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HCD z/VM and HCM support for zEC12 and zBC12

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HCD z/VM and HCM support for zEC12 and zBC12

With APAR VM65239 the support for two new processors - IBM zEnterprise EC12 server (zEC12) and IBM zEnterprise BC12 server (zBC12) - is available as well as new HCD functionality like support for Peripheral Component Interconnect Express (PCIe) adapters and Physical Network Ids (PNET IDs).

1.0 HCD z/VM 6.2:

Exploitation support for the IBM zEnterprise EC12 server (zEC12) and IBM zEnterprise BC12 server (zBC12).

The new processors are defined with

- type 2827 - model : H20, H43, H66, H89, HA1.
- type 2828 - model : H06, H13.

For a list of all supported processor types/models and their capabilities see the 'Supported Hardware Report' in HCD.

The following enhancements are introduced with this APAR:

- PCIe functions
- New CHPID attribute (PNET ID)
- New/changed reports

1.1 PCIe functions:

To support PCIe functions, HCD has added the FUNCTION keyword to its I/O configuration statements, which can be migrated into an IODF.

A PCIe function is specified with the FUNCTION statement which contains following keywords :

FID	Identifies the PCIe function within the processor configuration	mandatory	three hexadecimal characters (valid range X'000' - X'0FF')
UNIT	Identifies the PCIe function type	optional	Valid unit types: ROCE (default) ZEDC-EXPRESS
PCHID	Identifies the PCIe adapter card which provides the specified function by specifying the slot of the card in the I/O drawer	optional	three hexadecimal characters
VF	Identifies the PCIe virtual function number	optional	up to two decimal digits
PNETID	Identifies the physical network Ids (only valid for ROCE)	optional	(pnetid1,...,pnetid4) up to four 16-character alphanumeric physical network IDs
PART	Specifies the access and candidate lists of partitions	mandatory	access list: limited to one partition

	entitled to use the PCIe function.		candidate list : number of partitions not limited
DESC	Specifies a description of the PCIe function	optional	up to 32 characters

The following example defines a PCIe function of type ROCE.

```
FUNCTION FID=051,UNIT=ROCE,PCHID=53A, *
PNETID=(PNET01,,PNET03), *
PART=((LP01),(LP03,LP05,LP07)), *
DESC='function description'
```

Migration considerations:

The UNIT and DESC keyword are unknown to IOCP and have to be specified with *\$HCDC\$, if used to call IOCP.

It is necessary during IOCP data set build to work with extended migration which generates the additional keywords *\$HCDC\$ (HCD profile: MIGRATE_EXTENDED = YES) otherwise a problem may occur when re-migrating the IOCP data set because the PCIe Unit parameter is unknown and defaulted to 'ROCE'.

Sample:

```
FUNCTION FID=051,PART=((LP01),(LP03,LP05,LP07)), *
PNETID=(PNET01,,PNET03,),PCHID=53A
*$HCDC$ UNIT=ROCE
*$HCDC$ DESC='function description'
FUNCTION FID=005,VF=1,PART=((LP14),(LP01)),PCHID=105
*$HCDC$ UNIT=ZEDC-EXPRESS
*$HCDC$ DESC='myDescription'
```

PCIe support in HCM

HCM introduces a new dialog where users can define PCIe functions and assign them to LPARs.

To define, delete or change PCIe functions, click on the **Edit...** button in the **Processor** dialog to display the **Edit Processor** dialog. Then click on the **PCIe...** button to open the PCIe Functions dialog

PCIe Functions

PCIe Functions for: P35

Function ID	Virtual Func	PCHID	Function Type	Description	Access List	Candidate List	01	02	03	04	05	06	07
021		374	ROCE	LP48, 10.19.25.37.38.46	3.R35LP48	0.R35LP10 1.R35LP19 1.....							
020		370	ROCE	LP46, 10.19.25.37.38.48	3.R35LP46	0.R35LP10 1.R35LP19 1.....							
01F		364	ROCE	LP48, 10.19.25.37.38.46	3.R35LP48	0.R35LP10 1.R35LP19 1.....							
01E	1	360	ZEDC-EXPRESS	LP46, 10.19.25.37.38.48	3.R35LP46	0.R35LP10 1.R35LP19 1.....							
01D	2	35C	ZEDC-EXPRESS	LP38, 10.19.25.37.38.46.48	1.R35LP16	0.R35LP10 1.R35LP19 1.....							
01C	3	358	ZEDC-EXPRESS	LP01, 10.19.25.38.37.46.48	0.R35LP01	0.R35LP10 1.R35LP19 1..... A							
01B		344	ROCE	LP37, 10.19.25.38.46.48	2.R35LP37	0.R35LP10 1.R35LP19 1.....							
01A		340	ROCE	LP19, 10.25.37.38.46.48	0.R35LP06	0.R35LP10 1.R35LP25 2.....				C	C	A	C
019		33C	ROCE	LP25, 10.19.37.38.46.48	0.R35LP06	0.R35LP10 1.R35LP19 2.....				C	C	C	A
018		338	ROCE	LP10, 19.25.37.38.46.48	0.R35LP10	1.R35LP19 1.R35LP25 2.....							
017		334	ROCE	LP37, 10.29.25.38.46.48	2.R35LP37	0.R35LP10 1.R35LP19 1.....							
016	7	330	ZEDC-EXPRESS	LP19, 10.25.37.38.46.48	1.R35LP19	0.R35LP10 1.R35LP25 2.....							
015	8	324	ZEDC-EXPRESS	LP25, 10.19.37.38.46.48	1.R35LP25	0.R35LP10 1.R35LP19 2.....							
014	9	320	ZEDC-EXPRESS	LP10, 19.25.37.38.46.48	0.R35LP10	1.R35LP19 1.R35LP25 2.....							
013		30C	ROCE	LP36, 24.47.51	0.R35LP01	1.R35LP24 3.R35LP47 3..... A				C	C	C	
012		308	ROCE	LP24, 36.47.51	1.R35LP24	2.R35LP36 3.R35LP47 3.....				C	C	C	
011		318	ROCE	LP51, 24.36.47	3.R35LP51	1.R35LP24 2.R35LP36 3.....				C			
010		314	ROCE	LP47, 24.36.51	0.R35LP02	1.R35LP24 2.R35LP36 3.....				A			

Partition legend:

01=R35LP01 02=R35LP02 03=R35LP03 04=R35LP04 05=R35LP05 06=R35LP06 07=R35LP07 08=R35LP08
09=R35LP09 0A=R35LP10 0B=R35LP11 0C=IRD7 0D=R35LP13 0E=R35LP14 0F=R35LP15
11=R35LP16 12=R35LP17 13=R35LP18 14=R35LP19 15=R35LP20 16=R35LP21 17=R35LP22 18=R35LP23
19=R35LP24 1A=R35LP25 1B=IRD6 1C=IRD8 1D=R35LP28 1E=R35LP29 1F=R35LP30
21=R35LP31 22=R35LP32 23=R35LP33 24=R35LP34 25=R35LP35 26=R35LP36 27=R35LP37 28=R35LP38
29=R35LP39 2A=TRXC2FA 2B=R35LP41 2C=TRX1 2D=R35LP43 2E=R35LP44 2F=R35LP45
31=R35LP46 32=R35LP47 33=R35LP48 34=R35LP49 35=R35LP50 36=R35LP51 37=R35LP52 38=R35LP53
39=R35LP54 3A=R35LP55 3B=R35LP56 3C=TRX2 3D=R35LP58 3E=R35LP59 3F=R35LP60

The PCIe Functions dialog shows the existing PCIe functions defined in the currently accessed IODF. This dialog offers all required actions to manage PCIe functions in your configuration. Select any of the listed PCIe functions to either edit or delete it.

To define new PCIe functions, you can use either the **Add...** or **Copy...** button.

Add PCIe Function

Processor: P35

Function ID: 022

Function type: ZEDC-EXPRESS

Virtual function number: 4

PCHID: 380

Description: assigned to partition 0.IRD7

Physical Network IDs

Physical Network ID 1:

Physical Network ID 2:

Physical Network ID 3:

Physical Network ID 4:

Unassigned Partitions:

CSS Partition	Usage	Description
0.R35LP01	OS	
0.R35LP02	OS	
0.R35LP03	OS	
0.R35LP07	OS	
0.R35LP08	OS	
0.R35LP09	OS	
0.R35LP10	OS	
0.R35LP11	OS	z/VSE
0.R35LP13	OS	Mini-VM
0.R35LP14	OS	Automation-VM
0.R35LP15	OS	TEST - VM
1.IRD6	CF/OS	z/OS IRD6 zu IRD...
1.IRD8	OS	z/OS
1.R35LP16	OS	
1.R35LP17	OS	
1.R35LP18	OS	
1.R35LP19	OS	
1.R35LP20	OS	
1.R35LP21	OS	
1.R35LP22	OS	
1.R35LP23	OS	
1.R35LP24	OS	

Access list: 0.IRD7

Candidate list: 0.R35LP04, 0.R35LP05, 0.R35LP06

Buttons: Add >>, << Remove, Add >>, << Remove, OK, Cancel, Help

1.2 New CHPID attribute:

The CHPID statement has been enhanced to support the new optional operand PNET ID which is only applicable for CHPID type OSD and IQD.

IQD only accepts one Physical Network Id.

If the target processor type does not support PNET ID values, the CHPID statement will be processed with the PNET ID value being ignored.

Note:

HCD will not automatically adapt different Physical Network Id specifications for the same PCHID value on multiple PCIe functions.

Input statements have to be consistent; otherwise error message CBDG578I would be given when the production IODF is being built.

Sample:

```
CHPID PATH=(CSS(0),11),PARTITION=((LP01),(LP04),REC),          *
          PCHID=041,PNETID=(,NET11,NET2,),TYPE=OSD
*$HCDC$          DESC='myDescription'
```

1.3 Reports:

HCD provides following two new reports as part of the 'Channel Subsystem Summary Report':

- The '**PCIe Function Summary Report**' displays the partitions in the access and candidate lists which are entitled to access the available PCIe functions.

```
                                PCIe FUNCTION SUMMARY REPORT                                TIME: 10:57 DATE: 2013-06-11 PAGE A- 6
PROCESSOR ID  PROCNEW1 TYPE  2827  MODEL HA1  CONFIGURATION MODE: LPAR
                                PARTITION NUMBERS
FID VF PCHID TYPE          CSS0----- CSS1----- CSS2----- CSS3----- DESCRIPTION
                   123456789ABCDEF 123456789ABCDEF 123456789ABCDEF 123456789ABCDEF
001 1 010  ZEDC-EXPRESS ----- A----- C-----
002 2 010  ZEDC-EXPRESS ----- A----- C-----
003 3 010  ZEDC-EXPRESS ----- A----- C-----
010 500  ROCE          ----- A----- C-----
```

- The '**PCHID Summary Report**' as part of the CSS Summary Report lists all defined channel paths and PCIe functions sorted by their defined PCHID values or, as applicable, by their HCA adapter / port Ids.

PCHID SUMMARY REPORT

TIME: 10:57 DATE: 2013-06-11 PAGE A- 11

PROCESSOR ID PROCNEW1 TYPE 2827 MODEL HA1 CONFIGURATION MODE: LPAR

PCHID	VF	CHPID FID	TYPE	SWITCH	CSS Numbers	PNET-1	PNET-2	PNET-3	PNET-4
010	1	001	ZEDC-EXPRESS		1 2				
010	2	002	ZEDC-EXPRESS		1 2				
010	3	003	ZEDC-EXPRESS		1 2				
1D1		A1	OSD		1				
1E0		0A	CFP		2 3				
1E8		0B	CFP		2 3				
261		A0	OSD		2				
384		0F	OSD		1				
500		010	ROCE		1 2	A12345		C223344	
551		94	OSE		1				
5A0		76	OSD		2 3				

TOTALS FOR CHANNEL CARD TYPES								INTERNAL CHPIDS		PCIE FUNCTIONS	
CFP	CIB	FC	FCP	OSC	OSD	OSE	OSN	ICP	IQQ	ROCE	ZEDC
2	0	0	0	0	4	1	0	0	0	2	3

The '**PCIe compare report**' (which is a part of the IODF compare reports) allows to compare PCIe changes. The IODF compare report can be limited to the 'PCIe Compare Report' by the limit string CF.

e.g. PARM='COMPARE,AB,CL,CF,PROCNEW1,LPAR1,PROCNEW1,LPAR1'

PCIe Function Compare Report

TIME: 14:58 DATE: 2013-06-11 PAGE A - 2

New IODF name: IOF01 WORKIODF A

Old IODF name: IOF02 WORKIODF A

PROC	FID	New IODF	Old IODF	Description
PROCNEW1	001	Added		
		112		Physical Channel ID (PCHID)
		ZEDC-EXPRESS		Function Type
		1		Virtual Function ID (VF)
				Function Description
		>> LPAR1		Partition in Access List
PROCNEW1	020		Deleted	
			023	Physical Channel ID (PCHID)
			ZEDC-EXPRESS	Function Type
			1	Virtual Function ID (VF)
				Function Description
			>> LPAR1	Partition in Access List

2.0 z/VM 5.4 HCD

Exploitation support for the IBM zEnterprise EC12 server (zEC12) and IBM zEnterprise BC12 server (zBC12).

The new processors are defined with

- type 2827 - model : H20, H43, H66, H89, HA1.
- type 2828 - model : H06, H13.

For a list of supported processor types/models and their capabilities see the 'Supported Hardware Report' in HCD.

The following enhancements are tolerated with this APAR:

- PCIe functions
- New CHPID attribute (PNET ID)

2.1 Three scenarios need to be distinguished:

2.1.1 Scenario 1:

A **work or production IODF** with zEC12 GA2 or zBC12 processors does neither contain

- PCIe functions nor
- CHPIDs with PNET ID attributes.

Full support is available, including updates of a the work IODF, generation of reports, build production IODF, and all kinds of dynamic activates.

2.1.2 Scenario 2:

A **production IODF** with zEC12 GA2 or zBC12 processors contains

- PCIe functions and / or
- CHPIDs with PNET ID attributes

for the processor to be activated (in the active IODF or in the target IODF, or both).

- It is possible to perform a software-only activate or software activate with hardware validation.
 - A warning message CBDG593I (MSGCBDG593) will be issued:
"Processor @1 has PCIe functions or CHPIDs with PNET ID which are unknown to the HCD version or OS version. Both will be ignored."
- A full dynamic activate is not possible. If it is attempted, message CBDG592I (MSGCBDG592) is given:
 - "Processor @1 contains PCIe functions or CHPIDs with PNET ID, unsupported by the current HCD/OS version. Action is not possible."
- When generating an IOCP deck or issuing several reports, the unsupported objects are ignored and CBDG593I is issued.

2.1.3 Scenario 3:

A **work IODF** with zEC12 GA2 or zBC12 processors contains

- PCIe functions and / or
 - CHPIDs with PNET ID attributes
- for the processor to be activated.

- It is not possible to update the IODF or to build a production IODF. In both cases, message CBDG592 is issued (MSGCBDG592).
- This IODF must be maintained and activated on a z/VM 6.2 with VM65239 or z/OS V2R1 HCD system with OA39234 installed.