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## Table of Contents

CCIE Routing & Switching

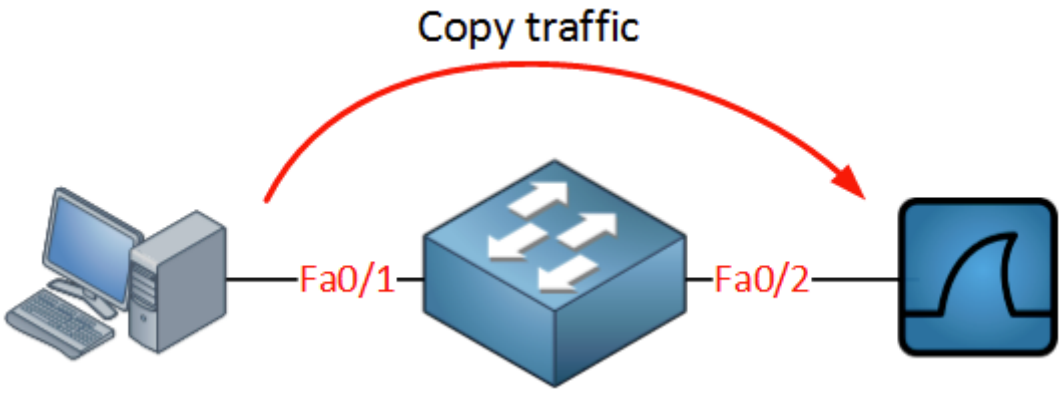
# Cisco IOS SPAN and RSPAN


Cisco Catalyst Switches have a feature called SPAN (Switch Port Analyzer) that lets you **copy all traffic from a source port or source VLAN** to a destination interface. This is very useful for a number of reasons:

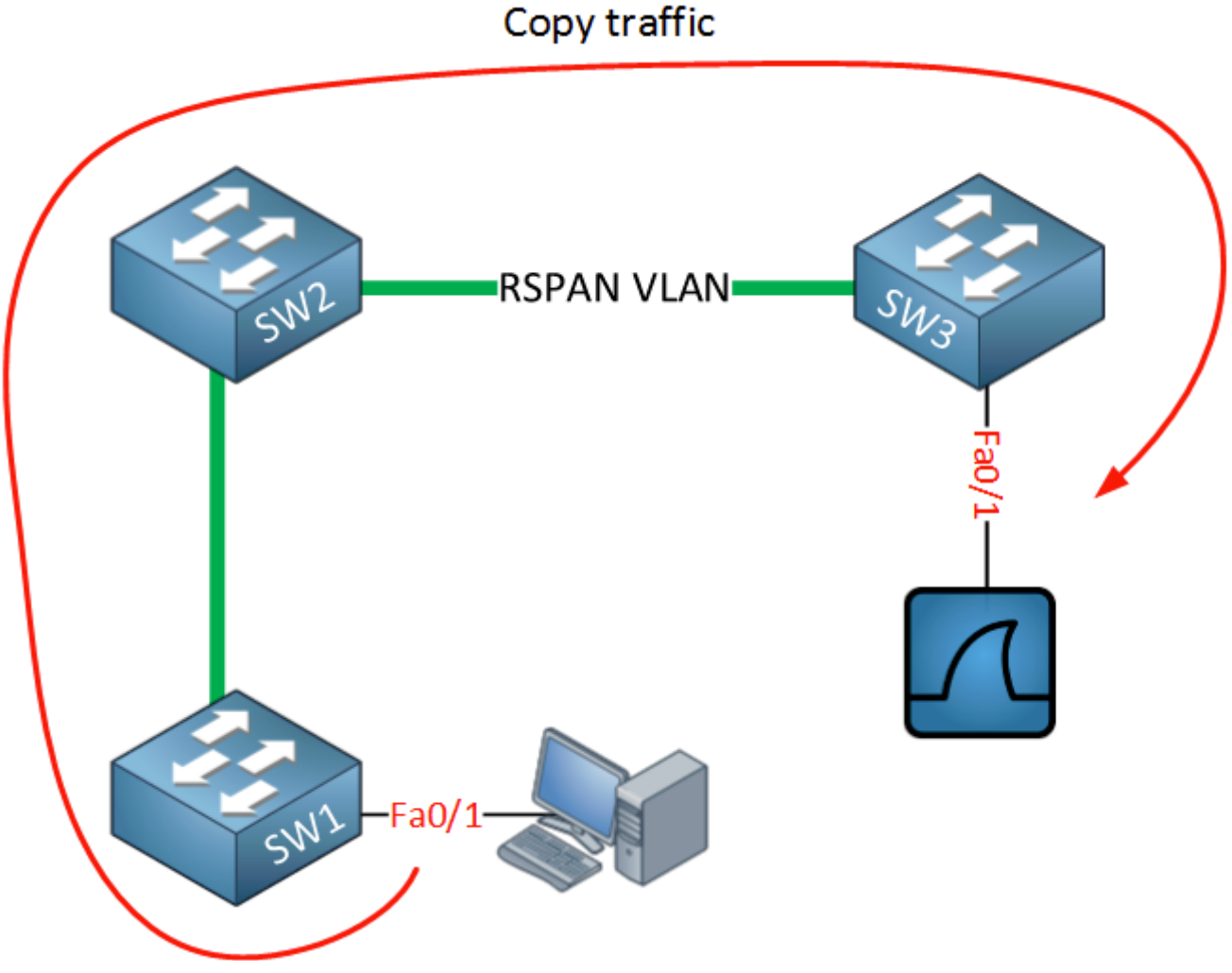
- If you want to use wireshark to capture traffic from an interface that is connected to a workstation, server, phone or anything else you want to sniff.
- Redirect all traffic from a VLAN to an IDS / IPS.

- Redirect all VoIP calls from a VLAN so you can record the calls.

The source can be an interface or a VLAN, the destination is an interface. You can choose if you want to forward **transmitted, received or both directions** to the destination interface.




When you use a destination interface on the same switch as your switch we call it SPAN, when the destination is a remote interface on another switch we call it **RSPAN** (Remote SPAN). When using RSPAN you need to use a VLAN for your RSPAN traffic so that traffic can travel from the source switch to the destination switch.



When you use RSPAN you need to use a VLAN that carries the traffic that you are copying. In the picture above you see SW1 which will copy the traffic from the computer onto a "RSPAN VLAN". SW2 doesn't do anything with it while SW3 receives the traffic and forwards it to a computer that has wireshark running. Make sure the trunks between the switches **allow the RSPAN VLAN**.

SPAN and RSPAN are great but there are a couple of things you need to keep in mind...

## Restrictions

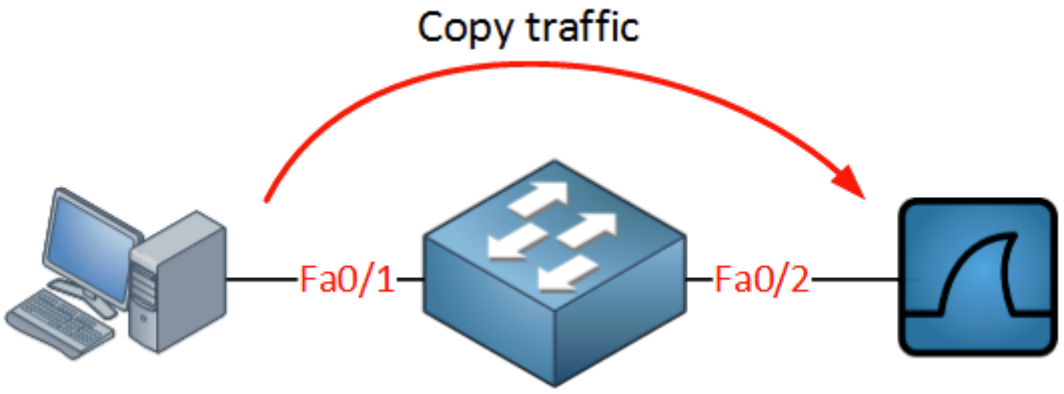
Both SPAN and RSPAN have some restrictions, I'll give you an overview of the most important ones:

- The source interface can be anything...switchport, routed port, access port, trunk port, etherchannel, etc.
- When you configure a trunk as the source interface it will copy traffic from all VLANs, however there is an option to filter this.
- You can use multiple source interfaces or a single VLAN, but you can't mix interfaces and VLANs.
- It's very simple to overload an interface. When you select an entire VLAN as the source and use a 100Mbit destination interface...it might be too much.
- When you configure a destination port you will "lose" its configuration. By default, the destination interface will only be used to forward SPAN traffic to. However, it can be configured to permit incoming traffic from a device that is connected to the destination interface.
- Layer 2 frames like CDP, VTP, DTP and spanning-tree BPDUs are not copied by default but you can tell SPAN/RSPAN to copy them anyway.

This should give you an idea of what SPAN / RSPAN are capable of. The configuration is pretty straight-forward so let me give you some examples...

## SPAN Configuration

Let's start with a simple configuration. I will use the example I showed you earlier:




```
Switch(config)#monitor session 1 source interface fa0/1
Switch(config)#monitor session 1 destination interface fa0/2
```

You can verify the configuration like this:

```
Switch#show monitor session 1
Session 1
---------
Type                   : Local Session
Source Ports           :
    Both               : Fa0/1
Destination Ports      : Fa0/2
    Encapsulation      : Native
          Ingress      : Disabled
```

As you can see, by default it will copy traffic that is transmitted and received (both) to the destination port. If you only want the capture the traffic going in one direction you have to specify it like this:

```
Switch(config)#monitor session 1 source interface fa0/1 ?
  ,     Specify another range of interfaces
  -     Specify a range of interfaces
  both  Monitor received and transmitted traffic
  rx    Monitor received traffic only
  tx    Monitor transmitted traffic only
```

Just add rx or tx and you are ready to go. If interface FastEthernet 0/1 were a trunk you could add a filter to select the VLANs you want to forward:

```
Switch(config)#monitor session 1 filter vlan 1 - 100
```

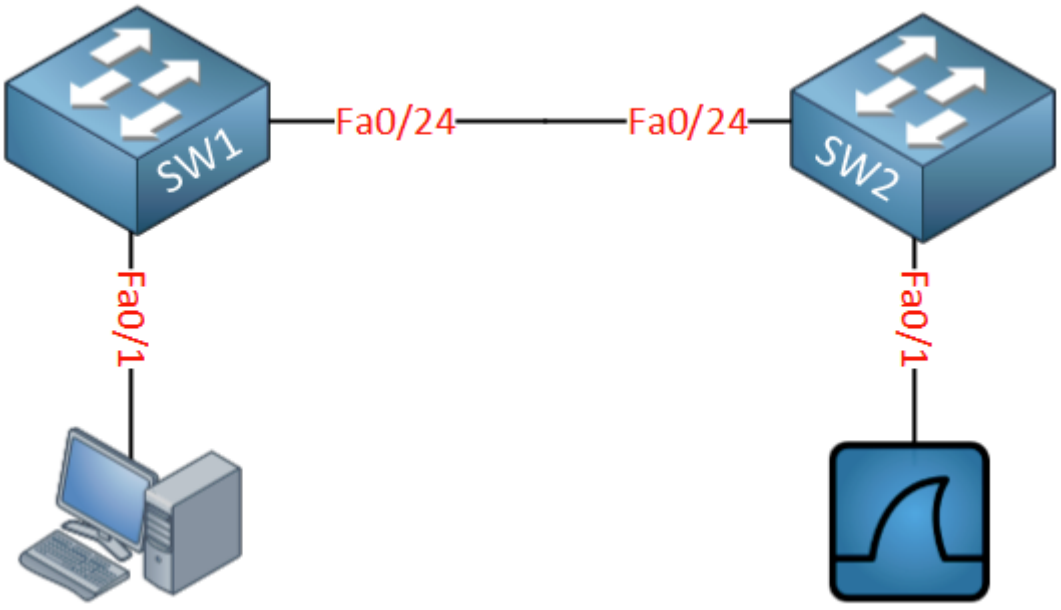
This filter above will only forward VLAN 1 – 100 to the destination. If you don't want to use an interface as the source but a VLAN, you can do it like this:

```
Switch(config)#monitor session 2 source vlan 1
Switch(config)#monitor session 2 destination interface fa0/3
```

I am unable to use session 1 for this because I am already using source interfaces for that session. It's also impossible to use the same destination interface for another session. This is why I created another session number and picked FastEthernet 0/3 as a destination. So far so good? Let's look at RSPAN!

## RSPAN Configuration

To demonstrate RSPAN I will use a topology with two switches:




The idea is to forward traffic from FastEthernet 0/1 on SW1 to FastEthernet 0/1 on SW2. There are a couple of things we have to configure here:

```
SW1(config)#vlan 100
SW1(config-vlan)#remote-span
```

```
SW2(config)#vlan 100
SW2(config-vlan)#remote-span
```

First we need to create the VLAN and tell the switches that it's a RSPAN vlan. This is something that is easily forgotten. Secondly we will configure the link between the two switches as a trunk:

```
SW1(config)#interface fastEthernet 0/24
SW1(config-if)#switchport trunk encapsulation dot1q
SW1(config-if)#switchport mode trunk
```

```
SW2(config)#interface fastEthernet 0/24
SW2(config-if)#switchport trunk encapsulation dot1q
SW2(config-if)#switchport mode trunk
```

Now we can configure RSPAN:

```
SW1(config)#monitor session 1 source interface fastEthernet 0/1
SW1(config)#monitor session 1 destination remote vlan 100
```

This selects FastEthernet 0/1 as the source and VLAN 100 as the destination...

```
SW2(config)#monitor session 1 source remote vlan 100
SW2(config)#monitor session 1 destination interface fastEthernet 0/1
```

And on SW2, we select VLAN 100 as the source and FastEthernet 0/1 as its destination. Here's the output of the show monitor session command:

```
SW1#show monitor session 1
Session 1
---------
Type                   : Remote Source Session
Source Ports           :
    Both               : Fa0/1
Dest RSPAN VLAN        : 100
```

```
SW2#show monitor session 1
Session 1
```

```
---------
Type                    : Remote Destination Session
Source RSPAN VLAN       : 100
Destination Ports       : Fa0/1
    Encapsulation       : Native
          Ingress       : Disabled
```

That's all there is to it. I hope this example has been helpful to you!

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- May 31, 2014 at 18:57 #11871 Reply

Andy
Thanks, Rene. Do you think its worth to taught us about ERSPAN?

November 4, 2015 at 10:00 #19505 Reply

sze jie k
Participant
Hi Rene,

I am unable to understand what is the maximum SPAN session limit ?

a) how many src / dst ports can be included in a SPAN session

b) if we specify session 1 for both src and destination, does that means that only 1 session is used up ? or src = 1 session, dst = 1 session total = 2 session

c) what is the maximum limit of SPAN session that can be created ? (is it base on src, destination combi or ?)

You can take 2960x as a reference.  Try reading the manual but can't figure the exact meaning out

Regards,

Alan

November 4, 2015 at 20:43 #19515 Reply

Rene Molenaar
Keymaster
Hi Alan,

Good question...only thing I could find is this document:

http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst2960x/software/15-0_2_EX/network_management/configuration_guide/b_nm_15ex_2960-x_cg/b_nm_15ex_2960-x_cg_chapter_0111.html#concept_A4AB227AC35840A1ACE51453EDBACD3E

a) It doesn't specify anything about the number of interfaces, only the number of sessions.

b) For a single session, you specify a source + destination so that's one session.

c) maximum of 4 (2 if switch is stacked with Catalyst 2960-S switches) source sessions and 64 RSPAN destination sessions. A source session is either a local SPAN session or an RSPAN source session.

Rene

January 7, 2016 at 01:09 #20753 Reply

SINAN A
Participant
Hello Rene,

As a CCIE course for SPAN & RSPAN , i think you need to add ERSPAN also to the CCIE course on SPAN &RSPAN , because this course is the same as in the Switching CCNP. Please clarified about that.

January 7, 2016 at 13:25 #20767 Reply

Rene Molenaar
Keymaster
Hi Sinan,

I agree, it's on the list. It seems ERSPAN can be configured on the CSR1000V routers.

Rene

March 9, 2016 at 16:49 #22627 Reply

Sean C
Participant
For RSPAN, if there is a switch between you and the port you want to monitor you would have to have the remote-span vlan on all of them?

March 10, 2016 at 15:46 #22639 Reply

Rene Molenaar

Keymaster
Hi Sean,

That's right, you'll have to configure the RSPAN VLAN on all switches in the path. Don't just add the VLAN but configure it as a RSPAN VLAN:

Hello Leo,

you need to declare the remote span vlan as remote span also in intermediate switches.

```
Switch(config)# vlan 500
Switch(config-vlan)# remote span
Switch(config-vlan)# end
```

Rene

April 8, 2016 at 19:45 #23271 Reply

Teressa C
Participant
Hi Rene, I recently heard about networklessons.com and I'm loving the information you provide. I need to renew my CCNP and this is tremendously helpful for me to review areas that I do not use much.

My question is that in this lesson you write:

```
Switch(config)#monitor session 1 filter vlan 1 - 100
```

"This will filter VLAN 1 – 100 from being forwarded."

That makes it sound like the VLANS 1-100 ARE NOT being monitored if this filter is in use. Looking at Cisco's documentation, it appears to be the opposite. Cisco seems to be saying that the filter command specifies the VLANs that ARE being monitored.

Source:
http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst3750x_3560x/software/release/12-2_55_se/configuration/guide/3750xscg/swspan.html#pgfId-1200141

Quote: When a VLAN filter list is specified, only those VLANs in the list are monitored on trunk ports or on voice VLAN access ports.

Can you please clarify?

Thanks so much for the great resource.

Teressa

April 8, 2016 at 22:07 #23276 Reply

Rene Molenaar
Keymaster
Hi Teressa,

I'm glad to hear you like my work!

You are correct about the monitor session filter command. The VLANs that you define there are those that will be forwarded to the destination, everything else will be ignored.

I just edited my example to emphasize this. Thanks for letting me know!

Rene

April 9, 2016 at 00:10 #23281 Reply

Teressa C
Participant
Thank you!

April 13, 2016 at 03:35 #23355 Reply

Ken W
Participant
I was reading that the use of the "Ingress" option would allow the destination (wireshark sniffer computer) to still be able to work properly (receive email etc.) while doing a SPAN ..

You mentioned above this is not the case so I was just looking for clarity.

"When you configure a destination port you will lose its configuration. When you remove SPAN, the configuration is restored. In short…you can't use the destination interface for anything besides receiving traffic."

April 17, 2016 at 17:37 #23441 Reply

Rene Molenaar
Keymaster
Hi Ken,

You are correct, it is possible to allow ingress traffic from the destination port. Here's an example:

```
SW1#show run | include ingress
monitor session 1 destination interface Fa0/2 ingress untagged vlan 12
```

This would allow a device on the destination interface to send/receive untagged traffic in VLAN 12. This is similar to an interface in access mode. You can also use 802.1Q if you have a device that can do tagging.

Rene

May 24, 2016 at 15:49 #24450 Reply

Mohammad Hasanuz Z
Participant
Hi Rene,

When you will add the ERSPAN article? Please let us know once when available.Thanks

br/
zaman

June 3, 2016 at 17:05 #24711 Reply

Edgar P
Participant
Hi

For both SPAN and RSPAN, will the source traffic be “untouched” and sent to SPAN/RSPAN dst port? ie if source is tagged, will it also be tagged at SPAN/RSPAN
dst port? Is there option to strip off the tag before going out the dst port? On RSPAN, is the RSPAN vlan tag stripped off before going out the dst port?

Thanks

June 21, 2016 at 18:56 #25846 Reply

Rene Molenaar
Keymaster
Hi Edgar,

For a SPAN session, it’s possible to keep the original VLAN tags. You should be able to do this with the following command:

```
monitor session 1 destination interface Fa0/11 encapsulation replicate
```

This won’t work for RSPAN. RSPAN is only able to send untagged traffic to the destination interface.

Rene

- Author
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