



Application Note 28

Configuring VLAN Tagging (802.1q)

Tech. Support

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1 INTRODUCTION

VLAN tagging works by inserting a 'tag' into the header of the Ethernet frame after the Source MAC Address. This tag is 4 bytes in length and includes a 12 bit field in which the VLAN ID resides. This can be a value between 0 and 4095. ($2^{12} = 4096$)

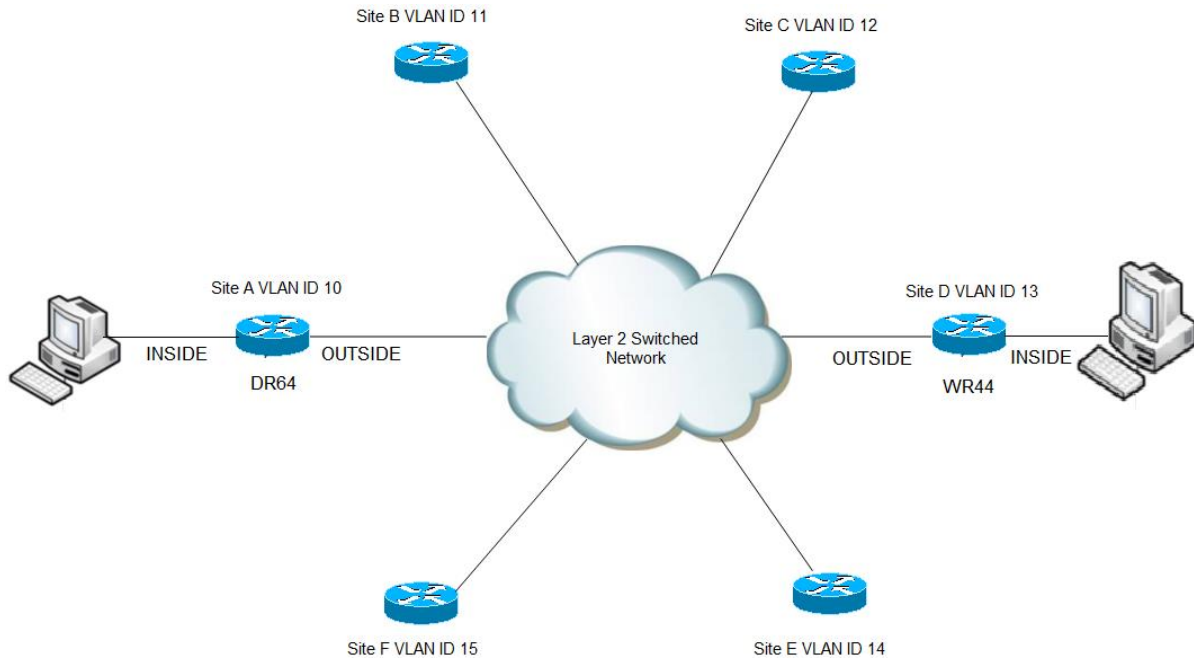
TransPort routers conform to the VLAN tagging standard 802.1Q.

An example of a layer 2 switched-network is a Microwave network. These are usually presented to the edge device as an Ethernet cable.

1.1 Outline

VLAN tagging is used on layer 2 switched networks to determine the destination for the frames. For example: in the diagram below if site A is sending data to site D, then the frame that is put into the switched network will need to have the VLAN tag of 13, and the reply back to site A will need the VLAN tag of 10.

In this example we are only going to configure 2 devices. Site A and site D. Site A being a DR64 and site D being a WR44.



1.2 Assumptions

This guide has been written for use by technically competent personnel with a good understanding of the communications technologies used in the product, and of the requirements for their specific application.

You have IP connectivity to the TransPort and are logged on to the web interface. Ensure that you save your configuration changes regularly.

The VLAN Tagging feature is only supported on version 4822 onwards.

To check if this feature is enabled navigate to **Configuration - Interfaces > Ethernet > ETH 0 > Configure** and check for the parameter 'VLAN'.

TransPort does NOT currently support VTP.

The VLAN tagging feature is NOT compatible with 'Port isolate mode'.

1.3 Corrections

Requests for corrections or amendments to this application note are welcome and should be addressed to: uksupport@digicom

Requests for new application notes can be sent to the same address.

1.4 Version

Version Number	Status
0.1	Draft
1.0	Published

2 CONFIGURATION

2.1 Ethernet Configuration – DR64 (Site A)

Configure the DR64 to have an inside and an outside address.

The outside interface will be 172.16.1.10 (ETH 0)

The inside interface will be 192.168.10.254 (ETH 1)

Note that when the IP address is changed, you will lose IP connectivity, you will need to change the IP address on your PC to an address that is valid in the new subnet.

To configure this navigate to:

Configuration - Network > Interfaces > Ethernet > ETH 0

Next enter the relevant IP address and mask.

[Configuration - Network](#) > [Interfaces](#) > [Ethernet](#) > [ETH 0](#)

▼ Interfaces


▼ Ethernet


▼ ETH 0

Description:

Get an IP address automatically using DHCP

Use the following settings

IP Address: 

Mask: 

Gateway:

DNS Server:

Secondary DNS Server:

Changes to these parameters may affect your browser connection

Click Apply

Repeat the steps for Eth 1

Configuration - Network > Interfaces > Ethernet > ETH 1

Configuration - Network > Interfaces > Ethernet > ETH 1

▼ Interfaces
▼ Ethernet
▶ ETH 0
▼ ETH 1

Description:

Get an IP address automatically using DHCP
 Use the following settings

IP Address: ←

Mask: ←

Gateway:

DNS Server:

Secondary DNS Server:

Changes to these parameters may affect your browser connection

Click Apply

DR64 settings:

Parameter	Setting	Description
Eth 0	172.16.1.10 255.255.255.0	Sets the OutsideIP address for the interface
Eth 1	192.168.10.254 255.255.255.0	Sets the Inside IP address for the interface

2.2 Ethernet Configuration – WR44 (Site D)

Repeat steps detailed in section 2.1 for the WR44 using the settings in the table below:

Parameter	Setting	Description
Eth 0	172.16.1.13 255.255.255.0	Sets the IP address for the interface
Eth 1	192.168.13.254 255.255.255.0	Sets the IP address for the interface

2.3 Routing Table

Configure the routing table so that packets that are destined for the remote network are sent to the correct interface. This is accomplished using static routes.

To configure static routes navigate to:

Configuration - Network > IP Routing/Forwarding > Static Routes > Routes 0 - 9 > Route 0

Configure the default routes as shown below.

[Configuration - Network > IP Routing/Forwarding > Static Routes > Route 0](#)

- ▶ Interfaces
- ▶ DHCP Server
- ▶ Network Services
- ▶ DNS Servers
- ▶ Dynamic DNS
- ▼ IP Routing/Forwarding
 - ▶ IP Routing
 - ▼ Static Routes
 - ▼ Route 0

Description:

Destination Network: Mask:

via

Gateway:

Interface:

Metric:

Click Apply

2.3.1 DR64 Static Route 0

Parameter	Setting	Description
IP Address	192.168.13.0	The remote subnet IP range
Mask	255.255.255.0	Subnet mask
Gateway	172.16.1.13	Next hop IP address
Interface	Ethernet	Interface type
Interface number	0	Interface number

[Configuration - Network](#) > [IP Routing/Forwarding](#) > [Static Routes](#) > [Route 0](#)

- ▶ Interfaces
- ▶ DHCP Server
- ▶ Network Services
- ▶ DNS Servers
- ▶ Dynamic DNS
- ▼ IP Routing/Forwarding
 - ▶ IP Routing
 - ▼ Static Routes
 - ▼ Route 0

Description:

Destination Network: Mask:

via

Gateway:

Interface:

Metric:

Click Apply

2.3.2 WR44 Static Route 0

Parameter	Setting	Description
IP Address	192.168.10.0	The remote subnet IP range
Mask	255.255.255.0	Subnet mask
Gateway	172.16.1.10	Next hop IP address
Interface	Ethernet	Interface type
Interface number	0	Interface number

2.4 Testing IP Connectivity

To test connectivity at this point you will be able to reach either remote interface using the source address from ETH 0 and 1.

On the DR64 navigate to: **Administration - Execute a command**

Enter the following command:

```
Ping 192.168.13.254 -eth1
```

This forces the TransPort to use Ethernet 1's IP address as the source address. Without the `-e1` the source address will be that of the interface that is sending the ping (in this case Ethernet 0).

Administration - Execute a command

Command:

2.5 Configuring the VLAN Tables

VLAN IDs on TransPort routers may be tagged based on source and or destination IP address or subnet. If the source address is missed off then all packets going to the destination will be tagged.

To configure the VLAN table navigate to:

Configuration - Network > Interfaces > Ethernet > VLANs

Configure the VLANs as shown below:

DR64 VLAN configuration

[Configuration - Network](#) > [Interfaces](#) > [Ethernet](#) > [VLANs](#)

▼ Interfaces

▼ Ethernet

- ▶ ETH 0
- ▶ ETH 1
- ▶ Logical Ethernet Interfaces
- ▶ MAC Filtering
- ▶ MAC Bridging
- ▼ VLANs

Enable VLAN support on Ethernet interfaces

Interface	Enable
ETH 0	<input checked="" type="checkbox"/>
ETH 1	<input type="checkbox"/>
ETH 2	<input type="checkbox"/>
ETH 3	<input type="checkbox"/>
ETH 4	<input type="checkbox"/>
ETH 5	<input type="checkbox"/>
ETH 6	<input type="checkbox"/>
ETH 7	<input type="checkbox"/>
ETH 8	<input type="checkbox"/>
ETH 9	<input type="checkbox"/>

You can configure up to 6 VLANs

VLAN ID	Ethernet Interface	IP Address	Mask	Source IP Address	Source mask
No VLAN configurations have been added					
13	0	192.168.13.0	255.255.255.0		<input type="button" value="Add"/>

Click Apply

Parameter	Setting	Description
VLAN ID	13	The ID the frame is to be tagged with
ETH Instance	0	The Ethernet interface that this applies to
IP Address	192.168.13.0	The IP or subnet address of the remote
Mask	255.255.255.0	The mask of the remote

2.5.1 WR44 VLAN Configuration

[Configuration](#) - [Network](#) > [Interfaces](#) > [Ethernet](#) > [VLANs](#)

- ▼ Interfaces
 - ▼ Ethernet
 - ▶ ETH 0
 - ▶ ETH 1
 - ▶ Logical Ethernet Interfaces
 - ▶ MAC Filtering
 - ▶ MAC Bridging
 - ▼ VLANs

Enable VLAN support on Ethernet interfaces

Interface	Enable
ETH 0	<input checked="" type="checkbox"/>
ETH 1	<input type="checkbox"/>
ETH 2	<input type="checkbox"/>
ETH 3	<input type="checkbox"/>
ETH 4	<input type="checkbox"/>
ETH 5	<input type="checkbox"/>
ETH 6	<input type="checkbox"/>
ETH 7	<input type="checkbox"/>
ETH 8	<input type="checkbox"/>
ETH 9	<input type="checkbox"/>

You can configure up to 6 VLANs

VLAN ID	Ethernet Interface	IP Address	Mask	Source IP Address	Source mask
No VLAN configurations have been added					
<input type="text" value="10"/>	<input type="text" value="0"/>	<input type="text" value="192.168.10.0"/>	<input type="text" value="255.255.255.0"/>	<input type="text"/>	<input type="text"/>
					<input type="button" value="Add"/>

Click Apply

Parameter	Setting	Description
VLAN ID	10	The ID the frame is to be tagged with
ETH Instance	0	The Ethernet interface that this applies to
IP Address	192.168.10.0	The IP or subnet address of the remote
Mask	255.255.255.0	The mask of the remote

3 CONFIGURATION FILES

This is the relevant section of configuration from Site A (DR64):

```
eth 0 descr "OUTSIDE"  
eth 0 IPaddr "172.16.1.10"  
eth 0 mask "255.255.0.0"  
eth 0 vlan ON  
eth 1 descr "INSIDE"  
eth 1 IPaddr "192.168.10.254"  
vlan 0 vlanid 13  
vlan 0 IPaddr "192.168.13.0"  
vlan 0 mask "255.255.255.0"  
route 0 IPaddr "192.168.13.0"  
route 0 gateway "172.16.1.13"  
route 0 ll_ent "ETH"
```

This is the relevant section of configuration from Site D (WR44):

```
eth 0 descr "OUTSIDE"  
eth 0 IPaddr "172.16.1.13"  
eth 0 vlan ON  
eth 1 descr "INSIDE"  
eth 1 IPaddr "192.168.13.254"  
vlan 0 vlanid 10  
vlan 0 IPaddr "192.168.10.0"  
vlan 0 mask "255.255.255.0"  
route 0 IPaddr "192.168.10.0"  
route 0 gateway "172.16.1.10"  
route 0 ll_ent "ETH"
```