Free Cisco Lab Packet Tracer Activity VOIP

Voice Over IP (VOIP) has become a very important part of the network engineers job in today’s new IT department. Cisco has added a new certification to their CCNA program (CCNA Voice) to prepare new Cisco engineers for this exciting technology. This lab is an effort to help students configure and demonstrate the basic operation of this technology.

In This lab we will learn to configure Voice and Data VLANs over the same network. We will be configuring VTP, VLAN Trunking and separate VLAN to support the Voice and Data traffic. You will configure a router to supply DHCP address for both the Voice and the Data VLANs, as well as a router on a stick to route the traffic. You will then configure Telephony Services to provide configuration for all the IP phone devices. After which you will verify the configuration of both the Voice and Data devices and insure that they all communicate properly.

Voice / Data VLAN Lab Activity

Basic Router & Switch Configuration:

1. Configure the hostname on all routers and switches as shown in the network diagram.
2. Configure the enable secret password to be cisco on all routers and switches.
3. Configure the enable password to be free on all routers and switches.
4. Configure the VTY password to be cisco on all routers and switches
5. Configure all routers not to do domain lookup.
6. Configure the console on all routers not to timeout.

Configure the server and PC workstations:

1. Configure all PC workstation to use DHCP.
2. Configure the IP address and subnet mask on the server as shown in the network diagram.
3. Configure the gateway address on the server as shown in the network diagram.

Configure VTP:

1. Configure VTP domain to bee Voice.
2. Configure SW1 VTP mode as Server.
3. Configure SW2 VTP mode as Client.
4. Display the VTP Status on SW1.

VTP Version : 2

Configuration Revision : 60

Maximum VLANs supported locally : 255

Number of existing VLANs : 7

VTP Operating Mode : Server

VTP Domain Name : voice

VTP Pruning Mode : Disabled

VTP V2 Mode : Disabled

VTP Traps Generation : Disabled

MD5 digest : 0x75 0xCA 0x23 0x4E 0xE7 0xF3 0x3D 0x98

Configuration last modified by 0.0.0.0 at 3-1-93 00:00:00

Local updater ID is 0.0.0.0 (no valid interface found)

Configure VLAN Trunking:

1. Configure Ports 20 and 24 Configure Ports 20 and 24 on SW1 to be 802.1Q VLAN Trunks.
2. Configure Port 24 on SW2 as 802.1Q VLAN Trunk.
3. On SW1 display port 24 switchport.

Name: Fa0/24

Switchport: Enabled

Administrative Mode: trunk

Operational Mode: trunk

Administrative Trunking Encapsulation: dot1q

Operational Trunking Encapsulation: dot1q

Negotiation of Trunking: On

Access Mode VLAN: 1 (default)

Trunking Native Mode VLAN: 1 (default)

Voice VLAN: none

Administrative private-vlan host-association: none

Administrative private-vlan mapping: none

Administrative private-vlan trunk native VLAN: none

Administrative private-vlan trunk encapsulation: dot1q

Administrative private-vlan trunk normal VLANs: none

Administrative private-vlan trunk private VLANs: none

Operational private-vlan: none

Trunking VLANs Enabled: ALL

Pruning VLANs Enabled: 2-1001

Capture Mode Disabled

Capture VLANs Allowed: ALL

Protected: false

Appliance trust: none

Create VLANS:

1. Using SW1 create VLAN 10 and name it Voice.
2. Using SW1 create VLAN 20 and name it DATA.
3. Using SW1 display VLANs.

VLAN Name Status Ports

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1 default active Fa0/1, Fa0/2, Fa0/3, Fa0/4, Fa0/6

Fa0/7, Fa0/8, Fa0/9, Fa0/10, Fa0/11

Fa0/12, Fa0/13, Fa0/14, Fa0/15

Fa0/16, Fa0/17, Fa0/18, Fa0/19, Fa0/20

Fa0/21, Fa0/22, Fa0/23, Fa0/24, Gig1/1

Gig1/2

10 Voice

20 data

1002 fddi-default active

1003 token-ring-default active

1004 fddinet-default active

1005 trnet-default active

Assign ports to VLANs:

1. Assign SW1 ports 1 and 10 as Access VLAN 20.
2. Display SW1 VLANs.

1 default active Fa0/2, Fa0/3, Fa0/4, Fa0/6

Fa0/7, Fa0/8, Fa0/9, Fa0/11

Fa0/12, Fa0/13, Fa0/14, Fa0/15

Fa0/16, Fa0/17, Fa0/18, Fa0/19

Fa0/21, Fa0/22, Fa0/23, Gig1/1

Gig1/2

10 Voice active Fa0/5

20 data active Fa0/1, Fa0/10

1002 fddi-default active

1003 token-ring-default active

1004 fddinet-default active

1. et-default active
2. Assign SW2 ports 1 – 5 ad mode access.
3. Assign SW2 ports 1 – 5 Access VLAN 20
4. Assign SW2 ports 1 – 5 Voice VLAN 10
5. Assign SW2 port 20 as Access VLAN 20
6. Display SW2 VLANs.

1 default active Fa0/6, Fa0/7, Fa0/8, Fa0/9

Fa0/11, Fa0/12, Fa0/13, Fa0/14

Fa0/15, Fa0/16, Fa0/17, Fa0/18

Fa0/19, Fa0/21, Fa0/22, Fa0/23

Gig1/1, Gig1/2

10 Voice active Fa0/20

20 data active Fa0/1, Fa0/2, Fa0/3, Fa0/4

Fa0/5, Fa0/10

1002 fddi-default active

1003 token-ring-default active

1004 fddinet-default active

1005 trnet-default active

Configure Router On A Stick:

1. Configure the fa0/0 interface of Router CME to have no IP address.
2. Create Sub-Interface fa0/0.10 on router CME.
3. Configure encapsulation dot1q on fa0/0.10 as VLAN 10.
4. Configure fa0/0.10 IP address as 172.16.1.1/24.
5. Configure a IP helper address on fa0/0.10 for DHCP.
6. Create Sub-Interface fa0/0.20 on router CME.
7. Configure encapsulation dot1q on fa0/0.10 as VLAN 20.
8. Configure fa0/0.10 IP address as 172.16.2.1/24.
9. Configure CME router to use RIP routing protocol.
10. Assign network 172.16.0.0 as part of the RIP routing process.

Configure WAN Router:

1. Configure Router WAN to exclude IP range 172.16.1.1 to 172.16.1.9 in the DHCP scope.
2. Configure Router WAN to exclude IP range 172.16.2.1 to 172.16.2.9 in the DHCP scope.
3. Create DHCP pool Data\_Scope on WAN Router.
4. Assign IP network 172.16.2.0/24 to DHCP Data\_Scope.
5. Assign Default-Router as 172.16.2.1 in DHCP Data\_Scope.
6. Assign DNS-Server as 4.2.2.2 in DHCP Data\_Scope.
7. Create DHCP pool Voice\_Scope on WAN Router.
8. Assign IP network 172.16.1.0/24 to DHCP Voice\_Scope.
9. Assign Default-Router as 172.16.1.1 in DHCP Voice\_Scope.
10. Configure Option 150 as IP address 172.16.1.1 in DHCP Voice\_Scope.
11. Assign DNS-Server as 4.2.2.2 in DHCP Voice\_Scope.

Configure Telephony-Service:

1. Configure the Maximum phones to be 5 on CME Router.
2. Configure the Maximum directories to be 5 on CME Router.
3. Create Loopback interface Lo0 on CME router.
4. Assign IP address 172.16.254.254/32 to Lo0
5. Configure the telephony-service source address to be 172.16.254.254.
6. Configure CME router to auto assign Ext numbers to buttons.
7. Configure Directory numbers 1 – 5 to be 1101 – 1105

Verifying The Configuration:

1. Save the configuration on all devices.
2. Power cycle the lab.
3. Monitor the CME router and insure that the IP phones register ( This may take a few minutes).
4. Verify that all IP phones are assigned an IP address from the 192.16.1.0 DHCP Voice\_Scope.
5. Verify that all PC workstations are assigned an IP address from the 192.16.2.0 DHCP Data\_Scope.
6. Verify that IP phone operation.
7. Verify that you can ping the server 172.16.2.200 from all PC workstations.