IBM Education Assistance for z/OS V2R1

Item: DCM Support for Cascaded FICON Switches
Element/Component: BCP IOS

Material is current as of June 2013

Agenda

- Trademarks
- Presentation Objectives
- Overview
- Usage & Invocation
- Interactions & Dependencies
- Migration & Coexistence Considerations
- Installation
- Presentation Summary
- Appendix

Trademarks

- See url http://www.ibm.com/legal/copytrade.shtml for a list of trademarks.

Presentation Objectives

- Describe the purpose of cascaded FICON connections
- Describe the purpose of FICON DCM with cascade support
- Identify Hardware and Software requirements
- Identify Migration/Coexistence considerations

Overview

- Problem Statement / Need Addressed
  - Defining an I/O configuration to maximize availability and performance is complex
  - Many customers tend to over-configure for performance peaks
- Solution
  - Allows z/OS to dynamically manage FICON channel paths and control unit ports in response to changing workload demands
    - Customer identifies FICON channels and control units that should be managed by the system
- Benefit / Value
  - Simplifies I/O configuration definition task
  - Improve overall I/O performance
  - More efficient use of hardware resources
  - Dynamically balances I/O resources based on workload demand
  - Enhanced availability by dynamically adding new channel paths for certain error conditions

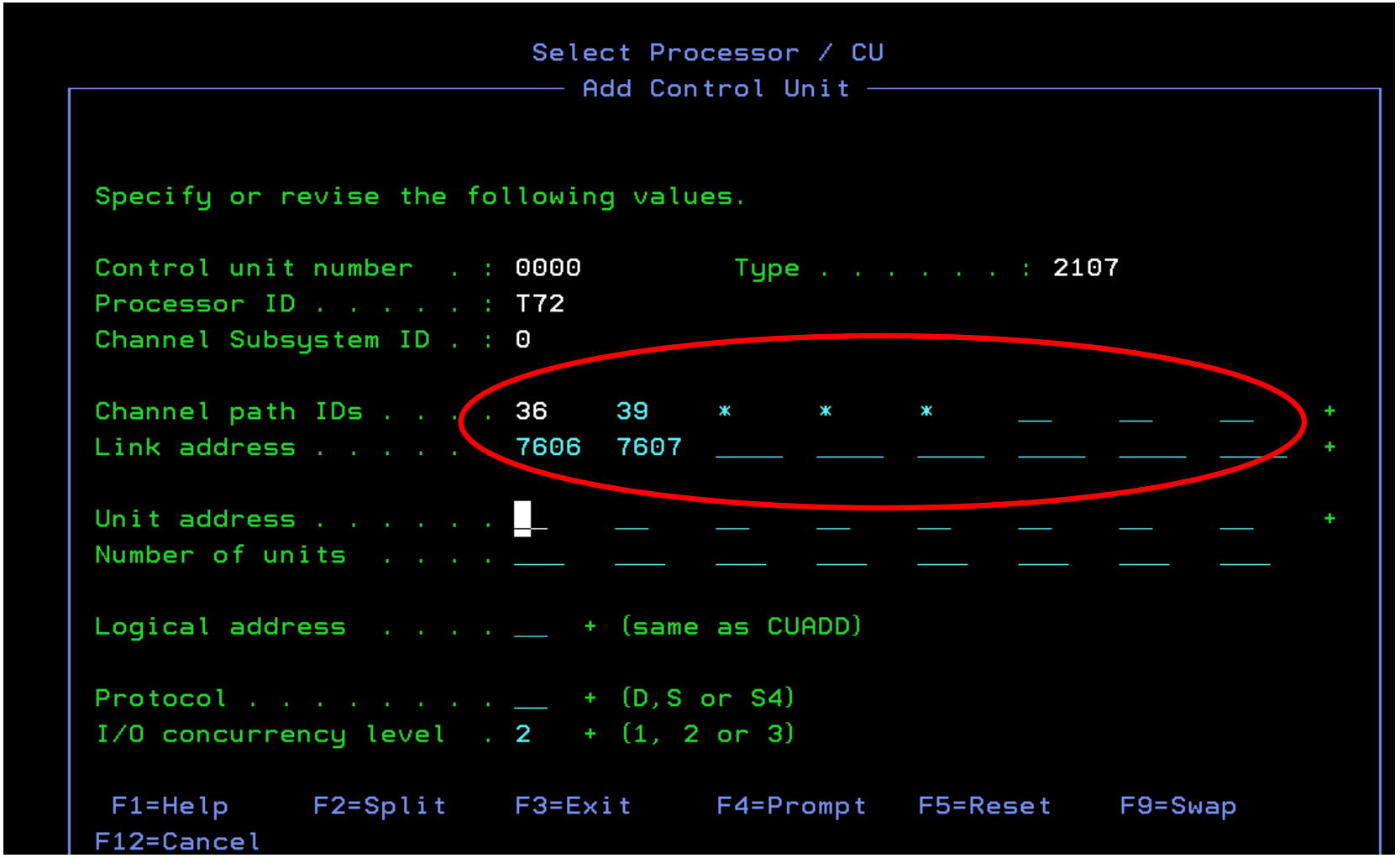
FICON DCM With Cascade Support

- FICON DCM support is extended to now allow cascade or multi-switch connections for managed channels
  - Eliminates requirement of only one switch between processor and control unit
  - Utilizes two-byte link addresses for cascaded connections
    - Two-byte link address specifies domain and port
  - Can have a mixture of managed cascaded channel paths and managed non-cascaded channel paths
    - FICON DCM chooses best connection

Usage & Invocation

- To enable DCM the following must be done:
  - Define managed control units in the IODF
  - Define managed channels in the IODF that are connected to the switches for the managed control units
  - Define switch devices in the IODF and vary them online to z/OS
  - Ensure that at least one system in the LPAR (I/O) cluster is authorized to make dynamic configuration changes
  - DCM will be automatically enabled
    - The SETIOS DCM=ON command can be used after IPL
    - DCM can be enabled/disabled at any time the SETIOS DCM command, or activating an IODF that does or does not have managed resources defined

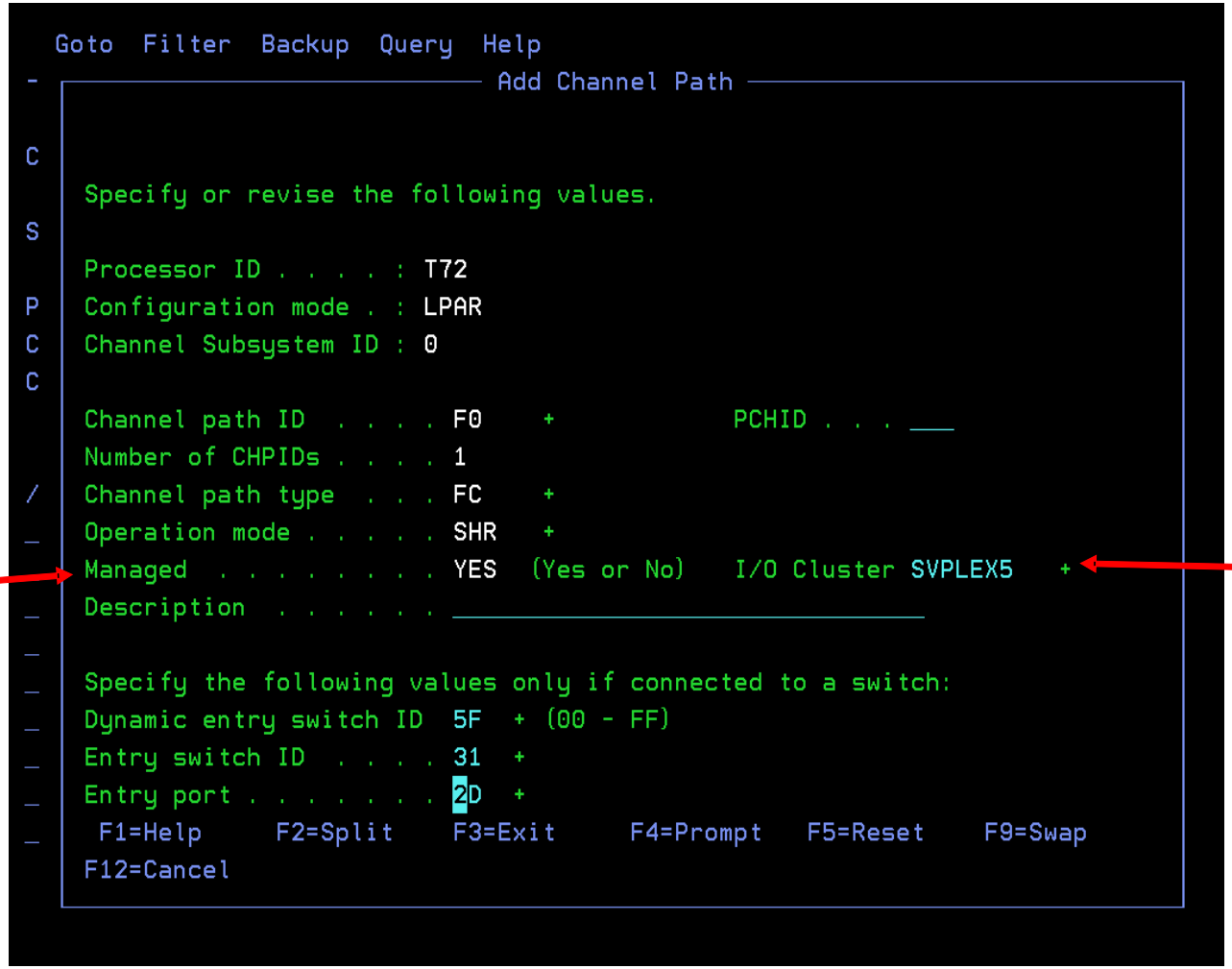
Defining Managed Control Units



Defining Managed Control Unit

```
 Goto  Filter  Backup  Query  Help
                View Control Unit Definition
                                                      Row 1 of 4 More:      >
Command ===>                                          Scroll ===> PAGE

Control unit number . : 3000
Control unit type . . : 2107          Serial number . . . : 2471

Connected switch.ports: 31.43 32.43 34.42 34.B2 35.42 35.B2 46.04 47.04
                        59.37 59.3B 59.3E 59.43 5A.08 5A.16 5A.18 5A.3F
                        5B.09 5B.0D 5B.11 5B.26 5B.2E 5B.32 5F.5E 5F.62
                        5F.7E 5F.82 89.17 89.24 89.25 89.27 89.2F 89.3D ..

ENTER to continue.

           ----------------Channel Path ID . Link Address-----------------
Proc.CSSID 1------ 2------ 3------ 4------ 5------ 6------ 7------ 8------
T72.0      A8.B2   AB.42   *       *       *       *
T72.1      93.6A18 A8.B2   B8.42   C4.6B26 AB.B2
T72.2      93.6A18 A8.B2   B8.42   C4.6B26 AB.B2
T72.3      93.6A18 A8.B2   B8.42   C4.6B26 AB.B2
 F1=Help       F2=Split       F3=Exit       F7=Backward    F8=Forward
 F9=Swap       F12=Cancel
```

Defining Managed Channel Path



Managed indicator

I/O cluster definition

Defining Managed Channel Path

```
  Goto  Filter  Backup  Query  Help
--------------------------------------------------------------------------------
                              Channel Path List     Filter Mode. More:       >
Command ===>                                                  Scroll ===> PAGE

Select one or more channel paths, then press Enter. To add use F11.

Processor ID . . . . . : T72
Configuration mode . . : LPAR
Channel Subsystem ID . : 0

                     DynEntry Entry +
/ CHPID Type+ Mode+ Switch + Sw Port Con Mngd Description
_ C2    FC    SPAN  59       59 3D      No
_ C3    FC    SPAN  5A       5A 3D      No
_ C4    FC    SPAN  5B       5B 37      No
_ C5    FC    SHR   5F       5F 31      Yes
_ C6    FC    SPAN  5A       5A 0B      No
_ C7    FC    SPAN  49       49 61      No
_ C8    FC    SPAN  35       35 F1      No
_ C9    FC    SHR   5C       5C 07      No
_ EA    FC    SHR   32       32 5A      Yes
 F1=Help      F2=Split     F3=Exit      F4=Prompt    F5=Reset     F7=Backward
 F8=Forward   F9=Swap      F10=Actions  F11=Add      F12=Cancel
```

Interactions & Dependencies

- Hardware Dependencies
  - Processor – All currently supported processors
  - Channels – All currently supported FICON channels
  - Coupling Facility required if running multi-system
  - Switches
    - Must have control unit port (CUP) function
    - CUP must be installed on entry switch, exit switch and intermediary switches for cascade connections
    - Must be defined in the IODF
  - Control Unit – No special microcode needed
- Software Dependencies
  - None

Migration & Coexistence Considerations

- No compatibility PTFs are required
- z/OS 2.1 does not have to be installed on all systems in LPAR cluster
  - Only z/OS 2.1 will make cascaded changes
  - DCM at lower levels will indicate control unit is ineligible for DCM
    - Not attached to an entry switch

Installation – Planning for DCM

- Start small. For example:
  - Take a few control units with 8 static channels and make 2 or 3 of them managed
  - Try out on a test LPAR that is isolated from the production LPARs (different SYSPLEX or LCSS)
- Convert more control units and channels to DCM management as you get comfortable
- Note:
  - DCM changes will potentially affect control units that share static channels with the managed control units
  - DCM changes will potentially affect all images sharing the control unit

Installation – Planning for DCM

- Number of Managed channels and Control Unit Interfaces
  - Workload characteristics analysis
    - Which subsystems have predictive unusual demands ?
    - Which/how many of the defined channels are assigned specifically for the peak demands?

      How many channels are needed for steady state demands?
    - Are those peak demand channels also assigned to other control units which have different peak demands?
    - How many channels are assigned specifically to handle peak demand requirement where the demands occur at different times of the day?

Installation - Steps

- Ensure at least one system in the LPAR cluster is enabled to make dynamic configuration changes
  - See PR/SM Planning Guide for your processor
- Ensure CUP feature is installed on switches that will be connected to managed channels.
  - For cascaded, exit switch CUP must defined with 2-byte link address
- I/O Configuration (IODF)
  - Define managed control units
  - Define managed channels
    - May need to remove static channels from existing control units if converting some static channels to managed
    - Channels must be switch attached
  - Define switch devices
    - Specify destination port of FE
    - Connect to operating system configurations used by LPAR cluster

Installation - Steps

- ACTIVATE the new I/O configuration
- Ensure that switch devices are brought online to z/OS
  - Add VARY commands in COMMNDxx or automation
  - Specify OFFLINE NO in HCD device parameters

Installation - Steps

- Additional Recommendations
- Enable DCM Component Tracing for IOS
  - In IECIOSxx add CTRACE(CTIIOSxx) where xx is the suffix
  - In CTIIOSxx include DCM in the OPTIONS
  - Use DS=xx to control size of CTRACE data space (default=512M)

```
TRACEOPTS
      ON
      OPTIONS('EXTEND,DCM,DS=xx')
```

- Utilize RMF
  - Recommend channel, device, IOQ and ESS reporting
  - Recording interval should be no more than 15 minutes

Presentation Summary

- Discussed the benefits of FICON DCM
- Reviewed DCM definitions and how to change the I/O configuration through HCD
- Reviewed Migration and Coexistence considerations
- Discussed Installation requirements/considerations

Appendix

- Reference materials
  - z/OS MVS System Commands
  - z/OS MVS System Messages, Volume 9
  - z/OS MVS Initialization and Tuning Reference
  - z/OS Resource Measurement Facility User's Guide
  - z/OS HCD User's Guide
  - z/OS HCD Reference Summary
  - z/OS Intelligent Resource Director Red Book SG24-5952-00 ISBN 0738417904