CCNA Quick Notes - Switching

1.What are three types of LAN traffic?   Unicasts - intended for one host.   Broadcasts - intended for everyone.   Multicasts - intended for a only a subset or group within an entire network.   2.What are unicast frames?   Unicast frames are the most common type of network traffic. A unicast frame is a frame intended for only one host. The only station that processes this frame is one station that has its own MAC address in the destination portion of packet.   3.What are broadcast frames?   Broadcast frames are frames intended for everyone. Stations view broadcast frames as public service announcements. All stations receive and process broadcast frames. In large networks, broadcasts can cause serious performance degradation in network hosts - (broadcast storm). The destination address of broadcast frames (Data Link / Layer 2 broadcast addresses is FF-FF-FF-FF-FF-FF or alternatively all 1s in binary (11111111).   4.What are multicast frames?   Multicast frames address a group of devices that have a common interest. These frames allow the source to send only one copy of the frame on the network even though it is intended for several stations. Only stations that have a card that is configured by software to receive multicast frames for a particular multicast group can process a frame to that multicast address - all other stations discard multicast frames. An example of a multicast frame is: 01:00:5E:01:01:01/ The "01" at the beginning of the address signifies that it is an Ethernet multicast frame.   5.What three major functions do Data Link Layer / Layer 2 Switches perform?   Address learning   Packet forwarding/filtering   Loop avoidance by spanning tree   6.What will occur when you attempt to segment a network with hubs and repeaters?   Basically, hubs and repeaters become extensions of the physical cable plant. All devices that connect to either a hub or a repeater share the same bandwidth and by definition hubs and repeaters create a single broadcast and collision domain.   Think of both devices are pass-through devices much like a electrical power-strip. Hubs and repeaters reside on the Physical Layer / Layer 1 of the OSI model where they pass 0s and 1s along the wire or up to the Data Link Layer. CSUs / Channel Service Units fall into the same category. All are regarded as unintelligent devices. No addressing takes place on the Physical layer.   7.What is the advantage of segmenting a network with bridges or switches?   Bridges and switches function on the Data Link Layer / Layer 2 of the OSI model and filter by MAC address. Each port on either device provides full, dedicated bandwidth and creates a single collision domain.   Very important: Because bridges and switches operate a Layer 2 -- they cannot filter broadcasts, and they create a single broadcast domain. (Note: each nailed-up port on a switch is a single Collision Domain - there will be a schematic on the exam to test your knowledge on broadcast and collision domains.)   Also, bridges are implemented by software and normally have a couple of network ports; whereas switches are implemented in hardware by ASIC chips and have many ports.   Think Data Link Layer / Layer 2 of the OSI model - physical addresses / MAC addresses   List some advantages Layer 2 switches have over bridges: · High-speed backplane - multiple simultaneous conversations.   · Data-buffering capabilities are used to store-and-forward packets to the correct port(s).   · Lower latency than bridges. Remember that switches are implemented in hardware not software. Much faster.   · Higher port count or density.   8.What are the pros can cons of segmenting a LAN with routers?   Pros: Each interface on a router creates a single broadcast and collision domain. Routers function or operate on the Network Layer / Layer 3 of the OSI model and do not propagate broadcasts*. (* very important concept)   Cons: Routers are not transparent and are implemented in software thereby introducing latency in the network.   Remember: Routers = Network Layer / Layer 3 on the OSI model - Logical addressing (IP address). Functions: Two key functions: routing and switching. The routing component is responsibile for learning and maintaining awareness of the network topology. The switching function is the process of moving packets from an inbound interface (Ethernet 0 for example) to an outbound interface (Serial 0 for example). Path selection is a key term.   9.What three devices are used to segment a LAN?   Router - logical addressing - IP address   Switch - physical addressing - MAC address   Bridge - physical addressing - MAC addres   10.What is microsegmentation?   Each workstation or network device on the network has its own dedicated segment - also known as a Collision Domain - to a switch. Each device gets the segments full bandwidth and does not have to share the dedicated segment with other devices. Collisions are reduced because each segment is its own Collision Domain.   Important: Full-duplex transmission is achieved by microsegmentation. Each device can send and receive at the same time which doubles the amount of bandwidth between nodes.   11.What are the three switching methods in Cisco Catalyst switches?   The three frame operating modes to handle frame switching are   Store-and-forward   Cut-through   Fragment-free   12.What is the Cisco Catalyst store-and-forward switching method?   In the store-and-forward switching method, the switch receives the entire frame before it forwards it. The switch reads the cyclic redundancy check (CRC) to make sure the frame is not bad. If the frame is good, the switch forwards it. Because the switch stores the frame before forwarding it, latency is introduced in the switch. Latency through the switch varies with the size of the frame.   13.What is the Cisco Catalyst cut-through switching method?   In cut-through switching mode, the switch only checks the frame's destination address and immediately begins forwarding the frame out the appropriate port. Because the switch checks the destination address in only the header and not the entire frame, the switch forwards a collision frame

or a frame that has a bad CRC.   14.What is the Cisco Catalyst fragment-free switching method?   Also known as modified cut-through, fragment-free switching checks the first 64 bytes before forwarding the frame. Ethernet specifications state that collisions should be detected during the first 64 bytes of the frame. By reading the first 64 bytes of the frame, the switch can filter most collisions, although late collisions are still possible.   15.What is the default switching mode in Cisco Catalyst 1900 switches?   The default switching mode for the Catalyst 1900 is fragment-free.   16.What is half-duplex transmission mode?   Half-duplex transmission is the default mode that Ethernet functions in. In half-duplex transmission, a device can only send or receive--not do both at once. In half-duplex mode, stations are susceptible to collisions, and efficiency is rated at 50 to 60 percent.   17.What is full-duplex transmission mode?   In full-duplex mode, a station can send and receive at the same time. In full-duplex mode, collision detection is disabled. This mode offers 100 percent efficiency in both directions.   On a Cisco Catalyst 1900 switch, what are the default duplex settings for 10BaseT/100BaseT ports, default switching mode, and default protocols?   The factory default settings for a Catalyst 1900 switch are as follows: · IP address: 0.0.0.0· CDP enabled· Switching mode: fragment-free· 10BaseT ports: half-duplex· 100BaseT ports: autonegotiate· Spanning tree enabled· No console password   18.What are the two configuration modes in a Catalyst 1900 switch?   Configuring a Catalyst 1900 switch is similar to configuring a router. The two configuration modes available are global configuration mode and interface configuration mode.   19.How do you configure an IP address and subnet mask on a Catalyst 1900 switch?   To configure an IP address and subnet mask on a Catalyst 1900 switch, use the ip address address mask global configuration command: Cat1900(config)#ip address 192.168.0.2 255.255.255.0   20.Why would you want to assign an IP address to a Layer 2 device, such as a switch?   You would assign an IP address to a Layer 2 device for management and configuration. With an IP address enabled on a Cisco switch, you can Telnet into it and change the configuration. You can also enable SNMP on the device and remotely monitor the switch.   How do you configure a default gateway on a Cisco Catalyst 1900 switch?   To configure a default gateway on a Catalyst 1900 switch, use the ip default-gateway ip address global configuration command. The following example configures the switch to use IP address 192.168.0.1 as its default gateway: Cat1900(config)#ip default-gateway 192.168.0.1   To remove the default gateway, use the no ip default-gateway command.   21.On a Catalyst 1900 switch, what command can you use to view the switch's IP address, subnet mask, and default gateway?   The show ip command displays the switch's IP address, subnet mask, and default gateway. Here's an example: Cat1900#show ipIP Address: 192.168.0.2   Subnet Mask: 255.255.255.0   Default Gateway: 192.168.0.1   Management VLAN: 1   Domain name: Name server 1: 0.0.0.0   Name server 2: 0.0.0.0   HTTP server : Enabled   HTTP port : 80   RIP : Enabled   Cat1900#   22.How do you change the duplex mode on a Catalyst 1900 switch?   To change the duplex mode on a Catalyst 1900 switch, use this command: duplex {auto full full-flow-control half}   The following example changes the duplex speed for Ethernet interface 1 on the switch to full duplex: Cat1900(config)#interface e0/1   Cat1900(config-if)#duplex full   23.How do you change the duplex mode on a Catalyst 1900 switch?   To change the duplex mode on a Catalyst 1900 switch, use this command: duplex {auto full full-flow-control half}   The following example changes the duplex speed for Ethernet interface 1 on the switch to full duplex: Cat1900(config)#interface e0/1   Cat1900(config-if)#duplex full   24.What command can you use to view the duplex settings and spanning tree state of a Catalyst switch?   You use the show interface type module/port EXEC command to view the duplex settings and spanning tree state. This example shows the output for the show interface command on Ethernet interface 0/1: Cat1900#show interface e0/1   Ethernet 0/1 is Suspended-no-link   beatHardware is Built-in 10Base-TAddress is 0010.F621.F681MTU 1500 bytes, BW 10000 Kbits802.1d   STP State: Forwarding   Forward Transitions: 1   Port monitoring: Disabled   Unknown unicast flooding: Enabled   Unregistered multicast flooding: Enabled   Description:Duplex setting: Full duplex   Back pressure: Disabled   25.What command can you use to check for frame check sequence (FCS) or late collision errors?   The show interface type module/port EXEC command displays FCS or late collision errors. Cat1900#show interface e0/1   Receive Statistics Transmit Statistics   -------------------------------------- --------------------------------------   Total good frames 0 Total frames 0Total octets 0 Total octets 0   Broadcast/multicast frames 0 Broadcast/multicast frames 0Broadcast/multicast octets 0 Broadcast/multicast octets 0Good frames forwarded 0 Deferrals 0Frames filtered 0 Single collisions 0 Runt frames 0 Multiple collisions 0No buffer discards 0 Excessive collisions 0 Queue full discards 0Errors: Errors: FCS errors 0 Late collisions 0 Alignment errors 0 Excessive deferrals 0 Giant frames 0 Jabber errors 0 Address violations 0 Other transmit errors 0   26.How do you display the MAC address table on a Catalyst 1900 switch?   The show mac-address-table EXEC command displays the MAC address table and also tells you whether the MAC address entry is dynamic, permanent, or static. Here's an example: Cat1900#show mac-address-table   Address Dest Interface Type Source Interface List   -- 0080.C6E7.9CEF Ethernet 0/21 Dynamic All0030.80EF.988C Ethernet 0/22 Dynamic All   0040.05A2.5E92 Ethernet 0/11 Dynamic All   27.What are dynamic addresses on a Catalyst switch?   Dynamic addresses are addresses that the switch learns about dynamically through the learning process. If the switch does not see a MAC address for a certain amount of time, it drops the

MAC address.   28.What are permanent MAC addresses on a Catalyst switch?   Permanent MAC addresses are entered manually by the administrator and are not aged out.   On a Catalyst 1900 switch, how do you make a MAC address permanent?   To make a MAC address permanent, use the mac-address-table permanent mac-address type module/port global command. The following example makes MAC address 0080.C6E7.9CEF permanent in the CAM table for port 0/21:   Cat1900(config)#mac-address-table permanent 0080.C6E7.9CEF Ethernet 0/21   29.What is the maximum number of MAC addresses a Catalyst 1900 can store in its MAC address table?   The maximum number of MAC addresses a Catalyst 1900 can store in its MAC address table is 1024. 30.What are static MAC addresses in a Catalyst 1900 switch?   On a Catalyst 1900 switch, static addresses allow you to restrict a MAC address to a specific port.   31.How do you restrict a MAC address to a specific port on a Catalyst 1900 switch?   To restrict a MAC address to a specific port, use the mac-address-table restricted static mac-address type module/port src-if-list global command: Cat1900(config)#mac-address-table restricted static aaaa.aaaa.aaaa e0/1   This restricts MAC address aaaa.aaaa.aaaa to Ethernet port 0/1.   32.What EXEC command can you use to show the port security configurations on a Catalyst 1900 switch? The show mac-address-table security command displays the port security configurations: Cat1900#show mac-address-table security   Action upon address violation : Suspend Interface Addressing Security Address Table Size Clear Address ---   Ethernet 0/1 Disabled N/A NoEthernet 0/2 Disabled N/A NoEthernet 0/3 Enabled 100 NoEthernet 0/4 Disabled N/A NoEthernet 0/5 Disabled N/A NoEthernet 0/6 Disabled N/A NoEthernet 0/7 Disabled N/A NoEthernet 0/8 Disabled N/A NoEthernet 0/9 Disabled N/A No   33.What Catalyst command can you use to display information about the IOS software version and hardware information about the switch?   The show version EXEC command displays the IOS software version and hardware information about the switch. The following example shows the output of the show version command on a Catalyst switch: Cat1900#show version   Cisco Catalyst 1900/2820 Enterprise Edition SoftwareVersion V9.00.04 written from 192.168.000.001Copyright (c) Cisco Systems, Inc. 1993-1999Cat1900 uptime is 0day(s) 01hour(s) 34minute(s) 47second(s)cisco Catalyst 1900 (486sxl) processor with 2048K/1024K bytes of memoryHardware board revision is 1Upgrade Status: No upgrade currently in progress.Config File Status: No configuration upload/download is in progress27 Fixed Ethernet/IEEE 802.3 interface(s)Base Ethernet Address: 00-10-F6-21-F6-80   show version will show up on the exam for sure - router or switch.   34.What Catalyst command do you use to back up the running configuration to a TFTP server? Use the copy nvram tftp://host/dst_file command to back up the running configuration to a TFTP server: Cat1900#copy nvram tftp://192.168.0.3/cat1900.cfg   Configuration upload is successfully completed   Cat1900#   35.How do you restore a configuration file from a TFTP server on a Catalyst 1900 switch?   To restore a configuration file from a TFTP server, use the copy tftp://host/src_file nvram command: Cat1900#copy tftp://192.168.0.3/cat1900.cfg nvram   TFTP successfully downloaded configuration file   Cat1900#   36.What Catalyst 1900 command would you use to restore the switch to its factory settings?   To restore a 1900 series switch to its factory settings, use the delete nvram command. PDF Version | Download