

IP Subnetting VLAN

Ethernet Switch

ZyNOS 4.0

Support Notes

Version 4.0

July 2011



Overview

Subnet based VLANs allow users to group traffic into logical VLANs based on the source IP address and IP subnet. When a frame is received on a port, the switch checks where the IP subnet it came from and what the source IP address is. The untagged packets from the same IP subnet are then placed in the same subnet based VLAN. The most significant advantage of using subnet based VLANs is that the priority can be divided and tuned base on what VLAN the traffic belongs to.

Scenario

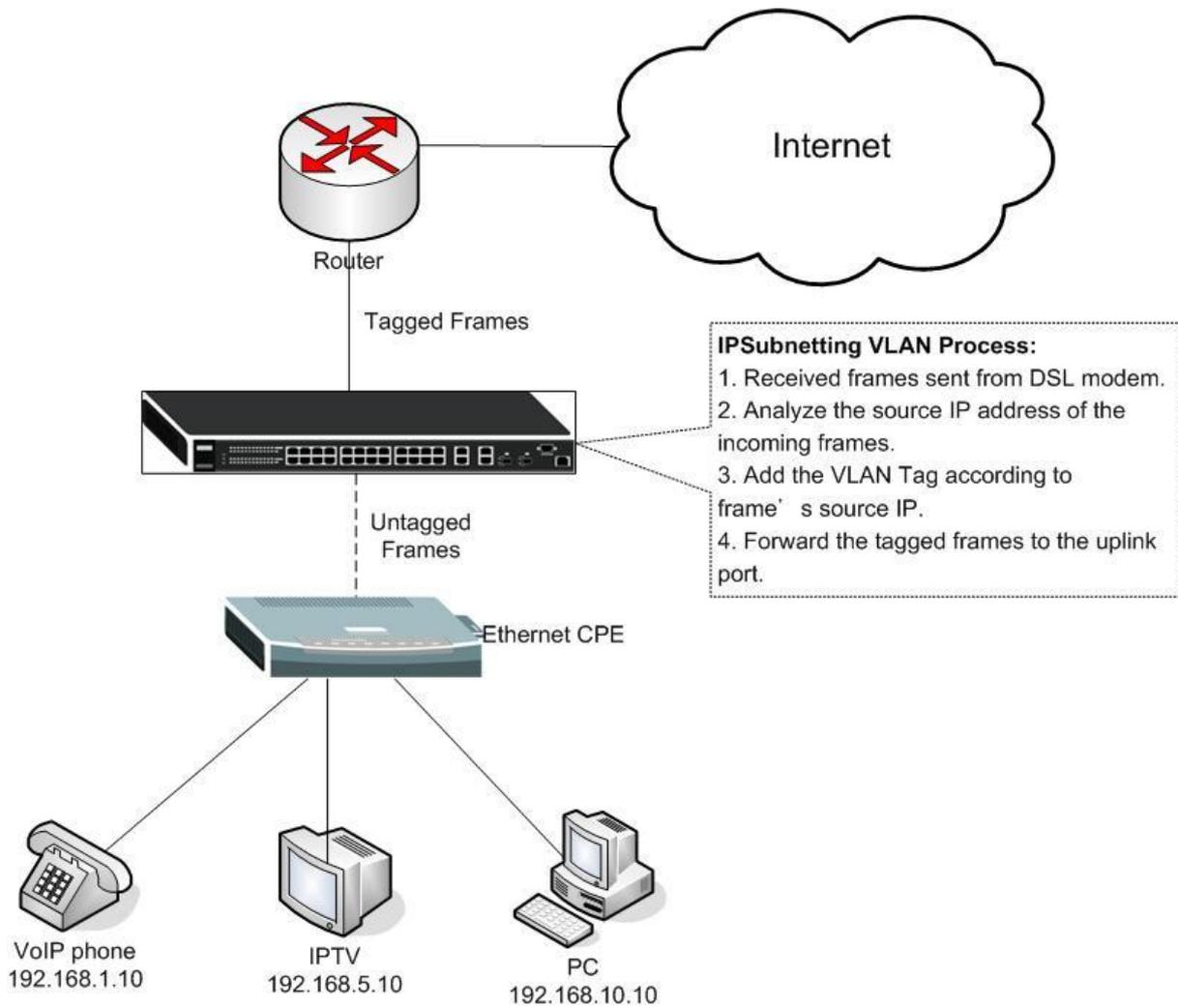
Considering the following topology:

Purpose:

Traffic from VoIP phone (source IP: 192.168.1.10) will be categorized into VLAN 3.

Traffic from IPTV (source IP: 192.168.5.10) will be categorized into VLAN 4.

Traffic from the PC (source IP: 192.168.10.10) will be categorized into VLAN 5.



When there are different IP services requirement behind a modem (e.g. VoIP, IPTV, and Common data networking). To separate the IP services in the edge site, we can classify different VLANs for each IP service.

By distinguishing each service, Service Providers can do further policy controlling for each VLAN.

In this topology, three IP services are needed by customer, VoIP, IPTV, and general network access. Each client belongs to different IP subnets. We can achieve this purpose using the switch with IPSubnetting VLAN function.

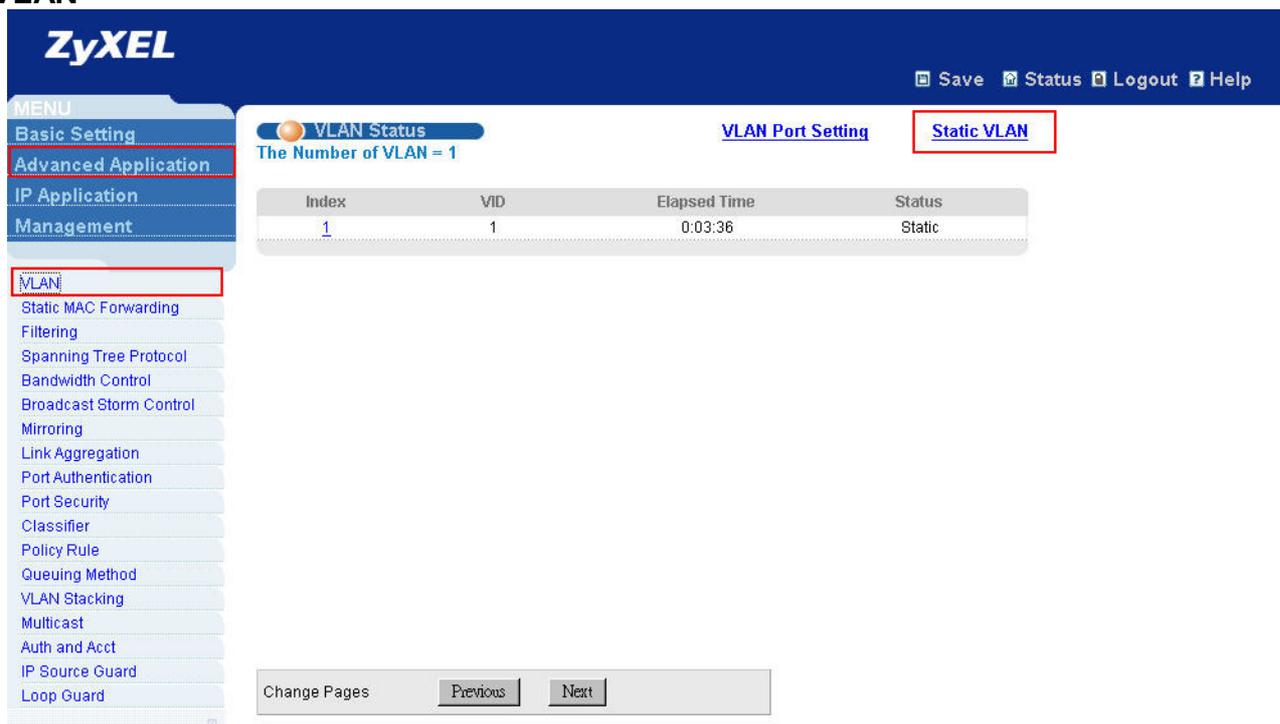
Configuration using the Web GUI

1. Connect the MGMT port to a PC or Notebook with the RJ45 Cable.
2. By default, the MGMT IP address of the out-band port is 192.168.0.1/24
3. Set your NIC to 192.168.0.100/24
4. Open an Internet browser (e.g. IE) and enter <http://192.168.0.1> into the URL field.
5. By default, the username for the administrator is “admin” and the password is “1234”.
6. After successfully logging in you will see a screen similar to the one below.

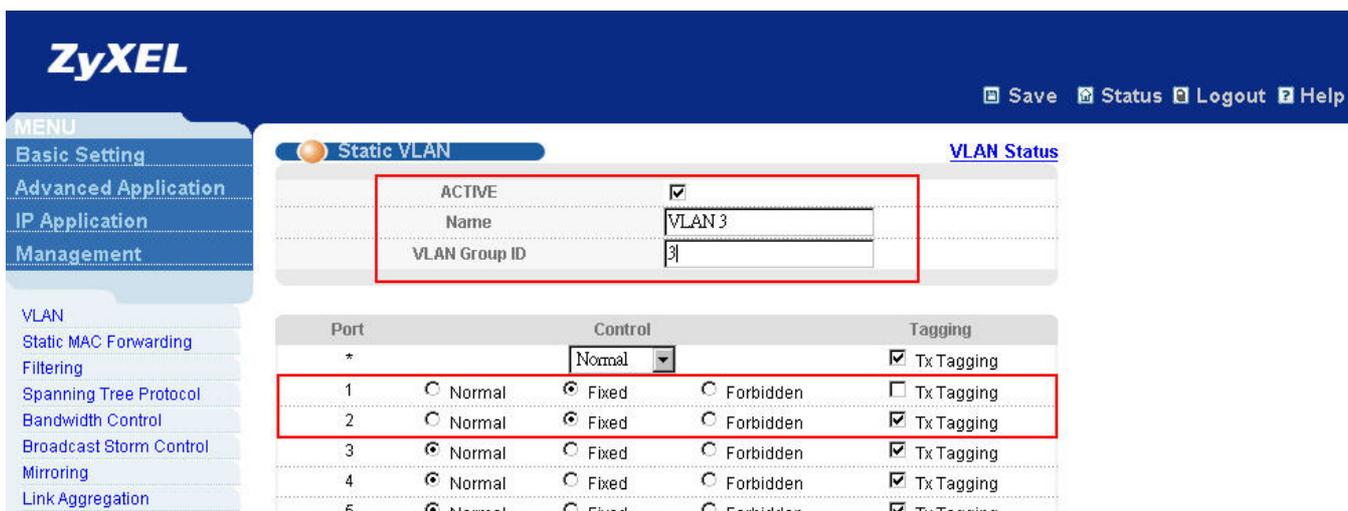
The screenshot shows the ZyXEL web GUI interface. At the top left is the ZyXEL logo. On the right side of the header, there are links for Save, Status, Logout, and Help. A left-hand menu contains options for Basic Setting, Advanced Application, IP Application, and Management. The main content area is titled 'Port Status' and displays a table with the following data:

Port	Name	Link	State	PD	LACP	TxPkts	RxPkts	Errors	Tx KB/s	Rx KB/s	Up Time
1		1000M/F	FORWARDING	Off	Disabled	1116	1476	0	29.787	8.825	1:17:32
2		Down	STOP	Off	Disabled	0	0	0	0.0	0.0	0:00:00
3		Down	STOP	Off	Disabled	0	0	0	0.0	0.0	0:00:00
4		Down	STOP	Off	Disabled	0	0	0	0.0	0.0	0:00:00
5		Down	STOP	Off	Disabled	0	0	0	0.0	0.0	0:00:00
6		Down	STOP	Off	Disabled	0	0	0	0.0	0.0	0:00:00
7		Down	STOP	Off	Disabled	0	0	0	0.0	0.0	0:00:00
8		Down	STOP	Off	Disabled	0	0	0	0.0	0.0	0:00:00
9		Down	STOP	-	Disabled	819	10239	0	0.0	0.0	0:00:00
10		Down	STOP	-	Disabled	0	0	0	0.0	0.0	0:00:00

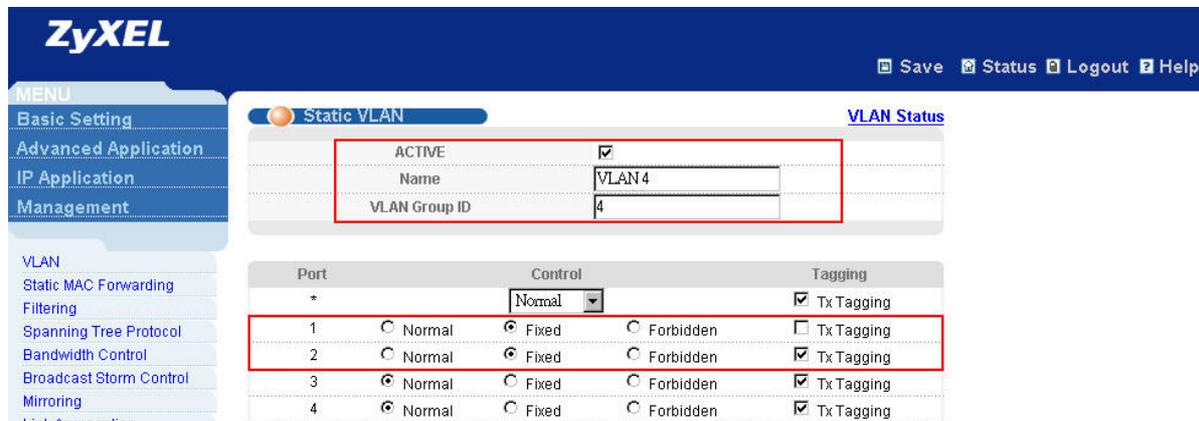
7. Go to “Static VLAN” page by clicking “Advanced Application” “VLAN” “Static VLAN”



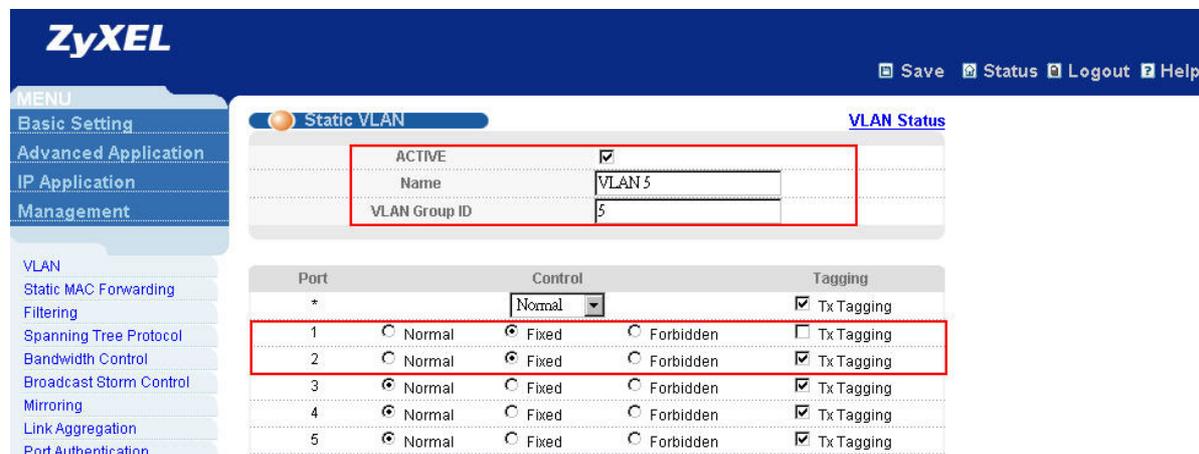
8. Create VLAN 3, include port 1 and port 2. Port 1 connects to the modem and packets going in and out this port shouldn't have VLAN tag. Port 2 connects to the router in the CO, and packets going in and out port 2 should have different VLAN tags according to its IP address. Click “Add”.



9. Create VLAN 4, include port 1 and port 2. Port 1 connects to the modem and packets going in and out this port shouldn't have VLAN tag. Port 2 connects to the router in the CO, and packets going in and out port 2 should have different VLAN tags according to its IP address. Click "Add".



10. Create VLAN 5, include port 1 and port 2. Port 1 connects to the modem and packets going in and out this port shouldn't have VLAN tag. Port 2 connects to the router in the CO, and packets going in and out port 2 should have different VLAN tags according to its IP address. Click "Add".



11. Go to “VLAN Port Setting” page by clicking “Advanced Application” “VLAN” “VLAN Port Setting”

ZyXEL Save Status Logout Help

MENU
 Basic Setting
 Advanced Application
 IP Application
 Management
 VLAN
 Static MAC Forwarding
 Filtering
 Spanning Tree Protocol
 Bandwidth Control
 Broadcast Storm Control
 Mirroring
 Link Aggregation
 Port Authentication
 Port Security
 Classifier
 Policy Rule
 Queuing Method
 VLAN Stacking
 Multicast
 Auth and Acct
 IP Source Guard
 Loop Guard

VLAN Status
 The Number of VLAN = 4

VLAN Port Setting Static VLAN

Index	VID	Elapsed Time	Status
1	1	0:46:59	Static
2	3	0:24:00	Static
3	4	0:10:00	Static
4	5	0:02:00	Static

Change Pages Previous Next

12. Go to “Subnet Based VLAN” page.

ZyXEL Save Status Logout Help

MENU
 Basic Setting
 Advanced Application
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 Port Security
 Classifier
 Policy Rule
 Queuing Method
 VLAN Stacking
 Multicast

VLAN Port Setting
 Subnet Based Vlan Protocol Based Vlan VLAN Status

GVRP
 Port isolation

Port	Ingress Check	PVID	GVRP	Acceptable Frame Type	VLAN Trunking
*	<input type="checkbox"/>		<input type="checkbox"/>	All	<input type="checkbox"/>
1	<input type="checkbox"/>	1	<input type="checkbox"/>	All	<input type="checkbox"/>
2	<input type="checkbox"/>	1	<input type="checkbox"/>	All	<input type="checkbox"/>
3	<input type="checkbox"/>	1	<input type="checkbox"/>	All	<input type="checkbox"/>
4	<input type="checkbox"/>	1	<input type="checkbox"/>	All	<input type="checkbox"/>
5	<input type="checkbox"/>	1	<input type="checkbox"/>	All	<input type="checkbox"/>
6	<input type="checkbox"/>	1	<input type="checkbox"/>	All	<input type="checkbox"/>
7	<input type="checkbox"/>	1	<input type="checkbox"/>	All	<input type="checkbox"/>
8	<input type="checkbox"/>	1	<input type="checkbox"/>	All	<input type="checkbox"/>
9	<input type="checkbox"/>	1	<input type="checkbox"/>	All	<input type="checkbox"/>
10	<input type="checkbox"/>	1	<input type="checkbox"/>	All	<input type="checkbox"/>

13. In the “Subnet Based VLAN” page, first we have to activate this function. Check the “Active” check box to enable it. Click “Apply”

Subnet Based VLAN Vlan Port Setting

Active	<input checked="" type="checkbox"/>
DHCP-Vlan Override	<input type="checkbox"/>

Apply

14. Create the Subnet Based VLAN entry for the VoIP phone.

Active	<input checked="" type="checkbox"/>
Name	VoIP
IP	192.168.1.10
Mask-Bits	24
VID	3
Priority	2

Add Cancel

Here we see that packets from 192.168.1.10/24 will be attached a VLAN tag 3 and its priority will be set to 2. Click “Add”

15. Create the Subnet Based VLAN entry for the IPTV device.

Active	<input checked="" type="checkbox"/>
Name	IPTV
IP	192.168.5.10
Mask-Bits	24
VID	4
Priority	5

Add Cancel

Here we see that packets from 192.168.5.10/24 will be attached a VLAN tag 4 and its priority will be set to 5. Click **“Add”**

16. Create the Subnet Based VLAN entry for the PC.

Active	<input checked="" type="checkbox"/>
Name	PC
IP	192.168.10.10
Mask-Bits	24
VID	5
Priority	7

Here we see that packets from 192.168.10.10/24 will be attached a VLAN tag 5 and its priority will be set to 7. Click **“Add”**

Configuration using the CLI

```
vlan 1 name 1
  normal ""
  fixed 1-10
  forbidden ""
  untagged 1-10
  ip address 192.168.1.1 255.255.255.0
exit
vlan 3
  name "VLAN 3"
  normal 3-10
  fixed 1-2
  forbidden ""
  untagged 1
exit
vlan 4
  name "VLAN 4"
  normal 3-10
  fixed 1-2
  forbidden ""
  untagged 1
exit
vlan 5
  name "VLAN 5"
  normal 3-10
  fixed 1-2
  forbidden ""
  untagged 1
exit
interface route-domain 192.168.1.1/24
exit
ip address 192.168.0.1 255.255.255.0
subnet-based-vlan
subnet-based-vlan name VoIP source-ip 192.168.1.10 mask-bits 24 vlan 3 priority 2
subnet-based-vlan name IPTV source-ip 192.168.5.10 mask-bits 24 vlan 4 priority 5
subnet-based-vlan name PC source-ip 192.168.10.10 mask-bits 24 vlan 5 priority 7
```