
LOGOFF	z/OSV2R1	<b>Updated:</b> The TSO segment, including the TSO profile, has been updated for the LOGOFF command.	Release update
LINK	z/OS V1R13	<b>Updated:</b> The LINK command has been updated with a new PRIV parameter of the STRIPSEC option.	Release update
MVSSERV	z/OS V1R13	<b>Updated:</b> The MVSSERV command has been updated.	Release update
SEND	z/OS V1R13	<b>Updated:</b> The SEND command has been updated.	Release update

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### Macros

There are no new or changed TSO/E macros in z/OS V2R2, V2R1, and V1R13.

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### Panels

There are no new or changed TSO/E panels in z/OS V2R2, V2R1, and V1R13.



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## Chapter 27. XL C/C++ summary of interface changes

This chapter describes interface changes to the XL C/C++ compiler.

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### Cataloged procedures

There are no new or changed cataloged procedures in z/OS V1R13, V2R1, and V2R2.

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### Commands

There are no new or changed commands for **as**, **c89**, **dbg1d**, or **x1c** utilities in z/OS V1R13, V2R1, and V2R2.

---

### Compiler options

Table 205 lists the new and updated XL C/C++ compiler options. See *z/OS XL C/C++ User's Guide* for more detailed information.

*Table 205. Summary of new and changed XL C/C++ compiler options*

Compiler option	Release	Description	Reason for change
ARCH(10)	z/OS V1R13	<b>New value:</b> Produces code that uses instructions available on the 2827-xxx models for IBM zEnterprise® EC12 (zEC12) in z/Architecture® mode.	Release update
ARCH(11)	z/OS V2R1	<b>New value:</b> Produces code that uses instructions available on the 2964-xxx models for IBM z Systems z13 (z13) in z/Architecture mode.	Release update
ASM   NOASM	z/OS V2R1	<b>New option:</b> Enables inlined assembly code inside C/C++ programs.	Release update
ASMLIB   NOASMLIB	z/OS V2R1	<b>New option:</b> Specifies assembler macro libraries to be used when assembling the inline assembler source code.	Release update
CHECKNEW   NOCHECKNEW (C++ only)	z/OS V2R2	<b>New option:</b> Controls whether a null pointer check is performed on the pointer that is returned by an invocation of the throwing versions of operator new and operator new[].	Release update
DEBUG(LEVEL( <i>level</i> ))	z/OS V2R1	<b>New value:</b> Controls the amount of debug information produced.	Release update
DSUSER( <i>value</i> ) (Metal C only)	z/OS V2R2	<b>New value:</b> Allocates a user field with the size of <i>value</i> 32-bit words on the stack.	Release update
FUNCEVENT   NOFUNCEVENT	z/OS V2R1	<b>New option:</b> Enables programmers to provide LE CEL4CASR, CELHCASR, and _CEL4CASR CWI (compler-writer interface) notifications for each specified function upon function entry.	Release update
INCLUDE   NOINCLUDE	z/OS V2R1	<b>New option:</b> Specifies additional header files to be included in a compilation unit.	Release update
LANGLVL(C1XNORETURN)	z/OS V2R1	<b>New value:</b> Controls whether the _Noreturn function specifier is supported.	Release update
LANGLVL(C99COMPLEX)	z/OS V1R13	<b>New value:</b> Controls whether C99 complex data types and related keywords are enabled.	Release update
LANGLVL(C99COMPLEXHEADER)	z/OS V1R13	<b>New value:</b> Controls whether the C99 complex.h header file is used.	Release update
LANGLVL(CHECKPLACEMENTNEW)	z/OS V2R1	<b>New value:</b> Controls whether a null pointer check is performed on the pointer that is returned by an invocation of the reserved forms of the placement operator new and operator new[].	Release update
LANGLVL(COMPATVALUEBINDING)	z/OS V1R13	<b>New value:</b> When you are porting code to IBM XL C/C++ compiler, you can specify this option to instruct the compiler to allow a non-const reference to bind to an rvalue of a user-defined type where an initializer is not required.	Release update
LANGLVL(CONSTEXPR)	z/OS V2R1	<b>New value:</b> Controls whether the generalized constant expressions feature is enabled.	Release update

*Table 205. Summary of new and changed XL C/C++ compiler options (continued)*

Compiler option	Release	Description	Reason for change
LANGLVL(DEFAULTANDDELETE)	z/OS V2R1	<b>New value:</b> Controls whether the defaulted and deleted functions feature is enabled.	Release update
LANGLVL(EXPLICITCONVERSION OPERATORS)	z/OS V2R1	<b>New value:</b> Controls whether the explicit conversion operators feature is enabled.	Release update
LANGLVL(EXTC1X)	z/OS V2R1	<b>New value:</b> Indicates that compilation is based on the C11 standard, invoking all the currently supported C11 features and other implementation-specific language extensions.	Release update
LANGLVL(GNU_COMPLEX)	z/OS V1R13	<b>New value:</b> Controls whether GNU complex data types and related keywords are enabled.	Release update
LANGLVL(GNU_SUFFIXIJ)	z/OS V1R13	<b>New value:</b> Controls whether support for GNU-style complex numbers is enabled.	Release update
LANGLVL(NULLPTR)	z/OS V2R2	<b>New value:</b> Controls whether the nullptr feature is enabled.	Release update
LANGLVL(REDEFMAC)	z/OS V2R1	<b>New value:</b> Controls whether a macro can be redefined without a prior #undef or undefine() statement.	Release update
LANGLVL(REFERENCECOLLAPSING)	z/OS V2R1	<b>New value:</b> Controls whether the reference collapsing feature is enabled.	Release update
LANGLVL(RIGHTANGLEBRACKET)	z/OS V2R1	<b>New value:</b> Controls whether the right angle bracket feature is enabled.	Release update
LANGLVL(RVALUEREFERENCES)	z/OS V2R1	<b>New value:</b> Controls whether the rvalue references feature is enabled.	Release update
LANGLVL(SCOPEENUM)	z/OS V2R1	<b>New value:</b> Controls whether the scoped enumeration feature is enabled.	Release update
LANGLVL(TEMPASLOCALS)	z/OS V1R13	<b>New value:</b> Extends the lifetime of temporaries to reduce migration difficulty.	Release update
LANGLVL(TEXTAFTERENDIF)	z/OS V1R13	<b>New value:</b> Suppresses the warning message that is emitted when you are porting code from a compiler that allows extra text after #endif or #else to IBM XL C/C++ compiler.	Release update
NAMEMANGLING(zOSV2R1_ANSI)	z/OS V2R1	<b>New value:</b> NAMEMANGLING(zOSV2R1_ANSI) is compatible with z/OS XL C++ V2R1 link modules that were created with NAMEMANGLING(ANSI) or #pragma namemangling(ansi).	Release update
SMP   NOSMP	z/OS V2R1	<b>New option:</b> Enables parallelization of program code.	Release update
STRICT(SUBSCRIPTWRAP)	z/OS V2R1	<b>New value:</b> Prevents the compiler from assuming that array subscript expressions will never overflow.	Release update
SYSSTATE (Metal C only)	z/OS V2R1	<b>New option:</b> Provides additional SYSSTATE macro parameters to the SYSSTATE macro that is generated by the compiler.	Release update
TARGET(zOSV1R13)	z/OS V1R13	<b>New value:</b> TARGET(zOSV1R13) generates object code to run under z/OS Version 1 Release 13 and subsequent releases.	Release update
TARGET(zOSV2R1)	z/OS V2R1	<b>New value:</b> TARGET(zOSV2R1) generates object code to run under z/OS Version 2 Release 1 and subsequent releases.	Release update
TARGET(zOSV2R2)	z/OS V2R2	<b>New value:</b> TARGET(zOSV2R2) generates object code to run under z/OS Version 2 Release 2 and subsequent releases.	Release update
TEMPLATEDEPTH (C++ only)	z/OS V1R13	<b>New option:</b> The TEMPLATEDEPTH option specifies the maximum number of recursively instantiated template specializations that are processed by the compiler.	Release update
THREADED   NOTHREADED	z/OS V2R1	<b>New option:</b> Indicates to the compiler whether it must generate threadsafe code.	Release update
TUNE(10)	z/OS V1R13	<b>New value:</b> TUNE(10) generates code that is executable on all models, but is optimized for the 2827-xxx using IBM zEnterprise EC12 (zEC12).	Release update
TUNE(11)	z/OS V2R1	<b>New value:</b> TUNE(11) generates code that is executable on all models, but is optimized for the 2964-xxx using IBM z Systems z13 (z13).	Release update
VECTOR   NOVECTOR	z/OS V2R1	<b>New option:</b> Enables compiler support for vector data types and operations.	Release update
VECTOR(AUTOSIMD)	z/OS V2R2	<b>New value:</b> Enables the compiler to generate code, when possible, using the SIMD instructions enabled under the Vector facility for z/Architecture. AUTOSIMD is an optimization that is available when HOT is in effect.	Release update
VECTOR(TYPE)	z/OS V2R2	<b>New value:</b> In addition to __vector data types, enables the compiler to support vector data types.	Release update

## Functions

Table 206 lists the new and changed C/C++ functions. For details, see *z/OS XL C/C++ Runtime Library Reference*.

Table 206. Summary of new and changed C/C++ functions

Callable service	Release	Description	Reason for change
<code>_smf_record()</code>	z/OS V2R2	Updated: With APAR OA48775, the <code>_smf_record()</code> function was updated with information about the <code>BPX.SMF.type.subtype</code> resource profile in the FACILITY class.	APAR OA48775 (SMF Record Type and Subtype Authorization for UNIX System Services Write an SMF Record)
<code>_smf_record2()</code>	z/OS V2R2	Updated: With APAR OA48775, the <code>_smf_record2()</code> function was updated with information about the <code>BPX.SMF.type.subtype</code> resource profile in the FACILITY class.	APAR OA48775 (SMF Record Type and Subtype Authorization for UNIX System Services Write an SMF Record)



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## Chapter 28. z/OS OpenSSH summary of interface changes

The z/OS OpenSSH interfaces described in this topic are:

- “Configuration files”
- “Commands”

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### Commands

Table 207 lists the new and changed shell commands. For details, see *z/OS UNIX System Services Command Reference*.

Table 207. Summary of new and changed commands

Command name	Release	Description	Reason for change
ssh	z/OS V2R2	<b>Updated command:</b> The -k and -K options were updated to reflect GSSAPI (Kerberos only) support.	GSSAPI (Kerberos only) support

---

### Configuration files

Table 208 lists the new and changed z/OS OpenSSH configuration files. For details, see *z/OS V2R2 OpenSSH User's Guide*.

Table 208. Summary of new and changed configuration files

Configuration file	Release	Description	Reason for change
ssh_config, sshd_config	z/OS V2R2	<b>Updated:</b> New GSSAPI options were added.	GSSAPI (Kerberos only) support
zos_ssh_config, zos_ssh_user_config, zos_sshd_config	z/OS V2R2	<b>Updated:</b> The zEnterprise Data Compression (zEDCCCompression) option was added.	zEDCCCompression support
zos_ssh_config, zos_ssh_user_config, zos_sshd_config	z/OS V2R2	<b>Updated:</b> ChannelConvert option was added.	Security enhancement
ssh_config	z/OS V2R2	<b>Updated:</b> ProxyUseFdPass option was added.	Security enhancement
ssh_config	z/OS V2R2	<b>Updated:</b> GSSAPIAuthentication and GSSAPIDelegateCredentials options were changed to reflect support of GSSAPI (Kerberos only).	GSSAPI (Kerberos only) support
sshd_config	z/OS V2R2	<b>Updated:</b> GSSAPIAuthentication and GSSAPICleanupCredentials options were changed to reflect support of GSSAPI (Kerberos only).	GSSAPI (Kerberos only) support
zos_ssh_config, zos_ssh_user_config, zos_sshd_config	z/OS V2R2	<b>Updated:</b> New options were added for FIPS 140-2 specifications.	FIPS 140-2 specifications support

---

## Environment variables

Table 209 lists the new and changed environment variables. For details, see *z/OS V2R2 OpenSSH User's Guide*.

*Table 209. Summary of new and changed z/OS OpenSSH environment variables.*

Environment variable	Release	Description	Reason for change
_ZOS_OPENSSH_DEBUG_TIMESTAMP	z/OS V2R2	<b>New:</b> A new option that contains the timestamp in debug information.	Release enhancement



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## Chapter 29. z/OS UNIX summary of interface changes

In addition to the interface changes included in this topic, updates to z/OS UNIX might have resulted in SYS1.PARMLIB and SYS1.SAMPLIB member changes. See Chapter 2, “Summary of changes to SYS1.PARMLIB,” on page 7 and Chapter 4, “Summary of changes to SYS1.SAMPLIB,” on page 23 for those changes.

The z/OS UNIX interfaces described in this topic are:

- “Callable services”
- “Configuration files” on page 356
- “Daemons” on page 356
- “Data sets” on page 356
- “Environment variables” on page 356
- “FACILITY class profiles” on page 357
- “REXX execs” on page 358
- “Shell commands” on page 358
- “Syscall commands” on page 363
- “System commands” on page 364
- “TSO/E commands” on page 365

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### Callable services

Table 210 lists the new and changed z/OS UNIX callable services. For details, see *z/OS UNIX System Services Programming: Assembler Callable Services Reference*.

Table 210. Summary of new and changed callable services

Callable service	Release	Description	Reason for change
BPX1CCS	z/OS V1R13	Updated: Expand the BPXYCCA macro used by BPX1CCS to map the MsgAttributes parameter to include both supplied and returned CART/ConsoleID fields.	The user-supplied CART/ConsoleID fields allow a user to identify the console used by WTO to issue messages.
BPX1CPL	z/OS V2R1	<b>Updated:</b> Two new values were added to the FunctionCode parameter.	Flash memory enhancement
BPX1EXC, BPX4EXC	z/OS V2R1	Updated: An usage note was added.	Logging off unattended terminals
BPX1FCT, BPX4FCT	z/OS V2R1	Updated: The SetCvtOff and SetCvtAll subcommands were updated.	Unicode exploitation
BPX1FSY, BPX4FSY	z/OS V2R1	Updated: The usage notes were updated with Unicode Services information.	Unicode exploitation
BPX1GTH, BPX4GTH	z/OS V2R1	Updated: A new usage note was added.	Pipes enhancement
	z/OS V2R2	Updated: A new usage note was added about using the <code>_BPXK_GPSENT_SECURITY=THREAD</code> environment variable.	Security enhancement
BPX1LSK, BPX4LSK	z/OS V2R1	Updated: The usage notes were updated with Unicode Services information.	Unicode exploitation

## z/OS UNIX

Table 210. Summary of new and changed callable services (continued)

Callable service	Release	Description	Reason for change
BPX1PTR, BPX4PTR	z/OS V2R1	Updated: <ul style="list-style-type: none"><li>• New constant options (PT_READ_VR, PT_WRITE_VR) were added for the ptrace request parameter.</li><li>• New parameter attributes (PT_READ_VR, PT_WRITE_VR) were added for request options.</li><li>• New return values and return codes (PT_READ_VR, PT_WRITE_VR) were added for the request options.</li></ul>	Vector registers support
BPX1RED, BPX4RED	z/OS V2R1	Updated: The usage notes were updated with Unicode Services information.	Unicode exploitation
BPX1SMF, BPX4SMF	z/OS V2R2	Updated: With APAR OA48775, the smf_record callable services was updated with information about the BPX.SMF.type.subtype resource profile in the FACILITY class.	APAR OA48775 (SMF Record Type and Subtype Authorization for UNIX System Services Write an SMF Record)
BPX1SPN, BPX4SPN	z/OS V2R1	Updated: An usage note was added.	Logging off unattended terminals

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## Configuration files

There are no new or changed configuration files for z/OS UNIX.

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## Daemons

There are no new or changed daemons for z/OS UNIX.

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## Data sets

There are no new or changed data sets for z/OS UNIX.

---

## Environment variables

Table 211 lists the new and changed environment variables. For details, see *z/OS UNIX System Services Planning*.

Table 211. Summary of new and changed z/OS UNIX environment variables.

Environment variable	Release	Description	Reason for change
_BPXK_AUTOCVT	z/OS V2R1	<b>Updated:</b> A new option activates the automatic conversion of files that are supported by Unicode Services.	Unicode exploitation
_BPXK_DISABLE_SHLIB	z/OS V1R13	<b>New:</b> Specifies whether normal system shared library program processing is enabled or disabled for a process.	Release enhancement
_BPXK_GPSENT_SECURITY	z/OS V2R2	<b>New:</b> When checking ownership of process information, the w_getpsent() callable service can use the thread-level identity that is created by the pthread_security_np() service.	Security enhancement
_BPXK_INET_FASTPATH	z/OS V2R1	Deleted.	Removal of support

Table 211. Summary of new and changed z/OS UNIX environment variables. (continued)

Environment variable	Release	Description	Reason for change
_BPXK_PCCSID	z/OS V2R1	<b>New:</b> Identifies the program CCSID for the running thread or user.	Unicode exploitation
_BPXK_TECHNIQUE	z/OS V2R1	<b>New:</b> Specifies the Unicode Services conversion technique to use for the I/O conversion operation.	Unicode exploitation
_BPXK_TIMEOUT	z/OS V2R1	<b>New:</b> Specifies whether the process should time out.	Logging off unattended terminals
_BPXK_UNICODE_TECHNIQUE	z/OS V2R1	<b>New:</b> Specifies the Unicode Services conversion technique to use for the I/O translation operation.	Unicode exploitation
_BPXK_UNICODE_SUB	z/OS V2R1	<b>New:</b> Specifies the Unicode Services substitution action to take for I/O translation operation when a source character is not convertible to a target character.	Unicode exploitation
_BPXK_UNICODE_MAL	z/OS V2R1	<b>New:</b> Specifies the Unicode Services substitution action to take for the translation operation when a source character is malformed.	Unicode exploitation

## FACILITY class profiles

Table 212 lists the new and changed z/OS UNIX resource profiles in the RACF FACILITY class. For details, see *z/OS UNIX System Services Planning*.

Table 212. Summary of new and changed z/OS UNIX resource profiles in the RACF FACILITY class

Class profile name	Release	Description	Reason for change
BPX.DEFAULT.USER	z/OS V2R1	Deleted: Use BPX.UNIQUE.USER instead.	Security enhancement
BPX.SMF	z/OS V2R2	Updated: Access to the SMF record function can be limited to specific SMF record types and subtypes by using the BPX.SMF.xxx.yyy resource profile in the FACILITY class where xxx is the SMF record type and yyy is the SMF record subtype.	APAR OA48775 (SMF Record Type and Subtype Authorization for UNIX System Services Write an SMF Record)

## UNIXPRIV class profiles

Table 213 lists the new and changed z/OS UNIX resource names in the RACF UNIXPRIV class. For details, see *z/OS UNIX System Services Planning*.

Table 213. Summary of new and changed z/OS UNIX resource names in the RACF UNIXPRIV class

Class profile name	Release	Description	Reason for change
SUPERUSER.FILESYS.DIRSRCH	z/OS V2R2	<b>New resource name:</b> SUPERUSER.FILESYS.DIRSRCH allows users to read and search all directories, without the authority to open other files.	Enhanced search authority

## z/OS UNIX

Table 213. Summary of new and changed z/OS UNIX resource names in the RACF UNIXPRIV class (continued)

Class profile name	Release	Description	Reason for change
SUPERUSER. FILESYS.USERMOUNT	z/OS V1R13	<b>New resource name:</b> SUPERUSER.FILESYS.USERMOUNT allows nonprivileged users to mount and unmount file systems with the nosetuid option.	Mount and unmount enhancement
SUPERUSER. SHMMCV.LIMITS	z/OS V2R1	<b>New resource name:</b> SUPERUSER.SHMMCV.LIMITS allows the user to create up to 4,194,304 mutexes or condition variables to be associated with a single shared memory segment.	Allow more mutexes

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## REXX execs

There are no new or changed REXX execs for z/OS UNIX.

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## REXX functions

Table 214 lists new and changed syscall commands. For details, see *z/OS Using REXX and z/OS UNIX System Services*.

Table 214. Summary of new and changed REXX functions

Function	Release	Description	Reason for change
procinfo()	z/OS V2R1	<b>New request type:</b> The filepath request retrieves file information for the specified process.	Pipes enhancement

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## Shell commands

Table 215 lists the new and changed shell commands. For details, see *z/OS UNIX System Services Command Reference*.

Table 215. Summary of new and changed shell commands

Command name	Release	Description	Reason for change
automount	z/OS V2R2	<b>Updated command:</b> The MapName option was updated to reflect the support of multi-name continuation.	Multi-line continuation support
	z/OS V2R1	<b>Updated command:</b> The -f option displays the information of the job that last accessed the specified file system.  A list of allocation-spec keywords for allocany and allocuser has been added.  A new keyword, charcase, was added. It indicates the case for names that can match the * specification.	Automount enhancement
bpxmtext	z/OS V2R1	<b>New option:</b> The -d option specifies that the <i>reason_code</i> or <i>error_number</i> is provided as a decimal number.	Errno support

Table 215. Summary of new and changed shell commands (continued)

Command name	Release	Description	Reason for change
cat	z/OS V2R1	<b>Updated command:</b> New options were added. TEXT_CONV was added to the Environment Variables section. The Portability section was updated.	Additional text conversion support
	z/OS V2R1	<b>Removed restriction:</b> The filecodeset restriction of the -W option was removed.	Unicode exploitation
cmp	z/OS V2R1	<b>Updated command:</b> New options were added. TEXT_CNV was added to the Environment Variables section. The Portability section was updated.	Additional text conversion support
	z/OS V2R1	<b>Removed restriction:</b> The filecodeset restriction of the -W option was removed.	Unicode exploitation
comm	z/OS V2R1	<b>Updated command:</b> New options were added. TEXT_CNV was added to the Environment Variables section. The Portability section was updated.	Additional text conversion support
cut	z/OS V2R1	<b>Updated command:</b> New options were added. TEXT_CNV was added to the Environment Variables section. The Portability section was updated.	Additional text conversion support
dbx	z/OS V2R1	<b>Missing subcommands:</b> The execution and files subcommands of <b>dbx</b> were added.	Missing documentation
	z/OS V2R1	<b>Updated subcommand:</b> The <i>\$showcodelines</i> variable was added to the <b>set</b> subcommand. It indicates the lines where the debugger can stop and where breakpoints can be set.	Debug enhancement
	z/OS V2R1	<b>New variable:</b> A new variable, <i>\$novregs</i> , was added to the <b>set</b> subcommand of <b>dbx</b> . The usage note for the registers subcommand was also updated with information about displaying and assigning vector registers.	Machine-level debugging of vector-enabled programs.
df	z/OS V1R13	<b>Updated option:</b> The -v option now displays the user name and effective user ID.	Nonprivileged user mounts
diff	z/OS V2R1	<b>Updated command:</b> New options were added. TEXT_CNV was added to the Environment Variables section. The Portability section was updated.	Additional text conversion support
	z/OS V2R1	<b>Removed restriction:</b> The filecodeset restriction of the -W option was removed.	Unicode exploitation

Table 215. Summary of new and changed shell commands (continued)

Command name	Release	Description	Reason for change
dircmp	z/OS V2R1	<b>Updated command:</b> New options were added. TEXT_CNV was added to the Environment Variables section.	Additional text conversion support
	z/OS V2R1	<b>Removed restriction:</b> The filecodeset restriction of the -W option was removed.	Unicode exploitation
ed	z/OS V2R1	<b>Updated command:</b> New options were added. TEXT_CNV was added to the Environment Variables section. The Portability section was updated.	Additional text conversion support
egrep	z/OS V2R1	<b>Updated command:</b> New options were added.	Additional text conversion support
ex	z/OS V1R13	<b>New -W option and new -B file tag specific option:</b> Support is added to edit untagged z/OS files containing ASCII data or to override the code set value of tagged files.	Enhanced text conversion control
	z/OS V2R1	<b>Updated command:</b> New options were added. TEXT_CNV was added to the Environment Variables section. The Portability section was updated.	Enhanced text conversion control
	z/OS V2R1	<b>Removed restriction:</b> The filecodeset restriction of the -W option was removed.	Unicode exploitation
expand	z/OS V2R1	<b>Updated command:</b> New options were added. TEXT_CNV was added to the Environment Variables section. The Portability section was updated.	Additional text conversion support
fgrep	z/OS V2R1	<b>Updated command:</b> New options were added.	Additional text conversion support
file	z/OS V2R1	<b>Updated command:</b> New options were added. TEXT_CNV was added to the Environment Variables section. The Portability section was updated.	Additional text conversion support
	z/OS V2R1	<b>Removed restriction:</b> The filecodeset restriction of the -W option was removed.	Unicode exploitation
grep	z/OS V2R1	<b>Updated command:</b> New options were added. TEXT_CNV was added to the Environment Variables section. The Portability section was updated.	Additional text conversion support
	z/OS V2R1	<b>Removed restriction:</b> The filecodeset restriction of the -W option was removed.	Unicode exploitation
head	z/OS V2R1	<b>Updated command:</b> New options were added. TEXT_CNV was added to the Environment Variables section. The Portability section was updated.	Additional text conversion support
	z/OS V2R1	<b>Removed restriction:</b> The filecodeset restriction of the -W option was removed.	Unicode exploitation

Table 215. Summary of new and changed shell commands (continued)

Command name	Release	Description	Reason for change
ld	z/OS V2R2	<b>Command update:</b> The <code>_LE_DEBUG_TRACE</code> environment variable can be used to export trace output to a UNIX file.	RAS
mount	z/OS V1R13	<b>New option:</b> If the <code>-m</code> option is used, the file name can be for any file or directory within the file system.	Mount granularity
	z/OS V2R1	<b>Updated command:</b> The parameter key has new options.	Early warning of full file systems
man	z/OS V2R2	<b>Updated command:</b> Cache pages under <code>/var/man</code> are no longer used or created for z/OS V2R2 man command. The z/OS V2R2 <code>man</code> command uses the temporary directory for caching man pages. The temporary directory can be the directory referred to by the <code>TMPDIR</code> environment variable, or <code>/tmp</code> if <code>TMPDIR</code> is not defined.	<b>man</b> enhancement
more	z/OS V2R1	<b>Updated command:</b> New options were added. <code>TEXT_CNV</code> was added to the Environment Variables section. The Portability section was updated. The interactive commands section was updated.	Additional text conversion support
	z/OS V2R1	<b>Removed restriction:</b> The filecodeset restriction of the <code>-W</code> option was removed.	Unicode exploitation
obrowse	z/OS V1R13	<b>New environment variable:</b> <code>BPXWISHISPF</code> controls the use of the ISPF browse dialog service.	Command enhancement
oedit	z/OS V1R13	<b>New environment variable:</b> <code>BPXWISHISPF</code> controls the use of the ISPF browse dialog service.	Command enhancement
pack	z/OS V2R1	<b>Updated command:</b> New options were added. <code>TEXT_CNV</code> was added to the Environment Variables section. The Portability section was updated.	Additional text conversion support
paste	z/OS V2R1	<b>Updated command:</b> New options were added. <code>TEXT_CNV</code> was added to the Environment Variables section. The Portability section was updated.	Additional text conversion support
pax	z/OS V2R2	<b>Updated command:</b> The socket-type file is now supported with the <code>-C</code> option in the copy mode.	APAR OA46639
script	z/OS V1R13	<b>New command:</b> Makes a typescript of a terminal session.	Release enhancement
sed	z/OS V2R1	<b>Updated command:</b> New options were added. <code>TEXT_CNV</code> was added to the Environment Variables section. The Portability section was updated.	Additional text conversion support

## z/OS UNIX

Table 215. Summary of new and changed shell commands (continued)

Command name	Release	Description	Reason for change
sh	z/OS V2R1	<b>Variable update:</b> The TMOUT variable includes text on using the PWT BPXPRMxx option instead.	Logging off unattended terminals
	z/OS V2R1	<b>New restriction:</b> If the tagged script is being run with automatic conversion enabled, the code page of the locale must be SBCS.	Unicode exploitation
strings	z/OS V2R1	<b>Updated command:</b> New options were added. TEXT_CNV was added to the Environment Variables section. The Portability section was updated.	Additional text conversion support
	z/OS V2R1	<b>Removed restriction:</b> The filecodeset restriction of the -W option was removed.	Unicode exploitation
tail	z/OS V2R1	<b>Updated command:</b> New options were added. TEXT_CNV was added to the Environment Variables section. The Portability section was updated.	Additional text conversion support
	z/OS V2R1	<b>Removed restriction:</b> The filecodeset restriction of the -W option was removed.	Unicode exploitation
tssh	z/OS V2R1	<b>New restriction:</b> If the tagged script is being run with automatic conversion enabled, the code page of the locale must be SBCS.	Unicode exploitation
umount	z/OS V1R13	<b>New option and parameter:</b> The -m option specifies that the <i>name...</i> parameter can be any file or directory within the file system to be unmounted.	Command enhancements
		A rule concerning mount authority was added.	Command clarification
unexpand	z/OS V2R1	<b>Updated command:</b> New options were added. TEXT_CNV was added to the Environment Variables section. The Portability section was updated.	Additional text conversion support
vi	z/OS V1R13	<b>New -W option and new -B file tag specific option</b> Support is added to edit untagged z/OS files containing ASCII data or to override the code set value of tagged files.	Enhanced text conversion control
	z/OS V2R1	<b>Updated command:</b> New options were added. TEXT_CONV was added to the Environment Variables section. The Portability section was updated.	Additional text conversion support
	z/OS V2R1	<b>Removed restriction:</b> The filecodeset restriction of the -W option was removed.	Unicode exploitation



Table 215. Summary of new and changed shell commands (continued)

Command name	Release	Description	Reason for change
wc	z/OS V2R1	<b>Updated command:</b> New options were added. TEXT_CNV was added to the Environment Variables section. The Portability section was updated.	Additional text conversion support

## Syscall commands

Table 216 lists new and changed syscall commands. For details, see *z/OS Using REXX and z/OS UNIX System Services*.

Table 216. Summary of new and changed z/OS UNIX syscall commands

Syscall commands	Release	Description	Reason for change
f_control_cvt	z/OS V2R1	<b>New parameters:</b> <ul style="list-style-type: none"> <li>• QueryCvt</li> <li>• SetAutoCvtAll</li> <li>• CVT_SETCVTALL</li> <li>• CVT_SETCVT_OFF</li> <li>• CVTSETCVTON</li> </ul>	Unicode support
getmntent	z/OS V1R13	<b>New parameter:</b> The pathflag parameter was added.	Command update
	z/OS V1R13	<b>New predefined variables:</b> The MNT_UID variable was added.	Command update
lchattr	z/OS V2R1	<b>New syscall command:</b> Invokes the lchattr syscall command to set the attributes associated with a file.	Missing from previous releases
mount	z/OS V1R13	A rule concerning mount authority was added.	Mount granularity
mmap	z/OS V2R2	<b>New syscall command:</b> Establishes mapping between address space of processes and UNIX files.	Mapping support
msgget	z/OS V2R1	<b>New syscall command:</b> Locates or creates a message queue.	Extending IPC capabilities for REXX
msgrcv	z/OS V2R1	<b>New syscall command:</b> Receives messages from message queues.	Extending IPC capabilities for REXX
msgrmid	z/OS V2R1	<b>New syscall command:</b> Removes the message queue.	Extending IPC capabilities for REXX
msgset	z/OS V2R1	<b>New syscall command:</b> Sets the message queue attributes	Extending IPC capabilities for REXX
msgsnd	z/OS V2R1	<b>New syscall command:</b> Sends messages to message queues.	Extending IPC capabilities for REXX
msgstat	z/OS V2R1	<b>New syscall command:</b> Obtains status information for a message queue.	Extending IPC capabilities for REXX
msync	z/OS V2R2	<b>New syscall command:</b> Writes modified pages to permanent storage for the mapped file, or discards changes to modified pages.	Mapping support
munmap	z/OS V2R2	<b>New syscall command:</b> Removes the mapping for pages that were established by the <b>mmap</b> service.	Mapping support
shmat	z/OS V2R1	<b>New syscall command:</b> Attaches a shared memory segment.	Extending IPC capabilities for REXX

Table 216. Summary of new and changed z/OS UNIX syscall commands (continued)

Syscall commands	Release	Description	Reason for change
shmdt	z/OS V2R1	<b>New syscall command:</b> Detaches a shared memory segment.	Extending IPC capabilities for REXX
shmget	z/OS V2R1	<b>New syscall command:</b> Locates or creates a shared memory segment.	Extending IPC capabilities for REXX
shmlkdestroy	z/OS V2R1	<b>New syscall command:</b> Removes a shared memory lock.	Extending IPC capabilities for REXX
shmlkinit	z/OS V2R1	<b>New syscall command:</b> Initializes a shared memory lock.	Extending IPC capabilities for REXX
shmlobtain	z/OS V2R1	<b>New syscall command:</b> Obtains a shared memory lock.	Extending IPC capabilities for REXX
shmlkrelease	z/OS V2R1	<b>New syscall command:</b> Releases a shared memory lock.	Extending IPC capabilities for REXX
shmrid	z/OS V2R1	<b>New syscall command:</b> Removes a shared memory lock.	Extending IPC capabilities for REXX
shmset	z/OS V2R1	<b>New syscall command:</b> Sets the attributes for a shared memory segment.	Extending IPC capabilities for REXX
shmstat	z/OS V2R1	<b>New syscall command:</b> Obtains the status information for a shared memory segment.	Extending IPC capabilities for REXX
unmount	z/OS V1R13	A rule concerning mount authority was added.	Mount granularity
v_close	z/OS V2R1	<b>New syscall command:</b> Closes a file that was previously opened using <b>v_open</b> .	Extending the file server interfaces for REXX
v_open	z/OS V2R1	<b>New syscall command:</b> Opens an existing file and optionally establishes share reservations on the file.	Extending the file server interfaces for REXX

## System commands

Table 217 lists new and changed system commands that affect z/OS UNIX. For more information, see *z/OS MVS System Commands*.

For other elements that have z/OS UNIX command impacts, see the following sections:

- “z/OS UNIX commands” on page 100
- “z/OS UNIX commands for Infoprint Server” on page 269

Table 217. Summary of new and changed system commands for z/OS UNIX

System command	Release	Description	Reason for change
D OMVS,F	z/OS V1R13	The UID filter displays information for the file systems mounted by the specific user.	Mount granularity
D OMVS,L	z/OS V1R13	The display output was updated to show the system limit and user limit of rnonprivileged user mounts.	Mount granularity
	z/OS V2R1	The display output was updated to show the maximum system limit of named or unnamed pipes (MAXPIPES) that can be open in the system. The limit is not configurable.	Pipe monitoring support

Table 217. Summary of new and changed system commands for z/OS UNIX (continued)

System command	Release	Description	Reason for change
D OMVS,O	z/OS V1R13	The display output was updated to show NONEMPTYMOUNTPT, MAXUSERMOUNTSYS, and MAXUSEDRMOUNTUSER information.	Mount granularity
D OMVS,PIPES	z/OS V2R1	New parameter: Displays pipe usage	Pipe monitoring support
D OMVS,STORAGE	z/OS V2R2	New parameter: The PROCESSES parameter specifies the number of process that is to be shown in the display.	Stacks above bar support
D OMVS,W	z/OS V1R13	The D OMVS,W display displays a table of file latch holders and waiters filtering options have been added to the D OMVS,W command to limit the amount of data being displayed.	Command enhancement
MODIFY	z/OS V1R13	The display was updated to show the system setting and highwater marks for MAXUSERMOUNTSYS and MAXUSERMOUNTUSER.	Mount granularity
SETOMVS	z/OS V1R13	New parameters: MAXUSERMOUNTSYS, MAXUSERMOUNTUSER, NONEMPTYMOUNTPT	Mount granularity
	z/OS V1R13	New parameter: LOSTMSG	Lost message detection

## TSO/E commands

Table 218 lists the new and changed TSO/E commands that affect z/OS UNIX. For details, see *z/OS UNIX System Services Command Reference*.

Table 218. Summary of new and changed TSO/E commands

TSO/E commands	Release	Description	Reason for change
BPXMTEXT	z/OS V2R1	Displays reason code text.	Not listed in previous releases
BPXMTRACE	z/OS V2R1	Activates or deactivate traces for processes	Not listed in previous releases
ISHELL	z/OS V1R13	A note was added about the BPXWISHISPF environment variable.	Command enhancement
OBROWSE	z/OS V1R13	<b>New option:</b> The <b>-o</b> option specifies that the original dialog service is to be used.	Command enhancement
OEDIT	z/OS V1R13	<b>New option:</b> The <b>-o</b> option specifies that the original dialog service is to be used.	Command enhancement
MOUNT	z/OS V1R13	<b>Updated option:</b> The behavior of the <b>-f fsname</b> option has changed.  A rule concerning mount authority was added.	Mount granularity

## z/OS UNIX

Table 218. Summary of new and changed TSO/E commands (continued)

TSO/E commands	Release	Description	Reason for change
ZLSOF	z/OS V2R1	<b>New command:</b> Displays information about open files, sockets, and pipes (including named pipes, which are also known as FIFO special files).	PIPE and LFS serviceability improvement

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## Chapter 30. z/OSMF summary of interface changes

This topic describes new and changed programming interfaces for IBM z/OS Management Facility (z/OSMF).

Table 219 lists the new and changed z/OSMF Representational State Transfer (REST) services. For details, see *IBM z/OS Management Facility Programming Guide*.

*Table 219. Summary of new and changed REST services*

REST service	Release	Description	Reason for change
Application server routing services	z/OS V2R2	<p>New Representational State Transfer (REST) services are added to route requests and responses between the client-side and server-side code for any z/OSMF plug-ins you created where the server-side code is hosted on an application server (referred to as the <i>target application server</i>) other than the z/OSMF server. The new services allow a caller to:</p> <ul style="list-style-type: none"><li>• Retrieve data from the target application server.</li><li>• Update data on the target application server.</li><li>• Delete data from the target application server.</li></ul>	Release update. This capability is also available for z/OSMF V2R1.

*Table 219. Summary of new and changed REST services (continued)*

REST service	Release	Description	Reason for change
Cloud provisioning	z/OS V2R2	<p>New REST APIs that can be used to provision z/OS software are added. These include APIs for:</p> <ul style="list-style-type: none"> <li>• Network resource provisioning</li> <li>• Resource management, for managing domains and tenants</li> <li>• Resource pools</li> <li>• Software services templates that are used to provision software</li> <li>• Software services instances that represent provisioned software</li> <li>• Software service instance names (SSINs)</li> <li>• Workload management resource pools.</li> </ul> <p>Resource management services, software services template services, and software services instance services support domains with more than one system.</p> <p>Software services template services and software services instance services support auditing a runAsUser ID.</p> <p>Services for getting a domain, a software services template, and a published software services template are updated to support defining security manually.</p> <p>Software services instance services reflect support for suspending and resuming provisioning and actions workflows.</p> <p>Software services template services and software services instance services let you specify the disposition of workflows and jobs after they complete.</p>	Support for IBM Cloud Provisioning and Management for z/OS, including the April 2017 enhancement.
Multisystem routing services	z/OS V2R2	<p>The multisystem routing services are enhanced to allow a calling application to:</p> <ul style="list-style-type: none"> <li>• Retrieve data from all the systems in a sysplex or CPC.</li> <li>• Update data for all the systems in a sysplex or CPC.</li> <li>• Delete data from all the systems in a sysplex or CPC.</li> </ul>	Release update

Table 219. Summary of new and changed REST services (continued)

REST service	Release	Description	Reason for change
Notification services	z/OS V2R2	<p>The notification services are added. Use them to send a notification in the form of a notification record or email, to a single or multiple recipients.</p> <ul style="list-style-type: none"> <li>• Get all of the notifications received by the current user</li> <li>• Send a notification from a z/OSMF task, when the content is the message from the bundle file</li> <li>• Send a notification and mail from a z/OSMF task or z/OSMF user</li> <li>• Send a notification from a third party product.</li> </ul>	
Software management services	z/OS V2R2	<p>New services are added to the software management API to allow a calling application to:</p> <ul style="list-style-type: none"> <li>• List the data sets included in a software instance.</li> <li>• Modify the properties of a software instance.</li> <li>• Retrieve the products, features, and FMIDs for a software instance.</li> <li>• Remove a software instance from z/OSMF.</li> </ul> <p>A portable software instance can be used to simplify distribution of a software instance across a network, and can be deployed by the z/OSMF Software Management task.</p> <p>Information about access controls for global zones is removed.</p> <ul style="list-style-type: none"> <li>• Software management services</li> <li>• Load the products, features, and FMIDs for a software instance</li> <li>• Add a new software instance</li> <li>• List the data sets included in a software instance</li> <li>• List the software instances defined to z/OSMF</li> <li>• Modify the properties of a software instance</li> </ul> <p>Perform an Export action on a software instance, which creates a portable software instance.</p> <p>Define non-SMP/E managed software products contained in a software instance.</p>	Release update
Topology services	z/OS V2R2	<p>Adds support for central processor complexes (CPCs) so that you can retrieve a list of the systems included in a CPC.</p>	Release update

## z/OSMF

Table 219. Summary of new and changed REST services (continued)

REST service	Release	Description	Reason for change
z/OS console services	z/OS V2R2	New services that provide a programming interface for performing z/OS console operations.	Release update
z/OS jobs REST interface services	z/OS V2R2	Enhanced to include data for active job steps	Release update
	z/OS V2R2	Enhanced to allow a calling application to retrieve information about each step in a job, such as the step name, step number, and completion code, when obtaining the status of a job.	Release update
z/OS data set and file REST interface	z/OS V2R2	<p>Services have been updated in the data set and file REST interface API.</p> <ul style="list-style-type: none"> <li>• List the data sets on a system.</li> <li>• List the members of a data set.</li> <li>• List the files and directories of a UNIX file path.</li> <li>• Retrieve the contents of a data set or member.</li> <li>• Retrieve the contents of a UNIX file.</li> <li>• Write to a data set or member.</li> <li>• Write to a UNIX file.</li> <li>• JSON document specifications for z/OS data set and file REST interface requests.</li> <li>• Error reporting categories.</li> </ul> <p>New services have been added to the data set and file REST interface API.</p> <ul style="list-style-type: none"> <li>• Create a sequential and partitioned data set.</li> <li>• Create a UNIX file or directory.</li> <li>• Delete a sequential or partitioned data set.</li> <li>• Delete a partitioned data set member.</li> <li>• Delete a UNIX file or directory.</li> <li>• Mount a UNIX file system.</li> <li>• Unmount a UNIX file system.</li> </ul>	Release update



Table 219. Summary of new and changed REST services (continued)

REST service	Release	Description	Reason for change
Workflow services	z/OS V2R2	The following services are enhanced with a new security control called <i>access type</i> : <ul style="list-style-type: none"> <li>• Create a workflow</li> <li>• Get the properties of a workflow</li> <li>• List the workflows for a system or sysplex.</li> </ul> <p>The service to get the properties of a workflow is enhanced to return more information about jobs that are run by steps and provisioning workflows.</p>	Release update
	z/OS V2R2	The following services are enhanced to support the use of REST steps: <ul style="list-style-type: none"> <li>• Get the properties of a workflow</li> <li>• Retrieve a workflow definition.</li> </ul>	Release update
	z/OS V2R2	New services are added for working with archived workflows, as follows: <ul style="list-style-type: none"> <li>• Archive a workflow instance</li> <li>• List the archived workflows for a system</li> <li>• Get the properties of an archived workflow</li> <li>• Delete an archived workflow.</li> </ul>	Release update
Workload management resource pools	z/OS V2R2	New services that provide a programming interface for WLM policy elements, including: <ul style="list-style-type: none"> <li>• Prime a WLM resource pool</li> <li>• Delete a WLM resource pool</li> <li>• Construct a WLM service definition</li> </ul>	Support for IBM Cloud Provisioning and Management for z/OS



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## Part 2. Summary of message and code changes for z/OS V2R2

These topics list new, changed, and deleted messages and codes for z/OS V2R2 elements and features. All message and code changes are in element specific topics.

The following elements and features were updated with new, changed, or deleted messages or codes for z/OS V2R2.

- Chapter 31, "BCP and DFSMS summary of message changes for z/OS V2R2 and its updates," on page 375
- Chapter 33, "Communications Server summary of message changes for z/OS V2R2," on page 387
- Chapter 37, "Distributed File System summary of message changes for z/OS V2R2," on page 401
- Chapter 34, "Cryptographic Services ICSF summary of message changes for z/OS V2R2," on page 391
- Chapter 38, "HCD summary of message changes for z/OS V2R2," on page 405
- Chapter 40, "Infoprint Server summary of message changes for z/OS V2R2," on page 411
- Chapter 54, "z/OS UNIX summary of message changes for z/OS V2R2," on page 443

## **z/OS V2R2 messages**

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## Chapter 31. BCP and DFSMS summary of message changes for z/OS V2R2 and its updates

This topic lists new, changed, and deleted messages and codes for BCP (MVS), DFSMSdftp, DFSMSdss, DFSMSshsm, DFSMSrmm, and DFSMSstvs. It also lists new, changed, and deleted operator messages for RMF and TSO/E. (New, changed, and deleted non-operator messages for TSO/E are in Chapter 51, "TSO/E summary of message changes for z/OS V2R2," on page 437.) All the messages and codes in this section are grouped together, without distinction as to element or feature.

All messages for the BCP and DFSMS, as well as the operator messages for RMF and TSO/E, are documented in:

- *z/OS MVS System Messages, Vol 1 (ABA-AOM)*
- *z/OS MVS System Messages, Vol 2 (ARC-ASA)*
- *z/OS MVS System Messages, Vol 3 (ASB-BPX)*
- *z/OS MVS System Messages, Vol 4 (CBD-DMO)*
- *z/OS MVS System Messages, Vol 5 (EDG-GFS)*
- *z/OS MVS System Messages, Vol 6 (GOS-IEA)*
- *z/OS MVS System Messages, Vol 7 (IEB-IEE)*
- *z/OS MVS System Messages, Vol 8 (IEF-IGD)*
- *z/OS MVS System Messages, Vol 9 (IGF-IWM)*
- *z/OS MVS System Messages, Vol 10 (IXC-IZP)*

Messages and codes that have been added, updated, or that are no longer issued in an updated edition of V2R2 are identified by the quarter and year that the message or code was updated, in parentheses. For example, (4Q2015) indicates that a message or code was updated in the fourth quarter of 2015.

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### New

AIR043I	AIR059I
AIR044I	AIR060I
AIR045I	AIR061I
AIR046I	AIR062I
AIR047I	AIR063I
AIR048I	ANTF0476E
AIR049I	ANTF0513E
AIR050I	ANTF0514E
AIR051I	ANTI1041E
AIR052I	ANTP0275E
AIR053I	ANTP0276E
AIR054I	ANTP0277E
AIR055I	ANTP7134E
AIR056I	ANTP7135E
AIR057I	ANTP7137E
AIR058I	ANTP7138E

ANTP7139E  
ANTQ8276I  
ANTQ8226I  
ANTQ8225I  
ANTQ8227I  
ANTQ8228I  
ANTQ8370I  
ANTQ8371I  
ANTQ8372I  
ANTQ8373I  
ANTQ8374I  
ANTQ8375I  
ANTQ8376I  
ANTR8125I  
ANTX5171W  
ANTX5172W  
ANTX5173W  
ANTX5174W  
ARC0279I (4Q2015)  
ARC0568I  
ARC0657I (4Q2015)  
ARC1127I  
ARC1301I  
ARC1327I  
ARC1560I  
ARC1562I  
ARC1563I  
ARC1564I  
ARC1565I  
ARC1566I  
ARC1567I  
ARC1568I  
ARC1569I  
ARC1627I  
ARC1692I  
ARC1829I  
ARC1849I (4Q2015)  
ARC1853I  
ARC1870I  
ARC1871I  
ARC1873I  
ASA020I (4Q2015)  
ASA021I (4Q2015)  
ASA120I (4Q2015)  
AXR0208I (1Q2016)

AXR0209I (1Q2016)  
AXR0210I (1Q2016)  
AXR0211I (1Q2016)  
AXR0212I (1Q2016)  
AXR0213I (1Q2016)  
AXR0214I (1Q2016)  
BPXF270I (1Q2016)  
BPXH073I  
BPXH074I  
BPXH075I  
BPXH076I  
BPXH077E  
BPXH078I  
BPXI089I  
BPXP029I  
BPXTF016I  
BPXTF017I  
BPXTF018I  
BPXW0005I  
CBR0450I  
CBR0451I  
CBR1952I (1Q2016)  
CBR3718I (1Q2016)  
CBR4121I (1Q2016)  
CBR7033I  
CEA0401I  
CEA0402I  
CEA0403I  
CEA0404I  
CNZ2205I  
CNZ6005I (1Q2016)  
CNZ6006I (1Q2016)  
CNZTTH01R (1Q2016)  
CNZTTH02E (1Q2016)  
CNZTTH03E (1Q2016)  
CNZTTH04E (1Q2016)  
CNZTTH05E (1Q2016)  
CNZTTH06E (1Q2016)  
CNZTTH07E (1Q2016)  
CNZTTH08E (1Q2016)  
CPO1022I  
CPO2295E  
CPO2296E  
CPO2297E  
CPO2298E

CPO2299E	IEA054I (4Q2015)
CPO3967I	IEA055I (4Q2015)
CPO4163I	IEA075I (2Q2016)
CPO4218I	IEA076E (2Q2016)
CPO4219I	IEA077A (2Q2016)
CPO4220I	IEA396E
CPO4221I	IEA397I
CPO8219W	IEA398I
CPO8220W	IEC395I
CPO8222W	IEC385S (Changed from IEC385W)
CPO8223W	IEC386S (Changed from IEC386W)
CPO8224W	IEC387S (Changed from IEC387W)
CPO8225W	IEE584I (2Q2016)
CPO8226W	IEE586I (2Q2016)
CPO8227W	IDG008I
CPO8228W	IEF043I (4Q2015)
CPO8229W	IEF188I (3Q2016)
CPO8230W	IEF731I (3Q2016)
CSV251II (1Q2016)	IEFA110I (4Q2015)
CSV428I	IEFA150I (4Q2015)
CSV429I	IEFA151I (4Q2015)
CSV465I	IEFA152I (4Q2015)
CSV466I	IEFA153I (4Q2015)
DMOH0201E (1Q2016)	IEFA154I (4Q2015)
DMOH0202I (1Q2016)	IEFA155I (4Q2015)
EDG0230E	IEFA156I (4Q2015)
EDG3373E	IEFA157D (4Q2015)
EDG3374E	IEFA159I (4Q2015)
GTZ0006I	IEFA160I (4Q2015)
HIS035I	IEFA161I (4Q2015)
HIS036E	IEFA162I (4Q2015)
HWI055I	IEFA163I (4Q2015)
HWT001I	IEFA164I (4Q2015)
HWT002I	IEFA165I (4Q2015)
HWT003I	IEFA166I (4Q2015)
IDC0011II	IEFA169I (4Q2015)
IDC0013I	IEFA170I (4Q2015)
IDC0015I	IEFA171I (4Q2015)
IDC01401I	IEFA173I (4Q2015)
IDC11994I	IEFA174E (4Q2015)
IDC11997I	IEFA175I (4Q2015)
IDC11998I	IEFI000I (4Q2015)
IDC11999I	IEFI001I (4Q2015)
IEA037I	IEFJ033I
IEA053I (4Q2015)	IEFJ038I

IEF990I	IOS128I
IEW2152S	IOS083I (1Q2016)
IEW2619I (4Q2015)	IOS128I (1Q2016)
IEW2620E	IOS584I (1Q2016)
IEW2652W	IOSHC150I (2Q2016)
IFA740E	IOSHC151E (2Q2016)
IFA741I	IOSHC152I (2Q2016)
IFA742I	IOSHC155I (2Q2016)
IFA743I	IOSHC156E (2Q2016)
IFA744I	IOSHC157I (2Q2016)
IFA745I	IOSHM0818I
IFA746E	IOSHM0819I
IFA747I (1Q2016)	IOSHM0820E (1Q2016)
IFA750I (3Q2016)	IRA260E (1Q2016)
IFA751I (3Q2016)	IRA262I (1Q2016)
IFA847I (4Q2016)	IRA265I (1Q2016)
IFA900I (4Q2015)	ISG382I
IFA910I (4Q2015)	ISG383I
IFA911I (4Q2015)	ISG384I
IFB102E (4Q2015)	ISG385I
IFB110I	ISG386I
IFB112I	IRA450E
IGD039I (4Q2015)	IRA452I
IGD092I	IRA459I
IGD400I	IRA866I
IGD401I	IWM066I
IGD06041I	IWM067I
IGGHC114I	IXCH0226I
IGGHC115I	IXCH0227I
IGGHC116E	IXCH0459E
IGGHC118I	IXC637I
IGGHC119I	IXC638I
IGGHC120I	IXC645E
IGGHC121I	IXG078I (4Q2015)
IGW029I	IXG320I
IGW048A	IXG321I
IGW423I	IXG322I
IGW705I	IXG323I
IGW710I	IXG324I
IGW10081I	IXG325I
IGW01185E	IXG326I
IGW01186T	IXG327I
IGW01187T	IXL017I
IGW01188T	IXL057I (4Q2015)
IGW01212E	



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## Changed

ADR285E	BPXF269I
ADR439E	BPXH072E
ADR497E	BPXI039I
ADR410E	BPXM059I
ADR562E	BPXO068I
ADR778E	BPXO042I
AIR005I	BPXO075I
AIR007I	BPXP014I (1Q2016)
AIR008I	BPXP018I
AIR009I	BPXP029I
AIR018I	BPXTF018I
AIR022I	BPXTF012I
AIR025I	BPXTF107I
AIR026I	BPXW0006I
AIR027I	CBR0010I
AIR039I	CBR0011I
AIR042I	CBR0018I
ANTI1037E	CBR0019I
ANTQ8221I	CBR0116I
ANTQ8253I	CBR0156I
ANTX8138I	CBR1110I
AMA723I	CBR1220I
ARC0161I	CBR3710I (1Q2016)
ARC0216I	CBR7525A
ARC0216I	CBR9703I
ARC0245I	CEA0004I
ARC0625I	CEA0023I
ARC0797I (4Q2015)	CPO4163I
ARC0814I	CSV235I (1Q2016)
ARC0980I	CSV236I (1Q2016)
ARC0981I	CSV518I
ARC1220I (4Q2015)	CSV538I (1Q2016)
ARC1500I	CSV540E
ARC1542I	CNZ0005I
ARC1806E	CNZ4100I
ARC1823I	CNZ9002I (1Q2016)
ARC1831I	CNZ6005I (1Q2016)
ARC1836I	CNZZ901I (1Q2016)
ARC1846E	CUN3000I (1Q2016)
ASA008I (4Q2015 )	DMO0063E (1Q2016)
ASA104I (4Q2015)	EDG2313I
ATR250E	EDG2050I (1Q2016)
AXR0200I (1Q2016)	EDG4061I (1Q2016)

EDG8200E	IEA434I
EDG8201E	IEA437I
GFTA086W	IEASYMU01I
GFTA109S	IEASYMU04I
GTZ1001I	IEATH005E (4Q2015)
GTZ1103I	IEATH006E (4Q2015)
GTZ1104I	IEATH009E (4Q2015)
GTZ1105I	IEB311I (4Q2015)
GTZ1106I	IEC027I (1Q2016)
GTZ1110I	IEC030I (1Q2016)
GTZ1111I	IEC031I (1Q2016)
GTZ1112I	IEC032I (1Q2016)
HIS003I	IEC036I (1Q2016)
HIS004I	IEC104I (1Q2016)
HIS005I	IEC130I (1Q2016)
HIS006I	IEC142I (1Q2016)
HIS007I	IEC143I (1Q2016)
HIS009I	IEC161I (1Q2016)
HIS010I	IEC190I (1Q2016)
HIS013I	IEC205I (1Q2016)
HIS015I	IEC353I
HIS016I	IEC385S (Changed from IEC385W)
HIS023I	IEC386S (Changed from IEC386W)
HIS024I	IEC387S (Changed from IEC387W)
HIS026I	IEC503I
HIS027I	IEC613A (1Q2016)
HIS028I	IEE080D (1Q2016)
HIS029I	IEE062I (1Q2016)
HZR0200I (3Q2016)	IEE178I
HZS0410I	IEE256I
IAZ0518I (4Q2015)	IEE289I (1Q2016)
IAZ0522I	IEE459I (form 1 of 3) (2Q2016)
IAZ0526I (4Q2015)	IEE479W (1Q2016)
IAZ0533I	IEE536I (1Q2016)
IDC0012I	IEE712I (1Q2016)
IDC3009I (4Q2015)	IEE716I (4Q2015)
IDC3506I (4Q2015)	IEE735I
IDC31559I (4Q2015)	IEE836D
IEA007I	IEE844W (1Q2016)
IEA013E	IEE972I
IEA074I (2Q2016)	IEFA105I (1Q2016)
IEA075I (4Q2015)	IEFA107I (1Q2016)
IEA252E	IEFA108I (1Q2016)
IEA253I (4Q2015)	IEFC653I (1Q2016)
IEA321I (4Q2015)	IEFJ022I

IEFJ023I	IOS051I (1Q2016)
IEFJ024I	IOS080I (1Q2016)
IEFJ027I	IOS085I (1Q2016)
IEFJ100I	IOS087I (1Q2016)
IEF176I (1Q2016)	IOS202E (1Q2016)
IEF233A	IOS500I (1Q2016)
IEF233D	IOSHM0201I
IEF653I (1Q2016)	IOSHM0303I
IEF863I (1Q2016)	IOSHM0304I
IEW2424I (2Q2016)	IOSHM0399I
IEW2426I relabeled IEW2546I (2Q2016)	IOSHM0401I
IEW2427I relabeled IEW2547I (2Q2016)	IOSHM0420I
IEW2646W	IOSHM0806I
IEW2652W (4Q2015)	IQP001I (1Q2016)
IFA707I (4Q2016)	IQP002I (1Q2016)
IFA714I (4Q2016)	IQP022I (1Q2016)
IFA788I (4Q2016)	IQP023I (1Q2016)
IFA832I	IQP024I (1Q2016)
IFA845I	IRA200E (1Q2016)
IFA846I (1Q2016)	IRA201E (1Q2016)
IFB099I	IRA202I (1Q2016)
IFB100E (4Q2015)	IRA206I (1Q2016)
IGD002 (4Q2015)	ISG343I - Indicates the active GRSMONxx parmlib member.
IGD002I (4Q2015)	ISG365I - Indicates errors related to the GRSMONxx parmlib member.
IGD004I	IWM001I
IGD008I (4Q2015)	IWM005W
IGD039I	IWM054I
IGD064I	IWM063I
IGD065I	IWM064I
IGD069D	IXC331I
IGD01012I	IXC332I
IGD01015I	IXC333I
IGD103I (1Q2016)	IXC337I
IGD104I (1Q2016)	IXC347I
IGD105I (1Q2016)	IXC358I (4Q2015)
IGD17051I	IXC359I
IGD17286I	IXC357I (4Q2015)
IGD17288I (1Q2016)	IXC360I
IGD17315I (4Q2015)	IXC362I
IGD17800I	IXC373I (4Q2015)
IGD21003I	IXC388I
IGW040I (1Q2016)	IXC440E
IGW700I (1Q2016)	IXC500I
IGW01011T (1Q2016)	
IOS000I (1Q2016)	

IXC517I	IXG262A
IXC518I	IXG283I
IXC530I (4Q2015)	IXG310I
IXC538I (4Q2015)	IXG601I (4Q2015)
IXC574I	IXG607I
IXC638I (4Q2015)	IXG651I
IXC745I	IXG652I
IXCH0202I	IXG653I
IXCH0206E	IXG661I
IXCH0912I (4Q2015)	IXG662I
IXG016E	IXG735I (4Q2015)
IXG058E (4Q2015)	IXL013I
IXG207I (4Q2015)	IXL015I
IXG233I	IXL047I
IXG261E	IXL150I

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## Deleted

CNZ0010A	IOS583I
CNZ0012D	IXCH0265E
IEE859I	IXCH0266I
IEFJ004I	IXCH0930I
IEW2619W (4Q2015)	

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## Dump output messages

### New

None

### Changed

None

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## MVS system codes

For explanations and additional details, see *z/OS MVS System Codes*.

### New

#### System completion codes

For system completion code 00C, new internal and external reason codes have been added.

For system completion code 026, new reason codes have been added to the lists of internal and external XES reason codes.

For system completion code 042, reason codes 00080000, 00080001, and 00080002 have been added. (4Q2016)

System completion code 04D has been added.

For system completion code 05C, reason code 703 has been added.

For system completion code 05E, reason code 28 has been added. (4Q2016)

For system completion code 073, reason code 44 has been added.

For system completion code 077, reason code 0032 has been added.

For system completion code 0B0, reason codes 2C, 30, 38, 40, and 44 have been added.

For system completion code 0F7, reason codes 1B4, 368, 376, 388, 392, 396, 400, 440, 444, 448, 452, 456, 460, 464, and 472 have been added.

For system completion code 0F7, reason codes 164, 170, 174, 184, 188, 18C, 190, 194, 198, 19C, 1A0, 1A4, 1A8, 1AC, 1B0, 1B8, 1BC, 1C0, 1C4, 1C8, 1CC, 1D0, 1D0, 1D4, and 1DC have been added. (4Q2016)

For system completion code 157, new reason codes have been added.

For system completion code 18F, reason codes 47A and 47B have been added.

For system completion code 1D0, reason code 0415 has been added.

For system completion code 1FB, reason codes 77, 78, 7A, 8E, 8F, EA, EB, and EC have been added.

For system completion code 290, several new reason codes have been added.

System completion code 353 has been added. (4Q2016)

For system completion code 3C4, reason code 1C has been added. (3Q2016)

The explanation of system completion code 422 has been updated.

For system completion code 4FB, reason codes 2C, 30, 34, and 38 have been added.

System completion code 753 has been added. (3Q2016)

System completion code 90D has been added.

For system completion code AC7, reason codes 00470001 and 00470003 have been added. (3Q2016)

For system completion code BC3, reason code 09 has been added.

For system completion code C0D, reason code 40000001 has been added.

For system completion code C78, reason codes C0, C4, C8, CC, and D8 have been added.

For system completion code D23, new reason codes have been added.

For system completion code DC2, reason codes 006D and 00AF have been added.

System completion code DC4 has a new xx0429xx reason code. (4Q2015)

System completion code E6D has been added.

For system completion code EC6, reason codes 0796, E04B, and E055 have been added.

#### **Wait state codes**

For wait state code 007, reason code 0001 has been added.

Wait state code 02F has been added. (2Q2016)

For wait state code 07B, reason code 1F has been added.

For wait state code A2C, reason code 03 has been added.

## **Changed**

### **System completion codes**

For system completion code 0F7, the following reason codes were listed as decimal values and have been changed to hexadecimal values: 368, 388, 392, 396, 400, 440, 444, 448, 452, 456, 460, 464, 472. (4Q2016)

For system completion code 1FB, reason code 11 has been updated.

For system completion code 206, the explanation and the explanation for reason code 4 have been updated. (4Q2016)

For system completion code 522, the explanation has been updated.

For system completion code EC6, the explanation for reason code 0585 has been updated.

**Wait state codes**

The information about wait state code 053 has been corrected. (4Q2015)

For wait state code 082, the explanation has been updated. (4Q2016)

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## Chapter 32. Common Information Model (CIM) summary of message changes for z/OS V2R2

This section contains new, changed, and deleted messages and codes for CIM.

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### New

#### Messages:

CFZ12567W  
CFZ14208W  
CFZ17001I  
CFZ17002E

X'xxxx0379'  
X'xxxx038A'  
X'xxxx039B'  
X'xxxx039D'  
X'xxxx039E'  
X'xxxx039F'

#### Reason codes:

X'xxxx0344'  
X'xxxx0345'  
X'xxxx0353'  
X'xxxx0354'  
X'xxxx0355'  
X'xxxx0356'  
X'xxxx0358'  
X'xxxx035B'

X'xxxx03A0'  
X'xxxx03A1'  
X'xxxx03A2'  
X'xxxx03A3'  
X'xxxx03A4'  
X'xxxx03A6'  
X'xxxx03A7'

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### Changed

CFZ02202I - changed from W to I  
CFZ02207I - changed from W to I  
CFZ06201I - changed from W to I





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## Chapter 33. Communications Server summary of message changes for z/OS V2R2

The messages for Communications Server are documented in:

- *z/OS Communications Server: IP Messages Volume 1 (EZA)*
- *z/OS Communications Server: IP Messages Volume 2 (EZB, EZD)*
- *z/OS Communications Server: IP Messages Volume 3 (EZY)*
- *z/OS Communications Server: IP Messages Volume 4 (EZZ, SNM)*
- *z/OS Communications Server: SNA Messages*

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### New

EZZ0067I (2Q2017)	EZZ0167I
EZZ0068I (2Q2017)	EZZ0404I
EZZ0069I (2Q2017)	EZZ2395I
EZZ0070I (2Q2017)	EZZ2677I (1Q2016)
EZZ0139I (2Q2017)	EZZ2678I (1Q2016)
EZZ0405I (2Q2017)	EZZ2679I (1Q2016)
IST2445I (2Q2017)	EZZ2680I (1Q2016)
IST2446I (2Q2017)	EZZ2681I (1Q2016)
EZA4443I (3Q2016)	EZZ2683I (1Q2016)
EZA5699I	EZZ3135I
EZA5700I	EZZ6062I
EZA5701I	EZZ6389I
EZA5702I	IST2412I
EZA5703I	IST2413I
EZA5704I	IST2414I
EZA5705I	IST2415I
EZA5706I	IST2416I
EZA5707I	IST2418I (1Q2016)
EZA5708I	IST2419I
EZAOP42I	IST2420I (1Q2016)
EZD1591I	IST2421I (1Q2016)
EZD2030I	IST2422I (1Q2016)
EZD2031I	IST2423I (1Q2016)
EZD2032I	IST2424I (3Q2016)
EZD2033I	IST2425I (3Q2016)
EZD2034I	IST2426I (3Q2016)
EZD2040I	IST2427I (3Q2016)
EZD2041I	IST2428I (3Q2016)
EZZ0140I	IST2429I (3Q2016)
EZZ0141I	IST2430I (3Q2016)
EZZ0142I	IST2431I (3Q2016)

IST2432I (3Q2016)	ISTM020E
IST2433I (3Q2016)	ISTM021I
IST2434I (3Q2016)	ISTM022E
IST2435I (3Q2016)	ISTM023I
IST2436I (3Q2016)	ISTM024E
IST2437I (3Q2016)	ISTM025I
IST2438I (3Q2016)	ISTM026E
IST2439I (3Q2016)	ISTM027I
IST2440I (3Q2016)	ISTM028E
IST2441I (3Q2016)	ISTM029I (1Q2016)
ISTH020I (3Q2016)	ISTM030E (1Q2016)
ISTH021E (3Q2016)	ISTM031I (3Q2016)
ISTH029I (3Q2016)	ISTM032E (3Q2016)
ISTH030E (3Q2016)	IVT5595I
ISTH031I (3Q2016)	IVT5596I
ISTH032E (3Q2016)	IVT5598I
ISTH033I (3Q2016)	IVT5603I
ISTH034E (3Q2016)	IVT5604I
ISTM017I	IVT5605I
ISTM018E	IVT5606I
ISTM019I	IVT5607I

---

## Changed

EZZ0059I (2Q2017)	EZZ0631I
EZZ0312I (2Q2017)	EZZ0656I
EZZ0358I (2Q2017)	EZZ4336I (1Q2016)
EZZ0661I (2Q2017)	EZZ6035I (1Q2016)
EZZ0733I (2Q2017)	EZZ6060I
EZZ6060I (2Q2017)	EZZ6206I
EZZ6080I (2Q2017)	EZZ6238I
IST315I (2Q2017)	EZZ7839I
IST879I (2Q2017)	EZZ7863I
IST1189I (2Q2017)	EZZ7882I
IST1370I (2Q2017)	EZZ8059I
EZA8567I	EZZ8070I
EZA8593I	EZZ8071I
EZB2460E	EZZ8128I
EZBH008E	EZZ8174I
EZZ0307I	EZZ8309I
EZZ0312I	EZZ8310I
EZZ0323I	EZZ8340I
EZZ0327I	EZZ8346I
EZZ0356I	EZZ8453I (1Q2016)
EZZ0358I	EZZ9298I
EZZ0378I (1Q2016)	EZZ9304I

IST087I (1Q2016)  
IST574E  
IST1221I (1Q2016)  
IST1242I (3Q2016)  
IST1244I (3Q2016)  
IST1314I (1Q2016)  
IST1345I (3Q2016)  
IST1451I (1Q2016)  
IST1717I (1Q2016)  
IST1865I (1Q2016)  
IST1904I (1Q2016)  
IST2337I (1Q2016)  
IST2361I  
IST2390I (1Q2016)  
IST2391I (1Q2016)  
IST2392I (1Q2016)  
IST2393I (1Q2016)  
IST2403I  
IST2405I  
IST2407I (1Q2016)  
IST2409I (1Q2016)  
IST2411I (1Q2016)

IST2417I (1Q2016)  
IST2419I (1Q2016)  
ISTH001I  
ISTH002I  
ISTH005I (3Q2016)  
ISTH006E (3Q2016)  
ISTH017E  
ISTM900I  
IVT5501I  
IVT5502I  
IVT5507I  
IVT5516I  
IVT5517I  
IVT5529I  
IVT5538I  
IVT5539I  
IVT5549I  
IVT5572I  
IVT5573I  
IVT5574I  
IVT5594I

---

## Deleted

EZA1535I  
EZB8801I  
EZZ0348I  
EZZ7450I  
EZZ7452I  
ISTM013I  
ISTM014E  
ISTM015I  
ISTM016E



---

## Chapter 34. Cryptographic Services ICSF summary of message changes for z/OS V2R2

The messages for Cryptographic Services Integrated Cryptographic Service Facility (ICSF) are documented in *z/OS Cryptographic Services ICSF Messages*.

---

### New

- ICSF FMID HCR77B0:
  - CSFG1034
  - CSFG1042
  - CSFH0030I
  - CSFH0031E
  - CSFH0032I
  - CSFM645I
  - CSFM653I
  - CSFM654I
  - CSFM655I
  - CSFM657I
  - CSFM659I
  - CSFM660I
  - CSFM661I
  - CSFM662I
  - CSFM663I
  - CSFM664I
  - CSFM665E
  - CSFM673E
  - CSFY0086
- ICSF FMID HCR77A1:
  - CSFC0336
  - CSFC0343
  - CSFG0974
  - CSFG0986
  - CSFG0994
  - CSFG1004
  - CSFG1014
  - CSFG1024
  - CSFH0017I
  - CSFH0018I
  - CSFH0019I
  - CSFH0020E
  - CSFH0021E
  - CSFH0022E
  - CSFH0023I

- CSFH0024I
- CSFH0025E
- CSFH0027I
- CSFM134I
- CSFM135E
- CSFM136I
- CSFM137E
- CSFM138I
- CSFM139I
- CSFM644E
- CSFM649I
- CSFM650I
- CSFM651I
- CSFM652I
- CSFO0240
- CSFO0404
- CSFO0414
- CSFO0424

---

## Changed

- ICSF FMID HCR77B0:
  - CSFC0316
  - CSFG0002
  - CSFH0011I
  - CSFM009I
  - CSFM109I
  - CSFM111I
  - CSFM123E
  - CSFM124I
  - CSFM129I
  - CSFM134I
  - CSFM135E
  - CSFM136I
  - CSFM137E
  - CSFM138I
  - CSFM139I
  - CSFM639I
  - CSFM641I
- ICSF FMID HCR77A1:
  - CSFG0224
  - CSFG0924
  - CSFM010E
  - CSFM014I
  - CSFM109I
  - CSFM111I

- CSFM122I
- CSFM123E
- CSFM124I
- CSFM126I
- CSFM127I
- CSFM128E
- CSFM129I
- CSFM451E
- CSFM505I
- CSFM530I
- CSFM616I
- CSFM617I
- CSFM620I
- CSFM621I
- CSFM622I
- CSFM626I
- CSFM651I
- CSFM652I

---

## Deleted

- ICSF FMID HCR77A1:
  - CSFC0254
  - CSFC0266
  - CSFC0306
  - CSFG0604
  - CSFG0886
  - CSFM005A
  - CSFM008I
  - CSFM020I
  - CSFM021I
  - CSFM105E
  - CSFM106A
  - CSFM107E
  - CSFM108I
  - CSFM110I
  - CSFM113E
  - CSFM114E
  - CSFM115E
  - CSFM116I
  - CSFM117I
  - CSFM118E
  - CSFM119E
  - CSFM120E
  - CSFM121E
  - CSFM125I

- CSFM224I
- CSFM302A
- CSFM305A
- CSFM315I
- CSFM404A
- CSFM405A
- CSFM403I
- CSFM406A
- CSFM407A
- CSFM411I
- CSFM412I
- CSFM413E
- CSFM414I
- CSFM416I
- CSFM417I
- CSFM418E
- CSFM419E
- CSFM420E
- CSFM424I
- CSFM430I
- CSFM431I
- CSFM432I
- CSFM433E
- CSFM434E
- CSFM435I
- CSFM436I
- CSFM437E
- CSFM438I
- CSFM440I
- CSFM441I
- CSFM452I
- CSFM501E
- CSFM503E
- CSFM504E
- CSFM510E
- CSFM511E
- CSFM512E
- CSFM522E
- CSFM532I
- CSFM601I
- CSFM605I
- CSFM606I
- CSFM609I
- CSFM624I
- CSFM627I



– CSFM631I



---

## Chapter 35. Cryptographic Services PKI Services summary of message changes for z/OS V2R2

This topic lists new, changed, and deleted messages for Cryptographic Services PKI Services.

All messages for PKI Services are documented in *z/OS Cryptographic Services PKI Services Guide and Reference*.

---

### New

IKYC090I

---

### Changed

None.

---

### Deleted

None.

---

### CMP return codes

None.



---

## Chapter 36. DFSORT summary of message changes for z/OS V2R2

This topic lists new, changed, and deleted messages for DFSORT.

All messages for DFSORT are documented in: *z/OS DFSORT Messages, Codes and Diagnosis Guide*

---

### New

None

---

### Changed

ICE000I  
ICE099A  
ICE121A  
ICE288I

---

### Deleted

Messages retired in V2R2:

None



---

## Chapter 37. Distributed File System summary of message changes for z/OS V2R2

### New messages

New zFS messages:

IOEZ00670I  
IOEZ00671E  
IOEZ00678E  
IOEZ00804E  
IOEZ00826A  
IOEZ00827I  
IOEZ00828E  
IOEZ00829E  
IOEZ00830E  
IOEZ00831E  
IOEZ00832E  
IOEZ00833E  
IOEZ00834E  
IOEZ00835E  
IOEZ00836I  
IOEZ00837E  
IOEZ00838E  
IOEZ00839E  
IOEZ00840E  
IOEZ00841E  
IOEZ00842E  
IOEZ00843E  
IOEZ00844E  
IOEZ00845E  
IOEZ00846E  
IOEZ00847E  
IOEZ00848I  
IOEZ00849I  
IOEZ00850I  
IOEZ00851I  
IOEZ00852E  
IOEZ00856E  
IOEZ00857I  
IOEZ00859I

New Health Checker messages:

IOEZH0062I  
IOEZH0063I

IOEZH0064I  
IOEZH0065E  
IOEZH0066E  
IOEZH0067E  
IOEZH0068I  
IOEZH0069I  
IOEZH0070I  
IOEZH0071E  
IOEZH0072E  
IOEZH0073E

### **New reason codes**

New DF04rr reason codes:

None.

New EFxrrr reason codes:

6A33  
6A0C  
6A0D  
6A0E  
6A0F  
6A10  
6A11  
6A12  
6A13  
6A17  
6A18  
6A19  
6A1A  
6A1B  
6A1C  
6A1D  
6A1E  
6A1F  
6B27  
6B28  
6B48  
6B49  
6B4A  
6B4B  
6B4C  
6B4D  
6B4E  
6B4F  
6B50  
6B51  
6B52  
6B53  
6B54  
6B55  
6B56  
6B5D  
6238  
6764



## **New return codes**

There were no new return codes in V2R2.

## **Changed messages for zFS**

IOEZ00040E  
IOEZ00093E  
IOEZ00094E  
IOEZ00241I  
IOEZ00242I  
IOEZ00320I  
IOEZ00336I  
IOEZ00374I  
IOEZ00439E  
IOEZ00617I  
IOEZ00639I  
IOEZ00645A  
IOEZ00723E  
IOEZ00807I

## **Changed messages for Health Checker**

IOEZH0040I  
IOEZH0041I  
IOEZH0042I  
IOEZH0043I  
IOEZH0044E  
IOEZH0045E

## **Changed reason codes for zFS**

6B56  
6012  
6151  
6407  
640C  
640D  
660A  
664D

## **Deleted messages for zFS**

IOEZ00816I  
IOEZ00817E  
IOEZ00819E  
IOEZ00821E

## **Deleted messages for Health Checker**

IOEZH0010I  
IOEZH0011E  
IOEZH0012I  
IOEZH0013R  
IOEZH0014E  
IOEZH0015I  
IOEZH00517E  
IOEZH0020I  
IOEZH0021E  
IOEZH0022I  
IOEZH0030I

IOEZH0031I  
IOEZH0032I  
IOEZH0033I

---

## Chapter 38. HCD summary of message changes for z/OS V2R2

This section contains the new, changed, and deleted messages for HCD for z/OS V2R2. The messages for HCD are documented in *z/OS and z/VM HCD Messages*.

### New

The section contains new messages for HCD for z/OS V2R2.

CBDA426I  
CBDA499I  
CBDA557I (3Q2016)  
CBDA874I (3Q2016)  
CBDA875I (3Q2016)  
CBDA877I (3Q2016)  
CBDA910I (1Q2016)  
CBDA911I (1Q2016)  
CBDA915I (1Q2016)  
CBDA916I (1Q2016)  
CBDA940I (3Q2016)  
CBDA941I (3Q2016)  
CBDA942I (3Q2016)  
CBDA943I (3Q2016)  
CBDA944I (3Q2016)  
CBDA945I (3Q2016)  
CBDA946I (3Q2016)  
CBDA947I (3Q2016)  
CBDA948I (3Q2016)  
CBDA949I (3Q2016)  
CBDA951I (3Q2016)  
CBDD792I  
CBDG560I  
CBDG561I  
CBDG562I  
CBDG563I  
CBDG564I  
CBDG565I (1Q2016)  
CBDG570I  
CBDG571I  
CBDG572I  
CBDG573I  
CBDG613I  
CBDG973I

## Changed

The section contains changed messages for HCD for z/OS V2R2.

CBDA037I  
CBDA099I (1Q2016)  
CBDA101I (3Q2016)  
CBDA131I (1Q2016)  
CBDA194I  
CBDA202I  
CBDA210I  
CBDA233I  
CBDA267I  
CBDA273I (3Q2016)  
CBDA285I (3Q2016)  
CBDA291I  
CBDA300I  
CBDA426I  
CBDA436I  
CBDA492I  
CBDA553I (3Q2016)  
CBDA583I  
CBDA691I (1Q2016)  
CBDA724I (1Q2016)  
CBDA911 (3Q2016)  
CBDC099I  
CBDD467I  
CBDD824I  
CBDG085I  
CBDG086I  
CBDG204I  
CBDG211I  
CBDG212I  
CBDG238I  
CBDG422I (1Q2016)  
CBDG521I  
CBDG523I  
CBDG524I  
CBDG533I  
CBDG540I  
CBDG542I  
CBDG543I  
CBDG560I  
CBDG562I (1Q2016)  
CBDG564I (1Q2016)  
CBDG573I

CBDG576I (1Q2016)  
CBDG577I  
CBDG578I (1Q2016)  
CBDG579I  
CBDG581I (1Q2016)  
CBDG582I (1Q2016)  
CBDG584I (1Q2016)  
CBDG585I (1Q2016)  
CBDG589I (1Q2016)  
CBDG591I (1Q2016)  
CBDG592I  
CBDG593I  
CBDG594I (1Q2016)  
CBDG596I  
CBDG597I (3Q2016)  
CBDG609I (1Q2016)  
CBDG614I

### **Deleted**

No messages were deleted from HCD for z/OS V2R2.

CBDG590I (1Q2016)



---

## Chapter 39. IBM Tivoli Directory Server summary of message changes for z/OS V2R2

This topic lists new, changed, and deleted messages for TDS.

The messages for IBM Tivoli Directory Server are documented in *z/OS IBM Tivoli Directory Server Messages and Codes for z/OS*.

---

### New

GLD1310W  
GLD1311E  
GLD1312E  
GLD1313E  
GLD1314I  
GLD1315I  
GLD1316W  
GLD1317W  
GLD1318E  
GLD1319E  
GLD1320E  
GLD1321E  
GLD1322E  
GLD1323E  
GLD1324E  
GLD1325E  
GLD1326E  
GLD1327E  
GLD1328W  
GLD1329E  
GLD1330E  
GLD1331E  
GLD1332W  
GLD1333W  
GLD1334W  
GLD1335I  
GLD1336E  
GLD1337E  
GLD1338E  
GLD1339E  
GLD1340E  
GLD1341E  
GLD1342E  
GLD1343E  
GLD1344E  
GLD8507E  
GLD8508E  
GLD8509E  
GLD8511I  
GLD8512I

---

**Changed**

GLD1237  
GLD1337  
GLD1338  
GLD1340  
GLD1341

---

**Deleted**

None.



---

## Chapter 40. Infoprint Server summary of message changes for z/OS V2R2

This section contains the new, changed, and deleted messages and codes for Infoprint Server for z/OS V2R2. The messages and codes for Infoprint Server are documented in *z/OS Infoprint Server Messages and Diagnosis*.

---

### New

AOP031E  
AOP182W  
AOP194I  
AOP196I  
AOP197I  
AOP198E  
AOP199E

---

### Changed

AOP044I  
AOP050E  
AOP137E  
AOP3504I  
AOP3505I  
API0930E

---

### Deleted

AOP067E

---

### System completion codes

#### New

09C



---

## Chapter 41. Integrated Security Services Network Authentication Service summary of message changes for z/OS V2R2

This topic lists new, changed, and deleted messages for Network Authentication Services.

All messages for Network Authentication Services are documented in

- *z/OS Integrated Security Services Network Authentication Service Administration*

---

### New

6EDA360A  
6EDA360B  
6EDA360C  
96C73A3E  
96C73A3F  
96C73A40  
96C73A41  
96C73A46  
96C73A47  
96C73A48  
96C73A49  
96C73A4B  
96C73A4C  
96C73A4D  
96C73A4E  
96C73A4F  
96C73A50  
96C73A51  
96C73C1B  
96C73C1C  
96C73C1D  
96C73C1E  
96C73C1F  
96C73C20  
96C73C21  
96C73C22  
96C73C23  
96C73C24  
96C73C25  
96C73C26  
96C73C27  
96C73C28  
96C73C29  
96C73C2A  
96C73C2B  
96C73C2C  
96C73C2D  
EUVF04163E  
EUVF04164E  
EUVF04165E

EUVF06163E  
EUVF06164E  
EUVF06165E  
EUVF06166E  
EUVF06167W  
EUVF06168E  
EUVF06169E  
EUVF06170E

---

**Changed**

EUVF06004I  
96C73A0D

---

**Deleted**

None

---

## Chapter 42. ISPF summary of message changes for z/OS V2R2

The messages for ISPF are documented in *z/OS V2R2 ISPF Messages and Codes*.

---

### New

ISPD304  
ISPD305  
ISRB513  
ISRE352  
ISRE360  
ISRE469  
ISRE494  
ISRE499  
ISRE657  
ISRE666  
ISRE667  
ISRF046  
ISRF047  
ISRF048  
ISRF049  
ISRU380  
ISRU381  
ISRU382  
ISRU383  
ISRU384  
ISRU385  
ISRU387  
ISRU741  
ISRU756  
ISRU757  
ISRU839  
ISRU840  
ISRU841  
ISRU842  
ISRU843  
ISRU850  
ISRU851  
ISRU852  
ISRU853  
ISRU854  
ISRU855  
ISRU856

ISRU857  
ISRU858  
ISRU860  
ISRU861  
ISRU862  
ISRU863  
ISRU864  
ISRU865  
ISRU866  
ISRU867  
ISRU868  
ISRU869  
ISRV010  
ISRV011

---

**Changed**

ISPD290  
ISPD294  
ISRB014  
ISRU197  
ISRU753  
ISRU754

---

**Deleted**

None

---

## Chapter 43. JES2 summary of message changes for z/OS V2R2

The messages for JES2 are documented in:

- *z/OS JES2 Messages*

Messages added, changed, or no longer issued by the December 2015 update are identified by (4Q2015).

---

### New

\$HASP148  
\$HASP261  
\$HASP262  
\$HASP732  
\$HASP734  
\$HASP739  
\$HASP790  
\$HASP1110  
\$HASP1111  
\$HASP1112  
\$HASP1114  
\$HASP1115  
\$HASP1116  
\$HASP1117  
\$HASP1118  
\$HASP1130  
\$HASP1131  
\$HASP1132  
\$HASP1133  
\$HASP1201  
\$HASP1210  
\$HASP1300  
\$HASP1301  
\$HASP1302  
\$HASP1303  
\$HASP1304  
\$HASP1305  
\$HASP1306  
\$HASP4401  
\$HASP9178  
\$HASP9179

---

## Changed

\$HASP003 (4Q2015)  
\$HASP095  
\$HASP101  
\$HASP110 (4Q2015)  
\$HASP112  
\$HASP118  
\$HASP119  
\$HASP148 (4Q2015)  
\$HASP165  
\$HASP233  
\$HASP237  
\$HASP255  
\$HASP260  
\$HASP290  
\$HASP292  
\$HASP293  
\$HASP295 (4Q2015)  
\$HASP296  
\$HASP305 (4Q2015)  
\$HASP375  
\$HASP395  
\$HASP414  
\$HASP436  
\$HASP445  
\$HASP492  
\$HASP493  
\$HASP686  
\$HASP740  
\$HASP745  
\$HASP852  
\$HASP890  
\$HASP895 (4Q2015)  
\$HASP1110 (4Q2015)  
\$HASP1111 (4Q2015)  
\$HASP1112 (4Q2015)  
\$HASP1114 (4Q2015)  
\$HASP1201 (4Q2015)  
\$HASP022E  
\$HASP023I  
\$HASP024I  
\$HASP025I  
\$HASP026I  
\$HASP027I



\$HASP028E  
\$HASP029E  
\$HASP030E

---

**Deleted**

None



---

## Chapter 44. JES3 summary of message changes for z/OS V2R2

The messages for JES3 are documented in:

- *z/OS JES3 Messages*

Messages added, changed, or no longer issued by the December 2015 update are identified by (4Q2015).

---

### New

IAT3211  
IAT3277  
IAT3278  
IAT3428  
IAT3429  
IAT4471  
IAT4472  
IAT6157  
IAT6825  
IAT7605  
IAT8167  
IAT8727  
IAT8728  
IAT8729  
IAT8735  
IAT8736  
IAT8737  
IAT8738  
IATH001I  
IATH002I  
IATH003E  
IATH010I  
IATH011E  
IATH012E  
IATH013E  
IATH014E

---

### Changed

IAT3236  
IAT4083  
IAT4084  
IAT4174  
IAT6295

IAT6315  
IAT6395  
IAT6396  
IAT7007 (4Q2015)  
IAT7762  
IAT8131  
IAT8600  
IAT8645  
IAT8646  
IAT8679

---

**Deleted**

IAT3101  
IAT4085  
IAT7918  
IAT8670

---

## Chapter 45. Language Environment summary of message changes for z/OS V2R2

The messages for Language Environment are documented in *z/OS Language Environment Runtime Messages*.

---

### New

New messages:

CEE3403E  
CEE3404I  
CEE3404I  
CEE3406S  
CEE3407S  
CEE3408E

New abend codes: None.

---

### Changed

Changed abend codes:

U4093

---

### Deleted

Deleted messages:

C4170001  
C4170002

Deleted abend codes: None.



---

## Chapter 46. NFS summary of message changes for z/OS V2R2

This topic lists new, changed, and deleted messages for NFS.

All messages for NFS are documented in: *z/OS Network File System Guide and Reference*

---

### New

Messages added by the December 2015 update are identified by (4q2015).

- GFSA477E
- GFSA478E
- GFSA507I
- GFSA508I
- GFSA509I
- GFSA519I
- GFSA892W
- GFSA882I
- GFSA939I (4q2015)
- GFSA1016E
- GFSC507I (4q2015)
- GFSN5032I
- GFSN5037E

---

### Changed

Messages changed by the December 2015 update are identified by (4q2015).

- GFSA476E renamed to GFSN5038E
- GFSA953I renamed to GFSA953A
- GFSA974I renamed to GFSA974A
- GFSA930I (4q2015)
- GFSA932I (4q2015)
- GFSA936I (4q2015)
- GFSA963E (4q2015)
- GFSC703E
- GFSC711E
- GFSC712E
- GFSC739E

---

### Deleted

Messages retired in V2R2:

- GFSA335I
- GFSA961I
- GFSA968I
- GFSC704E

GFSC705E  
GFSC706E  
GFSC707E  
GFSC709E  
GFSC710E  
GFSC736E



---

## Chapter 47. SDSF summary of message changes for z/OS V2R2

This topic lists new, changed, and deleted numbered messages for SDSF.

---

### New

HSF0001I through HSF0080I  
ISF045W  
ISF059I  
ISF176E  
ISF177E  
ISF194E  
ISF195E  
ISF196E  
ISF197E  
ISF198E  
ISF195E  
ISF450I  
ISF451I  
ISF452E  
ISF453I  
ISF912E

---

### Changed

ISF011I  
ISF039I  
ISF192E  
ISF193E  
ISF437I  
ISF452E  
ISF453I  
DATA NOT AVAIL system-name

---

### Deleted

ISF001I  
ISF002I  
ISF003I  
ISF004I  
ISF006I  
ISF007I  
ISF025I  
ISF026I  
ISF140E  
ISF141E  
ISF143I



---

## Chapter 48. RMF summary of message changes for z/OS V2R2

This topic lists new, changed, and deleted non-operator messages and codes for RMF.

### **New**

- ERB438I
- ERB628I
- ERB629I
- ERB946I
- GPM0630I
- GPM0631I
- GPM0632I
- GPM0633I

### **Changed**

- ERB430I
- ERB464I
- ERB467I
- ERB926I



---

## Chapter 49. Security Server RACF summary of message changes for z/OS V2R2

This topic lists new, changed, and deleted messages for RACF.

All messages for RACF are documented in

- *z/OS Security Server RACF Messages and Codes*

---

### New

ICH01025I  
ICH08027I  
ICH21043I  
ICH21044I  
ICH21045I  
ICH21046I (2Q16)  
ICH21047I (2Q16)  
ICH21048I (2Q16)  
ICH21049I (2Q16)  
ICH21050I (2Q16)  
ICH21051I (2Q16)  
ICH21052I (2Q16)  
ICH21053I (2Q16)  
ICH70008I (2Q16)  
IRR420I  
IRRC065I  
IRRC066I  
IRRC067I  
IRRC068I  
IRRC069I  
IRRC070I  
IRRC071I  
IRRC072I  
IRRC073I  
IRRC074I  
IRRC075I  
IRRC076I  
IRRC077I  
IRRG013I  
IRRH242I  
IRRH283E  
IRRH284I  
IRRH293E  
IRRH294I

IRRH296I  
IRRH297I  
IRRH298E  
IRRH299I  
IRRH320I  
IRRH321I  
IRRH322I  
IRRI082I  
IRRM042I  
IRRM043I  
IRRM098I  
IRRM099I  
IRRM100I  
IRRM101I  
IRRM102I  
IRRM103I  
IRRM104I  
IRRM105I  
IRRM106I  
IRRM107I  
IRRM108I  
IRRM109I  
IRRM110I  
IRRM111I  
IRRM112I  
IRRP023I  
IRRT035I

---

## Changed

ICH408I (2Q16)  
ICH08008I  
ICH14010I  
ICH21007I  
ICH21016I  
IRR52204I (2Q16)  
IRRH204E  
IRRH205I  
IRRH221I  
IRRH222I  
IRRH276E (2Q16)  
IRRI014I  
IRRI016I  
IRRM002I  
IRRM007I  
IRRM009I

IRRM010I  
IRRM028I  
IRRM096I  
IRRM100I (2Q16)

---

## Deleted

IRRH295E  
ICH21040I  
ICH21041I





---

## Chapter 50. SMP/E V3R6 summary of message changes for z/OS V2R2

This topic lists new, changed, and deleted non-operator messages for SMP/E V3R6. (New, changed, and deleted messages for SMP/E V3R6 are listed in *SMP/E for z/OS Messages, Codes, and Diagnosis*.)

---

### New

GIM69246E (2q2016)	GIM69252I (2q2016)
GIM69247W (2q2016)	GIM69253I (2q2016)
GIM69248I (2q2016)	GIM69254I (2q2016)
GIM69249I (2q2016)	GIM69255E (2q2016)
GIM692650I (2q2016)	GIM69256S (2q2016)
GIM69251I (2q2016)	GIM42802S

---

### Changed

GIM69207S

---

### Deleted

None



---

## Chapter 51. TSO/E summary of message changes for z/OS V2R2

The messages for TSO/E are documented in:

- *z/OS TSO/E Messages*

---

### New

IKJ56474I  
IKJ56475I  
IKJ56476I  
IKJH0401I  
IKJH0402E

---

### Changed

ICQAM827  
IKJ56225I  
IKJ56227I

---

### Deleted

None



---

## Chapter 52. XL C/C++ summary of message changes for z/OS V2R2

The messages for XL C/C++ are documented in *z/OS XL C/C++ Messages*.

---

### New

CCN4527	CCN8988
CCN4528	CCN8989
CCN6313	CCN8990

---

### Changed

CCN8955

---

### Deleted

CCN2469  
CCN2470  
CCN2471



---

## Chapter 53. z/OS OpenSSH summary of message changes for z/OS V2R2

The messages for z/OS OpenSSH are documented in *z/OS V2R2 OpenSSH User's Guide*.

---

### New

New messages:

FOTS0174 - FOTS0199	FOTS3405 - FOTS3424
FOTS0235 - FOTS0244	FOTS3501 - FOTS3503
FOTS0331 - FOTS0335	FOTS3505 - FOTS3535
FOTS0603 - FOTS605	FOTS3537 - FOTS3548
FOTS0721 - FOTS0722	FOTS3550
FOTS2084 - FOTS2085 (4q2015)	FOTS3601 - FOTS3647
FOTS2392 - FOTS2399	FOTS3701 - FOTS3740
FOTS3013 (4q2015)	FOTS3744
FOTS3312 - FOTS3330	FOTS3746 - FOTS3747
FOTS3335 - FOTS337	FOTS3748 - FOTS3752 (4q2015)
FOT3338 - FOT3339 (4q2015)	FOT3801 - FOT3834 (4q2015)
FOTS3401 - FOTS3403	FOTS3901 - FOTS3916 (4q2015)

---

### Changed

Changed messages: None. | FOT2378 (4q2015)

---

### Deleted

Deleted messages:

FOTS2227	FOTS1819
FOTS2229	FOTS2230
FOTS0162	FOTS2234
FOTS1420	FOTS2235
FOTS1152	FOTS2236
FOTS0903	FOTS2237
FOTS0989	FOTS2238
FOTS1810	FOTS2239
FOTS1811	FOTS1390
FOTS1812	FOTS1391
FOTS1813	FOTS2350
FOTS1814	FOTS2352
FOTS1815	FOTS2353
FOTS1816	FOTS2354
FOTS1817	FOTS2355
FOTS1818	FOTS2356
	FOTS2045

FOTS3003	FOTS1182
FOTS1123	FOTS0931
FOTS1007	FOTS0976
FOTS1820	FOTS1840
FOTS1821	FOTS1841
FOTS1822	FOTS1842
FOTS1823	FOTS1801
FOTS1824	FOTS1843
FOTS1825	FOTS1802
FOTS1826	FOTS1803
FOTS1827	FOTS1804
FOTS1829	FOTS1805
FOTS1596	FOTS1806
FOTS1597	FOTS1807
FOTS1246	FOTS1808
FOTS1288	FOTS1809
FOTS2245	FOTS1261
FOTS2246	FOTS1262
FOTS1941	FOTS1263
FOTS1944	FOTS1264
FOTS1945	FOTS1265
FOTS1946	FOTS2220
FOTS1947	FOTS2224
FOTS1948	
FOTS0146	
FOTS1361	
FOTS1638	
FOTS2051	
FOTS2368	
FOTS2054	
FOTS0884	
FOTS1755	
FOTS1098	
FOTS0960	
FOTS0929	
FOTS1830	
FOTS1831	
FOTS1838	
FOTS1252	
FOTS1296	
FOTS1953	
FOTS1954	
FOTS2065	
FOTS0815	
FOTS1764	



---

## Chapter 54. z/OS UNIX summary of message changes for z/OS V2R2

This topic lists new, changed, and deleted messages, reason codes, and return codes for z/OS UNIX. They are documented in *z/OS UNIX System Services Messages and Codes*.

---

### New

#### Messages

FDBX5056  
FOMF0165I  
FOMF0166I  
FOMF0201I

#### Reason codes

024C (JRMaxTasks)  
065E (JrRfiMax)

#### Return codes

None.

---

### Changed

#### Messages

FOMF0307I  
FOMF0308I  
FOMF0310I

#### Updated translation of Chinese messages

The following Chinese messages have changed translation even though the corresponding English messages did not change in V2R2.

BPXH002E  
BPXH011E  
BPXH015E  
BPXH024E  
BPXH025E  
BPXH040E  
BPXH072E  
BPXH072E  
BPXB001E  
BPXF001I  
BPXF002I  
BPXF005I  
BPXF006I  
BPXF010I  
BPXF011I  
BPXF016I  
BPXF019I  
BPXF023I

BPXF023I  
BPXF026I  
BPXF028I  
BPXF029E  
BPXF031I  
BPXF033I  
BPXF035I  
BPXF036I  
BPXF037I  
BPXF039I  
BPXF039I  
BPXF039I  
BPXF041I  
BPXF042I  
BPXF043I  
BPXF044I  
BPXF046I  
BPXF047I  
BPXF049I  
BPXF050I  
BPXF051I  
BPXF053I  
BPXF056I  
BPXF057I  
BPXF058I  
BPXF062I  
BPXF063I  
BPXF065I  
BPXF075I  
BPXF076I  
BPXF077S  
BPXF079S  
BPXF081I  
BPXF082I  
BPXF083I  
BPXF084I  
BPXF202I  
BPXF203I  
BPXF204I  
BPXF205I  
BPXF206I  
BPXF211I  
BPXF212I  
BPXF214E  
BPXF215E  
BPXF218I  
BPXF221I  
BPXF222E  
BPXF223I  
BPXF225I  
BPXF226E  
BPXF228I  
BPXF230I  
BPXF232E  
BPXF236I  
BPXF237I

BPXF242I  
BPXF243E  
BPXF244E  
BPXF245I  
BPXF246I  
BPXF248I  
BPXF252I  
BPXF253E  
BPXF257I  
BPXF259I  
BPXF260I  
BPXF261I  
BPXF262I  
BPXF263I  
BPXF264I  
BPXF265I  
BPXF266E  
BPXF267I  
BPXF268I  
BPXF269I  
BPXF270I  
BPXF271I  
BPXF272I  
BPXF273I  
BPXF274I  
BPXF900I  
BPXF901I  
BPXF902I  
BPXF903I  
BPXF904I  
BPXF905I  
BPXF906I  
BPXI006I  
BPXI007I  
BPXI008I  
BPXI009I  
BPXI010I  
BPXI011I  
BPXI017I  
BPXI021I  
BPXI022I  
BPXI023I  
BPXI024I  
BPXI026I  
BPXI031E  
BPXI034I  
BPXI035E  
BPXI037I  
BPXI039I  
BPXI042I  
BPXI045I  
BPXI047I  
BPXI050I  
BPXI060I  
BPXI066E  
BPXI067E

BPXI069I  
BPXI070E  
BPXI070I  
BPXI072I  
BPXI075I  
BPXI078I  
BPXI081I  
BPXI086I  
BPXI087I  
BPXI087I  
BPXI088I  
BPXM014I  
BPXM021E  
BPXM022E  
BPXM033I  
BPXM046I  
BPXM047I  
BPXM048I  
BPXM049I  
BPXM053I  
BPXM063D  
BPXM064I  
BPXM084I  
BPXM100I  
BPXM101I  
BPXM102I  
BPXM103I  
BPXM105I  
BPXM107I  
BPXM122I  
BPXM124E  
BPXM125I  
BPXN002I  
BPXN003E  
BPXO001I  
BPXO002I  
BPXO003I  
BPXO006I  
BPXO007I  
BPXO008I  
BPXO009I  
BPXO012I  
BPXO024I  
BPXO030I  
BPXO031I  
BPXO033I  
BPXO034I  
BPXO035I  
BPXO036I  
BPXO037E  
BPXO040I  
BPXO041I  
BPXO042I  
BPXO043I  
BPXO044I  
BPXO045I

BPXO046I  
BPXO047I  
BPXO048I  
BPXO049I  
BPXO051I  
BPXO053I  
BPXO056I  
BPXO057I  
BPXO058I  
BPXO059I  
BPXO060I  
BPXO063I  
BPXO066I  
BPXO068I  
BPXO070I  
BPXO072I  
BPXO073I  
BPXO074I  
BPXO075I  
BPXO088I  
BPXP003E  
BPXP005I  
BPXP009I  
BPXP010I  
BPXP011I  
BPXP013I  
BPXP018I  
BPXP023I  
BPXP025I  
BPXU001I  
BPXU004I

### **Reason codes**

0020 (JRForkExitRcParentBadEnv)  
00F7 (JRForkNoresource)  
0244 (JrApfAuthChange)

### **Return codes**

ESTALE

---

## **Deleted**

### **Messages**

There were no deleted messages in V2R2.

### **Reason codes**

There were no deleted reason codes in V2R2.

### **Return codes**

There were no deleted return codes in V2R2.



---

## Chapter 55. z/OSMF summary of message changes

This topic lists new, changed, and deleted messages for IBM z/OS Management Facility (z/OSMF).

The messages for z/OSMF are documented in the help system that ships with the z/OSMF product and in *IBM z/OS Management Facility Configuration Guide*.

### New

- GPM630I
- GPM631I
- GPM632I
- GPM633I
- |
- IYUCM0000E
- IYUCM0001E
- IYUCM0002E
- IYUCM0003E
- IYUCM0004E
- IYUCM0005E
- IYUCM0006E
- IYUCM0007E
- IYUCM0008W
- IYUCM0009E
- IYUCM0010E
- IYUCM0011E
- IYUCM0012E
- IYUCM0013E
- IYUCM0014E
- IYUCM0015E
- IYUCM0016E
- IYUCM0017E
- IYUCM0018E
- IYUCM0019E
- IYUCM0020W
- IYUCM0021W
- IYUCM0022E
- IYUCM0023E
- IYUCM0024E
- IZUCP0806W
- IZUCP0807E
- IZUCP0808W
- IZUCP0809E
- |
- IYURM0000E
- IYURM0001E
- IYURM0002E
- IYURM0003E
- IYURM0004E
- IYURM0005E
- IYURM0006E
- IYURM0007E
- IYURM0008W
- IYURM0009E
- IYURM0010E

- | • IYURM0011E
- | • IYURM0012E
- | • IYURM0013E
- | • IYURM0014E
- | • IYURM0015E
- | • IYURM0016E
- | • IYURM0017E
- | • IYURM0018E
- | • IYURM0019E
- | • IYURP0000W
- | • IYURP0001E
- | • IYURP0002E
- | • IYURP0003E
- | • IYURP0004E
- | • IYURP0005E
- | • IYURP0006E
- | • IYURP0007E
- | • IYURP0008E
- | • IYURP0009I
- | • IYURP0010I
- | • IYURP0012I
- | • IYURP0013I
- | • IYURP0014E
- | • IYURP0015E
- | • IYURP0016E
- | • IYUSC0000E
- | • IYUSC0001E
- | • IYUSC0002E
- | • IYUSC0003E
- | • IYUSC0004E
- | • IYUSC0005E
- | • IYUSC0006E
- | • IYUSC0007E
- | • IYUSC0008E
- | • IYUSC0009E
- | • IYUSC0010E
- | • IYUSC0011E
- | • IYUSC0012E
- | • IYUSC0013E
- | • IYUSC0014E
- | • IYUSC0015E
- | • IYUSC0016E
- | • IYUSC0017E
- | • IYUSC0018E
- | • IYUSC0019E
- | • IYUSC0020W
- | • IYUSC0021W
- | • IYUSC0022E
- | • IYUSC0023E
- | • IYUSC0024E
- | • IYUSC0025E
- | • IYUSC0026E
- | • IYUSC0027E
- | • IYUSC0028W
- | • IYUSC0029E
- | • IYUSC0030W



- IYUSC0031I
- IYUSC0032I
- IYUSC0033E
- IYUSC0034E
- IYUSC0035E
- IYUSC0036E
- IYUSC0037I
- IYUSC0038W
- IYUSP0000E
- IYUSP0001E
- IYUSP0002E
- IYUSP0003I
- IYUSP0004I
- IYUSP0005I
- IYUSP0006I
- IYUSP0007I
- IYUSP0008I
- IYUSR0000W
- IYUSR0001W
- IYUSR0002E
- IYUSR0003E
- IYUSR0004E
- IYUSR0005E
- IYUSR0006I
- IYUSR0007E
- IZUD206W
- IZUD260E
- IZUD261E
- IZUD262E
- IZUD263E
- IZUD264E
- IZUD265W
- IZUD266W
- IZUD267E
- IZUD268E
- IZUD270W
- IZUD271W
- IZUD272W
- IZUD273W
- IZUD274W
- IZUD275E
- IZUD276E
- IZUD277E
- IZUD278E
- IZUD291E
- IZUD292E
- IZUD293E
- IZUD294E
- IZUD295E
- IZUD278E
- IZUD321E
- IZUD425E
- IZUD722E
- IZUD723E
- IZUD724E
- IZUD725E

- IZUD726E
- IZUD994E
- IZUD9027E
- IZUD9028E
- IZUD9029E
- IZUD9030I
- IZUG408E
- IZUG409E
- IZUG411E
- IZUG456E
- IZUG457E
- IZUG458E
- IZUG475E
- IZUG478E
- IZUG479E
- IZUG882E
- IZUG2070W
- IZUG2071W
- IZUG2088W
- IZUG2159W
- IZUP844E
- IZUP845W
- IZUP846W
- IZUP847E
- IZUR444E
- IZUW415W
- IZUW668W
- IZUW678E
- IZUWE0001E
- IZUWE0002E
- IZUWE0003E
- IZUWE0004E
- IZUWE0005E
- IZUWE0006W
- IZUWE0007W
- IZUWE0200W
- IZUWE0201E
- IZUWE0202E
- IZUWE0203E
- IZUWE0204E
- IZUWE0205E
- IZUWE0206E
- IZUWE0207E
- IZUWE0208W
- IZUWE0209E
- IZUWE0210E
- IZUWE0211E
- IZUWE0212E
- IZUWE0213E
- IZUWE0214E
- IZUWE0215E
- IZUWE0300E
- IZUWE0301E
- IZUWE0302W
- IZUWE0400E
- IZUWE0401E

- IZUWE0402I
- IZUWE0403E
- IZUWE0500E
- IZUWE0501E
- IZUWE0502E
- IZUWE0503I
- IZUWE0504I
- IZUWE0505I
- IZUWE0506E
- IZUWE0507W
- IZUWE0508W
- IZUWE0509E
- IZUWE0510W
- IZUWE0511W
- IZUWE0514E
- IZUWE0515W
- IZUWE0516E
- IZUWE0517W
- IZUWE0518W
- IZUWF0032E
- IZUWF0033E
- IZUWF0034E
- IZUWF0215W
- IZUWF0216I
- IZUWF0217I
- IZUWF0218W
- IZUWF0219W
- IZUWF0220W
- IZUWF0221W
- IZUWF0222I
- IZUWF0223I
- IZUWF0224I
- IZUWF0225I
- IZUWF0226I
- IZUWF0227E
- IZUWF0228E
- IZUWF0229E
- IZUWF0250E
- IZUWF0251E
- IZUWF0252E
- IZUWF0253E
- IZUWF0254E
- IZUWF0255I
- IZUWF0256E
- IZUWF0257E
- IZUWF0258E
- IZUWF0259E
- IZUWF0260E
- IZUWF0261I
- IZUWF0262E
- IZUWF0263I
- IZUWF0264E
- IZUWF0266I
- IZUWF0267I
- IZUWF0270W
- IZUWF0271E

- | • IZUWF0272E
- | • IZUWF0280E
- | • IZUWF0281E
- | • IZUWF0282E
- | • IZUWF0283E
- | • IZUWF0284E
- | • IZUWF0285E
- | • IZUWF0287W
- | • IZUWF0290E
- | • IZUWF0291E
- | • IZUWF0292I
- | • IZUWF0293I
- | • IZUWF0294E
- | • IZUWF0295E
- | • IZUWF0296E
- | • IZUWF0301E
- | • IZUWF0302E
- | • IZUWF0303E
- | • IZUWF0304E
- | • IZUWF0305E
- | • IZUWF0306E
- | • IZUWF0320W
- | • IZUWF0321W
- | • IZUWF0322I
- | • IZUWF0323E
- | • IZUWF0350I
- | • IZUWF0351W
- | • IZUWF0352W
- | • IZUWF0353W
- | • IZUWF0354W
- | • IZUWF0355I
- | • IZUWF0356I
- | • IZUWF5001W
- | • IZUWF5002E
- | • IZUWF5003E
- | • IZUWF5004E
- | • IZUWF5005E
- | • IZUWF5006E
- | • IZUWF5007E
- | • IZUWF5008E
- | • IZUWF5009E
- | • IZUWF5010I
- | • IZUWF5011W
- | • IZUWF5012I
- | • IZUWF5013W
- | • IZUWF5014E
- | • IZUWF5015I
- | • IZUWF5016W
- | • IZUWF5017E
- | • IZUWF8000E
- | • IZUWF8000E
- | • IZUWF8001E
- | • IZUWF8002E
- | • IZUWF8003E
- | • IZUWF8005E
- | • IZUWF8006E

- IZUWF8007E
- IZUWF8008E
- IZUWF8009E
- IZUWF8010E
- IZUWF8011W
- IZUWF8012E
- IZUWF8013E
- IZUWF8014E
- IZUWF8015E
- IZUWF8016E
- IZUWF8017E
- IZUWF8018E
- IZUWF8019E
- IZUWF8020E
- IZUWF8021E
- IZUWF8022E
- IZUWF8023E
- IZUWF8024E
- IZUWF8025E
- IZUWF8026E
- IZUWF8028E
- IZUWF8029E
- IZUWF8030E
- IZUWF8031E
- IZUWF8032E
- IZUWF8033E
- IZUWF8034E
- IZUWF8035E
- IZUWF8036E
- IZUWF8037E
- IZUWF8038E
- IZUWF8040I
- IZUWF8041E
- IZUWF8042E
- IZUWF8043E
- IZUWF8044W
- IZUWF8047W
- IZUWF8048W
- IZUWF9998E

**Changed**

- IZUD103I
- IZUD548E
- IZUD9001E
- IZUD9723E
- IZUD9724E
- IZUD9725E
- IZUD9728E
- IZUD9729E
- IZUD9730E
- IZUD9731E
- IZUG473E
- IZUG809W
- IZUG1001E
- IZUG1049I
- IZUG1050W

- IZUG1057E
- IZUG1106E
- IZUG1113E
- IZUIS606E
- IZUIS613E
- IZUWF0001E
- IZUWF0005E
- IZUWF0006E
- IZUWF0015E
- IZUWF0016E
- IZUWF0021I
- IZUWF0022I
- IZUWF0023I
- IZUWF0024I
- IZUWF0025I
- IZUWF0028I
- IZUWF0082E
- IZUWF0100E
- IZUWF0101E
- IZUWF0103E
- IZUWF0104E
- IZUWF0155E
- IZUWF0169E
- IZUWF0201I
- IZUWF0203E

### **Deleted**

- IZUG808W
- IZUG810W
- IZUG811W
- IZUG2020I
- IZUG2027I
- IZUG2028W
- IZUG2029I
- IZUG2030I
- IZUG2031I
- IZUG2032I
- IZUG2033I
- IZUG2043I
- IZUG2070E
- IZUG2071E
- IZUG2088E
- IZUG2097W
- IZUG2100W

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## Part 3. Summary of message and code changes for z/OS V2R1

The topics list new, changed, and deleted messages for z/OS V2R1 elements and features. All message changes are in element specific topics.

The following elements and features were updated with new, changed, or deleted messages or codes for z/OS V2R1.

- Chapter 56, "BCP and DFSMS summary of message changes for z/OS V2R1," on page 459
- Chapter 57, "Communications Server summary of message changes for z/OS V2R1," on page 473
- Chapter 58, "Cryptographic Services ICSF summary of message changes for z/OS V2R1," on page 481
- Chapter 59, "Cryptographic Services PKI Services summary of message changes for z/OS V2R1," on page 485
- Chapter 60, "Cryptographic Services System SSL Programming summary of message changes for z/OS V2R1," on page 487
- Chapter 61, "DFSORT summary of message changes for z/OS V2R1," on page 489
- Chapter 62, "Distributed File Service summary of message changes for z/OS V2R1," on page 491
- Chapter 63, "IBM Tivoli Directory Server summary of message changes for z/OS V2R1," on page 503
- Chapter 64, "Infoprint Server summary of message changes for z/OS V2R1," on page 505
- Chapter 65, "JES2 summary of message changes for z/OS V2R1," on page 507
- Chapter 66, "JES3 summary of message changes for z/OS V2R1," on page 509
- Chapter 67, "Language Environment summary of message changes for z/OS V2R1," on page 511
- Chapter 68, "NFS summary of message changes for z/OS V2R1," on page 515
- Chapter 70, "Security Server RACF summary of message changes for z/OS V2R1," on page 519
- Chapter 69, "SDSF summary of message changes for z/OS V2R1," on page 517
- Chapter 71, "SMP/E V3R6 summary of message changes for z/OS V2R1," on page 521
- Chapter 72, "TSO/E summary of message changes for z/OS V2R1," on page 523
- Chapter 73, "XL C/C++ summary of message changes for z/OS V2R1," on page 525
- Chapter 74, "z/OS UNIX summary of message changes for z/OS V2R1," on page 529

## **z/OS V2R1 messages**



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## Chapter 56. BCP and DFSMS summary of message changes for z/OS V2R1

This topic lists new, changed, and deleted messages for BCP, DFSMSdftp, DFSMSdss, DFSMSHsm, DFSMSrmm, and DFSMSStvs. It also lists new, changed, and deleted operator messages for RMF and TSO/E. (New, changed, and deleted non-operator messages for TSO/E are in Chapter 93, "TSO/E summary of message changes for z/OS V1R13," on page 577.) All the messages in this section are grouped together, without distinction as to element or feature.

All messages for the BCP and DFSMS, as well as the operator messages for RMF and TSO/E, are documented in:

- *z/OS MVS System Messages, Vol 1 (ABA-AOM)*
- *z/OS MVS System Messages, Vol 2 (ARC-ASA)*
- *z/OS MVS System Messages, Vol 3 (ASB-BPX)*
- *z/OS MVS System Messages, Vol 4 (CBD-DMO)*
- *z/OS MVS System Messages, Vol 5 (EDG-GFS)*
- *z/OS MVS System Messages, Vol 6 (GOS-IEA)*
- *z/OS MVS System Messages, Vol 7 (IEB-IEE)*
- *z/OS MVS System Messages, Vol 8 (IEF-IGD)*
- *z/OS MVS System Messages, Vol 9 (IGF-IWM)*
- *z/OS MVS System Messages, Vol 10 (IXC-IZP)*

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### New

- ADR185W
- ADR530I
- ADR531E
- ADR532E
- ADR533I
- ADR560E
- ADR561E
- ADR562E
- ADR564E
- ADR565I
- ADR566E
- ADR567E
- ADR568I
- ADR569I
- ADR599I
- ADR803I
- ADR925W
- ADR984W
- ADYH005E
- ADYH006E
- AIR039I
- AIR040I
- AIR041I
- AIR042I
- AIR573I
- AIR574I
- AIZ002I
- AIZ003I
- AIZ004I
- AIZ005I
- AIZ006I
- AIZ007I
- AIZ008I
- AIZ009I
- AIZ010I
- AIZ011I
- AIZ012I
- AIZ013I
- AIZ014I
- AIZ015I
- AIZ016I
- AIZ017I
- AIZ018I
- AIZ019I
- AIZ020I
- AIZ021I
- AIZ022I
- AIZ023I

- AIZ024I
- AIZ025I
- AIZ026I
- AIZ027I
- AIZ028I
- AMA770I
- AMA771I
- AMA772I
- AMA773I
- AMA774I
- AMA775I
- AMD125I
- ANTA5500E
- ANTA5501E
- ANTB8002I
- ANTF0513
- ANTF0514
- ANTI1038E
- ANTI1041E
- ANTI8037I
- ANTP0275I
- ANTP0276I
- ANTQ8286I
- ANTQ8287I
- ANTQ8288I
- ANTQ8290I
- ANTQ8370I
- ANTQ8371I
- ANTQ8372I
- ANTQ8373I
- ANTQ8374I
- ANTQ8375I
- ANTS5170W
- ANTU2200I
- ANTU2201E
- ANTU2202I
- ANTU2203I
- ANTU2204I
- ANTU2205I
- ANTU2206E
- ANTU2207I
- ANTU2208I
- ANTU2210I
- ANTU2211I
- ANTU2212I
- ANTU2213I
- ANTU2214I
- ANTU2216I
- ANTU2217A
- ANTU2218I
- ANTU2219I
- ANTU2221I
- ANTU2222I
- ANTX5129E
- ANTX5130W
- ANTX5132W
- ANTX5133E
- ANTX5134E
- ANTX5135W
- ANTX5136E
- ANTX5139E
- ANTX5140E
- ANTX5151E
- ANTX5171W
- ANTX5172W
- ANTX5173W
- ANTX5174W
- ANTX8060I
- ANTX8061E
- ANTX8062W
- ANTX8063I
- ANTX8064E
- ANTX8070I
- ANTX8071I
- ANTX8072I
- ANTX8073I
- ANTX8074I
- ANTX8144I
- ANTX8145I
- ANTX8147I
- ANTX8148I
- ANTX8155I
- ANTX8158I
- ANTX8159I
- ANTX8160I
- ANTX8169I
- ANTX8170W
- ANTX8172I
- ANTX8173W
- ANTX8174W
- ANTX8175I
- ANTX8176I
- ANTX8177W
- ANTX8376I
- ANTF0447E
- ANTF0510E
- ANTF0511E
- ANTF0512E
- ANTP0274E
- ANTP7132E
- ANTP8803I
- ANTP8804I
- ANTP8807I
- ANTP8809I
- ARC0064E
- ARC0267I
- ARC0277I
- ARC0687I
- ARC0836I
- ARC1069I
- ARC1201I
- ARC1271I

- ARC1636I
- ARC1839I
- ARC1849I
- ASA014I
- ATR236I
- ATR250E
- ATR251I
- ATR252I
- ATR253I
- ATR254I
- ATR255E
- ATR256E
- ATR257E
- AXR0503I
- BHI0001I
- BHI0002I
- BHI0003I
- BHI0004I
- BHI0005I
- BHI0006E
- BPXF266E
- BPXF267I
- BPXF268I
- BPXF269I
- BPXF270I
- BPXF271I
- BPXF272I
- BPXF273I
- BPXF274I
- BPXI086I
- BPXP028I
- BPXO073I
- BPXO075I
- BPXP028I
- BPXTF019I
- CBR3730E
- CBR3731I
- CEA0603I
- CNZ0018I
- CNZ2610I
- CNZ4215W
- CNZ4216A
- CNZ4303I
- CNZ4304I
- CNZ6003I
- CNZ6004I
- COF021I
- COF007I
- COF008I
- COF016I
- COF026I
- COF027I
- CPO1064I
- CPO1065I
- CPO1066I
- CPO1067I
- CPO1068I
- CPO1069I
- CPO1071I
- CPO1072I
- CPO1094I
- CPO1096I
- CPO1164E
- CPO1189E
- CPO1194E
- CPO1195E
- CPO1251W
- CPO1252E
- CPO1253E
- CPO1254E
- CPO1255E
- CPO1256E
- CPO1257E
- CPO1258I
- CPO1260E
- CPO1261E
- CPO1262E
- CPO1263E
- CPO1264E
- CPO1265E
- CPO1266E
- CPO1267E
- CPO1268E
- CPO1269E
- CPO1270E
- CPO1271E
- CPO1272E
- CPO1273E
- CPO1274E
- CPO1280I
- CPO1281E
- CPO1282E
- CPO1283E
- CPO1284E
- CPO1285E
- CPO1286E
- CPO1287E
- CPO1288E
- CPO1289I
- CPO1290I
- CPO1291E
- CPO1292E
- CPO1293E
- CPO1294E
- CPO1295E
- CPO1296E
- CPO1297E
- CPO1298I
- CPO1299E
- CPO1300E
- CPO1301E
- CPO1302E

- CPO1303E
- CPO1304E
- CPO1305E
- CPO1306E
- CPO1307E
- CPO1308E
- CPO1309E
- CPO1310I
- CPO1311I
- CPO1312I
- CPO1313I
- CPO1314E
- CPO2002E
- CPO2003E
- CPO2004E
- CPO2005E
- CPO2006E
- CPO2007E
- CPO2008E
- CPO2010W
- CPO2025E
- CPO2026W
- CPO2028E
- CPO2130I
- CPO2131W
- CPO2132E
- CPO2291E
- CPO2292E
- CPO2293E
- CPO2294E
- CPO3019I
- CPO3027I
- CPO3037W
- CPO3960I
- CPO3961I
- CPO3962I
- CPO3963I
- CPO3964I
- CPO3965I
- CPO3966I
- CPO3967I
- CPO3968I
- CPO3969I
- CPO3970I
- CPO3971I
- CPO3972I
- CPO3973I
- CPO3974I
- CPO3975I
- CPO3976I
- CPO3977I
- CPO3978I
- CPO3979I
- CPO3980I
- CPO3981I
- CPO3982I
- CPO3983I
- CPO3984I
- CPO3985I
- CPO3986I
- CPO3987I
- CPO3988E
- CPO3990I
- CPO3991I
- CPO3992W
- CPO3993W
- CPO3994I
- CPO3995I
- CPO3996I
- CPO4130E
- CPO4131E
- CPO4210I
- CPO4211I
- CPO4212I
- CPO4213I
- CPO4214I
- CPO4215I
- CPO4216I
- CPO4217I
- CPO4309W
- CPO4310W
- CPO1400E
- CPO4402E
- CPO4403E
- CPO4404E
- CPO4405W
- CPO4406I
- CPO4407I
- CPO4410E
- CPO4411W
- CPO4412I
- CPO4420E
- CPO4421W
- CPO4422I
- CPO4430I
- CPO8705E
- CPO8706E
- CPO8707E
- CPO8708E
- CPO8709E
- CPO9874W
- CPO9877W
- CPO9878W
- CPO9879W
- CPO9880E
- CPO9881W
- CPO9882W
- CPO9883E
- CPO9884W
- CPO9885W
- CPO9886W
- CPO9887W

- CPO9888E
- CSV558I
- FEW1006I
- HWI022I
- HZS1220E
- IDAD1001E
- IEASYMU01I
- IEASYMU02I
- IEASYMU03I
- IEASYMU04I
- IEA032E
- IEA033I
- IEA034I
- IEA036I
- IEF910I
- IEF911I
- IEA988I
- IEAVEH110I
- IEAVEH111E
- IEB148E
- IEB1130I
- IEB1130E
- IEB1130W
- IEB1165T
- IEB1166T
- IEB1167T
- IEB1168T
- IEB1169T
- IEB1170T
- IEB1171T
- IEB1172T
- IEB1173T
- IEB1174T
- IEB1175E
- IEB1176T
- IEB1177T
- IEB1178T
- IEB1179W
- IEB1180T
- IEC161I (return code 132)
- IEC359I (form 5 of 6)
- IEC359I (form 6 of 6)
- IEC365D
- IEC366E
- IEC367W
- IECH0100I
- IECH0101E
- IEE088D
- IEE190I
- IEE583I
- IEE728I
- IEE745I
- IEE759I
- IEF024I
- IEF386I
- IEF900I
- IEF901I
- IEFA050E
- IEFA104I
- IEFA105I
- IEFA106I
- IEFA107I
- IEFA108I
- IEFC609I
- IEFC659I
- IEFI014I
- IEW2336I
- IEW2337I
- IEW2417I
- IEW2418I
- IEW2419I
- IEW2420I
- IEW2421I
- IEW2422I
- IEW2423I
- IEW2424I
- IEW2426I
- IEW2427I
- IEW2436W
- IEW2444W
- IEW2447I
- IEW2498E
- IEW2499E
- IEW2536I
- IEW2546I
- IFA730E
- IFA731I
- IFA762A
- IFA791I
- IFA792I
- IFA849I
- IGF960I
- IGD097I
- IGD11102I
- IGD11103I
- IGD17167I
- IGD17168I
- IGD17169I
- IGD17319I
- IGD17320I
- IGD17321I
- IGD17341I
- IGD17342I
- IGD17389I
- IGD17395I
- IGGHC111E
- IGGHC112I
- IGVH111I
- IGVH112E
- IGVH504I
- IGW051I
- IGW052I

- IGW053I
- IGW054I
- IGW431I
- IGW01047T
- IGW01262E
- IGW01263E
- IGW01264E
- IGWRH0132I
- ILRH0112I
- IOS140W
- IOS320I
- IOS321I
- IOS322I
- IOS323I
- IOS324I
- IOS325I
- IOS326I
- IOS327I
- IOS328I
- IOS329I
- IOS330I
- IOS331I
- IOS332I
- IOS333I
- IOS334I
- IOS634I
- IOS635I
- IOS636I
- IOSHC099I
- IOSHC117I
- IOSHC118I
- IOSHC119E
- IOSHC120I
- IOSHC130I
- IOSHC131I
- IOSHC132E
- IOSHC133I
- IOSHC140I
- IOSHC141I
- IOSHC142E
- IOSHC143I
- IOSHC144I
- IOSHC145I
- IOSHM0316I
- IOSHM0433I
- IOSHM0434I
- IOSHM0435I
- IOSHM0436I
- IOSHM0813I
- IOSHM0814I
- IOSHM0815I
- IOSHM0816E
- IOSHM0817A
- IOSHM0818I
- IOSHM0819I
- IOSHS0018I
- IOSHS0019I
- IOSPF500I
- IOSPF501I
- IOSPF502I
- IOSPF503I
- IOSPF504I
- IOSPF505I
- IQP001I
- IQP002I
- IQP004I
- IQP006I
- IQP007I
- IQP008I
- IQP020I
- IQP021I
- IQP022I
- IQP023I
- IQP024I
- IQP031I
- IQP032I
- IQP033I
- IQP034I
- IQP035I
- IQP036I
- IQP037I
- IQP038I
- IQP039I
- IQP040I
- IQP041I
- IQP060I
- IQP061I
- IQP062I
- IQP066I
- IRA127I
- IRA203E
- IRA866I
- ISG379E
- ISG380E
- ISG381D
- ISN013I
- IWM066I
- IWM067Ic
- IXC567I
- IXC568I
- IXC583I
- IXC584I
- IXC592I
- IXC593I
- IXC594I
- IXC746I
- IXCH0155I
- IXCH0218I
- IXCH0219I
- IXCH0224I
- IXCH0225E
- IXCH0257E

- IXCH0258I
- IXCH0259E
- IXCH0260I
- IXCH0261E
- IXCH0262I
- IXCH0263E
- IXCH0264I
- IXCH0265E
- IXCH0266I
- IXCH0439I
- IXCH047I
- IXCH048E
- IXCH0533I
- IXCH0924I
- IXCH0925I
- IXCH0926I
- IXCH0927I
- IXCH0928I
- IXCH0929I
- IXCH0930I
- IXC441I
- IXC442I
- IXC443I
- IXC444I
- IXC445I
- IXC471I
- IXC472I
- IXC473I
- IXG316E
- IXG317E
- IXG318E
- IXG319I
- IXL016I
- IXL163I
- IXL164I
- IXL165I

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## Changed

- ADR049E
- ADR285E
- ADR332E
- ADR342I
- ADR360I
- ADR380E
- ADR383W
- ADR439E
- ADR497E
- ADR502I
- ADR556W
- ADR707E
- ADR778E
- ADR832E
- ADR840W
- ADR918I
- ADR980E
- ADRY501I
- ADRY503E
- ADRY3501I
- AMA583E
- AMD115I
- AMD116I
- ANTC8407I
- ANTI1037E
- ANTI8027I
- ANTI8029I
- ANTQ8224I
- ANTQ8243I
- ANTR8845E
- ANTT0030I
- ANTT0031I
- ANTX8036I
- ANTX8138I
- ANTX8164W
- ANTF0420I
- ANTF0421I
- ANTP8802I
- ANTQ8221I
- ARC0034I
- ARC0061I
- ARC0103I
- ARC0139I
- ARC0161I
- ARC0162I
- ARC0167I
- ARC0185I
- ARC0216I
- ARC0246I
- ARC0260I
- ARC0336I
- ARC0340I
- ARC0352I
- ARC0412I
- ARC0434E
- ARC0442I
- ARC0445I
- ARC0461I
- ARC0514I
- ARC0550I
- ARC0640I
- ARC0654I
- ARC0704E
- ARC0734I
- ARC0784I
- ARC0936I
- ARC0939I
- ARC1128I
- ARC1158I
- ARC1179I

- ARC1248I
- ARC1258I
- ARC1280I
- ARC1311I
- ARC1334I
- ARC1356I
- ARC1358I
- ARC1806E
- ARC1812I
- ARC1836I
- ARC1901I
- ARC6172E
- ARC6250I
- ASA104I
- BPXF063I
- BPXF075I
- BPXF105E
- BPXF106E
- BPXF110E
- BPXF140E
- BPXF150I
- BPXF156E
- BPXF167E
- BPXF168E
- BPXF169E
- BPXF170E
- BPXF171E
- BPXF172E
- BPXF173E
- BPXF174E
- BPXF175E
- BPXF176E
- BPXF178I
- BPXF213E
- BPXF216E
- BPXF217E
- BPXF221I
- BPXF243E
- BPXF244E
- BPXF245I
- BPXF257I
- BPXF265I
- BPXF266E
- BPXF270I
- BPXH002E
- BPXI039I
- BPXI042I
- BPXM123E
- BPXO043I
- BPXO045I
- BPXO051I
- BPXO074I
- BPXP007E
- BPXP013I
- BPXTF009E
- BPXTF010E
- BPXTF011I
- BPXTF012I
- BPXTF014I
- BPXTF015I
- BPXTF107I replaces BPXTF007I
- CBR1110I
- CBR1180I
- CBR9225I
- CBR9890I
- CEA0023I
- CNZ0005I
- CNZ2400I
- CNZ2603I
- CNZ3005A
- CNZ3008A
- CNZ3009E
- CNZ3010I
- CNZ3011I
- CNZ3012A
- CNZ3015A
- CNZ4000I
- CNZ4001I
- CNZ4100I
- CNZ4102I
- CNZ4104I
- CNZ4207I
- CNZ4300I
- CNZ4301I
- CNZ4302I
- CNZ9001I
- CNZ9008A
- CNZ9012I
- CNZHF0002I
- CNZHF0003I
- CNZHF0005I
- CNZHF0006E
- CNZHS0003I
- CNZHS0005I
- COF004I
- COF012I
- COF013I
- COF015I
- COF023I
- COF101I
- COF102I
- COF103I
- COF104I
- COF105I
- COF106I
- COF107I
- COF108I
- COF109I
- COF110I
- COF111I
- COF112I
- COF113I



- COF114I
- COF115I
- COF116I
- COF117I
- CPO1020I
- CPO1026I
- CPO1027I
- CPO1028I
- CPO1029I
- CPO1039E
- CPO1086E
- CPO1088I
- CPO1109E
- CPO1110E
- CPO1111E
- CPO1127E
- CPO1129E
- CPO1135E
- CPO1141E
- CPO1148E
- CPO1149E
- CPO1155E
- CPO1158E
- CPO1162E
- CPO1165E
- CPO1167E
- CPO1169E
- CPO1171E
- CPO1172E
- CPO1175E
- CPO1176E
- CPO1177E
- CPO1178E
- CPO1185E
- CPO1201E
- CPO1206E
- CPO1209E
- CPO1210E
- CPO1211E
- CPO1212E
- CPO1232E
- CPO1308E
- CPO1401E
- CPO1402E
- CPO1403E
- CPO2013E
- CPO2014E
- CPO2015I
- CPO2016I
- CPO2017I
- CPO2018I
- CPO2019E
- CPO2020I
- CPO2021W
- CPO2022E
- CPO2023E
- CPO2027E
- CPO2030I
- CPO2050E
- CPO2051E
- CPO2052E
- CPO2053E
- CPO2054E
- CPO2055E
- CPO2056E
- CPO2057E
- CPO2070W
- CPO2102E
- CPO2104W
- CPO2106E
- CPO2115E
- CPO2102E
- CPO2103E
- CPO2104E
- CPO2105E
- CPO2106E
- CPO2107E
- CPO2108E
- CPO2109E
- CPO2110E
- CPO2111E
- CPO2112E
- CPO2113E
- CPO2114E
- CPO2115E
- CPO2116E
- CPO2117E
- CPO2118E
- CPO2119E
- CPO2120E
- CPO2121E
- CPO2122E
- CPO2284E
- CPO2285E
- CPO2290E
- CPO2505E
- CPO3002W
- CPO3005E
- CPO3006E
- CPO3007E
- CPO3008W
- CPO3009I
- CPO3016W
- CPO3017W
- CPO3018W
- CPO3020I
- CPO3030I
- CPO3031W
- CPO3032I
- CPO3033W
- CPO3036I
- CPO3040W

- CPO3041W
- CPO3042E
- CPO3044W
- CPO3045E
- CPO3046E
- CPO3047E
- CPO3048E
- CPO3050E
- CPO3051E
- CPO3056E
- CPO3060W
- CPO3801W
- CPO3802W
- CPO3870E
- CPO3910I
- CPO3911I
- CPO3912I
- CPO3913I
- CPO3950E
- CPO4001E
- CPO4002E
- CPO4003E
- CPO4104I
- CPO4106E
- CPO4113I
- CPO4201I
- CPO4202I
- CPO4250I
- CPO4307W
- CPO4309W
- CPO5000E
- CPO8051E
- CPO8052E
- CPO8058W
- CPO8060E
- CPO8061E
- CPO8108E
- CPO8311E
- CPO8312E
- CPO8700E
- CPO8701E
- CPO9806E
- CPO9808E
- CPO9809E
- CPO9809E
- CPO9810E
- CPO9811E
- CPO9813E
- CPO9818E
- CPO9834E
- CPO9845W
- CPO9846W
- CPO9847E
- CPO9848E
- CPO9854E
- CPO9857E
- CPO9858E
- CPO9861E
- CPO9862E
- CPO9865E
- CPO9866E
- CPO9869W
- CPO9871W
- CPO9900E
- CPO9901E
- CPO9902W
- CPO9903E
- CPO9904E
- CPO9905E
- CPO9906E
- CPO9907E
- CPO9908E
- CPO9909E
- CPO9910E
- CPO9911E
- CPO9912E
- CPO9913E
- CPO9914E
- CPO9915E
- CSV016I
- CSV518I
- CSV540E replaces CSV540I
- CSV560I
- CSV561I
- CUN3000I
- EDG0205E
- EDG2130I
- EDG3008E
- EDG4004I
- EDG6641E
- FEW1003E
- FEW1004E
- HIS005I
- HIS007I
- HIS015I
- HIS019I
- HIS025I
- HIS026I
- HIS031I
- HIS034I
- IAR019I
- IDC21364I
- IDC2899I
- IDC3009I
- IEA074I
- IEA075I
- IEA135I
- IEA195I
- IEA196I
- IEA383I
- IEA386I
- IEA434I

- IEA404A
- IEA494I
- IEA611I
- IEA911E
- IOC21364I
- IEC023I
- IEC026I
- IEC027I
- IEC030I
- IEC036I
- IEC141I
- IEC143I
- IEC214I
- IEC142I
- IEC143I
- IEC147I
- IEC161I (return code 001)
- IEC161I (return code 014)
- IEC161I (return code 020)
- IEC161I (return code 021)
- IEC161I (return code 022)
- IEC161I (return code 029)
- IEC161I (return code 032)
- IEC161I (return code 052)
- IEC161I (return code 056)
- IEC161I (return code 064)
- IEC161I (return code 089)
- IEC161I (return code 128)
- IEC161I (return code 129)
- IEC161I (return code 195)
- IEC161I (return code 205)
- IEC161I (return code 220)
- IEC204I
- IEC210I
- IEC214I
- IEC218I
- IEC347I
- IEC348I
- IEC349I
- IEC352I
- IEC353I
- IEC359I (form 1 of 6)
- IEC363D, IEC364D
- IEC378I (form 1 of 2)
- IEC393I
- IEC501A
- IEC501E
- IEC614I
- IEC999I
- IEE028I
- IEE097I
- IEE115I
- IEE148I
- IEE150I
- IEE174I (form 2 of 35)
- IEE174I (form 6 of 35)
- IEE174I (form 17 of 35)
- IEE174I (form 19 of 35)
- IEE174I (form 21 of 35)
- IEE174I (form 23 of 35)
- IEE178I
- IEE185I
- IEE241I
- IEE254I
- IEE296I
- IEE301I
- IEE316I
- IEE328I
- IEE342I
- IEE399I
- IEE406I
- IEE459I (form 1 of 3)
- IEE459I (form 2 of 3)
- IEE504I
- IEE505I
- IEE521I
- IEE583I
- IEE612I
- IEE677I
- IEE708I
- IEE735I
- IEE768I
- IEE841I
- IEE844W
- IEE852I
- IEE854I
- IEE921I
- IEE967I
- IEE970I
- IEF032I
- IEF157E
- IEF287I
- IEF473I
- IEF490I
- IEF689I
- IEF739D
- IEFA003I
- IEFC627I
- IEFC630I
- IEW2101I
- IEW2353E
- IFA023I
- IFA760I
- IFA761I
- IFA788I
- IFA790I
- IFA817I
- IFA832I
- IFA845I
- IGD002I
- IGD030I
- IGD031I

- IGD068I
- IGD17071I
- IGD17073I
- IGD17076I
- IGD17269I
- IGD17279I
- IEW2101I
- IEW2141E
- IEW2353E
- IGW031I
- IGW540I
- IGW704A
- IGWRH0130I
- IGWRH0131E
- IKJ574I
- IOS051I
- IOS085I
- IOS087I
- IOS090I
- IOS103I
- IOS156I
- IOS157I
- IOS158I
- IOS500I
- IOS502I
- IOS503I
- IOS506I
- IOS530I
- IOS566I
- IOS630I
- IOS1500I
- IOSHM0201I
- IOSHM0303I
- IOSHM0304I
- IOSHM0308I
- IOSHM0399I
- IOSHM0401I
- IOSHM0416I
- IOSHM0420I
- IOSHM0427I
- IOSHM0429I
- IOSHM0803E
- IOSHM0804I
- IOSHM0806I
- IOSHS0010I
- IOSHS0011I
- IRA200E
- IRA201E
- IRA202E
- IRA205I
- IRA206I
- IRA501I
- IWM002I
- IWM005W
- IWM063I
- IWM064I
- IWM078E
- IXC114I
- IXC250I
- IXC266I
- IXC291I
- IXC328I
- IXC334I
- IXC347I
- IXC352I
- IXC357I
- IXC359I
- IXC360I
- IXC361I
- IXC362I
- IXC367I
- IXC373I
- IXC375I
- IXC405D
- IXC420D
- IXC510I
- IXC511I
- IXC517I
- IXC518I
- IXC522I
- IXC528I
- IXC531I
- IXC532I
- IXC538I
- IXC544I
- IXC546I
- IXC574I
- IXC582I
- IXC583I
- IXC584I
- IXC585E
- IXC745I
- IXCH0444E
- IXCH0912I
- IXG256I
- IXG310I
- IXG384I
- IXG385I
- IXG510I
- IXG601I
- IXL014I
- IXL015I
- IXL150I
- IXL160E

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## Deleted

- BPXI070I
- CNZ1001I
- CNZ1002I
- CHZHF0013E
- HWI014I
- IEA026I
- IEB148I
- IEB600I
- IEB601I
- IEB602I
- IEB603I
- IEB604I
- IEB605I
- IEB606I
- IEB607I
- IEB608I
- IEB609I
- IEE047I
- IEE083A
- IEE125A
- IEE126I
- IEE130I
- IEE141A
- IEE142I
- IEE276I
- IEE277I
- IEE278I
- IEE319I
- IEE320I
- IEE367I
- IEE370I
- IEE501I
- IEE530I
- IEE687I
- IEE688I
- IEE870I
- IEE889I
- IEE890I
- IEE930I
- IEW2201W
- IGW701I
- IRA203I
- IRA204E
- IXL141I

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## Dump output messages

### New

- BHI10001I
- BHI10002I
- BHI10003I
- BHI10004I

### Changed

- BLS18210I
- BLS19002I
- BLS19003I
- BLS19005I

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## MVS system codes

For explanations and additional details, see *z/OS MVS System Codes*.

### New:

- 277
- EC6

### Changed system completion codes:

- 00C
- 042
- 050
- 05C

- 09E
- 1FB
- 18F
- 233
- 2E0
- 306
- 430
- 438
- 6FB
- 800
- C0D
- DC2
- D22
- EC7
- OOC

**Changed wait state codes:**

- 0A2
- 1FB

**Deleted:**

To eliminate redundancy, RACF system completion codes have been removed from *z/OS MVS System Codes*. Instead, find the complete descriptions for RACF system completion codes in *z/OS Security Server RACF Messages and Codes*:

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## Chapter 57. Communications Server summary of message changes for z/OS V2R1

The messages for Communications Server are documented in:

- *z/OS Communications Server: IP Messages Volume 1 (EZA)*
- *z/OS Communications Server: IP Messages Volume 2 (EZB, EZD)*
- *z/OS Communications Server: IP Messages Volume 3 (EZY)*
- *z/OS Communications Server: IP Messages Volume 4 (EZZ, SNM)*
- *z/OS Communications Server: SNA Messages*

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### New

EZA1532I	EZD1392I
EZA1533I	EZD1590I
EZA1545I	EZD2014I
EZA1546I	EZD2016I
EZA1548I	EZD2017I
EZA1549I	EZD2019I
EZA1555I	EZD2020A
EZA1556I	EZD2021A
EZA1771I	EZD2022A
EZA1773I	EZD2023I
EZA1775I	EZD2024I
EZA1776I	EZD2025I
EZA1777I	EZD2026I
EZA1778I	EZD2027I
EZA1779I	EZD2028I
EZA1780I	EZD2029I
EZA4268I	EZD2038I
EZA5205E	EZD2039I
EZA6409I	EZY1979I
EZA6410I	EZZ0061I
EZD0023I	EZZ0062I
EZD0032I	EZZ0063I
EZD0837I	EZZ0064I
EZD0838I	EZZ0065I
EZD0839I	EZZ0066I
EZD1156I	EZZ0143I
EZD1288I	EZZ0144I
EZD1289I	EZZ0618I
EZD1290I	EZZ0836I
EZD1390I	EZZ0837I
EZD1391I	EZZ0838I

EZZ2684I	IST2383I
EZZ2685I	IST2384E
EZZ2686I	IST2386I
EZZ2687I	IST2387I
EZZ2688I	IST2388I
EZZ6062I	IST2389I
EZZ8121I	IST2390I
EZZ8172I	IST2391I
EZZ8173I	IST2392I
EZZ8174I	IST2393I
IST2338I	IST2395I
IST2361I	IST2396I
IST2362I	IST2397I
IST2364I	IST2398I
IST2365I	IST2399I
IST2366I	IST2400I
IST2367I	IST2401I
IST2368I	IST2402I
IST2369I	IST2403I
IST2370I	IST2404I
IST2371I	IST2405I
IST2372I	IST2406I
IST2373I	IST2407I
IST2374I	IST2408I
IST2375I	IST2409I
IST2376I	IST2410I
IST2377I	IST2411I
IST2378I	IST2417I
IST2379I	ISTM015I
IST2380I	ISTM016I
IST2381I	IVT5593I
IST2382I	

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## Changed

EZA1532I	EZD0034I
EZA1533I	EZD0035I
EZA1545I	EZD0044I
EZA1546I	EZD0811I
EZA1548I	EZD0832I
EZA1549I	EZD0833I
EZA1555I	EZD0834I
EZA1556I	EZD0934I
EZA5164E	EZD0938I
EZB0760E	EZD0968I
EZD0033I	EZD1106I



EZD1163I	EZZ0710I
EZD1284I	EZZ0713I
EZD1374E	EZZ0714I
EZD1388E	EZZ0715I
EZD1723I	EZZ0716I
EZD1725I	EZZ0718I
EZD1731I	EZZ0721I
EZD1754I	EZZ0724I
EZYFT99I	EZZ0726I
EZZ0056I	EZZ0729I
EZZ0146I	EZZ0730I
EZZ0147I	EZZ0733I
EZZ0148I	EZZ0746I
EZZ0164I	EZZ0749I
EZZ0165I	EZZ0757I
EZZ0320I	EZZ0758I
EZZ0322I	EZZ0761I
EZZ0323I	EZZ0768I
EZZ0326I	EZZ0769I
EZZ0344I	EZZ0771I
EZZ0356I	EZZ0781I
EZZ0358I	EZZ0782I
EZZ0371I	EZZ0783I
EZZ0395I	EZZ0784I
EZZ0398I	EZZ0785I
EZZ0610I	EZZ0795I
EZZ0614I	EZZ0798I
EZZ0638I	EZZ0799I
EZZ0639I	EZZ0800I
EZZ0650I	EZZ0801I
EZZ0651I	EZZ0808I
EZZ0656I	EZZ0809I
EZZ0658I	EZZ0810I
EZZ0661I	EZZ0811I
EZZ0662I	EZZ0812I
EZZ0663I	EZZ0813I
EZZ0664I	EZZ0814I
EZZ0665I	EZZ0815I
EZZ0671I	EZZ0818I
EZZ0684I	EZZ0823I
EZZ0691I	EZZ0824I
EZZ0692I	EZZ0826I
EZZ0707I	EZZ0827I
EZZ0708I	EZZ0828I
EZZ0709I	EZZ0829I

EZZ0830I	EZZ8165I
EZZ0831I	EZZ8453I
EZZ0832I	EZZ8648I
EZZ2909I	EZZ8649I
EZZ3125I	EZZ9295I
EZZ3205I	EZZ9296I
EZZ4348I	EZZ9297E
EZZ6035I	EZZ9299E
EZZ6060I	EZZ9675E
EZZ6064I	EZZ9830I
EZZ6081I	IKT00201I
EZZ6238I	IST087I
EZZ6385I	IST486I
EZZ7453I	IST1016I
EZZ7839I	IST1074I
EZZ7805I	IST1085I
EZZ7822I	IST1221I
EZZ7884I	IST1230I
EZZ7900I	IST1314I
EZZ7901I	IST1476I
EZZ7902I	IST1494I
EZZ7906I	IST1578I
EZZ7922I	IST1631I
EZZ7923I	IST1650I
EZZ7924I	IST1680I
EZZ7925I	IST1684I
EZZ7940I	IST1697I
EZZ7946I	IST1717I
EZZ7948I	IST1719I
EZZ7952I	IST1724I
EZZ7953I	IST1751I
EZZ7955I	IST1871I
EZZ8052I	IST1884I
EZZ8061I	IST1968I
EZZ8128I	IST2001I
EZZ8138I	IST2154I
EZZ8142I	IST2155I
EZZ8143I	IST2337I
EZZ8144I	IST2346I
EZZ8145I	IST2361I
EZZ8146I	IST2362I
EZZ8147I	IST2389I
EZZ8148I	IST2396I
EZZ8149I	IST2397I
EZZ8150I	IST2398I

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**Deleted**

Messages deleted in V2R1:

EZA1535I	EZZ9347I
EZD1184I	EZZ9348I
EZZ8791I - EZZ8823I	EZZ9349I
EZZ8828I	EZZ9350I
EZZ9041I - EZZ9054I	EZZ9351I
EZZ9058I	EZZ9376I
EZZ9083I	EZZ9420I
EZZ9085I	EZZ9524I - EZZ9542I
EZZ9089I - EZZ9096I	EZZ9547I
EZZ9106I	EZZ9550I - EZZ9556I
EZZ9107I	EZZ9559I - EZZ9566I
EZZ9108I	EZZ9568I - EZZ9582I
EZZ9110I	EZZ9584I
EZZ9111I	EZZ9587I
EZZ9112I	EZZ9588I
EZZ9115I	EZZ9589I
EZZ9116I	EZZ9691I - EZZ9700I
EZZ9119I	EZZ9702I
EZZ9120I	EZZ9703I
EZZ9122I	EZZ9705I
EZZ9123I	EZZ9707I
EZZ9125I	EZZ9708I
EZZ9126I	EZZ9710I
EZZ9128I - EZZ9153I	EZZ9711I
EZZ9157I	EZZ9712I
EZZ9162I	EZZ9713I
EZZ9163I	EZZ9720I
EZZ9164I	EZZ9721I
EZZ9168I	EZZ9722I
EZZ9169I	EZZ9723I
EZZ9170I	EZZ9725I
EZZ9171I	EZZ9726I
EZZ9172I	ISTM011I
EZZ9215I - EZZ9220I	ISTM012E
EZZ9258I	
EZZ9270I	
EZZ9271I	
EZZ9338I	
EZZ9339I	
EZZ9340I	
EZZ9341I	

Messages deleted in Version 1 (V1R1 - V1R13)

EZA1470E
EZA1482I
EZA1483I
EZA1484I
EZA1487I
EZA1497I

EZA1499I	EZD1017I
EZA1500I - EZA1506I	EZD1023I
EZA1508I - EZA1510I	EZD1024I - Replaced by EZD1795I
EZA1516I	EZD1028I - Replaced by EZD1158I
EZA1517I	EZD1047I
EZA1521I	EZD1048I
EZA1523I - EZA1526I	EZD1050I
EZA1529I - EZA1530E	EZD1056I - Replaced by EZD1789I
EZA1537I - EZA1541I	EZD1078I
EZA1646I	EZD1080I
EZA1667I	EZD1084I
EZA1668I	EZD1091I - Replaced by EZD1912I
EZA1674W - EZA1679W	EZD1134I - Replaced by EZD1923I
EZA1738W	EZD1729I
EZA1763W	EZD1931I
EZA2088I	EZY1290I
EZA2089I	EZY1304I
EZA2187I	EZY1305E
EZA2188I	EZY1345E
EZA2191I	EZY1346E
EZA2246I	EZY1377I - EZY1379I
EZA2248I	EZY1387E
EZA3950I - EZA4173E	EZY1944I
EZA5925I	EZY2005I
EZA5949W	EZY2046I
EZA6191W	EZY2047I
EZA9216I	EZY2049I
EZA9217I	EZY2050I
EZA9233I	EZY2051I
EZA9452I	EZY2067I
EZB2500 - EZB2785	EZY2140I
EZD0011I	EZY2141I
EZD0901I	EZY2662E
EZD0914I	EZY2664I
EZD0916I	EZY2666I
EZD0921I	EZY3760 - EXY3773
EZD0947I	EZY3798 - EZY3817
EZD0949I	EZY3823 - EZY3835
EZD0955I	EZY3829 - EZY3827
EZD0972I	EZY3990 - EZY3992
EZD0976I	EZY4195 - EZY4197
EZD0997I has been replaced by EZD1158I	EZYFT56W
EZD0999I	EZYFT57I
EZD1000I - EZD1004I	EZYFT66
EZD1016I	EZYTE23E - EZYTE26E

EZZ0159I	EZZ8201I - EZZ8229I
EZZ0175 - EZZ0208	EZZ8483 - EZZ8494
EZZ0349I	EZZ8497
EZZ0352I	EZZ8499
EZZ0365I	EZZ9165I
EZZ0366I	EZZ9166I
EZZ0367I	EZZ9167I
EZZ0370I	EZZ9272I
EZZ0373I	EZZ9273I
EZZ0383I - EZZ0394I	EZZ9274I
EZZ0400I	IKV0001I - IKV0029I
EZZ0403I	IST004I
EZZ0606I	IST318I
EZZ0607I	IST407I
EZZ0668I - EZZ0670I	IST408I
EZZ0674I - EZZ0679I	IST409I
EZZ0727I	IST432I
EZZ0728I	IST446I
EZZ0755I	IST468I
EZZ0756I	IST469I
EZZ2368I	IST470I
EZZ3100I	IST471I
EZZ3102I - EZZ3104I	IST821I
EZZ3124I	IST823I
EZZ4212I	IST1165I
EZZ4329I	IST1171I
EZZ4820I - EZZ5027E	IST1172I
EZZ6004	IST1325I
EZZ6016	IST1340I
EZZ6019	IST1341I
EZZ6029 - EZZ6033	IST1344I
EZZ6036	IST1362I
EZZ6062	IST1371I - Replaced by IST1797I
EZZ6063	IST1387I - IST1390I
EZZ6066	IST1491I
EZZ6067I	IST1492I
EZZ6068I	IST1620I
EZZ6069 - EZZ6079	IST1646I
EZZ6108I	IST1647I
EZZ6360I	IST1648I
EZZ6383I	IST1659I
EZZ6452I - EZZ6705I	IST1741I
EZZ7251 - EZZ7331	IST1770I - Replaced by IST2275I
EZZ7476I	IST1771I - Replaced by IST2252I and IST2254I
EZZ8139I	IST1772I - Replaced by IST2252I and IST2254I

IST1812I - IST1815I  
IST1918I  
IST2051I  
IST2053I  
IST2060I  
IST2112I  
IST2228A  
ISTH003I  
ISTH004E  
ISTH007I  
ISTH008E  
ISTM001I - ISTM010E  
ISU1500I - ISU1583I  
IVT5602I

---

## Chapter 58. Cryptographic Services ICSF summary of message changes for z/OS V2R1

The messages for Cryptographic Services Integrated Cryptographic Service Facility (ICSF) are documented in *z/OS Cryptographic Services ICSF Messages*.

---

### New

- ICSF FMID HCR77A0:

- CSFG0904
- CSFG0914
- CSFG0924
- CSFG0934
- CSFG0944
- CSFG0956
- CSFG0964
- CSFH0014I
- CSFH0015E
- CSFH0016E
- CSFM102I
- CSFM132I
- CSFM133I
- CSFM533I
- CSFM534I
- CSFM535I
- CSFM536I
- CSFM537I
- CSFM538I
- CSFM634I
- CSFM635I
- CSFM637I
- CSFM638I
- CSFM639I
- CSFM640I
- CSFM641I
- CSFM642I
- CSFM643I

- ICSF FMID HCR7790:

- CSFC0316
- CSFG0876
- CSFG0886
- CSFG0896
- CSFH0010E
- CSFH0011I

CSFH0012I  
CSFH0013I  
CSFM131E  
CSFM532I  
CSFM540I  
CSFM615I  
CSFM616I  
CSFM618I  
CSFM619I  
CSFM620I  
CSFM621I  
CSFM622I  
CSFM623I  
CSFM624I  
CSFM625I  
CSFM626I  
CSFM628I  
CSFM629I  
CSFM630I  
CSFM631I  
CSFM632I  
CSFM633I  
CSFM636I  
CSFU006I

---

## Changed

- ICSF FMID HCR77A0:
  - CSFC0306
  - CSFG0224
  - CSFM012I
  - CSFM014I
  - CSFM015I
  - CSFM108I
  - CSFM109I
  - CSFM110I
  - CSFM111I
  - CSFM123E
  - CSFM124I
  - CSFM129I
  - CSFM131E
- ICSF FMID HCR7790:
  - CSFM108I
  - CSFM110I
  - CSFM111I
  - CSFM122I



CSFM128E  
CSFM400I  
CSFM409E

---

**Deleted**

None.



---

## Chapter 59. Cryptographic Services PKI Services summary of message changes for z/OS V2R1

This topic lists new, changed, and deleted messages for Cryptographic Services PKI Services.

All messages for PKI Services are documented in *z/OS Cryptographic Services PKI Services Guide and Reference*.

---

### New

IKYC089I  
IKYK004I  
IKYP046I

---

### Changed

None

---

### Deleted

None

---

### CMP return codes

**New:**

531  
557  
558  
559  
560

**Changed:**

520  
521



---

## Chapter 60. Cryptographic Services System SSL Programming summary of message changes for z/OS V2R1

The messages for Cryptographic Services System SSL Programming are documented in *z/OS Cryptographic Services System SSL Programming*.

---

### New

GSK00009E  
GSK01064I

---

### Changed

None.

---

### Deleted

None.



---

## Chapter 61. DFSORT summary of message changes for z/OS V2R1

This topic lists new, changed, and deleted messages for DFSORT.

All messages for DFSORT are documented in: *z/OS DFSORT Messages, Codes and Diagnosis Guide*

---

### New

ICE290A

ICE291I

---

### Changed

ICE000I

ICE236I

ICE015A

ICE243A

ICE034A

ICE244A

ICE083A

ICE245A

ICE114A

ICE272A

ICE118I

ICE276A

ICE141A

ICE283A

ICE189A

ICE285A

ICE217A

| ICE997I

ICE234A

---

### Deleted

Messages retired in V2R1:

None





---

## Chapter 62. Distributed File Service summary of message changes for z/OS V2R1

The messages for Distributed File Service are documented in *z/OS Distributed File Service Messages and Codes*.

---

### New

#### Messages

New zFS messages:

IOEZ00807I  
IOEZ00700E  
IOEZ00701E  
IOEZ00702E  
IOEZ00703E  
IOEZ00704E  
IOEZ00705I  
IOEZ00707I  
IOEZ00708E  
IOEZ00709I  
IOEZ00710E  
IOEZ00722I  
IOEZ00723I  
IOEZ00726I  
IOEZ00729I  
IOEZ00730I  
IOEZ00733I  
IOEZ00734E  
IOEZ00735I  
IOEZ00739I  
IOEZ00740E  
IOEZ00750E  
IOEZ00751I  
IOEZ00752E  
IOEZ00753I  
IOEZ00754I  
IOEZ00755I  
IOEZ00756I  
IOEZ00757I  
IOEZ00758I  
IOEZ00759I  
IOEZ00760I  
IOEZ00761E  
IOEZ00762E  
IOEZ00763E  
IOEZ00764E  
IOEZ00765E  
IOEZ00766E  
IOEZ00767E  
IOEZ00768E  
IOEZ00769E

IOEZ00770E  
IOEZ00771E  
IOEZ00773E  
IOEZ00774E  
IOEZ00775E  
IOEZ00776I  
IOEZ00777A  
IOEZ00778I  
IOEZ00780E  
IOEZ00781I  
IOEZ00782I  
IOEZ00783E  
IOEZ00784E  
IOEZ00785I  
IOEZ00786I  
IOEZ00787I  
IOEZ00788E  
IOEZ00789E  
IOEZ00790I  
IOEZ00791I  
IOEZ00792E  
IOEZ00793E  
IOEZ00794E  
IOEZ00795E  
IOEZ00797I  
IOEZ00798I  
IOEZ00800I  
IOEZ00801I  
IOEZ00802I  
IOEZ00803I  
IOEZ00805A  
IOEZ00806A  
IOEZ00807I  
IOEZ00808I  
IOEZ00809I  
IOEZ00810I  
IOEZ00811E  
IOEZ00812I  
IOEZ00813I  
IOEZ00814E  
IOEZ00816I  
IOEZ00815E  
IOEZ00816I  
IOEZ00817E  
IOEZ00819E  
IOEZ00821E  
IOEZ00822E  
IOEZ00823E  
IOEZ00824E  
IOEZ00825E  
IOEZH0030I  
IOEZH0031I  
IOEZH0032E  
IOEZH0033E  
IOEZH0041I  
IOEZH0043I

IOEZH0044E  
IOEZH0045E

New Health Checker messages:  
IOEZH0015I

### **Reason codes**

New DF04rr reason codes:  
0002

New EFxrrr reason codes

680A  
614A  
614B  
614D  
614E  
614F  
614B  
62A0  
62A1  
665F  
6660  
6661  
6662  
6A32  
62A0  
62A1  
6A24  
6A25  
6A26  
6A27  
6A28  
6A29  
6B00  
6B01  
6B02  
6B03  
6B04  
6B05  
6B06  
6B0C  
6B0D  
6B0E  
6B0F  
6B10  
6B12  
6B14  
6B15  
6B16  
6B17  
6B18  
6B19  
6B1A  
6B1B  
6B1C

6B1E  
6B1F  
6B20  
6B21  
6B24  
6B25

## Return codes

There were no new return codes in V2R1.

---

## Changed

### Changed Messages

IOEZ00053E  
IOEZ00055I  
IOEZ00093E  
IOEZ00094E  
IOEZ00095E  
IOEZ00183E  
IOEZ00185E  
IOEZ00190E  
IOEZ00201E  
IOEZ00369I  
IOEZ00440I  
IOEZ00547I  
IOEZ00548I  
IOEZ00576E  
IOEZ00581E  
IOEZ00587I  
IOEZ00589E  
IOEZ00604I  
IOEZ00617I  
IOEZ00639I  
IOEZ00643I  
IOEZ00675E  
IOEZ00676E  
IOEZ00742I

Changed Health Checker messages:

IOEZH0021E

### Reason codes

Changes to DF04rr reason codes

0002

Changes to zFS reason codes:

6028  
602D  
6034  
6058  
6127  
6128  
6130  
6132

6133  
6136  
6137  
6138  
6139  
613A  
613B  
613C  
613D  
613E  
613F  
6140  
6141  
6142  
6143  
6144  
6145  
6146  
6147  
6148  
624A  
624B  
625A  
625B  
62B4  
6324  
642C  
6507  
650B  
650E  
6510  
6511  
6609  
660A  
6617  
6645  
6647  
6648  
668  
6682  
668B  
668C  
668D  
668E  
668F  
6691  
6692  
6693  
6694  
669A  
669B  
669C  
669F  
66A2  
66A3  
66A9

66AB  
66B0  
66E1  
66E4  
6710  
671C  
6731  
6732  
6733  
6734  
6735  
6736  
6737  
6738  
6739  
673A  
673B  
673C  
673F  
6740  
6756  
6757  
6758  
6759  
675A  
675B  
6761  
6762  
6765  
6766  
676B  
6773  
6774  
6800  
6801  
6802  
6803  
6804  
6805  
6807  
6808  
696E  
696F  
6970  
6971  
6972  
6973  
6974  
6975  
6976  
6977  
6978  
6979  
697A  
697B  
697D

697E  
607F  
6081  
6982  
6983  
6984  
6985  
6986  
6987  
6988  
6989  
69A8  
69C7  
6B05  
6B11  
6B22  
6B23

### Return codes

There were no changed return codes.

---

## Deleted

### Deleted

IOEZ00021E  
IOEZ00022I  
IOEZ00026I  
IOEZ00027E  
IOEZ00028E  
IOEZ00029E  
IOEZ00030E  
IOEZ00031I  
IOEZ00047E  
IOEZ00049E  
IOEZ00056I  
IOEZ00061I  
IOEZ00063I  
IOEZ00065I  
IOEZ00066E  
IOEZ00067E  
IOEZ00071I  
IOEZ00072E  
IOEZ00073E  
IOEZ00074I  
IOEZ00075E  
IOEZ00086E  
IOEZ00089I  
IOEZ00090E  
IOEZ00091E  
IOEZ00097E  
IOEZ00098E  
IOEZ00099I  
IOEZ00101E  
IOEZ00102E

IOEZ00103E  
IOEZ00104E  
IOEZ00107E  
IOEZ00108I  
IOEZ00111E  
IOEZ00113I  
IOEZ00114I  
IOEZ00115I  
IOEZ00116I  
IOEZ00121E  
IOEZ00125E  
IOEZ00126E  
IOEZ00128E  
IOEZ00130I  
IOEZ00137E  
IOEZ00145E  
IOEZ00146E  
IOEZ00147E  
IOEZ00148E  
IOEZ00149E  
IOEZ00150E  
IOEZ00151E  
IOEZ00152E  
IOEZ00153E  
IOEZ00154E  
IOEZ00155E  
IOEZ00156E  
IOEZ00160E  
IOEZ00161E  
IOEZ00162E  
IOEZ00169E  
IOEZ00172I  
IOEZ00174I  
IOEZ00177I  
IOEZ00180E  
IOEZ00189E  
IOEZ00193I  
IOEZ00194E  
IOEZ00195E  
IOEZ00196E  
IOEZ00197E  
IOEZ00198E  
IOEZ00203E  
IOEZ00204E  
IOEZ00205E  
IOEZ00206E  
IOEZ00215I  
IOEZ00216I  
IOEZ00217E  
IOEZ00218I  
IOEZ00219I  
IOEZ00220E  
IOEZ00221E  
IOEZ00222E  
IOEZ00223E  
IOEZ00224E



IOEZ00225I  
IOEZ00226E  
IOEZ00227E  
IOEZ00228E  
IOEZ00254E  
IOEZ00305E  
IOEZ00306I  
IOEZ00307I  
IOEZ00310E  
IOEZ00311I  
IOEZ00310E  
IOEZ00313E  
IOEZ00316I  
IOEZ00319E  
IOEZ00330I  
IOEZ00332I  
IOEZ00333E  
IOEZ00335I  
IOEZ00339E  
IOEZ00352E  
IOEZ00384E  
IOEZ00386I  
IOEZ00402I  
IOEZ00404I  
IOEZ00407I  
IOEZ00408I  
IOEZ00409I  
IOEZ00414I  
IOEZ00415E  
IOEZ00419E  
IOEZ00423E  
IOEZ00448I  
IOEZ00449I  
IOEZ00450I  
IOEZ00452E  
IOEZ00455I  
IOEZ00456I  
IOEZ00525I  
IOEZ00526I  
IOEZ00527I  
IOEZ00528I  
IOEZ00529I  
IOEZ00530I  
IOEZ00531I  
IOEZ00532I  
IOEZ00533I  
IOEZ00534I  
IOEZ00535I  
IOEZ00541I  
IOEZ00542D  
IOEZ00543E  
IOEZ00544E  
IOEZ00546E  
IOEZ00552I  
IOEZ00556E  
IOEZ00577E

IOEZ00578E  
IOEZ00588E  
IOEZ00593I  
IOEZ00594I  
IOEZ00647E

### **Deleted reason codes**

60AE  
60B2  
60B3  
60B4  
60B5  
60B6  
60B7  
60B8  
60BB  
60BF  
60C1  
60CE  
60CF  
60D0  
60D2  
60D6  
60D7  
60DB  
60EC  
60F0  
60F1  
60F3  
60F4  
60F5  
60F6  
60F7  
60F8  
60F9  
60FA  
60FB  
60FF  
6059  
605F  
606F  
607D  
607E  
607F  
6092  
609C  
60A1  
60A4  
60AD  
6100  
6101  
6102  
6103  
6104  
6105  
6106

6107  
6116  
6122  
6123  
6124  
6127  
6129  
612A  
612B  
612C  
612D  
612E  
612F  
6131  
6134  
6135  
6149  
6152  
6160  
6211  
6213  
6214  
6215  
6216  
6217  
6218  
6219  
621A  
621B  
621D  
621E  
620  
621  
622  
6224  
6225  
6226  
6227  
6228  
6229  
622A  
622B  
622C  
6230  
6231  
6232  
6233  
6234  
6235  
6236  
6237  
6247  
6248  
6249  
627B  
6280

6281  
6282  
6283  
6284  
6285  
6286  
6287  
6288  
6289  
628A  
628B  
628C  
628D  
628E  
628F  
6290  
6291  
6292  
6293  
6294  
6295  
6296  
6297  
6298  
6299  
629A  
629B  
629C  
629D  
6687  
66AE  
66AF  
6997  
6998  
6999  
69B8

### **Deleted return codes**

There were no deleted return codes in V2R1.

---

## Chapter 63. IBM Tivoli Directory Server summary of message changes for z/OS V2R1

The messages for IBM Tivoli Directory Server are documented in *z/OS IBM Tivoli Directory Server Messages and Codes for z/OS*.

---

### New

GLD1303E  
GLD1304E  
GLD1305E  
GLD1306E  
GLD1307E  
GLD1308E  
GLD1309E  
GLD2032E  
GLD2287E  
GLD2288E  
GLD9101A  
GLD9102A  
GLD9103A  
GLD9104A  
GLD9105A  
GLD9106E  
GLD9107E  
GLD9108E  
GLD9110E  
GLD9111E  
GLD9112E  
GLD9201A  
GLD9202A  
GLD9203A  
GLD9204E  
GLD9205A  
GLD9206A  
GLD9207A

---

### Changed

None.

---

### Deleted

None.



---

## Chapter 64. Infoprint Server summary of message changes for z/OS V2R1

This section contains the new, changed, and deleted messages for Infoprint Server for z/OS V2R1. The messages for Infoprint Server are documented in *z/OS Infoprint Server Messages and Diagnosis*.

### New

The section contains new messages for Infoprint Server for z/OS V2R1.

AOP153W  
AOP174E  
AOP175W  
AOP176E  
AOP177W  
AOP178W  
AOP179W  
AOP180E  
AOP184I  
AOP185E  
AOP186E  
AOP187E  
AOP188E  
AOP189E  
AOP190W  
AOP191I  
AOP192E  
AOP193E  
AOP195E  
AOP4040E  
AOPIM006  
AOPIM019

### Changed

The section contains changed messages for Infoprint Server for z/OS V2R1.

AOP139E

### Deleted

No messages were deleted from Infoprint Server for z/OS V2R1.





---

## Chapter 65. JES2 summary of message changes for z/OS V2R1

The messages for JES2 are documented in *z/OS JES2 Messages*.

---

### New

\$HASP117	\$HASP539
\$HASP142	\$HASP825
\$HASP143	\$HASP1701
\$HASP144	\$HASP2101
\$HASP145	\$HASP2102
\$HASP146	

---

### Changed

\$HASP003  
\$HASP095  
\$HASP249  
\$HASP305  
\$HASP307  
\$HASP319  
\$HASP361  
\$HASP455  
\$HASP647  
\$HASP807  
\$HASP835  
\$HASP890  
\$HASP893  
\$HASP896

In addition, the following JES2 messages were changed from all uppercase characters to mixed-case characters. For details, see *z/OS JES2 Messages*:

\$HASP107  
\$HASP108  
\$HASP110  
\$HASP111  
\$HASP112  
\$HASP113  
\$HASP114  
\$HASP115  
\$HASP116  
\$HASP118

---

### Deleted

\$HASP306



---

## Chapter 66. JES3 summary of message changes for z/OS V2R1

The messages for JES3 are documented in *z/OS JES3 Messages*.

---

### New

IAT1200	IAT4453
IAT3208	IAT6156
IAT3210	IAT6303
IAT3233	IAT6315
IAT3234	IAT6824
IAT3303	IAT7244
IAT3839	IAT7262
IAT3840	IAT8101
IAT3841	IAT8352
IAT3842	IAT8750
IAT4042	IAT8751
IAT4043	IAT8752
IAT4044	IAT8753
IAT4045	IAT8754
IAT4046	IAT8755
IAT4047	IAT8756
IAT4221	IAT8989

---

### Changed

IAT2000	IAT6135
IAT2640	IAT6853
IAT3007	IAT7230
IAT3098	IAT7231
IAT3100	IAT7294
IAT3159	IAT7295
IAT3255	IAT7762
IAT3395	IAT8001
IAT3441	IAT8055
IAT3822	IAT8079
IAT4100	IAT8098
IAT4126	IAT8147
IAT4174	IAT8531
IAT4885	IAT8583
IAT6130	IAT8587
IAT6131	IAT8646
IAT6133	IAT8685

IAT8707  
IAT8756

IAT9103

---

**Deleted**

IAT3801  
IAT4101  
IAT6817  
IAT8000  
IAT8005  
IAT8685

---

## Chapter 67. Language Environment summary of message changes for z/OS V2R1

The messages for Language Environment are documented in *z/OS Language Environment Runtime Messages*.

---

### New

New messages:

CEE3235S  
CEE3716I  
CEE3717I  
CEE3753I  
CEE3754S  
CEE3236S  
CEE3771I  
EDC5263I  
EDC5264I  
IBM0645S  
CEE3237S  
IBM0646S  
IBM0647S  
IBM0889S  
IBM0890S  
CEE3238S  
IBM0891S  
IBM0892S  
IBM0893S  
IBM0894S  
CEE3239S  
IBM0895S  
IBM0896S  
IBM0897S  
IBM0898S  
CEE3240S  
IGZ0263I  
IGZ0264S  
IGZ0265S  
IGZ0266S  
IGZ0268W  
IGZ0269W

New abend codes: None.

---

### Changed

Changed messages:

CEE5101C  
CEE5727S  
IBM0210S  
IBM0555S  
IBM0562S

IBM0566S  
IBM0570S  
IBM0573S  
IBM0580S  
IBM0583S  
IBM0584S  
IBM0585S  
IBM0586S  
IBM0595S  
IBM0602S  
IBM0603S  
IBM0611S  
IBM0612S  
IBM0613S  
IBM0614S  
IBM0615S  
IBM0616S  
IBM0617S  
IBM0618S  
IBM0619S  
IBM0620S  
IBM0621S  
IBM0622S  
IBM0623S  
IBM0624S  
IBM0625S  
IBM0626S  
IBM0640S  
IBM0641S  
IBM0642S  
IBM0643S  
IBM0644S  
IBM0751S  
IBM0752S  
IBM0753S  
IBM0810S  
IBM0811S  
IBM0819S  
IBM0824S  
IBM0826S  
IBM0827S  
IBM0830S  
IBM0835S  
IBM0837S  
IBM0838S  
IBM0839S  
IBM0841S  
IBM0843S  
IBM0854S  
IBM0860S  
IBM0861S  
IBM0862S  
IBM0863S  
IBM0865S  
IBM0870S  
IBM0882S

IBM0883S  
IBM0884S  
IBM0885S  
IBM0886S  
IBM0887S  
IBM0888S  
IBM0900S  
IBM0913S  
IBM0914S  
IBM0916S  
IBM0930S  
IBM0950S  
IBM0951S  
IBM0952S  
IBM0953S  
IBM0955S

Changed abend codes:

U4036  
U4042  
U4083  
U4084  
U4088  
U4093  
U4094

The following errno2 was changed:

C51000D

---

## Deleted

Deleted messages: None.

Deleted abend codes: None.





---

## Chapter 68. NFS summary of message changes for z/OS V2R1

This topic lists new, changed, and deleted messages for NFS.

All messages for NFS are documented in: *z/OS Network File System Guide and Reference*

---

### New

GFSA572E  
GFSA779I  
GFSA780I  
GFSA5034E

---

### Changed

GFSA361I  
GFSA362I  
GFSA385I

---

### Deleted

Messages retired in V2R1:  
None



---

## Chapter 69. SDSF summary of message changes for z/OS V2R1

The messages for SDSF are documented in *z/OS SDSF Operation and Customization*.

---

### New

ISF041I	ISF781E
ISF042I	ISF782W
ISF050I	ISF783E
ISF051I	ISF784E
ISF052I	ISF785E
ISF053I	ISF786E
ISF054I	ISF787E
ISF055I	ISF788E
ISF056I	ISF789E
ISF057I	ISF790E
ISF058I	ISF791E
ISF115E	ISF792E
ISF121I	ISF793E
ISF166E	ISF794W
ISF167E	ISF865E
ISF778I	ISF866E
ISF779E	ISF867E
ISF780E	ISF868E

---

### Changed

ISF112I

---

### Deleted

None



---

## Chapter 70. Security Server RACF summary of message changes for z/OS V2R1

The messages for RACF are documented in *z/OS Security Server RACF Messages and Codes*.

---

### New

ICH513A	ICH555A	IRRH500I	IRRH501E	IRRH502I	IRRH503E
IRRH504I	IRRH505E	IRRH506I	IRRH507I	IRRD198I	IRRD199I
IRRD200I	IRRD301I	IRRD302I	IRRD303I		

---

### Changed

ICH408I	ICH584I	IRR008I	IRRC130I	IRRD108I	IRRD112I	IRRD117I
IRRD118I	IRRD125I	IRRD135I	IRRD162I	IRRD171I	IRRM096I	

---

### Deleted

ICH513I  
ICH555I



---

## Chapter 71. SMP/E V3R6 summary of message changes for z/OS V2R1

This topic lists new, changed, and deleted non-operator messages for SMP/E V3R6. (New, changed, and deleted messages for SMP/E V3R6 are listed in *SMP/E for z/OS Messages, Codes, and Diagnosis*.)

---

### New

GIM25602I	GIM70523E
GIM36600E	GIM70524E
GIM43502E	GIM70525E
GIM43502S	GIM70526E
GIM43503E	GIM70527E
GIM43503S	GIM70530E
GIM43504E	GIM70531I
GIM43504S	GIM70531E
GIM56301E	GIM70532I
GIM56501I	GIM70532E
GIM69235S	GIM70533E
GIM69236S	GIM70534E
GIM69237S	GIM70535E
GIM69238S	GIM70536E
GIM69239S	GIM70537E
GIM69240S	GIM70538E
GIM69241S	GIM70539E
GIM69242S	GIM70540E
GIM69243S	GIM70541E
GIM69244S	GIM70542E
GIM69245W	GIM70543E
GIM70505S	GIM70544E
GIM70510S	GIM70544S
GIM70511S	GIM70545E
GIM70512S	GIM70546E
GIM70513S	GIM70547E
GIM70514S	GIM70548E
GIM70515S	GIM70549E
GIM70516S	GIM70550S
GIM70517S	GIM70552I
GIM70518S	GIM70560E
GIM70520E	GIM70561E
GIM70521E	GIM70562E
GIM70522E	GIM70563E

GIM70564E  
GIM70565E  
GIM70566E  
GIM70567E  
GIM70568E  
GIM70569E  
GIM70570S  
GIM70580E

GIM70581E  
GIM70582E  
GIM70583E  
GIM70584S  
GIM70585E  
GIM70586E  
GIM70587E  
GIM70588E

---

## Changed

GIM20501I  
GIM20702S  
GIM20703S  
GIM20704S  
GIM25101S

GIM37100S  
GIM39203S  
GIM51611S  
GIM69016S

---

## Deleted

None



---

## Chapter 72. TSO/E summary of message changes for z/OS V2R1

This topic lists new, changed, and deleted non-operator messages for TSO/E. (New, changed, and deleted operator messages for TSO/E are listed in Chapter 56, "BCP and DFSMS summary of message changes for z/OS V2R1," on page 459.)

The non-operator messages for TSO/E are documented in *z/OS TSO/E Messages*. The operator messages for TSO/E are documented in the *z/OS MVS System Messages*:

- For the *z/OS MVS System Messages*, Vol 1, Vol 2, Vol 3, Vol 4, Vol 5, and Vol 6, see *z/OS MVS Data Areas* in the *z/OS Internet library* ([www.ibm.com/systems/z/os/zos/library/bkserv](http://www.ibm.com/systems/z/os/zos/library/bkserv)).
- *z/OS MVS System Messages, Vol 7 (IEB-IEE)*
- *z/OS MVS System Messages, Vol 8 (IEF-IGD)*
- *z/OS MVS System Messages, Vol 9 (IGF-IWM)*
- *z/OS MVS System Messages, Vol 10 (IXC-IZP)*

---

### New

IRX0276E  
IRX0277E  
IRX0278E  
IRX0510E  
IRX0511E

---

### Changed

IKJ55074I  
IKJ58411I  
IKJ58418I  
IKJ58419I  
IRX0240I  
IRX0566E

---

### Deleted

None



---

## Chapter 73. XL C/C++ summary of message changes for z/OS V2R1

The messages for XL C/C++ are documented in *z/OS XL C/C++ Messages*.

---

### New

CCN1145	CCN6692
CCN2407	CCN7534
CCN2476	CCN7535
CCN4483	CCN7536
CCN4485	CCN7537
CCN4500	CCN8127
CCN4501	CCN8157
CCN4502	CCN8421
CCN4503	CCN8426
CCN4504	CCN8461
CCN4505	CCN8462
CCN4506	CCN8463
CCN4507	CCN8464
CCN4508	CCN8465
CCN4509	CCN8466
CCN6306	CCN8467
CCN6307	CCN8468
CCN6308	CCN8469
CCN6309	CCN8470
CCN6310	CCN8471
CCN6311	CCN8472
CCN6312	CCN8473
CCN6388	CCN8474
CCN6389	CCN8475
CCN6390	CCN8660
CCN6648	CCN8661
CCN6649	CCN8662
CCN6650	CCN8663
CCN6670	CCN8664
CCN6671	CCN8665
CCN6672	CCN8666
CCN6679	CCN8667
CCN6688	CCN8668
CCN6689	CCN8669
CCN6690	CCN8670
CCN6691	CCN8800

CCN8801	CCN8968
CCN8816	CCN8969
CCN8817	CCN8970
CCN8887	CCN8971
CCN8888	CCN8972
CCN8891	CCN8973
CCN8903	CCN8974
CCN8918	CCN8975
CCN8922	CCN8976
CCN8923	CCN8977
CCN8925	CCN8978
CCN8926	CCN8979
CCN8927	CCN8980
CCN8931	CCN8981
CCN8959	CCN8984
CCN8960	CCN8985
CCN8966	CDA3505
CCN8967	

---

## Changed

CCN1131	CCN3437
CCN2102	CCN3442
CCN2103	CCN3443
CCN2104	CCN3730
CCN2105	CCN3737
CCN2106	CCN4430
CCN2107	CCN5539
CCN2108	CCN6122
CCN2180	CCN6280
CCN2181	CCN6290
CCN2182	CCN6606
CCN2183	CCN7643
CCN2464	CCN8434
CCN2465	CCN8445
CCN2466	CCN8460
CCN2474	CCN8885
CCN2475	CCN8939
CCN3022	CDA3419
CCN3420	

---

## Deleted

CCN5734	CCN8948
CCN5735	CCN8949
CCN6627	CCN8951
CCN8921	CCN8956

CCN8957  
CCN8965



---

## Chapter 74. z/OS UNIX summary of message changes for z/OS V2R1

This topic lists new, changed, and deleted messages, reason codes, and return codes for z/OS UNIX. They are documented in *z/OS UNIX System Services Messages and Codes*.

---

### New

#### Messages

FDBX0557  
FDBX0823  
FDBX0824  
FDBX0826  
FOMF126I  
FOMF127I  
FOMF128I  
FOMF129I  
FOMF161I  
FSUM1274  
FSUM1275  
FSUMF421  
FSUMF422  
FSUMF424  
FSUMF425  
FSUMF426

#### Reason codes

X'062E' (JrMountedUnowned); missing in previous releases.  
X'062A' (JrAlreadyUnDubbed); missing in previous releases.  
X'062B' (JrRemntMode); missing in previous releases.  
X'062D' (JrAsyncAnr); missing in previous releases.  
X'0638' (JrInAddrAnyNotAllowed); missing in previous releases.  
X'736C' (JRTTLSStopReadDataPending)  
X'736D' (JRTTLSStopWriteDataPending)  
X'736E' (JRInvalidFilter)

#### Return codes

The following reason codes are new.

065C (JrPtInvVRNumber)  
065D (JrPtVRNotSupported)

---

### Changed

#### Messages

FOMF0102I  
FSUM7131  
FSUM7963  
FSUMF143  
FSUMF174

### **Reason codes**

X'00DC' (JRSAFNotAuthorized)  
X'0316' (JrShmBadSize)

### **Return codes**

X'012A' (JrInvParmLength)  
X'051B' (JrJobNameNotValid)  
X'721D' (JrConfigErr)  
X'7314' (JrInvalidValue)  
X'734A' (JrIarv64Error)

---

## **Deleted**

### **Messages**

There were no deleted messages in V2R1.

### **Reason codes**

X'004A' (JrAppcCheckState)  
X'0014' (JrAppcErrAlloc)  
X'0016' (JrAppcErrSend)  
X'0015' (JrAppcErrRecv)  
X'0016' (JrappcErrAccept)  
X'0547' (JrDefUidNotAllowed)  
X'0120' (JrAppcErrRecvIncomp)

### **Return codes**

There were no deleted return codes in V2R1.



---

## **Part 4. Summary of message and code changes for z/OS V1R13**

The topics list new, changed, and deleted messages for z/OS V1R13 elements and features. All message changes are in element specific topics.

## **z/OS V1R13 messages**

---

## Chapter 75. BCP and DFSMS summary of message changes for z/OS V1R13

This topic lists new, changed, and deleted messages for BCP, DFSMSdftp, DFSMSdss, DFSMSHsm, DFSMSrmm, and DFSMSStvs. It also lists new, changed, and deleted operator messages for RMF and TSO/E. (New, changed, and deleted non-operator messages for TSO/E are in Chapter 93, "TSO/E summary of message changes for z/OS V1R13," on page 577.) All the messages in this section are grouped together, without distinction as to element or feature.

All messages for the BCP and DFSMS, as well as the operator messages for RMF and TSO/E, are documented in:

- *z/OS MVS System Messages, Vol 1 (ABA-AOM)*
- *z/OS MVS System Messages, Vol 2 (ARC-ASA)*
- *z/OS MVS System Messages, Vol 3 (ASB-BPX)*
- *z/OS MVS System Messages, Vol 4 (CBD-DMO)*
- *z/OS MVS System Messages, Vol 5 (EDG-GFS)*
- *z/OS MVS System Messages, Vol 6 (GOS-IEA)*
- *z/OS MVS System Messages, Vol 7 (IEB-IEE)*
- *z/OS MVS System Messages, Vol 8 (IEF-IGD)*
- *z/OS MVS System Messages, Vol 9 (IGF-IWM)*
- *z/OS MVS System Messages, Vol 10 (IXC-IZP)*

---

### New

- ADR185W
- ADR560E
- ADR561E
- ADR562E
- ADR564E
- ADR565I
- ADR566E
- ADR567E
- ADR568I
- ADR569I
- ADR599I
- ADR803I
- ADR925W
- ADYH005E
- ADYH006E
- AIR039I
- AIR040I
- AIR041I
- AIR042I
- AIR573I
- AIR574I
- AIZ002I
- AIZ003I
- AIZ004I
- AIZ005I
- AIZ006I
- AIZ007I
- AIZ008I
- AIZ009I
- AIZ010I
- AIZ011I
- AIZ012I
- AIZ013I
- AIZ014I
- AIZ015I
- AIZ016I
- AIZ017I
- AIZ018I
- AIZ019I
- AIZ020I
- AIZ021I
- AIZ022I
- AIZ023I
- AIZ024I
- AIZ025I
- AIZ026I
- AIZ027I
- AIZ028I

- AMA770I
- AMA771I
- AMA772I
- AMA773I
- AMA774I
- AMA775I
- AMD125I
- ANTA5500E
- ANTA5501E
- ANTB8002I
- ANTI1038E
- ANTI8037I
- ANTQ8286I
- ANTQ8287I
- ANTQ8288I
- ANTQ8290I
- ANTS5170W
- ANTU2200I
- ANTU2201E
- ANTU2202I
- ANTU2203I
- ANTU2204I
- ANTU2205I
- ANTU2206E
- ANTU2207I
- ANTU2208I
- ANTU2210I
- ANTU2211I
- ANTU2212I
- ANTU2213I
- ANTU2214I
- ANTU2216I
- ANTU2217A
- ANTU2218I
- ANTU2219I
- ANTU2221I
- ANTU2222I
- ANTX5129E
- ANTX5130W
- ANTX5132W
- ANTX5133E
- ANTX5134E
- ANTX5135W
- ANTX5136E
- ANTX5139E
- ANTX5140E
- ANTX5151E
- ANTX8060I
- ANTX8061E
- ANTX8062W
- ANTX8063I
- ANTX8064E
- ANTX8070I
- ANTX8071I
- ANTX8072I
- ANTX8073I
- ANTX8074I
- ANTX8144I
- ANTX8145I
- ANTX8147I
- ANTX8148I
- ANTX8155I
- ANTX8158I
- ANTX8159I
- ANTX8160I
- ANTX8169I
- ANTX8170W
- ANTX8172I
- ANTX8173W
- ANTX8174W
- ANTX8175I
- ANTX8176I
- ANTX8177W
- ANTF0510E
- ANTF0511E
- ANTP0274E
- ANTP7132E
- ANTP8803I
- ANTP8804I
- ANTP8807I
- ANTP8809I
- ATR247E

---

## Changed

- |           |           |
|-----------|-----------|
| ADR263E   | ANTI1015E |
| ADR380E   | ANTI1020I |
| ADR472E   | ANTI1025E |
| AIRH148E  | ANTI8027I |
| AMA152I   | ANTX8032W |
| AMD083I   | ANTQ8243I |
| AMD104I   | ANTQ8255I |
| ANTI1000I | ANTQ8257I |
| ANTI1001E | ANTQ8288I |
| ANTI1011E | ANTX8902I |

ANTX8905I	ARC1812I
ANTF0425I	ARC1823I
ARC0006I	ARC1834I
ARC0019I	ARC1836I
ARC0036E	ARC6087I
ARC0103I	ARC6088E
ARC0153I	BPXF035I
ARC0161I	BPXO043I
ARC0185I	BPXO044I
ARC0223I	BPXO045I
ARC0235I	BPXO051I
ARC0260I	BPXO063I
ARC0434E	CNZ6002I
ARC0503E	CNZZ001I
ARC0508I	CNZZ002E
ARC0541I	CNZZ003I
ARC0550I	CNZZ004E
ARC0553I	CNZZ010E
ARC0570I	CNZZ014E
ARC0580I	CNZZ019I
ARC0601E	CNZZ042I
ARC0604I	CNZZ043I
ARC0647I	CSV550I
ARC0704E	CSV470I
ARC0744E	CUN4026I
ARC0750I	CBR9843I
ARC1106I	DMO0012I
ARC1128I	DMO0050I
ARC1159I	DMO0051I
ARC1169I	DMO0052E
ARC1177I	DMO0053E
ARC1194I	DMO0054I
ARC1207I	EDG2420I
ARC1219I	EDG2421I
ARC1244I	EDG2424I
ARC1277I	EDG2425I
ARC1288I	EDG2426I
ARC1311I	EDG2427I
ARC1334I	EDG2428I
ARC1377I	EDG6680E
ARC1543I	EDG9114I
ARC1605I	EDG9115I
ARC1806E	EDG9116I
ARC1807I	ERB246I
ARC1809I	ERB247I

ERB324I	IEC029I
ERB803I	IEC030I
ERB812I	IEC036I
ERB818I	IEC143I
HIS019I	IEC145I
HWI003I	IEC147I
HWI008I	IEC161I
HWI009I	IEC218I
HWI011I	IEC708I
HWI013I	IEC709I
HWI014I	IEC710I
HWI019I	IEC711I
HWI020I	IEC712I
HWI021I	IEC988I
HZR0106I	IEE064I
HZR0107I	IEE174I
HZR0110I	IEE241I
HZS0200I	IEE254I
HZS0201I	IEE334I
HZS0202I	IEE459I
IAR007I	IEE479W
IAR019I	IEF017I
IAR021I	IEF157E
IDAI1001E	IEF287I
IDAI1002E	IEF377I
IDC3009I	IEF378I
IDC3309I	IEF379I
IDC11468I	IEF384I
IDC31617I	IEF893I
IEA015A	IEFA003I
IEA074I	IEW2690E
IEA080D	IEW4007I
IEA195I	IFA700I
IEA253I	IFA701I
IEA321I	IFA702I
IEA394A	IFA704I
IEA436I	IFA706I
IEA437I	IFA707I
IEA491E	IFA708I
IEA494I	IFA709I
IEA611I	IFA710I
IEA794I	IFA711I
IEA911E	IFA714I
IEC022I	IFA715I
IEC026I	IFA716I

IFA717I	ISG378I
IFA832I	IWM025I
IFA840I	IWM064I
IGD002I	IXC328I
IGD031I	IXC338I
IGD01019I	IXC347I
IGD17268I	IXC357I
IGD17351I	IXC359I
IGDH1011E	IXC360I
IGF513I	IXC361I
IGW048A	IXC362I
IGW451I	IXC374I
IGW612I	IXC375I
IGW612I	IXC510I
IGW701I	IXC517I
IGW838I	IXC518I
IGWRH0120I	IXC522I
IGWRH0121I	IXC538I
IGWRH0122I	IXC568I
IOS085I	IXC574I
IOS500I	IXC574I
IOS103I	IXG033E
IOSHM0201I	IXG210E
IOSHM0501I	IXG310I
IRA860I	IXG311I
IRA861I	IXG601I
ISG008E	IXG651I
ISG009D	IXG652I
ISG221I	IXG653I
ISG343I	IXL015I
ISG344I	IXL020I
ISG377I	IXL021I

---

## Deleted

EDG0300I	EDG0306I
EDG0301I	EDG2241E
EDG0302I	IAR007I
EDG0303D	IEC102I
EDG0304I	IRA251I
EDG0305I	IXC335I

---

## Dump output messages

z/OS V1R13 introduced no new, changed, or deleted dump output messages.

---

## MVS System Codes

For explanations and additional details, see *z/OS MVS System Codes*.

### New:

- 006
- EC6: 0794 and 0795, 0401 - 0791, 0794, 0795, 07E0 - 081C.
- EC7: 0090070 - 00090073, 00150031
- 582, 585
- 683, 684, 685
- 8FB
- 9C7, AC5
- D82, D83, D84, D85, DFB
- E82, E83, E84, E85

### Changed wait state codes:

- 074

### Changed system completion codes:

- 02A
- 02B
- 042
- 05C
- 066
- 0B0
- 0B5
- 0BA
- 18A
- 18F
- 422
- 66D
- 7C4
- 800
- 8FB
- B78
- D22
- DFB
- EC6
- EC7
- EFB

### Deleted:

Although the following RACF system completion codes are still in use, to avoid redundancy they are deleted from *z/OS MVS System Codes*. Instead, find the complete descriptions in *z/OS Security Server RACF Messages and Codes*:

- 182, 183, 185, 18F
- 282, 283, 285
- 382, 383, 385, 3C7
- 482, 483, 485, 4C6, 4C7



---

## **Chapter 76. CIM summary of message changes for z/OS V1R13**

The messages for Common Information Model (CIM) are documented in z/OS *Common Information Model User's Guide*.



---

## Chapter 77. Communications Server summary of message changes for z/OS V1R13

The messages for Communications Server are documented in:

- *z/OS Communications Server: IP Messages Volume 1 (EZA)*
- *z/OS Communications Server: IP Messages Volume 2 (EZB, EZD)*
- *z/OS Communications Server: IP Messages Volume 3 (EZY)*
- *z/OS Communications Server: IP Messages Volume 4 (EZZ, SNM)*
- *z/OS Communications Server: SNA Messages*

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### New

EZA5208E	EZZ2619I
EZAOP60I	EZZ2620I
EZBH014I	EZZ2672I
EZBH015E	EZZ2673I
EZBH016I	EZZ2674I
EZBH017I	EZZ2675I
EZBH018E	EZZ2676I
EZBH019I	EZZ3028I
EZBH020I	EZZ3029I
EZBH021E	EZZ3030I
EZBH022I	EZZ3066I
EZD0049I	EZZ8171I
EZD1160I	EZZ8346I
EZD1823I	EZZ8666I
EZD1827I	EZZ8667I
EZD1852I	EZZ8668I
EZD1862I	EZZ8669I
EZD1863I	EZZ8670I
EZD1924I	EZZ8671I
EZD1925I	EZZ8672I
EZD1974E	EZZ8673I
EZD2015I	EZZ8674I
EZD2018I	EZZ8675I
EZD2035I	EZZ8676I
EZD2036I	EZZ8677I
EZD2037E	EZZ8678I
EZYTE90W	EZZ8730I
EZZ2611I	EZZ9311E
EZZ2612I	EZZ9312I
EZZ2613I	EZZ9313I
EZZ2614I	IST2344I

IST2345I  
IST2346I

IST2347I  
IST2360I

---

## Changed

The following messages were changed in this release:

EZA5544E  
EZAOP47I  
EZD0044I  
EZD0832I  
EZD1069I  
EZD1214I  
EZD1312I  
EZD1726I  
EZD1806I  
EZD1825I  
EZY2638I  
EZZ0600I  
EZZ4223I  
EZZ6012I  
EZZ6023I  
EZZ6040I  
EZZ6049I  
EZZ8453I  
EZZ8455I  
EZZ8507I  
EZZ8644I  
EZZ8648I  
EZZ8649I  
EZZ8653I  
EZZ8654I  
EZZ8655I  
EZZ8656I  
EZZ8657I  
EZZ8662I  
EZZ8663I

EZZ8664I  
EZZ8665I  
EZZ8761I  
EZZ8769I  
EZZ8773I  
EZZ8774I  
EZZ9297E  
EZZ9298I  
EZZ9304I  
EZZ9327I  
EZZ9679E  
IST315I  
IST317I  
IST460I  
IST495I  
IST967I  
IST1054I  
IST1128I  
IST1221I  
IST1306I  
IST1345I  
IST1350I  
IST1370I  
IST1717I  
IST2130I  
IST2298I  
IST2299I  
IST2331I  
IST2332I  
IST2333I

---

## Deleted

EZD1729I  
EZD1931I  
IST318I  
IST1659I  
IST1741I  
ISTH003I  
ISTH004E

ISTH007I  
ISTH008E  
IVT5602I

---

## Chapter 78. Cryptographic Services ICSF summary of message changes for z/OS V1R13

The messages for Cryptographic Services Integrated Cryptographic Service Facility (ICSF) are documented in *z/OS Cryptographic Services ICSF Messages*.

---

### New

- ICSF FMID HCR7780:
    - CSFG0866
    - CSFM050I
    - CSFM051E
    - CSFM130I
    - CSFM420E
    - CSFM530I
    - CSFM531I
    - CSFM614I
    - CSFO0236
    - CSFV0560
- 

### Changed

None.

---

### Deleted

- ICSF FMID HCR7780:
  - CSFC0254
  - CSFC0266
  - CSFC0294



---

## Chapter 79. Cryptographic Services PKI Services summary of message changes for z/OS V1R13

The messages for PKI Services are documented in *z/OS Cryptographic Services PKI Services Guide and Reference*.

---

### New

IKYC077I  
IKYC078I  
IKYC079I  
IKYC080I  
IKYC081I  
IKYC082I  
IKYC083I  
IKYC084I  
IKYD002I  
IKYD003I  
IKYU018I

---

### Changed

IKYP030I

---

### Deleted

None





---

## Chapter 80. DFSORT summary of message changes for z/OS V1R13

The messages for DFSORT are documented in *z/OS DFSORT Messages, Codes and Diagnosis Guide*.

---

### New

- ICE290A
- ICE291I

---

### Changed

- ICE000I
- ICE015A
- ICE034A
- ICE083A
- ICE099A
- ICE121A
- ICE114A
- ICE118I
- ICE141A
- ICE189A
- ICE217A
- ICE234A
- ICE236I
- ICE243A
- ICE244A
- ICE245A
- ICE272A
- ICE276A
- ICE283A
- ICE285A

---

### Deleted

Messages retired in V1R13:

- None



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## Chapter 81. Distributed File Service summary of message changes for z/OS V1R13

The messages for Distributed File Service are documented in *z/OS Distributed File Service Messages and Codes*.

---

### New

The following messages were added:

IOEN00515I  
IOEZ00579I  
IOEZ00718I  
IOEZ00727I  
IOEP00001A  
IOEZ00587I  
IOEZ00719I  
IOEZ00728I  
IOEZ00743I  
IOEP00002A  
IOEZ00643I  
IOEZ00720I  
IOEZ00731I  
IOEZ00744I  
IOEZ00644I  
IOEZ00721I  
IOEZ00736I  
IOEZ00745E  
IOEZ00382I  
IOEZ00645I  
IOEZ00724I  
IOEZ00740E  
IOEZ00746E  
IOEZ00386I  
IOEZ00646I  
IOEZ00725I  
IOEZ00741I  
IOEZ00747I

The following EFXxxx reason codes were added:

614C  
6A2E  
69C1  
6A2F  
6A2A  
6A30  
6A2B  
6A31  
6A2C  
6A2D

---

## Changed

The following messages have changed:

IOEZ00051I  
IOEZ00660I  
IOEZ00057I  
IOEZH0010I  
IOEZ00326E  
IOEZH0012I  
IOEZ00338A  
IOEZ00422E  
IOEZ00548I

The following EFxxxx reason codes have changed:

6055  
6058  
663F

---

## Deleted

The messages listed in Table 220 are no longer issued by their respective subcomponents.

Table 220. V1R13 messages no longer issued by DFS components

Subcomponent	Messages no longer issued
Basic OverSeer Server (boserver) and <b>bos</b> commands	IOEB03001E IOEB03002E IOEB03003E IOEB03004E IOEB03006E IOEB03007E IOEB03009E
	IOEB03010E IOEB03011E IOEB03013E IOEB03015E IOEB03016E IOEB03017E IOEB03018E
	IOEB03023E IOEB03024E IOEB03025E IOEB03026E IOEB03027E IOEB03028E IOEB03029E
	IOEB03030E IOEB03031E IOEB03032E IOEB03033E IOEB03034E IOEB03035E IOEB03036E
	IOEB03037E IOEB03038E IOEB03039E IOEB03040E IOEB03041E IOEB03042E IOEB03043E
	IOEB03044E IOEB03045E IOEB03046E IOEB03047E IOEB03048E IOEB03049E IOEB03050E
	IOEB03051E IOEB03061E IOEB03062E IOEB03063E IOEB03064E IOEB03066E IOEB03067E
	IOEB03068E IOEB03069E IOEB03070E IOEB03071E IOEB03072E IOEB03073E IOEB03074E
	IOEB03075E IOEB03076E IOEB03077E IOEB03078E IOEB03082E IOEB03083E IOEB03084E
	IOEB03085E IOEB03086E IOEB03087E IOEB03088E IOEB03090E IOEB03092E IOEB03101E
	IOEB03102E IOEB03110E IOEB03111E IOEB03112E IOEB03113E IOEB03117E IOEB03118E
	IOEB03119E IOEB03120E IOEB03121E IOEB03123E IOEB03124E IOEB03125E IOEB03126E
	IOEB03127E IOEB03128E IOEB03129E IOEB03130E IOEB03131E IOEB03132E IOEB03133E
	IOEB03134E IOEB03135E IOEB03136E IOEB03137E IOEB03138E IOEB03139E IOEB03140E
	IOEB03141E IOEB03142E IOEB03143E IOEB03144I IOEB03145E IOEB03146E IOEB03147E
	IOEB03148E IOEB03149E IOEB03150E IOEB03151E IOEB03152E IOEB03153E IOEB03154E
	IOEB03155E IOEB03156E IOEB03157E IOEB03158E IOEB03159E IOEB03160E IOEB03161E
	IOEB03162E IOEB03163E IOEB03164E IOEB03165E IOEB03166E IOEB03167E IOEB03168E
	IOEB03169I IOEB03170E IOEB03171I IOEB03172I IOEB03585I IOEB03586E IOEB03587I
	IOEB03588I IOEB03589E IOEB03590E IOEB03592I IOEB03593E IOEB03596E IOEB03597E
	IOEB03598E IOEB03599E IOEB03600E IOEB03601E IOEB03602E IOEB03603E IOEB03604E
	IOEB03605E IOEB03606E IOEB03607E IOEB03608E IOEB03609E IOEB03610E IOEB03619E
	IOEB03621E IOEB03622E IOEB03623E IOEB03624E IOEB03625E IOEB03628E IOEB03629E
	IOEB03631E IOEB03632E IOEB03633E IOEB03634E IOEB03636E IOEB03644E IOEB03651E
	IOEB03652E IOEB03653E IOEB03654E IOEB03657E IOEB03660E IOEB03661E IOEB03662E
	IOEB03663E IOEB03664E IOEB03665E IOEB03666E IOEB03668E IOEB03669E IOEB03670E
	IOEB03671E IOEB03672E IOEB03673E IOEB03674E IOEB03675E IOEB03676E IOEB03677E
	IOEB03699E IOEB03700E IOEB03701E IOEB03703E IOEB03704E IOEB03705E IOEB03707E

Table 220. V1R13 messages no longer issued by DFS components (continued)

Subcomponent	Messages no longer issued								
DFS Client (Cache Manager) and cm commands	IOEC04096I	IOEC04097I	IOEC04101I	IOEC04102A	IOEC04103A	IOEC04104A	IOEC04105A		
	IOEC04106A	IOEC04107I	IOEC04108I	IOEC04109I	IOEC04110A	IOEC04112I	IOEC04113A		
	IOEC04114A	IOEC04115I	IOEC04116I	IOEC04117I	IOEC04118I	IOEC04119I	IOEC04120I		
	IOEC04121I	IOEC04122A	IOEC04123A	IOEC04124A	IOEC04125A	IOEC04126I	IOEC04127A		
	IOEC04128A	IOEC04129A	IOEC04130A	IOEC04131A	IOEC04132A	IOEC04133A	IOEC04134A		
	IOEC04135A	IOEC04136A	IOEC04137A	IOEC04138I	IOEC04139I	IOEC04140I	IOEC04141I		
	IOEC04142A	IOEC04143I	IOEC04144I	IOEC04145I	IOEC04146A	IOEC04147I	IOEC04148A		
	IOEC04149I	IOEC04150I	IOEC04151I	IOEC04152A	IOEC04153I	IOEC04154I	IOEC04155A		
	IOEC04156I	IOEC04157I	IOEC04158A	IOEC04159I	IOEC04160A	IOEC04161I	IOEC04162A		
	IOEC04163I	IOEC04164A	IOEC04166I	IOEC04167I	IOEC04168A	IOEC04169A	IOEC04170A		
	IOEC04171A	IOEC04172A	IOEC04173A	IOEC04174A	IOEC04175A	IOEC04176A	IOEC04177A		
	IOEC04178I	IOEC04179A	IOEC04180A	IOEC04181A	IOEC04182A	IOEC04183I	IOEC04184I		
	IOEC04185I	IOEC04186A	IOEC04187A	IOEC04188A	IOEC04189A	IOEC04190A	IOEC04191A		
	IOEC04192A	IOEC04193A	IOEC04194A	IOEC04195I	IOEC04196A	IOEC04197A	IOEC04198I		
	IOEC04199I	IOEC04200I	IOEC04201I	IOEC04202A	IOEC04203I	IOEC04204I	IOEC04205I		
	IOEC04206I	IOEC04207A	IOEC04208A	IOEC04209A	IOEC04210A	IOEC04211A	IOEC04212A		
	IOEC04213A	IOEC04214A	IOEC04215I	IOEC04216I	IOEC04217I	IOEC04218I	IOEC04219I		
	IOEC04220I	IOEC04221I	IOEC04222I	IOEC04223I	IOEC04224I	IOEC04225I	IOEC04226A		
	IOEC04227A	IOEC04228A	IOEC04229A	IOEC05001E	IOEC05002E	IOEC05003E	IOEC05004I		
	IOEC05005E	IOEC05006E	IOEC05007E	IOEC05008E	IOEC05009E	IOEC05011E	IOEC05020E		
	IOEC05027E	IOEC05028E	IOEC05029E	IOEC05033E	IOEC05034E	IOEC05037E	IOEC05201I		
	IOEC05202E	IOEC05203E	IOEC05204E	IOEC05205E	IOEC05206E	IOEC05207E	IOEC05208E		
	IOEC05209E	IOEC05210I	IOEC05211E	IOEC05212E	IOEC05213E	IOEC05214E	IOEC05215I		
	IOEC05216E	IOEC05217E	IOEC05218E	IOEC05219E	IOEC05220E	IOEC05221E	IOEC05222E		
	IOEC05223E	IOEC05224E	IOEC05225E	IOEC05226E	IOEC05227E	IOEC05228I	IOEC05229I		
	IOEC05230I	IOEC05231E	IOEC05232E	IOEC05233E	IOEC05234E	IOEC05235E	IOEC05236E		
	IOEC05237E	IOEC05238E	IOEC05239E	IOEC05240E	IOEC05241E	IOEC05242E	IOEC05243E		
	IOEC05244E	IOEC05245I	IOEC05246I	IOEC05247E	IOEC05248I	IOEC05249I	IOEC05250E		
	IOEC05251I	IOEC05252E	IOEC05253E	IOEC05254E	IOEC05255I	IOEC05256I	IOEC05257I		
	IOEC05258I	IOEC05259I	IOEC05260I	IOEC05261I	IOEC05262I	IOEC05263I	IOEC05264I		
	IOEC05265I	IOEC05266I	IOEC05267E	IOEC05268E	IOEC05269I	IOEC05270I	IOEC05271I		
	IOEC05272I	IOEC05273I	IOEC05274I	IOEC05275I	IOEC05276I	IOEC05277I	IOEC05278I		
	IOEC05279I	IOEC05280I	IOEC05281I	IOEC05282I	IOEC05283I	IOEC05284E	IOEC05285E		
	IOEC05286I	IOEC05287E	IOEC05288E	IOEC05289E	IOEC05290E	IOEC05291E	IOEC05292E		
	IOEC05293E	IOEC05294E	IOEC05295E	IOEC05296E	IOEC05297E	IOEC05298E	IOEC05299E		
	IOEC05300E	IOEC05301E	IOEC05302E	IOEC05303E	IOEC05304E	IOEC05305E	IOEC05306E		
	IOEC05307E	IOEC05308E	IOEC05309E	IOEC05310E	IOEC05311I	IOEC05312I	IOEC05313I		
	IOEC05318I	IOEC05319I							
	DFS Configuration Program (dfsconf)	IOED01016I	IOED01017I	IOED01018I	IOED01019I	IOED01020I	IOED01021I	IOED01022I	
		IOED01023I	IOED01024I	IOED01032I	IOED01033I	IOED01034I	IOED01035I	IOED01036A	
		IOED01037E	IOED01038E	IOED01039E	IOED01040E	IOED01041E	IOED01042E	IOED01043E	
		IOED01044I	IOED01045E	IOED01046E	IOED01047E	IOED01048E	IOED01049A	IOED01050A	
		IOED01051A	IOED01052E	IOED01060I	IOED01061I	IOED01062I	IOED01063A	IOED01064E	
		IOED01065E	IOED01066E	IOED01067E	IOED01069I	IOED01070A	IOED01075A	IOED01076A	

Table 220. V1R13 messages no longer issued by DFS components (continued)

Subcomponent	Messages no longer issued						
Fileset Server (ftserver) and <b>fts</b> commands	IOEF06001E	IOEF06004A	IOEF06005A	IOEF06006A	IOEF06007A	IOEF06008A	IOEF06009A
	IOEF06010I	IOEF06011A	IOEF06016E	IOEF06017E	IOEF06018E	IOEF06019E	IOEF06020E
	IOEF06026E	IOEF06031I	IOEF06032E	IOEF06033E	IOEF06046E	IOEF06047E	IOEF06048E
	IOEF06067E	IOEF06068E	IOEF06071E	IOEF06074I	IOEF06075E	IOEF06081E	IOEF06083E
	IOEF06084E	IOEF06085I	IOEF06086I	IOEF06087E	IOEF06501E	IOEF06502E	IOEF06503E
	IOEF06504E	IOEF06505E	IOEF06506E	IOEF06509E	IOEF06513E	IOEF06519E	IOEF06520E
	IOEF06522E	IOEF06523E	IOEF06524E	IOEF06525E	IOEF06526E	IOEF06527E	IOEF06528E
	IOEF06529E	IOEF06530E	IOEF06531E	IOEF06532E	IOEF06536E	IOEF06538E	IOEF06540E
	IOEF06548E	IOEF06550E	IOEF06552I	IOEF06553E	IOEF06555E	IOEF06557E	IOEF06558E
	IOEF06559E	IOEF06560E	IOEF06561E	IOEF06566E	IOEF06571E	IOEF06575E	IOEF06576E
	IOEF06577E	IOEF06578E	IOEF06579E	IOEF06580E	IOEF06581E	IOEF06586E	IOEF06587E
	IOEF06588E	IOEF06589E	IOEF06590E	IOEF06591E	IOEF06592E	IOEF06594E	IOEF06595E
	IOEF06596E	IOEF06597E	IOEF06598E	IOEF07062E	IOEF07063E	IOEF07064E	IOEF07065E
	IOEF07113E	IOEF07114E	IOEF07115E	IOEF07116E	IOEF07117E	IOEF07118E	IOEF07119E
	IOEF07120E	IOEF07121E	IOEF07122E	IOEF07123E	IOEF07124E	IOEF07125E	IOEF07126E
	IOEF07127I	IOEF07128E	IOEF07129I	IOEF07130E	IOEF07131E	IOEF07132E	IOEF07133E
	IOEF07136E	IOEF07137E	IOEF07138E	IOEF07139E	IOEF07140E	IOEF07141E	IOEF07145E
	IOEF07147E	IOEF07151E	IOEF07152E	IOEF07154E	IOEF07155E	IOEF07156I	IOEF07157E
	IOEF07158E	IOEF07159E	IOEF07160E	IOEF07161E	IOEF07162E	IOEF07163E	IOEF07164E
	IOEF07165E	IOEF07166E	IOEF07167E	IOEF07168E	IOEF07169E	IOEF07170E	IOEF07171E
	IOEF07172E	IOEF07173E	IOEF07174E	IOEF07175E	IOEF07176E	IOEF07177E	IOEF07179E
	IOEF07180E	IOEF07181E	IOEF07182E	IOEF07183E	IOEF07184E	IOEF07185E	IOEF07186E
	IOEF07187E	IOEF07208E	IOEF07209E	IOEF07210E	IOEF07211E	IOEF07212E	IOEF07213E
	IOEF07214E	IOEF07215E	IOEF07216E	IOEF07217E	IOEF07218E	IOEF07219E	IOEF07220E
	IOEF07221E	IOEF07222E	IOEF07223E	IOEF07224E	IOEF07231E	IOEF07232E	IOEF07233E
	IOEF07234E	IOEF07235E	IOEF07237E	IOEF07239E	IOEF07240E	IOEF07241E	IOEF07245E
	IOEF07246E	IOEF07247E	IOEF07248E	IOEF07249E	IOEF07250E	IOEF07251E	IOEF07252E
	IOEF07253E	IOEF07254E	IOEF07255E	IOEF07256E	IOEF07257E	IOEF07258E	IOEF07259E
	IOEF07260E	IOEF07261E	IOEF07262E	IOEF07263E	IOEF07264E	IOEF07265E	IOEF07266E
	IOEF07267E	IOEF07268E	IOEF07269E	IOEF07270E	IOEF07271E	IOEF07272E	IOEF07273E
	IOEF07274E	IOEF07275E	IOEF07276E	IOEF07277E	IOEF07280E	IOEF07281E	IOEF07282E
	IOEF07283E	IOEF07284E	IOEF07285E	IOEF07286E	IOEF07287E	IOEF07288E	IOEF07289E
	IOEF07290E	IOEF07291E	IOEF07292E	IOEF07293E	IOEF07294E	IOEF07295E	IOEF07296E
	IOEF07297E	IOEF07298E	IOEF07299E	IOEF07301I	IOEF07303E	IOEF07304E	IOEF07305E
	IOEF07306E	IOEF07307E	IOEF07308E	IOEF07309E	IOEF07310E	IOEF07311E	IOEF07313E
	IOEF07315E	IOEF07316E	IOEF07317E	IOEF07319E	IOEF07320E	IOEF07321E	IOEF07322E
	IOEF07323E	IOEF07324E	IOEF07325E	IOEF07326E	IOEF07327E	IOEF07349E	IOEF07350E
	IOEF07351E	IOEF07352E	IOEF07353E	IOEF07354E	IOEF07355E	IOEF07356E	IOEF07357E
	IOEF07358E	IOEF07359E	IOEF07360E	IOEF07361E	IOEF07362E	IOEF07363E	IOEF07364E
	IOEF07365E	IOEF07366E	IOEF07442E	IOEF07443E	IOEF07444E	IOEF07445E	IOEF07446I
	IOEF07447E	IOEF07451E	IOEF07452E	IOEF07454E	IOEF07455E	IOEF07456E	IOEF07457E
	IOEF07460E	IOEF07461I	IOEF07462E	IOEF07463E	IOEF07464E	IOEF07465E	IOEF07466E
	IOEF07467E	IOEF07468E	IOEF07469E	IOEF07470E	IOEF07471E	IOEF07472E	IOEF07473E
	IOEF07474E	IOEF07475E	IOEF07477E	IOEF07478E	IOEF07479I	IOEF07480E	IOEF07481E
	IOEF07482E	IOEF07483E	IOEF07484E	IOEF07485E	IOEF07486E	IOEF07487E	IOEF07488E
	IOEF07489E	IOEF07490E	IOEF07491E	IOEF07492E	IOEF07493E	IOEF07494E	IOEF07495I
	IOEF07496E	IOEF07497E	IOEF07498E	IOEF07499E	IOEF07500E	IOEF07501E	IOEF07502E
	IOEF07503E	IOEF07504E	IOEF07505E	IOEF07506E	IOEF07507E	IOEF07508E	IOEF07510E
	IOEF07511E	IOEF07527E	IOEF07528E	IOEF07529E	IOEF07530E	IOEF07531E	IOEF07532E
	IOEF07533E	IOEF07534E	IOEF07535E	IOEF07536E	IOEF07537E	IOEF07538E	

Table 220. V1R13 messages no longer issued by DFS components (continued)

Subcomponent	Messages no longer issued								
Backup Server (bakserver) and <b>bak</b> commands	IOEH08501E	IOEH08502E	IOEH08503E	IOEH08504E	IOEH08505E	IOEH08506E	IOEH08507E		
	IOEH08508E	IOEH08509E	IOEH08510E	IOEH08573E	IOEH08578E	IOEH08580I	IOEH08581E		
	IOEH08582E	IOEH08583E	IOEH08584E	IOEH08596E	IOEH08604E	IOEH08605E	IOEH08607I		
	IOEH08609I	IOEH08613I	IOEH08619I	IOEH08620E	IOEH08621I	IOEH08641E	IOEH08642I		
	IOEH08643E	IOEH08644E	IOEH08645E	IOEH08646E	IOEH08647E	IOEH08648E	IOEH08649E		
	IOEH08660I	IOEH08669E	IOEH08670E	IOEH08673E	IOEH08674E	IOEH08678E	IOEH08682E		
	IOEH08689E	IOEH08691E	IOEH08701E	IOEH08702E	IOEH08704I	IOEH08705I	IOEH08707I		
	IOEH08708I	IOEH08711E	IOEH08722E	IOEH08727E	IOEH08731I	IOEH08736I	IOEH08743E		
	IOEH08745E	IOEH08746E	IOEH08766E	IOEH08767E	IOEH08770E	IOEH08775E	IOEH08776E		
	IOEH08778E	IOEH08782I	IOEH08785E	IOEH08795E	IOEH08801E	IOEH08802E	IOEH08803E		
	IOEH08804E	IOEH08805E	IOEH08807E	IOEH08808E	IOEH08809E	IOEH08818E	IOEH08819E		
	IOEH08820E	IOEH08821E	IOEH08822E	IOEH08823E	IOEH08824E	IOEH08825E	IOEH08826E		
	IOEH08827E	IOEH08828E	IOEH08829E	IOEH08830E	IOEH08831E	IOEH08832E	IOEH08833E		
	IOEH08834E	IOEH08835E	IOEH08836E	IOEH08837E	IOEH08842E	IOEH08844E	IOEH08846I		
	IOEH08849I								
	Ubik Servers and <b>udebug</b> commands	IOEJ10001E	IOEJ10002E	IOEJ10003E	IOEJ10005E	IOEJ10006I	IOEJ10007E	IOEJ10008E	
		IOEJ10009E	IOEJ10010E	IOEJ10011E	IOEJ10012E	IOEJ10013E	IOEJ10014E	IOEJ10015E	
	Fileset Location Server (flserver)	IOEL10503E	IOEL10510I	IOEL10511I	IOEL10512I	IOEL10516I	IOEL10518A	IOEL10519A	
		IOEL10520A	IOEL10522A	IOEL10523A	IOEL10524E	IOEL10525I	IOEL10526A	IOEL10527I	
		IOEL10528E	IOEL10529E	IOEL10530E	IOEL10532E	IOEL10533E	IOEL10548I	IOEL10550E	
IOEL10551E		IOEL10553E	IOEL10554E	IOEL10556E	IOEL10557E	IOEL10558I			
<b>mapid</b> command	IOEM02000A	IOEM02001I	IOEM02002A	IOEM02003A	IOEM02004A	IOEM02050A	IOEM02051A		
	IOEM02052A	IOEM02053A	IOEM02054A	IOEM02055A	IOEM02056A	IOEM02057A	IOEM02058A		
	IOEM02059A	IOEM02060A	IOEM02061A	IOEM02062A	IOEM02067I	IOEM02068I	IOEM02069A		
	IOEM02100A	IOEM02101A							
General DFS	IOEN00105I	IOEN00108I	IOEN00135A	IOEN00137A	IOEN00138A	IOEN00139A	IOEN00140A		
	IOEN00141A	IOEN00142A	IOEN00143A	IOEN00144A	IOEN00145A	IOEN00148I	IOEN00149I		
	IOEN00150I	IOEN00180I	IOEN00181I	IOEN00182A	IOEN00183A	IOEN00184A	IOEN00185A		
	IOEN00186A	IOEN00187A	IOEN00188A	IOEN00189A	IOEN00190A	IOEN00191A	IOEN00192A		
	IOEN00193A	IOEN00194A	IOEN00403I	IOEN00404I	IOEN00405E	IOEN00406I	IOEN00409A		
	IOEN00410A	IOEN00423E							
General DFS internal errors	IOE011500A	IOE011501A	IOE011502A	IOE011504A	IOE011505A	IOE011506A	IOE011507I		
	IOE011508I	IOE011509I	IOE011510I	IOE011511I	IOE011512I	IOE011600A	IOE011700A		
	IOE011701A	IOE011702A	IOE011800A	IOE011900A	IOE011901A	IOE011902A	IOE011903A		
	IOE011904A	IOE011905A							
DFS Kernel (dfskern) and General DFS error	IOEP01157A	IOEP01158A	IOEP01159A	IOEP01163A	IOEP01500I	IOEP01501I	IOEP01502I		
	IOEP01503A	IOEP01504I	IOEP01505A	IOEP01506A	IOEP01507A	IOEP01508A	IOEP01509A		
	IOEP01510A	IOEP01511A	IOEP01512A	IOEP01513A	IOEP01514A	IOEP01515I	IOEP01521A		
	IOEP01522A	IOEP01523A	IOEP01524A	IOEP01525A	IOEP01526A	IOEP01527I	IOEP01528I		
	IOEP01710A								

Table 220. V1R13 messages no longer issued by DFS components (continued)

Subcomponent	Messages no longer issued	
scout command and token manager	IOES00401I IOES00402I IOES00403I IOES00404I IOES00405I IOES00406I IOES00407I	
	IOES00408I IOES00409I IOES00410I IOES00411E IOES00412E IOES00413E IOES00414E	
	IOES00415E IOES00416E IOES00417E IOES00418E IOES00419E IOES00420E IOES00421E	
	IOES14000A IOES14001A IOES14050A IOES14051A IOES14100A IOES14101A IOES14102A	
	IOES14150A IOES14151A IOES14152A IOES14153A IOES14154A IOES14200A IOES14201A	
	IOES14202A IOES14203A IOES14204A IOES14250A IOES14300A IOES14500I IOES14501A	
	IOES14502A IOES14503E IOES14504A IOES14506A IOES14507A IOES14508A IOES14509A	
	IOES14510A IOES14511A IOES14512A IOES14513A IOES14514A IOES14515A IOES14516A	
	IOES14517A IOES14518A IOES14525A IOES14526A IOES14527A IOES14528A IOES14529A	
	IOES14530A IOES14531A IOES14532A IOES14533A IOES14534A IOES14535I IOES14536A	
	IOES14537I IOES14538A IOES14539I IOES14540A IOES14541I IOES14542A IOES14543I	
	IOES14544A IOES14545I IOES14546A IOES14547A IOES14548A IOES14549I IOES14550A	
	IOES14551A IOES14553A IOES14561A IOES14800A IOES14801A IOES14802A IOES14803A	
	IOES14804A IOES14805A IOES14806A IOES14807A IOES14808A IOES14809A IOES14810A	
	IOES14811A IOES14812E IOES14813I IOES14814A IOES14815A	
	Update Server (upserver) and Update Client (upclient)	IOEU15507E IOEU15508E IOEU15509E IOEU15510E IOEU15511E IOEU15512E IOEU15514E
		IOEU15515E IOEU15516E IOEU15517E IOEU15518E IOEU15519E IOEU15522E IOEU15523E
		IOEU15524E IOEU15527E IOEU15528E IOEU15529E IOEU15531E IOEU15533E IOEU15535E
		IOEU15537E IOEU15539E IOEU15540E IOEU15541E IOEU15542E IOEU15543E IOEU15544E
		IOEU15545E IOEU15546E IOEU15547E IOEU15548E IOEU15549E IOEU15550E IOEU15551E
		IOEU15553E IOEU15554E IOEU15555E IOEU15556E IOEU15557E IOEU15558E IOEU15559E
IOEU15567E IOEU15569I IOEU15570E IOEU15571E IOEU15572E IOEU15573E IOEU15574E		
IOEU15575E IOEU15576E IOEU15577E IOEU15578E IOEU15579E IOEU15580E IOEU15581E		
IOEU15582E IOEU15584E IOEU15585E IOEU15586E IOEU15587E IOEU15588E IOEU15589E		
IOEU15590E IOEU15591E IOEU15592E IOEU15593E IOEU15594E IOEU15595E IOEU15596E		
IOEU15597E IOEU15599E IOEU15600E IOEU15601E IOEU15602E IOEU15603I IOEU15604E		
IOEU15605E		
SMB Health Checker		IOEWH0001I IOEWH0002I IOEWH0010I IOEWH0011E IOEWH0012I IOEWH0014I IOEWH0020E
File Exporter (dfsexport)		IOEX18500A IOEX18501A IOEX18502I IOEX18503A IOEX18504A IOEX18505I IOEX18506A
	IOEX18507A IOEX18508A IOEX18509A IOEX18510A IOEX18511A IOEX18512A IOEX18513I	
	IOEX18514A IOEX18515A IOEX18516A IOEX18517I IOEX18518I IOEX18519A IOEX18520A	
	IOEX18521I IOEX18522I IOEX18523I IOEX18524A IOEX18525A IOEX18526A IOEX18528A	
	IOEX18529I IOEX18530I IOEX18531I IOEX18532A IOEX18533A IOEX18534I IOEX18535A	
	IOEX18536I IOEX18537I IOEX18538A IOEX18539A IOEX18540A IOEX18541A IOEX18542A	
	IOEX18543A IOEX18544A	

The reason codes in Table 221 were deleted.

Table 221. V1R13 reason codes no longer issued for DFS

Reason code	Codes no longer issued
6Cxxxxr (DFS Client reason codes)	0001 0003 0005 0007 0008 0009 000A 000B 000C 000D 000E 000F 0010 0011 0012 0013 0014 0015 0016 0017 0018 0019 001A 001B 001C 001D 001E 001F 0020 0021 0022 0023 0024 0025 0026 0027 0028 0029



---

## Chapter 82. HCD summary of message changes for z/OS V1R13

The messages for HCD are documented in *z/OS and z/VM HCD Messages*.

---

### New

CBDG739I

---

### Changed

CBDA269I

CBDA377I

CBDA398I

CBDG181I

CBDG721I

---

### Deleted

None.



---

## Chapter 83. Infoprint Server summary of message changes for z/OS V1R13

The messages for Infoprint Server are documented in *z/OS Infoprint Server Messages and Diagnosis*.

---

### New

AOP125E  
AOP165E  
AOP166E  
AOP167I  
AOP168I  
AOP169I  
AOP170I  
AOP171I  
AOP172E  
AOP173E

---

### Changed

None

---

### Deleted

None



---

## Chapter 84. IBM Tivoli Directory Server summary of message changes for z/OS V1R13

The messages for IBM Tivoli Directory Server are documented in *z/OS IBM Tivoli Directory Server Messages and Codes for z/OS*.

---

### New

GLD1298E	GLD1301E
GLD1299I	GLD1302E
GLD1300E	GLD1869W

---

### Changed

GLD1070E	GLD3303E
GLD2401E	GLD3330E

---

### Deleted

GLD1173E



---

## Chapter 85. JES2 summary of message changes for z/OS V1R13

The messages for JES2 are documented in *z/OS JES2 Messages*.

---

### New

\$HASP519	\$HASP745
\$HASP740	\$HASP807
\$HASP741	\$HASP808
\$HASP742	\$HASP809
\$HASP743	\$HASP814
\$HASP744	

---

### Changed

\$HASP003	\$HASP445
\$HASP064	\$HASP709
\$HASP249	\$HASP720
\$HASP443	\$HASP895

---

### Deleted

None





---

## Chapter 86. JES3 summary of message changes for z/OS V1R13

The messages for JES3 are documented in *z/OS JES3 Messages*.

---

### New

IAT3275	IAT7992
IAT3300	IAT7993
IAT3301	IAT8181
IAT3302	IAT8385
IAT7990	IAT8346
IAT7991	IAT9385

---

### Changed

IAT3061	IAT7500
IAT3092	IAT7565
IAT3155	IAT7566
IAT3426	IAT8090
IAT4050	IAT8121
IAT4053	IAT8513

---

### Deleted

IAT3398



---

## Chapter 87. Language Environment summary of message changes for z/OS V1R13

The messages for Language Environment are documented in *z/OS Language Environment Runtime Messages*.

---

### New

New messages:

CEE3303E

EDC4199

New abend codes: None.

---

### Changed

Changed messages:

CEE5224W

EDC5234S

EDC6253S

EDC6254S

EDC6255S

EDC6256S

Changed abend codes:

U4088

U4093

U4094

---

### Deleted

Deleted messages:

None.

Deleted abends:

None.

---



---

## Chapter 88. NFS summary of message changes for z/OS V1R13

The messages for Network File System (NFS) are documented in *z/OS Network File System Guide and Reference*.

---

### New

None

---

### Changed

GFSC101E

---

### Deleted

None



---

## Chapter 89. RMF summary of message changes for z/OS V1R13

This topic lists new, changed, and deleted messages for RMF.

The non-operator messages for RMF are also documented in *z/OS RMF Messages and Codes*. The operator messages for RMF are documented in:

- *z/OS MVS System Messages, Vol 1 (ABA-AOM)*
- *z/OS MVS System Messages, Vol 2 (ARC-ASA)*
- *z/OS MVS System Messages, Vol 3 (ASB-BPX)*
- *z/OS MVS System Messages, Vol 4 (CBD-DMO)*
- *z/OS MVS System Messages, Vol 5 (EDG-GFS)*
- *z/OS MVS System Messages, Vol 6 (GOS-IEA)*
- *z/OS MVS System Messages, Vol 7 (IEB-IEE)*
- *z/OS MVS System Messages, Vol 8 (IEF-IGD)*
- *z/OS MVS System Messages, Vol 9 (IGF-IWM)*
- *z/OS MVS System Messages, Vol 10 (IXC-IZP)*

---

### New

None.

---

### Changed

ERB225I

ERB466I

---

### Deleted

None.





---

## Chapter 90. SDSF summary of message changes for z/OS V1R13

The messages for SDSF are documented in *z/OS SDSF Operation and Customization*.

---

### New

ISF160E	ISF438I
ISF161E	ISF439I
ISF162E	ISF440I
ISF163E	ISF441E
ISF308E	ISF442I
ISF315I	ISF546I
ISF433I	ISF863E
ISF435I	ISF2011E
ISF436I	ISF2012E
ISF437I	ISF2210W

---

### Changed

ISF311I	ISF312I
---------	---------

---

### Deleted

None



---

## Chapter 91. Security Server RACF summary of message changes for z/OS V1R13

The messages for RACF are documented in *z/OS Security Server RACF Messages and Codes*.

---

### New

IRRI016I, IRRI020I, IRRI021I, IRRI022I,  
IRRI023I, IRRI024I, IRRI025I, IRRI026I,  
IRRI027I, IRRI029I, IRRI030I, IRRI031I

IRRC040I, IRRC050I, IRRC051I, IRRC052I,  
IRRC053I, IRRC054I, IRRC055I, IRRC056I,  
IRRC057I, IRRC058I, IRRC059I, IRRC060I,  
IRRC061I, IRRC062I, IRRC063I, IRRC064I

IRRM087I, IRRM088I, IRRM089I, IRRM090I,  
IRRM091I, IRRM092I, IRRM093I, IRRM094I,  
IRRM095I, IRRM096I, IRRM097I

IRRN001I, IRRN010I

IRRQ001I, IRRQ010I, IRRQ180I, IRRQ181I

IRRW214I, IRRW215I, IRRW216I

---

### Changed

ICH12304

ICH12305

ICH14078

ICH11009I

ICH66102I

IRR803I

IRRB023I

IRRD125I, IRRD130I, IRRD135I, IRRD157I,

IRRD160I, IRRD171I, IRRD187I, IRRD188I

---

### Deleted

IRRM056I



---

## Chapter 92. SMP/E V3R5 summary of message changes for z/OS V1R13

This topic lists new, changed, and deleted non-operator messages for SMP/E V3R5. (New, changed, and deleted messages for SMP/E V3R5 are listed in *SMP/E for z/OS Messages, Codes, and Diagnosis*.)

---

### New

GIM20702S	GIM50811S
GIM20702T	GIM50812E
GIM20703S	GIM50812S
GIM20703T	GIM58902S
GIM20704S	GIM58903W
GIM20704T	GIM58904E
GIM26316E	GIM58905E
GIM26316S	GIM58906S
GIM34401I	GIM65915E
GIM34401S	GIM69224S
GIM35973I	GIM69225E
GIM35974I	GIM69227W
GIM35975I	GIM69228I
GIM35976I	GIM69229I
GIM35977I	GIM69230E
GIM39802E	GIM69231E
GIM44285I	GIM69232S
GIM65915E	GIM69233I
GIM42001I	GIM69234I
GIM50811E	

---

### Changed

IKJ56411I	GIM69211S
GIM22800S	GIM693I
GIM26307E	GIM694I
GIM26307S	
GIM26501W	
GIM45301E	
GIM50301S	
GIM52101E	
GIM54001E	
GIM56701E	
GIM58900S	
GIM69147S	
GIM69210S	

---

## Deleted

IKJ540111  
IKJ540151  
IKJ54017A  
IKJ54020A  
IKJ540301  
IKJ566671

---

## Chapter 93. TSO/E summary of message changes for z/OS V1R13

This topic lists new, changed, and deleted non-operator messages for TSO/E. (New, changed, and deleted operator messages for TSO/E are listed in Chapter 75, “BCP and DFSMS summary of message changes for z/OS V1R13,” on page 533.)

The non-operator messages for TSO/E are documented in *z/OS TSO/E Messages*. The operator messages for TSO/E are documented in the *z/OS MVS System Messages*:

- *z/OS MVS System Messages, Vol 7 (IEB-IEE)*
- *z/OS MVS System Messages, Vol 8 (IEF-IGD)*
- *z/OS MVS System Messages, Vol 9 (IGF-IWM)*
- *z/OS MVS System Messages, Vol 10 (IXC-IZP)*

---

### New

IRX0241I

IRX0242I

---

### Changed

IKJ56411I

IKJ56447A

IKJ56424I

IKJ56702A

---

### Deleted

IKJ54011I

IKJ54015I

IKJ54017A

IKJ54020A

IKJ54030I

IKJ56667I





---

## Chapter 94. XL C/C++ summary of message changes for z/OS V1R13

The messages for XL C/C++ are documented in *z/OS XL C/C++ Messages*.

---

### New

CCN0007	CCN5895
CCN2063	CCN8153
CCN2118	CCN8434
CCN2187	CCN8445 to CCN8447
CCN2475	CCN8460
CCN4474	CCN8659
CCN4475	CCN8948
CCN4478	CCN8949
CCN5734	CCN8951 to CCN8958
CCN5735	CCN8961 to CCN8965

---

### Changed

CCN7613	CCN8647
CCN8154	CCN8802

---

### Deleted

CCN2473  
CCN4157



---

## Chapter 95. z/OS UNIX summary of message changes for z/OS V1R13

The messages for z/OS UNIX are documented in *z/OS UNIX System Services Messages and Codes*. Messages from the REXX processor are documented in *z/OS MVS System Messages, Vol 3 (ASB-BPX)*.

---

### New

#### Messages:

BPXTR009  
BPXWE001  
BPXWE002  
BPXWE004  
BPXWE005  
BPXWE006  
BPXWE009  
BPXWE100  
BPXWE101  
BPXWE102  
BPXWE103  
BPXWE104  
BPXWE105  
BPXWE106  
BPXWE107  
BPXWE108  
BPXWE109  
BPXWE110  
BPXWE112  
FOMF0512I  
FSUM3132  
FSUM7930  
FSUM7934  
FSUM7963  
FSUM7964  
FSUMF174  
FSUMF412  
FSUMF415  
FSUMF416  
FSUMF419  
FSUMF420

#### Return codes:

None

#### Reason codes:

X'063B', JrNoSetUID  
X'063C', JrNoEmptyMntPtDir  
X'063D', JrExceedMaxUsrMntSys  
X'063E', JrExceedMaxUsrMntUsr  
X'063F', JrNotOwner  
X'0640', JrNotRootOwner

X'0641', JrFileSystemMigrated  
X'0642', JrSysNameNotAllowed  
X'0643', JrRemountNotAllowed  
X'0644', JrUserUnMountNotAllowed  
X'0645', JrPFSNotSupported  
X'0646', JrNoRootAccess  
X'0647', JrNoMntPtAccess  
X'0648', JrTooManyInProgress  
X'735B' JrNotAuthUnRsvdPort  
X'735C' JrUnRsvdTCPPortConflict  
X'735D' JrNoCritSocks  
X'735E' JrNoPartnerInfo  
X'735F' JrInvalidTCPIPStack  
X'7360' JrNotSameSecDomain  
X'7361' JrNoSecDomain  
X'7362' JrNoSuspend  
X'7363' JRSocketIPv6InvalidScopeIdZero  
X'7364' JROSMAccessDenied  
X'7365' JRDisabled  
X'7366' JRCallerMismatch  
X'7367' JRTooManyInstances  
X'7368' JROutOfSequence  
X'7369' JRTcpGlobalStall  
X'736A' JRTcpQueueSize

---

## Changed

Messages:

FSUM1272  
FSUM8999  
FSUMF174  
FSUMF209

Return codes:

None

Reason codes:

X'00DC' JRSAFNotAuthorized  
X'018F', JrQuiescing  
X'0316', JRShmBadSize  
X'0570', JrSecurityConflict  
X'0641', JrfileSystemMigrated

---

## Deleted

Messages:

None

Return codes:

None

Reason codes:

None

---

## Part 5. Appendixes



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## Appendix. Accessibility

Accessible publications for this product are offered through IBM Knowledge Center ([www.ibm.com/support/knowledgecenter/SSLTBW/welcome](http://www.ibm.com/support/knowledgecenter/SSLTBW/welcome)).

If you experience difficulty with the accessibility of any z/OS information, send a detailed message to the Contact z/OS web page ([www.ibm.com/systems/z/os/zos/webqs.html](http://www.ibm.com/systems/z/os/zos/webqs.html)) or use the following mailing address.

IBM Corporation  
Attention: MHVRCFS Reader Comments  
Department H6MA, Building 707  
2455 South Road  
Poughkeepsie, NY 12601-5400  
United States

---

### Accessibility features

Accessibility features help users who have physical disabilities such as restricted mobility or limited vision use software products successfully. The accessibility features in z/OS can help users do the following tasks:

- Run assistive technology such as screen readers and screen magnifier software.
- Operate specific or equivalent features by using the keyboard.
- Customize display attributes such as color, contrast, and font size.

---

### Consult assistive technologies

Assistive technology products such as screen readers function with the user interfaces found in z/OS. Consult the product information for the specific assistive technology product that is used to access z/OS interfaces.

---

### Keyboard navigation of the user interface

You can access z/OS user interfaces with TSO/E or ISPF. The following information describes how to use TSO/E and ISPF, including the use of keyboard shortcuts and function keys (PF keys). Each guide includes the default settings for the PF keys.

- *z/OS TSO/E Primer*
- *z/OS TSO/E User's Guide*
- *z/OS V2R2 ISPF User's Guide Vol I*

---

### Dotted decimal syntax diagrams

Syntax diagrams are provided in dotted decimal format for users who access IBM Knowledge Center with a screen reader. In dotted decimal format, each syntax element is written on a separate line. If two or more syntax elements are always present together (or always absent together), they can appear on the same line because they are considered a single compound syntax element.

Each line starts with a dotted decimal number; for example, 3 or 3.1 or 3.1.1. To hear these numbers correctly, make sure that the screen reader is set to read out

punctuation. All the syntax elements that have the same dotted decimal number (for example, all the syntax elements that have the number 3.1) are mutually exclusive alternatives. If you hear the lines 3.1 USERID and 3.1 SYSTEMID, your syntax can include either USERID or SYSTEMID, but not both.

The dotted decimal numbering level denotes the level of nesting. For example, if a syntax element with dotted decimal number 3 is followed by a series of syntax elements with dotted decimal number 3.1, all the syntax elements numbered 3.1 are subordinate to the syntax element numbered 3.

Certain words and symbols are used next to the dotted decimal numbers to add information about the syntax elements. Occasionally, these words and symbols might occur at the beginning of the element itself. For ease of identification, if the word or symbol is a part of the syntax element, it is preceded by the backslash (\) character. The \* symbol is placed next to a dotted decimal number to indicate that the syntax element repeats. For example, syntax element \*FILE with dotted decimal number 3 is given the format 3 \\* FILE. Format 3\* FILE indicates that syntax element FILE repeats. Format 3\* \\* FILE indicates that syntax element \* FILE repeats.

Characters such as commas, which are used to separate a string of syntax elements, are shown in the syntax just before the items they separate. These characters can appear on the same line as each item, or on a separate line with the same dotted decimal number as the relevant items. The line can also show another symbol to provide information about the syntax elements. For example, the lines 5.1\*, 5.1 LASTRUN, and 5.1 DELETE mean that if you use more than one of the LASTRUN and DELETE syntax elements, the elements must be separated by a comma. If no separator is given, assume that you use a blank to separate each syntax element.

If a syntax element is preceded by the % symbol, it indicates a reference that is defined elsewhere. The string that follows the % symbol is the name of a syntax fragment rather than a literal. For example, the line 2.1 %OP1 means that you must refer to separate syntax fragment OP1.

The following symbols are used next to the dotted decimal numbers.

**? indicates an optional syntax element**

The question mark (?) symbol indicates an optional syntax element. A dotted decimal number followed by the question mark symbol (?) indicates that all the syntax elements with a corresponding dotted decimal number, and any subordinate syntax elements, are optional. If there is only one syntax element with a dotted decimal number, the ? symbol is displayed on the same line as the syntax element, (for example 5? NOTIFY). If there is more than one syntax element with a dotted decimal number, the ? symbol is displayed on a line by itself, followed by the syntax elements that are optional. For example, if you hear the lines 5 ?, 5 NOTIFY, and 5 UPDATE, you know that the syntax elements NOTIFY and UPDATE are optional. That is, you can choose one or none of them. The ? symbol is equivalent to a bypass line in a railroad diagram.

**! indicates a default syntax element**

The exclamation mark (!) symbol indicates a default syntax element. A dotted decimal number followed by the ! symbol and a syntax element indicate that the syntax element is the default option for all syntax elements that share the same dotted decimal number. Only one of the syntax elements that share the dotted decimal number can specify the ! symbol. For example, if you hear the lines 2? FILE, 2.1! (KEEP), and 2.1 (DELETE), you know that (KEEP) is the



default option for the FILE keyword. In the example, if you include the FILE keyword, but do not specify an option, the default option KEEP is applied. A default option also applies to the next higher dotted decimal number. In this example, if the FILE keyword is omitted, the default FILE(KEEP) is used. However, if you hear the lines 2? FILE, 2.1, 2.1.1! (KEEP), and 2.1.1 (DELETE), the default option KEEP applies only to the next higher dotted decimal number, 2.1 (which does not have an associated keyword), and does not apply to 2? FILE. Nothing is used if the keyword FILE is omitted.

**\* indicates an optional syntax element that is repeatable**

The asterisk or glyph (\*) symbol indicates a syntax element that can be repeated zero or more times. A dotted decimal number followed by the \* symbol indicates that this syntax element can be used zero or more times; that is, it is optional and can be repeated. For example, if you hear the line 5.1\* data area, you know that you can include one data area, more than one data area, or no data area. If you hear the lines 3\* , 3 HOST, 3 STATE, you know that you can include HOST, STATE, both together, or nothing.

**Notes:**

1. If a dotted decimal number has an asterisk (\*) next to it and there is only one item with that dotted decimal number, you can repeat that same item more than once.
2. If a dotted decimal number has an asterisk next to it and several items have that dotted decimal number, you can use more than one item from the list, but you cannot use the items more than once each. In the previous example, you can write HOST STATE, but you cannot write HOST HOST.
3. The \* symbol is equivalent to a loopback line in a railroad syntax diagram.

**+ indicates a syntax element that must be included**

The plus (+) symbol indicates a syntax element that must be included at least once. A dotted decimal number followed by the + symbol indicates that the syntax element must be included one or more times. That is, it must be included at least once and can be repeated. For example, if you hear the line 6.1+ data area, you must include at least one data area. If you hear the lines 2+, 2 HOST, and 2 STATE, you know that you must include HOST, STATE, or both. Similar to the \* symbol, the + symbol can repeat a particular item if it is the only item with that dotted decimal number. The + symbol, like the \* symbol, is equivalent to a loopback line in a railroad syntax diagram.



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---

## Minimum supported hardware

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