

# TN3270 Cisco SNA Direct PU Configuration and Verification

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## **Introduction**

The Cisco Telnet 3270 (TN3270) Server emulates one or more Systems Network Architecture (SNA) Physical Units (PUs), and each PU can support up to 255 Logical Units (LUs type 1 and 3 printers) or type 2 terminals. TN3270 emulates a PU2.1 node with dependent LUs configured on the host, similar to any other SNA remote PU with the Channel Interface Processor (CIP) Cisco SNA feature.

This document discusses how TN3270 Cisco SNA direct PU can be used to enable clients to connect with dynamic and static LU requests. The Network Setup in this document highlights the relationship between the CIP router configuration and host definitions.

## **Prerequisites**

### **Requirements**

There are no specific requirements for this document.

### **Components Used**

This document is not restricted to specific software or hardware versions.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

## Conventions

For more information on document conventions, refer to the Cisco Technical Tips Conventions.

## Configure

In this section, you are presented with the information to configure the features described in this document.

**Note:** To find additional information on the commands used in this document, use the Command Lookup Tool (registered customers only) .

## Network Setup

This document uses this network setup:

**TN3270 Direct PU Static and Dynamic LUs**

```

interface Channel0/0 slot/port
csnaC010E4
!--- ESCON port C0
!--- MVS logical partition 1
!--- ICUADD=0
!
interface Channel0/2
ip address 20.1.1.54 255.255.255.0
max-llc2-sessions 4000
!
lan TokenRing 0
adapter 0, 4000.4040.0000
!
tn3270-server
pu (JEPU 01754321) 20.1.1.55
!--- PU name, IDBLK/IDNUM, IP address
token-adapter 0 44
!--- LSAP=44
RMAC 4000.4040.0000 RSAP 04
!--- TEST to (RMAC,RSAP)
lu-seed JELU##
!--- LU names that the CIP will use.

```

```

SYS1.VTAMLST(JEXCA)
VBUILD TYPE=XCA

JEXCAP PORT
ADAPNO=0,
CUADDR=7E4,
SAPADDR=04,
MEDIUM=RING,
TIMER=03 (OR >30)

JEXCAG GROUP
DIAL=YES,
AUTOGEN=(50,L,P),
ANSWER=ON,
CALL=INOUT

SYS1.VTAMLST(JESMIN)
JESMIN VBUILD TYPE=SWNET,
MANGRP=10, MAXNO=10, MAXDLUR=10

```

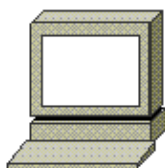
```

JEPU PU
ADDR=01,
IDBLK=017,
IDNUM=54321
or CPNAME=JEC
LUSEED=JELU##
!--- Dynamic LUs JELU06, JELU07, etc.
MAXPATH=1,
DLOGMOD=D4A32782,
USSTAB=ISTINCDT,
MODETAB=ISTINCLM,
SSCPFM=USS3270,
MAXDATA=2052, MAXOUT=7,
PACING=7, VPACING=10,
PUTYPE=2

```

The client requests  
(dynamic LUs)  
20.1.1.55 and  
a model 3278

The host generates  
the next available  
LU name  
(JELU06 is the first)



**TN3270  
Client**

Static LUs  
20.1.1.55  
LU name  
JELU04

```

!--- Static Logical Units:
JELU01 LU LOCADDR=01
JELU02 LU LOCADDR=02
JELU03 LU LOCADDR=03
JELU04 LU LOCADDR=04
JELU05 LU LOCADDR=05

```

## Configurations

The most common request from TN3270 clients is a request for a dynamic LU that specifies a 3270 terminal type. The Server assigns the session to the next available LU from a pool of dynamic LUs (for example, JELU06 in the Network Setup). A TN3270E client may also request a specific LU name that is statically configured on the host switched major node (for example, JELU01). The name requested must match the name by which the TN3270 Server knows the LU. In the case of a TN3270 Dependent LU Requester (DLUR), the Server learns the names from the host ACTLUs (no LUSEED parameter is needed on the router).

In the case of direct PU, the parameter INCLUD0E=YES can be specified in the switched major node to tell the host to pass the VTAM LU names to the router. The default behavior, however, is this: if this parameter is not specified or set to NO, then the host passes only the LOCADDR (not the LU name), and the TN3270 Server creates the name out of the router LUSEED parameter and the host LU LOCADDR. The client must

configure the correct remote LU name (from the router LUSEED and the host LOCADDR) to attain a session with a host LOCADDR LU. For example, TN3270 client JELU01 maps to the host LU with a LOCADDR = 01.

If the INCLUDE option is not being used, it is best to use the same LU (and LUSEED) name convention on the router and on the host, as shown in the Network Setup.

The configurations in this section are the TN3270 Cisco SNA direct PU tasks.

## Configure the Host XCA Major Node SYS1.VTAMLST(JEXCA)

This output shows the External Communication Adapter (XCA) major node definitions:

```
JEXCA VBUILD TYPE=XCA
JEXCAP PORT CUADDR=7E4

!--- This is the subchannel address that corresponds to the CIP device address E4.

-- -- -- MEDIUM=RING, --

!--- This is the Token Ring.

-- -- -- ADAPNO=0, --

!--- This corresponds to the CIP.

adapter 0 4000.4040.0000
-- -- -- SAPADDR=4, --

!--- The CIP assumes this service access point (SAP), and the remote PU issues
!--- TEST to CIP MAC and this SAP.

-- -- -- TIMER=60 -- --

!--- This must be equal to or greater than 30.

JEXCAG GROUP DIAL=YES,
-- -- -- ANSWER=ON,
-- -- -- CALL=INOUT,
-- -- -- AUTOGEN=(50,L,P),

!--- 255 x 50 Logical Link Control, type 2 (LLC2) sessions are supported.

-- -- -- ISTATUS=ACTIVE
```

## Configure CIP Cisco SNA Feature and the TN3270 Server

The next output shows the CIP router configuration. Because Cisco SNA is a prerequisite for TN3270, the Cisco SNA path statement is defined as described in Host and Router Configuration Dependencies. Notice that PU JEPU is also defined with IDBLK/IDNUM using the same adapter as that used for Cisco SNA (adapter 0); therefore, it is LSAP 44.

**Note:** IP connectivity from the clients to the router is assumed.

```
source-bridge ring-group 100

!--- This is virtual ring 100 for source-route bridging (SRB).

interface Channel0/0
slot/port
csna C010 E4
```

```
!--- ESCON port C0, Multiple Virtual Storage (MVS) logical partition 1,  
!--- logical controller unit address the CUADD=0, the subchannel address that  
!--- corresponds to the CIP device address E4. Refer to the Network Setup.
```

```
interface Channel0/2  
ip address 20.1.1.54 255.255.255.0  
max-llc2-sessions 4000  
lan TokenRing 0  
adapter 0 4000.4040.0000  
tn3270-server  
pu JEPU 01754321 20.1.1.55 token-adapter 0 44 RMAC 4000.4040.0000 RSAP 04  
luseed JELU##
```

```
!--- PU name IDBLK, IDNUM, IP address, adapter 0,  
!--- Link SAP (LSAP)=44, TEST to (Remote MAC [RMAC], Remote SAP [RSAP]),  
!--- LU names that CIP uses.
```

## TN3270, Cisco SNA, and Switched Major Node

This output represents the JESMN switched major node:

```
-- -- VBUILD TYPE=SWNET  
JEPU PU -- ADDR=01, -- -- -- -- --  
-- -- -- -- ISTATUS=ACTIVE,  
-- -- -- -- IDBLK=017, -- -- -- -- --  
-- -- -- -- IDNUM=54321,  
-- -- -- -- MAXDATA=2052,  
-- -- -- --MAXPATH=1,  
-- -- -- --PUTYPE=2,  
-- -- -- -- LUGROUP=DDDLUGMP, !  
-- -- -- -- LUSEED=JELU##, -- -- ! Dynamic LUs  
  
JELU01 LU LOCADDR=01 ! 5 STATIC Logical Units  
JELU02 LU LOCADDR=02  
JELU03 LU LOCADDR=03  
JELU04 LU LOCADDR=04  
JELU05 LU LOCADDR=05  
  
Dynamic LUs JELU06 LU LOCADDR=06, ?,  
up to LUs JELUFF LU LOCADDR=FF - 255 LUs
```

The TN3270 PU name, JEPU, and the IDBLK=017, IDNUM=54321 must be configured in the corresponding host switched major node SYS1.VTAMLST(JESMN). The JEPU is also configured on the CIP token-adapter 0 with LSAP=44. It issues TEST to RMAC 4000.4040.0000 and RSAP 04 (if not specified, the default is the MAC address of the token-adapter configured on the PU JEPU adapter 0). The RSAP must be equal to the XCA SAP (in this example, 04, which is the default and can be omitted from the **pu** command).

The LUSEED is used for static LU names, and there is no need for it to match the LUSEED parameter configured on the host switched major node (however, it is recommended that the names be the same). The TN3270 clients issue requests to the IP address 20.1.1.55, and they must supply the LU name to access the static LUs on the host: the last two digits must match the LU LOCADDR (if the LUSEED ends with ## hex) or must match the last three digits (if the LUSEED ends with ### decimal). The TN3270 clients must supply a 3270 terminal model number to access the dynamic LUs. The CIP TN3270 Server assigns the first available dynamic LU address. In this example, JELU01 through JELU05 are configured as static, and JELU06 through JELUFF are configured as dynamic.

# CIP Router and Host Verification Commands

## Display the Status on the CIP Physical Channel

Issue the **show extended channel 0/0 statistics** command to verify the status of the channel.

```
# show extended channel 0/0 statistics

Path: C0100 -- ESTABLISHED
      Command          Selective      System      Device      CU
Dev Connects Retries Cancels      Reset      Reset      Errors      Busy
E4      170          0          1          0          1          0          0

      Blocks          Bytes          Dropped Blk      Memd
Dev-Lnk  Read   Write   Read  Write   Read   Write   wait Con
E4-00   1466  1455  20014 19254   0      0      0    Y
Total:  1466  1465  20014 19254   0      0      0

Last statistics 6 seconds old, next in 4 seconds

!--- XCA and CIP Cisco SNA are up.
```

In that **show extended channel 0/0 statistics** output, the two most important fields are:

- Path: C010 is ESTABLISHED The physical channel is up.
- Con Y The connection between CIP Cisco SNA device E4 and corresponding host subchannel address 7E4 is up.

This indicates that the CIP and the host resources are operational. If the remote PU can not connect to the host, you should troubleshoot the LLC2 side of the connection: TEST, exchange identifications (XIDs) (IDBLK, IDNUM), data-link switching (DLSw) or remote source-route bridging (RSRB) peers, the remote devices, or the PU status on the host. For further troubleshooting guidance, refer to Introduction and Overview to Troubleshoot CSNA.

## Display the Status of the XCA Major Node

Issue this host **display** command to verify the status of the XCA major node:

```
/D NET,ID=JEXCA,e

DISPLAY ACCEPTED
NAME = JEXCA, TYPE = XCA MAJOR NODE
STATUS= ACTIV, DESIRED STATE= ACTIV

!--- The XCA major node is active on the host.

MEDIUM=RING,ADAPNO= 0,CUA=07E4,SNA SAP= 4

!--- Subchannel 7E4 is active.
```

Next, issue this command to inactivate the XCA major node:

```
/V NET,INACT,ID=JEXCA
```

Issue the **show extended channel 0/0 statistics** command again, to verify the status of the channel:

```
# show extended channel 0/0 statistics
```

```

Path: C0100 -- ESTABLISHED
      Command          Selective      System      Device      CU
Dev Connects Retries Cancels      Reset      Reset      Errors      Busy
E4      170           0           1           0           1           0           0

      Blocks          Bytes          Dropped Blk  Memd
Dev-Lnk  Read   Write      Read   Write      Read   Write  wait Con
E4-00   110   109      21778  4446      0      0      0    N
Total:  110   109      21778  4446      0      0      0

```

Last statistics 6 seconds old, next in 4 seconds

*!--- The CIP Cisco SNA device is down. The subchannel 7E4 is down.*

The Con N indicates that the host devices are not activated or are incorrectly configured (usually adapter 0, SAP, TIMER > 30). In this example, the XCA major node on the host has been inactivated.

## Reactivate the XCA Switched Major Node

Issue this command to reactivate the XCA switched major node:

```

/V NET,ACT,ID=JEXCA

/D NET,ID=JEXCA ,e
DISPLAY ACCEPTED
NAME = JEXCA, TYPE = XCA MAJOR NODE
STATUS= ACTIV, DESIRED STATE= ACTIV

!--- The XCA is active on the host.

MEDIUM=RING,ADAPNO= 0,CUA=07E4,SNA SAP= 4

!--- Subchannel 7E4 is active.

```

# show extended channel 0/0 statistics

```

Path: C0100 -- ESTABLISHED
      Command          Selective      System      Device      CU
Dev Connects Retries Cancels      Reset      Reset      Errors      Busy
E4      180           0           1           0           2           0           0

      Blocks          Bytes          Dropped Blk  Memd
Dev-Lnk  Read   Write      Read   Write      Read   Write  wait Con
E4-00   200   160      23778  3846      0      0      0    Y
Total:  200   160      23778  3846      0      0      0

```

Last statistics 5 seconds old, next in 5 seconds

*!--- Cisco SNA and the XCA are up.*

Issue this command to verify that the PU, JEPU, is active:

```

# show extended channel 0/2 tn3270-server

<current stats>      < connection stats >      <response time(ms)>
server-ip:tcp      lu in-use      connect      disconn fail      host      tcp
20.1.1.55:23      255 0           0           0 0           0 0
total            255 0

configured max_lu 2100      unbind-action keep
idle-time      0           keepalive 1800 (send timing-mark 30)

```

```
ip-preced-screen 0 ip-preced-printer 0 ip-tos-screen 0 ip-tos-printer 0
tcp-port 23 generic-pool permit no timing-mark
lu-termination unbind lu-deletion never
```

```
name(index) ip:tcp xid state link destination r-lsap
JEPU(2) 20.1.1.55:23 01754321 ACTIVE tok 0 4000.4040.0000 04 44
```

*!--- The PU is up.*

**Note:** For more information on the previous command, refer to the show extended channel tn3270–server section of IBM Channel Attach Commands.

Issue the **show extended channel 0/2 tn3270–server pu** command, to determine whether the PU is active and to display the status of LUs:

```
show extended channel 0/2 tn3270–server pu JEPU
```

```
name(index) ip:tcp xid state link destination r-lsap
JEPU(2) 20.1.1.55:23 01754321 ACTIVE tok 0 4000.4040.0000 04 44
idle-time 0 keepalive 1800 unbind-act discon generic-pool perm
bytes 475 in, 481 out; frames 25 in, 36 out; NegRsp 0 in, 0 out
actlus 15, dactlus 10, binds 0
```

*!--- Note: If the state is ACT/NA, then the client is disconnected.*

```
lu name client ip:tcp state model frames in out idle for
1 JELU01 never connected ACT/NA 1 1 0:15:14
2 JELU02 never connected ACT/NA 1 1 0:15:14
3 JELU03 never connected ACT/NA 1 1 0:15:15
4 JELU04 never connected ACT/NA 1 1 0:15:15
5 JELU05 never connected ACT/NA 1 1 0:15:15
```

As shown above, the TN3270 client is ready to start a session. Similarly, issue the **/D NET,ID=JESMN,E** command on the host, to display the PU and LU status:

```
/D NET,ID=JESMN,E
```

```
NAME = JESMN, TYPE = SW SNA MAJ NODE 700
STATUS= ACTIV, DESIRED STATE= ACTIV
NETWORK RESOURCES:
JEPU TYPE = PU_T2.1 -- -- , ACTIV
JELU01 TYPE = LOGICAL UNIT -- , ACTIV
JELU02 TYPE = LOGICAL UNIT -- , ACTIV
JELU03 TYPE = LOGICAL UNIT -- , ACTIV
JELU04 TYPE = LOGICAL UNIT -- , ACTIV
JELU05 TYPE = LOGICAL UNIT -- , ACTIV
```

## Inactivate the Switched Major Node on the Host

Issue this command to inactivate the switched major node on the host:

```
/V NET,INACT,ID=JESMN
```

Again, on the router, display the status of the PU:

```
show extended channel 0/2 tn3270–server pu JEPU
```

```
name(index) ip:tcp xid state link destination r-lsap
JEPU(2) 20.1.1.55:23 01754321 XID tok 0 4000.4040.0000 04 44
```

*!--- The TN3270 PU is in exchange XID state and is waiting for the host switched*

```

!--- major node PU response to XID.

/V NET,ACT,ID=JESMN,E

!--- Reactivates the switched major node.

/D NET,ID=JESMN,E

NAME = JESMN, TYPE = SW SNA MAJ NODE 700
STATUS= ACTIV, DESIRED STATE= ACTIV
NETWORK RESOURCES:
JEPU TYPE = PU_T2.1 -- -- , ACTIV
JELU01 TYPE = LOGICAL UNIT -- , ACTIV

!--- The static LU is activated.

JELU02 TYPE = LOGICAL UNIT -- , ACTIV

!--- ACTLU/+rsp ACTLU is completed.

JELU03 TYPE = LOGICAL UNIT -- , ACTIV
JELU04 TYPE = LOGICAL UNIT -- , ACTIV
JELU05 TYPE = LOGICAL UNIT -- , ACTIV

```

```
show extended channel 0/2 tn3270-server pu JEPU
```

```

name(index) ip:tcp          xid      state link  destination      r-lsap
JEPU(2)     20.1.1.55:23      01754321 ACTIVE tok 0   4000.4040.0000   04 44

lu  name  client ip:tcp      state  model frames in out idle for
 1  JELU01 never connected  ACT/NA          1      1  0:15:14
 2  JELU02 never connected  ACT/NA          1      1  0:15:14
 3  JELU03 never connected  ACT/NA          1      1  0:15:15
 4  JELU04 never connected  ACT/NA          1      1  0:15:15
 5  JELU05 never connected  ACT/NA          1      1  0:15:15

```

If the switched major node activation fails, recheck it to determine if the IDBLK/IDNUM (or the CPNAME) configured in the host switched major node is equal to the one configured on the remote PU (or on the CIP TN3270 PU). If they match, ensure that the CIP is receiving the TEST and XID frames.

## Starting a TN3270 Client Session

This is output that is displayed when you issue the **show extended channel 0/2 tn3270-server PU** command after the client starts a TN3270 session:

```
show extended channel 0/2 tn3270-server pu JEPU
```

```

name(index) ip:tcp          xid      state link  destination      r-lsap
JEPU(2)     20.1.1.55:23      01754321 ACTIVE tok 0   4000.4040.0000   04 44

lu  name  client ip:tcp      state  model frames in out idle for
 1  JELU01 never connected  ACT/NA          1      1  0:15:14
 2  JELU02 never connected  ACT/NA          1      1  0:15:14
 3  JELU03 never connected  ACT/NA          1      1  0:15:15
 4  JELU04 never connected  ACT/NA          1      1  0:15:15
 5  JELU05 never connected  ACT/NA          1      1  0:15:15
 6  JELU06 20.1.1.100      ACT/SESS 32780  8      7  0:17:15

```

```
!--- The first LU session was started by the TN3270 client using dynamic LUs.
```

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