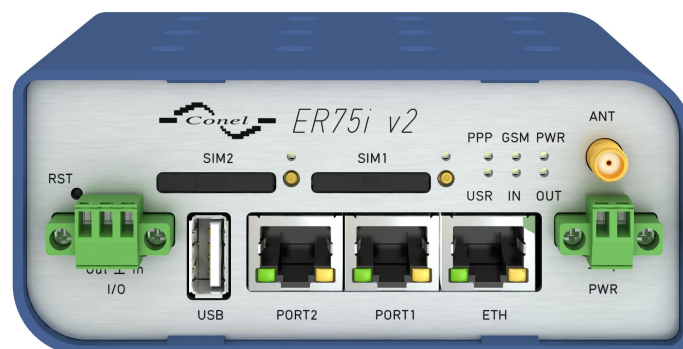
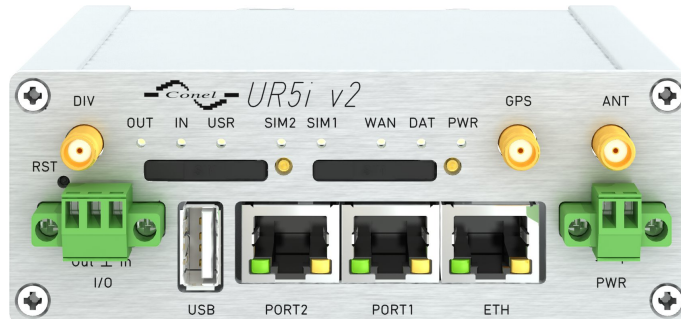




A B&B ELECTRONICS Company

Virtual Local Area Network

APPLICATION NOTE



Used symbols



Danger – important notice, which may have an influence on the user's safety or the function of the device.



Attention – notice on possible problems, which can arise in specific cases.



Information, notice – information, which contains useful advice or special interest.



Example – example of function, command or script.



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1. Introduction to VLAN

A VLAN (Virtual Local Area Network) is an entity which uses IP header tagging to simulate multiple LANs within a single physical LAN. By identifying or tagging specific headers to indicate a specific broadcast domain they belong to, VLANs allow you to assign either physical or virtual ports to reside within partitioned port groups, within the actual LAN on the device. This provides you with the ability to create specialized domains that have common topical or geographical attributes, giving you flexibility in your network setup.

While multiple VLANs are distinct from one another like multiple LANs are, multiple VLANs can exist together on the same physical networking segment. VLANs require VLANaware networking devices to offer this kind of virtualization. These include switches, routers and firewalls that have the ability to recognize, process, remove and insert VLAN tags to direct packets to the correct VLAN location after arriving at the device.

1.1 VLAN example

Imagine that you have a house with two floors. There are three computer stations connected to one switch on each floor. Switches are connected by backbone line. If you want to connect PC stations to two independent groups (VLAN1 and VLAN2 – see the picture above), create a VLAN for each group, because physical network would be very difficult to create (due to two floors).

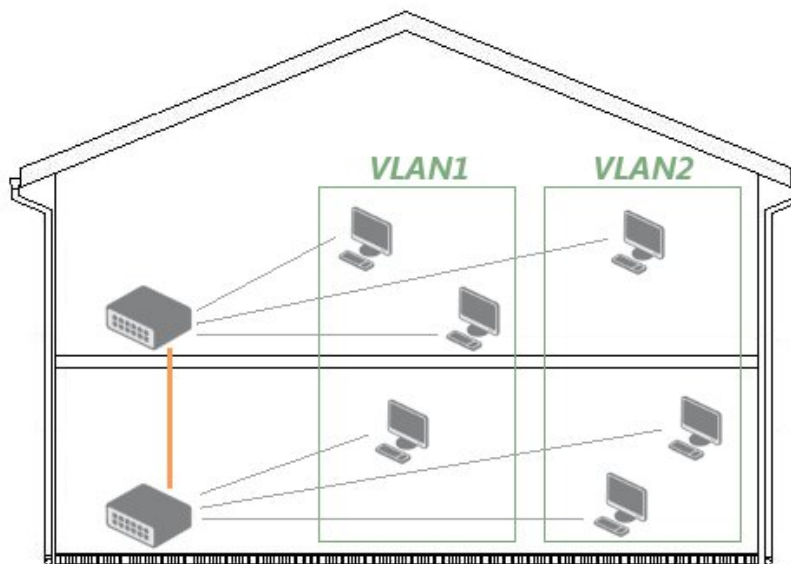


Figure 1: VLAN example

2. Configuration

The following configuration is supported by routers with firmware 3.0.6 and later.

2.1 Create VLAN interface

It will be used eth1 interface. However at first it is necessary to have to bring the interface up without IP address assigned to it before eth1 can be used.



```
ifconfig eth1 0.0.0.0 up
```

Now it can be created interface vlan 11 and vlan 12 on this eth1 interface. To create a vlan interface, use *vconfig add* command as below:



```
vconfig add eth1 11
Added VLAN with VID == 11 to IF -:eth1:-

vconfig add eth1 12
Added VLAN with VID == 12 to IF -:eth1:-
```

These commands (mentioned above) create virtual interfaces eth1.11 and eth1.12 that are considered by system as another network devices so you can configure and assign IP address like other. You can see the VLAN interfaces by typing *ifconfig -a* command:



```
ifconfig -a

eth1.11 Link encap:Ethernet HWaddr 00:30:48:BF:4E:BD
BROADCAST MULTICAST MTU:1500 Metric:1
RX packets:0 errors:0 dropped:0 overruns:0 frame:0
TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:0
RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)

eth1.12 Link encap:Ethernet HWaddr 00:30:48:BF:4E:BD
BROADCAST MULTICAST MTU:1500 Metric:1
RX packets:0 errors:0 dropped:0 overruns:0 frame:0
TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:0
RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)
```

2.2 Assign IP address to the VLAN interfaces

The VLAN interfaces were successfully created on the previous section. Now we assign IP address on those interfaces using `ifconfig` command as below:



```
ifconfig eth1.11 192.168.11.254 netmask 255.255.255.0 up
ifconfig eth1.12 192.168.12.254 netmask 255.255.255.0 up
```

Make sure that the IP addresses were assigned successfully on the interfaces. It can be done by running the `ipconfig` command with interface name as a parameter:



```
ifconfig eth1.11

eth1.11 Link encap:Ethernet HWaddr 00:30:48:BF:4E:BD
inet addr:192.168.11.254 Bcast:192.168.11.255 Mask:255.255.255.0
UP BROADCAST MULTICAST MTU:1500 Metric:1
RX packets:0 errors:0 dropped:0 overruns:0 frame:0
TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:0
RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)

ifconfig eth1.12

eth1.12 Link encap:Ethernet HWaddr 00:30:48:BF:4E:BD
inet addr:192.168.12.254 Bcast:192.168.12.255 Mask:255.255.255.0
UP BROADCAST MULTICAST MTU:1500 Metric:1
RX packets:0 errors:0 dropped:0 overruns:0 frame:0
TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:0
RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)
```