Test 1: NET3011 – Advanced Switching
Winter 2014

Time: 50 minutes; Test scored out of: 45   Total Marks available: at least 46
(Allocation of marks is shown beside each question)

Instructions:

1. <u>BEFORE</u> 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. (The only exception is ASL interpreters.)

3. 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? _____

1. [1 mark] Cisco uses the terms "Layer 2 switch" and "Layer 3 switch". What capability does a Layer 3 switch have that a Layer 2 switch does **not**? [Ref: Ch 1, p. 12]

2. [3 marks] What are the steps that a switch performs when processing a frame? The steps should include the possibility that the frame traverses a trunk link. [Ref: Quiz 1]

3. [2 marks] **Name** and **clearly** describe & differentiate the last two phases of the PPDIOO model. (They both start with "O"; what are they and what's the *difference* between them??)

4. [1 mark] According to Cisco's definitions (contained in the textbook), is Algonquin a:

    (A) small campus network
    (B) medium campus network
    (C) large campus network
    (D) none of the above (a trick question because of the wording of all the answers A-C)

5. [2 marks] What are the exact commands required to capture the <u>complete</u> configuration of a switch?

6. [2 marks] The diagram below shows a small network of 2960 switches running STP. There are two **separate**, **independent** scenarios. In scenario #1 (on the left), only the configuration of the port costs for fa0/1 and fa0/2 are changed. In scenario #2 (on the right), only the configuration of the port priorities fa0/1 and fa0/2 are changed. **Clearly** indicate for each scenario (left, right), which STP port states <u>could</u> change as a result of the configuration. If it helps, you may assume that Switch 1 is the root switch. [Ref: Lab 3.2]
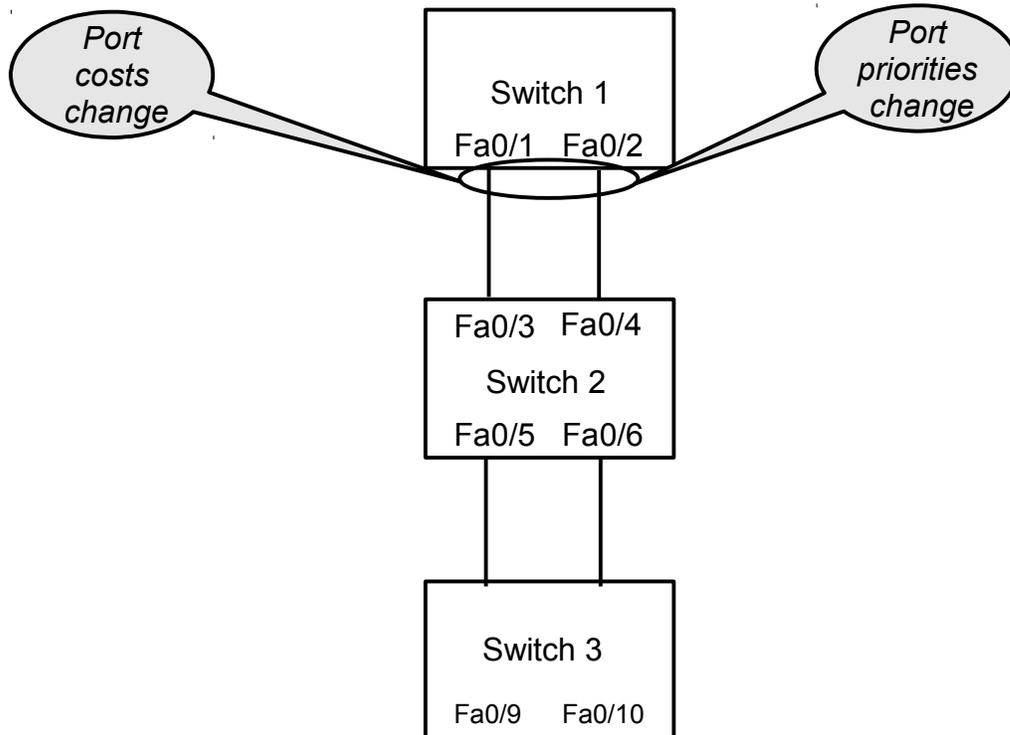
7. [2 marks] The diagram below shows a small network of 2960 switches running STP. There are two **separate**, **independent** scenarios. In scenario #1 (on the left), only the configuration of the port costs for fa0/3 and fa0/4 are changed. In scenario #2 (on the right), only the configuration of the port priorities fa0/3 and fa0/4 are changed. **Clearly** indicate for each scenario (left, right), which STP port states _could_ change as a result of the configuration. If it helps, you may assume that Switch 1 is the root switch. [Ref: Lab 3.2]
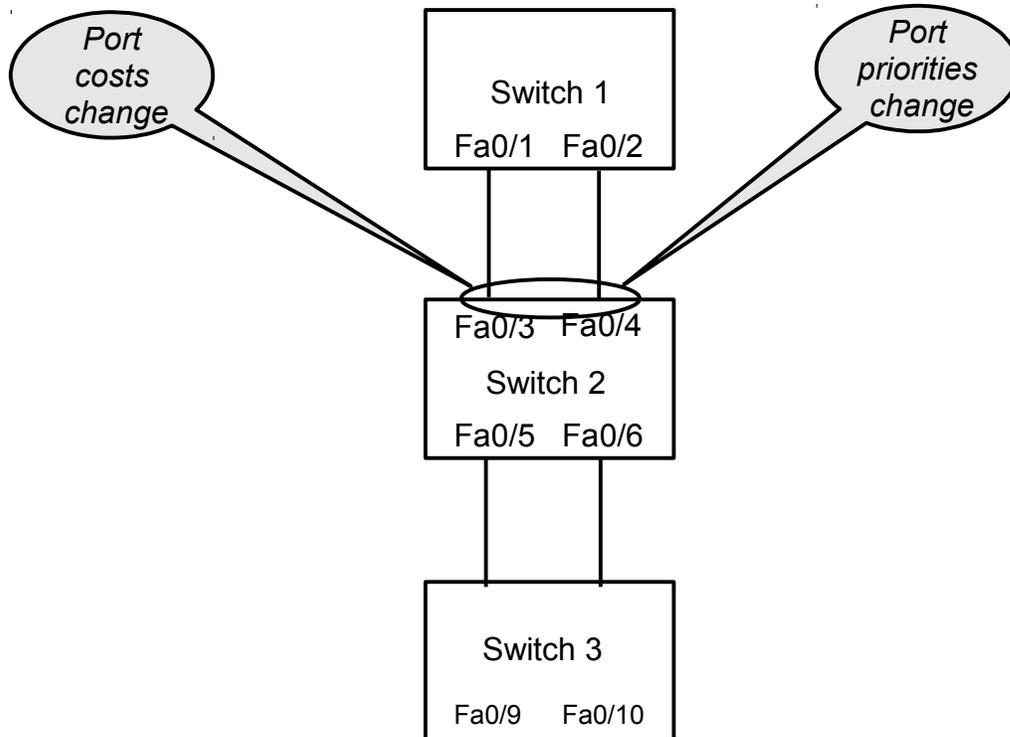

8. [4 marks] Your co-worker is trying to get a promotion, so he took the Boss out for lunch & a round of golf, and talked about boosting the entire company's bandwidth using link aggregation. He told the Boss that configuring link aggregation on any Cisco switch is completely foolproof and guaranteed to increase the usable bandwidth under all conditions. The Boss has given you 2 days and a staff of 1st year BIT-NET students to boost all network speeds. What could possibly go wrong?? Separate your answer into specific items.

    [1 mark per item in the list below]

9. Study the diagram below carefully. It shows a Cisco 2960 switch with 3 ports using the basic protected port feature, and three ports in VLAN 10. All other settings are at their default. [Ref: pVLAN quiz]

[1 mark] On which interfaces, if any, will VLAN tags be present in the frames?

[3 marks] **Label** each interface with its **equivalent pVLAN functionality**. Be as specific as possible.
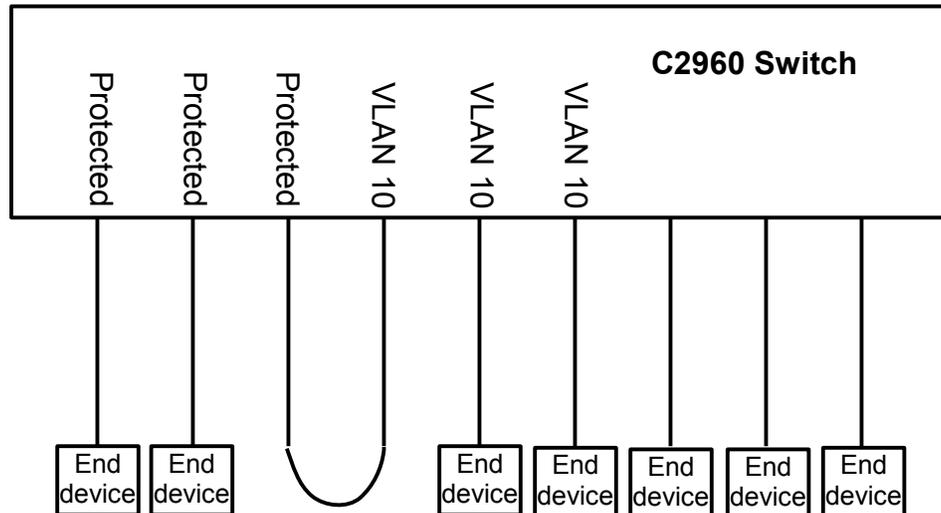
10. [1 mark] In a pVLAN configuration on a single Cisco 3560 switch, such as the one in Lab 2.9, which of the interfaces has VLAN tags present in the frames? [Ref: Lab 2.9]

11. [2 marks] You need to back up the VLAN configuration for a dozen (or more) network switches, which are all cascaded in one long chain. Your colleague says that all VLAN configs are identical to the root bridge, which is in VTP server mode. To prove it, he creates a new VLAN on that switch and then new VLAN appears on the very last switch in the chain. What do you say? Explain and justify your answer, whether you agree or disagree!

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12. A. [5 marks] We have discussed 5 different categories for VLANs. Give the name and **clearly** describe each of the 5 categories. Include specific VLAN numbers and example protocols where appropriate.

B. [2 marks] One of the VLAN categories above *shouldn't* have any traffic flowing into it. Which category is it? **Clearly** explain why we don't expect any traffic.

C. [1 mark] In several labs this semester, starting with Lab 1.2, you've used a shortcut command which allows you to configure multiple interfaces all at once. What is this command? (eg. for configuring interfaces fa0/1 – fa0/24)

13. A. [1 mark] We have discussed two different models or architectures for VLAN design. Which one requires trunking?

B. [1 mark] Can trunking be used over an etherchannel link? [Ref: lab work]

C. [1 mark] In Cisco's "Heirarchical Campus Model", is trunking used at the Access layer? If yes, identify **clearly and specifically** where it is used. [Ref: p. 29-30]

D. [1 mark] In Cisco's "Heirarchical Campus Model", is trunking typically used at the Core layer? If yes, identify **clearly and specifically** where it is used. [Ref: p. 30-31]

E. [2 marks] What are the recommended Best Practices for VLAN design that relate to trunking? You **must** give supporting info (for example, the reason) for each recommendation! [Ref: VLANs slide 8]

14. [2 marks] **Clearly** identify all **necessary** conditions for VLAN information to be exchanged between a pair of switches.

15. [4 marks] Some 2nd year BIT-NET students are discussing VLANs. Unfortunately they are confused about the maximum number of VLANs. Some students say the maximum is 64, others say 1000, others say 1005, and one student even says 4096. To prove that you're smarter (ie. a 3rd year student!!), **clearly** explain the correct answer and respond to **each** student so that s/he can go away **not** feeling like a complete fool.

16. [2 marks] Complete the DTP chart below, to show the result when combining each possible combination of DTP modes. Be sure to use the **correct** term for the resulting state, and indicate any problematic combination(s). [Ref: slide Ch 2-32]

Extra Work

[max 3 marks] Bonus question for following the instructions: Discuss, with <u>insightful</u> comments, any of the four short videos that you have been asked to watch. Use the space above.