



Communication Controller for Linux on zSeries

# Token Ring to Ethernet INN using Cisco DLSw

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

## Target Audience

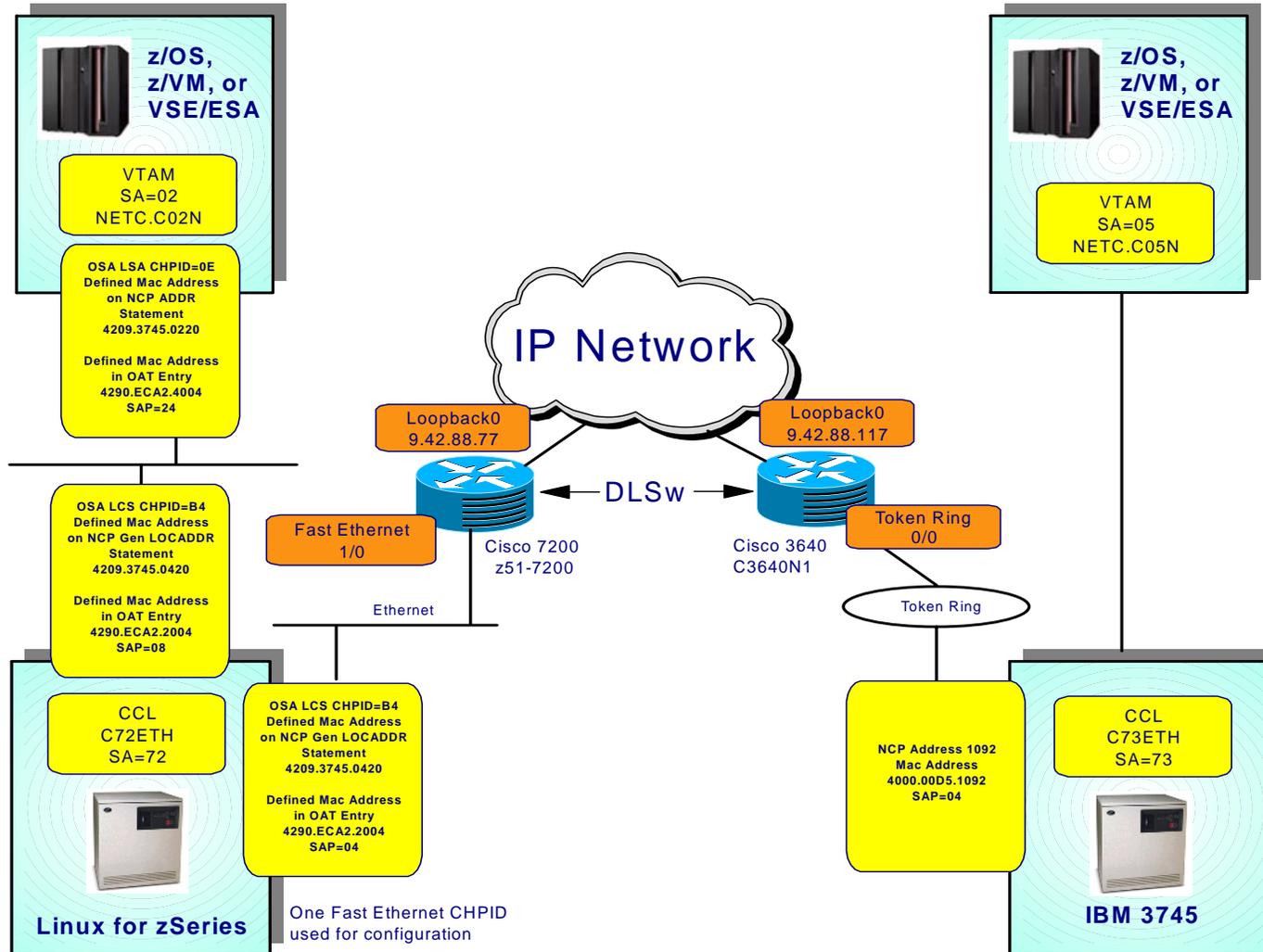
Customers using Token Ring INN (Native or SNI) between two 3745/3746-900s. One FEP will be replaced with Communication Controller for Linux z/Series V1R1 and converting Token Ring to Ethernet

## 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
- One Linux ID running as guest under z/VM
  - 512mb of memory
  - 1 Virtual CP
  - 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 C72PG2C HAS CONTACTED C73ETH SA 73
IST093I C72PG2C 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
```

## Load and Activate the 3745

- From NETC.C03N load and activate the NCP major node

```
V NET,ACT,ID=C73ETH,ALL,LOAD=YES,U=012
IST097I VARY ACCEPTED
IST461I ACTIVATE FOR U/RNAME ENTRY ID = 0012-S STARTED
IST897I LOAD OF C73ETH STARTED
IST270I LOAD OF C73ETH COMPLETE - LOAD MODULE = C73ETH
IST464I LINK STATION 0012-S HAS CONTACTED C73ETH SA 73
IST521I GBIND QUEUED FOR COS ISTVTCOS FROM C05N TO C73ETH
IST528I VIRTUAL ROUTE NUMBER    0    1    2    3    4    5    6    7
IST523I REASON = NO ROUTES OPERATIVE
IST093I C73ETH ACTIVE
IST464I LINK STATION C73CP5 HAS CONTACTED ISTPUS SA 5
IST093I C73CP5 ACTIVE
IST093I C73PU92A ACTIVE
```

## Link Station and CDRM Activation

- From NETC.C02, verify link station activation and contact

```
IST464I LINK STATION C72PG2C HAS CONTACTED C73ETH SA 73
IST093I C72PG2C ACTIVE
IST464I LINK STATION C72PG2B HAS CONTACTED C02NPU SA 2
IST093I C72PG2B ACTIVE
```

- Display the CDRMs from NETC.C02N and verify we have CDRMs to NETC.C05N

```
D NET,CDRMS
IST097I DISPLAY ACCEPTED
IST350I DISPLAY TYPE = CDRMS 651
IST089I C02CDRM TYPE = CDRM SEGMENT , ACTIV
IST482I C02N ACTIV, SA 2, EL 1, NETID = NETC
IST482I C03N ACTIV, SA 3, EL 1, NETID = NETC
IST482I C05N ACTIV, SA 5, EL 1, NETID = NETC
IST1454I 3 RESOURCE(S) DISPLAYED
IST314I END
```

## 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,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 C73ETH

```

*****
*           NTRI INN LOGICAL CONNECTIONS FOR 1089           *
*           Native Connection to VTAM C02N and VTAM C05N     *
*****
*
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=18420937450220,SSAP=(08,H)
*
*-----
* Link Station to VTAM C05N - Connection to C73ETH
*-----
*
C72LG2C  LINE   TGN=1,TGCONF=SINGLE
C72PG2C  PU     ADDR=04400000D51092,SSAP=(04,H)

```

# C73ETH – NTRI INN – Physical Definitions

```
*****
* TOKEN RING INTERFACES *
*****
*
C73PTRG1 GROUP 2CLTYPE=(PHY,ANY),ADAPTER=TIC2,ANS=CONT,MAXTSL=16732, X
                RCVBUFC=32000,ISTATUS=ACTIVE,XID=NO, X
                RETRIES=(20,5,5)
*
C73TR92 LINE ADDRESS=(1092,FULL),TRSPEED=16,PORTADD=92, X
                LOCADD=400000D51092
C73PU92A PU
```

# C73ETH – NTRI INN – Logical Definitions

```
*****
*      NTRI INN LOGICAL CONNECTIONS FOR 1092      *
*****
*
C73INNG1  GROUP  ECLTYPE=(LOGICAL, SUBAREA), ANS=CONT, MODETAB=AMODETAB,      X
              ISTATUS=ACTIVE, LOCALTO=13.5, REMOTTO=18.2, PHYPORT=92,      X
              T2TIMER=(1.5, 2.0, 3), PHYRSC=C73PU92A, USSTAB=AUSSTAB,      X
              SDL CST=(C73PRI, C73SEC)
*
*-----
* Link Station to NETC.C72ETH
*-----
*
C73LG2A  LINE  TGN=1, TGCONF=SINGLE
C73PG2A  PU    ADDR=04420937450420, BLOCK=(4096, 8)
*
```

## 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 unreachable
  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 unreachable
  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 9.42.88.77
!
interface Loopback0
  description Loopback Interface for VIP
  ip address 9.42.88.117 255.255.255.252
  no ip unreachable
  no ip proxy-arp
!
!
interface TokenRing0/0
  description DLSw Ring from 3745 C73
  no ip address
  no ip unreachable
  no ip proxy-arp
  no ip mroute-cache
  ring-speed 16
  no cdp enable
  source-bridge 100 1 1111
  source-bridge spanning
```