BMC Cost Analyzer for 
zEnterprise User Guide

Supporting

Version 1.0 of BMC Cost Analyzer for zEnterprise

June 2013
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<thead>
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<th>Telephone</th>
<th>Fax</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMC SOFTWARE INC 2101 CITYWEST BLVD</td>
<td>1 713 918 8800</td>
<td>1 713 918 8000</td>
</tr>
<tr>
<td>HOUSTON TX 77042-2827 USA</td>
<td>or</td>
<td>or</td>
</tr>
<tr>
<td></td>
<td>1 800 841 2031</td>
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■ Find the most current information about BMC products
■ Search a database for problems similar to yours and possible solutions
■ Order or download product documentation
■ Download products and maintenance
■ Report a problem or ask a question
■ Subscribe to receive proactive e-mail alerts
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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 problem
■ 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
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Overview of Cost Analyzer

This section introduces the BMC Cost Analyzer for zEnterprise (Cost Analyzer) product, describing its architecture, user roles, and tools.

Cost Analyzer provides interactive tools for comprehensive analysis of your IBM sub-capacity licensing costs across your mainframe system. As part of your cost-savings program, Cost Analyzer:

- Utilizes the Universal Information Exchange (UIE) component running on the mainframe to populate data in Capacity Management Databases (CDBs).
- Retrieves data from CDB to create a cost model.
- Provides you with the knowledge of the costs of your environment so you can enact effective plans to make reductions.
- Unifies the various components of your overall cost-saving solution by providing reporting, planning, and cost management capabilities.
- Utilizes cost analysis tools that can determine where and how to implement changes for maximum cost savings.

How Cost Analyzer works

Cost Analyzer is a tool for analysis, optimization, and planning of software license cost for IBM Base Monthly License Charge (MLC) products with Sub-Capacity Variable Workload License Charges (VWLC) licenses.

IBM bases sub-capacity pricing on the four-hour rolling average utilization of z/OS LPARs recorded during the period of a month. A monthly period runs from 00:00 on the second day of the month through midnight (24:00) on the first day of the next month.

The unit of measurement for utilization of z/OS LPARs is MSUs or Millions of Service Units used per hour. MSUs are also sometimes called Software MSUs (as opposed to Hardware MSUs) and are calculated as CPU seconds used by general
purpose CPs in a z/OS LPAR during an hour multiplied by the Software Service Units coefficient reported by RMF in field SMF70CPA of the type 70 record.

The Software Service Units coefficient determines the MSU rating of an IBM mainframe processor. However, MSU ratings cannot be utilized as a capacity metric since IBM uses MSUs only to gauge software pricing. For this reason, the information provided by Cost Analyzer cannot be used for Capacity Planning or Performance Reporting and should be used only for cost analysis and planning.

For more information about IBM sub-capacity pricing, see http://www-03.ibm.com/systems/z/resources/swprice/subcap/zos.html.

For the table containing MSU ratings for IBM mainframe processors see http://www-304.ibm.com/servers/resourcelink/lib03060.nsf/pages/LsprITRzOSv1r13?OpenDocument&pathID=%20%27

As a component of the BMC Cost & Performance Optimization for System z suite, Cost Analyzer:

- Provides reports and interactive displays that clearly indicate where cost savings can be realized by managing and optimizing your LPAR capacities and workloads
- Retrieves specific data from the CDB server and then dynamically builds it into a cost model that can be processed and analyzed by a variety of tools
- Utilizes a Reporting Tool and a Planning Tool for your cost analysis:
  — The Reporting Tool provides information about MLC products existing in your data center environment, and components that impact the overall cost.
  — The Planning Tool gives you the ability to investigate the effect of future data center environment changes on the overall cost. It also enables you to analyze potential cost optimization actions.

**Cost Analyzer architecture**

BMC Cost Analyzer is built on a four-tiered architecture that consists of the following components:

- (IBM z/OS) Universal Information Exchange (UIE) data processing/analysis batch program
- (Microsoft Windows) Capacity Management Database (CDB) application server
- (MS Windows) Cost Analyzer application server
- (Web Browser Client) Microsoft Silverlight Rich Internet Application (RIA)

Figure 1 on page 9 illustrates the architecture of the BMC Cost Analyzer environment.

**Figure 1: Cost Analyzer architecture**

**Terminology**

This topic lists and defines terminology used throughout Cost Analyzer.
### Table 1: Cost Analyzer terminology

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
</table>
| 4 hour rolling average (4HRA)           | CPU consumption, measured in MSUs  
4HRA is calculated by the RMF using the last 48 5-minute buckets and written into the type 70 record of the z/OS image in which the RMF is running. While the RMF in each z/OS image records the CPU consumption of all LPARs on the same CPC, the 4HRA metric is available only for the host LPAR (the LPAR in which this record is created).  
**Note:** The 4 Hour Rolling Average or 4HRA is sometimes called *R4HA*. |
| Central processor complex (CPC)          | Physical collection of hardware that includes main storage, one or more central processors, timers, and channels  
| Logical partition (LPAR)                 | Subset of a single system that contains resources (processors, memory, and input/output devices)  
An LPAR operates as an independent system and can contain different operating systems such as:  
- z/OS  
- Integrated Coupling Facility  
- Linux (from Linus Torvalds)  
- IBM z/VM  
An LPAR can also be inactive. |
<p>| Millions of Service Units (MSUs)         | A measure of CPU time consumption, calculated as number of CPU seconds used per hour, multiplied by the service units per seconds (SU/sec) coefficient. The SU/sec coefficient depends on the CPC type and model and normally is the same for all LPARs on a CPC. |</p>
<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
</table>
| Monthly License Charges (MLCs)    | One of the methods that IBM is using to charge for software products  
This method is used for the operating system itself and for the most important (and expensive) transaction processing subsystems (for example, CICS, DB2, IMS, and Web Sphere MQ).  
For more information see, http://www-03.ibm.com/systems/z/resources/swprice/mlc/index.html |
| MLC Product                       | IBM System z software product using MLC pricing                                                                                                                                                            |
| Sub-Capacity                      | A group of licensing rules, terms, and conditions for software licenses based on actual CPU resource usage  
For more information see, http://www-03.ibm.com/systems/z/resources/swprice/subcap/index.html |
| Sub-Capacity Reporting Tool (SCRT)| IBM tool that processes the RMF and SMF records (in particular type 70 and type 89) and produces the Sub-Capacity report  
This report is used by IBM to calculate the monthly license charge. IBM customers using Sub-Capacity licenses must use SCRT to process data from all LPARs on a CPC for the complete billing month (from 00:00 of day 2 of the calendar month to 24:00 of day 1 of the next calendar month) and send it to IBM.  
For more information see, http://www-03.ibm.com/systems/z/resources/swprice/subcap/scrt/index.html |
| Universal Information Exchange (UIE)| A BMC component that runs on your mainframe system to read and process SMF/RMF and subsystem data collected from target z/OS images  
UIE can produce two types of output:  
- XML data files  
- Visualizer files  
For more information, see the *Universal Information Exchange User Guide*. |
### Term | Description
--- | ---
Workload | A group of work to be tracked, managed, and reported as a unit. A workload consumes system resources such as CPU time and I/O operations. Cost Analyzer analyzes only CPU resource consumption. Work performed in the system can be measured and reported by different tools (SMF, RMF). It also can be grouped using different rules. The selected reporting tool or grouping rule determines the workload type. For more information, see “Cost Analyzer workloads” on page 12.

| z/OS | 64-bit operating system for IBM mainframe computers |
| z/OS image | An instance of z/OS running in an LPAR or as VM guest. z/OS images can run in an LPAR or inside an instance of the z/VM operating system as a guest. |
| z/VM | IBM Virtual Machine operating system for mainframe computers |

### Cost Analyzer workloads

Cost Analyzer provides you the opportunity to analyze the work that affects software cost not only on the level of individual LPARs, but also on the level of individual jobs, started tasks, and address spaces aggregated into objects called *workloads*.

Cost Analyzer provides the following different methods of aggregation:

- Importance
- Service Class name
- WLM Workload name in WLM Policy
- Suite
- Subsystem Address Space (IBM CICS, IBM IMS, IBM DB2, and so on)

Each workload type always corresponds to the total activity in the LPAR. So, different types of workloads always represent, from different perspectives, the same total work performed in an LPAR. This information is derived from RMF and SMF measurement data using proprietary BMC algorithms.
Table 2 on page 13 describes each workload type:

Table 2: Cost Analyzer Workload types

<table>
<thead>
<tr>
<th>Workload type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Importance</td>
<td>Activity is aggregated using Service Class Period Importance from the WLM Policy.</td>
</tr>
<tr>
<td>Service Class name</td>
<td>Activity is aggregated by Service Class. Note: Using data from each Service Class in the model would not be practical, so you must specify a filter: a list of Service Class names (possibly with wildcards) that you want to include in the model. All Service Classes not included explicitly by the filter are aggregated into workload OTHER_WORK.</td>
</tr>
<tr>
<td>Suites</td>
<td>Suites are user-defined groups of jobs and STC. The number of the Suites can be very high, so a filter is required. Suites are defined in UIE directives.</td>
</tr>
<tr>
<td>WLM Workload name in WLM Policy</td>
<td>Activity is aggregated according to the workload name in the Workload Manager (WLM) policy.</td>
</tr>
<tr>
<td>Subsystem address space</td>
<td>Subsystem address space type activity is aggregated by Subsystem Address Types (CICS, CICSUTL, DB2, DB2UTL, IMS, IMSUTL, IRLM, OMVS, MQSeries, WAS). All other activity is aggregated into workload OTHER_WORK.</td>
</tr>
</tbody>
</table>

BMC Cost Analyzer User Groups

The functionality of Cost Analyzer tools and access to cost data can vary for each user and is determined by assigning users to BMC Cost Analyzer user groups.

It is the responsibility of the Windows system administrator to assign each user to a User Group. For more information, see “Assigning users to BMC Cost Analyzer User Groups” on page 35.

The user’s assignment to a BMC Cost Analyzer group determines:

- Which tools the user can access and the degree of functionality of those tools
- Whether the group members have access to cost information

Users should be assigned to one of the following BMC Cost Analyzer groups:
BMC Product Administrators
Group members can access all product components and can use Administration Tools to perform application administration functions such as editing the cost tables and defining Cost Analyzer Model Builder Tasks.

BMC Cost Analyzer Capacity Planners
Group members can access all product components and can view MLC cost information but cannot access Administration Tools or edit the cost table.

BMC Cost Analyzer System Programmers
Group members can access limited application functionality but cannot view MLC cost information.

BMC Cost Analyzer Application Support
Group members can access limited application functionality but cannot view MLC cost information.

BMC Cost Analyzer Executives
Group members can access limited application functionality and can view MLC cost information.

BMC Cost Analyzer Managers
Group members can access limited application functionality and can view MLC cost information.

The following table lists the BMC Cost Analyzer groups and details their attributes:

Table 3: BMC Cost Analyzer groups and component access control

<table>
<thead>
<tr>
<th>User Group</th>
<th>MSU Cost Editor</th>
<th>Reporting Tool</th>
<th>Planning Tool</th>
<th>Administration Tools</th>
<th>Tool functionality</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMC Product Administrators</td>
<td>Yes</td>
<td>Yes (with cost info)</td>
<td>Yes (with cost info)</td>
<td>Yes</td>
<td>Full functionality</td>
</tr>
<tr>
<td>BMC Cost Analyzer Capacity Planners</td>
<td>No</td>
<td>Yes (with cost info)</td>
<td>Yes (with cost info)</td>
<td>No</td>
<td>Full functionality</td>
</tr>
<tr>
<td>BMC Cost Analyzer System Programmers</td>
<td>No</td>
<td>Yes (no cost info)</td>
<td>No</td>
<td>No</td>
<td>Limited functionality</td>
</tr>
<tr>
<td>BMC Cost Analyzer Application Support</td>
<td>No</td>
<td>Yes (no cost info)</td>
<td>No</td>
<td>No</td>
<td>Limited functionality</td>
</tr>
</tbody>
</table>
Cost Analyzer tools

Cost Analyzer provides group-based Administration, Reporting, and Planning Tools.

Administration Tools

You need to be a BMC Product Administrator to access the Administration Tools. For more information, see “BMC Cost Analyzer User Groups” on page 13.

Administrators can access tools that can:

- Manage profiles where Cost Analyzer gathers the data for analysis
- Build models that determine the composition of the data
- View Application, Services, and Model Build log files

Table 4 on page 15 provides details about the Administration Tools:

<table>
<thead>
<tr>
<th>Administration Tool</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manage CDB Server Profiles</td>
<td>Add, remove, or modify CDB server profiles</td>
</tr>
<tr>
<td></td>
<td>This tool also provides a list of the available CDB Server profiles once they have been added by the administrator.</td>
</tr>
<tr>
<td></td>
<td>See “Defining connections to CDB servers” on page 39.</td>
</tr>
<tr>
<td>Administration Tool</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Model Builder Tasks</td>
<td>Add, modify or remove Model Builder Tasks to determine the parameters for the cost models. Model Builder Tasks can specify different workload types and filters. Your Model Builder Tasks can also gather data from different CDB servers and databases. This tool provides a list of the available Model Builder Tasks that have been created and added by the administrator. Additionally, you have the option to run the task immediately. See “Defining Model Builder Tasks” on page 41.</td>
</tr>
<tr>
<td>Application Server Log Viewer</td>
<td>View Application, Services, and Model Build log files. See “Displaying Cost Analyzer log files” on page 87.</td>
</tr>
</tbody>
</table>

Administrators can also access the MSU Cost Editor where they need to edit cost tables for each MLC product by assigning costs to predefined MSU ranges. See “Using the MSU Cost Editor” on page 36.

**Group-based component tools**

Based on the user’s group assignment, Cost Analyzer can perform a variety of reporting and analysis functions. Table 1 on page 10 describes the available assigned component tools:

<table>
<thead>
<tr>
<th>Table 5: Cost Analyzer group-based component tools</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Component</strong></td>
</tr>
<tr>
<td>Reporting Tool</td>
</tr>
<tr>
<td>Planning Tool</td>
</tr>
</tbody>
</table>

**Logging on to Cost Analyzer**

Use the following procedure to access Cost Analyzer.
Before you begin

Before you can login and use Cost Analyzer, you need to add at least one user to a BMC Cost Analyzer Group. For more information, see “Assigning users to BMC Cost Analyzer User Groups” on page 35.

To log on to Cost Analyzer

1. Perform one of the following actions:

   - From a web browser, type the required URL to access BMC Cost Analyzer at your site.
     For example: http://machineName | IPAddress/BMCSCA/default.aspx
   - From the Start menu, select All Programs => BMC Capacity Management for Mainframes => Cost Analyzer for zEnterprise => Navigate to Cost Analyzer for zEnterprise.

2. Type your user name (in the format domain\userName ) and password, and click OK.

   The BMC Cost Analyzer splash screen is displayed.

Note

If you need to call Customer Support for a BMC Cost Analyzer issue, make note of the product version and build number that appear on the login page. This information can also be obtained on the About page.

Cost Analyzer console

The Cost Analyzer console provides a selection of tools for analyzing the cost of MLC products in your data center.
The following figure illustrates the Cost Analyzer console:

**Figure 2: Cost Analyzer console**

The Cost Analyzer console consists of the following items:

- The toolbar buttons provide access to the Administration Tools and MSU Cost Editor as described in the following table:

  **Table 6: Cost Analyzer toolbar buttons**

<table>
<thead>
<tr>
<th>Toolbar Button</th>
<th>Tasks</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration Tools</td>
<td>Manage CDB Servers Profiles</td>
<td>Add, remove, or modify CDB server profiles</td>
</tr>
<tr>
<td></td>
<td>Model Builder Tasks</td>
<td>Add, remove, or modify Model Builder Tasks</td>
</tr>
<tr>
<td></td>
<td>Application Server Log Viewer</td>
<td>View all available Application Server log files</td>
</tr>
<tr>
<td>MSU Cost Editor</td>
<td>Edit cost table entries</td>
<td>Assign cost coefficients to predefined MSU ranges for individual MLC products</td>
</tr>
</tbody>
</table>

*Note*

The availability of the Toolbar buttons on your console depends upon your User Group assignment. For more information, see “BMC Cost Analyzer User Groups” on page 13.

- The tool tabs provide access to the Reporting Tool and Planning Tool as described in the following table:
### Table 7: Cost Analyzer Tool Tabs

<table>
<thead>
<tr>
<th>Tool Tab</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reporting Tool</td>
<td>Generate Monthly Summary Reports for analysis</td>
</tr>
<tr>
<td></td>
<td>You can run reports and use interactive features to explore and analyze the results.</td>
</tr>
<tr>
<td>Planning Tool</td>
<td>Create cost optimization plans for future activity or environment changes and estimate the effects on total cost</td>
</tr>
<tr>
<td></td>
<td>Using interactive features, you can move LPARS from CPCs, scale workloads, and redistribute MSUs to strategize potential cost savings</td>
</tr>
</tbody>
</table>

- The links provide access to logging out, online Help (a PDF of the BMC Cost Analyzer User Guide), and product information.

---

**Note**

The user name link displays an information window that indicates the user group assignment for the user.

---

### Where to go from here

This topic directs you to the following sections:

- To install BMC Cost Analyzer, see “Installation” on page 21.

- To perform the administrative setup tasks that will prepare BMC Cost Analyzer for use, see “Setting up Cost Analyzer” on page 33.

- When you are ready to start using BMC Cost Analyzer, see “Generating cost-analysis reports” on page 55 and “Developing cost-reduction plans” on page 71.
Installation

Installing the Cost Analyzer product requires installing the CDB server components, followed by the Cost Analyzer application files.

Installing the CDB server

This section describes the requirements and procedures for installing the CDB server in a Windows environment.

You must install the following CDB components:

- BMC CDB Services
- BMC CDB Workflow Service

**Note**

- CDB version 1.2 Patch 02 or later is required to run Cost Analyzer.
- 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.

CDB system requirements

This topic lists the requirements for installing CDB components.

**Note**

The user running the installation must be an administrator.
Table 8: CDB system requirements

<table>
<thead>
<tr>
<th>Component</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating system</td>
<td>You must be using one of the following Microsoft systems:</td>
</tr>
<tr>
<td></td>
<td>■ Windows Server 2012</td>
</tr>
<tr>
<td></td>
<td>■ Windows Server 2008 R2</td>
</tr>
<tr>
<td></td>
<td>■ Windows 8</td>
</tr>
<tr>
<td></td>
<td>■ Windows 7</td>
</tr>
<tr>
<td>Features</td>
<td>■ Microsoft .NET Framework 4.5 must be installed.</td>
</tr>
<tr>
<td></td>
<td>■ Microsoft Message Queuing Server (MSMQ) must be installed and running.</td>
</tr>
<tr>
<td>Internet Information Server (IIS)</td>
<td>■ IIS must be installed.</td>
</tr>
<tr>
<td></td>
<td>■ IIS ASP.NET must be enabled.</td>
</tr>
<tr>
<td></td>
<td>■ IIS HTTP Activation must be enabled.</td>
</tr>
<tr>
<td></td>
<td>■ IIS Windows Authentication must be enabled.</td>
</tr>
<tr>
<td></td>
<td>■ IIS Metabase must be enabled.</td>
</tr>
<tr>
<td>Memory</td>
<td>8 GB</td>
</tr>
</tbody>
</table>

**Before you begin**

Before you set up the CDB server, review the following information:

- Ensure that you have the following shared components installed:
  - BMC Universal Information Exchange (UIE): 1.9.10 Patch04
  - Capacity Management Database 1.2.00 Patch 02
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.

**Installing BMC CDB Services**

Use the following procedure to install BMC CDB Services.

**To install BMC CDB Services**

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 files were saved.
   - If you received a physical product shipment, insert the BMC CDB installation CD into a CD drive.

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

3. On the Welcome page, click **Next**.

4. Read the license agreement and click **Yes**.

5. Review the Readme file and click **Next**.

6. On the Choose Destination Location page, perform one of the following options:
   - Click **Next** to accept the default location.
   - Click **Browse** to choose a different location.

   The Destination 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**
   The selected Destination Location becomes the IIS virtual directory, which provides access to BMC CDB Services.

7. On the Start Copying Files page, review the destination folder and click **Next** to begin the installation.

   The Setup Status page displays a progress bar. After the files are installed, the Setup program updates your registry.
8 Click **Finish** and, if prompted to restart your computer, restart it now.

---

**Note**

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

---

## Installing BMC CDB Workflow Service

Use the following procedure to install BMC CDB Workflow Service.

---

**Note**

You can install BMC CDB Workflow Service on the same machine as BMC CDB Services or on a different machine.

---

### To install BMC CDB Workflow Service

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

2. On the Welcome page, click **Next**.

3. Read the license agreement and click **Yes**.

4. Review the Readme file and click **Next**.

5. On the Choose Destination Location page, perform one of the following actions:

   - Click **Next** to accept the default location.
   - Click **Browse** to choose a different location.

   The Destination 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 as shown in Figure 3 on page 25, 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 <strong>localhost</strong>.</td>
</tr>
</tbody>
</table>
### Field | Description
--- | ---
**Port** | Port number of the BMC CDB Services server. The default port number is 80.  
**Virtual Directory** | Virtual directory where BMC CDB Services is installed. The default directory is BMCCDB.  
**Username** | *(optional)* User name to be used when accessing a secure IIS server where BMC CDB Services is installed.  
**Password** | *(optional)* Password to be used when accessing a secure IIS server where BMC CDB Services is installed.

---

**Note**

If you have an open site, you can use the default login, **Anonymous**. If you have a secure site, you must specify user account information.

---

**Figure 3: CDB Services Binding Information page**

Click **Test CDB Connection** to verify the connection, and then click **Next**.
**Note**

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

8 On the Service Account Information page as shown in Figure 4 on page 26, select an account under which the BMC CDB Workflow Service should run:

- If BMC CDB Workflow Service is on the same machine as BMC CDB Services, select Local System Account and click Next.

- If the BMC CDB Workflow Service is binding to BMC CDB Services on a remote machine, select Specific User Account. After entering a user name and password, click Test User Account to verify the account, and then click Next to continue.

![Figure 4: CDB Workflow Service Account Information page](image)

9 When the Start Copying Files page is displayed, review your entries and click Next to begin the installation.

   The Setup Status page displays a progress bar. After the files are installed, BMC CDB Workflow Service detects the Microsoft Windows Firewall.

10 When asked if you want to configure the firewall, enter YES or NO based on the following conditions:
Enter **YES** if you want the installation program to add all necessary entries to the firewall.

Enter **NO** if you want to enter the firewall settings shown in Table 9 on page 27 manually.

### Table 9: Firewall settings for BMC CDB Workflow Service

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

11 Click **Finish** and, if prompted to restart your computer, restart it now.

## Installing Cost Analyzer

This section describes the requirements and procedures for installing Cost Analyzer.

**Note**

You can install Cost Analyzer on the same machine as the CDB server components (BMC CDB Services and BMC CDB Workflow Service) or on a different machine.

## Cost Analyzer system requirements

The following topics describe the Cost Analyzer application server and web client requirements.

### Cost Analyzer application server requirements

This topic lists the requirements for installing the Cost Analyzer application server.
Table 10: Application server requirements for Cost Analyzer

<table>
<thead>
<tr>
<th>Component</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating system</td>
<td>■ Microsoft Windows Server 2012</td>
</tr>
<tr>
<td></td>
<td>■ Windows Server 2008 R2</td>
</tr>
<tr>
<td></td>
<td>■ Windows 8</td>
</tr>
<tr>
<td></td>
<td>■ Windows 7</td>
</tr>
<tr>
<td>Additional OS features and roles</td>
<td>■ Microsoft .NET Framework 4.5</td>
</tr>
<tr>
<td></td>
<td>■ Microsoft Message Queuing Server (MSMQ)</td>
</tr>
<tr>
<td></td>
<td>■ Internet Information Server (IIS) for your version of Windows, with the following items enabled:</td>
</tr>
<tr>
<td></td>
<td>— IIS ASP.NET</td>
</tr>
<tr>
<td></td>
<td>— IIS HTTP WCF Activation</td>
</tr>
<tr>
<td></td>
<td>— IIS Windows Authentication</td>
</tr>
<tr>
<td></td>
<td>— IIS Metabase</td>
</tr>
<tr>
<td>Memory</td>
<td>8 GB</td>
</tr>
</tbody>
</table>

**Cost Analyzer web-browser requirements**

This topic lists the system requirements for launching the Cost Analyzer application in a web browser.
Table 11: Browser-related requirements for Cost Analyzer

<table>
<thead>
<tr>
<th>Component</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating system</td>
<td>■ Microsoft Windows Server 2012</td>
</tr>
<tr>
<td></td>
<td>■ Windows Server 2008 R2</td>
</tr>
<tr>
<td></td>
<td>■ Windows 8</td>
</tr>
<tr>
<td></td>
<td>■ Windows 7</td>
</tr>
<tr>
<td>Web-browser</td>
<td>■ Windows Internet Explorer 8 or later</td>
</tr>
<tr>
<td></td>
<td>■ Mozilla Firefox</td>
</tr>
<tr>
<td></td>
<td>■ Google Chrome</td>
</tr>
<tr>
<td>Additional components</td>
<td>Latest version of Microsoft Silverlight</td>
</tr>
<tr>
<td>Memory</td>
<td>4 GB</td>
</tr>
<tr>
<td>Screen resolution</td>
<td>■ 1280 x 1024</td>
</tr>
</tbody>
</table>

**Note:** For screen resolutions lower than 1280 x 1024, BMC recommends that you put your web browser into full-screen mode (F11) to fully utilize the available screen space.

## Installing Cost Analyzer on a web server

Use the following procedure to install the Cost Analyzer server component on a web server.

**Before you begin**

The installation program checks for the requirements described in “Cost Analyzer application server requirements” on page 27. If any requirement is not satisfied, the installation program notifies you and stops. Before restarting the installation program, you must satisfy the missing requirements.
After the installation completes, the administrator does need to associate each Windows domain user account with a BMC Cost Analyzer group definition.

**To install Cost Analyzer**

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 files were saved.
   - If you received a physical product shipment, insert the Cost Analyzer installation CD into a CD drive.

2. In the Cost Analyzer folder, double-click the `setup.exe` file.

3. On the Welcome page, click **Next**.

4. Read the license agreement and then click **Yes**.

5. Review the Readme file and then click **Next**.

6. On the Choose Destination Location page, perform one of the following actions:
   - Click **Next** to accept the default location.
   - Click **Browse** to choose a different location.

   The Destination Location identifies the folder where you want to install Cost Analyzer files. The default destination folder is `C:\Program Files\BMC Software\SCA`.

7. Perform the following actions:
   - a. On the Service Account Information page, select an account under which the Cost Analyzer Service should run.

       You can select either **Local System Account** or **Specific User Account**. The specific user account must have 'Log On As A Service' rights in the form of `<domain>\<user>`.

       b. Enter the user name and password for the account.

       c. Click **Test User Account** to verify the account.

       d. When finished, click **Next**.
The Start Copying Files page is displayed.

8 Review your entries on the Start Copying Files page and click **Next** to begin the installation.

The Setup Status page displays a progress bar that indicates the progression of the installation process.

After the installation completes, Cost Analyzer detects the Microsoft Windows firewall.

9 When prompted, configure the firewall based on the following options:

- If you want the installation program to add all necessary entries to the firewall, click **YES**.
- If you want to enter the firewall settings manually, click **NO** and use the following table to complete the configuration.

<table>
<thead>
<tr>
<th>Firewall setting</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rule Type</td>
<td>Port</td>
</tr>
<tr>
<td>Direction</td>
<td>Inbound/Outbound</td>
</tr>
<tr>
<td>Program</td>
<td>BMCSCAService.EXE</td>
</tr>
<tr>
<td>Protocol and ports</td>
<td>TCP All local ports</td>
</tr>
<tr>
<td>Action</td>
<td>Allow connection</td>
</tr>
<tr>
<td>Profile</td>
<td>DomainPrivate</td>
</tr>
<tr>
<td>Name</td>
<td>BMCSCAService</td>
</tr>
</tbody>
</table>

10 Click **Finish** and, if prompted, restart your computer.

**Where to go from here**

Assign at least one user to a BMC Cost Analyzer user group in order to login and use Cost Analyzer. For more information, see “Assigning users to BMC Cost Analyzer User Groups” on page 35.

**Installing Microsoft Silverlight**

If Silverlight is not already installed when you launch Cost Analyzer for the first time, you are prompted to install it.
**Note**
Depending on your site standards, installing Silverlight might require Administrator rights. If you are not able to install Silverlight yourself, contact your local administrator.

**To install Microsoft Silverlight**


2. Follow the instructions on the Silverlight installation page.

3. When the installation wizard completes the installation, click **Finish**.
Setting up Cost Analyzer

This section describes the administrative operations you need to perform before using the Reporting and Planning tools.

Overview of setup tasks

This topic explains the administrative setup tasks required to make the tools functional for all users.
Before the Reporting Tool and Planning Tool can be used, you need to complete the administration setup tasks described in Figure 5 on page 34:

**Figure 5: Setup tasks flowchart**

The following table provides hyperlinks to the topics that explain how to complete the administration setup tasks:

<table>
<thead>
<tr>
<th>Task</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assign users to the appropriate user group on</td>
<td>“Assigning users to BMC Cost Analyzer User Groups” on page 35</td>
</tr>
<tr>
<td>the application server</td>
<td></td>
</tr>
<tr>
<td>Edit cost tables</td>
<td>“Using the MSU Cost Editor” on page 36</td>
</tr>
<tr>
<td>Define connections to CDB servers</td>
<td>“Defining connections to CDB servers” on page 39</td>
</tr>
</tbody>
</table>
### Assigning users to BMC Cost Analyzer User Groups

Use the following procedure to assign a user to a BMC Cost Analyzer User Group.

Before a user can begin to use Cost Analyzer, he or she must be assigned to a BMC Cost Analyzer User Group. The group assignment determines the user's access to Cost Analyzer components.

**To assign a user to a BMC Cost Analyzer User Group**

1. In Microsoft Windows, navigate to **Computer Management**.

2. In the left pane, expand **Local Users and Groups** and select the **Groups** folder.

3. From the list in the **Groups** folder, select the BMC Cost Analyzer User Group that you want to assign the user to.

   **Note**

   Each BMC Cost Analyzer group provides different functionality to the user by allowing access to particular Cost Analyzer components. Determine which Cost Analyzer components the user should have access to and then assign the user to the appropriate group. For more information, see “BMC Cost Analyzer User Groups” on page 13.

4. In the Properties dialog, click the **Add** button.

5. In the Select users, Computers, Service Accounts or Groups dialog, enter the object names to select and then click **Check Names**.

   Windows verifies your credentials and adds the new name to the BMC Cost Analyzer group.

6. Click **OK**.
The Select users, Computers, Service accounts or Groups dialog closes.

7. From the properties dialog of the BMC Cost Analyzer Group, verify that the new name displays in the list of members.

8. Click **OK** to close the dialog.

## Using the MSU Cost Editor

The MSU Cost Editor provides you with the ability to edit your Variable Workload License Charges (VWLCs) so Cost Analyzer can use your actual costs when building cost models. Use the following procedure to edit the MSU cost tables for each MLC product operating on your system.

In order to calculate the costs of running MLC products, Cost Analyzer requires the incorporation of IBM's "Variable Workload License Charge Structure" table information available from the R4HA MSU cost coefficients in your IBM License Agreement.

The MSU Cost Editor provides MSU cost tables for each MLC Product. These cost tables are structured identically to the 4HRA ranges fixed by IBM. Cost Analyzer sets the default value of the cost coefficients in these tables to zero. You must edit the cost coefficients in the cost tables by entering your actual cost coefficient values provided by IBM.

### Note

You must specify the cost coefficients for your MLC products before you can use the Reporting Tool or Planning Tool. Similarly, you should edit the cost coefficients to reflect any changes to your pricing arrangements with IBM.

### To edit the cost coefficients

1. From the console, click **MSU Cost Editor**.

   The MSU Cost Editor displays as shown in the following figure:
2 Click on a MLC product from the table listing MLC products by product name and product ID.
A cost table displays showing the MSU ranges and their associated cost coefficients as shown in Figure 6 on page 38:

**Figure 6: Sample MSU Cost Table**

<table>
<thead>
<tr>
<th>MSU Range</th>
<th>Cost Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 - 45 MSUs</td>
<td>0</td>
</tr>
<tr>
<td>46 - 175 MSUs</td>
<td>0</td>
</tr>
<tr>
<td>176 - 315 MSUs</td>
<td>0</td>
</tr>
<tr>
<td>316 - 575 MSUs</td>
<td>0</td>
</tr>
<tr>
<td>576 - 875 MSUs</td>
<td>0</td>
</tr>
<tr>
<td>876 - 1315 MSUs</td>
<td>0</td>
</tr>
<tr>
<td>1316 - 1975 MSUs</td>
<td>0</td>
</tr>
<tr>
<td>1976+ MSUs</td>
<td>0</td>
</tr>
</tbody>
</table>

3 Edit the cost coefficients in the cost table.

You can set the Base Workload Licensing Charge (WLC) for charges up to 3 MSU. For each level in the MSU range, you can specify the cost coefficient associated with this MSU usage.

4 *(optional)* Click on the **Reporting Locale** drop-down list to change the reporting locale.

You can change the Reporting Locale to indicate the locale of the cost coefficients so that the Reporting Tool and Planning Tool use the correct currency and dating designations used by the locale. For instance, selecting **French (France):fr-FR** determines that costs will be designated in Euros and the date format will be *DD/MM/YYYY*.

**Note**

Changing the reporting locale does not convert the cost coefficients into the currency of the locale. Cost coefficients must match the currency of the selected locale.

5 Repeat Step 2 on page 17 through Step 4 on page 38 for each MLC product you want to edit.

6 When finished, click on **Save Changes**.

Cost Analyzer saves your changes and closes the MSU Cost Editor.
You can edit the cost coefficients for multiple MLC products. When you click on **Save Changes**, Cost Analyzer saves the changes to each MLC product.

---

**Defining connections to CDB servers**

You define connections to CDB servers by adding or modifying CDB Server Profiles. Use the following procedure to define the CDBs that Cost Analyzer will access to gather data.

**To define a connection by adding or modifying a CDB Server profile**

1. From the Cost Analyzer console, click **Administration Tools**.

   The Administration Tools dialog is displayed.

2. Click on **Manage CDB Server Profiles**.

   The Manage CDB Server Profiles dialog is displayed:

   ![Manage CDB Server Profiles dialog](image)

3. Perform one of the following actions:

   - To add a new profile, click the **Add** button.
   - To modify an existing CDB Server profile, select the icon of the profile you want to modify from the list, and then click the **Modify** button.
The Add/Modify CDB Server Profile dialog is displayed:

4 Complete each field based on the following table:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profile Name</td>
<td>Name for the profile</td>
</tr>
<tr>
<td>Profile Description</td>
<td><em>(optional)</em> Brief description for the profile</td>
</tr>
<tr>
<td>Server Hostname or IP-Address</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 <strong>localhost</strong>.</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><em>(optional)</em> User name to be used when accessing a secure IIS server where BMC CDB Services is installed</td>
</tr>
</tbody>
</table>
5 Click on **Test Connection**.

Cost Analyzer tests the connection and displays the status in the **Connection Status** field.

6 When the test is finished, perform one of the following actions:

- Click on **Add Profile** to add the profile.
- Click on **Modify Profile** to modify the profile.

**To remove a CDB Server profile**

1 From the list of available CDB Server profiles, select the CDB Server profile you want to remove.

2 Click the **Remove** button.

Cost Analyzer removes the CDB Server profile.

3 Click **Save Changes** to commit the changes to the application server.

---

**Defining Model Builder Tasks**

Use the following procedure to create, add, and manage Model Builder Tasks.

The Model Builder Tasks tool provides you with the ability to build cost models based on current data from the CDB server. Once defined and scheduled, Model Builder Tasks generate the models required for the Reporting Tool and the Planning Tool.

You can build a variety of models to affect the scope of your analysis. In general, if you have more than one workload type you want to process, you should define a Model Builder Task for each workload type you want to run. If you have multiple servers, you should define multiple Model Builder Tasks to run.
Assigning the same workload type to multiple CDB servers aggregates the workloads in the Planning Tool. The Planning Tool displays one instance for each workload type, even though that workload type may have multiple Model Builder Tasks associated to it. For more information, see “Developing cost-reduction plans” on page 71.

Before you begin

You need to define at least one CDB Server profile before you can create a Model Builder Task. Defining the CDB Server profile enables Cost Analyzer to connect to the CDB database and retrieve the necessary data for the model. For more information, see “Defining connections to CDB servers” on page 39.

To define Model Builder Tasks

1. From the Cost Analyzer console, click Administration Tools.

2. In the Administration Tools window, click Model Builder Tasks.

   The Model Builder Tasks dialog opens, listing all of the tasks that have been defined by the user:

   ![Model Builder Tasks dialog](image)

   From the dialog you can add, modify, or remove Model Builder Tasks.

3. Perform one of the following actions:

   - To add a new Model Builder Task, click the Add button.
To modify an existing Model Builder Task, select the icon of the task you want to modify from the list, and then click the **Modify** button.

The Add/Modify dialog is displayed as shown in the following figure:

![Add Model Build Task dialog](image)

4. Complete each field based on Table 13 on page 43:

   **Note**
   
   When you define a Model Builder Task, you can specify only one workload type at a time. If you want to process more than one workload type, you must define a Model Builder Task for each type.
   
   It is also possible to create models from data in separate Source CDB Servers and/or databases by creating multiple Model Builder Tasks. In this situation, you must select the same workload types for each Model Builder Task.

   **Table 13: Add Model Build Task fields**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task name</td>
<td>Name to be assigned to the task</td>
</tr>
<tr>
<td></td>
<td><strong>Tip:</strong> Make a record of the task name because you need it to schedule the Cost Analyzer Model Builder Proxy application.</td>
</tr>
<tr>
<td>Task description</td>
<td><em>(optional)</em> Description of the task</td>
</tr>
<tr>
<td>Field</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Workload type</td>
<td>One of the following types:</td>
</tr>
<tr>
<td></td>
<td>■ Suites</td>
</tr>
<tr>
<td></td>
<td>■ Service Class</td>
</tr>
<tr>
<td></td>
<td>■ Subsystem Address Space</td>
</tr>
<tr>
<td></td>
<td>■ Importance</td>
</tr>
<tr>
<td></td>
<td>■ Workload Manager</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> Suites and Service Class workloads require a filter to be specified.</td>
</tr>
<tr>
<td></td>
<td>For more information, see “Cost Analyzer workloads” on page 12.</td>
</tr>
<tr>
<td>Workload Filter</td>
<td>Filter for the workload</td>
</tr>
<tr>
<td></td>
<td>If the selected workload type is either Suites or Service Class, you must enter a comma-separated list of capitalized workload names or</td>
</tr>
<tr>
<td></td>
<td>wildcard character patterns that will be used as a filter to reduce the size of the cost model.</td>
</tr>
<tr>
<td></td>
<td>As a web-based application, Cost Analyzer cannot manage very large workload collections that may exist in the database. The workload</td>
</tr>
<tr>
<td></td>
<td>filter provides the ability to specify which workloads to process.</td>
</tr>
<tr>
<td>Source CDB Server</td>
<td>Desired CDB Server Profile</td>
</tr>
<tr>
<td>Source CBD Database</td>
<td>Desired CDB Database accessible from the specified CDB Server</td>
</tr>
<tr>
<td></td>
<td>The database needs to be compatible with Cost Analyzer.</td>
</tr>
<tr>
<td>Time Zone Offset</td>
<td>Desired time zone offset</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> The time zone offset should match your SCRT report time zone offset. This ensures that the data Cost Analyzer produces and the</td>
</tr>
<tr>
<td></td>
<td>cost values match the SCRT report.</td>
</tr>
</tbody>
</table>

5 *(optional)* Click **Check Database Compatibility**.

Cost Analyzer checks that the selected Source CDB database contains all necessary information to ensure that the cost models can be generated.
New databases need to be populated with data before their compatibility can be checked. For more information, see “Overview of Cost Analyzer scheduled operations” on page 45.

6 After the database compatibility has been verified, click Add Task. The task appears as a listing in the Model Builder Tasks dialog.

7 Click Save Changes to save the Model Builder Task to the server.

Where to go from here

Note
After defining your Model Builder Tasks, schedule them to run on a nightly basis for use with the Reporting Tool and the Planning Tool. For more information, see “Scheduling Model Builder Tasks” on page 47.

If necessary, Model Builder Tasks also provides you with the option to run the task immediately by utilizing Run Task Now. You can use this option if your scheduled tasks will not process the data you need for a specific cost model as described in the following examples:

- If you are running the UIE to process older data, you can run the task to generate a cost model.
- If you updated or corrected a cost table, you can run the task to rebuild the cost models to reflect the new values.
- If for some reason the regularly scheduled task did not run, you can run the task to generate the missing data.
- If you want to generate cost models for multiple workloads, you can run the task after specifying the workload type. Then modify the Model Builder Task by changing the workload type, and continue this process until you have generating cost models for each type of workload you need.

Overview of Cost Analyzer scheduled operations

You must schedule daily cost model builds to provide Cost Analyzer with pertinent data for your analysis.
You should establish the following environment for Cost Analyzer:

- Depending on the number of LPARs, volume of the data, schedule of SMF dumps on the mainframe side, and the need to see Cost Analyzer reports ASAP, you can set up a 24-hour, 12-hour, 8-hour, or other hourly cycle.

- In each cycle, UIE is scheduled to run and process data for all LPARs.

**Note**

If you are using other CMM products, such as Visualizer, at least some of the Cost Analyzer charts and reports require processing in a single UIE run of all LPARs from a particular CPC.

Cost Analyzer itself does not have such a requirement. Several groups of LPARs can be processed in separate UIE runs. However, to produce valid 4HRA and cost estimates, it is necessary to process all LPARs all the time. If some LPAR data will be missing, Cost Analyzer still can produce the reports, but the values will not necessarily match the SCRT report and IBM bill.

- Certain UIE commands affect the information in Cost Analyzer models. These commands are:
  
  — Commands defining Physical System name and parameters (PSYS)
  
  — Commands defining VM Guests and VM Hosts
  
  — Commands defining aggregation of work into larger units (SUITE). These commands should be specified in such way that ensures consistency of these units during the billing month.
  
  — Commands defining the time zone for the data in the CDB

- After successful UIE runs, the generated Visualizer files populate into the CDB server by a scheduled Automator event. In the Automator script, the Build Model event creates all Cost Analyzer models for the current billing month, gathering into this model all data from the beginning of the billing month. The current models replace all of the models from a previous cycle, which by that time might already be invalid because the latest populated data can contain different Peak values and costs. For any billing month, there is always only one set of valid models (CPCs and Workloads). The current set of models contains one model per CPC and up to 5 types of Workload models per CPC.

After Model Builder Tasks execute, Cost Analyzer makes the cost models available for use with the Reporting Tool and Planning Tool and can be selected for use together with all previous billing month models.
Scheduling Model Builder Tasks

This section explains how to schedule Model Builder Tasks by using the Model Builder Proxy.

In general, your company populates its mainframe data into a Visualizer database using Automator. To generate a cost model for Cost Analyzer, you need to run a Model Builder Task that builds the cost model after the mainframe data populates.

The following scenarios are the preferred ways to schedule and run Cost Analyzer Model Builder Tasks:

■ Add the Cost Analyzer Model Builder Task to a new or existing Automator script.
■ Manually schedule the Cost Analyzer Model Builder Proxy program using the Windows Task Scheduler.

Installing the Cost Analyzer Model Builder Proxy

Use the following procedure to install the Cost Analyzer Model Builder Proxy. The program and its dependencies are packaged in a zip file in the Cost Analyzer product installation directory.

To install Cost Analyzer Model Builder Proxy

1 Find the proxy zip file by navigating to the Cost Analyzer installation folder.

By default, the folder location is: C:/Program Files (x86)/BMC Software/SCA/Services/MBProxyBin/SCAModelBuildProxy.zip.
The following figure shows a sample location for the proxy zip file.

**Figure 7: Sample location for proxy zip file**

2. Extract the contents of the `SCAModelBuildProxy.zip` file.

The contents of this file must be extracted to a folder on the machine where you wish to schedule the model build task.

**Note**

If the plan is to schedule the Cost Analyzer Model Builder Proxy as part of an Automator script, either CDB or Visualizer must also be on the machine.

**Tip**

The machine on which the Model Builder Proxy will run must also have .NET 4.5 installed.

3. Run the `SCAModelBuildProxy.exe` program.

**Note**

You must run `SCAModelBuildProxy.exe` program at least once to configure the target SCA machine information.

The Cost Analyzer Model Builder Proxy dialog is displayed:
By default, the dialog fills the field data for you. If you are running the proxy application on the Cost Analyzer installation machine, you do not need to change anything. However, if you are running the proxy application on a different machine, you will have to change the server name.

4 Check the field data for accuracy and click **Close**.

---

**Tip**

The Model Build Proxy must run under the same user identity that will be used to execute this task using the Windows Scheduler.

---

## Creating an Automator populate event

Use the following procedure to create an Automator populate event.

### Before you begin

---

**Note**

This procedure assumes that you have already configured or know how to configure a 32-bit ODBC system data source, and that you have added it to the Automator catalog. For more information about how to create an OBDC data source, see the Knowledge Base on the BMC Support Central site ([http://www.bmc.com/support](http://www.bmc.com/support)).

---

### To create an Automator populate event

1 Run the Automator application.
Depending on your installation this may be found in the Start Menu under BMC Performance Assurance - Visualizer or BMC Performance Assurance - CDB.

2 Select **File => New**.

A new script window is displayed.

3 Select **Edit => Add Target Database/Group**.

4 From the list, select the ODBC Database from which you want to populate the data to and click **OK**.

5 Select **Edit => Add Event => Populate**.

6 Browse or enter a location on the local machine to which you want to transfer the VIS files.

7 Click **OK**.

Your script should now look something like this:

If you were to run this now and you have VIS files in the specified folder, they should populate to the designated database.

**Adding the Cost Analyzer Model Builder Proxy event**

After creating an Automator populate event, you need to add a new run event to the script so Automator can run the Cost Analyzer Model Builder Proxy. Use the following procedure to add the Cost Analyzer Model Builder proxy event.
To add the Cost Analyzer Model Builder Proxy run event

1. Open the script.

2. Select Edit => Add Event => Run Visualizer Input File Transfer.

   **Note**
   This event runs another application, such as an FTP application or (in this case) the Cost Analyzer Model Builder Proxy application.

3. Click the Browse button, navigate to the folder where you extracted the contents of the SCAModelBuildProxy.zip file, and select the SCAModelBuildProxy.exe file.

4. In the Arguments field, type the name of the Model Build Task created in the Cost Analyzer product.

   **Tip**
   If the task name has spaces in it, enclose it in quotes (for example, "My Task").

5. Click OK.

   Be sure the run event appears after the populate event. If not, select the run event and then use Ctrl+Up or Ctrl+Down to move it to the correct location.

   You want the run event to execute after the populate event to ensure that the latest data is in the database before the Cost Analyzer model is generated. If the populate event does not execute or fails, any events following it in the script will not execute either. This ensures that the Cost Analyzer Model will not be generated if the data did not populate correctly.

   Your script should now look like this:

6. Save the script to a name and location for future use.
Scheduling the Automator script

Use the following procedure to schedule the Automator script to run every night.

To schedule the Automator script

1. Select **Run** => **Schedule**.

2. Browse for the script file that you want to schedule.
   
   If necessary, refer to the name that you used in “Creating an Automator populate event” on page 49.

3. Select a start time.
   
   Select a time that occurs after the VIS files are available.

4. Select dates on which to run the script, or **All** to run the script daily.

5. Enter a name for the task, and the user name and password under which the task should run.
   
   **Note**
   Specify the user who configured the Cost Analyzer Model Builder Proxy; otherwise the settings used by the proxy will be incorrect.

6. Click **OK** to schedule the script.

   The Automator scheduler uses the Windows Task Scheduler to schedule and run tasks.

   **Note**
   After creating a task, you need to use the Windows Task Scheduler to modify, pause, or delete it.

Scheduling the Proxy using Windows Task Scheduler

Use the following procedure to schedule the proxy by using the Windows Task Scheduler.

**Note**

The location of the Windows Task Scheduler depends on the version of your operating system. Typically, the scheduler is under **Administration Tools** in either the Control Panel or the Start menu.
To use Windows Task Scheduler to schedule the proxy

1 Create a new task.

2 Specify the task's execution schedule.

   Cost Analyzer recommends that you schedule the script to run daily.

3 Specify the action to perform (for example, running a program such as SCMModelBuildProxy.exe).

4 Specify any arguments to the program and the name of the task.

   **Tip**
   If the task name has spaces in it, enclose it in quotes (for example, "My Task").

5 Click **Save** to save the new task.

   **Note**
   One of the drawbacks of scheduling the Cost Analyzer Model Build Proxy manually with the Windows Task Scheduler is that you must specify a time that the task executes after the Automator Populate has taken place. For example, if you know that the Automator Populate completes around 7 AM, then you can schedule the Proxy to run at 7:15 AM or 7:30 AM. But if for some reason the Automator Populate does not execute or finish by then, the Proxy will still run. In this instance, the generated model will not contain any new data.

**Other Cost Analyzer Model Builder Proxy options**

The Model Builder Proxy can execute a task immediately or execute a task for a specific month and year. By default, the Model Builder Proxy runs for the current month and year.

**To run a Model Builder Proxy task manually**

1 In the Cost Analyzer Model Builder Proxy, click the **Submit Task** button.

   The program communicates with the configured Cost Analyzer Server and retrieves a list of Model Build Tasks.

   The Run Task Now dialog displays as shown in the following figure:
2 In the Run Task Now dialog box, select a task from the **Model Build Task Name** list.

3 In the **Billing period to run for** field, specify the year and month in which to run the task.

   Use the format **YYYY/MM**, where valid values for MM are 01 through 12. For example, enter **2013/05** for May 2013.

4 Click **Submit**.

   Cost Analyzer builds a model for the specified year and month using information from the selected Model Build Task.

**To run a Model Builder Proxy task as an argument**

1 Specify the year and month as an argument to the Automator Run event or the Windows Task Scheduler arguments list.

   Use the format **YYYY/MM**, where valid values for MM are 01 through 12. For example, enter **2013/05** for May 2013.

**To run a Model Builder Proxy task from the Command line**

1 On the Command line, specify **SCAModelBuildProxy "taskName" YYYY/MM** where "**taskName**" is the name of the task, **YYYY** is the year, and **MM** is the month.

   For example, enter **SCAModelBuildProxy "My Task" 2013/01** to run the task named My Task for January 2013, using either the default Cost Analyzer Server settings or the Cost Analyzer Server settings that the user previously specified.
Generating cost-analysis reports

This section describes how to use the Reporting Tool to generate Monthly Summary Reports and how to utilize the report’s interactive capabilities in your cost analysis.

Reporting Tool overview

You can use the Reporting Tool to generate and analyze monthly cost reports.

The Reporting Tool provides a tool panel where you can perform the following tasks:

- Generate a Monthly Summary Report
- Export the Monthly Summary Report to a PDF

Figure 8: Sample tool panel

You can display or hide the tool panel by clicking on the icon.

For more information, see “Working with the Reporting Tool panel” on page 57.
Monthly Summary Report

The Monthly Summary Report and its interactive features provides you with the ability to identify and understand the key contributing factors to your monthly costs.

You can use the report to identify areas for cost reduction and perform the following analysis:

- Compare actual costs and/or MSUs in varying degrees of detail and contexts.
- Identify all monthly peak 4HRA MSU Utilizations by MLC product.
- Identify the date and time of the first and second peaks of 4HRA MSU Utilizations.
- View and compare LPAR 4HRA MSU Utilization curves.
- Analyze the percent of total cost breakdown by MLC product, CPC, and LPAR.
- View the breakdown of cost data listed in order from greatest to least amount.
- View the cost information breakdown as a funnel chart that visually represents costs as separate segments of the total cost.
- View charts that compare average hourly MSU Utilization to the 4HRA.
- Compare cost data of MLC products running on specific CPCs or LPARs.
- Export charts as an image.

Additionally, the Monthly Summary Report features hyperlinks that navigate to more detailed levels of the report; for example, you can access an interactive charting area to compare charts for comprehensive analysis of all the factors that affect your monthly costs.

By comparing charts that contain 4HRA information correlated with business activity and license costs, you can perform an informed analysis of:

- System activity
- The impact of peak periods (or exceptions) on software costs
Working with the Reporting Tool panel

From the Reporting Tool panel, you can generate a Monthly Summary Report and export the report to a PDF.

To set up and generate a Monthly Summary Report

1. From the Cost Analyzer console, click the **Reporting Tool** tab.
2. Click on the icon to display the tool panel (if not displayed).
3. From the tool panel, select the month and year of the cost model from the list of **Available Cost Models** indicated on the calendar.
4. From the list of **Available CPCs** list, select one or more CPC to include in the report.
5. Click on the **Generate Summary Report** button.

The Reporting Tool panel closes and the Monthly Summary Report displays.

To export the Monthly Summary Report to a PDF

1. Open the Reporting Tool panel by clicking on the icon.
2. On the Reporting Tool panel, click on the **Export to PDF** button.

A dialog indicates that the PDF generation was successful. You can open to view the PDF or save the PDF to your local computer.

Quick tour of the Monthly Summary Report

The Monthly Summary Report displays rows that list each MLC Product and columns that organize the monthly cost data for ease of comparison. The report features hyperlinks that you can use to drill down on specific data to see more details and access interactive charts.
Figure 9 on page 58 shows a sample Monthly Summary Report.

**Figure 9: Sample Monthly Summary Report**

This topic explains the interactive features of the Monthly Summary Report.

Table 14 on page 58 describes the data that each column of the report contains.

**Table 14: Monthly Summary Report column header descriptions**

<table>
<thead>
<tr>
<th>Column header</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLC Product</td>
<td>Monthly License Charge product that qualifies for sub-capacity pricing under IBM System z Variable Workload License Charges (VWLCs)</td>
</tr>
<tr>
<td>CPC</td>
<td>CPCs on which this MLC product was active during some intervals of the reporting period</td>
</tr>
</tbody>
</table>
| 4HRA MSU Utilization  | Preview chart of the aggregated (4HRA) of the LPARs where this product was running  
The preview chart for each LPAR includes only those intervals where the product was running. The red dot on the chart represents the high or the peak value. |
<p>| 4HRA First Peak Cost  | Monthly license cost determined by the First Peak 4HRA value                                                                                |</p>
<table>
<thead>
<tr>
<th>Column header</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of Total Cost</td>
<td>Provides a percentage for the MLC product's contribution to the total monthly cost. Additional percentages are provided to break down the cost contribution of each CPC running the MLC Product. In an MLC Product Name row, the percentage indicates this product's contribution to Total Monthly cost. In a CPC row, the percentage indicates this CPC's contribution to total Monthly Cost for this particular product.</td>
</tr>
<tr>
<td>4HRA First peak (MSU)</td>
<td>4HRA value in MSUs at the first peak. To the right of the 4HRA value, the number in parentheses indicates the number of occurrences of the same value during the reporting period.</td>
</tr>
<tr>
<td>4HRA First Peak Date</td>
<td>Date and time the first peak occurred.</td>
</tr>
<tr>
<td>4HRA Second Peak (MSU)</td>
<td>4HRA value in MSUs at the second peak. To the right of the 4HRA value, the number in parentheses indicates the number of occurrences of the same value during the reporting period. Note: 4HRA Second Peak value and Date/Time do not affect Monthly License Cost but do provide useful information. For example, if the First Peak has only one occurrence and the Second Peak value is significantly smaller than the First Peak, either an abnormal situation occurred or you have an opportunity to decrease the cost.</td>
</tr>
<tr>
<td>4HRA Second Peak Date</td>
<td>Date and time when the second peak occurred.</td>
</tr>
<tr>
<td>Average Cost/MSU</td>
<td>Total product cost on a particular CPC divided by the First Peak 4HRA value.</td>
</tr>
<tr>
<td>Incremental Cost/MSU</td>
<td>Cost of one additional MSU for this product on this CPC. Note: Cost tables are not linear, so the cost of an additional MSU depends on the current First Peak 4HRA value.</td>
</tr>
</tbody>
</table>

**Data hyperlinks**

The data in particular columns also serve as hyperlinks that drill down to details on specific CPCs and MLC products. These levels also provide you with interactive capabilities to analyze and compare charts of the 4HRA MSU Utilizations.

*Note*

Hovering over a hyperlink displays a tooltip indicating the next level of detail.
Table 15 on page 60 lists the columns that contain data hyperlinks and describes the details you can access:

### Table 15: Hyperlinks of the Monthly Summary Report

<table>
<thead>
<tr>
<th>Column</th>
<th>Hyperlink</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPC</td>
<td>Any CPC name in the column</td>
<td>Hyperlinks to CPC details that list all the MLC products running on the CPC and their relevant 4HRA MSU Utilization data.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Note:</strong> While all these MLC Products are running on the same CPC, the 4HRA charts and corresponding Peak values can be different if the products are running on different LPARs or during different intervals.</td>
</tr>
<tr>
<td>4HRA MSU Utilization</td>
<td>Any preview chart in the column</td>
<td>Drills down in the context of the MLC product corresponding to the selected preview chart. The Hyperlink will navigate to LPAR details that list all the LPARs on which the selected MLC Product is running, and their relevant 4HRA MSU Utilization data.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Note:</strong> For each LPAR, only the intervals in which the selected MLC Product was running are displayed.</td>
</tr>
<tr>
<td>% of total cost</td>
<td>Any percentage in the breakdown</td>
<td>Opens a display of a funnel chart that graphically represents the cost distribution details.</td>
</tr>
</tbody>
</table>

### Data display controls

The Monthly Summary Report contains control icons to adjust the view of the data and access the Reporting Tool panel as described in Table 16 on page 61.
Table 16: Icons for the Monthly Summary Report

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Down Arrow]</td>
<td>Displays or hides the Reporting Tool panel</td>
</tr>
<tr>
<td>![Vertical Ellipsis]</td>
<td>Adjusts the column width</td>
</tr>
<tr>
<td>![Plus] or ![Minus]</td>
<td>Expands or collapses row data</td>
</tr>
</tbody>
</table>

If the data in a column can be sorted, when you hover the mouse over the column header, the header is highlighted.

## Drill-down levels

You can access the drill-down levels by using the hyperlinks in the Monthly Summary Report.

Each level contains:

- A summary area in the top left
- A tabular report in the top right
- A charting area at the bottom

Using the drill-down levels, you can analyze:

- A specific CPC to compare the 4HRA MSU Utilizations for each MLC Product
- A particular MLC Product to compare the 4HRA MSU Utilizations for each LPAR on which the MLC product is active
CPC level

Figure 10 on page 62 shows a sample of a Monthly Summary Report's CPC level that lists the MLC Products running under a particular CPC and the 4HRA MSU Utilization data.

Figure 10: Sample Monthly Summary Report CPC level

Some of the columns in the CPC level contain hyperlinks to details or views of the data as described in Table 15 on page 60:

Note
The drill-down data is displayed in the context of the selected CPC.

Table 17: Hyperlinks of the CPC level

<table>
<thead>
<tr>
<th>Column</th>
<th>Hyperlink</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLC Product</td>
<td>Any MLC Product in the column</td>
<td>Hyperlinks to the 4HRA MSU Utilization details for each LPAR on which this MLC product is running</td>
</tr>
<tr>
<td>% of total cost</td>
<td>Any percentage in the breakdown</td>
<td>Opens a display of a funnel chart that graphically represents the cost distribution details for all MLC Products on the CPC</td>
</tr>
</tbody>
</table>

MLC Product level

Figure 11 on page 63 shows a sample of a Monthly Summary Report's MLC Product level that lists the LPARs on which the MLC Product is running and the
4HRA MSU Utilization data. The information in this drill-down view is determined by the CPC context and the MLC Product context of the hyperlink.

Figure 11: Sample Monthly Summary Report MLC Product level

Table 18: MLC Product level column header descriptions

<table>
<thead>
<tr>
<th>Column header</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4HRA MSU Utilization Weight</td>
<td>Percentage this LPAR contributed to the CPC First Peak 4HRA value.</td>
</tr>
<tr>
<td>LPAR MSU at CPC First Peak</td>
<td>Value is determined by the sum of 4HRA of the LPARs on which this MLC product was running during this interval.</td>
</tr>
</tbody>
</table>

Table 19 on page 63 lists the columns that contain data hyperlinks and describes the details of what you can access by using the link:

Table 19: Hyperlinks of the MLC Product level

<table>
<thead>
<tr>
<th>Data Column</th>
<th>Hyperlink</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4HRA MSU Utilization</td>
<td>Any preview chart in the column</td>
<td>Opens a detailed view of a chart that compares average hourly MSUs to the 4HRA MSU Utilization of the LPAR</td>
</tr>
<tr>
<td>% of total cost</td>
<td>Any percentage in the breakdown</td>
<td>Displays a funnel chart that graphically represents the distribution of the 4HRA First Peak value for the context CPC and MLC Product by individual LPARs</td>
</tr>
</tbody>
</table>
**Icons**

The CPC level and MLC Product level of the report contain icons to change the display of data and navigate between the levels as described in Table 16 on page 61.

**Table 20: Icons for CPC and MLC Product levels**

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Icon" /></td>
<td>Navigates back to the previous data level</td>
</tr>
<tr>
<td><img src="image2" alt="Icon" /></td>
<td>Returns to the Monthly Summary Report</td>
</tr>
<tr>
<td><img src="image3" alt="Icon" /></td>
<td>Displays the chart of the 4HRA MSU Utilization in the charting area</td>
</tr>
</tbody>
</table>

Table 21 on page 64 describes the charting area icons.

**Table 21: Icons for charting area**

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image4" alt="Icon" /></td>
<td>Opens a separate window that displays the chart</td>
</tr>
<tr>
<td><img src="image5" alt="Icon" /></td>
<td>Exports the chart as an image that can be saved on your local computer</td>
</tr>
</tbody>
</table>

**Working with the charting area**

You can use the charting area to compare charts of 4HRA MSU Utilizations.

The Monthly Summary Report provides a charting area when analyzing data in a drill-down level for a specific CPC or MLC Product. Figure 12 on page 65 and
Figure 13 on page 65 show samples of CPC and MLC Product levels with charts in the charting area.

**Figure 12: Sample CPC level with charts in charting area**

**Figure 13: Sample MLC Product level with charts in charting area**

**To add or remove charts from the charting area**

1. Using the hyperlinks, drill down to a CPC level or MLC Product level.

2. In the **Visibility** column ( ), click on the dot next to the MLC Product (in a CPC level report) or next an LPAR (in a MLC Product level report) to add this product’s chart to the charting area.

The charting area displays the 4HRA MSU Utilization chart for the selected MLC product or LPAR, and the **Visibility indicator** ( ) displays next to the selected object in the list.

To assist in the analysis of the chart, you can perform any of the following actions:

- Hover the mouse over any point on the chart to view the MSU value as well as the date and hour it occurred.
Click and drag between any two points on the chart to zoom in on the selected area.

Click on the edge of the bottom scroll bar, and then expand or contract the control bar to adjust the zoom feature. Alternatively, you can click on **Zoom Out** to expand the view to show more of the chart.

Click on **Show All** to restore the view to show the chart for the entire month.

Click on the **Pop Out** button (☞) to view a pop out chart in a separate window.

Click on the **Save chart as image** button (☞) button to export the chart.

In the CPC level, you can control the intensity of the chart display in the charting area by using the **On/Off** toggle switches located in the Intensity column. Setting the toggle switch to **Off** dims the display of the selected chart.

**Note**

On the MLC Product-level chart and selected LPAR 4HRA area charts, a grayed out total CPC 4HRA line shows a red dot marking the First Peak. All of these charts are displayed in the context of the selected MLC Product.

---

**Working with funnel charts**

Some report data can be viewed as a funnel chart that can be exported.

Using hyperlinks, the following data can be viewed as a funnel chart:

- Any % of **Total Cost** value in a CPC level
- Any **4HRA Utilization weight** value in a MLC Product level

**To view data as a chart**

1. From the appropriate column of the report, click on the hyperlink.
A window displays the funnel chart (Figure 14 on page 67).

**Figure 14: Sample funnel chart**

By default, the segment corresponding to where the chart was accessed is separated from the rest of the funnel. You can click on any colored segment of the funnel and set it apart from the whole.

2  *(optional)* Click on the **Save chart as image** button (☰) to export the chart.

**Comparing average hourly MSUs to the 4HRA**

For any MLC Product running on a particular LPAR, you can compare the average hourly MSUs to the 4HRA.

1  Using the hyperlinks, navigate to the MLC Product level of the MLC Product you want to analyze by performing one of the following actions:

- From the Monthly Summary Report, find the MLC Product from the list and click on the corresponding 4HRA MSU Utilization preview chart.
- From the CPC level, find the MLC Product from the list and click on it.

2. Find the LPAR listed in the LPAR Name column, and click on its 4HRA MSU Utilization preview chart.

A window displays a chart that compares the average hourly MSUs to the 4HRA MSU Utilization (Figure 15 on page 68).

**Figure 15: Sample chart comparing average hourly MSUs to the 4HRA**

With this chart, you can perform the same interactive actions as described in “Drill-down levels” on page 61.

You can also click on the **Visibility indicators** to control which curves are displayed.

**Note**

The **Defined Capacity** control either displays or hides a background to contrast the charts against the LPAR Defined Capacity. If the Defined Capacity value is 0 MSUs, no background is displayed.

### Usage scenarios

This topic contains usage scenarios that describe how a user might use the Monthly Summary Report to access relevant information for cost reduction.

#### What's my monthly IBM bill breakdown?

*Challenge.* A company executive wants to know what the IBM software bill was for the last month and how it is distributed between different products or CPCs. The
IBM SCRT report provides only Peak R4HA values, but does not provide actual cost. The actual bill from IBM typically arrives two months after report was submitted.

Cost Analyzer solution: After updating the company cost coefficients in the MSU Cost Editor, the Monthly Summary Report provides the total cost and its absolute and relative components in a clear and concise form.

**Which LPAR is costing me the most?**

*Challenge:* A budget planner needs to know which LPARs contributed the most to the total cost of a product on a particular CPC.

*Cost Analyzer solution:* Clicking on the 4HRA MSU Utilization preview chart of this CPC displays the LPAR view of this CPC for a particular MLC Product. Each LPAR's activity is displayed only during the intervals where the selected product was active.

**How can the report help me know how to reduce costs?**

*Challenge:* An administrator needs to cut the IT consumption costs by 10%.

*Cost Analyzer solution:* By analyzing the SCA Monthly Summary Report, the administrator discovers that the First Peak R4HA is significantly higher than the Second Peak R4HA. SCA provides a possibility to investigate the period around the first peak and determine what LPARs contributed to it.

After determining what factors contributed to the differences in the peaks, use the Planning Tool to determine which workloads were executed on these LPARs at that time. If this is a normal situation, (that is, the peak was not caused by an accidental, "runaway" program), the administrator can reduce the cost by moving some work or imposing a Defined Capacity limit.

This option can be further researched in the Planning Tool. For more information, see “Developing cost-reduction plans” on page 71.
Developing cost-reduction plans

This section describes how to use the Planning Tool to create cost optimization plans and evaluate the effects of different cost optimization actions.

Planning Tool overview

Use the Planning Tool to create interactive and customizable cost optimization plans where you can perform cost reduction exercises.

When creating a plan, you select a complete billing month and a workload type. The Planning Tool then enables you to perform operations on these objects.

You can use Cost Optimization Plans to:

- Evaluate the effects of expected workload growth or decline
- Estimate the effects of different cost-reduction actions

Each plan uses existing historical monthly models as a starting point or baseline for exercises that demonstrate the effects of changes to your system. You can perform the following actions to see the effects on your monthly costs:

- Delete LPARs from a CPC
- Move LPARs to another CPC
- Introduce or change the Defined Capacity of an LPAR
- Delete workloads from an LPAR
- Move the whole workload or part of it to a different LPAR on the same or on a different CPC
- Scale (increase or decrease) workload activity
- Delete or move MLC Product licenses when deleting or moving workloads
After performing any of these actions, the Planning Tool evaluates the cost model and then generates a Plan Evaluation Summary Report that contains the cumulative results. You can view the report after each operation, or add multiple operations and then view all of the results.

The Plan Evaluation Summary Report shows the cumulative effects of:

- All operations of the plan on the individual MLC product costs
- All previous changes on the individual Workloads, LPARs, and CPCs

At any time during the exercise, you can also view charts and data that detail the effects of the operations. You can compare:

- Peak CPC 4HRA values and their dates and time
- Aggregated CPC 4HRA charts
- 4HRA charts for individual LPARs and their contribution to CPC Peak 4HRA
- 4HRA charts of individual workloads and their contribution to CPC Peak value

**Note**
Depending on your changes and on Workload/LPAR Utilization patterns, new Peaks can appear at different moments during the billing month.

**Launching the Planning Tool**

Use the following procedure to launch the Planning Tool.

1. From the Cost Analyzer console, click on the **Planning Tool** tab.

   The Planning Tool Start Page displays as shown in the following figure:
You can perform the following Plan Actions:

- “Creating plans” on page 73
- “Opening a plan” on page 74
- “Deleting a plan” on page 75

Creating plans

Use the following procedure to create a plan.

**To create a plan**

1. From the Cost Analyzer console, click the **Planning Tool** tab.
2. From the Plan Actions pane, click Create Plan.

The Create Plan dialog displays as shown in the following figure:

3. In the Create plan dialog, enter the appropriate information in the required fields based on Table 22 on page 74:
Table 22: Create Plan dialog fields

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan Name</td>
<td>Name for the plan</td>
</tr>
<tr>
<td>Plan Description</td>
<td><em>(optional)</em> Description to identify the plan</td>
</tr>
<tr>
<td>Month Cost Model</td>
<td>Click on the Calendar icon to browse the application server and select an available model. The models are designated by month and year.</td>
</tr>
<tr>
<td>Workload Type</td>
<td>From the drop-down list, select the workload type. For more information, see “Cost Analyzer workloads” on page 12. <em>Note:</em> The Planning Tool bases the list of Workload types on the selected Month Cost Model.</td>
</tr>
<tr>
<td>Available CPCs</td>
<td>From the list of available CPCs, select the CPCs that you want to include. <em>Note:</em> The list of available CPCs depends on the selected workload type.</td>
</tr>
</tbody>
</table>

4 When finished, click the **Create Plan** button.

Cost Analyzer creates the plan and makes it available for an exercise so you can explore potential reduction operations.

**Opening a plan**

Use the following procedure to open a plan.

1 From the Cost Analyzer console, click the **Planning Tool** tab.

2 From the Plan Actions pane, click **Open Plan**.

3 From the Open Plan dialog, select the plan you want to open and click on **Open Plan**.

The Planning Tool opens the Plan by displaying a tree of the Plan's CPCs and LPARs in the Plan Actions pane to the left. A title bar in the pane details the billing month of the cost model.

4 Perform one of the following actions:

- Click on a CPC to view CPC level reports and charts.
Click on an LPAR to view LPAR level reports and charts.

The Planning Tool opens the selected object. Depending on which level you select, you can perform operations on the objects of the CPC level or LPAR level. For more information, see “Working with plans” on page 75.

### Deleting a plan

Use the following procedure to delete a plan.

**WARNING**
Deleting a plan cannot be undone.

1. From the Cost Analyzer console, click the Planning Tool tab.
2. From the Plan Actions pane, click Delete Plan.
3. From the Delete Plan dialog, select the plan you want to delete and click Delete Plan.

The Planning Tool deletes the selected plan.

### Working with plans

Within any plan that you create, you can work at the CPC level and perform actions against LPARs running on the CPC, or you can work at the LPAR level and perform actions against the workloads running on the LPAR.

**Note**
All LPAR level operations for a particular LPAR must be performed before any operation for another LPAR. For a particular LPAR, the Defined Capacity operation must be performed before any Workload operation.

### Working with a plan at the CPC level

Use the following procedure to view CPC-level reports or charts and perform CPC-level operations.

1. From the Cost Analyzer console, click the Planning Tool tab.
From the Plan Actions pane, click the CPC with which you want to work.

The selected CPC object opens in the viewer as shown in the following figure:

Note
For each LPAR, the data represents the complete activity for the selected billing month. The list shows all LPARs on the particular CPC for which there is data.

You can display individual LPAR charts in the charting area by clicking on the Visibility indicator (●) for each LPAR.

For a description of the charting area actions and icons, see “Working with the charting area” on page 64.

You can click on any preview chart in the 4HRA MSU Utilization column to open a pop-up window that displays a chart that shows the comparison of the average hourly MSUs to the 4HRA MSU Utilization.

You can also hyperlink to the LPAR level for any LPAR in the list by clicking on the LPAR's name.

To learn about the LPAR actions that you can perform, see “Moving an LPAR” on page 76 and “Deleting an LPAR” on page 78.

Moving an LPAR

Use the following procedure to move an LPAR to another CPC.

Note
For each LPAR, the data represents the complete activity for the selected billing month. The list shows all LPARs on the particular CPC for which there is data.

You can display individual LPAR charts in the charting area by clicking on the Visibility indicator (●) for each LPAR.

For a description of the charting area actions and icons, see “Working with the charting area” on page 64.

You can click on any preview chart in the 4HRA MSU Utilization column to open a pop-up window that displays a chart that shows the comparison of the average hourly MSUs to the 4HRA MSU Utilization.

You can also hyperlink to the LPAR level for any LPAR in the list by clicking on the LPAR’s name.

To learn about the LPAR actions that you can perform, see “Moving an LPAR” on page 76 and “Deleting an LPAR” on page 78.
Example

You might notice that the incremental cost per MSU gets much smaller as the Peak 4HRA value grows. For example, assume that you have two CPCs, one with 2000 Peak 4HRA and the other with 200. Moving an LPAR that uses 50 MSUs from the second CPC to the first can save between $10,000 and $15,000.

To move an LPAR to another CPC

1. In the LPAR Actions column, click on the arrow (↑) for the LPAR you want to move.

   The Move LPAR to CPC dialog displays as shown in the following figure:

   ![Move LPAR to CPC dialog](image)

2. From the dialog, specify where you want to move the LPAR by selecting a target CPC.

3. Click on Move LPAR.

   The Planning Tool applies changes to the model and performs an evaluation. When the evaluation is successful, a dialog prompts you with the option to view the evaluation results.

4. Click Yes to view the evaluation results now, or click No to return to working on the CPC in the plan.

   Clicking No closes the dialog, and the viewer displays the results of moving the LPAR from the CPC.
Deleting an LPAR

Use the following procedure to delete an LPAR from the CPC in the plan.

**WARNING**
Deleting an LPAR from a CPC removes all product licenses as well as its activity.

Many reasons exist for deleting LPARs. For example, if you have a separate LPAR for each customer, you might need to delete a customer’s LPAR because the contract expired and was not renewed. Also, you might want to consolidate two or more LPARs by moving all workloads and then deleting the LPARs that are not being used.

**To delete an LPAR from a CPC in a plan**

1. In the LPAR actions column, click on the red delete button (❌) for the LPAR you want to delete.

2. When prompted, click Yes to delete the LPAR, or No to return to working in the plan.

The Planning Tool applies changes to the model and performs an evaluation. When the evaluation is successful, a dialog prompts you with the option to view the plan Evaluation Summary Report. For more information, see “Viewing the Plan Evaluation Summary Report” on page 84.

**Working with a plan at the LPAR level**

Use the following procedure to view LPAR level reports and charts and to perform LPAR level operations.

**Note**
In your plan, you must complete all operations against a particular LPAR before performing operations against another LPAR.

1. From the tree in the Plan Actions pane to the left or from the list of LPARs in the report, click on the LPAR you want to view.

The selected LPAR object opens in the viewer as shown in the following figure:
The LPAR level shows rows that list all workloads running on the LPAR and columns that detail the activity of each workload. The Workload R4 at Peak column contains values that represent the R4 MSU contribution for each workload at the time of the first CPC peak.

In the charting area, the gray line is a chart of the total R4 for the LPAR. You can use the Show LPAR visibility indicator to show or hide this line. When you change the Defined Capacity value, the charting area indicates the new Defined Capacity as a solid black line. You can use the Show Defined Capacity indicator to show or hide this line.

You can view any workload contribution to total LPAR R4 in the charting area by clicking on the Visibility indicator (◯) for each workload you want to analyze.

For descriptions of the charting area actions and icons, see “Working with the charting area” on page 64.

You can view a list of MLC products for the LPAR by clicking on the link in the pane to the left.

You can also perform the following actions against workloads on this LPAR:

- “Changing the Defined Capacity” on page 80
- “Moving a workload” on page 81
- “Scaling a workload by percentage” on page 83
- “Deleting a workload from the LPAR” on page 83
Changing the Defined Capacity

Use the following procedure to change the Defined Capacity for the LPAR.

The Defined Capacity can be changed for individual LPARs only.

When Cost Analyzer evaluates the operations on the model based on the changes made in a plan, the plan steps execute not in the order in which you defined them, but according to the priority of the operation. Changing the Defined Capacity is the highest priority operation that can be performed on the LPAR level. When you change the Defined Capacity, the workload might change; Defined Capacity changes must be completed before any workload changes take effect.

**Note**

For a particular LPAR, the Defined Capacity operation must be performed before any Workload operation.

**To change the Defined Capacity**

1. In the Defined Capacity adjustment control, enter the Defined Capacity MSU value you want to set or use the +/- buttons to set the MSUs value.

2. When finished, click on **Apply**.

   The Planning Tool applies changes to the model and performs an evaluation.

3. When prompted to view the evaluation results, click **Yes** to view them (as described in “Viewing the Plan Evaluation Summary Report” on page 84) or **No** to continue working.

   If you continue working, a straight black line in the viewer’s charting area indicates the new Defined Capacity.

   When you change the Defined Capacity, any activity in a workload that operates above the new limit shifts to the next interval. If the next interval is still above the limit, this process continues until the total LPAR R4 drops sufficiently below the Defined Capacity to absorb all activity that could not be executed in previous intervals because of the new limit.

   Cost Analyzer modifies not only the total LPAR, but also the workload values. The modification shifts the least important work to the next interval. If the shift is not enough to bring LPAR usage below the new Defined Capacity, the process repeats for the next-least-important workload. This procedure models the actions of WLM corresponding to decreasing the Defined Capacity or introducing a Defined Capacity to a system that previously did not have it.
Moving a workload

Use the following procedure to move a workload to another LPAR.

For any MLC product running on an LPAR, the charge is calculated for total LPAR activity. By moving high-consuming batch jobs from an LPAR, you can reduce the license cost not only for z/OS on this LPAR, but also for DB2, IMS, CICS, and MQSeries.

On the other hand, if you have a small CICS region on an LPAR where a lot of batch jobs and IMS are running, you can incur high CICS license charges. By moving the workload containing this CICS region to other LPARs where many other CICS regions are also running, you can significantly decrease your costs.

To move a workload to another LPAR in a plan

1. In the Workload actions column, click on the arrow (►) for the Workload you want to move.

The Move Workload to LPAR dialog displays as shown in the following figure:
2 In section 1 of the dialog, specify where you want to move the workload by selecting a target LPAR.

You can move the workload to an LPAR in the same CPC or an LPAR on a different CPC.

---

**Note**

Moving a workload to a different LPAR on the same CPC may not affect the licensing cost of z/OS; however it can change other product costs because you can move workloads to LPARs that may not have some of the product licenses existing on the source LPAR. When you execute such a change, you can affect the overall cost of the MLC product.

---

3 In section 2 of the dialog, specify which licensed products to add to the target LPAR or remove from the source LPAR by selecting the appropriate boxes from the list.

When you move workloads from the LPAR, it is impossible to determine automatically from the measurement data if this is a batch that does not require any additional licensed software except for z/OS, or if this workload is the last CICS region on this LPAR. To account for these types of conditions, the Planning Tool provides the option to specify any licenses that need to be added or removed.

---

**Note**

Cost Analyzer allows you to remove the licensed product from the source LPAR without adding the same licensed product to the target LPAR. You must ensure that the target LPAR has the licensed product so that proper cost calculations can be performed.

---

4 In section 3 of the dialog, specify what percent of the workload you want to move to the target LPAR by using the slider tool.

For example, you cannot move all 100,000 batch jobs from this system, but you can move 20% to reduce the Peak R4 and, as a result, reduce the cost for all products on this LPAR.

5 When finished, click **Move Workload**.

The Planning Tool applies changes to the model and performs an evaluation.

6 When prompted to view the evaluation results, click **Yes** to view them (as described in “Viewing the Plan Evaluation Summary Report” on page 84) or **No** to continue working.
Scaling a workload by percentage

Use the following procedure to scale a workload by percentage to see the potential cost savings by limiting the workload activity.

You might also scale a workload to evaluate expected workload changes (for example, changes due to a new advertising campaign or to acquiring a new store).

*Note*
When scaling workload activity, the Planning Tool changes the entire billing month by the selected percentage.

To scale a workload by a percentage

1. In the Workload Actions column, enter the percentage number, or use the +/- buttons to set the percentage of the workload you want to change.

   To increase by a certain percentage, add the percentage to the workload's existing value of 100%. For example, if you wanted to increase the workload by 50%, you would adjust the workload's percentage to 150%.

2. When finished, click on **Apply**.

   The Planning Tool applies changes to the model and performs an evaluation.

3. When prompted to view the evaluation results, click **Yes** to view them (as described in “Viewing the Plan Evaluation Summary Report” on page 84) or **No** to continue working.

   *Note*
After Cost Analyzer evaluates the model, the modified workload activity becomes the current 100% level.

Deleting a workload from the LPAR

Use the following procedure to delete a workload from an LPAR.

**WARNING**
Deleting a Workload from the LPAR cannot be undone.

To delete a workload from an LPAR

1. In the Workload actions column, click on the red delete button (❌) for the Workload you want to delete.
A dialog displays as shown in the following figure:

![Delete Workload From LPAR Dialog](image)

The dialog lists all MLC products that exist on this LPAR.

2 From the list of licensed products associated with this workload, select the products that you want to delete.

3 Click on **Delete Workload**.

   The Planning Tool applies changes to the model and performs an evaluation.

4 When prompted to view the evaluation results, click **Yes** to view them (as described in “Viewing the Plan Evaluation Summary Report” on page 84) or **No** to continue working.

**Viewing the Plan Evaluation Summary Report**

You can view the changes executed on a CPC, LPAR or workload in a plan. Whenever you make changes to objects within a plan, you can view the results in the Plan Evaluation Summary Report.

**To view the Plan Evaluation Summary Report**

1 Use either of the following methods to access the report:
In the Plan Actions pane to the left, click here to view evaluation results.

After executing a change in a plan, click Yes when prompted to view the evaluation results.

The Planning Tool opens a Plan Evaluation Summary Report with rows that list MLC Products and columns that display relevant data as shown in the following figure:

If the data in a column can be sorted, when you hover the mouse over the column header, the header is highlighted.

The columns contain data similar to the Monthly Summary Report. For a description of each column, see “Quick tour of the Monthly Summary Report” on page 57. The following table describes the columns that are unique to this report:

<table>
<thead>
<tr>
<th>Column header</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost Change</td>
<td>The change in cost resulting from the changes made to the plan</td>
</tr>
<tr>
<td>Old 4HRA First Peak (MSU)</td>
<td>4HRA value in the cost model that was used to build this plan</td>
</tr>
<tr>
<td></td>
<td>The Old value designates the starting value before the changes were executed.</td>
</tr>
<tr>
<td>Old 4HRA First Peak Date</td>
<td>Date and time of the Old 4HRA Peak (MSU)</td>
</tr>
</tbody>
</table>

The Cost Change column details any change to the cost of the MLC Product caused by the LPAR move. A cost reduction is indicated by a green dot (●) and the amount of the gain. A cost increase is indicated by a red dot (●) and the amount of the loss.

You can scroll to the bottom of the report to view a tally of the gain, loss, and difference.
To export the Plan Evaluation Summary Report to a PDF

1 Export the Plan Evaluation Summary Report by clicking on the icon and clicking on the Export to PDF button.

A dialog indicates that the PDF generation was successful. You can open to view the PDF or save the PDF to your local computer.

2 When finished, close the Plan Evaluation Summary Report.

Viewing plan changes

After executing any changes to a plan, you can view a list of the changes.

1 In the Plan Actions pane to the left, click on the name of the plan.

A pop-up window lists the steps executed against any LPAR, CPC, or workload. The following figure shows a sample:

Figure 16: Sample Plan Changes pop-up window
Displaying Cost Analyzer log files

This topic describes how to display the log files that Cost Analyzer produces. BMC Customer Support might ask you to review these log files as part of problem diagnosis.

To display log files

1. From the Cost Analyzer console, click Administration Tools.
2. Click on Application Server Log Viewer.
3. Click the tab for the log file that you want to display (Table 23 on page 87).

Table 23: Types of log files

<table>
<thead>
<tr>
<th>File name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Event Logs</td>
<td>Monitoring and troubleshooting information about the product’s core services</td>
</tr>
<tr>
<td></td>
<td>You can limit the type of messages that are displayed to All, Error, Warning, or Informational.</td>
</tr>
<tr>
<td>Model Build Event Logs</td>
<td>Monitoring and troubleshooting information about the Model Build Event process</td>
</tr>
<tr>
<td></td>
<td>You can limit the type of messages that are displayed to All, Error, Warning, or Informational.</td>
</tr>
<tr>
<td>RBA Audit Logs</td>
<td>Temporal tracking about the RBA Audit</td>
</tr>
<tr>
<td>Audit Logs</td>
<td>Temporal tracking information about all transactions associated with the product’s web services</td>
</tr>
<tr>
<td>Model Build Logs</td>
<td>Temporal tracking about the Model Build Tasks</td>
</tr>
</tbody>
</table>
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