BMC Capacity Management Database User Guide

Supporting

Version 1.2 of BMC Capacity Management Database
Version 1.9 of BMC Capacity Management for Mainframes

May 2012
Contacting BMC Software

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United States and Canada

Address  
BMC SOFTWARE INC  
2101 CITYWEST BLVD  
HOUSTON TX 77042-2827  
USA

Telephone  
1 713 918 8800  or  
1 800 841 2031

Fax  
1 713 918 8000

Outside United States and Canada

Telephone  
+01 713 918 8800

Fax  
+01 713 918 8000

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Support website

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- order or download product documentation
- download products and maintenance
- report an issue or ask a question
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In the United States and Canada, if you need technical support and do not have access to the web, call 1 800 537 1813 or send an e-mail message to customer_support@bmc.com. (In the subject line, enter SupID:<yourSupportContractID>, such as SupID:12345). Outside the United States and Canada, contact your local support center for assistance.

Before contacting BMC

Have the following information available so that Customer Support can begin working on your issue immediately:

- product information
  - product name
  - product version (release number)
  - license number and password (trial or permanent)
- operating system and environment information
  - machine type
  - operating system type, version, and service pack or other maintenance level such as PUT or PTF
  - system hardware configuration
  - serial numbers
  - related software (database, application, and communication) including type, version, and service pack or maintenance level
- sequence of events leading to the issue
- commands and options that you used
- messages received (and the time and date that you received them)
  - product error messages
  - messages from the operating system, such as file system full
  - messages from related software
License key and password information

If you have questions about your license key or password, use one of the following methods to get assistance:

- Send an e-mail message to customer_support@bmc.com.
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About this book

This book contains detailed information about installing and using the BMC Capacity Management Database product, and is intended for capacity planners and system administrators.

Capacity Management Database (CDB) and Capacity Management Information System (CMIS) are both ITIL® terms. While ITIL is transitioning use of CDB to CMIS, CDB is used here to describe a particular BMC component. All references in this manual to CDB refer to components that are specific to BMC.

Like most BMC documentation, this book is available in printed and online formats. To request printed books or to view online books and notices (such as release notes and technical bulletins), see the support website at http://www.bmc.com/support.

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**NOTE**

Online books are formatted as PDF or HTML files. To view, print, or copy PDF books, use the free Adobe Reader from Adobe Systems. If your product installation does not install the reader, you can obtain the reader at http://www.adobe.com.

The software also offers online Help. To access Help, press F1 within any product or click the Help button in graphical user interfaces (GUIs).

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Related publications

From the BMC Support Central website (http://www.bmc.com/support), you can

- download a zipped set of documentation PDFs from each product’s EPD page
- link to the BMC Documentation Center (https://webapps.bmc.com/infocenter/index.jsp) to browse documentation sets, or to view video demos (short overviews of selected product concepts, tasks, or features)
- view individual product documents (books and notices) within the “A – Z Supported Product List”
You can order hardcopy documentation from your BMC sales representative or from the support site. You can also subscribe to proactive alerts to receive e-mail messages when notices are issued.

Conventions

This book uses the following special conventions:

- All syntax, operating system terms, and literal examples are presented in this typeface.
- Variable text in path names, system messages, or syntax is displayed in italic text:
  
  \texttt{testsy/inстанce/fileName}

- The symbol $=>$ connects items in a menu sequence. For example, \texttt{Actions => Create Test} instructs you to choose the \texttt{Create Test} command from the \texttt{Actions} menu.
Introduction

This part presents the following topics:

Chapter 1
  Overview of BMC Capacity Management Database ...................... 15
Overview of BMC Capacity Management Database

This chapter provides an overview of the BMC Capacity Management Database (BMC CDB) product and its components.

BMC CDB contains BMC Capacity Management for Mainframes data that has been processed and analyzed to provide a shared data repository that any user, application, or process can access. You access the data by using a set of web services to

- create, modify, and populate data extensions
- extract data for
  - monitoring
  - selecting modeling intervals
  - trending analysis
  - capacity planning

CDB clusters

A BMC CDB cluster, in its simplest form, contains everything you need to run services for the BMC CDB and consists of one machine on which the following services and components reside:

- BMC CDB Services
- one instance of the BMC CDB Workflow Service
- at least one relational database management system (RDBMS), such as Oracle® or Microsoft SQL Server
The BMC CDB Workflow Service acts as a load balance manager. Additional instances of the BMC CDB Workflow Service can be installed on other machines, as needed, to improve load balancing and response time as workload demands increase. A BMC CDB cluster can easily be expanded to contain multiple BMC CDB Workflow Service machines that bind with the BMC CDB Services server.

In Figure 1, the values in parentheses (1..n, 1..1) reflect the relationship between the BMC CDB Services server and the BMC CDB Workflow Service machines. The 1 to $n$ notation means that there can be one BMC CDB Services server for many BMC CDB Workflow Service machines. The 1 to 1 notation means that each BMC CDB Workflow Service machine can bind to only one BMC CDB Services server.

Figure 1  Dynamic CDB cluster workflow
In a BMC CDB cluster, BMC CDB Services communicate with one or more databases by using Open Database Connectivity (ODBC). ODBC is used to identify each BMC CDB database in your environment as a unique data source. You can have more than one data source configured.

CDB data organization

A CDB database contains

- schema, which is a description of all the object classes, properties, and relations that are in the database
- performance data from any platform that is supported by BMC Capacity Management for Mainframes
- business data extensions
- data dictionary information

BMC CDB Services

A BMC CDB database is populated with BMC Capacity Management for Mainframes data collected from the various systems in your user environment. You can access this data by using BMC CDB Studio tools to request services, as described in Chapter 4, “Using BMC CDB Studio tools.” You can request operations from any of the following core BMC CDB Services:

- Object Services—perform object and schema discovery, build views, and execute queries on the data
- Extensibility Services—extend existing CDB objects and relations in the schema with user-defined metrics and relations
- Population Services—populate extended CDB object properties data into the CDB
- Trending Services—predict performance metrics values at the specified time points using linear trending of measured or summarized data according to the specified statistical policy
- Data Dictionary Editor Services—view and edit any CDB-related performance metric name.
### Terminology

Table 1 provides a list of capacity management terms, their equivalent terms in the BMC CDB component, and what they mean.

**Table 1  Capacity Management terms and CDB equivalents**

<table>
<thead>
<tr>
<th>Capacity management term</th>
<th>BMC CDB equivalent term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>interval table</td>
<td>interval class</td>
<td>date and time interval for data that is collected</td>
</tr>
<tr>
<td>static table</td>
<td>object class</td>
<td>object identifications that are not dynamic</td>
</tr>
<tr>
<td>dynamic table</td>
<td>relation</td>
<td>relationships between interval class and object class performance data items</td>
</tr>
<tr>
<td>database description</td>
<td>schema</td>
<td>description of object classes and their properties</td>
</tr>
<tr>
<td>database field</td>
<td>property</td>
<td>schema and real value of a data item</td>
</tr>
<tr>
<td>key field</td>
<td>key property</td>
<td>ID that uniquely identifies a record</td>
</tr>
</tbody>
</table>
Part 2

Installation and configuration

This part presents the following topics:

Chapter 2
Installing BMC CDB components .................................................. 21

Chapter 3
Configuring BMC CDB components ............................................. 31
Installing BMC CDB components

This chapter describes how to install BMC Capacity Management Database (BMC CDB) components in a Windows environment.

Installation overview

To install and configure BMC CDB, you must perform the following tasks:

1. Satisfy the installation requirements listed in “System requirements” on page 22.

2. Install the following BMC CDB components:

<table>
<thead>
<tr>
<th>Component</th>
<th>Refer to</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMC CDB Services</td>
<td>“Installing BMC CDB Services” on page 23</td>
</tr>
<tr>
<td>BMC CDB Workflow Service</td>
<td>“Installing BMC CDB Workflow Service” on page 24</td>
</tr>
<tr>
<td>BMC CDB Studio (optional)</td>
<td>“Installing BMC CDB Studio (optional)” on page 28</td>
</tr>
</tbody>
</table>

To use BMC CDB functions, you must install at least BMC CDB Services and BMC CDB Workflow Service; installing BMC CDB Studio is optional.

You can install BMC CDB Services and BMC CDB Workflow Service on the same machine or on different machines. At least one instance of each component is required.

**NOTE**

Multiple instances of BMC CDB Workflow Service can be bound to a single instance of BMC CDB Services to improve load balancing.

3. *(optional)* Configure BMC CDB component settings.
The default settings should work for most applications. However, if you want to customize settings such as security or logging, you can use the BMC CDB Configuration Tool described in Chapter 3, “Configuring BMC CDB components.”

**System requirements**

Table 2 lists the requirements for installing BMC CDB components.

<table>
<thead>
<tr>
<th>Component</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>operating system</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Windows 7</td>
</tr>
<tr>
<td></td>
<td>• Windows 2008 Server R2</td>
</tr>
<tr>
<td></td>
<td>• Windows 2008 Server SP1 or later</td>
</tr>
<tr>
<td></td>
<td>• Windows 2003 Server R2 SP2 or later</td>
</tr>
<tr>
<td><strong>features</strong></td>
<td>• .NET Framework versions 3.5 and 4.0 FULL</td>
</tr>
<tr>
<td></td>
<td>• Message Queuing Server (MSMQ)</td>
</tr>
<tr>
<td><strong>roles</strong></td>
<td>• Internet Information Server (IIS) for your version of Windows</td>
</tr>
<tr>
<td></td>
<td>— ASP.NET</td>
</tr>
<tr>
<td></td>
<td>— Windows Authentication</td>
</tr>
<tr>
<td></td>
<td>— IIS Management Compatibility</td>
</tr>
</tbody>
</table>

**Starting the installation**

This topic describes how to start the process of installing BMC CDB components.

**To start the installation**

1. Perform one of the following actions:

   - If you downloaded the product from the Electronic Product Distribution (EPD) facility, navigate to the folder where the installation file was saved.

   - If you received a physical product shipment, insert the BMC CDB installation CD into a CD drive.
2 Navigate to the folder for the component that you want to install:

- BMC CDB Services
- BMC CDB Workflow Service
- BMC CDB Studio

Each folder contains a setup.exe file that you use to install the component.

### Installing BMC CDB Services

This topic describes how to install BMC CDB Services.

**NOTE**
To use BMC CDB Services, you must have a functioning BMC Capacity Management for Mainframes environment, with data automatically populated into a database on a daily basis. BMC CDB Services rely on the collection and delivery of data that is performed by Universal Information Exchange (UIE).

### Before you begin

- Close all open files and applications. If the installation program cannot override certain system files, you might have to restart your computer when the installation is complete.

- The installation program checks for the requirements described in “System requirements” on page 22. If you are missing any required software, the installation program tells you what is missing and stops. Before you restart the installation program, you must install the missing software.

### To install BMC CDB Services

1 In the BMC CDB Services folder, double-click the setup.exe file.

   The installation wizard opens, and the Welcome page is displayed.

2 Click Next to display the License Agreement page.

3 Read the license agreement and click Yes to accept the agreement and continue with the installation.

4 Review the Readme file for BMC CDB Services, and then click Next.
Installing BMC CDB Workflow Service

5 On the Choose Destination Location page, click Next to accept the default location or Browse to choose a different location.

This location identifies the folder where you want to install BMC CDB Services product files. The default destination folder is C:\Program Files\BMC Software\CDB.

**NOTE**
This location becomes the IIS virtual directory, which provides access to BMC CDB Services.

6 On the Start Copying Files page, review the destination folder and click Next to begin the copying process.

The Setup Status page is displayed with a progress bar that shows the BMC CDB Services files being installed. After the files are installed, a status message is displayed to indicate the Setup program is updating your registry.

If there are no errors, the final page of the installation wizard opens. If an error occurs, you receive a message.

7 If Setup is unable to override certain system files, you might have to restart your computer.

If you are prompted to restart, click Finish to restart your computer now.

**NOTE**
You must restart your computer before you attempt to access BMC CDB Services.

---

**Installing BMC CDB Workflow Service**

You must install at least one instance of the BMC CDB Workflow Service to complete a CDB cluster. You can install the BMC CDB Workflow Service on the same machine as BMC CDB Services or on any number of other machines.

**Before you begin**

- Close all open files and applications. If the installation program cannot override certain system files, you might have to restart your computer when the installation is complete.
The installation program checks for the requirements described in “System requirements” on page 22. If you are missing any required software, the installation program tells you what is missing and stops. Before you restart the installation program, you must install the missing software.

To install BMC CDB Workflow Service

1. In the BMC CDB Workflow Service folder, double-click the setup.exe file.

   The installation wizard opens and the Welcome page is displayed.

2. Click Next to display the License Agreement page.

3. Read the license agreement and click Yes to accept the agreement and continue with the installation.

4. Review the Readme file for BMC CDB Workflow Service, and then click Next.

5. On the Choose Destination Location page, click Next to accept the default location or Browse to choose a different location.

   This location identifies the folder where you want to install BMC CDB Workflow Service product files. The default destination folder is C:\Program Files\BMC Software\CDB.

6. On the Binding Information page (Figure 2 on page 26), specify the following information to bind this instance of BMC CDB Workflow Service to an instance of BMC CDB Services:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDB Server</td>
<td>host name or IP address of the BMC CDB Services server</td>
</tr>
<tr>
<td></td>
<td>If BMC CDB Services is installed on the same machine, you can specify localhost.</td>
</tr>
<tr>
<td>Port</td>
<td>port number of the BMC CDB Services server</td>
</tr>
<tr>
<td></td>
<td>The default port number is 80.</td>
</tr>
<tr>
<td>Virtual Directory</td>
<td>virtual directory where BMC CDB Services is installed</td>
</tr>
<tr>
<td></td>
<td>The default directory is BMCCDB.</td>
</tr>
<tr>
<td>Username</td>
<td>(optional) user name to be used when accessing a secure IIS server where BMC CDB Services is installed</td>
</tr>
<tr>
<td>Password</td>
<td>(optional) password to be used when accessing a secure IIS server where BMC CDB Services is installed</td>
</tr>
</tbody>
</table>
NOTE
If you have an open site, you can use an Anonymous login (the default). If you have a secure site, you must specify user account information.

Figure 2 BMC CDB Workflow Service binding information

7 Click Test CDB Connection to verify the connection, then Click Next.

If you get a message that the connection failed, correct your binding information to specify a valid connection.

8 On the Service Account Information page (Figure 3 on page 27), select an account under which the BMC CDB Workflow Service should run:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local System Account</td>
<td>standard LocalSystem account</td>
</tr>
<tr>
<td></td>
<td>Select this option if BMC CDB Workflow Service is on the same machine as BMC CDB Services.</td>
</tr>
<tr>
<td>Specific User Account</td>
<td>user account</td>
</tr>
<tr>
<td></td>
<td>Select this option if the BMC CDB Workflow Service is binding to BMC CDB Services on a remote machine.</td>
</tr>
</tbody>
</table>
If you selected Specific User Account, specify the user name and password for the account and click Test User Account.

If you get a message that the account information is invalid, correct what you entered and specify a valid account.

When the Start Copying Files page is displayed, review the information that you entered on previous pages.

If you need to make changes, click Back until you reach the appropriate page.

When the information is correct, click Next to begin the copying process.

The Setup Status page is displayed with a progress bar that shows the BMC CDB Workflow Service files being installed.

After the files are installed, BMC CDB Workflow Service detects the existence of the Microsoft Windows firewall automatically, as described in “Configuring the Microsoft Windows Firewall” on page 28.

If Setup is unable to override certain system files, you might have to restart your computer.

If you are prompted to restart, click Finish to restart your computer now.
Configuring the Microsoft Windows Firewall

When the BMC CDB Workflow Service installation process detects the existence of the Microsoft Windows Firewall, a prompt asks if you want to configure the firewall automatically. You can respond in one of the following ways:

**YES** The installation process adds all necessary entries to the firewall.

**NO** You must enter firewall settings manually, as shown in Table 3.

<table>
<thead>
<tr>
<th>Rule type</th>
<th>Direction</th>
<th>Program</th>
<th>Protocol and ports</th>
<th>Action</th>
<th>Profile</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port</td>
<td>Inbound / Outbound</td>
<td>CDBWorkflowService.EXE</td>
<td>TCP All local ports</td>
<td>Allow Connection</td>
<td>Domain Private</td>
<td>CDBWorkflowService</td>
</tr>
</tbody>
</table>

NOTE

If you are not required to restart your computer, Setup starts the BMC CDB Workflow Service automatically.

Installing BMC CDB Studio *(optional)*

This topic describes how to install BMC CDB Studio.

**Before you begin**

- Close all open files and applications. If the installation program cannot override certain system files, you might have to restart your computer when the installation is complete.

- The installation program checks for the requirements described in “System requirements” on page 22. If you are missing any required software, the installation program tells you what is missing and stops. Before you restart the installation program, you must install the missing software.

**To install BMC CDB Studio**

1. In the BMC CDB Studio folder, double-click the setup.exe file

   The installation wizard opens and the Welcome page is displayed.
2. Click **Next** to display the License Agreement page.

3. Read the license agreement and click **Yes** to accept the agreement and continue with the installation.

4. Review the Readme file for BMC CDB Studio, and then click **Next**.

5. On the Choose Destination Location page, click **Next** to accept the default location or **Browse** to choose a different location.

   This location identifies the folder where you want to install BMC CDB Studio product files. The default destination folder is `C:\Program Files\BMC Software\CDBStudio`.

6. On the Start Copying Files page, review the destination folder and click **Next** to begin the copying process.

   The Setup Status page is displayed with a progress bar that shows the BMC CDB Studio files being installed. After the files are installed, a status message is displayed to indicate the Setup program is updating your registry.

   If there are no errors, the final page of the installation wizard opens. If an error occurs, you receive a message.

7. If Setup is unable to override certain system files, you might have to restart your computer.

   If you are prompted to restart, click **Finish** to restart your computer now.

---

**NOTE**

You must restart your computer before you attempt to access BMC CDB Studio.

---

### Verifying the installations

After you install BMC CDB Services and BMC CDB Workflow Service, you should verify that the installations were successful.

**To verify the installations**

From a server where BMC CDB Services or BMC CDB Workflow Service is installed, open the Event Viewer and verify that you have no errors.
For information about the Event Viewer, see “Viewing event messages” on page 118.

# Getting started with BMC CDB

After you install the necessary components, you are ready to get started with BMC CDB.

## To get started with BMC CDB Services

From the **BMC Performance Assurance – CDB** menu, select one of the following tools:

- **Configuration Tool**: perform configuration tasks on the services, such as setting up logging and job tracking (Chapter 3, “Configuring BMC CDB components”)
- **Workflow Viewer**: display the flow of BMC CDB job requests (Chapter 9, “Viewing BMC CDB workflow activity”)
- **Log and Event Viewer**: review the BMC CDB Services log (Chapter 10, “Viewing logs and events”)

## To get started with BMC CDB Studio

From the **BMC Performance Assurance – CDB** menu, select one of the following tools:

- **CDB Graph Exploration Tool**: build customized graphs of your collected data (Chapter 5, “Graphing CDB data”)
- **CDB Business Data Extension Tool**: add business-related data to your performance data (Chapter 6, “Creating and managing business data extensions”)
- **CDB Data Dictionary Editor**: view and edit data objects (Chapter 7, “Modifying data object names and descriptions”)
- **CDB Business Data Population Utility**: populate the BMC CDB server with business data from a CSV file (Chapter 8, “Populating business data”)

---

*BMC Capacity Management Database User Guide*
This chapter describes how to configure the settings for BMC Capacity Management Database (BMC CDB) components.

Configuration overview

You can use the Service Framework Configuration Tool to configure the default settings for the following components:

- BMC CDB Services
- BMC CDB Workflow Service

The Configuration Tool is installed automatically as part of BMC CDB installation. The default file path of the Configuration Tool is:

<drive>\Program Files\BMC Software\CDB\Common\Utilities

You can view and edit any of the following .CONFIG files by using the Configuration Tool. These configuration files are located in the destination directory that you specified for the associated component during installation.

- BMC CDB Services
  - WEB.CONFIG
- BMC CDB Workflow Service
  - CDBWORKFLOWSERVICE.EXE.CONFIG
  - CDBVISPROXY.EXE.CONFIG (configures access to the BMC CDB data store)
Opening the Configuration Tool

This task explains how to open the Configuration Tool.

To open the Configuration Tool

1. From the Start menu, select BMC Performance Assurance - CDB=>Service Framework Configuration Tool.

2. On the Configuration Tool Start Page, click Open Configuration File or the Open button in the toolbar.

3. Select the .CONFIG file for the component that you want to configure.

   The Configuration Tool opens with the current settings for that component.

   **NOTE**

   Only one .CONFIG file can be open in the Configuration Tool at a time. When you finish with one .CONFIG file, click the Open button to open a different .CONFIG file.

When you select a component in the Configuration Tool, a list of configuration options for that component is displayed in the right pane. When you click on an option, a short description appears at the bottom of the right pane.
Configuration options

This section describes the configuration options for each of the BMC CDB components.

BMC CDB Services configuration options

This section describes the configuration options for BMC CDB Services (Figure 4).

Figure 4  BMC CDB Services configuration options

NOTE

MessageQueueManager is used internally by JobManager; there is nothing to configure for the MessageQueueManager option.
AuditManager – Auditing web service usage

Use AuditManager to track and log information about the usage of BMC CDB Services.

To audit web service usage

1 Click AuditManager.

2 Click one of the following AuditManager options in the right pane:

- **AuditLevel** (enable (True) or disable (False) the types of information written to the log file for auditing purposes)
  Information types are requests, responses, and exceptions.

- **Impersonate** (optional) specify a user name, password, and whether the text is encrypted
  Use this option to define an impersonation context for accessing the AuditManager resource.

- **Payload Enabled** (optional) specify whether payload data should be written to the audit file (True or False)
  Use this option primarily for problem resolution.

- **AuditProvider** specify the following options:
  - **Enabled** – Enable (True) or disable (False) writing to an audit log.
  - **Path** – Specify the location of the audit log.
  - **Periodicity** – Specify how frequently a new audit log should be created.
  - **Prefix** - Specify a unique prefix for audit log files.
AuthorizationManager – Authorizing access to services and databases

AuthorizationManager provides access to services and databases under two providers:

- **CDBRolesAuthorizationProvider**
  - **Enabled** - Enable and disable the role authorization checks.
  - **ServiceList** - Edit what roles are authorized to access available services.

- **CDBDSNAuthorizationProvider**
  - **DSNList** - Edit a list of data source names and users.
  - **Enabled** - Enable and disable the DSN checks.

By default, all users are authorized to access all services and databases. If IIS is configured for anonymous access, authorization checks are bypassed.

**To add or remove a role**

1. Click **AuthorizationManager**.
2. Click **CDBRolesAuthorizationProvider**.
3. On the **ServiceList** line in the right pane, click **ServiceList** and then the ellipsis (...).
4. In the Services and Roles dialog box, click the service you want to manage and perform one of the following actions:
   - To remove a role, select the role and click **Remove**.
   - To add a role, click **Add** and type the name of the new role in the Add New Role dialog box; then, click **OK**.
5. Click **OK** to exit the Services and Roles dialog box.

**To add or remove a DSN database**

1. Click **AuthorizationManager**.
2. Click **CDBDSNAuthorizationProvider**.
3. On the **DSNList** line in the right pane, click **DSNList** and then the ellipsis (...).
4. In the Data Source Names and Users dialog box, you can add or remove DSNs or authorized users by performing one of the following actions:
To remove an item, select the item and click **Remove**.

To add an item, click **Add** under the appropriate list (**DSN** or **Users authorized for the DSN**) and type the name of the new DSN or user; then, click **OK**.

5 Click **OK** to exit the Data Source Names and Users dialog box.

**JobManager – Configuring job queues**

Use JobManager to edit the location of job queues and to set a limit of days until a job in a queue expires. The queue that the job is in describes the general status of that job:

<table>
<thead>
<tr>
<th>Queue name</th>
<th>Holds jobs that</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pending</td>
<td>have not yet been started</td>
</tr>
<tr>
<td>Working</td>
<td>are in progress</td>
</tr>
<tr>
<td>Completed</td>
<td>have finished processing</td>
</tr>
<tr>
<td>Unsuccessful</td>
<td>could not be completed</td>
</tr>
</tbody>
</table>

**To configure job queues**

1 Click **JobManager**.

2 Click one of the following JobManager options in the right pane:

- **Queues**
  - edit the path for the location of a particular job queue
  - Select one of the job queues and type a new path in the **Path** box; then, click **OK**.

- **Time to Live**
  - specify the number of days after which a transaction expires if it has not been processed

**NOTE**

By default, the job queues are configured in the same machine as BMC CDB Services. You have to use the Configuration Tool to set up these queues in a location other than the BMC CDB Services machine.

**RealTimeActivityManager – Managing real-time activity**

Use RealTimeActivityManager to edit the location of the real-time activity job queue and to set a limit of days until a job in a queue expires.
To configure the real-time job queue

1  Click RealTimeActivityManager.

2  Click one of the following RealTimeActivityManager options in the right pane:

   Queues  edit the path for the location of the real-time activity job queue

   Select RealTimeActivityQueue and type a new path in the Path box; then, click OK.

   Time to Live  specify the number of days after which a transaction expires if it has not been processed

LogManager – Managing event viewer and file system logs

Use LogManager to enable or disable logging of end-to-end BMC CDB Services request activity. You can also edit the location, frequency, and prefix of the log file, as well as the severity of messages written to the log.

To manage event viewer and file system logs

1  Click LogManager.

2  Click one of the following LogManager options in the right pane:

   Impersonate  specify a user name, password, and whether the text is encrypted

   Use this option to define an impersonation context for accessing the LogManager resource.
WorkflowServiceLogRegistrationManager – Configuring the Workflow Service registration file

Use the WorkflowServiceLogRegistrationManager file to define an impersonation context for accessing BMC CDB Workflow Service.

To define an impersonation context

1. Click WorkflowServiceLogRegistrationManager, and then click Impersonate.
2. Click Cleartext and choose True or False from the list to disable or enable encryption.
3. Click Password or Username and then the ellipsis (...) next to that field.
4. Enter or change the user name and password information, and click OK.

EventViewerProvider specify the following options:

- Enabled – Enable (True) or disable (False) the event viewer log.
- Severity Level – Select the severity level of messages to be written to the event viewer log.

By default, events of all severities (Error, Informational, Severe, Trace, and Warning) are logged.

FileSystemProvider specify the following options:

- Enabled – Enable (True) or disable (False) the file system log.
- Path – Specify the location of the file system log.
- Periodicity – Specify how frequently messages should be written.
- Prefix – Specify a unique prefix for the file system log.
- Severity Level – Select the severity level of messages to be written to the file system log.

By default, events of all severities (Error, Informational, Severe, Trace, and Warning) are logged.
BMC CDB Workflow Service configuration options

This section describes the configuration options for BMC CDB Workflow Service (Figure 5).

**Figure 5  BMC CDB Workflow Service configuration options**

![Service Framework Configuration Tool](image)

**NOTE**
- LogManager for BMC CDB Workflow Service provides the same options as LogManager for BMC CDB Services. For more information, see “LogManager – Managing event viewer and file system logs” on page 37.
- MessageQueueManager is used internally by JobManager; there is nothing to configure for the MessageQueueManager option.

**JobManager – Configuring job account information**

Use JobManager to specify the user name and password of an account that has access to remote BMC CDB Services for job queues, as well as a Universal Resource Identifier (URI) for those services.
BMC CDB Workflow Service configuration options

To configure the account for accessing remote services

1. Click JobManager.

2. Click one of the following JobManager options in the right pane:

   - **ClearText**: choose True or False from the list to disable or enable encryption.
   - **Username**
   - **Password**: specify a user name and password for accessing the remote service.

   If you are using a proxy account, use the ProxyPassword and ProxyUsername fields instead.

   - **Proxytype**: specify the type of proxy being used:
     - **None**: You are not using a proxy account.
     - **UseProxy**: You are using a proxy account.
     - **UseDefault**: You are using the default account.

   - **Uri**: specify the location of the remote service.

   If you are using a proxy account, use the ProxyUri field instead.

RealTimeActivityManager – Managing real-time activity

Use RealTimeActivityManager to specify the user name and password of an account that has access to remote BMC CDB Services for real-time activity, as well as a Universal Resource Identifier (URI) for those services.

To configure the account for accessing remote services

1. Click RealTimeActivityManager.

2. Click one of the following RealTimeActivityManager options in the right pane:

   - **ClearText**: choose True or False from the list to disable or enable encryption.
   - **Username**
   - **Password**: specify a user name and password for accessing the remote service.

   If you are using a proxy account, use the ProxyPassword and ProxyUsername fields instead.

   - **Proxytype**: specify the type of proxy being used:
     - **None**: You are not using a proxy account.
     - **UseProxy**: You are using a proxy account.
     - **UseDefault**: You are using the default account.

   - **Uri**: specify the location of the remote service.

   If you are using a proxy account, use the ProxyUri field instead.
TaskManager – Managing tasks

Use TaskManager to configure internal BMC CDB Workflow Service operations.

To manage task retry attempts

1. Click TaskManager, and then click the operation you want to configure:
   - InboundWorker1
   - InboundWorker2
   - InboundWorker3
   - InboundWorker4

2. Click RetryCount.

3. Specify how many attempts can be made to execute a job before it is moved to the Unsuccessful queue, and click OK.
BMC CDB Visualizer Proxy options

This section describes the configuration options for BMC CDB Visualizer Proxy (Figure 6).

**Figure 6  BMC CDB Visualizer Proxy configuration options**

![Service Framework Configuration Tool](image)

**JobManager – Configuring Visualizer Proxy job account information**

Use JobManager to specify the user name and password of an account that has access to remote services, as well as a Universal Resource Identifier (URI) for those services. The JobManager for BMC CDB Visualizer Proxy provides the same options as JobManager for BMC CDB Workflow Service. For more information, see “JobManager – Configuring job account information” on page 39.
LogManager – Managing Visualizer Proxy event viewer logs

Use LogManager to enable or disable logging of end-to-end Visualizer Proxy event viewer activity. The LogManager for BMC CDB Visualizer Proxy provides the same options as the EventViewerProvider in LogManager for BMC CDB Services. For more information, see “LogManager – Managing event viewer and file system logs” on page 37.
This part presents the following topics:

Chapter 4
Using BMC CDB Studio tools ................................................................. 47

Chapter 5
Graphing CDB data. ........................................................................... 57

Chapter 6
Creating and managing business data extensions ............................ 69

Chapter 7
Modifying data object names and descriptions ............................... 91

Chapter 8
Populating business data ................................................................. 95

Chapter 9
Viewing BMC CDB workflow activity ........................................... 105

Chapter 10
Viewing logs and events ............................................................... 113
This chapter provides an overview of the BMC CDB Studio tools and describes common procedures you can perform with the tools.

Overview of BMC CDB Studio

BMC CDB Studio is a collection of tools for performing various tasks in your BMC CDB environment.

BMC CDB Studio tools

BMC CDB Studio provides the following graphical and command line tools:

- **BMC CDB Graph Exploration Tool** — Create a single graph with data from multiple data streams (CDBs and business data extensions). This tool provides a wizard that helps you select the data objects and metrics you want to appear in the graph.
  
  For more information, see Chapter 5, “Graphing CDB data.”

- **BMC CDB Business Data Extension Tool**
  
  — create, modify, and delete data extensions
  — create, modify, and delete relations for an extension
  — create, modify, and delete classes for an extension
  — create, modify and delete relation or class properties
  — commit changes to the CDB
  
  For information about these tasks, see Chapter 6, “Creating and managing business data extensions.”
CDB cluster profiles

- **BMC CDB Data Dictionary Editor** — Display any CDB-related performance metric name to view or edit.

  For more information, see Chapter 7, “Modifying data object names and descriptions.”

- **BMC CDB Business Data Population Tool** — Extract and translate source file data and send it to Population Services for database population. Because this is a command line interface, you can schedule its operations with an automated task scheduler.

  For more information, see Chapter 8, “Populating business data.”

CDB cluster profiles

To use the BMC CDB Studio tools, you must create a profile for each CDB cluster to which you want to connect. A CDB profile provides information the tools need to connect to a BMC CDB server, including

- CDB server name
- port number for the connection
- virtual directory for the connection
- optional account name and password to restrict access to authorized users

Within each tool, you can create a new profile or select an existing one. After a profile is created, it is accessible to all BMC CDB tools that reside on your machine; users on different machines must create their own profiles. Figure 7 on page 49 shows the relationship between a profile and the BMC CDB tools on the local machine.
Toolbars, tabs, and context menus

BMC CDB Studio tools provide toolbar buttons at the top and bottom of their main windows. Some tools also have tabs or buttons at the bottom that enable you to switch views between relations, classes, and other objects. Many tool windows also provide context menus, which are available by right-clicking an object.
Messages and status information

At the bottom of each BMC CDB Studio tool window, a status bar displays

- current server connection status
- icon indicating the auto-save option
- last error message issued

If an error occurs when you are performing an operation, the message dialog box opens with information about the operation. The message dialog box includes the following options:

**Details**
If additional information is available about a message, use **Details** to expand the message.

**Copy to Clipboard**
From an expanded message, use **Copy to Clipboard** to copy the detailed information to the clipboard. You can paste the information into an e-mail to BMC Customer Support.

Common tool procedures

Many BMC CDB Studio tools share the following common procedures:

- opening a BMC CDB Studio tool
- connecting to a CDB cluster
- managing CDB profiles
- viewing BMC CDB Studio messages
- saving or discarding user changes
- committing changes to the BMC CDB server
- using toolbars, context menus, and tabs

Opening a BMC CDB Studio tool

This task explains how to open any of the BMC CDB Studio tools.

**To open a BMC CDB Studio tool**

Click the appropriate tool icon on your desktop, or select the tool from the **BMC Performance Assurance – CDB** menu.
Each BMC CDB Studio tool opens its own main window that requires you to connect to a CDB cluster server.

NOTE
If you used a tool previously and the state is saved, the tool automatically reconnects to the last CDB cluster server that you used.

Connecting to a CDB cluster

After you open a BMC CDB Studio tool, you must connect to a CDB cluster server before you can perform any tasks.

NOTE
Some BMC CDB Studio tools prompt you to connect before the tool opens. If you have a CDB profile already defined, you can select the profile before the tool window opens.

To connect to a CDB cluster

1  Click the Connect to CDB Cluster toolbar button.

   The Select CDB Profile dialog box opens.

2  Perform one of the following procedures:

   - If profiles have already been created, select one from the list, click OK, and skip to step 4. To see more information about a profile, click Details.

   - If no profiles are available, click the here text link to create one.
3 Specify the following information for the new profile:

- profile name
- (optional) description of the profile
- cluster server’s name or IP address
- port number to be used for the connection
- virtual directory where BMC CDB Services is located on the selected server
- (optional) valid user name and password, if the server requires account information to access it

4 When the information for the new profile is complete (or an existing profile is displayed), click **Verify Connection**.

If the connection is successful, the version of BMC CDB Services (1.0, 1.1, or 1.2) that is running on the server is displayed in the **CDB Services Version** field.

If the connection is not successful, review the information you specified, as well as any error messages.

---

**NOTE**

You cannot perform version 1.2 BMC CDB Studio tasks when you are connected to an older version of BMC CDB Services.

---

5 Click **OK**.

The following information is displayed in the tool window:

- **Connected to Network** message (bottom left)
- name of the connected server (title bar)

---

**Managing CDB cluster profiles**

From the Manage CDB Profiles dialog box, you can

- add a new profile
- modify a profile
- remove an existing profile
- verify a profile
To add a CDB profile

1 From a tool’s main window, click **Connect to CDB Cluster**.

2 On the Select CDB Profile dialog, click **Manage Profiles**.

3 On the Manage CDB Profiles dialog box, click **Add**.

4 Specify the following information for the new profile:
   - profile name
   - *(optional)* description of the profile
   - cluster server’s name or IP address
   - port number to be used for the connection
   - virtual directory where BMC CDB Services is located on the selected server
   - *(optional)* valid user name and password, if the server requires account information to access it

5 Click **OK**.

   The new profile is saved locally. To save the profile to the server, click **Commit** on the main window.

To modify a CDB profile

1 From a tool’s main window, click **Connect to CDB Cluster**.

2 On the Select CDB Profile dialog, click **Manage Profiles**.

3 Select the profile you want to modify and click **Modify**.

4 Make changes to the profile and click **OK**.

   The changes you made are saved locally. To save your changes to the server, click **Commit** on the main window.

**NOTE**
Any changes that you make to a CDB cluster profile are stored locally; they are written to the BMC CDB server *only* when you click the **Commit** button.
To remove a CDB profile

1. From a tool’s main window, click **Connect to CDB Cluster**.
2. On the Select CDB Profile dialog, click **Manage Profiles**.
3. Select one or more profiles that you want to remove and click **Remove**.

The changes you made are saved locally. To save your changes to the server, click **Commit** on the main window.

To verify a profile

1. From a tool’s main window, click **Connect to CDB Cluster**.
2. On the Select CDB Profile dialog, click **Manage Profiles**.
3. Select one or more profiles that you want to verify and click **Verify Profiles**.

When the verification is complete

- a green checkmark indicates profile verification was successful
- a red X indicates profile verification was *not* successful; an error message describes why the verification failed

**NOTE**

If you need to interrupt the verification process before it is complete, click **Stop Verify** (which is visible only during verification).

Saving changes locally

You can save changes made with a BMC CDB Studio tool to local storage until you are ready to commit them to the BMC CDB server.

To save user changes locally

To save changes without committing them to the BMC CDB server, click **Save Changes Locally and Exit** when you exit a BMC CDB Studio tool.

Next time you open the tool, the saved changes are restored to your display.
If you attempt to exit with unsaved changes, you are prompted to

- commit the changes to the BMC CDB server
- save the changes locally and exit
- discard the changes made since the last auto-save operation

**Committing changes to the server**

You can commit changes made with a BMC CDB Studio tool to the BMC CDB server so they are available to other users.

**To commit changes to the server**

To commit changes to the BMC CDB server, click **Commit** before you exit a BMC CDB Studio tool.

**Discarding changes**

You can discard changes made with a BMC CDB Studio tool since the last time you committed changes to the BMC CDB server.

**To discard changes**

To discard changes that have not been committed to the BMC CDB server, click **Discard Changes**.
Graphing CDB data

This chapter explains how to use the BMC CDB Graph Exploration Tool to graph CDB data.

Overview of the BMC CDB Graph Exploration Tool

You can use the BMC CDB Graph Exploration Tool to

- create graphs by using data from multiple time spans and sources, including different CDBs and business extensions
- modify the contents of a graph
- customize the appearance of a graph
- save and print graphs
- copy a graph to the clipboard or export it to a PDF file

Using the graph exploration tool involves the following tasks:

1. Create a new project or open an existing one.
   
   A project is a workspace in which you can create one or more views of a graph.

2. Define one or more graph views.

   A view sets the “look and feel” of the graph. For example, whether it is a bar chart or line graph, axis orientation, and so on. You can define multiple views for the same graph in your project and customize their appearance.

3. Run the CDB Stream Wizard.
This wizard enables you to create a data stream of relations, class references, and properties of objects within the interval time span that you specify. You can also modify, copy, or remove data streams.

4. Create and save the graph.

You create the graph within the context of the project, views, and data streams that you created.

**Using the graph exploration tool**

This section describes the tasks you can perform by using the BMC CDB Graph Exploration Tool.

**Opening the graph exploration tool**

To open the BMC CDB Graph Exploration Tool, perform one of the following actions:

- click the graph exploration tool icon on your desktop
- select **BMC CDB Graph Exploration Tool** from the **BMC Performance Assurance – CDB** menu

The BMC CDB Graph Exploration Tool opens with a blank window.

**Creating a project**

A graph exploration project is the workspace in which you define the contents of a graph. You must have a project open before you can create views or data streams for your graph.

**To create a project**

1. On the toolbar, click **New Project**.
2. In the New Project dialog box, type a project name and a description.
3. Click **OK**.

The BMC CDB Graph Exploration Tool main window is displayed (**Figure 8**). You can now create views and data streams for your graph.
Working with projects

You can open or delete a project at any time.

To open an existing project

1. On the toolbar, click Open Project.
2. Select a project from the Available projects list and click Open.

**NOTE**

If a project is open and you try to create or open another project, the active project closes automatically.
Defining graph views

To delete an existing project

1. On the toolbar, click **Open Project**.
2. Select the project you want to delete from the list and click **Delete**.

Defining graph views

A graph view defines a particular presentation of a graph and is created within the context of an open project. You can define multiple views to display different presentations of the same data in the same project.

**NOTE**

You must have a project open before you can define views for your graph.

To add a view

1. On the toolbar, click **Add View**.
2. Enter a view name and a description, and click **OK**.

To remove a view

1. On the toolbar, click **Remove View**.
2. Select one or more views that you want to remove and click **OK**.

Defining the contents of a graph

The CDB Stream Wizard steps you through the process of defining the contents of a graph. Because you can have different data from the same or different CDBs and from the same or different time spans, you must run the wizard for each set of data that will appear in the graph.

After you create a data stream, it is listed as an available stream on your local machine until you remove it. So you can use a data stream that you created for one graph in other graphs as well.
Defining the contents of a graph

Chapter 5  Graphing CDB data

**NOTE**

You must have a project open before you can create data streams for your graph.

---

**Data stream examples**

Consider the following examples of data streams you might want to create:

- If you want to compare utilization rates for the same storage device in the same CDB at different times, use the CDB Stream Wizard to define the data for each time span. To compare three time spans, use the wizard three times to define three streams of data, one for each time span.

- If you want to compare utilization rates for the storage device in the previous example and a storage device in a different CDB, you could use an existing data stream and run the wizard once more to define the data for the new storage device. If you did not have an appropriate data stream for the first device, you would use the wizard twice to create a data stream for each storage device from their respective CDBs.

---

**Creating a new data stream**

This task explains how to create a new data stream.

**To create a new data stream**

1. To open the CDB Stream Wizard, perform one of the following actions:

   - On the toolbar, click **New Stream**.
   - In the **Available Streams** pane, click the **here** text link.
2 On the Specify CDB Binding page, specify information about the data you want to include in the graph and click Next:

- **CDB Profile**: an existing CDB profile
- **Data Source**: CDB database where the data is stored
- **Platform**: platform from which the data was collected
- **Data Type**: data type, as Measured, Summary, Summary_tag, or Statistics

**NOTE**
You can also click Manage Profiles to view and edit existing CDB profiles, as described in “Managing CDB cluster profiles” on page 52.

3 On the Relation Selection page, choose the CDB relation that contains the data (objects and metrics) you want to include and click Next.

4 On the Query Time Span page, select the start and end date and time for which you want data and click Next.
5 (optional) On the Select Identifiers for Graph Labeling page:

A Click Browse to choose one or more objects (class property names) that you want to include.
On the Instance Exploration and Selection page, perform one of the following actions to identify the objects:

- Select All instances to search all objects in the data source.
- Select Match the given pattern and specify a pattern for the search.

C Click Execute Query to display the objects in the Query Results window.

D In the Query Results window, select the objects you want to include and click OK.

6 (optional) Repeat step 5 for each data object and click Next when you are done.

7 On the Metric Selection page, select one or more metrics and click Next.

8 On the Select Ranking Metric and Instance Count page, select the following criteria and click Next:

- name of the metric that should determine top or bottom ranking
- Top or Bottom to identify the top or bottom performers
- number of instances to return, from 1 to 50
- whether to include the remaining instances (those not in the top or bottom n) as an aggregate, or exclude them

NOTE
BMC recommends that you select ranking criteria, especially if you are dealing with a large number of objects. Metric numbers can run in excess of 10,000 for some objects in some environments. If you do not select ranking criteria, you might receive a message that the number of metrics found is too high to display and a default number is being displayed.
9 Specify a name and description for the data stream and click Finish.

**Working with data streams**

This section explains how to modify or remove a data stream.

**To modify a data stream**

1 In the *Stream Operations* pane, click *Modify Stream*.

   The CDB Stream Wizard opens with the current values for the data stream.

2 Step through the wizard and make changes to the data stream, as needed.

3 Click Finish.

**To remove a data stream**

In the *Stream Operations* pane, click *Remove Stream* and follow the instructions.
Creating and saving a graph

After you create a project, a view, and the data streams you want to use, you are ready to create a graph.

To create and save a graph

1. In the Available Streams pane, select the check box for each data stream that you want to include in the graph.

2. On the tool bar, click Save.

The graph is saved on your local machine.

NOTE

To change the look and feel of a graph, see “Options for customizing a graph” on page 66.

Working with graphs

This section explains what you can do with a graph after it is created.

Options for customizing a graph

The following options (located across the bottom of the right pane) enable you to customize the appearance of the graphs that you create:

- **Zoom**: increase or decrease the graph by various percentages for viewing
- **Full View**: show the complete graph
- **Proportional View**: shows a portion of the graph
- **Graph Style**: choose a style for the graph (such as whether it is a bar chart or line graph, axis orientation, and so on)
- **Series Style**: customize a series, which is a metric representation in the graph (such as a line representing SYSA I/O rate)

Printing a graph

On the toolbar, click Print View to open the Print dialog box.
Copying a graph to the clipboard

On the toolbar, click Copy to Clipboard while the graph is displayed in the window.

Exporting a graph to a PDF file

On the toolbar, click Export to PDF while the graph is displayed in the window.
Working with graphs
Creating and managing business data extensions

This chapter explains how to use the BMC CDB Business Data Extension Tool to create and manage business data extensions.

Overview of the BMC CDB Business Data Extension Tool

You can use the BMC CDB Business Data Extension (CDB BDE) Tool to augment CDB performance data with business-related data. These business data extensions can then be used by other CDB functions in the same way as they use CDB performance data.

CDB BDE terminology

The CDB BDE tool works with the following objects:

- extensions
- relations
- object classes
- properties

Extensions

An extension is an additional schema that contains definitions of object relations and classes. The BMC CDB server merges all extensions of a particular platform with core schema so that all extension objects become part of the platform.
Relations

*Relations* are entities that contain business metrics and identify the objects to which those metrics belong.

When you create a new extension, you have to create new relations and, if necessary, new classes. You also have to define the classes with which the relation is associated.

When you open an existing extension, the list of relations associated with that extension is displayed.

Object classes

*Object classes* represent information about static business objects of the same type (such as customers, manufacturing plants, or business applications).

A class can be shared by one or more extensions belonging to a particular platform, but the extension in which the class is created is the owner of the class and the only context in which it can be deleted. When you create a relation, you must connect it to one or more object classes.

Object classes can be selected from the list of core classes that exist for the platform to which the extension belongs, or from classes defined in the extension itself. All object classes must be defined before the relations that are connected to them.

Properties

Object classes and relations have *properties*, which are their individual characteristics. A customer name, business application type, or product ID are examples of object properties. Examples of relation properties include the number of orders, a department’s expenses, or customer charges.

Properties have the following attributes:

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display name</td>
<td>user-specified name that identifies the property</td>
</tr>
<tr>
<td>Description</td>
<td>user-specified description of the property</td>
</tr>
<tr>
<td>Type</td>
<td>user-specified property type (alphanumeric string, integer, or floating point number)</td>
</tr>
<tr>
<td>Length</td>
<td>user-specified length of an alphanumeric value</td>
</tr>
<tr>
<td>Internal BMC CDB name</td>
<td>generated by CDB BDE</td>
</tr>
<tr>
<td>Database column name</td>
<td>generated by CDB BDE</td>
</tr>
</tbody>
</table>
In the underlying RDBMS database that contains BMC CDB data, object classes are represented by static tables that contain object instances. Relations are represented by dynamic tables that contain individual object instance characteristics (or metrics) associated with particular time intervals. Properties are represented by RDBMS table columns.

Some properties are key properties. A combination of the key properties of an object class uniquely identifies an individual object instance. A combination of the key properties of a relation uniquely identifies object instances and their time interval. Both object classes and relations must have at least one key property.

Some key properties of a relation are references. A reference property uniquely identifies an instance of a particular object class. A relation always has an interval reference property. This property is created automatically when you create a new relation.

**Naming conventions**

When you specify a display name for an object class, relation or property, CDB BDE simultaneously generates the following additional names:

- **Short display name**: used on charts and in other situations where screen display space is limited
  
  By default, this name is the display name that you specify.

- **RDBMS name**: used by the underlying relational database management system (RDBMS) that contains BMC CDB data as a table or column name

- **Internal BMC CDB name**: used by BMC CDB operations internally to identify classes, relations, and properties

After you save the extension, you can edit the user-specified display name and the generated short display name by using the BMC Data Dictionary Editor Tool (Chapter 7, “Modifying data object names and descriptions”). Your edits are reflected in the BMC CDB user interface only and not in the underlying databases. You cannot edit either the RDBMS or the internal BMC CDB name.

**Types of business data**

You can add the following types of business data to a BMC CDB server:

- Business data related to object classes that are already defined in the core CDB schema. You are required to define new relations for this business data.
Task summary

For all business data types, you must perform the following tasks:

1. Use the CDB BDE tool to define additional object classes and relations for BMC CDB business data extensions schema, as needed:

2. Save the extension schema in the BMC CDB server.

3. Schedule regular data collection to generate extension data in a format that corresponds to the defined extension schema.

4. Use the BMC CDB Business Data Population Utility to populate the extension data into the BMC CDB server.

The BMC CDB Business Data Population Utility reads business data from a CSV file and uses BMC CDB Population Services to store the data in the BMC CDB server. For more information, see Chapter 8, “Populating business data.”
Using the CDB BDE tool

This section explains how to

- open the CDB BDE tool
- work with the CDB BDE main window
- perform the following operations:
  - extension
  - relation
  - class
  - non-key property
  - key property

Opening the CDB BDE tool

This task explains how to open the CDB BDE tool.

To open the CDB BDE tool

1. Click the CDB BDE icon on your desktop or select **BMC CDB Business Data Extension** from the **BMC Performance Assurance – CDB** menu.

   The CDB BDE Getting Started dialog box is displayed (Figure 9 on page 74).
2 Select a CDB profile to use for the connection to a CDB cluster.

If you defined a CDB profile for this connection previously, select it from the list. Otherwise, you must create a profile, as described in “Connecting to a CDB cluster” on page 51.

3 Select an operation to perform:

- create a new extension
- open an existing extension
- delete an extension

**NOTE**

Modifying or deleting an existing extension invalidates any data populated into any data source prior to the modification. Because CDB BDE does not verify the existence of populated extension data, only extensions that were never populated into a BMC CDB database can be modified or deleted. If you try to modify or delete an extension that was populated into a BMC CDB database, errors and invalid results can occur.
In the main CDB BDE window (Figure 10), you can

- create, modify, and delete extensions
- create, modify, and delete relations or classes
- create, modify, and delete non-key properties of a relation or class
- add, modify, or remove key properties of a relation or class

When the window opens, all relations that belong to the current extension are listed. You can also display the classes associated with an extension.
Performing extension operations

The CDB BDE main window is divided into the following areas:

- top left pane - lists the relations or classes for an extension, depending on the view that is selected
- bottom left pane - contains the Select View tabs that enable you to switch between relation and class views, and links for relation and class operations
- top right pane - lists the key properties and non-key properties of a relation or class
- bottom right pane - contains links for key property and non-key property operations

**NOTE**

In the underlying RDBMS tables, columns are created in the same order that classes and relation properties are created in the CDB BDE. Key properties always precede non-key properties, but you can change the order of display within each category by sorting them in the top right pane. Select the property that you want to move and click the up or down arrow to move it in the list.

Performing extension operations

You can perform the following extension operations:

- create a new extension
- open an existing extension
- delete an extension

Creating a new extension

This task explains how to create a new extension.

**To create a new extension**

1. On the toolbar, click **New Schema Extension**.
2. Type a name for the extension you want to create ([Figure 11 on page 77]).
Performing extension operations

Figure 11  Creating a new extension

3 Select a platform from the list and click OK.

The CDB BDE main window opens with empty Relations and Properties panes (Figure 10 on page 75).

4 Under Relation Operations, click New Relation to create a new relation for the extension, as described in “Creating a new relation” on page 80.

5 (optional) To create a new object class or modify an existing one, perform the following steps:

A From the Select View tabs, click Classes.

B Under Class Operations, click New Class to create a new class for the extension, as described in “Creating a new object class” on page 83.

---

**NOTE**

New classes must be created before the relations that will use them.
Opening an existing extension

This task explains how to open an existing extension.

NOTE

Modifying or deleting an existing extension invalidates any data populated into any data source prior to the modification. Because CDB BDE does not verify the existence of populated extension data, only extensions that were never populated into a BMC CDB database can be modified or deleted. If you try to modify an extension that was populated into a BMC CDB database, errors and invalid results can occur.

To open an existing extension

1. On the toolbar, click Open Schema Extension.

2. Select a platform from the list.

   All existing extensions associated with that platform are displayed (Figure 12).

Figure 12  Open Schema Extension dialog box

3. Select the extension that you want to open, and click OK.
Performing relation operations

Deleting an extension

This task explains how to delete an extension.

**NOTE**
If no extensions are available for the platform that you select, an error message indicates the reason. Click Details to display additional information.

**Deleting an extension**

To delete an extension

1. On the toolbar, click **Delete Schema Extension**.
2. Select a platform from the list.
3. Select one or more extensions that you want to delete from the list, and click **OK**.

**NOTE**
Modifying or deleting an existing extension invalidates any data populated into any data source prior to the modification. Because CDB BDE does not verify the existence of populated extension data, only extensions that were never populated into a BMC CDB database can be modified or deleted. If you try to modify or delete an extension that was populated into a BMC CDB database, errors and invalid results can occur.

**Performing relation operations**

You can perform the following relation operations:

- create a new relation
- modify a relation
- delete a relation from an extension
Creating a new relation

When you click New Relation to create a new relation for an extension, a wizard opens to guide you through the process. You can

- create an empty relation, and then create all its properties
- use an existing relation as a model and edit its properties to create the new relation

**NOTE**
The New Relation wizard is one way to add, modify, and delete properties. You can also perform these operations by using the property options, as described in “Performing non-key property operations” on page 85 and “Performing key property operations” on page 87.

To use the New Relation wizard

1. From the Select View tabs, click Relations.
2. In the Relation Operations area, click New Relation and then click Next.
3. Specify a display name and description for the relation and click Next.

The Specify CDB relation structure page is displayed.
Performing relation operations

4 Depending on how you want to create the new relation, select one of the following options and click Next:

Yes create the new relation by using the structure of an existing relation
No create the relation as a completely new structure

The Add Relation Properties page is displayed. If you are creating the new relation based on an existing relation, the properties of that relation are displayed; otherwise, the list is empty.

5 In the Property Operations area, select one of the following options:

New Property add a property to the relation

The New Property dialog is displayed; the fields are blank.

Modify Property select an existing property to edit

The Modify Property dialog is displayed; the fields contain existing values.

Delete Selected Properties select one or more properties to delete

6 When you are done working with properties, click Next.
Performing relation operations

The Add Class References dialog box is displayed. If you are using an existing relation as a template, class references from that relation are displayed; otherwise, the list is empty.

**NOTE**
You can also use this dialog box to delete class references. However, you cannot delete the **Interval** class reference from a relation.

7 In the **Class Reference Operations** area, click **Add Class Reference**.

8 Select one or more entries from the **Add Class Reference** list and click **OK**.

9 When you are done working with class references, click **Next**.

10 In the Statistical Filtering dialog box, select the check box to request an additional database table for Multivariant Adaptive Statistical Filters (MASF).

11 Click **Finish** to complete the New Relation wizard.
Modifying a relation

You can modify the following attributes of a relation:

- user-specified display name and description
- whether statistical filtering is enabled or disabled

To modify a relation

1. In the Relation Operations area, click Modify Relation.
2. Modify one or more attributes of the relation and click OK.

Deleting a relation from an extension

This task explains how to delete a relation from an extension.

To delete a relation from an extension

1. From the Select View tabs, click Relations.
2. In the Relation Operations area, click Delete Relation.
3. Select one or more relations that you want to delete and click Delete.
4. Click Yes to confirm or No to cancel the deletion.

Performing object class operations

You can perform the following object class operations:

- create a new object class
- modify an object class
- delete an object class from an extension

Creating a new object class

When you click New Class to create a new object class, a wizard opens to guide you through the process.
Performing object class operations

NOTE
The New Class wizard is one way to add, modify and delete properties. You can also perform these operations by using the property options, as described in “Performing non-key property operations” on page 85 and “Performing key property operations” on page 87.

To use the New Class wizard

1 From the Select View tabs, click Classes.

2 In the Class Operations area, click New Class and then click Next.

3 Specify a display name and a description for the object class and click Next.

   The Add Class Properties page is displayed.

4 On the Add Class Properties page, you can select from the following options:

   **New Property**

   specify the following attributes for the new property:

   - display name
   - description
   - type (alphanumeric string, integer, or floating point number)
Performing non-key property operations

You can perform the following operations for non-key properties:

- create a new property for a relation or class
- modify a property
- delete a property

Modifying an object class

You can modify the display name and description of an object class that you created.

To modify an object class

1. From the Select View tabs, click Classes.
2. In the Class Operations area, click Modify Class.
3. Modify the display name or description of the class and click OK.

Deleting a class from an extension

This task explains how to delete a class from an extension.

To delete a class from an extension

1. From the Select View tabs, click Classes.
2. In the Class Operations area, click Delete Class.
3. Select one or more classes that you want to delete and click Delete.
4. Click Yes to confirm or No to cancel the deletion.

Performing non-key property operations

You can perform the following operations for non-key properties:

- create a new property for a relation or class
- modify a property
- delete a property

Click Next, and then click Finish to complete the wizard.
Creating a new non-key property

This task explains how to create a new non-key property.

To create a new non-key property

1. From the Select View tabs, click Relations or Classes.
2. Select a relation or class in the left pane, and click Non-Key Properties in the right pane.
3. In the Property Operations area, click New Relation Property or New Class Property.
4. Specify the following attributes for the new property and click OK:
   - display name
   - description
   - type (alphanumeric string, integer, or floating point number)

Modifying a non-key property

This task explains how to modify a non-key property.

To modify a non-key property

1. From the Select View tabs, click Relations or Classes.
2. Select a relation or class in the left pane, and click Non-Key Properties in the right pane.
3. Select the property that you want to modify and click Modify Relation Property or Modify Class Property.
4. Modify any attribute of the property and click OK.
Deleting a non-key property

This task explains how to delete a non-key property.

To delete a non-key property

1. From the Select View tabs, click Relations or Classes.
2. Select a relation or class in the left pane, and click Non-Key Properties in the right pane.
3. Select one or more properties that you want to delete and click Delete Relation Property or Delete Class Property.
4. Click Yes to confirm or No to cancel the deletion.

Performing key property operations

Key property operations are slightly different from non-key property operations. All the key properties of a relation or class combined form a unique key for that relation or class.

You can perform the following key property operations:

- add a class reference to the key of a relation
- add a relation or class non-key property to the key of the relation or class
- modify the key property of a relation or class
- remove a class reference from the key of a relation
- remove a property from the key of a relation or class

Adding a class reference to the key of a relation

This task explains how to add a class reference to the key of a relation.

To add a class reference

1. From the Select View tabs, click Relations.
2. Select the relation from which you want to add the class reference and click Key Properties.
3. In the Key Property Operations area, click Add Class Reference to Key.
Performing key property operations

From the list of class references for that platform, select one or more to add to the key of the relation and click **OK**.

**NOTE**

Class references added to the key of a relation cannot be modified.
Adding a relation or class non-key property to the key of the relation or class

This task explains how to add a relation or class non-key property.

To add a relation or class non-key property to a key

1. From the Select View tabs, click Relations or Classes.
2. Select the relation or class that you want to modify and click Key Properties.
3. In the Key Property Operations area, click Add Relation Property to Key or Add Class Property to Key.
4. From the list of properties for that relation or class, select one or more to be key properties and click OK.

**NOTE**

Properties of relations or classes that are added to the key can be modified.

Modifying a key property of a relation or class

This task explains how to modify a key property.

To modify a key property of a relation or class

1. From the Select View tabs, click Relations or Classes.
2. Select the relation or class that you want to modify and click Key Properties.
3. Select the key property that you want to modify and click Modify Relation Property or Modify Class Property.
4. Modify any attribute of the property and click OK.

**NOTE**

Key properties that are class references cannot be modified.
Performing key property operations

Removing a class reference from the key of a relation

This task explains how to remove a class reference.

To remove a class reference

1. From the Select View tabs, click Relations.

2. Select the relation that contains the class reference you want to remove and click Key Properties.

3. In the Key Property Operations area, click Remove Class Reference from Key.

4. Select one or more class references and click Remove.

Removing a property from the key of a relation or class

This task explains how to remove a property from the key.

To remove a property from the key

1. From the Select View tabs, click Relations or Classes.

2. Select the relation or class that contains the property you want to remove from the key and click Key Properties.

3. In the Key Property Operations area, click Remove Relation Property from Key or Remove Class Property from Key.

4. Select one or more properties and click Remove.
Chapter 7 Modifying data object names and descriptions

This chapter explains how to use the BMC CDB Data Dictionary Editor to modify data objects.

Overview of the BMC CDB Data Dictionary Editor

You can view data objects and edit their names and descriptions by using the BMC CDB Data Dictionary Editor. When you commit your edits to the connected CDB cluster, all tools that accessing the object on that cluster can see your changes.

Like most BMC CDB Studio tools, the BMC CDB Data Dictionary Editor has a two-pane window. After you connect to a CDB cluster and open a dictionary, the left pane displays a list of intervals, classes, or relations. The right pane displays the properties for the selected interval, class, or relation with the following modifiable values:

- long name
- short name
- unit designator (such as ms, sec, or %)
- description

To open the BMC CDB Data Dictionary Editor

- click the data dictionary icon on your desktop
- select BMC CDB Data Dictionary Editor from the BMC Performance Assurance – CDB menu

The BMC CDB Data Dictionary Editor is displayed (Figure 13 on page 92).
Using the data dictionary editor

This section describes how to use the data dictionary editor to

- open a BMC CDB data dictionary
- select an object view
- modify or restore defaults

NOTE

If you previously worked in the data dictionary editor and saved your data to the local system, the tool opens with the CDB cluster connected and the BMC CDB data dictionary opened, as shown in Figure 13.

If this is the first time you are using the data dictionary, you must connect to a CDB cluster, as described in “Connecting to a CDB cluster” on page 51.
Opening a BMC CDB data dictionary

This task explains how to open a BMC CDB data dictionary.

**To open a data dictionary**

1. On the toolbar, click *Open Data Dictionary* to open the CDB Platform Selection dialog box.

2. Select a platform from the list and click *OK*.

   The platform that you selected opens a data dictionary and populates the editor with relevant information.

Selecting an object view

After you open a data dictionary, the editor offers object views in the left pane.

**To select an object view**

Click one of the following *Select View* tabs to choose the type of objects you want to view or edit:

- **Interval**: displays interval objects in the platform
- **Classes**: displays class objects in the platform
- **Relations**: displays relation objects in the platform

The properties of the selected objects are displayed in the right pane.

Modifying or restoring defaults

You can modify or restore default values to the objects in the left pane or to the properties of those objects in the right pane.

**To modify or restore an interval, class, or relation**

1. In the left pane, select the object you want to modify or restore.

2. In the *Operations* area, click on of the following options:
Modifying or restoring defaults

<table>
<thead>
<tr>
<th>Modified or restored defaults</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Modify</strong> Clear the <strong>Use Default</strong> check box, if it is checked, and enter a new value.</td>
</tr>
<tr>
<td><strong>Restore Defaults</strong> Reset the attributes to their default values.</td>
</tr>
</tbody>
</table>

3 Click OK.

**NOTE**
You can change the type of objects displayed in the left pane by clicking a different **Select View** tab.

**To modify or restore a property**

1 In the left pane, select the object whose properties you want to modify or restore.

2 In the right pane, select a property.

3 In the **Property Operations** area, click **Modify** or **Restore Defaults**.

**NOTE**
Properties that you modify are indicated by an open book icon in the **Short Name** column. Unmodified objects have a closed book icon, and those objects for which you discarded changes have a closed book icon with an editing pencil over it.

4 Click one of the following toolbar buttons:

- **Commit Data Dictionary** saves the changes throughout all BMC CDB Studio tools.
- **Discard Changes** restores all values since the last commit action to their default values.
- **Save Changes Locally and Exit** saves the changes on the local machine before exiting.
- **Reset Data Dictionary** resets the data dictionary to its original default values.

**Reset Data Dictionary** causes all changes by any users, whether in this session or in previous sessions, to be reset back to the original defaults.
Populating business data

This chapter explains how to use the BMC CDB Business Data Population Utility to populate the BMC CDB database with business data.

Overview of the BMC CDB Business Data Population Utility

The BMC CDB Business Data Population Utility is a command-line utility that extracts, reads, and translates the business data in a CSV file. The population utility sends the translated data to the Population Services component, which stores it in the BMC CDB database.

You specify parameters for the population utility in an XML file. The name of the XML file is passed to the population utility as its only argument.

**NOTE**
The structure of the CSV file that contains your business data must correspond to a business data extension that you defined. For more information, see Chapter 6, “Creating and managing business data extensions.”
Running the population utility

This section explains how to run the population utility.

Before you begin

Before you run the population utility, you must perform the following tasks:

- Define a CDB profile (“Connecting to a CDB cluster” on page 51).

- Define the business data extension that you want to populate to the BMC CDB and store it in the BMC CDB Cluster Server (Chapter 6, “Creating and managing business data extensions”).

- Make sure the data source name you plan to use is one of the data source names defined to BMC CDB Services.

NOTE

To be available to BMC CDB Services, the data source must be defined as a System ODBC data source. User ODBC data sources are not available to the BMC CDB Services server.

To run the population utility

1 Specify the population utility parameters in an XML file by using the guidelines in “Format of the XML parameters file” on page 97 and “Population utility parameters” on page 97.

2 Create a CSV input file, as described in “CSV input file format and structure” on page 99.

3 Issue the CDBBDEPopulate.exe command, including the name of the XML parameters file as an argument.

EXAMPLE

`c:\Program Files\BMC Software\CDBStudio\CDBBDEPopulate.exe <XML parameters filename>`

Your path to the CDBBDEPopulate.exe file might be different, depending on where you installed BMC CDB Services.
Format of the XML parameters file

The following example shows the parameters that are in an XML parameters file:

```xml
<?xml version="1.0"?>
<PARMS>
  <CDBProfileName>cdb_profile_name</CDBProfileName>
  <DataSourceName>data_source_name</DataSourceName>
  <Platform>platform_name</Platform>
  <CSVInput>CSV input file name with complete path</CSVInput>
  <ErrorsOutput>Path and name of error message file</ErrorsOutput>
  <NormalizeToExistingIntervals>True or False</NormalizeToExistingIntervals>
  <ResolveIncompleteKeys>True or False</ResolveIncompleteKeys>
  <TreatWarningsAsErrors>True or False</TreatWarningsAsErrors>
  <SuppressProgressIndicator>True or False</SuppressProgressIndicator>
</PARMS>
```

The following example shows sample values for an XML parameters file:

```xml
<?xml version="1.0"?>
<PARMS>
  <CDBProfileName>RemoteCDBServer</CDBProfileName>
  <DataSourceName>DatabaseOnRemoteCDBServer</DataSourceName>
  <Platform>CPMVS</Platform>
  <CSVInput>C:\Data\ThirdPartyBusinessData.csv</CSVInput>
  <ErrorsOutput>C:\Data\ErrorMessages.txt</ErrorsOutput>
  <NormalizeToExistingIntervals>True</NormalizeToExistingIntervals>
  <ResolveIncompleteKeys>True</ResolveIncompleteKeys>
  <TreatWarningsAsErrors>False</TreatWarningsAsErrors>
  <SuppressProgressIndicator>False</SuppressProgressIndicator>
</PARMS>
```

Population utility parameters

Table 4 describes the parameters that you can specify in the population utility XML file.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDBProfileName</td>
<td>name of the CDB profile (“CDB cluster profiles” on page 48)</td>
</tr>
<tr>
<td>DataSourceName</td>
<td>name of the data source (“Connecting to a CDB cluster” on page 51)</td>
</tr>
<tr>
<td>Platform</td>
<td>name of the platform to which the business data extension belongs (“Using the CDB BDE tool” on page 73)</td>
</tr>
</tbody>
</table>
Population utility parameters

Table 4  Population utility parameters (part 2 of 3)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSVInput</td>
<td>name of the file that contains the business data you want to process</td>
</tr>
<tr>
<td>ErrorsOutput</td>
<td>name of the file where error messages should be sent</td>
</tr>
<tr>
<td>NormalizeToExistingIntervals</td>
<td>determines whether the input data will be normalized to existing intervals</td>
</tr>
<tr>
<td></td>
<td>True – Input data is normalized to those intervals that already exist in the</td>
</tr>
<tr>
<td></td>
<td>specified data source.</td>
</tr>
<tr>
<td></td>
<td>False – Intervals are created exactly as specified.</td>
</tr>
<tr>
<td></td>
<td>Note:</td>
</tr>
<tr>
<td></td>
<td>- Specifying overlapping intervals of the same type (such as measurement</td>
</tr>
<tr>
<td></td>
<td>or daily summary) where you do not match one of them exactly can cause</td>
</tr>
<tr>
<td></td>
<td>unpredictable results.</td>
</tr>
<tr>
<td></td>
<td>- For the normalization rules that apply to business data, see “CSV input</td>
</tr>
<tr>
<td></td>
<td>file format and structure” on page 99.</td>
</tr>
<tr>
<td>ResolveIncompleteKeys</td>
<td>determines whether the population utility requires a complete set of key</td>
</tr>
<tr>
<td></td>
<td>properties or can recognize a class instance based on incomplete information</td>
</tr>
<tr>
<td></td>
<td>True – The population utility attempts to recognize the correct class instance</td>
</tr>
<tr>
<td></td>
<td>based on partial information provided in the CSV input file.</td>
</tr>
<tr>
<td></td>
<td>False – All key properties for all class instances (both those that already</td>
</tr>
<tr>
<td></td>
<td>exist in BMC CDB and those that must be created during population) must be</td>
</tr>
<tr>
<td></td>
<td>specified.</td>
</tr>
<tr>
<td></td>
<td>Note:</td>
</tr>
<tr>
<td></td>
<td>For successful population of the BMC CDB database, the population utility</td>
</tr>
<tr>
<td></td>
<td>must provide a complete set of key properties for each class instance in a</td>
</tr>
<tr>
<td></td>
<td>particular CSV input file. However, the population utility can, in some cases,</td>
</tr>
<tr>
<td></td>
<td>recognize class instances by incomplete keys, if those instances already exist</td>
</tr>
<tr>
<td></td>
<td>in the database.</td>
</tr>
<tr>
<td></td>
<td>For example, the complete key for an LPAR contains LPAR Name, Physical</td>
</tr>
<tr>
<td></td>
<td>System name, CPU Serial number, Number of Logical processors, and other</td>
</tr>
<tr>
<td></td>
<td>attributes. If complete data for all LPARs already exists in the database,</td>
</tr>
<tr>
<td></td>
<td>the population utility can recognize an LPAR instance by the LPAR Name alone.</td>
</tr>
</tbody>
</table>
### CSV input file format and structure

A CSV input file consists of individual records, where each record is delimited by carriage return (CR) and line feed (LF) characters. One or more comment records can be inserted between any two records. Comment records are identified by a slash character (/) in the first position. Blank records (records containing blanks or CR/LF characters only) are not permitted.

Input file records are separated into the following sections:

- **Header** contains a single record
- **Interval** contains interval object instances (interval table records)
- **Classes** *(optional)* static tables that contain data for one or more object classes

Each class must contain all records for which business data is provided in the Relations section of the input file. For example, if relation PARTOSAD contains data for two LPARs and three OSA links, the static section of the file would contain two classes:

- **PARTNS** with 2 LPAR instances
- **OSAS** with three OSA link instances

- **Relations** *(optional)* dynamic tables that contain data for one or more relations

#### Table 4  Population utility parameters (part 3 of 3)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TreatWarningsAsErrors</td>
<td>determines how the population utility responds if it finds records that cannot be populated</td>
</tr>
<tr>
<td></td>
<td><strong>True</strong> – Records that cannot be populated are treated as errors and no records are populated.</td>
</tr>
<tr>
<td></td>
<td><strong>False</strong> – Records that cannot be populated are treated as warnings and the population process continues.</td>
</tr>
<tr>
<td></td>
<td>Regardless of this setting, information about the population process appears in the ErrorsOutput file.</td>
</tr>
<tr>
<td>SupressProgressIndicator</td>
<td>determines whether the population utility progress indicator is displayed</td>
</tr>
<tr>
<td></td>
<td><strong>True</strong> – The progress indicator should be suppressed because the population utility runs in the background and does not have access to a terminal screen.</td>
</tr>
<tr>
<td></td>
<td><strong>False</strong> – The progress indicator should be displayed.</td>
</tr>
</tbody>
</table>
The interval object and each class and relation in the interval correspond to a table in the underlying RDBMS. Parts of the input file for the interval, as well as each class and each relation in the interval have a similar structure that contains:

- a required T record that identifies the table

  There is a T; in the first two positions, followed by a class or relation name, which is actually a table name. For example:

  - T;INTVL
  - T;PARTNS
  - T;OSAS

- an optional K record that contains the names of all properties of the class or relation specified in the file

  There is a K; in the first two positions, followed by a comma-separated list of names.

  If the K record is not present for a particular class or relation, the subsequent data records must contain all properties of the corresponding class or relation in exactly the same order as the user defined them in the business data extension.

  If the K record is present, properties in subsequent data records must be specified in the order that corresponds to the K record. For example, the K record for an Interval class might look like this:

  K;DATE,TIME,DURN,INTTYPE.

  In this case, only date, time, duration and the type of interval will be specified in the data records.

- one or more data records containing property values for the instances of class or relation

  Data records are identified by a semicolon (;) in the first position, followed by a comma-separated list of values. For example, data records for Interval will look like this:

  ;07/01/15,0000,60.0,M,
  ;07/01/15,0100,60.0,M,
  ;07/01/15,0200,60.0,M,
Rules for specific sections of the input file

Specific sections in the input file have specific rules.

**Header section rules**

The Header section contains one line only (required characters shown in bold):

```
H;<Platform name>,<Number of intervals defined in Interval section>,B,
```

For example, the following header indicates that data is to be populated into the CPMVS platform and 24 intervals are defined in the Interval section:

```
H;CPMVS, 24,B,
```

**Interval section rules**

The Interval section contains records for a single Interval class.

**NOTE**

The schema of an Interval class is identical for all platforms that are supported by the BMC CDB. However, each platform has its own underlying RDBMS interval table, and while the names of the columns in each RDBMS interval table are the same for all platforms, the tables themselves have a unique name.

This naming convention allows multiple platforms to store data in one RDBMS database instance, as well as allowing different overlapping intervals for different platforms. Overlapping intervals of the same type are not permitted in a single platform.

An interval class has the following properties:

- **DATE** in the format YY/MM/DD
- **TIME** in the format HHMM
- **DURN** an integer representing the duration, in minutes
- **INTTYPE** a single character representing the type of interval: M for measurement data or S for summary
- **DESCR** (summary intervals only) an interval description field
For example, if the input file contains metrics for 24 hourly intervals, the Interval sections will appear as follows:

```
T;INTVL
K;DATE,TIME,DURN,INTTYPE,
;08/09/11,0000,60,M
;08/09/11,0100,60,M
... 
;08/09/11,2300,60,M
```

The processing of an Interval section (and the processing of all Relation sections) depends on the `NormalizeToExistingIntervals` parameter (Table 4 on page 97):

**False**

All 24 intervals are added to the RDBMS Interval table if they were not inserted previously. All four Interval class properties are key properties and are case-sensitive.

**Note:** There are two more key properties in the Interval class, `DESCR` and `INTSUBT`. These properties must be specified for a summary interval, but can be ignored for measurement intervals.

**True**

The population utility tries to find existing intervals that have the same type, description, and subtype, and which are completely overlapped by one of the intervals specified in the input file. If such intervals are found, the utility normalizes the content of Relation records to the existing intervals.

**Note:** Intervals in the input file that do not overlap any existing interval are ignored.

For example, if the Interval table in the RDBMS contains only 20 hourly intervals (0000 to 2000 for a particular date), and the business data for the input file is generated only once a day, the input file will contain only one interval. Each relation in the input file for each object will contain only one record, but the population utility creates from the 20 records and inserts that information into the RDBMS table.

**Class section rules**

The Class section contains data for one or more object classes. This section must contain all classes that are referred to in the Relations section, including classes from the core BMC CDB and from other extensions of the platform.

For example, the relation PARTOSAD has two class references, PARTNS and OSAS. Both PARTNS and OSAS classes must be included in the Class section.

In general, it is necessary to specify all key fields for each class. However, the population utility provides an option to resolve incomplete keys; for more information, see the `ResolveIncompleteKeys` parameter in Table 4 on page 97.
For example, key fields for LPAR class PARTNS are composed of the LPAR name, physical system name, CEC serial number, number of logical processors, and some other values. If the ResolveIncompleteKeys is set to True, you need to specify only an LPAR name. In addition, you need to use a K record for the LPAR class, like this:

```
T;PARTNS
K;PARTITN
;LPPROD
;LPTEST
```

**Relation section rules**

The Relation section contains data for one or more relations. This section must adhere to the following rules:

- The key properties of the relation can be either class or interval references or explicit keys. All key properties for the relation must always be present.

- The name of the property that is a class reference is the same as the name of the corresponding class.

- In the data records for the class references, the ordinal number of corresponding class instances in the input file is specified.

For example, the PARTOSAD relation appears as follows:

```
T;PARTOSAD
K;INTVL,PARTNS,OSAS,TCPINB,TCPOUTB,UDPINB,UDPOUTB
;1,1,1,0.002,15.5,25.1,37,
;1,1,2,0.002,14.5,25.1,37,
;1,1,3,0.002,13.5,25.1,37,
;1,2,1,5.002,115.5,25.1,37,
;1,2,2,0.002,15.5,25.1,37,
;1,2,3,0.002,15.5,25.1,37,
;2,1,1,0.002,15.5,25.1,37,
;2,1,2,0.002,15.5,25.1,37,
...
```

In this input file, the first data record is related to Interval 1, LPAR 1 and OSA Link 1, which translates to

- the interval 08/09/11 from 00:00 to 01:00
- the LPAR named LPPROD
- OSA link OSAL1
Only the following types of data are permitted in non-key relation properties:

— additive metrics represented as rates over time (such as Kbytes/sec, Transactions/hour, Calls/day, or IO/sec)

— average metrics represented as rates over one of the additive metrics above, that are present in the same relation (such as average cost in Dollars/Transaction or average response time of an I/O operation in msec/IO)

— nonadditive absolute numbers like memory size in Mbytes or the number of available scratch tapes

**NOTE**

For all three types of data values, it is assumed that they are constant during a particular interval. Under this assumption, if the **NormalizeTo Existing Intervals** parameter is set to **True**, the values in all existing intervals that are overlapped by a single interval from the input file are the same.
Viewing BMC CDB workflow activity

This chapter explains how to use the BMC CDB Workflow Viewer to display workflow activity in real time.

Overview of the BMC CDB Workflow Viewer

The BMC CDB Workflow Viewer lets you display short- and long-term job activity in real time.

To open the BMC CDB Workflow Viewer

- click the workflow viewer icon on your desktop
- select BMC CDB Workflow Viewer from the BMC Performance Assurance – CDB menu

The BMC CDB Workflow Viewer is displayed (Figure 14 on page 106).
Workflow Activity View

The initial display in the BMC CDB Workflow Viewer is the Workflow Activity View (Figure 14), which is a logical representation of a physical CDB cluster. The lists in this view represent the message queues through which your long-running CDB job requests will flow. You can use this workflow information to monitor the health of the CDB cluster or to diagnose problems.

**NOTE**

Long-running requests are also known as *ticketed requests*. Examples of such requests are the population of third-party extensions, queries for object data, and queries for trending data.
In the Workflow Activity View, there are small icons to the left of message IDs that represent the following states:

- The message is normal and healthy.
- An error has occurred while processing this message. The message will be sent through the workflow again for a retry.
- After several attempts, the message could not be processed and was, therefore, aborted.

Status indicators for individual message queues are also color-coded as follows:

- Green icons mean the connection to the message queue is active.
- Gray icons mean you are not connected to the message queue.
- Red icons indicate a message queue error condition. If you hover the cursor over the red icon, a message describes the error.

**Realtime Activity View**

The BMC CDB Workflow Viewer includes a Realtime Activity View that you can use to display real-time web service (CDB) activity (Figure 15 on page 108). After a period of time, messages in this view expire and are no longer viewable.
In the Realtime Activity View, you can

- double-click any message to view the HTTP header content
- clear all messages
BMC CDB Workflow Viewer toolbar

From the BMC CDB Workflow Viewer toolbar, you can perform the following operations:

- **Connect to CDB Cluster**: Connect to a BMC CDB Services server. You must connect to a server before you can start monitoring the flow of messages.

- **Start Queue Monitoring**: Start monitoring the flow of messages through the BMC CDB workflow.

- **Stop Queue Monitoring**: Stop monitoring the flow of messages through the BMC CDB workflow. Stop monitoring when you want to freeze the user interface for analysis. This operation does not stop the actual flow of messages; it just prevents the user interface from being updated.

- **Find Ticket**: Find a job by searching for its ticket ID. Use this operation to determine what queue a job is in and to evaluate its current status.

Using the workflow viewer

This section describes how to use the BMC CDB Workflow Viewer to:

- Connect to a BMC CDB Services server
- Display the properties of a message
- Display log files from a workflow machine

Connecting to a BMC CDB Services server

You must connect to a BMC CDB Services server to monitor workflow messages.

To connect to a BMC CDB Services server

1. On the Workflow Activity View, click **Connect to CDB Cluster**.
2. In the Connect... dialog, enter the values for each field:
### Displaying message properties

You can display the properties of a workflow message to learn more about it.

**To display the properties of a message**

On the Workflow Activity View, double-click a message in any message queue. The **Message Properties** and **Content Properties** panes on the right display the message properties. All displayed properties are read-only.

**NOTE**

For security reasons, no passwords, database connection strings, or actual message contents are displayed.

### Displaying workflow machine log files

The Workflow Activity View includes a list of CDB workflow machines that are participating in the CDB cluster. You can display the log files for any workflow machine.

**To display workflow machine log files**

In the **CDB Workflow Machines** pane of the Workflow Activity View, double-click a workflow machine name to launch the BMC CDB Services Log Viewer (Figure 16 on page 111).
Figure 16  BMC CDB Services Log Viewer
Viewing logs and events

This chapter explains how to use the BMC CDB Log File Viewer to display a variety of logged information.

Overview of the BMC CDB Log File Viewer

With the BMC CDB Log File Viewer, you can display the following types of logged information:

- BMC CDB Services and BMC CDB Workflow Service logs
- event messages
- audit messages (BMC CDB Services only)

You can view both local and remote information as follows:

- from the BMC CDB Services server
  - local BMC CDB Services and Workflow Service logs, event messages, and audit messages
  - remote BMC CDB Services and Workflow Service logs, event messages, and audit messages on BMC CDB Workflow Service machines

- from a remote BMC CDB Workflow Service server
  - local BMC CDB Services and Workflow Service logs and event messages

- from a device with an Really Simple Syndication (RSS) reader
  - event messages on a BMC CDB Services or BMC CDB Workflow Service machine, if you have enabled an RSS feed
You can use the Configuration Tool to set up the following logging options:

- whether you want to see event messages and, if so, what severity level
- whether you want to see file system log messages and, if so
  - what severity level
  - how frequently you want them
  - file path for where they are located
  - prefix for the messages

For more information, see “LogManager – Managing event viewer and file system logs” on page 37.

**Using the logging tool**

This section describes how to open the BMC CDB Log File Viewer and use the logging tool to view

- file and system log files
- event messages
- audit messages

**Opening the logging tool**

You can access all log and event information by opening the logging tool in your web browser.

**To open the logging tool**

Perform one of the following tasks:

- Use links that are provided in the Program Files folder.
- Enter the URL of the server for which you want to view information:
  - HTTP://<servername>:80/BMCCDB (BMC CDB Services)
  - HTTP://<workflow_servername>:8080/CDB/CDB.LOG (BMC CDB Workflow Service)
NOTE

Your virtual directory name might be different from the one that is shown in the BMC CDB Services URL (BMCCDB). If so, replace BMCCDB with your virtual directory name.

The initial window depends on whether you open the logging tool from the BMC CDB Services server (Figure 17 on page 115) or a BMC CDB Workflow Service server (Figure 18 on page 116).

Figure 17  Log Viewer window on the BMC CDB Services server
On a BMC CDB Services server, the logging tool displays a list of servers, including the CDB source, as well as a list of remote BMC CDB Workflow Service servers for which you can view information.

**NOTE**

When you open the logging tool on the BMC CDB Services server, you must select a server from the **CDB Server** or **Workflow Service Servers** list. The server you select will be the data source for all the information the logging tool displays.

![Log Viewer window on a BMC CDB Workflow Service server](image)

On a BMC CDB Workflow Service server, you can view only information that is local to that server.
Viewing file and system log files

You can view file and system log files on a BMC CDB Services server or a BMC CDB Workflow Service server.

To view log files

1. Select the Log Files tab.

2. From the Dates column, select a date and time entry.

The log file that you selected is displayed in the right pane (Figure 19).

Figure 19  Log Files view
Viewing event messages

You can view event messages on a BMC CDB Services server or a BMC CDB Workflow Service server.

To view event messages

1. Select the Event Viewer tab.

2. From the Log Entry Severity column, select a severity level.

   Messages of that severity level are displayed in the right pane (Figure 20).

   **Figure 20  Event Viewer view**

   ![Event Viewer view](image)

3. To view the events on a device that has an RSS reader, click RSS.
Viewing audit messages

You can view audit messages on a BMC CDB Services server. Some audit messages also provide detailed payload data.

**NOTE**

Before you can view audit messages, you must enable the logging of audit information (see “AuditManager – Auditing web service usage” on page 34).

To view audit messages

1. Select the Audit Logs tab.

2. From the Dates column, select a date and time entry.

The audit messages for the date you selected are displayed in the right pane (Figure 21).

**Figure 21  Audit Logs view**
To view payload data for an audit message

When payload data is available for an audit message, a live link appears next to the Payload field. To view the payload data, click View Payload Data (Figure 22).

Figure 22  Payload data for an audit message
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