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Using HCD/HCM to manage your I/O configuration in z/VM

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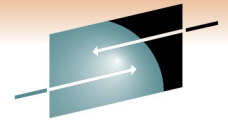
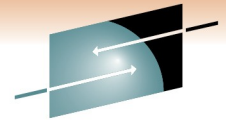


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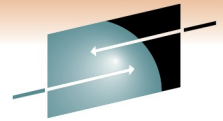
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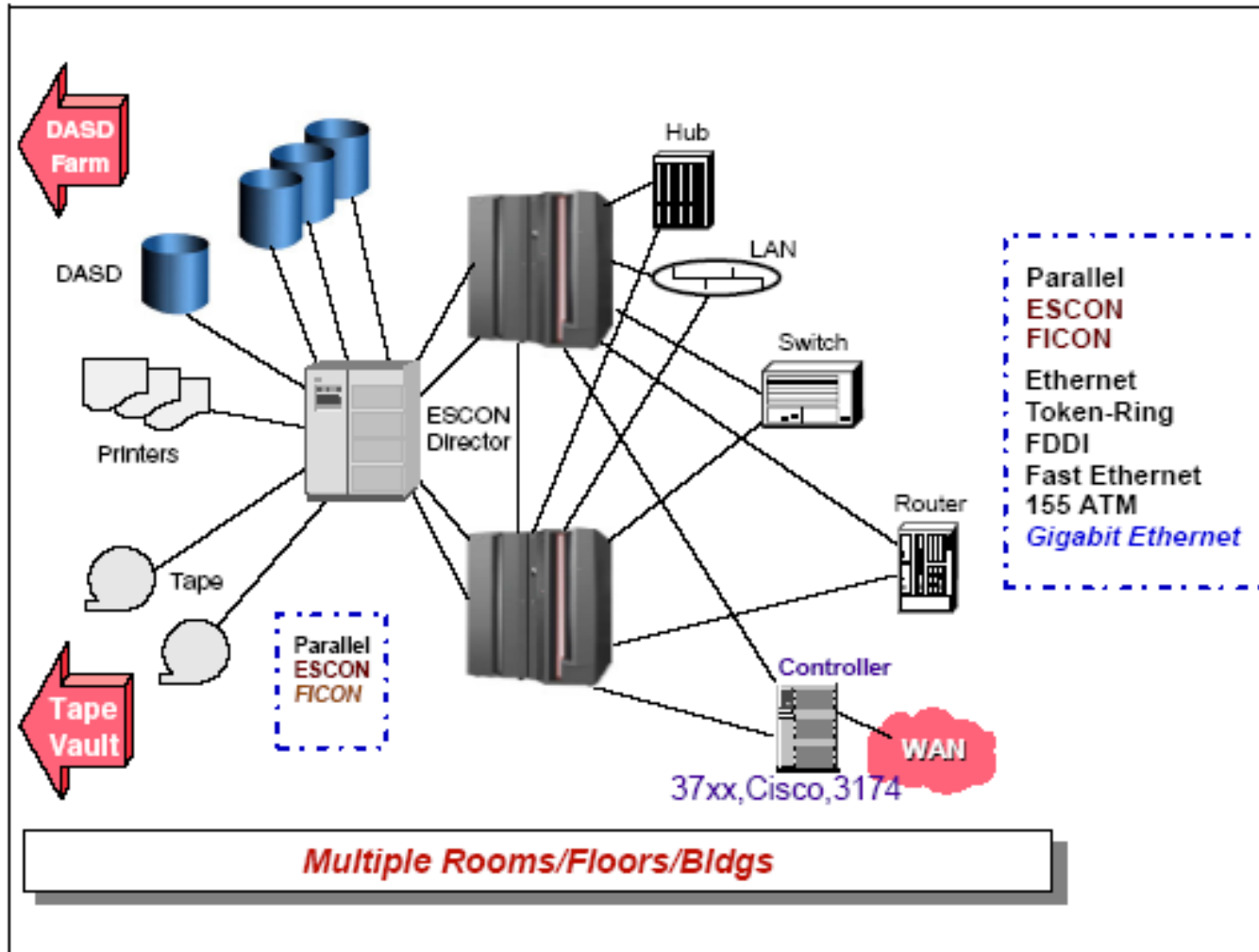
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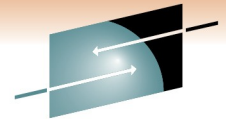
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Scope of I/O Configuration





I/O Configuration Management

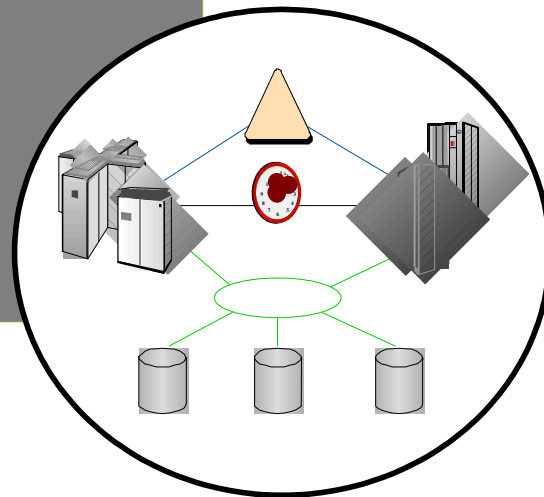
Configuration Management

Plan

Define

Activate

Operate



Configuration Aspects Hardware Management

assets

CSS and OS

physical

cabling

network

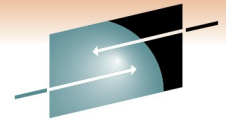
floorspace

power, cooling, etc.

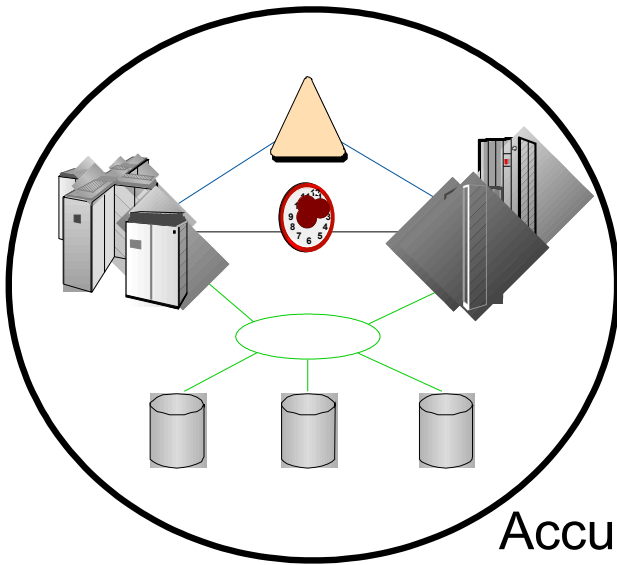
change

performance

problem



The problem



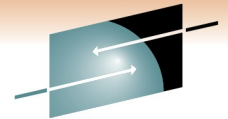
Different tools

Redundant data

Manual mapping between various aspects

Accuracy of documentation by human discipline only

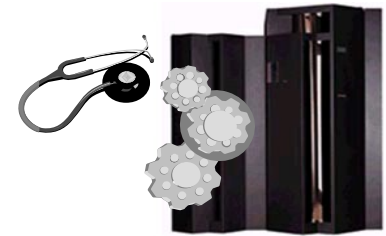
Increasing complexity with System z

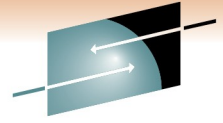


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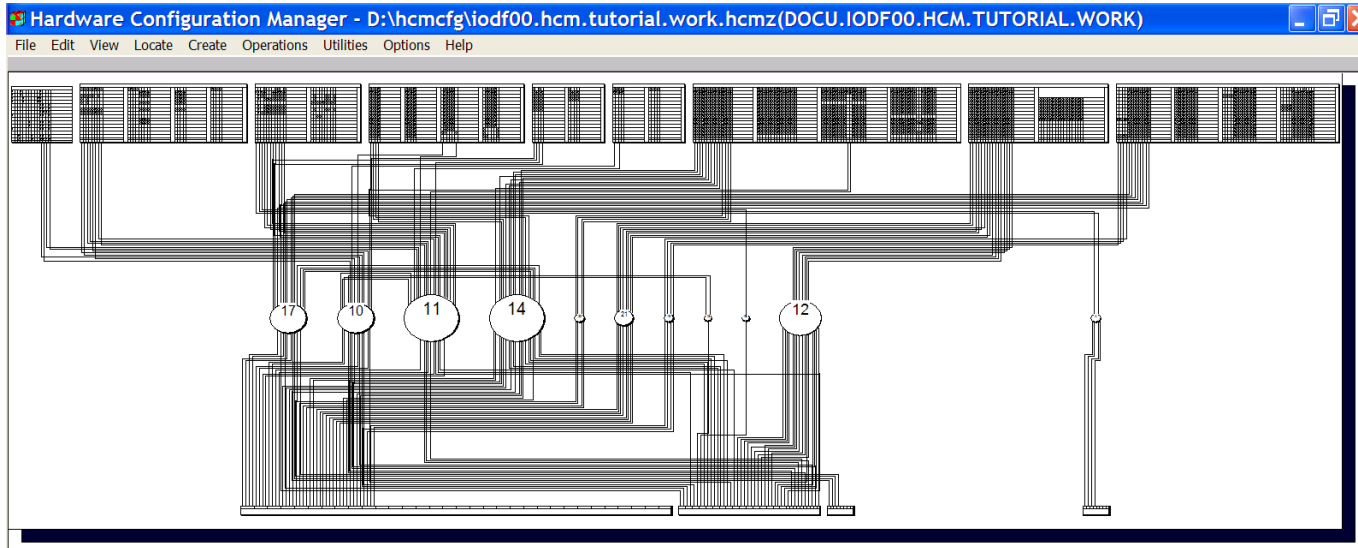
Value of HCD

- Integrates **I/O definitions** for the CSS and the OS
- Configuration data stored in a **single repository** (IODF)
- **Rigorous validation** of hardware configuration data
- Helps to **avoid system outages** due to definition inconsistencies
- **Dynamic activate** of configuration changes **non-disruptively**
- Extensive **reporting facility** for configuration data
- HCD Customers (base element in both z/OS and z/VM)
 - **all z/OS customers** (mandatory)
 - **all z/VM customers** (optional)
- **Provides configuration migration**
 - z10 migration
 - configuration migration of IOCP

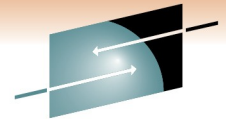




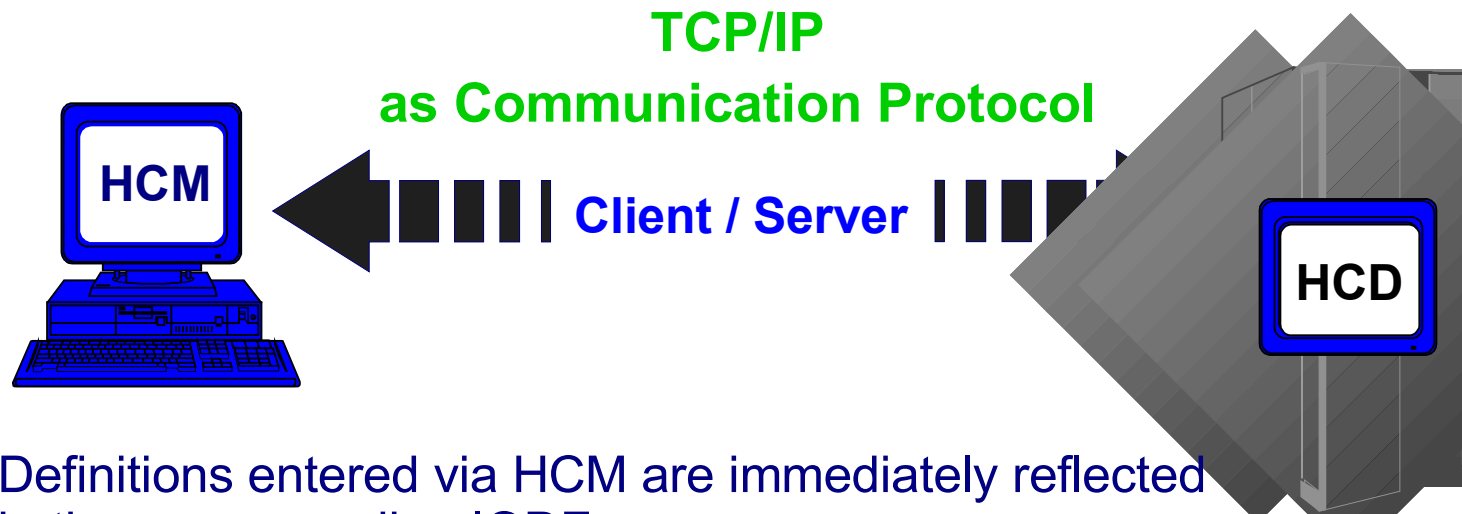
Value of HCM



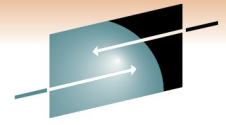
- + provides intuitive graphical user interface to HCD
- + manages physical and logical data in one place
- + includes powerful definition wizards
- + provides accurate configuration documentation
- + uses HCD as a server for data validation



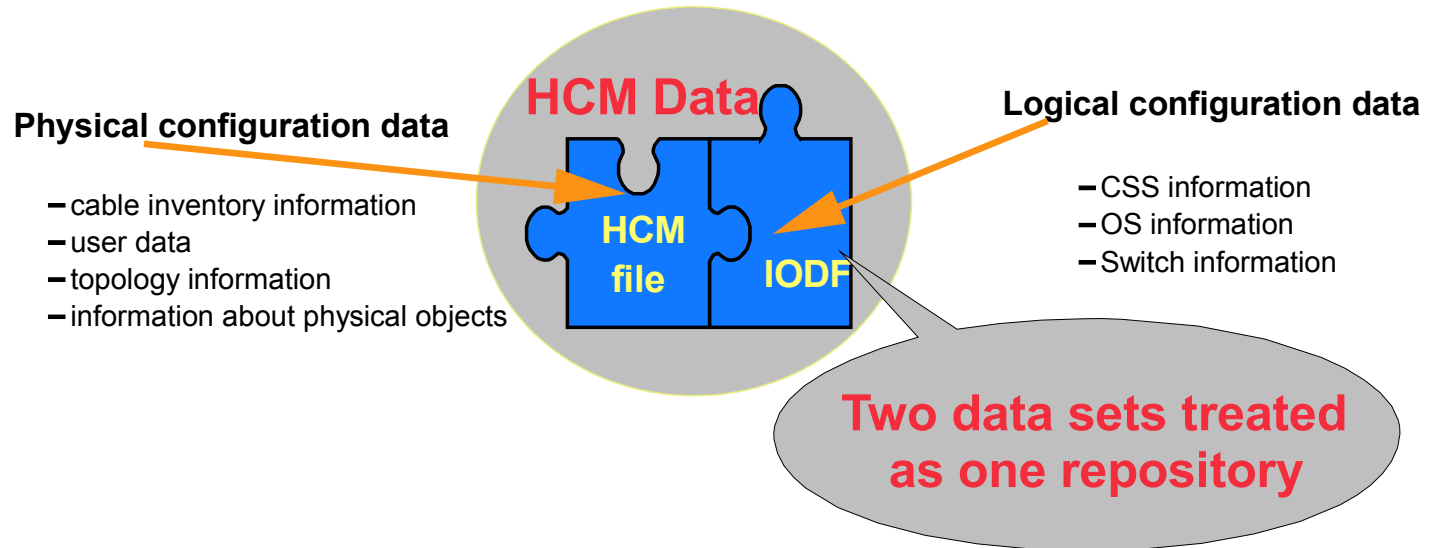
HCD – HCM relationship



- ★ Definitions entered via HCM are immediately reflected in the corresponding IODF.
- ★ The access to the IODF as well as the validation of data is done by HCD.
- ★ The use of HCD's rigorous validation algorithm ensures that all data are correct and complete.



Data repository



No duplication of data entry for physical and logical definitions

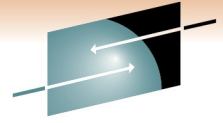
Multiple configuration versions supported

name of IODF stored in HCM file

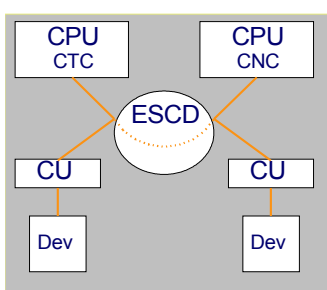
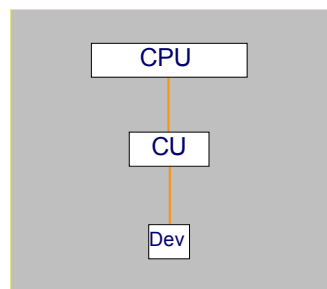
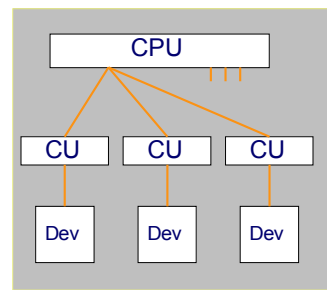
Data integrity ensured by time stamp / token

token updated by HCD whenever IODF is modified

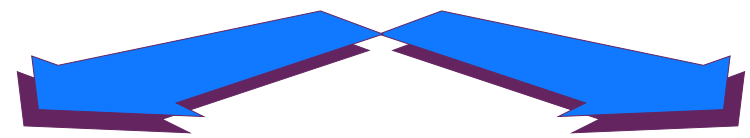
in case of token mismatch a resynchronization takes place



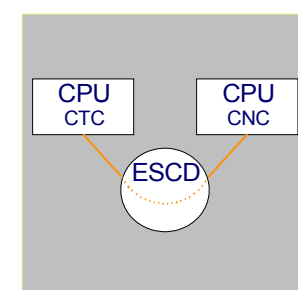
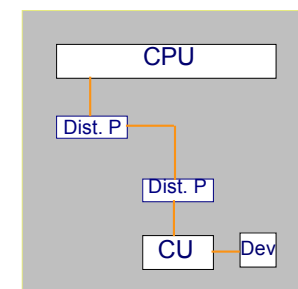
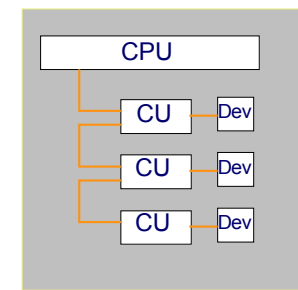
General concept

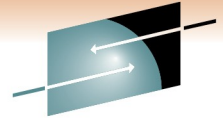


Logical vs. Physical

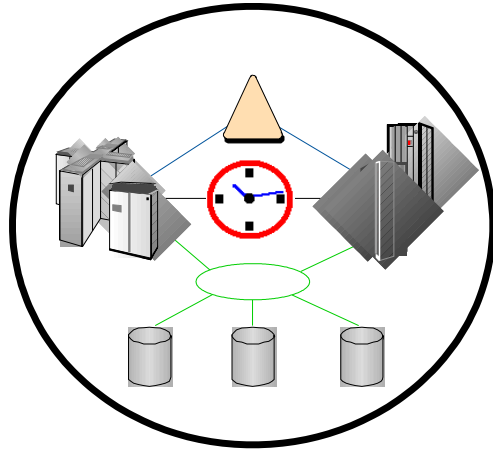


View





Supported I/O equipment



**Support for I/O Equipment
is determined by:**

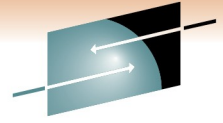
▶ **HCD's Unit Information Modules (UIMs)**

the logical characteristics and connectivity rules for each device or device group

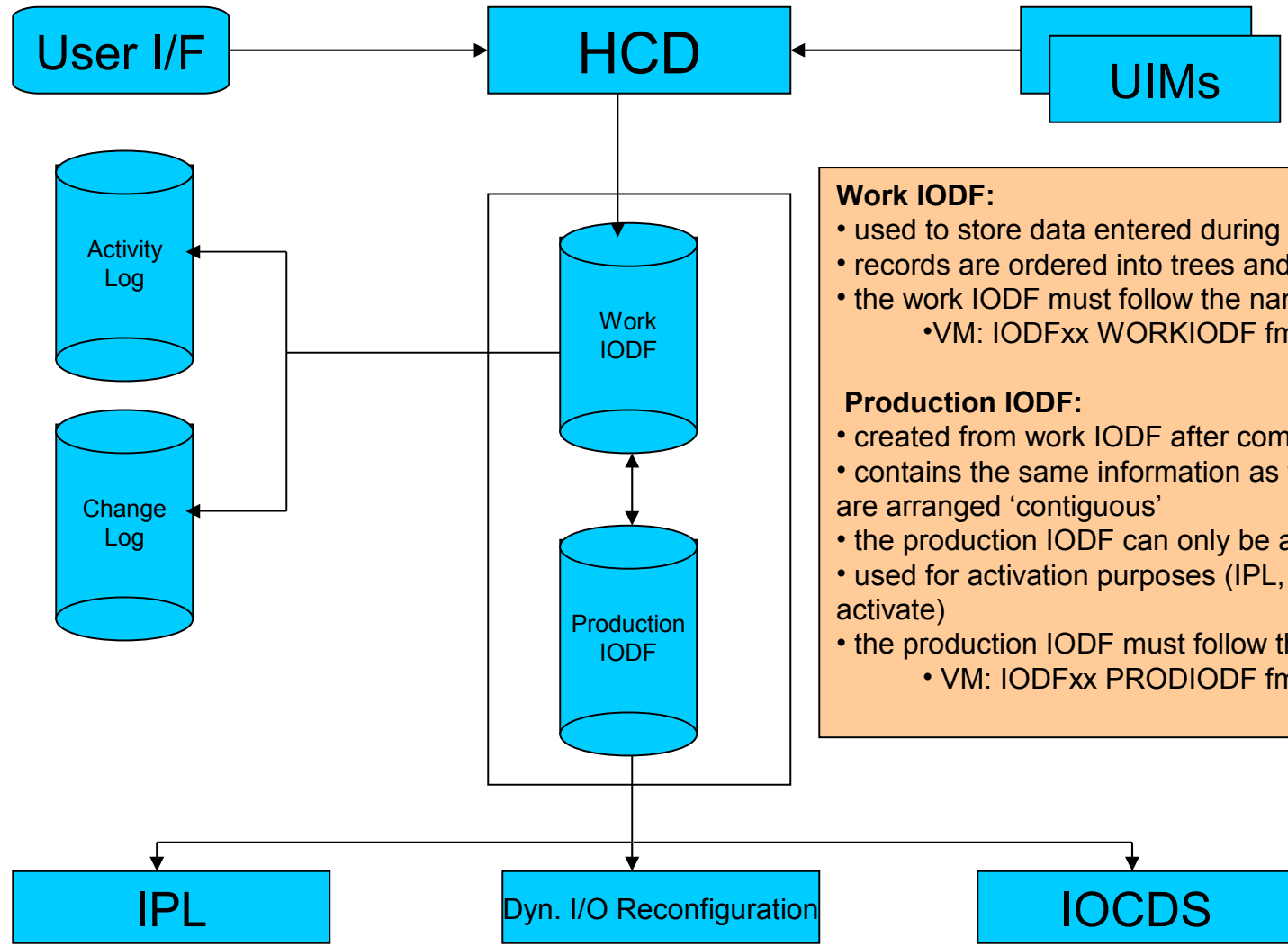
▶ **HCM's Physical Description Files (PDFs)**

the physical appearance of the object on the diagram (e.g. number and name of channel interfaces)

Same technique for OEM equipment



Concept of work and production IODF



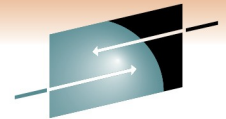
Work IODF:

- used to store data entered during definition
- records are ordered into trees and connected together
- the work IODF must follow the naming conventions:
 - VM: IODFxx WORKIODF fm

Production IODF:

- created from work IODF after completeness validation
- contains the same information as the work IODF but the records are arranged 'contiguous'
- the production IODF can only be accessed in READ mode
- used for activation purposes (IPL, IOCDS download, dynamic activate)
- the production IODF must follow the naming convention:
 - VM: IODFxx PRODIODF fm

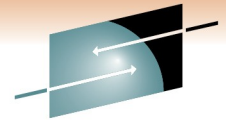
HCD Functions



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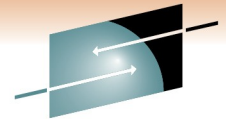
Controlled by user configuration file, CBDCONF NAMES

- Create and initialize an empty IODF
 - `cbdsiodf iodf01 workiodf a 2096`
- Migrate (import) I/O configuration statements / IOCP deck into an IODF
 - `cbdsmigr iodf01 workiodf a iocp deck a i procl 2097-e12 lpar`
- Export I/O configuration statements from an IODF
 - `cbdsconf iodf01 workiodf a config deck a i procl`
- Extract software configuration file from RDEV control blocks
 - `cbdsrdev cbdmconf rdevlist a`
- Import RDEV configuration into the IODF
 - `cbdsmigr iodf01 workiodf a cbdmconf rdevlist a r vml`
- Build a production IODF
 - `cbdsprod iodf01 workiodf a iodf01 prodiodef a`
- Build a work IODF from a production IODF
 - `cbdswork iodf01 prodiodef a iodf01 workiodf a`



HCD Functions (cont.)

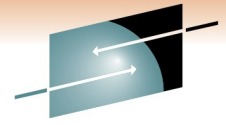
- Copy IODF
 - `cbds copy iodf01 workiodf a iodf11 workiodf c (repl`
- Print configuration reports
 - `cbds rep iodf01 workiodf a iodf01 report a cpuds`
- Create a graphical configuration report
 - `cbds draw iodf01 workiodf a iodf01 script a lcu procl`
- Compare configurations in IODFs
 - `cbds comp iodf01 prodiodef a iodf11 prodiodef c iodf01 compare a`
- Export an IODF
 - `cbdsexp iodf01 prodiodef a jack boevm3`
- Import an IODF
 - `cbdsimp 0018 iodf88 workiodf a`



HCD Functions (cont.)

- Build an IOCP deck
 - `cbdsiocp iodf01 prodiodf a procl d procl iocp a`
- Write an IOCDS
 - `cbdsiocp iodf01 prodiodf a procl i a1`
- Dynamically activate a configuration
 - `cbdsact iodf01 procl vm1 a1`

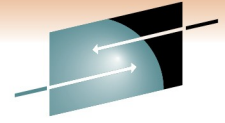
- Start the z/VM HCD TCP/IP dispatcher for HCM
 - `cbdsdisp`
- Stop the z/VM HCD TCP/IP dispatcher for HCM
 - `server stop`



Additional CMS files

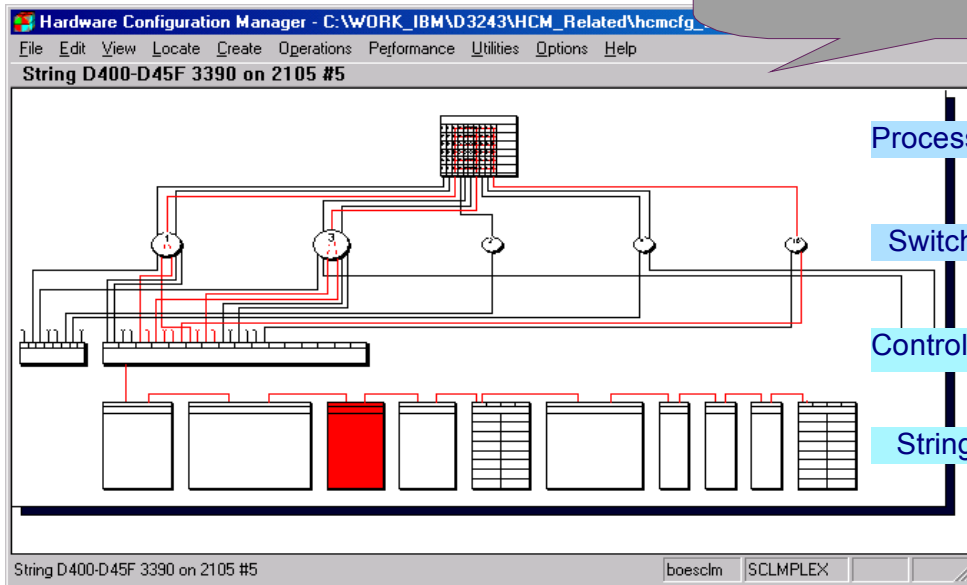
- HCD message log
`<rexx-utility_name> msglog a`
- HCD profile
`hcd profile a`
- HCD trace file
`hcd trace a`
- HCD activity log file
`<iodf_name> workactl a`
- HCD change log file
`<iodf_name> workclog a`
- HCM master configuration file
`<iodf_name> workmcf a`
`<iodf_name> prodmcf a`

Layout of the HCM screen



The logical definitions in the IODF are represented as

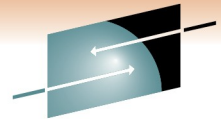
- ▶ connections between objects in the diagram , and
- ▶ attribute information in appropriate dialogs



Configuration Diagram

- ▶ **starting point** for any configuration task (like create/edit, or connect/disconnect objects)
- ▶ presents the **physical view** of the elements and their relation
- ▶ layouted in a **hierarchical structured** form (Processors, Switches, Controllers (CU), and Strings)
- ▶ allows **zooming and filtering** techniques to work with the elements of interest

Use HCM to add, delete, or modify physical connections and associated logical definitions.



Support of CHPID Mapping Tool

Edit Processor

ID: PROC2084 Short name: 84 Info...

Description: z990 eServer zSeries Processor CMT...

Serial No.: 6784352084 OK

Type-Model: 2084-B16 Cancel

Configuration Mode

Basic LPAR Help

Support Level:

XMP, 3xx models, OSC

Specify SNA address only if part of an S/390 microprocessor cluster:

SNA address

Network name: [dropdown]

CPC name: [dropdown]



CHPID Mapping Tool (CMT) Support

Processor: TREXGA3

Export IOCP File for CMT

D:\hcm\P2084.iocp

Launch CMT

Input IOCP File for CMT

D:\hcm\P2084.iocp

Output IOCP File for CMT

D:\hcm\P2084.iocp

Import IOCP File from CMT Show Listing

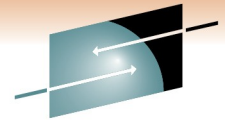
D:\hcm\P2084.iocp

OK Cancel Help

CHPID Mapping Tool (CMT): Assigns PCHIDs to CHPIDs 'automatically'
'CHPID Mapping Tool Support' dialog in HCM assists you in

1. Exporting an IOCP file for the CMT for a selected processor,
2. Launching the CMT with IOCP input and output specifications
3. Importing an updated IOCP file from the CMT to the IODF.

Support of WWPN Prediction Tool



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Edit Processor

ID: Short name: Info...

Description: DMT...

Serial No.:

Type-Model: WPT...

Configuration Mode

Basic LPAR

Support Level:
XMP, 2097 support, RPQ 8P2337

SNA address
Specify SNA address only if part of an S/390 microprocessor cluster:
Network name: CPC name:

Local system name:

OK Cancel Help

WWPN Prediction Tool Support

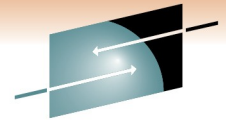
Processor:

Export FCP data for the WWPN Prediction Tool
Output File
 ...

Launch the WWPN Prediction Tool
Input File
 ...

OK Cancel Help

HCD offers a new option for exporting the FCP specific part of the I/O configuration. This file can be used together with the I/O Serial Number (from Resource Link) as input for the WWPN Prediction Tool to generate the WWPNs for the system.



HCM Wizards

To support you in performing complex processor configuration tasks, HCM offers several wizards or utilities:

- Copy Processor
- Copy Channel Subsystem (*)
- Copy Partition
- Aggregate CHPID
- Move Port Connections
- Import/Export PPRC Connections
- Converting CNC Channels to FICON Channels
- Change Link Address Format
- Creating/Copying/Editing an I/O subsystem (*)
- Define CTC / CF / STP connections

(*) Example dialogs are shown on the following pages

Copy channel subsystem (1)

Copy Channel Subsystem - Specify Target Type

Specify the target of the copy operation: a channel subsystem or a new SMP processor. For a channel subsystem, the target processor must already exist.

Copy into a channel subsystem

Processor:

Copy into an SMP processor



Copy Channel Subsystem - Specify Target Channel Subsystem

Target Channel Subsystem in PROC07

ID: Description:

Maximum number of devices:

in subchannel set 0: in subchannel set 1:

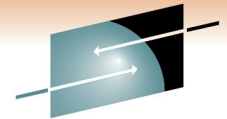


Copy Channel Subsystem - Map Partitions

Map the partitions of the source channel subsystem or SMP processor to unique partition names in the target processor. A partition name must be unique in the whole processor.

Source Partition in PROC07.0	Target Partition in PROC07.2	Source Partition in PROC07.0	Target Partition in PROC07.2
PROC07.0.T60LP01	<input type="text" value="P1"/>	PROC07.0.T60LP02	<input type="text" value="P2"/>
PROC07.0.T60LP03	<input type="text" value="P3"/>	PROC07.0.T60LP04	<input type="text" value="P4"/>
PROC07.0.T60LP05	<input type="text" value="P5"/>	PROC07.0.T60LP06	<input type="text" value="P6"/>
PROC07.0.T60LP07	<input type="text" value="P7"/>	PROC07.0.T60LP08	<input type="text" value="P8"/>
PROC07.0.T60LP09	<input type="text" value="P9"/>	PROC07.0.T60LP10	<input type="text" value="P10"/>
PROC07.0.T60LP11	<input type="text" value="P11"/>	PROC07.0.T60LP12	<input type="text" value="P12"/>
PROC07.0.T60LP13	<input type="text" value="P13"/>	PROC07.0.T60LP14	<input type="text" value="P14"/>
PROC07.0.T60LP15	<input type="text" value="P15"/>		

Copy channel subsystem (2)



Copy Channel Subsystem - Map CHPIDs

Map the CHPIDs of the source to the CHPIDs of the target channel subsystem. If the target CHPID field is empty then the source CHPID is not copied to the target processor or channel subsystem. You can specify new CHPID connections on the following wizard pages.

Source CHPID	Target CHPID	Span with
PROC07.0.17 S CNC SHR Not connected	17	None
PROC07.0.30 S FC SPAN[0/1] to SWCH_21.18	30	CSS 0,1
PROC07.0.31 S FC SPAN[0/1] to SWCH_21.1A	31	CSS 0,1

Copy Channel Subsystem - Repeat or Upgrade?

The copy operation supports two scenarios. Specify either to Repeat or to Upgrade the source object.

Repeat

The source object is used as a model to create a new object. Physical connections are not moved and stay with the source object, while logical connections are copied to the target object. You can assign default connections for target CHPIDs which are affected by the Repeat scenario. CTC and CF connections remain on the source object.

Upgrade

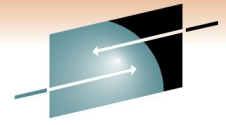
The target object is intended to be an upgrade of the source object. Physical connections will be moved from the source object to the target object. Logical connections will be copied from the source object to the target object, and they also remain on the source object. The source object will not be deleted. CTC and CF connections get moved from the source object to the target object.

Copy Channel Subsystem - Assign Switch Ports

Assign switch port connections of new target CHPIDs.

Target CHPID	Switch ID	Port
PROC07.2.32	21	00
PROC07.2.33	21	01
PROC07.2.34	21	02

Create I/O subsystem (1)



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Create I/O Subsystem (1) - Set Controller Attributes and I/O Subsystem Type step 1 of 6

Type

Select model from: Physical Description File Controller

Select subsystem type:

- IBM 3880 Model 21 DASD Controller
- IBM 3880 Model 23 DASD Controller
- IBM 3880 Model 3 DASD Controller
- IBM 3880 Model 4 DASD Controller
- IBM 3880P DASD Controller
- IBM 3990 DASD Controller
- IBM 3990 Model 6 DASD Controller
- IBM Enterprise Storage Server (ESS)
- IBM Enterprise Storage Server (ESS) as 3990
- IBM TotalStorage DS6000
- IBM TotalStorage DS8000, Model 2107-9xx**
- Amdahl 6100 All Models (3880)

Selected subsystem type:
IBM TotalStorage DS8000, Model 2107-9xx (Controllers: 1; Device Type:)

Attributes

Number of controllers:

Label Prefix

use default specify

(2107)

Create I/O Subsystem (2) - Add Control Units step 2 of 6

Serial number (for all CUs):

Control Unit Attributes

Filter:

Type:

Starting number (in hex): times

Offset between subsequent CU numbers:
(in hex)

SSID:

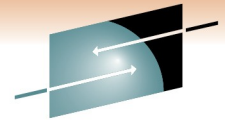
Description:

Added Control Units			
Number	Type	Filter	SSID
A000	2107	DASD	
A100	2107	DASD	
A200	2107	DASD	
A300	2107	DASD	

Selected Control Unit

Number	Filter	Type	SSID
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Description: <input type="text"/>			

Create I/O subsystem (2)



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Create I/O Subsystem (4) - Add Strings step 4 of 6

Define Strings
Select Type

Filter: DASD
Type: 3390

Generic DASD
 IBM 3390 all models
 IBM RAMAC 2 Array DASD
 IBM RAMAC 2 Array DASD (93
 IBM RAMAC 2 Array DASD (93)

1 times

Label: _____

Starting device number: A400 (in hex)

Number of devices (range): 64

Offset between starting devices: 80 (in hex)

Description: _____

Label	Type	Devices	Starting number	Description

Defined Strings

Label	Type	Device	Number	Range
String A000-A03F	3390	A000	64	
String A080-A0BF	3390	A080	64	
String A100-A13F				
String A180-A1BF				
String A200-A23F				
String A280-A2BF				
String A300-A33F				
String A380-A3BF				

Create I/O Subsystem (6) - Connect Control Units and Strings step 6 of 6

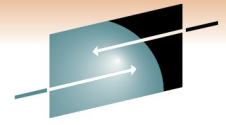
Control Unit(s)

A000
String A000-A03F 3390
String A080-A0BF 3390
A100
String A100-A13F 3390
String A180-A1BF 3390
A200
String A200-A23F 3390
String A280-A2BF 3390
A300
String A300-A33F 3390
String A380-A3BF 3390

Connectable String(s) with Device(s)

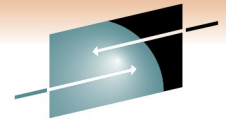
Label	Type	Device	Number	Range
String A000-A03F	3390	A000	64	
String A080-A0BF	3390	A080	64	
String A100-A13F	3390	A100	64	
String A180-A1BF	3390	A180	64	
String A200-A23F	3390	A200	64	
String A280-A2BF	3390	A280	64	
String A300-A33F	3390	A300	64	
String A380-A3BF	3390	A380	64	

String can be connected to...
CU number (Controller / Segment)



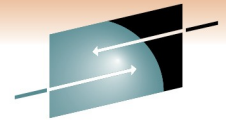
Reports

- HCD Reports
 - Textual Reports: CSS configuration (like IOCP reports), OS configuration, switch configuration, CTC connections, CF connections, supported hardware, compare reports
 - Graphical Reports (logical view): bookmaster, DCF, GML, GDF
- HCM Reports
 - HCD textual reports
 - Textual: processor, switches, controllers, strings, cables and links, cabinets and general boxes, crossbar switches
 - Format: print, XML, csv
 - Graphical reports (physical view): diagrams



Migration to z/VM HCD

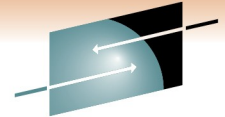
- Change the dynamic I/O configuration method from CP commands to lock-step mechanism of HCD.
- Two scenarios:
 1. Installation has no z/OS system:
 - > IODF definition for z/VM has to be done by z/VM HCD
 2. Installation has a z/OS system
 - > IODF definition for z/VM can be done by z/OS HCD



Scenario 1: z/VM is used to define the IODF

- Step 1: Prepare your IOCP deck for migration to the IODF
 - Step 2: Migrate the IOCP deck
 - Step 3 (optional): Migrate your RDEV information
 - Step 4: Verify the IODF configuration
 - Step 5: Prepare for POR and IPL with the production IODF
 - Step 6: POR with HCD generated IOCDS
 - Step 7: IPL with IODF
 - Step 8: Load IODF into HCM
-
- Recurring step: Perform dynamic I/O reconfiguration

Step 1: Prepare your IOCP for migration



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- Use comment tags `*$HCDC$` and `*HCD`
- RESOURCE statement:

- Include partition usage types

```
RESOURCE PART=( (LP1,1) , (LP2,2) , (LP3,3) , (CF1,4) )
*$HCDC$      USAGE=( OS,OS,OS,CF)
```

- CHPID statements:

- Provide switch connection data
- Provide coupling facility connection data

```
CHPID PATH-( CSS(0) , 14 ) , SHARED , PCHID=100 , TYPE=FC
*$HCDC$      SWPORT=( A0 , 18)
```

- CNTLUNIT statements:

- Change UNIT operand to control unit type that is supported by HCD
- Provide switch connection data
- Provide serial numbers for DASD/TAPE control units

```
CNTLUNIT CUNUMBR=8000 , PATH=( 14 , 16 , 19 , 1B ) , LINK=( E0 , E4 , E8 , EC ) ,      *
          CUADD=0 , UNITADD=( 00 , 64 ) , UNIT=2107
*$HCDC$      SWPORT=( ( A0 , E0 ) , ( A0 , E8 ) , ( B0 , E4 ) , ( B0 , EC ) ) , SERIAL='23425'
```

- IODVICE statements:

- Change UNIT/MODEL operands to device types that are supported by HCD

- Include SWITCH statements for the used directors

```
*$HCD$      SWITCH SWID=A0 , ADDRESS=60 , PORT=( ( 04 , 43 ) , ( FE , FE ) ) , UNIT=2032
```

Step 2: Migrate the IOCP deck to IODF

- Create and initialize an empty work IODF
 - `cbdsiodf iodf71 workiodf h 4096`
- Migrate the prepared work IOCP deck into the work IODF
 - `cbdsmigr iodf71 workiodf h procl iocp a procl 2097-e12`
- Verify successful migration

- Inspect the output files:

CBDSMIGR MSGLOG

HCD message log file informs about the success of the migration function

CBDSMIGR LISTING

Assembler listing file informs about syntax errors

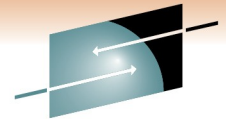
CBDSMIGR MESSAGES

Migration messages, inform about validation errors

- Repeat the migrate task until the IOCP has been successfully imported in the IODF
- Produce an HCD report and check the configuration for correct data
 - `cbdsrep iodf71 workiodf h iodf71 report a`

Step 3 (optional): Migrate RDEV data

- Create an RDEVLIST from your active z/VM system
 - `cbdsrdev vmconf rdevlist a`
- Migrate the RDEVLIST into your work IODF
 - `cbdsmigr iodf71 workiodf h vmconf rdevlist a r realvm`
- Complete the OS configuration
 - Export OS configuration as I/O configuration statements
 - `cbdsconf iodf71 workiodf h realvm deck a o realvm`
 - Update OS configuration with additional devices
 - `RDEVICE DEVNO=(1100,1),DEVTYPE=3215,OFFLINE=NO`
 - Re-migrate the updated OS configuration deck
 - `cbdsmigr iodf71 workiodf h realvm deck a op realvm`
- Verify the OS configuration
 - Generate an OS configuration report
 - `cbdsrep iodf71 workiodf h realvm report a mn`



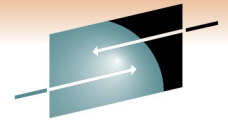
Step 4: Verify I/O configuration

- Check whether CSS definitions match the OS definitions
 - Use the HCD compare report to check partition configuration with OS configuration

```
cbdscomp iodf71 workiodf h * * * iodf71 compare a d
                                procl lp1 realvm
```
- Build the production IODF
 - `cbdsprod iodf71 workiodf h iodf71 prodiodef h`
- Inspect the messages given in the HCD message log file
 - `CBDSPROD MSGLOG A`
 - Error messages does not allow the production IODF to be built
 - Warning messages/information messages may indicate configuration problems
- Correct the IODF definitions if necessary

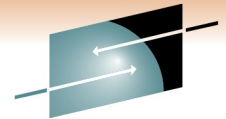
Step 5: Prepare for POR and IPL with production IODF

- Perform an IOCDS download
 - `cbdsiocp iodf71 prodiodef h procl i al`
- Copy the production IODF to the SYSPARM disk
- Set up the SYSTEM CONFIG file
 - Insert IODF statement
`IODF IODF71 REALVM`
or
`IODF * REALVM`



Step 6: POR with HCD generated IOCDS

- Adapt the Reset Profile to allow dynamic changes.
- Select the IOCDS slot to which the IODF processor configuration has been written.
- Perform a POR.



Step 7: Perform IPL

- IPL your system
- After IPL, check if HCD controls the I/O configuration

- `q hcd`

```
HCD is currently active: IODF = IODF71 PRODIODF
```

```
HCD is enabled for dynamic hardware changes
```

```
HCD is controlling the software configuration
```

```
HCD recover is not currently required
```

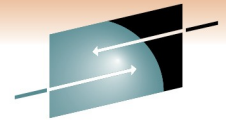
```
Ready;
```

- `q token`

```
PROC1..m.o.....10-03-1007:50:15SYS4      IODF71
```

```
Ready;
```

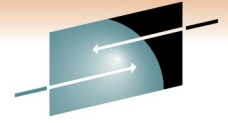
- If IODF to be loaded is not on the SYSPARM disk, a disabled WAIT occurs.



Step 8: Load IODF into HCM

- Download HCM from host and run installation EXE file.
- On z/VM host, start HCD dispatcher
 - `cbdsdisp`
- Launch HCM from your workstation
- Logon to the z/VM user, using TCP/IP host name and port number
- In **File** menu, select item **IODFs...**
- On the **IODFs** list, select the work IODF and press the LOAD button
- Provide the name of the HCM configuration file
- You now see the default configuration diagram of the IODF and are now ready to work with HCM.
- For new logins, select **File** – **Open** to open the HCM configuration file

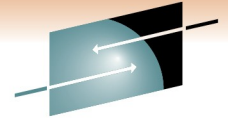
Recurring step: Perform dynamic I/O



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- Using HCD, build a new production IODF with the changes:
 - Make a work IODF from your active production IODF
`cbdswork iodf71 prodiodef h iodf72 workiodf h`
 - Export processor and OS configurations to CMS files
`cbdsconf iodf72 workiodf h procl deck a i procl (repl`
`cbdsconf iodf72 workiodf h realvm deck a o realvm (repl`
 - Edit the I/O configuration statements with the changes
 - Remigrate the changed configuration files (partial migrate)
`cbdsmigr iodf72 workiodf h procl deck a ip procl`
`Cbdsmigr iodf72 workiodf h realvm deck a op realvm`
 - Build production IODF
`cbdsprod iodf72 workiodf h iodf72 prodiodef h`
- Or, use HCM to perform the changes to the IODF directly
- Activate the changes
 - `cbdsact iodf72 procl realvm a1`
- Use `q hcd` and `q token` to check that the new configuration is active.

Scenario 2: z/OS is used to define the IODF

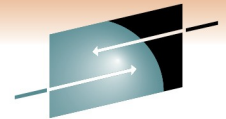


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Almost same steps as with scenarios 2, however, they may be done differently.

- Step 1: Prepare your z/VM IOCP deck for migration to the IODF
- Step 2: Migrate the IOCP deck
- Step 3 (optional): Migrate your RDEV information
- Step 4: Verify the IODF configuration
- Step 5: Prepare for POR and IPL with the production IODF
- Step 6: POR with HCD generated IOCDS
- Step 7: IPL with IODF
- Step 8: Load IODF into HCM

- Recurring step: Perform dynamic I/O reconfiguration



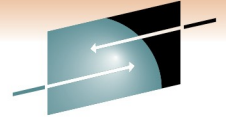
Step 1: Prepare your IOCP for migration

- identical to scenario 1

Step 2: Migrate the IOCP deck to the IODF

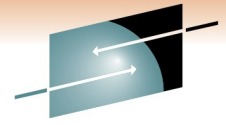
- Transmit the IOCP deck from your z/VM to your z/OS system
 - `Sendfile procl iocp to ossys at boetrx2`
- Migrate the VM IOCP deck using z/OS HCD into the existing work IODF

Step 3 (optional): Migrate your RDEV data



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- Export your work IODF to z/VM using z/OS HCD
- Import the work IODF under your z/VM system
 - `cbdsimp 0018 iodf71 workiodf h`
- Create an RDEVLIST from your active z/VM system
 - `cbdsrdev vmconf rdevlist a`
- Migrate the RDEVLIST into your work IODF
 - `cbdsmigr iodf71 workiodf h vmconf rdevlist a r realvm`
- Complete the OS configuration
 - Export OS configuration as I/O configuration statements
 - `cbdsconf iodf71 workiodf h realvm deck a o realvm`
 - Update OS configuration with additional devices
 - `RDEVICE DEVNO=(1100,1),DEVTYPE=3215,OFFLINE=NO`
 - Re-migrate the updated OS configuration deck
 - `cbdsmigr iodf71 workiodf h realvm deck a op realvm`
- Verify the OS configuration
 - Generate an OS configuration report
 - `cbdsrep iodf71 workiodf h realvm report a mn`
- Export the work IODF back to z/OS
 - `cbdsexp iodf71 workiodf h ossys boetrx2`

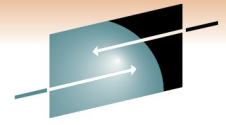


Step 4: Verify I/O configuration

- If you are using HCM with z/OS HCD, open your HCM configuration file connected to your work IODF. A resync will take place.
- Other tasks are same as with scenario 1 but tasks are done in z/OS HCD or z/OS HCM.

Step 5: Prepare for POR and IPL with production IODF

- Perform remote IOCDS download under z/OS HCD for the CEC running your z/VM system
- Export the production IODF to your z/VM system and receive it there
- Copy the production IODF to the SYSPARM disk
- Set up the SYSTEM CONFIG file as with scenario 1



Step 6: POR with HCD generated IOCDs

- Same as with scenario 1

Step 7: Perform IPL

- Same as with scenario 1

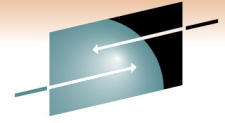
Step 8: Load the IODF into HCM

- If you are using HCM with z/OS HCD, open your HCM configuration file connected to your work IODF. A resync will take place to include the new processor configuration into the HCM configuration and diagram.

Recurring step: Perform dynamic I/O

- Using the z/OS HCD or z/OS HCM dialogs, build a new production IODF with the changes for your z/VM CPC or VM operating system.
- Distribute the production IODF to your z/VM CPC.
- Activate the changes
 - `cbdsact iodf72 procl realvm a1`
- Use `q hcd` and `q token` to check that the new configuration is active.

Exchange an IODF between z/VM and z/OS

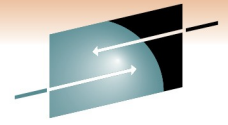


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- Export an IODF from z/OS to z/VM
 - z/OS HCD function **Export IODF** (dialog option 6.5). Use CMS **RECEIVE** or the **CBDSIMP** REXX utility to obtain the CMS file.
 - Use FTP to the exported VSAM data format
 - Use z/OS HCM function **Export IODF** to download the exported format to the HCM workstation. Send the file as mail attachment or connect HCM to z/VM. Use HCM function **Import IODF** to establish the IODF as CMS file.
- Export an IODF from z/VM to z/OS
 - Use CMS **SENDFILE** or the **CBSEXP** REXX utility. On z/OS, use HCD dialog option 6.6. (**Import IODF**).
 - Use FTP to the CMS file. On z/OS, use HCD dialog option 6.6.
 - Use HCM function **Export IODF** to download the IODF to the workstation. Connect to z/OS HCD. Use HCM function **Import IODF** to establish the IODF as VSAM file.
- Sharing volume between z/OS and z/VM
 1. Bring up z/OS guest on z/VM.
 2. Invoke z/OS HCD and use option 6.5 **Export IODF** to shared DASD xxxx.
 1. **VARY xxxx, OFFLINE**
 1. Detach device xxxx from z/OS.

On z/VM:

 5. **ATTACH xxxx * R/O** or link to the appropriate full-disk minidisk
 6. **ACCESS xxxx T**
 7. **LISTDS T**
 8. **FILEDEF IODFIN T DSN userid.exported.iodf01 (DSORG PS**
 9. **FILEDEF IODFOUT DISK IODF01 PRODIODF H**
 10. **MOVEFILE IODFIN IODFOUT**



Session Summary

- This session showed
 - What benefits the use of HCD and HCM for I/O configuration management has.
 - How HCD and HCM can be used to manage the I/O configuration for z/VM.
 - Which are the migration steps to use HCD and HCM

- Q & A

Appendix

References:

- z/VM I/O Configuration, SC24-6100
- z/OS and z/VM Hardware Configuration Manager User's Guide, SC33-7989
- z/OS and z/VM Hardware Configuration Definition Messages, SC33-7986

HCD/HCM Homepage:

- <http://www.ibm.com/servers/eserver/zseries/zos/hcm/>