BMC Cost Analyzer for zEnterprise User Guide

Supporting

Version 1.2 of BMC Cost Analyzer for zEnterprise

January 2015
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<table>
<thead>
<tr>
<th>Address</th>
<th>Telephone</th>
<th>Fax</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMC SOFTWARE INC</td>
<td>1 713 918 8800</td>
<td>1 713 918 8000</td>
</tr>
<tr>
<td>2101 CITYWEST BLVD</td>
<td>or</td>
<td></td>
</tr>
<tr>
<td>HOUSTON TX 77042-2827 USA</td>
<td>or</td>
<td>1 800 841 2031</td>
</tr>
</tbody>
</table>

Outside United States and Canada

<table>
<thead>
<tr>
<th>Telephone</th>
<th>Fax</th>
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<tbody>
<tr>
<td>+01 713 918 8800</td>
<td>+01 713 918 8000</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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Before contacting BMC

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

- Product information
  - Product name
  - Product version (release number)
  - License number and password (trial or permanent)
- Operating system and environment information
  - Machine type
  - Operating system type, version, and service pack or other maintenance level such as PUT or PTF
  - System hardware configuration
  - Serial numbers
  - Related software (database, application, and communication) including type, version, and service pack or maintenance level
- Sequence of events leading to the 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
  - Messages from related software
License key and password information

If you have questions about your license key or password, contact Customer Support through one of the following methods:

- Send an e-mail message to customer_support@bmc.com. (In the Subject line, enter SupID:yourSupportContractID, such as SupID:12345.)
- In the United States and Canada, call 1 800 537 1813. Outside the United States and Canada, contact your local support center for assistance.
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About this book

This book contains detailed product information and is intended for system administrators and database administrators (DBAs).

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

Note

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

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- Link to the BMC Documentation Center (https://webapps.bmc.com/infocenter/index.jsp) to browse documentation sets.

- View BMC Quick Course demos (short overviews of selected product concepts, tasks, or features), which are included in the BMC Documentation Center.

- Read individual product documents (books and notices) within the “A – Z Supported Product List.”

You can order hardcopy documentation from your BMC sales representative or from the support site. You can also subscribe to proactive alerts to receive e-mail messages when notices are issued.
Tip
You can access the BMC Support Central site at http://www.bmc.com/support.
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 the following tools for your cost analysis:
  - Software Contract Reporting tool presents an array of quadrant charts that serve as portals to access comprehensive charting data about your actual and projected spending for the entire duration of your software contract.
  - Monthly Reporting tool provides information about MLC products existing in your data center environment, and components that impact the overall cost.
  - 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
- (Microsoft Windows) Cost Analyzer application server
- (Web Browser Client) Microsoft Silverlight Rich Internet Application (RIA)

Figure 1 on page 13 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. |
| AWLC                              | Advanced Workload License Charges                                                                                                                                                                           |
| AEWLC                             | Advanced Entry Workload License Charges                                                                                                                                                                    |
| Central processor complex (CPC)   | Physical collection of hardware that includes main storage, one or more central processors, timers, and channels  
| EWLC                              | Entry Workload License Charges                                                                                                                                                                             |
| FWLC                              | Flat Workload License Charges                                                                                                                                                                              |
| 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. |
| 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. |
<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly License Charges (MLCs)</td>
<td>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 WebSphere MQ). For more information see, <a href="http://www-03.ibm.com/systems/z/resources/swprice/mlc/index.html">http://www-03.ibm.com/systems/z/resources/swprice/mlc/index.html</a></td>
</tr>
</tbody>
</table>
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 16.

**zNALC**

IBM System z New Application License Charges

**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
- Report Class
- 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 17 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. <strong>Note:</strong> 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>Report Class</td>
<td>Activity is aggregated by Report Class</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 41.

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>Monthly Reporting</th>
<th>Planning</th>
<th>Software Contract Reporting</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 information)</td>
<td>Yes (with cost information)</td>
<td>Yes (with cost information)</td>
<td>Yes</td>
<td>Full functionality</td>
</tr>
<tr>
<td>BMC Cost Analyzer Capacity Planners</td>
<td>No</td>
<td>Yes (with cost information)</td>
<td>Yes (with cost information)</td>
<td>Yes (with cost information)</td>
<td>No</td>
<td>Full functionality</td>
</tr>
<tr>
<td>BMC Cost Analyzer System Programmers</td>
<td>No</td>
<td>Yes (no cost information)</td>
<td>No</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

Note
You need to be a BMC Product Administrator to access the Administration Tools. For more information, see “BMC Cost Analyzer User Groups” on page 17.

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
- Specify duration and parameters for IBM software contracts
- Specify cost coefficient values for MLC products
- Configure CPC pricing metrics and PricingPlex
- View Application, Services, and Model Build log files

Table 4 on page 20 provides details about the Administration Tools:
Table 4: Cost Analyzer Administration Tools

<table>
<thead>
<tr>
<th>Administration Tool</th>
<th>Description</th>
</tr>
</thead>
</table>
| Manage CDB Server Profiles        | Add, modify, or remove CDB server profiles  
This tool also provides a list of the available CDB Server profiles once they have been added by the administrator.  
See “Defining connections to CDB servers” on page 45. |
| Manage Model Builder Tasks        | Add, modify or remove Model Builder Tasks to determine the parameters for the cost models  
You can perform the following actions to your cost models:  
- Specify different workload types and filters  
- Gather data from different CDB servers and databases  
- Setup time zone offsets  
- Exclude particular LPARs from the model  
- Designate zNALC LPARs to include in the model  
This tool provides a list of the available Model Builder Tasks that have been created and added by the administrator. Additionally, instead of waiting for the nightly build process to execute, you have the option to run the task immediately.  
See “Defining Model Builder Tasks” on page 48. |
| Manage Software Contracts         | Add, modify or remove software contracts  
You can perform the following tasks:  
- Define the duration, total budget, and periods of your IBM contract  
- Specify the budget amount for specific months during a period  
- Account for any Cost Table change events that will take affect during the term of the contract |
| CPC Configuration Editor          | Configure default Pricing Metrics and PricingPlex information  
See “Using the CPC Configuration Editor” on page 75. |
Administration Tool | Description
--- | ---
MSU Cost Editor | Setup and manage the cost structure of MLC products for your enterprise based on your agreement with IBM. You can perform the following tasks:
- Edit cost tables and assign cost coefficients to predefined MSU ranges for individual MLC products.
- Specify pricing metric override values.
- Specify if MLC products are covered by a Single Version Charge (SVC) agreement.
- Specify reporting locale.
See “Using the MSU Cost Editor” on page 81.

Application Server Log Viewer | View Application, Services, and Model Build log files.
See “Displaying Cost Analyzer log files” on page 165.

**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 14 describes the available assigned component tools:

**Table 5: Cost Analyzer group-based component tools**

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly Reporting</td>
<td>Generate monthly MSU Summary Reports and perform comparative analysis of R4HA MSU Utilizations by MLC Product, CPC, LPAR, or Workload.</td>
</tr>
<tr>
<td>Planning</td>
<td>Create sub-capacity licensed product cost optimization plans for future activity and data center environment changes.</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 41.

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 About box.

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 button provides access to the Administration Tools as described in the following table:

<table>
<thead>
<tr>
<th>Administration Tool</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manage CDB Servers Profiles</td>
<td>Add, remove, or modify CDB server profiles</td>
</tr>
<tr>
<td>Manage Model Builder Tasks</td>
<td>Add, remove, or modify Model Builder Tasks</td>
</tr>
<tr>
<td>Manage Software Contracts</td>
<td>Add, modify or remove software contracts</td>
</tr>
<tr>
<td>CPC Configuration Editor</td>
<td>Configure CPC pricing metrics and PricingPlex</td>
</tr>
<tr>
<td>MSU Cost Editor</td>
<td>Specify cost coefficient values for MLC Products</td>
</tr>
<tr>
<td>Application Server Log Viewer</td>
<td>View all available Application Server log files</td>
</tr>
</tbody>
</table>

**Note**

The availability of the Toolbar button on your console depends upon your User Group assignment. For more information, see “BMC Cost Analyzer User Groups” on page 17.

- The tool tabs provide access to the Software Contract Reporting, Monthly Reporting, and Planning tools 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>Software Contract Reporting</td>
<td>Generate a Software Contract Summary Report based on budgeted, actual, and projected costs for analysis. You can run a report that provides details on budgeted allocations, actual usage, and future cost projections. Using the comprehensive view of the entire contract, you can track the cost changes that occur over time, monitor the performance of budgeted cost against actual cost, and analyze the cost contribution of MLC products, CPCs and R4HA.</td>
</tr>
<tr>
<td>Monthly Reporting</td>
<td>Generate Monthly Summary Reports for analysis. You can run reports and use interactive features to explore and analyze the results.</td>
</tr>
<tr>
<td>Planning</td>
<td>Create cost optimization plans for future activity or environment changes and estimate the effects on total cost. Using interactive features, you can move LPARS from CPCs, scale workloads, and redistribute MSUs to strategize potential cost savings.</td>
</tr>
</tbody>
</table>

- The view tabs can be used to open multiple views of reports and to toggle between the views. (Multiple views are available for only Software Contract Reporting and Monthly Reporting)
- The task status indicator gives information about the current state of model builder tasks (whether running or sleeping) and provides access to a popup with details about the most recent task activity.
- The links provide access to logging out, online Help, social communications, 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 27.
- To perform the administrative setup tasks that will prepare BMC Cost Analyzer for use, see “Setting up Cost Analyzer” on page 39.
When you are ready to start using BMC Cost Analyzer, see “Generating cost-analysis reports” on page 93 and “Developing cost-reduction plans” on page 145.
Installation

Installing the Cost Analyzer product requires installing the Universal Information Exchange (UIE) mainframe component and CDB server components, followed by the Cost Analyzer application files.

Installing UIE on the mainframe

You must install the Universal Information Exchange product to use Cost Analyzer. The Universal Information Exchange (UIE) is a tool that processes performance metrics, enabling you to do capacity planning for subsystems running on z/OS.

For more information, see the BMC Capacity Management for Mainframes Installation Guide and the Universal Information Exchange User Guide.

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 5 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>
</table>
| Operating system               | ■ Microsoft Windows Server 2012 R2  
|                                | ■ Windows Server 2012                          |
|                                | ■ Windows Server 2008 R2                        |
|                                | ■ Windows 8.1                                   |
|                                | ■ Windows 8                                     |
|                                | ■ Windows 7                                     |
| Additional OS features and roles | ■ Microsoft .NET Framework 4.5                  |
|                                | ■ Microsoft Message Queuing Server (MSMQ)       |
|                                | ■ Internet Information Server (IIS) for your version of Windows, with the following items enabled: |
|                                | — IIS ASP.NET                                   |
|                                | — IIS HTTP WCF Activation                       |
|                                | — IIS Windows Authentication                    |
|                                | — IIS Metabase                                  |
| Memory                         | 8 GB                                             |

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 Patch 11
— Capacity Management Database CDB 1.2.00 Patch 5

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 the 64-bit OS destination folder is C:/Program Files (x86)/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.

---

**Before you begin**

If you plan to use a specific user account to run BMC CDB Workflow Service, the account must have "Log On as a Service" rights.

**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 the 64-bit OS destination folder is **C:/Program Files (x86)/BMC Software/CDB**.
On the Binding Information page as shown in Figure 3 on page 31, 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>
<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</td>
</tr>
<tr>
<td></td>
<td>where BMC CDB Services is installed</td>
</tr>
<tr>
<td>Password</td>
<td><em>(optional)</em> Password to be used when accessing a secure IIS server</td>
</tr>
<tr>
<td></td>
<td>where BMC CDB Services is installed</td>
</tr>
</tbody>
</table>

---

**Note**

If you have a secure site, you must specify user account information.

**Figure 3: CDB Services Binding Information page**
7 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 32, 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**. The specific user account must have "Log On As A Service" rights. 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.
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 33 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>

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 R2</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 8.1</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 R2</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 8.1</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 33. If any requirement is not satisfied, the installation program notifies you and stops. Before restarting the installation program, you must satisfy the missing requirements.
If you plan to use a specific user account to run Cost Analyzer, the account must have "Log On as a Service" rights.

**Note**
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 the 64-bit OS destination folder is `C:/Program Files (x86)/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.

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

   - c. Click Test User Account to verify the account.
When finished, click Next.

The Start Copying Files page is displayed.

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.

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 12: Manual firewall settings for Cost Analyzer

<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>

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 41.
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 Software Contract Reporting, Monthly 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 Software Contract Reporting, Monthly Reporting, and Planning tools can be used, you need to complete the administration setup tasks described in Figure 5 on page 40:

**Figure 5: Setup tasks flowchart**

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

<table>
<thead>
<tr>
<th>Task</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assign users to the appropriate user group on the application server</td>
<td>“Assigning users to BMC Cost Analyzer User Groups” on page 41</td>
</tr>
<tr>
<td>Create and schedule the Automator script</td>
<td>“Creating and scheduling the Automator script” on page 43</td>
</tr>
<tr>
<td>Define connections to CDB servers</td>
<td>“Defining connections to CDB servers” on page 45</td>
</tr>
<tr>
<td>Define Model Builder Tasks</td>
<td>“Defining Model Builder Tasks” on page 48</td>
</tr>
<tr>
<td>Install the Model Builder Proxy</td>
<td>“Installing the Cost Analyzer Model Builder Proxy” on page 54</td>
</tr>
<tr>
<td>Update the Automator script</td>
<td>“Updating the Cost Analyzer Model Builder Proxy event” on page 56</td>
</tr>
<tr>
<td>Add software contracts</td>
<td>“Defining software contracts” on page 61</td>
</tr>
<tr>
<td>Verify/edit CPC Configuration</td>
<td>“Verifying and editing the CPC Configuration” on page 72</td>
</tr>
<tr>
<td>Edit cost tables</td>
<td>“Editing the cost coefficients” on page 76</td>
</tr>
</tbody>
</table>

**Tip**

You need to add at least one user to a BMC Cost Analyzer Group before you can login and use Cost Analyzer.

For a checklist and complete details about how to install Cost Analyzer on a MS Windows Server, see “Checklist to install Cost Analyzer for zEnterprise on a MS Windows Server” on page 171.

## 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 17.

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.

---

**Populating your mainframe data into the CDB server**

The CDB Server manages the databases that contain the populated output data from the mainframe UIE batch job. Cost Analyzer uses the data that has been populated into this database as input to the model build process.

The population of your mainframe data into the CDB server depends upon the following conditions:

- Your enterprise *is currently using* BMC Capacity Management for Mainframes (CMM)

  In this case, you are already generating and populating Visualizer data files on a daily basis. Cost Analyzer accesses the exact same database for the output of the UIE runs and then uses the database as the input for the model build process.
Your enterprise is not currently using BMC Capacity Management for Mainframes (CMM)

In this case, you must create a new Automator script, run the mainframe UIE batch job, and populate the output data into this CDB-managed database. Cost Analyzer then accesses this populated data and uses it as the input to the model build process. For more information, see “Creating and scheduling the Automator script” on page 43.

Note
If you currently use CMM and want to populate the mainframe data into a separate database for Cost Analyzer to access, you must create a new Automator script.

Creating and scheduling the Automator script

Complete the following tasks to create and schedule the Automator script.

Note
If you are currently using BMC Capacity Management for Mainframes (CMM), you should skip this task and use the Automator script that already exists for that product.

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).

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.

**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 43.

3 Select a start time.

Tip
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.

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.

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 Manage CDB Server Profiles.

The Manage CDB Server Profiles dialog is displayed:
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 13 on page 47:

Table 13: Add CDB Server Profile fields

<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 localhost.</td>
</tr>
<tr>
<td>Port</td>
<td>Port number of the BMC CDB Services server</td>
</tr>
<tr>
<td></td>
<td>The default port number is 80.</td>
</tr>
<tr>
<td>Virtual Directory</td>
<td>Virtual directory where BMC CDB Services is installed</td>
</tr>
<tr>
<td></td>
<td>The default directory is BMCCDB.</td>
</tr>
<tr>
<td>Username</td>
<td><em>(optional)</em> User name to be used when accessing a secure IIS server</td>
</tr>
<tr>
<td></td>
<td>where BMC CDB Services is installed</td>
</tr>
<tr>
<td>Password</td>
<td><em>(optional)</em> Password to be used when accessing a secure IIS server</td>
</tr>
<tr>
<td></td>
<td>where BMC CDB Services is installed</td>
</tr>
</tbody>
</table>

5 Click 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 **Add Profile** to add the profile.
- Click **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 Software Contract Reporting, Monthly Reporting, and Planning tools.

You can build a variety of models to affect the scope of your analysis. In general, if you have multiple CDB servers, you have to define multiple Model Builder Tasks to run. If you have more than one workload type you want to process, you can define one Model Builder Task for all of the workloads. It is not necessary to create a separate task for each workload type.

Note

If you are using multiple CDB Servers, they CANNOT contain LPARs from the same CPCs. This type of LPAR arrangement invalidates all cost models.

Model Builder tasks provide advanced options where you can:

- Exclude particular LPARs from the cost calculations
- Designate the LPARs that use zNALC licensing for z/OS products
- Enable trace messages to the log file to assist in diagnostics

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 45.

Cost models are built using the active Cost Table. If you have multiple cost tables, you need to ensure that the cost table you want to use for cost calculations is set as the active cost table. For more information, see “Managing multiple cost tables” on page 86.

To define Model Builder Tasks

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

2. In the Administration Tools window, click Manage Model Builder Tasks.
The Manage Model Builder Tasks dialog opens, listing all of the tasks that have been defined by the user:

![Manage 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:
4 Complete each field based on Table 14 on page 50:

**Note**
It is 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 14: 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>Click one or more 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>■ Report 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>Note: Suites and Service Class workloads require a filter to be specified. For more information, see “Cost Analyzer workloads” on page 16.</td>
<td></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 list of comma delimited workload names or wildcard character patterns that will be used as a filter to reduce the size of the cost model.</td>
</tr>
<tr>
<td>Note: Specifying a very large number of workloads may significantly degrade performance of Cost Analyzer. The workload filter provides the ability to specify which workloads to process.</td>
<td></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>You can specify an offset from the time zone of the data in the CDB database.</td>
</tr>
<tr>
<td>Note: When using the Planning tool, all CPCs included in the plan must be built with the same time zone offset.</td>
<td></td>
</tr>
</tbody>
</table>

5 (optional) If you want to exclude particular LPARs from the cost calculation, designate zNALC LPARs, or enable Trace messages, click **Advanced Options**.

The Advanced Options dialog displays as shown in figure:
a To designate zNALC LPARs, enter the name of the zNALC LPAR you want to include, and then click Add.

   **Note**
   You can enter LPARs either individually or you can list multiple LPARs separated by commas. Entries are case-sensitive, so be sure to enter the LPAR name exactly as it appears in z/OS, which primarily uses capital letters for all LPAR names.

b To exclude LPARs from the cost calculation click the Exclude LPARs tab, enter the name of the LPAR you want to exclude and then click Add.

c To enable Trace messages, click the Diagnostics tab, change the toggle switch to Yes, and then click Accept.

   **Note**
   Enabling Trace messages can dramatically increase the size of the log file and should only be enabled for troubleshooting.

d When finished, click Accept.

6 When finished with all selections, 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 Software Contract Reporting, Monthly Reporting, and Planning tools. For more information, see “Scheduling Model Builder Tasks” on page 53.

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 for some reason the regularly scheduled task did not run, you can run the task to generate the missing data.
- If you excluded LPARs or specified zNALC LPARs, you can run the task to rebuild the cost models to reflect the new values.

**Scheduling Model Builder Tasks**

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

To generate a cost model for Cost Analyzer, you need to run a Model Builder Task that builds the cost model from the populated mainframe data.

The preferred way to schedule and run Cost Analyzer Model Builder Tasks is to add the Cost Analyzer Model Builder Task to a new or existing Automator script.

**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 R4HA 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 usage 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 usage month, gathering into this model all data from the beginning of the usage 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 usage 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 6 types of Workload models per CPC.

After Model Builder Tasks execute, Cost Analyzer makes the cost models available for use with the Software Contract Reporting, Monthly Reporting, and Planning tools and can be selected for use together with all previous usage month models.

### 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 file by navigating to the Cost Analyzer installation folder.

By default, the 64-bit OS folder location is: `C:/Program Files (x86)/BMC Software/SCA/Services/MBProxyBin/SCAModelBuildProxy`.

The following figure shows a sample location for the proxy file.

Figure 6: Sample location for proxy file

2 In the proxy file, run the `SCAModelBuildProxy.exe` program.

*Note*

You must run `SCAModelBuildProxy.exe` program at least once to configure the target Cost Analyzer machine information. (The same user that runs this program, must also be the same user that schedules the Automator script. If the Automator script is scheduled to run under a system account, contact BMC Support for assistance.)

The Cost Analyzer Model Builder Proxy dialog is displayed:
By default, the dialog fills the field data for you.

3 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. If the Automator script is scheduled to run under a system account, contact BMC Support for assistance.

---

### Updating 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 update 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 SCAModelBuildProxy 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:

![Image of Automator script]

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

**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.
Running the Model Builder Task manually

You can run a Model Builder Task at any time without interfering with its scheduled run time. Use the following procedure to run the Model Builder Task manually.

**Note**
The time to run a Model Builder Task varies. When running a task manually, you will not be able to use any of the Cost Analyzer tools until the task is complete.

**To run the Model Builder Task manually**

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:

3. From the list, select the Model Builder Task you want to run and click **Run Task Now**.

   The Run Task Now dialog opens:

   ![Run Task Now dialog](image)

   ![Manage Model Builder Tasks dialog](image)
4 From the calendar in the dialog, select the usage month for the model you want to build.

The usage month starts on the 2nd day of the month and ends on the 1st day of the following month.

5 Click Submit.

Cost Analyzer runs the Model Builder Task. Check the indicator at the top right of the console for the status of the task.

### Manage Software Contracts

The Manage Software Contracts administration tool provides you with the ability to define your software contracts.

The definition of your software contract parameters are used by the Software Contract Reporting tool to provide reports that compare your monthly budgets for MLC product costs with actual MSU usage.

You can use this administration tool to:

- Designate the total amount of the contract budget
- Define the duration or length of the term of the contract
- Assign budget allocations to contract periods and period months


- Specify events that affect software costs during the contract

## Defining software contracts

Use the following procedure to manage your IBM software contracts.

**Note**

Please refer to your IBM MLC contract for budget amounts and period details described in the following procedure.

### To define a software contract

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

2. In the Administration Tools window, click **Manage Software Contracts**.

   The Manage Software Contracts dialog opens, listing all of the available Software Contracts that have been defined by the user:

   From the dialog you can add, modify, or remove Software Contracts.

3. Perform one of the following actions:

   - To add a new Software Contract, click the **Add** button.
   - To modify an existing Software Contract, select the icon of the task you want to modify from the list, and then click the **Modify** button.
**Note**
When modifying an existing contract, you need to unlock the dialog by unlocking the lock toggle before you can modify the fields or values in the dialog. When prompted, confirm that you want to enable modifications by clicking Yes.

The Add Software Contract dialog or the Modify Software Contract dialog displays, depending on your selection. The Add Software Contract dialog is shown in the following figure:

![Add Software Contract dialog](image)

4 Complete each field based on Table 15 on page 62:

**Table 15: Add Software Contract fields**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract Name</td>
<td>Name to be assigned to the software contract</td>
</tr>
<tr>
<td>Contract description</td>
<td><em>(optional)</em> Description of the software contract</td>
</tr>
<tr>
<td>Starting Month</td>
<td>Click on the calendar and designate the month and year that the contract starts</td>
</tr>
<tr>
<td>Field</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Duration              | Specify the total number of months that determine the duration of the contract  
You can specify the duration of the contract in months from 1 to 5 years (either 12, 48, 36, 48, or 60 months).                                                                 |
| Budget                | Total budget of the contract  
Refer to your IBM contract for the total value budgeted for the contract.                                                                                                                                 |
| Months in first period | Specify the number of months in the first period of the contract  
Typically, IBM contracts are divided into yearly periods. Depending on your contract with IBM, enter the number of months that determine the first period of the contract.  
**Note:** In most contracts, the number of months in the first period is 12. However, business circumstances might require that the first period of the contract be less than one year. In order to account for this situation, the proper value can be selected from the drop down. All subsequent periods are generated automatically depending on this value and the duration of the contract. |
| Cost Table change events | Specify any Cost Table change events  
If the cost table will change over the course of a contract, you need to add a Cost Table change event to account for the change in the pricing structure.  
For more information, see “Cost table change event overview” on page 68.                                                                                     |

5 Configure the monthly budget allocations for each period by clicking **Edit Period Details**.

The Contract Period Details window opens as shown in the following figure.
By default, Cost Analyzer divides the total budget amount of the contract by the number of months indicated as the contract duration and allocates this value as the monthly budget amount for each month of each period. In order to reflect your exact monthly budget figures, however, you need to edit the details of each individual month so that the values correspond to your actual budgeted allocations.

For the period you want to edit, click the triangle (♦) to display the monthly values allocated for each month.

The following figure shows the monthly values for Period 1.
b Adjust the values allocated for each individual month based on the actual monthly budget allocations that exist for this period of the contract.

**Note**

If the monthly budget values change the total budget amount established for that period, Cost Analyzer recalculates and updates the total budget amount for that period and also recalculates the total amount of the entire contract.

c *(optional)* Adjust the value allocated for a period to change the monthly budget allocation for each month of that period.

When adjusting the budget amount for a period, Cost Analyzer automatically distributes the new budget amounts across the months of the period, maintaining the existing proportion of each month. For an example, see “Contract Period Details example” on page 66.

d When finished editing the values of each individual month of each period, click **Accept**.

6 When finished entering values for all fields, perform one of the following actions:

- If you are adding a software contract, click **Add Contract**.
- If you a modifying a software contract, click **Modify Contract**.

The dialog closes.
In the Manage Software Contracts dialog, click **Save Changes**.

**Contract Period Details example**

The following example demonstrates the dynamic features enabled by editing the budgeted values in the Contract Period dialog.

In the following example, the following values define the Software Contract:

- Start month: Jan 2015
- Duration: 36
- Budget: $360,000,000
- Months in first period: 12

After adding the software contract parameters the dialog displays as shown in the following figure:
When you click on **Edit Period Details**, the Contract Period Details dialog displays. For demonstration purposes, Period 3 has been expanded in the figure.

As you can see, each period is allocated $120,000,000 and each individual month in each period would be allocated $10,000,000.

If the 3rd Period's costs are going to increase by 10% ($12,000,000), you can change the value for Period 3 to $132,000,000.

The following figure shows the results of the 10% increase for Period 3.
As you can see, Period 3 has been changed to $132,000,000 and Cost Analyzer has automatically increased the value for each month to $11,000,000. The New Budget total ($372,000,000) also displays.

The budget figures for your enterprise may be much more complicated and the proportions less obvious. It is import to note that Cost Analyzer calculates the proportion each individual month contributes to the total for a period and updates the values for each individual month based on this proportion.

**Cost table change event overview**

Over the duration of a contract, there may be changes that affect which cost table is used to calculate the cost data. When defining your software contract, you can specify the starting month for using a new, modified, or different cost table when calculating the cost data for use with the Software Contract Reporting tool.

This change of cost table is known as a Cost Table change event.

Since the active cost table is used as a default to calculate the cost models used by the Software Contract Reporting tool, changes to the cost table that will occur in the future can only be accounted for by adding a Cost Table change event, which overrides the default cost table.

**Note**

Cost table change events are applied only to the projected costs of future months. When the month specified in the Cost Table change event arrives in actual time, the new Cost Table needs to be set as active in the MSU Cost Editor in order for the new pricing information to be used when building cost models. For more information see, “Setting a cost table as active” on page 89.

Adding a Cost Table change event to your software contact does not affect the budget amounts of the contract. The Software Contract Reporting tool uses the event to change the cost table that is used when calculating projected costs that occur on and after the starting month.

By specifying the Cost Table change event, you select the month to begin using a different cost table, so your cost data remains in synch with any cost table changes that you know will occur in the future. When adding or modifying a software contract, use **Cost Table change events** to assign the appropriate cost table to use for calculating all cost data that occurs on and after the event.

If you do not specify a Cost Table change event, the Software Contract Reporting tool uses the active cost table for the entire term of the contract when generating a report.
Note

It is the responsibility of the administrator to manage changes to the Cost Table that will also necessitate adding or modifying Cost Table change events so that the definition of your software contract remains consistent with changes to MLC costs that may occur during the course of a contract.

Adding a change event to the software contract

Use the following procedure to add a Cost Table change event to the definition of your software contract.

To add a Cost Table change event

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

2. In the Administration Tools window, click Manage Software Contracts.

   The Manage Software Contracts dialog opens, listing all of the available Software Contracts that have been defined by the user.

3. From the list, select the Software Contract that needs a Cost Table change event, and then click Modify.

   Note

   If you are adding a new Software Contract, you can also add a Cost Table change event as you define all of the contract parameters. In this case, click Add instead of Modify.

The Modify Software Contract dialog is displayed as shown in the following figure.
4 Unlock the Modify Contract dialog by unlocking the lock toggle ( ), and when prompted, confirm that you want to enable modifications by clicking Yes.

5 Click the Add button to the right of the Cost Table change events box.

The Event Details dialog displays as shown in figure:
6 In the **Starting Month** box, use the calendar to select the month and year the Cost Table change event occurs.

7 From the list of Cost Tables, select the Cost Table to be used for cost model calculations when the change event occurs.

   The selected Cost Table will be used from the beginning of the selected Starting Month until the last month of the contract.

   **Note**

   You can have more than one Cost Table change event over the duration of the contract. In this instance, the Cost Table will be used at the start of the selected Starting Month and its use will end at the next change event.

8 When finished, click **Add Event**.

   The Event Details dialog closes.

   The starting month and year as well as the name of the Cost Table that will be used at that time are displayed in the **Cost Table change events** box of the dialog.

9 Click **Modify Contract** to close the dialog.
Note
If you are adding a software contract, click Add Contract.

10 In the Manage Software Contracts dialog, click Save Changes.

Cost Analyzer saves the changes and closes the Manage Software Contracts tool.

Verifying and editing the CPC Configuration

After building cost models, Cost Analyzer uses IBM default rules for sub-capacity licensing to produce a configuration of your CPCs. The configuration defines the default pricing metric type and PricingPlex grouping for each CPC. You should verify and, if needed, edit the configuration so that each CPC has correct values defined.

Cost Analyzer uses the most recent cost model to produce the configuration; you have access to the configuration after running the initial Model Builder Task. For more information, see “Scheduling Model Builder Tasks” on page 53

Overview of the CPC Configuration Editor

For each CPC, the CPC Configuration Editor lists the default pricing metric type applied to the cost models for all MLC products on that CPC. If applicable, the configuration also specifies the PricingPlex that aggregates the MSU utilization of the CPC into a group for pricing purposes.

Note
CPC configuration within a PricingPlex is applicable only if your CPCs are combined into a PricingPlex as allowed by your IBM license agreement. If no PricingPlex exists for a CPC based on the information from the cost models, the PricingPlex name should be blank.
Figure 7 on page 73 shows a sample CPC Configuration Editor:

Figure 7: Sample CPC Configuration Editor

How the configuration determines the pricing metric type

In general, the Pricing Metric Type default is determined by the CPU type you are using. However, depending upon your contractual agreement with IBM, your Pricing Metric Type may vary from these established defaults. The CPC Configuration Editor provides you with the ability to edit the value of the Pricing Metric Type to account for any variation that may exist for your enterprise.

How the configuration determines the PricingPlex parameter

Cost Analyzer defines the PricingPlex for each CPC by determining the most active Sysplex to which the CPC is connected. However, your actual PricingPlex groupings may be different, so you can use the CPC Configuration Editor to add or change the PricingPlex parameter. If a CPC is not part of a PricingPlex, you can also edit the PricingPlex parameter so that its designation is blank, indicating that a PricingPlex does not apply to this CPC.
After you verify or change the PricingPlex parameter for each CPC, Cost Analyzer does not apply the changes to the costs that are generated in the Monthly Summary Report unless the **Use Sysplex Pricing?** toggle is set to **Yes**.

If the **Use Sysplex Pricing?** is set to **No**, the PricingPlex groupings indicated in the PricingPlex column have no affect on cost calculations.

**Note**

IBM allows CPCs to be aggregated across a qualified Parallel Sysplex ("Sysplex Pricing") only when certain criteria are met. Before using Sysplex Pricing with Cost Analyzer, you must confirm that your IBM contract contains this arrangement. Cost Analyzer does NOT verify Sysplex Pricing criteria and does not use Sysplex Pricing automatically. It is the responsibility of the administrator to set **Use Sysplex Pricing?** correctly.

After verifying and editing the CPC Configuration, you do not need to rebuild the cost models. Any changes to the CPC Configuration parameters will take effect immediately and the resulting changes to the costing data can be viewed by generating a Monthly Summary Report. For more information, see Using the CPC Configuration Editor on page 75.

**CPC Configuration updates**

Each time a Model Builder Task runs and a Cost Model is built, the CPC Configuration is updated from the most recent costing data. **However, Cost Analyzer only applies the updates to the parameters that are saved in the CPC Configuration Editor when certain conditions are met.** Updates to the parameters saved in the CPC Configuration Editor are applied as follows:

- Cost Analyzer adds any new CPCs to the CPC configuration with a default Pricing Metric Type and PricingPlex designation that requires your verification.

- Cost Analyzer does not change any values that you previously edited in the CPC Configuration Editor. Values that you defined for the CPC override the updates.

- Based on the most recent cost model, Cost Analyzer updates all values that you have not previously edited.

- Preexisting CPCs in the CPC Configuration that no longer exist in the most recent Cost Model are not changed. These CPCs remain listed in the CPC Configuration Editor, but they are inactive and their parameters do not affect the costing data.
Using the CPC Configuration Editor

Use the following procedure to verify that your CPCs are configured correctly to their Pricing Metric Type and applicable PricingPlex names. If necessary, you can edit the information to align the CPCs with the correct values.

Before you begin

You must run one Model Builder Task before using the CPC Configuration Editor. For more information, see “Defining Model Builder Tasks” on page 48.

To verify and edit the CPC configuration

1. From the console, click Administration Tools.

2. From the Administration Tools dialog, click CPC Configuration Editor.

   The CPC Configuration Editor lists CPCs, their Pricing Metric Type, and if applicable, the names of their PricingPlex.

3. Check that each CPC has the correct Pricing Metric Type and PricingPlex name (if applicable).

   The configuration does not require editing unless a discrepancy exists. If the CPC is configured correctly, no further action is necessary and you can skip to Step 6 on page 76.

4. (optional) For any CPC that you want to edit, perform the following actions:

   ■ Using the PricingPlex drop-down box, select the PricingPlex name that applies to the CPC.

   ■ Using the Pricing Metric Type drop-down box, select the Pricing Metric Type that applies to the CPC.

5. (optional) To add a PricingPlex name that is not on the list, perform the following actions:

   a. Click the Manage link.

   b. In the Manage PricingPlex dialog, enter the name of the PricingPlex.

   c. Click Accept to add the name to the list.
Find the CPC to which you want to add the new PricingPlex name, and select the new name from that CPC's PricingPlex drop-down box.

The PricingPlex name displays in the box configured to the CPC.

5. d Repeat Step 5.d on page 76 for each CPC to which you want to add the new PricingPlex name.

5. e When finished, click Save Changes.

Where to go from here

If you edited the CPC configuration, apply the changes to the cost models by generating a Monthly Summary Report; you can view the report to see how the configuration changes affect your costs.

Editing the cost coefficients

This section describes how to use the MSU Cost Editor to edit your cost coefficients and manage multiple cost tables.

You can use the MSU Cost Editor to:

- Edit the cost coefficients for each MLC product
- Create multiple Cost Tables to manage future changes to MLC product costs or alternative pricing arrangements
- Set the active Cost Table to be used by the Model Builder Tasks when building cost models
- Update and install changes to the Product Table

Note

During installation, Cost Analyzer creates a default cost table with zero as the value for all cost coefficients and sets this cost table as active. The name of this default cost table is SPRDFIL.

If your installation replaces a previous version of Cost Analyzer, all cost coefficients from your previous cost table are preserved in the SPRDFIL cost table.

When setting up Cost Analyzer, use the MSU Cost Editor to enter the actual cost information from your contract with IBM and adjust each component of the cost so that it accurately reflects the real cost structure that has been established for your enterprise.
To set up your cost tables, complete the following tasks with the MSU Cost Editor:

■ Specify the cost coefficients that Cost Analyzer uses to calculate your MLC product costs
  For more information, see “Using the MSU Cost Editor” on page 81

■ Override the default pricing metric type used for a particular MLC product (if applicable)
  For more information, see “Overriding the pricing metric type” on page 83

■ Designate which MLC products accrue charges based on Single Version Charge (SVC)
  For more information, see “Specifying Single Version Charging for specific MLC products” on page 84

■ Change the reporting locale
  For more information, see “Changing the reporting locale” on page 85

  Note
  Modifications to the cost tables will affect the cost models that are used by the Software Contract Reporting, Monthly Reporting, and Planning tools.

Overview of the MSU Cost Editor

The MSU Cost Editor lets you edit your IBM Workload License Charges (WLCs) so that Cost Analyzer can use actual costs when building your cost models. You can create and manage multiple cost tables.

  Note
  When you create multiple cost tables, one of them must be set as the active cost table. When first setting up Cost Analyzer, the SPRDFIL cost table is automatically set as the active cost table. Only the active cost table is utilized to build your cost models. For more information, see “Managing multiple cost tables” on page 86. If you want to change which cost table is active, see “Setting a cost table as active” on page 89.

The active cost table always opens when you launch the MSU Cost Editor. However, if you are setting up Cost Analyzer for the first time, a default cost table created by the installation process displays. The name of this cost table is SPRDFIL and it is automatically set as the active cost table. When setting up your first cost table, you should edit the coefficients in SPRDFIL.

After you have completed the editing, you can:
Make a clone of the SPRDFIL cost table

Give the cloned Cost Table a new name

Set the cloned Cost Table as active

For more information, see “Managing multiple cost tables” on page 86.

For any cost table that you want to edit, use the MSU Cost Editor to insert the cost coefficients from your IBM License Agreement. As indicated in the sample in Figure 8 on page 78, the MSU Cost Editor lists all of the MLC products on a system and enables you to account for every provision in your contract with IBM.

Figure 8: Sample MSU Cost Editor

<table>
<thead>
<tr>
<th>#</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Reporting Locale Settings</td>
<td>Accesses a dialog where you can change the reporting locale. For more information, see “Changing the reporting locale” on page 85.</td>
</tr>
<tr>
<td>2</td>
<td>Pencil icon</td>
<td>Indicates that the cost coefficient tables for the product have been edited.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Note:</strong> If a MLC product's cost coefficients have not been edited, but the product features cost coefficients have been edited the pencil icon displays by the Product name column.</td>
</tr>
<tr>
<td>3</td>
<td>Triangle icon</td>
<td>Lets you display or hide product features by clicking the icon.</td>
</tr>
<tr>
<td>4</td>
<td>Cost Table name</td>
<td>Unique name that identifies the cost table.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Note:</strong> A check mark icon indicates the cost table is active.</td>
</tr>
<tr>
<td>#</td>
<td>Description</td>
<td>Details</td>
</tr>
<tr>
<td>----</td>
<td>----------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>5</td>
<td>Open Cost Table button</td>
<td>Accesses a dialog where you can select an existing cost table for editing or viewing</td>
</tr>
<tr>
<td>6</td>
<td>Type</td>
<td>The license type used by the products on your system. <strong>Note:</strong> Cost Analyzer supports only Monthly License Charge (MLC) products at this time.</td>
</tr>
<tr>
<td>7</td>
<td>Group</td>
<td>The IBM software family of the product (CICS, DB2, IMS, MQ, ZOS, or OTH)</td>
</tr>
<tr>
<td>8</td>
<td>Product ID</td>
<td>The product's identification designation</td>
</tr>
<tr>
<td>9</td>
<td>Create Cost Table button</td>
<td>Accesses a dialog where you can create a new cost table or a clone of an existing cost table. You can create multiple cost tables to manage any changes to your MLC product cost arrangements.</td>
</tr>
<tr>
<td>10</td>
<td>Product Name</td>
<td>The name of the product</td>
</tr>
</tbody>
</table>
| 11 | Delete Cost Table button         | Accesses a dialog where you can select and delete cost tables The following Cost Tables cannot be deleted:  
  ■ The active Cost Table.  
  ■ Any Cost Table referenced by the cost model of a historical month.                                                                                                                                                                                                       |
| 12 | Feature ID                       | The feature's identification designation                                                                                                                                                                                                                                                                                                 |
| 13 | Feature Name                     | The name of the feature                                                                                                                                                                                                                                                                                                                  |
| 14 | NO89 Req.                        | Indicates whether a Universal Information Exchange (UIE) command NO89 is required in order to include the MLC product's cost data in the cost models  
  The requirements are as follows:  
  ■ YES – Indicates a UIE NO89 command must be defined in the UIE before cost information can be including in the cost model  
  ■ NO – Indicates a UIE NO89 command is not required  
  For more information, see “UIE Command NO89” on page 177.                                                                                                                                                                                                                       |
<table>
<thead>
<tr>
<th>#</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>Cost Coefficients</td>
<td>Contains a link for editing the cost coefficient tables and provides a list of pricing metric types that have had their cost tables edited. Access the cost tables to assign cost coefficients to the MSU ranges defined by IBM. You can edit a separate cost table for every Pricing Metric Type that applies to the MLC product. For more information, see “Using the MSU Cost Editor” on page 81.</td>
</tr>
<tr>
<td>16</td>
<td>Pricing Metric Override</td>
<td>Enables you to designate a different pricing metric type for any MLC product to override the default pricing metric type defined for the CPC. For more information, see “Overriding the pricing metric type” on page 83.</td>
</tr>
<tr>
<td>17</td>
<td>Single Version Charge</td>
<td>Enables you to designate that two versions of the same MLC product accrue charges based on Single Version Charging (SVC). <strong>Note:</strong> When certain conditions are met during the migration to newer versions of IBM Middleware or an IBM Operating System, IBM provides Single Version Pricing (SVC) for a limited period. For more information see, “Specifying Single Version Charging for specific MLC products” on page 84.</td>
</tr>
</tbody>
</table>

**Note**

The MSU Cost Editor uses the Product Table from IBM to display the list of MLC products in your cost tables.

When you open the MSU Cost Editor, Cost Analyzer automatically checks for an update to the Product Table. If an update is available, the MSU Cost Editor displays the **Product Table Update** button.

For more information see, “Updating the Product Table” on page 90.

---

### Adjusting the MSU Cost Editor data display

To change how the data is displayed in the MSU Cost Editor, you can perform the following actions:

- Sort the data in a column alphabetically, in either ascending or descending order, by clicking the column header.

- Adjust the column widths by hovering over the header's column lines, and then clicking and dragging them to the desired size.
Using the MSU Cost Editor

In order to calculate the costs of running MLC products, Cost Analyzer requires you to insert cost coefficients from your IBM license agreement into cost tables. Use the MSU Cost Editor to edit the cost coefficients for each MLC product on your system.

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 Software Contract Reporting, Monthly Reporting, or Planning tools. 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 **Administration Tools**.

2. From the Administration Tools dialog, click **MSU Cost Editor**.

   The MSU Cost Editor displays showing a listing of MLC products as shown in Figure 8 on page 78.

3. In the MSU Cost Editor, perform one of the following actions:

   - To specify coefficients for a specific product, find the row for that product and click the **Edit** link in the Cost Coefficients column.

   - To specify or modify cost coefficients for individual Features of an MLC product, click the triangle icon (△) in that product's row to display the product's available features; then, click **Edit** in the Cost Coefficients column for the feature that you want.
A dialog displays a cost table showing the MSU ranges and their associated cost coefficients (Figure 9 on page 82).

**Figure 9: Sample MSU Cost Table**

![Sample MSU Cost Table](image)

---

**Note**

A separate cost table is available for each Pricing Metric Type.

---

4 From the **Pricing Metric Type** drop-down list, click the desired type to select its cost table for editing.

You should edit a separate cost table for each Pricing Metric Type associated with the MLC product. The pencil icon next to the Pricing Metric Type designation indicates that the cost table has been previously edited.

---

**Tip**

You can edit multiple cost tables at one time. If you want to switch to another cost table, click **Pricing Metric Type** to select it. You can perform this action whenever you want to alternate between cost tables.

---

5 Set the Base charge.
For Flat Workload License Charges (FWLC), you can only enter the flat price as MSU ranges do not apply to this type.

6 Edit the cost coefficients values in the cost table, entering the coefficients provided in your IBM License Agreement.

For each level in the MSU range, you can specify the cost coefficient associated with this MSU usage.

7 If you want to edit the cost table for another Pricing Metric Type, repeat Step 4 on page 82 through Step 6 on page 83.

8 When finished editing cost coefficients, click Accept.

Cost Analyzer applies your changes and closes the dialog.

9 Repeat Step 3 on page 22 through Step 8 on page 83 for each MLC product you want to edit.

10 When finished editing MLC products in the MSU Cost Editor, click Save Changes.

Overriding the pricing metric type

In most instances, the MLC products running on a CPC use the same pricing metric. However, there may be particular MLC products on the CPC that are using a different pricing metric type.

Use the follow procedure to override the CPC pricing metric type and designate a different pricing metric type for a specific MLC product.

Note For each MLC product, Cost Analyzer uses the default pricing metric type defined for the CPC in the CPC Configuration Editor. For more information, see “Using the CPC Configuration Editor” on page 75.

1 From the console, click Administration Tools.

2 From the Administration Tools dialog, click MSU Cost Editor.

3 From the MSU Cost Editor, perform one of the following actions:

- In the Pricing Metric Override column for the MLC product that you want to edit, click the drop-down box.
To specify a pricing metric override for an individual Feature of an MLC product, click the triangle icon ( ) in that product’s row to display the product’s available features; then, click the drop-down box in the **Pricing Metric Override** column.

4 From the drop-down list, click the Workload License Charge that you want to apply to the MLC product.

You can select from the options described in Table 16 on page 84:

**Table 16: Workload License Charge types**

<table>
<thead>
<tr>
<th>Workload License Charge</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEWLC</td>
<td>Advanced Entry Workload License Charges</td>
</tr>
<tr>
<td>AWLC</td>
<td>Advanced Workload License Charges</td>
</tr>
<tr>
<td>EWLC</td>
<td>Entry Workload License Charges</td>
</tr>
<tr>
<td>FWLC</td>
<td>Flat Workload License Charges</td>
</tr>
<tr>
<td>VWLC</td>
<td>Variable Workload License Charges</td>
</tr>
<tr>
<td>ZNALC</td>
<td>System z New Application License Charges</td>
</tr>
</tbody>
</table>

Once selected, the Pricing Metric Type that applies to the MLC product is displayed in **Pricing Metric Override** column.

5 Repeat Step 3 on page 83 through Step 4 on page 84 for each MLC product that you want to edit.

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

**Specifying Single Version Charging for specific MLC products**

Use the following procedure to specify single version charging for specific MLC products.

According to IBM, enterprises migrating to a new version of an IBM software product may require continued use of the old version during a transition period. In this situation, such use may be permitted without license charges accruing for the old version until the transition is complete. This is known as Single Version Charging (SVC).

If you have SVC arrangements with IBM, you need to indicate which MLC products are priced based on SVC, so that the correct pricing is included in the cost models.
1 From the console, click Administration Tools.

2 From the Administration Tools dialog, click MSU Cost Editor.

3 In the MSU Cost Editor, specify which products have SVC agreements:

   **Note**

   When specifying Single Version Charging for two versions of the same MLC Product, you must specify the SVC information in the row that corresponds to the newer version.

   a From the list of MLC Products, find the newer version of the product to which SVC applies.

   b In the Single Version Charge column of the newer version, click the drop-down box.

   c From the list of MLC product versions in the drop-down list, select the *old version* of the product covered by the SVC agreement.

   The MSU editor creates a link between the associated versions of the MLC products and populates the link in the Single Version Charge column. The link identifies the Product IDs of the associated versions and specifies which version is linked.

   **Note**

   When necessary, you can break the links established between MLC Products by clicking on the link icon (✩) and confirming that you want to remove the link when prompted.

   d Repeat Step 3.a on page 85 through Step 3.c on page 85 for each product that has an SVC agreement.

4 Repeat Step 3 on page 85 through Step 3.c on page 85 for each MLC product you want to edit.

5 When finished editing, click Save Changes.

Cost Analyzer retrieves SVC data from the cost table and applies that data to the cost model when you generate a report.

**Changing the reporting locale**

The reporting locale controls how your reports format monetary units, decimal numbers, dates, and times. Use the following procedure to change your system’s reporting locale to correspond to the standard location for your enterprise.
1 From the console, click **Administration Tools**.

2 From the Administration Tools dialog, click **MSU Cost Editor**.

3 To change the locale, click **Reporting Locale Settings**.

4 In the Reporting Locale Settings dialog, select the locale that you want from the list of Available Locales.

   For example, to select France in order to show costs in euros and dates in `dd/mm/yyyy` format, click the drop-down box and select **French (France):fr-FR**.

   **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 Click **Accept**.

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

**Managing multiple cost tables**

Use the following procedures to create and manage multiple cost tables.

The following list describes the features of working with multiple cost tables:

- Cost Analyzer has one active cost table. Whenever you open the MSU Editor, the active cost table displays and is indicated by the green check mark (`✔`).

- After the MSU Editor is open, you can:
  - Open an existing cost table
  - Create a new cost table
  - Delete a cost table

- When you create a new cost table or open a cost table that is not active, the MSU Editor provides the **Set as "active" cost table** button, which can be used to set this cost table as active. For more information, see “Setting a cost table as active” on page 89.
For any existing cost table, you can create a clone of the cost table and rename it.

**Note**
When Cost Analyzer builds the cost models, only the active cost table is used to calculate the cost data.
For more information, see “Overview of the MSU Cost Editor” on page 77.

**To create a new Cost Table**

1. From the MSU Editor, click **Create Cost Table**.

   The Create Cost Table dialog opens as shown in Figure 10 on page 87:

   **Figure 10: Sample Create Cost Table dialog**

2. In the **Cost Table Name** field, enter a unique name.

3. *(optional)* In the **Description** field, enter a description that pertains to the cost table.

4. From the list of Cost Tables, select a cost table template based on the following options:
   - Select **New Cost Table** to create a cost table that lists all MLC Products, but does not contain any cost coefficients.
Select an existing Cost Table to create a clone of that cost table, which can then be modified as needed.

5 Click Create Cost Table.

Cost Analyzer creates and displays the cost table in the MSU Cost Editor. You can modify the cost table and perform actions as described in “Using the MSU Cost Editor” on page 81.

To open an existing Cost Table

1 From the MSU Cost Editor, click Open a Cost Table.

The Open Cost Table dialog is displayed, listing the existing cost tables.

2 From the list of existing Cost Tables, select the Cost Table you want to open and then click Open Cost Table.

Cost Analyzer opens and displays the cost table in the MSU Cost Editor.

To delete a Cost Table

1 From the MSU Cost Editor, click Delete Cost Tables.

The Delete Cost Tables dialog is displayed, listing the existing cost tables.

Note
The following Cost Tables cannot be deleted and are not listed in the dialog:

- The active Cost Table.
- Any Cost Table referenced by a cost model of a historical month.

2 From the list of existing Cost Tables, select one or more Cost Tables that you want to delete.

3 Click Delete Cost Table and when prompted confirm that you want to delete the cost tables.

Cost Analyzer deletes the selected cost tables and closes the dialog.

Note
Deleting a cost table cannot be undone.
Setting a cost table as active

Use the following procedure to set a cost table as active.

When working with multiple cost tables, one table is always required to be set as the active cost table. When the daily Model Builder Task runs, the active cost table is used to build the cost model. Whenever required, you can change which cost table is set as the active cost table.

Whenever you open the MSU Cost Editor, the currently active cost table is automatically displayed.

To set a cost table as active

1. From the console, click Administration Tools.

2. From the Administration Tools dialog, click MSU Cost Editor.
   
   The MSU Cost Editor displays the active cost table.

3. Click Open Cost Table.

   The Open Cost Table dialog displays a list of available Cost Tables as shown in the following figure.
Note
A green check mark indicates which cost table is currently active.

4 From the list, select the Cost Table you want to set as active, then click Open Cost Table.

The MSU Cost Editor opens the selected cost table as shown in the following figure.

5 Click Set as "active" Cost Table.

6 Click Save Changes.

The MSU Cost Editor saves your changes and closes. The following results apply after changing the active cost table:

- Cost Analyzer uses the newly active cost table in your Model Builder Tasks to build the cost models.
- When you open the MSU Cost Editor, the newly active cost table is displayed.

Note
Changing the active Cost table does not affect previously built cost models. If you want to use the newly active cost table to calculate your previously built cost models, you need to rebuild them.

Updating the Product Table

Use the following procedure to update the Product Table used by the MSU Cost Editor to display the list of MLC Products your cost tables.
To update the Product Table

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

2. From the Administration Tools dialog, click **MSU Cost Editor**.

   The MSU Cost Editor displays the active cost table as shown in the following sample figure.

3. Click **Product Table Update Available**.

   The Update Product Table dialog opens as shown in the following sample figure.
4 Click **Install Updates**, then when prompted to confirm the installation click **Yes**.

Cost Analyzer downloads and installs the new Product Table. Then, the MSU Cost Editor reloads and displays the cost table.

*Note*

Repeat this procedure for each cost table you have defined.
Generating cost-analysis reports

This chapter explains how to use the Monthly Reporting tool and the Software Contract Reporting tool.

Creating and working with multiple views of reports

Use the following procedure to create a reporting view for viewing multiple reports at the same time. This procedure applies for both the Software Contract Reporting tool and the Monthly Reporting tool.

For more information, view the Quick Course Multi-month Software Contract Reporting. You must have a BMC Support ID to view the Quick Course.

To create a reporting view

1. At the bottom of either the Software Contract Reporting tool or the Monthly Reporting tool, click Create Reporting View (●).

   A reporting View tab opens at the bottom of the tool.

2. Use the selection panel to generate a Software Contract Summary Report or a Monthly Summary Report.

   For more information, see “Working with the Software Contract Reporting selection panel” on page 115 or “Working with the Monthly Reporting selection panel” on page 96.

3. Repeat Step 1 on page 22 and Step 2 on page 22 for each report you want to view.

4. When finished with a view, click the x to close the view.
Working with the Monthly Reporting tool

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

Monthly Reporting tool overview

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

**Note**

By using the view tabs, you can add views that allow you to generate multiple reports and give you the ability to toggle between the views. For more information see, “Creating and working with multiple views of reports” on page 93.

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

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

**Figure 11: Sample Monthly Summary Report selection panel**

You can display or hide the selection panel by clicking the icon.

For more information, see “Working with the Monthly Reporting selection panel” on page 96.
**Monthly Summary Report**

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

The report contains comprehensive breakdowns of monthly cost data; you can compare actual costs, MSUs, or both in varying degrees of detail and contexts. You can use the report to identify areas for cost reduction and perform the following analysis:

- Identify all monthly peak R4HA MSU Utilizations by MLC product.
- Identify the date and time of the first and second peaks of R4HA MSU Utilizations.
- Analyze the percent of total cost breakdown by MLC product, CPC, and LPAR.
- Compare cost data of MLC products running on specific CPCs or LPARs.
- Convert chart data into exportable data grids that list:
  - For any CPC, the hourly MSU Utilizations for all MLC products running on it
  - For any MLC product, the hourly MSU Utilization across LPARs

The report also provides dynamic and interactive data views of:

- LPAR R4HA MSU Utilization curves
- Baseline software license costs correlated with workload utilization and R4HA KPIs
- Charts that compare workload MSU Utilization across LPARs
- Charts that compare average hourly MSU Utilization to the R4HA
- Bar charts and funnel charts that break down the cost information into separate segments
- MSU Utilizations for Priced Features of MLC products

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 factors that affect your monthly costs.

By comparing charts that contain R4HA 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 Monthly Reporting selection panel

From the Monthly Reporting selection panel, you can generate a Monthly Summary Report to view on your screen or to export as a PDF.

To set up and generate a Monthly Summary Report

1. From the Cost Analyzer console, click the Monthly Reporting tab.
2. Click the icon to display the selection panel (if not displayed).
3. From the selection panel, select the usage month and year of the cost model from the list indicated on the calendar.

You can only select a usage month if there is an available cost model that has been built for that month. If a cost model is not available for a particular month, the month on the calendar is greyed-out and cannot be selected.

4. From the list of CPCs, select one or more CPC to include in the report.

   Note
   If Sysplex pricing is enabled in the CPC configuration editor, you need to select all the CPCs of a given PricingPlex in order to generate a report.

5. Select the output type:

   ■ To view the report on your screen, click the Screen Report button.
   

   Note
   You can generate multiple reports for viewing by clicking on the Create Reporting View button (>Create Reporting View (opens in new window)) to add a view. After the view is added, repeat Step 3 on page 96 through Step 5 on page 96.

   ■ To view the report as a PDF, click the PDF Report button.
   
   A dialog opens and prompts you to click Save As to save the PDF to your local computer or click Open to view the PDF in a separate window of your browser.
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. Using the hyperlinks, you can drill down on specific data to see more details and access interactive charts.

The top of each report identifies:

- Usage Month – The month when the MSU utilizations occurred.
- Billing Month – The month that IBM invoices for payment.
- Sysplex Pricing – Whether sysplex pricing applies to the report.
- Monthly MLC Total – The total cost of the MLC charges for the month.

Figure 12 on page 97 shows a sample Monthly Summary Report.

Figure 12: Sample Monthly Summary Report

Table 17 on page 97 describes the data that each column of the report contains.

Table 17: Data in the Monthly Summary Report

<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</td>
</tr>
<tr>
<td></td>
<td>The product ID is indicated in parentheses under the MLC product name.</td>
</tr>
<tr>
<td>CPC Name (PricingPlex Name)</td>
<td>Name of the CPCs on which this MLC product was active during some</td>
</tr>
<tr>
<td></td>
<td>intervals of the reporting period</td>
</tr>
<tr>
<td></td>
<td>The PricingPlex name (if one exists), is indicated in parentheses under the</td>
</tr>
<tr>
<td></td>
<td>CPC name.</td>
</tr>
<tr>
<td>Column header</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>4HRA MSU Utilization</td>
<td>Preview chart of the aggregated 4HRA MSU Utilization 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 peak value. You can expand or contract the chart data by adjusting the column width. When hovering over the chart, a tooltip displays chart statistics that provide more details about the chart data, as described in “Chart statistics display” on page 99.</td>
</tr>
<tr>
<td>4HRA First Peak Cost</td>
<td>Monthly license cost determined by the First Peak 4HRA value</td>
</tr>
<tr>
<td>% of Total Cost</td>
<td>The percentage that the product contributes to the total monthly cost Additional percentages are provided to break down the cost contribution of each CPC running the MLC Product. Note: 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>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>
<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: The 4HRA Second Peak value and Date/Time value do not affect MLC but do provide useful information. For example, if the first peak has only one occurrence and the second peak 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>
</tbody>
</table>

In the CPC column, a callout (Ⓡ) indicates that an adjustment has been made to the cost calculation for the data in that row. Hover over the callout to view the adjustment message.
Chart statistics display

By hovering over any 4HRA MSU Utilization chart in the list, you can display chart statistics that provide more details about the chart data. Table 18 on page 99 describes the chart statistics.

Table 18: Chart statistics for the Monthly Summary Report

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum 4HRA MSU</td>
<td>Minimum MSU value for the given month</td>
</tr>
<tr>
<td>Maximum 4HRA MSU</td>
<td>Maximum MSU value (peak value) for the given month</td>
</tr>
<tr>
<td>Average 4HRA MSU</td>
<td>Average MSU value for the given month</td>
</tr>
<tr>
<td>Spread 4HRA MSU</td>
<td>Difference between the Maximum and Minimum 4HRA MSU</td>
</tr>
<tr>
<td>Linear Trend Start</td>
<td>Starting MSU value for linear trend projection for the given month</td>
</tr>
<tr>
<td>Linear Trend End</td>
<td>Ending MSU value for linear trend projection for the given month</td>
</tr>
<tr>
<td>Linear Trend Direction</td>
<td>or indicates if the 4RHA linear trend projection is trending upwards or downwards</td>
</tr>
</tbody>
</table>

Data hyperlinks

In some columns, the data also serves as hyperlinks that let you drill down to details about 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 19 on page 99 lists the columns that contain data hyperlinks and describes the details that you can access:

Table 19: Hyperlinks in the Monthly Summary Report

<table>
<thead>
<tr>
<th>Column</th>
<th>Hyperlink</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLC Product</td>
<td>MLC products in the list that have Priced Features</td>
<td>Hyperlinks to details that list the Priced Features for the MLC product and their relevant 4HRA MSU Utilization data</td>
</tr>
<tr>
<td>Column</td>
<td>Hyperlink</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| CPC Name (PricingPlex Name)   | Any CPC name in the column | Hyperlinks to CPC details that list all MLC products running on the CPC and their relevant 4HRA MSU Utilization data  
Note: Although these 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. |
| 4HRA MSU Utilization          | Any preview chart in the column | 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 of the LPARs on which the selected MLC product is running, and their relevant 4HRA MSU Utilization data.  
Note: For each LPAR, the hyperlink displays only the intervals in which the selected product was running. |
| % of total cost               | Any percentage in the breakdown | Displays a funnel chart or bar chart that graphically represents cost distribution details |

**Data display controls**

Table 20 on page 100 describes the Monthly Summary Report icons that you can use to adjust the view and to access the Monthly Reporting tool panel.

**Table 20: Icons for the Monthly Summary Report**

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
</table>
| ![Icon](image) | Sorts a column's data in alphabetic or numeric order  
The arrow toggle controls whether the sort is in either ascending or descending order.  
**Note:** If a column's data can be sorted, the column's header becomes highlighted when you hover the mouse over the header. |
<p>| <img src="image" alt="Icon" /> | Displays or hides the Monthly Reporting tool panel |
| <img src="image" alt="Icon" /> | Adjusts the column width |</p>
<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>▼ or ▲</td>
<td>Expands or collapses row data</td>
</tr>
</tbody>
</table>

**Drill-down levels**

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

Using the drill-down levels, you can analyze:

- A specific CPC to compare the 4HRA MSU Utilizations for each MLC Product
  For more information, see “CPC level” on page 102.

- A particular MLC Product to compare the 4HRA MSU Utilizations for each LPAR on which the MLC product is active
  For more information, see “MLC Product level” on page 102.

Using the hyperlinks available at each level, you can:

- Compare average hourly MSUs to the 4HRA
  For more information, see Comparing average hourly MSUs to the 4HRA on page 108.

- Compare MSU Utilizations of workloads operating on LPARs
  For more information, see Viewing aggregated workloads across LPARs on page 109.
**CPC level**

Figure 13 on page 102 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 13: 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 19 on page 99:

*Note*

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

**Table 21: Hyperlinks of the CPC level**

<table>
<thead>
<tr>
<th>Column</th>
<th>Hyperlink</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4HRA MSU Utilization</td>
<td>Any chart 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 14 on page 103 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 14: Sample Monthly Summary Report MLC Product level

Table 22: 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 23 on page 103 lists the columns that contain data hyperlinks and describes the details of what you can access by using the link:

Table 23: 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>
<tr>
<td>Data Column</td>
<td>Hyperlink</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>---------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Aggregated Workload Views</td>
<td>Any workload link in the</td>
<td>Hyperlinks to the Aggregated Workload Viewer where you can compare workloads across LPARs For more information, see Viewing aggregated workloads across LPARs on page 109</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 20 on page 100.

### Table 24: Icons for CPC and MLC Product levels

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

Table 25 on page 104 describes the charting area icons.

### Table 25: Icons for charting area

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Data Grid View" /></td>
<td>Opens the Data Grid View window that contains a tabular view of the charting area data You can view the data in the window or export the data to a CSV file saved locally.</td>
</tr>
<tr>
<td><img src="image" alt="Chart" /></td>
<td>Opens a separate window that displays the chart</td>
</tr>
<tr>
<td><img src="image" alt="Chart" /></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 15 on page 105 and
Figure 16 on page 105 show samples of CPC and MLC Product levels with charts in the charting area.

**Figure 15: Sample CPC level with charts in charting area**

**Figure 16: 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, select the box next to the MLC Product (in a CPC level report) or next to 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.

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

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

Click the **Data Grid View** link () to open a window that displays a tabular view of the charting area data.

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

Click 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 and bar 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 the hyperlink.
A window displays the funnel chart (Figure 17 on page 107).

Figure 17: 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 any colored segment of the funnel and set it apart from the whole.

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

3 (optional) Click the **Bar Chart** tab to view the data in a bar chart form.
A window displays the funnel chart (Figure 18 on page 108).

Figure 18: Sample bar 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 the corresponding 4HRA MSU Utilization preview chart.
   - From the CPC level, find the MLC Product from the list and click the corresponding 4HRA MSU Utilization preview chart.

2. Find the LPAR listed in the LPAR Name column, and click its 4HRA MSU Utilization preview chart.
A window displays a chart that compares the average hourly MSUs to the 4HRA MSU Utilization (Figure 19 on page 109).

Figure 19: 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 101.

You can also click 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.

3 (optional) To export the chart as an image or export the data to a CSV file, perform one of the following actions:

- Click the Export chart as image button ( ) to export the chart.
- Click the Export To CSV button ( ) to export the data as a CSV file.

A dialog opens prompting you to save the file or image on your local computer.

Viewing aggregated workloads across LPARs

Use the following procedure to compare charts and MSU Utilization of workloads across LPARs.
For this procedure, you drill-down to the Workload Views level. Figure 20 on page 110 shows a sample of the Workload Views level:

**Figure 20: Sample Workload Views level**

<table>
<thead>
<tr>
<th>#</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Refresh Workload List</td>
<td>Refresh button for refreshing the view of the charting area</td>
</tr>
<tr>
<td>2</td>
<td>List of LPARs</td>
<td>LPARs contributing to the workloads</td>
</tr>
<tr>
<td>3</td>
<td>List of Workloads</td>
<td>Name of the workloads categorized under the Workload type</td>
</tr>
<tr>
<td>4</td>
<td>Show CPC 4HRA</td>
<td>Toggle switch that displays or hides the CPC's MSU Utilization chart from the charting area</td>
</tr>
<tr>
<td>5</td>
<td>Tabs of Workload types</td>
<td>Tabs to access the Workload types available for viewing in the Aggregated (by LPARs) Workload Viewer</td>
</tr>
<tr>
<td>6</td>
<td>Data Grid View</td>
<td>Link that opens the Data Grid View window that contains a tabular view of the charting area data</td>
</tr>
<tr>
<td>7</td>
<td>Chart view selectors</td>
<td>Buttons that change the view of the charts in the charting area</td>
</tr>
<tr>
<td>8</td>
<td>Export as image</td>
<td>Button that exports the chart as an image that can be saved on your local computer</td>
</tr>
</tbody>
</table>

For workloads and LPARs, the bar graphs visually represent the contribution of this element to the CPC peak. By hovering over any bar graph, a tooltip displays the contribution as a percentage.

**To drill-down to the Workload Views level and compare charts**

1. Using the hyperlinks, navigate to the MLC product level of the product that 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 the corresponding 4HRA MSU Utilization preview chart.

From the CPC level, find the MLC product from the list and click the corresponding 4HRA MSU Utilization preview chart.

2 From the list of Workload Reports, click the workload that you want to view.

The Workload Views level for the MLC product is displayed (Figure 20 on page 110).

3 From the list of workloads, select the workloads to add to the charting area by selecting the box next to the workload bar graph and name.

   Tip
   You can use the Select link to select or unselect all of the workloads. Also, you can click Sort by to rearrange the workloads by:

   - Name
   - 4HRA Contribution (in descending order)
   - Importance (most important to least)

Selecting a workload displays a chart. The chart represents the contribution of the workload to the total CPC peak value, aggregated for all of the listed LPARs.

In the charting area, you can perform the same interactive actions as described in “Drill-down levels” on page 101.

4 (optional) To add or remove the contribution of particular LPARs from the workloads, perform the following actions:

   a From the list of LPARs, select the LPARs whose contribution you want to add or remove from the workloads.

   b Click Refresh Workload List.

   The charts in the charting area are refreshed and the view is updated based on the selected LPARs.

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 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 145.
Working with the Software Contract Reporting tool

This section describes how to use the Software Contract Reporting tool to generate Software Contract Summary Reports and how to utilize the report's quadrants and capabilities in your cost analysis.

Software Contract Reporting tool overview

You can use the Software Contract Reporting tool to generate and analyze MLC Software Contract summary reports.

Note
By utilizing the reporting view tabs at the bottom of the Software Contract Reporting tool, you can generate MLC Contract summary reports for multiple MLC Software Contracts. For more information see, “Creating and working with multiple views of reports” on page 93.

The Software Contract Reporting tool provides a selection panel where you can browse existing MLC Software Contracts and generate MLC Software Contract Summary Reports.

Figure 21: Sample Software Contract Summary Report selection panel

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

For more information, see “Working with the Software Contract Reporting selection panel” on page 115.
Software Contract Summary Report

The Software Contract Summary Report and its interactive features provide you with the ability to compare charts of current and projected spending by billing month. Both historical and projected monthly data can also be compared against the monthly budgeted allocations.

The report contains quadrants of specific charts as identified in Table 26 on page 114.

<table>
<thead>
<tr>
<th>Quadrant</th>
<th>For more information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract Summary</td>
<td>“Contract Summary quadrant” on page 120</td>
</tr>
<tr>
<td>MLC Cost by Billing Month</td>
<td>“MLC Cost By Billing Month quadrant” on page 134</td>
</tr>
<tr>
<td>Average MSU Used to Peak R4HA (Ratio)</td>
<td>“Average MSU Used to Peak R4HA (Ratio) quadrant” on page 130</td>
</tr>
<tr>
<td>Cost Variance by Billing Month</td>
<td>“Cost Variance by Billing Month quadrant” on page 140</td>
</tr>
</tbody>
</table>

The quadrant charts each have unique drill-down levels that provide you with the ability to view a breakdown of:

- Software cost by MLC product
- Peak R4HA costs by CPCs
- Cumulative aggregated MLC costs by billing month
- Workload activity views of individual MLC products that detail:
  - Current R4HA usage on CPCs and across LPARs
  - Changes in both monthly cost and R4HA over previous months

For any month of the duration of the contract, the report also provides you with the ability to open and view:

- The actual Monthly Summary Report for any month in the past.
- The projected Monthly Summary Report for any month in the future.
Working with the Software Contract Reporting selection panel

From the Software Contract Reporting selection panel, you can generate a Software Contract Summary Report.

To generate a Software Contract Summary Report

1. From the Cost Analyzer console, click the Software Contract Reporting tab.

2. Click the icon to display the selection panel (if not displayed).

3. From list of software contracts on the selection panel, select the software contract that you want for a screen report.

4. Click Screen Report.

Note: You can generate multiple reports for viewing by clicking on the Create Reporting View button (>Create) to add a view. After the view is added, repeat Step 2 on page 96 through Step 4 on page 96.

Quick tour of the Software Contract Summary Report

The Software Contract Summary Report displays chart quadrants that serve as portals to launch detailed analysis of historical and projected MLC product spending based on your IBM contract, budget allocations, actual MSU usage and projected spending expenditures.

Using the drill-down features unique to each quadrant and hyperlinks to the Monthly Summary Report, you can view charts and data in a variety of forms for comprehensive analysis of MLC product costs for the entire duration of your contract.
Figure 22 on page 116 shows a sample Software Contract Summary Report.

**Figure 22: Sample Software Contract Summary Report**

Table 27 on page 116 describes the initial charts displayed in each quadrant.

**Table 27: Quadrant charts**

<table>
<thead>
<tr>
<th>Quadrant chart</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract Summary</td>
<td>View charts that compare spending against budgeted amounts for both the current expenditures and the projected total cost of the entire term of the contract.</td>
</tr>
<tr>
<td>MLC Cost by Billing Month</td>
<td>View charts that compare actual and projected monthly costs against budget allotments.</td>
</tr>
<tr>
<td>Average MSU Used to Peak R4HA (Ratio)</td>
<td>View charts that compare the ratio of average monthly MSU utilizations to the monthly Peak R4HA.</td>
</tr>
<tr>
<td>Cost Variance by Billing Month</td>
<td>View charts that compare the cost difference between the budgeted allocations and the monthly spending costs for both actual and projected spending.</td>
</tr>
</tbody>
</table>

Each quadrant provides navigation buttons to access drill-down level, change chart display options, and toggle between views as described in **Table 28 on page 116**.

**Table 28: Navigation buttons**

<table>
<thead>
<tr>
<th>Navigation Button</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maximizes the displays of the quadrant</td>
</tr>
<tr>
<td></td>
<td>Minimizes the display of the quadrant</td>
</tr>
<tr>
<td></td>
<td>Opens a window to access a drilldown link to a chart view unique to the quadrant</td>
</tr>
<tr>
<td></td>
<td>Opens a window to access selection options for available chart views and contract period view types</td>
</tr>
</tbody>
</table>
Navigation Button | Description
---|---
● | Provides the ability to toggle between views of charts specific to that quadrant

Chart options provide you with the ability to select from the available chart views or change the presentation of the display of the chart by selecting a contract period view type. For more information about the unique chart views available for a quadrant, see “Quadrant charts” on page 118.

Table 29 on page 117 describes the contract period view type options.

### Table 29: Contract Period View Types

<table>
<thead>
<tr>
<th>Contract Period View Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Period View</td>
<td>Displays a chart of all periods with every month of the contract arranged in sequential order</td>
</tr>
<tr>
<td>Stacked Period View</td>
<td>Displays a chart for each period of the contract with each period chart stacked in sequential order and aligned by months</td>
</tr>
<tr>
<td>Grouped Period View</td>
<td>Displays a chart of all periods grouped together by billing month. For every month, the monthly data for that month from each period is displayed side-by-side.</td>
</tr>
</tbody>
</table>

For more information about the hyperlinks and drill-down links available for each quadrant, see the following topics:

- “Contract Summary quadrant” on page 120
- “MLC Cost By Billing Month quadrant” on page 134
- “Average MSU Used to Peak R4HA (Ratio) quadrant” on page 130
- “Cost Variance by Billing Month quadrant” on page 140

### Working with chart options

Use the following procedure to change the chart period view type with the Chart Options icon.

1. In the quadrant chart you want to change, click on Chart Options icon.

   The Chart Options window displays.

2. Perform any of the following actions:
Select a Chart View from the dropdown list.
The chart is displayed in the viewer.

Click a Contract Period View Type.
When you select a Contract Period View Type, the view type is changed for all charts in the quadrant. After you select the Contract Period View Type, if you click on the toggle dots (•) the selected view type remains consistent for the alternative chart views.

3 Click Close to close the Chart Options window.

Working with drilldown links

Use the following procedure to display the drilldown chart with the Drilldown Links icon (φ).

To display a drilldown link chart

1 In the quadrant chart, click on Drilldown Links icon (φ).

The Drilldown Links window displays.

2 Click on the hyperlink to display the chart.

Cost Analyzer generates and displays the selected hyperlink chart.

Tip
If you want to return to the Software Contract Summary Report, click Go Home (Go Home) or Go Back (Go Back).

Quadrant charts

This section describes the quadrant charts, drill-down levels, and hyperlinks of the Software Contract Summary Report that can be used for comprehensive analysis of budgeted, historical and projected spending.

Billing Month vs. Usage Month

The billing month is the month IBM invoices for payment of MLC costs that accrued from a usage month in the past. In all cases, the billing month is one month after the
end of a usage month. For example, the billing month of March corresponds to the usage month of January.

The Software Contract Summary Report displays all cost data based on the billing month. It is important to note that when using the billing month in a chart to hyperlink to the Monthly Summary Report, Cost Analyzer opens the corresponding usage month in the Reporting tool.

**Tip**
Since the view tabs at the bottom of the Monthly Summary Reporting tool identify the Usage Month, use the banner at the top of the Monthly Summary Report to identify the Billing Month.

### Source of cost data

The charts of the Software Contract Summary Report contain the following types of monthly cost data as described in Table 30 on page 119.

#### Table 30: Cost data types

<table>
<thead>
<tr>
<th>Cost data</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted</td>
<td>Budgeted amounts are based on values contained in the Software Contract and defined by the administrator.</td>
</tr>
<tr>
<td>Usage</td>
<td>Usage data are based on cost models built from Model Builder Tasks. A usage month starts on the 2nd of the current month, and ends on the 1st of the next month. Once all cost models from a usage month have been built, they serve as the historical record of the monthly spending and are accessed by the Software Contract Reporting tool when calculating the cost data of the report. Actual usage data for a month replaces projected spending only after all cost models have been built for the complete month. <strong>Note:</strong> All cost models for a complete usage month are usually available starting from 0000 hours of the third day of the next month, but this availability cannot be assumed because it depends on whether all the data for the usage month has been processed.</td>
</tr>
<tr>
<td>Projected</td>
<td>Projected costs are based historical usage, LPAR MSU usage, and Product LPAR licensing. Projected spending extends for the duration of the contract. The projections differentiate weekly shift periodicity and distinguish day-of-month, hourly variance. Linear projections are made for each shift for each LPAR and LPAR Licensed Product, with detailed results available through the monthly cost model reporting. <strong>Note:</strong> Projected spending does not contain any seasonal adjustments.</td>
</tr>
</tbody>
</table>
Guide to the charts of the Software Contract Summary Report

The following topic provides a quick reference table that contains links for more information about the charts of the Software Contract Summary Report.

Table 31 on page 120 describes the charts available in the Software Contract Summary Report quadrants.

Table 31: Charts of the Software Contract Summary Report

<table>
<thead>
<tr>
<th>Quadrant</th>
<th>Charts</th>
<th>For more information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract Summary</td>
<td>Contract Summary</td>
<td>“Contract Summary quadrant” on page 120</td>
</tr>
<tr>
<td></td>
<td>MLC Product Summary View</td>
<td>“Accessing the MLC Product Summary View” on page 123</td>
</tr>
<tr>
<td></td>
<td>MLC Product Activity View</td>
<td>“Accessing the MLC Product Activity View” on page 126</td>
</tr>
<tr>
<td>MLC Cost by Billing Month</td>
<td>MLC Cost by Billing Month</td>
<td>“Accessing the Aggregated MLC Cost by Billing Month chart” on page 136</td>
</tr>
<tr>
<td></td>
<td>Aggregated MLC Cost by Billing Month</td>
<td>“Accessing the Aggregated MLC Cost by Billing Month chart” on page 136</td>
</tr>
<tr>
<td></td>
<td>Software Cost by MLC Product</td>
<td>“Accessing and working with the Software Cost by MLC Product view” on page 138</td>
</tr>
<tr>
<td>Average MSU used to Peak R4HA (Ratio)</td>
<td>Average MSU used to Peak R4HA (Ratio)</td>
<td>“Average MSU Used to Peak R4HA (Ratio) quadrant” on page 130</td>
</tr>
<tr>
<td></td>
<td>Peak R4HA by Billing Month</td>
<td>“Accessing the Peak R4HA by Billing Month chart” on page 131</td>
</tr>
<tr>
<td></td>
<td>MLC Contract: CPC Usage</td>
<td>“Accessing and working with the MLC Product: CPC Usage chart” on page 132</td>
</tr>
<tr>
<td>Cost Variance by Billing Month</td>
<td>Cost Variance by Billing Month</td>
<td>“Cost Variance by Billing Month quadrant” on page 140</td>
</tr>
<tr>
<td></td>
<td>Cost Variance to Date</td>
<td>“Accessing the Cost Variance to Date chart” on page 142</td>
</tr>
<tr>
<td></td>
<td>Software Cost by MLC Product</td>
<td>“Accessing and working with the Software Cost by MLC Product view” on page 138</td>
</tr>
</tbody>
</table>

Contract Summary quadrant

The Contract Summary quadrant displays a chart that compares spending against budgeted amounts for both the current expenditures and the projected total cost of the entire term of the contract.
The current month designation does not refer to the month of the present time. Cost Analyzer determines your current month as the most recent month from the past that has a complete set of cost models built.

For example, if today is January 16, 2015, and there are a complete set of cost models built for December, 2014, then your current month is December.

However, if for some reason the cost models for December and November were never built, and the most recent month that has a complete set of cost models built is October. Then, your current month is October.

Figure 23 on page 121 shows a sample Contract Summary that displays charts that show the current spend and the projected spend compared to their corresponding budgeted allocations.

Figure 23: Sample Contract Summary quadrant

<table>
<thead>
<tr>
<th>#</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Contract end month with cost difference</td>
<td>The date identifies the month the contract ends and the amount indicates the cost difference between the accumulated Projected Spend amount and the accumulated Budgeted amount.</td>
</tr>
<tr>
<td>#</td>
<td>Description</td>
<td>Details</td>
</tr>
<tr>
<td>----</td>
<td>--------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 2  | Toggle dots                                | Click on the dots to toggle between available chart views. These dots let you switch between the following views:  
- MLC Contract Summary View  
- MLC Product Summary View                                                                                     |
| 3  | Contract billing month with cost difference | The date identifies the current billing month of the contract and the amount indicates the cost difference between the current spending amount and the current budget amount.                                                                                                               |
| 4  | Year over Year Cost                        | The amount indicates the difference between what was spent in the current month relative to how much was spent in the same month a year ago.                                                                                                                                  |
| 5  | Ending date of contract                    | The date and year of the last month of the contract.                                                                                                                                                                                                                                                                               |
| 6  | Starting Date of contract                  | The date and year of the starting month of the contract.                                                                                                                                                                                                                                                                          |
| 7  | Current spend amount                       | The amount indicates the total MLC product spending from the start of the contract through the current billing month.                                                                                                                                                     |
| 8  | Volume chart of current spend and current budget | The bar chart indicates the cumulative volume level of both the current spending and the current budget amounts. The bar represents the accumulated spending from the start of the contract through the current billing month.  
The color (whether green or red) indicates whether the current spending is over or under the budgeted amount allocated. |
| 9  | Current budget                             | The amount indicates the total budgeted for spending from the start of the contract through the current billing month.                                                                                                                                                  |
| 10 | Contract name                              | The name assigned to the contract.                                                                                                                                                                                                                                                                                               |
| 11 | Projected spend                            | The amount indicates the total MLC product spending from the start of the contract through the end of the contract.  
**Note:** The amount includes a sum of both actual and projected cost amounts.                                                                                                                        |
| 12 | Volume chart of projected spend and total budget | The bar chart indicates the cumulative volume level of both the total projected spending and the total budget amounts. The bar represents the accumulated spending from the start of the contract through the end of the contract.  
The color (whether green or red) indicates whether the projected spending is over or under the budgeted amount allocated.                                                        |
| 13 | Total budget                               | The total amount budgeted for the contract.                                                                                                                                                                                                                                                                                       |
| 14 | Minimize/maximize control button           | A control button to maximize or minimize the chart view.                                                                                                                                                                                                                                                                         |
**Note**

For any value in the chart, the arrow color (whether green or red) indicates whether the value is over (▲) or under (▼) the budgeted amount.

The *Contract Summary* contains an alternative Chart View (*MLC Product Summary View*) where you can also access hyperlinks to the *MLC Product Activity View*.

For information about drill-down levels and hyperlinks of the *MLC Contract Summary View*, see “Accessing the MLC Product Summary View” on page 123.

**Drill-down levels and links (Contract Summary)**

This section describes the drill-down levels and links available in the MLC Contract Summary View quadrant.

The following views are available:

- “Accessing the MLC Product Summary View” on page 123
- “Accessing the MLC Product Activity View” on page 126

For quick reference, Table 32 on page 123 describes how to access the drill-down levels and hyperperlink views.

### Table 32: Accessing drill-down and hyperlink views

<table>
<thead>
<tr>
<th>To access</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLC Product Summary View</td>
<td>In the MLC Contract Summary View, click on the grayed-out dot (●).</td>
</tr>
<tr>
<td>MLC Product Activity View</td>
<td>In the MLC Product Summary View, click on any cost change value in the MoM, QoQ, or YoY columns.</td>
</tr>
</tbody>
</table>

**Accessing the MLC Product Summary View**

By accessing the *MLC Product Summary View*, you can view a breakdown of the MLC Contract Summary View into its individual MLC Products and their contributions to the Current Usage and Projected Costs. The toggle dots (●) at the bottom of the quadrant provide you with the ability to toggle between the available views.

**Tip**

By hovering over the toggle dot, a popup tooltip indicates the view it displays.

**To access the MLC Product Summary view**

1. In the *MLC Contract Summary View*, click the grayed-out toggle dot (●).  

The **MLC Product Summary View** displays as shown in Figure 24 on page 124.

**Figure 24: Sample MLC Product Summary View**

The **MLC Product Summary View** shows a breakdown of the cost of every MLC product in the contract. The view details each individual MLC Product’s contribution to the Current Usage Cost and the Projected Total Cost.

Table 33 on page 124 describes the data that each column contains.

**Table 33: Data in the MLC Product Summary View**

<table>
<thead>
<tr>
<th>Column header</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLC Product</td>
<td>Name of the MLC product</td>
</tr>
<tr>
<td>Current Usage Cost</td>
<td>Total Usage Cost of the MLC product</td>
</tr>
<tr>
<td></td>
<td>The amount indicated is the sum of the actual usage costs from the contract starting month to the current billing month. The percentage represents the contribution of the MLC product to the total usage cost.</td>
</tr>
<tr>
<td>Projected Total Cost</td>
<td>Total Projected Cost of the MLC Product</td>
</tr>
<tr>
<td></td>
<td>The amount indicated is the sum of the actual usage costs and the projected costs from the contract starting month to the contract ending month. The percentage represents the contribution of the MLC product to the total contract cost.</td>
</tr>
<tr>
<td>Current Vs. Projected</td>
<td>Bar graph of the current usage cost and the projected costs</td>
</tr>
<tr>
<td></td>
<td>The bar graph indicates the current contribution with a solid blue bar and the projected cost contribution with a striped bar. By hovering over the bar graph, a popup displays the numeric amount of the costs.</td>
</tr>
<tr>
<td>Column header</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| MoM Cost Change | Month Over Month cost change  
The amount indicates the difference between the cost of the MLC Product for the current billing month and the MLC Product cost of the previous month. The percentage represents the percent difference from the previous month.  
Note: The cost change value is a hyperlink to the Activity View of the MLC product. For more information see, “Accessing the MLC Product Activity View” on page 126. |
| QoQ Cost Change | Quarter Over Quarter cost change  
The amount indicates the difference between the cost of the MLC product for the current month and the MLC Product cost for the month that was 3 months prior to that. The percentage represents the percent difference between the monthly costs.  
Note: The cost change value is a hyperlink to the Activity View of the MLC product. For more information see, “Accessing the MLC Product Activity View” on page 126. |
| YoY Cost Change | Year Over Year cost change  
The amount indicates the difference between the cost of the MLC Product for the current month and the MLC Product cost that was 12 months prior to that. The percentage represents the percent difference from the previous year.  
Note: N/A (Not Available) indicates that Cost Analyzer does not have the cost data needed to calculate the value.  
The cost change value is a hyperlink to the Activity View of the MLC product. For more information see, “Accessing the MLC Product Activity View” on page 126. |

*Tip*  
By clicking on the column header, you can sort any of the columns in the report either by alphabetic order or by ascending or descending values.

The *MLC Product Summary View* contains hyperlinks to the *Activity View of the MLC Product*.

The Activity Views can be accessed from data hyperlinks in the following columns:

- MoM Cost Change
- QoQ Cost Change
- YoY Cost Change

For information about the hyperlinks to the Activity Views of the MLC products, see “Accessing the MLC Product Activity View” on page 126.

**Accessing the MLC Product Activity View**

The *MLC Product Activity View* provides a report of the current usage activity that affects the cost of a particular MLC product by contributing to the total Peak R4HA value, and the activity changes from a previous month, quarter, or year.

**To access the Activity View of any MLC Product**

1. In the *MLC Product Summary View*, click on any cost change value in the following columns:
   - MoM Cost Change
   - QoQ Cost Change
   - YoY Cost Change

The *MLC Product Activity View* for the MLC Product initializes and displays as shown in Figure 25 on page 126.

**Figure 25: Sample MLC Product Activity View**

**MLC Product Activity View legend**

<table>
<thead>
<tr>
<th>#</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Generate Report button</td>
<td>Generates a report based on the selection of CPC, LPARs and Workloads from the tree</td>
</tr>
</tbody>
</table>
### Description

<table>
<thead>
<tr>
<th>#</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Workloads</td>
<td>List of Workloads for the LPAR</td>
</tr>
<tr>
<td>3</td>
<td>LPARs</td>
<td>LPARs on the CPC</td>
</tr>
<tr>
<td>4</td>
<td>CPC</td>
<td>CPC name</td>
</tr>
</tbody>
</table>
| 5  | Variance Filter   | Filter dropdown menu to change the data display in the report. You can select which change data to display in the report. Use the dropdown menu to select the change data as follows:  
  - Change from Last Month  
  - Change from Last 3 Months  
  - Change from Last 12 Months |
| 6  | Go Back           | Navigates back to the MLC Product Summary View                         |
| 7  | Go Home           | Navigates back to the MLC Product Summary View                         |
| 8  | Workload tabs     | Workloads type tabs  
  You can select the Workload tab to display its Activity View.         |
| 9  | Activity report   | Columns of data that detail the activity of the MLC Product            |

When initializing the Activity View, the report displays the CPC and LPAR (and Workload, if available) that contribute the largest difference in cost for that MLC product. For any report display formation, the largest contribution status for any CPC, LPAR, or Workload is indicated by a flag ( []).

**Table 34 on page 127** describes the data that each column contains.

**Table 34: Data in the MLC Product Activity View**

<table>
<thead>
<tr>
<th>Column header</th>
<th>Description</th>
</tr>
</thead>
</table>
| CPC:LPAR:WORKLOAD      | Name of the CPCs, LPARs and Workloads  
  The following icons indicate the sysplex component type:  
  -    (CPC)  
  -    (LPAR)  
  -    (Workload) |
<p>| Type                   | Indicates the sysplex component type (whether CPC, LPAR, or Workload)      |</p>
<table>
<thead>
<tr>
<th>Column header</th>
<th>Description</th>
</tr>
</thead>
</table>
| Actual Cost                                      | Actual usage cost of the MLC Product for the current billing month  
**Note:** Actual costs are available only for the CPC. For LPARS and Workloads the Actual Costs amounts are not calculated because the cost is calculated as a whole for the CPC. |
| Current R4HA                                     | Peak R4HA value of the current billing month                                                                                                                                                            |
| Monthly Cost Change Over Previous Month/3 Months/12 Months | Difference between the actual cost and previous costs over a specific length of time
The cost change can be displayed for the previous month, previous 3 months, or previous 12 months. You change the display by using the Variance Filter dropdown menu.  
**Note:** Cost changes are available only for the CPC. For LPARS and Workloads the cost change amounts are not calculated because the cost changes are calculated as a whole for the CPC. |
| Monthly R4HA Change Over Previous Month/3 Months/12 Months | Difference between the R4HA and previous R4HA over a specific length of time
The R4HA change can be displayed for the previous month, previous 3 months, or previous 12 months. You change the display by using the Variance Filter dropdown menu. |
| Monthly Cost Change Average Over Last Month/3 Months/12 Months | Difference between the average actual cost and the average previous costs over a specific length of time
The average cost change can be displayed for the previous month, previous 3 months, or previous 12 months. You change the display by using the Variance Filter dropdown menu.  
**Note:** Average cost changes are available only for the CPC. For LPARS and Workloads the average cost change amounts are not calculated because the average cost change is calculated as a whole for the CPC. |
| Monthly R4HA Change Average Over Last Month/3 Months/12 Months | Difference between the average R4HA and previous average R4HA over a specific length of time
The average R4HA change can be displayed for the previous month, previous 3 months, or previous 12 months. You change the display by using the Variance Filter dropdown menu. |

**Note**
For any Cost Change or R4HA Change column a red triangle (▲) indicates the value is higher than the current billing month, while a green triangle (▼) indicates the value is lower.
Working with the MLC Product Activity View

The *MLC Product Activity View* provides the ability to generate the activity data in a variety of forms to facilitate the analysis of the data.

**To generate Activity View reports**

1. Open the Activity View for the MLC Product you want to display.
   For more information, “Accessing the MLC Product Activity View” on page 126.

2. From the Workload tabs, select the Workload you want to examine.

3. Perform one or more of the following actions:
   - Above the tree, click **Select Highest**. The Activity Viewer automatically generates a report that shows the highest contributing CPC, LPAR, and, if available, the Workload.
   - Above the tree, click **Select All**. The Activity view automatically generates a report that shows all CPCs, LPARs, and Workloads.
   - From the tree, select the individual CPCs, LPARs and Workloads you want to display, then click **Generate Report**.

     **Note**
     Press and hold the **Shift** key to select an element and its children.

   - Click on the Variance Filter dropdown menu and select from the following options:
     - Change From Last Month
     - Change From Last 3 Months
     - Change From Last 12 Months
     The Activity View automatically generates a report based on the selection.

     **Tip**
     By clicking on the column header, you can sort any of the columns in the report either by alphabetic order or by ascending or descending values.
Average MSU Used to Peak R4HA (Ratio) quadrant

The Average MSU Used to Peak R4HA (Ratio) quadrant displays a chart that can be used as an indicator of whether your system is tuned for cost optimization. The metric utilized to determine cost optimization is the ratio of the average MSU Used to the Peak R4HA.

The average MSU Usage indicates the theoretical minimal value of the Peak R4HA that a system could have been charged during a month, if all activity was evenly distributed between the hours of the month. The Peak Four-hour Rolling Average (R4HA) represents the utilization level that determines the actual cost that will be charged for using MLC products during that month.

Since the peak R4HA utilization is always greater than the average MSU used, their ratio indicates whether your actual average MSU usage approaches the peak usage level that determines the cost. The closer the ratio is to 1, the closer the system is optimized for cost efficiency. In the chart, this is represented by the yellow optimal ratio line at the top.

No matter what the ratio, a relatively level charting over time (a flat line) indicates the system's month-to-month cost stability. Similarly, dips and valleys in the charting indicate months where the cost optimization was not operating effectively.

Figure 26 on page 130 shows a sample Average MSU Used to Peak R4HA (Ratio).

Figure 26: Sample Average MSU Used to Peak R4HA (Ratio)

The chart shows every month that comprises the software contract. For any billing month from the past, the ratio is based on actual costs and is indicated by a solid blue dot. For any future billing month, the ratio is based on projected costs and is indicated by a grey dot.

You can use the toggle dots (●) to switch between the following chart views:

- Average MSU Used to Peak R4HA (Ratio)
- Peak R4HA by Billing Month
You can use the Chart Options icon (○) to change the display of the chart as follows:

- Single period view
- Stacked period view
- Grouped period view

For more information see about these views, see “Quick tour of the Software Contract Summary Report” on page 115.

The *Average MSU Used to Peak R4HA (Ratio)* quadrant contains an alternative Chart View (*Peak R4HA by Billing Month*) and a drill-down level to examine the Peak R4HA by Billing Month charts for CPCs.

For more information, see the following topics:

- “Accessing the Peak R4HA by Billing Month chart” on page 131
- “Accessing and working with the MLC Product: CPC Usage chart” on page 132

**Accessing the Peak R4HA by Billing Month chart**

By accessing the *Peak R4HA by Billing Month* chart, you can view separate charting lines for both the Peak R4HA and the Average MSU Used. The toggle dots at the bottom of the quadrant provide you with the ability to toggle between the available views.

**To access the Peak R4HA by Billing Month chart**

1. Perform one of the following actions:

   - In the *Average MSU Used to Peak R4HA* quadrant, click the greyed-out toggle dot ( ●).
   - Click on the Chart Options icon (○), and then select **Peak R4HA by Billing Month** from the Chart Views dropdown list.
The Peak R4HA by Billing Month chart displays as shown in Figure 27 on page 132.

**Figure 27: Sample Peak R4HA by Billing Month**

By viewing the coefficients of the ratio as separate charts, you can identify which one was more responsible for any dip or valley of the ratio chart.

In general, if the chart for the average MSU for a month contains a sudden drop and the Peak R4HA for the same month remains level, it indicates that during this month the system was underutilized. In this case, you should investigate why there is a wide discrepancy between the actual cost of MSU usage and the average amount of MSU being utilized.

On the other hand, if the chart for the Peak R4HA for a month contains a sudden spike and the Average MSU Usage for the same month remains level, it indicates that during this month, there may have been a problem. In this case, you should investigate what event occurred to cause the surge in the Peak R4HA.

At any time, you can use the toggle dot (●) to switch to the Average MSU to Peak R4HA (Ratio) chart.

The Peak R4HA by Billing Month chart also contains a link to the MLC Product: CPC Usage drill-down chart. This chart can be accessed from the drill-down links button (●).

For information about the MLC Product: CPC Usage chart, see “Accessing and working with the MLC Product: CPC Usage chart” on page 132.

**Accessing and working with the MLC Product: CPC Usage chart**

The MLC Product: CPC Usage chart contains separate charting of the Peak R4HA by Billing Month for each CPC of the system.
To access the MLC Product: CPC Usage chart

1. From the Average MSU Used to Peak R4HA chart or the R4HA by billing Month chart, click on the Drilldown Links button (🔗).

   The Drilldown links window displays.

2. In the Drilldown links window, click on the **MLC Product: CPC Usage** hyperlink.

   The MLC Contract: CPC Usage view displays as shown in Figure 28 on page 133.

   **Figure 28: Sample Peak R4HA by Billing Month**

3. *(optional)* From the list of CPCs, select which CPCs to display in the viewer.

   Use the following options to change the CPCs displayed in the chart:

   - Scroll through the list of Contract CPCs and select the CPCs to display in the chart.
   - Click **Select All** to select all CPCs for display in the chart.

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

   - Click and drag between any two points on the chart to zoom in on the selected area.
   - Click the edge of the bottom scroll bar, and then expand or contract the control bar to adjust the zoom feature.
   - Hover the mouse over any point on the chart to view the value as well as the date it occurred.

4. *(optional)* To view alternative chart options, perform one of the following actions:

   - Click on the toggle dots to access the following Chart Views:
—Peak R4HA by Billing Month
—Average Monthly MSU Used by CPC
—Average MSU Used to Peak R4HA (Ratio)

- Click on the Chart Options button (°), then select one of the Chart Views from the dropdown list.

Figure 29 on page 134 shows a sample Average Monthly MSU Used by CPC.

Figure 29: Sample Average Monthly MSU Used by CPC

Figure 30 on page 134 shows a sample Average MSU Used to Peak R4HA (Ratio).

Figure 30: Sample Average MSU Used to Peak R4HA (Ratio)

**MLC Cost By Billing Month quadrant**

The MLC Cost by Billing Month quadrant contains a bar chart that displays the actual costs and projected costs for every billing month of the contract. Additionally, a line at the top of the chart represents the budgeted costs for each billing month.
Figure 31 on page 135 shows a sample MLC Cost By Billing Month chart.

Figure 31: Sample MLC Cost by Billing Month

![Sample MLC Cost by Billing Month chart](image)

Table 35 on page 135 describes the elements of the chart.

Table 35: Chart elements of the MLC Cost by Billing Month

<table>
<thead>
<tr>
<th>Chart element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid bar</td>
<td>Actual cost of the billing month</td>
</tr>
<tr>
<td>Striped Bar</td>
<td>Projected cost of the billing month</td>
</tr>
<tr>
<td>Black/gray point</td>
<td>Budgeted cost of the billing month</td>
</tr>
</tbody>
</table>

The toggle dots (●) of the quadrant provide you with the ability to toggle between the following chart views:

- MLC Cost By Billing Month
- Aggregated MLC Cost By Billing Month

You can also use the Chart Options icon (●) to select the alternative chart or to change the display of the chart as follows:

- Single period view
- Stacked period view
- Grouped period view

For more information see about these views, see “Quick tour of the Software Contract Summary Report” on page 115.
Hyperlinks to the Monthly Summary Report

Each bar of the chart (whether solid or striped) is a hyperlink to the Monthly Summary Report for that billing month. By clicking on the bar, Cost Analyzer opens the Monthly Reporting tool and generates the Monthly Summary Report for that billing month.

Figure 32 on page 136 shows the Monthly Summary Report for a projected billing month.

**Figure 32: Sample Monthly Summary Report ("Projected")**

![Monthly Summary Report](image)

You can drill-down into the Monthly Summary Report for in-depth analysis of the utilization data. For more information, see “Drill-down levels” on page 101.

At any time, when you want to return to the Software Contract Report, click on the Software Contract Reporting tool tab.

The MLC Cost By Billing Month quadrant contains an alternative Chart View (Aggregated MLC Cost by Billing Month) and a drill-down level to examine the Software Cost by MLC Product.

For more information, see the following topics:

- “Accessing the Aggregated MLC Cost by Billing Month chart” on page 136
- “Accessing and working with the Software Cost by MLC Product view” on page 138

**Accessing the Aggregated MLC Cost by Billing Month chart**

By accessing the Aggregated MLC Cost by Billing Month chart, you can view a cumulative chart that displays the actual costs and projected costs for every billing month of the contract. Additionally, the sloped line at the top represents the cumulative budget costs for each billing month.
The toggle dots at the bottom of the quadrant provide you with the ability to toggle between the available Chart Views.

To access the Aggregated MLC Cost by Billing Month chart

1. Perform one of the following actions:
   - In the MLC Cost By Billing Month quadrant, click the grayed-out toggle dot (●).
   - Click on the Chart Options icon (●●), and then select Aggregated MLC Cost by Billing Month from the Chart Views dropdown list.

   The Aggregated MLC Cost by Billing Month displays as shown in Figure 33 on page 137.

   **Figure 33: Sample Aggregated MLC Cost by Billing Month**

   ![](chart.png)

   Table 36 on page 137 describes the elements of the chart.

   **Table 36: Chart elements of the Aggregated MLC Cost by Billing Month**

<table>
<thead>
<tr>
<th>Chart element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid bar</td>
<td>Actual cumulative cost of the billing month</td>
</tr>
<tr>
<td>Striped Bar</td>
<td>Projected cumulative cost of the billing month</td>
</tr>
<tr>
<td>Black/gray point</td>
<td>Budgeted cost of the billing month</td>
</tr>
</tbody>
</table>

   You can use the Chart Options icon (●●) to select the alternative chart or to change the display of the chart as follows:

   - Single period view
■ Stacked period view

■ Grouped period view

For more information about these views, see “Quick tour of the Software Contract Summary Report” on page 115.

Each bar in the chart is a hyperlink to the Monthly Summary Report and operates as described in “MLC Cost By Billing Month quadrant” on page 134.

By viewing the aggregated chart, you can see a cumulative view of monthly the MLC Costs for the entire term on the contract. At any time, you can use the toggle dot (●) to switch to the MLC Cost by Billing Month chart.

The Aggregated MLC Cost by Billing Month chart also contains a link to the Software Cost by MLC Product chart. This chart can be accessed from the drill-down links button (φ).

For information about the Software Cost by MLC Product chart, see “Accessing and working with the Software Cost by MLC Product view” on page 138.

Accessing and working with the Software Cost by MLC Product view

The Software Cost by MLC Product view displays a chart of the actual costs and projected costs for every billing month of the contract and provides you with the ability to view the individual contributions of MLC Products.

To access the Software Cost by MLC Product view

1. From the MLC Cost by Billing Month chart or the Aggregated MLC Cost by Billing Month chart, click Drilldown Links (φ).

   The Drilldown Links window displays.

2. In the Drilldown Links window, click the Software Cost by MLC Product hyperlink.
The Software Cost by MLC Product view displays as shown in Figure 34 on page 139.

**Figure 34: Sample Software Cost by MLC Product chart**

Table 37 on page 139 describes the elements of the chart.

**Table 37: Chart elements of the Software by MLC Product view**

<table>
<thead>
<tr>
<th>Chart Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid colors</td>
<td>Actual cost of MLC product for the billing month</td>
</tr>
<tr>
<td>Striped colors</td>
<td>Projected cost of the MLC Product for the billing month</td>
</tr>
<tr>
<td>Black point</td>
<td>Actual total monthly cost for all MLC Products</td>
</tr>
<tr>
<td>Gray point</td>
<td>Projected total monthly cost for all MLC products</td>
</tr>
</tbody>
</table>

3 (optional) From the MLC Product List, select which MLC products to display in the viewer.

Use the following options to change the MLC Products displayed in the chart:

- Scroll through the MLC Product List to select individual products to display in the chart.
- Click **Select All** to select all MLC Products for display in the chart.

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

- Use the **Show Total Monthly Cost** toggle, if you want to show or hide a charting of the total monthly cost across all months of the chart.
- Click and drag between any two points on the chart to zoom in on the selected area.
Click the edge of the bottom scroll bar, and then expand or contract the control bar to adjust the zoom feature.

Hover the mouse over any bar on the chart to view the value as well as the date it occurred.

4 (optional) To view alternative chart options, perform one of the following actions:

- Click on the toggle dots (•) to access the following Chart Views:
  - MLC Products: MLC Cost by Billing Month
  - MLC Products: Cost to Date

- Click on the Chart Options button (••), then select one of the Chart Views from the dropdown list.

Figure 35 on page 140 shows a sample MLC Products: MLC Cost to Date view.

**Figure 35: Sample MLC Products: MLC Cost to Date**

---

**Cost Variance by Billing Month quadrant**

The Cost Variance by Month quadrant contains a bar chart that displays the cost difference between the budgeted amount and actual or projected cost for every billing month of the contract.
Figure 36 on page 141 shows a sample Cost Variance by Billing Month chart.

**Figure 36: Sample Cost Variance by Billing Month**

Table 38 on page 141 describes the elements of the chart.

**Table 38: Chart elements of the Cost Variance by Billing Month**

<table>
<thead>
<tr>
<th>Chart Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid bar</td>
<td>Actual cost difference of the billing month</td>
</tr>
<tr>
<td>Striped Bar</td>
<td>Projected cost difference of the billing month</td>
</tr>
<tr>
<td>Green Bar</td>
<td>Indicates the actual or projected cost was less than the budgeted cost for the billing month</td>
</tr>
<tr>
<td>Red Bar</td>
<td>Indicates the actual or projected cost was greater than the budgeted cost for the billing month</td>
</tr>
</tbody>
</table>

The toggle dots (●) of the quadrant provide you with the ability to toggle between the following chart views:

- Cost Variance by Month
- Cost Variance to Date

You can also use the Chart Options icon (⚙️) to select the alternative chart or to change the display of the chart as follows:

- Single period view
- Stacked period view
- Grouped period view

For more information see about these views, see “Quick tour of the Software Contract Summary Report” on page 115.
Hyperlinks to the Monthly Summary Report

Each bar of the chart (whether solid or striped) is a hyperlink to the Monthly Summary Report for that billing month. By clicking on the bar, Cost Analyzer opens the Monthly Reporting tool and generates the Monthly Summary Report for that billing month. For more information, see “MLC Cost By Billing Month quadrant” on page 134.

The Cost Variance by Month quadrant contains an alternative Chart View (Cost Variance to Date) and a drill-down level to examine the Software Cost by MLC Product.

For more information, see the following topics:

- “Accessing the Cost Variance to Date chart” on page 142
- “Accessing and working with the Software Cost by MLC Product view” on page 138

Accessing the Cost Variance to Date chart

By accessing the Cost Variance to Date chart, you can view a chart that displays the cumulative amount of difference between the actual costs and projected costs for every billing month of the contract.

**Note**

The toggle dots at the bottom of the quadrant provide you with the ability to toggle between the available Chart Views.

To access the Cost Variance to Date chart

1. Perform one of the following actions:

   - In the Cost Variance by Billing Month quadrant, click the grayed-out toggle dot (•).

   - Click on the Chart Options icon (♦), and then select Cost Variance to Date from the Chart Views dropdown list.
The \textit{Cost Variance to Date} chart displays as shown in Figure 37 on page 143.\par

\textbf{Figure 37: Sample Cost Variance to Date} \par

![Sample Cost Variance to Date](image)

Table 39 on page 143 describes the elements of the chart.\par

\textbf{Table 39: Chart elements of the Cost Variance to Date} \par

<table>
<thead>
<tr>
<th>Chart Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid bar</td>
<td>Actual cumulative cost difference of the billing month</td>
</tr>
<tr>
<td>Striped Bar</td>
<td>Projected cumulative cost difference of the billing month</td>
</tr>
<tr>
<td>Green Bar</td>
<td>Indicates the actual or projected cumulative cost was less than the cumulative budgeted cost from the contract starting month up to the billing month</td>
</tr>
<tr>
<td>Red Bar</td>
<td>Indicates the actual or projected cumulative cost was greater than the cumulative budgeted cost from the contract starting month up to the billing month</td>
</tr>
</tbody>
</table>

You can use the Chart Options icon \(^{(\ast)}\) to select the alternative chart or to change the display of the chart as follows:\par

\begin{itemize}
  \item Single period view
  \item Stacked period view
  \item Grouped period view
\end{itemize}

For more information see about these views, see “Quick tour of the Software Contract Summary Report” on page 115.\par

Each bar in the chart is a hyperlink to the Monthly Summary Report and operates as described in “MLC Cost By Billing Month quadrant” on page 134.\par

By the viewing the \textit{Cost Variance to Date} chart, you can see a cumulative view of monthly the MLC Cost differences between budgeted and actual costs for the entire term on the contract. At any time, you can use the toggle dot (\(\ast\)) to switch to the \textit{Cost Variance by Billing Month} chart.
The *Cost Variance to Date* chart also contains a link to the *Software Cost by MLC Product* chart. This chart can be accessed from the drill-down links button (φ).

For information about the Software Cost by MLC Product chart, see “Accessing and working with the Software Cost by MLC Product view” on page 138.
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 usage 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
As you perform exercises in the plan, you can view the results of any action immediately. If necessary, you can undo any action to restore the plan to a previous point in the exercise. For more information, see “Working with plans” on page 151.

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

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

Launching the Planning tool

Use the following procedure to launch the Planning tool.

1. From the Cost Analyzer console, click the Planning tool tab.
The Planning tool Start Page displays as shown in the following figure:

**Figure 38: Sample Planning tool Start Page**

You can perform the following Plan Actions:

- “Creating plans” on page 147
- “Opening a plan” on page 149
- “Deleting a plan” on page 151

**Note**
The Actions pane displays a list of Recent Plans. As a shortcut, you can click on any plan in the list to open the plan.

---

**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 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 40 on page 148:

Table 40: Create Plan dialog fields

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan Name</td>
<td>Enter a name for the plan.</td>
</tr>
<tr>
<td>Plan Description</td>
<td>(optional) Enter a description to identify the plan.</td>
</tr>
<tr>
<td>Usage Month</td>
<td>Click the Calendar icon to browse the application server and select an available usage month cost model.</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 16. Note: 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. Note: 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.

*Note*

After launching the Planning tool, the Actions pane displays a list of Recent Plans. As a shortcut, you can click on any plan in the list to open the plan.

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

2. Perform one of the following actions:
   - From the Actions pane, click **Open Plan**.
   - From the list of Recent Plans, click on the plan that you want to open.
     The Planning tool opens the Plan as shown in Figure 39 on page 149.

3. From the Open Plan dialog, select the plan you want to open and click **Open Plan**.
   The Planning tool opens the Plan as shown in Figure 39 on page 149.

![Figure 39: Sample Plan](image)

**Plan legend**

- Viewer
- Actions pane
- 1
- 2
- 3
- 4
- 5
- 6
You can use the toolbar buttons to perform the actions described in Table 41 on page 150:

- View changes made to the plan
- View plan evaluation results
- Close the plan

Perform one of the following actions:

- Click a CPC to view CPC level reports and charts.
- Click 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 151.

### Closing a plan

Use the following procedure to close a plan.

1. From the Actions pane, click the close button (×).

Cost Analyzer closes the plan. Any changes that you made are automatically saved.
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 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

This section describes in detail how to perform actions against your monthly historical models that demonstrate the effects of changes to your system. Through the exercises in a plan, you can develop alternative structures for your sysplex to view the effect on the monthly costs. Since MLC Products are priced based on the 4HRA, a plan can show you configurations that reduce MSU Utilizations, limit the contribution to peak values, and provide a way to explore options to discover the most cost-efficient structure for your enterprise.

Within any plan that you create, you can:

- Work at the CPC level and perform actions against LPARs running on the CPC.
- Work at the LPAR level and perform actions against the workloads running on the LPAR.

As you perform exercises and make changes to your plan, the Planning tool executes and records the changes sequentially. At any time, you can view a list of the changes made to the plan. If you want to undo any action that was executed, you can use the viewer to remove the change. For more information, see “Viewing and removing plan changes” on page 162.
Tip

When performing exercise in a Plan, the following suggestions apply:

- All LPAR level operations for a particular LPAR should be performed before any operation for another LPAR.
- For a particular LPAR, the Defined Capacity operation should 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.
2. From the 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 40 on page 152:

**Figure 40: Plan CPC level**

![Image of CPC level plan]

Note

For each LPAR, the data represents the complete activity for the selected usage 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 the Visibility indicator ( ) for each LPAR.
For a description of the charting area actions and icons, see “Working with the charting area” on page 104.

You can click 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 the LPAR's name.

To learn about the LPAR actions that you can perform, see “Moving an LPAR” on page 153 and “Deleting an LPAR” on page 154.

Moving an LPAR

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

**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 provide a substantial savings in your costs.

**To move an LPAR to another CPC**

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

   The Move LPARs to CPC dialog displays as shown in the following figure:
2 From the list of LPARs, select the LPARs that you want to move to a target CPC.

3 From the list of target CPCs, specify where you want to move the LPARs by selecting a target CPC.

4 Click **Move LPARs**.

   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.

5 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.

   **Note**
   You can view the evaluation results at any time by clicking **View plan evaluation results** button () in the Actions pane. For more information, see “Viewing the Plan Evaluation Summary Report” on page 161.

### 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 from the plan. You can undo this action by viewing the Plan Changes and marking the deletion for removal. For more information, see “Viewing and removing plan changes” on page 162.

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 the **Delete LPAR from current CPC** 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 161.

**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, it is recommended that you complete all operations against a particular LPAR before performing operations against another LPAR.

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

The selected LPAR object opens in the viewer as shown in the following Figure 41 on page 155:

![Figure 41: Plan LPAR level](image1)

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 the Visibility indicator ( 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 104.

You can view a list of MLC products for the LPAR by clicking 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 156
- “Moving a workload” on page 157
- “Scaling a workload by percentage” on page 159
- “Deleting a workload from the LPAR” on page 160

**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 should 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 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 161) 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 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, select the workloads that you want to move to a target LPAR.

3 In section 1 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 of this workload.

4 In section 2 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.

5 In section 3 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.

6 When finished, click **Move Workloads**.

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

7 When prompted to view the evaluation results, click **Yes** to view them (as described in “Viewing the Plan Evaluation Summary Report” on page 161) 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 activity of that workload for the entire usage 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 **Apply**.

   The Planning tool applies changes to the model and performs an evaluation.
When prompted to view the evaluation results, click Yes to view them (as described in “Viewing the Plan Evaluation Summary Report” on page 161) 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 removes all of its activity from the plan. You can undo this action by viewing the Plan Changes and marking the deletion for removal. For more information, see “Viewing and removing plan changes” on page 162.

---

**To delete a workload from an LPAR**

1. In the Workload actions column, click the **Delete Workload From LPAR** 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 **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 161) 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 Actions pane, click the **View plan evaluation results** button ( ).
   - 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 42 on page 161:

**Figure 42: Sample Plan Evaluation Summary Report**

![Plan Evaluation Summary Report](image-url)
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 97.

Table 42 on page 162 describes the columns that are unique to this report:

**Table 42: Plan Evaluation Summary Report columns**

<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 triangle (▼) and the amount of the gain. A cost increase is indicated by a red triangle (▲) 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 the icon and clicking 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 and removing plan changes**

After executing changes to a plan, you can view a list of the changes in the order they were executed. You can use this view to see the overall changes that have been made to your plan. Additionally, you can use the viewer to remove any change that is unwanted. Any unwanted change can undone and removed from the plan by marking it for removal. However, since the plan changes are listed sequentially, you
must work from the last change executed and remove each change in reverse order until you remove the unwanted change.

1 In the Actions pane, click the View changes made to this plan button ( ).

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

![Figure 43: Sample Plan Changes pop-up window](image)

2 Starting with the final change made to the plan, click on Remove Plan Change for each change you want to remove.

As you mark the plan changes for removal, the Plan Change is designated Marked for Removal and is greyed-out. To restore the Plan Change and keep it in the list, click on Marked for Removal again.

Alternatively, you can select or deselect all Plan Changes by clicking on Remove All or Keep All.

3 When ready to remove the changes, click Update Plan.
Cost Analyzer log files

This appendix describes how to access the log files using the Application Server Log Viewer that is available in the Administration Tools and how to use the viewer to see all available Application Server log files.

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.

*Note*
Cost Analyzer does not automatically send Trace messages to the log file. If you want to view Trace messages, you need to enable the sending of Trace messages. For more information, see “Enabling Trace messages to the log file” on page 166.

**To display log files**

1. From the Cost Analyzer console, click Administration Tools.
2. Click Application Server Log Viewer.
The Application Server Log Viewer displays as shown in Figure 44 on page 166.

Figure 44: Sample Application Server Log Viewer

3 Click the tab for the log file that you want to display (Table 43 on page 166).

Table 43: Types of log files

<table>
<thead>
<tr>
<th>File name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model Build Logs</td>
<td>Temporal tracking about the Model Build Tasks</td>
</tr>
<tr>
<td></td>
<td>For more information, see “Model Build Logs” on page 169.</td>
</tr>
<tr>
<td>Model Build Event Logs</td>
<td>Monitoring and troubleshooting information about the Model Build</td>
</tr>
<tr>
<td></td>
<td>Event process</td>
</tr>
<tr>
<td></td>
<td>You can limit the type of messages that are displayed to All, Error,</td>
</tr>
<tr>
<td></td>
<td>Warning, or Informational.</td>
</tr>
<tr>
<td>Service Event Logs</td>
<td>Monitoring and troubleshooting information about the product’s</td>
</tr>
<tr>
<td></td>
<td>core services</td>
</tr>
<tr>
<td></td>
<td>You can limit the type of messages that are displayed to All, Error,</td>
</tr>
<tr>
<td></td>
<td>Warning, or Informational.</td>
</tr>
<tr>
<td>RBA Audit Logs</td>
<td>Temporal tracking about the Role-Based Access (RBA) Audit</td>
</tr>
<tr>
<td>Audit Logs</td>
<td>Temporal tracking information about all transactions associated</td>
</tr>
<tr>
<td></td>
<td>with the product’s web services</td>
</tr>
</tbody>
</table>

Enabling Trace messages to the log file

Cost Analyzer does not automatically send Trace messages to the log file. When the Model Builder Tasks do not run as expected or encounter problems that render the costing data unusable, you may want to enable Trace messages to assist the troubleshooting process.
Once enabled, the Trace messages can dramatically increase the size of the log file, but can be instrumental in resolving problems.

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

2 From the Administration Tools dialog, select **Manage Model Builder Tasks**.

3 From the list of Model Builder Tasks, select the task that you want to enable for Trace messages, then click **Modify**.

   The Modify Model Build Tasks dialog displays as shown in the following figure:

4 Click **Advanced Options**, then select the **Diagnostics tab**.

   The Advanced Options dialog displays as shown in the following figure:
5 Change the toggle switch to Yes, then click Accept.

The Advanced Option dialog closes.

6 From the Model Build Task dialog, click Modify Task.

The Model Build Task dialog closes.

7 From the Manage Model Build Tasks dialog, click Save Changes.

Cost Analyzer enables all Trace messages for the selected task to be sent to the log viewer. The Trace messages will be available in the log viewer after the next model builder task runs.

Since model builder tasks are usually scheduled for nightly runs, if you need to view Trace messages immediately, you must run the task manually by performing Run Task Now. For more information, see “Running the Model Builder Task manually” on page 59.

---

**Note**

Enabling Trace messages applies only to the selected Model Builder Task. If you have more than one task that needs Trace messages, you need to enable the messages for each task individually.

After you have finished troubleshooting, remember to disable Trace messages in order to dramatically reduce the number of messages in the log.
Model Build Logs

You can use Model Build Logs to find detailed information about every run of your Model Builder Tasks. You access the Model Build logs by using the Application Server Log Viewer to display the log files.

Figure 45 on page 169 is a sample of a Model Build Logs view that shows each defined Model Builder Task in a tree and lists every run by the date and time it occurred.

Figure 45: Sample Model Build Logs in the Application Server Log Viewer

Model Build Logs legend

<table>
<thead>
<tr>
<th>#</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CPCs and Summary logs</td>
<td>List of CPCs logs and summary log for the Model Builder Task run</td>
</tr>
<tr>
<td>2</td>
<td>Task run date time</td>
<td>List of Model Builder Task run date times</td>
</tr>
<tr>
<td>3</td>
<td>Model Builder Tasks</td>
<td>Defined Model Builder Tasks with logs</td>
</tr>
<tr>
<td>4</td>
<td>Application Server Log viewer tabs</td>
<td>Available tab views for all log types</td>
</tr>
<tr>
<td>5</td>
<td>Reload contents button</td>
<td>Refresh button to reload contents from application server</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Note: This button works only for the Model Build Logs.</td>
</tr>
<tr>
<td>6</td>
<td>Message type and tally</td>
<td>Tally of messages by message severity level</td>
</tr>
<tr>
<td>7</td>
<td>Message list</td>
<td>List of messages in the log</td>
</tr>
</tbody>
</table>

A marker by the Model Builder Task name and the date time of each run indicates the final status of the run as described in the following table:
The status of the *most recent* run of the Model Builder Task is indicated by the marker next to the Model Builder Task name.

You can click on any of the entries in the list of Model Builder Task runs to display the messages that were generated for that run. The messages display in the viewer as indicated by the following table:

<table>
<thead>
<tr>
<th>Click this entry in the list</th>
<th>Description of viewer display</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model Builder Task name</td>
<td>Displays a list of the log run date, detailing the status and number of logs. The number of logs is determined by the existence of a separate log for each CPC that is included in the task and a summary log for the entire run.</td>
</tr>
<tr>
<td>Task run date time</td>
<td>Displays a table that lists the CPC and summary logs with a corresponding tally of all messages categorized by message severity level.</td>
</tr>
<tr>
<td>CPC name or Summary</td>
<td>Displays a scrollable list of all messages arranged by message severity level. Summary messages are informational and provide general information that applies to the entire run and all of the CPCs included in the task.</td>
</tr>
</tbody>
</table>
Checklist to install Cost Analyzer for zEnterprise on a MS Windows Server

This appendix defines the steps required to install Cost Analyzer on a Microsoft Windows server, identify the type of expertise needed to complete each step, and provide links where more information can be found.

Required steps

The following topic lists the required steps to install Cost Analyzer on an MS Windows server.

1. “Prepare the Windows server for use with Cost Analyzer” on page 172
2. “Install the CDB server” on page 172
3. “Install Cost Analyzer” on page 172
4. “Set up required plugin on the client machine” on page 173
5. “Install the database client components” on page 173
6. “Set up a database to be used as Cost Analyzer’s CDB repository” on page 173
7. “Set up the CDB to use Windows Authentication” on page 174
8. “Create an ODBC Data Source Name (DSN) entry” on page 174
9. “Add a Database to the Automator Catalog” on page 175
10. “Set up Cost Analyzer” on page 175
Prepare the Windows server for use with Cost Analyzer

This topic explains how to prepare the Windows server for use with Cost Analyzer.

**Expertise** – Windows

For a Windows 2008 R2 Server follow this link for an instructional video: https://kb.bmc.com/infocenter/index?page=content&id=KA390934

For a Windows 2012 Server follow the instructions in this video: https://kb.bmc.com/infocenter/index?page=content&id=KA391406

Install the CDB server

This topic provides a table with links to the tasks for installing the CDB server.

<table>
<thead>
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<th>Expertise</th>
<th>See</th>
</tr>
</thead>
<tbody>
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<td>Windows</td>
<td>“CDB system requirements” on page 28</td>
</tr>
<tr>
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<td>Windows</td>
<td>“Before you begin” on page 28</td>
</tr>
<tr>
<td>Installing BMC CDB Services</td>
<td>Windows</td>
<td>“Installing BMC CDB Services” on page 29</td>
</tr>
<tr>
<td>Installing BMC CDB Workflow Service</td>
<td>Windows</td>
<td>“Installing BMC CDB Workflow Service” on page 30</td>
</tr>
</tbody>
</table>

Install Cost Analyzer

This topic provides a table with links to the tasks for installing Cost Analyzer.

<table>
<thead>
<tr>
<th>Task</th>
<th>Expertise</th>
<th>See</th>
</tr>
</thead>
<tbody>
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<td>Cost Analyzer System requirements</td>
<td>Windows</td>
<td>“Cost Analyzer system requirements” on page 33</td>
</tr>
<tr>
<td>Installing Cost Analyzer on a web server</td>
<td>Windows</td>
<td>“Installing Cost Analyzer on a web server” on page 35</td>
</tr>
<tr>
<td>Installing Microsoft Silverlight</td>
<td>Windows</td>
<td>“Installing Microsoft Silverlight” on page 38</td>
</tr>
</tbody>
</table>
Set up required plugin on the client machine

This topic provides information about how to set up the required plugin on the client machine.

**Expertise** – Windows

On the Windows client machine where the Cost Analyzer Web Interface will be accessed, Microsoft's Silverlight Plugin must be installed. For more information on compatible Operating Systems and Browsers and to download the Silverlight plugin use the following link: http://www.microsoft.com/getsilverlight/get-started/install/default.aspx

Install the database client components

This topic provides information about how to install the database client components.

**Expertise** – DBA/Windows

To access the database from a remote server/client computer, database client components must be installed as follows:

- **To set up database client components for SQL Server:** [https://kb.bmc.com/infocenter/index?page=content&id=KA391287](https://kb.bmc.com/infocenter/index?page=content&id=KA391287)

- **To set up database client components for Oracle:** [https://kb.bmc.com/infocenter/index?page=content&id=KA391312](https://kb.bmc.com/infocenter/index?page=content&id=KA391312)

Set up a database to be used as Cost Analyzer’s CDB repository

This topic provides information about how to set up a database to be used as Cost Analyzer's CDB repository.

**Expertise** – DBA

A SQL Server or an Oracle database can be used. If an existing Visualizer CDB is available that database can be used for the Cost Analyzer tables as well.

To set up a **SQL Server** database to be used with Cost Analyzer or Visualizer see either of the following links:
To set up a database using SQL Server Authentication: https://kb.bmc.com/infocenter/index?page=content&id=KA286400

To set up a database using Windows Authentication (Trusted Connection): https://kb.bmc.com/infocenter/index?page=content&id=KA286766

To set up an Oracle database see the following link: https://kb.bmc.com/infocenter/index?page=content&id=KA389475

---

**Set up the CDB to use Windows Authentication**

This topic provides a link to set up the CDB to use Windows Authentication.

---

*Note*

This task is only required if you are using SQL Server Windows Authentication.

---

**Expertise** – Windows

To set up Windows Authentication in CDB see the following link: https://kb.bmc.com/infocenter/index?page=content&id=KA392449

---

**Create an ODBC Data Source Name (DSN) entry**

This topic provides information and links for creating an ODBC Data Source Name (DSN) entry.

---

**Expertise** – Windows

Visualizer/CDB accesses the database through Microsoft's Open Database Connectivity interface (ODBC). See the following links to set up an ODBC entry:

- To create an ODBC entry for a SQL Server database using SQL Server Authentication: https://kb.bmc.com/infocenter/index?page=content&id=KA390536

- To create an ODBC entry for a SQL Server database using Windows Authentication: https://kb.bmc.com/infocenter/index?page=content&id=KA391030
Add a Database to the Automator Catalog

This topic provides information about how to add a Database to the Automator Catalog.

**Expertise** – Windows

Before a database can be used by CDB it must be added to the Automator Catalog. See the following link to set up an Automator Catalog entry: [https://kb.bmc.com/infocenter/index?page=content&id=KA390544](https://kb.bmc.com/infocenter/index?page=content&id=KA390544)

Set up Cost Analyzer

This topic provides a table with links to the tasks for setting up Cost Analyzer.

<table>
<thead>
<tr>
<th>Task</th>
<th>Expertise</th>
<th>See</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overview of setup tasks</td>
<td>Windows</td>
<td>“Overview of setup tasks” on page 39</td>
</tr>
<tr>
<td>Assigning users to BMC Cost Analyzer Groups</td>
<td>Windows</td>
<td>“Assigning users to BMC Cost Analyzer User Groups” on page 41</td>
</tr>
<tr>
<td>Defining connections to CDB Servers</td>
<td>Windows</td>
<td>“Defining connections to CDB servers” on page 45</td>
</tr>
<tr>
<td>Defining Model Builder Tasks</td>
<td>Windows</td>
<td>“Defining Model Builder Tasks” on page 48</td>
</tr>
<tr>
<td>Using the MSU Cost Editor</td>
<td>Windows</td>
<td>“Using the MSU Cost Editor” on page 81</td>
</tr>
</tbody>
</table>

Set up scheduled operations for Cost Analyzer

This topic provides a table with links to the tasks for setting up Cost Analyzer.

<table>
<thead>
<tr>
<th>Task</th>
<th>Expertise</th>
<th>See</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installing the Cost Analyzer Model Builder Proxy</td>
<td>Windows</td>
<td>“Installing the Cost Analyzer Model Builder Proxy” on page 54</td>
</tr>
<tr>
<td>Creating an Automator populate event</td>
<td>Windows</td>
<td>“Creating an Automator populate event” on page 43</td>
</tr>
<tr>
<td>Task</td>
<td>Expertise</td>
<td>See</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>-----------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Adding the Cost Analyzer Model Builder proxy event</td>
<td>Windows</td>
<td>“Updating the Cost Analyzer Model Builder Proxy event” on page 56</td>
</tr>
<tr>
<td>Scheduling the Automator script</td>
<td>Windows</td>
<td>“Scheduling the Automator script” on page 44</td>
</tr>
<tr>
<td>Other Cost Analyzer Model Builder Proxy options</td>
<td>Windows</td>
<td>“Other Cost Analyzer Model Builder Proxy options” on page 57</td>
</tr>
</tbody>
</table>
UIE Commands

This appendix describes the UIE commands that can be used in association with Cost Analyzer.

UIE Command NO89

This topic describes the use of the Universal Information Exchange (UIE) command NO89 command.

MLC products and Priced Features without SMF Type 89 Records

Your enterprise may be using MLC products or Priced Features that do not create SMF Type 89 records. For these products, you must use the Universal Information Exchange (UIE) command NO89 to include their cost data in the cost models.

The NO89 command provides information for products and priced features which do not create SMF Type 89 records. Unless this command is specified in the JCL that runs the Universal Information Exchange batch job, products and Priced Features that do not generate Type 89 records will not exist in the cost data that builds the Cost Analyzer Cost Models.

For more information, see the Universal Information Exchange User Guide.

The following commands need to be added to the UIE JCL:

- For a product that does not create SMF Type 89 records:
  
  NO89 productID=parname,... | *All
Example

N089 5697-WSZ=LPAR1,LPAR2
N089 5697-WSZ=AB37:LPAR1,CD17:LPAR2
N089 5655-018=*ALL
N089 5655-018=AB37:*ALL

- For a Priced Feature that does not create SMF Type 89 records:
  N089  productID:featureCode=lparName,... | *All

Example

N089 5655-018:S00151M=*ALL
N089 5655-018:S00151N=1234:*ALL
N089 5655-DB2:S00MVJ4=AB37:LPAR1,CD17:LPAR3
N089 5655-DB2:S00MVJ4=LPAR1,LPAR2,LPAR3,LPAR4

Table 44 on page 178 defines the values of the variables:

Table 44: NO89 command variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>productID</td>
<td>IBM product number</td>
</tr>
<tr>
<td>lparName</td>
<td>List of LPAR names separated by commas</td>
</tr>
<tr>
<td></td>
<td><strong>Note</strong>: You must enter the LPAR name and not the SID</td>
</tr>
<tr>
<td>featureCode</td>
<td>IBM priced feature number</td>
</tr>
</tbody>
</table>

Note

When there are LPARs with identical names on the CPCs processed in the same UIE run, you can use LPAR names preceded by the CPC serial number as follows:
N089  productID=serialNumber:lparName,...

The  serialNumber  variable represents the last 4 digits of the CPC serial number.

### UIE Command EXCLUDE89

This topic describes the use of the UIE EXCLUDE89 command.

Excluding intervals from Peak R4HA calculation for selected MLC Products and LPARs

When authorized, IBM permits you to use the special Exclude control statement to direct SCRT to exclude the processing of certain data that is reported on SMF and SCRT89 records.
If you have excluded records in your cost data, UIE can implement the EXCLUDE89 command, which has a similar format and performs a similar function when building cost models.

The UIE EXCLUDE89 command permits you to specify intervals that must be excluded from Peak R4HA calculation. This command enables you to exclude intervals with abnormal activity that can affect the MLC sub-capacity cost determination.

You can exclude records for:

- All LPARs and MLC products
- A specific list of LPARs and MLC products.

The following command needs to be added to the UIE JCL:

```
EXCLUDE89  CPC=xxxx  IMAGE_ID=parName,... | *ALL
           PRODUCT_ID=productID,... |*ALL
           START=yyyy/mm/dd/hh
           RESUME=yyyy/mm/dd/hh
           ACTIVE=Y|N
```

When the EXCLUDE89 command is inserted into the UIE command stream, the corresponding information is written into VIS file and subsequently stored in the CDB.

During the Model Build process this information is extracted from CDB and is used to exclude specified intervals from calculation of Peak R4HA for specified LPARs and MLC products.

**Note**

The LPAR activity in these intervals is still saved in the cost model and is taken into account in the calculation of the Peak R4HA of LPARs or MLC Products that are not specified in the command. This activity is also taken into account in all Planning tool Plans. The EXCLUDE89 command affects ONLE baseline cost calculation in the Planning tool.

The EXCLUDE89 command is associated with the billing month of the interval that needs to be excluded. Thus, it is sufficient to have the EXCLUDE89 command in only one UIE run processing data for some period in the same billing month.
Example
This example applies if you are processing SMF data daily:

(Task) – After the processing data for January 15th, loading them into the CDB server, building the cost models, and looking at the reports, you determine that you want to exclude some utilization hours from January 15th.

(Solution) – You need to insert the EXCLUDE89 command into the UIE job processing any date from January 16th to Feb 1st, 23:59 inclusive. Alternatively, you can insert the EXCLUDE89 command into the job reprocessing data for any period from January 2nd to January 15th.

The following rules apply to EXCLUDE89 command:

- Parameters CPC, START and RESUME are required. Xxxx in CPC parameter are last 4 hex digits of CPC serial number.

- Parameters IMAGE_ID, PRODUCT_ID and ACTIVE are optional. If they are not specified, the default values are used.

- Defaults are for IMAGE_ID and PRODUCT_ID default is *All, for ACTIVE – Y.

- For the IMAGE_ID the LPAR name must be specified (not SYSTEM name and not SMFID)

- PRODUCT_ID has the form NNNN-XXX. For example, z/OS Version 1 has PRODUCT_ID=5694-A01

- For IMAGE_ID and PRODUCT_ID a list of comma-separated names can be used.

It is not possible to delete the EXCLUDE89 command, but it is possible to make it inactive. To do this, you need to insert another EXCLUDE89 command into the UIE JCL with exactly same parameters, but then specify ACTIVE=N. All inactive EXCLUDE89 commands are ignored by Cost Analyzer.

Note
If a list of MLC products or LPARs is used in these parameters, the EXCLUDE89 command is split into multiple commands in the UIE JCL and each will contain only a single value for both of these parameters. For example, if two LPARs and 3 products were specified, 6 commands will be created. Each of these 6 commands can be then be deactivated individually.
Examples

The following example excludes the hours 1000:1100 and 1100:1200 from calculation of Peak R4HA for products 5655-018 and 5697-WSZ on LPARs LPARA and LPARB on CPC with serial F123:

```
EXCLUDE89 CPC=F123 IMAGE_ID=LPARA,LPARB
   PRODUCT_ID=5655-018,5697-WSZ
   START=2014/12/02/10
   RESUME=2014/12/02/12
   ACTIVE=Y
```

The following example excludes the hours 1000:1100 and 1100:1200 from calculation of Peak R4HA for all products on all LPARs on CPC with serial FE77:

```
EXCLUDE89 CPC=FE77 IMAGE_ID=*ALL
   PRODUCT_ID=*ALL
   START=2014/12/02/10
   RESUME=2014/12/02/12
   ACTIVE=Y
```
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