User Experience Defining FICON CTCs

Rick Barlow
Velocity Software Inc

June 2024

Disclaimer

The content of this presentation is for demonstration only and is not intended to be an endorsement by Velocity Software. Each site is responsible for their own use of the concepts and examples presented.

- All IOCP decks passed through syntax checking
- All IOCP decks were successfully imported to an IODF
- CBDSREP reports used to verify
- None of these examples were tested on a real processor
- Most of this is simplified; many configurations are more complex

Agenda

- **IOCP statements**
- **HCD specific statements**
- **Picture**
- **Code the IOCP**
- **More IOCP examples**
  - More LPARs for SSI eight members
  - Multiple CTC pairs
  - Across CPCs
  - FICON switches
- **Implementation**
- **Reference**

IOCP Statements

- **IOCP macros**
  - ID
    - Describes the CPC
    - MSG1 and MSG2 can be used to describe the machine and/or purpose of this IOCP deck
    - SYSTEM can be important depending on what hardware is included
    - TOK= is generated by the IOCP EXEC
  - RESOURCE
    - Defines the Channel Subsystems (CSS) and Partitions; default CSS is 0
  - CHPID
    - CHPID maps a physical channel (PCHID) to a logical channel path (CHPID)
  - CNTLUNIT
    - Defines some hardware connected to the channel path. For FCTC, it also shows the target LPAR
  - IODEVICE
    - Defines the real devices connected through the CNTLUNIT to the CHPID
- **Reference:**
  - SB10-7177-02 Input/Output Configuration Program User's Guide for ICP IOCP

HCD Specific Statements

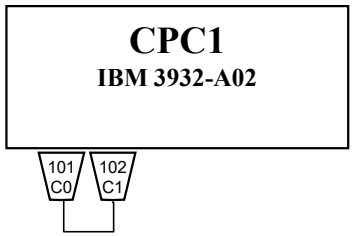
- **In z/OS these details may be added via the ISPF HCD dialogue**
- **Can be added through the HCM interface**
- **Some examples in IOCP manual**
- **More details discovered using CBDIOCP**
  - HCD PROFILE
    - MIGRATE_EXTENDED = YES
    - SHOW_IOCP_DEFAULTS = YES
- **Three statements needed to supply necessary details**
  - *HCD SWITCH to define switch characteristics
  - *$HCDC$ to provide continuation to the IOCP macros
  - *$DFLT$ document HCD defaults

Picture

- Create a picture of your connections
- May be simple text or your favorite tool (e.g. PowerPoint)
- This is the simplest possible CTC configuration; one pair of CHPIDs

```
_____________________
| CHPID    CHPID |
|_C0_____C1_____|
  |        |
   \_____/

  C0       C1
 C010     C110      1   VM1
 C020     C120      2   VM2
 C030     C130      3   VM3
 C040     C140      4   VM4
```



Bare Bones IOCP Source Deck

```
        ID    MSG1='CTC1      IOCDS A1           REVISED 24/03/26',   X
              MSG2='I/O CONFIG FOR CPC1 (z16 3932-A02)',              X
              SYSTEM=(3932,1),                                        X
              TOK=('VM-TOKEN',F0F361F2F661F2F4F2F17AF2F67AF2F040404040X
              ,00000000,'03/26/24','21:26:20','SYS1','IODFC1')
*
        RESOURCE PARTITION=((CSS(0),(VM1,1),(VM2,2),(VM3,3),(VM4,4),  *
              (*,5),(*,6),(*,7),(*,8),(*,9),(*,A),(*,B),(*,C),(*,D),  *
              (*,E),(*,F)))
*
        CHPID PATH=(CSS(0),C0),SHARED,                                *
              PARTITION=(VM1,VM2,VM3,VM4),TYPE=FC,PCHID=101
        CNTLUNIT CUNUMBR=C010,PATH=(CSS(0),C0),UNIT=FCTC,             *
              UNITADD=((00,16)),CUADD=01
        IODEVICE ADDRESS=(C010,16),CUNUMBR=C010,UNIT=FCTC,            *
              UNITADD=00
        CNTLUNIT CUNUMBR=C020,PATH=(CSS(0),C0),UNIT=FCTC,             *
              UNITADD=((00,16)),CUADD=02
        IODEVICE ADDRESS=(C020,16),CUNUMBR=C020,UNIT=FCTC,            *
              UNITADD=00
        CNTLUNIT CUNUMBR=C030,PATH=(CSS(0),C0),UNIT=FCTC,             *
              UNITADD=((00,16)),CUADD=03
        IODEVICE ADDRESS=(C030,16),CUNUMBR=C030,UNIT=FCTC,            *
              UNITADD=00
        CNTLUNIT CUNUMBR=C040,PATH=(CSS(0),C0),UNIT=FCTC,             *
              UNITADD=((00,16)),CUADD=04
        IODEVICE ADDRESS=(C040,16),CUNUMBR=C040,UNIT=FCTC,            *
              UNITADD=00
*
```

```
CHPID PATH=(CSS(0),C1),SHARED,                                        *
      PARTITION=(VM1,VM2,VM3,VM4),TYPE=FC,PCHID=102
CNTLUNIT CUNUMBR=C110,PATH=(CSS(0),C1),UNIT=FCTC,                     *
      UNITADD=((00,16)),CUADD=01
IODEVICE ADDRESS=(C110,16),CUNUMBR=C110,UNIT=FCTC,                    *
      UNITADD=00
CNTLUNIT CUNUMBR=C120,PATH=(CSS(0),C1),UNIT=FCTC,                     *
      UNITADD=((00,16)),CUADD=02
IODEVICE ADDRESS=(C120,16),CUNUMBR=C120,UNIT=FCTC,                    *
      UNITADD=00
CNTLUNIT CUNUMBR=C130,PATH=(CSS(0),C1),UNIT=FCTC,                     *
      UNITADD=((00,16)),CUADD=03
IODEVICE ADDRESS=(C130,16),CUNUMBR=C130,UNIT=FCTC,                    *
      UNITADD=00
CNTLUNIT CUNUMBR=C140,PATH=(CSS(0),C1),UNIT=FCTC,                     *
      UNITADD=((00,16)),CUADD=04
IODEVICE ADDRESS=(C140,16),CUNUMBR=C140,UNIT=FCTC,                    *
      UNITADD=00
```

Code the IOCP; Everything the Hardware Needs

```
         ID    MSG1='CTC1      IOCDS A1           REVISED 24/03/26',   X
               MSG2='I/O CONFIG FOR CPC1 (z16 3932-A02)',              X
               SYSTEM=(3932,1),                                        X
               TOK=('VM-TOKEN',F0F361F2F661F2F4F2F17AF2F67AF2F040404040X
               ,00000000,'03/26/24','21:26:20','SYS1','IODFC1')
*
         RESOURCE PARTITION=((CSS(0),(VM1,1),(VM2,2),(VM3,3),(VM4,4),  *
               (*,5),(*,6),(*,7),(*,8),(*,9),(*,A),(*,B),(*,C),(*,D),  *
               (*,E),(*,F)))
```

- **ID**
  - Describes the CPC
  - MSG1 and MSG2 can be used to describe the machine and/or purpose of this IOCP deck
  - SYSTEM can be important depending on what hardware is included
  - TOK= is generated by the IOCP EXEC
- **RESOURCE**
  - Defines the Partitions and MIF ID for each partition
    - Since the HSA has a slot for every possible LPAR, the IOCP RESOURCE macro also has a slot for every partition in every CSS

Code the IOCP; Comments May Help Understanding

```
        CHPID PATH=(CSS(0),C0),SHARED,
              PARTITION=(VM1,VM2,VM3,VM4),TYPE=FC,PCHID=101
*
*    FCTC CONTROL UNIT target VM1
        CNTLUNIT CUNUMBR=C010,PATH=(CSS(0),C0),UNIT=FCTC,
              UNITADD=((00,16)),CUADD=01
        IODEVICE ADDRESS=(C010,16),CUNUMBR=C010,UNIT=FCTC,
              UNITADD=00
*
*    FCTC CONTROL UNIT target VM2
        CNTLUNIT CUNUMBR=C020,PATH=(CSS(0),C0),UNIT=FCTC,
              UNITADD=((00,16)),CUADD=02
        IODEVICE ADDRESS=(C020,16),CUNUMBR=C020,UNIT=FCTC,
              UNITADD=00
*
*    FCTC CONTROL UNIT target VM3
        CNTLUNIT CUNUMBR=C030,PATH=(CSS(0),C0),UNIT=FCTC,
              UNITADD=((00,16)),CUADD=03
        IODEVICE ADDRESS=(C030,16),CUNUMBR=C030,UNIT=FCTC,
              UNITADD=00
*
*    FCTC CONTROL UNIT target VM4
        CNTLUNIT CUNUMBR=C040,PATH=(CSS(0),C0),UNIT=FCTC,
              UNITADD=((00,16)),CUADD=04
        IODEVICE ADDRESS=(C040,16),CUNUMBR=C040,UNIT=FCTC,
              UNITADD=00
```

```
        CHPID PATH=(CSS(0),C1),SHARED,
              PARTITION=(VM1,VM2,VM3,VM4),TYPE=FC,PCHID=102
*
*    FCTC CONTROL UNIT 1 target VM1
        CNTLUNIT CUNUMBR=C110,PATH=(CSS(0),C1),UNIT=FCTC,
              UNITADD=((00,16)),CUADD=01
        IODEVICE ADDRESS=(C110,16),CUNUMBR=C110,UNIT=FCTC,
              UNITADD=00
*
*    FCTC CONTROL UNIT 2 target VM2
        CNTLUNIT CUNUMBR=C120,PATH=(CSS(0),C1),UNIT=FCTC,
              UNITADD=((00,16)),CUADD=02
        IODEVICE ADDRESS=(C120,16),CUNUMBR=C120,UNIT=FCTC,
              UNITADD=00
*
*    FCTC CONTROL UNIT 3 target VM3
        CNTLUNIT CUNUMBR=C130,PATH=(CSS(0),C1),UNIT=FCTC,
              UNITADD=((00,16)),CUADD=03
        IODEVICE ADDRESS=(C130,16),CUNUMBR=C130,UNIT=FCTC,
              UNITADD=00
*
*    FCTC CONTROL UNIT 4 target VM4
        CNTLUNIT CUNUMBR=C140,PATH=(CSS(0),C1),UNIT=FCTC,
              UNITADD=((00,16)),CUADD=04
        IODEVICE ADDRESS=(C140,16),CUNUMBR=C140,UNIT=FCTC,
              UNITADD=00
```

Code the IOCP; Everything the Hardware Needs

```
          CHPID PATH=(CSS(0),C0),SHARED,                              *
                PARTITION=(VM1,VM2,VM3,VM4),TYPE=FC,PCHID=101
*
*     FCTC CONTROL UNIT target VM1
          CNTLUNIT CUNUMBR=C010,PATH=(CSS(0),C0),UNIT=FCTC,           *
                UNITADD=((00,16)),CUADD=01
          IODEVICE ADDRESS=(C010,16),CUNUMBR=C010,UNIT=FCTC,          *
                UNITADD=00
```

- **CHPID**
  - FICON CTCs are defined on TYPE=FC CHPIDs
- **CNTLUNIT**
  - Target LPAR is specified using the CUADD parameter. The number is the MIF ID of the target LPAR

Verify the FICON CTCs Using HCD

- **EXEC CBDSIODF IODFC1 WORKIODF A 2048 (REP**
  - Create an empty IODF
- **EXEC CBDSMIGR IODFC1 * A CTC1 IOCP A I CPC1 3932-A02 LPAR H221130**
  - Migrate the IOCP source into the IODF
- **EXEC CBDSREP IODFC1 WORKIODF A IODFC1 REP_CTC A T (REP**
  - Create the CTC report

```
CTC CONNECTION REPORT                    TIME: 16:11  DATE: 2024-05-24  PAGE T-   1
       ------------------------- SIDE 1 ----------------------- - COMMON -- ------------------------- SIDE 2 -----------------------
       PROC.CSSID PART.    DEVICE --CHPID--- ENTRY -----CU----- --DEVICE--- PROC.CSSID PART.    DEVICE ---CHPID-- ENTRY -----CU-----
LINE               NAME     NUM OS ID MOD TYP SW PO ID   LA   #  RNG TYPE UA            NAME     NUM OS ID MOD TYP SW PO ID   LA   #
------ ---------- -------- ------ -- --- --- -- -- ---- ---- -- --- ---- -- ---------- -------- ------ -- --- --- -- -- ---- ---- --
    1* CPC1.0     VM1      C010 N C0 SHR FC        C010      1   16 FCTC 00
    2* CPC1.0     VM1      C020 N C0 SHR FC        C020      2   16 FCTC 00
    3* CPC1.0     VM1      C030 N C0 SHR FC        C030      3   16 FCTC 00
    4* CPC1.0     VM1      C040 N C0 SHR FC        C040      4   16 FCTC 00
    5* CPC1.0     VM1      C110 N C1 SHR FC        C110      1   16 FCTC 00
    6* CPC1.0     VM1      C120 N C1 SHR FC        C120      2   16 FCTC 00
    7* CPC1.0     VM1      C130 N C1 SHR FC        C130      3   16 FCTC 00
    8* CPC1.0     VM1      C140 N C1 SHR FC        C140      4   16 FCTC 00
------ ---------- -------- ------ -- --- --- -- -- ---- ---- -- --- ---- -- ---------- -------- ------ -- --- --- -- -- ---- ---- --
```

HCD Needs More to Complete the Picture

- ***$HCDC$**
  - Continuation of standard IOCP macros to provide HCD-specific information
- ***$DFLT$**
  - Shows HCD defaults for some IOCP macros
- ***HCD SWITCH**
  - Define characteristics of a FICON switch

- **Some statement coding information in z/OS HCD User's Guide**
- **Best examples come from IOCP source extracted from HCD using CBDSIOCP EXEC with NOSA option**

HCD Needs More to Complete the Picture

```
         ID    MSG1='CTC1      IOCDS A1           REVISED 24/03/26',   X
               MSG2='I/O CONFIG FOR CPC1 (z16 3932-A02)',              X
               SYSTEM=(3932,1),                                        X
               TOK=('VM-TOKEN',F0F361F2F661F2F4F2F17AF2F67AF2F040404040X
               ,00000000,'03/26/24','21:26:20','SYS1','IODFC1')
*$HCDC$        DESC='CPC1 - z16-A02'
*$HCDC$        SERIAL='0123453932'
*
*=====================================================================
         RESOURCE PARTITION=((CSS(0),(VM1,1),(VM2,2),(VM3,3),(VM4,4),  *
               (*,5),(*,6),(*,7),(*,8),(*,9),(*,A),(*,B),(*,C),(*,D),  *
               (*,E),(*,F)))
*$HCDC$        USAGE=(OS,OS,OS,OS,CF/OS,CF/OS,CF/OS,                   *
               CF/OS,CF/OS,CF/OS,CF/OS,CF/OS,CF/OS,CF/OS,CF/OS)
```

- **ID**
  - The *$HCDC$ statements provide more details about the CPC; mostly comments / description
- **RESOURCE**
  - The *$HCDC$ statements tell HCD what type of LPAR: CF. OS, FW

HCD Needs More to Complete the Picture

```
         CHPID PATH=(CSS(0),C0),SHARED,                          *
               PARTITION=(VM1,VM2,VM3,VM4),TYPE=FC,PCHID=101
*
*    FCTC CONTROL UNIT target VM1
         CNTLUNIT CUNUMBR=C010,PATH=(CSS(0),C0),UNIT=FCTC,       *
               UNITADD=((00,16)),CUADD=01
*$HCDC$        SERIAL='C000000001'
         IODEVICE ADDRESS=(C010,16),CUNUMBR=C010,UNIT=FCTC,      *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4))
*
*    FCTC CONTROL UNIT target VM2
         CNTLUNIT CUNUMBR=C020,PATH=(CSS(0),C0),UNIT=FCTC,       *
               UNITADD=((00,16)),CUADD=02
*$HCDC$        SERIAL='C000000001'
         IODEVICE ADDRESS=(C020,16),CUNUMBR=C020,UNIT=FCTC,      *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4))
*
*    FCTC CONTROL UNIT target VM3
         CNTLUNIT CUNUMBR=C030,PATH=(CSS(0),C0),UNIT=FCTC,       *
               UNITADD=((00,16)),CUADD=03
*$HCDC$        SERIAL='C000000001'
         IODEVICE ADDRESS=(C030,16),CUNUMBR=C030,UNIT=FCTC,      *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4))
*
*    FCTC CONTROL UNIT target VM4
         CNTLUNIT CUNUMBR=C040,PATH=(CSS(0),C0),UNIT=FCTC,       *
               UNITADD=((00,16)),CUADD=04
*$HCDC$        SERIAL='C000000001'
         IODEVICE ADDRESS=(C040,16),CUNUMBR=C040,UNIT=FCTC,      *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4))
```

```
         CHPID PATH=(CSS(0),C1),SHARED,                          *
               PARTITION=(VM1,VM2,VM3,VM4),TYPE=FC,PCHID=102
*
*    FCTC CONTROL UNIT 1 target VM1
         CNTLUNIT CUNUMBR=C110,PATH=(CSS(0),C1),UNIT=FCTC,       *
               UNITADD=((00,16)),CUADD=01
*$HCDC$        SERIAL='C000000001'
         IODEVICE ADDRESS=(C110,16),CUNUMBR=C110,UNIT=FCTC,      *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4))
*
*    FCTC CONTROL UNIT 2 target VM2
         CNTLUNIT CUNUMBR=C120,PATH=(CSS(0),C1),UNIT=FCTC,       *
               UNITADD=((00,16)),CUADD=02
*$HCDC$        SERIAL='C000000001'
         IODEVICE ADDRESS=(C120,16),CUNUMBR=C120,UNIT=FCTC,      *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4))
*
*    FCTC CONTROL UNIT 3 target VM3
         CNTLUNIT CUNUMBR=C130,PATH=(CSS(0),C1),UNIT=FCTC,       *
               UNITADD=((00,16)),CUADD=03
*$HCDC$        SERIAL='C000000001'
         IODEVICE ADDRESS=(C130,16),CUNUMBR=C130,UNIT=FCTC,      *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4))
*
*    FCTC CONTROL UNIT 4 target VM4
         CNTLUNIT CUNUMBR=C140,PATH=(CSS(0),C1),UNIT=FCTC,       *
               UNITADD=((00,16)),CUADD=04
*$HCDC$        SERIAL='C000000001'
         IODEVICE ADDRESS=(C140,16),CUNUMBR=C140,UNIT=FCTC,      *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4))
*
```

HCD Needs More to Complete the Picture

- **For point-to-point CTC connections, a serial number must be added to all CNTLUNIT macros that are part of the same connection**
  - *$HCDC$ SERIAL='C000000001'
- **To document defaults such as all LPARs that share the same resource**
  - *$DFLT$ PARTITION=((CSS(0),VM1,VM2,VM3,VM4))

Verify the FICON CTCs Using HCD

- **EXEC CBDSIODF IODFC1 WORKIODF A 2048 (REP**
  - Create an empty IODF
- **EXEC CBDSMIGR IODFC1 * A CTC1 IOCP A I CPC1 3932-A02 LPAR H221130**
  - Migrate the IOCP source into the IODF
- **EXEC CBDSREP IODFC1 WORKIODF A IODFC1 REP_CTC A T (REP**
  - Create the CTC report

```
 CTC CONNECTION REPORT                    TIME: 21:27  DATE: 2024-03-26  PAGE T-   1
       ------------------------- SIDE 1 ----------------------- - COMMON -- ------------------------- SIDE 2 -----------------------
       PROC.CSSID PART.    DEVICE --CHPID--- ENTRY -----CU----- --DEVICE--- PROC.CSSID PART.    DEVICE ---CHPID-- ENTRY -----CU-----
LINE               NAME     NUM OS ID MOD TYP SW PO ID   LA   #  RNG TYPE UA             NAME     NUM OS ID MOD TYP SW PO ID   LA   #
------ ---------- -------- ------ -- --- --- -- -- ---- ---- -- --- ---- -- ---------- -------- ------ -- --- --- -- -- ---- ---- --
    1* CPC1.0     VM1      C010 N C0 SHR FC        C010      1   16 FCTC 00 CPC1.0     VM1      C110 N C1 SHR FC        C110      1
     2 CPC1.0     VM1      C020 N C0 SHR FC        C020      2   16 FCTC 00 CPC1.0     VM2      C110 N C1 SHR FC        C110      1
     3 CPC1.0     VM1      C030 N C0 SHR FC        C030      3   16 FCTC 00 CPC1.0     VM3      C110 N C1 SHR FC        C110      1
     4 CPC1.0     VM1      C040 N C0 SHR FC        C040      4   16 FCTC 00 CPC1.0     VM4      C110 N C1 SHR FC        C110      1
    5* CPC1.0     VM1      C110 N C1 SHR FC        C110      1   16 FCTC 00 CPC1.0     VM1      C010 N C0 SHR FC        C010      1
     6 CPC1.0     VM1      C120 N C1 SHR FC        C120      2   16 FCTC 00 CPC1.0     VM2      C010 N C0 SHR FC        C010      1
     7 CPC1.0     VM1      C130 N C1 SHR FC        C130      3   16 FCTC 00 CPC1.0     VM3      C010 N C0 SHR FC        C010      1
     8 CPC1.0     VM1      C140 N C1 SHR FC        C140      4   16 FCTC 00 CPC1.0     VM4      C010 N C0 SHR FC        C010      1
------ ---------- -------- ------ -- --- --- -- -- ---- ---- -- --- ---- -- ---------- -------- ------ -- --- --- -- -- ---- ---- --
```

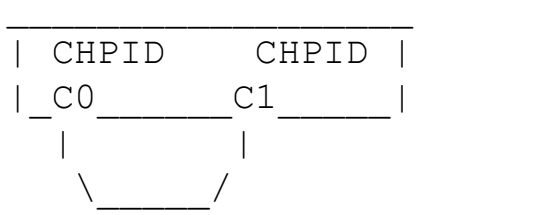
Without vs With *$HCDC$ SERIAL='C000000001’

```
CTC CONNECTION REPORT                    TIME: 16:11  DATE: 2024-05-24  PAGE T-   1
       ------------------------- SIDE 1 ----------------------- - COMMON -- ------------------------- SIDE 2 -----------------------
       PROC.CSSID PART.    DEVICE --CHPID--- ENTRY -----CU----- --DEVICE--- PROC.CSSID PART.    DEVICE ---CHPID-- ENTRY -----CU-----
LINE               NAME     NUM OS ID MOD TYP SW PO ID   LA   #  RNG TYPE UA             NAME     NUM OS ID MOD TYP SW PO ID   LA   #
------ ---------- -------- ------ -- --- --- -- -- ---- ---- -- --- ---- -- ---------- -------- ------ -- --- --- -- -- ---- ---- --
    1* CPC1.0     VM1      C010 N C0 SHR FC        C010      1   16 FCTC 00
    2* CPC1.0     VM1      C020 N C0 SHR FC        C020      2   16 FCTC 00
    3* CPC1.0     VM1      C030 N C0 SHR FC        C030      3   16 FCTC 00
    4* CPC1.0     VM1      C040 N C0 SHR FC        C040      4   16 FCTC 00
    5* CPC1.0     VM1      C110 N C1 SHR FC        C110      1   16 FCTC 00
    6* CPC1.0     VM1      C120 N C1 SHR FC        C120      2   16 FCTC 00
    7* CPC1.0     VM1      C130 N C1 SHR FC        C130      3   16 FCTC 00
    8* CPC1.0     VM1      C140 N C1 SHR FC        C140      4   16 FCTC 00
------ ---------- -------- ------ -- --- --- -- -- ---- ---- -- --- ---- -- ---------- -------- ------ -- --- --- -- -- ---- ---- --
```

```
 CTC CONNECTION REPORT                    TIME: 21:27  DATE: 2024-03-26  PAGE T-   1
       ------------------------- SIDE 1 ----------------------- - COMMON -- ------------------------- SIDE 2 -----------------------
       PROC.CSSID PART.    DEVICE --CHPID--- ENTRY -----CU----- --DEVICE--- PROC.CSSID PART.    DEVICE ---CHPID-- ENTRY -----CU-----
LINE               NAME     NUM OS ID MOD TYP SW PO ID   LA   #  RNG TYPE UA             NAME     NUM OS ID MOD TYP SW PO ID   LA   #
------ ---------- -------- ------ -- --- --- -- -- ---- ---- -- --- ---- -- ---------- -------- ------ -- --- --- -- -- ---- ---- --
    1* CPC1.0     VM1      C010 N C0 SHR FC        C010      1   16 FCTC 00 CPC1.0     VM1      C110 N C1 SHR FC        C110      1
    2  CPC1.0     VM1      C020 N C0 SHR FC        C020      2   16 FCTC 00 CPC1.0     VM2      C110 N C1 SHR FC        C110      1
    3  CPC1.0     VM1      C030 N C0 SHR FC        C030      3   16 FCTC 00 CPC1.0     VM3      C110 N C1 SHR FC        C110      1
    4  CPC1.0     VM1      C040 N C0 SHR FC        C040      4   16 FCTC 00 CPC1.0     VM4      C110 N C1 SHR FC        C110      1
    5* CPC1.0     VM1      C110 N C1 SHR FC        C110      1   16 FCTC 00 CPC1.0     VM1      C010 N C0 SHR FC        C010      1
    6  CPC1.0     VM1      C120 N C1 SHR FC        C120      2   16 FCTC 00 CPC1.0     VM2      C010 N C0 SHR FC        C010      1
    7  CPC1.0     VM1      C130 N C1 SHR FC        C130      3   16 FCTC 00 CPC1.0     VM3      C010 N C0 SHR FC        C010      1
    8  CPC1.0     VM1      C140 N C1 SHR FC        C140      4   16 FCTC 00 CPC1.0     VM4      C010 N C0 SHR FC        C010      1
------ ---------- -------- ------ -- --- --- -- -- ---- ---- -- --- ---- -- ---------- -------- ------ -- --- --- -- -- ---- ---- --
```

Add 4 More LPARs for 8-member SSI Picture

- **Create a picture of your connections**



C0	C1		
C010	C110	1	VM1
C020	C120	2	VM2
C030	C130	3	VM3
C040	C140	4	VM4
C050	C150	5	VM5
C060	C160	6	VM6
C070	C170	7	VM7
C080	C180	8	VM8

Code the IOCP

```
         CHPID PATH=(CSS(0),C0),SHARED,                                *
               PARTITION=(VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8),TYPE=FC,    *
               PCHID=101
*
*    PEER FCTC CONTROL UNIT 1 target VM1
         CNTLUNIT CUNUMBR=C010,PATH=(CSS(0),C0),UNIT=FCTC,             *
               UNITADD=((00,16)),CUADD=01
*$HCDC$        SERIAL='C000000001'
         IODEVICE ADDRESS=(C010,16),CUNUMBR=C010,UNIT=FCTC,            *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
*
*    PEER FCTC CONTROL UNIT 2 target VM2
         CNTLUNIT CUNUMBR=C020,PATH=(CSS(0),C0),UNIT=FCTC,             *
               UNITADD=((00,16)),CUADD=02
*$HCDC$        SERIAL='C000000001'
         IODEVICE ADDRESS=(C020,16),CUNUMBR=C020,UNIT=FCTC,            *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
*
*    PEER FCTC CONTROL UNIT 3 target VM3
         CNTLUNIT CUNUMBR=C030,PATH=(CSS(0),C0),UNIT=FCTC,             *
               UNITADD=((00,16)),CUADD=03
*$HCDC$        SERIAL='C000000001'
         IODEVICE ADDRESS=(C030,16),CUNUMBR=C030,UNIT=FCTC,            *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
*
*    PEER FCTC CONTROL UNIT 4 target VM4
         CNTLUNIT CUNUMBR=C040,PATH=(CSS(0),C0),UNIT=FCTC,             *
               UNITADD=((00,16)),CUADD=04
*$HCDC$        SERIAL='C000000001'
         IODEVICE ADDRESS=(C040,16),CUNUMBR=C040,UNIT=FCTC,            *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
*
```

```
*    PEER FCTC CONTROL UNIT 5 target VM5
         CNTLUNIT CUNUMBR=C050,PATH=(CSS(0),C0),UNIT=FCTC,             *
               UNITADD=((00,16)),CUADD=05
*$HCDC$        SERIAL='C000000001'
         IODEVICE ADDRESS=(C050,16),CUNUMBR=C050,UNIT=FCTC,            *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
*
*    PEER FCTC CONTROL UNIT 6 target VM6
         CNTLUNIT CUNUMBR=C060,PATH=(CSS(0),C0),UNIT=FCTC,             *
               UNITADD=((00,16)),CUADD=06
*$HCDC$        SERIAL='C000000001'
         IODEVICE ADDRESS=(C060,16),CUNUMBR=C060,UNIT=FCTC,            *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
*
*    PEER FCTC CONTROL UNIT 7 target VM7
         CNTLUNIT CUNUMBR=C070,PATH=(CSS(0),C0),UNIT=FCTC,             *
               UNITADD=((00,16)),CUADD=07
*$HCDC$        SERIAL='C000000001'
         IODEVICE ADDRESS=(C070,16),CUNUMBR=C070,UNIT=FCTC,            *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
*
*    PEER FCTC CONTROL UNIT 8 target VM8
         CNTLUNIT CUNUMBR=C080,PATH=(CSS(0),C0),UNIT=FCTC,             *
               UNITADD=((00,16)),CUADD=08
*$HCDC$        SERIAL='C000000001'
         IODEVICE ADDRESS=(C080,16),CUNUMBR=C080,UNIT=FCTC,            *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
*
```

Code the IOCP

```
         CHPID PATH=(CSS(0),C1),SHARED,                                *
               PARTITION=(VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8),TYPE=FC,    *
               PCHID=102
*
*    PEER FCTC CONTROL UNIT 1 target VM1
         CNTLUNIT CUNUMBR=C110,PATH=(CSS(0),C1),UNIT=FCTC,            *
               UNITADD=((00,16)),CUADD=01
*$HCDC$        SERIAL='C000000001'
         IODEVICE ADDRESS=(C110,16),CUNUMBR=C110,UNIT=FCTC,           *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
*
*    PEER FCTC CONTROL UNIT 2 target VM2
         CNTLUNIT CUNUMBR=C120,PATH=(CSS(0),C1),UNIT=FCTC,            *
               UNITADD=((00,16)),CUADD=02
*$HCDC$        SERIAL='C000000001'
         IODEVICE ADDRESS=(C120,16),CUNUMBR=C120,UNIT=FCTC,           *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
*
*    PEER FCTC CONTROL UNIT 3 target VM3
         CNTLUNIT CUNUMBR=C130,PATH=(CSS(0),C1),UNIT=FCTC,            *
               UNITADD=((00,16)),CUADD=03
*$HCDC$        SERIAL='C000000001'
         IODEVICE ADDRESS=(C130,16),CUNUMBR=C130,UNIT=FCTC,           *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
*
*    PEER FCTC CONTROL UNIT 4 target VM4
         CNTLUNIT CUNUMBR=C140,PATH=(CSS(0),C1),UNIT=FCTC,            *
               UNITADD=((00,16)),CUADD=04
*$HCDC$        SERIAL='C000000001'
         IODEVICE ADDRESS=(C140,16),CUNUMBR=C140,UNIT=FCTC,           *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
*
```

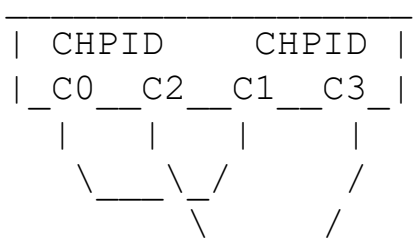
```
*    PEER FCTC CONTROL UNIT 5 target VM5
         CNTLUNIT CUNUMBR=C050,PATH=(CSS(0),C0),UNIT=FCTC,            *
               UNITADD=((00,16)),CUADD=05
*$HCDC$        SERIAL='C000000001'
         IODEVICE ADDRESS=(C050,16),CUNUMBR=C050,UNIT=FCTC,           *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
*
*    PEER FCTC CONTROL UNIT 6 target VM6
         CNTLUNIT CUNUMBR=C060,PATH=(CSS(0),C0),UNIT=FCTC,            *
               UNITADD=((00,16)),CUADD=06
*$HCDC$        SERIAL='C000000001'
         IODEVICE ADDRESS=(C060,16),CUNUMBR=C060,UNIT=FCTC,           *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
*
*    PEER FCTC CONTROL UNIT 7 target VM7
         CNTLUNIT CUNUMBR=C070,PATH=(CSS(0),C0),UNIT=FCTC,            *
               UNITADD=((00,16)),CUADD=07
*$HCDC$        SERIAL='C000000001'
         IODEVICE ADDRESS=(C070,16),CUNUMBR=C070,UNIT=FCTC,           *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
*
*    PEER FCTC CONTROL UNIT 8 target VM8
         CNTLUNIT CUNUMBR=C080,PATH=(CSS(0),C0),UNIT=FCTC,            *
               UNITADD=((00,16)),CUADD=08
*$HCDC$        SERIAL='C000000001'
         IODEVICE ADDRESS=(C080,16),CUNUMBR=C080,UNIT=FCTC,           *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
*
```

Verify the FICON CTCs Using HCD

- **EXEC IOCP CTC2 (NOWRT DESC1 SYS1 DESC2 IODFC2**
  - Use the IOCP EXEC to verify the syntax of the source deck
- **EXEC CBDSIODF IODFC2 WORKIODF A 2048 (REP**
  - Create an empty IODF
- **EXEC CBDSMIGR IODFC2 * A CTC2 IOCP A I CPC1 3932-A02 LPAR H221130**
  - Migrate the IOCP source into the IODF
- **EXEC CBDSREP IODFC2 WORKIODF A IODFC2 REP_CTC A T (REP**
  - Create the CTC report

Add Additional CHPID Pair

- **Create a picture of your connections**



C0	C1	Tgt		C2	C3
C010	C110	1	VM1	C210	C310
C020	C120	2	VM2	C220	C320
C030	C130	3	VM3	C230	C330
C040	C140	4	VM4	C240	C340
C050	C150	5	VM5	C250	C350
C060	C160	6	VM6	C260	C360
C070	C170	7	VM7	C270	C370
C080	C180	8	VM8	C280	C380

Code the IOCP

- **CHPIDs C0 and C1 remain the same**
- **Duplicate and modify for CHPIDs C2 and C3**

```
        CHPID PATH=(CSS(0),C0),SHARED,                          *
              PARTITION=(VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8),TYPE=FC,  *
              PCHID=101
*
*    PEER FCTC CONTROL UNIT 1 target VM1
        CNTLUNIT CUNUMBR=C010,PATH=(CSS(0),C0),UNIT=FCTC,       *
              UNITADD=((00,16)),CUADD=01
*$HCDC$       SERIAL='C000000001'
        IODEVICE ADDRESS=(C010,16),CUNUMBR=C010,UNIT=FCTC,      *
              UNITADD=00
*$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
*
*    PEER FCTC CONTROL UNIT 2 target VM2
        CNTLUNIT CUNUMBR=C020,PATH=(CSS(0),C0),UNIT=FCTC,       *
              UNITADD=((00,16)),CUADD=02
*$HCDC$       SERIAL='C000000001'
        IODEVICE ADDRESS=(C020,16),CUNUMBR=C020,UNIT=FCTC,      *
              UNITADD=00
*$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
*
  and so on ...
```

```
        CHPID PATH=(CSS(0),C1),SHARED,                          *
              PARTITION=(VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8),TYPE=FC,  *
              PCHID=102
*
*    PEER FCTC CONTROL UNIT 1 target VM1
        CNTLUNIT CUNUMBR=C110,PATH=(CSS(0),C1),UNIT=FCTC,       *
              UNITADD=((00,16)),CUADD=01
*$HCDC$       SERIAL='C000000001'
        IODEVICE ADDRESS=(C110,16),CUNUMBR=C110,UNIT=FCTC,      *
              UNITADD=00
*$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
*
*    PEER FCTC CONTROL UNIT 2 target VM2
        CNTLUNIT CUNUMBR=C120,PATH=(CSS(0),C1),UNIT=FCTC,       *
              UNITADD=((00,16)),CUADD=02
*$HCDC$       SERIAL='C000000001'
        IODEVICE ADDRESS=(C120,16),CUNUMBR=C120,UNIT=FCTC,      *
              UNITADD=00
*$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
*
   and so on ...
```

Code the IOCP

- **Complexity increases**

```
         CHPID PATH=(CSS(0),C2),SHARED,                              *
               PARTITION=(VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8),TYPE=FC,  *
               PCHID=103
*
*    PEER FCTC CONTROL UNIT 1 target VM1
         CNTLUNIT CUNUMBR=C210,PATH=(CSS(0),C2),UNIT=FCTC,           *
               UNITADD=((00,16)),CUADD=01
*$HCDC$        SERIAL='C000000002'
         IODEVICE ADDRESS=(C210,16),CUNUMBR=C210,UNIT=FCTC,          *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
*
*    PEER FCTC CONTROL UNIT 2 target VM2
         CNTLUNIT CUNUMBR=C220,PATH=(CSS(0),C2),UNIT=FCTC,           *
               UNITADD=((00,16)),CUADD=02
*$HCDC$        SERIAL='C000000002'
         IODEVICE ADDRESS=(C220,16),CUNUMBR=C220,UNIT=FCTC,          *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
*
  and so on ...
```

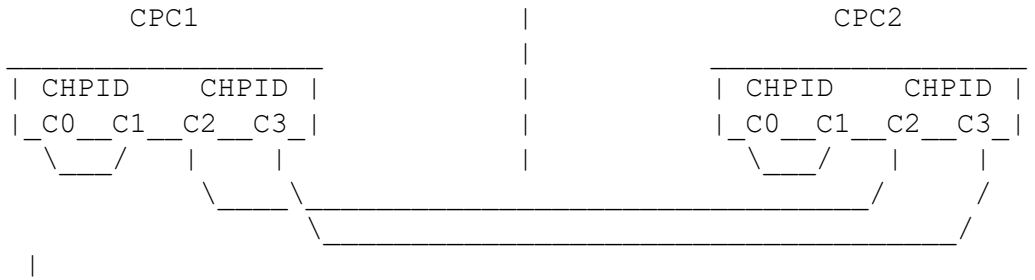
```
         CHPID PATH=(CSS(0),C3),SHARED,                              *
               PARTITION=(VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8),TYPE=FC,  *
               PCHID=104
*
*    PEER FCTC CONTROL UNIT 1 target VM1
         CNTLUNIT CUNUMBR=C310,PATH=(CSS(0),C3),UNIT=FCTC,           *
               UNITADD=((00,16)),CUADD=01
*$HCDC$        SERIAL='C000000002'
         IODEVICE ADDRESS=(C310,16),CUNUMBR=C310,UNIT=FCTC,          *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
*
*    PEER FCTC CONTROL UNIT 2 target VM2
         CNTLUNIT CUNUMBR=C320,PATH=(CSS(0),C3),UNIT=FCTC,           *
               UNITADD=((00,16)),CUADD=02
*$HCDC$        SERIAL='C000000002'
         IODEVICE ADDRESS=(C320,16),CUNUMBR=C320,UNIT=FCTC,          *
               UNITADD=00
*$DFLT$        PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
*   and so on ...
```

Verify the FICON CTCs Using HCD

- **EXEC IOCP CTC3 (NOWRT DESC1 SYS1 DESC2 IODFC3**
  - Use the IOCP EXEC to verify the syntax of the source deck
- **EXEC CBDSIODF IODFC3 WORKIODF A 2048 (REP**
  - Create an empty IODF
- **EXEC CBDSMIGR IODFC3 * A CTC3 IOCP A I CPC1 3932-A02 LPAR H221130**
  - Migrate the IOCP source into the IODF
- **EXEC CBDSREP IODFC3 WORKIODF A IODFC3 REP_CTC A T (REP**
  - Create the CTC report

Increase Availability Across Multiple CPCs

- **Create a picture of your connections**
- **Requires more CHPIDs for point-to-point CTCs**



C0	C1	C2	C3	Tgt		Tgt		C0	C1	C2	C3
C010	C110	x	x	1	VM1			x	x	C210	C310
C020	C120	x	x	2	VM2			x	x	C220	C320
x	x	C230	C330			3	VM3	C030	C130	x	x
x	x	C240	C340			4	VM4	C040	C140	x	x
C050	C150	x	x	5	VM5			x	x	C250	C350
C060	C160	x	x	6	VM6			x	x	C260	C360
x	x	C270	C370			7	VM7	C070	C170	x	x
x	x	C280	C380			8	VM8	C080	C180	x	x

Code the IOCP

- Two separate IOCP source decks
- Import to the same IODF
- Activate the same IODF on both CPCs

```
        CHPID PATH=(CSS(0),C0),SHARED,                          *
              PARTITION=(VM1,VM2,VM5,VM6),TYPE=FC,PCHID=101
*
*    PEER FCTC CONTROL UNIT 1 target VM1
        CNTLUNIT CUNUMBR=C010,PATH=(CSS(0),C0),UNIT=FCTC,       *
              UNITADD=((00,16)),CUADD=01
*$HCDC$       SERIAL='C000000001'
        IODEVICE ADDRESS=(C010,16),CUNUMBR=C010,UNIT=FCTC,      *
              UNITADD=00
*$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM5,VM6))
*
*    PEER FCTC CONTROL UNIT 2 target VM2
        CNTLUNIT CUNUMBR=C020,PATH=(CSS(0),C0),UNIT=FCTC,       *
              UNITADD=((00,16)),CUADD=02
*$HCDC$       SERIAL='C000000001'
        IODEVICE ADDRESS=(C020,16),CUNUMBR=C020,UNIT=FCTC,      *
              UNITADD=00
*$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM5,VM6))
*
*    PEER FCTC CONTROL UNIT 5 target VM5
        CNTLUNIT CUNUMBR=C050,PATH=(CSS(0),C0),UNIT=FCTC,       *
              UNITADD=((00,16)),CUADD=05
*$HCDC$       SERIAL='C000000001'
        IODEVICE ADDRESS=(C050,16),CUNUMBR=C050,UNIT=FCTC,      *
              UNITADD=00
*$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM5,VM6))
*
*    PEER FCTC CONTROL UNIT 6 target VM6
        CNTLUNIT CUNUMBR=C060,PATH=(CSS(0),C0),UNIT=FCTC,       *
              UNITADD=((00,16)),CUADD=06
*$HCDC$       SERIAL='C000000001'
        IODEVICE ADDRESS=(C060,16),CUNUMBR=C060,UNIT=FCTC,      *
              UNITADD=00
*$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM5,VM6))
*
```

```
        CHPID PATH=(CSS(0),C1),SHARED,                          *
              PARTITION=(VM1,VM2,VM5,VM6),TYPE=FC,PCHID=102
*
*    PEER FCTC CONTROL UNIT 1 target VM1
        CNTLUNIT CUNUMBR=C110,PATH=(CSS(0),C1),UNIT=FCTC,       *
              UNITADD=((00,16)),CUADD=01
*$HCDC$       SERIAL='C000000001'
        IODEVICE ADDRESS=(C110,16),CUNUMBR=C110,UNIT=FCTC,      *
              UNITADD=00
*$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM5,VM6))
*
*    PEER FCTC CONTROL UNIT 2 target VM2
        CNTLUNIT CUNUMBR=C120,PATH=(CSS(0),C1),UNIT=FCTC,       *
              UNITADD=((00,16)),CUADD=02
*$HCDC$       SERIAL='C000000001'
        IODEVICE ADDRESS=(C120,16),CUNUMBR=C120,UNIT=FCTC,      *
              UNITADD=00
*$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM5,VM6))
*
*    PEER FCTC CONTROL UNIT 5 target VM5
        CNTLUNIT CUNUMBR=C150,PATH=(CSS(0),C1),UNIT=FCTC,       *
              UNITADD=((00,16)),CUADD=05
*$HCDC$       SERIAL='C000000001'
        IODEVICE ADDRESS=(C150,16),CUNUMBR=C150,UNIT=FCTC,      *
              UNITADD=00
*$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM5,VM6))
*
*    PEER FCTC CONTROL UNIT 6 target VM6
        CNTLUNIT CUNUMBR=C160,PATH=(CSS(0),C1),UNIT=FCTC,       *
              UNITADD=((00,16)),CUADD=06
*$HCDC$       SERIAL='C000000001'
        IODEVICE ADDRESS=(C160,16),CUNUMBR=C160,UNIT=FCTC,      *
              UNITADD=00
*$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM5,VM6))
```

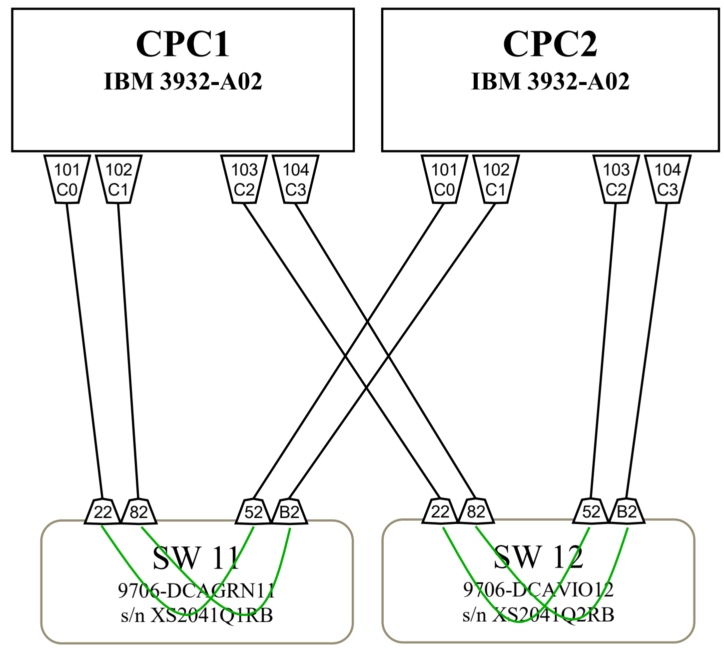
Verify the FICON CTCs Using HCD

- **EXEC IOCP CTC4CPC1 (NOWRT DESC1 SYS1 DESC2 IODFC4**
  EXEC IOCP CTC4CPC2 (NOWRT DESC1 SYS1 DESC2 IODFC4
  - Use the IOCP EXEC to verify the syntax of the source deck
- **EXEC CBDSIODF IODFC4 WORKIODF A 2048 (REP**
  - Create an empty IODF
- **EXEC CBDSMIGR IODFC4 * A CTC4CPC1 IOCP A I CPC1 3932-A02 LPAR H221130**
  EXEC CBDSMIGR IODFC4 * A CTC4CPC2 IOCP A I CPC2 3932-A02 LPAR H221130
  - Migrate the IOCP source into the IODF
- **EXEC CBDSREP IODFC4 WORKIODF A IODFC4 REP_CTC A T (REP**
  - Create the CTC report

Multiple CPCs and Add FICON Switches

- **Create a picture of your connections**

```
*        CPC1                  |                 CPC2
* __________________           |          __________________
* | CHPID    CHPID |           |          | CHPID    CHPID |
* |_C0__C1__C2__C3_|                      |_C0__C1__C2__C3_|
*   \   \    \   \           _______________/  /    /   /
*    \   \    \   \_________/_______          /    /   /
*     \   \    \___________/______  \        /    /   /
*      \   \_______       /  _____\__\______/ ___/   /
*       \_______   \     /  /      \  \      /  ____/
*               \___\___/__/        \__\____/__/
*              /22 82  52 B2\      /22 82  52 B2\
*              |            |      |            |
*              |   SW 11    |      |   SW 12    |
*              \____________/      \____________/
*                              |
*                              |
*   C0   C1   C2   C3  Tgt     | Tgt       C0   C1   C2   C3
*  C010 C110  x    x    1  VM1 |           x    x   C210 C310
*  C020 C120  x    x    2  VM2 |           x    x   C220 C320
*   x    x   C230 C330         |  3  VM3  C030 C130  x    x
*   x    x   C240 C340         |  4  VM4  C040 C140  x    x
*  C050 C150  x    x    5  VM5 |           x    x   C250 C350
*  C060 C160  x    x    6  VM6 |           x    x   C260 C360
*   x    x   C270 C370         |  7  VM7  C070 C170  x    x
*   x    x   C280 C380         |  8  VM8  C080 C180  x    x
```



Code the IOCP

- Two separate IOCP source decks
- Import to the same IODF
- Activate the same IODF on both CPCs

```
       CHPID PATH=(CSS(0),C0),SHARED,                                  *
             PARTITION=((VM1,VM2,VM5,VM6),(=)),SWITCH=11,PCHID=101,    *
             TYPE=FC
*$HCDC$      DESC='FCTC to SW11,22'
*$HCDC$      SWPORT=((11,22))
*
*    PEER FCTC CONTROL UNIT 1 target VM1
       CNTLUNIT CUNUMBR=C010,PATH=((CSS(0),C0)),UNITADD=((00,016)),  *
             LINK=((CSS(0),1182)),CUADD=01,UNIT=FCTC
*$HCDC$      DESC='FCTC to VM1 on CPC1'
*$HCDC$      SWPORT=((11,82))
       IODEVICE ADDRESS=(C010,16),CUNUMBR=C010,UNIT=FCTC,            *
             UNITADD=00
*$DFLT$      PARTITION=((CSS(0),VM1,VM2,VM5,VM6))
*
*    PEER FCTC CONTROL UNIT 2 target VM2
       CNTLUNIT CUNUMBR=C020,PATH=((CSS(0),C0)),UNITADD=((00,016)),  *
             LINK=((CSS(0),1182)),CUADD=02,UNIT=FCTC
*$HCDC$      DESC='FCTC to VM2 on CPC1'
*$HCDC$      SWPORT=((11,82))
       IODEVICE ADDRESS=(C020,16),CUNUMBR=C020,UNIT=FCTC,            *
             UNITADD=00
*$DFLT$      PARTITION=((CSS(0),VM1,VM2,VM5,VM6))
*
   and so on ...
```

```
CHPID PATH=(CSS(0),C1),SHARED,                                  *
             PARTITION=((VM1,VM2,VM5,VM6),(=)),SWITCH=11,PCHID=102,    *
             TYPE=FC
*$HCDC$      DESC='FCTC to SW11,82'
*$HCDC$      SWPORT=((11,82))
*
*    PEER FCTC CONTROL UNIT 1 target VM1
       CNTLUNIT CUNUMBR=C110,PATH=((CSS(0),C1)),UNITADD=((00,016)),  *
             LINK=((CSS(0),1122)),CUADD=01,UNIT=FCTC
*$HCDC$      DESC='FCTC to VM1 on CPC1'
*$HCDC$      SWPORT=((11,22))
       IODEVICE ADDRESS=(C110,16),CUNUMBR=C110,UNIT=FCTC,            *
             UNITADD=00
*$DFLT$      PARTITION=((CSS(0),VM1,VM2,VM5,VM6))
*
*    PEER FCTC CONTROL UNIT 2 target VM2
       CNTLUNIT CUNUMBR=C120,PATH=((CSS(0),C1)),UNITADD=((00,016)),  *
             LINK=((CSS(0),1122)),CUADD=02,UNIT=FCTC
*$HCDC$      DESC='FCTC to VM2 on CPC1'
*$HCDC$      SWPORT=((11,22))
       IODEVICE ADDRESS=(C120,16),CUNUMBR=C120,UNIT=FCTC,            *
             UNITADD=00
*$DFLT$      PARTITION=((CSS(0),VM1,VM2,VM5,VM6))
*
   and so on ...
```

Code the IOCP

```
        CHPID PATH=(CSS(0),C2),SHARED,                                  *
              PARTITION=((VM1,VM2,VM5,VM6),(=)),SWITCH=12,PCHID=103,    *
              TYPE=FC
*$HCDC$       DESC='FCTC to SW12,22'
*$HCDC$       SWPORT=((12,22))
*
*    PEER FCTC CONTROL UNIT 3 target VM3
        CNTLUNIT CUNUMBR=C230,PATH=((CSS(0),C2)),UNITADD=((00,016)),    *
              LINK=((CSS(0),12B2)),CUADD=03,UNIT=FCTC
*$HCDC$       DESC='FCTC to VM3 on CPC2'
*$HCDC$       SWPORT=((12,B2))
        IODEVICE ADDRESS=(C230,16),CUNUMBR=C230,UNIT=FCTC,              *
              UNITADD=00
*$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM5,VM6))
*
*    PEER FCTC CONTROL UNIT 4 target VM6
        CNTLUNIT CUNUMBR=C240,PATH=((CSS(0),C2)),UNITADD=((00,016)),    *
              LINK=((CSS(0),12B2)),CUADD=04,UNIT=FCTC
*$HCDC$       DESC='FCTC to VM4 on CPC2'
*$HCDC$       SWPORT=((12,B2))
        IODEVICE ADDRESS=(C240,16),CUNUMBR=C240,UNIT=FCTC,              *
              UNITADD=00
*$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM5,VM6))
*
```

```
CHPID PATH=(CSS(0),C3),SHARED,                                  *
              PARTITION=((VM1,VM2,VM5,VM6),(=)),SWITCH=12,PCHID=104,    *
              TYPE=FC
*$HCDC$       DESC='FCTC to SW12,82'
*$HCDC$       SWPORT=((12,82))
*
*    PEER FCTC CONTROL UNIT 3 target VM3
        CNTLUNIT CUNUMBR=C330,PATH=((CSS(0),C3)),UNITADD=((00,016)),    *
              LINK=((CSS(0),1252)),CUADD=03,UNIT=FCTC
*$HCDC$       DESC='FCTC to VM3 on CPC2'
*$HCDC$       SWPORT=((12,52))
        IODEVICE ADDRESS=(C330,16),CUNUMBR=C330,UNIT=FCTC,              *
              UNITADD=00
*$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM5,VM6))
*
*    PEER FCTC CONTROL UNIT 4 target VM4
        CNTLUNIT CUNUMBR=C340,PATH=((CSS(0),C3)),UNITADD=((00,016)),    *
              LINK=((CSS(0),1252)),CUADD=04,UNIT=FCTC
*$HCDC$       DESC='FCTC to VM4 on CPC2'
*$HCDC$       SWPORT=((12,52))
        IODEVICE ADDRESS=(C340,16),CUNUMBR=C340,UNIT=FCTC,              *
              UNITADD=00
*$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM5,VM6))
*
```

Define the FICON Switches to HCD

- Tell HCD the characteristics of the FICON switches
- IOCP decks no longer need the virtual *$HCDC$ SERIAL='C000000001' statements
- HCD determines connections from the SWPORT and LINK parameters on CHPID and CNTLUNIT macros

```
*$HCD$   SWITCH   SWID=11,ADDRESS=11,SERIAL='XS2041Q1RB',          *
               DESC='9706-DCAGRN11',PORT=((00,FF)),UNIT=2032
*$HCD$   SWITCH   SWID=12,ADDRESS=12,SERIAL='XS2041Q2RB',          *
               DESC='9706-DCAVIO12',PORT=((00,FF)),UNIT=2032
```

Verify the FICON CTCs Using HCD

- **EXEC IOCP CTC6CPC1 (NOWRT DESC1 SYS1 DESC2 IODFC6**
  EXEC IOCP CTC6CPC2 (NOWRT DESC1 SYS1 DESC2 IODFC6
  - Use the IOCP EXEC to verify the syntax of the source deck
- **EXEC CBDSIODF IODFC6 WORKIODF A 2048 (REP**
  - Create an empty IODF
- **EXEC CBDSMIGR IODFC6 * A CTC6CPC1 IOCP A I CPC1 3932-A02 LPAR H221130**
  EXEC CBDSMIGR IODFC6 * A CTC6CPC2 IOCP A I CPC2 3932-A02 LPAR H221130
  - Migrate the IOCP source into the IODF
- **EXEC CBDSREP IODFC6 WORKIODF A IODFC6 REP_CTC A T (REP**
  - Create the CTC report

Dynamic Change Decision

- **Choose how and where to manage I/O configuration**
  - Manage with z/OS if z/OS LPARs or guests are in use
    - z/VM can use and activate IODF generated with z/OS HCD
    - z/OS cannot use IODF generated be z/VM HCD
- **z/VM has two options**
  - HCD
    - Import IODF from z/OS and manage activation
    - Build and maintain IODF directly on z/VM HCD
      - Using IOCP decks
      - Using HCM
    - Single IODF can have all CPCs in a site configuration; that share peripheral devices
  - Native z/VM CP Dynamic I/O commands
    - Requires more in depth IOCP knowledge
    - Making dynamic changes requires careful execution to minimize possibility of mistakes
    - Each CPC has its own IOCP deck

Dynamic Activation Options

- **z/OS can do it all (configuration requirements must be met)**
- **Shared**
  - z/OS maintain IODF; activate hardware changes
  - Copy IODF to z/VM; export function documented in z/OS HCD User's Guide
  - Use CBDSIMP on z/VM
  - Use CBDSACT to soft activate on z/VM
- **z/VM HCD only**
  - HCM not covered
- **Native z/VM Commands**
  - EXEC IOCP for syntax checking
  - z/VM CP Dynamic I/O commands
  - EXEC IOCP to write IOCDS
  - CP SET IOCDS An

Configure for Dynamic I/O - Hardware

- **Choose one LPAR to manage I/O for entire CPC**
- **Configure the CPC from the HMC**
  - Customize Activation Profiles
  - Select LPAR profile
  - View the “Security” tab
  - Check the box for “Input/output (I/O) configuration control”

Configure for Dynamic I/O - Software

- **SYSTEM CONFIG**
  - Features,
    Disable,
    DYNamic_I/O, Allow hardware I/O changes
  - Features,
    Enable,
    SET_DYNamic_io, Allow use of SET DYNamic ON/OFF command
    SET_DEVices, Allow privileged users to reset CP's view of real devices
    NEW_DEVices_initialized_when_added
    CP will create a real device control block (RDEV) when it receives an I/O machine check (IOMCK)

One-time Hardware Enablement on Each CPC at Install if Possible

- **Code IOCP**
  - Syntax check with IOCP program to generate proper TOKEN statement
  - Optionally extract from IODF using CBDSIOCP and SA parameter
- **Copy to USB – HMC has restrictions on usable devices**
  - Be sure to include the TOK= parameter on the ID macro
  - Be sure to remove all of the comments
- **Shutdown all running LPARs**
- **Use Stand-Alone IOCP program on CPC**
- **POR (IML / Activate) the CPC**
- **This is all documented in the HMC User's Guide**

Implement a Dynamic Change Using z/VM HCD

- **Update IODF or create new IODF**
  - Directly on z/VM CBDIODSP
    - Validate using CBDSPROD to convert WORKIODF to PRODIODF
  - On z/OS TSO HCD
    - Export and transfer directly or FTP; Receive to CBDIODSP 191
- **Place a copy of the IODF onto the MAINT CF1 disk.**
  - CP will match the IODF information with the TOKEN.
- **Test activation of the IODF on CBDIODSP**
  - EXEC CBDSACT IODFfn cpcnm * (TEST
  - Review CBDSACT MSGLOG for errors
- **Activate the hardware changes once on each CPC**
  - EXEC CBDSACT IODFfn cpcnm iocds# (FORCE
- **Software-only activate on other z/VM LPARs on the CPC**
  - EXEC CBDSACT IODFfn cpcnm iocds# (SOFTNOval

Implement Change Using z/VM CP Commands

- **Update the IOCP source statements with proposed changes**
- **Run IOCP EXEC with NOWRT option to check syntax**
  - Do not load or activate
- **Use some sort of compare utility to extract differences between old and new IOCP**
  - XCOPY software had a utility called CMPR; this package is no longer available
  - Fran Hensler's XCOMPARE is available from the VM Workshop page
- **Use the output from the compare utility to code z/VM CP Dynamic I/O commands**
- **Implement the change from a single EXEC so that you can check return codes from all CP commands and stop if any error occurs**
  - CP SET DYNamic ON
  - Issue CP commands to dynamically make changes
    - **NOTE**: If any command fails, keep track of what was completed. Either reverse the completed commands or fix the failed commands. Write either the old or a new IOCP to a new IOCDS and activate it.
  - If commands complete successfully, run **IOCP** EXEC again with write option to create an IOCDS
  - Issue **CP SET IOCDS_active** command to activate the new IOCDS
    - This will change the hardware pointer so that the new IOCDS is selected at a future POR.
  - CP SET DYNamic OFF

Implement Change Using z/VM CP Commands

- **Code the IOCP source changes**
  - Example is adding 4 more LPARs to change SSI from 4 members to 8 members (CTC1 to CTC2 above)
- **Run IOCP EXEC with NOWRT option to check syntax**
- **Use some sort of compare utility to extract differences between old and new IOCP**
  - XCOPY software had a utility called CMPR; this package is no longer available
  - Fran Hensler's XCOMPARE is available from the VM Workshop page
- **Use the output from the compare utility, the new and old IOCP source files to code z/VM CP Dynamic I/O commands**
  - DEFINE / MODIFY CHPID
  - DEFINE / MODIFY CNTLUNIT
  - DEFINE / MODIFY DEVICE
- **Put commands into an EXEC**
- **Run the EXEC to issue CP commands to dynamically make changes**

Implement Change Using z/VM CP Commands

- **Compare new IOCP source to old IOCP source to create "diff" file**
  - Fran Hensler's XCOMPARE – XCOMPARE CTC2 IOCP A CTC1 IOCP A (DISK
  - Results in XCOMPARE LISTING A

```
FILE 1      1          ID    MSG1='CTC2      IOCDS A2          REVISED 24/03/26',   X
FILE 2      1          ID    MSG1='CTC1      IOCDS A1          REVISED 24/03/26',   X
FILE 1      4                TOK=('VM-TOKEN',F0F361F2F761F2F4F0F87AF2F07AF3F540404040X
FILE 1      5                ,00000000,'03/27/24','08:20:35','SYS1','IODFC2')
FILE 2      4                TOK=('VM-TOKEN',F0F361F2F661F2F4F2F17AF2F67AF2F040404040X
FILE 2      5                ,00000000,'03/26/24','21:26:20','SYS1','IODFC1')
FILE 1     11                (VM5,5),(VM6,6),(VM7,7),(VM8,8),                      *
FILE 1     12                (*,9),(*,A),(*,B),(*,C),(*,D),(*,E),(*,F)))
FILE 1     13  *$HCDC$       USAGE=(OS,OS,OS,OS,OS,OS,OS,OS,                       *
FILE 1     14                CF/OS,CF/OS,CF/OS,CF/OS,CF/OS,CF/OS,CF/OS,CF/OS)
FILE 2     11                (*,5),(*,6),(*,7),(*,8),(*,9),(*,A),(*,B),(*,C),(*,D),*
FILE 2     12                (*,E),(*,F)))
FILE 2     13  *$HCDC$       USAGE=(OS,OS,OS,OS,CF/OS,CF/OS,CF/OS,                 *
FILE 2     14                CF/OS,CF/OS,CF/OS,CF/OS,CF/OS,CF/OS,CF/OS,CF/OS)
FILE 1     31  *  C050   C150     5  VM5
FILE 1     32  *  C060   C160     6  VM6
FILE 1     33  *  C070   C170     7  VM7
FILE 1     34  *  C080   C180     8  VM8
FILE 1     39                PARTITION=(VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8),TYPE=FC,  *
FILE 1     40                PCHID=101
FILE 2     35                PARTITION=(VM1,VM2,VM3,VM4),TYPE=FC,PCHID=101
FILE 1     48  *$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
FILE 2     43  *$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4))
FILE 1     56  *$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
FILE 2     51  *$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4))
FILE 1     64  *$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
FILE 2     59  *$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4))
FILE 1     72  *$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
FILE 2     67  *$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4))
```

```
FILE 1     74  *    PEER FCTC CONTROL UNIT 5 target VM5
FILE 1     75          CNTLUNIT CUNUMBR=C050,PATH=(CSS(0),C0),UNIT=FCTC,          *
FILE 1     76                UNITADD=((00,16)),CUADD=05
FILE 1     77  *$HCDC$       SERIAL='C000000001'
FILE 1     78          IODEVICE ADDRESS=(C050,16),CUNUMBR=C050,UNIT=FCTC,         *
FILE 1     79                UNITADD=00
FILE 1     80  *$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
FILE 1     82  *    PEER FCTC CONTROL UNIT 6 target VM6
FILE 1     83          CNTLUNIT CUNUMBR=C060,PATH=(CSS(0),C0),UNIT=FCTC,          *
FILE 1     84                UNITADD=((00,16)),CUADD=06
FILE 2     70          CHPID PATH=(CSS(0),C1),SHARED,                             *
FILE 2     71                PARTITION=(VM1,VM2,VM3,VM4),TYPE=FC,PCHID=102
FILE 2     72  *
FILE 2     73  *    PEER FCTC CONTROL UNIT 1 target VM1
FILE 2     74          CNTLUNIT CUNUMBR=C110,PATH=(CSS(0),C1),UNIT=FCTC,          *
FILE 2     75                UNITADD=((00,16)),CUADD=01
FILE 1     86          IODEVICE ADDRESS=(C060,16),CUNUMBR=C060,UNIT=FCTC,         *
FILE 2     77          IODEVICE ADDRESS=(C110,16),CUNUMBR=C110,UNIT=FCTC,         *
FILE 1     88  *$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
FILE 2     79  *$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4))
FILE 1     90  *    PEER FCTC CONTROL UNIT 7 target VM7
FILE 1     91          CNTLUNIT CUNUMBR=C070,PATH=(CSS(0),C0),UNIT=FCTC,          *
FILE 1     92                UNITADD=((00,16)),CUADD=07
FILE 2     81  *    PEER FCTC CONTROL UNIT 2 target VM2
FILE 2     82          CNTLUNIT CUNUMBR=C120,PATH=(CSS(0),C1),UNIT=FCTC,          *
FILE 2     83                UNITADD=((00,16)),CUADD=02
FILE 1     94          IODEVICE ADDRESS=(C070,16),CUNUMBR=C070,UNIT=FCTC,         *
FILE 2     85          IODEVICE ADDRESS=(C120,16),CUNUMBR=C120,UNIT=FCTC,         *
FILE 1     96  *$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
FILE 2     87  *$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4))
```

And many more…

Create CP Dynamic I/O Commands

- **Use the output from the compare utility, the new and old IOCP source files to code**

```
 CTC2     IOCP     A1  F 80  Trunc=80 Size=177 Line=38 Col=1 Alt=0
====>
      |...+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....>
00038          CHPID PATH=(CSS(0),C0),SHARED,                          *
00039                PARTITION=(VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8),TYPE=FC,  *
00040                PCHID=101
00043          CNTLUNIT CUNUMBR=C010,PATH=(CSS(0),C0),UNIT=FCTC,       *
00044                UNITADD=((00,16)),CUADD=01
00045 *$HCDC$        SERIAL='C000000001'
00046          IODEVICE ADDRESS=(C010,16),CUNUMBR=C010,UNIT=FCTC,      *
00047                UNITADD=00
00048 *$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))

CTC1     IOCP     A1  F 80  Trunc=80 Size=107 Line=34 Col=1 Alt=0
====>
      |...+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....>
00034          CHPID PATH=(CSS(0),C0),SHARED,                          *
00035                PARTITION=(VM1,VM2,VM3,VM4),TYPE=FC,PCHID=101
00038          CNTLUNIT CUNUMBR=C010,PATH=(CSS(0),C0),UNIT=FCTC,       *
00039                UNITADD=((00,16)),CUADD=01
00040 *$HCDC$        SERIAL='C000000001'
00041          IODEVICE ADDRESS=(C010,16),CUNUMBR=C010,UNIT=FCTC,      *
00042                UNITADD=00
00043 *$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4))
```

```
FILE 1     1          ID    MSG1='CTC2      IOCDS A2          REVISED 24/03/26',   X
FILE 2     1          ID    MSG1='CTC1      IOCDS A1          REVISED 24/03/26',   X
FILE 1     4                TOK=('VM-TOKEN',F0F361F2F761F2F4F0F87AF2F07AF3F540404040X
FILE 1     5                ,00000000,'03/27/24','08:20:35','SYS1','IODFC2')
FILE 2     4                TOK=('VM-TOKEN',F0F361F2F661F2F4F2F17AF2F67AF2F040404040X
FILE 2     5                ,00000000,'03/26/24','21:26:20','SYS1','IODFC1')
FILE 1    11                (VM5,5),(VM6,6),(VM7,7),(VM8,8),                      *
FILE 1    12                (*,9),(*,A),(*,B),(*,C),(*,D),(*,E),(*,F)))
FILE 1    13  *$HCDC$       USAGE=(OS,OS,OS,OS,OS,OS,OS,OS,                       *
FILE 1    14                CF/OS,CF/OS,CF/OS,CF/OS,CF/OS,CF/OS,CF/OS)
FILE 2    11                (*,5),(*,6),(*,7),(*,8),(*,9),(*,A),(*,B),(*,C),(*,D),  *
FILE 2    12                (*,E),(*,F)))
FILE 2    13  *$HCDC$       USAGE=(OS,OS,OS,OS,CF/OS,CF/OS,CF/OS,                 *
FILE 2    14                CF/OS,CF/OS,CF/OS,CF/OS,CF/OS,CF/OS,CF/OS,CF/OS)
FILE 1    31  *  C050   C150     5  VM5
FILE 1    32  *  C060   C160     6  VM6
FILE 1    33  *  C070   C170     7  VM7
FILE 1    34  *  C080   C180     8  VM8
FILE 1    39                PARTITION=(VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8),TYPE=FC,  *
FILE 1    40                PCHID=101
FILE 2    35                PARTITION=(VM1,VM2,VM3,VM4),TYPE=FC,PCHID=101
FILE 1    48  *$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
FILE 2    43  *$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4))
FILE 1    56  *$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
FILE 2    51  *$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4))
FILE 1    64  *$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
FILE 2    59  *$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4))
FILE 1    72  *$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4,VM5,VM6,VM7,VM8))
FILE 2    67  *$DFLT$       PARTITION=((CSS(0),VM1,VM2,VM3,VM4))
```

CP DEFINE LPAR VM5 MIF_id 05 — **repeat for the other three new LPARs**

CP MODIFY CHPID C0 ADD INIT VM5 VM6 VM7 VM8 ACC VM5 VM6 VM7 VM8 — **repeat for all CHPIDs**

CP MODIFY DEVICE C010-C01F ADD PART VM5 VM6 VM7 VM8 — **repeat for all IODEVICEs**

Implement Change Using z/VM CP Commands

- **Put commands into an EXEC**

```
/* Add 4 more LPARs with FCTCs */

Address 'COMMAND'
Parse Source With . exec_nm .
'CP SPOOL CONSOLE TO * START NAME' exec_nm 'CONLOG'
Trace 'C'
Signal On Error
  'CP DEFINE LPAR VM5 MIF_id 05'
  'CP DEFINE LPAR VM6 MIF_id 06'
  'CP DEFINE LPAR VM7 MIF_id 07'
  'CP DEGINE LPAR VM8 MID_id 08'

  'CP MODIFY CHPID C0 ADD INIT VM5 VM6 VM7 VM8 ACC VM5 VM6 VM7 VM8'
  'CP MODIFY CHPID C1 ADD INIT VM5 VM6 VM7 VM8 ACC VM5 VM6 VM7 VM8'

  'CP MODIFY DEVICE C010-C01F ADD PART VM5 VM6 VM7 VM8'
/* more MODIFY DEVICE commands for other */

  'CP DEFINE CU C050 TYPE FICON_CTC UNITADD 00-16 CUADD 05 CHPID C0'
/* more DEFINE CNTLUNIT commands for new CNTLUNITs with CUADD for 05, 06, 07, 08 */

  'CP DEFINE DEV C050-C05F UNITADD 00 CU C050 NOTDASD STAT PAR VM1 VM2 VM3 VM4 VM5 VM6 VM7 VM8'
/* more DEFINE DEVICE commands for new IODEVICEs for the new LPARs */

Signal Off Error /* if we got this far then all of the HSA updates were successful */
```

Implement Change Using z/VM CP Commands

- **Put commands into an EXEC (continuation)**

```
iocp_fn = 'NEWIOCP1'
IOCDS = 'A3'
token1 = 'SYS1'
token2 = 'IODF11'

'GETFMADR'
Pull . . tmpvdev .
'CP DEFINE VFB-512 AS' tmpvdev 'BLK 75000'
'ACCESS' tmpvdev 'B'
'EXEC VMLINK IOCP_SOURCE <* C> (WRITE'
'COPYFILE' iocp_fn 'IOCP C = = B (REPLACE'
'EXEC IOCP' iocp_fn '(WRT'IOCDS 'DESC1' token1 'DESC2' token2
Say 'IOCP RC='rc
If rc \> 4 Then
  Do
    'ERASE' iocp_fn 'LISTING B'
    'CP SET IOCDS' IOCDS
    'CP SET TOKEN DESC1' token1 'DESC2' token2
    'COPYFILE' iocp_fn 'IOCP B = = C (REPLACE OLDD'
  End

'RELEASE B (DETACH'
'RELEASE C (DETACH'
Error:
erc = rc
'CP SPOOL CONSOLE STOP CLOSE TERM'
Exit erc
```

Questions?

References

- **HELP DYNIO**

```
Change specific device handling after initialization
Change the definition of an existing CHPID
Change the definition of an existing control unit
Change the definition of one or more existing
   real devices
Change the IOCDS file used during the next POR
Define a new channel path identifier
Define a new control unit
Define one or more new real devices
Delete an existing channel path identifier
Delete an existing control unit
Delete one or more existing real devices
Enable or disable the ability to dynamically change
   the processor's I/O configuration
Turn configuration mode on or off
```

Bibliography

- **Library bibliography HELP LIBRARY**
- **Pointer to VM publications from http://www.vm.ibm.com/library**

- **Input/Output Configuration Program User's Guide for ICP IOCP SB10-7177-02**
- **z/OS 3.1 Hardware Configuration Definition User's Guide SC34-2669-60**
  - Some information about $HCDC$, HCD SWITCH, $DFLT$
- **z/OS and z/VM: z/OS and z/VM V6R2.0 HCD Messages SC34-2669-60**
- **z/VM I/O Configuration V7R3 SC24-6291-73**
- **z/VM CP Messages and Codes V7R3 GC24-6270-73**
- **z/VM CP Planning and Administration V7R3 SC24-6271-73**
- **z/VM CP Commands and Utilities Reference V7R3 C24-6268-73**

Contact Information

RICK BARLOW

SENIOR Z/VM SPECIALIST

VELOCITY SOFTWARE INC.

450 ALKYRE RUN DRIVE, SUITE 200
WESTERVILLE, OH 43082

OFFICE MAIN (650) 964 8867

FAX (650) 964 9012

E-MAIL RICKB@VELOCITYSOFTWARE.COM

WEB WWW.VELOCITYSOFTWARE.COM