Catalyst 4908G-L3 VLAN 路由与桥接示例配置

目录

简介

本文论述 Catalyst 4908G-L3 交换机的配置示例，以支持 VLAN 间路由和若干第二层(L2)交换机间的 VLAN 桥接。

先决条件

要求

本文读者一定对Catalyst 4908G-L3交换机熟悉：

- 从配置角度看， Catalyst 4908G-L3 是一个路由器。它使用一个Cisco IOS配置接口，并且，默认情况下，所有接口是路由接口。
- Catalyst 4908G-L3不支持几份面向第二层的协议，例如VLAN中继协议(VTP)、在其他Catalyst交换机找到的动态中继协议(DTP)或者端口聚合协议(PAgP)。
- 在版本12.0(7)WX5(15d)中， Catalyst 4908G-L3不支持这些：数据平面(安全)访问控制列表

(ACL) ：换句话说，用户数据流量不可能限制与输入或输出访问列表在路由器接口。**版本12.0(10)W5(18e)当前支持数据平面ACL。**桥接在802.1q子接口，即，与**encapsulation dot1q**和应用的**网桥群组n**命令的一子接口：在交换机间链路(ISL)子接口支持桥接。**在802.1q子接口版本12.0(10)W5(18e)当前支持桥接。**AppleTalk 路由端口侦听，亦称SPAN，端口镜像，混杂模式

使用的组件

本文档中的信息基于以下软件和硬件版本：

- 运行Cisco IOS 12.0(7)W5(15d)的Catalyst 4908G-L3交换路由器
- 运行Cisco IOS 12.0(5.2)XU的三台Catalyst 3512xl交换机

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

Catalyst 4908G-L3 VLAN 路由和桥接示例

本部分提供有关如何配置本文档所述功能的信息。

注意： 使用命令查找工具（仅限注册用户）可获取有关本部分所使用命令的详细信息。

在本示例配置中，部署 Catalyst 4908G-L3 交换机有两个目的：

- 延伸五VLAN (VLAN1， 10， 20， 30和40)在几第二层交换机间：在这种情况下，三台Catalyst 3512XLs
- 执行IP和互联网分组交换的VLAN间路由能允许设备之间的通信在不同的VLAN

为了延伸在交换机间的VLAN， 3512XLs连接对4908G-L3通过在从一3512XL交换机的给的VLAN到达，在对其他交换机的该VLAN桥接有桥接配置的遵从正常桥接规则的中继链路和流量。两台 3512XL 交换机使用千兆 EtherChannel 连接到 4908G-L3 交换机。另一台 3512XL 交换机使用单条千兆以太网链路。

为了支持VLAN间路由，集成路由和桥接(IRB)和网桥虚拟接口(BVI)，配置路由IP和IPX区别VLAN之间。

终端站和服务器挂接到 Catalyst 3512XL 交换机。如果在一个VLAN的一个设备需要连接到在另一个VLAN的一个设备，流量发送到Catalyst 4908G-L3，并且路由在BVI接口的流量。

在部署是一个大型网络的一部分的盒中，被注定的流量核心的路由在一另外的子网上(此配置没有考虑得此处)通过对核心交换机或路由器的一连接。

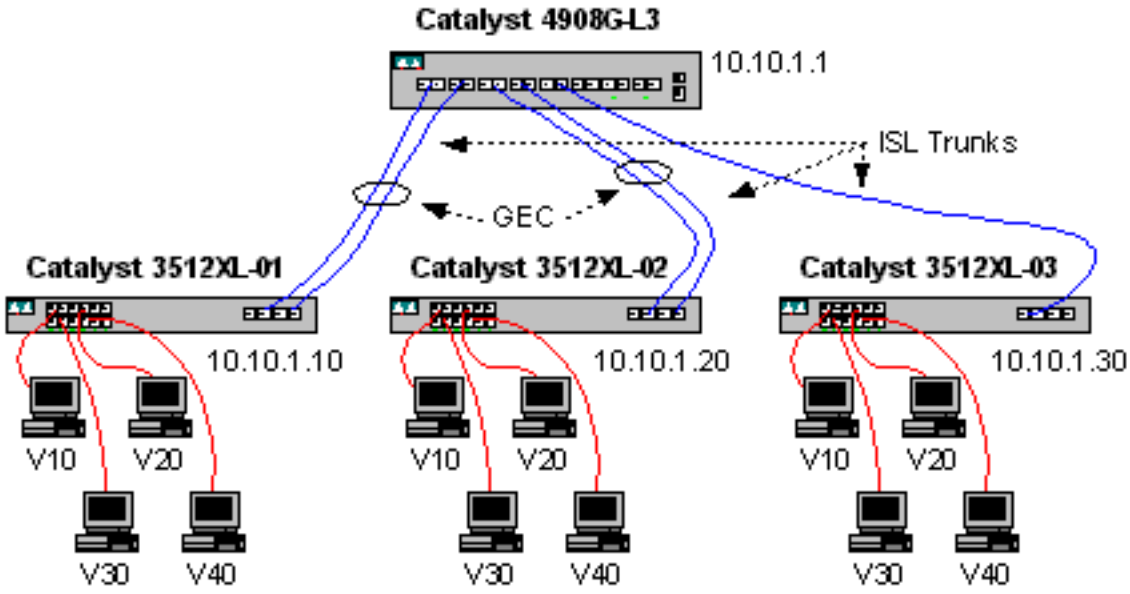
交换机采用以下配置：

- 基本初始配置应用。

- 为便于管理而为交换机分配 IP 地址和默认网关。
- VTP模式设置对透明，并且VLAN在Catalyst 3512xl交换机配置。
- 千兆以太网通道链路配置在Catalyst 4908G-L3和3512xl-01和3512XL-02交换机之间。
- 桥接， BVI接口和IP和IPX路由在Catalyst 4908G-L3配置。
- ISL中继线配置在Catalyst 4908G-L3和三台Catalyst 3512xl交换机之间，并且桥接在中继线子接口配置。
- 这些是IP和IPX网络对VLAN映射：
- 访问VLAN分配，并且生成树Portfast在Catalyst 3512xl交换机的所有快速以太网接口启用。

网络图

本文档使用以下网络设置：



配置

本文档使用以下配置：

- 一般配置任务
- 为管理配置交换机
- 配置 VLAN
- 配置以太网信道
- 配置桥接和路由
- 配置交换机间 ISL 中继线
- 配置终端站端口
- 保存交换机配置
- 完整的设备配置

一般配置任务

在基于Cisco IOS的交换机上，例如Catalyst 4908G-L3及Catalyst 3512XL交换机，必须应用此基本配置到每交换机：

```
!-- The calendar set command does not apply to the Catalyst 3500XL switches.

Router#calendar set 18:00:00 Jan 8 2003
Router#clock set 18:00:00 Jan 8 2003
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname 4908G-L3
4908G-L3(config)#clock timezone PST -8
4908G-L3(config)#clock calendar-valid
4908G-L3(config)#service timestamps log datetime localtime msec
4908G-L3(config)#service timestamps debug datetime localtime msec
4908G-L3(config)#enable password verysecret
4908G-L3(config)#line vty 0 4
4908G-L3(config-line)#password secret
4908G-L3(config-line)#exit
4908G-L3(config)#no logging console
4908G-L3(config)#^Z
4908G-L3#
```

注意：

- **calendar set命令**设置在交换机的内部日历芯片的时间与日期。此命令不适用于Catalyst Catalyst 3512XL交换机。
- **clock set命令**设置交换机的时钟的时间与日期。
- **hostname** 命令可设置交换机的主机名称。
- **clock calendar-valid命令**通知交换机设置时钟日期和时刻与在日历芯片存储的日期和时间在下一次重新加载。此命令不适用于Catalyst 3548xl交换机。
- service timestamps log datetime localtime msec和service timestamps debug datetime localtime msec命令通过用当前日期和时间(精确到毫秒)的时间戳系统日志和调试输出，帮助进行管理和故障排除。
- **enable password命令**定义了密码输入在交换机的特权模式。
- **line vty 0 4命令**回车到线路配置模式里，因此我们能定义入站Telnet远程登录会议的一个密码虚拟终端(VTY)线路的。在Catalyst 3512xl交换机上，请使用line vty 0 15。
- **password命令**定义了密码通过VTY线路的一远程登录会话输入在交换机的正常模式。
- **no logging console命令不**允许系统消息出现在终端控制台;命令用于这些示例简化屏幕截图。

为管理配置交换机

在 Catalyst 3512XL 交换机上，在 VLAN 1中配置IP地址和默认网关以支持交换机管理。默认网关是BVI 1接口的IP地址在Catalyst 4908G-L3的;BVI接口配置的以后。

注意： 您不能远程登录到Catalyst 4908G-L3，直到IP地址分配到接口。

Catalyst 3512XL-01 ：

```
3512XL-01#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
3512XL-01(config)#interface vlan 1
3512XL-01(config-if)#ip address 10.10.1.10 255.255.255.0
3512XL-01(config-if)#management
3512XL-01(config-if)#exit
3512XL-01(config)#ip default-gateway 10.10.1.1
3512XL-01(config)#^Z
3512XL-01#
```

注意：

- ip default-gateway 命令定义下一跳路由器接口的默认网关IP地址。这是需要的，因为交换机不参加IP路由并且不了解网络的第3层(L3)拓扑。
- 用于默认网关的IP地址是10.10.1.1， BVI 1接口(已配置的以后的IP地址在本例中)在Catalyst 4908G-L3交换机。

Catalyst 3512XL-02 ：

```
3512XL-02#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
3512XL-02(config)#interface vlan 1
3512XL-02(config-if)#ip address 10.10.1.20 255.255.255.0
3512XL-02(config-if)#management
3512XL-02(config-if)#exit
3512XL-02(config)#ip default-gateway 10.10.1.1
3512XL-02(config)#^Z
3512XL-02#
```

Catalyst 3512XL-03 ：

```
3512XL-03#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
3512XL-03(config)#interface vlan 1
3512XL-03(config-if)#ip address 10.10.1.30 255.255.255.0
3512XL-03(config-if)#management
3512XL-03(config-if)#exit
3512XL-03(config)#ip default-gateway 10.10.1.1
3512XL-03(config)#^Z
3512XL-03#
```

配置 VLAN

Catalyst 4908G-L3 交换机不支持 VTP。在本例中，因为VTP域不可能在Catalyst 4908G-L3间，被延伸Catalyst 3512xl交换机在VTP透明模式配置。

在 Catalyst 3512XL-01, 3512XL-02, 和 3512XL-03交换机上的配置完全相同：

```
3512XL-01#vlan database
3512XL-01(vlan)#vtp transparent
Setting device to VTP TRANSPARENT mode.
3512XL-01(vlan)#vlan 10 name Vlan10
VLAN 10 added:
    Name: Vlan10
3512XL-01(vlan)#vlan 20 name Vlan20
VLAN 20 added:
    Name: Vlan20
3512XL-01(vlan)#vlan 30 name Vlan30
VLAN 30 added:
    Name: Vlan30
3512XL-01(vlan)#vlan 40 name Vlan40
VLAN 40 added:
    Name: Vlan40
3512XL-01(vlan)#exit
APPLY completed.
Exiting....
3512XL-01#
```

您能验证VLAN配置用**show vtp status**和**show VLAN**命令：

```
3512XL-01#show vtp status
VTP Version                     : 2
Configuration Revision          : 0
Maximum VLANs supported locally : 254
Number of existing VLANs        : 9
```

```
VTP Operating Mode              : Transparent
VTP Domain Name                 :
VTP Pruning Mode                : Disabled
VTP V2 Mode                     : Disabled
VTP Traps Generation            : Disabled
MD5 digest                      : 0xF0 0xEA 0x28 0x34 0xA1 0xC6 0x2A 0xDE
Configuration last modified by 10.10.1.10 at 9-18-00 18:04:06
3512XL-01#show vlan
VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/1, Fa0/2, Fa0/3, Fa0/4,
                                                Fa0/5, Fa0/6, Fa0/7, Fa0/8,
                                                Fa0/9, Fa0/10, Fa0/11, Fa0/12,
                                                Gi0/1, Gi0/2
10   Vlan10                           active
20   Vlan20                           active
30   Vlan30                           active
40   Vlan40                           active
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        1002   1003
10   enet  100010     1500  -      -      -        -    -        0      0
20   enet  100020     1500  -      -      -        -    -        0      0
30   enet  100030     1500  -      -      -        -    -        0      0
40   enet  100040     1500  -      -      -        -    -        0      0
1002 fddi  101002     1500  -      -      -        -    -        1      1003
1003 tr    101003     1500  1005   0      -        -    srb      1      1002
1004 fdnet 101004     1500  -      -      1        ibm  -        0      0
1005 trnet 101005     1500  -      -      1        IBM  -        0      0
3512XL-01#
```

配置以太网信道

此输出显示如何配置Catalyst 4908G-L3和Catalyst 3512xl-01及3512xl-02交换机之间的EtherChannel链路。3512XL-01 交换机上的接口gig0/1 和gig0/2连接到 Catalyst 4908G-L3 交换机上的接口gig1和 gig2。3512XL-02 交换机上的接口 gig0/1 和gig0/2连接到 Catalyst 4908G-L3 交换机上的gig3和gig4。

为了配置在Catalyst 4908G-L3的一EtherChannel，您必须分配物理接口到一个逻辑(Port-Channel)接口与**channel-group命令**。在Catalyst 3512xl交换机上，物理接口分配到端口组。没有在Catalyst 3512XL的逻辑端口信道接口。

Catalyst 4908G-L3 ：

```
4908G-L3#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
4908G-L3(config)#interface port-channel 1
4908G-L3(config-if)#exit
4908G-L3(config)#interface gig1
4908G-L3(config-if)#no shutdown
4908G-L3(config-if)#channel-group 1

GigabitEthernet1 added as member-1 to port-channel1
4908G-L3(config-if)#exit
4908G-L3(config)#interface gig2
4908G-L3(config-if)#no shutdown
```

```
4908G-L3(config-if)#channel-group 1

GigabitEthernet2 added as member-2 to port-channel1
4908G-L3(config-if)#exit
4908G-L3(config)#interface port-channel 2
4908G-L3(config-if)#exit
4908G-L3(config)#interface gig3
4908G-L3(config-if)#no shutdown
4908G-L3(config-if)#channel-group 2

GigabitEthernet3 added as member-1 to port-channel2
4908G-L3(config-if)#exit
4908G-L3(config)#interface gig4
4908G-L3(config-if)#no shutdown
4908G-L3(config-if)#channel-group 2

GigabitEthernet4 added as member-2 to port-channel2
4908G-L3(config-if)#^Z
4908G-L3#
```

注意：

- interface port-channel命令创建逻辑接口;在本例中，两个逻辑端口信道接口创建。
- channel-group命令添加物理接口到逻辑端口信道接口;信道组号码对应于端口信道接口号。

您能验证EtherChannel配置用show interface port-channel命令：

```
4908G-L3#show interface port-channel 1
Port-channel1 is up, line protocol is up
  Hardware is GEChannel, address is 0030.78fe.a007 (bia 0000.0000.0000)
  MTU 1500 bytes, BW 2000000 Kbit, DLY 10 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
  Half-duplex, Unknown Speed, Media type unknown, Force link-up
  ARP type: ARPA, ARP Timeout 04:00:00
    No. of active members in this channel: 2
        Member 0 : GigabitEthernet1
        Member 1 : GigabitEthernet2
  Last input 00:00:25, output never, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/300, 0 drops
  5 minute input rate 0 bits/sec, 1 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     489 packets input, 41461 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 watchdog, 0 multicast
     0 input packets with dribble condition detected
     19 packets output, 8668 bytes, 0 underruns(0/0/0)
     0 output errors, 0 collisions, 0 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
     0 output buffer failures, 0 output buffers swapped out
4908G-L3#
```

注意：

- 注意属于EtherChannel的show interface port-channel命令显示激活成员数量和特定接口。

Catalyst 3512XL-01 ：

```
3512XL-01#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
3512XL-01(config)#interface gig0/1
```

```
3512XL-01(config-if)#port group 1
3512XL-01(config-if)#exit
3512XL-01(config)#interface gig0/2
3512XL-01(config-if)#port group 1
3512XL-01(config-if)#^Z
3512XL-01#
```

注意：

- port group命令添加物理端口到逻辑端口组(EtherChannel)。

您能验证EtherChannel配置用**show port group命令**：

```
3512XL-01#show port group
Group  Interface              Transmit Distribution
-----  ---------------------  --------------------
    1  GigabitEthernet0/1     source address
    1  GigabitEthernet0/2     source address
3512XL-01#
```

Catalyst 3512XL-02 ：

```
3512XL-02#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
3512XL-02(config)#interface gig0/1
3512XL-02(config-if)#port group 1
3512XL-02(config-if)#exit
3512XL-02(config)#interface gig0/2
3512XL-02(config-if)#port group 1
3512XL-02(config-if)#^Z
3512XL-02#
```

您能验证EtherChannel配置用**show port group命令**。

配置桥接和路由

此输出显示如何配置桥接和路由的Catalyst 4908G-L3。对于每个VLAN，独立网桥进程定义;接口分配到Configuring the ISL Trunks Between Switches部分的网桥群组，以后在本例中。由于VLAN间路由要求，必须用**bridge irb命令**启用集成路由和桥接(IRB)。

此外，为了在不同网桥组之间路由IP和IPX数据流，必须创建网桥虚拟接口(BVI)。

在配置在交换机之间的部分ISL中继线，在ISL中继线的VLAN子接口加入给适合的网桥群组创建每个VLAN的一个单层2域，与作为在该VLAN的路由器接口的通讯员BVI。

Catalyst 4908G-L3 ：

```
4908G-L3#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
4908G-L3(config)#ipx routing
4908G-L3(config)#bridge irb
4908G-L3(config)#bridge 1 protocol ieee
4908G-L3(config)#bridge 1 route ip
4908G-L3(config)#bridge 10 protocol IEEE
4908G-L3(config)#bridge 10 route ip
4908G-L3(config)#bridge 10 route ipx
4908G-L3(config)#bridge 20 protocol IEEE
4908G-L3(config)#bridge 20 route ip
4908G-L3(config)#bridge 20 route ipx
4908G-L3(config)#bridge 30 protocol IEEE
4908G-L3(config)#bridge 30 route ip
4908G-L3(config)#bridge 30 route ipx
```

```
4908G-L3(config)#bridge 40 protocol IEEE
4908G-L3(config)#bridge 40 route ip
4908G-L3(config)#bridge 40 route ipx
4908G-L3(config)#interface bvi 1
4908G-L3(config-if)#ip address 10.10.1.1 255.255.255.0
4908G-L3(config-if)#exit
4908G-L3(config)#interface bvi 10
4908G-L3(config-if)#ip address 10.10.10.1 255.255.255.0
4908G-L3(config-if)#ipx network 1000
4908G-L3(config-if)#exit
4908G-L3(config)#interface bvi 20
4908G-L3(config-if)#ip address 10.10.20.1 255.255.255.0
4908G-L3(config-if)#ipx network 2000
4908G-L3(config-if)#exit
4908G-L3(config)#interface bvi 30
4908G-L3(config-if)#ip address 10.10.30.1 255.255.255.0
4908G-L3(config-if)#ipx network 3000
4908G-L3(config-if)#exit
4908G-L3(config)#interface bvi 40
4908G-L3(config-if)#ip address 10.10.40.1 255.255.255.0
4908G-L3(config-if)#ipx network 4000
4908G-L3(config-if)#^Z
4908G-L3#
```

注意：

- 在Catalyst 4908G-L3的**ipx routing命令**enable (event) IPX路由。
- 在路由器的**bridge irb命令**enable (event)同意的路由和桥接，在网桥组内给您路由流量。
- **bridge number protocol ieee命令**创建运行IEEE生成树的网桥进程。
- **bridge number route ip命令**允许将路由的IP数据流在BVI编号接口和其他IP接口之间在路由器。
- **bridge number route ipx命令**允许将路由的IPX数据流在BVI编号接口和其他IPX接口之间在路由器;注意此命令为网桥进程1 [the management VLAN]省略。
- interface bvi number 命令创建一个网桥虚拟接口（BVI），用作 该number 网桥组的一个L3 接口
- **IP地址命令**分配IP地址到BVI接口。
- **ipx network命令**分配IPX网络编号到BVI接口;注意在管理VLAN的BVI [BVI 1]没有分配的一个IPX网络编号。

在我们配置ISL中继线链路并且添加中继线子接口到适当的网桥群组后，我们能验证桥接配置后在本例中。

配置交换机间 ISL 中继线

此输出显示如何配置Catalyst 4908G-L3和Catalyst 3512xl交换机之间的中继链路。

为了配置在Catalyst 4908G-L3的中继，它要求子接口的新增内容在主接口下，在中继传送的每个VLAN的一子接口。在本例中，在逻辑端口信道接口上配置了两条中继线，同时在物理接口上配置第3条中继线。

另外，**网桥群组**命令配置在子接口下加入每个VLAN子接口对适合的网桥群组，完成在配置的桥接和路由部分和路由配置开始的桥接在本例中被找到前。

Catalyst 4908G-L3 ：

```
4908G-L3#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
4908G-L3(config)#interface port-channel 1.1
```

```
4908G-L3(config-subif)#encapsulation isl 1
4908G-L3(config-subif)#bridge-group 1
4908G-L3(config-subif)#exit
4908G-L3(config)#interface port-channel 1.10
4908G-L3(config-subif)#encapsulation isl 10
4908G-L3(config-subif)#bridge-group 10
4908G-L3(config-subif)#exit
4908G-L3(config)#interface port-channel 1.20
4908G-L3(config-subif)#encapsulation isl 20
4908G-L3(config-subif)#bridge-group 20
4908G-L3(config-subif)#exit
4908G-L3(config)#interface port-channel 1.30
4908G-L3(config-subif)#encapsulation isl 30
4908G-L3(config-subif)#bridge-group 30
4908G-L3(config-subif)#exit
4908G-L3(config)#interface port-channel 1.40
4908G-L3(config-subif)#encapsulation isl 40
4908G-L3(config-subif)#bridge-group 40
4908G-L3(config-subif)#exit
4908G-L3(config)#interface port-channel 2.1
4908G-L3(config-subif)#encapsulation isl 1
4908G-L3(config-subif)#bridge-group 1
4908G-L3(config-subif)#exit
4908G-L3(config)#interface port-channel 2.10
4908G-L3(config-subif)#encapsulation isl 10
4908G-L3(config-subif)#bridge-group 10
4908G-L3(config-subif)#exit
4908G-L3(config)#interface port-channel 2.20
4908G-L3(config-subif)#encapsulation isl 20
4908G-L3(config-subif)#bridge-group 20
4908G-L3(config-subif)#exit
4908G-L3(config)#interface port-channel 2.30
4908G-L3(config-subif)#encapsulation isl 30
4908G-L3(config-subif)#bridge-group 30
4908G-L3(config-subif)#exit
4908G-L3(config)#interface port-channel 2.40
4908G-L3(config-subif)#encapsulation isl 40
4908G-L3(config-subif)#bridge-group 40
4908G-L3(config-subif)#exit
4908G-L3(config)#interface gig 5
4908G-L3(config-if)#no shutdown
4908G-L3(config-if)#exit
4908G-L3(config)#interface gig 5.1
4908G-L3(config-subif)#encapsulation isl 1
4908G-L3(config-subif)#bridge-group 1
4908G-L3(config-subif)#exit
4908G-L3(config)#interface gig 5.10
4908G-L3(config-subif)#encapsulation isl 10
4908G-L3(config-subif)#bridge-group 10
4908G-L3(config-subif)#exit
4908G-L3(config)#interface gig 5.20
4908G-L3(config-subif)#encapsulation isl 20
4908G-L3(config-subif)#bridge-group 20
4908G-L3(config-subif)#exit
4908G-L3(config)#interface gig 5.30
4908G-L3(config-subif)#encapsulation isl 30
4908G-L3(config-subif)#bridge-group 30
4908G-L3(config-subif)#exit
4908G-L3(config)#interface gig 5.40
4908G-L3(config-subif)#encapsulation isl 40
4908G-L3(config-subif)#bridge-group 40
4908G-L3(config-subif)#^Z
4908G-L3#
```

注意：

- 例如，为了创建在主接口的逻辑子接口，请指定主接口interface port-channel 1，跟随由期限(。)和子接口号，例如， interface port-channel 1.10。子接口number/VLAN数字/桥组编号不必须是相同的，但是这使管理更加容易。
- encapsulation isl vlan命令可指定在子接口上接收的封装类型(ISL)和VLAN。
- 注意VLAN子接口没有分配IP地址或IPX网络编号，然而被添加到网桥群组用**bridge-group number命令**，允许每个VLAN跨过所有交换机在Layer2。在配置的桥接和路由部分配置的BVI有IP地址和IPX网络号。

您能验证配置用**show interface、show ip interface**和**show ipx interface**命令。例如，请使用这些命令验证在Port-Channel 1.10 (在EtherChannel链路的VLAN 10)子接口的配置对Catalyst 3512XL-01和通讯员BVI (VLAN10的BVI 10) ：

```
4908G-L3#show interface port-channel 1.10
Port-channel1.10 is up, line protocol is up
  Hardware is GEChannel, address is 0030.78fe.a007 (bia 0000.0000.0000)
  MTU 1500 bytes, BW 2000000 Kbit, DLY 10 usec, rely 255/255, load 1/255
  Encapsulation ISL Virtual LAN, Color 10.
  ARP type: ARPA, ARP Timeout 04:00:00
4908G-L3#show ip interface bvi 10
BVI10 is up, line protocol is up
  Internet address is 10.10.10.1/24
  Broadcast address is 255.255.255.255
  Address determined by setup command
  MTU is 1500 bytes
  Helper address is not set
  Directed broadcast forwarding is disabled
  Outgoing access list is not set
  Inbound  access list is not set
  Proxy ARP is enabled
  Security level is default
  Split horizon is enabled
  ICMP redirects are always sent
  ICMP unreachables are always sent
  ICMP mask replies are never sent
  IP fast switching is enabled
  IP fast switching on the same interface is disabled
  IP Null turbo vector
  IP multicast fast switching is enabled
  IP multicast distributed fast switching is disabled
  Router Discovery is disabled
  IP output packet accounting is disabled
  IP access violation accounting is disabled
  TCP/IP header compression is disabled
  RTP/IP header compression is disabled
  Probe proxy name replies are disabled
  Policy routing is disabled
  Network address translation is disabled
  Web Cache Redirect is disabled
  BGP Policy Mapping is disabled
4908G-L3#show ipx interface bvi 10
BVI10 is up, line protocol is up
  IPX address is 1000.0030.78fe.a00b, NOVELL-ETHER [up]
  Delay of this IPX network, in ticks is 2 throughput 0 link delay 0
  IPXWAN processing not enabled on this interface.
  IPX SAP update interval is 60 seconds
  IPX type 20 propagation packet forwarding is disabled
  Incoming access list is not set
  Outgoing access list is not set
  IPX helper access list is not set
```

```
  SAP GNS processing enabled, delay 0 ms, output filter list is not set
  SAP Input filter list is not set
  SAP Output filter list is not set
  SAP Router filter list is not set
  Input filter list is not set
  Output filter list is not set
  Router filter list is not set
  Netbios Input host access list is not set
  Netbios Input bytes access list is not set
  Netbios Output host access list is not set
  Netbios Output bytes access list is not set
  Updates each 60 seconds aging multiples RIP: 3 SAP: 3
  SAP interpacket delay is 55 ms, maximum size is 480 bytes
  RIP interpacket delay is 55 ms, maximum size is 432 bytes
  RIP response delay is not set
  IPX accounting is disabled
  IPX fast switching is configured (disabled)
  RIP packets received 0, RIP packets sent 19, 0 Throttled
  RIP specific requests received 0, RIP specific replies sent 0
  RIP general requests received 0, 0 ignored, RIP general replies sent 0
  SAP packets received 0, SAP packets sent 5, 0 Throttled
  SAP GNS packets received 0, SAP GNS replies sent 0
  SAP GGS packets received 0, 0 ignored, SAP GGS replies sent 0
4908G-L3#
```

您能验证桥接配置用**show bridge group**和**show spanning-tree number**命令。此外，您还可以使用 show bridge 命令来查看网桥转发表。

在Catalyst 3512xl交换机上，配置是相同的在Catalyst 3512XL-01、3512XL-02和3512XL-03。中继链路在适当的千兆以太网接口配置。对于 EtherChannel 链路，中继配置只需应用于端口组中的一个接口。中继在同一组中自动地应用对其他接口并且在配置里出现：

```
3512XL-01#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
3512XL-01(config)#interface gig 0/1
3512XL-01(config-if)#switchport mode trunk
3512XL-01(config-if)#^Z
3512XL-01#
```

注意：

- 一旦3512XL-01和3512XL-02，当配置在信道组中时应用对单个接口，相同的配置在组中自动地应用对其他接口并且在每个接口的配置里出现。
- **switchport mode trunk命令**配置接口作为中继端口。
- 3500XL交换机使用ISL封装默认情况下，当您将中继，那么那里是没有需要在这种情况下指定封装。

您可以通过 **show interface switchport** 命令验证配置：

```
3512XL-01#show interface gig0/1 switchport
Name: Gi0/1
Switchport: Enabled
Administrative mode: trunk
Operational Mode: trunk
Administrative Trunking Encapsulation: isl
Operational Trunking Encapsulation: isl
Negotiation of Trunking: Disabled
Access Mode VLAN: 0 ((Inactive))
Trunking Native Mode VLAN: 1 (default)
Trunking VLANs Enabled: ALL
Trunking VLANs Active: 1,10,20,30,40
Pruning VLANs Enabled: 2-1001
```

```
Priority for untagged frames: 0
Override vlan tag priority: FALSE
Voice VLAN: none
Appliance trust: none
3512XL-01#
```

配置终端站端口

现在，Catalyst 3512XL 交换机的端口被分配给了 VLAN 而且spanning-tree portfast已被激活。任何 3512XL 交换机上的任何端口都可以分配到任何已配置的 VLAN 上。

必须分配特定VLAN的终端站在范围的一个IP地址关联与该VLAN，并且必须使用BVI的IP地址在Catalyst 4908G-L3的该VLAN作为他们的默认网关。

此输出显示如何配置在VLAN10的接口fast0/1和快速0/2和恢复操作在接口的portfast ：

```
3512XL-01#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
3512XL-01(config)#interface fast0/1
3512XL-01(config-if)#switchport access vlan 10
3512XL-01(config-if)#spanning-tree portfast
3512XL-01(config-if)#exit
3512XL-01(config)#interface fast0/2
3512XL-01(config-if)#switchport access vlan 10
3512XL-01(config-if)#spanning-tree portfast
3512XL-01(config-if)#^Z
3512XL-01#
```

您能验证配置用**show interface switchport命令**和**show spanning-tree interface**命令：

```
3512XL-01#show interface fast0/1 switchport
Name: Fa0/1
Switchport: Enabled
Administrative mode: static access
Operational Mode: static access
Administrative Trunking Encapsulation: isl
Operational Trunking Encapsulation: isl
Negotiation of Trunking: Disabled
Access Mode VLAN: 10 (Vlan10)
Trunking Native Mode VLAN: 1 (default)
Trunking VLANs Enabled: NONE
Pruning VLANs Enabled: NONE

Priority for untagged frames: 0
Override vlan tag priority: FALSE
Voice VLAN: none
Appliance trust: none
3512XL-01#show spanning-tree interface fast 0/1
Interface Fa0/1 (port 13) in Spanning tree 10 is FORWARDING
   Port path cost 19, Port priority 128
   Designated root has priority 16384, address 0090.ab28.d000
   Designated bridge has priority 16384, address 0090.ab28.d000
   Designated port is 193, path cost 0
   Timers: message age 2, forward delay 0, hold 0
   BPDU: sent 1, received 73
   The port is in the portfast mode
3512XL-01#
```

注意：

show interface switchport命令显示操作模式(静态访问)和接口的访问模式VLAN (10)。

show spanning-tree interface命令显示端口的生成树状态，并且表明“端口在portfast模式”。

保存交换机配置

确保将运行配置保存到所有交换机上的 NVRAM （启动配置），以便在重新加载时保留该配置。

Catalyst 4908G-L3 ：

```
4908G-L3#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
4908G-L3#
```

Catalyst 3512xl交换机：

```
3512XL-01#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...

3512XL-01#
```

完整的设备配置

这些是用于此示例的设备的完全配置：

- Catalyst 4908G-L3
- Catalyst 3512XL-01
- Catalyst 3512XL-02
- Catalyst 3512XL-03

Catalyst 4908G-L3

```
4908G-L3#show running-config
Building configuration...

Current configuration:
!
! Last configuration change at 14:09:14 PST Tue Sep 19
2000
! NVRAM config last updated at 14:09:15 PST Tue Sep 19
2000
!
version 12.0
no service pad
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
no service password-encryption
!
hostname 4908G-L3
!
no logging console
enable password verysecret
!
clock timezone PST -8
clock calendar-valid
ip subnet-zero
ipx routing 0030.78fe.a000
!-- Enables IRB to route between bridge groups. bridge
irb
```

```
!
!
!
!-- Creates a logical interface (1) to group physical
interfaces into a channel. interface Port-channel1
 no ip address
 no ip directed-broadcast
 hold-queue 300 in
!
!-- A subinterface is added to allow VLAN 1 traffic to
be transmitted on the trunk. interface Port-channel1.1
 !-- Specifies ISL encapsulation for VLAN 1.
encapsulation isl 1
 no ip redirects
 no ip directed-broadcast
 !-- Assign the subinterface to the appropriate bridge-
group
   for bridging and routing.
bridge-group 1
!
!-- A subinterface is added to allow VLAN 10 traffic to
be transmitted on the trunk. interface Port-channel1.10
   !-- Specifies ISL encapsulation for VLAN 10.
 encapsulation isl 10
 no ip redirects
 no ip directed-broadcast
!-- Assign the subinterface to the appropriate bridge-
group for bridging and routing.  bridge-group 10
!
!-- VLAN 20 configuration. interface Port-channel1.20
 encapsulation isl 20
 no ip redirects
 no ip directed-broadcast
 bridge-group 20
!
!-- VLAN 30 configuration. interface Port-channel1.30
 encapsulation isl 30
 no ip redirects
 no ip directed-broadcast
 bridge-group 30
!
!-- VLAN 40 configuration. interface Port-channel1.40
 encapsulation isl 40
 no ip redirects
 no ip directed-broadcast
 bridge-group 40
!
!-- Creates a logical interface (2) to group physical
interfaces into a channel. interface Port-channel2
No ip address
 no ip directed-broadcast
 hold-queue 300 in
!
!-- VLAN 1 configuration. interface Port-channel2.1
 encapsulation isl 1
 no ip redirects
 no ip directed-broadcast
 bridge-group 1
!
!-- VLAN 10 configuration. interface Port-channel2.10
 encapsulation isl 10
 no ip redirects
 no ip directed-broadcast
 bridge-group 10
```

```
!
!-- VLAN 20 configuration. interface Port-channel2.20
 encapsulation isl 20
 no ip redirects
 no ip directed-broadcast
 bridge-group 20
!
!-- VLAN 30 configuration. interface Port-channel2.30
 encapsulation isl 30
 no ip redirects
 no ip directed-broadcast
 bridge-group 30
!
!-- VLAN 40 configuration. interface Port-channel2.40
 encapsulation isl 40
 no ip redirects
 no ip directed-broadcast
 bridge-group 40
!
interface GigabitEthernet1
 no ip address
 no ip directed-broadcast
!-- Logically groups the physical interface to interface
port-channel 1. channel-group 1
!
interface GigabitEthernet2
 no ip address
 no ip directed-broadcast
!-- Logically groups the physical interface to interface
port-channel 1. channel-group 1
!
interface GigabitEthernet3
 no ip address
 no ip directed-broadcast
!-- Logically groups the physical interface to interface
port-channel 2. channel-group 2
!
interface GigabitEthernet4
 no ip address
 no ip directed-broadcast
!-- Logically groups the physical interface to interface
port-channel 2. channel-group 2
!
interface GigabitEthernet5
 no ip address
 no ip directed-broadcast
!
!-- A subinterface is added to allow VLAN 1 traffic to
be transmitted on the trunk. interface
GigabitEthernet5.1
!-- Specifies ISL encapsulation for VLAN 1.
encapsulation isl 1
 no ip redirects
 no ip directed-broadcast
!-- Assign the subinterface to the appropriate bridge-
group for bridging and routing. bridge-group 1
!
!-- VLAN 10 configuration. Interface GigabitEthernet5.10
 encapsulation isl 10
 no ip redirects
 no ip directed-broadcast
 bridge-group 10
!
!-- VLAN 20 configuration. interface GigabitEthernet5.20
```

```
 encapsulation isl 20
 no ip redirects
 no ip directed-broadcast
 bridge-group 20
!
!-- VLAN 30 configuration. interface GigabitEthernet5.30
 encapsulation isl 30
 no ip redirects
 no ip directed-broadcast
 bridge-group 30
!
!-- VLAN 30 configuration. interface GigabitEthernet5.40
 encapsulation isl 40
 no ip redirects
 no ip directed-broadcast
 bridge-group 40
!
interface GigabitEthernet6
 no ip address
 no ip directed-broadcast
 shutdown
!
interface GigabitEthernet7
 no ip address
 no ip directed-broadcast
 shutdown
!
interface GigabitEthernet8
 no ip address
 no ip directed-broadcast
 shutdown
!
!-- BVI 1 is an L3 interface for bridge-group 1 (VLAN
1). interface BVI1
!-- The IP address assigned to bridge-group 1. ip
address 10.10.1.1 255.255.255.0
 no ip directed-broadcast
 no ip route-cache cef
!
!-- BVI 10 is an L3 interface for bridge-group 10 (VLAN
10). interface BVI10
!-- The IP address assigned to bridge-group 10. ip
address 10.10.10.1 255.255.255.0 no ip directed-
broadcast no ip route-cache cef !-- Assigns IPX network
1000 to BVI 10. ipx network 1000 ! !-- BVI 20 is a Layer
3 interface for bridge-group 20 (VLAN 20).
Interface BVI20
!-- IP address assigned to bridge-group 20. ip address
10.10.20.1 255.255.255.0
   no ip directed-broadcast
 no ip route-cache cef
!-- Assigns IPX network 1000 to BVI 20. ipx network
2000!
!-- BVI 30 configuration.interface BVI30  ip address
10.10.30.1 255.255.255.0
 no ip directed-broadcast
 no ip route-cache cef
 ipx network 3000
!
!-- BVI 40 configuration. interface BVI40
 ip address 10.10.40.1 255.255.255.0
 no ip directed-broadcast
 no ip route-cache cef
 ipx network 4000
```

```
!
ip classless
!
!
!
!
!-- Applies IEEE Ethernet Spanning-Tree Protocol (STP)
to bridge-group 1. bridge 1 protocol ieee
!-- Allows IP traffic to be routed between the BVI 1 and
other IP interfaces. bridge 1 route ip
bridge 10 protocol ieee
 bridge 10 route ip
!-- Allows IPX traffic to be routed between the BVI 10
and other IP interfaces.  bridge 10 route ipx
bridge 20 protocol ieee
 bridge 20 route ip
 bridge 20 route ipx
bridge 30 protocol ieee
 bridge 30 route ip
 bridge 30 route ipx
bridge 40 protocol ieee
 bridge 40 route ip
 bridge 40 route ipx
!
line con 0
 transport input none
line aux 0
line vty 0 4
 password secret
 login
!
end

4908G-L3#
```

Catalyst 3512XL-01

```
3512XL-01#show running-config
Building configuration...

Current configuration:
!
! Last configuration change at 08:24:03 PST Tue Sep 19
2000
! NVRAM config last updated at 08:24:03 PST Tue Sep 19
2000
!
version 12.0
no service pad
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
no service password-encryption
!
hostname 3512XL-01
!
no logging console
enable password verysecret
!
!
!
!
!
clock timezone PST -8
!
ip subnet-zero
```

```
!
!
!
interface FastEthernet0/1
!-- The switchport access command configures the port to
be an L2 2 port. !-- Assigns the port to be a member of
VLAN 10.  switchport access vlan 10
!-- Enables spanning-tree portfast.  spanning-tree
portfast
!
interface FastEthernet0/2
 switchport access vlan 10
 spanning-tree portfast
!
interface FastEthernet0/3
 switchport access vlan 10
 spanning-tree portfast
!
interface FastEthernet0/4
!-- Assigns the port to be a member of VLAN 20.
switchport access vlan 20
 spanning-tree portfast
!
interface FastEthernet0/5
 switchport access vlan 20
 spanning-tree portfast
!
interface FastEthernet0/6
switchport access vlan 20 spanning-tree portfast !
interface FastEthernet0/7 !-- Assigns the port to be a
member of VLAN 30. switchport access vlan 30
 spanning-tree portfast
!
interface FastEthernet0/8
 switchport access vlan 30
 spanning-tree portfast
!
interface FastEthernet0/9
 switchport access vlan 30
 spanning-tree portfast
!
interface FastEthernet0/10
!-- Assigns the port to be a member of VLAN 40.
switchport access vlan 40
 spanning-tree portfast
!
interface FastEthernet0/11
 switchport access vlan 40
 spanning-tree portfast
!
interface FastEthernet0/12
 switchport access vlan 40
 spanning-tree portfast
!
interface GigabitEthernet0/1
!-- Assigns the port to logical port-group 1 to create
the EtherChannel. port group 1
!-- Configures the port to be an ISL trunk. switchport
mode trunk ! Interface GigabitEthernet0/2 !-- Assigns
the port to logical port-group 1 to create the
EtherChannel. port group 1
!-- Configures the port to be an ISL trunk. switchport
mode trunk ! Interface VLAN1 !-- The IP address of the
management interface. ip address 10.10.1.10
```

```
255.255.255.0
 no ip directed-broadcast
 no ip route-cache
!
!-- The default gateway is set to the BVI 1 interface on
the 4908G-L3. ip default-gateway 10.10.1.1
!
line con 0
 transport input none
 stopbits 1
line vty 0 4
 password secret
 login
line vty 5 15
 password secret
 login
!
end

3512XL-01#
```

Catalyst 3512XL-02

```
3512XL-02#show running-config
Building configuration...

Current configuration:
!
! Last configuration change at 08:25:22 PST Tue Sep 19
2000
! NVRAM config last updated at 08:25:22 PST Tue Sep 19
2000
!
version 12.0
no service pad
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
no service password-encryption
!
hostname 3512XL-02
!
no logging console
enable password verysecret
!
!
!
!
!
clock timezone PST -8
!
ip subnet-zero
!
!
!
interface FastEthernet0/1
!-- The switchport access command configures the port to
be an L2 port. !-- Assigns the port to be a member of
VLAN 10. switchport access vlan 10
!-- Enables spanning-tree portfast. spanning-tree
portfast
!
Interface FastEthernet0/2
 switchport access vlan 10
 spanning-tree portfast
!
```

```
interface FastEthernet0/3
!-- Assigns the port to be a member of VLAN 20.
switchport access vlan 20
 spanning-tree portfast
!
interface FastEthernet0/4
 switchport access vlan 20
 spanning-tree portfast
!
interface FastEthernet0/5
 switchport access vlan 20
 spanning-tree portfast
!
interface FastEthernet0/6
 switchport access vlan 20
 spanning-tree portfast
!
interface FastEthernet0/7
 switchport access vlan 20
 spanning-tree portfast
!
interface FastEthernet0/8
 switchport access vlan 20
 spanning-tree portfast
!
interface FastEthernet0/9
!-- Assigns the port to be a member of VLAN 30.
switchport access vlan 30
 spanning-tree portfast
!
interface FastEthernet0/10
 switchport access vlan 30
 spanning-tree portfast
!
interface FastEthernet0/11
!-- Assigns the port to be a member of VLAN 40.
switchport access vlan 40
 spanning-tree portfast
!
interface FastEthernet0/12
 switchport access vlan 40
 spanning-tree portfast
!
interface GigabitEthernet0/1
!-- Assigns the port to logical port-group 1 to create
the EtherChannel. port group 1
!-- Configures the port to be an ISL trunk.  switchport
mode trunk
!
Interface GigabitEthernet0/2
!-- Assigns the port to logical port-group 1 to create
the EtherChannel. port group 1
!-- Configures the port to be an ISL trunk. switchport
mode trunk
!
Interface VLAN1
!-- The IP address of the management interface. ip
address 10.10.1.20 255.255.255.0
 No ip directed-broadcast
 no ip route-cache
!
!-- The default gateway is set to the BVI 1 interface on
the 4908G-L. ip default-gateway 10.10.1.1
!
```

```
line con 0
 transport input none
 stopbits 1
line vty 0 4
 password secret
 login
line vty 5 15
 password secret
 login
!
end

3512XL-02#
```

Catalyst 3512XL-03

```
3512xl-03#show running-config
Building configuration...

Current configuration:
!
! Last configuration change at 12:13:33 PST Tue Sep 19
2000
! NVRAM config last updated at 12:13:34 PST Tue Sep 19
2000
!
version 12.0
no service pad
service timestamps debug datetime msec localtime
service timestamps log datetime msec localtime
no service password-encryption
!
hostname 3512xl-03
!
no logging console
enable password verysecret
!
!
!
!
!
clock timezone PST -8
!
ip subnet-zero
!
!
!
interface FastEthernet0/1
!-- The switchport access command configures the port to
be an L2 port. !-- Assigns the port to be a member of
VLAN 10.  switchport access vlan 10
!-- Enables spanning-tree portfast.  spanning-tree
portfast
!
interface FastEthernet0/2
 switchport access vlan 10
 spanning-tree portfast
!
interface FastEthernet0/3
 switchport access vlan 10
 spanning-tree portfast
!
interface FastEthernet0/4
 switchport access vlan 10
 spanning-tree portfast
```

```
!
interface FastEthernet0/5
 switchport access vlan 10
 spanning-tree portfast
!
interface FastEthernet0/6
 switchport access vlan 10
 spanning-tree portfast
!
interface FastEthernet0/7
!-- Assigns the port to be a member of VLAN 20.
switchport access vlan 20
 spanning-tree portfast
!
interface FastEthernet0/8
 switchport access vlan 20
 spanning-tree portfast
!
interface FastEthernet0/9
!-- Assigns the port to be a member of VLAN 30.
switchport access vlan 30
 spanning-tree portfast
!
interface FastEthernet0/10
 switchport access vlan 30
 spanning-tree portfast
!
interface FastEthernet0/11
!-- Assigns the port to be a member of VLAN 40.
switchport access vlan 40
 spanning-tree portfast
!
interface FastEthernet0/12
 switchport access vlan 40
 spanning-tree portfast
!
interface GigabitEthernet0/1
!-- Configures the port to be an ISL trunk.  switchport
mode trunk
!
Interface GigabitEthernet0/2
!
interface VLAN1
!-- The IP address of the management interface.  ip
address 10.10.1.30 255.255.255.0
 no ip directed-broadcast
 no ip route-cache
!
!-- The default gateway is set to the BVI 1 interface on
the 4908G-L3.  ip default-gateway 10.10.1.1
!
Line con 0
 transport input none
 stopbits 1
line vty 0 4
 password secret
 login
line vty 5 15
 password secret
 login
!
end

3512xl-03#
```

验证

当前没有可用于此配置的验证过程。

故障排除

目前没有针对此配置的故障排除信息。

相关信息

- 在 Catalyst 4908G-L3 交换机上配置 EtherChannel
- 在 Catalyst 3500XL 交换机上配置 EtherChannel
- 在 Catalyst 4908G-L3 交换机上配置桥接
- 在 Catalyst 4908G-L3 交换机上配置 VLAN 中继线
- 在 Catalyst 2900XL 和 3500XL 交换机上配置 VTP、VLANs 和 VLAN 中继线
- 技术支持和文档 - Cisco Systems