IBM

Token Ring to Ethernet BNN using Cisco DLSw

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

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Target Audience

Customers using Token Ring BNN in a remote branch. A 3745/3746 900 will be replaced in the datacenter and NTRI will be converted to Ethernet using Communication Controller for Linux z/Series V1R1.

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

IBM
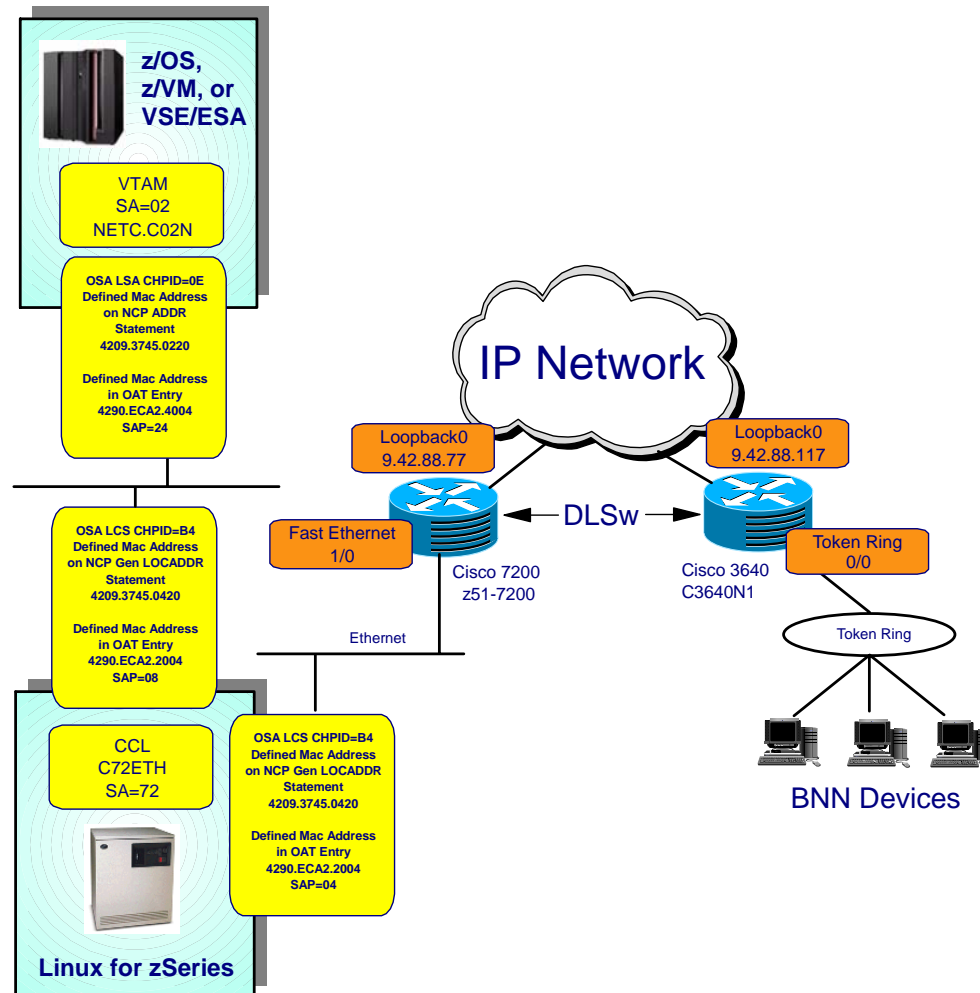
Resources Used for Solution Verification

- **Two z/OS Communications Servers**

- **One Linux ID running as guest under z/VM**
  - 512mb of memory
  - 3 Virtual CPs
  - 2 3390-3 DASD volumes

- **Two OSA Copper Ethernet OSA adapters**
- **Layer 2 or Layer 3 Ethernet Switch**

- **Layer 2 Token Ring Switch or hub**

- **One CCU of an IBM 3745**

Two Cisco IOS Routers
  - For testing purposes, we used Cisco 3600 and 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 -mC72ETH -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 C72ETH SA 72
IST093I C02ETHPU ACTIVE
```

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

```
V NET,ACT,ID=C72ETH,ALL
IST097I VARY ACCEPTED
IST093I C72ETH ACTIVE
IST093I C72PU89A ACTIVE
IST093I C72NPPU ACTIVE
IST464I LINK STATION C72PG2B HAS CONTACTED C02NPU SA 2
IST093I C72PG2B 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  C72ETH      72     NETC
IST314I END
```

BNN Devices Connecting into VTAM

- From the BNN device, establish the connection to VTAM. In our case, we used TPNS and Communications Server (NT and Linux) to simulate boundary devices.

```
IST590I CONNECTIN ESTABLISHED FOR PU NTPU1001 ON LINE J0028F9F
```

- Once the CONNECTIN is received at the VTAM console, the LUs downstream will receive the USS10 message and the user will be able to logon to the application.

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
```

C72ETH – NTRI Physical Line Definitions

```
*****************************************************************
* Physical NTRI Lines
*****************************************************************
*
C72PTRG1 GROUP ECLTYPE=(PHY,ANY),ADAPTER=TIC2,ANS=CONT,MAXTSL=16732,   X
               RCVBUFC=32000,USSTAB=AUSSTAB,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
```

C72ETH – NTRI Logical Line to Host C02N

```
***************************************************************
*               NTRI INN LOGICAL CONNECTIONS FOR 1089        *
*                   Native Connection to VTAM C02N           *
***************************************************************
*
C72INNG2 GROUP ECLTYPE=(LOGICAL,SUBAREA),ANS=CONT,MONLINK=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
*
*-------------------------------------------------------------------
* Link Station to VTAM NETC.C02N
*-------------------------------------------------------------------
*
C72LG2B  LINE  TGN=1,TGCONF=SINGLE
C72PG2B  PU    ADDR=1842093745020,SSAP=(08,H)
```

C72SVT2 – NTRI BNN – Logical Definitions

```
****************************************************************
*      NTRI BNN LOGICAL LINES FOR TOKEN RING PORT 1089         *
****************************************************************
*
C72BNNG2 GROUP ECLTYPE=LOGICAL,ANS=CONTINUE,AUTOGEN=1000,CALL=INOUT,   X
               ISTATUS=ACTIVE,PHYSRSC=C72PU89A,                        X
               USSTAB=AUSSTAB,RETRIES=(10,10,10,20),XMITDLY=NONE,      X
               MODETAB=AMODETAB,NPACOLL=YES
*
```

Sample NTRI SMN PU and LU

```
*************************************************************
*       SMN for NTRI BNN                                    *
*************************************************************
*
NTRISMN   VBUILD MAXGRP=10,MAXNO=180,TYPE=SWNET
*
NTPU1001 PU    ADDR=C1,PUTYPE=2,IDBLK=017,IDNUM=01001,      *
               MAXPATH=1,MAXOUT=3,ANS=CONTINUE,MODETAB=AMODETAB
NTL1001A LU    LOCADDR=2,DLOGMOD=D6327802,USSTAB=AUSSTAB
```

Cisco Router Definitions – Z51-7200

```
dlsw local-peer peer-id 9.42.88.77
dlsw remote-peer 0 tcp 9.42.88.117
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
 mac-address 0200.7200.5210
 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 – C3640N1

```
source-bridge ring-group 1111
dlsw local-peer peer-id 9.42.88.117
dlsw remote-peer 0 tcp 9.42.88.145
!
interface Loopback0
 description Loopback Interface for VIP
 ip address 9.42.88.117 255.255.255.252
 no ip unreachables
 no ip proxy-arp
!
!
interface TokenRing0/0
 description DLSw Ring from 3745 C73
 mac-address 4000.3640.0100
 no ip address
 no ip unreachables
 no ip proxy-arp
 no ip mroute-cache
 ring-speed 16
 no cdp enable
 source-bridge 100 1 1111
 source-bridge spanning
```