System z

Capacity on Demand User's Guide

SC28-6846-02

Level 02c, October 2009

System z

Capacity on Demand User's Guide

SC28-6846-02

Level 02c, October 2009

Note

Before using this information and the product it supports, read the information in "Safety" on page v, Appendix C, "Notices," on page C-1, and *IBM Systems Environmental Notices and User Guide*, Z125-5823.

Third Edition (April 2007)

This edition, SC28-6846-02, applies to the IBM® System z™ processors, and replaces SC28-6846-01 and SC28-6846-01a. A technical change to the text or illustration is indicated by a vertical line to the left of the change.

There may be a newer version of this document in PDF format available on Resource Link. Go to *http://www.ibm.com/servers/resourcelink* and click on Library on the navigation bar. A newer version is indicated by a lower-case, alphabetic letter following the form number suffix (for example: 00a, 00b, 01a, 01b).

Contents

Safety

Safety Notices

Safety notices may be printed throughout this guide. **DANGER** notices warn you of conditions or procedures that can result in death or severe personal injury. **CAUTION** notices warn you of conditions or procedures that can cause personal injury that is neither lethal nor extremely hazardous. **Attention** notices warn you of conditions or procedures that can cause damage to machines, equipment, or programs.

There are no **DANGER** notices in this guide.

World Trade Safety Information

Several countries require the safety information contained in product publications to be presented in their national languages. If this requirement applies to your country, a safety information booklet is included in the publications package shipped with the product. The booklet contains the safety information in your national language with references to the US English source. Before using a US English publication to install, operate, or service this IBM® product, you must first become familiar with the related safety information in the booklet. You should also refer to the booklet any time you do not clearly understand any safety information in the US English publications.

Laser Safety Information

All System z® models can use I/O cards such as PCI adapters, ESCON®, FICON®, Open Systems Adapter (OSA), InterSystem Coupling-3 (ISC-3), or other I/O features which are fiber optic based and utilize lasers or LEDs.

Laser Compliance

All lasers are certified in the U.S. to conform to the requirements of DHHS 21 CFR Subchapter J for class 1 laser products. Outside the U.S., they are certified to be in compliance with IEC 60825 as a class 1 laser product. Consult the label on each part for laser certification numbers and approval information.

CAUTION:
Data processing environments can contain equipment transmitting on system links with laser modules that operate at greater than Class 1 power levels. For this reason, never look into the end of an optical fiber cable or open receptacle. (C027)

CAUTION:
This product contains a Class 1M laser. Do not view directly with optical instruments. (C028)

About This Publication

This publication provides information that can be used to order, enable, and activate the family of flexible Capacity on Demand offerings for the following platforms:
- IBM® System z9® Enterprise Class (z9 EC) (formerly the IBM System z9® 109)
- IBM System z9 Business Class (z9 BC), and
- IBM zSeries™

In this document, IBM System z and System z are the umbrella names used when referring to the combination of the IBM System z9 (z9 EC and z9 BC) and eServer zSeries servers and systems.

Note: For details on Capacity Backup (CBU) for zSeries 890 and 990, refer to *zSeries 890 and 990 Capacity Backup User's Guide*. For details on Capacity Backup (CBU) for zSeries 800 and 900, refer to *zSeries 800 and 900 Capacity Backup User's Guide*.

Capacity on Demand implements Customer Initiated Upgrade (CIU), On/Off Capacity on Demand, and Capacity Backup (CBU) to upgrade processor capacity and memory.

The Capacity on Demand offerings are available on IBM System z servers that allow an enterprise to add and remove *temporary* or *permanent* processor capacity and memory, enabling capacity growth determined by your business needs. Part of IBM's On Demand Business initiative, Capacity on Demand solutions are designed to provide you with network-delivered, processor capacity and memory upgrades, including fixed-fee and pay-as-you go pricing.

Screen captures that appear in this publication may not be at the latest level. They are provided to represent the task for reference and navigation purposes only.

Organization of This Document

This document contains five chapters and two appendixes:
- Chapter 1, "Capacity on Demand - Based on Your Requirements" provides the information to help you select the solution that best fits the needs for your enterprise and information on managing system capacity.
- Chapter 2, "Customer Initiated Upgrade (CIU)" provides information on how to plan, order, and activate CIU for permanent upgrades.
- Chapter 3, "On/Off Capacity on Demand (On/Off CoD)" provides information on how to plan, order, and activate On/Off CoD for temporary upgrades.
- Chapter 4, "Capacity Backup (CBU)" provides information on how to plan and activate CBU, the temporary activation of central processors on servers, with the CBU feature installed.
- Chapter 5, "Status and Messages," on page 5-1 provides order status and product messages pertaining to problems you may be experiencing.
- Appendix A, "Obtaining a Password to Activate CBU," on page A-1 for S390™ (9672) and System z (206x, 208x and 209x) systems.
- Appendix B, "Hardware Management Console User Interface Types," on page B-1describes the two HMC interface styles, **classic** type user interface and **tree** style user interface.
- Appendix C, "Notices," on page C-1 contains IBM trademarks and other special notices.
- "Glossary" on page D-1 contains Capacity on Demand terms and definitions for CIU, On/Off CoD, and CBU applications.

Individual checklists are provided in Chapter 2, “Customer Initiated Upgrade (CIU),” Chapter 3, “On/Off Capacity on Demand (On/Off CoD),” and Chapter 4, “Capacity Backup (CBU),” to help you perform the steps necessary to complete your task.

Related Publications

Along with this publication, the following publications provide information about the functions and characteristics of the Capacity on Demand products and applications.

System z

z9 EC and z9 BC
PR/SM Planning Guide, SB10-7041

zSeries

z800 and z900
CBU User’s Guide, SC28-6810
PR/SM Planning Guide, SB10-7033

z890 and z990
CBU User’s Guide, SC28-6823
PR/SM Planning Guide, SB10-7036

S/390®

EBU/CBU User’s Guide, SC28-6804
PR/SM Planning Guide, GA22-7236

Who Should Read This Document

This document is intended for customers and enterprise decision makers to understand the On Demand concept for implementing Customer Initiated Upgrade (CIU), On/Off Capacity on Demand, and Capacity Backup (CBU) for their enterprise. It can also be used by service representatives and IBM Business Partners who install and maintain system capacity.

This document provides planning and setup information for increasing system processors and memory on a temporary or permanent basis. It is not intended as an education or instruction resource. Education and instructional information is available on Resource Link at http://www.ibm.com/servers/resourcelink

How to Send Your Comments

Your feedback is important in helping to provide the most accurate and high-quality information. Send your comments by using Resource Link™ at *http://www.ibm.com/servers/resourcelink*. Select **Feedback** on the Navigation bar on the left. You can also send an e-mail to reslink@us.ibm.com. Be sure to include the name of the book, the form number of the book, the version of the book, if applicable, and the specific location of the text you are commenting on (for example, a page number or table number).

Summary of changes

Summary of changes for the *System z Capacity On Demand User's Guide*.

Table 1. Summary of Changes

Release Level	Date	Changes in Level
02c	10/09	This revision contains editorial changes and the following technical changes: • Under “Ordering” in “Chapter 3. On/Off Capacity on Demand (On/Off CoD),” updated information about staging On/Off CoD orders.
02b	08/09	This revision contains editorial changes and the following technical changes: • Updated CIU Express information. By default, CIU Express is now enabled for each machine as indicated in the contract. • Updated the CIU retrieve and apply data information under “Downloading and Activation” in “Chapter 2. Customer Initiated Upgrade (CIU).” • Added a new section, “Removing Retrieved Data,” in “Chapter 2. Customer Initiated Upgrade (CIU).” • For clarity, under “Downloading and Activation” in “Chapter 3. On/Off Capacity on Demand (On/Off CoD),” identified were the records are staged (on the IBM Service Support System or on the Support Element). • Under “Adding Capacity Backup” in “Chapter 4. Capacity Backup (CBU),” corrected the mode required to add the CBU feature to your system.
02a	08/08	This revision contains editorial changes and the following technical changes: • Added the new Support Element **Perform Model Conversion** window to “Chapter 2. Customer Initiated Upgrade (CIU)” • Updated the following information in “Chapter 3. On/Off Capacity on Demand (On/Off CoD):” – Added limitation information – Updated the downloading and activating task to differentiate between SE level 2.9.2 and SE level 2.9.1 – Updated the On/Offf CoD removal information. • Made major updates and additions to “Chapter 4. Capacity Backup (CBU).”

Chapter 1. Capacity on Demand - Based on Your Requirements

It may sound revolutionary, but it's really quite simple. In the highly unpredictable world of on demand business, you should have access to the resources you need, when you need them. This is the basic principle underlying Capacity on Demand for IBM System z servers.

System z servers provide concurrent, on-demand upgrades for the server hardware. With operating system support and appropriate planning, concurrent upgrades can also be non-disruptive to the operation system. Such upgrades provide additional capacity (memory, processors) without a server outage.

Subcapacity models, together with concurrent upgrades, provide flexibility in capacity settings and configurations. Activating or converting PUs is used to change the capacity of the server. Existing capacity can be redistributed; for example, instead of two slower processors, you can configure one faster, without changing the overall capacity.

You can add capacity by:
- Adding CPs
- Increasing the capacity settings of installed CPs
- Adding CPs and increasing capacity settings of all CPs (to the same capacity setting)
- Increasing the capacity settings and reducing the number of CPs
- Decreasing the capacity settings and increasing the number of CPs

System z servers provide for concurrent upgrade capability through Customer Initiated Upgrade with the following offerings:
- **Customer Initiated Upgrade (CIU)** - The CIU feature enables you to order permanent capacity upgrades rapidly and download them without disrupting applications already running on the server. When extra processing power becomes necessary, an administrator simply navigates to Resource Link to order the upgrade and uses the Remote Service Facility on the Hardware Management Console to download and activate preinstalled inactive processors or memory for an additional charge.

  See Chapter 2, "Customer Initiated Upgrade (CIU)," on page 2-1 for complete details on CIU.
- **On/Off Capacity on Demand (On/Off CoD)** - Available through CIU, use On/Off CoD for temporary increases in processor capacity for your fluctuating workloads. With temporary processor capacity, you can help your business manage both predictable and unpredictable surges in capacity demands. You can activate and deactivate quickly and efficiently as the demands on your organization dictate—obtain additional capacity that you need, when you need it, and the server will keep track of your usage. On/Off CoD provides a cost-effective strategy for handling seasonal or period-end fluctuations in activity and may enable you to deploy pilot applications without investing in new hardware. Although there is a fee for On/Off CoD, free tests are available.

  See Chapter 3, "On/Off Capacity on Demand (On/Off CoD)," on page 3-1 for complete details on On/Off CoD.
- **Capacity Backup (CBU)** - Use CBU to add temporary processing capacity to a backup server in the event of an unforeseen loss of server capability because of an emergency. With CBU, you can divert entire workloads to backup servers for

up to 90 days. Although free tests are available for CBU, there is an up front fee and an emergency-use fee, which includes testing; software fees are not affected.

See Chapter 4, “Capacity Backup (CBU),” on page 4-1 for complete details on CBU.

How Capacity on Demand Offerings Help Your Business

Businesses must handle unpredictable market opportunities, customer needs, and external pressure without missing a beat or interrupting existing processes by using an IT infrastructure that can support changing business objectives - an on demand operating environment.

Your enterprise may need an on demand operating environment that provides responsiveness, resilience, and a variable cost structure to provide maximum business benefits. The Capacity on Demand solutions offer permanent or temporary increases in processor capacity and additional memory.

Capacity on Demand solutions offer advantages to numerous industries. For example:

- Two hospitals have merged and IT can assist in streamlining the combined processes with a permanent CIU upgrade.
- A manufacturer can adapt to temporary market shifts rapidly and cost effectively.
- An investor can develop faster and more accurate reporting with additional memory.

Because costs vary with use, temporary upgrades can provide a highly cost-effective method of handling the temporary usage peaks and valleys that occur in any business. With the correct physical infrastructure present, this design can allow companies to quickly scale their IT infrastructures to meet dynamic application requirements without purchasing additional servers.

Measurable Benefits

The benefits from the Capacity on Demand solutions are numerous:

- Provide extra processing power to help you meet the demands of your business without affecting your pre-existing operational commitments.
- Allow you to activate dormant processing capacity quickly and easily as your workload increases, for short term and long term temporary periods, minimizing the risks with unexpected growth.
- Allow you to invest for the future while paying only for your immediate requirements.
- Provide the ability to quickly scale up without adding servers, minimizing disruptions.
- Enable you to consolidate your servers on a single platform, helping you to further reduce your operational costs.
- Provide a convenient means of testing resources with minimal investment.
- Offer an affordable disaster recovery solution through Capacity BackUp.

Granularity Offering and Model Capacity

Three ’dial down’ CP features were added to the System z9 servers. These additional CP offerings will reduce the entry level capacity (MIP) size and future upgrade capacity (MIP) increments available. This granularity offering allows you to select a capacity that provides the best balance between system capacity and software costs.

The different combinations of capacity levels and numbers of processors possible offer considerable overlap in absolute capacity, provided in different ways. For example, a specific capacity (in MIPS) might be obtained with a single faster CP or with three slower CPs; the hardware cost is approximately the same. The single CP version might be a better choice for traditional single-task workloads, while the three-way server might be a better choice for mixed batch workloads.

The hardware price for the System z9 BC is based on total processor capacity purchased and not the number of processors. For a given capacity and cost, the user has choices of more (and slower) processors or fewer (but faster) processors.

- Up to eight of these new CP features may be ordered on any of the five System z9 EC models (S08, S18, S28, S38, and S54) or two System z9 BC models (R07 and S07).
- The CP features for System z9 are mutually exclusive because System z9 does not support a mix of CP speeds.
- Only one CP speed can be activated at a time.
- Any CBU feature can be exchanged for any other CBU feature.

Until now, the hourly performance and audit data in the Transmit System Availability Data (TSAD) was captured once a week. Because the model and model capacity indicator changes more frequently than in previous systems, it is important to know more precisely when one of these changes. Now, the hardware model and the model capacity indicator will be included in the Transmit System Availability Data (TSAD) file data.

Matching Capacity on Demand Offerings with Your Business Demands

Get the flexibility you need to increase your mainframe capabilities as your requirements change. Capacity on Demand solutions for System z servers offer a low-cost means of handling unpredictable capacity requirements during business cycles.

There are two different types of demand capacity - permanent and temporary. For each of these, there is a Capacity on Demand solution for the IBM server product families:

- **Permanent capacity for non-disruptive growth**: Customer Initiated Upgrade - Provides a means of planned growth for customers who know they will be needing increased capacity.
- **Temporary capacity for fluctuating workloads**: On/Off Capacity on Demand - Provides for planned and unplanned short-term growth driven by temporary processing requirements such as seasonal activity, period-end requirements or special promotions.
- **Temporary capacity for workload peaks and testing**: On/Off Capacity on Demand - Provides the flexibility to evaluate how additional resources will affect existing workloads, or to test new applications.
- **Interim capacity for continued operation**: Capacity Backup - Becomes the backup server with the extra processing capacity needed in case of an unforeseen server outage.

Differences Between CIU, On/Off CoD, and CBU

CIU, On/Off CoD, and CBU all provide upgrade functionality for separate and different purposes.

Use this chart to determine the solution that is best for your needs:

Table 1-1. Comparison chart

	Customer Initiated Upgrade	On/Off Capacity on Demand	Capacity Backup
Type	Permanent capacity - Also the facility for ordering, configuring, pricing and installing capacity upgrades.	Temporary capacity-unlimited duration; orderable through CIU; customer activation and deactivation.	Reserve temporary backup PU capacity of CPs, ICFs, IFLs, zAAPs, and zIIPs for System z9 models and CPs only for zSeries models for a specified duration. Original configuration must be restored after test or disaster recovery.
System	Available for LIC enabled z800, z900, z890, z990, and System z9 servers.	Orderable feature available for z890 and z990, and System z9 servers.	Available for z800, z900, z890, z990, and System z9servers.
Servers	Non-disruptive capacity activation and driver level 63 for System z9, driver level 3G for z800 and z900, and driver level 55 for z890 and z990.	Non-disruptive temporary CP, ICF, IFL, zAAP, or zIIP upgrade for driver level 63 for System z9 and driver level 55 on z890 and z990. Customer deactivates; activation is mutually exclusive with CBU activation.	Non-disruptive capacity for CP, ICF, IFL, zAAP, and zIIP activation on System z9 servers, CP activation only for z800/z900 and z890/ z990 servers.
Planning	Customer or IBM Planning is required.	Customer or IBM Planning is required.	Customer or IBM Planning is required.
Ordering	Ordered by customer.	Ordered through IBM Sales.	Ordered through IBM Sales.
Enablement	CIU contract must be in place prior to implementation.	CIU contract must be in place prior to implementation with special On/Off CoD terms and conditions and right-to-use feature.	CBU contract must be in place prior to implementation and reserve PUs available for test or disaster recovery.
Download and Activate	By customer using an HMC for CPs, ICFs, IFLs, zAAPs, zIIPs, and memory upgrades.	Once enabled, customer orders temporary CPs, ICFs, IFLs, zAAPs, or zIIPs upgrade through CIU.	Installed by customer or IBM service representative for a pre-determined period of use.

- **Customer Initiated Upgrade** is an application that enables you to configure, order and download a **permanent** Licensed Internal Code Configuration Control (LICCC) upgrade to your Central Processors (CPs) Integrated Coupling Facilities (ICFs), Integrated Facilities for Linux® (IFLs), System z Application Assist Processors (zAAPs), System z9 Integrated Information Processors (zIIPs), and memory dynamically and non-disruptively.

  - Web-based solution on IBM Resource Link, available when needed
  - Engine prices pre-negotiated with a CIU contract, and registration on Resource Link in place prior to implementation
  - Customer planning required
  - Available for processors and memory in all System z models
- **On/Off Capacity on Demand** provides the ability to **temporarily** add one or more CPs, ICFs, IFLs, System z Application Assist Processors (zAAPs), and System Z9 Integrated Information Processors (zIIPs) dynamically and non-disruptively for an unlimited duration. On/Off CoD provides for planned and unplanned short-term growth driven by temporary processing requirements such as seasonal activity, period-end requirements, and special promotions.
  - Web-based solution on IBM Resource Link
  - Orderable through CIU with special On/Off CoD terms and conditions prior to implementation
  - Customer planning required
  - Must buy base configuration
  - 24-hour daily charge on temporary engines
  - Prices based on permanent price
  - Available in System z servers
  - Activation is mutually exclusive with CBU activation
  - Requires customer deactivation
- **Capacity BackUp** provides the ability to **temporarily** increment the capacity of your processor nondisruptively using LICCC. If an unforeseen loss of substantial computing capacity at one or more of your eligible sites occurs:
  - **For System z9 servers** - CPs, ICFs, IFLs, zAAPs, and zIIPs can be added for up to a 90-day period using CBU.
  - **For z800, z900, z890 and z990 servers** - Only CPs can be added.
    Activation is done electronically (no technician required)
    Customer planning required
    Reserved processing units must be available for test or disaster recovery
    Activation is mutually exclusive with On/Off CoD activation
    Original configuration must be restored after test or disaster recovery

Disruptive versus Non-Disruptive Installation Matrix

This disruptive versus non-disruptive matrix is hardware based. Some operating systems may require a power on and reset after upgrades are applied.

Table 1-2. Disruptive vs. non-disruptive matrix

Type of Upgrade	Applied concurrently	Requires Power on and Reset
CPs	Yes	No
ICFs	Yes	If new partition is required
IFLs	Yes	If new partition is required
zAAPs	Yes	No
zIIPs	Yes	No
Memory	Upgrades only	Any downgrades

Enhanced Flexibility for Upgrades

System z servers are designed to be able to nondisruptively increase computing resources within the server. These include computing resources such as processors, memory, and I/O.

- Enable dynamic and flexible capacity growth for mainframe servers.

- Enable nondisruptive activation of additional resources such as memory, I/O, and processors.

  Note: Multi-book System z9 servers can use enhanced book availability and redundant I/O interconnect to assist in some nondisruptive book upgrade functions by providing continuous access to I/O resources assigned to the book being upgraded.
- Allow for *temporary capacity* using On/Off Capacity on Demand.
- Allow for *temporary emergency* addition of processors such as CPs for z800, z900, z890, and z990 servers, and specialty engines (IFLs, ICFs, zAAPs, or zIIPs) for the System z9 servers.

Note: Upgrading to a model S54 from other z9 EC models requires a planned outage necessary to replace all four of the 12 PU books with 16 PU books. (On the z800 and z890, most of the memory upgrades cannot be done nondisruptively and some upgrades to the server require a system restart for the software.)

Enhanced Book Availability

Enhanced book availability is designed to help reduce the impact of outages. The z9 EC design of redundant I/O interconnect allows a single book, in a multibook server, to be concurrently removed from the server and reinstalled during an upgrade or repair action. To help minimize the impact on current workloads and applications, ensure that you have sufficient inactive physical resources on the remaining books to complete a book removal. For maximum availability, it is recommended that a z9 EC server is purchased with one additional book.

- If you require from one to eight Processor Units (PUs), you need a Model S18.
- If you require from nine to 18 PUs, you need a Model S28.
- If you require from 19 to 28 PUs, you need a Model S38.
- If you require 29 to 40 PUs, you need a Model S54.

Using these configurations, all purchased PUs can be available in the rare event of a book outage.

To help ensure you have the appropriate level of memory, you may want to consider selecting the **flexible memory option** (FC #2802 - #2824) to provide additional resources when replacing a book or when considering plan ahead options for the future. Enhanced book availability may also provide benefits if you choose not to configure for maximum availability. In these cases, you need sufficient inactive resources on the remaining books to contain critical workloads while completing a book replacement.

Table 1-3. Concurrent Book Replace

Book	Max PU per book	Customer Configure PU	Total PUs during CBR
0	16	12	16 = 2 SAPs, 14 PUs
1	16	14	16 = 2 SAPs, 14 PUs
2	16	14	16 = 3 SAPs, 13 PUs
3	16	14	Book being evacuated

Contact your IBM representative to help you determine the appropriate configuration. With proper planning, you may be able to reduce the duration of a planned outage when utilizing enhanced book availability.

Enhanced book availability is exclusive to the z9 EC.

Concurrent Book Add

Enhanced book availability is an extension of the support for Concurrent Book Add (CBA) delivered on z990. With proper planning, CBA is designed to allow you to concurrently upgrade a z9 EC by integrating a second, third, or fourth book into the server without affecting application processing.

The z9 EC goes an additional step by allowing a single book, in a multibook server, to be concurrently removed from the server and reinstalled during an upgrade or repair action. Redundant I/O interconnect provides connectivity to the server I/O resources using a second path from a different book during the action.

To help minimize the impact on current workloads and applications, you should ensure that you have a sufficient inactive physical resources on the remaining books to complete a book removal. For maximum availability, IBM recommends that you purchase a z9 EC with one additional book. Use of enhanced book availability may require acquisition of additional hardware resources.

Chapter 2. Customer Initiated Upgrade (CIU)

CIU (FC 9896, 9898) is a Web-based solution for customers ordering and installing permanent upgrades by creating an order on IBM Resource Link and utilizing the System z Remote Service Facility (RSF) for downloading and activation.

Enabling CIU requires a special contract and registration with IBM:
- IBM Customer Agreement, Attachment for Customer Initiated Upgrade and IBM eServer On/Off Capacity on Demand, US Form #Z125-6611 (first instance only)
- IBM Customer Agreement, Supplement for Customer Initiated Upgrade and IBM eServer On/Off Capacity on Demand II, US Form #Z125-6688 (each new direct sale with customer purchase or IGF financing, and each new BP sale)
- IBM Customer Agreement, Supplement for Customer Initiated Upgrade and IBM eServer On/Off Capacity on Demand, US Form #Z125-6612 (each new direct sale with non-IGF third-party financing)
- IBM Customer Agreement, Addendum to Customer Initiated Upgrade and IBM eServer On/Off Capacity on Demand Tests, US Form #Z125-7139 (each existing CIU customer who signed a base agreement prior to the -03 level and who wants On/Off CoD Tests)
- Business Partner Agreement, Attachment for Temporary Capacity on Demand, contract number z125-6846. (Signed once for each Business Partner firm and all sales of On/Off CoD to all customers are covered by this one agreement.)

CIU is:
- A Web-based solution that enables you to configure, order and download Licensed Internal Code Configuration Control (LICCC) to upgrade your processors and memory.
- Available for both owned and leased System z servers.
- Offered through your IBM Sales Representative or Business Partner; available after you sign an IBM Customer Agreement for a specific machine.
- Enabled on a machine-by-machine basis. Each machine must be separately registered, and may have a separately negotiated price.
- Provides fast access to processor and memory upgrades through an easy-to-use interface.

The CIU feature limits servers to one active order at a time. It requires proper planning for ordering and activation.

CIU upgrades are referred to as dynamic upgrades because no additional hardware is being added to the machine. When the CIU feature is installed on a machine and is enabled, the CIU upgrade is a simple automated process that allows you to activate additional processors or memory resident in the machine through code that is delivered to the machine. IBM provides a secure Web site to give you the ability to order new capacity and install a permanent upgrade as your business needs require.

The sequence you follow to obtain a CIU upgrade is enabling, ordering, and download and activating.

For additional information and customer education on CIU, go to *www.ibm.com/servers/resourcelink* and select **Customer Initiated Upgrade** on the navigation bar.

Planning

Planning for capacity and memory upgrades for your system is important:

- Plan in advance to determine what configurations you might need based on work load projections.
- Place an order for those configurations and have them ready for download when the need arises.
- Ensure that you enable your system well in advance of needing to place an order.
- Place an order in advance of when you need it.

Because the actual upgrade process is fully automated, you can download and activate an upgrade using the function on the HMC through the Remote Service Facility (RSF), without requiring assistance from your service provider. After all the prerequisites are in place, you perform the entire process, from ordering to activating the upgrade. See “Enablement” on page 2-3, “Ordering” on page 2-5, and “Downloading and Activation” on page 2-6.

- All additional capacity required by downloading a CIU upgrade must be previously installed. This means that additional books or memory features cannot be installed using CIU.
- The sum of CPs, unassigned CPs (or unassigned CP capacity), IFLs, unassigned IFLs, ICFs, and zAAPs, and zIIPs is limited by the hardware or book capacity.
- The total number of zAAPs cannot exceed the number of CPs plus unassigned CPs.
- The total number of zIIPs cannot exceed the number of CPs plus unassigned CPs.

Important

CIU for processors cannot be completed when CBU or On/Off CoD is *activated* on a server. If this is the case, you can order and retrieve CIU for processors, but CIU upgrades *cannot* be applied until the temporary capacity upgrade using CBU or On/Off CoD is deactivated.

Additional logical processors can be concurrently configured online to logical partitions by the operating system when reserved processors are previously defined, resulting in image upgrades. The operating system must have the capability to concurrently configure more processors online.

CIU Express

CIU Express is a CIU function available for each machine, whether owned or leased. CIU Express allows you to place CIU orders to upgrade processors and memory for your machine and have the orders ready for download in a significantly shorter time frame - within three hours.

When you place a permanent upgrade order, you can choose whether to place the order using CIU Express.

Software Considerations

While capacity upgrades to the server itself are concurrent, your software may not be able to take advantage of the increased capacity without performing an Initial Program Load (IPL).

Software charges based on the total capacity of the server on which the software is installed are adjusted to the new capacity that is in place after the CIU upgrade.

Software products using Workload License Charge (WLC) may not be affected by the server upgrade, as their charges are based on partition utilization and not based on server total capacity.

Enablement

To be enabled to order upgrades, you must have a signed agreement with terms and conditions in place for the Customer Initiated Upgrade (CIU) feature (FC 9898). You must also have a Resource Link profile set up for your machine.

With enablement:
- IBM offers the CIU feature to customers with System z servers installed and a CIU contract in place.
- The IBM CIU contract facilitates creating the machine specific profile of machine type, model, and serial number on the IBM Resource Link Web site.
- With a signed contract, you have secure access to Resource Link machine profile information to order processor or memory upgrades or unassign previously purchased CPs and IFLs.
- Billing for CIU occurs on download.

The CIU enablement process begins when you sign the CIU contract and ends when you receive an e-mail from Resource Link notifying you that your machine is enabled for ordering upgrades.

For System z9 servers, the process differs because the enablement features are preinstalled in the Vital Product Data (VPD) when the servers are ordered, which means you only need to wait for the e-mail notification from Resource Link.

For **all servers**:

☐ Sign the CIU Supplement.

☐ IBM sales representative sends the CIU Supplement to the IBM CIU Access Administrator.

☐ IBM CIU Access Administrator uses the information from the CIU Supplement to create a machine profile on Resource Link.

☐ Resource Link enables the IBM Service Support System to download the CIU feature codes to the machine the next time the machine performs a Transmit Service Availability Data (TSAD) transmission. Resource Link sends an e-mail to the customer requesting that they transmit the machine TSAD to the IBM Service Support System.

For eServer zSeries servers follow these steps: (Although, these steps will occur without intervention, you can use these steps to enhance the process time.)

☐ Transmit the TSAD to the IBM Service Support System.
Note: Ensure that the Support Element (SE) is scheduled to transmit service data regularly. If necessary, open a **Single Object Operation** from the HMC to open a console session with the SE to manually transmit the TSAD to the IBM Service Support System.

☐ The IBM Service Support System receives the machine TSAD. When this occurs:

- IBM Service Support System downloads the CIU feature codes to the machine
- SE installs and applies the feature codes
- SE updates the machine VPD to indicate that the feature codes are installed
- SE enables transmitting the updated VPD to IBM Service Support System the next time the machine is scheduled to call home

Important: The SE does not call home at this time; it only enables transmitting the VPD at the next scheduled call home.

☐ Use the SE to transmit the updated VPD to the IBM Service Support System the next time the machine is scheduled to call home.
Note: Ensure that the SE is scheduled to transmit service data regularly. To expedite the enablement process without waiting for the next scheduled transmission, open a **Single Object Operations** from the HMC to open a console session with the SE to manually transmit the TSAD to the IBM Service Support System.

☐ IBM Service Support System sends the VPD to the Resource Link Web site. Resource Link processes the machine VPD and enables the machine for ordering upgrades when it finds the CIU feature codes installed.

For all servers:

☐ Resource Link sends an e-mail to notify the customer that the machine is enabled for ordering updates.

CIU Registration and Agreed Contract for CIU

Before you can use a CIU offering, you must have an IBM Registration ID (IBM ID) and be registered on the IBM Resource Link Web site at *www.ibm.com/servers/resourcelink*. When you have a registered user ID, you can gain access to the CIU offering by ordering the CIU feature from your IBM sales representative or Business Partner.

This capability requires a CIU contract which provides you with the benefit of a much faster upgrade than if you waited for a normal upgrade to process. Having a contract in place allows you to be ready to accommodate new workload peaks in a more timely manner.

☐ Contact your IBM sales representative or Business Partner to create a signed contractual agreement. This agreement spells out the terms and conditions for your CIU offering.

☐ Have a negotiated pricing and billing agreement in place for the Customer Initiated Upgrade (CIU) facility (FC 9898), and acknowledge and agree to additional specific terms that govern the use of capacity upgrades with a correct profile setup.

☐ The CIU Supplement to the Agreement is sent to the CIU administrator who creates the machine profile based on the information you provide in the Supplement. It requires your IBM ID, customer number, machine type and serial number, and the customer identifier of the purchased or leased machine.

☐ Enablement occurs during the next scheduled availability call home.

- **For eServer zSeries** servers, this is approximately 2 to 3 days after the next call home. CIU receives the Vital Product Data (VPD) showing that the feature is installed on your machine. An e-mail notification is sent that the CIU feature is now available.
- **For System z9** servers, the VPD is preinstalled. Therefore, you only need to wait until Resource Link sends the e-mail notification when the CIU feature is available.

The Resource Link Web site is responsible for delivering the negotiated pricing (or lease) agreement to you.

- The CIU interface on Resource Link handles the order differently based on whether you are leasing the server or not.
- The customer profile associated with the machine serial number contains an indicator that Resource Link uses to make the determination.

☐ If you accept this agreement, it is forwarded to the correct billing system.

Only Resource Link users who accept this feature are able to access the CIU offering for increased capacity for CPs, ICFs, IFLs, zAAPs, zIIPs, and/or memory.

Ordering

The Resource Link Web site provides the interface that allows you to order a dynamic CIU upgrade order for a specific server. Using this interface, you can create, cancel, and view the CIU upgrade order. You can also view the history of orders that were placed through this interface.

For ordering *processor upgrades*, Resource Link offers the ability to order only those configurations that are deemed valid by the Order Process, within the already installed number of books.

Note

The CBU features count does not change. It is adjusted only when the customer creates an order that requires the CBU feature count be decremented because there are no other PUs left.

For ordering *memory upgrades*, Resource Link retrieves and stores relevant data associated with the installed memory cards for the specific server. It allows you to order only those options that are deemed valid by the Order Process. Resource Link only allows you to order memory within the given bounds of the currently installed hardware. It does not allow for ordering memory or books not attainable within the current configuration.

☐ Select **Customer Initiated Upgrade** from the navigation bar on the main Resource Link page. Customer and machine details associated with the customer information and machine options are listed. Select a machine and serial number to view the current configuration (PU allocation and memory).

☐ Select a machine and click **Create permanent order**. The current configuration and available upgrades display.

☐ Create a target configuration for each upgradeable option. Resource Link limits options to those that are valid for this configuration. When you change the configuration, the price of the order is displayed.

☐ Click **Submit.**
- If there is no Price Agreement for this machine, the **Total purchase price** is displayed as **Not Negotiated.** You cannot complete the order without a price agreement signed and set up to be displayed.
  – Contact your IBM Sales Representative or Business to negotiate the price agreement.
- By default, CIU Express is enabled for each machine as indicated in the contract. Select whether you are using the CIU Express method and confirm your selection. You must select the order method:
  – To choose CIU Express, select **Yes**.
  – To select regular order processing, select **No**.

☐ The target configuration is verified. If the information is correct and you accept the terms of the order, click **I accept the terms of this order**.

☐ The order is created and verified against the pre-established agreement.

☐ The price is quoted for the order and you can accept or reject the price.
- If the machine is a leased machine, the **Order leasing information** window is displayed. Click **Submit** to complete the order.
- When an order is created that requires a purchase order, the **Customer purchase order information** window is displayed. Enter the PO number and click **Submit**.

☐ Approve the upgrade charges.
- To accept the prices, click **I approve the above upgrade charges**.
- To cancel the order, click **Cancel order**.

  A secondary order approval may be required. If this is the case, a notification is sent to the secondary approver for all orders. Servers owned by a third party require approval by the third party before an upgrade is made available.

  The secondary approver must:
  – Log on to Resource Link and access the machine profile that requires approval. Click on the order number in the order history section.
  – Approve or cancel the order and click **Close** to close the window.

☐ When confirmation is accepted, the order is processed. With CIU Express, a CIU upgrade is available to download from the IBM Service Support System within three hours after it is ordered.

Downloading and Activation

You will receive e-mail notifying you that the upgrade is ready to download:

☐ You are given an order number. Resource Link notifies you by e-mail that the upgrade is ready for download.

☐ After Resource Link notifies you when the upgrade is ready for download, go to any Hardware Management Console (HMC) attached to the system.

Downloading and activating the upgrade requires:
- System programmer access to an HMC connected to the machine.
- The order number of the upgrade.

☐ Your upgrade is ready to download through your HMC and activated on the server.
- With CIU Express, a CIU upgrade is ready for download from the IBM Service Support System within three hours after it is ordered.

CIU Express permanent orders may be staged for an extended period of time, more than 30 days, unless one of the following conditions occur:
  - The order is canceled by the customer
  - The machine is no longer under warranty or under an IBM maintenance service agreement
  - The permanent PU or memory configurations are changed.
- Non-CIU Express permanent orders can be staged for up to 30 days. Notification is sent seven days before the code expires.

A new CIU order cannot be staged until the permanent order is downloaded and installed, VPD is received showing the ordered configuration is installed, and the billing is complete.

☐ The system programmer, in SYSPROG mode, must use the HMC mode and the **Single Object Operations** to open a console session with the machine's Support Element (see Appendix B, "Hardware Management Console User Interface Types," on page B-1 for more information).

☐ Select the **Perform Model Conversion** task to download and activate the upgrade. Completing this task requires the system programmer to enter the order number of the upgrade.

☐ On the **Perform Model Conversion** window, select **Customer Initiated Upgrade (CIU)**.

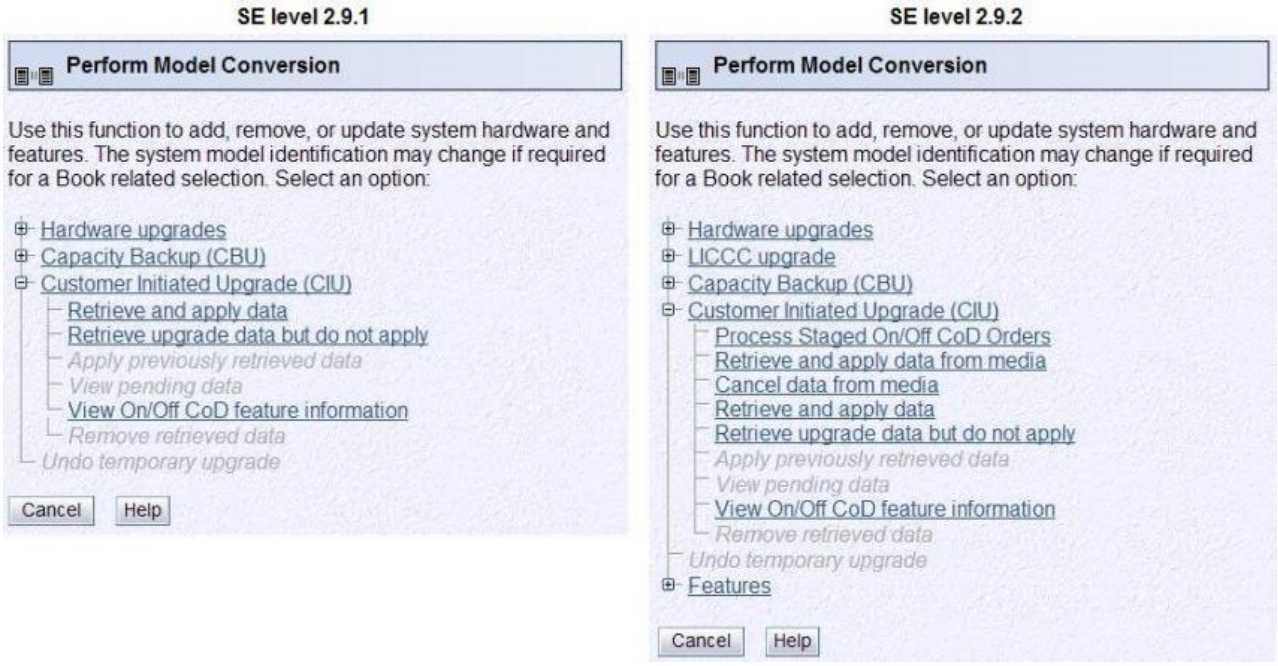


Figure 2-1. Perform Model Conversion - SE level 2.9.1 and SE level 2.9.2

☐ Retrieve and apply data.

There are two methods to retrieve and apply a permanent upgrade. You can either retrieve and immediately apply the permanent upgrade or retrieve the permanent upgrade and apply it at a later time.

- To retrieve and immediately apply the permanent upgrade, follow these steps:

  ☐ Select **Retrieve and apply data**.

- ☐ Enter the order number of the upgrade. Click **OK.** The CIU upgrade will be downloaded and applied.

  The system checks if the upgrades can be retrieved and activated when the upgrade is downloaded.

- To retrieve the permanent upgrade and apply it at a later time, follow these steps:
  - ☐ Select **Retrieve upgrade data but do not apply**.
  - ☐ Enter the order number of the upgrade. Click **OK.**

    The system checks if the upgrades can be retrieved when the upgrade is downloaded. The upgrade is retrieved and stored on the Support Element to be applied at a later time.

    Note: After you click **Retrieve upgrade data but do not apply**, the **View pending data** and **Apply previously retrieved data** options become active.
  - ☐ Before you apply the retrieve upgrade, you have the ability to view the upgrade data by selecting **View pending data** on the **Perform Model Conversion** window.
  - ☐ When you are ready to apply the upgrade you previously retrieved, select **Apply previously retrieved data**. The permanent upgrade is now applied.

☐ Purchase billing is generated when the memory or processor upgrade is downloaded and the machine owner receives an e-mail confirmation that it is downloaded.

If your server is a leased machine, the lease payment is recalculated.

Using CIU to Unassign Capacity

You can use CIU to reduce your currently active CP and IFL capacity. You may want to do this if you currently have excess active capacity and want to turn off the capacity to reduce the software charges.

To turn off capacity, go to **Customer Initiated Upgrade** from the navigation menu on Resource Link and click the ″Create permanent order″ option. Your current CP and IFL capacity is shown. For each engine type, use the pull down to view the possible configurations. If you select a configuration that has a lower CP capacity or fewer IFLs, the order will result in turning off capacity where you specify. Be aware that there is a charge for turning off capacity for all systems.

When turned off, the capacity may be reactivated by placing another permanent upgrade order. You can select your target configuration, however, if the target configuration is greater than the current configuration, the unassigned capacity is chosen first for activation. Once the unassigned capacity is used up, you can start purchasing new capacity.

- There is a charge for reactivating unassigned capacity for z890 and z990 systems.
- There is no charge reactivating unassigned capacity for System z9 EC and z9 BC systems.

Because CIU is a permanent change, you may need to deactivate processors within an image to allow the unassign to complete.

Important: Each image needs to be using less than or equal to the number of CIU (permanent) engines that will be left. You will need to deconfigure the engine within that image:

- if you do not have enough resource deactivated to enable you to unassign capacity, or
- if you have more resources assigned than will allow you to meet the processor requirement that the unassign will accommodate,

If you do not deconfigure enough resources you will get one to the following messages:

- ACT37180E System resources are insufficient
- ACT37181E System resources are insufficient

Cancelling an Order

You can cancel an order anytime before you download the LICCC. When you download the LICCC, you are accepting the charge and the option to cancel is no longer available.

- When you cancel an order, processing stops and you receive notification that the order was canceled.
- When you receive notification that the order was canceled, you can place a new order for the same machine on the same day.
- If you cancel an order, you can place another order for the same price as long as the price agreement has not changed.

Removing Retrieved Data

If you need to remove data that was retrieved but not applied (either by selecting **Retrieve and apply data**, but an error occurred causing the upgrade not to be applied or by selecting **Retrieve upgrade data but do not apply**, follow these steps:

- ☐ Using system programmer mode (SYSPROG) from the HMC, use **Single Object Operations** to the Support Element where the upgrade is applied (see Appendix B, “Hardware Management Console User Interface Types,” on page B-1 for more information).
- ☐ Select the **Perform Model Conversion** task.
- ☐ On the **Perform Model Conversion** window, expand **Customer Initiated Upgrade (CIU)**.
- ☐ Select **View Pending Data**.
- ☐ Verify that the data is the correct data you want to remove.
- ☐ Under **Customer Initiated Upgrade (CIU)**, select **Remove retrieved data**.

  Note: The **View Pending Data** and **Remove retrieved data** options will now be grayed out.
- ☐ Transmit VPD to IBM Service Support System using the **Transmit Vital Product Data** task.

Chapter 3. On/Off Capacity on Demand (On/Off CoD)

On/Off CoD (FC 9896), a Customer Initiated Upgrade offering, provides **temporary** server upgrades through Licensed Internal Code (LIC) enabling. Use On/Off CoD to concurrently add CPs, IFLs, ICFs, zAAPs, and zIIPs. See the special contract and registration requirements on page 2-1 for On/Off CoD.

On/Off CoD is:
- A Web-based solution available with an IBM ID and registered with Resource Link through the CIU feature for customers who require short-term additional capacity.
- Machine specific, allowing only one order to be activated at a time for each machine. However, if you are using SE level 2.9.2, you can stage multiple orders on the Support Element for each machine.
- Mutually exclusive with Capacity Backup (CBU) activation. Although both On/Off CoD and CBU can reside on the same server, only one can be activated at a time.

The sequence you follow to obtain an On/Off CoD upgrade is enabling, ordering, and download and activating.

For additional information and customer education on On/Off CoD, go to *www.ibm.com/servers/resourcelink* and select **Customer Initiated Upgrade** on the navigation bar.

Planning

Planning for capacity upgrades for your system is important and adequate planning is required to use On/Off CoD:
- Plan in advance to determine what configurations you might need based on work load projections.
- Place an order for those configurations and have them ready for download when the need arises.
- Ensure that you enable your system well in advance of needing to place an order.
- Place an order in advance of when you need it.
- Order On/Off CoD Test to validate the processes of downloading, activating, and deactivating the On/Off CoD function in your environment or Administrative On/Off CoD Test to test the process of ordering, downloading, activating, and deactivating an upgrade without any actual upgrade.

On/Off CoD allows you to temporarily turn on unowned PUs, unassigned CPs (or unassigned CP capacity), and unassigned IFLs available within the current model to help meet your peak workload requirements. On/Off CoD uses the CIU process to order the upgrade through the Resource Link Web site.

| For System z9 users using SE level 2.9.2, you can instantaneously change your
| activated “on-demand” capacity by activating additional On/Off CoD records. You no longer need to back off the current active record before starting a new record of a different capacity. From a capacity standpoint, this means you can now apply On/Off CoD based on your performance needs without losing any processors while updating to a new temporary record.

For example, if you have an On/Off CoD record active to increase capacity and decide that you need a new On/Off CoD record with even more capacity, you do not

need to deactivate your current record to apply the new configuration record, temporarily leaving you with reduced capacity. This also applies when you decide that you do not need all of your activated On/Off CoD temporary capacity and you download and activate a new On/Off CoD record with less capacity.

No PU upgrades involving physical hardware are supported while an On/Off CoD upgrade is active on a particular system. However, LIC-only upgrades can be ordered from Resource Link and downloaded from the IBM Service Support System, but not activated while an On/Off CoD upgrade is active.

Important

The On/Off CoD capability can coexist with CBU enablement. Both On/Off CoD and CBU LICCC can be installed on your server, but the On/Off CoD activation and CBU activation are mutually exclusive, meaning that only one can be activated at a time.

You can download and apply the upgrade using the **Single Object Operation** function on the HMC through the Remote Service Facility (RSF). After all the prerequisites are in place, you can perform the entire process - from ordering to activating the upgrade - without requiring the assistance of a service provider.

Additional logical processors can be concurrently configured online to logical partitions by the operating system when reserved processors are previously defined, resulting in image upgrades. The operating system must have the capability to concurrently configure more processors online.

Test Orders

Two types of test orders are now available for System z machines, the On/Off CoD Test and the Administrative On/Off CoD Test.

On/Off CoD Test

On/Off CoD has been enhanced to allow for a no-charge test, which means that no IBM charges are assessed for test periods, including IBM charges associated with temporary hardware capacity, IBM software, or IBM maintenance.

Use this test to validate the processes to download, activate, and deactivate On/Off CoD capacity non-disruptively. In addition to validating the On/Off CoD function with your environment, you may use this test as a training session for your authorized users to activate On/Off CoD.

An On/Off CoD no-charge test can be requested from Resource Link (*http://www.ibm.com/servers/resourcelink*).

For an On/Off CoD Test order:

- A test On/Off CoD order is available for each machine; each machine is entitled to one no-charge test, per contract.

  This test may last up to a maximum duration of 24-hours commencing with the download and activation of an On/Off CoD order.

  If the test order is on the processor for more than 24 hours, you are billed for the total time the order is active. If you are billed for the test order, one free test is still available for the machine.
- This test order must be deactivated within 24 hours of its activation.

The On/Off CoD no-charge test is the same as or similar to a normal On/Off CoD order.

Administrative On/Off CoD Test

The Administrative On/Off CoD Test order, available on the Resource Link Web site, does not change machine capacity. With this test order, the machine's ordered configuration will always be the same as the current configuration.

The purpose of an administrative test is simply to test the process of ordering, downloading, activating, and deactivating an upgrade, without any actual upgrade. This differs from the On/Off CoD Test order, which tests the process but actually upgrades to the configuration you specify.

For an Administrative On/Off CoD Test order:

- There are no charges involved because the machine capacity is not changed.
- There is no limit on how long an Administrative On/Off CoD Test order remains activated, and there is no limit on the number of administrative tests you create.

An Administrative On/Off CoD Test can be requested from Resource Link (*http://www.ibm.com/servers/resourcelink*).

Storing Records in an Unactivated State

It is possible to download and store up to 100 On/Off CoD LICCC orders in an unactivated state on the Support Element hard drive at any given time. This provides greater flexibility to quickly enable needed temporary capacity, allowing you to later activate the staged orders as needed, without contacting the IBM System Support System. The billing begins upon activation. Refer to "Downloading and Activating" on page 3-7 for details on staging orders on the Support Element hard drive.

One Hour Grace Period to the 24 Hour Billing Period

You have up to an hour *before* the next billing period starts to increase the On/Off CoD configuration for the next 24-hour billing period without affecting the billing of the current 24-hour period. You also have up to an hour *after* the current 24-hour billing period to either decrease the On/Off CoD configuration for the next 24-hour billing period or deactivate the current On/Off CoD configuration without affecting the billing of the next 24-hour period.

Limitations

The maximum limit of an On/Off CoD order is two times the current purchased capacity of the machine. This includes unassigned engines. However, the capacity is computed differently depending on the model:

- For z990 machines, capacity is computed based on the number of engines.

  For example, if you owns a 311, you can activate up to a 322. If you have a 311 with 2 unassigned engines, then you actually own up to a 313, so you can activate up to a 326.
- For z9 EC, z9 BC, z890 machines, capacity is computed based on processing capacity gained by adding the engines. (It is based off the published LSPR values for the configuration.)

  For example, if you own a 711, you can activate up to a 726. If you own a 711 with 2 unassigned engines (713 purchased), you can activate up to a 731.

Spare capacity and spare PUs that are currently unassigned and unowned can be temporarily and concurrently activated as CP capacity, ICFs, IFLs, zAAPs, or zIIPs using LICCC. An On/Off CoD upgrade cannot change the server model, as additional book installation is not supported. However, On/Off CoD may change the server software model if additional CP capacity is requested.

Using the On/Off CoD offering, you can add temporary capacity of the various processor types (CPs, ICFs, IFLs, zAAPs, or zIIPs) up to the maximum of available processing units that are unassigned or uncharacterized (previously unpurchased capacity).

If unassigned or uncharacterized capacity is available, you can add:

- Temporary processing capacity up to two times your current purchased capacity. This means you can temporarily activate up two times your permanently active processing capacity plus your unassigned processing capacity.
- As many temporary IFLs up to the total of permanently active IFLs plus unassigned IFLs.
- As many temporary ICFs up to the total of permanently active ICFs, as long as the sum of the temporary and permanent ICFs is less than or equal to 16, on the same machine.
- zAAPs up to the total of permanently active zAAPs. In addition, the total number of active zAAPs cannot exceed the number of PUs with active or unassigned CP capacity on the server.
- zIIPs up to the total of permanently active zIIPs. In addition, zIIPs up to the total number of temporary active CPs plus permanently assigned CP capacity on the server.

Software Considerations

Software Parallel Sysplex® License Charge (PSLC) customers are billed at the million service unit (MSU) level represented by the combined permanent and temporary capacity. All PSLC products are billed at the peak MSUs enabled during the month, regardless of usage.

Customers with Workload License Charge (WLC) licenses are billed by product, at the highest four-hour rolling average for the month. In this instance, temporary capacity does not necessarily increase your software billing until that capacity is allocated to logical partitions and actually consumed.

Enablement

On/Off CoD is delivered through the CIU feature. To participate in this offering, you must have installed CIU Enablement (FC 9898) and On/Off CoD Enablement (FC 9896).

Activation of this upgrade is mutually exclusive the CBU upgrade activation. The On/Off CoD feature and the CBU feature can be installed at the same time on the same server, but an On/Off CoD upgrade and a CBU upgrade cannot be activated at the same time.

On/Off CoD for Customers without IBM Service Support System

On/Off CoD is now available as a request for price quotation (RPQ) for customers who do not have remote service with the IBM Service Support System. This RPQ is only available for z9 servers.

Typically, On/Off CoD is ordered through a Customer Initiated Upgrade (CIU) contract. Now with the RPQ availability, you can request On/Off CoD through (diskette) media if you do not have a remote connection to the IBM Service Support System.

For more information, contact your IBM Sales Representative.

On/Off CoD Registration and Agreed Contract for On/Off CoD

To participate in this offering, you must have accepted contractual terms for On/Off CoD, in addition to Customer Initiated Upgrade (CIU), established a CIU profile, and installed an On/Off CoD “right to use” feature on the servers. Then you can concurrently install temporary capacity, based on your contract, and use it for an indeterminate time.

- ☐ Before you can process an order for temporary capacity, you must have a signed agreement in place for the Customer Initiated Upgrade (CIU) facility (FC 9898) with a CIU profile on the Resource Link Web site.
- ☐ You need to acknowledge and agree to additional specific terms that govern the use of temporary capacity and an On/Off CoD contract.
- ☐ When the signed contract is completed, a temporary upgrade is ordered through CIU to install an On/Off CoD ″right to use″ feature.
- ☐ You need the machine profile, created on Resource Link by the IBM Access Administrator, which is built from the customer order information for a specific machine with established prices set for that profile.
- ☐ Have a negotiated pricing and billing agreement in place for the Customer Initiated Upgrade (CIU) facility (FC 9898).

Ordering

On/Off CoD upgrades can only be ordered through CIU:

- The resources eligible for temporary use are CPs, ICFs, IFLs, zAAPs, and zIIPs.
- Spare PUs that are currently unassigned and unowned can be temporarily and concurrently activated as CPs, ICFs, IFLs, zAAPs, or zIIPs using LICCC, **not to exceed the combined quantity of temporarily active CPs plus permanently active CPs on the same machine.** This means that On/Off CoD upgrade cannot change the server model, as additional book installation is not supported. However, On/Off CoD may change the server software model if additional CPs are requested.
- The total number of On/Off CoD active zAAPs plus zAAPs cannot exceed the number of On/Off CoD active CPs, plus the number of CPs, plus the number of unassigned CPs on the server.

A LIC record is established and staged in the IBM Service Support Facility for this order, where it is kept available. After it is activated, this record has no expiration date. Only one configuration record can be activated at one time. To create the same configuration again requires generating a new order to produce a new LIC record for the temporary configuration you need.

The following is an example of the sequence you will follow on Resource Link to order an upgrade:

☐ Sign in on Resource Link to order an upgrade.

☐ Select **Customer Initiated Upgrade** from the navigation bar on the main Resource Link page. CIU enabled servers are listed by machine type and serial number. You can view the current configuration (PU allocation) for a selected machine serial number.

☐ Select **Create On/Off CoD order**. The current configuration and available upgrades are displayed.

☐ Create a target configuration for each upgradeable option. Resource Link limits options to those that are valid for this configuration. The **Total daily price** is the price you are billed for each partial or full 24-hour period that the upgrade is activated on your machine.

☐ Click **Submit**.
- If there is no Price Agreement for this machine, the **Total daily price** is listed as **Not Negotiated**. You cannot complete the order without a price agreement signed and set up to be displayed.
  - Contact your IBM Sales Representative or Business Partner to negotiate the price agreement.

☐ If you accept the terms of the order, click **I accept the terms of this order**.

☐ The order is created.

☐ The Machine profiles page is updated to show the **Order number** and **Order status** in the **Order history** area.

☐ The order is now staged on IBM Service Support System.

All On/Off CoD orders may be staged for an extended period of time, more than 30 days, unless one of the following conditions occur:
- The order is canceled by the customer
- The machine is no longer under warranty or under an IBM maintenance service agreement

- An LICCC upgrade or book upgrade (CIU or MES) is performed, then the staged On/Off CoD records are deleted from the staged area. Once the updated VPD is uploaded into Resource Link, the deleted On/Off CoD orders are cancelled on Resource Link. However, if the permanent upgrade contains only a memory or Crypto change, then the staged On/Off CoD orders are not deleted. If the permanent upgrade contains any PU changes, all staged On/Off CoD orders are deleted.

Downloading and Activating

Resource Link notifies you by e-mail when the order staged on IBM Service Support System is ready for download. You will use your HMC and SE to download and activate your On/Off CoD orders.

The download and activation process differs depending on the SE level. With SE level 2.9.2, you can chose to either stage On/Off CoD orders on the Support Element (download, then activate later) or download and immediately activate On/Off CoD orders. With SE level 2.9.1, On/Off CoD orders are activated as soon as they are downloaded. You cannot stage them on the Support Element.

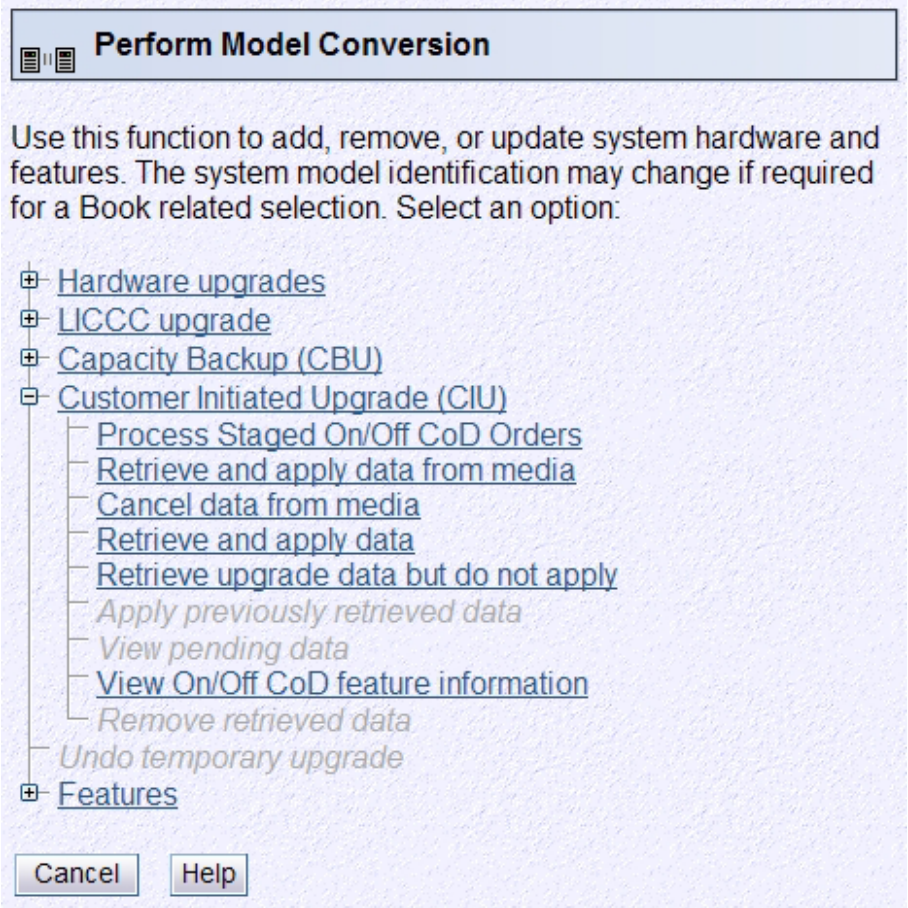
☐ Using system programmer mode (SYSPROG) from the HMC, use **Single Object Operations** to the Support Element where the upgrade is applied (see Appendix B, “Hardware Management Console User Interface Types,” on page B-1 for more information).

☐ Select the **Perform Model Conversion** task.

☐ On the **Perform Model Conversion** window, expand **Customer Initiated Upgrade (CIU)** to download the LICCC at your convenience.

☐ **SE level 2.9.2**

Using SE level 2.9.2, the following **Perform Model Conversion** window displays:



- To stage your On/Off CoD orders on the Support Element then activate later, follow these steps:

  ☐ On the **Perform Model Conversion** window, select **Process Staged On/Off CoD Orders.**

  Note: DO NOT select **Retrieve upgrade data but do not apply**. This task is for permanent upgrade orders only.

  ☐ If there are valid or available staged orders ready for activation, the **Process Staged On/Off CoD Orders** window displays a list of the staged orders. Then you can select an order and select **Activate** to activate the order.

  If there are no valid or available staged orders ready for activation, the **Process Staged On/Off CoD Orders** window displays a message asking if you want to retrieve any orders from the IBM Service Support System. Select **OK**. The **Process Staged On/Off CoD Orders** window displays a list of the staged orders. Then you can select an order and select **Activate** to activate the order.

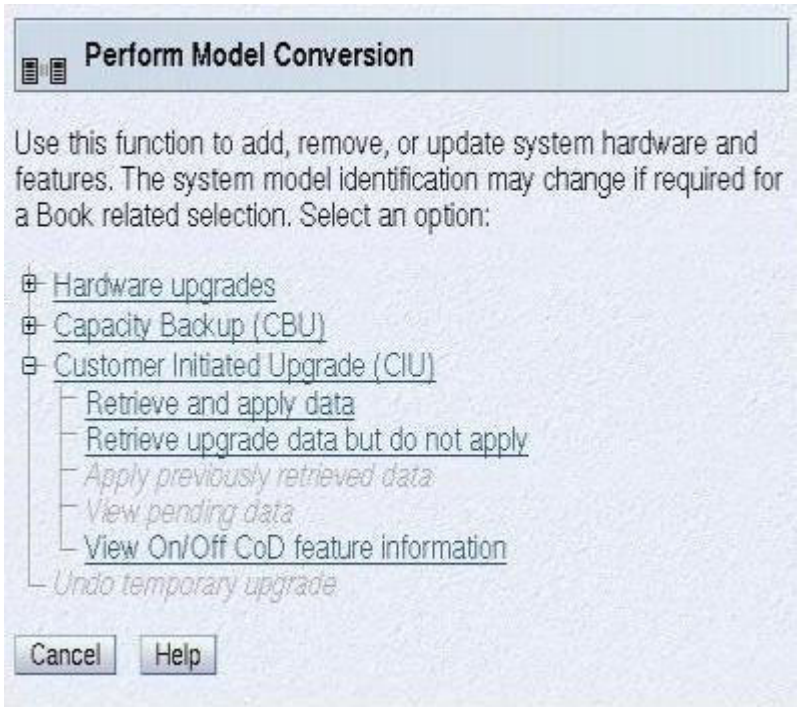
- To download and activate your On/Off CoD order at the same time, follow these steps:

  ☐ On the **Perform Model Conversion** window, select **Retrieve and apply data**.

☐ On the **Activation Number Panel**, enter the eight-digit order activation number to specify the correct On/Off CoD order. Click **OK.**

SE level 2.9.1

With SE level 2.9.1, the following **Perform Model Conversion** window displays:



☐ On the **Perform Model Conversion** window, select **Retrieve and apply data**.

☐ On the **Activation Number Panel**, enter the eight-digit order activation number to specify the correct On/Off CoD order. Click **OK.**

☐ You will receive an e-mail notification that your order was downloaded and applied.

For a detailed simulation showing how to process staged On/Off CoD orders, refer to Resource Link. (On the main Resource Link window, select **Education**; under Featured education, select **Customer Initiated Upgrade**; and on the Using CIU and On/Off CoD window, select **Staging On/Off CoD Orders on a z9 Support Element**.)

Billing

You are billed on a monthly basis for On/Off CoD. Monitoring occurs through the server Call Home facility and an invoice is generated if the capacity was enabled for any portion of a calendar month. You are billed for the total usage for the month.

- You are billed for using temporary capacity until you return the server to its original state.
  - After concurrently returning the server to the original state, you may choose to activate a new temporary session that can be different from the previous session.

- The CIU process will continue billing for the upgrade on a daily basis until it detects the On/Off CoD is deactivated.
  - When the temporary capacity is no longer required, removal is non-disruptive and you must take action to deactivate.

If On/Off CoD is activated on any System z server, other hardware upgrades are restricted. With the exception of memory and channels, LICCC enabled features, such as CPs, ICFs, IFLs, zAAPs, and zIIPs can be ordered but not enabled until the On/Off CoD upgrade is deactivated.

Deactivation

When you are finished using temporary capacity, you must take action to deactivate the upgrade.

- This deactivation is non-disruptive to your operation.
- Depending on the use of the extra capacity, you may need to perform tasks at the logically partitioned level to remove the temporary CPs, such as the removal of temporary CPs allocated to a logical partition.

When you are ready to deactivate an On/Off CoD upgrade:

☐ Using system programmer mode (SYSPROG) from the HMC, use **Single Object Operations** to the Support Element where the upgrade is applied (see Appendix B, “Hardware Management Console User Interface Types,” on page B-1 for more information).

☐ Select **CPC Configuration** task.

☐ Select the **Perform Model Conversion** task.

☐ On the **Perform Model Conversion** window, select **Undo Temporary Upgrade**.

☐ Follow the directions on the screen. (For details, continue to the “Follow the directions on the screen” step on page 4-13.)

Monitoring

When you activate an On/Off CoD upgrade, an indicator is set in the Vital Product Data. This indicator is part of the Call Home transmission, which is sent on a scheduled basis. A time stamp is placed into Call Home data when the upgrade is deactivated.

CIU begins the invoicing process at the end of each calendar month.

On/Off CoD Removal

When you decide that you want to disable future On/Off CoD or when you dispose of the server, you need to provide the termination feature that disables the right to use.

Any On/Off CoD features must be disabled/removed before starting the discontinue process. You are contractually required to have the On/Off CoD right to use feature (also called the ″On/Off CoD Enablement″ feature) removed prior to transfer of possession of the machine for which the right to use feature has been added.

You should also consider the following concerning the On/Off CoD right to use feature:

- You can terminate the On/Off CoD right to use feature without transferring ownership. This might apply if you want business controls put in place that prevent On/Off CoD from being used in the future.
- CIU cannot be removed if an On/Off CoD upgrade is active. Anytime CIU is removed, the On/Off CoD right to use will also be removed.
- If you reactivate the On/Off CoD right to use feature, you will be subject to whatever terms and fees apply at that time.

Before disabling/removing an On/Off CoD feature, remove any currently installed On/Off CoD upgrades using the following steps:

1. Deactivate any currently active On/Off CoD upgrades
2. Delete any On/Off CoD upgrades staged on the Support Element
3. Export the VPD to media and upload the VPD using the **Upload VPD** option on the CIU machine profile.

Chapter 4. Capacity Backup (CBU)

Note: This chapter description the CBU function for System z9 servers. For details on Capacity Backup (CBU) for zSeries 890 and 990, refer to *zSeries 890 and 990 Capacity Backup User's Guide*. For details on Capacity Backup (CBU) for zSeries 800 and 900, refer to *zSeries 800 and 900 Capacity Backup User's Guide*.

CBU is offered with System z servers to provide reserved emergency backup processor capacity for unplanned situations where you experience a loss of capacity in another part of your enterprise and want to recover by adding the reserved capacity on a designated System z server. When you lose processing capacity due to an emergency or disaster recovery situation, CBU provides quick, *temporary emergency* activation for up to 90 days of CPs and specialty engines.

CBU can concurrently add temporary CPs, ICFs, IFLs, zAAPs, and zIIPs to a System z9 server's existing configuration when other servers are experiencing unplanned outages. CPs can assume any kind of workload that can run on ICF and IFL processors at the failed system or systems. z/VM®, Linux, Java™ code, and CFCC (for Coupling Facility partitions) can also run on CPs.

One CBU for each ″backup″ CP must be ordered and installed to restore the required capacity under disaster situations. The CBU activation can be tested for disaster recovery procedures validation and testing. Since this is a temporary upgrade, the original configuration must be restored after a test or disaster recovery situation.

Typically, the PUs associated with CBU are reserved for future use with CBU features installed on the backup server. When the production server has an unplanned outage, the backup server can be temporarily upgraded to the target model planned to get the capacity to take over the workload on the failed production server.

You must deactivate the CBU temporary capacity upgrade when it is no longer needed and before the end of 90 days. The deactivation is nondisruptive. If CBU is activated on a System z server, other hardware upgrades are restricted. With the exception of channels, MES enabled features such as CPs, ICFs, IFLs, zAAPs, zIIPs, memory, and Crypto Assist on System z9 servers can be ordered but not enabled, until the CBU temporary capacity upgrade is deactivated.

Important

The CBU capability can coexist with On/Off CoD enablement. Both CBU and On/Off CoD LICCC can be installed on the system server, but the CBU activation and On/Off CoD activation are mutually exclusive.

Planning

Before ordering, installing, and activating a CBU feature, you should be aware of the following:

- CBU can activate PUs through LICCC only.
- System z servers must have the correct number of books installed to allow the required upgrade by LICCC. CBU changes the server software model but cannot change the System z server model.

- A CBU contract must be in place before the special code that enables this offering can be loaded on your server. CBU features can be added non-disruptively by a service representative to an existing System z server.
- Installing the CBU code provides an alternate configuration that can be activated for an actual emergency. Five CBU tests, lasting up to 10 days each, and one CBU activation, lasting up to 90 days for a real disaster recovery, are usually allowed in each CBU contract.

  Test CBU upgrades the machine for the sole purpose of checking your system's ability to adequately perform in the event of an emergency. The basic CBU contract allows for up to five, 10-day tests over the period of the contract. Contact your Sales Representative to place an order for CBU if CBU was not included in the order with your new machine.

  CBU Tests do not allow the primary instance of production workload to be run on the CBU Upgrade.
- CBU features are configured as a delta to the base permanent configuration. This delta CBU record is defined with specific PU resources (CP's, ICF's, IFL's, zAAP's and zIIP's) that take advantage of the spare PU resources already available on your system in case of an emergency. One CBU feature is required for each "stand-by" CP that can be activated. A CBU activation enables the total number of CBU features installed.
  - The base CBU configuration must have sufficient memory and channels to accommodate the potential needs of the large CBU target server. When capacity is needed in an emergency, you can activate the emergency CBU configuration with the reserved spare PUs added into the configuration as CPs. It is very important to ensure that all required functions are available on the "backup" servers, including CFLEVELs for Coupling Facility partitions, as well as cryptographic and connectivity capabilities.
  - The CPs and PUs that can be activated by CBU come from the available spare PUs on any installed book of the designated System z server. This means that the number of CBU features that can be ordered, one for each "stand-by" CP or specialty engine, is limited by the number of spare PUs on the server.
  - This upgraded configuration is activated temporarily and provides additional CPs above and beyond the server's original, permanent configuration. The number of additional CPs is predetermined by the alternate configuration, stated in the CBU contract.
- After the CBU activation, the System z server has additional physical processor resources available to the operating system images. The logical partition images can concurrently increase the number of logical processor resources by configuring reserved processors online. The operating system must also have the capability to concurrently configure more processors online.
- If CBU is activated on any System z server, other hardware upgrades may be restricted.
- When the emergency is over or the CBU test is complete, the server must be taken back to its original, permanent configuration. The CBU features can be deactivated at any time before the expiration date. If not, the performance of the system will be degraded after expiration, until CBU is deactivated. Refer to "Reaching Expiration Date without Manually Deactivating" on page 4-14 for more information.

Software Considerations

IBM software charges during a disaster or a test are not affected by CBU. Software charges for the designated CBU machine are based on its permanent configuration;

software charges for any machine whose workload is transferred to the CBU machine during an emergency are based on that machine's permanent configuration.

Enablement

CBU (FC 7870-7895, 7896-7899) requires a special contract with IBM:

- IBM Customer Agreement, Attachment for Capacity Backup Upgrade, US Form # Z125-5598 serves as the base agreement between IBM and you.
- IBM Customer Agreement, Supplement for Capacity Backup Upgrade, US Form # Z125-6857 contains associated information for each z9 CBU directly sold transaction.
- IBM Customer Agreement, Supplement for Capacity Backup Upgrade II, US Form # Z125-7137 contains associated information for each z9 CBU transaction sold through an IBM Business Partner.

These contractual agreements also apply when using CBU for limited disaster recovery testing.

To enable CBU:

☐ The base agreement (Z125-5598 in the United States) is signed once by the end user customer.

☐ The supplemental agreement (Z125-6857 or Z125-7137 in the United States) is signed for **each** new transaction where CBU features are ordered for servers. (Z125-6857 for each new direct transaction and Z125-7137 for each new BP transaction.)

Automatic CBU Enablement for Geographically Dispersed Parallel Sysplex (GDPS)

The intent of the GDPS CBU is to enable automatic management of the reserved PUs provided by the CBU feature in the event of a server failure or a site failure. When a site failure or planned disaster test is detected, GDPS concurrently adds CPs to the servers in the take-over site to restore processing power for mission-critical production workloads. GDPS automation will:

- Perform the analysis required to determine the scope of the failure to minimize operator intervention and the potential for errors.
- Automate authentication and activation of the reserved CPs.
- Automatically restart the critical applications after reserved CP activation.
- Reduce the outage time to restart critical workloads from several hours to minutes.

Ordering

The CBU feature can be available with a new machine order or can be added by a service representative.

A special bid contract is required and must be approved before the CBU feature is ordered. Requirements for processor memory and channels must be planned for by the end user and sufficiently available in the CBU machine prior to CBU being invoked. Subsequent upgrade activity to this system or the system it protects may require changes to the CBU contract.

Capacity Backup is done concurrently with system operations.

- **CBU FC 7820** - The feature code (FC) identifies to IBM's Vital Product Data (VPD) database how many CPs are in the Capacity Backup.
- **Special Configuration Fast Activation (CBU activate through the IBM Service Support System)** - For customers with CBU feature identified (FC 7820), an option to electronically activate their CBU configuration is available.

Viewing the Capacity Backup Information/Status

You can use this task to determine whether the CBU feature is installed and to view the status of either your activated temporary CBU feature upgrade or a test of CBU upgrade, depending on whether you have activated temporary or test upgrade.

To view the CBU information and status, follow these steps:

☐ Logon to the Hardware Management Console (HMC) in system programmer mode (SYSPROG).

☐ Connect to the Support Element through **Single Object Operations** (see Appendix B, "Hardware Management Console User Interface Types," on page B-1 for more information).

☐ From the Support Element, open the **Task List** from the **Views** area.

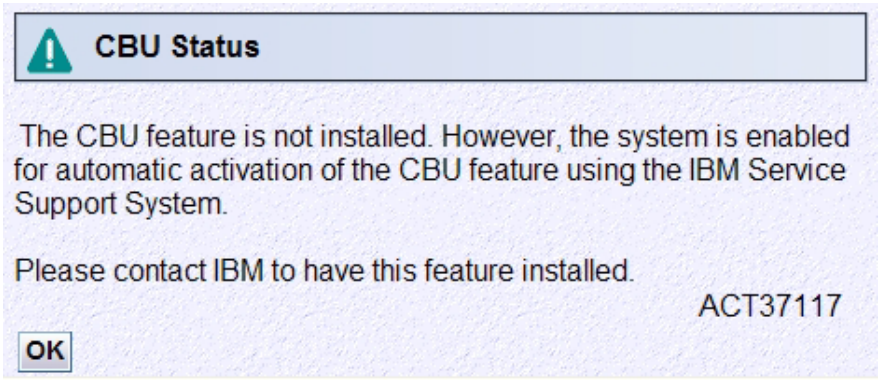
☐ Open **CPC Configuration** from the **Task List Work Area**.

☐ Open **Groups** from the **Views** area.

☐ Open the CPC group from the **Groups Work Area**.

☐ Drag and drop the CPC on **View CBU Feature Information** in the **CPC Configuration** tasks area.

- If the CBU feature is not installed, the **CBU Status** window displays:



- If the CBU feature is installed, the **View CBU Feature Information Confirmation** window displays.

  Click **Continue** to display the following information:
  - If CBU is active
  - If the system is enabled for CBU and the IBM Service Support option
  - The additional resources for installing the CBU feature
  - The date CBU was activated
  - The date CBU will expire
  - Whether the activated CBU is a Test CBU or Temporary Upgrade CBU
  - How many CBU tests are remaining.

Adding Capacity Backup

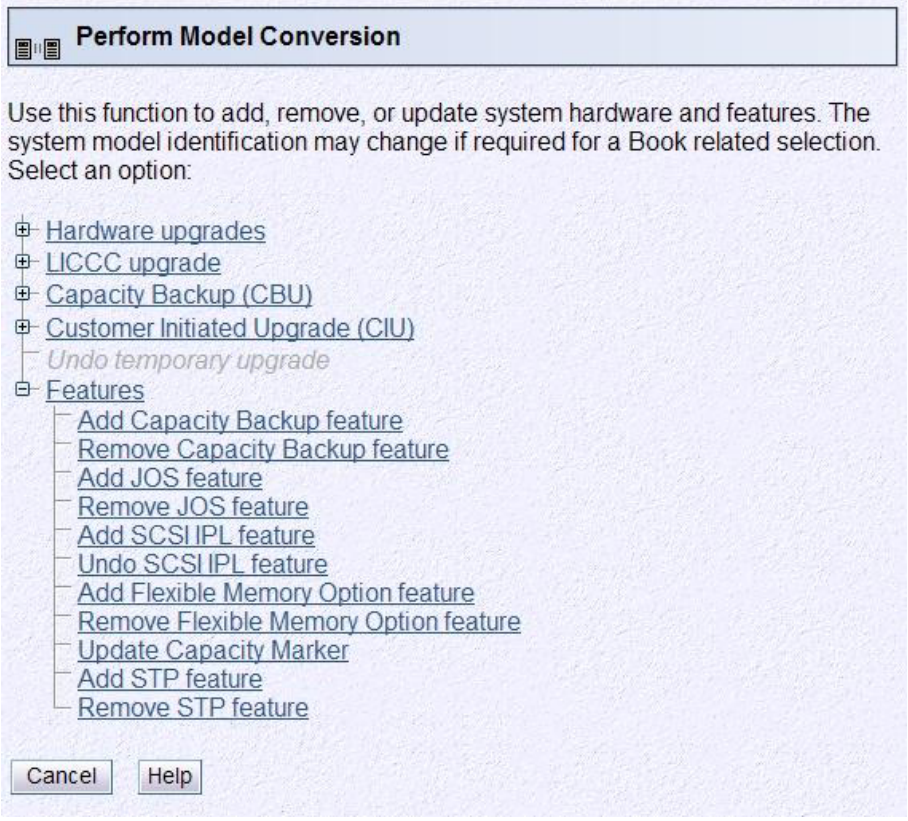
The CBU feature can be available with a new machine order or can be added by the service representative. CBU feature media is required to complete this task. Your service representative will install this CBU LIC-CC media.

Before adding the CBU feature, determine whether it is already installed. (Refer to “Viewing the Capacity Backup Information/Status” on page 4-4.)

To add the CBU feature to your system, your service representative must follow these steps:

- ☐ Logon to the Hardware Management Console (HMC) in service mode (SERVICE).
- ☐ Connect to the Support Element through **Single Object Operations** (see Appendix B, “Hardware Management Console User Interface Types,” on page B-1 for more information).
- ☐ Open the **Task List** from the **Views** area.
- ☐ Open **CPC Configuration** from the **Task List Work Area**.
- ☐ Open **Groups** from the **Views** area.
- ☐ Open the CPC group from the **Groups Work Area**.
- ☐ Drag and drop the CPC on **Perform Model Conversion** in the **CPC Configuration** tasks area. The **Perform Model Conversion** window displays.
- ☐ Expand the **Features** option and select the **Add Capacity Backup feature** task.

  Note: If the CBU feature is already installed, the **Add Capacity Backup feature** task would not be available.



☐ A window displays prompting you to insert the CBU LIC-CC media. Insert the media and follow the remaining prompts.

Testing and Activating

You can test and activate (and deactivate) a CBU feature without a service representative onsite. To test or activate a CBU feature, you must have a CBU password. You can obtain a CBU password (and, therefore, test and activate a CBU feature) using one of three methods:

- **Using the IBM Service Support System**
  A FAST electronic activation is available through the HMC and Remote Service Facility (RSF), reducing activation time. The server invokes the RSF to trigger an automatic verification of CBU authentication to IBM Service Support System. This sends the authentication to your server, automatically unlocking the reserved capacity and activating the target configuration.
- **Calling the IBM support center for the password**
  CBU can be activated with a few hours using a password panel.
- **Manually reading the CBU password from the LIC-CC5 diskette**
  CBU can be activated using a password panel. For more information, refer to Appendix A, “Obtaining a Password to Activate CBU,” on page A-1.

The Test Capacity Backup feature is only a test and is not to be used for a temporary upgrade for production workload. The test can be active for up to 10 days and can be undone any time during that time. This is counted as one test being used. There are five CBU tests allowed per CBU machine, each test lasting up to 10 days.

Enabling the System to Automatically Retrieve the CBU Password

To allow the system to use the IBM Service Support System to automatically retrieve the CBU password, follow these steps:

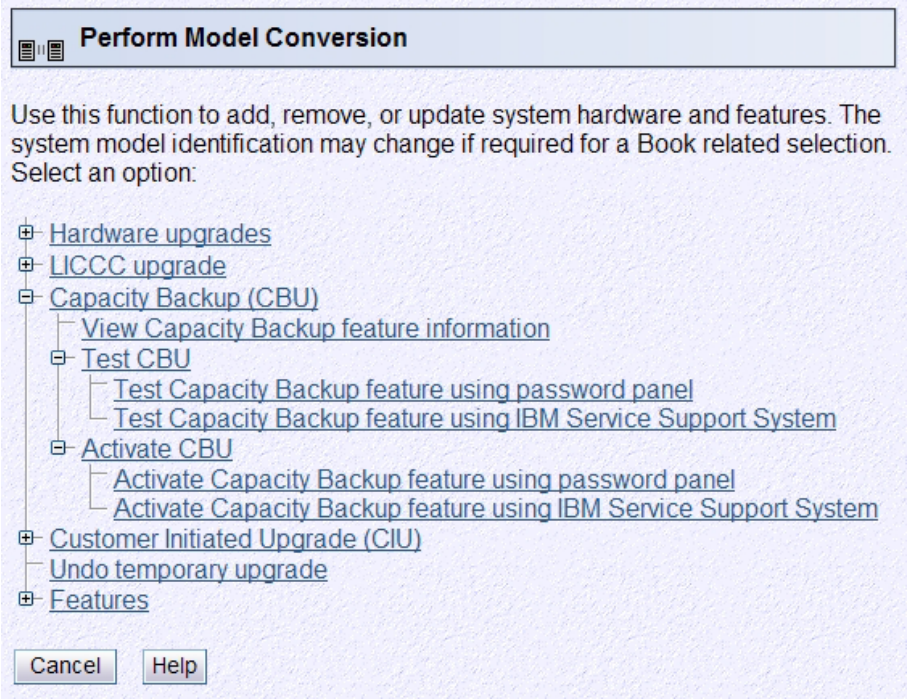
- ☐ From the Support Element, open the **Console Actions** from the **Views** area.
- ☐ Open **Support Element Settings** from the **Console Actions Work Area**.
- ☐ Open **Customize Console Services** from the **Support Element Settings Work Area**. The **Customize Console Services** window displays.
- ☐ Select **Enabled** next to the Capacity Backup service to allow testing or a temporary upgrade of the CBU feature using the IBM Service Support System.
- ☐ Select **OK** to save the setting.

Testing a CBU Feature Using the Password Panel

Note: If not already done, the CBU feature must be added using the **Add Capacity Backup** feature selection under the **Perform Model Conversion** task. (Refer to “Adding Capacity Backup” on page 4-5 for details.)

To test the CBU feature using the Password Panel, follow these steps:

- ☐ Logon to the Hardware Management Console (HMC) in system programmer mode (SYSPROG).
- ☐ Connect to the Support Element through **Single Object Operations** (see Appendix B, “Hardware Management Console User Interface Types,” on page B-1 for more information).
- ☐ Open the **Task List** from the **Views** area.
- ☐ Open **CPC Configuration** from the **Task List Work Area**.
- ☐ Open **Groups** from the **Views** area.
- ☐ Open the **CPC** group from the **Groups Work Area**.
- ☐ Drag and drop the CPC on **Perform Model Conversion** in the CPC Configuration tasks area. The **Perform Model Conversion** window displays.
- ☐ Expand the **Capacity Backup (CBU)** option, and expand the **Test CBU** option.



☐ Select **Test Capacity Backup feature using password panel**. The **Capacity Backup (CBU) Activation Authorization** window displays.

☐ Obtain the CBU password by either calling the IBM support center or reading the log file on your system that was downloaded from CBU LIC-CC media.

Calling IBM support center

☐ Before calling the IBM support center for the CBU password, write down the PU serial number and PU Detailed Data from the **Capacity Backup (CBU) Activation Authorization** window.

☐ Contact the IBM Remote Technical Support Center requesting a service call for the correct password based on the processing unit (PU) data displayed.

Note: In the United States, DO NOT select phone option #4 (Business recovery/Disaster recovery services).

Reading the log file from the CBU LIC-CC media

☐ For details on retrieving the CBU password from the log file from the CBU LIC-CC media, refer to Appendix A, “Obtaining a Password to Activate CBU,” on page A-1.

☐ Once you have the password, enter it on the **Capacity Backup (CBU) Activation Authorization** window, continue, and follow the remaining prompts.

Note: After three unsuccessful attempts to enter the password, the CBU feature will no longer be available to the system. You must contact IBM for a new CBU record and its password. There are five, 10-day tests allowed per CBU feature prior to the executing a Temporary CBU upgrade. Consult

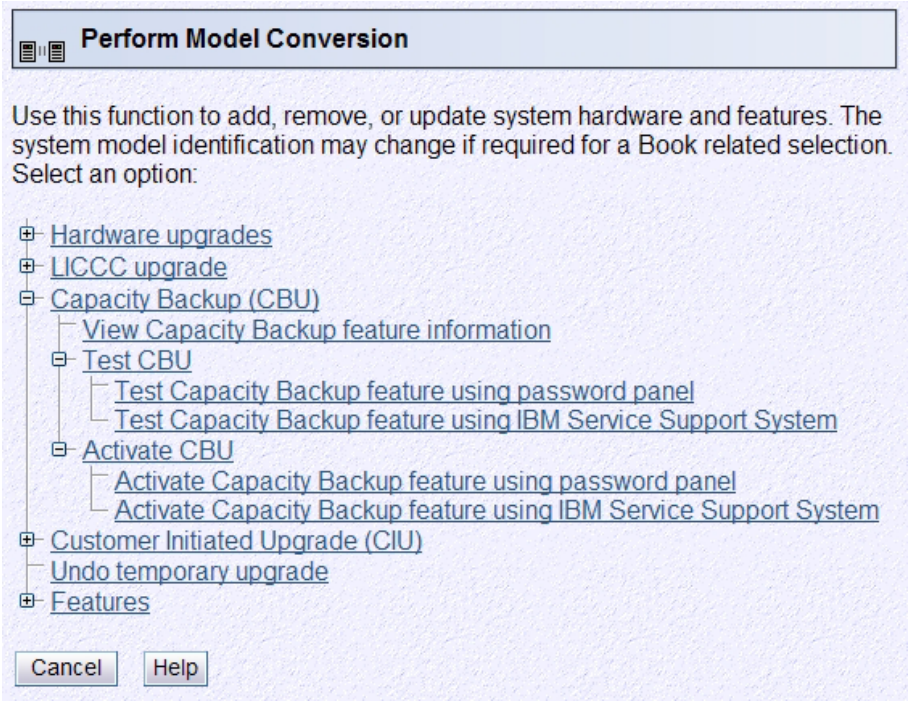
your contract with IBM or contact your IBM account representative to determine the number of tests allowed each year and when you will be billed for activations.

Testing a CBU Feature Using the IBM Service Support System

Note: If not already done, the CBU feature must be added using the **Add Capacity Backup feature** selection under the **Perform Model Conversion** task (refer to “Adding Capacity Backup” on page 4-5) and enabled to use IBM Service Support System to retrieve the CBU password (refer to “Enabling the System to Automatically Retrieve the CBU Password” on page 4-7.

To test the Capacity Backup (CBU) feature using the IBM Service Support System:

- ☐ Logon to the Hardware Management Console (HMC) in system programmer mode (SYSPROG).
- ☐ Connect to the Support Element through **Single Object Operations** (see Appendix B, “Hardware Management Console User Interface Types,” on page B-1 for more information).
- ☐ Open the **Task List** from the **Views** area.
- ☐ Open **CPC Configuration** from the **Task List Work Area**.
- ☐ Open **Groups** from the **Views** area.
- ☐ Open the **CPC** group from the **Groups Work Area**.
- ☐ Drag and drop the CPC on **Perform Model Conversion** in the CPC Configuration tasks area. The **Perform Model Conversion** window displays.
- ☐ Expand the **Capacity Backup (CBU)** option, and expand the **Test CBU** option.



☐ Select **Test Capacity Backup feature using IBM Service Support System**. The **Activate CBU using IBM Service Support System Configuration** window displays.

☐ Click **Continue** and follow the remaining prompts. The system will automatically retrieve the CBU password.

Activating a Temporary CBU Feature Using the Password Panel

Note: If not already done, the CBU feature must be added using the **Add Capacity Backup** feature selection under the **Perform Model Conversion** task. (Refer to "Adding Capacity Backup" on page 4-5 for details.)

To activate the CBU feature using the Password Panel, follow these steps:

☐ Logon to the Hardware Management Console (HMC) in system programmer mode (SYSPROG).

☐ Connect to the Support Element through **Single Object Operations** (see Appendix B, "Hardware Management Console User Interface Types," on page B-1 for more information).

☐ Open the **Task List** from the **Views** area.

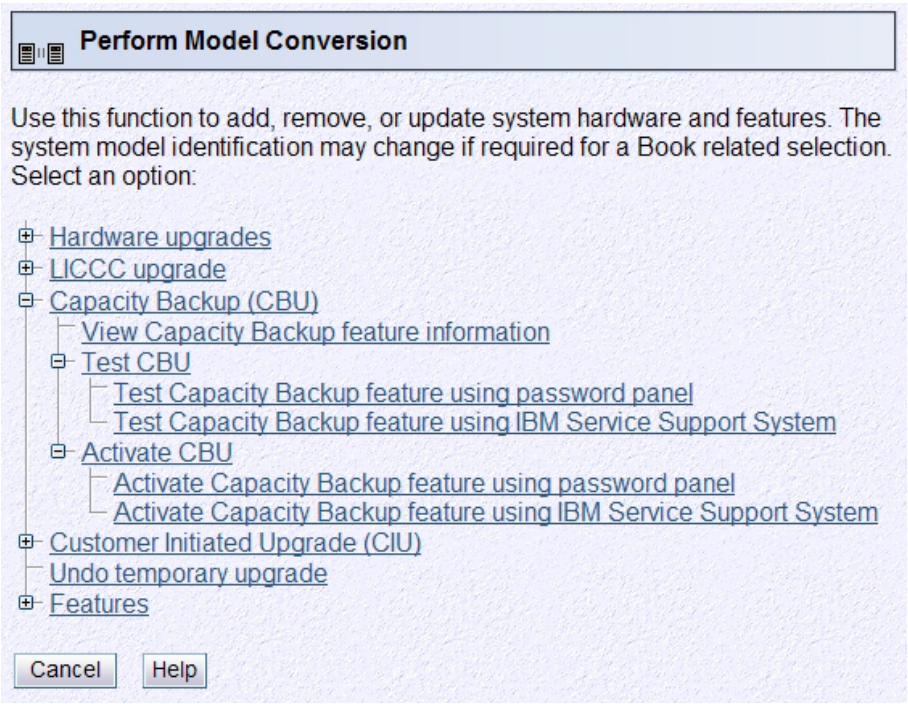
☐ Open **CPC Configuration** from the **Task List Work Area**.

☐ Open **Groups** from the **Views** area.

☐ Open the **CPC** group from the **Groups Work Area**.

☐ Drag and drop the CPC on **Perform Model Conversion** in the CPC Configuration tasks area. The **Perform Model Conversion** window displays.

☐ Expand the **Capacity Backup (CBU)** option, and expand the **Activate CBU** option.



- ☐ Select **Activate Capacity Backup feature using password panel**. The **Capacity Backup (CBU) Activation Authorization** window displays.
- ☐ Obtain the CBU password by either calling the IBM support center or reading the log file on your system that was downloaded from CBU LIC-CC media.

  Calling IBM support center

  - ☐ Before calling the IBM support center for the CBU password, write down the PU serial number and PU Detailed Data from the **Capacity Backup (CBU) Activation Authorization** window.
  - ☐ Contact the IBM Remote Technical Support Center requesting a service call for the correct password based on the processing unit (PU) data displayed.

    Note: In the United States, DO NOT select phone option #4 (Business recovery/Disaster recovery services).

  Reading the log file from the CBU LIC-CC media

  - ☐ For details on retrieving the CBU password from the log file from the CBU LIC-CC media, refer to Appendix A, “Obtaining a Password to Activate CBU,” on page A-1.
- ☐ Once you have the password, enter it on the **Capacity Backup (CBU) Activation Authorization** window, continue, and follow the remaining prompts.

  Note: After three unsuccessful attempts to enter the password, the CBU feature will no longer be available to the system. You must contact IBM for a new CBU record and its password. There are five, 10-day tests allowed per CBU feature prior to the executing a Temporary CBU upgrade. Consult your contract with IBM or contact your IBM account representative to determine the number of tests allowed each year and when you will be billed for activations.

Activating a Temporary CBU Feature Using the IBM Service Support System

Note: If not already done, the CBU feature must be added using the **Add Capacity Backup feature** selection under the **Perform Model Conversion** task (refer to “Adding Capacity Backup” on page 4-5) and enabled to use IBM Service Support System to retrieve the CBU password (refer to “Enabling the System to Automatically Retrieve the CBU Password” on page 4-7.

To activate the Capacity Backup (CBU) feature using the IBM Service Support System:

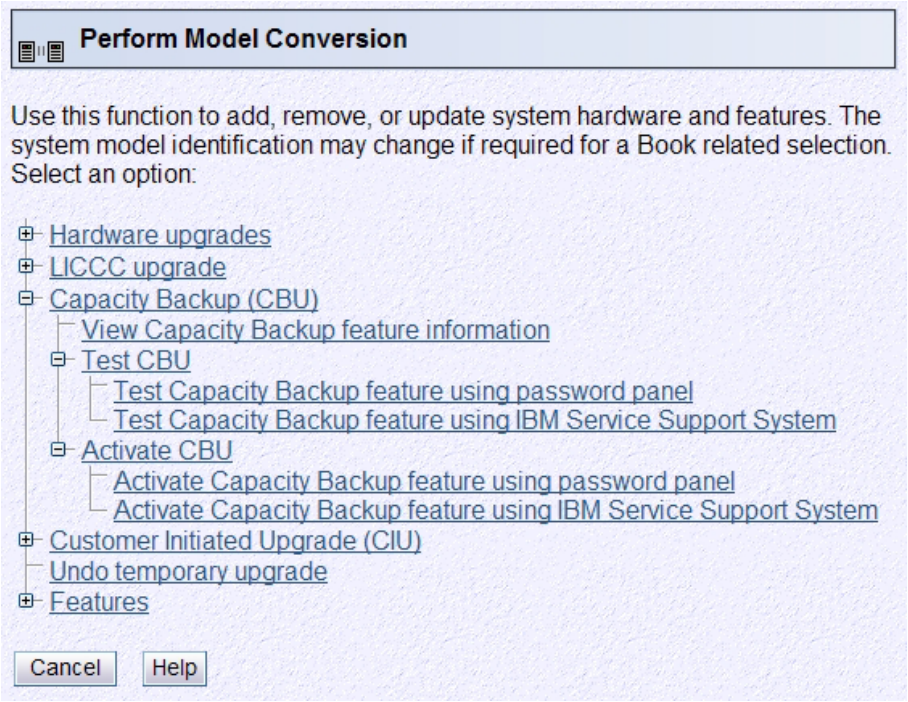
- ☐ Logon to the Hardware Management Console (HMC) in system programmer mode (SYSPROG).
- ☐ Connect to the Support Element through **Single Object Operations** (see Appendix B, “Hardware Management Console User Interface Types,” on page B-1 for more information).
- ☐ Open the **Task List** from the **Views** area.
- ☐ Open **CPC Configuration** from the **Task List Work Area**.

☐ Open **Groups** from the **Views** area.

☐ Open the **CPC** group from the **Groups Work Area**.

☐ Drag and drop the CPC on **Perform Model Conversion** in the CPC Configuration tasks area. The **Perform Model Conversion** window displays.

☐ Expand the **Capacity Backup (CBU)** option, and expand the **Activate CBU** option.



☐ Select **Activate Capacity Backup feature using IBM Service Support System**. The **Activate CBU using IBM Service Support System Configuration** window displays.

☐ Click **Continue** and follow the remaining prompts. The system will automatically retrieve the CBU password.

Deactivation

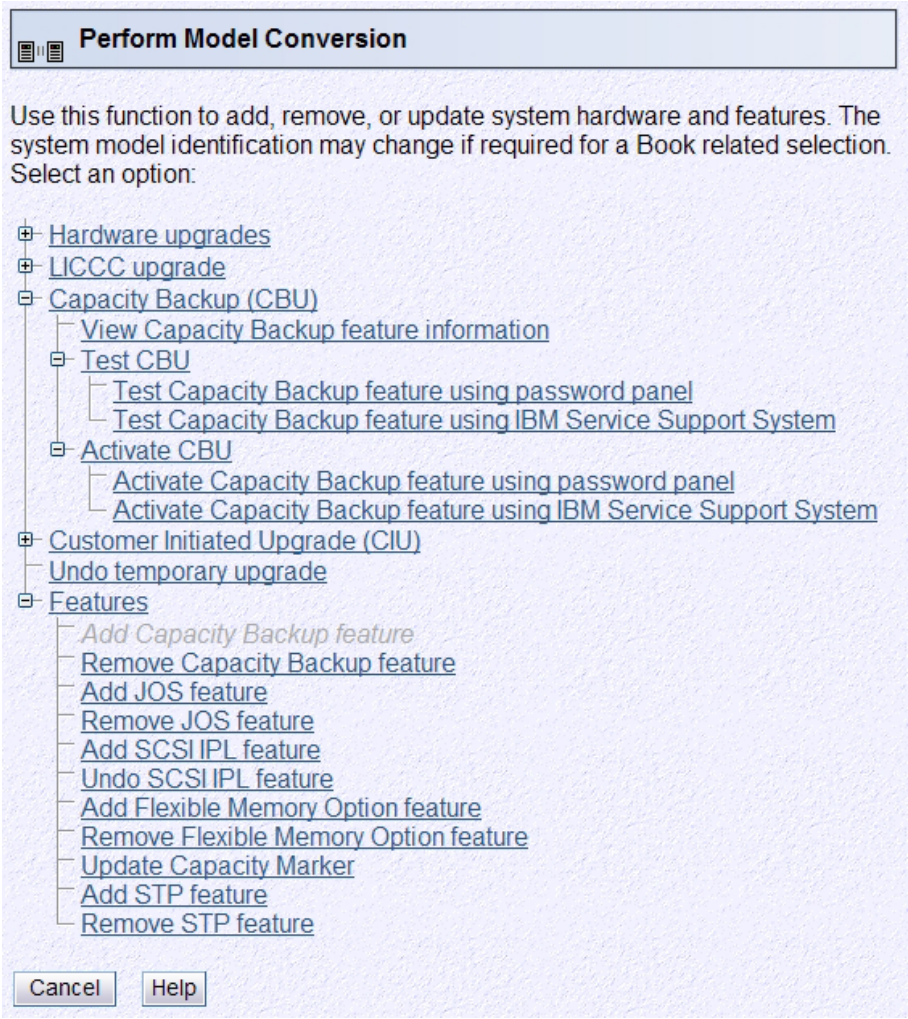
A CBU temporary capacity upgrade must be deactivated when it is no longer needed and before the end of the 90 days (for an emergency activation) or 10 days (for a CBU test activation).

- CBU deactivation is nondisruptive
- For CBU records that add a new resource type, you will need to manage your profiles closely.

  For example: Your base model is a Linux only configuration. You now activate a CBU record that adds CPs. When it comes time to perform the UNDO Temporary Upgrade, you will see the message **"Activation profiles may be changed due to the configuration update."** As long as the temporary CBU record remains installed (even if not activated), your image profile will not touch the ESA/390 mode or the CP selections. You will only be able to activate this profile when CBU is active. It is important to know that once the temporary CBU is removed from your system, your image profiles defined with CPs will have its mode changed to LINUX and the CP selections will be lost.

To deactivate CBU:

- ☐ Quiesce the added CPs (normally the highest numbered CPs) from all the logical partitions.
- ☐ Vary the added CPs *offline* from the operating systems.
- ☐ Logon to the Hardware Management Console (HMC) in system programmer mode (SYSPROG).
- ☐ Connect to the Support Element through **Single Object Operations** (see Appendix B, “Hardware Management Console User Interface Types,” on page B-1 for more information).
- ☐ Open the **Task List** from the **Views** area.
- ☐ Open **CPC Configuration** from the **Task List Work Area**.
- ☐ Open **Groups** from the **Views** area.
- ☐ Open the **CPC** group from the **Groups Work Area**.
- ☐ Drag and drop the CPC on **Perform Model Conversion** in the CPC Configuration tasks area. The **Perform Model Conversion** window displays.



- ☐ Select **Undo Temporary Upgrade**.
- ☐ Follow the directions on the screen.

If the message “Model conversion performed successfully” is displayed, the Undo was concurrent. Continue to the last step to copy the critical CPC data.

or

If your message indicates that IML (power-on reset or activation) is required, continue to the next check box.

Note: Failure to perform the IML will prevent future upgrades.

☐ Open the **Daily** tasks list from the **Task List Work Area**.

☐ Drag and drop the CPC on **Activate** in the **Daily** tasks area. The **Activate Task Confirmation** window is displayed.

Note: This is a disruptive task.

☐ Verify the correct activation profile is being used, then click **Yes** to start activation.

The **Activate Progress** window displays indicating the progress of the activation and the outcome.

☐ After activation is completed, right click on the CPC and select CP from the pop-up menu and verify that the correct number of CPs are defined. If the CPs are still showing the number equal to the CBU model, you must do a CPC Deactivate and then verify that the correct activation profile is being used.

☐ Copy critical CPC data using the **Backup Critical Data** task. (Refer to the *System z9 Service Guide* for detailed information.)

Reaching Expiration Date without Manually Deactivating

The CBU feature is temporary licensed internal code and will expire if the Undo procedure is not completed. If the CBU licensed internal code expires, the system performance will be dramatically reduced. If an IML (power-on-reset) is attempted, the system will complete, but be degraded (kneecapped) in performance.

Note: When CBU is expired on a z990 system at driver level 55K or System z9 EC at driver level 63J, an IML is no longer required and the system is allowed to return to the normal operating speed after performing an Undo Temporary Upgrade concurrently. However, if you are in an expired state and perform an IML, and then perform an Undo, the Undo will not be performed concurrently and you will need to perform an IML to return the system to normal operation speed.

The following explains what happens as the system nears the expiration date:

- With 5 days remaining of a Test or Real upgrade, the system will start posting hardware messages to the Support Element and the HMC informing of the expiration.
- For a Test upgrade, CBU expires at the end of 10 days; for a Real upgrade, CBU expires at the end of 90 days.
- CBU is granted a 2 day grace period for the system to start posting hardware messages to the Support Element and HMC informing of the expiration.
- On the day of expiration, the system posts a hardware message and calls home to IBM to open a problem machine history (PMH) that alerts the Remote Technical support Center to call the customer to ensure they understand what is happening and how to UNDO the CBU record.

- If the UNDO Temporary Upgrade is not performed by the end of the 2nd day grace period, the system is kneecapped 80%. The system creates a hardware message and calls home to IBM. When the system is kneecapped and the last 2-day grace period hardware message is posted, the system will continue to post a new hardware message and call home one each day until the UNDO is completed.
- The system continues to run in this state, leaving the customer with 10-20% performance, until an UNDO Temporary Upgrade is performed. The system will still function as the CBU model with the same number of engines, but at a much lower performance level.

  Example:

  Base Model = Performance B
  CBU Model = Performance B + C
  CBU expired active kneecap performance = (B + C) × 15% (±5%)
- This is an immediate operation.
- Reactivation of the CBU configuration is not possible. CBU Undo is required in order to recover.
- To reactivate, you may have to obtain a new CBU record.
- After the UNDO Temporary Upgrade, z9 EC and z9 BC servers **do not** require a power-on-reset; they return to normal operating speed automatically.

Expiration Reference Codes

Call home hardware reference codes are initiated by the system and sent to the IBM Remote Support Facility on a 24-hour cycle.

As an example, if you activated a CBU record at 4:00 a.m., the messages associated with the expiration reference codes will be posted around 4:00 a.m. The same is true for the time the record actually expires; it will also occur around 4:00 a.m.

In such instances, the reference codes may be:

xx939991 005Fnn01
The temporary upgrade is about to expire in less than 5 days. 'nn' equals number of days before expiration.

xx939992 005Fii01
The temporary upgrade is expired. The system will be slowed down within 2 days. 'ii' equals grace days until system will be slowed down.

xx = 76 on 9672 G3 and G4
xx = 79 on 9672 G5
xx = 20 on 206x z800/z900
xx = 24 on 208x System z990 and z890
xx = 26 on 209x System z9 EC and z9 BC

Removing Capacity Backup

Contact your service representative to remove CBU. These tasks are available in ***Service Representative*** mode only.

If one of the following conditions occur, the CBU feature **must** be removed:

- Transfer of asset
- Termination of IBM Maintenance Agreement contract
- Termination of CBU contract

- Installation of a MES that upgrades the system to the maximum configuration, leaving no spare PU resources

Note: You cannot perform **Remove Capacity Backup** when CBU is active. You must first perform an **Undo Temporary Upgrade**. (Refer to “Deactivation” on page 4-12.)

Questions or problems during this procedure should be referred to the next level of support.

To remove the CBU feature, your service representative must follow these steps:

☐ Logon to the Hardware Management Console (HMC) in service mode (SERVICE).

☐ Connect to the Support Element through **Single Object Operations** (see Appendix B, “Hardware Management Console User Interface Types,” on page B-1 for more information).

☐ From the Support Element open the **Task List** from the **Views** area

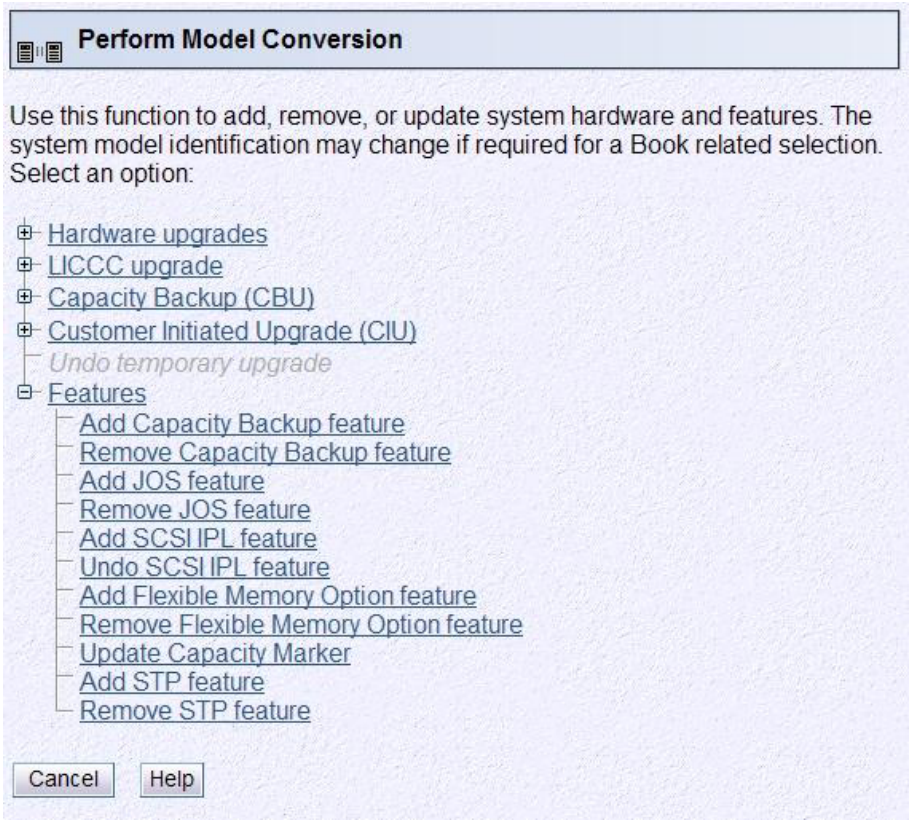
☐ Open **CPC Configuration** from the **Task List Work Area**.

☐ Open **Groups** from the **Views** area.

☐ Open the **CPC** group from the **Groups Work Area**.

☐ Drag and drop the CPC on **Perform Model Conversion** in the **CPC Configuration** tasks area. The **Perform Model Conversion** window displays.

☐ Expand the **Features** option and select the **Remove Capacity Backup** feature task.



☐ Wait for the message that the procedure was a success and click **OK.**

Chapter 5. Status and Messages

This chapter provides useful information for troubleshooting problems you may encounter when you plan for, order, and activate any of our Capacity on Demand solutions.

"CIU and On/Off CoD Order Status:" provides explanations of the order status when ordering and installing CIU and On/Off CoD orders on Resource Link.

The "Messages" on page 5-2 provides product messages with descriptions, in alphanumeric sequence, that are displayed on the Support Element.

CIU and On/Off CoD Order Status:

Activated
The On/Off CoD order has been activated.

denied
A cancellation received after the order was downloaded is denied and the billing process continues. Contact your sales representative with any questions.

Canceled
The cancellation request is complete and the order was canceled. New orders can now be created for the machine.

Cancel requested
You requested to cancel the order. Notification is sent to you verifying the cancellation. New orders can be created after the cancel request is competed for the order.

Complete
The order has been downloaded, installed and billing is complete.

Deactivated
The On/Off CoD order has been deactivated.

Downloaded
The upgrade has been downloaded to the machine and billing is notified.

Download Ready
The order is ready for you to download and install using the Hardware Management console. Downloading requires the order key that was generated for the order.

Installed
The order was detected as installed on the machine, Notification is sent to you. New orders can now be created for the machine.

Needs customer approval
Pricing set prices for an order that was created without a pre-negotiated CIU agreement. The registered Resource Link customer user ID is notified that the Purchase Price needs to be approved or the order is canceled.

Needs lease quote
A lease agreement is being created for your approval.

Needs price agreement
An order was created without a pre-negotiated CIU agreement in place.

Your order cannot be activated or downloaded until there is a price agreement in place. Pricing will negotiate a CIU agreement with you and the sales representative.

Needs secondary approval
An upgrade order placed for this machine requires a secondary approval or cancellation from an authorized Resource Link secondary approval user ID. Notification is sent to the authorized approver when a secondary approval is required.

New Order
The approved order is being processed in the IBM Remote Service Facility.

Partially installed
Part of the upgrade order was installed. It must be fully installed before new orders can be created for the machine.

Processing credit
Order entry is processing the order.

Staging order
This order is now being processed in the IBM Service Support System. You will be notified by e-mail when the order is ready to be downloaded.

Messages

This topic describes the messages displayed on the Support Element by the Capacity on Demand offerings during download and activation. The messages and descriptions are in alphanumeric sequence by message identifier.

The message format is:

`ACT`*`nnns text`*

nnn Is the message serial number.

s Is the type code:

- **E** Error. The user must perform a specific action.
- **I** Information. No operator action is required.
- **Q** Question. Requires a response or action.
- **W** Warning. A process is pending. Determine and perform an action.

text Is the message text.

ACT37101W Allocation warning

Explanation: Ensure that the CPs being converted to SAP can be deconfigured. Dedicated CPs cannot be converted to SAPs. The following processor allocation will be made if **OK** is selected. Select **CANCEL** if you wish to make changes or abort the allocation.
Number of CPs = *{0}*
Number of SAPs =*{1}*

User response: Click **OK** or click **CANCEL** if you want to make changes or stop the allocation.

ACT37102W Allocation warning

Explanation: The following processor allocation will be made if **OK** is selected. Select **CANCEL** if you wish to not make changes or abort the allocation.
Number of CPs = *{0}*
Number of SAPs =*{1}*

User response: Click **OK** or click **CANCEL** if you do not want to make changes or to stop the allocation.

ACT37103I Allocation successful

Explanation: Processors have been updated successfully.

User response: None.

ACT37104W IML required

Explanation: This operation can not be done until the system IML is complete.

User response: Try the operation again after the system IML is complete.

ACT37105W System degraded

Explanation: This operation can not be done because the system is degraded.

User response: None.

ACT37106W Retry

Explanation: The requested change could not be completed at this time. Please retry the operation.

User response: Try the operation again.

ACT37107W Power On Reset required

Explanation: The system was successfully updated with the new changes. However, validation of the changes will not occur until the next Power On Reset.

User response: It is strongly recommended that you perform a Power On Reset now to verify the changes or this will severely affect system performance.

ACT37108E Resource error

Explanation: System resources are insufficient to perform this operation.

User response: Ensure that the CPs being converted to SAPs are off line and not dedicated prior to reassignment.

ACT37109E Error

Explanation: An ERROR was encountered while making the processor assignments.

User response: Try the operation again.

ACT37110I No changes detected

Explanation: No changes were detected. Exiting function.

User response: None.

ACT37111E Warmstart error

Explanation: A problem was detected while updating the configuration.

User response: It is strongly recommended that you reboot the Support Element now to complete the configuration update. Failure to reboot the Support Element will preserve configuration data mismatches and unexpected system performance problems.

ACT37112E I390 Sync error

Explanation: A problem was detected while trying to update the configuration concurrently.

User response: Please retry the operation. If a subsequent retry fails, then the operation must be completed disruptively. Deactivate the system and retry the operation.

ACT37113I VPD information

Explanation: Update of the hardware configuration and VPD was successful.

User response: None.

ACT37114E VPD error

Explanation: A problem was detected while updating the configuration and VPD. The hardware configuration and VPD may not have been updated.

User response: Ensure that the configuration and VPD have been updated and try the operation again.

ACT37115E VPD error

Explanation: Update of the hardware configuration and VPD cannot be done on this machine type.

User response: Try the operation on a valid machine type.

ACT37116Q VPD

Explanation: Update the hardware configuration and vital product data to reflect the current LICCC data. If **OK** is selected below, the hardware configuration and VPD will be updated.

User response: Click **OK** to update the hardware configuration and VPD.

ACT37117W CBU status - enabled not installed

Explanation: The CBU feature is not installed. However, the system is enabled for automatic activation of the CBU feature using the IBM Service Support System.

User response: Please contact IBM to have the feature installed.

ACT37118W CBU status - enabled installed

Explanation: The CBU feature is installed but it has not been activated for a real Capacity Backup. The system is enabled for automatic activation of the CBU feature using the IBM Service Support System. There are *{0}* CBU feature tests remaining for this system. CBU data includes *{1}* CPs, *{2}* SAPs, *{3}* ICFs, *{4}* IFLs, *{5}* IFAs, *{6}* for Model Capacity Identifier.

User response: Use the standard procedures to activate the CBU feature for your system requirements.

ACT37119W CBU status - test enabled installed

Explanation: The CBU feature is installed and activated for testing on *{0}* with an expiration date of *{1}*. There are *{2}* CBU feature tests remaining for this system. An activation for a real Capacity Backup is still available. The system is enabled for automatic activation of the CBU feature using the IBM Service Support System. CBU data includes *{3}* CPs, *{4}* SAPs, *{5}* ICFs, *{6}* IFLs, *{7}* IFAs, *{8}* for Model Capacity Identifier,

User response: Use your planning procedures to schedule the remaining CBU feature tests.

ACT37120W CBU status - real enabled installed

Explanation: The CBU feature is installed and was activated for a real Capacity Backup on *{0}* with an expiration of *{1}*. If you want the CBU feature available after the expiration date, contact IBM to have a new CBU feature installed. The system is enabled for automatic activation of the CBU feature using the IBM Service Support System. CBU data includes *{2}* CPs, *{3}* SAPs, *{4}* ICFs, *{5}* IFLs, *{6}* IFAs, *{7}* for Model Capacity Identifier,

User response: If you want the CBU feature available after the expiration date, contact IBM to have a new CBU feature installed.

ACT37121E CBU error

Explanation: An error was encountered while trying to obtain the CBU status.

User response: Contact the IBM Service Support System.

ACT37122W CBU status - not enabled not installed

Explanation: The CBU feature is not installed. Please contact IBM to have this feature installed. The system is not enabled for automatic activation of the CBU feature using the IBM Service Support System.

User response: Contact IBM to have this feature installed.

ACT37123W CBU status - not enabled installed

Explanation: The CBU feature is installed but has not been activated for a real Capacity Backup. There are *{0}* CBU feature tests remaining for this system. The system is not enabled for automatic activation of the CBU feature using the IBM Service Support System. CBU data includes *{1}* CPs, *{2}* SAPs, *{3}* ICFs, *{4}* IFLs, *{5}* IFAs, *{6}* for Model Capacity Identifier,

User response: Use the standard procedures to activate the CBU feature for your system requirements.

ACT37124W CBU status - test not enabled installed

Explanation: The CBU feature is installed and was activated for testing on *{0}* with an expiration of *{1}*. There are *{2}* CBU feature tests remaining for this system. An activation for a real Capacity Backup is still available. The system is not enabled for automatic activation of the CBU feature using the IBM Service Support System. CBU data includes *{3}* CPs, *{4}* SAPs, *{5}* ICFs, *{6}* IFLs, *{7}* IFAs, *{8}* for Model Capacity Identifier.

User response: Contact the IBM Service Support System to enable the system for automatic activation of the CBU feature.

ACT37125W CBU status - real not enabled installed

Explanation: The CBU feature is installed and was activated for a real Capacity Backup on *{0}* with an expiration of *{1}*. If you want to continue having the CBU feature available after the expiration date, contact IBM to have a new CBU feature installed. The system is not enabled for automatic activation of the CBU feature using the IBM Service Support System. CBU data includes *{2}* CPs, *{3}* SAPs, *{4}* ICFs, *{5}* IFLs, *{6}* IFAs, *{7}* for Model Capacity Identifier.

User response: If you want to continue having the CBU feature available after the expiration date, contact IBM to have a new CBU feature installed.

ACT37126W CBU status - real enabled not installed

Explanation: The CBU feature was activated for a real Capacity Backup on *{0}* with an expiration of *{1}*. If you want the CBU feature available after the expiration date, contact IBM to have a new CBU feature installed. The system is enabled for automatic activation of the CBU feature using the IBM Service Support System. CBU data includes *{2}* CPs, *{3}* SAPs, *{4}* ICFs, *{5}* IFLs, *{6}* IFAs, *{7}* for Model Capacity Identifier,

User response: If you want the CBU feature available after the expiration date, contact IBM to have a new CBU feature installed.

ACT37127W CBU status - test not enabled not installed

Explanation: The CBU feature was activated for testing on *{0}* with an expiration of *{1}*. Since the time of activation the CBU feature was removed from the system. There are no CBU feature tests remaining for this system and an activation for a real Capacity Backup is no longer available. If you want the CBU feature available after the expiration date, contact IBM to have a new CBU feature installed. The system is not enabled for automatic activation of the CBU feature using the IBM Service Support System. CBU data includes *{2}* CPs, *{3}* SAPs, *{4}* ICFs, *{5}* IFLs, *{6}* IFAs, *{7}* for Model Capacity Identifier,

User response: If you want the CBU feature available after the expiration date, contact IBM to have a new CBU feature installed.

ACT37128W CBU status - real not enabled not installed

Explanation: The CBU feature was activated for a real Capacity Backup on *{0}* with an expiration of *{1}*. If you want the CBU feature available after the expiration date, contact IBM to have a new CBU feature installed. The system is not enabled for automatic activation of the CBU feature using the IBM Service Support System. CBU data includes *{2}* CPs, *{3}* SAPs, *{4}* ICFs, *{5}* IFLs, *{6}* IFAs, *{7}* for Model Capacity Identifier,

User response: If you want the CBU feature available after the expiration date, contact IBM to have a new CBU feature installed.

ACT37129W CBU status - test enabled not installed

Explanation: The CBU feature was activated for a testing on *{0}* with an expiration of *{1}*. Since the time of activation the CBU feature was removed from the system. There are no CBU feature tests remaining for this system and an activation for a real Capacity Backup is no longer available. If you want the CBU feature available after the expiration date, contact IBM to have a new CBU feature installed. The system is enabled for automatic activation of the CBU feature using the IBM Service Support System. CBU data includes *{2}* CPs, *{3}* SAPs, *{4}* ICFs, *{5}* IFLs, *{6}* IFAs, *{7}* for Model Capacity Identifier.

User response: If you want the CBU feature available after the expiration date, contact IBM to have a new CBU feature installed.

ACT37130Q Test initial

Explanation: A test will be performed to determine if various system FRUs meet minimum serviceability requirements.

User response: If **OK** is selected below, the test will be performed and a message will be displayed indicating the results.

ACT37131I Test OK

Explanation: The MSQ processor test indicates acceptable hardware.

User response: None.

ACT37132E Spare PUs

Explanation: There are insufficient spare PUs available. The MSQ test fails.

User response: None.

ACT37133E Test failure

Explanation: A problem was detected during the MSQ processor test. The test could not be completed.

User response: None.

ACT37134I JOS Add successful

Explanation: JOS feature has been installed successfully. This will not take affect until the next IML.

User response: None.

ACT37135E JOS Add error

Explanation: An error occurred while installing the JOS feature.

User response: Try the operation again. If the error continues, contact your next level of support.

ACT37136I JOS remove successful

Explanation: JOS feature was removed successful. This will not take effect until the next IML.

User response: None.

ACT37137E JOS remove error

Explanation: The removal of the JOS feature was unsuccessful.

User response: Try the operation again. If the error continues, contact your next level of support.

ACT37138I IPL add successful

Explanation: The SCSI IPL feature was added successfully.

User response: None.

ACT37139E IPL add error

Explanation: The SCSI IPL feature failed to add.

User response: Try the operation again. If the error continues, contact your next level of support.

ACT37140I IPL Undo successful

Explanation: The SCSI IPL feature UNDO completed successfully.

User response: None.

ACT37141E IPL Undo error

Explanation: The SCSI IPL feature UNDO failed.

User response: Try the operation again. If the error continues, contact your next level of support.

ACT37142I Add successful

Explanation: The Flexible Memory Option feature was added successfully.

User response: None.

ACT37143E Add error

Explanation: An error occurred while installing the Flexible Memory Option feature.

User response: Try the operation again. If the error continues, contact your next level of support.

ACT37144I Remove successful

Explanation: Remove of the Flexible Memory Option feature was successful.

User response: None.

ACT37145E Remove error

Explanation: Remove of the Flexible Memory Option feature was unsuccessful.

User response: Try the operation again. If the error continues, contact your next level of support.

ACT37146W IML warning

Explanation: The selected operation cannot be processed at this time because a required IML was never completed after a previous configuration update.

User response: Please IML your system and retry the operation.

ACT37147W CBU Undo warning

Explanation: A temporary upgrade must be done before selecting UNDO.

User response: Please make another selection.

ACT37148E CBU error

Explanation: Undo of the temporary upgrade feature failed because there are not enough CPs or ICFs.

User response: None.

ACT37149I CBU upgrade not enabled

Explanation: This system is not enabled for the CBU feature.

User response: From the Support Element, enable the console for CBU authorization. Refer to “Enabling the System to Automatically Retrieve the CBU Password” on page 4-7 for information on enabling your system to use the IBM Service Support System to automatically retrieve the CBU password.

ACT37150W CBU Busy

Explanation: The requested operation cannot be done at this time because a mirror operation is in progress.

User response: Please try again in approximately 10 minutes.

ACT37151E CBU Error

Explanation: An error was encountered requiring the SE to be rebooted.

User response: Reboot the Support Element.

ACT37152I Completion successful

Explanation: Requested function completed successfully.

User response: None.

ACT37153W User cancelled

Explanation: Request was cancelled.

User response: None.

ACT37154E CBU partial

Explanation: There is insufficient hardware available for the requested upgrade. A partial upgrade was performed successfully.

User response: None.

ACT37155I Undo CBU LPAR

Explanation: Undo Temporary Upgrade was selected from the **Perform Model Conversion** panel. Ensure that no more than *{0}* logically dedicated General Purpose (GP) CPs, *{1}* ICF CPs, *{2}* IFAs, *{3}* IFLs, and *{4}* zIIPs are configured online. You need at least one non-dedicated GP CP, ICF CP, IFA, IFL or zIIP for any logical partitions using shared GP CPs, ICF CPs, IFAs, IFLs, or zIIPs.

User response: Select **OK** to continue. Select **CANCEL** if you do not want to perform the Undo now.

ACT37156I Undo CBU native

Explanation: Undo Temporary Upgrade was selected from the **Perform Model Conversion** panel. Ensure that no more than *{0}* General Purpose (GP) CPs, *{1}* ICF CPs, *{2}* IFAs, *{3}* IFLs, and *{4}* zIIPs are configured online. **Warning**: If more than *{0}* GP CPs, *{1}* ICF CPs, *{2}* IFAs, *{3}* IFLs, and *{4}* zIIPs are configured online, processing will be interrupted.

User response: Select **OK** to continue. Select **CANCEL** if you do not want to perform the Undo now.

ACT37157W CBU warning

Explanation: This request will automatically Activate the Capacity Backup (CBU) feature using IBM Service Support System validation. If you are activating CBU as a result of an Emergency, you will be billed by IBM.

User response: Select **OK** to automatically activate the CBU feature or **CANCEL** if you do not understand or agree with the terms set by IBM in the CBU feature contract.

ACT37158W CBU test warning

Explanation: This request will test the automatic activation of the Capacity Backup (CBU) feature using IBM Service Support System validation. The CBU tests amounts remaining will be decreased by one for a test of the Capacity Backup (CBU) feature.

User response: Select **OK** to continue or **CANCEL** to exit this function.

ACT37159W CBU warning

Explanation: The requested upgrade cannot be performed because the password was not an IBM authorized password. Enter the correct password to activate the Capacity Backup feature or contact IBM for assistance. **Warning**: The Capacity Backup feature will be deleted from the system after three unsuccessful attempts using an incorrect password data.

User response: Enter the correct password to activate the Capacity Backup feature or contact IBM for assistance.

ACT37160E Internal error

Explanation: Error detected performing the requested function.

User response: Try the operation again. If the problem continues, contact your next level of support.

ACT37161W Disable CP Assist for Cryptographic Functions

Explanation: The **IBM CP Assist for Cryptographic Functions** (CPACF) feature will be removed from the system. Operating Systems and applications utilizing these functions may become unpredictable and fail.

Some functions of Integrated Cryptographic Service Facility (ICSF) may fail. See the *Application Programmer's Guide* for more information.

Some Linux kernel and application cryptographic functions may become unusable. Linux images should be shut down gracefully before removal of CPACF functions.

User response: Select **OK** to continue to process the new LICCC data. Select **CANCEL** if you do not want to process the new LICCC at this time.

ACT37162W CBU Undo remove

Explanation: Warning: CBU feature is currently installed and active on the system. It must be Undone and removed in order to continue with the CIU request.

User response: Select **OK** to remove the CBU feature and continue processing the CIU request. Select **CANCEL** if you do not want to remove the CBU feature at this time.

ACT37163W CBU Undo warning

Explanation: **Warning:** CBU feature is currently active on the system. It must be Undone in order to continue with the CIU request.

User response: Select **OK** to remove the CBU feature and continue processing the CIU request.

ACT37164W CBU remove warning

Explanation: **Warning:** CBU feature is currently installed on the system. It must be removed in order to continue with the CIU request.

User response: Select **OK** to remove the CBU feature and continue processing the CIU request.

ACT37165W Undo warning

Explanation: **Warning:** On/Off CoD feature is currently active on the system. It must be Undone and removed in order to continue with the CIU request.

User response: Select **OK** to remove the On/Off CoD feature and continue processing the CIU request. Select **CANCEL** if you do not want to remove On/Off CoD at this time.

ACT37166W On/Off CoD warning

Explanation: **Warning:** You selected to not apply the temporary CIU upgrade at this time. The Temporary CIU data will be lost if not applied now and not available for a future apply. It is strongly recommended that you cancel this request and apply the ordered temporary upgrade.

User response: Select **OK** if you do not want to apply the temporary upgrade. Select **CANCEL** if you do want to apply the upgrade at this time.

ACT37167W Memory successful

Explanation: The system was successfully updated with the new MCM and memory LICCC data. The system was able to complete the MCM upgrade concurrently. However, the upgrade will not take effect until the next IML is performed.

User response: Perform a system IML to initiate the MCM upgrade.

ACT37168W CP split error

Explanation: The request cannot be performed at this time because the PU CP/SAP assignments have been changed from the original LICCC configuration.

User response: Restore the PU assignments to the original LICCC configuration and retry the operation.

ACT37169W IOCDS active

Explanation: The request cannot be performed while the D0 IOCDS is active.

User response: Re-IML with another IOCDS and retry the operation.

ACT37170W Disruptive OK

Explanation: The system was successfully updated with the new LICCC data. However, validation of the new LICCC data will not occur until the next IML.

User response: It is strongly recommended that you perform a Power On Reset now to verify the new LICCC data. Incorrect LICCC data will severely affect system performance.

ACT37171E Function failed

Explanation: The operation cannot be performed in a timely manner.

User response: Try the operation again. If the problem continues, contact your next level of support.

ACT37172W IML required

Explanation: The system was successfully updated with the new LICCC data. However, validation of the new LICCC data will not occur until the next IML. It is strongly recommended that you perform a Power On Reset now to verify the new LICCC data. Incorrect LICCC data will severely affect the system performance.

User response: It is strongly recommended that you perform a Power On Reset now to verify the new LICCC data.

ACT37173E LICCC data corrupted

Explanation: The request was not performed because the LICCC data is corrupted.

User response: Contact IBM to have your system updated.

ACT37174E Machine state

Explanation: The request cannot be performed in the power-off state.

User response: Power-on and retry the operation.

ACT37175E No spare

Explanation: The request cannot be performed at this time because there is no available hardware to support the LICCC upgrade.

User response: Try the operation again at a later time.

ACT37176E Not enabled

Explanation: The request cannot be performed until the feature is enabled.

User response: Contact IBM to have your system updated.

ACT37177W Upgrade warning

Explanation: Although the upgrade was successful it will be lost after the next IML due to a SE problem. The next IML will restore the system back to its original configuration.

User response: Perform an IML to restore the system back to its original configuration.

ACT37178W Partial error

Explanation: Only a partial upgrade was performed There is insufficient hardware available for the requested LICCC upgrade.

User response: None.

ACT37179E Partial success

Explanation: Request was partially successful. Detected errors were logged.

User response: Refer to the error log.

ACT37180E System resources are insufficient

Explanation: System resources are insufficient to perform this operation. Please ensure that all the resources requested to be removed are not in use. Contact your system programmer for assistance.

User response: Contact your system programmer.

ACT37181E System resources are insufficient

Explanation: Ensure that no more than *{0}* logically dedicated General Purpose (GP) CPs, *{1}* ICF CPs, *{2}* IFAs, *{3}* IFLs, and *{4}* zIIPs are configured online. You need at least one non-dedicated GP CP, ICF CP, IFA, IFL, or zIIP for any logical partitions using shared GP CPs, ICF CPs IFAs, IFLs, or zIIPs respectively.

User response: Contact your system programmer.

ACT37182E Data corrupted

Explanation: The request was not performed because the retrieved data from the IBM Service Support System is corrupted.

User response: Contact IBM for assistance.

ACT37183E Retrieve error

Explanation: An error was detected trying to retrieve data from the IBM Service Support System.

User response: Contact IBM for assistance.

ACT37184E No data

Explanation: No data was retrieved from the IBM Service Support System.

User response: Contact IBM for assistance.

ACT37185E Password error

Explanation: An error occurred trying to retrieve the password data from the IBM Service Support System.

User response: Contact IBM for assistance.

ACT37186W Retry

Explanation: Request to apply the CIU On/Off CoD was cancelled by the user and therefore it was deleted from the system.

User response: Contact IBM for assistance.

ACT37187W System degraded

Explanation: Undo of the temporary upgrade feature was successful. However, the system is running kneecapped because the CBU time expired before the Undo Temporary (CBU) Upgrade was performed.

User response: An IML is required to return to normal system performance.

ACT37188E System degraded

Explanation: The request cannot be done at this time because the system is currently degraded.

User response: Correct the problem and retry the operation.

ACT37189W Temporary upgrade active

Explanation: The request cannot be performed at this time because the new LICCC data would alter the MCM configuration. MCM configuration updates are not allowed while a temporary upgrade is active.

User response: Undo the temporary upgrade and retry the operation.

ACT37190W TVM mode active

Explanation: The request cannot be performed while TVM mode is active.

User response: Try the request at a later time.

ACT37191E Request not authorized

Explanation: The request was not performed because the feature data would decrease system performance if activated.

User response: Contact IBM to have your system updated.

ACT37192E Request not authorized

Explanation: The request was not performed because the LICCC data is corrupted.

User response: Contact IBM to have your system updated.

ACT37193E Not authorized

Explanation: The request was not performed because the feature data would downgrade the MCM configuration if activated.

User response: Contact IBM to have your system updated.

ACT37194E Not authorized

Explanation: Request failed due to missing or invalid LICCC data.

User response: Contact IBM to have your system updated.

ACT37195E Not authorized

Explanation: The request was not performed because the LICCC data is not authorized for this system.

User response: Contact IBM to have your system updated.

ACT37196E Not authorized

Explanation: The request cannot be performed because the number of allowable attempts to test the CBU feature was exceeded.

User response: Contact IBM to have your system updated.

ACT37197E Not authorized

Explanation: The request was not performed because the LICCC data was previously used.

User response: Contact IBM to have your system updated.

ACT37198E No telephone server

Explanation: The system was unable to connect to the IBM Service Support System because there was no available phone server.

User response: Retry the request when a phone server becomes available.

ACT37199E No RSF connection

Explanation: The system was unable to connect to the IBM Service Support System because there was no RSF connection.

User response: Retry the request after you restore your RSF connection.

ACT37200W Pending data

Explanation: New Customer Initiated Upgrade data cannot be retrieved because previously retrieved unapplied data has been detected.

User response: Existing upgrade data must be applied or removed before additional upgrade data can be retrieved.

ACT37201I No data available

Explanation: Customer Initiated Upgrade data is not present on the system.

User response: Contact your next level of support.

ACT37202W No telephone server

Explanation: Customer Initiated Upgrade data cannot be retrieved because your system is not registered as a phone server.

User response: Retry the request when your system is registered as a phone server.

ACT37203W No data

Explanation: There is no retrieved Customer Initiated Upgrade data to be applied.

User response: Only unapplied upgrades can be removed.

ACT37204W Retrieve warning

Explanation: Defective PUs have been detected while retrieving Customer Initiated Upgrade data. It is strongly recommended that you replace the MCM prior to retrieving the CIU data.

User response: Select **OK** if you want to continue with CIU. Select **CANCEL** if you do not want to retrieve the CIU data.

ACT37204I Order not valid

Explanation: An incorrect customer order number was entered.

User response: Enter the correct order number or contact IBM for assistance.

ACT37205I Pending data

Explanation: *{0}*

{1}

User response: None.

ACT37206W Activate CBU

Explanation: This CBU activation is not a Test CBU.

User response: Select **OK** to continue with the request. Select **CANCEL** if you do not want to continue.

ACT37207E Reboot

Explanation: A problem was detected while updating the configuration. It is strongly recommended that you perform a Power On Reset after rebooting the Support Element to complete the configuration update. Failure to perform both operations will preserve configuration data mismatches and unexpected system performance problems.

User response: It is strongly recommended that you perform a Power On Reset after rebooting the Support Element to complete the configuration update.

ACT37208W Add hardware

Explanation: Before beginning the Book operation, verify that all the required hardware and software is available.

User response: The following FRUs are needed to complete this operation:

{0}

ACT37209W Service pending

Explanation: This system has outstanding service pending. You may wish to postpone this operation until the service has been completed.

User response: Select **OK** to continue or **CANCEL** to exit this operation.

ACT37210W Fenced

Explanation: The system has fenced books.

User response: Please correct this before trying the requested function.

ACT37211E Feature data corrupted

Explanation: The request was not performed because the feature data is corrupted.

User response: Contact IBM to have your system updated.

ACT37212E Feature data not valid

Explanation: Request failed due to missing or invalid feature data.

User response: Contact IBM to have your system updated.

ACT37213E Flexible memory option error

Explanation: The Flexible Memory Option feature cannot be installed due to insufficient memory.

User response: Contact IBM to have your system updated.

ACT37214I Memory downgrade

Explanation: The requested operation cannot be completed at this time. The request to downgrade the system is a disruptive action.

User response: If you want to continue, then deactivate the system, power on the CEC and retry the operation.

ACT37215I Remove media

Explanation: At this time remove the media from the device.

User response: Remove the media from the device.

ACT37216E Unauthorized password

Explanation: The request upgrade cannot be performed because the password obtained from the IBM Service Support System is not authorized for this system.

User response: Contact IBM for assistance.

ACT37217W Retrieve On/Off CoD

Explanation: **Warning**: Data for a temporary upgrade was detected from the Retrieve request. Would you like to apply this data now?

User response: Select **OK** to continue the temporary upgrade request and process the new LICCC data. Select **CANCEL** if you do not want to upgrade at this time.

ACT37218W Retrieve On/Off CoD

Explanation: **Warning**: You selected to not apply the On/Off CoD upgrade at this time. The On/Off CoD data will be lost if not applied now, and not available for a future apply. It is strongly recommended that you cancel this request and apply the ordered On/Off CoD upgrade.

User response: Select **OK** if you do not want to apply the upgrade. Select **CANCEL** if you do want to apply the upgrade at this time.

ACT37219W Check records

Explanation: **Warning**: The data on the media does not contain LICCC for every book in the system. Only the books with LICCC data will be updated. If this is not what is expected, it is strongly recommended you cancel this request. Contact IBM for assistance.

User response: Select **OK** if you want to continue. Select **CANCEL** if you do not want to apply the upgrade at this time.

ACT37220W Activate On/Off CoD

Explanation: The CBU activation request cannot be performed at this time because the On/Off CoD is currently active.

User response: Undo the On/Off CoD and retry the operation.

ACT37221W No On/Off CoD

Explanation: The On/Off CoD request cannot be performed at this time because the CBU feature is currently active.

User response: Try the operation again at a later time.

ACT37222W Disruptive partial upgrade

Explanation: Only a partial upgrade was performed. There is insufficient hardware available for the requested LICCC upgrade. Validation of the new LICCC data will not occur until the next IML.

User response: None.

ACT37223E Time out

Explanation: Unable to establish connection to the IBM Service Support System.

User response: None.

ACT37224I Insert media

Explanation: Please ensure that the media has been inserted in the device.

User response: Select **OK** to continue or **CANCEL** to exit.

ACT37225E Not prepared

Explanation: The request cannot be done at this time. The system is not ready for any Enhanced Book Availability operations at this time.

User response: Perform the *Prepare for Enhanced Book Availability* to determine the corrective actions.

ACT37226E Target error

Explanation: The request cannot be done at this time. The system is not ready for the Enhanced Book Availability operation on the targeted book.

User response: Perform the *Prepare for Enhanced Book Availability* to determine the corrective actions.

ACT37227E Next level retry

Explanation: Error detected performing the requested function.

User response: Contact IBM for assistance.

ACT37228E Next level no retry

Explanation: Error detected performing the requested function. This function should not be retried.

User response: Contact IBM for assistance.

ACT37229I Reseat book

Explanation: A problem was encountered while applying power to the target book. It is possible the book was not seated properly when installed. You can reseat the book at this time and retry the power sequence.

User response: Select **OK after** reseating the book. Select **CANCEL** to exit without retrying.

ACT37230I CBU Activation Profiles

Explanation: Activation profiles may be changed due to the configuration update.

User response: None.

ACT37231W Memory Degraded

Explanation: **Warning**: The system detected degraded memory.

It is strongly recommended that you cancel this request and service this system prior to upgrading system memory.

Select **OK** to continue the memory upgrade request and process the new LICCC data. Validation of the new LICCC data will not occur until the next IML.

Select **CANCEL** if you do not want to upgrade memory at this time.

User response: Select **OK** to continue or select **CANCEL**.

ACT37232W Incorrect Memory

Explanation: **Warning**: The requested memory upgrade cannot be done concurrently because the system is not in the correct Power on Reset state.

Select **OK** to continue the memory upgrade request and process the new LICCC data. Validation of the new LICCC data will not occur until the next IML.

Select **CANCEL** if you do not want to upgrade memory at this time.

User response: Select **OK** to continue or select **CANCEL**.

ACT37233W Add Hardware MRU Missing

Explanation: **Warning**: Add Book Hardware processing cannot continue until the second MRU is installed on the system.

Please install the required MRU and then retry this action.

User response: Install the required MRU and retry the action.

ACT37234W Add Hardware Power Error

Explanation: **Warning**: System power is required for processing any book updates. If system power is on and the request was to Add Book Hardware then the power system must be upgraded in order to support the additional book.

Please power on the system then retry this action.

User response: Power on the system and retry this action.

ACT37235W Add Hardware DCA Error

Explanation: **Warning**: A DCA plugging error was detected. Add Book Hardware processing cannot continue until the DCA cabling is corrected.

Please correct the DCA plugging and then retry this action.

User response: Correct the DCA plugging and retry this action.

ACT37236I Fanout card rebalancing

Explanation: You have successfully completed an Add Book Hardware procedure. If you would like to continue with the fanout card rebalancing press the **YES** button. Otherwise, press the **NO** button.

User response: Click the **YES** push button to continue with the fanout card rebalancing, or click the **NO** push button.

ACT37237E Replug cables

Explanation: **Warning**: During the FRU activation, STI cables have been detected to be misplugged. Check the labels on your STI cables and replug them in the same positions they were prior to starting this Enhanced Book Availability (memory add) operation.

Select **OK** to continue after replugging the STI cables in the correct locations as per the labels.

User response: After you replug the STI cables in the correct locations, select **OK** to continue.

ACT37238E Unsupported hardware

Explanation: The system was successfully updated with the new LICCC data. However, the request to reset the capacity marker data was not performed because the data file does not match this system or because the capacity marker values in the data file are incorrect. Contact IBM to have your system updated.

User response: Your system needs to be updated. Contact IBM to have your system updated.

ACT37239W Delete staged upgrade

Explanation: The new LICCC data request will invalidate the existing staged On/Off CoD orders. These staged On/Off CoD orders will be deleted if you continue.

Select **OK** to continue. Select **CANCEL** if you want to install the new LICCC data.

User response: Select **OK** to continue and delete the staged On/Off CoD upgrades. Select **CANCEL** if you want to install the new LICCC data.

ACT37240W On/Off CoD

Explanation: The On/Off CoD feature request will downgrade processors. Ensure that no more than {0} logically dedicated General Purpose (GP) CPs, {1} ICF CPs, {2} IFAs {3} IFLs and {4} zIIPs are configured online. You need at least one non-dedicated GP CP, ICF CP, IFA, IFL, or zIIP for any logical partitions using shared GP CPs, ICF CPs, IFAs, IFLs or zIIPs. Select **OK** to continue. Select **CANCEL** if you do not want to perform the On/Off CoD now.

User response: Select **OK** to continue. Select **CANCEL** if you do not want to perform the On/Off CoD now.

ACT37241W Unsupported

Explanation: You have successfully completed an Add Book Hardware procedure. **WARNING:** The LICCC applied to the new book is inconsistent with the LICCC on the system. You must update LICCC on the remaining books. Not updating LICCC will severely affect system performance.

User response: Update LICCC on the remaining books.

ACT37242E On/Off CoD activated

Explanation: The On/Off CoD order cannot be removed since it has already been activated on the system.

User response: None.

ACT37243E Timeout

Explanation: The request could not be performed because the system was unable to connect to the IBM Service Support System in a timely manner.

User response: None.

ACT37244W Timeout

Explanation: You have selected to remove the Capacity Backup Feature data. This data will no longer be available for activation if deleted. Select **OK** to continue or cancel if you do not want to delete the data at this time.

User response: Select **OK** to continue. If you do not want to delete the data at this time, click **CANCEL** .

ACT37250W No staged upgrade available

Explanation: No valid or available On/Off CoD staged orders for activation. Would you like to retrieve them at this time from the IBM Service Support System? Select **OK** to retrieve and **CANCEL** to exit.

User response: Select **OK** to retrieve the upgrades from the IBM Service Support System, or select **CANCEL**.

ACT37251E No staged upgrade selected

Explanation: You must select at least one order for the chosen action.

User response: Select one On/Off CoD update to be staged.

ACT37252E Select only one staged upgrade

Explanation: You must only select one order for the chosen action.

User response: Select only one staged upgrade.

ACT37253E No staged upgrade found

Explanation: No valid or available On/Off CoD staged orders for activation.

User response: Select a valid or available On/Off CoD upgrade.

ACT37254E Staged upgrade not valid

Explanation: Invalid On/Off CoD staged orders were detected on retrieving from the IBM Service Support System. Only valid orders will be available for activation. Contact IBM for assistance.

User response: Try the operation again and select a valid On/Off CoD upgrade or contact IBM.

ACT37255E Errors on deletion

Explanation: While performing deletion on multiple orders, the following orders were not successfully deleted:

{0}

User response: None.

ACT37256W Delete warning

Explanation: You have selected to delete staged On/Off CoD order {0}. This data will no longer be available for activation if deleted.

Order Description: {1}

Number of incremental CPs: {2}

Number of incremental SAPs: {3}

Number of incremental IFLs: {4}

Number of incremental ICFs: {5}

Number of incremental IFAs: {6}

Number of incremental zIIPs: {7}

Target Model Capacity Identifier: {8}

Select **OK** to continue or **CANCEL** if you do not want to delete the data at this time.

User response: Select **OK** to continue. If you do not want to delete the data at this time, click**CANCEL**.

ACT37257W Activate warning

Explanation: You have selected to activate the staged On/Off CoD order {0}.

Order Description: {1}

Number of incremental CPs: {2}

Number of incremental SAPs: {3}

Number of incremental IFLs: {4}

Number of incremental ICFs: {5}

Number of incremental IFAs: {6}

Number of incremental zIIPs: {7}

Target Model Capacity Identifier: {8}

Select **OK** to continue or **CANCEL** if you do not want to activate this staged On/Off CoD order at this time.

User response: Select **OK** to continue. If you do not want to activate the staged On/Of CoD order data at this time, click**CANCEL**.

ACT37292W Status ready

Explanation: Upon the selection of a book, the *Perform Enhanced Book Availability* request will evacuate resources and will power off the selected book. Select **OK** to continue or **CANCEL** if you do not want to perform this request at this time.

User response: Select **OK** to continue. If you do not want to perform the request at this time, click **CANCEL**.

ACT37293I Status ready

Explanation: The *Prepare for Enhanced Book Availability* has been performed on Book *{0}*. The book is ready for the *Prepare for Enhanced Book Availability* step.

User response: None.

ACT37294W Confirmation warning

Explanation: The following processor allocation will be made if **OK** is selected. Select **CANCEL** if you wish to not make changes or abort the allocation.

Number of CPUs = *{0}*
Number of ICFs =*{1}*
Number of IFLs =*{2}*
Number of IFAs = *{3}*
Number of zIIPs = *{4}*
PUs not assigned = *{5}*

User response: Select **OK** to continue or **CANCEL** to exit.

ACT37295E Reassign not numeric data

Explanation: The data for *{0}* at *Non-Dedicated Count* is not of a numeric format.

User response: Please re-enter the data.

ACT37296E Reassign column error

Explanation: The total value of *{0}* for *Non-Dedicated Count* PUs will exceed the allowable value of *{1}*.

User response: Please readjust the entered values in the *Non-Dedicated Count* column for the various PUs.

ACT37297E Reassign row error

Explanation: The *{0}* entry value of *{1}* would make the total for this entry greater than the allowed LICCC value of *{2}* for this type of PU.

User response: Please correct the entered value in the non-dedicated PUs row for *{0}*.

ACT37298E Book selection no changes

Explanation: You must select a target book for the chosen action.

User response: Select a target book.

ACT37299E Add book hardware error

Explanation: An error occurred that prevents the book from being added.

{0}

Please use the following panels to remove all the hardware in the reverse order of installation.

User response: Press the **OK** button to start removing the hardware.

ACT37300E Perform Model Conversion error

Explanation: While doing a **Perform Model Conversion** Hardware Management Console (HMC) Single Object Operations on a media device, the following error occurred:

{0} (rc=*{1}*)

User response: Select **YES** to retry the operation. Select **NO** if you wish to exit.

Appendix A. Obtaining a Password to Activate CBU

There are three methods to obtain your CBU password:

1. The Support Element calls up to IBM through the HMC phone server and automatically downloads the CBU password.
2. You call the IBM support representative to obtain the password to enter on the password panel.
3. IBM support provided a diskette or CD media when they loaded the CBU record. A log file contains a password and you enter it on the password panel. (Refer to “Manually Read CBU Password Procedure.”)

   This method would be used when a communication line is not available.

Manually Read CBU Password Procedure

When the service provider loads a new CBU record on the system with a diskette or CD media, it contains the text file:

BBCPUSAP.LOG

with the text formatted as shown in this example:

```
FRU   =  YH1016584023
ECID  =  29B1C947FFFF0406
PUs   =  0
CPs   =  3
SAPs  =  0
ICFs  =  0
IFLs  =  0
Perf  =  0
Mem   =  0
CBU   = 90
NSpID=  0
Crypt =  0
uaCPs=  0
uaIFL=   0
IFAs  =   0
SUPs =  0
Comment:  My Favorite Customer's CBU to add 3 cp's.
Version:     F.52
Keyword:   034939F0                    << CBU Password
dtlData:     0300570000000000000000000000000000000000000000002A1981F2
```

Figure A-1. CBU record example

1. The CBU password can be obtained in the **Keyword** field as indicated. It is recommended that you also keep the **FRU** and **dtlDATA** fields with the **Keyword**.

   Note: Keeping the CBU password on-site is the responsibility of the IBM Account team and the Customer to manage.
2. This CBU password is **only** good for the record with which it was received. Any mismatch in the data will result in a CBU activation error. If the wrong CBU password is entered 3 times, the CBU record is removed from the system and a new record can only be ordered by an IBM sales representative.

3. When entering the CBU password on the CBU manual input panel, the following fields must match with the **BBCPUSAP.LOG** file:

Support Element CBU Password Panel		**BBCPUSAP.LOG file**
PU Serial number	=	FRU
PU Detailed data	=	dtlData

Appendix B. Hardware Management Console User Interface Types

The Hardware Management Console (HMC) allows you to choose the interface style in which you prefer to work: the **classic style user interface** (the default), or the **tree style user interface**.

Classic Style User Interface

The **classic style user interface** (or classic interface) is designed to provide the functions you need through an object-oriented design. Through this design, you can directly manipulate the objects that are defined to the HMC and be aware of changes to hardware status as they are detected.

The classic interface allows you to work with the objects on the workplace using the mouse to select them. One way to do this is to select an object with a single left-click and double-click the task. An alternate method is known as the *drag and drop* technique, which involves using the mouse to pick one or more objects, dragging them to a task, and then dropping them. These techniques are examples of *direct manipulation*.

Using the Classic Interface for Capacity on Demand

You use the HMC to connect to the Support Element using **Single Object Operations** to download and activate Capacity on Demand functionality, perform On/Off CoD tests and removal, test the Capacity Backup feature, and deactivate Capacity on Demand functionality, including an Undo of temporary upgrade. To access **Single Object Operations** from the classic interface on an HMC:

- Go to the **Task List** from the **Views** area.
- Select the **Recovery** task list.
- Select **Single Object Operations**.

Tree Style User Interface

The **tree style user interface** (or tree interface) is an another user interface provided with the HMC as an alternative to the classic interface. The tree interface navigation model provides hierarchical views of system resources and tasks using drill-down and launch-in-context techniques to enable direct access to hardware resources and task management capabilities. It also utilizes common terminology where possible; for example, instead of referring to *CPC*, the more general term of *server* is used for this interface.

Using the Tree Interface for Capacity on Demand

You use the HMC to connect to the Support Element using **Single Object Operations** to download and activate Capacity on Demand functionality, perform On/Off CoD tests and removal, test the Capacity Backup feature, and deactivate Capacity on Demand functionality, including an Undo of temporary upgrade. To access **Single Object Operations** from the tree interface on an HMC:

- Select **System Management** from the left navigation area.
- Select **Custom Groups**.
- Select **All Objects** and select an object.
- Select **Single Object Operations** under the **Recovery** task.

Changing the Interface Style

If the HMC is configured to enable users to change user interface styles, go to **User Settings** to change the interface style. If the HMC is not configured to enable users to change user interface styles, see “Enabling Users to Change the Interface Style”to change the interface style.

To change from the classic interface to the tree interface:

- Open **User Settings**, located under **Console Actions**.
- Click the **UI Style** tab to open the **User Style Information** window.
- Select **Tree Style**, and click **Apply**.
- Click **OK**.

You must restart your login session for the interface change to take effect.

To change from the tree interface to the classic interface:

- Select **HMC Management** in the left navigation area and open **User Settings**, listed alphabetically or located under the **Configuration** heading.
- Click the **UI Style** tab to open the **User Style Information** window.
- Select **Classic Style**, and click **Apply**.
- Click **OK**.

You must restart your login session for the interface change to take effect.

Enabling Users to Change the Interface Style

If there is no **UI Style** tab in the **User Settings** task, changing the interface style is not enabled for you on the HMC. The access administrator can enable users to change the user interface style from the classic style to the tree style or change the default user interface for the HMC:

1. Log on the HMC using the ACSADMIN default user ID or a user ID that has the predefined Access Administrator roles.
2. Open **User Settings.** (In the classic interface, open **Console Actions** under **Views**, then open **User Settings**. In the tree interface, click **HMC Management** in the **Navigation** area, and click **User Settings**, listed alphabetically or located under the **Configuration** heading.)
3. Click the **UI Style** tab to open the **User Style Information** window. To enable users to change user interface styles:
   a. Select **Allow user to change the IU style** and click **Apply**. An message specifies that you must restart your login session for the change to take effect. Click **OK.**.
   b. Restart your login session by logging off and then logging back on.

      To control the default user interface style for the HMC:

      1) Select **Classic Style** or **Tree Style** and click **Apply**. message specifies that you must restart your login session for the change to take effect. Click **OK.**
      2) Restart your login session by logging off and then logging back on.

Appendix C. Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785 U.S.A.

The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law:

INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

All statements regarding IBM's future direction or intent are subject to change or withdrawal without notice, and represent goals and objectives only.

All IBM prices shown are IBM's suggested retail prices, are current and are subject to change without notice. Dealer prices may vary.

This information is for planning purposes only. The information herein is subject to change before the products described become available.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

If you are viewing this information softcopy, the photographs and color illustrations may not appear.

Trademarks

IBM, the IBM logo, and ibm.com® are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both. If these and other IBM trademarked terms are marked on their first occurrence in this information with a trademark symbol (® or ™), these symbols indicate U.S. registered or common law trademarks owned by IBM at the time this information was published. Such trademarks may also be registered or common law trademarks in other countries. A current list of IBM trademarks is available on the Web at "Copyright and trademark information" at www.ibm.com/legal/copytrade.shtml.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Other company, product and service names may be trademarks or service marks of others.

Electronic Emission Notices

The following statement applies to this IBM product. The statement for other IBM products intended for use with this product will appear in their accompanying manuals.

Federal Communications Commission (FCC) Statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are

designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions contained in the installation manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors, by installation or use of this equipment other than as specified in the installation manual, or by any other unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Canadian Department of Communications Compliance Statement

This Class A digital apparatus complies with Canadian ICES-003.

Avis de conformlté aux normes du ministère des Communications du Canada

Cet appareil numérique de la classe A est conform à la norme NMB-003 du Canada.

European Union (EU) Electromagnetic Compatibility Directive

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to European Standard EN 55022. The limits for Class equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

Warning: This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

European Community contact:
IBM Technical Regulations
Pascalstr. 100, Stuttgart, Germany 70569
Telephone: 0049 (0) 711 785 1176
Fax: 0049 (0) 711 785 1283
email: tjahn@de.ibm.com

EC Declaration of Conformity (In German)

Deutschsprachiger EU Hinweis: Hinweis für Geräte der Klasse A EU-Richtlinie zur Elektromagnetischen Verträglichkeit

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 89/336/EWG zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022 Klasse A ein.

Um dieses sicherzustellen, sind die Geräte wie in den Handbüchern beschrieben zu installieren und zu betreiben. Des Weiteren dürfen auch nur von der IBM empfohlene Kabel angeschlossen werden. IBM übernimmt keine Verantwortung für die Einhaltung der Schutzanforderungen, wenn das Produkt ohne Zustimmung der IBM verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung der IBM gesteckt/eingebaut werden.

EN 55022 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden: ″Warnung: Dieses ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funk-Störungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen zu ergreifen und dafür aufzukommen.″

Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem “Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)“. Dies ist die Umsetzung der EU-Richtlinie 89/336/EWG in der Bundesrepublik Deutschland.

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) vom 18. September 1998 (bzw. der EMC EG Richtlinie 89/336) für Geräte der Klasse A.

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Konformitätserklärung nach Paragraf 5 des EMVG ist die IBM Deutschland GmbH, 70548 Stuttgart.

Informationen in Hinsicht EMVG Paragraf 4 Abs. (1) 4:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 Klasse A.

update: 2004/12/07

People’s Republic of China Class A Compliance Statement

This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may need to perform practical actions.

声　明

此为A级产品，在生活环境中，
该产品可能会造成无线电干扰。
在这种情况下，可能需要用户对其
干扰采取切实可行的措施。

Japan Class A Compliance Statement

This is a Class A product based on the standard of the VCCI Council. If this equipment is used in a domestic environment, radio interference may occur, in which case, the user may be required to take corrective actions.

この装置は，クラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。　VCCI－A

Korean Class A Compliance Statement

이 기기는 업무용으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이점을 주의하시기 바라며, 만약 잘못 판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.

Taiwan Class A Compliance Statement

Warning: This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user will be required to take adequate measures.

警告使用者:
這是甲類的資訊產品，在
居住的環境中使用時，可
能會造成射頻干擾，在這
種情況下，使用者會被要
求採取某些適當的對策。

台灣IBM 產品服務聯絡方式：
台灣國際商業機器股份有限公司
台北市松仁路7號3樓
電話：0800-016-888

Glossary

This glossary includes terms and definitions from:

- The *Dictionary of Computing*, SC20-1699.
- The *American National Standard Dictionary for Information Systems*, ANSI X3.172-1990, copyright 1990 by the American National Standards Institute (ANSI). Copies can be purchased from the American National Standards Institute, 1430 Broadway, New York, New York 10018. Definitions are identified by the symbol (A) after the definition.
- The *ANSI/EIA Standard - 440A: Fiber Optic Terminology*, copyright 1989 by the Electronics Industries Association (EIA). Copies can be purchased from the Electronic Industries Association, 2001 Pennsylvania Avenue N.W., Washington, D.C. 20006. Definitions are identified by the symbol (E) after the definition.
- The *Information Technology Vocabulary*, developed by Subcommittee 1, Joint Technical Committee 1, of the International Organization for Standardization and the International Electrotechnical Commission (ISO/IEC JTC1/SC1). Definitions of published parts of this vocabulary are identified by the symbol (I) after the definition; definitions taken from draft international standards, committee drafts, and working papers being developed by ISO/IEC JTC1/SC1 are identified by the symbol (T) after the definition, indicating that final agreement has not yet been reached among the participating National Bodies of SC1.

The following cross-references are used in this glossary:

- **Contrast with.**This refers to a term that has an opposed or substantively different meaning.
- **See.** This refers the reader to multiple-word terms in which this term appears.
- **See also.** This refers the reader to terms that have a related, but not synonymous, meaning.
- **Synonym for.** This indicates that the term has the same meaning as a preferred term, which is defined in the glossary.

B

Book. A physical package that contains memory, a Multichip Module (MCM), and the Memory Bus Adapters (MBAs). A book plugs into one of four slots in the central processing complex (CPC) cage of the z9 EC.

C

Call Home facility. A communication link established between the server and a service provider. The server can place a call to a service provider when it requires service. With access to the machine, service personnel can perform service tasks, such as viewing error and problem logs or initiating trace and dump retrievals.

CIU. See Customer Initiated Upgrade.

CIU Capability Feature. A feature code indicating CIU capability.

CIU Express. An option that enables quicker delivery of a permanent upgrade through a limited license to the Licensed Internal Code (LIC) that may be activated for each CIU eligible machine.

CIU Eligible Machine. A machine on which you have installed the CIU Capability Feature.

CIU Facility. The aggregation of IBM applications, personnel, and business processes which support and are necessary for execution of CIU and Temporary Capacity.

Concurrent book add. Allows you to concurrently upgrade a System z9 or zSeries server by integrating a second, third, or fourth book into the server without impacting application processing.

CP. Central Processor. The sequencing and processing facilities for instruction execution, initial program load, and other machine operations.

Customer Initiated Upgrade (CIU). A permanent upgrade ordered, downloaded, and installed by you using the IBM CIU web-based application on Resource Link.

Customer Profile. This information, also known as machine profiles, resides on Resource Link and contains customer and machine information for CIU.

E

Eligible Machine. A CIU Eligible Machine or TC Eligible Machine, as applicable.

Enhanced book availability. In a multibook server, the ability to have a single book concurrently removed from the server and reinstalled during an upgrade or repair action.

G

GDPS. Geographically Dispersed Parallel Sysplex. An S/390 implementation which enables high availability across sites up to 40km apart.

I

IBM System z. An umbrella name used to include all IBM System z9 and IBM @server zSeries servers.

IBM System z9. The name used to include IBM System z9 Enterprise Class (z9 EC) and IBM System z9 Business Class (z9 BC) servers.

IBM System z9 Enterprise Class (z9 EC). The name for the server formerly named the IBM System z9 109 (z9-109).

ICF. Integrated Coupling Facility. A Processing Unit (PU) dedicated to the coupling facility to provide lower utilization values.

IFL. Integrated Facility for Linux. A dedicated Linux processor. Each IFL is considered a single, physical processor.

L

LICCC. Licensed Internal Code Configuration Control.

M

Memory. Program-addressable storage from which instructions and other data can be loaded directly into registers for subsequent running or processing.

Millions of Service Units (MSUs) . Units of workload capacity of a TC Eligible Machine.

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.

On/Off CoD Software Charges. Charges for selected IBM programs, as announced by IBM, running on a TC eligible machine that results from the use of Temporary Capacity of that TC eligible machine.

Order Staged. The point when your order is staged for download. The download is valid for 30 days unless otherwise specified in an agreement. Unlimited staging is available in most countries. Notification for a staged order is sent 7 days before the code expires.

Order States. See Chapter 5, “Status and Messages,” on page 5-1.

P

Permanent Upgrade. LIC licensed by IBM to enable the activation of applicable computing resources, such as processors or memory, for a specific CIU Eligible Machine on a permanent basis.

Pricing. Receives the CIU price request and manages and assigns prices and price tables.

PU. Processing Units; Central Processors (CPs), Integrated Coupling Facilities (ICFs), and Integrated Facilities for Linux (IFLs), and System z9 and zSeries Application Assist Processors (zAAPs).

R

Remote Service Facility (RSF). A control program plus associated communication equipment that allows local personnel to connect to an IBM service center, and allows remote personnel to operate the remote system or send new internal code fixes to it, if the personnel are properly authorized.

Repair and Verify. Guided procedures used by service representatives to remove, replace, and install parts and perform repair actions on problems generated by reference codes through Isolation Procedures.

Reporting Period. The period which begins on the second day of a month and ends on the first day of the following month.

RSF. See **Remote Service Facility**.

R&V. See **Repair and Verify**.

S

SAP. System Assist Processor.

Secondary Approval. Some servers require a Secondary Approval for orders, and notification is sent to the secondary approval when required. For example, leased servers owned by a third party require approval by the third party before an upgrade is made available.

Staged order. See **Order Staged**.

System z. See **IBM System z**.

System z9. See **IBM System z9**.

T

TC. See **Temporary Capacity**.

Temporary Capacity (TC). 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″.

Temporary Capacity Capability Feature. A feature code indicating Temporary Capacity capability.

Temporary Capacity Upgrade (TC Upgrade). LIC licensed by IBM to enable the activation of the applicable computing resources, such as processors, for a specific TC Eligible Machine on a temporary basis.

TC Eligible Machine. A machine on which you have installed the CIU Capability Feature and the Temporary Capacity Capability Feature.

TC Upgrade. See Temporary Capacity Upgrade.

U

uncharacterized. For CIU, a term used for previously unpurchased capacity.

V

VPD. Vital Product Data.

Z

zAAP. z Application Assist Processor. The zAAP is 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. System z9 Integrated Information Processor. Available on z9 EC and z9 BC systems, the zIIP is 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.

Index

T

U

W

Level 02c, October 2009
Printed in USA

SC28-6846-02