

Sysplex Coupling Links In zCP3000

2016 Channel Path Enhancements



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Overview

Starting with z/OS 2.1, a new section was added to the SMF type 74 subtype 4 “Coupling Facility Activity” records, entitled the “Channel Path Data Section”. This new SMF section provides additional detail about coupling link channel path (chpid)¹.

Why this matters to you

The addition of the new channel path data to the zCP3000 model automates some processes which previously had to be done manually, but more importantly, it adds data to the model which enables some new insights, particularly for understanding link configuration, getting a better idea of what is happening on a specific physical link, and more insight when analyzing service time of busy CF-SYS links.

The new 74.4 channel path section is generated for ICA (CS5), InfiniBand, and ISC3 linktypes. It is not generated for IC or ICB linktypes, or for SCP levels prior to z/OS 2.1. The new information, when provided and complete, provides the link distance, the adapter and link type, whether the link is operating in degraded mode, and the adapter id and port through which it is running. This solves some persistent problems with doing zCP3000 sysplex studies that previously required the modeler to manually add information to the model which had to be solicited from the customer team. But now, with 74.4 channel path detail:

- The InfiniBand linktype (12x, 1x, or IFB3) can now be discerned.
- Link distance between CPCs can now be discerned.
- The z/OS systems sharing a channel path will be known, if data has been collected from them all.
- The z/OS systems, and to a great extent, the coupling facilities, sharing a physical ICA or InfiniBand link (which carries up to 8 chpids), will be known, if data has been collected from all sysplex members. Although traffic by chpid is still not provided, the AID/port information will enable the modeler to estimate traffic per physical link.

EDF data input files from z/OS 2.1 systems since CP3KEXTR v12/2015 (December 2015) have included the new channel path information records. Exploitation of the new channel path information started in February 2016, but is expected to take more than a year to fully implement.

This is why, as always, when starting a new zCP3000 study, it is very important to download and use the latest available CP3KEXTR to create the EDF data input files, and the latest available zCP3000 to do the modelling.

¹ Please see Appendix B for the new fields collected in the EDF, and the SMF fields they came from.

Summary of Changes

February 2016

New information about sysplex coupling links started to be collected for zCP3000 capacity planning models starting with the December 2015 version of CP3KEXTR. Collected from SMF 74-4 channel path section records from z/OS 2.1 and up, then new information describes the actual physical links in use, including information about the link adapters, configuration information, latency (from which distance can be calculated), and whether the link was operating in degraded mode. This new information fills in some configuration information which is important to understanding the effects of a hardware or configuration change.

Starting with the Feb 2016 version of zCP3000:

- Channel path records are used during EDF load to fill in linktype, whether IFB3 protocol is in use, link distance, and sharing information, so that the modeler no longer has to bug the account team to provide that information, and no longer needs to do the “link quick fix”, or check off the sharing sysids for each link.²
- Existing reports PLEX1008 – Sysplex Coupling Summary (page 19) and CF1014 - Coupling Facility Summary (page 25) have been modified to use the new channel path information when available.
- CF1029 - Coupling Facility Link Summary (new) report (page 27) on the CF window graph list.

September 2016

While the new channel path section fills in key information about the z/OS end of a coupling link, the information is not reported for the CF end of a coupling link. Having full physical configuration information about a channel path is to be able to make observations about a physical coupling link. Starting with the Sept 2016 version of zCP3000:

- Coupling Links Summary Window (new), shown on page 11, documents the known (SYS-end) link configuration, and provides an interface for entering adapter, port, and chpid information for the CF-end of the link.
- New report CFLWorksheet - CF link configuration worksheet (page 13) is a formatted data-input worksheet to help make it easy to gather the missing configuration information from a customer or account team contact.
- New report PLEX1011 - Sysplex Coupling Adapter Summary (page 16) summarizes the known information about the physical link configuration, including sharing partitions, and an adapter/chpid map.

² Models created before Dec 2015 will not contain channel path information.

November 2016

- Introduction of a cached sysplex configuration, for use by CF and Sysplex windows, reports, and algorithms. This is a performance enhancement to zCP3000, to avoid having to find the same metrics over and over again. Initially exploited only by the “CF show red triangle” function.
- When channel path information records are available, the Coupling Link Detail window (see page 9) will show physical adapter/port/chpid information, effective linktype, and owning partitions, for each chpid.
- CFL005 - **Coupling Facility Link Topology** (see page 30) updated to use physical adapter/port/chpid information when available, including showing z/OS images sharing chpids, and z/OS or CF images sharing adapter/ports. This can be used to identify why a link is running in 12x when you thought it should be (faster) IFB3.

December 2016

Additional exploitation of sysplex channel path (chpid) detail:

- in QM when modelling a coupling link change for a CF-SYS pair, service time recalculations will be done for other z/OS systems sharing that chpid, if chpid information is known.
- CF chpid information can be added either in the coupling links window or in the Coupling Link Detail window (page 9) window.
- If too many fields are missing from the channel path information for a CF-SYS set of links, it will all be ignored; it cannot be edited in.
- bug fix for link util% when z/OS members are sharing chpids
- adjust the service time recalc algorithm for when only CF engine speed is changing.
- PLEX1011 - Sysplex Coupling Adapter Summary report (page 1616) will now use the cached sysplex configuration object (see November 2016 enhancements).

New and Changed Windows

zCP3000 displays coupling link information in a number of places. When the new channel path information is available, and where it makes sense, displayed link information has been changed to give you the best available insight for that level of detail. Illustrations in this section are mostly taken from the 2016 IBM zMasters lab materials for zCP3000. Please see the url on page 33 in the references and links appendix for downloading IBM zMasters (2016) zCP3000 Lab Testcase data.

zCP3000 Main Window

The addition of the channel path information section to the SMF 74-4 record, starting with z/OS 2.1, solves a number of problems with a zCP3000 sysplex model. Previously, uncertainties in the configuration would require additional, manual input from the modeler.

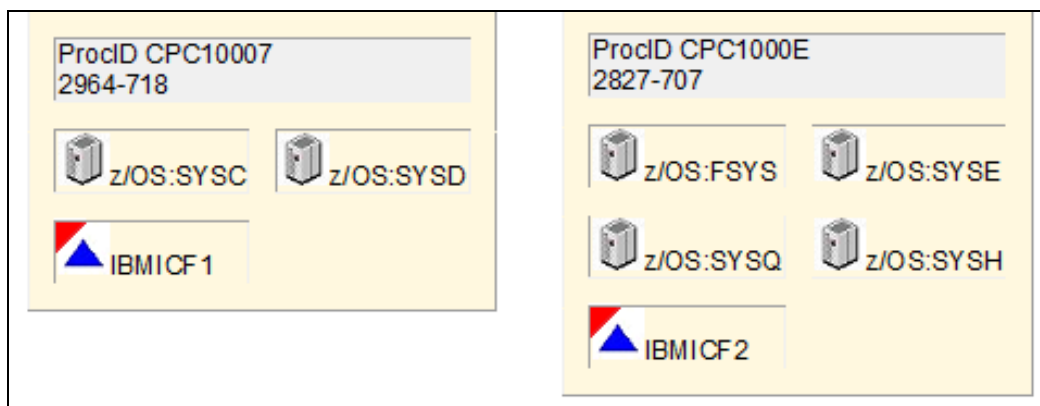


Figure 1 Configuration with errors, before zCP3000 v02/16

The coupling facilities in Figure 1 are marked with “red triangles” which flag CFs with definition errors that must be fixed before most reports are enabled. In this case, the CFs are using InfiniBand links; SMF prior to z/OS 2.1 identified these links as “CIB” (InfiniBand) channel type, but not which *type* of InfiniBand (ie, 1x, 12x, or IFB3). Additionally, shared channel paths are not known in the SMF data before 74-4 channel path information sections came along, but unlike the IFB linktype, what looks like an unshared chpid, but which is in fact shared by 2 or more partitions, would not generate a red triangle. Instead, it would simply look like there were more channel paths defined than there actually are.

With the new channel path information, most links will automatically be fully defined, manual editing will not generally be needed, and red triangles will be rare. For example, if this same sample data had been collected after January 2016, there would be no red triangles marking the IBMICF1 and IBMICF2 coupling facilities, because it would have known from the new link configuration data that:

- The “CIB” Infiniband links are actually IFB-12x links, some of which are running IFB3 protocol, and others which are running at 12x speed.
- From the latency field in the channel path information, it knows that the distance between the coupling facilities and the z/OS sysplex members is effectively zero.
- It knows that the adapters being used are HCA3-O type adapters (this could also be deduced from the IFB3 protocol, which requires HCA3-O type adapters on both ends).
- The zCP3000 model knows from the chpid value in the channel path information, that many of the coupling links are shared between several z/OS partitions on the same CPC. As shown in the Channel Path Information section of report CF1029, it is known that chpid 87, which runs through port 1 of adapter id 000A on CPC1000C over to IBMICF1 on CPC10007, that the z/OS systems SYSP, SYSA, SYST, SYSJ, SYSW, SYSB, and SYSL are sharing that chpid and 3 others for sysplex traffic to IBMICF1.

Note that even between a CF-SYS pair, there can be some links running at 12x speed and others at the faster IFB3 speed. If an IFB3-capable (HCA3-O type) adapter/port has been configured with more chpids than are allowed for IFB3 speed, it will instead run at the slower 12x speed. Not only is it unlikely that the modeler would know this, but zCP3000 does not support mixed linktypes when manually entering link configuration data. An example of mixed linktypes can be seen in Figure 3, where 3 of the 4 chpids between GFDEV and GFD2 are running at the slower 12x speed. A discussion of why those 3 chpids are running at 12x speed is included in the section discussing the Coupling Links Summary Window (new).

CF Detail Window

This window is reached by double-clicking a CF on the main zCP3000 window. In the link section of the window (near the top), the linktype column will now list all linktypes found for that CF-SYS set of links. Figure 2 shows that the 4 chpids between the GFD2 system and the GFCFDI coupling facility are made up of both IFB3 and IFB-12x links. IFB3 protocol links are considerably faster than 12x.

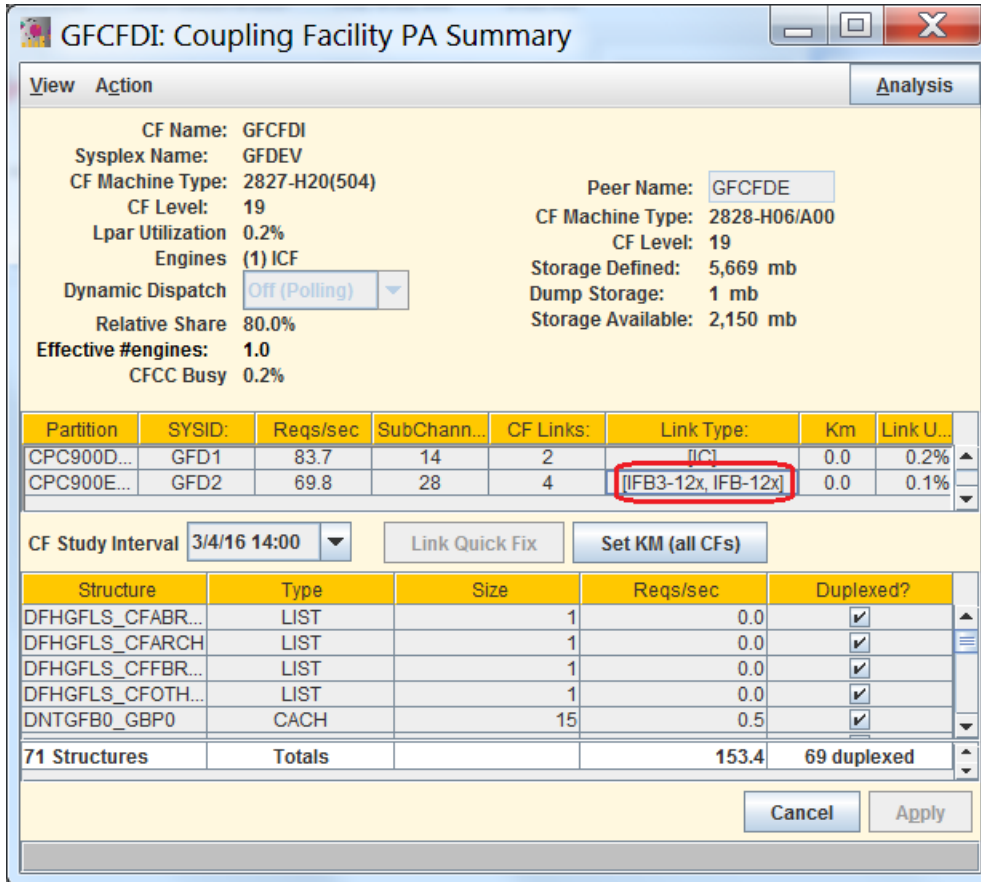


Figure 2. CF Detail Window, showing mixed linktypes

Coupling Link Detail window

This window is reached from the

CF Detail Window by double-clicking one of the lines in the link section (or single click select then right click and Edit CF Link Type).

- This window was renamed from “Edit CF Link Type” to “Coupling Link Detail”
- Link types will be listed in the link summary (left middle).
- If channel path information is available, the center right table, which used to list z/OS systems that could potentially share a chpid or adapter port, has been completely replaced with the known channel path information.

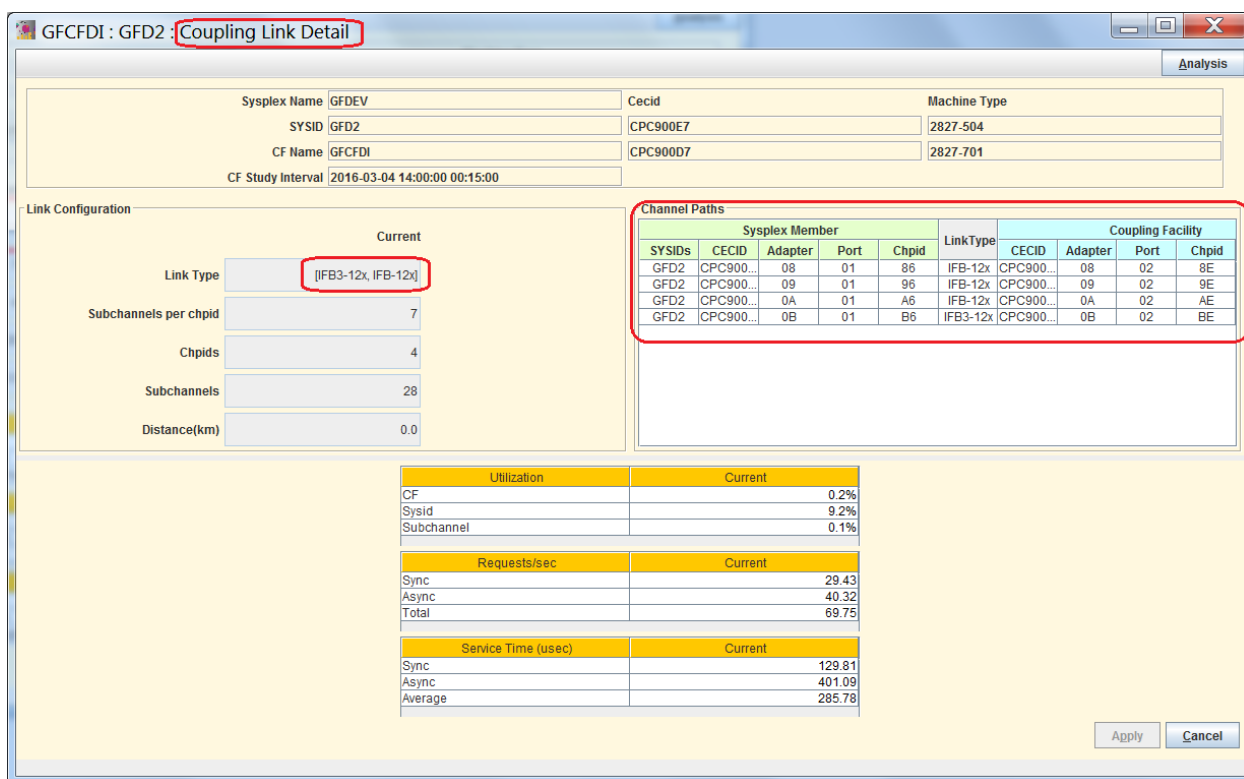


Figure 3. Edit CF Link window, when channel path information is available.

In z/OS 2.1, coupling adapter configuration information is available only for the z/OS end of the link. The adapter id, port #, and chpid are not included in the SMF 74-4 records for the CF end of the configuration, and must be manually entered. Figure 4 illustrates this process. Don't guess at the values, use the CFL worksheet report to help you get the correct information from the customer.

Sysplex Member					LinkType	Coupling Facility			
SYSIDs	CECID	Adapt...	Port	Chpid		CECID	Adapter	Port	Chpid
GFP2,GFP4	CPC900E7	08	01	87	IFB-12x	CPC900...	08	02	8F
GFP2,GFP4	CPC900E7	09	01	97	IFB-12x	CPC900...			
GFP2,GFP4	CPC900E7	0A	01	A7	IFB-12x	CPC900...			
GFP2,GFP4	CPC900E7	0B	01	B7	IFB3-12x	CPC900...			

Figure 4. Enter CF Coupling Link Configuration Information.

For IC type links, or older linktypes, or if SMF channel path information was not available in the collected data, then the middle right table will instead contain a

simplified table describing the link. Figure 5 shows the Coupling Link Detail window as it appears when channel path information is not available (for IC, older linktypes, older z/OS releases, and older cp3kextr levels).

Analysis

Sysplex Name	GFP1	Cecid	CPC900D7	Machine Type	2827-504
SYSID	GFP1	CPC900D7	CPC900D7	2827-701	
CF Name	GFCFPI				
CF Study Interval	2016-03-04 14:00:...				

Link Configuration

Current

Link Type: IC

Subchannel...: 7

Chpids: 2

Subchannels: 14

Distance(km): 0.0

Shared Links

Chpids Adapters

Shared-L	Chpids	SYSID
<input checked="" type="checkbox"/>	2	GFP1
<input type="checkbox"/>	2	GFP3

Utilization	Current
CF	2.3%
Sysid	14.0%
Subchannel	0.1%

Requests/sec	Current
Sync	550.41
Async	39.07
Total	589.48

Service Time (usec)	Current
Sync	7.76
Async	112.4
Average	14.68

Edit Apply Cancel

Figure 5. Link Detail, for IC or when channel path information is not available.

For coupling links where the chpid detail is not known, it is possible to defined shared chpids using the checkboxes in the Shared Links table (Figure 5 middle right). Please note that if chpid sharing is defined on this window, it will be applied to all chpids between this CF-SYS.

Coupling Links Summary Window (new)

This window is reached from the zCP3000 main menu by right-clicking in an empty area of the window and selecting “Coupling Links” from the pop-up menu. Reports available from this window include the “CFLWorksheet - CF link configuration worksheet”, and the “PLEX1011 - Sysplex Coupling Adapter Summary”. The Coupling Link window, seen in Figure 6, is the one place you can see all physical adapters and links for all sysplexes and coupling facilities³. Because an adapter/port may be configured for use by multiple z/OS partitions, coupling facilities, sysplexes, and channel paths, this tends to be a very wide table. Columns, and the window itself, are resizable, so move or stretch the boundaries around to see what you want to see.

Sysplex Member					Sysplex	Coupling Facility				
SYSIDs	CECID	Adapter	Port	Chpids	CECID	Adapter	Port	Chpids	Cfs	
[GFP1, SYS1, GFP3, PRD3, PRD1, GFD1]	CPC900D7	08	01	[80, 82, 84, 85]	[WSCPROD, GFPRD, WSCSYSP, GFDEV]	CFSR893B7	08	02	[44, 45, 40, 42]	[GFCFDE, GFCFPE, WSCSYSE, WSCPRDE]
[SYS1, PRD3, GFCFDI, GFCFPI, PRD1, GFCFS]	CPC900D7	08	02	[88, 89]	[WSCPROD, GFPRD, WSCSYSP, GFDEV]	CPC900E7	08	01	[80, 81]	[WSCSYSL, WSCPRDI]
[GFP1, GFP3, SYS1, PRD3, PRD1, GFS1, GFD1]	CPC900D7	09	01	[92, 94, 95, 96, 90]	[WSCPROD, GFPRD, WSCSYSP, GFSYS]	CFSR893B7	09	02	[55, 56, 50, 52, 54]	[GFCFDE, GFCFPE, GFCFSE, WSCSYSE, WSCPRDE]
[PRD3, GFCFDI, GFCFPI, PRD1, GFCFS]	CPC900D7	09	02	[98]	[WSCPROD, GFPRD, GFDEV, GFSYS]	CPC900E7	09	01	[90]	[WSCPRDI]
[GFP1, GFP3, PRD3, PRD1, GFS1, GFD1]	CPC900D7	0A	01	[A2, A4, A5, A6]	[WSCPROD, GFPRD, GFSYS, GFDEV]	CFSR893B7	0A	02	[34, 35, 36, 32]	[GFCFDE, GFCFPE, GFCFSE, WSCPRDE]
[SYS1, PRD3, GFCFDI, GFCFPI, PRD1]	CPC900D7	0A	02	[A4, A8]	[WSCPROD, GFPRD, WSCSYSP, GFDEV]	CPC900E7	0A	01	[A2, A0]	[WSCSYSL, WSCPRDI]
[GFP1, GFP3, PRD3, PRD1, GFD1]	CPC900D7	0B	01	[B2, B4, B5]	[WSCPROD, GFPRD, GFDEV]	CFSR893B7	0B	02	[B2, B4, B5]	[GFCFDE, GFCFPE, WSCPRDE]
[PRD3, GFCFDI, GFCFPI, PRD1]	CPC900D7	0B	02	[B8]	[WSCPROD, GFPRD, GFDEV]	CPC900E7	0B	01	[B0]	[WSCPRDI]
[GFP2, GFP4, GFD2, GFS2]	CPC900E7	08	01	[85, 86, 87]	[GFPRD, GFDEV, GFSYS]	CPC900D7	08	02	[8D, 8E, 8F]	[GFCFDI, GFCFPI, GFCFS]
[GFP2, SYS2, GFP4, PRD2, PRD4, GFD2, GFS2]	CPC900E7	08	02	[88, 8A, 8C, 8D, 8E]	[WSCPROD, GFPRD, WSCSYSP, GFDEV]	CFSR893B7	08	01	[4D, 4E, 48, 4A, 4C]	[GFCFDE, GFCFPE, GFCFSE, WSCSYSE, WSCPRDE]
[GFP2, GFP4, GFD2, GFS2]	CPC900E7	09	01	[95, 96, 97]	[GFPRD, GFDEV, GFSYS]	CPC900D7	09	02	[9E, 9F, 9D]	[GFCFDI, GFCFPI, GFCFS]
[GFP2, GFP4, PRD2, PRD4, GFD2]	CPC900E7	09	02	[9A, 9C, 9D]	[WSCPROD, GFPRD, GFDEV]	CFSR893B7	09	01	[3C, 3D, 3A]	[GFCFDE, GFCFPE, WSCPRDE]
[GFP2, GFP4, GFD2]	CPC900E7	0A	01	[A5, A7]	[GFPRD, GFDEV]	CPC900D7	0A	02	[AE, AF]	[GFCFDI, GFCFPI]
[GFP2, GFP4, SYS2, PRD2, PRD4, GFD2, GFS2]	CPC900E7	0A	02	[AA, AC, AD, AE, A8]	[WSCPROD, GFPRD, WSCSYSP, GFDEV]	CFSR893B7	0A	01	[5E, 58, 5A, 5C, 5D]	[GFCFDE, GFCFPE, GFCFSE, WSCSYSE, WSCPRDE]
[GFP2, GFP4, GFD2]	CPC900E7	0B	01	[B5, B7]	[GFPRD, GFDEV]	CPC900D7	0B	02	[BF, BE]	[GFCFDI, GFCFPI]
[GFP2, GFP4, PRD2, PRD4, GFD2]	CPC900E7	0B	02	[BC, BD, BA]	[WSCPROD, GFPRD, GFDEV]	CFSR893B7	0B	01	[6C, 6D, 6A]	[GFCFDE, GFCFPE, WSCPRDE]

Fill in any pink cells. A link will not appear in reports until the adapter & port for both ends are valid (white background).

Figure 6. Coupling Links window shows all physical adapters.

Each row is associated with a port on an IFB or ICA adapter on the z/OS side of a link. Each adapter/port has a single optical cable coming out of it, which runs to an adapter/port on the CF end of the link⁴. For most IFB or ICA links, there are 2 ports(cables) per adapter, but an IFB-1x LR (long distance) adapter may have 4 ports. Only adapter/ports which the model knows about are listed in the Coupling Links summary window. A port not listed is not necessarily unused; it might be used by a test/dev sysplex, for which an EDF was not created.

The window columns are in 3 groups:

1. values associated with the z/OS side of the link (green column header).
2. values associated with the CF side of the link (blue column header).
3. the sysplex(es) this link(cable) is used by (grey column header).

³ Or at least, the adapters known to the model. Sysplex information is known only for z/OS systems whose EDF files were loaded into the zCP3000 model. IFB and ICA configuration information will usually be available for the z/OS end of a link, if an EDF was loaded, and if the z/OS level was at 2.1 or above.

⁴ Because the adapter/port on either end of a link can be configured with both CF and z/OS-owned chpids, a single link (cable) may appear twice in this table. I.e., in Figure 6, both the second and tenth rows list information about the same physical link, but row 2 talks about the z/OS chpids on CPC900D7 which talk to CFs on CPC900E7, whereas row 10 talks about the z/OS chpids on CPC900E7 which talk to CFs on CPC900D7.

This is a complicated window, meant to give a comprehensive view, and several columns may have more than one value in them. Stepping through all of the column values in the first row in the table:

- **Sysplex Member Sysids:** this cell lists all of the z/OS systems that send traffic through this link (cable). In Figure 6, GFP1, SYS1, GFP3, PRD3, PRD1, and GFD1 use one or more of the chpids listed in the Sysplex Member chpids column, which all use the same adapter/port. Some partitions may be sharing chpids (channel paths), or they could all be using unshared chpids.
- **Sysplex Member Cecid:** there can be only one value here. This adapter is installed and active on this CPC, and the 6 z/OS systems listed in column one are partitions on this CPC (CPC900D7).
- **Sysplex Member Adapter:** there can be only one value here. This is the Host Channel Adapter ID (SMF field R744HAID), which is unique to the CPC.
- **Sysplex Member Port:** there can be only one value here, this usually has the value 1 or 2 (they don't seem to start at zero), which is unique to this adapter id.
- **Sysplex Member Chpids:** this will usually have more than one value. Each IFB or ICA can carry up to 8 chpids, but ports running IFB3 protocol links are limited to 4 chpids (a 5th chpid will bump all of the chpids on the adapter/port down to IFB-12x speed). Each of these chpids is carrying traffic from one or more z/OS systems.
- **Sysplex:** each chpid carried on an adapter/port link (cable) could potentially belong to a different sysplex, so there could be more than one sysplex here. It is still true that each sysid and CF can belong to only one sysplex.
- **Coupling Facility Cecid:** there can be only one value here, and it usually will be different from the z/OS side cecid. The 4 coupling facility partitions using the adapter/port identified in this row, reside on CFSR893B7.
- **Coupling Facility Adapter:** there can be only one value here. This is the Host Channel Adapter ID (SMF field R744HAID), which is unique to the CPC. Information about the CF side adapter, port, and chpids is not available in SMF, and must be manually added to the model by the modeler.
- **Coupling Facility Port:** there can be only one value here, this usually has the value 1 or 2 (they don't seem to start at zero), which is unique to this adapter id. Information about the CF side adapter, port, and chpids is not available in SMF, and must be manually added to the model by the modeler.
- **Coupling Facility Chpids:** this will usually have more than one value. Each IFB or ICA can carry up to 8 chpids, but ports running IFB3 protocol links are limited to 4 chpids (a 5th chpid will bump all of the chpids on the adapter/port down to IFB-12x speed). Unlike chpids on the z/OS side, a channel path cannot be shared by more than one coupling facility partition. Information about the CF side adapter, port, and chpids is not available in SMF, and must be manually added to the model by the modeler.
- **Coupling Facilities:** this cell lists all of the z/OS systems that send traffic through this link (cable). In Figure 6, GFCFDE, SYS1, GFCFPE, WSCPRDE, WSCSYSE use one or more of the chpids listed in the CF chpids column, which all use the same adapter/port.

New and Changed Reports

CFLWorksheet - CF link configuration worksheet

This report is available from the Analysis button on the “Coupling Links Summary Window (new)” (see page 4).

Please work with customer i/o configuration information to fill in all blank cells. The data for cells which are already filled in, came from SMF and was correct on the date the SMF data was collected. It is important to match the the adapter and port on the CF end with the correct one on the SYS end, so please verify that the chpids, adapters, ports, and sharing LPARs already printed on the worksheet match what is in the customer configuration information that you are working with.

Sysplex Member				Coupling Facility			
CECID	Adapter	Port	Chpids	CECID	Adapter	Port	Chpids
CPC900D7	0008	01	80	CFSR893B7			
			82				
			84				
			85				
CPC900D7	0008	02	88	CPC900E7			
			89				
CPC900D7	0009	01	90	CFSR893B7			
			92				
			94				
			95				
			96				
CPC900D7	0009	02	98	CPC900E7			
CPC900D7	000A	01	A2	CFSR893B7			
			A4				
			A5				
			A6				
CPC900D7	000A	02	A8	CPC900E7			
			AA				
CPC900D7	000B	01	B2	CFSR893B7			
			B4				
			B5				
CPC900D7	000B	02	B8	CPC900E7			

Table 1. Input Worksheet for CPC900D7

Sysplex Member				Coupling Facility			
CECID	Adapter	Port	Chpids	CECID	Adapter	Port	Chpids
CPC900E7	0008	02	88	CFSR893B7			
			8A				
			8C				
			8D				
			8E				
CPC900E7	0009	01	95	CPC900D7			
			96				
			97				
CPC900E7	0009	02	9A	CFSR893B7			
			9C				
			9D				
CPC900E7	000A	01	A6	CPC900D7			
			A7				
CPC900E7	000A	02	A8	CFSR893B7			
			AA				
			AC				
			AD				
			AE				
CPC900E7	000B	01	B6	CPC900D7			
			B7				
CPC900E7	000B	02	BA	CFSR893B7			
			BC				
			BD				

Table 2. Input Worksheet for CPC900E7

Table 3 provides a reference of all machines, partitions, z/OS sysplex members, coupling facilities, and sysplex names, for all sysplex-related entities known to this study.

CPC ID	Partition Name	SYS/CF ID	Type
CPC900D7	GFDEV1	GFD1	z/OS system
CPC900D7	GFPRD1	GFP1	z/OS system
CPC900D7	GFPRD3	GFP3	z/OS system
CPC900D7	GFSYS1	GFS1	z/OS system
CPC900D7	WSCP RD1	PRD1	z/OS system
CPC900D7	WSCP RD3	PRD3	z/OS system
CPC900D7	WSCP SYS1	SYS1	z/OS system
CPC900D7	GFCFDI	GFCFDI	Coupling Facility
CPC900D7	GFCFPI	GFCFPI	Coupling Facility
CPC900D7	GFCFSI	GFCFSI	Coupling Facility
CPC900E7	GFDEV2	GFD2	z/OS system
CPC900E7	GFPRD2	GFP2	z/OS system
CPC900E7	GFPRD4	GFP4	z/OS system
CPC900E7	GFSYS2	GFS2	z/OS system
CPC900E7	WSCP RD2	PRD2	z/OS system
CPC900E7	WSCP RD4	PRD4	z/OS system
CPC900E7	WSCP SYS2	SYS2	z/OS system
CPC900E7	WSCP RDI	WSCP RDI	Coupling Facility
CPC900E7	WSCP SYSI	WSCP SYSI	Coupling Facility
CFSR893B7	GFCFDE	GFCFDE	Coupling Facility
CFSR893B7	GFCFPE	GFCFPE	Coupling Facility
CFSR893B7	GFCFSE	GFCFSE	Coupling Facility
CFSR893B7	WSCP RDE	WSCP RDE	Coupling Facility
CFSR893B7	WSCP SYSE	WSCP SYSE	Coupling Facility
Table 3. Location reference for sysplex members and coupling facilities.			

PLEX1011 - Sysplex Coupling Adapter Summary

This report is available from the Analysis button on the “Coupling Links Summary Window (new)” (see page 4).

This report provides a summary of the physical configuration information known about the coupling links supporting the 5 sysplexes identified in the data collected for IBM ZMASTERS:

- 4 z/OS members and 2 coupling facilities making up the WSCPROD sysplex : WSCPRDI, PRD1, PRD3, WSCPRDE, PRD2, PRD4
- 4 z/OS members and 2 coupling facilities making up the GFPRD sysplex : GFP2, GFCFPI, GFP1, GFP4, GFP3, GFCFPE
- 2 z/OS members and 2 coupling facilities making up the WSCSYSP sysplex : WSCSYSE, SYS2, SYS1, WSCSYSI
- 2 z/OS members and 2 coupling facilities making up the GFDEV sysplex : GFCFDE, GFD2, GFCFDI, GFD1
- 2 z/OS members and 2 coupling facilities making up the GFSYS sysplex : GFCFSI, GFS1, GFCFSE, GFS2

Coupling Link Summary for CPC900D7

Table 1 provides a reference of all coupling links originating from z/OS sysplex members which reside on CPC900D7.

Sysplex Member					LinkType	Coupling Facility				
CECID	Adapter	Port	Chpids	Sys/CF		CECID	Adapter	Port	Chpids	Sys/CF
CPC900D7	000B	01	B2	[PRD3, PRD1]	IFB3-12x	CFSR893B7	000B	02	B2	[WSCPRDE]
			B4	[GFD1]	IFB3-12x				B4	[GFCFDE]
			B5	[GFP1, GFP3]	IFB3-12x				B5	[GFCFPE]
CPC900D7	000B	02	BE	[GFCFDI]	IFB3-12x	CPC900E7	000B	01	B6	[GFD2]
			BF	[GFCFPI]	IFB3-12x				B7	[GFP2, GFP4]
			B8	[PRD3, PRD1]	IFB3-12x				B0	[WSCPRDI]
CPC900D7	0008	01	80	[SYS1]	IFB-12x	CFSR893B7	0008	02	40	[WSCSYSE]
			82	[PRD3, PRD1]	IFB-12x				42	[WSCPRDE]
			84	[GFD1]	IFB-12x				44	[GFCFDE]
			85	[GFP1, GFP3]	IFB-12x				45	[GFCFPE]
CPC900D7	0008	02	88	[PRD3,	IFB-12x	CPC900E7	0008	01	80	[WSCPRDI]

Sysplex Member					LinkType	Coupling Facility				
CECID	Adapter	Port	Chpids	Sys/CF		CECID	Adapter	Port	Chpids	Sys/CF
				PRD1]						
			89	[SYS1]	IFB-12x				81	[WSCSYSI]
			8D	[GFCFSI]	IFB-12x				85	[GFS2]
			8E	[GFCFDI]	IFB-12x				86	[GFD2]
			8F	[GFCFPI]	IFB-12x				87	[GFP2, GFP4]
CPC900D7	0009	01	90	[SYS1]	IFB-12x	CFSR893B7	0009	02	52	[WSCSYSE]
			92	[PRD3, PRD1]	IFB-12x				54	[WSCP RDE]
			94	[GFD1]	IFB-12x				55	[GFCFDE]
			95	[GFP1, GFP3]	IFB-12x				56	[GFCFPE]
			96	[GFS1]	IFB-12x				50	[GFCFSE]
CPC900D7	0009	02	9D	[GFCFSI]	IFB-12x	CPC900E7	0009	01	95	[GFS2]
			9E	[GFCFDI]	IFB-12x				96	[GFD2]
			9F	[GFCFPI]	IFB-12x				97	[GFP2, GFP4]
			98	[PRD3, PRD1]	IFB-12x				90	[WSCP RDI]
CPC900D7	000A	01	A2	[PRD3, PRD1]	IFB-12x	CFSR893B7	000A	02	32	[WSCP RDE]
			A4	[GFD1]	IFB-12x				34	[GFCFDE]
			A5	[GFP1, GFP3]	IFB-12x				35	[GFCFPE]
			A6	[GFS1]	IFB-12x				36	[GFCFSE]
CPC900D7	000A	02	AA	[SYS1]	IFB-12x	CPC900E7	000A	01	A2	[WSCSYSI]
			AE	[GFCFDI]	IFB-12x				A6	[GFD2]
			AF	[GFCFPI]	IFB-12x				A7	[GFP2, GFP4]
			A8	[PRD3, PRD1]	IFB-12x				A0	[WSCP RDI]

Table 1. Coupling Link Summary for CPC900D7

Coupling Link Summary for CPC900E7

Table 2 provides a reference of all coupling links originating from z/OS sysplex members which reside on CPC900E7.

Sysplex Member					LinkType	Coupling Facility				
CECID	Adapter	Port	Chpids	Sys/CF		CECID	Adapter	Port	Chpids	Sys/CF
CPC900E7	000B	02	BC	[GFD2]	IFB3-12x	CFSR893B7	000B	01	6C	[GFCFDE]

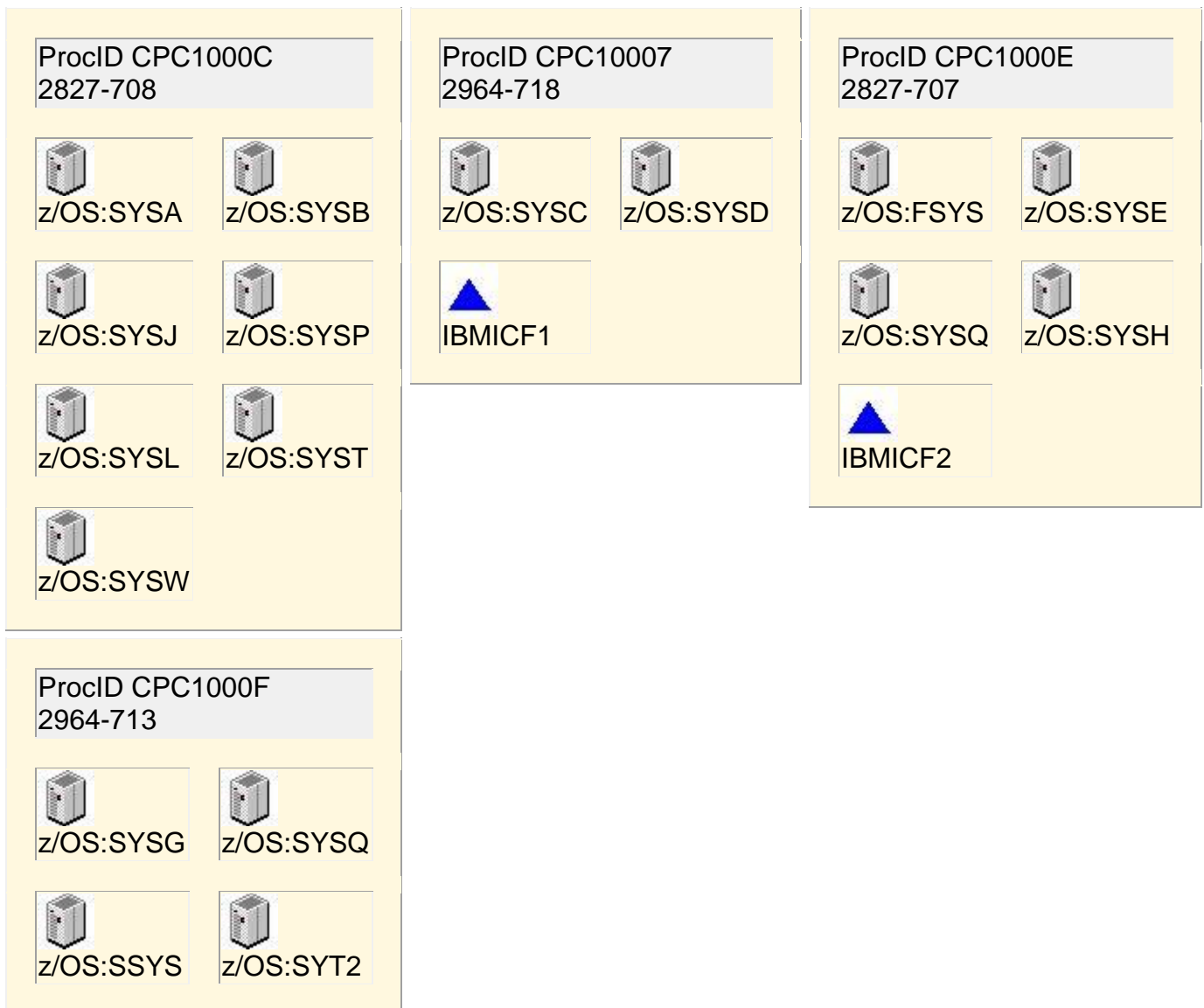
Sysplex Member					LinkType	Coupling Facility				
CECID	Adapter	Port	Chpids	Sys/CF		CECID	Adapter	Port	Chpids	Sys/CF
			BD	[GFP2, GFP4]	IFB3-12x				6D	[GFCFPE]
			BA	[PRD2, PRD4]	IFB3-12x				6A	[WSCRDE]
CPC900E7	0008	01	80	[WSCRDI]	IFB-12x	CPC900D7	0008	02	88	[PRD3, PRD1]
			81	[WCSYSI]	IFB-12x				89	[SYS1]
			85	[GFS2]	IFB-12x				8D	[GFCFSI]
			86	[GFD2]	IFB-12x				8E	[GFCFDI]
			87	[GFP2, GFP4]	IFB-12x				8F	[GFCFPI]
CPC900E7	0008	02	88	[SYS2]	IFB-12x	CFSR893B7	0008	01	48	[WCSYSE]
			8A	[PRD2, PRD4]	IFB-12x				4A	[WSCRDE]
			8C	[GFD2]	IFB-12x				4C	[GFCFDE]
			8D	[GFP2, GFP4]	IFB-12x				4D	[GFCFPE]
			8E	[GFS2]	IFB-12x				4E	[GFCFSE]
CPC900E7	0009	01	90	[WSCRDI]	IFB-12x	CPC900D7	0009	02	98	[PRD3, PRD1]
			95	[GFS2]	IFB-12x				9D	[GFCFSI]
			96	[GFD2]	IFB-12x				9E	[GFCFDI]
			97	[GFP2, GFP4]	IFB-12x				9F	[GFCFPI]
CPC900E7	0009	02	9A	[PRD2, PRD4]	IFB3-12x	CFSR893B7	0009	01	3A	[WSCRDE]
			9C	[GFD2]	IFB3-12x				3C	[GFCFDE]
			9D	[GFP2, GFP4]	IFB3-12x				3D	[GFCFPE]
CPC900E7	000A	01	A2	[WCSYSI]	IFB-12x	CPC900D7	000A	02	AA	[SYS1]
			A6	[GFD2]	IFB-12x				AE	[GFCFDI]
			A7	[GFP2, GFP4]	IFB-12x				AF	[GFCFPI]
			A0	[WSCRDI]	IFB-12x				A8	[PRD3, PRD1]
CPC900E7	000A	02	AA	[PRD2, PRD4]	IFB-12x	CFSR893B7	000A	01	5A	[WSCRDE]
			AC	[GFD2]	IFB-12x				5C	[GFCFDE]
			AD	[GFP2, GFP4]	IFB-12x				5D	[GFCFPE]
			AE	[GFS2]	IFB-12x				5E	[GFCFSE]
			A8	[SYS2]	IFB-12x				58	[WCSYSE]

Table 2. Coupling Link Summary for CPC900E7

PLEX1008 – Sysplex Coupling Summary

This report is available from the Analysis button on the Logical Sysplex main window (zCP3000 main window->View->Sysplex Logical). It is available in PA and QM modes.

The analysis in the graph "Sysplex Coupling Summary"⁵ is about the coupling facility links for all sysplexes in the model data.



⁵ Old graph id, new name

Missing Sysplex Members

Data is missing from the zCP3000 model. Data was not collected for the following systems, which are part of the sysplex but are not included in the topology or in the model:

- PLEXIBM:SY3A
- PLEXIBM:SY3B

Coupling Facility Link Summary

Table 1. sums the coupling links by type by machine. If the number of defined links is greater than the number of configured channel paths, then this indicates that two or more partitions are sharing the channel path for a coupling facility link. Channel path information is available for InfiniBand, ICA, and ISC-3 linktypes, using z/OS 2.1 or higher, and CP3KEXTR 12/15 or higher. Further detail is noted in the detail section for that processor, but **please note that, for links with incomplete channel path information, sharing information must be manually added to the model.**

Processor ID	Link Type:	Defined Links	Configured ⁶ CHPIDS	Adapters ⁷	Adapter ⁸ Types
CPC10007	IC	12	8	n/a	IC
	IFB3-12x	20	16*	2*	[HCA3-O]*
CPC1000C	IFB3-12x	56	8	4	[HCA3-O]
CPC1000F	IFB3-12x	32	8	4	[HCA3-O]
CPC1000E	IC	20	8	n/a	IC
	IFB3-12x	28	16*	2*	[HCA3-O]*

Table 1. Coupling Facility Link Summary

* For channel paths or adapters marked with an asterisk (*), the chpid and/or adapter information available from the model data was incomplete.

⁶ Previously, this would have been the same number as defined links, unless the modeler went to the trouble of defining all of the shared links. Now, we know how many actual chpids there are. The asterisk, if present, indicates incomplete information. Ie, if channel path information is incomplete, or if data was not collected from all sysplex members.

⁷ Previously, this was "Minimum Recommended Adapters". Now, we can tell you what you actually have. Adapter information is collected in a separate field from the chpid, it is possible for the chpid to be good but the adapter info to be incomplete.

⁸ zCP3000 didn't know adapter type before. This is important to know because an HCA2-O adapter carried forward to a newer machine might prevent the faster IFB3 protocol from being used (it requires HCA3-O on both ends).

In Table 1. Coupling Facility Link Summary,

- **Link Type:** is the linktype read from SMF data or input manually in the model
- **Defined Links** are the total number of CF links as seen by the sysplex member partitions. A z/OS system will not try to start any more requests to the coupling facility than it thinks it has free subchannels for.
- **Configured CHPIDS** are the Defined Links minus any channel paths that are shared between partitions. If this number looks high and is tagged with an asterisk, then possibly some of these chpids are shared but have not been identified as shared in the model.
- **Adapters** counts the unique adapters from the channel path information. IFB and ICA adapters typically have 2 ports, each carrying 4 or more coupling chpids. An asterisk indicates that the adapter information in the channel path records was incomplete for at least some adapters.⁹
- **Adapter Types** lists the adapter types found in the channel path information records for this linktype.

CPC Distance

The model data defines 1 Sysplex, which uses resources on 4 different machines. Table 2. shows the distance, in kilometers (KM), between these machines. When the distance value is unknown, or there are conflicting values set, the value is listed as "n/a".¹⁰

KM	CPC10007	CPC1000C	CPC1000F	CPC1000E
CPC10007	-	-	-	-
CPC1000C	0.0	-	-	-
CPC1000F	0.0	0.0	-	-
CPC1000E	0.0	0.0	0.0	-

Table 2. Distances(km) between processors

⁹ Included in the channel path information are the Adapter ID, port #, and adapter type, so we can now get an idea of how much traffic is running on this physical link because we also know which chpids (up to 8) are configured to run on it.

¹⁰ This entire distance section is new.

Processor Detail

Table 3. describes CPC CPC10007, which is a 2964-718 processor with eighteen GCPs, nine IFLs, five zIIPs and four ICFs with eleven active partitions, of which 3 participate in a sysplex.

Processor CPC10007 SR# B9777					
Partition	CF/SYSID	Sysplex	OpSys	CF Links ¹¹	Shared Channel Path
SYSC	SYSC	PLEXIBM	z/OS 1.13.0	(4) IC*	[SYSD]
				(4) IFB3-12x*	[SYSD]
SYSD	SYSD	PLEXIBM	z/OS 1.13.0	(4) IC*	[SYSC]
				(4) IFB3-12x*	[SYSC]
IBMICF1	IBMICF1	PLEXIBM	CFCC Level 20	(4) IC	n/a
				(12) IFB3-12x	n/a

Table 3. CPC10007 Processor Detail¹²

Note: * indicates coupling links which are shared by this z/OS system with another z/OS system in the same sysplex, on the same machine. Coupling Facilities cannot share channel paths, only z/OS sysplex members can share channel paths.

Table 4. describes CPC CPC1000C, which is a 2827-708 processor with eight GCPs, three zIIPs and one ICF with thirteen active partitions, of which 7 participate in a sysplex.

Processor CPC1000C SR# 414C7					
Partition	CF/SYSID	Sysplex	OpSys	CF Links	Shared Channel Path
SYSA	SYSA	PLEXIBM	z/OS 1.13.0	(8) IFB3-12x*	[SYSB, SYSJ, SYSP, SYSL, SYST, SYSW]

¹¹ The sum of this column should equal what's in the "Defined Links" column above, but now we know that z/OS may think it has 4 chpids (28 subchannels) to run work on, but since it's sharing, it really has one sixth of that.

¹² Table Numbers and captions are new, and are also used in the text associated with the table.

SYSB	SYSB	PLEXIBM	z/OS 1.13.0	(8) IFB3- 12x*	[SYSA, SYSJ, SYSP, SYSL, SYST, SYSW]
SYSJ	SYSJ	PLEXIBM	z/OS 1.13.0	(8) IFB3- 12x*	[SYSA, SYSB, SYSP, SYSL, SYST, SYSW]
SYSP	SYSP	PLEXIBM	z/OS 1.13.0	(8) IFB3- 12x*	[SYSA, SYSB, SYSJ, SYSL, SYST, SYSW]
SYSL	SYSL	PLEXIBM	z/OS 1.13.0	(8) IFB3- 12x*	[SYSA, SYSB, SYSJ, SYSP, SYST, SYSW]
SYST	SYST	PLEXIBM	z/OS 1.13.0	(8) IFB3- 12x*	[SYSA, SYSB, SYSJ, SYSP, SYSL, SYSW]
SYSW	SYSW	PLEXIBM	z/OS 1.13.0	(8) IFB3- 12x*	[SYSA, SYSB, SYSJ, SYSP, SYSL, SYST]

Table 4. CPC1000C Processor Detail

Note: * indicates coupling links which are shared by this z/OS system with another z/OS system in the same sysplex, on the same machine.

Table 5. describes CPC CPC1000F, which is a 2964-713 processor with thirteen GCPs, nine IFLs, five zIIPs and three ICFs with seventeen active partitions, of which 4 participate in a sysplex.

Processor CPC1000F SR# B97F7					
Partition	CF/SYSID	Sysplex	OpSys	CF Links	Shared Channel Path
SYSG	SYSG	PLEXIBM	z/OS 1.13.0	(8) IFB3- 12x*	[SYSQ, SSYS, SYT2]
SYSQ	SYSQ	PLEXIBM	z/OS 1.13.0	(8) IFB3- 12x*	[SYSG, SSYS, SYT2]
SSYS	SSYS	PLEXIBM	z/OS 1.13.0	(8) IFB3- 12x*	[SYSG, SYSQ, SYT2]
SYT2	SYT2	PLEXIBM	z/OS 1.13.0	(8) IFB3- 12x*	[SYSG, SYSQ, SSYS]

Table 5. CPC1000F Processor Detail

Note: * indicates coupling links which are shared by this z/OS system with another z/OS system in the same sysplex, on the same machine.

Table 6. describes CPC CPC1000E, which is a 2827-707 processor with seven GCPs, one zIIP and two ICFs with twelve active partitions, of which 5 participate in a sysplex.

Processor CPC1000E SR# 414E7					
Partition	CF/SYSID	Sysplex	OpSys	CF Links	Shared Channel Path
FSYS	FSYS	PLEXIBM	z/OS 1.13.0	(4) IC*	[SYSE, SYSQ, SYSH]
				(4) IFB3- 12x*	[SYSE, SYSQ, SYSH]
SYSE	SYSE	PLEXIBM	z/OS 1.13.0	(4) IC*	[FSYS, SYSQ, SYSH]
				(4) IFB3- 12x*	[FSYS, SYSQ, SYSH]
SYSQ	SYSQ	PLEXIBM	z/OS 1.13.0	(4) IC*	[FSYS, SYSE, SYSH]
				(4) IFB3- 12x*	[FSYS, SYSE, SYSH]
SYSH	SYSH	PLEXIBM	z/OS 1.13.0	(4) IC*	[FSYS, SYSE, SYSQ]
				(4) IFB3- 12x*	[FSYS, SYSE, SYSQ]
IBMICF2	IBMICF2	PLEXIBM	CFCC Level 19	(4) IC	n/a
				(12) IFB3- 12x	n/a
Table 6. CPC1000E Processor Detail					

Note: * indicates coupling links which are shared by this z/OS system with another z/OS system in the same sysplex, on the same machine. Coupling Facilities cannot share channel paths, only z/OS sysplex members can share channel paths.

CF1014 - Coupling Facility Summary

This report is available from the Analysis button on the CF Detail Window” (see page 8).

This report shows summary information for Coupling Facility **WSCP**RDE during the selected interval 3/4/2016 14:00. The Logical Utilization refers to the logical utilization of the partition. The table also includes the number and type of engines defined to the partition during the study interval, and their relative share of that resource.

The logical utilization of the partition may differ from the CFCC Busy field when the CPU resource is shared with other partitions. CFCC Busy is based on the CPU seconds used by the coupling facility relative to the time it spends waiting for work, and does not include time used by other partitions contending for the same resource.

CF Name	WSCP
Sysplex Name	WSCP
CF Machine Type	2828-H06/A00
CF Level	19
Lpar Utilization	3.9%
Engines	(1) ICF
Relative Share	Dedicated Engines
Effective #engines	1.0
CFCC Busy	3.9%
Storage Defined	5157.0 mb
Storage Available	1282.0 mb
Dump Storage	1.0 mb

Peer Coupling Facility for Duplexing

A peer coupling facility is defined for this sysplex. For the structures marked as duplex, the request is also issued to the peer CF, and synchronizing messages between the coupling facilities are sent. The peer coupling facility, called WSCP RDI, is on a 2828-H06/A00 running at CF Level 19. |

Coupling Facility Links

The following table displays information about the link(s) between the Coupling Facility and each of the member systems for which data was collected. An asterisk indicates that these channel paths are shared with at least one other sysplex member. Link Utilization is shown during the selected interval 3/4/2016 14:00.

Partition	SYSID:	Reqs/sec	Sub Channels:	CF Links:	Link Type:	Km	Link Utilization
CPC900D7_WSCPRD1	PRD1	2,123.8	28*	4*	[IFB3-12x, IFB-12x]	0.0	0.6%
CPC900E7_WSCPRD2	PRD2	1,935.0	28*	4*	[IFB3-12x, IFB-12x]	0.0	0.5%
CPC900D7_WSCPRD3	PRD3	5,328.0	28*	4*	[IFB3-12x, IFB-12x]	0.0	0.6%
CPC900E7_WSCPRD4	PRD4	5,460.4	28*	4*	[IFB3-12x, IFB-12x]	0.0	0.5%

Shared Channel Paths

Some channel paths to WSCPRDE are shared between two or more sysplex members co-residing on the same CPC. The utilization for these links shown in the Links table (above) shows the sum of all of the links sharing that same channel path.

CF Links:	SubChannels:	Link Type:	Origin CPC	Sharing Sysids	Combined Utilization
4	28	IFB-12x	CPC900D7	[PRD1, PRD3]	0.6%
4	28	IFB-12x	CPC900E7	[PRD2, PRD4]	0.5%

Structures

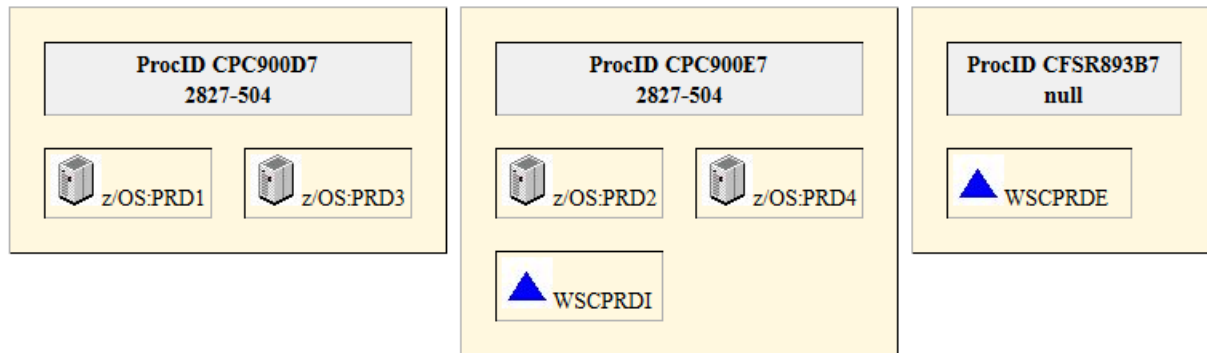
The following table displays information about the busiest 10 structures on coupling facility WSCPRDE. Request rates shown are for the selected interval 3/4/2016 14:00. Request rates in the structure table do not include requests from the systems for which data was not collected. More detail about all 39 structures on WSCPRDE can be found in the CF Structure Tables report and other detail reports.

Structure	Type	Reqs/sec	% Sync	Duplexed?
DNPDBR0_LOCK1	LOCK	10,554.0	100.0%	No
IXCPRD1	LIST	1,240.7	0.0%	No
DNPDBR0_GBP6	CACH	1,064.5	0.0%	Yes
DNPDBR0_GBP1	CACH	514.5	0.0%	Yes
DNPDBR0_GBP32K1	CACH	358.1	0.0%	Yes
DNPDBR0_GBP5	CACH	285.2	0.1%	Yes
DNPDBR0_GBP11	CACH	186.3	0.0%	Yes
DFHXQLS_TSQWSCR	LIST	115.8	100.0%	No
DFHGFLS_DFHGFR01	LIST	106.9	69.7%	Yes
DNPDBR0_GBP14	CACH	99.8	0.1%	Yes

CF1029 - Coupling Facility Link Summary (new)

This report is available from the Analysis button on the CF Detail Window” (see page 8).

The analysis in the graph "**Coupling Facility Link Summary**"¹³ is about the coupling facility links for the WSCPROD sysplex. This is similar to the PLEX1008 graph, but is restricted to the resources associated with sysplex WSCPROD and coupling facility WSCPRDE.



Missing Sysplex Members

For the zMasters lab data, SMF data was collected for all 14 members of the 5 sysplexes, so this section would not appear in the report. If data had *not* been collected from the dev/test sysplexes, for example, then the missing data would be listed here, if it can be known from other collected data.

Summary

Table 1. sums the coupling links by type by machine. If the number of defined links is greater than the number of configured channel paths, then this indicates that two or more partitions are sharing the channel path for a coupling facility link. Channel path information is available for InfiniBand, ICA, and ISC-3 linktypes, using z/OS 2.1 or higher, and CP3KEXTR 12/15 or higher. Further detail is noted in the detail section for that processor, but **please note that, for links with incomplete channel path information, sharing information must be manually added to the model.**

¹³ This entire report is new. It is sort of a mashup of PLEX1008 and CF1014, but this is the only place you will see a table of the channel path information, with the actual chpids, adapter ids, and port #'s.

Processor ID	Link Type:	Defined Links	Configured CHPIDS	Adapters	Adapter Types
CFSR893B7	IFB3-12x	3	3*	2*	n/a
	IFB-12x	5	5*	2*	n/a
CPC900D7	IFB3-12x	4	2	1	[HCA3-O]
	IFB-12x	12	6	3	[HCA3-O]
CPC900E7	IFB3-12x	5	3*	2*	[HCA3-O]*
	IFB-12x	7	5*	2*	[HCA3-O]*
	IC	8	8	n/a	IC

Table 1. Coupling Facility Link Summary

* For channel paths or adapters marked with an asterisk (*), the chpid and/or adapter information available from the model data was incomplete.

Where:

- **Link Type:** is the linktype read from SMF data or input manually in the model
- **Defined Links** are the total number of CF links as seen by the sysplex member partitions. A z/OS system will not try to start any more requests to the coupling facility than it thinks it has free subchannels for.
- **Configured CHPIDS** are the Defined Links minus any channel paths that are shared between partitions. If this number looks high and is tagged with an asterisk, then possibly some of these chpids are shared but have not been identified as shared in the model.
- **Adapters** counts the unique adapters from the channel path information. IFB and ICA adapters typically have 2 ports, each carrying 4 or more coupling chpids. An asterisk indicates that the adapter information in the channel path records was incomplete for at least some adapters.
- **Adapter Types** lists the adapter types found in the channel path information records for this linktype.

CPC Distance

The zMasters lab data defines 5 Sysplexes, which uses resources on 3 different machines. Table 2. shows the distance, in kilometers (KM), between these machines. When the distance value is unknown, or there are conflicting values set, the value is listed as "n/a".

KM	CPC900D7	CPC900E7	CFSR893B7
CPC900D7	0.0	0.0	0.0
CPC900E7	0.0	0.0	0.0
CFSR893B7	0.0	0.0	0.0

Table 2. Distances(km) between processors

Channel Path Information

Table 3 describes the known channel path information for the z/OS systems connected to coupling facility WSCPRDE. Coupling Facility WSCPRDE resides on CPC CFSR893B7, but the z/OS members of a sysplex will often reside on other machines, in addition to CFSR893B7. Table 3 lists the channel path information for the z/OS end of the link only; the channel path id, adapter id, and port id are often not known for the CF end of the link. Information about configured channel paths is available from input data collected with version 12/2015 or later of the CP3KEXTR data extract utility, when collected from z/OS v2.1 or later, for InfiniBand, ICA, and ISC3 linktypes.

Origin CPC	Chpid	Adapter	Port	Adapter Type	Sharing Sysids
CPC900D7	82	0008	01	HCA3-O	[PRD3, PRD1]
CPC900D7	92	0009	01	HCA3-O	[PRD3, PRD1]
CPC900D7	A2	000A	01	HCA3-O	[PRD3, PRD1]
CPC900D7	B2	000B	01	HCA3-O	[PRD3, PRD1]
CPC900E7	8A	0008	02	HCA3-O	[PRD2, PRD4]
CPC900E7	9A	0009	02	HCA3-O	[PRD2, PRD4]
CPC900E7	AA	000A	02	HCA3-O	[PRD2, PRD4]
CPC900E7	BA	000B	02	HCA3-O	[PRD2, PRD4]

Table 3. Channel Path Information

Processor Detail

Table 3. describes CPC CFSR893B7, which, during the selected interval (2016-03-04 14:00), is a processor with three ICFs with five active partitions, of which 1 participate in a sysplex.

Processor CFSR893B7 SR# 893B7					
Partition	CF/SYSID	Sysplex	OpSys	Channel Paths	Sharing Sysids
WSCPRDE	WSCPRDE	WSCPROD	CFCC Level 19	(3) IFB3-12x	n/a
				(5) IFB-12x	n/a

Table 3. CFSR893B7 Processor Detail

Note: * indicates coupling links which are shared by this z/OS system with another z/OS system in the same sysplex, on the same machine. Coupling Facilities cannot share channel paths, only z/OS sysplex members can share channel paths.

Table 4. describes CPC CPC900D7, which is a 2827-504 processor with four GCPs, two IFLs, three zIIPs and two ICFs with fourteen active partitions, of which 2 participate in a sysplex.

Processor CPC900D7 SR# 900D7					
Partition	CF/SYSID	Sysplex	OpSys	Channel Paths	Sharing Sysids
WSCPRD1	PRD1	WSCPROD	z/OS 2.1.0	(2) IFB3-12x*	[PRD3]
				(6) IFB-12x*	[PRD3]
WSCPRD3	PRD3	WSCPROD	z/OS 2.1.0	(2) IFB3-12x*	[PRD1]
				(6) IFB-12x*	[PRD1]

Table 4. CPC900D7 Processor Detail

Note: * indicates coupling links which are shared by this z/OS system with another z/OS system in the same sysplex, on the same machine. Coupling Facilities cannot share channel paths, only z/OS sysplex members can share channel paths.

Table 5. describes CPC CPC900E7, which is a 2827-504 processor with four GCPs, two IFLs, three zIIPs and two ICFs with fourteen active partitions, of which 2 participate in a sysplex.

Processor CPC900E7 SR# 900E7					
Partition	CF/SYSID	Sysplex	OpSys	Channel Paths	Sharing Sysids
WSCPRD2	PRD2	WSCPROD	z/OS 2.1.0	(2) IFB3-12x*	[PRD4]
				(2) IFB-12x*	[PRD4]
				(2) IC*	[PRD4]
WSCPRD4	PRD4	WSCPROD	z/OS 2.1.0	(2) IFB3-12x*	[PRD2]
				(2) IFB-12x*	[PRD2]
				(2) IC*	[PRD2]
WSCPRDI	WSCPRDI	WSCPROD	CFCC Level 19	(1) IFB3-12x	n/a
				(3) IFB-12x	n/a
				(4) IC	n/a

Table 5. CPC900E7 Processor Detail

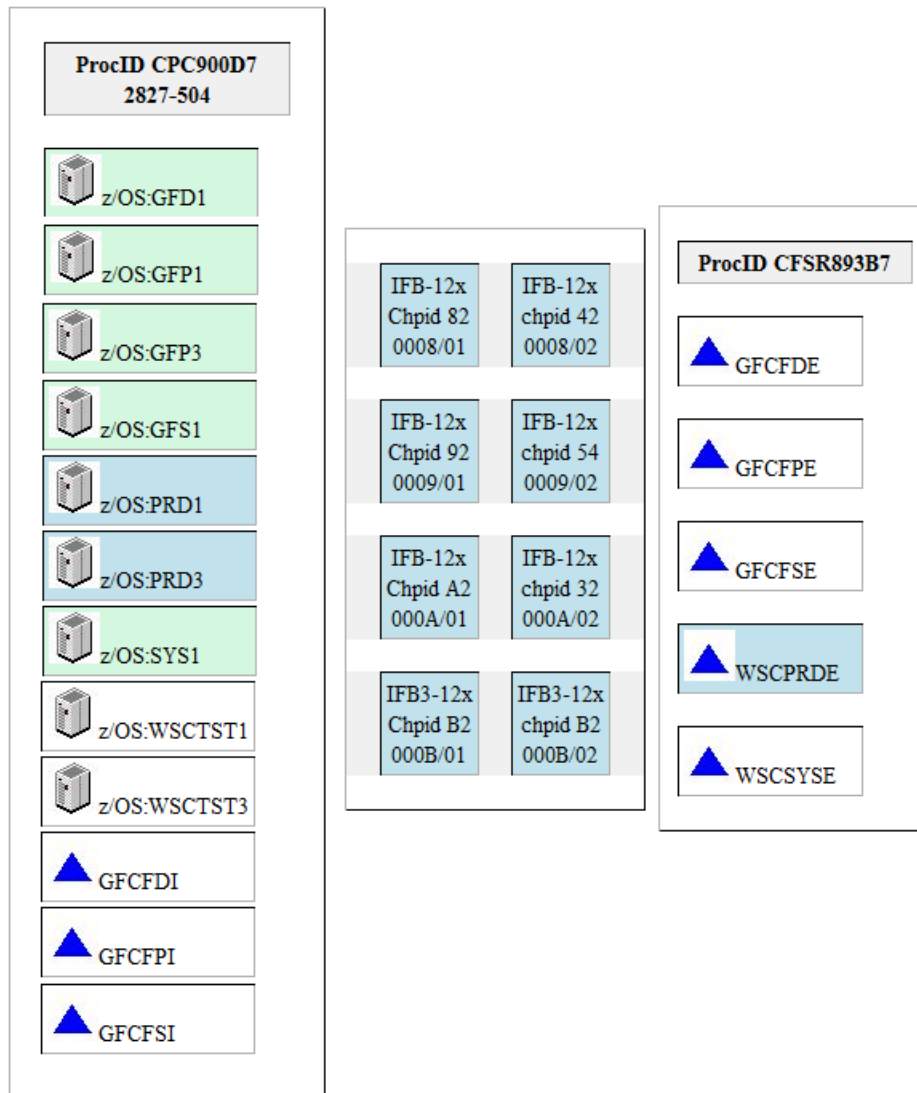
Note: * indicates coupling links which are shared by this z/OS system with another z/OS system in the same sysplex, on the same machine. Coupling Facilities cannot share channel paths, only z/OS sysplex members can share channel paths.

CFL005 - Coupling Facility Link Topology

This report is available from the Analysis button on the Coupling Link Detail window (see page 9). In this report, the CF adapter/port/chpid configuration information has been filled in by the modeler and is shown in the report. CF link config data is not currently available from the SMF record and must be manually filled in by the modeler.

Topology of WSCPRDE:PRD1 coupling links on WSCPROD

This report focuses on the connection between the WSCPRDE coupling facility and the PRD1 z/OS system, which are part of the WSCPROD sysplex. The WSCPROD channel paths between WSCPRDE and PRD1 run on IFB-12x adapter(s). This report shows the minimal recommended configuration to support the sysplex definitions in the zCP3000 model, and may not match the actual physical configuration used by this customer. Please note also that RAS considerations suggest that a minimum of 2 IFB-12x adapters be installed.



PRD1-WSCPRDE Coupling Links

Traffic between z/OS system PRD1, on CPC CPC900D7, and coupling facility WSCPRDE, on CPC CFSR893B7, flows over 28 subchannels on 4 channel paths (CHPIDs). These chpids are carried by 4 ports on 4 adapters. on the CPC900D7 side

and by 4 ports on 4 adapters. on the CFSR893B7 side. The configuration of the 4 channel paths is shown in Table 1.

z/OS System(s)					LinkType	Coupling Facility WSCRDE			
SYSIDs	CECID	Adapter	Port	Chpid		CECID	Adapter	Port	Chpid
PRD1,PRD3	CPC900D7	0008	01	82	IFB-12x	CFSR893B7	0008	02	42
PRD1,PRD3	CPC900D7	0009	01	92	IFB-12x	CFSR893B7	0009	02	54
PRD1,PRD3	CPC900D7	000A	01	A2	IFB-12x	CFSR893B7	000A	02	32
PRD1,PRD3	CPC900D7	000B	01	B2	IFB3-12x	CFSR893B7	000B	02	B2

Table 1. Channel Path Configuration from PRD1 to WSCRDE.

Table 2 lists the z/OS systems and coupling facilities that share the adapter/port on either the z/OS or CF end, including those sharing the 4 channel paths defined between PRD1 and WSCRDE.

CPCID	Adapter id	Port number	SYSID/CFNAME
CPC900D7	000B	01	[GFP1, GFP3, PRD3, PRD1, GFD1]
CPC900D7	0009	01	[GFP1, GFP3, SYS1, PRD3, PRD1, GFS1, GFD1]
CPC900D7	0008	01	[GFP1, SYS1, GFP3, PRD3, PRD1, GFD1]
CPC900D7	000A	01	[GFP1, GFP3, PRD3, PRD1, GFS1, GFD1]
CFSR893B7	0008	02	[]
CFSR893B7	0009	02	[]
CFSR893B7	000B	02	[]
CFSR893B7	000A	02	[]

Table 2. Partitions sharing adapter/ports with PRD1-WSCRDE.

CHPID Sharing

The PRD1 system on CPC900D7 shares 4 chpids to the WSCRDE coupling facility on CFSR893B7 with 1 other partitions.

Adapter Sharing

The adapter/ports which carry 4 chpids between WSCRDE and PRD1 also carry other coupling links from this sysplex or another. The systems and CFs on CPC900D7 and CFSR893B7 which share the physical link but not any of the channel paths, are shaded green in the illustration.

Appendix A: Links and References

IBM zMasters (2016) zCP3000 Lab Testcase data

Testcase data from the zCP3000 Lab at the 2016 zMasters conference in Herndon VA, is used in many examples in this document. You can download the testcase data yourself from:

[IBM w3 : Techdoc PRS5318](#)

<http://w3.ibm.com/support/techdocs/atmastr.nsf/WebIndex/PRS5318>

[IBM PartnerWorld : Techdoc PRS5319](#)

https://www.ibm.com/partnerworld/wps/servlet/mem/ContentHandler/tech_PRS5319

Useful Publication URLs

[IBM w3 : Techdoc PRS4144 : CP3KEXTR Data Extract Utility](#)

<http://w3-03.ibm.com/support/techdocs/atmastr.nsf/WebIndex/PRS4144>

[IBM PartnerWorld : Techdoc PRS4144 : CP3KEXTR Data Extract Utility](#)

https://www.ibm.com/partnerworld/wps/servlet/mem/ContentHandler/tech_PRS4144

[SMF Type 74 subtype 4 - Coupling Facility Activity](#)

https://www.ibm.com/support/knowledgecenter/SSLTBW_2.1.0/com.ibm.zos.v2r1.ieag200/iea3q2_Subtype_4_Coupling_Facility_Activity.htm

Appendix B: EDF Channel Path Section

The EDF will contain CFL data for each IFB or ICA chpid used by a z/OS sysplex member for which sysplex SMF data was collected. Please refer to the online CP3KEXTR user's guide for the latest information. Please refer to the IBM publication z/OS MVS System Management Facilities (SMF) for definitions of the SMF fields. As of the publication of this paper, the following lists current CFL fields:

HCPI	Channel path Identifier	Hex (2)	R744HCPI	
HFLG	Validity bit mask	Hex (4)	R744HFLA	
HOPM	Channel path operation mode	Hex (2)	R744HOPM	
HPCP	Physical channel ID (PCHID)	Hex (4)	R744HPCP	
HAID	Host channel adapter ID	Hex (4)	R744HAID	
HAPN	Host channel adapter port nbr.	Hex (2)	R744HAPN	
HCHF	Status flags	Vector	R744HCHF	
HLAT	Channel path latency time	Vector	R744HLAT	