Note!

Before using this information and the product it supports, be sure to read the general information under "Notices" on page 31.

Third Edition (June 2013)

This edition applies to Debug Tool for z/OS, Version 12.1 (Program Number 5655-W70 with the PTF for APAR PM85967), which supports the following compilers:

- AD/Cycle C/370™ Version 1 Release 2 (Program Number 5688-216)
- C/C++ for MVS/ESA Version 3 (Program Number 5655-121)
- C/C++ feature of OS/390 (Program Number 5647-A01)
- C/C++ feature of z/OS (Program Number 5694-A01)
- OS/VS COBOL, Version 1 Release 2.4 (5740-CB1) - with limitations
- VS COBOL II Version 1 Release 3 and Version 1 Release 4 (Program Numbers 5668-958, 5688-023) - with limitations
- COBOL/370 Version 1 Release 1 (Program Number 5688-197)
- COBOL for MVS & VM Version 1 Release 2 (Program Number 5688-197)
- COBOL for OS/390 & VM Version 2 (Program Number 5648-A25)
- Enterprise COBOL for z/OS and OS/390 Version 3 (Program Number 5655-G53)
- Enterprise COBOL for z/OS Version 4 (Program Number 5655-S71)
- Enterprise COBOL for z/OS Version 5 Release 1 (Program Number 5655-W32)
- PL/I for MVS & VM Version 1 Release 1 (Program Number 5688-235)
- VisualAge® PL/I for OS/390 Version 2 Release 2 (Program Number 5655-B22)
- Enterprise PL/I for z/OS and OS/390 Version 3 (Program Number 5655-H31)
- Enterprise PL/I for z/OS Version 4.3 and earlier (Program Number 5655-W67)

This edition also applies to all subsequent releases and modifications until otherwise indicated in new editions or technical newsletters.

You can order publications online at www.ibm.com/shop/publications/order, or order by phone or fax. IBM Software Manufacturing Solutions takes publication orders between 8:30 a.m. and 7:00 p.m. Eastern Standard Time (EST). The phone number is (800)879-2755. The fax number is (800)445-9269.

You can find out more about Debug Tool by visiting the IBM Web site for Debug Tool at: http://www.ibm.com/software/awdtools/debugtool

US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.
About this document

This document describes how to use an application programming interface (API) to create, delete, and modify DTCN profiles.

Who might use this document

This document is intended for programmers that are developing applications that need access to the DTCN profiles stored on a z/OS® system. Programmers must be familiar with using APIs that use the HTTP protocol and the Representational State Transfer (REST) access method. Programmers must also be familiar with DTCN profiles.

Accessing z/OS licensed documents on the Internet

z/OS licensed documentation is available on the Internet in PDF format at the IBM® Resource Link® Web site at:

http://www.ibm.com/servers/resourcelink

Licensed documents are available only to customers with a z/OS license. Access to these documents requires an IBM Resource Link user ID and password, and a key code. With your z/OS order you received a Memo to Licensees, (GI10-8928), that includes this key code.

To obtain your IBM Resource Link user ID and password, log on to:

http://www.ibm.com/servers/resourcelink

To register for access to the z/OS licensed documents:
1. Sign in to Resource Link using your Resource Link user ID and password.
2. Select User Profiles located on the left-hand navigation bar.

Note: You cannot access the z/OS licensed documents unless you have registered for access to them and received an e-mail confirmation informing you that your request has been processed.

Printed licensed documents are not available from IBM.

You can use the PDF format on either z/OS Licensed Product Library CD-ROM or IBM Resource Link to print licensed documents.

How this document is organized

This document is divided into areas of similar information for easy retrieval of appropriate information. The following list describes how the information is grouped:

• Chapter 1 describes, in general terms, the two parts of the API: the resources it identifies and the actions you can do on those resources.
• Chapter 2 describes, in more detail, the actions that you can do on resources, and the codes used by the z/OS system to indicate whether the actions were completed successfully.
Chapter 3 describes the security measures you must consider when you access DTCN profiles, how to identify which version of the API you are using, and how compatibility is determined between different versions of the API.

Chapter 4 describes the changes you have to make to the z/OS system where the DTCN profiles are stored so that the API can access them.

Chapter 5 describes the meaning of the XML tags you use to create the XML documents that contain the information required to do each action.

Appendix A displays a sample HTTP request body and a sample HTTP response body.

Appendix B describes the resources that are available to help you solve any problems you might encounter with Debug Tool.

Appendix C describes the features and tools available to people with physical disabilities that help them use Debug Tool and Debug Tool documents.

The last several topics list notices, bibliography, and glossary of terms.

How to send your comments

Your feedback is important in helping us to provide accurate, high-quality information. If you have comments about this document or any other Debug Tool documentation, contact us in one of these ways:

- Use the Online Readers' Comment Form at www.ibm.com/software/awdtools/rcf/. Be sure to include the name of the document, the publication number of the document, the version of Debug Tool, and, if applicable, the specific location (for example, page number) of the text that you are commenting on.

- Send your comments by email to comments@us.ibm.com. Be sure to include the name of the book, the part number of the book, the version of Debug Tool, and, if applicable, the specific location of the text you are commenting on (for example, a page number or table number).

When you send information to IBM, you grant IBM a nonexclusive right to use or distribute the information in any way it believes appropriate without incurring any obligation to you.
Summary of changes

This section lists the key changes made to Debug Tool for z/OS that affect this publication and the locations in this publication describing these changes.

Changes introduced with Debug Tool V12

The following changes, if applicable, are marked with revision bars:

**Startup at subprogram boundary.**
Delay debug mode is added, enabling Debug Tool to operate in a dormant state until a compile unit of interest to the user becomes active. Delay debug mode is valid for non-CICS programs written in Enterprise PL/I or Enterprise COBOL. When delay debug is on, Debug Tool delays starting the initialization for the debugging session until a compile unit matching the program naming pattern in the delay debug profile is found. That matched compile unit is started using the TEST runtime options in the delay debug profile.

**Dynamic debugging supports applications using XPLINK linkage.**
You can now debug non-CICS C and C++ applications that use XPLINK linkage without having to insert compiled-in hooks. Additional benefits include smaller load modules, enhanced performance, and improved interaction between Java-based applications and COBOL, PL/I, and Assembler.

**User exits are consolidated into one.**
The three Debug Tool Language Environment user exits (EQADBCXT, EQADDCXT, and EQADICXT) are merged into a single one: EQAD3CXT. The existing user exit routines are still supported for upward compatibility and to help users transition to the consolidated user exit.

**Enhanced remote communication security.**
This enhancement enables encrypted communication between Debug Tool and remote debug mode for better privacy and integrity. The enablement uses the Secure Sockets Level (SSL) protocol and digital certificates.

**DTCN enhancement prevents a non-owner from deleting a profile.**
The 3270 BMS DTCN transaction checks to see if users are authorized to delete or modify other owners’ profiles, and rejects unauthorized attempts.

**DTCN profile plug-in is integrated with CICS objects in the CICS Explorer.**
This provides a new mechanism to create or manage a DTCN profile when you want to debug a transaction or program. With the mouse, you can right-click on either a transaction in the Transactions view or a program in the Programs view in the CICS Explorer and choose one of the actions: Update Profile or Manage Profile.

**Code Coverage enhancement to monitor sessions.**
The Coverage Utility increases the number of monitor sessions from 32 to 256.

**Set list by subscript for remote.**
You can specify a SET LIST BY SUBSCRIPT command to control the display format when you view a COBOL array. You can change it to display as it is stored in memory. This enhancement is for remote debug mode only.
Prevent duplicate entries in Monitor table.
Previously, Debug Tool allowed duplicate monitor commands to be entered. Now users can prevent duplicate monitor definitions. This enhancement potentially saves space in the monitor window and in the monitor commands list.

Prevent display of local variables outside of a valid scope.
Debug Tool does not establish a Monitor command for Monitor Local List expression if one or more variables are not defined in the specified compile unit. This enhancement reduces unnecessary information in the monitor window.

Reduced storage overhead and performance for automonitor.
Storage overhead is reduced, and performance of automonitor is improved when you debug a program with large structures.

Handle PL/I generic ENDFILE conditions.
PL/I conditions associated with file handling can now use a wildcard instead of users having to specify a file reference. Specifically, the AT OCCURRENCE file_condition(file_reference) and ON file_condition(file_reference) commands are enhanced for Enterprise PL/I programs to support a wildcard for the file_reference. The wildcard indicates that the breakpoint is honored for all files that raise the ENDFILE condition.

EQAOPTS DYNDDEBUG command.
The EQAOPTS DYNDDEBUG command is added so that you can specify an initial default for the SET DYNDDEBUG command.

%CHAR built-in function.
The %CHAR Debug Tool built-in function is added to enable you to display the result of an expression in EBCDIC format.

NONLESP option for EQANMDBG.
The NONLESP option is added to EQANMDBG to enable you to direct Debug Tool to use a different storage subpool for its storage in cases where the program being debugged does a FREEMAIN of subpool 1 (where Debug Tool places its data by default).

COMPOPTS parameter for load module analyzer.
A new parameter, COMPOPTS, is now supported by the load module analyzer. COMPOPTS lists the compiler options that are known at runtime to be listed for each CSECT in the load module.

EQAOPTS QUIET keyword.
The new EQAOPTS QUIET keyword for the SVCSCREEN,OFF command can be used to suppress the message "EQA2458I SVC Screening is disabled by EQAOPTS. Handling of non-LE events is not available. Debugging of non-LE programs will be restricted in this Debug Tool session."

EQAOPTS STARTSTOPMSG command.
The new EQAOPTS STARTSTOPMSG command tells Debug Tool whether to issue a message when each Debug Tool session starts and stops.

Customization of site default data set names for new users.
The Debug Tool Utilities enable you to customize the site default data set name for new users for the options Debug Tool User Exit Data Set and Delay Debug Profile.

Customization of site default data set name in the Terminal Interface Manager.
The Terminal Interface Manager now allows you to customize the site default data set name for the option "LE options data set".
LOADDEBUGDATA command enhancement.

The LOADDEBUGDATA command has been enhanced to support %CU and %PROGRAM substitution for the cu_name operand.

UNIX System Services multi-process support.

POSIX multi-process support is enhanced for remote debug mode.
Chapter 1. Introduction to the API resources and actions

Debug Tool provides an API that communicates with the DTCN profile manager so that you can create, retrieve, update, or delete profiles in the DTCN profile repository. This API uses the HTTP protocol and provides a RESTful (Representational State Transfer) access method. The API describes (abstracts) resources and actions you can do on the resources.

Resource description

The resources are a DTCN profile and a DTCN profile repository. The following list describes how Debug Tool abstracts a DTCN profile and a DTCN profile repository as a Uniform Resource Identifier (URI):

DTCN profile
   http://ip/dtcn/profileID

DTCN profile repository
   http://ip/dtcn

The following table describes each symbol in the URI:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ip</td>
<td>The IP address and port number of the CICS® HTTP server.</td>
</tr>
<tr>
<td>dtcn</td>
<td>Name of the profile collection, which must be dtcn.</td>
</tr>
<tr>
<td>profileID</td>
<td>A key which identifies a specific profile. This is the TSO user ID of the owner of the DTCN profile.</td>
</tr>
</tbody>
</table>

You can use a query string to provide additional information, the client version, and a profile record number to the DTCN profile manager. You specify a query string by adding a delimiter (the question mark, ?) after the resource name. The following table describes the symbols you can use in the query string:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>clientversion=nnnn</td>
<td>A four digit decimal number that identifies the version of the API that you are using in your application. To learn how to identify version numbers and determine compatibility, see “Compatibility of different versions” on page 7.</td>
</tr>
<tr>
<td>s=number</td>
<td>A decimal number that identifies a profile in the profile repository. The DTCN profile manager numbers profile records in the repository in sequence beginning with 1.</td>
</tr>
</tbody>
</table>

The following examples describe how you might write an URI with a query string:

http://yourhost.yourcompany.com:30000/dtcn/userjoe?clientversion=0102

Identifies a DTCN profile stored in the host yourhost and owned by user userjoe.
http://anotherhost.yourcompany.com:30000/dtcn?clientversion=0102&s=1

Use this URI with the GET method to retrieve up to the first 10 profiles starting with profile record 1 in the DTCN profile repository on the host anotherhost.

**Action descriptions**

The following table describes the actions you can do on a resource:

<table>
<thead>
<tr>
<th>HTTP method</th>
<th>Corresponding action</th>
</tr>
</thead>
<tbody>
<tr>
<td>GET</td>
<td>READ (retrieve a specific profile)</td>
</tr>
<tr>
<td>GET</td>
<td>LIST (retrieve a collection of profiles)</td>
</tr>
<tr>
<td>POST</td>
<td>UPDATE</td>
</tr>
<tr>
<td>PUT</td>
<td>CREATE</td>
</tr>
<tr>
<td>DELETE</td>
<td>DELETE</td>
</tr>
</tbody>
</table>

For each action, you provide any data needed to do an action in the HTTP request body. The host returns any data in the HTTP response body and the response status code and reason phrase in the HTTP response header. The HTTP request and response bodies are XML documents. To learn about the tags in the XML document, see Chapter 5, “Definition of XML tags,” on page 11. You can see an example of an XML document in Appendix A, “Examples: HTTP request body and HTTP response body,” on page 19. To learn more about the specific information you must provide for each action, and the information you receive from the host after it completes an action, see Chapter 2, “HTTP methods, response status codes, and reason phrases,” on page 3.
Chapter 2. HTTP methods, response status codes, and reason phrases

This topic describes the HTTP methods (the actions you can do on a resource), response status codes, and reason phrases. The response status codes and reason phrases are stored in the HTTP response body and HTTP request body.

HTTP methods

The following list describes the HTTP methods you can use on an URI.

**GET method (READ)**
Retrieve a specific DTCN profile from the DTCN profile repository. You must provide the repository name, the profile ID, and the client version in the URI. The HTTP request body must not contain any data. In the HTTP response body, the DTCN profile manager returns an XML document that contains control information (for example, a message and the server version) and the contents of the specified profile.

**GET method (LIST)**
Retrieve a list of the DTCN profiles from the DTCN profile repository, up to ten at a time. In the URI, you must provide the repository name, a number that identifies a profile in the profile repository, and the client version. The HTTP request body must not contain any data. In the HTTP response body, the DTCN profile manager returns an XML document that contains control information (for example, a message and the server version) and a set of ten or fewer profiles.

The DTCN profile manager can return up to 10 profiles, starting with the number you specified in the $s=number$ symbol of the query string.

You can retrieve the entire repository by repeating the GET request. In the first request, specify “1” as the number in the $s=number$ symbol. Repeat the request, each time adding the number of profiles returned from the previous request, until the DTCN profile manager returns no more profiles.

**POST method (UPDATE)**
Modify a specific profile with the information in the HTTP request body. In the URI, you must provide the profile ID and the client version. In the HTTP request body, you must provide all the profile information in a well-formed XML document. In the HTTP response body, the DTCN profile manager returns an XML document that contains control information (for example, a message and the server version).

**PUT method (CREATE)**
Create a new profile with the information in the HTTP request body. In the URI, you must provide the profile ID and the client version. In the HTTP request body, you must provide all the profile information in a well-formed XML document. In the HTTP response body, the DTCN profile manager returns an XML document that contains control information (for example, a message and the server version).

**DELETE method (DELETE)**
Delete the specified profile. In the URI, you must provide the profile ID and the client version. The HTTP request body must be empty. In the HTTP
response body, the DTCN profile manager returns an XML document that contains control information (for example, a message and the server version).

**HTTP response status codes and reason phrases**

The following table shows the status codes and reason phrases the DTCN profile manager might send to your application:

<table>
<thead>
<tr>
<th>Status code</th>
<th>Reason phrase</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>OK</td>
<td>The DTCN profile manager completed the method (action) successfully.</td>
</tr>
<tr>
<td>200</td>
<td>Profile_Already_Exists_With_Identical_Resources</td>
<td>A PUT request was sent specifying resources that are already used by another profile in the DTCN profile repository. The DTCN profile manager did not create a new profile.</td>
</tr>
<tr>
<td>200</td>
<td>Profile_Already_Exists_With_Same_Owner</td>
<td>A PUT request was sent specifying a profile ID that is already used by another profile in the DTCN profile repository. The DTCN profile manager did not create a new profile.</td>
</tr>
<tr>
<td>201</td>
<td>Profile_Created_OK</td>
<td>The DTCN profile manager successfully created a new profile.</td>
</tr>
<tr>
<td>400</td>
<td>Unsupported_Client_Version</td>
<td>A client version that is 2 or more levels higher or lower than the server version was specified.</td>
</tr>
<tr>
<td>400</td>
<td>Invalid_Client_Version</td>
<td>The syntax of the clientversion symbol is incorrect. For the correct syntax, see &quot;Compatibility of different versions&quot; on page 7.</td>
</tr>
<tr>
<td>400</td>
<td>Invalid_Profile_Record_Number</td>
<td>Starting profile record number is incorrect.</td>
</tr>
<tr>
<td>400</td>
<td>No_Resource_Specified</td>
<td>No resources were specified in the HTTP request body.</td>
</tr>
<tr>
<td>400</td>
<td>Site_Rules Require Terminal ID Specified</td>
<td>The HTTP request body does not specify a terminal ID. The DTCN profile manager requires that you specify a terminal ID.</td>
</tr>
<tr>
<td>400</td>
<td>Site_Rules Require Transaction ID Specified</td>
<td>The HTTP request body does not specify a transaction ID. The DTCN profile manager requires that you specify a transaction ID.</td>
</tr>
<tr>
<td>400</td>
<td>Site_Rules Require At Least One Load Mod Name Specified</td>
<td>The HTTP request body does not specify the name of a load module. The DTCN profile manager requires that you specify the name of at least one load module.</td>
</tr>
<tr>
<td>400</td>
<td>Site_Rules Require At Least One Program Name Specified</td>
<td>The HTTP request body does not specify the name of a compile unit. The DTCN profile manager requires that you specify the name of at least one compile unit.</td>
</tr>
<tr>
<td>Status code</td>
<td>Reason phrase</td>
<td>Explanation</td>
</tr>
<tr>
<td>------------</td>
<td>---------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>400</td>
<td>Site_Rules Require User_ID_Specified</td>
<td>The HTTP request body does not specify a user ID. The DTCN profile manager requires that you specify a user ID.1</td>
</tr>
<tr>
<td>400</td>
<td>Site_Rules Require NetName_Specified</td>
<td>The HTTP request body does not specify a netname. The DTCN profile manager requires that you specify a netname.1</td>
</tr>
<tr>
<td>400</td>
<td>Site_Rules Require Client_IP_Specified</td>
<td>The HTTP request body does not specify the IP address of the client. The DTCN profile manager requires that you specify the IP address of the client.1</td>
</tr>
<tr>
<td>400</td>
<td>Invalid Session Address</td>
<td>For a PUT or POST request, the HTTP request body is missing the &lt;sessaddr&gt; tag or a value in the &lt;sessaddr&gt; tag, which is required if you specify TCP in the &lt;sessiontype&gt; tag.</td>
</tr>
<tr>
<td>400</td>
<td>Invalid Session Type</td>
<td>The HTTP request body specifies a value for the &lt;sesstype&gt; tag that is invalid. MFI or TCP are the only valid values for the &lt;sesstype&gt; tag.</td>
</tr>
<tr>
<td>400</td>
<td>Invalid Session Port</td>
<td>The HTTP request body specifies a value for the &lt;sessport&gt; tag that is not numeric or specifies a port number when the session type is MFI. A port number is used only when the session type is TCP.</td>
</tr>
<tr>
<td>400</td>
<td>Invalid UrmDeb_Flag</td>
<td>The HTTP request body specifies a value for &lt;urmdebug&gt; tag that is invalid. Y or N are the only valid values for the &lt;urmdebug&gt; tag.</td>
</tr>
<tr>
<td>400</td>
<td>Invalid Activation Flag</td>
<td>The HTTP request body specifies a value for the &lt;activation&gt; tag that is invalid. A or I are the only valid values for the &lt;activation&gt; tag.</td>
</tr>
<tr>
<td>400</td>
<td>Invalid Trigger</td>
<td>The HTTP request body specifies a value for the &lt;trigger&gt; tag that is invalid. TEST or NOTEST are the only valid values for the &lt;trigger&gt; tag.</td>
</tr>
<tr>
<td>400</td>
<td>Invalid Test_Level</td>
<td>The HTTP request body specifies a value for the &lt;level&gt; tag that is invalid. The only valid values for the &lt;level&gt; tag are ALL, ERROR, or NONE.</td>
</tr>
<tr>
<td>400</td>
<td>Error Parsing XML Doc</td>
<td>z/OS XML parser failed to parse the HTTP request.</td>
</tr>
<tr>
<td>400</td>
<td>Bad Request</td>
<td>The URI is invalid.</td>
</tr>
<tr>
<td>401</td>
<td>No_Write_Access For Unauthorized User</td>
<td>The user ID specified in the &lt;userid&gt; tag is not authorized (through RACF®) to update or delete another user’s profile.</td>
</tr>
</tbody>
</table>
Table 4. Explanation of reason phrases (continued)

<table>
<thead>
<tr>
<th>Status code</th>
<th>Reason phrase</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>401</td>
<td>CICS_Default_Userid_Not_Allowed</td>
<td>The CICS default user ID can not be used to access profiles.</td>
</tr>
<tr>
<td>401</td>
<td>Create_Not_Allowed_By_Non_Owner</td>
<td>Only the owner of a profile can create a profile with the same user ID.</td>
</tr>
<tr>
<td>404</td>
<td>Profile_Not_Found</td>
<td>For the GET, POST, or DELETE request, the DTCN profile manager did not find a profile with the specified profile (user) ID.</td>
</tr>
<tr>
<td>500</td>
<td>CICS_Error</td>
<td>There was an error in the CICS region.</td>
</tr>
<tr>
<td>500</td>
<td>Dtcn_Manager_Received_Invalid_Function</td>
<td>The DTCN profile manager had internal error.</td>
</tr>
<tr>
<td>500</td>
<td>Unknown_Return_Code_Error</td>
<td>The DTCN profile manager had internal error.</td>
</tr>
</tbody>
</table>

**Note:**

1. When Debug Tool was installed, it was customized so that when a user created a DTCN profile, Debug Tool verifies that the user specifies a specific resource or resources. If you receive this message, it means that your site requires that you specify the indicated resource when you create a DTCN profile.

2. A DFHWB0723 message appears in the CICS region job output that shows a response code of 8 and one of the following reason codes:

   5 Profile collection name is missing
   6 Profile collection name is invalid
   7 Profile ID is missing
   8 Profile ID is too long
   9 Profile ID is invalid
   10 Query string is missing
   11 Client version is invalid
   12 Query string is invalid
   13 Starting profile record is invalid

The following example shows how the message appears in the CICS region job output:

```
DFHWB0723 04/29/2009 19:30:10 S07CICP8 CWXN The CICS Web analyzer program returned an error response. Program name: EQADCAN0.
```
Chapter 3. Authentication, access control, and version compatibility

You must authenticate any user that wants to create, delete, or modify DTCN profiles. The DTCN profile manager then determines if the user has the correct access to create, delete, or modify DTCN profiles. The DTCN profile manager also determines if the version of the API running in your application is compatible with the version of the API running on the z/OS system.

How to authenticate a user

Authenticating a user involves the following tasks:
1. You must obtain the user's CICS user ID and password.
2. Encrypt their user ID and password with a base64 encoding scheme and place it in the header area of the HTTP request. For additional protection during transmission, you might want to use the HTTPS protocol with SSL encryption.
3. Transmit your HTTP request. The CICS HTTP server authenticates the user ID and password by using the RACF facility or other equivalent security facility.

How DTCN profile manager determines access to DTCN profiles

After the CICS HTTP server authenticates a user, it determines whether the user is authorized to do the HTTP request.

An authenticated user can read any profile (GET, where corresponding action is READ) or obtain a list of profiles in the repository (GET, where corresponding action is LIST). However, only the profile owner can create (PUT), update (POST), or delete (DELETE) his profile. You can give a user the ability to update or delete a profile owned by any user by adding that user's ID to the EQADTOOL.DTCNCHNGEANY resource profile of the FACILITY class, as described in the topic “Defining who can create, modify, or delete DTCN profiles” in the Debug Tool Customization Guide.

Compatibility of different versions

When Debug Tool releases an update to the API, it assigns each release a version number. The following table describes the version numbers:

| Table 5. API version number and it's corresponding Debug Tool for z/OS version number |
|-----------------------------------|----------------------------------|
| Debug Tool for z/OS version number | Corresponding API version number |
| Version 10                        | 0102                             |

When you write your application, you identify the version of the API that you are using with the clientversion symbol in the URI. When the DTCN profile manager responds, it sends you the version of the API that it is using with the <serverversion> XML tag in the HTTP response body.

The following table describes how the DTCN profile manager and your application respond when the version numbers differ:
<table>
<thead>
<tr>
<th>Version difference</th>
<th>What the DTCN profile manager does</th>
<th>What your application does</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\text{&lt;clientversion&gt; = &lt;serverversion&gt;}$</td>
<td>The DTCN profile manager processes the request and responds with results from the request.</td>
<td>Your application accepts the DTCN profile manager’s response and continues running.</td>
</tr>
<tr>
<td>$\text{&lt;clientversion&gt; &gt; &lt;serverversion&gt;}$</td>
<td>If $\text{&lt;clientversion&gt;}$ is more than two levels higher than the $\text{&lt;serverversion&gt;}$, the DTCN profile manager responds with the HTTP response status code of 400, and the reason phrase “Unsupported_Client_Version”. Otherwise, the DTCN profile manager processes the request and sends an HTTP response body that uses the XML tags for the version of the API that the DTCN profile manager is using.</td>
<td>If your application can use the information provided at the $\text{&lt;serverversion&gt;}$ and $\text{&lt;profileversion&gt;}$ level, continue running. Otherwise, display a message that says the DTCN profile manager is running a version of the API that is too old.</td>
</tr>
<tr>
<td>$\text{&lt;clientversion&gt; &lt; &lt;serverversion&gt;}$</td>
<td>If the $\text{&lt;clientversion&gt;}$ is more than two levels lower than the $\text{&lt;serverversion&gt;}$, the DTCN profile manager responds with the HTTP response status code of 400 and the reason phrase “Unsupported_Client_Version”. Otherwise, the DTCN profile manager processes the request and sends an HTTP response body that uses the XML tags for the version of the API that your application is using.</td>
<td>If the DTCN profile manager responds with a $\text{&lt;profileversion&gt;}$ level that your application can use, continue running. Otherwise, display a message that say the DTCN profile manager is running a version of the API that is too recent.</td>
</tr>
</tbody>
</table>
Chapter 4. Customizing your z/OS system to give the API access to DTCN profiles

Before you begin using the API, you must do the following tasks:

- Verify that the application you are developing provides the proper authentication and security measures, as described in Chapter 3, “Authentication, access control, and version compatibility,” on page 7.

- Enable TCP/IP communication between your application and the z/OS system, as described in the topic “Defining the CICS TCPIPSERVICE resource” in the Debug Tool Customization Guide.

- If you want users other than the profile owners to modify or delete DTCN profiles, see the topic “Defining who can create, modify, or delete DTCN profiles” in the Debug Tool Customization Guide.
Chapter 5. Definition of XML tags

This topic describes the XML tags used to create the XML document that contains the data required in HTTP request and response bodies.

<ACTIVATION>
A flag to activate or deactivate the profile or indicate the status of a profile.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>1 byte</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid values</td>
<td>A, I</td>
</tr>
<tr>
<td>Usage</td>
<td>Optional</td>
</tr>
<tr>
<td>Default</td>
<td>I</td>
</tr>
</tbody>
</table>

<CICSREGIONNAME>
The name of a CICS region that end user wants to access.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>8 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample value</td>
<td>S07CICPH</td>
</tr>
<tr>
<td>Usage</td>
<td>Output only</td>
</tr>
<tr>
<td>Default</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

<CLIENTIP>
The IP name or address that starts the CICS application that the end user wants to debug.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>60 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample value</td>
<td>9.30.60.1.1</td>
</tr>
<tr>
<td>Usage</td>
<td>Optional</td>
</tr>
<tr>
<td>Default</td>
<td>Null</td>
</tr>
</tbody>
</table>

<CLIENTVERSION>
The version of the API you are using in your application. For a description of the version numbers, see “Compatibility of different versions” on page 7.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>4 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample value</td>
<td>0102</td>
</tr>
<tr>
<td>Usage</td>
<td>Output only</td>
</tr>
<tr>
<td>Default</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

<COMMANDFILE>
The name of a file that contains a set of Debug Tool commands to control the debug session.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>80 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample value</td>
<td>ELIN.TEST.COMMANDS</td>
</tr>
<tr>
<td>Usage</td>
<td>Optional</td>
</tr>
<tr>
<td>Default</td>
<td>*</td>
</tr>
</tbody>
</table>
<COMMAREADATA>
A data pattern, in character string or hexadecimal format, compared against a commarea passed to the program the end user wants to debug when that program is invoked. If the data pattern in the commarea and other specified resources match, that program is debugged.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>60 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample value</td>
<td>X'C1C2C3'</td>
</tr>
<tr>
<td>Usage</td>
<td>Optional</td>
</tr>
<tr>
<td>Default</td>
<td>Null</td>
</tr>
</tbody>
</table>

<COMMAREAOFFSET>
A numeric, in character string or hexadecimal format, that represents an offset of data in a commarea passed to the program the end user wants to debug when that program is invoked.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>8 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample value</td>
<td>X'AC'</td>
</tr>
<tr>
<td>Usage</td>
<td>Optional</td>
</tr>
<tr>
<td>Default</td>
<td>Null</td>
</tr>
</tbody>
</table>

<CONTAINERDATA>
A data pattern, in character string or hexadecimal format, compared to a container within the current channel passed to the program the end user wants to debug when that program is invoked. If the data pattern in the container and other specified resources match, that program is debugged.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>60 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample value</td>
<td>X'C1C2C3'</td>
</tr>
<tr>
<td>Usage</td>
<td>Optional</td>
</tr>
<tr>
<td>Default</td>
<td>Null</td>
</tr>
</tbody>
</table>

<CONTAINERNAME>
Name of the container within the current channel passed to the program the end user wants to debug when that program is invoked.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>16 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample value</td>
<td>INPUTCNT</td>
</tr>
<tr>
<td>Usage</td>
<td>Optional</td>
</tr>
<tr>
<td>Default</td>
<td>Null</td>
</tr>
</tbody>
</table>

<CONTAINEROFFSET>
A numeric, in character string or hexadecimal format, that represents an offset of data in the named container within the current channel passed to the program the end user wants to debug when that program is invoked.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>8 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample value</td>
<td>X'T2C'</td>
</tr>
<tr>
<td>Usage</td>
<td>Optional</td>
</tr>
<tr>
<td>Default</td>
<td>Null</td>
</tr>
</tbody>
</table>
### <EQAOPTSFILE>
Name of a file containing a set of EQAOPTS commands to set the initial environment for the debug session.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>54 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample value</td>
<td>USER1.EQAOPTS.DATA</td>
</tr>
<tr>
<td>Usage</td>
<td>Optional</td>
</tr>
<tr>
<td>Default</td>
<td>(blank)</td>
</tr>
</tbody>
</table>

### <LEVEL>
Conditions required for Debug Tool to gain control.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>8 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid values</td>
<td>ALL, ERROR, NONE</td>
</tr>
<tr>
<td>Usage</td>
<td>Optional</td>
</tr>
<tr>
<td>Default</td>
<td>ALL</td>
</tr>
</tbody>
</table>

### <LOADNAME>
The name of the load module that the user wants to debug, which is part of a program specification. Use this tag with the <PGMNAME> tag to identify a specific compile unit.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>8 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample value</td>
<td>APP1LMD1</td>
</tr>
<tr>
<td>Usage</td>
<td>Optional</td>
</tr>
<tr>
<td>Default</td>
<td>Null</td>
</tr>
</tbody>
</table>

### <MESSAGE>
An informational or error message returned by the server.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>60 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample value</td>
<td>Invalid_Client_Version</td>
</tr>
<tr>
<td>Usage</td>
<td>Output only</td>
</tr>
<tr>
<td>Default</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

### <NETNAME>
The name of a logical unit in the VTAM network.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>8 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample value</td>
<td>CICSNET1</td>
</tr>
<tr>
<td>Usage</td>
<td>Optional</td>
</tr>
<tr>
<td>Default</td>
<td>Null</td>
</tr>
</tbody>
</table>

### <OTHEROPTS>
Additional Language Environment® run time options needed to run the application that the end user wants to debug.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>80 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample value</td>
<td>STORAGE(00,00,00)</td>
</tr>
</tbody>
</table>
### `<PGMNAME>`

The name of the compile unit the user wants to debug, which is part of a program specification. Use with the `<LOADNAME>` tag to identify a specific compile unit.

<table>
<thead>
<tr>
<th>Usage</th>
<th>Optional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>Null</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>8 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample value</td>
<td>APP1PGM1</td>
</tr>
<tr>
<td>Usage</td>
<td>Optional</td>
</tr>
<tr>
<td>Default</td>
<td>Null</td>
</tr>
</tbody>
</table>

### `<PREFERENCEFILE>`

Name of a file containing a set of Debug Tool commands to control the debug session.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>80 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample value</td>
<td>ELIN.TEST.PREFFILE</td>
</tr>
<tr>
<td>Usage</td>
<td>Optional</td>
</tr>
<tr>
<td>Default</td>
<td>*</td>
</tr>
</tbody>
</table>

### `<PROFILE>`

Tag that encapsulates all information.

### `<PROFILECOUNT>`

Number of profiles to send to your application. The maximum value number of profiles that can be sent to your application is 10.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>2 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample value</td>
<td>5</td>
</tr>
<tr>
<td>Usage</td>
<td>Output only</td>
</tr>
<tr>
<td>Default</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

### `<PROFILEID>`

ID for a profile whose data is in the HTTP response body.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>8 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample value</td>
<td>ELIN</td>
</tr>
<tr>
<td>Usage</td>
<td>Output only</td>
</tr>
<tr>
<td>Default</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

### `<PROFILERECORD>`

Tag that encapsulates all the tags needed for a profile.

### `<PROFILEVERSION>`

Version and release of the profile.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>4 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample value</td>
<td>0102</td>
</tr>
<tr>
<td>Tag</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>&lt;PROGRAM&gt;</td>
<td>Tag that encapsulates a pair of &lt;LOADNAME&gt; and &lt;PGMNAME&gt; tags. A profile can have up to eight &lt;PROGRAM&gt; tags.</td>
</tr>
<tr>
<td>&lt;PROMPTLEVEL&gt;</td>
<td>A prompt level that indicates whether Debug Tool is invoked at Language Environment initialization. It can also contain commands.</td>
</tr>
<tr>
<td>&lt;SERVERVERSION&gt;</td>
<td>Version of the API that the DTCN profile manager is running. For a description of the version numbers, see “Compatibility of different versions” on page 7.</td>
</tr>
<tr>
<td>&lt;SERVICEID&gt;</td>
<td>ID of the Service Oriented Architecture (SOA) service.</td>
</tr>
<tr>
<td>&lt;SESSADDR&gt;</td>
<td>The terminal ID or IP address of the device running your application.</td>
</tr>
<tr>
<td>&lt;SESSPORT&gt;</td>
<td>Number of the TCP/IP port of the device running your application.</td>
</tr>
</tbody>
</table>

### <PROGRAM> Tag
- **Usage**: Output only
- **Default**: Not applicable

### <PROMPTLEVEL> Tag
- **Usage**: Optional
- **Default**: PROMPT

### <SERVERVERSION> Tag
- **Usage**: Output only
- **Default**: Not applicable

### <SERVICEID> Tag
- **Usage**: Output only
- **Default**: Not applicable

### <SESSADDR> Tag
- **Usage**: Required if the value of the <SESTYPE> tag is TCP.
- **Default**: Not applicable

### <SESSPORT> Tag
- **Usage**: Optional
- **Default**: 8001

---

**Notes**
- Maximum length
- Sample value
- Usage
- Default
<SESSTYPE>
The method the end user wants to use to interact with Debug Tool.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>4 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid values</td>
<td>TCP, MFI</td>
</tr>
<tr>
<td>Usage</td>
<td>Optional</td>
</tr>
<tr>
<td>Default</td>
<td>TCP</td>
</tr>
</tbody>
</table>

<STARTPROFILERECORD>
The number you specified in the s symbol of the URI.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>4 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample value</td>
<td>5</td>
</tr>
<tr>
<td>Usage</td>
<td>Output only</td>
</tr>
<tr>
<td>Default</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

<TERMINALID>
The ID of the CICS terminal running the application that the end user wants to debug.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>4 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample value</td>
<td>TRM1</td>
</tr>
<tr>
<td>Usage</td>
<td>Optional</td>
</tr>
<tr>
<td>Default</td>
<td>Null</td>
</tr>
</tbody>
</table>

<TRANSACTIONID>
ID of the CICS transactions that starts the application that the end user wants to debug.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>4 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample value</td>
<td>TRN1</td>
</tr>
<tr>
<td>Usage</td>
<td>Optional</td>
</tr>
<tr>
<td>Default</td>
<td>Null</td>
</tr>
</tbody>
</table>

<TRIGGER>
Indicates whether to start Debug Tool when the application that the end user wants to debug is initialized.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>8 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid values</td>
<td>TEST, NOTEST</td>
</tr>
<tr>
<td>Usage</td>
<td>Optional</td>
</tr>
<tr>
<td>Default</td>
<td>TEST</td>
</tr>
</tbody>
</table>

<URMDEB>
A flag to indicate whether the end user wants to debug URMs during his debugging session.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>1 byte</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid values</td>
<td>Y, N</td>
</tr>
<tr>
<td>Usage</td>
<td>Optional</td>
</tr>
<tr>
<td>---------</td>
<td>----------</td>
</tr>
<tr>
<td>Default</td>
<td>N</td>
</tr>
</tbody>
</table>

**<USERID>**

The ID of the user that runs the transaction the end user wants to debug.

<table>
<thead>
<tr>
<th>Maximum length</th>
<th>8 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample value</td>
<td>ELIN1</td>
</tr>
<tr>
<td>Usage</td>
<td>Optional</td>
</tr>
<tr>
<td>Default</td>
<td>Null</td>
</tr>
</tbody>
</table>
Appendix A. Examples: HTTP request body and HTTP response body

The following sample XML document displays the HTTP request body of a PUT (CREATE) or POST (UPDATE) request.

```xml
<?xml version="1.0"?>
<profile>
  <profilerecord>
    <activation>A</activation>
    <program>
      <loadname>APP1LM01</loadname>
      <pgmname>APP1PGM1</pgmname>
    </program>
    <program>
      <loadname>APP1LM02</loadname>
      <pgmname>APP1PGM2</pgmname>
    </program>
    <transactionid>TRN1</transactionid>
    <terminalid>TRM1</terminalid>
    <userid>ELIN</userid>
    <netname>CICSNET1</netname>
    <clientip>9.30.60.200</clientip>
    <commareaoffset>12</commareaoffset>
    <commareadata>ABC</commareadata>
    <containername>APP1CONT</containername>
    <containeroffset>100</containeroffset>
    <containerdata>DEF</containerdata>
    <urmdeb>N</urmdeb>
    <trigger>TEST</trigger>
    <level>ALL</level>
    <sesstype>TCP</sesstype>
    <sessaddr>9.30.60.100</sessaddr>
    <sessport>8005</sessport>
    <commandfile>ELIN.TEST.COMMANDS</commandfile>
    <preferencefile>ELIN.TEST.PRFFILE</preferencefile>
    <otheropts>STORAGE(00,00,00)</otheropts>
  </profilerecord>
</profile>
```

The following sample XML document displays the HTTP return body after the DTCN profile manager completes the GET request of the profile created or updated in the previous example.

```xml
<?xml version="1.0"?>
<profile>
  <profileversion>0102</profileversion>
  <serviceid>DBGTPROF</serviceid>
  <clientversion>0102</clientversion>
  <serverversion>0102</serverversion>
  <profilerecord>
    <profileid>ELIN</profileid>
    <activation>A</activation>
    <program>
      <loadname>APP1LM01</loadname>
      <pgmname>APP1PGM1</pgmname>
    </program>
    <program>
      <loadname>APP1LM02</loadname>
      <pgmname>APP1PGM2</pgmname>
    </program>
  </profilerecord>
</profile>
```
<transactionid>TRN1</transactionid>
<terminalid>TRM1</terminalid>
<userid>ELIN1</userid>
<netname>CICSNET1</netname>
<clientip>9.30.60.200</clientip>
<commareaoffset>12</commareaoffset>
<commareadata>ABC</commareadata>
<containername>APP1CONT</containername>
<containeroffset>100</containeroffset>
<containerdata>DEF</containerdata>
<urmdeb>N</urmdeb>
<trigger>TEST</trigger>
<level>ALL</level>
<sesstype>TCP</sesstype>
<sessaddr>9.30.60.100</sessaddr>
<sessport>8005</sessport>
<commandfile>ELIN.TEST.COMMANDS</commandfile>
<preferencefile>ELIN.TEST.PREFFILE</preferencefile>
<promptlevel>PROMPT</promptlevel>
<otheropts>STORAGE(00,00,00)</otheropts>
</profilerecord>
</profile>
Appendix B. Support resources and problem solving information

This section shows you how to quickly locate information to help answer your questions and solve your problems. If you have to call IBM support, this section provides information that you need to provide to the IBM service representative to help diagnose and resolve the problem.


- “Searching knowledge bases”
- “Getting fixes” on page 23
- “Subscribing to support updates” on page 23
- “Contacting IBM Support” on page 24

Searching knowledge bases

You can search the available knowledge bases to determine whether your problem was already encountered and is already documented.

- Searching the information center
- Searching product support documents

Searching the information center

You can find this publication and documentation for many other products in the IBM System z Enterprise Development Tools & Compilers information center at http://publib.boulder.ibm.com/infocenter/pdthelp/v1r1/index.jsp. Using the information center, you can search product documentation in a variety of ways. You can search across the documentation for multiple products, search across a subset of the product documentation that you specify, or search a specific set of topics that you specify within a document. Search terms can include exact words or phrases, wild cards, and Boolean operators.

To learn more about how to use the search facility provided in the IBM System z Enterprise Development Tools & Compilers information center, you can view the multimedia presentation at http://publib.boulder.ibm.com/infocenter/pdthelp/v1r1/index.jsp?topic=/com.ibm.help.doc/InfoCenterTour800600.htm.

Searching product support documents

If you need to look beyond the information center to answer your question or resolve your problem, you can use one or more of the following approaches:

- Find the content that you need by using the IBM Support Portal at www.ibm.com/software/support or directly at www.ibm.com/support/entry/portal.

The IBM Support Portal is a unified, centralized view of all technical support tools and information for all IBM systems, software, and services. The IBM
Support Portal lets you access the IBM electronic support portfolio from one place. You can tailor the pages to focus on the information and resources that you need for problem prevention and faster problem resolution.

Familiarize yourself with the IBM Support Portal by viewing the demo videos at https://www.ibm.com/blogs/SPNA/entry/the_ibm_support_portal_videos?lang=en_us about this tool. These videos introduce you to the IBM Support Portal, explore troubleshooting and other resources, and demonstrate how you can tailor the page by moving, adding, and deleting portlets.

Access a specific IBM Software Support site:
- Application Performance Analyzer for z/OS Support
- Debug Tool for z/OS Support
- Enterprise COBOL for z/OS Support
- Enterprise PL/I for z/OS Support
- Fault Analyzer for z/OS Support
- File Export for z/OS Support
- File Manager for z/OS Support
- WebSphere® Studio Asset Analyzer for Multiplatforms Support
- Workload Simulator for z/OS and OS/390® Support

- Search for content by using the IBM masthead search. You can use the IBM masthead search by typing your search string into the Search field at the top of any ibm.com® page.
- Search for content by using any external search engine, such as Google, Yahoo, or Bing. If you use an external search engine, your results are more likely to include information that is outside the ibm.com domain. However, sometimes you can find useful problem-solving information about IBM products in newsgroups, forums, and blogs that are not on ibm.com. Include “IBM” and the name of the product in your search if you are looking for information about an IBM product.
- The IBM Support Assistant (also referred to as ISA) is a free local software serviceability workbench that helps you resolve questions and problems with IBM software products. It provides quick access to support-related information. You can use the IBM Support Assistant to help you in the following ways:
  - Search through IBM and non-IBM knowledge and information sources across multiple IBM products to answer a question or solve a problem.
  - Find additional information through product and support pages, customer news groups and forums, skills and training resources and information about troubleshooting and commonly asked questions.

In addition, you can use the built in Updater facility in IBM Support Assistant to obtain IBM Support Assistant upgrades and new features to add support for additional software products and capabilities as they become available.

For more information, and to download and start using the IBM Support Assistant for IBM System z Enterprise Development Tools & Compilers products, please visit http://www.ibm.com/support/docview.wss?rs=2300&context=SSFMHB&dc=D600&uid=swg21242707&loc=en_US&cs=UTF-8&lang=en

General information about the IBM Support Assistant can be found on the IBM Support Assistant home page at http://www.ibm.com/software/support/isa
Getting fixes

A product fix might be available to resolve your problem. To determine what fixes and other updates are available, select a link from the following list:

- Latest PTFs for Application Performance Analyzer for z/OS
- Latest PTFs for Debug Tool for z/OS
- Latest PTFs for Fault Analyzer for z/OS
- Latest PTFs for File Export for z/OS
- Latest PTFs for File Manager for z/OS
- Latest PTFs for Optim™ Move for DB2®
- Latest PTFs for WebSphere Studio Asset Analyzer for Multiplatforms
- Latest PTFs for Workload Simulator for z/OS and OS/390

When you find a fix that you are interested in, click the name of the fix to read its description and to optionally download the fix.

Subscribe to receive e-mail notifications about fixes and other IBM Support information as described in Subscribing to Support updates.

Subscribing to support updates

To stay informed of important information about the IBM products that you use, you can subscribe to updates. By subscribing to receive updates, you can receive important technical information and updates for specific Support tools and resources. You can subscribe to updates by using the following:

- RSS feeds and social media subscriptions
- My Notifications

RSS feeds and social media subscriptions


My Notifications

With My Notifications, you can subscribe to Support updates for any IBM product. You can specify that you want to receive daily or weekly email announcements. You can specify what type of information you want to receive (such as publications, hints and tips, product flashes (also known as alerts), downloads, and drivers). My Notifications enables you to customize and categorize the products about which you want to be informed and the delivery methods that best suit your needs.

To subscribe to Support updates, follow the steps below. Additional information is provided at [http://www.ibm.com/support/docview.wss?rs=615&uid=swg21172598](http://www.ibm.com/support/docview.wss?rs=615&uid=swg21172598).

1. Go to the IBM software support site at [http://www.ibm.com/software/support](http://www.ibm.com/software/support)
2. Click the My Notifications link in the Notifications portlet on the page that is displayed.

3. If you have already registered for My notifications, sign in and skip to the next step. If you have not registered, click register now. Complete the registration form using your e-mail address as your IBM ID and click Submit.

4. In the My notifications tool, click the Subscribe tab to specify products for which you want to receive e-mail updates.

5. To specify Problem Determination Tools products, click Other software and then select the products for which you want to receive e-mail updates, for example, Debug Tool for z/OS and File Manager for z/OS.

6. To specify a COBOL or PL/I compiler, click Rational® and then select the products for which you want to receive e-mail updates, for example, Enterprise COBOL for z/OS.

7. After selecting all products that are of interest to you, scroll to the bottom of the list and click Continue.

8. Determine how you want to save your subscription. You can use the default subscription name or create your own by entering a new name in the Name field. It is recommended that you create your own unique subscription name using something easily recognized by you. You can create a new folder by entering a folder name in the New field or select an existing folder from the pulldown list. A folder is a container for multiple subscriptions.

9. Specify the types of documents you want and the e-mail notification frequency.

10. Scroll to the bottom of the page and click Submit.

To view your current subscriptions and subscription folders, click My subscriptions.

If you experience problems with the My notifications feature, click the Feedback link in the left navigation panel and follow the instructions provided.

---

**Contacting IBM Support**

IBM Support provides assistance with product defects, answering FAQs, and performing rediscovery.

After trying to find your answer or solution by using other self-help options such as technotes, you can contact IBM Support. Before contacting IBM Support, your company must have an active IBM maintenance contract, and you must be authorized to submit problems to IBM. For information about the types of available support, see the information below or refer to the Support portfolio topic in the Software Support Handbook at [http://www14.software.ibm.com/webapp/set2/sas/f/handbook/offerings.html](http://www14.software.ibm.com/webapp/set2/sas/f/handbook/offerings.html).

- For IBM distributed software products (including, but not limited to, Tivoli®, Lotus®, and Rational products, as well as DB2 and WebSphere products that run on Windows, or UNIX operating systems), enroll in Passport Advantage® in one of the following ways:

  **Online**
  
  Go to the Passport Advantage Web site at [http://www.lotus.com/services/passport.nsf/WebDocs/Passport_Advantage_Home](http://www.lotus.com/services/passport.nsf/WebDocs/Passport_Advantage_Home) and click How to Enroll.

  **By phone**
  
  For the phone number to call in your country, go to the Contacts page of

- For customers with Subscription and Support (S & S) contracts, go to the Software Service Request Web site at http://www.ibm.com/support/servicerequest.


- For IBM eServer® software products (including, but not limited to, DB2 and WebSphere products that run in zSeries, pSeries, and iSeries environments), you can purchase a software maintenance agreement by working directly with an IBM sales representative or an IBM Business Partner. For more information about support for eServer software products, go to the IBM Technical Support Advantage Web site at http://www.ibm.com/servers/eserver/techsupport.html.

If you are not sure what type of software maintenance contract you need, call 1-800-IBMSERV (1-800-426-7378) in the United States. From other countries, go to the Contacts page of the IBM Software Support Handbook on the Web at http://www14.software.ibm.com/webapp/set2/sas/f/handbook/contacts.html and click the name of your geographic region for phone numbers of people who provide support for your location.

Complete the following steps to contact IBM Support with a problem:

1. “Define the problem and determine the severity of the problem”
2. “Gather diagnostic information” on page 26
3. “Submit the problem to IBM Support” on page 26

To contact IBM Software support, follow these steps:

**Define the problem and determine the severity of the problem**

Define the problem and determine severity of the problem When describing a problem to IBM, be as specific as possible. Include all relevant background information so that IBM Support can help you solve the problem efficiently.

IBM Support needs you to supply a severity level. Therefore, you need to understand and assess the business impact of the problem that you are reporting. Use the following criteria:

**Severity 1**

The problem has a critical business impact. You are unable to use the program, resulting in a critical impact on operations. This condition requires an immediate solution.

**Severity 2**

The problem has a significant business impact. The program is usable, but it is severely limited.

**Severity 3**

The problem has some business impact. The program is usable, but less significant features (not critical to operations) are unavailable.

**Severity 4**

The problem has minimal business impact. The problem causes little impact on operations, or a reasonable circumvention to the problem was implemented.

Gather diagnostic information

To save time, if there is a Mustgather document available for the product, refer to the Mustgather document and gather the information specified. Mustgather documents contain specific instructions for submitting your problem to IBM and gathering information needed by the IBM support team to resolve your problem. To determine if there is a Mustgather document for this product, go to the product support page and search on the term Mustgather. At the time of this publication, the following Mustgather documents are available:


If the product does not have a Mustgather document, please provide answers to the following questions:

- What software versions were you running when the problem occurred?
- Do you have logs, traces, and messages that are related to the problem symptoms? IBM Software Support is likely to ask for this information.
- Can you re-create the problem? If so, what steps were performed to re-create the problem?
- Did you make any changes to the system? For example, did you make changes to the hardware, operating system, networking software, and so on.
- Are you currently using a workaround for the problem? If so, be prepared to explain the workaround when you report the problem.

Submit the problem to IBM Support

You can submit your problem to IBM Support in one of three ways:

Online using the IBM Support Portal
Click Service request on the IBM Software Support site at http://www.ibm.com/software/support On the right side of the Service request page, expand the Product related links section. Click Software
support (general) and select ServiceLink/IBMLink to open an Electronic Technical Response (ETR). Enter your information into the appropriate problem submission form.

Online using the Service Request tool
The Service Request tool can be found at \[http://www.ibm.com/software/support/servicerequest\]

By phone
Call 1-800-IBMSERV (1-800-426-7378) in the United States or, from other countries, go to the Contacts page of the IBM Software Support Handbook at \[http://www14.software.ibm.com/webapp/set2/sas/f/handbook/contacts.html\] and click the name of your geographic region.

If the problem you submit is for a software defect or for missing or inaccurate documentation, IBM Support creates an Authorized Program Analysis Report (APAR). The APAR describes the problem in detail. Whenever possible, IBM Support provides a workaround that you can implement until the APAR is resolved and a fix is delivered. IBM publishes resolved APARs on the IBM Support website daily, so that other users who experience the same problem can benefit from the same resolution.

After a Problem Management Record (PMR) is open, you can submit diagnostic MustGather data to IBM using one of the following methods:

- FTP diagnostic data to IBM. For more information, refer to \[http://www.ibm.com/support/docview.wss?rs=615&uid=swg21154524\]
- If FTP is not possible, e-mail diagnostic data to techsupport@mainz.ibm.com. You must add PMR xxxxx bbb ccc in the subject line of your e-mail. xxxxx is your PMR number, bbb is your branch office, and ccc is your IBM country code. Go to \[http://itcenter.mainz.de.ibm.com/ecurep/mail/subject.html\] for more details.

Always update your PMR to indicate that data has been sent. You can update your PMR online or by phone as described above.
Appendix C. Accessibility

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully. The accessibility features in z/OS provide accessibility for Debug Tool.

The major accessibility features in z/OS enable users to:
- Use assistive technology products such as screen readers and screen magnifier software
- Operate specific or equivalent features by using only the keyboard
- Customize display attributes such as color, contrast, and font size

The IBM System z Enterprise Development Tools & Compilers Information Center, and its related publications, are accessibility-enabled. The accessibility features of the information center are described at http://publib.boulder.ibm.com/infocenter/pdthelp/v1r1/topic/com.ibm.help.doc/accessibility_info.html.

Using assistive technologies

Assistive technology products work with the user interfaces that are found in z/OS. For specific guidance information, consult the documentation for the assistive technology product that you use to access z/OS interfaces.

Keyboard navigation of the user interface

Users can access z/OS user interfaces by using TSO/E or ISPF. Refer to z/OS TSO/E Primer, z/OS TSO/E User’s Guide, and z/OS ISPF User’s Guide Volume 1 for information about accessing TSO/E and ISPF interfaces. These guides describe how to use TSO/E and ISPF, including the use of keyboard shortcuts or function keys (PF keys). Each guide includes the default settings for the PF keys and explains how to modify their functions.

Accessibility of this document

Information in the following format of this document is accessible to visually impaired individuals who use a screen reader:
- HTML format when viewed from the IBM System z Enterprise Development Tools & Compilers Information Center

Syntax diagrams start with the word Format or the word Fragments. Each diagram is preceded by two images. For the first image, the screen reader will say "Read syntax diagram". The associated link leads to an accessible text diagram. When you return to the document at the second image, the screen reader will say "Skip visual syntax diagram" and has a link to skip around the visible diagram.
Notices

This information was developed for products and services offered in the U.S.A. IBM might not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

IBM Corporation
J46A/G4
555 Bailey Avenue
San Jose, CA 95141-1003
U.S.A.

For license inquiries regarding double-byte (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

Intellectual Property Licensing
Legal and Intellectual Property Law
IBM Japan, Ltd.
3-2-12, Roppongi, Minato-ku, Tokyo 106-8711

The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with the local law:

INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION “AS IS” WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Some states do not allow disclaimer of express or implied warranties in certain transactions; therefore, this statement might not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.
Copyright license

This information contains sample application programs in source language, which illustrates programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to IBM, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or functions of these programs.

Programming interface information

This book is intended to help you debug application programs. This publication documents intended Programming Interfaces that allow you to write programs to obtain the services of Debug Tool.

Trademarks and service marks

IBM, the IBM logo, and ibm.com are trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Web at “Copyright and trademark information” at www.ibm.com/legal/copytrade.shtml.

Java™ and all Java-based trademarks and logos are trademarks of Oracle and/or its affiliates.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

MasterCraft is a trademark of Tata Consultancy Services Ltd.
Bibliography

Debug tool publications

Using CODE/370 with VS COBOL II and OS PL/I, SC09-1862

Debug Tool for z/OS

You can access Debug Tool publications through the IBM System z Enterprise Development Tool and Compilers information center. You can receive RSS feeds about updates to the information center by following the instructions in the topic "Subscribe to information center updates", which is in the IBM System z Enterprise Development Tools and Compilers information center.

Debug Tool API User’s Guide and Reference, SC19-3712
Debug Tool Coverage Utility User’s Guide and Messages, SC19-3714
Debug Tool Customization Guide, GC19-3708
Debug Tool Reference and Messages, GC19-3709
Debug Tool Reference Summary, GC19-3711
Debug Tool User’s Guide, SC19-3713
Program Directory for IBM Debug Tool for z/OS, GI10-8929
COBOL and CICS Command Level Conversion Aid for OS/390 & MVS™ & VM: User’s Guide, SC26-9400-02
Program Directory for IBM COBOL and CICS Command Level Conversion Aid for OS/390 & MVS & VM, GI10-5080-04
Japanese Program Directory for IBM COBOL and CICS Command Level Conversion Aid for OS/390 & MVS & VM, GI10-6976-02

Related publications

CICS
Application Programming Guide, SC34-6231
Application Programming Primer, SC34-0674
Application Programming Reference, SC34-6232

z/OS
MVS JCL Reference, SA22-7597
MVS JCL User’s Guide, SA22-7598
MVS System commands, SA22-7627

Softcopy publications

Online publications are distributed on CD-ROMs and can be ordered through your IBM representative. Debug Tool User’s Guide, Debug Tool Customization Guide, and Debug Tool Reference and Messages are distributed on the following collection kit: SK5T-8871
Online publications can also be downloaded from the IBM website. Visit the IBM website for each product to find online publications for that product.
Index

C
customer support 24

D
documents, licensed v

E
error messages 4
error messages in CICS region job output 6

F
fixes, getting 23

I
IBM Support Assistant, searching for problem resolution 21
information centers, searching for problem resolution 21
Internet
   searching for problem resolution 21

K
knowledge bases, searching for problem resolution 21

L
licensed documents v

P
passwords, authenticating a user’s 7
problem determination
describing problems 26
determining business impact 25
submitting problems 26

S
Software Support
   contacting 24
describing problems 26
determining business impact 25
receiving updates 23
submitting problems 26