



Communication Controller for Linux on zSeries

SDLC INN to Ethernet using Cisco DLSw

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

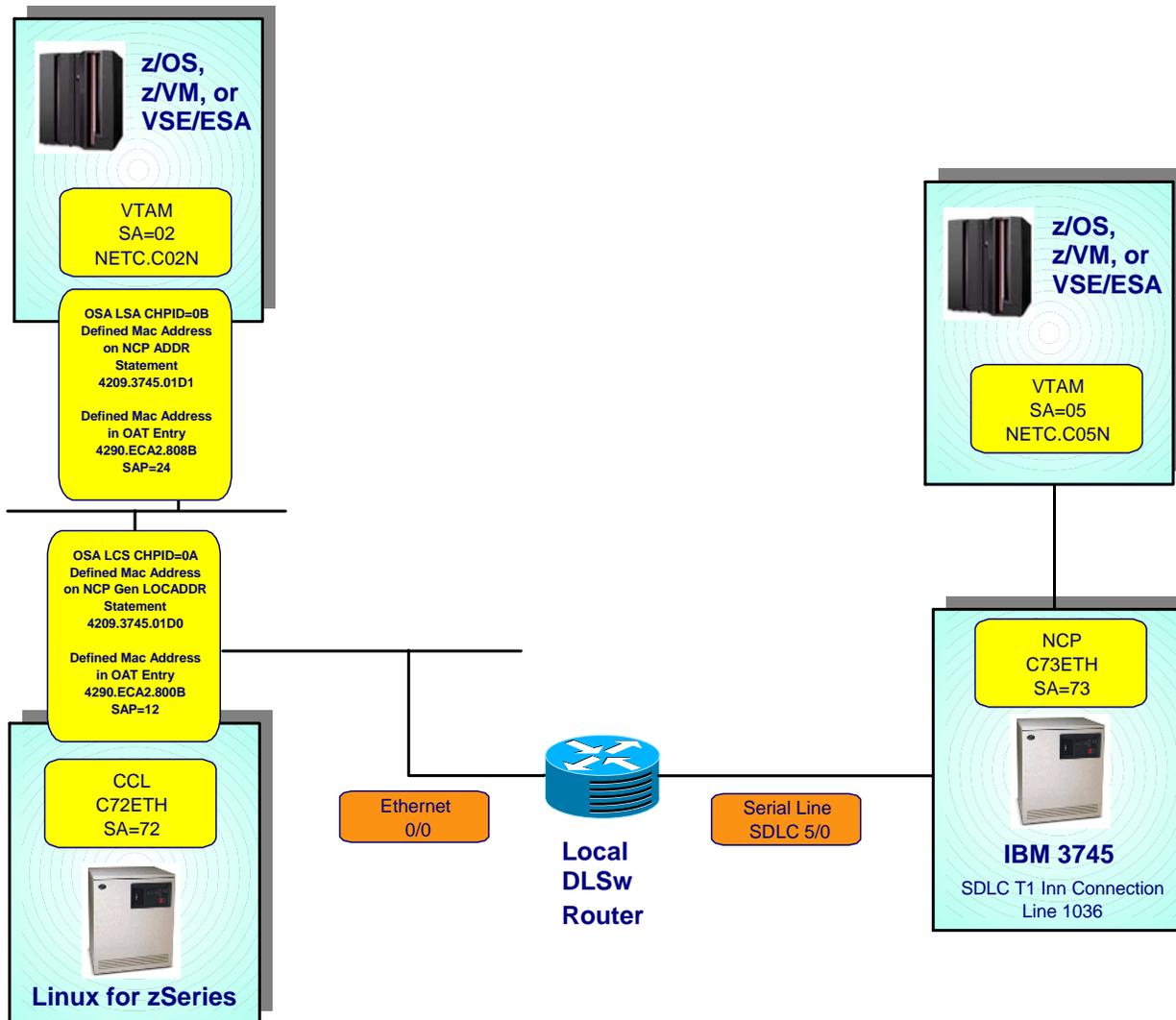
Target Audience

- IBM's customers who use IBM 3745 or IBM 3746/900 SDLC INN to communicate to remote FEPs (Same NETID or SNI).

Purpose of this Paper

- In this paper, two FEPs will be connected over an SDLC INN. One site will be using Communications Controller for Linux on z/Series; the other site will be connected using an IBM 3745 or IBM 3746-900.
- This document will provide working examples of the following:
 - VTAM XCA Major Node
 - NCP Physical and Logical lines
 - DLSw Definitions for Cisco Router

Configuration



Required Resources

- Two z/OS Communications Server IDs
- One Linux ID running as guests under z/VM
 - 512mb of memory
 - 3 Virtual CPs
 - 2 3390-3 DASD volumes
- Layer 2 or Layer 3 Fast Ethernet Switch
- Two OSA Fast Ethernet OSA adapters
- One CCU of an IBM 3745
- One Cisco IOS Router
 - For testing purposes, we used a Cisco 7200 Series IOS Router
 - Assuming SDLC 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 -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, SCOPE=ALL
IST097I  VARY      ACCEPTED
IST093I  C02XCA    ACTIVE
IST464I  LINK STATION C02ETHP1 HAS CONTACTED C72ETH
IST093I  C02ETHP1 ACTIVE
```

- From NETC.C02N activate the NCP

```
V NET,ACT, ID=C72ETH, SCOPE=ALL
IST097I  VARY      ACCEPTED
IST093I  C72ETH    ACTIVE
IST093I  C72PU88A  ACTIVE
IST093I  C72NPPU   ACTIVE
IST464I  LINK STATION C72PG2C HAS CONTACTED C73ETH
IST093I  C72PG2C   ACTIVE
IST464I  LINK STATION C72PG2B HAS CONTACTED C02NPU
IST093I  C72PG2B   ACTIVE
```

Activating the Remote 3745 SDLC Line and CDRM

- Activate the CCL physical SDLC line from VTAM NETC.C05N

```
V NET,ACT,ID=C73L1036,ALL
IST093I C73L1036 ACTIVE
IST464I LINK STATION C73P1036 HAS CONTACTED C72ETH SA 72
IST093I C73P1036 ACTIVE
```

- Activate the CDRM from VTAM NETC.C05N

```
V NET,ACT,ID=C02N
IST093I C02N ACTIVE
```

C02XCA – XCA Major Node Definitions

```
C02XCA  VBUILD  TYPE=XCA
*
C02ETHPT  PORT  MEDIUM=CSMACD , ADAPNO=0 , SAPADDR=24 , CUADDR=2EBA ,           X
          TIMER=100
*
C02ETHGP  GROUP  DIAL=NO , ISTATUS=ACTIVE
*
C02ETHL1  LINE  USER=SNA , ISTATUS=ACTIVE
C02ETHP1  PU    MACADDR=4290ECA2800B , PUTYPE=5 , SUBAREA=72 , TGN=ANY ,       X
          SAPADDR=12 , ALLOWACT=YES
```

C72ETH – NTRI Physical Line Definitions

```
*****
```

```
* Physical Ethernet - DLSw BNN and INN
```

```
*****
```

```
*
```

```
C72PTRG1 GROUP ECLTYPE=(PHY,ANY),ADAPTER=TIC2,ANS=CONT,MAXTSL=16732, X  
RCVBUFC=1440,USSTAB=AUSSTAB,ISTATUS=ACTIVE,XID=NO, X  
RETRIES=(20,5,5),NPACOLL=(YES,EXTENDED)
```

```
*
```

```
C72TR88 LINE ADDRESS=(1088,FULL),TRSPEED=16,PORTADD=88, X  
LOCADD=4209374501D0,NPACOLL=YES
```

```
C72PU88A PU
```

```
*
```

C72ETH – NTRI Logical Lines

```

*****
*           NTRI INN LOGICAL CONNECTIONS FOR 1088           *
*           Native Connection to VTAM C02N and VTAM C05N     *
*****
*
C72INNG1 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=C72PU88A,              X
                SDLCST=(C72PRI,C72SEC),NPACOLL=YES
*
*****
* Link Station to VTAM NETC.C02N
*****
*
C72LG2B  LINE  TGN=1
C72PG2B  PU    ADDR=184209374501D1,SSAP=(0C,H)
*
*****
* Link Station to VTAM C05N - DLSw to Ethernet Connection
*****
*
C72LG2C  LINE  TGN=1
C72PG2C  PU    ADDR=04400036400004,SSAP=(0C,H)
*

```

C73ETH – SDLC INN Definitions

```
*****
* SDLC INN THRU DLSW NETWORK *
*****
*
C73INN1  GROUP  ACTIVTO=60.0,ANS=CONT,CLOCKNG=EXT,DATRATE=HIGH,DIAL=NO, *
          DUPLEX=FULL,IRETRY=NO,ISTATUS=ACTIVE,LNCTL=SDLC, *
          MAXOUT=7,MAXPU=1,MONLINK=YES,NEWSYNC=NO,NRZI=YES, *
          PASSLIM=254,PAUSE=0.2,REPLYTO=1,RETRIES=(3,1,3), *
          SDLCST=(C73PRI,C73SEC),SERVLIM=254,TRANSFR=27,TYPE=NCP
*
C73L1036 LINE  ADDRESS=(1036,FULL),ISTATUS=ACTIVE
C73P1036 PU    PUTYPE=4,TGN=1
```

Cisco Router Definition

```
dlsw local-peer
dlsw bridge-group 1
!
interface FastEthernet0/0
  description Ethernet Connection to C72ETH
  no ip address
  no ip unreachable
  no ip proxy-arp
  no ip mroute-cache
  duplex full
  no cdp enable
  bridge-group 1
end
!
interface Serial5/0
  description SDLC Connection to C73ETH
  no ip address
  no ip unreachable
  no ip proxy-arp
  encapsulation sdlc
  no ip mroute-cache
  no keepalive
  serial restart-delay 0
  nrzi-encoding
  sdlc vmac 4000.3640.0000
  sdlc address 04 seconly
  sdlc partner 4209.3745.01d0 04
  sdlc saps 04 0C 04
  sdlc dlsw 4
End
!
bridge 1 protocol ieee
```

SDLC to Ethernet Conversion Considerations

- Typically SDLC interfaces have large PIU sizes. Ethernet interfaces support 1500 byte packets. We need to handle this disparity when configuring CCL.
- When migrating from 3745 to CCL, you may not be able to change the remote business partner's NCP gen. In this instance, you will need define the NTRI interface on the CCL side with parameters to limit the send and receive size of the PIU and support segmentation.
- Since MLTG is not supported using DLSw, you must ensure MLTG links definitions have been removed from the remote side of the CCL connection.
- Even though Mutli-link TGs are not supported, both sides of the INN connection must be coded as TGCONF=MULTI in order to allow large frames to be segmented as they flow across the link.
 - TGCONF=MULTI is the default for INN connections. So the best way to handle this is to not code TGCONF at all.

NCP Gen Hints and Tips – SDLC Interface for 3745

- Cisco SDLC supports only MODULO 8 - make sure to code MODULO=8 and MAXOUT=7. This should be coded on the SDLCST statements and on the PU statement.
- Code MAXDATA=1440 on the SDLC PU. This parameter is optional if you code RCVBUFC on the adjacent node's NTRI physical GROUP statement.
- MLTG is not supported when using DLsw. It is still recommended you code TGCONF=MULTI on the PU definition for the SDLC interface. This will invoke the MLTG segmentation/reassembly logic.
 - TGCONF=MULTI is the default for INN connections. So the best way to handle this is to not code TGCONF at all.

NCP Gen Hints and Tips – NTRI Interface for CCL

- The SDLC station address will replace the last byte of the SDLC VMAC address. The result of this replacement will be the MAC address coded on the NCP ADDR statement on the NTRI logical link station

example: 4000.3640.0004

- MLTG is not supported when using DLSw. However, you must code TGCONF=MULTI on the NTRI connection. This will allow the adjacent NCP to send segmented PIUs.
- Code RCVBUFC=1440 on the NTRI physical GROUP or LINE. This sets the maximum receive PIU size.
 - This method will affect all connections using the physical lines defined under the NTRI Physical group where RCVBUFC=1440 is coded; whereas, coding MAXDATA on the adjacent SDLC PU affects only the one PU

Cisco Hints and Tips

- When defining the SDLC VMAC Address, the last byte must be coded as x'00'
example: 4000.3640.0000
- It is recommended to code the SDLC Address as "seconly" on the Cisco router
example (sdlc address 04 seconly)
- The SDLC station address will replace the last byte of the SDLC VMAC address. The result of this replacement will be the MAC address coded on the NCP ADDR statement
example: 4000.3640.0004
- MTU for the serial interface should be set to 1500 which will force the SDLC N1 value to 12016 $((1500+2)*8)$
- SDLC SAPS is read as the SDLC station address (04) destination sap (0c) and source sap (04)
- Even though you are using Ethernet, Cisco supports the non-canonical MAC addresses for both the VMAC and SDLC PARTNER