White Paper

SNI Replacement

The IBM Communications Controller, commonly known as the front-end processor (FEP), has been used for many specific functions during the several decades that it served as a network attachment point for IBM mainframes. Of these, almost all either have been rendered obsolete or are now being done by more modern equipment. The only significant exception to this change is a function known as SNA Network Interconnection (SNI). SNI is the connection, by gateways, of two or more independent SNA networks to allow communication between logical units (LUs) in those networks. In many cases FEPs that were purchased to support hundreds or thousands of networks devices are now being used to support a very small number of attachments to other SNA networks. This may create an extremely inefficient use of resources and a disproportionate cost to benefit. The largest impediment to replacing this technology is usually a result of it being embedded in at least two separate organizations, meaning that both must simultaneously agree to change.

The general advice from Cisco is to replace SNI at the application level. For each business function that is being performed through an SNI connection, there is almost certainly a readily available equivalent solution that uses the open IP protocol for connectivity.

Cisco acknowledges, however, that there are cases where an SNA-based alternative may be more expedient and, equally important, may require less inter-company agreement. This paper addresses these scenarios, first showing the parameters for the typical configuration that uses FEPs at both organizations, and then four alternatives that continue to use SNA but allow either one or both of the organizations to decommission their FEPs.

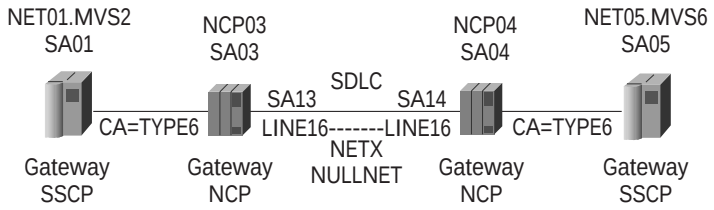
This paper details the following five SNI and SNI replacement configuration examples:

- Back-to-back configuration
- Extended Border Node (EBN) over Enterprise Extender (EE) connections
- Single-sided (adjacent) SNI configuration
- Advanced Peer-to-Peer Networking (APPN) EBN over a Layer 2 SNA link
- Casual Connection

Example 1: Back-to-Back Configuration

The back-to-back configuration is the current configuration in many cases. It is included here to show the "before" picture: two gateway Virtual Telecommunications Access Methods (VTAMs) and two gateway Network Control Programs (NCPs) that connect through a null network (see Figure 1). According to recent Cisco surveys, this is the most popular configuration used between client and partner networks.

Figure 1 Back-to-Back Configuration



Replacing a back-to-back SNI connection to a partner's network requires changes to VTAM and changes and additions to the partner's VTAMs, gateway NCP, and subarea path definitions. The source statements for the gateway NCP-NCP04 are as follows:

```
         OPTIONS NEWDEFN=(YES,ECHO,SUPP,REUSE)
*************************************************************************
*                                                                       *
*    CISCO -  BACK-TO-BACK CONFIGURATION                                *
*                                                                       *
*                                NULLNET                                *
* NET01.MVS2----NCP03—---SA13----NETX—--SA14----NCP04-----NET05.MVS6   *
*                                                                       *
*    SA01        SA03                            SA04        SA05       *
*                                                                       *
*************************************************************************
*    NEWNAME = NCP04    *        *                                     *
*****************************    M   *                                 *
*                           *    V   *     MAXSUBA  = 63               *
* ACF/NCP FOR PDVC 3745     *    S   *     SUBAREA  = 04               *
*                           *        *                                 *
*************************************************************************
*       PCCU SPECIFICATIONS - ACF/VTAM  NCP04    (SUBAREA 04)           *
*************************************************************************
MVS6     PCCU CUADDR=1F4,                                              *
              SUBAREA=(05),                                            *
              OWNER=PHOST05,                                           *
              NETID=NET05,                                             *
              AUTODMP=YES,                                             *
              AUTOIPL=YES,          LOAD 37XX IF FOUND IN LOAD MODE    *
              AUTOSYN=YES,          TELL VTAM NCP NAME                 *
              BACKUP=YES,           TELL VTAM NCP NAME                 *
              CDUMPDS=NCPDUMP,                                         *
              CHANCON=COND,                                            *
              DUMPDS=NCPDUMP,                                          *
              MDUMPDS=NCPDUMP,                                         *
              MAXDATA=6400,                                            *
              VFYLM=YES         ASK OPERATOR BEFORE LOADING
```

```
*********************************************************************
        BUILD STATEMENT SPECIFICATIONS                              **
*********************************************************************
CPBUILD BUILD BFRS=(240),         NCP BUFFER SIZE,EP FREE BUFFER      *
              NETID=NET05,        NATIVE NETWORK NAME                 *
              USGTIER=1,          NCP USGAE TIER                      *
              CSMHDR=27F5C711C3F0405C40C8C4D9405C, 3270 CRITSIT HDR   *
              CSMHDRC=40E3C5E7E3405C5C, 3270 CRITST HEADER XTRA TXT   *
              CSMSG=C3D9C9E3E2C9E35A40E385819440F040, CRITSIT MESG    *
              CSMSGC=6040C1D5E240828587A4954B, CRITST MESG XTRA TXT   *
              CWALL=50,           MIN. BUFFERS BEFORE SLOWDOWN        *
              DSABLTO=11.5,       DATA SET READY TIME OUT=11.5 SEC    *
              ENABLTO=11.5,       IBM 386X REQUIRE 6.5 AS MINIMUM     *
              HPR=YES,            IBM 386X REQUIRE 6.5 AS MINIMUM     *
              NUMHSAS=6,          UP TO 6 CONCURRENT HOSTS            *
              LOADLIB=LOADLIB,    DDNAME FOR VTAM TO FIND NCP LOADLIB *
              MAXSSCP=8,          8 SSCP'S CAN ACTIVATE THIS NCP      *
              MAXSUBA=63,         ALLOW FOR UP TO  63 SUBAREAS        *
              NAMTAB=50,          INDEPENDENT LU SUPPORT              *
              PRTGEN=(NOGEN),                                         *
              SUBAREA=04,         SUBAREA ADDRESS = 04                *
              MODEL=3745-170,      LOAD MODULE FOR A 3745 CONTROLLER  *
              SLODOWN=12,         % OF BUFFERS LEFT                   *
              DYNPOOL=(50,35),                                        *
               TYPSYS=OS,          OS/MVS GENERATION                  *
               VERSION=V7R7,       NCP VERSION 6 RELEASE 2.0          *
               NEWNAME=NCP04,     MEMBERNAME IN LOADLIB AND VTAMLST   *
               TYPGEN=NCP,         NCP ONLY, NO EP OR PEP             *
               VRPOOL=128,         NUMBER OF VR POOL                  *
               NETLIM=500,   HSCBS ASSIGNED AT ONE TIME TO ALL ADDRS  *
               HSBPOOL=150   HALF-SESSION CBS FOR XNET SSCPS AND LUS
*********************************************************************
*       SYSCNTRL STATEMENT SPECIFICATIONS                           *
*********************************************************************
**NOTE: IF THE NCP DOES NOT CONTAIN START/STOP OR BSC DEVICES,       *
**      SYSCNTRL OPTIONS WILL NOT BE INCLUDED IN THE ACF/NCP/VS      *
**      GENERATION EVEN IF INCLUDED IN THE SOURCE DECK               *
*                                                                   *
SYSCNT03 SYSCNTRL OPTIONS=(BHSASSC,ENDCALL,MODE,RCNTRL,RCOND,RECMD,RIMM*
              ,NAKLIM,SESSION,SSPAUSE,XMTLMT,STORDSP,DLRID,RDEVQ)
*********************************************************************
*        HOST MACROS                                                *
*********************************************************************
PHOST05  HOST MAXBFRU=64,                                           *
              UNITSZ=500,                                           *
              BFRPAD=0,                                             *
              NETID=NET05,                                          *
              SUBAREA=(05)
*
*********************************************************************
*        PREDEFINED NON-NATIVE NAU'S FOR CROSS-NETWORK SESSIONS     *
*********************************************************************
        GWNAU NAME=MVS6MVS2,                                       *
              NETID=NET01,                                          *
              ELEMENT=1,                                            *
              NUMSESS=1
```

```
*************************************************************************
*        LUDRPOOL MACROS                                                *
*************************************************************************
PPOOL09  PUDRPOOL NUMBER=500
LPOOL09  LUDRPOOL NUMILU=750,NUMTYP1=750,NUMTYP2=750
*************************************************************************
*        PATH SPECIFICATIONS                                            *
*************************************************************************
HOST05   PATH DESTSA=05,                                                *
               ER0=(05,1),                                              *
               ER1=(05,1),                                              *
               ER2=(05,1),                                              *
               ER3=(05,1),                                              *
               ER4=(05,1),                                              *
               VR0=0,VR1=1,VR2=2,VR3=3,VR4=4 8 S
*************************************************************************
*        GROUP SPECIFICATION FOR SDLC LINES                             *
*************************************************************************
G07STP   SDLCST GROUP=G07NCPP,     ASSOCIATED GROUP                     *
               MAXOUT=7,           FULL DUPLEX FACILITY                 *
               MODE=PRIMARY,       NON-RETURN-TO-ZERO-INVERTED          *
               PASSLIM=254,        REPLY TIME-OUT= 1 SECOND             *
               RETRIES=(7,7,15)    7 RETRIES PAUSE 4 SECONDS 5 TIMES
G07STS   SDLCST GROUP=G07NCPS,     ASSOCIATED GROUP                     *
               MAXOUT=7,           FULL DUPLEX FACILITY                 *
               MODE=SECONDARY,     NON-RETURN-TO-ZERO-INVERTED          *
               PASSLIM=254,        REPLY TIME-OUT= 1 SECOND             *
               RETRIES=(7,7,15)    7 RETRIES PAUSE 4 SECONDS 5 TIMES
*************************************************************************
*        GROUP SPECIFICATION FOR NCP-NCP LINKS                          *
*************************************************************************
G07NCPS  GROUP LNCTL=SDLC,                                              *
               MODE=SEC,                                                *
               ACTIVTO=420,                                             *
               REPLYTO=12.0
G07NCPP  GROUP LNCTL=SDLC,                                              *
               MODE=PRI,                                                *
               REPLYTO=12.0
G80NCPP  GROUP LNCTL=SDLC,                                              *
               DIAL=NO,                                                 *
               ISTATUS=ACTIVE,                                          *
               REPLYTO=6.0,                                             *
               TYPE=NCP
*************************************************************************
*     PU4 TO PU4 NCP04---NCP03                                          *
*************************************************************************
L0916    LINE ADDRESS=(16,FULL),   USE ONE ADDRESS                      *
               DUPLEX=(FULL),      REQUEST TO SEND ALWAYS UP            *
               CLOCKNG=DIRECT,     CLOCKING BY 3745                     *
               SPEED=9600,         9600 BPS                             *
               NRZI=NO,                                                 *
               MODULO=8,                                                *
               MONLINK=NO,                                              *
               PAUSE=(0.5,1.0),                                         *
               RETRIES=(10,30,10),                                      *
               SDLCST=(G07STP,G07STS)
```

```
P0916A   PU PUTYPE=4,NETID=NETX,                                        *
               MAXOUT=7,                                               *
               ANS=CONTINUE,                                           *
               SRT=(,64),                                              *
               TGN=1
CAN09    GROUP LNCTL=CA                CHANNEL ADAPTER GROUP
CA1N09LN LINE CA=TYPE6,ADDRESS=00      FIRST CHANNEL ADAPTER
CA1N09PU PU PUTYPE=5,TGN=1,NETID=NET05
*                                                                       *
************************************************************************
*  NET01  NETWORK                                                      *
************************************************************************
NET01   NETWORK SUBAREA=13,                                             *
               NETID=NETX,                                             *
               ACTPU=NO,                                               *
               COSTAB=ISTSDCOS,                                        *
               NUMHSAS=7,                                              *
               PATHEXT=0,                                              *
               TGBXTRA=0,                                              *
               MAXSUBA=63
         GWNAU NETID=NET05,NAME=MVS6,ELEMENT=1,NUMSESS=5
         GWNAU NUMADDR=20
         PATH DESTSA=04,ER0=(04,1),VR0=0,ER1=(04,1),VR1=1,              *
               VRPWS00=(2,6),VRPWS01=(2,6),VRPWS02=(3,9),              *
               VRPWS10=(2,6),VRPWS11=(2,6),VRPWS12=(3,9)
************************************************************************
*    E N D   E N D   E N D   E N D   E N D   E N D   E N D   E N D    *
************************************************************************
         GENEND
```

The source statements for the Cross Domain Resource Manager (CDRM) in NET05 VTAM are as follows:

```
************************************************************************
*                                                                      *
*    NET05 VTAM LIST FOR SNI BACK-TO-BACK CONNECTIONS                  *
*                                                                      *
************************************************************************
*  CDRM FOR BACK-TO-BACK SNI CONNECTION                                *
************************************************************************
          VBUILD TYPE=CDRM
NET5M6M2  NETWORK NETID=NET01
MVS2MVS6  CDRM CDRDYN=YES,CDRSC=OPT,ISTATUS=ACTIVE
          GWPATH GWN=NCP04,
               ADJNET=NETX,
               ADJNETSA=14,
               ADJNETEL=1
```

The NET05 VTAM PATH definition statement for NCP04 is as follows:

```
************************************************************************
*  PATH FOR NCP04                                                      *
************************************************************************
NCPSA04  PATH DESTSA=04,                                               X
               ER0=(4,1),VR0=0,                                        X
               ER1=(4,1),VR1=1,                                        X
               ER2=(4,1),VR2=2,                                        X
               ER3=(4,1),VR3=3,                                        X
               ER4=(4,1),VR4=4
```

The source statements for the gateway NCP NCP03 are as follows:

```
OPTIONS NEWDEFN=(YES,ECHO,SUPP,REUSE)
*********************************************************************
*                                                                   *
*   NCP03 - BACK TO BACK SNI DEFINITIONS                            *
*                                                                   *
*                              NULLNET                              *
* NET01.MVS2--NCP03<--SA13------NETX----SA14----->NET04----NET05.MVS6 *
*                                                                   *
*   SA01       SA03                                 SA04       SA05     *
*                                                                   *
*                                                                   *
*                                                                   *
*********************************************************************
*********************************************************************
*    NEWNAME = NCP03    *        *                                   *
*****************************    M   *                               *
*                           *    V   *     MAXSUBA  = 63             *
* ACF/NCP FOR SNI  3745     *    S   *     SUBAREA  = 03             *
*                           *        *                               *
*********************************************************************
*       PCCU SPECIFICATIONS - ACF/VTAM  N06      (SUBAREA 11)         *
*********************************************************************
MVS2     PCCU CUADDR=1E0,
               SUBAREA=(01),
               OWNER=PHOST01,
               NETID=NET01,
               AUTODMP=YES,
               AUTOIPL=YES,          LOAD 37XX IF FOUND IN LOAD MODE
               AUTOSYN=YES,          TELL VTAM NCP NAME
               BACKUP=YES,           TELL VTAM NCP NAME
               CDUMPDS=NCPDUMP,
               CHANCON=COND,
               DUMPDS=NCPDUMP,
               MDUMPDS=NCPDUMP,
               MAXDATA=6400,
               VFYLM=YES         ASK OPERATOR BEFORE LOADING
*                                                                   *
*********************************************************************
*        BUILD STATEMENT SPECIFICATIONS                            **
*********************************************************************
NCPBUILD BUILD BFRS=(240),          NCP BUFFER SIZE,EP FREE BUFFER
               NETID=NET01,         NATIVE NETWORK NAME
               USGTIER=1,           NCP USGAE TIER
               CSMHDR=27F5C711C3F0405C40C8C4D9405C, 3270 CRITSIT HDR
               CSMHDRC=40E3C5E7E3405C5C, 3270 CRITST HEADER XTRA TXT
               CSMSG=C3D9C9E3E2C9E35A40E385819440F040, CRITSIT MESG
               CSMSGC=6040C1D5E240828587A4954B, CRITST MESG XTRA TXT
               CWALL=50,            MIN. BUFFERS BEFORE SLOWDOWN
               DSABLTO=11.5,        DATA SET READY TIME OUT=11.5 SEC
               ENABLTO=11.5,        IBM 386X REQUIRE 6.5 AS MINIMUM
               HPR=YES,             IBM 386X REQUIRE 6.5 AS MINIMUM
               NUMHSAS=6,           UP TO 6 CONCURRENT HOSTS
               LOADLIB=LOADLIB,     DDNAME FOR VTAM TO FIND NCP LOADLIB
               MAXSSCP=8,           8 SSCP'S CAN ACTIVATE THIS NCP
               MAXSUBA=63,          ALLOW FOR UP TO  63 SUBAREAS
               NAMTAB=50,           INDEPENDENT LU SUPPORT
```

```
               PRTGEN=(NOGEN),
               SUBAREA=03,          SUBAREA ADDRESS = 11
               MODEL=3745-170,       LOAD MODULE FOR A 3745 CONTROLLER
               SLODOWN=12,          % OF BUFFERS LEFT
               DYNPOOL=(50,35),
               TYPSYS=OS,           OS/MVS GENERATION
               VERSION=V7R7,        NCP VERSION 6 RELEASE 2.0
               NEWNAME=NCP03,       MEMBERNAME IN LOADLIB AND VTAMLST
               TYPGEN=NCP,          NCP ONLY, NO EP OR PEP
               VRPOOL=128,          NUMBER OF VR POOL
               NETLIM=500,    HSCBS ASSIGNED AT ONE TIME TO ALL ADDRS
               HSBPOOL=150    HALF-SESSION CBS FOR XNET SSCPS AND LUS
*************************************************************************
*       SYSCNTRL STATEMENT SPECIFICATIONS                               *
*************************************************************************
**NOTE: IF THE NCP DOES NOT CONTAIN START/STOP OR BSC DEVICES,          *
**      SYSCNTRL OPTIONS WILL NOT BE INCLUDED IN THE ACF/NCP/VS         *
**      GENERATION EVEN IF INCLUDED IN THE SOURCE DECK                  *
*                                                                       *
SYSCNT03 SYSCNTRL OPTIONS=(BHSASSC,ENDCALL,MODE,RCNTRL,RCOND,RECMD,RIMM
               ,NAKLIM,SESSION,SSPAUSE,XMTLMT,STORDSP,DLRID,RDEVQ)
*************************************************************************
*        HOST MACROS                                                    *
*************************************************************************
PHOST01  HOST MAXBFRU=64,
               UNITSZ=500,
               BFRPAD=0,
               NETID=NET01,
               SUBAREA=(01)
*                                                                     *
*************************************************************************
*        PREDEFINED NON-NATIVE NAU'S FOR CROSS-NETWORK SESSIONS         *
*************************************************************************
*
        GWNAU NAME=MVS2MVS6,
               NETID=NET05,
               ELEMENT=5,
               NUMSESS=1
*************************************************************************
*        LUDRPOOL MACROS                                                *
*************************************************************************
PPOOL11  PUDRPOOL NUMBER=500
*
LPOOL11  LUDRPOOL NUMILU=750,NUMTYP1=750,NUMTYP2=750
*
*************************************************************************
*        PATH SPECIFICATIONS                                            *
*************************************************************************
HOST01   PATH DESTSA=01,
               ER0=(01,1),
               ER1=(01,1),
               ER2=(01,1),
               ER3=(01,1),
               ER4=(01,1),
               VR0=0,VR1=1,VR2=2,VR3=3,VR4=4
```

```
*************************************************************************
*        GROUP SPECIFICATION FOR SDLC LINES                             *
*************************************************************************
G11STP   SDLCST GROUP=G11NCPP,     ASSOCIATED GROUP
              MAXOUT=7,            FULL DUPLEX FACILITY
              MODE=PRIMARY,        NON-RETURN-TO-ZERO-INVERTED
              PASSLIM=254,         REPLY TIME-OUT= 1 SECOND
              RETRIES=(7,7,15)     7 RETRIES PAUSE 4 SECONDS 5 TIMES
G11STS   SDLCST GROUP=G11NCPS,     ASSOCIATED GROUP
              MAXOUT=7,            FULL DUPLEX FACILITY
              MODE=SECONDARY,      NON-RETURN-TO-ZERO-INVERTED
              PASSLIM=254,         REPLY TIME-OUT= 1 SECOND
              RETRIES=(0,0,0)      7 RETRIES PAUSE 4 SECONDS 5 TIMES
*
*************************************************************************
*        GROUP SPECIFICATION FOR NCP-NCP LINKS                          *
*************************************************************************
G11NCPP  GROUP LNCTL=SDLC,
              MODE=PRI,
              REPLYTO=12.0
G11NCPS  GROUP LNCTL=SDLC,
              MODE=SEC,
              ACTIVTO=420,
              REPLYTO=12.0
*
*
G80NCPP  GROUP LNCTL=SDLC,
              DIAL=NO,
              ISTATUS=ACTIVE,
              REPLYTO=6.0,
*
*************************************************************************
*     PU4 TO PU4 NCP03---NCP04                                          *
*************************************************************************
L1116    LINE ADDRESS=(16,FULL),   USE ONE ADDRESS                      *
              DUPLEX=(FULL),       REQUEST TO SEND ALWAYS UP           *
              CLOCKNG=EXT,         CLOCKING BY 3745                    *
              SPEED=9600,          SPEED 4800 BPS                      *
              MODULO=8,                                                *
              NRZI=NO,                                                 *
              MONLINK=NO,                                              *
              PAUSE=(0.5,1.0),                                         *
              SDLCST=(G11STP,G11STS),                                  *
              RETRIES=(10,30,10)
P1116A   PU PUTYPE=4,NETID=NETX,                                       *
              ANS=CONTINUE,        DON'T BREAK THE X-DOMAIN SESSIONS   *
              MAXOUT=7,                                                *
              SRT=(64),                                                *
              TGN=1
CAN11    GROUP LNCTL=CA                CHANNEL ADAPTER GROUP
CA1N11LN LINE CA=TYPE6,ADDRESS=01      FIRST CHANNEL ADAPTER
CA1N11PU PU PUTYPE=5,TGN=1,NETID=NET01
*                                                                      *
*************************************************************************
*    NETWORKS NET05                                                    *
*************************************************************************
NET05   NETWORK SUBAREA=14,
```

```
               NETID=NETX,
               ACTPU=NO,
               COSTAB=ISTSDCOS,
               NUMHSAS=7,
               PATHEXT=0,
               TGBXTRA=0,
               MAXSUBA=63
         GWNAU NETID=NET01,NAME=MVS2,ELEMENT=1,NUMSESS=5
         GWNAU NUMADDR=20
         PATH DESTSA=03,ER0=(03,1),VR0=0,ER1=(03,1),VR1=1,
               VRPWS00=(2,6),VRPWS01=(2,6),VRPWS02=(3,9),
               VRPWS10=(2,6),VRPWS11=(2,6),VRPWS12=(3,9)
*********************************************************************
*    E N D   E N D   E N D   E N D   E N D   E N D   E N D   E N D    *
*********************************************************************
         GENEND
```

The source statements for the CDRM in NET01 VTAM are as follows:

```
*********************************************************************
*    NET01 VTAMLST CDRM FOR MVS2-----MVS6                           *
*********************************************************************
          VBUILD TYPE=CDRM
NET1M2M6  NETWORK NETID=NET05
MVS6MVS2  CDRM CDRDYN=YES,CDRSC=OPT,ISTATUS=ACTIVE
          GWPATH GWN=NCP03,
               ADJNET=NETX,
               ADJNETSA=13,
               ADJNETEL=1
```

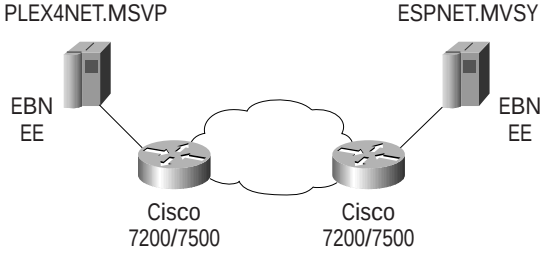
The NET01 VTAM PATH definition statement for NCP03 is as follows:

```
*********************************************************************
*    NET01 VTAMLST PATH FOR NCP03                                   *
*********************************************************************
NCPSA03  PATH DESTSA=03,
               ER0=(03,1),VR0=0,
               ER1=(03,1),VR1=1,
               ER2=(03,1),VR2=2,
               ER3=(03,1),VR3=3,
               ER4=(03,1),VR4=4
```

Example 2: EBN over EE

The next example is APPN EBN on both ends of an EE or High Performance Routing (HPR)/IP connection, with SNA traffic over an IP network (see Figure 2). When completed, the IP network components can be leveraged for use in delivering SNA traffic and consolidating the network infrastructure into one IP network.

Figure 2 EBN over EE Connection



The VTAM start options required for APPN EBN and EE are as follows:

```
BN=YES
NODETYPE=NN
TCPNAME=TCP/IP Stack name
IPADDR=
```

The following set of configurations are the VTAM definitions for each system to be able to use an EBN/EE connection through Cisco Channel Interface Processors (CIPs) using the Cisco MultiPath Channel Plus (CMPC+) channel protocol. The Transport Resource List (TRL) entry on system MVSP is defined to and activated by VTAM, and the name on the TRL entry statement, TRLB10E, must match the name used on the device definition statement in the TCP/IP profile:

```
TRLB10EE VBUILD TYPE=TRL
TRLB10E  TRLE  LNCTL=MPC,MPCLEVEL=HPDT,MAXBFRU=16,MPCUSAGE=SHR,       X
               READ=(B10E),                                          X
               WRITE=(B10F),                                         X
               REPLYTO=3.0
```

The XCA major node entry on system MVSP is as follows:

```
EEXCAV   VBUILD TYPE=XCA
EETG     PORT  MEDIUM=HPRIP,CAPACITY=1000M,                          X
               VNNAME=EESNI,                                         X
               VNGROUP=EEGRPIO,                                      X
               LIVTIME=15,                                           X
               SRQTIME=15,                                           X
               SRQRETRY=9,                                           X
               SAPADDR=04
EEGRPIO  GROUP ANSWER=ON,                                            X
               AUTOGEN=(10,LIO,PIO)                                  X
               CALL=INOUT,                                           X
               DIAL=YES,                                             X
               DYNPU=YES,                                            X
               DYNPUPFX=$E,                                          X
               ISTATUS=ACTIVE
```

The switch major node entry on system MVSP is as follows:

```
EESMN    VBUILD TYPE=SWNET
EEMVSP01 PU    CPCP=YES,                                             X
               CONNTYPE=APPN,                                        X
               HPR=YES,                                              X
               TGP=ESCON,                                            X
               DYNLU=YES,                                            X
               DISCNT=NO,                                            X
               DWACT=YES,                                            X
               NETID=ESPNET,                                         X
               CPNAME=MVSY,                                          X
               ISTATUS=ACTIVE
EEPATHY  PATH  IPADDR=172.18.47.102,                                 X
               GRPNM=EEGRPIO,SAPADDR=4
```

The TRL entry on system MVSY is defined to and activated by VTAM, and the name on the TRL entry statement, TRL500E, must match the name used on the device definition statement in the TCP/IP profile:

```
TRL500EE VBUILD TYPE=TRL
TRL500E  TRLE  LNCTL=MPC,MPCLEVEL=HPDT,MAXBFRU=16,MPCUSAGE=SHR,       X
               READ=(500E),                                          X
               WRITE=(500F)
```

The XCA major node entry on system MVSY is as follows:

```
EEXCAV   VBUILD TYPE=XCA
EETG     PORT  MEDIUM=HPRIP,CAPACITY=1000M,                          X
               VNNAME=EESNI,                                        X
               VNGROUP=EEGRPIO,                                     X
               LIVTIME=15,                                          X
               SRQTIME=15,                                          X
               SRQRETRY=9,                                          X
               SAPADDR=04
EEGRPIO  GROUP ANSWER=ON,                                           X
               AUTOGEN=(10,LIO,PIO),                                X
               CALL=INOUT,                                          X
               DIAL=YES,                                            X
               DYNPU=YES,                                           X
               DYNPUPFX=$E,                                         X
               ISTATUS=ACTIVE
```

The switch major node entry on system MVSY is as follows:

```
EESMN    VBUILD TYPE=SWNET
EEMVSY01 PU    CPCP=YES,                                            X
               CONNTYPE=APPN,                                       X
               HPR=YES,                                             X
               TGP=ESCON,                                           X
               DYNLU=YES,                                           X
               DISCNT=NO,                                           X
               DWACT=YES,                                           X
               NETID=PLEX4NET,                                      X
               CPNAME=MVSP,                                         X
               ISTATUS=ACTIVE
EEPATHP  PATH  IPADDR=172.18.47.245,                                X
               GRPNM=EEGRPIO,SAPADDR=4
```

The TCP/IP profile for MVSP (TCPMVSP2) is as follows:

```
DEVICE   IUTSAMEH    MPCPTP     AUTORESTART
LINK     SAMELINK    MPCPTP     IUTSAMEH
DEVICE VIPADEV1  VIRT    0
LINK   VIPALNK1  VIRT    0 VIPADEV1
DEVICE TRLB10E MPCPTP
LINK   EELINK1 MPCPTP  TRLB10E
HOME
172.18.47.242 EELINK1
172.18.47.245 VIPALNK1
GATEWAY
172.18                    = EELINK1   4096   0.0.255.248  0.0.47.240
DEFAULTNET   172.18.47.241  EELINK1   4096 0
START IUTSAMEH
START TRLB10E
```

The TCP/IP profile for MVSY (TCPMVSY7) is as follows:

```
DEVICE   IUTSAMEH    MPCPTP     AUTORESTART
LINK     SAMELINK    MPCPTP     IUTSAMEH
DEVICE VIPADEV1  VIRT    0
LINK   VIPALNK1  VIRT    0 VIPADEV1
DEVICE TRL500E MPCPTP
```

```
LINK   EELINK1 MPCPTP  TRL500E
HOME
172.18.47.98     EELINK1
172.18.47.102    VIPALNK1
GATEWAY
172.18                      = EELINK1    4096 0.0.255.248  0.0.47.96
DEFAULTNET    172.18.55.97   EELINK1    4096 0
START IUTSAMEH
START TRL500E
```

The following is the router configuration for the router connected to MVSP, which was previously defined by the TRL named TRLB10E:

```
odyssey#sho run
Building configuration...
Current configuration : 1514 bytes
!
version 12.2
no service pad
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
no service single-slot-reload-enable
!
hostname odyssey
!
logging queue-limit 100
enable password lab
!
microcode CIP flash slot0:cip28-11
microcode reload
ip subnet-zero
ip cef
no ip domain-lookup
ip host biz 64.102.16.25
!
call rsvp-sync
!
source-bridge ring-group 100
dlsw local-peer peer-id 172.18.47.50
dlsw remote-peer 0 tcp 172.18.47.19
!
interface FastEthernet0/0/0
 ip address 172.18.47.50 255.255.255.192
 no ip route-cache
 no ip mroute-cache
 full-duplex
!
interface Channel5/0
 description CHP 25 on MVSY
 no ip address
 no keepalive
 csna 01E0 00
 cmpc 01E0 0E TGMVSY READ
 cmpc 01E0 0F TGMVSY WRITE
!
interface Channel5/2
 ip address 172.18.47.97 255.255.255.248
```

```
 no keepalive
 lan TokenRing 0
  source-bridge 101 1 100
  adapter 0 4000.0b0e.0000
 tg TGMVSY   ip 172.18.47.98 172.18.47.97
!
router eigrp 109
 network 172.18.0.0
 no auto-summary
 no eigrp log-neighbor-changes
!
ip default-gateway 172.18.47.1
ip classless
ip route 0.0.0.0 0.0.0.0 172.18.47.1
ip route 172.18.47.102 255.255.255.255 172.18.47.98
no ip http server
!
line con 0
 exec-timeout 0 0
line aux 0
line vty 0 4
 exec-timeout 0 0
 password lab
 login
!
end

odyssey#
```

The following is the router configuration for the router connected to MVSY, which was previously defined by the TRL named TRL500E:

```
fred#sho run
Building configuration...
Current configuration : 1577 bytes
!
version 12.2
no service pad
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname fred
!
boot system flash slot0:c7200-is-mz.122-12
logging buffered 128000 debugging
enable secret 5 $1$YQo/$l/o8VflA5guEYVjWUJ/Oh0
enable password lab
!
microcode ecpa slot0:xcpa28-12
microcode reload
ip subnet-zero
ip cef
!
!
ip host bizarre 64.102.16.25
!
```

```
call rsvp-sync
source-bridge ring-group 100
dlsw local-peer peer-id 172.18.47.19
dlsw remote-peer 0 tcp 172.18.47.50
!
interface FastEthernet0/0
 ip address 172.18.47.19 255.255.255.192
 no ip mroute-cache
 duplex half
!
interface Channel1/0
 ip address 172.18.47.241 255.255.255.248
 no ip route-cache cef
 load-interval 30
 no keepalive
 csna 0150 00
 cmpc 0150 0E TGMVSP READ
 cmpc 0150 0F TGMVSP WRITE
 lan TokenRing 0
  source-bridge 101 1 100
  adapter 0 4000.3745.0fff
 tg TGMVSP   ip 172.18.47.242 172.18.47.241
!
interface Serial2/0
 no ip address
 encapsulation sdlc
 load-interval 30
 no keepalive
 shutdown
 sdlc address C1
 sdlc dlsw partner 4000.3745.0fff  inbound
 sdlc dlsw C1
 duplex half
!
interface Channel1/0
 ip address 172.18.47.241 255.255.255.248
 no ip route-cache cef
 load-interval 30
 no keepalive
 csna 0150 00
 cmpc 0150 0E TGMVSP READ
 cmpc 0150 0F TGMVSP WRITE
 lan TokenRing 0
  source-bridge 101 1 100
  adapter 0 4000.3745.0fff
 tg TGMVSP   ip 172.18.47.242 172.18.47.241
!
router eigrp 109
 network 172.18.0.0
 no auto-summary
!
ip classless
ip route 0.0.0.0 0.0.0.0 172.18.47.3
ip route 172.18.47.245 255.255.255.255 172.18.47.242
no ip http server
!
dial-peer cor custom
!
```

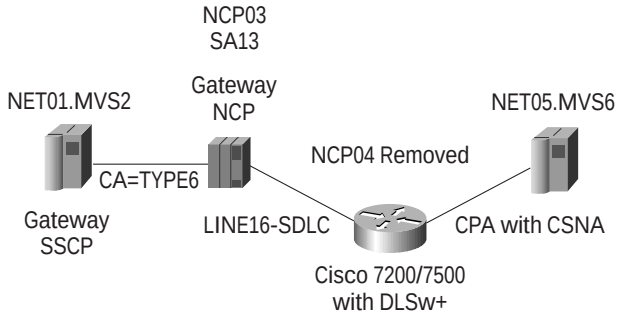
```
gatekeeper
 shutdown
!
!
line con 0
 exec-timeout 0 0
line aux 0
line vty 0 4
 exec-timeout 0 0
 password lab
 login
!
end

fred#
```

Note: If the VTAM Session Management Exit (ISTEXCAA) was previously used in the subarea networks for controlling the establishment of sessions through the network, the VTAM Directory Services Management Exit (DSME) must be used instead.

Example 3: Single-Sided SNI

This example shows a gateway VTAM with a gateway NCP connecting to a gateway VTAM without a gateway NCP (see Figure 3). This configuration is the easiest to configure and define, and cross-network session control is centralized. This configuration should be considered when the organization wants to remove its FEP, cannot find an IP-based application alternative, and the partner will not change to an APPN connection. The nongateway NCP can be replaced with a Cisco CIP- or Channel Port Adapter (CPA)-equipped router using the CSNA channel protocol, and the wide area connection can be LAN to LAN via Data-Link Switching Plus (DLSw+) or Synchronous Data Link Control (SDLC).

Figure 3 Single-Sided (Adjacent) SNI Configuration



In this example, NET05 is removing a FEP and NET01 is not. NET01 will continue to provide the application services for NET05, and NET01 will remove the NCP/3745 that is currently being used for SNI back-to-back connection to NET05. The same LINE16 is used for the SDLC connection to the router, but Token Ring could have been used for this connection.

The following changes are required to move from the null network SNI configuration to the adjacent SNI configuration at the site NET01 where the FEP is being retained:

- Change the SDLC LINE/PU definitions
- Change the NETWORK statement NETID parameter
- Change the NCP PATH definitions
- Change the GWPATH statement in the CDRM major node

The following changes are required at the site NET05 where the FEP is being replaced:

- Remove the NCP major node from the ATCCONxx VTAM startup list
- Add an XCA major node to define the CIP in the router
- Change the GWPATH statement in the CDRM major node
- Add the VTAM path statement to reflect the more direct SNA route
- Attach the Cisco router with CSNA and DLSw+ configured

Note: Because there is a new subarea defined in NCP03, PATH definitions will be added to all the subarea nodes in NET01. PATH definitions for all the subareas in NET01 will also be added to the NCP03 gateway NCP deck.

The changes made to NCP03 are shown in the following statements:

```
*     NCP03 CHANGES FOR SINGLE SIDED SNI... NCP04 REPLACE BY ROUTER
*************************************************************************
*     PU4 TO PU4 NCP03---CISCO 7200 SDLC LINE16                         *
*************************************************************************
L1116    LINE ADDRESS=(16,FULL),   USE ONE ADDRESS                      *
              DUPLEX=(FULL),       REQUEST TO SEND ALWAYS UP           *
              CLOCKNG=EXT,         CLOCKING BY 3745                    *
              SPEED=56000,         SPEED 56KB                          *
              MODULO=8,                                                *
              NRZI=NO,                                                 *
              MONLINK=NO,                                              *
              PAUSE=(0.5,1.0),                                         *
              SDLCST=(G11STP,G11STS),                                  *
              RETRIES=(10,30,10)
P1116A   PU PUTYPE=4,NETID=NET05,                                   *
              ANS=CONTINUE,        DON'T BREAK THE X-DOMAIN SESSIONS  *
              MAXOUT=7,                                                *
              SRT=(64),                                                *
              TGN=2
*************************************************************************
*    NETWORK  PLEX4NET                                                 *
*************************************************************************
PLEX4N  NETWORK SUBAREA=13,                                            *
              NETID=NET05,                                         *
              ACTPU=NO,                                                *
              COSTAB=ISTSDCOS,                                         *
              NUMHSAS=7,                                               *
              PATHEXT=0,                                               *
              TGBXTRA=0,                                               *
              MAXSUBA=63
        GWNAU NETID=NET01,NAME=MVS2,ELEMENT=1,NUMSESS=5
        GWNAU NUMADDR=20
        PATH DESTSA=07,ER0=(07,2),VR0=0,ER1=(07,2),VR1=1,              *
              VRPWS00=(2,6),VRPWS01=(2,6),VRPWS02=(3,9),               *
              VRPWS10=(2,6),VRPWS11=(2,6),VRPWS12=(3,9)
```

The VTAM CDRM definition on MVS2 is as follows:

```
          VBUILD TYPE=CDRM
NET5M2M6  NETWORK NETID=NET05
MVS6MVS2  CDRM CDRDYN=YES,CDRSC=OPT,ISTATUS=ACTIVE
          GWPATH GWN=NCP03,                                          C
               ADJNET=NET05,                                         C
               ADJNETSA=05,                                          C
               ADJNETEL=1
```

Several VTAM definitions are required on system MVS6. The XCA major node definition for the CIP router is as follows:

```
XSAB1000 VBUILD TYPE=XCA
PSAB1000 PORT  ADAPNO=0,CUADDR=B100,SAPADDR=04,MEDIUM=RING,TIMER=60
GSAB1000 GROUP DIAL=NO,ISTATUS=ACTIVE
*
LSAB1000 LINE
SSAB1000 PU PUTYPE=4,TGN=2,ISTATUS=ACTIVE,MACADDR=000037450F16,       X
               SAPADDR=4,LANTEST=GLOBAL,SUBAREA=13
```

The CDRM definition with the GWPATH statement removed and the subarea changed is as follows:

```
          VBUILD TYPE=CDRM
NETWMPMY  NETWORK NETID=NET01
MVS2MVS6  CDRM CDRDYN=YES,CDRSC=OPT,ISTATUS=ACTIVE,                   X
               SUBAREA=13,ELEMENT=1
```

The PATH definition for NCP03 gateway NCP subarea 13 is as follows:

```
RTRSA13  PATH DESTSA=13,                                              X
               ER0=(13,2),VR0=0,                                      X
               ER1=(13,2),VR1=1,                                      X
               ER2=(13,2),VR2=2,                                      X
               ER3=(13,2),VR3=3,                                      X
               ER4=(13,2),VR4=4
```

The Cisco router configuration used in this example to configure DLSw+ and CSNA is as follows:

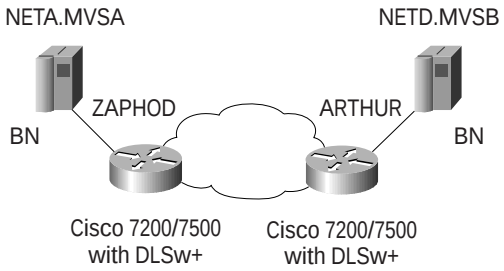
```
source-bridge ring-group 100
dlsw local-peer
!
...
!
interface Channel1/0
 no ip address
 no ip route-cache cef
 load-interval 30
 no keepalive
 csna 0150 00
 lan TokenRing 0
  source-bridge 101 1 100
  adapter 0 4000.3745.0fff
!
...
!
interface Serial2/0
 no ip address
```

```
 encapsulation sdlc
 load-interval 30
 no keepalive
 sdlc vmac 0000.3745.0f00
 sdlc address 16
 sdlc simultaneous full-datmode
 sdlc dlsw partner 4000.3745.0fff
 sdlc dlsw 16
!
```

Example 4: APPN EBN

By using APPN, this configuration eliminates any requirement for FEPs. The two different networks are connected using Cisco CIPs to replace the FEP channel connections, and Cisco DLSw+ for reliable wide area transport (see Figure 4). The example also shows dynamic and static cross domain resources (CDRSCs).

Figure 4 APPN Extended Border Node over Layer 2 SNA link



VTAM is a border node, and CONNTYPE is set to APPN. This causes a control point (CP)-to-CP session to start between the two VTAMs. The output from the log on MVSB when dialed is as follows:

```
V NET,DIAL,ID=DKPUMVSA
IST097I VARY ACCEPTED
NSP2000I DATA RECORDED TO PRIMARY FOR PU DKPUMVSA
IST590I CONNECTOUT ESTABLISHED FOR PU DKPUMVSA ON LINE L4300000
IST1086I APPN CONNECTION FOR NETA.MVSA IS ACTIVE - TGN = 22
IST1096I CP-CP SESSIONS WITH NETA.MVSA ACTIVATED

D NET,ID=DKPUMVSA,E
IST097I DISPLAY ACCEPTED
IST075I NAME = DKPUMVSA, TYPE = PU_T2.1 411
IST486I STATUS= ACTIV--L--, DESIRED STATE= ACTIV
IST1043I CP NAME = MVSA, CP NETID = NETA, DYNAMIC LU = YES
IST1589I XNETALS = YES
IST1105I RESOURCE STATUS TGN CP-CP TG CHARACTERISTICS
IST1106I DKPUMVSA AC/R    22 YES   9875000000000000000014C00808080
IST1482I HPR = RTP - OVERRIDE = N/A - CONNECTION = NO
IST136I SWITCHED SNA MAJOR NODE = DKSW02
IST081I LINE NAME = L4300000, LINE GROUP = DKGR44, MAJNOD = DKXCA43
IST654I I/O TRACE = OFF, BUFFER TRACE = OFF
IST1500I STATE TRACE = OFF
IST1656I VTAMTOPO = REPORT, NODE REPORTED - YES
IST1657I MAJOR NODE VTAMTOPO = REPORT
IST355I LOGICAL UNITS:
IST080I MVSA     ACT/S----Y
IST314I END
```

The following statements are from the MVSA:

```
NSP2000I DATA RECORDED TO PRIMARY FOR PU DKPUMVSB
IST1086I APPN CONNECTION FOR NETD.MVSB IS ACTIVE - TGN = 22
IST1096I CP-CP SESSIONS WITH NETD.MVSB ACTIVATED


D NET,ID=DKPUMVSB,E
IST097I DISPLAY ACCEPTED
IST075I NAME = DKPUMVSB, TYPE = PU_T2.1 466
IST486I STATUS= ACTIV--L--, DESIRED STATE= ACTIV
IST1043I CP NAME = MVSB, CP NETID = NETD, DYNAMIC LU = YES
IST1589I XNETALS = YES
IST1105I RESOURCE STATUS TGN CP-CP TG CHARACTERISTICS
IST1106I DKPUMVSB AC/R    22 YES   9875000000000000000014C00808080
IST1482I HPR = RTP - OVERRIDE = N/A - CONNECTION = NO
IST136I SWITCHED SNA MAJOR NODE = DKSW01
IST081I LINE NAME = L4400000, LINE GROUP = DKGR44, MAJNOD = DKXCA44
IST654I I/O TRACE = OFF, BUFFER TRACE = OFF
IST1500I STATE TRACE = OFF
IST1656I VTAMTOPO = REPORT, NODE REPORTED - YES
IST1657I MAJOR NODE VTAMTOPO = REPORT
IST355I LOGICAL UNITS:
IST080I MVSB     ACT/S----Y
IST314I END

D NET,ID=ISTCDRDY,E
IST097I DISPLAY ACCEPTED
IST075I NAME = ISTCDRDY, TYPE = CDRSC SEGMENT 731
IST486I STATUS= ACTIV, DESIRED STATE= ACTIV
IST478I CDRSCS:
IST483I TCD10002 ACT/S----Y, CDRM = MVSA    , NETID = NETA
IST483I MVSB     ACT/S----Y, CDRM = MVSA    , NETID = NETD
IST483I CNM01    ACT/S----Y, CDRM = MVSA    , NETID = NETA
IST483I MVSF     ACT/S----Y, CDRM = MVSA    , NETID = NETA
IST483I MVSE     ACT/S----Y, CDRM = MVSA    , NETID = NETA
IST483I CPAC     ACT/S----Y, CDRM = MVSA    , NETID = NETA
IST483I MVSD     ACT/S----Y, CDRM = MVSA    , NETID = NETA
IST483I MVSG     ACT/S----Y, CDRM = MVSA    , NETID = NETA
IST483I MVS2     ACT/S----Y, CDRM = MVSA    , NETID = NETA
IST1500I STATE TRACE = OFF
IST314I END


D NET,ID=MVSB,E
IST097I DISPLAY ACCEPTED
IST075I NAME = NETD.MVSB, TYPE = ADJACENT CP 736
IST486I STATUS= ACT/S----Y, DESIRED STATE= ACTIV
IST1447I REGISTRATION TYPE = NO
IST977I MDLTAB=***NA*** ASLTAB=***NA***
IST1333I ADJLIST = ***NA***
IST861I MODETAB=***NA*** USSTAB=***NA*** LOGTAB=***NA***
IST934I DLOGMOD=***NA*** USS LANGTAB=***NA***
IST597I CAPABILITY-PLU ENABLED  ,SLU ENABLED  ,SESSION LIMIT NONE
IST231I CDRSC MAJOR NODE = ISTCDRDY
IST479I CDRM NAME = MVSA, VERIFY OWNER = NO
IST1184I CPNAME = NETD.MVSB - NETSRVR = ***NA***
IST1044I ALSLIST = ISTAPNPU
```

```
IST082I DEVTYPE = INDEPENDENT LU / CDRSC
IST654I I/O TRACE = OFF, BUFFER TRACE = OFF
IST1500I STATE TRACE = OFF
IST228I ENCRYPTION = NONE
IST1563I CKEYNAME = MVSB CKEY = PRIMARY CERTIFY = NO
IST1552I MAC = NONE MACTYPE = NONE
IST171I ACTIVE SESSIONS = 0000000002, SESSION REQUESTS = 0000000000
IST206I SESSIONS:
IST1081I ADJACENT LINK STATION = DKPUMVSB
IST634I NAME     STATUS         SID          SEND RECV VR TP NETID
IST635I MVSA     ACTIV/CP-S C3BF054E2C28AE51 0072 0001  0  0 NETA
IST635I MVSA     ACTIV/CP-P C3BBDE1E84FDAABE 0001 0072  0  0 NETA
IST924I -------------------------------------------------------------
IST075I NAME = NETD.MVSB, TYPE = DIRECTORY ENTRY
IST1186I DIRECTORY ENTRY = DYNAMIC NN
IST1184I CPNAME = NETD.MVSB - NETSRVR = ***NA***
IST314I END
```

The XCA major node on MVSA is as follows:

```
DKXCA44  VBUILD TYPE=XCA
DKXP44   PORT  ADAPNO=0,CUADDR=4400,SAPADDR=04,MEDIUM=RING,TIMER=20
DKGR44   GROUP ANSWER=ON,                                        X
               AUTOGEN=(10,L,P),                                 X
               CALL=INOUT,DIAL=YES,ISTATUS=ACTIVE
```

The XCA major node on MVSB is as follows:

```
DKXCA43  VBUILD TYPE=XCA
DKXP43   PORT  ADAPNO=0,CUADDR=4300,SAPADDR=04,MEDIUM=RING,TIMER=20
DKGR43   GROUP ANSWER=ON,                                        X
         AUTOGEN=(10,L,P),CALL=INOUT,DIAL=YES,ISTATUS=ACTIVE
```

The switched major node on MVSA is as follows:

```
DKSW01   VBUILD TYPE=SWNET
DKPUMVSB PU  ADDR=C1,PUTYPE=2,CPNAME=MVSB,XNETALS=YES,NETID=NETD,
         CONNTYPE=APPN
         PATH  DIALNO=0104400075130002,GRPNM=DKGR44
```

The switched major node on MVSB is as follows:

```
DKSW02   VBUILD TYPE=SWNET
DKPUMVSA PU  ADDR=C1,PUTYPE=2,CPNAME=MVSA,XNETALS=YES,NETID=NETA,
             CONNTYPE=APPN
             PATH  DIALNO=0104400075130001,GRPNM=DKGR43
```

Now static CDRSCs are used, predefining the cross domain resources. The VTAMOPT CDRDYN=NO is specified in MVSA and MVSB. Also note that the DYNPU=NO is specified on the XCA major node GROUP statement. PARTAPPL is the only application on MVSB that can be accessed from MVSA using LUs TCY10000 or TCY10001 only. The application is located on NETD.MVSB. The VTAM CDRSC definition for system MVSA is as follows:

```
         VBUILD TYPE=CDRSC
         NETWORK NETID=NETD
MVSB     CDRSC
PARTAPPL CDRSC  CDRM=MVSB
TCY10000 CDRSC  CDRM=MVSB
TCY10001 CDRSC  CDRM=MVSB
```

The VTAM CDRM definitions for system MVSA is as follows:

```
         VBUILD TYPE=CDRM
MVSA     CDRM  CDRDYN=NO,         DYNAMIC CDRSC NOT AUTHORIZED         X
               CDRSC=REQ,          REQUIRE PREDEFINED CDRSCS           X
               ELEMENT=1,          CDRM ELEMENT ADDRESS                X
               ISTATUS=ACTIVE,     VTAM INITIAL STATUS                 X
               SUBAREA=7,          NETWORK UNIQUE SUBAREA ADDRES S     X
               VPACING=63          PACING BETWEEN CDRMS
```

The VTAM CDRM definitions for system MVSB is as follows:

```
         VBUILD TYPE=CDRM
MVSB     CDRM  CDRDYN=NO,         DYNAMIC CDRSC NOT AUTHORIZED         X
               CDRSC=REQ,          REQUIRE PREDEFINED CDRSCS           X
               ELEMENT=1,          CDRM ELEMENT ADDRESS                X
               ISTATUS=ACTIVE,     VTAM INITIAL STATUS                 X
               SUBAREA=54,          NETWORK UNIQUE SUBAREA ADDRES S    X
               VPACING=63          PACING BETWEEN CDRMS
```

Turning to the VTAM XCA and switch major node definitions for MVSA and MVSB, the XCA major node definition for the CIP on MVSA is as follows:

```
XCAB1000 VBUILD TYPE=XCA
RTXPRTB1 PORT  ADAPNO=0,CUADDR=B100,SAPADDR=04,MEDIUM=RING,TIMER=30,  X
               CAPACITY=1000M,VNGROUP=RTXGRPB1,VNNAME=VNRTB1
RTXGRPB1 GROUP ANSWER=ON,                                            X
               AUTOGEN=(9,B1,B1),                                    X
               CALL=INOUT,                                           X
               DIAL=YES,                                             X
               DYNPU=NO,                                             X
               ISTATUS=ACTIVE
```

The switch major node definition for system MVSA is as follows:

```
SWNSNI2Y VBUILD TYPE=SWNET,MAXGRP=14,MAXNO=64
RTPUSNI0 PU    ADDR=01,                                              X
               DWACT=YES,                                            X
               CPNAME=MVSB,                                          X
               NETID=NETD,                                           X
               CONNTYPE=APPN,                                        X
               MAXDATA=4400,                                         X
               ISTATUS=ACTIVE
         PATH  DIALNO=0104400075130002,GRPNM=RTXGRPB1
```

The XCA major node definition for the CIP on MVSB is as follows:

```
XCA50000 VBUILD TYPE=XCA
RTXPRT25 PORT  ADAPNO=0,CUADDR=5000,SAPADDR=04,MEDIUM=RING,TIMER=30
RTXGRP25 GROUP ANSWER=ON,                                            X
               AUTOGEN=(50,L,P),                                     X
               CALL=INOUT,                                           x
               DIAL=YES,                                             x
               DYNPU=NO,                                             X
               ISTATUS=ACTIVE
```

The switch major node definition for system MVSB is as follows:

```
SWNSNI2P VBUILD TYPE=SWNET,MAXGRP=14,MAXNO=64
RTPUSNI1 PU     ADDR=01,                                              X
                DWACT=YES,                                            X
                CPNAME=MVSA,                                          X
                NETID=NETA,                                           X
                CONNTYPE=APPN,                                        X
                MAXDATA=4400,                                         X
                ISTATUS=ACTIVE
         PATH   DIALNO=0104400075130001,GRPNM=RTXGRP25
```

The following changes have been made to test CDRDYN=YES on MVSA and CDRDYN=NO on MVSB. The CDRSC on MVSB restricts MVSA access to applications on MVSB via terminals (TCP10055-TCP10058) only. The CDRSC also restricts MVSB access to applications (TSOA,ECHOMVSA) on MVSA. To implement greater session establishment security, VTAM provides a Session Management Exit (SME) and DSME. In a representative size network, the static CDRSC would require a great deal of coordination between networks.

On MVSA the command F NET,VTAMOPTS,CDRDYN=YES was issued and DYNPU=NO was changed to DYNPU=YES in the XCA major node definition. The XCA major node for the CIP is as follows:

```
XCAB1000 VBUILD TYPE=XCA
RTXPRTB1 PORT   ADAPNO=0,CUADDR=B100,SAPADDR=04,MEDIUM=RING,TIMER=30,  X
                CAPACITY=1000M,VNGROUP=RTXGRPB1,VNNAME=VNRTB1
*
RTXGRPB1 GROUP  ANSWER=ON,                                            X
                AUTOGEN=(9,B1,B1),                                    X
                CALL=INOUT,                                           X
                DIAL=YES,                                             X
                DYNPU=YES,                                            X
                ISTATUS=ACTIVE
```

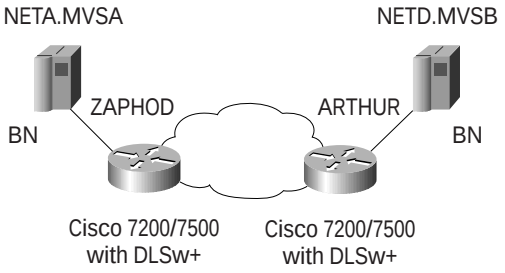
The CDRSC definitions for MVSB are as follows:

```
         VBUILD TYPE=CDRSC
         NETWORK NETID=NETA
MVSA     CDRSC
TSOA     CDRSC  CDRM=MVSA
TSOA0001 CDRSC  CDRM=MVSA
TSOA0002 CDRSC  CDRM=MVSA
TSOA0003 CDRSC  CDRM=MVSA
TSOA0004 CDRSC  CDRM=MVSA
TSOA0005 CDRSC  CDRM=MVSA
TSOA0006 CDRSC  CDRM=MVSA
TSOA0007 CDRSC  CDRM=MVSA
TSOA0008 CDRSC  CDRM=MVSA
TSOA0009 CDRSC  CDRM=MVSA
TSOA0010 CDRSC  CDRM=MVSA
ECHOMVSA CDRSC  CDRM=MVSA
TCP10055 CDRSC  CDRM=MVSA
TCP10056 CDRSC  CDRM=MVSA
TCP10057 CDRSC  CDRM=MVSA
TCP10058 CDRSC  CDRM=MVSA
```

Example 5: Casual Connection

Casual Connection is a PU 2.1-to-PU 2.1 connection with no CP-to-CP sessions. Low-Entry Networking (LEN) between two different networks is called Casual Connection. Static CDRSCs are required, and with LEN connections, only LU 6.2 sessions can establish.

Figure 5 Casual Connection



The CONNTYPE was forced to be LEN on the PU. In this case, there is no CP-to-CP session between the VTAMs, and any LUs must be defined to the other VTAM as hard-coded CDRSCs. The output from the log on MVSA when dialed is as follows:

```
V NET,DIAL,ID=DKPUMVSB
IST097I VARY ACCEPTED
NSP2000I DATA RECORDED TO PRIMARY FOR PU DKPUMVSB
```

Notice that there is no CP-to-CP session started. The displays from NETA.MVSA are as follows:

```
D NET,ID=ISTCDRDY,E
IST097I DISPLAY ACCEPTED
IST075I NAME = ISTCDRDY, TYPE = CDRSC SEGMENT 498
IST486I STATUS= ACTIV, DESIRED STATE= ACTIV
IST478I CDRSCS:
IST483I MVSB     ACT/S----Y, CDRM = ***NA***, NETID = NETD
IST483I CNM11    ACT/S----Y, CDRM = MVSA    , NETID = NETA
IST483I MVSE     ACT/S----Y, CDRM = MVSA    , NETID = NETA
IST483I TCD10002 ACT/S----Y, CDRM = MVSA    , NETID = NETA
IST483I CNM01    ACT/S----Y, CDRM = MVSA    , NETID = NETA
IST483I MVSF     ACT/S----Y, CDRM = MVSA    , NETID = NETA
IST483I CPAC     ACT/S----Y, CDRM = MVSA    , NETID = NETA
IST483I MVSD     ACT/S----Y, CDRM = MVSA    , NETID = NETA
IST483I MVSG     ACT/S----Y, CDRM = MVSA    , NETID = NETA
IST483I MVS2     ACT/S----Y, CDRM = MVSA    , NETID = NETA
IST1500I STATE TRACE = OFF
IST314I END

D NET,ID=MVSB,E
IST097I DISPLAY ACCEPTED
IST075I NAME = NETD.MVSB, TYPE = ADJACENT CP 504
IST486I STATUS= ACT/S----Y, DESIRED STATE= ACTIV
IST1447I REGISTRATION TYPE = NO
IST977I MDLTAB=***NA*** ASLTAB=***NA***
IST1333I ADJLIST = ***NA***
IST861I MODETAB=***NA*** USSTAB=***NA*** LOGTAB=***NA***
IST934I DLOGMOD=SNASVCMG USS LANGTAB=***NA***
IST597I CAPABILITY-PLU ENABLED  ,SLU ENABLED  ,SESSION LIMIT NONE
IST231I CDRSC MAJOR NODE = ISTCDRDY
```

```
IST1044I ALSLIST = DKPUMVSB
IST082I DEVTYPE = INDEPENDENT LU / CDRSC
IST654I I/O TRACE = OFF, BUFFER TRACE = OFF
IST1500I STATE TRACE = OFF
IST228I ENCRYPTION = NONE
IST1563I CKEYNAME = MVSB CKEY = PRIMARY CERTIFY = NO
IST1552I MAC = NONE MACTYPE = NONE
IST171I ACTIVE SESSIONS = 0000000001, SESSION REQUESTS = 0000000000
IST206I SESSIONS:
IST1081I ADJACENT LINK STATION = DKPUMVSB
IST634I NAME     STATUS         SID          SEND RECV VR TP NETID
IST635I MVSA     ACTIV/SV-P C3BBDE1E84FDABAE 0001 0001       NETA
IST924I -------------------------------------------------------------
IST075I NAME = NETD.MVSB, TYPE = DIRECTORY ENTRY
IST1186I DIRECTORY ENTRY = DYNAMIC NN
IST1184I CPNAME = NETD.MVSB - NETSRVR = ***NA***
IST314I END

D NET,ID=DKPUMVSB,E
IST097I DISPLAY ACCEPTED
IST075I NAME = DKPUMVSB, TYPE = PU_T2.1 507
IST486I STATUS= ACTIV--L--, DESIRED STATE= ACTIV
IST1043I CP NAME = MVSB, CP NETID = NETD, DYNAMIC LU = YES
IST1589I XNETALS = YES
IST136I SWITCHED SNA MAJOR NODE = DKSW01
IST081I LINE NAME = L4400000, LINE GROUP = DKGR44, MAJNOD = DKXCA44
IST654I I/O TRACE = OFF, BUFFER TRACE = OFF
IST1500I STATE TRACE = OFF
IST1656I VTAMTOPO = REPORT, NODE REPORTED - YES
IST1657I MAJOR NODE VTAMTOPO = REPORT
IST355I LOGICAL UNITS:
IST080I APPCMVB1 ACT/S      MVSB     ACT/S----Y
IST314I END

D NET,ID=APPCMVB1,E
IST097I DISPLAY ACCEPTED
IST075I NAME = NETD.APPCMVB1, TYPE = CDRSC 521
IST486I STATUS= ACT/S, DESIRED STATE= ACTIV
IST1447I REGISTRATION TYPE = NO
IST977I MDLTAB=***NA*** ASLTAB=***NA***
IST1333I ADJLIST = ***NA***
IST861I MODETAB=***NA*** USSTAB=***NA*** LOGTAB=***NA***
IST934I DLOGMOD=***NA*** USS LANGTAB=***NA***
IST597I CAPABILITY-PLU ENABLED  ,SLU ENABLED  ,SESSION LIMIT NONE
IST231I CDRSC MAJOR NODE = DKCDRSC1
IST1044I ALSLIST = DKPUMVSB
IST082I DEVTYPE = INDEPENDENT LU / CDRSC
IST654I I/O TRACE = OFF, BUFFER TRACE = OFF
IST1500I STATE TRACE = OFF
IST228I ENCRYPTION = NONE
IST1563I CKEYNAME = APPCMVB1 CKEY = PRIMARY CERTIFY = NO
IST1552I MAC = NONE MACTYPE = NONE
IST171I ACTIVE SESSIONS = 0000000001, SESSION REQUESTS = 0000000000
IST206I SESSIONS:
IST1081I ADJACENT LINK STATION = DKPUMVSB
IST634I NAME     STATUS         SID          SEND RECV VR TP NETID
IST635I MVSA     ACTIV/SV-P C3BBDE1E84FDABB3 0002 0002       NETA
IST314I END
```

The following are similar displays from the other VTAM (NETD.MVSB):

```
D NET,ID=ISTCDRDY,E
IST097I DISPLAY ACCEPTED
IST075I NAME = ISTCDRDY, TYPE = CDRSC SEGMENT 728
IST486I STATUS= ACTIV, DESIRED STATE= ACTIV
IST478I CDRSCS:
IST483I MVSA     ACT/S----Y, CDRM = ***NA***, NETID = NETA
IST1500I STATE TRACE = OFF
IST314I END
IEF126I CRBROWN - LOGGED OFF - TIME=16.57.04
$HASP395 CRBROWN  ENDED
$HASP250 CRBROWN PURGED -- (JOB KEY WAS B0D1D3A1)
IEA989I SLIP TRAP ID=X33E MATCHED.  JOBNAME=*UNAVAIL, ASID=001B.

D NET,ID=DKPUMVSA,E
IST097I DISPLAY ACCEPTED
IST075I NAME = DKPUMVSA, TYPE = PU_T2.1 735
IST486I STATUS= ACTIV--L--, DESIRED STATE= ACTIV
IST1043I CP NAME = MVSA, CP NETID = NETA, DYNAMIC LU = YES
IST1589I XNETALS = YES
IST136I SWITCHED SNA MAJOR NODE = DKSW02
IST081I LINE NAME = L4300000, LINE GROUP = DKGR44, MAJNOD = DKXCA43
IST654I I/O TRACE = OFF, BUFFER TRACE = OFF
IST1500I STATE TRACE = OFF
IST1656I VTAMTOPO = REPORT, NODE REPORTED - YES
IST1657I MAJOR NODE VTAMTOPO = REPORT
IST355I LOGICAL UNITS:
IST080I MVSA     ACT/S----Y
IST314I END


D NET,ID=MVSA,E
IST097I DISPLAY ACCEPTED
IST075I NAME = NETA.MVSA, TYPE = CDRSC 738
IST486I STATUS= ACT/S----Y, DESIRED STATE= ACTIV
IST1447I REGISTRATION TYPE = NO
IST977I MDLTAB=***NA*** ASLTAB=***NA***
IST1333I ADJLIST = ***NA***
IST861I MODETAB=***NA*** USSTAB=***NA*** LOGTAB=***NA***
IST934I DLOGMOD=SNASVCMG USS LANGTAB=***NA***
IST597I CAPABILITY-PLU ENABLED  ,SLU ENABLED  ,SESSION LIMIT NONE
IST231I CDRSC MAJOR NODE = ISTCDRDY
IST1044I ALSLIST = DKPUMVSA
IST082I DEVTYPE = INDEPENDENT LU / CDRSC
IST654I I/O TRACE = OFF, BUFFER TRACE = OFF
IST1500I STATE TRACE = OFF
IST228I ENCRYPTION = NONE
IST1563I CKEYNAME = MVSA CKEY = PRIMARY CERTIFY = NO
IST1552I MAC = NONE MACTYPE = NONE
IST171I ACTIVE SESSIONS = 0000000002, SESSION REQUESTS = 0000000000
IST206I SESSIONS:
IST1081I ADJACENT LINK STATION = DKPUMVSA
IST634I NAME     STATUS         SID          SEND RECV VR TP NETID
IST635I APPCMVB1 ACTIV/SV-S C3BBDE1E84FDABB3 0002 0002       NETD
IST635I MVSB     ACTIV/SV-S C3BBDE1E84FDABAE 0001 0001       NETD
IST924I -------------------------------------------------------------
```

```
IST075I NAME = NETA.MVSA,  TYPE = DIRECTORY ENTRY
IST1186I DIRECTORY ENTRY = DYNAMIC NN
IST1184I CPNAME = NETA.MVSA - NETSRVR = ***NA***
IST314I END
```

The XCA major node on MVSA is as follows:

```
DKXCA44  VBUILD TYPE=XCA
DKXP44   PORT  ADAPNO=0,CUADDR=4400,SAPADDR=04,MEDIUM=RING,TIMER=20
DKGR44   GROUP ANSWER=ON,                                          X
               AUTOGEN=(10,L,P),                                   X
               CALL=INOUT,DIAL=YES,ISTATUS=ACTIVE
```

The XCA major node on MVSB is as follows:

```
DKXCA43  VBUILD TYPE=XCA
DKXP43   PORT  ADAPNO=0,CUADDR=4300,SAPADDR=04,MEDIUM=RING,TIMER=20
DKGR43   GROUP ANSWER=ON,                                          X
         AUTOGEN=(10,L,P),CALL=INOUT,DIAL=YES,ISTATUS=ACTIVE
```

The switched PU major node on NETA.MVSA is as follows:

```
DKSW01   VBUILD TYPE=SWNET
DKPUMVSB PU    ADDR=C1,PUTYPE=2,CPNAME=MVSB,XNETALS=YES,NETID=NETD,    X
               CONNTYPE=LEN
         PATH  DIALNO=0104400075130002,GRPNM=DKGR44
```

The switched PU major node on NETD.MVSB is as follows:

```
DKSW02   VBUILD TYPE=SWNET
DKPUMVSA PU    ADDR=C1,PUTYPE=2,CPNAME=MVSA,XNETALS=YES,               X
               NETID=NETA,CONNTYPE=LEN
         PATH  DIALNO=0104400075130001,GRPNM=DKGR43
```

Notice that CONNTYPE=LEN was coded on both PUs. This is because the VTAMs are APPN border nodes, and CONNTYPE=APPN is specified in the VTAM startups (as shown in the statements that follow). So the CONNTYPE had to be overrided in the PU definition, and VTAM V4R4 or later is required to do this. By coding CONNTYPE=LEN, the PU can only be a LEN resource, even if at activation the XID indicates the PU can be an APPN resource. The hard-coded CDRSC major node from NETA.MVSA is as follows:

```
DKCDRSC1 VBUILD TYPE=CDRSC
         NETWORK NETID=NETD
APPCMVB1 CDRSC ALSLIST=(DKPUMVSB),ALSREQ=NO
```

Every APPLID must be defined to the other VTAM as a CDRSC, as in the previous statements. LU 6.2 sessions only work over a LEN node. The VTAM options output from the VTAMs is as follows:

NETA.MVSA:

```
D NET,VTAMOPTS
IST097I DISPLAY ACCEPTED
IST1188I VTAM CSV2R8 STARTED AT 20:36:26 ON 12/03/02 775
IST1349I COMPONENT ID IS 5695-11701-801
IST1348I VTAM STARTED AS INTERCHANGE NODE
IST1189I AFFDELAY = 600                  ALSREQ   = NO
IST1189I APPNCOS  = NONE                 ASIRFMSG = OLUSSCP
IST1189I ASYDE    = TERM                 AUTHLEN  = YES
IST1189I AUTORTRY = AUTOCAP              AUTOTI   = 0
```

```
IST1189I BN       = YES                 BNDYN    = FULL
IST1189I BNORD    = PRIORITY            BSCMDRS  = (STATS,INOPS)
IST1189I BSCTMOUT = 286                 CACHETI  = 8
IST1189I CDRDYN   = YES                 CDRSCTI  = 480S
IST1189I CDSERVR  = YES                 CDSREFER = ***NA***
IST1189I CINDXSIZ = 8176                CMPMIPS  = 100
IST1189I CMPVTAM  = 0                   CNMTAB   = *BLANKS*
IST1189I COLD     = YES                 CONFIG   = MA
IST1189I CONNTYPE = APPN                CPCDRSC  = YES
IST1189I CPCP     = YES                 CSALIMIT = 90112K
IST1189I CSA24    = 1024K               DATEFORM = MDY
IST1189I DIALRTRY = YES                 DIRSIZE  = 0
IST1189I DIRTIME  = 691200S             DISCNTIM = (15,0)
IST1189I DLRORDER = STATNID             DLRTCB   = 32
IST1189I DSPLYDEF = 300                 DSPLYMAX = 16384
IST1189I DSPLYWLD = FULLWILD            DUPDEFS  = ALL
IST1189I DYNADJCP = YES                 DYNASSCP = YES
IST1189I DYNDLGMD = NONE                DYNHPPFX = CNR
IST1189I DYNLU    = YES                 DYNMODTB = NONE
IST1189I DYNPUPFX = CN                  DYNVNPFX = CNV
IST1189I ENCRPREF = NONE                ENCRYPTN = 31
IST1189I ENHADDR  = YES                 ESIRFMSG = ALLSSCP
IST1189I FLDTAB   = MSGFLOOD            FSIRFMSG = OLUSSCP
IST1189I GWSSCP   = YES                 HNTSIZE  = 4080
IST1189I HOSTPU   = ISTPUS              HOSTSA   = 57
IST1189I HOTIOTRM = 20                  HPR      = (RTP,RTP)
IST1189I HPRARB   = RESPMODE            HPRNCPBF = NO
IST1189I HPRPST   = LOW          480S   HPRPST   = MEDIUM       240S
IST1189I HPRPST   = HIGH         120S   HPRPST   = NETWRK        60S
IST1189I HSRTSIZE = 9973                INITDB   = NONE
IST1189I INOPDUMP = OFF                 IOINT    = 900
IST1189I IOMSGLIM = 2                   IOPURGE  = 300S
IST1189I IPADDR   = 0.0.0.0             IRNSTRGE = 0
IST1189I ISTCOSDF = INDLU               LIMINTCP = 43200
IST1189I LIST     = 00                  MAINTLVL = *BLANKS*
IST1189I MAXLOCAT = 5000                MAXLURU  = 6144
IST1189I MAXSSCPS = 10                  MAXSUBA  = 63
IST1189I MIHTMOUT = 1800                MSGLEVEL = BASE
IST1189I MSGMOD   = NO                  MXSAWBUF = 10000
IST1189I MXSSCPRU = 4096                MXSUBNUM = 511
IST1189I NCPBUFSZ = 512                 NETID    = NETA
IST1189I NMVTLOG  = NPDA                NNSPREF  = ***NA***
IST1189I NODELST  = *BLANKS*            NODETYPE = NN
IST1189I NQNMODE  = NAME                NSRTSIZE = *BLANKS*
IST1189I NUMTREES = 200                 OSIEVENT = PATTERNS
IST1189I OSIMGMT  = NO                  OSITOPO  = ILUCDRSC
IST1189I OSRTSIZE = 43                  PDTRCBUF = 2
IST1189I PIUMAXDS = 200                 PLUALMSG = NOSUPP
IST1189I PPOLOG   = YES                 PSRETRY  = LOW             0S
IST1189I PSRETRY  = MEDIUM         0S   PSRETRY  = HIGH            0S
IST1189I PSRETRY  = NETWRK         0S   PSSTRACE = NORB
IST1189I PSWEIGHT = LESSTHAN            RESUSAGE = 100
IST1189I ROUTERES = 128                 SACONNS  = YES
IST1189I SAVERSCV = (NO,KEEP)           SAWMAXDS = 100
IST1189I SAWMXQPK = 0                   SDLCMDRS = (STATS,INOPS)
IST1189I SECLVLCP = ***NA***            SIRFMSG  = ALLSSCP
IST1189I SLOWVAL  = (0,0)               SLUALMSG = NOSUPP
IST1189I SMEAUTH  = DISCARD             SNAPREQ  = 1000
```

```
IST1189I SNVC     = 15                  SONLIM   = (60,30)
IST1189I SORDER   = APPN                SRCHRED  = OFF
IST1189I SRCOUNT  = 10                  SRTIMER  = 30S
IST1189I SSCPDYN  = YES                 SSCPID   = 57
IST1189I SSCPNAME = MVSA                SSCPORD  = PRIORITY
IST1189I SSDTMOUT = 30                  SSEARCH  = CACHE
IST1189I STRGR    = ISTGENERIC          STRMNPS  = ISTMNPS
IST1189I SUPP     = NOSUP               SWNORDER = CPNAME
IST1189I TCPNAME  = TCPMVSA2            TNSTAT   = NOCNSL,TIME=60
IST1189I TRANSLAT = (0,1,2,3,4,5,6,7)   UPDDELAY = 60S
IST1189I USSTAB   = *BLANKS*            VERIFYCP = NONE
IST1189I VFYRED   = YES                 VFYREDTI = OFF
IST1189I VOSDEACT = NO                  VRTG     = YES
IST1189I VRTGCPCP = YES                 VTAMEAS  = 32001
IST1189I WARM     = NO                  XCFINIT  = YES
IST1189I XNETALS  = NO
IST314I END

NETD.MVSB:
D NET,VTAMOPTS
IST097I DISPLAY ACCEPTED
IST1188I VTAM CSV2R10 STARTED AT 14:04:16 ON 01/08/03 012
IST1349I COMPONENT ID IS 5695-11701-10A
IST1348I VTAM STARTED AS INTERCHANGE NODE
IST1189I AFFDELAY = 600                 ALSREQ   = NO
IST1189I APPNCOS  = NONE                ASIRFMSG = OLUSSCP
IST1189I ASYDE    = TERM                AUTHLEN  = YES
IST1189I AUTORTRY = AUTOCAP             AUTOTI   = 0
IST1189I BN       = YES                 BNDYN    = FULL
IST1189I BNORD    = PRIORITY            BSCMDRS  = (STATS,INOPS)
IST1189I BSCTMOUT = 286                 CACHETI  = 8
IST1189I CDRDYN   = YES                 CDRSCTI  = 480S
IST1189I CDSERVR  = YES                 CDSREFER = ***NA***
IST1189I CINDXSIZ = 8176                CMPMIPS  = 100
IST1189I CMPVTAM  = 0                   CNMTAB   = *BLANKS*
IST1189I COLD     = YES                 CONFIG   = MB
IST1189I CONNTYPE = APPN                CPCDRSC  = YES
IST1189I CPCP     = YES                 CSALIMIT = 131072K
IST1189I CSA24    = 1024K               DATEFORM = MDY
IST1189I DIALRTRY = YES                 DIRSIZE  = 0
IST1189I DIRTIME  = 691200S             DISCNTIM = (15,0)
IST1189I DLRORDER = STATNID             DLRTCB   = 32
IST1189I DLURSAW  = YES                 DSPLYDEF = 512
IST1189I DSPLYMAX = 768                 DSPLYWLD = FULLWILD
IST1189I DUPDEFS  = ALL                 DYNADJCP = YES
IST1189I DYNASSCP = YES                 DYNDLGMD = NONE
IST1189I DYNHPPFX = CNR                 DYNLU    = YES
IST1189I DYNMODTB = NONE                DYNPUPFX = CN
IST1189I DYNVNPFX = CNV                 ENCRPREF = NONE
IST1189I ENCRYPTN = 31                  ENHADDR  = YES
IST1189I ESIRFMSG = ALLSSCP             FLDTAB   = MSGFLOOD
IST1189I FSIRFMSG = OLUSSCP             GWSSCP   = YES
IST1189I HNTSIZE  = 4080                HOSTPU   = ISTPUS
IST1189I HOSTSA   = 59                  HOTIOTRM = 20
IST1189I HPR      = (RTP,RTP)           HPRARB   = RESPMODE
IST1189I HPRNCPBF = NO                  HPRPST   = LOW          480S
IST1189I HPRPST   = MEDIUM       240S   HPRPST   = HIGH         120S
IST1189I HPRPST   = NETWRK        60S   HSRTSIZE = 9973
```

```
IST1189I INITDB   = NONE                INOPDUMP = OFF
IST1189I IOINT    = 900                 IOMSGLIM = 2
IST1189I IOPURGE  = 300S                IPADDR   = 0.0.0.0
IST1189I IRNSTRGE = 0                   ISTCOSDF = INDLU
IST1189I LIMINTCP = 43200               LIST     = 00
IST1189I MAINTLVL = *BLANKS*            MAXLOCAT = 5000
IST1189I MAXLURU  = 6144                MAXSSCPS = 10
IST1189I MAXSUBA  = 63                  MIHTMOUT = 1800
IST1189I MSGLEVEL = BASE                MSGMOD   = NO
IST1189I MXSAWBUF = 10000               MXSSCPRU = 4096
IST1189I MXSUBNUM = 511                 NCPBUFSZ = 512
IST1189I NETID    = NETD                NMVTLOG  = NPDA
IST1189I NNSPREF  = ***NA***            NODELST  = *BLANKS*
IST1189I NODETYPE = NN                  NQNMODE  = NAME
IST1189I NSRTSIZE = *BLANKS*            NUMTREES = 200
IST1189I OSIEVENT = PATTERNS            OSIMGMT  = NO
IST1189I OSITOPO  = ILUCDRSC            OSRTSIZE = 43
IST1189I PDTRCBUF = 2                   PIUMAXDS = 200
IST1189I PLUALMSG = NOSUPP              PPOLOG   = YES
IST1189I PSRETRY  = LOW            0S   PSRETRY  = MEDIUM         0S
IST1189I PSRETRY  = HIGH           0S   PSRETRY  = NETWRK         0S
IST1189I PSSTRACE = NORB                PSWEIGHT = LESSTHAN
IST1189I RESUSAGE = 100                 ROUTERES = 128
IST1189I SACONNS  = YES                 SAVERSCV = (NO,KEEP)
IST1189I SAWMAXDS = 100                 SAWMXQPK = 0
IST1189I SDLCMDRS = (STATS,INOPS)       SECLVLCP = ***NA***
IST1189I SIRFMSG  = ALLSSCP             SLOWVAL  = (0,0)
IST1189I SLUALMSG = NOSUPP              SMEAUTH  = DISCARD
IST1189I SNAPREQ  = 1000                SNVC     = 15
IST1189I SONLIM   = (60,30)             SORDER   = APPN
IST1189I SRCHRED  = OFF                 SRCOUNT  = 10
IST1189I SRTIMER  = 30S                 SSCPDYN  = YES
IST1189I SSCPID   = 59                  SSCPNAME = MVSB
IST1189I SSCPORD  = PRIORITY            SSDTMOUT = 30
IST1189I SSEARCH  = CACHE               STRGR    = ISTGENERIC
IST1189I STRMNPS  = ISTMNPS             SUPP     = NOSUP
IST1189I SWNORDER = CPNAME              TCPNAME  = TCPMVSB2
IST1189I TNSTAT   = NOCNSL,TIME=60      TRANSLAT = (0,1,2,3,4,5,6,7)
IST1189I UPDDELAY = 60S                 USSTAB   = *BLANKS*
IST1189I VARYWLD  = FULLWILD            VERIFYCP = NONE
IST1189I VFYRED   = YES                 VFYREDTI = OFF
IST1189I VOSDEACT = NO                  VRTG     = NO
IST1189I VRTGCPCP = YES                 VTAMEAS  = 32001
IST1189I WARM     = NO                  XCFINIT  = YES
IST1189I XNETALS  = NO
IST314I END
```

The router configurations and some relevant show command output are as follows:

```
arthur#show running-config
Building configuration...


Current configuration:
!
version 11.2
no service password-encryption
no service udp-small-servers
```

```
no service tcp-small-servers
!
hostname arthur
!
enable secret 5 $1$u5YS$HJj4jDDAwYmxGeELdAE.D1
enable password cisco
!
microcode CIP flash slot0:cip22-31
microcode reload
no ip domain-lookup
source-bridge ring-group 100
dlsw local-peer peer-id 172.26.16.17
dlsw remote-peer 0 tcp 172.26.16.18
!
interface Loopback0
 no ip address
!
interface Ethernet0/0
 ip address 172.26.14.113 255.255.254.0
 no ip mroute-cache
 no cdp enable
!
interface TokenRing2/1/0
 ip address 172.26.16.17 255.255.255.240
 ring-speed 16
!
interface Channel3/0
 no ip address
 no keepalive
 csna 0120 00
!
interface Channel3/2
 no ip address
 no keepalive
 lan TokenRing 0
  source-bridge 4043 1 100
  adapter 0 4000.7513.0002
!
router eigrp 777
 network 172.26.0.0
!
no ip classless
!
!
line con 0
 exec-timeout 0 0
line aux 0
line vty 0 4
 password cisco
 login
!
end


arthur#sh ext ch 3/0 csna oper
     Path Dv Status       SlowDown  maxpiu       time-delay   length-delay
```

```
CSNA 0120 00 setupComplet off       20470        10           20470
arthur#sh ext ch 3/2 llc oper

  LAN Token  0 Adapter   0 4000.7513.0002
      Open SAPs=1
      Max SAPs Opened=1
arthur#sh dls peer
Peers:                state     pkts_rx   pkts_tx  type  drops ckts TCP   uptime
 TCP 172.26.16.18    CONNECT        662       668  conf      0    0   0 05:09:01
arthur#


zaphod#show running-config
Building configuration...


Current configuration:
!
version 11.3
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname zaphod
!
enable secret 5 $1$VD73$crrrNw3hLoL1kJr61MhjN/
enable password cisco
!
microcode CIP flash slot1:cip25-7
microcode reload
!
source-bridge ring-group 100
dlsw local-peer peer-id 172.26.16.18
dlsw remote-peer 0 tcp 172.26.16.17
!
interface Loopback0
 ip address 172.26.16.254 255.255.255.255
!
interface Ethernet0/0
 ip address 172.26.14.114 255.255.254.0
 no ip mroute-cache
 no cdp enable
!
interface TokenRing1/1/0
 ip address 172.26.16.18 255.255.255.240
 ring-speed 16
!
interface Channel3/0
 no ip address
 no keepalive
 csna 0110 00
!
interface Channel3/2
 ip address 172.26.16.1 255.255.255.240
 no keepalive
 lan TokenRing 0
  source-bridge 4044 1 100
```

```
  adapter 0 4000.7513.0001
!
router eigrp 777
 network 172.26.0.0
!
no ip classless
!
!
!
line con 0
 exec-timeout 0 0
line aux 0
line vty 0 4
 password cisco
 login
!
end
```

```
zaphod#sh dls peer
Peers:                state     pkts_rx   pkts_tx  type  drops ckts TCP   uptime
 TCP 172.26.16.17    CONNECT        669       663  conf      0    0   0 05:09:33
Total number of connected peers: 1
Total number of connections:     1
```

```
zaphod#sh ext ch 3/2 llc oper

  LAN Token  0 Adapter   0 4000.7513.0001
      Open SAPs=1
      Max SAPs Opened=1
```

```
zaphod#sh ext ch 3/0 csna oper
     Path Dv Status       SlowDown  maxpiu       time-delay   length-delay
CSNA 0110 00 setupComplet off       20470        10           20470
zaphod#
```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