

Application Monitor for z/OS



Customization Guide

Version 2 Release 1

Application Monitor for z/OS



Customization Guide

Version 2 Release 1

Second Edition (September 2004)

Note: Before using this information and the product it supports, be sure to read the general information under Notices.

| This edition applies to IBM Application Monitor for z/OS Version 2 Release 1 (5655-L22) as modified by the PTFs
| listed in "About this document" on page v and to any subsequent releases until otherwise indicated in new
| editions. Make sure you are using the correct edition for the level of IBM Application Monitor.

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You can find out more about IBM Application Monitor by visiting the IBM Web site for IBM Application Monitor at: <http://www.ibm.com/software/awdtools/applicationmonitor/>

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About this document

This document describes IBM Application Monitor for z/OS, Version 2 Release 1 plus the following PTFs:

UQ83326
UQ85391
UQ86637
UQ87221
UQ88081
UQ88135
UQ89665
UQ90570
UQ91176
UQ92317
UQ92498
UQ92540

The product is hereafter referred to as IBM Application Monitor.

IBM Application Monitor is a performance analyzer for application and systems programs. IBM Application Monitor shows total resource utilization within a target address space for items such as a job, started task, or TSO/E session. This document explains how to configure IBM Application Monitor after it has been installed.

If you need to install IBM Application Monitor, refer to the *IBM Application Monitor for z/OS Program Directory* for installation instructions.

Who might use this document

This document is intended for system programmers and system administrators who plan for, customize, and maintain IBM Application Monitor.

To use this document, you need to be familiar with the z/OS® operating system, the publications that describe your system, and job control language (JCL) and Rexx exec processing.

The following operating systems and subsystems are supported:

- z/OS Version 1 Release 1 (or later) and OS/390 Version 2 Release 10
 - CICS
 - IMS
 - DB2 Universal Database™
 - TSO/E

Other documentation that you might need

For the installation of IBM Application Monitor you will need to refer to the *IBM Application Monitor for z/OS Program Directory*.

For information about how to use the product, see the publication *IBM Application Monitor User's Guide*.

For further information about how to do specific configuration tasks for DB2, IMS, and CICS (as might be described in this book), see the product documentation for these subsystems.

IBM Application Monitor publications, related product publications, and their order numbers are listed in the “Bibliography” on page 49.

Document conventions

The following typographical conventions are used throughout this document:

Category	Convention	Examples
Command names	ALL CAPITAL LETTERS	RDEFINE
Member names	ALL CAPITAL LETTERS	FBIISPF
Variables	<i>italics</i>	<i>xxx</i> OPERAND invalid <i>hlq</i> .SFBIJCL
JCL code	monospace type	// <i>jobname</i> JOB
JCL lines that need to be altered for your system	Bold	DSN=xxxxxx
High-level qualifiers that you chose	<i>hlq</i>	<i>hlq</i> .SFBIJCL

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Chapter 1. Preparing to customize IBM Application Monitor

To help you prepare to customize IBM Application Monitor, this chapter provides planning information. You can use the checklist to get an overview of the tasks and to note your progress.

Checklist for installing and customizing IBM Application Monitor

To customize IBM Application Monitor, you will need to ensure that the appropriate tasks in the following checklist are completed.

- ___ 1. If you ordered IBM Application Monitor using the Custom-Built Product Delivery Offering (CBPDO), follow the steps in the *IBM Application Monitor for z/OS Program Directory* for installation. (If Application Monitor is delivered through a ServerPac, the installation is completed for you.)
- ___ 2. Ensure that the storage requirements for IBM Application Monitor are met.
- ___ 3. Ensure that security access is configured.
- ___ 4. Authorize IBM Application Monitor modules.
- ___ 5. Modify the TSO/E logon procedure.
- ___ 6. Make the FBISTART started task available.
- ___ 7. Start the FBISTART started task.
- ___ 8. Start IBM Application Monitor.
- ___ 9. Run COBOL or PL/I IVPs to verify the customization of IBM Application Monitor (optional).
- ___ 10. Run IMS IVPs to verify the customization of IBM Application Monitor (optional).

If you want to use IBM Application Monitor with DB2 Universal Database, do the following tasks:

- ___ 1. Create and bind a DB2 UDB access plan.
- ___ 2. Enable the use of dynamic explain.
- ___ 3. Set up the DB2 Associated Address Space (AAS).
- ___ 4. Verify the customization of IBM Application Monitor under DB2 UDB (optional).

If you want to use IBM Application Monitor with CICS, do the following tasks:

- ___ 1. Update the CICS system definition data set.
- ___ 2. Add group FBI210 to the active list.
- ___ 3. Install group FBI210.
- ___ 4. Verify the customization of IBM Application Monitor under CICS (optional).

Library names after you finish installing

After you install IBM Application Monitor, you have the data sets available as listed in Table 1. If you changed the names during installation, you can add the current names to the table for easy reference.

Table 1. IBM Application Monitor library names

Default name	Contents	Site name if different
hlq.SFBIAUTH	Load library modules	
hlq.SFBICLIB	CLIST library modules	
hlq.SFBIMENU	ISPF messages	
hlq.SFBIPENU	ISPF panels	
hlq.SFBIDBRM	Data	
hlq.SFBIJCL	Sample JCL	
hlq.SFBIILOD	Load library modules for IVPs	
hlq.SFBIDATA	IVP Data	
hlq.SFBIDAT2	IVP Data	
hlq.SFBIIVP	Sample JCL for IVPs	
hlq.SFBICOB	COBOL and Enterprise COBOL listings	
hlq.SFBIPLI	PL/I listings	
hlq.SFBIPLIE	Enterprise PL/I listings	

Common and private area storage

IBM Application Monitor uses ECSA (Extended Common Storage Area) to hold control blocks, modules, and buffers for transporting data and commands. IBM Application Monitor retains some ECSA control blocks and programs when it is stopped so that it can reuse them the next time it is started.

IBM Application Monitor uses EPVT (Extended Private Storage Area) in the TSO or deferred listener address space to accumulate and analyze collected data.

Requirements

- ECSA permanent space requires 1 MB.
- You should also allow for up to 50 MB of ECSA to be used to transport data buffers and commands during analysis.
- Specify a private area region size of at least 250 MB.

Note: If you do not configure enough ECSA or EPVT, IBM Application Monitor will terminate monitoring sessions to avoid causing shortages.

Storage thresholds

During analysis, IBM Application Monitor monitors the amount of ECSA and EPVT available, and uses thresholds to detect storage shortages. When IBM Application Monitor detects a storage shortage, it issues messages and stops one or more monitoring sessions to avoid making the shortage worse.

You can change the IBM Application Monitor default thresholds for ECSA and EPVT usage by specifying the following parameters in the FBISTART started task. If you decide to override the default values, ensure that your values are bigger than the defaults.

Parameter in FBISTART	Description
ECSAPCT= <i>nn</i>	Specify a percent value between 1 - 99. When IBM Application Monitor allocates storage in ECSA and determines that the percentage of ECSA in use has exceeded this value, IBM Application Monitor shuts down the monitoring session that just allocated the buffer and releases its buffer storage. The default is ECSAPCT=85.
QCSAPCT= <i>nn</i>	Specify a percent value between 1 and 99. When IBM Application Monitor determines that a single monitoring session has exceeded this percentage of ECSA on a specific buffer queue, IBM Application Monitor shuts down the monitoring session and releases its buffer storage. The default is QCSAPCT=35.
QPVTPCT= <i>nn</i>	Specify a percent value between 1 and 99. When IBM Application Monitor determines that a single monitoring session has exceeded this percentage of EPVT on a specific buffer queue, IBM Application Monitor shuts down the monitoring session and releases its buffer storage. The default is QPVTPCT=50.
EPVTPCT= <i>nn</i>	Specify a percent value between 1 and 99. When IBM Application Monitor allocates EPVT and determines that the amount of EPVT in use has exceeded this percentage, IBM Application Monitor shuts down the monitoring sessions for this listener. The default is EPVTPCT=40.
QSPEED= <i>nnnn</i>	Specify a value between 1 and 9999. As IBM Application Monitor adds monitor data to a listener queue, it verifies that the data is being removed from the queue in a timely manner. If IBM Application Monitor adds QSPEED buffers to the listener queue before any buffers are removed, IBM Application Monitor shuts down the monitoring session. The default is QSPEED=512.

Messages displayed for thresholds exceeded

When a storage threshold is exceeded, IBM Application Monitor stops selected monitoring sessions and writes the following messages to the job log of the listener:

```
FBI5665I STORAGE ERROR DETECTED FOR MONITOR = XXXXXXXX TYPE = YYYYYYYY
FBI5666I ALL MONITORS WILL BE STOPPED
XXXXXXXX - The name of the monitored job.
YYYYYYYY - The type of storage shortage. It can be one of the following:
ECSA SHORTAGE - The ECSAPCT=nn storage threshold was exceeded
```

PRIVATE SHORTAGE - The EVPTPCT=nn storage threshold was exceeded
QLIMIT EXCEEDED - The QPVTPTCT=nn or QCSAPCT=nn storage threshold was exceeded
DEAD LISTENER - The QSPEED=nnnn storage threshold was exceeded

History data sets

When you perform real-time or deferred job analysis, IBM Application Monitor creates a history data set that you can use for post-processing analysis. The amount of storage for each history data set depends on the number of monitoring samples collected. However, an average history data set uses 15 tracks.

Parallel sysplex requirement

There are no special sysplex requirements for IBM Application Monitor. If you use a Coupling Facility for a parallel sysplex, IBM Application Monitor recognizes and uses the Coupling Facility.

Planning for security

IBM Application Monitor runs on a z/OS or OS/390 system as a started task. The user ID assigned to the started task must have READ access or higher to the resources used by monitored systems and applications.

Authorization considerations

The IBM Application Monitor started task automatically runs the procedure to create the DB2 Associated Address Space (AAS) and Deferred Monitor Listener. The DB2 AAS and Deferred Monitor Listener inherit the RACF authorization of its creator (in this case, the IBM Application Monitor started task). The best way to ensure that IBM Application Monitor has the needed authorizations for DB2 is to assign the following items to the same RACF STARTED class:

- IBM Application Monitor started task.
- Each DB2 AAS.
- Deferred Monitor Listener AAS, see “Customizing the procedure JCL for deferred monitoring” on page 9 for more information.

This RACF STARTED class must have trace authority for DB2. You can establish trace authority for DB2 by using the following DB2 SQL statements:

- GRANT TRACE TO *authid*
- GRANT MONITOR2 TO *authid*
- GRANT ALL ON *authid.PLAN_TABLE* TO *authid*

Note: *authid* is the user ID defined in the RACF STARTED class profile for DB2 AAS.

Security for MVS system started tasks

IBM Application Monitor is not designed to monitor MVS system address spaces such as those assigned to JES or VTAM. The results of monitoring these address spaces with IBM Application Monitor are unpredictable. We recommend that you assign such jobs to a security class that prevents IBM Application Monitor from analyzing them.

Restricting access to analysis data

If you are concerned about allowing any user access to analysis data, you can restrict access through a security access manager, such as RACF®. The security

interface of IBM Application Monitor accesses security definitions that are stored in the external security products (such as RACF) that use the IBM System Authorization Security Facility (SAF). All calls are made from within the structure of ISPF and TSO/E.

Restricting access to individual jobs

In addition to restricting access generally, you can specify security at the job name level and so control the security of individual jobs. The job name security level requires that the user have authority to access a particular job. The profile name that controls security access is as follows, where *jobname* is any job for which you wish to impose security:

FBI.JOBREAD.*jobname*

In this situation, *jobname* can be any of the following:

- Name of a started task.
- Name of a TSO user session.
- Name of a user application that is submitted to run as a batch job.
- Name of a CICS region.
- Name of an IMS dependent region.

For RACF the security profile is defined in the FACILITY class.

For all security products, the same security profile is used within the appropriate security class. The profile is as follows, where *jobname* is filled in from the job or started task or TSO/E name that was user-selected for monitoring.

FBI.JOBREAD.*jobname*

The user must have READ access to the profile for accessing the performance data for the job.

Because performance data does not usually present a security risk, you might want to define a generic profile of FBI.JOBREAD.* with universal access (or its equivalent) of READ in the correct class. Then performance analysts can view the performance information for any job without the need for individual profiles.

For other security packages, you must set up corresponding definitions.

Dispatching priority for Application Monitor

You must specify a dispatching priority for the Application Monitor started task that is higher than that of the jobs you want to analyze with Application Monitor.

Planning for using dynamic explain with IBM Application Monitor under DB2 Universal Database

To enable dynamic explain, you must create the plan table in a database and tablespace of your choosing, based on site standards. For that reason, no DDL is provided to create the database or tablespaces.

Consult with a DB2 UDB administrator to determine the appropriate database and tablespace into which the plan tables will be created.

Database _____

| **Migration considerations**

| There are several changes to IBM Application Monitor that affect sites that have
| earlier versions of IBM Application Monitor installed. The changes are as follows:

- Checkpoint data set is not required.

Earlier releases of IBM Application Monitor required the checkpoint data set *hlq.SFBICKPT*. This release does not require it. Delete this data set unless you continue to use the earlier releases.

- DB2 authorization exit is not required.

Earlier releases of IBM Application Monitor required you to install the authorization exit *DSN3@ATH*. Remove the authorization exit unless you continue to use the earlier releases.

- Existing history data sets are not processed.

This release of IBM Application Monitor cannot process history data sets created by earlier releases. Delete any existing history data sets before running this version of IBM Application Monitor.

Chapter 2. Customizing IBM Application Monitor

You need to perform the following tasks to set up the basic product after installing it:

- “Authorizing IBM Application Monitor modules” on page 7
- “Modifying the TSO/E logon procedure to include Application Monitor user interface” on page 7
- “Making the FBISTART started task available” on page 8
- “Starting the FBISTART started task” on page 9
- “Customizing the procedure JCL for deferred monitoring” on page 9
- “Starting IBM Application Monitor user interface” on page 10

Authorizing IBM Application Monitor modules

The library *hlq.SFBIAUTH* contains all of the IBM Application Monitor modules that must be authorized for the product to execute successfully. Add *hlq.SFBIAUTH* to the system APF list by performing the following steps:

1. Create or update a PROGxx member in SYS1.PARMLIB (or any parmlib that will be used for IPL). Add one of the following statements, where *hlq* is the high-level qualifier that you used to install IBM Application Monitor:
 - If the library is managed by SMS, use:
APF ADD DSN(*hlq.SFBIAUTH*) SMS
 - If the library is not managed by SMS, use:
APF ADD DSN(*hlq.SFBIAUTH*) VOLUME(*parm*)

The variable *parm* is one of the following:

- A six-character identifier for the volume on which *hlq.SFBIAUTH* resides
 - *********, which indicates that *hlq.SFBIAUTH* is located on the current SYSRES volume
 - ***MCAT***, which indicates that *hlq.SFBIAUTH* is located on the volume that contains the master catalog
2. To make the change effective, either issue the SET PROG=xx command or IPL.

Modifying the TSO/E logon procedure to include Application Monitor user interface

The functional routines of IBM Application Monitor are executed under ISPF in a TSO/E user’s session. To allow users to start the IBM Application Monitor user interface, you must make these ISPF libraries available to them.

To make the ISPF libraries available to users, do the following steps:

1. In member FBIISPF in your CLIST library *hlq.SFBICLIB*, change the high-level qualifier as appropriate. FBI is the default.
2. Concatenate *hlq.SFBICLIB* to your TSO/E logon procedure under DDname SYSPROC.

To prevent possible RECFM conflict, ensure that all libraries concatenated under DDname SYSPROC have the same RECFM. If they are all

variable-blocked (VB) and *hlq.SFBICLIB* is fixed-blocked (FB), you must reallocate *hlq.SFBICLIB* as a VB data set and copy the FB data set into it.

3. Add IBM Application Monitor user interface to your ISPF menu by inserting the additional lines (**NEW**) as shown in the following example:

```

) BODY  CMD(ZCMD)
  ...
  9  IBM Products      IBM program development products
  10 SCLM              SW Configuration Library Manager
  11 Workplace        ISPF Object/Action Workplace
  APM AppMonitor      Application Monitor for z/OS ( NEW )
  ...
) PROC
  ...
  &ZSEL = TRANS( TRUNC  (&ZCMD, '.'))
  ...
  9, 'PANEL(ISRDIIS) ADDPOP'
  10, 'PGM(ISRSCLM) SCRNAME(SCLM) NOCHECK'
  11, 'PGM(ISRUDA) PARM(ISRWORK) SCRNAME(WORK)'
  APM, 'CMD(%FBIISPF)' /*Application Monitor*/ ( NEW )
  ...
```

For more information about configuring your ISPF Primary Option menu, see *z/OS ISPF Planning and Customizing* or *OS/390 ISPF Planning and Customizing*.

Making the FBISTART started task available

To make the FBISTART started task available, do the following steps:

1. Edit the procedure FBISTART in your library *hlq.SFBIJCL*. See the instructions in the sample job for more information.
2. Copy this procedure to a library in the JES2 or JES3 procedure library concatenation for started tasks.
3. Define a user ID for the FBISTART started task.
4. Grant the user ID you created in step 3 READ access to IBM Application Monitor libraries.
5. Define a profile in the RACF STARTED class for the FBISTART started task so that it can access protected resources. To do this, update your security definitions by using the RDEFINE command to associate FBISTART with user IDs as follows:

```
RDEFINE STARTED FBISTART.* STDATA(USER(userid) GROUP(group))
```

Where *userid* is the user ID, and *group* is the group on your system that has access to the RACF-protected resources.

You can issue the above command under TSO/E or on the system console log.

For more information about using the STARTED class, see *z/OS Security Server (RACF) Security Administrator's Guide* or *OS/390 Security Server (RACF) Security Administrator's Guide*.

6. Create or update a COMMND xx parmlib member that will be used for IPL so that it contains the following command:

```
COM='START FBISTART'
```

Starting the FBISTART started task

The FBISTART started task must be started for it to become operational. If you have not re-IPLed after making changes to parmlib as described in step 6 on page 8 of the task for making FBISTART available, you can start FBISTART by entering the command 'S FBISTART' on the system console. When you re-IPL your system, the started task FBISTART is automatically started.

Customizing the procedure JCL for deferred monitoring

IBM Application Monitor creates an Associated Address Space (AAS) to process deferred monitoring requests. Complete the following steps to enable that process:

1. Edit the procedure FBILSTN in your *hlq.SFBIJCL*. See the instructions in the sample job for more information.

FBILSTN is the default name used for deferred listener AAS. If you need to use a different name than the default, see "Changing the default procedure JCL for deferred monitoring."

2. Copy this procedure to a library in the JES2 or JES3 procedure concatenation.
3. Define a user ID for the FBILSTN started task.
4. Grant the user ID READ access to IBM Application Monitor libraries.
5. Define a profile in the RACF STARTED class for the FBILSTN started task so that it can access protected resources. To do this, update your security definitions by using the RDEFINE command to associate FBILSTN with user IDs as follows:

```
RDEFINE STARTED FBILSTN.* STDATA(USER(userid) GROUP(group))
```

Where *userid* is the user ID, and *group* is the group on your system that has access to the RACF-protected resources.

You can issue the above command under TSO/E or on the system console log.

Note: Do not start this procedure. IBM Application Monitor starts it automatically when it is needed.

For more information about using the STARTED class, see *z/OS Security Server (RACF) Security Administrator's Guide* or *OS/390 Security Server (RACF) Security Administrator's Guide*.

Changing the default procedure JCL for deferred monitoring

If you need to use a different name than the default FBILSTN, do the following steps:

1. Copy or rename procedure FBILSTN in your *hlq.SFBIJCL* to another procedure, for example, *new_name*.
2. Copy *new_name* to a library in the JES2 or JES3 procedure library concatenation for started tasks.
3. Define a user ID for the *new_name* started task.
4. Grant the user ID READ access to IBM Application Monitor libraries.
5. Define a profile in the RACF STARTED class for the *new_name* started task so that it can access protected resources. To do this, update your security definitions by using the RDEFINE command to associate *new_name* with user IDs as follows:

```
RDEFINE STARTED new-name.* STDATA(USER(userid) GROUP(group))
```

Where *userid* is the user ID, and *group* is the group on your system that has access to the RACF-protected resources.

You can issue the above command under TSO/E or on the system console log.

6. Add a DEFERSTC=*new_name* parameter in the FBISTART started task.

For example, if you use the name AM2LSTN for your deferred listener monitoring, you must change FBISTART as follows:

```
//FBISTART EXEC PGM=FBISPM00,REGION=0M,TIME=1440,  
// PARM='SUBSYS=FBIO,DEFERSTC=AM2LSTN,...)'
```

Note: Do not start this procedure. IBM Application Monitor starts it automatically when it is needed.

Starting IBM Application Monitor user interface

To start IBM Application Monitor, do the following steps:

1. Enter FBIISPF at the TSO/E command prompt.

```
----- TSO COMMAND PROCESSOR -----  
ENTER TSO COMMAND, CLIST, OR REXX EXEC BELOW:  
====> FBIISPF
```

Alternatively, you can select APM from your ISPF Primary Option menu, as shown below:

```
Menu Utilities Compilers Options Status Help  
-----  
ISPF Primary Option Menu  
  
Option ==>  
0      Settings           Terminal and user parameters  
1      View               Display source data or listings  
2      Edit               Create or change source data  
3      Utilities          Perform utility functions  
4      Foreground         Interactive language processing  
5      Batch              Submit job for language processing  
6      Command            Enter TSO or Workstation commands  
7      Dialog Test        Perform dialog testing  
8      LM Facility        Library administrator functions  
9      IBM Products       IBM program development products  
10     SCLM                SW Configuration Library Manager  
11     Workplace          ISPF Object/Action Workplace  
APM    AppMonitor         Application Monitor for z/OS
```

You will see the IBM Application Monitor Primary Options menu.

2. To begin an analysis session, choose one of the options from the menu and press Enter.

```
----- IBM AM for z/OS - Primary Options -----
```

```
Option ==>
```

- 1 Select an Active Job to analyze
- 2 Analyze a Specified Job
- 3 Analyze a Named Set of Jobs
- 4 Schedule a Deferred Monitoring Request
- 5 Analyze Historical data
- 6 Set Your Defaults
- 7 Administration
- X Exit

```
Copyright(c)2000-2003 Serena Software Inc. All Rights Reserved
```

```
Enter END (PF3) to exit
```

The base product is now activated and ready for use.

Chapter 3. Verifying the customization of IBM Application Monitor (optional)

In these installation verification programs (IVPs), you monitor two COBOL or PL/I programs (which do not need compiling) and verify the batch job monitoring. The load modules for these IVPs are available in *hlq.SFBILOD*. Additionally, you can run the IBM-supplied IMS IVPs to test IMS application monitoring.

The following steps explain how to start IBM Application Monitor and run the IVPs.

You can run the IVP program as many times as you wish.

Step 1. Start IBM Application Monitor user interface

1. Start IBM Application Monitor by typing 'TSO FBIISPF' at the TSO command prompt, or by selecting APM from the ISPF Primary Option menu.
2. Split the screen and run the IVP as shown below.

Step 2. Run COBOL IVPs

You can run job FBIICBR or FBIICBRE or both.

Run FBIICBR

Job FBIICBR in *hlq.SFBIIVP* runs program FBIICO1, reads records from *hlq.SFBIDATA(FBIIVDAT)*, which is supplied, write the records to the SYSOUT data set, and perform some simple computations.

Program FBIICO1 is prepared with COBOL for OS/390 & VM compile and run-time libraries.

FBIICBR enables you to use IBM Application Monitor to verify COBOL batch job monitoring and to display program and COBOL statement analysis displays.

Take the following steps to prepare and run FBIICBR:

1. Edit member *hlq.SFBIIVP(FBIICBR)*. Make all changes according to the instructions in the sample job.
2. From the IBM Application Monitor Primary Options menu, go to option 6.1, Specify Default Sampling Parameters, and type the forward slash (/) character in the entry fields for Delay and Data Set analysis.

Note: Press PF3 to save your updates.

3. Go to option 6.2, Specify History File Name and Options, and specify the prefix and options for the history data set that is created when your job is run. Ensure that IBM Application Monitor has the authority to allocate the history data sets under this prefix.

Note: Press PF3 to save your updates.

4. Go to option 6.3, Specify History Allocation Options, and specify default allocation values for the history file.

5. Go to option 6.4, Specify Your Listing Data Set Names, and specify *hlq.SFBICOB* for the COBOL Listings data set.
6. Go to IBM Application Monitor Primary Option 1, Select an Active Job To Analyze, and specify BAT on the mask line for the Typ column. This will restrict display content only to batch jobs and will make it easier for you to spot job FBIICBR when it becomes active.
7. In another TSO session (or use the ISPF split screen facility), submit member FBIICBR for execution.
8. Switch back to the IBM Application Monitor session, and press Enter a few times while you are viewing the Option 1, Select an Active Job to Analyze panel until job FBIICBR appears on the list of active jobs.
9. Cursor-select the job and press Enter to bring up the Active Monitor Sessions panel. Press Enter a few times to get a few samples, and then cursor-select the entries in the following columns:
 - Pgm Rpts (to display program analysis data)
 - Dly Rpts (to display delay analysis data)
 - Dsn Rpts (to display data set analysis data)

(Refer to the *IBM Application Monitor User's Guide* for instructions on navigating the panel hierarchy and bringing up the analysis displays.)
10. Because you specified the name of the COBOL Listings data set on the Option 6.4, Specify Your Listing Data Set Names panel, you can view the Statement Analysis display for the sample COBOL program. Take the following steps to bring up the Statement Analysis display for this program:
 - a. Cursor-select the entry in the Pgm Rpts column on the Active Monitor Sessions display and press Enter.
 - b. Cursor-select module FBIICO1 in the Module column on the CPU and Loadmod Analysis display and press Enter.
 - c. Cursor-select the COBOL* value in the Language field on the CSECT Utilization Analysis display and press Enter to bring up the Statement Analysis display for this COBOL program.

You can use this same JCL to execute a sample COBOL program that calls a PL/I program. Take the following steps:

1. Change the PGM parameter on the EXEC statement to PGM=FBIICO2.
2. Submit the JCL to execute the job.

Note: The COBOL and PL/I object modules are statically link-edited into the same load module. IBM Application Monitor does not currently provide Statement Analysis for applications that contain multiple CSECTs.

Run FBIICBRE

Job FBIICBRE in *hlq.SFBIIVP* performs the same functions as FBIICBR, except that program FBIICO1E is prepared with Enterprise COBOL compile and run-time libraries.

Take the following steps to prepare and run FBIICBRE:

1. Edit member *hlq.SFBIIVP*(FBIICBRE). Make all the changes according to the instructions in the sample job.
2. From the IBM Application Monitor primary options menu, go to option 6.1, Specify Default Sampling Parameters, and type the forward slash (/) character in the entry fields for Delay and Data Set analysis.

Note: Press PF3 to save your updates.

3. Go to option 6.2, Specify History File Name and Options, and specify the prefix and options for the history data set that is created when your job is run. Ensure that IBM Application Monitor has the authority to allocate the history data sets under this prefix.

Note: Press PF3 to save your updates.

4. Go to option 6.3, Specify History Allocation Options, and specify default allocation values for the history file.
5. Go to option 6.4, Specify Your Listing Data Set Names, and specify *hlq.SFBICOB* for the COBOL Listings data set.
6. Go to IBM Application Monitor Primary Menu option 1, Select an Active Job To Analyze, and specify BAT on the mask line for the Typ column. This will restrict display content only to batch jobs and will make it easier for you to spot job FBIICBRE when it becomes active.
7. In another TSO session (or use the ISPF split screen facility), submit member FBIICBRE for execution.
8. Switch back to the IBM Application Monitor session, and press Enter a few times while you are viewing the Option 1, Select an Active Job to Analyze panel until job FBIICBRE appears on the list of active jobs.
9. Cursor-select the job and press Enter to bring up the Active Monitor Sessions panel. Press Enter a few times to get a few samples, and then cursor-select the entries in the Pgm Rpts, Dly Rpts, and Dsn Rpts columns to view the desired analysis data. (Refer to the *IBM Application Monitor User's Guide* for instructions on navigating the panel hierarchy and bringing up the analysis displays.)
10. Because you specified the name of the COBOL Listings data set on the Option 6.4, Specify Your Listing Data Set Names panel, you can view the Statement Analysis display for the sample COBOL program. Take the following steps to bring up the Statement Analysis display for this program:
 - a. Cursor-select the entry in the Pgm Rpts column on the Active Monitor Sessions display and press Enter.
 - b. Cursor-select module FBIICO1E in the Module column on the CPU and Loadmod Analysis display and press Enter.
 - c. Cursor-select the COBOL* value in the Language field on the CSECT Utilization Analysis display and press Enter to bring up the Statement Analysis display for this COBOL program.

You can use this same JCL to execute a sample COBOL program that calls a PL/I program. Take the following steps:

1. Change the PGM parameter on the EXEC statement to PGM=FBIICO2E.
2. Submit the JCL to execute the job.

Note: The COBOL and PL/I object modules are statically link-edited into the same load module. IBM Application Monitor does not currently provide Statement Analysis for applications that contain multiple CSECTs.

Step 3. Run PL/I IVPs

You can run job FBIIPLR or FBIIPLRE or both.

Run FBIPLR

Job FBIPLR in *hlq.SFBIIVP* runs program FBIPL3, which is prepared with IBM PL/I for MVS and VM compile and run-time libraries.

This job enables you to use IBM Application Monitor to verify PL/I batch job monitoring and to display program and PL/I statement analysis displays.

Take the following steps to prepare and run FBIPLR:

1. Edit member *hlq.SFBIIVP(FBIPLR)*. Make all the changes according to the instructions in the sample job.
2. From the IBM Application Monitor primary option menu, go to option 6.1, Specify Default Sampling Parameters, and type the forward slash (/) character in the entry fields for Delay and Data Set analysis.

Note: Press PF3 to save your updates.

3. Go to option 6.2, Specify History File Name and Options, and specify the prefix and options for the history data set that is created when your job is run. Ensure that IBM Application Monitor has the authority to allocate the history data sets under this prefix.

Note: Press PF3 to save your updates.

4. Go to option 6.3, Specify History Allocation Options, and specify default allocation values for the history file.
5. Go to option 6.4, Specify Your Listing Data Set Names, and specify *hlq.SFBIPLI* for the PL/I Listings data set.
6. Go to IBM Application Monitor Primary Option 1, Select an Active Job To Analyze, and specify BAT on the mask line for the Typ column. This will restrict display content only to batch jobs and will make it easier for you to spot job FBIPLR when it becomes active.
7. In another TSO session (or use the ISPF split screen facility), submit member FBIPLR for execution.
8. Switch back to the IBM Application Monitor session, and press Enter a few times while you are viewing the Option 1, Select an Active Job to Analyze panel until job FBIPLR appears on the list of active jobs.
9. Cursor-select the job and press Enter to bring up the Active Monitor Sessions panel. Press Enter a few times to get a few samples, and then cursor-select the entries in the Pgm Rpts, Dly Rpts, and Dsn Rpts columns to view the desired analysis data. (Refer to the *IBM Application Monitor User's Guide* for instructions on navigating the panel hierarchy and bringing up the analysis displays.)
10. Because you specified the name of the PL/I Listings data set on the Option 6.4, Specify Your Listing Data Set Names panel, you can view the Statement Analysis display for the sample PL/I program. Take the following steps to bring up the Statement Analysis display for this program:
 - a. Cursor-select the entry in the Pgm Rpts column on the Active Monitor Sessions display and press Enter.
 - b. Cursor-select module FBIPL3 in the Module column on the CPU and Loadmod Analysis display and press Enter.
 - c. Cursor-select the PL1* value in the Language field on the CSECT Utilization Analysis display and press Enter to bring up the Statement Analysis display for this PL/I program.

Run FBIPLRE

Job FBIPLRE in *hlq.SFBIIVP* performs the same functions as FBIPLR, except that program FBIPL3E is prepared with Enterprise PL/I compile and run-time libraries.

Take the following steps to prepare and run the job described in member FBIPLRE:

1. Edit member *hlq.SFBIIVP*(FBIPLRE). Make all the changes according to the instructions in the sample job.
2. From the IBM Application Monitor primary option menu, go to option 6.1, Specify Default Sampling Parameters, and type the (/) character in the entry fields for Delay and Data Set analysis.

Note: Press PF3 to save your updates.
3. Go to option 6.2, Specify History File Name and Options, and specify the prefix and options for the history data set that is created when your job is run. Ensure that IBM Application Monitor has the authority to allocate the history data sets under this prefix.

Note: Press PF3 to save your updates.
4. Go to option 6.3, Specify History Allocation Options, and specify default allocation values for the history file.
5. Go to option 6.4, Specify Your Listing Data Set Names, and specify *hlq.SFBIPLIE* for the PL/I Listings data set.
6. Go to IBM Application Monitor Primary Option 1, Select an Active Job To Analyze, and specify BAT on the mask line for the Typ column. This will restrict display content only to batch jobs and will make it easier for you to spot job FBIPLRE when it becomes active.
7. In another TSO session (or use the ISPF split screen facility), submit member FBIPLRE for execution.
8. Switch back to the IBM Application Monitor session, and press Enter a few times while you are viewing the Option 1, Select an Active Job to Analyze panel until job FBIPLRE appears on the list of active jobs.
9. Cursor-select the job and press Enter to bring up the Active Monitor Sessions panel. Press Enter a few times to get a few samples, and then cursor-select the entries in the Pgm Rpts, Dly Rpts, and Dsn Rpts columns to view the desired analysis data. (Refer to the *IBM Application Monitor User's Guide* for instructions on navigating the panel hierarchy and bringing up the analysis displays.)
10. Because you specified the name of the PL/I Listings data set on the Option 6.4, Specify Your Listing Data Set Names panel, you can view the Statement Analysis display for the sample PL/I program. Take the following steps to bring up the Statement Analysis display for this program:
 - a. Cursor-select the entry in the Pgm Rpts column on the Active Monitor Sessions display and press Enter.
 - b. Cursor-select module FBIPL3E in the Module column on the CPU and Loadmod Analysis display and press Enter.
 - c. Cursor-select the PL1* value in the Language field on the CSECT Utilization Analysis display and press Enter to bring up the Statement Analysis display for this PL/I program.

Step 4. Run IMS IVPs

Follow the steps described in this section to prepare and run the IMS IVPs.

Preparing the IMS IVPs

Follow these steps to generate the Database Descriptor (DBD), Program Specification Block (PSB), Application Control Block (ACB), and VSAM cluster that are needed for the IMS IVPs. (You only need to perform these actions once.)

1. Edit and submit member *hlq.SFBIIVP(FBIDBD)* to create the GEMSDB member of *hlq.IVP.IMS.DBDLIB*. See the instructions in the sample job for more information.
2. Edit and submit member *hlq.SFBIIVP(FBIPSB)* to create the PSBDLI member of *hlq.IVP.IMS.PSBLIB*. See the instructions in the sample job for more information.
3. Edit and submit member *hlq.SFBIIVP(FBIACB)* to create the ACB for GEMSDB and PSBDLI and store it in *hlq.IVP.IMS.ACBLIB*. See the instructions in the sample job for more information.
4. Edit and submit member *hlq.SFBIIVP(FBIDBDL)* to create the VSAM cluster *hlq.IVP.IMS.GEMSDB* for the GEMSDB database.

Before submitting job FBIDBDL, you must make one additional change. Job FBIDBDL currently contains the following DD statement:

```
//DFSUDUMP DD DISP=SHR,DSN=hlq.SFBIDAT2(FBIIMAGE)
```

Because DDname //DFSUDUMP must point to a sequential data set, you must copy member FBIIMAGE to a sequential data set first, and then replace *hlq.SFBIDAT2(FBIIMAGE)* with this sequential data set.

5. Confirm that the IMS sample PSB DFSIVP6 and database IVPDB1 are installed and available. For more information on IMS IVP sample applications, see *IMS Installation Volume 1: Installation Verification*.
6. If you use FastPath, confirm that the IMS sample transaction IVTFD is installed and available.

Running FBIASM

Sample job FBIASM in *hlq.SFBIIVP* runs program DFSRRRC00 to test the Assembler Language-DLI interface.

Follow these steps to run the FBIASM IVP:

1. Be sure that you have already generated the DBD, PSB, and ACB for the IMS IVPs before you submit this job. (See "Preparing the IMS IVPs.")
2. Edit and submit member *hlq.SFBIIVP(FBIASM)*.
You can increase or decrease the loop value on the SYSIN DD statement as desired. If you decrease it, the job will run for a shorter period of time. If you increase it, the job will run for a longer period of time. The value that is coded on the statement enables IBM Application Monitor to monitor the job and capture sufficient analysis samples for you to test IMS monitoring.
3. Go to IBM Application Monitor primary options menu and select job FBIASM for monitoring. Be sure to request that delay and dataset analysis data be captured. (You can do this through IBM Application Monitor Options 6, 2, or 4. Refer to the *IBM Application Monitor User's Guide* for information on how to request delay and dataset analysis data.)
4. Press Enter a few times on the Active Monitor Sessions panel to ensure that IBM Application Monitor is collecting analysis data.

5. Select YES in the IMS Rpts, Pgm Rpts, Dly Rpts, and Dsn Rpts column of the Active Monitor Sessions panel to bring up the IMS, program, delay, and data set analysis reports, respectively. See the *IBM Application Monitor User's Guide* for a description of these displays.

Note: The Delay Analysis display may be empty if the %Time Ready column of the IMS Messages Processed by Region panel shows 100 percent for job FBIASM (meaning that the job is experiencing no delays).

Running FBIBMP

Sample job FBIBMP in *hlq.SFBIIVP* runs program DFSRRC00 to test the IMS batch message processing (BMP) region.

Follow these steps to run the FBIBMP IVP:

1. Be sure that you have already generated the DBD, PSB, and ACB for the IMS IVPs before you submit this job. (See "Preparing the IMS IVPs" on page 18.)
2. Edit and submit member *hlq.SFBIIVP(FBIBMP)*.
You can increase or decrease the loop value on the SYSIN DD statement as desired. If you decrease it, the job will run for a shorter period of time. If you increase it, the job will run for a longer period of time. The value that is coded on the statement enables IBM Application Monitor to monitor the job and capture sufficient analysis samples for you to test IMS monitoring.
3. Go to IBM Application Monitor primary options menu and select job FBIBMP for monitoring. Be sure to request that delay and dataset analysis data be captured. (You can do this through IBM Application Monitor Options 6, 2, or 4. Refer to the *IBM Application Monitor User's Guide* for information on how to request delay and dataset analysis data.)
4. Press Enter a few times on the Active Monitor Sessions panel to ensure that IBM Application Monitor is collecting analysis data.
5. Select YES in the IMS Rpts, Pgm Rpts, Dly Rpts, and Dsn Rpts column of the Active Monitor Sessions panel to bring up the IMS, program, delay, and data set analysis reports, respectively. See the *IBM Application Monitor User's Guide* for a description of these displays.

Note: The Delay Analysis display may be empty if the %Time Ready column of the IMS Messages Processed by Region panel shows 100 percent for job FBIBMP (meaning that the job is experiencing no delays).

Running FBIDBB

Sample job FBIDBB in *hlq.SFBIIVP* runs program DFSRRC00 to test the Database Management Batch (DBB) region.

Follow these steps to run the FBIDBB IVP:

1. Be sure that you have already generated the DBD, PSB, and ACB for the IMS IVPs before you submit this job. (See "Preparing the IMS IVPs" on page 18.)
2. Edit and submit member *hlq.SFBIIVP(FBIDBB)*.

You can increase or decrease the loop value on the SYSIN DD statement as desired. If you decrease it, the job will run for a shorter period of time. If you increase it, the job will run for a longer period of time. The value that is coded on the statement enables IBM Application Monitor to monitor the job and capture sufficient analysis samples for you to test IMS monitoring.

3. Go to IBM Application Monitor primary options menu and select job FBIDBB for monitoring. Be sure to request that delay and dataset analysis data be captured. (You can do this through IBM Application Monitor Options 6, 2, or 4. Refer to the *IBM Application Monitor User's Guide* for information on how to request delay and dataset analysis data.)
4. Press Enter a few times on the Active Monitor Sessions panel to ensure that IBM Application Monitor is collecting analysis data.
5. Select YES in the IMS Rpts, Pgm Rpts, Dly Rpts, and Dsn Rpts column of the Active Monitor Sessions panel to bring up the IMS, program, delay, and data set analysis reports, respectively. See the *IBM Application Monitor User's Guide* for a description of these displays.

Note: The Delay Analysis display may be empty if the %Time Ready column of the IMS Messages Processed by Region panel shows 100 percent for job FBIDBB (meaning that the job is experiencing no delays).

Monitoring Message IVTNO

IVTNO is an IBM-supplied message that you can execute in a Message Processing Program (MPP) region to test how IBM Application Monitor monitors an online IMS message.

You will need to have two terminal sessions active at the same time to monitor the IVTNO message in real time:

- In one session you will need to have IBM Application Monitor up and running.
- In another session, you will need to be logged onto your IMS system. Then, follow these steps:
 1. In the IBM Application Monitor session, choose option 6, Set Your Defaults. Then choose option 1, Specify Default Sampling Parameters.
 - Type the forward slash (/) character in the Delays and Data Set analysis entry fields to request that delay and data set analysis data be collected.
 - The Max Duration and Max Samples defaults are sufficient for monitoring the IVTNO message.
 - Press PF3 twice to return to the Primary Options panel.
 - Choose option 1, Select an Active Job To Analyze.
 - Type the letter Y in the I column on this display and press Enter to restrict display contents to jobs that access IMS.
 - Cursor-select the target IMS MPP region from this list of active jobs and press Enter. This brings up the Active Monitor Sessions display.
 2. Now, switch over to the IMS session. In the IMS session, enter the following command to bring up a formatted input screen for the IVTNO message:


```
/for ivtno
```
 3. When the formatted input screen appears, enter an Add transaction to add a record to the data base. Then, enter several Display or Update transactions to display or update the same record repeatedly.
 4. Switch back to the IBM Application Monitor session. You should be viewing the Active Monitor Sessions panel.
 - Press Enter a few times to be sure that IBM Application Monitor is collecting analysis data.
 - Cursor-select the YES entry in the IMS Rpts column and press Enter to bring up the IMS Messages Processed By Region display.

- Cursor-select the IVTNO message and press Enter to begin drilling down to the IMS analysis panels.
- 5. Continue to monitor the message, displaying the IMS, program, delay, and data set analysis reports that you want to view as described in the *IBM Application Monitor User's Guide*.

Monitoring Message IVTFD

IVTFD is an IBM-supplied IMS message that is designed to be executed in a Fast Path (FP) region.

This message runs rather quickly. Follow the instructions given above in the section "Monitoring Message IVTNO" on page 20, and fill in the job details as appropriate for the target FP region and IVTFD message.

Note: You may not be able to enter, update, or display information on the IVTFD screen. However, initiating the transaction without entering any data is sufficient to enable you to view some IMS analysis data for this transaction with IBM Application Monitor.

Step 5. End the IVP

After you have completed viewing the panels and monitoring data from the IVP job, press PF3 to exit the IBM Application Monitor panels.

For further information about how to use IBM Application Monitor, see the *User's Guide*.

Chapter 4. Customizing IBM Application Monitor for use with DB2 Universal Database

This chapter describes the tasks for configuring the optional DB2 Universal Database component. These tasks are only required if you want IBM Application Monitor to collect and report DB2 analysis data. After the base product has been installed, do the customization steps for your DB2 UDB subsystem where IBM Application Monitor DB2 UDB support is desired.

The procedure for configuring DB2 UDB requires:

- Intermediate or advanced knowledge of DB2 UDB
- Authorization in DB2 UDB to bind plans
- Availability of a database and tablespace for creation of PLAN_TABLE
- Availability of the DB2 subsystem ID
- Authority to create a plan table for IBM Application Monitor started tasks
- Authority to define RACF

For these reasons, we recommend that you work closely with a DB2 UDB administrator to complete the following tasks:

1. “Deciding which authorization ID to use”
2. “Creating and binding a DB2 UDB access plan”
3. “Enabling the use of dynamic explain”
4. “Setting up the DB2 Associated Address Space (AAS)” on page 24
5. “Changing the default prefix for DB2 AAS” on page 25
6. “Enabling DB2 AAS to use DB2 trace data” on page 25

Deciding which authorization ID to use

Before running the tasks described in the following sections, you must choose a unique *authid*. The *authid* is the same *authid* that you defined for the DB2 AAS RACF STARTED class. You must use the same *authid* to bind a DB2 plan (see “Creating and binding a DB2 UDB access plan”) and create a PLAN_TABLE (see “Enabling the use of dynamic explain”).

Creating and binding a DB2 UDB access plan

To create and bind a DB2 UDB access plan, do the following steps:

1. Edit member FBIPLINS in your *hlq*.SFBIJCL library. This sample job requires you to have knowledge of the DB2 UDB subsystem. See the instructions in the sample job for more information.
2. For the *authid* in the QUALIFIER keyword, use the same user ID that you defined for the DB2 AAS RACF STARTED class.
3. Submit the sample job. You will get a return code of 0 if the job runs correctly.

Enabling the use of dynamic explain

To use dynamic explain with the IBM Application Monitor DB2 UDB component, IBM Application Monitor started tasks must have access to a PLAN_TABLE.

1. Create PLAN_TABLE in an appropriate database and tablespace. Use the sample Data Definition Language (DDL) in member FBIPLCR8 of *hlq.SFBIJCL* to create PLAN_TABLE.
2. Edit and submit job FBIPLCR8 for IBM Application Monitor started tasks to access PLAN_TABLE.
FBIPLCR8 requires that a database and tablespace be supplied as PARM input (DBNAME and TSNAME). The provided DBNAME and TSNAME are used during the creation of the *userid*.PLAN_TABLE.
3. For the *userid* in the table name, use the same user ID that you defined for the DB2 AAS RACF STARTED class.
4. Issue a GRANT to make PLAN_TABLE accessible to other users.

Note: Only one PLAN_TABLE for the IBM Application Monitor started task is required for this release of IBM Application Monitor. This requirement differs from earlier releases of IBM Application Monitor, which required you to create a PLAN_TABLE for each individual user.

Setting up the DB2 Associated Address Space (AAS)

When you analyze DB2 activity, the IBM Application Monitor subsystem creates an Associated Address Space (AAS) to monitor the DB2 subsystem that you specified. The name of the AAS is composed of a four-character prefix followed by the DB2 subsystem ID. The default prefix is FBID. For a DB2 subsystem named DSN1, the default AAS name would be FBIDDSN1.

If you need to use a different prefix because of naming conventions at your site, refer to section “Changing the default prefix for DB2 AAS” on page 25.

To set up the DB2 AAS so that IBM Application Monitor can collect DB2 analysis data, do the following steps:

1. Edit member FBIDBAAS in your *hlq.SFBIJCL* library. This procedure requires you to have knowledge of a three-character or four-character identifier of your target DB2 subsystem.
2. Change baas on the PROC and EXEC statements to the three-character or four-character subsystem ID. See the instructions in the sample job for more information.
3. Place this procedure in a PROCLIB that is accessible to JES. Rename the member FBIDBAAS to FBIDxxxx, where FBID is the default prefix and xxxx is your three-character or four-character subsystem ID.
4. Create a separate procedure named FBIDxxxx for each DB2 subsystem from which you want IBM Application Monitor to collect DB2 analysis data.
5. Define a user ID for the FBIDxxxx started task.
6. Grant the user ID READ access to IBM Application Monitor libraries.
7. Define a profile in the RACF STARTED class for the FBIDxxxx started task so that it can access protected resources. To do this, update your security definitions by using the RDEFINE command to associate FBIDxxxx with user IDs as follows:

```
RDEFINE STARTED FBIDxxxx.* STDATA(USER(userid) GROUP(group))
```

Where *userid* is the user ID, and *group* is the group on your system that has access to the RACF-protected resources.

You can issue the above command under TSO/E or on the system console log.

Note: Do not start these procedures. The IBM Application Monitor started tasks start them automatically when they are needed.

For more information about using the STARTED class, see *z/OS Security Server (RACF) Security Administrator's Guide* or *OS/390 Security Server (RACF) Security Administrator's Guide*.

Changing the default prefix for DB2 AAS

To change the default prefix FBID, you must zap load module FBICFG00. Tailor the following JCL to meet your site's requirement, and submit the job.

```
//FBIZAP JOB <job parameters>
//*
/* ZAP TO CHANGE THE DB2 PROCEDURE PREFIX FROM THE 'FBID' DEFAULT TO
/* ANY OTHER VALID FOUR CHARACTERS FOR A STARTED TASK NAME.
/*
//AMASPZAP EXEC PGM=AMASPZAP,REGION=0M
//SYSLIB DD DISP=SHR,DSN=h1q.SFBIAUTH <=== Change "h1q"
//SYSPRINT DD SYSOUT=*
/* *****
/* *** THE FOLLOWING TABLE LISTS THE ONLY VALID CHARACTERS ***
/* *** THAT CAN BE USED IN THE ASSOCIATED ADDRESS SPACE NAME ***
/* *** PREFIX. ONLY THE LAST FOUR CHARACTERS CAN BE CHANGED. ***
/* *****
/* *** A B C D E F G H I J K L M ***
/* *** C1 C2 C3 C4 C5 C6 C7 C8 C9 D1 D2 D3 D4 ***
/* ***
/* *** N O P Q R S T U V W X Y Z ***
/* *** D5 D6 D7 D8 D9 E2 E3 E4 E5 E6 E7 E8 E9 ***
/* ***
/* *** 0 1 2 3 4 5 6 7 8 9 @ # $ ***
/* *** F0 F1 F2 F3 F4 F5 F6 F7 F8 F9 7C 7B 5B ***
/* *****
/* ***
/* *** TO CHANGE THE PREFIX FROM THE DEFAULT "FBID" TO "APMS" DO: ***
/* *** A A S P R E F I X = F B I D ***
/* *** VER 000370 C1C1E2D7D9C5C6C9E77EC6C2C9C4 ***
/* *** REP 000370 C1C1E2D7D9C5C6C9E77EC1D7D4E2 ***
/* *** A A S P R E F I X = A P M S ***
/* *****
//SYSIN DD *
NAME FBICFG00 FBICFG00
VER 000370 C1C1E2D7D9C5C6C9E77EC6C2C9C4
REP 000370 C1C1E2D7D9C5C6C9E77EC1D7D4E2
/*
```

Make sure that you rerun this zap job every time you apply a service APAR or PTF that replaces the load module FBICFG00.

Enabling DB2 AAS to use DB2 trace data

Enter the following DB2 GRANT statements to allow the DB2 AAS to use DB2 trace data:

```
GRANT TRACE TO authid
GRANT MONITOR2 TO authid
GRANT ALL ON authid.PLAN_TABLE TO authid
```

where *authid* is the user ID defined in the RACF STARTED class profile for DB2 AAS.

Setting DB2 control objects

This step is required if you are monitoring CICS/DB2 transactions and your installation is configured to use DB2 thread-sharing in CICS. There are three control objects that must be set correctly to allow IBM Application Monitor to collect DB2 information while using DB2 thread-sharing in CICS. If these objects are not set correctly, you might not see any DB2 reports or SQL call statements in the CICS reports.

The three objects are:

DB2CONN

Defines the CICS connection to DB2. There is only one DB2CONN installed at a time.

DB2ENTRY

Defines the resources to be used by a specific transaction or by a group of transactions when accessing DB2. The parameter values entered for DB2ENTRY override those in DB2CONN.

DB2TRAN

Associates a transaction or group of transactions with a DB2ENTRY. The parameter values entered for DB2TRAN override those in DB2CONN and DB2ENTRY.

The values for these objects can be set using either RDO or the CICS CEMT transaction. When defining these objects, you must consider how they work together for the transactions you are monitoring. For more information on CICS-supplied transactions, refer to the *CICS Transaction Server for z/OS Release Guide* and *CICS-Supplied Transactions*.

ACCOUNTREC parameter

To allow IBM Application Monitor to collect DB2 information, there is a specific requirement for coding the ACCOUNTREC parameter. You can set this parameter on the DB2CONN and DB2ENTRY objects. The object must have a value set other than None.

ACCOUNTREC | None | TXid | TAsk | Uow

Note: If the ACCOUNTREC parameter has a value of None at the highest level, you will not see any DB2 reports or SQL call statements in the CICS reports.

Chapter 5. Verifying the customization of IBM Application Monitor under DB2 UDB (optional)

The batch job with the IVP will issue a series of static and dynamic SQL queries against the DB2 UDB catalog. The process is as follows:

1. You edit and then submit the sample job.
2. The job issues two WTORs to the MVS console indicating that execution of the queries is ready to begin
3. You start IBM Application Monitor and begin monitoring the batch job before the queries start
4. You reply to the WTORs.
5. The queries execute.
6. The IVP ends.

As you monitor the DB2 UDB IVP, you verify that the IBM Application Monitor was customized properly for DB2 UDB, and you view each of IBM Application Monitor's DB2 UDB panels. The following steps explain how to start the IVP and use the IBM Application Monitor panels.

You can run the IVP program as many times as you wish.

Step 1. Bind the DB2 UDB IVP plan

To bind the DB2 UDB IVP plan, do the following steps:

1. Edit the sample job FBIIBIND in *hlq.SFBIIVP*. See the instructions in the sample job for more information.
2. Submit your revised sample job FBIIBIND. You will get a return code of 0 if the job runs correctly.

Step 2. Start IBM Application Monitor user interface

1. Edit sample job FBIIDRUN in *hlq.SFBIIVP*. See the instructions in the sample job for more information. Do not submit the job yet.
2. Split the screen and start IBM Application Monitor user interface by typing 'TSO FBIISPF' at the TSO/E command prompt, or by selecting APM from the ISPF Primary Option menu.

Step 3. Prepare to start monitoring

1. From the IBM Application Monitor primary options menu, select option 6.1, Specify Default Sampling Parameter, and type the forward slash (/) character in the entry fields for Delay analysis, Data Set analysis, and DB2 analysis. Also specify the four-character DB2 subsystem ID for the target DB2 subsystem.

Note: Press PF3 to save your updates.

2. Go to option 6.2, Specify History File Name and Options, and specify the prefix and options for the history data set that is created when your job is run.

Ensure that IBM Application Monitor has the authority to allocate the history data sets under this prefix. There are no COBOL or PL/I Listings data sets for this job.

Note: Press PF3 to save your updates.

3. Go to option 6.3, Specify History Allocation Options, and specify default allocation values for the history file.
4. Go to IBM Application Monitor Primary Option 1, Select an Active Job To Analyze, and specify BAT on the mask line for the Typ column. This will restrict display content only to batch jobs and will make it easier for you to spot job FBIIDRUN when it becomes active.
5. In another TSO/E session (or use the ISPF split screen facility), submit member FBIIDRUN for execution.
6. Invoke SDSF from the ISPF primary options panel.
 - Issue a STATUS command, and locate the entry for this job.
 - Type ? in the NP column to bring up the available logs for this job.
 - Type the letter S in the NP column to select the JESMSG LG log.
7. On the last line of the display, look for the @*nnn*, where *nnn* is the number of the WTOR message that you need to respond to. The message text is:
@*nnn* FBI4003R Do you want ALL messages or only error messages?
8. On the Command Input ==> line, respond to this message as follows:
/*nnn*,a

That is, type the (/) character followed by the message number *nnn*, a comma, and the letter a (for all messages) or the letter e (for error messages only).

Press Enter twice to bring up the next WTOR message:

@*nnn* FBI4003R How many iterations do you want? Enter a number between 1 and 99999999.

9. On the Command Input ==> line, respond to this message as follows:
/*nnn*,5000

That is, type the (/) character followed by the message number *nnn*, a comma, and the number 5000.

Note: 5000 is sufficient iterations of the loop to give you a good sampling of SQL calls for IBM Application Monitor to analyze. You can, however, specify any number you want between 1 and 99999999.

Press Enter twice. In response, you will see on the log that the program is issuing SQL calls.

10. Switch back to the IBM Application Monitor session, and press Enter a few times while you are viewing the Option 1, Select an Active Job to Analyze panel until job FBIIDRUN appears on the list of active jobs.
11. Cursor-select the job and press Enter to bring up the Active Monitor Sessions panel. Press Enter a few times to get a few samples, and then cursor-select the entry in the DB2 Rpts column to view the first DB2 analysis data. You can also select the entry in the Pgm Rpts, Dly Rpts, and Dsn Rpts columns to view program, delay, and data set analysis displays. (Refer to the *IBM Application Monitor User's Guide* for instructions on navigating the panel hierarchy and bringing up the analysis displays.)

Chapter 6. Customizing IBM Application Monitor for use with CICS

This chapter describes the tasks for configuring the optional CICS component. These tasks are required only if you want to configure IBM Application Monitor onto your CICS subsystems. After the base product has been installed, repeat the following steps for each CICS subsystem where IBM Application Monitor CICS support is desired.

The CICS customization procedure requires:

- Intermediate or advanced knowledge of CICS
- Knowledge of DFHCSDUP (system definition data set utility program) exit's existence and where to locate it
- Authorization on the system to install the CICS exits
- Adding the IBM Application Monitor programs and transaction group to an active list
- Optionally, running the installation verification program (IVP)

For these reasons, we recommend that you work closely with a CICS administrator to complete the following tasks. Repeat these tasks for each CICS subsystem on which you want IBM Application Monitor CICS support.

1. Update the CICS system definition data set (CSD).
2. Add group FBI210 to the active list.
3. Install group FBI210.
4. Update the Program List Table (PLT).

Updating the CICS system definition data set (CSD)

To update the CICS system definition data set, do the following steps:

1. Edit member FBICIC4J in your *hlq.SFBIJCL* library. See the instructions in the sample job for more information.

Job FBICIC4J defines two programs and three transactions as shown in the table below.

Program/Transaction	Description
FBIMEI20 program	This program enables IBM Application Monitor to gather data samples from the CICS exits.
FBIMPL20 program	This program processes the FBII, FBIO, and FBIR transactions.
FBII transaction	This transaction enables IBM Application Monitor on the target CICS subsystem.
FBIO transaction	This transaction deactivates IBM Application Monitor on the target CICS subsystem.
FBIR transaction	This transaction removes IBM Application Monitor from the target CICS subsystem.

2. Submit member FBICIC4J.

When you first run this job, you might get non-zero return code in step DELOLD1. You should get return code 0 for subsequent runs.

Adding group FBI210 to the active list

A group is a collection of CICS resource definitions. To add group FBI210 to the active list, do the following steps:

1. Log on to CICS.
2. Enter the following command, where *active* is the name of an active CICS list:

```
CEDA ADD GROUP(FBI210) LIST(active)
```

To view the active lists, look at the CICS startup sequence, usually displayed in the startup parameters as GRPLIST. If the lists are not present in the GRPLIST, contact your CICS administrator.

CEDA is a CICS transaction that defines resources online. Using CEDA, you can update both the CICS CSD and the running CICS system. Authorization may be required. For more information about CEDA, see *CICS-Supplied Transactions*.

Installing group FBI210

To install group FBI210, do the following steps:

1. Concatenate *hlq.SFBIAUTH* and *hlq.SFBIILOD* to your DFHRPL (relocatable program library). SFBIAUTH contains the CICS exit.
2. Shut down and then restart CICS.
3. Issue this command on the CICS screen command line:

```
CEDA  INS GR(FBI210)
```

You should see the message "Install Successful".
4. Issue the following transaction ID to activate the IBM Application Monitor on the target CICS subsystem:

```
FBII
```
5. Clear the screen.

The IBM Application Monitor is now active on the target CICS subsystem.

Note: You should start and stop IBM Application Monitor automatically, using PLT entries. See "Updating the Program List Table" for more information. If you entered FBII to start IBM Application Monitor, then you must also enter FBIR before you shut down CICS. Otherwise, IBM Application Monitor might abend when CICS ends.

Updating the Program List Table

If you need to monitor a CICS system permanently, FBIMPL20 must be invoked at system initialization and shutdown time. Make the following changes to your Program List Table (PLT) and System Initialization Table (SIT) to invoke FBIMPL20.

Program List Table

If you do not already have a PLT, create one using the following statements:

```
DFHPLT TYPE=INITIAL,SUFFIX=I1
DFHPLT TYPE=ENTRY,PROGRAM=DFHDELIM
DFHPLT TYPE=ENTRY,PROGRAM=FBIMPL20
DFHPLT TYPE=FINAL
```

Note: On the first line, the SUFFIX value can be any two characters, as long as it matches what is specified in the PLTP1 keyword of the SIT. In the above example, the value I1 is specified in the SIT as PLTP1=I1.

If you already have a PLT, add the following statement:

```
DFHPLT TYPE=ENTRY,PROGRAM=FBIMPL20
```

System Initialization Table

Use the following SIT keywords to specify the initialization and shutdown PLTs that invoke FBIMPL20:

```
PLTP1=I1 PLTSD=T1
```

PLTP1 specifies the initialization stage 2 PLT. The two character value must be the same as the SUFFIX value of the DFHPLT statement in the PLT.

PLTSD specifies the shutdown stage 1 PLT.

Chapter 7. Verifying the customization of IBM Application Monitor under CICS (optional)

Do the following steps to ensure that the CICS monitoring facility is operating correctly:

1. "Create the VSAM cluster for *hlq.CICS.FILE1*"
2. "Verify the resource definition group name and the VSAM data set name"
3. "Create the resource definition group name, and FBI1 and FBI2 transactions"
4. "Install the CICS IVP FBI210VP"
5. "Run the FBI1 and FBI2 transactions"

Create the VSAM cluster for *hlq.CICS.FILE1*

Edit and submit sample job FBIIVSCR in *hlq.SFBIIVP* to create the VSAM cluster for *hlq.CICS.FILE1*, which is needed for the sample CICS transactions. See the instructions in the sample job for more information.

Verify the resource definition group name and the VSAM data set name

Edit sample job FBIIDCI2 in *hlq.SFBIIVP* to verify the resource definition group name and supply the high-level qualifier for the VSAM data set CICS.FILE1. This sample job is used as input to the FBIDCIC job, which generates the definitions needed for CICS.

Create the resource definition group name, and FBI1 and FBI2 transactions

Edit and submit sample job FBIIDCIC in *hlq.SFBIIVP* to create the resource definition group name, and FBI1 and FBI2 transactions. See the instructions in the sample job for more information.

Install the CICS IVP FBI210VP

1. Log on to CICS.
2. Issue the commands:

```
CEDA ADD GROUP(FBI210VP) LIST(active)
CEDA INS GR(FBI210VP)
```

You should see the message "Install Successful."

Run the FBI1 and FBI2 transactions

FBI1 and FBI2 are CICS transactions that you can run to test CICS monitoring.

FBI1 displays the map and enables you to specify the following three options:

- Initiate the FDR2 transaction. (FBI2 and FDR2 are the same transactions.)
- Write to a Temporary Storage queue.
- Write and delete records from the FBIFILE data set.

FBI2 only issues SEND MAP and RECEIVE MAP commands.

Take the following steps to run these transactions:

1. Be sure that you have already run the steps described above in the section to set up the definitions needed for this IVP.
2. Start IBM Application Monitor and choose option 1, Select an Active Job To Analyze, from the Primary Options panel.
3. Select the target, active CICS region from the list of active jobs, and press Enter to bring up the Active Monitor Sessions display.
4. In another session, log onto the target CICS subsystem and issue the FBI1 transaction ID. The following map appears:

```
IVPS FOR VERIFYING APM CICS SUPPORT
-----
OPTION :
  OPTIONS      DESCRIPTION AND RESOURCE
  1. START DTR   TRN: FDR2 PR:FBIDDR2
  2. ACCESS TS,TD TSQ=FBTS TDQ=FBTD
  3. ACCESS FILES FBIFILE
  PRESS F3 TO QUIT F4 TO CLEAR

ENTER YOUR OPTION
```

5. Select option 2 a few times to run statements that write a temporary storage queue.
6. Select option 3 a few times to run statements that write and delete records from the FBIFILE data set.
7. Select option 1 a few times to run the FDR2 (same as FBI2) transaction. This transaction executes SEND MAP and RECEIVE MAP commands.
8. Switch back to your IBM Application Monitor session.
 - Press Enter a few times to show that IBM Application Monitor is collecting samples from the target CICS region.
 - Cursor-select YES in the CICS Rpts column and press Enter to bring up the CICS Transactions display.
9. On the CICS Transactions display, you can drill down to more detailed CICS displays as follows:
 - a. Cursor-select the FBI1 transaction from the Tran column to drill down to the CICS Calls in a Transaction display. This display lists the CICS calls that transaction FBI1 has made.
 - b. Cursor-select the number in the Count column to drill down to the CICS Transaction Executions display. This display lists the FBI1 transaction instances that you have entered.
 - c. Select a transaction instance from the Taskid column to bring up the CICS Calls in a Unit of Work. This display lists the calls that each instance of the FBI1 transaction has made.
10. You can return to the Active Monitor Sessions panel and select Dly Rpts and Dsn Rpts to view delay and data set analysis data. You should be able to drill down from the Data Set Analysis report to the VSAM Data Set Analysis Detail report for:
 - The FBIFILE VSAM file that option 3 of the FBI1 transaction accesses.
 - The temporary storage queue that option 2 of the FBI1 transaction accesses.

Refer to the *IBM Application Monitor User's Guide* for detailed descriptions of display content.

Appendix A. Stopping the IBM Application Monitor started tasks

To stop the IBM Application Monitor started tasks, do the following steps:

1. Enter the command 'P FBISTART' from the system console.
2. If 'P FBISTART' fails to stop the started task, retry the command.
3. If this command still fails, issue the transaction 'FBIO' in the monitored CICS session to stop all CICS monitoring. Then issue the command 'C FBISTART' to cancel the started task.

Attention: Use the cancel command only if the stop command fails. Before issuing this cancel command, ensure that you disable all CICS monitoring by starting transaction 'FBIO'.

Appendix B. Terminating CICS monitoring

| To terminate CICS monitoring and to disable IBM Application Monitor exit
| programs for CICS, enter the command 'FBIO'.

To remove IBM Application Monitor from CICS, enter the command 'FBIR'.

Appendix C. Applying service APAR or PTF

This section describes how to apply updates to IBM Application Monitor. To use the maintenance procedures effectively, you must install IBM Application Monitor with SMP/E before doing the maintenance procedures below.

What you receive

If you report a problem with IBM Application Monitor to your IBM Support Center, you might receive a tape containing one or more Authorized Program Analysis Reports (APARs) or Program Temporary Fixes (PTFs) that were created to solve your problem.

You might also receive a list of prerequisite APARs or PTFs, which you must apply to your system before applying the current APAR. These prerequisite APARs or PTFs might relate to IBM Application Monitor or any other licensed product you have installed, including z/OS.

Checklist for applying an APAR or PTF

The following checklist describes the steps and associated SMP/E commands to install the APAR or PTF:

- ___ Step 1. Prepare to install the APAR or PTF
- ___ Step 2. Receive the APAR or PTF (SMP/E RECEIVE)
- ___ Step 3. Review the HOLDDATA
- ___ Step 4. Accept previously applied APARs or PTFs (optional) (SMP/E ACCEPT)
- ___ Step 5. Apply APAR or PTF (SMP/E APPLY)
- ___ Step 6. Test APAR or PTF
- ___ Step 7. Accept APAR or PTF (SMP/E ACCEPT)

Step 1. Prepare to install APAR or PTF

Before you start to install an APAR or PTF, do the following steps:

1. Create a backup copy of the current IBM Application Monitor libraries. Save this copy of IBM Application Monitor until you have completed installing the APAR or PTF and you are confident that the service runs correctly.
2. Research each service tape through the IBM Support Center for any errors or additional information. Note all errors on the tape that were reported by APARs or PTFs and apply the relevant fixes. You should also review the current Preventive Service Planning (PSP) information.

Step 2. Receive the APAR or PTF

Receive the service using the SMP/E RECEIVE command from either the SMP/E dialogs in ISPF or by using a batch job similar to FBIWRECV in *hlq.SFBIJCL*.

Step 3. Review the HOLDDATA

Review the HOLDDATA summary reports for the APAR or PTF. Follow any instructions described in the summary reports.

Step 4. Accept a previously applied APAR or PTF (optional)

If there is any APAR or PTF that you applied earlier but did not accept, and the earlier APAR or PTF is not causing problems in your installation, accept the applied service from either the SMP/E dialogs in ISPF or by using a batch job.

Accepting the earlier service allows you to use the SMP/E RESTORE command to return to your current level if you encounter a problem with the service that you are currently applying. You can do this either from the SMP/E dialogs in ISPF or by using a batch job similar to FBIWACPT in *hlq.SFBIJCL*.

Step 5. Apply the APAR or PTF

We recommend that you first use the SMP/E APPLY command with the CHECK operand. Check the output; if it shows no conflict, rerun the APPLY command without the CHECK operand. This can be done from the SMP/E dialogs in ISPF or by using a batch job similar to FBIWAPLY in *hlq.SFBIJCL*.

Step 6. Test the APAR or PTF

Thoroughly test your updated IBM Application Monitor. Do not accept an APAR or PTF until you are confident that it runs correctly.

Step 7. Accept the APAR or PTF

We recommend that you first use the SMP/E ACCEPT command with the CHECK operand. Check the output; if it shows no conflict, rerun the ACCEPT command without the CHECK operand. You can do this either from the SMP/E dialogs in ISPF or by using a batch job similar to FBIWACPT in *hlq.SFBIJCL*.

Appendix D. Accessibility

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

The major accessibility features in z/OS enable users to:

- Use assistive technology products such as screen readers and screen magnifier software
- Operate specific or equivalent features by using only the keyboard
- Customize display attributes such as color, contrast, and font size

Using assistive technologies

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

Keyboard navigation of the user interface

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

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Glossary

A

abend. Abnormal end of a task. The termination of a task before its completion because of an error condition that cannot be resolved by recovery facilities while the task is executing.

access plan. The set of access paths that are selected by the optimizer to evaluate a particular SQL statement.

APF. Authorized program facility. A facility that permits the identification of programs that are authorized to use restricted functions.

authorized program. A system program or user program that is allowed to use restricted functions.

B

batch. A processing mode in which a predefined series of actions are performed with little or no interaction between the user and the system.

bind. To convert the output from the SQL compiler to a usable control structure.

C

checkpoint. A place in a program at which a check is made, or at which data is recorded, to provide real-time monitoring.

checkpoint data set. A data set that contains checkpoint records.

connection authorization exit. An exit that approves or disapproves requests for a connection to another program.

D

data set. The major unit of data storage and retrieval, consisting of a collection of data in one of several prescribed arrangements and described by control information to which the system has access.

dynamic. Pertaining to events that occur at run time or during processing.

E

explain. To capture detailed information about the access plan that was chosen by the SQL compiler to resolve an SQL statement.

I

ISPF. Interactive system productivity facility. An IBM licensed program that serves as a full-screen editor and dialog manager.

J

JCL. Job control language. A control language that is used to identify a job to an operating system and to describe the job's requirements.

M

monitor. To collect data about an application from the running agents that are associated with the application.

P

panel. An area of the screen that displays formatted information and that can include entry fields.

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Customization Guide
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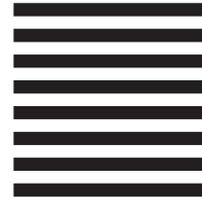
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