

# Configuring Hundreds of TN3270 PUs Without Exceeding TN3270 Server Configuration Limitations

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## Introduction

Often, in typical TN3270 server implementations, several hundred direct Physical Units (PUs) must be configured on a single Channel Interface Processor (CIP) or Channel Port Adapter (CPA). This can cause one or more TN3270 server parameters to exceed its limits and, therefore, cause the CIP or CPA to fail to configure the desired number of PUs. This document provides a sample configuration for hundreds of PUs (600, in this document) that do not exceed any of the limitations on the TN3270 server configuration parameters.

## 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 Cisco Technical Tips Conventions.

### Problems

There are several limitations in TN3270 server configurations on a single CIP or CPA:

- You can define a maximum of 160 different listening points (160 different IP addresses).
- You can open a maximum of 128 Service Access Points (SAPs).
- You can define a maximum of 18 adapters (numbers 0 through 31).

## Configure

How can you configure hundreds of PUs but not reach the previously listed limitations? This section provides the answer to this question. This answer uses 600 PUs.

This is a sample output of one adapter that is used for both TN3270 server and Cisco Systems Network Architecture (CSNA):

```
interface Channel2/1
  description CISCO Channel Interface Processor
  csna 0100 70
!
interface Channel2/2
  description TN3270 Server
  ip address 10.14.20.33 255.255.255.248
  no keepalive
  max-llc2-sessions 100
  lan TokenRing 0
  adapter 0 4000.0501.0001
  tn3270-server
  maximum-lus 253
  pu CAPPU1 05D18101 10.14.20.34 token-adap 0 44 rmac 4000.0501.0001 lu-seed CAP01L##
```

Rather than configure TN3270 and CSNA on the same adapter, use one adapter for all of the TN3270 PUs local adapter server configurations, and use a different adapter for each CSNA statement that corresponds to each Virtual Telecommunication Access Method (VTAM) External Communications Adapter (XCA) major node.

On the TN3270 server adapter, open 100 SAPs in total, but reuse these for every adapter that is opened by an XCA major node. You must define Logical Link Control Type 2 (LLC2) sessions from those PUs (multiplexed via SAPs on the TN3270 server adapter) toward the first adapter on the first XCA. This will be your first set of 100 PUs. For the next 100 PUs, you need to define a second CSNA adapter and define LLC2 sessions from those PUs toward the second adapter. Repeat this for each set of 100 PUs.

For example, assume that you want to define 600 TN3270 direct PUs. First, you need to define six adapters for VTAM and one adapter for TN3270 server. When you define six adapters with SAP 04, you have already used six SAPs. When you add to the 100 SAPs for the TN3270 PUs, you have a total of  $100 + 6 = 106$  SAPs in use. This ensures that the limit of 128 SAPs per adapter has not been exceeded.

This is sample output:

```
interface Channel 5/0
  csna 0100 01
  csna 0100 02
  csna 0100 03
  csna 0100 04
  csna 0100 05
  csna 0100 06

interface Channel 5/2
  max-llc2-sessions 6000
  lan TokenRing 0
  source-bridge 2 1 200
  adapter 1 4000.0000.0001
```

```
!--- First XCA major node with SAP 04.

adapter 2 4000.0000.0002

!--- Second XCA major node with SAP 04.

adapter 3 4000.0000.0003

!--- Third XCA major node with SAP 04.

adapter 4 4000.0000.0004

!--- Fourth XCA major node with SAP 04.

adapter 5 4000.0000.0005

!--- Fifth XCA major node with SAP 04.

adapter 6 4000.0000.0006

!--- Sixth XCA major node with SAP 04.

adapter 31 4000.0000.3270

!--- The TN3270 server.

tn3270-server
maximum-lus 16000

pu PU1 00000001 10.10.1.1 token-adapter 31 04 rmac 4000.0000.0001 lu-seed P1###
pu PU2 00000002 10.10.1.1 token-adapter 31 06 rmac 4000.0000.0001 lu-seed P2###

!--- Output suppressed.

pu PU100 00000100 10.10.1.1 token-adapter 31 CA rmac 4000.0000.0001 lu-seed P100###

!--- First 100 PUs that go to the first XCA.

pu PU101 00000101 10.10.1.2 token-adapter 31 04 rmac 4000.0000.0002 lu-seed P101###
pu PU102 00000102 10.10.1.2 token-adapter 31 06 rmac 4000.0000.0002 lu-seed P102###

!--- Output suppressed.

pu PU200 00000200 10.10.1.2 token-adapter 31 CA rmac 4000.0000.0002 lu-seed P200###

!--- Second 100 PUs that go to the second XCA.

pu PU201 00000201 10.10.1.3 token-adapter 31 04 rmac 4000.0000.0003 lu-seed P201###
pu PU202 00000202 10.10.1.3 token-adapter 31 06 rmac 4000.0000.0003 lu-seed P202###

!--- Output suppressed.

pu PU300 00000300 10.10.1.3 token-adapter 31 CA rmac 4000.0000.0003 lu-seed P300###

!--- Third 100 PUs that go to the third XCA.

pu PU301 00000301 10.10.1.4 token-adapter 31 04 rmac 4000.0000.0004 lu-seed P301###
pu PU302 00000302 10.10.1.4 token-adapter 31 06 rmac 4000.0000.0004 lu-seed P302###

!--- Output suppressed.

pu PU400 00000400 10.10.1.4 token-adapter 31 CA rmac 4000.0000.0004 lu-seed P400###

!--- Fourth 100 PUs that go to the fourth XCA.

pu PU401 00000401 10.10.1.5 token-adapter 31 04 rmac 4000.0000.0005 lu-seed P401###
```

```

pu PU402 00000402 10.10.1.5 token-adapter 31 06 rmac 4000.0000.0005 lu-seed P402###

!--- Output suppressed.

pu PU500 00000500 10.10.1.5 token-adapter 31 CA rmac 4000.0000.0005 lu-seed P500###

!--- Fifth 100 PUs that go to the fifth XCA.

pu PU501 00000501 10.10.1.6 token-adapter 31 04 rmac 4000.0000.0006 lu-seed P501###
pu PU502 00000502 10.10.1.6 token-adapter 31 06 rmac 4000.0000.0006 lu-seed P502###

!--- Output suppressed.

pu PU600 00000600 10.10.1.6 token-adapter 31 CA rmac 4000.0000.0006 lu-seed P600###

!--- Sixth 100 PUs that go to the sixth XCA.

```

**Note:** This sample configuration applies equally to the CPA card. The only difference is that all of the configuration resides on the physical interface, because the CPA does not have a virtual interface.

These two commands must be tuned for the several PUs configuration:

- **maximum-lus**
- **max-llc2-sessions**

The **maximum-lus** command is configured in the TN3270 server configuration. It is the maximum number of Logical Unit (LU) control blocks that are allowed. The allowed range is 0 through 32000; however, the practical upper limit for concurrently operating TN3270 sessions depends on the hardware and usage characteristics. The default is 2100. If you limit the number of LU control blocks that are allocated, then you can ensure that sufficient memory is available to support other Cisco Mainframe Channel Connection (CMCC) functions. The control blocks themselves require about 1000 bytes per LU. During session activity, a further 2000 bytes per LU might be needed for data. On a CIP, 32 MB of memory will support 4000 LUs. To support more than 4000 LUs, 64 MB of memory is recommended. On a CPA, 8 MB of memory supports 1000 LUs.

The **max-llc2-sessions** command is configured on the virtual interface of a CIP or on the physical interface of a CPA. Use it to specify the maximum number of LLC2 sessions that are supported on the CMCC adapter. If you do not configure this parameter on the CMCC adapter, then the limit of LLC2 sessions is 256. It is a value in the range of 1 through 6000 LLC sessions.

You must increase **maximum-lus** and **max-llc2-sessions** command parameters based on your needs.

This is output from the **show extended channel 5/2 connection-map llc2** command:

```

# show extended channel 5/2 con llc2

LAN Token 0 Adapter 1 4000.0000.0001
Local SAP=04 LLC2 Connections=100 CSNA Port=0 Path=0100 Device=01
LAN Token 0 Adapter 2 4000.0000.0002
Local SAP=04 LLC2 Connections=100 CSNA Port=0 Path=0100 Device=02
LAN Token 0 Adapter 3 4000.0000.0003
Local SAP=04 LLC2 Connections=100 CSNA Port=0 Path=0100 Device=03
LAN Token 0 Adapter 4 4000.0000.0004
Local SAP=04 LLC2 Connections=100 CSNA Port=0 Path=0100 Device=04
LAN Token 0 Adapter 5 4000.0000.0005
Local SAP=04 LLC2 Connections=100 CSNA Port=0 Path=0100 Device=05
LAN Token 0 Adapter 6 4000.0000.0006
Local SAP=04 LLC2 Connections=100 CSNA Port=0 Path=0100 Device=06
LAN Token 0 Adapter 31 4000.0000.3270

```

```
Local SAP=04 LLC2 Connections=6 CSNA Port=0 Path=0110 Device=00
Local SAP=06 LLC2 Connections=6 CSNA Port=0 Path=0110 Device=00
Local SAP=08 LLC2 Connections=6 CSNA Port=0 Path=0110 Device=00
Local SAP=0A LLC2 Connections=6 CSNA Port=0 Path=0110 Device=00
```

*!--- Output suppressed.*

```
Local SAP=CA LLC2 Connections=6 CSNA Port=0 Path=0110 Device=00
Total : SAPs opened = 106 Connections active = 1200
```

## Verify

There is currently no verification procedure available for this configuration.

## Troubleshoot

There is currently no specific troubleshooting information available for this configuration.

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