

Test 2: NET3011 – Advanced Switching

Winter 2015

Time: 60 minutes; Test scored out of: 43 Total Marks available: up to 46
(Allocation of marks is shown beside each question)

Instructions:

1. **BEFORE** answering any questions, please check that your copy of the test has all pages (as indicated in the footer at the bottom of each page). Please read all questions carefully, then answer question 0 first!
2. This is a closed book test. No textbooks, notes, electronic devices, or any other aids are permitted.
3. Make note of multi-part questions! Hints or answers *may* be available to assist you with later parts, but you will *not* get any credit for the parts where help is given.
4. Where there is ambiguity, assume that questions are referring to output, configuration, commands, and features on Cisco switches and routers.
5. If you are uncertain what a question is asking, make reasonable assumptions, write those assumptions down on this test paper, and continue answering the question.

0. What is your:

NAME? _____

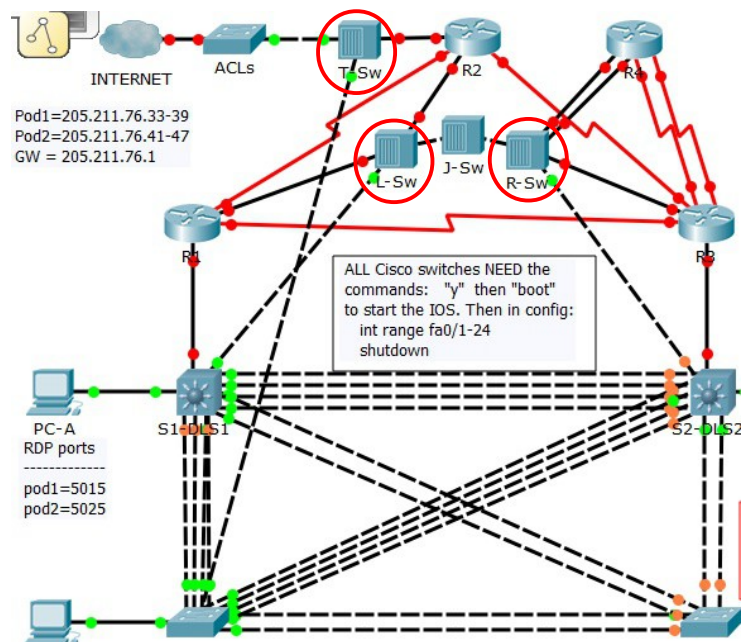
(Continued on next page)

- [1 mark] **Clearly** identify where STP is used within Cisco's 3-layer Hierarchical Network Model.
- [1 mark] What are the possible choices for the VTP mode when using pVLANs on 3560s?
- [1 mark] **Clearly** explain why a switch running MST in an all-Cisco environment is very likely to become the root bridge if all other switches are running RSTP.
- [1 mark] Use **clear**, concise wording to identify which VLAN carries traffic along the path to its destination in a pVLAN setup.
- [2 marks] NetLab is designed to be totally flexible, without imposing any restrictions on choice of IP addresses, VLANs, sub-interfaces, etc.

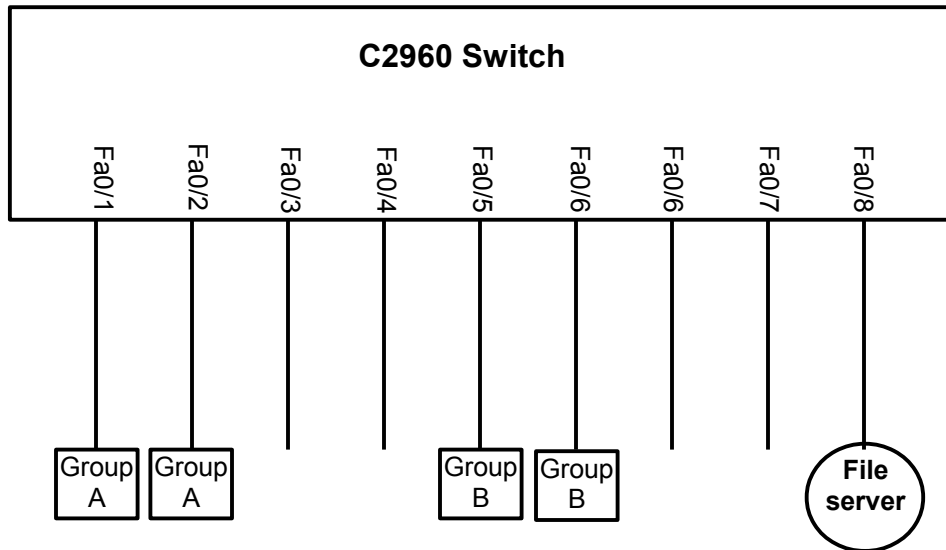
For implementing NetLab, a set of cheap \$10 switches is used to create extra connectivity (ie. "T-Sw", "L-Sw", "R-Sw" as circled). These switches are "dumb" and do nothing other than forward traffic based on destination MAC. They're used despite the availability of plenty of spare ports on the 2950 "ACLs" switch which could be used with 3 separate VLANs.

Why was this choice **necessary**?

(Hint: Hopefully you paid attention during the pVLAN lab, where you joined two 3560 switches with a 29xx switch in the middle. What was needed for things work to?)



6. [4 marks] Show your mastery of pVLAN concepts by implementing a simplified version of a pVLAN on a 2960 switch, using one or more protected ports. Draw on the diagram below and label ports to **clearly** indicate how to create the equivalent of two different communities which both access a file server.



[2 marks] If you've answered the question correctly, there may be a problem with the switch receiving unexpected or "conflicting" BPDUs. What command will completely eliminate BPDUs to solve this problem? **Give** the (kind of) command, and the required CLI context.

7. [3 marks] "Flexlinks" have at least one major advantage over all other redundancy technologies that we studied. They also have at least one distinct disadvantage. Finally, they have potential "danger" to the proper functioning of the network. **Clearly** explain each.

8. [6 marks] You've hopefully memorized the steps in the STP port election process:

To elect the **root port**, the following criteria are used in order:

1. Accumulated Cost to Root bridge
2. Bridge ID
3. Port ID (of sender)
4. Port ID (of local switch)

To elect the **designated port**, the following criteria are used in order:

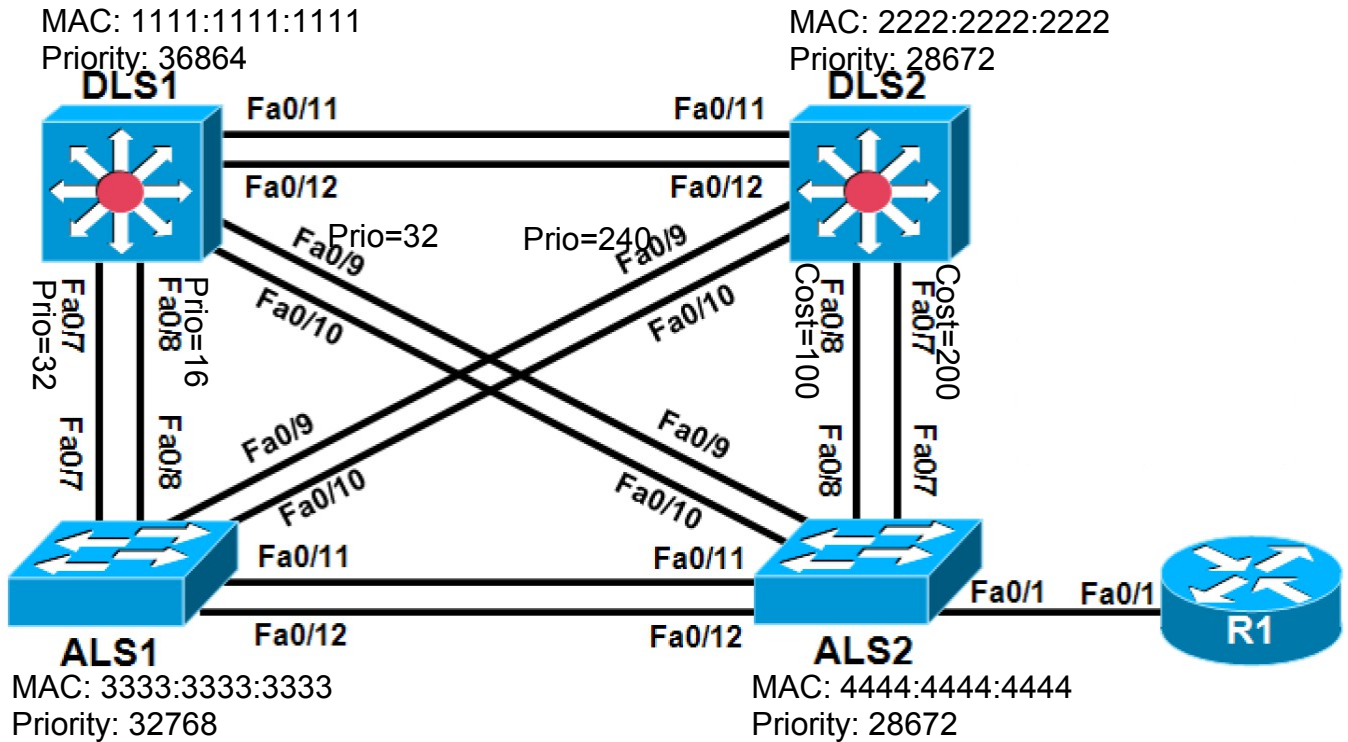
- Lowest cost to root
5. Bridge ID
6. Port ID

To prove your understanding of these elections, draw 1-2 (or more) small topology diagrams and **clearly** identify **where** in the topology each rule becomes the tie-breaker in the election process.

9. A. [2 marks] Ensuring and protecting the placement of the root bridge within a network topology is important from both the perspective of performance as well as security. **Clearly** explain the reasons why.

B. [1 mark] What STP command protects lower-level bridges from "over-throwing" the root bridge?

11. Study the topology diagram below carefully. All parameters are at default unless indicated.



A. [1 mark] ALS2 uses all default settings except that Fa0/1 is set as portfast. Does R1 receive BPDUs?

B. [2 marks; 1 per pair] Identify the STP role for every device and port in the topology:
 1. Circle the root bridge. 2. Draw the letter R(oot), D(esigned), or B(lock)

C. [2 marks] I do not want any odd numbered ports as Root ports. What change(s) can satisfy this requirement (other than shutting down the port!)

12. A. [1 mark] What is the primary technical reason for using portfast?

B. [2 marks] There are four different combinations / variations for deploying of portfast. **Clearly** identify the four, **and** identify the response upon receiving a BPDU.

13. [3 marks] STP has three port roles: blocking, designated, root. RSTP adds two more port roles. **Name** the new roles, and then **clearly** define or explain each one. [Hint available]

B. [1 mark] The two new RSTP port roles don't exist in 802.1D. In what state would these same ports be if 802.1D is running instead of RSTP?

14. [2 marks] If you've studied properly for this test, there must surely be a question you were expecting that has not been asked. **Clearly** state a **security-related question** and the correct answer. The question must be worth (at least) two marks, and must not be a repeat from a previous test this semester.

Additional work, notes, or rough work