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| **DOCUMENT RULES:** | |
| **Task Number / Name:** | **Task #7 / CISCO Switch 2960 (Basic configuration)** |
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| **#** | **Questions** | **Answers to the questions** |
| **1** | Network switches and their purpose | A network switch connects devices (such as computers, printers, wireless access points) in a network to each other, and allows them to 'talk' by exchanging data packets. Switches can be hardware devices that manage physical networks, as well as software-based virtual devices. |
| **2** | What are the different types of network switches(from the physical standpoint)? | They network switches can be **fixed, stackable and modular**. |
| **3** | What is a fixed switch? | Its port, interfaces, power supplies and cooling fans are set and cannot be changed, added or altered. Additionally, fixed switches cannot be stacked onto other switches to create a single logical switch from which to manage. |
| **4** | **CISCO fixed switches as an example:** |  |
|  | Types of CISCO switches | * Access * Distribution * Core |
| **5** | Access switches | The access layer is used to grant the user access to network applications and functions. In enterprise access layers, you will find fixed configuration switches, like the Cisco Catalyst, 2960-X series. It offers a wide range of deployments. |
| **6** | Cisco switches 2960 series | They are two-layered, fixed configuration switches that typically include Cisco's LAN base software and are available in a variety of configurations. There are several different Cisco 2960 series, including 2960-L, 2960C, and Catalyst 2960S |
| **7** | Pros and cons of Cisco Switches 2960 series | Pros:   1. They work very well at the access layer or distribution/core layer at small remote sites. 2. Reliable 3. Optimal size   Cons:   1. Expensive prices 2. Bad support for SFP/SFP+ 3. Poor tech support |
|  | Configuration | Consists of 0-resetting all settings, 1-picking a name for the switch, 2-customization of m.i., 3-user authentification, 4-creating vlan, 5-binding vlans and ports. |
|  | Step 0 | Reset all the settings:  After removing a new switch out of the box, [use the console cable](https://deltaconfig.com/connecting-to-cisco-devices/) to connect to the switch and clear all it’s current configuration by going to the privileged mode (#) and using the command write erase (details about the configuration of Cisco equipment can be found [here](https://deltaconfig.com/cisco-configuration-modes/)).  ***Switch>enable Switch# write erase /confirmation of cleaning the configuration/ Switch# reload /confirmation/*** The switch will reboot within 3 minutes and initial configuration dialog will appear. Type “**no**” and move to next step. ***--- System Configuration Dialog --- At any point you may enter a question mark '?' for help. Use ctrl-c to abort configuration dialog at any prompt. Default settings are in square brackets '[]'. Would you like to enter the initial configuration dialog? [yes/no]:*** |
|  | Step 1 | Pick a name for your switch:  Assign a name to the switch **SW-DELTACONFIG-1**.(SW – abbreviation SWitch). Just go to **configuration mode (conf t)** and type the following commands: ***Switch #conf t*** Enter configuration commands, one per line.End with CNTL/Z. ***Switch (config)# hostname SW-DELTACONFIG-1 SW-DELTACONFIG-1(config)#***So, the device name changed from the «Switch» to «SW-DELTACONFIG-1». |
|  | Step 2 | Customizing the management interface:  Let’s customize our interface for managing the switch. By default it’s **vlan 1**. You should assign an **ip** address of the interface and activate it by command **no shutdown.**  ***SW-DELTACONFIG-1(config)# interface vlan 1 ip address 192.168.1.11 255.255.255.0 no shutdown*** From now your switch will be available under the **ip** addess **192.168.1.11** |
|  | Step 3 | User authentification:  We have to configure authentication to access the device. Set password to access the **privileged** mode (the **#** sign next to device name), and create a user account with password for remote connection.  Setting a password to access the privileged mode **#** ***SW-DELTACONFIG-1(config)# enable secret XXXX***  Creating a user account for remote connection and a password ***username admin secret YYYYY***  Enabling authentication using the local database of usernames and passwords ***SW-DELTACONFIG-1(config)# line vty 0 4 login local***  To check the availability of **enable** mode (**#**) after the input of these commands, exit all configuration modes (press **exit** or **Q** in each mode or use the combination of keys **Ctrl+Z**). You should see the initial mode on your screen (denoted by symbol **>**). Try to re-enter the **privileged** mode (denoted by symbol #). For password request – type the one you’ve chosen before. |
|  | Step 4 | Let’s create a **Vlan** for each department and assign serial numbers and names to them. ***SW-DELTACONFIG-1(config)# vlan 10 name NET\_SALES vlan 20 name NET\_ACCOUNT vlan 100 name NET\_ADMIN***  Each switch has Vlan 1 as a default one. It will be used for remote control.  To check the current **Vlan** settings, type **sh vlan** command: ***SW-DELTACONFIG-1# show vlan VLAN Name                 Status    Ports ---- -------------------- -------- --------------------- 1    default              active    Fa0/1, Fa0/2, /...cut.../ 10  NET\_SALES            active 20  NET\_ACCOUNT          active 100  NET\_ADMIN            active***  Make sure that all networks are in your list. |
|  | Step 5 | Assign the switch **access ports** to your Vlan’s. For example, switch has 24 **FastEthernet** ports and 2 **Gigabit Ethernet** ports. For users connection only **Fast Ethernet** will be used.  Let’s split them as follows:   * 6 for administration network (**Vlan 100**) * 12 for sales department (**Vlan 10**) * 6 for accounting department (**Vlan20**)   It would be great to add description strings for each interface . This is a text field which doesn’t affect any other settings. ***SW-DELTACONFIG-1(config)# interface range fa 0/1 – 6 switchport access vlan 100 description NET\_ADMIN interface range fa 0/7 – 18 switchport access vlan 10 description NET\_SALES interface range fa 0/19 – 24 switchport access vlan 20 description NET\_ACCOUNT***  Then, ports will be shown next to each **Vlan**. The result of **sh vlan** command should be similar to this: ***SW-DELTACONFIG-1# show vlan VLAN Name            Status    Ports ---- ---------------- --------- ------------------------------- 1    default          active 10  NET\_SALES        active    Fa0/7, Fa0/8, Fa0/9, Fa0/10, Fa0/11, Fa0/12, Fa0/13, Fa0/14, Fa0/15, Fa0/16, Fa0/17, Fa0/18 20  NET\_ACCOUNT      active    Fa0/19, Fa0/20, Fa0/21, Fa0/22, Fa0/23, Fa0/24 100  NET\_ADMIN        active    Fa0/1, Fa0/2, Fa0/3, Fa0/4, Fa0/5, Fa0/6***  By previous commands we shared one **physical** switch to 4 **logical** ones (**Vlan 1, Vlan 10, Vlan 20 and Vlan 100**). |
|  | Notes | You need a **router** connected to the switch using a **trunk** port in order to that all networks could communicate with each other. The difference of **trunk** interface is that the transmission of each packet of traffic is marked by **Vlan** number. This allows the device to forward packets correctly. In the switch, port is configured like this: ***SW-DELTACONFIG-1(config)# interface GigabitEthernet 0/1 switchport mode trunk switchport trunk encapsulation dot1q***  If system doesn’t accept the last line, then **dot1q** mode is the only possible one, and goes by default.  After making all of the steps, connect two workstations to ports belonging to the same **Vlan**, eg with the number 100, set ip addresses **192.168.100.1** and **192.168.100.2**, then use **ping** from one to another. A successful response means that everything works as it should.  Don’t forget **to save** running configuration on all Cisco devices or you will loose all the changes after reboot. Do this with the command “**write**” or “**copy run start**” ***FW-DELTACONFIG-1#write Building configuration... [OK]*** |