

# IBM Education Assistance for z/OS V2R1

Item: I/O Autoconfiguration (zDAC) Stage 4

Element/Component: HCD/HCM



## Agenda

- Overview - Verify configuration available by using zDAC
- Overview - Provide single point of failure information
- Usage & Invocation
- Interactions & Dependencies
- Presentation Summary
- Appendix



## Overview – Verify configuration available by using zDAC

- Problem Statement / Need Addressed
  - Verify configuration is available only, if Tivoli System Automation (TSA) I/O Operations is installed and loaded. TSA I/O Operations is a priced product.
- Solution
  - For processors capable of zDAC (z196 / z114) zDAC is used to discover the active configuration, if TSA I/O Operations is not operational.
- Benefit / Value
  - The prerequisite for TSA I/O Operations is removed.



## Overview – Provide single point of failure information

- Problem Statement / Need Addressed
  - There is no information on single points of failure (SPOF) for active paths within HCD.
- Solution
  - Integrate information provided by macro IOSSPOF into I/O path report.
- Benefit / Value
  - Customers can easily identify single points of failure.



## Usage & Invocation – similar to existing IO path report

- Use production IODF
- Option 2
  - activate or process
- Option 6
  - activate or verify
- Option 4 or 5
  - verify ..
- Identify target

z/OS V2.1 HCD

C Activate or Process Configuration Data

S Activate or Verify Configuration

6

2

The currently active IODF matches the hardware I/O configuration. Both hardware and software definitions may be changed. Select one of the following tasks.

1. Activate new hardware and software configuration.
2. Activate software configuration only. Validate hardware changes. Process changes to Coupling Facility elements.
3. Activate software configuration only.
4. \*Verify active configuration against system.
5. \*Verify target configuration against system.
6. Build CONFIGxx member.

Identify System I/O Configuration

Specify or revise the following values. Press ENTER to continue.

IODF to be used . . . . : SYS1.IODF01

Processor ID . . . . : P35 +

Partition name . . . . : TRX1 +

OS configuration ID . . : MVSVM +

I/O Cluster name . . . . : \_\_\_\_\_ + (only for Build CONFIGxx)

F3=Exit      F9=Swap      F12=Cancel



## Usage & Invocation – also via sysplex list

### Actions on selected systems

- Use production IODF

- Option 2  
activate or process configuration ...

- Option 7  
activate configuration sysplex-wide

Select by number or action code and press Enter.

```

      Goto  Query  Help
-----
      Active Sysple...
Command ==> _____ Scroll ==> PAGE

1.  Activate software configuration only . . . . . (o)
2.  Activate software and hardware configuration (a)
3.  Resume activation of target configuration . (t)
4.  Reset source configuration . . . . . (r)
5.  Switch IOCDs for next POR . . . . . (s)
6.  View messages . . . . . (m)
7.  Delete messages . . . . . (d)
8.  View configuration status . . . . . (v)
9.  *Verify active configuration against system (k)
10. *Verify target configuration against system (l)
11. Build CONFIGxx member . . . . . (b)
12. Process DISPLAY M=CONFIG(xx) command . . . . (p)
    
```

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

IODF to be activated: SYS1.IODF00  
Active sysplex . . : TRX1PLEX

System	Processor	Partition	Active	Config.	EDT	Act./Verify
/ Name	ID	Name	IODF	ID	ID	Status
/ TRX1	P35	TRX1	SYS1.IODF01	MVSVM	00	
_ TRX2	P35	TRX2	SYS1.IODF01	MVSVM	00	

\*\*\*\*\* Bottom of data \*\*\*\*\*



## Usage & Invocation – Informational message about zDAC being used

When TSA I/O Operations is not available, HCD tries to retrieve the active configuration via zDAC.

Messages are sorted by severity. Select one or more, then press Enter.

```
/ Sev Msg. ID  Message Text
_ E   CBDG133I I/O Operations processing completed unsuccessfully.
#           Return code = 20 and reason code = 300D0004. IHVU029I
#           I/O-OPS IS NOT OPERATIONAL.
_ I   CBDG375I I/O path is generated by means of IOS system discovery.
#           Sensed data is limited to FICON attached storage devices
#           on local system.
***** Bottom of data *****
```





## Usage & Invocation – resulting I/O path list

Goto Filter Backup Query Help

I/O Path List Row 5 of 1515 More: >

Command ==> \_\_\_\_\_ Scroll ==> PAGE

Accessed IODF: SYS1.IODF01

Active IODF : SYS1.IODF01

System . : THIS-SYS

Processor . : P35

Partition : TRX1

OS config: MVSVM

----I/O Path-----			-----Sensed Data-----				-----IODF Data-----				D
CHP	CU	DEV	STAT	CHT	CUTYPE	DEVTYPE	O	CHT	CUTYPE	DEVTYPE	S
0D	0621	0620,16						OSM	OSM	OSA-M	*
30	2000	2000,2	5	FC_S	2107-9A2	3390B		FC	2107	3390B	
30	2000	2002,17		FC_S	2107-9A2	3390B	Y	FC	2107	3390B	
30	2000	2013	5	FC_S	2107-9A2	3390B		FC	2107	3390B	
30	2000	2014,14		FC_S	2107-9A2	3390B	Y	FC	2107	3390B	
30	2000	2022,4	5	FC_S	2107-9A2	3390B		FC	2107	3390B	
30	2000	2026,9		FC_S	2107-9A2	3390B	Y	FC	2107	3390B	
30	2000	202F	5	FC_S	2107-9A2	3390B		FC	2107	3390B	
30	2000	2030,32		FC_S	2107-9A2	3390B	Y	FC	2107	3390B	





## Changed column STAT to indicate Single Point Of Failure

- Operational (blank),
- not operational (OFFL),
- or unknown (UNKN).
- If the report has been requested for the local system, it contains the status as returned from IOCINFO PATHMAP for the channel path in focus. For all operational paths (either via IOCINFO or I/O Operations API) a check for single point of failure is performed. The 4 letters map in following way
  - POS 1: BLANK OR NUMBER BETWEEN 3 AND 8, (3: BOOK, 4: CAGE, 5: FAILOVER DOMAIN, 6: FANOUT, 7: DOMAIN, 8: SECONDARY STI/STI)
  - POS 2: C, IF CU I/F SHARE SINGLE POINT OF FAILURE
  - POS 3: P, IF DEVICE HAS ONLY ONE PATH ONLINE
  - POS 4: S, IF ALL PATHS GO THROUGH ONE SWITCH



## Column explanations

- Senseds Data - CHT is the channel path type as returned ....from IOSCHPT. In case of discovery this information is only available, if the report is done for the local system.
- Senseds Data - CUTYPE ..... if ZDAC was used: the type as specified in the node descriptor of the controller.
- Senseds Data - DEVTYPE .... if ZDAC was used: the device type is the type found in the IODF (only filled, if the report is issued for the local system and if we have a token match with the active IODF)
- Senseds Data - O ... if ZDAC was used the state is the state returned from UCBSCAN. (only filled, if the report is issued for the local system and if we have a token match with the active IODF)



## Usage & Invocation: Issue I/O path report via dialog

- Option 3 Print or compare
- Option 1 Print configuration reports
- Select I/O path report
- Limit reports

Limit Reports

To limit the reports, specify the following to the IODF in access.

Processor ID . . . . . + CSS, CTC, I/O path reports

Partition name . . . . . + CSS, CTC, I/O path report

OS configuration ID . . . . . + OS, I/O path report

Switch ID . . . . . + switch report

Specify the sysplex and system name to gather the actual configuration from. (Blanks default to the local system.)

Sysplex name . . . . . I/O path report

System name . . . . . I/O path report

F1=Help    F2=Split    F3=Exit    F4=Prompt    F5=Reset

F9=Swap    F12=Cancel

C Print or Compare Configuration Data

Print Configuration Reports

Select the types of report you want, and specify the values below.

IODF name : 'REDDE.IODF23.TEST'

Types of report	Limit report(s)
<input type="checkbox"/> CSS report	1 1. Yes
<input type="checkbox"/> Switch report	2. No
<input type="checkbox"/> OS report	
<input type="checkbox"/> CTC connection report	
<input checked="" type="checkbox"/> I/O path report	



## Usage & Invocation – Informational message about zDAC being used

When TSA I/O Operations is not available, HCD tries to retrieve the active configuration via zDAC.

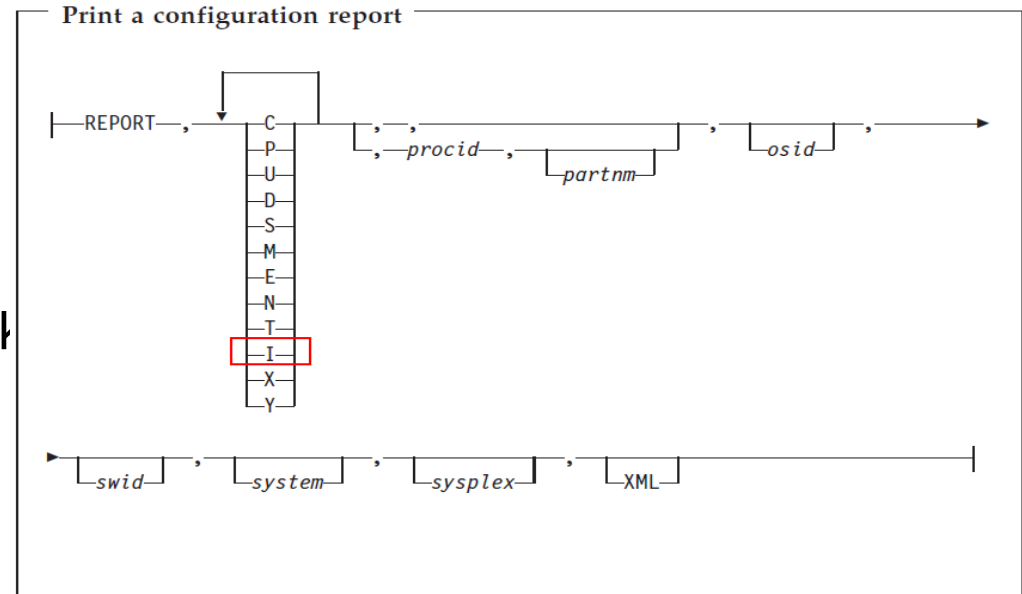
Messages are sorted by severity. Select one or more, then press Enter.

```
/ Sev Msg. ID  Message Text
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***** Bottom of data *****
```



## Commands

- Batch invocation for IO path report is unchanged.
- Sysplex name must be blank or local sysplex if TSA I/O operations is not available



e.g.

```
//REPORT1 EXEC PGM=CBDMGHCP,
//
      PARM='REPORT,I,PROC1,PART1,MVS1,MYSYS,MYPLEX'
//HCDIODFS DD DSN=BWIN.IODF03.WORK,DISP=SHR
```



## Messages (New and Updated)

- CBDG375I I/O path is generated by means of IOS system discovery. Sensed data is limited to FICON attached storage devices on local system.

- CBDG376I I/O path report using discovery is not possible.  
Reason: @1 Error information: @2 @3 @4

(sysplex not local, system not known, active IODF not available, dynamic changes not allowed ..)

- CBDC096I Preparation of I/O path report in process - please wait ...



## Interactions & Dependencies

- User must be authorized to perform dynamic activation
- Software Dependencies
  - None.
- Hardware Dependencies
  - IBM zEnterprise 196 or IBM zEnterprise 114 servers or IBM zEC 12
- Exploiters
  - Systems programmers responsible for I/O definition





## Presentation Summary

- This presentation explained the functional enhancements of the I/O path report to verify a configuration, along with its setup, usage and diagnostic information.

The functional enhancements are:

- The usage of zDAC for discovery in case TSA I/O operations not being available
- Giving information about single points of failure (SPOF).



## Appendix

- Hardware Configuration Definition User's Guide, SC33-7988
- Hardware Configuration Manager User's Guide, SC33-7989
- Hardware Configuration Definition Messages, SC-7986
- Hardware Configuration Definition Planning, GA22-7525
  
- HCD/HCM Homepage:
  - <http://www.ibm.com/systems/z/os/zos/features/hcm/>
  
- HCD/HCM Contact:
  - [IBMHCD@de.ibm.com](mailto:IBMHCD@de.ibm.com)

