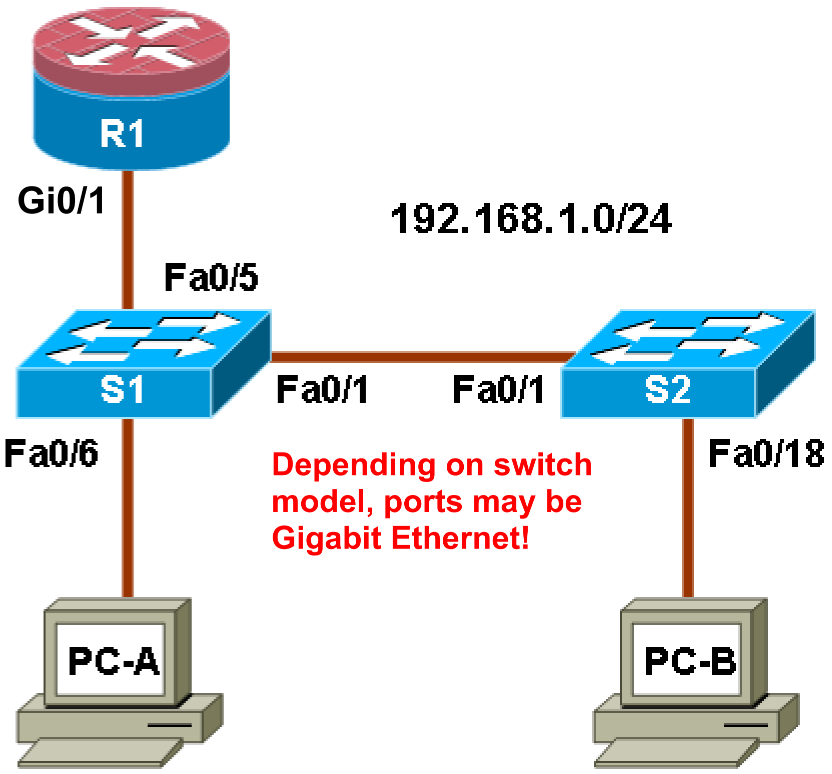
From: CCNA Security

# *Chapter 6 Lab A: Using Cisco SPAN*

The purpose of this lab is to become more familiar with some essential tools for network administration and trouble-shooting.

## Topology



**Depending on switch model, ports may be Gigabit Ethernet!**

Note the port numbers! Commands in this lab are provided based on the port numbers as shown. (Post-lab questions may refer to these ports.)

## IP Addressing Table

| Device | Interface | IP Address | Subnet Mask | Default Gateway | Switch Port |
|---|---|---|---|---|---|
| R1 | Fa0/1 | 192.168.1.1 | 255.255.255.0 | N/A | S1 FA0/5 |
| S1 | VLAN 1 | 192.168.1.2 | 255.255.255.0 | N/A | N/A |
| S2 | VLAN 1 | 192.168.1.3 | 255.255.255.0 | N/A | N/A |
| PC-A | NIC | 192.168.1.10 | 255.255.255.0 | 192.168.1.1 | S1 FA0/6 |
| PC-B | NIC | 192.168.1.11 | 255.255.255.0 | 192.168.1.1 | S2 FA0/18 |

## Objectives

Part 4: Configure SPAN and Monitor Traffic

- Configure Switched Port Analyzer (SPAN).
  - Monitor port activity using Wireshark.

## Background

The Layer 2 (Data Link) infrastructure consists mainly of interconnected Ethernet switches. Most end-user devices, such as computers, printers, IP phones and other hosts, connect to the network via Layer 2 access switches. As a result, they can present a network security risk. Similar to routers, switches are subject to attack from malicious internal users. The switch Cisco IOS software provides many security features that are specific to switch functions and protocols.

In this lab [...] you use Cisco SPAN to monitor traffic to specific ports on the switch.

**Note:** The router commands and output in this lab are from a Cisco 1841 with Cisco IOS Release 12.4(20)T (Advanced IP image). The switch commands and output are from a Cisco WS-C2960-24TT-L with Cisco IOS Release 12.2(46)SE (C2960-LANBASEK9-M image). **Other routers, switches, and IOS versions may be used**. See the Router Interface Summary table at the end of the lab to determine which interface identifiers to use based on the equipment in the lab. Depending on the router or switch model and IOS version, the commands available and output produced might vary from what is shown in this lab.

**Note:** Make sure that the router and the switches have been erased and have no startup configurations.

## Required Resources

- One router (Cisco 1841 with Cisco IOS Release 12.4(20)T1 or comparable)
- Two switches (Cisco 2960 or comparable with cryptography IOS image for SSH support – Release 12.2(46)SE or comparable)
- PC-A (Windows XP or Vista with a PuTTY SSH client and Wireshark)
- PC-B (Windows XP or Vista with a PuTTY SSH client and SuperScan)
- Ethernet cables as shown in the topology
- Rollover cables to configure the switches via the console

## Part 4: Configure SPAN and Monitor Traffic

Cisco IOS provides a feature that can be used to monitor network attacks called Switched Port Analyzer (SPAN). Cisco IOS supports local SPAN and remote SPAN (RSPAN). With local SPAN, the source VLANs, source switch ports, and the destination switch ports are on the same physical switch.

In this part of the lab, you configure a local SPAN to copy traffic from one port where a host is connected to another port where a monitoring station is connected. The monitoring station will run the Wireshark packet sniffer application to analyze traffic.

**Note:** SPAN allows you to select and copy traffic from one or more source switch ports or source VLANs onto one or more destination ports.

## Task 0: Configure the Network

### Step 1: Configure the network as per the topology diagram on the first page

## Task 1: Configure a SPAN Session

### Step 1: Configure a SPAN session on S1 with a source and destination

a. Set the SPAN source interface using the **monitor session** command in global configuration mode. The following configures a SPAN source port on FastEthernet 0/5 for ingress and egress traffic. Traffic copied on the source port can be ingress only, egress only or both. Switch S1 port Fa0/5 is connected to router R1, so traffic to (ingress) and from (egress) switch port Fa0/5 to R1 will be monitored.

```
S1(config)#monitor session 1 source interface fa0/5 both
```

**Note:** You can specify to monitor tx (transmit) or rx (receive) traffic. The keyword **both** includes tx and rx. The source can be a single interface, a range of interfaces, a single VLAN, or a range of VLANs.

b. Set the SPAN destination interface.

```
S1(config)#monitor session 1 destination interface fa0/6
```

All traffic from S1 Fa0/5, where R1 is connected, will be copied to the SPAN destination port Fa0/6, where PC-A with Wireshark is connected.

**Note:** The destination can be an interface or a range of interfaces.

### Step 2: Verify the setup of the SPAN session on S1.

Confirm the SPAN session setup.

```
S1#show monitor session 1

Session 1
---------
Type                    : Local Session
Source Ports            :
    Both                : Fa0/5
Destination Ports       : Fa0/6
    Encapsulation       : Native

          Ingress       : Disabled
```

### Step 3: Ensure Wireshark is installed on PC-A.

a. Ensure Wireshark is installed on the PC.  If not, download and install it.

### Step 4: Monitor switch S1 port Fa0/5 ping activity using Wireshark on PC-A.

a. Start Wireshark.

b. From the main menu, select **Capture > Interfaces**.
Note: Be sure to choose all required options in order to be sure of seeing all traffic.

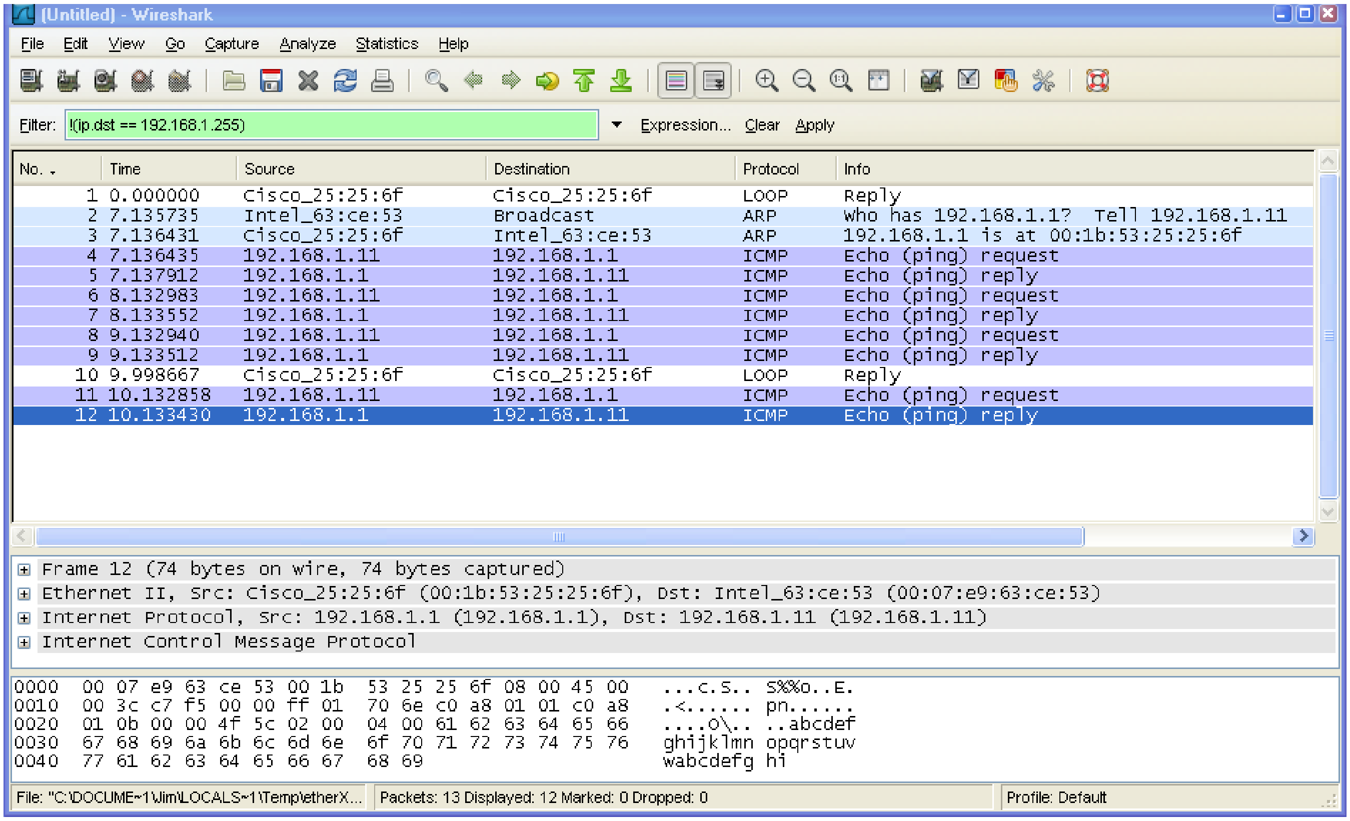
c. Click the **Start** button for the local area network interface adapter with IP address 192.168.1.10.

d. Generate some traffic from PC-B (192.168.1.11) to R1 interface Fa0/1 (192.168.1.1) using **`ping`**. This traffic will go from S2 port Fa0/18 to S2 port Fa0/1 across the trunk link to S1 port Fa0/1 and then exit interface Fa0/5 on S1 to reach R1.

```
PC-B:\>ping 192.168.1.1
```

e. Observe the results in Wireshark on PC-A. You may observe an initial ARP request broadcast from PC-B (Intel NIC) to determine the MAC address of the R1 Fa0/1 interface with IP address 192.168.1.1 and the ARP reply from the R1 Cisco Ethernet interface. After the ARP request, the pings (echo request and replies) can be seen going from PC-B to R1 and from R1 to PC-B through the switch.

**Note:** Your screen should look similar to the one below. Some additional packets might be captured in addition to the pings, such as the R1 Fa0/1 LOOP reply.



Filter: !(ip.dst == 192.168.1.255)

```
No. .  Time       Source             Destination        Protocol  Info
    1 0.000000   Cisco_25:25:6f     Cisco_25:25:6f     LOOP      Reply
    2 7.135735   Intel_63:ce:53     Broadcast          ARP       Who has 192.168.1.1?  Tell 192.168.1.11
    3 7.136431   Cisco_25:25:6f     Intel_63:ce:53     ARP       192.168.1.1 is at 00:1b:53:25:25:6f
    4 7.136435   192.168.1.11       192.168.1.1        ICMP      Echo (ping) request
    5 7.137912   192.168.1.1        192.168.1.11       ICMP      Echo (ping) reply
    6 8.132983   192.168.1.11       192.168.1.1        ICMP      Echo (ping) request
    7 8.133552   192.168.1.1        192.168.1.11       ICMP      Echo (ping) reply
    8 9.132940   192.168.1.11       192.168.1.1        ICMP      Echo (ping) request
    9 9.133512   192.168.1.1        192.168.1.11       ICMP      Echo (ping) reply
   10 9.998667   Cisco_25:25:6f     Cisco_25:25:6f     LOOP      Reply
   11 10.132858  192.168.1.11       192.168.1.1        ICMP      Echo (ping) request
   12 10.133430  192.168.1.1        192.168.1.11       ICMP      Echo (ping) reply
```

```
⊞ Frame 12 (74 bytes on wire, 74 bytes captured)
⊞ Ethernet II, Src: Cisco_25:25:6f (00:1b:53:25:25:6f), Dst: Intel_63:ce:53 (00:07:e9:63:ce:53)
⊞ Internet Protocol, Src: 192.168.1.1 (192.168.1.1), Dst: 192.168.1.11 (192.168.1.11)
⊞ Internet Control Message Protocol
```

```
0000  00 07 e9 63 ce 53 00 1b  53 25 25 6f 08 00 45 00   ...c.S.. S%%o..E.
0010  00 3c c7 f5 00 00 ff 01  70 6e c0 a8 01 01 c0 a8   .<...... pn......
0020  01 0b 00 00 4f 5c 02 00  04 00 61 62 63 64 65 66   ....O\.. ..abcdef
0030  67 68 69 6a 6b 6c 6d 6e  6f 70 71 72 73 74 75 76   ghijklmn opqrstuv
0040  77 61 62 63 64 65 66 67  68 69                     wabcdefg hi
```

File: "C:\DOCUME~1\Jim\LOCALS~1\Temp\etherX... Packets: 13 Displayed: 12 Marked: 0 Dropped: 0 Profile: Default

## Step 6: Dig Deeper

Make sure you dig deeper into the results. Run some "show …" commands to get extra info, capture the output and then save it for answering potential post-lab questions!

- show the status of (all) monitoring sessions (mainly for confirmation and documentation purposes)
- show the state (brief) of all interfaces What is the state of the SPAN destination interface (up or down)?
- show the state (full details) of the SPAN destination interface What is the SPAN destination state?
- show all the dynamic entries in the MAC address table. How many exist for SPAN destination interface?
- show and record anything else that you find interesting, unusual, or unexpected.