Aim ↬ To configure the Cisco Switch through remote access.

Objectives ↬

- To create the network topology using Cisco router and switch.
- To configure the router 2911.
- To configure the switch 2960 for virtual LAN.
- To verify the remote access from a distant PC for configuring the switch.

Apparatus ↬ Switch 2960, Router 2911, Connecting cables.

Theory ↬

A switch connects devices within a local area network (LAN) and operates at Layer 2 of the OSI model, managing data traffic based on MAC addresses. A router connects different networks, such as LAN to WAN, and operates at Layer 3, forwarding data based on IP addresses.

The switch is configured remotely using commands executed via remote access. For this router 2911 and switch 2960 are set up in a network topology with a virtual LAN (VLAN) configuration to facilitate remote access from a distant PC.

Description of Commands Used ↴

i. **enable [en]:** Activates privileged EXEC mode, allowing access to advanced commands necessary for switch configuration.

ii. **configure terminal [config t]:** Enters global configuration mode, where overall settings of the switch can be adjusted.

iii. **hostname [name]:** Sets the name of the switch, making it easier to identify the device within the network.

iv. **interface gig:** Enters the configuration mode for the specified Gigabit Ethernet interface, enabling the setup of IP addresses and other interface-specific settings.

v. **ip address [IP_address Subnet_mask]:** Assigns an IP address and subnet mask to the selected interface, allowing the switch to communicate on the network.

vi. **no shutdown:** Activates the specified interface, ensuring it is up and operational. By default, network interfaces are shut down.

vii. **interface vlan [vlan_number]:** Enters the VLAN interface configuration mode, used for setting up a virtual interface for management purposes.

viii. **ip default-gateway [IP_address]:** Sets the default gateway IP address for the switch, enabling it to communicate with devices outside its local subnet.

ix. **username admin password [your_password]:** Creates a local user account with the specified username and password, used for authentication during remote access.

x. **enable password [your_password]:** Sets a password for entering privileged EXEC mode, adding an extra layer of security to access advanced commands.

xi. **line vty [0 15]:** Enters the configuration mode for virtual terminal (VTY) lines, allowing the configuration of remote access settings like Telnet.

xii. **login local:** Configures the VTY lines to use local user accounts for authentication during remote access.

xiii. **transport input telnet:** Enables Telnet access on the VTY lines, allowing remote configuration of the switch over the network.

xiv. **do write [do wr]:** Saves the current configuration to the startup configuration file in NVRAM, ensuring that the changes persist after a reboot.

Simulation ↬

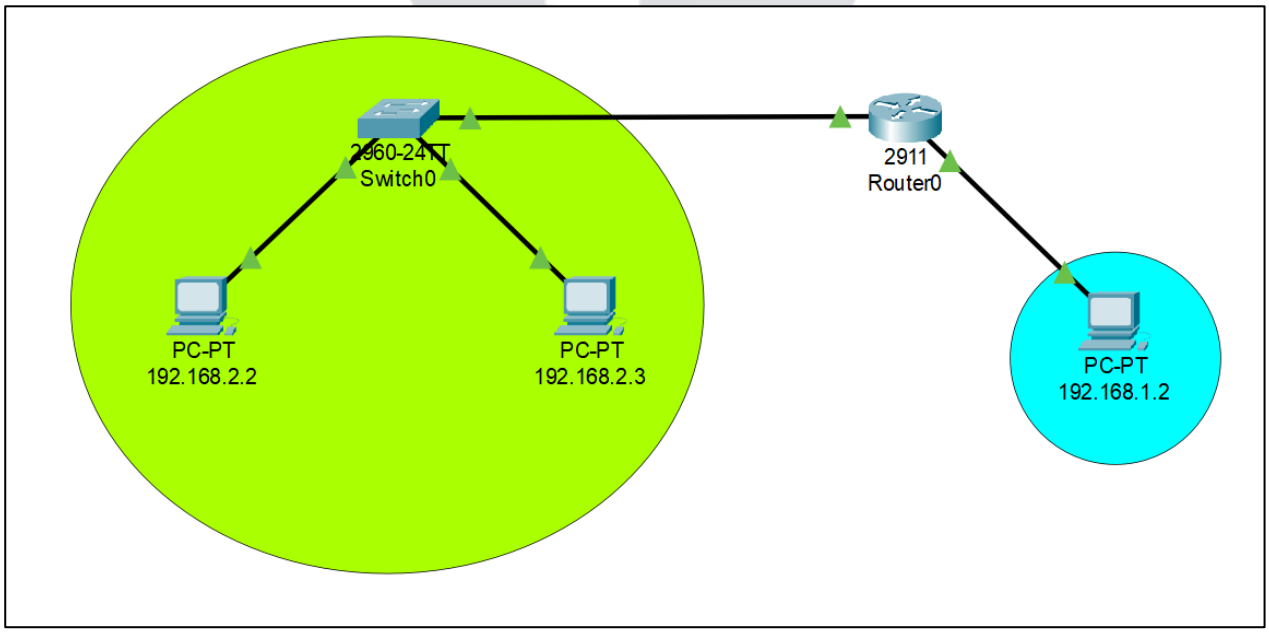

Fig. i) Switch Configuration

```
Router>en
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#?
Configure commands:
  aaa                 Authentication, Authorization and Accounting.
  access-list         Add an access list entry
  banner              Define a login banner
  bba-group           Configure BBA Group
  boot                Modify system boot parameters
  cdp                 Global CDP configuration subcommands
  class-map           Configure Class Map
  clock               Configure time-of-day clock
  config-register     Define the configuration register
  crypto              Encryption module
  default             Set a command to its defaults
  do                  To run exec commands in config mode
  dot11               IEEE 802.11 config commands
  enable              Modify enable password parameters
  end                 Exit from configure mode
  exit                Exit from configure mode
  flow                Global Flow configuration subcommands
  hostname            Set system's network name
  interface           Select an interface to configure
  ip                  Global IP configuration subcommands
  ipv6                Global IPv6 configuration commands

Router(config)#hostname Steve
Steve(config)#interface gig0/0
Steve(config-if)#ip add 192.168.1.1 255.255.255.0
Steve(config-if)#no shutdown

Steve(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

Steve(config-if)#exit
Steve(config)#
Steve(config)#interface gig0/1
Steve(config-if)#ip add 192.168.2.1 255.255.255.0
Steve(config-if)#no shutdown

Steve(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

Steve(config-if)#exit
Steve(config)#
Steve(config)#
Steve(config)#exit
Steve#
%SYS-5-CONFIG_I: Configured from console by console
```

```
Switch>en
Switch#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname Gary
Gary(config)#interface gig0/0
%Invalid interface type and number
Gary(config)#interface ?
  Ethernet          IEEE 802.3
  FastEthernet      FastEthernet IEEE 802.3
  GigabitEthernet   GigabitEthernet IEEE 802.3z
  Port-channel      Ethernet Channel of interfaces
  Vlan              Catalyst Vlans
  range             interface range command
Gary(config)#interface vlan ?
  <1-4094>  Vlan interface number
Gary(config)#interface vlan 1
Gary(config-if)#ip address 192.168.2.254 255.255.255.0
Gary(config-if)#no shutdown

Gary(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up

Gary(config-if)#exit
```

```
Gary(config)#ip default-gateway 192.168.2.1
Gary(config)#username admin password CPT
Gary(config)#enable ?
  password  Assign the privileged level password
  secret    Assign the privileged level secret
Gary(config)#enable password CPT
Gary(config)#line ?
  <0-16>   First Line number
  console  Primary terminal line
  vty      Virtual terminal
Gary(config)#line vty ?
  <0-15>  First Line number
Gary(config)#line vty 0 15
Gary(config-line)#login ?
  authentication  authenticate using aaa method list
  local           Local password checking
  <cr>
Gary(config-line)#login local
Gary(config-line)#transport ?
  input   Define which protocols to use when connecting to the terminal server
  output  Define which protocols to use for outgoing connections
Gary(config-line)#transport input ?
  all     All protocols
  none    No protocols
  ssh     TCP/IP SSH protocol
  telnet  TCP/IP Telnet protocol
Gary(config-line)#transport input telnet
Gary(config-line)#exit
Gary(config)#do wr
Building configuration...
[OK]
```

Fig. ii) Various Commands

Result ↬

- The network topology was created using a Cisco 2911 router and 2960 switch.
- The 2911 router was configured successfully for network communication.
- The 2960 switch was set up with a virtual LAN (VLAN) for network segmentation.
- Remote access from a distant PC was verified, allowing the successful configuration of the switch.

Conclusion ↬

This experiment demonstrated configuring a Cisco 2960 switch in Packet Tracer, providing practical experience in VLAN setup, IP addressing, and remote access management.

Precautions ↬

- Use the correct cables to connect the switch, router, and PC.
- Enter commands accurately to avoid configuration errors.
- Secure access with strong passwords and enable encryption.
- Save the running configuration regularly to prevent loss after a reboot.