

X.25 to TCP Translation

Document ID: 14216

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Introduction

XOT (X.25 Over TCP) is designed by Cisco Systems, and is detailed in Request For Comments (RFC) 1613, to transport X.25 over IP internets. This allows X.25 packets to be sent over a Transmission Control Protocol/Internet Protocol (TCP/IP) network instead of a Link Access Procedure, Balanced (LAPB) link. XOT is a method of sending X.25 packets over IP internets through encapsulation of the X.25 Packet Level in TCP packets.

This document presents a sample configuration that illustrates these two translations:

- Transmission Control Protocol (TCP) to X.25 translation.
- X.25 to TCP translation.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

This translation requires the ENTERPRISE feature set, which is only supported on Cisco router platforms 26xx and above.

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.

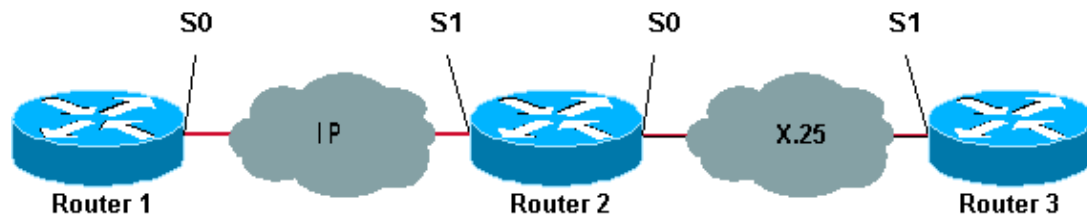
Configure

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 Diagram

This document uses this network setup:



As shown here, back-to-back links are used between Routers 1 and 2 and between Routers 2 and 3.

Configurations

This document uses these configurations:

- Router1
- Router2
- Router3

Note: We have truncated the following configurations to display the relevant information.

```
Router1
version 12.1
service timestamps debug datetime msec
service timestamps log datetime msec
!
hostname Router1
!
interface Serial0
description DCE connection to s1 Router2
ip address 10.0.0.6 255.255.255.252
no ip mroute-cache
clockrate 56000
!
ip route 192.168.7.0 255.255.255.0 10.0.0.5
```

```
Router2
version 12.1
service timestamps debug datetime msec
service timestamps log datetime msec
!
hostname Router2
!
x25 routing
!
interface Loopback0
```

```
ip address 192.168.7.1 255.255.255.0
!
interface Serial0
description DCE connection to s1 Router3
encapsulation x25 dce
no ip mroute-cache
clockrate 64000
!
interface Serial1
description DTE connection to s0 Router1
ip address 10.0.0.5 255.255.255.252
!
x25 route 123 interface Serial0
!
translate tcp 192.168.7.2 x25 123
translate x25 345 tcp 10.0.0.6
```

Router3

```
Router3#show running-config
Building configuration...

Current configuration:
!
version 12.1
service timestamps debug datetime msec
service timestamps log datetime msec
hostname Router3
!
ip subnet-zero
!
x25 routing
!
interface Serial1
description DTE connection to s0 Router2
encapsulation x25
x25 address 123
!
x25 route 345 interface Serial1
```

Verify

Use the following commands to test that your network is operating properly:

Certain **show** commands are supported by the Output Interpreter Tool (registered customers only) , which allows you to view an analysis of **show** command output.

- **show debug** enables you to display a variety of debug information, or to perform specific troubleshooting activities.
- **telnet 192.168.7.2** connects to computer systems on the Internet in prompt mode.
- **pad 345** logs you on to a PAD.
- **show x25 vc** displays information about active switched virtual circuits (SVCs), and permanent virtual circuits (PVCs) in privileged EXEC mode.

The output shown in the tests below is a result of entering these commands on the devices shown in the network diagram above. This output shows that the network is operating properly.

Test 1: TCP to X.25 Translation

In this test, we perform a Telnet session from Router1 to the IP address of Router2:

1. Telnet 192.168.7.2 from Router1.

Note: This address belongs to the network 192.168.7.0 /24 in Router2. This address must not be assigned to any other system in the network.

2. Router2 does a TCP to X.25 translation in order to reach Router3. The output is shown below.

```
Router2#show debug
```

```
TCP:
  TCP special event debugging is on
X.29 PAD:
  X25 PAD debugging is on
X.25:
  X.25 special event debugging is on
Protocol translation:
  Protocol Translation debugging is on
Router2#
```

```
Router1#telnet 192.168.7.2
```

```
Trying 192.168.7.2 ... Open
Trying 123...Open
  User Access Verification
  Password:
Router3>
```

```
Router2#
```

```
*Mar 1 01:50:28.759: TCP0: state was LISTEN -> SYNRCVD [23 -> 10.0.0.6(11007)]
*Mar 1 01:50:28.763: TCB00499CAC setting property TCP_TOS (11) C0094
*Mar 1 01:50:28.767: tcppad2: fork started
*Mar 1 01:50:28.767: TCP: sending SYN, seq 3338770911, ack 4026886977
*Mar 1 01:50:28.771: TCP2: Connection to 10.0.0.6:11007, advertising MSS 1460
*Mar 1 01:50:28.775: TCP2: Connection to 10.0.0.6:11007, received MSS 556, MSS is 556
*Mar 1 01:50:28.791: TCP2: state was SYNRCVD -> ESTAB [23 -> 10.0.0.6(11007)]
*Mar 1 01:50:28.803: pad_open_connection: found a valid route
*Mar 1 01:50:28.807: Serial0: X.25 O R1 Call (11) 8 lci 1
*Mar 1 01:50:28.811: From (0): To (3): 123
*Mar 1 01:50:28.811: Facilities: (0)
*Mar 1 01:50:28.815: Call User Data (4): 0x01000000 (pad)
*Mar 1 01:50:28.827: Serial0: X.25 I R1 Call Confirm (5) 8 lci 1
*Mar 1 01:50:28.831: From (0): To (0):
*Mar 1 01:50:28.835: Facilities: (0)
*Mar 1 01:50:28.835: PAD2: Call completed
*Mar 1 01:50:28.839: PAD2: Control packet received.
*Mar 1 01:50:28.851: PAD2: Input X29 packet type 4 (Read X.3 param) len 1
*Mar 1 01:50:28.855: PAD2: 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 01:50:28.879: PAD2: Control packet received.
*Mar 1 01:50:28.883: PAD2: Input X29 packet type 6 (Set and Read) len 9
  2:0, 4:1, 15:0, 7:21,
*Mar 1 01:50:28.887: tcppad2: Sending WILL ECHO
*Mar 1 01:50:28.891: PAD2: Output X29 packet type 0 (Parameter indication) len 9
  2:0, 4:1, 15:0, 7:21,
```

```
Router2#show x25 vc
```

```
SVC 1, State: D1, Interface: Serial0
  Started 00:00:25, last input 00:00:22, output 00:00:22
```

```

Line: 2 vty 0 Location: Host: 10.0.0.6
      connected to 123 PAD <--> X25
Window size input: 2, output: 2
      Packet size input: 128, output: 128
      PS: 5 PR: 4 ACK: 4 Remote PR: 5 RCNT: 0 RNR: no
      P/D state timeouts: 0 timer (secs): 0
      data bytes 57/62 packets 5/4 Resets 0/0 RNRs 0/0 REJs 0/0 INTs 0/0
Router2#

```

Test 2: X.25 to TCP translation

In this test, we start a packet assembler/disassembler (PAD) session from Router3 to the X.25 address of Router2:

1. Do a PAD to 345 from Router3.
2. Router2 does an X.25 to TCP translation in order to reach Router1. The output is shown below.

```
Router2#show debug
```

```

TCP:
  TCP special event debugging is on
X.29 PAD:
  X25 PAD debugging is on
X.25:
  X.25 special event debugging is on
Protocol translation:
  Protocol Translation debugging is on
Router2#

```

```
Router3#pad 345
```

```

Trying 345...Open
Trying 10.0.0.6 ... Open
  User Access Verification
  Password: CCCC
Router1>

```

```
Router2#
```

```

*Mar 1 01:51:31.475: Serial0: X.25 I R1 Call (12) 8 lci 1024
*Mar 1 01:51:31.479: From (3): 123 To (3): 345
*Mar 1 01:51:31.483: Facilities: (0)
*Mar 1 01:51:31.483: Call User Data (4): 0x01000000 (pad)
*Mar 1 01:51:31.487: PAD: translate call to 345
*Mar 1 01:51:31.491: Call User Data (4): 0x01000000 (pad)
*Mar 1 01:51:31.495: PAD: Creating proto translation on tty2 for vc 1024
*Mar 1 01:51:31.499: Serial0: X.25 O R1 Call Confirm (5) 8 lci 1024
*Mar 1 01:51:31.503: From (0): To (0):
*Mar 1 01:51:31.503: Facilities: (0)
*Mar 1 01:51:31.507: PAD2: Call completed
*Mar 1 01:51:31.511: padtcp2: fork started
*Mar 1 01:51:31.515: PAD2: Output X29 packet type 4 (Read X.3 param) len 1
*Mar 1 01:51:31.523: TCB0049E7A4 created
*Mar 1 01:51:31.523: TCB0049E7A4 setting property TCP_TOS (11) 49C853
*Mar 1 01:51:31.527: TCB0049E7A4 bound to UNKNOWN.44034
*Mar 1 01:51:31.531: PAD2: Control packet received.
*Mar 1 01:51:31.531: TCP: sending SYN, seq 3401534831, ack 0
*Mar 1 01:51:31.535: TCP2: Connection to 10.0.0.6:23, advertising MSS 1460
*Mar 1 01:51:31.539: TCP2: state was CLOSED -> SYNSENT [44034 -> 10.0.0.6(23)]
*Mar 1 01:51:31.559: TCP2: state was SYNSENT -> ESTAB [44034 -> 10.0.0.6(23)]
*Mar 1 01:51:31.563: TCP2: Connection to 10.0.0.6:23, received MSS 1460, MSS is 1460
*Mar 1 01:51:31.567: TCB0049E7A4 connected to 10.0.0.6.23
*Mar 1 01:51:31.571: PAD2: Input 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 01:51:31.583: PAD2: Setting ParamsIn, length 44

```

```

*Mar 1 01:51:31.587: PAD2: Output X29 packet type 6 (Set and Read) len 9
      2:0, 4:1, 15:0, 7:21,
*Mar 1 01:51:31.599: PADTCP2: Telnet received WILL ECHO (1)
*Mar 1 01:51:31.599: PAD2: Control packet received.
*Mar 1 01:51:31.607: PADTCP2: Telnet received DO TTY-TYPE (24)
*Mar 1 01:51:31.611: PAD2: Output X29 packet type 6 (Set and Read) len 3 2:0,
*Mar 1 01:51:31.619: PAD2: Input
*Mar 1 01:51:31.619: PAD2: Control packet received.X29 packet type 0

      (Parameter indication) len 9 2:0, 4:1, 15:0, 7:21,
*Mar 1 01:51:31.627: PAD2: Setting ParamsIn, length 8
*Mar 1 01:51:31.631: PAD2: Input X29 packet type 0 (Parameter indication) len 3 2:0,
*Mar 1 01:51:31.635: PAD2: Setting ParamsIn, length 2
*Mar 1 01:51:31.643: PADTCP2: Telnet received DONT TTY-LOCATION (23)
*Mar 1 01:51:31.647: PADTCP2: Telnet received DONT TTY-SPEED (32)
Router2#

```

```

Router2#show x25 vc
SVC 1024, State: D1, Interface: Serial0
  Started 00:00:10, last input 00:00:07, output 00:00:05
Line: 2 vty 0 Location: Host: 123
      123 connected to 345 PAD <--> X25
Window size input: 2, output: 2
  Packet size input: 128, output: 128
  PS: 1 PR: 6 ACK: 6 Remote PR: 1 RCNT: 0 RNR: no
  P/D state timeouts: 0 timer (secs): 0
  data bytes 3057/60 packets 33/6 Resets 0/0 RNRs 0/0 REJs 0/0 INTs 0/0
Router2#
Router2#

```

Before issuing **debug** commands, refer to Important Information on Debug Commands.

Troubleshoot

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

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