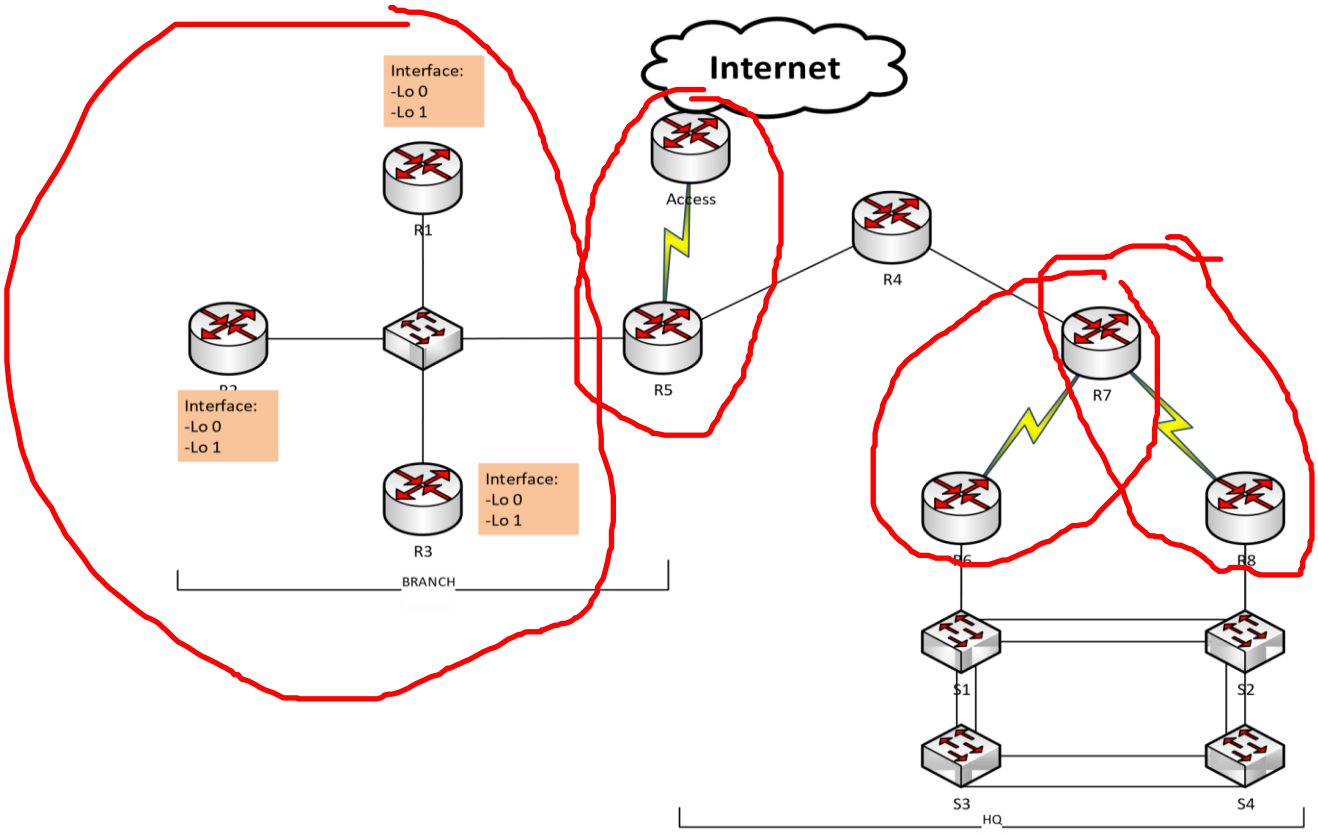
Topology



Part 1: IPv4

1) Addressing Scheme

- X :Date

- A : Month

- Y = X+ 100

- B = A +5

- HQ area is used network address X.X.X.X/A (7.0.0.0/8)
- Branch area is used network address Y.Y.Y.Y/B (107.104.0.0/13)
- Address table:

Network	Address
R7 ↔ R6	202.0.100.0/30
R7 ↔ R8	202.0.100.4/30
R5 ↔ ACCESS	202.0.100.8/30

- Host number requirement for VLAN HQ site

VLAN	Name	Host Number
10	TEAM1	500 7.0.0.0/23
20	TEAM2	200 7.0.2.0/24
30	TEAM3	100 7.0.3.0/25
40	GUEST	100 7.0.3.128/25
50	SERVERS	50 7.0.4.0/26
60	Management(Native)	50 7.0.4.64/26

Subnet Name	Needed Size	Allocated Size	Address	Mask	Dec Mask	Assignable Range	Broadcast
A	500	510	7.0.0.0	/23	255.255.254.0	7.0.0.1 - 7.0.1.254	7.0.1.255
B	200	254	7.0.2.0	/24	255.255.255.0	7.0.2.1 - 7.0.2.254	7.0.2.255
C	100	126	7.0.3.0	/25	255.255.255.128	7.0.3.1 - 7.0.3.126	7.0.3.127
D	100	126	7.0.3.128	/25	255.255.255.128	7.0.3.129 - 7.0.3.254	7.0.3.255
E	50	62	7.0.4.0	/26	255.255.255.192	7.0.4.1 - 7.0.4.62	7.0.4.63
F	50	62	7.0.4.64	/26	255.255.255.192	7.0.4.65 - 7.0.4.126	7.0.4.127

- Host number requirement for Branch site

Device	Interface	Host Number
R1	Lo 0	200
R1	Lo 1	300
R2	Lo 0	100
R2	Lo 1	100

R3	Lo 0	200
R3	Lo 1	100

Subnet Name	Needed Size	Allocated Size	Address	Mask	Dec Mask	Assignable Range	Broadcast
B	300	510	107.104.0.0	/23	255.255.254.0	107.104.0.1 - 107.104.1.254	107.104.1.255
A	200	254	107.104.2.0	/24	255.255.255.0	107.104.2.1 - 107.104.2.254	107.104.2.255
E	200	254	107.104.3.0	/24	255.255.255.0	107.104.3.1 - 107.104.3.254	107.104.3.255
C	100	126	107.104.4.0	/25	255.255.255.128	107.104.4.1 - 107.104.4.126	107.104.4.127
D	100	126	107.104.4.128	/25	255.255.255.128	107.104.4.129 - 107.104.4.254	107.104.4.255
F	100	126	107.104.5.0	/25	255.255.255.128	107.104.5.1 - 107.104.5.126	107.104.5.127
G	4	6	107.104.5.128	/29	255.255.255.248	107.104.5.129 - 107.104.5.134	107.104.5.135

2) PPP Connections

- Configuration PPP connection between R7 and R6 router using PAP authentication
- Configuration PPP connection between R7 and R8 router using CHAP authentication

3) Routing

- Configure OSPF routing protocol in HQ site
- Configure static routing protocol in Branch site
- On R5, configure a default route to ACCESS router and propagate it to OSPF process
- On R5, configure static route (use summary route) to Branch site and propagate OSPF process in HQ site.
- Set passive on appropriate interface

4) Switching

- Switch S2 is VTP Server, remain switchs are VTP client
- Change spanning tree protocol to Rapid PVST+ mode
- S1 is root bridge for VLAN 10, 20, 30, 40. S2 is root bridge for remain VLANs
- Use network address of Management VLAN assign to switch
- Configure SSH on all switches
- Configure router-on-a-stick Inter-VLAN routing on R6 for VLAN 10, 20, 30, 40 and R8 for VLAN 50, 60.
- Configure EtherChannel with LACP protocol for all links between switch.

5) NAT and DHCP

- Configure NAT overload on Access allow private addresses of HQ and Branch site can access Internet.
- Setup an Web in Servers VLAN, configure port forwarding allow hosts from Internet can access the HTTP and HTTPS service.
- Setup DHCP server on R4 to assign IP address and other parameters to host in VLAN 10, 20, 30, 40 automatically.

6) Other requirements

- Create ACL not allow users on GUEST VLAN access to all network of HQ and Branch but can use to the Internet.
- Create ACL allow only SERVERS VLAN can SSH to switches

Part 2: IPv6

1) Address Scheme

- For the networks connect routers

Network	Address
Access ↔ R5	2001:ABBA:AAAA:1::/64
R7 ↔ R6	2001:ABBA:CCCC:1::/64
R7 ↔ R8	2001:ABBA:DDDD:1::/64
R4 ↔ R5	2001:ABBA:EEEE:1::/64
R4 ↔ R7	2001:ABBA:FFFF:1::/64

- Assign static link-local address for all interface using FE80::/10 range.
- Use the first five subnets of network 2001
- :ABBA:BBBB:/48 for five VLAN 10, 20, 30, 40, 50. The default gateway will be used the first IP address. Remark: assign appropriate static link-local address by yourself.

2) Routing

- Configure IPv6 static routing in HQ site.
- Configure a default route from R5 to Access and R5 is also default gateway for all remain networks
- Configure inter-VLAN routing using the same sub-interface for each VLAN in above IPv4 configuration.

3) DHCP

- Setup Stateless DHCPv6 on R7 router to assign IP address and other information for VLAN 10, 20,30 and 40 dynamically. Use 2001:4860:4860::8888 for DNS Server address.
- Configure relay agent on appropriate interfaces.