

COMPUTER NETWORKS - LABORATORY 051

Subject:

Configuring Cisco Catalyst routing switches.

Task A: Basic configuration of the Cisco Catalyst routing switch

Prepare one Cisco Catalyst 3550, 3560, 3750, 3850 or 3950 switch. The subject of the exercise will be to configure IP routing between VLANs defined in the switch. To do this, you will need to connect to the switch at least two PC hosts or other devices that will allow IP testing (ping, traceroute).

1. Connect a console to the switch. After obtaining command shell activate the privileged mode – command: *enable*.
2. Then switch to the terminal configuration: configure terminal or conf t:
Switch # conf t
Switch (config) #
3. Select the “Interface VLAN” configuration. VLAN interfaces in L3 switch can be defined in vast numbers according to rule: "one VLAN - one VLAN IP interface". An example for VLAN1 (the default VLAN):
Switch (config) # interface vlan 1
Switch (config-if) #
4. After selecting the interface, you can define the IP address and enable the interface:
Switch (config-if) #ip address 192.168.1.1 255.255.255.0
Switch (config-if) #no shutdown
 Naturally, IP addressing for all interfaces used must be defined independently and must meet general rules.
5. Check the settings:
Switch (config) #do show ip interface brief
Switch (config) #do show ip interface vlan 1
 or
Switch # show ip interface brief
Switch # show ip interface vlan 1

Switch # show running-config

Task B: Configuring VLANs on Cisco Catalyst switch

1. Check the current state of the VLAN database:
Switch # show vlan
2. You should create two new VLAN on selected numbers:
Switch # conf t
Switch (config) #vlan 20
Switch (config-vlan) #exit

Switch (config) #vlan 21

3. Assign individual ports to a VLAN, for example:

Switch (config) #interface fa0 / 2

Switch (config-if) #no shutdown

Switch (config-if) #switchport mode access

Switch (config-if) #switchport access vlan 20

4. You can assign new VLAN ports using another method - by defining the range of ports:

Switch (config) #interface range fa0/15 – 17

Switch (config-if-range) #switchport mode access

Switch (config-if-range) #switchport access vlan 20

5. If you intend to configure VLAN trunk between Cisco 3550/3560/3750 switches it is necessary to force the proper encapsulation mode for the port, which is to act as a VLAN trunk:

Switch (config-if) #switchport trunk encapsulation dot1q

Switch (config-if) #switchport mode trunk

Task C: Configuring routing between VLANs on Cisco Catalyst

1. Define the IP addressing for the two VLANs, eg:

Switch (config) #int VLAN 3

Switch (config-if) #ip address 10.0.1.1 255.255.255.0

Switch (config) #int VLAN 4

Switch (config-if) #ip address 10.0.2.1 255.255.255.0

2. Turn on IP routing:

Switch (config)#ip routing

Assign switch ports to VLANs:

Switch(config)#interface fa0 / 2

Switch (config-if) #no shutdown

Switch (config-if) #switchport mode access

Switch (config-if) #switchport access vlan 3

3. Connect two PC computers to switch ports assigned to VLAN3 and VLAN4, respectively.
4. Configure it's IP addresses to comply with proper VLANS IP addresses, respectively.
5. Set a default gateway values in PC's (IP address configuration window) as VLAN interface addresses in a switch, also respectively.
6. Test the routing between VLANs by performing ping between PCs.
7. Test a routing path with a *tracert* command in a PC (trace another PC)

Task D: Creating layer 3 interfaces on Cisco Catalyst Ethernet ports

1. In L3 Cisco switches you can turn the layer 2 VLAN functionality off for any physical Ethernet port and obtain layer 3 interface that way. This procedure allows to turn the switch into multi-port router:

```
Switch (config) # interface fa 0 / 1  
Switch (config-if) #no switchport
```

After switching L2 off it is possible to assign an IP address to a physical port, as it was previously in interface VLAN case:

```
Switch (config-if) #ip address 192.168.123.150 255.255.255.0  
Test the interface (ping).
```

Turn the IP routing on:
Switch (config) #ip routing

2. Reconnect one of PC computers into L3 port just configured.
3. Configure it's IP address to comply with L3 port IP address.
4. Set a default gateway value in PC (IP addressing configuration window) to point L3 interface in a switch.
5. Test the routing by performing ping between two PCs.
6. Test a routing path with a *tracert* command in a PC (trace another PC)