Packet Tracer – CCNA Skills Integration Challenge

Topology

Addressing Table

<table>
<thead>
<tr>
<th>Device</th>
<th>Interface</th>
<th>IP Address</th>
<th>Subnet Mask</th>
<th>Default Gateway</th>
<th>DLCI Mapping</th>
</tr>
</thead>
<tbody>
<tr>
<td>HQ</td>
<td>G0/0</td>
<td>10.0.1.1</td>
<td>255.255.255.0</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>S0/0/0.41</td>
<td>10.255.255.1</td>
<td>255.255.255.252</td>
<td>N/A</td>
<td>DLCI 41 to B1</td>
</tr>
<tr>
<td></td>
<td>S0/0/1</td>
<td>10.255.255.253</td>
<td>255.255.255.252</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>S0/1/0</td>
<td>209.165.201.1</td>
<td>255.255.255.252</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>B1</td>
<td>G0/0.10</td>
<td>10.1.10.1</td>
<td>255.255.255.0</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>G0/0.20</td>
<td>10.1.20.1</td>
<td>255.255.255.0</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>G0/0.30</td>
<td>10.1.30.1</td>
<td>255.255.255.0</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>G0/0.99</td>
<td>10.1.99.1</td>
<td>255.255.255.0</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>S0/0/0</td>
<td>10.255.255.2</td>
<td>255.255.255.252</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>B1-S2</td>
<td>VLAN 99</td>
<td>10.1.99.22</td>
<td>255.255.255.0</td>
<td>10.1.99.1</td>
<td></td>
</tr>
</tbody>
</table>
VLAN Configurations and Port Mappings

<table>
<thead>
<tr>
<th>VLAN Number</th>
<th>Network Address</th>
<th>VLAN Name</th>
<th>Port Mappings</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>10.1.10.0/24</td>
<td>Admin</td>
<td>Fa0/6</td>
</tr>
<tr>
<td>20</td>
<td>10.1.20.0/24</td>
<td>Sales</td>
<td>Fa0/11</td>
</tr>
<tr>
<td>30</td>
<td>10.1.30.0/24</td>
<td>Production</td>
<td>Fa0/16</td>
</tr>
<tr>
<td>99</td>
<td>10.1.99.0/24</td>
<td>Mgmt&amp;Native</td>
<td>Fa0/1-4</td>
</tr>
<tr>
<td>999</td>
<td>N/A</td>
<td>BlackHole</td>
<td>Unused Ports</td>
</tr>
</tbody>
</table>

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. Configure dynamic NAT with PAT for the pool HQ.

- 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**.