
Cisco OnPlus ON100 VLAN Discovery

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This application note is intended for Cisco OnPlus Partners who wish to take advantage of the enhanced OnPlus VLAN discovery features to improve device discovery on customer networks with multiple VLANs. The enhanced VLAN discovery enables Partners to see devices in the Topology view that were previously not discoverable.

Prior to release 7.2 of the OnPlus Service, the ON100 Network Agent could reliably discover only devices on the LAN to which it was connected, which was typically the management VLAN. In some cases, specific device drivers paired with valid access credentials would allow device discovery on other VLANs. Beginning with Release 7.2, however, device discovery across multiple VLANs can be achieved by connecting the ON100 to a trunk port with access to those VLANs.

The rest of this application provides additional details and configuration examples that apply to enabling enhanced VLAN discovery with the Cisco OnPlus Service.

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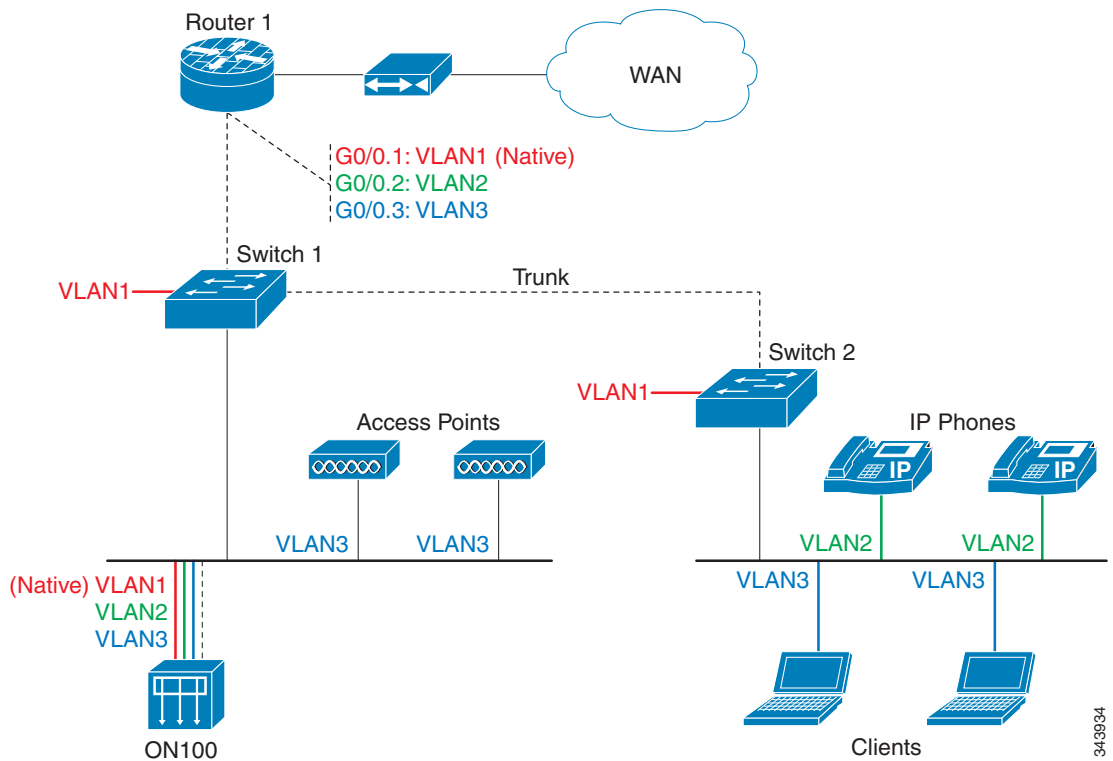
How OnPlus VLAN Discovery Works

Cisco OnPlus ON100 VLAN discovery aids in the discovery of devices within the network by receiving IEEE 802.1q tagged VLAN traffic. Using this functionality, device discovery can now occur across multiple VLANs when the ON100 Network Agent is trunked.

The Cisco ON100 self-provisions to receive VLAN traffic as soon as it is connected into a standard IEEE 802.1q trunked interface. The ON100 reads all 802.1q tagged VLAN frames and creates virtual interfaces for each of the VLANs from which traffic is received. These virtual interfaces will accept DHCP addressing and have network connectivity within each respective VLAN once an address is assigned.

OnPlus VLAN Discovery Scenarios

In the scenario shown below, Router1 performs inter-VLAN routing for the VLANs, The switches are trunked to each other and to the router. The ON100 is connected to the trunk port on Switch1.



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Some of the challenges that occur without VLAN awareness include:

- In scenarios that are not using supported network devices for OnPlus discovery, the Cisco ON100 lacks visibility across VLANs and subnets. In the topology shown above, Switch1, Switch2, and Router1 must be supported by OnPlus discovery and require the correct device credentials to provide discovery across VLAN2 and VLAN3.
- Network connectivity is dependent on Router1 for all inter-VLAN routing. Devices that may have been discovered on VLAN2 and VLAN3 with layer-2 protocols, may not have full layer-3 connectivity without the proper routes installed.

Connecting the Cisco ON100 Network Agent to a trunk port helps alleviate both of the issues presented in the example above. As the ON100 creates virtual interfaces based on the VLANs defined in each to 802.1q tagged frames, it has the capability to use standard OnPlus discovery protocols within these specific VLANs and broadcast domains. With correct DHCP capabilities, the ON100 will also have full layer-3 network connectivity to the devices in VLAN1, VLAN2, and VLAN3 from the virtual interfaces that are created.

Configuration Examples

The ON100 does not require any additional configuration to receive 802.1q tagged VLAN traffic. Implementing this type of VLAN awareness on the Cisco ON100 Network Agent requires the interfaces to be trunked.

Sample trunk interface configurations are provided below.

Trunk Port Configuration on an IOS-based Cisco Catalyst 2960-S

To configure a standard IEEE 802.1q trunk for the IOS-based Cisco Catalyst 2960-S Switch, follow these steps:

In privileged EXEC mode, enter global configuration mode configure terminal.

	Command	Purpose
Step 1	configure terminal	Enter global configuration mode.

Application Note

	Command	Purpose
Step 2	interface <i>interface-id</i>	Specify the port to be configured for trunking and enter interface configuration mode.
Step 3	switchport mode {dynamic {auto desirable} trunk}	Configure the interface as a Layer-2 trunk (required only if the interface is a Layer-2 access port or to specify the trunking mode). <ul style="list-style-type: none">▪ dynamic auto - Set the interface to a trunk link if the neighboring interface is set to trunk or desirable mode. This is the default.▪ dynamic desirable - Set the interface to a trunk link if the neighboring interface is set to trunk, desirable, or auto mode.▪ trunk - Set the interface in permanent trunking mode and negotiate to convert the link to a trunk link even if the neighboring interface is not a trunk interface.
Step 4	switchport access vlan <i>vlan-id</i>	(Optional) Specify the default VLAN, which is used if the interface stops trunking.
Step 5	switchport trunk native vlan <i>vlan-id</i>	Specify the native VLAN for IEEE.802.1Q trunks.
Step 6	end	Return to privileged EXEC mode.
Step 7	show interfaces <i>interface-id</i> switchport	Display the switchport configuration of the interface in the <i>Administrative Mode</i> and the <i>Administrative Trunking Encapsulation</i> fields of the display.
Step 8	show interfaces <i>interface-id</i> trunk	Display the trunk configuration of the interface.
Step 9	copy running-config startup-config	(Optional) Save your entries in the configuration file.

The following command-line example shows how to configure a port as an IEEE 802.1q trunk. The example assumes that the neighbor interface is configured to support IEEE 802.1q trunking.

```
Switch# configure terminal
Enter configuration commands, one per line, End with CNTL/Z.
Switch (config)# interface gigabitethernet1/0/2
Switch (config-if)# switchport mode dynamic desirable
Switch (config-if)# end
```

Trunk Port Configuration for a Cisco Small Business 300 Series Managed Switch

The following configuration steps are for a standard IEEE 802.1q trunk configuration on the Cisco Small Business 300 Series managed switch.

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- STEP 1** Click **VLAN Management > Interface Settings**.
 - STEP 2** Select an interface type (Port or Link Aggregation (LAG)) and click **Go**. Ports or LAGs and the VLAN parameters are displayed.
 - STEP 3** Select either Port or LAG and click **Edit**.
 - STEP 4** Enter the values for the following fields:
 - Interface - Select a Port/LAG.
 - Interface VLAN Mode - Select “Trunk” for the interface mode the VLAN. The interface is an un-tagged member of one VLAN at most, and is a tagged member of zero or more VLANs. A port configured in this mode is known as a trunk port.
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Best Practices

If a trunk port is not configured for the ON100, it can still be used with an access port. However, the access port will not allow the ON100 to discover other VLANs. With connection to an access port, devices from other VLANs will populate via layer-2 (for example, Cisco Discovery Protocol, MAC Table) methods, but a layer-3 connection to these devices will not be possible.

Where To Go From Here

Cisco provides a wide range of resources to help customers obtain the full benefits of the Cisco OnPlus Portal.

Support	
Cisco Small Business Support Community	www.cisco.com/go/smallbizsupport
Cisco Small Business Support and Resources	www.cisco.com/go/smallbizhelp
Phone Support Contacts	www.cisco.com/go/sbsc
Cisco Small Business Firmware Downloads	www.cisco.com/go/software
Documentation	
Cisco ON100 Network Agent	www.cisco.com/go/onplus-docs
Cisco OnPlus Portal	www.cisco.com/go/onplus-docs
Cisco Small Business	
Cisco Partner Central for Small Business (Partner Login Required)	www.cisco.com/web/partners/sell/smb
Cisco Small Business Home	www.cisco.com/smb

For additional details, refer to the Cisco Small Business 300 Series Managed Switch Administration Guide, available at the following URL: http://www.cisco.com/en/US/docs/switches/lan/csbms/sf30x_sg30x/administration_guide/78-19308-01.pdf

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