X.25 到 TCP 转换

目录

简介

XOT(X.25 over TCP)由思科系统公司设计，详见征求意见(RFC)1613，用于通过IP网际网络传输X.25。这允许通过传输控制协议/互联网协议(TCP/IP)网络而不是链路访问过程、平衡(LAPB)链路发送X.25数据包。XOT是一种通过TCP数据包中X.25数据包级别的封装通过IP网际网发送X.25数据包的方法。

本文档提供了说明以下两种转换的示例配置：

- 传输控制协议(TCP)到X.25的转换。
- X.25到TCP转换。

先决条件

要求

本文档没有任何特定的要求。

使用的组件

此转换需要ENTERPRISE功能集，该功能集仅在Cisco路由器平台26xx及更高版本上受支持。

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您使用的是真实网络，请确保您已经了解所有命令的潜在影响。

规则

有关文档规则的详细信息，请参阅 Cisco 技术提示规则。

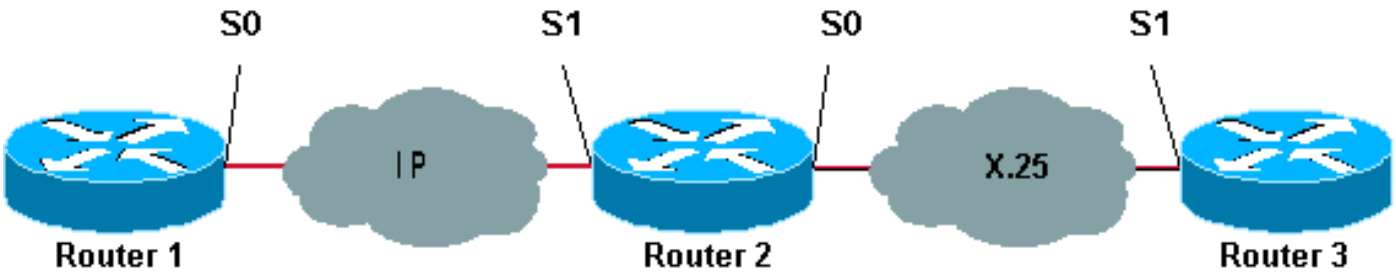
配置

本部分提供有关如何配置本文档所述功能的信息。

注：要查找有关本文档中使用的命令的其他信息，请使用命令查找工具(仅注册客户)。

网络图

本文档使用以下网络设置：



如图所示，路由器1和2之间以及路由器2和3之间使用背靠背链路。

配置

本文档使用以下配置：

- 路由器1
- 路由器2
- 路由器3

注：我们截断了以下配置以显示相关信息。

路由器1

```
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
```

路由器2

```
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
```

路由器3

```
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
```

验证

使用以下命令测试您的网络是否正常运行：

命令输出解释程序工具（仅限注册用户）支持某些 **show 命令，使用此工具可以查看对 show 命令输出的分析。**

- **show debug** -显示各种各样的debug信息，或者执行特定故障排除工作。
- **telnet 192.168.7.2** — 以提示模式连接到Internet上的计算机系统。
- **pad 345** — 将您登录到PAD。

- **show x25 vc** — 显示有关处于特权EXEC模式的活动交换虚电路(SVC)和永久虚电路(PVC)的信息。

以下测试中显示的输出是在上述网络图中所示的设备上输入这些命令的结果。此输出表示，网络在适当地运行。

测试 1：TCP到X.25的转换

在本测试中，我们从Router1到Router2的IP地址执行Telnet会话：

1. 从Router1 Telnet 192.168.7.2。**注意：**此地址属于Router2中的网络192.168.7.0 /24。此地址不得分配给网络中的任何其他系统。
2. 路由器2执行TCP到X.25的转换以到达路由器3。输出如下所示。

```
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#
```

测试 2：X.25到TCP转换

在本测试中，我们启动从Router3到Router2的X.25地址的数据包汇编/拆解器(PAD)会话：

1. 从Router3执行PAD到345。
2. 路由器2执行X.25到TCP转换以到达路由器1。输出如下所示。

```
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#
```

在发出调试指令前，请参见关于Debug调试指令的重要信息。

故障排除

目前没有针对此配置的故障排除信息。

相关信息

- 更多X.25技术提示
- 技术支持 - Cisco Systems