



**WebSphere Studio Application Monitor CICS Data Collector
Product Guide**



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Product Guide**

Note:

Before using this information and the product it supports, read the information in "Notices" on page 71.

Third Edition (April 2005)

This edition applies to WebSphere Studio Application Monitor (product number 5697-J17) and to all subsequent releases and modifications until otherwise indicated in new editions.

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Preface

About this book

This book helps you use the WebSphere Studio Application Monitor CICS Data Collector (CICS Data Collector) in conjunction with WebSphere Studio Application Monitor (Application Monitor).

There are three parts to this book:

- *Part I:* Instructions on installing and customizing the CICS Data Collector, which lets CICS® Regions join the Application Monitor Managed Space.
- *Part II:* Instructions for enabling the Composite Request features of the Application Monitor, including the operation of the Managing Server component specific to Composite Requests—transactions that start on a J2EE application server and use CTG or MQ to access resources in CICS Regions.
- *Part III:* Instruction for using the Managing Server with the CICS Data Collector.

Who should read this book

This book is written for the following audiences:

- Administrators or advanced users who want to install or modify the configuration of the CICS Data Collector, or the aspects of Application Monitor that relate to Composite Requests.

For certain sections, a working knowledge of z/OS and CICS is expected. For other sections, a working knowledge on deploying WebSphere® applications in a UNIX® environment with DB2® experience is expected.

- Anyone who wants to learn more about how to use the Composite Request features of the Application Monitor.

Where to find more information

The following list shows the books in the Application Monitor library:

- *WebSphere Studio Application Monitor User's Guide* contains instructions and user information for the Application Monitor.
- *WebSphere Studio Application Monitor Operator's Guide* contains information about the operation of Application Monitor and the common services address space.
- *WebSphere Studio Application Monitor Installation and Customization Guide* contains instructions on installing user's exits and customizing the Application Monitor.
- *WebSphere Studio Application Monitor CICS Data Collector Product Guide* contains information about the installation, configuration and use of the Application Monitor CICS Data Collector.
- *WebSphere Studio Application Monitor IMS Data Collector for IMS Data Collector Product Guide* contains information about the installation, configuration and use of the Application Monitor IMS Data Collector.
- *WebSphere Studio Application Monitor Messages and Codes* contains information about messages and codes generated by the Application Monitor.
- *WebSphere Studio Application Monitor Program Directory for the CICS Data Collector* contains complete installation instructions for the Application Monitor CICS Data Collector Engine.

- *WebSphere Studio Application Monitor Program Directory for the IMS Data Collector* contains complete installation instructions for the Application Monitor IMS Data Collector Engine.
- *WebSphere Studio Application Monitor CICS Data Collector* has an online help system that describes all of the commands and dialogs available from its graphical user interface.

Publications

This section describes how to access Tivoli publications online and how to order Tivoli publications.

Accessing publications online

The documentation CD contains the publications that are in the product library. The format of the publications is PDF, HTML, or both. Refer to the readme file on the CD for instructions on how to access the documentation.

The product CD contains the publications that are in the product library. The format of the publications is PDF, HTML, or both. To access the publications using a Web browser, open the `infocenter.html` file. The file is in the appropriate publications directory on the product CD.

IBM posts publications for this and all other Tivoli products, as they become available and whenever they are updated, to the Tivoli software information center Web site. Access the Tivoli software information center by first going to the Tivoli software library at the following Web address:

<http://www.ibm.com/software/tivoli/library/>

Scroll down and click the **Product manuals** link. In the Tivoli Technical Product Documents Alphabetical Listing window, click the **WebSphere Studio Application Monitor** link to access the product library at the Tivoli software information center.

Note: If you print PDF documents on other than letter-sized paper, set the option in the **File → Print** window that allows Adobe Reader to print letter-sized pages on your local paper.

Ordering publications

You can order many Tivoli publications online at the following Web site:

<http://www.elink.ibm.com/public/applications/publications/cgi-bin/pbi.cgi>

You can also order by telephone by calling one of these numbers:

- In the United States: 800-879-2755
- In Canada: 800-426-4968

In other countries, see the following Web site for a list of telephone numbers:

In other countries, contact your software account representative to order Tivoli publications.

Accessibility

Accessibility features help users with a physical disability, such as restricted mobility or limited vision, to use software products successfully. With this product, you can use assistive technologies to hear and navigate the interface. You can also use the keyboard instead of the mouse to operate all features of the graphical user interface.

For additional information, see the Accessibility Appendix at the end of this book.

Tivoli technical training

For Tivoli technical training information, refer to the following IBM Tivoli Education Web site:

<http://www.ibm.com/software/tivoli/education>

Support information

If you have a problem with your IBM software, you want to resolve it quickly. IBM provides the following ways for you to obtain the support you need:

- Searching knowledge bases: You can search across a large collection of known problems and workarounds, Technotes, and other information.
- Obtaining fixes: You can locate the latest fixes that are already available for your product.
- Contacting IBM Software Support: If you still cannot solve your problem, and you need to work with someone from IBM, you can use a variety of ways to contact IBM Software Support.

For more information about these three ways of resolving problems, see “Contacting IBM Software Support” on page 65.

Conventions used in this guide

This guide uses several conventions for special terms and actions, operating system-dependent commands and paths, and margin graphics.

Typeface conventions

This guide uses the following typeface conventions:

Bold

- Lowercase commands and mixed case commands that are otherwise difficult to distinguish from surrounding text
- Interface controls (check boxes, push buttons, radio buttons, spin buttons, fields, folders, icons, list boxes, items inside list boxes, multicolumn lists, containers, menu choices, menu names, tabs, property sheets), labels (such as **Tip:**, and **Operating system considerations:**)
- Keywords and parameters in text

Italic

- Words defined in text
- Emphasis of words (words as words)
- New terms in text (except in a definition list)
- Variables and values you must provide

Monospace

- Examples and code examples
- File names, programming keywords, and other elements that are difficult to distinguish from surrounding text
- Message text and prompts addressed to the user
- Text that the user must type
- Values for arguments or command options

Operating system-dependent variables and paths

This guide uses the UNIX convention for specifying environment variables and for directory notation.

When using the Windows command line, replace *\$variable* with *% variable%* for environment variables and replace each forward slash (/) with a backslash (\) in directory paths. The names of environment variables are not always the same in Windows and UNIX. For example, %TEMP% in Windows is equivalent to \$tmp in UNIX.

Note: If you are using the bash shell on a Windows system, you can use the UNIX conventions.

Part 1. Installing and Configuring CICS Data Collectors

Chapter 1. Overview of CICS Data Collectors

This chapter covers the following topics:

- “System Requirements.”
- “How the CICS Data Collector Works” on page 5.
- “Overview of the Installation and Configuration Process” on page 7.

System Requirements

z/OS Requirements

You can install and configure CICS Data Collectors on systems with the following specifications:

- CICS Transaction Server for z/OS® v1.3, v2.2 or v2.3, running on z/OS v1.3, v1.4, v1.5 and v1.6.

Note: CICS v2.3 will not work on z/OS less than v1.4.

- One or more LPARs

Managing Server Requirements

You must have available a Managing Server from the WebSphere Studio Application Monitor (Application Monitor) in order to use your CICS Data Collectors.

Supported Platforms

CICS Data Collectors work in conjunction with any v3.2 Application Monitor Managing Server. See the WebSphere Studio Application Monitor Installation and Customization Guide for the supported platform/application server/database combinations.

Configuration Information

These instructions assume that you know the following information about your Managing Server:

- *Kernel Codebases.* The fully qualified URIs, including port numbers, that resolve to the Kernels' Codebase servers. (A Kernel is a component of the Managing Server. There may be several Kernels in a Managing Server deployment; the default number of Kernels, and therefore the number of Kernel Codebase URIs, is two.)
-

RMI Server Codebases. The fully qualified URIs, including port numbers, that resolve to the Kernels' RMI servers.

- *RFS Server Addresses.* The addresses of the Request-for-Stub (RFS) servers, which are part of the Managing Server, including TCP/IP host names and ports.

Composite Request Requirements

The Application Monitor can monitor transactions that span several application servers, such as, WebSphere, MQ and CICS.

To monitor Composite Requests, your Data Collectors that initiate Composite Requests (J2EE and CICS) as well as those that receive them (CICS) must be among those supported by the Application Monitor.

Support is defined in terms of a combination of Operating System, Application Server and CTG or MQ version. CTG and MQ are the two supported mechanisms for Composite Requests that involve CICS.

Table 1 on page 4 and Table 2 describe the supported combinations for CICS Data Collectors, and Table 3 and Table 4 describes the supported combinations for J2EE Data Collectors.

Table 1. Composite Request Requirements for CICS Data Collector using CTG

Operating System	Application Server	CTG Version
z/OS 1.3, 1.4, 1.5, 1.6	CICS 1.3 or 2.2	5.0.1 or 5.1.0
z/OS 1.4, 1.5, 1.6	CICS 2.3	5.0.1 or 5.1.0

Table 2. Composite Request Requirements for CICS Data Collector using MQ

Operating System	Application Server	MQ Version
z/OS 1.3, 1.4, 1.5, 1.6	CICS 2.2, CICS 1.3	5.3.1
z/OS 1.4, 1.5, 1.6	CICS 2.3	5.3.1

Table 3. Composite Request Requirements for J2EE Data Collector using CTG

Operating System	Application Server	CTG Version
z/OS 1.3, 1.4, 1.5, 1.6	WebSphere 5.0.2 and 5.1	5.0.1 or 5.1.0
AIX	WebSphere 5.0.2 and 5.1	5.0.1 or 5.1.0

Table 4. Composite Request Requirements for J2EE Data Collector using MQ

Operating System	Application Server	MQ Version
z/OS 1.3, 1.4, 1.5, 1.6	WebSphere 5.0.2 and 5.1	5.3.1
AIX	WebSphere 5.1	5.3.1
Solaris	WebSphere 5.1	5.3.1

See Chapter 5, “Enabling Composite Request Features in the Application Monitor,” on page 35 for instructions on how to enable Composite Request monitoring on J2EE Data Collectors.

Scope of CICS Data Collector Installation

For this release, CICS Data Collectors must be installed on all CICS Regions involved in certain EAI transactions. This includes the following CICS Regions:

- CICS Regions whose programs are invoked through CTG, where the invocations are from applications running within J2EE application servers which use the ECI interface (directly, or through CCI,) and where the J2EE servers are in the Managed Space. See “The Scope of Composite Requests” in the *WebSphere Studio Application Monitor User’s Guide* for more detailed information about the Composite Request Space.

An exception to this is that a CICS Region is acting exclusively as a TOR does not need to have a CICS Data Collector installed.

- If CTG invokes a TOR, all CICS Regions to which the TOR routes requests must have CICS Data Collector installed.
- All other CICS Regions invoked by way of DPL from programs invoked in the first two cases.

How the CICS Data Collector Works

The CICS Data Collector is fully integrated with CICS Transaction Server v1.3, v2.2 and v2.3.

The CICS Data Collector monitors all requests arriving to CICS/TS through Distributed Program Link (DPL)-based connections or through RMI/IIOP connections (protocols used with OMG/CORBA-based requests.)

The CICS Data Collector monitors activity in CICS/TS using hooks in the CICS Global User Exits (GLUE) and by Task-Related User Exits (TRUE) invoked at task-start and at task-end times. In addition, at the deepest level of monitoring, the CICS Data Collector intercepts CICS transactions at additional GLUE exit points for entry to and exit from EXEC CICS commands. The CICS Data Collector uses these hooks to intercept and obtain access to CICS' SMF110 system monitoring buffers.

Standalone and Composite Requests

In addition to monitoring standalone transactions, the CICS Data Collector participates in monitoring Composite Requests, which are requests that span multiple servers.

WebSphere Studio Application Monitor uses a passport/visa token technique to track and correlate activity from J2EE application servers (through invocations using the CICS Transaction Gateway) into CICS/TS itself. Thus, the entire processing path of the request/transaction is monitored as a composite unit, allowing its progress through the various servers to be tracked and analyzed as a single unit of work.

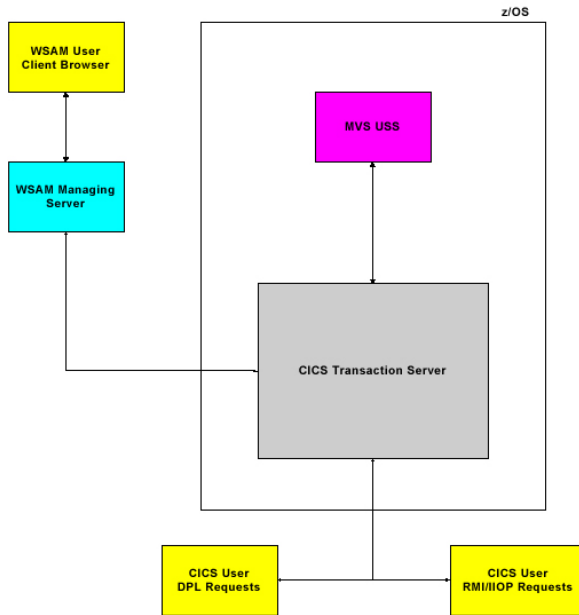


Figure 1. Composite Request Architecture

Parts of the CICS Data Collector

The CICS Data Collector is composed of three parts:

- The Data Capture component is launched when the CICS Region starts up .
The Data Capture component is the part that operates at GLUE and TRUE exit points in CICS/TS, and binds the collected data together with the underlying user tasks.
- The Services component is middleware that transfers the monitored data from the Data Capture component to the Communications Driver component, by putting the captured data into memory.
The Services component runs under the Data Capture component, and is primarily a set of macros called by the Data Capture component.
- The Communications Driver component is then responsible for publishing the CICS/TS user tasks' monitored data to the Managing Server.
The Communications Driver component runs in a JVM in CICS/TS that is used exclusively by the CICS Data Collector. The JVM used by the CICS Data Collector is approximately 8 MB in size, and is run under a subtask thread in the MVS task control block started by the Services component.
The Communications Driver understands the protocol between Data Collectors and the Managing Server, as well as accepts commands via RMI from the Managing Server, acting as a proxy for the Data Capture component.

Processing Path Within CICS

The following is the processing path of the CICS Data Collector for a Composite Request within CICS/TS:

1. A request flows across a DPL-based or RMI/IIOP-based connection with CICS/TS.
2. CICS/TS builds the request into a CICS transaction and initiates the transaction using standard CICS/TS dispatching methods.

3. At CICS PLT time, a TRUE is enabled that intercepts CICS/TS transactions at task-start and at task-end times, for the purpose of collecting monitoring data.
4. A set of six GLUEs are enabled at CICS PLT time, which collect monitoring data and intercept transactions that issue commands.
5. If L3 Monitoring is in effect, then two of the six GLUE exits are activated to catch EXEC CICS commands as they are invoked and as they are completed.
6. The data collected by the TRUE and GLUE exits are passed to routines executing within MVS USS Services and/or in APF-authorized routines. These routines reformat and translate the MVS assembler-based data into structures that can be processed by Java language routines.
7. Java routines in the CICS/TS JVM acquire and transfer this data to the MS. This involves bi-directional communications between the CICS/TS JVM and the Publish Server component of the WSAM Managing Server.
8. Additionally, a WSAM CICS transaction named SAMC is activated at CICS PLT time and runs in background mode, initiated periodically by CICS/TS Interval Control processes. This transaction serves as a conduit between the assembler language data collectors and the command agent proxy on the Java JVM, permitting dynamic control of the CICS Data Collector from the WSAM Managing Server.

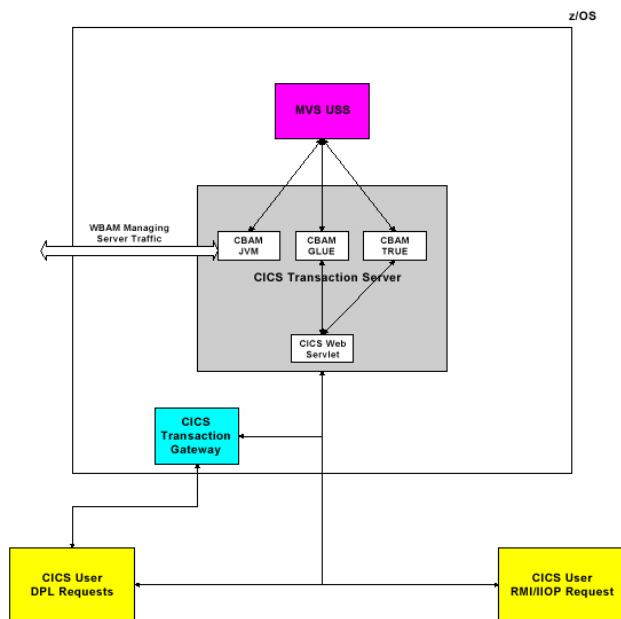


Figure 2. Activity Within CICS/TS

Overview of the Installation and Configuration Process

Who Is Involved?

There can be several individuals involved in the CICS Data Collector installation and configuration:

- z/OS Systems Programmer
- CICS Systems Programmer
- USS Systems Programmer
- WSAM Administrator

These may or may not be the same person, but they are presented as distinct in order to clarify the different skills needed to perform the different installation and configuration tasks.

What Tasks Need To Be Performed?

Here is a summary of the tasks involved in installing and configuring a CICS Data Collector.

z/OS Systems Programmer

- Pre-allocate Data Sets for use by the CICS Data Collector.
- Transfer files.
- Install files.
- Define subsystem CYN1.
- APF-authorize the CICS Data Collector data sets and update CICS JCL.
- Initialize z/OS.
- Verify components.

CICS Systems Programmer

- Introduce CICS Data Collector definitions to your SIT.
- Prepare your PLT to use the CICS Data Collector.
- Add CICS Data Collector (CYN) program definitions to your CSD.
- Compile sample programs (optional).
- Enable Composite Request features on the CICS Data Collector.
- Restart CICS Regions (Post-installation).

USS Systems Programmer

- Unpack the CICS Data Collector (once per USS).
- Install and Configure the CICS Data Collector (once per CICS Region).

Application Monitor Administrator

- Configure the Data Collector on the Managing Server (once per CICS Region) (Post-installation)
- Configure the Managing Server's Publish Servers to support CICS Data Collectors.
- Restart the Managing Server's Publish Servers (optional).
- Enable logging for CICS Data Collectors (optional; once per CICS Region).

Where Are the Instructions?

Detailed, step-by-step descriptions of these tasks are provided in the following two chapters:

- Chapter 3, "Compiling Sample CICS Programs," on page 23 (For tasks performed by z/OS, CICS and USS Systems Programmers.)
- Chapter 5, "Enabling Composite Request Features in the Application Monitor," on page 35 (For tasks performed by the Application Monitor Administrator.)

Chapter 2. Installing and Configuring CICS Data Collectors

This chapter covers the following topics:

- “Step-by-Step Instructions: z/OS.”
- “Step-by-Step Instructions: CICS” on page 10.
- “Step-by-Step Instructions: USS” on page 14.
- “Post-Installation Tasks” on page 16.

Step-by-Step Instructions: z/OS

Before You Begin

Identify APPLIDs

Gather the following information about your z/OS system(s):

- The APPLIDs of the CICS Regions to be monitored, on all z/OS LPARs, on your z/OS system. Provide this list to your CICS Systems Programmer and USS Systems Programmer.

Install the CYN1 Subsystem

Before you install the CICS Data Collector, you may optionally install the CYN1 subsystem provided with the WSAM Data Collector for WAS z/OS. This subsystem provides additional SMF data for the CICS data collector. Refer to the Program Directory for IBM WebSphere Studio Application Monitor V3.2 for z/OS (GI10-3349-00) for details.

You may have already installed them on an LPAR, as a result of having installed the IMS Data Collector or the Data Collector for WebSphere on z/OS on that LPAR.

The instructions for customizing and configuring the CYN1 subsystem can be found in WebSphere Studio Application Monitor Installation and Customization Guide (SC32-1762-00). The Data Collector for z/OS, in Chapter 8. Installation and Configuration, in the Installing the Data Collector section, under the heading Installing MVS Components.

Install the CICS Data Collector

In order to install the CICS Data Collector, see the Program Directory for IBM WebSphere Studio Application Monitor Data Collector for CICS v3.2 (5697-J17) (GI10-3350-00).

Authorizing the Data Sets and Updating CICS JCL

The following procedure enables the CICS Data Collector data set to be used by CICS.

To authorize the CICS Data Collector data sets and update your CICS JCL:

1. APF-authorize the CYN.SCYNAUT2 data set:
2. Put the CYN.SCYNAUT2 data set in the STEPLIB, and put both the CYN.SCYNAUT2 and CYN.CICS.SCYNSLIB data sets in the DFHRPL concatenation of your CICS JCL.

The lines to add have the following format:

```
//STEPLIB DD DSN=CYN.SCYNAUT2,DISP=SHR
//DFHRPL DD DSN=CYN.SCYNAUT2,DISP=SHR
```

Note: The instructions for authorizing the data sets needed for SMF support are located in the *WebSphere Studio Application Monitor Installation and Customization Guide*, in Part 3. The Data Collector for z/OS, in Chapter 8. Installation and Configuration, in the Installing the Data Collector section, under the heading Installing MVS Components.

Step-by-Step Instructions: CICS

Configuring Your CICS Regions

These procedures need to be performed by your CICS Systems Programmer:

- Assembling a SIT and/or Adding SIT Overrides
- Defining CICS Data Collector programs and transactions to CICS
- Modifying your own PLT or using the supplied PLT

Performing these steps enables your CICS Regions to become CICS Data Collectors.

Before You Begin

Gather the following information about your z/OS system(s):

<DB2 DBRMLIB data set>

The DSN of your DB2 DBRMLIB PDS data set, which is specific to your DB2 installation. For example: DSN810.DBRMLIB.DATA.

<APPLID>

The APPLIDs of the CICS Regions to be monitored, on all z/OS LPARs, on your z/OS system. Provide this list to your CICS Systems Programmer and USS Systems Programmer.

<SYSLMOD>

Your load library.

<HLQ>

Your high level qualifier.

<CICS HLQ>

Your CICS high level qualifier..

<SDFHLOAD>

The CICS SDFHLOAD library for your particular release.

<CSD>

The fully-qualified name of your CSD.

<Group List>

The group list specific to your CICS Region.

<SDFHMAC>

The fully-qualified name of your SDFHMAC.

SIT Strategy

The CICS Data Collector needs several definitions to be defined in the SIT. There are several ways to accomplish this:

- Transfer the definitions specific to or necessary for the CICS Data Collector into your existing SIT (and assemble it.)

- Put the appropriate definitions as part of the SYSIN overrides for each CICS Region.

SIT Definitions

The following SIT definitions are needed by the CICS Data Collector:

- **INITPARM=(CYNCINI1='<install path>')**

The value of <install path> needs to be the location, in the USS file system, where the CICS Data Collector files will be installed. The default value of <install path> is /usr/lpp/wsam.

Note: The value of <install path> is case sensitive.

- **INITPARM=(CYNCSQLP='<DB2 DBRMLIB dataset>')**

The value of <DB2 DBRMLIB dataset> is specific to your DB2 installation, and must be the DSN of your DB2 DBRMLIB PDS dataset.

An example for the value of <DB2 DBRMLIB dataset> is DSN810.DBRMLIB.DATA.

Note: The <DB2 DBRMLIB dataset> should have all the DBRMs used by the monitored CICS applications to bind DB2 plans for the CICS system. This allows the CICS Data Collector to discover the original, full SQL string when it captures a SQL statement. Otherwise, the CICS Data Collector supplies only partial, abbreviated SQL strings for Level 2 (L2) SQL events.

- **PLTPI=<XX>**

The PLTPI specifies a program list table, which contains a list of programs to be executed in the final stages of system initialization.

If you already have a PLT, then you already have this parameter in your SIT, and do not need to change it. However, in this case, you must add the CICS Data Collector definitions to your PLT table and reassemble the PLT, which is described in “Modifying the PLT.”

If you do not use a PLT, you can use the one supplied in the CICS Data Collector sample programs data set: CYN.SCYNSAM2 (CYN\$PTCY). The suffix defined in the supplied PLT is **CY** (although you can change this suffix, too. See “Modifying the PLT” for more information about PLTs.)

- **MN=ON**

MNPER=ON

The MN=ON and MNPER=ON definitions enable CPU time monitoring. This is optional.

Modifying the PLT

Your CICS Systems Programmer needs to perform this once for each distinct set of CICS System Definitions (CSD.)

Performing these steps ensures that your CICS Region is pre-initialized to become a CICS Data Collector.

Using Your Existing PLT

This is appropriate if you already have a PLT in use.

To prepare CICS to use the CICS Data Collector:

1. Include the following lines in your PLT:

```
DFHPLT TYPE=ENTRY,PROGRAM=CYNCINI1
DFHPLT TYPE=ENTRY,PROGRAM=DFHDELIM
```

```
DFHPLT TYPE=ENTRY,PROGRAM=CYNINI2
```

2. You may also include either of the following lines in your PLT; use CSQCCODF for MQ and DFHD2CM0 for DB2:

```
DFHPLT TYPE=ENTRY,PROGRAM=CSQCCODF
```

```
DFHPLT TYPE=ENTRY,PROGRAM=DFHD2CM0
```

3. Assemble your PLT.

Note: You must assemble your PLT.

Using the Supplied PLT

Perform the following procedure if you do not already use a PLT in your CICS Region.

To prepare CICS as a CICS Data Collector:

1. Assemble the PLT supplied in the CYN.SCYNSAM2 data set, which is called CYN\$PTCY.

For reference, the table for the supplied PLT is as follows:

```
TITLE 'DFHPLTCY - SAM/CICS SAMPLE PLT TABLE'

*
* SAM/CICS has two stages of initialization
*
DFHPLTCY  DFHPLT TYPE=INITIAL,SUFFIX=CY
          DFHPLT TYPE=ENTRY,PROGRAM=CYNINI1
          DFHPLT TYPE=ENTRY,PROGRAM=DFHDELIM
          DFHPLT TYPE=ENTRY,PROGRAM=CYNINI2
          DFHPLT TYPE=FINAL
          END DFHPLTBA
```

Note: The suffix specified in this PLT must match the suffix specified by the PLTPI parameter in your SIT.

Note: If you want to use MQ and DB2 you may use the sample CYN\$PTAL in CYN.SCYNSAM2 as a reference for the MQ and DB2 programs. Alternately, you can add the appropriate lines to the PLT, as described in the preceding section.

Assembling the PLT

Assemble the supplied PLT using your own standard in-house procedures.

Defining CICS Data Collector Resources

This needs to be done by your CICS Systems Programmer.

Performing these steps adds and modifies program definitions needed by the CICS Data Collector to your CSD.

You will need to identify the following:

<SDFHLOAD>

The CICS SDFHLOAD library for your particular release.

<CSD>

Your CICS CSD.

<Group List>

The group list specific to your CICS Region.

To add CICS Data Collector program definitions to your CSD:

1. Modify the job named CYN\$INST, in the CYN.SCYNSAM2 data set.

Note: You only need to perform this step if you use the CICS-supplied mirror program DFHMIRS in LPA. Otherwise, proceed to the next step.

Update the definition for the CICS-supplied DFHMIRS mirror program, within the CYN\$INST job, to include the USELPACOPY(YES) line, as follows:

```
DEFINE PROGRAM(DFHMIRS)
    GROUP(CYNCICS) LANGUAGE(ASSEMBLER)
    STATUS(ENABLED) RELOAD(NO) USAGE(NORMAL)
    RESIDENT(NO) EXECKEY(CICS)
    DATALOCATION(BELOW) CEDF(NO)
    USELPACOPY(YES)
```

2. Modify the job named CYN\$INST to identify <SDFHLOAD>, <CSD> and <Group List>.

If desired, change the group name, to which all of the CICS Data Collector programs are defined, from **CYNCICS** to one of your choosing.

The CYN\$INST JCL has the following format (there are multiple DEFINE PROGRAM statements):

```
//STEPLIB DD DSN=<SDFHLOAD>,DISP=SHR
//DFHCSD DD DSN=<CSD>,DISP=SHR
```

```
...
*
* Add group to the master list
* Please edit list name
*
ADD GROUP(CYNCICS) LIST(<Group List>)
```

Here is an example of modified JCL:

```
//STEPLIB DD DSN=CICSST22.CICS.SDFHLOAD,DISP=SHR
//DFHCSD DD DSN=CICSST22.CICS.DFHCSD,DISP=SHR
```

```
...
*
* Add group to the master list
* Please edit list name
*
ADD GROUP(CYNCICS) LIST(CYNGPLST)
```

3. Submit the CYN\$INST job.
4. Using the SDSF log, verify that the CYN\$INST job ran correctly, and that the CICS Data Collector definitions went into your CSD.
5. If you use the CICS-supplied DFHMIRS mirror program, verify whether it is set to use the USElpacopy.
 - a. Log into a 3270 terminal emulation for z/OS.
 - b. At the prompt, type the following, where <APPLID> is the APPLID of the appropriate CICS region:
1 <APPLID>
The "CICS Good Morning" screen comes up.
 - c. Enter the following command at the prompt:
ceda di gr(<Group List>)
The list of programs in the group is displayed.
 - d. Scroll down to the mirror program, DFHMIRS.
 - e. Type v to view the program definition.
 - f. Verify the value of the property USElpacopy is YES.

Next, you may choose to compile sample programs shipped with the data set. These samples are provided as-is and should be compiled using your own procedures.

Step-by-Step Instructions: USS

To install the CICS Data Collector, follow the instructions in the following sections:

- “Deploying the USS Files for the CICS Data Collector.”
- “Installing the CICS Data Collector for each CICS Region” on page 15.
- “Restarting CICS Regions” on page 17.
- “Configuring the Managing Server” on page 17.

Deploying the USS Files for the CICS Data Collector

This needs to be done by your USS Systems Programmer.

The USS Systems Programmer must have access to a USS command line, and must use a login with privileges necessary to create directories and change file permissions (within the CICS Data Collector installation directory.)

Before You Begin

Know Your CICS Region APPLIDs:

Before you begin, determine on which CICS Regions you are installing CICS Data Collectors, and know the APPLIDs of these regions. In these instructions, you choose a distinct installation subdirectory for each CICS Region, named by its <APPLID>.

The instructions in “Installing the CICS Data Collector for each CICS Region” on page 15 need to be repeated for each CICS Region (identified by its <APPLID>) that you want to monitor.

Choose an Installation Directory:

SMP/E installs into a fixed location. This install directory is set as /usr/lpp/wsam.

- The <install path> is defined by your CICS Systems Programmer in an INITPARM statement in each CICS Region’s SIT (See “SIT Definitions” on page 11.)

The default value for the <install path> is “/usr/lpp/wsam”.

- The subdirectory “cics” is fixed.
- It is recommended that the last subdirectory, known as <APPLID>, be the name of the CICS Region. The default is “CICS1”.

For example, the default <installation directory> of the CICS Data Collector is /usr/lpp/wsam/cics/CICS1. The examples provided in these instructions use the default installation directory. You must adjust the commands appropriately for the installation directory you choose.

Prepare Your Filesystem as READ-WRITE:

Wherever you decide to install your CICS Data Collectors, several directories within it must have READ-WRITE permissions. The default installation directories for CICS Data Collectors are all within /usr/lpp/wsam, which is often READ-ONLY.

Note: Directories in USS are case sensitive.

Making directories READ-WRITE may be accomplished by mounting a unique HFS file over the installation directory, or by creating a symbolic link between the appropriate subdirectories where each CICS Data Collector creates files.

Installing the CICS Data Collector for each CICS Region

This needs to be done by your USS Systems Programmer.

Performing these steps configures the CICS Data Collector to monitor a single CICS Region. Perform these steps for each CICS Region that you want to monitor. You must know the <APPLID> of the CICS Region.

The Data Collector must point to the Managing Server. This is done by setting parameters that identify the IP address of the Managing Server. These changes must be implemented prior to starting the Data Collector.

To configure the CICS Data Collector to monitor a CICS Region

1. Create a directory for the CICS APPLID you wish to monitor. Use the default location: /usr/lpp/wsam/cics/<APPLID>.

Unless you are upgrading the CICS Data Collector, you must create the <APPLID> subdirectory, where <APPLID> is named for a CICS Region. Here is an example of how to create the monitored CICS directory:

```
mkdir /usr/lpp/wsam/cics/PRODCICS
```

2. If you are upgrading the CICS Data Collector, then move the lib, logs, etc and bin subdirectories to an archived location. Here is an example of how to relocate these directories into a new directory called archive:

```
cd /usr/lpp/wsam/cics/CICS2
```

```
mkdir archive
```

```
mv lib logs etc bin archive
```

3. Copy the contents (recursively) of the cics/CICS1 subdirectory of the installation directory to this CICS Region-specific directory you just created. For example: This example assumes the installation distribution is in /usr/lpp/tmp/wsam:

```
cp -R /usr/lpp/tmp/wsam/cics/CICS1/* /usr/lpp/wsam/cics/<APPLID>
```

This copies a set of directories (etc, logs, lib and bin) which contain the following files:

- etc/LogMessages
- etc/datacollector.env
- etc/datacollector.policy
- etc/datacollector.properties
- etc/version.properties
- lib/kernel.common.jar
- lib/libam_cics_zos.so
- lib/model.jar
- lib/ppe.probe-intf.jar
- lib/ppe.cicsprobe.jar
- bin/cicsprobe
- logs

4. In the /usr/lpp/wsam/cics/<APPLID>/etc directory, modify the datacollector.properties file to update the following definitions:

```
kernel.codebase=<Kernel Codebase URIs>
kernel.rfs.address=<Managing Server RFS Addresses>
java.rmi.server.codebase=<Java RMI Server Codebase URIs>
```

For descriptions of all these properties, see “The datacollector.properties file” on page 17.

5. In the <installation directory>/etc directory, modify the datacollector.env file to reflect the CICS Region-specific paths of the installation. In particular, the following variables contain CICS Region-specific paths:
 - am.classpath
 - am.mod
 - am.libpath

The default values for these variables include paths that begin with /usr/lpp/wsam/cics/CICS1. The “CICS1” value needs to be replaced with the appropriate CICS Region’s <APPLID>.

If you choose to install the CICS Data Collector in a location other than the default installation path, you must also change the occurrences of /usr/lpp/wsam to this custom location.

You may want to set the values of other properties in the datacollector.env file to non-default values; see “The datacollector.env file” on page 20 for a complete list of properties in the datacollector.env file used by the CICS Data Collector.

6. When you first start a CICS region, the CICS Data Collector will create the following four files located in the <installation directory>/etc directory:
 - <SYSPLEX>.<MACHINE>.<LPAR>.<SYSID>.<APPLID>.datacollector.properties
 - <SYSPLEX>.<MACHINE>.<LPAR>.<SYSID>.<APPLID>.id
 - <SYSPLEX>.<MACHINE>.<LPAR>.<SYSID>.<APPLID>.gpsCounter.txt
 - am.mod

The files use the following naming conventions:

- <SYSPLEX> is the sysplex name.
- <MACHINE> is the machine name.
- <LPAR> is the LPAR name.
- <SYSID> is the z/OS System ID.
- <APPLID> is the CICS Region ID.

Therefore, the <installation directory>/etc directory must have READ-WRITE permissions. (Or, you can create a symbolic link that will redirect access from this directory to another directory that has READ-WRITE permissions.)

Post-Installation Tasks

Enabling Composite Request Features on CICS Data Collectors

For information on how to enable composite request features on your CICS Data Collectors that use MQ, please see the WebSphere Studio Application Monitor Installation and Customization Guide.

Please see Chapter 5, “Enabling Composite Request Features in the Application Monitor,” on page 35.

Note: If your CICS Region does not use CTG you don’t need to carry out the steps listed in Chapter 5.

Restarting CICS Regions

Having installed your CICS Data Collectors, you can restart your CICS Regions.

Note: Whenever you make changes to a `datacollector.properties` file, you will need first to remove a file from the Data Collector's `<installation directory>/etc` directory (in the USS filesystem).

You can then restart the CICS Region.

Verifying the CICS Data Collector Installation

To verify that the CICS region has started successfully with the CICS Data Collector, look for the following messages:

- From the SYS00001 log: JVM Started
- From the SYSOUT log: CYNK0001I <PPECONTROLLER,...

Configuring the Managing Server

There are several procedures your Application Monitor Administrator needs to perform in order to prepare your Managing Server for monitoring the CICS Regions on which you have installed and configured CICS Data Collectors.

Please see Chapter 6, "Using the Application Monitor with CICS Data Collectors," on page 45 for these instructions.

The `datacollector.properties` file

For each CICS Data Collector, there is a `datacollector.properties` file located in its `<installation directory>/etc` directory. For example, the following is the default for the fully-qualified path of the `datacollector.properties` file:

```
/usr/lpp/wsam/cics/CICS1/etc/datacollector.properties
```

Note: If you change the `datacollector.properties` file, you need to remove a file and restart the server in order to make your changes take effect.

To update the `datacollector.properties` file:

1. Update the `datacollector.properties` file with your changes.
2. Remove the following system-generated file, which is located in the `<installation directory>/etc` directory:
`<SYSPLEX>.<MACHINE>.<LPAR>.<SYSID>.<APPLID>.
datacollector.properties`
3. Restart the server.

DEFAULT datacollector.properties
<p>UNIX: kernel.codebase=http://9.30.134.134:9122/kernel.core.jar http://9.30.134.134:9123/kernel.core.jar kernel.rfs.address=9.30.134.134:9120 9.30.134.134:9121 probe.rmi.port=8200-8299 java.rmi.server.codebase=file:///<msinstallation directory>/lib3.2/ppe.cicsprobe.jar file:///<msinstallation directory>/lib/ppe.probe-intf.jar probe.controller.rmi.port=8300-8399 probe.library.name=am_cics_zos </p> <p>Windows: kernel.codebase=http://9.48.147.140:9122/kernel.core.jar http://9.48.147 kernel.rfs.address=9.48.147.140:9120 9.48.147.140:9121 probe.rmi.port=8700-8799 java.rmi.server.codebase=file:/C:\\Progra~1\\IBM\\wsam\\lib\\ppe.probe-intf.jar file:/C:\\Progra~1\\IBM\\wsam\\lib3.2\\ppe.cicsprobe.jar probe.controller.rmi.port=8800-8899 probe.library.name=am_cics_zos</p>

Note: Each entry in the datacollector.properties file must occupy a single line, including the properties kernel.codebase and java.rmi.server.codebase.

The following list describes some of the properties that may appear in the datacollector.properties file of the CICS Data Collector.

am.rmsocket.timeout

If the am.usecustomrmi property is set to true, than this property specifies the duration of the timeout used for rmi calls.

Value

A duration, in milliseconds.

Example

am.rmsocket.timeout=60000

am.usecustomrmi

Enables use of custom RMI socket factories that enforce timeouts, which prevents hanging the Kernel. Set to false to use standard RMI.

Value

true or false

Example

am.usecustomrmi=true

gpsCushion

Specifies how frequently the counter, which is used to create unique tokens used to correlate Composite Requests, is written to a file. The default value is 200. Increase this value if there is too much I/O as a result of monitoring systems that process many Composite Requests.

Value an integer

Example

gpsCushion=200

java.rmi.server.codebase

This parameter provides the locations of the libraries that the Data Collector downloads from the kernel.

Value

A space-delimited list of the addresses of the fully-qualified URIs, including port numbers, of the Java RMI servers.

Note: The value must be specified on a single line.

Example

```
java.rmi.server.codebase=file:///opt/wsam/lib/ppe.probe-intf.jar  
file:///opt/wsam/lib3.2/ppe.cicsprobe.jar
```

kernel.codebase

The URIs of the Kernel Codebase.

Value

A space-delimited list of the fully-qualified URIs, including port numbers, that resolve to the Kernels' Codebase servers. This should all be on a single line.

Note: The value must be specified on a single line.

Example

```
kernel.codebase=http://9.30.134.134:9122/kernel.core.jar  
http://9.30.134.134:9123/kernel.core.jar
```

kernel.rfs.address

The RFS addresses of the Managing Server.

Value

A space-delimited list of the addresses of the RFS servers, in a TCP/IP host name:port format.

Example

```
kernel.rfs.address=9.30.134.134:9120 9.30.134.134:9121
```

probe.library.name

The shared library that contains the CICS Data Collector libraries.

Value

The name of the shared library file (not including the ".so" extension,) in the lib subdirectory of the installation directory, that contains the CICS Data Collector libraries.

Example

```
probe.library.name=am_cics_zos
```

probe.rmi.port

The range of ports that may be used by the CICS Data Collector.

Value

Either a single port number, or a port range.

Example

```
probe.rmi.port=8800-8899
```

The datacollector.env file

For each CICS Data Collector, the datacollector.env file exists in the <installation directory>/etc directory. For example:

/usr/lpp/wsam/cics/CICS1/etc/datacollector.env.

DEFAULT datacollector.env

```
am.classpath=/usr/lpp/wsam/cics/CICS1/lib/ppe.cicsprobe.jar:
/usr/lpp/wsam/cics/CICS1/lib/model.jar:/usr/lpp/wsam/cics/CICS1/
lib/ppe.probe-intf.jar:/usr/lpp/wsam/cics/CICS1/lib/kernel.common.jar:
/usr/lpp/java/IBM/J1.3/lib:/usr/lpp/java/IBM/J1.3/bin:/usr/lpp/java
/IBM/J1.3/bin/classic
am.mod=/usr/lpp/wsam/cics/CICS1/etc/am.mod
java.home=/usr/lpp/java/IBM/J1.3
am.path=/usr/lpp/java/IBM/J1.3/bin
am.libpath=/usr/lpp/wsam/cics/CICS1/lib:./usr/lpp/java/IBM/
java.security.policy=/usr/lpp/wsam/cics/CICS1/etc/datacollector
am.mapper=no
am.user.cputime=no
am.memory.dsa=yes
am.mx=8m
am.txn.exclude=C*,SAM*
am.txn.excludeOverride=CPMI,CSMI,CKTI
```

Note: Each entry in the datacollector.properties file must occupy a single line, including the property am.classpath.

The following list describes the complete set of properties that may appear in the datacollector.env file of the CICS Data Collector.

am.debug

Specifies whether the CICS Data Collector is to run in debug mode. When running in debug mode, the CICS Data Collector populates the messages log with messages about its state, and about the operation of its internal components.

Note: Running in debug mode should be done only for debugging purposes by IBM Support Services.

Value

no or yes.

Example

```
am.debug=no
```

am.mapper

Specifies whether the request mapper is to be used. A value of "no" (default) means that the default mapping is to be used. See the "Request Mapper" chapter in the WebSphere Studio Application Monitor User's Guide for a complete discussion of the Request Mapper.

Value

no or yes.

Example

```
am.mapper=no
```

am.memory.dsa

Specifies whether to display DSA memory usage or EDSA memory usage in all memory fields within the Managing Server. A value of "yes" (default) means that the DSA memory usage is used.

Value

no or yes.

Example

```
am.memory.dsa=yes
```

am.mod

Specifies the file that the Data Collector uses to maintain persistence of its current monitoring level across restarts.

Value

A fully-qualified file name.

Example

```
am.mod=/usr/lpp/wsam/cics/CICS1/etc/am.mod
```

am.mx

Specify the maximum size, in bytes, of the java memory allocation pool.

Value

A multiple of 1024, and greater than 2MB.
Append the letter k or K to indicate kilobytes, or m or M to indicate megabytes. The default value is 8m.

Example

```
am.mx=8m
```

am.txn.exclude

Specify the list of transaction names you do not want the CICS Data Collector to monitor. Used in conjunction with the am.txn.excludeOverride property.

Value

A comma-delimited list of transaction names you want the CICS Data Collector to not monitor. Supports wildcards (*).

Example

```
am.txn.exclude=C*,SAM*
```

am.txn.excludeOverride

Specify the list of transaction names you want the CICS Data Collector to monitor; this list is used in conjunction with the am.txn.exclude property. You only need to specify a transaction in the exclude override list if it was listed in the exclude list; by default, everything that is not specifically excluded is monitored.

Value

A comma-delimited list of transaction names you want the CICS Data Collector to monitor. Supports wildcards (*).

Example

```
am.txn.excludeOverride=CPMI,CSMI,CKTI
```

java.security.policy

The Java™ Security Policy file.

Value

The complete path of the Java Security Policy file, as it resides in the USS file system.

Example

```
java.security.policy=/usr/lpp/wsam/cics/CICS1/etc/datacollector.policy
```

am.user.cputime

Specifies whether to display user CPU time or user and CICS CPU time in all CPU Time fields within the Managing Server. A value of "no" (default) means that the CICS CPU time is used.

Value

no or yes.

Example

```
am.user.cputime=no
```

Chapter 3. Compiling Sample CICS Programs

This chapter describes how to compile sample CICS programs that are supplied in the CICS Data Collector distribution.

Compiling Sample Programs

This may be done by your CICS Systems Programmer.

A set of sample programs is supplied in the CYN.SCYNSAM2 data set, which can be used on an as-is basis. Performing these steps compiles the sample program of your choosing, identified by <Program Name>, shipped with the CYN.SCYNSAM2 data set.

Note: For CICS 1.3, make sure you compile using the CICS 1.3 Macros.

To compile sample programs:

1. Modify the job named CYN\$APRG, in the CYN.SCYNSAM2 data set, to identify <SDFHLOAD>, <Program Name>, <SDFHMAC> and the <LOADLIB> you want to compile.

The lines to modify have the following format:

```
//STEPLIB DD DSN=<SDFHLOAD>,DISP=SHR
//SYSPRINT DD SYSOUT=H
//SYSIN DD DSN=CYN.CYNSAM2(<Program Name>),DISP=SHR
...
//SYSLIB DD DSN=<SDFHMAC>,DISP=SHR
//          DD DSN=SYS1.MACLIB,DISP=SHR
...
//COPYLINK EXEC PGM=IEBGENER,COND=(7,LT,ASM)
//SYSUT1 DD DSN= <SDFHMAC>(DFHEILIA),DISP=SHR
...
//SYSLMOD DD DSN=<LOADLIB>,DISP=SHR
...
//SYSIN DD *
          NAME <Program Name>(R)
/*
```

Here is an example of the JCL modified to compile the program CYN\$PUMP, which uses CICSTS22.CICS as the CICS High Level Qualifier for both <SDFHLOAD> and <SDFHMAC>, and uses CYN.CICS as the High Level Qualifier for <LOADLIB>:

```
//STEPLIB DD DSN=CICSTS22.CICS.SDFHLOAD,DISP=SHR
//SYSPRINT DD SYSOUT=H
//SYSIN DD DSN=CYN.SCYNSAM2 (CYN$PUMP),DISP=SHR
..
//SYSLIB DD DSN=CICSTS22.CICS.SDFHMAC,DISP=SHR
//          DD DSN=SYS1.MACLIB,DISP=SHR
..
//COPYLINK EXEC PGM=IEBGENER,COND=(7,LT,ASM)
//SYSUT1 DD DSN=CICSTS22.CICS.SDFHMAC(DFHEILIA),DISP=SHR
..
//SYSLMOD DD DSN=a_DFHRPL_load_library,DISP=SHR
..
//SYSIN DD *
          NAME CYN$PUMP(R)
/*
```

2. Run the CYN\$BLDT clist, by using TSO option 6, using the following format, which includes <HLQ> and <CICS HLQ>:

ex 'CYN.SCYNSAM2 (CYN\$BLDT) '<HLQ> <CICS HLQ>'

Here is an example of the command, using CYN as <HLQ> and CICSTS22.CICS as <CICS HLQ>:

ex 'CYN.SCYNSAM2 (CYN\$BLDT) 'CYN CICSTS22.CICS'

Here is a similar example of the command, using CICSTS23.CICS as <CICS HLQ>:

ex 'CYN.SCYNSAM2 (CYN\$BLDT) 'CYN CICSTS23.CICS'

Here is another example of the command, using CICSTS13.CICS as <CICS HLQ>:

ex 'CYN.SCYNSAM2 (CYN\$BLDT) 'CYN CICSTS13.CICS'

3. Using the SDSF log, verify that the assembly jobs ran correctly, and that the programs were added to the load library specified in your SYSLMOD.

CICS Definitions

The following program is distributed in the CYN.SCYNSAM2 data set.

See “Defining CICS Data Collector Resources” on page 12 for instructions on how to add definitions and sample programs from this data set to your CICS region.

CYN\$INST

The CYN\$INST job adds the CICS Data Collector definitions and the sample programs. This member adds the definitions and sample programs appropriate for the version of CICS you are running (versions 1.3, 2.2 or 2.3.)

Sample Program Descriptions

The following programs are distributed in the CYN.SCYNSAM2 data set.

CYN\$APLT

Used to assemble tables.

Execution

Called by CYN\$BLDT.

CYN\$APRG

Used to compile sample programs, as described in “Compiling Sample Programs” on page 23.

Execution

Called by CYN\$BLDT.

CYN\$BLDT

Used to compile sample programs, as described in “Compiling Sample Programs” on page 23.

Execution

This member may be run manually in TSO.

CYN\$CPUP

Posts a notification that a specific time interval has expired. The example posts the notification after 2 seconds. Checks a timer-event control area at intervals.

Execution

The program is executed by running transaction TIME.

CYN\$DPL2

Links to CYN\$DPL3 and CYN\$DPL4 three times each and passes a COMMAREA of 27 bytes for each LINKed call. Writes to a CICS Transient Data Queue named CSSL.

Execution

The program is executed through the WebSphere Test Servlet, on WebSphere 4.x or 5.x with CTG, using the CTGTesterECI.

The CTGTesterECI is a traditional servlet-based application that uses the CICS TG ECIRequest class to call a specified COMMAREA-based CICS program, and displays the result of the returned COMMAREA. The CTGTesterECI runs in the Web Container of WebSphere Application Server.

Make sure you set the following parameters in the CTGTesterECI invocation:

- COMMAREA length: 27
- Encoding: IBM037

Note: Details of this application can be obtained from the following RedBook: CICS Transaction Gateway V5 - The WebSphere Connector for CICS 'SG24-6133-01'

CYN\$DPL3

Obtains the name of the current program, data and time and return the values to CYN\$DPL2 through a COMMAREA. The date and time are formatted prior to returning control back to CYN\$DPL2.

Execution

Invoked as a DPL by CYN\$DPL2.

CYN\$DPL4

Obtain the name of the current program, data and time and return the values to CYN\$DPL2 through a COMMAREA. The date and time are formatted prior to returning control back to CYN\$DPL2.

Execution

Invoked as a DPL by CYN\$DPL2.

CYN\$ECI2

Calls the programs CYN\$ECI3 and CYN\$ECI4, passing a COMMAREA and expecting the COMMAREA to be returned to the CTGTesterECI test servlet.

Execution

Executed in the same manner as CYN\$DPL2.

CYN\$ECI3

Supports the program CYN\$ECI2, which passes a COMMAREA. Returns a COMMAREA to the CTGTesterECI test servlet.

Execution

Invoked as a DPL by CYN\$ECI2.

CYN\$ECI4

Supports the program CYN\$ECI2, which passes a COMMAREA. Returns a COMMAREA to the CTGTesterECI test servlet.

Execution

Invoked as a DPL by CYN\$ECI2.

CYN\$HEAD

Contains copyright information.

Execution

This member does not contain any executable code.

CYN\$LOOP

Assigns a program name and userid and makes a couple of delay calls. Links to the program CYN\$STCK, which writes to a queue before returning back to CYN\$LOOP. Runs repeatedly until terminated by the user, or through the In-Flight Search Page of the Application Monitor. This member is used for CICS versions 2.2 and 2.3.

Execution

Transaction LOOP is used to execute the program.

CYN\$MAPL

A copybook used in CYN\$RMAP.

Execution

Used by CYN\$RMAP.

CYN\$PUMP

A program that runs continuously and calls transaction SAM6, which loops.

Execution

Transaction PUMP is used to execute the program.

CYN\$RMAP

The sample request mapper program, which you can edit in order to map the transaction name and program name of the currently executing transaction to something else. A copy book CYN\$MAPL is used to ensure byte boundary.

Execution

The request mapper is used when the datacollector.env file has the following setting:

```
am.mapper=yes
```

When the CICS Data Collector is configured to use the request mapper, all executing transactions and applications have their transaction name and program name mapped to the values set in the CYN\$RMAP program.

CYN\$SMP1

Verifies that CICS and the CICS Data Collector are working correctly. Makes a link to CYN\$SMP2 and returns a message that states that everything is ok.

Execution

Called by the transaction CAM1.

CYN\$SMP2

Called by program CYN\$SMP1, writes to a temporary storage queue and returns control back to program CYN\$SMP1.

Execution

Use transaction CAM1 to verify the program.

CYN\$SMP6

Writes a start message to a temporary storage queue CYN\$ and starts transaction SAM7 twice. Passes the COMMAREA for each call to SAM7. On return from SAM7, writes to the CYN\$ queue. SAM7 is defined as a transaction that executes program CYN\$SMP7.

Execution

Called by transaction SAM6.

CYN\$SMP7

Retrieves information from the task into the COMMAREA, issues a delay and links to program CYN\$SMP8, passing a COMMAREA with a specific length. On return the information is written to a Temporary Storage Queue.

Execution

Called by transaction SAM7.

CYN\$SMP8

Retrieves information from the task into the COMMAREA, issues a delay and links to program CYN\$SMP9, passing a COMMAREA with a specific length. On return the information is written to a Temporary Storage Queue.

Execution

Called by program CYN\$SMP7.

CYN\$SMP9

Retrieves information from the task into the COMMAREA, issues a delay and writes to a Temporary Storage Queue.

Execution

Called by program CYN\$SMP8.

CYN\$STCK

This program is called by CYN\$LOOP. This program works for CICS versions 2.2 and 2.3.

Execution

Called by CYN\$LOOP.

CYN\$XCT0

Transfers control (XCTL) to program CYN\$XCT1. Program CYN\$XCT0 relinquishes control once CYN\$XCT1 gets control.

Execution

Called by transaction XCT0.

CYN\$XCT1

Writes a message to the Operator and has a delay set. On returning from the delay, the program returns and completes.

Execution

Called by transaction XCT0.

CYN\$XCT2

Links to program CYN\$XCT3. When CYN\$XCT3 is invoked, it transfers control (XCTL) to CYN\$XCT1.

Execution

Called by transaction XCT2.

CYN\$XCT3

Writes a message to the Operator and links to program CYN\$XCT1.

Execution

Called by transaction XCT2.

CYN\$SYSN

An example of the parameters needed for CICS SYSIN overrides. See "SIT Strategy" on page 10 for more information.

Execution

Not invoked by any sample programs.

CYN\$PTCY

An example program list table that contains definitions described in "SIT Strategy" on page 10.

Execution

Not invoked by any sample programs.

Debugging Tools

The following programs are distributed in the CYN.SCYNMAM2 data set.

CYN\$PR13

The Print program to be used for CICS 1.3 is DFHTU530. The STEPLIB should contain CICSTS13.CICS.SDFHLOAD and CICSTS13.CICS.SDFHLINK.

See "Auxiliary Trace" on page 59 for instructions on how to use this job.

CYN\$PR22

The Print program to be used for CICS 2.2 is DFHTU620. The STEPLIB should contain CICSTS22.CICS.SDFHLOAD and CICSTS22.CICS.SDFHLINK.

See "Auxiliary Trace" on page 59 for instructions on how to use this job.

CYN\$PR23

The Print program to be used for CICS 2.3 is DFHTU630. The STEPLIB should contain CICSTS23.CICS.SDFHLOAD and CICSTS23.CICS.SDFHLINK.

See "Auxiliary Trace" on page 59 for instructions on how to use this job.

Chapter 4. CICS Data Collector Log Files

Logs are available in both the CICS and USS environments.

Logs may provide useful information for troubleshooting, with or without the assistance of the IBM® Support team.

When troubleshooting issues related to the Managing Server, please see the WebSphere Studio Application Monitor Operator's Guide for information about log files that reside on the Managing Server.

Viewing CICS Data Collector Logs

Viewing Logs in the CICS Regions

Within CICS, you can use the Spool Search and Display Facility (SDSF) to view information the CICS Data Collector receives from the Managing Server, and information produced by the CICS Data Collectors.

Information is spooled to **SYS00001** and **SYSOUT**.

The information spooled to **SYS00001** includes variable definitions received from the Managing Server.

The information spooled to **SYSOUT** comes from the CICS Data Collector; You may want to compare it to the information in the Managing Server's properties files.

To view CICS Region Logs for the CICS Data Collector:

1. Login to the z/OS Mainframe.
2. Type in the command line to get to the Display Active panel in your SDSF (Spool Display.)
3. Specify the prefix related to your CICS jobs.
4. Select the CICS region with ?
5. Select the **SYS00001** or **SYSOUT**.
6. Verify the JVM has started by looking at the SYS0001 log, and verify that the CICS region connected to the kernel, and to the Publish Server in the SYSOUT.

Note: If there are any problems loading the shared library (libam_cics_zos.so), no meaningful messages will be displayed in **SYS00001**, and no **SYSOUT** will be created. You can verify this by looking at the am_datacollector.log file in the USS file system; see the following section for more details.

Viewing Logs in USS

Logs are created in USS for each CICS Data Collector.

Where Are the Logs?

Files for each CICS Region are located within the CICS Data Collector <installation directory>, based on the CICS Region's APPLID:

<install path>/cics/<APPLID>

For example, the location of files for a CICS Region with an APPLID of CICS1, installed in the default location, is as follows:

```
/usr/lpp/wsam/cics/cics1
```

What Logs Are Available?

There are several files associated with each monitored CICS Region:

- etc/<SYSPLEX>.<SYSID>.<APPLID>.datacollector.properties
- etc/<SYSPLEX>.<SYSID><APPLID>.gpsCounter.txt
- etc/<SYSPLEX>.<SYSID>.<APPLID>.id
- etc/am.mod
- logs/datacollector_<date>.log
- logs/am_datacollector.log

The term <SYSPLEX> represents the sysplex name, and <SYSID> represents the z/OS SYSID. (<SYSPLEX>.<SYSID> represents the admin server name.)

These six files are created when the CICS Data Collector is started or restarted. (If you want to restart the CICS Data Collector after changing its configuration, you must delete the first two of these files.)

etc/<SYSPLEX>.<SYSID>.<APPLID>.datacollector.properties:

This log file contains the same information as the etc/datacollector.properties file, but in an escaped format, and with an additional line for the date. (The etc/datacollector.properties file is one of the configuration files for the CICS Data Collector.)

etc/<SYSPLEX>.<SYSID>.<APPLID>.id:

This file contains information about how the CICS Data Collector and its RMI interface are known to the Managing Server and its components.

etc/am.mod:

This file contains information about the current monitoring level of the CICS Data Collector.

logs/datacollector_<date>.log:

The <date> is in yyyyymmddhhmmss format. This file contains information from the CICS Data Collector about major events that occur with regard to the Managing Server, like joining the kernel or disconnecting from the kernel.

logs/am_datacollector.log:

The am_datacollector.log file will display any errors that occur prior to loading the shared library. The log file is created regardless of errors.

Note: If the am_datacollector.log file cannot be created in the <installation directory>/logs directory, the CICS Data Collector will attempt to create this log in the directory named /tmp.

Part 2. Operating the CICS Data Collector

Chapter 5. Enabling Composite Request Features in the Application Monitor

The WebSphere Studio Application Monitor CICS Data Collector (CICS Data Collector) is integrated with the WebSphere Studio Application Monitor (Application Monitor).

To enable Composite Request features, you must configure each Data Collector that participates in Composite Requests, including J2EE as well as CICS Data Collectors.

In addition, you must perform a few tasks in order to prepare the Managing Server for using CICS Data Collectors. This chapter describes these tasks, including:

- “Step-by-Step Instructions: J2EE Data Collectors.”
- “Configuring CICS Data Collectors on the Managing Server” on page 38
- “Configuring Publish Servers” on page 38
- “Starting the Global Publish Server” on page 40

Step-by-Step Instructions: J2EE Data Collectors

Your Application Monitor Administrator must perform these procedures for each J2EE Data Collector that initiates Composite Requests.

These instructions are Application Server-dependent. Furthermore, you must configure each application server for either or both mechanism used to connect to CICS: CTG and MQ.

Follow the instructions appropriate for the Application Server version and platform.

Enable Composite Request Features for WebSphere 5 Distributed Data Collector

1. Login to the WebSphere Admin Console
2. Navigate to the Servers > Application Servers > select the <ServerName>.
3. Go to Process Definition > Control Region > JVM.
4. Set Maximum Heap Size to 150.

Enabling Composite Request Features for WebSphere 5 Data Collectors on z/OS

Enabling Composite Requests Features for CTG

Perform the following procedure if you want to enable Composite Request features on a Data Collector that uses CTG to access CICS.

To enable Composite Request features on a WebSphere 5 Data Collector on z/OS that uses CTG:

1. Update the etc/bcm.properties file as follows:

- a. Login to the USS system where you have access to the <installation directory> of the J2EE Data Collector.
- b. Edit the etc/bcm.properties file, which is located within the installation directory of the J2EE Data Collector whose Composite Request features you are enabling. For example:
vi /<installation directory>/etc/bcm.properties
- c. Set the value of the 'ctg.enable' property to 'yes'. For example:
ctg.enable=yes
- d. Save the updated etc/bcm.properties file.
- e. Remove the generated bcm.properties file from the /etc directory
<MACHINE.was.instance>bcm.properties

Note: The important point is that this directory should contain all the shared libraries needed for CTG to operate, for instance, libCTGJNI.so.

2. Make sure that the directory /usr/lpp/cicsts/gateway/ctg/bin is in the LIBPATH:
 - a. Login to the WebSphere Administration Console.
 - b. Navigate as follows:
 - 1) Select the Server > Application Server option and select the <ServerName> of the server on which you are enabling Composite Request features.
 - 2) Select Additional Properties: Process Definition > Servant > Additional Properties: Environment Entries.
 - 3) Select New button for creating new entry LIBPATH or select the LIBPATH entry for an update.
 - 4) Insert the following properties as name/value pair to the beginning:

NAME	VALUE
LIBPATH	/usr/lpp/cicsts/gateway/ctg/bin:

- 5) Select <Apply>.

Note: A colon ':' must be used to separate two property values. If only one property value is present, the colon is not required. For example,
<installation directory>/wsam/<server>/lib:/usr/lpp/cicsts/gateway/ctg/bin

You may confirm your changes in was.env and server.xml under /<WebSphere directory>/servers/<ServerName> directory via key word 'server_region_libpath' and 'LIBPATH', respectively.

Note: The was.env and server.xml files are ASCII encoded. To view them, you need to either use an editor which support ASCII encoding (e.g. viascii) or export it to a computer (UNIX or Windows) which supports the ASCII character set by default.

3. Update the CLASSPATH as follows:
 - a. Select the Server > Application Servers option and select the server on which you are enabling composite request features.
 - b. Navigate to the Additional Properties : Custom Services section.
 - c. In the Custom Services panel, select '-' of the probe service for update.
 - d. Insert the following value at the beginning of the classpath:
\${CONNECTOR_INSTALL_ROOT}/cicsecl.rar:

- Note:** The colon is used to separate paths within the classpath.
- e. In the Messages dialog box, select 'Save'.
 - f. In the Save to Master Configuration dialog box,
 - If you are under ND environment, be sure the checkbox 'Synchronize changes with Nodes' is selected and then select 'Save'.
 - If you are NOT under ND environment, simply select 'Save'.
4. Verify the location of the cicseci.rar directory:
 - a. Select Environment > Manage WebSphere Variables.
 - b. Select the node with server option as blank and click the <Apply> button.
 - c. Look for \${CONNECTOR_INSTALL_ROOT} and its real value.
 For example, \${CONNECTOR_INSTALL_ROOT} might resolve to \${USER_INSTALL_ROOT}/installedConnectors.
 The variable \${USER_INSTALL_ROOT} might resolve to /WebSphere/V5R1M0/AppServer.
 - d. On the z/OS USS system, verify the existence of the directory named cicseci.rar under the directory \${CONNECTOR_INSTALL_ROOT}. For example:


```
cd /WebSphere/V5R1M0/AppServer/installedConnectors
ls -l cicseci.rar
```

Note: If you don't see the cicseci.rar file in this location, you need to locate this cicseci.rar directory (via your WebSphere or CICS administrator(s)) and update the value of the WebSphere variable \${CONNECTOR_INSTALL_ROOT} to reference the correct directory path.
 5. Restart WebSphere.

Enabling Composite Request Features for MQ

The instructions for enabling Composite Request features of Data Collectors for application servers that use MQ to connect to CICS are located in the WebSphere Studio Application Monitor Installation and Customization Guide, in Part 3. The Data Collector for z/OS, in Chapter 9. Customization, in the Optional z/OS WebSphere 5 Support section, under the heading Adding MQI Capturing Support.

Disabling Composite Request Features for WebSphere 5 Data Collectors on z/OS

Perform the following procedure to disable Composite Request features on a WebSphere 5 Data Collector on z/OS.

To disable Composite Request Features on a WebSphere 5 Data Collector on z/OS:

1. Update the 'ctg.enable' property in the Data Collector's etc/bcm.properties file:
 - a. Login to the USS system where you have access to the <installation directory> of the Data Collector.
 - b. Edit the etc/bcm.properties file, which is located within the installation directory of the CICS Data Collector whose Composite Request features you are disabling. For example:


```
vi /<installation directory>/etc/bcm.properties
```
 - c. Set the value of the 'ctg.enable' property to 'no'. For example:


```
ctg.enable=no
```
 - d. Save the updated etc/bcm.properties file.

- e. Remove the generated bcm.properties file from the /etc directory
<MACHINE.was.instance>bcm.properties.
2. Restart WebSphere.

Step-by-Step Instructions: Managing Server

These procedures need to be performed by your Managing Server Administrator.

Performing these tasks prepares your Managing Server for monitoring the CICS Regions on which you have installed and configured CICS Data Collectors:

- Configuring CICS Data Collectors on the Managing Server
- Configuring J2EE Data Collectors on the Managing Server
- Updating the Publish Server Properties Files
- Restarting the Publish Servers

This chapter also covers the following tasks, which you may need to perform from time to time:

- Toggling Data Collector Logging (on the Managing Server)
- Stopping and Checking the Status of the Global Publish Server.

Configuring CICS Data Collectors on the Managing Server

You must configure the Managing Server to communicate with your CICS Data Collectors.

To configure a Data Collector within the Managing Server

1. Open the Application Monitor.
2. Click the **Administration** tab on the top navigation.
3. Select **Server Management > Data Collector Configuration**
4. Apply a configuration setting to your Data Collector.

Note: If you want to monitor Composite Requests using MQ, make sure that the configuration you apply to your CICS Data Collector has MQ monitoring enabled. Make sure that the exclude and exclude override lists accurately specify the queues you do and do not want to monitor.

See the WebSphere Studio Application Monitor User's Guide for more information about Data Collector Configuration.

Configuring Publish Servers

For best results when using CICS Data Collectors, increase the value of the TIMEOUT_LIMIT property of all Publish Servers to 60 (minutes.)

Updating the Publish Server Properties Files

The properties files of the Publish Servers are located within the etc directory of the Application Monitor installation directory, and are named with the convention psX.properties, where X is an integer. Here are some example Publish Server properties file locations:

```
/<MSinstallation directory>/etc/ps1.properties  
/<MSinstallation directory>/etc/ps2.properties
```

The desired definition looks like the following:

```
TIMEOUT_LIMIT=60
```

For these settings to take effect, you must restart the Publish Servers.

Restarting the Publish Servers

To restart a Publish Server, you must stop it and then restart it. To do so, run the `amctl.sh` script, located in the `<Application Monitor installation directory>/bin` directory.

For example, the following commands restart the Publish Server whose properties file is `ps1.properties`:

```
cd <Application Monitor installation directory>
cd bin
./amctl.sh ps1 stop
./amctl.sh ps1 start
```

toggling Data Collector Logging (on the Managing Server)

In order to toggle logging of Data Collectors, run the `dcctl.sh` script, located in the `<Application Monitor installation directory>/bin` directory.

The log file this affects is described in “`logs/datacollector_<date>.log`” on page 32.

Note: Although toggling the Data Collector log file is performed on the Managing Server, the log file itself is located on the USS filesystem, within the CICS Data Collector installation directory.

To enable logging on a Data Collector

1. Run the following commands on the Managing Server host:

```
cd <Application Monitor installation directory>
cd bin
./dcctl.sh debug
```

You see a list of the Data Collectors known to the Managing Server followed by a prompt, which looks like the following:

```
0 CIQ5:CICS5 813102ab-32c2-d701-686e-c69b95b483d2.120
1 zlnx:servzln 6181978b-d8b7-d701-7a5c-000255ac59c8.2471
2 ADCDPL:BBOSAM1A 202c7303-89bc-d701-6d93-ad2b66481876.105
3 CIQ2:CICS2 61132cc5-55c1-d701-43be-68992bcec9bc.97
4 aix:ws405_aix_01 50f2a8bb-fea8-d701-d25d-01005e000001.13324
-->
```

The number at the beginning of each line identifies the Data Collector to the `dcctl.sh` script.

2. Enter the number associated with the Data Collector for which you want to enable logging.

To reset a Data Collector log:

1. Run the following commands on the Managing Server host:

```
cd Application Monitor installation directory
cd bin
./dcctl.sh info
```

You see a list of the Data Collectors known to the Managing Server followed by a prompt, which looks like the following:

```
0 CIQ5:CICS5 813102ab-32c2-d701-686e-c69b95b483d2.120
1 zlnx:servzln 6181978b-d8b7-d701-7a5c-000255ac59c8.2471
2 ADCDPL:BBOSAM1A 202c7303-89bc-d701-6d93-ad2b66481876.105
3 CIQ2:CICS2 61132cc5-55c1-d701-43be-68992bcec9bc.97
4 aix:ws405_aix_01 50f2a8bb-fea8-d701-d25d-01005e000001.13324
-->
```

The number at the beginning of each line identifies the Data Collector to the `dcctl.sh` script.

2. Enter the number associated with the Data Collector whose log you want to reset.

Starting the Global Publish Server

In order for the Managing Server to track Composite Requests, you must start the Global Publish Server, which is a component of the Managing Server.

Starting the Global Publish Server is similar to starting other Managing Server components.

For more information on operating other components within the Managing Server, please see the *WebSphere Studio Application Monitor Operator's Guide*.

To start the Global Publish Server

1. Enter the following commands at a command prompt, substituting the appropriate location of your <Application Monitor installation directory>:

```
su - amuser
cd <Application Monitor installation directory>
./samctl.sh sam start
```
2. To check whether the Global Publish Server started successfully, you can type in the following command.

```
./samctl.sh ping
```

You may receive a similar message:

```
GPS <GPSID> has been up since Jan 01 2005: 071032AM.
```

Stopping the Global Publish Server

Stopping the Global Publish Server is similar to stopping other Managing Server components.

To stop the Global Publish Server

1. Login to the Managing Server. Navigate to the <MSinstallation directory>/bin. Type 'ls -al'. Login as the owner of the files. Enter the following commands at a command prompt, substituting the appropriate location of <Application Monitor installation directory>:

```
su - amuser
cd <Application Monitor installation directory>
./samctl sam stop
```
2. To check whether the Global Publish Server stopped successfully, you can type in the following command.

```
./samctl sam ping
```

Checking the status of the Global Publish Server

Checking the status of the Global Publish Server is similar to checking the status of other Managing Server components.

To check the status of the Global Publish Server

1. Enter the following commands at a command prompt, substituting the appropriate location of <Application Monitor installation directory>:


```
su - amuser
cd <Application Monitor installation directory>
./samctl sam status
```

Starting Multiple Instances of the Global Publish Server

In this release, it is not possible to use more than one instance of a Global Publish Server.

Part 3. Using the CICS Data Collector

with CICS Data CollectorsChapter 6. Using the Application Monitor

Although the architectures of CICS and J2EE are distinct, the Application Monitor integrates them in a single monitoring solution. However, there are some distinctions between CICS and J2EE that affect your use of the Application Monitor.

In cases where CICS and J2EE terminology differ, the Application Monitor uses both names to be clear. Some Application Monitor features are only relevant to J2EE architectures, and are therefore unavailable for use with CICS Data Collectors. Likewise, other features have CICS-specific details and are only available for use with CICS Data Collectors.

This chapter reviews the differences between CICS and J2EE terms, and describes the availability of Application Monitor features for CICS Data Collectors.

Overview of Application Monitor Features Available for CICS Data Collectors

For the current release, not all Application Monitor features are available for CICS Data Collectors. This section describes the features that are available for CICS Data Collectors.

Administration

The top-level navigation for Administration includes Account Management, Server Management, Monitoring on Demand™, and Managing Server.

Account Management

The Account Management section contains the User Profiles and Role Configuration. Manage your user accounts in User Profiles. Add and delete user accounts as necessary. Role Configuration displays the system default roles and any custom roles created by the administrator specific to the needs of their data center environment. Manage the custom roles by maintaining and updating user account access.

Server Management

Server Management contains the Server Groups, Web Server and Administration. In Server Groups, manage the groups by creating, duplicating, and deleting groups as needed. Maintain existing groups by editing them when necessary. In Data Collector Configuration, configure and unconfigure Data Collectors, maintain your Data Collectors' status and create configurations to apply to your Data Collectors. In addition, manage your configurations by creating, applying, modifying, duplicating, and deleting to keep them up-to-date. The Web Server Administration section provides a method for adding and deleting Web servers from the Web Server Overview page.

Monitoring on Demand™

Monitoring on Demand™ (MOD) provides the user with three different types of monitoring levels to choose from for each group or server including: L1

(Production mode), L2 (Problem Determination mode), and L3 (Tracing mode). Create a schedule to apply to a server or group of servers.

Managing Server

The Managing Server contains the System Properties and Self-Diagnosis. In System Properties, maintain the system settings for Application Monitor. Also control the settings for the following properties: Data Collection Settings, Application Overview Display. (SNMP Network is not applicable for CICS Data Collectors.)

Self-Diagnosis:

The Self-Diagnosis allows you to view all the components currently running in Application Monitor, and their states and attributes in the Self-Diagnosis.

Application Monitor consists of the following components:

- Kernel
- Archive Agents
- Publish Servers
- Global Publish Servers
- Polling Agents
- Message Dispatcher
- Data Collector Controllers

Because Application Monitor is designed to work as a loosely-coupled system, the components can be up or down without affecting the integrity of the whole system. Data Management provides a method for permanently deleting excess data from the database server.

Availability

The top-level navigation for Availability includes the Systems Overview and the Server Statistics Overview.

Systems Overview

Enterprise Overview: The Enterprise Overview page displays information for groups of servers (i.e. server farm). It provides the highest level view of health status for the server farm in a typical Data Center. Additional data displayed on the page includes completed requests for the group. Links are available for each of the groups to further investigate the availability and to search the group information for a request.

Group Overview:

The Group Overview page provides a high-level overview of activity for each server in the group. Specifically, the overview includes the response time and throughput for the last hour as well as the current monitoring level for each server. The user can analyze this data in order to ascertain whether the servers in the group are functioning properly.

Server Overview:

The Server Overview page displays comprehensive server information, activity, statistics, and resource data for the selected server. View the summary data to understand the status of your applications and application server (CICS Region) behavior. This page provides vital information for determining the health of your server farm.

Portal Overview:

The Portal Overview page shows you the portals in your system and how they are operating. You can monitor the status of your portals from the slowest portals to the portals with the highest throughput for the last hour. In addition, view the metrics for the portals including Average Response Time and Count for authentication and authorization, as well as credential and content access metrics.

Web Server Overview:

The Web Server Overview page offers a quick method for viewing whether your Web servers are properly functioning. While performing problem determination functions, it is useful to know the status of your Web servers. You can efficiently eliminate your Web servers as the source of the problems by checking the Web Server Overview page. The Application Overview page displays information for groups of servers (i.e. server farm). It provides the highest level view of health status for the server farm in a typical Data Center. Additional data displayed on the page includes completed requests for the group. Links are available for each of the groups to further investigate the availability and to search the group information for a request.

Server Statistics Overview

The Server Statistics Overview page provides application server-level statistics for quick assessment of server activity and related platform data (from the perspective of the Server Statistics Overview, CICS is considered an application server.) This page assists the operators in drawing an educated guess of the true availability of the applications being served in the individual application servers. This is also called activity- based availability as opposed to IP availability.

Workload Manager

The Workload Manager feature offers a way to view selected data from the Workload Manager (WLM) for z/OS and OS/390, for the address space associated with a particular server, as well as its associated service class data, service class period and enclave data. This feature is only available for z/OS servers and CICS Regions.

The Workload Manager feature is not available directly from the top-level navigation. It is available through the Tools button on the Server Overview (within the Systems Overview feature) and the Server Statistics Overview, for z/OS servers and CICS Regions.

Problem Determination

The top-level navigation for Problem Determination includes the In-Flight Request Search, Server Activity Display, Recent Activity Display, Memory Diagnosis, JVM Thread Display, Software Consistency Check, and Trap & Alert Management.

Among these features, only In-Flight Request Search, Server Activity Display, Recent Activity Display and Memory Diagnosis are available for CICS Data Collectors.

In-Flight Request Search

The In-Flight Request Search page provides a searching component to search for a request on a troubled application server (CICS Region). When a client makes a request for a particular server resource, in most cases, the user requests a Web page or a Java application. To search for a request, enter in the request using alpha numeric characters or a URL string or leave it blank to search for everything.

Server Activity Display

The Server Activity Display page provides task data for an application server (CICS Region) at a specific point in time, as well as the 100 most recently completed transactions. You may filter the tasks by the type, or select another filter from the drop-down list. This will limit the list to the type of tasks you want to view. After pinpointing a hung task, click the Task's ID to review more request detail. View a stack trace, program/component trace; or view, email or export a PDF file of the trace to other WSAM users.

Recent Activity Display

Recent Activity Display is an aid to investigating potential memory problems relating to the Process/Region heap size. Use Recent Activity Display to create a server activity analysis report.

Memory Diagnosis

The Memory Diagnosis section provides the user with diagnostic tools to discover memory related problems in their environment. **Memory Analysis** provides an interface to help the user create useful server activity analysis reports regarding memory.

Performance Analysis

The top-level navigation for Performance Analysis includes the Create Reports, View Saved Reports, Performance Analysis & Reporting, and Daily Statistics.

Among these features, only Performance Analysis & Reporting is available for CICS Data Collectors.

Performance Analysis & Reporting

Users can easily analyze application and application server (CICS Region) data using the Performance Analysis & Reporting functions. Create reports breaks down even further to Application Reports and Server Reports. Create reports for a Group of servers or a selected server. Analyze data for requests/transactions, methods/programs, SQL calls and server availability. For CICS Data Collectors, there is no system resource data, and therefore there are no system resources report features. From the report analysis, access more details on the behavior, performance, memory utilization of the application server and the percentage of the server availability.

Help

Application Monitor online Help offers you multiple ways to find answers to your questions. You can use the Contents tab to browse through the available Help topics; Index tab for an alphabetical listing of all our help text; and Search tab to find the answer to a specific question.

Glossary

Our easy to use glossary offers definitions for headings in results tables, processes, and unfamiliar terms presented in the Application Monitor application. Search alphabetically to quickly find a definition for the term in question.

About

About provides the current version number for Application Monitor and trademark information, regarding pending and approved trademarks for Application Monitor and International Business Machines Corporation.

J2EE and CICS Terminology

Comparison of Terms

The following table lists terms that describe equivalent concepts in J2EE and CICS:

Table 5. J2EE and CICS Terms

J2EE Name	CICS Name
Application Server	CICS Region
Request	Transaction
Thread ID	Task ID
Method Name	Program
JVM	Process/Region

Whenever these terms are used, the labeling is in the following format:

- [J2EE Name]/[CICS Name]

Features with Dual J2EE/CICS Terminology

The following Application Monitor features display both the J2EE and CICS terms described in Table 5.

Table 6. Features with Dual J2EE/CICS Terminology

Section	Feature
Administration	Server Management
	Monitoring on Demand™
	Managing Server
Availability	Systems Overview
	Server Statistics Overview
Problem Determination	In-Flight Request Search
	Recent Activity Display
	Memory Diagnosis: Memory Analysis
Performance Analysis	Performance Analysis & Reporting
Help	All

WSAM Features for CICS Data Collectors

Features Unavailable to CICS Data Collectors

Various features specific to J2EE Data Collectors are not available for CICS Data Collectors. The following lists describes the features of WSAM that are not available for CICS Data Collectors:

Table 7. Application Monitor Features Unavailable for use with CICS Data Collectors

Section	Feature
Problem Determination	Recent Activity Display: Garbage Collection options
	Software Consistency Check
	Memory Diagnosis: Memory Analysis: Garbage Collection options
	Memory Diagnosis: Heap Analysis
	Memory Diagnosis: Memory Leak
	JVM Thread Display
	Trap & Alert Management
Performance Analysis	System Resources
	System Resource Comparison
	Performance Analysis & Reporting: System Resource Analysis Reports
	Daily Statistics
Availability	System Resources
	System Resource Comparison

CICS-Customized Features

In several cases, features are customized based on whether or not a Data Collector is a CICS Data Collector or a J2EE Data Collector:

Administration

Server Management: Data Collector Configuration:

There is a Data Collector configuration that is tailored to CICS Data Collectors named 'CICS default.' The exclude list of the CICS default configuration is populated with regular expressions that match the names of CICS programs you will typically not want to monitor, such as DFH*, CSQ*, DSN*, DFS* and CYN*.

Monitoring on Demand:

Monitoring on Demand (MOD) provides the user with three different types of monitoring levels to choose from for each group or server including: L1 (Production mode), L2 (Problem Determination mode), and L3 (Tracing mode). Create a schedule to apply to a server or group of servers.

The same philosophy of monitoring levels applies to CICS as to J2EE:

- L1—Top level requests/transactions.
- L2—API calls. (Includes L1 events)
- L3—Low level trace. (Includes L1 and L2 events.)

The following table describes which type of CICS events are monitored, and in which monitoring level they first appear.

Table 8. CICS Events and MOD Levels

Event	Monitoring Level
Transaction	L1—Production

Table 8. CICS Events and MOD Levels (continued)

Event	Monitoring Level
EXEC CICS API	L2—Problem Determination
MQI	L2—Problem Determination
DSQL	L2—Problem Determination
Program	L3—Tracing

Availability

Workload Manager:

The Workload Manager (WLM) feature for CICS Regions includes support for service class and service class periods, but not for enclaves.

From the WLM point of view, a CICS Region is a server address space, and so there is additionally some subsystem work manager delay data (transactions in various states in the begin-to-end or execution phases,) which is not available in WLM for WebSphere on z/OS.

See “Viewing the *WLM Associated Service Class Summary*” on page 54 and “Viewing the *WLM Associated Service Class Period Detail*” on page 55.

Problem Determination

Server Activity Display: Active Requests:

The options for the Request/Thread Type filter include CICS as an option, along with the usual options of EJB, Servlet and JSP.

Note: When you click the Cancel Request button once, the CICS Data Collector issues an EXEC CICS SET TASK PURGE to the task.

If you click the the Cancel Request button a second time, and the task has not completed, the CICS Data Collector issues an EXEC CICS SET TASK FORCEPURGE to the task.

If you click the the Cancel Request button a third time, and the task has still not completed, the CICS Data Collector issues an EXEC CICS SET TASK KILL to the task.

Server Activity Display: Request Detail:

- The range of values for changing a transaction’s priority is from 1 to 255.
- There is an additional field for User Name, which is the name of the user initiating the transaction.
- There is a Work Area page for viewing the contents of work areas, which is described in “Viewing the Contents of a Work Area” on page 52
- In the Stack Trace for CICS Data Collectors, there is no Class Name associated with the methods (programs.)

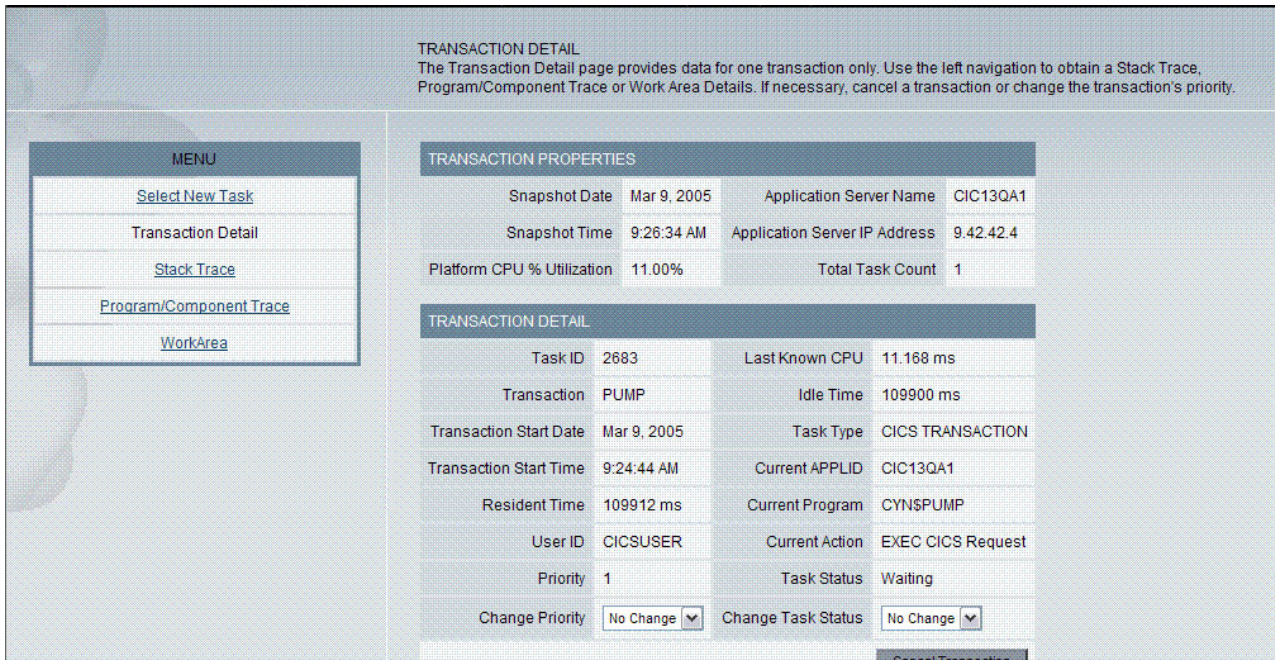


Figure 3. Transaction Detail page for CICS

Recent Activity Display:

- The metrics related to Garbage Collection are not available for CICS Data Collectors.
- CICS Data Collectors use Process/Region CPU instead of JVM CPU as a metric.
- CICS Data Collectors use Process/Region heap size instead of JVM Heap size as a metric.
- The Process/Region heap size graphs also contain a reference line for the maximum heap size.

Note: The maximum heap size reference is not dynamic. If you change the limit in a CICS Region, the new value will not be reflected in the Recent Activity Display. You must disable and reconfigure the CICS Data Collector in order to obtain the new maximum heap size.

Memory Diagnosis: Memory Analysis:

Memory Analysis uses the same metrics as Recent Activity Display, and are interpreted to reflect the Process/Region, rather than the JVM.

Performance Analysis

Performance Analysis & Reporting:

- The Request/Thread Type dropdown includes CICS as an option, along with EJB, Servlet and JSP.

Viewing the Contents of a Work Area

When debugging an active transaction, it may be desirable to view the contents of the Work Areas. When used with CICS Data Collectors, the Application Monitor provides a familiar Hex Viewer to view the Work Areas.

The Hex Viewer allows you to view the contents of any of the following Work Areas in either EBCDIC or ASCII format:

- COMMAREA (Communications Area)
- CWA (Common Work Area)
- TCTUA (Terminal Control Terminal User Area)
- TIOA (Terminal Input Output Area)
- TWA (Transaction Work Area)

To view the contents of a Work Area:

1. From the top navigation, click **Problem Determination > In-Flight Request Search**.

The In-Flight Request search page displays active requests/transactions.

2. Locate a transaction running on a CICS server (on the basis of the **Server Name**) and click its name in the **Thread/Task ID** column.

The Transaction Detail page for that CICS transaction opens.

3. Click the Work Area link in the left navigation of the Transaction Detail page.

The Work Area page opens, which includes Transaction Information and a **Hex Viewer** at the bottom of the page. An example of the Hex Viewer from a Transaction Detail page is shown in Figure 1 on page 6.

4. Select a **Work Area** from the Work Area drop-down.
5. Select either the **EBCDIC** or **ASCII** translation option.
6. Click **OK**.

The contents of the Work Area is presented in terms of the columns **Address**, **Offset**, **Hex Values** and **Text Values**.

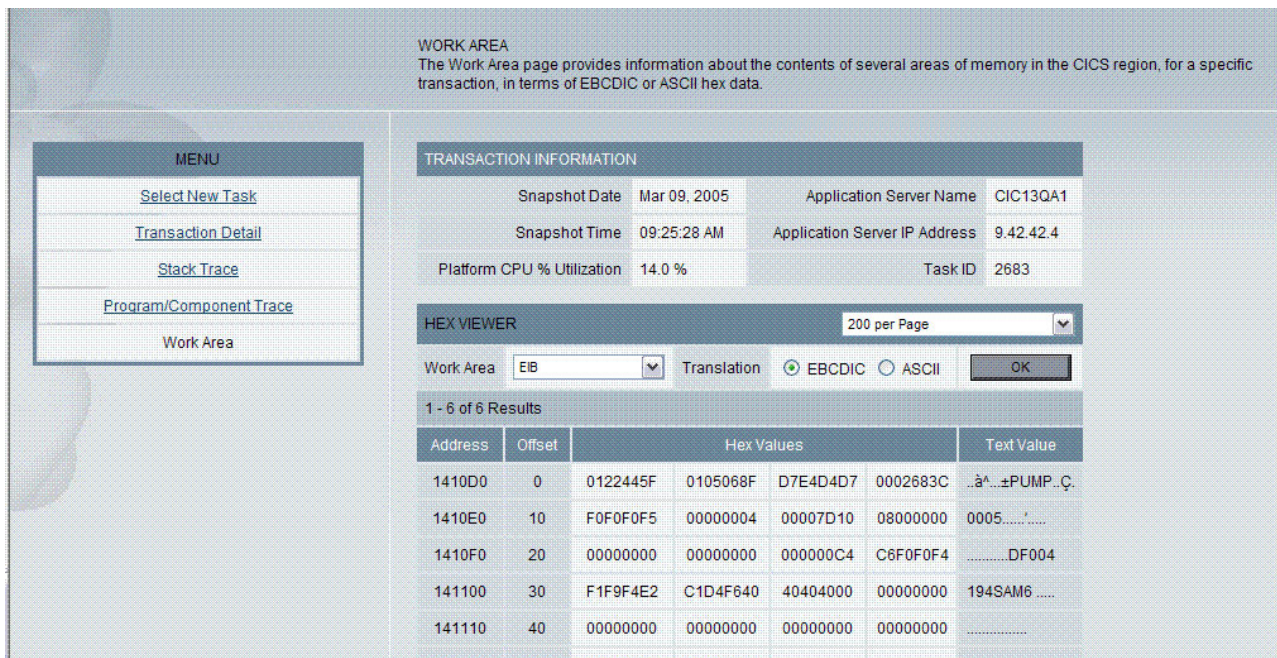


Figure 4. CICS Data Collector Hex Viewer

Viewing the *WLM Associated Service Class Summary*

The WLM Associated Service Class Summary page offers a way to view selected data from the Workload Manager (WLM) for z/OS and OS/390, for the address space associated with a particular server, as well as its associated service class data and service class period data.

The address space properties include the server name and associated Report Class, Resource Group, Workload, Server Space and Associated Service Class Goals.

The associated service class properties include Service Class Name, Description, Associated Workload, Associated Resource Group, Number of Service Class Periods, WLM Mode, Last Initialized Time, Data Collected Time, Policy Name, Policy Activated Time, Policy Activator User ID, Policy Activated System, Current Delay Sample Intervals (ms), and Number of times the WLM Sample Code ran.

Each associated service class period data includes Period Name, Goal Type, Response Time Units, Goal % Value, Importance Level, Response Time Velocity, and Period Duration, for each associated service class period. Drill down on the period name to see the WLM Associated Service Class Period Detail.

To open the WLM Associated Service Class Summary page:

1. From the top navigation, click **Availability > Systems Overview > Server**.
The Server Overview selection page opens.
2. Select a Group and a Server from the drop-down menus.
The Server Overview page opens displaying data for the selected server.
3. Click the **WLM Associated Service Class Summary** from the tools button.
The WLM Associated Service Class Summary page opens.



Figure 5. WLM Associated Service Class Summary page for CICS

Viewing the WLM Associated Service Class Period Detail

The WLM Associated Service Class Period Detail page offers a way to view selected data from the Workload Manager (WLM) for z/OS and OS/390, for a selected service class period. This includes the response time distribution detail, and possibly delay detail information, about each subsystem work manager.

The service class period properties include the Period Name, Response Time, Goal % Value, Importance Level, Response Time Velocity, Period Duration, and Data Collected Time.

The response time distribution detail includes the Total Transactions and the Goal and Transaction information for all 14 goal "buckets."

The delay data, if available, includes, for each subsystem work manager, the number of programs in each of the Active, Ready, Waiting, Local, Sysplex and Network states, for both the begin-to-end phase and execution phase.

To open the WLM Associated Service Class Period Details page:

1. From the top navigation, click **Availability > Systems Overview > Server**.
The Server Overview selection page opens.
2. Select a Group and a Server from the drop-down menus.
The Server Overview page opens displaying data for the selected server.
3. Click the **WLM Associated Service Class Summary** from the tools button.
The WLM Associated Service Class Summary page opens.
4. Click the name of one of the associated service class periods.

The WLM Associated Service Class Period Detail page opens.

WLM ASSOCIATED SERVICE CLASS PERIOD DETAIL
 The Workload Manager (WLM) for z/OS and OS/390 displays selected service class period data.

Service Class Enclave

ASSOCIATED SERVICE CLASS PERIOD PROPERTIES

Name	STCLOW	Response Time Units (msec., sec., min., hr.)	Unknown	Goal % Value	0	Importance Level (1-5)	4
Period	1	Response Time/Velocity (Goal Value)	20	Period Duration	0	Data Collected Time	Mar 9, 2005 9:30:33 AM

RESPONSE TIME DISTRIBUTION DETAIL

Total Transactions	0					
	Buckets	Transactions	Buckets	Transactions	Buckets	Transactions
	< 50%	0	90 - 100%	0	130 - 140%	0
	50 - 60%	0	100 - 110%	0	140 - 150%	0
	60 - 70%	0	110 - 120%	0	150 - 200%	0
	70 - 80%	0	120 - 130%	0	200 - 400%	0
	80 - 90%	0			> 400%	0

[< Back](#)

Figure 6. WLM Associated Service Class Period Detail page for CICS

Chapter 7. The Request Mapper for CICS Data Collectors

You can make the Application Monitor easier to use by giving more meaningful names to the programs and transactions monitored by the CICS Data Collector. You can do this using the Request Mapper.

This chapter describes how to use the Request Mapper, and provides guidance on how to write your own.

Using the Request Mapper

What the Request Mapper Does

When the Request Mapper is in use, a program named CYN\$RMAP is invoked, as an EXEC CICS LINK, during every transaction start (EXEC CICS START TRANSID.)

The CYN\$RMAP program changes the values of the transaction name (TRANNAME) and program name (APPLNAME). These new values for the transaction name and program name are sent to the Application Monitor, and used instead of the original values, wherever the data appears.

The Request Mapper Program

You can use the sample Request Mapper that ships with the CYN.SCYN\$SAM2 data set, or you can write your own. In either case, the Request Mapper must be a program named CYN\$RMAP. It must be compiled and included in your CSD. It can be written in any language, such as COBOL, C, PL/1 or Assembler.

Assuming you have an appropriate Request Mapper program, to turn on the Request Mapper feature you need to set the `am.mapper` property, in the `datacollector.properties` file, to `yes`, and restart the CICS Data Collector:

Using the Supplied Request Mapper

There is a request mapper shipped with the CICS Data Collector. The following procedure describes how to use this request mapper. This must be done for each CICS Region.

To use the supplied request mapper

1. Compile the program named CYN\$RMAP, which is in the CYN.SCYN\$SAM2 data set. See "Compiling Sample Programs" on page 23 for instructions on how to compile programs using the job named CYN\$APRG, which is also in the CYN.SCYN\$SAM2 data set.
2. Edit the definition of the following property in the `datacollector.env` file:
`am.mapper=yes`
3. Include the CYN\$RMAP in your CSD. You can do this either by modifying an existing batch job that adds programs to your CICS Regions, or by using CEDA
`DEF PROGRAM(CYN$RMAP) GR(YOUR GROUP)`.
4. Restart the CICS Region.

The supplied Request Mapper appends the string "-MAPPED" to the transaction name and the program name.

Sample Code

Here is the source code to the supplied Request Mapper:

```

      TITLE 'CYN$RMAP - SAM/CICS SAMPLE REQUEST MAPPER'
*****

MODULE NAME = WSAM SAMPLE PROGRAM

DESCRIPTIVE NAME = SAMPLE PROGRAM USED TO MODIFY THE TRANSACTION
                  AND PROGRAM NAME WHEN MAPPER FUNCTION IS
                  ENABLED IN THE DATACOLLECTOR.ENV FILE ON THE
                  U.S.S
                  USES A COPYBOOK: CYN$MAPL
                  (Sample ASSEMBLER Version)
*****
COMPTR  EQU R4
*
DFHEISTG DSECT
ICAT1   DS CL8
*
DFHCOMMAREA DSECT
        COPY CYN$MAPL
*
CYN$RMAP CSECT
CYN$RMAP AMODE 31
CYN$RMAP RMODE ANY
*
        DFHREGS
        MVC  ICAT1,CYN$MAPI
        LH   COMPTR,EIBCALEN
        LTR  COMPTR,COMPTR
        BZ   ERROR
        L    COMPTR,DFHEICAP
        USING DFHCOMMAREA,COMPTR
*
* You can use EXEC CICS ADDRESS and ASSIGN commands to obtain access
* to areas like CWA, TWA, and TCTUA to determine what the Transaction
* name and Application name should be. The first COMMAREA pointer is
* passed in CYN$MAPL. This area should be for read only.
*
* Move EIBTRNID to TRANNAME
        MVC  TRANNAME(L'EIBTRNID),EIBTRNID
        MVC  TRANNAME+L'EIBTRNID(7),=C'-MAPPED'
*
* Move Application Name to APPLNAME
        MVC  APPLNAME(L'SAMAPPL),SAMAPPL
*
* Return to CYN$TRUE
EXEC CICS RETURN
*
ERROR   EQU *
EXEC CICS ABEND ABCODE(ABCODE)
*
        LTORG
ABCODE  DC    C'CYNM'
CYN$MAPI DC  C'CYN$RMAP'
CYN$MAPI DC  C'CYN$RMAP'
SAMAPPL DC    C'SAM/CICS Test Mapper App'
END

```

Chapter 8. Debugging Tools

This chapter describes a few techniques for troubleshooting the CICS Data Collector.

Debug Mode

It is possible to run any WebSphere Studio Application Monitor Data Collector in debug mode. When a Data Collector is run in debug mode, additional information is produced that describes what a Data Collector is doing.

For CICS Data Collectors, these messages are sent to sysout. Debug mode should be used, therefore, only when necessary, or else your spool will fill up.

There are two ways to put a CICS Data Collector in debug mode.

Setting am.debug

One way to put a CICS Data Collector in debug mode is to set `am.debug=yes` in the `datacollector.env` file. See “The `datacollector.env` file” on page 20 for more information about the location of the `datacollector.env` file, and other properties you can set.

In order for this to take effect, you must remove several log files and restart the CICS Region. For details, see “Restarting CICS Regions” on page 17.

Using `dcctl.sh`

You can dynamically put the CICS Data Collector in and out of debug mode by using a program on the managing server called `dcctl.sh` (Data Collector Control).

See “Toggling Data Collector Logging (on the Managing Server)” on page 39 for more details on how to toggle the debug mode of Data Collectors.

Auxiliary Trace

Another way to obtain more troubleshooting information about the CICS Data Collector is to print an auxiliary trace.

To obtain CICS Data Collector trace information for an active CICS Region:

1. Login to the CICS Region using normal login processes.
2. Check the status of Auxiliary Tracing by issuing the following command:
`CEMT INQ AUXTRACE`
3. If the trace is stopped (STO) then turn on the trace by overtyping the STO option with STA.
4. Verify whether the auxiliary trace is been written to the DFHAUXT or the DFHBUXT trace dataset.
5. Modify the CYN\$PR22 job (for CICS v2.2) or the CYN\$PR23 (for CICS v2.3) or the CYN\$PR13 job (for CICS v1.3) in the CYN.CICS.SCYNSAM2 dataset to point to the active auxiliary trace dataset for your CICS Region, and to set the value of TYPETR.

In all cases, the TYPETR value should be as follows:

```
TYPETR=(AP00A8)
```

The sections of the CYN\$PRT22, CYN\$PRT23 or CYN\$PRT13 job that you need to modify as follows:

```
//STEPLIB DD DSN=<SDFHLOAD Data Set>,DISP=SHR  
//          DD DSN=<SDFHLINK Data Set>,DISP=SHR  
//AUXTRACE DD DSN=<DFH Data Set>,DISP=SHR
```

Replace <SDFHLOAD Data Set> and <SDFHLINK Data Set> and with the fully-qualified name of the CICS data sets that are specific to your CICS versions. Verify with your CICS System programmer the names of the CICS data sets. For example:

- CICSTS13.CICS.SDFHLOAD and CICSTS13.CICS.SDFHLINK
- CICSTS22.CICS.SDFHLOAD and CICSTS22.CICS.SDFHLINK
- CICSTS23.CICS.SDFHLOAD and CICSTS23.CICS.SDFHLINK

Replace <DFH Data Set> with the name of the auxiliary trace data set that pertains to your specific CICS region. For example:
CICSTS22.CICSREGION.DFHAUXT or CICSTS22.CICSREGION.DFHBUXT.

6. Submit the job.
7. Send the output to IBM support.

To stop auxiliary tracing for an active CICS Region

1. Login to the CICS Region using normal login processes.
2. Check the status of Auxiliary Tracing by issuing the following command:
CEMT INQ AUXTRACE
3. If the trace is started (STA) then turn off the trace by overtyping the STA option with STO.

Part 4. Appendixes

Appendix A. Support Information

<http://www.ibm.com/software/support>

<http://techsupport.services.ibm.com/guides/handbook.html>

<http://techsupport.services.ibm.com/guides/contacts.html>

http://www.lotus.com/services/passport.nsf/WebDocs/Passport_Advantage_Home

<https://techsupport.services.ibm.com/ssr/login>

<http://www.ibm.com/software/support/probsub.html>

<http://www.ibm.com/servers/eserver/techsupport.html>

<http://www.ibm.com/services/us/index.wss/so/its/a1000030/dt006>

If you have a problem with your IBM software, you want to resolve it quickly. This section describes the following options for obtaining support for IBM software products:

- “Searching knowledge bases”
- “Obtaining fixes” on page 64
- “Receiving weekly support updates” on page 64
- “Contacting IBM Software Support” on page 65

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

IBM provides extensive documentation that can be installed on your local computer or on an intranet server. You can use the search function of this information center to query conceptual information, instructions for completing tasks, and reference information.

Searching the Internet

If you cannot find an answer to your question in the information center, search the Internet for the latest, most complete information that might help you resolve your problem.

To search multiple Internet resources for your product, use the **Web search** topic in your information center. In the navigation frame, click **Troubleshooting and support** ► **Searching knowledge bases** and select **Web search**. From this topic, you can search a variety of resources, including the following:

- IBM technotes
- IBM downloads
- IBM Redbooks

- IBM developerWorks
- Forums and newsgroups
- Google

Obtaining fixes

A product fix might be available to resolve your problem. To determine what fixes are available for your IBM software product, follow these steps:

1. Go to the IBM Software Support Web site at <http://www.ibm.com/software/support>.
2. Click **Downloads and drivers** in the **Support topics** section.
3. Select the **Software** category.
4. Select a product in the **Sub-category** list.
5. In the **Find downloads and drivers by product** section, select one software category from the **Category** list.
6. Select one product from the **Sub-category** list.
7. Type more search terms in the **Search within results** if you want to refine your search.
8. Click **Search**.
9. From the list of downloads returned by your search, click the name of a fix to read the description of the fix and to optionally download the fix.

For more information about the types of fixes that are available, see the *IBM Software Support Handbook* at <http://techsupport.services.ibm.com/guides/handbook.html>.

Receiving weekly support updates

To receive weekly e-mail notifications about fixes and other software support news, follow these steps:

1. Go to the IBM Software Support Web site at <http://www.ibm.com/software/support>.
2. Click **My support** in the upper right corner of the page.
3. If you have already registered for **My support**, 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. Click **Edit profile**.
5. In the **Products** list, select **Software**. A second list is displayed.
6. In the second list, select a product segment, for example, **Application servers**. A third list is displayed.
7. In the third list, select a product sub-segment, for example, **Distributed Application & Web Servers**. A list of applicable products is displayed.
8. Select the products for which you want to receive updates, for example, **IBM HTTP Server** and **WebSphere Application Server**.
9. Click **Add products**.
10. After selecting all products that are of interest to you, click **Subscribe to email** on the **Edit profile** tab.
11. Select **Please send these documents by weekly email**.
12. Update your e-mail address as needed.
13. In the **Documents** list, select **Software**.

14. Select the types of documents that you want to receive information about.
15. Click **Update**.

If you experience problems with the **My support** feature, you can obtain help in one of the following ways:

Online

Send an e-mail message to erchelp@ca.ibm.com, describing your problem.

By phone

Call 1-800-IBM-4You (1-800-426-4968).

Contacting IBM Software Support

IBM Software Support provides assistance with product defects.

Before contacting IBM Software Support, your company must have an active IBM software maintenance contract, and you must be authorized to submit problems to IBM. The type of software maintenance contract that you need depends on the type of product you have:

- 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 and click **How to Enroll**.

By phone

For the phone number to call in your country, go to the IBM Software Support Web site at

<http://techsupport.services.ibm.com/guides/contacts.html> and click the name of your geographic region.

- For customers with Subscription and Support (S & S) contracts, go to the Software Service Request Web site at <https://techsupport.services.ibm.com/ssr/login>.
- For customers with IBMLink, CATIA, Linux, S/390, iSeries, pSeries, zSeries, and other support agreements, go to the IBM Support Line Web site at <http://www.ibm.com/services/us/index.wss/so/its/a1000030/dt006>.
- 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://techsupport.services.ibm.com/guides/contacts.html> and click the name of your geographic region for phone numbers of people who provide support for your location.

To contact IBM Software support, follow these steps:

1. "Determining the business impact"
2. "Describing problems and gathering information"
3. "Submitting problems"

Determining the business impact

When you report a problem to IBM, you are asked 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.

Describing problems and gathering information

When describing a problem to IBM, be as specific as possible. Include all relevant background information so that IBM Software Support specialists can help you solve the problem efficiently. To save time, know the answers to these 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.

Submitting problems

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

Online

Click **Submit and track problems** on the IBM Software Support site at <http://www.ibm.com/software/support/probsub.html>. Type your information into the appropriate problem submission form.

By phone

For the phone number to call in your country, go to the contacts page of the *IBM Software Support Handbook* at <http://techsupport.services.ibm.com/guides/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 Software Support creates an Authorized Program Analysis Report (APAR). The APAR describes the problem in detail. Whenever possible, IBM Software Support provides a workaround that you can implement until the APAR is resolved and a fix is delivered. IBM publishes resolved APARs on the Software Support Web site daily, so that other users who experience the same problem can benefit from the same resolution.

Appendix B. Accessibility

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully. These are the major accessibility features you can use with *WebSphere Studio Application Monitor* when accessing it via the *IBM Personal Communications* terminal emulator:

- You can operate all features using the keyboard instead of the mouse.
- You can read text text through interaction with assistive technology.
- You can use system settings for font, size, and color for all user interface controls.
- You can magnify what is displayed on your screen.

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