



Communication Controller for Linux on System z

NPSI Sub Area Dial INN over XOT

Sample Definitions for Communications
Controller for Linux on System z

Target Audience

- Customers wanting a migrate NPSI Sub Area Dial INN connection from 3745/3746 hardware to Communication Controller for Linux on System z9 and zSeries using an IP network as a transport medium.

Purpose of this Paper

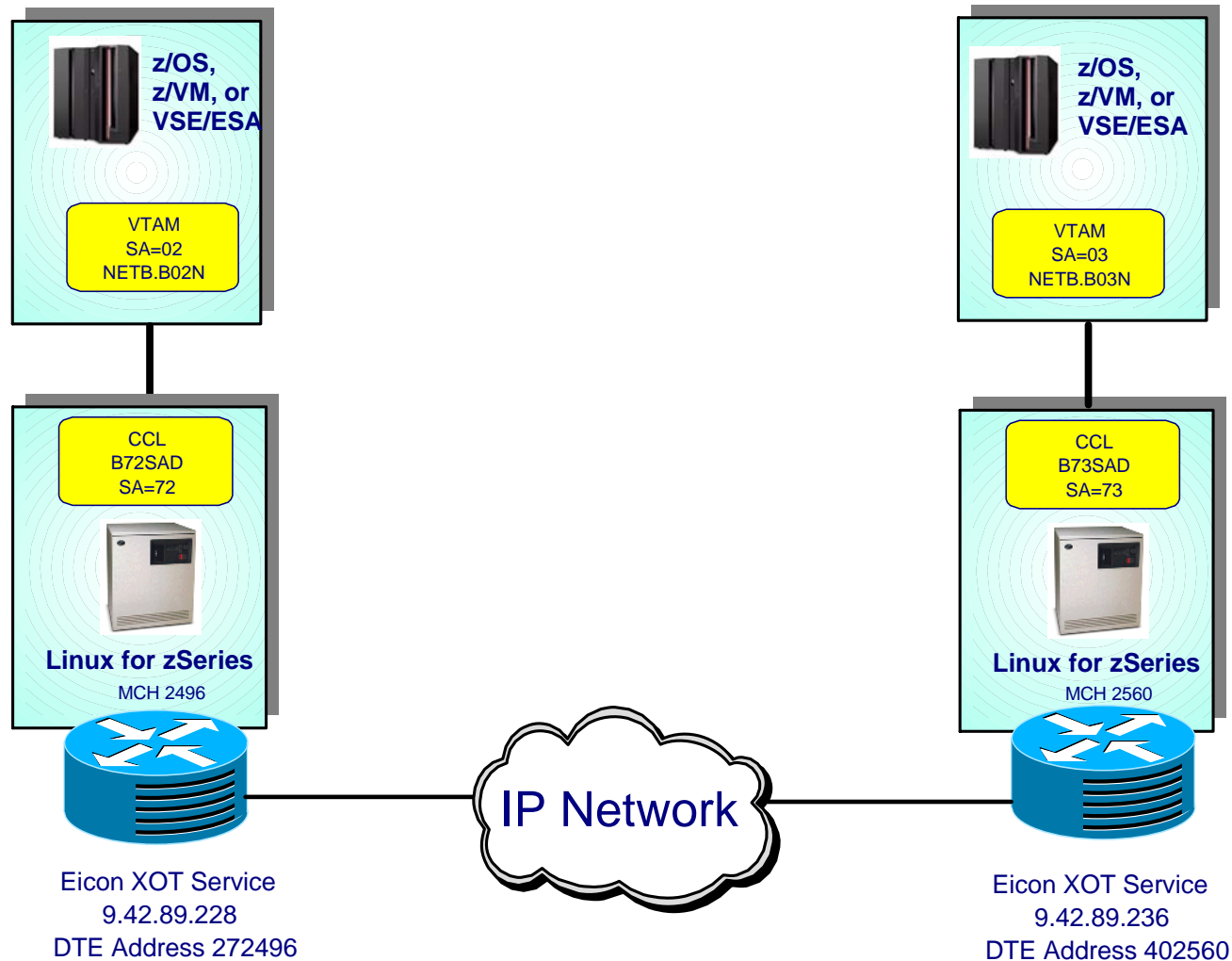
The intent of this paper is to provide a sample solution for customers during the migration from 3745/3746-900 FEPs to Communication Controller for Linux on System z9 or zSeries (CCL). This document will provide working examples of the following:

- NCP gen parameters
- XOT definitions for Eicon (CCL Connection)

Technology Disclaimer

- When running in an environment between two Communications Controllers for Linux on System z, the XOT based solution will provide full mappings of LCI (logical channel group number and logical channel numbers. This example shows this function by using LCGN=1 and LCN=1 for the Sub Area Dial connection.
- At the present time, the Cisco XOT function passes all connections on the XOT leg on LCI=1. We support this environment by disabling the LCGN support in the XOT configuration file.
- This function limits the customer to using LCGN=0 only and restricts the number of VCs to 254 per MCH.
- If you plan to use XOT on a Cisco router to connect a 3745/3746 to Communications Controllers for Linux on System z, please refer to the Cisco examples.

Test Configuration



Resources Used for Solution Verification

- Two z/OS Communications Servers
- Two Linux IDs 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 per z/VM guest
- Eicon XOT Server for Linux

B72SAD – 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,USRFIELD=1234567890
      X25.OUFT INDEX=4,OPTFACL=420A0A436464
*
```

B72SAD – MCH2496 Physical Line Definition

```
MCH2496  X25.MCH ADDRESS=2496 ,
          RESETPVC=YES ,
          RNRTIMER=30 ,
          RNRPKT=YES ,
          FRMLGTH=133 ,
          MMODULO=8 ,
          MWINDOW=7 ,
          ANS=CONT ,
          DBIT=YES ,
          GATE=NO ,
          LCGDEF=(1,1) ,
          LCN0=NOTUSED ,
          LLCLIST=LLC3 ,
          LSPRI=NO ,
          LUNAME=XU2496 ,
          MBITCHN=YES ,
          NPADTEAD=712496 ,
          NCPGRP=XG2496 ,
          PHYSRSC=NO ,
          PUNAME=XP2496 ,
          SDRTCNT=1 ,
          SDRTIME=10 ,
          SHM=YES ,
          SPEED=1843200 ,
          STATION=DTE ,
          SVCINN=1 ,
          TPTIMER=3 ,
          TDTIMER=1 ,
          NPRETRY=10 ,
          NDRETRY=3 ,
          XMONLNK=YES
```

B72SAD – SVC INN Logical Line Definitions

```
*****
*                                LOGICAL LINE DEFINITIONS                                *
*****
*
      X25.LCG LCGN=1
*
XLA96GGH X25.LINE DSTNODE=INN,CALL=INOUT,SPAN=OPER1,TYPE=S,
      NCPGRP=XGA96SAD
*
XPA96GGH X25.PU ISTATUS=INACTIVE,PUTYPE=4
*
XUA96GGH X25.VC LCN=1,TYPE=S,OUFINDX=2,VCCINDX=1,CALL=INOUT,
      ISTATUS=ACTIVE,HEXNAME=NO,SPAN=OPER1,SUFFIX=1,
      PRFLINE=XM96RESL,PRFPU=XM96RESP,PRFLU=XM96RESU
*
```


B02SADMN – Sub Area Dial Switched Major Node

```
B02SADSM VBUILD MAXGRP=5,MAXNO=5,TYPE=SWNET
```

```
*
```

```
*****
```

```
* SAD CONNECTION TO NPSI SUBAREA 78 *
```

```
*****
```

```
*
```

```
HOSTB03X PU      SUBAREA=73,ADDR=01,ANS=CONT,PUTYPE=4,MAXDATA=1024,  
                  MAXPATH=2,MAXOUT=7,TGN=1,IDNUM=88888
```

```
*
```

```
SADPATH1 PATH    DIALNO=402560*27249610202,GID=128,PID=01,  
                  GRPNM=XGA60SAD,SHM=YES,SHMTIM=1000
```

B73SAD – 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,USRFIELD=1234567890

X25.OUFT INDEX=4,OPTFACL=420A0A436464

*

B73SAD – MCH2560 Physical Line Definition

```
MCH2560  X25.MCH ADDRESS=2560 ,
          RESETPVC=YES ,
          RNRTIMER=30 ,
          RNRPKT=YES ,
          FRMLGTH=133 ,
          MWINDOW=7 ,
          MMODULO=8 ,
          ANS=CONT ,
          DBIT=YES ,
          GATE=NO ,
          LCGDEF=(1,1) ,
          LCN0=NOTUSED ,
          LLCLIST=LLC3 ,
          LSPRI=NO ,
          LUNAME=XU2560 ,
          MBITCHN=YES ,
          NCPGRP=XG2560 ,
          NDRETRY=3 ,
          NPRETRY=7 ,
          PHYSRSC=NO ,
          PUNAME=XP2560 ,
          SDRTCNT=1 ,
          SDRTIME=10 ,
          SHM=YES ,
          SPEED=1843200 ,
          STATION=DTE ,
          SVCINN=1 ,
          TDTIMER=3 ,
          TPTIMER=10 ,
          XMONLNK=YES
```

B73SAD – SVC INN Logical Line Definitions

```
*****
*                                LOGICAL LINE DEFINITIONS                                *
*****
*
      X25.LCG LCGN=1
*
XLA60GGH X25.LINE DSTNODE=INN,CALL=INOUT,SPAN=OPER1,TYPE=S,
      NCPGRP=XGA60SAD
*
XPA60GGH X25.PU ISTATUS=INACTIVE,PUTYPE=4
*
XUA60GGH X25.VC LCN=1,TYPE=S,OUFINDX=2,VCCINDX=1,CALL=INOUT,
      ISTATUS=ACTIVE,HEXNAME=NO,SPAN=OPER1,SUFFIX=1,
      PRFLINE=XM60RESL,PRFPU=XM60RESP,PRFLU=XM60RESU
```

B03SADMN – Sub Area Dial Switched Major Node

```
B03SADSM VBUILD MAXGRP=5,MAXNO=5,TYPE=SWNET
```

```
*
```

```
*****
```

```
* SAD CONNECTION TO NPSI SUBAREA 78
```

```
*****
```

```
*
```

```
HOSTB02X PU      SUBAREA=72,ADDR=01,ANS=CONT,PUTYPE=4,MAXDATA=1024,  
                  MAXPATH=2,MAXOUT=7,TGN=1,IDNUM=88888
```

```
*
```

```
SADPATH1 PATH    DIALNO=272496*40256010202,GID=128,PID=01,  
                  GRPNM=XGA60SAD,SHM=YES,SHMTIM=1000
```

B72SAD – EICON Definitions (Page 1 of 3)

```
[xot_server]
  product_id=EXS
  product_name=Eicon XOT Server
  product_version=V1R1
  number_of_ports=1

;-----
; MCH2496 - Subarea Dial MCH
;-----

[xot_server/port.1]
  mch_name=MCH2496
  lcn_support=1
  local_svc_x25_address=272496
  local_pvc_interface=Serial1
  remote_pvc_interface=Serial1
  number_of_xot_maps=1
  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
```

B72SAD – EICON Definitions (Page 2 of 3)

```
[xot_server/port.1/xot_map.1]
  map_enabled=1
  lcgn=1
  remote_svc_x25_address=402560
  remote_svc_ip=9.42.89.236
  remote_pvc_ip=9.42.89.236
  group_first_pvc=0
  group_num_pvc=0
  group_first_svc=1
  group_num_svc=1
  backup_svc_ip=0.0.0.0
  backup_timer=0
  caller_address=
  caller_override=0
  call_timer=0
  call_retries=0
  call_retry_delay=0
  cug=0
  cug_ext_format=0
  cug_override=0
  idle_timer=0
```

B72SAD – EICON Definitions (Page 3 of 3)

```
[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
```


B73SAD – EICON Definitions (Page 1 of 3)

```
[xot_server]
  product_id=EXS
  product_name=Eicon XOT Server
  product_version=V1R1
  number_of_ports=1

;-----
; MCH2496 - Subarea Dial MCH
;-----

[xot_server/port.1]
  mch_name=MCH2560
  lcn_support=1
  local_svc_x25_address=402560
  local_pvc_interface=Serial1
  remote_pvc_interface=Serial1
  number_of_xot_maps=1
  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
```

B73SAD – EICON Definitions (Page 2 of 3)

```
[xot_server/port.1/xot_map.1]
  map_enabled=1
  lcn=1
  remote_svc_x25_address=272496
  remote_svc_ip=9.42.89.228
  remote_pvc_ip=9.42.89.228
  group_first_pvc=0
  group_num_pvc=0
  group_first_svc=1
  group_num_svc=1
  backup_svc_ip=0.0.0.0
  backup_timer=0
  caller_address=
  caller_override=0
  call_timer=0
  call_retries=0
  call_retry_delay=0
  cug=0
  cug_ext_format=0
  cug_override=0
  idle_timer=0
```

B73SAD – EICON Definitions (Page 3 of 3)

```
[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
```

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 -mcclcdp -p2072 B72 & at z/VM Guest #1`
 - `nohup ./cclengine -mcclcdp -p2073 B73 & at z/VM Guest #2`
 - 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
 - B72 and B73 are the directories where the `iplport` definitions are located

Starting the XOT Servers

- 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.B02N, load and activate the NCP Major Node

```
V NET,ACT,ID=B72SAD,ALL,LOAD=YES,U=3F81
IST097I  VARY          ACCEPTED
IST461I  ACTIVATE     FOR U/RNAME ENTRY ID = 3F81-S    STARTED
IST897I  LOAD          OF B72SAD                      STARTED
IST270I  LOAD OF B72SAD  COMPLETE - LOAD MODULE = B72SAD
IST464I  LINK STATION 3F81-S  HAS CONTACTED B72SAD    SA          72
IST093I  B72SAD      ACTIVE
IST093I  B72P2112 ACTIVE
IST093I  B72NPPU    ACTIVE
IST093I  XP2496     ACTIVE
IST464I  LINK STATION C1P13E80 HAS CONTACTED ISTPUS    SA          2
IST093I  C1P13E80 ACTIVE
```

Activating NCP using Channel Commands

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

```
V NET,ACT,ID=B73SAD,ALL,LOAD=YES,U=3F01
IST097I  VARY          ACCEPTED
IST461I  ACTIVATE     FOR U/RNAME ENTRY ID = 3F01-S    STARTED
IST897I  LOAD          OF B73SAD                      STARTED
IST270I  LOAD OF B73SAD  COMPLETE - LOAD MODULE = B73SAD
IST464I  LINK STATION 3F01-S  HAS CONTACTED B73SAD    SA          73
IST093I  B73SAD      ACTIVE
IST093I  B73NPPU    ACTIVE
IST093I  B73P2112   ACTIVE
IST380I  ERROR FOR ID = XUHO          - REQUEST: ACTLU      , SENSE: 081C0000
IST093I  XP2560     ACTIVE
IST464I  LINK STATION C3P23E00 HAS CONTACTED ISTPUS    SA          3
IST093I  C3P23E00   ACTIVE
```

Activate Switched Major Nodes

From NETB.B02N, Activate the Switched Major Nodes

```
VARY NET,ACT,ID=B02SADMN,SCOPE=ALL  
IST097I  VARY      ACCEPTED  
IST093I  HOSTB03X  ACTIVE  
IST093I  B02SADMN  ACTIVE
```

From NETB.B03N, Activate the Switched Major Nodes

```
VARY NET,ACT,ID=B03SADMN,SCOPE=ALL  
IST097I  VARY      ACCEPTED  
IST093I  HOSTB02X  ACTIVE  
IST093I  B03SADMN  ACTIVE
```


Issue Dial and Activate CDRMs

From NETB.B02N, Issue the Dial Command

```
V NET,DIAL,ID=HOSTB03X
IST097I  VARY      ACCEPTED
IST590I  CONNECTOUT ESTABLISHED FOR PU HOSTB03X ON LINE XLA96GGH
IST464I  LINK STATION HOSTB03X HAS CONTACTED B73SAD  SA
IST241I  VARY DIAL  COMMAND COMPLETE FOR HOSTB03X
```

At NETB.B03N, Incoming Call Received

```
IST590I  CONNECTIN ESTABLISHED FOR PU HOSTB02X ON LINE XLA60GGH
IST464I  LINK STATION HOSTB02X HAS CONTACTED B72SAD  SA
```

From NETB.B03N, activate the CDRM

```
VARY NET,ACT,ID=B02N
IST097I  VARY      ACCEPTED
IST093I  B02N      ACTIVE
```