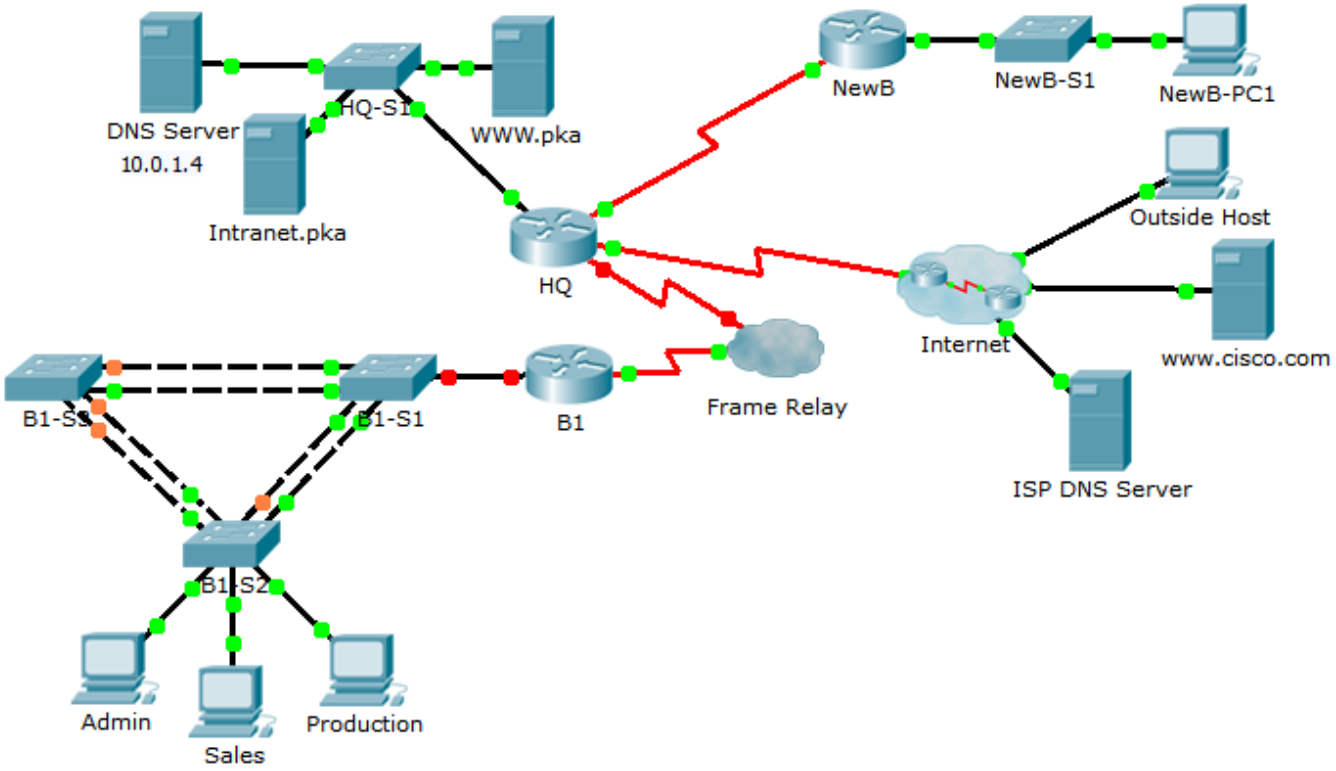
Packet Tracer – CCNA Skills Integration Challenge

Topology



Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway DLCI Mapping
HQ	G0/0	10.0.1.1	255.255.255.0	N/A
	S0/0/0.41	10.255.255.1	255.255.255.252	DLCI 41 to B1
	S0/0/1	10.255.255.253	255.255.255.252	N/A
	S0/1/0	209.165.201.1	255.255.255.252	N/A
B1	G0/0.10	10.1.10.1	255.255.255.0	N/A
	G0/0.20	10.1.20.1	255.255.255.0	N/A
	G0/0.30	10.1.30.1	255.255.255.0	N/A
	G0/0.99	10.1.99.1	255.255.255.0	N/A
	S0/0/0	10.255.255.2	255.255.255.252	N/A
B1-S2	VLAN 99	10.1.99.22	255.255.255.0	10.1.99.1

VLAN Configurations and Port Mappings

VLAN Number	Network Address	VLAN Name	Port Mappings
10	10.1.10.0/24	Admin	Fa0/6
20	10.1.20.0/24	Sales	Fa0/11
30	10.1.30.0/24	Production	Fa0/16
99	10.1.99.0/24	Mgmt&Native	Fa0/1-4
999	N/A	BlackHole	Unused Ports

Scenario

In this comprehensive CCNA skills activity, the XYZ Corporation uses a combination of Frame Relay and PPP for WAN connections. Other technologies include NAT, DHCP, static and default routing, EIGRP for IPv4, inter-VLAN routing, and VLAN configurations. Security configurations include SSH, port security, switch security, and ACLs.

Requirements

Note: The user EXEC password is **cisco** and the privileged EXEC password is **class**.

SSH

- Configure **HQ** to use SSH for remote access.
  - Set the modulus to **2048**. The domain name is **CCNASkills.com**.
  - The username is **admin** and the password is **adminonly**.
  - Only SSH should be allowed on VTY lines.
  - Modify the SSH defaults: version 2; 60-second timeout; two retries.

Frame Relay

- Configure Frame Relay between **HQ** and **B1**.
  - Refer to the Addressing Table for the IP address, subnet mask, and DLCI.
  - **HQ** uses a point-to-point subinterface and DLCI 41 to connect to **B1**.
  - The LMI type must be manually configured as **q933a** for **HQ** and **B1**.

PPP

- Configure the WAN link from **HQ** to the Internet using PPP encapsulation and CHAP authentication.
  - Create a user **ISP** with the password of **cisco**.
- Configure the WAN link from **HQ** to **NewB** using PPP encapsulation and PAP authentication.
  - **HQ** is the DCE side of the link. You choose the clock rate.
  - Create a user **NewB** with the password of **cisco**.

NAT

- Configure static and dynamic NAT on HQ
  - Allow all addresses for the 10.0.0.0/8 address space to be translated using a standard access list named **NAT**.

- XYZ Corporation owns the 209.165.200.240/29 address space. The pool, **HQ**, uses addresses .241 to .245 with a /29 mask.
- The **WWW.pka** website at 10.0.1.2 is registered with the public DNS system at IP address 209.165.200.246 and should be accessible from the **Outside Host**.

DHCP

- On **B1**, configure a DHCP pool for the Sales VLAN 20 using the following requirements:
  - Exclude the first 10 IP addresses in the range.
  - The case-sensitive pool name is **VLAN20**.
  - Include the DNS server attached to the **HQ** LAN as part of the DHCP configuration.
- Configure the **Sales** PC to use DHCP.

Static and Default Routing

- Configure **HQ** with a default route to the **Internet** and a static route to the **NewB** LAN. Use the exit interface as an argument.

EIGRP Routing

- Configure and optimize **HQ** and **B1** with EIGRP routing.
  - Use autonomous system 100 and disable automatic summarization.
  - **HQ** should advertise the static and default router to **B1**.
  - Disable EIGRP updates on appropriate interfaces.
  - Manually summarize EIGRP routes so that the **B1** router only advertises the 10.1.0.0/16 address space to **HQ**.

Inter-VLAN Routing

- Configure **B1** for inter-VLAN routing.
  - Using the addressing table for branch routers, configure and activate the LAN interface for inter-VLAN routing. VLAN 99 is the native VLAN.

VLANs and Trunking Configurations

- Configure trunking and VLANs on **B1-S2**.
  - Create and name the VLANs listed in the **VLAN Configuration and Port Mappings** table on **B1-S2** only.
  - Configure the VLAN 99 interface and default gateway.
  - Assign VLANs to the appropriate access ports.
  - Set trunking mode to on for Fa0/1 - Fa0/4.
  - Disable all unused ports and assign the **BlackHole** VLAN.

Port Security

- Use the following policy to establish port security on the **B1-S2** access ports:
  - Allow one MAC addresses to be learned on the port.
  - Configure the first learned MAC address to stick to the configuration.
  - Set the port to shut down if there is a security violation.

Access List Policy

- Because HQ is connected to the Internet, configure a named ACL called **HQINBOUND** in the following order:
  - Allow inbound HTTP requests to the **WWW.pka** server.
  - Allow only established TCP sessions from the Internet.
  - Allow only inbound ping replies from the Internet.
  - Explicitly block all other inbound access from the Internet.

Connectivity

- Verify full connectivity from each PC to **WWW.pka** and **www.cisco.pka.**