



Communication Controller for Linux on zSeries

# Frame Relay INN using Cisco DLSw

Sample Conversion from the IBM 3745 to  
Communications Controller for Linux on zSeries

## Target Audience

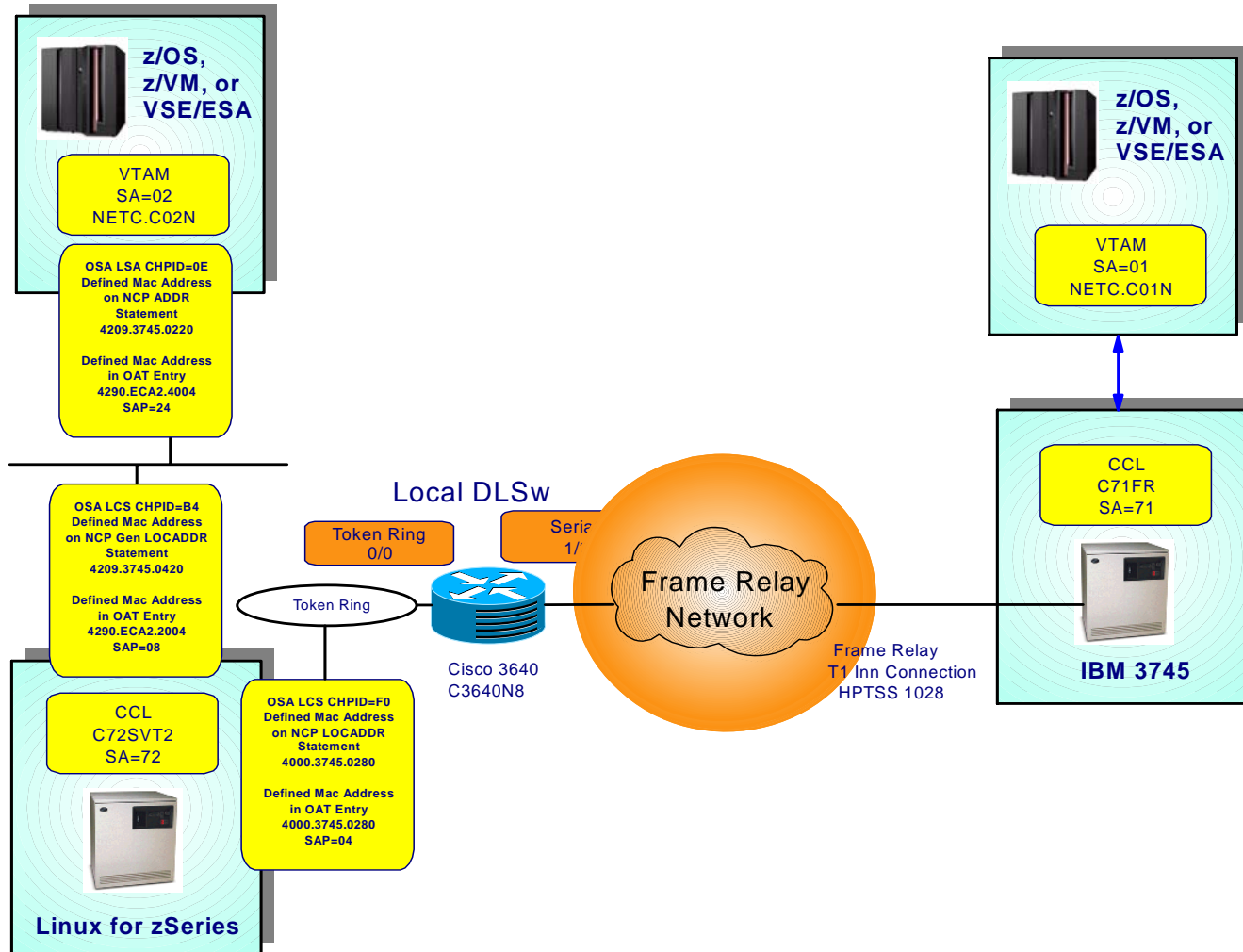
Customers using 3745/3746-900s Frame Relay INN who will be replacing the FEP with Communication Controller for Linux z/Series V1R1.

## 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
  - NCP to VTAM
  - NCP BNN Devices
- DLSw Definitions for Routers

# Test Configuration



## Resources Used for Solution Verification

- One z/OS Communications Server
- 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
- One Token Ring OSA adapter
- Layer 2 Token Ring Switch or hub
- Two Cisco IOS Routers
  - For testing purposes, we used a Cisco 3600 Series IOS Router
  - Assuming Frame Relay connection will terminate in data center allowing us to use a DLSw Local configuration

# 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
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 C72SVT2 72 NETC
IST314I END

```

# Link Station and CDRM Activation

- **Activate the logical INN link**

```
V NET,ACT,ID=C72LG1B,ALL
IST097I VARY ACCEPTED
IST093I C72LG1B ACTIVE
IST464I LINK STATION C72PG1B HAS CONTACTED C71FR SA 71
IST093I C72PG1B ACTIVE
```

- **Activate the CDRM**

```
v net,act,id=c01n
IST093I C01N 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

## C72SVT2 – NTRI Physical Line Definitions

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\* 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)

\*

C72TR88 LINE ADDRESS=(1088,FULL),TRSPEED=16,PORTADD=88, X  
LOCADD=400037450280,NPACOLL=YES

C72PU88A PU

\*

C72TR89 LINE ADDRESS=(1089,FULL),TRSPEED=16,PORTADD=89, X  
LOCADD=420937450420,NPACOLL=YES

C72PU89A PU

## C72SVT2 – NTRI Logical Line to VTAM

```
*****
* Connection to VTAM SA=02                                     *
*****
*
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
*
C72LG2B   LINE   TGN=1,TGCONF=SINGLE,MONLINK=CONT
C72PG2B   PU     ADDR=18420937450220,SSAP=(08,H)
```

## C72SVT2 – NTRI INN – Logical Definitions

\*\*\*\*\*

\* INN Connection to SA=73 - Frame Relay INN to 3745

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\*

```
C72INNG1 GROUP ECLTYPE=(LOGICAL,SUBAREA),ANS=CONT,PHYSRSC=C72PU88A,      X
                LOCALTO=13.5,REMOTTO=18.2,T2TIMER=(0.2,0.2,3),          X
                ISTATUS=ACTIVE,SDLCST=(C72PRI,C72SEC),NPACOLL=YES,       X
                MONLINK=CONT
```

\*

```
C72LG1B  LINE  TGN=1,TGCONF=SINGLE
```

```
C72PG1B  PU    ADDR=04400036400020,SSAP=(04,H),BLOCK=(4096,8),          *
                MODULO=8,MAXOUT=7
```

\*

- The ADDR statement is defined using the VMAC on the Virtual Token Ring interface. The VMAC on the router is coded as 4000.3640.0000 -- the finalized definition results from appending DLCI 32 (x'20') to the end of the VMAC address.

# C71FR – Physical Line Definitions

```
*****
* FRAME RELAY PHYSICAL LINE - HPTSS
*****
*
C71FRPG1 GROUP FRELAY=( PHYSICAL,ANY ),TYPE=NCP,MAXFRAME=4096,          *
          NPACOLL=( YES,EXTENDED)
*
C71F1028 LINE ADDRESS=( 1028,FULL ),                                     *
          CLOCKNG=EXT,PORTADD=28,                                       *
          SPEED=1843200,                                                *
          NRZI=NO
C71P1028 PU LMI=ANSI,TIMERS=( 29,30 ),ERRORT=( 9,10 ),                 *
          ANS=CONTINUE
```

## C71FR – Logical Line Definitions

```
*****
* FRAME RELAY LOGICAL LINE - INN TO C72                                     *
*****
*
C71FRLG1 GROUP FRELAY=LOGICAL,NPACOLL=(YES,EXTENDED),                      *
          ISTATUS=ACTIVE,                                                  *
          SDLCST=(C71PRI,C71SEC),                                          *
          LOCALTO=12.0,                                                    *
          T2TIMER=(1.2,,30),                                              *
          MODULO=8,                                                        *
          MAXOUT=7,                                                        *
          PHYSRSC=C71P1028
*
C71FLL1  LINE ISTATUS=INACTIVE
C71FLP1  PU PUTYPE=4,TGCONF=SINGLE,ADDR=20,TGN=1
*
```

## Cisco Router Definitions – C3640N8

```
frame-relay switching
!
source-bridge ring-group 1111
dlsw local-peer
!!
interface TokenRing0/0
  description Token Ring Connection to C72SVT1 doing DSLw
  no ip address
  no ip unreachable
  no ip proxy-arp
  no ip mroute-cache
  ring-speed 16
  no cdp enable
  source-bridge 2 1 1111
  source-bridge spanning
!
```

## Cisco Router Definitions – C3640N8 - Continued

```
interface Serial1/2
  description Frame Relay INN
  mtu 2500
  no ip address
  encapsulation frame-relay IETF
  no ip mroute-cache
  keepalive 12
  serial restart-delay 0
  no fair-queue
  frame-relay map llc2 32
  frame-relay lmi-type ansi
  frame-relay intf-type dce
  frame-relay lmi-t392dce 30
  frame-relay lmi-n392dce 9
  frame-relay lmi-n393dce 10
!
interface Virtual-TokenRing0
  no ip address
  ring-speed 16
  source-bridge 3 1 1111
  source-bridge spanning
  llc2 local-window 8
  llc2 t1-time 13500
  llc2 tpf-time 20000
  fras-host dlsw-local-ack
  fras-host bnn Serial1/2 fr-lsap 04 vmac 4000.3640.0000 hmac 4000.3745.0280
```