

Stormy Traffic (Instructor Version)

Instructor Note: Red font color or Gray highlights indicate text that appears in the instructor copy only.

Objective

Explain the purpose of the Spanning Tree Protocol (STP) in a switched LAN environment with redundant switch links.

Instructor Notes:

- Spanning Tree Protocol (STP) and its variations are the focus of this chapter. This modeling activity is designed to help students realize that a switched network can be shaped using STP or its variations.
- This activity can be completed individually, in small groups, or as a class.

Scenario

It is your first day on the job as a network administrator for a small- to medium-sized business. The previous network administrator left suddenly after a network upgrade took place for the business.

During the upgrade, a new switch was added. Since the upgrade, many employees complain that they are having trouble accessing the Internet and servers on your network. In fact, most of them cannot access the network at all. Your corporate manager asks you to immediately research what could be causing these connectivity problems and delays.

So you take a look at the equipment operating on your network at your main distribution facility in the building. You notice that the network topology seems to be visually correct and that cables have been connected correctly, routers and switches are powered on and operational, and switches are connected together to provide backup or redundancy.

However, one thing you do notice is that all of your switches' status lights are constantly blinking at a very fast pace to the point that they almost appear solid. You think you have found the problem with the connectivity issues your employees are experiencing.

Use the Internet to research STP. As you research, take notes and describe:

- Broadcast storm
- Switching loops
- The purpose of STP
- Variations of STP

Complete the reflection questions that accompany the PDF file for this activity. Save your work and be prepared to share your answers with the class.

Resources

- Internet access to the World Wide Web

Reflection

1. What is a definition of a broadcast storm? How does a broadcast storm develop?

A broadcast storm develops when switches forward traffic out of all ports while looking for a destination for the traffic. It develops when switches continuously forward traffic between themselves without time to block interfaces on the switches to create one good path to the destination.

2. What is a definition of a switching loop? What causes a switching loop?

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A switching loop forms when redundancy is present on switches and the paths formed create a circle of delivery. Packets travel endlessly along the redundant paths, particularly with multicast and broadcast traffic. This causes a myriad of traffic on the network, causing hosts to have problems accessing the network.

3. How can you mitigate broadcast storms and switching loops caused by introducing redundant switches to your network?

Implement STP or one of its variations. Create VLANs to limit broadcast domains. Check physical connections to make sure that cabling is correct so that switches are not perpetuating broadcasts and routing loops within your network.

4. What is the IEEE standard for STP and some other STP variations, as mentioned in the hyperlinks provided?

802.1D (STP), 802.1W (RSTP), and 802.1I (MST)

5. In answer to this scenario, what would be your first step (after visually checking your network) to correcting the described network problem?

Three answers would be appropriate for this question.

- A network protocol analyzer could be used to check and map network traffic, thus identifying what kind of network problem is present.
- Removing the new switch and its cables to isolate the problem might be a troubleshooting step.
- Checking each switch to make sure that STP is operational is another possible troubleshooting step.

Identify elements of the model that map to IT-related content:

- Spanning Tree Protocol (STP)
- Broadcast storms
- Switching loops
- IEEE STP standards (802.1D, 802.1S, 802.1I)