z/OS

# z/OS MVS Capacity Provisioning User's Guide

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> **Note**
>
> Before using this information and the product it supports, be sure to read the general information under "Notices" on page 173.

This edition applies to Version 1 Release 9 of z/OS (5694-A01) and to all subsequent releases and modifications until otherwise indicated in new editions.

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# About this document

This manual supports z/OS (5694–A01). This document contains information to help you use Capacity Provisioning and to make the most out of Capacity Provisioning.

## Who should use this document

This document is intended for system administrators who want to use MVS™ Capacity Provisioning to manage Capacity on Demand, and for system programmers, system analysts, and systems engineers who are responsible for implementing MVS Capacity Provisioning.

## Where to find more information

Where necessary, this document references information in other documents, using shortened versions of the document title. For complete titles and order numbers of the documents for all products that are part of z/OS, refer to *z/OS Information Roadmap*.

| Softcopy Title | Title | Order Number |
|---|---|---|
| *z/OS MVS Initialization and Tuning Guide* | *z/OS MVS Initialization and Tuning Guide* | SA22-7591 |
| *z/OS MVS Initialization and Tuning Reference* | *z/OS MVS Initialization and Tuning Reference* | SA22-7592 |
| *z/OS MVS JCL User's Guide* | *z/OS MVS JCL User's Guide* | SA22-7598 |
| *z/OS MVS JCL Reference* | *z/OS MVS JCL Reference* | SA22-7597 |
| *z/OS Planning for Installation* | *z/OS Planning for Installation* | GA22-7504 |
| *z/OS MVS Planning: Workload Management* | *z/OS MVS Planning: Workload Management* | SA22-7602 |
| *z/OS MVS Programming: Workload Management Services* | *z/OS MVS Programming: Workload Management Services* | SA22-7619 |
| *z/OS MVS Setting Up a Sysplex* | *z/OS MVS Setting Up a Sysplex* | SA22-7625 |
| *z/OS MVS System Commands* | *z/OS MVS System Commands* | SA22-7627 |
| System zNext: Capacity on Demand User's Guide | System zNext: Capacity on Demand User's Guide | SC28-6871 |

# Other Referenced Documents

| Softcopy Title | Title | Order Number |
|---|---|---|
| *z/OS RMF Report Analysis* | *z/OS RMF Report Analysis* | SC33-7991 |
| *z/OS UNIX System Services Programming Tools* | *z/OS UNIX System Services Programming Tools* | SA22-7805 |
| *z/OS UNIX System Services Planning* | *z/OS UNIX System Services Planning* | GA22-7800 |
| *z/OS UNIX System Services Parallel Environment: Operation and Use* | *z/OS UNIX System Services Parallel Environment: Operation and Use* | SA22-7810 |
| *PR/SM Planning Guide* | *PR/SM Planning Guide* | GA22-7236 |
| *Support Element Operations Guide* | *Support Element Operations Guide* | SC28-6802 |

# The Capacity Provisioning Web Page

For the latest information, see the Capacity Provisioning web page at:

`http://www.ibm.com/servers/eserver/zseries/zos/wlm/cp`

## Using LookAt to look up message explanations

LookAt is an online facility that lets you look up explanations for most of the IBM®
messages you encounter, as well as for some system abends and codes. Using
LookAt to find information is faster than a conventional search because in most
cases LookAt goes directly to the message explanation.

You can use LookAt from these locations to find IBM message explanations for
z/OS® elements and features, z/VM®, z/VSE™, and Clusters for AIX® and Linux™:

- The Internet. You can access IBM message explanations directly from the LookAt
  Web site at www.ibm.com/servers/eserver/zseries/zos/bkserv/lookat/.
- Your z/OS TSO/E host system. You can install code on your z/OS systems to
  access IBM message explanations using LookAt from a TSO/E command line
  (for example: TSO/E prompt, ISPF, or z/OS UNIX® System Services).
- Your Microsoft® Windows® workstation. You can install LookAt directly from the
  *z/OS Collection* (SK3T-4269) or the *z/OS and Software Products DVD Collection*
  (SK3T-4271) and use it from the resulting Windows graphical user interface
  (GUI). The command prompt (also known as the DOS > command line) version
  can still be used from the directory in which you install the Windows version of
  LookAt.
- Your wireless handheld device. You can use the LookAt Mobile Edition from
  www.ibm.com/servers/eserver/zseries/zos/bkserv/lookat/lookatm.html with a
  handheld device that has wireless access and an Internet browser (for example:
  Internet Explorer for Pocket PCs, Blazer or Eudora for Palm OS, or Opera for
  Linux handheld devices).

You can obtain code to install LookAt on your host system or Microsoft Windows
workstation from:

- A CD-ROM in the *z/OS Collection* (SK3T-4269).
- The *z/OS and Software Products DVD Collection* (SK3T-4271).
- The LookAt Web site (click **Download** and then select the platform, release,
  collection, and location that suit your needs). More information is available in
  the LOOKAT.ME files available during the download process.

## Using IBM Health Checker for z/OS

IBM Health Checker for z/OS is a z/OS component that installations can use to gather information about their system environment and system parameters to help identify potential configuration problems before they impact availability or cause outages. Individual products, z/OS components, or ISV software can provide checks that take advantage of the IBM Health Checker for z/OS framework. This book might refer to checks or messages associated with this component.

For additional information about checks and about IBM Health Checker for z/OS, see *IBM Health Checker for z/OS: User's Guide*.

SDSF also provides functions to simplify the management of checks. See *z/OS SDSF Operation and Customization* for additional information.

## How to read syntax diagrams

This section describes how to read syntax diagrams. It defines syntax diagram symbols, items that may be contained within the diagrams (keywords, variables, delimiters, operators, fragment references, operands) and provides syntax examples that contain these items.

Syntax diagrams pictorially display the order and parts (options and arguments) that comprise a command statement. They are read from left to right and from top to bottom, following the main path of the horizontal line.

## Symbols

The following symbols may be displayed in syntax diagrams:

| Symbol | Definition |
|---|---|
| ►►— | Indicates the beginning of the syntax diagram. |
| —→ | Indicates that the syntax diagram is continued to the next line. |
| ►— | Indicates that the syntax is continued from the previous line. |
| —►◄ | Indicates the end of the syntax diagram. |

## Syntax items

Syntax diagrams contain many different items. Syntax items include:
- Keywords - a command name or any other literal information.
- Variables - variables are italicized, appear in lowercase, and represent the name of values you can supply.
- Delimiters - delimiters indicate the start or end of keywords, variables, or operators. For example, a left parenthesis is a delimiter.
- Operators - operators include add (+), subtract (-), multiply (*), divide (/), equal (=), and other mathematical operations that may need to be performed.
- Fragment references - a part of a syntax diagram, separated from the diagram to show greater detail.
- Separators - a separator separates keywords, variables or operators. For example, a comma (,) is a separator.

**Note:** If a syntax diagram shows a character that is not alphanumeric (for example, parentheses, periods, commas, equal signs, a blank space), enter the character as part of the syntax.

Keywords, variables, and operators may be displayed as required, optional, or default. Fragments, separators, and delimiters may be displayed as required or optional.

| Item type | Definition |
|---|---|
| **Required** | Required items are displayed on the main path of the horizontal line. |
| **Optional** | Optional items are displayed below the main path of the horizontal line. |
| **Default** | Default items are displayed above the main path of the horizontal line. |
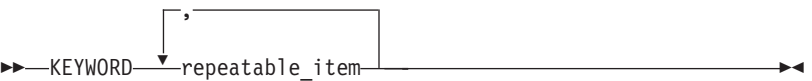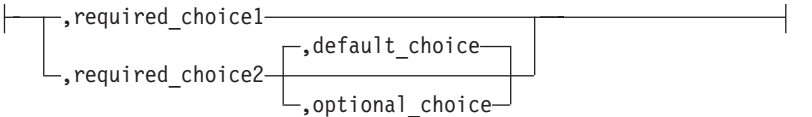
## Syntax examples

The following table provides syntax examples.

*Table 1. Syntax examples*

| Item | Syntax example |
|---|---|
| Required item.<br><br>Required items appear on the main path of the horizontal line. You must specify these items. | ►►—KEYWORD—required_item———————————————————►◄ |
| Required choice.<br><br>A required choice (two or more items) appears in a vertical stack on the main path of the horizontal line. You must choose one of the items in the stack. | ►►—KEYWORD—┬─required_choice1─┬———————————————►◄<br>                         └─required_choice2─┘ |
| Optional item.<br><br>Optional items appear below the main path of the horizontal line. | ►►—KEYWORD—┬──────────────┬———————————————►◄<br>                         └─optional_item─┘ |
| Optional choice.<br><br>An optional choice (two or more items) appears in a vertical stack below the main path of the horizontal line. You may choose one of the items in the stack. | ►►—KEYWORD—┬──────────────────┬———————————►◄<br>                         ├─optional_choice1─┤<br>                         └─optional_choice2─┘ |
| Default.<br><br>Default items appear above the main path of the horizontal line. The remaining items (required or optional) appear on (required) or below (optional) the main path of the horizontal line. The following example displays a default with optional items. | ►►—KEYWORD—┬─default_choice1─┬———————————►◄<br>                         ├─optional_choice2─┤<br>                         └─optional_choice3─┘ |
| Variable.<br><br>Variables appear in lowercase italics. They represent names or values. | ►►—KEYWORD—*variable*———————————————————►◄ |

*Table 1. Syntax examples  (continued)*

| Item | Syntax example |
|------|----------------|
| Repeatable item.<br><br>An arrow returning to the left above the main path of the horizontal line indicates an item that can be repeated.<br><br>A character within the arrow means you must separate repeated items with that character.<br><br>An arrow returning to the left above a group of repeatable items indicates that one of the items can be selected, or a single item can be repeated. | ►►—KEYWORD—┬─repeatable_item─┬──────────────────────────►◄<br><br>►►—KEYWORD—┬─repeatable_item─┬──────────────────────────►◄<br> (with `,` in the arrow) |
| Fragment.<br><br>The fragment symbol indicates that a labelled group is described below the main syntax diagram. Syntax is occasionally broken into fragments if the inclusion of the fragment would overly complicate the main syntax diagram. | ►►—KEYWORD—┤ fragment ├──────────────────────────►◄<br><br>**fragment:**<br><br>├─┬─,required_choice1──────────────────────┬─┤<br>  └─,required_choice2─┬─,default_choice──┬─┘<br>                      └─,optional_choice─┘ |

# Part 1. Getting started

This part gives an overview of Capacity Provisioning and how to implement it.

# Chapter 1. Introducing z/OS Capacity Provisioning

Performance and capacity management on System z™ must ensure that work is processed according to the service level agreements that are in place. Guaranteeing service levels remains a relatively static task as long as the workloads that need to be considered are sufficiently stable. However, in many environments workloads may fluctuate considerably over time. As the total workload or the mixture of workloads varies it may become increasingly difficult to guarantee service levels. z/OS Workload Management (WLM) allows incoming work to be classified with a performance goal and a priority that reflects the business priority of that work. WLM will try to accommodate the goals of all the work in the system. However, even with an ideal WLM service definition, it may not be possible to achieve all specified goals when the total workload increases. In this case trade-offs must be made. WLM decides which goals may be compromised first, based on the assigned importance level. Discretionary work will be displaced first, followed by low importance work.

At some point, however, this may not be acceptable, either because the displaced work is relevant from a business perspective, or because it interacts with resources that are required by the more important work. In these cases the processing capacity must be increased to accommodate the increased workload. This may result in a permanent capacity increase for planned growth or a temporary capacity increase for seasonal or unpredictable peak periods. IBM System z provides the capability of quickly and non-disruptively activating additional processor capacity that is built directly into System z servers — IBM Capacity Upgrade on Demand (CUoD) for a permanent increase of processing capability, and IBM On/Off Capacity on Demand (On/Off CoD) for a temporary capacity increase.

On/Off Capacity on Demand allows the activation, for example, of general purpose processor (CP) capacity and specialty processors, such as zAAPs or zIIPs. Several models of System z10 Enterprise Class (z10 EC) are subcapacity models. On such models additional general purpose processor capacity can be provided by a different capacity level, by additional processors, or by a combination of both.

## What Capacity Provisioning can do for you

z/OS Capacity Provisioning helps you to manage the CP, zAAP and zIIP capacity of z10 EC servers that are running one or more z/OS systems. Based on On/Off CoD, temporary capacity may be activated and deactivated under control of a policy that you define. z/OS Capacity Provisioning simplifies the monitoring of critical workloads, and its automation features can help to activate additional resources faster than manual operation.

When you use Capacity Provisioning you can select different levels of automation to provide you with an appropriate level of control. For further information on these processing modes refer to page 21.

For example, it is possible to:
- Activate and deactivate temporary capacity through operator commands
- Activate and deactivate temporary capacity based on a defined schedule, without considering workload performance

- Have the Provisioning Manager suggest changes to the capacity of the z10 EC server based on the observation of workloads that you define
- Have the Provisioning Manager automatically implement changes to the capacity of the z10 EC server based on the observation of workloads that you define

# What are the components of Capacity Provisioning?

z/OS Capacity Provisioning is delivered as part of the z/OS MVS Base Control Program (BCP) component. Capacity Provisioning includes the following:

- Capacity Provisioning Manager (Provisioning Manager) - the server program
- Capacity Provisioning Control Center (Control Center) - the workstation code
- Sample datasets and files

Capacity Provisioning configuration entities, such as policies and domain configurations, are defined using the Control Center on a workstation. Observation of workloads and the interaction with the servers defined to Capacity Provisioning is performed by the Provisioning Manager on the z/OS host.

The following sections briefly describe the components of Capacity Provisioning:

## The Capacity Provisioning Manager

The Provisioning Manager monitors the workload on a set of z/OS systems and organizes the allocation of additional capacity to these systems when required. The systems to be observed are defined in a domain configuration file. Details of additional capacity and the rules for its allocation are held in a policy file. These two files are created and maintained using the Control Center.

## The Capacity Provisioning Control Center

The Control Center, installed on a workstation, is the graphical user interface to Capacity Provisioning. Through this interface administrators work with provisioning policies and domain configurations, and can transfer these to the Provisioning Manager.

You can set up a direct connection from the Control Center to the Provisioning Manager, and use this to transfer provisioning policies and domain configurations files to the Provisioning Manager, or to query its status.

## Capacity Provisioning sample datasets and files

The Capacity Provisioning component includes several samples to simplify customization and speed up the definition of your provisioning policies:

- Sample jobs for setting up and customizing the Capacity Provisioning component are placed in SYS1.SAMPLIB. The use of these sample members is described in Chapter 3, "Setting up a Capacity Provisioning domain," on page 27.
- The Control Center contains sample domain configurations and policies. These samples are used throughout this book to illustrate concepts.

# Prerequisites

z/OS Capacity Provisioning has certain hardware and software requirements. If your configuration does not meet all these requirements you cannot use the full functionality of Capacity Provisioning. However, some functions can be exploited with fewer requirements.

## System z hardware requirements

- One or more z10 EC servers.
- If temporary capacity is to be controlled by the Provisioning Manager running in confirmation or autonomic mode, or if provisioning actions are to be performed through Provisioning Manager commands, temporary capacity must be available. This requires the On/Off CoD enablement (feature code 9896 on the z10 EC), as well as a valid On/Off CoD record for temporary general purpose processor, zAAP or zIIP capacity.
- If more than one processor complex is to be controlled a Hardware Management Console (HMC) is required. The available options are listed in Table 2.
- Support elements (SE) and the Hardware Management Console (when used) must be at driver level D73G or later.

*Table 2. Support Element (SE) or Hardware Management Console (HMC) requirement by Capacity Provisioning configuration*

| Configuration | Communication Through System z API (SNMP) |
|---|---|
| All observed systems and hosting system on one processor complex | HMC (preferred) or SE |
| All observed systems on one processor complex; hosting system on a different processor complex | HMC (preferred) or SE. |
| Observed systems on multiple processor complexes | HMC |

## z/OS software requirements

- z/OS must be release 9 or above.
- z/OS Resource Measurement Facility (RMF™), an optional element of z/OS, must be enabled, or you may use an equivalent product.
- Your z/OS security product must support creation of PassTickets (R_GenSec) and evaluation through the SAF interfaces. If you are using a security product other than IBM Security Server (Resource Access Control Facility, or RACF®), check with your vendor how to do this.
- Network (SNMP) connectivity from your hosting system to the HMC or SE.

## Supported LPAR and z/OS Environments and Restrictions

The IBM System z platform and z/OS allow for great flexibility. Capacity Provisioning supports a broad range of configurations but certain configurations are not supported or are restricted. This chapter summarizes the restrictions that apply to Capacity Provisioning in z/OS Release 9.

- Observed systems must be running z/OS Release 9 or higher. Other operating systems, or the Coupling Facility Control Code (CFCC), may be active in other LPARs.

- Observed systems running as guests under z/VM are not supported. You are also recommended not to use a z/OS system running as a z/VM guest to run the Provisioning Manager.
- An observed system may run in a *shared* or *dedicated* LPAR. An LPAR with *dedicated* processors, however, can only generate demand for higher general purpose processor capacity level. If the processor complex is not a subcapacity model but is already operating at its maximum capacity level, no additional demand will be recognized. If the LPAR is *dedicated* no demand for additional special purpose processors will be recognized.
- Demand for additional physical processors – as opposed to increased capacity level – for shared CP, zAAP, or zIIP processors can only be recognized if the current sum of logical processors is greater than the number of physical processors in the respective processor pool. Capacity Provisioning will not configure reserved or offline processors online.
- Observed systems may have general purpose CPs, zAAPs and zIIPs configured.
- Demand for zAAP processors can only be recognized if at least one zAAP is already online to the system.
- Demand for zIIP processors can only be recognized if at least one zIIP is already online to the system.
- The additional physical capacity provided through Capacity Provisioning will be distributed through PR/SM™ and the operating systems. In general the additional capacity will be available to all LPARs, but facilities such as defined capacity (soft capping) or initial capping (hard capping) can be used to control the use of capacity.
- You are recommended not to define provisioning conditions for service classes associated with resource groups for which a capacity maximum is in effect.

## Workstation requirements

The workstation on which the Control Center runs must meet the following minimum requirements:

- An INTEL Pentium® or equivalent processor with 512 MB memory (1 GB recommended)
- At least 150 MB of available disk space
- Microsoft Windows XP Professional. Service Pack 2 or later
- Screen resolution 1024x768 or higher
- If the Control Center is used to connect to the Provisioning Manager (recommended) a TCP/IP connection to the z/OS system hosting the Provisioning Manager

# Chapter 2. Capacity Provisioning basics

A knowledge of the concepts of Capacity Provisioning and the terms used in these concepts is assumed in the remainder of this book. This chapter is intended to clarify these terms and to give the background to the concepts. To set the scene, this is the environment in which Capacity Provisioning operates:

**Field of operation**

The scope of a z/OS Capacity Provisioning system is referred to as a Capacity Provisioning Domain, or simply a domain. The domain configuration describes the scope of management within a provisioning domain. The domain includes hardware and software elements. The hardware elements are one or more Central Processor Complexes (CPCs) where temporary capacity can be activated or deactivated by Capacity Provisioning. The software elements are z/OS operating systems which can run on one or more of these CPCs and which are monitored by Capacity Provisioning to determine the hardware requirements.

**Rules of operation**

Provisioning Management is controlled by a Capacity Provisioning Policy, or simply a policy. This defines the actions to be performed on the hardware elements in response to the demands of the observed software elements. A policy contains rules, which define workload conditions that will trigger intervention, the resources which can be activated, and the time periods during which the rule can be applied.

The domain is controlled by the Provisioning Manager. This runs in a z/OS system and controls the domain in real time. It observes the software elements and monitors workload demands. It can recommend hardware configuration changes to the system operator, or can be empowered to activate or deactivate hardware elements itself to satisfy these demands.

The Capacity Provisioning software also includes a graphical user interface to the Provisioning Manager, the Control Center.

These concepts are expanded below in the overview section. The domain is described on page 8, policies on page 8, the Provisioning Manager on page 9 and the Control Center on page 10.

More information on key points follows in "Capacity Provisioning in detail" on page 10. The final section of this chapter is "Naming Conventions" on page 25.

## Overview

This section describes:
- The environment of Capacity Provisioning (the Capacity Provisioning Domain)
- The processing rules (the Capacity Provisioning Policy)
- The program used to run Capacity Provisioning (the Capacity Provisioning Manager)
- The program used to manage Capacity Provisioning (the Capacity Provisioning Control Center)

## Capacity Provisioning Domain

The domain consists of:

- Observed systems which can trigger provisioning (described on page 10), and
- Central Processor Complexes (CPCs) on which provisioning can be managed (described on page 10).

As Capacity Provisioning is capable of maintaining the configuration of more than one domain for different purposes, each domain must be identified by a unique name.

An example of a domain is:
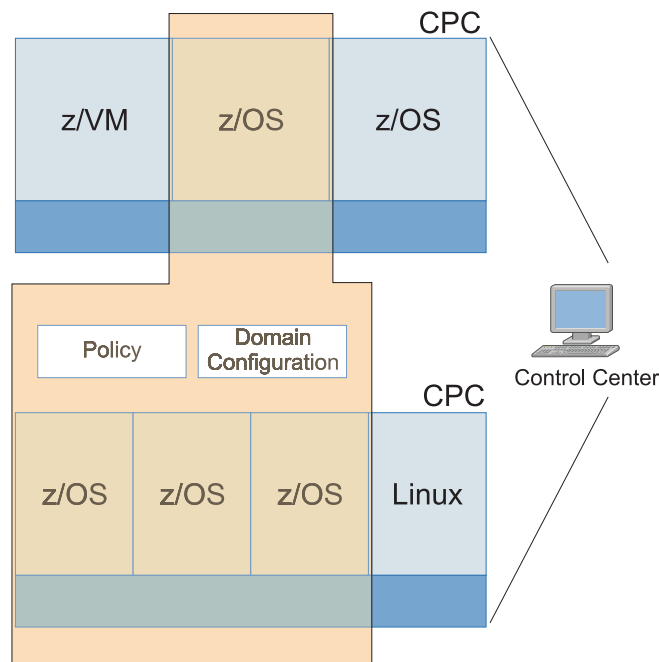


*Figure 1. Capacity Provisioning domain*

The domain configuration describes the scope of management within a provisioning domain. Figure 1 shows an example domain configuration with two CPCs to be managed and four systems to be observed. This shows that Capacity Provisioning can be performed for one or more CPCs. A set of CPCs may be divided among multiple domains, but you should not include any individual CPC in more than one domain. Each system in the domain configuration is identified by its z/OS system name and by the name of the sysplex it belongs to. Systems keep the same name even if they move across LPARs and CPCs.

## Capacity Provisioning Policy

The policy controls the provisioning of additional capacity. Different policies can be created for different circumstances, but only one of these policies can be used by the Provisioning Manager at any point in time. The policy defines:

- How much additional capacity may be activated
- When this additional capacity may be activated
- What triggers the activation of additional capacity

Each policy has a maximum provisioning scope which defines the total amount of resources that may be activated. This includes:

- Maximum amount of general purpose capacity, in MSUs
- Maximum number of Application Assist Processors (zAAPs)
- Maximum number of Integrated Information Processors (zIIPs)

General purpose capacity can be provided either by additional general purpose processors (CPs) or by increased processor capabilities.

A policy contains one or more provisioning rules. These rules define limits (provisioning scope) to the capacity that can be activated, time periods (time conditions) when activation is possible, and triggers (workload conditions) that can cause activation.

Rules contain provisioning conditions which describe the situations in which the Provisioning Manager can activate temporary resources under the rule. These situations can include time conditions indicating periods in which provisioning is allowed, and workload conditions indicating demand that can trigger activation. Workload conditions are expressed in terms of the z/OS WLM service class model.

Additional capacity may only be activated by z/OS Capacity Provisioning when business critical work is suffering. This work should be identified at the planning stage and must be specified in the workload conditions of a policy.

For more information on rules refer to page 13, and for conditions refer to page 13.

## Capacity Provisioning Manager

The Provisioning Manager controls a domain. It monitors the observed systems, and can activate or propose manual activation of temporary capacity, based on the settings in your active domain configuration and policy.

The specifications of the CPCs to be managed and the systems to be observed are held in a domain configuration. The Provisioning Manager must be able to access these CPCs from every host system it can run on. Information from available CPCs is obtained through a connection to the hardware console. This console can be a service element (SE) or a hardware management console (HMC).

**Note:** In the rest of this book a HMC is assumed unless otherwise indicated, but the term HMC can be replaced throughout by SE if your system uses this.

Management of the domain is controlled by a policy, which specifies the workload conditions which can trigger provisioning, and the resources which can be allocated under these conditions.

Domain configurations are held in a domain configuration repository, and policies in a policy repository. As these repositories may contain more than one domain configuration or policy each configuration or policy must be given a unique name to identify it. At any given time only one configuration and one policy can be active in the domain. Refer to "Defining the runtime datasets" on page 31 for details of the repository files.

The Provisioning Manager can operate in any one of four processing modes with varying powers of autonomy. These modes are described in detail on page 21.

Temporary capacity activated by the Provisioning Manager is referred to as being resources owned by the Provisioning Manager. Resources that are activated

manually, either using Provisioning Manager commands or using the interfaces available at the HMC, are not managed by the Provisioning Manager.

## Capacity Provisioning Control Center

The Control Center is a program which runs under Windows. It holds information in a workspace directory. You can prepare domain configurations and policies in the workspace and can then transmit these directly from the Control Center to the Provisioning Manager if a communication channel for this is set up. When this channel is set up the Control Center connects to the Common Information Model (CIM) server on the system where the Provisioning Manager is active, using the CIM HTTP or CIM HTTPS protocol.

For more details of the Control Center refer to page 24, and for the workspace refer to page 24.

# Capacity Provisioning in detail

This section expands on the information given in the overview.

## Capacity Provisioning Domain

The CPCs to be managed and the systems to be observed are specified in a domain configuration. You can create and edit a domain configuration using the Control Center (refer to page 24). If you want to activate the domain configuration you must install it into the domain configuration repository of the Provisioning Manager. You can store multiple domain configurations for different purposes in the repository, but at any time only one domain configuration can be active in the domain.

### Observed systems

To get information about the workload running on a system the Provisioning Manager must be connected to this system. The information is provided by a CIM server on the system. The domain configuration includes attributes for each system which describe how to connect to the system. One attribute is the host address of the system, another attribute is the protocol to be used and a third specifies the port on which the CIM server is listening.

Each system has an *enabled* attribute that specifies whether the Provisioning Manager is allowed to connect to the system and retrieve the information. You can switch this attribute on or off at runtime using the Provisioning Manager commands ENABLE CONFIGURATION and DISABLE CONFIGURATION described on pages 101 and 99.

### CPCs

Temporary capacity must be installed on a CPC before it can be activated. Installed capacity is described in a capacity record, as described in *System zNext Capacity on Demand User's Guide*. The Provisioning Manager can only activate the residual capacity in this record within limits which were defined during the order process of the record. It is possible that some CPCs in a domain may not have temporary capacity. In this case the Provisioning Manager can still report resource shortages on these CPCs.

The provisioning domain contains a set of logical partitions (LPARs). These can be parts of a stand-alone system (a monoplex) or can be parts of a sysplex. A z/OS system runs within each LPAR. When you define the domain configuration you specify the set of z/OS systems to be observed. Each z/OS system is identified by

name, and if it is running in a sysplex this name is further qualified by the name of the sysplex. A system can only be observed and considered for capacity changes if it runs on a CPC in the provisioning domain.

Each CPC in the domain configuration is identified by its logical name which defines it on the SE of that processor complex. For each CPC there is an *enabled* attribute which specifies whether the CPC is to be considered for temporary capacity changes. If it is enabled the Provisioning Manager is allowed to perform changes to the temporary capacity of that CPC. If it is disabled only manual capacity changes using Provisioning Manager commands are allowed. You can switch the *enabled* attribute on or off at runtime, in the same way as for systems, by using the Provisioning Manager commands ENABLE CONFIGURATION and DISABLE CONFIGURATION described on pages 101 and 99.

The temporary capacity that can be activated on a CPC can be described by multiple capacity records, identified by unique record IDs. Only one of these records can be in use by the Provisioning Manager at any one time. You can specify the ID of the record to use in the domain configuration, or if there is only one record you may leave the Provisioning Manager to find it.

## Capacity Provisioning Policy

The management of temporary resources is based on a policy that contains rules for activation and deactivation. You can create and edit a policy using the Control Center. When the policy is complete you must install it into the policy repository of the domain before it can be activated. You can have multiple policies for different purposes in the policy repository, but at any one time only one policy can be active in the domain.

Figure 2 shows the basic structure of a policy:
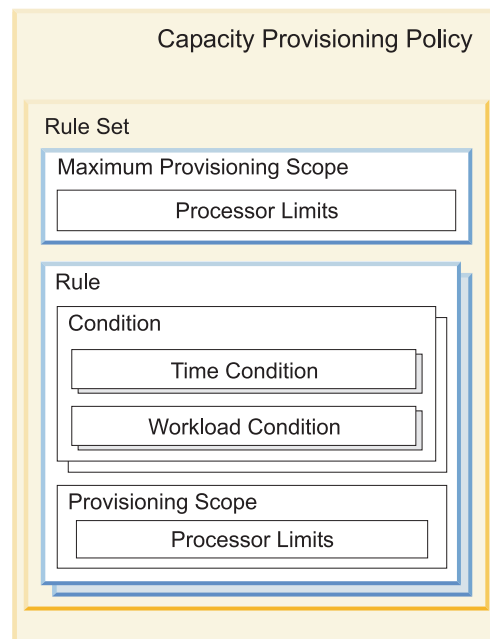


*Figure 2. Capacity Provisioning policy structure*

It contains a maximum provisioning scope and a set of provisioning rules. The maximum provisioning scope limits the amount of additional resources that may

be activated on behalf of the contained rules. A rule contains provisioning conditions and a provisioning scope limiting the additional capacity that may be provisioned based on the rule. Two types of condition are supported:

**Time conditions**  specify time periods during which additional capacity can be activated.

**Workload conditions**  identify work which is eligible to cause an activation, and the conditions under which activation can be triggered. Eligible work is specified according to the workload model of the z/OS Workload Manager (WLM).

Each provisioning policy is identified by name. Within a policy you should identify rules, provisioning conditions, time conditions and workload conditions by names which must be unique within the policy. These names are used in commands to the Provisioning Manager (for example to enable or disable a rule or a provisioning condition), and in reports from the Provisioning Manager which reference these policy elements.

## Maximum Provisioning Scope

Table 3 shows an example of a provisioning scope in which limits are defined for two CPCs named CPC0 and CPC1. The first definition specifies that on CPC0 200 MSUs and four additional zIIPs may be activated, but no zAAPs. The second definition specifies that on CPC1 a maximum of 300 MSUs, two zIIPs and three zAAPs may be activated.

*Table 3. Provisioning scope example*

| CPC | Maximum MSUs | Maximum zAAP Processors | Maximum zIIP Processors |
|-----|--------------|-------------------------|-------------------------|
| CPC0 | 200 | 0 | 4 |
| CPC1 | 300 | 3 | 2 |

A Capacity Provisioning policy includes a maximum provisioning scope which defines the total capacity that can be activated at any one time by all the rules contained in the policy. Each rule also contains a provisioning scope which restricts the capacity that may be activated by that rule. If the provisioning scope of a rule includes restrictions on CPCs, these must also be included in the maximum provisioning scope, otherwise no additional capacity will be activated for these CPCs.

For example, suppose you want to allow one additional zAAP to be activated when an online service class suffers, and one or two additional zAAPs when a batch service class suffers, but you do not want to have more than two additional zAAPs active at the same time. To model this scenario you should define a maximum provisioning scope of two zAAPs, and two rules: one for the online service class with a provisioning scope of one zAAP and one for the batch service class with a provisioning scope of two zAAPs. With these rules, if two additional zAAPs are requested for a batch application and one additional zAAP for an online application at the same time, one of the requests will be unfulfilled (either the batch service class will only be allocated one additional zAAP or the online service class will be allocated no additional zAAPs) so that in total there will never be more than two additional zAAPs active at the same time.

## Rules

A rule can be associated with a particular service class, so that in the provisioning scope you can limit the additional capacity which can be allocated to applications You can use time conditions to select periods when you expect significant capacity shortages, and you can identify triggers such as the WLM service class to be associated with an application. Additional capacity will then only be activated within periods specified by the time conditions, and when at least one of the associated service classes is suffering. Rules should be defined for all applications to which additional temporary capacity may be allocated.

A rule can be enabled or disabled. Only enabled rules are considered by the Provisioning Manager. You can specify in the policy whether a rule is initially enabled or disabled. This status can be changed at runtime by using the Provisioning Manager commands ENABLE POLICY and DISABLE POLICY described on pages 102 and 99. In this way you can specify different scenarios in the policy and activate only those relevant at any time, or you can temporarily disable provisioning, for example if a maintenance period overlaps with a time condition in the policy.

## Provisioning conditions

The workload conditions apply to all time conditions of the rule. For example, a workload condition could be defined for a service class SC1 associated with month-end jobs, and time conditions could be defined to cause provisioning on January 31$^{st}$, February 28$^{th}$, and so on. To consider workloads running on different sysplexes or systems, several workload conditions may be specified. For example, service class SC2 could be specified to trigger provisioning when running in sysplex PLEX1 and service class SC3 to trigger provisioning on system SYS2 only when running in sysplex PLEX2.

All the resources included by the provisioning scope of a rule are shared by all provisioning conditions within that rule. If you want to allocate a different set of resources for a provisioning condition then you should create a new rule to include this condition.

Provisioning conditions can be enabled or disabled, in the same way as rules. Only enabled provisioning conditions are considered by the Provisioning Manager. You can specify in the policy whether a provisioning condition is initially enabled or disabled. This status can be changed at runtime, in the same way as rules, by using the Provisioning Manager commands ENABLE POLICY and DISABLE POLICY described on pages 102 and 99. In this way you can specify different scenarios in the policy and activate only those relevant at any time, or you can temporarily disable part of the policy, for example, if a maintenance period overlaps with a time condition.

## Time conditions

A time condition is defined by the following parameters:

**Name**  This uniquely identifies the time condition within the policy. The name is used in Provisioning Manager reports which reference the time condition.

**Start time**  The time at which the Provisioning Manager can start to activate additional capacity if one of the associated workloads suffers.

**Deadline**  The latest time when activation of additional capacity is allowed.

Additional capacity which has already been activated can remain activated until the end time or until the capacity is no longer needed.

**End time**   The time at which the Provisioning Manager starts to deactivate additional capacity.

Figure 3 describes two time conditions and shows how the Provisioning Manager interprets them. On the left you can see the effect of time condition TC1. Resource shortages are only considered between the start time and the deadline; resource shortages between the deadline and the end time cannot trigger activation of additional resources. The boxes represent additionally provisioned general purpose capacity. On the right you can see the effect of time condition TC2. In this condition the period between the start time and the deadline is very short compared to the period between the deadline and the end time, so additionally provisioned capacity can remain active for a longer period but cannot be increased after the deadline.

| Name | Start Time | Deadline | End Time |
|------|-----------|----------|----------|
| TC1 | 03.15.2008 08:00:00 | 03.18.2008 10:00:00 | 03.19.2008 10:00:00 |
| TC2 | 10.28.2008 08:00:00 | 10.28.2008 16:00:00 | 10.30.2008 11:59:00 |
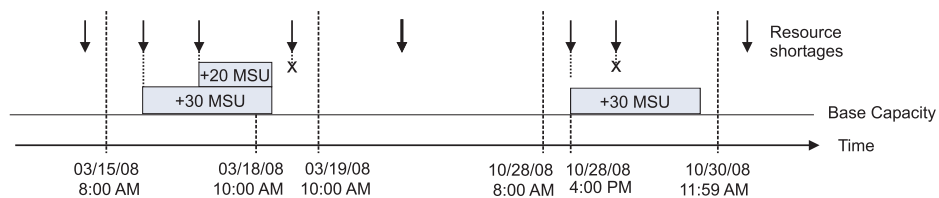


*Figure 3. Time condition semantics*

## Workload conditions

If time conditions are defined in a rule, but no workload conditions, the Provisioning Manager performs scheduled activation and deactivation of additional capacity. At the start of these time conditions the maximum additional resources allowed in the provisioning scope will be activated. The deadline has no effect in this case, but at the end of the time condition the activated resources will be deactivated.

Specification of business critical work eligible for provisioning is based on the WLM service class model. In this model work is assigned to service classes which are associated with goals, such as a response time that should be met when the work is processed. A service class can be allowed up to eight defined periods of operation with specified durations and importance. A different goal can be specified for each period. If a period expires before the work is finished, the work will continue in the next defined period. Parcelling out the work in this manner allows a better distribution of resources, as a high resource usage in one section of the work only impacts the periods during which that section is running and not the entire duration of the work. See *z/OS MVS Planning: Workload Management* for information on WLM service classes.

The importance of service classes is used to resolve resource contention. Service class periods with a higher importance will be allocated resources first, and service class periods with a lower importance will get whatever is left.

Service classes are defined in WLM for the entire sysplex, so every service class is available on every system in the sysplex. Different service classes may be business critical on different systems, depending on the work that is running on each system.

A workload condition allows business critical service class periods to be specified. Each workload condition is given a name to uniquely identify it within the policy and to be used in Provisioning Manager reports. The workload condition has the following parameters:

- **Sysplex** The sysplex in which the workload can run. If you specify '*' for this parameter the workload condition applies to all sysplexes observed by the Provisioning Manager.
- **System** The z/OS system the workload condition applies to. If you specify '*' for this parameter the workload condition applies to all systems observed on the specified sysplex.
- **Importance filters** These allocate service class periods by importance level to sets of provisioning criteria (refer to page 16). The Provisioning Manager will check for resource shortages for all service class periods with an importance level equal to or higher than the specified value. Separate provisioning criteria can be defined for each importance level. Specification of importance filters is optional.
- **Included Service Classes** These identify sets of service class periods by name. For these periods the Provisioning Manager will check for resource shortages. Separate provisioning criteria can be defined for each service class period. Specification of included service classes is optional.
- **Excluded Service Classes Filter** These identify sets of service class periods by name that are not to be considered by the Provisioning Manager. Specification of excluded service classes is optional.

The importance filters allow eligible service class periods to be specified by their importance. If this method is not appropriate to identify business critical service class periods you can specify additional eligible service class periods by name as included service classes. Specifying excluded service class periods allows you to exclude ineligible service class periods which would otherwise be included. At least one importance filter or included service class period must be defined for the workload condition to take effect.

The Provisioning Manager determines the set of eligible service class periods as follows:

1. Service class periods that fulfill the importance filters on the specified system in the specified sysplex are chosen first.
2. This set is then extended to include the periods that match the included service class filters.
3. Service class periods that match the excluded service class filter are then removed from the set.
4. The Provisioning Manager will check for resource shortages for those service class periods remaining in the set.

Whenever a new WLM service policy is activated the set of observed service class periods is redetermined.

As all work running in an eligible service class period can trigger provisioning, you should verify that the service classes and classification rules in the WLM service definition are properly defined before using these service classes to trigger Capacity Provisioning.

**Provisioning criteria:** To detect when a service class period is suffering from insufficient processing capacity, the Provisioning Manager uses two major indications: the performance index (PI), and the resource demand of the service class period. The resource demand of a service class period can be detected automatically by the Provisioning Manager. PI thresholds must be defined in the provisioning policy as provisioning criteria associated with importance filters or included service classes.

The PI is calculated as the ratio of the specified goal of a service class period to the measured response time or velocity of the work running in this period. A PI of 1.0 indicates that the work is meeting the goal. A PI lower than 1.0 indicates that the work in the service class period over-fulfils the goal. A PI higher than 1.0 indicates that the goal is not fulfilled. In practice a PI greater than 1.0 may be adequate for your installation, so you can assign a sufficient or appropriate target PI threshold to each service class period. Capacity Provisioning considers an action if the PI of a defined service class period is greater than the target PI for a specified amount of time. This indicates that WLM or, when active, Intelligent Resource Director (IRD), have not been able to resolve the bottleneck by shifting access to processor resources. The speed at which the Provisioning Manager should react if a PI is above tolerance is also installation dependant, so individual provisioning criteria can be defined for eligible service classes within the workload condition.

Importance filters and included service classes filters have the following parameters in common:

| Provisioning criteria | Explanation |
|---|---|
| Provisioning PI | The value of the performance index, at or beyond which the Provisioning Manager considers the service class period to be suffering. |
| Duration in min | The length of time during which the performance index must exceed the target PI before the Provisioning Manager intervenes. Note that in practice the actual duration can be longer than the specified duration, for example if the performance monitor sampling interval is not aligned with the specified duration. |
| Deprovisioning PI | The value of the performance index below which the Provisioning Manager considers the service class period no longer suffering. The deprovisioning PI must be lower than the provisioning PI. |
| Duration in min | The length of time during which the performance index must be less than the deprovisioning PI before the Provisioning Manager considers that the service class period is no longer suffering. |

| Provisioning criteria | Explanation |
|---|---|
| PI Scope | This indicates whether the provisioning PI and deprovisioning PI values refer to the sysplex PI or the system PI of the service class period. The sysplex PI is the PI of the service class period within the sysplex. The system PI is the performance index of the service class period on each system in the sysplex. This is also referred to as the local performance index (local PI). The default and recommended setting is "System". A sysplex PI should only be considered if all systems joining the sysplex are defined to the provisioning domain. **Note:** Some system monitoring products may only display the sysplex PI. If you use z/OS RMF the local PI can be found in the RMF Monitor III Data Portal SYSINFO report, in the RMF Monitor III as metric 0x8D1020, or in the RMF WLMGL report if the SYSTEMS option is in effect or if only data from a single system is provided. |

Provisioning PI and provisioning PI duration are used by the Provisioning Manager to detect if observed service class periods need help. Before any actions are taken the Provisioning Manager considers the resource demand of the service class period to ensure that the activation of additional processing capacity can improve the PI. Deprovisioning PI and deprovisioning PI duration are used by the Provisioning Manager to detect when a service class period no longer needs help.

For example, assume a workload condition is specified including service class ONLINE. This condition is defined with one period of WLM service definition WLMSD, a provisioning PI of 1.8 and duration of 10 minutes, and a deprovisioning PI of 1.2 and duration of 10 minutes. If the PI of the service class period changes within a defined time condition, as shown in Figure 4 on page 18, the Provisioning Manager would detect three instances where the provisioning PI criteria are fulfilled. At the first two instances the Provisioning Manager will activate additional capacity. The third instance is ignored as it occurs after the deadline. The Provisioning Manager would also detect an instance when the deprovisioning PI criteria are fulfilled. The Provisioning Manager then decides service class ONLINE no longer needs additional capacity and starts to deactivate this.

```
Name:        PT1
Sysplex:     PLEX1
System:      SYSA
Importance Filter:
    Importance <= 2 with PI >= 1.8 for 10 min until PI <= 1.2 for 20 min
Included Service Class Periods:
    ONLINE.1 in WLMSD with PI >= 1.8 for 10 min until PI <= 1.2 for 10 min
Excluded Service Class Periods:
    BACKUP.1 in WLMSD
```
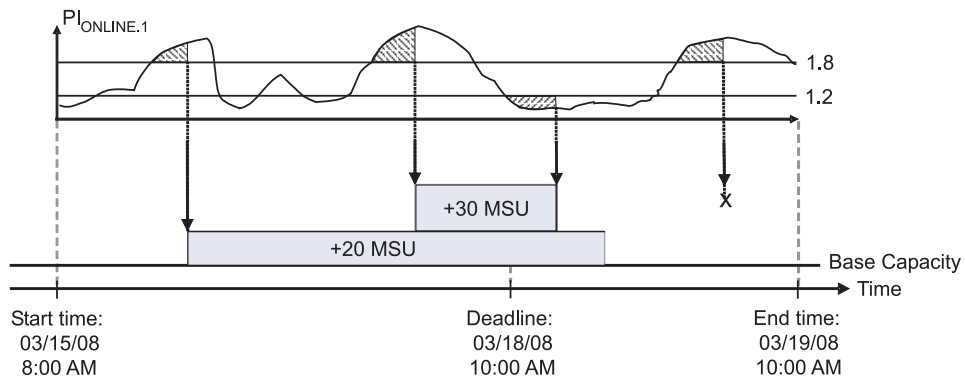


*Figure 4. Provisioning criteria semantics*

**Importance filter:**  An importance filter selects service class periods based on their importance. It includes the following parameter:

| Parameter | Explanation |
|---|---|
| Importance | The relative importance of the service class periods. All service class periods with an importance value equal or smaller than that specified match the filter unless another importance filter applies. |

as well as Provisioning Criteria PI values (refer to page 16) indicating when service class periods matching the importance filter are considered to be suffering.

For example, if you specify importance value 3 in a filter all service class periods with importance values 3, 2, and 1 match the filter and the specified provisioning criteria will be applied to them. To define different provisioning criteria only for service class periods of importance value 1 you can define another importance filter with the new criteria. The filter for importance value 3 then applies only to service class periods with importance values 3 and 2, and the filter for importance value 1 only to service class periods with importance value 1.

**Service class period filter:**  Included and excluded service class periods are identified by service class period filters, which contain criteria that a service class period must match to be considered or ignored by the Provisioning Manager. These filters include the following parameters:

| Parameter | Explanation |
|---|---|
| Service Definition | The name of the WLM service definition. The specified service class periods are only considered if this WLM service definition is installed. You may specify '*' to include all WLM service definitions. |

| Parameter | Explanation |
|---|---|
| Service Policy | The name of the service policy within the WLM service definition. The specified service class periods are considered if a service policy with that name is activated. You may specify '*' to include all service policies matching the other criteria. |
| Service Class | The name of the service class. You may specify '*' to include all service classes matching the other criteria. |
| Period | The limiting period of the service class that is to be considered. In an included service class filter, this period and all periods with a lower period number are considered eligible to trigger provisioning. If a service class has less periods than this number all periods will be considered. In an excluded service class filter, this period and all periods with a higher period number are excluded from provisioning. |

as well as Provisioning Criteria PI values (refer to page 16) which determine if service class periods matching the service class filter are considered to be suffering. Provisioning criteria are used only with included service classes.

# Capacity Provisioning Manager

The Provisioning Manager program resides in SYS1.SIEALNKE and in the file system under /usr/lpp/cpo. It must be invoked through a started task procedure. It works with the resource definitions from the domain configuration and the workload and time conditions from the policy. These are created using the Control Center.

The Provisioning Manager observes z/OS systems by connecting to the CIM servers on these systems, and uses these connections to retrieve the required capacity and performance metrics. To monitor and control resources a connection to the HMC must be established using the SNMP protocol. For this a network path to the console must be available. Refer to "Defining the connection to the HMC" on page 41 for details.

The processing mode of the Provisioning Manager (refer to page 21) is controlled by operator commands. The processing actions available are described in "Processing activations and deactivations" on page 23. Refer to "Provisioning Manager commands" on page 77 for the method of entering these commands, and to Chapter 8, "Provisioning Manager command reference," on page 93 for the actual commands.

To ensure availability you can install and set up the Provisioning Manager on more than one system. You are recommended to run the Provisioning Manager on a system which is included in the domain. There should be no more than one instance of the Provisioning Manager active at any time. To cater for situations when the Provisioning Manager needs to stop, or when you need to shut down the system on which the Provisioning Manager is currently running, you can define a restart policy. You can use your automation product or the z/OS Automatic Restart Manager (ARM) for this purpose.

## Processing the domain configuration

When connected to the HMC the Provisioning Manager retrieves a list of available CPCs. This list is correlated to the list of CPCs defined in the active domain configuration. Any CPCs defined in the domain configuration which are not listed as available by the HMC are marked as "not correlated". The Provisioning Manager regularly checks for additional CPCs, and when these are found it checks if they can be correlated to CPCs defined in the domain configuration.

After the CPC lists have been correlated, the Provisioning Manager retrieves specific information about all CPCs common to both lists. When this information shows that a CPC has temporary capacity which can be managed by the Provisioning Manager, the CPC is considered valid for activation and deactivation requests.

Temporary capacity on a CPC in an enabled state can be automatically activated or deactivated by the Provisioning Manager. In a disabled state it can only be activated or deactivated manually using Provisioning Manager commands.

When the Provisioning Manager is in the processing modes `analysis`, `confirmation` or `autonomic`, and the observed system is enabled, the Provisioning Manager tries to connect to the CIM server on the observed system. This requires a network connection to the observed system to be available, and all required services on this system must be configured and running. These include the CIM server itself and the providers for the workload metrics. If RMF supplies the CIM providers then RMF and the distributed data server (DDS) must be operating and the RMF CIM provider must have a connection to the DDS.

After data has been retrieved through the connection, the Provisioning Manager verifies that the responding z/OS system is the one specified and that it is running on a CPC defined in the domain configuration. Performance information relating to the CPC, the LPAR, and the WLM service classes is then retrieved for the workload defined in the policy. As this information changes regularly, the rate at which the values are retrieved is synchronized with the change intervals. If RMF is used this interval is the value of the RMF MINTIME option.

There are some situations when the metric data is not valid. In particular, changes to the WLM policy may cause disruption. Such changes can be due to updating and reactivating the current WLM policy, or to installing a new WLM service definition. In these situations the Provisioning Manager must reevaluate the workload situation. This may result in some history no longer being valid, and if resources are currently activated by the Provisioning Manager these may be deactivated.

The actual state information about the domain configuration and the observed systems and managed CPCs can be reported by the Provisioning Manager in the domain configuration report. For more information about this report refer to page 82. The enabled state of the system and the CPC domain configuration elements may be changed using Provisioning Manager commands. For details of these commands refer to "ENABLE CONFIGURATION" on page 101 and "DISABLE CONFIGURATION" on page 99.

## Processing policy time conditions

One of the parameters of a time condition of a policy is a start time, which defines when the activation of temporary resources may start. The provisioning condition containing the time condition may also contain workload conditions. Based on the provisioning PI durations of all associated workload conditions, the Provisioning Manager calculates the time at which observation of the workload must start in order to allow activation at the start time if it is necessary. This calculated time is referred to as the observation start time.

Note: The Provisioning Manager may run at different times on different systems, and it will normally be observing several other systems. As these systems may be running in different time zones, the Provisioning Manager calculates

and reports all times based on a common time zone. This common timezone is the Coordinated Universal Time (UTC).

A time condition can be in any of the states in the following list, depending on the current time, the enabled state of the time condition, and the enabled state of the policy. The enabled state of the time condition depends on the enabled states of the provisioning condition, rule and policy that contain this time condition. If all of these policy elements are enabled the time condition is also enabled.

| Time condition state | Meaning |
|---|---|
| Pending | The current time is before the start time of the condition and no observation of any system is necessary. |
| Observing and enabled | The current time is after the observation start time and before the start time of the condition, the time condition and policy are enabled, and one or more workload conditions are defined which require systems to be observed if possible. Systems that are referenced by associated workload conditions may be contacted to get performance information for further processing. |
| Observing and disabled | The current time is after the observation start time and before the start time of the condition; the policy is enabled but the. The time condition is disabled. |
| Active and enabled | The current time is after the start time and before the deadline of the condition, and the time condition is enabled. The Provisioning Manager may change the activation level of the managed CPCs based on the provisioning condition that contains the time condition. |
| Active and disabled | The current time is after the start time and before the deadline of the condition. No changes to the activation level of the managed CPCs may be performed by the Provisioning Manager based on the provisioning condition that contains the time condition. |
| Drained and enabled | The current time is after the deadline and before the end time of the condition; the time condition is enabled. The Provisioning Manager may not activate additional temporary resources but may maintain the current activation level of the managed CPCs based on the provisioning condition that contains the time condition. |
| Drained and disabled | The current time is after the deadline and before the end time of the condition. No changes to the activation level of the managed CPCs may be performed by the Provisioning Manager based on the provisioning condition that contains the time condition. |
| Inactive | The current time is after the end time of the condition. No changes to the activation level of the managed CPCs may be performed by the Provisioning Manager based on the provisioning condition that contains the time condition. |

The states of time conditions in the active provisioning policy can be reported by the Provisioning Manager in the policy report. For more information about this report refer to page 80. The enabled/disabled states of the rule and provisioning condition policy elements may be changed using Provisioning Manager commands. For details of these commands refer to "ENABLE POLICY" on page 102 and "DISABLE POLICY" on page 99. The state of the active policy itself depends on the processing mode of the Provisioning Manager, as described on page 21. The policy is disabled in manual mode and enabled in all other processing modes.

## Processing modes

The Provisioning Manager must collect a different amount of information depending on the processing mode. The possible processing modes are:

| Mode | Explanation |
|------|-------------|
| Manual | In this mode you can issue manual activation and deactivation commands to the Provisioning Manager, but the Provisioning Manager will not perform any activation or deactivation by itself. You may use this processing mode if you want to maintain your systems and CPCs yourself, or if you want to quiesce the Provisioning Manager. The active policy and the active domain configuration are not processed. |
| Analysis | In this mode you are informed through console messages if any additional resources are required. The Provisioning Manager processes the active policy, analyzes the workload on all accessible systems, and sends the messages. These contain details of the maximum resources allowed by the policy which can be provisioned to help the current workload situation. In this mode, as in manual mode, the Provisioning Manager does not perform any activation or deactivation by itself. **Note:** In this mode the Provisioning Manager does not check whether the CPC on which the workload is running can permit the activation. It may report a need for additional resources for CPCs that do not in fact have any temporary resources that can be activated by the Provisioning Manager. |
| Confirmation | In this mode you are informed through console messages of proposed changes to the capacity settings of the CPCs, and you are asked to confirm the changes. The Provisioning Manager processes the active policy and the active domain configuration, analyzes the current workload situation on the observed systems, calculates which resources are needed, and sends the proposals. You can either accept or deny the proposed action.<br><br>If you accept the proposal the Provisioning Manager performs the action and continues processing based on the new activation level.<br><br>If you deny the proposal the Provisioning Manager will not consider the CPC for additional changes for a period of time, typically two hours. After this time the Provisioning Manager considers the CPC again and may propose the same or other actions according to the new situation.<br><br>While the answer to the request message is pending, the Provisioning Manager continues to check for any necessary changes. If the old requirement no longer exists the request is cancelled. If any new requirement has arisen a new proposal will be issued.<br><br>If you need more information to answer the proposal you may request reports from the Provisioning Manager, for example to show the actual workload situation as observed by the Provisioning Manager, or the current activation level of the CPC. |
| Autonomic | In this mode the Provisioning Manager autonomically adjusts the capacity settings of the CPCs as required, from analysis of the workload situation on the observed systems. The Provisioning Manager processes the active policy and the active domain configuration. When any activation or deactivation is performed it issues a message to the console to inform you which activities have been performed. |

You can switch between these processing modes while the Provisioning Manager is running. Information about activation level changes that have been performed based on the policy is preserved in all modes. If you switch to a mode that allows the activation level to be changed, the Provisioning Manager continues to manage those resources which it has activated.

When you start the Provisioning Manager you can pass the initial processing modeas a parameter. You can change the processing mode at any time using the Provisioning Manager SET DOMAIN command. Refer to page 108 for details of

this command. The current processing mode is reported by the Provisioning Manager in the domain report, described on page 79.

Table 4 shows the requirements for each mode and the functions available in each mode.

*Table 4. Processing modes*

| Requirement/ Function | MANUAL | ANALYSIS | CONFIRMATION | AUTONOMIC |
|---|---|---|---|---|
| Domain and policy definitions required. | No | Yes | Yes | Yes |
| RMF DDS and CIM server required. | No | Yes | Yes | Yes |
| Provisioning and deprovisioning through Provisioning Manager commands. | Yes | Yes | Yes | Yes |
| Observation of defined workloads. | No | Yes | Yes | Yes |
| Provisioning and deprovisioning recommendations or actions. | No | Recommendations through console messages. | Console messages (WTOR) that may be accepted, rejected, or ignored. | Actions are implemented immediately. |
| On/Off Capacity on Demand record required to be installed. | No | No | Yes | Yes |

## Processing activations and deactivations

The actions defined in a provisioning policy can be based on a schedule alone, based on workload conditions, or based on a combination of these.

Schedule based provisioning actions are defined by provisioning conditions that do not have any workload condition. All available associated resources are activated at the start of the time condition. If there are not enough resources available for activation at the start time, resources that become available later, for example by replenishing the record of the managed CPC or by deactivating resources that are not managed by the Provisioning Manager, may be activated at any time up to the deadline. All activated resources are deactivated at the end time of the condition

Workload based provisioning actions define workload targets of the observed systems. If the workload suffers because of insufficient resources, the Provisioning Manager activates temporary resources, one by one, until the situation is resolved or the supply of resources is exhausted. For this resolution the Provisioning Manager considers the performance index, as described in the provisioning conditions, and assesses which resources are needed and how they would help the workload. For example, it considers whether the LPAR containing the system has sufficient logical processors or whether the processing weight is high enough to absorb more capacity.

The Provisioning Manager performs activation level changes based on the active policy and the workload situation on the observed systems, and monitors the effect of these changes on the workload situation. There are multiple mechanisms that need to adjust to the new capacity situation, for example PR/SM on the hardware side and WLM and IRD on the software side. These mechanisms take time to distribute the available capacity so the Provisioning Manager blocks the CPC for a period of time, referred to as the 'blocking' time. Blocking means that the Provisioning Manager does not consider it for further changes after any activation or deactivation of temporary capacity has been performed until this 'blocking' time has elapsed.

Temporary resources will not be deactivated by the Provisioning Manager until they have been active for a 'minimum activation' time, even if the workload situation of the observed systems no longer requires them or rules in the provisioning policy become inactive. This is designed to ensure that short-term fluctuations in the workload situation do not cause too many changes in the activation level.

Information about the provisioning actions which are performed by the Provisioning Manager based on the workload situation and the active policy is reported in the activity report. For more information about this report refer to page 86.

**Note:** Manual changes to the activation level are not listed in the activity report.

You are recommended to leave management of the record describing the temporary capacity to the Provisioning Manager, but if necessary you can manually activate and deactivate temporary resources contained in this record. If you manually activate resources these will not be managed by the Provisioning Manager and you must deactivate them manually when needed. If you manually deactivate resources that have been activated by the Provisioning Manager this is detected and reported. The Provisioning Manager continues to manage from the new activation level of the CPC, and, if needed, the resources can be activated again. You can manually change the activation level of the record at the HMC or by using Provisioning Manager commands.

## Capacity Provisioning Control Center

The Control Center is the graphical user interface to capacity provisioning. Through this interface you can work with provisioning policies and domain configurations. If there is a connection to the Provisioning Manager you can then transfer the policies and configurations to the Provisioning Manager and view the status of the Provisioning Manager, for example to view which policy is active. The interface is described in Chapter 4, "Using the Capacity Provisioning Control Center," on page 49.

### Workspace

The Control Center maintains a workspace which includes the Provisioning Manager connections, a set of domain configurations and a set of provisioning policies. The workspace is stored on the file system in a `Workspace` directory. This contains three subdirectories:

- `Workspace`
  - `Connections`
  - `DomainConfigurations`
  - `ProvisioningPolicies`

When you leave the Control Center you are prompted to save any changes you made to the workspace. Provisioning policies are saved in the directory **ProvisioningPolicies**, domain configurations in **DomainConfigurations**, and the connection definitions for the Provisioning Manager in **Connections** directory.

You may have several workspace directories, for example a separate one for each provisioning domain, but you can only work on one workspace at a time. During the startup of the Control Center you are prompted to select a workspace. If you want to switch to a different workspace, just start the Control Center again with the different workspace.

During installation a workspace directory is created. To create an additional workspace directory, start the Control Center and when asked, specify the directory, where the new workspace shall be placed. If the directory does not exist, it will be created. Under the specified directory a subdirectory with the name `Workspace` and its three subdirectories are created. These directories contain sample files which you may use as models to copy into your own definition files. You are strongly advised not to use these samples themselves because service updates to the Control Center can replace the sample files.

### The Control Center time zone

Policies contain time conditions which define time periods during which additional capacity can be activated. You may choose what time zone the Control Center will use to display the times contained in the time conditions. The default display time zone is GMT. When you switch the Control Center to a different time zone all times in the time conditions in all policies will be converted.

Independent of the displayed time zone, times in policies are always stored in UTC.

## Naming Conventions

Policy names and configuration names must be unique within the workspace. If the name you specify for a new policy or configuration already exists in the workspace this name is altered by the Control Center to make it unique. The names of policy elements must be unique within that policy, and these names too will be altered if necessary.

The length of names and the character set which can be used are restricted.

Named elements within a provisioning policy or a domain configuration, and elements referencing external entities such as an operating system name or the logical name of a CPC, must conform to the rules defined in Table 5. In this table the hyphen (-) indicates that any character within the ASCII range which includes the characters on either side of the hyphen is valid.

*Table 5. Name restrictions*

| Name | Minimum length | Maximum length | Initial character | Subsequent characters |
|---|---|---|---|---|
| Domain | 1 | 8 | A - Z | A - Z, 0 - 9, # |
| Provisioning policy | 1 | 8 | A - Z | A - Z, 0 - 9, # |
| Provisioning rule | 1 | 12 | A - Z, a - z | A - Z, a - z, 0 - 9, #, _ |
| Provisioning condition | 1 | 12 | A - Z, a - z | A - Z, a - z, 0 - 9, #, _ |

*Table 5. Name restrictions  (continued)*

| Name | Minimum length | Maximum length | Initial character | Subsequent characters |
|------|------|------|------|------|
| Time condition | 1 | 12 | A - Z, a - z | A - Z, a - z, 0 - 9, #, _ |
| Workload condition | 1 | 12 | A - Z, a - z | A - Z, a - z, 0 - 9, #, _ |
| WLM service definition | 1 | 8 | A - Z, a - z, 0 - 9, #, $, %, @ | A - Z, a - z, 0 - 9, #, $, %, @, _ |
| WLM service policy | 1 | 8 | A - Z, a - z, 0 - 9, #, $, %, @ | A - Z, a - z, 0 - 9, #, $, %, @, _ |
| WLM service class | 1 | 8 | A - Z, a - z, 0 - 9, #, $, %, @ | A - Z, a - z, 0 - 9, #, $, %, @, _ |
| Domain configuration | 1 | 8 | A - Z | A - Z, 0 - 9, # |
| System | 1 | 8 | A - Z, 0 - 9, #, $, @ | A - Z, 0 - 9, #, $, @ |
| Sysplex | 1 | 8 | A - Z, 0 - 9, #, $, @ | A - Z, 0 - 9, #, $, @ |
| CPC | 1 | 8 | A - Z, 0 - 9, #, $, @ | A - Z, 0 - 9, #, $, @ |
| CPC record ID | 8 | 8 | A - Z, 0 - 9 | A - Z, 0 - 9 |
| Description | 0 | 128 | A - Z, a - z, 0 - 9, #, $, %, @, _, blank, nl, period | A - Z, a - z, 0 - 9, #, $, %, @, _, blank, nl, period |

# Chapter 3. Setting up a Capacity Provisioning domain

To set up a domain follow these steps:

- Plan the domain set up:

  define your configuration settings such as the name of the domain, prepare your security and collect information about your system.

- Define the Provisioning Manager:

  prepare your z/OS system to start up a Provisioning Manager.

- Install the Control Center:

  check the prerequisites and install the Control Center on a workstation.

The second and third steps can be performed in either order.

When you set up the Provisioning Manager you must create security definitions and CIM definitions. For the background to Security definitions refer to *z/OS Security Server RACF Security Administrator's Guide*, and for CIM definitions refer to *z/OS Common Information Model (CIM) User's Guide*.

## Planning the domain set up

To plan the domain set up consider the following points:

- What naming conventions to use
- Which z/OS system to run the Provisioning Manager on
- Where the prerequisites are located

### Choosing names

Capacity Provisioning includes samples which you can use to set up a new domain. These samples contain default values for element names. If you are satisfied with these defaults you need not change these values to set up the domain. If you choose a different naming convention replace all occurrences of the default names with the names you select during the actual definition steps. Table 6 on page 28 includes space for you to record the names you choose. The following paragraphs describe the element names, their default values and their meaning.

Every domain is identified by a domain name. If you use multiple domains each name should be unique. For further information about the rules for a valid domain name refer to "Naming Conventions" on page 25.

The Provisioning Manager runs as a started task, using an entry set up for this purpose in the started task procedure dataset used in your installation (normally SYS1.PROCLIB). A sample started task procedure, CPOSERV, is delivered in SYS1.SAMPLIB. This, or an equivalent, can be copied to your started task procedure dataset. If you choose a name other than CPOSERV for the started task you must name the member in this dataset accordingly.

When the Provisioning Manager starts, a user is assigned to the started task. This user must be defined and must be authorized for all resources accessed by the Provisioning Manager.

The Provisioning Manager holds status and configuration data in datasets. The names of these datasets should use the same high-level qualifier, to make security definitions easier.

Provisioning policies and domain configurations are defined using the Control Center. If a connection is set up between the Control Center and the Provisioning Manager you can install policies and domain configurations directly from the Control Center. In this case the user of the Control Center must connect to the CIM server on the system where the Provisioning Manager runs. Different security definitions are needed according to the operations required:

- If a Control Center user only needs to query the Provisioning Manager then the user should be a member of the Provisioning Manager query security group.
- If the user is allowed to modify the run time behavior of the Provisioning Manager then the user should also be a member of the Provisioning Manager control security group.

The Provisioning Manager and the Control Center communicate using the CIM protocol. The CIM server user will be needed to set up security definitions for this.

Table 6 contains a list of names to be chosen and their default values. If you do not use the defaults you are recommended to make a note of the names you use here.

*Table 6. Name information for a new domain*

| Name | Default | Your value |
|------|---------|-----------|
| Domain name | DOMAIN1 | |
| Started task procedure name | CPOSERV | |
| Runtime dataset high-level qualifier | CPO | |
| Provisioning Manager user | CPOSRV | |
| Control Center user[1] | CPCCUSR | |
| Provisioning Manager query security group | CPOQUERY | |
| Provisioning Manager control security group | CPOCTRL | |
| CIM server user | CFZADM | |

**Notes:**

1. The Control Center user can be any z/OS user authorized to interact between the Control Center and the Provisioning Manager.

   The Control Center user must be set up with a password (to authenticate through the Control Center). The other user ids can be set up with no password.

## Defining the runtime environment

Once you have defined your names you should define the environment for the Provisioning Manager. To start with you should identify the primary z/OS system on which you will run the Provisioning Manager, and you are recommended to select alternative systems on which a backup of the Provisioning Manager can run in the case that the primary system becomes unavailable. All of these systems need access to the Provisioning Manager datasets.

To allow a restart on an alternative system the runtime information shown in Table 7 on page 29 and all paths listed in Table 8 on page 30 must be identical on

the two systems. The term "runtime systems" in the following refers to all systems on which the Provisioning Manager may run, but note that only one instance of the Provisioning Manager can be running at any one time.

You can use z/OS Automatic Restart Manager (ARM) to restart the Provisioning Manager in the event of failure. If you do, you need to define the ARM restart policy, element name and element type. If you do not use ARM you may use any automation product which can restart the Provisioning Manager when needed.

The Provisioning Manager uses the Simple Network Management Protocol (SNMP) to communicate with the hardware. This hardware can be managed either by a CPC Support Element (SE) or by a Hardware Management Console (HMC). The SE or HMC that will serve the Provisioning Manager must be identified. Note that to manage multiple CPCs you require a HMC. In the remainder of this document the term HMC is used to mean HMC or SE, unless otherwise noted.

You need the name of the community through which the Provisioning Manager is to access the HMC, and the address it must connect to. It is possible to use the default community name ("public") but you are recommended to define a new community name for this purpose. This community name must be authorized to issue read and write operations and to issue commands to alter the temporary capacity. The address defined can be either the host nameor the TCP/IP address of the HMC.

For service information the Provisioning Manager may write trace and log data. As this is temporary data it is usually written to the /tmp directory on the runtime system. If you want this data to be written to another location you may redirect it to another file system. The selected path must be available on the runtime system, and the Provisioning Manager user must be authorized to write to this location.

You should use the Control Center to define the policies and domain configurations for the Provisioning Manager. A workstation is required to run the Control Center program.

Table 7 contains a list of all necessary environment information, and the default values of these where applicable. You are recommended to record here any values you change for your domain.

*Table 7. Provisioning Manager runtime environment*

| Name | Default | Your value |
|---|---|---|
| Primary runtime system | - | |
| Alternative runtime systems | - | |
| ARM restart needed | no | |
| ARM element type | SYSCPM | |
| ARM element name | SYSCPO | |
| HMC address | - | |
| SNMP community name | public | |
| Log data location | /tmp | |
| Trace data location | /tmp | |
| Control Center workstation | - | |

## Collecting information about prerequisites

To set up the Provisioning Manager you need information about other components and products on your runtime system. The information required is the following:

- The installation directory for the Java™ product
- The installation directory for the CIM server
- The location of the CIM Java client
- The location of the System Authorization Facility (SAF) libraries
- The location of the SAF Java library for secured signon function

Table 8 contains a list of all these prerequisite components and products and their default locations. You are recommended to record the locations that are defined on your runtime systems here.

*Table 8. Prerequisites information*

| Product or Component | Default location | Your location |
|---|---|---|
| IBM 31-bit SDK for z/OS, Java 2 Technology Edition, V5 (5655-N98) | /usr/lpp/java/J5.0 | |
| CIM server | /usr/lpp/wbem | |
| CIM Java client | /usr/lpp/wbem/jclient/ sblimCIMClient.jar | |
| SAF library | /usr/lib | |
| SAF jar file | /usr/include/java_classes/ IRRRacf.jar | |

## Preparing the Provisioning Manager

The prerequisites must be satisfied before you can successfully start the Provisioning Manager. These prerequisites include the runtime system and the systems that are observed by the Provisioning Manager. The runtime system may also be one of the observed systems. On the runtime system you should:

- Define datasets used for the runtime data
- Set the configuration parameters to your chosen values
- Create a started task procedure
- Provide APF authorization
- Define the security
- Define a restart policy

If you have defined alternative runtime systems and these share the same resources, for example a common RACF database, the definitions only have to be done once.

On the observed systems you must define the security to allow the Provisioning Manager user to connect to the system and to query the information for its management purposes.

**Note:** The following definitions and examples use the default values for all the data that you collected in the planning step. If you chose different values

you should adjust the examples accordingly. For further information about the different values and their defaults refer to "Planning the domain set up" on page 27.

## Defining the runtime datasets

The Provisioning Manager stores permanent and temporary data in datasets. You only need to define these datasets once for a domain. The datasets must be accessible on all runtime systems. Table 9 contains a list of the required datasets and their attributes:

*Table 9. Provisioning Manager datasets*

|  | **Restart dataset** | **Policy repository** | **Domain configuration repository** | **Provisioning Manager parameters** |
|---|---|---|---|---|
| dataset | *prefix*`.RESTART` | *prefix*`.POLICIES` | *prefix*`.DOMCFG` | *prefix*`.PARM` |
| DSORG | PO | PO | PO | PO |
| DSNTYPE | LIBRARY (preferred) or PDS | LIBRARY (preferred) or PDS | LIBRARY (preferred) or PDS | LIBRARY (preferred) or PDS |
| RECFM | VB | VB | VB | VB |
| LRECL | 16384 | 512 | 512 | 512 |
| BLKSIZE | 32760 | 32760 | 32760 | 32760 |
| Directory blocks (if DSNTYPE=PDS) | 20 | 20 | 20 | 20 |
| Primary allocation | 1 MB | 1 MB | 1 MB | 300 KB |
| Secondary allocation | 2 MB | 2 MB | 2 MB | 600 KB |

The *prefix* for the dataset names is the high-level qualifier and the name of the domain defined in Table 6 on page 28. For example, with the default values, the restart dataset name would be `CPO.DOMAIN1.RESTART`.

After you have created the datasets, copy two sample files from the Capacity Provisioning installation file system into the datasets for the Provisioning Manager parameters. These are the files `env` and `parm` from directory `/usr/lpp/cpo/samples`. Copy these as members `ENV` and `PARM`, respectively.

Capacity Provisioning provides a sample job for defining these datasets and copying the files. The sample job is available as member `CPOMKDSN` in library `SYS1.SAMPLIB`. Note that this job will delete any existing datasets with the same names as those to be defined.

## Adapting the Provisioning Manager parameters

Some parameters of the Provisioning Manager may need to be adapted to your environment. These parameters are held in the Provisioning Manager parameters dataset, *prefix*`.PARM`, in the members `ENV` for the Provisioning Manager runtime environment data and `PARM` for the Provisioning Manager configuration information.

The ENV member contains information about the runtime processing environment for your Provisioning Manager. Modify the following paths to match your installation settings:

**LIBPATH**

> This entry must contain:
>
> the path /usr/lib for SAF libraries,
>
> the Java installation paths /usr/lpp/java/J5.0/bin and usr/lpp/java/J5.0/bin/classic,
>
> and the Capacity Provisioning installation path /usr/lpp/cpo/lib.

**CLASSPATH**

> This entry must contain:
>
> the Capacity Provisioning JAR files, and hwmcaapi.jar from the installation directory /usr/lpp/cpo/classes,
>
> the SAF JAR file /usr/include/java_classes/IRRRacf.jar,
>
> and the CIM Java client /usr/lpp/wbem/jclient/sblimCIMClient.jar.

For example:
```
LIBPATH=/usr/lib:/usr/lpp/java/J5.0/bin:usr/lpp/java/J5.0/bin/classic:...
        /usr/lpp/cpo/lib
CLASSPATH=/usr/lpp/cpo/classes/cpom.jar:...
          /usr/lpp/cpo/classes/cpocommon.jar:...
          /usr/lpp/cpo/classes/hwmcaapi.jar:...
          /usr/include/java_classes/IRRRacf.jar:...
          /usr/lpp/wbem/jclient/sblimCIMClient.jar
```

**Note:** The information for each path must be on one line, and there must be no blanks between the path values.

The PARM member contains configuration information for the Provisioning Manager. It has the structure of a Java property-file with keyword-value pairs. Both keywords and values are case sensitive. Comment lines may be included starting with a hash character ('#'). In the PARM member you can enter keywords for:

**Hardware access**

> The Provisioning Manager must access a hardware management console (HMC) to get information about the available CPCs and the temporary capacity of these, and to activate and deactivate this temporary capacity if required. You must specify access information for the HMC. This information is the host name or IP address of the HMC, and the community name under which all operations are performed. The HMC host address is specified using the configuration key Topology.Address. The community name is specified using the key Topology.Community. The syntax is:
>
> ```
> # Topology settings
> Topology.Address = HMC_address
> Topology.Community = community_name
> ```

**Automatic Restart Manager setting**

> To use ARM to monitor availability of the Provisioning Manager you must set the value ARM.Register to "Yes". (You can do this simply by removing the comment symbol from this statement in the sample member provided.)

If this key is not specified, or if it is given any value other than "Yes", the Provisioning Manager will not be registered with ARM. The value is not case sensitive.

If you use ARM to monitor the Provisioning Manager you must define an ARM policy. This policy specifies an ARM element type and an ARM element name. If you have chosen the default element type and name, SYSCPM and SYSCPO, no changes are needed. If you have changed these values you must replace the values of the keys ARM.ElementType and ARM.ElementName with those you have chosen. The defaults are:

```
# ARM settings
ARM.Register    = No
ARM.ElementType = SYSCPM
ARM.ElementName = SYSCPO
```

**Security groups for Control Center commands authorization**

To allow the Control Center user to communicate with the Provisioning Manager you must define the Provisioning Manager query security group and the Provisioning Manager control security group in the configuration keys CIM.ReadGroup and CIM.ModifyGroup. The defaults for these are:

```
# Command authorization definitions
CIM.ReadGroup=CPOQUERY
CIM.ModifyGroup=CPOCTRL
```

**Trace and Log data**

If you have chosen other directories than the defaults for the trace and log data you must set configuration keys Trace.Path and Log.Path accordingly. The directories must already exist and the Provisioning Manager must have write access to them. The default entries are:

```
# Service data location
Trace.Path = /tmp
Log.Path = /tmp
```

**Additional parameters to control provisioning management**

In addition to the configuration parameters described above, the PARM member can also contain optional directives that influence the operation of the Provisioning Manager. When these values are specified they override the default values of the Provisioning Manager. It is recommended that you only specify a value if you have a need to override the default.

*Table 10. Additional control parameters*

| Key | Default value | Description |
|-----|-----|-----|
| Planner.BlockingTime | 15 | Number of minutes the provisioning manager will wait after detection of the CPC capacity before any new capacity change action is initiated. This time allows the workload to be redistributed after a capacity change. If a faster provisioning or deprovisioning is warranted the value may be lowered. The recommended range is a value between 5 and 15 minutes. |

*Table 10. Additional control parameters  (continued)*

| Key | Default value | Description |
| --- | --- | --- |
| `Planner.ProvisioningRejectTime` | 120 | Number of minutes a CPC is not considered for CPM actions after a provisioning request in confirmation mode has been rejected. |
| `Planner.DeprovisioningRejectTime` | 120 | Number of minutes a CPC is not considered for CPM actions after a deprovisioning request in confirmation mode has been rejected. |
| `Planner.MinimumActivationTime` | 240 | Number of minutes a temporary resource must remain active before it is considered for deactivation. This time interval starts again with any new activation and applies to all active resources. When specified, the minimum activation time must be greater than the blocking time. |
| `Analyzer.Threshold.Decision001TotalSharedPhysicalUtilCp` | 95 | Minimum percentage of physical utilization of shared CPs that is required before considering additional general purpose capacity. In some environments severe processor contention can already occur at lower levels of processor utilization. In such environments you can specify a lower percentage value, such as 90. |
| `Analyzer.Threshold.Decision001TotalSharedPhysicalUtilZaap` | 95 | Minimum percentage of physical utilization of shared zAAPs that is required before considering additional zAAP capacity. In some environments severe processor contention can already occur at lower levels of processor utilization. In such environments you can specify a lower percentage value, such as 90. |
| `Analyzer.Threshold.Decision001TotalSharedPhysicalUtilZiip` | 95 | Minimum percentage of physical utilization of shared zIIPs that is required before considering additional zIIP capacity. In some environments severe processor contention can already occur at lower levels of processor utilization. In such environments you can specify a lower percentage value, such as 90. |

## Creating the started task procedure

You can create the started task procedure by copying the member `CPOSERV` from dataset `SYS1.SAMPLIB` to the started task procedure dataset. This is normally

SYS1.PROCLIB. If you have not chosen to use the default name for the started task, CPOSERV, you must rename the member appropriately. In the header section of the procedure you should change the following values to those you have chosen:

**HLQ**          the high-level qualifier of the runtime datasets

**DOMAIN**     the name of the domain

**CPODIR**      the home directory of the Provisioning Manager user

**OUTCLS**     a suitable output class

**RGNSIZE**    a region size allowed by the server

The sample procedure supplied is:

```
//*******************************************************
//* Licensed Materials - Property of IBM
//* 5694-A01
//* Copyright IBM Corp. 2007
//* Status = HPV7740
//*******************************************************
//CPOSERV  PROC PMODE='*',
//              POLICY='*'
//* This section of variables may require customization
//HLQ      SET HLQ=CPO              HLQ of runtime datasets
//DOMAIN   SET DOMAIN=DOMAIN1       provisioning domain name
//CPODIR   SET CPODIR='/u/cposrv'   home directory of cposrv
//OUTCLS   SET OUTCLS=A             output class
//RGNSIZE  SET RGNSIZE=256M         server region size
//*
```

## Providing APF authorization

For this, first ensure that dataset SYS1.SIEALNKE is in the link list. The system automatically places this dataset at the beginning of the link list, unless this is overridden by a SYSLIB statement in PROG*xx*. In addition, the default IEASYS*xx* value LNKAUTH=LNKLST must be in effect, or SYS1.SIEALNKE must be APF authorized.

The next steps in this process are optional. They are only required if you copied the Capacity Provisioning files or the Java files on your runtime system.

On any runtime system the Provisioning Manager must run with APF authorization. The code must be authorized for this; the main program is located in a program library dataset (PDSE) and the libraries are located in the file system.

If you have copied the Capacity Provisioning library files from the UNIX file system you must make sure that all Provisioning Manager libraries and the Java libraries are sufficiently authorized. The Provisioning Manager libraries are located in /usr/lpp/cpo/lib. You can check the authorization by entering the command:

```
extattr /usr/lpp/cpo/lib/*
```

at a UNIX shell prompt.

The following libraries require APF authorized = YES:
- libcpoarm.so
- libcpoconsole.so
- libcposocket.so
- libcpostream.so

The Java library is in `/usr/lpp/java/J5.0/bin/classic`, and is named `libjvm.so`. If you have copied the Java SDK code you must ensure that this has APF authorization the same as the Provisioning Manager libraries.

# Securing the runtime system

You should set up security on the runtime system and on the observed systems. As an observed system can also be a runtime system you may have to perform both definitions on these. On the runtime system the steps to take are:

- Define the started task
- Define ARM access
- Define access for the Provisioning Manager user
- Define the secured signon function
- Define access for the Control Center user

The following examples assume your external security manager is RACF. If you have installed a different external security manager you should modify the examples accordingly. These examples also assume that the Provisioning Manager user and the Control Center user are already defined to the security manager, and that an OMVS segment has been defined for both users.

### Defining the started task

The Provisioning Manager started task on the runtime system must be assigned to the Provisioning Manager user. Here is an example definition using RACF:

```
RDEFINE STARTED CPOSERV.* STDATA(USER(CPOSRV))
SETROPTS RACLIST(STARTED) REFRESH
```

### Defining ARM access

If Automatic Restart Manager (ARM) is used a FACILITY class profile must be defined and the Provisioning Manager user must have UPDATE access to this. If you make changes to the default ARM element type, ARM element name or Provisioning Manager user you must replace the values SYSCPM, SYSCPO or CPOSRV in the following with the values you have chosen. An example definition is:

```
RDEFINE FACILITY IXCARM.SYSCPM.SYSCPO UACC(NONE)
PERMIT IXCARM.SYSCPM.SYSCPO CLASS(FACILITY) ID(CPOSRV) ACC(UPDATE)
SETROPTS RACLIST(FACILITY) REFRESH
```

### Defining security for the Provisioning Manager user

The Provisioning Manager user requires access to local resources on your runtime system. These include:

- Membership of the Provisioning Manager security groups CPOQUERY and CPOCTRL
- UPDATE access to the Provisioning Manager datasets `CPO.DOMAIN1.*`
- READ access to the profile `BPX.CONSOLE` in the FACILITY class
- CONTROL access to the Provisioning Manager user datasets `CPOSRV.*`

You can define these access rights as follows:

```
ADDGROUP CPOQUERY OMVS(GID(...))
ADDGROUP CPOCTRL OMVS(GID(...))

CONNECT (CPOSRV) AUTH(USE) GROUP(CPOQUERY)
CONNECT (CPOSRV) AUTH(USE) GROUP(CPOCTRL)

ADDSD ('CPO.DOMAIN1.*') GENERIC UACC(NONE)
PERMIT 'CPO.DOMAIN1.*'  GENERIC ID(CPOSRV) ACCESS(UPDATE)
```

```
ADDSD ('CPOSRV.**')     GENERIC UACC(NONE)
PERMIT 'CPOSRV.**'      GENERIC ID(CPOSRV) ACCESS(CONTROL)
SETROPTS GENERIC(DATASET) REFRESH

PERMIT 'BPX.CONSOLE' CLASS(FACILITY) ID(CPOSRV) ACCESS(READ)
SETROPTS RACLIST(FACILITY) REFRESH
```

Note that you need to complete the OMVS information for the Provisioning
Manager security groups before entering these definitions.

In addition the Provisioning Manager user needs access to files and directories in
the local file system of the runtime system. These access rights are usually
sufficient by default. The following access is needed for the Provisioning Manager
user:

- Read and execute access to the Capacity Provisioning installation directory
  `/usr/lpp/cpo` and all its subdirectories
- Read and execute access to the Java installation directory `/usr/lpp/java` and all
  its subdirectories
- Read access to the CIM Java client `/usr/lpp/wbem/jclient/sblimCIMClient.jar`
- Read access to the SAF library `/usr/include/java_classes/IRRRacf.jar`
- Read and write access to trace and log data in file system path `/tmp`
- Read and write access to file system path `/var`
- Read and write access to the home directory of the Provisioning Manager user
  `/u/cposrv`

If the current access rights are insufficient you must set the "other" read, write, and
execute access permissions of the directories and files accordingly, using the UNIX
command chmod, for example:

```
chmod -R o+rx /usr/lpp/cpo
```

These permissions will allow all users to read and execute files and directories
starting with `/usr/lpp/cpo`.

**Note:** This command must be issued by a user with appropriate access rights.

## Defining the secured signon function on the runtime system

Communication between the runtime system and the observed systems requires
authentication and authorization. This is implemented using the secured signon
function, which generates PassTickets when the Provisioning Manager logs on to
an observed system. The log on is performed as the Provisioning Manager user, so
this user must be defined on the runtime system and all observed systems.

The following definitions are needed to use the secured signon function and to
generate PassTickets:

**To activate the PTKTDATA class**

> Use the definitions

> ```
> SETROPTS CLASSACT(PTKTDATA)
> SETROPTS RACLIST(PTKTDATA)
> ```

**To use PassTickets**

> Define the profile CFZAPPL in the PTKTDATA class. The Provisioning
> Manager user must have at least READ access to this profile. If a common
> cryptographic architecture (CCA) product is installed on the systems with
> the secured signon function you can encrypt the secured signon application
> keys. If it is not you can mask the secured signon application key by using
> the SSIGNON operand and a 64-bit KEYMASKED value. For example:

```
                RDEFINE PTKTDATA CFZAPPL SSIGNON(KEYMASKED(XXXXXXXXXXXXXXXX))
                PERMIT CFZAPPL CLASS(PTKTDATA) ID(CPOSRV) ACCESS(READ)
                SETROPTS RACLIST(PTKTDATA) REFRESH
```

**To generate PassTickets**

To enable the Provisioning Manager user to generate PassTickets create the
security profile IRRPTAUTH.CFZAPPL.CPOSRV in the PTKTDATA class giving
the Provisioning Manager user at least UPDATE access authority. Then
create the profile IRR.RTICKETSERV in the FACILITY class, giving this user
at least READ access authority. For example:

```
RDEFINE PTKTDATA IRRPTAUTH.CFZAPPL.CPOSRV
PERMIT IRRPTAUTH.CFZAPPL.CPOSRV CLASS(PTKTDATA) ID(CPOSRV) ACCESS(UPDATE)
SETROPTS RACLIST(PTKTDATA) REFRESH

RDEFINE FACILITY IRR.RTICKETSERV
PERMIT IRR.RTICKETSERV ID(CPOSRV) ACCESS(READ) CLASS(FACILITY)
SETROPTS RACLIST(FACILITY) REFRESH
```

For more information about configuring RACF to use PassTicket services, refer to
*z/OS Security Server RACF Security Administrator's Guide.*

## Defining security for the Control Center user

The Control Center user must be authorized to connect the Control Center to the
Provisioning Manager. Define this user on the runtime system with an OMVS
segment, and add the user to the appropriate Provisioning Manager security group
depending on which administration and operation commands the user is allowed.

This connection uses the CIM server, so the Control Center user needs appropriate
CIM security to allow this. The first step is to define and activate the dynamic class
WBEM by creating profile WBEM in the CDT class:

```
RDEFINE CDT WBEM UACC(NONE)
 CDTINFO( CASE(UPPER)
          FIRST(ALPHA)
          OTHER(ALPHA,NUMERIC)
          MAXLENGTH(246)
          MAXLENX(246)
          KEYQUALIFIERS(0)
          PROFILESALLOWED(YES)
          POSIT(200) RACLIST(REQUIRED) )
SETROPTS CLASSACT(CDT) RACLIST(CDT) REFRESH
SETROPTS CLASSACT(WBEM) RACLIST(WBEM)
```

The Control Center user needs UPDATE access to the CIMSERV profile in the
WBEM class. If the CIM server is configured to require surrogate definitions for all
users, define the CIM server user as a surrogate of the Control Center user. To do
this create profile BPX.SRV.CPCCUSR in the SURROGAT class. The CIM server user
requires at least READ access to this profile. The next step depends on the
authorization to be given to the Control Center user.

If the Control Center user is only authorized to query information from the
Provisioning Manager, add this user to the Provisioning Manager query security
group CPOQUERY and grant this user UPDATE access to the CIMSERV profile:

```
CONNECT (CPCCUSR) AUTH(USE) GROUP(CPOQUERY)

PERMIT CIMSERV CLASS(WBEM) ID(CPCCUSR) ACCESS(UPDATE)
SETROPTS CLASSACT(WBEM) RACLIST(WBEM) REFRESH

RDEFINE SURROGAT BPX.SRV.CPCCUSR UACC(NONE)
PERMIT BPX.SRV.CPCCUSR CLASS(SURROGAT) ACCESS(READ) ID(CFZADM)
SETROPTS GENERIC(SURROGAT) REFRESH
```

If instead the Control Center user is authorized to alter the processing characteristics of the Provisioning Manager, add this user to both Provisioning Manager security groups, CPOQUERY and CPOCTRL, and grant this user UPDATE access to the CIMSERV profile:

```
CONNECT (CPCCUSR) AUTH(USE) GROUP(CPOQUERY)
CONNECT (CPCCUSR) AUTH(USE) GROUP(CPOCTRL)

PERMIT CIMSERV CLASS(WBEM) ID(CPCCUSR) ACCESS(UPDATE)
SETROPTS CLASSACT(WBEM) RACLIST(WBEM) REFRESH

RDEF SURROGAT BPX.SRV.CPCCUSR UACC(NONE)
PERMIT BPX.SRV.CPCCUSR CLASS(SURROGAT) ACCESS(READ) ID(CFZADM)
SETROPTS GENERIC(SURROGAT) REFRESH
```

# Securing the observed systems

When a system is observed the Provisioning Manager connects to the CIM server on that system and retrieves configuration information and performance information about the workload. To enable this communication, establish a connection in the name of the Provisioning Manager user and authorized by a PassTicket. The steps to take are:

- Define the Provisioning Manager user on the observed systems with the same password as on the runtime system
- Enable the secured signon function
- Authorize the Provisioning Manager user to access the CIM server

The following definitions assume that the Provisioning Manager user is already defined and has an OMVS segment assigned. These definitions must be effective on all observed systems.

## Defining the secured signon function on the observed systems

This must be set up on the observed systems as on the runtime system (described in "Defining the secured signon function on the runtime system" on page 37). Note that the KEYMASKED value must match the runtime system, and PassTicket generation is only performed on the runtime systems.

## Defining access to the CIM server

RACF must be configured as follows to allow the Provisioning Manager user to access the CIM server on all observed systems. This assumes that the CIM server user is already defined.

- Define and activate the dynamic class WBEM by creating the profile WBEM in the CDT class

```
RDEFINE CDT WBEM UACC(NONE)
   CDTINFO( CASE(UPPER)
            FIRST(ALPHA)
            OTHER(ALPHA,NUMERIC)
            MAXLENGTH(246)
            MAXLENX(246)
            KEYQUALIFIERS(0)
            PROFILESALLOWED(YES)
            POSIT(200) RACLIST(REQUIRED) )
SETROPTS CLASSACT(CDT) RACLIST(CDT) REFRESH
SETROPTS CLASSACT(WBEM) RACLIST(WBEM)
```

- Enable access to a system using CIM

  Create the profile CIMSERV in the WBEM class. The Provisioning Manager user needs at least READ access to this profile, and the CIM server user at least CONTROL access.

```
RDEFINE WBEM CIMSERV
PERMIT CIMSERV CLASS(WBEM) ID(CPOSRV) ACCESS(READ)
PERMIT CIMSERV CLASS(WBEM) ID(CFZADM) ACCESS(CONTROL)
SETROPTS CLASSACT(WBEM) RACLIST(WBEM) REFRESH
```

- If the CIM server is configured to require surrogate definitions for all users, define the CIM server user as a surrogate of the Provisioning Manager user. To do this create profile BPX.SRV.CPOSRV in the SURROGAT class.The CIM server user requires at least READ access to this profile.

```
RDEFINE SURROGAT BPX.SRV.CPOSRV
PERMIT BPX.SRV.CPOSRV CLASS(SURROGAT) ACCESS(READ) ID(CFZADM)
SETROPTS RACLIST(SURROGAT) REFRESH
```

For further information refer to *z/OS Common Information Model (CIM) User's Guide*.

## Setting up Automatic Restart Manager

This step is only needed if you use ARM to restart the Provisioning Manager.

The Provisioning Manager requires the following to exploit the ARM capability:

- The element name is SYSCPO, unless you chose another value in Provisioning Manager runtime environment.
- The element type is SYSCPM, unless you chose another value in Provisioning Manager runtime environment.
- The Provisioning Manager should normally be restarted with the policy and processing mode that were in use the last time it ran, together with any modifications to the policy that were triggered by console commands. To achieve this the policy name and the processing mode on the restart command should be specified as '*'.
- The Provisioning Manager may be restarted on another system of the sysplex, provided that this system has access to the runtime datasets and the required file systems used by the previous system.

An example setup is supplied in member CPOARMPO of SYS1.SAMPLIB. For more information on ARM refer to *z/OS MVS Setting Up a Sysplex*.

## Preparing the connection to the CIM server

The Provisioning Manager and the Control Center communicate through a CIM server. You can establish connections through the server using either the CIM HTTP protocol or the CIM HTTPS protocol, provided that the CIM server is configured to support the chosen protocol. For details on how to configure the CIM server refer to the *z/OS Common Information Model (CIM) User's Guide*. For the HTTPS protocol you should use an AT-TLS configuration. The Provisioning Manager and the Control Center do not support authentication based on SSL certificates.

**Note:** Ensure that the configured port of the CIM server matches the definitions that you make in your domain configuration and the Control Center.

### Required settings for the RMF Distributed Data Server

The GPMSRVxx member that is used by the RMF Distributed Data Server must specify a higher value for MAXSESSIONS_HTTP than the default of 20. The recommended value is 60 or greater.

```
MAXSESSIONS_HTTP(60)              /* MaxNo of concurrent HTTP requests */
```

## Preparing the connection to the Provisioning Manager

To allow the user of the Control Center to connect to the Provisioning Manager on the runtime system you must register the Capacity Provisioning CIM provider with the CIM server on that system as follows:

1. Ensure that the CIM server is started.
2. Log on to a z/OS UNIX session as a CIM administrator user.
3. Ensure that automatic conversion is enabled by entering the command:

   ```
   export _BPXK_AUTOCVT=ON
   ```
4. Register the Capacity Provisioning CIM provider:

   ```
   cimmof -nroot/PG_InterOp \
          /usr/lpp/cpo/provider/IBMzOS_CapacityProvisioningRegistration.mof
   ```
5. Register the schema for the Capacity Provisioning CIM class:

   ```
   cimmof /usr/lpp/cpo/provider/IBMzOS_CapacityProvisioningSchema.mof
   ```
6. Copy the Capacity Provisioning CIM provider properties file to the /etc directory:

   ```
   cp /usr/lpp/cpo/provider/cpoprovider.properties /etc
   ```
7. If your domain name is not the default (DOMAIN1) you must edit the file you copied (for example using oedit /etc/cpoprovider.properties) to change the DomainNames = DOMAIN1 line to match the name of your domain.
8. Verify that the program controlled flag is set in the extended file attributes for the Capacity Provisioning CIM provider library:

   ```
   ls -E /usr/lpp/cpo/lib/libcpoprovider.so
   ```

   If the attribute is not set use the following command to set the program control flag manually:

   ```
   extattr +p /usr/lpp/cpo/lib/libcpoprovider.so
   ```
9. Verify that a link to the Capacity Provisioning CIM provider library has been created in the CIM server provider directory:

   ```
   ls -l /usr/lpp/wbem/provider/libcpoprovider.so
   ```

   If the link does not exist, use the following command to create the link manually:

   ```
   ln -s /usr/lpp/cpo/lib/libcpoprovider.so
         /usr/lpp/wbem/provider/libcpoprovider.so
   ```

## Defining the connection to the HMC

Ensure that there is a network connection between the runtime system and the HMC, that any firewall between these will permit access, and that the HMC is configured for remote API operations. The first step is to define the community name that you have chosen in your configuration for the Provisioning Manager (see Table 7 on page 29). This community name must be authorized for read and write operations. The address and network mask of the community name must allow for all runtime systems. The next step is to allow external programs remote operation using the API. For further information about the configuration of a HMC for API programs, refer to *zSeries Application Programming Interfaces*.

## Tuning measures and workload classification for Capacity Provisioning

Your Workload Management (WLM) service definition for the observed systems should ensure that monitors run at a higher priority than the work being monitored. The Provisioning Manager, and the infrastructure that it uses, must be

prioritized so that they will execute reliably even in a capacity-constrained situation. On the runtime systems you should ensure that the Provisioning Manager started task CPOSERV is classified appropriately.

You are recommended either to classify the Provisioning Manager and the supporting subsystems into SYSSTC, or to give these an aggressive single period velocity goal at an importance level that is higher than the work that will be defined in your provisioning policy. In particular the following subsystems and address spaces are required:

On the runtime system:
- The Provisioning Manager (CPOSERV)
- The TCP/IP infrastructure
- The CIM server, if the Control Center is used to control the Provisioning Manager.

On the observed systems:
- The RMF address spaces
- The RMF Distributed Data Server (GPMSERVE)
- The TCP/IP infrastructure
- The CIM server

Network latency in the CIM protocol can be minimized by specifying numeric IP addresses or by defining entries in the hosts file for the observed systems.

Other contention factors that could impact the ability of the Provisioning Manager to operate efficiently must be minimized. The Provisioning Manager and the CIM servers rely on the z/OS UNIX file system. Severe contention must be relieved by appropriate tuning measures to allow capacity provisioning to operate reliably.

### Resource consumption considerations

The consumption of resources (processor or virtual storage) by the Provisioning Manager largely depends on the domain and policy definitions. The following factors will increase resource consumption by the server:
- A large number of observed systems
- A large number of monitored service class periods
- A small RMF MINTIME
- Use of the HTTPS protocol for communication with the CIM server
- Activated traces

Most Provisioning Manager processing is zAAP-eligible. On systems configured with zAAPs they will be utilized automatically and no additional definitions are required.

## Starting the Provisioning Manager

The Provisioning Manager runs as a z/OS started task. You can use the MVS start command to start the program. There are two optional parameters for this: the name of the policy to be activated at start up and the initial processing mode. The start command for the Provisioning Manager has the following syntax:

```
►►──┬─START─┬──CPOSERV────┬──────────────────────┬──┬───────────────────────────┬──►◄
    └─S─────┘             │        ┌──*───┐      │  │        ┌──*────────┐      │
                         └─,POLICY=─┴─name─┘      └─,PMODE=──┼──MAN──────┤──────┘
                                                            ├──ANALYSIS─┤
                                                            ├──CONF─────┤
                                                            └──AUTO─────┘
```
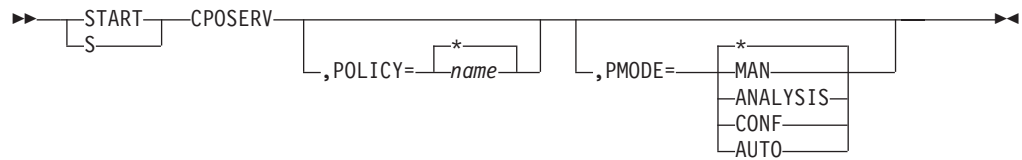
The meaning of these parameters is:

**POLICY=**_name_

> specifies the name of the policy to be activated when the Provisioning
> Manager starts. A policy with this name must be available in the policy
> repository accessible to the Provisioning Manager. If the Provisioning Manager
> cannot activate the new policy it stops.

> You can specify an asterisk ('*') instead of a policy name. In this case the policy
> that was last active in the provisioning domain will be used and no policy will
> be retrieved from the policy repository. POLICY=* is the default of this
> parameter.

**PMODE=**_mode_

> specifies the initial processing mode of the Provisioning Manager. The
> following processing mode values are supported:

> **MAN** manual mode (policies are disabled),

> **ANALYSIS**
> > analysis mode,

> **CONF** confirmation mode,

> **AUTO**
> > autonomic mode.

> If the Provisioning Manager cannot activate the processing mode it will stop
> immediately.

> You can specify an asterisk ('*') instead of a processing mode. In this case the
> processing mode that was last active in the provisioning domain will be used.
> PMODE=* is the default of this parameter.

If you start the Provisioning Manager for the first time without specifying start
parameters it will start with the default policy and the default processing mode.
The default policy is indicated by the policy name "*none". This policy is an empty
policy that contains no rules. The default processing mode is manual (MAN).

When you start the Provisioning Manager for the first time the default domain
configuration is activated. The default domain configuration is indicated by the
name "*none". This configuration is empty, containing no CPCs and no systems.

For further information on how to activate a new policy, a new domain
configuration or a new processing mode refer to "SET DOMAIN" on page 108.

# Installing the Control Center

There are two stages to the installation of the Capacity Provisioning Control Center:

- Installing the CIM Client
- Running the Control Center installation wizard

## Installing the CIM Client

The Control Center requires a CIM client Java archive file (jar) on the workstation. The location of the CIM Java client in the host file system is given in the prerequisites information in Table 8 on page 30. Download the `sblimCIMClient.jar` file in binary mode from the host to your workstation, and make a note of its location on the workstation as this will later be required by the installation wizard. If you use the defaults you can download the file using FTP as follows:

```
cd "C:\Program Files\IBM\CIMClient"
ftp <host>
ftp> cd /usr/lpp/wbem/jclient
ftp> binary
ftp> get sblimCIMClient.jar
ftp> bye
```

## Installing the Control Center using the installation wizard

The first step is to download the installation wizard to the workstation from the host. You can then execute the installation wizard on the workstation.

### Retrieving the Control Center Installation Package

The installation program is located in the /pws subdirectory of the Capacity Provisioning installation directory on the host. Download the file /usr/lpp/cpo/pws/cpccsetup.exe in binary mode to a temporary directory on your workstation, for example:

```
cd "C:\Documents and Settings\Administrator\Local Settings\Temp"
ftp <host>
ftp> cd /usr/lpp/cpo/pws
ftp> binary
ftp> get cpccsetup.exe
ftp> bye
```

### Starting the initial installation

**Note:** You must have administrator access rights on your Windows system to install and use the Control Center.

Start the installation by executing the file `cpccsetup.exe`, for example

```
cd "C:\Documents and Settings\Administrator\Local Settings\Temp"
cpccsetup
```

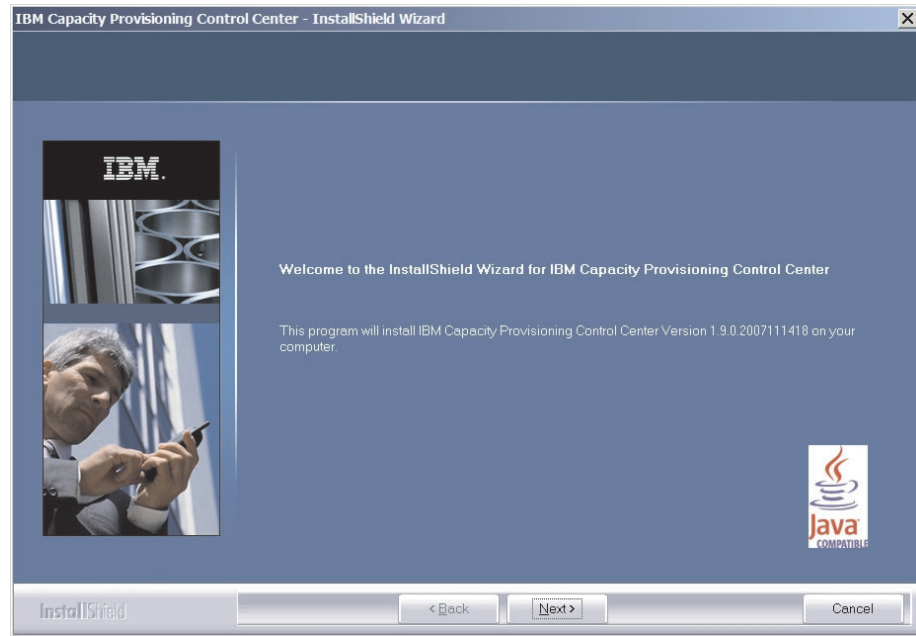The installation will begin with the following panel:

*Figure 5. Control Center installation wizard: Initial installation*

Follow the steps specified by the installation wizard. You will be asked where to place the Capacity Provisioning workspace (refer to "Workspace" on page 24), and in which directory you have put the `sblimCIMClient.jar` file.

After the installation is finished you may delete `cpccsetup.exe`.

## Updating an existing Control Center installation

Updates will be received via the host system, and must then be applied on the workstation.

**Receiving an update for the Control Center:** The Control Center is serviced through the Capacity Provisioning component on the z/OS host. Service, such as a PTF, will be flagged with a `++HOLD...SYSTEM REASON(DOWNLD)` action to indicate that a new version of the Control Center is available. SMP/E will report the `++HOLD` requirements when the service is received. Apply the service in SMP/E and then download the updated `/usr/lpp/cpo/pws/cpccsetup.exe` binary to a temporary directory on your workstation, as described in "Retrieving the Control Center Installation Package" on page 44.

Unless a particular APAR documents a different requirement the Provisioning Manager does not require a particular service level of the Control Center within the same z/OS release.

**Applying an update for the Control Center:** Stop the Control Center before starting the update. Refer to "Stopping the Control Center" on page 56 for details. Start the update by executing the file `cpccsetup.exe`, as described in "Starting the initial installation" on page 44.

Start the update installation by executing the file `cpccsetup.exe` to reinstall the application with the settings you selected during the first installation. The user settings and the workspace will not be changed. The new version of the Control Center will be installed to the directories you chose in the initial installation.

**Repairing an existing Control Center installation:**  If the same version of the install program is launched again on a system where the Control Center is installed the installation wizard Welcome screen gives you the option to 'Repair or remove the program'. The repair option will reinstall the application with the settings you selected during the first installation. The user settings and the workspace will not be changed. Select **Repair** on the panel. The Control Center will be reinstalled to the directories you chose in the initial installation.

To move the Control Center to a different location, select **Remove** on the panel instead. The program will be removed from your workstation. You should choose the option to keep the Control Center workspace, which contains the connection definitions, the domain configurations and the provisioning policies. You can then install the Control Center in the new location, as described in "Starting the initial installation" on page 44, and can enter the location of the old workspace to use the existing definitions. See the note under Uninstalling the Control Center for more considerations.

## Uninstalling the Control Center

If you no longer require the Control Center on a workstation you can use the "Add or Remove Programs" option on the Windows control panel to remove the IBM Capacity Provisioning Control Center program. The installation wizard tracks the installation and any updates and maintains a corresponding uninstall action.

Stop the Control Center before starting the uninstall. Refer to "Stopping the Control Center" on page 56 for details. The Control Center code will be removed from your workstation. You have the option to remove the Control Center workspace as well, which contains the connection definitions, the domain configurations and the provisioning policies.

**Note:** The file `settings/Unity.Toolkit.User.ser` in the directory in which you originally installed the Control Center will not be removed and must be deleted manually.

# Part 2. Operating Capacity Provisioning

This part describes the use of Provisioning Management.

# Chapter 4. Using the Capacity Provisioning Control Center

The Control Center is the graphical user interface to Capacity Provisioning. It is a desktop application that runs on a Windows workstation. As an administrator you can work with provisioning policies and domain configurations through this interface, and can also use it to transfer these to the Provisioning Manager or query the status, for example to see which policy is active. The Control Center provides the following functionality:

**Provisioning Manager**
> Define the connection to the Provisioning Manager and show the status of the Provisioning Manager

**Domain Configurations**
> Manage domain configurations, defining the CPCs to be managed and the systems to be observed

**Provisioning Policies**
> Manage provisioning policies, defining how much additional capacity can be activated on each CPC

## The Control Center window layout

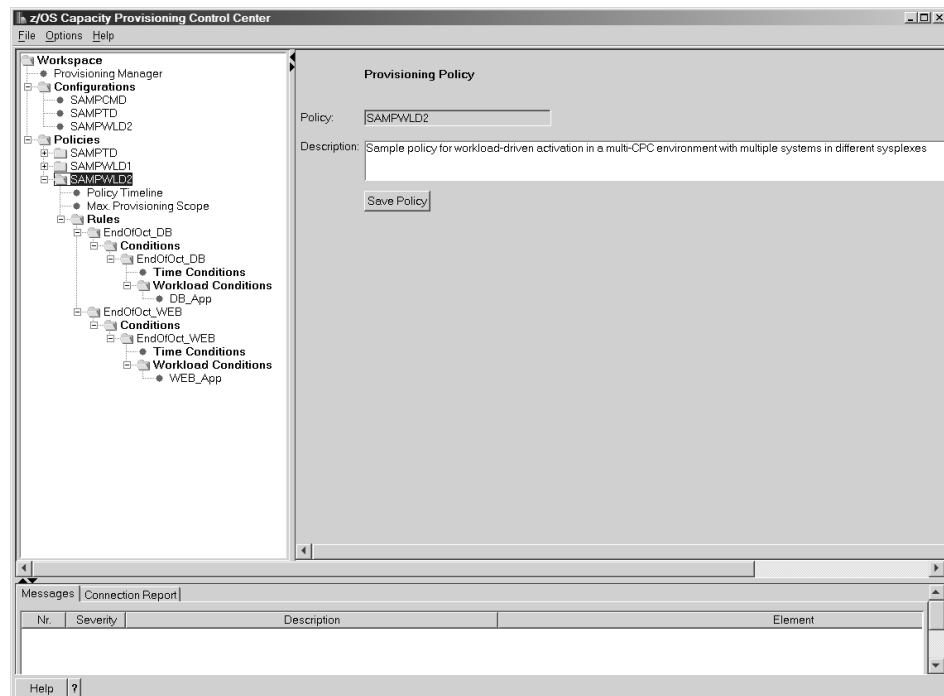The Control Center is a graphical user interface, with a screen layout as shown:



*Figure 6. Layout of the Graphical User Interface*

The menu bar at the top is used for general actions. The main window below the menu bar is divided into three panels: the tree view on the left, the details view on the right and the information view at the bottom.

- The **tree view** displays the workspace and its contents as a tree.

- Details of the object selected in the tree are displayed in the **details view**.
- Information about the selected object is displayed in the **information view**.

## The tree view

The tree view shows the structure of the Capacity Provisioning workspace. It contains the **Provisioning Manager** specification, the **Configurations** folder and the **Policies** folder. The **Configurations** folder contains one entry for each defined configuration. The **Policies** folder is structured hierarchically. For each policy it contains an entry for the **Maximum Provisioning Scope** and a **Rules** folder. A rule contains **Conditions**, which may be **Time Conditions**, **Workload Conditions** or both.

In the tree view folders are always preceded by a [+] or [−] symbol. Clicking on these symbols expands or collapses the folder. Nodes that cannot be expanded are indicated by a bullet symbol. Note that a folder may be empty, in which case clicking on the [+] symbol will not show any more detail.

### Operations on the tree

A left-click on an item in the tree selects the object and displays the details of the selected object in the **Details view** on the right.

A right-click on an item in the tree opens the context menu for the selected object if possible, for example:
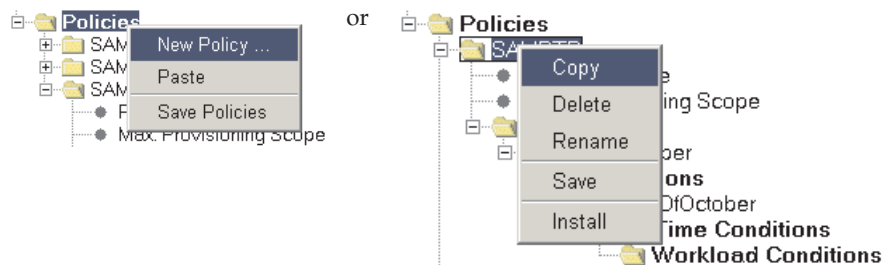


If this menu exists the object is also selected and the details are displayed in the **Details view**.

**Note:** The characters '...' following a command name indicate that the command opens a dialog. This dialog may require further input.

The context commands are:

**Command   Action**
New...      Creates a new object and prompts for a name.

             This command can create a child object in any folder which has a name in **bold** type in the tree view (except the **Workspace** folder).

             The **New** command is available on the folders **Configurations**, **Policies**, **Rules**, **Conditions** and **Workload Conditions**.

| Command | Action |
| --- | --- |
| Copy | Copies an object to the Control Center clipboard. The object can then be pasted at another corresponding position. Only one object can be stored in the clipboard; a second copy command overwrites the previous one.<br><br>The **Copy** command is available for a selected configuration, policy, rule, condition or workload condition. |
| Paste | Pastes a copied object in the selected folder if the type of the copied object allows this. For example, a rule can only be pasted in a **Rules** folder. The object remains in the clipboard, so it can be pasted more than once. If an object with the name of the copied object already exists in the selected policy, the name of the pasted object is altered by the Control Center to make it unique.<br><br>The **Paste** command is available in the folders **Configurations**, **Policies**, **Rules**, **Conditions** and **Workload Conditions**. |
| Delete | Deletes an object from the workspace. Policies and configurations are deleted immediately. Policy elements are deleted when the policy is saved.<br><br>The **Delete** command is available for a selected configuration, policy, rule, condition or workload condition. |
| Rename | Prompts for a name and renames an existing object. If the new name exists you are prompted to specify a different one. If a policy or configuration is renamed and it has changed you are prompted to save it before the rename.<br><br>The **Rename** command is available for a selected configuration, policy, rule, condition and workload condition. |
| Save... | Saves the selected object or object group in the workspace.<br><br>**Save** commands are available in the **Provisioning Manager** and in the **Configurations** and **Policies** folders, and for selected configurations and policies. |
| Install | Transfers a policy or a configuration to the Provisioning Manager. A connection to the Provisioning Manager must be established and you must be a member of the Provisioning Manager control security group (refer to "Adapting the Provisioning Manager parameters" on page 31). Domain configurations are installed in the domain configuration repository and policies in the policy repository (refer to "Defining the runtime datasets" on page 31).<br><br>The **Install** command is available for a selected configuration or policy. |

## The details view

The details view shows the properties of the capacity provisioning object which is selected in the tree view. This view also shows related elements for some objects.
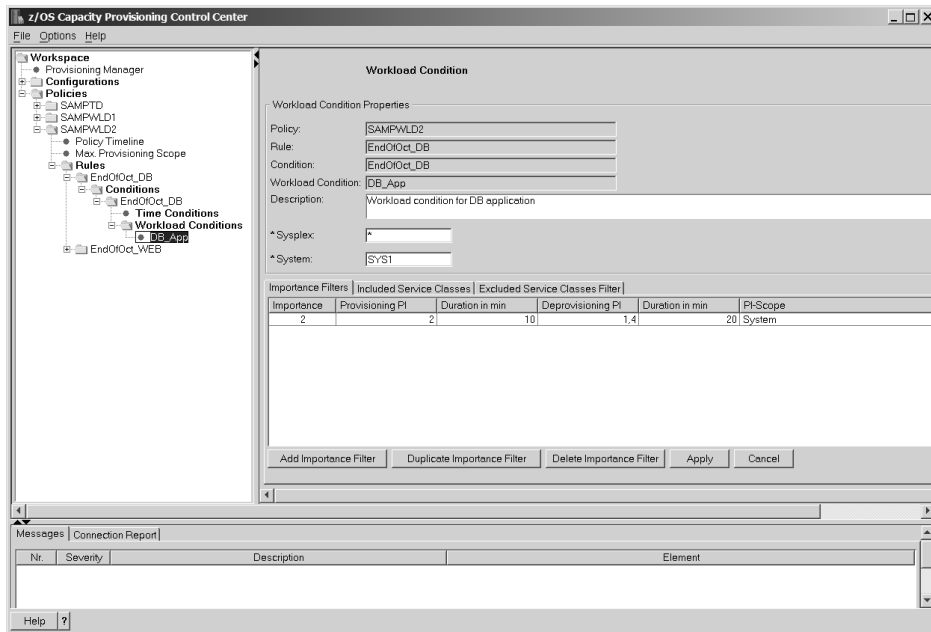
*Figure 7. Details view showing the details of a workload condition.*

The properties displayed in the upper part of the panel are dependant on the type of object selected. Figure 7 shows the properties of a **Workload Condition**. For most objects you can add a textual description for your reference.

The lower part of the panel may show a table containing additional elements of the displayed object which are not shown in the tree view. On some panels the lower part contains tabs which you may click on to switch between multiple tables.

## Operations on tables

Buttons below a table allow you to modify the table. The actions performed are:

| Button | Action |
|--------|--------|
| Add... | Adds a new row after the selected row |
| Delete... | Deletes the selected row |
| Apply | Accepts changes to the properties and the table contents, and checks for errors. If you select a different tab or a different node in the tree **Apply** is executed automatically. |
| Cancel | Rejects any changes which have been made to the properties and the table since the last **Apply** action. |

You can also perform actions directly on rows of the table The methods of doing this are:

| Action | Method |
|--------|--------|
| Select a table row | To select a row left-click anywhere in the row. |
| Edit a table cell | To edit a cell click on the cell. The cursor is placed at the left of the cell, and as soon as you start to type the background color of the cell changes. If you double-click on the cell the color changes immediately and you can position the cursor in the cell. |

# The information view

This view shows one of two panels; one for **Messages** and one for the **Connection Report**. These are identified by tabs. Left-click on these tabs to switch from one panel to the other.

## Messages

The **Messages** panel shows a list of messages related to the selected object in the tree. If the object belongs to a provisioning policy, messages relating to the complete policy are shown. The list will be refreshed when the **Apply** action is executed or when a different object is selected in the tree.

Messages indicate that a policy or domain configuration is not complete or that it contains incompatible specifications. Errors are displayed if required parts are missing or the specifications are incompatible. Warnings are displayed if optional but recommended parts are missing. Errors and warnings indicate the next steps you should take. An example messages report is:

| Nr. | Severity | Description | Element |
|-----|----------|-------------|---------|
| 1 | ⊗ | CPO9852E A Processor Limit has to be specified. | Policy "NEW" /Maximum Provisioning Scope |
| 2 | ⊗ | CPO9852E A Condition has to be specified. | Policy "NEW" /Rule "NEW" |
| 3 | ⊗ | CPO9849E CPC Name value is mandatory. | Policy "NEW" /Rule "NEW" /Provisioning Scope/Processor Limit #1 |
| 4 | ⚠ | CPO9840W A MSU, zAAP, or zIIP limit greater than zero should be def... | Policy "NEW" /Rule "NEW" /Provisioning Scope/Processor Limit #1 |

*Figure 8. Messages*

## Connection Report

The connection report contains information about the interaction between the Control Center and the Provisioning Manager. An entry is added whenever one of the following actions is performed on the Provisioning Manager panel:

- **Connect**
- **Disconnect**
- **Refresh Status**

An entry is also added to the connection report when a policy or a domain configuration is installed. You can remove all entries from the connection report by clicking on the **Clear Connection Report** button.

The columns in this report show:

**Time**  The time the message was generated

**Severity**  The type of message. This can be:

| Symbol | Meaning |
|--------|---------|
| | For informational messages. These messages report that the executed operation was successful. |
| | For warning messages. These messages are issued in situations that may prevent successful completion. You should check if the situation is OK or if you need to take corrective action. |
| | For error messages. These messages are issued when the Control Center could not connect to the Provisioning Manager of the domain, or a policy or domain configuration could not be installed. In these situations check that the Provisioning Manager and the CIM server are running on the specified host. |

**Description**  The message number and a description of the message

**Host Address**  The address to which the Control Center tried to connect

An example connection report is:



*Figure 9. Connection report*

## The menu bar

The menu bar contains three pull down menus: **File**, **Options** and **Help**.

The choices on the **File** menu are:

**New Configuration...**      You are prompted to specify a name for a new domain configuration which is then created.

**New Policy...**      You are prompted to specify a name for a new provisioning policy which is then created.

**Save Connections**      Saves all connection definitions in the workspace.

**Save Configurations**      Saves all domain configurations in the workspace.

**Save Policies**      Saves all provisioning policies in the workspace.

**Save All**      Saves all the above in the workspace.

**Refresh Workspace**      Reloads all connection definitions, domain configurations and policies. Before the reload you are asked if you want to save your changes as these will otherwise be overwritten.

**Exit**      Closes the Control Center. You will be prompted to save any changes before you exit.

The **Options** menu contains the **Preferences** dialog:
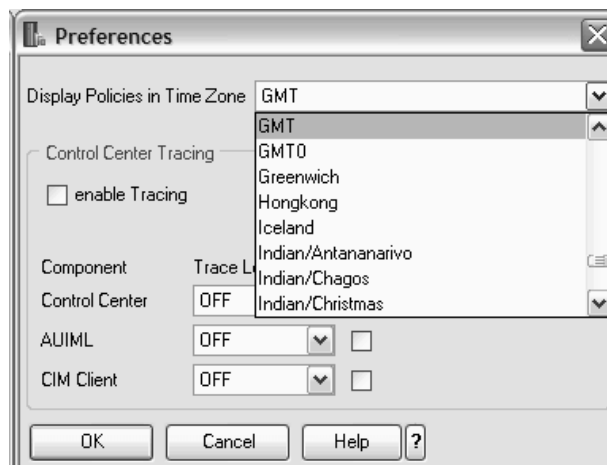


Here you may set the time zone and the trace settings for the Control Center:

**Display Policies in Time Zone**

The time zone specified here determines the offset with which times are displayed and entered in the **Time Conditions** panel. It affects the display of all policies. Click on the time zone field to open a list of time zones. The list contains standard time zone abbreviations and descriptions such as

Europe/London. You can scroll quickly to a section of the list by typing the initial letter of that section, and can then scroll to and select the time zone of your choice.

**Control Center Tracing**
If you are advised by IBM service representatives to enable tracing for the Control Center, check the box **enable Tracing** and fill in the other details as advised. For normal operation the **enable Tracing** box should not be checked.

The **Help** menu contains the following actions:

**Welcome**
This shows an introduction to the Control Center.

**About Capacity Provisioning Control Center**

This shows the version of the installed Control Center. This information will be required if you send a problem report.

The information displayed is:

| | |
|---|---|
| **Version** | The version of the Control Center installed |
| **Driver Level** | The build level of the code |
| **APAR Level** | The latest update applied to the program after installation |
| **CIM Client Version** | The version of the client which interfaces between the Control Center and the Provisioning Manager |

## Starting the Control Center

To start the Control Center click on the IBM Capacity Provisioning Control Center on your desktop or in the IBM Capacity Provisioning program group. When the Control Center starts you will be asked which directory contains your workspace. The default is the directory you last used. (When you start the Control Center for the first time the default is the directory which was specified during installation.) You may have several workspace directories, for example one for each provisioning domain, but you can only work in one directory at a time. If you want to switch to a different workspace directory you must restart the Control Center and specify a new workspace. If the directory does not exist it will be created.

You also have the opportunity at this point to specify the time zone for which policies will be displayed.
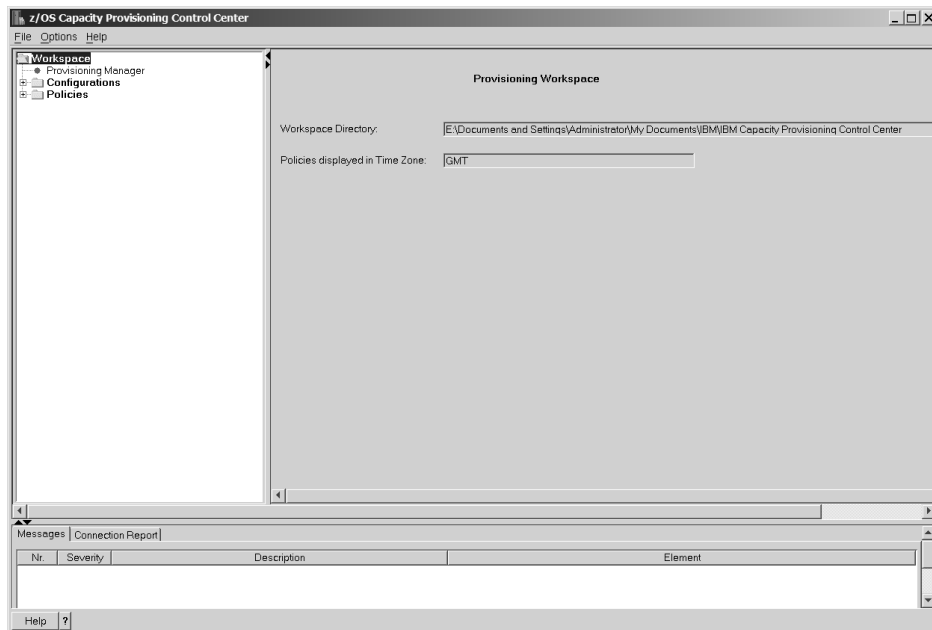
The initial screen displayed is:



*Figure 10. Workspace screen*

## Stopping the Control Center

To stop the Control Center close the window or select **Exit** from the **File** menu. If you have modified any provisioning policies, domain configurations or the connection definition you are asked whether you want to save your changes before you leave.

## Accessing the Provisioning Manager

The Provisioning Manager is the component of Capacity Provisioning which monitors the domain and performs activation and deactivation requests for temporary capacity, based on your active policy and domain configuration. When the Control Center is connected to the Provisioning Manager you can view the status of the Provisioning Manager and install provisioning policies and domain configurations. This section describes:

1. How to define the connection to the Provisioning Manager.
2. How to work with the Provisioning Manager.

### Defining connections

To enable a connection to the Provisioning Manager you must define three elements: the host address where the Provisioning Manager is running, the port to connect to on this system and the protocol to be used. The procedure to follow is:

1. Click on **Provisioning Manager** in the tree view.
2. Click the **Add Connection** button. A new entry in the Connections table is created.
3. Click on the field in the **Host Address** column and type either the host name or the IP address of the system where the Provisioning Manager is running.
4. To change the default protocol select the arrow in the **Protocol** column. You may choose either HTTP or HTTPS protocol.

5. To change the default port click on the field in the **Port** column and enter the port number.
6. Click the **Apply** button and check the messages in the information view to ensure that the connection definition does not contain any errors.
7. Click the **Save Connections** button to save the connection definitions in the workspace.

Here is an example showing a system with three host connections defined:
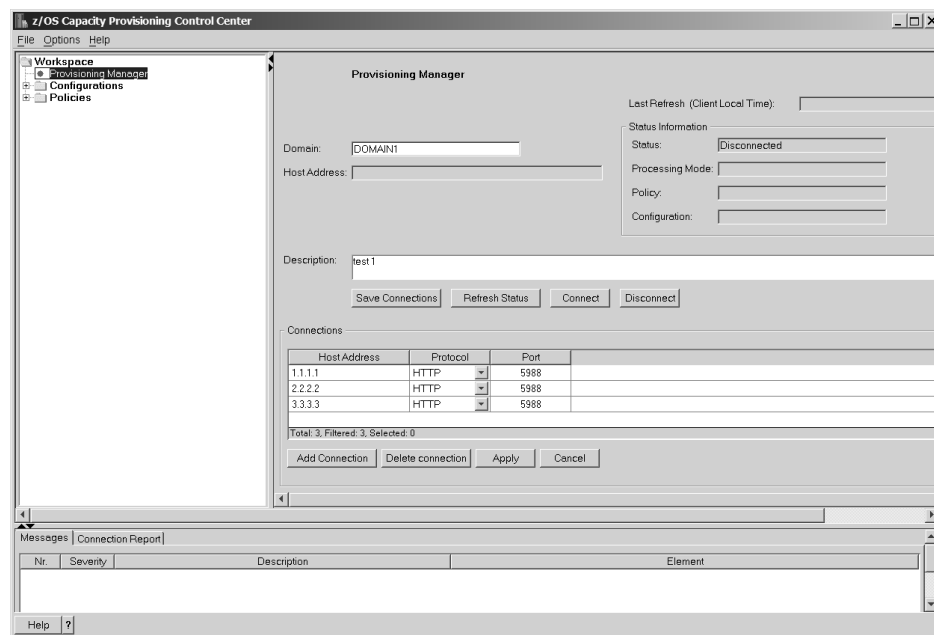


*Figure 11. Provisioning Manager screen*

It is possible to create more than one connection definition. This is necessary if the Provisioning Manager can be started on more than one system. Only one connection can be active at any time.

## Working with the Provisioning Manager

To connect to the Provisioning Manager on a domain you must be a member of the Provisioning Manager query security group (refer to page 33), and if you want to install policies or domain configurations you must also be a member of the Provisioning Manager control security group. The steps to take to make a connection are:

1. Enter the name of the domain in the **Domain** field on the Provisioning Manager screen. This should be the name you used in Table 6 on page 28.
2. Click on the connection you want to use in the Connections table.
3. Click the **Connect** button. A panel asking for the login information is shown:

*Figure 12. Login screen*

4. Enter your **User** name and **Password** for the system you want to connect to, and click the **OK** button.

The Control Center now checks that a Provisioning Manager for the specified domain is running on the host defined in the Connections table and tries to connect to it using the specified protocol and port. If you are unable to connect you can try an alternative connection using another entry in the Connections table. If no connection can be established check the **Connection Report** in the information view for the cause. refer to page 53 for details.

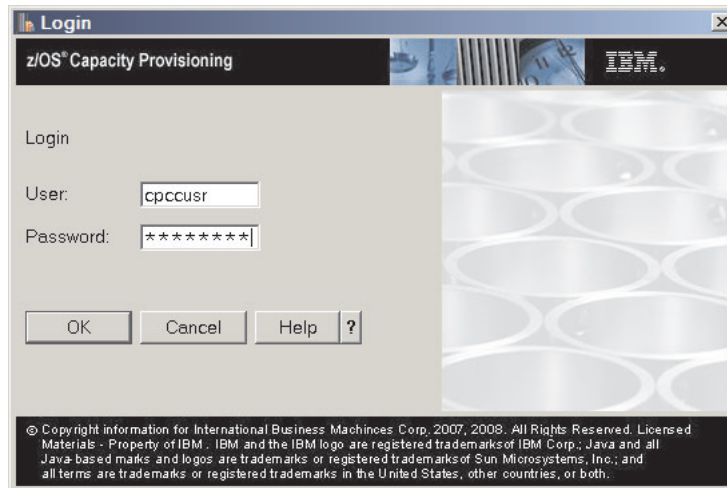The status of the connection between the Control Center and the Provisioning Manager is shown in the **Status Information** area of the Provisioning Manager screen. The **Status** field can display:

**Disconnected**  The Control Center is not connected to the Provisioning Manager.

**Connecting**  The Control Center is trying to establish a connection to the Provisioning Manager.

**Started**  The connection is established and the Provisioning Manager is running.

**Not active**  The connection is established but the Provisioning Manager is not running.

When the status is **Started** you can install policies and domain configurations into the repositories of the domain, and further information is displayed in the other fields of the **Status Information**. The information in each field is:

**Processing mode**

The mode in which the Provisioning Manager is operating. This may be:

**Manual**  The Provisioning Manager will not perform any activation or deactivation requests on its own.

**Analysis**  The Provisioning Manager observes the systems and provides you with information about required additional resources.

**Confirmation**  The Provisioning Manager proposes changes to the capacity settings of the CPCs and asks for confirmation.

**Autonomic** The Provisioning Manager analyzes the workload situation on the observed systems and autonomically adjusts the capacity settings of the CPCs as required.

For further information about these modes refer to "Processing modes" on page 21.

**Policy** The name of the active policy used by the Provisioning Manager

**Configuration**
The name of the active domain configuration used by the Provisioning Manager

**Note:** The Provisioning Manager status information is not refreshed automatically. To update the status information click the **Refresh Status** button. The **Last Refresh** field will be updated to show the date and time the information was last gathered.

To close the connection click the **Disconnect** button.

### Switching to another domain

If you want to work on a different provisioning domain you should enter its name in the **Domain** field and press the **ENTER** key. If you are still connected to the Provisioning Manager of the current domain you will be asked if you want to switch to the new domain now. Selecting **YES** will close the existing connection.

The next time you start the Control Center the last domain worked on will be the new default.

## Working with Domain Configurations

A domain configuration describes the managed CPCs and the observed systems in a domain. The Control Center is used to define domain configurations, and can also be used to install them. An installed domain configuration can be activated for the domain by the Provisioning Manager command SET DOMAIN described on page 108.

This section describes:
* How to create a new domain configuration
* How to define the set of CPCs where the Provisioning Manager may activate additional capacity
* How to specify the z/OS systems to be observed by the Provisioning Manager
* How to install and activate a domain configuration

## Creating a domain configuration

A domain configuration lists a set of z/OS systems, which can be monitored by the Provisioning Manager,and a set of CPCs, which can be activated or deactivated. To create a domain configuration follow these steps:

1. Right-click on the **Configurations** folder in the tree view of the Control Center.
2. Select **New Configuration...**
3. Enter a name for the new configuration. If a configuration with this name already exists in the workspace the name of the new configuration will be altered by the Control Center to make it unique. For information on valid names refer to "Naming Conventions" on page 25. Note that characters must be entered in upper case.

4. Click **OK**. The new configuration is displayed. Since further steps are needed to complete the domain configuration there will be prompts in the **Messages** panel at the bottom of the screen to indicate the next steps you should take.

5. In the **Description** field you may enter a description of this configuration for your reference.

The next steps are to define the observed systems and the controlled CPCs.

## Defining the systems

The **Systems** panel defines the set of all z/OS systems to be monitored by the Provisioning Manager for resource shortages. The systems are identified by a sysplex name and a system name as shown:



*Figure 13. Domain configuration system definition screen*

To define the systems perform the following steps:

1. Click the **Systems** tab in the details view of the domain configuration.

2. Click the **Add System** button. This creates a new entry in the systems table.

3. Click on the field in the **System** column and type the name of the z/OS system.

4. Click on the field in the **Sysplex** column and type the name of the sysplex to which this z/OS system belongs.

5. Click on the field in the **Primary Host Address** column and type either the host name or the IP address of this system.

6. If this system has an alternate address, to be used if the primary address is not working, click on the field in the **Alternate Host Address** column and type either the alternate host name or the alternate IP address of the system.

7. If the entry for the protocol of the CIM server running on the z/OS system is not correct click on the arrow in the **Protocol** column and choose the protocol to use.

8. If the port to be used is not the default (5988) click on the field in the **Port** column and type the number of the port the CIM server is listening to.

9. Systems are enabled by default. If you want to disable the system click the checkbox in the **Enabled** column to clear it. You can also enable or disable systems at runtime by using the Provisioning Manager commands "ENABLE CONFIGURATION" on page 101 and "DISABLE CONFIGURATION" on page 99.

10. Click the **Apply** button. The Control Center then checks the specifications for errors. If any errors are found they will be reported in the **Messages** section at the bottom of the screen.

   **Note:** To complete the domain configuration you must specify at least one system.

11. To add more systems repeat the steps from **Add System**.

## Defining the CPCs

In the **CPCs** panel you define the set of CPCs which the Provisioning Manager is responsible for. These CPCs must be defined at your HMC.
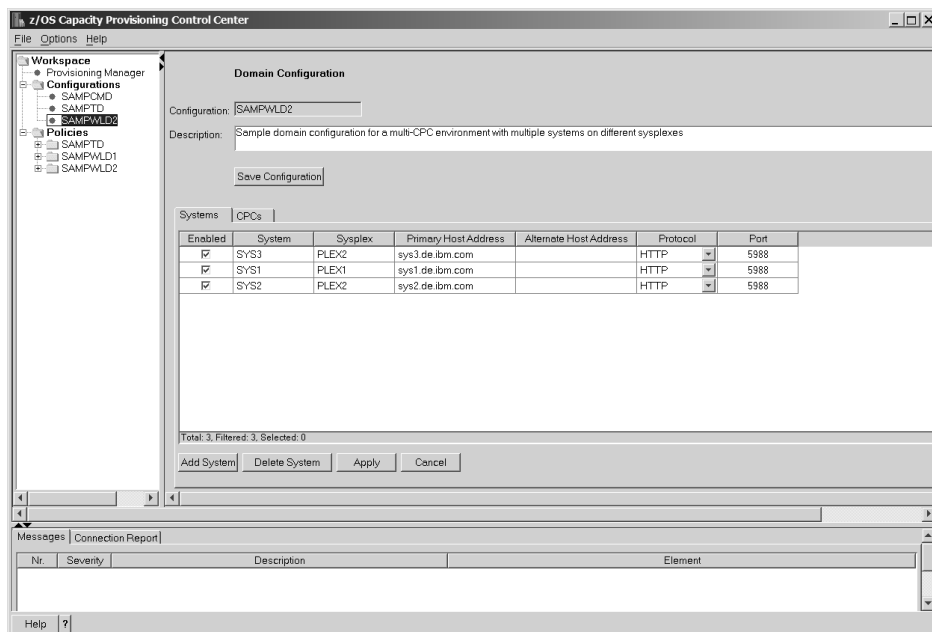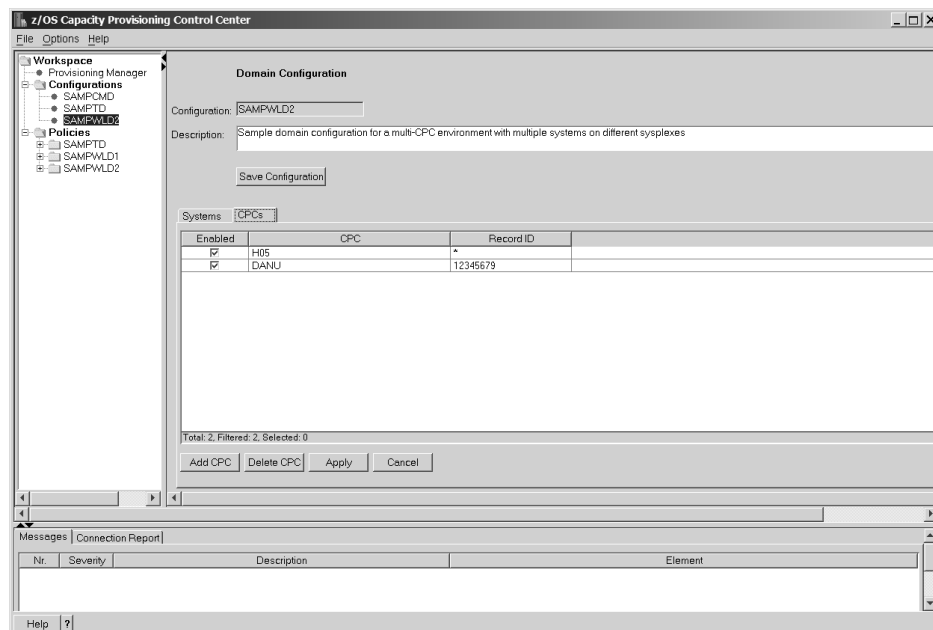


*Figure 14. Domain configuration CPC definition screen*

To define the CPCs perform the following steps:

1. Click the **CPCs** tab in the details view of the domain configuration.
2. Click the **Add CPC** button. This creates a new entry in the CPCs table.
3. Click on the field in the **CPC** column and type in the name of the processor complex. This name is the logical name by which it is identified at the support element (SE) of that processor complex.
4. If you want the Provisioning Manager to use specific temporary capacity values click on the field in the **Record ID** column and enter the identifier of one of the On/Off CoD records describing temporary capacity that can be activated on that CPC. You may also enter an asterisk (*) in this field, in which case the Provisioning Manager selects a default On/Off CoD record.
5. CPCs are enabled by default. If you want to disable the CPC click the checkbox in the **Enabled** column to clear it. You can also enable or disable CPCs at

runtime using the Provisioning Manager commands "ENABLE CONFIGURATION" on page 101 and "DISABLE CONFIGURATION" on page 99.

6. Click the **Apply** button. The Control Center then checks the specifications for errors. If any errors are found they will be reported in the **Messages**panel at the bottom of the screen.

   **Note:** You must specify at least one CPC.

7. To add more CPCs repeat the steps from **Add CPC**.

The domain configuration is now complete. Select the domain configuration in the tree view and click the **Save Configuration** button to save the domain configuration to the workspace.

## Installing and activating a domain configuration

If you want to activate the domain configuration when it is complete and error free you must install it into the domain configuration repository of the Provisioning Manager. To install a domain configuration using the Control Center do the following:

1. Click on **Provisioning Manager** in the tree view and check that the Status field shows **Started**.
2. If it is not connected click the **Connect** button and check that the status changes to **Started**.
3. Right-click on the name of the domain configuration in the tree view.
4. Select **Install**.

To activate a domain configuration do the following:

1. Log on to the host where the Provisioning Manager is running.
2. Issue the Provisioning Manager command:

   SET DOMAIN CFG=*domain_configuration_name*

For further information refer to "SET DOMAIN" on page 108.

## Working with provisioning policies

A provisioning policy is used by the Provisioning Manager to determine when and under which conditions additional capacity may be activated and deactivated. You can define provisioning policies using the Control Center. A completed provisioning policy can be installed and activated for the domain using the Provisioning Manager command "ENABLE POLICY" on page 102. This chapter describes:

• How to create a new provisioning policy
• How to define the components of a provisioning policy
• How to install and activate a provisioning policy
• How to display the policy timeline, to see an overview of the time periods when provisioning is allowed

## Creating a provisioning policy

A provisioning policy contains a set of provisioning rules which define the time periods in which additional capacity can be activated and the work which can trigger the activation of this capacity. It also contains a Maximum Provisioning

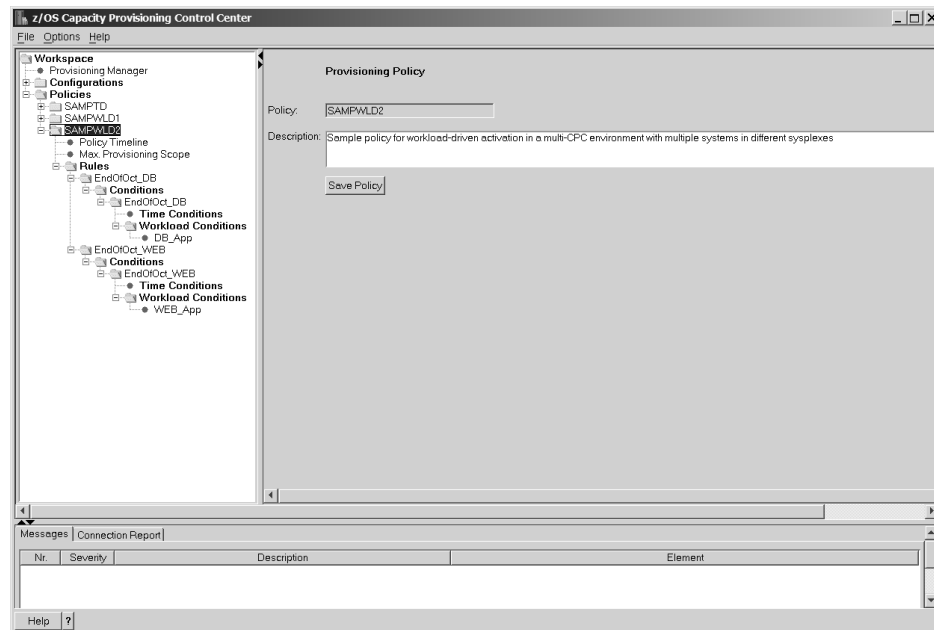Scope which places restrictions on the resources which can be activated.



*Figure 15. Provisioning policy screen*

To create a provisioning policy do the following:

1. Right-click on the **Policies** folder in the tree view of the Control Center.
2. Select **New Policy...**
3. Enter a name for the new policy. If a policy with this name already exists in the workspace the name of the new policy will be altered by the Control Center to make it unique. For information on valid names refer to "Naming Conventions" on page 25. Note that characters must be entered in upper case.
4. Click **OK**. The new policy is created with entries for the **Policy Timeline** and the **Max. Provisioning Scope**, and a **Rules** folder. Since further steps are needed to complete the policy there will be prompts in the **Messages** panel at the bottom of the screen to indicate the next steps you should take.
5. In the **Description** field you may enter a description of this policy for your reference.

The next steps are to define the Maximum Provisioning Scope and to create provisioning rules for the policy.

## Defining the Maximum Provisioning Scope

A policy contains a single Maximum Provisioning Scope element which defines the maximum number of resources that may be activated through all the contained rules. The resources bound by the Maximum Provisioning Scope are:

- The general purpose capacity in MSUs
- The number of Application Assist Processors (zAAPs)
- The number of Integrated Information Processors (zIIPs)

The Maximum Provisioning Scope limits how much additional capacity can be activated for each CPC. You cannot define two different limits for any one CPC in the same Maximum Provisioning Scope.
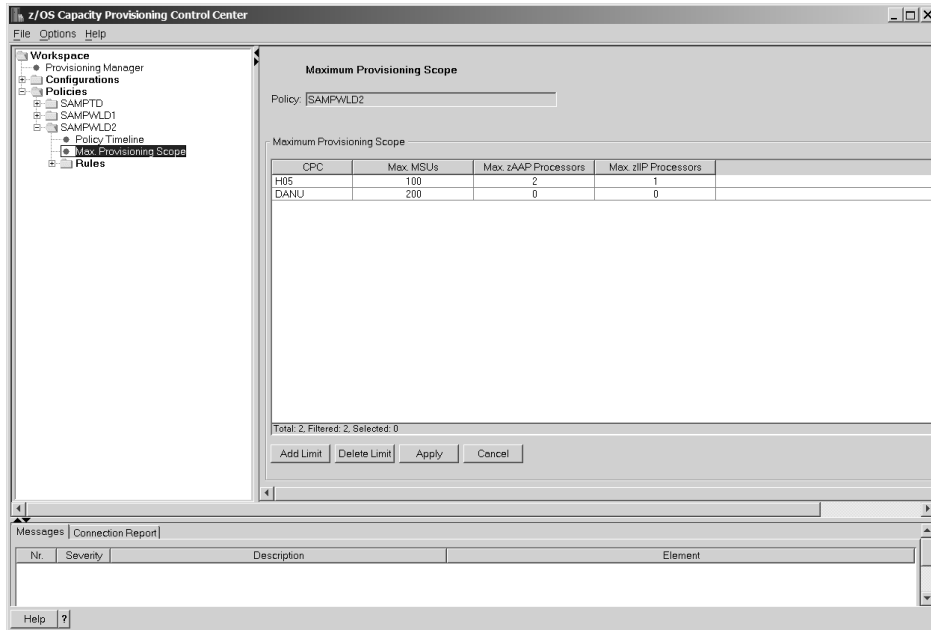
*Figure 16. Maximum provisioning scope screen*

To define the Maximum Provisioning Scope for your provisioning policy do the following:

1. In the tree view click on the '+' to the left of the name of the policy for which want to specify the maximum provisioning scope.

2. Click on **Max. Provisioning Scope**. The Maximum Provisioning Scope panel is shown in the details view of the Control Center.

3. Click the **Add Limit** button to define a provisioning limit for a dedicated processor complex. A new entry in the Maximum Provisioning Scope table is created.

4. Click on the field in the **CPC** column and type in the name of the processor complex. This name is the logical name by which it is identified at the support element(SE) of that processor complex.

5. If you want to allow the Provisioning Manager to activate additional general purpose capacity click on the field in the **Max. MSUs** column and type the maximum amount of MSUs to be activated.

6. If you want to allow the Provisioning Manager to activate additional zAAP processors click on the field in the **Max. zAAP Processors** column and type the maximum number of processors to be activated.

7. If you want to allow the Provisioning Manager to activate additional zIIP processors click on the field in the **Max. zIIP Processors** column and type the maximum number of processors to be activated.

8. Click the **Apply** button. The Control Center checks that the specifications are error free.

   **Note:** At least one processor limit must be specified, and each limit must define at least one type of capacity.

9. If you want to add a provisioning limit for another processor complex repeat the steps from **Add Limit**.

## Creating provisioning rules

A provisioning rule contains a provisioning scope and provisioning conditions. The provisioning scope restricts the capacity that may be activated by the conditions in the rule. Each rule must have a unique name within the policy.

A rule can be enabled or disabled. Disabled rules are ignored by the Provisioning Manager.

To create a provisioning rule do the following:

1. Right-click on **Rules** in the tree view of the policy.

2. Select **New Rule...**

3. Enter the name of the new rule. If a rule with this name already exists in the policy the name of the new rule will be altered by the Control Center to make it unique. For information on valid names refer to "Naming Conventions" on page 25.

4. Click **OK**. The new rule is created and a **Conditions** folder is created under it in the tree view.

5. In the **Description** field you may enter a description of this rule for your reference.

6. Rules are enabled by default. If you want to disable the rule click the **Enabled** checkbox to clear it. If the rule is disabled the Provisioning Manager will not consider it for triggering activation or deactivation of additional resources. You can also enable or disable rules at runtime by using the Provisioning Manager commands "ENABLE POLICY" on page 102 and "DISABLE POLICY" on page 99.
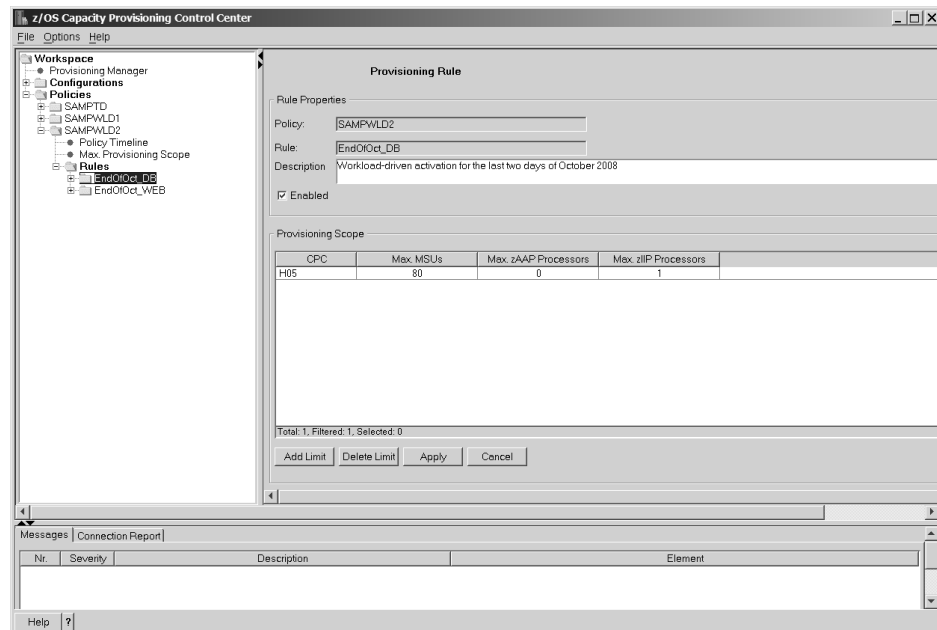


*Figure 17. Provisioning rule screen*

You can now define the provisioning scope and provisioning conditions for the rule.

**Defining the provisioning scope for a rule:** A rule contains a provisioning scope element, which defines the maximum number of resources that may be activated

through all the contained conditions. The provisioning scope is defined in a similar way to the maximum provisioning scope (refer to page 63).

If you define restrictions for CPCs in the provisioning scope of a rule, limits for these CPCs should be defined in the maximum provisioning scope. If they are not additional capacity will not be activated. The values in the provisioning scope for each rule must be less than or equal to the values in the maximum provisioning scope.

**Creating a provisioning condition for a rule:** A provisioning condition contains two parts:

- **Time conditions** define time periods during which additional capacity can be activated.
- **Workload conditions** define the work that is eligible to cause activation of additional capacity and the conditions under which that work can trigger the activation of additional capacity.

A provisioning condition is either enabled or disabled. Disabled provisioning conditions are not considered by the Provisioning Manager.
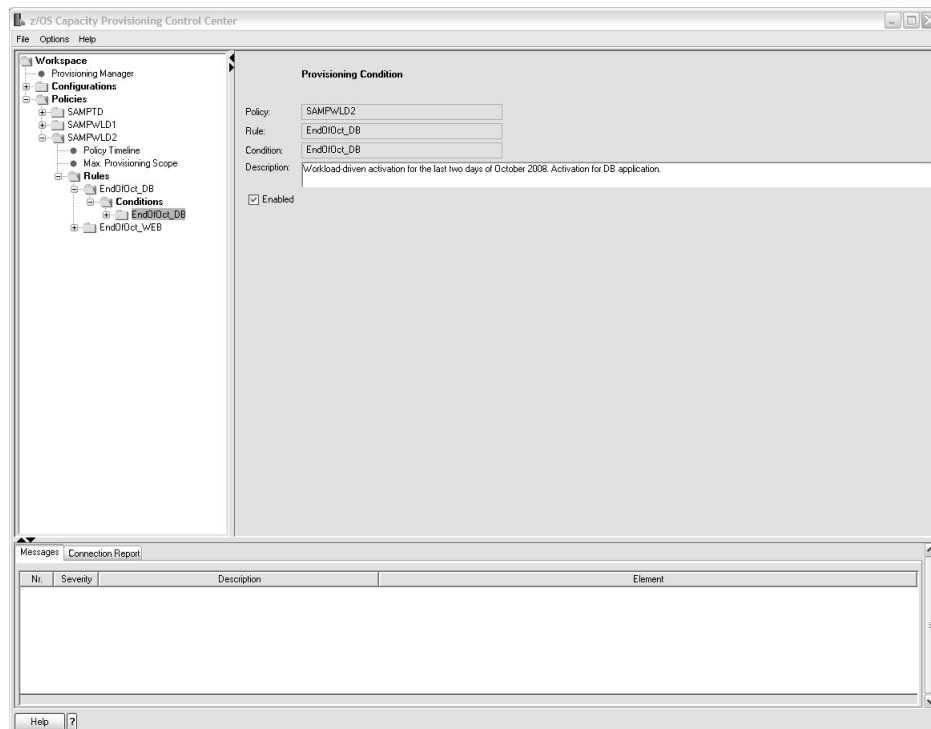


*Figure 18. Provisioning condition screen*

To specify a provisioning condition do the following:
1. In the tree view click on the '+' to the left of the name of the rule to which you want to add the condition.
2. Right-click on **Conditions**.
3. Select **New Condition...**

4. Enter the name of the new condition. If a condition with this name already exists in the policy the name of the new condition will be altered by the Control Center to make it unique. For information on valid names refer to "Naming Conventions" on page 25.

5. Click **OK**. The new condition is created and an entry for the **Time Conditions** and a **Workload Conditions** folder are created under it in the tree view.

6. Conditions are enabled by default. If you want to disable the condition click the **Enabled** checkbox to clear it. If the condition is disabled, or the enclosing rule is disabled, the Provisioning Manager will not consider it for triggering activation or deactivation of additional resources. You can also enable or disable conditions at runtime by using the Provisioning Manager commands "ENABLE POLICY" on page 102 and "DISABLE POLICY" on page 99.

7. In the **Description** field you may enter a description of this condition for your reference.

The next step is to define a time condition for the provisioning condition.

**Specifying a time condition:** A time condition defines a period during which the activation of additional resources is allowed. The format of the date and time that is accepted by the Control Center is determined by the regional options of your workstation.

**Note:** If the regional options determine that seconds are displayed, they can be specified but they are not used by the Control Center.

All dates and times are entered and displayed using the time zone displayed in the field **Policy displayed in Time Zone**. The time zone can be changed using the **Options** menu as described in "The menu bar" on page 54. A change to this affects the display of all policies. The actual date and time values are stored in the workspace as Coordinated Universal Time (UTC).
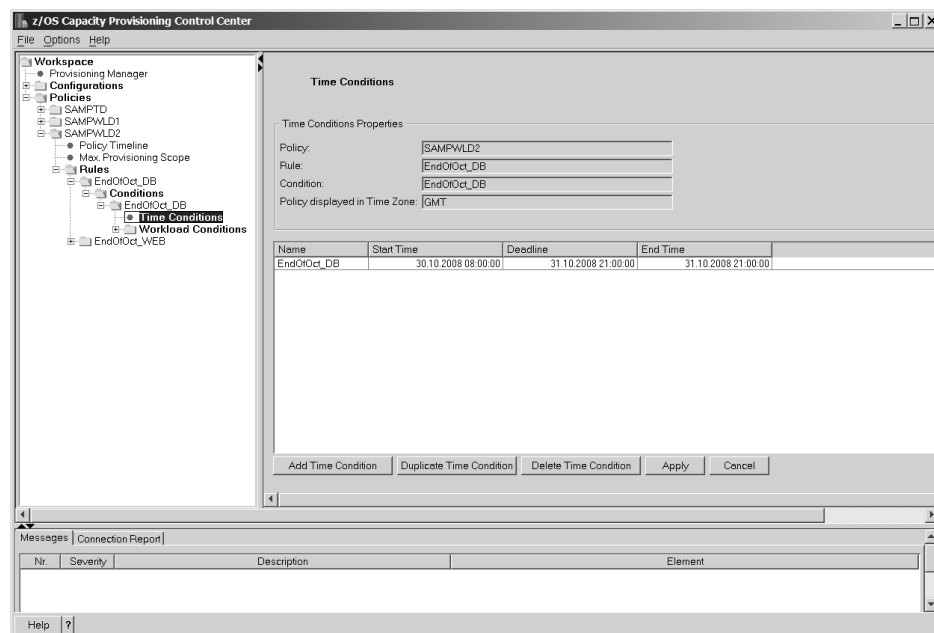


*Figure 19. Time condition screen*

To specify a time condition do the following:

1. In the tree view click on the '+' to the left of the name of the condition to which you want to add a time condition.
2. Click on **Time Conditions**.
3. Click the **Add Time Condition** button. A new row is added to the table where you can specify the new time condition.
4. Click on the field in the **Name** column and type a name for the new time condition. If a condition with this name already exists in the policy the name of the new time condition will be altered by the Control Center to make it unique. For information on valid names refer to "Naming Conventions" on page 25.
5. Click on the field in the **Start Time** column and enter the time for the provisioning period to begin.
6. Click on the field in the **Deadline** column and enter the latest time when activation of additional capacity is allowed. This must be after the **start time**.
7. Click on the field in the **End Time** column and enter the time for the Provisioning Manager to start deactivating the additional capacity. This must be on or after the **deadline**.
8. Click the **Apply** button. The Control Center then checks the specifications for errors. If any errors are found they will be reported in the **Messages** panel at the bottom of the screen.

You now have the option of defining a workload condition. If time conditions are defined but no workload conditions the Provisioning Manager performs a scheduled activation and deactivation of additional capacity. At the start of a time condition the maximum allowed additional resources, as restricted by the provisioning scope, will be activated. At the end time of the time condition any activated capacity will be deactivated.

**Creating a workload condition:**  A workload condition defines work that is eligible to cause activation of additional capacity, and the conditions under which that work can trigger activation. The specification of eligible work follows the workload model of the z/OS Workload Manager (WLM).
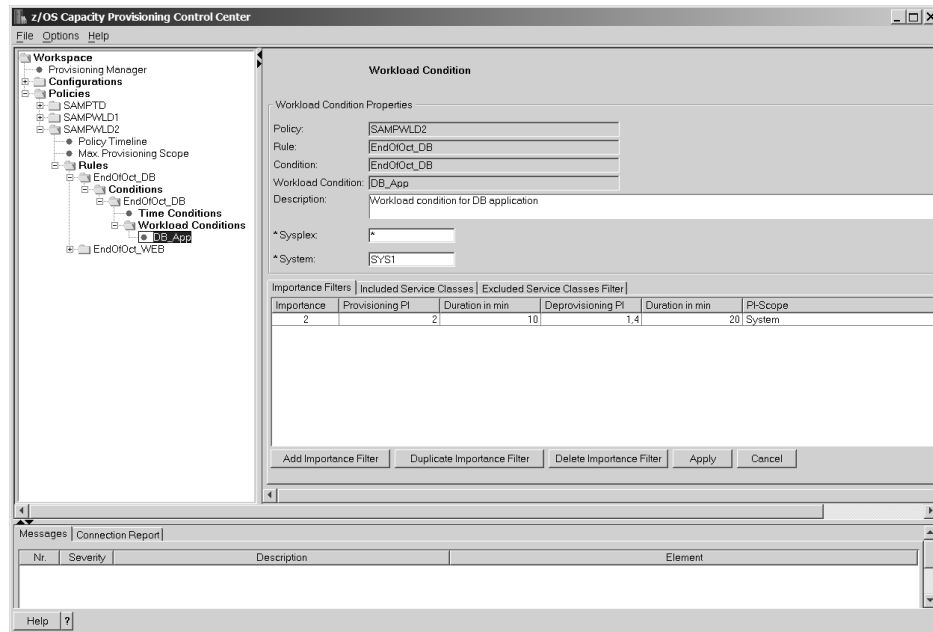
*Figure 20. Workload condition screen*

To create a workload condition do the following:

1. In the tree view right-click on **Workload Conditions**.

2. Select **New Workload Condition...**

3. Enter the name of the new workload condition. If a condition with this name already exists in the provisioning policy the name of the new workload condition will be altered by the Control Center to make it unique. For information on valid names refer to "Naming Conventions" on page 25.

4. Click **OK**. The new workload condition is displayed. Since further steps are needed to complete the workload condition there will be prompts in the **Messages** panel at the bottom of the screen to indicate the next steps you should take.

5. In the **Description** field you may enter a description of this workload condition for your reference.

6. Enter a name in the **Sysplex** field. To apply the condition to all sysplexes in the domain configuration insert an asterisk (*) here. Otherwise only workload on the named sysplex will be considered to trigger provisioning for this workload condition.

7. Enter the name of a z/OS system in the **System** field. To apply the condition to all systems in the named sysplex or the domain configuration insert an asterisk (*). Otherwise only workload on the named system will be considered to trigger provisioning for this workload condition.

8. Click the **Apply** button. The Control Center then checks the specifications for errors. If any errors are found they will be reported in the **Messages** panel at the bottom of the screen.

The next step is to identify the workload on the specified system based on the z/OS WLM service class model. Depending on the work that is running on a system, different service classes can be business-critical. The lower part of the **Workload Condition** panel contains three tabs. These can be used to identify potentially critical service class periods. For details refer to "Workload conditions" on page 14. The tabs are:

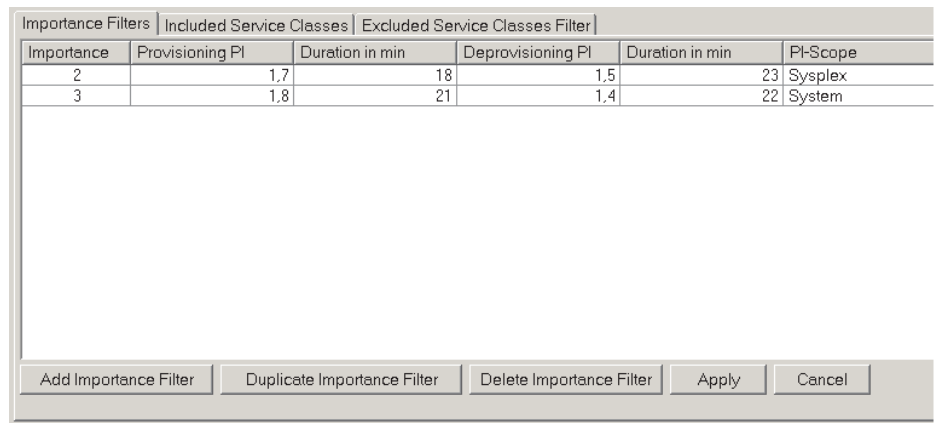| | |
|---|---|
| **Importance Filters** | This allows you to specify service class periods to be monitored, based on their importance, and the performance index values and durations to trigger intervention. |
| **Included Service Classes** | This allows you to specify service classes to be monitored in addition to any identified by importance filters, and the triggers for these. |
| **Excluded Service Classes filter** | This allows you to specify service classes to be excluded from importance filters, or subsets of Included Service Classes to be excluded. |

**Note:** You must specify at least one Importance filter or Included Service Class filter for a workload condition.

**Specifying an importance filter:** The specification of importance filters is optional, however there must be at least one importance filter or one included service class filter for a valid workload condition. All service class periods with an importance level equal or higher than the specified value will be monitored by the Provisioning Manager for resource shortages. For each specified importance level additional provisioning criteria must be defined.

| Importance Filters | Included Service Classes | Excluded Service Classes Filter | | | |
|---|---|---|---|---|---|
| Importance | Provisioning PI | Duration in min | Deprovisioning PI | Duration in min | PI-Scope |
| 2 | 1,7 | 18 | 1,5 | 23 | Sysplex |
| 3 | 1,8 | 21 | 1,4 | 22 | System |

Add Importance Filter | Duplicate Importance Filter | Delete Importance Filter | Apply | Cancel

*Figure 21. Importance filters screen*

To specify an importance filter do the following:

1. In the tree view of the Control Center click on the name of the workload condition for which you want to specify an importance filter.
2. Click the **Importance Filters** tab.
3. Click the **Add Importance Filter** button. A new entry in the Importance Filters table is created containing the default values for an importance filter. All fields of an importance filter are required. If any of the defaults are not suitable correct them as follows:
   - Click on the field in the **Importance** column to change it. Service class periods with the specified importance level or higher will be observed.
   - Click on the field in the **Provisioning PI** column to change it. If the performance index of a service class period is equal or higher than the specified value the Provisioning Manager considers the service class period to be suffering.

- Click on the field in the first **Duration in min** column to change it. This is the duration in minutes a service class period has to exceed the provisioning PI before the Provisioning Manager considers the service class period to be suffering.
- Click on the field in the **Deprovisioning PI** column to change it. If the performance index of a service class period is lower than the specified value it is not considered to be suffering. The deprovisioning PI must be at least 0.2 less than the provisioning PI limit, and must be not less than 1.1.
- Click on the field in the second **Duration in min** column to change it. This is the duration in minutes the PI of the selected service classes must be lower than the specified deprovisioning PI for it to be considered no longer suffering. It must have a value between 5 and 1440 minutes.
- Click on the field in the **PI-Scope** column to change it. This indicates which PI the other criteria apply to. The possible values are **System** and **Sysplex**. The default is **System**.

4. If you want to add an additional importance filter proceed from the step **Add Importance Filter**.
5. Click the **Apply** button. The Control Center then checks the specifications for errors. If any errors are found they will be reported in the **Messages** section at the bottom of the screen.

**Specifying an included service class:**  The specification of included service classes filters is optional, however at least one importance filter or one included service class filter must be specified for a valid workload condition. All service classes listed on the **Included Service Classes** panel can trigger provisioning when they are in the defined service class period. For each specified service class period additional provisioning criteria must be defined.
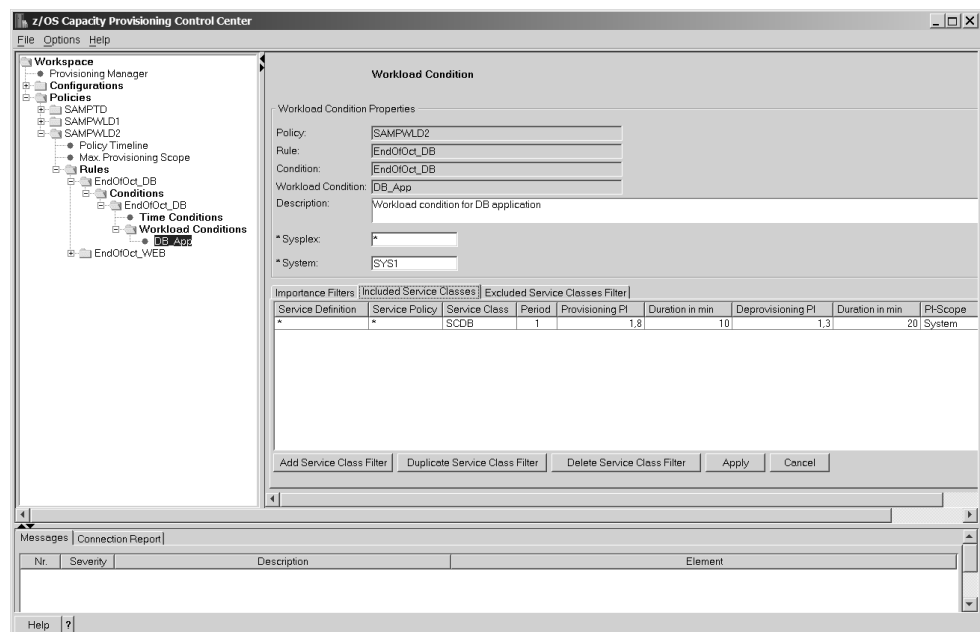


*Figure 22. Included service class screen*

To add a service class on the **Included Service Classes** panel do the following:
1. Click the **Included Service Classes** tab.

2. Click the **Add Service Class Filter** button. A new entry in the included service classes tableis created containing the default values for the additional provisioning criteria. All fields of a service class filter are required.

   - Click on the field in the **Service Definition** column and specify the name of the WLM service definition. To specify all service definitions insert an asterisk (*).
   - Click on the field in the **Service Policy** column and specify the name of the WLM service policy. To specify all service policies insert an asterisk (*).
   - Click on the field in the **Service Class** column and specify the name of the WLM service class to consider. To specify all service classes insert an asterisk (*).

   If any of the defaults are not suitable correct them as follows:

   - Click on the field in the **Period** column and specify the number of the highest period of the service class that should be considered. All periods with a period number lower than or equal to this are considered.
   - Click on the field in the **Provisioning PI** column and insert a value between 1.3 and 10. If the performance index of a service class period is equal to or higher than this value the Provisioning Manager considers the service class period to be suffering.
   - Click on the field in the first **Duration in min** column to change it. This is the duration in minutes a service class period has to exceed the provisioning PI for the Provisioning Manager to consider it to be suffering.
   - Click on the field in the **Deprovisioning PI** column and insert a value between 1.1 and 9.8. If the performance index of a service class period is equal to or lower than the specified value the Provisioning Manager considers the service class period not to be suffering
   - Click on the field in the second **Duration in min** column to change it. This is the duration in minutes a service class period has to be lower than the provisioning PI for the Provisioning Manager to consider it to be no longer suffering.
   - Click on the field in the **PI-Scope** column to change it. This indicates which PI the other criteria apply to. The possible values are **System** and **Sysplex**. The default is **System**.

3. If you want to add an additional service class proceed from the step **Add Service Class Filter**.

4. Click the **Apply** button. The Control Center then checks the specifications for errors. If any errors are found they will be reported in the **Messages** panel at the bottom of the screen.

**Specifying an excluded service class:** The specification of excluded service classes filters is optional. It is used to exclude selected service classes which would otherwise be included by an importance filter. The service classes listed on the **Excluded Service Classes Filter** panel cannot trigger provisioning even if they match the importance filters or the included service classes criteria.
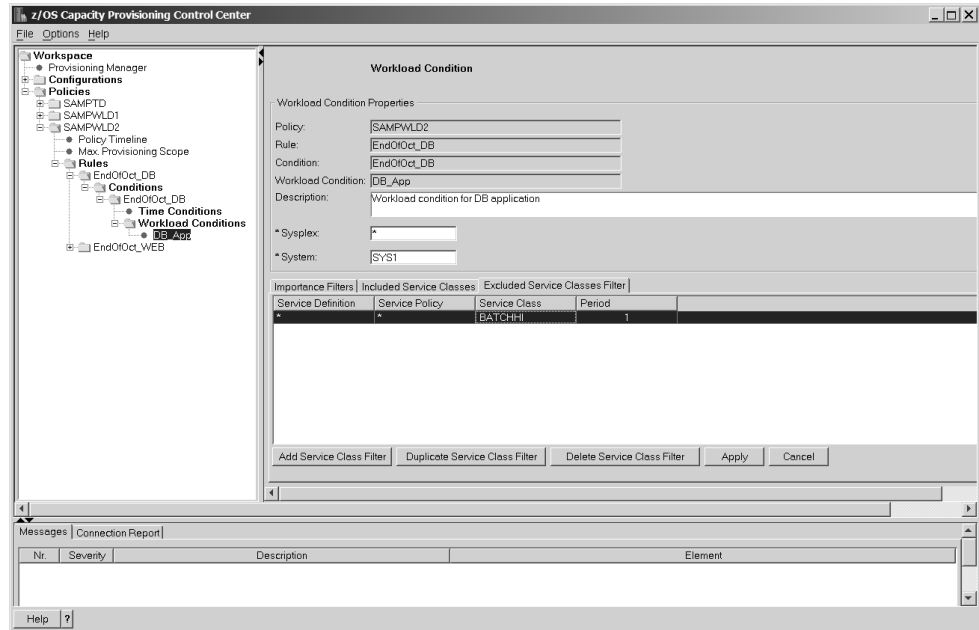
*Figure 23. Excluded service class screen*

To exclude a service class on the **Excluded Service Classes** panel take the following steps:

1. Click the **Excluded Service Classes** tab.
2. Click the **Add Service Class Filter** button. A new entry in the excluded service classes table is created containing the default values for the additional provisioning criteria. All fields of a Service Class Filter are required.

   - Click on the field in the **Service Definition** column and specify the name of the WLM service definition. To specify all service definitions insert an asterisk (*).

   - Click on the field in the **Service Policy** column and specify the name of the WLM service policy. To specify all service policies insert an asterisk (*).

   - Click on the field in the **Service Class** column and specify the name of the WLM service class to consider. To specify all service classes insert an asterisk (*).

   If the default period is not suitable correct it as follows:

   - Click on the field in the **Period** column and specify the number of the maximum period of the service class which shall not be considered for provisioning. All periods with a number equal to or higher than this are not considered.

3. If you want to exclude additional service classes repeat from the step **Add Service Class Filter**.
4. Click the **Apply** button. The Control Center then checks the specifications for errors. If any errors are found they will be reported in the **Messages** panel at the bottom of the screen.

The provisioning policy is now complete. Select the policy in the tree view and click the **Save Policy** button to save the policy to the workspace.

## Installing and activating a provisioning policy

If you want to activate the provisioning policy when it is complete and error free you must install it into the provisioning policy repository of the domain. To install a provisioning policy using the Control Center do the following:

1. Click on **Provisioning Manager** in the tree view and check that the Status field shows **Connected**.

2. If it is not connected click the **Connect** button and check that the status changes to **Connected**.

3. Right-click on the name of the provisioning policy in the tree view.

4. Select **Install**.

To activate a provisioning policy do the following:

1. Log on to the host where the Provisioning Manager is running.

2. Issue the following Provisioning Manager command:

   SET DOMAIN POL=*policy_name*

For further information refer to "SET DOMAIN" on page 108.

## Displaying the policy timeline

To see an overview of the times when additional capacity can be activated and deactivated you may display the timeline of the policy.
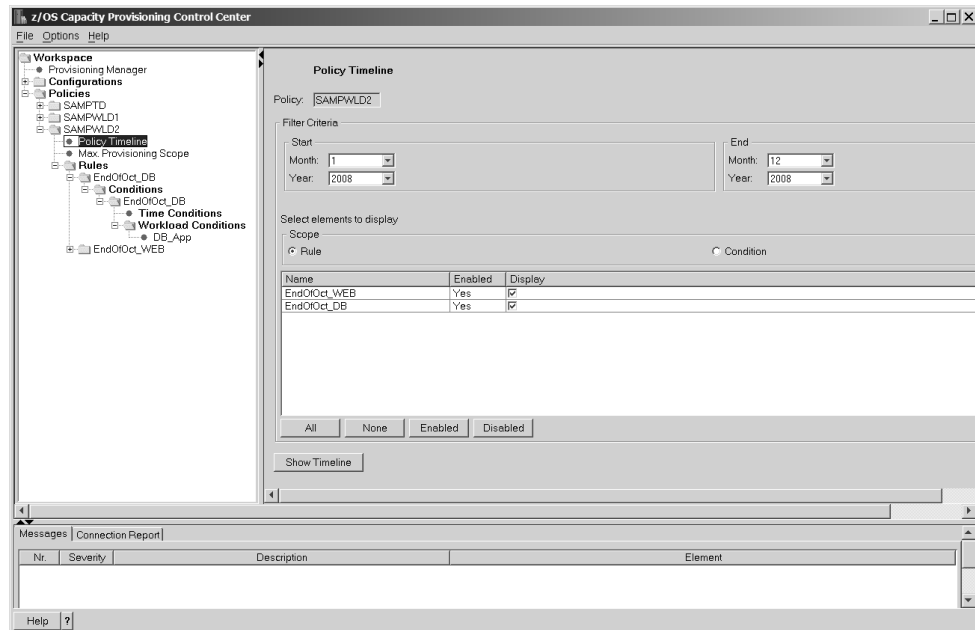


*Figure 24. Select timeline to display screen*

The procedure for displaying the timeline of a policy is as follows:

1. Select the start and end dates to choose the time period for which you want to see the possible activations. The only years available are those for which time conditions exist in the selected policy.

2. Click on one of the radio buttons to select elements to display from the rules of the policy or from the conditions of the policy.

3. Select the rules or conditions you want to display. The screen shows whether the rules or conditions are enabled or disabled in the policy. The buttons below the table are provided for your convenience to select or deselect groups of entries:

**All**                All rules or conditions are to be displayed.

**None**           All rules or conditions are deselected and none are displayed.

**Enabled**       All enabled rules or conditions are to be displayed.

**Disabled**      All disabled rules or conditions are to be displayed.

4. When you have selected the rules or conditions that you want to include click the **Show Timeline** button.

A window opens showing the selected time period and the included time conditions of the selected rules or conditions. An example of this is:



*Figure 25. Policy timeline screen*

# Chapter 5. Controlling the Provisioning Manager

The Provisioning Manager is the server component in a Capacity Provisioning domain which manages the activation and deactivation of temporary capacity on your CPCs. It can be accessed from the MVS console or from any console device.

## Provisioning Manager commands
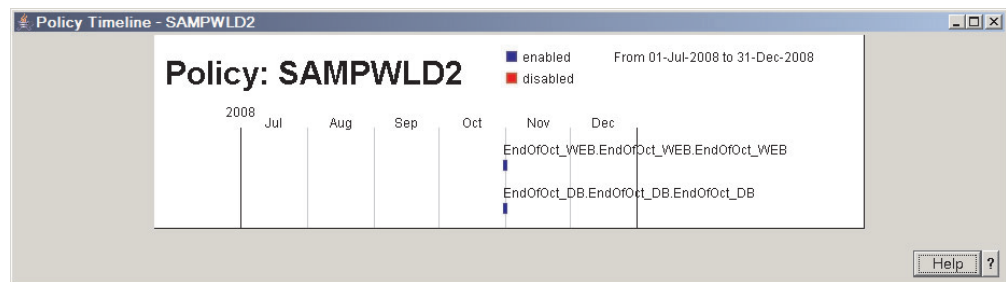
When the Provisioning Manager is running it responds to MVS MODIFY and STOP commands. You can pass commands to it using MODIFY. These commands are processed sequentially.

The syntax to issue Provisioning Manager commands is:

```
►►──┬─MODIFY─┬──CPOSERV──,──APPL=Provisioning Manager command────────────►◄
    └─F──────┘
```

For information about the Provisioning Manager commands refer to Chapter 8, "Provisioning Manager command reference," on page 93.

## Stopping the Provisioning Manager

Two commands can be used to end Provisioning Manager processing:
- The Provisioning Manager `stop manager` command. For details refer to page 111.
- The MVS STOP command. This is equivalent to the Provisioning Manager command `stop manager mode=normal`. The format of the MVS command is:

```
►►──┬─STOP─┬──CPOSERV──────────────────────────────────────────────────►◄
    └─P────┘
```

After the Provisioning Manager has been requested to stop it does not accept any further commands. While the Provisioning Manager runs it writes status data to a restart dataset so that when it is restarted it can continue to manage resources from the point where it was stopped. This allows for short breaks, for example in case you need to transfer the Provisioning Manager to another system. If you expect a longer interruption to processing you are recommended to end the program only when there are no temporary resources activated by the Provisioning Manager.

**Note:** After a restart the Provisioning Manager needs time to collect all the data necessary to decide on actions related to workload conditions. The minimum time required for this is the provisioning duration of all the specified and active workload conditions. Until this data is gathered the Provisioning Manager will assume that no additional capacity is needed on behalf of workload conditions.

Temporary capacity that has been activated by the Provisioning Manager is not automatically deactivated when the Provisioning Manager stops. If temporary resources must be deactivated you should do this manually before issuing the stop command. To find out which temporary resources are currently active you can

issue a `report configuration` command (refer to page 104). After the Provisioning Manager has stopped, temporary resources can only be deactivated by using the hardware interface at the HMC.

## Answering operator messages

In some situations the Provisioning Manager issues operator messages that you can reply to. These situations occur:

- when the Provisioning Manager runs in confirmation mode and asks whether the proposed actions are allowed.
- in very rare situations where inconsistencies with the hardware are detected.

If the Provisioning Manager is running in confirmation mode it checks the policy and the workload on the systems that are defined in the domain configuration to see if there is any need to activate or deactivate temporary resources. The Provisioning Manager proposes a change in the activation level and issues a message asking whether you want to allow the proposed action. If you allow the action the Provisioning Manager attempts to apply it to the CPC. If you deny the action the CPC will not be considered again for this type of action (activation or deactivation) for a period of a few hours.

Until you respond the Provisioning Manager continues to check the policy and the workload to see if the proposed action is still necessary. If the action is no longer necessary then the outstanding message is cancelled. If another action is proposed instead a new message is issued. While the Provisioning Manager is waiting for the answer you may use report commands to help you decide on the response.

In some situations there may be inconsistencies between the status of the Provisioning Manager and the CPC, for example if an activation is triggered and the expected change in the activation level of the On/Off CoD record did not complete. In such situations the Provisioning Manger issues a request message to the console asking how to resolve this situation. If the situation is resolved by any new information from the hardware the request message will be cancelled.

# Chapter 6. Working with reports

You can request various reports of the status of the Provisioning Manager. The content varies depending on the type of report. The following reports can be requested:

- Domain report
- Policy report
- Domain configuration report
- Workload report
- Activity report
- Trace report

These reports can be written to the console or to a file in the file system using Provisioning Manager commands. If the report is sent to the console the command response message includes the type of report, date and time (in ), for example:

```
CPO1008I Domain report generated at 12/22/2007 08:45:01
```

If the report is written to a file this information is included in the first line of the file, for example:

```
Domain report generated at 12/22/2007 08:45
```

In both cases the report data follows this line. The following sections contain a description of the different reports and how to interpret the information.

**Note:** If the report is written to the console the amount of information written is limited. If the data exceeds the limit the information will be truncated or missing. In this case you should direct the report to a file to get the complete information.

## The domain report

To create a domain report issue a REPORT DOMAIN command. Refer to page 105 for the syntax of this command. The report contains information about the current setup of the domain managed by the Provisioning Manager. This information is (in the following order):

- The name of the provisioning domain and the time when the Provisioning Manager was started.
- The active processing mode and the time it was activated. The possible values for the processing mode are:
  - MANUAL
  - ANALYSIS
  - CONFIRMATION
  - AUTONOMIC
- The active domain configuration and the time it was activated. A domain configuration name of "*none" indicates that the default domain configuration is active as you have never activated your own domain configuration. In this case the reported time is the time when the Provisioning Manager first ran.

- The name of the active provisioning policy and the time it was activated. A policy name of "*none" indicates that the default policy is active as you have never activated your own policy. In this case the reported time is the time when the Provisioning Manager first ran.
- Service information about the code level of the running program.

All reported times are in UTC.

**Note:** The activation times for the processing mode, the domain configuration and the policy may have occurred in a previous run of the Provisioning Manager and may be earlier than the current start time of the Provisioning Manager.

An example of a domain report is:

```
Domain report generated at 12/22/2007 08:45
Provisioning Manager for domain DOMAIN1 started at 12/22/2007 08:40:53
Active processing mode is AUTONOMIC since 12/22/2007 08:40:54
Active domain configuration is DCSAMPLE since 12/22/2007 08:40:54
Active policy is EXAMPLE since 12/22/2007 08:40:54
Code level is 200712201
```

## The policy report

To create a policy report issue a REPORT POLICY command. Refer to page 105 for the syntax of this command. The report contains information about the active policy and its status. Indentation is used in this report to group related items together, similar to the list below. The information reported is:

- The name of the active policy, and its enabled/disabled status. A policy is disabled if the Provisioning Manger is running in processing mode MANUAL. In all other processing modes the policy is enabled.
- The maximum provisioning scope of the policy. One line is displayed for each entry. This contains the CPC name and the maximum resources which can be activated by all provisioning rules.
- The provisioning rules contained in the policy. The information displayed about each rule is:
  - The rule name, the current enabled or disabled status, and the default status as defined in the policy when it was activated
  - The provisioning scope for the rule. One line is displayed for each entry. This contains the CPC name and the resources eligible to be activated by this rule.
  - The provisioning conditions. For each provisioning condition the following information is given:
    - The provisioning condition name, the current enabled or disabled status, and the default status as defined in the policy when it was activated.
    - The workload conditions, if any. For each workload condition the following information is given:
      - The workload condition name and the name of the sysplex this condition is for.
      - The name of the system to which the workload condition applies.
      - The importance filters defined in the workload condition if any. For each importance filter the following information is given:
        - The importance (I), the provisioning performance index limit (PL), the provisioning performance index limit duration (PD), the deprovisioning performance index limit (DL), the deprovisioning performance index limit duration (DD), and the scope for the performance index (S).

- The included service classes defined in the workload condition, if any. For each included service class the following information is given:
  - The Workload Management (WLM) service definition name, policy name, service class name and service class period number to be observed.
  - The provisioning performance index limit (PL), the provisioning performance index limit duration (PD), the deprovisioning performance index limit (DL), the deprovisioning performance index limit duration (DD), and the scope for the performance index (S).
- The excluded service classesdefined in the workload condition, if any. For each excluded service class the following information is given:
  - The Workload Management (WLM) service definition name, policy name, service class name and service class period number not to be observed.
- The time conditions. For each time condition the following information is given:
  - The time condition name and status. The status is one of the following:
    - pending
    - observing and enabled
    - observing and disabled
    - active and enabled
    - active and disabled
    - drained and enabled
    - drained and disabled
    - inactive

  For more information about the time condition status, refer to page 13.

  Since time conditions cannot be enabled or disabled, the status reflects the enabled/disabled status of all the elements it is contained in. A time condition is enabled if the policy, the rule, and the provisioning condition are all enabled. Otherwise it is disabled.
  - The start, deadline and end time of the condition. These times are reported in UTC.

An example of a policy report follows:

```
Policy EXAMPLE is enabled
Maximum provisioning scope:
 Limit for CPC SAMPCPC is 150 MSUs, 3 zAAPs, 3 zIIPs
Rule SampleRule is enabled (default enabled)
 Provisioning scope:
  Limit for CPC SAMPCPC is 30 MSUs, 0 zAAPs, 0 zIIPs
 Provisioning condition SampleCS is enabled (default enabled)
  Workload condition "SampleWLC" for sysplex "SYSPLEX"
   System name "*"
   I/PL/PD/DL/DD/S 1 1.5 10 1.2 10 System
   Included: SAMPLESD/SAMPLEP/SAMPSC.1
    PL/PD/DL/DD/S 2.0 15 1.2 7 Sysplex
   Excluded: SAMPLESD/SAMPLEP/SC2
  Time condition SampleTime is active and enabled
   s/d/e: 01/01/2008 00:00 / 12/31/2008 16:00 / 12/31/2008 20:00
```

# The domain configuration report

To create a domain configuration report issue a REPORT CONFIGURATION command. Refer to page 104 for the syntax of this command. The report contains information about the active domain configuration and the status of its elements. Indentation is used in this report to group related items together, similar to the list below. The information reported is:

- The name of the active domain configuration and its enabled/disabled status. A domain configuration is disabled if the Provisioning Manger is running in processing mode MANUAL. In all other processing modes the domain configuration is enabled.
- Information about the CPCs defined in the domain configuration. For each CPC this contains:
  - The name of the CPC, its record ID, its current enabled/disabled status and the default status defined in the domain configuration when it was activated.
  - Runtime information about the CPC:
    - The status of the CPC at the SE or HMC. This status will be:

      **not correlated**
      > The CPC has not yet been detected by the SE or HMC. It cannot be used to activate temporary capacity.

      **correlated**
      > The CPC has been detected by the SE or HMC but detailed information about it is not yet available to the Provisioning Manager. It cannot be used at present to activate temporary capacity.

      **matched**
      > The CPC has been detected by the SE or HMC and detailed information about it is available. Temporary capacity may be activated on it if a valid record exists.

    - The CPC hardware type and model. If the CPC is not supported for capacity management this is indicated at the end of the line. If it is supported then detailed information about the CPC follows in separate lines:
      - The current CPC model, capacity in MSUs, number of zAAPs and number of zIIPs.
      - The permanent model and capacity in MSUs.
      - If the record ID in the domain configuration is defined as "*", the record ID used by the Provisioning Manager for managing temporary capacity is displayed.
      - If a usable record was detected:
        - The record ID used by the Provisioning Manager for managing temporary capacity.
        - The remaining capacity: the number of processors available which can still be activated as general purpose, zAAP or zIIP.
        - The activation limits: the number of zAAP and zIIP processors allowed to be active for this record. If there is no activation limit in the record a value of -1 is reported.
        - The active resources: how many resources are currently active for the record. The resources are displayed in MSUs followed by the number of additional processors, the number of increases in the capacity settings, the number of zAAPs and the number of zIIPs.

- If no usable record was detected:
  - A note that no record for capacity management is available.
- If the record ID in the domain configuration is not defined as "*":
  - A note that the record ID is not valid.
- If the CPC cannot be used for capacity management:
  - The reason that capacity cannot be activated or deactivated. This can be, for example, the record has expired or the configuration of the CPC does not allow commands to perform the temporary capacity change.
- Information about the systems in the domain configuration. For each system this contains:
  - The operating system name, the name of the sysplex it belongs to, its enabled/disabled status and the default status as defined in the domain configuration when it was activated
  - The primary host address
  - The alternate host address, if defined
  - The protocol and the port
  - Information about the system at the primary host address:
    - The observation status information. This status can be:

      **observed**
      > The Provisioning Manager retrieves information from the system at the reported host address. The system can be observed if the domain configuration is enabled and the system is enabled. If the alternate host address is not defined the system at the primary host address is observed. If both host addresses are defined at least one of the two systems is observed. This depends on the runtime status of the system at the other host address.

      **not observed**
      > The Provisioning Manager does not retrieve information from the system at the reported host address. The system is not observed if the domain configuration is disabled or the system is disabled. If the domain configuration is enabled and the system is enabled and if both host addresses are defined the system may be not observed. This depends on the runtime status of the system at the other host address.
- If the system is observed, the following lines contain runtime information about the system at the reported host address. The first information is the connection status and the time when the connection changed into this status. The connection status can be one of the following:

  **not connected**
  > The connection to the system has not yet been established successfully. The Provisioning Manager is trying to connect to the system at the related host address.

  **available**
  > The connection to the system has been successfully established.

  **temporarily unavailable**
  > The connection to the system has been suspended after successfully establishing a connection. The Provisioning Manager tries to reestablish the connection.

**unavailable**
> The connection to the system has been broken. The Provisioning Manager will try to connect to the system again.

- If additional information about the system is available it is reported as follows:
  - The date and time the system became available
  - The CPC where the system is running
  - The installed WLM service definition and active WLM policy
- If the Provisioning Manager does not yet have all required information about the system at the related host address this is reported as follows:
  - A note indicating the information is unavailable
  - A message indicating which initialization step has not yet finished or could not finish successfully. If the step could not finish successfully a corresponding message was sent to the console at the first time of this occurrence. This message is one of the following:

    **The system is not identified**
    > The name of the system and/or the name of the sysplex has not yet been retrieved.

    **The system is not correlated**
    > The Provisioning Manager has not yet detected if the name of the system and the name of the sysplex this system belongs to match the names in the domain configuration. Both names are reported in the message.

    **The operating system version is not available**
    > The version of the operating system has not yet been retrieved.

    **The CPC serial number is not available**
    > The serial number of the CPC on which the system is running has not yet been retrieved.

    **The CPC serial number is not correlated**
    > The serial number of the CPC has not yet been correlated with the name of the CPC. The serial number of the CPC is reported in the message.

    **The CPC is not correlated**
    > The CPC has not yet been correlated. The Provisioning Manager has not detected if the CPC the system is running on is defined in the domain configuration.

    **The information for retrieving metric values is not available**
    > The information for retrieving metric values has not yet been retrieved, or could not be retrieved.

    **The information about the WLM service definition is not available**
    > The name of the installed WLM service definition, the name of the active WLM policy or the activation time of this policy have not yet been retrieved.

    **The information about WLM service class periods is not available**
    > The service class periods defined in the active WLM policy have not yet been retrieved.

- Even if all data can successfully be initialized there may be other conditions which prevent further processing. If so the condition that is not fulfilled is reported. This condition will be one of the following:

**The system is not the defined system**
> The name of the system and/or the name of the sysplex this system belongs to does not match the definition of these names in the domain configuration. Both names are reported in the message.

**The system version is not supported**
> The version of the system is not supported by the Provisioning Manager.

**The CPC is not part of the domain**
> The CPC the system is running on is not defined in the domain configuration.

An example of a domain configuration report is:

```
Domain configuration DCSAMPLE for domain DOMAIN1 is enabled
CPC SAMPCPC with record * is enabled (default enabled)
 CPC is matched with serial 000020016F7A since 01/16/2008 16:51:06
 Hardware is of type 2097 with model E12
 Current model is 705 with 342 MSUs, 2 zAAPs, and 3 zIIPs
 Permanent model is 704 with 281 MSUs
 Active record ID is A0123456
 Hardware has 6 spare processors
 Activation limits are 3 zAAPs, and 1 zIIP
 Active resources GP/zAAP/zIIP 61(1/0)/0/0
System SYSTEM1 in sysplex SVPLEX is enabled (default enabled)
 Primary host address: system1.ibm.com
 Alternate host address: 9.99.99.99
 Protocol: HTTP, port: 5988
 The system at primary host address is observed
  This system is available since 04/27/2008 16:46:32
  This system is running on the CPC SAMPCPC
  WLM service definition: SAMPLESD, active policy: SAMPLEP
 The system at alternate host address is not observed
```

# The workload report

To create a workload report issue a REPORT WORKLOAD command. Refer to page 106 for the syntax of this command. The report contains information about the currently observed workload. The information reported is:

- The number of systems on which workload may be observed.
- For each system that is observed:
  - The name of the operating system, the name of the sysplex the system belongs to, and the name of the CPC the system is running on.
  - For each WLM service class period observed on the system:
    - The service class period name and number, for example SAMPSC.1, followed by the provisioning performance index limit (PL), the provisioning performance index limit duration (PD), the deprovisioning performance index limit (DL), the deprovisioning performance index limit duration (DD) and the scope for the performance index (S).
    - The performance index last measured and the time of this measurement. A dash (-) is displayed whenever the performance index is not available at the time of measurement; for example this can occur when the workload running in the observed service class has been displaced. To show how long the performance index has been at this level the line also contains the last time when the performance index crossed the provisioning or deprovisioning performance index limit. Both times are shown in UTC.

An example of a workload report is:

```
Workload is analyzed for 1 system(s)
Workload for system SYSTEM1 of sysplex SYSPLEX on CPC SAMPCPC
 SAMPSC.1 PL/PD/DL/DD/S 1.4 10 1.2 10 Sysplex
  PI from 01/16/2008 16:55 is 1.2. Last limit crossing was 01/16/2008 16:55
```

# The activity report

To create an activity report issue a REPORT ACTIVITY command. Refer to page 103 for the syntax of this command. The report contains information about the activation and deactivation of temporary resources initiated by the Provisioning Manager based on the policy and workload status.

This activity is displayed in reverse chronological order, with the latest actions displayed at the top of the list, so that when the display is truncated the oldest data is not displayed. Note that activation and deactivation are processed asynchronously by the CPC. The activity report does not show whether the commands completed successfully.

The information reported is:
- A summary line showing the time period reported and the number of activities performed by the Provisioning Manager.
- For each of these activities the details follow:
  - The type of activity (activation or deactivation), the CPC affected and the time the activity took place.
  - The target activation level. This includes the target model for general purpose capacity and the numbers of temporary zAAP and zIIP processors.
  - The activation level of the CPC at the time the activity was initiated, in the same format as the target activation level.
  - If the activity was an activation of temporary resources, for each workload that triggered the activation:
    - The policy element that triggered the activation: the policy name, the provisioning rule, the provisioning condition and the time condition.
    - The system that was suffering: the operating system and the sysplex it belongs to.
    - The service class period that was suffering: the active WLM service definition and policy name and the service class name and number.

An example of an activity report is:
```
Number of activities between 11/14/2007 and 01/16/2008 was 2
Deactivation for CPC SAMPCPC at 01/16/2008 21:26:29
 Deactivation to model 505, 0 zAAPs, 0 zIIPs
 Active resources before deactivation: model 506, 0 zAAPs, 0 zIIPs
Activation for CPC SAMPCPC at 01/16/2008 17:26:25
 Activation of model 506, 0 zAAPs and 0 zIIPs
 Active resources before activation: model 505, 0 zAAPs, 0 zIIPs
 Inducing policy element is policy EXAMPLE, rule SampleRule,
  provisioning condition SampleCS, time condition SampleTime
 Inducing system is SYSTEM1 in sysplex SYSPLEX
 Inducing workload is WLM service definition SAMPLESD,
  policy SAMPLEP, service class period SAMPSC.1
```

# The trace report

To create a trace report issue a REPORT TRACE command. Refer to page 106 for the syntax of this command. The report contains information about the current trace level settings and trace file settings:

- A header "Trace level settings", followed by:
  - The value for the default level
  - The values for each individual trace component
- A header "Trace file settings", followed by:
  - The prefix of the trace file name. The full filename is constructed from this by appending a dot (.) and the sequence number of the trace, starting from 0 (zero). For example the first trace file could be /tmp/ cpotrace_20080127134147469.log.0.
  - The maximum size and number of trace files. When the size limit is reached a new file is started. When the maximum number is reached the sequence numbers begins again at 0 and the old files are reused.

An example of a trace report is:

```
Trace level settings
 Default level is set to INFO
 Level for component BASE is set to default
 Level for component UTIL is set to default
 Level for component POLICY is set to ALL
 Level for component CONFIGURATION is set to ALL
 Level for component ANALYZER is set to default
 Level for component PLANNER is set to default
 Level for component CONSOLESERVER is set to default
 Level for component CIMOBSERVER is set to default
 Level for component CIMCLIENT is set to OFF
 Level for component HMCCLIENT is set to OFF
Trace file settings
 Trace is written to /tmp/cpotrace_20080127134147469.log
 Limit=100000000, count=1
```

# Managing reports

The Provisioning Manager only reports the status information currently in memory, and does not keep a history. If you require a history you must organize this yourself by regularly requesting the reports you are interested in. You should specify a unique file name for each report as the Provisioning Manager overwrites the content of a file if it already exists.

# Chapter 7. Considerations for defining policies and domains

This chapter lists some points you should consider when setting parameters in a Capacity Provisioning policy or domain configuration.

## Choosing service class periods

z/OS Capacity Provisioning uses the performance index (PI) of service class periods as the primary trigger for provisioning and deprovisioning actions. For example the Capacity Provisioning Manager only considers a provisioning action if the actual PI of any included service class period is worse than the defined PI. You must select appropriate service class periods for which the performance index is correlated to the performance of your business application.

As an example, an important business application may consist of multiple service classes that are defined as importance 2 and 3 in the WLM service definition. Somewhat simplified, the goal attainment of those service classes primarily depends on other work that may be classified as importance 1, SYSSTC or SYSTEM. When system resources such as processing capacity become constrained WLM will attempt to help the most important work first and assign less resources to other work. In this example resources will be taken from the service class periods of importance 3 first, and these in turn will show a higher (worse) PI.

It is best practice in WLM not to define too many service class periods as active at any point in time. The reason for this is to have a substantial service measurement in any period, so that WLM has sufficient sample data to go on. This is especially important for service class periods that are defined with average response times or response time with percentile goals. The same objective applies to Capacity Provisioning. Furthermore, the number of transaction endings should be high enough to allow RMF to compute a performance index. At least one transaction ending per RMF MINTIME, and preferably more, are required.

You can only specify service class periods with importance 1 to 5. SYSTEM, SYSSTC, SYSSTC1 to SYSSTC5 and DISCRETIONARY work cannot trigger a provisioning action and will be ignored, if included. You are also recommended not to include any service classes associated with a resource group capacity maximum. If a service class is capped, Capacity Provisioning will avoid provisioning on behalf of it if possible.

You cannot use service class periods that are for transactions using WLM execution delay monitoring services; these are CICS and IMS transaction service class periods. You can use service classes that the servers are managed to, though.

## Choosing provisioning criteria

The PI limits that you specify in your provisioning criteria depend on what you would consider tolerable when capacity is constrained. If the goal for the service class period is defined such that the goal is still achievable at times of peak demand – without additional capacity being active – then the provisioning PI could be set just above 1. In other cases, with more aggressive goals in effect, a provisioning PI would need to be higher.

The provisioning duration determines how fast the Provisioning Manager would activate additional capacity when the PI of the respective service class period is consistently above the limit. The duration should be viewed relative to the RMF MINTIME, the default of which is 100 seconds. In general the duration should be greater than 3 minutes, to avoid a short term disturbance causing a provisioning action. It may also take some time for WLM to resolve a PI problem by reassigning resources.

The specified duration is not a guaranteed reaction time. Certain events cause the Provisioning Manager to block for some time to allow WLM to re-adjust. Such events are, for example, the activation of a new WLM service definition or policy, or a capacity change of the observed CPC.
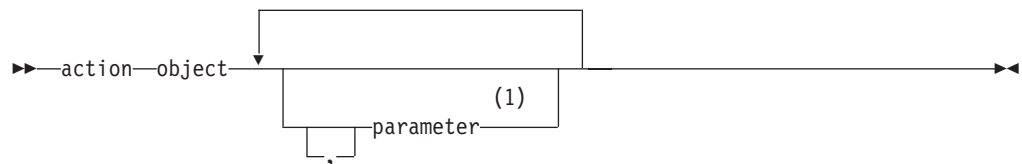
# Part 3. Reference

This part contains the Provisioning Manager command reference and messages.

# Chapter 8. Provisioning Manager command reference

This chapter describes the Provisioning Manager commands and their syntax. To pass commands to the Provisioning Manager refer to page 77.

## Introduction

The Provisioning Manager command syntax is based on the z/OS command syntax shown in the following diagram:

```
►►──action──object─┬──────────────────────┬──────────────────►◄
                   │       ┌──────────┐    │
                   │       │       (1)│    │
                   └─────┬─parameter──┴────┘
                         └─,─
```

**Notes:**

1  Parameters may be required, optional or nonexistent, depending on the specific action and object.

Refer to "How to read syntax diagrams" on page xi for help in reading these diagrams.

Commas are optional, and any number of blanks are allowed to separate action, object, and parameters. A comment is allowed at any place where a blank is allowed. Comments have the form:

```
/* comment */
```

Parameters have the following form:

```
►►──parameter_name=value──────────────────────────────────────►◄
```

The names of the parameters may vary between commands. The sequence of parameters is not significant. A value can be any sequence of characters. If special characters are needed, for example spaces or commas, then the parameter value must be enclosed in single apostrophes ('). Within these apostrophes there can be any characters. To include an apostrophe within the parameter it must be represented by two apostrophes; for example "parm1='It''s mine'" assigns the value "It's mine" to the parameter parm1. Actions, objects and parameter names are not case sensitive. Values may be case sensitive if they are not keywords. In this case the value must be enclosed in apostrophes.

The commands fall into three types:

- Control commands, which alter the operation of the Provisioning Manager.
- Status commands, which report the current situation.
- Debug commands, which can be used to give diagnostic information to IBM service personnel.

The supported commands (actions and objects) are listed below, together with a short form of the command (which may be used to save typing - note that the short forms are not abbreviations), and the page on which each command is described.

*Table 11. Control commands*

| Command | Short form | Page |
|---|---|---|
| ACTIVATE RESOURCE | a r | 95 |
| DEACTIVATE RESOURCE | i r | 98 |
| DISABLE CONFIGURATION | d c | 99 |
| DISABLE POLICY | d p | 99 |
| ENABLE CONFIGURATION | e c | 101 |
| ENABLE POLICY | e p | 102 |
| RESET CONFIGURATION | t c | 107 |
| RESET POLICY | t p | 107 |
| SET DOMAIN | s d | 108 |
| STOP MANAGER | p m | 111 |

*Table 12. Status commands*

| Command | Short form | Page |
|---|---|---|
| LIST CONFIGURATION | l c | 102 |
| LIST POLICY | l p | 103 |
| REPORT ACTIVITY | r a | 103 |
| REPORT CONFIGURATION | r c | 104 |
| REPORT DOMAIN | r d | 105 |
| REPORT POLICY | r p | 105 |
| REPORT TRACE | r t | 106 |
| REPORT WORKLOAD | r w | 106 |

*Table 13. Debug commands*

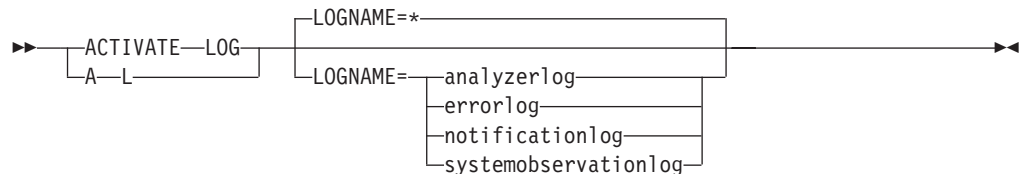| Command | Short form | Page |
|---|---|---|
| ACTIVATE LOG | a l | 94 |
| DEACTIVATE LOG | i l | 97 |
| DUMP MANAGER | none | 100 |
| SET TRACE | s t | 110 |
| RESET TRACE | t t | 108 |
| WRITE LOG | w l | 112 |

## Commands

### ACTIVATE LOG

Use the ACTIVATE LOG command to start recording log data to a file. Log data is always collected in memory. If the log is activated then whenever the log buffer is full the buffer is written to a file. The default location for this file is the /tmp directory. This location can be overridden as described in "Planning the domain set up" on page 27. You must ensure that there is sufficient space in the active location.

The data is written until the log is deactivated (see "DEACTIVATE LOG" on page 97) or the Provisioning Manager terminates. When the Provisioning Manager is started or restarted all logs are set to their default state. The default state for the error log is activated. For all other logs it is deactivated.

**Note:** This command should only be used if so instructed by IBM service personnel.

### Syntax

The syntax for the ACTIVATE LOG command is:

```
>>──┬─ACTIVATE──LOG─┬──┬──────────────────────────LOGNAME=*──────────────────────────┬──><
    └─A──L──────────┘  └─LOGNAME=──┬─analyzerlog─────────┬─┘
                                   ├─errorlog────────────┤
                                   ├─notificationlog─────┤
                                   └─systemobservationlog─┘
```

### Parameters

The command has a single parameter:

**LOGNAME=**_name_
  The type of data to be recorded. This may be:

  **analyzerlog**
      workload analysis decisions.

  **errorlog**
      unexpected errors detected during processing.

  **notificationlog**
      communications with the Provisioning Manager.

  **systemobservationlog**
      monitored metrics from the observed systems.

  You may also specify LOGNAME=* to indicate that writing should be activated for all logs. This is the default if you omit the LOGNAME parameter. _name_ is not case sensitive.

### Example

To record communications with the Provisioning Manager issue the following command:

```
MODIFY CPOSERV,APPL=ACTIVATE LOG LOGNAME=NotificationLog
```

or:

```
F CPOSERV,APPL=A L LOGNAME=NotificationLog
```

The response on the console should be:

```
CPO1031I Logging successfully activated for log NotificationLog
```
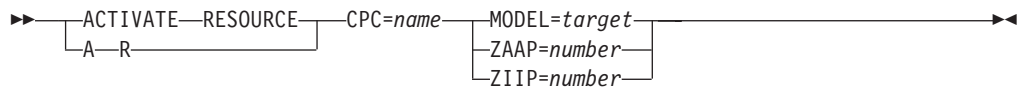
## ACTIVATE RESOURCE

Use the ACTIVATE RESOURCE command to manually activate temporary resources of a CPC in the provisioning domain. The temporary resources can only be activated for the On/Off CoD record identified in the domain configuration.

**Note:** When a number is supplied as a parameter this is the total number of resources that you want to have active, not the number of resources that you want to add to the already active resources.

Before performing the activation, the Provisioning Manager checks that the specified resource level is an activation (has more capacity) and that the target record allows the requested change. The resources are not managed by the Provisioning Manager, and in particular they will not be deactivated automatically.

## Syntax
The syntax for the ACTIVATE RESOURCE command is:

```
►►──┬─ACTIVATE──RESOURCE─┬──CPC=name──┬─MODEL=target──┬────────────────►◄
    └─A──R───────────────┘            ├─ZAAP=number───┤
                                      └─ZIIP=number───┘
```

## Parameters
The command has the following parameters:

**CPC=**_name_
the name of the CPC on which you want to activate the temporary resources. A CPC with this name must be part of the active domain configuration. The CPC must be at the supported hardware level, there must be an On/Off CoD record at the CPC that is managed by the Provisioning Manager, and this record must allow for the requested activation level.

**MODEL=**_target_
the model capacity identifier that you want to make active on the CPC. The target model must have more general purpose capacity measured in MSUs than the current model. In addition the On/Off CoD record managed by the Provisioning Manager must allow for the capacity defined by the requested model.

**ZAAP=**_number_
the number of temporary zAAP processors that you want to have active. The target number must be higher than the number of active zAAP processors, and is limited by the number of spare processors on the machine, the maximum number of zAAP processors allowed by the On/Off CoD record, and the remaining capacity for zAAP processors of this record.

**ZIIP=**_number_
the number of temporary zIIP processors that you want to have active. The target number must be higher than the number of active zIIP processors, and is limited by the number of spare processors on the machine, the maximum number of zIIP processors allowed by the On/Off CoD record, and the remaining capacity for zIIP processors of this record.

## Example
To activate one zAAP for CPC G14 issue the following command:
```
MODIFY CPOSERV,APPL=ACTIVATE RESOURCE CPC=G14 ZAAP=1
```

or:
```
F CPOSERV,APPL=A R CPC=G14 ZAAP=1
```

The response on the console should be:
```
CPO1026I Activation level change to 1 zAAPs successfully initiated for CPC G14
```
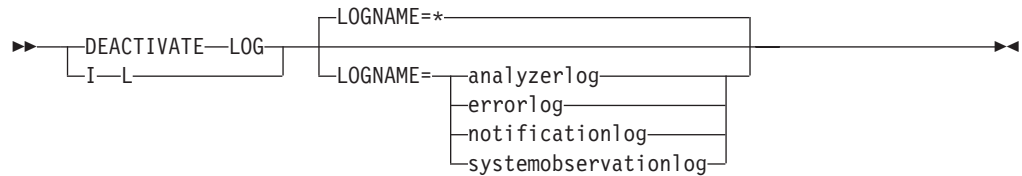
# DEACTIVATE LOG

Use the DEACTIVATE LOG command to stop recording log data to a file. The log data will continue to be collected in memory. If the log was active the current log buffer is written to the file. The default location for this file is the /tmp directory. This location can be overridden as described in "Planning the domain set up" on page 27.

**Note:** This command should only be used if so instructed by IBM service personnel.

## Syntax

The syntax for the DEACTIVATE LOG command is:

```
►►──┬─DEACTIVATE─LOG─┬──┬──────LOGNAME=*──────────────────┬──►◄
    └─I─L────────────┘  └─LOGNAME=─┬─analyzerlog────────┬─┘
                                   ├─errorlog───────────┤
                                   ├─notificationlog────┤
                                   └─systemobservationlog┘
```

## Parameters

The command has the following parameters:

**LOGNAME=**_name_

The type of data to stop recording. This may be:

**analyzerlog**
    contains workload analysis decisions.

**errorlog**
    contains unexpected errors detected during processing.

**notificationlog**
    contains communications with the Provisioning Manager.

**systemobservationlog**
    contains monitored metrics from the observed systems.

You may also specify LOGNAME=* to indicate that writing should be deactivated for all logs. This is the default if you omit the LOGNAME parameter. _name_ is not case sensitive.

## Example

To stop recording monitored metrics from the observed systems, issue the following command:

```
MODIFY CPOSERV,APPL=DEACTIVATE LOG LOGNAME=NotificationLog
```

or:

```
F CPOSERV,APPL=I L LOGNAME=NotificationLog
```

The response on the console should be of the form:

```
CPO1031I Logging successfully deactivated for log NotificationLog
CPO2030I Log information written to file
                /tmp/cpoNotificationLog_20071024131732469.log
```

# DEACTIVATE RESOURCE

Use the DEACTIVATE RESOURCE command to manually deactivate temporary resources of a CPC in the provisioning domain. The temporary resources can only be deactivated for the On/Off CoD record identified in the domain configuration.
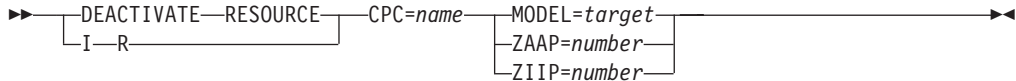
You should use this command to deactivate resources that you activated manually, for example by using the `activate resource` command (refer to page 95).

**Note:** When a number is supplied as a parameter this is the total number of resources that you want to have active, not the number of resources that you want to remove from the already active resources.

Before performing the deactivation, the Provisioning Manager checks that the specified resource level is below the currently active resources within the managed record.

## Syntax

The syntax for the DEACTIVATE RESOURCE command is:

```
►►─┬─DEACTIVATE─RESOURCE─┬──CPC=name──┬─MODEL=target──┬──────────────────►◄
   └─I─R─────────────────┘            ├─ZAAP=number───┤
                                      └─ZIIP=number───┘
```

## Parameters

The command has the following parameters:

**CPC=***name*
> the name of the CPC on which you want to deactivate the temporary resources. A CPC with this name must be part of the active domain configuration. The CPC must be at the supported hardware level and there must be an On/Off CoD record at the CPC that is managed by the Provisioning Manager.

**MODEL=***target*
> the model capacity identifier that you want to have active on the CPC. The target model must have less general purpose capacity in terms of MSUs than the current model. In addition, the On/Off CoD record managed by the Provisioning Manager must allow for the requested model.

**ZAAP=***number*
> the number of temporary zAAP processors that you want to have active. The target number must be less than the current number of active zAAP processors for this record.

**ZIIP=***number*
> the number of temporary zIIP processors that you want to have active. The target number must be less than the current number of active zIIP processors for this record.

## Example

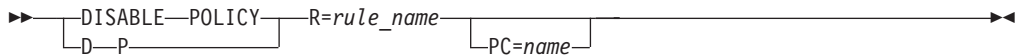To deactivate all zAAPs for CPC G14 issue the following command:
```
MODIFY CPOSERV,APPL=DEACTIVATE RESOURCE CPC=G14 ZAAP=0
```

or:
```
F CPOSERV,APPL=I R CPC=G14 ZAAP=0
```

The response on the console should be:

```
CPO1028I Activation level change to 0 zAAPs successfully initiated for CPC G14
```
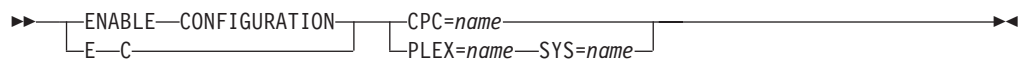
# DISABLE CONFIGURATION

Use the DISABLE CONFIGURATION command to disable a CPC or a system within the active domain configuration. If a system is disabled the Provisioning Manager no longer observes the system. If a CPC is disabled the Provisioning Manager no longer considers it for activation and deactivation of temporary resources.

If the command completes successfully the selected CPC or system will be listed as disabled in the domain configuration report.

## Syntax

The syntax for the DISABLE CONFIGURATION command is:

```
►►──┬─DISABLE──CONFIGURATION─┬──┬─CPC=name───────────────┬──────────────────────►◄
    └─D──C─────────────────────┘  └─PLEX=name──SYS=name─┘
```

## Parameters

The command has the following parameters:

**CPC=**_name_
    specifies the name of the CPC that you want to disable. A CPC with this name must be part of the active domain configuration.

**PLEX=**_name_
    specifies the name of the sysplex which includes the system which you want to disable. A sysplex with this name must be in the active domain configuration.

**SYS=**_name_
    specifies the name of the system which you want to disable. A system with this name must exist in the specified sysplex in the active domain configuration.

## Example

To disable CPC G14 issue the following command:

```
MODIFY CPOSERV,APPL=DISABLE CONFIGURATION CPC=G14
```

or:

```
F CPOSERV,APPL=D C CPC=G14
```

The response on the console should be:

```
CPO1012I CPC G14 in current configuration successfully disabled
```

# DISABLE POLICY

Use the DISABLE POLICY command to disable an entire provisioning rule or a specific provisioning condition within a provisioning rule in the active provisioning policy. If there are already temporary resources activated through any affected time conditions these resources will be deactivated.

If the command completes successfully the selected rule or provisioning condition will be listed as disabled in the policy report.

### Syntax

The syntax for the DISABLE POLICY command is:

```
►►──┬─DISABLE──POLICY─┬──R=rule_name─────────────────────────────►◄
    └─D───P───────────┘              └─PC=name─┘
```

### Parameters

The command has the following parameters:

**R=**_rule_name_
> the name of the rule that you want to disable. A rule with this name must exist in the active policy.

**PC=**_name_
> the name of the provisioning condition that you want to disable. A provisioning condition with the specified name must be part of the _rule_name_ specified.

### Example

To disable rule CP160106R issue the following command:

```
MODIFY CPOSERV,APPL=DISABLE POLICY R=CP160106R
```

or:

```
F CPOSERV,APPL=D P R=CP160106R
```

The response on the console should be:

```
CPO1003I Rule CP160106R successfully disabled
```

## DUMP MANAGER

Use the DUMP MANAGER command to request dumps from the Provisioning Manager. Different types of dumps can be requested:

- Heap dumps
- Java dumps
- Java system dumps

The dumps will be created in the home directory of the Provisioning Manager user.

**Note:** This command should only be used if so instructed by IBM service personnel.

### Syntax

The syntax for the DUMP MANAGER command is:

```
►►──DUMP──MANAGER───TYPE=──┬─HEAP───┬──────────────────────────────►◄
                           ├─JAVA───┤
                           └─SYSTEM─┘
```

### Parameters

The command has the following parameters:

**TYPE=**_type_
> specifies the type of dump to be taken. The following types are supported:

> **HEAP** requests a Java heap dump

**JAVA**   requests a Java dump

**SYSTEM**

requests a Java system dump

The type values are not case sensitive.

### Example

To take a snap dump issue the following command:

```
MODIFY CPOSERV,APPL=DUMP MANAGER TYPE=SNAP
```

The response on the console should be:

```
CPO1088I Dump manager command for dump type SNAP successfully performed
```

# ENABLE CONFIGURATION

Use the ENABLE CONFIGURATION command to enable a CPC or a system within the active domain configuration. If a system is enabled the Provisioning Manager starts to observe it and resources may get activated based on the workload situation of this system. If a CPC is enabled the Provisioning Manager considers it for activation and deactivation of temporary resources.

If the command is successful then the selected CPC or system will be listed as enabled in the domain configuration report.

### Syntax

The syntax for the ENABLE CONFIGURATION command is:

```
►►──┬─ENABLE─CONFIGURATION─┬──┬─CPC=name──────────────┬──────────────►◄
    └─E─C────────────────┘  └─PLEX=name──SYS=name─┘
```

### Parameters

The command has the following parameters:

**CPC=***name*

specifies the name of the CPC that you want to enable. A CPC with this name must be part of the active domain configuration.

**PLEX=***name*

specifies the name of the sysplex which includes the system which you want to enable. A sysplex with this name must be in the active domain configuration.

**SYS=***name*

specifies the name of the system which you want to enable. A system with this name must exist in the specified sysplex in the active domain configuration.

### Example

To enable CPC G14 issue the following command:

```
MODIFY CPOSERV,APPL=ENABLE CONFIGURATION CPC=G14
```

or:

```
F CPOSERV,APPL=E C CPC=G14
```

The response on the console should be:

```
CPO1011I CPC G14 in current configuration successfully enabled
```

## ENABLE POLICY

Use the ENABLE POLICY command to enable an entire provisioning rule or a specific provisioning condition within a provisioning rule in the active provisioning policy. If time conditions are enabled by this command temporary resources may be activated.

If the command is successful the selected rule or provisioning condition will be listed as enabled in the policy report.

### Syntax

The syntax for the ENABLE POLICY command is:

```
►►──┬─ENABLE──POLICY─┬──R=rule_name────────────────────────────────────►◄
    └─E──P───────────┘              └─PC=name─┘
```

### Parameters

The command has the following parameters:

**R=***rule_name*
> the name of the rule that you want to enable. A rule with this name must exist in the active policy.

**PC=***name*
> the name of the provisioning condition that you want to enable. A provisioning condition with the specified name must be part of the *rule_name* specified.

### Example

To enable rule CP160106R issue the following command:

```
MODIFY CPOSERV,APPL=ENABLE POLICY R=CP160106R
```

or:

```
F CPOSERV,APPL=E P R=CP160106R
```

The response on the console should be:

```
CPO1001I Rule CP160106R successfully enabled
```

## LIST CONFIGURATION

Use the LIST CONFIGURATION command to list the entries in the domain configuration repository of the domain.

### Syntax

The syntax for the LIST CONFIGURATION command is:

```
►►──┬─LIST──CONFIGURATION─┬───────────────────────────────────────────►◄
    └─L──C────────────────┘
```

### Parameters

None.

### Example

To list the domain configuration issue the following command:

```
MODIFY CPOSERV,APPL=LIST CONFIGURATION
```

or:

```
F CPOSERV,APPL=L C
```

The response on the console should be something like:
```
CPO1049I Domain configuration list generated at 01/17/2006 02:14:08
  DS
```

# LIST POLICY

Use the LIST POLICY command to list the entries in the policy repository of the domain.

### Syntax
The syntax for the LIST POLICY command is:

```
►►──┬─LIST──POLICY─┬──────────────────────────────────────────────────►◄
    └─L───P────────┘
```

### Parameters
None.

### Example
To list the available policies issue the following command:
```
MODIFY CPOSERV,APPL=LIST POLICY
```

or:
```
F CPOSERV,APPL=L P
```

The response on the console should be something like:
```
CPO1048I Policy list generated at 01/17/2006 02:38:39
  BERLINP
```

# REPORT ACTIVITY

Use the REPORT ACTIVITY command to display the activation and deactivation operations which have been performed by the Provisioning Manager. Information about activations and deactivations is retained for approximately two months. You can select the time period to be reported.

For the information in the report refer to page 86.

**Note:** Manual activations and deactivations are not recorded by the Provisioning Manager in the activity log.

### Syntax
The syntax for the REPORT ACTIVITY command is:

```
                              ┌─DEST=*──────┐
►►──┬─REPORT──ACTIVITY─┬──┼─────────────┼──┬──────────────┬──┬────────────┬──►◄
    └─R───A────────────┘  └─DEST=file───┘  └─FROM=date────┘  └─TO=date────┘
```

### Parameters
The command has the following parameters:

**DEST**
>   specifies the destination of the activity report. The following destinations are supported:

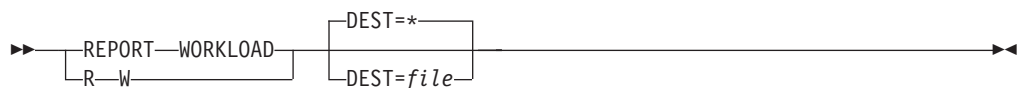| * | (the default) specifies the report is to be written to the console issuing the command. |
|---|---|
| *file* | specifies a file where the information is to be stored. If the name includes lower case characters this parameter must be enclosed in single quotes ('). The file must be in the hierarchical file system. You can specify either an absolute path or a relative path to the file. If this is not absolute the path is relative to the home directory of the user running the Provisioning Manager. You must ensure that there is sufficient space in the selected location. The Provisioning Manager user must be authorized to write to this location. |

**FROM=***date*
specifies the start date of the report. All activations and deactivations done from the beginning of that day are reported. If the parameter is omitted the start date of the log is used. The start date of the report should be before the end date of the report specified using the TO parameter.

The format to specify the start date is mm/dd/yyyy, where mm is the month, dd is the day of the month and yyyy is the year. For example April, 20th 2006 should be specified as 4/20/2006.

**TO=***date*
specifies the end date of the report. All activations and deactivations done before the end of that day are reported. If the end date is omitted the current day is used. The end date of the report should be after the start date of the report specified using the FROM parameter.

The format to specify the end date is the same as that for the start date above.

## REPORT CONFIGURATION

Use the REPORT CONFIGURATION command to display the active domain configuration.

For the information in the report refer to page 82.

### Syntax
The syntax for the REPORT CONFIGURATION command is:
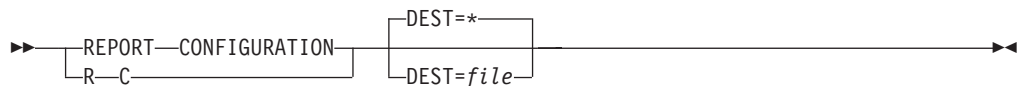
```
►►──┬─REPORT─CONFIGURATION─┬──┬─DEST=*────┬──────────────────►◄
    └─R──C────────────────┘  └─DEST=file─┘
```

### Parameters
The command has the following parameter:

**DEST**
specifies the destination of the domain configuration report. The following destinations are supported:

| * | (the default) specifies the report is to be written to the console issuing the command. |
|---|---|
| *file* | specifies a file where the information is to be stored. If the name includes lower case characters this parameter must be enclosed in single quotes ('). The file must be in the hierarchical file system. You can specify either an absolute path or a relative path to the file. If this is not absolute the path is relative to the home directory of the user running the Provisioning Manager. You must ensure that there is |

sufficient space in the selected location. The Provisioning Manager user must be authorized to write to this location.

# REPORT DOMAIN

Use the REPORT DOMAIN command to display the status of the current domain.

### Syntax

The syntax for the REPORT DOMAIN command is:

```
           ┌─DEST=*──────┐
►►──┬─REPORT─DOMAIN─┬──┼─────────────┼────────────────────────────►◄
    └─R──D──────────┘  └─DEST=file──┘
```
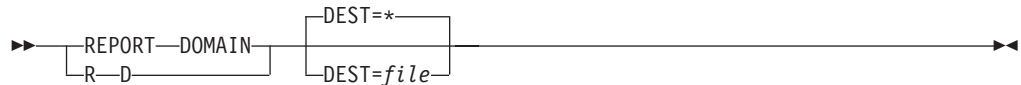
### Parameters

The command has the following parameter:

**DEST**

(the default) specifies the destinationof the domain report. The following destinations are supported:

  *     (the default) specifies the report is to be written to the console issuing the command.

  *file*   specifies a file where the information is to be stored. If the name includes lower case characters this parameter must be enclosed in single quotes ('). The file must be in the hierarchical file system. You can specify either an absolute path or a relative path to the file. If this is not absolute the path is relative to the home directory of the user running the Provisioning Manager. You must ensure that there is sufficient space in the selected location. The Provisioning Manager user must be authorized to write to this location.

# REPORT POLICY

Use the REPORT POLICY command to display the active provisioning policy.

### Syntax

The syntax for the REPORT POLICY command is:
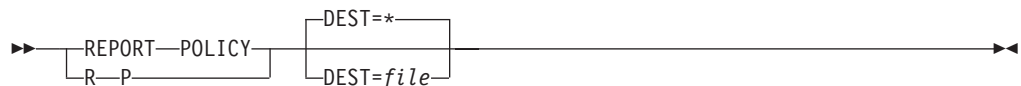
```
           ┌─DEST=*──────┐
►►──┬─REPORT─POLICY─┬──┼─────────────┼────────────────────────────►◄
    └─R──P──────────┘  └─DEST=file──┘
```

### Parameters

The command has the following parameter:

**DEST**

specifies the destination of the policy report. The following destinations are supported:

  *     (the default) specifies the report is to be written to the console issuing the command.

*file*      specifies a file where the information is to be stored. If the name includes lower case characters this parameter must be enclosed in single quotes ('). The file must be in the hierarchical file system. You can specify either an absolute path or a relative path to the file. If this is not absolute the path is relative to the home directory of the user running the Provisioning Manager. You must ensure that there is sufficient space in the selected location. The Provisioning Manager user must be authorized to write to this location.

## REPORT TRACE

Use the REPORT TRACE command to display the active trace configuration.

For the information in the report refer to page 87.

### Syntax
The syntax for the REPORT TRACE command is:

```
                               ┌─DEST=*────┐
►►──┬─REPORT──TRACE─┬──────────┴───────────┴────────────────────────────►◄
    └─R──T──────────┘          └─DEST=file─┘
```

### Parameters
The command has the following parameter:

**DEST**
> specifies the destination of the trace report. The following destinations are supported:

> \*      (the default) specifies the report is to be written to the console issuing the command.

> *file*      specifies a file where the information is to be stored. If the name includes lower case characters this parameter must be enclosed in single quotes ('). The file must be in the hierarchical file system. You can specify either an absolute path or a relative path to the file. If this is not absolute the path is relative to the home directory of the user running the Provisioning Manager. You must ensure that there is sufficient space in the selected location. The Provisioning Manager user must be authorized to write to this location.

## REPORT WORKLOAD

Use the REPORT WORKLOAD command display the WLM service class periods that are currently monitored on the observed systems.

For further information in the report refer to page 85.

### Syntax
The syntax for the REPORT WORKLOAD command is:

```
                                   ┌─DEST=*────┐
►►──┬─REPORT──WORKLOAD─┬───────────┴───────────┴──────────────────────────►◄
    └─R──W─────────────┘           └─DEST=file─┘
```

### Parameters
The command has the following parameter:

**DEST**

> specifies the destination of the workload report. The following destinations are supported:

> \*      (the default) specifies the report is to be written to the console issuing the command.

> *file*      specifies a file where the information is to be stored. If the name includes lower case characters this parameter must be enclosed in single quotes ('). The file must be in the hierarchical file system. You can specify either an absolute path or a relative path to the file. If this is not absolute the path is relative to the home directory of the user running the Provisioning Manager. You must ensure that there is sufficient space in the selected location. The Provisioning Manager user must be authorized to write to this location.

# RESET CONFIGURATION

Use the RESET CONFIGuration command to undo all configuration changes which have been issued since the domain configuration was activated.

## Syntax

The syntax for the RESET CONFIGURATION command is:

```
►►──┬─RESET──CONFIGURATION─┬──────────────────────────────────►◄
    └─T──C────────────────┘
```
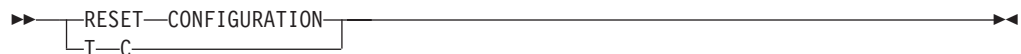
## Parameters

None.

## Example

To reset the configuration issue the following command:

```
MODIFY CPOSERV,APPL=RESET CONFIGURATION
```

or:

```
F CPOSERV,APPL=T C
```

The response on the console should be:

```
CPO1019I Current configuration successfully reset
```

# RESET POLICY

Use the RESET POLICY command to reset all elements in the active provisioning policy to their default states as defined in the policy at the time of activation.

## Syntax

The syntax for the RESET POLICY command is:

```
►►──┬─RESET──POLICY─┬───────────────────────────────────────►◄
    └─T──P─────────┘
```

## Parameters

None.

### Example

To reset the current policy issue the following command:

```
MODIFY CPOSERV,APPL=RESET POLICY
```

or:

```
F CPOSERV,APPL=T P
```

The response on the console should be:

```
CPO1018I Current policy successfully reset
```

## RESET TRACE

Use the RESET TRACE command to reset the tracing parameters of the Provisioning Manager. The default trace level and the trace level for all trace components are reset to the defaults delivered by the product.

**Note:** This command should only be used if so instructed by IBM service personnel.

### Syntax

The syntax for the RESET TRACE command is:

```
►►──┬─RESET─TRACE─┬───────────────────────────────────────────────►◄
     └─T─T────────┘
```
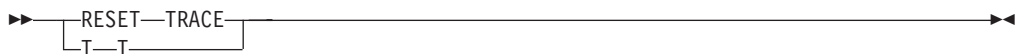
### Parameters

None.

### Example

To reset the current trace configuration issue the following command:

```
MODIFY CPOSERV,APPL=RESET TRACE
```

or:

```
F CPOSERV,APPL=T T
```

The response on the console should be:

```
CPO1070I The trace configuration has been reset
```

## SET DOMAIN

Use the SET DOMAIN command to change the global processing information of the domain. This information includes the active provisioning policy, the active domain configuration and the active processing mode.

The information supplied is validated before processing. If the command cannot be processed for any reason the previous information remains active.

**Note:** If any resources are active when you change a policy or configuration these resources may be deactivated.

### Syntax

The syntax for the SET DOMAIN command is:

**Set domain command syntax**

```
►►──┬─SET──DOMAIN─┬──┬─CFG=name────────┬───────────────────────────────►◄
    └─S───D───────┘  ├─POL=name────────┤
                     └─MODE=─┬─MAN──────┬┘
                            ├─ANALYSIS─┤
                            ├─CONF─────┤
                            └─AUTO─────┘
```
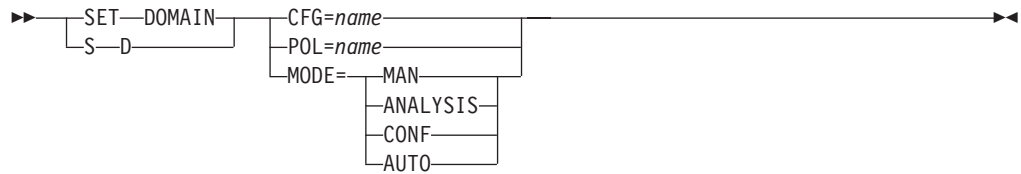
## Parameters

The command has the following parameters:

**CFG=**_name_
>    specifies the name of the domain configuration that you want to activate. A
>    domain configuration with the specified name must be installed in the domain
>    configuration repository of the Provisioning Manager. Before activating the
>    domain configuration the content is validated.

**POL=**_name_
>    specifies the name of the policy that you want to activate. A policy with the
>    specified name must be installed in the policy repository of the Provisioning
>    Manager. Before activating the policy, the content is validated.

**MODE=**_mode_
>    specifies the new processing mode for the Provisioning Manager. The
>    following processing mode values are supported:

>    **MAN**   manual mode (policies are disabled)

>    **ANALYSIS**
>             analysis mode

>    **CONF**  confirmation mode

>    **AUTO**
>             autonomic mode

>    The processing mode values are not case sensitive.

## Example

To activate configuration DS issue the following command:
```
MODIFY CPOSERV,APPL=SET DOMAIN CFG=DS
```

or:
```
F CPOSERV,APPL=S D CFG=DS
```

The response on the console should be:
```
CPO1041I Domain configuration DS successfully activated
```

To change the policy to BERLINP issue the following command:
```
MODIFY CPOSERV,APPL=SET DOMAIN POL=BERLINP
```

or:
```
F CPOSERV,APPL=S D POL=BERLINP
```

The response on the console should be:
```
CPO1020I Policy successfully changed to BERLINP
```

To set the processing mode to autonomic issue the following command:

```
MODIFY CPOSERV,APPL=SET MODE=AUTO
```

or:

```
F CPOSERV,APPL=S D MODE=AUTO
```

The response on the console should be:

```
CPO1009I Processing mode successfully changed to AUTO
```

## SET TRACE

Use the SET TRACE command to change the tracing parameters of the Provisioning Manager. You may set a default trace level and also separate trace levels for individual trace components. Setting the default trace level does not overwrite a trace level set for an individual component.

**Note:** This command should only be used if so instructed by IBM service personnel.

### Syntax

The syntax for the SET TRACE command is:
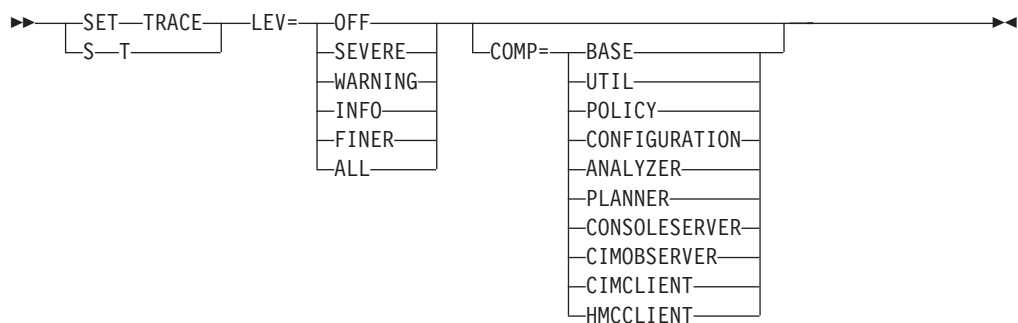


### Parameters

The parameter names and trace values are not case sensitive. This command has the following parameters:

**LEV**

> the name of the trace level you want to activate. The following trace levels are supported:

> **OFF**     do not trace

> **SEVERE**
>> trace severe information

> **WARNING**
>> trace warnings or severe information

> **INFO**     trace general information

> **FINER**
>> trace at a finer information level

> **ALL**     trace all information

**COMP**

> the name of a component within the Provisioning Manager for which you want to alter the trace level. The supported component names are:

**BASE**   the base processing

**UTIL**   utility classes

**POLICY**
>   policy relevant processing

**CONFIGURATION**
>   domain configuration relevant processing

**ANALYZER**
>   analysis of the metrics retrieved from the observed systems

**PLANNER**
>   processing relevant to planning

**CONSOLESERVER**
>   command processing

**CIMOBSERVER**
>   processing CIM requests

**CIMCLIENT**
>   the CIM client API

**HMCCLIENT**
>   the HMC or SE client API

If COMP is not specified the default trace level is changed.

### Example
To set the global trace level to ALL issue the following command:
```
MODIFY CPOSERV,APPL=SET TRACE LEV=ALL
```

or:
```
F CPOSERV,APPL=S T LEV=ALL
```

The response on the console should be:
```
CPO1060I The global trace level has been set to ALL
```

## STOP MANAGER
Use the STOP MANAGER command to stop processing of the Provisioning Manager. After the Provisioning Manager has been requested to stop it does not accept any other commands. The state of resources does not change. Any active resources remain active.

### Syntax
The syntax for the STOP MANAGER command is:

```
                          ┌─MODE=NORMAL─┐
►►──┬─STOP─MANAGER─┬──┼─────────────┼──────────────────►◄
    └─P────M───────┘  └─MODE=FORCE──┘
```

### Parameters
The command has the following parameter:

**MODE**
>   the mode in which you want to end the Provisioning Manager. There are two supported stop modes:

**NORMAL**
> the default stop mode is to terminate all processing and to unregister the Provisioning Manager from ARM if applicable, or

**FORCE**
> to stop processing immediately. If the Provisioning Manager is registered with ARM the process may get restarted.

The mode values are not case sensitive.

### Example

To stop the Provisioning Manager issue the following command:

```
MODIFY CPOSERV,APPL=STOP MANAGER
```

or:

```
F CPOSERV,APPL=P M
```

The response on the console should be:

```
CPO1007I Stop command for the Provisioning Manager accepted
```

## WRITE LOG

Use the WRITE LOG command to save the current data for a specific log to a file.

**Note:** This command should only be used if so instructed by IBM service personnel.

### Syntax

The syntax for the WRITE LOG command is:
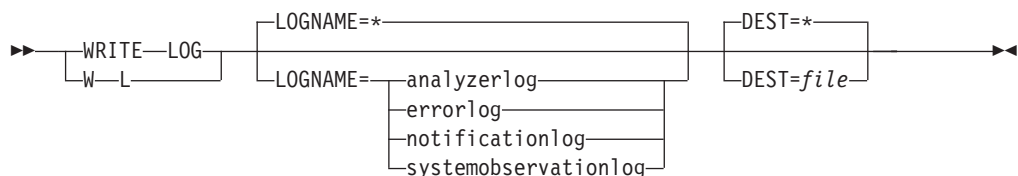


### Parameters

The command has the following parameters:

**LOGNAME=***name*
> The type of data to be recorded. This may be:

> **analyzerlog**
>> workload analysis decisions.

> **errorlog**
>> unexpected errors detected during processing.

> **notificationlog**
>> communications within the Provisioning Manager.

> **systemobservationlog**
>> monitored metrics from the observed systems.

> The log names are not case sensitive.

**DEST**
> specifies the destination of the log. The following destinations are supported:

* (the default) specifies the report is to be written to the standard log file in the log path that has been specified during your set-up. This option can be used if logging is already active for the specified log and data is available in the log.

*file* specifies a file where the information is to be stored. If the name includes lower case characters this parameter must be enclosed in single quotes ('). The file must be in the hierarchical file system. You can specify either an absolute path or a relative path to the file. If this is not absolute the path is relative to the home directory of the user running the Provisioning Manager. You must ensure that there is sufficient space in the selected location. The Provisioning Manager user must be authorized to write to this location. This option can always be used and does not require that log writing for the specified log has been activated.

## Example
To write the notification log to file `nl.log` issue the following command:
```
MODIFY CPOSERV,APPL=WRITE LOG LOGNAME=NotificationLog DEST='nl.log'
```

or:
```
F CPOSERV,APPL=W L LOGNAME=NotificationLog DEST='nl.log'
```

The response on the console should be:
```
CPO1040I Log NotificationLog successfully written to file nl.log
```

# Chapter 9. Capacity Provisioning Messages

The Capacity Provisioning programs may issue information messages, warnings or errors if such situations are detected. These programs are the Control Center and the Provisioning Manager. The Provisioning Manager also issues messages in response to Provisioning Manager commands and in situations where an operator should take an action, for example when the Provisioning Manager is running in confirmation mode and the operator needs to confirm a provisioning action that has been detected.

Capacity Provisioning message identifiers have the form CPO*nnnns* where *nnnn* is the message number and *s* specifies the severity. The severity can be one of the following:

**Severity**
> **Description**

**I**    Informational messages. Such messages report information and do not require any action.

**W**    Warning messages. Such messages are issued in situations that may prevent successful completion of the processing. You should check if you need to perform an action to resolve the situation.

**E**    Error messages. Such messages are issued in situations where a program operation is unsuccessful. You must perform some action to recover the situation.

---

**CPO1001I**    **Rule** *name* **successfully enabled**

**Explanation:**  The ENABLE POLICY command with the R parameter specifying the referenced provisioning rule name has been issued. The provisioning rule is now enabled.

**User response:**  None.

---

**CPO1002I**    **Provisioning condition** *condition* **in rule** *rule* **successfully enabled**

**Explanation:**  The ENABLE POLICY command with the R and the PC parameters specifying the referenced provisioning rule name and provisioning condition name has been issued. The provisioning condition is now enabled.

**User response:**  None.

---

**CPO1003I**    **Rule** *name* **successfully disabled**

**Explanation:**  The DISABLE POLICY command with the R parameter specifying the referenced provisioning rule name has been issued. The provisioning rule is now disabled.

**User response:**  None.

---

**CPO1004I**    **Provisioning condition** *condition* **in rule**

*rule* **successfully disabled**

**Explanation:**  The DISABLE POLICY command with the R and the PC parameters specifying the referenced provisioning rule name and provisioning condition name has been issued. The provisioning condition is now disabled.

**User response:**  None.

---

**CPO1005I**    **Policy report generated at** *time*

**Explanation:**  The REPORT POLICY command has been issued and returned the following status for the active policy. The status contains information about the policy and the policy elements.

**User response:**  None.

---

**CPO1006W**    **Command** *"input"* **not recognized**

**Explanation:**  The referenced input has been entered as command but the input is not recognized as a supported command for the Provisioning Manager.

**User response:**  Enter a supported command or direct the command to a program that supports the command.

**CPO1007I**    **Stop command for the Provisioning Manager accepted**

**Explanation:**   A STOP MANAGER command with the parameter MODE set to NORMAL was issued. The command is accepted and the Provisioning Manager starts termination.

**User response:**   None.

---

**CPO1008I**    **Domain report generated at** *time*

**Explanation:**   The REPORT DOMAIN command has been issued and returned the following status for the current domain.

**User response:**   None.

---

**CPO1009I**    **Processing mode successfully changed to** *mode*

**Explanation:**   The SET DOMAIN command with the parameter MODE set to the referenced mode value has been issued. The Provisioning Manager changed the processing mode to the requested mode.

**User response:**   None.

---

**CPO1010I**    **Configuration report generated at** *time*

**Explanation:**   The REPORT CONFIGURATION command has been issued and returns the status of the current domain configuration. Each element in the domain configuration is reported in separate lines.

**User response:**   None.

---

**CPO1011I**    **CPC** *cpc* **in current configuration successfully enabled**

**Explanation:**   The ENABLE CONFIGURATION command with the CPC parameter set to the referenced CPC name has been issued. The CPC is now enabled.

**User response:**   None.

---

**CPO1012I**    **CPC** *cpc* **in current configuration successfully disabled**

**Explanation:**   The DISABLE CONFIGURATION command with the CPC parameter set to the referenced CPC name has been issued. The CPC is now disabled.

**User response:**   None.

---

**CPO1013I**    **System** *system* **in sysplex** *sysplex* **of current configuration successfully enabled**

**Explanation:**   The ENABLE CONFIGURATION command with the SYS and PLEX parameters set to the referenced system and sysplex names has been issued. The system is now enabled.

**User response:**   None.

---

**CPO1014I**    **System** *system* **in sysplex** *sysplex* **of current configuration successfully disabled**

**Explanation:**   The DISABLE CONFIGURATION command with the SYS and PLEX parameters set to the referenced system and sysplex names has been issued. The system is now disabled.

**User response:**   None.

---

**CPO1017E**    **Required object missing for command** *command*

**Explanation:**   The referenced command has been issued but the input is incomplete. The command object is required for the requested command action.

**User response:**   Specify a supported object for the command action. For a list of supported objects refer to the product documentation.

---

**CPO1018I**    **Current policy successfully reset**

**Explanation:**   The RESET POLICY command has been issued. The status of all provisioning conditions and provisioning rules is now reset to their initial state.

**User response:**   None.

---

**CPO1019I**    **Current configuration successfully reset**

**Explanation:**   The RESET CONFIGURATION command has been issued. The status of all systems and CPCs is now reset to their initial state.

**User response:**   None.

---

**CPO1020I**    **Policy successfully changed to** *name*

**Explanation:**   The SET DOMAIN with the POL parameter set to the reference policy name has been issued. The Provisioning Manager successfully read and activated the new policy. All resource activations and deactivations will now be based on the content of the new policy.

**User response:**   None.

---

**CPO1023I**    **Temporary upgrade for CPC** *name* **to model** *model* **successfully initiated**

**Explanation:**   The ACTIVATE RESOURCE command with the CPC and MODEL parameters set to the referenced CPC and model names has been issued. The command processing successfully initiated activation of the requested model. The activation may take some time to complete.

**User response:**   None.

**CPO1024E    Object** *object* **not supported with** *verb* **command**

**Explanation:**  The referenced command action has been issued with the referenced object. The object is not allowed in combination with the requested action.

**User response:**  Use a supported object with the command action or use a different command that supports the requested object. Then retry the changed command.

**CPO1025I    Temporary downgrade for CPC** *name* **to model** *model* **successfully initiated**

**Explanation:**  The DEACTIVATE RESOURCE command with the CPC and MODEL parameters set to the referenced CPC and model names has been issued. The command processing successfully initiated activation of the requested model. The activation may take some time to complete.

**User response:**  None.

**CPO1026I    Activation level change to** *count* **zAAPs successfully initiated for CPC** *name*

**Explanation:**  The ACTIVATE RESOURCE command with the CPC and ZAAP parameters set to the referenced CPC name and amount of zAAP processors has been issued. The command processing successfully initiated activation of the new number of temporary zAAP processors. The activation may take some time to complete.

**User response:**  None.

**CPO1027I    Activation level change to** *count* **zIIPs successfully initiated for CPC** *name*

**Explanation:**  The ACTIVATE RESOURCE command with the CPC and ZIIP parameters set to the referenced CPC name and amount of zIIP processors has been issued. The command processing successfully initiated activation of the new number of temporary zIIP processors. The activation may take some time to complete.

**User response:**  None.

**CPO1028I    Activation level change to** *count* **zAAPs successfully initiated for CPC** *name*

**Explanation:**  The DEACTIVATE RESOURCE command with the CPC and ZAAP parameters set to the referenced CPC name and amount of zAAP processors has been issued. The command processing successfully initiated deactivation to the new number of temporary zAAP processors. The deactivation may take some time to complete.

**User response:**  None.

**CPO1029I    Activation level change to** *count* **zIIPs successfully initiated for CPC** *name*

**Explanation:**  The DEACTIVATE RESOURCE command with the CPC and ZIIP parameters set to the referenced CPC name and amount of zIIP processors has been issued. The command processing successfully initiated deactivation to the new number of temporary zIIP processors. The deactivation may take some time to complete.

**User response:**  None.

**CPO1030I    Report successfully written to file** *filename*

**Explanation:**   A REPORT command with the DEST parameter set to the referenced filename has been issued. The report information was successfully written to the specified file.

**User response:**  None.

**CPO1031I    Logging successfully activated for log** *name*

**Explanation:**   The ACTIVATE LOG command with the LOGNAME parameter set to the referenced name has been issued. The log information for the requested log will be written to a log file, when needed.

**User response:**  None.

**CPO1032I    Logging successfully activated**

**Explanation:**   The ACTIVATE LOG command with the LOGNAME parameter set to '*' for all logs has been issued. The log information for all logs will be written to a log file, when needed.

**User response:**  None.

**CPO1033E    Unknown log** *name*

**Explanation:**   The ACTIVATE LOG command with the LOGNAME parameter set to the referenced name has been issued. A log with the specified name does not exist.

**User response:**  Use a supported log name and retry the command. If you don't now the name, activate logging for all logs.

**CPO1034I    Logging successfully deactivated for log** *name*

**Explanation:**   The DEACTIVATE LOG command with the LOGNAME parameter set to the referenced name has been issued. The log information will no longer be written to a file.

**User response:**  None.

**CPO1035I    Logging successfully deactivated**

**Explanation:**  The DEACTIVATE LOG command with the LOGNAME parameter set to '*' for all logs has been issued. The log information for all logs will no longer be written to a log file.

**User response:**  None.

---

**CPO1036E    Unknown log** *name*

**Explanation:**  The DEACTIVATE LOG command with the LOGNAME parameter set to the referenced name has been issued. A log with the specified name does not exist.

**User response:**  Use a supported log name and retry the command. If you don't now the name, deactivate logging for all logs.

---

**CPO1037E    Unknown log** *name*

**Explanation:**  The WRITE LOG command with the LOGNAME parameter set to the referenced name has been issued. A log with the specified name does not exist.

**User response:**  Use a supported log name and retry the command.

---

**CPO1038E    Cannot open destination file** *filename* **for writing log information**

**Explanation:**  The WRITE LOG command with the DEST parameter set to the referenced filename has been issued. Opening the requested destination file was not successful. The log information is not written.

**User response:**  Specify a valid filename and retry the command.

---

**CPO1039E    Error writing to file** *filename*. **The reason is** *"text"*

**Explanation:**  The WRITE LOG command with the DEST parameter set to the referenced filename has been issued. The log information could not be written to the specified file because of an I/O error. More detailed information may be provided by the error text. The log information may be inconsistent.

**User response:**  Correct the I/O problem and try again.

---

**CPO1040I    Log** *name* **successfully written to file** *filename*

**Explanation:**  The WRITE LOG command with the LOGNAME and DEST parameters set to the referenced log name and file name has been issued. The requested log information is successfully written to the specified file.

**User response:**  None.

---

**CPO1041I    Domain configuration** *name* **successfully activated**

**Explanation:**  The SET DOMAIN command with the CFG parameter set to the referenced domain configuration name has been issued. The new domain configuration is now active.

**User response:**  None.

---

**CPO1042I    Activity report generated at** *time*

**Explanation:**  The REPORT ACTIVITY command has been issued and returns the list of previous activities initiated by the Provisioning Manager. Each activation and deactivation is reported in separate lines.

**User response:**  None.

---

**CPO1043I    Content of policy file** *name* **successfully retrieved**

**Explanation:**  The GET POLICY command successfully retrieved the content of the file for the referenced policy.

**User response:**  None.

---

**CPO1044I    Content of domain configuration file** *name* **successfully retrieved**

**Explanation:**  The GET CONFIGURATION command successfully retrieved the content of the file for the referenced domain configuration.

**User response:**  None.

---

**CPO1045I    Content for policy** *name* **successfully installed**

**Explanation:**  The PUT POLICY command successfully stored the content for the referenced policy into the policy repository of the Provisioning Manager.

**User response:**  None.

---

**CPO1046I    Content for domain configuration file** *name* **successfully installed**

**Explanation:**  The PUT CONFIGURATION command successfully stored the content for the referenced domain configuration into the configuration repository of the Provisioning Manager.

**User response:**  None.

---

**CPO1047I    Workload report generated at** *time*

**Explanation:**  The REPORT WORKLOAD command has been issued and returns the list of currently observed systems and the workload that is observed on these systems.

**User response:**  None.

**CPO1048I    Policy list generated at** *time*

**Explanation:**  The LIST POLICY command has been issued and returns the list of available policies in the policy repository.

**User response:**  None.

**CPO1049I    Domain configuration list generated at** *time*

**Explanation:**  The LIST CONFIGURATION command has been issued and returns the list of available domain configurations in the configuration repository.

**User response:**  None.

**CPO1050I    Trace report generated at** *time*

**Explanation:**  The REPORT TRACE command has been issued and returns the current trace configuration.

**User response:**  None.

**CPO1060I    The global trace level has been set to** *level*

**Explanation:**  The SET TRACE command has been issued with the LEV parameter set to the referenced trace level. The COMP parameter has not been specified in the command. The new global trace setting is now active.

**User response:**  None.

**CPO1061I    The trace level for component** *component* **has been set to** *level*

**Explanation:**  The SET TRACE command has been issued with the COMP and LEV parameters set to the referenced component and level. The trace level is now active for the specified component.

**User response:**  None.

**CPO1062E    Unknown trace level** *level*

**Explanation:**  The SET TRACE command has been issued with the LEV parameter set to the referenced trace level. A trace level with the specified name does not exist.

**User response:**  Use a supported trace level name and issue the command again.

**CPO1063E    Unknown trace component** *component*

**Explanation:**  The SET TRACE command has been issued with the COMP parameter set to the referenced trace component. A trace component with the specified name does not exist.

**User response:**  Use a supported trace component name and issue the command again.

**CPO1070I    The trace configuration has been reset**

**Explanation:**  The RESET TRACE command has been issued. The trace configuration is now reset to the initial setting.

**User response:**  None.

**CPO1080E    Error creating trace file** *filename*. **Error is** *"error"*

**Explanation:**  Creating of the specified file for writing trace information was not successful. The trace information cannot be written. The error description contains more information about the problem. If the Provisioning Manager detected at startup a setup problem for writing trace information one of the messages CPO1082W or CPO1083W has been written.

**User response:**  Correct the problem.

**CPO1081E    Error writing to trace file** *filename*. **Error is** *"error"*

**Explanation:**  The trace information could not be written to the specified file. The error description contains more information about the problem.

**User response:**  Correct the problem.

**CPO1082W    The directory** *directory* **for writing trace information does not exist**

**Explanation:**  The Provisioning Manager detected that the specified directory for writing trace information does not exist. This will result in unsuccessfully writing of trace information.

**User response:**  Create the directory for writing trace information.

**CPO1083W    The directory** *directory* **for writing trace information is not set up correctly or trace directory is full**

**Explanation:**  The Provisioning Manager detected that the specified directory for writing trace information is not set up correctly for creating files or that the specified directory is full. Creating of files requires at least WRITE and EXECUTE permission to the specified directory and enough disk space.

**User response:**  Correct the problem.

**CPO1084E    Error writing trace information**

**Explanation:**  The trace information could not be written. One of the messages CPO1080E, CPO1081E, CPO1086E, CPO1087E has been send to console before. Refer to this message to get more information about the error.

**User response:**  Correct the problem.

**CPO1085I    Continue writing trace information**

**Explanation:**  The trace information could be written successfully. The corresponding message CPO1084E has been send to console before.

**User response:**  None.

**CPO1086E    Could not get lock for trace file prefix** *trace file prefix*

**Explanation:**  The Provisioning Manager could not get a lock for the trace file with the specified prefix. This implies that the maximum number of trace lock files with the same prefix would be exceed. The trace information cannot be written.

**User response:**  Delete unused trace lock files with the same prefix.

**CPO1087E    Error creating trace lock file** *filename***. Error is** *"error"*

**Explanation:**  Creating of the specified trace lock file was not successful. The trace information cannot be written. The error description contains more information about the problem. If the Provisioning Manager detected at startup a setup problem for writing trace information one of the messages CPO1082W or CPO1083W has been written.

**User response:**  Correct the problem.

**CPO1088I    Dump manager command for dump type** *type* **succesfully performed**

**Explanation:**  A DUMP MANAGER command with the parameter TYPE set to the referenced value was issued. The command has been processed and the dump is available.

**User response:**  None.

**CPO1090I    Writing log** *name* **successfully initiated**

**Explanation:**  The WRITE LOG command with the LOGNAME set to the referenced log name and without the DEST parameter specified has been issued. Writing the requested log information is successfully initiated.

**User response:**  None.

**CPO1103E    Parameter** *name* **is duplicate**

**Explanation:**  You entered a command and specified the referenced parameter name twice.

**User response:**  Remove the obsolete parameter and issue the command again.

**CPO1104E    Unknown parameter** *name*

**Explanation:**  You entered a command with the referenced parameter name but the parameter is not supported by the command.

**User response:**  Remove the parameter and issue the command again.

**CPO1105E    Syntax error. The command you passed ends with a comma (,)**

**Explanation:**  You entered some command input. The syntax for commands doesn't allow a comma at the end of the input.

**User response:**  Remove the comma at the end of the input and issue the command again.

**CPO1106E    Required parameter** *name* **is missing**

**Explanation:**  A command has been entered. The command requires a value for the referenced parameter name. The command is not processed.

**User response:**  Add the required parameter and issue the command again.

**CPO1107E    Unknown command** *"text"*

**Explanation:**  The referenced text has been entered as command. The command starts with a token that does not represent a valid command action supported by this interface.

**User response:**  Issue a correct command.

**CPO1108E    Command is empty**

**Explanation:**  A command has been entered. The command string does not contain any token.

**User response:**  Enter a valid command.

**CPO1109E    Syntax error in command; expected** *token* **but found** *string*

**Explanation:**  A command has been entered. While parsing the command line a string is found that does not match the required syntax for a command. The command is not processed.

**User response:**  Correct the command and try again.

**CPO1110E**  **Syntax error. The command must not end with keyword** *parameter*

**Explanation:**  A command has been entered. The parser for the command found an allowed parameter but the parameter requires a value. The parameter syntax is parameter=value.

**User response:**  Correct the command and try again.

**CPO1111E**  **Syntax error. Parameter** *parameter* **is missing a value**

**Explanation:**  A command has been entered. The parser for the command does not find a value for the referenced parameter. The parameter syntax is parameter=value.

**User response:**  Correct the command and try again.

**CPO1114E**  **Unexpected end of string. Start position** *offset* **after** *token*

**Explanation:**  A command has been entered. The input to parse contained a start of a string value and the string value is not closed before the end of the input.

**User response:**  Correct the command and retry.

**CPO1115E**  **Internal error**

**Explanation:**  A command has been entered. The program tried to read beyond end of string.

**User response:**  Contact IBM.

**CPO1116E**  **Internal error**

**Explanation:**  A command has been entered. The program tried to read beyond end of string.

**User response:**  Contact IBM.

**CPO1118W**  **Required parameter missing**

**Explanation:**  The ENABLE CONFIGURATION command is invoked with insufficient parameters. No action is performed.

**User response:**  Specify either SYS and PLEX parameters or the CPC parameter and retry the command.

**CPO1119E**  **Too many parameters specified**

**Explanation:**  The ENABLE CONFIGURATION command is invoked with both a CPC and at least one of the SYS and PLEX parameters. Only the CPC parameter or the SYS and PLEX parameters is allowed.

**User response:**  Remove the SYS, PLEX or CPC parameter as needed and retry the command.

**CPO1120W**  **Required parameter missing**

**Explanation:**  The DISABLE CONFIGURATION command is invoked with insufficient parameters. No action is performed.

**User response:**  Specify either the SYS and PLEX parameters or the CPC parameter and retry the command.

**CPO1121E**  **Too many parameters specified**

**Explanation:**  The DISABLE CONFIGURATION command is invoked with both the CPC parameter and at least one of the SYS and PLEX parameters. Only the CPC parameter or the SYS and PLEX parameters is allowed.

**User response:**  Remove the system, sysplex or cpc parameter as needed and retry the command.

**CPO1122E**  **Cannot open report file** *"filename"*

**Explanation:**  A report with a DEST parameter set to the referenced filename was requested but the file could not be opened. Either the name is not a valid filename, the specified path does not exist, the type of the file is not correct, or you are not authorized to open the file.

**User response:**  Check whether you specified a correct filename. Correct the error and retry the command.

**CPO1126E**  **Unexpected end of comment. Start position** *offset* **after** *token*

**Explanation:**  A command was issued with incorrect syntax. The input to parse contained a start of a comment and the comment is not closed before the end of the input.

**User response:**  Correct the command and retry.

**CPO1127E**  **Policy** *name* **not found**

**Explanation:**  The SET DOMAIN command with the POL parameter set to the referenced name was issued. The program could not find the policy file for the requested policy in the policy repository.

**User response:**  If you have the new policy defined then upload the policy to the Provisioning Manager policy repository and retry. Otherwise specify the name of an existing policy in the policy repository and retry.

**CPO1128I**  **Policy not changed**

**Explanation:**  The SET DOMAIN command with the POL parameter set was issued. The command was not successful. The policy is not changed and the Provisioning Manager still performs resource activations and deactivations based on the existing policy.

**User response:** Check previous error messages and correct the problem. Then retry the command.

---

**CPO1129E**     **I/O error reading policy** *name*

**Explanation:** The SET DOMAIN command with the POL parameter set to the referenced name was issued. The program tried to read the policy file but failed with an I/O error.

**User response:** Correct the problem and retry the command.

---

**CPO1130E**     **Processing mode** *mode* **not supported**

**Explanation:** The SET DOMAIN command with the MODE parameter set to the referenced mode value was issued. The mode value is not supported by the command.

**User response:** Change the mode value to a supported processing mode and retry the command. Allowed values are MAN for manual mode, ANALYSIS for analysis mode, CONF for confirmation mode, and AUTO for autonomic mode.

---

**CPO1131E**     **Stop mode** *mode* **not supported**

**Explanation:** The STOP MANAGER command with the MODE parameter set to the referenced mode value was issued. The mode values is not supported by the command.

**User response:** Change the mode value to a supported stop mode and retry the command. Allowed values are NORMAL and FORCE.

---

**CPO1132E**     **Rule** *name* **is not part of active policy**

**Explanation:** A command that used the referenced provisioning rule name was issued. A provisioning rule with the specified name is not part of the active policy.

**User response:** Choose a correct provisioning rule name and retry the command. To find out the available provisioning rules issue a REPORT POLICY command.

---

**CPO1133E**     **Provisioning condition** *condition* **is not part of rule** *rule*

**Explanation:** A command that used the referenced provisioning condition name and provisioning rule name was issued. A provisioning condition with the specified name is not part of the specified provisioning rule.

**User response:** Choose a correct provisioning condition name and retry the command. To find out the available provisioning conditions in the provisioning rule issue a REPORT POLICY command.

---

**CPO1134E**     **System** *system* **in sysplex** *sysplex* **is not part of the current configuration**

**Explanation:** A command with the referenced system name and sysplex name was entered. The specified system within the specified sysplex does not exist in the in the current domain configuration.

**User response:** Choose available system and sysplex names and retry the command. To find out the available system and sysplex names in the current domain configuration issue a REPORT CONFIGURATION command.

---

**CPO1135E**     **CPC** *cpc* **is not part of the current configuration**

**Explanation:** A command with the referenced CPC name was issued. The specified CPC does not exist in the current domain configuration.

**User response:** Choose an available CPC and retry the command. To find out the available CPCs in the current domain configuration issue a REPORT CONFIGURATION command.

---

**CPO1138E**     **The specified number** *"value"* **is not in a correct format**

**Explanation:** A command with the referenced number for the amount of specialty processors was issued. The specified number does not represent a valid integer value.

**User response:** Correct the number value and retry the command. Allowed numbers are may only contain characters 0-9.

---

**CPO1139E**     **The specified amount of** *number* **is out of range**

**Explanation:** A command with the referenced number for the amount of specialty processors was issued. The specified number is not in the range of allowed values for the current command.

**User response:** Specify a number within the allowed range for the command and retry the command. Allowed values are positive numbers only.

---

**CPO1140E**     **The CPC** *name* **is not in the correct state for the operation**

**Explanation:** You tried to activate temporary capacity for a CPC contained in the domain configuration. The CPC is either not yet found to be an existing CPC or it is not yet fully initialized. Therefore the command is not processed.

**User response:** If the CPC specifies an existing CPC check for communication problems to the hardware. Retry the command later again if the CPC is in the correct state. The state of the CPC can be checked using

the REPORT CONFIGURATION command. If the CPC does not specify existing hardware then change your domain configuration to include only existing hardware.

**CPO1141E  Insufficient processors. Available spares are** *amount*

**Explanation:**  You tried to activate or deactivate temporary capacity that requires additional processors. The CPC does not have sufficient spare processors to perform the change to the activation level. Be aware that you need sufficient number of free processors to activate all resources. A conversion between different processor types in this operation is not allowed. The activation is not processed. This message is also issued if the Provsioning Manager is currently reading updated information and the update is still in process.

**User response:**  If the CPC has spare processors then reduce the requested amount of new processors to at most this number. If no spares are available you need to provide additional hardware resource first before activating them. If reading the information is still in process, wait some time and try again.

**CPO1142E  Insufficient general purpose capacity. The residual capacity is** *amount*

**Explanation:**  The ACTIVATE RESOURCE command with the CPC and MODEL parameters has been issued. The target model has more capacity in MSU than the amount that is allowed by the residual capacity of the target On/Off CoD record. The command is not processed.

**User response:**  If the On/Off CoD record of the CPC managed by the Provisioning Manager has still temporary general purpose capacity available then select a target model that requires not more than the available residual capacity. If no more temporary capacity is available you need to add temporary general purpose capacity before activating it.

**CPO1143W  Required parameter missing**

**Explanation:**  The SET DOMAIN command has been invoked without any parameter. No action is performed.

**User response:**  Specify either a mode (MODE), a policy (POL), or a domain configuration (CFG) and retry the command.

**CPO1144E  Too many parameters specified**

**Explanation:**  The SET DOMAIN command is invoked with more than one of the parameters for mode (MODE), policy (POL), and domain configuration (CFG). Only one parameter is allowed at a time.

**User response:**  Remove the obsolete parameter and retry the command.

**CPO1146E  Insufficient zAAP capacity. The residual capacity is** *amount*

**Explanation:**  The ACTIVATE RESOURCE command with the CPC and ZAAP parameters has been issued. The specified target number for zAAP processors is above the residual capacity for the CPC. The command is not processed.

**User response:**  If the On/Off CoD record of the CPC managed by the Provisioning Manager has still temporary capacity for zAAPs available then reduce the amount of processors to be activate to fit this capacity. If no more temporary capacity is available you need to add temporary zAAP capacity before activating it.

**CPO1147E  Insufficient zIIP capacity. The residual capacity is** *amount*

**Explanation:**  The ACTIVATE RESOURCE command with the CPC and ZIIP parameters has been issued. The specified target number for zIIP processors is above the residual capacity for the CPC. The command is not processed.

**User response:**  If the On/Off CoD record of the CPC managed by the Provisioning Manager has still temporary capacity for zIIPs available then reduce the amount of processors to be activate to fit this capacity. If no more temporary capacity is available you need to add temporary zIIP capacity before activating it.

**CPO1148E  Target number of zAAPs (***target number***) is not below current number of active zAAPs (***current number***) at CPC** *name*

**Explanation:**  The DEACTIVATE RESOURCE command with the CPC and ZAAP parameters has been issued. The specified target number for zAAP processors is higher than or equal to the number of currently active zAAP processors. The action is not performed. This message is also issued if the Provsioning Manager is currently reading updated information and the update is still in process.

**User response:**  Retry the command with a target number that is less than the currently active number. If reading the information is still in process, wait some time and try again.

**CPO1149E  Target number of zIIPs (***target number***) is not below current number of active zIIPs (***current number***) at CPC** *name*

**Explanation:**  The DEACTIVATE RESOURCE command with the CPC and ZIIP parameters has been issued. The specified target number for zIIP processors is higher than or equal to the number of currently active zIIP processors. The action is not performed. This message is also issued if the Provsioning Manager

is currently reading updated information and the update is still in process.

**User response:** Retry the command with a target number that is less than the currently active number. If reading the information is still in process, wait some time and try again.

---

**CPO1150E**    **On/Off CoD record** *id* **for CPC** *name* **is expired**

**Explanation:** Either an ACTIVATE RESOURCE or a DEACTIVATE RESOURCE command for the referenced CPC has been issued. The On/Off CoD record that is specified for this CPC in the domain configuration is already expired and therefore doesn't allow and further operation. The action is not performed.

**User response:** You need either to replenish the On/Off CoD record to change the record expiration or you can switch to another On/Off CoD record by switching to a new domain configuration.

---

**CPO1151E**    **On/Off CoD record** *id* **for CPC** *name* **currently active for TEST**

**Explanation:** Either an ACTIVATE RESOURCE or a DEACTIVATE RESOURCE command for the referenced CPC has been issued. The On/Off CoD record that is specified for this CPC in the domain configuration is currently active for test. The Provisioning Manager does not support activations for test. The action is not performed.

**User response:** Deactivate the referenced On/Off CoD record and retry the command.

---

**CPO1152E**    **Another On/Off CoD record than** *id* **for CPC** *name* **is currently active**

**Explanation:** Either an ACTIVATE RESOURCE or a DEACTIVATE RESOURCE command for the referenced CPC has been issued. There is another On/Off CoD record than the one that is specified for this CPC in the domain configuration currently active. The hardware does not support multiple On/Off CoD records to be active. The action is not performed.

**User response:** Deactivate any active On/Off CoD record on the CPC and retry the command.

---

**CPO1153E**    **On/Off CoD record** *id* **for CPC** *name* **has no activations left**

**Explanation:** An ACTIVATE RESOURCE command for the referenced CPC has been issued. The On/Off CoD record is currently in a state that doesn't allow for any new activation. The action is not performed.

**User response:** Replenish the On/Off CoD record and retry the command.

---

**CPO1154E**    **CPC** *name* **is not configured to allow capacity changes**

**Explanation:** Either an ACTIVATE RESOURCE or a DEACTIVATE RESOURCE command for the referenced CPC has been issued. The CPC configuration doesn't allow API commands to activate or deactivate temporary capacity. The action is not performed.

**User response:** Change the CPC configuration at the HMC or SE to allow the API commands and retry the command.

---

**CPO1155E**    **The specified value for the FROM parameter (***data***) is incorrect**

**Explanation:** The REPORT ACTIVITY command with the FROM parameter set to the reference data was issued. The value for this parameter has an incorrect format or value for a date.

**User response:** Specify a correct date for the FROM parameter and retry the command. A correct date has the format mm/dd/yyyy where yyyy specifies the year, mm the month of the year, and dd the day of the month.

---

**CPO1156E**    **The specified value for the TO parameter (***data***) is incorrect**

**Explanation:** The REPORT ACTIVITY command with the TO parameter set to the referenced data was issued. The value for this parameter has an incorrect format or value for a date.

**User response:** Specify a correct date for the TO parameter and retry the command. A correct date has the format mm/dd/yyyy where yyyy specifies the year, mm the month of the year, and dd the day of the month.

---

**CPO1157E**    **FROM date** *from date* **is after TO date** *to date*

**Explanation:** The REPORT ACTIVITY command was issued. The specified time period is not valid. The specified FROM date is after the specified TO date.

**User response:** Specify a correct time period and retry the command.

---

**CPO1158E**    **Target model** *model* **for CPC** *name* **not possible**

**Explanation:** The activation or deactivation of temporary capacity to the requested target model is not possible. The requested model in not one of the allowed target positions based on the capacity restriction of the On/Off CoD record for the CPC that is managed by the Provisioning Manager.

**User response:** Specify an allowed target model and try again.

**CPO1159E    Activation with less general purpose capacity not allowed**

**Explanation:** An activation of temporary general purpose capacity has been requested. The specified target model has less general purpose capacity than the currently active model. This is not allowed for an activation.

**User response:** If you want to activate general purpose capacity then specify a target model with the same or more general purpose capacity and try again. If you want to reduce the general purpose capacity use the command to deactivate capacity.

**CPO1160E    Activation with less zAAP capacity not allowed**

**Explanation:** An activation of temporary zAAP processors has been requested. The specified amount of zAAPs is less than the number of zAAPs that are the currently active. This is not allowed for an activation.

**User response:** If you want to activate zAAP capacity specify a target number of zAAPs that is higher than the current number of active temporary zAAPs and try again. If you want to reduce the zAAP capacity use the command to deactivate capacity.

**CPO1161E    Activation with less zIIP capacity not allowed**

**Explanation:** An activation of temporary zIIP processors has been requested. The specified amount of zIIPs is less than the number of zIIPs that are the currently active. This is not allowed for an activation.

**User response:** If you want to activate zIIP capacity specify a target number of zIIPs that is higher than the current number of active temporary zIIPs and try again. If you want to reduce the zIIP capacity use the command to deactivate capacity.

**CPO1162E    Deactivation with more general purpose capacity not allowed**

**Explanation:** A deactivation of temporary general purpose capacity has been requested. The specified target model has more general purpose capacity than the currently active model. This is not allowed for a deactivation.

**User response:** If you want to deactivate general purpose capacity then specify a target model with the same or less general purpose capacity and try again. If you want to increase the general purpose capacity use the command to activate capacity.

**CPO1163E    Insufficient processors. Available spares are *amount***

**Explanation:** You tried to deactivate temporary general purpose capacity. The specified target requires additional processors to be active but the CPC does not have sufficient spare processors to activate the requested target model. Be aware that you need sufficient number of free processors to activate them. A conversion between different processor types in this operation is not allowed. The deactivation is not processed.

**User response:** If the CPC has spare processors then specify a target number model where the required number of additional general purpose processors is not more than the remaining number of spare processors. If no spare processors are available then you need to provide additional hardware resource to allow the requested target model or you can deactivate other temporary processors before activating the requested target model.

**CPO1164E    Required parameter missing**

**Explanation:** The ACTIVATE RESOURCE was issued with insufficient parameters. No action is performed.

**User response:** Specify either the MODEL, ZAPP, or ZIIP parameter and retry the command.

**CPO1165E    Too many parameters specified**

**Explanation:** The ACTIVATE RESOURCE command was issued with too many parameters. You specified more than one of the parameters MODEL, ZAAP, and ZIIP. Only one of these parameters is allowed.

**User response:** Remove the obsolete parameters as needed and retry the command. If you want to activate multiple resources then call the ACTIVATE RESOURCE command multiple times, each time for another type of resource.

**CPO1166E    Target model *name* not possible with current On/Off CoD record**

**Explanation:** The ACTIVATE RESOURCE command with the CPC and MODEL parameters specified has been issued. You tried to activate temporary general purpose capacity but the CPC capacity does not allow activation of the requested model. You have either not enough capacity in the On/Off CoD record managed by the Provisioning Manager to move to the position, there are other capacity records active that do not allow moving to the requested model, or the requested model is not an allowed target model for the CPC. The activation is not processed.

**User response:** Specify a target model that is one of the possible target models based on the On/Off CoD record managed by the Provisioning Manager and retry the command.

**CPO1167E**  **Target model** *name* **has less capacity than is currently active**

**Explanation:**  The ACTIVATE RESOURCE command with the CPC and MODEL parameters has been issued. You tried to activate temporary general purpose capacity but the specified target model has less capacity than the capacity that is currently active for the On/Off CoD record. An activation can only be performed if the capacity of the target model is higher than or equal to the current active capacity. The activation is not processed. This message is also issued if the Provsioning Manager is currently reading updated information and the update is still in process.

**User response:**  If you want to have more general purpose capacity active then specify a target model that has more capacity than the currently active capacity of your On/Off CoD record and retry the command. If you want to have less capacity use the DEACTIVATE RESOURCE command and specify a target model with less capacity than currently active. If reading the information is still in process, wait some time and try again.

**CPO1168E**  **Target model** *name* **not possible with current On/Off CoD record**

**Explanation:**  The DEACTIVATE RESOURCE command with the CPC and MODEL parameters has been issued. You tried to deactivate temporary general purpose capacity but the CPC does not allow deactivation on the requested model. You have either other capacity records active that do not allow the deactivation on the requested model, or the requested model is not an allowed model for the CPC. The deactivation is not processed.

**User response:**  Specify a target model that is one of the possible target models based on the On/Off CoD record managed by the Provisioning Manager and retry the command.

**CPO1169E**  **Target model** *name* **has more capacity than is currently active**

**Explanation:**  The DEACTIVATE RESOURCE command with the CPC and MODEL parameters has been issued. You tried to deactivate temporary general purpose capacity but the specified target model has more capacity than the capacity that is currently active for the On/Off CoD record. A deactivation can only be performed if the capacity of the target model is lower than or equal to the current active capacity. The deactivation is not processed. This message is also issued if the Provsioning Manager is currently reading updated information and the update is still in process.

**User response:**  If you want to have less general purpose capacity active then specify a target model that has less capacity than the currently active capacity of your On/Off CoD record and retry the command. If

you want to have more capacity use the ACTIVATE RESOURCE command and specify a target model with more capacity than currently active. If reading the information is still in process, wait some time and try again.

**CPO1170W**  **Target model** *model* **already active at CPC** *name*

**Explanation:**  The ACTIVATE RESOURCE or the DEACTIVATE RESOURCE command with the CPC and MODEL parameters has been issued. You tried to change the temporary general purpose capacity but the specified target model is already active. The command is not processed.

**User response:**  If you want to change the temporary capacity model of your CPC then specify a different target model than the one that is already active and retry the command.

**CPO1171E**  **Target number** *number* **is not above current number of active zAAPs for CPC** *name*

**Explanation:**  The ACTIVATE RESOURCE command with the CPC and ZAAP parameters has been issued. You tried to increase the temporary zAAP capacity but the specified target number of processors is either equal to or below the number of currently active zAAP processors. The command is not processed. This message is also issued if the Provsioning Manager is currently reading updated information and the update is still in process.

**User response:**  If you want to increase the number of temporary zAAP processors then choose a higher number and retry the command. If you do not know the current number of active zAAP processors then use the REPORT CONFIGURATION command to display the current value. If reading the information is still in process, wait some time and try again.

**CPO1172E**  **Target number** *number* **is not above current number of active zIIPs for CPC** *name*

**Explanation:**  The ACTIVATE RESOURCE command with the CPC and ZIIP parameters has been issued. You tried to increase the temporary zIIP capacity but the specified target number of processors is either equal to or below the number of currently active zIIP processors. The command is not processed. This message is also issued if the Provsioning Manager is currently reading updated information and the update is still in process.

**User response:**  If you want to increase the number of temporary zIIP processors then choose a higher number and retry the command. If you do not know the current number of active zIIP processors then use the REPORT CONFIGURATION command to display the current

value. If reading the information is still in process, wait some time and try again.

---

**CPO1173E    Requested number of zAAPs (*number*) exceeds limit *limit***

**Explanation:** The ACTIVATE RESOURCE command with the CPC and ZAAP parameters has been issued. You tried to activate temporary zAAP processors but the requested number exceeds the limit of zAAPs that are allowed to be active by the On/Off CoD record. The command is not processed.

**User response:** If you want to increase the number of temporary zAAP processors then you need to order a On/Off CoD record that allows this requested number. If your number is incorrect then reduce the target number of zAAP processors to an allowed value and retry the command.

---

**CPO1174E    Requested number of zIIPs (*number*) exceeds limit *limit***

**Explanation:** The ACTIVATE RESOURCE command with the CPC and ZIIP parameters has been issued. You tried to activate temporary zIIP processors but the requested number exceeds the limit of zIIPs that are allowed to be active by the On/Off CoD record. The command is not processed.

**User response:** If you want to increase the number of temporary zIIP processors then you need to order a On/Off CoD record that allows this requested number. If your number is incorrect then reduce the target number of zIIP processors to an allowed value and retry the command.

---

**CPO1175E    Deactivation of zAAP capacity not allowed. Requested delta (*requested number*) is above current activation level (*current number*)**

**Explanation:** A deactivation of temporary zAAP processors has been requested. The specified number of zAAPs to deactivate is higher than the current number of active temporary zAAP processors. This is not allowed for an deactivation. The action is not performed.

**User response:** Specify a supported number and try again.

---

**CPO1176E    Deactivation of zIIP capacity not allowed. Requested delta (*requested number*) is above current activation level (*current number*)**

**Explanation:** A deactivation of temporary zIIP processors has been requested. The specified number of zIIPs to deactivate is higher than the current number of active temporary zAAP processors. This is not allowed for an deactivation. The action is not performed.

---

**CPO1177E    Activation with fewer general purpose processors not allowed**

**Explanation:** An activation of temporary general purpose capacity has been requested. The specified target model has fewer general purpose processors than the currently active model. This is not allowed for an activation.

**User response:** If you want to activate more general purpose processors then specify a target model with the same or more general purpose processors and try again. If you want to reduce the number of general purpose processors use the command to deactivate capacity.

---

**CPO1178E    Deactivation with more general purpose processors not allowed**

**Explanation:** A deactivation of temporary general purpose capacity has been requested. The specified target model has more general purpose processors than the currently active model. This is not allowed for a deactivation.

**User response:** If you want to deactivate general purpose processors then specify a target model with the same or fewer general purpose processors and try again. If you want to reduce the number of general purpose processors use the command to deactivate capacity.

---

**CPO1180E    I/O error *"error"* reading policy list**

**Explanation:** The LIST POLICY command has been issued. Trying to read the list of policies results in the referenced I/O error.

**User response:** Correct the problem and retry the command.

---

**CPO1181E    I/O error *"error"* reading domain configuration list**

**Explanation:** The LIST CONFIGURATION command has been issued. Trying to read the list of domain configurations results in the referenced I/O error.

**User response:** Correct the problem and retry the command.

---

**CPO1182E    CPC *name* is not in correct state for this operation**

**Explanation:** An ACTIVATE RESOURCE command for the referenced CPC has been issued. The CPC is either in NOT OPERATING state, NO POWER state, STATUS CHECK state, or LINK NOT ACTIVE state. In these

states activation is not allowed. The action is not performed.

**User response:** Check the SE state at the HMC or SE and retry the command.

---

**CPO1183E**     **CPC** *name* **is not in correct state for this operation**

**Explanation:** A DEACTIVATE RESOURCE command for the referenced CPC has been issued. The CPC is either in NO POWER state, STATUS CHECK state, or LINK NOT ACTIVE state. In these states deactivation is not allowed. The action is not performed.

**User response:** Check the SE state at the HMC or SE and retry the command.

---

**CPO1184E**     **CPC** *name* **does not have a valid On/Off CoD record**

**Explanation:** An ACTIVATE RESOURCE or DEACTIVATE RESOURCE command for the referenced CPC has been issued. The CPC is does not have an On/Off CoD record defined, or this record is not of a valid type. The action is not performed.

**User response:** Check the record ID that you have defined for the CPC in the domain configuration. Correct the problem and retry the command.

---

**CPO1185E**     **CPC** *name* **does not have the defined On/Off CoD record**

**Explanation:** An ACTIVATE RESOURCE or DEACTIVATE RESOURCE command for the referenced CPC has been issued. The CPC is does not have an On/Off CoD record with the defined ID. The action is not performed.

**User response:** Check the record ID that you have defined for the CPC in the domain configuration. Correct the ID or installed the defined On/Off CoD record and retry the command.

---

**CPO1186E**     **Dump type** *type* **not supported**

**Explanation:** The DUMP MANAGER command with the TYPE parameter set to the referenced mode value was issued. The type values is not supported by the command.

**User response:** Change the type value to a supported dump type and retry the command. Allowed values are JAVA, HEAP, and SYSTEM.

---

**CPO1187E**     **Writing log information for log** *name* **is not active**

**Explanation:** The WRITE LOG command with the LOGNAME parameter set to the referenced log name was issued. Writing log information is not activated for the specified log.

**User response:** Activate logging for the specified log before issuing this command or use the DEST parameter to write the log information to a specified destination.

---

**CPO1188W**     **No information to write to log** *type*

**Explanation:** The WRITE LOG command with the LOGNAME parameter set to the referenced log name was issued. The log currently does no contain any information so no data is written.

**User response:** None.

---

**CPO1201E**     **Duplicate element** *name*

**Explanation:** The program tried to build a now policy or domain configuration and found an element with the referenced element. An element with the referenced name already exists.

**User response:** Correct the policy or domain configuration and retry the command.

---

**CPO1204E**     **I/O error writing to file** *"filename"*. **Error is** *"error"*

**Explanation:** While trying to write to the specified file, an I/O error occurred. The error description contains more information about the problem.

**User response:** Correct the problem and retry the command.

---

**CPO1205E**     **I/O error reading file** *"filename"*. **Error is** *"error"*

**Explanation:** While trying to read from the specified file, an I/O error occurred. The error description contains more information about the problem.

**User response:** Correct the problem and retry the command.

---

**CPO1206E**     **Policy** *name* **does not exist**

**Explanation:** The program tried to read a policy with the reference name. A policy with this name does not exist in the policy repository.

**User response:** Specify an existing policy name and retry the command. To find the available policies in the policy repository issue a LIST POLICY command

---

**CPO1207E**     **Incorrect policy** *name* **in policy file** *filename*

**Explanation:** The program tried to read a new policy with the referenced name. The referenced policy file does not contain a policy with the required name. This can happen if you transferred the policy file with an incorrect name.

**User response:** Correct the policy in the file or rename the file to match the name of the policy. The retry the command.

---

**CPO1208E    Incorrect domain configuration** *name* **in domain configuration file** *filename*

**Explanation:** The program tried to read a new domain configuration with the referenced name. The referenced domain configuration file does not contain a domain configuration with the required name. This can happen if you transferred the domain configuration file with an incorrect name.

**User response:** Correct the configuration in the file or rename the file to match the name of the domain configuration. Then retry the command.

---

**CPO1209E    Parser initialization error:** *error*

**Explanation:** The program tried to initialize a parser and got the referenced error.

**User response:** Correct the error or try again.

---

**CPO1210E    Policy is not correct**

**Explanation:** The program tried to read a policy XML file but found that this is not correct. The policy XML file is not processed.

**User response:** Check that the file is correctly transferred to the policy repository. You can also download the file to the Control Center, correct the error, upload the file, and retry the command.

---

**CPO1211E    Domain configuration file** *name* **does not exist**

**Explanation:** The specified file for domain configuration does not exist.

**User response:** Specify an existing domain configuration filename and try again.

---

**CPO1212E    Domain configuration** *name* **is for domain** *domain name 1* **(must be** *domain name 2*)

**Explanation:** The SET DOMAIN command with the CFG parameter set to the reference domain configuration name 2. The program tried to activate the new domain configuration. This domain configuration is not defined for the current domain.

**User response:** Choose another domain configuration that is defined for the current domain and retry the command.

---

**CPO1230E    I/O error reading file** *"filename"***. Error is** *"error"*

**Explanation:** While trying to read from the specified domain configuration file, an I/O error occurred. The error description contains more information about the problem.

**User response:** Correct the problem and retry the command.

---

**CPO1231E    Domain configuration file** *"filename"* **not found**

**Explanation:** The domain configuration file is not available. The command is not processed.

**User response:** Specify an existing domain configuration file and retry the command.

---

**CPO1232E    Domain configuration is not correct**

**Explanation:** The program tried to read a domain configuration XML file but found that this is not correct. The domain configuration XML file is not processed.

**User response:** Download the file to the Control Center, correct the error, upload the file, and try again.

---

**CPO1401E    Cannot read from command input device:** *error information*

**Explanation:** The program tried to read commands from a command input device but got an I/O error. The cause of the problem is described by the parameter. The program is not able to process any further input from the this device.

**User response:** Correct the problem and restart the program.

---

**CPO1402E    Unexpected error during command processing**

**Explanation:** The program got an unexpected error while processing a Provisioning Manager command. The program is not able to process the current command but continues to accept further commands.

**User response:** Contact IBM and report the error.

---

**CPO1403E    Unexpected error during console request processing**

**Explanation:** The program sent a operator request message and tried to get an operator response but failed with an unexpected error. The request is not processed.

**User response:** Contact IBM and report the error.

---

**CPO2001I   Provisioning Manager starting at** *time* **for Domain** *domain* **with policy** *policy* **and mode** *mode*

**Explanation:**   The Provisioning Manager was started for the indicated domain using the referenced parameters for policy name and processing mode. A policy or mode of '*' indicates that these parameters are not provided and the Provisioning Manager uses the policy and processing mode from the last activation.

**User response:**   None.

---

**CPO2002E   The configuration parameter file is missing**

**Explanation:**   The Provisioning Manager tried to read the configuration parameter file for the current domain but could not find the file. The Provisioning Manager will terminate.

**User response:**   Create the configuration parameter file for the domain and restart the Provisioning Manager.

---

**CPO2003E   I/O Error reading configuration parameter file**

**Explanation:**   The Provisioning Manager tried to read the configuration profile for the current domain but reading results in an I/O error. The Provisioning Manager will terminate.

**User response:**   Assure that the configuration file is readable and that the Provisioning Manager has the required access rights to read the file. Afterwards restart the Provisioning Manager.

---

**CPO2004E   The configuration parameter file contains the number** *"value"* **that is not valid**

**Explanation:**   The Provisioning Manager read the configuration parameter file for the current domain and found a configuration key that allows only numbers as values. Trying to convert the value to a number failed. The Provisioning Manager will terminate.

**User response:**   Correct the values within the configuration parameter file and restart the Provisioning Manager.

---

**CPO2005E   The value for configuration key** *name* **is out of range**

**Explanation:**   The Provisioning Manager read the configuration parameter file for the referenced key. The value is not in the allowed range for the key. The Provisioning Manager will terminate.

**User response:**   Correct the value for the referenced key in the configuration parameter file for the domain and restart the Provisioning Manager. For the allowed range of the key see the product documentation.

---

**CPO2006E   The configuration contains inconsistent information. The value** *value* **for key** *key 1* **requires also a value for key** *key 2*

**Explanation:**   The Provisioning Manager read the configuration parameter file for the current domain and found the supported value for the first key. That key requires a value for the second configuration key. A value for this dependent key is not found in the file. The Provisioning Manager will terminate.

**User response:**   Add the required key into the configuration parameter file and restart the Provisioning Manager.

---

**CPO2007E   The number of start parameters is incorrect. Found** *count* **but required are** *number*

**Explanation:**   The Provisioning Manager requires the referenced number of parameters to start, at least the domain name, the policy and the initial processing mode. The number of start parameters doesn't match this requirement. The Provisioning Manager will terminate.

**User response:**   Restart the Provisioning Manager with a correct number of parameters. For a description of the parameters and their allowed values refer to the product documentation.

---

**CPO2008E   The configuration file is missing a value for key** *name*

**Explanation:**   The Provisioning Manager read the configuration parameter file and finds that a value for the referenced configuration key is missing. A value for that key is mandatory. The Provisioning Manager will terminate.

**User response:**   Add the required value for the key in the configuration parameter file and restart the Provisioning Manager.

---

**CPO2009E   Current domain** *current name* **does not match restart information domain name** *restart name*

**Explanation:**   The Provisioning Manager is started for the domain referred to as current domain. The restart information found by the Provisioning Manager indicates that last time it was working for the domain indicated by the restart domain name. The Provisioning Manager will terminate.

**User response:**   Start the Provisioning Manager for the correct domain or use the correct restart information and restart the Provisioning Manager.

**CPO2011I     Provisioning Manager terminates due to errors**

**Explanation:**  The Provisioning Manager detected an error that does not allow to start the processing. See previous message for details. The Provisioning Manager terminates.

**User response:**  Correct the problem and restart the Provisioning Manager.

**CPO2012W     Error initializing CIM provider interface:** *error*

**Explanation:**  The Provisioning Manager tried to create the sockets for the CIM provider to allow to remote access. Creating these devices failed with the referenced error. This interface is not established and remote commands are not possible. The Provisioning Manager continues to run.

**User response:**  If you need remote access via the CIM interface then correct the problem and restart the Provisioning Manager.

**CPO2013E     SNMP Java API not found, class** *class*

**Explanation:**  The Provisioning Manager is configured to use the System z Application Programming Interfaces for Java but the corresponding class is not found. The Provisioning Manager terminates.

**User response:**  Add the System z Application Programming Interfaces for Java classes to the CLASSPATH of the Provisioning Manager and restart the program.

**CPO2014E     SBLIM CIM Client not found, class** *class*

**Explanation:**  The Provisioning Manager is configured to use the SBLIM CIM Client but the corresponding class is not found. The Provisioning Manager terminates.

**User response:**  Add the SBLIM CIM Client classes to the CLASSPATH of the Provisioning Manager and restart the program.

**CPO2015I     Provisioning Manager successfully initialized. Policy is** *policy name*, **Configuration is** *configuration name*, **and Processing Mode is MANUAL**

**Explanation:**  The Provisioning Manager is started and initialization was successful. It is now processing the reference policy, the referenced domain configuration, and processing mode MANUAL.

**User response:**  None.

**CPO2016I     Provisioning Manager successfully initialized. Policy is** *policy name*, **Configuration is** *configuration name*, **and Processing Mode is ANALYSIS**

**Explanation:**  The Provisioning Manager is started and initialization was successful. It is now processing the reference policy, the referenced domain configuration, and processing mode ANALYSIS.

**User response:**  None.

**CPO2017I     Provisioning Manager successfully initialized. Policy is** *policy name*, **Configuration is** *configuration name*, **and Processing Mode is CONFIRMATION**

**Explanation:**  The Provisioning Manager is started and initialization was successful. It is now processing the reference policy, the referenced domain configuration, and processing mode CONFIRMATION.

**User response:**  None.

**CPO2018I     Provisioning Manager successfully initialized. Policy is** *policy name*, **Configuration is** *configuration name*, **and Processing Mode is AUTONOMIC**

**Explanation:**  The Provisioning Manager is started and initialization was successful. It is now processing the reference policy, the referenced domain configuration, and processing mode AUTONOMIC.

**User response:**  None.

**CPO2020I     Register with ARM using element type** *type* **and element name** *name* **was successful**

**Explanation:**  The Provisioning Manager is configured to register with ARM using the referenced element type and element name. Registering with ARM was successful and ARM now observes the availability of the program.

**User response:**  None.

**CPO2021W     Registration with ARM using element type** *type* **and element name** *name* **not successful**

**Explanation:**  The Provisioning Manager is configured to register with ARM using the referenced element type and element name. Registering with ARM was not successful. Therefore the programs availability is not observed by ARM. The program continues to run.

**User response:**  See previous messages and correct the error. Afterwards restart the program.

**CPO2022E    ARM registration failed with return code** *return code* **reason** *reason code*

**Explanation:**  The Provisioning Manager is configured to register with ARM. Registration failed with the referenced return and reason codes. The program continues to run.

**User response:**  Check ARM return and reason code and correct the problem. Afterwards restart the program.

**CPO2023E    ARM ready failed with return code** *return code* **reason** *reason code*

**Explanation:**  The Provisioning Manager is configured to register with ARM. Indicating readiness failed with the referenced return and reason codes. The program continues to run.

**User response:**  Check ARM return and reason code and correct the problem. Afterwards restart the program.

**CPO2024E    ARM de-registration failed with return code** *return code* **reason** *reason code*

**Explanation:**  The Provisioning Manager is configured to register with ARM. De-registration failed with the referenced return and reason codes.

**User response:**  Check ARM return and reason code and correct the problem.

**CPO2027E    PassTicket generation services not found. Class** *class*

**Explanation:**  The Provisioning Manager is configured to use the PassTicket generation services, but the corresponding class could not be found. The Provisioning Manager terminates.

**User response:**  Add the PassTicket generation services classes to the CLASSPATH of the Provisioning Manager and restart the program.

**CPO2030I    Log information written to file** *filename*

**Explanation:**  Log information has been collected and written to the referenced file.

**User response:**  Provide the log information to IBM.

**CPO2035E    Unable to setup the CIM provider query communication with security group** *group*

**Explanation:**  The Provisioning Manager could not setup the socket for query communication between the Provisioning Manager and the Provisioning Manager CIM provider. The group of this socket could not be changed to the referenced name.

**User response:**  Check that the referenced Provisioning Manager query security group exists. If necessary, reconfigure this group using the configuration key CIM.ReadGroup. Check that the Provisioning Manager user is connected to the referenced Provisioning Manager query security group. Restart the CPM.

**CPO2036E    Unable to setup the CIM provider control communication with security group** *group*

**Explanation:**  The Provisioning Manager could not setup the socket for control communication between the Provisioning Manager and the Provisioning Manager CIM provider. The group of this socket could not be changed to the referenced name.

**User response:**  Check that the referenced Provisioning Manager control security group exists. If necessary, reconfigure this group using the configuration key CIM.ModifyGroup. Check that the Provisioning Manager user is connected to the referenced Provisioning Manager control security group. Restart the CPM.

**CPO2050E    Unable to load Java runtime library**

**Explanation:**  The program tried to load the Java runtime library libjvm.so but the file could not be loaded. The program does not continue to run.

**User response:**  Check that the program is invoked with the correct LIBPATH and that the program has access to the Java library.

**CPO2051E    Unable to locate JNI functions in loaded runtime library**

**Explanation:**  The program failed to load the function JNI_CreateJavaVM from the Java runtime library. The program does not continue to run.

**User response:**  Check that the correct Java library is referenced using the LIBPATH.

**CPO2052E    Failed to create Java VM**

**Explanation:**  The program failed to create the Java virtual machine.

**User response:**  Contact IBM.

**CPO2053E    Could not load invocation class**

**Explanation:**  The program failed to load the Provisioning Manager main class.

**User response:**  Check that the Provisioning Manager Java archive files are in the CLASSPATH environment variable and that the program is authorized to access them. The program does not continue to run.

**CPO2054E    Could not find main method**

**Explanation:**  The program failed to find the Provisioning Manager main method.

**User response:**  Check that the Provisioning Manager Java archive files are in the CLASSPATH environment variable and that the program is authorized to access them. The program does not continue to run.

**CPO2055E    Could not create string for argument array**

**Explanation:**  The program failed to create a Java String.

**User response:**  Check that the program is invoked with sufficient main storage.

**CPO2056E    Could not create argument array**

**Explanation:**  The program failed to create a Java String array.

**User response:**  Check that the program is invoked with sufficient main storage.

**CPO2057E    Could not build argument string**

**Explanation:**  The program failed to create a Java String.

**User response:**  Check that the program is invoked with sufficient main storage.

**CPO2070W    Following message may be truncated or missing:** *text*

**Explanation:**  The program tried to send the referenced message to the console but the text is longer than supported. For display purposes the referenced message is truncated. If it appear on the console, the message may be before or after this message. The program continues to run.

**User response:**  If the message is a result of a report command, try to limit the amount of report data or direct the output to another destination. Otherwise contact IBM and report the problem.

**CPO2101E    I/O error** *"error"* **reading restart data from file** *name*

**Explanation:**  The Provisioning Manager tried to read the restart data from the referenced file but failed with the referenced I/O error. The restart data cannot be used, so the Provisioning Manager will stop.

**User response:**  Correct the I/O problem and restart the Provisioning Manager.

**CPO2102E    The restart information found in** *name* **is incorrect**

**Explanation:**  The Provisioning Manager read the restart information from the referenced file but did not found the expected information. The restart data cannot be used, so the Provisioning Manager will stop.

**User response:**  Use the correct restart file and restart the Provisioning Manager.

**CPO2103E    The restart information found for element** *name* **is incorrect**

**Explanation:**  The Provisioning Manager read the restart information for the referenced element but the content of the corresponding restart file is not of the correct type. The restart data cannot be used, so the Provisioning Manager will stop.

**User response:**  Use the correct restart file and retry.

**CPO2104W    The restart information cannot be written. Error:** *error*

**Explanation:**  The Provisioning Manager tried to write restart information and got the reference I/O error. This operation was not successful. The Provisioning Manager continues to run but the restart information may not be usable.

**User response:**  Correct the problem and restart the Provisioning Manager.

**CPO2105E    The restart information cannot be written. Error:** *error*

**Explanation:**  The Provisioning Manager tried to write restart information and got the referenced I/O error. This operation was not successful. The Provisioning Manager stops.

**User response:**  Correct the problem and restart the Provisioning Manager.

**CPO2106E    The log file** *name* **cannot be opened. Error:** *error*

**Explanation:**  The Provisioning Manager tried to open the referenced logfile but got the reference error. This operation was not successful. The log information is not written and lost but the Provisioning Manager continues to run.

**User response:**  Correct the problem and try again.

**CPO2110E    An internal error occurred for** *component*

**Explanation:**  The Provisioning Manager detected an unexpected internal exception. Some information could not be handled correctly.

**User response:** Collect service information and contact IBM.

**CPO2111E     An internal error occurred during HMC or SE observation**

**Explanation:**  The Provisioning Manager detected an unexpected internal exception during observation of the HMC or SE. Some information could not be handled correctly.

**User response:**  Contact IBM and report the problem.

**CPO2112E     An internal error occurred during topology observation on HMC or SE**

**Explanation:**  The Provisioning Manager detected an unexpected internal exception during observation of the HMC or SE. Some information could not be handled correctly.

**User response:**  Contact IBM and report the problem.

**CPO2113E     An internal error occurred during policy processing**

**Explanation:**  The Provisioning Manager detected an unexpected internal exception during policy processing. Some information could not be handled correctly.

**User response:**  Contact IBM and report the problem.

**CPO2115E     Provisioning Manager ends due to environmental problems**

**Explanation:**  The Provisioning Manager encountered a severe environmental problem, such as a memory shortage. The program creates service data such as dumps and stderr output and terminates.

**User response:**  Collect all service information and contact IBM.

**CPO2120E     The specified repository location** *path* **is not a directory**

**Explanation:**  The program opened the referenced location and found that this is not a directory. The processing is stopped.

**User response:**  Define the referenced location as a directory or use a different location. Then restart the Provisioning Manager.

**CPO2121E     The specified repository location** *location* **may not be a PDS or PDSE**

**Explanation:**  The program read the referenced location and received an unexpected end of file. The location may not specify a PDS or PDSE. The processing is stopped.

**User response:**  Change the defined the referenced

location to a PDS or PDSE or use a different location. Then restart the Provisioning Manager.

**CPO2122E     A directory entry was found with incorrect data**

**Explanation:**  The program read the directory information for a PDS or PDSE and found incorrect data. The processing is stopped.

**User response:**  Check that all repositories point to a PDS or PDSE. Then restart the Provisioning Manager.

**CPO2201E     Policy name missing**

**Explanation:**  The policy name is required but not available.

**User response:**  Provide a correct policy name.

**CPO2202E     Policy name too short**

**Explanation:**  The policy name is too short. A valid policy name has a minimum length of one character.

**User response:**  Provide a longer policy name.

**CPO2203E     Policy name** *"policy name"* **longer than 8 characters**

**Explanation:**  The policy name is too long. A valid policy name has a maximum length of 8 characters.

**User response:**  Provide a shorter policy name.

**CPO2204E     Policy name** *"name"* **has incorrect starting character**

**Explanation:**  The policy name starts with a character that is not allowed. A policy name has to start with an uppercase alpha character (A-Z).

**User response:**  Correct the first character.

**CPO2205E     Policy name** *"name"* **contains incorrect character**

**Explanation:**  The policy name contains a character that is not allowed. A policy name can only consist of uppercase alpha characters (A-Z), numbers (0-9), and the special character number sign ('#').

**User response:**  Correct the character.

**CPO2206E     Rule set name missing**

**Explanation:**  The rule set name is required but not available.

**User response:**  Provide a correct rule set name.

**CPO2207E    Rule set name too short**

**Explanation:**   The rule set name is too short. A valid rule set name has a minimum length of one character.

**User response:**   Provide a longer rule set name.

**CPO2208E    Rule set name** *"name"* **longer than 12 characters**

**Explanation:**   The rule set name is too long. A valid rule set name has a maximum length of 12 characters.

**User response:**   Provide a shorter rule set name.

**CPO2209E    Rule set name** *"name"* **has incorrect starting character**

**Explanation:**   The rule set name starts with a character that is not allowed. A rule set name has to start with an alpha character (A-Z, a-z).

**User response:**   Correct the first character.

**CPO2210E    Rule set name** *"name"* **contains incorrect character**

**Explanation:**   The rule set name contains a character that is not allowed. A rule set name can only consist of alphanumerical characters (A-Z, a-z, 0-9) or the special characters underscore ('_') and number sign ('#').

**User response:**   Correct the character.

**CPO2211E    Rule name missing**

**Explanation:**   The rule name is required but not available.

**User response:**   Provide a correct rule name.

**CPO2212E    Rule name too short**

**Explanation:**   The rule name is too short. A valid rule name has a minimum length of one character.

**User response:**   Provide a longer rule name.

**CPO2213E    Rule name** *"name"* **longer than 12 characters**

**Explanation:**   The rule name is too long. A valid rule name has a maximum length of 12 characters.

**User response:**   Provide a shorter rule name.

**CPO2214E    Rule name** *"name"* **has incorrect starting character**

**Explanation:**   The rule name starts with a character that is not allowed. A rule name has to start with an alpha character (A-Z, a-z).

**User response:**   Correct the first character.

**CPO2215E    Rule name** *"name"* **contains incorrect character**

**Explanation:**   The rule name contains a character that is not allowed. A rule name can only consist of alphanumerical characters (A-Z, a-z, 0-9) or the special character underscore ('_') and number sign ('#').

**User response:**   Correct the character.

**CPO2216E    Provisioning condition name missing**

**Explanation:**   The Provisioning condition name is required but not available.

**User response:**   Provide a correct provisioning condition name.

**CPO2217E    Provisioning condition name too short**

**Explanation:**   The provisioning condition name is too short. A valid provisioning condition name has a minimum length of one character.

**User response:**   Provide a longer provisioning condition name.

**CPO2218E    Provisioning condition name** *"name"* **longer than 12 characters**

**Explanation:**   The provisioning condition name is too long. A valid provisioning condition name has a maximum length of 12 characters.

**User response:**   Provide a shorter provisioning condition name.

**CPO2219E    Provisioning condition name** *"name"* **has incorrect starting character**

**Explanation:**   The provisioning condition name starts with a character that is not allowed. A provisioning condition name has to start with an alpha character (A-Z, a-z).

**User response:**   Correct the first character.

**CPO2220E    Provisioning condition name** *"name"* **contains incorrect character**

**Explanation:**   The provisioning condition name contains a character that is not allowed. A provisioning condition name can only consist of alphanumerical characters (A-Z, a-z, 0-9) or the special character underscore ('_') and number sign ('#').

**User response:**   Correct the character.

**CPO2221E**    **Time condition name missing**

**Explanation:** The time condition name is required but not available.

**User response:** Provide a correct time condition name.

---

**CPO2222E**    **Time condition name too short**

**Explanation:** The time condition name is too short. A valid time condition name has a minimum length of one character.

**User response:** Provide a longer time condition name.

---

**CPO2223E**    **Time condition name** *"name"* **longer than 12 characters**

**Explanation:** The time condition name is too long. A valid time condition name has a maximum length of 12 characters.

**User response:** Provide a shorter time condition name.

---

**CPO2224E**    **Time condition name** *"name"* **has incorrect starting character**

**Explanation:** The time condition name starts with a character that is not allowed. A time condition name has to start with an alpha character (A-Z, a-z).

**User response:** Correct the first character.

---

**CPO2225E**    **Time condition name** *"name"* **contains incorrect character**

**Explanation:** The time condition name contains a character that is not allowed. A time condition name can only consist of alphanumerical characters (A-Z, a-z, 0-9) or the special character underscore ('_') and number sign ('#').

**User response:** Correct the character.

---

**CPO2226E**    **Workload condition name missing**

**Explanation:** The workload condition name is required but not available.

**User response:** Provide a correct workload condition name.

---

**CPO2227E**    **Workload condition name too short**

**Explanation:** The workload condition name is too short. A workload condition name has a minimum length of one character.

**User response:** Provide a longer workload condition name.

---

**CPO2228E**    **Workload condition name** *"name"* **longer than 12 characters**

**Explanation:** The workload condition name is too long. A valid workload condition name has a maximum length of 12 characters.

**User response:** Provide a shorter workload condition name.

---

**CPO2229E**    **Workload condition name** *"name"* **has incorrect starting character**

**Explanation:** The workload condition name starts with a character that is not allowed. A workload condition name has to start with an alpha character (A-Z, a-z).

**User response:** Correct the first character.

---

**CPO2230E**    **Workload condition name** *"name"* **contains incorrect character**

**Explanation:** The workload condition name contains a character that is not allowed. A workload condition name can only consist of alphanumerical characters (A-Z, a-z, 0-9) or the special character underscore ('_') and number sign ('#').

**User response:** Correct the character.

---

**CPO2231E**    **Domain name missing**

**Explanation:** The domain name is required but not available.

**User response:** Provide a correct domain name.

---

**CPO2232E**    **Domain name too short**

**Explanation:** The domain name is too short. A valid domain name has a minimum length of one character.

**User response:** Provide a longer domain name.

---

**CPO2233E**    **Domain name** *"name"* **longer than 8 characters**

**Explanation:** The domain name is too long. A valid domain name has a maximum length of 8 characters.

**User response:** Provide a shorter domain name.

---

**CPO2234E**    **Domain name** *"name"* **has incorrect starting character**

**Explanation:** The domain name starts with a character that is not allowed. A domain name has to start with an uppercase character (A-Z).

**User response:** Correct the first character.

---

**CPO2235E    Domain name** *"name"* **contains incorrect character**

**Explanation:**   The domain name contains a character that is not allowed. A domain name can only consist of uppercase alpha characters (A-Z), numbers (0-9), and the special character number sign ('#').

**User response:**   Correct the character.

---

**CPO2236E    CPC name missing**

**Explanation:**   The CPC name is required but not available.

**User response:**   Provide a correct CPC name.

---

**CPO2237E    CPC name too short**

**Explanation:**   The CPC name is too short. A valid CPC name has a minimum length of one character.

**User response:**   Provide a longer CPC name.

---

**CPO2238E    CPC name** *"name"* **longer than 8 characters**

**Explanation:**   The CPC name is too long. A valid CPC name has a maximum length of 8 characters.

**User response:**   Provide a shorter CPC name.

---

**CPO2240E    CPC name** *"name"* **contains incorrect character**

**Explanation:**   The CPC name contains a character that is not allowed. A CPC name can only consist of uppercase alpha characters (A-Z), numbers (0-9), or the special characters #, @, and $.

**User response:**   Correct the character.

---

**CPO2241E    System name missing**

**Explanation:**   The system name is required but not available.

**User response:**   Provide a correct system name.

---

**CPO2242E    System name too short**

**Explanation:**   The system name is too short. A valid system name has a minimum length of one character.

**User response:**   Provide a longer system name.

---

**CPO2243E    System name** *"name"* **longer than 8 characters**

**Explanation:**   The system name is too long. A valid system name has a maximum length of 8 characters.

**User response:**   Provide a shorter system name.

---

**CPO2245E    System name** *"name"* **contains incorrect character**

**Explanation:**   The system name contains a character that is not allowed. A system name can only consist of uppercase alpha characters (A-Z), numbers (0-9), or the special characters #, @, and $.

**User response:**   Correct the character.

---

**CPO2246E    Sysplex name missing**

**Explanation:**   The sysplex name is required but not available.

**User response:**   Provide a correct sysplex name.

---

**CPO2247E    Sysplex name too short**

**Explanation:**   The sysplex name is too short. A valid sysplex name has a minimum length of one character.

**User response:**   Provide a longer sysplex name.

---

**CPO2248E    Sysplex name** *"name"* **longer than 8 characters**

**Explanation:**   The sysplex name is too long. A valid sysplex name has a maximum length of 8 characters.

**User response:**   Provide a shorter sysplex name.

---

**CPO2250E    Sysplex name** *"name"* **contains incorrect character**

**Explanation:**   The sysplex name contains a character that is not allowed. A sysplex name can only consist of uppercase alpha characters (A-Z), numbers (0-9), or the special characters #, @, and $.

**User response:**   Correct the character.

---

**CPO2251E    WLM policy name missing**

**Explanation:**   The WLM policy name is required but not available.

**User response:**   Provide a correct WLM policy name.

---

**CPO2252E    WLM policy name too short**

**Explanation:**   The WLM policy name is too short. A valid WLM policy name has a minimum length of one character.

**User response:**   Provide a longer WLM policy name.

---

**CPO2253E    WLM policy name** *"name"* **longer than 8 characters**

**Explanation:**   The WLM policy name is too long. A valid WLM policy name has a maximum length of 8 characters.

**User response:** Provide a shorter WLM policy name.

---

**CPO2254E   WLM policy name** *"name"* **has incorrect starting character**

**Explanation:**   The WLM policy name starts with a character that is not allowed. A WLM policy name has to start with an alphanumerical character (A-Z, a-z, 0-9), or the special characters #, @, and $.

**User response:**   Correct the first character.

---

**CPO2255E   WLM policy name** *"name"* **contains incorrect character**

**Explanation:**   The WLM policy name contains a character that is not allowed. A WLM policy name can only consist of alphanumerical characters (A-Z, a-z, 0-9) or the special characters #, @, $, and underscore ('_').

**User response:**   Correct the character.

---

**CPO2256E   Service definition name missing**

**Explanation:**   The service definition name is required but not available.

**User response:**   Provide a correct service definition name.

---

**CPO2257E   Service definition name too short**

**Explanation:**   The service definition name is too short. A valid service definition name has a minimum length of one character.

**User response:**   Provide a longer service definition name.

---

**CPO2258E   Service definition name** *"name"* **longer than 8 characters**

**Explanation:**   The service definition name is too long. A valid service definition name has a maximum length of 8 characters.

**User response:**   Provide a shorter service definition name.

---

**CPO2259E   Service definition name** *"name"* **has incorrect starting character**

**Explanation:**   The service definition name starts with a character that is not allowed. A service definition name has to start with an alphanumerical character (A-Z, a-z, 0-9), or the special characters #, @, and $.

**User response:**   Correct the first character.

---

**CPO2260E   Service definition name** *"name"* **contains incorrect character**

**Explanation:**   The service definition name contains a character that is not allowed. A service definition name can only consist of alphanumerical characters (A-Z, a-z, 0-9) or the special characters #, @, and $.

**User response:**   Correct the character.

---

**CPO2261E   Service class name missing**

**Explanation:**   The service class name is required but not available.

**User response:**   Provide a correct service class name.

---

**CPO2262E   Service class name too short**

**Explanation:**   The service class name is too short. A valid service class name has a minimum length of one character.

**User response:**   Provide a longer service class name.

---

**CPO2263E   Service class name** *"name"* **longer than 8 characters**

**Explanation:**   The service class name is too long. A valid service class name has a maximum length of 8 characters.

**User response:**   Provide a shorter service class name.

---

**CPO2264E   Service class name** *"name"* **has incorrect starting character**

**Explanation:**   The service class name starts with a character that is not allowed. A service class name has to start with an alphanumerical character (A-Z, a-z, 0-9), or the special characters #, @, and $.

**User response:**   Correct the first character.

---

**CPO2265E   Service class name** *"name"* **contains incorrect character**

**Explanation:**   The service class name contains a character that is not allowed. A service class name can only consist of alphanumerical characters (A-Z, a-z, 0-9) or the special characters #, @, $, and underscore ('_').

**User response:**   Correct the character.

---

**CPO2266E   Domain configuration name missing**

**Explanation:**   The domain configuration name is required but not available.

**User response:**   Provide a correct domain configuration name.

---

**CPO2267E    Domain configuration name too short**

**Explanation:**  The domain configuration name is too short. A valid domain configuration name has a minimum length of one character.

**User response:**  Provide a longer domain configuration name.

**CPO2268E    Domain configuration name** *"name"* **is longer than 8 characters**

**Explanation:**  The domain configuration name is too long. A valid domain configuration name has a maximum length of 8 characters.

**User response:**  Provide a shorter domain configuration name.

**CPO2269E    Domain configuration name** *"name"* **has incorrect starting character**

**Explanation:**  The domain configuration name starts with a character that is not allowed. A domain configuration name has to start with an uppercase character (A-Z).

**User response:**  Correct the first character.

**CPO2270E    Domain configuration name** *"name"* **contains incorrect character**

**Explanation:**  The domain configuration name contains a character that is not allowed. A domain configuration name can only consist of uppercase alpha characters (A-Z), numbers (0-9), and the special character number sign ('#').

**User response:**  Correct the character.

**CPO2271E    Provisioning Manager connection name missing**

**Explanation:**  The Provisioning Manager connection name is required but not available.

**User response:**  Provide a correct Provisioning Manager connection name.

**CPO2272E    Provisioning Manager connection name too short**

**Explanation:**  The Provisioning Manager connection name is too short. A valid Provisioning Manager connection name has a minimum length of one character.

**User response:**  Provide a longer Provisioning Manager connection name.

**CPO2273E    Provisioning Manager connection name** *"name"* **longer than 8 characters**

**Explanation:**  The Provisioning Manager connection name is too long. A valid Provisioning Manager connection name has a maximum length of 8 characters.

**User response:**  Provide a shorter Provisioning Manager connection name.

**CPO2274E    Provisioning Manager connection name** *"name"* **has incorrect starting character**

**Explanation:**  The Provisioning Manager connection starts with a character that is not allowed. A Provisioning Manager connection name has to start with an uppercase alpha character (A-Z).

**User response:**  Correct the first character.

**CPO2275E    Provisioning Manager connection name** *"name"* **contains incorrect character**

**Explanation:**  The Provisioning Manager connection name contains a character that is not allowed. A Provisioning Manager connection name can only consist of uppercase alpha characters (A-Z), numbers (0-9), and the special character number sign ('#').

**User response:**  Correct the character.

**CPO2276E    Record ID missing**

**Explanation:**  The On/Off CoD record ID is required but not available.

**User response:**  Provide a correct record ID.

**CPO2277E    Record ID too short**

**Explanation:**  The On/Off CoD record ID is too short. A valid On/Off CoD record ID has a length of 8 characters.

**User response:**  Provide a longer record ID.

**CPO2278E    Record ID** *"name"* **longer than 8 characters**

**Explanation:**  The On/Off CoD record ID is too long. A valid On/Off CoD record ID has a length of 8 characters.

**User response:**  Provide a shorter record ID.

**CPO2279E    Record ID** *"name"* **has incorrect starting character**

**Explanation:**  The On/Off CoD record ID starts with a character that is not allowed. A On/Off CoD record ID has to start with an uppercase alpha character of a numerical character (A-Z, 0-9).

**User response:** Correct the first character.

---

**CPO2280E    Record ID** *"name"* **contains incorrect character**

**Explanation:** The On/Off CoD record ID contains a character that is not allowed. A On/Off CoD record ID can only consist of uppercase alpha characters or of numerical characters (A-Z, 0-9).

**User response:** Correct the character.

---

**CPO2281E    Description missing**

**Explanation:** The description is required but not available.

**User response:** Provide a correct description.

---

**CPO2282E    Description too short**

**Explanation:** The description is too short.

**User response:** Provide a longer description.

---

**CPO2283E    Description** *"text"* **longer than 128 characters**

**Explanation:** The description is too long. A valid description has a length of 128 characters.

**User response:** Provide a shorter description.

---

**CPO2284E    Description** *"text"* **has incorrect starting character**

**Explanation:** The description starts with a character that is not allowed. A description has to start with an alphanumeric character, one of the special characters '#', '$', '@', '-', '.', and '%', a blank or a newline character.

**User response:** Correct the first character.

---

**CPO2285E    Description** *"text"* **contains incorrect character**

**Explanation:** The description contains a character that is not allowed. A description can contain alphanumeric characters, the special characters '#', '$', '@', '-', '.', and '%', blanks and newline characters.

**User response:** Correct the character.

---

**CPO2500W    MISSING APF AUTHORIZATION. EXECUTION MAY FAIL**

**Explanation:** The server environment is not APF authorized. Execution continues but is likely to fail.

**User response:** Make sure that the DLLs are APF authorized as documented. Then restart the Provisioning Manager.

---

**CPO2501E    SEVERE ERROR - DUMP REQUESTED**

**Explanation:** The server address space encountered a severe error and requested a dump.

**User response:** Contact IBM.

---

**CPO2502E    BYPASSING DUMP IN UNAUTHORIZED ENVIRONMENT**

**Explanation:** The server address space encountered an error. No dump was requested because the environment is not authorized.

**User response:** Correct the problem described under message CPO2500E.

---

**CPO2503E    MISSING APF AUTHORIZATION**

**Explanation:** Upon startup, the server environment is not APF authorized. The Provisioning Manager will terminate.

**User response:** Make sure that the CPOJLNCH program is loaded from an APF authorized library or link list.

---

**CPO2504E    FUNCTION MUST BE EXECUTED AS STARTED TASK**

**Explanation:** The CPOJLNCH program has been invoked but is not executing as a started task.

**User response:** Make sure that the CPOJLNCH program is executed as a started task.

---

**CPO2505E    FUNCTION NOT AVAILABLE**

**Explanation:** The invoked function is not available. The program terminates.

**User response:** The function cannot be invoked.

---

**CPO3001E    Unable to connect to HMC or SE at address** *"address"*

**Explanation:** A connection to the HMC or SE at the specified address cannot be established.

**User response:** Check connection parameters and make sure that the HMC or SE is running.

---

**CPO3002W    Connection problem for connection to HMC or SE at address** *"address"*

**Explanation:** While using the connection to the HMC or SE, communication problems occurred. The current operation couldn't complete.

**User response:** Check whether your HMC or SE is still processing requests properly. The program will retry after some time.

---

**CPO3003E    Topology file not found at** *"path"*

**Explanation:**  An error occurred while trying to read the topology file.

**User response:**  Check whether the topology file exists and correct the problem.

---

**CPO3004E    Hardware configuration file for** *"id"* **not found at** *"path"*

**Explanation:**  An error occurred while trying to read the configuration file.

**User response:**  Check whether the configuration file exists and correct the problem.

---

**CPO3005E    HMC or SE not found at address** *"address"*

**Explanation:**  The program tried to connect to the referenced address for a HMC or SE. The address is not known to the network.

**User response:**  Check whether the address is correct. If it is correct then check that there is a network connection to it. Otherwise correct the parameter.

---

**CPO3006E    HMC or SE initialization error at address** *address*

**Explanation:**  The program tried to connect to the referenced address for a HMC or SE. The connection is established but initializing results in an exception. This is probably due to an unauthorized community name.

**User response:**  Check that the community name is authorized for read and write operations at the HMC or SE at the referenced address.

---

**CPO3007E    HMC or SE initialization timeout at address** *"address"*

**Explanation:**  The program tried to connect to the referenced address for a HMC or SE. The connection is established but initializing results in a timeout. This is probably due to a community name that is not defined, remote API access to the HMC or SE is not allowed, there is no SNMP server running at the reference address, or the communication to the address is not working, for example because of an incorrect set up of a firewall.

**User response:**  Check that the community name is defined and authorized for read and write operations at the HMC or SE at the referenced address. Make also sure that the program can communicate to the referenced address. Once communication is working, the program will try again to connect.

---

**CPO3008W    Mandatory information for a CPC not found**

**Explanation:**  The program tried to retrieve information about a CPC from a HMC or SE but failed for information that should be available. The reason could be that the CPC is no longer defined to the HMC or SE. The information for the CPC within the Provisioning Manager is not updated and may be incorrect.

**User response:**  Check whether all CPCs defined in your domain configuration are still defined to your HMC or SE. If not and the CPC should be processed then add the CPC to the HMC or SE. Otherwise you should remove the CPC from your domain configuration.

---

**CPO3009I    Problem retrieving information for CPC** *name*

**Explanation:**  The program failed to retrieve information about the reference CPC from a HMC or SE. For details see previous messages.

**User response:**  Check previous messages and correct the problem.

---

**CPO3010W    Hardware for CPC** *name* **not at correct level**

**Explanation:**  While trying to get the information about the referenced CPC, some information cannot be retrieved. The missing value indicates that the CPC is not at a required level. Check the product prerequisites for supported hardware. The CPC is not considered for activation or deactivation of temporary capacity.

**User response:**  Check whether the referenced CPC is correctly specified in the domain configuration. If it is not, change the CPC in your domain configuration to another CPC that can be managed by the Provisioning Manager.

---

**CPO3011W    On/Off CoD record** *"id"* **not found at CPC** *name*

**Explanation:**  The domain configuration specifies that the Provisioning Manager can manage the temporary capacity defined in the referenced On/Off CoD record for the referenced CPC. A On/Off CoD record with this ID was not found for the CPC. The CPC is not considered for activation or deactivation of temporary capacity.

**User response:**  Check whether the referenced On/Off CoD record in the CPC will be installed. If not, specify a different On/Off CoD record ID in the domain configuration that is used by the Provisioning Manager.

**CPO3012W    Activation for CPC** *name* **currently not allowed**

**Explanation:**  An activation was tried while the CPC is no longer in a state that allows this operation.

**User response:**  If the problem persists, report the problem.

**CPO3013W    Deactivation for CPC** *name* **currently not allowed**

**Explanation:**  A deactivation was tried while the CPC is no longer in a state that allows this operation.

**User response:**  If the problem persists, report the problem.

**CPO3014W    Record ID** *id* **for CPC** *name* **has an unsupported record type**

**Explanation:**  The current domain configuration contains the definition of the named CPC with the referenced record ID. The hardware information for this CPC can be found but the record type is not supported by the Provisioning Manager. The record is not used and no activation or deactivation of temporary resources for this CPC can be performed.

**User response:**  Change the domain configuration to reference a record of a supported type. Then change the domain to use the updated domain configuration.

**CPO3015W    Connection problem for connection to HMC or SE at address** *address*. **Error is** *error*

**Explanation:**  While using the connection to the HMC or SE, communication problems occurred. The current operation couldn't complete. See the error information for further details.

**User response:**  Check whether your HMC or SE is still processing requests properly.

**CPO3016W    SNMP error for request to HMC or SE at address** *address*. **Error is** *error*

**Explanation:**  While using the a command to for a CPC, an SNMP error occurred. The current operation couldn't complete. See the error information for further details.

**User response:**  Check whether your HMC or SE is still processing requests properly.

**CPO3017W    Information about CPC** *name* **currently not available**

**Explanation:**  The program tried to retrieve information about a CPC from a HMC but the information cannot be found due to a communication problem between the HMC and the SE. The reason

could be that the CPC has no longer power or it is no longer available. The information for the CPC within the Provisioning Manager is not updated and may be incorrect.

**User response:**  Check the HMC for communication problems to the CPC and correct the problem. If the CPC no longer exists the remove the CPC from your domain configuration.

**CPO3020I    Information for CPC** *name* **now accessible again**

**Explanation:**  The program previously failed to retrieve information about the reference CPC from a HMC or SE. The problem now no longer exists.

**User response:**  None.

**CPO3021W    No supported On/Off CoD record for CPC** *name* **found**

**Explanation:**  The current domain configuration contains the definition of the named CPC with the record ID set to *. The hardware information for this CPC can be found but there is no record for temporary capacity of the type supported by the Provisioning Manager. No record is usable and no activation or deactivation of temporary resources for this CPC can be performed.

**User response:**  Add a On/Off CoD record to the CPC.

**CPO3022W    Record ID** *id* **for CPC** *name* **not available**

**Explanation:**  The current domain configuration contains the definition of the named CPC with the referenced On/Off CoD record ID. The hardware information for this CPC can be found but a On/Off CoD record with the defined ID is not available. No activation or deactivation of temporary resources for this CPC can be performed.

**User response:**  Change the domain configuration to reference an available On/Off CoD record or install the referenced On/Off CoD record on the CPC.

**CPO3030I    Command completed successfully for CPC** *name*

**Explanation:**  The program detected that a command that involved adding temporary resources to the referenced CPC has successfully been completed. Such changes may be performed as a result of a ACTIVATE RESOURCE or DEACTIVATE RESOURCE commands. The program will try to adjust to the new situation.

**User response:**  None.

**CPO3031W**   **Unsuccessful command completion for CPC** *name*. **Reason** *number*

**Explanation:**  The program detected that a command that involved adding temporary resources to the referenced CPC failed. Such changes may be performed as a result of a ACTIVATE RESOURCE or DEACTIVATE RESOURCE commands. If the activation was initiated by the Provisioning Manager, it may detect missing resource adjustments.

**User response:**  If the activation of additional temporary resources was initiated manually, then check the reason code and correct the problem. The meanings of the reason codes are described in the document zSeries Application Programming Interfaces, SB10-7030. If the command was initiated by the Provisioning Manager, the missing resource adjustment will be detected and you should instruct it to not wait any further for the adjustments to appear.

**CPO3032I**   **Command completed successfully for CPC** *name*

**Explanation:**  The program detected that a command that involved removing active temporary resources from the referenced CPC has successfully been completed. Such changes may be performed as a result of a DEACTIVATE RESOURCE or ACTIVATE RESOURCE commands. The program will try to adjust to the new situation.

**User response:**  None.

**CPO3033W**   **Unsuccessful command completion at CPC** *name*. **Reason** *number*

**Explanation:**  The program detected that a command failed that involved removing active temporary resources from the referenced CPC. Such changes may be performed as a result of a DEACTIVATE RESOURCE or ACTIVATE RESOURCE commands. If the deactivation was initiated by the Provisioning Manager, it may detect missing resource adjustments.

**User response:**  If the removal of active temporary resources was initiated manually, check the reason code and correct the problem. The meaning of the reason codes are described in the document zSeries Application Programming Interfaces, SB10-7030. If the command was initiated by the Provisioning Manager, the missing resource adjustments will be detected and you should respond to messages that the Provisioning Manager should not wait for further adjustments to appear for the referenced CPC.

**CPO3034W**   **Priority request pending for CPC** *name*

**Explanation:**  The current domain configuration contains the definition of the named CPC. On this CPC a priority activation has been performed that was not able to activate all required resources. Temporary

resources should be freed to allow the priority request. The Provisioning Manager holds its current activated resources and continues to manage from the current situation.

**User response:**  Check which resources for the CPC are missing at the HMC or SE and deactivate those temporary resources either from those activated by the Provisioning Manager or from others not managed by the Provisioning Manager.

**CPO3800I**   **The system at address** *address* **is available**

**Explanation:**  The Provisioning Manager tried to connect to the system at the specified address. This connection could successfully be established.

**User response:**  None.

**CPO3801W**   **The system at address** *address* **is temporarily unavailable**

**Explanation:**  The Provisioning Manager tried to connect to the system at the specified address. This connection could not be established. This message indicates that the Provisioning Manager at the last time tried to connect to this system the connection could successfully be established. A message in the range CPO3850 - CPO3870 describing the problem more detailed may have been send to console before.

**User response:**  Check the previous CPO message for more information.

**CPO3802W**   **The system at address** *address* **is unavailable**

**Explanation:**  The Provisioning Manager tried to connect to the system at the specified address. This connection could not be established. This message indicates that the Provisioning Manager not tried to connect to this system before or that the connection some times in series could not successfully be established. A message in the range CP3801W, CPO3850 - CPO3870 describing the problem more detailed may have been send to console before.

**User response:**  Check the previous CPO message for more information.

**CPO3805W**   **The system at address** *address* **could not be identified**

**Explanation:**  The Provisioning Manager could not retrieve the name of the system at the specified address and/or the name of the sysplex this system belongs to. The Provisioning Manager is not able to identify this system. A message in the range CPO3830 - CPO3838 describing the problem more detailed may have been send to console before.

**User response:** Check the previous CPO message for more information.

---

**CPO3806I**    **The system at address** *address* **is** *name* **in sysplex** *sysplex name*

**Explanation:** The Provisioning Manager retrieved the specified name of the system at the specified address and the specified name of the sysplex this system belongs to.

**User response:** None.

---

**CPO3807W**    **The system at address** *address* **is not the defined system** *name* **in sysplex** *sysplex name*

**Explanation:** The Provisioning Manager detected that the system at the specified address is not the system with the specified name and sysplex name. The message CPO3806I contains the information about the system that the Provisioning Manager found at the specified address.

**User response:** Correct the domain configuration.

---

**CPO3808W**    **The version of the system at address** *address* **is not available**

**Explanation:** The Provisioning Manager could not retrieve the version of the system at the specified address. The Provisioning Manager is not able to detect if the version of this system is supported.

**User response:** Check the CIM server setup.

---

**CPO3809W**    **The version** *version* **of the system at address** *address* **is not supported**

**Explanation:** The Provisioning Manager detected the specified version of the system at the specified address. This version is not supported by the Provisioning Manager.

**User response:** Correct the domain configuration.

---

**CPO3810W**    **The CPC the system at address** *address* **is running on is not available**

**Explanation:** The Provisioning Manager could not retrieve the serial number of the CPC the system at the specified address is running on. A message in the range CPO3830 - CPO3838 describing the problem more detailed may have been send to console before.

**User response:** Check the previous CPO message for more information.

---

**CPO3811W**    **Cannot correlate system at address** *address* **to a CPC with serial number** *serial*

**Explanation:** The Provisioning Manager detected that the system at the specified address is running on the CPC with the specified serial number. This serial number could not be correlated to a CPC name. The initialization of this system will not be continued until the correlation information is available to the Provisioning Manager.

**User response:** None.

---

**CPO3812W**    **The CPC** *name* **the system at address** *address* **is running on is not part of the domain**

**Explanation:** The Provisioning Manager detected that the system at the specified address is running on the CPC with the referenced name. This CPC is not specified in the domain configuration. This system is not valid for further processing.

**User response:** Correct the domain configuration.

---

**CPO3813I**    **The system at address** *address* **is running on CPC** *name*

**Explanation:** The Provisioning Manager detected that the system at the specified address is running on the CPC with the specified name. This CPC is specified in the domain configuration.

**User response:** None.

---

**CPO3815W**    **Insufficient information for retrieving metric values from the system at address** *address*

**Explanation:** The Provisioning Manager could not retrieve the sysplex MINTIME interval from the system at the specified address. This is an indication that the CIM server setup for accessing the RMF Distributed Data Server (DDS) may be incorrect, or that the DDS or RMF data gatherer address spaces are not started. A message in the range CPO3830 - CPO3838 describing the problem more detailed may have been send to console before.

**User response:** Make sure that the Distributed Data Server and RMF Data Gatherer address spaces are started, that the CIM server is set up to communicate with the DDS, and the DDS is configured to allow for communication by the CIM server.

---

**CPO3816W**    **Missing information about the WLM service definition for the system at address** *address*

**Explanation:** The Provisioning Manager could not retrieve the information about the WLM service definition from the system at the specified address. A

message in the range CPO3830 - CPO3838 describing the problem more detailed may have been send to console before.

**User response:** Check the previous CPO message for more information.

---

**CPO3817W  Missing information about WLM service class periods for the system at address** *address*

**Explanation:** The Provisioning Manager could not retrieve the information about WLM service class periods from the system at the specified address. A message in the range CPO3830 - CPO3838 describing the problem in more details may have been sent to the console before.

**User response:** Check the previous CPO message for more information.

---

**CPO3818I  The WLM service definition for the system at address** *address* **has been changed. Name is** *name*, **policy** *policy* **activated at** *policy activation time*

**Explanation:** The Provisioning Manager detected a change of the WLM service definition at the system at the specified address. A new WLM service definition may have been installed, a new policy may have been activated or the active policy may have been reactivated.

**User response:** None.

---

**CPO3819W  Metric values not available for system at** *address*

**Explanation:** The Provisioning Manager tried to retrieve metric values from the system at the specified address. This message is send to console if metric values are not available for more than one interval. This messages indicates that the RMF Distributed Data Server (DDS) may not be started, or the communication between the DDS and the RMF CIM providers does not work correctly.

**User response:** Check that the RMF Distributed Data Server (DDS) is started, and the DDS is configured to allow for communication by the CIM server.

---

**CPO3820W  Long metrics retrieval interval for system at** *address*

**Explanation:** The Provisioning Manager retrieved metrics from the system at the specified address. The retrieval interval is long in relation to the sysplex MINTIME interval. The result is that the metrics cannot be retrieved reliably. A reason may be that the classification in the system causes the CIM/RMFDDS/TCPIP infrastructure to suffer under load.

**User response:** Correct the classification.

---

**CPO3829E  An internal error occurred for observer of system at** *address*

**Explanation:** The observer of the system at the specified address detected an error that has not been handled. This error has been written to the error log.

**User response:** Contact IBM.

---

**CPO3830W  The metric** *name* **is not defined to CIM server at address** *address*

**Explanation:** The Provisioning Manager retrieved the metrics that are defined to the CIM server at the specified address. The specified metric is required for processing but is not defined to the CIM server. This results in an unavailability of values for this metric. The Provisioning Manager processing is limited in case of missing metric values.

**User response:** Correct the CIM server setup.

---

**CPO3831E  Error retrieving metric definitions from CIM server at address** *address*

**Explanation:** The Provisioning Manager tried to retrieve the instances of CIM class IBMzOS_BaseMetricDefinition from the CIM server at the specified address. The CIM operation failed. A message in the range CPO3850E - CPO3870E describing the error more detailed has been send to console before.

**User response:** Check the previous CPO message for more detailed error information.

---

**CPO3833W  No instances of class** *name* **retrieved from CIM server at address** *address*

**Explanation:** The Provisioning Manager could not retrieve instances of the specified CIM class from the CIM server at the specified address. The CIM operation did not fail but no instances were returned. For the CIM classes IBMz_CEC, IBMz_ComputerSystem, IBMzOS_WLMServiceDefinition and IBMzOS_WLMServiceClassPeriod this is an indication that the CIM server setup for accessing the RMF Distributed Data Server (DDS) may be incorrect, or that the DDS or RMF data gatherer address spaces are not started.

**User response:** If this message is issued for CIM classes IBMz_CEC, IBMz_ComputerSystem, IBMzOS_WLMServiceDefinition, or IBMzOS_WLMServiceClassPeriod correct the setup for retrieving instances of the specified CIM class and make sure that the Distributed Data Server and RMF Data Gatherer address spaces are started, that the CIM server is set up to communicate with the DDS, and the DDS is configured to allow for communication by the CIM server. If this message is issued or other CIM

classes than mentioned above contact IBM.

**CPO3834E    Error retrieving instances of class** *name* **from CIM server at address** *address*

**Explanation:**  The Provisioning Manager tried to retrieve instances of the specified CIM class from the CIM server at the specified address. The CIM operation failed. A message in the range CPO3850E - CPO3870E describing the error more detailed has been send to console before.

**User response:**  Check the previous CPO message for more detailed error information.

**CPO3836W    No metric values for class** *name* **retrieved from CIM server at address** *address*

**Explanation:**  The Provisioning Manager tried to retrieve metric values for an instance of the specified CIM class from the CIM server at the specified address. The CIM operation did not fail but no metric values have been returned. This is an indication that the setup for retrieving metric values is not correct. The CIM server may not be correctly configured to access the RMF distributed data server (DDS), the DDS may not be started, the DDS may not be correctly configured to allow request from the system at the specified address (HTTP_NOAUTH), RMF and/or RMF monitors may not be started.

**User response:**  Correct the setup for retrieving metric values.

**CPO3837E    Error retrieving metric values for class** *name* **from CIM server at address** *address*

**Explanation:**  The Provisioning Manager tried to retrieve metric values for an instance of the specified CIM class from the CIM server at the specified address. The CIM operation failed. A message in the range CPO3850E - CPO3870E describing the error more detailed has been send to console before.

**User response:**  Check the previous CPO message for more detailed error information.

**CPO3838E    Error retrieving metric values for metric** *name* **from CIM server at address** *address*

**Explanation:**  The Provisioning Manager tried to retrieve metric values for the specified metric definition from the CIM server at the specified address. The CIM operation failed. A message in the range CPO3850E - CPO3870E describing the error more detailed has been send to console before.

**User response:**  Check the previous CPO message for more detailed error information.

**CPO3850E    Unable to connect to CIM server at** *address*

**Explanation:**  Unable to connect to the CIM server at the specified address. Possible reasons may be that the system is not running, the CIM server is not started, or a network problem.

**User response:**  Ensure that the system and the CIM server are running and/or correct network problems.

**CPO3851E    Timeout while connecting to CIM server at** *address*

**Explanation:**  Unable to connect to the CIM server at the specified address. Timed out.

**User response:**  Ensure that the system and the CIM server are running and/or correct network problems.

**CPO3852E    No CIM server at** *address*

**Explanation:**  Unable to connect to the CIM server at the specified address. Possible reasons may be that the system is not running, the CIM server is not started, or a network problem.

**User response:**  Ensure that the system and the CIM server are running and/or correct network problems.

**CPO3853E    Unknown address** *address*

**Explanation:**  Unable to connect to the CIM server at the specified address. The specified host address cannot be resolved.

**User response:**  Correct the setup.

**CPO3855E    Authentication error at CIM server at** *address*

**Explanation:**  The authentication to the specified CIM server failed for the Provisioning Manager user ID. For further information check the z/OS console of the CIM server system for CIM server messages. The Provisioning Manager user ID may not be known at the CIM server system and/or the setup for your security product pass ticket validation is not correct.

**User response:**  Correct the setup.

**CPO3856E    Proxy authentication error at CIM server at** *address*

**Explanation:**  The authentication to the specified CIM server failed for the Provisioning Manager user ID. For further information check the z/OS console of the CIM server system for CIM server messages. The Provisioning Manager user ID may not be known at the CIM server system and/or the setup for your security product pass ticket validation is not correct.

**User response:**  Correct the setup.

**CPO3860E    CIM_ERR_ACCESS_DENIED at CIM server at** *address*. **Error is** *"error"*

**Explanation:**   An operation at the CIM server at the specified address failed with the error code CIM_ERR_ACCESS_DENIED: Access to a CIM resource is not available to the client. More specific information is contained in the specified error text. Ensure that the setup of the Provisioning Manager user ID for accessing CIM resources is correct.

**User response:**   Check the error text and correct the setup.

---

**CPO3861E    CIM_ERR_NOT_SUPPORTED at CIM server at** *address*. **Error is** *"error"*

**Explanation:**   An operation at the CIM server at the specified address failed with the error code CIM_ERR_NOT_SUPPORTED: The requested operation is not supported. More specific information is contained in the specified error text. This error may occur if a CIM provider module that is participated in the failed CIM operation is not installed or is disabled. To list the installed CIM provider modules and their status use the command cimprovider.

**User response:**   Check the error text and correct the setup.

---

**CPO3862E    CIM_ERR_INVALID_CLASS at CIM server at** *address*. **Error is** *"error"*

**Explanation:**   An operation at the CIM server at the specified address failed with the error code CIM_ERR_INVALID_CLASS: The specified class does not exist. More specific information is contained in the specified error text. This error may occur if the CIM class the CIM operation failed for is not registered to the CIM server. To validate if this class is registered correctly use the command cimcli -gc {CIM class name}.

**User response:**   Check the error text and correct the setup.

---

**CPO3863E    CIM_ERR_INVALID_NAMESPACE at CIM server at** *address*. **Error is** *"error"*

**Explanation:**   An operation at the CIM server at the specified address failed with the error code CIM_ERR_INVALID_NAMESPACE: The target namespace does not exist. More specific information is contained in the specified error text. The Provisioning Manager uses the default CIM namespace root/cimv2. Ensure that the CIM repository is set up correctly.

**User response:**   Check the error text and correct the setup.

---

**CPO3864E    CIM_ERR_LOW_ON_MEMORY at CIM server at** *address*. **Error is** *"error"*

**Explanation:**   An operation at the CIM server at the specified address failed with the error code CIM_ERR_LOW_ON_MEMORY. More specific information is contained in the specified error text.

**User response:**   Check the error text and correct the setup.

---

**CPO3865E    CIM_ERR_NOT_FOUND at CIM server at** *address*. **Error is** *"error"*

**Explanation:**   An operation at the CIM server at the specified address failed with the error code CIM_ERR_NOT_FOUND: The requested object cannot be found. More specific information is contained in the specified error text.

**User response:**   Check the error text and correct the setup.

---

**CPO3866E    CIM_ERR_FAILED at CIM server at** *address*. **Error is** *"error"*

**Explanation:**   An operation at the CIM server at the specified address failed with the error code CIM_ERR_FAILED: A general error occurred that is not covered by a more specific error code. More specific information is contained in the specified error text.

**User response:**   Check the error text and correct the setup.

---

**CPO3870E**    *error code* **at CIM server at** *address*. **Error is** *"error"*

**Explanation:**   An operation at the CIM server at the specified address failed with the specified error code.

**User response:**   Check the error text and correct the setup.

---

**CPO3880I    System** *system name* **in sysplex** *sysplex name* **is now monitored**

**Explanation:**   The monitoring of the referenced system has been started. The Provisioning Manager has been initialized this system successfully and has been identified this system as eligible system.

**User response:**   None.

---

**CPO3881I    System** *system name* **in sysplex** *sysplex name* **monitoring stopped**

**Explanation:**   The monitoring of the referenced system has been stopped. This may be when this system has been disabled, when this system has became permanently unavailable, when the processing mode has been changed to manual, when a new configuration has been activated, or when the

Provisioning Manager has been stopped.

**User response:** None.

---

**CPO3900E** **Error reading simulation file** *"filename"*. **Error is** *"error"*

**Explanation:** The Provisioning Manager tried to read the system observation simulation file with the specified name. This operation failed with the specified error.

**User response:** Correct the problem.

---

**CPO3901W** **Missing simulation data for system at address** *address*

**Explanation:** The Provisioning Manager tried to load the simulation data for the system at the specified address. This operation failed. This may be intended to simulate the unavailability of the system at the specified address.

**User response:** Check message CPO3900E for more specific information.

---

**CPO3902W** **Missing simulation data for resource** *name*

**Explanation:** The Provisioning Manager tried to load the simulation data for the resource with the specified name. This operation failed. This may be intended to simulate the unavailability of metric values for the resource with the specified name.

**User response:** Check message CPO3900E for more specific information.

---

**CPO3940E** **Error detecting the Provisioning Manager user name. Error is** *"error"*

**Explanation:** The Provisioning Manager tried to detect the name of the user ID it has been started with. This operation failed with the specified error.

**User response:** Correct the problem and start the Provisioning Manager again.

---

**CPO3950E** **Pass ticket generation for user** *user* **and application** *applid* **failed with return codes** *racf rc*,*racf rsn*,*saf rc*

**Explanation:** The Provisioning Manager tried to generate a pass ticket for the specified user name and the specified application. The generation failed with the specified return codes. For an explanation of the return codes refer to the discussion of R_GenSec in z/OS Security Server RACF Callable Services, or the respective documentation of your vendor.

**User response:** Correct the setup for generating pass tickets.

---

**CPO4001E** *resource type resource name* **monitoring data** *monitoring metric* **was not available for analysis**

**Explanation:** The Capacity Provisioning Analyzer was not able to retrieve metric values.

**User response:** Please make sure that the given resource is activated/available.

---

**CPO4002E** **Analysis-step** *decision ID* **lacked of necessary data for deciding on provisioning** *provisioning type* **resources**

**Explanation:** The Capacity Provisioning Analyzer lacked metric values needed for the recognition of resource bottlenecks.

**User response:** Please observe the indications in the preceding message CPO4001.

---

**CPO4003E** *resource type resource name* **monitoring data** *monitoring metric* **has value 0 that is not valid**

**Explanation:** The Capacity Provisioning Analyzer cannot calculate with the provided data.

**User response:** Please find out why the mentioned data holds values that are not valid and correct the problem.

---

**CPO4101W** **Manual intervention detected for CPC** *name*. **Continue managing model** *model* **(** *CP number*/*capacity level***) with** *zAAP number* **zAAPs and** *zIIP number* **zIIPs**

**Explanation:** The Provisioning Manager detected changes to the activated temporary capacity that is below the level of resources that have been activated. The manager continues to run but may not correctly recognize resources that get active because of Provisioning Manager activation requests.

**User response:** Do not perform activations and deactivations while the Provisioning Manager has activation requests outstanding. It may happen that additional activations are left and will be reported later by the hardware. Such resources must be deactivated manually, if required.

---

**CPO4103I** **A change of the manually activated resources has been detected for CPC** *name*. **The base levels for provisioning management are now** *CP number* **CP, capacity level** *capacity level*, *zAAP number* **zAAP and** *zIIP number* **zIIP**

**Explanation:** The Provisioning Manager detected a change of the manually activated resources. Only the capacities that have more CPs, a higher capacity level, more zAAPs and more zIIPs than the capacity written in the message will be managed, so that the

Provisioning Manager will not deprovision to a lower capacity.

**User response:** Check the resources that are not managed by the Provisioning Manager and deactivate them when they are no longer needed.

---

**CPO4104I** **A change of the On/Off CoD record has been detected on CPC** *name*. **New record id is** *record id*

**Explanation:** The Provisioning Manager detected a change of the On/Off CoD record that it manages on the given CPC. The activation level have been reinitialized, and all precedent activations and request are lost.

**User response:** None.

---

**CPO4105I** **A change of the manually activated resources has been detected for CPC** *name*. **All resources of the defined On/Off CoD record are now managed by the Provisioning Manager**

**Explanation:** Previously, the Provisioning Manager detected that there were active resources for the managed On/Off CoD record that had not been activated by the Provisioning Manager. All these resources are now inactive. The Provisioning Manager continues to manage all remaining active resources of the defined On/Off CoD record.

**User response:** None.

---

**CPO4106E** **I/O error sending request to operator:** *"text"*

**Explanation:** The Provisioning Manager tried to send a request to the operator console by failed with the referenced error. The message is not displayed.

**User response:** Correct the error and try again.

---

**CPO4107I** **Message** *message* **for CPC** *name* **is cancelled**

**Explanation:** There was an outstanding request to the operator for the referenced CPC. The situation has been resolved automatically, and the reply is not needed any longer.

**User response:** None.

---

**CPO4108I** **Activation of resources for CPC** *name* **successfully initiated: model** *model* **(**CP *number*/*capacity level***) with** *zAAP number* **zAAPs and** *zIIP number* **zIIPs**

**Explanation:** The Provisioning Manager has initiated the activation of the referenced resources on the referenced CPC. This activation may fail in the next steps after its initialization, so this message should not

be taken as a confirmation for an activation.

**User response:** None.

---

**CPO4109I** **Deactivation of resources for CPC** *name* **successfully initiated: model** *model* **(**CP *number*/*capacity level***) with** *zAAP number* **zAAPs and** *zIIP number* **zIIPs**

**Explanation:** The Provisioning Manager has initiated the deactivation of the referenced resources on the referenced CPC. This deactivation may fail in the next steps after its initialization, so this message should not be taken as a confirmation for a deactivation.

**User response:** None.

---

**CPO4110E** **Response** *"reply"* **to operator request for CPC** *name* **is not valid**

**Explanation:** The reply to operator request message for the referenced CPC is not in the allowed range. Allowed values are '1' and '2'. The request is issued again.

**User response:** Reply to the new request with a supported answer.

---

**CPO4111E** **Response** *"reply"* **to operator request for CPC** *name* **is not valid**

**Explanation:** The reply to operator request message for the referenced CPC is not in the allowed range. Allowed values are '1' and '2'. The request is issued again.

**User response:** Reply to the new request with a supported answer.

---

**CPO4112I** **Activation request for CPC** *name* **rejected**

**Explanation:** The operator has rejected an activation needed by the policy and the current workload situation. The CPC is not considered for any further activations for some time.

**User response:** None.

---

**CPO4113I** **Deactivation request for CPC** *name* **rejected**

**Explanation:** The operator has rejected an deactivation needed by the policy and the current workload situation. The CPC is not considered for any further activations for some time.

**User response:** None.

---

**CPO4114I**    **The requested capacity on CPC** *name* **has been reached. Message** *message* **for this CPC is cancelled**

**Explanation:** There was an outstanding request to the operator for the referenced CPC. The described situation has been resolved automatically, and the reply is not needed any longer.

**User response:** None.

**CPO4115I**    **The CPC** *name* **is being stopped. Message** *message* **for this CPC is cancelled**

**Explanation:** There was an outstanding request to the operator for the referenced CPC. The described situation has been resolved automatically, and the reply is not needed any longer.

**User response:** None.

**CPO4116I**    **Workload situation has changed on CPC** *name*. **Message** *message* **for this CPC is cancelled**

**Explanation:** There was an outstanding request to the operator for the referenced CPC. The described situation has been resolved automatically, and the reply is not needed any longer.

**User response:** None.

**CPO4117I**    **No more capacity change needed on CPC** *name*. **Message** *message* **for this CPC is cancelled**

**Explanation:** There was an outstanding request to the operator for the referenced CPC. The described situation has been resolved automatically, and the reply is not needed any longer.

**User response:** None.

**CPO4118I**    **Provisioning timer timed out on CPC** *name*. **Message** *message* **for this CPC is cancelled**

**Explanation:** There was an outstanding request to the operator for the referenced CPC. The described situation has been resolved automatically, and the reply is not needed any longer.

**User response:** None.

**CPO4119I**    **Deprovisioning timer timed out on CPC** *name*. **Message** *message* **for this CPC is cancelled**

**Explanation:** There was an outstanding request to the operator for the referenced CPC. The described situation has been resolved automatically, and the reply is not needed any longer.

**User response:** None.

**CPO4120I**    **The provisioning planner is not in confirmation mode anymore. Message** *message* **for CPC** *name* **is cancelled**

**Explanation:** There was an outstanding request to the operator for the referenced CPC. The described situation has been resolved automatically, and the reply is not needed any longer.

**User response:** None.

**CPO4121I**    **Some temporary resources were already active when starting managing the CPC** *name*. **Only resources exceeding** *CP number* **CP, capacity level** *capacity level*, *zAAP number* **zAAP and** *zIIP number* **zIIP will be managed by the Provisioning Manager**

**Explanation:** The Provisioning Manager that some resources were already activated when starting managing the CPC. Only the capacities that have more CPs, a higher capacity level, more zAAPs and more zIIPs than the capacity written in the message will be managed, so that the Provisioning Manager will not deprovision to a lower capacity level.

**User response:** Check the resources that are not managed by the Provisioning Manager and deactivate them when they are no longer needed.

**CPO4150I**    **Policy recommends provisioning of resources due to scheduled activation on CPC** *CPC name*.\nNew recommendation **is:** *New MSU* **MSU/**-*New zAAP* **zAAP/**-*New zIIP* **zIIP.\nPrevious recommendation was:** *Old MSU* **MSU/**-*Old zAAP* **zAAP/**-*Old zIIP* **zIIP**

**Explanation:** The Provisioning Manager is in analysis mode and detected that, according to the policy, changes in the capacity settings on the referenced CPC are needed.

**User response:** Check whether the situation is correctly identified and, if not, adjust the policy.

**CPO4151I**    **Policy recommends deprovisioning of resources due to scheduled deactivation on CPC** *CPC name*.**\nNew recommendation is:** *New MSU* **MSU/**-*New zAAP* **zAAP/**-*New zIIP* **zIIP.\nPrevious recommendation was:** *Old MSU* **MSU/**-*Old zAAP* **zAAP/**-*Old zIIP* **zIIP**

**Explanation:** The Provisioning Manager is in analysis mode and detected that, according to the policy, changes in the capacity settings on the referenced CPC are needed.

**User response:** Check whether the situation is

correctly identified and, if not, adjust the policy.

---

**CPO4152I    Policy recommends provisioning of resources due to scheduled activation on CPC** *CPC name*.**\nRecommendation is:** *MSU* **MSU/***zAAP* **zAAP/***zIIP* **zIIP**

**Explanation:**  The Provisioning Manager is in analysis mode and detected that, according to the policy, changes in the capacity settings on the referenced CPC are needed.

**User response:**  Check whether the situation is correctly identified and, if not, adjust the policy.

---

**CPO4153I    Policy recommends deprovisioning of resources on CPC** *CPC name*.**\nNew recommendation is:** *New MSU* **MSU/***New zAAP* **zAAP/***New zIIP* **zIIP.\nPrevious recommendation was:** *Old MSU* **MSU/***Old zAAP* **zAAP/***Old zIIP* **zIIP**

**Explanation:**  The Provisioning Manager is in analysis mode and detected that, according to the policy and the current workload situation, changes in the capacity settings on the referenced CPC are needed.

**User response:**  Check whether the situation is correctly identified and, if not, adjust the policy.

---

**CPO4154I    Policy recommends provisioning of resources on behalf of observed workload on CPC** *CPC name*.**\nNew recommendation is: Increase CP capacity settings. Policy limit is** *New MSU* **MSU**

**Explanation:**  The Provisioning Manager is in analysis mode and detected that, according to the policy and the current workload situation, changes in the capacity settings on the referenced CPC are needed.

**User response:**  Check whether the situation is correctly identified and, if not, adjust the policy.

---

**CPO4155I    Policy recommends provisioning of resources on behalf of observed workload on CPC** *CPC name*.**\nNew recommendation is: Increase CP capacity settings or activate zAAPs. Policy limit is** *New MSU limit* **MSU/***New zAAP limit* **zAAP**

**Explanation:**  The Provisioning Manager is in analysis mode and detected that, according to the policy and the current workload situation, changes in the capacity settings on the referenced CPC are needed.

**User response:**  Check whether the situation is correctly identified and, if not, adjust the policy.

---

**CPO4156I    Policy recommends provisioning of resources on behalf of observed workload on CPC** *CPC name*.**\nNew recommendation is: Increase CP capacity settings or activate zIIPs. Policy limit is** *New MSU limit* **MSU/***New zIIP limit* **zIIP**

**Explanation:**  The Provisioning Manager is in analysis mode and detected that, according to the policy and the current workload situation, changes in the capacity settings on the referenced CPC are needed.

**User response:**  Check whether the situation is correctly identified and, if not, adjust the policy.

---

**CPO4157I    Policy recommends provisioning of resources on behalf of observed workload on CPC** *CPC name*.**\nNew recommendation is: Increase CP capacity settings or activate zAAPs or zIIPs. Policy limit is** *New MSU limit* **MSU/***New zAAP limit* **zAAP/***New zIIP limit* **zIIP**

**Explanation:**  The Provisioning Manager is in analysis mode and detected that, according to the policy and the current workload situation, changes in the capacity settings on the referenced CPC are needed.

**User response:**  Check whether the situation is correctly identified and, if not, adjust the policy.

---

**CPO4158I    Policy recommends provisioning of resources on behalf of observed workload on CPC** *CPC name*.**\nNew recommendation is: Increase CP capacity level. Policy limit is** *New MSU* **MSU**

**Explanation:**  The Provisioning Manager is in analysis mode and detected that, according to the policy and the current workload situation, changes in the capacity settings on the referenced CPC are needed.

**User response:**  Check whether the situation is correctly identified and, if not, adjust the policy.

---

**CPO4159I    Policy recommends provisioning of resources on behalf of observed workload on CPC** *CPC name*.**\nNew recommendation is: Increase CP capacity level or activate zAAPs. Policy limit is** *New MSU limit* **MSU/***New zAAP limit* **zAAP**

**Explanation:**  The Provisioning Manager is in analysis mode and detected that, according to the policy and the current workload situation, changes in the capacity settings on the referenced CPC are needed.

**User response:**  Check whether the situation is correctly identified and, if not, adjust the policy.

---

**CPO4160I**  **Policy recommends provisioning of resources on behalf of observed workload on CPC** *CPC name***.\nNew recommendation is: Increase CP capacity level or activate zIIPs. Policy limit is** *New MSU limit* **MSU/***New zIIP limit* **zIIP**

**Explanation:** The Provisioning Manager is in analysis mode and detected that, according to the policy and the current workload situation, changes in the capacity settings on the referenced CPC are needed.

**User response:** Check whether the situation is correctly identified and, if not, adjust the policy.

**CPO4161I**  **Policy recommends provisioning of resources on behalf of observed workload on CPC** *CPC name***.\nNew recommendation is: Increase CP capacity level or activate zAAPs or zIIPs. Policy limit is** *New MSU limit* **MSU/***New zAAP limit* **zAAP/***New zIIP limit* **zIIP**

**Explanation:** The Provisioning Manager is in analysis mode and detected that, according to the policy and the current workload situation, changes in the capacity settings on the referenced CPC are needed.

**User response:** Check whether the situation is correctly identified and, if not, adjust the policy.

**CPO4162I**  **Policy recommends provisioning of resources on behalf of observed workload on CPC** *CPC name***.\nNew recommendation is: Activate zAAPs. Policy limit is** *New zAAP limit* **zAAP**

**Explanation:** The Provisioning Manager is in analysis mode and detected that, according to the policy and the current workload situation, changes in the capacity settings on the referenced CPC are needed.

**User response:** Check whether the situation is correctly identified and, if not, adjust the policy.

**CPO4163I**  **Policy recommends provisioning of resources on behalf of observed workload on CPC** *CPC name***.\nNew recommendation is: Activate zIIPs. Policy limit is** *New zIIP limit* **zIIP**

**Explanation:** The Provisioning Manager is in analysis mode and detected that, according to the policy and the current workload situation, changes in the capacity settings on the referenced CPC are needed.

**User response:** Check whether the situation is correctly identified and, if not, adjust the policy.

**CPO4164I**  **Policy recommends provisioning of resources on behalf of observed workload on CPC** *CPC name***.\nNew recommendation is: Activate zAAPs or zIIPs. Policy limit is** *New zAAP limit* **zAAP/***New zIIP limit* **zIIP**

**Explanation:** The Provisioning Manager is in analysis mode and detected that, according to the policy and the current workload situation, changes in the capacity settings on the referenced CPC are needed.

**User response:** Check whether the situation is correctly identified and, if not, adjust the policy.

**CPO4165I**  **Policy recommends deprovisioning of resources on behalf of observed workload on CPC** *CPC name***.\nNew recommendation is: Decrease CP capacity settings. Policy limit is** *New MSU* **MSU**

**Explanation:** The Provisioning Manager is in analysis mode and detected that, according to the policy and the current workload situation, changes in the capacity settings on the referenced CPC are needed.

**User response:** Check whether the situation is correctly identified and, if not, adjust the policy.

**CPO4166I**  **Policy recommends deprovisioning of resources on behalf of observed workload on CPC** *CPC name***.\nNew recommendation is: Decrease CP capacity settings or deactivate zAAPs. Policy limit is** *New MSU limit* **MSU/***New zAAP limit* **zAAP**

**Explanation:** The Provisioning Manager is in analysis mode and detected that, according to the policy and the current workload situation, changes in the capacity settings on the referenced CPC are needed.

**User response:** Check whether the situation is correctly identified and, if not, adjust the policy.

**CPO4167I**  **Policy recommends deprovisioning of resources on behalf of observed workload on CPC** *CPC name***.\nNew recommendation is: Decrease CP capacity settings or deactivate zIIPs. Policy limit is** *New MSU limit* **MSU/***New zIIP limit* **zIIP**

**Explanation:** The Provisioning Manager is in analysis mode and detected that, according to the policy and the current workload situation, changes in the capacity settings on the referenced CPC are needed.

**User response:** Check whether the situation is correctly identified and, if not, adjust the policy.

**CPO4168I  Policy recommends deprovisioning of resources on behalf of observed workload on CPC** *CPC name*.**\nNew recommendation is: Decrease CP capacity settings or deactivate zAAPs or zIIPs. Policy limit is** *New MSU limit* **MSU/***New zAAP limit* **zAAP/***New zIIP limit* **zIIP**

**Explanation:**  The Provisioning Manager is in analysis mode and detected that, according to the policy and the current workload situation, changes in the capacity settings on the referenced CPC are needed.

**User response:**  Check whether the situation is correctly identified and, if not, adjust the policy.

**CPO4169I  Policy recommends deprovisioning of resources on behalf of observed workload on CPC** *CPC name*.**\nNew recommendation is: Decrease CP capacity level. Policy limit is** *New MSU* **MSU**

**Explanation:**  The Provisioning Manager is in analysis mode and detected that, according to the policy and the current workload situation, changes in the capacity settings on the referenced CPC are needed.

**User response:**  Check whether the situation is correctly identified and, if not, adjust the policy.

**CPO4170I  Policy recommends deprovisioning of resources on behalf of observed workload on CPC** *CPC name*.**\nNew recommendation is: Decrease CP capacity level or deactivate zAAPs. Policy limit is** *New MSU limit* **MSU/***New zAAP limit* **zAAP**

**Explanation:**  The Provisioning Manager is in analysis mode and detected that, according to the policy and the current workload situation, changes in the capacity settings on the referenced CPC are needed.

**User response:**  Check whether the situation is correctly identified and, if not, adjust the policy.

**CPO4171I  Policy recommends deprovisioning of resources on behalf of observed workload on CPC** *CPC name*.**\nNew recommendation is: Decrease CP capacity level or deactivate zIIPs. Policy limit is** *New MSU limit* **MSU/***New zIIP limit* **zIIP**

**Explanation:**  The Provisioning Manager is in analysis mode and detected that, according to the policy and the current workload situation, changes in the capacity settings on the referenced CPC are needed.

**User response:**  Check whether the situation is correctly identified and, if not, adjust the policy.

**CPO4172I  Policy recommends deprovisioning of resources on behalf of observed workload on CPC** *CPC name*.**\nNew recommendation is: Decrease CP capacity level or deactivate zAAPs or zIIPs. Policy limit is** *New MSU limit* **MSU/***New zAAP limit* **zAAP/***New zIIP limit* **zIIP**

**Explanation:**  The Provisioning Manager is in analysis mode and detected that, according to the policy and the current workload situation, changes in the capacity settings on the referenced CPC are needed.

**User response:**  Check whether the situation is correctly identified and, if not, adjust the policy.

**CPO4173I  Policy recommends deprovisioning of resources on behalf of observed workload on CPC** *CPC name*.**\nNew recommendation is: Deactivate zAAPs. Policy limit is** *New zAAP limit* **zAAP**

**Explanation:**  The Provisioning Manager is in analysis mode and detected that, according to the policy and the current workload situation, changes in the capacity settings on the referenced CPC are needed.

**User response:**  Check whether the situation is correctly identified and, if not, adjust the policy.

**CPO4174I  Policy recommends deprovisioning of resources on behalf of observed workload on CPC** *CPC name*.**\nNew recommendation is: Deactivate zIIPs. Policy limit is** *New zIIP limit* **zIIP**

**Explanation:**  The Provisioning Manager is in analysis mode and detected that, according to the policy and the current workload situation, changes in the capacity settings on the referenced CPC are needed.

**User response:**  Check whether the situation is correctly identified and, if not, adjust the policy.

**CPO4175I  Policy recommends deprovisioning of resources on behalf of observed workload on CPC** *CPC name*.**\nNew recommendation is: Deactivate zAAPs or zIIPs. Policy limit is** *New zAAP limit* **zAAP/***New zIIP limit* **zIIP**

**Explanation:**  The Provisioning Manager is in analysis mode and detected that, according to the policy and the current workload situation, changes in the capacity settings on the referenced CPC are needed.

**User response:**  Check whether the situation is correctly identified and, if not, adjust the policy.

**CPO4201I**    **Proposed upgrade for CPC** *name* **is model** *target* **with** *zAAP count* **zAAPs and** *zIIP count* **zIIPs. Enter 1 to activate or 2 reject**

**Explanation:** The Provisioning Manager detected that additional temporary resources for the referenced CPC are needed. It is running in controlled mode so you may allow or reject the activation of the temporary resources.

**User response:** Enter '1' to allow the activation of the proposed temporary resources. If you don't want to allow this, reply with '2'. In this case planning for further activations for the CPC is not done for some time.

**CPO4202I**    **Proposed downgrade for CPC** *name* **is model** *target* **with** *zAAP count* **zAAPs and** *zIIP count* **zIIPs. Enter 1 to deactivate or 2 to reject**

**Explanation:** The Provisioning Manager detected that less temporary resources for the referenced CPC are needed. It is running in controlled mode so you may allow or reject the deactivation of the temporary resources.

**User response:** Enter '1' to allow the deactivation of the proposed temporary resources. If you don't want to allow this, reply with '2'. In this case planning for further deactivations for the CPC is not done for some time.

**CPO4203I**    **Unexpected capacity setting for CPC** *name*. **Action may be pending. Expected** *expected model*(*expected CP count*/*expected capacity level*) *expected zAAP count*/*expected zIIP count*. **Actual:** *actual model*(*actual CP count*/*actual capacity level*) *actual zAAP count*/*actual zIIP count*

**Explanation:** The Provisioning Manager initiated the activation of some temporary resources but the completion event for this activation was not received. Different reasons may lead to this situation, such as the temporary capacity of the CPC was changed manually, interfering with the activation by the Provisioning Manager, a problem in the communication protocol to the CPC, the Provisioning Manager was down when the event occurred, or there was a delay in the CPC activation. Subsequent prompt CPO4205I allows you to specify whether the provisioning manager should continue waiting for the completion of the activation or whether it should accept the current capacity setting.

**User response:** Check for subsequent message CPO4205I and reply to that message.

**CPO4204I**    **Unexpected capacity setting for CPC** *name*. **Action may be pending. Expected** *expected model*(*expected CP count*/*expected capacity level*) *expected zAAP count*/*expected zIIP count*. **Actual:** *actual model*(*actual CP count*/*actual capacity level*) *actual zAAP count*/*actual zIIP count*

**Explanation:** The Provisioning Manager initiated the deactivation of some temporary resources but the completion event for this activation was not received. Different reasons may lead to this situation, such as the temporary capacity of the CPC was changed manually, interfering with the activation by the Provisioning Manager, a problem in the communication protocol to the CPC, the Provisioning Manager was down when the event occurred, or there was a delay in the CPC activation. Subsequent prompt CPO4206I allows you to specify whether the provisioning manager should continue waiting for the completion of the activation or whether it should accept the current capacity setting.

**User response:** Check for subsequent message CPO4206I and reply to that message.

**CPO4205I**    **CPC** *name*: **Enter '1' to keep waiting for pending activation or '2' to accept current capacity setting**

**Explanation:** The Provisioning Manager initiated the activation of some temporary resources but the completion event for this activation was not received. Different reasons may lead to this situation, such as the temporary capacity of the CPC was changed manually, interfering with the activation by the Provisioning Manager, a problem in the communication protocol to the CPC, the Provisioning Manager was down when the event occurred, or there was a delay in the CPC activation. Refer to the preceding CPO4203I message for this CPC for more detail on the expected and currently effective capacity settings.

**User response:** Refer to the preceding CPO4203I message for this CPC for more detail on the expected and currently effective capacity settings.

**CPO4206I**    **CPC** *name*: **Enter '1' to keep waiting for pending deactivation or '2' to accept current capacity setting**

**Explanation:** The Provisioning Manager initiated the deactivation of some temporary resources but the completion event for this activation was not received. Different reasons may lead to this situation, such as the temporary capacity of the CPC was changed manually, interfering with the activation by the Provisioning Manager, a problem in the communication protocol to the CPC, the Provisioning Manager was down when the event occurred, or there was a delay in the CPC activation. Refer to the preceding CPO4204I message for this CPC for more detail on the expected and currently effective capacity settings.

**User response:** Refer to the preceding CPO4204I message for this CPC for more detail on the expected and currently effective capacity settings.

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**CPO5000E** **The Provisioning Manager is not started**

**Explanation:** The invoke method request failed because the Provisioning Manager is not started.

**User response:** None.

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**CPO5001E** **The Provisioning Manager may not be started**

**Explanation:** The invoke method request failed because the Provisioning Manager may not be started.

**User response:** None.

---

**CPO5010E** **User is not authorized to query the Provisioning Manager**

**Explanation:** The get instance/enumerate instances request failed because the requesting user ID is not authorized to query the Provisioning Manager using the CIM provider interface.

**User response:** Add the user ID to the group that is configured to execute Provisioning Manager query commands using the CIM provider interface.

---

**CPO5011E** **User is not authorized to query the Provisioning Manager**

**Explanation:** The invoke method request failed because the requesting user ID is not authorized to query the Provisioning Manager using the CIM provider interface.

**User response:** Add the user ID to the group that is configured to execute Provisioning Manager query commands using the CIM provider interface.

---

**CPO5012E** **User is not authorized to control the Provisioning Manager**

**Explanation:** The invoke method request failed because the requesting user ID is not authorized to control the Provisioning Manager using the CIM provider interface.

**User response:** Add the user ID to the group that is configured to execute Provisioning Manager control commands using the CIM provider interface.

---

**CPO8010E** **Authentication error: User or password may not be valid. For further information check the z/OS console messages**

**Explanation:** The authentication to the specified host failed. User or password may not be valid. Please check

the z/OS Console messages, there may be further information.

**User response:** Correct the domain setup. For a description how to set up the domain refer to the product documentation.

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**CPO8011E** **Authentication error: User or password may not be valid. For further information check the z/OS console messages**

**Explanation:** The authentication to the specified host failed. User or password may not be valid. Please check the z/OS Console messages, there may be further information.

**User response:** Correct the domain setup. For a description how to set up the domain refer to the product documentation.

---

**CPO8020E** **Security error: Access to the host is denied. For further information check the z/OS console messages**

**Explanation:** The Control Center tried to connect to the system at the specified address and failed with the error code EXT_ERR_ACCESS_DENIED. Ensure that the setup of the user for accessing CIM resources is correct.

**User response:** Ensure that the setup of the user for accessing CIM resources is correct. For a description how to set up the domain refer to the product documentation.

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**CPO8021E** **Security error: Access to the host is denied. For further information check the z/OS console messages**

**Explanation:** The Control Center tried to connect to the system at the specified address and failed with the error code EXT_ERR_INVALID_CREDENTIAL. Ensure that the setup of the user for accessing CIM resources is correct.

**User response:** Ensure that the setup of the user for accessing CIM resources is correct. For a description how to set up the domain refer to the product documentation.

---

**CPO8022E** **An security error occurred:** *"CIMException class"*. **For further information check the z/OS console messages**

**Explanation:** The Control Center tried to connect to the host at the specified address and failed with an exception CIMSecurityException. Ensure that the setup of the user for accessing CIM resources is correct.

**User response:** Ensure that the setup of the user for accessing CIM resources is correct. For a description

how to set up the domain refer to the product documentation.

**CPO8030E    No CIM server found**

**Explanation:**  Unable to connect to the CIM server. Possible reasons may be that the system is not running, the CIM server is not started, or a network problem exists.

**User response:**  Ensure that the system and the CIM server are running and correct possible network problems.

**CPO8031E    Unable to connect to CIM server**

**Explanation:**  Unable to connect to the CIM server. Possible reasons may be that the system is not running, the CIM server is not started, or a network problem exists.

**User response:**  Ensure that the system and the CIM server are running and correct possible network problems.

**CPO8032E    The specified host** *address* **is unknown**

**Explanation:**  Unable to connect to the specified host. The specified host address cannot be resolved.

**User response:**  Correct the domain setup. For a description how to set up the domain refer to the product documentation.

**CPO8033E    Timeout while connecting to host** *address*

**Explanation:**  Unable to connect to the specified host. Timed out.

**User response:**  Ensure that the system and the CIM server are running and correct possible network problems.

**CPO8034E    An unknown CIM transport exception occurred:** *"CIMException class"*. **For further information check the z/OS console messages**

**Explanation:**  Unknown CIM exception occurred while trying to connect to the host. Please check the z/OS Console messages, there may be further information.

**User response:**  Ensure that the system and the CIM server are running and/or correct network problems.

**CPO8040E    Access to the host is denied. For further information check the z/OS console messages**

**Explanation:**  The Control Center tried to connect to the system at the specified address and failed with the error code CIM_ERR_ACCESS_DENIED.

**User response:**  Ensure that the security setup for the provisioning manager and the security setup for the user for accessing CIM resources is correct. For a description how to set up the provisioning domain refer to the product documentation.

**CPO8050E    An CIM exception occurred: Error is** *"error"*. **For further information check the z/OS console messages**

**Explanation:**  An operation at the CIM server failed with the specified error code.

**User response:**  Check the error text and correct the setup. For a description how to set up the domain refer to the product documentation.

**CPO8051E    Unable to connect to CIM server with the already established connection. Connect to the host again**

**Explanation:**  It is not possible to refresh the status information using the existing connection. Please check the z/OS Console messages, there may be further information.

**User response:**  Connect to the host to create a new connection.

**CPO8052E    No Provisioning Manager configured for domain** *domain name*

**Explanation:**  There is no Provisioning Manager configured for the given domain.

**User response:**  Correct the domain setup. For a description how to set up the domain refer to the product documentation.

**CPO8053E    No connection established to the defined host address**

**Explanation:**  It was not possible to establish a connection the defined host address. For more details see the connection report.

**User response:**  Check the connection report for detailed information.

**CPO8054I    Connection established to host** *host address*

**Explanation:**  A connection was established.

**User response:**  None.

**CPO8055E    Connection request to a host was stopped by the user**

**Explanation:**  A connection request to a cim server was stopped by pressing the disconnect button.

**User response:**  None.

**CPO8056I    Status information successfully refreshed**

**Explanation:**  None.

**User response:**  None.

---

**CPO8057I    Connection cancelled**

**Explanation:**  The connection was cancelled by the user.

**User response:**  None.

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**CPO8062E    The SBLIM CIM Client was not found in the current class path. The current class path is:** *class*

**Explanation:**  The Capacity Provisioning Control Center is configured to use the SBLIM CIM Client but the corresponding class is not found.

**User response:**  Ensure that the SBLIM CIM Client 'sblimCIMClient.jar' resides in the directory you specified while the installation of the control center.

---

**CPO8071E    Install** *name* **failed. The Provisioning Manager ist not started**

**Explanation:**  An error occurred while installing the policy or configuration on the host.

**User response:**  Start the Provisioning Manager.

---

**CPO8072E    Install** *name* **failed. The request failed**

**Explanation:**  An error occurred while installing a policy or configuration on host.

**User response:**  Start the Provisioning Manager.

---

**CPO8073E    Install** *name* **failed. The response failed**

**Explanation:**  An error occurred while installing the policy or configuration on host.

**User response:**  Start the Provisioning Manager.

---

**CPO8074E    Install** *name* **failed. Unknown error**

**Explanation:**  An error occurred while installing the policy or configuration on host.

**User response:**  Start the Provisioning Manager.

---

**CPO8075E    The installation of** *name* **was not successful**

**Explanation:**  It was not possible to install the policy or Configuration on the host. For more details see the connection report.

**User response:**  Check the connection report for detailed information.

---

**CPO8076I    *name* is successfully installed**

**Explanation:**  Policy or configuration successfully installed.

**User response:**  None.

---

**CPO8100E    The settings file** *filename* **cannot be found**

**Explanation:**  An error occurred while reading the settings file.

**User response:**  Check whether the file exists and is read accessible

---

**CPO8101E    The settings file** *filename* **cannot be saved**

**Explanation:**  An error occurred while saving the settings file. The file does not exist.

**User response:**  Check whether the file exists and is write accessible.

---

**CPO8105E    Unable to read settings file** *filename*

**Explanation:**  An error occurred while reading the settings file.

**User response:**  Check whether the file exists and is read accessible

---

**CPO8106E    Unable to save settings file** *filename*

**Explanation:**  An error occurred while saving the settings file.

**User response:**  Check whether the file exists and is write accessible.

---

**CPO8110E    Unable to parse the policy** *filename*. *Error details*

**Explanation:**  An error occurred while reading the policy.

**User response:**  Check whether the file exists and is read accessible.

---

**CPO8111E    Unable to parse the configuration** *filename*. *Error details*

**Explanation:**  An error occurred while parsing the configuration.

**User response:**  Check whether the file exists and is read accessible.

**CPO8112E    Unable to parse the Provisioning Manager connections** *filename***.** *Error details*

**Explanation:**  An error occurred while parsing the Provisioning Manager connections.

**User response:**  Check whether the file exists and is read accessible.

**CPO8300E    Internal error**

**Explanation:**  An internal error occurred while refreshing the workspace.

**User response:**  Contact IBM.

**CPO8301E    Internal error**

**Explanation:**  An internal error occurred creating a new policy.

**User response:**  Contact IBM.

**CPO8302E    Internal error**

**Explanation:**  An internal error occurred creating a new configuration.

**User response:**  Contact IBM.

**CPO8303E    Internal error**

**Explanation:**  An internal error occurred renaming a policy.

**User response:**  Contact IBM.

**CPO8304E    Internal error**

**Explanation:**  An internal error occurred while connecting to host.

**User response:**  Contact IBM.

**CPO8305E    Internal error**

**Explanation:**  An internal error occurred while checking configurations.

**User response:**  Contact IBM.

**CPO8306E    Internal error**

**Explanation:**  An internal error occurred getting the connection report data.

**User response:**  Contact IBM.

**CPO8307E    Internal error**

**Explanation:**  An internal error occurred getting the host addresses.

**User response:**  Contact IBM.

**CPO8308E    Internal error**

**Explanation:**  An internal error occurred getting the systems of the configuration.

**User response:**  Contact IBM.

**CPO8309E    Internal error**

**Explanation:**  An internal error occurred getting the CPCs of the configuration.

**User response:**  Contact IBM.

**CPO8310E    Internal error**

**Explanation:**  An internal error occurred getting the errors for the error list.

**User response:**  Contact IBM.

**CPO8311E    Internal error**

**Explanation:**  An internal error occurred getting the maximum provisioning scope data.

**User response:**  Contact IBM.

**CPO8312E    Internal error**

**Explanation:**  An internal error occurred getting the provisioning scope data.

**User response:**  Contact IBM.

**CPO8313E    Internal error**

**Explanation:**  An internal error occurred getting the result of a CIM Client method call.

**User response:**  Contact IBM.

**CPO9800E    Index** *index* **is out of bounds**

**Explanation:**  Operation failed because passed index is out of bounds.

**User response:**  Contact IBM and report the problem.

**CPO9801E    Attribute** *attribute* **already exists**

**Explanation:**  Policy element already has an attribute with this name.

**User response:**  Contact IBM and report the problem.

**CPO9802E**     **Referenced attribute** *attribute* **not found**

**Explanation:** Policy element does not have an attribute with this name.

**User response:** Contact IBM and report the problem.

---

**CPO9803E**     **Attribute** *attribute* **does not exist**

**Explanation:** Policy element does not have an attribute with this name.

**User response:** Contact IBM and report the problem.

---

**CPO9804E**     **Attribute** *attribute* **does not support multiple values**

**Explanation:** This attribute does not support more than one value.

**User response:** Contact IBM and report the problem.

---

**CPO9805E**     **Child of type** *type* **not found**

**Explanation:** Policy element has no child of that type.

**User response:** Contact IBM and report the problem.

---

**CPO9806E**     **Policy element namespace** *namespace* **is incompatible**

**Explanation:** Policy element has an incompatible namespace.

**User response:** If this message is appended to a parsing error message please re-specify the policy with the Capacity Provisioning Control Center otherwise contact IBM and report the error.

---

**CPO9807E**     **Policy element is already contained in a policy element**

**Explanation:** Policy element can not be inserted more than once.

**User response:** Contact IBM and report the problem.

---

**CPO9808E**     **Policy element** *element 1* **is not a valid first child element of a** *element 2* **policy element**

**Explanation:** Policy structure is not valid.

**User response:** If this message is appended to a parsing error message please re-specify the policy with the Capacity Provisioning Control Center otherwise contact IBM and report the error.

---

**CPO9809E**     **Policy element** *element 1* **is not a valid last child element of a** *element 2* **policy element**

**Explanation:** Policy structure is not valid.

**User response:** If this message is appended to a parsing error message please re-specify the policy with the Capacity Provisioning Control Center otherwise contact IBM and report the error.

---

**CPO9810E**     **Policy element** *element 1* **is not a valid successor of a** *element 2* **policy element**

**Explanation:** Policy structure is not valid.

**User response:** If this message is appended to a parsing error message please re-specify the policy with the Capacity Provisioning Control Center otherwise contact IBM and report the error.

---

**CPO9811E**     **Policy element** *element 1* **is not a valid predecessor of a** *element 2* **policy element**

**Explanation:** Policy structure is not valid.

**User response:** If this message is appended to a parsing error message please re-specify the policy with the Capacity Provisioning Control Center otherwise contact IBM and report the error.

---

**CPO9812E**     **Policy element** *element* **can not be replaced**

**Explanation:** Policy element can not be replaced.

**User response:** Contact IBM and report the problem.

---

**CPO9813E**     **A** *element 1* **element can not contain more than** *number element 2* **elements**

**Explanation:** The named element can not have more than the indicated number of sub-elements.

**User response:** If this message is appended to a parsing error message please re-specify the policy with the Capacity Provisioning Control Center.

---

**CPO9814E**     **Operation not possible because policy element** *element* **is not contained in a tree**

**Explanation:** Operation is not possible.

**User response:** Contact IBM and report the problem.

---

**CPO9815E**     **Policy tree structure disrupted**

**Explanation:** Policy structure is disrupted.

**User response:** Contact IBM and report the problem.

---

**CPO9816E**     **Referenced policy element of type** *type* **not found**

**Explanation:** Referenced policy element not found.

**User response:** Contact IBM and report the problem.

**CPO9817E**  **Passed input parameter is null**

**Explanation:** An input parameter of null is not allowed.

**User response:** Contact IBM and report the problem.

---

**CPO9818E**  **Policy element** *element 1* **is not a valid child element of** *element 2*

**Explanation:** Policy structure is not valid.

**User response:** If this message is appended to a parsing error message please re-specify the policy with the Capacity Provisioning Control Center otherwise contact IBM and report the error.

---

**CPO9819E**  **Policy element has no ID attribute**

**Explanation:** Policy element does not have an ID attribute.

**User response:** Contact IBM and report the problem.

---

**CPO9820E**  **Integer value not allowed for attribute** *attribute*

**Explanation:** Policy attribute does not accept integer values.

**User response:** Contact IBM and report the problem.

---

**CPO9821E**  **Cannot convert value of attribute** *attribute* **to integer**

**Explanation:** Policy attribute does not contain an integer value.

**User response:** Contact IBM and report the problem.

---

**CPO9822E**  **Date value not allowed for attribute** *attribute*

**Explanation:** Policy attribute does not accept date values.

**User response:** Contact IBM and report the problem.

---

**CPO9823E**  **Cannot convert value of attribute** *attribute* **to date**

**Explanation:** Policy attribute does not contain a date value.

**User response:** Contact IBM and report the problem.

---

**CPO9824E**  **Fixed-point value not allowed for attribute** *attribute*

**Explanation:** Policy attribute does not accept fixed-point values.

**User response:** Contact IBM and report the problem.

---

**CPO9825E**  **Cannot convert value of attribute** *attribute* **to fixed-point**

**Explanation:** Policy attribute does not contain fixed-point value.

**User response:** Contact IBM and report the problem.

---

**CPO9828E**  **Policy element value not allowed for attribute** *attribute*

**Explanation:** Policy attribute does not accept a policy element reference value.

**User response:** Contact IBM and report the problem.

---

**CPO9829E**  **Cannot convert value of attribute** *attribute* **to policy element value**

**Explanation:** Policy attribute does not contain a policy element reference value.

**User response:** Contact IBM and report the problem.

---

**CPO9831W**  **An identical Service Class Period Filter already exists**

**Explanation:** Service Class Period Filter is identical to another one.

**User response:** Consider to delete the duplicate Service Class Period Filter.

---

**CPO9832E**  **Resource type** *type* **is unknown**

**Explanation:** Resource type is not known.

**User response:** Contact IBM and report the problem.

---

**CPO9833E**  **Deprovisioning PI must be at least** *difference* **less than Provisioning PI**

**Explanation:** Provisioning and deprovisioning PI limit should differ by 0.2

**User response:** Specify a larger Provisioning PI or a smaller Deprovisioning PI.

---

**CPO9834E**  **A definition for that system-sysplex combination already exists**

**Explanation:** A definition for that system-sysplex combination already exists.

**User response:** Delete the duplicate definition.

---

**CPO9835E**  **A definition for that CPC already exists**

**Explanation:** A definition for that CPC already exists.

**User response:** Delete the duplicate definition.

---

**CPO9836W**    **Alternate Host Address equal to Primary Host Address**

**Explanation:**  Alternate Host Address should differ from Primary Host Address.

**User response:**  Consider to specify another Alternate Host Address or to remove the Alternate Host Address.

**CPO9837E**    *Property* **value must not be set**

**Explanation:**  A value for the named property must not be specified.

**User response:**  Please do not specify this property value.

**CPO9838E**    *Property* **value must be set**

**Explanation:**  A value for the named property must be specified.

**User response:**  Please specify this property value.

**CPO9839E**    **Multiple definitions exist for CPC** *"CPC name"*

**Explanation:**  Only one Processor Limit can be defined for a CPC.

**User response:**  Delete the duplicate Processor Limit definition.

**CPO9840W**    **A MSU, zAAP, or zIIP limit greater than zero should be defined**

**Explanation:**  If no limit greater zero is defined, no additional resources can be activated for this CPC.

**User response:**  Specify a MSU, zAAP, or zIIP limit greater than zero.

**CPO9841W**    **An Importance or Included Service Class Filter should be defined**

**Explanation:**  If no Importance or Included Service Class Filter is defined the Workload Condition has no effect.

**User response:**  Specify an Importance or Included Service Class Filter.

**CPO9842W**    **A Time Condition with such properties already exists**

**Explanation:**  The Time Condition is identical to another one.

**User response:**  Consider to delete the duplicate Time Condition.

**CPO9843W**    **A Connection with such properties already exists**

**Explanation:**  The Connection is identical to another one.

**User response:**  Consider to delete the duplicate Connection.

**CPO9844E**    **Value** *property* **must not be longer than** *number* **characters**

**Explanation:**  Value of named property is too long.

**User response:**  Specify a shorter property value.

**CPO9845W**    **Max. MSUs value** *limit 1* **is greater than Max. MSUs value** *limit 2* **in Maximum Provisioning Scope**

**Explanation:**  The Maximum Provisioning Scope defines how much additional capacity may be activated in total. If in a Provisioning Scope a Max. MSUs value greater than the Max. MSUs value in the Maximum Provisioning Scope is specified for a CPC, additional capacity will only be activated up to the Max. MSUs value in the Maximum Provisioning Scope.

**User response:**  Consider to specify a smaller Max. MSUs value for the CPC in the Provisioning Scope.

**CPO9846W**    **Max. zAAP Processors value** *limit 1* **is greater than Max. zAAP Processors value** *limit 2* **in Maximum Provisioning Scope**

**Explanation:**  The Maximum Provisioning Scope defines how much additional capacity may be activated in total. If in a Provisioning Scope a Max. zAAP Processors value greater than the Max. zAAP Processors value in the Maximum Provisioning Scope is specified for a CPC, additional capacity will only be activated up to the Max. zAAP Processors value in the Maximum Provisioning Scope.

**User response:**  Consider to specify a smaller Max. zAAP Processors value for the CPC in the Provisioning Scope.

**CPO9847E**    *Element* **element is missing**

**Explanation:**  Named element must be contained in policy.

**User response:**  Please re-specify the policy with the Capacity Provisioning Control Center.

**CPO9848E**    **Element** *element* **contains too few elements**

**Explanation:**  Named element must contain more elements.

**User response:** Please re-specify the policy with the Capacity Provisioning Control Center.

---

**CPO9849E**    *Property* **value is mandatory**

**Explanation:**   Named property value must be specified.

**User response:**   Please specify property value.

---

**CPO9850E**    *Value* **is not a valid** *property* **value**

**Explanation:**   Specified property value is not valid.

**User response:**   Please specify a valid property value.

---

**CPO9851E**    **A** *element* **with such a** *property* **value already exists**

**Explanation:**   Specified element property value is not unique.

**User response:**   Please specify another unique element property value.

---

**CPO9852E**    **A** *element* **has to be specified**

**Explanation:**   An element of the named type has to be specified.

**User response:**   Please specify such an element.

---

**CPO9853E**    *Property* **value must not be less than** *minimum*

**Explanation:**   Value specified for named property is too small.

**User response:**   Specify a larger property value.

---

**CPO9854E**    *Property* **value must not be greater than** *maximum*

**Explanation:**   Value specified for named property is too big.

**User response:**   Specify a smaller property value.

---

**CPO9855E**    *Property value 1* **must be less than** *property value 2* **of predecessor element**

**Explanation:**   Value specified for named property must be less than the value of the named property of the predecessor element.

**User response:**   Specify a smaller property value.

---

**CPO9856E**    *Property value 1* **must be less than or equal to** *property value 2* **of predecessor element**

**Explanation:**   Value specified for named property must be less than or equal to the value of the named property of the predecessor element.

---

**User response:** Specify a smaller property value.

---

**CPO9857E**    *Property value 1* **must be greater than** *property value 2* **of predecessor element**

**Explanation:**   Value specified for named property must be greater than the value of the named property of the predecessor element.

**User response:**   Specify a greater property value.

---

**CPO9858E**    *Property value 1* **must be greater than or equal to** *property value 2* **of predecessor element**

**Explanation:**   Value specified for named property must be greater than or equal to the value of the named property of the predecessor element.

**User response:**   Specify a greater property value.

---

**CPO9859E**    *Property value 1* **must be less than** *property value 2* **of successor element**

**Explanation:**   Value specified for named property must be less than the value of the named property of the successor element.

**User response:**   Specify a smaller property value.

---

**CPO9860E**    *Property value 1* **must be less than or equal to** *property value 2* **of successor element**

**Explanation:**   Value specified for named property must be less than or equal to the value of the named property of the successor element.

**User response:**   Specify a smaller property value.

---

**CPO9861E**    *Property value 1* **must be greater than** *property value 2* **of successor element**

**Explanation:**   Value specified for named property must be greater than the value of the named property of the successor element.

**User response:**   Specify a greater property value.

---

**CPO9862E**    *Property value 1* **must be greater than or equal to** *property value 2* **of successor element**

**Explanation:**   Value specified for named property must be greater than or equal to the value of the named property of the successor element.

**User response:**   Specify a greater property value.

---

**CPO9863E**  *Property value 1* **must be less than** *property value 2*

**Explanation:**  Value specified for named property must be less than value of the other named property.

**User response:**  Specify a smaller property value.

---

**CPO9864E**  *Property value 1* **must be less than or equal to** *property value 2*

**Explanation:**  Value specified for named property must be less than or equal to value of the other named property.

**User response:**  Specify a smaller property value.

---

**CPO9865E**  *Property value 1* **must be greater than** *property value 2*

**Explanation:**  Value specified for named property must be greater than value of the other named property.

**User response:**  Specify a greater property value.

---

**CPO9866E**  *Property value 1* **must be greater than or equal to** *property value 2*

**Explanation:**  Value specified for named property must be greater than value of the other named property.

**User response:**  Specify a greater property value.

---

**CPO9867E**  *Value* **is not a valid** *property* **value. Valid values are floating-point numbers in the range** *range*

**Explanation:**  Floating-point number specified is not valid.

**User response:**  Specify a floating-point number within the described range.

---

**CPO9868E**  *Value* **is not a valid** *property* **value. Valid values are integers in the range** *range*

**Explanation:**  Integer specified is not valid.

**User response:**  Specify an integer within the described range.

---

**CPO9869W**  **A Processor Limit for CPC** *CPC name* **is not defined in the Maximum Provisioning Scope**

**Explanation:**  A Processor Limit for a CPC in a Provisioning Scope is not considered until a Processor Limit for the CPC is defined in the Maximum Provisioning Scope.

**User response:**  Specify a Processor Limit for the named CPC in the Maximum Provisioning Scope.

---

**CPO9870W**  **A** *element* **should be specified**

**Explanation:**  An element of the named type should be specified otherwise the specification may not have the desired effect.

**User response:**  Please specify such an element.

---

**CPO9871W**  **Max. zIIP Processors value** *limit 1* **is greater than Max. zIIP Processors value** *limit 2* **in Maximum Provisioning Scope**

**Explanation:**  The Maximum Provisioning Scope defines how much additional capacity may be activated in total. If in a Provisioning Scope a Max. zIIP Processors value greater than the Max. zIIP Processors value in the Maximum Provisioning Scope is specified for a CPC, additional capacity will only be activated up to the Max. zIIP Processors value in the Maximum Provisioning Scope.

**User response:**  Consider to specify a smaller Max. zIIP Processors value for the CPC in the Provisioning Scope.

---

**CPO9900E**  **Fatal parsing error at line** *line***:** *message*

**Explanation:**  Fatal error occurred parsing policy XML file.

**User response:**  Please re-specify the policy with the Capacity Provisioning Control Center.

---

**CPO9901E**  **Parsing error at line** *line***:** *message*

**Explanation:**  Error occurred parsing policy XML file.

**User response:**  Please re-specify the policy with the Capacity Provisioning Control Center.

---

**CPO9902W**  **Parsing warning at line** *line***:** *message*

**Explanation:**  Warning occurred parsing policy XML file.

**User response:**  Please re-specify the policy with the Capacity Provisioning Control Center.

---

**CPO9903E**  **Parsing error at line** *line***: Unknown processing instruction**

**Explanation:**  Unknown processing instruction was found in parsed policy XML file.

**User response:**  Please re-specify the policy with the Capacity Provisioning Control Center.

---

**CPO9904E**  **Parsing error at line** *line***: Unknown entity** *entity*

**Explanation:**  Unknown entity was found in parsed policy XML file.

**User response:**  Please re-specify the policy with the

Capacity Provisioning Control Center.

---

**CPO9905E    Parsing error at line** *line*: **Element** *element* **does not allow multiple values**

**Explanation:** Error occurred parsing policy XML file.

**User response:** Please re-specify the policy with the Capacity Provisioning Control Center.

---

**CPO9906E    Parsing error at line** *line*: **No character data allowed within** *element* **element**

**Explanation:** Error occurred parsing policy XML file.

**User response:** Please re-specify the policy with the Capacity Provisioning Control Center.

---

**CPO9907E    Parsing error at line** *line*: **Unexpected end of document**

**Explanation:** Error occurred parsing policy XML file.

**User response:** Please re-specify the policy with the Capacity Provisioning Control Center.

---

**CPO9908E    Parsing error at line** *line*: **document structure is not valid, contains nested attributes**

**Explanation:** Error occurred parsing policy XML file.

**User response:** Please re-specify the policy with the Capacity Provisioning Control Center.

---

**CPO9909E    Parsing error at line** *line*: **document structure is not valid, end of document expected**

**Explanation:** Parsing occurred parsing policy XML file.

**User response:** Please re-specify the policy with the Capacity Provisioning Control Center.

---

**CPO9910E    Parsing error at line** *line*: **root element is not valid**

**Explanation:** Error occurred parsing policy XML file.

**User response:** Please re-specify the policy with the Capacity Provisioning Control Center.

---

**CPO9911E    Parsing error at line** *line*: **Unknown namespace**

**Explanation:** Error occurred parsing policy XML file.

**User response:** Please re-specify the policy with the Capacity Provisioning Control Center.

---

**CPO9912E    Parsing error at line** *line*: **Unknown element** *element* **of namespace** *namespace* **found**

**Explanation:** Error occurred parsing policy XML file.

**User response:** Please re-specify the policy with the Capacity Provisioning Control Center.

---

**CPO9913E    Parsing error at line** *line*: **Misplaced element** *element* **found**

**Explanation:** Error occurred parsing policy XML file.

**User response:** Please re-specify the policy with the Capacity Provisioning Control Center.

---

**CPO9914E    Parsing error at line** *line*: **End-tag** *tag* **does not have corresponding start-tag**

**Explanation:** Error occurred parsing policy XML file.

**User response:** Please re-specify the policy with the Capacity Provisioning Control Center.

---

**CPO9915E    Parsing error at line** *line*: **End-tag** *end-tag* **does not match start-tag** *start-tag*

**Explanation:** Error occurred parsing policy XML file.

**User response:** Please re-specify the policy with the Capacity Provisioning Control Center.

---

**CPO9916E    Parser configuration error:** *message*

**Explanation:** Parser configuration error occurred.

**User response:** Contact IBM and report the problem.

# Part 4. Appendixes

# Appendix. Accessibility

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully. The major accessibility features in z/OS enable users to:

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

## Using assistive technologies

Assistive technology products, such as screen readers, function with the user interfaces found in z/OS. Consult the assistive technology documentation for specific information when using such products to access z/OS interfaces.

## Keyboard navigation of the user interface

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

## z/OS information

z/OS information is accessible using screen readers with the BookServer/Library Server versions of z/OS books in the Internet library at:

`www.ibm.com/servers/eserver/zseries/zos/bkserv/`

# Capacity Provisioning Terms

## A

**Application Assist Processor.** See zAAP.

**ARM.** See Automatic Restart Manager.

**Automatic Restart Manager (ARM).** A z/OS recovery function that can automatically restart tasks after they or the system on which they are running end unexpectedly.

## B

**Base Control Program (BCP).** A program that provides essential services for the MVS and z/OS operating systems. The program includes functions that manage system resources. These functions include input/output, dispatch units of work, and the z/OS UNIX System Services kernel.

**BCP.** See Base Control Program.

## C

**capacity.** See temporary capacity.

**Capacity Provisioning Control Center.** A Windows application installed on a workstation which provides a graphical user interface to Capacity Provisioning. Through this interface administrators can work with provisioning policies and domain configurations, and can transfer these to the Provisioning Manager.

**Capacity Upgrade on Demand (CUoD).** The capability to permanently activate one or more inactive processors without having to restart the server or interrupt the data flow of the business, through the purchase of a permanent processor activation. This capability adds significant value by enabling a fast and economical way to add capacity for new workloads, enabling the server to adapt to unexpected performance demands.

**CDT.** See class descriptor table.

**Central Processor Complex (CPC).** A physical collection of hardware that consists of main storage, one or more central processors, timers, and channels.

**CFCC.** See Coupling Facility.

**CIM.** See Common Interface Module.

**CIU.** See Customer Initiated Upgrade.

**class descriptor table (CDT).** In RACF, a table containing class descriptors. The CDT contains descriptors with default class names for CICS resources. Users can modify the supplied descriptors and add new ones.

**Common Interface Module (CIM).** An implementation-neutral, object-oriented schema for describing network management information. The Distributed Management Task Force (DMTF) develops and maintains CIM specifications.

**condition.** See time condition, workload condition.

**control center.** See Capacity Provisioning Control Center.

**Coupling Facility.** A special logical partition that provides high-speed caching, list processing, and locking functions in a sysplex.

**CPC.** See Central Processor Complex.

**CUoD.** See Capacity Upgrade on Demand.

**Customer Initiated Upgrade (CIU).** A permanent upgrade ordered, downloaded, and installed by you using the IBM CIU web-based application on Resource Link.

## D

**deadline.** The time during a time condition after which activation of additional capacity is no longer allowed. Additional capacity activated in the time condition before the deadline can remain activated until the end time or until the capacity is no longer needed. See also start time, end time.

**deprovisioning PI.** The minimum of the performance index range for a service class period, at or below which the Provisioning Manager considers the service class period not to be suffering.

**domain configuration.** The definition of the CPCs to be managed and the systems to be observed by the Provisioning Manager.

## E

**end time.** The end of a time condition, after which the Provisioning Manager starts to deactivate any additional capacity activated in the time condition. See also start time, deadline.

## H

**hardware management console (HMC).** A system that controls managed systems, including the management of logical partitions and use of Capacity Upgrade on Demand. Using service applications, the HMC communicates with managed systems to detect, consolidate, and send information to IBM for analysis.

**HMC.** See hardware management console.

## I

**importance filter.** A table assigning importance levels to sets of provisioning criteria.

**Integrated Information Processor.** See zIIP

**Intelligent Resource Director (IRD).** A z/OS facility designed to give your installation an enhanced ability to dynamically move resources to your most important work.

**IRD.** See Intelligent Resource Director.

## L

**logical processor.** A processor which may be shared between LPARs.

## M

**maximum provisioning scope.** The total amount of resources which can be additionally activated for a domain. See also provisioning scope.

**monoplex.** A sysplex consisting of one system that uses a sysplex couple dataset (CDS).

## O

**On/Off Capacity on Demand (On/Off CoD).** An addition to the CIU tool that enables you to configure, order and download temporary upgrades for your processors. It is used to temporarily increase CPs, IFLs, zAAPs, and ICFs concurrently and non-disruptively. The increased capacity is billed on a 24-hour basis.

**On/Off CoD.** See On/Off Capacity on Demand.

## P

**PassTicket.** In RACF secured sign-on, a dynamically generated, random, one-time-use, password substitute that a workstation or other client can use to sign on to the host rather than sending a RACF password across the network.

**performance index (PI).** A measure of the performance of a system, based on metrics such as transaction rates or response times.

**PI.** See performance index.

**policy.** A set of rules controlling the provisioning of additional capacity.

**provisioning.** The process of configuring servers, software, networks, and storage resources.

**provisioning condition.** See time condition, workload condition.

**provisioning criteria.** A set of parameters indicating the target performance index range expected of a service class period and the lengths of time it may go out of range before intervention is required. See also provisioning PI, deprovisioning PI, performance index.

**provisioning PI.** The maximum of the performance index range for a service class period, at or beyond which the Provisioning Manager considers the service class period to be suffering.

**provisioning scope.** The amount of resources which can be additionally activated for a policy. See also maximum provisioning scope.

## R

**Resource Measurement Facility (RMF).** A feature of z/OS that measures selected areas of system activity and presents the data collected in the format of printed reports, System Management Facility (SMF) records, or display reports.

**RMF.** See Resource Measurement Facility.

**rule.** A provisioning rule links a provisioning scope to time conditions and may also link it to workload conditions.

## S

**SAF.** See System Authorization Facility.

**System Authorization Facility (SAF).** An MVS interface with which programs can communicate with an external security manager, such as RACF.

**service class.** A group of work items which have the same performance goals, resource requirements, or business importance. For workload management you assign a service goal and optionally a resource group to a service class.

**service class period.** A division of time during which a transaction can execute.

**specialty processor.** See zAAP, zIIP.

**start time.** The start of a time condition, at which point the Provisioning Manager can start to activate additional capacity if one of the workloads associated with the time condition is suffering. See also deadline, end time.

**sysplex.** A set of z/OS systems that communicate with each other through certain multisystem hardware components and software services.

# T

**temporary capacity.** An option available on certain IBM Machines that may be enabled for each applicable TC Eligible Machine that you indicate on a Supplement. IBM may also refer to TC as "IBM eServer On/Off Capacity on Demand", "On/Off Capacity on Demand", or "On/Off CoD".

**time condition.** A specification of time periods during which temporary capacity may be activated or deactivated for a rule.

**time period.** A section of a time condition. The time periods are delimited by the start time, deadline and end time.

# W

**WLM.** See Workload Management.

**workload condition.** A definition of work that is eligible to cause activation of additional capacity and the conditions under which activation occurs.

**Workload Management (WLM).** A component of z/OS that provides the ability to run multiple workloads at the same time within one z/OS image or across multiple images.

# Z

**zAAP.** z9 Application Assist Processor. A specialized processing unit that provides an economical Java execution environment for customers who want the traditional quality of service and the integration advantages of the z platform.

**zIIP.** z9 Integrated Information Processor. A specialty engine designed to improve resource optimization and lower the cost of eligible workloads, enhancing the role of the mainframe as the data hub of the enterprise.

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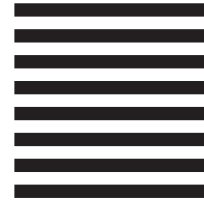
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