

5.5

*IBM OMEGAMON for Db2 Performance
Expert on z/OS
Planning, Configuring, Installing, and
Updating*



2024-08-26 edition

This edition applies to IBM® OMEGAMON for DB2® Performance Expert on z/OS (product number 5655-W37) and to any subsequent releases until otherwise indicated in new editions. Make sure you are using the correct edition for the level of the product.

Specific changes are indicated by a vertical bar to the left of a change. A vertical bar to the left of a figure caption indicates that the figure has changed. Editorial changes that have no technical significance are not noted.

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About this information

IBM OMEGAMON for Db2 Performance Expert on z/OS (also referred to as OMEGAMON for Db2® Performance Expert) is a performance analysis, monitoring, and tuning tool for Db2 on z/OS® environments.

The document is part of the OMEGAMON for Db2 Performance Expert documentation library which provides instructions for installing, configuring, and using OMEGAMON for Db2 Performance Expert and is designed to help database administrators, system programmers, application programmers, and system operators perform these tasks:

- Plan for the installation of OMEGAMON for Db2 Performance Expert
- Install and operate OMEGAMON for Db2 Performance Expert
- Customize your OMEGAMON for Db2 Performance Expert environment
- Diagnose and recover from OMEGAMON for Db2 Performance Expert problems
- Design and write applications for OMEGAMON for Db2 Performance Expert
- Use OMEGAMON for Db2 Performance Expert with other DB2 products

Chapter 1. Overview

IBM OMEGAMON for Db2 Performance Expert on z/OS (OMEGAMON for Db2 Performance Expert) enables you to monitor, analyze, and tune the performance of your Db2 subsystems and Db2 applications.

Service updates and support information

Service updates and support information for this product, including software fix packs, PTFs, frequently asked questions (FAQs), technical notes, troubleshooting information, and downloads, are available from the web.

To find service updates and support information, see the following website:

<https://www.ibm.com/support/pages/omegamon-xe-db2-pepm-web-based-delivery-and-updates-windows-and-unix-based-components>

How to read syntax diagrams

The rules in this section apply to the syntax diagrams that are used in this publication.

Arrow symbols

Read the syntax diagrams from left to right, from top to bottom, following the path of the line.



Two right arrows followed by a line indicate the beginning of a statement.



One right arrow at the end of a line indicates that the statement syntax is continued on the next line.



One right arrow followed by a line indicates that a statement is continued from the previous line.



A line followed by a right arrow and a left arrow indicates the end of a statement.

Conventions

- SQL commands appear in uppercase.
- Variables appear in italics (for example, *column-name*). They represent user-defined parameters or suboptions.
- When entering commands, separate parameters and keywords by at least one blank if there is no intervening punctuation.
- Enter punctuation marks (slashes, commas, periods, parentheses, quotation marks, equal signs) and numbers exactly as given.
- Footnotes are shown by a number in parentheses, for example, (1).

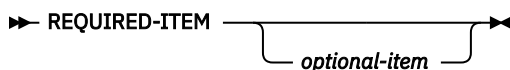
Required items

Required items appear on the horizontal line (the main path).

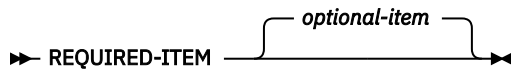


Optional items

Optional items appear below the main path.

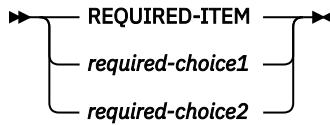


If an optional item appears above the main path, that item has no effect on the execution of the statement and is used only for readability.

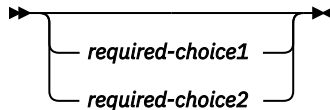


Multiple required or optional items

If you can choose from two or more items, they appear vertically in a stack. If you *must* choose one of the items, one item of the stack appears on the stack main path.

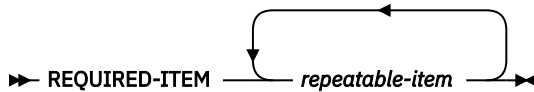


If choosing one of the items is optional, the entire stack appears below the main path.

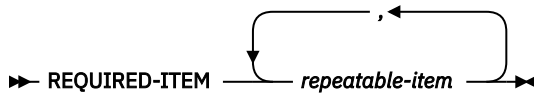


Repeatable items

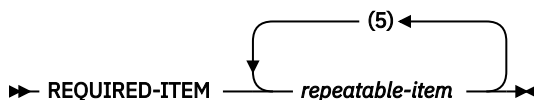
An arrow returning to the left above the main line indicates that an item can be repeated.



If the repeat arrow contains a comma, you must separate repeated items with a comma.



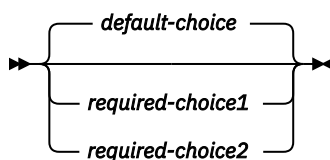
If the repeat arrow contains a number in parenthesis, the number represents the maximum number of times that the item can be repeated.



A repeat arrow above a stack indicates that you can specify more than one of the choices in the stack.

Default keywords

IBM-supplied default keywords appear above the main path, and the remaining choices are shown below the main path. In the parameter list following the syntax diagram, the default choices are underlined.



Conventions

These conventions are used throughout the documentation.

Symbols

The following symbols might appear in command syntax:

Symbol	Usage
	<p>The or symbol is used to denote a choice. You can use the argument on the left or the argument on the right. For example:</p> <pre>YES NO</pre> <p>In this example, you can specify YES or NO.</p>
()	<p>Denotes optional arguments. Arguments that are not enclosed in square brackets are required. For example:</p> <pre>APPLDEST DEST (ALTDEST)</pre> <p>In this example, DEST is a required argument and ALTDEST is optional.</p>
{ }	<p>Some documents use braces to denote mandatory arguments, or to group arguments for clarity. For example:</p> <pre>COMPARE {workload} - REPORT={SUMMARY HISTOGRAM}</pre> <p>In this example, the workload variable is mandatory. The REPORT keyword must be specified with a value of SUMMARY or HISTOGRAM.</p>
–	<p>Default values are underscored. For example:</p> <pre>COPY infile outfile - [COMPRESS={YES NO}]</pre> <p>In this example, the COMPRESS keyword is optional. If specified, the only valid values are YES or NO. If omitted, the default is YES.</p>

Notation conventions

The following conventions are used when referring to high-level qualifiers:

hilev

A high-level qualifier. The high-level qualifier is the first prefix or set of prefixes in the data set name. Site-specific high-level qualifiers are shown in italics.

For example:

- *thilev* refers to the high-level qualifier for your target data set.
- *rhilev* refers to the high-level qualifier for your runtime data set.

For members in target libraries, the high-level qualifier is *thilev* rather than *rhilev*.

- *shilev* refers to the SMP/E library high-level qualifier.

Terminology

The following table shows the products that are described in this publication and the short names with which they are referred to throughout this publication.

Table 1. Product names and their short names	
Product name	Short name
IBM OMEGAMON for Db2 Performance Expert on z/OS	OMEGAMON for Db2 Performance Expert
IBM zSystems Monitoring Configuration Manager	Configuration Manager

Accessibility features

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use a software product successfully.

The major accessibility features in this product enable users to perform the following activities:

- Use assistive technologies such as screen readers and screen magnifier software. Consult the assistive technology documentation for specific information when using it to access z/OS interfaces.
- Customize display attributes such as color, contrast, and font size.
- Operate specific or equivalent features by using only the keyboard. Refer to the following publications for information about accessing ISPF interfaces:

- *z/OS ISPF User's Guide, Volume 1*
- *z/OS TSO/E Primer*
- *z/OS TSO/E User's Guide*

These guides describe how to use the ISPF interface, including the use of keyboard shortcuts or function keys (PF keys), include the default settings for the PF keys, and explain how to modify their functions.

Chapter 2. Planning the configuration

To plan the configuration, check system and security prerequisites, and familiarize yourself with default and custom configurations. A worksheet is provided to help plan.

Prerequisites

Ensure that you meet the following requirements.

Hardware requirements

You can deploy the product on any zSeries system that is capable of running z/OS, version 2 release 3, or later.

Software requirements

For a detailed list of the software requirements, refer to the Announcement Letter.

OMEGAMON for Db2 Performance Expert installation

You must install OMEGAMON for Db2 Performance Expert through SMP/E, a tool that installs and maintains software in z/OS systems and subsystems.

Authorization requirements

To set up the product and certain Db2 privileges, such as data set privileges, access privileges are required. You find these in the two tables below. Furthermore, several user IDs are required for the configuration. You must create the following new user IDs or assign existing user IDs to the tasks:

- DB2PM as user ID or group ID for the OMEGAMON Collector
- A user ID for the Db2 Connect Monitoring Agent (in case you want to use the function Db2 Connect Monitoring)

During the configuration process, Configuration Manager or PARMGEN create jobs that contain all statements that grant the required Db2 privileges are created. After you successfully complete the configuration, you'll find these jobs in your *&rhilev.&rte.RD2SAM* library.

The following table lists the Db2 privileges you must grant to different users and the respective grant jobs that you must submit. In the table, *<ssid>* denotes the Db2 subsystem ID.

Table 2. Db2 privileges	
User	Db2 privileges/grant jobs
Performance Expert Client (including Performance Warehouse Client) or ISPF Dialogs	OMGP<ssid> This job contains the following privileges: <ul style="list-style-type: none">• EXECUTE on PLAN KO2PLAN• MONITOR1• MONITOR2• DISPLAY• TRACE If you want to allow certain users to execute CANCEL THREAD in Thread Activity, then you have to grant those privileges additionally (for example SYSOPR).
Db2 Connect Monitoring Agent	PWGA<ssid>
The EXPLAIN function	EXGP<ssid>
Performance Warehouse	PWG2<ssid>

Table 2. Db2 privileges (continued)	
User	Db2 privileges/grant jobs
Product setup	<ul style="list-style-type: none"> • SYSADM (to submit GRANT jobs) • SYSCNTRL (to submit BIND jobs)
OMEGAMON Collector user ID (DB2PM)	<ul style="list-style-type: none"> • OMGR<ssid> • OMGP<ssid> <p>This job contains the following privileges:</p> <ul style="list-style-type: none"> – EXECUTE on PLAN KO2PLAN – MONITOR1 – MONITOR2 – DISPLAY – TRACE <ul style="list-style-type: none"> • If Performance Warehouse is enabled: PWG1<ssid>
Classic User Interface	No additional Db2 privileges needed.

The following table lists the required data set authorizations.

Table 3. Data set authorizations	
Users	Authorizations on data sets
Product setup	<ul style="list-style-type: none"> • UPDATE on system VTAMLST • UPDATE on system PROCLIB • ALTER on the high-level qualifier of your RTE(s) (&rhilev.&rte) • EXECUTE on the high-level qualifier of PARMGEN (&shilev) • READ on the SMP/E target high-level qualifier of your SMP/E installation (&thilev)
ISPF Dialogs or Buffer Pool Analyzer	<ul style="list-style-type: none"> • READ on &rhilev.&rte.RKANCLHT • READ on &rhilev.&rte.RKANCLLI • READ on &rhilev.&rte.RKANISP • READ and EXECUTE on &rhilev.&rte.RKANMOD • READ on &rhilev.&rte.RKANENU • READ on &rhilev.&rte.RKANSAMV • READ on &rhilev.&rte.RKD2SAM • READ on &rhilev.&rte.RKANSAS
OMEGAMON Collector user ID (DB2PM)	<ul style="list-style-type: none"> • ALTER on the high-level qualifiers that you want the OMEGAMON Collector to use for work data set allocation. You can specify a high-level qualifier for VSAM data sets and one for non-VSAM data sets.

Table 3. Data set authorizations (continued)

Users	Authorizations on data sets
OMEGAMON Collector started task	<ul style="list-style-type: none"> • READ on MVSADMIN.WLM.POLICY RACF® facility class profile. • If PE Client is enabled: OMVS access in RACF • For information about configuring RRSF, see “Setting up RRSF” on page 44. • If the ability to dynamically add to link pack area is restricted, the OMEGAMON Collector started task (ompestc_uid) needs update authority to the facility. In RACF this is accomplished by permitting the OMEGAMON for Db2 Performance Expert task update authority to the facility: <ul style="list-style-type: none"> – PERMIT CSVDYLP.A.ADD.KO2ZINIB CLASS(FACILITY) ID(ompestc_uid) ACCESS(UPDATE) – PERMIT CSVDYLP.A.DEL.KO2ZINIB CLASS(FACILITY) ID(ompestc_uid) ACCESS(UPDATE) – PERMIT CSVDYLP.A.ADD.DGOVRM01 CLASS(FACILITY) ID(ompestc_uid) ACCESS(UPDATE) – PERMIT CSVDYLP.A.DEL.DGOVRM01 CLASS(FACILITY) ID(ompestc_uid) ACCESS(UPDATE) • If the specific facility needs to be defined: <ul style="list-style-type: none"> – RDEFINE FACILITY CSVDYLP.A.ADD.KO2ZINIB UACC(NONE) – RDEFINE FACILITY CSVDYLP.A.DEL.KO2ZINIB UACC(NONE) – RDEFINE FACILITY CSVDYLP.A.ADD.DGOVRM01 UACC(NONE) – RDEFINE FACILITY CSVDYLP.A.DEL.DGOVRM01 UACC(NONE)

<i>Table 3. Data set authorizations (continued)</i>	
Users	Authorizations on data sets
Tivoli Enterprise Monitoring Agent	<p>Apply to all RTEs that connect to the same Hub TEMS.</p> <p>Your SAF security rules may need to be changed. The agent address spaces need to have WLM permissions. The agent address spaces need access authority to the resource IWM.SERVER.REGISTER in the FACILITY class. If this resource is not defined, access authority to the FACILITY class resource BPX.WLMSERVER is required.</p> <p>In RACF, the command is:</p> <pre>PERMIT IWM.SERVER.REGISTER CLASS(FACILITY) ID(userid) ACCESS(READ)</pre> <p>Where userid is the owner user ID of your agent's started task.</p>

The following table lists the required APF authorizations.

<i>Table 4. APF authorizations</i>	
Users	APF authorizations
Tivoli® Enterprise Monitoring Agent user ID	APF authorizations on the libraries in the STEPLIB of the Tivoli Enterprise Monitoring Agent

Feature cost considerations

Be aware that each optional feature or function you add causes additional resource and CPU costs.

For best results, consider which features you need. Then, decide whether you want to run each feature all the time or if you can save CPU costs and turn the feature on only when needed.

Following are additional tips for deciding which optional features and functions to add:

- Monitor traces for real-time are typically inexpensive. This includes Statistics and Accounting class (1) traces.
- Accounting trace class (3) and especially class (2) on the plan level as well as the equivalent classes (7 and 8) on the package level will generate additional overhead within the Db2 engine.
- SQL related traces (Dynamic SQL, NegSQL, sort, scan, and locking) can be very expensive. These traces should be used cautiously and only for a short period of time. For example, they are used as an option in Near-Term History.
- Object Analysis can be very expensive. Consider using the online function to switch this function on and off dynamically if you need it.

Security considerations

Plan your security strategy by considering user IDs or special privileges you may need during configuration, as well optional security features.

Enhanced 3270 user interface security considerations

For details on enabling security for the enhanced 3270 user interface see <https://www.ibm.com/docs/sl/om-shared?topic=interface-enable-security-omegamon-enhanced-3270-user> in *OMEGAMON shared documentation*.

User authorization to issue Take Action commands

Certain commands, which are known as *Take Action* commands, can be issued from the Tivoli Enterprise Portal and Enhanced 3270 User Interface user interfaces.

OMEGAMON for Db2 Performance Expert supports the following types of Take Action commands: z/OS system commands, UNIX commands, and agent-provided commands. Planning for security includes deciding the extent to which you want to protect Take Action commands and authorize users to issue these commands.

For more information, see:

OMEGAMON shared documentation, Version 6.3.0 Fix Pack 2 and above: Configuring
<https://www.ibm.com/docs/en/om-shared?topic=above-configuring>

z/OS commands

By default, Take Action commands that are issued by OMEGAMON for Db2 Performance Expert through the Tivoli Enterprise Portal are issued as z/OS system commands.

In IBM® Tivoli® Monitoring Version 6.3.0, you can enable SAF and RACF® authorization of Take Action commands and authorize the use of Take Action commands by selected portal server users (Tivoli Enterprise Portal user ID). You can restrict others from issuing Take Action commands.

You can secure Tivoli Enterprise Portal user IDs or the RACF groups that the user IDs are in by using standard security objects that are provided by the security product at your site. For more information, see:

OMEGAMON shared documentation, Version 6.3.0 Fix Pack 2 and above: Configuring Take Action command access using SAF profiles

<https://www.ibm.com/docs/en/om-shared?topic=csmsz-configuring-take-action-command-access-using-saf-profiles>

OMEGAMON shared documentation, Version 6.3.0 Fix Pack 2 and above: Enable RACF authorization of Take Action commands

<https://www.ibm.com/docs/en/om-shared?topic=zos-enable-racf-authorization-take-action-commands>

With IBM Tivoli Monitoring Version 6.3.0, Tivoli Management Services provides an auditing function that captures information about significant events that occur in your IBM Tivoli Monitoring environment, including those events that allow or disallow the execution of Take Action commands. On a z/OS system, the auditing facility creates and stores information in Systems Management Facility (SMF) format records. For more information, see:

OMEGAMON shared documentation, Version 6.3.0 Fix Pack 2 and above: Configuring Take Action command access using SAF profiles

<https://www.ibm.com/docs/en/om-shared?topic=csmsz-configuring-take-action-command-access-using-saf-profiles>

IBM Tivoli Monitoring: Tivoli Enterprise Portal User's Guide

<https://www.ibm.com/docs/en/tivoli-monitoring/6.3.0?topic=guides-tivoli-enterprise-portal-users-guide>

Although the preferred configuration method is to use the RACF authorization and SMF auditing facilities to issue Take Action commands, you can also configure a monitoring server or monitoring agent address space to redirect Take Action commands to NetView® through the Program to Program Interface (PPI). For more information about configuring Tivoli NetView for z/OS authorization of z/OS commands, see:

OMEGAMON shared documentation, Version 6.3.0 Fix Pack 2 and above: Enable NetView to authorize Take Action commands

<https://www.ibm.com/docs/en/om-shared?topic=commands-enable-netview-authorize-take-action>

UNIX commands

Take Action commands that are issued on the Tivoli Enterprise Portal with any of the following prefixes are issued as UNIX commands. By default, only user IDs that are defined for z/OS® UNIX System Services (USS) and have superuser, or root, authority are allowed to issue UNIX commands through the Tivoli Enterprise Portal.

Prefixes are as follows:

- OMVS:, Omvs:, or omvs:
- UNIX:, Unix:, or unix:

Use RACF® commands to define user IDs for z/OS UNIX. The z/OS UNIX attributes are maintained in the OMVS segment of the RACF user profile.

Follow these guidelines to enable users with Tivoli Enterprise Portal user IDs to issue UNIX commands:

- The Tivoli Enterprise Portal user ID must be defined in RACF.
- The profile that is associated with the RACF user ID must contain an OMVS segment.
- In the OMVS segment, the z/OS UNIX user identifier (UID) must have a value of 0 (superuser).

For more information, see:

OMEGAMON shared documentation, Version 6.3.0 Fix Pack 2 and above: Enabling security validation on a z/OS hub

<https://www.ibm.com/docs/en/om-shared?topic=zos-enabling-security-validation-hub>

Prefixed Take Action commands

OMEGAMON for Db2 Performance Expert uses Take Action commands to issue commands to Db2 from the Enhanced 3270 User Interface.

Take Action commands, which are prefixed by IP, are known as agent commands. Security for OMEGAMON for Db2 Performance Expert Take Action commands is based on SAF security classes and resource profile names. If no resource profiles are created to control Take Action commands, all commands are denied.

The Enhanced 3270 User Interface validates the resource profile to determine whether users are authorized to issue the Take Action commands. To allow Take Action commands on all managed systems, use the following profile:

```
KDP.**.TAKEACTION
```

You can use this profile to issue the Take Action command to the agent from the Enhanced 3270 User Interface. The agent uses the security profile that is used by the Db2 subsystem to issue the specific Db2 command.

For example, to issue OMEGAMON for Db2 Performance Expert Take Actions commands on all managed systems that use an SAF class name of \$KOBSEC, issue the following RACF® commands:

```
RDEFINE $KOBSEC KDP.**.TAKEACTION UACC(NONE)
SETROPTS RACLIST($KOBSEC) REFRESH
PERMIT KDP.**.TAKEACTION ID(userid) ACCESS(UPDATE) CLASS($KOBSEC)
```

At a minimum, you must use this pattern for the global security class (RTE_SECURITY_CLASS) to create a profile. You must also set permissions to authorize users to issue OMEGAMON for Db2 Performance Expert Take Action commands to update the profile. When you specify the RTE_SECURITY_CLASS parameter (RKANPARU member KOBENV) and it is not set to the reserved name, OMEGDEMO, the OMEGAMON for Db2 Performance Expert agent uses this class to validate the authority of a user to issue commands. You can also create other profiles for more granular access control.

While the previous profile of KDP:**.TAKEACTION allows Db2 commands to be issued for all managed systems, you can also create other profiles for more granular access and control. Use the following profile:

```
KDP.msn.TAKEACTION
```

where *msn* is the name of the managed system and uses this format for an Db2 subsystem: *ssid:smfid*:DB2. The *ssid* is the four-character ID of the Db2 subsystem. The *smfid* is the four-character System Management Facility ID.

To control the ability to issue Take Action commands to an OMEGAMON for Db2 Performance Expert agent that is running on LPAR MVS1 for DB2A, for example, use the following profile:

```
KDP.DB2A:MVS1:DB2.TAKEACTION
```

Users must be given UPDATE access to the profiles. In addition, an SAF Pass Ticket profile must be defined to allow the Enhanced 3270 User Interface to authenticate between the interface and the hub monitoring server. For more information, see:

OMEGAMON shared documentation

- [Configuring security on a monitoring server on z/OS](#)
- [Common parameters](#)

Db2 take action commands

If you want to allow certain users to execute CANCEL THREAD actions in Thread Activity in the Enhanced 3270 User Interface, you must use the Db2 GRANT statement to grant privileges additionally (for example SYSOPR).

Classic User Interface customized security

Important: Passphrase support for the OMEGAMON 3270 Classic interface is introduced with APAR OA57133 (PTF UA98944). When passphrase support is enabled, OMEGAMON implements the OMEGAMON 3270 Classic interface external security without the use of security exits. For more information, see [OMEGAMON 3270 Classic interface security](#) and [How to: Configure passphrase and MFA support in the OMEGAMON 3270 Classic interface](#).

You can set up an interface between the Classic User Interface and an external security package, such as RACF or ACF2. The product has no security feature set up as the default.

Whether you use internal security, external security, or a combination of the two, you can customize the Classic User Interface security table to the needs of your installation.

Terminology for security procedures

The following terms are used in the descriptions of the customization procedures for security.

Update Program

The KOBSUPDT member of *&rhilev.&rte*.RKANMOD is a utility program that performs the update to the security table of the Classic User Interface.

Control Statements

The KO2SUPDI member of *&rhilev.&rte*.RKD2SAM contains control statements that you can edit to change the defaults for internal security or to specify external security. KO2SUPDI provides the input for the update program.

JCL

The KO2SUPD member of *&rhilev.&rte.RKD2SAM* contains the JCL to run the security update program.

Exit Routine

At start time, the Classic User Interface accesses the security exit routine of the user that provides the interface to the external security package. The name of this routine must be specified by the administrator.

Internal versus external security

When you start the Classic Interface, it checks if an exit routine for an external security package is installed.

You can use external security alone, internal security alone, or external security on some commands and internal on others. We do not recommend use of internal security.

Important: The use of the term *authorized* implies APF authorization.

- If the exit routine exists, it gets control for the commands that are marked for external security. It determines authorization through the external security package. If external security allows the command, the Classic Interface does not check internal security.
- If external security is not used for the command, internal security takes effect. The Classic Interface includes specific authorized commands. They require an internal security password for execution.

Authorized commands and their authorization level

The Classic Interface includes specific authorized commands for which you can use internal security. Authorized commands have a security level of 3.

All Classic Interface commands (major, minor, immediate, and INFO-line) have a security level of 0, 1, 2, or 3. Level 3 provides the highest degree of protection. A setting of 0 means that any user can access the command.

All commands have a default security level of 0 except for authorized commands. By default, authorized commands have a security level of 3.

You must run the security update to prevent that specific commands that can potentially damage your system are available to all users.

The KO2SUPDI member in *&rhilev.&rte.RKD2SAM* contains instructions and the control statements for updating the authorization level of authorized commands as needed.

The following commands are the authorized commands for this product:

CONS	DCMD	DCNS	.DSA	MCHN	MLST	MSCN
MZAP	OCMD	OSPC	PEEK	SCHN	SLST	SSCN
SZAP	TCMD	XMCH	XMLS	XMSC	XMZP	

These commands are described in *Monitoring Performance from the OMEGAMON Classic Interface*.

Important: The **PEEK** major command has the minor commands **AMAP**, **DDNS**, **JOBS**, **MODS**, **STEP**, **SUBP**, and **TCBS**. These minor commands also have default security level of 3.

Note that the authorized commands require an internal password for execution.

Using passwords for authorized commands

Each security level can have its own password.

About this task

The level 3 password accesses all levels. The level 2 password accesses levels 2, 1, and 0. The level 1 password accesses only levels 1 and 0. Level 0 commands execute without a password.

If you enter a command that requires higher authority than yours, the following message is displayed:

OB0921 Security check failed (Internal)

To get access to the authorized commands, use the **/PWD** command in the following way:

Procedure

1. Enter **/PWD** on the INFO-line.

The Classic Interface shows the password prompt.

```
_ <=== Please enter password
```

2. Enter your password on the INFO-line.

The password does not display as you type it.

The message **PASSWORD ACCEPTED** is displayed.

3. Press Enter again to get access to all authorized commands that are associated with that password and to lower command levels.

What to do next

To reset the security level to 0 after you complete the authorized functions, do one of the following:

- Press the PA1 or the ATTN key.
- Enter **/PWD** on the INFO-line and press Enter twice without entering a password.

The Classic Interface shows:

```
_____ Password level reset
```

Access to the authorized commands is restricted until you enter the password again.

If you use the Classic Interface with an external security package, you can prevent the use of the **/PWD** command.

External security concepts

The Classic Interface supports external security for all modes of operation.

You can use external security for the logon and for commands. When using external security, you can log on to the Classic Interface only if you are allowed to access the INITIAL resource name.

You can use a resource name of INITIAL0, INITIAL1, INITIAL2, or INITIAL3 to allow logon to the Classic Interface and set the internal security level to 0, 1, 2, or 3, respectively.

When you issue a command, the Classic Interface performs an external security check to see if the following conditions are met:

- The name of the user exit module is specified in the security table.
- An external security exit routine is located and loaded.
- External security is specified for the issued command in the security table by using the **COMMAND** control statement with the **EXTERNAL=YES** keyword setting.
- For VTAM® mode, the library that contains the KOBVTAM load module is APF-authorized.

If any commands are specified for external security checking and if an exit routine is not found, the Classic Interface recognizes a possible security exposure and disables those commands with an internal security level of 0 for the session. Commands with a level of 1, 2, or 3 run only after you enter the internal password.

Using the VTAM, TSO, or ISPF mode logon panel

You can log on through the VTAM, TSO, or ISPF mode panel using the KOBVTAM logon panel.

About this task

Advantages of using the KOBVTAM logon panel are:

- The exit routine can cause the Classic Interface to stop an unauthorized logon.
- The exit routine makes all security checks based on the user logon ID and not on the authority for the Classic Interface address space.

Note: If you are in an active VTAM session and you want to change the external security level of authorization, you can use the relogon feature.

To logon to the Classic Interface through the VTAM, TSO, or ISPF mode panel, perform the following step:

Procedure

Log on to VTAM.

The logon panel for the Classic Interface VTAM application program (KOBVTAM) is displayed.

Logging on again to an active session

You can use the relogon feature to logon to an active VTAM session without logging out first.

About this task

The relogon feature is a function of the **/PWD** command. You can use this feature to perform the following tasks:

- Enter your user ID and password for the external security package from an active Classic Interface session.
- Change the security level without having to close a current VTAM session.

When you work with the relogon feature, consider these issues:

- Do not mark the **/PWD** command as EXTERNAL=YES in the security table.
- In your user exit, you can determine the default action if the supplied user ID or logon password is not valid.

For example, you can specify that all Classic Interface commands that are marked as EXTERNAL=YES are not enabled. You can also specify that the session reverts to the previous user ID. The available options are explained in the sample exit routines.

- If you use the relogon feature and your password has expired, you cannot enter a new one by using the **/PWD** command.

To use the relogon feature, perform the following step:

Procedure

Enter **/PWD** and your user ID on the INFO-line as seen in the following example:

```
/PWD user01____02INIT01 DED 02 V600.#P $DB2 mm/dd/yy 17:03:37
```

You are now logged on again to the active session using external security.

Implementing external security

You must implement an external security package before the exit routine can refer to it for authorization. If external security is not implemented, internal security takes effect.

About this task

To implement external security, perform the following steps:

Procedure

1. Modify the rules in the external security package to interface with the Classic Interface. For instructions, refer to [“Modifying RACF security rules” on page 17](#).
2. Customize the sample exit routine that is provided on the Classic Interface tape.
 - For instructions, refer to [“Exit routine concepts” on page 19](#).
 - For a description of options, refer to [“Optional Classic User Interface external security features” on page 15](#).
3. Assemble and link-edit the routine.
4. Modify and update the security table to specify the commands that are to be checked by RACF or ACF2 and the name of the module that contains the exit routine. Note that no default is supplied for the module name. For instructions, refer to [“Updating the security table” on page 31](#).
5. Ensure that your security package has authorized the started-task identifier for OMEGAMON for Db2 PE.

During configuration, OMEGAMON for Db2 PE generates the security jobs KO2ACF2A, KO2RACFA, and KO2SUPD. These jobs create exit programs for external security packages. The members are in *&rhilev.&rte.RKANSAMU*.

Optional Classic User Interface external security features

You can setup your user exit routine to use one of the following external security features. You can also use the control options that are supplied with the security package, such as SHIFT validation and SOURCE validation. To use them, specify the commands EXTERNAL=YES and implement the option as the security package directs.

Customization of error messages

To suit your individual requirements, you can create customized error messages if one of these conditions occur:

- The authority of the user is insufficient.
- The user enters a wrong user ID.
- The user enters a wrong password.

The customized error messages can be up to 120 bytes long, except for INFO-line messages. INFO-line messages, for example, /PWD relogin messages, can be up to 60 bytes long.

Members KO2RACFX and KOACF2X in the SECEXITS data set (Configuration Manager) and *&rhilev.&rte.RKD2SAM* data set (PARMGEN) contain sample exit routines.

Password update

You can give the user the ability of interactive communication when logging on to external security.

For example, if a user logs on by using an expired password, the security exit can prompt the user for a new password and update the security database.

Restriction: This option is not available when relogging on by using the **/PWD** command.

Audit suppression

You can suppress WTO or SMF auditing. To indicate suppression of WTO or SMF, your exit routine might set a flag in \$UCHECK at initialization or relogon.

Audit supplement

In addition to the WTO and SMF audits that are available with the Classic User Interface, you can use the audit features of the external security package to supplement command tracking. The RACF Report Writer and ACF2 ACFRPT utility programs are examples of this supplemental audit capability.

Locking feature

The feature can prevent users from changing their internal security level by using the **/PWD** command. Their level of authority is set only once and only at logon. It can be set to one of four levels (level 0, 1, 2, or 3).

Restrictions:

- Because the feature locks the internal security level of a user, it affects only those commands that are marked as EXTERNAL=NO.
- The locking feature disables the **/PWD** command only for supplying internal passwords. The user can still use the **/PWD** command to relogon to an external user ID.
- You must define the security level of a user in ACF2 or RACF as an INITIAL n resource, where n is a number from 0 to 3.
- You must assign corresponding values to commands in the security update program by using the **LEVEL** keyword of the **COMMAND** control statement.
- The routine starts checking INITIAL n resources at the highest level. If you define users of INITIAL2, INITIAL3, and PERMIT to INITIAL3, the users are locked to level 3.
- Users who have INITIAL authority without an attached value from 0 to 3 are allowed to change their internal security level by using the **/PWD** command.

User validation through RACF

To validate a user, the user exit routine checks the RACF resource class that is defined by the ICHERCDE macro.

The resources that allow the startup of the Classic User Interface include INITIAL, INITIAL0, INITIAL1, and INITIAL3.

This example shows these resources:

```
<Allows /PWD to work>
RDEFINE ccccccc INITIAL UACC(READ)

<Defines security level 0 as inaccessible>
RDEFINE ccccccc INITIAL0 UACC(NONE)

<Defines security level 1 as inaccessible>
RDEFINE ccccccc INITIAL1 UACC(NONE)

<Defines security level 2 as inaccessible>
RDEFINE ccccccc INITIAL2 UACC(NONE)

<Defines security level 3 as inaccessible>
RDEFINE ccccccc INITIAL3 UACC(NONE)

<Locks USER02 to level 2 power>
PERMIT INITIAL2 CLASS(classme) ID(USER02) ACC(READ)
```

where *classme* is the resource class name that you define when you modify RACF security rules.

User validation through ACF2

To validate a user, the user exit routine checks the ACF2 resource class.

The resources that allow the startup of the Classic User Interface include INITIAL, INITIAL0, INITIAL1, and INITIAL3.

To allow users to change their authorization level with the **/PWD** command, use INITIAL.

This example shows sample definitions:

```
<Allows /PWD to work for USER01>
ACFNRULE KEY(INITIAL) TYPE(cls) ADD(UID(*****USER01) ALLOW)

<Locks USER02 to security level 0 commands>
ACFNRULE KEY(INITIAL0) TYPE(cls) ADD(UID(*****USER02) ALLOW)

<Locks USER03 to security level 1 commands>
ACFNRULE KEY(INITIAL1) TYPE(cls) ADD(UID(*****USER03) ALLOW)

<Locks USER04 to security level 2 commands>
ACFNRULE KEY(INITIAL2) TYPE(cls) ADD(UID(*****USER04) ALLOW)

<Locks USER05 to security level 3 commands>
ACFNRULE KEY(INITIAL3) TYPE(cls) ADD(UID(*****USER05) ALLOW)
```

where *cls* is the generalized resource class name that you define when you modify RACF security rules.

Modifying RACF security rules

You must modify the RACF security rules to interface with the Classic Interface.

About this task

To modify RACF security rules, do the following:

Procedure

1. Update the resource class description table to define a class name, for example, O2IBM, by using the ICHERCDE macro call.

Requirement: This must be the same name that you use when you define the resource class in the security exit routine.

You should define the ICHERCDE macro as follows:

```
ICHERCDE CLASS=classnme,
           ID=nnn,
           MAXLNTH=8,
           FIRST=ALPHANUM,
           OTHER=ANY,
           POSIT=nnn,
           DFTUACC=NONE
```

where *classnme* and *nnn* are determined by your installation. Additional operands for this macro might also be required at your installation.

2. Define a resource profile for logging on to the Classic Interface by using the **TSO RDEFINE** command with a resource of **INITIAL**.

The following example shows a definition that allows all users to sign on to the Classic Interface and use the **/PWD** command for internal security. It allows access to all commands that are marked EXTERNAL=NO.

RDEFINE classnme INITIAL UACC(READ)

where *classnme* is the name that is assigned in the previous step.

This definition is the minimum required for logon. If you want to restrict the use of the **/PWD** command, refer to “Optional Classic User Interface external security features” on page 15.

3. Define resource profiles for the commands that you want to protect by using external security. The commands are marked EXTERNAL=YES.

- a) Use the **TSO RDEFINE** to specify the Classic Interface command as the resource.

Ensure that you define UACC(NONE) so that only specific users can execute the command.

- b) Use the **PERMIT** command to define the users who can access the resource, that is the users who can execute the command.
- c) Give the defined users READ access

The following example shows how to authorize a user to run the **PEEK** command with RACF:

```
RDEFINE classme PEEK UACC(NONE)
```

```
PERMIT PEEK CLASS(classme) ID(USER01) ACCESS(READ)
```

4. Include the RACF macro libraries SYS1.MACLIB and SYS1.AMODGEN, and the macro library &thilev.TKANMAC in the assembly of the security exit routine.

What to do next

Important: When you authorize commands, the Classic Interface modifies the command name. For example, it makes the following replacements:

- It replaces the slash of the INFO-line commands with a dollar sign. For example, /cccc becomes \$cccc and /LOGOUT is defined to RACF as \$LOGOUT in CLASS(cccccccc).
- It replaces the period of the immediate commands with @. For example, .cccc becomes @cccc.

Modifying ACF2 security rules

You must modify the ACF2 security rules to interface with the Classic Interface.

About this task

To modify ACF2 security rules, do the following:

Procedure

1. If you run the Classic Interface in VTAM mode, define the name of its started task to ACF2.

The started task name that you use for the Classic Interface in VTAM mode should have the MUSASS attribute assigned. This allows ACF2 to check the individual user authorization rather than using the address space ID of the Classic Interface. If STC(NO) is specified, you must run the Classic Interface in batch mode with a job name that has the MUSASS attribute.

2. To set up a resource class for ACF2, define a generalized resource class name, for example, O2S.

Requirement: It must be the same name that you use when you define the resource class in the security exit routine.

For generalized resources, the name consists of three characters but gets the letter R as prefix within the security exit.

This allows the Classic Interface to make security checks.

3. Define an ACF2 rule for resource INITIAL.

This allows VTAM users to log on to the Classic Interface as in the following example:

```
ACFNRULE KEY(INITIAL) TYPE(O2S) ADD(UID(*****uid) ALLOW)
```

Requirement: O2S must be identical to the resource class name that you define in the security exit routine.

uid is a user ID or a user ID mask. If you want to restrict the use of the **/PWD** command, refer to “Optional Classic User Interface external security features” on page 15.

4. Define resource rules for the command that you want to protect by using the KEY operand of the ACF2 rule compiler.

This authorizes a user to execute the **PEEK** command with ACF2 as in the following example:

ACFNRULE KEY(PEEK) TYPE(02S) ADD(UID(***USER01) ALLOW)**

For information about the format of the string, ask your security administrator.

5. Include the ACF2 macro library and the IBM macro library *&thilev.TKANMAC* in the assembly of the security exit routine.

What to do next

Important: When you authorize commands, the Classic Interface modifies the command name. For example, it makes the following replacements:

- It replaces the slash of the INFO-line commands with a dollar sign. For example, */cccc* becomes *\$cccc* and */LOGOUT* is defined to ACF2 as *\$LOGOUT* in *CLASS(cccccccc)*.
- It replaces the period of the immediate commands with *@*. For example, *.cccc* becomes *@cccc*.

Modifying CA-TOP SECRET security rules

You must modify the CA-TOP SECRET security rules to interface with the Classic Interface.

About this task

To modify CA-TOP SECRET security rules, do the following:

Procedure

1. Define the users who can access the resource by using the **TSS PERMIT** command.
2. Run the Classic Interface command.

Example

The following example shows how to authorize a user to execute the **PEEK** command with CA-TOP SECRET.

TSS PERMIT(userid) cccccccc(PEEK)

where *cccccccc* is the resource class name.

Exit routine concepts

The exit routine provides an interface between the Classic Interface and the security product.

Concepts for exit routines are:

- You can specify any unique name for your exit routine.

The name must be identical to the name in the control statements that update the security table.

- You can share the exit routine between systems.
- You must define a resource class in the exit routine.

The name of this resource class must be identical to the generalized resource class name that you define when you modify RACF or ACF2 rules.

- You can use the same exit routine to define security for several Classic Interfaces.

You must then use the same name on the **MODULE=** control statement for each Classic Interface.

You can use the value of the **B#DDPRFX** field in the **\$BIA** data area as part of a resource name that you want to use for the Classic Interface that is currently in use.

The *&rhilev.&rte.RKD2SAM* data set contains the following sample members:

- Members KO2ACF2X and KO2RACFX that contain models for ACF2 and RACF routines.

Many configurations use these models without modification. They are, however, documented with comments so that you can modify them because security procedures are configuration-dependent.

You can also use these models if you have a security system other than RACF or ACF2. In this case, use the sample RACF or ACF2 exits as guides to see the following:

- Which information is passed to the exit routine
- Which information is returned to the Classic Interface

- Members KO2ACF2A and KO2RACFA that contain sample JCL to help you assemble and link-edit your routine.

Calling conventions of the Classic Interface

The Classic Interface uses a single control block \$UCHECK to pass information to the exit routine. The exit routine uses \$UCHECK to pass information back to the Classic Interface.

The \$UCHECK control block is mapped by the \$UCHECK macro. The macro is defined in member KOBGMAC of *&thilev.TKANMAC*.

The Classic Interface maintains the control block for the entire duration of the session.

Restriction: The \$UCHECK work area for the configuration is limited to 512 bytes. If your installation requires a larger work area, perform these steps:

1. Perform a GETMAIN for the additional storage required.
2. Place the pointer to this GETMAIN area in \$UCHECK.

Note: Do not try to enlarge the work area in another way because this causes an overlay of essential control blocks for the Classic Interface. Results are then unpredictable.

If you modify the RACF RACROUTE macro, you must perform a GETMAIN for at least 512 bytes for use as the WORKA parameter.

The Classic Interface calls the user exit module with these conventions:

Register 1

Address of parameter list

Register 13

Address of a standard save area

Register 14

Return address

Register 15

Entry point address (in)

Register 15

Return code (out)

Word 1

Address of control block

Calling flow between Classic Interface and user security exit

Calling flow between the Classic Interface and your user security exit routine takes place at initialization, during command verification, at relogin, and at termination.

Calling flow at initialization

At initialization, the Classic Interface passes control to your user exit routine. The initialization call is indicated by an **I** in the **U#CHTYP** field. This indicates that the Classic Interface requires a logon validation.

This list shows the conditions that apply to the calling flow at initialization:

- If the user ID field length is nonzero, the user ID and password information are available.
- If additional information or some form of retry is required, the routine can request a reshown of the screen. It can also reset any field lengths to indicate that no data, such as user ID, password, group, or new password, is available.

To perform a reshown in VTAM mode, perform these steps:

1. Set a message of up to 120 bytes length in the **U#CHMSG** field.
2. Set the **U@CHRSHO** bit in the **U#CHRESP** field.
3. Return to the caller.

The message appears below the panel. Appropriate fields, such as original user ID and password, are filled in, unless overridden (length = 0).

- After validation is complete, a return code of 0 from the user exit indicates that the user is allowed to log on.

Any other return code stops the session.

- After successful logon, the validation routine can perform resource validation.

Optionally, it assigns a command security level (0, 1, 2, or 3) to the user. The default level is 0.

Place the appropriate number into the **U#CHAUT4** field. To force the user to use only this level, you must also set the **U@CH1LOK** bit in the **U#CHAUT1** field.

Calling flow during command verification

During command verification, the Classic Interface places a **C** in the **U#CHTYP** field. At this point, the user authorization can be checked.

If a command is allowed, the user can use this account on subsequent tries until security is reset with the **/PWD** command.

If a command is not allowed, the user cannot use this account on subsequent tries until security is reset with the **/PWD** command.

Each time the user attempts to use the command, the user exit is notified. Also, an audit record can be written, and a customized error message can be issued.

Return codes from the exit routine can be:

RC = 0

Indicates that the command is allowed.

For RACF and ACF.

RC = 4

Indicates that the command is unknown.

The Classic Interface allows the command to execute. For information about how to define a command to RACF, refer to [“Modifying RACF security rules” on page 17](#).

For RACF only.

RC = 8

Indicates that the command is known to the security package and that access is denied.

For RACF and ACF.

Important: When you authorize commands, the Classic Interface modifies the command name. For example, it makes the following replacements:

- It replaces the slash of the INFO-line commands with a dollar sign. For example, /cccc becomes \$cccc.
- It replaces the period of the immediate commands with @. For example, .cccc becomes @cccc.

Calling flow at relogin

At relogin, the Classic Interface places an **R** in the **U#CHTYP** field to indicate a logon validation.

The processing is identical to the one for initialization, except that users might not enter a new password or group because the Classic Interface does not display the logon panel.

Calling flow at termination

At termination, the Classic Interface passes a **T** to the user exit routine.

You can then do any termination cleanup required, such as freeing user control blocks, or perform a FREEMAIN for any GETMAIN areas.

Security control statements

The security table consists of specific control statements and control keywords. You can edit these statements to update the security table for internal and external security.

Overview

The following lists the keywords and their description.

AUTHLIB

Specifies an authorized screen space (PROC) library for initialization that bypasses the security check.

COMMAND

Sets the internal security levels of commands, marks them for external security, and requests an audit.

LIST

Specifies whether a listing of the current security settings is to be produced on this run.

MINOR

Specifies the security options for minor commands.

MODULE

Specifies the name of the module that contains the user external security exit routine.

PASSWORD

Specifies the internal passwords.

RESET

Clears current settings.

SMFNUM

Specifies the record ID number for SMF audit requests.

UPDATE

Specifies whether updating is to be performed on this run.

Format rules for control statements

These format rules apply to all control statements.

- Control statements can begin anywhere in the input record but cannot extend beyond column 72.
- Statements can be in any order in the input stream. The update program processes the statements as it encounters them, with the exception of the LIST and UPDATE statements. These statements take effect after all other input is processed.
- All information for a particular control statement must fit in a single line.
- All input must be in uppercase letters.
- Statements must be in this format:

CONTROLSTATEMENT=cccccc,KEYWORD1=cccccc,KEYWORD2=cccccc,

Note: Blanks are not allowed because the update program treats data that follows a blank as a comment. The data prints on the edit listing but is ignored for processing purposes.

- To insert comment lines anywhere in the input stream, place an asterisk (*) in the first column of the input record.
- If the update program identifies statements as incorrect, correct the statements and resubmit them.
To correct the setting, specify a new one instead of deleting or replacing part of the old one, especially when changing a command from EXTERNAL=YES to EXTERNAL=NO.
- The Classic Interface does not recognize changes of control statements until the update job completes successfully and until a new Classic Interface session is started.

Usually, the control statement edit listing indicates successful completion of the update.

AUTHLIB control statement

This control statement specifies the data set name of an authorized screen space (PROC) library. The library contains commands that should be invoked without security checks at the Classic Interface initialization.

Purpose

It lets you execute protected commands as part of the initialization screen without entering a password.

Recommendation: You should restrict WRITE access to the **AUTHLIB** data set because security checking for screens from this data set is bypassed.

Concatenate the data set that contains the authorized screens in your O2PROC DD statement. Note that the data set that contains the authorized screen libraries is not an APF-authorized data set.

Security checking resumes if one of these conditions occurs:

- The Classic Interface fetches a screen from an unauthorized library
- A screen is loaded into memory
- A user enters any keystroke including a cursor movement

Important: If you create an authorized screen library and if you use the Classic Interface menu system, checking security causes initialization to fail if one of these conditions occurs:

- The Classic Interface fetches a screen that contains an authorized command.

Therefore, the **.FGO** and **.VAR** commands should be unprotected.

- The Classic Interface fetches a screen space that is loaded into memory.

Screen @ZSCRNDF loads screen spaces into memory.

Format

The format of the **AUTHLIB** control statement is:

```
AUTHLIB=dsname,VOL={volume|NOVOLUME}
```

where *dsname* denotes the name of the authorized screen library that you have created.

Keyword

VOL

Always required.

Specifies the volume serial where the specified data set resides and serves as an additional security measure.

You can specify a volume serial number even if the data set is cataloged.

If you do not want the additional volume serial number checking to be performed, specify NOVOLUME.

COMMAND control statement

This control statement protects the name of a major, immediate, or INFO-line command of the Classic Interface. Minor commands are protected at the major command level unless the **MINOR** control statement is specified.

Purpose

When you update an INFO-line command, you must use the actual command name and not its alias. The Classic Interface automatically assigns the same protection attributes to all aliases of the command.

The Classic Interface does not check for multiple **COMMAND** control statements for the same command in the same run. It processes the last **COMMAND** control statements for the command.

Format

The format of the **COMMAND** control statement is:

```
COMMAND=
{cccc|.ccc|/cccccc}
[,LEVEL={0|1|2|3|DISABLE}]
[,EXTERNAL={YES|NO}]
[,AUDIT={WTO|SMF|BOTH|NONE}]
```

where *cccc*, *.ccc*, or */cccccc* is the name of the Classic Interface command that should be audited.

To have the control statement edit listing show the current security settings for a command, enter a **COMMAND=cccc**, **=.ccc**, or **=/cccccc** control statement without additional operands.

Keywords

LEVEL

Specifies the internal security level to be associated with this command.

Level 0

Allows the command to execute without an internal security check.

Levels 1, 2, and 3

Specify that the command executes only if you have previously entered the corresponding password for that level or for a higher level by using the **/PWD** INFO-line command.

DISABLE

Specifies that the Classic Interface should never execute the command.

You can audit attempts to execute the command for the session, but you cannot specify internal or external security.

EXTERNAL

Specifies if an external security package checks this command.

YES

The external security package checks the command unless you specify `LEVEL=DISABLE`.

If no exit routine is available, the Classic Interface disables the command for the session if the command security level is 0.

If the command security level is 1, 2, or 3, internal security is used by default.

NO

The external security package does not check the command.

If you change `EXTERNAL=YES` to `EXTERNAL=NO`, you must run the security update program before the change comes into effect.

AUDIT

Specifies if the Classic Interface audits the command when a user invokes it.

If you specify an audit for a disabled command, you are notified of attempts to execute it.

Possible values are:

NONE

Specifies that commands are not audited. This is the default setting.

WTO

Produces a one-line message on the master console.

SMF

Specifies that the Classic Interface writes an SMF record.

The SMF record must be specified in the **SMFNUM** control statement.

If the SMF audit cannot be performed, the Classic Interface uses a WTO audit by default.

BOTH

Specifies that the Classic Interface issues a WTO message to a console and writes an SMF record.

LIST control statement

This control statement specifies if the update program produces a security file listing.

Purpose

A security file listing is a complete record of the security table showing:

- The name of the authorized screen library
- Its volume serial number
- The name of the user exit module
- All command names along with their corresponding security information

You can specify only one **LIST** control statement per run.

Format

The format of the **LIST** control statement is:

```
LIST={YES|NO}
```

Keywords

YES

Generates the security file listing independent of edits to the control statements when submitted as the only control statement in the command stream.

NO

This is the default setting. Generates a listing that shows what the control statements and security information would look like if the update had taken place.

MINOR control statement

This control statement specifies the name of a Classic Interface minor command that should be protected.

Purpose

The Classic Interface protects the minor commands independently of the major commands. Therefore, any changes to minor commands apply to all minor commands with the same name and attributes, regardless of their major commands.

Access to a minor command requires access to the appropriate major command. If you do not specify an EXTERNAL keyword, the associated major controls access this minor command.

A minor command in a run is not checked for multiple **MINOR** control statements. The last **MINOR** control statement for the minor command takes effect.

Format

The format of the **MINOR** control statement is:

```
MINOR=cccc  
[,LEVEL={1|2|3|DISABLE}]  
[,EXTERNAL={YES|NO}]  
[,AUDIT={WTO|SMF|BOTH|NONE}]
```

Keywords

cccc denotes the name of the minor command that should be protected.

MODULE control statement

This control statement specifies the name of the module that contains your external security exit routine.

Purpose

You must specify this control statement to use external security.

The name of the module must be identical to the name of the load module that you specify in KO2ACF2A or KO2RACFA.

Format

The format of the **MODULE** control statement is:

```
MODULE=cccccccc
```

where cccccccc denotes the name of the module that contains your external security exit routine.

Usage notes

- No default value exists.
- To remove control from external security:
 1. Delete the value of MODULE=
 2. Run the security update job.
 3. Restart the Classic Interface.

PASSWORD control statement

This control statement specifies that the password for each internal security level must be used with the **/PWD** command.

Purpose

If you enter a valid password for a security level, the Classic Interface allows access to commands that have the same security level, and to commands that have a lower security level.

Requirements:

- The password must be one to eight characters long.
- Use a separate **PASSWORD** control statement for each security level.
- Use unique passwords for each security level.

If you assign the same password to more than one security level, the Classic Interface matches it at the lowest level and denies access to commands at higher levels.

The Classic Interface checks the password for a match in this order:

1. Level 1
2. Level 2
3. Level 3

Format

The format of the **PASSWORD** control statement is:

```
PASSWORD=password, LEVEL={1|2|3}
```

where *password* denotes the unique password for this level.

Keywords

LEVEL

Always required.

Specifies the security level that is associated with this password.

Levels 1, 2, and 3 specify that the command executes only if you have previously entered the corresponding password for that level or for a higher level through the **/PWD** INFO-line command.

RESET control statement

This control statement clears the current settings of the other control statements.

Purpose

Reset control statements remain unprotected unless you specify new settings with the appropriate control statements and rerun the update program.

You can use the **RESET** control statement only once per run.

Format

The format of the **RESET** control statement is:

```
RESET=ccccccc
```

where *ccccccc* denotes one of the keywords.

Keywords

ALL | YES

Clears settings for all control statements and all keywords in the security table for the Classic Interface.

AUTHLIB

Clears the name and volume serial number of the authorized library.

INFO

Clears settings for all INFO-line commands on the **COMMAND** control statement.

For example, if you do not want to use the default security levels for INFO-line commands and if you want to start again, enter RESET=INFO. This resets all LEVEL settings to security level 0 and clears any existing EXTERNAL and AUDIT settings for the INFO-line commands.

MAJOR

Clears settings for all major and immediate commands on the **COMMAND** control statement.

For example, if you do not want to use the default security levels for major and immediate commands and if you want to start again, enter RESET=MAJOR. This resets all LEVEL settings to security level 0 and clears any existing EXTERNAL and AUDIT settings for major and immediate commands.

MINOR

Clears settings for all minor commands.

MODULE

Clears the name of your exit routine module.

PASSWORD

Clears the internal passwords.

SLASH

Clears the record number for SMF audits.

SMFNUM control statement

This control statement specifies the ID number of the SMF record.

Purpose

The Classic Interface uses this SMF record for its audit.

The record ID number must be a unique number from 128 to 255 that you do not use for other applications.

A default value does not exist.

Format

The format of the **SMFNUM** control statement is:

```
SMFNUM=nnn
```

where *nnn* denotes the SMF record ID number.

UPDATE control statement

This control statement specifies if the Classic Interface updates the control statements during a run.

Purpose

The default is UPDATE=YES.

You can use the **UPDATE** control statement only once per run.

Format

The format of the **UPDATE** control statement is:

```
UPDATE={YES|NO}
```

Contents of the security file listing

The security update program creates a list of the control statement modifications. By using the **LIST** control statement, you can produce an additional listing that contains all security information, called security file listing.

The security file listing consists of:

- Header
- Control Statement Edit Listing
- Security File Listing
- Security Update Program Trace

Header

The header of the security file listing contains:

- The name of the data set where the load module resides
- The module name of the security table
- The OMEGAMON for Db2 Performance Expert version number in the format *XnnnCOM*, where *nnn* denotes the version number. For example, *X550COM* denotes OMEGAMON for Db2 Performance Expert 5.5.0.
- Messages indicating successful completion of the job or errors, such as a failure to open the SYSLIB data set or to read the security table.

```
OBSECUP 1.2-- SECURITY UPDATE PROGRAM--(c) IBM CORPORATION-- MM/DD/YY HH:MM
OB9261 OBSECUP BEGUN
OB9144 OBSELR00 CALLED TO READ 020CMDB
OB9148 SYSLIB DCB OPENED SUCCESSFULLY
OB9149 LIBRARY DSNAME IS: &rhilev.&rte.RKANMOD
OB9158 LOAD MODULE ID:
      OMCMDX
      X550COM
      MM/DD/YY HH:MM
OB9146 LOAD MODULE TEXT SUCCESSFULLY READ
OB9150 SYSLIB DCB CLOSED
OB9262 LOAD MODULE READ RETURN CODE IS 0000
```

Control Statement Edit Listing

The control statement edit listing contains a list of the control statements that have been edited. The list shows the previous contents and the new contents. It does not show previous passwords.

If the **UPDATE** control statement is specified as **UPDATE=YES**, date and time of the previous update is reported.

```

OBSECUP 1.2-- SECURITY UPDATE PROGRAM--(c) IBM CORPORATION-- MM/DD/YY HH:MM

*** CONTROL STATEMENT EDIT ***

AUTHLIB=&rhilev.&rte.RK02PROC,VOL=NOVOLUME
PREVIOUS CONTENTS =
NEW CONTENTS      = &rhilev.&rte.RK02PROC      NOVOLUME

*      CHANGE THE PASSWORD FOR LEVEL 3 COMMAND ACCESS
PASSWORD=IBM3,LEVEL=3
PREVIOUS CONTENTS = ***** NEW CONTENTS = IBM3

* DISPLAY SECURITY INFORMATION FOR THE PEEK COMMAND
COMMAND=PEEK
PREVIOUS CONTENTS = 3 B      NEW CONTENTS = 3 B

* DISPLAY SECURITY INFORMATION FOR MINOR JOBS
MINOR=JOBS
PREVIOUS CONTENTS = 0EW      NEW CONTENTS = 0EW

* PROTECT MZAP COMMAND
COMMAND=MZAP,LEVEL=3
PREVIOUS CONTENTS = 0      NEW CONTENTS = 3

* DISABLE CONS COMMAND
COMMAND=CONS,LEVEL=DISABLE,AUDIT=BOTH
PREVIOUS CONTENTS = 0      NEW CONTENTS = * B

*** END OF CONTROL STATEMENT INPUT ***

```

The codes for the previous and new contents of commands are positional. This list shows the valid positions:

1. The first position shows the number of the internal security level. If the command is not enabled, it shows an asterisk (*).
2. The second position shows the external security option.

E

Use external security for this command.

blank

A blank denotes no external security.

3. The third position shows the auditing option.

W

Audit this command by using WTO.

S

Audit this command by using SMF.

B

Audit this command by using WTO and SMF.

blank

A blank denotes no auditing.

Security File Listing

If you specify LIST=YES anywhere in the input stream, the security update program generates this information:

- A complete listing of the security information
- The name of the authorized screen library and its volume serial number
- The name of the external security user exit module
- The SMF record number
- All commands and their security information

```

OBSECUP 1.2-- SECURITY UPDATE PROGRAM--(c) IBM CORPORATION-- MM/DD/YY HH:MM
* * * SECURITY FILE LISTING * * *

AUTHLIB=&rhilev.&rte.RK02PROC          VOLUME=NOVOLUME

LEVEL1=***** LEVEL2=***** LEVEL3=*****
SMFNUM=233
MODULE=MYSECURE

COMMAND= /A          0          TYPE=S          (ALIAS)
COMMAND= /ABORT      0          TYPE=S
.
.
COMMAND= /AUP        0          TYPE= S
.
.
COMMAND= .AUP        0          TYPE= I
COMMAND= .DSA        0          TYPE= I
COMMAND= .SCC        *          TYPE= I
.
.
COMMAND= OCMD        3EB        TYPE= I
.
.
SECURITY TABLE LAST UPDATED ON MM/DD/YY HH:MM:SS

```

The commands are succeeded by the security level. An asterisk (*) indicates that a command is not enabled. Minor commands are listed below their corresponding major commands.

The **TYPE** field shows the following kinds of Classic Interface commands:

- C**
Major
- I**
Immediate
- S**
Slash (INFO-line)

Security Update Program Trace

The last part of the listing shows if an update has successfully completed.

```

OBSECUP 1.2-- SECURITY UPDATE PROGRAM--(c) IBM CORPORATION-- MM/DD/YY HH:MM

OB9145 OBSELW00 CALLED TO WRITE K020CMDB
OB9148 SYSLIB DCB CLOSED SUCCESSFULLY
OB9147 LOAD MODULE TEXT SUCCESSFULLY UPDATED
OB9150 SYSLIB DCB CLOSED
OB9269 K0BSUPDT ENDED

```

Updating the security table

You can update the security table for internal and external security.

About this task

To update the security table, perform these steps:

Procedure

1. Edit the control statements in the K02SUPDI member of *&rhilev.&rte.RKD2SAM*.

To edit the setting, specify a new one instead of blanking out the old one, especially when changing a command from EXTERNAL=YES to EXTERNAL=NO.

If you implement external security, perform these steps:

- a. Enter the **MODULE** control statement.

It denotes the load module that contains the exit routine.

- b. Indicate which commands should use external security by using the EXTERNAL=YES setting on the **COMMAND** control statements.

To remove control from external security, perform these steps:

- a. Blank out the keyword of the **MODULE** control statement.
- b. Change commands that are marked with EXTERNAL=YES to EXTERNAL=NO.

Otherwise, you cannot execute commands that are marked with an internal security level of 0.

2. Submit the job by using the KO2SUPD member of *&rhilev.&rte.RKD2SAM*.

KO2SUPD contains the JCL to run KOBSUPDT, which is the security update utility program. KOBSUPDT performs the updates to the security table. It generates a list of the edits and, if requested, a complete list of security information.

Successful completion of the job produces the message 0B9147 LOAD MODULE TEXT SUCCESSFULLY UPDATED

If the update program flags statements as incorrect, correct the statements and resubmit them.

3. Stop all Classic Interface sessions in an address space.

You must do this before the changed security table comes into effect because it is part of a reentrant load module. For example, if five Classic Interface sessions are active, you must stop them all before new Classic Interface sessions can use the updated security table.

4. Start a new Classic Interface session.

Results

The changes to the security table come into effect.

Examples

This example shows the provided sample JCL that you can modify according to the needs of your system.

It resides in the data set *&rhilev.&rte.RKD2SAM*(KOBSUPDT), where *&rhilev.&rte* is the high-level qualifier of your runtime environment.

```
//SECURITY JOB ,
//STEP1      EXEC PGM=KOBSUPDT,PARM=K02OCMDB
//STEPLIB    DD DSN=&rhilev.&rte.RKANMOD,DISP=SHR
//SYSLIB     DD DSN=&rhilev.&rte.RKANMOD,DISP=SHR
//SYSPRINT   DD SYSOUT=*
//SYSIN      DD DSN=&rhilev.&rte.SECEXITS(KO2SUPDI),DISP=SHR
//
```

where:

PARM=

Identifies the load module that contains the security table of the Classic Interface.

STEPLIB

Specifies the name of the load library where KOBSUPDT resides.

SYSLIB

Specifies the name of the library where K02OCMDB resides.

SYSPRINT

Specifies the print output for the reports that the security program produces.

SYSIN

Specifies the name of the data set that contains the control statements.

This example shows the control statements that are used to update the security table.

Member KO2SUPDI in the *&rhilev.&rte.SECEXITS* data set contains these control statements:

```
COMMAND=PEEK LEVEL=1
COMMAND=.DSA,LEVEL=3,EXTERNAL=YES,AUDIT=WTO
COMMAND=MLST,EXTERNAL=YES
COMMAND=XMZP,LEVEL=DISABLE,AUDIT=BOTH
COMMAND=XMLS,LEVEL=2
MINOR=JOBS,LEVEL=2
COMMAND=/SAVE,LEVEL=1,AUDIT=NONE
MODULE=MYSECURE
SMFNUM=233
LIST=YES
UPDATE=NO
```

The command control statements in this example result in these settings for the commands of the Classic Interface:

PEEK

A user who has specified the internal security level 1 password or higher can execute PEEK and its minor commands. The Classic Interface does not perform external security checking.

.DSA

The Classic Interface performs external security checking and writes a message on the master console when .DSA is invoked. If external security is unavailable, only a user who specifies the internal security level 3 password can execute .DSA.

MLST

The Classic Interface performs external security checking but no auditing.

XMZP

The command cannot be executed. The Classic Interface writes a message on the master console and writes an SMF record when XMZP is issued. There is no external security checking.

XMLS

A user who has specified either the level 2 or level 3 internal security password can execute XMLS.

JOBS

This is a minor command of the **PEEK** command. In the example, the **PEEK** is specified as a level 1 authorized command. The LEVEL=2 setting on the **JOBS** command specifies that only level 2 or 3 users can access it.

/SAVE

A user who has specified the level 1 password, the level 2 password, or the level 3 password can execute the **/SAVE** command. It is not audited.

The remaining command control statements in this example result in these settings:

MODULE

MYSECURE is the name of the module that contains the security exit routine.

SMFNUM

The SMF ID is set to 233.

LIST

YES indicates that the Classic Interface produces a listing.

UPDATE

NO indicates that the Classic Interface does not update the security table. This is a trial run.

Virtual terminal pool sharing considerations

Virtual terminal pool (VTPOOL) defines the virtual terminal pool from which the virtual terminal manager VTM1 uses a virtual terminal for each OMEGAMON for Db2 Performance Expert session. Usually, each installation of VTM1 includes a VTPOOL definition. You can, however, also share a VTPOOL definition among several VTM1 installations.

Requirement: You can launch the OMPE Classic User Interface from the OMPE TSO or ISPF interface. To provide support for OMEGAMON for Db2 Performance Expert sessions under more than one TSO or ISPF, you must install VTM1 in every VTAM domain that controls a TSO.

Sample network

For the VTPOOL sharing procedure that is described in this topic, it is assumed that the network looks like this:

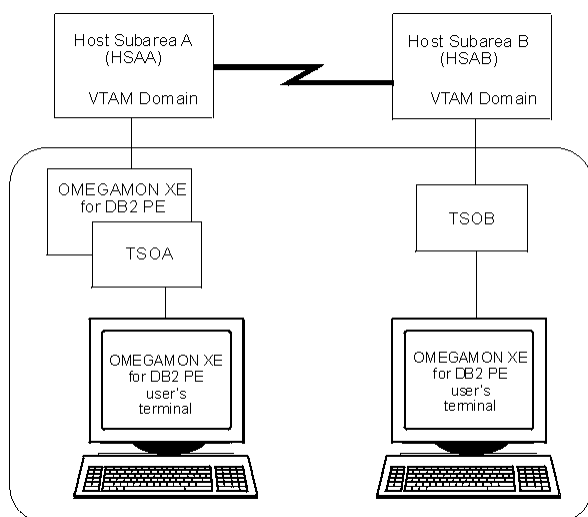


Figure 1. Sample network for VTPOOL sharing

In this example, there are two VTAM domains:

- Host Subarea A (HSAA)
- Host Subarea B (HSAB)

Host Subarea A runs OMEGAMON for Db2 Performance Expert and TSO (TSOA). Host Subarea B runs TSO (TSOB).

Assumptions are that:

- Users of OMEGAMON for Db2 Performance Expert who use ISPF or TSO mode must use the local TSO.
- A pool of ten virtual terminals is required for each host subarea.

This means that:

- Users whose terminals are controlled by VTAM domain HSAA must log on to TSOA.
- Users whose terminals are controlled by VTAM domain HSAB must log on to TSOB.

To share the VTPOOL definition, you must:

1. Define the VTPOOL to VMT1.
2. Define the VTPOOL to each VTAM.
3. Provide access to VTPOOL.

Define the VTPOOL to VMT1

To define the VTPOOL of ten virtual terminals to VMT1, use this \$VTAPPL statement:

```
$VTAPPL    APPL#:=10, VTAPPL=OBVTM1
```

Define the VTPOOL to each VTAM

To define the virtual terminals to each VTAM domain, define the local name and the network name separately.

Both names are defined in the VTAM APPL definition statement:

- The ACBNAME keyword defines the local name.

- The name field defines the network name.

In the following sample VTAM APPL definition statements, the HSAA network names are different from the HSAB network names. The local names for each virtual terminal are identical in both host subareas.

This example shows HSAA VTAM definition statements for Host Subarea A that correspond to the \$VTAPPL definition statement.

```

HSAAVTM1 VBUILD TYPE=APPL
HSAAVT01 APPL ACBNAME=OBVTM101,EAS=1
HSAAVT02 APPL ACBNAME=OBVTM102,EAS=1
HSAAVT03 APPL ACBNAME=OBVTM103,EAS=1
HSAAVT04 APPL ACBNAME=OBVTM104,EAS=1
HSAAVT05 APPL ACBNAME=OBVTM105,EAS=1
HSAAVT06 APPL ACBNAME=OBVTM106,EAS=1
HSAAVT07 APPL ACBNAME=OBVTM107,EAS=1
HSAAVT08 APPL ACBNAME=OBVTM108,EAS=1
HSAAVT09 APPL ACBNAME=OBVTM109,EAS=1
HSAAVT10 APPL ACBNAME=OBVTM110,EAS=1

```

This example shows HSAB VTAM definition statements for Host Subarea B that correspond to the \$VTAPPL definition statement.

```

HSABVTM1 VBUILD TYPE=APPL
HSABVT01 APPL ACBNAME=OBVTM101,EAS=1
HSABVT02 APPL ACBNAME=OBVTM102,EAS=1
HSABVT03 APPL ACBNAME=OBVTM103,EAS=1
HSABVT04 APPL ACBNAME=OBVTM104,EAS=1
HSABVT05 APPL ACBNAME=OBVTM105,EAS=1
HSABVT06 APPL ACBNAME=OBVTM106,EAS=1
HSABVT07 APPL ACBNAME=OBVTM107,EAS=1
HSABVT08 APPL ACBNAME=OBVTM108,EAS=1
HSABVT09 APPL ACBNAME=OBVTM109,EAS=1
HSABVT10 APPL ACBNAME=OBVTM110,EAS=1

```

Provide access to VTPOOL

To provide access to VTPOOL, you must:

1. Assemble and link-edit the VTPOOL definition statements to produce the module *&shilev.TKANSAM(KOBVTPL)*.
VTM1 uses this module at runtime to select a virtual terminal prior to starting a OMEGAMON for Db2 Performance Expert session.
2. Store the VTM1 execution-time modules including the link-edited module *&shilev.TKANSAM(KOBVTPL)* in a library on DASD that is shared by TSOA and TSOB users.

If this is not possible, you must use separate libraries with identical modules for both host subareas. You can, however, still perform VTPOOL maintenance from a single master library.

Modify VTPOOL definitions for TSO/ISPF mode

If you use TSO or ISPF mode and if your runtime environment does not share libraries with other runtime environments or with SMP/E, perform these steps:

1. Define your virtual terminals and LOGMODE names to the VTM1 program by updating RKANSAM data set member KOBVTPL.
2. Assemble and link the KOBVTPL source by using the JCL in RKANSAM data set member KOBVTPLX.
The resulting load module KOBVTPL is stored in the RKANMOD data set.
3. Update the following member and controls accordingly if you modified the terminal names or the number of terminals:
 - VTAM node list member KOBVT1AP in the RKANSAM data set
 - VTAMLIST controls

Gather information about your environment

The following describes information to gather while planning the OMEGAMON for Db2 PE configuration.

User interfaces

Gather information about the user interfaces you intend to use and note them down.

<i>Table 5. User interfaces of OMEGAMON for Db2 Performance Expert</i>	
User interfaces	
3270 user interfaces on the host	
Enhanced 3270 user interface	
Classic Interface	
ISPF Dialogs	
User interfaces on the workstation	
Performance Expert Client	
Tivoli Enterprise Portal	

Data set naming conventions

<i>Table 6. High-level qualifiers of the data sets</i>		
High-level qualifier	Description	Parameter name
High-level qualifier of configuration method working libraries	Used for the configuration method work libraries.	RTE_PLIB_HILEV
High-level qualifier for the SMP/E target libraries (&thilev)	The name of the target libraries of your SMP/E installation of the product.	GBL_TARGET_HILEV
High-level qualifier for VSAM and non-VSAM runtime libraries (&rhilev)	Used for allocating the runtime libraries. One set of runtime libraries contains the executable code (base libraries). A second set of libraries contains the configuration members that are unique for a particular LPAR. The runtime libraries are referenced by started tasks running on a z/OS image. You can specify two different high-level qualifiers for VSAM and non-VSAM data sets with a maximum length of 26 characters.	RTE_HILEV or RTE_VSAM_HILEV
High-level qualifier for work data sets allocated by the OMEGAMON Collector	Used by the OMEGAMON Collector for the allocation of additional work data sets (for example for Event Exception Processing or Performance Warehouse). This high-level qualifier is also used to allocate operational data sets, for example for Near-Term History data collection. You can specify two different high-level qualifiers for VSAM and non-VSAM data sets with a maximum length of 18 characters.	KD2_OMPE_VSAM_DSHLQ and KD2_OMPE_DSHLQ

Runtime environment parameters

The following table lists the key parameters that you specify for the runtime environment. Other values that you specify for the runtime environment are used to generate default values for the configuration of the product. You can overwrite the values during configuration of your runtime environments.

Table 7. Parameters required to configure a runtime environment

Runtime environment parameter	Description	Parameter name
Name of the runtime environment (mid-level qualifier)	Specify a name for your runtime environment. The runtime libraries that are allocated for this setup will use this name as mid-level qualifier in the data set names. If you enable system variable support, use the name of the LPAR that you run your initial tests on before rolling out the product(s) to other LPARs.	RTE_NAME
Type of runtime environment	Select the type of runtime environment that you want to use. If using Configuration Manager: <ul style="list-style-type: none"> • FULL • SHARING SMP/E If using PARMGEN: <ul style="list-style-type: none"> • FULL • SHARING SMP/E • SHARING with other runtime environments 	RTE_TYPE
Started task prefix for OMEGAMON address spaces	Specify a 4-character prefix according to the naming conventions on your system. It will be used to generate default values for the started tasks.	RTE_STC_PREFIX
Tivoli Enterprise Monitoring Server	Decide if you want to configure a Tivoli Enterprise Monitoring Server in this runtime environment. Your Tivoli Enterprise Monitoring Server can be configured in a different runtime environment on this LPAR, on a different LPAR or on one of the supported workstation platforms. For more information, see IBM Tivoli Monitoring documentation .	na
System variable support	Specify whether you want to enable system variable support. If system variable support is enabled, you can use z/OS system symbols as part of the VTAM applid names and other qualifying parameters.	RTE_SYSV_SYSVAR_FLAG
Fold password to upper case	Specify whether you want to enable mixed case password support. If you specify N, the passwords entered by the user will not be folded to upper case any more.	RTE_SECURITY_FOLD_PASSWORD_FLAG
Network ID	Specify the network ID used for VTAM communication.	RTE_VTAM_NETID
VTAM applid prefix	A four character prefix used for generating the VTAM applies for the components configured.	RTE_VTAM_APPLID_PREFIX

Basic configuration parameters

Table 8. Parameters required for the basic configuration		
Basic configuration parameters	Description	Parameter name
OMEGAMON Collector started task	Started task name for the OMEGAMON Collector.	GBL-DB2-KD2-CLASSIC-STC
Db2 load library	The name of the data set in which the Db2 load modules reside. Specify one Db2 load library for each Db2 subsystem version that you want to monitor.	KD2-OMPE-DB2LOADLIB-Vxx

Table 8. Parameters required for the basic configuration (continued)		
Basic configuration parameters	Description	P a r a m e t e r n a m e
Db2 run library	The name of the data set in which the Db2 RUNLIB load modules reside. Specify one Db2 run library for each Db2 subsystem version that you want to monitor. This library should contain the modules DSNTIAD and DSNTIAUL to be used to run in batch. The run library is used to generate GRANT and BIND jobs that prepare the Db2 subsystems for monitoring.	K D 2 - O M P E - D B 2 R U N L I B - V x x
Db2 exit library	The name of the data set in which the Db2 exit load modules reside that should be used by the OMEGAMON Collector. This parameter is only needed if you want to use a Db2 authorization exit.	K D 2 - O M P E - D B 2 E X I T

Table 8. Parameters required for the basic configuration (continued)		
Basic configuration parameters		P a r a m e t e r n a m e
OMEGAMON Collector plan/package owner	The OMEGAMON Collector plan/package owner is the USERID/ GROUPID that will be granted the authority to administrate the OMEGAMON Collector, for example to rebind the Db2 packages of the OMEGAMON Collector.	K D 2 - C L A S S I C - D B 2 P M - P L A N P K G - O W N E R

Db2 subsystem parameters

You need to specify the information listed in the following table for each Db2 subsystem that you configure. For Configuration Manager, use the DISCOVER action to generate an initial list of related parameters. For PARMGEN, use the Discovery Library Adapter function to generate an initial list of related parameters.

Table 9. Parameters required for each Db2 subsystem				
Db2 ID	Db2 version (for example: 12, 13)	MONITOR (Y or N)	TCP/IP port number (only if Performance Expert Client is used)	z/OS system ID (SMFID) that the Db2 runs on
<Db2_id>	<Db2_version>	<monitor_y_or_n>	<tcp_ip_port_number>	<zos_system_id>
<Db2_id>	<Db2_version>	<monitor_y_or_n>	<tcp_ip_port_number>	<zos_system_id>

Table 9. Parameters required for each Db2 subsystem (continued)				
Db2 ID	Db2 version (for example: 12, 13)	MONITOR (Y or N)	TCP/IP port number (only if Performance Expert Client is used)	z/OS system ID (SMFID) that the Db2 runs on
<Db2_id>	<Db2_version>	<monitor_y_or_n>	<tcp_ip_port_number>	<zos_system_id>

Configuration methods

You can use Configuration Manager or PARMGEN to configure your OMEGAMON for Db2 Performance Expert runtime environments.

We strongly suggest that you use Configuration Manager to configure your OMEGAMON for Db2 Performance Expert runtime environments and version 5.5.0 is a good time to move to Configuration Manager.

For a comprehensive reference of the parameters for this product, see the documentation entry [Parameter Reference](#) to look up the following information for each parameter:

- Parameter name and description
- Required or optional parameter for running the OMEGAMON for Db2 PE server
- Default value
- Minimum value (if the parameter type is numeric)
- Maximum value (if the parameter type is numeric)
- Permissible values (if the parameter type is list)
- Locations where the parameter is stored (the configuration member and the data set it is generated to)
 - Parameter name (the line that is written to the configuration member to store the value)

Configuration Manager

IBM zSystems Monitoring Configuration Manager, also known as Monitoring Configuration Manager or Configuration Manager, enables you to configure an OMEGAMON runtime environment from a set of parameters that you specify.

To learn how to use Configuration Manager see the following in *OMEGAMON shared documentation*:

- [Introduction to Configuration Manager](#)
- [Creating your first, minimal runtime environment](#)
- If you intend to move from PARMGEN to Configuration Manager with OMEGAMON for Db2 Performance Expert 5.5.0, see [MIGRATE](#).

PARMGEN

In PARMGEN, all product-specific parameters are stored in one PARMGEN profile. Parameters are grouped into sections, and each section contains the parameters for only one product or component. Additionally, all parameters start with *Kpp_* where *pp* is the product identifier.

Use PARMGEN to configure products as follows:

1. Complete a basic setup of an RTE.
2. Choose the products and components to configure.
3. Prepare the environment.
4. Configure products and components.
5. Finish the deployment.

You can find information on how to use PARMGEN in the following sources:

- [The PARMGEN configuration method](#)
- [Common PARMGEN - Implementation scenarios](#)
- [Common parameters](#)

Monitoring profile considerations

Configuration Manager and PARMGEN monitoring profiles specify which monitoring functionality is to be used for the different Db2 subsystems. Each Db2 subsystem is associated with a monitoring profile.

OMEGAMON for Db2 PE offers many functions that can be configured for each Db2 subsystem. In most cases however, the monitoring requirements for the different Db2 subsystems are not unique, which means that you can reuse one configuration for several Db2 subsystems. For example, in a development environment you might want to collect very detailed performance data to perform a sophisticated analysis, while in a production environment this level of detail is not needed and causes unnecessary overhead. So you would use one set of configuration values for the Db2 subsystems that are used for development and another set of configuration values for Db2 subsystems in production.

A monitoring profile is such a set of configuration values. It is independent of the Db2 subsystem. Each Db2 subsystem is associated with a monitoring profile to determine the monitoring functionality. Several Db2 subsystems can be associated with the same profile, independent of the LPAR they reside on. As a result, profiles are reusable for many different Db2 subsystems that have similar monitoring requirements across different LPARs, and you can do changes to monitoring profiles rather than re-configuring every single Db2 subsystem.

Note: The monitoring profile refers to the DB2 monitoring function parameters. This is not to be confused with the PARMGEN user profile that holds all product and component parameters.

DB2 subsystems and monitoring profiles can be distinguished by their parameter name, as follows:

- **KD2_DBnn** - Parameters for the DB2 subsystem configuration
- **KD2_PFnn** - Parameters for the monitoring profiles

nn is used to distinguish between different DB2 subsystem configurations and monitoring profiles. The first profile uses *01*, the second *02*, and so on. It is required to put all **KD2_DBnn/KD2_PFnn** parameters between starting and ending identifiers, as in the following examples.

Tip: Use the Configuration Manager DISCOVER function to discover the **KD2_DBnn** parameters you need for the configuration.

```

KD2_DB          START

KD2_DB01 . . .
. . .
KD2_DB02 . . .
. . .
KD2_DBnn . . .
. . .
KD2_DB          END
```

```

KD2_PF          START

KD2_PF01 . . .
. . .
KD2_PF02 . . .
. . .
KD2_PFnn . . .
. . .
KD2_PF          END
```

Preparing the system

Before configuring OMEGAMON for Db2 Performance Expert, you must install the program files, set up a first runtime environment, and ensure that your system fulfills the prerequisites for the components that you plan to use.

Installing OMEGAMON for Db2 Performance Expert program files

OMEGAMON for Db2 PE on z/OS is installed using SMP/E. You must apply the PTF for PH46145.

About this task

See the *Program Directory for IBM OMEGAMON for Db2 Performance Expert on z/OS* for detailed instructions.

Setting up security for the OMEGAMON Collector

The OMEGAMON Collector started task runs under a user ID. Therefore, you must create either a user ID or a group ID with the name DB2PM and connect the started task to this ID. Note that if you do not want to use Performance Warehouse, Db2 Connect Monitoring, or SQL Performance Analyzer, you can use a different started task user ID that is not DB2PM. In this case, perform the steps below with your started task user ID instead of DB2PM.

Before you begin

Ensure that you have sufficient privileges to create a new user ID or group ID in the security system that you are using, for example RACF.

About this task

Complete the following steps to create the user ID or group ID DB2PM and connect the OMEGAMON Collector started task to it:

Procedure

1. Create the user ID DB2PM in your security system.
If you prefer to use an alternative user ID other than DB2PM, create a group ID DB2PM and add the user ID that you want to use to the user group DB2PM.
2. Connect the OMEGAMON Collector started task to the user ID DB2PM.

Setting up TCP/IP services

The OMEGAMON Collector uses OpenEdition to perform TCP/IP services. If you plan to use Performance Expert Client, you must configure the OMEGAMON Collector to use TCP/IP services. This means that the user ID and the connected group ID of the OMEGAMON Collector must be known to OpenEdition and have sufficient OpenEdition privileges.

Before you begin

Perform this task only if you plan to use Performance Expert Client.

If you perform this task, ensure that you have system administrator privileges for your security system, for example RACF SPECIAL for RACF security.

About this task

OpenEdition can be used by user IDs that have a valid OMVS segment in the RACF user profile. Add the OMVS segment to the user ID of the OMEGAMON Collector by performing the following steps:

Procedure

1. Assign a UID in the OMVS segment to the RACF user profile of the OMEGAMON Collector user ID.

Issue the following command:

```
ALTUSER <OMEGAMON Collector user ID> OMVS(UID(0))
```

where *<OMEGAMON Collector user ID>* is the user ID that the OMEGAMON Collector started task is connected to.

Note: The usage of special TCP/IP services requires that the user ID of the OMEGAMON Collector has root privileges in OpenEdition. To minimize the impact of granting the OpenEdition root privilege, use a user ID for the OMEGAMON Collector started task that is not a valid TSO user ID.

2. Optional: If you connected the OMEGAMON Collector started task to a user ID and a group ID, you need to assign a GID in the OMVS segment to the group ID.

Issue the following command:

```
ALTGROUP <OMEGAMON Collector group ID> OMVS(GID(<gid>))
```

where *<OMEGAMON Collector group ID>* is the group ID that the OMEGAMON Collector started task is connected to. Replace *<gid>* with a valid and free group ID in OpenEdition. You can use the **LISTGRP OMVS** command of RACF to get an overview about the currently used group IDs in OpenEdition.

Setting up RRSF

OMEGAMON for Db2 PE uses Resource Recovery Services Attachment Facility (RRSAF) for connecting to Db2 subsystems.

About this task

Ensure that RRSF can be used on your system. Complete the following steps:

1. Ensure that the RRS subsystem is running on your system.
2. If you have not already established a profile for controlling access from the RRS attachment facility, define *<ssid>.RRSAF* (where *ssid* is the Db2 subsystem ID) in the resource class DSNR (the RACF resource class for Db2). This has to be done for each Db2 subsystem that you want to monitor. You can also define a generic resource RRSF. These profiles might already exist if, for example, stored procedures have been used before. Assign READ authority for this RACF profile to the OMEGAMON for Db2 PE Collector started task ID (userid).

Default and custom installations

This section shows you how to complete a default installation and customize functions of OMEGAMON for Db2 Performance Expert.

Configuring a default OMEGAMON for Db2 PE installation using Configuration Manager

Use Configuration Manager to create a default runtime environment for OMEGAMON for Db2 PE.

Before you begin

- Install the product using SMP/E.
- In *OMEGAMON shared documentation*, read [Creating your first, minimal runtime environment](#).

About this task

Typically, you'll enable only a few monitoring functions and add more later. After completing this task, you can use enhanced 3270 or Classic Interface to check performance of your Db2 subsystems on a specific LPAR.

Procedure

1. Copy and customize the job TKANSAM (KFJJMCM) to perform the CREATE action of Configuration Manager, then submit that job. The CREATE action creates a runtime environment definition library `rte_plib_hilev.RTEDEF` and populates that library with an initial set of parameters.

For details on the CREATE action, see [CREATE](#) in *OMEGAMON shared documentation*.

2. In the `rte_plib_hilev.RTEDEF` library, in the `RTEDEF(rte_name)` member, set the following parameters to Y:

- **CONFIGURE_TEMS_KDS** to configure a static hub monitoring server
- **CONFIGURE_DB2_AGENT_KD5** to configure a Db2 agent
- **CONFIGURE_E3270UI_KOB** to configure an enhanced 3270 user interface

3. In the `rte_plib_hilev.RTEDEF` library, in the `RTEDEF(rte_name)` member, set the following parameters for your environment:

- **RTE_STC_PREFIX**
- **RTE_VTAM_APPLID_PREFIX**
- **RTE_USS_RTEDIR**
- **RTE_TCP_PORT_NUM**
- (Optional) **RTE_X_STC_INAPF_INCLUDE_FLAG**

For more information on `RTE_*` parameters, see [Runtime environment \(RTE\) parameters](#) in *OMEGAMON shared documentation*.

4. In the `rte_plib_hilev.RTEDEF` library, in the `RTEDEF(GBL$PARM)` member, set the following parameters:

- **GBL_HFS_JAVA_DIR1**
- **GBL_DSN_DB2_DSNEXIT**
- Depending on your Db2 version, where (nn = 12, 13), configure **GBL_DSN_DB2_RUNLIB_Vnn** or **GBL_DSN_DB2_LOADLIB_Vnn**.

For more information on global `GBL_*` parameters, see [Global \(GBL\) parameters](#) in *OMEGAMON shared documentation*.

5. Submit a job that performs the DISCOVER action. The DISCOVER action discovers CICS regions, Db2 subsystems, IMS control regions, MQ subsystems, TCP/IP stacks, and system symbols, and then writes corresponding members to the RTEDEF library.

- Reuse the same JCL as before and change the program name in the JCL EXEC statement to KCIALPHA. KCIALPHA is an APF-authorized version of KCIOMEGA. APF-authorization enables the program to discover more subsystem details.
- Change the action to DISCOVER. DISCOVER creates several members in your RTEDEF data set. The member specific to OMEGAMON for Db2 PE is `RTEDEF(KD5@<1par>)`. This member contains all discovered Db2 subsystems on the LPAR that the JCL runs and populates the Db2 Configuration entries with discovered values and parameters. You do not need to change the discovered output for a default configuration.

For details on the DISCOVER action, see [DISCOVER](#) in *OMEGAMON shared documentation*.

6. Submit a job that performs the GENERATE action. The GENERATE action generates the runtime members for the runtime environment, including the started tasks. Reuse the same JCL as before, with the following changes:

- If you changed the program name to KCIALPHA for the DISCOVER action, change it back to KCIOMEGA before performing the GENERATE action.
- Change the action to GENERATE. The GENERATE action generates the runtime members for the runtime environment, including the started tasks.

For details, see [GENERATE](#) in *OMEGAMON shared documentation*.

7. Complete all steps in “Completing the configuration” on page 111 to complete configuration of the runtime environment outside of the configuration software.
8. Start your E3270 or Classic Interface by logging on using the default generated applies:
 - E3270: <STC-prefix>OBAP
 - Classic Interface: <STC-prefix>O2

Customizing OMEGAMON for Db2 Performance Expert functions

Use Configuration Manager to customize the default OMEGAMON for Db2 Performance Expert configuration by adding monitoring functions and features.

Configuring classic near-term history using Configuration Manager

Use Configuration Manager to configure near-term history in a runtime environment (RTE).

Before you begin

You must have a basic runtime environment definition created.

Procedure

1. Open the rte_plib_hilev.RTEDEF data set member KD5\$PARM. If the member does not exist, create one.
2. Add the following parameters to the member:
 - **KD2_PF01_PROFID** must match the profile ID you referenced in KD5@<1par> with parameter **KD2_DB01_DB2_PROFID**.
 - **KD2_PF01_HIS_START** enables the near-term history function.
 - **KD2_PF01_HIS_STORE** set to value 'VSAM' to store data collected by classic near-term history in VSAM data sets.
 - **KD2_PF01_HIS_LOG_NUM** specifies the number of VSAM data sets allocated by the GENERATE action.
 - **KD2_PF01_HIS_ACCTG_CLAS** specifies which ACCOUNTING Traces the near-term history collector starts and therefore what data is collected to the VSAM data sets.
 - (Optional) **KD2_PF01_HIS_VSAM_SU** and **KD2_PF01_HIS_VSAM_MB** set the size of the data sets. If you do not configure values, the default values are used.

The following example shows the parameters added to the member.

```
*
* Customizations for default monitoring profile P001
*
KD2_PF
BEGIN

KD2_PF01_ROW          01
KD2_PF01_PROFID       "P001"
KD2_PF01_HIS_START    Y
KD2_PF01_HIS_STORE    VSAM
KD2_PF01_HIS_LOG_NUM  10
KD2_PF01_HIS_VSAM_SU  CYLS
KD2_PF01_HIS_VSAM_MB  30
KD2_PF01_HIS_ACCTG_CLAS "1 2 3 7 8"
KD2_PF                END
```

To perform more complex configurations of your near-term history component, refer to [“Enabling Near-Term History”](#) on page 90.

3. Stop the started tasks for monitoring server, Tivoli OMEGAMON Manager (TOM), monitoring agents, and data collectors.
4. Run the GENERATE action using the JCL you created and customized to perform Configuration Manager actions.
5. Start the started tasks for monitoring server, TOM, monitoring agents, and data collectors to pick up the configuration changes.

Chapter 3. Installing components

This section shows you how to install several components.

Installing components on the workstation

In addition to the components on z/OS, OMEGAMON for Db2 PE also offers several components that run on the workstation.

Installing and configuring Performance Expert Client

Performance Expert Client provides real-time monitoring of a Db2 subsystem or Db2 data sharing group.

Hardware requirements for Performance Expert Client

Ensure that you meet hardware installation requirements for Performance Expert Client.

The minimum hardware requirements to install and run Performance Expert Client are:

- A personal computer or virtual machine with recent processor architecture
- 2 GB RAM
- 650 MB disk space in the installation directory for the installation files
- 400 MB temporary space for running the installation program
- A high-resolution display unit of 1024 x 768 or higher
- If you plan to use buffer pool object placement, consider the following additional memory requirements:
 - 60 MB for up to 1000 objects
 - 220 MB for up to 100 000 objects
 - 500 MB for up to 200 000 objects

where objects are table spaces and index spaces.

Recommendation: If you have installed only the minimum requirements, you should not run other applications at the same time.

Software requirements for Performance Expert Client

Performance Expert Client has several system and software prerequisites. Review these requirements to ensure that your environment is prepared for installation.

- One of the following Windows (x86-64) versions:
 - Windows 7 Professional Edition and Ultimate Edition including FDCC
 - Windows 8 Standard Edition, Professional Edition, and Enterprise Edition
 - Windows 8.1 Standard Edition, Professional Edition, and Enterprise Edition.
 - Windows 10 Standard Edition, Professional Edition, and Enterprise Edition.
 - Windows 11 Standard Edition, Professional Edition, and Enterprise Edition.
 - Windows Server 2008 Standard Edition, Enterprise Edition, and Datacenter Edition
 - Windows Server 2008 R2 Standard Edition, Enterprise Edition, and Datacenter Edition
 - Windows Server 2012 Standard Edition and Datacenter Edition
 - Windows Server 2016 Standard Edition and Datacenter Edition
 - Windows Server 2019 Standard Edition and Datacenter Edition
- The following data servers (Windows 64-bit) are supported for Db2 Performance Expert Client:

- IBM Db2 Enterprise Server Edition for Linux®, UNIX, and Windows version 10.5 up to 11.5
- IBM Db2 Workgroup Server Edition for Linux, UNIX, and Windows version 10.5 up to 11.5
- IBM Db2 Personal Server Edition for Linux, UNIX, and Windows version 10.5 up to 11.5
- IBM Db2 Connect Enterprise Edition for Linux, UNIX, and Windows version 10.5 up to 11.5
- IBM Db2 Connect Personal Edition for Linux, UNIX, and Windows version 10.5 up to 11.5
- IBM Db2 Connect Application Server Edition for Linux, UNIX, and Windows version 10.5 up to 11.5
- IBM Db2 Data Server Client version 11.5 or later
- If the Explain function is used:
 - IBM Data Server Manager V2.1.5
- TCP/IP installed on the workstation
- An updated version of a modern, secure web browser such as for Mozilla Firefox or Google Chrome.

Downloading the installer files

Db2 Performance Expert installer files are available online.

Procedure

Download instructions are available in the technote *OMEGAMON for Db2 PE/PM: web-based delivery and updates for Windows- and UNIX-based components* on the [IBM Software Support website](#). The available program build levels and fix descriptions are documented in the technote.

Installing Performance Expert Client using Installer files

After downloading the Performance Expert Client installer files, use the InstallAnywhere Wizard to begin installing the files.

Before you begin

Before installation:

- Verify that you have administration privileges.
- Download the Performance Expert Client program files.
- If you want to perform a silent installation, you must create a response file to record your installation steps.

Procedure

1. Extract the files and directories from the compressed installer file(s) into the installation directory, for example, C:\PROGRAMS\IBM\PECLIENT.
The archives contain the following files and directories:
 - db2pe.client.*.exe
 - iehs*win.jar
2. Run the *.exe file with administrative privileges.
With Windows 8 or later, ensure that you run the *.exe file in Windows 7 Compatibility mode.
3. Click **Next**.
The next setup window shows the License Agreement.
4. To install Performance Expert Client, click **I accept the terms of the license agreement**, then click **Next**.
5. Click **Performance Expert on z/OS**, then click **Next**.
6. Select the setup type that you prefer, then click **Next**.

In the subsequent window, you can specify the installation path.

7. To install the program files to the default destination folder, click **Next**. To install the program files to a different folder, click **Browse**, then select another folder.
8. Select whether to import a list of configured subsystems or whether to add them manually.
9. Check the summary information, then click **Install**.

The program files are copied to the specified destination folder and the next setup window opens. It shows summary information about the installation. It also shows the location of the log file.

10. Click **Finish** to exit the InstallAnywhere Wizard.

Installing Performance Expert Client silently using a response file

A silent installation runs without displaying an interface or prompting you for input. You can do silent installations of Performance Expert Client to simplify the process of installing it on multiple computers.

Before you begin

Before you install Performance Expert Client silently, you must first create a response file. A *response file* is a file that contains the properties and values that drive the installation. You create a response file by running the installation wizard or console mode with the following command-line option: `-r response_file_name`. When you complete the installation, the information that you entered in the installation wizard or console mode is recorded in the response file. You will use this file to install the product silently on other computers.

Procedure

1. From the directory of the installation image for Performance Expert Client, run the following command as Administrator:

On Windows 64-bit:

```
db2pe.client.*.install-on-win64.exe -i silent -f response_file_name
```

where *response_file_name* is the name of the response file that you created during a previous installation of the product.

Note: If you are on Windows 8, ensure that you run the *.exe file in Windows 7 Compatibility mode.

2. Verify that the installation was successful by checking the `db2pecli.log` installation log file in the following directory:
 - On Windows: `%USERPROFILE%` (For example: `C:\Documents and Settings\Administrator`)
3. Start the Performance Expert Client from the Windows **Start** menu or the created Desktop icon.

Setting up your environment for Performance Warehouse

Before you can access Performance Warehouse on z/OS from Performance Expert Client, you must have Db2 Data Server Runtime Client installed with the appropriate licenses to access Db2 for z/OS. With OMEGAMON for Db2 Performance Expert, you receive a limited license for this usage.

Procedure

1. Download the Windows 64-bit version 11.5 of Db2 Data Server Runtime Client at [*Download Db2 Fix Packs by version for Db2 for Linux, UNIX and Windows website*](#) or use the version packaged with Shop Z.
2. Install the downloaded Db2 Data Server Runtime Client.
3. Download the member FPEKCNLI from your TKO2WS01 SMPE/E library in binary format. Add the extension `.zip`. Extract the zip file, which contains a `.lic` and `.jar` file for the Data Server Runtime client version 11.5.

4. Locate the \consv_ee\db2\licence folder within the .zip file. Extract the .lic file to Program Files\IBM\SQLLIB and the db2cc_license_cisuz.jar file to \IBM\SQLLIB\java assuming you installed the Data Server Runtime Client in Program files\IBM\SQLLIB.
5. In Program Files\IBM\SQLLIB run the following command to register the license: **db2licm -a nnnn** where *nnnn* is the .lic file name you have extracted in the previous step. Double check with command **db2licm -l** that you have the necessary permanent license installed.
6. Before you can access your z/OS database, it needs to be added to your workstation's Db2 catalog. This is called a Database Alias. Enter db2cmd to start the Db2 Command Line Processor window from \IBM\SQLLIB. At the next prompt, type db2.
 - a) **CATALOG TCPIP NODE <node-name> REMOTE <host-name> SERVER <port-number> OSTYPE OS390** where port number is the port on which the Db2 subsystem is listening, not the port on which OMEGAMON is listening.
 - b) **CATALOG DATABASE <location-name> AS <alias> AT NODE <node-name> AUTHENTICATION SERVER**
 - c) **CATALOG DCS DATABASE <alias> AS <target-DB-name>**

Establishing a connection to the OMEGAMON Collector

Before you can use the Performance Expert Client, you must establish a connection to the OMEGAMON Collector by defining the Db2 subsystem. This allows the Performance Expert Client access to the performance data for this Db2 subsystem.

About this task

If there is a local firewall on the processor where the Performance Expert Client is installed, you must grant access for DB2PEClient.exe. Otherwise, the connection fails.

Procedure

1. Establish the connection.
 - a) Start the Performance Expert Client and go to **Monitor → New Db2 Subsystem**.
 - b) Select **Db2 on z/OS, OS 390** systems. Click **Next**.
 - c) In the **Host** field, enter the hostname where the OMEGAMON Collector is running.
 - d) In the **Port** field, enter the port for the OMEGAMON Collector. Click **Next**.
 - e) Click **Retrieve**.
The Wizard adds information about the Db2 subsystem to your configuration.
 - f) When prompted, enter a user ID and a password for a TSO user on the system where the OMEGAMON Collector is running.
If the retrieval fails, check the following and then click retrieve again.
 - Check that the OMEGAMON Collector is started.
 - Check that the TCP/IP port is correct.
 - Check that a firewall is not blocking your connection request.
 When retrieval is successful, the **Db2 System Properties** panel is displayed.
 - g) Optional: If you want to work with Performance Warehouse, specify the database alias on the **Performance Warehouse** tab, in the **Database alias** field, specify the database alias you created.
 - h) Click **Finish**.
2. Verify that the connection was successful.
 - a) Logon to the OMEGAMON Collector.
To do so, from the Db2 Performance Expert - System Overview window, right click on the server in the navigation tree in the panel on the left. Select **Logon**.

- b) Verify that the main functions for the Performance Expert Client are displayed in the middle panel of the window.

Configuring the Performance Warehouse Client

You can view information stored in the Performance Warehouse from the Performance Warehouse Client. If you want to use the Performance Warehouse Client, you must configure it first.

Before you begin

- You must install the Performance Expert Client before beginning.
- You must install Performance Warehouse on z/OS before beginning.

Procedure

1. Define a connection to the Db2 z/OS subsystem or data sharing group which hosts the Performance Warehouse database.
2. Configure the Performance Warehouse Client:
 - a) Start the Performance Expert Client.
 - b) Right click on the Db2 subsystem that contains the Performance Warehouse from the navigation tree in the left frame. Select **Properties**.
 - c) Select the **Performance Warehouse** tab, and in the **Database alias** field, enter the Database alias that you created or enter the appropriate JDBC T4 connection string. Click **OK**.
3. Start Performance Warehouse by choosing one of the Performance Warehouse options in the **Tools** menu.

Installing Tivoli Enterprise Portal

In this step, you install Tivoli Enterprise Portal, Tivoli Enterprise Portal Server, and IBM Eclipse Help Server on the workstation.

Before you begin

You must install and configure the IBM Tivoli Monitoring components on z/OS before installing and configuring Tivoli Enterprise Portal. See [“Enabling IBM Tivoli Monitoring” on page 81](#) for more information.

About this task

Because the entire OMEGAMON family of products uses the Tivoli Enterprise Portal, the installation instructions are available at [IBM Tivoli Monitoring documentation](#).

Workspaces and attributes

For information about predefined workspaces and attributes, see <https://www.ibm.com/docs/en/om-db2-pe/5.5.0?topic=tivoli-enterprise-portal>.

Adding Tivoli Data Warehouse

Configuration of your Tivoli Data Warehouse depends on the size of the environment, which database management systems you use, and which operating systems you use.

Before you begin

You must install and configure the IBM Tivoli Monitoring components on z/OS before adding Tivoli Data Warehouse. See [“Enabling IBM Tivoli Monitoring” on page 81](#) for more information.

About this task

You can use the Tivoli Data Warehouse to store collected performance information when you want to compare past Db2 activity or review trends.

Installation and configuration instructions are available in *Setting up data warehousing* in the Monitoring section of the [IBM Tivoli Monitoring documentation](#).

Summarization and pruning

Use summarization and pruning to customize the time required for saving data (*pruning*) and how often to compress data (*summarization*) in the Tivoli Data Warehouse.

OMEGAMON for Db2 Performance Expert supports configurable data summarization and data pruning. With summarized data, the performance of queries can be improved considerably. In addition, with data summarization and data pruning working together, the amount of disk space utilized can be better managed.

Summarization and pruning uses information that is stored in the data warehouse to generate, store, and prune data. The data in the data warehouse is a historical record of activity and conditions in your enterprise. Summarizing the data is the process of aggregating your historical data into time-based categories such as hourly, daily, weekly, and so on. You can summarize your data to perform historical analysis of the data over time.

Pruning data means that old data is deleted automatically, rather than manually. You can set pruning criteria to remove old data from the data warehouse to limit the size of your database tables.

Configuring summarization and pruning

Summarization and pruning allows you to customize the length of time for which to save data and how often to compress data. You can see and maintain the historical collections that have been configured for a monitored application and configure new collections.

Before you begin

Before you begin, ensure that you have started the following items:

- Tivoli Enterprise Monitoring Server
- Tivoli Enterprise Portal Server
- Tivoli Enterprise Portal
- Tivoli Enterprise Monitoring Agent

Procedure

1. From the **Edit** menu of the Tivoli Enterprise Portal, select **History Configuration**.
The **History Collection Configuration** window opens.
2. In the **Monitored Applications** pane, select **OMEGAMON for Db2 PE on z/OS**.
The **Select Attribute Groups** pane opens.
3. From the **Select Attribute Groups** column, select the name of the attribute group that you want to configure.
4. In the **Configuration and Controls** section, set the Summarization and Pruning options.
 - a) In the **Summarization** section, set the time period for data aggregation.
 - b) In the **Pruning** section, set the time period to prune data.
5. Click **OK** to save your changes and close the window.

Installing Performance Expert Agent for Db2 Connect Monitoring

You can use the installation wizard to install Performance Expert Agent for Db2 Connect Monitoring on your workstation or use a command line installation. You will also need to configure some components to successfully complete the installation.

Before you begin

Before you begin the series of installation tasks, ensure that you:

- Complete tasks in [“Enabling Performance Warehouse”](#) on page 103.
- Complete tasks in [“Enabling Performance Expert Agent for Db2 Connect Monitoring support”](#) on page 99.
- Complete tasks in [“Enabling Snapshot History”](#) on page 99.

About this task

The Performance Expert Agent for Db2 Connect Monitoring monitors connections of remote applications within the Distributed Relational Database Architecture (DRDA) of Db2 that are connected through Db2. The Performance Expert Agent for Db2 Connect Monitoring is installed on the Db2 Connect Server gateway and provides Db2 Connect data for the OMEGAMON Collector.

Configuration scenarios

With Db2 Connect Monitoring, you can monitor remote Db2 clients that connect through a Db2 Connect gateway. There are several ways to set up Performance Expert Agent for Db2 Connect Monitoring.

Db2 Connect Monitoring involves the OMEGAMON Collector and the Performance Expert Agent for Db2 Connect Monitoring. The Performance Expert Agent for Db2 Connect Monitoring, also called Db2 Connect Agent, collects information about the requests that are issued from the clients through the Db2 Connect gateway and makes it available for the OMEGAMON Collector. You can view the monitoring information with Tivoli Enterprise Portal, Classic Interface, OMEGAMON enhanced 3270 user interface, and Performance Expert Client.

You can configure one of two scenarios for the Performance Expert Agent for Db2 Connect Monitoring. You can configure it to report the Db2 Connect gateway information to each Db2 subsystem monitored by the OMEGAMON Collector, or you configure it to report the information to just one of the monitored Db2 subsystems. Both scenarios are described in more detail.

Scenario One

In scenario one, the Performance Expert Agent for Db2 Connect Monitoring reports all client requests that come through the Db2 Connect gateway to one Db2 subsystem. Use scenario one if you plan to use the Performance Expert Client for monitoring and want to monitor the Db2 Connect data for all Db2 subsystems from only the Db2 Connect gateway perspective, or if you need the detailed data for only one Db2 subsystem.

If the following conditions are met, the Performance Expert Agent for Db2 Connect Monitoring reports all requests issued to the Db2 Connect gateway to only one Db2 subsystem:

- Monitoring is enabled for only one Db2 subsystem. See [“Enabling a Db2 instance gateway to be monitored”](#) on page 58.
- When configuring, you enabled Performance Expert Agent for Db2 Connect Monitoring for only this one Db2 subsystem. See [“Installing Performance Expert Agent for Db2 Connect Monitoring”](#) on page 55.

In this scenario, the data you can access in the user interface is limited. If you are using Performance Expert Client, for example, and you select the Db2 subsystem you configured Db2 Connect Monitoring for, you can retrieve all information that you gathered on the Db2 Connect gateway for this Db2 subsystem. However, if you select another Db2 subsystem in Performance Expert Client, you will not see Db2 Connect data because the data is stored in the Performance Warehouse database for the one Db2 subsystem enabled for monitoring. The OMEGAMON Collector does not check this Performance Warehouse database when another Db2 subsystem is selected.

To view requests from all Db2 subsystems, do not select a specific Db2 subsystem in the Performance Expert Client and instead choose the Db2 Connect gateway. This view is available in only the Performance Expert Client, not in Tivoli Enterprise Portal or Classic Interface.

Scenario Two

In scenario two, the Performance Expert Agent for Db2 Connect Monitoring reports all client requests that come through the Db2 Connect gateway to all Db2 subsystems. In scenario two, you can select each of the Db2 subsystems in the monitoring user interface and access all data.

If the following conditions are met, the Performance Expert Agent for Db2 Connect Monitoring reports all requests issued to the Db2 Connect gateway to all Db2 subsystems:

- Monitoring is enabled for all Db2 subsystems that you want to monitor. See [“Enabling a Db2 instance gateway to be monitored”](#) on page 58.
- When configuring, you enabled Performance Expert Agent for Db2 Connect Monitoring for all Db2 subsystems. See [“Installing Performance Expert Agent for Db2 Connect Monitoring”](#) on page 55.

Installing Performance Expert Agent for Db2 Connect Monitoring on Windows

Performance Expert Agent for Db2 Connect Monitoring monitors connections of remote applications within the Distributed Relational Database Architecture (DRDA) of Db2. When Performance Expert Agent for Db2 Connect Monitoring is installed on the same system Db2 Connect is installed as a gateway, Performance Expert Agent for Db2 Connect Monitoring collects connection-related data, such as the connection status of a remote application, as well as statistics about Db2 Connect activities.

You'll need to complete configurations that register the OMEGAMON Collector and prepare DB2 Connect monitoring before starting it. Performance Expert Agent for Db2 Connect Monitoring stores the collected data in the Performance Warehouse database DB2PM on the host (referred to as *performance database*) that the OMEGAMON Collector resides on. OMEGAMON Collector correlates this data with the monitored DB2 activity. You can complete configurations that register the OMEGAMON Collector and prepare DB2 Connect monitoring with the graphical user interface or command line utility.

After configuring, you can start, stop, update, or remove Performance Expert Agent for Db2 Connect Monitoring.

Hardware requirements

You must meet the following minimum hardware requirements to install Performance Expert Agent on Windows.

- A personal computer or virtual machine with a recent processor architecture
- 1 GB RAM
- 150 MB disk space in the TEMP directory for the temporary program files used during the installation of Performance Expert Agent.
- The following disk space in the installation directory for the program files of Performance Expert Agent according to your operating system:
 - 320 MB
- 5 MB disk space in the working directory for log and ini files of Performance Expert Agent

The name of the working directory is

`C:\Program Files\IBM\IBM DB2 Performance Expert Agent V5\instances\<instance name>`

where <instance name> is the name of the Db2 subsystem on which Performance Expert Agent runs.

Software requirements

You must meet the following minimum hardware requirements to install Performance Expert Agent for Db2 Connect Monitoring on Windows.

- One of the following Db2 systems for Windows 64-bit:

- Db2 Enterprise systems:
 - Db2 Enterprise Server Edition V11.5 or later
- Db2 Connect systems:
 - Db2 Connect Application Server Edition V11.5 or later

To check the fix pack level of your Db2 installation, type **db2level** on the command line.

- TCP/IP installed on the workstation.
- Software programs to download files or code from z/OS, such as File Transfer Protocol (FTP) or IBM Personal Communications.

Passwords and Multi-factor authentication (MFA)

- The PE Agent supports password phrases.
- The PE Agent does not support multi-factor authentication. The MFA token for authentication is not stored so the PE Agent cannot be restarted automatically when using MFA.

Downloading program files

All program files and download instructions for Performance Expert Agent for Db2 Connect Monitoring are available online.

About this task

For details, see technote *OMEGAMON for Db2 PE/PM: web-based delivery and updates for Windows- and UNIX-based components* on the [IBM Software Support website](#). Available program build levels and fix descriptions are also documented in the technote.

Installing Performance Expert Agent program files

Complete these steps to install Performance Expert Agent or to migrate from a previous version of Performance Expert Agent.

Before you begin

- The name of the directory you install the program files from and the name of the directory you install to might not contain non-Latin-based characters.
- You need administration privileges and Db2 instance owner privileges.
- You must install Performance Expert Agent on the same system Database Connection Services (DCS) connections are performed.
- If you want to perform a silent installation for additional Performance Expert Agents, you must create a response file to record your installation steps. For detailed instructions on silent installation, see [“Installing Performance Expert Agent silently using a response file” on page 67](#).

Procedure

1. Extract the files from the compressed file(s). Ensure that all downloaded files are extracted.
2. Ensure that all of the installation files are in the same directory.

The installation package consists of these items:

- An installation launcher `db2pe.agent.*.install-on-win64.exe`
- The `iehs321win.jar` file that contains the help system files

The installation wizard starts, and the **IBM Db2 Performance Expert Agent V5 Setup** window opens.

3. Click **Next**.
4. Accept the **IBM Db2 Performance Expert Agent V5 Setup** License Agreement, and click **Next**.
5. Specify the installation directory for the program files. You can install to the default location, select a custom location, or overwrite files in a directory for a previous version.

6. Click **Install**.

The program files are copied to the directory you specified and the next **IBM Db2 Performance Expert Agent V5 Setup** window opens, summarizing the installation and location of the log file.

7. Click **Finish** to exit the installation wizard.

What to do next

You can now start the configuration GUI of **IBM Db2 Performance Expert Agent V5 Setup** at any time from the Windows **Start** menu in Performance Expert Agent.

Configuring Performance Expert Agent for Db2 Connect Monitoring from the user interface

To configure Performance Expert Agent for Db2 Connect Monitoring on Windows so that it monitors DB2 instances that serve as a gateway, you must complete several tasks within the Agent Configuration user interface.

Before you begin

Before you install the program files, ensure that you have the necessary privileges and that the users and user groups under which Performance Expert Agent for Db2 Connect Monitoring run are defined. The required privileges and user group requirements are as follows:

- To install the program files, you must have the following privileges:
 - Windows administrator rights.
 - Db2 instance gateway owner privileges. The Db2 instance user ID and password must be alphanumeric. White-space characters or multibyte characters are not allowed.
- The setup procedure can use only existing users and user groups.

If you do not want to use the default account db2admin but the option **Account from locally defined users**, ensure that one of the following conditions applies:

- The selected user has SYSADM authority in Db2 and the Windows right **Log on as service**.
- The selected user is a member of the Windows administrators group.

If none of these conditions applies, the selected user cannot start Performance Expert Agent for Db2 Connect Monitoring.

- One or more local Db2 instances that serve as a Db2 Connect gateway must be available.

Enabling a Db2 instance gateway to be monitored

After you install Performance Expert Agent for Db2 Connect Monitoring, you must enable monitoring of the local Db2 instances that serve as a Db2 Connect gateway.

Procedure

1. Open the Db2 Performance Expert Agent for Db2 Connect Monitoring Configuration window by clicking **Start > ProgramsIBM Db2 Performance Expert Agent V5 > Configure Using the GUI**.
 - The left pane shows the local Db2 instances that serve as a Db2 Connect gateway. Active Db2 instances that are available for monitoring are indicated with **(available)**.
 - If you have not yet configured a system for monitoring, the **Enable Monitoring** button is displayed in the right pane.
2. Select the Db2 instance that you want to monitor.
3. Click **Enable Monitoring**.
4. In the field **User ID**, enter the user ID of the administrator of the gateway.
5. In the field **Password**, enter the password for this user ID.
6. Click **OK**.

Defining a connection to the host performance database

You must add one or more performance databases to each enabled DB2 instance that Performance Expert Agent for Db2 Connect Monitoring stores collected data for. A performance database is the database on the host that has been enabled for Performance Warehouse.

Procedure

1. Open the **DB2 Performance Expert Agent for Db2 Connect Monitoring Configuration** window by clicking **Start → Programs → IBM Db2 Performance Expert Agent V5 → Configure Using the GUI**.
2. Select the DB2 instance for which you want to add a performance database.
3. Select **Add Database** from the **Selected** menu.
4. Complete all fields in the dialog box, then click **OK**.

For more information about the fields, see [Field description](#).

After you click **OK**, the dialog box closes and the updated information is shown in the right pane of the **DB2 Performance Expert Agent for Db2 Connect Monitoring Configuration** window.

Changing authorization for a performance database

For security purposes, you might have to change authorization settings for a performance database. You must make these changes also on Performance Expert Agent for Db2 Connect Monitoring to enable connection to the database.

Procedure

1. Open the **DB2 Performance Expert Agent for Db2 Connect Monitoring Configuration** window by clicking **Start → Programs → IBM Db2 Performance Expert Agent V5 → Configure Using the GUI**.
2. Select the DB2 instance that you want to change.
3. Select the performance database for which you want to change the authorization.
4. Select **Change Database Authorization** from the **Selected** menu.

The connection details are disabled, you can change only the user details.

5. Change the user ID, or the password, or both, then click **OK**.

If you change the user ID, the **User ID** column in the right pane shows the updated information.

Disabling a Db2 instance for monitoring

When you disable a Db2 instance, monitoring stops immediately. The Db2 instance remains in the list of registered Db2 instances.

Procedure

1. Open the Db2 Performance Expert Agent for Db2 Connect Monitoring Configuration window by clicking **Start > Programs > IBM Db2 Performance Expert Agent V5 > Configure Using the GUI**.
2. Select the Db2 instance that you want to disable.
3. Select **Disable Monitoring** from the **Selected** menu.
4. Click **OK**.

The selected Db2 instance is disabled for monitoring.

Removing a performance database

You might have to remove a performance database if the location of the OMEGAMON Collector changes or is no longer available.

Procedure

1. Open the **DB2 Performance Expert Agent for Db2 Connect Monitoring Configuration** window by clicking **Start → Programs → IBM Db2 Performance Expert Agent V5 → Configure Using the GUI**.
2. Select the DB2 instance for which you want to remove the performance database.

3. Select the performance database that you want to remove.
4. Select **Remove Database** from the **Selected** menu.
5. To confirm the removal, click **Yes**.

The performance database is removed from the right pane in the **DB2 Performance Expert Agent for Db2 Connect Monitoring Configuration** window.

Testing the connection to a performance database

After you add a performance database, you can test the connection to ensure that Performance Expert Agent for Db2 Connect Monitoring can store collected data in this database.

Procedure

1. Open the **DB2 Performance Expert Agent for Db2 Connect Monitoring Configuration** window by clicking **Start → Programs → IBM Db2 Performance Expert Agent V5 → Configure Using the GUI**.
2. Select the performance database that you want to test.
3. Select **Test Database Configuration** from the **Selected** menu.

If the test is not successful, you get an SQL error message.

Configuring Performance Expert Agent for Db2 Connect Monitoring using the command line utility

You can configure Performance Expert Agent for Db2 Connect Monitoring on Windows from the command line utility to monitor DB2 connect gateways for collecting data.

Before you begin

Before you install the program files, ensure that you have the necessary privileges and that the users and user groups under which Performance Expert Agent for Db2 Connect Monitoring should run are defined. To install the program files, you must have the following privileges:

- Windows administrator rights.
- DB2 instance owner privileges. The DB2 instance user ID and password must be alphanumeric. White-space characters or multibyte characters are not allowed.

If you do not want to use the default account db2admin but the option **Account from locally defined users**, ensure that one of the following conditions applies:

- The selected user has SYSADM authority in DB2 and the Windows right **Log on as service**.
- The selected user is a member of the Windows administrators group.

If none of these conditions applies, the selected user cannot start Performance Expert Agent for Db2 Connect Monitoring.

- One or more local DB2 instances that serve as a DB2 Connect gateway must be available.

Procedure

1. [“Registering the OMEGAMON Collector on Windows” on page 60](#)
2. [“Reusing the configuration file on Windows” on page 62](#)
3. [“Reactivating the connection mode on Windows” on page 62](#)

Registering the OMEGAMON Collector on Windows

Before Performance Expert Agent for Db2 Connect Monitoring can store the collected data, you must register the OMEGAMON Collector and prepare DB2 Connect monitoring.

Procedure

1. Log on to the workstation on which Performance Expert Agent for Db2 Connect Monitoring is installed.
2. Open a Command Prompt window.

3. Change to the bin folder of the installation directory.
4. Stop Performance Expert Agent for Db2 Connect Monitoring.
5. Enter one of the following commands on the command line depending on what you want to do.

- a) To add an OMEGAMON Collector that is located on z/OS to the e2e.ini file of Performance Expert Agent for Db2 Connect Monitoring, enter **e2e --addhost <host name> <DB2 port> <location name> <mainframe flag> <user login> <user password>**

Variable description:

<host name>

Denotes the network host name or IP address of the DB2 subsystem on which the registered OMEGAMON Collector runs.

<DB2 port>

Denotes the port number of the DB2 subsystem on which the registered OMEGAMON Collector runs.

<location name>

Denotes the location name of the DB2 subsystem on which the registered OMEGAMON Collector runs.

<mainframe flag>

Denotes whether the OMEGAMON Collector is located in a mainframe environment.

<user login>

Denotes the user ID of the user who has access to the DB2PM database in Performance Warehouse on the OMEGAMON Collector side.

<user password>

Denotes the password of the user who has access to the DB2PM database in Performance Warehouse on the OMEGAMON Collector side.

Important: You should not include the password in the --addhost command if it contains special characters because the command might not work with special characters. You are then prompted to enter the password afterwards on a separate line. You can include the following special characters in passwords, but they might not work on the command line: ! @ # \$ % ^ & () [] { } * . - _ / \ ? : ; , < > = ' " + |

- b) To change the user ID and password for a registered OMEGAMON Collector later, enter **e2e --change <number> <user login> <user password>**

where:

<number>

Denotes the number of the OMEGAMON Collector that you want to change the user login and password for.

<user login>

Denotes the user ID of the user who has access to the DB2PM database in Performance Warehouse on the OMEGAMON Collector side.

<user password>

Denotes the password that you want to change.

Important: You should not include the password in the --change command if it contains special characters because the command might not work with special characters. You are then prompted to enter the password afterwards on a separate line. You can include the following special characters in passwords, but they might not work on the command line: ! @ # \$ % ^ & () [] { } * . - _ / \ ? : ; , < > = ' " + |

- c) To see the numbers of all registered OMEGAMON Collectors, enter **e2e --listhosts**
- d) To remove the registration entry of an OMEGAMON Collector from the e2e.ini file of Performance Expert Agent for Db2 Connect Monitoring, enter **e2e --removehost <number>**

where:

<number>

Denotes the number of the OMEGAMON Collector that you want to remove the registration entry for.

- e) To test the connection to the registered server, enter **e2e --test <number>**
6. Ensure that the OMEGAMON Collector PE Server subtask is configured for snapshot history and Db2 connect monitoring.
- SNAPSHOTHISTORY=Y for Snapshot History processing
 - SHDB2CONNECTAPPLICATION=Y if you want to collect DB2 Connect application data
 - SHDB2CONNECTSYSTEM=Y if you want to collect DB2 Connect system data
7. When DB2 Connect monitoring is active for more than one server, ensure that only one of these servers accesses the collected data on the corresponding DB2 subsystem at a time.

You must consider this if one of these conditions applies:

- You use more than one OMEGAMON for Db2 PE.
- You use DB2 Performance Expert for z/OS and OMEGAMON for Db2 PE, or both, or several of both.
- You use OMEGAMON for Db2 PE in a data sharing group running on different logically partitioned modes (LPARs) in a sysplex environment.

Reusing the configuration file on Windows

Performance Expert Agent for Db2 Connect Monitoring uses the configuration file in the agent's working directory. Alternatively, you can reuse the `e2e.ini` configuration file of Performance Expert Agent for Db2 Connect Monitoring each time you install a new Performance Expert Agent for Db2 Connect Monitoring.

Procedure

1. Copy the `e2e.ini` configuration file that you want to reuse from the agent's working directory to another directory to store it there.
2. Install the new Performance Expert Agent for Db2 Connect Monitoring.
3. Copy the `e2e.ini` configuration file from the directory where you stored it to the new agent's working directory.

Reactivating the connection mode on Windows

If the host of the connection mode is in *paused* status, you can reactivate the connection in the `e2e.ini` configuration file. Refer to the **--change** command

About this task

Hosts in connection mode *paused* are shown in the log file and on the console after each start of Performance Expert Agent for Db2 Connect Monitoring.

The connection to the corresponding host is changed to *paused* in the `e2e.ini` configuration file if one of the following conditions applies:

- You specified the wrong user ID or password.

Procedure

1. View the paused flag using the command **e2e --listhosts**.
2. Reactivate the connection to the registered OMEGAMON Collector by changing the incorrect user ID or password using either the command **e2e --change** or by selecting the **Change** option in the user interface.

Starting Performance Expert Agent for Db2 Connect Monitoring on Windows

On Windows, you start Performance Expert Agent from the Windows Start Menu or from the Control Panel.

Procedure

1. Click **Start** → **Settings** → **Control Panel** → **Administrative Tools**.
2. Double-click **Services**.
3. Check that the **DB2 Performance Expert Agent for DB2 Instance (DB2)** service is started, where (DB2) denotes the DB2 instance on which Performance Expert Agent for Db2 Connect Monitoring runs.
If it is not started, right-click the corresponding service and click **Start**.
4. Optional: Configure the service to start automatically at system start.
 - a) Right-click the corresponding service and click **Properties**.
 - b) In the **Startup Type** list, select **Automatic**.

Stopping Performance Expert Agent for Db2 Connect Monitoring on Windows

On Windows, you stop Performance Expert Agent for DB2 Connect Monitoring from the Control Panel.

Procedure

1. Click **Start** → **Settings** → **Control Panel** → **Administrative Tools**.
2. Double-click **Services**.
3. Right-click **Performance Expert Agent for DB2 Connect Monitoring**.
4. Click **Stop**.

Testing Performance Expert Agent for Db2 Connect Monitoring

After updating, you can test Performance Expert Agent for Db2 Connect Monitoring.

Procedure

1. Ensure that Performance Expert Agent for Db2 Connect Monitoring is started.
2. Use Performance Expert Client to log on to a DB2 subsystem for which Performance Expert Agent for Db2 Connect Monitoring collects data about the connection status.
3. Verify that the data is collected.

Removing Performance Expert Agent for Db2 Connect Monitoring on Windows

You can remove Performance Expert Agent for Db2 Connect Monitoring from Windows

Procedure

1. Stop Performance Expert Agent for Db2 Connect Monitoring.
2. Click **Start** → **IBM Db2 Performance Expert Agent V5** → **Uninstall**.
The **Performance Expert Agent for Db2 Connect Monitoring Setup** window opens.
3. Click **Next**.
4. Check the summary information, then click **Uninstall**.
The program files are removed. You are asked if you want to remove the files that were not deleted from the installation directory.
5. To completely remove Performance Expert Agent for Db2 Connect Monitoring, click **Next**.
The files are removed and the next Performance Expert Agent for Db2 Connect Monitoring Setup window opens. It shows summary information and the location of the log file.
6. Click **Finish** to exit the InstallAnywhere Wizard.

Installing and configuring Performance Expert Agent for Db2 Connect Monitoring on zLinux

Performance Expert Agent for Db2 Connect Monitoring monitors connections of remote applications within the Distributed Relational Database Architecture (DRDA) of Db2. When Performance Expert Agent for Db2 Connect Monitoring is installed on the same system Db2 Connect is installed as a gateway, Performance Expert Agent for Db2 Connect Monitoring collects connection-related data, such as the connection status of a remote application, as well as statistics about Db2 Connect activities.

Hardware requirements for Performance Expert Agent on zLinux

Ensure that your system has enough resources. Check the RAM and available disk space.

The minimum hardware requirements for Performance Expert Agent are:

- 512 MB RAM
- The following disk space in a temporary directory for the temporary program files during the installation of Performance Expert Agent:
 - Linux on zSeries: 300 MB
- The following disk space in the installation directory for the program files and log files of Performance Expert Agent:
 - Linux on zSeries: 200 MB
- 5 MB disk space in the working directory for log and ini files of Performance Expert Agent

Software requirements for Performance Expert Agent for Db2 Connect Monitoring on zLinux

Performance Expert Agent for Db2 Connect Monitoring has the following system and software requirements.

The minimum software requirements to install and run Performance Expert Agent for Db2 Connect Monitoring on zLinux are:

- One of the Linux systems as shown in the following table:
 - Validated distributions are marked with *Validated*.
 - Distributions that are supported, but have not yet been validated are marked with *Supported*.
 - Unsupported distributions are marked with *Not supported*.

Table 10. Supported Linux systems	
Linux on zSeries 64-bit	
Validated	
Validated	
Validated	
Validated	

- One of the following Db2 systems:
 - Db2 systems:
 - Db2 Enterprise Server Edition version 11.5 or later
 - Db2 Connect systems:
 - Db2 Connect Enterprise Edition version 11.5 or later
 - Db2 Connect Application Server Edition version 11.5 or later
 - Db2 Connect Personal Server Edition version 11.5 or later

- TCP/IP installed on the workstation
- Software programs to download files or code from z/OS, such as File Transfer Protocol (FTP) or IBM Personal Communications

The following table shows which bit width Performance Expert supports for the Db2 instances on the supported platforms.

<i>Table 11. Platform support matrix</i>		
Operating system	32-bit	64-bit
Linux on System z	Not supported	Supported
Windows 2008 SP2	Not supported	Validated
Windows 2008 R2 SP1	Not supported	Validated
Windows 2012	Not supported	Validated
Windows 2016	Not supported	Validated
Windows 10	Not supported	Validated

Downloading the program files of Performance Expert Agent for Db2 Connect Monitoring on zLinux

The initial version and later fixes for the program files for Performance Expert Agent for Db2 Connect Monitoring are available online.

About this task

Download instructions are available in the Tech Note *OMEGAMON for Db2 PE/PM: web-based delivery and updates for Windows- and UNIX-based components* at [IBM Software Support website](#). A direct link to this Tech Note is included in the hold instructions of every Performance Expert Agent PTF on the host.

Installing the program files of Performance Expert Agent Version 5 on zLinux

Install Performance Expert Agent or to update from Performance Expert Agent.

Before you begin

- The name of the directory from which you install the program files and the name of the directory to which you install the program files, might not contain non-Latin-based characters or blanks.
- You must install Performance Expert Agent on the same system on which DCS connections are performed.
- If you want to perform a silent installation for additional Performance Expert Agents, you must create a response file to record your installation steps. For detailed instructions on silent installation, see [“Installing Performance Expert Agent silently using a response file” on page 67](#).
- If you want to run the installation wizard in GUI mode, ensure that you can run X applications.

Procedure

1. Log on as **root** and ensure that your umask is 022.
sudo is not supported.
2. Extract the file from the downloaded compressed file into one directory.
The installation package consists of the following item:
 - An installation launcher `db2pe.agent.*.install-on-zseries.bin`
3. Start the installation wizard in GUI mode or in console mode.

- To run the installation wizard in GUI mode, open a shell window and run the executable file that is appropriate for your operating system. The executable files have the following form:
 - `./db2pe.agent.*.install-on-zseries.bin`
- To run the installation wizard in console mode, enter the appropriate command for your operating system and append **-i console**.

./db2pe.agent.*.install-on-zlinux -i console

Note: To avoid problems with multiple versions of the script being present in the installation directory, you should use the original file name, replacing the * as appropriate.

Important: Installation path names might not contain blanks.

The program files are temporarily stored in a temporary directory. By default, the temporary directory is created in the home directory of the root user, for example, `/root`.

Important: If you specify a different temporary directory, program files are stored in the new temporary directory, and program scripts are stored in the default temporary directory. Therefore, you must ensure that both temporary directories have enough disk space.

To specify a different path name for the temporary directory, enter the command

export IATEMPDIR=<temp dir name>

where *<temp dir name>* is the name of the temporary directory.

The installation wizard starts, and the **IBM Db2 Performance Expert Agent V5 Setup** Welcome window opens.

4. Click **Next**.

The **IBM Db2 Performance Expert Agent V5 Setup** window shows the License Agreement.

5. Select **I accept the terms of the license agreement**, then click **Next**.

The next **IBM Db2 Performance Expert Agent V5 Setup** window opens.

6. Specify the installation directory for the program files.

This step depends on the task that you want to perform:

New installation: You install Performance Expert Agent Version 5 whereas no previous version is installed.

- If you install Performance Expert Agent Version 5 where no previous version is installed, take one of these steps:

- To install the program files to the default installation directory, click **Next**.

The name of the default installation directory is:

`/opt/IBM/db2peage/v5`

- To install the program files to a different directory, click **Browse**, select another directory, then click **Next**.

The next **IBM Db2 Performance Expert Agent V5 Setup** window opens.

7. Click **Next**.

The next **IBM Db2 Performance Expert Agent V5 Setup** window opens.

8. Check the displayed information, then click **Install**.

The program files are copied to the specified directory, then the next **IBM Db2 Performance Expert Agent V5 Setup** window opens. It shows summary information about the installation. It also shows the location of the log file.

9. Check the summary information, then click **Finish** to exit the installation wizard.

Installing Performance Expert Agent silently using a response file

A silent installation runs without displaying an interface or prompting you for input. You can do silent installations of Performance Expert Agent to simplify the process of installing it on multiple computers.

Before you begin

Before you install Performance Expert Agent silently, you must first create a response file. A *response file* is a file that contains the properties and values that drive the installation. You create a response file by running the installation wizard or console mode with the following command-line option: `-r response_file_name`. When you complete the installation, the information that you entered in the installation wizard or console mode is recorded in the response file. You will use this file to install the product silently on other computers.

Procedure

To install Performance Expert Agent silently by using a response file:

1. From the directory of the installation image for Performance Expert Agent, run the following command:

On Windows 64-bit:

```
db2pe.agent.*.install-on-win64.exe -i silent -f response_file_name
```

For Linux on zSeries:

```
db2pe.agent.*.install-on-zseries.bin -i -silent -f response_file_name
```

where *response_file_name* is the name of the response file that you created during a previous installation of the product.

2. Verify that the installation was successful by checking the `db2peage.log` installation log file in the following directory:
 - On Windows: **%USERPROFILE%** (For example: `C:\Documents and Settings\Administrator`)
 - On zLinux: `/var/log`
3. Start Performance Expert Agent:
 - [“Starting Performance Expert Agent for Db2 Connect Monitoring on zLinux” on page 71](#)
 - [“Starting Performance Expert Agent for Db2 Connect Monitoring on Windows” on page 63](#)

Configuring Performance Expert Agent for Db2 Connect Monitoring on zLinux

Performance Expert Agent for Db2 Connect Monitoring stores collected data in the Performance Warehouse database DB2PM on the host (referred to as performance database) the OMEGAMON Collector resides on. OMEGAMON Collector correlates this data with the monitored DB2 activity. You must register the OMEGAMON Collector and prepare DB2 Connect monitoring before starting it.

Consider the following restrictions before configuring Performance Expert Agent for Db2 Connect Monitoring on UNIX and Linux:

- When DB2 Connect monitoring is active for more than one server, only one of these servers should access the collected data on the corresponding DB2 subsystem at a time.
- When more than one Performance Expert Agent for Db2 Connect Monitoring is installed on one LPAR, the hub Tivoli Enterprise Monitoring Server can only accept monitoring data from one Performance Expert Agent for Db2 Connect Monitoring per LPAR at a time.

You must consider this if you use one of the following:

- More than one OMEGAMON for Db2 Performance Expert
- DB2 Performance Expert for z/OS and OMEGAMON for Db2 Performance Expert, or both, or several of both
- OMEGAMON for Db2 Performance Expert in a data sharing group running on different logically partitioned modes (LPARs) in a sysplex environment

Registering the OMEGAMON Collector on zLinux as root

Before Performance Expert Agent for Db2 Connect Monitoring can store collected data, you must register the OMEGAMON Collector and prepare DB2 Connect monitoring before starting it.

About this task

All information regarding the server registration is added to the configuration file `e2e.ini`. It is located in the directory `/var/db2pe/V3/<DB2 subsystem>`, where `<DB2 subsystem>` denotes the DB2 subsystem on which Performance Expert Agent for Db2 Connect Monitoring runs. You can reuse the configuration file that contains a list of registered OMEGAMON Collectors for other Performance Expert Agents for Db2 Connect Monitoring that you want to install.

Procedure

1. Log on directly as root via telnet or ssh, for example, or switch to root by entering **su -**
2. Change to the directory `/opt/IBM/db2peage/V5/bin`
3. Invoke the configuration script by entering **./db2peage-config**
4. Type the name of the DB2 instance for which you want to configure Performance Expert Agent for Db2 Connect Monitoring.
5. Select **Add a host to your Performance Expert Agent**.

This host is the DB2 system the OMEGAMON Collector runs on and contains the DB2PM database the collected data is stored on.

To add all OMEGAMON Collector now, select this option repeatedly.

6. Ensure that the following configuration for the OMEGAMON Collector PESERVER subtask is available before you start DB2 Connect monitoring.

SNAPSHOTHISTORY=Y

for Snapshot History processing

SHDB2CONNECTAPPLICATION=Y

if you want to collect DB2 Connect application data

SHDB2CONNECTSYSTEM=Y

if you want to collect DB2 Connect system data

7. When DB2 Connect monitoring is active for more than one server, ensure that only one of these servers accesses the collected data on the corresponding DB2 subsystem at a time.

You must consider this if you use one of the following:

- More than one OMEGAMON for Db2 PE
- DB2 Performance Expert for z/OS and OMEGAMON for Db2 PE, or both, or several of both
- OMEGAMON for Db2 PE in a data sharing group running on different logically partitioned modes (LPARs) in a sysplex environment

Registering an OMEGAMON Collector on zLinux as Db2 instance owner

As an alternative to registering OMEGAMON Collector using the script `db2peage-config`, you can register and unregister OMEGAMON Collectors at any time without root authorization.

Before you begin

- You must prepare instances for the Performance Expert Agent for Db2 Connect Monitoring before beginning. You can do this either by:
 - Having registered an OMEGAMON Collector by using the script `db2peage-config` as root.
 - Starting the `db2peage-config` configuration script to prepare the instances, but exit the script without actually having configured the server. This will prepare the instances for later configuration.
- If Performance Expert Agent for Db2 Connect Monitoring is started, you must stop it before you can issue any command.

About this task

All information regarding the server registration is added to the configuration file `e2e.ini`. You can reuse the configuration file that contains a list of registered OMEGAMON Collector for other Performance Expert Agents for Db2 Connect Monitoring that you want to install.

Procedure

1. Log on to the DB2 instance on which Performance Expert Agent for Db2 Connect Monitoring is installed.
2. Change to the BIN folder of the installation directory of Performance Expert Agent for Db2 Connect Monitoring.
3. Stop Performance Expert Agent for Db2 Connect Monitoring by entering **`./e2e --stop`**
4. Enter one of the following commands on the command line depending on what you want to do:
 - a) To add an OMEGAMON Collector that is located on z/OS to the `e2e.ini` file of Performance Expert Agent for Db2 Connect Monitoring, enter **`./e2e --addhost <host name> <DB2 port> <location name> <mainframe flag> <user login> <user password>`**

where the variables represent the following:

`<host name>`

the network host name or IP address of the DB2 subsystem on which the registered OMEGAMON Collector runs.

`<DB2 port>`

the port number of the DB2 subsystem on which the registered OMEGAMON Collector runs.

`<location name>`

the location name of the DB2 subsystem on which the registered OMEGAMON Collector runs.

`<mainframe flag>`

whether the OMEGAMON Collector is located in a mainframe environment.

For a z/OS environment, specify Y. For a multiplatform environment, specify N.

`<user login>`

the user ID of the user who has access to the DB2PM database in Performance Warehouse on the OMEGAMON Collector side.

`<user password>`

the password of the user who has access to the DB2PM database in Performance Warehouse on the OMEGAMON Collector side.

Important: You should not include the password in the `--addhost` command if it contains special characters because the command might not work with special characters. You are then prompted to enter the password afterwards on a separate line. You can include the following special characters in passwords, but they might not work on the command line:

`! @ # $ % ^ & () [] { } * . - _ / \ ? : ; , < > = ' " + |`

- b) To later change the user ID and password for a registered OMEGAMON Collector, enter **`./e2e --change <number> <user login> <user password>`**

where the variables represent the following:

`<number>`

the number of the OMEGAMON Collector for which user login and password are to be changed.

`<user login>`

the user ID of the user who has access to the DB2PM database in Performance Warehouse on the OMEGAMON Collector side.

`<user password>`

the password that is to be changed.

Important: You should not include the password in the `--change` command if it contains special characters because the command might not work with special characters. You are then prompted to enter the password afterwards on a separate line. You can include the following special characters in passwords, but they might not work on the command line:

! @ # \$ % ^ & () [] { } * . - _ \ / ? : ; , < > = ' " + |

- c) To see the numbers of all registered OMEGAMON Collectors, enter **`./e2e --listhosts`**
 - d) To remove the registration entry of an OMEGAMON Collector from the `e2e.ini` file of Performance Expert Agent for Db2 Connect Monitoring, enter **`./e2e --removehost <number>`**
where `<number>` denotes the number of the OMEGAMON Collector for which you want to remove the registration entry.
 - e) To test the connection, enter **`e2e --test <number>`**
5. Ensure that the following configuration for the OMEGAMON Collector PESERVER subtask is available before you start DB2 Connect monitoring:

SNAPSHOTHISTORY=Y

for Snapshot History processing

SHDB2CONNECTAPPLICATION=Y

if you want to collect DB2 Connect application data

SHDB2CONNECTSYSTEM=Y

if you want to collect DB2 Connect system data

6. When DB2 Connect monitoring is active for more than one server, ensure that only one of these servers accesses the collected data on the corresponding DB2 subsystem at a time.

You must consider this if you use one of the following:

- More than one OMEGAMON for Db2 PE
- DB2 Performance Expert for z/OS and OMEGAMON for Db2 PE, or both, or several of both
- OMEGAMON for Db2 PE in a data sharing group running on different logically partitioned modes (LPARs) in a sysplex environment

Reusing the configuration file on zLinux

You can reuse the `e2e.ini` configuration file of Performance Expert Agent for Db2 Connect Monitoring each time you install a new Performance Expert Agent for Db2 Connect Monitoring.

About this task

To reuse the `e2e.ini` configuration file, it must be located in the directory `/var/db2pe/V3/<Db2 instance>`, where `<Db2 instance>` denotes the name of the monitored Db2 instance that serves as a gateway.

Procedure

1. Copy the `e2e.ini` configuration file that you want to reuse from the home directory to another directory to store it there.
2. Install the new Performance Expert Agent for Db2 Connect Monitoring.
3. Copy the `e2e.ini` configuration file from the directory in which you stored it to the directory `/var/db2pe/V3/<Db2 instance>`, where `<Db2 instance>` denotes the name of the monitored Db2 instance that serves as a gateway.

When you start Performance Expert Agent for Db2 Connect Monitoring, it uses the configuration file in the directory `/var/db2pe/V3/<Db2 instance>`

Reactivating the connection mode on zLinux

If the host of the connection mode is in paused status, you can reactivate the connection in the `e2e.ini` configuration file.

About this task

Hosts in connection mode paused are shown in the log file and on the console after each start of Performance Expert Agent for Db2 Connect Monitoring.

The connection to the corresponding host is changed to paused in the `e2e.ini` configuration file if one of the following conditions applies:

- You specify the user ID or the password incorrectly.
- The password on the OMEGAMON Collector side is changed or expired.

Procedure

1. View the paused flag using the command **`e2e --listhosts`**.
2. Reactivate the connection to the registered OMEGAMON Collector by changing the incorrect user ID or password using the command **`e2e --change`**.

Starting Performance Expert Agent for Db2 Connect Monitoring on zLinux

Start Performance Expert Agent for Db2 Connect Monitoring on zLinux.

Procedure

1. Log on as the Db2 instance owner under which you want to run Performance Expert Agent for Db2 Connect Monitoring.
2. Change to the directory `<installdiragent>/bin`
where `<installdiragent>` denotes the installation directory of Performance Expert Agent for Db2 Connect Monitoring, for example, `/opt/IBM/db2peage/V5`
3. Enter **`./e2e --start`**.
To start Performance Expert Agent for Db2 Connect Monitoring as a background process, enter one of the following commands:
 - **`./e2e --start &`**
 - **`./e2e --start -bg`**

Stopping Performance Expert Agent for Db2 Connect Monitoring on UNIX and Linux

You can stop Performance Expert Agent for Db2 Connect Monitoring running on UNIX and Linux.

Procedure

1. Log on as the DB2 instance owner under which you want to run Performance Expert Agent for Db2 Connect Monitoring.
2. Change to the directory `<installdiragent>/bin`
where `<installdiragent>` denotes the installation directory of Performance Expert Agent for Db2 Connect Monitoring.
3. Enter the command **`./e2e --stop`**

Removing Performance Expert Agent for Db2 Connect Monitoring on UNIX and Linux

Remove Performance Expert Agent for Db2 Connect Monitoring from your UNIX or Linux system.

Procedure

1. Log on as the DB2 instance owner.

2. Change to the directory `<installdiragent>/bin`
where `<installdiragent>` denotes the installation directory of Performance Expert Agent for Db2 Connect Monitoring.
3. Stop Performance Expert Agent for Db2 Connect Monitoring.
4. Log on as root.
5. Enter `<installdiragent>/uninstall/uninstaller`
where `<installdiragent>` denotes the installation directory of Performance Expert Agent for Db2 Connect Monitoring.
6. Press Enter.
opens.
7. In the **InstallAnywhere Multiplatform Wizard**, select **Next** and follow the instructions.
8. Select **Finish** to complete the procedure.
9. Enter `rm -fr /<installdiragent>` to delete the installation directory of Performance Expert Agent for Db2 Connect Monitoring.

Installing Buffer Pool Analyzer

This information describes how to configure the component Buffer Pool Analyzer for z/OS (hereafter abbreviated to Buffer Pool Analyzer).

Configuration summary for Buffer Pool Analyzer

Follow the installation instructions in the Program Directory that is included with Buffer Pool Analyzer. After you install Buffer Pool Analyzer, you must configure the tool by using the instructions in this topic.

The SMP/E installation of Buffer Pool Analyzer is described in *Program Directory for IBM OMEGAMON for Db2 Performance Expert on z/OS*.

This topic describes how to configure the setup of Buffer Pool Analyzer. It also explains the mandatory or optional setup steps, and shows the corresponding authorizations that you need to perform each step.

The product image is installed from tape to the high-level qualifier hlqdb2pe. Before you start the configuration, you should create other data sets to which sample members are to be copied and where sample members are to be changed. This prevents your sample members from being overwritten, for example, when you install a program temporary fix (PTF).

Authorizations for a typical configuration

The following table indicates authorizations required to complete each step of a typical configuration.

Table 12. Required authorizations for setup steps	
Step	Authorization
“Granting Db2 privileges” on page 73	GRANT privileges and Db2 administration rights
“Binding Buffer Pool Analyzer packages for Db2” on page 73	<p>The following Db2 privileges:</p> <ul style="list-style-type: none"> • BINDADD • PACKADM on collection BPO540 • SELECT on the following catalog tables: <ul style="list-style-type: none"> – SYSIBM.SYSINDEXES – SYSIBM.SYSTABLESPACE <p>GRANT statements to support these authorizations are included in section 1 of the DDL member BPOYAUTH.</p>

Table 12. Required authorizations for setup steps (continued)	
Step	Authorization
“Binding Db2 plan” on page 74	The Db2 privilege BINDADD
“Reviewing security requirements” on page 74	<p>The following Db2 privileges:</p> <ul style="list-style-type: none"> • EXECUTE on the Buffer Pool Analyzer plan (K02PLAN) • MONITOR1 privilege • MONITOR2 privilege • TRACE and DISPLAY privilege • Resource Access Control Facility (RACF) administrator • PCF administrator <p>GRANT statements to support these authorizations are included in section 2 of the DDL member BPOYAUTH.</p>
“Changing the FPEJINIT EXEC” on page 74 “Configuring ISPF defaults ” on page 75 “Adding Buffer Pool Analyzerto your ISPF environment” on page 76	Authorizations required for these steps.

Granting Db2 privileges

Grant Db2 privileges for Buffer Pool Analyzer.

About this task

You must perform this task for each Db2 subsystem.

Procedure

1. Run section 1 of the DDL member BPOYAUTH.
2. Run the DDL member by using SQL Processor Using File Input (SPUFI) or an equivalent.
3. Ensure that the SQL return code is 0 and that a commit is performed.

Binding Buffer Pool Analyzer packages for Db2

Bind Buffer Pool Analyzer packages for Db2.

About this task

You must perform this task for each Db2 subsystem.

Procedure

1. Change the Db2 subsystem ID.
2. Change the Db2 high-level qualifier in the job BPOYBIND.
3. Run the job BPOYBIND.

Binding Db2 plan

Bind the Db2 plan for Buffer Pool Analyzer.

Procedure

For each Db2 subsystem, run the job BPOYPLAN.

Reviewing security requirements

Review your existing security definitions to ensure they match your system software and functions you plan to use.

About this task

GRANT statements to support these authorizations are included in section 2 of the DDL member BPOYAUTH.

Procedure

To work with the Host Online Monitor, set the following DB2 privileges:

EXECUTE

On the host online monitor plan (K02PLAN).

MONITOR1

Grants the privilege to obtain IFC data classified as serviceability data, statistics, accounting, and other performance data that does not contain potentially sensitive data.

MONITOR2

Grants the privilege to obtain IFC data classified as containing potentially sensitive data, such as SQL statement text and audit data. Note that users with MONITOR2 privileges have also MONITOR1 privileges.

TRACE and DISPLAY

For users who have to use the CRD function.

Changing the FPEJINIT EXEC

Procedure

1. Copy the FPEJINIT EXEC from the target library hlqdb2pe.TKO2SAMP into a library that is in your EXEC library concatenation.
2. Change the corresponding lines in this EXEC. They are at the beginning of the EXEC and are delimited by comments. These comments indicate the start and the end of the section that you can change.

```
checks = 1;  
rte_mode = 0;  
smpe_mode = 1;  
hlq2.1    = "hlq of SMP/E data sets";  
sclm_mode = 0;
```

where "hlq of SMP/E data sets" denote the names that you choose for the SMP/E target libraries.

For example, if the libraries start with SYS1.DB2BPA, change the statement in the following way:

```
hlq2.1 = "SYS1.DB2BPA"
```

3. Save the updated FPEJINIT EXEC.
4. Optional: Change the FPEJINIT EXEC after the installation verification procedure (IVP) completes successfully from checks = 1 to checks = 0.

5. Optional: If you want to use the Host Online Monitor, you must allocate the Db2 load library corresponding to the version and release number of the Db2 subsystem to be monitored to ISPLLIB. You can also have the library in a STEPLIB, JOBLIB, or the system LNKLIST concatenation.
6. To test this EXEC, perform the installation verification procedures as described in [“Verifying installation of Buffer Pool Analyzer”](#) on page 76.

Configuring ISPF defaults

BPOJVARs is a REXX EXEC in the library hlqdb2pe.TK02SAMP that you can use to configure defaults for the ISPF dialog.

Procedure

1. Enter the following command in ISPF option 6 (TSO Command Processor) to run the EXEC:

EXEC 'hlqdb2pe.TK02SAMP(BPOJVARs)'

The following panel shows the parameters.

```

BPOJ0PTS          IBM Db2 Buffer Pool Analyzer Customization

Complete fields as indicated, then press Enter.

Type requested names
z/OS subsystem name . . .      DGOV
Load library . . . . . 'BPO540.TKANMOD'

Select option with '/'
/ Load library is in the system LNKLIST concatenation

F1=Help          F2=Split          F9=Swap          F12=Cancel

```

2. Check the following parameters and configure them for your environment:

- z/OS subsystem name
- Load library name
- Load library in the system LNKLIST concatenation

3. Complete the panel fields and press **Enter**.

Message BPOJ0008 is displayed.

In the following example, the name of the load library is changed and the load library is in the system LNKLIST concatenation.

```

BPOJ0PTS          IBM Db2 Buffer Pool Analyzer Customization

Complete fields as indicated, then press Enter.

Type requested names
z/OS subsystem name . . .      DGOV
Load library . . . . . 'SYS1.TKANMOD'

Select option with '/'
/ Load library is in the system LNKLIST concatenation

F1=Help          F2=Split          F9=Swap          F12=Cancel

```

Adding Buffer Pool Analyzer to your ISPF environment

If you are working with ISPF and TSO systems, you can add Buffer Pool Analyzer as an ISPF application to your environment.

Procedure

1. Select a panel that is available to all users, for example, the ISPF/PDF main menu ISR@PRIM.
2. Change the panel for the application.

The associated ZSEL variable value for the application is CMD(%FPEJINIT).

3. Ensure that the new version of the FPEJINIT EXEC is available in the active EXEC library. FPEJINIT uses the TSO ALTLIB command to allocate and deallocate the EXEC library dynamically.

Adding Buffer Pool Analyzer to the Db2 Administration Tool launchpad

You have the option to add Buffer Pool Analyzer to the Db2 Administration Tool launchpad.

About this task

You must have system administrator privileges to perform this step.

Procedure

1. Edit the sample EXEC BPOADBI in the library hlqdb2pe.TKO2SAMP:
 - a) Set the high-level qualifier of Db2 Admin data sets.
 - b) Set the name of the CLSIT/EXEC library, which contains the ADBDMTI exec.
 - c) Specify the ISPF statement to invoke Buffer Pool Analyzer.
2. Execute the EXEC BPOADBI.

Buffer Pool Analyzer is added to the launchpad.

Installing Buffer Pool Analyzer Client

Install Buffer Pool Analyzer Client if you want to use the Buffer Pool Analyzer Client graphical user interface (GUI) .

From IBM OMEGAMON for Db2 Performance Monitor on z/OS version 5.4.0 or later, Buffer Pool Analyzer is no longer a standalone option and is delivered only as part of IBM OMEGAMON for Db2 Performance Expert on z/OS. For information, refer to [Installing and configuring Performance Expert Client](#).

Verifying installation of Buffer Pool Analyzer

After you complete the SMP/E installation, run the verification jobs shown in the following table.

Procedure

1. Run the following verification jobs.

Table 13. Buffer Pool Analyzer configuration jobs	
Job	Description
BPOYAUTH	Grant Db2 privileges for Buffer Pool Analyzer. Use the DDL member.
BPOYBIND	DB2 bind packages for Buffer Pool Analyzer.
BPOYPLAN	Db2 bind plan for Buffer Pool Analyzer.
BPOYAUTH	Review security requirements. Use the DDL member.

<i>Table 13. Buffer Pool Analyzer configuration jobs (continued)</i>	
Job	Description
BPOJIVPA	Verifies the configuration of Buffer Pool Analyzer. BPOJIVPA is located in data set <i>hlqdb2pe.TKO2SAMP</i> .

2. Move the updated FPEJINIT to a system EXEC or CLIST library so that users can access it.

Chapter 4. Configuring components

Topics in this section provide configuration best practices, and show you how to successfully configure components.

Configuring basic components on z/OS

The basic setup of OMEGAMON for Db2 PE covers the configuration of the OMEGAMON Collector, the configuration of the user interfaces, and the configuration of the monitoring functions that are enabled globally for all Db2 subsystems.

For more information on parameters referred to in these topics, see *Parameter Reference*. Though you can configure all parameters using Configuration Manager or PARMGEN, we recommend that you use Configuration Manager.

Configuring global control parameters and the OMEGAMON Collector

You must specify the global control parameters for the runtime environment that you created and configure the OMEGAMON Collector.

You must specify parameters to control specific rollout scenarios and to control the creation of Db2 related runtime members.

Enabling Db2 Event Exception Processing

Db2 Event Exception Processing alerts you when specific system events occur.

These events include deadlocks, timeouts, locks, escalations, and starts and stops of a coupling facility structure rebuild. To enable Db2 Event Exception Processing, set parameter **KD2_OMPE_DB2_EVENT** to Y.

Here is a list of the related parameters:

- KD2_OMPE_AUTH_FAIL
- KD2_OMPE_EDMP_FULL
- KD2_OMPE_THREAD_COMMIT
- KD2_OMPE_DEADLOCK
- KD2_OMPE_TIMEOUT
- KD2_OMPE_CF_REBUILT
- KD2_OMPE_GLOBAL_TRACE
- KD2_OMPE_DSN_EXTENT
- KD2_OMPE_EXTENT_THOLD
- KD2_OMPE_UR
- KD2_OMPE_LOGSPACE

Enabling CPU parallelism data collection

To collect query parallelism data for real-time and historical monitoring, enable CPU parallelism data collection.

To enable CPU parallelism data collection, set parameter **KD2_OMPE_CPU_PARALLEL** to Y.

The following parameter is related:

- KD2_OMPE_DSP_SIZE

Configuring Classic Interface

Classic Interface is always configured by default.

Here is a list of the related parameters:

- KD2_CLASSIC_VTAM_NODE
- KD2_CLASSIC_VTAM_APPL_LOG
- KD2_CLASSIC_UMAX
- KD2_CLASSIC_USER_PROFILE
- KD2_CLASSIC_LROWS
- KD2_CLASSIC_DB2ID_DEFAULT

Configuring ISPF Dialogs

ISPF Dialogs are always configured by default.

Enabling Performance Expert Client support

If you want to use Performance Expert Client, you must enable the host data collector started task to listen on a specific TCP/IP port.

The Performance Expert Client is a user interface that supports online monitoring and reporting, Performance Warehouse management, and buffer pool analysis on the workstation.

To enable Performance Expert Client to communicate with the data collector, set parameter **KD2_OMPE_PE_SUPPORT** to Y.

Here is a list of the related parameters:

- KD2_OMPE_TCPIP_NAME
- KD2_OMPE_TCPIP_ADDRESS
- KD2_OMPE_MAX_SESSIONS

After you have enabled Performance Expert Client support, you must complete the following tasks:

- Specify a separate port for each Db2 subsystem if the Performance Expert Client is enabled, otherwise there will be errors in the log. See [“Specifying Performance Expert Client port information”](#) on page 102.
- Ensure that the OMEGAMON Collector is configured to use TCP/IP services. See [“Setting up TCP/IP services”](#) on page 43 for detailed information.
- Install Performance Expert Client on the workstation. For Performance Expert Client, see [“Installing and configuring Performance Expert Client”](#) on page 49 for more information.

Creating secure JDBC connections for Performance Warehouse

Follow these steps to create a secure JDBC connection from your PE Client to Performance Warehouse.

Procedure

Edit the JDBC string to include the following parameters:

- sslConnection=true
- sslCertLocation=<certificate_location>

For example, for a system name **DS01** with a secure port **4000** and monitored Db2 subsystem **DB1A**, the JDBC string would be modified as follows:

```
jdbc:db2://DS01:4000/DS01DB1A:sslConnection=true;sslCertLocation=C:\\temp\\DB2.CERTAUTH.CERTB64
```

If you store your certificates in a TrustStore, then you must specify the following JDBC parameters (instead of `sslConnection` and `sslCertLocation`):

- `sslTrustStoreLocation=<truststore_location>`
- `sslTrustStorePassword=<password>`

For more information, see <https://www.ibm.com/docs/en/db2/11.5?topic=sqlj-data-server-driver-jdbc-support-ssl>

Enabling IBM Tivoli Monitoring

IBM Tivoli Monitoring (ITM) monitors and manages system and network applications and monitors the availability and performance of all parts of your enterprise. IBM Tivoli Monitoring also provides reports that you can use to track trends and troubleshoot problems.

IBM Tivoli Monitoring consists of the following components:

- Tivoli Enterprise Monitoring Agent. The Tivoli Enterprise Monitoring Agent for OMEGAMON for Db2 Performance Expert is the OMEGAMON Agent.
- Tivoli Enterprise Monitoring Server
- Tivoli Enterprise Portal Server
- Tivoli Enterprise Portal
- IBM Eclipse Help Server
- Tivoli Data Warehouse

To use IBM Tivoli Monitoring, you must install Tivoli Enterprise Monitoring Server, Tivoli Enterprise Monitoring Agent, and Tivoli Enterprise Monitoring Server application support. Additionally, you must install Tivoli Enterprise Portal, Tivoli Enterprise Portal Server, and IBM Eclipse Help Server on the workstation. Tivoli Data Warehouse is an optional component that is installed on the workstation.

For further information, see:

- Tivoli Enterprise Portal
- [“Installing Tivoli Enterprise Portal” on page 53](#)
- [IBM Tivoli Monitoring documentation](#)

Configuring Tivoli Enterprise Monitoring Server

The Tivoli Enterprise Monitoring Server collects performance data from monitored resources, preprocesses it, and then archives it in a central database. You need at least one Tivoli Enterprise Monitoring Server to be the HUB for your Tivoli Enterprise Portal environment.

About this task

If you have many monitored resources, you might also install remote Tivoli Enterprise Monitoring Servers to preprocess some of the data for the HUB Tivoli Enterprise Monitoring Server.

Enabling Tivoli Enterprise Monitoring Agent

The Tivoli Enterprise Monitoring Agent for OMEGAMON for Db2 PE is the OMEGAMON Agent.

About this task

When used with OMEGAMON for Db2 Performance Expert, the Tivoli Enterprise Monitoring Agent does not retrieve performance data. Instead, it connects with the OMEGAMON Collector so that the Tivoli Enterprise Portal infrastructure can access the performance data that is collected in the OMEGAMON Collector.

You can configure the Tivoli Enterprise Monitoring Agent as a stand-alone address space or as part of a Tivoli Enterprise Monitoring Server address space. To improve performance, you might want to configure the Tivoli Enterprise Monitoring Agent as a stand-alone address space.

Restriction: When more than one Tivoli Enterprise Monitoring Agent for Db2 is installed and running on the same LPAR connecting to the same hub Tivoli Enterprise Monitoring Server, the hub Tivoli Enterprise Monitoring Server can only accept data from one Tivoli Enterprise Monitoring Agent per LPAR at a time.

The instructions in this section describe how to configure a stand-alone Tivoli Enterprise Monitoring Agent in its own address space (that is on the same LPAR as the Tivoli Enterprise Monitoring Server).

Verifying that Tivoli Enterprise Monitoring Agent starts correctly

Before you install Tivoli Enterprise Portal, check that the Tivoli Enterprise Monitoring Server and the Tivoli Enterprise Monitoring Agent are configured correctly and that they connect to the other components correctly.

About this task

To verify that Tivoli Enterprise Monitoring Agent starts successfully, perform the following steps:

Procedure

1. Start the OMEGAMON Collector.
2. Start the Tivoli Enterprise Monitoring Server.
3. Start the Tivoli Enterprise Monitoring Agent.
4. Check the Tivoli Enterprise Monitoring Agent startup messages.
 - a) Verify that the Tivoli Enterprise Monitoring Server that is configured is correct.

This information is found in the RKLVLLOG in the following message:

```
(000B-DA3327CB:kbbssge.c,52,"BSS1_GetEnv") CT_CMSLIST="<protocol>:<TEMS>;"
```

where *<protocol>* is the communication protocol and *<TEMS>* is the name of the Tivoli Enterprise Monitoring Server.

- b) Verify that the Tivoli Enterprise Monitoring Agent connected to the Tivoli Enterprise Monitoring Server.

You can verify the connection with message RKLVLLOG:

```
(0001-DA300D6B:kraalog.cpp,442,"ctira_insert_log") KRAREG000,  
Connecting to CMS MM RTE:CMS., Producer(IRA Manager)
```

where *MM RTE:CMS* is the name of the Tivoli Enterprise Monitoring Server, and with the following message indicating a successful connection:

```
021.225 08:44:19.95 (0026-B56DC853:kraalog.cpp,692,"IRA_OutputLogMsg") Connecting to CMS  
MM RTE:CMS  
021.225 08:44:19.95 (0027-B56DC853:kraalog.cpp,475,"ctira_insert_log") KRAREG000,  
Connecting to CMS MM RTE:CMS, Producer(IRA_Manage  
021.225 08:44:19.95  
r)  
  
021.225 08:44:19.95 (0028-B56DC853:kraareg.cpp,1087,"ConnectToProxy") Successfully  
connected to CMS MM RTE:CMS using ip.pipe:#192.1  
021.225 08:44:19.95 68.54.83.16500.
```

- c) Verify that the Tivoli Enterprise Monitoring Agent connected to the OMEGAMON Collector.

This information is in the JESMSGLOG in the following message:

```
08.43.12 S0660303 K02I0189I AGENT Agent STC ATTEMPTING CONNECTION TO Agent STC  
VERSION V550 BY REQUEST - DB2 DB2SSID (D5CONN)  
08.43.13 S0660303 K02I0193I AGENT Agent STC CONNECTED TO Agent STC - DB2 DB2SSID  
(D5CONN)
```

where:

- *Agent STC* is the name of the Tivoli Enterprise Monitoring Agent started task.
- *OM Server STC* is the started task ID of server.

- *DB2SSID* is the Db2 subsystem ID.

If you do not see this message, verify that the OMEGAMON Collector started task name specified for the **KD5_AGT_STC** parameter.

- d) Verify that the Tivoli Enterprise Monitoring Agent connected to the OMEGAMON Collector.

This information is in the JESYSMSG of the OMEGAMON Collector in the following message:

```
K02I0154I D5API COLLECTOR IS CONNECTING TO DB2 DB2SSID
ON BEHALF OF AGENT Agent STC
```

where:

- *DB2SSID* is the Db2 subsystem ID.
- *Agent STC* is the name of the Tivoli Enterprise Monitoring Agent started task.

If you do not see this message, verify on the **SPECIFY CONFIGURATION PARAMETERS** panel that the OMEGAMON Collector started task name specified in the **KD5_AGT_STC** parameter is correct.

Configuring TEP features

You can configure Tivoli Enterprise Portal (TEP) features.

Accessing an OMEGAMON host session

When researching the cause of an alert, you may want to review conditions raised by an OMEGAMON product.

To access an OMEGAMON host session, use the *terminal emulator adapter* feature of Tivoli Enterprise Portal.

The terminal emulator adapter turns a view into a 3270 or 5270 interface so you can connect to any TN3270 or TN5250 host system (such as MVS or OS/400) using TCP/IP. The terminal emulator adaptor provides for simple terminal emulation. It also provides a scripting language interface that:

- Allows you to record (capture) a host session. As you interact with a host session, the session is recorded as a set of script commands that can be saved under a name you specify and played back at a later time. This allows you to automate navigation to a specific set of panels.
- Allows you to author complex scripts containing custom functions for manipulating host sessions.

History configuration

Use history configuration to configure history collection for OMEGAMON for Db2 Performance Expert.

The Collection Location must be set to TEMA for the following attribute groups::

- All threads
- Thread details
- Distributed thread details
- Thread enclave
- Detailed thread exception
- MVS storage

HTML navigation

The HTML navigation allows you to navigate from one workspace to another, while passing context information to the next workspace.

You can use the HTML navigation feature to navigate from one workspace to another, while passing context information to the next workspace. The workspaces that belong to the same functional unit are

linked using HTML navigation. Tivoli Enterprise Portal workspaces are grouped into the following units: Thread Summary workspaces, Thread Detail workspaces, and Statistics workspaces.

Adding HTML Links to the Existing HTML Navigation Structure

You can add new HTML links to the existing HTML navigation structure.

Procedure

1. Determine the name of the customized workspace that you want to add to the existing navigation structure. You find the workspace name in the title bar of the Tivoli Enterprise Portal window.
2. Determine the workspace ID that uniquely identifies the customized workspace. Enter the following SQL statement on the Tivoli Enterprise Portal Server database: `select OBJECTID from <TEPS database name>.KFWWORKSPACE where "NAME" like '<name of the new user-defined workspace>'`

In this SQL statement *<TEPS database name>* is the database name of Tivoli Enterprise Portal Server. Make a note of the OBJECTID, as it is needed later.

3. Choose a navigation category that you would like to add the new workspace link to. The available navigation categories are:
 - Statistic_Navigation
 - Thread_Detail_Navigation
 - Thread_Summary_Navigation
4. Open the file with file extension XML that defines all HTML links for the chosen navigation category. The name of the file is *<navigation category>.xml*. The path for this file is the following:
ITM base directory\CNB\classes\candle\kdp\resources\help\language locale\HTML_BrowserNavigation\version

where:

ITM base directory

Identifies the base directory of IBM Tivoli Monitoring

language locale

Identifies the language that is used. An empty language locale string represents the English language locale.

version

Identifies the current version: V540

5. Add a new `first_level_navigator` node. You can add the new node between any other existing `first_level_navigator` nodes. If you add the new node at the bottom of the file with file extension XML, the new HTML link shows up at the end of the HTML links list.
6. Make the following changes to the added `first_level_navigator` node: Set the name of your customized workspace as the new `caption_EN_US` value. Set the name of your customized workspace as the new `caption_NLS` value. Set the `target_workspace_objectid` to the OBJECTID that you have determined in Step “2” on page 84.

Parameter details:

- a) `caption_EN_US`: This property must be unique in the file with file extension XML. Therefore, choose a `caption_EN_US` name that does not exist yet in this file.
- b) `caption_NLS`: This xml node contains the link caption. The new workspace link gets its caption from here.
- c) `target_workspace_objectid`: This xml node defines the target workspace for the HTML link.
- d) `keep_symbols`: This parameter is important for context-sensitive navigation.
`keep_symbols` set to 'true' specifies that there is context information that must be passed along when linking to the workspace.

keep_symbols set to 'false' specifies that no context information that must be passed along when linking to the workspace.

Do not change this parameter.

7. To generate the files with file extension XML that are required for the HTML navigation in Tivoli Enterprise Portal, browse to the following directory:

*ITM base directory\CNB\classes\candle\kdp\resources\help\language
locale\HTML_BrowserNavigation\version*

where:

ITM base directory

Identifies the base directory of IBM Tivoli Monitoring

language locale

Identifies the language that is used. An empty language locale string represents the English language locale.

version

Identifies the current version: V540

8. Run the HTML_Navigation_Generator.bat.
9. Restart Tivoli Enterprise Portal.
10. Use the added HTML link to navigate to your customized workspace. The new customized workspace is displayed. But in the HTML navigation the wrong navigator item is highlighted. The new customized workspace is displayed and that navigator item should be the one that is highlighted.
 - a) To correct this, open the **Properties** dialog for the HTML navigation. In the "HOME" text field, change the file name of the file with file extension XML to the caption_EN_US value that you specified for the added HTML link.
 - b) In the file name, replace all blanks by underscores.
 - c) Click **OK**.
11. Click on the added HTML link again, and click **OK** when you are asked to save the workspace changes. Now the correct navigator item is highlighted when the new customized workspace is displayed in Tivoli Enterprise Portal.

Exception paths

About this task

One exception path is that you enter a wrong OBJECTID into the file with file extension XML (see Step "5" on page 84). This means that the identifier for the workspace that Tivoli Enterprise Portal should navigate to is wrong. The effect in Tivoli Enterprise Portal is that nothing happens when you click on that workspace link with the wrong OBJECTID in the HTML navigation view. There is no error message displayed on the Tivoli Enterprise Portal GUI, but Tivoli Enterprise Portal provides a trace log. You can navigate to the trace log using the **Manage Tivoli Enterprise Monitoring Services** dialog.

Results

In the trace log you find the following error messages that indicate the problem:

```
...
An error occurred requesting the workspace record for: REPORT, 117cae1a3ad
...
No workspace group was found for the given workspace type and id
At least one invalid parameter found, request has failed.
...
```

Here 117cae1a3ad is the wrong OBJECTID.

What to do next

You can correct the OBJECTID by either removing a typo or by determining the correct workspace ID of the new customized workspace (Step “2” on page 84).

Changing HTML Links to Point to User-Defined Workspaces

You can customize workspaces and change the corresponding HTML link to point to the user-defined workspace.

About this task

Procedure

1. Determine the name of the workspace link that you want to use in order to point to a user-defined workspace.
For example, you have created a customized Thread Wait Events workspace. Now you want to change the default Thread Wait Events HTML link to point to your customized Thread Wait Events workspace. In this case, the name of the workspace link that you want to change is Thread Wait Events.
2. Open the **Properties** dialog of the browser view of the HTML navigation browser and determine the navigation category that the workspace link belongs to. The available navigation categories are:
 - Statistic_Navigation
 - Thread_Detail_Navigation
 - Thread_Summary_Navigation
3. Navigate to your custom workspace that should become the new target of the HTML link. Determine the name of the new user-defined workspace that should be the new target for the link. You find the workspace name in the title bar of the Tivoli Enterprise Portal window.
4. Determine the workspace ID that uniquely identifies the new customized workspace. Enter the following SQL statement on the Tivoli Enterprise Portal Server database: `select OBJECTID from <TEPS database name>.KFWWORKSPACE where "NAME" like '<name of the new user-defined workspace>'`
In this SQL statement <TEPS database name> is the database name of Tivoli Enterprise Portal Server. Make a note of the OBJECTID, as it is needed later.
5. Open the XML file that defines all HTML links for the chosen navigation category. The name of the XML file is <navigation category>.xml. The path for this XML file is the following:
<ITM base directory>\CNB\classes\candle\kdp\resources\help\<language locale>\HTML_BrowserNavigation\V420
where <ITM base directory> is the base directory of IBM Tivoli Monitoring.
Remark: An empty language locale string represents the English language locale.
6. Search for the caption_NLS element that contains the name of the workspace link that you want to change. You have determined the workspace name in Step “1” on page 86.

```
<first_level_navigator>
  <caption_EN_US>Thread Wait Events</caption_EN_US>
  <caption_NLS>Thread Wait Events</caption_NLS>
  <target_workspace_objectid>1013a039535:420</target_workspace_objectid>
  <keep_symbols>true</keep_symbols>
</first_level_navigator>
```

7. Make the following changes: Set the caption_NLS to the name of your customized workspace that you have determined in Step “3” on page 86. Set the target_workspace_objectid to the OBJECTID that you have determined in Step “4” on page 86.

Parameter details:

- a) caption_EN_US: Do not change the text in this node as it is important for the proper function of the HTML navigation.

- b) `caption_NLS`: This xml node contains the link caption.
 - c) `target_workspace_objectid`: This xml node defines the target workspace for the HTML link. Set it to the OBJECTID determined in Step “3” on page 86.
 - d) `keep_symbols`: This parameter is important for context-sensitive navigation.
 - `keep_symbols` set to 'true' specifies that there is context information that must be passed along when linking to the workspace.
 - `keep_symbols` set to 'false' specifies that no context information that must be passed along when linking to the workspace.
 - Do not change this parameter.
8. XML files that are required for the HTML navigation in Tivoli Enterprise Portal are generated in this step. To generate these XML files, browse to the following directory:
`<ITM base directory>\CNB\classes\candle\kdp\resources\help\<language locale>\HTML_BrowserNavigation\V420`
where `<ITM base directory>` is the base directory of IBM Tivoli Monitoring.
9. Run the `HTML_Navigation_Generator.bat`.
10. Restart Tivoli Enterprise Portal.
11. The old HTML link caption has changed to the caption of the new customized workspace. When clicking on that customized workspace HTML link, Tivoli Enterprise Portal links to this new workspace.

Exception paths

About this task

One exception path is that you enter a wrong OBJECTID into the XML file (see Step “5” on page 86). This means that the identifier for the workspace that Tivoli Enterprise Portal should navigate to is wrong. The effect in Tivoli Enterprise Portal is that nothing happens when you click on that workspace link with the wrong OBJECTID in the HTML navigation view. There is no error message displayed on the Tivoli Enterprise Portal GUI, but Tivoli Enterprise Portal provides a trace log. You can navigate to the trace log using the **Manage Tivoli Enterprise Monitoring Services** dialog.

Results

In the trace log you find the following error messages that indicate the problem:

```
...
An error occurred requesting the workspace record for: REPORT, 117cae1a3ad
...
No workspace group was found for the given workspace type and id
At least one invalid parameter found, request has failed.
...
```

Here 117cae1a3ad is the wrong OBJECTID.

What to do next

You can correct the OBJECTID by either removing a typo or by determining the correct workspace ID of the new customized workspace (Step “3” on page 86).

Configuring monitoring profiles for Db2 subsystems

OMEGAMON for Db2 Performance Expert provides several optional z/OS components to help you analyze, monitor, and tune your Db2 subsystems.

About this task

You must add one or more monitoring profiles to configure the monitoring functionality that you want to use for the different Db2 subsystems. The monitoring profiles define the monitoring functionality that you want to use.

- For each Db2 subsystem, you must specify which monitoring profile it should use. Each profile can be used for one or more Db2 subsystems. You do this by associating the Db2 subsystem with a monitoring profile. For instructions, refer to [“Associating a Db2 subsystem with a monitoring profile”](#) on page 88.

You can configure as many Db2 subsystems as you like. However, the server only monitors the first 32 monitoring-enabled Db2 subsystems as listed in RKD2PRF(DB2PROF). To monitor more Db2 subsystems on a single LPAR you need to configure an additional OMPE Collector.

Note: Depending on the monitoring functions enabled and overall workload, the maximum number of subsystems that can be monitored might be less than 32.

- To configure Db2 subsystem-specific Performance Expert Client, refer to [“Specifying Performance Expert Client port information”](#) on page 102.
- To configure Performance Warehouse, refer to [“Enabling Performance Warehouse”](#) on page 103.

Associating a Db2 subsystem with a monitoring profile

You must associate each Db2 subsystem with a monitoring profile and build the Db2-related runtime members. The monitoring profiles define the monitoring functionality you want to use.

Procedure

1. Enter the profile ID from the **KD2_PFxx_PROFID** parameter to the **KD2_DBxx_DB2_PROFID** parameter. The default profile assigned to the Db2 subsystems is P001.
2. Specify which monitoring profile you want to apply for each Db2 subsystem.
3. Enter configuration information specific to each Db2 subsystem
4. Build the runtime members for the Db2 subsystem.

Configuring Object Volume Analysis

The Object Volume Analysis function reveals the effect of an application on overall disk access. This can help you balance the load and determine where Db2 data sets should be placed to reduce system congestion.

Procedure

Set parameter **KD2_PFxx_OA_ECM** to Y, which enables the base event collection needed to collect Object volume related information.

You can configure the following additional configuration parameters for Object Analysis:

- **KD2_PF01_OA_WAIT**
- **KD2_PF01_OA_START**
- **KD2_PF01_OA_THREAD**
- **KD2_PF01_OA_INTV**

Note: Do not set **KD2_PF01_OA_START** to Y unless your system has sufficient CPU space. If not, use the real-time control options to activate Object Analysis collection as needed. For more information, see [“Evaluating the cost of Object Analysis”](#) on page 123.

Verifying the Object Volume Analysis configuration

To verify that the server accepted the parameter configuration, check the OMEGAMON Collector JESMSGLOG output.

Before you begin

Before you test the setup of Object Volume Analysis, ensure that you have completed the product setup, so that you can start the OMEGAMON Collector.

Procedure

1. Start the OMEGAMON Collector.
2. In SDSF, open the JESMSGLOG output of the OMEGAMON Collector started task.
3. Review the JESMSGLOG.

You should see the output similar to the following:

```
...
K02E3000I EVENTMGR INITIALIZATION IN PROGRESS
K02E3001I EVENTMGR INITIALIZATION SUCCESSFUL
...
K02E3070I OBJECT ANALYSIS - INITIALIZATION IN PROGRESS FOR DB2=D824
K02E3050I OBJECT ANALYSIS - PHASE1 INITIALIZATION COMPLETE FOR DB2=D824
...
K02E3051I OBJECT ANALYSIS - PHASE2 INITIALIZATION COMPLETE FOR DB2=D824
...
K02E3071I OBJECT ANALYSIS - INITIALIZATION SUCCESSFUL FOR DB2=D824
```

Messages K02E3000I and K02E301I indicate that the Event Collection Manager is configured and is starting.

Messages K02E3070I, K02E3051I, and K02E3071I indicate that the Object Analysis support is configured and is starting.

Enabling Periodic Exception Processing

Periodic Exception Processing analyzes system metrics and compares them against predefined thresholds, user-defined thresholds, and application metrics. When a threshold is exceeded, an event exception is shown. If you configure Periodic Exception Processing, the function is started automatically at startup of the OMEGAMON Collector.

About this task

You can use Periodic Exception Processing in the following ways:

- Configure Periodic Exception Processing. In this case, the function is started automatically at startup of the OMEGAMON Collector. One common set of threshold definitions is used for all users.
- Start Periodic Exception Processing manually after you start Performance Expert Client. In this case, you do not need to configure the function. You can define a set of threshold definitions for each user ID.
- You can use the Exception Processing user exit that issues messages to the operator console in case of exceptions.

Procedure

Set parameter **KD2_PFxx_AEXCP_D2PYACT** to Y.

What to do next

1. After you configure the component, allocate operational data sets. See [“Completing the configuration” on page 111](#).

2. In addition, you must provide threshold definitions in the threshold data set. Before you can use Periodic Exception Processing, you must allocate additional runtime data sets first to allocate the Threshold Exception data set, and then copy the default threshold definitions. For more information, see the *Tivoli OMEGAMON for Db2 Performance Expert on z/OS Reporting User's Guide*.

Enabling Near-Term History

Near-Term History captures and stores recent Db2 instrumentation data so that you can review thread performance after the threads have ended. Near-Term History is available through the Classic Interface and OMEGAMON enhanced 3270 user interface.

Procedure

Set parameter **KD2_PFxx_HIS_START** to Y or C.

You can use variable **%DB%** for the Db2 subsystem ID or variable **%SY%** for the system ID in the VSAM data set names. Variable **%DB%** will be replaced by the Db2 subsystem ID for the allocation of the data sets, and variable **%SY%** will be replaced by the z/OS system ID that you configured.

Near-term history data collection options

This topic provides an overview of the near-term history data collection options member of RKD2PAR.

Related parameters

For more information about the **KD2_PFnn_HIS** parameters that control the history behavior in your environment, refer to 'KD2_PFnn_HIS - History' in the *Parameter Reference*.

For more information about the **KD2_PFnn_THRDHIS** parameters that control the thread history behavior in your environment, refer to 'KD2_PFnn_THRDHIS - Thread history' in the *Parameter Reference*.

Options

Data collection options determine the behavior of a Near-Term History Data Collector and the amount of data being collected.

For each Near-Term History Data Collector, a data set member `rHilev.RKD2PAR(COPTcccc)` where `cccc` specifies the Db2 subsystem identifier) is generated that holds the data collection options. Collection options members for specific Db2 subsystems can be created and invoked at startup of a Near-Term History Data Collector. Collection options in a `COPTcccc` data set member are specified by keywords and associated keyword values. Basically, keywords and values specify and limit the data to be collected by the Near-Term History Data Collector.

Generally, configurations you make to near-term history parameters generate collection options members. Nevertheless, a collection options member for a specific Db2 subsystem can also be created by copying an existing collection options member or the default member `rHilev.RKD2PAR(COPTcccc)` and modifying the collection options in the copied member. Before you do this, ensure that you make backups of the member as configurations you make might overwrite existing members.

COPTcccc Keyword syntax and considerations

Keywords in a collection options member are used in the following ways:

- `Keyword(value)`
- `Keyword(value,value,...)`
- `Keyword(value_value_...)`

If a keyword accepts only one value, enter the value in parentheses after the keyword. If a keyword accepts multiple values, enter the values in parentheses after the keyword and separate the values by commas or spaces.

The NOT operator (¬) negates value specifications. For example, CONNID (¬IM3D, ¬I210) specifies that the Near-Term History Data Collector should collect data about all connection identifiers except for IM3D and I210.

The asterisk (*) wildcard character can be used at the end of value specifications. For example, PLAN (ABCD*) specifies that the Near-Term History Data Collector should collect data about all plans with names that begin with ABCD.

The question mark (?) wildcard character can be used as a single character replacement within value specifications. For example, DB2ID (D??T) specifies that the Near-Term History Data Collector should collect data about all Db2 subsystems with names that begin with D, followed by two variable characters, and end with T.

If you must continue statements in an COPTcccc member on another line for keywords such as AUTHID, CONNID, CORRID, ORIGAUTH, or PLAN:

- Do not use a continuation character. This means, do not repeat a "Keyword(" entry on the next line.
- Do not start the continuation line in column 1. Only keywords should begin in column 1, as in the following example:

```
PLAN(¬DSNG* ¬DSNTI* ¬FINAN1 ¬FINAN2 ¬DSNG*  
  ¬¬DSNZZ ¬FINAN3 ¬FINAN4 ¬DSNR* ¬DSNRR*  
  ¬¬FINAN5 ¬FINAN6)
```

Verifying Near-Term History

Check the OMEGAMON Collector JESMSGLOG output to verify that the server accepted your parameters.

Before you begin

Before you test the setup for Near-Term History, make sure that you have completed the product setup, so that you can start the OMEGAMON Collector.

Procedure

1. Start the OMEGAMON Collector.
2. In SDSF, open the JESMSGLG output of the OMEGAMON Collector started task.
3. Review the JESMSGLG.

You should see the output similar to the following:

```
.  
. .  
K0201309I NEAR-TERM HISTORY DATA COLLECTOR SERVER K02DMGRB  
  IS ACTIVE (SERVINIE)  
K02R0100I DRIVER INITIALIZED (CPINIT )  
K02R0128I CAPTURING OUTPUT ON DATA SET  
  SYS1PMO.V4.FULLTST.D824.RKD2VS03  
K02R0105I SET STARTED - CONTSET1 D824 K0201309I  
  NEAR-TERM HISTORY DATA COLLECTOR  
  SERVER K02SSRVB IS ACTIVE (SERVINIE)  
K0201308I NEAR-TERM HISTORY DATA COLLECTOR ACTIVELY  
  MONITORING DB2 D824 (H2WLMGRE)  
. .  
.
```

Messages K0201309I and K0201308I indicate that Near-Term History started successfully for the configured Db2 subsystems. Message K02R0128I identifies the previously configured Near-Term History data sets.

4. Review the SYSPRINT log.

You should see the following message:

Near-term history data collection options keywords by purposes

This topic groups the keywords that can be used in a collection options member of RKD2PAR by their purposes.

Define DB2 subsystem and collection interval

- DB2SYS
- INTERVAL
- NTAINTERVAL

Define data types to collect

- ACCTG
- DYNAMICSQL
- LOCKCONT
- LOCKSUSP
- NEGSQL
- SCAN
- SORT
- STATISTICS

Specify storage destination

- ARCHIVESEQ
- H2DATASET
- SEQDATASET
- WRITEOPTION
- THRDDATASET

Define filter and options

- AUTHID
- CONNID
- CONNTYPE
- CORRID
- ORIGID
- PLAN

Performance options

- BUFSIZE
- IFIREADTIME
- POSTPCT

Near-term history data collection option keyword descriptions

You can configure keywords in the collection options member RKD2PAR. The keywords are listed in alphabetical order. The respective configuration parameter to be used with Configuration Manager or PARMGEN is enclosed in parenthesis.

ACCTG - Near-term history data collection options keyword

Specifies the type of Accounting data to collect.

Configuration parameter: **KD2_PF_HIS_ACCTG_CLAS**

type

- 1**
collects data from Accounting class 1 (IFCID 0003, and 0106, no In-DB2 or I/O and lock wait times).
- 2**
collects data from Accounting class 1 and 2 (IFCID 0003 In-DB2 elapsed and CPU time).
- 3**
collects data from Accounting class 1, 2, and 3 (IFCID 0003 all wait times I/O and lock wait times).
- 7**
collects data from Accounting class 7 (IFCID 0003, 0239 Package In-DB2 time).
- 8**
collects data from Accounting class 8 (IFCID 0003, 0239 Package I/O and lock wait times).
- 10**
collects data from Accounting class 10 (IFCID 0239 Package detail).
- 11**
collects data from Accounting class 11 (IFCID 0003 and 0200). For DB2 11 and above only.

Accounting class 10 data contains package detail data from IFCID 239. To avoid unnecessary system overhead, collect this data only if required.

To reduce the number of IFCIDs collected and not collect the IFCID 239, class 11 should be requested without classes 7, 8 and 10.

No default is applied. If this keyword is not specified, no Accounting data is collected.

ARCHIVESEQ - Near-term history data collection options keyword

Specifies the pointer to the ASEQcccc member in data set *rhilev*. RKD2PAR. The member contains the JCL required to archive static sequential data sets and is mandatory in this case.

ARCHIVESEQ(*member*)

member

A 1- to 8-character member name.

AUTHID - Near-term history data collection options keyword

Specifies the authorization identifier about which data to collect.

Configuration Parameter: **KD2_PF_HIS_WHEN_AUTHID**

AUTHID(*identifier*)

identifier

A 1- to 8-character authorization identifier.

No default is applied. If this keyword is not specified, all data from all authorization identifiers is collected.

BUFSIZE - Near-term history data collection options keyword

Specifies the size of the buffer that is used to hold IFI records until they can be written out by the Near-Term History Data Collector.

Configuration Parameter: **KD2_PF_HIS_BUFSIZE**

BUFSIZE (*n*)

n

The buffer size, in KB, from 50 to 16000 KB. 300 KB is the default.

CONNID - Near-term history data collection options keyword

Specifies the connection identifier about which data should be collected.

Configuration Parameter: **KD2_PF_HIS_WHEN_CONNID**

CONNID (*identifier*)

identifier

A 1- to 8-character connection identifier.

No default is applied. If this keyword is not specified, all data from all connection identifiers is collected.

CORRID - Near-term history data collection options keyword

Specifies the correlation identifier about which data should be collected.

Configuration Parameter: **KD2_PF_HIS_WHEN_CORRID**

CORRID (*identifier*)

identifier

A 1- to 12-character correlation identifier.

No default is applied. If this keyword is not specified, all data from all correlation identifiers is collected.

DB2SYS - Near-term history data collection options keyword

Specifies the DB2 subsystem to be monitored.

DB2SYS (*name*)

name

A 1- to 4-character DB2 subsystem name.

This keyword is required and will be completed automatically by the configuration tool.

DYNAMICSQL - Near-term history data collection options keyword

Specifies whether the Near-Term History Data Collector should collect SQL text and access path information for dynamic SQL.

Configuration Parameter: **KD2_PF_HIS_DYN_SQL**

DYNAMICSQL (*toggle*)

toggle

YES

IFCID63 is collected to provide SQL text.

NO

No SQL text-related IFCIDS are started.

FULL

IFCID350 is collected to provide SQL text.

H2DATASET - Near-term history data collection options keyword

Specifies up to 768 names of the VSAM data sets in which the classic near-term history data is to be stored by the Near-Term Historical Data Collector.

H2DATASET (*data set name, data set name, data set name*)

data set name

A 1- to 44-character VSAM data set name.

This keyword is required if WRITEOPTION(VSAM), WRITEOPTION(VSAM,SEQ), or WRITEOPTION(VSAM,THVSAM) is specified.

IFIREADTIME - Near-term history data collection options keyword

Specifies the frequency with which the Near-Term History Data Collector reads new IFI trace records into its buffer.

Configuration Parameter: **KD2_PF_HIS_IFIREAD**

IFIREADTIME (*mmssth*)

mmssth

mm
Minutes
ss
Seconds
t
Tenths
h
Hundredths

If this keyword is not specified, the default of 010000 (one minute) is applied.

The maximum value that should be specified is one minute.

INTERVAL - Near-term history data collection options keyword

Specifies the time interval used by the Near-Term History Data Collector to record Statistics or Accounting data, if the GROUPBY keyword is used.

Configuration Parameter: **KD2_PF_HIS_COLL_INTV**

INTERVAL (*time specification*)

time specification

n
An interval ranging from 1 to 60 minutes.

RMF
This keyword synchronizes the collection interval with the RMF interval. If RMF is not active, a 15-minute interval is assumed.

LOCKCONT - Near-term history data collection options keyword

Specifies whether the Near-Term History Data Collector should collect lock timeout and deadlock information.

Configuration Parameter: **KD2_PF_HIS_LOCK_CNTN**

LOCKCONT (*toggle*)

toggle

YES
Collect lock timeout and deadlock information.

NO

Do not collect lock timeout and deadlock information.

LOCKSUSP - Near-term history data collection options keyword

Specifies whether the Near-Term History Data Collector should collect lock suspension information.

Configuration Parameter: **KD2_PF_HIS_LOCK_SUSP**

LOCKSUSP (*toggle*)

toggle**YES**

Collect lock suspension information.

NO

Do not collect lock suspension information.

NEGSQ L - Near-term history data collection options keyword

Specifies whether the Near-Term History Data Collector should collect negative SQL code IFCID 58 and produce the Negative Application Codes SQL report.

Configuration Parameter: **KD2_PF_HIS_NEQSQL**

NEGSQ L (*toggle*)

toggle**YES**

Collect negative SQL code IFCID 58 and produce the Negative Application Codes SQL report.

Note: Set NEGSQ L to YES only if WRITEOPTION(VSAM, **SEQ**) is selected. In this case the negative SQL data is written to the sequential data set and can then be analyzed in the SQL Activity Report.

NO

Do not collect negative SQL code IFCID 58 and produce the Negative Application Codes SQL report.

NTAINTERVAL - Near-term history data collection options keyword

Specifies the number of minutes or seconds to be used as the smallest time span for display of historical thread accounting data by subinterval. The subinterval should be specified as a period of time for convenient display of the threads executed. The more threads executed per minute, the smaller subinterval you may want to specify.

Configuration Parameter: **KD2_PF_HIS_SUBINT**

NTAINTERVAL (*time specification*)

time specification***n***

The subinterval in minutes.

nS

The subinterval in seconds. *n* must be some even fraction of a minute, for example 5S, 6S, 10S, 20S, or 30S. However, 7S is not allowed.

The INTERVAL keyword can only be set as low as one minute. Installations with a huge number of threads per minute might use the Thread History By Subinterval panel to view thread history by smaller periods of time. The NTAINTERVAL keyword gives control over the time interval that is used for the Thread History By Subinterval panel.

ORIGAUTH - Near-term history data collection options keyword

Specifies the original authorization identifier for which OMEGAMON for DB2 PE should collect Accounting activity data.

Configuration Parameter: **KD2_PF_HIS_WHEN_ORIG**

ORIGAUTH(*identifier*)

identifier

A 1- to 8-character original authorization identifier.

No default is applied. If this keyword is not specified, all data from all original authorization identifiers is collected.

PLAN - Near-term history data collection options keyword

Specifies the plane name for which OMEGAMON for DB2 PE should collect data.

Configuration Parameter: **KD2_PF_HIS_WHEN_PLAN**

PLAN(*name*)

name

A 1- to 8-character plan name.

No default is applied. If this keyword is not specified, all data from all plan names is collected.

SCAN - Near-term history data collection options keyword

Directs OMEGAMON for DB2 PE to collect scan data.

Configuration Parameter: **KD2_PF_HIS_SCAN_SUMM**

SCAN(*toggle*)

toggle

YES

Collect scan data.

NO

Do not collect scan data.

SEQDATASET - Near-term history data collection SEQ options keyword

Specifies up to 10 names of static sequential data sets in which the near-term history data is to be stored by the Near-Term Historical Data Collector.

Configuration Parameter: **KD2_PF_HIS_SEQ_LOG_NUM**

SEQDATASET(*data set name*, *data set name*, ...)

data set name

A 1- to 44-character data set name.

This keyword is required if WRITEOPTION(VSAM,SEQ) or (VSAM, SEQ, THVSAM) is specified.

The SPACE keyword is required in conjunction with SEQDATASET to allocate the data set appropriately.

If dynamic sequential data sets or Generation Data Group (GDG) data sets were chosen as the medium of sequential data storage, the corresponding (base) file name is added as keyword value.

Example for static sequential data sets

```
SEQDATASET(  
  SYS1PMO.04.ESP.ESP4.DB11.RKD2SQ01  
  SYS1PMO.04.ESP.ESP4.DB11.RKD2SQ02  
  SYS1PMO.04.ESP.ESP4.DB11.RKD2SQ03  
)  
SPACE(CYL,65,2)
```

Example for dynamic sequential data set

```
SEQDATASET(SYS1PMO.04.SEQARC.@DB2.@DATE.@TIME)  
SPACE(CYL,5,2)
```

Example for GDG data set

```
SEQDATASET(SYS1PMO.04.SEQGDG(+1))  
SPACE(CYL,5,2)
```

SORT - Near-term history data collection options keyword

Directs OMEGAMON for DB2 PE to collect sort data.

Configuration Parameter: **KD2_PF_HIS_SORT_SUMM**

SORT (*toggle*)

toggle

YES

Collect sort data.

NO

Do not collect sort data.

SPACE - Near-term history data collection options keyword

Used in conjunction with the SEQDATASET options keyword to specify the space allocation for a sequential data set.

SPACE (CYLxxx, *primary*, *secondary*)

Configuration parameter: **KD2_PF_HIS_SEQ_PRIMARY_CYL**

primary

The number for primary allocation.

Configuration Parameter: **KD2_PF_HIS_SEQ_SECONDARY_CYL**

secondary

The number for secondary allocation.

STATISTICS - Near-term history data collection options keyword

Directs OMEGAMON for DB2 PE to collect Statistics trace data.

Configuration Parameter: **KD2_PF_HIS_DB2_STAT**

STATISTICS (*toggle*)

toggle

YES

Collect Statistics trace data.

NO

Do not collect Statistics trace data.

WRITEOPTION - Near-term history data collection options keyword

Specifies the storage medium for near-term history data.

Configuration Parameter: **KD2_PF_HIS_STORE**

WRITEOPTION (*medium*)

medium

VSAM

Store the data to VSAM data sets for OMEGAMON Db2 Classic near-term-history (NTH) support.

VSAMSEQ

Store the data to VSAM data sets and sequential files for OMEGAMON Db2 Classic NTH support.

THVSAM

Store the data to VSAM data sets for Enhanced 3270UI Thread history support.

VSAMSEQTHVSAM

Store the data to VSAM data sets, sequential files for OMEGAMON Db2 Classic NTH support and VSAM data sets for Enhanced 3270UI Thread history support.

SEQTHVSAM

Store the data to sequential files for OMEGAMON Db2 Classic NTH Statistics support and VSAM data sets for Enhanced 3270UI Thread history support.

VSAMTHVSAM

Store the data to VSAM data sets for OMEGAMON Db2 Classic NTH support and VSAM data sets for Enhanced 3270UI Thread history support. If you specify WRITEOPTION(THVSAM), then THRDLOG(*n*) and THRDDATASET(*name**) are required. THRDLOG specifies the number of VSAM files. THRDDATASET specifies the beginning of the VSAM file and * is completed with a four-digit number for each file. For example: THRDLOG(7) THRDDATASET(D01OMPE.VTS5815.DBA9.RKTH*).

Enabling Snapshot History

Snapshot history data enables you to examine activities leading to, and following, an exception without recreating the situation.

Procedure

Set parameter **KD2_PFxx_SH_D2SHKHST** to Y.

The following is a list of additional configuration parameters you can configure for Snapshot History. For information, see entries in the *Parameter Reference*.

Collection:

- KD2_PFxx_SH_D2SHSSZE
- KD2_PFxx_SH_D2SHSTAT / KD2_PFxx_SH_D2SHSTAI
- KD2_PFxx_SH_D2SHDATA / KD2_PFxx_SH_D2SHDATI
- KD2_PFxx_SH_D2SHSPAR / KD2_PFxx_SH_D2SHSPAI
- KD2_PFxx_SH_D2SHTHDD / KD2_PFxx_SH_D2SHTHDI
- KD2_PFxx_SH_D2SHLTHD
- KD2_PFxx_SH_D2SHSQLT

Filter options:

- KD2_PFxx_SH_D2SQPRI<*n*>, *n*=1 - 6
- KD2_PFxx_SH_D2SQPLA<*n*>, *n*=1 - 6
- KD2_PFxx_SH_D2SQCON<*n*>, *n*=1 - 6
- KD2_PFxx_SH_D2SQCOR<*n*>, *n*=1 - 6

Enabling Performance Expert Agent for Db2 Connect Monitoring support

The Performance Expert Agent for Db2 Connect Monitoring monitors connections of remote applications within the Distributed Relational Database Architecture (DRDA) of Db2 that are connected through Db2. It is installed on the Db2 Connect Server gateway and provides Db2 Connect data for the OMEGAMON Collector.

Before you begin

You must enable Performance Warehouse before beginning. See [“Enabling Performance Warehouse” on page 103](#) for more information.

Tip: If you do not want to use Performance Warehouse for purposes other than Db2 Connect Monitoring, you can enable it a single time, verify that the OMEGAMON Collector has created the Performance Warehouse tables, and then disable it. If you disable Performance Warehouse, you must enable it again

before you install a PTF that indicates that in the ++HOLD. Otherwise, the necessary changes to the Performance Warehouse database are not made. This might result in SQL errors.

About this task

If you are installing or configuring OMEGAMON for Db2 Performance Expert in a data sharing environment, you might need to alter configuration of certain components. Consider the following configurations for a data sharing environment:

- **Monitor one member of a data sharing group.** This configuration is sufficient in most data sharing environments, even when the members reside on different LPARS in a sysplex environment.
- **Monitor two or more members of a data sharing group.** To enable Db2 Connect Monitoring, you have to enable Snapshot History and activate the collection of Db2 Connect Monitoring data. You can enable that for two or more members of a data sharing group. However, consider the following effects:
 - Db2 Connect Monitoring data is collected and stored for only one member of the data sharing group. Monitoring is started first for this Db2 subsystem.
 - The user interfaces must connect to the member for which Db2 Connect Monitoring data is collected and stored. Otherwise, they cannot display Db2 Connect Monitoring data.
 - If the monitoring for the Db2 subsystem, for which the Db2 Connect Monitoring data was collected, is stopped, and you have enabled Db2 Connect Monitoring for two or more members of a data sharing group, then data collection for another member takes over. Ensure to reconnect the user interface to this member to display Db2 Connect Monitoring data.

Procedure

1. Set parameter **KD2_PFxx_SH_D2SHKHST** to Y.
2. Set parameter **KD2_PFxx_DCM_D2SHDCAP** to Y.

The following is a list of additional configuration parameters you can configure. For information, see entries in the *Parameter Reference*.

- KD2_PF01_DCM_D2SHDCAI
- KD2_PF01_DCM_D2SHDCST
- KD2_PF01_DCM_D2SHDCSI

What to do next

1. After you have enabled Performance Expert Agent for Db2 Connect Monitoring support, you must install Performance Expert Agent for Db2 Connect Monitoring on the system hosting a Db2 Connect gateway. See [“Installing Performance Expert Agent for Db2 Connect Monitoring” on page 55](#) for more information.

Enabling Db2 EXPLAIN

Explain functions provide an easy-to-read representation of access plan information for your SQL queries and statements. You can use this information to decide how to tune your queries. The built-in explain functions are Easy Explain and the EXPLAIN report.

Before you begin

You must create a database to be used by EXPLAIN. There are no special requirements regarding database name, storage group, or index buffer pool. But you must use an 8 KB buffer pool. The database name has to be specified in parameter **KD2_PFxx_EX_D2EXDB**.

Procedure

Set parameter **KD2_PFxx_EX_D2EXACT** to Y.

What to do next

After you enable explain functions and generate the runtime members, you must complete steps listed in [Complete the Configuration](#).

Enabling IBM Db2 SQL Performance Analyzer

IBM Db2 SQL Performance Analyzer provides resource usage information and costs associated with SQL queries without having to run them in Db2. This analysis helps you to tune your queries to achieve maximum performance.

Before you begin

You must install IBM Db2 SQL Performance Analyzer as a separate product before you begin. See the *IBM Db2 SQL Performance Analyzer for z/OS Installation Guide* in the *IBM Db2 Tools Product Documentation*.

Performance Warehouse must be enabled before you begin and running while you are using SQL Performance Analyzer.

Note: Only SQL Performance Analyzer version 5.1 specified in **KD2_PFxx_SQLPA_VERSION** is supported with OMEGAMON for Db2 Performance Expert version 5.5.0.

Procedure

Set parameter **KD2_PFxx_SQLPA_ENABLE** to Y.

You can configure the following additional parameters:

- **KD2_PFxx_SQLPA_STEPDSN**
- **KD2_PFxx_SQLPA_VERSION**
- **KD2_PFxx_SQLPA_CF_ENBL**
- **KD2_PFxx_SQLPA_CF_ANLC**
- **KD2_PFxx_SQLPA_CF_ANLP**

Configuring Additional Db2 traces

You can configure and start additional Db2 traces. For certain functionality, such as displaying SQL statements and metrics for dynamic statement cache or EDM pool, it is required to start additional Db2 traces. Starting these traces can cause considerable CPU overhead. Therefore, these traces are not started by default. With this option you can specify if additional Db2 traces should be started automatically when the OMEGAMON Collector starts.

About this task

There are two ways to configure additional Db2 traces.

Procedure

- Complete one of the two following steps.
 - Set parameter **KD2_PFxx_TRACES_318** and parameter **KD2_PFxx_TRACES_400** to Y. This enables collection IFCID 318 for dynamic and IFCID 400 for static statement cache metrics.
 - Use the **KD2_PFxx_TRACES_DB2CMDx** parameters (where x is either 2, 3, or 4). This option enables you to provide three more custom **START TRACE** commands. Since it is not possible to add line breaks to the statement, use abbreviations for this command wherever possible.

Configuring additional Db2 messages monitoring

You must use configuration parameters to enable additional monitoring functions, such as Db2 message monitoring.

About this task

Db2 message monitoring is used to show Db2 messages in the Tivoli Enterprise Portal workspaces.

Procedure

To start Db2 message monitor, set parameter **KD2_PFxx_ACS_DB2MSGMON** to Y.

You can configure the following additional parameters:

- **KD2_PFxx_READA_OPBUFSIZE**
- **KD2_PFxx_READA_OPBUFTHR**

Specifying Performance Expert Client port information

If you want to use Performance Expert Client and/or end-to-end SQL or stored procedure monitoring for some Db2 subsystems, you must specify the Performance Expert Client port information for each Db2 subsystem.

Procedure

Set parameter **KD2_DBxx_DB2_PORT_NUM** for each Db2 subsystem configuration that you want to monitor using either Performance Expert Client or end-to-end SQL or stored procedure monitoring.

Verifying the port information

Check the OMEGAMON Collector started task SYSPRINT output to verify that the server accepted your parameters.

Before you begin

Before you test the setup of the OMEGAMON Collector, ensure you have completed the product setup, so that you can start the OMEGAMON Collector.

Procedure

1. Start the OMEGAMON Collector.
2. Review the SYSPRINT output of the OMEGAMON Collector started task in SDSF. Verify that the following outputs match the parameters you specified:
 - a) TCP/IP.
 - b) IP ADDRESS OF SERVER INSTANCE.
If you left the IP address blank because your host only has one IP address, you will see 0.0.0.0 here.
 - c) MAXIMUM NUMBER OF PARALLEL SESSIONS.
 - d) TCPNAME (this value is not of interest for end-to-end SQL or stored procedure monitoring).
 - e) DATASHARINGGROUP.
 - f) TCPIP PORT.
3. Verify that the last output is FPEV1330I, TCP/IP SERVER TASK STARTED.
This means that the TCP/IP port opened successfully.

Enabling Performance Warehouse

The Performance Warehouse is a collection of Db2 tables which store Accounting and Statistics performance and internal control information.

Before you begin

- The started task user ID must be DB2PM or associated with a group ID with the name DB2PM.
- If you want to install the Performance Warehouse Client, you must first enable Performance Expert Client support.
- Verify that your system supports started jobs.
- Create any storage groups that you will use for this Performance Warehouse database.
- Create 4 KB and 32 KB buffer pools that you will use for this Performance Warehouse database.
- Grant user DB2PM or group DB2PM access to the buffer pools that you will use for this Performance Warehouse database.
- In a data-sharing environment, you can enable Performance Warehouse for only one member of a data sharing group.

About this task

You must configure Performance Warehouse on Db2 subsystem level. It cannot be configured on monitoring profile level, because several configuration parameters are unique for each Db2 subsystem.

During the configuration process, you can define some parameters for the database, but the database name is always DB2PM and you cannot change it.

Procedure

1. Set parameter **KD2_DBxx_PWH_D2PWPWHA** to Y.
2. Configure related parameters for your environment.

Parameter	Default value
KD2_DB01_PWH_LOADLIB	DB2.V12.SDSNLOAD
KD2_DB01_PWH_EXITLIB	DB2.V12.SDSNEXIT
KD2_DB01_PWH_D2PWASNM	<rte_stc_prefix>.PWH1
KD2_DB01_PWH_D2PWPSTG	STOGRPPR
KD2_DB01_PWH_D2PWBUPF	BP0
KD2_DB01_PWH_D2PWOSTG	STOGRPOU
KD2_DB01_PWH_D2PW0BUF	BP0
KD2_DB01_PWH_D2PWCSTG	STOGRPCO
KD2_DB01_PWH_D2PWCBUF	BP0
KD2_DB01_PWH_D2PWR0TS	STOGRPRO
KD2_DB01_PWH_D2PWR0TG	BP0
KD2_DB01_PWH_D2PW0LTG	STOGRPON
KD2_DB01_PWH_D2PW0LBP	BP32K
KD2_DB01_PWH_D2PWQRY5	STOGRPQR
KD2_DB01_PWH_D2PWQRYF	BP32K

Parameter	Default value
KD2_DB01_PWH_D2PWSTTG	STOGRPST
KD2_DB01_PWH_D2PWSTBP	BP32K
KD2_DB01_PWH_D2PWACCG	STOGRPAC
KD2_DB01_PWH_D2PWACCP	BP0
KD2_DB01_PWH_D2PWSTGG	STOGRPPW
KD2_DB01_PWH_D2PWIXBP	BP0

Verifying the Performance Warehouse configuration

Check the OMEGAMON Collector started task SYSPRINT output to verify that the server accepted your parameters.

Before you begin

Before you test the setup of the Performance Warehouse, ensure that you have completed the product setup, so that you can start the OMEGAMON Collector.

About this task

To verify that the OMEGAMON Collector has successfully incorporated your changes, review the SYSPRINT output of the OMEGAMON Collector started task:

Procedure

1. Start the OMEGAMON Collector.
2. In SDSF, open the SYSPRINT output of the OMEGAMON Collector started task.
3. Review the SYSPRINT.

You should see the output similar to the following excerpt:

```
FPEV0129I D824 PERFORMANCEWAREHOUSE=YES
FPEV0133I D824 - PERFORMANCEWAREHOUSEADDRESSSPACENAME=CANSPW
FPEV1339I D824 TCPIP PORT=6080
...
FPEV5003I D824 CHECKING DATABASE FOR NECESSARY CHANGES. PLEASE WAIT
FPEV5016I D824 REQUIRED DBRM DGOZMIG1 NOT BOUND. BINDING IT
...
FPEV5005I D824 DATABASE UPDATE COMPLETE
```

Note: It might take several minutes to create the Performance Warehouse database, especially at first startup. Message FPEV5016I indicates that the OMEGAMON Collector is still creating the database and binding the DBRMs. In every subsequent startup, the database already exists and the OMEGAMON Collector will only check for required updates and BINDs. After this check, the message FPEV5005I is displayed.

Configuring a Performance Database

You can use the sample statements in the sample library to create and to load a Performance Database. If you use an SMP/E sharing runtime environment, the sample library is TKO2SAMP. For all other types of runtime environments, the sample library is RKO2SAMP.

About this task

The Performance Database is a Db2 database that can hold aggregated and raw Db2 activity information spanning a long period of time. The type of data stored in the Performance Database depends on the

reporter command (FILE or SAVE) used to create input data sets for the Db2 LOAD utility. This long-term history can help you with performance tuning activities, with trend analysis, and with capacity planning.

Important: If you are planning to use a Performance Warehouse and a Performance Database in the same Db2 subsystem, then you need to create the Performance Database tables with an owner ID that differs from the Performance Warehouse owner ID DB2PM.

For information about the structure of the Performance Database, including the types of data you can store in a Performance Database, and how it is formatted and loaded, see the *IBM OMEGAMON for Db2 Performance Expert on z/OS Reporting User's Guide*.

Procedure

1. Create data for the Performance Database from already collected performance data.
You can use the OMEGAMON for Db2 PE batch reporter with either the FILE option or the SAVE option to create performance data. However, if you use the SAVE option, you must convert the data to the FILE format before you can load it into the tables.
2. Create the Performance Database tables.
You can use the sample CREATE statements in the RKO2SAMP library as a starting point and then modify the statements to meet your needs.
3. Load data into the Performance Database.
You can use the sample LOAD statements in the RKO2SAMP library and the Db2 LOAD utility. If you modified the CREATE statements from the RKO2SAMP library, you must also modify the LOAD statements.

Batch reporting

The Reporter is automatically enabled when you download the program files from SMP/E. The Reporter generates predefined reports to help you collect and analyze historical performance data. It also enables you to prepare performance data before you load it into the Performance Warehouse or into the Performance Database.

About this task

Because the Report is automatically enabled when you download program files from SMP/E, you do not need to perform any installation or configuration steps.

For information about the Reporter, see *IBM Tivoli OMEGAMON for Db2 Performance Expert on z/OS Report Command Reference*.

Enabling options in OMEGAMON for Db2 PE Collector Realtime Customer Options (OMPEOPTS)

You can enable options in OMEGAMON for Db2 PE Collector Realtime Customer Options to override default settings.

About this task

These options are not exposed as official configuration parameters and are not validated by configuration method parameter validation routines. Nevertheless, invalid options you set will be rejected by the OMEGAMON Collector at startup.

The OMPEOPTS Realtime Customer options are provided in the WCONFIG(KD2\$POP1) member for PARMGEN and the EMBEDS(KD2\$POP1) member for Configuration Manager. Make changes to options in this override member so that changes persist across Configuration Manager GENERATE runs or PARMGEN \$PARSE executions. Making the changes directly in the RKD2PAR(OMPEOPTS) member is not recommended as the member will be overridden when the runtime members are regenerated.

When BATSQID=YES is added to RKD2PAR(OMPEOPTS), statements using unqualified Db2 objects (tables) can be explained using the SQLPA interface in both the Classic interface and the Enhanced 3270 user interface.

The XCFMODE option specifies how the coupling facility component of the OMEGAMON for Db2 PE Collector subsystem is initialized at OMEGAMON for Db2 PE Collector initialization time. The default is XCFMODE=ACTIVE, which causes the coupling facility component of the OMEGAMON for Db2 PE to initialize in active mode. You can disable this option by specifying XCFMODE=INACTIVE. This causes the coupling facility XCF gateway component of the OMEGAMON for Db2 Performance Expert to be initialized in inactive mode.

Once XCFMODE is enabled, you can also enable user options DB2RTCPU and DB2REMIO. The default for both user options is enabled (DB2RTCPU=YES and DB2REMIO=YES). For more information, refer to [Cross-system coupling facility](#).

The DB2RTCPU user option allows viewing Db2 remote thread CPU time for threads running on remote members of the data sharing group that the connected Db2 subsystem belongs to. It is also used for collecting lock information for remote threads. You can disable this user option by specifying DB2RTCPU=NO.

The DB2REMIO user option allows viewing Thread DSN Activity for threads running on remote members of the data sharing group that the connected Db2 subsystem belongs to. You can disable this user option by specifying DB2REMIO=NO.

The message subsystem displays the current Db2 subsystem and IRLM messages. It also allows you to issue Db2 commands, for example, to display the status of utility jobs or terminate utilities that have abended. Message subsystem activation and deactivation is controlled by the MGSUBSYS={ACTIVE/INACTIVE} user option specified in OMPEOPTS member of the RKD2PAR data set. By default, OMEGAMON for Db2 PE on z/OS is shipped with MGSUBSYS=INACTIVE. To activate the message subsystem, set MGSUBSYS=ACTIVE, generate the runtime members, and restart the OMEGAMON for Db2 Performance Expert Collector address space. You can then view messages when you select the Db2 CONSOLE option on the OMEGAMON Classic Interface Realtime main menu.

Cross-system coupling facility

The cross-system coupling facility (OMEGAMON/XCF) enables peer-to-peer communication between OMEGAMON Collector.

The OMEGAMON Collector XCF gateway component allows peer-to-peer communication between OMEGAMON Collector by implementing the cross-system coupling (XCF) services supported in the z/OS system complex (sysplex) environment. OMEGAMON Collector use XCF member connection services to connect to a predefined **OMPEXCF** default group name. All OMEGAMON Collector connected to the same group can then issue send and receive requests against each other to exchange data.

The OMEGAMON/XCF feature is initialized at OMEGAMON Collector initialization time when real-time user option **XCFMODE=ACTIVE** is specified in member OMPEOPTS of the **RKD2PAR** parameters data set. When **XCFMODE=ACTIVE** is specified, the XCF gateway component performs additional environmental initialization functions specified by the following parameters of member **OMPE00** of the **RKD2PAR** data set:

- **XCFGROUP=OMPEXCF**
- **XCFTASKS=06**
- **XCFTIMER=30**
- **DSPSIZE=128M**

OMPE00 entries are tailored in embed override **KD2\$POMP** found in **WCONFIG(KD2\$POMP)** for PARMGEN and **EMBEDS(KD2\$POMP)** for Configuration Manager. Do not make manual changes in this member as manual changes will be lost when runtime members are regenerated.

The XCF group is a set of related members defined in the z/OS XCF by the OMEGAMON Collector XCF gateway, in which members of the group can communicate (send and receive data) between z/OS systems with other OMEGAMON Collector members of the same group. A group can span one or more of

the systems in a sysplex and represents a complete logical entity to z/OS XCF. When a Classic or Common (D5API) OMEGAMON Collector session is started, the OMEGAMON Collector XCF gateway connects a member to the group name (**XCFGROUP=OMPEXCF**). The member connection persists for the life of the Classic or Common Collector session.

The z/OS XCF member connection is terminated when one of the following conditions is met:

- The Classic or Common Collector session terminates.
- The Classic session switches to a different Db2 subsystem.
- The OMEGAMON Collector address space is normally shut down.

When the OMEGAMON Collector address space is abnormally terminated, all connections are terminated. Canceling or forcing the OMEGAMON Collector address space might under certain conditions only activate the XCF connections. Issuing the **D XCF, GROUP, OMPEXCF** z/OS command might still show these connections as defined to z/OS XCF.

The OMEGAMON Collector XCF gateway will reuse these existing connections on subsequent OMEGAMON Collector start ups.

Validate cross-system coupling facility

Use the messages to validate the cross-system coupling facility (OMEGAMON/XCF) setup.

Procedure

1. Use message KO2Z638I to validate. KO2Z638I is issued to indicate that a Classic or Common Collector session has joined the OMPEXCF group. For example, KO2Z638I OMPE V550 Session BPMYD2C/IPV\$TCE0 joined XCF group OMPEXCF/PM01SGP1DM520001

Value	Explanation
OMPE	Identifies the subsystem name assigned to the OMEGAMON Collector
V550	Identifies the OMEGAMON Collector release
BPMYD2C	Identifies the OMEGAMON Collector VTAM ACB name
IPV\$TCE0	Identifies the VTAM terminal ID
/	Group name and member name separator
OMPEXCF	Identifies the OMEGAMON Collector XCF gateway group name
PM01	Identifies the SMF system ID
SGP1DM52	Identifies the name of the OMEGAMON Collector STC address space
0001	Identifies the joined unique XCF gateway connection ID

2. Use message KO2Z806I to validate. KO2Z806I is issued to indicate that a Classic or Common Collector session has been disconnected from the OMPEXCF group. For example, KO2Z608I OMPE V550 Session BPMYD2C/IPV\$TCE0 disconnected from XCF group OMPEXCF/PM01SGP1DM520001

Value	Explanation
OMPE	Identifies the subsystem name assigned to the OMEGAMON Collector
V550	Identifies the OMEGAMON Collector release
BPMYD2C	Identifies the OMEGAMON Collector VTAM ACB name
IPV\$TCE0	Identifies the VTAM terminal ID
/	Group name and member name separator

Value	Explanation
OMPEXCF	Identifies the OMEGAMON Collector XCF gateway group name
PM01	Identifies the SMF system ID
SGP1DM52	Identifies the name of the OMEGAMON Collector STC address space
0001	Identifies the joined unique XCF gateway connection ID

This OMEGAMON Collector XCF gateway parameter specifies the number of receive tasks to attach in the OMEGAMON Collector address space. These tasks are used to receive and process OMEGAMON Collector service requests from other local or remote OMEGAMON Collector connected to the same **OMPEXCF** group name.

The default number of tasks that are attached at OMEGAMON Collector initialization time is **MAXTASKS=04**. The minimum number of tasks that can be specified is **MAXTASKS=2**. At task initialization time, each receive task connects to the OMEGAMON Collector XCF gateway using the **XCFGROUP=OMPEXCF**. The XCF connection for each attached receive task persists for the life of the OMEGAMON Collector address space. When the OMEGAMON Collector is normally shut down, these XCF connections are terminated. When the OMEGAMON Collector is canceled or forced, these XCF connections remain defined to the z/OS XCF and will be reused by the OMEGAMON Collector on subsequent start up.

You can display all XCF gateway connections by issuing the **D XCF, GROUP, OMPEXCF** z/OS XCF command. For example:

```
D XCF, GROUP, OMPEXCF
```

```
IXC332I 22.45.54 DISPLAY XCF 992
GROUP OMPEXCF:
```

```

PM01SGP1DM52X000 PM01SGP1DM52X001 PM01SGP1DM52X002
PM01SGP1DM52X003 PM01SGP1DM52X004 PM01SGP1DM52X005
PM01SGP1DM52X006 PM01SGP1DM52X007 PM01SGP1DM52X008
PM01SGP1DM52X009 PM01SGP1DM52X010 PM01SGP1DM52X011
PM01SGP1DM52X012 PM01SGP1DM52X013 PM01SGP1DM52X014
PM01SGP1DM52X015
```

Value	Explanation
OMPEXCF	Identifies the OMEGAMON Collector XCF gateway group name
PM01	Identifies the SMF system ID
SGP1DM52	Identifies the name of the OMEGAMON Collector STC address space
X	Identifies the member name as a receive task member name
0001	Identifies the joined unique XCF gateway connection ID

The default **XCFTIMER=30** parameter specifies the maximum elapsed time in seconds required to complete a send request from one OMEGAMON Collector to another collector, connected to the same **OMPEXCF** group. If a response is not received within the 30 seconds default elapsed time interval, the request is terminated and the K02Z810E error message is issued. For example: K02Z810E OMPE V510 OMPE Collector SGP1DM5S SSID=D91A MEMBER=PM01SGP1DM5S0010 response not received

This error condition might be caused by one or more of the following:

- The remote OMEGAMON Collector address space terminated either normally or abnormally.
- All receive tasks specified by the **MAXTASKS** parameter are busy.
- The remote LPAR/VMID has failed or is being restarted.

- The OMEGAMON Collector WLM dispatch priority is too low.

Take the following action(s):

- Verify that the remote OMEGAMON Collector is still active.
- Increase the number of receive tasks defined by the **XCFTASKS** parameter.
- Increase the **XCFTIMER** elapsed time seconds value.
- Verify that the OMEGAMON Collector is executing with the same priority or higher as your Db2 subsystem.

The default **DSPSIZE=128M** parameter specifies the size of the XCF gateway data space (in megabytes) that is created when a Classic or Common Collector session is connected to the OMEGAMON Collector XCF gateway. The data space is used to collect remote thread CPU data. Up to 20,000 remote threads CPU usage data can be collected in a single XCF send service request.

Note: z/OS page data set space is only incurred when remote thread CPU data is being retrieved. When remote thread CPU data is not being collected, the paging space is released and not used.

Configuring dynamic subsystem name assignment

Dynamic subsystem name assignment removes the restriction that the OMEGAMON Collector subsystem name is specified in the **PARM=JCL** parameter.

This change does not affect you if you already specify the OMEGAMON Collector subsystem name in your JCL procedure. You can optionally specify a two-character prefix in addition to the four-character name that is required.

The following subsystem name specifications are supported:

- **PARM= '/SUB=OMPE '**

The OMEGAMON Collector JCL procedure is shipped with a default OMEGAMON Collector subsystem name of **OMPE (PARM= '/SUB=OMPE ')**.

```
//O2CI      EXEC  PGM=K02ZTOPB,
//              REGION=OM, MEMLIMIT=NOLIMIT, DPRTY=(15,15), TIME=1440,
//              PARM= '/SUB=OMPE '
```

- **PARM= '/SUB=OM '**

This serviceability enhancement also allows you to only specify a two-character OMEGAMON Collector subsystem prefix. When only the subsystem prefix is specified, the subsystem initialization driver dynamically adds an unused suffix in the range of 00 to 99 to form a complete four-character OMEGAMON Collector subsystem name.

```
//O2CI      EXEC  PGM=K02ZTOPB,
//              REGION=OM, MEMLIMIT=NOLIMIT, DPRTY=(15,15), TIME=1440,
//              PARM= '/SUB=OM '
```

Once a subsystem name is associated with an OMEGAMON Collector address space, the association is maintained for the life of the z/OS operating system IPL.

The OMEGAMON Collector also creates a subsystem called O2. If Object Analysis is configured, a subsystem called E2 will be started.

How to fully customize your data set allocations

You can customize data sets beyond the capabilities supported by Configuration Manager or PARMGEN.

During the configuration process of OMEGAMON for Db2 Performance Expert many data sets can be potentially pre-allocated, depending on the monitoring features selected, such as:

- Enhanced 3270 Thread History
- Static Sequential data sets

- Periodic Exception processing related data sets

For the selected features, most of these data sets will be pre-allocated only one time during the configuration process as they will be updated with data that is collected on the systems where the monitor runs. Primary examples are the Enhanced 3270 Thread History VSAM data sets.

Configuration Manager or PARMGEN generate a JCL to allocate these “static” data sets in RKD2SAM(ALLOCDS); this JCL can also be submitted manually, if needed. The configuration process provides only limited flexibility on the customization of the allocation attributes of the individual data sets, especially as mostly not needed for SMS storage based configurations. For non-SMS storage configurations, the allocation process can be tailored to meet specific needs, for example to specify a specific volume for each Enhanced 3270 Thread History data set. This granular customization can be accomplished by modifying the RKD2SAM(ALLOCDS) JCL accordingly.

Use the **KD2_OMPE_RUNALLOC** and **KFJ_LOCAL_KD2_RUN_ALLOC** (for remote deployments) parameters to drive the allocation of the data sets, for example, by running the Configuration Manager **GENERATE** action. For example, if you specify **KD2_OMPE_RUNALLOC** as “N”, the RKD2SAM(ALLOCDS) member will be generated, but not executed. If you want to tailor ALLOCDS after the initial generation and submit manually, use the “N” option for **KD2_OMPE_RUNALLOC** and add the RKD2SAM(ALLOCDS) job to the exclude member KCI\$XW2R in the embed override member.

Defining OMEGAMON Collector component message logs

This function allows units of work executing in the OMEGAMON Collector address space to have their messages stored in component message logs.

Component message logs are optional and are not required for normal OMEGAMON Collector operation.

The following component message logs are supported:

FPEVLOG

This log is activated when DD name "//FPEVLOG DD SYSOUT=*" is specified on the OMEGAMON Collector JCL procedure. It contains messages issued by the OMEGAMON Collector Performance Expert component.

OMPELOG

This log is activated when DD name "//OMPELOG DD SYSOUT=*" is specified on the OMEGAMON Collector JCL procedure. It contains messages issued by all OMEGAMON Collector components.

KO2ILOG

This log is activated when DD name "//KO2ILOG DD SYSOUT=*" is specified on the OMEGAMON Collector JCL procedure. It contains messages issued by the Common Collector subsystem.

KO2HLOG

This log is activated when DD name "//KO2HLOG DD SYSOUT=*" is specified on the OMEGAMON Collector JCL procedure. It contains messages issued by the OMEGAMON Collector Near-Term History component.

KO2RLOG

This log is activated when DD name "//KO2RLOG DD SYSOUT=*" is specified on the OMEGAMON Collector JCL procedure. It contains messages issued by the capture server component.

KO2OLOG

This log is activated when DD name "//KO2OLOG DD SYSOUT=*" is specified on the OMEGAMON Collector JCL procedure. It contains messages issued by OMEGAMON Collector Near-Term History parser component.

KO2SLOG

This log is activated when DD name "//KO2SLOG DD SYSOUT=*" is specified on the OMEGAMON Collector JCL procedure. It contains messages issued by Virtual Storage Manager STORMAN component.

KO2XLOG

This log is activated when DD name "//K02XLOG DD SYSOUT=*" is specified on the OMEGAMON Collector JCL procedure. It contains messages issued by VTAM classic cross-memory component functions.

KO2ZLOG

This log is activated when DD name "//K02ZLOG DD SYSOUT=*" is specified on the OMEGAMON Collector JCL procedure. It contains messages issued by the OMEGAMON Collector subsystem.

Completing the configuration

After you configure OMEGAMON for Db2 Performance Expert using your preferred configuration method (either Configuration Manager or PARMGEN), you must complete several post-configuration steps. The post-configuration steps that you must complete are a combination of required steps and conditional steps that depend on your particular configuration and monitoring objectives.

Table 14. General steps to complete the configuration of OMEGAMON for Db2 Performance Expert

General steps	Required for ...
“Creating the DB2PM ID” on page 112	Required for all configurations
“Copying started task definitions” on page 113	Required for all configurations
“Granting privileges” on page 113	Required for all configurations
“APF-authorize libraries” on page 113	Required for all configurations
“Preparing the Db2 subsystems” on page 114	Required for all configurations
“Starting Db2 traces” on page 115	Required for all configurations
“Setting up RRSAP” on page 116	Required for all configurations

Before you begin with the conditional configuration steps, ensure you have properly set up TCP/IP. For more information, see [“Setting up TCP/IP services” on page 43](#).

Table 15. Conditional steps to complete the configuration of OMEGAMON for Db2 Performance Expert

Conditional steps	Required for ...
“Copying VTAM definitions” on page 117	Required for the Classic User Interface
“Reviewing runtime members and jobs” on page 117	Required if you used PARMGEN as your configuration method
“Manually allocating data sets” on page 118	Required for Near-Term History Collection
“Preallocating Snapshot History data sets” on page 119	Required for Snapshot History
“Completing Performance Warehouse setup” on page 119	Required for the Performance Warehouse component
“Defining additional security” on page 121	Required for the Performance Expert Agent for Db2 Connect Monitoring component
“Creating the Db2 EXPLAIN database” on page 121	Required for SQL tuning (EXPLAIN)
“Activating SOURCE EXPLAIN” on page 122	Required for SQL tuning
“Evaluating the cost of Object Analysis” on page 123	Required for Object Analysis
“Starting NTH data collection” on page 123	Required for Near Term History

Table 15. Conditional steps to complete the configuration of OMEGAMON for Db2 Performance Expert (continued)

Conditional steps	Required for ...
“Enabling Db2 Query Monitor in the E3270 UI” on page 124	Required for integration with Db2 Query Monitor

Component codes

Table 16. Component codes

Name	Component code
OMEGAMON for Db2 Performance Expert (Server)	KO2/KD2
OMEGAMON for Db2 Performance Expert (Agent)	KD5/KDP

Before you begin

Review the complete the configuration topics for the following common components before you proceed:

- KCI - (Required) Common to all components configured in this RTE
- KAG - (Required) Common Tivoli Enterprise Monitoring Agent (TEMA)
- KDS - (Conditional) Tivoli Enterprise Monitoring Server
- KOB - (Conditional) OMEGAMON OMEGAMON Enhanced 3270 User Interface

Your OMEGAMON for Db2 Performance Expert version installed is FMID HKDB%KD6VER%.

Creating the DB2PM ID

The OMEGAMON started tasks run under the authorization DB2PM. You must create the user ID and group ID DB2PM and connect it to the started tasks, which is required by the OMEGAMON started tasks.

Before you begin

Ensure that authorizations to create a new user ID or group ID in your security system (for example, RACF) are provided.

Procedure

1. Create the user ID DB2PM in your security system.
If you want to use an alternative user ID other than DB2PM:
 - a) Create the group ID DB2PM in your security system.
 - b) Add the user ID that you want to use to the user group DB2PM.
2. Connect the OMEGAMON started tasks to the user ID and group ID DB2PM.

For example, use the following RACF commands:

```
RDEFINE STARTED server_stc.* STDATA(USER(DB2PM))
SETR RACLIST(STARTED) REFRESH
```

If the group ID DB2PM is used instead of the user ID DB2PM, assign the OMEGAMON started tasks to the user ID *user* that was added to the group ID DB2PM:

```
RDEFINE STARTED server_stc.* STDATA(USER(user) GROUP(DB2PM))
SETR RACLIST(STARTED) REFRESH
```

Depending on your configuration, there can be additional OMEGAMON started tasks (such as the Performance Warehouse started task or Tivoli Enterprise Monitoring Server started task).

If you do not want to connect each started task explicitly and your started tasks are named with the same prefix, use the prefix instead of the explicit started task name in the command to connect all OMEGAMON started tasks at once.

Copying started task definitions

Make the OMEGAMON Collector and OMEGAMON Db2 Agent JCL available as a started tasks.

Before you begin

You must ensure that UPDATE privileges on the system PROCLIB are provided, for example: SYS1.PROCLIB.

Procedure

- If you are using Configuration Manager, copy the OMEGAMON Collector started task definitions generated for your RTE from *rHilev.rte_name* to your system PROCLIB.
- If you are using PARMGEN, copy the OMEGAMON Collector started task definitions from RKD2SAM (OMEGAMON Collector) and RKANSAM (OMEGAMON Db2 Agent) to your system PROCLIB.

Granting privileges

The OMEGAMON Collector creates work data sets when running. You must grant privileges for the high-level qualifiers you specified (one for VSAM and one for non-VSAM data sets) and to enable the OMEGAMON Collector to allocate work data sets.

Before you begin

Ensure that you grant ALTER privileges to data server high-level qualifiers (VSAM and non-VSAM).

Procedure

In your security system, grant ALTER privileges to the user ID and group ID DB2PM used by the OMEGAMON Collector started task on the data set high-level qualifiers.

For example, using the following RACF command:

```
PERMIT 'vsam_data_server_hlq.**' ID(DB2PM) ACCESS(ALTER)
PERMIT 'non_vsam_data_server_hlq.**' ID(DB2PM) ACCESS(ALTER)
```

Your current values are:

```
KD2_OMPE_VSAM_DSHLQ = TDCIT.DB2.DB2
KD2_OMPE_DSHLQ = TDCIT.DB2.DB2
```

APF-authorize libraries

You must APF-authorize any runtime libraries that are concatenated in the STEPLIB DDNAME of the OMEGAMON started tasks (like OMEGAMON Collector, TEMS, or TEMA).

Before you begin

Ensure you complete one of the following: requirements

- Provide UPDATE privilege for the OMEGAMON Collector started task JCL in your system PROCLIB (SYS1.PROCLIB)
- Provide UPDATE privilege for your system PARMLIB (SYS1.PARMLIB) and z/OS system command authority

Procedure

Add the following runtime load libraries to your list of APF-authorized libraries:

- *rHilev.rte_name*.RKANMODU
- *rHilev.rte_name*.RKANMOD
- *rHilev.rte_name*.RKANMODL
- *rHilev.rte_name*.RKANMODP

You can accomplish this in three different ways:

- Set the RTE_X_STC_INAPF_INCLUDE_FLAG to Y in your configuration tool user profile. This will handle all APF authorizations for you by adding the necessary statements into the started tasks.
- Add the APF authorization directly to the OMEGAMON Collector started task. Open the JCL in your system PROCLIB and add the following line before the EXEC statement (PGM=KO2ZTOPB) at the beginning of the started task for each of the libraries listed above:

```
// SETPROG APF,ADD,DSN=library_name,SMS
```

Note: If the data sets are not SMS managed, you must modify the statements above accordingly.

It is sufficient to add the APF authorization to the OMEGAMON Collector started task. The OMEGAMON Collector is always started first and therefore the libraries are already APF-authorized for the other started tasks.

- To manage the APF authorizations centrally, define your APF authorizations in your system's PARMLIB.
 - Add the following line to the member PROGxy in your system's PARMLIB (SYS1.PARMLIB) for each of the libraries listed above:

```
APF ADD DSN=library_name SMS
```

If the data sets are not SMS managed, you must modify the statements above accordingly.

- Enter the following z/OS system command to activate the changes:

```
/t PROG=xy
```

Preparing the Db2 subsystems

For each Db2 subsystem that you want to monitor, the OMEGAMON Collector requires that you bind several Db2 packages and Db2 plans.

Before you begin

Ensure the following requirements are met:

- SYSCTRL or higher
- If necessary, privileges to create a new user ID in your security system (for example, RACF)
- If the Db2 subsystems are members of a data sharing group, it is sufficient to submit the jobs for one member of the data sharing group.

About this task

All members referenced in the following steps are included in the *rHilev.rte_name*.RKD2SAM library.

Procedure

1. For each Db2 subsystem that you want to monitor, grant Db2 privileges to the OMEGAMON Collector plan and package owner by submitting the following members:
OMGRdb2ssid

2. Bind OMEGAMON Collector Db2 plan KO2PLAN by submitting the following members:

OMBPdb2ssid

3. Bind the OMEGAMON Collector Db2 packages by submitting the following members:

OMBDdb2ssid

Package versioning allows you to run and rollout multiple package versions in a data-sharing environment where OMEGAMON for Db2 Performance Expert runtime load libraries are not shared between LPARs. To use package versioning, remove the FREE PACKAGE subcommand from the JCL as described in the job header and then submit the job.

The FREE PACKAGE subcommand before the BIND will cause a return code > 0 at the first time you run the job. This is acceptable as the packages did not exist at this point in time.

4. Verify that each z/OS user ID that you want to use to access the OMEGAMON Collector by using the Performance Expert Client is available in your z/OS security system. Otherwise, create the z/OS user IDs.
5. Open the following members to grant Db2 privileges to each user ID that will work with the OMEGAMON Collector:
OMGPdb2ssid
 - a) Replace each occurrence of %peuser% with the user ID and submit the edited member.
 - b) %peuser% may also be customized using parameters KD2_OMPE_GRANT* using the configuration method of your choice and making sure the parameter generation is run accordingly.

Starting Db2 traces

Because the OMEGAMON Collector analyzes data for online monitoring collected by your Db2, the Db2 monitor trace must be started.

Before you begin

Ensure the following requirements are met:

- MONITOR1 privilege to access the collected data, or
- MONITOR2 privilege to access the collected data including sensitive data such as SQL statements

Procedure

1. In most cases the Db2 traces are automatically started by the OMEGAMON Collector for each subsystem that is monitored. However, if they were not started for a Db2 subsystem, an error message is written to the OMEGAMON Collector log. Check the server log for the following message:

```
FPEV0128S db2ssid CONNECT TO DB2 FAILED. MONITOR TRACE IS NOT STARTED
```

where *db2ssid* is the Db2 subsystem ID for which the monitor traces are not started.

2. If you receive the message above, you need to start the Db2 traces manually by doing the following:
 - a) Stop the OMEGAMON Collector started task:

```
P IBM02
```

- b) Start the DB2 MONITOR trace using one of the following commands:

- For local scope:

```
START TRACE(MON) CLASS(*)
```

- For data sharing scope:

```
START TRACE(MON) CLASS(*) SCOPE(GROUP)
```

Perform the command for each Db2 subsystem that caused the error message FPEV0128S. The command can be issued from a z/OS console, a DSN session, or a DB2I panel while Db2 is running.

3. Restart the OMEGAMON Collector started task with the following command:

```
S IBM02
```

Optionally, you can start/stop all configured products by starting the composite IBMSTRT/IBMSTOP job in the SYS1.PROCLIB library. This job includes /START &&*stc_name* commands for all configured products. These jobs are copied in the step “Copying started task definitions” on page 113.

Setting up RRSAF

OMEGAMON for Db2 Performance Expert uses Resource Recovery Services Attachment Facility (RRSAF) for connecting to Db2 subsystems

Before you begin

Ensure that RRSAF can be used on your system.

Procedure

1. Ensure that the RRS subsystem is running on your system.
2. If you have not already established a profile for controlling access from the RRS attachment facility, define *db2ssid*.RRSAF (where *db2ssid* is the Db2 subsystem ID) in the resource class DSNR (the RACF resource class for Db2).

This has to be done for each Db2 subsystem that you want to monitor. You can also define a generic resource RRSAF. These profiles might already exist if, for example, stored procedures have been used before. Assign READ authority for this RACF profile to the OMEGAMON Collector started task ID (PGDX02).

Conditional steps

Use the following information to enable the additional functions, components, and user interfaces and to determine the conditional steps needed to complete the configuration.

Before you begin with the conditional configuration steps:

- Ensure you have properly set up TCP/IP. For more information, see “Setting up TCP/IP services” on page 43.
- Review the list of functions in Table 17 on page 116 to ensure you have set their corresponding enablement parameters to Y as appropriate for your installation.

Table 17. Parameters for enabling functions	
Function	Parameter (set to Y to enable)
CPU Parallelism	KD2_OMPE_CPU_PARALLEL
PE Client	KD2_OMPE_PE_SUPPORT
Performance Warehouse	KD2_DBnn_PWH_D2PWPWHA
Event Collection Manager	KD2_PFn_OA_ECM
Object Analysis	KD2_PFn_OA_START
Automatic Exception Processing	KD2_PFn_AEXCP_D2PYACT
Near Term Thread History	KD2_PFn_HIS_START
Snapshot History	KD2_PFn_SH_D2SHKHST
Db2 Connect Monitoring app.	KD2_PFn_DCM_D2SHDCAP
Db2 Explain	KD2_PFn_EX_D2EXACT

<i>Table 17. Parameters for enabling functions (continued)</i>	
Function	Parameter (set to Y to enable)
IBM Db2 SQL Performance Analyzer	KD2_PFn SQLPA_ENABLE

After you have properly set up TCP/IP and enabled features, proceed with conditional steps to complete the configuration:

<i>Table 18. Conditional steps to complete the configuration of OMEGAMON for Db2 Performance Expert</i>	
Conditional steps	Required for ...
“Copying VTAM definitions” on page 117	Required for the Classic User Interface
“Reviewing runtime members and jobs” on page 117	Required if you used PARMGEN as your configuration method
“Manually allocating data sets” on page 118	Required for Near-Term History Collection
“Preallocating Snapshot History data sets” on page 119	Required for Snapshot History
“Completing Performance Warehouse setup” on page 119	Required for the Performance Warehouse component
“Defining additional security” on page 121	Required for the Performance Expert Agent for Db2 Connect Monitoring component
“Creating the Db2 EXPLAIN database” on page 121	Required for SQL tuning (EXPLAIN)
“Activating SOURCE EXPLAIN” on page 122	Required for SQL tuning
“Evaluating the cost of Object Analysis” on page 123	Required for Object Analysis
“Starting NTH data collection” on page 123	Required for Near Term History
“Enabling Db2 Query Monitor in the E3270 UI” on page 124	Required for integration with Db2 Query Monitor

Copying VTAM definitions

Copy the VTAM definitions to your VTAMLST system only if you plan to use the Classic User Interface.

Before you begin

Ensure that you provide UPDATE privilege on the system VTAMLST (SYS1.VTAMLST).

Procedure

- If you are using Configuration Manager, copy the VTAM major nodes for your RTE from *rHlev.rte_name.RKD2SAM* to your VTAMLST.
- If you are using PARMGEN, copy the VTAM major nodes from RKD2SAM (OMEGAMON Collector) and RKANSAM (Performance Expert Agent) to your VTAMLST.

Reviewing runtime members and jobs

Complete this step only if you are using PARMGEN. If you are using Configuration Manager you do not need to complete this task. You want to use the Db2 subsystem definitions that are configured in a model RTE (KD2_OMPE_CHECKSYS is set to Y). In the model RTE, all the Db2 subsystems are configured that you want to monitor with the OMEGAMON Collector running on this RTE. All the configuration information that you need for the Db2 subsystem-related runtime members is created in the profile library RKD2PRF

of the model RTE. By submitting the job CRTDB2* all runtime members needed for this are created on the basis of the RKD2PRF library of the model RTE.

Before you begin

Ensure that you provide ALTER privileges on::

- *rHilev.rte_name*.RKD2SAM
- *rHilev.rte_name*.RKD2PAR

Ensure that you provide READ privileges on:

- *rHilev.rte_name*.RKD2PRF

You must also ensure that Model RTE used (Set KD2_OMPE_CHECKSYS to Y)

Procedure

1. If you specified that your RTE uses the monitoring profiles and Db2 subsystem definitions of another RTE, then submit the appropriate \$PARSE* jobs.

For example, if you specified the following overrides:

```
KD2_OMPE_USE_MODEL = Y
KD2_OMPE_SHARED_PROFILE_LIB = IBM.DB2MODEL.LPARRTE2
RTE_SYSV_SYSVAR_FLAG = Y
```

then submit the following \$PARSE* jobs that create Db2 runtime members and sample jobs required by OMEGAMON for Db2 Performance Expert.

- *rHilev.rte_name*.WKD2SAM(CRTDB2) or
- *rHilev.rte_name*.WKD2SAM(CRTDB2V) if enabled for System Variables

2. Customize WCONFIG(DB2). For example:

```
KD2_OMPE_USE_MODEL = N
KD2_OMPE_SHARED_PROFILE_LIB
RTE_SYSV_SYSVAR_FLAG = N
```

If your RTE is not using Db2 monitoring profiles from another RTE, then submit \$PARSE* jobs:

- *rHilev.rte_name*.WKD2PRF(CRTDB2M) or
- *rHilev.rte_name*.WKD2PRF(CRTDB2MV) if enabled for System Variables

Manually allocating data sets

This optional task allocates the data sets that Near-Term History and Periodic Exception Processing require for data collection. The configuration tool assembles a job that contains allocation steps for all data sets that are needed for all Db2 subsystems according to your configuration.

Before you begin

Ensure the following requirements are met:

- ALTER privileges are granted for the high-level qualifiers that you specified for Near-Term History and Periodic Exception Processing data sets
- Configuration parameter KD2_OMPE_RUNALLOC is set to N (disabled)
- Near-Term History is enabled, and/or
- Periodic Exception Processing is enabled

About this task

The allocation job does not delete existing data sets. It allocates data sets only if the data sets do not already exist. Consider setting the configuration parameter KD2_OMPE_RUNALLOC to Y to automatically allocate the data sets using Configuration Manager or PARMGEN.

Procedure

1. Edit the member *rHilev.rte_name*.RKD2SAM(ALLOCDS) as needed for your environment.
2. Submit the job.

Preallocating Snapshot History data sets

You must preallocate the data set for every Db2 subsystem that you keep snapshot history information for.

Before you begin

Ensure that the following requirements are met:

- DEFINE CLUSTER privilege on data sets with the data server data sets high-level qualifier
- Snapshot History is enabled
- Snapshot History archive is defined on specific volumes, or the size is greater than 2 GB
- Fulfill the requirements for allocating data sets

Procedure

1. Open the member *rHilev.rte_name*.RKD2SAM(OMDD&*dbid*), where &*dbid* is the Db2 subsystem ID.
2. Edit the list of the volumes.
3. Submit the edited job.
4. Repeat these steps for each Db2 subsystem.

Completing Performance Warehouse setup

To complete setup of Performance Warehouse, grant the user ID/group ID DB2PM the required Db2 privileges to create and maintain the Performance Warehouse database and to make the Performance Warehouse started job executable. you can find all listed members in the library *rHilev.rte_name*.RKD2SAM.

Before you begin

Ensure the following requirements are met:

Required authorizations

- UPDATE privilege on the started tasks PROCLIB (for example, SYS1.PROCLIB)
- SYSADM authority on the Db2 subsystems for which Performance Warehouse is activated. If necessary, privileges to create a new user ID in your security system (for example, RACF).

Other requirements

- Performance Warehouse is enabled
- The started task user ID must be DB2PM or it must be associated to a group ID DB2PM
- Your z/OS is configured to support started jobs

Procedure

1. If your z/OS system is already configured to support started jobs, skip this step. If you perform this step, ensure that you have UPDATE privileges on the system PARMLIB.
Your z/OS system must be configured to search started jobs in the PROCLIB of the started tasks, so that the OMEGAMON Collector can create the Performance Warehouse at startup.
The master JCL MSTJCLxx in your system PARMLIB defines started job PROCLIBs either by an IEFJOBS or an IEFPDSI DD statement. As the Performance Warehouse job will be copied to the started tasks PROCLIB, this PROCLIB data set must be part of the IEFJOBS or IEFPDSI concatenation.
 - a) Open the master JCL in your system PARMLIB and find the IEFJOBS or the IEFPDSI DD statement. If no IEFJOBS or IEFPDSI DD statement exists, add a new IEFJOBS DD statement to the master JCL.
 - b) Add a further partitioned data set to the IEFPDSI or IEFJOBS concatenation for your started tasks PROCLIB.
2. Grant the Db2 privileges to the USERID/GROUPID DB2PM. Open and submit the following members: PWG1db2ssid
3. Make the Performance Warehouse started jobs executable. For each Db2 subsystem for which Performance Warehouse is activated, a started job is generated. Complete the following steps for each of the listed Performance Warehouse started jobs (for example, IBMPWH1):
 - a) Open the Performance Warehouse started job JCL and edit it:
 - Replace JOBACC with your job accounting information.
 - Replace JOBPROGRAMMER with the job owner name information.
 - b) Copy the Performance Warehouse started job JCL to your started task PROCLIB (for example, SYS1.PROCLIB).
4. Connect the Performance Warehouse started job to the userid DB2PM.
For example, by using the following RACF commands:

```
RDEFINE STARTED pwh_stc.* STDATA(USER(DB2PM))  
SETR RACLIST(STARTED) REFRESH
```

If the group ID DB2PM is used instead of the user ID DB2PM, assign the Performance Warehouse started job to the user ID <USER> that was added to the group ID DB2PM.

```
RDEFINE STARTED pwh_stc.* STDATA(USER(user) GROUP(DB2PM))  
SETR RACLIST(STARTED) REFRESH
```

where *pwh_stc* is the Performance Warehouse started task (for example, IBMPWH1).

5. Create the Performance Warehouse database.

Note: This step is not required if you use the same prefix for the Performance Warehouse started job as for the OMEGAMON started tasks and have connected the prefix to the user ID/group ID DB2PM in the mandatory step 1 already.

- a) Start the OMEGAMON Server started task by using one of the following commands:

```
S server_stc (system console)  
/S server_stc (SDSF)
```

- b) Open the SYSPRINT data set or log and wait until the following message is displayed:

```
FPEV5005I  xxxx DATABASE UPDATE COMPLETE
```

This message indicates that the creation of the Performance Warehouse database is complete (xxxx is the name of your Db2 subsystem). It is printed for every Db2 subsystem that was configured to use Performance Warehouse.

- c) Verify that each user ID for which you want to allow access to the Performance Warehouse is available in your z/OS security system. Otherwise create the z/OS user IDs.
- d) Open the following members to grant Db2 privileges to a Performance Warehouse user:

PWG2db2ssid. Replace each occurrence of %pwuser% with the user ID that you want to allow access for to the Performance Warehouse. Submit the edited member.

Note:

- %pwuser% may also be customized using parameter KD2_OMPE_GRANT_*
- Instead of assigning the privileges to each Performance Warehouse user ID, you can also connect all Performance Warehouse user IDs to a group ID and grant the privileges to this group ID.

Defining additional security

The Performance Expert Agent for Db2 Connect Monitoring communicates with the OMEGAMON Server by means of Db2 tables that are created by the Performance Warehouse. You can grant required Db2 privileges to the z/OS user ID that the Performance Expert Agent will use to access these tables.

Before you begin

Ensure the following requirements are met:

Required authorizations

- DBADM or higher on each Performance Warehouse database that is updated by the Performance Expert Agent
- If necessary, privileges to create a new user ID in your security system (for example, RACF)

Other requirements

Snapshot History for Db2 Connect Monitoring is enabled. This is the case if at least one of following collections are enabled for Snapshot History:

- DB2 Connect Application
- DB2 Connect System

The OMEGAMON Server must have been started at least once with Performance Warehouse enabled for the Db2 subsystem that hosts the Db2 Connect Monitoring. This is because the Performance Warehouse creates the tables that are used internally for the communication between the Performance Expert Agent and the OMEGAMON Server.

Procedure

1. Verify that the z/OS user ID that is used by the Performance Expert Agent to collect the DB2 Connect Monitoring data is available in the z/OS security system. Otherwise create the z/OS user IDs.
2. Edit member *rHilev.rte_name.RKD2SAM* to grant Db2 privileges to the Performance Expert Agent user: PWGAdb2ssid.

Replace each occurrence of %aguser% with the user ID of the Performance Expert Agent. This user ID is specified during the Performance Expert Agent configuration.

Note:

- %aguser% may also be customized using parameter KD2_OMPE_GRANT_*
 - Instead of assigning the privileges to each Performance Expert Agent user ID, you can also connect all Performance Expert Agent user IDs to a group ID and grant the privileges to this group ID.
3. Submit the edited member.

Creating the Db2 EXPLAIN database

Db2 EXPLAIN uses views on Db2 catalog tables and on its own application tables. To set up your Db2 EXPLAIN database, you must create these tables and views and grant privileges for each Db2

subsystem that you want to use Db2 EXPLAIN for. You can find all listed members in the library *rHilev.rte_name.RKD2SAM*.

Before you begin

Ensure the following requirements are met before completing this step.

Required authorizations

- SYSADMIN authorization for the Db2 subsystems with Db2 EXPLAIN enabled
- If necessary, privileges to create a new user ID in your security system (for example, RACF)

Other requirements

- Db2 EXPLAIN is activated

Procedure

1. Grant Db2 privileges to the RACF user ID/group ID that you entered as the owner of the EXPLAIN objects. Run the following members: *EXGRdb2ssid*
2. Create EXPLAIN tables by running the following members: *EXCTdb2ssid*
3. If EXPLAIN was already installed in a previous version, drop the EXPLAIN views. Run the following members: *EXDVdb2ssid*
4. Create EXPLAIN views by running member: *EXCVdb2ssid*
5. Create EXPLAIN QMF views by running the following members (in the case where QMF is not installed, dummy tables are created): *EXCQdb2ssid*
6. Bind EXPLAIN Db2 plan KO2EXPL by running the following members: *EXBPdb2ssid*
7. Bind EXPLAIN Db2 packages by running the following members: *EXBDdb2ssid*
Package versioning allows you to run and rollout multiple package versions in a data-sharing environment where OMEGAMON for Db2 Performance Expert runtime load libraries are not shared between LPARs. To use package versioning, remove the FREE PACKAGE subcommand from the JCL as described in the job header and then submit the job.
8. Verify that each z/OS user ID that you want to allow the usage of EXPLAIN is available in your z/OS security system. Otherwise create the z/OS user IDs.
9. Open the following members to grant Db2 privileges to EXPLAIN user ID: *EXGPdb2ssid*
Replace each occurrence of *%exuser%* with the user ID that you want to allow the usage of EXPLAIN. Submit the edited member.
%exuser% may also be customized in Db2 LPAR RTE profile parameter *KD2_OMPE_GRANT_**

Activating SOURCE EXPLAIN

You can use SOURCE EXPLAIN to explain SQL statements that are embedded in a source program or SPUFI input. SOURCE EXPLAIN is performed from within an ISPF/PDF editor, so you can have an SQL statement explained while editing a source program or SPUFI input. Install and customize the REXX EXEC *FPEJXPLS* in *rHilev.rte_name.RKO2SAMP*.

Before you begin

Ensure the following requirements are met before completing this step.

Required authorizations

- ALTER privilege on your EXEC library

Other requirements

- Db2 EXPLAIN is activated
- You want to use EXPLAIN on an SQL statement from within an ISPF edit session

Procedure

1. Copy FPEJXPLS to your EXEC library.
2. Rename the copy of FPEJXPLS to EXPLAIN.
3. Open the renamed REXX EXEC.
4. Find the section "ICAT / User" in the file and set the variable hlq3.1 to *rHilev*.
5. Customize the REXX EXEC according to your needs. See the customization options in the header of the REXX EXEC.

Evaluating the cost of Object Analysis

In an environment with significant levels of I/O activity on monitored DASD volumes, you can evaluate the cost of activating the Object Analysis function.

Procedure

When Object Analysis is started, thread details are also collected that correlate thread activity to Db2 getpage and I/O.

You can dynamically START/STOP the OA function using a MODIFY (F) command:

If Event Manager (EVENTMGR) is not yet started, start EVENTMGR:

At the command prompt, type or complete typing a system command, then press Enter:

```
====> /F IBM02, START EVENTMGR
```

Start OA dynamically (dependent on EVENTMGR):

At the command prompt, type or complete typing a system command, then press Enter:

```
====> /F IBM02, F EVENTMGR,START  
====> DB2=SS01, INTERVAL=15, THREAD=NO
```

Stop OA dynamically after you collect the Db2 data:

At the command prompt, type or complete typing a system command, then press Enter:

```
====> /F IBM02, F EVENTMGR,STOP  
====> DB2=SS01, INTERVAL=15, THREAD=NO
```

To avoid reconfiguration of the OMEGAMON for Db2 Performance Expert runtime members in the *rHilev.rte_name.RKD2** user libraries, START/STOP these functions dynamically.

Starting NTH data collection

You can issue specific subtask commands to the Near Term History (NTH) data collector subtask (H2WLMGR). The subtask commands must be preceded by the MODIFY command of the OMEGAMON Collector.

Before you begin

By default, OMEGAMON for Db2 Performance Expert uses seven VSAM data sets to store Near Term History (NTH) information. If your installation uses more than this default number of data sets, then you should customize and run the JCL in TKO2SAMP member KO2INCAP to format all of these data sets before they are accessed by the OMEGAMON Collector. Formatting these data sets in advance avoids a long wait or a timeout when the OMEGAMON Collector is started and NTH collection is initiated.

Procedure

You can dynamically START/STOP functions using a MODIFY (F) command:

If NTH Data Collector is not yet started, start NTH Collector:

At the command prompt, type or complete typing a system command, then press Enter:

```
====> /F IBM02, S H2WLMGR,  
====> OPTION=COPTdb2ssid
```

Stop NTH Data Collector dynamically

At the command prompt, type or complete typing a system command, then press Enter:

```
====> /F IBM02,  
====> STOP H2db2ssid
```

List the Virtual Storage Access Method (VSAM) data sets for history data

List the Virtual Storage Access Method (VSAM) data sets for history data that are defined in the collections options member (COPTSS01 for example), in the RKD2PAR data set. Also, display the status of each dataset and amount of space used.

At the command prompt, type or complete typing a system command, then press Enter:

```
====> /F IBM02, F H2db2ssid,  
====> LISTH2DS
```

To avoid reconfiguration of the OMEGAMON for Db2 Performance Expert runtime members in the *rHilev.rte_name*.RKD2* user libraries, you can START/STOP these functions dynamically using operator commands.

Enabling Db2 Query Monitor in the E3270 UI

You can integrate the OMEGAMON Enhanced 3270 User Interface with IBM Db2 Query Monitor for z/OS.

Before you begin

When you configure OMEGAMON for Db2 Performance Expert using either Configuration Manager or PARMGEN, the following OMEGAMON Enhanced 3270 User Interface integration data sets are allocated:

- *rHilev.RSPLEX0K.XKANWENU*
- *rHilev.RSPLEX0K.XKANHENU*
- *rHilev.RSPLEX0K.XKANEXEC*

You can use the LPAR RTE parameter RTE_XKAN_HILEV to override the default high-level qualifier *rHilev.&SYSPLEX*. with alternate Tivoli OMEGAMON (TOM) data sets for other integration products that deliver work spaces and other E3270 UI support elements.

Note:

- Specify the same HLQ for other RTEs that report to the same TOM in order to share the same XKAN* data sets.
- The configuration method allocation jobs automatically append the XKAN* low-level suffix to this HLQ.

The following XKAN* data sets are concatenated in the respective E3270 UI PGDXTOM started task DDNAMEs automatically:

```
VIEW      rHilev.rte_name.xKANSAMU(PGDXTOM)  
Command ===>  
//*****  
//* TOM workspace definitions:  
//*****  
//RKANWENU DD DISP=SHR,  
//          DSN=&RHILEV..&SYS..UKANWENU  
//          DD DISP=SHR,  
//          DSN=&BASEHLEV.KANWENU  
//          DD DISP=SHR,  
//          DSN=TDCIT.DB2.RSPLEX0K.XKANWENU  
//*****  
//* TOM help definitions:  
//*****  
//RKANHENU DD DISP=SHR,  
//          DSN=&RHILEV..&SYS..UKANHENU  
//          DD DISP=SHR,  
//          DSN=&BASEHLEV.KANHENU
```



```
//          DD DISP=SHR,
//          DSN=TDCIT.DB2.RSPLEX0K.XKANHENU
//*****
//* TOM standard REXX libraries:
//*****
//RKANEXEC DD DISP=SHR,
//          DSN=&RHILEV..&SYS..UKANEXEC
//          DD DISP=SHR,
//          DSN=&BASEHLEV.KANEXEC
//          DD DISP=SHR,
//          DSN=TDCIT.DB2.RSPLEX0K.XKANEXEC
```

Procedure

1. To use the embedded data feature of the E3270 UI to view more detailed information about the currently executing SQL statement, you must install application support files for Db2 Query Monitor.

To enable the Db2 Query Monitor integration with the E3270 UI, refer to the Db2 Query Monitor PTF that provides the E3270 UI integration. Db2 Query Monitor provides the detailed HOLDDATA information to populate the *rHilev.RSPLEX0K.XKAN** data sets and other enablement steps.

The following sample copy job is provided:

- *rHilev.rte_name*.RKANSAMU(KOBXKNCP)
2. Review the RKANSAMU(KOBXKNCP) job and customize it to specify the XKAN* source data sets from which to copy the E3270 UI SMP/E elements.
 3. Submit the customized job in the RTE in which the E3270 UI is configured. If the E3270 UI reports to a z/OS-based Hub TEMS, submit the job in the RTE where the z/OS Hub TEMS is configured, if it is not the same local LPAR RTE where the E3270 UI is configured.

Chapter 5. Updating your installation

This section shows you how to update your installation to a later version.

Updating to V5.5.0

OMEGAMON V5.5.0 monitoring agents require Tivoli Management Services V6.3.0 Fixpack 7.

If you upgrade from OMEGAMON for Db2 PE V5.1.1 or later, you must upgrade to Tivoli Management Services V6.3.0 Fixpack 7 or later.

If you have installed an earlier version of Tivoli Management Services V6.3.0, you must, at least, upgrade the hub Tivoli Enterprise Monitoring Server before you install your first V5.5.0 monitoring agent. In addition, any remote monitoring server through which a V5.5.0 OMEGAMON monitoring agent reports to the hub monitoring server must also be upgraded to Tivoli Management Services V6.3.0 Fixpack 7 or later.

The OMEGAMON V5.5.0 products support a staged migration. This means as you are migrating from OMEGAMON V5.1, V5.2 or V5.3 products to OMEGAMON V5.5.0 products, you may have a combination of V5.1.1, V5.2, V5.3, and V5.4 monitoring agents installed in your environment. For example, you may have an OMEGAMON for Db2 PE monitoring agent V5.3 and an OMEGAMON for Db2 PE monitoring agent V5.4 running in the same hub Tivoli Enterprise Monitoring Server environment during the migration period. Support of a mixed environment is provided as a migration help. Operators working in such a transitional environment should be aware of the following issues:

- OMEGAMON for Db2 supports agent versioning. If a workspace has different versions, it always shows the agent that corresponds to the version. For example, a V5.4 workspace is displayed for a V5.4 agent. The full-text help and the situation editor provides information for all supported versions of agents.
- You can use the predefined dynamic workspace links provided by the OMEGAMON for Db2 workspace in the workspace of another OMEGAMON product as long as the target workspace exists in this IBM Tivoli Monitoring (ITM) enterprise. If the target workspace does not exist, you will receive message KFWITM081E.
- You can use the predefined dynamic workspace links provided by V5.5.0 agents to link from an OMEGAMON V5.5.0 workspace to the workspace of another OMEGAMON V5.4 product as long as the target workspace exists in the product. If the target workspace does not exist, you will receive message KFWITM081E.
- In cases where the V5.5.0 of the target workspace has been modified (for example, HTML links added to some workspaces) you may notice a different behavior when you migrate the target product from V5.1.1 to V5.5.0.
- All user interfaces (except for the Configuration Tool and Install Shield) provided with Tivoli Enterprise Portal version 6.2 or later and the OMEGAMON version 5.1 or later monitoring agents are globalized. As a result, workspaces in OMEGAMON XE V5.1 or later are displayed in the specified language (for example, Spanish or Chinese).

Updating to OMEGAMON for Db2 Performance Expert V5.5.0

You can update previous versions of OMEGAMON for Db2 Performance Expert to V5.5.0. If you want to update to V5.5.0 from 5.2.0 or earlier, you must first update certain tables to 5.3.0, then update all other tables to V5.5.0.

For an overview of steps that you will complete to update tables, see [Figure 2 on page 135](#).

Installing the SMP/E

Instructions for installing the SMP/E are in the Program Directory for your product. Also check the PSP bucket for additional information. Ensure you have installed all PTFs available at the time you install.

You can find the Program Directory for your product at [Where to find information](#) for OMEGAMON for Db2 Performance Expert.

When installing the SMP/E:

- Install the latest PTFs for the version of OMEGAMON for Db2 Performance Expert you are updating to.
- You can use a separate SMP/E CSI zone for the new version of OMEGAMON for Db2 PE, or you can use the same SMP/E CSI zone for both, the old and the new versions.
 - If using separate SMP/E zones, install the new SMP/E as a new installation shown at [SMP/E maintenance and upgrade scenarios](#).
 - If using the same SMP/E zone, use the instructions in the Program Directory, keeping in mind that the SMP/E control statements of each FMID control acceptance and installation rules.

Switching to Configuration Manager from PARMGEN

To switch your existing PARMGEN configuration to Configuration Manager, use the Configuration Manager MIGRATE action. Consider using the *in-place migrate* option. Alternatively, you can create a new runtime environment using new high-level qualifiers.

About this task

See the [OMEGAMON shared documentation](#) for information about:

- [Configuration Manager](#)
- The **MIGRATE** action
- [Creating your first, minimal runtime environment](#)

Procedure

1. Make a copy of the sample program TKANCUS(KFJJMCM) and customize as instructed in the JCL.
2. Run the **MIGRATE** action to create an RTEDEF/SECEXITS and, optionally, an EMBEDS data set to contain the PARMGEN parameter settings for your RTE.
3. Change any high-level qualifiers for your environment.
4. Adopt new parameters introduced in 5.5.0 that simplify the Classic Near Term History configuration.
5. Run the **GENERATE** action to create your runtime environment.
6. Complete steps in [Complete the Configuration](#).

Updating the runtime environment with Configuration Manager

Complete this task if you are using Configuration Manager to update your runtime environment.

Procedure

1. Update your SMP/E libraries.
2. If the default values for new parameters do not work or you have Classic Near-Term History and customized sequential data sets, check for 5.5.0 changes to parameter values, deprecated parameters, and new parameters.
 - [Changes to parameter values](#)
 - [Deprecated parameters](#)
 - [New parameters](#)
3. Run the **GENERATE** action.

4. For each Db2 subsystem you want to monitor, submit the BIND jobs OMBP<ssid> and OMBD<ssid> in RKD2SAM, where <ssid> is the Db2 subsystem ID. If you use EXPLAIN, submit the BIND jobs EXBP<ssid> and EXBD<ssid> for each Db2 subsystem you use EXPLAIN. See also Completing the Configuration steps for details.

Updating the runtime environment with PARMGEN

Complete this task if you are using PARMGEN to update your runtime environment.

About this task

After your SMP/E installation or update is completed, you must make changes to support Db2 Version 13 in your runtime environment. We also recommend switching to Configuration Manager from PARMGEN to benefit from configuration enhancements in 5.5.0.

For more details on updating your runtime environment with PARMGEN, see 'SMP/E maintenance and upgrade scenarios' in the [OMEGAMON shared documentation](#).

Procedure

1. Add **GBL_DSN_DB2_LOADLIB_V13** and **GBL_DSN_DB2_RUNLIB_V13** to the list of Db2 system libraries, as shown below. For Db2 Version 13, you must provide corresponding load and run libraries for the version-specific libraries. \$GBL\$USR is not updated during migration and you'll need to add the corresponding parameters manually.

```
GBL_DSN_DB2_SDSNLOAD "DSN.VBAR1M0.SDSNLOAD"
```

```
GBL_DSN_DB2_LOADLIB_V11 "DSN.VBR1M0.SDSNLOAD"
```

```
GBL_DSN_DB2_LOADLIB_V12 "DSN.VCR1M0.SDSNLOAD"
```

```
GBL_DSN_DB2_LOADLIB_V13 "DSN.VDR1M0.SDSNLOAD"
```

```
GBL_DSN_DB2_RUNLIB_V11 "DSN.VBR1M0.RUNLIB"
```

```
GBL_DSN_DB2_RUNLIB_V12 "DSN.VCR1M0.RUNLIB"
```

```
GBL_DSN_DB2_RUNLIB_V13 "DSN.VDR1M0.RUNLIB"
```

```
GBL_DSN_DB2_DSNEXT "DSN.VAR1M0.DSNEXIT"
```

2. Recreate the BIND jobs:
 - a) Copy the BIND sample jobs FPEVOMBD and FPEVOMBP from the *&shilev.TKO2SAMP* library to the *&rhilev.RKD2PRF* library of the RTE.
 - b) Rename the sample job FPEVOMBD to OMBDDBDID, and rename the sample job FPEVOMBP to OMBPDBID.
 - c) Submit the *&rhilev.RKD2PRF(CRTDB2M)* job to recreate all configured Db2 subsystem-related runtime members.
A BIND job for each configured Db2 subsystem is created.
 - d) For each Db2 subsystem you want to monitor, submit the BIND jobs OMBP<ssid> and OMBD<ssid> where <ssid> is the Db2 subsystem ID. If you use EXPLAIN, submit the BIND jobs EXBP<ssid> and EXBD<ssid> for each Db2 subsystem you use EXPLAIN.
3. Repeat the steps above for each runtime environment.

Changes to parameter values

Before updating to OMEGAMON for Db2 Performance Expert 5.5.0, familiarize yourself with changed values for certain parameters.

Changes to parameter values apply to the Configuration Manager and PARMGEN. You must change values for the following parameters in the Configuration Manager RTEDEF data set or the PARMGEN profile for 5.5.0.

Table 19. Changed parameter values		
Parameter	V5.4.0 values	5.5.0 values
KD2_DBxx_DB2_VER	10, 11, 12	11, 12, 13
	<ul style="list-style-type: none"> • OMEGAMON for Db2 Performance Expert V5.4.0 does not support Db2 Version 10. • OMEGAMON for Db2 Performance Expert V5.5.0 supports Db2 Version 13. 	
KD2_PFxx_SQLPA_VERSION	4.2, 5.1	5.1
	OMEGAMON for Db2 Performance Expert V5.5.0 does not support SQL Performance Analyzer (SQLPA) V4.1 and 4.2. Version 5.1 is the only valid value for this parameter.	
KD2_PFxx_SQLPA_CF_ENBL	Y	Y
GBL_DSN_DB2_LOADLIB_V13 GBL_DSN_DB2_RUNLIB_V13	<i>Db2 load and run libraries</i>	<i>Db2 load and run libraries</i>
	These parameters configure the load and run libraries for Db2 Version 13 monitoring. These parameters are located in Configuration Manager member RTEDEF(GBL\$PARM) or the global parameter configuration profile \$GBL\$USR for PARMGEN. You can also add them to the existing LOADLIB and RUNLIB parameters for other Db2 versions.	
GBL_DSN_DB2_LOADLIB_V12 GBL_DSN_DB2_RUNLIB_V12	<i>Db2 load and run libraries</i>	<i>Db2 load and run libraries</i>
	These parameters configure the load and run libraries for Db2 Version 12 monitoring. These parameters are located in Configuration Manager member RTEDEF(GBL\$PARM) or the global parameter configuration profile \$GBL\$USR for PARMGEN. You can also add them to the existing LOADLIB and RUNLIB parameters for other Db2 versions.	
GBL_DSN_DB2_LOADLIB_V11 GBL_DSN_DB2_RUNLIB_V11	<i>Db2 load and run libraries</i>	<i>Db2 load and run libraries</i>
	These parameters configure the load and run libraries for Db2 Version 11 monitoring. These parameters are located in Configuration Manager member RTEDEF(GBL\$PARM) or the global parameter configuration profile \$GBL\$USR for PARMGEN. You can also add them to the existing LOADLIB and RUNLIB parameters for other Db2 versions.	

Deprecated parameters

APAR OA62832 removes support for the following parameters for all versions and releases of OMEGAMON for Db2 Performance Expert. If these parameters are still specified in a Configuration Manager RTEDEF data set member or in a PARMGEN WCONFIG file, they are ignored.

You can safely remove these parameters from your configuration:

- KD2_DBnn_DB2_USEFLG
- KD2_OMPE_E2E_MON_SPRT

- KD2_PFnN_READA_SPMON
- KD2_PFnN_SH_D2SHSQLC
- KD2_PFnN_SH_D2SHSQLI
- KD5_DBnn_OPM_E2ESQLHN_TCP_HOST
- KD5_DBnn_OPM_E2ESQLPT_PORT_NUM
- KD5_DBnn_OPM_E2ESECURE_SECURE

APAR OA62832 also deprecates the following parameters in OMEGAMON for Db2 Performance Expert 5.5.0. If you are using Configuration Manager, you can remove these parameters from the RTEDEF data set member. If you are using PARMGEN, these parameters are *ignored*, but they **cannot** be removed from a PARMGEN WCONFIG file due to backward compatibility constraints.

- KD2_PFnN_HIS_LOG<n>, n = 1...7
- KD2_PFnN_HIS_VSAM_SCLAS<n>, n = 2...7
- KD2_PFnN_HIS_VSAM_MCLAS<n>, n = 2...7
- KD2_PFnN_HIS_VSAM_VOLUME<n>, n = 2...7
- KD2_PFnN_HIS_SEQLOG<n>, n = 1...7
- KD2_PFnN_HIS_SEQ_MCLAS<n>, n = 1...7
- KD2_PFnN_HIS_SEQ_SCLAS<n>, n = 1...7
- KD2_PFnN_HIS_SEQ_UNIT<n>, n = 1...7
- KD2_PFnN_HIS_SEQ_VOLUME<n>, n = 1...7

Tip: Before you migrate to OMEGAMON for Db2 Performance Expert 5.5.0, review the information in [“Migration considerations for Classic Near-Term History and Enhanced 3270 Thread History in 5.5.0 \(OA66051\)”](#) on page 133.

New parameters

OMEGAMON for Db2 Performance Expert 5.5.0 introduces new parameters that simplify configuration for Classic Near-Term History VSAM and static sequential data sets.

In addition, the existing real-time options parameter **NTHDB2I** is exposed as a formal parameter **KD2_OMPE_OPTS_NTHDB2I**.

NTH Collector Db2 initialization option

The following parameter controls the behavior of the NTH collection task during startup:

- KD2_OMPE_OPTS_NTHDB2I

Db2 Version 13

If you want to configure a Db2 13 subsystem, specify the data set in which the Db2 version 13 LOADLIB and RUNLIB modules reside.

- GBL_DSN_DB2_LOADLIB_V13
- GBL_DSN_DB2_RUNLIB_V13

Near-Term History Classic VSAM file definition

Beginning with 5.5.0, you can specify the number of VSAM data sets to allocate by using **KD2_PFnN_HIS_LOG_NUM** in the respective monitoring profile. You can customize the allocation attributes for all data sets by using the existing parameters **KD2_PFnN_HIS_VSAM_SU** and **KD2_PFnN_HIS_VSAM_MB** accordingly. Additionally, you can use the following storage allocation parameters for all data sets as specified in **KD2_PFnN_HIS_LOG_NUM**:

- KD2_PFnN_HIS_VSAM_SCLAS

- KD2_PFnn_HIS_VSAM_MCLAS
- KD2_PFnn_HIS_VSAM_VOLUME

Note: The **KD2_PFnn_HIS_LOG_NUM** parameter replaces all instances of **KD2_PFnn_HIS_LOG<i>**. For information, see [Deprecated parameters](#).

The Classic Near-Term History VSAM low-level qualifier (LLQ) in 5.5.0 changed to accommodate a number of data sets greater than 99 as specified by the **KD2_PFnn_HIS_LOG_NUM** parameter.

- Old VSAM LLQ (for 5.4.0 and earlier versions): RKD2VSxx
- New VSAM LLQ: RKD2Vxxx

Allocation of the 5.5.0 VSAM data sets is completed entirely by Configuration Manager (or PARMGEN) using the following pattern:

- *[RTE_VSAM_HILEV.RTE_NAME|KD2_OMPE_VSAM_DSHLQ].%DB%.RKD2Vxxx*

If parameter **KD2_OMPE_VSAM_DSHLQ** is set, this parameter is used as the High-Level Qualifier (HLQ) for the VSAM data set. If not set, the default HLQ name is the concatenation of parameter values for HLQ **RTE_VSAM_HILEV** and **RTE_NAME**. In all cases, the value **%DB%** is derived from the Db2 monitoring definition parameter **KD2_DBxx_DB2_SSID**.

The following parameters are introduced in APAR OA66051:

- For Classic Near-Term History:
 - KD2_PFnn_HIS_VSAM_PREFIX
 - KD2_PFnn_HIS_VSAM_CUSTOMIZE
- For Enhanced 3270 Thread History:
 - KD2_PF_THRDHIS_VOLUME
 - KD2_PF_THRDHIS_SCLAS
 - KD2_PF_THRDHIS_MCLAS

For information about using these parameters, see the following topics:

- When upgrading from 5.4.0 and earlier versions, see [“Migration considerations for Classic Near-Term History and Enhanced 3270 Thread History in 5.5.0 \(OA66051\)”](#) on page 133.
- For information about customization, see [“Advanced customization for Classic Near-Term History”](#) on page 133.

Near-Term History Classic Static Sequential file definition

Beginning with 5.5.0, you can specify the number of static sequential data sets to use by specifying parameter **KD2_PFnn_HIS_SEQ_LOG_NUM** in the monitoring profile. If you need to customize allocation attributes, use the following parameters to configure customizations for all allocated data sets:

Note: Parameters **KD2_PFnn_HIS_SEQ_PRIMARY_CYL** and **KD2nn_PF_HIS_SEQ_SECONDARY_CYL** are reused accordingly.

- **KD2_PFnn_HIS_SEQ_LOG_NUM** replaces **KD2_PFnn_HIS_SEQLOG<i>**, **i = 1...7**
- **KD2_PFnn_HIS_SEQ_MCLAS** replaces **KD2_PFnn_HIS_SEQ_MCLAS<i>**, **i = 1...7**
- **KD2_PFnn_HIS_SEQ_SCLAS** replaces **KD2_PFnn_HIS_SEQ_SCLAS<i>**, **i = 1...7**
- **KD2_PFnn_HIS_SEQ_UNIT** to **KD2_PFnn_HIS_SEQ_UNIT<i>**, **i = 1...7**
- **KD2_PFnn_HIS_SEQ_VOLUME** to **KD2_PFnn_HIS_SEQ_VOLUME<i>**, **i = 1...7**

For explanations of each parameter, find the parameter in [Parameters](#) in the *OMEGAMON for Db2 Performance Expert on z/OS User's Guide*.

For more information about customizing your data set allocations, see [“How to fully customize your data set allocations”](#) on page 109.

New Enhanced 3270 Thread History configuration settings (OA66051)

Prior to APAR OA66051, the Enhanced 3270 Thread History VSAM data sets used the **KD2_PF_HIS_VSAM_VOLUME1**, **KD2_PF_HIS_VSAM_SCLAS1**, and **KD2_PF_HIS_VSAM_MCLAS1** parameters for default allocation attributes. These parameters were also shared with the Classic Near-Term History functionality, which was not optimal for differentiating between the parameters used for Enhanced 3270 Thread History vs Classic Near-Term History.

With APAR OA66051, new parameters are introduced to differentiate the allocation attributes for each function:

- **KD2_PF_THRDHIS_VOLUME** (defaults to RTE_SMS_VSAM_VOLUME, if not specified)
- **KD2_PF_THRDHIS_SCLAS** (defaults to RTE_SMS_VSAM_STORCLAS, if not specified)
- **KD2_PF_THRDHIS_MCLAS** (RTE_SMS_VSAM_MGMTCLAS, if not specified)

Important: If you are not using the given defaults for the parameters, ensure that the new parameters match the expected values for RKTH* data sets.

Migration considerations for Classic Near-Term History and Enhanced 3270 Thread History in 5.5.0 (OA66051)

With APAR OA66051, the following parameter changes are introduced to simplify migration when you upgrade to 5.5.0 from 5.4.0 and earlier versions.

The number of Classic Near-Term History VSAM data sets in 5.5.0 is specified exclusively by parameter **KD2_PFn_HIS_LOG_NUM**. The parameters **KD2_PF_HIS_LOG<i>** are deprecated and will be ignored. Parameters **KD2_PFn_HIS_VSAM_SU** and **KD2_PFn_HIS_VSAM_MB** are reused accordingly to define the size of an individual VSAM data set.

The following parameters can be reused from a 5.4.0 configuration as per the WCONFIG PARMGEN member or the respective RTEDEF Configuration Manager member if the new parameter **KD2_PFn_HIS_VSAM_PREFIX** is set to "VS" (default is "V"):

- **KD2_PFn_HIS_VSAM_SCLAS<i>**, i = 1...7
- **KD2_PFn_HIS_VSAM_MCLAS<i>**, i = 1...7
- **KD2_PFn_HIS_VSAM_VOLUME<i>**, i = 1...7

If you want to migrate 5.4.0 Classic Near-Term History configurations that used a number of VSAM data sets larger than 7, the use of embed overrides is no longer supported. Instead, specify the following parameters in the existing PARMGEN WCONFIG member or the respective Configuration Manager RTEDEF member, along with the new parameters **KD2_PFn_HIS_VSAM_PREFIX** (set to "VS", see above) and **KD2_PFn_HIS_VSAM_CUSTOMIZE** (set to "Y"):

- **KD2_PFn_HIS_VSAM_SCLAS<i>**, i = 7...768
- **KD2_PFn_HIS_VSAM_MCLAS<i>**, i = 7...768
- **KD2_PFn_HIS_VSAM_VOLUME<i>**, i = 7...768

Advanced customization for Classic Near-Term History

You can tailor individual data sets in Classic Near-Term History by specifying parameter **KD2_PFn_HIS_VSAM_CUSTOMIZE** set to "Y".

This setting allows you to specify different values for each data set in the PARMGEN WCONFIG or respective RTEDEF member. This setting will persist the configuration changes without the previous requirement to use embed overrides or RKD2SAM(ALLOCDS) customizations.

The following parameters qualify for customization:

- **KD2_PFn_HIS_VSAM_SCLAS<i>**, i = 1...768
- **KD2_PFn_HIS_VSAM_MCLAS<i>**, i = 1...768
- **KD2_PFn_HIS_VSAM_VOLUME<i>**, i = 1...768

Note: If you use the new parameter **KD2_PFn_HIS_VSAM_CUSTOMIZE** set to Y along with **KD2_PFn_HIS_VSAM_PREFIX** set to "VS" (for example if you migrate 5.4.0 settings without changing the LLQ for your Classic Near-Term History data sets), you can only customize up to 99 data sets using this customization option.

Updating Tivoli Enterprise Monitoring Agent

If the updated runtime environment has a Tivoli Enterprise Monitoring Agent, you must update the Tivoli Enterprise Monitoring Agent.

Procedure

- To update the Tivoli Enterprise Monitoring Agent, complete the steps for your implementation scenario. For instructions, see [Implementation scenarios](#).

Updating the Performance Warehouse

If you created a Performance Warehouse for an earlier version, you must manually update it for V5.4.0.

Before you begin

Due to data model changes, you will need to manually update data stored in Statistics tables to 5.4.0.

If Performance Warehouse is enabled, the new OMEGAMON Collector automatically detects older Performance Warehouse versions and stops the Performance Warehouse server task.

If you are starting with version 5.4.0, delete the existing Performance Warehouse database DB2PM from the old version and drop the plan DB2PM and its packages. There are no further update steps. Note that if Performance Warehouse is enabled in the configuration, the OMEGAMON Collector of the new version automatically manages the bind of its packages in the plan DB2PM and creates the Performance Warehouse tables.

Note: After you update the Performance Warehouse tables, Db2 might place the table space STAT in advisory REORG-pending (AREO*) status because existing data is not immediately converted to its new definition. You can reorganize the table space to prevent possible performance degradation. When data is in REORG-pending or AREO* status, you can automatically re-organize partitions using the REORG utility with the SCOPE PENDING option - you do not need to identify which partitions need to be reorganized or customize the REORG control statement.

Procedure

1. Disconnect all workstation clients and stop the OMEGAMON Collector enabled for the Performance Warehouse.
2. Drop the table space STAT in the database DB2PM.
3. Start the new OMEGAMON Collector with the newly created Performance Warehouse configuration and Performance Warehouse response file.

The Collector recreates the table space STAT and create the new Statistics tables. The table space STAT has a default size of 32K and a minimum size of 4K.

Note: If this step fails, continue to step 5; otherwise, continue with step 4.

4. Stop the Performance Warehouse server task using the following console command: `/F <started task>,F PESERVER,F <db2ssid>, PWH=N.`
5. Restart the Performance Warehouse server task in FORCE mode by using the following console command: `/F <started task>,F PESERVER,F <db2ssid>, PWH=F.`

Updating the Performance Database

Use the following figure as a reference for the steps you need to complete to update to OMEGAMON for Db2 Performance Expert Performance Database V5.5.0.

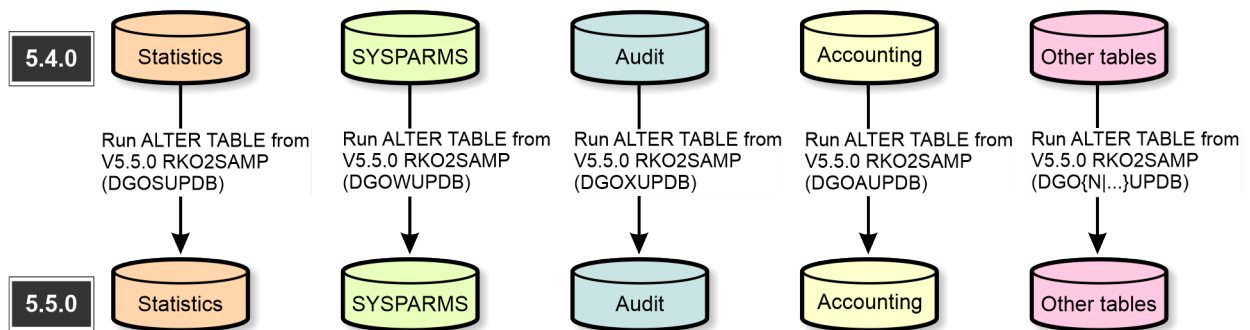


Figure 2. Overview of update steps to V5.5.0

Updating Performance Database tables to V5.5.0

Update Performance Database tables to V5.5.0.

About this task

Note:

After you execute ALTER TABLE statements, Db2 might place the table space containing the modified data in advisory REORG-pending (AREO*) status because existing data is not immediately converted to its new definition. You can reorganize the table space to prevent possible performance degradation. When data is in REORG-pending or AREO* status, you can automatically re-organize partitions using the REORG utility with the SCOPE PENDING option - you do not need to identify which partitions need to be reorganized or customize the REORG control statement.

Procedure

1. Complete one of the following:
 - If you are starting with V5.4.0, execute the ALTER TABLE statements that apply to version V5.5.0 to add or drop columns listed in members DGO*UPDB of the V5.5.0 library RKO2SAMP (RTE).
2. Populate all modified tables with new data:
 - Customize the LOAD parts of the new version.
 - If you work with Accounting and Statistics SAVE tables, use the SAVE file conversion utility with the new version.

Updating statistics field selection lists of the Spreadsheet Input Data Generator

You can update customized field selection lists delivered with the Spreadsheet Input Data Generator.

Procedure

- Recreate the customized field selection lists based on the sample lists delivered as members RKANSAMF/TKANSAMF(FPEP*) in the product library. Note that RKANSAMF/TKANSAMF is a new product library. If you do not want to customize the lists, the Spreadsheet Input Data Generator can use the sample lists in this library as input.

Updating the Performance Expert Client

You must update to the new Performance Expert Client when you update the V5.5.0 OMEGAMON Collector. The old Performance Expert Client does not work with the new server.

Procedure

- Complete the instructions in [“Installing and configuring Performance Expert Client”](#) on page 49 of this guide.

Use the same installation directory for the new Performance Expert Client. You do not need to uninstall the old version before beginning because the new version overwrites the old version. Subsystem definitions in the old Performance Expert Client are automatically imported into the new Performance Expert Client. You do not need to manually export and then import the definitions.

Updating the Performance Expert Agent for Db2 Connect Monitoring

You must manually update Performance Expert Agent for Db2 Connect Monitoring to version V5.5.0 on each system.

Before you begin

Configuration entries containing the Db2 Performance Expert for Linux, UNIX, and Windows server version 3.2.0 or later are no longer supported. They will be set to *paused* status during runtime.

Procedure

- To manually update the Performance Expert Agent for Db2 Connect Monitoring on each system, complete the instructions for your environment available at [“Installing Performance Expert Agent for Db2 Connect Monitoring on Windows”](#) on page 56.

Updating IBM Tivoli Monitoring components

You must update IBM Tivoli Monitoring components such as Tivoli Enterprise Monitoring Server, Tivoli Enterprise Portal, and Tivoli Enterprise Portal Server so that the OMEGAMON for Db2 PE V5.4.0 Application Support works.

Procedure

1. Update each of the IBM Tivoli Monitoring framework components to IBM Tivoli Monitoring V6.3.0 by completing the instructions at [IBM Tivoli Monitoring documentation](#).
Personalized workspaces are automatically migrated during the update.
2. Install the application support files using the application support file DVD from Shopz.

Updating User-Tailored Report (UTR) layouts

You can create and tailor accounting and statistics report layouts with User-Tailored Reports (UTR).

You can add and remove report blocks and fields within blocks and change block and field labels. UTR functionality is described in the [Reporting User's Guide, Customizing OMEGAMON for Db2 PE functions](#).

OMEGAMON for Db2 Performance Expert supports the migration of accounting and statistics report layouts created with previous releases. Previous layouts are identified and mapped to the internal representation of the new version, and a user-defined report is externalized similarly in version 5.5.0. You are encouraged to recreate a user-tailored report layout within the new version to avoid report mismatches that result from semantic changes in the new version.

Converting Performance Warehouse table spaces for Db2 12 FL504 compatibility

Follow these steps to convert Performance Warehouse table spaces for Db2 12 FL504 compatibility.

About this task

If you use Db2 V12 subsystems activated at FL504 or later and make use of any of the following:

- Performance Warehouse (PWH)
- Db2 connect monitoring
- IBM Db2 SQL Performance Analyzer (SQLPA)

You must apply APAR PH08213, you must complete the following steps for each Db2 subsystem for which PWH is configured:

Procedure

1. Optional: If you have an existing Db2PM database in Db2 that uses PWH, and tables in ACCS and STAT that contain data you want to preserve.

If you do not have an existing Db2PM database, proceed to step 2.

Before restarting the OMPE server task:

- a. Run the unload utility to save data from the DB2PM database tables.
- b. Drop the DB2PM database.

2. Restart the OMPE server task to activate APAR PH08213.

This creates the new PWH Db2 objects in the DB2PM database.

3. Optional: If you unloaded data from an existing DB2PM database that uses PWH (step 1), then run the load utility to reload the data to the newly created tables.

The new tables might now reside in a different table space.

The Accounting Save-File Utility

Use the Save-File utility to migrate and convert Accounting Save data sets into a format suitable for OMEGAMON for Db2 Performance Expert V5.5.0.

The function performed is specified in a parameter on the EXEC command.

Migrating Data Sets

This topic describes how to migrate Accounting Save data sets created by OMEGAMON for Db2 Performance Expert V5.2.0 or V5.3.0 into the record format of OMEGAMON for Db2 Performance Expert V5.5.0.

Procedure

1. Create a VSAM data set for version 5.3.0 or 5.4.0.
2. Define an OMEGAMON for Db2 Performance Expert V5.5.0 VSAM data set using IDCAMS as output.
3. Use the MIGRATE function of the Save-File utility to migrate the data sets of OMEGAMON for Db2 Performance Expert version 5.3.0 or 5.4.0.
4. Restore the migrated VSAM data sets in V5.5.0 and compare the reports.

What to do next

The RK02SAMP library provides the sample job DGOPJAMI, which you can modify to suit your installation.

Note:

- You can only process VSAM data sets in the same version of OMEGAMON for Db2 Performance Expert as they have been created. For example, if you create a SAVE data set in version 5.5.0, it can only be RESTORED in version 5.5.0.
To use a SAVE data set in a higher version, you must migrate the SAVE data set using a migration utility.
- Before you restore or convert SAVE data sets from V5.3.0 or V5.4.0, you must first migrate this data to OMEGAMON for Db2 Performance Expert V5.5.0 format.
- Restored reports only show fields that are supported by the current version of OMEGAMON for Db2 Performance Expert.

Converting Data Sets

To store performance data in Performance Database tables or spreadsheets, you must first convert Accounting Save data sets of OMEGAMON for Db2 Performance Expert V5.5.0 into sequential data sets that can be used by the Db2 load utility or the Spreadsheet Input-Data Generator of OMEGAMON for Db2 Performance Expert.

You can use the CONVERT function of the Accounting Save-File Utility to convert Accounting Save data sets of OMEGAMON for Db2 Performance Expert V5.5.0 into sequential data sets. The RKO2SAMP library provides the sample job DGOPJACO, which you can modify to suit your installation.

You can also use the ACCOUNTING SAVE subcommand with the CONVERT option to convert and save reduced data into a sequential data set. The output of this subcommand option is a sequential data set, that is specified and requested in SYSIN. The data set attributes are:

Organization

PS

Record format

VB

Record length

9072

Block size

9076

For more information about the ACCOUNTING SAVE subcommand refer to [Report Command Reference](#).

The following list shows the types of records that are created by the CONVERT function (or CONVERT command option) and where to find their layout descriptions in the sample library RKO2SAMP:

- General data records (DGOADSGE)
- Buffer pool data records (DGOADSBU)
- Distributed Data Facility (DDF) data records (DGOADSDF)
- Group buffer pool records (DGOADSGP)
- Package records (DGOADSPK)
- Resource Limit Facility (RLF) records (DGOADSRF)
- Accelerator records (DGOADSXC)

For more information about the Spreadsheet Input-Data Generator refer to [Reporting User's Guide](#).

Save-File Utility DD Statements

This topic lists the DD statements needed for migration and conversion. All of the DD statements described here are required.

Input

The DDNAME of the input data set. This can be an OMEGAMON for Db2 Performance Expert V5.3.0 or V5.4.0 Accounting SAVE data set for the MIGRATE function, or an OMEGAMON for Db2 Performance Expert V5.5.0 Accounting VSAM Save data set for the CONVERT function.

Output

The DDNAME of the output data set.

For CONVERT, allocate the data set with the following characteristics:

RECFM
VB
LRECL
9072
BLKSIZE
9076

DPMLOG

OMEGAMON for Db2 Performance Expert command processor messages and messages indicating exceptional processing conditions are written to DPMLOG. If DPMLOG is not specified, it is dynamically allocated to the SYSOUT message class of the job. Allocate the data set with the following attributes:

RECFM
FBA
LRECL
133
BLKSIZE
6251

The Statistics Save-File Utility

Use the Save-File utility to migrate and convert Statistics Save data sets into a format suitable for OMEGAMON for Db2 Performance Expert V5.5.0.

The function performed is specified in a parameter on the EXEC command.

Migrating Data Sets

Migrate Statistics Save data sets created by OMEGAMON for Db2 Performance Expert V5.3.0 or V5.4.0 into the record format of OMEGAMON for Db2 Performance Expert V5.5.0.

To migrate Statistics Save data sets:

1. Create a VSAM data set for V5.3.0 or V5.4.0.
2. Define an OMEGAMON for Db2 Performance Expert V5.5.0 VSAM data set using IDCAMS as output.
3. Use the MIGRATE function of the Save-File utility to migrate the data sets of OMEGAMON for Db2 Performance Expert V5.3.0 or V5.4.0.
4. Restore the migrated VSAM data sets in V5.5.0 and compare the reports.

The RK02SAMP library provides the sample job DGOPJSMI, which you can modify to suit your installation.

Note:

- You can only process VSAM data sets in the same version of OMEGAMON for Db2 Performance Expert as they have been created. For example, if you create a SAVE data set in version 5.5.0, it can only be RESTORED in version 5.5.0.

To use a SAVE data set in a higher version, you must migrate the SAVE data set using a migration utility.

- Before you restore or convert SAVE data sets from V5.3.0 or V5.4.0, you must first migrate this data to OMEGAMON for Db2 Performance Expert V5.5.0 format.
- Restored reports only show fields that are supported by the current version of OMEGAMON for Db2 Performance Expert.

Converting Data Sets

To store performance data in Performance Database tables or spreadsheets, you must first convert Statistics Save data sets of OMEGAMON for Db2 Performance Expert V5.5.0 into sequential data sets that can be used by the Db2 load utility or the Spreadsheet Input-Data Generator of OMEGAMON for Db2 Performance Expert.

You can use the CONVERT function of the Statistics Save-File Utility to convert Statistics Save data sets of OMEGAMON for Db2 Performance Expert V5.5.0 into sequential data sets. The RKO2SAMP library provides the sample job DGOPJSCO, which you can modify to suit your installation.

You can also use the STATISTICS SAVE subcommand with the CONVERT option to convert and save reduced data into a sequential data set. The output of this subcommand option is a sequential data set, that is specified and requested in SYSIN. The data set attributes are:

Organization

PS

Record format

VB

Record length

9072

Block size

9076

For more information about the STATISTICS SAVE subcommand refer to [Report Command Reference](#).

The following list shows the types of records that are created by the CONVERT function (or CONVERT command option) and where to find their layout descriptions in the sample library RKO2SAMP:

- General data records (DGOSDGEN)
- Buffer Pool data records (DGOSDBUF)
- DDF data records (DGOSDDDF)
- Group Buffer Pool records (DGOSDGBP)
- Buffer Pool data set records (DGOSDSET)
- Accelerator data records (DGOSDXCL)
- Aggregated Accounting data records (DGOSDACC)
- Storage data records (DGOSDSTG)

For more information of the Spreadsheet Input-Data Generator refer to [Reporting User's Guide](#).

Save-File Utility DD Statements

This topic lists the DD statements needed for migration and conversion. All of the DD statements described here are required.

Input

The DDNAME of the input data set. This can be an OMEGAMON for Db2 Performance Expert V5.3.0 or V5.4.0 Statistics Save data set for the MIGRATE function, or an OMEGAMON for Db2 Performance Expert V5.5.0 Statistics VSAM Save data set for the CONVERT function.

Output

The DDNAME of the output data set.

For CONVERT, allocate the data set with the following characteristics:

RECFM

VB

LRECL

9072

BLKSIZE

9076

DPMLOG

OMEGAMON for Db2 Performance Expert command processor messages and messages indicating exceptional processing conditions are written to DPMLOG. If DPMLOG is not specified, it is dynamically allocated to the SYSOUT message class of the job. Allocate the data set with the following attributes:

RECFM

FBA

LRECL

133

BLKSIZE

6251

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