Contents

7. SECTION 6 : AUTOMATION

7.1 PYTHON : Use Python to get Data from Routers Legacy and Vedges.

7.2 ANSIBLE : Add inventory, write basic playbooks to configure OSPF routing, push playbooks to perform on Routers

TOPOLOGY

CCIE ENTERPRISE INFRASTRUCTURE PRACTICE LABS
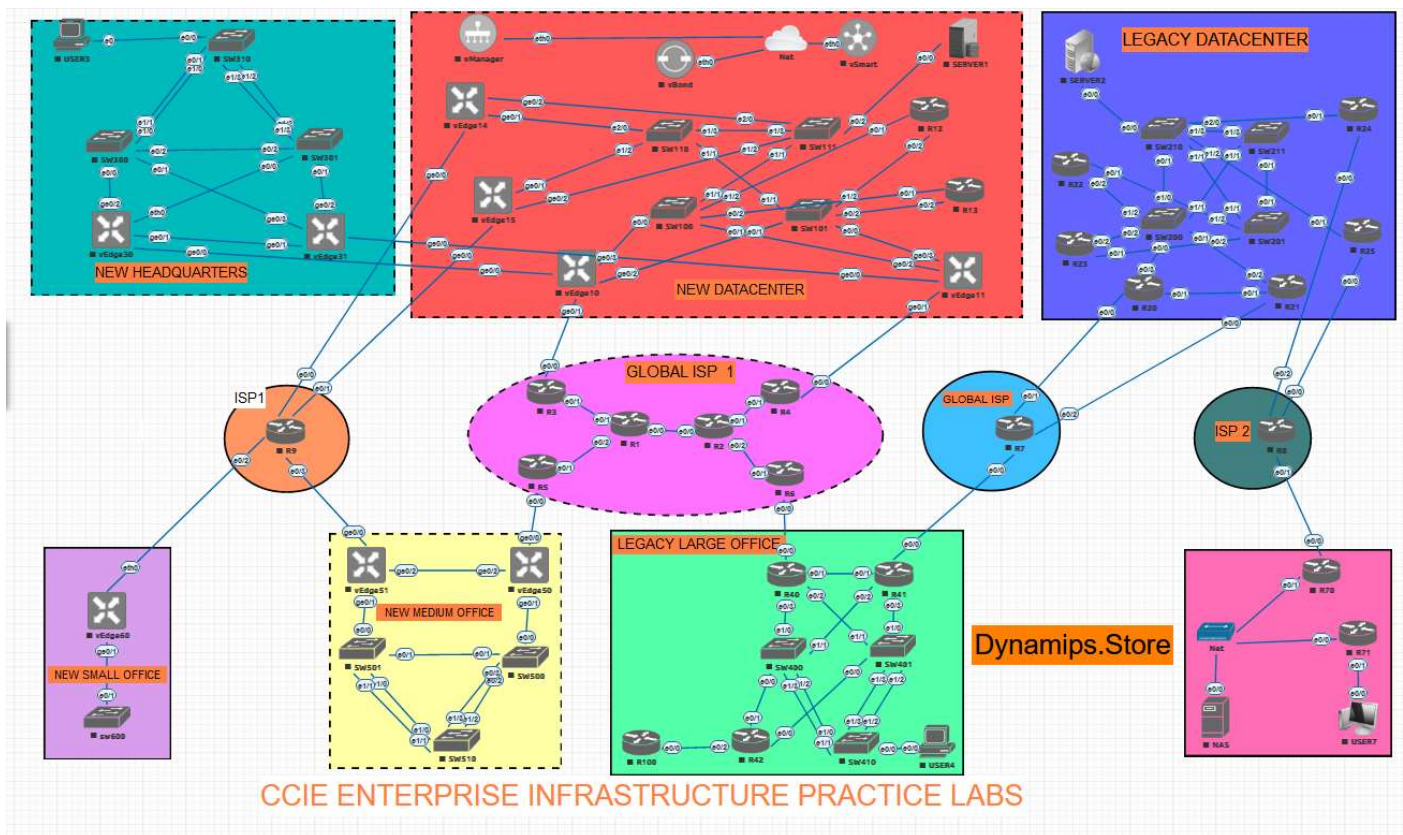
1. SECTION 1: Layer 2 technologies

1.1 Section 1.1: LAN Access
Question:

The following requirements were pre-configured:

- VTP is turned off in all Switches.
- All required VLAN, and access-ports configuration in all relevant switches are provisioned.
- All required SVI Interfaces in all relevant switches (including IP address and subnet mask) are provisioned.

Configure the network in all sites as per the following requirements:

- Access-port must immediately transition to the forwarding state upon link up, as long as they do not receive a BPDU. Use the minimal number of commands per switch to enable this feature.
- If an access-port receives a BPDU, it must automatically shutdown. Use the minimal number of commands per switch to enable this feature.
- Ports that were shutdown must attempt to automatically recover after 10 minutes.
- None of the switches can generate a TC.

SOLUTON:

SW100/SW101/SW110/SW111/SW200/SW201/SW210/SW211/SW300/ SW301/SW310/SW400/SW401/SW410/SW500/SW501/SW510/SW600

```
spanning-tree portfast edge default
spanning-tree portfast edge bpduguard default
errdisable recovery cause bpduguard
errdisable recovery interval 600
```

1.2 Section 1.2: LAN Distribution
Question:

Configure the Headquater's Network as well as the large and medium office network as the following requirements:

- All trunks must use Dot1Q encapsulation.
- Negotiation of the trunking protocol must be disabled in all switches.
- Distribution switches (SW300, SW301, SW400, SW401, SW500, SW501) must initiate Etherchannel negotiation using LACP.
- Access Switches (SW310, SW410, SW510) should never initiate Etherchannel negotiation.

- Configure Layer 2 Etherchannel number as show in the Diagram 1: Main Topology and Daigram 5: Layer 2 connections (they use only Po1 and PO2).
- Ensure that all ports included in Etherchannels are effectively in use and bundled in the expected channel.
- Access switches must see similar output as shown below:

SW300/SW400/SW501

```
inter range e2/0-1
shut
sw trunk en dot1q
sw mod trunk
sw nonego
channel-group 1 mod ac
!
int port-channel 1
sw trunk en dot1q
sw mod trunk
sw nonego
```

SW301/401/500

```
int range e2/2-3
shut
sw trunk en do
sw mod trunk
sw nonego
channel-group 2 mod active
!
interface port-channel2
sw trunk en dot1q
sw mod trunk
sw nonego
```

SW310/410/510

```
int range e2/0-1
shut
sw trunk en do
sw mod trunk
sw none
channel-group 1 mode passive
!
interface port-channel1
sw trunk en dot1q
sw mod trunk
sw nonego
```

```
!
int range e2/2-3
shut
sw trunk en do
sw mod trunk
sw none
channel-group 2 mode passive
!
interface port-channel2
sw trunk en dot1q
sw mod trunk
sw nonego
```

SW300, SW310, SW400, SW410, SW501, SW510

```
int range e2/0-1
no shut
```

SW301, SW310, SW401, SW410, SW500, SW510

```
int range e2/2-3
no shut
```

1.3 *Section 1.3: Spanning Tree*
Question:

Configure the Headquater's network as the following requirements:

- SW300 must be the spanning tree root bridge and must maintain a signle spanning tree instance for the following VLANs: 2000, 2002, 2004, 2006, 2008 (use instance number 2).
- SW301 must be the spanning tree root bridge and must maintain a single spanning tree instance for the following VLANs: 2001, 2003, 2005, 2007, 2009 (use instance number 1).
- All other VLANS, except 3001 must share the default spanning tree instance.
- Ensure that insterface E0/2 of SW300 and SW301 is a Dot1q trunk and that it switches frames for VLAN 3001 only.
- SW300, SW301, and SW310 must not have any blocked ports for any access VLANs (i.e 2000-2009).
- SW310 must have the least chance of being elected the root bridge for any VLANs.
- None of the three switches may run more than four instances of spanning tree any points in time.

Configure all access switches in both DC network (SW110, SW111, SW210, SW211 as the following requirements:

- Use 32-bit based values for default port path costs.

- All four switches must use the default value for their interface cost.

Solution: (Click to Expand)

SW300/301/310

```
spanning-tree mode mst
spanning-tree mst configuration
inst 1 vlan 2001,2003,2005,2007,2009
inst 2 vlan 2000,2002,2004,2006,2008
inst 3 vlan 3001
```

SW300

```
int e0/2
sw trunk allow vlan 3001
sw trunk en do
sw mod trunk
sw nonego
span mst 2 pri 0
```

SW301

```
int e0/2
sw trunk all vlan 3001
sw trunk en do
sw mod trunk
sw nonego
span mst 1 pri 0
```

SW310

```
span mst 0-3 pri 61440
```

SW110/SW111/SW210/SW211

```
span pathcost method long
```

1.4 *Section 1.4: WAN Switching*
Question:

Configure the home router R70 as per following requirements:

- The Ethernet WAN Link must rely on a layer 2 protocol that supports authentication and layer 3 protocol negotiation.
- The service provider expects that R70 completes a three-way handshake by providing the expected response of a challenge requested.
- R70 must use the hostname: R70 and password CCIE
- R70 must receive an IP address from R8 and must install a default route pointing to 201.99.70.1
- Ensure that R70 can successfully ping 8.8.8.8, which is located in the ISP#2 cloud.
- You are not allowed to configure any static route in R70 in order to archive the previous requirements.
- Use the pre-configured dialer1 interface as appropriate.

R70

```
int e0/0
no ip add
int dialer 1
ip add nego
ip mtu 1492
en ppp
dia pool 1
ppp chap hostname R70
ppp chap pass 0 CCIE
ppp ipcp route default
!
int e0/0
pppoe enable group global
pppoe-client dial-pool-number 1
```

2. 2. SECTION 2 : SDWAN BACKGROUND

2.1 2.1 Section 2.1 : SDWAN Installation for Control and Data plane

Install Control Plane and Data Plan of SDwan, please follow this lab → **Cisco Viptela SDWAN Control and Data Plan**