

# IBM i 7.5 and IBM i Portfolio give strong foundation for continuing innovation

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## Overview

IBM<sup>(R)</sup> i 7.5 contains enhancements to many base operating system components and to the Licensed Program Products in the IBM i Portfolio. Some of the new capabilities are described here.

### ***Base operating system***

#### **Security**

- A new Password Encryption Scheme helps users achieve even greater levels of security, implemented by setting the Password Level (QPWDLVL) to 4.
- By using a new API, Check Password Meets Password Rules (QSYCHKPR), users or password management tools can predetermine if a value would meet the configured password rules set by the company.
- The Service Tools CL commands have been enhanced. The SST user attribute "Password expiration interval" can now be set using the Create Service Tools User ID (CRTSSTUSR) and Change Service Tools User ID (CHGSSTUSR) commands. Many other SST security attributes can now be set using the Change SST Security Attributes (CHGSSTSECA) command. A new SST security attribute was added to indicate whether password exit programs can be added or removed from the QIBM\_QSY\_VLD\_PASSWRD and QIBM\_QSY\_CHK\_PASSWRD exit points. This attribute can be set in SST or by using the CHGSSTSECA command.
- Digital Certificate Manager (DCM) has multiple enhancements to improve the user experience and provide additional functions to the base security components.

#### **Compression**

- The ZLIB algorithm is allowed on selected commands to provide an additional option for data compression to produce a smaller result and to improve performance when running on an IBM Power10 processor.

#### **Save and Restore**

- The new default on the ASYNCBRING parameter on Save commands improves performance for saving IFS data.
- RSTUSRPRF \*ALL no longer requires a dedicated system.
- Restore operations have an updated message that includes the size of data that has been completed to allow better estimation of the time remaining to finish the restore.

#### **Networking**

- SNMP attributes can be configured to allow only SNMPv3 in some environments and to restrict information being returned by SNMPv3 to provide a higher level of security.
- TCP Selective Acknowledgment (SACK) support on IBM i streamlines the retransmission of data when there is packet loss in the network.
- The password policy capabilities of IBM Tivoli<sup>(R)</sup> Directory Server for i can be extended to enforce rules for advanced password syntax checking in addition to the standard default rules.
- IBM i DNS upgrades to a newer BIND release.
- The FTP client can be configured to allow a FTP user to accept a server certificate that is not signed by a trusted certificate authority. The FTP server logon exit point allows the IPV4 address to be specified for IPV4 passive data connection reply.
- SMTP allows users to configure a different retention time for successfully and unsuccessfully sent emails, configure a different sender address, and allow auto-forward emails.

### **Application development**

- With IBM i 7.5, some significant changes are made to the Integrated Web Services Rest API engine, including increasing the number of parameters to 248 and updating capabilities of the IWS logging to include Access Client Solutions logging capabilities.
- To better serve client-based development tools, the create and update commands for program and service program objects can provide command completion information in an events file. That information can be interrogated to provide command completion status.
- To support many new markets for IBM i, the range of CCSIDs has been increased.
- The Call (CALL) and Call Bound Procedure (CALLPRC) commands now allow expressions to be passed as parameters and allow you to specify type and length for each parameter.
- New ILE C/C++ built-in functions for atomic memory access are added in this release. In a program with multiple threads, you can use these functions to atomically and safely modify data in one thread without interference from another thread.

### **System administration**

- Clients can now change the scope of 2-digit year date ranges. The QIBM\_QBASEYEAR environment variable enables clients to shift the base year from 1940 to 1970.
- IBM i 7.5 supports a maximum of 48 processors per partition in SMT8 mode and therefore a maximum of 384 threads on servers with Power10 or IBM Power9 technology.
- Service Tools can now display detailed information about individual NVMe devices on the system.
- New enhancements have been added to the Job Scheduler commands and display.
- Several hardware and software enhancements have been made in IBM i 7.5 Performance Tools.
- IBM Navigator for i offers additional tasks and features to provide administrators with more information than previous versions.
- Several hardware and software enhancements have been added to the Integrated File System (IFS), including a new layer of security for IBM i NetServer, new exit points, and more resilient file sharing options.
- It takes less time to perform Cluster Resource Group (CRG) switchover for selected configurations.
- System administrators can use Service Tools to display and make better informed decisions about NVMe devices with more detailed information about the individual devices.

- To set the console configuration and debug console problems on a server that is not managed by a Hardware Management Console (HMC) or other management interface, the operator panel must be used. The number of operator panel functions to get to the console service functions has been reduced.

### **Db2<sup>(R)</sup> for i**

- Db2 for i provides additional functions for HTTP requests to publish or consume web services.
- Db2 for i is providing more advanced, easy-to-use tooling for the database engineer (DBE).
- IBM i Services, the strategic method for gaining access to IBM i objects, system information, and much more is expanding to provide useful SQL-based alternatives to IBM i commands and APIs.
- Db2 for i increases the number of working examples and tools in the SYSTOOLS schema.

### **Open Source for IBM i**

- In response to community requests, IBM is restating the various options available for application serving on IBM i. Many of these have support available from IBM Technical Support Services.

### **LPPs**

- In IBM Rational<sup>(R)</sup> Development Studio, RPG IV is responding to requirements from the development community and offering some new message-handling operations.
- The IBM i Access Client Solutions (ACS) interface is updated and enhanced with three major updates to the core ACS product: Group Views, Customize the GUI content, and a Run SQL Scripts tab capability.
- IBM PowerHA<sup>(R)</sup> SystemMirror<sup>(R)</sup> for i 7.5 brings a new set of enhancements centered around simplification, reporting, and performance.
- The Backup, Recovery, and Media Services (BRMS) for i product has numerous enhancements across many areas of the product, adding or updating command defaults and providing new capabilities through SQL Services and new APIs.
- IBM Db2 Mirror for i at 7.5 fulfills the commitment of running in a mixed OS release environment.
- IBM Content Manager OnDemand for i (CMOD) has improved programmer productivity by adding and enhancing capabilities such as commands, creation of .pdf files, and better integration with other IBM i tools.

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## **Key requirements**

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IBM i 7.5 is supported on selected IBM Power<sup>(R)</sup> servers with Power9 and Power10 technology-based processors.

Clients using servers with earlier processors need to move to newer systems to take advantage of the features in IBM i 7.5.

For up-to-date information about all types of code levels needed for support of a particular feature, see the [IBM Prerequisites](#) website.

See the [Technical Information](#) section for specific hardware and software prerequisites.

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## **Planned availability date**

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- May 10, 2022, except for e-config support for PowerHA SystemMirror for i 7.5 (5770-HAS) and PowerHA's Geographic Mirroring Compression enhancement.

PowerHA SystemMirror for i 7.5 can be downloaded from the [Entitled System Support](#) on May 10, 2022.

- June 28, 2022, e-config support for PowerHA SystemMirror for i 7.5 (5770-HAS) and PowerHA's Geographic Mirroring Compression enhancement.

Availability within a country is subject to local legal requirements.

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## Description

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The *i* in *IBM i* stands for integration of the many components in the suite. Updates have been made to all aspects of the portfolio in this announcement, including the operating system and Licensed Program Products.

For technical details for IBM i enhancements delivered with IBM i 7.5, see the [IBM i Technology Updates](#) wiki.

To make it easy to find IBM i 7.5 base release enhancements, see the aggregated list of enhancements on the [IBM i 7.5](#) wiki landing page.

### **Base operating system**

The term *IBM i* encompasses a suite of products, including the base operating system. This section highlights the enhancements to the base operating system.

### **Security**

#### *Password enhancements*

- A new password encryption scheme assists clients in achieving even greater levels of security. This new scheme is activated by setting the system value Password Level QPWDLVL to 4 or the System Service Tools (SST) password level to 3. The new password levels use Password-based Key Derivation Function 2 (PBKDF2) with HMAC SHA512 (SHA-2 512 bit) encryption for the scheme. For more information, see the [Planning password level changes](#) topic in IBM Documentation.
- The new Check Password Meets Password Rules (QSYCHKPR) API checks if the password specified in the password information meets the password rules for the system on which this API is run. The password rules are composed of system values QPWDRQDDIF and either QPWDRULES or all the following: QPWDMINLEN, QPWDMAXLEN, QPWDLMTAJC, QPWDLMTCHR, QPWDLMTREP, and QPWDRQDDGT. System values QPWDPOSDIF and QPWDRULES \*LMTSAMPOS are not enforced because there isn't a current password to use for a comparison. This API checks only the password; it does not actually change the user's password. For more information, see the [QSYCHKPR API description](#) in IBM Documentation.

#### *Service tools enhancements*

Enhancements have been made to those SST commands used for user ID management and configuration:

- The "Password expiration interval" attribute was added to the Create Service Tools User ID (CRTSSTUSR), Change Service Tools User ID (CHGSSTUSR), and Display Service Tools User ID (DSPSSTUSR). This attribute allows the password expiration interval for an SST user to be set to a different value than the SST password expiration interval security attribute.
- The following SST attributes were added to the Change SST Security Attributes (CHGSSTSECA) and Display SST Security Attributes (DSPSSTSECA) commands:
  - Duplicate password control
  - Allow add of digital certificates
  - Allow service tools user ID with default and expired password to change its own password

- Maximum sign-on attempts
- Password expiration interval
- Allow add and remove of password exit programs (new)
- The remaining attributes continue to be managed in SST. The new SST attribute "Allow add and remove of password exit programs" controls whether new exit programs are allowed to be added to, or existing exit programs are allowed to be removed from, the QIBM\_QSY\_VLD\_PASSWRD and QIBM\_QSY\_CHK\_PASSWRD exit points.

For more information, see the [CHGSSTSECA command description](#) and [CHGSSTUSR command description](#) in IBM Documentation.

### *Digital Certificate Manager*

Digital Certificate Manager (DCM) has multiple enhancements to improve the user experience and provide additional functions to the base security components.

- Full replace of the UI for object signing, providing new functions:
  - Support for object signing store, applications, and actions related to signing objects
  - Support for the signature verification store and actions related to verifying signatures
- Browse and select buttons have been added to multiple panels, eliminating the need to manually type IFS paths and file names. Examples include:
  - Browse and select certificate from local file system for import
  - Browse and select certificate from an IFS path for import
  - Browse and select from a local file system for export
  - Browse and select an IFS path for export
  - Browse and select a KDB file when opening a certificate store
  - Browse and select files for object signing support
- To better manage the certificate objects residing in the Upload and Download directory used for import and export functionality:
  - Items in the Upload directory
  - Items in the Download directory
- Provide the ability to remove the default certificate assignment for the \*SYSTEM certificate store.
- Added current industry Root and Intermediate CA certificates from well-known certificate providers for the Populate Certificate Store functionality.

For more information about DCM, see the [Digital Certificate Manager](#) topic in IBM Documentation.

### **Compression**

#### **ZLIB algorithm**

The ZLIB algorithm provides an additional option for data compression. Test results show it is often faster than previously available algorithms and generally produces a smaller result, though actual results will vary, depending on the compressibility of the data. The new algorithm automatically uses the on-chip Nest Accelerator (NX) GZIP when running in Power10 compatibility mode on a Power10 processor and is therefore faster and less CPU-intensive than previously available compression options.

The ZLIB option has been implemented for these use cases:

- Save commands and APIs for Save Files and Optical, including Virtual Optical, that have the data compression parameter
- CPRDATA MI instruction

- [Geographic Mirroring synchronization](#)

See the following topics in IBM Documentation for more information:

- [CL Command Finder](#) to search for Save commands
- [API Finder](#) to search for Save APIs
- [Compress Data \(CPRDATA\)](#)
- [Start Disk Management Operation \(QYASSDMO\)](#) API
- [Open List of ASPs \(QYASPOL\)](#) API
- [Materialize Resource Management Data \(MATRMD\)](#)

## ***Save and Restore***

### **New default value for ASYNCBRING parameter**

The new default value for the ASYNCBRING parameter on the Save Object (SAV) command and the QsrSave API provides the same or better performance for saving IFS data. Objects are brought into memory asynchronously during IFS save processing, potentially improving the performance of the save operation. The GO SAVE menu options automatically inherit this new default. For more information, see the [SAV](#) and [QsrSave](#) topics in IBM Documentation.

### **RSTUSRPRF USRPRF(\*ALL)**

RSTUSRPRF USRPRF(\*ALL) no longer requires a dedicated system. Specifying \*ALL for the User profile (USRPRF) parameter on the Restore User Profiles (RSUSRPRF) command no longer requires that all other subsystems on the system be ended. For more information, see the [RSTUSRPF](#) topic in IBM Documentation.

### **Progress message for IFS restore**

The progress message displayed during an IFS restore now includes the size of objects that have completed. For those who know the size of the data that needs to be restored, this will help to estimate the time remaining.

## ***Networking***

### **SNMPv3 security enhancements**

SNMP attributes can be configured to allow only SNMPv3 for the SNMP agent, the local trap manager, and the SNMP manager APIs. An SNMPv3 driver is available for network-attached printers. In addition, it is now possible to restrict information being returned by SNMPv3 by defining View-based Access Control Model (VACM) rules. Additional SHA-2 authentication types for SHA-256 and SHA-512 are new options when configuring SNMPv3 users.

See the following new and changed commands in IBM Documentation for more information:

- [ADDVACSNMP](#)
- [CHGVACSNMP](#)
- [RMVVACSNMP](#)
- [ADDUSRSNMP](#)
- [CFGTCPSNMP](#)
- [CHGDEVPRT](#)
- [CHGSNMPA](#)
- [CHGUSRSNMP](#)
- [CRTDEVPRT](#)

### **TCP Selective Acknowledgment (SACK) support**

When transmitting data segments, TCP will acknowledge segments that have been received. When a segment is missing between received segments, only the newest contiguous data segment is acknowledged; therefore, noncontiguous segments received must be retransmitted in addition to the missing segment.

In this release, TCP Selective Acknowledgment (SACK) support on IBM i is added. TCP SACK enables the TCP stack to handle lost packets and selectively acknowledge the data segments that have been received so that only the missing data segments need to be retransmitted by the sender. SACK is enabled by default for the TCP network layer.

### **IBM Tivoli Directory Server for i (LDAP)**

The password policy capabilities of IBM Tivoli Directory Server for i can be extended to enforce rules for advanced password syntax checking in addition to the standard default rules. Password complexity rules help to strengthen the security of authentication mechanisms. See "Setting advanced password policy" in IBM Documentation for more information.

### **DNS**

IBM i DNS upgrades to a newer BIND release. The \*PUBLIC authorities on the directories /QOpenSys/QIBM/ProdData/OS400/DNS, /QOpenSys/QIBM/UserData/OS400/DNS, and /QIBM/UserData/OS400/DNS are changed to \*EXCLUDE in this release.

### **FTP**

The FTP client can be configured to allow FTP users to accept the server certificate that is not signed by a trusted certificate authority when building secure connections with the remote server. This function is disabled to all FTP users by default. FTP server logon exit point QIBM\_QTMF\_SVR\_LOGON format TCPL0200 and TCPL0300 allow the IPV4 address to be specified for IPV4 passive data connection reply. See IBM Documentation for more information.

### **SMTP**

The KEEPUNTIL parameter in CL command CHGSMTPA is split to two fields so that successful and unsuccessful email retention time can be configured with different values. New parameters FORWARDING and ORIGINATOR are added to CL command ADDUSRSMTP and CHGUSRSMTP. If the FORWARDING parameter was specified for a current local SMTP user, then mail going to the current local SMTP user will be automatically forwarded to the new address as specified. If the ORIGINATOR parameter was specified for a current local SMTP user, then the "From:" field in the MIME file sent by the current local SMTP user will be displayed as specified. If the current user profile differs from the ORIGINATOR, then the "Sender:" field in the MIME file will be displayed as the current user profile.

### ***Application development***

#### **Integrated Web Services (IWS)**

The industry has seen significant change in the Rest API landscape, and IBM is delivering some significant changes to the Rest API engine in IBM i. These are the key changes:

- Previously, the number of supported parameters on an API call was limited to 7. This forced developers to change their backend code to leverage data structures to pass more data. In this release, changes to the Call Services Program Procedure API (QARUCLSP) raise the limitation to 248 parameters. Existing IWS services will see no change and behave as they did previously. New services can now specify the increased number of parameters. Calling this API directly will require special attention to the format required for specifying the increased number of parameters. See [QZRUCLSP](#) in IBM Documentation for more information.

- Prior to this release, IWS logging was limited to error-centric or debug-centric logging. In this release, updates to the logging support within IWS enable additional functions.
  - The data written to the logs can now be written in JSON format. This enables these logs to be easily consumed by many standard market log understanding tools such as Splunk or Elastic Stack.
  - Access logging can now track more information about usage of each Rest API, such as who is calling, from where they are calling, and what is being requested.
  - HTTP message logging takes two forms, both are captured in the access log:
    - HTTP Header Logging enables HTTP header attributes to be written to the access log.
    - HTTP Message Logging writes details about the request and what key items are being returned within the content of the message payload for each Rest API called.

### **OPTION(\*EVENTF) added to selected program commands**

The Create Program (CRTPGM), Create Service Program (CRTSRVPGM), Update Program (UPDPGM), and Update Service Program (UPDSRVPGM) commands have a new creation option that provides command completion information to an events file for use by client tooling. The events file can be monitored by the client tools, such as IBM Rational Developer for i (RDi), to provide integrated error feedback. See [Rational Developer for i Events Files](#) in IBM Documentation for more information.

### **Globalization**

Many updates and additions have been made to the portfolio of CCSIDs available in IBM i.

The IBM i CCSID conversion support moving dates to and from Unicode has been updated for data stored in EBCDIC CCSIDs 1377 (Traditional Chinese) and 1388 (Simplified Chinese). This new support reflects some new Unicode assignments for existing CCSID 1377 and 1388 characters. To preserve the current mapping, IBM provides two new CCSIDS. The new CCSIDS to use are:

- Use CCSID 13676 instead of 1388.
- Use CCSID 5473 instead of 1377.

CCSID 1379 provides additional support for Traditional Chinese, including some Simplified Chinese support.

CCSID 1210 adds limited support for UTF-EBCDIC. This is applicable only on the [iconv\\_open\(\)](#) and [QtqIconvOpen\(\)](#) conversion APIs, which can enable legacy applications running on IBM i to process Unicode data containing variant characters without losing those characters.

For more information about these changes, see the [What's new for IBM i 7.5](#) website, the [IBM i: Memo to Users](#) wiki, and the [UTF-EBCDIC](#) website.

### **Control language**

For a Call (CALL) command that is issued from a compiled ILE CL procedure, you can now specify expressions as parameters passed on the PARM parameters. For a Call (CALL) command that is issued from a compiled ILE CL procedure, is run interactively, or is submitted by a Submit Job (SBMJOB) command, type and length can be specified explicitly to tell how the parameters are passed to the called program. For a Call Bound Procedure (CALLPRC) command that is issued from a compiled ILE CL procedure, expressions can be specified as parameters passed on the PARM parameters, and type and length can be specified explicitly to tell how the parameters are passed to the called procedure. See IBM Documentation for more information.

### **ILE C/C++ compiler**



New ILE C/C++ built-in functions for atomic memory access are added in this release. In a program with multiple threads, you can use these functions to atomically and safely modify data in one thread without interference from another thread. See IBM Documentation for more information.

## **System administration**

### **2-digit year date format**

The current supported date range for 2-digit year date formats is January 1, 1940 - December 31, 2039. When using a date format that includes only the last two digits of a year, the system assumes years 40 to 99 are 1940 - 1999, and years 00 to 39 are 2000 - 2039.

In IBM i 7.5, support has been added for a new base year of 1970, with a date range of January 1, 1970 - December 31, 2069. Therefore, dates entered in a command using a 2-digit year will now refer to the base year specified in the QIBM\_QBASEYEAR environment variable. The QIBM\_QBASEYEAR value can be set to 1940 or 1970. If the environment variable is not present, the current default of 1940 is used for the base year.

The new base year support is limited to commands that use a parameter of TYPE(\*DATE). Business applications that continue to use 2-digit date formats may need to be updated to use a date format with a 3-digit or 4-digit year before January 1, 2040.

**Note:** RPG and IBM Db2 for i are not being updated to adjust the date range. The recommendation is to move all dates in RPG and Db2 for i to a 4-digit year format.

### **Processor limits per partition**

IBM i 7.5 supports a maximum of 48 processors per partition in SMT8 mode and therefore a maximum of 384 threads on servers with Power10 or Power9 technology. However, with an IBM Lab Services engagement, an IBM i 7.5 partition can increase to a maximum of 240 processors and 1920 threads when using Power10 compatibility mode. This maximum IBM i partition reaches the maximum compute capacity available to a single partition on the largest enterprise server with Power10 technology. See [Maximum Capacities](#) in IBM Documentation for more information.

### **NVMe health information in Service Tools**

Service Tools can now display detailed information about individual NVMe devices on the system. Information includes life remaining, spare capacity, the number of media errors, the firmware level, and many other fields of interest. See [Display NVMe health](#) in IBM Documentation for more information.

### **Simplified operator panel sequence for unmanaged servers**

For those who need to install the IBM i Operating System or debug console problems on a server that is not managed by an HMC or other management interface, the steps to access the console service functions are simplified. The number of operator panel functions in the sequence is reduced. Previously, it was necessary to use operator panel function 65, followed by function 21 to cycle through the service function options. Now only operator panel function 65 is needed, thereby saving the time of cycling through the operator panel to perform a function 21 to get to the next function. This improvement is for all generations of Power servers that are supported by IBM i 7.5. See [Using the console service functions](#) in IBM Documentation for more information.

**Note:** For those clients who are familiar with the operator panel, carefully review the changes to the panel functions. In some cases, the streamlined functions will cause different behavior than in previous releases.

For additional information, see the [Memo to Users](#).

## IBM Job Scheduler

The Job Scheduler has a new option to prevent the scheduler from submitting jobs until a later time while preserving the individual status of each entry. This new option, `JOB(*JOBSCD)`, can be found on the [Hold Job Schedule Entry \(HLDJOBSCDE\)](#) and [Release Job Schedule Entry \(RLSJOBSCDE\)](#) commands.

The Job Scheduler has also added the ability to schedule a job with a frequency of once per year. This new special value, `FRQ(*YEARLY)`, can be found on the [Add Job Schedule Entry Command \(ADDJOBSCDE\)](#) command.

## Performance tools

IBM i has a rich set of performance instrumentation and tools built into the operating system. Several updates have been made in IBM i 7.5 to incorporate the new hardware and software enhancements:

- Power10 hardware updates in Collection Services and Performance Explorer.
- More SQL Plan Cache metrics added to Collection Services.
- New metrics for Db2 Mirror performance analysis in Collection Services and Job Watcher.
- Performance Explorer resource affinity events and activation group events enhancements.
- Collection Services Historical Data creation is now enabled by default.

## System management functions added

A subset of the commands previously available in the 5770-SM1 product have been moved into the base operating system and can be found in the QSYS library instead of QSMU.

For additional information, see the [Memo to Users](#).

## IBM Navigator for i

The new version of IBM Navigator for i was announced in September 2021. In IBM i 7.5, IBM Navigator for i is further enhanced. New tasks and features provide administrators with additional information not available in previous versions. Some of these enhancements include:

- Support for configuring and updating the Simple Network Time Protocol service (SNTP)
- Support for configuring and updating the Simple Mail Transfer Protocol support (SMTP)
- Support for Virtual Private Networking, including properties, defaults, and IP Security Policies
- Internet Key Exchange (IKE)
- Support to configure, create, and update LDAP servers for IBM i
- New and improved views for looking at Authority Collection information
- IASP support for Custom Charts metrics
- Ability to review Audit Journal details using rich graphical views to better understand audit issues to determine what issues need to be reviewed at a granular level
- Update to Performance Data Investigator to significantly improve user navigation with easy tree-like navigation

For the latest on this new interface, see the [IBM Navigator Support](#) web page.

**Note:** To support client security requirements, the function usage value **QIBM\_NAV\_ALL\_FUNCTION** has been changed from `*ALLOWED` to `*DENIED`. This means that users that may have had access to the new Navigator may now be denied access. Administrators will need to take action to give users access to IBM

Navigator for i. For function usage details, see the [IBM Navigator for i - Function Usage IDs](#) website.

## **Integrated File System**

The file systems within IBM i are used extensively on every system. Several key enhancements have been added based on requirements from the user community. Some of these enhancements are:

- An additional layer of security has been added for IBM i NetServer to allow securing access to the server or specific shares through \*AUTL objects. Administrators can now restrict which users can access IBM i NetServer or specific shares without changes to underlying object permissions.
- The QNTC file system is now able to access and follow Distributed File System (DFS) shares. This allows more flexibility in accessing resilient file sharing solutions.
- Two new exit points, QIBM\_QP0L\_OBJ\_CLOSE and QIBM\_QP0L\_OBJ\_OPEN, are supplied in this release. A new file system attribute, "Run exit program", controls whether the exit programs registered to these exit points will run when a file system object is opened or closed. An exit program can perform application-specific processing when the object is opened or closed, such as verification, conversion, or removal of temporary objects. This support is enabled for the root, QOpenSys, user-defined, and QDLS file systems.

For additional information, see the [Memo to Users](#).

## **Time reduction to perform CRG switchover**

When performing a switchover of a device Cluster Resource Group (CRG), the job queue that is specified in the job description for the interactive user that is performing the switchover is used to vary off and on the Independent Auxiliary Storage Pool (IASP). This may result in the switchover taking longer than expected if the user profile performing the switchover has its job queue set to a queue that is either held or has a low maximum limit of active jobs. For example, if the user performing the switchover has QDFTJOB set as the job description, the IASP vary jobs will be submitted to the QBATCH job queue.

Because the QBATCH job queue may be held or may allow only one active job at a time, the switchover may be held up for a long time. The behavior has been changed such that both planned switchovers, performed with the Initiate<sup>(R)</sup> Switchover API, and failovers will automatically use the QSYSNOMAX job queue for IASP vary on and off operations, regardless of the user profile initiating the operation. For selected configurations, this reduces the amount of time required to perform the CRG switchover because there will not be a limit on the number of active jobs.

**Note:** This does not affect CRG user exit programs; the job queue referenced by the user profile parameter specified when creating or changing the CRG will continue to be used. The job queue specified in the user profile's job description is used for submitting user exit programs, regardless of the user initiating the planned switchover operation.

## ***I/O enhancement***

With IBM i 7.5, IBM i supports a new I/O offering for Power:

### **Enterprise PCIe4 NVMe disk**

There is a new generation of Enterprise PCIe4 NVMe disks in U.2 form factor for Power9 servers.

### ***Db2 for i***

Db2 for i, the integrated database for IBM i known for containing the attributes valued by business computing solutions, is enhanced to include new capabilities for

SQL application developers, DBEs, and anyone interested in modern and advanced security management.

## Db2 for i enhancements

Many Db2 for i enhancements are included with IBM i 7.5. While many of the IBM i 7.5 enhancements are or will also be delivered in previous IBM i operating system levels, these database enhancements are unique to IBM i 7.5:

- The SQL Query Engine (SQE) is enhanced to deliver improved query costing and related query performance improvements. SQE is also enhanced to recognize system-wide high consumption of resources, and automatically adjusts query execution to be less aggressive from a resource perspective.
- The maximum size of a Db2 for i binary radix index is increased from 1.7 TB to 16 TB. The logical page size of the index determines the new maximum index size.
- Ragged Flash capability is delivered to allow clients who utilize FlashCopy<sup>(R)</sup> services to make an instant point-in-time copy of their IBM i partition. Prior to using FlashCopy, the administrator would indicate whether active transactions should be automatically rolled back or left uncommitted upon IPL of the flash copy. By having control over the behavior of the IPL of the flash target, clients gain the ability to control how they utilize the copy node.
- The RESTRICT ON DROP clause is added to Db2 for i, enabling a DBE to establish a protection against deleting an SQL table, database physical file, or a database source physical file.
- The SQL language in Db2 for i is extended to include the BOOLEAN data type. In addition to the new data type, many enhancements are made to the SQL language, compilers, and database interfaces to support BOOLEAN.
- To complement the new BOOLEAN support, many SQL language constructs are enhanced:
  - Constants: TRUE, FALSE, ON, OFF, and UNKNOWN
  - Scalar functions: BOOLEAN, ISTRUE, ISFALSE, ISNOTTRUE, and ISNOTFALSE
  - Aggregate functions: ANY, EVERY, and SOME
  - Predicates: IS TRUE, IS FALSE, TRUE, and FALSE
- JSON support within Db2 for i is enhanced to support BOOLEAN values for publishing or shredding JSON with SQL.
- Db2 for i provides additional functions for HTTP requests to publish or consume web services. These functions enable the SQL programmer to use Representational State Transfer (RESTful) through SQL, including Embedded SQL. The additional functions are based in QSYS2 and have advantages over the established and widely used SYSTOOLS HTTP functions in that the new functions do not rely upon Java<sup>TM</sup> and that they include other ease-of-use benefits.
- New QSYS2-based HTTP functions that provide the ability to modify the resource include:
  - HTTP\_PATCH() Scalar function
  - HTTP\_PATCH\_VERBOSE() Table function
- TRY\_CAST() is a new built-in scalar function that provides an easy and reliable technique for using SQL to evaluate the veracity of existing data. DBEs can use TRY\_CAST to "try casting" a data element to a specific data type and discover whether the data adheres to the rules of that data type. In this way, invalid data can be rooted out and corrected.

## Db2 for i Services

Db2 for i is providing more advanced and easy-to-use tooling for the DBE:

- MTI\_INFO returns details about Maintained Temporary Indexes (MTI), turning an abstract topic into a very easy and straightforward topic for the DBE.
- Some other additional Db2 for i Services have also been enhanced.

These and other enhancements are delivered through the Db2 PTF Group.

See the [Db2 for i - Technology Updates](#) wiki to learn more about these and other Db2 for IBM i enhancements.

## IBM i Services

IBM i Services, the strategic method for gaining access to IBM i objects, system information, and much more, continues to grow. Leveraging the power of SQL and the Db2 for i SQL Query Engine (SQE), application developers, DBEs, and system managers have an easy pathway to explore IBM i objects and data in ways that were not possible with previous technologies.

In this release, IBM i Services are added and enhanced, providing useful SQL-based alternatives to IBM i commands and APIs.

- `SPOOLED_FILE_INFO`: Matches the speed and usability of the Work with Spooled Files (WRKSPLF) CL command.
- `ACTIVATION_GROUP_INFO`: Discover the deep details about activation groups within the current or target job.
- `ASSOCIATE_JOURNAL_RECEIVER`: Use SQL to re-establish the relationship of journal receivers with a journal.
- `REMOTE_JOURNAL_INFO`: Discover the existence and attributes of remote journals on other IBM i systems associated with journals on this IBM i.
- `JOURNAL_RECEIVER_INFO`: Discover the existence and attributes of journal receivers.
- `SQL_CHECK_SPECIAL_AUTHORITY`: Easily determine if the current user has a specific special authority.
- `SQL_CHECK_FUNCTION_USAGE`: Easily determine if the current user is allowed to use a specific function usage.
- `CHANGE_USER_SPACE`: Use SQL to change the contents of a \*USRSPC object.
- `CHANGE_USER_SPACE_ATTRIBUTES`: Use SQL to change the attributes of a \*USRSPC object.
- `ADD_USER_INDEX_ENTRY`: Use SQL to add an entry to a \*USRIDX object.
- `REMOVE_USER_INDEX_ENTRY`: Use SQL to remove an entry from a \*USRIDX object.
- `ELECTRONIC_SERVICE_AGENT_INFO`: An SQL alternative to the Verify Service Agent (VFYSRVAGT) CL command.
- `TELNET_SERVER_ATTRIBUTES`: A new service to understand the TELNET server configuration.
- `CHECK_PASSWORD`: A new service to test whether a password will be valid.
- `SECURITY_INFO`: Enhanced to return more security insight.
- `SET_SERVER_SBS_ROUTING`: Enhanced to support the secure versions of the Database server (QZDASSINIT) and File server (QPWFSESVSS).
- `SERVER_SHARE_INFO`: Enhanced to return authorization list detail.
- `NETSTAT_JOB_INFO`: Enhanced to return job type.
- `USER_STORAGE`: Enhanced to return many new columns, which show previously hard-to-access security deployment summary detail for the user.
- `OBJECT_STATISTICS`: Enhanced to return user-controlled build identification object detail.

Db2 for i provides working examples and tools in the SYSTOOLS schema. As IBM has done in previous technology refreshes, SYSTOOLS is enhanced to help clients take a step forward with extreme automation using SQL. One of the functions that has been enhanced is Audit Journal functions. Table functions unique to specific audit journal entry types are added to SYSTOOLS. The table functions return the basic audit journal detail but also extract the entry-specific detail into easily consumed return columns.

For details on these enhancements and the other IBM i Services enhancements, see the [IBM i Services](#) wiki.

## **Open Source for IBM i**

### **Application serving**

IBM i continues to enable several open source Java application servers on IBM i. Some examples include WildFly, Eclipse Jetty, and Apache Tomcat. WildFly is an open source version of JBoss<sup>(R)</sup>. It is actively developed by Red Hat<sup>(R)</sup>. It offers a simple upgrade path to JBoss Enterprise Application Platform (JBoss EAP) if needed. Apache Tomcat is one of the most popular application servers on IBM i and has been in use for over a decade. Eclipse Jetty is a lightweight web server that brings both scalability and ease of use. For more information about these options, see the [Open Source Java Application Servers](#) GitHub.

Support is offered as part of IBM's open source support offering. For more information, see the [Open Source Support for IBM i](#) website.

### **LPPs**

#### **IBM Rational Development Studio (5770-WDS)**

New features have been added in this release to the ILE compilers, specifically RPG IV. Responding to requirements from the development community, IBM i has added some new operations in RPG IV. Two of the enhancements are:

- SND-MSG opcode: Send a message to the job log.
- ON-EXCP opcode: Monitor for specific messages and take an action.

For details on these and many more updates, see the [RPG Cafe](#) website.

#### **IBM i Access Client Solutions (5770-XJ1) (ACS version 1.1.9.0)**

The Access Client Solutions interface is updated and enhanced to meet requests from IBM i administrators. The major updates to the core ACS product are:

- Group support: A new Groups View has been added to ACS, enabling administrators to manage multiple systems as a group. From System Configuration, it is easy to define new groups and move or add systems into these groups for a simpler way to organize multiple systems. Administrators can choose to work with systems using the traditional ACS view or they can leverage the new Groups View.
- Control the Information Displayed on GUI: System administrators can choose to limit the columns displayed on the GUI to just those of most interest for their environment. Additionally, it is possible to simplify the main GUI appearance by hiding the right pane.
- Run SQL Scripts Tab Support: Multiple SQL scripts may now be opened within a single window or connection. Each script is displayed in its own tab. This can be accomplished by doing a drag and drop of one or more SQL files from Windows<sup>TM</sup> Explorer or macOS Finder to have each opened in a new tab. Additionally, dragging and dropping a folder that contains multiple SQL scripts will open each script in its own tab. Additionally, it is possible to save a script while that script is running.

#### **IBM PowerHA SystemMirror for i (5770-HAS)**

IBM PowerHA SystemMirror for i 7.5 brings a new set of enhancements centered around simplification, reporting, and performance.

##### *Simplified Single Edition Offering*

The PowerHA SystemMirror for i offering is simplified to have a single edition containing all functionality.

## *Geographic Mirroring Compression*

Geographic mirroring performs disk-level replication. This means that all changes on disk in an Independent Auxiliary Storage Pool (IASP) are replicated over the TCP/IP network to the target system. When PowerHA performs a synchronization, whether for the initial synchronization, after an unplanned failure, or when resuming from a suspend operation, PowerHA replicates data over the TCP/IP network.

With this enhancement, PowerHA can now compress geographic mirroring data during resynchronization, reducing the data transfer required. In addition, on Power10 systems running in Power10 compatibility mode, PowerHA uses the on-chip NX GZIP accelerator, which provides hardware-accelerated compression.

## *Reduction in time required to perform CRG switchover for selected configurations*

IBM PowerHA for i is building additional enhancements on top of the newly enhanced clustering capabilities of the base operating system of IBM i 7.5. The time required to perform a Cluster Resource Group (CRG) switchover for some configurations is reduced.

## *Recently released enhancements*

The PowerHA product continues to provide enhancements through PTF several times a year. The following enhancements were previously released in December of 2021 and are also available in PowerHA 7.5:

### *Simplified IP Address Switching*

Previously, in a PowerHA environment, users could configure a server takeover IP address associated with an IASP device in a device cluster resource group (CRG). This IP address follows the primary node in the CRG and enables users and applications to access the correct primary system at any point in time.

Environments with many IP addresses often required a custom-coded user exit program attached to the IASP vary-on and vary-off exit points. PowerHA now allows users to add up to 256 IP addresses to a device CRG by using a new device type of \*IPA. This simplifies a PowerHA implementation by enabling simple switching of IP addresses without custom coding, exit programs, or scripts.

### *Integrated Switchover Progress Monitoring*

Previously, PowerHA introduced switchover progress monitoring through a new command, Display CRG Activity (DSPCRGACT), which shows the progress of a switchover. This progress monitoring has been enhanced:

- Integrated into the CHGCRGPRI command to automatically display progress during a switchover.
- A new action required step indicates when a job queue is held or a subsystem is inactive.

### *Performance improvements*

While PowerHA has always required minimal resources on nodes in the environment, PowerHA continues this trend by providing improved performance for many operations with the following enhancements:

- Performance improvements for SVC-based storage communication, reducing the time required to perform operations.
- Performance improvements related to temporary user spaces and user queues with up to a 48% decrease in CPU usage, and up to a 90% decrease in the number of user spaces created for certain PowerHA operations.

## *Additional enhancements*

There are several other enhancements to PowerHA. For more information about these enhancements and to get started, see the [IBM PowerHA SystemMirror for i](#) wiki page.

## IBM Backup, Recovery, and Media Services for i (5770-BR1)

Backup, Recovery, and Media Services for i (BRMS) is the strategic IBM solution for planning and managing the save and restore operations for IBM i.

In IBM i 7.5, the BRMS product has numerous enhancements across many areas of the product, adding or updating command defaults and providing new capabilities through SQL Services and new APIs.

In the area of backup and restore the following enhancements have been made

- The **SAVBRM** command parameter has the new default of **ASYNCRING(\*YES)**.
- Backup control group support for IFS backups using **SAVACTOPT(\*ALWCHKPVRT)** and **SAVACTOPT(\*ALL)**.
- Backup control group entry support for Save active message queue library.
- **RSTLIBBRM** now includes the **STRJRN()** and **SELECT()** parameters.
- **RSTOBJBRM** includes the **STRJRN()** parameter.

Additionally, IBM i 7.5 enhancements can be found in the reporting capabilities.

- Recovery report ( **QP1ARCY** ) steps have been enhanced to include cloud recovery support for Network Install Using Network File System (NFS) and using DSI VTL iSCSI attached devices.
- An **EXPDATE()** parameter is added to **PRTRPTBRM**, allowing the selection of the records to include in the report.
- **DSPLGBRM** has been enhanced to support **OUTPUT(\*OUTFILE)** and **OUTPUT(\*OUTSTMF)**.

New enhancements are added to the media command **WRKMEDBRM**.

- Now allows the selection of multiple *From locations* and multiple *Media class names*.
- Now supports **OUTPUT(\*OUTFILE)** and **OUTPUT(\*OUTSTMF)**.

Policy enhancements are added to the **WRKPCYBRM** command.

- **WRKPCYBRM \*SYS** option for BRMS includes all BRMS command processing messages into the BRMS log.
- **WRKPCYBRM \*RCY** option for check the size of the restore.
- **WRKPCYBRM \*BKU** option for automatic virtual volume attributes.

## SQL Services

- SQL Service interfaces are added as a new way to view, order, and subset BRMS information.

## Security enhancements

- The default for the BRMS shipped database is changing from **\*PUBLIC \*USE** authority to **\*PUBLIC \*EXCLUDE**.
- The default authority for BRMS shipped functional usage is changing from default authority **\*ALLOWED** to **\*DENIED**. Use the **SETUSRBRM** command as a starting point to grant system operators and administrators access to BRMS functions and components. Then use the functional usage model to customize access by user.
- Default for the BRMS APIs assigned functional authority is changed from **\*ALLOWED** to **\*DENIED**.
- The data authority for BRMS shipped flight recording is changing from **\*RWX** to **\*WX**.



## APIs and Exit program enhancements

- Reclaim Media (Q1ARCLMED) API gives users the ability to programmatically reclaim a single tape volume.
- Change Control Group Attributes (Q1ACHGCGA) API enables users to change programmatically the control group attributes.
- Control Group exit program support for new format BKUI0200.

## Hardware support

- Added support for Ultrium<sup>®</sup> 9 (LTO9) tape drives and media.
- Added support for DSI VTL iSCSI attached devices.

To discover more detail on these and other BRMS enhancements, see the [Enhancements to BRMS](#) wiki.

## **IBM Db2 Mirror for i (5770-DBM)**

With IBM i 7.5, Db2 Mirror for i now is capable of supporting a mixed OS release environment. This means that one node can be running at IBM i 7.4 and the other node running at IBM i 7.5. The mixed OS release mode can be used to facilitate OS upgrades with minimal to zero business impact.

Db2 Mirror for i also includes a new feature that allows the designating of one node as read-only. The read-only node will still receive all replication synchronously, allowing business intelligence workloads to receive real-time updates from the active node. However, the read-only node will block any updates to replicated Db2 objects. This facilitates the offloading of the read-only Db2 workloads and gives confidence that those applications cannot change the active node Db2 files.

Additionally, the Db2 Mirror for i GUI and documentation have been enhanced, providing guidance for clients to visualize how to move to Db2 Mirror and manage Db2 Mirror and best practices for security when implementing Db2 Mirror.

## **IBM Content Manager OnDemand for i (5770-RD1)**

IBM Content Manager OnDemand for i (CMOD) provides significant new function in IBM i 7.5 with enhancements to existing commands and updates to others. Support for converting some types of spooled files to .pdf has also been added.

- New commands:
  - Display Resource List (DSPRSCLOND) command lists the AFP resources used in a spooled file.
  - Add Document (ADDDOCOND) command adds a document to CMOD with the provided index values.
  - Update Document (UPDDOCOND) command updates the specified CMOD document's index fields with the provided values.

These new commands are also available through PTFs for CMOD for i versions 7.3 and 7.4.

- Enhanced commands:
  - Create Instance (CRTINSTOND) command is enhanced to support the configuration of SSL during the creation of an instance.
  - Add Report (ADDRPTOND) command is enhanced to support the automatic generation of the trace file name.
  - Start Monitor (STRMONOND) command is enhanced to support ending the monitor if an error limit is reached.
  - Change Policy Level Date (CHGPLDOND) command has been enhanced to allow the next level date to be changed based on the old date plus or minus a specific number of days.

These command enhancements are also available through PTFs for CMOD for i versions 7.3 and 7.4:

- The Content Manager OnDemand component of IBM Navigator for i has been modernized to take advantage of the new design and technology.
- New support for converting SCS and AFPDS spooled files to PDF during load time: The Add Report (ADDRPTOND) command now supports the ability to convert an input spooled file from SCS or AFPDS to PDF before indexing and loading into CMOD. Subsequent retrievals of the archived data are displayed and printed as a PDF.
- New transforms for CMOD Web Enablement Kit (ODWEK) and CMOD Distribution Facility (ODF): Three transforms are added to the CMOD Web Enablement Kit (ODWEK) and the CMOD Distribution Facility (ODF) to enable archived data to be converted to PDF as it is sent to the viewer or printer. Support is provided for IBM i SCS to PDF, IBM i SCS-Extended to PDF, and IBM i AFP to PDF transforms. The new support requires the IBM Transform Services for i (5770-TS1) Licensed Program Product.
- Additional enhancements include:
  - The Content Manager OnDemand for i Archived Storage Manager (ASM) now supports using NFS version 4.
  - In the 400 indexer, the maximum number of lines per page has been increased from 512 to 1024.
  - An LDAP synchronization tool is included in version 7.5 to help automate the synchronization of changes in user and group definitions in corporate directory servers with Content Manager OnDemand for i.
  - ASM now supports additional cloud storage options. The new support requires the IBM Cloud<sup>(R)</sup> Storage Solutions for i (5733-ICC) Licensed Program Product.
  - With the deprecation of applet-based technologies, a modern HTML5-based line data viewer with graphical annotation capability is available for use with IBM Content Navigator to view and annotate line data content in Content Manager OnDemand.

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## Reference information

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- For information about IBM i 7.4 TR6, see Software Announcement [222-094](#), dated May 3, 2022.
- For information about IBM Power Systems Enhancements, see Hardware Announcement [122-042](#), dated May 3, 2022.

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## Program number

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Program number	VRM	Program name
5770-SS1	7.5	IBM i
5733-AC1	1.1.5	ARCAD RPG Converter
5733-AO1	1.1.5	ARCAD Observer
5770-BR1	7.5	IBM Backup, Recovery and Media Services for i
5733-CY3	7.5	IBM Cryptographic Device Manager for i
5770-DBM	7.5	IBM Db2 Mirror for i
5770-HAS	7.5	IBM PowerHA SystemMirror for i
5770-NLV	7.5	IBM National Languages for i
5770-QU1	7.5	IBM Query for i
5770-ST1	7.5	IBM DB2 <sup>(R)</sup> Query Manager and SQL Development Kit for i

Program number	VRM	Program name
5770-WDS	7.5	IBM Rational Development Studio for i
5770-XW1	7.5	IBM i Access Family

The following products are available with IBM i 7.5 but are not being refreshed:

Program number	VRM	Program name
5770-AMT	7.2	IBM Rational Application Management Tool Set for i
5770-JS1	7.2	IBM Advanced Job Scheduler for i
5733-B45	3.1	IBM AFP Font Collection for Workstations and OS/400 <sup>(R)</sup>
5648-E77	1.1	IBM Infoprint Fonts for Multiplatforms
5722-IP1	5.3	IBM Infoprint Server for iSeries
5733-ARE	1.1	IBM Application Runtime Expert for i
5733-ITL	1.1	IBM Software Temporary License for i
5733-RDW	9.6	IBM Rational Developer for i
5733-WQX	2.3	IBM DB2 Web Query for i
5733-XT2	1.2	IBM XML Toolkit for i
5761-AP1	6.1	IBM Advanced DBCS Printer Support for iSeries
5761-CM1	6.1	IBM Communications Utilities for System i
5761-DB1	6.1	IBM System/38 Utilities for System i
5761-DS2	6.1	IBM Business Graphics Utility for System i
5769-FN1	4.2	IBM Advanced Function Printing DBCS Fonts for AS/400
5769-FNT	4.2	IBM Advanced Function Printing Fonts for AS/400
5733-NKY	5.2	Remove Keys/ePOEs for Transferred Software
5770-PT1	7.4	IBM Performance Tools for i

### Additional products

The following products are shipped with the IBM i operating system (5770-SS1):

- IBM Application Runtime Expert for i (5733-ARE)
- IBM CICS<sup>(R)</sup> Transaction Server for i (5770-DFH)
- IBM HTTP Server for i (5770-DG1)
- IBM Facsimile Support for i (5798-FAX)
- IBM i OptiConnect, Option 23 (5770-SS1)
- IBM Developer Kit for Java (5770-JV1)
- IBM Network Authentication Enablement for i (5770-NAE)
- IBM OmniFind Text Search Server for DB2 for i (5733-OMF)<sup>1</sup>
- IBM Portable Utilities for i (5733-SC1)
- IBM TCP/IP Connectivity Utilities for i (5770-TC1)
- IBM Transform Services for i (5770-TS1)
- IBM Universal Manageability Enablement for i (5770-UME)

- IBM i Open Source Solutions (5733-OPS) (available only at the [IBM i open source RPM](#) website)
- IBM i Access Client Solutions (5733-XJ1)<sup>2</sup>
- IBM i Access for Web (5770-XH2)<sup>2</sup>

<sup>1</sup> Now is automatically delivered with IBM i and is not separately orderable.

<sup>2</sup> Some of the functions of these products require an entitlement for IBM i Access Family (5770-XW1).

In order to allow clients more flexibility in staying current with IBM Web Enablement for i products, clients can download IBM Web Enablement for i from the [Entitled System Support](#) site for no additional charge. IBM Web Enablement for i is no longer ordered, preloaded, or available on physical media.

Program number	VRM	Program name
5733-WE3	1.1.x	IBM Web Enablement for i

Program number	Maintenance 3-month program number	Maintenance 1-year program number	Maintenance 2-year program number	Maintenance 3-year program number	Maintenance 4-year program number	Maintenance 5-year program number
5770-SS1	5733-SPN	5733-SPM	5733-PO2	5733-SPO	5733-PO4	5733-PO5

Program number	Maintenance 1-year program number	Maintenance 2-year program number	Maintenance 3-year program number	Maintenance 4-year program number	Maintenance 5-year program number
5770-SS1	5733-SPP	5733-SP2	5733-SP3 5733-SPE	5733-SP4	5733-SP5

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## Offering Information

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Product information is available on the [IBM Offering Information](#) website.

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## Publications

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None

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## Services

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### IBM Systems Lab Services

Systems Lab Services offers infrastructure services to help build hybrid cloud and enterprise IT solutions. From servers to storage systems and software, Systems Lab Services can help deploy the building blocks of a next-generation IT infrastructure to empower a client's business. Systems Lab Services consultants can perform infrastructure services for clients online or onsite, offering deep technical expertise, valuable tools, and successful methodologies. Systems Lab Services is designed to help clients solve business challenges, gain new skills, and apply best practices.

Systems Lab Services offers a wide range of infrastructure services for IBM Power servers, IBM Storage systems, IBM Z<sup>(R)</sup>, and IBM LinuxONE. Systems Lab Services has a global presence and can deploy experienced consultants online or onsite around the world.

For assistance, contact Systems Lab Services at [ibmsls@us.ibm.com](mailto:ibmsls@us.ibm.com).

To learn more, see the [IBM Systems Lab Services](#) website.

### **IBM Consulting™**

As transformation continues across every industry, businesses need a single partner to map their enterprise-wide business strategy and technology infrastructure. IBM Consulting is the business partner to help accelerate change across an organization. IBM specialists can help businesses succeed through finding collaborative ways of working that forge connections across people, technologies, and partner ecosystems. IBM Consulting brings together the business expertise and an ecosystem of technologies that help solve some of the biggest problems faced by organizations. With methods that get results faster, an integrated approach that is grounded in an open and flexible hybrid cloud architecture, and incorporating technology from IBM Research<sup>(R)</sup> and IBM Watson<sup>(R)</sup> AI, IBM Consulting enables businesses to lead change with confidence and deliver continuous improvement across a business and its bottom line.

For additional information, see the [IBM Consulting](#) website.

### **IBM Technology Support Services (TSS)**

Get preventive maintenance, onsite and remote support, and gain actionable insights into critical business applications and IT systems. Speed developer innovation with support for over 240 open-source packages. Leverage powerful IBM analytics and AI-enabled tools to enable client teams to manage IT problems before they become emergencies.

TSS offers extensive IT maintenance and support services that cover more than one niche of a client's environment. TSS covers products from IBM and OEMs, including servers, storage, network, appliances, and software, to help clients ensure high availability across their data center and hybrid cloud environment.

For details on available services, see the [Technology support for hybrid cloud environments](#) website.

### **IBM Expert Labs**

Expert Labs can help clients accelerate their projects and optimize value by leveraging their deep technical skills and knowledge. With more than 20 years of industry experience, these specialists know how to overcome the biggest challenges to deliver business results that can have an immediate impact.

Expert Labs' deep alignment with IBM product development allows for a strategic advantage as they are often the first in line to get access to new products, features, and early visibility into roadmaps. This connection with the development enables them to deliver First of a Kind implementations to address unique needs or expand a client's business with a flexible approach that works best for their organization.

For additional information, see the [IBM Expert Labs](#) website.

### **IBM Security<sup>(R)</sup> Expert Labs**

With extensive consultative expertise on IBM Security software solutions, Security Expert Labs helps clients and partners modernize the security of their applications, data, and workforce. With an extensive portfolio of consulting and learning services, Expert Labs provides project-based and premier support service subscriptions.

These services can help clients deploy and integrate IBM Security software, extend their team resources, and help guide and accelerate successful hybrid cloud solutions, including critical strategies such as zero trust. Remote and on-premises software deployment assistance is available for IBM Cloud Pak<sup>(R)</sup> for Security, IBM Security QRadar<sup>(R)</sup>/QRoC, IBM Security SOAR/Resilient<sup>(R)</sup>, IBM i2<sup>(R)</sup>, IBM Security Verify, IBM Security Guardium<sup>(R)</sup>, and IBM Security MaaS360<sup>(R)</sup>.

For more information, contact Security Expert Labs at [sel@us.ibm.com](mailto:sel@us.ibm.com).

For additional information, see the [IBM Security Expert Labs](#) website.

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## Technical information

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### **Specified operating environment**

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#### **Hardware requirements**

IBM i 7.5 is supported on select Power servers with Power9 or Power10 processors.

For up-to-date information about all types of code levels needed for support of a particular feature, see the [Power Systems Prerequisites](#) website.

For additional information, see the [System to IBM i mapping](#) website.

#### **Software requirements**

For specific software requirements, see the [Memo to Users](#).

#### **IBM Support**

[IBM Support](#) is your gateway to technical support tools and resources that are designed to help you save time and simplify support. IBM Support can help you find answers to questions, download fixes, troubleshoot, submit and track problem cases, and build skills. Learn and stay informed about the transformation of IBM Support, including new tools, new processes, and new capabilities, by going to the [IBM Support Insider](#).

#### **Additional IBM support**

##### **IBM Client Engineering for Systems**

Client Engineering for Systems is a framework for accelerating digital transformation. It helps you generate innovative ideas and equips you with the practices, technologies, and expertise to turn those ideas into business value in weeks. When you work with Client Engineering for Systems, you bring pain points into focus. You empower your team to take manageable risks, adopt leading technologies, speed up solution development, and measure the value of everything you do. Client Engineering for Systems has experts and services to address a broad array of use cases, including capabilities for business transformation, hybrid cloud, analytics and AI, infrastructure systems, security, and more. Contact Client Engineering for Systems at [sysgarage@ibm.com](mailto:sysgarage@ibm.com).

##### **The IBM Electronic Service Agent**

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The IBM Electronic Service Agent, in combination with IBM Support, is dedicated to providing fast, exceptional support to organizations that have IBM Systems. The IBM Electronic Service Agent is a no-additional-charge tool that proactively monitors and reports hardware events, such as system errors, performance issues, and inventory. The Electronic Service Agent can help you stay focused on your company's strategic business initiatives, save time, and spend less effort managing day-to-day IT maintenance issues. Servers enabled with the Electronic Service Agent can automatically open a problem with IBM Support when covered under IBM warranty or maintenance agreements.

Integrated into the base operating system of IBM i, AIX<sup>(R)</sup>, Power Linux<sup>(R)</sup> Tools pack, and the Power hardware management console (HMC), the Electronic Service Agent is designed to automatically and electronically report system failures and utilization issues to IBM, which can result in faster problem resolution and increased availability. The Electronic Service Agent includes a powerful web user interface, giving the administrator easy access to configurations, status, tool settings, problem information, and filters. System configuration and inventory information collected by the Electronic Service Agent also can be viewed on the IBM Support website and

used to improve problem determination and resolution by you and the IBM support team.

For more information and documentation on how to configure and use the Electronic Service Agent, go to the [IBM Electronic Service Agent](#) website.

[IBM Support](#) is a single internet entry point that replaces the multiple entry points traditionally used to access IBM internet services and support. IBM Support enables you to gain easy access to IBM resources for assistance in resolving technical problems. The Call Home web, which is available from the My support menu with links to My systems and My inventory, and premium search functions make it easy for organizations with Electronic Service Agent enabled products to track system inventory and find pertinent fixes.

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## Planning information

### **Packaging**

This offering is delivered electronically. Alternatively, one can order physical media.

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### **Security, auditability, and control**

IBM i uses the security and auditability features of IBM i.

The client is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communication facilities.

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## Ordering information

### **IBM Configurator for e-business (e-config)**

#### **New feature numbers**

IBM i 7.5 (5770-SS1) introduces the following feature numbers:

<b>Program number</b>	<b>Feature description</b>	<b>Supply feature number</b>
5770-SS1	i 7.5 Machine Code	5875
5770-SS1	i 7.5 USB License Mach. Code	5975
5770-SS1	Lang Grp 1 Supply	5851
5770-SS1	Lang Grp 2 Supply	5852
5770-SS1	Lang Grp 3 Supply	5853
5770-SS1	DB2 Multisystem Supply	5955
5770-SS1	DB2 Symm Multi Supply	5963
5770-SS1	HA Journal Perf Supply	5960
5770-SS1	HA Switch Res Supply	5959
5770-SS1	M&S Extensions Supply	5961
5770-SS1	PSF 1-100 IPM Prtr Supp	5957
5770-SS1	PSF/400 1-55 IPM Supply	5956
5770-SS1	PSF Any Speed Supply	5958
5770-SS1	Db2 Data Mirroring Supply	5983

### **ARCAD RPG Converter (5733-AC1)**

<b>Program number</b>	<b>Feature description</b>	<b>Supply feature number</b>
5733-AC1	ARCAD RPG Converter Supply	5839

### **ARCAD Observer (5733-AO1)**

<b>Program number</b>	<b>Feature description</b>	<b>Supply feature number</b>
5733-AO1	ARCAD Observer Supply	5839

**Cryptographic Device Manager for i (5733-CY3)**

<b>Program number</b>	<b>Feature description</b>	<b>Supply feature number</b>
5733-CY3	Cryptographic Device Manager for i	5849

**Web Enablement for i (5733-WE3)**

<b>Program number</b>	<b>Feature description</b>	<b>Supply feature number</b>
5733-WE3	Web Enablement for i	5821

**Backup, Recovery, and Media Services for i (5770-BR1)**

<b>Program number</b>	<b>Feature description</b>	<b>Supply feature number</b>
5770-BR1	Language Group 1	5857
5770-BR1	Language Group 2	5858
5770-BR1	Language Group 3	5859
5770-BR1	Language Group 1 Network	5930
5770-BR1	Language Group 2 Network	5931
5770-BR1	Language Group 3 Network	5932
5770-BR1	Language Group 1 Advanced	5933
5770-BR1	Language Group 2 Advanced	5934
5770-BR1	Language Group 3 Advanced	5935

**Query for i (5770-QU1)**

<b>Program number</b>	<b>Feature description</b>	<b>Supply feature number</b>
5770-QU1	Language Group 1	5857
5770-QU1	Language Group 2	5858
5770-QU1	Language Group 3	5859

**DB2 Query Manager and SQL Dev Kit for i (5770-ST1)**

<b>Program number</b>	<b>Feature description</b>	<b>Supply feature number</b>
5770-ST1	Language Group 1	5857
5770-ST1	Language Group 2	5858
5770-ST1	Language Group 3	5859

**Rational Development Studio (5770-WDS)**

<b>Program number</b>	<b>Feature description</b>	<b>Supply feature number</b>
5770-WDS	Language Group 1	5857
5770-WDS	Language Group 2	5858
5770-WDS	Language Group 3	5859
5770-WDS	Language Group 1 ILE Compilers	5963
5770-WDS	Language Group 2 ILE Compilers	5964
5770-WDS	Language Group 3 ILE Compilers	5965
5770-WDS	Language Group 1 Heritage Compilers	5983
5770-WDS	Language Group 2 Heritage Compilers	5984
5770-WDS	Language Group 3 Heritage Compilers	5985
5770-WDS	Language Group 1 Application Development ToolSet	5995



<b>Program number</b>	<b>Feature description</b>	<b>Supply feature number</b>
5770-WDS	Language Group 2 Application Development ToolSet	5996
5770-WDS	Language Group 3 Application Development ToolSet	5997

#### **IBM i Access Family (5770-XW1)**

<b>Program number</b>	<b>Feature description</b>	<b>Supply feature number</b>
5770-XW1	Language Group 1 Processor based	5850
5770-XW1	Language Group 2 Processor based	5851
5770-XW1	Language Group 3 Processor based	5852
5770-XW1	Language Group 1 User Based	5757
5770-XW1	Language Group 2 User Based	5758
5770-XW1	Language Group 3 User Based	5759

#### **Db2 Mirror for i (5770-DBM)**

<b>Program number</b>	<b>Feature description</b>	<b>Supply feature number</b>
5770-DBM	Language Group 1	5857
5770-DBM	Language Group 2	5858
5770-DBM	Language Group 3	5859

#### **IBM National Languages for i (5770-NLV)**

<b>Program number</b>	<b>Feature description</b>	<b>Supply feature number</b>
5770-NLV	i 7.5 Lang Grp 1 Supply	5851
5770-NLV	i 7.5 Lang Grp 2 Supply	5852
5770-NLV	i 7.5 Lang Grp 3 Supply	5853
5770-NLV	i 7.5 Licensed Machine Code	5875
5770-NLV	i 7.5 USB License Machine Code	5975
5770-NLV	English U/L SBCS Secondary	5124
5770-NLV	Estonian Secondary Language	5102
5770-NLV	Lithuanian Secondary Language	5103
5770-NLV	Latvian Secondary Language	5104
5770-NLV	Vietnamese Secondary Language	5105
5770-NLV	Lao Secondary Language	5106
5770-NLV	Belgian English Secondary	5109
5770-NLV	Slovenian Secondary Language	5111
5770-NLV	Croatian Secondary Language	5112
5770-NLV	Macedonian Secondary Language	5113
5770-NLV	Serbian Secondary Language	5114
5770-NLV	Portuguese Secondary Language	5122
5770-NLV	Dutch Secondary Language	5123

<b>Program number</b>	<b>Feature description</b>	<b>Supply feature number</b>
5770-NLV	Finnish Secondary Language	5125
5770-NLV	Danish Secondary Language	5126
5770-NLV	French Secondary Language	5128
5770-NLV	German Secondary Language	5129
5770-NLV	Japanese Universal Secondary	5130
5770-NLV	Spanish Secondary Language	5131
5770-NLV	Italian Secondary Language	5132
5770-NLV	Norwegian Secondary Language	5133
5770-NLV	Swedish Secondary Language	5137
5770-NLV	English U/C DBCS Secondary	5138
5770-NLV	German MNCS Secondary Language	5139
5770-NLV	French MNCS Secondary Language	5140
5770-NLV	Italian MNCS Secondary Language	5142
5770-NLV	Arabic Secondary Language	5154
5770-NLV	Turkish Secondary Language	5156
5770-NLV	Greek Secondary Language	5157
5770-NLV	Icelandic Secondary Language	5158
5770-NLV	Hebrew Secondary Language	5161
5770-NLV	Japanese DBCS Secondary	5162
5770-NLV	Belgian Dutch Secondary Lang	5163
5770-NLV	Belgian French Secondary Lang	5166
5770-NLV	Thai DBCS Secondary Language	5172
5770-NLV	Bulgarian Secondary Language	5174
5770-NLV	Czech Secondary Language	5175
5770-NLV	Hungarian Secondary Language	5176
5770-NLV	Polish Secondary Language	5178
5770-NLV	Russian Secondary Language	5179
5770-NLV	Braz Portuguese Secondary Lang	5180
5770-NLV	Canadian French Secondary Lang	5181
5770-NLV	English U/L DBCS Secondary	5184
5770-NLV	Korean DBCS Secondary Language	5186

<b>Program number</b>	<b>Feature description</b>	<b>Supply feature number</b>
5770-NLV	Trad Chinese DBCS Secondary	5187
5770-NLV	Simp Chinese DBCS Secondary	5189
5770-NLV	Romanian Secondary Language	5192
5770-NLV	Slovakian Secondary Language	5194
5770-NLV	Albanian Secondary Language	5195
5770-NLV	Portuguese MNCS Secondary	5196
5770-NLV	Farsi Secondary Language	5198

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5733-SPO	IBM SW Maintenance for IBM i and Selected Products, 3-Year Extended Registration
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5733-SP2	IBM SW Maintenance for IBM i and Selected Products, 2-Year Registration
5733-SP3	IBM SW Maintenance for IBM i and Selected Products, 3-Year Registration
5733-SP4	IBM SW Maintenance for IBM i and Selected Products, 4-Year Registration
5733-SP5	IBM SW Maintenance for IBM i and Selected Products, 5-Year Registration
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There is no new ordering information for the Maintenance program numbers this release.

## Charge metric

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Program identifier	License Information document title	License Information document number
5770-SS1	IBM i 7.5	<a href="#">L-LHIH-BWXQED</a>

Select your language of choice and scroll down to the Charge Metrics section. Follow-on releases, if any, may have updated terms. See the [License Information documents](#) website for more information.

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