Ethernet INN using Cisco DLSw

Sample Conversion from the IBM 3745 to Communications Controller for Linux z/Series

Target Audience

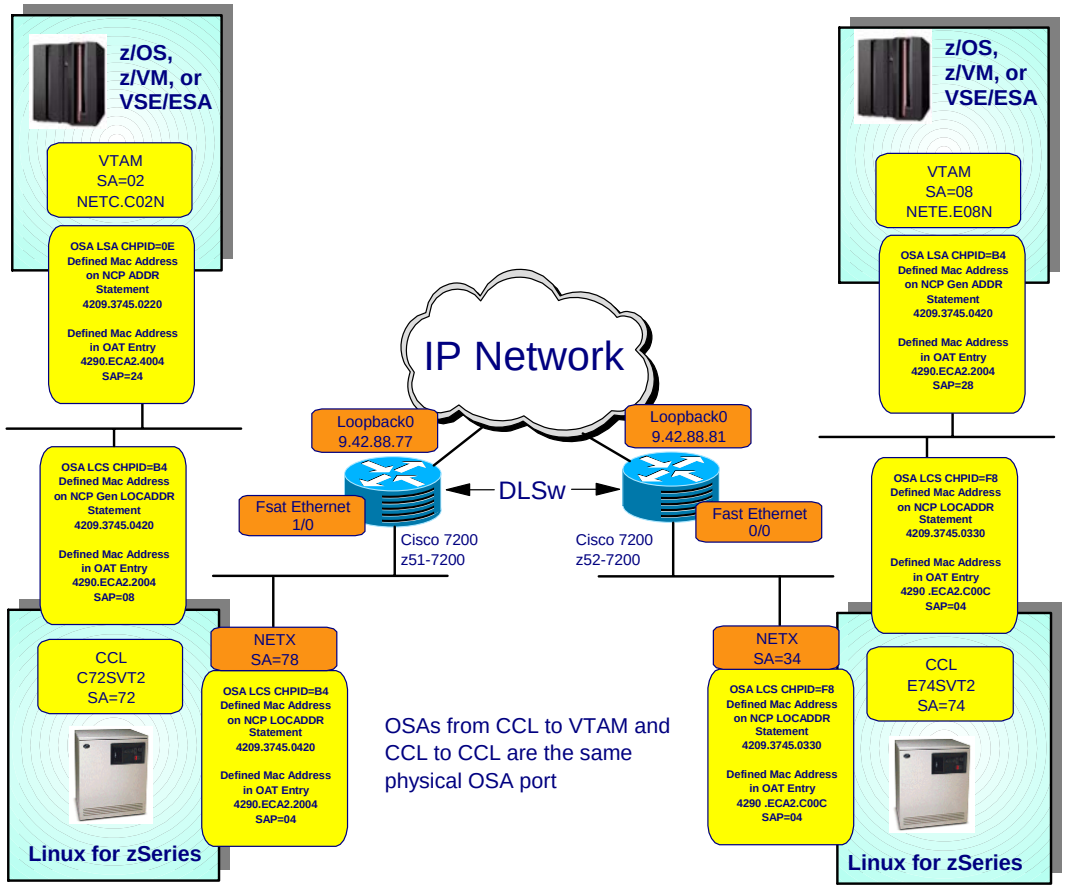
Customers using Token Ring (Native or SNI) between two IBM 3745/3746-900s. Both FEPs with be replaced with Communication Controller for Linux z/Series V1R1 and connections will be converted to Ethernet.

Purpose of this Paper

The intent of this paper is to provide a tested solution for customers during the migration from 3745/3746-900 FEPs to Communication Controller for Linux z/Series (CCL). This document will provide working examples of the following:

- VTAM XCA Major Node – VTAM to CCL
- NCP Physical and Logical lines – CCL to 3745
  - VTAM to Communication Controller for Linux z/Series
  - 3745 to Communication Controller for Linux z/Series
- DLSw Definitions for Routers

Test Configuration



Resources Used for Solution Verification

- Two z/OS Communications Servers
- Two Linux IDs running as guest under z/VM
  - 512mb of memory
  - 3 Virtual CPs
  - 2 3390-3 DASD volumes
- Three OSA Copper Ethernet OSA adapters
  - For our test, we were able to share the OSA LSA adapter. For most customer configurations, a total of 4 OSA adapters will be required.
- Layer 2 or Layer 3 Ethernet Switches
- Two Cisco IOS Routers
  - For testing purposes, we used Cisco 7200 Series IOS Routers

Starting CCL from Linux

- From the Linux console, change to the CCL directory:
  - cd /opt/ibm/Communication_Controller_for_Linux/
- Load the CCL kernel module
  - ./load_ndh.sh
    - You will receive the message :

      NDH kernel modules loaded. You are now able to run the cclengine
- Start the CCL engine
  - nohup ./cclengine -mC72SVT2 -p2072 SVTC72 &
    - If you use telnet or ssh into the Linux host you will want to preface the command with “nohup” so that the process will remain active even after the telnet/ssh session is terminated.

Activating NCP using XCA from NETC.C02N

- **From NETC.C02N activate the XCA major node**

```
V NET,ACT,ID=C02XCA,ALL
IST097I VARY ACCEPTED
IST093I C02XCA ACTIVE
IST464I LINK STATION C02ETHPU HAS CONTACTED SA 72
IST093I C02ETHPU ACTIVE
```

- **From NETC.C02N activate the NCP**

```
V NET,ACT,ID=C72SVT2,RNAME=C02ETHPU
IST097I VARY ACCEPTED
IST093I C72SVT2 ACTIVE
IST728I GWPATHS FOR GWN C72SVT2 ARE NOW ENABLED FOR THESE CDRMS
IST778I E04N
IST314I END
IST093I C72PU89A ACTIVE
IST093I C72NPPU ACTIVE
IST720I C72PG2A HAS CONTACTED E74TEST IN NETX, SA 34
IST093I C72PG2A ACTIVE
IST464I LINK STATION C72PG2B HAS CONTACTED C02NPU SA 2
IST093I C72PG2B ACTIVE
```

Activating NCP using XCA from NETE.E08N

- **From NETE.E04N activate the XCA major node**

```
V NET,ACT,ID=E08XCA,ALL
IST093I E08XCA ACTIVE
IST464I LINK STATION E08ETHPU HAS CONTACTED E74SVT2 SA 74
IST093I E08ETHPU ACTIVE
```

- **From NETE.E08N activate the NCP**

```
V NET,ACT,ALL,ID=E74SVT2,RNAME=E08ETHPU
IST097I VARY ACCEPTED
IST093I E74SVT2 ACTIVE
IST093I E74PU92A ACTIVE
IST093I E74PU93A ACTIVE
IST093I E74NPPU ACTIVE
IST093I E74NRFPU ACTIVE
IST464I LINK STATION E74PG1A HAS CONTACTED E04N SA 4
IST093I E74PG1A ACTIVE
IST464I LINK STATION E74PG2A3 HAS CONTACTED E08NPU SA 8
IST093I E74PG2A3 ACTIVE
```

Displaying the XCA Major Node - NETC.C02N

- **Display the XCA major node and the XCA Line**

```
D NET,ID=C02XCA,E
IST097I DISPLAY ACCEPTED
IST075I NAME = C02XCA, TYPE = XCA MAJOR NODE 723
IST486I STATUS= ACTIV, DESIRED STATE= ACTIV
IST1021I MEDIUM=CSMA/CD,ADAPNO= 0,CUA=2EEA,SNA SAP= 24
IST654I I/O TRACE = OFF, BUFFER TRACE = OFF
IST1656I VTAMTOPO = REPORT, NODE REPORTED - YES
IST170I LINES:
IST232I C02ETHLN ACTIV----E
IST314I END

D NET,ID=C02ETHLN,E
IST097I DISPLAY ACCEPTED
IST075I NAME = C02ETHLN, TYPE = LINE 735
IST486I STATUS= ACTIV----E, DESIRED STATE= ACTIV
IST087I TYPE = LEASED             , CONTROL = SDLC, HPDT = *NA*
IST134I GROUP = C02ETHGP, MAJOR NODE = C02XCA
IST1500I STATE TRACE = OFF
IST1656I VTAMTOPO = REPORT, NODE REPORTED - YES
IST1657I MAJOR NODE VTAMTOPO = REPORT
IST396I LNKSTA   STATUS     CTG GTG  ADJNODE ADJSA    NETID ADJL
IST397I C02ETHPU ACTIV--W-E   1   1  C72SVT2    72     NETC
IST314I END
```

Displaying the XCA Major Node - NETE.E08N

- **Display the XCA major node and the XCA Line**

```
D NET,ID=E08XCA,E
IST075I NAME = E08XCA, TYPE = XCA MAJOR NODE
IST486I STATUS= ACTIV, DESIRED STATE= ACTIV
IST1021I MEDIUM=CSMA/CD,ADAPNO= 0,CUA=2B4C,SNA SAP= 28
IST1885I SIO = 27 SLOWDOWN = NO
IST654I I/O TRACE = OFF, BUFFER TRACE = OFF
IST1656I VTAMTOPO = REPORT, NODE REPORTED - YES
IST170I LINES:
IST232I E08ETHLN ACTIV----E
IST314I END

D NET,ID=E08ETHLN,E
D NET,ID=E08ETHLN,E
IST075I NAME = E08ETHLN, TYPE = LINE
IST486I STATUS= ACTIV----E, DESIRED STATE= ACTIV
IST087I TYPE = LEASED             , CONTROL = SDLC, HPDT = *NA*
IST134I GROUP = E08ETHGP, MAJOR NODE = E08XCA
IST1500I STATE TRACE = OFF
IST1656I VTAMTOPO = REPORT, NODE REPORTED - YES
IST1657I MAJOR NODE VTAMTOPO = REPORT
IST396I LNKSTA   STATUS     CTG GTG  ADJNODE ADJSA    NETID
   ADJLS
IST397I E08ETHPU ACTIV--W-E   1   1  E74SVT2    74     NETE
IST314I END
```

Link Station and CDRM Activation

- From NETC.C02N, verify link station activation and contact

```
IST720I C72PG2A HAS CONTACTED E74TEST IN NETX, SA 34
IST093I C72PG2A ACTIVE
```

- From NETE.E08N, verify link station activation and contact

```
IST720I E74PG2A HAS CONTACTED C72SVT2 IN NETX, SA 78
IST093I E74PG2A ACTIVE
```

- From NETC.C02N, activate the CDRM

```
V NET,ACT,ID=E08N
IST097I VARY ACCEPTED
IST737I DEFAULT VR LIST USED FOR CDRM E08N USING GWN C72SVT2
IST324I ACTIVATE IN PROGRESS WITH ID = E08N DUE TO ACTCDRM REQUEST
IST093I E08N ACTIVE
```

C02XCA – XCA Major Node Definitions

```
C02XCA   VBUILD  TYPE=XCA
*
C02ETHPT PORT    MEDIUM=CSMACD,ADAPNO=0,SAPADDR=24,CUADDR=2EEA,          X
                 TIMER=100
*
C02ETHGP GROUP   DIAL=NO,ISTATUS=ACTIVE
C02ETHLN LINE    USER=SNA,ISTATUS=ACTIVE
C02ETHPU PU      MACADDR=4290ECA22004,PUTYPE=4,SUBAREA=72,TGN=1,         X
                 SAPADDR=08,ALLOWACT=YES
```

E08XCA – XCA Major Node Definitions

```
E08XCA   VBUILD  TYPE=XCA
*
E08ETHPT PORT    MEDIUM=CSMACD,ADAPNO=0,SAPADDR=28,CUADDR=2B4C,TIMER=100
E08ETHGP GROUP   DIAL=NO,ISTATUS=ACTIVE
E08ETHLN LINE    USER=SNA,ISTATUS=ACTIVE
E08ETHPU PU      MACADDR=4290ECA2C00C,PUTYPE=4,SUBAREA=74,TGN=1,          *
                 SAPADDR=04,ALLOWACT=YES
```

C72SVT2 – NTRI Physical Line Definitions

```
************************************************************
* Physical NTRI Lines
************************************************************
*
C72PTRG1 GROUP ECLTYPE=(PHY,ANY),ADAPTER=TIC2,ANS=CONT,MAXTSL=16732,    X
               RCVBUFC=32000,ISTATUS=ACTIVE,XID=NO,                     X
               RETRIES=(20,5,5),NPACOLL=(YES,EXTENDED)
**
C72TR89  LINE  ADDRESS=(1089,FULL),TRSPEED=16,PORTADD=89,               X
               LOCADD=420937450420,NPACOLL=YES
C72PU89A PU
```

C72SVT2 – NTRI Logical Lines

```
C72INNG2 GROUP ECLTYPE=(LOGICAL,SUBAREA),ANS=CONT,                    X
               ISTATUS=ACTIVE,LOCALTO=13.5,REMOTTO=18.2,              X
               T2TIMER=(0.2,0.2,3),PHYSRSC=C72PU89A,                  X
               SDLCST=(C72PRI,C72SEC),NPACOLL=YES
*
*-----------------------------------------------------------------
* Connection to Remote NCP over SNI Connection
*-----------------------------------------------------------------
*
C72LG2A  LINE  TGN=1,TGCONF=(MULTI,NORMAL)
C72PG2A  PU    ADDR=04420937450330,NETID=NETX,SSAP=(04,H),            X
               BLOCK=(4096,8)
*
*-----------------------------------------------------------------
* Connection to VTAM
*-----------------------------------------------------------------
*
C72LG2B  LINE  TGN=1,TGCONF=SINGLE,MONLINK=CONT
C72PG2B  PU    ADDR=18420937450220,SSAP=(08,H)
```

- Since the connection is over Ethernet, the BLOCK size will be limited to 1500 bytes regardless of what is coded on MAXTSL and BLOCK keywords in the NCP gen.

E74SVT2 – NTRI Physical Line

```
E74PTRG1 GROUP ECLTYPE=(PHY,ANY),ADAPTER=TIC2,ANS=CONT,MAXTSL=16732,    X
               RCVBUFC=32000,ISTATUS=ACTIVE,XID=NO,                     X
               RETRIES=(20,5,5),NPACOLL=(YES,EXTENDED)
*
*------------------------------------------------------------------
* Physical Ethernet - DLSw BNN and INN
*------------------------------------------------------------------
*
E74TR93  LINE  ADDRESS=(1093,FULL),TRSPEED=16,PORTADD=93,              X
               LOCADD=420937450330,NPACOLL=YES
E74PU93A PU
*
```

E74SVT2 – NTRI INN – Physical Definitions

```
E74INNG2 GROUP ECLTYPE=(LOGICAL,SUBAREA),ANS=CONT,                    X
               ISTATUS=ACTIVE,LOCALTO=13.5,REMOTTO=18.2,              X
               T2TIMER=(0.2,0.2,3),PHYSRSC=E74PU93A,                  X
               SDLCST=(E74PRI,E74SEC),NPACOLL=YES
*
*-------------------------------------------------------------------
* Connection to Remote NCP over SNI Connection
*-------------------------------------------------------------------
*
E74LG2A  LINE  TGN=1,TGCONF=(MULTI,NORMAL)
E74PG2A  PU    ADDR=04420937450420,NETID=NETX,SSAP=(04,H),            X
               BLOCK=(4096,8)
*
*-------------------------------------------------------------------
* Connection to VTAM – NETE.E08N
*-------------------------------------------------------------------
*
E74LG2A3 LINE  TGN=1
E74PG2A3 PU    ADDR=1C420937450420,SSAP=(04,H)
```

- Since the connection is over Ethernet, the BLOCK size will be limited to 1500 bytes regardless of what is coded on MAXTSL and BLOCK keywords in the NCP gen.

Cisco Router Definitions – Z51-7200

```
dlsw local-peer peer-id 9.42.88.77
dlsw remote-peer 0 tcp 9.42.88.81
dlsw bridge-group 1
!
interface Loopback0
 description Loopback Interface for VIPA
 ip address 9.42.88.77 255.255.255.252
 ip broadcast-address 0.0.0.0
 no ip unreachables
 no ip proxy-arp
 no ip route-cache
 no ip mroute-cache
!
interface FastEthernet1/0
 description DSLw Connection to CCL C72
 no ip address
 no ip unreachables
 no ip proxy-arp
 no ip route-cache
 duplex full
 bridge-group 1
!
bridge 1 protocol ieee
```

Cisco Router Definitions – Z52-7200

```
dlsw local-peer peer-id 9.42.88.81
dlsw remote-peer 0 tcp 9.42.88.77
dlsw bridge-group 1
!
interface Loopback0
 description Loopback Interface for VIPA
 ip address 9.42.88.81 255.255.255.252
 ip broadcast-address 0.0.0.0
 no ip unreachables
 no ip proxy-arp
 no ip route-cache
 no ip mroute-cache
!
interface FastEthernet0/0
 description DSLw Connection to CCL E74
 no ip address
 no ip unreachables
 no ip proxy-arp
 no ip route-cache
 duplex full
 bridge-group 1
!
bridge 1 protocol ieee
```