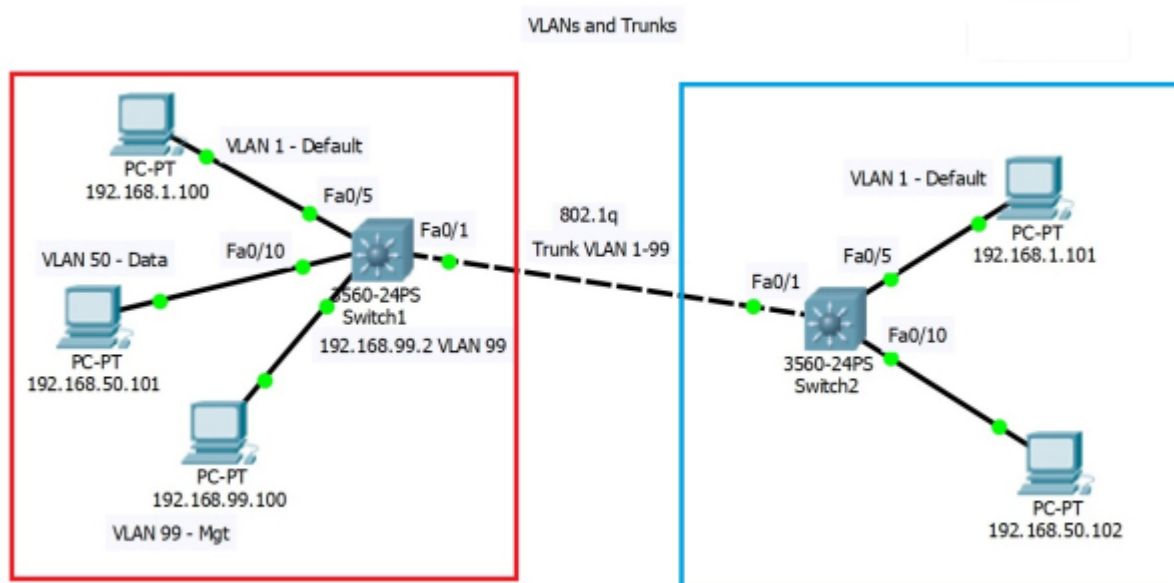


Cisco Trunks

Nov 2017

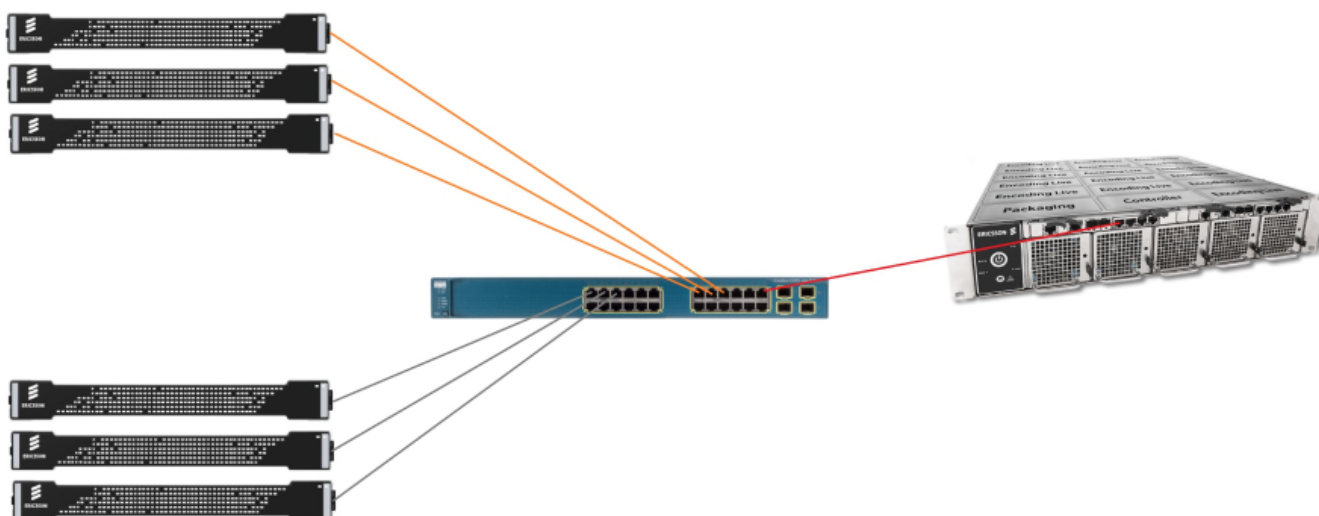
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Introduction

In the previous topic regarding [Cisco VLANs and Trunks](#) there are some videos outlining the theory of using VLANs and Trunks. Here we will look more at a worked example, and see some of the commands.

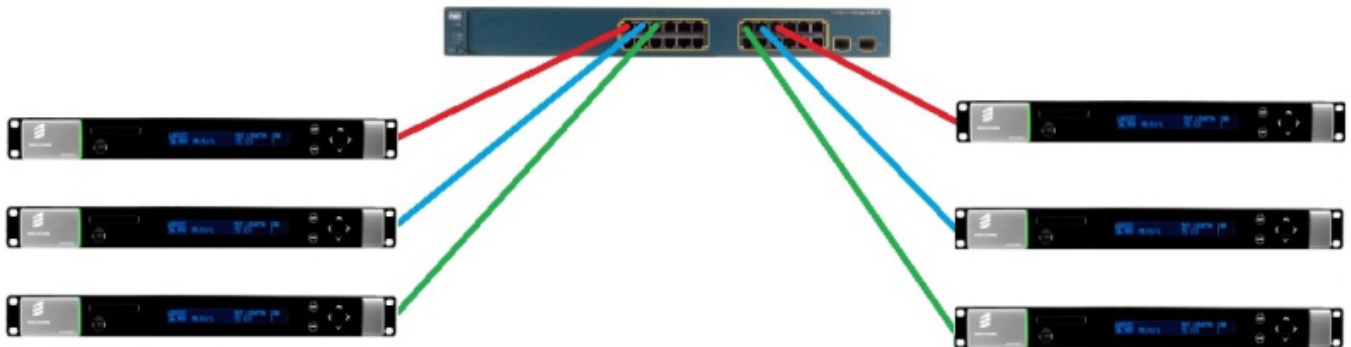
Why is using a Trunk port important? There are a few reasons for this, but from my perspective it is down to a new product that we have, the T1. The T1 is effectively a group of blades in a box with two switches. Access to the switches, which have a number of ports, is limited to just a few ports on the front panel. This means we really need to be able to group all of our multicasts in to a single source interface, and connect this to the T1.



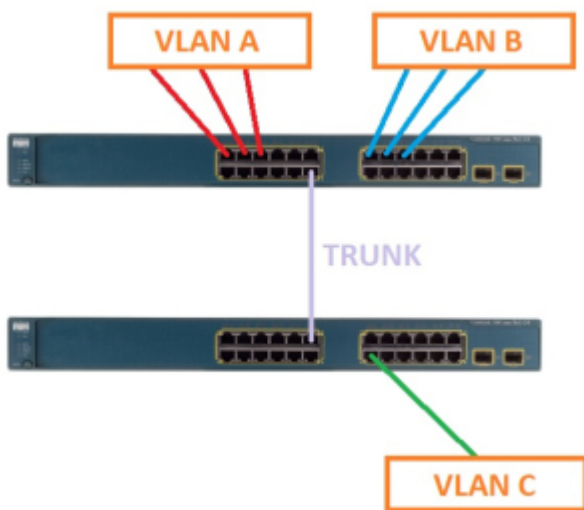
Looking at the above diagram, we see an example of some sources on the left (could be encoders, receivers or streaming devices) feeding a cisco switch. The Cisco could have one or more VLANs configured, and we need to get all of these VLANs in to a single interface in our T1.

Overview

First of all, I would like to outline what I am trying to achieve. Look at the diagram below.



There are two sets of receivers (so consider two sets of multicast) coming from different head-ends. To keep the traffic separate, let's consider that the ports connected to the receivers on the left are all in VLAN A, and the receivers on the right are in VLAN B, as shown below.



VLAN C is on another switch where our destination equipment is located. The link between the two Cisco switches is our Trunk.

TRUNK



The reason we are using a Trunk is that a single port (interface) can only carry traffic from a single VLAN, because an interface can only exist in one VLAN. So if you have multiple VLANs that you wish to carry from one switch to another, you need to use a Trunk. A Trunk can carry the traffic from multiple VLANs.

Example

VLANs, while technically the same, can be broken down into functions. Some of these are:

- Default VLAN
- Native VLAN
- Data VLAN
- Management VLAN
- Voice VLAN

I will discuss the meaning of these VLANs later, but for now I want to look at the configuration.

Default VLAN

As the name suggests, the default VLAN is the VLAN that the interfaces are initially located in. On a Cisco this is VLAN 1. From the Cisco CLI you can use the command **show vlan** to list the currently configured VLANs.

VLAN	Name	Status	Ports
1	default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/6, Fa0/7, Fa0/8 Fa0/9, Fa0/10, Fa0/11, Fa0/12 Fa0/13, Fa0/14, Fa0/15, Fa0/16 Fa0/17, Fa0/18, Fa0/19, Fa0/20 Fa0/21, Fa0/22, Fa0/23, Fa0/24 Gig0/1, Gig0/2
1002	fddi-default	act/unsup	
1003	token-ring-default	act/unsup	
1004	fddinet-default	act/unsup	
1005	trnet-default	act/unsup	

Above we can see that VLAN 1 is listed as the default VLAN, this VLAN contains all the ports on the switch, this is how the switch will be configured from new when powered on.

Native VLAN

notes

Default VLAN

Native VLAN

Data VLAN

Management VLAN

Voice VLAN

Default VLAN is VLAN 1

VLAN	Name	Status	Ports
1	default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/6, Fa0/7, Fa0/8 Fa0/9, Fa0/10, Fa0/11, Fa0/12 Fa0/13, Fa0/14, Fa0/15, Fa0/16 Fa0/17, Fa0/18, Fa0/19, Fa0/20 Fa0/21, Fa0/22, Fa0/23, Fa0/24 Gig0/1, Gig0/2
1002	fddi-default	act/unsup	
1003	token-ring-default	act/unsup	
1004	fddinet-default	act/unsup	
1005	trnet-default	act/unsup	

Cannot delete or rename vlan 1

vlan50

name student

vlan99

name mgt

```
exit
```

```
sh vlan
```

see vlan but no ports, need to assign ports.

```
int fa 0/10
switchport mode access
switchport access vlan 50
```

VLAN Name	Status	Ports
1 default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/6, Fa0/7, Fa0/8 Fa0/9, Fa0/11, Fa0/12, Fa0/13 Fa0/14, Fa0/15, Fa0/16, Fa0/17 Fa0/18, Fa0/19, Fa0/20, Fa0/21 Fa0/22, Fa0/23, Fa0/24, Gig0/1 Gig0/2
50 student	active	Fa0/10

```
Switch(config-if)#ip address 192.168.99.2 255.255.255.0
Switch(config-if)#no shutdown
```

not using vlan 1 is better for security, as guessing a vlan or interface number is harder.

Native VLAN is important for Trunk Ports

Interfaces (access ports) are one port per vlan effectively (but no vlan configured)

Trunk Port carries multiple VLANs across a single link (single interface)

```
virtual terminal
```

```
Switch(config)#line vty 0 15
Switch(config-line)#password cisco
Switch(config-line)#login
Switch(config)#enable secret cisco
```

```
Switch(config-if)#switchport trunk encapsulation dot1q
Switch(config-if)#switchport mode trunk
```

```
Switch(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
```

```
Switch(config-if)#switchport trunk allowed vlan 1-99
```

```
interface FastEthernet0/1
switchport trunk allowed vlan 1-99
switchport trunk encapsulation dot1q
switchport mode trunk
```

port 1 no longer shown:

VLAN Name	Status	Ports
1 default	active	Fa0/2, Fa0/3, Fa0/4, Fa0/5 Fa0/6, Fa0/7, Fa0/8, Fa0/9 Fa0/11, Fa0/12, Fa0/13, Fa0/14 Fa0/15, Fa0/16, Fa0/17, Fa0/18 Fa0/19, Fa0/20, Fa0/21, Fa0/22 Fa0/23, Fa0/24, Gig0/1, Gig0/2
50 student	active	Fa0/10

```
1002 fddi-default      act/unsup
1003 token-ring-default act/unsup
1004 fddinet-default    act/unsup
1005 trnet-default      act/unsup
```

```
Switch#sh interfaces trunk
```

Port	Mode	Encapsulation	Status	Native vlan
Fa0/1	on	802.1q	trunking	1

Port	Vlans allowed on trunk
Fa0/1	1-99

Port	Vlans allowed and active in management domain
Fa0/1	1,50

Port	Vlans in spanning tree forwarding state and not pruned
Fa0/1	1,50

The native vlan defaults to vlan 1 (default vlan)

Protocol 802.1q is the trunking protocol that puts tags on packets as they traverse the trunk (vlan tagging)

If you have a device that does not support 802.1q, then the switch will put that traffic on the default vlan (if that vlan is allowed in the trunk)
(the default vlan is vlan 1 unless you changed it)
This traffic remains untagged.

```
Switch(config)#vlan 80
Switch(config-vlan)#name native
```

```
Switch#show interfaces fastEthernet 0/1 switchport
```

```
Name: Fa0/1
Switchport: Enabled
Administrative Mode: trunk
Operational Mode: trunk
Administrative Trunking Encapsulation: dot1q
Operational Trunking Encapsulation: dot1q
Negotiation of Trunking: On
Access Mode VLAN: 1 (default)
Trunking Native Mode VLAN: 1 (default)
Voice VLAN: none
Administrative private-vlan host-association: none
Administrative private-vlan mapping: none
Administrative private-vlan trunk native VLAN: none
Administrative private-vlan trunk encapsulation: dot1q
Administrative private-vlan trunk normal VLANs: none
Administrative private-vlan trunk private VLANs: none
Operational private-vlan: none
Trunking VLANs Enabled: 1-99
Pruning VLANs Enabled: 2-1001
Capture Mode Disabled
Capture VLANs Allowed: ALL
Protected: false
Unknown unicast blocked: disabled
Unknown multicast blocked: disabled
Appliance trust: none
```

```
set native vlan
Switch(config-if)#switchport trunk native vlan 80
```

```
show interfaces fastEthernet 0/1 switchport
```

```
Name: Fa0/1
Switchport: Enabled
Administrative Mode: trunk
Operational Mode: trunk
Administrative Trunking Encapsulation: dot1q
Operational Trunking Encapsulation: dot1q
Negotiation of Trunking: On
Access Mode VLAN: 1 (default)

Trunking Native Mode VLAN: 80

Voice VLAN: none
Administrative private-vlan host-association: none
Administrative private-vlan mapping: none
Administrative private-vlan trunk native VLAN: none
Administrative private-vlan trunk encapsulation: dot1q
Administrative private-vlan trunk normal VLANs: none
Administrative private-vlan trunk private VLANs: none
Operational private-vlan: none
Trunking VLANs Enabled: 1-99
Pruning VLANs Enabled: 2-1001
Capture Mode Disabled
Capture VLANs Allowed: ALL
Protected: false
Unknown unicast blocked: disabled
Unknown multicast blocked: disabled
Appliance trust: none
```

```
Switch#show interfaces trunk
```

Port	Mode	Encapsulation	Status	Native vlan
Fa0/1	on	802.1q	trunking	80

Port	Vlans allowed on trunk
Fa0/1	1-99

Port	Vlans allowed and active in management domain
Fa0/1	1,50,80

Port	Vlans in spanning tree forwarding state and not pruned
Fa0/1	1,50,80

native vlan for backwards compatibility, or non tagged vlan traffic.
REMEMBER TO DO THIS ON BOTH SWITCHES.

You will see this message after configuring the first switch, on the second switch.

```
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/1 (1), with Switch FastEthernet0/1 (80).
```

until you configure second switch.
(CDP Cisco Discovery Protocol) This message occurs if Spanning Tree protocol is on.

You will see an unblock message when second switch is configured.
%SPANTREE-2-UNBLOCK_CONSIST_PORT: Unblocking FastEthernet0/1 on VLAN0001. Port consistency restored.

```
do show ip interface br
```

```
Switch(config)#do sh ip int br
```

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/1	unassigned	YES	unset	up	up
FastEthernet0/2	unassigned	YES	unset	down	down
FastEthernet0/3	unassigned	YES	unset	down	down
FastEthernet0/4	unassigned	YES	unset	down	down

FastEthernet0/5	unassigned	YES	unset	up	up
FastEthernet0/6	unassigned	YES	unset	down	down
FastEthernet0/7	unassigned	YES	unset	down	down
FastEthernet0/8	unassigned	YES	unset	down	down
FastEthernet0/9	unassigned	YES	unset	down	down
FastEthernet0/10	unassigned	YES	unset	up	up
FastEthernet0/11	unassigned	YES	unset	down	down
FastEthernet0/12	unassigned	YES	unset	down	down
FastEthernet0/13	unassigned	YES	unset	down	down
FastEthernet0/14	unassigned	YES	unset	down	down
FastEthernet0/15	unassigned	YES	unset	down	down
FastEthernet0/16	unassigned	YES	unset	down	down
FastEthernet0/17	unassigned	YES	unset	down	down
FastEthernet0/18	unassigned	YES	unset	down	down
FastEthernet0/19	unassigned	YES	unset	down	down
FastEthernet0/20	unassigned	YES	unset	down	down
FastEthernet0/21	unassigned	YES	unset	down	down
FastEthernet0/22	unassigned	YES	unset	down	down
FastEthernet0/23	unassigned	YES	unset	down	down
FastEthernet0/24	unassigned	YES	unset	up	up
GigabitEthernet0/1	unassigned	YES	unset	down	down
GigabitEthernet0/2	unassigned	YES	unset	down	down
Vlan1	unassigned	YES	unset	administratively down	down
Vlan99	192.168.99.2	YES	manual	up	up

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Last update: **2023/03/09 22:35**

