IBM System z10™

Capacity on Demand - Update

95. z/OS – Guide – Tagung in Lahnstein

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Agenda

- What is new on System z10?
- The Basics - Capacity on Demand
- Admin Aspects
- Elements of the Offerings
- Capacity Back Up
- Capacity for Planned Events
- On/Off Capacity on Demand
- Capacity Provisioning Manager (Software)
What is new on System z10

A lot!

New Capacity on Demand architecture and enhancements

Good News
- more flexibility
- more options
- more concurrency

Maybe not so Good News
- more flexibility
- more options
- more concurrency
- no administrative tests
z10 CoD – a new approach

- All offerings are resident on the machine
  - No connection or passwords required at time of activation

- 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

- All movement between configurations is concurrent

- Multiple records can be simultaneously active
  - Each has independent controls and policy
  - Each can be activated / deactivated in any sequence

- 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

- API enhancements to support use by Capacity Provisioning Manager
  - Capacity Provisioning Manager provides policy based automation
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Capacity on Demand

**Permanent Capacity Upgrade**
- Customer Initiated Upgrade
  - (HW pay when purchased)

**Temporary Capacity Upgrade**
- On/Off CoD
  - (HW pay on a daily basis)
- Capacity Back Up
  - (HW pay prior to usage)
- Capacity for Planned Events
  - (HW pay prior to usage)
Permanent Upgrades

- **CUoD - Capacity Upgrade on Demand**
  - LIC or hardware upgrade by IBM service personnel
  - Provides the ability to add CPs, ICFs, IFLs, zAAPs, zIIPs, SAPs, Memory, I/O, Concurrent Book Add
  - Post-paid

- **CIU - Customer Initiated Upgrade**
  - Customer initiated order, download and activation
  - Provides the ability to add CPs, ICFs, IFLs, zAAPs, zIIPs, SAPs, Memory
  - Concurrent PU conversions
  - Post-paid
Temporary Upgrades

- **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
  - Capacity Provisioning Manager (CPM)
  - Post-paid or Pre-paid (tokens)

- **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
z10 – 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 (GA2)
No expiration
Capacity
- MSU %
- # Engines
Tokens
- MSU days
- Engine days

New for GA2!

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

New for GA2!

On/Off CoD with tokens (GA2)
180 days expiration
Capacity
- MSU %
- # Engines
Tokens
- MSU days
- Engine days

New for GA2!
z10 EC Base and Sub-Capacity Offerings

- The z10 EC has 36 additional capacity settings at the low end
- Available on ANY H/W Model for 1 to 12 CPs. Models with 13 CPs have to be full capacity
- All CPs must be the same capacity within the z10 EC
- All specialty engines run at full capacity. The one for one entitlement to purchase one zAAP or one zIIP for each CP purchased is the same for CPs of any capacity.
- Only 12 CPs can have granular capacity, other PU cores must be CBU or characterized as specialty engines
z10 EC CoD High Water Mark (HWM)

- **Desired capacity = 408**
- **This equates to 8 CP4s**

<table>
<thead>
<tr>
<th>PU core</th>
<th>Feature Type</th>
<th>Code</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP4</td>
<td>6807</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

- **High Water Mark (HWM): 408, FC 7108**
- **Active processors can be any capacity setting with a MIPS rating below the MIPS rating of the HWM**
- **Example for Model Capacity Identifier = 402**
  - This information is reported by STSI
  - Establishes maintenance prices
  - Establishes starting point for temporary capacity additions

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The Basics - CoD
Temporary Upgrades

- **Upgrades only (no downgrades)**
  - Any to Any is not permitted
    - **Capacity Backup**
      - Cannot reduce CP capacity level
      - Cannot reduce the number of engines that are active
    - **Capacity for Planned Event**
      - Cannot reduce CP capacity level
      - Cannot reduce the number of engines that are active
    - **On/Off Capacity on Demand**
      - Cannot reduce CP capacity level
      - Cannot reduce the number of engines that are active
      - Cannot be more than twice the purchased capacity (0-100%) capacity or more than twice the number of specialty processors

| 7xx | 701 | 702 | 703 | 704 | 705 | 706 | 707 | 708 | 709 | 710 | 711 | 712 | 713 | 714 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 6xx | 601 | 602 | 603 | 604 | 605 | 606 | 607 | 608 | 609 | 610 | 611 | 612 |     |     |
| 5xx | 501 | 502 | 503 | 504 | 505 | 506 | 507 | 508 | 509 | 510 | 511 | 512 |     |     |
| 4xx | 401 | 402 | 403 | 404 | 405 | 406 | 407 | 408 | 409 | 410 | 411 | 412 |     |     |
| N-way | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
## Capacity on Demand Comparisons – z9 vs z10

<table>
<thead>
<tr>
<th></th>
<th>System z9</th>
<th>System z10</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Resources</strong></td>
<td>CP, zIIP, zAAP, IFL, ICF</td>
<td>CP, zIIP, zAAP, IFL, ICF, SAP</td>
</tr>
<tr>
<td><strong>Offerings</strong></td>
<td>Require access to IBM/Retain to activate</td>
<td>Does not require access to IBM/Retain to activate</td>
</tr>
<tr>
<td></td>
<td>CBU, On/Off CoD</td>
<td>CBU, On/Off CoD, CPE</td>
</tr>
<tr>
<td></td>
<td>One offering at a time</td>
<td>Multiple offerings active</td>
</tr>
<tr>
<td><strong>Permanent upgrades</strong></td>
<td>Requires de-provisioning of temporary capacity first</td>
<td>Concurrent with temporary offerings</td>
</tr>
<tr>
<td><strong>Replenishment</strong></td>
<td>No</td>
<td>Yes with CBU &amp; On/Off CoD</td>
</tr>
<tr>
<td><strong>CBU Tests</strong></td>
<td>5 tests per record</td>
<td>5 (default), 10, or 15 tests per record</td>
</tr>
<tr>
<td><strong>CBU expiration</strong></td>
<td>No expiration</td>
<td>Specific term length</td>
</tr>
<tr>
<td><strong>Capacity Provisioning Manager support</strong></td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Agenda

- What is new on System z10?
- The Basics - Capacity on Demand
- **Admin. Aspects**
- Elements of the Offerings
- Capacity Back Up
- Capacity for Planned Events
- On/Off Capacity on Demand
- Capacity Provisioning Manager (Software)
CoD Billing

- Two different billing methods

  - Prepaid – for replaced restored Capacity
    - CBU & CPE
      - The flat rate is being paid in advance
    - OOCoD Tokens

  - Postpaid – effectively used additional Capacity
    - CIU & OOCoD
      - Charging is based on the activated subset only
      - Will be managed via Retain and Resource Link
    - OOCoD Tokens

New for GA2!
On/Off CoDBilling and Pricing

Hardware billing

- On/Off CoD charging done in 24 hrs increments per processor
- 24 hrs block can start at any time during a day
- Consider highest number of CPs used within a 24 hrs period
On/Off CoD Billing and Pricing

Software billing (IBM SW)

- IPLA products will be billed at the daily rate
  - max. MSU activated in 24 hrs period
- Sub capacity MLC – highest observed 4 hrs rolling average
- Full capacity MLC – separate bill for additional MSU capacity

- Note: Please refer to customers sales rep. for customers agreed SW prices
Prerequisites

- Feature Codes ordered
- CoD Contracts in Place
- Negotiated Prices
- IBM Maintenance Contract for RETAIN Support
  or RPQ for non RSF Support
- Machine Profile generated
- Resource Link / IBM User ID
## Capacity on Demand

### Capacity On Demand Enablement Features

<table>
<thead>
<tr>
<th>Feature Code</th>
<th>Description</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>9900</td>
<td>Online Capacity on Demand Buying Enablement</td>
<td>Enables CIU machine profile for on-line ordering</td>
</tr>
<tr>
<td>9910</td>
<td>Capacity Backup Enablement</td>
<td>Enables Capacity Backup</td>
</tr>
<tr>
<td>9912</td>
<td>Capacity for Planned Events Enablement</td>
<td>Enables Capacity for Planned Events</td>
</tr>
<tr>
<td>9896</td>
<td>On/Off Capacity Enablement</td>
<td>Enables On/Off Capacity on Demand</td>
</tr>
<tr>
<td>9698</td>
<td>Permanent Upgrade enablement</td>
<td>Enables permanent upgrade ordering in CIU</td>
</tr>
</tbody>
</table>
Capacity on Demand Contract

CoD from Contract Point of View!!!

New System z10 CoD capability and offerings
Only supported with new contract set

Existing contracts CBU / CIU / OnOffCod
Carried forward with old features only
Capacity on Demand Contract

CoD Offerings from Contract Point of View !!!

- New contract structure eliminates redundancy between contract documents
- Contract documents structured in 3 tiers
  - Tier 1 High level terms for any CoD offering
  - Tier 2 Terms to support certain class of CoD offering
  - Tier 3 Terms to support particular offerings
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The Big Picture – a new approach on System z10

- All offering records are resident on machine
  - No connection or passwords required at time of activation
  - Records are changed only when customer places order for new / updated offering

- Multiple records can be simultaneously active
  - Each has independent controls and policy
  - Each can be activated / deactivated in any sequence

- Individual record can be used to temporarily reach multiple configurations
  - Customer determines level of resources activation real time based on circumstances (i.e. multiple use for a single On/Off CoD record, even during a permanent upgrade)
  - All movement between configurations is concurrent

- More flexibility to configure offering limits

- Ability to perform upgrades while temporary resources are active
  - Modification of record entitlement performed dynamically and concurrently

- “Capacity Provisioning Manager” provides policy based advice and automation
## Installed and Staged CoD Records

- **Order and stage up to 200 records on the Support Element**
- **Install up to 8 records simultaneously**
  - CBU can have multiple “active” records
  - Only one On/Off CoD can be “active” at a time, but multiples can be “installed”.
  - CPE can install multiples, but only one is needed.

### Temporary Upgrades - H51

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>CR78RS6J</td>
<td>On/Off CoD</td>
<td>*0</td>
<td>3/0</td>
<td>0/0</td>
<td>0/0</td>
<td>1/0</td>
<td>1/0</td>
<td>Installed</td>
</tr>
<tr>
<td>CB78RS8C</td>
<td>CBU</td>
<td>*0</td>
<td>1/0</td>
<td>1/0</td>
<td>1/0</td>
<td>1/0</td>
<td>1/0</td>
<td>Installed</td>
</tr>
<tr>
<td>CP78RS9J</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**
- Total Used: 2 3 0 0 1 1

**Permanent**
- Total Used: 2 3 0 0 1 1

**System Summary**
- Model-Capacity Identifier: 602
- MSUs: 105
- Model-Temporary-Capacity Identifier: 602
- Available PUs: 8
- Model-Permanent-Capacity Identifier: 602
Basic z10 COD Design

- Eight CoD Records (LIC) could be installed and activated simultaneously

New for GA2!

Elements of the Offering

Installed Record

Activation and usage of dormant resources over time
IBM System z10 EC Store System Information (STSI) Enhancements

- **Model-Capacity Identifier**
  - Base/Permanent capacity (not high water mark)
  - Plus Capacity on Demand
    - Replacement (CPE and/or CBU)
    - Billable (On/Off CoD)

- **Model-Permanent-Capacity Identifier**
  - Base/Permanent capacity (not high water mark)

- **Model-Temporary-Capacity Identifier**
  - Base/Permanent capacity (not high water mark)
  - Plus billable capacity added by On/Off CoD

- 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
Reserved CP, zAAP, zIIP

Maximum total logical CPs (including initial and reserved) for any partition equals the number of physical CPs achievable through concurrent CP upgrade.

Note: z10 EC GA2 supports addition of Logical resources concurrently running z/OS 1.10.

On the z10 EC, the total (initial plus reserved) amount of general purpose CPs is 64.

z/OS® V1R9+ supports up to 64 processors including CPs, zAAPs, and zIIPs.

z/VM® V5R3 supports up to 32 processors.
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
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 *
  - On/Off CoD - 180 days from date of order

- **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 SE/HMC

* records order through manufacturing include 47 additional days to allow for fulfillment and installation of machine.
Online - CoD Order Process

Prerequisites
- CoD Contracts in Place
- Negotiated Prices
- IBM Maintenance Contract for RETAIN Support
  or RPQ for non RSF Support
Flow of CoD Records

- Retrieve CoD Record from IBM Remote Support (stage)
- Or - Retrieve CoD Record from media
- Apply (install) a CoD Record
- Activate installed CoD Record
- Delete staged, installed activated Records
- Deleted Records can not be activated anymore
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CBU – Capacity Back Up

- Replacement Capacity
  - Replaces lost capacity within a customer’s enterprise for disaster recovery

- Specialty engines managed by quantities
  - Added capacity dictated by Processor types
    - One CP required for each zIIP or zAAP (1 zIIP + 1 zAAP per 1 CP permitted)
  - Indicates the number of engines that can be added to the permanent configuration

- 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
# z10 EC Capacity Back Up – CBU

<table>
<thead>
<tr>
<th><strong>Resources</strong></th>
<th><strong>Time elements</strong></th>
<th><strong>Tokens</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>CP Capacity Features&lt;br&gt;Specialty engines: zIIP, zAAP, ICF, IFL, SAP</td>
<td>Test duration = 10 days&lt;br&gt;Real activation = 90 days&lt;br&gt;2 day grace period&lt;br&gt;Expiration date set to 1 through 5 years</td>
<td>Number of Tests = 5&lt;br&gt;(default)&lt;br&gt;Up to 15 can be ordered&lt;br&gt;Number of Real activations = 1</td>
</tr>
</tbody>
</table>

**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
Model Dependency

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

<table>
<thead>
<tr>
<th>HW Model</th>
<th>Model Capacity Identifier</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>E12</td>
<td>700 – 712, 6xx, 5xx, 4xx</td>
<td></td>
</tr>
<tr>
<td>E26</td>
<td>700 – 726, 6xx, 5xx, 4xx</td>
<td></td>
</tr>
<tr>
<td>E40</td>
<td>700 – 740, 6xx, 5xx, 4xx</td>
<td></td>
</tr>
<tr>
<td>E56</td>
<td>700 – 756, 6xx, 5xx, 4xx</td>
<td></td>
</tr>
<tr>
<td>E64</td>
<td>700 – 764, 6xx, 5xx, 4xx</td>
<td>Where xx = 1 to 12</td>
</tr>
</tbody>
</table>
CBU Order Panel – ResourceLink

Note: Panels are subject to change at GA.

www.ibm.com/servers/resourcelink
602 previously upgraded with CBU to a 603

- Upgrade using the same active CBU record to a model 703
603 upgrade with CBU to 703

- 602 already upgraded to a 603 in a previous CBU upgrade
- If a permanent upgrade were performed to an n-book model, CBU could go higher

**Change Activation Levels - H51**

<table>
<thead>
<tr>
<th>Record ID: CB78RS8C</th>
<th>Record Type: CBU</th>
<th>Status: Active-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description: +1 CPs, 114 MSU model capacity, +1 ICF, +1 zAAP, +1 zIIP, +1 IFL, +1 SAP</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model-Capacity Identifier</th>
<th>CPs</th>
<th>MSU Value</th>
<th>MSU Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>603</td>
<td>0</td>
<td>151</td>
<td>46</td>
</tr>
<tr>
<td>604</td>
<td>1</td>
<td>193</td>
<td>88</td>
</tr>
<tr>
<td>605</td>
<td>2</td>
<td>235</td>
<td>130</td>
</tr>
<tr>
<td>703</td>
<td>0</td>
<td>219</td>
<td>114</td>
</tr>
</tbody>
</table>

**Processors**

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

**Activation Options**

- Test Activation
- Real Activation

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

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

- Record ID: CB78RS8C
- Description: +1 CPs, +14 MSU model capacity, +1 ICF, +1 ZAAP, +1 ZIIP, +1 IFL, +1 SAP
- Activation type: Test activation

<table>
<thead>
<tr>
<th>Model-Capacity Identifier</th>
<th>Original</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPs</td>
<td>1</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
## Result


The following table shows all the installed records on the system.

<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>CP78RS3J</td>
<td>On/Off CoD</td>
<td>0/0</td>
<td>0/0</td>
<td>0/0</td>
<td>0/0</td>
<td>1/0</td>
<td>1/0</td>
<td>Installed</td>
</tr>
<tr>
<td>CB78RS8C</td>
<td>CBU</td>
<td>1/1</td>
<td>1/0</td>
<td>1/0</td>
<td>1/0</td>
<td>1/0</td>
<td>1/0</td>
<td>Active-Test</td>
</tr>
<tr>
<td>CP78RS9J</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**

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Permanent**

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

**Total Used**

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

**Description:**

- The maximum value is unlimited.

**System Summary**

- Model-Capacity Identifier: 703
- Model-Temporary-Capacity Identifier: 602
- MSUs: 219
- Model-Permanent-Capacity Identifier: 602
- Available PUs: 7

---

Walter Necker FTSS Germany

IBM Systems
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 or the CBU record is deleted.

CIU Upgrade from 705 To 706

2097-E12
705 Base

2097-E12
706 Base
Comparison – z9 CBU versus z10 EC CBU

<table>
<thead>
<tr>
<th></th>
<th>z9</th>
<th>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>End of term</strong></td>
<td>CBU record does not expire</td>
<td>CBU record expires</td>
</tr>
<tr>
<td><strong>Number of CBU orders</strong></td>
<td>Buy one, apply one</td>
<td>Buy many, apply many</td>
</tr>
<tr>
<td><strong>Terms</strong></td>
<td>Usually 5 years</td>
<td>Variable, 1-5 years</td>
</tr>
</tbody>
</table>
Agenda

- What is new on System z10?
- The Basics - Capacity on Demand
- Elements of the Offerings
- Capacity Back Up
- Capacity for Planned Events
- On/Off Capacity on Demand
- Capacity Provisioning Manager (Software)
Capacity for Planned Events

- **Replacement Capacity**
  - Replaces lost capacity within a customer’s enterprise for **planned** down time events
    - Push/Pull planned outages
    - Planned Data Center moves and relocations

- **CP capacity details are NOT managed by feature codes**
  - Any available and dormant resources may be configured and consumed

- **Normal specialty engine rules are not managed/enforced**
  - For example,
    - One CP required for each zIIP and zAAP (1 zIIP + 1 zAAP per 1 CP permitted)
      - Not enforced
## z10 EC Capacity for Planned Event

<table>
<thead>
<tr>
<th>Resources</th>
<th>Time elements</th>
<th>Tokens</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP Capacity Features Specialty engines: zIIP, zAAP, ICF, IFL, SAP</td>
<td>Test duration = NA Real activation = 3 days No grace period No Expiration date</td>
<td>Number of Tests = 0 Number of Real activations = 1</td>
</tr>
</tbody>
</table>

### 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
- All 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
Order Capacity for Planned Events record

Step 1 of 1: Review and submit your order

The Capacity for Planned Events record you are about to order will be configured to support activating capacity up to the maximum additional model capacity and specialty engines allowed by your physical hardware for up to 3 days.

(*) indicates accepting the Terms and Conditions of this order is required to submit it. Mark the checkbox to indicate acceptance.

Total price: $0.00

**Description**: Capacity for Planned Events

<table>
<thead>
<tr>
<th>Planned Event Terms and Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPDATE below</td>
</tr>
<tr>
<td>Terms of Order</td>
</tr>
</tbody>
</table>

You have requested an On/Off Capacity on Demand, or Temporary Capacity upgrade. Your enterprise has previously accepted the Temporary Capacity terms, restated here:

- [ ] I accept the Terms and Conditions of this order

---

**Machine summary**

<table>
<thead>
<tr>
<th>Types</th>
<th>2097 E25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>703</td>
</tr>
<tr>
<td>Serial number</td>
<td>RED01</td>
</tr>
</tbody>
</table>

**Current configuration**

<table>
<thead>
<tr>
<th>Model capacity</th>
<th>2 CPs</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICF</td>
<td>4</td>
</tr>
<tr>
<td>zAAP</td>
<td>2</td>
</tr>
<tr>
<td>zILP</td>
<td>2</td>
</tr>
<tr>
<td>IFL</td>
<td>2</td>
</tr>
<tr>
<td>SAP</td>
<td>6</td>
</tr>
</tbody>
</table>

**Available engines**: 13
- **Model E12**
- **CBU can be active** ✓ (602 to 702)
- **CPE can use remaining resources available** ✓ 12 (on an E12) ✓ -2 Active CPs ✓ -2 Active Specialties ✓ 8 Dormant engines (available PUs)
CPE Example – 702 to 708

- 12 on an E12
  - 2 active CPs
  - 2 active specialties
  - 8 additional PUs available for CPE

- Add 2 specialty (zAAPs)

- Add 6 CPs (from 8 total available)
CPE Example - 702 to 710

- 12 on an E12
  - 2 active CPs
  - 2 active specialties

Add 8 CPs (8 total)

- no resources to add zAAPs
CPE Confirmation

- Real Activations only
- Tests do no apply to CPE
- Number of engines can be modified dynamically as required

![Image ofTemporary Upgrades - H51 window showing model-capacity identifier, CPs, SAPs, ICFs, IFLs, zAAPs, zIIPs, with original and new values, and the option to confirm with 'Yes' or 'No'.](https://9.56.193.157:9950 - H51: Perform Model Conversion...)

- Record ID: CP78RS9J
- Description: Capacity for Planned Events
- Activation type: Real activation

Model-Capacity Identifier: 702 → 710

<table>
<thead>
<tr>
<th></th>
<th>Original</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPs</td>
<td>0</td>
<td>8</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
CPE Provisioned

- **Attention !** (expire warning)
- 1 Activation
- Record expires in 3 days
- No replenishment

### Temporary Upgrades - H51

<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>CR78RS6J</td>
<td>On/Off CoD</td>
<td>7/0</td>
<td>3/0</td>
<td>0/0</td>
<td>0/0</td>
<td>1/0</td>
<td>1/0</td>
<td>Installed</td>
</tr>
<tr>
<td>CB78RS8C</td>
<td>CBU</td>
<td>1/0</td>
<td>1/0</td>
<td>1/0</td>
<td>1/0</td>
<td>1/0</td>
<td>1/0</td>
<td>Active-Test</td>
</tr>
<tr>
<td>CP78RS9J</td>
<td>Planned Event</td>
<td>1/8</td>
<td>1/0</td>
<td>1/0</td>
<td>1/0</td>
<td>1/0</td>
<td>1/0</td>
<td>Active-Real(Attention)</td>
</tr>
</tbody>
</table>

**Active Temporary**
- Permanent: 2
- Total Used: 10

**System Summary**
- Model-Capacity Identifier: 710
- Model-MSUs: 613
- Model-Temporary-Capacity Identifier: 602
- Available PUs: 0
- Model-Permanent-Capacity Identifier: 602
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

2097-E12
705 Base

2097-E12
706 Base

Base (705)

Reduced CPE Resources

CPE Max Resources

CPE Max Resources

Base (706)
The base will increase if the resource is available, otherwise the permanent upgrade will be blocked until the resource is freed.

2097-E12

CIU Upgrade from 705 To 706, Upgrade blocked no resources

2097-E12

Unused resource

2097-E12

CIU Upgrade from 705 To 706, Install

705 Base

CPE Max

Resources

Reduced CPE

Resources

705 Base

CPE

Resources

706 Base

CPE Max

Resources

705 Base
Agenda

- What is new on System z10?
- The Basics - Capacity on Demand
- Elements of the Offerings
- Capacity Back Up
- Capacity for Planned Events
- On/Off Capacity on Demand
- Capacity Provisioning Manager (Software)
### z10 EC On/Off Capacity on Demand

<table>
<thead>
<tr>
<th>Resources</th>
<th>Time elements</th>
<th>Tokens</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP Capacity % MSU</td>
<td>Test duration = NA</td>
<td>Number of Tests = 0</td>
</tr>
<tr>
<td>Specialty engines: zIIP, zAAP, ICF, IFL, SAP</td>
<td>Real activation = Unlimited</td>
<td>Number of Real activations = Unlimited</td>
</tr>
<tr>
<td></td>
<td>1 hr grace period</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Expiration date set to 180 days</td>
<td></td>
</tr>
</tbody>
</table>

**Order process limits**
- Temporary CP capacity up to 100% or purchased capacity using MSU rating as metric
- 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 MSUs with temporary activations

**Contract terms and conditions**
- H/W and S/W charges
## On/Off CoD Use of Unassigned Capacity

<table>
<thead>
<tr>
<th>Customer capacity</th>
<th>z9</th>
<th>z10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not owned, enabled thru On/Off CoD</td>
<td>Use charged at 1/90th going rate for CP/day. Billed in arrears</td>
<td>Use charged at 1/90th going rate for CP/day. Billed in arrears</td>
</tr>
<tr>
<td>Owned but unassigned, enabled thru On/Off CoD</td>
<td>Hardware charges for temporary use. Billed in arrears.</td>
<td>No hardware charges for temporary use.</td>
</tr>
<tr>
<td>Permanent capacity</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As long as the activated On/Off CoD record (or subset thereof) does not exceed the HWM, no Hdw. charges become due.
z10 EC with On/Off CoD

- On/Off CoD offering presently set to 100% (2x) increase in purchased capacity (permanent + unassigned)
- Capacity increase to valid CP model configurations only
- No decrement in engine count nor Capacity Level from permanent configuration
- Allowable deltas in engine count and Capacity Level is based on permanent configuration
  - These deltas are consistent regardless of other record activation levels

<table>
<thead>
<tr>
<th></th>
<th>7xx</th>
<th>6xx</th>
<th>5xx</th>
<th>4xx</th>
<th>N-way</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7xx</td>
<td>704</td>
<td>604</td>
<td>501</td>
<td>401</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>(298)</td>
<td>(240)</td>
<td>(197)</td>
<td>(28)</td>
<td></td>
</tr>
<tr>
<td>705</td>
<td>605</td>
<td>505</td>
<td>402</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(363)</td>
<td>(292)</td>
<td>(240)</td>
<td>(55)</td>
<td></td>
</tr>
<tr>
<td>(422)</td>
<td>606</td>
<td>506</td>
<td>(80)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(422)</td>
<td>(339)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(479)</td>
<td>607</td>
<td>507</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(479)</td>
<td>(385)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(428)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>712</th>
<th>713</th>
<th>714</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(783)</td>
<td>(821)</td>
<td>(866)</td>
</tr>
<tr>
<td>612</td>
<td>(735)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Note: The MSU numbers used in this table are illustrative only. Please refer to LSPR for the current MSU values published by IBM
On/Off CoD on-line order

- Replenishment due date
- Show model capacity upgrades
- Range 0 to 100 %
Relative Capacity Table is provided

<table>
<thead>
<tr>
<th>Model capacity</th>
<th>Relative capacity</th>
<th>Software MSU target - delta</th>
</tr>
</thead>
<tbody>
<tr>
<td>703</td>
<td>(100)</td>
<td>219 - 0</td>
</tr>
<tr>
<td>704</td>
<td>(129)</td>
<td>281 - 62</td>
</tr>
<tr>
<td>705</td>
<td>(157)</td>
<td>342 - 123</td>
</tr>
<tr>
<td>706</td>
<td>(183)</td>
<td>399 - 180</td>
</tr>
</tbody>
</table>

The number in parentheses is the relative capacity as a percentage of the current capacity.
On/Off CoD - Example

- **Purchased capacity is a model 602**

  - Model-Capacity Identifier: 602
  - Model-Temporary-Capacity Identifier: 602
  - Model-Permanent-Capacity Identifier: 602

- **model MSU Value**

  - MSUs: 105

- 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"
On/Off CoD – 602 to 604

- This example is targeting the capacity identifies of a model 604

- The panel will automatically provide you with valid target choices
On/Off CoD - Confirmation

There is a dialog box titled "Temporary Upgrades - H51" asking if the user is sure they want to change the activation levels for this record.

- Record ID: CR78RS6J
- Description: +100% model capacity, +0 ICF, +1 zAAP, +1 zIIP, +0 IFL, +3 SAP, to 05/06/2008 TE
- Activation type: Real activation

### Model-Capacity Identifier

<table>
<thead>
<tr>
<th>Original</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>602</td>
<td>604</td>
</tr>
</tbody>
</table>

### Model-Capacity Components

- **CPs**: 0 => 2
- **SAPs**: 0 => 0
- **ICFs**: 0 => 0
- **IFLs**: 0 => 0
- **zAAPs**: 0 => 0
- **zIIPs**: 0 => 0

**ACT37464**

[Yes] [No]
On/Off CoD - Result

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>CR78RS66J</td>
<td>On/Off CoD</td>
<td>1/2</td>
<td>3/0</td>
<td>0/0</td>
<td>0/0</td>
<td>1/0</td>
<td>1/0</td>
<td>Active-Real</td>
</tr>
<tr>
<td>CB78RS8C</td>
<td>CBU</td>
<td>1/0</td>
<td>1/0</td>
<td>1/0</td>
<td>1/0</td>
<td>1/0</td>
<td>1/0</td>
<td>Installed</td>
</tr>
<tr>
<td>CP78RS9J</td>
<td>Planned Event</td>
<td>1/0</td>
<td>1/0</td>
<td>1/0</td>
<td>1/0</td>
<td>1/0</td>
<td>1/0</td>
<td>Installed</td>
</tr>
</tbody>
</table>

Active Temporary
2 0 0 0 0 0

Permanent
2 3 0 0 1 1

Total Used
4 3 0 0 1 1

Description:
- The maximum value is unlimited.

System Summary
- Model-Capacity Identifier: 604
- MSUs: 193
- Model-Temporary-Capacity Identifier: 604
- Available PUs: 6
- Model-Permanent-Capacity Identifier: 602

Model temporary capacity identifier now shows 604
On/Off CoD on-line – add/change CBU too!

- Now a disaster strikes or a CBU test is scheduled
- 2 6xx CPs required to satisfy the above need

On/Off CoD from a 602 to a 604 was installed

![Image of IBM System z interface showing temporary upgrades and processors](https://example.com/ibm-system-z-interface.png)
602 + 604 OnOff CoD + 606 CBU

- Pick the required final model
On/Off CoD + CBU Confirmation

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

- Record ID: CB78RS8C
- Description: +1 CPs, 114 MSU model capacity, +1 ICF, +1 zAAP, +1 zVIP, +1 IFL, +1 SAP
- Activation type: Test activation

<table>
<thead>
<tr>
<th>Model-Capacity Identifier</th>
<th>Original</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>604</td>
<td>606</td>
</tr>
<tr>
<td>CPs</td>
<td>0</td>
<td>2</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>zVIPs</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

ACT37464
On/Off CoD + CBU Result

- **Base = 602**
- **On/Off CoD = 604**
- **CBU = 606**
On/Off CoD on-line order

- Range 0-100%
- Replenishment due date
  - 180 days

Show Model Capacity Upgrades
z10 EC Permanent Upgrade with On/Off CoD Active

The On/Off CoD processors are “absorbed”.

- 2097-E12
  - 705 Base
  - On/Off CoD With 2 CPs

- 2097-E12
  - CIU Upgrade from 705 To 706
  - Temporary CP Converted to Permanent

- New 706 Base
  - On/Off CoD With 1 CP
### Comparison – z9 OOCoD versus z10 EC OOCoD

<table>
<thead>
<tr>
<th></th>
<th>z9</th>
<th>z10</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Resources</strong></td>
<td>CP, zIIP, zAAP, IFL, ICF</td>
<td>CP, zIIP, zAAP, IFL, ICF, SAP</td>
</tr>
<tr>
<td><strong>Configuration</strong></td>
<td>One order per Configuration</td>
<td>Multiple Configuration with one order</td>
</tr>
<tr>
<td><strong>Activation</strong></td>
<td>Deactivation prior to Configuration change</td>
<td>Configuration change on the fly</td>
</tr>
<tr>
<td><strong>Owned but unassigned CPs</strong></td>
<td>Hardware charges for temporary use</td>
<td>No hardware charges for temporary use</td>
</tr>
<tr>
<td><strong>Automation</strong></td>
<td>Not possible</td>
<td>Capacity Provisioning Manager</td>
</tr>
</tbody>
</table>
Agenda

- What is new on System z10?
- The Basics - Capacity on Demand
- Elements of the Offerings
- Capacity Back Up
- Capacity for Planned Events
- On/Off Capacity on Demand
- Capacity Provisioning Manager (Software)
z/OS Capacity Provisioning

Capacity Provisioning Control Center - CPCC

Domain Configuration(s)
Policies

The workstation code

The server program

Sample datasets and files

Capacity Provisioning Manager – CPM
Common Information Model - CIM
Provisioning Architecture

Capacity Provisioning Manager & Capacity Provisioning Policy

When
Which work
How much additional capacity

Implementation Steps
Manual - Analysis - Confirmation – Autonomic

Orders downloaded from Retain/media

Enforce Terms and Conditions
Enforce physical model limitations

- Up to 8 temporary capacity records
- May be any combination
- Customer assigns

Base Model
Change permanent capacity via MES order

Customer defined policy or manual operations

Authorization Layer

HMC Policy
WLM Policy

Query
Activation

R1 R2 R3 R4 R5 R6 R7 R8

Dormant Capacity
Permanent Capacity

CBE – CPE – On/Off CoD

IBM System z
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 by a rule
- 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 (CPCC) application
Supported Environments and Prerequisites

- One or more z10 EC server
  - 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)
  - Available disk space 150 MB
  - Microsoft® Windows® XP Professional - Service Pack 2 or later
  - Screen resolution 1024x768 or higher
Agenda

- What is new on System z10?
- The Basics - Capacity on Demand
- Elements of the Offerings
- Capacity Back Up
- Capacity for Planned Events
- On/Off Capacity on Demand
- Capacity Provisioning Manager (Software)
Support – CoD & CPM

- **Resource Link**
  - Resource Link Online Training

- **On Site Customer Presentation**
  - CoD Introduction
  - Demo / Workshops

- **TMCC Boeblingen**
  - Customer Meetings
  - Demo / Workshops
Questions?