

Sending PAD Calls From a Router using CMNS

Document ID: 14154

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Introduction

Connection–Mode Network Service (CMNS) provides a mechanism through which you can extend local X.25 switching to different media, such as Ethernet, Fiber Distributed Data Interface (FDDI), and Token Ring, using OSI–based network service access point (NSAP) addresses. This implementation runs X.25 (packet level) over Logical Link Control, type 2 (LLC2) (frame level), to facilitate the extension of X.25 to other media. The Cisco CMNS implementation supports services defined in ISO Standards 8208 (packet level) and 8802–2 (frame level).

The sample configuration in this document shows you how to configure the router in order to make outgoing packet assembler/disassembler (PAD) calls from the router using CMNS.

Refer to the *Configure CMNS Routing* section of *Configuring X.25 and LAPB* for more information.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

The command to enable CMNS on the Ethernet interface is **cmns enable**. This requires the feature set ENTERPRISE PLUS. This command first appears in Cisco IOS® Software Release 11.1.

This configuration was developed and tested using Cisco IOS Software Release 12.0(16).

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

Refer to Cisco Technical Tips Conventions for more information on document conventions.

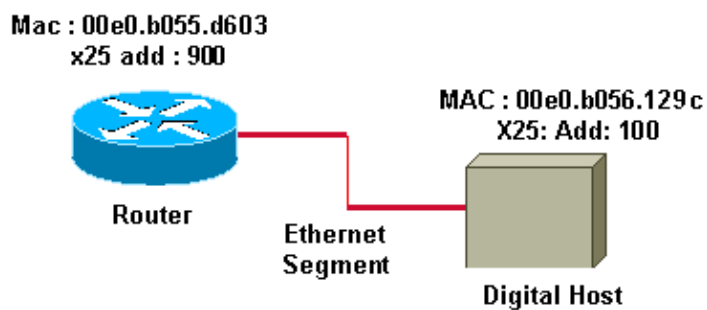
Configure

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

Note: Use the Command Lookup Tool (registered customers only) to find more information on the commands used in this document.

Network Diagram

This document uses this network setup:



Configurations

This document uses this configuration:

Configuration
<pre>service pad cmns !--- Enable PAD through CMNS. service timestamps debug datetime msec service timestamps log datetime msec ! hostname router ! enable password ! x25 routing !--- Enable x25 switching. ! ! ! interface Ethernet0 ip address 10.200.16.17 255.255.255.0 no ip directed-broadcast no ip mroute-cache cmns enable !--- Enable CMNS on this Ethernet segment x25 address 900.</pre>

```

!--- Note: The cmns enable command is not available in the IP Base feature set.
!--- Refer to Cisco bug ID CSCse39205 (registered customers only)
!--- for more information.

!
x25 route ^100 interface Ethernet0 mac 00e0.b056.129c

!--- Switch the call via CMNS (specify a remote MAC).

!
line con 0
exec-timeout 0 0
password length 0
transport input none
line aux 0
line vty 0 4
password login
!
end

```

Verify

Use this section to confirm that your configuration works properly.

The Output Interpreter Tool (registered customers only) (OIT) supports certain **show** commands. Use the OIT to view an analysis of **show** command output.

- **show x25 route** Checks the route statement.
- **show llc2** Checks Layer 2 between two Ethernet devices.
- **show debug** Displays the current state of tracing. pad 100 – log on to a PAD.
- **show x25 pad** Displays information about current open connections. This information includes packet transmissions, X.3 parameter settings, and information about the current status of virtual circuits.
- **show x25 vc** Displays information about active switched virtual circuits (SVCs) and permanent virtual circuits (PVCs).

Before the Outgoing Call

Use these **show** commands:

```

router#show x25 route
# Match      Substitute      Route to
1 dest ^100    Ethernet0 00e0.b056.129c

router#show llc2
LLC2 Connections: total of 1 connections
Ethernet0 DTE: 00e0.b056.129c 00e0.b055.d603 7E 7E state NORMAL
V(S)=110, V(R)=107, Last N(R)=110, Local window=7, Remote Window=127
akmax=3, n2=10,
xid-retry timer      0/0      ack timer      0/1000
p timer              0/1000   idle timer     8000/10000
rej timer            0/3200   busy timer     0/9600
akdelay timer        0/100    txQ count      0/200

```

During Connection

```
router#show debug
X.29 PAD:
  X.25 PAD debugging is on
X.25:
  X.25 special event debugging is on

router#pad 100
Trying 100...Open

connected>

*Mar 1 02:37:04.355: pad_open_connection: found a valid route
*Mar 1 02:37:04.359: Ethernet0: CMNS O R1 Call (12) 8 lci 1
*Mar 1 02:37:04.363:   From (3): 900 To (3): 100
*Mar 1 02:37:04.367:   Facilities: (0)
*Mar 1 02:37:04.367:   Call User Data (4): 0x01000000 (pad)
*Mar 1 02:37:04.427: got data.ind for Ethernet0 00e0.b056.129c, state 9
*Mar 1 02:37:04.427: Ethernet0: CMNS I R1 Call Confirm (5) 8 lci 1
*Mar 1 02:37:04.431:   From (0): To (0):
*Mar 1 02:37:04.431:   Facilities: (0)
*Mar 1 02:37:04.435: PAD0: Call completed
*Mar 1 02:37:04.439: cmns_restart_tx: Ethernet0 00e0.b056.129c
*Mar 1 02:37:04.443: got data.ind for Ethernet0 00e0.b056.129c, state 9
*Mar 1 02:37:04.443: PAD0: Control packet received.
*Mar 1 02:37:04.447: got data.ind for Ethernet0 00e0.b056.129c, state 9
*Mar 1 02:37:04.451: PAD0: Input X29 packet type 4 (Read X.3 param) len 1
*Mar 1 02:37:04.451: PAD0: Output X29 packet type 0 (Parameter indication)
  Len 45
    1:1, 2:1, 3:2, 4:1, 5:0, 6:0, 7:4,
    8:0, 9:0, 10:0, 11:14, 12:0, 13:0, 14:0, 15:0,
    16:127, 17:21, 18:18, 19:0, 20:0, 21:0, 22:0,
*Mar 1 02:37:04.491: got data.ind for Ethernet0 00e0.b056.129c, state 9
*Mar 1 02:37:04.495: PAD0: Control packet received.
*Mar 1 02:37:04.495: got data.ind for Ethernet0 00e0.b056.129c, state 9
*Mar 1 02:37:04.499: PAD0: Input X29 packet type 6 (Set and Read)
  Len 9 2:0, 4:1, 15:0, 7:21,
*Mar 1 02:37:04.503: PAD0: Output X29 packet type 0 (Parameter indication)
  Len 9 2:0, 4:1, 15:0, 7:21,
*Mar 1 02:37:04.523: got data.ind for Ethernet0 00e0.b056.129c, state 9
```

Check your Connection

Issue these commands in order to check your connection:

```
router#show x25 pad
tty0, connection 1 to host 100

Total input: 3, control 2, bytes 20, drops 0. Input Queued:
0 of 7 (0 bytes).
Total output: 0, control 2, bytes 0. Output Queued: 0 of 5.
Flags: 1, State: 3, Last error: 1
ParamsIn: 1:0, 2:0, 3:0, 4:0, 5:0, 6:0, 7:0,
          8:0, 9:0, 10:0, 11:0, 12:0, 13:0, 14:0, 15:0,
          16:0, 17:0, 18:0, 19:0, 20:0, 21:0, 22:0,
ParamsOut: 1:1, 2:0, 3:2, 4:1, 5:0, 6:0, 7:21,
           8:0, 9:0, 10:0, 11:14, 12:0, 13:0, 14:0, 15:0,
           16:127, 17:21, 18:18, 19:0, 20:0, 21:0, 22:0,

router#show x25 vc
SVC 1, State: D1, Interface: Ethernet0
Started 00:00:26, last input 00:00:26, output 00:00:26
```

```
Line: 0   con 0   Location:   Host: 100
900 connected to 100 PAD <--> CMNS Ethernet0 00e0.b056.129c

Window size input: 2, output: 2
Packet size input: 128, output: 128
PS: 2 PR: 3 ACK: 3 Remote PR: 2 RCNT: 0 RNR: no
P/D state timeouts: 0 timer (secs): 0
data bytes 54/20 packets 2/3 Resets 0/0 RNRs 0/0 REJs 0/0 INTs 0/0
```

Disconnect

This debug output is related to a disconnection:

```
*Mar 1 02:38:20.935: PAD0: Control packet received.
*Mar 1 02:38:20.935: PAD0: Input X29 packet type 1 (Inv to clear)
  Len 1 Invite Clear
*Mar 1 02:38:20.943: PAD: Connection closed Cause: 0 Diag: 0
*Mar 1 02:38:20.947: Ethernet0: CMNS O R1 Clear (5) 8 lci 1
*Mar 1 02:38:20.947:   Cause 0, Diag 0
  (DTE originated/No additional information)
*Mar 1 02:38:20.951: pad_clear_TX: context 20E3A0, packet 1B8624
*Mar 1 02:38:20.951: cmns_restart_TX: Ethernet0 00e0.b056.129c
*Mar 1 02:38:20.955: PAD0: Closing connection to . In 47/13, out 7/7
*Mar 1 02:38:20.979: got data.ind for Ethernet0 00e0.b056.129c, state 9
*Mar 1 02:38:20.983: Ethernet0: CMNS I R1 Clear Confirm (3) 8 lci 1
```

Troubleshoot

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

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Updated: Aug 06, 2007

Document ID: 14154
