



TES7000 Hardened Ethernet Switch

Application Note: VLAN Configuration

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GENERAL INFORMATION

Extreme Copper's TES7000 Hardened Gigabit Ethernet Switch can be configured for VLAN (Virtual Local Area Networking) by experienced IT professionals with the help of this application note. The purpose of implementing a VLAN is to improve the performance of a network or apply appropriate security features. A Virtual Local Area Network (VLAN) is a logical group of workstations, servers, and networked devices that appear to be on the same LAN despite their geographical distribution. A VLAN allows a network of computational devices and users to communicate in a simulated environment as if they exist in a single LAN and are sharing a single broadcast and multicast domain. VLANs are implemented to achieve scalability, security and ease of network management and can quickly adapt to changes in network requirements and relocation of workstations and server nodes.

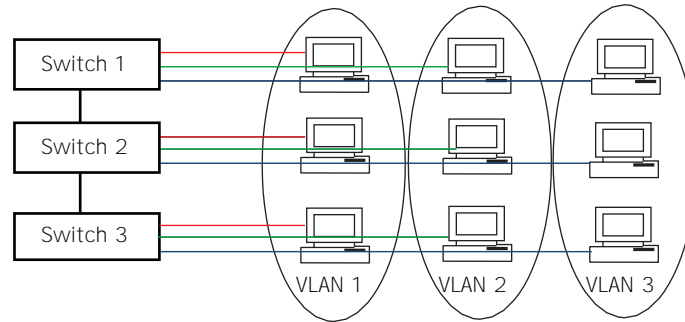
Higher-end Ethernet switches such as the TES7000 allow the functionality and implementation of complex VLAN configurations. The TES7000's extremely flexible and comprehensive VLAN functionality may be configured using the intuitive web-GUI or an industrial CLI which is CISCO-like. Computer networks can be segmented into Local Area Networks (LANs) and Wide Area Networks (WANs). Network devices such as switches, hubs, bridges, workstations, and servers connected to each other in the same network at a specific location are generally known to reside on a LAN. A LAN is also considered a broadcast domain. A VLAN allows several networks to work virtually as on a LAN. One of the most beneficial elements of a VLAN is that it removes latency in the network, which saves network resources and increases network efficiency. In addition, VLANs are created to provide segmentation and assist with issues like security, network management, and scalability. Traffic patterns can also easily be controlled by using VLANs.

The key benefits of implementing VLANs include:

- ◁ Allowing network administrators to apply additional security to network communications
- ◁ Making expansion and relocation of a network or a network device easier
- ◁ Providing flexibility because administrators are able to configure in a centralized environment while the devices might be located in different geographical locations
- ◁ Decreasing the latency and traffic load on the network and the network devices, offering increased performance

VLAN

The following illustration shows an example VLAN configuration.



7 VLAN Quick Configuration Example

Because VLAN 1 is created by default, one need only add VLAN 2 and 3 as follows:

```
# configure terminal
(config)# VLAN 2
(config)# VLAN 3
```

Set the access port. Assume that port 1 through 3 are connected to the PC. The PVID (Port VLAN ID) of each port is different.

```
# configure terminal
(config)# interface GigabitEthernet 1/1
(config-if)# switchport mode access
(config-if)# switchport access VLAN 1
(config)# exit
```

Note: The nomenclature Gigabit Ethernet 1/1 is Gigabit Ethernet Switch 1, Port 1.

```
(config)# interface GigabitEthernet 1/2
(config-if)# switchport mode access
(config-if)# switchport access VLAN 2
(config)# exit
```

```
(config)# interface GigabitEthernet 1/3
(config-if)# switchport mode access
(config-if)# switchport access VLAN 3
(config)# exit
```

Set the trunk port. Assume that port 4 is the “trunk” port which is connected to the other switch. Set the allowed VLAN to accept 1-3.

```
# configure terminal
(config)# interface GigabitEthernet 1/4
(config-if)# switchport mode trunk
(config-if)# switchport trunk allowed VLAN 1-3
Configure the port such that frames are always transmitted with a tag on port 4.
(config-if)# switchport trunk VLAN tag native
```

Global Configuration

Existing VLAN

CLI Example: Adding VLAN 2

```
# configure terminal
(config)# VLAN 2
```

CLI Example: Removing VLAN 2

```
# configure terminal
(config)# no VLAN 2
```

CLI Example: Show existing VLANs

```
# show VLAN brief
VLAN  Name                               Interfaces
-----
1      default                               Gi 1/1-6
2      VLAN0002
3      # configure terminal
      (config)# VLAN 1,10-
      13,200,300
```

The Allowed Access VLAN field only affects ports configured as access ports. Ports in other modes are members of all VLANs specified in the allowed VLANs field. By default, only VLAN 1 is enabled. More VLANs may be created by using the following list syntax.

Individual elements are separated by commas and ranges are specified with a dash separating the lower and upper bound spaces are allowed in between the delimiters. The example above creates VLANs 1, 10, 11, 12, 13, 200 and 300.

The screenshot displays the 'Global VLAN Configuration' page. The 'Allowed Access VLANs' field is set to '1' and is highlighted with a black arrow. Below it is a table for 'Port VLAN Configuration' with columns for Port, Mode, Port VLAN, Port Type, Ingress Filtering, Ingress Acceptance, Egress Tagging, Allowed VLANs, and Forbidden VLANs. The table shows configurations for ports 1 through 6.

Port	Mode	Port VLAN	Port Type	Ingress Filtering	Ingress Acceptance	Egress Tagging	Allowed VLANs	Forbidden VLANs
1	Access	2	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	2	
2	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
3	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
4	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
5	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
6	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	

7 VLAN Allowed Access VLANs Configuration

VLAN Naming

CLI Example: Set VLAN 2's name to test

```
# configure terminal
(config)# VLAN 2
(config-VLAN)# name test
```

Web GUI

Not available.

Ethertype for Custom S-ports

This field specifies the EtherType/TPID (specified in hexadecimal) of tagged frames. The Tag Protocol Identifier (TPID) is a 16-bit field. It can be set to a value of 0x8100 in order to identify the frame as an IEEE 802.1Q-tagged frame. The setting applies to all ports whose Port Type is set to S-Custom-Port. It takes effect on the egress side.

CLI Example

```
# configure terminal
(config)# VLAN ether-type s-custom-port
<0x0600-0xffff>
```

The screenshot shows the eXtreme copper web GUI for VLAN configuration. On the left is a navigation menu with options like Security, Aggregation, Link OAM, Loop Protection, Spanning Tree, IPMC Profile, MVR, IPMC, LLDP, SyncE, EPS, MEP, ERPS, MAC Table, VLAN Translation, Private VLANs, VCL, Voice VLAN, Ethernet Services, and Performance Monitor. The main content area is titled 'Global VLAN Configuration' and contains two input fields: 'Allowed Access VLANs' with the value '1' and 'Ether-type for Custom S-ports' with the value '88A8'. Below this is the 'Port VLAN Configuration' table.

Port	Mode	Port VLAN	Port Type	Ingress Filtering	Ingress Acceptance	Egress Tagging	Allowed VLANs	Forbidden VLANs
1	Access	2	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	2	
2	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
3	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
4	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
5	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
6	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	

At the bottom of the configuration area are 'Save' and 'Reset' buttons.

7 VLAN Ether-type for Custom Ports Configuration

Port Based Configuration

Port Mode

Port mode determines the fundamental behavior of the port in question. A port can be in one of three modes, with Access being the default.

Access

Access ports are normally used to connect to end stations. Dynamic features like Voice VLAN may add the port to more VLANs behind the scenes. Access ports have the following characteristics:

- Member of exactly one VLAN, the Port LAN or Access VLAN, which by default is 1
- Accepts untagged frames and C-tagged frames
- Discards all frames that are not classified to the Access VLAN
- Upon egress all frames are transmitted untagged

Trunk

Trunk ports can carry traffic on multiple VLANs simultaneously and are normally used to connect to other switches. Trunk ports have the following characteristics.

- Member of all existing VLANs by default (limited by the use of allowed VLANs)
- All frames, except those classified to the Port VLAN or Native VLAN, get tagged on egress by default (frames classified to the Port VLAN do not get C-tagged on egress)
- Egress tagging can be changed to tag all frames, in which case only tagged frames are accepted on ingress

Hybrid:

Hybrid ports resemble trunk ports in many ways while including additional port configuration features. In addition to the characteristics described for trunk ports, hybrid ports have the following abilities.

- Can be configured to be VLAN tag unaware, C-tag aware, S-tag aware, or S-custom-tag aware
- Ingress filtering can be controlled
- Ingress acceptance of frames and configuration of egress tagging can be configured independently

CLI Example: Configure as Access port on the first Gigabit port

```
# configure terminal
(config)# interface GigabitEthernet 1/1
(config-if)# switchport mode access
```

CLI Example: Configure as Trunk port on the first Gigabit port

```
# configure terminal
(config)# interface GigabitEthernet 1/1
(config-if)# switchport mode trunk
```

CLI Example: Configure as Hybrid port on the first Gigabit port

```
# configure terminal
(config)# interface GigabitEthernet 1/1
(config-if)# switchport mode hybrid
```

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Global VLAN Configuration

Allowed Access VLANs: 1
Ethertype for Custom S-ports: 88A8

Port	Mode	Port VLAN	Port Type	Ingress Filtering	Ingress Acceptance	Egress Tagging	Allowed VLANs	Forbidden VLANs
1	Access	2	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	2	
2	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
3	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
4	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
5	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
6	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	

Save Reset

Port VLAN

Port VLAN determines the port's VLAN ID, or PVID. Allowed VLANs are in the range of 1 through 4095, with the default being 1.

On ingress, frames get classified to the Port VLAN if the port is configured as VLAN unaware, the frame is untagged, or VLAN awareness is enabled on the port, but the frame is priority tagged (VLAN ID = 0).

On egress, frames classified to the Port VLAN do not get tagged if Egress Tagging is set to untag port VLAN.

Port VLAN is called an Access VLAN for ports in access mode and Native VLAN for ports in trunk or hybrid mode.

CLI Example: Set Port VLAN to 2 on the first Gigabit port (configured as access mode)

```
# configure terminal
(config)# interface GigabitEthernet 1/1
(config-if)# switchport access VLAN 2
      <vlan_id>      VLAN ID of the native VLAN when this port is in trunk mode
```

CLI Example: Set Port VLAN to 2 on the first Gigabit port (configured as trunk mode)

```
# configure terminal
(config)# interface GigabitEthernet 1/1
(config-if)# switchport trunk native VLAN 2
```

CLI Example: Set Port VLAN to 2 on the first Gigabit port (configured as hybrid mode)

```
# configure terminal
(config)# interface GigabitEthernet 1/1
(config-if)# switchport hybrid native VLAN 2
```

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Global VLAN Configuration

Allowed Access VLANs: 1
Ethertype for Custom S-ports: 88A8

Port	Mode	Port VLAN	Port Type	Ingress Filtering	Ingress Acceptance	Egress Tagging	Allowed VLANs	Forbidden VLANs
1	Access	2	E-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	2	
2	Access	1	E-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
3	Access	1	E-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
4	Access	1	E-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
5	Access	1	E-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
6	Access	1	E-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	

Save Reset

Port Type

Ports in hybrid mode allow for changing the port type, that is, whether a frame's VLAN tag is used to classify the frame on ingress to a particular VLAN, and if so, which TPID it reacts on. Likewise, on egress, the port type determines the TPID of the tag, if a tag is required.

Unaware

On ingress, all frames, whether carrying a VLAN tag or not, get classified to the Port VLAN and possible tags are not removed on egress.

C-Port

On ingress, frames with a VLAN tag with TPID = 0x8100 get classified to the VLAN ID embedded in the tag. If a frame is untagged or priority tagged, the frame gets classified to the Port VLAN. If frames must be tagged on egress, they are tagged with a C-tag.

S-Port

On ingress, frames with a VLAN tag with TPID = 0x8100 or 0x88A8 get classified to the VLAN ID embedded in the tag. If a frame is untagged or priority tagged, the frame gets classified to the Port VLAN. If frames must be tagged on egress, they will be tagged with an S-tag.

S-Custom-Port

On ingress, frames with a VLAN tag with a TPID = 0x8100 or equal to the Ethertype configured for Custom-S ports get classified to the VLAN ID embedded in the tag. If a frame is untagged or priority tagged, the frame gets classified to the Port VLAN. If frames must be tagged on egress, they will be tagged with the custom S-tag.

CLI Example: Set Port Type on the first Gigabit port

```
# configure terminal
(config)# interface GigabitEthernet 1/1
(config-if)# switchport hybrid port-type ?
    c-port          Customer port
    s-custom-port   Custom Provider port s-port
                   Provider port
    unaware        Port in not aware of VLAN tags
```

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Port	Mode	Port VLAN	Port Type	Ingress Filtering	Ingress Acceptance	Egress Tagging	Allowed VLANs	Forbidden VLANs
1	Access	2	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	2	
2	Trunk	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1-4095	
3	Hybrid	1	C-Port	<input type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1-4095	
4	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
5	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
6	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	

Ingress Filtering

Hybrid ports allow for changing ingress filtering. Access and trunk ports always have ingress filtering enabled.

If ingress filtering is enabled, frames classified to a VLAN that the port is not a member of get discarded.

If ingress filtering is disabled, frames classified to a VLAN that the port is not a member of are accepted and forwarded to the switch engine. However, the port will never transmit frames classified to VLANs that it is not a member of.

CLI Example: Set ingress filtering on the first Gigabit port

```
# configure terminal
(config)# interface GigabitEthernet 1/1
(config-if)# switchport hybrid ?
acceptable-frame-type      Set acceptable frame type on a port
allowed                    Set allowed VLAN characteristics when interface is in hybrid mode
egress-tag                 Egress VLAN tagging configuration ingress-filtering
                           VLAN Ingress filter configuration
native                     Set native VLAN
port-type                  Set port type
```

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The screenshot shows the 'Global VLAN Configuration' and 'Port VLAN Configuration' sections. The 'Port VLAN Configuration' table is as follows:

Port	Mode	Port VLAN	Port Type	Ingress Filtering	Ingress Acceptance	Egress Tagging	Allowed VLANs	Forbidden VLANs
1	Access	2	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	2	
2	Trunk	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1-4095	
3	Hybrid	1	C-Port	<input type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1-4095	
4	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
5	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
6	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	

Ingress Acceptance

Hybrid ports allow for changing the type of frames that are accepted on ingress.

Tagged and Untagged

Both tagged and untagged frames are accepted.

Tagged Only

Only tagged frames are accepted on ingress. Untagged frames are discarded.

Untagged Only

Only untagged frames are accepted on ingress. Tagged frames are discarded.

CLI Example: Configure ingress filtering on the first Gigabit port

```
# configure terminal
(config)# interface GigabitEthernet 1/1
(config-if)# switchport hybrid acceptable-frame-type ?
    all          Allow all frames
    tagged       Allow only tagged frames
    untagged     Allow only untagged frames
```

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The screenshot shows the 'Global VLAN Configuration' and 'Port VLAN Configuration' sections. The 'Port VLAN Configuration' table is as follows:

Port	Mode	Port VLAN	Port Type	Ingress Filtering	Ingress Acceptance	Egress Tagging	Allowed VLANs	Forbidden VLANs
*	<>	2	<>	<input checked="" type="checkbox"/>	<>	<>	2	
1	Access	2	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	2	
2	Trunk	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1-4095	
3	Hybrid	1	C-Port	<input type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1-4095	
4	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
5	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
6	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	

Egress Tagging

Ports in Trunk and Hybrid mode may control the tagging of frames on egress.

Untag Port VLAN

Frames classified to the Port VLAN are transmitted untagged. Other frames are transmitted with the relevant tag.

Tag All

All frames, whether classified to the Port VLAN or not, are transmitted with a tag.

Untag All

All frames, whether classified to the Port VLAN or not, are transmitted without a tag. This option is only available for ports in Hybrid mode.

CLI Example: Set egress tagging on the first Gigabit port

```
# configure terminal
(config)# interface GigabitEthernet 1/1
(config-if)# switchport hybrid egress-tag ?
    all      Tag all frames
    none     No tagging(egre)
```

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Port	Mode	Port VLAN	Port Type	Ingress Filtering	Ingress Acceptance	Egress Tagging	Allowed VLANs	Forbidden VLANs
*	<>	2	<>	<input checked="" type="checkbox"/>	<>	<>	2	
1	Access	2	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	2	
2	Trunk	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1-4095	
3	Hybrid	1	C-Port	<input type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1-4095	
4	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
5	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	
6	Access	1	C-Port	<input checked="" type="checkbox"/>	Tagged and Untagged	Untag Port VLAN	1	

Allowed VLANs

Ports in Trunk and Hybrid mode may control which VLANs they are allowed to become members of. Access ports can only be members of the Access VLAN.

The field's syntax is identical to the syntax used in the Existing VLANs field. By default, a port may become a member of all possible VLANs, and is therefore set to 1-4095.

The field may be left empty, which means that the port will not be member of any of the existing VLANs.

CLI Example: Set port VLAN to 2 on the first Gigabit port (configured as trunk mode)

```
# configure terminal
(config)# interface GigabitEthernet 1/1
(config-if)# switchport trunk allowed VLAN ?
  <vlan_list>    VLAN IDs of the allowed VLANs when this port is in hybrid mode
  add            Add VLANs to the current list
  all           All VLANs
  except        All VLANs except the following
  none         No VLANs
  remove       Remove VLANs from the current list
```

CLI Example: Set port VLAN to 2 on the first Gigabit port (configured as hybrid mode)

```
# configure terminal
(config)# interface GigabitEthernet 1/1
(config-if)# switchport hybrid allowed VLAN ?
  <vlan_list>    VLAN IDs of the allowed VLANs when this port is in hybrid mode
  add            Add VLANs to the current list
  all           All VLANs
  except        All VLANs except the following
  none         No VLANs
  remove       Remove VLANs from the current list
```

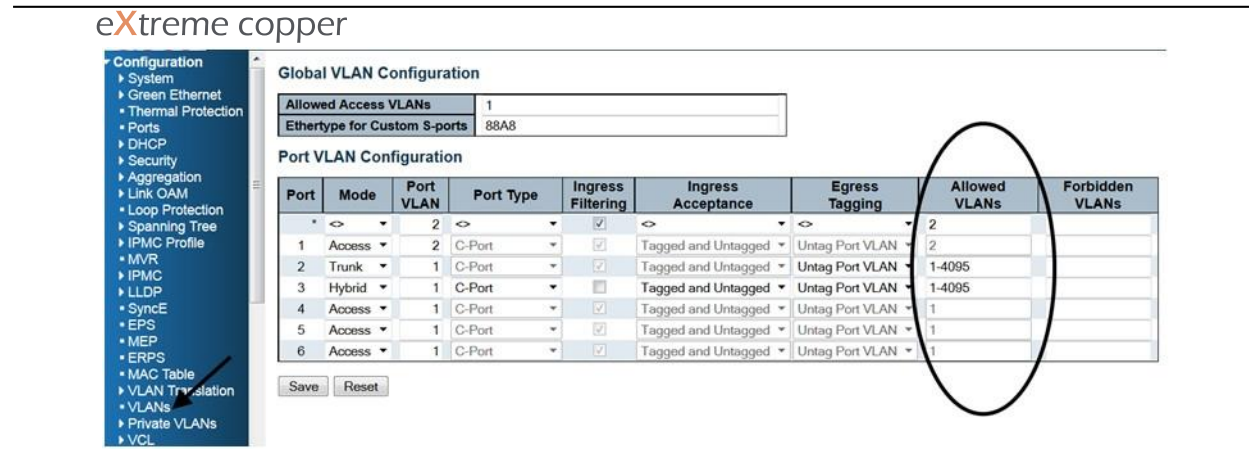


Figure 1 Allowed VLANs Configuration

Forbidden VLANs

A port may be configured to never be a member of one or more VLANs. This is particularly useful when dynamic VLAN protocols such as MVRP and GVRP must be prevented from dynamically adding ports to VLANs.

The trick is to mark such VLANs as forbidden on the port in question. The syntax is identical to the syntax used in the Existing VLANs field.

By default, the field is left blank, which means that the port may become a member of all possible VLANs.

CLI Example: Configure forbidden VLAN on the first Gigabit port

```
# configure terminal
(config)# interface GigabitEthernet 1/1
(config-if)# switchport forbidden VLAN ?
      add      Add to existing list.
      remove   Remove from existing list.
```

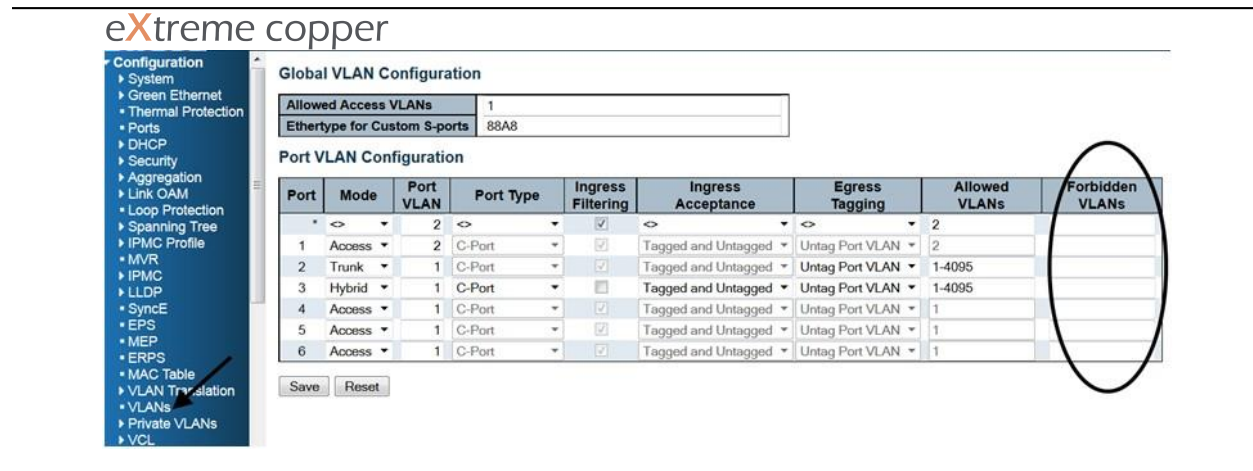


Figure 1 Forbidden VLANs Configuration

Show VLAN Status

CLI Example

```
# show VLAN ?
    brief          VLAN summary information
    id             VLAN status by VLAN id
    ip-subnet     Show VLAN ip-subnet entries.
    mac           Show VLAN MAC entries.

    name          VLAN status by VLAN name
    protocol      Protocol-based VLAN status
    status        Show the VLANs configured for each interface.
    <cr>
```

Web GUI

Various internal software modules may use VLAN services to configure VLAN memberships such as NAS, GVRP, MVR, Voice VLAN, MEP, or EVC.

The drop-down list on the right allows for selecting between showing VLAN memberships as configured by an administrator (Admin) or as configured by one of these internal software modules.

The Combined entry will show a combination of the administrator and internal software module configuration to reflect what is actually configured in hardware.

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VLAN Membership Status for Combined users

Start from VLAN 1 with 20 entries per page. <<<

VLAN ID	Port Members					
	1	2	3	4	5	6
1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Combined Auto-refresh Refresh

- Combined
- Admin
- NAS
- GVRP
- MVR
- Voice VLAN
- MEP
- EVC
- RMirror

Figure 1 VLAN Membership Status

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- PTP
- ▶ GVRP
- sFlow
- ▶ RFC2544
- DDMI
- Monitor
- ▶ System
- ▶ Green Ethernet
- Thermal Protection
- ▶ Ports
- ▶ Link OAM
- ▶ DHCP
- ▶ Security
- ▶ LACP
- Loop Protection
- ▶ Spanning Tree
- ▶ MVR
- ▶ IPMC
- ▶ LLDP
- ▶ Ethernet Services
- ▶ Performance
- Monitor
- PTP
- MAC Table
- ▼ VLANs
 - Membership
 - Ports
- ▶ VCL
- sFlow
- ▶ DDMI

VLAN Port Status for Combined users

Combined Auto-refresh Refresh

Port	Port Type	Ingress Filtering	Frame Type	Port VLAN ID	Untagged VLAN ID	Conflicts
1	C-Port	<input checked="" type="checkbox"/>	All			No
2	C-Port	<input checked="" type="checkbox"/>	All			No
3	C-Port	<input checked="" type="checkbox"/>	All			No
4	C-Port	<input checked="" type="checkbox"/>	All			No
5	C-Port	<input checked="" type="checkbox"/>	All	1	Untag PVID	No
6	C-Port	<input checked="" type="checkbox"/>	All	1	Untag PVID	No

Figure 1 VLAN Port Status

SERVICE AND UNRESOLVED PROBLEMS

For assistance, contact Extreme Copper's Customer Service Department between 8:00 AM and 5:00 PM Pacific Time at (818) 230-2477 or submit your request via FAX (818) 292-8590 (this will assist in logging in the request).

When calling for assistance, try to do so from the installation site as we have a better chance to successfully troubleshoot your installation and getting your installation up and running.

Before returning a product for repair, you must call Extreme Copper's Customer Service and receive a Returned Material Authorization (RMA) number. This number must appear on the outside of the shipping container with the address as indicated below. Products should be returned to:

EXTREME COPPER, INC.
Attention: Customer Service – RMA #
107 N. Reino Rd., Suite 233
Newbury Park, CA 91320

To ensure accurate return of repaired/replaced product, please enclose a note with the returned item that states your name, company name, mailing address, telephone number, RMA number, and any special instructions. During the first year after the date of purchase, all labor and materials will be provided without charge. There shall be no warranty for either parts or labor after the expiration of one year from the date of purchase or if in Extreme Copper's sole discretion the product has been deemed to be modified or abused.

Units must be returned postage prepaid, CODs will not be accepted! It is recommended that the unit be insured when shipped. Units returned without proof of date-of-purchase or out-of-warranty units will be repaired or replaced (at the discretion of Extreme Copper) and a charge will be made for parts and labor. Products repaired/replaced under warranty will be returned to any destination within the USA at Extreme Copper's expense. The carrier and method of shipment will be determined by Extreme Copper.

If the customer requests a specific form of conveyance or is located beyond the USA borders or if the unit is out-of-warranty, all shipping costs will be incurred by the customer.