



GS700TS FS700TS – Access to the Internet on multiple VLANs using Multi-Homing

This document describes how to obtain Internet access on multiple VLANs using one Internet gateway capable of managing multiple IP subnets (Multi-homing).

The procedure described can apply to all the Smart Switches and VPN Firewall with new Web Interface (defined as the one with the Menu appearing horizontally on top).

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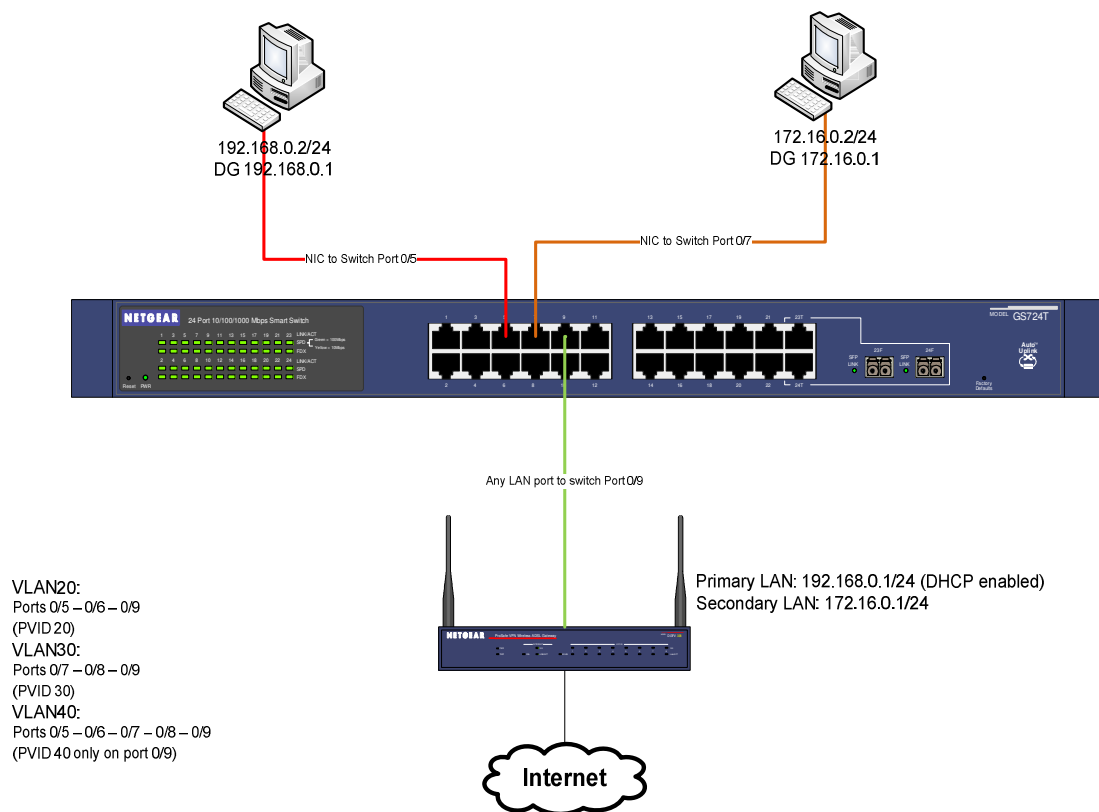
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VLAN-Definition

VLANs are logical subgroups within a Local Area Network (LAN), which combine user stations, and network devices into a single unit, regardless of the physical LAN segment to which they are attached. VLANs allow network traffic to flow more efficiently within subgroups. VLANs use software to reduce the amount of time it takes for network changes, additions, and moves to be implemented.

Notes when setting-up VLANs

- A VLAN does not have a minimum number of port
- VLANs work at the OSI Layer 2
- A VLAN can be created per unit, device or via logical connection/combination
- Broadcast and Multicast traffic is transmitted only in the VLAN in which traffic is generated.
- To allow traffic between VLAN a device working at protocol level (Layer 3) is required



Multi-Homing (extract from the DGFV338 Help page)

Network Configuration ✕

Secondary LAN IP Setup
If you have computers using different IP networks in the LAN, (for example: 172.16.2.0, 10.0.0.0), then you can add “aliases” to the LAN port and give computers on those networks, access to the Internet.

Available Secondary LAN IPs
The tables lists the secondary LAN IP addresses added to the router.

IP Address: The IP address alias added to the LAN port of the router. This is the gateway for computers that need to access the Internet.

Subnet Mask: IPv4 Subnet Mask.

Action/Edit: Click to make changes to the selected entry.

Select All: Selects all the entries in the **Available Secondary LAN IPs** table.

Delete: Deletes selected entries from the **Available Secondary LAN IPs** table.

Add Secondary LAN IP Address
To add a secondary LAN IP address, type in the **IP Address** and the **Subnet Mask** in the respective text fields and click **Add**.

Note: Additional IP addresses cannot be configured in the DHCP server. The hosts on the secondary subnets must be manually configured with the IP addresses, gateway IP and DNS server IPs.

IMPORTANT!
Make sure the secondary IP addresses are different from the LAN, WAN, and any other subnet attached to this router.

Example:
ADSL IP address: 10.0.0.1 with subnet 255.0.0.0
WAN Ethernet IP address: 20.0.0.1 with subnet 255.0.0.0
LAN IP address: 192.168.1.1 with subnet 255.255.255.0
Secondary LAN IP: 192.168.20.1 with subnet 255.255.255.0

Physical Setup

1x GS724TS Prosafe Smartswitch - Firmware 3.1.0.1
2x Windows XP Computers (2 on each VLAN)
1 x DGFV338 Prosafe Firewall Router (Router firmware 3.4.0.19)

Logical Setup

GS724TS:
Management IP on VLAN1 (192.168.0.239)

DGFV338 :
Primary range 192.168.0.1/24 (DHCP enabled)
Secondary range 172.16.0.1/24 (DHCP not enabled)

PC1 – VLAN20 – 192.168.0.2/24
PC2 – VLAN30 – 172.16.0.2/24

VLAN20: Ports 0/5 and 0/6 and 0/9 (PVID 20 for all the ports)
VLAN30: Ports 0/7 and 0/8 and 0/9 (PVID 30 for all the ports)
VLAN40: Port 0/5 – 0/9 (PVID 40 only for port 0/9)

DGFV338 Primary LAN

The Primary LAN settings can be defined on the GUI of the DGFV338 (Network Configuration, LAN Setup).

If DHCP is required ensure that the correct Starting IP address and Ending IP address are configured including the DNSs settings.

NETGEAR
PROSAFE

NETGEAR ProSafe VPN Wireless ADSL Gateway DGFV338

| Network Configuration | Security | VPN | Administration | Monitoring | Web Support | Logout |

:: WAN Settings :: Wireless Settings :: Dynamic DNS :: LAN Setup :: Routing ::

LAN Setup LAN Groups LAN Multi-homing [DHCP Log](#)

LAN TCP/IP Setup [help](#)

IP Address: 192 . 168 . 0 . 1 Subnet Mask: 255 . 255 . 255 . 0

DHCP [help](#)

Disable DHCP Server
 Enable DHCP Server

Domain Name: netgear.com

Starting IP Address: 192 . 168 . 0 . 2

Ending IP Address: 192 . 168 . 0 . 254

Primary DNS Server:

Secondary DNS Server:

WINS Server:

Lease Time: 24 Hours

DHCP Relay

Relay Gateway:

Enable LDAP information

LDAP Server:

Search Base:

port: (leave blank for default port)

DNS Proxy [help](#)

Enable DNS Proxy:

Apply **Reset**

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DGFV338 Secondary VLAN

In order to add a Secondary LAN to the DGFV338 the Multi-homing option should be used.

This can be accessed via the GUI (Network configuration, LAN Setup, Multi-Homing)

The screenshot displays the NETGEAR ProSafe VPN Wireless ADSL Gateway DGFV338 web interface. The top navigation bar includes links for Network Configuration, Security, VPN, Administration, Monitoring, Web Support, and Logout. The breadcrumb trail shows: WAN Settings :: Wireless Settings :: Dynamic DNS :: LAN Setup :: Routing :: LAN Setup > LAN Groups > LAN Multi-homing.

The main content area is titled "Available Secondary LAN IPs" and contains a table with the following data:

| | IP Address | Subnet Mask | Action |
|--------------------------|------------|---------------|----------------------|
| <input type="checkbox"/> | 172.16.0.1 | 255.255.255.0 | edit |

Below the table are "select all" and "delete" buttons. Underneath is the "Add Secondary LAN IP Address:" section with input fields for IP Address (172, 16, 0, 1) and Subnet Mask (255, 255, 255, 0), and an "add" button.

At the bottom of the page, the copyright notice reads: 2007 © Copyright NETGEAR®

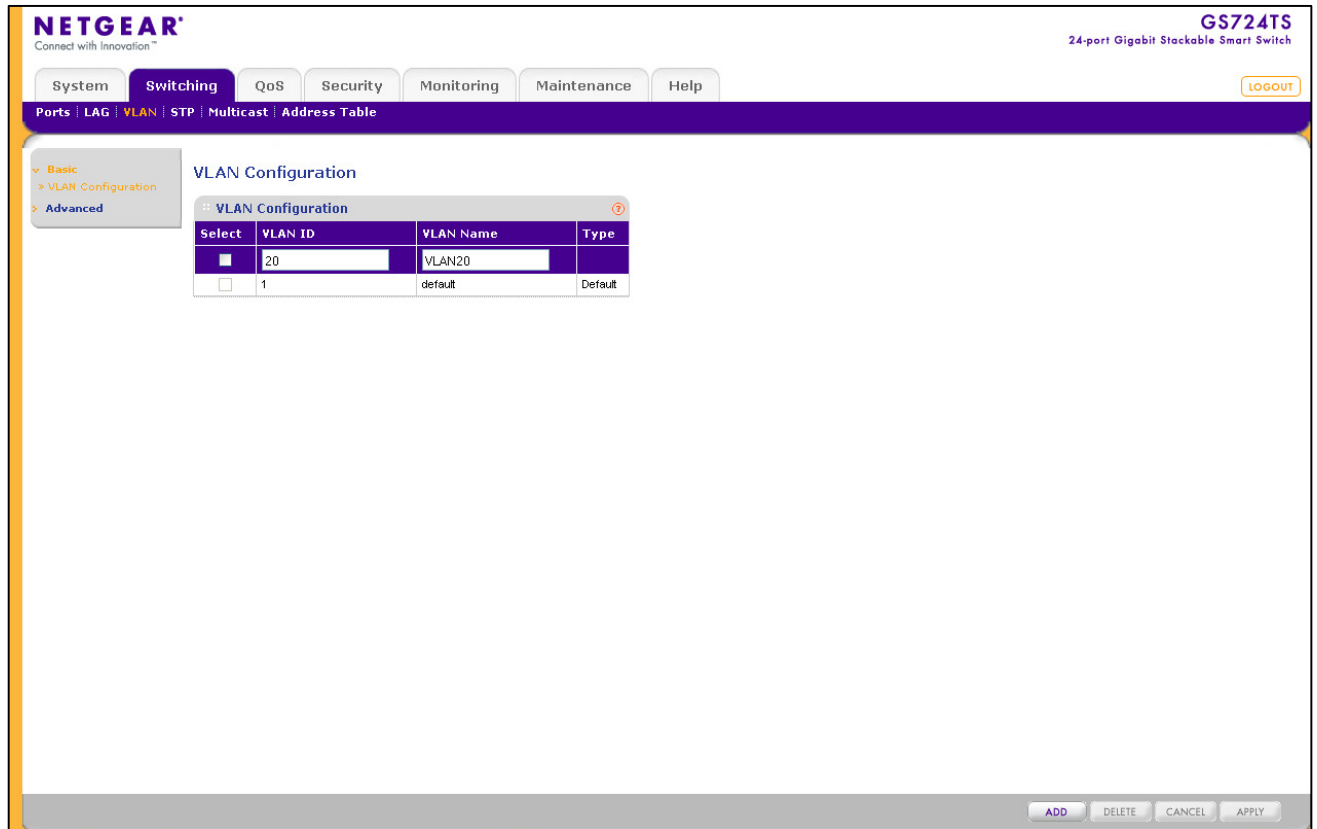
PCs with an IP address within this range will need the IP address, Default Gateway and DNS servers (if different from the Default Gateway) manually set.

Smartswitch VLAN creation

VLAN are created on the Smartswitch via the GUI (Switching, VLAN, Basic, VLAN configuration).

To complete the scenarion 3 VLAN will need to be created.

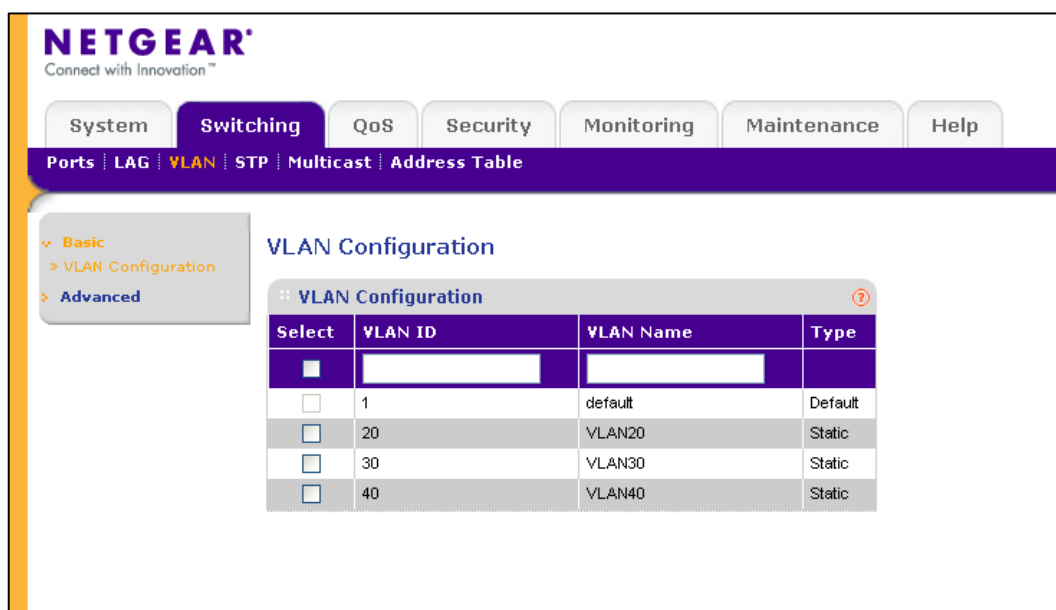
The two pictures below show the creation of VLAN20, and the results of the creation of all the VLAN required to complete the scenario (VLAN20, 30, 40)



The screenshot shows the Netgear Smartswitch GUI for a GS724TS switch. The navigation menu includes System, Switching, QoS, Security, Monitoring, Maintenance, and Help. Under Switching, there are links for Ports, LAG, VLAN, STP, Multicast, and Address Table. The left sidebar shows a tree view with Basic, VLAN Configuration, and Advanced. The main content area is titled 'VLAN Configuration' and contains a table with the following data:

| Select | VLAN ID | VLAN Name | Type |
|-------------------------------------|---------|-----------|---------|
| <input checked="" type="checkbox"/> | 20 | VLAN20 | |
| <input type="checkbox"/> | 1 | default | Default |

At the bottom right of the page, there are buttons for ADD, DELETE, CANCEL, and APPLY.



The screenshot shows the Netgear Smartswitch GUI for a GS724TS switch, similar to the first image. The navigation menu and sidebar are the same. The main content area is titled 'VLAN Configuration' and contains a table with the following data:

| Select | VLAN ID | VLAN Name | Type |
|--------------------------|---------|-----------|---------|
| <input type="checkbox"/> | | | |
| <input type="checkbox"/> | 1 | default | Default |
| <input type="checkbox"/> | 20 | VLAN20 | Static |
| <input type="checkbox"/> | 30 | VLAN30 | Static |
| <input type="checkbox"/> | 40 | VLAN40 | Static |

Assigning Port membership to a VLAN

Port membership can be assigned via the GUI (Switching, VLAN, Advanced , VLAN membership).

Three options are available:

- No membership (no symbol appearing in the gray box underneath the port number)
- Untagged membership (U)
- Tagged membership (T)

In order to browse through the options just continuously click on the gray box until the correct one is set.

For this scenario we will be using the U (Untagged) option on all the ports.

The screenshot displays the Netgear web interface for a GS724TS switch. The 'Switching' tab is active, and the 'VLAN' sub-tab is selected. The 'VLAN Membership' configuration window is open, showing the following settings:

| VLAN ID | Group Operation |
|-----------|-----------------------|
| 20 | Tag All |
| VLAN Name | UNTAGGED PORT MEMBERS |
| VLAN Type | TAGGED PORT MEMBERS |

Below the configuration window, a table shows the membership status for each port:

| Port | Membership |
|------|------------|
| 01 | |
| 02 | |
| 03 | |
| 04 | |
| 05 | U |
| 06 | |
| 07 | |
| 08 | U |
| 09 | |
| 10 | |
| 11 | |
| 12 | |
| 13 | |
| 14 | |
| 15 | |
| 16 | |
| 17 | |
| 18 | |
| 19 | |
| 20 | |
| 21 | |
| 22 | |
| 23 | |
| 24 | |

The 'LAG' section is also visible at the bottom of the port membership table.

Assigning a PVID to a port

The PVID (Port VLAN ID) is assigned to each port via the GUI (Switching, VLAN, Advanced, Port PVID configuration).

It is important that the PVID matches the VLAN a port is member of, unless such port belongs to multiple VLANs (in which case the PVID must still be set and be unique, but can match any of the VLAN IDs).

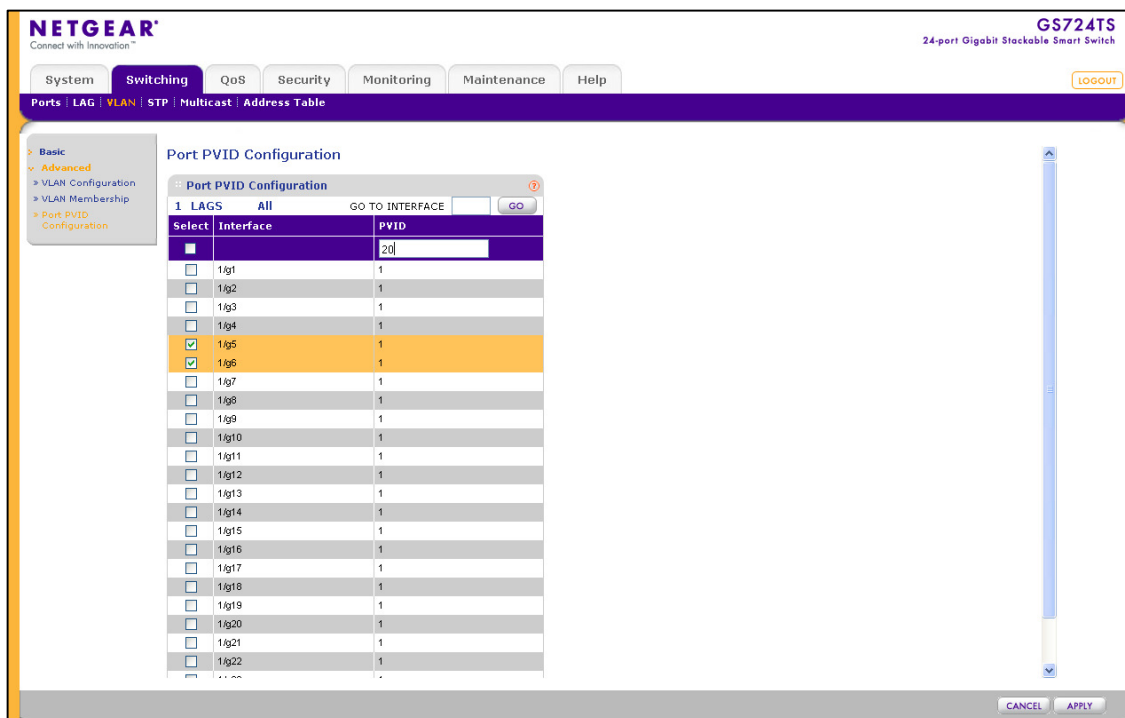
In our scenario the following PVID will apply:

Ports 0/5 - 0/6 (PVID 20)

Ports 0/7 - 0/8 (PVID 30)

Port 0/9 (PVID 40)

The below pictures show how after clicking on apply (for all 3 VLANs PVID) we obtain the correct settings:



The screenshot shows the Netgear GS724TS web interface. The top navigation bar includes System, Switching, QoS, Security, Monitoring, Maintenance, and Help. The main navigation bar includes Ports, LAG, VLAN, STP, Multicast, and Address Table. The left sidebar shows a tree view with Basic, Advanced, VLAN Configuration, VLAN Membership, and Port PVID Configuration. The main content area is titled "Port PVID Configuration" and contains a "Port PVID Configuration" dialog box. The dialog box has a "GO TO INTERFACE" field and a "GO" button. Below this is a table with columns "Select", "Interface", and "PVID". The table lists ports from 1/g1 to 1/g22. Ports 1/g5 and 1/g6 are selected, and their PVID is set to 20. The "PVID" field is a text input box containing the value "20". At the bottom of the dialog box are "CANCEL" and "APPLY" buttons.

| Select | Interface | PVID |
|-------------------------------------|-----------|------|
| <input type="checkbox"/> | 1/g1 | 1 |
| <input type="checkbox"/> | 1/g2 | 1 |
| <input type="checkbox"/> | 1/g3 | 1 |
| <input type="checkbox"/> | 1/g4 | 1 |
| <input checked="" type="checkbox"/> | 1/g5 | 1 |
| <input checked="" type="checkbox"/> | 1/g6 | 1 |
| <input type="checkbox"/> | 1/g7 | 1 |
| <input type="checkbox"/> | 1/g8 | 1 |
| <input type="checkbox"/> | 1/g9 | 1 |
| <input type="checkbox"/> | 1/g10 | 1 |
| <input type="checkbox"/> | 1/g11 | 1 |
| <input type="checkbox"/> | 1/g12 | 1 |
| <input type="checkbox"/> | 1/g13 | 1 |
| <input type="checkbox"/> | 1/g14 | 1 |
| <input type="checkbox"/> | 1/g15 | 1 |
| <input type="checkbox"/> | 1/g16 | 1 |
| <input type="checkbox"/> | 1/g17 | 1 |
| <input type="checkbox"/> | 1/g18 | 1 |
| <input type="checkbox"/> | 1/g19 | 1 |
| <input type="checkbox"/> | 1/g20 | 1 |
| <input type="checkbox"/> | 1/g21 | 1 |
| <input type="checkbox"/> | 1/g22 | 1 |

- Basic
- Advanced
 - VLAN Configuration
 - VLAN Membership
 - Port PVID Configuration

Port PVID Configuration

Port PVID Configuration

1 LAGS All GO TO INTERFACE GO

| Select | Interface | PVID |
|--------------------------|-----------|----------------------|
| <input type="checkbox"/> | | <input type="text"/> |
| <input type="checkbox"/> | 1/g1 | 1 |
| <input type="checkbox"/> | 1/g2 | 1 |
| <input type="checkbox"/> | 1/g3 | 1 |
| <input type="checkbox"/> | 1/g4 | 1 |
| <input type="checkbox"/> | 1/g5 | 20 |
| <input type="checkbox"/> | 1/g6 | 20 |
| <input type="checkbox"/> | 1/g7 | 30 |
| <input type="checkbox"/> | 1/g8 | 30 |
| <input type="checkbox"/> | 1/g9 | 40 |
| <input type="checkbox"/> | 1/g10 | 1 |
| <input type="checkbox"/> | 1/g11 | 1 |
| <input type="checkbox"/> | 1/g12 | 1 |
| <input type="checkbox"/> | 1/g13 | 1 |
| <input type="checkbox"/> | 1/g14 | 1 |
| <input type="checkbox"/> | 1/g15 | 1 |
| <input type="checkbox"/> | 1/g16 | 1 |
| <input type="checkbox"/> | 1/g17 | 1 |
| <input type="checkbox"/> | 1/g18 | 1 |
| <input type="checkbox"/> | 1/g19 | 1 |
| <input type="checkbox"/> | 1/g20 | 1 |
| <input type="checkbox"/> | 1/g21 | 1 |
| <input type="checkbox"/> | 1/g22 | 1 |
| <input type="checkbox"/> | 1/g23 | 1 |

Testing the scenario

In order to test the scenario:

- Connect one PC with IP address in the 192.168.0.0/24 range to port 0/5 or 0/6
- Connect one PC with IP address in the 172.16.0.0/24 range to port 0/7 or 0/8
- Connect the Prosafe firewall to port 0/9

It should now be possible for each PC to ping the IP address of the Prosafe Firewall within the same IP subnet, and also connect to the Internet (assuming the DNS settings are correctly set via DHCP or manual configuration)

Further notes

The solution illustrated above allows multiple LANs to access the Internet but does not create Layer 3 separation, whilst Layer 2 VLAN separation is guaranteed by the switch.

To obtain full Layer 3 separation a Layer 3 devices with ACL capability must be used.