WebSphere Studio Application Monitor

WebSphere Studio Application Monitor IMS Data Collector Product Guide

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Note:

Before using this information and the product it supports, read the information in “Notices” on page 51.

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This edition applies to WebSphere Studio Application Monitor (product number 5697-J01) and to all subsequent releases and modifications until otherwise indicated in new editions.

You can order publications through your IBM representative or the IBM branch office serving your locality.

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Preface

About this book

This book describes how to use the *WebSphere Studio Application Monitor IMS Data Collector* (IMS Data Collector) in conjunction with *WebSphere Studio Application Monitor* (Application Monitor).

In particular, this book contains the following three parts:

- *Part I*: Instructions on installing and customizing the IMS Data Collector, which lets IMS® 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 IC4J and IMS Connect to access resources in IMS Regions.
- *Part III*: Instruction for using the Application Monitor with the IMS 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 IMS Data Collector, or the aspects of Application Monitor that relate to Composite Requests.

  For certain sections, a working knowledge of z/OS and IMS 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 IMS Data Collector 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 for CICS Data Collector Product Guide* contains information about the installation, configuration and use of the Application Monitor CICS Data Collector.
- *Websphere Studio Application MonitorWebSphere 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* contains complete installation instructions for the Application Monitor Engine.
- *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* has an online help system that describes all of the commands and dialogs available from its graphical user interface.

Documentation Conventions

The following table describes the conventions used throughout thsi book.

Table 1. Documentation Conventions

Convention	**Item**
Ctrl+Tab	Indicates that you must press two or more keys simultaneously.
<installation directory>	Indicates that you should insert the directory appropriate for your environment.
`monospace text`	Indicates code samples.

Part 1. Installing and Configuring IMS Data Collectors

Chapter 1. Overview of IMS Data Collectors

This chapter covers the following topics:

System Requirements

z/OS® Requirements

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

- IMS for z/OS version 7.1 with a minimum put level 0401, 8.1 or 9.1 running on z/OS 1.2, 1.3 or 1.4
- One or more LPARs

WSAM Managing Server Requirements

You must have a WSAM Managing Server in order to use your IMS Data Collectors.

Supported Platforms

IMS Data Collectors work in conjunction with any v3.1 Application Monitor Managing Server. See the *WebSphere Studio Application Monitor Installation and Customization Guide* for the supported platform/application server/database combinations.

In addition, in order to use the Composite Request features of the Application Monitor, you must configure one or more Data Collectors that monitor J2EE requests, from among the following application server/platform combinations:

- Websphere 5.1 on z/OS 1.2 (and above), AIX® 5L or Solaris 8

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, including IMS.

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

Support is defined in terms of a combination of Operating System, Application Server and IMS Connect or MQ version. IMS Connect and MQ (using the IMS Bridge) are the two supported mechanisms for Composite Requests that involve IMS.

Table 2 and Table 3describe the supported combinations for IMS Data Collectors, and Table 4 and Table 5describes the supported combinations for J2EE Data Collectors.

Table 2. Composite Request Requirements for IMS Data Collector using IMS Connect

Operating System	Application Server	IMS Connect Version
z/OS 1.2-1.4	IMS 7.1, 8.1 or 9.1	2.1 or 2.2

Table 3. Composite Request Requirements for IMS Data Collector using MQ

Operating System	Application Server	MQ Version
z/OS 1.2-1.4	IMS 7.1, 8.1 or 9.1	5.3.1

Table 4. Composite Request Requirements for J2EE Data Collector using IMS Connect

Operating System	Application Server	IMS Connect Version
z/OS 1.2-1.4	WebSphere 5.0.2 and 5.1	2.1 or 2.2

Table 5. Composite Request Requirements for J2EE Data Collector using MQ

Operating System	Application Server	MQ Version
z/OS 1.3-1.4	WebSphere 5.0.2 and 5.1	5.3.1

See Chapter 4. “Enabling Composite Request Features in the Application Monitor” on page 25 for instructions on how to enable Composite Request monitoring on J2EE Data Collectors.

Scope of IMS Data Collector Installation

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

- IMS Regions whose programs are invoked through IMS Connect, where the invocations are from applications running within J2EE application servers which

use the IC4J interface, 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.

- All other IMS Regions invoked by way of Mulitple System Communication (MSC) from programs invoked in the first case.

How the IMS Data Collector Works

The IMS Data Collector is fully integrated with IMS v7.1, 8.1 and 9.1.

The IMS Data Collector monitors all requests arriving to IMS through OTMA, BTAM, VTAM and APPC.

The IMS Data Collector monitors activity in IMS Control Regions using Standard Exits invoked at various times.

Standalone and Composite Requests

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

WSAM uses a passport/visa token technique to track and correlate activity from J2EE application servers (through invocations using IMS Connect) into IMS 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.

Parts of the IMS Data Collector

The IMS Data Collector is composed of three parts:

- The Data Capture component is launched when the IMS Region starts up .

  The Data Capture component is the part that operates at exit points in IMS, 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 monitored data to the Managing Server.

  The Communications Driver component runs in a JVM that is used exclusively by the IMS Data Collector. The JVM used by the IMS Data Collector is approximately 8 MB in size, and is run under a subtask thread in the MVS Task Control Block (TCB) 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 IMS

The following is the processing path of the IMS Data Collector for a Composite Request within IMS.

An IMS transaction is not always confined to a single control region and corresponding dependent regions. For example, a transaction may start on one control region, be shipped to another control region, execute a program running in a dependent region (in that remote region,) whose response message may be shipped back to the originating control region.

When a single transaction executes in multiple IMS regions, it uses the SYSPLEX shared queue (SQ) facility or the MSC environment.

MS Network (Complex)

We use the term "IMS Network (Complex)" to refer to all IMS regions that have the capability of communicating with one another, while processing IMS transactions.

The Composite Request feature of the Application Monitor tracks requests that execute across more than one application server. For example, a request that originates from a J2EE Application Server that invokes IMS resources will be correlated with the corresponding transaction within the IMS Network.

However, the Application Monitor represents the entire path of an MSC transaction within an IMS Network as a single transaction, even though the events are collected by distinct IMS Data Collectors. This occurs automatically, once you install and configure IMS Data Collectors in various regions within an IMS Network.

Overview of the Installation and Configuration Process

Who Is Involved?

There are, potentially, four individuals involved in the IMS Data Collector installation and configuration:

- z/OS Systems Programmer
- IMS 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 an IMS Data Collector.

z/OS Systems Programmer

- APF-authorize the IMS Data Collector data sets and update IMS JCL.

IMS Systems Programmer

- Authorize the load library and update IMS JCL.
- Run custom linkage-editor jobs in the IMS environment.
- Configure IMS Region to use the IMS Data Collector (once per IMS Region.)
- Restart IMS Regions (Post-installation.)

USS Systems Programmer

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

Application Monitor Administrator

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

Where Are the Instructions?

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

- Chapter 2, "Installing and Configuring IMS Data Collectors," on page 9 (For tasks performed by z/OS, IMS and USS Systems Programmers.)
- Chapter 4, "Enabling Composite Request Features in the Application Monitor," on page 25 (For tasks performed by the Application Monitor Administrator.)

Chapter 2. Installing and Configuring IMS Data Collectors

This chapter covers the following topics:

Step-by-Step Instructions: z/OS

Preparing Your z/OS Systems

Your z/OS Systems Programmer must APF-authorize the IMS Data Collector load library and update the IMS JCL.

This prepares your z/OS systems for IMS Data Collector installation.

Before You Begin

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

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

Locate the Data Sets in the Distribution

Obtain the following data sets distributed with the IMS Data Collector:

- CYN.IMS.SCYNAUTH (Load libraries)
- CYN.IMS.SCYNINST (Configuration and customization)

The following data sets provide support for SMF and WLM, and are also necessary for the IMS Data Collector. However, you do not have to install them if there are other WSAM components installed on the same LPAR (a CICS Data Collector or a Data Collector for WebSphere on z/OS):

- CYN.CINSTALL.ACYNAUTH
- CYN.CINSTALL.ACYNPROC

All five of these data sets work for CICS v1.3, v2.2 and v2.3, and are distributed with the IMS Data Collector.

Install WLM Support

Before you install the IMS Data Collector, you must install the two data sets that support WLM: CYN.CINSTALL.ACYNAUTH and CYN.CINSTALL.ACYNPROC.

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

The instructions for installing those data sets are locaed 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.

Authorizing the Data Sets and Updating IMS JCL

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

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

1. APF-authorize the CYN.IMS.SCYNAUTH data set.
2. Put the CYN.IMS.SCYNAUTH data set in the STEPLIB of the Control Region procedure before the IMS RESLIB.

   The line to add has the following format:

   ```
   //STEPLIB DD DSN=CYN.IMS.SCYNAUTH,DISP=SHR
   ```

Step-by-Step Instructions: IMS

Authorizing the Load Library and Updating IMS JCL

The following procedure enables the IMS Data Collector to monitor a specific IMS region.

To authorize the IMS Data Collector load library and update your IMS JCL:

1. APF-authorize the CYN.IMS.SCYNAUTH load library on all LPARs hosting the IMS regions to be monitored.
2. Update the JCL in the catalog procedures that start the IMS regions to be monitored.

   Note: The member IMS7PROC in the library CYN.IMS.SCYNINST contains an example of a modified cataloged procedure.

   a. Make sure that the REGION parameter (RGN) in the PROC statement specifies "0M". This turns off MVS memory limit to the JOB, which prevents the JVM from running out of memory.

   b. In the STEPLIB DD statement, concatenate CYN.IMS.SCYNAUTH before the IMS RESLIB. For example:

      ```
      //STEPLIB  DD DSN=CYN.IMS.SCYNAUTH,DISP=SHR,DCB=BLKSIZE=32760
      //                 DD DSN=IMS710.SYS1A.&SYS2.SDFSRESL,DISP=SHR
      ```

   c. Add a CYNIMSIN DD statement to point to an unnumbereed data set containing the home library path of the USS information.

      Note: The CYN$PATH member of the CYN.IMS.SCYNINST data set contains an example. You may need to modify the value of the path from the default, which is /usr/lpp/cyanea.

      Update the catalogued procedure JCL as follows:

      ```
      //CYNIMSIN DD DSN=CYN.IMS.SCYNINST(CYN$PATH),DISP=SHR
      ```

Customizing the IMS Environment

Exit Routines

The IMS Data Collector uses the TM and MSC Message Routing and Control user exit routine (DFSMSCE0) and the OTMA Input/Output Edit exit routine (DFSYIOE0).

These routines could already be in use at your site. Also, DFSMSCE0 supersedes the following MSC exit routines used prior to IMS v7:

- Input Message Routing (DFSNPRT0)
- Link Receive (DFSCMLR0/DFSCMLR1)
- Program Routing (DFSCMPR0)
- Terminal Routing (DFSCMTR0)

If you do not use DFSMSCE0, but instead use any of these older exits, you must run a few customizing linkage-editor jobs, in order for the IMS Data Collector to be invoked. The JCL for these jobs can be found in the CYN.IMS.SCYNINST data set, and are described in the following section.

Customization Jobs

The members in the CYN.IMS.SCYNINST data set are linkage editor jobs. You need to run these jobs if you use certain user exits.

Table 6. Exits and Corresponding Linkage-Editor Jobs

If You Use this Exit...	...Run this Linkage-Editor Job
DFSYIOE0	CYN$IOE0
DFSCMLR0/DFSCMLR1	CYN$MLR0 and/or CYN$MLR1
DFSCMPR0	CYN$MPR0
DFSCMTR0	CYN$MTR0
DFSNPRT0	CYN$PRT0
DFSMSCE0	CYN$SCE0

These customization jobs copy the load modules that contain your exit routines from your load library to the CYN.IMS.SCYNAUTH library, and rename them by replacing the first letter "D" with the letter "Z".

For example, the job named CYN$MTR0 will rename the module DFSCMTR0 to ZFSCMTR0, and copy it to the CYN.IMS.SCYNAUTH library.

When IMS gives control to the IMS Data Collector programs through one of the DFSMSCE0 or DFSYIOE0 entry points, they will look for the corresponding "Z" modules, and call the appropriate modules, as if they were called from IMS directly.

Table 7. Original and Renamed Exits

Original Exit Name	Renamed Exit
DFSYIOE0	ZFSYIOE0
DFSCMLR0	ZFSCMLR0
DFSCMLR1	ZFSCMLR1
DFSCMPR0	ZFSCMPR0
DFSCMTR0	ZFSCMTR0
DFSNPRT0	ZFSNPRT0
DFSMSCE0	ZFSMSCE0

To restore your original environment, remove the CYN.IMS.SCYNAUTH load library from the STEPLIB.

Example Linkage-Editor Job: CYN$IOE0:

Before you run the CYN$IOE0 job, customize the JCL to point at the correct <IMS EXITS LIB> libraries, and update the job card.

```
//DFSYIOE0 JOB 'ACCT#',REGION=4096K,MSGCLASS=X,
//                    NOTIFY=&SYSUID
//*
//* RELINK SITE USER EXIT INTO CYANEA LIBRARY
//*
//LKED EXEC PGM=IEWL,REGION=4096K,
//            PARM=('XREF,LET,LIST,MAP,NCAL,RENT,AC=0')
//INLIB DD DISP=SHR,DSN=<IMS EXITS LIB>
//SYSPRINT DD SYSOUT=*
//SYSUT1 DD UNIT=3390,SPACE=(CYL,(1,1))
//SYSLMOD DD DISP=SHR,DSN=CYN.IMS.SCYNAUTH
//SYSLIN DD *
INCLUDE INLIB(DFSYIOE0)
ENTRY DFSYIOE0
NAME ZFSYIOE0(R)
/*
```

Step-by-Step Instructions: USS

Installing the IMS 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, change file permissions (within the IMS Data Collector installation directory,) and APF-authorize binaries.

Before You Begin

Know Your IMS Region IMS IDs:

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

The instructions in "Configuring the IMS Data Collector to Monitor an IMS Region" on page 13 need to be repeated for each IMS Region (identified by its <IMS ID>) that you want to monitor.

Choose an Installation Directory:

The following convention is suggested for choosing an installation directory for the IMS Data Collector: /<install path>/ims/<IMS ID>.

- The <install path> is defined by your IMS Systems Programmer in the CYN$PATH member of the CYN.IMS.SCYNINST data set, which is pointed to by the CYNIMSIN DD statement in the JCL of the corresponding IMS Control Region catalogue procedures.

  The default value for the <install path> is "/usr/lpp/cyanea".
- The subdirectory "ims" is fixed.

- The last subdirectory, known as <IMS ID>, must be the name of the IMS Region. The default is "IMS1".

For example, the default <installation directory> of the IMS Data Collector is /usr/lpp/cyanea/ims/IMS1. The examples provided in these instructions use the default installation directory. You must adjust the commands appropriately for your system.

Prepare Your file system as READ-WRITE:

Wherever you decide to install your IMS Data Collectors, several directories within it must have READ-WRITE permissions. The default installation directories for IMS Data Collectors are all within /usr/lpp/cyanea, 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 IMS Data Collector creates files.

Configuring the IMS Data Collector to Monitor an IMS Region

This needs to be done by your USS Systems Programmer.

Performing these steps configures the IMS Data Collector to monitor a single IMS Region. Perform these steps for each IMS Region that you want to monitor, and you need to know the <IMS ID> of the IMS Region.

The IMS 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 IMS Data Collector to monitor a IMS Region:

1. Create the <installation directory>, which is /<install path>/ims/<IMS ID>.

   You must create the <IMS ID> subdirectory, where <IMS ID> is named for an IMS Region. Here is an example of how to create the default installation directory:

   ```
   mkdir /usr/lpp/cyanea/ims/IMS1
   ```

2. Copy the contents (recursively) of the ims/cyanea_one subdirectory of the installation distribution to this IMS Region-specific directory you just created. This example assumes the installation distribution is in /usr/lpp/tmp/cyanea:

   ```
   cp -R  /usr/lpp/tmp/cyanea/ims/cyanea_one/* /usr/lpp/cyanea/ims/IMS1
   ```

   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/libcyanea_ims71_zos.so
   - lib/libcyanea_ims81_zos.so
   - lib/libcyanea_ims91_zos.so

- lib/model.jar
- lib/ppe.probe-intf.jar
- lib/ppe.imsprobe.jar
- bin/imsprobe
- logs/

3. In the <installation directory>/etc directory, update the following definitions in the datacollector.properties file:

```
kernel.codebase=<Kernel Codebase URIs>
kernel.rfs.address=<Managing Server RFS Addresses>
java.rmi.server.codebase=<Java RMI Server Codebase URIs>
java.security.policy=<Java Security Policy file>
probe.library.name=<IMS Data Collector Library Name>
probe.rmi.port=<RMI Port Range>
```

   For descriptions of all these properties, see “The datacollector.properties file” on page 15.

4. In the <installation directory>/etc directory, modify the datacollector.env file to reflect the IMS Region-specific paths of the installation. In particular, the following variables contain IMS Region-specific paths:

   - cyanea.classpath
   - cyanea.mod
   - cyanea.libpath

   The default values for these variables include paths that begin with /usr/lpp/cyanea/ims/IMS1. The "IMS1" value needs to be replaced with the appropriate IMS Region’s <IMS ID>.

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

   You may want to set the values of other properties in the datacollector.env file to non-default values; see 15 for a complete list of properties in the datacollector.env file used by the IMS Data Collector.

5. When you first start a IMS region, the IMS Data Collector will create the following three files located in the <installation directory>/etc directory:

   - <IMS Network>.<SYSPLEX>.<LPAR>.<MACHINE>.<LPAR>.<IMS ID>.datacollector.properties
   - <IMS Network>.<SYSPLEX>.<LPAR>.<MACHINE>.<LPAR>.<IMS ID>.id
   - <IMS Network>.<SYSPLEX>.<LPAR>.<MACHINE>.<LPAR>.<IMS ID>.gpsCounter.txt
   - cyanea.mod

   The files use the following naming conventions:

   - <IMS Network> is the value of the cyanea.ims.network property configured in the datacollector.env file.
   - <SYSPLEX> is the sysplex name.
   - <MACHINE> is the machine name..
   - <LPAR> is the LPAR name.
   - <IMS ID> is the IMS 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.)

6. You must APF-authorize two executable files: <installation directory>/bin/imsprobe and <installation directory>/lib/cyanea_ims71_zos.so.

   This example assumes the <installation directory> is /usr/lpp/cyanea/ims/IMS1:

```
cd /usr/lpp/cyanea/ims/IMS1
su
extattr +a bin/imsprobe
extattr +a lib/libcyanea_ims71_zos.so
```

Post-Installation Tasks

Restarting IMS Regions

Having installed your IMS Data Collectors, you are ready to restart your IMS Regions.

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

See 15 for details.

You can then restart the IMS region.

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 IMS Regions on which you have installed and configured IMS Data Collectors.

Please see Chapter 4, "Enabling Composite Request Features in the Application Monitor," on page 25 for these instructions.

The datacollector.properties file

For each IMS 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/cyanea/ims/IMS1/etc/datacollector.properties

To update the datacollector.properties file:

1. Update the datacollector.properties file with your changes.
2. Remove the system-generated file named <IMS Network>.<SYSPLEX>.<MACHINE>.<LPAR>.<IMS ID>.datacollector.properties, which is located in the <installation directory>/etc directory.
3. Restart the server.

DEFAULT datacollector.properties
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=8700-8799 java.rmi.server.codebase=file:///opt/cyaneaone/lib/ppe.probe-intf.jar file:///opt/cyaneaone/lib3.1/ppe.imsprobe.jar probe.controller.rmi.port=8800-8899 probe.library.name=cyanea_ims71_zos

Note: Each entry in the datacollector.properties file must occupy a single line, including the properties kernel.codebase and java.rmi.server.codebase, which appear in the 16 as if they each occupy two lines.

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

cyanea.rmisocket.timeout

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

Value

A duration, in milliseconds.

Example

```
cyanea.rmisocket.timeout=60000
```

cyanea.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

```
cyanea.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

The URIs of the Java RMI Server Codebase.

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/cyaneaone/lib/ppe.probe-intf.jar
file:///opt/cyaneaone/lib3.1/ppe.imsprobe.jar
```

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/cyanea/ims/IMS1/etc/datacollector.policy
```

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.

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 IMS 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 IMS Data Collector libraries.

Example

```
probe.library.name=cyanea_ims71_zos
```

probe.rmi.port

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

Value

Either a single port number, or a port range.

Example

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

The datacollector.env file

For each IMS Data Collector, the datacollector.env file exists in the <installation directory>/etc directory. For example, the default location of this file is /usr/lpp/cyanea/ims/IMS1/etc/datacollector.env.

DEFAULT datacollector.env
cyanea.classpath=/usr/lpp/cyanea/ims/I72B/lib/ppe.imsprobe.jar:/usr/lpp/cyanea/ims/I72B/lib/model.jar:/usr/lpp/cyanea/ims/I72B/lib/ppe.probe-intf.jar:/usr/lpp/cyanea/ims/I72B/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 cyanea.mod=/usr/lpp/cyanea/ims/I71A/etc/cyanea.mod java.home=/usr/lpp/java/IBM/J1.3 cyanea.path=/usr/lpp/java/IBM/J1.3/bin cyanea.libpath=/usr/lpp/cyanea/ims/I71A/lib:.:/usr/lpp/java/IBM/J1.3/lib:/usr/lpp/java/IBM/J1.3/bin/classic:/usr/lpp/java/IBM/J1.3/bin java.security.policy=/usr/lpp/cyanea/ims/I71A/etc/datacollector.policy cyanea.ims.network=network1 cyanea.mx=8m

Note: Each entry in the datacollector.env file must occupy a single line, including the properties cyanea.classpath and cyanea.libpaht, which appear in the 18 as if they each occupy two lines.

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

cyanea.classpath

Specifies the libraries the IMS Data Collector uses.

Value

Colon-delimited list of paths used by the IMS Data Collector.

Example

cyanea.classpath=/usr/lpp/cyanea/ims/171A/lib/ppe.imsprobe.jar:/usr/lpp/cyanea/ims/171A/lib/model.jar:/usr/lpp/cyanea/ims/171A/lib/ppe.probe-intf.jar:/usr/lpp/cyanea/ims/171A/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

cyanea.debug

Specifies whether the IMS Data Collector is to run in debug mode. When running in debug mode, the IMS Data Collector populates the messages log and JES message log files 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

```
cyanea.debug=no
```

cyanea.libpath

Colon-delimited list of the directories in which the libraries used by the IMS Data Collector reside.

Value

cyanea.libpath=<list>

Example

```
cyanea.libpath=/usr/lpp/cyanea/ims/171A/lib:.:/usr/lpp/java/IBM/J1.3/lib:/us
r/lpp/java/IBM/J1.3/bin/classic:/usr/lpp/java/IBM/J1.3/bin
```

cyanea.ims.network

Specifies which IMS Data Collectors are considered to be on the same network. For example, if you have distinct development and production environments, you might configure all the IMS Data Collectors in the development environment with cyanea.ims.network=DEV, and all the IMS Data Collectors in the production environment with cyanea.ims.network=PROD.

Note: All IMS Regions that communicate with each other should have their IMS Data Collectors configured with the same value for the cyanea.ims.network property.

Value

```
The name of the network.
```

Example

```
cyanea.ims.network=network1
```

cyanea.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

cyanea.mod=/usr/lpp/cyanea/ims/IMS1/etc/cyanea.mod

cyanea.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

```
cyanea.mx=8m
```

cyanea.path

The location of Java executables.

Value

```
cyeana.path=<path of JVM>/bin
```

Example

```
cyanea.path=/usr/lpp/java/IBM/J1.3/bin
```

java.home

Specifies the location of the JVM used by the IMS Data Collector.

Value

```
java.home=<directory where JVM is located>
```

Example

```
java.home=/usr/lpp/java/IBM/J1.3
```

java.security.policy

The path of the Java security policy file.

Value

java.security.policy=<file>

Example

java.security.policy=/usr/lpp/cyanea/ims/171A/etc/datacollector.policy

Chapter 3. IMS Data Collector Log Files

Logs are available in both the IMS 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 IMS Data Collector Logs

Viewing Logs in the IMS Regions

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

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 IMS Data Collector; You may want to compare it to the information in the Managing Server's properties files.

To view IMS Region Logs for the IMS 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 IMS jobs.
4. Select the IMS region with **?**
5. Select the SYS00001 or SYSOUT.
6. Verify the JVM has started by looking at the SYS0001 log, and verify that the IMS Region connected to the kernel, and to the Publish Server in the SYSOUT.

Note: If there are any problems loading the shared library (libcyanea_ims71_zos.so), no meaningful messages will be displayed in SYS00001, and no SYSOUT will be created. You can verify this by looking at the cyanea_datacollector.log file in the USS file system; see 22 for more details.

Note: You can also view the JESMSGLG data set in the selected IMS regions and observe the CYN-prefixed log messages.

Viewing IMS Data Collector Logs in USS

Logs are created in USS for each IMS Data Collector.

Where Are the Logs?

Files for each IMS Region are located within the IMS Data Collector installation path, based on the IMS Region's IMS ID:

```
<install path>/ims/<IMS ID>
```

For example, the location of files for a IMS Region with an IMS ID of IMS1, installed in the default location, is as follows:

```
/usr/lpp/cyanea/ims/IMS1
```

What Logs Are Available?

There are several files associated with each monitored IMS Region.

In these file names, <IMS Network> represents the value of the cyanea.ims.network property configured in the datacollector.env file, <SYSPLEX> represents the sysplex name, <SYSID> represents the MVS System ID and <IMS ID> represents the IMS Region ID:

- etc/<IMS Network><SYSPLEX>.<SYSID>.<IMS ID>. datacollector.properties
- etc/<IMS Network>.<SYSPLEX>.<SYSID>.<IMS ID>.id
- logs/<IMS ID>.<Date>.<Process ID>.datacollector.log
- logs/cyanea_datacollector.log

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

etc/<IMS Network>.<SYSPLEX>.<SYSID>.<IMS ID>.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 IMS Data Collector.)

etc/<IMS Network>.<SYSPLEX>.<SYSID>.<IMS ID>.id:

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

logs/<IMS ID>.<Date>.<ASID>.datacollector.log:

The <Date> is in MMDDHHMM format, and the <ASID> is the Address Space ID of the IMS Region associated with the IMS Data Collector. This file contains information from the IMS Data Collector about major events that occur with regard to the Managing Server, like joining the kernel or disconnecting from the kernel.

logs/cyanea_datacollector.log:

The cyanea_datacollector.log file will display any errors that occur prior to loading the shared library. If there are no problems before loading the shared library, this log file will not be created.

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

Part 2. Operating the IMS Data Collector

Chapter 4. Enabling Composite Request Features in the Application Monitor

The *WebSphere Studio Application Monitor IMS Data Collector* (IMS 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 IMS Data Collectors.

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

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 IMS: IMS Connect and MQ.

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

Configuring WebSphere 5 on z/OS

Perform the following procedure to enable Composite Requests, regardless of the mechanism used to connect to IMS (IMS Connect or MQ.)

Note: If you use IMS Connect, you must first install and deploy IMS Connect to your z/OS WebSphere server before you can configure the Data Collector to support Composite Request features.

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

1. Add the appserver.platform custom property in the WebSphere configuration.
   a. Login to the WebSphere Administration Console.
   b. Navigate as follows:
      1) Select the Server > Application Servers option and select the server you want to configure for use with WSAM.
      2) Navigate to the Additional Properties section.
      3) In the Additional Properties Section, select 'Process Definition'.
      4) In the Process Definition section, select 'Servant'.
      5) In the Servant/Additional Properties section, select "Java Virtual Machine'
      6) In the Java Virtual Machine Panel scroll down to the Additional Properties Dialog box and select 'Custom Properties'.

7) In the Custom Properties dialog box, select 'New'.

8) In the configuration panel, enter the following name/value pairs. Select <OK> after each add operation:

VARIABLE	VALUE
appserver.platform	WS502 (for WebSphere 5.0.2) or WS510 (for WebSphere 5.1)

Note: You may re-verify your configuration data in /<WebSphere directory>/<server>/servant.jvm options by searching the variable name (e.g., appserver.platform).

2. Restart the Data Collector.

Enabling Composite Requests Features for IMS Connect

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

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

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 'imsconnect.enable' property to 'yes'. For example:

      ```
      imsconnect.enable=yes
      ```

   d. Save the updated etc/bcm.properties file.
2. Add the location of the imseci.jar file to 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 section.
   c. In the Additional Properties Section, select 'Custom Services'.
   d. In the Custom Services panel, select '-' of the probe service for update.
   e. Insert the following path into the classpath:

      ```
      ${CONNECTOR_INSTALL_ROOT}/imsico.rar/imseci.jar:
      ```

      Note: The colon is used to separate paths within the classpath.
3. Verify the location of the imsico.jar file:
   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 file imsico.jar under the directory ${CONNECTOR_INSTALL_ROOT}/imsico.rar.

For example:

cd /WebSphere/V5R1M0/AppServer/installedConnectors/imsico.rar

ls -l imsico.jar

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

4. In the Messages dialog box, select 'Save'.
5. 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'.
6. Restart WebSphere.

Enabling Composite Request Features for MQ

The instructions for enabling Composite Request featues of Data Collectors for application servers that use MQ to connect to IMS 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 a WebSphere 5 Data Collector on z/OS

Perform the following procedure to disable Composite Request features

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

1. Update the 'imsconnect.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 'imsconnect.enable' property to 'no'. For example:

      ```
      imsconnect.enable=no
      ```

   d. Save the updated etc/bcm.properties file.
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 IMS Regions on which you have installed and configured IMS Data Collectors:

- Configuring 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 Data Collectors on the Managing Server

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

To configure a Data Collector within the Managing Server

1. Open the Monitoring Console.
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.

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

Configuring IMS Data Collectors on the Managing Server

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

To configure an IMS Data Collector within the Managing Server

1. Open the Monitoring Console.
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 IMS Data Collector has MQ monitoring enabled, and that the queues you want to monitor are specified in the names to monitor

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

Configuring J2EE Data Collectors on the Managing Server

If you are monitoring Composite Requests for applications that use MQ as a mechanism to bridge J2EE and IMS, you must configure the J2EE Data Collectors to monitor MQ.

Note: These instructions assume your J2EE Data Collectors have already been configured

To enable MQ monitoring on a Data Collector within the Application Monitor

1. Open the Monitoring Console.
2. Click the **Administration** tab on the top navigation.
3. Select **Server Management > Data Collector Configuration**

4. Follow the **Configuration List** link in the left navigation.
5. Locate the J2EE application server in the Associated Server column of the Configuration List table and click the **Modify** icon for that row.
6. Check the **Enable MQ** checkbox (if it is not already checked.)
7. Fill in the **Exclude (Queue)** and **Exclude Override (Queue)** lists to specify which queues you want to monitor.
8. Click the **Save** button.

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

Configuring Publish Servers

For best results when using IMS 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:

```
/opt/cyaneaone/etc/ps1.properties

/opt/cyaneaone/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 cyaneactl.sh script, located in the bin subdirectory of the <Application Monitor installation directory>.

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

```
cd <Application Monitor installation directory>

cd bin

./cyaneactl.sh ps1 stop

./cyaneactl.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 bin subdirectory of the Application Monitor installation directory.

The log file this affects is described in "logs/<IMS ID>.<Date>.<ASID>.datacollector.log:" on page 22.

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 IMS 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 IMS5:IMS5 81310ab-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 IMS1:IMS5 81310ab-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 <Application Monitor installation directory>.

   ```
   su – cyanea
   cd <Application Monitor installation directory>
   ./cyaneactl sam start
   ```

2. To check whether the Global Publish Server started successfully, you can type in the following command.

   ```
   ./cyaneactl sam ping
   ```

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

   ```
   su – cyanea
   cd <Application Monitor installation directory>
   ./cyaneactl sam stop
   ```

2. To check whether the Global Publish Server stopped successfully, you can type in the following command.

   ```
   ./cyaneactl 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 – cyanea
   cd <Application Monitor installation directory>
   ./cyaneactl 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 IMS Data Collector

Chapter 5. Using the Application Monitor with IMS Data Collectors

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

In cases where IMS 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 IMS Data Collectors. Likewise, other features have IMS-specific details and are only available for use with IMS Data Collectors.

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

Overview of Application Monitor Features Available for IMS Data Collectors

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

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, Self-Diagnosis, and Data Management. 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 IMS 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, Data Collector Controller, Publish Server, Global Publish Server, Archive Agent and Message Dispatcher. 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.

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 (IMS Region) behavior. This page provides vital information for determining the health of your server farm.

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*, an IMS Region 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.

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* and *Recent Activity Display* are available for IMS Data Collectors.

In-Flight Request Search

The *In-Flight Request Search* page lets you search for a transaction on a troubled application server (IMS Region). 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 active transaction data for an application server (IMS Region) at a specific point in time, as well as the 100 most recently completed transactions, and the 50 most recent events. You may filter the transactions by type, or select another filter from the drop-down list. This will limit the list to the type of transactions you want to view. After pinpointing a hung transaction, click the value in the Task ID column to review Transaction Detail for that transaction. 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.

Performance Management

The top-level navigation for Performance Management includes the *System Resources*, *System Resource Comparison*, *Performance Analysis & Reporting*, and *Daily Statistics*.

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

Performance Analysis & Reporting

Users can easily analyze application and application server (IMS Region) data using the *Performance Analysis & Reporting* functions. Create reports for a Group of servers or a selected server. Analyze data for requests/transactions, and server availability. For IMS 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 used in the Application Monitor. 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 IMS Terminology

Comparison of Terms

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

Table 8. J2EE, CICS and IMS Terms

J2EE Name	CICS Name	IMS Name
Application Server	CICS Region	IMS Region
Request	Transaction	Transaction
Thread ID	Task ID	Message Tag
Method Name	Program	Event
JVM	Region	Region

Whenever these terms are used in features that support heterogeneous Data Collectors, the labeling is in the following format:

- [J2EE Name]/[CICS Name]

Features with Mixed Terminology

The following Application Monitor features display both the J2EE and CICS terms described in Table 6 on page 11.

Table 9. Features with MIxed 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
Performance Management	*Performance Analysis & Reporting*

Table 9. Features with MIxed Terminology (continued)

Section	Feature
Help	All

Application Monitor Features for IMS Data Collectors

Features Unavailable to IMS Data Collectors

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

Table 10. Application Monitor Features Unavailable for use with IMS Data Collectors

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

IMS-Customized Features

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

Administration

Server Management: Data Collector Configuration:

There is a Data Collector configuration that is tailored to IMS Data Collectors named 'IMS default.' The exclude list of the IMS default configuration is empty, since there are no programs that will universally be uninteresting to monitor.

Note: You must apply a configuration to an IMS Data Collector, even if it is a configuration whose exclude list is empty

Monitoring on Demand:

Provides you with a choice of three different types of monitoring levels for each group or server. Create a schedule to apply to a server or group of servers.

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

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

  Note: IMS Data Collectors do not produce any L2 events. Therefore, IMS Data Collectors operate identically at L1 and L2.
- L3—Low level trace. (Includes L1 and L2 events.)

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

Table 11. IMS Events and MOD Levels

Event	Monitoring Level
Transaction	L1—Production
Terminal Receive	L3—Tracing
OTMA Input/Output	L3—Tracing
Link Receive	L3—Tracing
Program Routing	L3—Tracing

Note: An IMS transaction produces, at most, one top-level Transaction record. Therefore, it is possible for you to see L3 events for an IMS region, even when there are no monitored L1 events for that region—this is because the L1 event is associated with a different IMS region.

Availability

Workload Manager:

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

From the WLM point of view, an IMS 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 46 and “Viewing the WLM Associated Service Class Period Detail” on page 46.

Problem Determination

Server Activity Display: Active Requests:

The options for the Request/Thread Type filter include four IMS-specific transaction types:

- BTAM
- VTAM
- APPC
- OTMA

Server Activity Display: Recent Events:

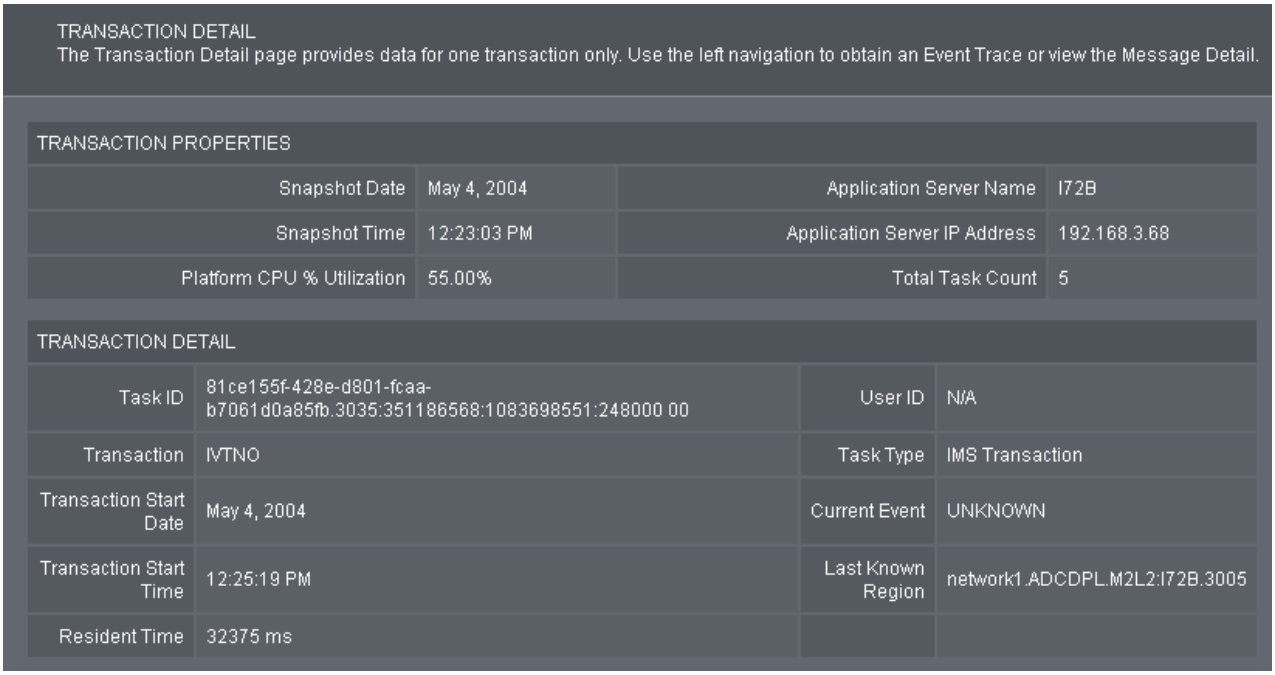
Recent Events is a new section of the *Server Activity Display* specifically for IMS Data Collectors. The Recent Events tab shows the most recent 50 events (including any L3 events) that occur within the selected IMS Data Collector.

Event detail is shown in Figure 3 on page 44.

Note: An IMS transaction will appear as a top-level transaction on at most one IMS region, even when it uses resources on more than one IMS region. In these cases, you can use the Recent IMS Events tab to see the all events associated with an IMS region, even for transactions that originate in other IMS regions.

Server Activity Display: Transaction Detail:

- There are no displays or controls for changing a transaction's priority or status.
- There is no display of CPU Time or Idle Time for IMS Data Collectors.
- Since IMS Transactions may execute on more than one region, there is a Last Known Region field, which displays the name of the IMS Region which provided the most recent known event.
- There is a *Hex Viewer* page for viewing the contents of work areas, which is described in "Recent Events" on page 42.
- There is no Stack Trace for IMS Data Collectors.
- There is a Message Data link, which presents a popup of a Hex Viewer that allows you to browse through the Message Data of the transaction.



TRANSACTION DETAIL
The Transaction Detail page provides data for one transaction only. Use the left navigation to obtain an Event Trace or view the Message Detail.

TRANSACTION PROPERTIES

Snapshot Date	May 4, 2004	Application Server Name	I72B
Snapshot Time	12:23:03 PM	Application Server IP Address	192.168.3.68
Platform CPU % Utilization	55.00%	Total Task Count	5

TRANSACTION DETAIL

Task ID	81ce155f-428e-d801-fcaa-b7061d0a85fb.3035:351186568:1083698551:248000 00	User ID	N/A
Transaction	IVTNO	Task Type	IMS Transaction
Transaction Start Date	May 4, 2004	Current Event	UNKNOWN
Transaction Start Time	12:25:19 PM	Last Known Region	network1.ADCDPL.M2L2:I72B.3005
Resident Time	32375 ms		

Figure 1. Transaction Detail page for IMS

Recent Activity Display:

- The metrics related to Garbage Collection and Heap Size are not available for IMS Data Collectors.
- The only available metrics for IMS Data Collectors are Number of Requests, Average Response Time, IMS Control Region CPU and Paging Rate.

Performance Management

Performance Analysis & Reporting:

- The Request/Thread Type drop-down includes the four transaction types for IMS: BTAM, VTAM, APPC and OTMA, in addition to the regular options (CICS, EJB, Servlet and JSP.)

Recent Events

The Server Activity Display page has an additional tab for IMS Data Collectors, called Recent Events.

The Recent Events tab shows you the 50 most recent events that have occurred on the IMS region monitored by the selected IMS Data Collector. The Recent Events tab shows events that occurred on the monitored IMS region, regardless of the region on which the transaction initiated.

Expand each event to see the event detail, and see information such as Message Data, Message Control Information, State Data and User Data. The Hex Viewer allows you to view these datum in either EBCDIC or ASCII format.

To open the Server Activity Display (Recent Events) page:

1. From the top navigation, click **Problem Determination > Server Activity Display**.

   The Server Activity Display page opens.

2. Select a group and server from the drop-down list.

   The Server Activity Display (Active Requests) page opens.

3. Click the **Recent Events** tab.

   The Server Activity Display (Recent Events) page opens.

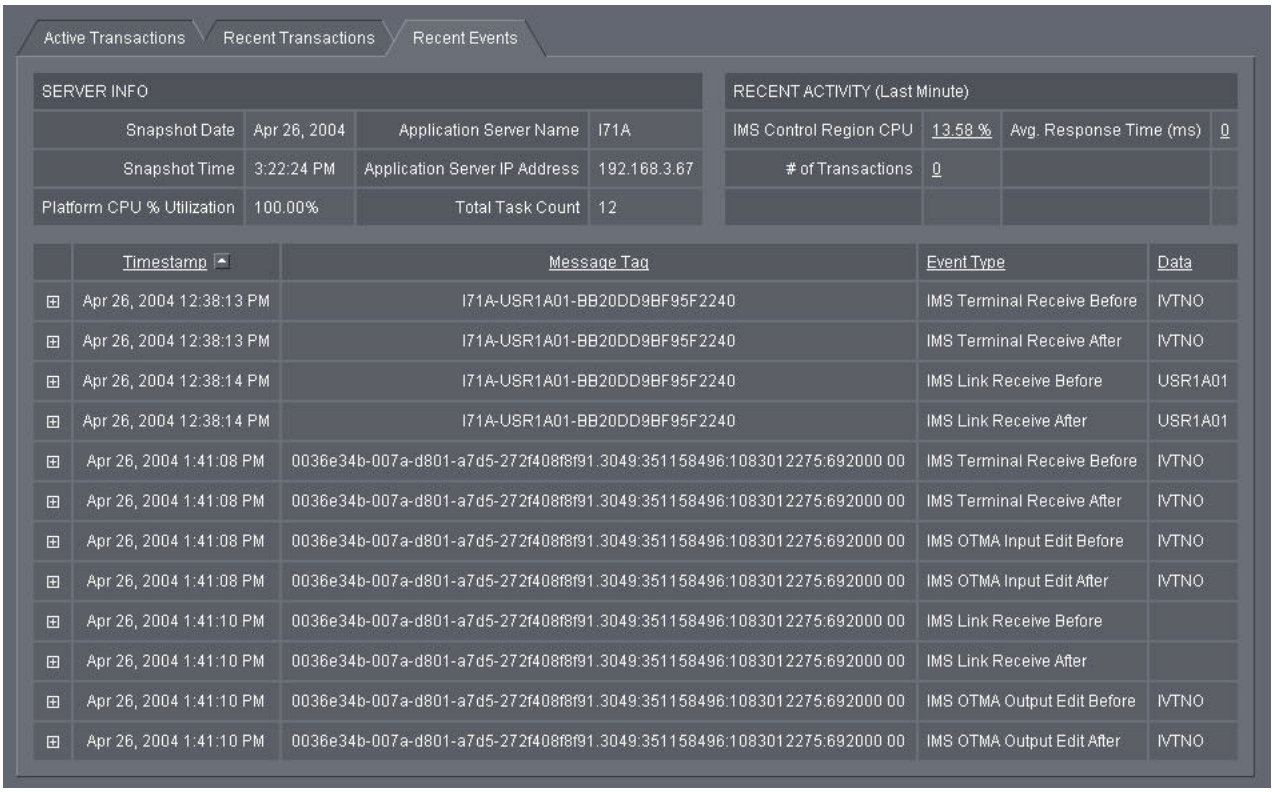


Figure 2. Recent Events page for IMS

To view (or hide) event detail:

1. On the Server Activity Display (Recent Events) page, click the plus sign (**+**) next to the event whose detail you want to see.

   The event detail expands.

2. Click the minus sign (**-**) to hide the event detail.

   The event detail collapses.

	Timestamp	Message Tag	Event Type	Data
⊞	May 4, 2004 12:17:57 PM	81ce155f-428e-d801-fcaa-b7061d0a85fb.3035:351190440:1083698108:802000 00	IMS Terminal Receive Before	IVTNO
⊟	May 4, 2004 12:17:57 PM	81ce155f-428e-d801-fcaa-b7061d0a85fb.3035:351190440:1083698108:802000 00	IMS OTMA Input Edit Before	IVTNO

Thread ID	81ce155f-428e-d801-fcaa-b7061d0a85fb.3035:351190440:1083698108:802000 00	TPIPE Name	2500
Transaction Code	IVTNO	Member Name	HWS1I2B
User ID	USR2B02		

MESSAGE DATA (FIRST 128 BYTES)

Offset	Hex Values				Text Values
0000	003B0000	C9E5E3D5	D6404040	4040C4C9	....IVTNO DI
0010	E2D7D3C1	E840E3D6	C1C44040	40404040	SPLAY TOAD
0020	40404040	40404040	40404040	40404040	
0030	40404040	40404040	40404000	00000000	.....

More...

MESSAGE CONTROL INFORMATION (FIRST 128 BYTES)

Offset	Hex Values				Text Values
0000	01400000	0000F2F5	F0F04040	4040A0F0	. ....2500 .0
0010	00000012	00000000	00000000	00010000	.....

More...

STATE DATA (FIRST 128 BYTES)

Offset	Hex Values				Text Values
0000	00481020	00404040	40404040	40400000	....
0010	00000000	00000000	00000000	00000000	.....
0020	00000000	0000BB2A	E698E443	8A800000	.....WqU.....
0030	00000000	00000000	00000000	00004040	.....
0040	40404040	40400000	00000000	00000000	.....

More...

USER DATA (FIRST 128 BYTES)

Offset	Hex Values				Text Values
0000	01000000	C9F7F2C2	40404040	C8E6E2C4	....I72B HWSD
0010	E4C9F4C5	F2F5F0F0	40404040	BB2AE698	UI4E2500 ..Wq
0020	E442DA80	00000000	00000000	00000000	U.....
0030	13964AB8	00000000	00000000	10002000	.o.....
0040	00000000	40404040	40404040	00000000	....
0050	01000000	00000000	00000000	00000000	.....
0060	00000000	00000000	00000000	00000000	.....
0070	00000000	00000000	00000000	00000000	.....

More...

Figure 3. Recent Event detail for IMS

To view event data:

1. On the Server Activity Display (Recent Events) page, click the plus sign (**+**) next to the event whose detail you want to see.

   The event detail expands.

2. Click any of the **More...** links within the Message Data section.

   The **Hex Viewer** opens. See Figure 4 for an example of a Hex Viewer.
3. Select the number of rows of data per page you want to see in the drop-down.
4. Select either the **EBCDIC** or **ASCII** translation option.
5. Click **OK**.

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

Viewing Message Data

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

The Hex Viewer allows you to view the contents of the Message Data in either EBCDIC or ASCII format:

To view the contents of a transaction's Message Data:

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 an IMS Region (on the basis of the **Server Name**) and click its name in the **Thread/Task ID** column.

   The Transaction Detail page for that IMS transaction opens.
3. Click the Message Data link in the left navigation of the Transaction Detail page.

   The Message Data page opens, which includes a **Hex Viewer**.

   An example of the Hex Viewer from a Transaction Detail page is shown in Figure 4.
4. Select either the **EBCDIC** or **ASCII** translation option.
5. Click **OK**.

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

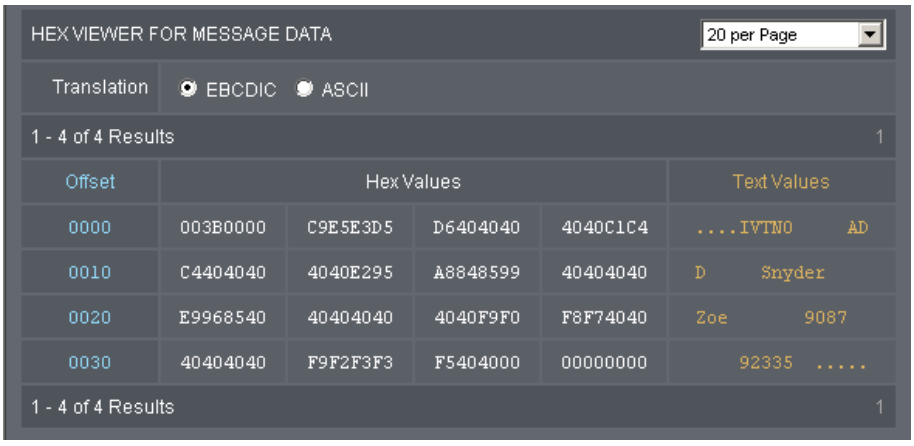


Figure 4. IMS Data Collector Hex Viewer

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.

Service Class | Enclave

ADDRESS SPACE PROPERTIES

Server Name (Region)	ADCDPL.P390.CICS3.78 (L3)	Associated Report Class		Associated Resource Group	
Associated Workload	STARTED	Server Space	Yes	Associated Service Class Goals	Applied

ASSOCIATED SERVICE CLASS PROPERTIES

Name	STCLOM	Description	Started Tasks Low - Med	Associated Workload	STARTED
Associated Resource Group		# of Service Class Periods	2	WLM Mode	Goal Mode
Last Initialized Time	Oct 22, 2003 8:50:26 PM	Data Collected Time	Oct 23, 2003 11:55:20 AM	Policy Name	ETPBASE
Policy Activated Time	Oct 20, 2003 3:56:55 PM	Policy Activator User ID	JHELER	Policy Activated System	P390
Current Delay Sample Intervals (ms)	250	Total # WLM Sample Code	217,173		

ASSOCIATED SERVICE CLASS PERIOD

Period	Goal Type	Response Time Units (msec., sec., min., hr.)	Goal % Value	Importance Level (1-5)	Response Time/Velocity (Goal Value)	Period Duration
Period 1	Velocity Goal	Unknown	0	3	40	1000
Period 2	Percentile Goal	ms	40	2	20000	0

Figure 5. WLM Associated Service Class Summary page for IMS

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.

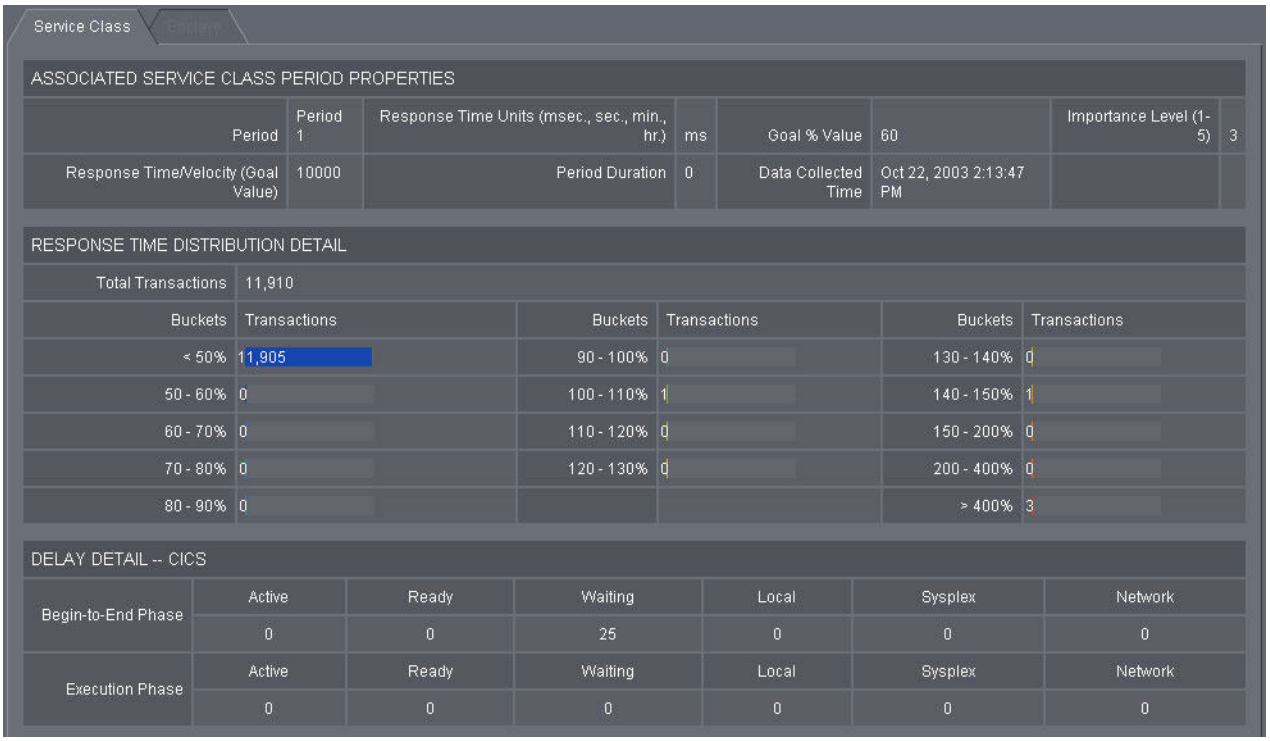


Figure 6. WLM Associated Service Class Period Detail page for IMS

Chapter 6. Troubleshooting

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

Debug Mode

It is possible to run any 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 IMS Data Collectors, these messages are sent to sysout. Debug mode should be used, therefore, only when necessary, or else your spool will fill up. Message traces are also displayed in the JES Message Log (JESMSGLG) for the control region in SDSF.

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

Setting cyanea.debug

One way to put a IMS Data Collector in debug mode is to set cyanea.debug=yes in the datacollector.env file. See “The datacollector.env file” on page 18 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 IMS Region. For details, see “Restarting IMS Regions” on page 15.

Using dcctl.sh

You can dynamically put the IMS 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 29 for more details on how to toggle the debug mode of of Data Collectors.

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WebSphere Studio Application Monitor
WebSphere Studio Application Monitor IMS Data Collector Product Guide
3.1

Publication No. SC31-6869-00

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Accurate	❑	❑	❑	❑	❑
Complete	❑	❑	❑	❑	❑
Easy to find	❑	❑	❑	❑	❑
Easy to understand	❑	❑	❑	❑	❑
Well organized	❑	❑	❑	❑	❑
Applicable to your tasks	❑	❑	❑	❑	❑

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