



z/OS 2.1 HCD HMC- wide Dynamic Activate

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Agenda

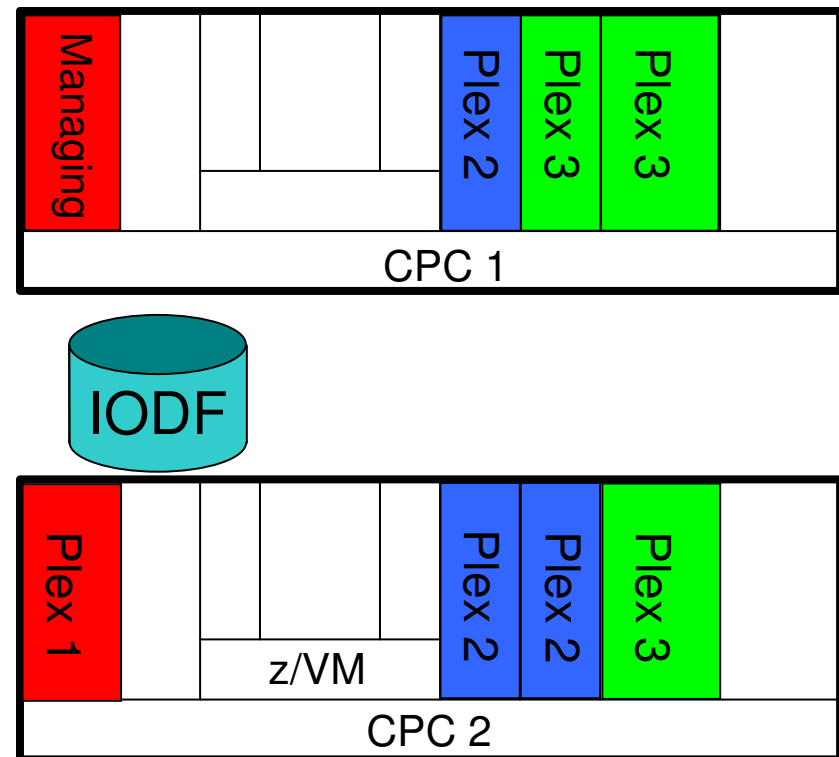
- Activating a new I/O configuration today
- Activating a new I/O configuration with z/OS 2.1 HCD
- Examples
- Setup requirements
- Questions and answers

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Sample Environment

- One master IODF, disks are not shared
- 2 CPCs
- 3 Sysplexes and one z/VM system
- Managing HCD is on red system on CPC 1
- Task is to dynamically activate a configuration change
- Note: does not include H/W installation, changes to LOADxx, LPAR image profiles etc

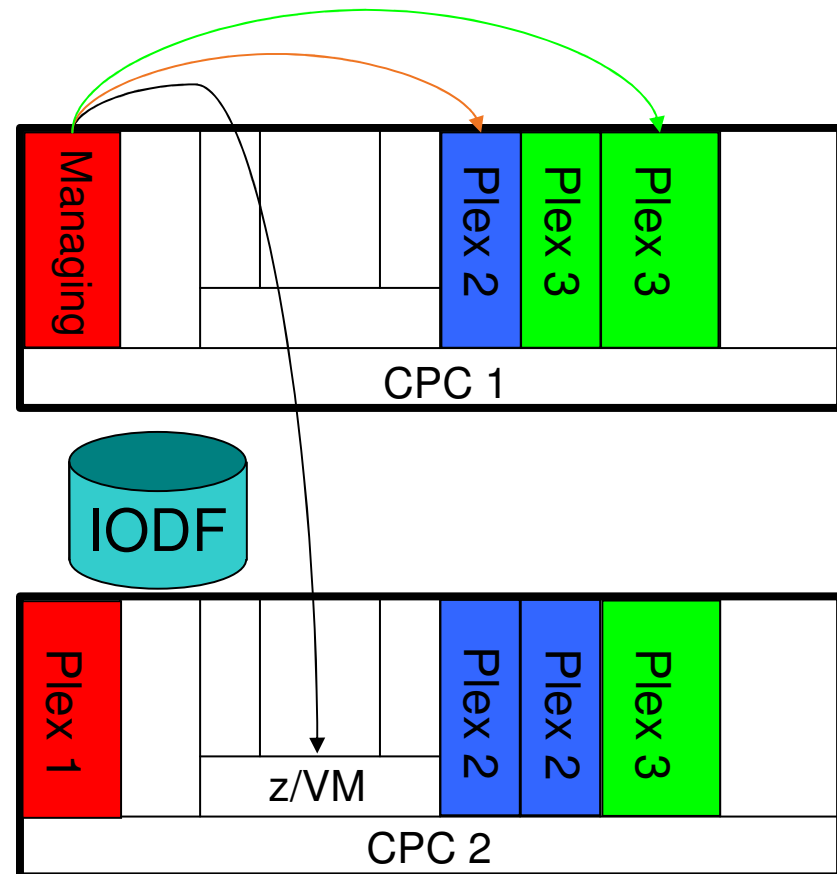


Activating a New Configuration Today



- Transfer IODF to one of the blue systems
- Software activate (with hardware validation) on all blue systems via sysplex wide activate dialog
- Transfer IODF to one of the green systems
- Software activate (with hardware validation) on all green systems via sysplex wide activate dialog
- Transfer IODF to z/VM system
- Software activate on z/VM system via command
- Hardware and software activate on red systems on CPC 1 and CPC 2 via sysplex wide activate dialog

★ Does not include test activates and vary or config commands



Problems

- Change management process takes a long time
- It is error prone since there are many manual steps and context switches
- With increasing number of CPCs, LPARs per CPC, and increasing number of sysplexes and z/VM systems, dynamic activates become hard to manage

Solution: HCD HMC-Wide Activate Function in z/OS 2.1

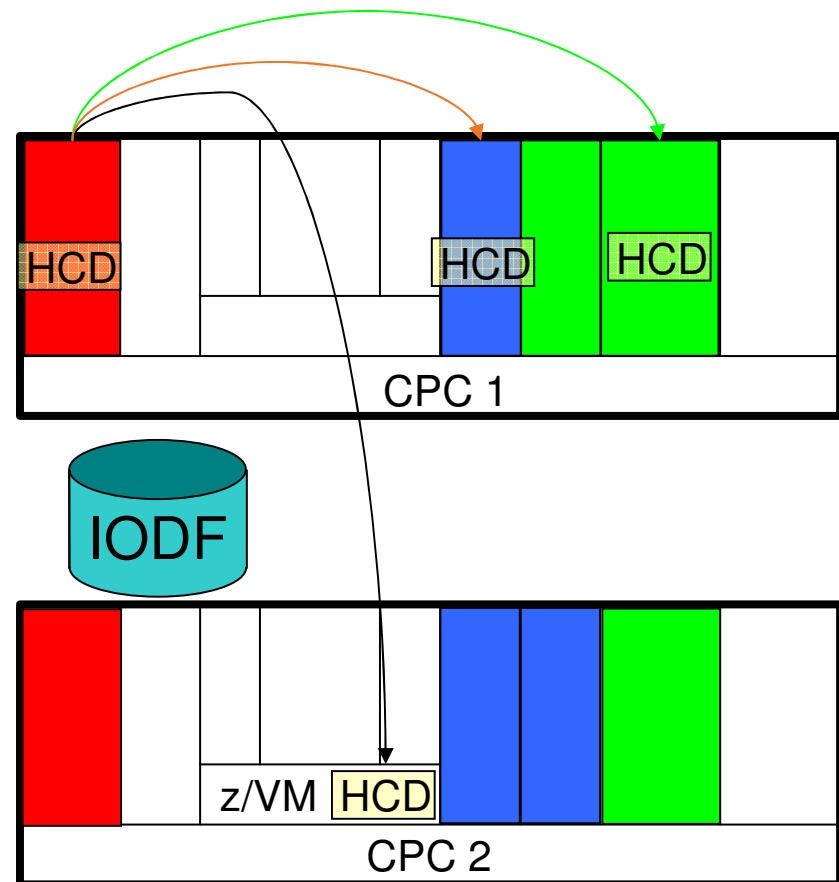
Activating a New Configuration in z/OS V2.1



- A single, managing HCD system can be used to define, distribute, and activate the I/O configuration for all systems controlled by the same HMC
 - List status of reachable systems on the CPC (BCPii)
 - HCD communicates with HCD instances on target systems to deploy IODF and perform dynamic activates
 - Messages are returned to the managing HCD
- Supported for both z/OS and z/VM systems
- Function integrated into existing dialog used to perform the IOCDS and IPL parameter management in an HMC controlled CPC cluster.

Activating a New Configuration in z/OS V2.1

- Configuration defined via red system on CPC 1
- TCP/IP connectivity established from managing system to one system per sysplex or z/VM system
- A list of all reachable systems is displayed in HCD allowing to initiate all actions on that system
- For remote sysplexes and z/VM system
 - Transmit new production IODF
 - Initiate sysplex wide S/W activate
 - Optionally vary online status of path or device
 - Messages are returned and displayed
- For local (red) sysplex, activates are done via sysplex wide activate function



Defining the Connection

- A connection table describes the target systems / sysplexes that are to be managed.
 - Each entry contains the IP address / port number and login data. (A password is not required if pass-tickets are used.)
 - For each remote sysplex, a connection to at least one system is required.
 - An entry for each z/VM system is needed
 - On each remote system the HCD dispatcher has to be active.

* NETWORK NAME	IMAGE	IP ADDR	PORT	USERID	PASSWORD
IBM390PS, R35	, TRX2	, BOETRX2	, 51107	, BBEI	, xxxxxxxx
IBM390PS, DAN2	, SYSA	, BOESYSA	, 51107	, BBEI	, xxxxxxxx
IBM390PS, ECL2	, SYSD	, BOESYSD	, 51107	, BBEI	, xxxxxxxx
IBM390PS, ECL2	, SCLM1	, BOESCLM	, 51107	, BBEI	, xxxxxxxx
IBM390PS, POL1	, HCDVM	, BOEHCDVM	, 51107	, BEICHTER	, xxxxxxxx

Configuration

New HCD profile options:

- **CONNECTION_TABLE = <dataset-name>** specifies the name of a data set that contains the table for establishing connectivity to the remote systems via TCP/IP.
- **RCALL_LOG = YES | NO** specifies whether remote HCD calls are logged in dataset hlq.CBDQCLNT.LOG.
- **RCALL_TIMEOUT = <seconds>** specifies the timeout value for the initial connection to a remote system. Default is 60 seconds.

Invocation



```
Session C - [32 x 80]
File Edit View Communication Actions Window Help
z/OS V2.1 HCD
Command ==>

Hardware Configuration

Select one of the following.

2 0. Edit profile options and policies
1. Define, modify, or view configuration data
2. Activate or process configuration data
3. Print or compare configuration data
4. Create or view graphical configuration data
5. Migrate configuration data
6. Maintain I/O definition files
7. Query supported hardware and installation
8. Getting started with this dialog
9. What's new in this release

For options 1 to 5, specify the name of the
I/O definition file . . . 'SYS4.IODF00'
```

```
z/OS V2.1 HCD
Activate or Process Configuration Data

Select one of the following tasks.

11 1. Build production I/O definition file
2. Build IOCDs
3. Build IOCP input data set
4. Create JES3 initialization stream data
5. View active configuration
6. Activate or verify configuration dynamically
7. Activate configuration sysplex-wide
8. *Activate switch configuration
9. *Save switch configuration
10. Build I/O configuration data
11. Build and manage System z cluster IOCDs, IPL attributes and dynamic I/O changes
12. Build validated work I/O definition file

* = requires TSA I/O Operations
F1=Help F2=Split F3=Exit F9=Swap
F12=Cancel
```

- 1. Access target production IODF
- 2. Select option 2.11



Invocation

3. Select action V - View CPC image list

```
Session C - [32 x 80]
File Edit View Communication Actions Window Help
-----
Goto Query Help
-----
                                System z Cluster List                                Row 1 of 18
Command ==> _____ Scroll ==> PAGE
Select one or more CPCs, then press Enter.

-----CPC----- IODF
/ SNA Address      Type   Model  Processor ID
- IBM390PS.DAN2    2094   S28    DAN2
- IBM390PS.ECL2    2097   E40    ECL2
- IBM390PS.G14     2084   B16    G14
- IBM390PS.G15     2084   D32    G15
- IBM390PS.H05     2097   E26    H05
- IBM390PS.H37     2097   E26    H37
- IBM390PS.H42     2097   E26    H42
- IBM390PS.POL1    2096   S07    POL1
- IBM390PS.P0ZGMR04 2818   M10    ZGMR04
- IBM390PS.P0000H27 2097   E56    H27
- IBM390PS.RAP     2066   004    RAP
- IBM390PS.RAP2    2066   004    RAP2
- IBM390PS.R17     2817   M32    R17
- IBM390PS.R35     2817   M49    R35
- IBM390PS.R37     2817   M32    R37
- IBM390PS.T29     2094   S18    T29
- IBM390PS.T53     2094   S18    T53
- IBM390PS.T63     2094   S38    T63
***** Bottom of data *****

F1=Help      F2=Split     F3=Exit      F4=Prompt    F5=Reset     F7=Backward
F8=Forward   F9=Swap      F10=Actions  F12=Cancel   F13=Instruct F22=Command

MA c 23/004
Connected to remote server/host tn3270.de.ibm.com using lu/pool FU0U6836 and port 23
```

Invocation (cont.)



```

Session C - [32 x 80]
File Edit View Communication Actions Window Help
-----
Goto Query Help
-----
CPC Image List          Row 49 of 60 More:  >
Command ==> _____ Scroll ==> PAGE

Select one or more systems of the CPC, then press Enter. To refresh the
Activate/Verify Status, press Enter without selections made.

Processor ID : R35          SNA Address : IBM390PS.R35
HSA Token   . : R35        11-11-15 07:33:54 SYS4   IODF71

  -- Partition --- Co Sysplex  ----- System -----  ---- Activation ----
 / Name      ID Stat St Name   Name      Type   Level  HW SW Status
# R35LP49   34 0001
# R35LP50   35 0001          LINUX  3.0.8
# R35LP51   36 0001          LINUX  3.0.8
# R35LP52   37 0002
# R35LP53   38 0002
# R35LP54   39 0002
# R35LP56   3B 0002
- R35LP58   3D 0001          BOER3558 VM    6.1
- R35LP59   3E 0001          BOER3559 VM    5.4
  R35LP60   3F 0001          BOER3560 VM    6.1
- TRX1      2C 0001 Y  TRX1PLEX TRX1      MVS    2.1    Y  Y
- TRX2      3C 0001 S  TRX1PLEX TRX2      MVS    1.13   Y  Y
***** Bottom of data *****

F1=Help      F2=Split    F3=Exit     F4=Prompt   F7=Backward F8=Forward
F9=Swap      F10=Actions F12=Cancel  F13=Instruct F14=SortName F15=SortStat
F16=SortSplx F20=Right   F22=Command

MA c 04/015
Connected to remote server/host tn3270.de.ibm.com using lu/pool FU0U6836 and port 23
  
```

HW=Y: hardware changes are possible
 HW=N: hardware changes are not possible
 SW=Y|S: software changes are possible
 SW=N: software changes are not possible

Connected systems (connection status 'Y' or 'S') show their activation status:



Invocation (cont.)

Connected systems show:

- active IODF
- active OS config
- active EDT

```
Session C - [32 x 80]
File Edit View Communication Actions Window Help
Goto Query Help
-----
CPC Image List          Row 49 of 60 More: <
Command ===> _____ Scroll ===> PAGE

Select one or more systems of the CPC, then press Enter. To refresh the
Activate/Verify Status, press Enter without selections made.

Processor ID : R35          SNA Address : IBM390PS.R35
HSA Token   . : R35          11-11-15 07:33:54 SYS4      IODF71

  Partition  Active          Conf          EDT
 / Name      IODF              ID            ID
# R35LP49
# R35LP50
# R35LP51
# R35LP52
# R35LP53
# R35LP54
# R35LP56
- R35LP58
- R35LP59
- R35LP60
- TRX1      SYS1.IODF01      MVSVM        00
- TRX2      SYS1.IODF01      MVSVM        00
***** Bottom of data *****

F1=Help      F2=Split      F3=Exit      F7=Backward  F8=Forward  F9=Swap
F10=Actions  F12=Cancel   F19=Left    F22=Command

MÁ c 14/002
Connected to remote server/host tn3270.de.ibm.com using lu/pool FU0U6836 and port 23
```

Invocation (cont.)

- Activation actions are similar to the actions on the sysplex-wide activate panel.
- In addition, an explicit Transmit IODF action is added which brings up the Export IODF dialog and system commands can be remotely processed.

```

Session C - [32 x 80]
File Edit View Communication Actions Window Help
-----
Goto Query Help
-----
Command ==>
Select one or
Activate/Veri
Processor ID
HSA Token .

-- Partitio
/ Name ID
# R35LP49 34
# R35LP50 35
# R35LP51 36
# R35LP52 37
# R35LP53 38 0002
# R35LP54 39 0002
# R35LP56 3B 0002
_ R35LP58 3D 0001          BOER3558 VM 6.1
_ R35LP59 3E 0001          BOER3559 VM 5.4
_ R35LP60 3F 0001          BOER3560 VM 6.1
/ TRX1 2C 0001 Y TRX1PLEX TRX1 MVS 2.1 Y Y
_ TRX2 3C 0001 S TRX1PLEX TRX2 MVS 1.13 Y Y
***** Bottom of data *****

F1=Help F2=Split F3=Exit F9=Swap F12=Cancel

F1=Help F2=Split F3=Exit F4=Prompt F7=Backward F8=Forward
F9=Swap F10=Actions F12=Cancel F13=Instruct F14=SortName F15=SortStat
F16=SortSplx F20=Right F22=Command

MA c 07/018
Connected to remote server/host tn3270.de.ibm.com using lu/pool FU0U6836 and port 23

```

Activation



```

Session C - [32 x 80]
File Edit View Communication Actions Window Help
Goto Query Help
Activate Software Configuration Only
Command ==> _____ Row 1 of 1
Specify or revise the values for activation, then press Enter.
IODF to be activated: 'SYS4.IODF00'

System Processor Partition Config. EDT Valid. Test Active
Name ID + Name ID + ID + HW Ch. Only IODF
TRX2 R35 TRX2 MVSVM 00 Yes Yes SYS1.IODF01
***** Bottom of data *****
    
```

```

Session C - [32 x 80]
File Edit View Communication Actions Window Help
Goto Query Help
Activate Hardware and Software Configuration
Command ==> _____ Row 1 of 1 More:
Specify or revise the values for activation, then press Enter.
IODF to be activated: 'SYS4.IODF00'

System Processor Partition Config. EDT -FORCE Option- Switch Test
Name ID + Name ID + ID + DEVICE CANDID. IOCDS + Only
TRX1 R35 TRX1 MVSVM 00 No No ___ Yes
***** Bottom of data *****

F1=Help F2=Split F3=Exit F4=Prompt F5=Reset
F7=Backward F8=Forward F9=Swap F12=Cancel F20=Right

- R35LP58 3D 0001 BOER3558 VM 6.1
- R35LP59 3E 0001 BOER3559 VM 5.4
- R35LP60 3F 0001 BOER3560 VM 6.1
a TRX1 2C 0001 Y TRX1PLEX TRX1 MVS 2.1 Y Y
F1=Help F2=Split F3=Exit F4=Prompt F7=Backward F8=Forward
F9=Swap F10=Actions F12=Cancel F13=Instruct F14=SortName F15=SortStat
F16=SortSplx F20=Right F22=Command

MA c 12/014
    
```

```

Goto Query Help
CBDPCCF0 CPC Image List Row 1 of 26 More:
Command ==> _____ Scroll ==> PAGE

Select one or more systems of the CPC, then press Enter. To refresh the
Activate/Verify Status, press Enter without selections made.

Processor ID : DAN2 SNA Address : IBM390PS.DAN2
HSA Token . : DAN2 12-11-14 10:09:38 SYS4 IODF71

-- Partition --- Co Sysplex ----- System -----
/ Name ID Stat St Name Name Type Level HW SW Activation -----
# COBCF1 2F 0001 COBPLEX COB1 MVS 1.12
- COB1 22 0001 COBPLEX COB1 MVS 1.12
- COB2 23 0001 COBPLEX COB2 MVS 1.12
- COB3 24 0001 COBPLEX COB3 MVS 1.12
Goto Query Help
    
```

```

# D2 0008
# D9 0008
- IRD3 13 0001 S IRDPLEX IRD3 MVS 2.1 ? Y Activating
# LNXDWH1 0B 0001
# LNXDWH2 0A 0001
# RSE0CFE 0E 0001
    
```

After pressing Enter

```

# D2 0008
# D9 0008
- IRD3 13 0001 S IRDPLEX IRD3 MVS 2.1 ? Y Messages
# LNXDWH1 0B 0001
# LNXDWH2 0A 0001
# RSE0CFE 0E 0001
- RSE1 0C 0001 RSEPLEX RSE1 MVS 1.12
- VMCOB 2E 0001 BOEVMCOB VM 5.4
# ZMF0CFF 1F 0001
- ZMF1 14 0001 ZMF1PLEX ZMF1 MVS 1.12
- ZMF2 15 0001 ZMF1PLEX ZMF2 MVS 1.13
- ZMF3 16 0001 ZMF1PLEX ZMF3 MVS 2.1
- ZMF4 19 0001 ZMF1PLEX ZMF4 MVS 2.1
- ZMF5 1B 0001 ZMF1PLEX ZMF5 MVS 1.13
*****
    
```

The activate/verify status was refreshed.

Activation messages

- Action code m for 'view activate messages' shows a list with the activate messages related

```
message List
Save Query Help
-----
CBDPMSG2                                     Row 1 of 5
Command ==> _____ Scroll ==> PAGE

Select one or more messages, then press Enter. To refresh the list, press
ENTER without selections made. To reply to a WTOR message, use the REPLY
command.

System name: IRD3

/ Message Text
_ IOS500I ACTIVATE RESULTS 330
# TEST DETECTED NO CONDITIONS WHICH WOULD RESULT IN ACTIVATE
# FAILURE
# NOTE = 0100, SOFTWARE-ONLY CHANGE
# COMPID=SC1C3
***** Bottom of data *****
```


Remote commands



```
Session C - [32 x 80]
File Edit View Communication Actions Window Help
Goto Query Help
----- Process System Command -----
C Specify a system command. It will be executed on the selected target
S system. Press ENTER to continue.
A System . . . : TRX1
P Sysplex . . . : TRX1PLEX
H Command . . . d ios,config(all)_____
/ Do you want the specified command being
# executed on all systems in the sysplex ? 2 1. Yes
# 2. No
#
# F1=Help F2=Split F3=Exit F5=
#
# R35LP56 3B 0002
# R35LP58 3D 0001 B0ER3558
# R35LP59 3E 0001 B0ER3559
# R35LP60 3F 0001 B0ER3560
# c TRX1 2C 0001 Y TRX1PLEX TRX1
# TRX2 3C 0001 S TRX1PLEX TRX2
# ***** Bottom of
#
# F1=Help F2=Split F3=Exit F4=
# F9=Swap F10=Actions F12=Cancel F13=
# F16=SortSplx F20=Right F22=Command
#
# Connected to remote server /host tn3270.de.ibm.com using lu/pool FU0U6836 and port 23
```

System commands can be issued for the remote system or all systems of a remote sysplex.

```
Session C - [32 x 80]
File Edit View Communication Actions Window Help
Goto Query Help
----- Message List -----
----- Save Query Help -----
----- Row 1 of 28 -----
Command ==> _____ Scroll ==> PAGE
Select one or more messages, then press Enter. To refresh the list, press
ENTER without selections made. To reply to a WTOR message, use the REPLY
command.
System name: TRX1
/ Message Text
# IOS506I 17.00.07 I/O CONFIG DATA 380
# ACTIVE IQDF DATA SET = SYS1.IQDF01
# CONFIGURATION ID = MVSVM EDT ID = 00
# TOKEN: PROCESSOR DATE TIME DESCRIPTION
# SOURCE: R35 11-11-15 07:33:54 SYS4 IQDF71
# ACTIVE CSS: 2 SUBCHANNEL SETS CONFIGURED: 0, 1, 2
# CHANNEL MEASUREMENT BLOCK FACILITY IS ACTIVE
# F1=Help F2=Split F3=Exit F4=Prompt F5=Reset
# F7=Backward F8=Forward F9=Swap F10=Actions F12=Cancel
# F13=Instruct F22=Command
# ***** Bottom of data *****
```

Messages resulting from the system command are displayed in the message list panel.



Pre-requisites

- Software Dependencies
 - Managing HCD system must be z/OS 2.1
 - Remote systems must run z/OS V1R10 or z/VM V5R4 or higher
 - Compatibility PTFs for back-level systems must be installed (OA37901, VM64976)
- Hardware Dependencies
 - Local and remote systems must reside on z9 or higher servers.

Setup/Customization - General

- Customers have to set up a consistent naming convention for production IODFs on the target systems.
- Create connection table
 - At least one entry for each system in the target sysplex
 - One entry for single target that is remotely managed (e.g., z/VM system)
 - Update your HCD profile to specify the connection table data set name

Setup/Customization - BCPii

- BCPii address space (HWIBCPii) must be started on the managing system.
- Support element (SE) and SAF Authorizations for managing system:
 - Enable BCPii calls for managing logical partitions (local and remote SEs)
 - Define BCPii community name (local and remote SEs, SAF)
 - Enable managing user ID for BCPii calls to target CPCs and images (SAF)
 - HWI.TARGET.network.cpcname.*

Setup/Customization – Remote Systems



- The HCD dispatcher program has to be started
 - Must be listening to the IP port given in the connection table.
- At least one system on each CEC must be enabled for dynamic I/O
- Authorization requirements
 - Remote user ID must have ALTER authority for new production IODF.
 - Profile for activate command in OPERCMDS class (MVS.ACTIVATE, UPDATE access)
 - Profiles for other z/OS commands that will be directed to these systems
 - Pass-ticket support if passwords are not used in the connection table

Setup/Customization - PassTickets



- The RACF class **PTKTDATA** must be **activated**, if not already done:
 - SETROPTS CLASSACT(PTKTDATA)
 - SETROPTS RACLIST(PTKTDATA)
- Then **define a profile for the HCD dispatcher** (CBDSERVE) with an associated encryption key and authorize user:
 - RDEFINE PTKTDATA CBDSERVE
SSIGNON([KEYENCRYPTED|KEYMASKED](<key>))
 - SETROPTS RACLIST(PTKTDATA) REFRESH
- Then **define profile for user and authorize connecting user**:
 - RDEFINE PTKTDATA IRRPTAUTH.CBDSERVE.* UACC(NONE)
 - PERMIT IRRPTAUTH.CBDSERVE.* CLASS(PTKTDATA) ID(<user>)
ACCESS(UPDATE)
 - SETROPTS RACLIST(PTKTDATA) REFRESH
- If APPL class is active and a profile that covers CBDSERVE already exists:
 - RDEFINE APPL CBDSERVE UACC(NONE)
 - PERMIT CBDSERVE CLASS(APPL) ID(<user>) ACCESS(READ)

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

References

- Hardware Configuration Definition User's Guide, SC34-2669
- Hardware Configuration Manager User's Guide, SC34-2664
- Hardware Configuration Definition Messages, SC34-2668
- Hardware Configuration Definition Planning, GA32-0907
- z/OS Migration from z/OS V1R13 and z/OS V1R12 to z/OS V2R1, GA32-0889

- HCD/HCM Homepage:
 - <http://www.ibm.com/systems/z/os/zos/features/hcm/>

- HCD Contact:
 - IBMHCD@de.ibm.com

Thank you



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