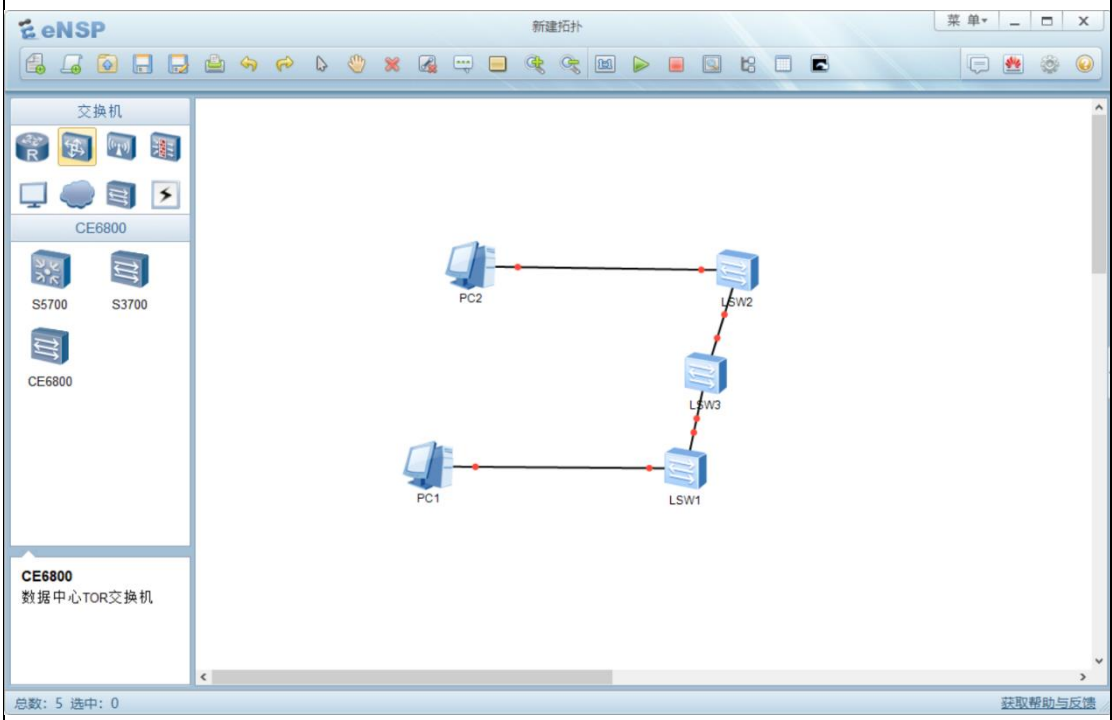


实验名称：交换机 VLAN 间路由	
实验台号：	实验时间：
实验小组：张楷	
实验目的： 利用三层交换机跨交换机实现 VLAN 间路由。	
实验环境说明： 实验拓扑图：	
	
图 1 实验拓扑	

实验过程、步骤（可另附页、使用网络拓扑图等辅助说明）及结果：

一、基本配置：

将 PC1 的 IP 地址设为 192.168.10.3,子网掩码为 255.255.255.0，默认网关设为 192.168.10.1,PC2 的 IP 地址设为 192.168.20.3,子网掩码为 255.255.255.0，默认网关设为 192.168.20.1。

二、LSW1 的配置

1) 创建 VLAN

输入 display vlan 命令显示 vlan 状况

```
LSW1
Enter system view, return user view with Ctrl+Z.
[Huawei] display vlan
The total number of vlans is : 1

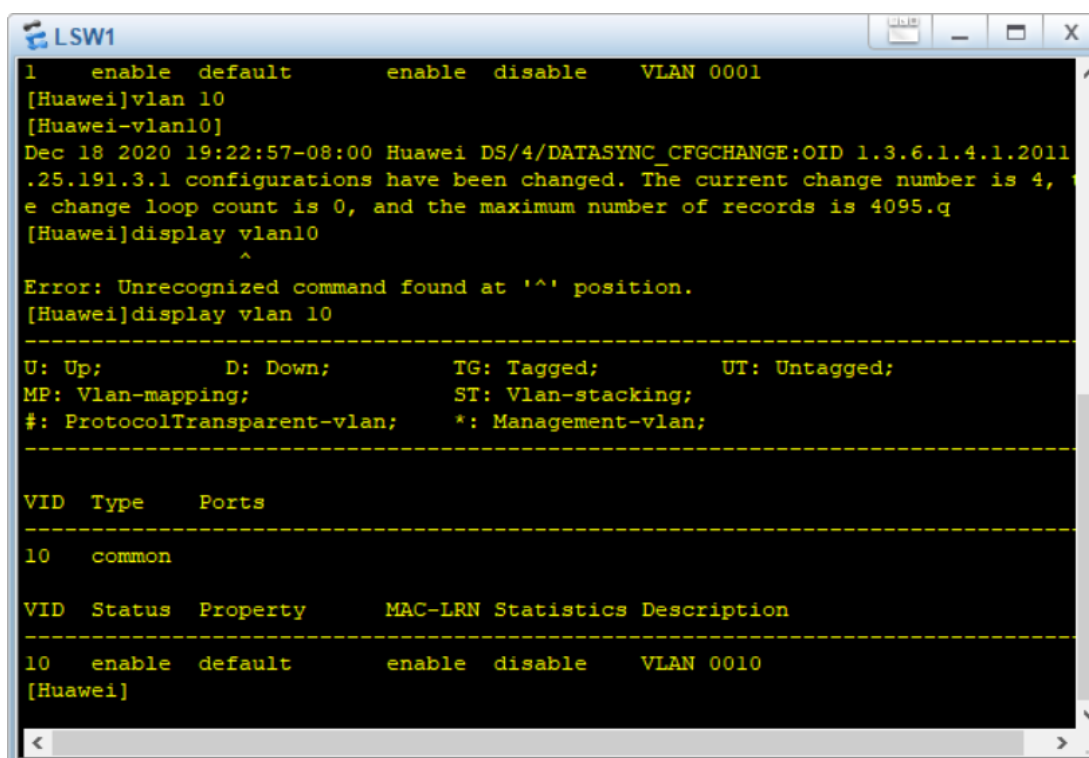
-----
U: Up;           D: Down;           TG: Tagged;       UT: Untagged;
MP: Vlan-mapping; ST: Vlan-stacking;
#: ProtocolTransparent-vlan; *: Management-vlan;
-----

VID  Type    Ports
-----
1    common  UT:Eth0/0/1(U)  Eth0/0/2(U)  Eth0/0/3(D)  Eth0/0/4(D)
                        Eth0/0/5(D)  Eth0/0/6(D)  Eth0/0/7(D)  Eth0/0/8(D)
                        Eth0/0/9(D)  Eth0/0/10(D) Eth0/0/11(D) Eth0/0/12(D)
                        Eth0/0/13(D) Eth0/0/14(D) Eth0/0/15(D) Eth0/0/16(D)
                        Eth0/0/17(D) Eth0/0/18(D) Eth0/0/19(D) Eth0/0/20(D)
                        Eth0/0/21(D) Eth0/0/22(D)  GE0/0/1(D)  GE0/0/2(D)

VID  Status  Property      MAC-LRN Statistics Description
-----
1    enable  default      enable  disable  VLAN 0001
[Huawei]
```

图 2 显示 vlan

输入 vlan 10 建立编号为 10 的 vlan,并输入 display vlan 命令显示 vlan 状态

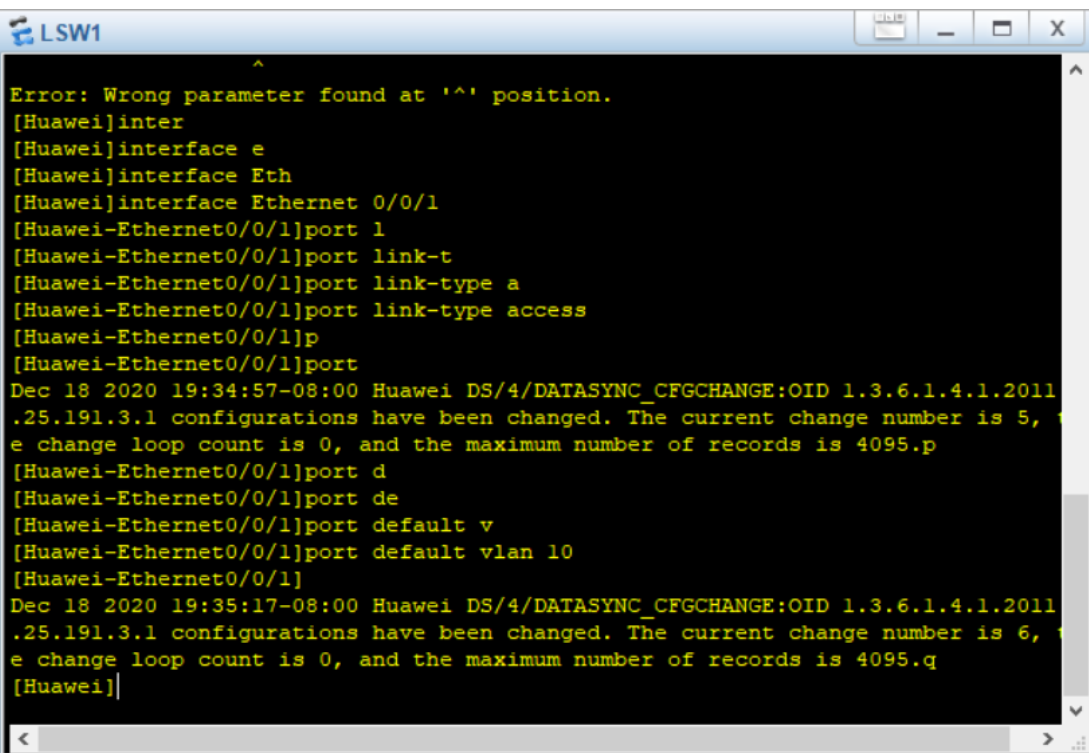


```
LSW1
1 enable default enable disable VLAN 0001
[Huawei]vlan 10
[Huawei-vlan10]
Dec 18 2020 19:22:57-08:00 Huawei DS/4/DATASYNC_CFGCHANGE:OID 1.3.6.1.4.1.2011.25.191.3.1 configurations have been changed. The current change number is 4, the change loop count is 0, and the maximum number of records is 4095.q
[Huawei]display vlan10
^
Error: Unrecognized command found at '^' position.
[Huawei]display vlan 10
-----
U: Up;          D: Down;          TG: Tagged;      UT: Untagged;
MP: Vlan-mapping;  ST: Vlan-stacking;
#: ProtocolTransparent-vlan; *: Management-vlan;
-----
VID  Type    Ports
-----
10   common
-----
VID  Status  Property      MAC-LRN Statistics Description
-----
10   enable  default      enable  disable  VLAN 0010
[Huawei]
```

图 3 配置 vlan10

2) 配置端口

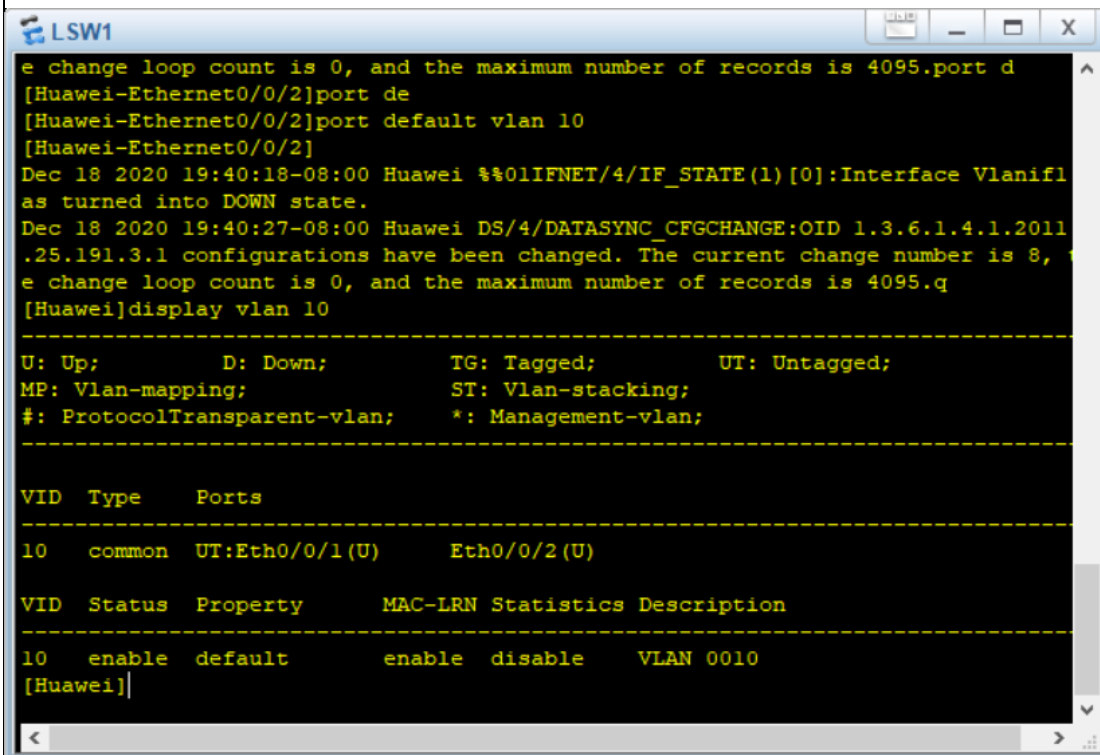
使用 interface Ethernet 0/0/1 进入该端口使用 port link-type access 命令配置交换机上某些端口模式为 access 类型接口。并使用 port default vlan 10 命令加入 VLAN10 中。



```
LSW1
^
Error: Wrong parameter found at '^' position.
[Huawei]inter
[Huawei]interface e
[Huawei]interface Eth
[Huawei]interface Ethernet 0/0/1
[Huawei-Ethernet0/0/1]port 1
[Huawei-Ethernet0/0/1]port link-t
[Huawei-Ethernet0/0/1]port link-type a
[Huawei-Ethernet0/0/1]port link-type access
[Huawei-Ethernet0/0/1]p
[Huawei-Ethernet0/0/1]port
Dec 18 2020 19:34:57-08:00 Huawei DS/4/DATASYNC_CFGCHANGE:OID 1.3.6.1.4.1.2011.25.191.3.1 configurations have been changed. The current change number is 5, the change loop count is 0, and the maximum number of records is 4095.p
[Huawei-Ethernet0/0/1]port d
[Huawei-Ethernet0/0/1]port de
[Huawei-Ethernet0/0/1]port default v
[Huawei-Ethernet0/0/1]port default vlan 10
[Huawei-Ethernet0/0/1]
Dec 18 2020 19:35:17-08:00 Huawei DS/4/DATASYNC_CFGCHANGE:OID 1.3.6.1.4.1.2011.25.191.3.1 configurations have been changed. The current change number is 6, the change loop count is 0, and the maximum number of records is 4095.q
[Huawei]
```

图 4 对端口的配置

对另一端口进行同样的操作。检查结果配置。



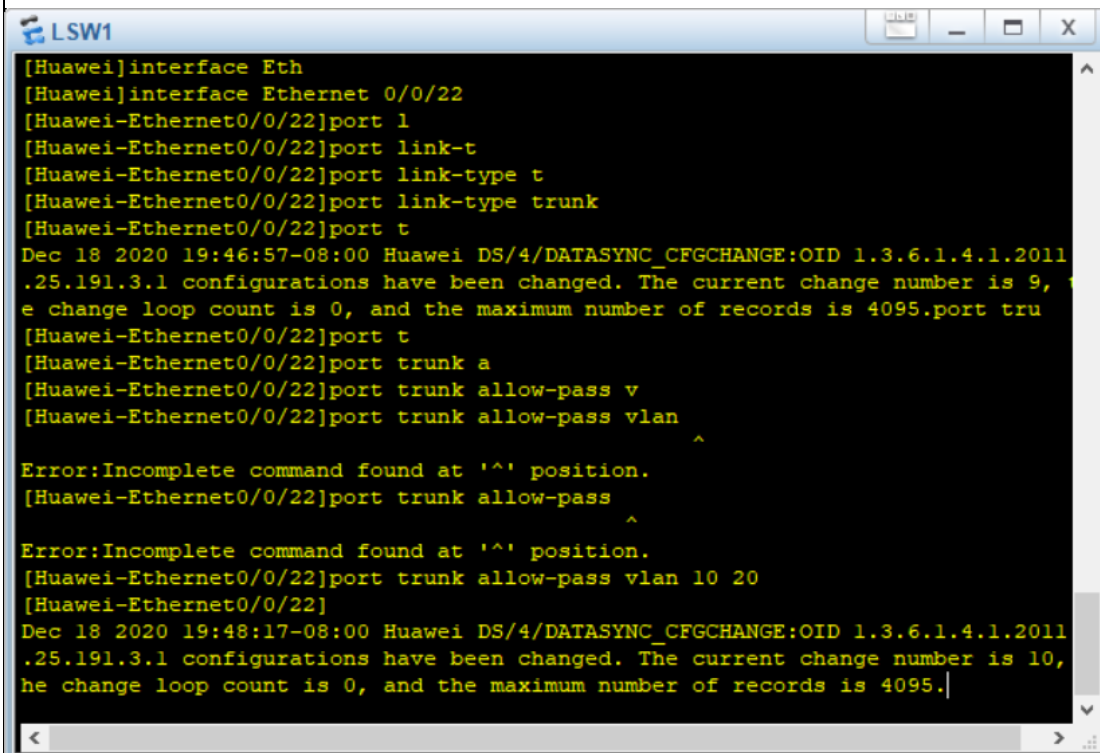
```
LSW1
e change loop count is 0, and the maximum number of records is 4095.port d
[Huawei-Ethernet0/0/2]port de
[Huawei-Ethernet0/0/2]port default vlan 10
[Huawei-Ethernet0/0/2]
Dec 18 2020 19:40:18-08:00 Huawei %01IFNET/4/IF_STATE(1)[0]:Interface Vlanifl
as turned into DOWN state.
Dec 18 2020 19:40:27-08:00 Huawei DS/4/DATASYNC_CFGCHANGE:OID 1.3.6.1.4.1.2011
.25.191.3.1 configurations have been changed. The current change number is 8,
e change loop count is 0, and the maximum number of records is 4095.q
[Huawei]display vlan 10
-----
U: Up;           D: Down;           TG: Tagged;       UT: Untagged;
MP: Vlan-mapping;   ST: Vlan-stacking;
#: ProtocolTransparent-vlan;  *: Management-vlan;
-----

VID  Type    Ports
-----
10   common  UT:Eth0/0/1(U)   Eth0/0/2(U)

VID  Status  Property      MAC-LRN Statistics Description
-----
10   enable  default      enable  disable  VLAN 0010
[Huawei]
```

图 5 检查配置

将 Eth0/0/22 端口配置为 trunk，并允许 vlan10 20 传输。

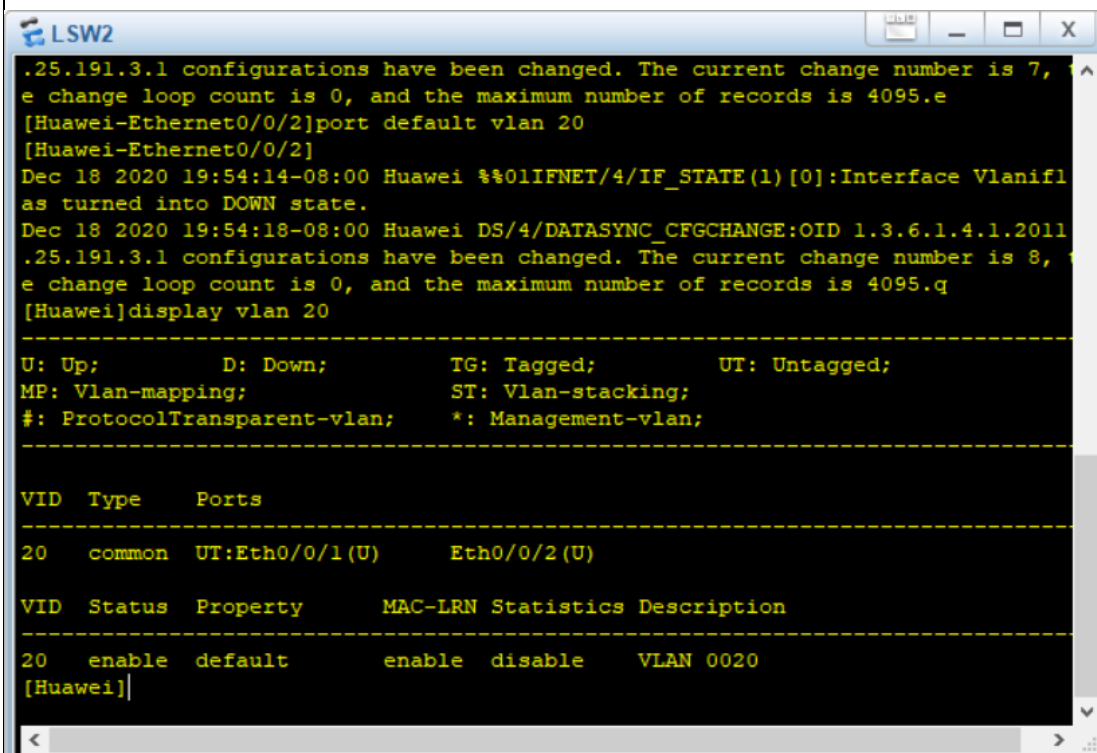


```
LSW1
[Huawei]interface Eth
[Huawei]interface Ethernet 0/0/22
[Huawei-Ethernet0/0/22]port 1
[Huawei-Ethernet0/0/22]port link-t
[Huawei-Ethernet0/0/22]port link-type t
[Huawei-Ethernet0/0/22]port link-type trunk
[Huawei-Ethernet0/0/22]port t
Dec 18 2020 19:46:57-08:00 Huawei DS/4/DATASYNC_CFGCHANGE:OID 1.3.6.1.4.1.2011
.25.191.3.1 configurations have been changed. The current change number is 9,
e change loop count is 0, and the maximum number of records is 4095.port tru
[Huawei-Ethernet0/0/22]port t
[Huawei-Ethernet0/0/22]port trunk a
[Huawei-Ethernet0/0/22]port trunk allow-pass v
[Huawei-Ethernet0/0/22]port trunk allow-pass vlan
^
Error:Incomplete command found at '^' position.
[Huawei-Ethernet0/0/22]port trunk allow-pass
^
Error:Incomplete command found at '^' position.
[Huawei-Ethernet0/0/22]port trunk allow-pass vlan 10 20
[Huawei-Ethernet0/0/22]
Dec 18 2020 19:48:17-08:00 Huawei DS/4/DATASYNC_CFGCHANGE:OID 1.3.6.1.4.1.2011
.25.191.3.1 configurations have been changed. The current change number is 10,
he change loop count is 0, and the maximum number of records is 4095.|
```

图 6 配置 trunk 端口

三、配置 LSW2

过程与步骤二相同，配置的 vlan 为 valn 20 。



```
.25.191.3.1 configurations have been changed. The current change number is 7,
e change loop count is 0, and the maximum number of records is 4095.e
[Huawei-Ethernet0/0/2]port default vlan 20
[Huawei-Ethernet0/0/2]
Dec 18 2020 19:54:14-08:00 Huawei %01IFNET/4/IF_STATE(1)[0]:Interface Vlanifl
as turned into DOWN state.
Dec 18 2020 19:54:18-08:00 Huawei DS/4/DATASYNC_CFGCHANGE:OID 1.3.6.1.4.1.2011
.25.191.3.1 configurations have been changed. The current change number is 8,
e change loop count is 0, and the maximum number of records is 4095.q
[Huawei]display vlan 20
-----
U: Up;          D: Down;          TG: Tagged;      UT: Untagged;
MP: Vlan-mapping;  ST: Vlan-stacking;
#: ProtocolTransparent-vlan;  *: Management-vlan;
-----

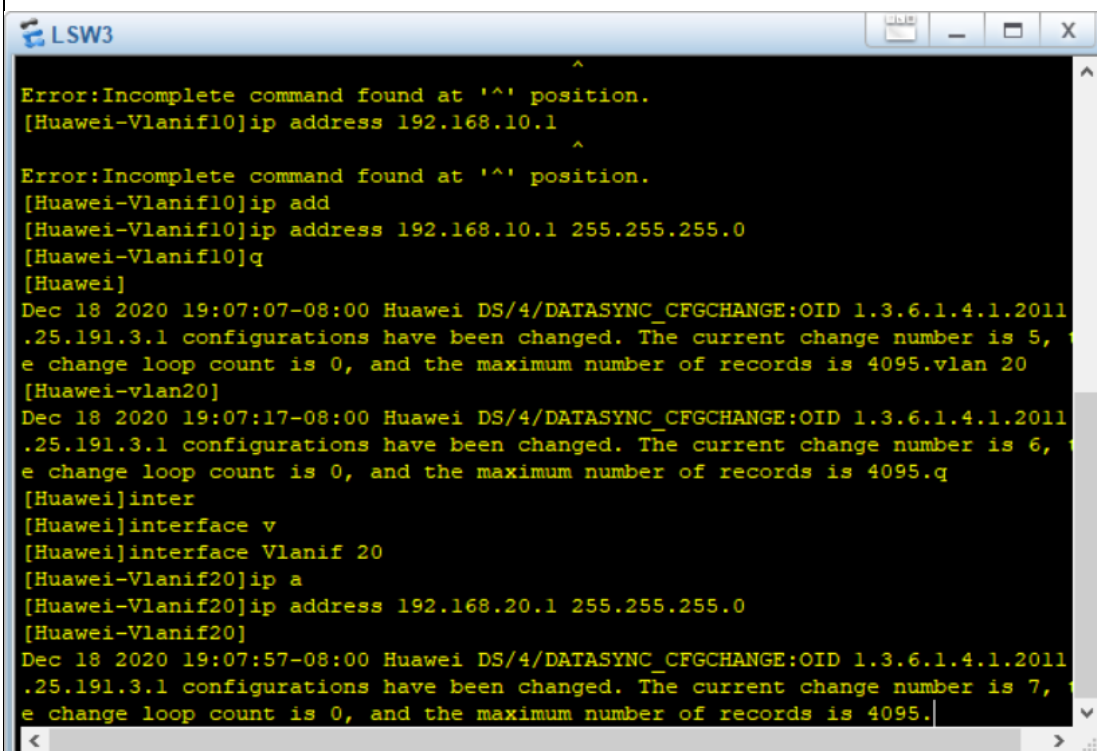
VID   Type    Ports
-----
20    common  UT:Eth0/0/1(U)    Eth0/0/2(U)

VID   Status  Property      MAC-LRN Statistics Description
-----
20    enable  default      enable  disable  VLAN 0020
[Huawei]|
```

图 7 确认 LSW2 的 vlan 配置

四、LSW3 的配置

- 1) 在 LSW3 上创建 vlan10 和 vlan20 并分别设立 ip 地址为 192.168.10.1 和 192.168.20.1

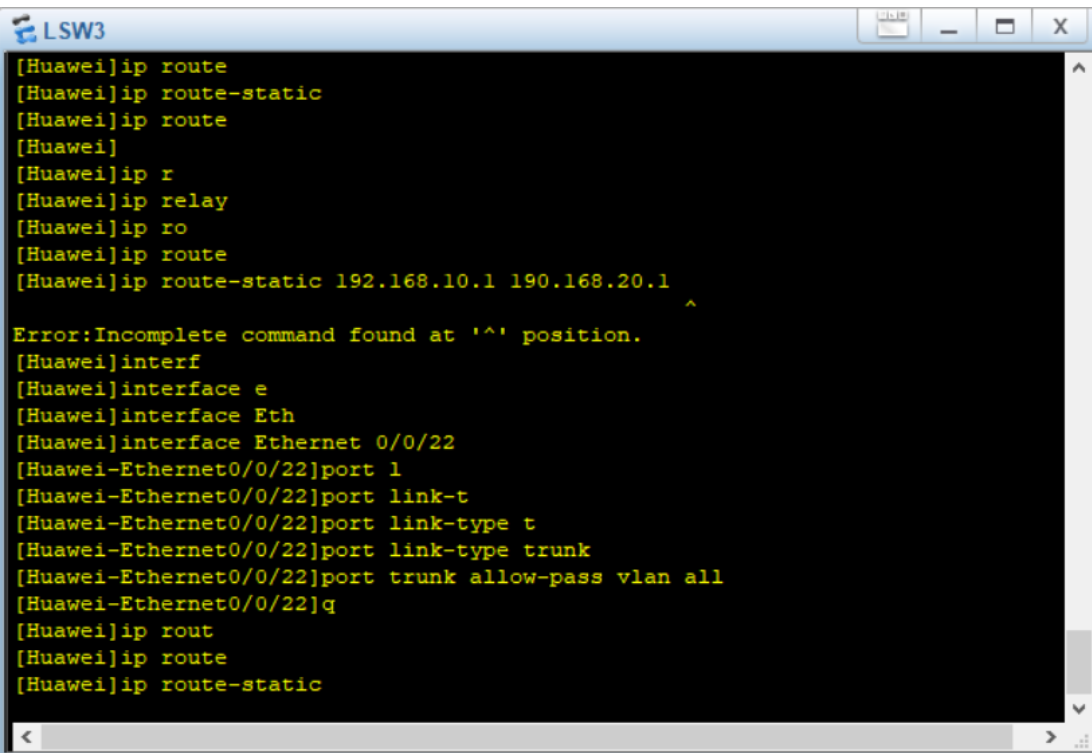


```
LSW3
Error:Incomplete command found at '^' position.
[Huawei-Vlanif10]ip address 192.168.10.1
Error:Incomplete command found at '^' position.
[Huawei-Vlanif10]ip add
[Huawei-Vlanif10]ip address 192.168.10.1 255.255.255.0
[Huawei-Vlanif10]q
[Huawei]
Dec 18 2020 19:07:07-08:00 Huawei DS/4/DATASYNC_CFGCHANGE:OID 1.3.6.1.4.1.2011
.25.191.3.1 configurations have been changed. The current change number is 5,
e change loop count is 0, and the maximum number of records is 4095.vlan 20
[Huawei-vlan20]
Dec 18 2020 19:07:17-08:00 Huawei DS/4/DATASYNC_CFGCHANGE:OID 1.3.6.1.4.1.2011
.25.191.3.1 configurations have been changed. The current change number is 6,
e change loop count is 0, and the maximum number of records is 4095.q
[Huawei]inter
[Huawei]interface v
[Huawei]interface Vlanif 20
[Huawei-Vlanif20]ip a
[Huawei-Vlanif20]ip address 192.168.20.1 255.255.255.0
[Huawei-Vlanif20]
Dec 18 2020 19:07:57-08:00 Huawei DS/4/DATASYNC_CFGCHANGE:OID 1.3.6.1.4.1.2011
.25.191.3.1 configurations have been changed. The current change number is 7,
e change loop count is 0, and the maximum number of records is 4095.
```

图 8 创建 vlan10 和 vlan20

2) 为 LSW 配置 trunk

在 LSW 的 0/0/22 端口上设置为 Trunk,并设置允许所有 vlan 可以通过。

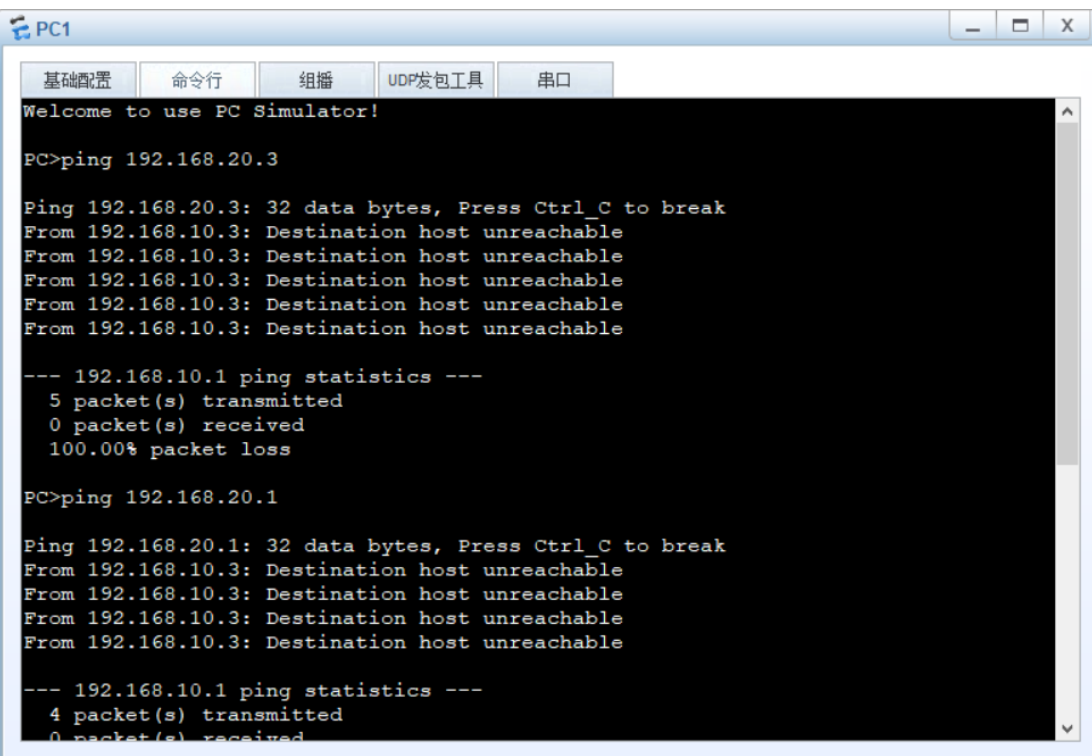


```
[Huawei]ip route
[Huawei]ip route-static
[Huawei]ip route
[Huawei]
[Huawei]ip r
[Huawei]ip relay
[Huawei]ip ro
[Huawei]ip route
[Huawei]ip route-static 192.168.10.1 190.168.20.1
^
Error:Incomplete command found at '^' position.
[Huawei]interf
[Huawei]interface e
[Huawei]interface Eth
[Huawei]interface Ethernet 0/0/22
[Huawei-Ethernet0/0/22]port 1
[Huawei-Ethernet0/0/22]port link-t
[Huawei-Ethernet0/0/22]port link-type t
[Huawei-Ethernet0/0/22]port link-type trunk
[Huawei-Ethernet0/0/22]port trunk allow-pass vlan all
[Huawei-Ethernet0/0/22]q
[Huawei]ip rout
[Huawei]ip route
[Huawei]ip route-static
```

图 9LSW3 的 Trunk 配置

五、检验连通性

在 PC1 上运行 ping 192.168.20.3 和 ping 192.168.20.1 以及 192.168.10.1, 说明此时已经联通。



```
Welcome to use PC Simulator!

PC>ping 192.168.20.3

Ping 192.168.20.3: 32 data bytes, Press Ctrl_C to break
From 192.168.10.3: Destination host unreachable
From 192.168.10.3: Destination host unreachable
From 192.168.10.3: Destination host unreachable
From 192.168.10.3: Destination host unreachable
From 192.168.10.3: Destination host unreachable

--- 192.168.10.1 ping statistics ---
 5 packet(s) transmitted
 0 packet(s) received
100.00% packet loss

PC>ping 192.168.20.1

Ping 192.168.20.1: 32 data bytes, Press Ctrl_C to break
From 192.168.10.3: Destination host unreachable
From 192.168.10.3: Destination host unreachable
From 192.168.10.3: Destination host unreachable
From 192.168.10.3: Destination host unreachable

--- 192.168.10.1 ping statistics ---
 4 packet(s) transmitted
 0 packet(s) received
```

图 10 连通性检验

实验总结（遇到的问题及解决办法、体会）：明白了 Vlan 的使用，和三层交换机如何实现路由	
器材、工具领用及归还负责人： 张楷	实验记录人：（签名）张楷
实验执笔人：（签名）张楷	报告协助人：（签名）张楷
小组成员签名：（签名）张楷	
验收人：	成绩评定：