Agenda

- The Basics - Capacity on Demand
- Elements of the Offerings
- Capacity Backup
- Capacity for Planned Events
- On/Off Capacity on Demand
- Capacity Provisioning Manager
Capacity on Demand

- **Permanent upgrade**
- **Temporary upgrade**
  - Replacement capacity
    - pre-paid
    - no additional IBM software charges
    - CBU, CPE
  - Billable capacity
    - post paid or pre-paid hardware (tokens)
    - involves also IBM software charges (post paid)
    - On/Off CoD

Ordered via ResourceLink or directly from IBM
The Big Picture – a new approach

- **Resources can be activated in any amount up to defined limit**
  - Customer can customize activation real-time, based on circumstances
  - Eliminates unique record to be managed for all possible permutations
  - Dynamic changes in activation level without reloading records

- **As records expire or are consumed, the resources will be deactivated**
  - System will not reduce to subcapacity when records expire
  - Will not deactivate if removing dedicated engines or last of that engine type

- **Various record limits can be dynamically updated / replenished**
  - Changes possible even if record is currently active

- **Ability to perform permanent upgrades while temporary capacity is active**
  - Allows quick conversion of temporary capacity to permanent
  - Permanent upgrade changes to allow for Purchase of unassigned CP or IFL capacity (z196/z114)

- **API enhancements to support use by Capacity Provisioning Manager**
  - Capacity Provisioning Manager provides policy based automation
The Basics – Temporary Upgrades

- **Capacity Backup (CBU)**
  - Predefined capacity for disasters on a other “lost” server(s)
  - Concurrently add CPs, IFLs, ICFs, zAAPs, zIIPs, SAPs
  - Pre-paid

- **Capacity for Planned Events (CPE)**
  - CBU-like offering, when a disaster is not declared
  - Example: System migration (push/pull) or relocation (data center move)
  - Predefined capacity for a fixed period of time (3 days)
  - Pre-paid

- **On/Off Capacity on Demand (On/Off CoD)**
  - Satisfy periods of peak demand for computing resources
  - Concurrent 24 hour rental of CPs, IFLs, ICFs, zAAPs, zIIPs, SAPs
  - Supported through a new software offering – Capacity Provisioning Manager (CPM)
  - Post-paid or Pre-paid (tokens)
Basics of CoD

Capacity on Demand

Permanent Upgrade

Temporary Upgrade

Replacement Capacity

Billable Capacity

CBU

CPE

Pre-paid

Post-paid

On/Off CoD with tokens
No expiration
Capacity
- MSU %
- # Engines
Tokens
- MSU days
- Engine days

On/Off CoD
180 days expiration
Capacity
- MSU %
- # Engines

On/Off CoD with tokens
180 days expiration
Capacity
- MSU %
- # Engines
Tokens
- MSU days
- Engine days
Tokens Overview

- **Pre-paid Offering**
  - Non-expiring

- **Post paid Offering**
  - To set spending limits on the offering record expires after 180 days
  - Can arranged to be replenished automatically (z196/z114).

**Types of Tokens:**

- **Specialty engines: IFL/ICF/zIIP/zAAP/SAP Day tokens**
  - The specialty engine tokens to be billed per day equal the highest activation level for this resource during the current 24 hour billing window period
  - Example: if 5 zAAPs were the max activation level during this window, at the end of the window 5 zAAP tokens will be subtracted

- **CP MSU Tokens**
  - CP 1 MSU Token is used per MSU day per 24 hour period
  - Example: 86 additional MSU’s for 300 days (86x300=25,800 MSU tokens)
Activation Sequence – examples

Activation and usage of dormant resources over time
# Capacity on Demand Comparisons (z10 versus zEnterprise)

<table>
<thead>
<tr>
<th>Feature</th>
<th>System z10</th>
<th>z196/z114</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto renewal (On/Off CoD)</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Administrative Tests (On/Off CoD)</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Pre-load (install) up to four temporary records during manufacture</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Permanent upgrade changes to allow for purchase of unassigned CP or IFL capacity</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Expiration Date

- **Definition**: Last day a record is usable
  - Regardless of whether the record is installed, active or staged.

- **Offering specific**
  - CBU - quantity of FC 6817 (CBU years) from date of order *
    - * records ordered through manufacturing include 47 additional days to allow for fulfillment and installation of machine.
  - On/Off CoD - 180 days from date of order

- **GMT (UTC) vs. Local time**
  - A record will expire and its associated resources made unavailable at **23:59 GMT** on the date of expiration.
  - Resource Link sends out warning e-mails prior to expiration.

- **Warning messages** will begin at least 5 days prior to expiration for installed records
  - Warning messages appear on ResourceLink as well as the CoD panels on the HMC
Agenda

- The Basics - Capacity on Demand
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Installed and Staged CoD Records – (Perform Model Conversion ICON)

- Order and stage up to 200 records on the Support Element
- Records must be moved from Staged to Installed to use
- Install up to 8 records simultaneously
### STStore System Information (STSI) Enhancements

- Provide capacity ratings for license purposes that can be verified by STSI.
- Facilitates the ability for programs to recognize On/Off CoD and CBU activity.

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Model-Capacity Identifier</th>
<th>Base (not high water mark)</th>
<th>Billable (On/Off CoD)</th>
<th>Replacement (CBU,CPE)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model-Capacity Identifier</td>
<td>Base (not high water mark)</td>
<td>Billable (On/Off CoD)</td>
<td>Replacement (CBU,CPE)</td>
</tr>
<tr>
<td></td>
<td>Model-Permanent Capacity Identifier</td>
<td>Base (not high water mark)</td>
<td>Billable (On/Off CoD)</td>
<td>Replacement (CBU,CPE)</td>
</tr>
<tr>
<td></td>
<td>Model-Temporary Capacity Identifier</td>
<td>Base (not high water mark)</td>
<td>Billable (On/Off CoD)</td>
<td>Replacement (CBU,CPE)</td>
</tr>
</tbody>
</table>
Elements of the Offerings

- **Replenishments**
  - Resources
  - Time elements
  - Tokens

- Order process limits
- Machine limits
- Contract terms and conditions
Offering Parameters – 3 ways of handling

Resources - (order process limits)
- Limit the amount of a particular resource that can be activated
- Absolute number which represents maximum resource entitlement
- Activation to resource limits may not be achieved depending on current configuration
- e.g. #CPs, #IFLs, #Capacity levels

Time Elements - (machine limits)
- Limit the length of time that the record can be active; full or partial (applies to all record types)
- All time limits are measured in days or calendar date
- Absolute number which represents maximum time entitlement
- e.g. Number of days in test, Number of days in real activation, calendar date

Tokens - (terms and conditions)
- Consumable – record updated each 24 hours to reflect consumption level
- Values are treated as incremental delta to the current token level
- e.g. number of tests, number of real activations
- Limits (new) for limiting financial exposure: pre-paid and post paid tokens

NOTE: Negative updates to these limits are not allowed
Agenda

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Capacity Backup – CBU

Resources
CP Capacity Features
Specialty engines: zIIP, zAAP, ICF, IFL, SAP

Time elements
Test duration = 10 days
Real activation = 90 days
2 day grace period
Expiration date set to 1 through 5 years

Tokens
Number of Tests = number of CBU years ordered plus up to 10 additional (max=15)
Number of Real activations = 1

Order process limits
- Total CP Capacity features = number of net new engines + number of permanent engines changing capacity level
  - No limit to the resources ordered
- Number of zIIPs or zAAPs can not exceed total number of permanent + temporary CPs
- No more than 15 tests per record

Machine limits
- Can not decrement capacity level
- Can not remove permanent engines from configuration
- No Tests while in Real activation
- No Tests if number of Real activations equals zero
- Auto deactivation of activated resources upon time limit
  - If any resource can not be removed all resources stay active
  - Ability to remove resources checked every 24 hours

Contract terms and conditions
- To be used only for replacement capacity within an enterprise
- Priced for H/W. No IBM S/W charges
## CBU Replenishment

<table>
<thead>
<tr>
<th>Component</th>
<th>Replenish</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resources (CP, specialty engines)</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Used “real” activation</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Expiration date</td>
<td>No</td>
<td>May 2009</td>
</tr>
<tr>
<td>CBU Tests</td>
<td>Yes</td>
<td>May 2009</td>
</tr>
</tbody>
</table>

- **Order additional tests in single increments limited by CBU record total tests <=15.**
- eg. if 3 tests remain, order up to 12 additional tests (15 total tests)
Managing temporary capacity with GDPS V3.9 GDPS/PPRC, GDPS/XRC, GDPS/GM

- Adds/removes capacity for GDPS-managed CECs
  - GDPS already supports activation of a specific OOCoD LIC record
    - Only supports activation of the "default" CBU record.

- CBU and OOCoD activation status tracked at CEC level
  - New panel to view installed temporary capacity records
  - New panel to define named profiles for full or partial activation
    - CAPACITY script statement enhanced with extensive support for full and partial record activation/removal
      - All engine types (CP, SAP, zIIP, zAAP, ICF, IFL)

- CBU multiple LIC record support
  - Activate a specific LIC record for CBU without requiring operator intervention at the HMC to mark the desired LIC record as being the default.
CBU

- **CP capacity managed by feature codes**
  - Feature code either adds engine or increases capacity to a permanent engine
  - Total feature codes required = number of net new engines + number of permanent engines changing capacity
Use of CP CBU Feature Codes
z10 BC or z114 Example

1. **Increasing capacity of permanent engines**
   
   $B02 \rightarrow D02$ requires 2 CP_FCs to change capacity of 2 permanent CPs

2. **Adding additional engines at same capacity**
   
   $B02 \rightarrow B05$ requires 3 CP_FCs to add 3 new engines at same capacity

3. **Additional engines and increasing capacity of permanent engines**
   
   $B02 \rightarrow H04$ requires 4 CP_FCs which adds 2 new engines and a change of capacity of 2 permanent CPs

*Note: You can’t decrease the number of CPs or decrease capacity setting –*
Use of CP CBU Feature Codes
z10 BC or z114 Example

1. **Increasing capacity of permanent engines**
   \[ B02 \rightarrow D02 \] requires 2 CP_FCs to change capacity of 2 permanent CPs

2. **Adding additional engines at same capacity**
   \[ B02 \rightarrow B05 \] requires 3 CP_FCs to add 3 new engines at same capacity

3. **Additional engines and increasing capacity of permanent engines**
   \[ B02 \rightarrow H04 \] requires 4 CP_FCs which adds 2 new engines and a change of capacity of 2 permanent CPs

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Use of CP CBU Feature Codes
z10 BC or z114 Example

1. **Increasing capacity of permanent engines**
   
   \( B02 \rightarrow D02 \) requires 2 CP_FCs to change capacity of 2 permanent CPs

2. **Adding additional engines at same capacity**
   
   \( B02 \rightarrow B05 \) requires 3 CP_FCs to add 3 new engines at same capacity

3. **Additional engines and increasing capacity of permanent engines**
   
   \( B02 \rightarrow H04 \) requires 4 CP_FCs which adds 2 new engines and a change of capacity of 2 permanent CPs

---

**Note:** You can't decrease the number of CPs or decrease capacity setting –
Authorization space example CBU

base model C04

5 CP CBUs

Note: A CBU record could also include specialty engines. The z114 has a number of processing units (5 PU’s) that are available beyond the 5 CP’s shown here.
Authorization space example (z196)

**base model 405**

6 CP CBUs

|   | 7xx | 701 | 702 | 703 | 704 | 705 | 706 | 707 | 708 | 709 | 710 | 711 | 712 | 713 | 714 | 715 | 716 |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 6xx | 601 | 602 | 603 | 604 | 605 | 606 | 607 | 608 | 609 | 610 | 611 | 612 | 613 | 614 | 615 |     |
| 5xx | 501 | 502 | 503 | 504 | 505 | 506 | 507 | 508 | 509 | 510 | 511 | 512 | 513 | 514 | 515 |     |
| 4xx | 401 | 402 | 403 | 404 | 405 | 406 | 407 | 408 | 409 | 410 | 411 | 412 | 413 | 414 | 415 |     |
| N-way | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
Authorization space example (z10 EC)

Base model 504

5 CP CBUs

<table>
<thead>
<tr>
<th>7xx</th>
<th>701</th>
<th>702</th>
<th>703</th>
<th>704</th>
<th>705</th>
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<th>708</th>
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<th>711</th>
<th>712</th>
<th>713</th>
<th>714</th>
</tr>
</thead>
<tbody>
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<td>6xx</td>
<td>601</td>
<td>602</td>
<td>603</td>
<td>604</td>
<td>605</td>
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<td>409</td>
<td>410</td>
<td>411</td>
<td>412</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N-way</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
</tr>
</tbody>
</table>
z196 & z10 EC Model Dependency

- Ensure there are enough books/PUs to support the target CBU destination

<table>
<thead>
<tr>
<th>Z196 / z10 HW Model</th>
<th>Model Capacity Identifier</th>
</tr>
</thead>
<tbody>
<tr>
<td>z196 - M15</td>
<td>700 – 715, 6xx, 5xx, 4xx</td>
</tr>
<tr>
<td>z10 - E12</td>
<td>700 – 712, 6xx, 5xx, 4xx</td>
</tr>
<tr>
<td>z196 - M32</td>
<td>700 – 732, 6xx, 5xx, 4xx</td>
</tr>
<tr>
<td>z10 - E26</td>
<td>700 – 726, 6xx, 5xx, 4xx</td>
</tr>
<tr>
<td>z196 - M49</td>
<td>700 – 749, 6xx, 5xx, 4xx</td>
</tr>
<tr>
<td>z10 - E40</td>
<td>700 – 740, 6xx, 5xx, 4xx</td>
</tr>
<tr>
<td>z196 - M66</td>
<td>700 – 766, 6xx, 5xx, 4xx</td>
</tr>
<tr>
<td>z10 - E56</td>
<td>700 – 756, 6xx, 5xx, 4xx</td>
</tr>
<tr>
<td>z196 - M80</td>
<td>700 – 780, 6xx, 5xx, 4xx</td>
</tr>
<tr>
<td>z10 - E64</td>
<td>700 – 764, 6xx, 5xx, 4xx</td>
</tr>
</tbody>
</table>
CBU Example in eConfig

- 2098-E10
- Base – C04
CBU Example

- 5 CBU CP's
- Five Year contract
- 10 additional Tests (total 15)
CBU Order Panel – ResourceLink

Order Capacity Backup record
Step 1 of 2: Configure the record

Use this form to order a Capacity Backup (CBU) record and contract:

1. Select the maximum additional model capacity and specialty engines that can be activated with this record.
2. Select the contract length (how long you want to use the record).
3. Your order includes 1 CBU activation and 5 CBU test activations. Optionally, select whether you want to purchase additional test activations.

Needed:
On-line CoD buying FC9900
CBU Authorization FC9910
Contract signature

www.ibm.com/servers/resourcelink
### CBU – Capacity Backup

**Example**

- Model C04
- CBU max target = Z05
- Add 5 CBU CPs
- 5 Year Contract
- 10 Additional tests
- \(5 \times 5 = 25\)

**On Demand Capacity Selections:**

<table>
<thead>
<tr>
<th>NEW00001 - CBU - CP(5) - Total Tests(15) - Years(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 additional test per CBU Year is included in the CBU record, maximum of 15 total tests.</td>
</tr>
</tbody>
</table>

| 5027 | 4-Way Processor C04 | 1 |
| 6658 | CP-C                | 4 |
| 6805 | 1 Additional CBU Tests | 10 |
| 6817 | 1 CBU Year          | 5 |
| 6818 | CBU                 | 1 |
| **6821** | 25 CBU CP              | 1 |
| 6857 | C04 Capacity Marker  | 1 |
Permanent model 709

### Temporary Upgrades - SCZP201

<table>
<thead>
<tr>
<th>Record ID</th>
<th>Record Type</th>
<th>CPs</th>
<th>SAPs</th>
<th>ICFs</th>
<th>IFLs</th>
<th>zAAPs</th>
<th>zLPs</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB7BKU9T</td>
<td>CBU</td>
<td>*0</td>
<td>0/0</td>
<td>0/0</td>
<td>0/0</td>
<td>4/0</td>
<td>4/0</td>
<td>Installed</td>
</tr>
<tr>
<td>CR7BKUEQ</td>
<td>On/Off CoD</td>
<td>*0</td>
<td>6/0</td>
<td>4/0</td>
<td>0/0</td>
<td>2/0</td>
<td>2/0</td>
<td>Installed</td>
</tr>
<tr>
<td>CP7BKQ93</td>
<td>Planned Event</td>
<td>*0</td>
<td>*0</td>
<td>*0</td>
<td>*0</td>
<td>*0</td>
<td>*0</td>
<td>Installed</td>
</tr>
</tbody>
</table>

**Active Temporary**

- Permanent: 9
- Total Used: 9

**System Summary**

- Model-Capacity Identifier: 709
- MSUs: 804
- Model-Temporary-Capacity Identifier: 709
- Available PUs: 9
- Model-Permanent-Capacity Identifier: 709
**STore System Information (STSI) REVIEW**

- Provide capacity ratings for license purposes that can be verified by STSI
- Facilitates the ability for programs to recognize On/Off CoD and CBU activity

<table>
<thead>
<tr>
<th>Capacity</th>
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<th>Billable (On/Off CoD)</th>
<th>Replacement (CBU,CPE)</th>
</tr>
</thead>
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<tr>
<td>Model-Capacity Identifier</td>
<td>Base (not high water mark)</td>
<td>Billable (On/Off CoD)</td>
<td>Replacement (CBU,CPE)</td>
</tr>
<tr>
<td>Model-Permanent-Capacity Identifier</td>
<td>Base (not high water mark)</td>
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<td>Replacement (CBU,CPE)</td>
</tr>
<tr>
<td>Model-Temporary-Capacity Identifier</td>
<td>Base (not high water mark)</td>
<td>Billable (On/Off CoD)</td>
<td>Replacement (CBU,CPE)</td>
</tr>
</tbody>
</table>
709 upgrade with CBU to 714

**Change Activation Levels - SCZP201**

- **Record ID:** CB7BKU9T
- **Record Type:** CBU
- **Status:** Installed
- **Description:** +9 CP FCs, +4 zAAP, +4 zIIP

**Model-Capacity Identifier:** 709  CPs: 0  MSU Value: 663

<table>
<thead>
<tr>
<th>Select ^</th>
<th>Target Model-Capacity ID ^</th>
<th>CPs ^</th>
<th>Target MSU Value ^</th>
<th>MSU Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>711</td>
<td>2</td>
<td>944</td>
<td>146</td>
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<tr>
<td></td>
<td>712</td>
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<td></td>
<td>713</td>
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<td>714</td>
<td>5</td>
<td>1139</td>
<td>347</td>
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<tr>
<td></td>
<td>715</td>
<td>6</td>
<td>1202</td>
<td>410</td>
</tr>
</tbody>
</table>

**Processors**

- **SAPs:** 0  Current: 0
- **ICFs:** 0  Current: 0
- **IFLs:** 0  Current: 0
- **zAAPs:** 2  Current: 0
- **zIIPs:** 1  Current: 0

**Activation Options**

- Test Activation
- Real Activation

- Force activation

**When you have finished setting the activation levels, press the "OK" button to save your changes.**

**OK**

---
CBU Confirmation

**Temporary Upgrades - SCZP201**

Are you sure you want to change the activation levels for this record?

- Record ID: CB7BKU9T
- Description: +9 CP FCs, +4 zAAP, +4 zIIP
- Activation type: Test activation

<table>
<thead>
<tr>
<th>Model-Capacity Identifier</th>
<th>Original</th>
<th>New</th>
</tr>
</thead>
<tbody>
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<td>CPs</td>
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</tr>
<tr>
<td>SAPs</td>
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<td>0</td>
</tr>
<tr>
<td>ICFs</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>IFLs</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>zAAPs</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>zIIPs</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

ACT37464

[Image of a computer screen showing a confirmation window with options to confirm or deny the changes.]
### Temporary Upgrades - SCZP201

The following table shows all the installed records on the system.
*To view a record description, place the mouse over the record.
*The processors in the table are represented as "Maximum/Active".

<table>
<thead>
<tr>
<th>Record ID</th>
<th>Record Type</th>
<th>CPs</th>
<th>SAPs</th>
<th>ICFs</th>
<th>IFLs</th>
<th>zAAPs</th>
<th>zILPs</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB7BKU9T</td>
<td>CBU</td>
<td>5/6</td>
<td>0/0</td>
<td>0/0</td>
<td>0/0</td>
<td>4/2</td>
<td>4/1</td>
<td>Active-Test</td>
</tr>
<tr>
<td>CR7BKUEQ</td>
<td>On/Off CoD</td>
<td>*0/6</td>
<td>0/4</td>
<td>0/0</td>
<td>2/0</td>
<td>2/0</td>
<td></td>
<td>Installed</td>
</tr>
<tr>
<td>CP7BKQ93</td>
<td>Planned Event</td>
<td>*0/0</td>
<td>*0/0</td>
<td>*0/0</td>
<td>*0/0</td>
<td>*0/0</td>
<td>*0/0</td>
<td>Installed</td>
</tr>
</tbody>
</table>

**Active Temporary**
- **Permanent**
- **Total Used**

**Description:**
*For CPs, the maximum value is determined by an offering specific algorithm that accounts for engines, speed changes, and resulting capacity. For all other processor types, the maximum value is unlimited.*

**System Summary**
- Model-Capacity Identifier: 714
- MSUs: 1139
- Model-Temporary-Capacity Identifier: 709
- Available PUs: 1
- Model-Permanent-Capacity Identifier: 709
Permanent Upgrade with CBU Active

CBU resources on top of new base. The base will increase if the resources are available, otherwise the permanent upgrade will be blocked until the resources are freed.

Permanent capacity

Available PUs

CBU upgrade

MPCI: 708
MTCI: 708
MCI: 708

Available PUs

CBU adds 2 CPs

permanent capacity

MPCI: 708
MTCI: 708
MCI: 710

permanent upgrade

from 708 to 709

Available PUs

CBU adds 2 CPs

permanent capacity

MPCI: 709
MTCI: 709
MCI: 711
## Comparison – z9 CBU versus z196/z114 & z10 CBU

<table>
<thead>
<tr>
<th></th>
<th>z9</th>
<th>z196, z114 &amp; z10</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Granularity</strong></td>
<td>All on / All off</td>
<td>Granular</td>
</tr>
<tr>
<td><strong>Customer exceeds terms</strong></td>
<td>Reduce machine capacity</td>
<td>Removed automatically, if possible</td>
</tr>
<tr>
<td><strong>Number of CBU orders</strong></td>
<td>Buy one, apply one</td>
<td>Buy many, apply many simultaneously</td>
</tr>
<tr>
<td><strong>Terms</strong></td>
<td>Usually 5 years</td>
<td>Variable, 1-5 years</td>
</tr>
</tbody>
</table>
Agenda

- The Basics - Capacity on Demand
- Elements of the Offerings
- Capacity Backup
- Capacity for Planned Events
- On/Off Capacity on Demand
- Capacity Provisioning Manager
## Capacity for Planned Events (CPE)

### Resources
- CP Capacity Features
- Specialty engines: zIIP, zAAP, ICF, IFL, SAP

### Time elements
- Test duration = NA
- Real activation = 3 days
- No grace period
- No Expiration date

### Tokens
- Number of Tests = 0
- Number of Real activations = 1

### Order process limits
- No more than 1 real activation per record

### Machine limits
- Can not decrement capacity level
- Can not remove permanent engines from configuration
- Auto deactivation of activated resources upon time limit
  - If any resource can not be removed all resources stay active
  - Ability to remove resources checked every 24 hours
- Ordered dormant resources are available for use during the activation

### Contract terms and conditions
- To be used only for replacement capacity within an enterprise
- Priced for H/W use BUT like CBU, no IBM S/W charges
## CPE Replenishment

<table>
<thead>
<tr>
<th>Component</th>
<th>Replenish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resources (CP, specialty engines)</td>
<td>No</td>
</tr>
<tr>
<td>Expiration date -</td>
<td>No</td>
</tr>
</tbody>
</table>
CPE

- Announcement October 20, 2009
  - 2097 GA3, November 20, 2009, but new CPE function available December 31, 2009
  - Driver 79

- Replacement Capacity
  - Replaces lost capacity within a customer’s enterprise for planned downtime events
    - Push/Pull planned outages
    - Planned Data Center moves and relocations
  - CP capacity details are NOT now managed by feature codes
    - Any available and dormant resources may be configured and consumed

- Normal specialty engine rules are not managed/enforced
  - For example,
    - If you are a 703 then you can order CPE up to 3 zIIPs and 3 zAAPs.
    - If you want 5 zIIPs you need to order corresponding CP capacity in CPE record
Planned Event Example
Planned Event Example

NEW00001 - Capacity for Planned Event - CP Model(Z05) - CP(3) - KCID(Z1) - CP Models

CP Models

CP Model U02
CP Model U03
CP Model U04
CP Model U05
CP Model V02
CP Model V03
CP Model V04
CP Model V05
CP Model W02
CP Model W03
CP Model W04
CP Model W05
CP Model X02
CP Model X03
CP Model X04
CP Model X05
CP Model Y02
CP Model Y03
CP Model Y04
CP Model Y05
CP Model Z02
CP Model Z03
CP Model Z04

Current Model E02, Target: Model Z05

< Previous  Next  OK  Cancel  Reset Page >
**Planned Event Example**

![Image of planned event example](image)

### Capacity for Planned Event - CP Model(Z05) - CP(3) - KCID(21) - ODC CPs

<table>
<thead>
<tr>
<th>Processors</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPs - selection controlled by CP Models</td>
<td></td>
</tr>
<tr>
<td>IFL (0 - 5)</td>
<td>0</td>
</tr>
<tr>
<td>Integrated Coupling Facility (0 - 5)</td>
<td>0</td>
</tr>
<tr>
<td>zSeries Application Assist Processor (0 - 5)</td>
<td>0</td>
</tr>
<tr>
<td>System z10 Integrated Information Processor (0 - 5)</td>
<td>0</td>
</tr>
<tr>
<td>Optional SAP (0 - 2)</td>
<td>0</td>
</tr>
<tr>
<td>Speed Step Increase - selection controlled by CP Models</td>
<td>21</td>
</tr>
</tbody>
</table>

Current Model: E02  Target Model: Z05

[Previous]  [Next]  [OK]  [Cancel]  [Reset Page]
Planned Event Example
### Capacity for Planned Event

**On Demand Capacity Selections:**
- **NEW00001** - Capacity for Planned Event -
  - **CP Model(Z05) CP(3)** - KCID(21)

**On Demand Capacity Selections:**
- **NEW00001** - Capacity for Planned Event

<table>
<thead>
<tr>
<th>2098-E10</th>
<th>IBM System z10 Business Class</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>5035</td>
<td>2-Way Processor E02</td>
<td>1</td>
</tr>
<tr>
<td>6660</td>
<td>CP-E</td>
<td>2</td>
</tr>
<tr>
<td>6833</td>
<td>Capacity for Planned Event</td>
<td>1</td>
</tr>
<tr>
<td>6865</td>
<td>E02 Capacity Marker</td>
<td>1</td>
</tr>
<tr>
<td>9912</td>
<td>CPE authorization</td>
<td>1</td>
</tr>
</tbody>
</table>
CPE Order Panel – ResourceLink

Needed:
On-line CoD buying
FC9900
CPE Authorization
FC9912
CPE example

- Model E26
- 26 PUs (on an E26)
- 9 active CPs
- 8 active specialty engines
- 9 dormant engines (available PUs)

Fields will now be limited by new CPE record
CPE Example – 709 to 716

```
<table>
<thead>
<tr>
<th>Select</th>
<th>Target Model-Capacity</th>
<th>CPs</th>
<th>Target MSU Value</th>
<th>MSU Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>712</td>
<td>3</td>
<td>1011</td>
<td>215</td>
</tr>
<tr>
<td></td>
<td>713</td>
<td>4</td>
<td>1076</td>
<td>282</td>
</tr>
<tr>
<td></td>
<td>714</td>
<td>5</td>
<td>1139</td>
<td>347</td>
</tr>
<tr>
<td></td>
<td>715</td>
<td>6</td>
<td>1202</td>
<td>410</td>
</tr>
<tr>
<td></td>
<td>716</td>
<td>7</td>
<td>1264</td>
<td>473</td>
</tr>
</tbody>
</table>
```

Processors:
- SAPs: 0 Current: 0
- ICFS: 0 Current: 0
- IFLs: 0 Current: 0
- zAAPs: 1 Current: 0
- zIIPs: 1 Current: 0

When you have finished changing the activation levels, press the 'OK' button to save your changes.
CPE Confirmation

Temporary Upgrades - SCZP201

Are you sure you want to change the activation levels for this record?

- Record ID: CP7BKQ93
- Description: Capacity for Planned Events
- Activation type: Real activation

<table>
<thead>
<tr>
<th>Model-Capacity Identifier</th>
<th>Original</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPs</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>SAPs</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>ICFs</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>IFLs</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>zAAPs</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>zIIPs</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

ACT37464

[Yes] [No]
CPE active

![Image of the user interface showing temporary upgrades](https://sczhmc8.itso.ibm.com:9950 - SCZP201: Perform Model Conversion - Mozilla Firefox)

The following table shows all the installed records on the system:
- To view a record description, place the mouse over the record.
- The processors in the table are represented as 'Maximum/Active'

<table>
<thead>
<tr>
<th>Record ID</th>
<th>Record Type</th>
<th>CPs</th>
<th>SAPs</th>
<th>ICFs</th>
<th>IFLs</th>
<th>zAAPs</th>
<th>zIPs</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB7BKU91</td>
<td>CBU</td>
<td>4/0</td>
<td>0/0</td>
<td>0/0</td>
<td>0/0</td>
<td>4/0</td>
<td>4/0</td>
<td>Installed</td>
</tr>
<tr>
<td>CR7BKUEQ</td>
<td>On/Off CoD</td>
<td>0/0</td>
<td>6/0</td>
<td>4/0</td>
<td>0/0</td>
<td>2/0</td>
<td>2/0</td>
<td>Installed</td>
</tr>
<tr>
<td>CP7BKG93</td>
<td>Planned Event</td>
<td>1/7</td>
<td>1/0</td>
<td>1/0</td>
<td>1/0</td>
<td>1/1</td>
<td>1/1</td>
<td>Active-Real!</td>
</tr>
</tbody>
</table>

Active Temporarily:
- [Record ID]
- [CPs]
- [SAPs]
- [ICFs]
- [IFLs]
- [zAAPs]
- [zIPs]
- [Status]

Permanent:
- [Record ID]
- [CPs]
- [SAPs]
- [ICFs]
- [IFLs]
- [zAAPs]
- [zIPs]
- [Status]

Total Used:
- [Record ID]
- [CPs]
- [SAPs]
- [ICFs]
- [IFLs]
- [zAAPs]
- [zIPs]
- [Status]

Description:
- For CPs, the maximum value is determined by an offering specific algorithm that accounts for engines, speed changes, and resulting capacity. For all other processor types, the maximum value is unlimited.

**System Summary**
- Model-Capacity Identifier: 716
- MSUs: 1264
- Model-Temporary-Capacity Identifier: 709
- Model-Permanent-Capacity Identifier: 709
- Available PUs: 0
Permanent Upgrade with CPE Active

The base will increase if the resource is available, otherwise the permanent upgrade will be blocked until the resource is freed.

- CIU Upgrade from 705 To 706, Upgrade blocked no resources
- CIU Upgrade from 705 To 706, Install

Base (705) → Reduced CPE Resources → Base (706)
Agenda

- The Basics - Capacity on Demand
- Elements of the Offerings
- Capacity Backup
- Capacity for Planned Events
- On/Off Capacity on Demand
- Capacity Provisioning Manager
On/Off Capacity on Demand

Resources
- CP Capacity
- % increase in capacity
- Specialty engines: zIIP, zAAP, ICF, IFL, SAP

Time elements
- Test duration = NA
- Real activation = Unlimited
- 1 hr grace period
- Expiration date set to 180 days

Tokens
- Number of Tests = 0
- Number of Real activations = Unlimited
- Tokens - MSU days and processor days (for specialty engines)

Order process limits
- Temporary CP capacity up to 100% of purchased capacity
- Number of temporary zIIPs or zAAPs can not exceed total number of permanent + temporary CPs
- Number of temporary IFLs up to the total of purchased IFLs
- Number of temporary ICFs plus permanent ICFs not to exceed 16

Machine limits
- Can not decrement capacity level
- Can not remove permanent engines from configuration
- Positive increase in capacity (processor speed) with temporary activations

Contract terms and conditions
- H/W and S/W charges
- No administrative tests (except on z196, z114 and z9)
- One 24 hour test record
## On/Off CoD Replenishment

<table>
<thead>
<tr>
<th>Component</th>
<th>Replenish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resources</td>
<td>Yes</td>
</tr>
<tr>
<td>(CP, specialty engines)</td>
<td></td>
</tr>
<tr>
<td>On/Off CoD Test</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Yes, if z196, z114 or z9</td>
</tr>
<tr>
<td>Pre-Paid Tokens</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Pre-paid On/Off CoD records do not expire.</td>
</tr>
<tr>
<td>Post Paid Tokens</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Post Paid On/Off CoD records can expire, even when with Tokens.</td>
</tr>
<tr>
<td>Expiration date -</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Automatic replenishment if z196 or z114</td>
</tr>
</tbody>
</table>
New On/Off Capacity on Demand – Tokens

- **Self-imposed limits**
  - **Specialty Engines** or CP MSU’s
    - IFL day or ICF day or zIIP day or zAAP day
  - “Engine day” - Use specialty engine for 24 hours per token
    - Example: Purchase 5 IFL day engines for 20 days (5x20=100 tokens)
    - 1 token “per peak activated engine(s)” is decremented during a 24 hour period
      - Activate 2 IFL’s for 5 days (2x5=10 tokens used)
      - Thus, 100-10=90 tokens remaining
      - Auto deactivation after all tokens have expired
  - No scheduled expiration date for pre-paid tokens
    - Post-paid On/Off CoD expiration dates remain, but tokens can also be used with post paid On/Off CoD
    - Tokens decrement as used
    - Token pools can be replenished to increase a specialty engine-day pool or
      - an MSU-day pool
    - Auto deactivation after any active record’s token pool (IFL days, CP MSU days, etc) is empty
      - After auto deactivate, you may re-activate those resources that still have tokens left (remaining zIIP tokens for example)

- **Ordered by the customer via ResourceLink Wizard**
  - Not ordered via IBM Configurator
Capacity tokens for specialty engines

- **Unassigned IFLs**
  - IFL tokens are only consumed for IFL activation levels above the unassigned IFL count
  - Example:
    - Machine has 2 Unassigned IFLs
    - IFL tokens are not consumed if <= 2 IFLs are activated – eg activating 1 IFL
      - Consumes no IFL Day tokens per 24 hour period
    - Tokens are only consumed from 3rd IFL on – eg activating 3 IFLs
      - Consumes one IFL Day token per 24 hour period
CP MSU Day – Tokens

- Pre-Paid with self-imposed limits - CP MSU day

- “MSU day” - Use peak MSU value for a 24 hour period per token
  - Example: Customer purchases **200 additional MSU’s for 60 days** (200 x 60 = 12,000 MSU tokens)
    - x tokens are decremented where x is the CP MSU days deltas between maximum purchased capacity (including high water mark) and the active On/Off Capacity on Demand record
    - **Activate Y03 (47 additional MSU’s (202-155=47)) for 5 days (47 x 5 = 235 used MSU tokens)**
    - 12,000 – 235 = 11,765 remaining tokens

- Rules
  - No reduction of capacity or the number of CPs permitted (even if capacity increased)
  - Cannot exceed 2 times the purchased capacity (155 x 2 = 310 in this example)
    - same is true for specialty engines
  - On/Off CoD below the high water mark will not consume tokens

<table>
<thead>
<tr>
<th>CI (MSU)</th>
<th>Y01 (76)</th>
<th>Z01 (83)</th>
<th>Y02 (142)</th>
<th>Z02 (155) HWM</th>
<th>X03 (177)</th>
<th>Y03 (202)</th>
<th>Z03 (221)</th>
<th>Y04 (258)</th>
<th>Z04 (283)</th>
<th>2x HWM (310)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X03</td>
<td>126 MSUs</td>
<td></td>
<td>47 MSUs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y04</td>
<td>207 MSUs</td>
<td>128 MSUs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Z03</td>
<td></td>
<td></td>
<td>177</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Z04</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N-way</td>
<td>1 1 2 2 3 3 3 3 3 4 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
On/Off CoD on-line order

The On/Off CoD upgrade options on this order form are initialized to the maximum selections for upgrades that have prices set for this machine. Maximizing selections creates an On/Off CoD record that supports the widest possible range of On/Off CoD upgrades for the current machine configuration. Adjust the selections only if you want to change the type or range of On/Off CoD upgrades that can be activated with this record.

(*) indicates setting a replenishment due date is required to continue. Its initial setting is the maximum date allowed.

Replenishment due date*: 08/04/2008 (mm/dd/yyyy)

Enable upgrades for up to:

<table>
<thead>
<tr>
<th>Model capacity</th>
<th>more model capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICF</td>
<td>4</td>
</tr>
<tr>
<td>zAAP</td>
<td>2</td>
</tr>
<tr>
<td>zIIP</td>
<td>2</td>
</tr>
<tr>
<td>IFL</td>
<td>0</td>
</tr>
<tr>
<td>SAP</td>
<td>6</td>
</tr>
</tbody>
</table>

---

Needed:
- On-line CoD buying FC9900
- OOCoD Authorization FC9896
- Contract signature
Post Paid On/Off CoD on-line order with Tokens

Order On/Off CoD record
Step 2 of 3: Set spending limits

Use this form to set spending limits on this record. You can set a spending limit on each type of upgrade this record can be used to activate. Setting a spending limit on an upgrade will configure this record to support activating upgrade configurations with daily prices within the spending limit. Then:

- Each activation of an upgrade spends a portion of its spending limit.
- How much is spent depends on the size of the upgrade and how long it is activated.
- You can continue using the record to activate upgrades as long as the daily price of at least one upgrade configuration is within the unspent portion of its spending limit.

Set spending limits in whole numbers only (for example: 500000).

<table>
<thead>
<tr>
<th>Upgrades enabled up to:</th>
<th>Limit spending to: (in US Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model capacity: 100%</td>
<td></td>
</tr>
<tr>
<td>ICF: 4</td>
<td>0</td>
</tr>
<tr>
<td>zAAP: 0</td>
<td>0</td>
</tr>
<tr>
<td>zIIP: 1</td>
<td>0</td>
</tr>
<tr>
<td>IFL: 0</td>
<td>0</td>
</tr>
<tr>
<td>SAP: 6</td>
<td>0</td>
</tr>
</tbody>
</table>

Continue

Machine summary
- Type: 2097 E26
- Model: 706
- Downgraded from model: 710
- Serial number: 2097B

Current configuration
- Model capacity: 6 CPs
- ICF: 4
- zAAP: 1
- zIIP: 1
- IFL: 1
- SAP: 6
- Available engines: 13
Pre-Paid Tokens within an On/Off CoD order

Order On/Off CoD record

Step 2 of 3: Add prepaid upgrades

Use this form to add prepaid upgrades to your On/Off CoD record order. Repeat these steps for each prepaid upgrade you want to order:

1. Select an upgrade.
2. Enter the number of days you want to use the selected upgrade.
3. Click the “Add to order” link for the selected upgrade.

<table>
<thead>
<tr>
<th>Model capacity</th>
<th>Upgrade configuration</th>
<th>Price per day</th>
<th>Days of use</th>
<th>Add to order</th>
</tr>
</thead>
<tbody>
<tr>
<td>606 (6 CPs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICF</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>zAAP</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>zIIP</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IFL</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAP</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Prepaid upgrades**

<table>
<thead>
<tr>
<th>Upgrade configuration</th>
<th>Days of use</th>
<th>Tokens</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>608 (8 CPs)</td>
<td>10</td>
<td>1130</td>
<td>$0.00</td>
</tr>
<tr>
<td>607 (7 CPs)</td>
<td>5</td>
<td>265</td>
<td>$0.00</td>
</tr>
<tr>
<td>706 (6 CPs)</td>
<td>3</td>
<td>519</td>
<td>$0.00</td>
</tr>
<tr>
<td>4 IFLs</td>
<td>5</td>
<td>5</td>
<td>$0.00</td>
</tr>
<tr>
<td>5 IFLs</td>
<td>2</td>
<td>4</td>
<td>$0.00</td>
</tr>
</tbody>
</table>

Total price $0.00

---

Order number LC7EENGL

**About this order**

- Ordered 7 May 2008
- Staging order
- Description: +100% model capacity, +0 ICF, +2 zAAP, +1 zIIP, +3 IFL, +6 SAP, to 11/03/2008

**Replenishment due date:** 11/03/2008

**Upgrades enabled for up to 100% more model capacity**

- 0 more ICF engines: $1,388.89 per engine
- 2 more zAAP engines: $1,111.11 per engine
- 1 more zIIP engines: $1,666.67 per engine
- 3 more IFL engines: $2,777.78 per engine
- 6 more SAP engines

This order is maximized for the current machine configuration.
On/Off CoD authorization space

base capacity 402
HWM 402 (51 MSU)

=> authorization area up to 102 MSU (2 x 51)

<table>
<thead>
<tr>
<th>7xx</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6xx</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5xx</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>502 (110)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4xx</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>402 (51)</td>
<td>403 (75)</td>
<td>404 (97)</td>
<td>405 (118)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N-way</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>
On/Off CoD authorization space

Permanent capacity 402
purchased capacity high water mark (HWM) 504 (207 MSU)
=> authorization area up to 414 MSU (2 x 207)

<table>
<thead>
<tr>
<th>7xx</th>
<th>702 (215)</th>
<th>703 (312)</th>
<th>704 (401)</th>
<th>705 (488)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6xx</td>
<td>602 (149)</td>
<td>603 (151)</td>
<td>604 (277)</td>
<td>605 (339)</td>
</tr>
<tr>
<td>5xx</td>
<td>502 (110)</td>
<td>503 (160)</td>
<td>504 (207)</td>
<td>505 (252)</td>
</tr>
<tr>
<td>4xx</td>
<td>402 (51)</td>
<td>403 (75)</td>
<td>404 (97)</td>
<td>405 (118)</td>
</tr>
<tr>
<td>N-way</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Zero Hardware cost
On/Off CoD - Example

The following table shows all the installed records on the system:
- To view a record description, place the mouse over the record.
- The processors in the table are represented as "Maximum/Active"

<table>
<thead>
<tr>
<th>Record ID</th>
<th>Record Type</th>
<th>CPs</th>
<th>SAPs</th>
<th>ICFs</th>
<th>IFLs</th>
<th>zAAPs</th>
<th>zILPs</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB7BKU9T</td>
<td>CBU</td>
<td>0/0</td>
<td>0/0</td>
<td>0/0</td>
<td>0/0</td>
<td>4/0</td>
<td>4/0</td>
<td>Installed</td>
</tr>
<tr>
<td>CR7BKUE0</td>
<td>On/Off CoD</td>
<td>0/0</td>
<td>6/0</td>
<td>4/0</td>
<td>0/0</td>
<td>2/0</td>
<td>2/0</td>
<td>Installed</td>
</tr>
</tbody>
</table>

Active Temporary
- Permanent: 9, 6, 4, 0, 2, 2
- Total Used: 9, 6, 4, 0, 2, 2

Description:
* - For CPs, the maximum value is determined by an offering specific algorithm that accounts for engines, speed changes, and resulting capacity. For all other processor types, the maximum value is unlimited.

System Summary
- Model-Capacity Identifier: 709
- MSUs: 804
- Model-Temporary-Capacity Identifier: 709
- Available PUs: 9
- Model-Permanent-Capacity Identifier: 709
On/Off CoD – 709 to 710

### Change Activation Levels - SCZP201

- **Record ID:** CR7BKLEQ
- **Record Type:** On/Off CoD
- **Status:** Installed
- **Description:** +100% model capacity, +4 ICF, +2 zAAP, +2 zILP, +0 IFL, +8 SAP, to 08/04/2008

**Model-Capacity Identifier:** 709

<table>
<thead>
<tr>
<th>Select</th>
<th>Target Model-Capacity ID</th>
<th>CPs</th>
<th>Target MSU Value</th>
<th>MSU Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>709</td>
<td>0</td>
<td>804</td>
<td>0</td>
</tr>
<tr>
<td>○</td>
<td>710</td>
<td>1</td>
<td>875</td>
<td>75</td>
</tr>
<tr>
<td>○</td>
<td>711</td>
<td>2</td>
<td>944</td>
<td>146</td>
</tr>
<tr>
<td>○</td>
<td>712</td>
<td>3</td>
<td>1011</td>
<td>215</td>
</tr>
<tr>
<td>○</td>
<td>713</td>
<td>4</td>
<td>1076</td>
<td>282</td>
</tr>
</tbody>
</table>

**Processors**

- **SAPs:** 0 current: 0
- **ICFs:** 0 current: 0
- **IFLs:** 0 current: 0
- **zAAPs:** 0 current: 0
- **zILPs:** 0 current: 0

*When you have finished changing the activation levels, press the "OK" button to save your changes.*
On/Off CoD - Confirmation

Temporary Upgrades - SCZP201

Are you sure you want to change the activation levels for this record?

- Record ID: CR7BKUEQ
- Description: +100% model capacity, +4 ICF, +2 zAAP, +2 zIIP, +0 IFL, +6 SAP, to 08/04/2008
- Activation type: Real activation

<table>
<thead>
<tr>
<th>Model-Capacity Identifier</th>
<th>Original</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPs</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>SAPs</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>ICFs</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>IFLs</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>zAAPs</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>zIIPs</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

ACT37464

Yes  No
### On/Off CoD - Result

#### Temporary Upgrades - SCZP201

The following table shows all the installed records on the system:
- To view a record description, place the mouse over the record.
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<table>
<thead>
<tr>
<th>Record ID</th>
<th>Record Type</th>
<th>CPs</th>
<th>SAPs</th>
<th>ICFs</th>
<th>IFLs</th>
<th>zAAPs</th>
<th>zIPs</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR7BKU9T</td>
<td>CBU</td>
<td>0/0</td>
<td>0/0</td>
<td>0/0</td>
<td>0/0</td>
<td>4/0</td>
<td>4/0</td>
<td>Installed</td>
</tr>
<tr>
<td>CR7BKUEQ</td>
<td>On/Off CoD</td>
<td>1/1</td>
<td>6/0</td>
<td>4/0</td>
<td>0/0</td>
<td>2/0</td>
<td>2/0</td>
<td>Active-Real</td>
</tr>
</tbody>
</table>

**Active Temporary**
- 1
- 0
- 0
- 0
- 0
- 0

**Permanent**
- 9
- 6
- 4
- 0
- 2
- 2

**Total Used**
- 10
- 6
- 4
- 0
- 2
- 2

**Description:**
- For CPs, the maximum value is determined by an offering specific algorithm that accounts for engines, speed changes, and resulting capacity. For all other processor types, the maximum value is unlimited.

#### System Summary
- Model-Capacity Identifier: 710
- MSUs: 875
- Model-Temporary-Capacity Identifier: 710
- Available PUs: 8
- Model-Permanent-Capacity Identifier: 709
Permanent Upgrade with On/Off CoD Active

The On/Off CoD processors of the same type are converted to permanent.

Available PUs

permanent capacity

On/Off CoD upgrade from 708 to 710

MPCL: 708
MTCI: 708
MCI: 708

permanent capacity

On/Off CoD with 2 CPs

MPCL: 708
MTCI: 710
MCI: 710

conversion will NOT occur if there are “pending” CBU resources.

Available PUs

permanent upgrade from 708 to 709

MPCI: 708
MTCI: 710
MCI: 710

permanent capacity

On/Off CoD with 1 CP

MPCI: 709
MTCI: 710
MCI: 710
**Multiple active temporary records - example**

### Temporary Upgrades - SCZP201

#### Installed Records

The following table shows all the installed records on the system.
- To view a record description, place the mouse over the record.
- The processors in the table are represented as "Maximum/Active".

<table>
<thead>
<tr>
<th>Record ID</th>
<th>Record Type</th>
<th>CPs</th>
<th>SAPs</th>
<th>ICFs</th>
<th>IFLs</th>
<th>zAAPs</th>
<th>zIPs</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB7BKU9T</td>
<td>CBU</td>
<td>/0</td>
<td>0/0</td>
<td>0/0</td>
<td>0/0</td>
<td>4/0</td>
<td>4/0</td>
<td>Installed</td>
</tr>
<tr>
<td>CR7BKUEQ</td>
<td>On/Off CoD</td>
<td>/0</td>
<td>6/0</td>
<td>4/0</td>
<td>0/0</td>
<td>2/0</td>
<td>2/0</td>
<td>Installed</td>
</tr>
</tbody>
</table>

#### Description:

- For CPs, the maximum value is determined by an offering specific algorithm that accounts for engines, speed changes, and resulting capacity. For all other processor types, the maximum value is unlimited.

#### System Summary:

- Model-Capacity Identifier: 709
- MSUs: 804
- Model-Temporary-Capacity Identifier: 709
- Available PUs: 9
- Model-Permanent-Capacity Identifier: 709

### Details

- Add processors...
- Remove processors...
- Delete
- Help

**Cancel**
Multiple active temporary records - example
Multiple active temporary records - example

### Temporary Upgrades - SCZP201

#### Installed Records

The following table shows all the installed records on the system.
- To view a record description, place the mouse over the record.
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<table>
<thead>
<tr>
<th>Record ID</th>
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<th>CPs</th>
<th>SAPs</th>
<th>ICFs</th>
<th>IFLs</th>
<th>zAAPs</th>
<th>zIPs</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB7BKU9T</td>
<td>CBU</td>
<td>*1/0</td>
<td>0/0</td>
<td>0/0</td>
<td>0/0</td>
<td>4/0</td>
<td>4/0</td>
<td>Installed</td>
</tr>
<tr>
<td>CR7BKUL7E</td>
<td>On/Off CoD</td>
<td>*1/0</td>
<td>5/0</td>
<td>4/0</td>
<td>0/0</td>
<td>2/2</td>
<td>2/1</td>
<td>Active-Real</td>
</tr>
</tbody>
</table>

**Description:**
- For CPs, the maximum value is determined by an offering specific algorithm that accounts for engines, speed changes, and resulting capacity. For all other processor types, the maximum value is unlimited.

#### System Summary

- Model-Capacity Identifier: 710  
- MSUs: 875
- Model-Temporary-Capacity Identifier: 710  
- Available PUs: 5
- Model-Permanent-Capacity Identifier: 709

![Details](image-url)  
Add processors...  
Remove processors...  
Delete  
Help  

Cancel
Multiple active temporary records - example
Multiple active temporary records - example

The following table shows all the installed records on the system.
- To view a record description, place the mouse over the record.
- The processors in the table are represented as "Maximum/Active"

<table>
<thead>
<tr>
<th>Record ID</th>
<th>Record Type</th>
<th>CPs</th>
<th>SAPs</th>
<th>ICFs</th>
<th>IFLs</th>
<th>zAAPs</th>
<th>zIIPs</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB7BKU9T</td>
<td>CBU</td>
<td>6/5</td>
<td>0/0</td>
<td>0/0</td>
<td>0/0</td>
<td>4/0</td>
<td>4/0</td>
<td>Active-Real</td>
</tr>
<tr>
<td>CR7BKUEQ</td>
<td>On/Off CoD</td>
<td>4/1</td>
<td>6/0</td>
<td>4/0</td>
<td>0/0</td>
<td>2/2</td>
<td>2/1</td>
<td>Active-Real</td>
</tr>
</tbody>
</table>

**Active Temporary**
- Active: 6 0 0 0 2 1
- Permanent: 9 6 4 0 2 2
- Total Used: 15 6 4 0 4 3

Description:
* For CPs, the maximum value is determined by an offering specific algorithm that accounts for engines, speed changes, and resulting capacity. For all other processor types, the maximum value is unlimited.

**System Summary**
- Model-Capacity Identifier: 715  MSUs: 1202
- Model-Temporary-Capacity Identifier: 710  Available PUs: 0
- Model-Permanent-Capacity Identifier: 709
Multiple active temporary records - example

![Change Activation Levels - SCZP201](image)

**Record ID:** CR7BKUEQ  
**Record Type:** On/Off CoD  
**Status:** Active-Real

**Description:** +100% model capacity, +4 ICF, +2 zAAP, +2 zIIP, +0 IFL, +6 SAP, to 08/04/2008

**Model-Capacity Identifier:** 715  
**CPs:** 1  
**MSU Value:** 1030

<table>
<thead>
<tr>
<th>Select</th>
<th>Target Model-Capacity ID</th>
<th>CPs</th>
<th>Target MSU Value</th>
<th>MSU Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>714</td>
<td>-1</td>
<td>1139</td>
<td>0</td>
</tr>
<tr>
<td>✗</td>
<td>715</td>
<td>0</td>
<td>1202</td>
<td>75</td>
</tr>
</tbody>
</table>

**Processors**

- **SAPs:** 0  
- **ICFs:** 0  
- **IFLs:** 0  
- **zAAPs:** 1  
- **zIIPs:** 0

Select the counts you would like for each processor type.

When you have finished changing the activation levels, press the "OK" button to save your changes.
Multiple active temporary records - example

### Temporary Upgrades - SCZP201

#### Installed Records

The following table shows all the installed records on the system.
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- The processors in the table are represented as "Maximum/Active".

<table>
<thead>
<tr>
<th>Record ID</th>
<th>Record Type</th>
<th>CPs</th>
<th>SAPs</th>
<th>ICFs</th>
<th>IFLs</th>
<th>zAAPs</th>
<th>zIIPs</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB7BKWuT</td>
<td>CBU</td>
<td>5/5</td>
<td>0/0</td>
<td>0/0</td>
<td>0/0</td>
<td>4/0</td>
<td>4/0</td>
<td>Active-Real</td>
</tr>
<tr>
<td>CR7BKUEQ</td>
<td>On/Off CoD</td>
<td>1/1</td>
<td>6/0</td>
<td>4/0</td>
<td>0/0</td>
<td>2/1</td>
<td>2/0</td>
<td>Active-Real</td>
</tr>
</tbody>
</table>

**Active Temporary**
- 6 CPs
- 0 SAPs
- 0 ICFs
- 0 IFLs
- 1 zAAPs
- 0 zIIPs

**Permanent**
- 9 CPs
- 6 SAPs
- 4 ICFs
- 0 IFLs
- 2 zAAPs
- 2 zIIPs

**Total Used**
- 15 CPs
- 6 SAPs
- 4 ICFs
- 0 IFLs
- 3 zAAPs
- 2 zIIPs

Description:
* For CPs, the maximum value is determined by an offering specific algorithm that accounts for engines, speed changes, and resulting capacity. For all other processor types, the maximum value is unlimited.

**System Summary**

- Model-Capacity Identifier: 715
- MSUs: 1202
- Model-Temporary-Capacity Identifier: 710
- Available PUs: 2
- Model-Permanent-Capacity Identifier: 709
Multiple active temporary records - example
Multiple active temporary records - example

The following table shows all the installed records on the system.
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- The processors in the table are represented as "Maximum/Active."

<table>
<thead>
<tr>
<th>Record ID</th>
<th>Record Type</th>
<th>CPs</th>
<th>SAPs</th>
<th>ICFs</th>
<th>IFLs</th>
<th>zAAPs</th>
<th>zIIPs</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB7B0KU9T</td>
<td>CBU</td>
<td>*/1</td>
<td>6/0</td>
<td>0/0</td>
<td>0/0</td>
<td>4/0</td>
<td>4/0</td>
<td>Active</td>
</tr>
<tr>
<td>CR7BKUEQ</td>
<td>On/Off CoD</td>
<td>9/1</td>
<td>6/0</td>
<td>4/0</td>
<td>0/0</td>
<td>2/1</td>
<td>2/0</td>
<td>Active</td>
</tr>
</tbody>
</table>

**Active Temporary** 8 0 0 0 1 0

**Permanent** 9 6 4 0 2 2

**Total Used** 17 6 4 0 3 2

Description:
* For CPs, the maximum value is determined by an offering specific algorithm that accounts for engines, speed changes, and resulting capacity. For all other processor types, the maximum value is unlimited.

System Summary

- Model-Capacity Identifier: 717 MSUs: 1329
- Model-Temporary-Capacity Identifier: 710 Available PUs: 0
- Model-Permanent-Capacity Identifier: 709
Multiple active temporary records - example

Change Activation Levels - SCZP201

Record ID: CR7BKUEQ  Record Type: On/Off  CoD  Status: Active-Real
Description: +100% model capacity, +4 ICF, +2 zAAP, +2 zIIP, +0 IFL, +6 SAP, to 08/04/2008
Model-Capacity Identifier: 717  CPs: 1  MSU Value: 1141

<table>
<thead>
<tr>
<th>Select</th>
<th>Target Model-Capacity ID</th>
<th>CPs</th>
<th>Target MSU Value</th>
<th>MSU Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>○</td>
<td>716</td>
<td>-1</td>
<td>1264</td>
<td>0</td>
</tr>
<tr>
<td>○</td>
<td>717</td>
<td>0</td>
<td>1329</td>
<td>75</td>
</tr>
</tbody>
</table>

Processors

Select the counts you would like for each processor type.

- SAPs: 0  Current: 0
- ICFs: 0  Current: 0
- IFLs: 0  Current: 0
- zAAPs: 0  Current: 1
- zIIPs: 0  Current: 0

When you have finished changing the activation levels, press the "OK" button to save your changes.

OK  Cancel  Restore Current Levels  Undo  Help
Multiple active temporary records - example

The following table shows all the installed records on the system.
- To view a record description, place the mouse over the record.
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<table>
<thead>
<tr>
<th>Record ID</th>
<th>Record Type</th>
<th>CPs</th>
<th>SAPs</th>
<th>ICFs</th>
<th>IFIs</th>
<th>zAAPs</th>
<th>zILPs</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB7BKUG9T</td>
<td>CBU</td>
<td>7/7</td>
<td>0/0</td>
<td>0/0</td>
<td>0/0</td>
<td>4/0</td>
<td>4/0</td>
<td>Active-Real</td>
</tr>
<tr>
<td>CR7BKUEQ</td>
<td>On/Off CoD</td>
<td>4/0</td>
<td>4/0</td>
<td>0/0</td>
<td>0/0</td>
<td>2/0</td>
<td>2/0</td>
<td>Installed</td>
</tr>
</tbody>
</table>

Active Temporary
- CPs: 7, SAPs: 6, ICFs: 4, IFIs: 0, zAAPs: 2, zILPs: 2

Permanent
- CPs: 9, SAPs: 6, ICFs: 4, IFIs: 0, zAAPs: 2, zILPs: 2

Total Used
- CPs: 16, SAPs: 6, ICFs: 4, IFIs: 0, zAAPs: 2, zILPs: 2

Description:
* - For CPs, the maximum value is determined by an offering specific algorithm that accounts for engines, speed changes, and resulting capacity. For all other processor types, the maximum value is unlimited.

System Summary:
- Model-Capacity Identifier: 716, MSUs: 1264
- Model-Temporary-Capacity Identifier: 709, Available PUs: 2
- Model-Permanent-Capacity Identifier: 709

Details... Add processors... Remove processors... Delete Help

Cancel
Agenda

- The Basics - Capacity on Demand
- Elements of the Offerings
- Capacity Back Up
- Capacity for Planned Events
- On/Off Capacity on Demand
- Capacity Provisioning Manager
z/OS Capacity Provisioning

Capacity Provisioning Control Center - CPCC

Domain Configuration(s)

Policies

Files

Capacity Provisioning Manager – CPM
Common Information Model - CIM

HMC

CPM

CIM
Provisioning Architecture

Customer defined policy or manual operations

WLM Policy

HMC Policy

Authorization Layer

Query

Activation

R1  R2  R3  R4  R5  R6  R7  R8

Dormant Capacity

Permanent Capacity

CBU – CPE – On/Off CoD

Orders downloaded from Retain/media

SE Hard Drive

http://www-03.ibm.com/servers/eserver/zseries/zos/wlm/cp/

Capacity Provisioning Manager & Capacity Provisioning Policy

When

Which work

How much additional capacity

Implementation Steps

Manual - Analysis - Confirmation – Autonomic

• Enforce Terms and Conditions
• Enforce physical model limitations
• Token aware

• Up to 8 temporary capacity records
• Customer assigns

• Base Model
• Change permanent capacity via MES order

Permanent

Capacity

http://www-03.ibm.com/servers/eserver/zseries/zos/wlm/cp/
The Capacity Provisioning Domain

- The domain configuration defines CPCs and z/OS systems that are controlled by a CPM instance.
- Sysplexes do not have to be completely contained in a domain but must not belong to more than one domain.
- Multiple Sysplexes and hence multiple WLM service definitions may be involved.
- One active Capacity Provisioning Policy (CPP) per Domain at a time:
  - More than one policy can exist for different purposes.
A policy may consist of multiple rules
- Based on a variety of things, such as specific applications (bank transactions for example)

The “Maximum Provisioning Scope” defines the maximum additional capacity that may be activated at any time for all contained rules
- Expressed in MSUs, zIIPs, zAAPs

“Provisioning Condition“ is simply a group of Time and Workload Conditions that can be referred to
- WLM Service Class conditions
- Time Condition (start/deadline/end)
- Workload (critical workload conditions)

“Provisioning Scope” defines the maximum capacity that may be activated
- Expressed in MSUs, zIIPs, zAAPs
CPM – Processing Modes

The CPM operates in either of these four modes:

- **Manual mode**
  - This is basically a command driven mode where no CPM policy is active

- **Analysis mode**
  - CPM processes the capacity provisioning policy and informs the operator when a provisioning / deprovisioning action would be due according to the criteria specified in the policy. It is up to the operator either to ignore that information or to perform the up/downgrade manually (using the HMC/SE or the available CPM commands)

- **Confirmation mode**
  - CPM processes the policy as well as the On/Off CoD record to be used for capacity provisioning. Every provisioning action needs to be authorized (confirmed) by the operator

- **Autonomic mode**
  - Similar to the preceding mode, except that no human (operator) intervention is required.

In all modes:

- Various reports will be available with information about workload and provisioning status, and the rationale for provisioning recommendations

- **User interface through**
  - z/OS system console and CP control center application
Shared CPs

- Currently, CPM will only recognize a provisioning action if:
  - the current sum of logical processors is greater than or equal to the target number of physical processors in the respective pool

- Capacity Provisioning does not configure reserved or offline processors online to an LPAR
  - CF CPU(05),ONLINE
Shared CPs

Utilization

100% 10%
LPAR 1 LPAR 2

Adding a Physical CP will not help LPAR1, thus CPM will not activate/provision an On/Off CoD record.

LCPs

Physical CPs

On/Off CoD Record

The current sum of logical processors is less than the target number of physical processors in the respective pool.
Adding a Physical CP will help LPAR1, thus CPM will activate/provision an On/Off CoD record….. one CP at a time until it stops suffering.

The current sum of logical processors is greater than or equal to the target number of physical processors in the respective pool.
Dedicated CPs

- An “observed” system may run in a shared or dedicated LPAR

- A Dedicated engine can benefit only by increasing the capacity level
  - CPM can only add physical processors to the shared pool
  - CPM cannot help an LPAR defined with dedicated engines by adding physical processors to the shared pool so it will not automatically provision another CP, even if the LPAR is suffering.
    - Dedicated CP capacity-indicator can be increased

- No support for dedicated specialty engines in an LPAR
Reports, Logs, Audit Trails

- **CPM Reports**
  - Activity & Workload reports can be directed to CPM files and archived

- **CPM Logging**
  - Metrics, decisions and other data can be logged

- **Audit Trails**
  - Processor model and capacity changes can be recorded, outside of CPM
    - SMF22
    - RMF 70.1
Supported Environments and Prerequisites

- One or more z196, z114 and/or z10 servers
  - On/Off Capacity on Demand - enablement feature

- Hardware Management Console
  - TCP/IP connection to HMC must be available

- Multi-LPAR Environments
  - Sufficient number of logical CPs to utilize additional physical CPs

- z/OS Release 9 (on any observed system)
  - RMF or like product
  - RACF or like product
  - CPM not supported when z/OS is a z/VM Guest

- CPCC Workstation
  - An INTEL Pentium® or equivalent processor with 512 MB memory (1 GB recommended)
  - Microsoft Windows XP Professional - Service Pack 2 or later
  - Microsoft Vista – via z/OS V1.12
  - Screen resolution 1024x768 or higher
  - Browser monitoring planned via browser in z/OS V1.13
Statement of Direction
February 15, 2011

- z/OS V1.13 is planned to be the last release to provide the z/OS Capacity Provisioning support that utilizes the System z API for communication with the Support Element (SE) or Hardware Management Console (HMC). This protocol is based on IP network connection using SNMP.

- IBM recommends configuring the Capacity Provisioning Manager for communication via the z/OS BCP Internal Interface (BCPii) protocol. The SE and HMC support for the System z API remains, and is not affected by this withdrawal of support.
Resources

- Capacity on Demand
  - zEnterprise Capacity on Demand User’s Guide, SC28-2605
  - z10 Capacity on Demand User’s Guide, SC28-6871
  - z10 Capacity on Demand Redbook, SG24-7504
  - www.ibm.com/systems/z/cod/

- z/OS Capacity Provisioning
  - z/OS MVS Capacity Provisioning Manager User’s Guide, SA33-8299
Questions?
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