Chapter 1 : Data, Voice and Video Installation - The Cable University Training Program

Laboratory Manual to accompany Data, Voice and Video Cabling, 3rd Edition [Jim Hayes] on www.nxgvision.com *FREE* shipping on qualifying offers. The Lab Manual for DATA, VOICE AND VIDEO CABLING, 3rd Edition, is a valuable tool designed to enhance your classroom experience.

This chapter focuses on establishing those services. Before phones are connected, you must establish network connectivity and configure needed services. Network Connectivity This lab uses the following equipment: Wherever an x is shown, substitute the pod number. Clear Prior Configurations Clear any prior configuration on the router and switch, and delete the vlan. The PC will be connected later. Configure Basic Setup This task establishes the basic configuration commands on both the router and switch. If your equipment does not support this command, change it to line vty 0 4. It allows minutes of inactivity before logging you out. In a production environment, this could be a security risk. Configure the Switch For the purposes of security and ease of implementing quality of service QoS , use VLANs to keep voice traffic separate from other traffic. Configure the Trunk Port Configure the trunk port that connects the switch to the router. Layer 3 switches such as the Cisco Catalyst require that the trunking protocol be specified with the switchport trunk encapsulation command before the interface can be set as a trunk. If you are using a Layer 2 switch such as a Cisco Catalyst or , the command is not needed and will be rejected. To improve security, it would be better to create another VLAN as the native VLAN that will remain unused, but to simplify this lab, it is not covered. Configure the Access Ports Almost all Cisco IP Phones are designed with a three-port switch built inside one physical port connected to the production switch, one physical port for a PC to connect to the phone, and one internal port for the phone itself. This built-in switch saves money in wiring costs, as existing phone cabling might not meet networking standards. This enables an existing computer to be plugged into the phone, and the phone connects to the switch in the wiring closet. Current best practice configures the ports connected to phones and PCs to use access mode but adds a secondary voice VLAN. The switch ports use the access VLAN to send data traffic as untagged frames. This creates a pseudotrunk that allows only the data and voice VLANs on the link. Use the interface range command to assign settings. This is the fastest way to assign settings to more than one switch port at a time. You can verify this with the show run command, as shown in Example Configure the Switch Management Interface Set up an interface to manage the switch remotely. SwPodx config interface vlan x1 SwPodx config-if ip address Each subinterface will be the default gateway for a paired subnet. When using subinterfaces on a router, it is necessary to assign the correct VLAN to the subinterface before an IP address can be entered. Because there are three VLANs, you need three subinterfaces. Verification Check the configuration to determine whether it matches what you expect. This will help to avoid future problems. Verify Switch Port Assignment Use the show interfaces switchport command to verify the configuration of trunk and access ports. SwPod11 show interfaces switchport Name: Verify Router Subinterface IP Assignment Use the show ip interface brief command to verify that the trunk is assigned correctly. This output is from Pod 11; your output will have different subinterface and IP address numbers. However, if the DHCP server is in a different subnet than the clients, it is necessary to use the ip helper-address command on each router subinterface to forward the DHCP requests to the server. Additionally, DHCP can provide additional information to clients, allowing them to locate necessary resources on the network at the same time they receive an IP address. This lab assigns the default gateway IP address as the option address, as there is only one way to reach the call agent in this network. NOTE If there was redundancy in the network, it would be worthwhile to create a loopback interface and set the option address to the loopback address, as that interface is always up. This avoids IP addresses that should be excluded from being assigned to devices. Enter the network statement as the last command in the pool. Otherwise, if devices are connected, they are assigned an IP address by DHCP right after the network statement is entered, even if the default gateway and option are not configured. This can make troubleshooting difficult, as the PCs and

phones will receive IP addresses, but the phones will not register and the PCs will not communicate outside their own subnet without the default router gateway address. Create DHCP pools for both the data and voice networks. RtrPodx config ip dhcp excluded-address Test and Cleanup Step Test Connectivity Connect a PC to the switch. Verify that the PC is assigned an IP address from the Verify that the PC can telnet to both the router and the switch management IP addresses. If not, troubleshoot the configuration. Save the Configurations Save the configurations into a text file for both the router and switch. They will be needed for future labs. TIP When saving output from the console window, do not forget that some commands are not included and will not be present if pasted back to a device. Common examples include the no shutdown command for interfaces and VLAN creation and naming. To avoid problems, add missing commands to the text file or enter a reminder at the top of the text file. See Figure for an example. Cisco IP Phone Connections If you connect an older Cisco IP Phone a , for example that supports only Cisco-proprietary inline power, you might see a message like this on the switch console line: Power granted When verifying PoE usage or troubleshooting phone power problems, you can see the existing PoE usage with the show power inline command. Knowing the remaining PoE capacity is important, as Cisco sells some switch models that do not have enough PoE to fully power all ports, such as the port Catalyst LT-L that supports only eight PoE devices at The phone 6. SwPod11 show power inline Available: The messages displayed on the phones are useful information when troubleshooting.

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