

802.1Q Encapsulation

FEATURE OVERVIEW AND CONFIGURATION GUIDE

Introduction

This guide describes 802.1Q encapsulation on Ethernet and tunnel interfaces and its configuration. 802.1Q is the networking standard that defines virtual LANs (VLANs) on an Ethernet network.

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Products and software version that apply to this guide

This Guide applies to AlliedWare Plus products that support 802.1Q encapsulation, running version **5.4.5** or later:

However, implementation varies between products. To see whether a product supports a feature or command, see the following documents:

- The [product's Datasheet](#)
- The [AlliedWare Plus Datasheet](#)
- The product's [Command Reference](#)

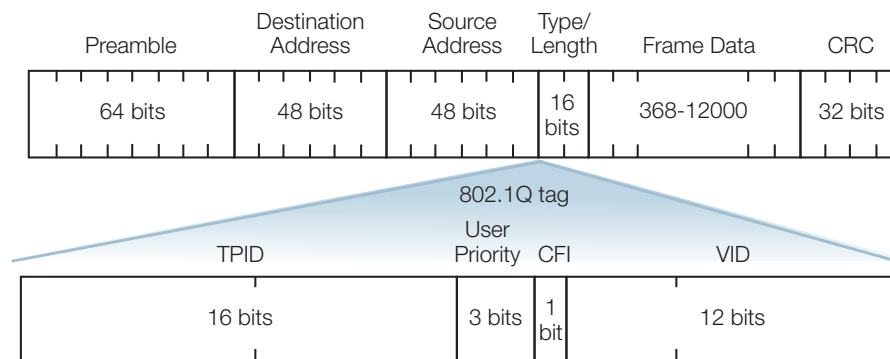
These documents are available from the above links on our website at alliedtelesis.com.

Feature support may change in later software versions. For the latest information, see the above documents.

What is 802.1Q Encapsulation?

802.1Q is the networking standard that defines virtual LANs (VLANs) on an Ethernet network. VLANs are logical networks that share a single physical connection using 802.1Q tagged frames. An Ethernet frame can contain an 802.1Q tag, with fields that specify VLAN membership and user priority. The VLAN tag is inserted between the source MAC address and the Type/Length fields in the Ethernet frame. Figure 1 shows how the VLAN tag is inserted in the frame.

Figure 1: IEEE 802.1Q encapsulation with the 802.1Q tag



802.1Q-2011 specifies the insertion and removal of the VLAN tag. To accommodate the tag, IEEE 802.1Q also increased the maximum allowable length for an Ethernet frame to 1522 octets. VLAN-aware devices can add the VLAN tag to the Ethernet frame header. VLAN-unaware devices cannot set or read the VLAN tag, but may L2 forward the frame depending on their ingress and egress forwarding rules.

The device supports 802.1Q tagging on Ethernet interfaces and Layer 2 tunnel interfaces—OpenVPN and L2TPv3 Ethernet pseudowire. For more information about OpenVPN and L2TPv3 Ethernet pseudowire, see the OpenVPN introduction chapter and the L2TPv3 Ethernet pseudowire introduction chapter respectively.

802.1Q tags are inserted before transmission out the interface and removed from frames received from the interface. Frames received on the interface are passed to the tagged interface if they contain a tag with that interface's VLAN ID (VID). The interfaces can be configured to insert 802.1Q tags for multiple VIDs.

Note that using the same VID on two different interfaces to enable 802.1Q encapsulation does not automatically create a bridge between those interfaces. For example, having eth1.1 and eth2.1 configured on the same Ethernet interface will not bridge frames between the interfaces. You must explicitly configure a bridge between the interfaces. In this way, you can

pass the frames received on one interface on to the other interface. A bridge is a logical grouping of Layer 2 interfaces into the same broadcast domain.

Configuration Example

This example shows how to configure 802.1Q Encapsulation.

By default, 802.1Q encapsulation is disabled on any Ethernet interface or Layer 2 tunnel interface, and you need to explicitly enable it.

Step 1: Enter the Interface Configuration mode.

```
awplus#configure terminal
awplus(config)#interface eth1
```

Step 2: Enable 802.1Q encapsulation for VLAN 2

```
awplus(config-if)#encapsulation dot1q 2
```

Step 3: Associate Ethernet sub-interface with existing bridge group entities or configure an IP address for the sub-interface

```
awplus(config-if)#interface eth1.2
awplus(config-if)#bridge-group 1
awplus(config-if)#interface eth1.3
awplus(config-if)#ip address 172.168.1.1/24
```