



Communication Controller for Linux on System z

NPSI LLC0 BNN Devices over Cisco XOT

Sample Definitions for Communications
Controller for Linux on System z

Target Audience

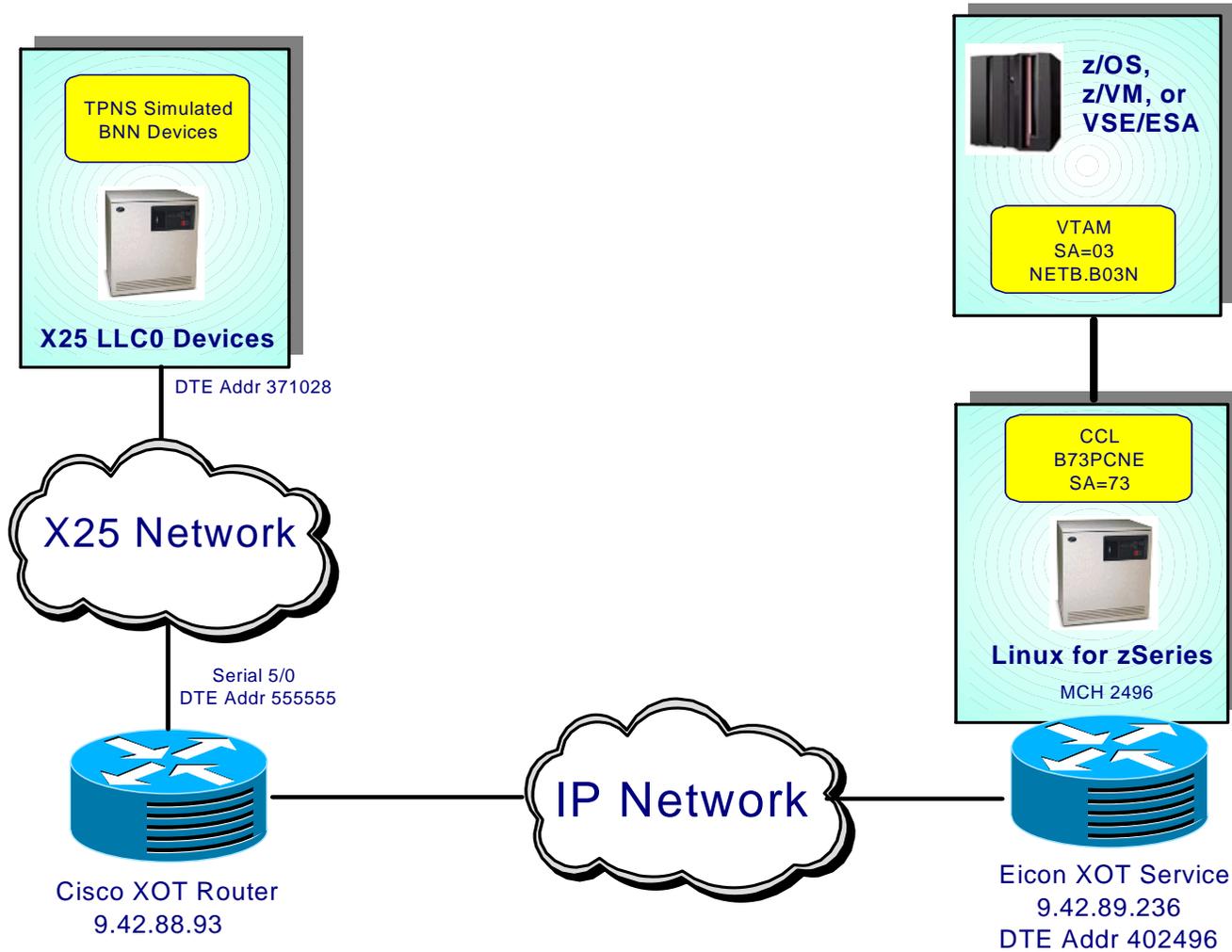
- Customers wanting a migrate from 3745/3746 hardware to Communication Controller for Linux on System z and use an IP network as a transport medium. Boundary devices will connect to a Cisco IOS router using serial interfaces. Cisco routers will be responsible for terminating X25.

Purpose of this Paper

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

- NCP gen parameters
- XOT definitions for Eicon (CCL Connection)
- XOT definitions for Cisco routers (PVC maps and SVC routes)

Test Configuration



Resources Used for Solution Verification

- One z/OS Communications Servers
- One Linux ID running as guest under z/VM
 - 512mb of memory
 - 2 Virtual CPs
 - 2 3390-3 DASD volumes
- OSN Connection from zOS to CCL
 - LSA/LCS connections can be used – OSN is not a requirement
- One QDIO or LCS OSA Adapter for IP communication
- Eicon XOT Server for Linux on System z
- Cisco IOS Router
 - Cisco fix is tracked by following the DDTS number CSCsd77820. The fix is targeted for 12.4 train of IOS code

B73PCNE – VCCPT and OUFT Indexes

```
*****
*      X25.VCCPT STATEMENTS
*****
*
*      X25.VCCPT INDEX=1,MAXPKTL=128,VWINDOW=1
*      X25.VCCPT INDEX=2,MAXPKTL=128,VWINDOW=7
*      X25.VCCPT INDEX=3,MAXPKTL=4096,VWINDOW=127
*      X25.VCCPT INDEX=4,MAXPKTL=4096,VWINDOW=127
*
*****
*      X25.OUFT STATEMENTS
*****
*
*      X25.OUFT INDEX=1
*      X25.OUFT INDEX=2,OPTFACL=420707430707
*      X25.OUFT INDEX=3,OPTFACL=420707430303,USRFILD=1234567890
*      X25.OUFT INDEX=4,OPTFACL=420A0A436464
*
```

B73PCNE – MCH2496 Physical Line Definition

```
MCH2496  X25.MCH ADDRESS=2496      NPACOLL=(MCHLINE,MCHPU,VCPU),
          FRMLGTH=133,              NPPVCN=10,
          MMODULO=8,                NPRETRY=31,
          LCGDEF=(0,10),            SPAN=X2501,
          RESETPVC=YES,            STATION=DTE,
          MWINDOW=7,               TDTIMER=1,
          ACCOUNT=YES,             TPTIMER=8,
          ANS=CONT,                NPADTEAD=712496
          PHYSRSC=YES,
          NCPGRP=XG2496,
          PUNAME=XP2496,
          LUNAME=XU2496,
          IDBLKC=069,
          DBIT=YES,
          GATE=NO,
          LCN0=NOTUSED,
          LLCLIST=(LLC0),
          NDRETRY=3,
```

B73PCNE – PVC INN Logical Line Definitions

```
*****
*                               LOGICAL LINE DEFINITIONS                               *
*****
*
X25.LCG LCGN=0
*
X25.VC LCN=01,LLC=LLC0,VCCINDX=1,TYPE=P
X25.VC LCN=02,LLC=LLC0,VCCINDX=1,TYPE=P
X25.VC LCN=03,LLC=LLC0,VCCINDX=1,TYPE=P
X25.VC LCN=04,LLC=LLC0,VCCINDX=1,TYPE=P
X25.VC LCN=05,LLC=LLC0,VCCINDX=1,TYPE=P
*
X25.VC CALL=INOUT,HEXNAME=NO,ISTATUS=ACTIVE,
      LCN=(06,10),NCPGRP=XGA96SVC,OUFINDX=2,PRFLINE=XLA96,
      PRFLU=XUA96,PRFPU=XPA96,SPAN=OPER1,SUFFIX=101,
      TYPE=S,VCCINDX=2
```

B73PCNE – EICON Definitions

```
[xot_server]
  product_id=EXS
  product_name=Eicon XOT Server
  product_version=V1R1
  number_of_ports=1
;
[xot_server/port.1]
  mch_name=MCH2496
  lcgcn_support=0
  local_svc_x25_address=402496
  local_pvc_interface=Serial1
  remote_pvc_interface=Serial5/0
  number_of_xot_maps=0
  pvc_reconnect_timer=30
  vport_trace_enabled=1
  vport_trace_size=2
;
[xot_server/port.1/x25]
  max_window_size=7
  max_packet_size=128
  first_pvc=1
  num_pvc=5
  first_svc=6
  num_svc=5
  remote_pvc_ip=9.42.88.93
  remote_svc_x25_address=371028
  remote_svc_ip=9.42.88.93
```

```
[xot_server/port.1/hdlc]
  startup=0
  station_type=0
  pack_format=0
  max_window_size=7
  max_retry_counter=10
  check_point_timer=2900
  ack_delay_timer=200
  idle_probe_timer=15000
```

Note: remote_pvc_interface must match the serial interface on the Cisco router. The local_pvc_interface value is coded on the Cisco side to map the PVCs back to this interface.

Cisco Router – XOT Definitions

```
x25 routing
!
interface Serial5/0
description Connection for PCNE BNN Devices
no ip address
no ip unreachable
no ip proxy-arp
encapsulation x25 dce
no ip mroute-cache
x25 address 555555
x25 win 7
x25 wout 7
X25 ltc 6
X25 htc 10
x25 use-source-address
x25 pvc 1 xot 9.42.89.236 interface Serial 1 pvc 1
x25 pvc 2 xot 9.42.89.236 interface Serial 1 pvc 2
x25 pvc 3 xot 9.42.89.236 interface Serial 1 pvc 3
x25 pvc 4 xot 9.42.89.236 interface Serial 1 pvc 4
x25 pvc 5 xot 9.42.89.236 interface Serial 1 pvc 5
serial restart-delay 0
dce-terminal-timing-enable
no cdp enable
!
x25 route 371028 interface Serial5/0
x25 route 402496 xot 9.42.89.236 xot-source Loopback0
```

- “Serial 1” on the X25 PVC statement must map the local_pvc_interface called “Serial 1” in the Eicon XOT definitions. “X25 LTC” must be coded to allow for the PVC range.

Starting CCL from Linux – With Load Option

- From the Linux console, change to the CCL directory:
 - `cd /opt/ibm/ndh`
- 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
- From the Linux console, change to the CCL directory:
 - `cd /opt/ibm/Communication_Controller_for_Linux/`
- Start the CCL engine
 - `nohup ./cclengine -mccldp -p2073 B73 &`
 - 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.
 - `cclcdp` tells the cclengine the load will come from the VTAM command

Starting the XOT Server

- The XOT configuration file must be in the same directory as the exotd server
 - In this case, the exotd server will be in the directory /opt/eicon/xot

- Start the XOT server
 - `nohup ./exotd &`
 - 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 Channel Commands

From NETB.B03N, load and activate the NCP Major Node

```
V NET,ACT, ID=B73PCNE,ALL,LOAD=YES,U=3F01
IST097I  VARY          ACCEPTED
IST461I  ACTIVATE     FOR U/RNAME ENTRY ID = 3F01-S    STARTED
IST897I  LOAD                OF B73PCNE                STARTED
IST270I  LOAD OF B73PCNE  COMPLETE - LOAD MODULE = B73PCNE
IST464I  LINK STATION 3F01-S  HAS CONTACTED B73PCNE  SA          73
IST093I  B73PCNE  ACTIVE
IST093I  B73P2112 ACTIVE
IST093I  B73NPPU  ACTIVE
IST093I  XP2496   ACTIVE
IST464I  LINK STATION C3P23E00 HAS CONTACTED ISTPUS  SA          3
IST093I  C3P23E00 ACTIVE
```

Display PVCs in Session with Test Appl

From NETB.B03N, display the ECHO test application

```
DISPLAY NET, ID=ECHOB03A, SCOPE=ALL
IST097I  DISPLAY  ACCEPTED
IST075I  NAME = NETB.ECHOB03A      , TYPE = DYNAMIC APPL
IST486I  STATUS= ACT/S           , DESIRED STATE= ACTIV
IST1447I REGISTRATION TYPE = CDSERVR
.
.
.
IST171I  ACTIVE SESSIONS = 0000000005, SESSION REQUESTS = 0000000000
IST206I  SESSIONS:
IST634I  NAME      STATUS          SID          SEND RECV VR TP NETID
IST635I  XUHKW003  ACTIV-S      E7D787653E66AB19 001F 001E  0  0 NETB
IST635I  XUHKW001  ACTIV-S      E7D787653E66AB18 001D 001C  0  0 NETB
IST635I  XUHKW002  ACTIV-S      E7D787653E66AB17 0020 001F  0  0 NETB
IST635I  XUHKW005  ACTIV-S      E7D787653E66AB1B 001D 001C  0  0 NETB
IST635I  XUHKW004  ACTIV-S      E7D787653E66AB1A 0021 0020  0  0 NETB
IST314I  END
```

Inbound Calls and Clears

Results of Simulated X25 devices issuing a CALL

```
IST590I CONNECTIN ESTABLISHED FOR PU PCPU0101 ON LINE XLA96101
IST590I CONNECTIN ESTABLISHED FOR PU PCPU0102 ON LINE XLA96102
IST590I CONNECTIN ESTABLISHED FOR PU PCPU0103 ON LINE XLA96103
IST590I CONNECTIN ESTABLISHED FOR PU PCPU0104 ON LINE XLA96104
IST590I CONNECTIN ESTABLISHED FOR PU PCPU0105 ON LINE XLA96105
```

Results of Simulated X25 devices issuing a CLEAR

```
IST259I INOP RECEIVED FOR PCPU0101 CODE = 01
IST619I ID = PCPU0101 FAILED - RECOVERY IN PROGRESS
IST590I CONNECTION TERMINATED FOR PU PCPU0101 ON LINE XLA96101
IST259I INOP RECEIVED FOR PCPU0102 CODE = 01
IST619I ID = PCPU0102 FAILED - RECOVERY IN PROGRESS
IST590I CONNECTION TERMINATED FOR PU PCPU0102 ON LINE XLA96102
IST259I INOP RECEIVED FOR PCPU0103 CODE = 01
IST619I ID = PCPU0103 FAILED - RECOVERY IN PROGRESS
IST590I CONNECTION TERMINATED FOR PU PCPU0103 ON LINE XLA96103
IST621I RECOVERY SUCCESSFUL FOR NETWORK RESOURCE PCPU0101
IST621I RECOVERY SUCCESSFUL FOR NETWORK RESOURCE PCPU0102
IST621I RECOVERY SUCCESSFUL FOR NETWORK RESOURCE PCPU0103
IST259I INOP RECEIVED FOR PCPU0104 CODE = 01
IST619I ID = PCPU0104 FAILED - RECOVERY IN PROGRESS
IST590I CONNECTION TERMINATED FOR PU PCPU0104 ON LINE XLA96104
IST621I RECOVERY SUCCESSFUL FOR NETWORK RESOURCE PCPU0104
IST259I INOP RECEIVED FOR PCPU0105 CODE = 01
IST619I ID = PCPU0105 FAILED - RECOVERY IN PROGRESS
IST590I CONNECTION TERMINATED FOR PU PCPU0105 ON LINE XLA96105
IST621I RECOVERY SUCCESSFUL FOR NETWORK RESOURCE PCPU0105
```