z/OS V1R13

BCP BCPii: z/OS V1R13 enhancements

Systems and servers

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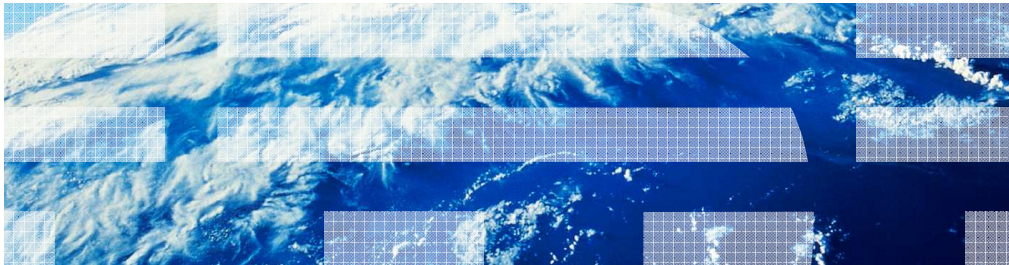
Session objectives

- Quick overview of BCPii
- Overview of new functionality introduced in V1R13
  – Working with user-defined image groups
  – New attributes
  – Internal enhancements

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Overview

- Problem statement / need addressed
  - The z/OS programmatic BCPii interface needs to support more support element controls
- Solution
  - BCPii now supports close to the complete set of System z API interfaces
- Benefit / value
  - Increased z/OS programmatic control capability of the System z enterprise

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What is BCPii (1 of 2)

CPC1

CPC2

SE

SE

Process
Control
(HMC)
Network

SE

HMC

CPC3
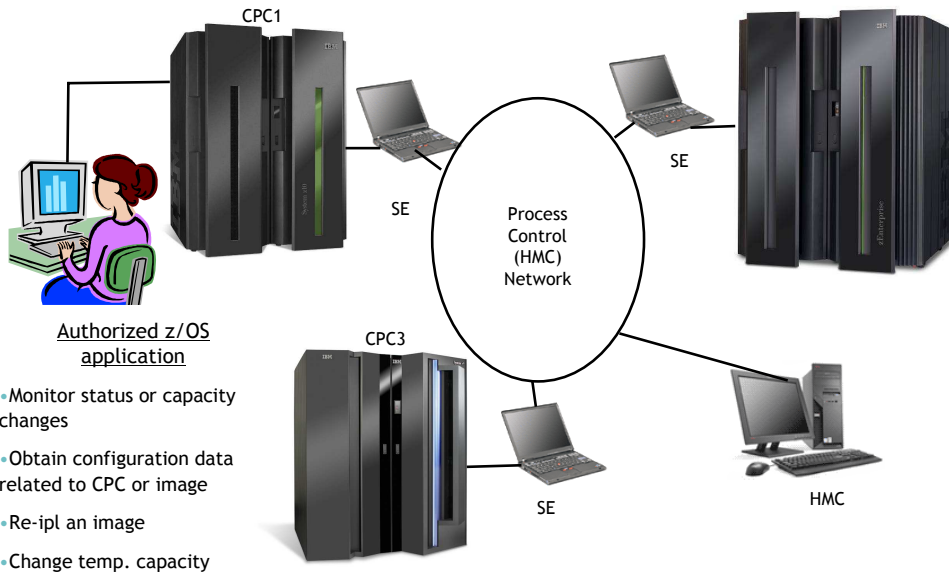
__Authorized z/OS
application__

- Monitor status or capacity changes
- Obtain configuration data related to CPC or image
- Re-ipl an image
- Change temp. capacity
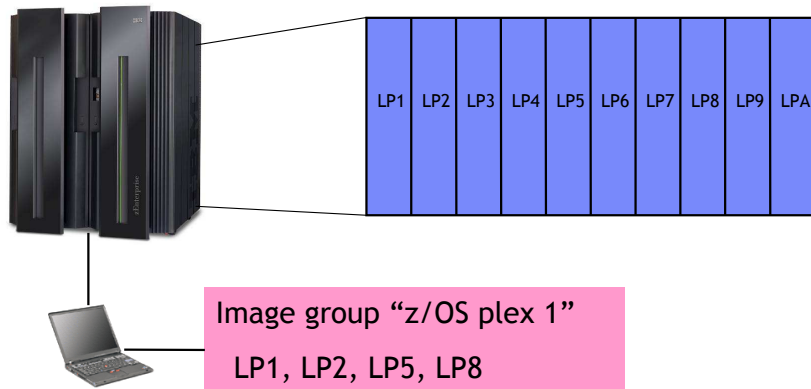- Etc..

What is BCPii (2 of 2)

- Base control program internal interface
    - Allows authorized z/OS applications to have HMC-like control over systems in the process control (HMC) network
        - A set of robust APIs is provided
    - Complete communication isolation of existing networks (intranet/internet) from the process control (HMC) network
        - Communication to the support element is completely within base z/OS

Usage and Invocation - Overview

- Support for user-defined image groups
- New query-able and set-able CPC and image attributes
- Internal code optimizations

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New user-defined Image Group support

- Use BCPii to work with this user-defined image group
  - List the image names in the group
  - Connect to, disconnect from the group
  - Query values associated with the group
  - Issue commands against all members in the group

LP1	LP2	LP3	LP4	LP5	LP6	LP7	LP8	LP9	LPA

Image group "z/OS plex 1"

LP1, LP2, LP5, LP8

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BCPii APIs enhanced for image group support (1 of 5)

- HWILIST - Retrieve HMC and BCPii configuration-related information
  - List CPCS
    - **List the CPCs interconnected with the local CPC**
  - List images
    - **List the images (LPARs) contained on an individual CPC or in an image group**
  - List capacity records
    - **List the capacity records contained on an individual CPC**
  - List events
    - **List the events already registered on a particular BCPii connection**
  - List local CPC, list local image
    - **Obtain the name of the CPC name or image (LPAR) name that the BCPii application is currently running on.**
  - List reset activation profiles, list image A.P. and list load A.P.
    - **List the currently defined activation profiles contained on an individual CPC**
  - List user-defined image group names
    - **List the currently defined image group names contained on an individual CPC.**

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BCPii APIs enhanced for image group support (2 of 5)

- HWICONN - Establish a logical connection between the application and a:
  - Central processor complex (CPC),
  - CPC image (LPAR) on a particular CPC
  - Capacity record on a particular CPC
  - Activation profiles on a particular CPC
  - User-defined image group on a particular CPC
- Input:
  - Connection type (above 3 types)
  - Connection name (CPC example: Net1.Cpc01)
  - Previous ConnectToken
    - if type is image, caprec, activation profile or image group
- Output:
  - ConnectToken used on subsequent BCPii calls.

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BCPii APIs enhanced for image group support (3 of 5)

- HWIQUERY - Retrieve information about objects managed by the hardware management console (HMC)/support element related to:
  - Central processor complexes (CPCs),
  - CPC images (LPARs) on a particular CPC,
  - Capacity records on a particular CPC
  - Activation Profiles (Reset, Image, or Load) on a particular CPC
  - User-defined Image Group on a particular CPC
- Input:
  - ConnectToken (associated with one of the above)
  - List of attributes requested, data areas to store the return values)
- Output:
  - Data returned

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BCPii APIs enhanced for image group support (4 of 5)

- HWICMD – Direct hardware/software commands to CPCs, images, and image groups
- Input:
  - ConnectToken (associated with a CPC,image or image group)
  - Command parameter structure (based on the type of command issued)
- Output:
  - Synchronous return code
  - Asynchronous command completion event delivered to previously-registered event user when command finishes.
    - **For image commands targeted to an image group, one image event is returned for each image in the user-defined image group.**

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BCPii APIs enhanced for image group support (5 of 5)

- Important notes
  - Only z10 and higher hardware supported
  - Operating system, Activate with activation profile and System reset with IPLToken commands cannot be targeted to an image group
  - If the image group contains the local image the application is running on, only "non-suicide" commands will be permitted
  - Security is strictly enforced
    - Application must have at least READ access to the CPC where the image groups reside in order to get list of image group names, to list the images residing in an image group, or to query attributes associated with the image group
    - Application must have at least CONTROL access to each of the images contained in the image group for all commands targeted to an image group. Access validation is done at the time of the HWICMD invocation
- BCPii handles if an image group definition changes under the covers after the application has already connected.

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New attributes supported

- HWIQUERY only (CPC attributes)
  - HWI_VERSION
    - Version of the Support Element console application associated with this CPC.
  - HWI_EC_MCL_INFO
    - Engineer code and microcode levels installed on this CPC.
  - HWI_LIST_IP_ADDRESSES
    - IP addresses associated with this CPC
  - HWI_AUTO_SWITCH_ENABLED
    - Flag indicating whether auto switch between the primary and the alternate support elements is enabled on this CPC
- HWIQUERY and HWISET (Image attribute)
  - HWI_GROUP_PROFILE_CAPACITY
    - Workload unit capacity for the group profile associated with an image.

Interactions & Dependencies

- Software Dependencies
  - None
- Hardware Dependencies
  - zEnterprise
    - MCL220 in the N29802 EC stream – Bundle #22
  - z10
    - MCL??? in the N24409 EC stream – Bundle #??
    - The above will be updated when the MCL is built and the numbers are known.
- Exploiters
  - None announced

Migration & Coexistence Considerations

- None

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Installation

- Apply appropriate microcode level fix depending on your hardware level

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Appendix - References

- ***z/OS MVS Programming: Callable Services for High-Level Languages*** (SA22-7613)
  - Primary BCPii documentation including:
    - Installation instructions
    - BCPii API documentation
- ***z/OS MVS Programming: Authorized Assembler Services Reference, Volume 2*** (EDT-IXG) (SA22-7610)
  - BCPii's ENF68 documentation
- ***z/OS MVS System Commands*** (SA22-7627)
  - START HWISTART and STOP HWIBCPII commands
- ***z/OS MVS Diagnosis: Tools and Service Aids*** (GA22-7589)
  - BCPii's CTRACE documentation
- ***z/OS MVS Initialization and Tuning Reference*** (SA22-7592)
  - Miscellaneous documentation
- ***z/OS MVS System Codes*** (SA22-7626)
  - BCPii abend '042'x documentation