

Manual VLAN Trunking



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Module Overview



Creating dynamic trunks

Troubleshooting trunks and missing VLANs

Creating unconditional trunks

Managing the MAC address table

Native VLANs

Manual VLAN pruning

VLAN trunking

A way for switches to pass traffic for multiple VLANs across a single link

Trunk Requirements

Switches must agree to trunk

Switches must agree on the trunk encapsulation type

Switches must have appropriate VLANs configured

Creating a Dynamic Trunk

Dynamic Trunking Protocol (DTP)

**Negotiate access or
trunk ports**

**Negotiates trunk
encapsulation type**

Encapsulation Types

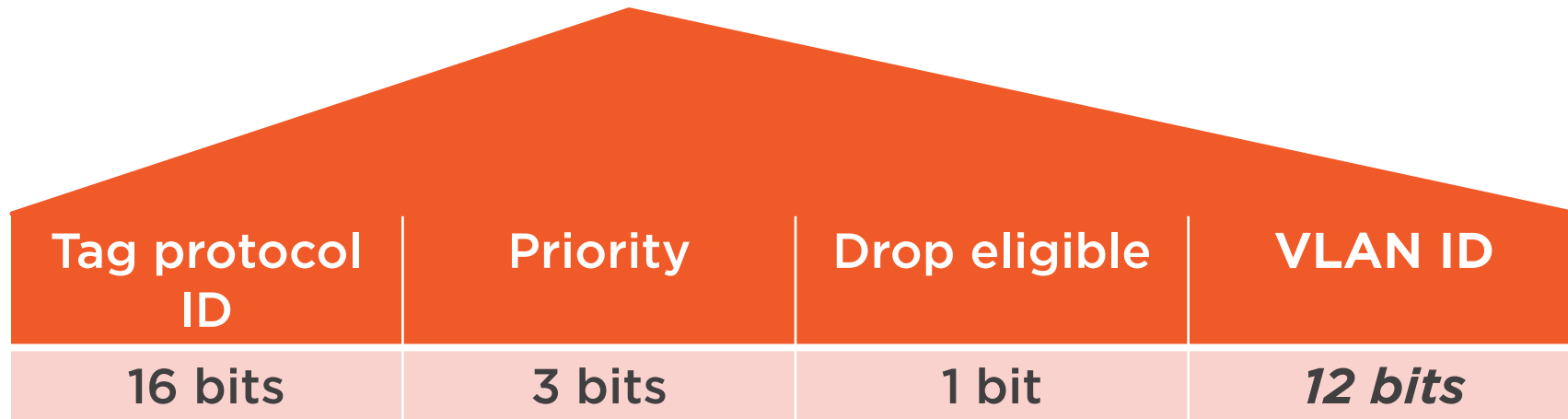
**Protocol for
indicating which
frame belongs to
which VLAN**

IEEE 802.1Q

**Inter-switch link
(ISL)**

Ethernet IEEE 802.3 Frame with 802.1q Tag

Destination MAC	Source MAC	802.1q VLAN Tag	Type/length	Data	FCS
6 bytes	6 bytes	4 bytes	2 bytes	Variable	4 bytes

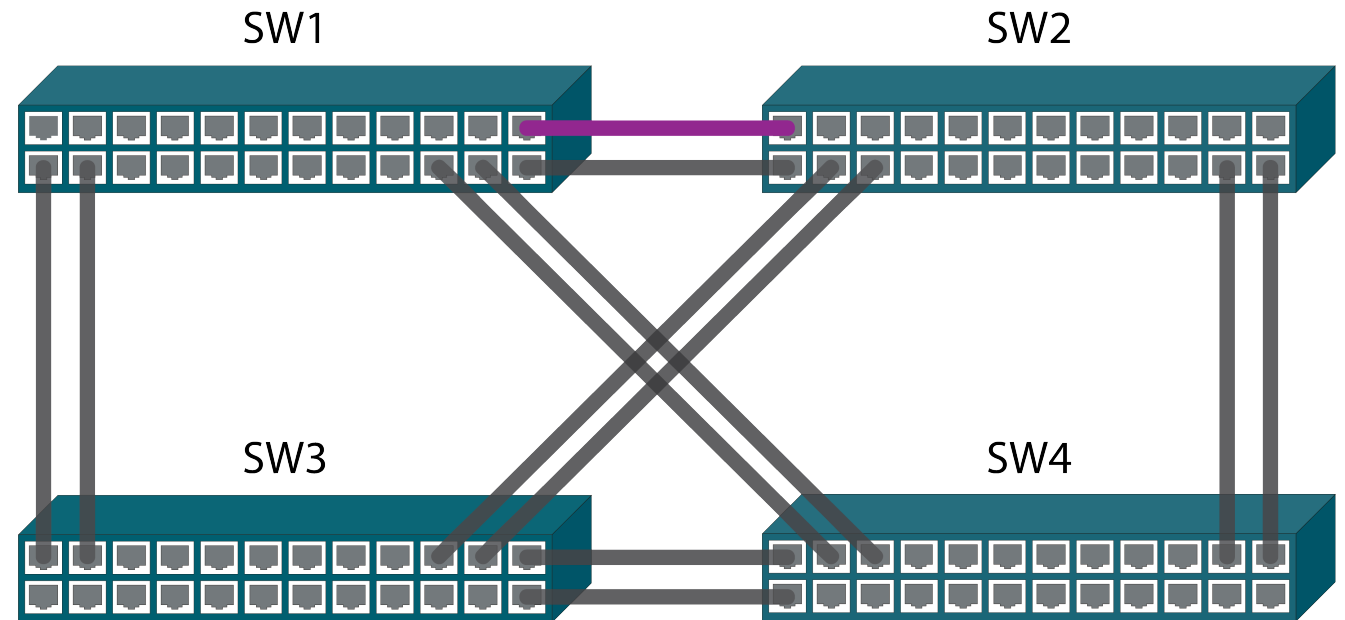


Inter-switch Link (ISL)

Cisco proprietary

Not widely used

Configure an 802.1Q
trunk between SW1
and SW2



Dynamic Trunking Protocol

	Dynamic auto	Dynamic desirable
Dynamic auto	Access	Trunk
Dynamic desirable	Trunk	Trunk

Troubleshooting Missing VLANs

Requirement

Ensure traffic for VLANs 100 and 120 traverses the trunk between SW1 and SW2 in both directions

Troubleshooting Trunks Using the MAC Address Table

Content Addressable Memory (CAM) Table

MAC address

Interface

VLAN

Requirement

Ensure traffic for VLANs 100 and 120 traverses the trunk between SW1 and SW2 in both directions

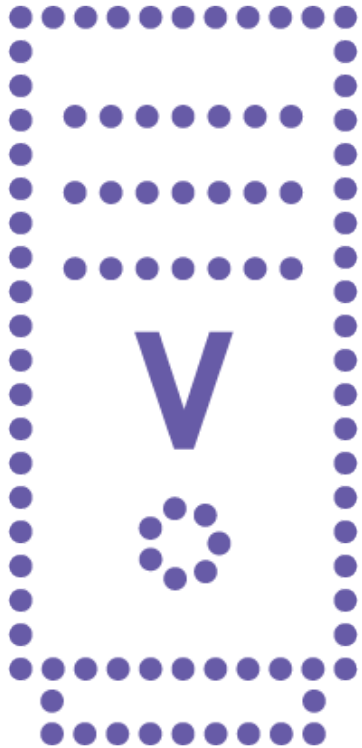
Creating an Unconditional 802.1Q Trunk for Virtual Machine Hosts

Unconditional Trunk



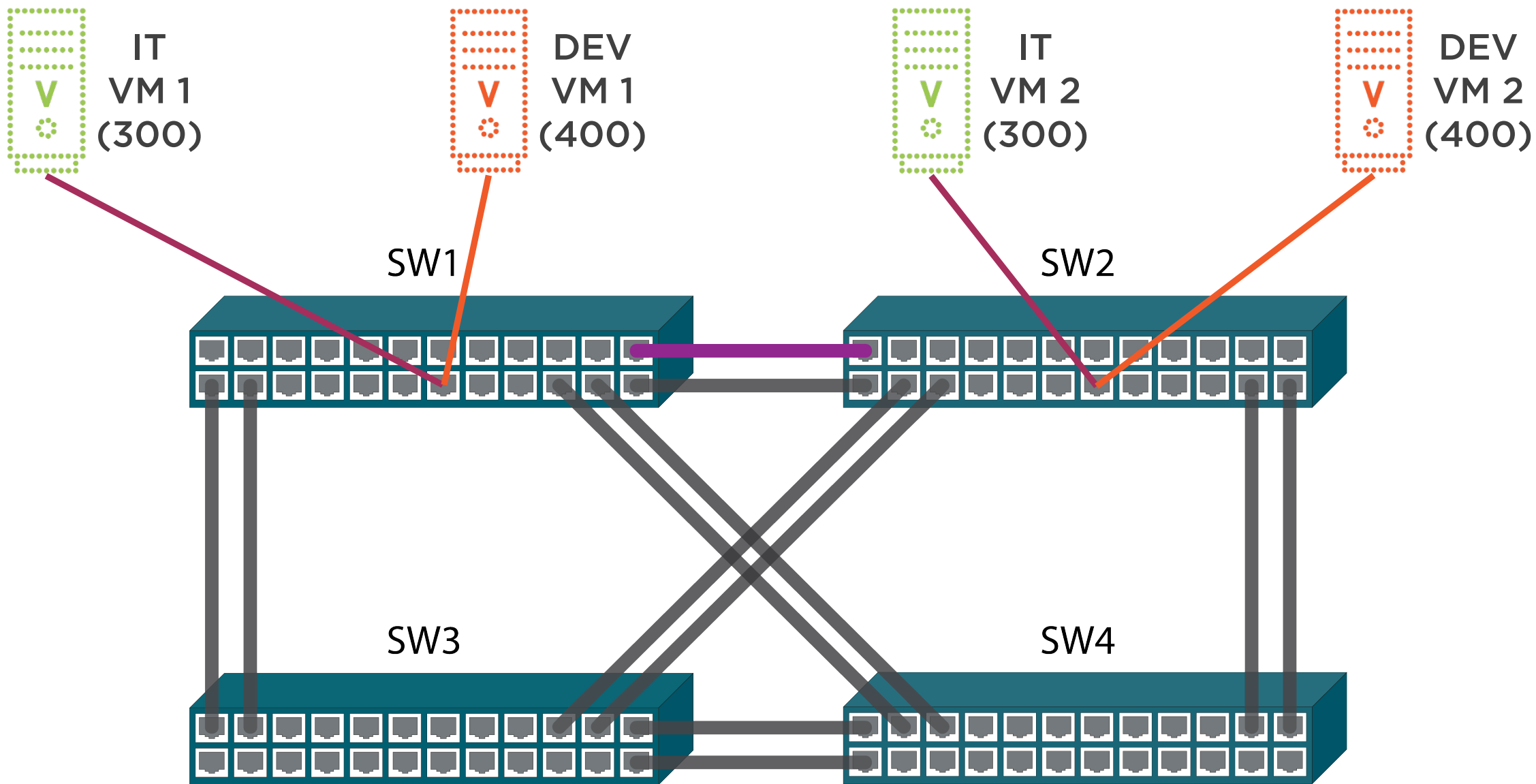
**Eliminates potential problems caused by
DTP delays and failures**

Unconditional Trunk



Useful when connecting to a virtual machine host (e.g. VMware ESXi)

Unconditional trunks are
usually 802.1Q, not ISL



Requirement

Create and name two new VLANs on SW1 and SW2:

- VLAN 300 (IT)
- VLAN 400 (DEV)

Configure SW1 and SW2 to establish full layer 2 connectivity among the following virtual machines:

- IT VM 1 and 2 in VLAN 300
- DEV VM 1 and 2 in VLAN 400

Managing the MAC Address Table

Requirement

On SW1, create an SVI for each new VLAN as follows:

- VLAN 300: 192.168.3.1/24
- VLAN 400: 192.168.4.1/24

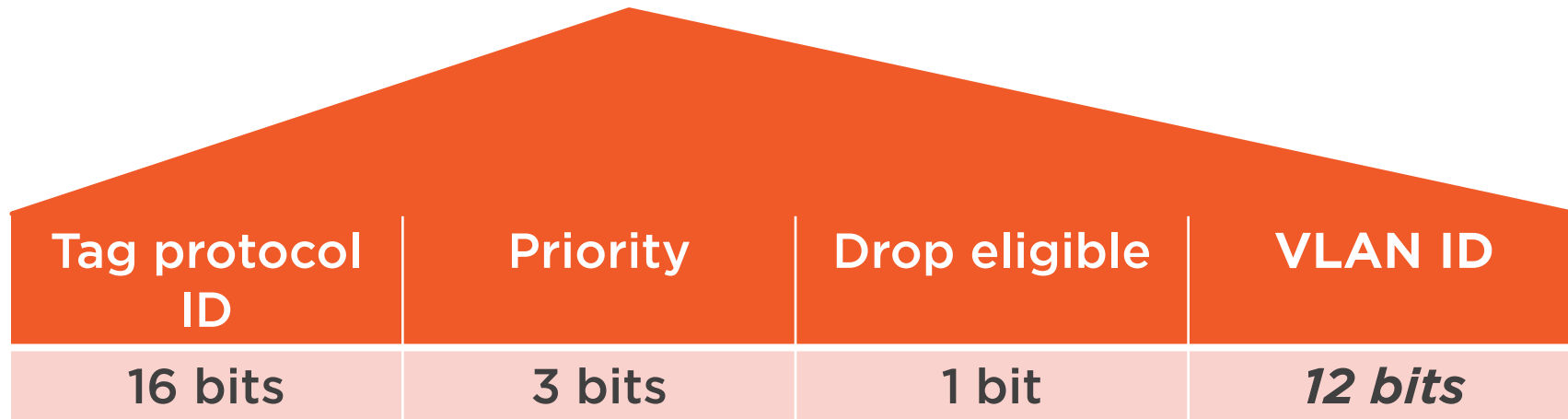
Use the SVIs to ping the following VMs:

- IT VM 1: 192.168.3.10
- IT VM 2: 192.168.3.11
- DEV VM 1: 192.168.4.10
- DEV VM 2: 192.168.4.11

Native VLANs

Ethernet IEEE 802.3 Frame with 802.1q Tag

Destination MAC	Source MAC	802.1q VLAN Tag	Type/length	Data	FCS
6 bytes	6 bytes	4 bytes	2 bytes	Variable	4 bytes



Some Frames on an 802.1Q Trunk May Be Untagged

Destination MAC	Source MAC	Type/length	Data	FCS
6 bytes	6 bytes	2 bytes	Variable	4 bytes

Native VLAN

Untagged frames belong to
the native VLAN

VLAN 1 by default

Requirement

On the trunk between SW1 and SW2, set the native VLAN to 300

Native VLAN Tagging

Tags all traffic to and from the native VLAN

Mitigates VLAN hopping attacks

Requirement

On SW1 and SW2, ensure all native VLAN traffic is tagged

Manual VLAN Pruning

VLAN pruning

Preventing a specific VLAN's traffic from passing over a trunk

Requirement

**Prune VLAN 300 from the trunk link
between SW1 and SW2**

Summary

Summary



A VLAN trunk is between only two devices

Summary



DTP can negotiate whether a trunk will establish and which encapsulation it will use

Summary



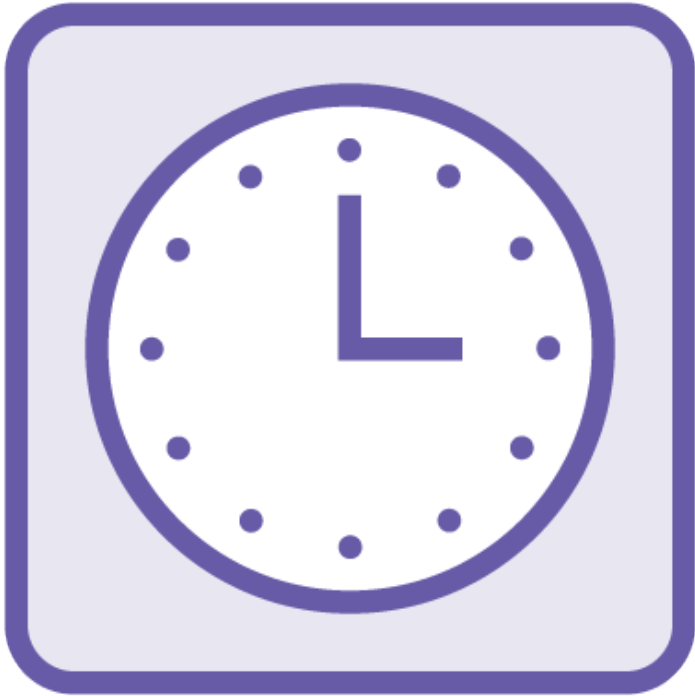
**DTP can be disabled with the switchport
nonegotiate command**

Summary



For two switches to pass VLAN traffic over a trunk, both switches must have the VLANs configured

Summary



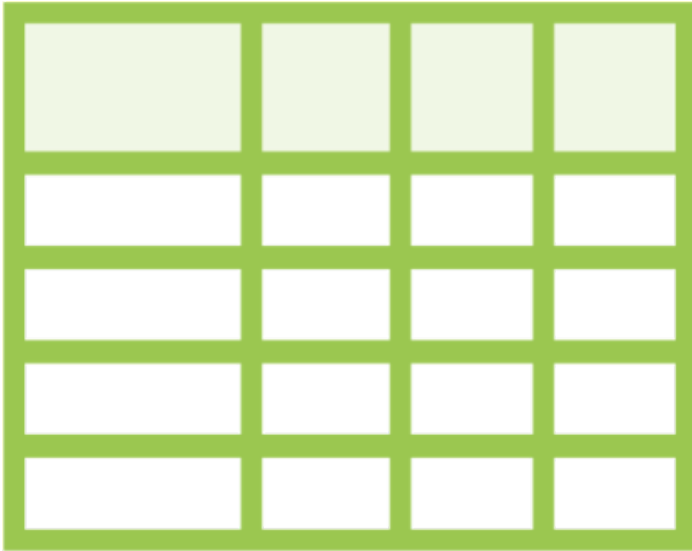
You can configure unconditional trunks to avoid potential problems and delays with DTP

Summary



Configuring an unconditional trunk requires manually setting the encapsulation type

Summary



The MAC address (CAM) table contains
MAC, interface, and VLAN

Summary



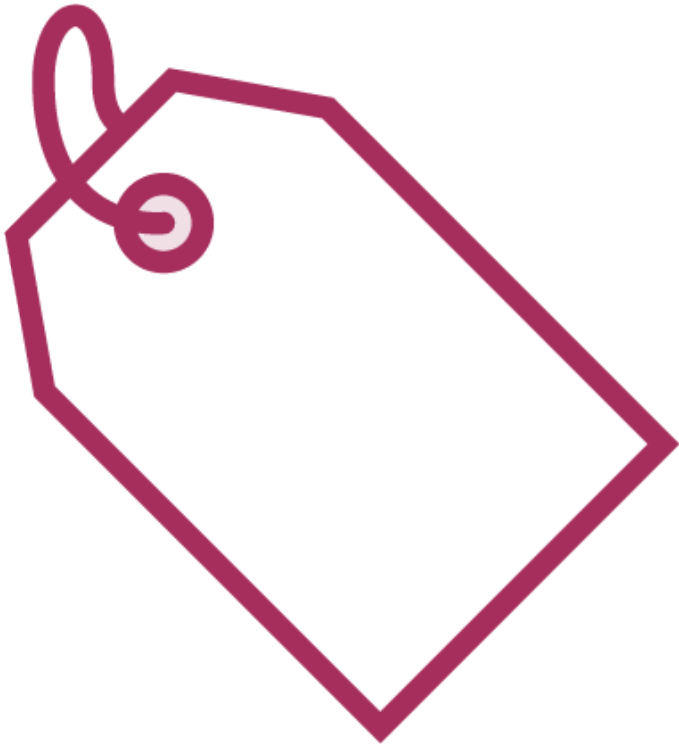
The default aging time for the CAM table is 300 seconds (5 minutes)

Summary



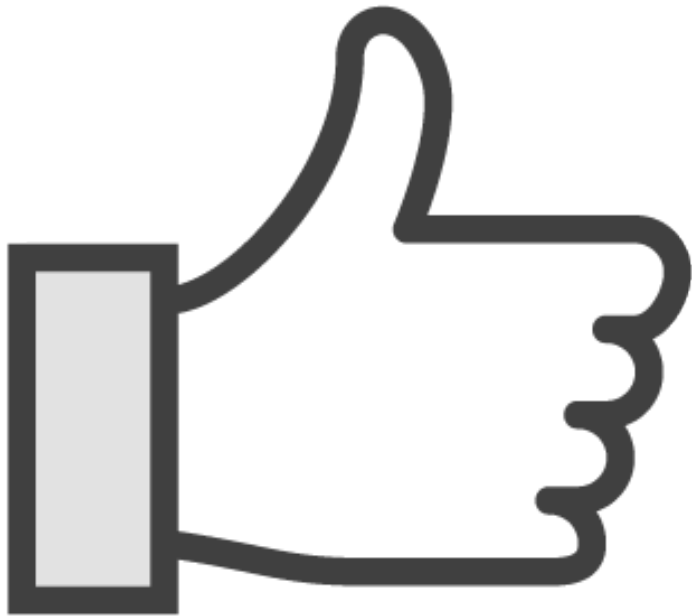
**Untagged traffic on an 802.1Q trunk
belongs to the native VLAN (1) by default**

Summary



The native VLAN can be tagged or untagged

Summary



Both ends of a trunk must agree on both the native VLAN and whether it's tagged

In the Next Module



We're going to cover the VLAN trunking protocol (VTP)!

Port Mappings

SW1 fa0/2 ⇔ SW3 fa0/1

SW1 fa0/20 ⇔ SW4 fa0/3

SW2 fa0/22 ⇔ SW4 fa0/21

SW1 fa0/4 ⇔ SW3 fa0/3

SW1 fa0/22 ⇔ SW4 fa0/5

SW2 fa0/24 ⇔ SW4 fa0/23

SW1 fa0/23 ⇔ SW2 fa0/1

SW2 fa0/4 ⇔ SW3 fa0/19

SW3 fa0/23 ⇔ SW4 fa0/1

SW1 fa0/24 ⇔ SW2 fa0/2

SW2 fa0/6 ⇔ SW3 fa0/21

SW3 fa0/24 ⇔ SW4 fa0/2