

Service Managed Gateway™

Configuring a Multiple Ethernet Connection

Issue 2.0

Date 31 May 2010

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1 About this document

1.1 Scope

This document explains:

- what an Ethernet switch is,
- the benefits of an Ethernet switch, and
- how to configure multiple LANs with an Ethernet switch.

This document also gives an example of a simple Ethernet switch configuration and a complex Ethernet switch configuration.

1.2 Readership

This document is for end users or engineers who need to configure LANs on the Service Managed Gateway (SMG).

1.3 More information

For information on how to configure firewalls on a LAN, read the guide '**Configuring a Firewall**'.

2 Introduction

2.1 Security and multiple LANs

The 6000 and GW7000 series gateways support up to 4 separate Ethernet LANs and can route data packets between these LANs. You can apply firewall rules to the traffic routing between each LAN, which allows for each of the LANs to have a different function, and for security to be applied between these functions.

2.2 The physical configuration of the Ethernet ports

Your Service Managed Gateway features four-port Fast Ethernet ports. This enables the SMG to interconnect and control the traffic between up to four local area networks (LANs) and the Internet.

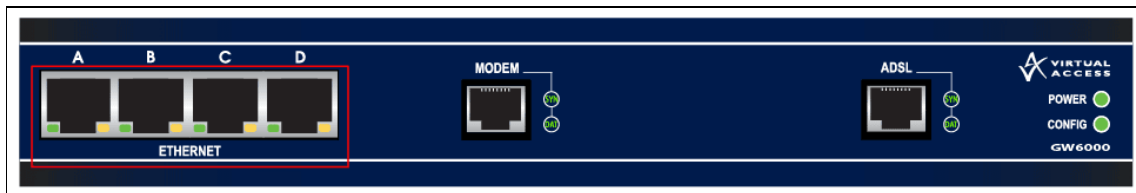


Figure 1: The four-port Ethernet interface on the 6000 series SMG

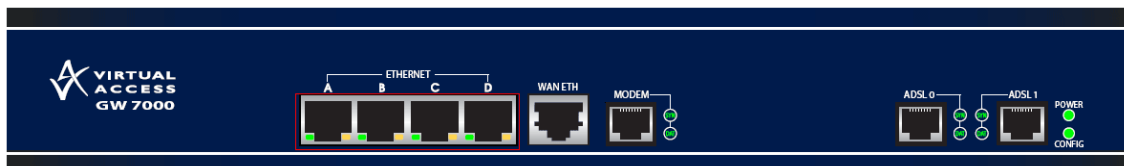


Figure 2: The four-port Ethernet interface on the GW7000 series SMG

The interface for the Ethernet switch in the web of your SMG enables you to assign different LANs and public servers to the Ethernet interface ports. You can assign any port to any Ethernet interface. Figure 3 shows the factory configuration of the Ethernet switch.

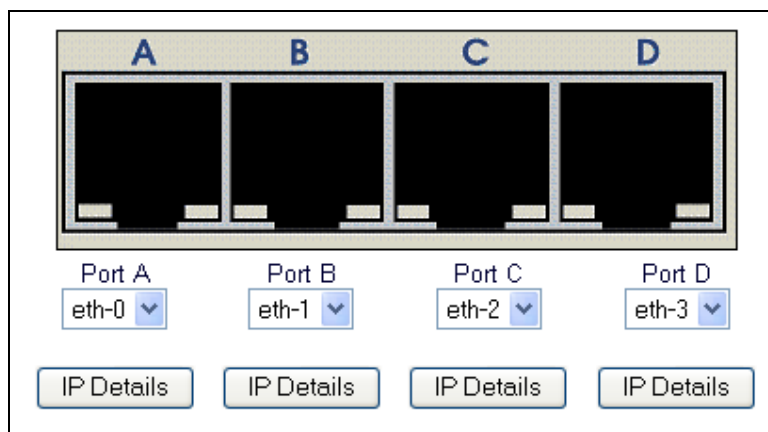


Figure 3: The Ethernet switch in the SMG web.

If you need help using the Ethernet switch in the web, read section 3.0, [How to use the multiple Ethernet switch to configure Ethernet interfaces](#).

2.3 The benefits of the Ethernet switch

If two or more ports are on the same LAN, then there is Ethernet switching between the ports, using the features that are listed below.

- **Address matching:** every time a new packet arrives into one of the ports that are on the same LAN, the switch searches an internal table to match the physical port number to the packet's destination MAC address. When it finds a match, the switch forwards the packet only through the port that it matched to the packet. It does not send the packet to other ports on the same LAN, including the SMG processor. Address matching results in faster performance.
- **Learning:** After the switch forwards the packet, it records the packet's source MAC address and the port that the packet was received from into the table. When response packets come from other ports, the switch already knows where to forward them. Learning results in faster performance.
- **Aging:** users can dynamically change cables into different ports at any time. To allow for cables that change ports, the switch clears its internal routing table after a certain amount of inactivity.

3 Configuring Ethernet interfaces

3.1 Open the LAN configuration window

To configure multiple Ethernet connections, first type **fast.start** in the address field of your browser.

You may need a password to log in to your SMG. If you do, type the password into the Password field that appears. Then click **Login**.

A screenshot of a web form for logging into the SMG. It features a text input field labeled "Password" with a vertical cursor on the right. Below the field are two buttons: "Login" and "Reset Form".

Figure 4: The password field in the SMG web

The SMG start page appears.



Figure 5: The SMG start page

Click the **Fast.Start** icon. The Fast.Start Welcome page appears.

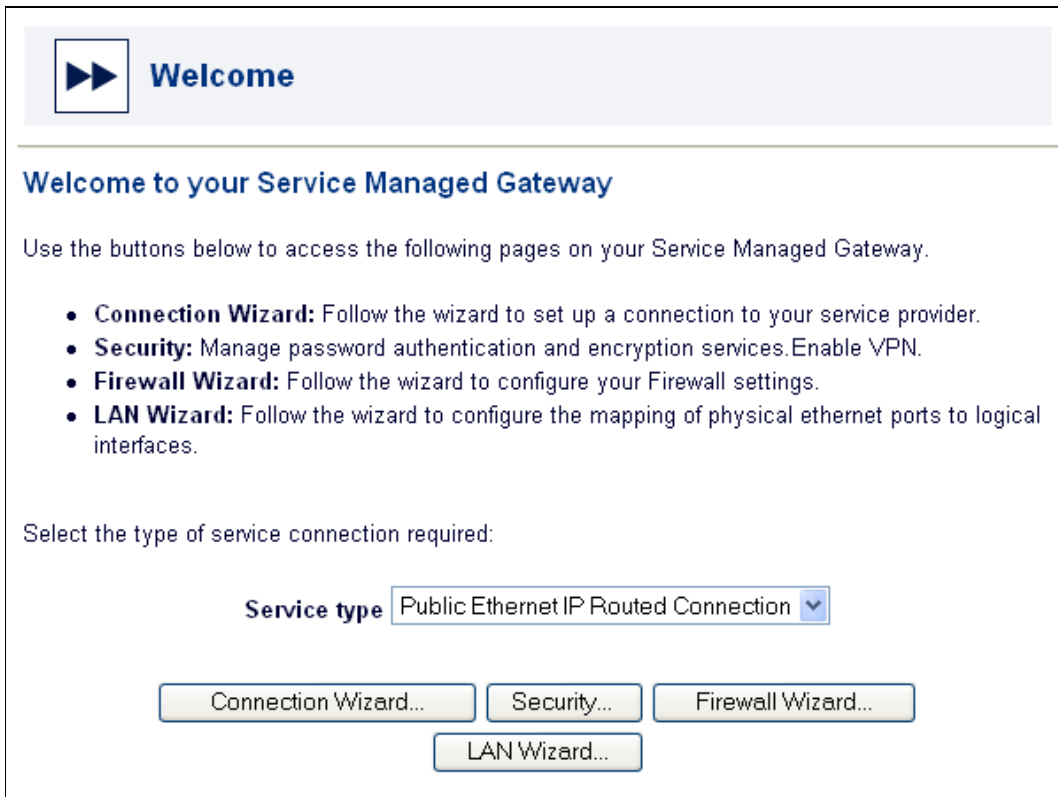


Figure 6: The fast.start welcome page

3.2 Ensure that the service type is correct

Make sure that the service type is correct before you configure the Ethernet switch.

Look at the Service type field. It should show the correct connection type for your SMG. If it does not, select the correct connection type from the Service type drop-down list.

If you need to configure the Ethernet connections on an ADSL or T1/E1 SMG, please read section 3.3, [How to configure the Ethernet connections on an ADSL or T1/E1 SMG](#).

If you need to configure the Ethernet connections on an Ethernet SMG, please read section 3.4, [How to configure the Ethernet connections on an Ethernet SMG](#).

3.3 Configure the Ethernet connections on an ADSL or T1/E1 SMG

To configure your Ethernet connections, click **LAN Wizard** on the Welcome page. The LAN Configuration page appears, which contains the Ethernet switch.

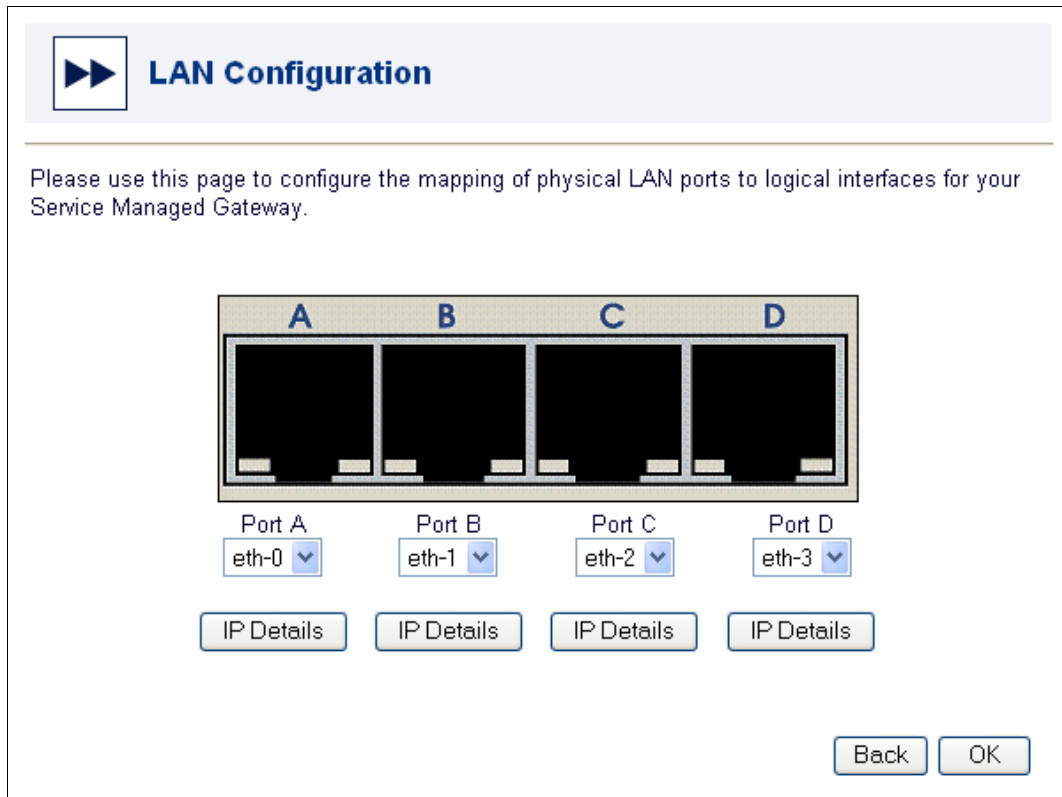


Figure 7: The LAN Configuration window

You can configure any port to any Ethernet interface.

To assign an Ethernet interface to a port, click arrow beside the port drop-down list and select the interface you want to assign.

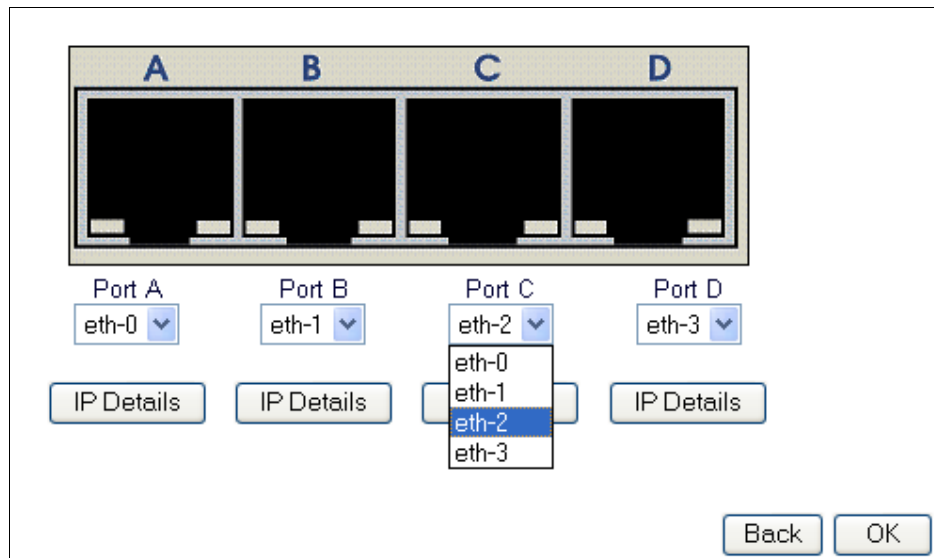


Figure 8: How to select the Ethernet interface that you want to assign to a port

Please go to section 2.5, [How to configure local address settings for an Ethernet interface](#).

3.4 Configure the Ethernet connections on an Ethernet SMG

To configure your Ethernet connections, click **LAN Wizard** on the Welcome page. The LAN Configuration page appears which contains the Ethernet switch.

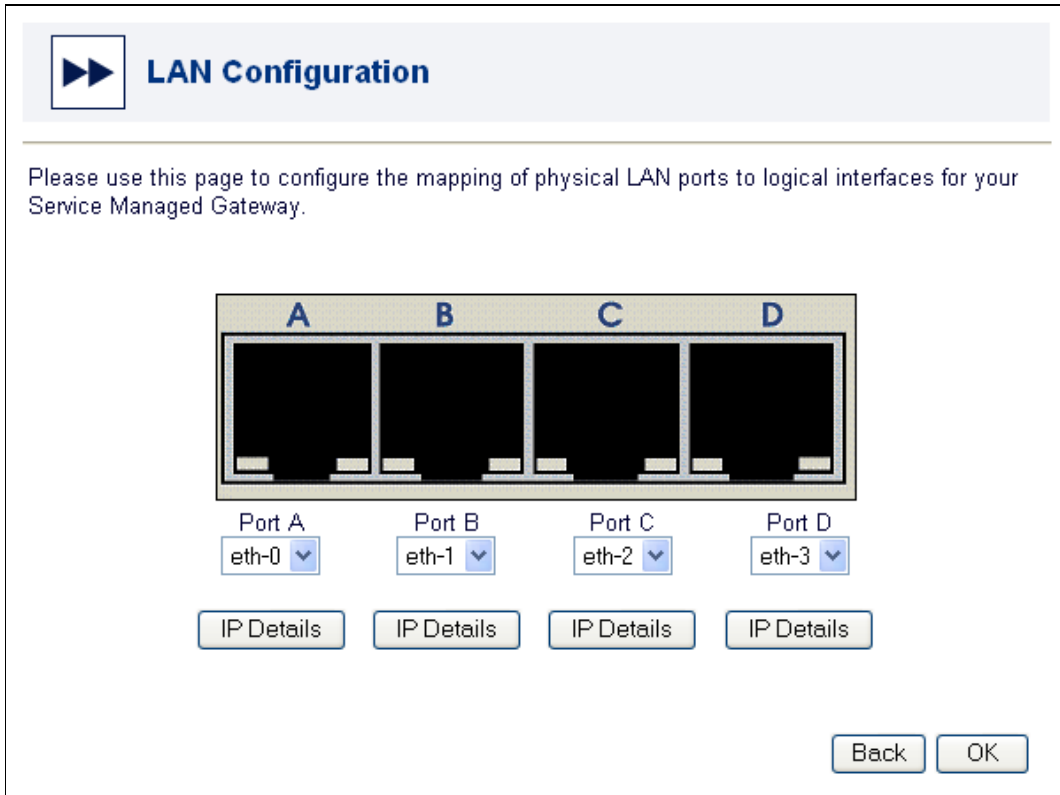


Figure 9: The LAN Configuration window

You can configure any port to any Ethernet interface, but we recommend that you use the configurations in Table 1.

The number of LAN connections you need	Port A is configured as	Port B is configured as	Port C is configured as	Port D is configured as	Your WAN connection is
1	Eth-0	Eth-0	Eth-0	Eth-1	Port D
2	Eth-0	Eth-0	Eth-1	Eth-2	Port C
3	Eth-0	Eth-1	Eth-2	Eth-3	Port B

Table 1: The recommended Ethernet port configurations for an Ethernet SMG

If your SMG was automatically activated, Eth-1 was assigned to the WAN Internet connection. This assignment automatically applies WAN firewall rules to Eth-1. If you manually activate your SMG, we recommend that you assign Eth-1 to the WAN Internet connection. For more information about manually activating your SMG, please read the configuration guide that is relevant to your type of connection.

To configure an Ethernet interface on a port, click the down-pointing arrow next to the Port drop-down list and select the interface you want.

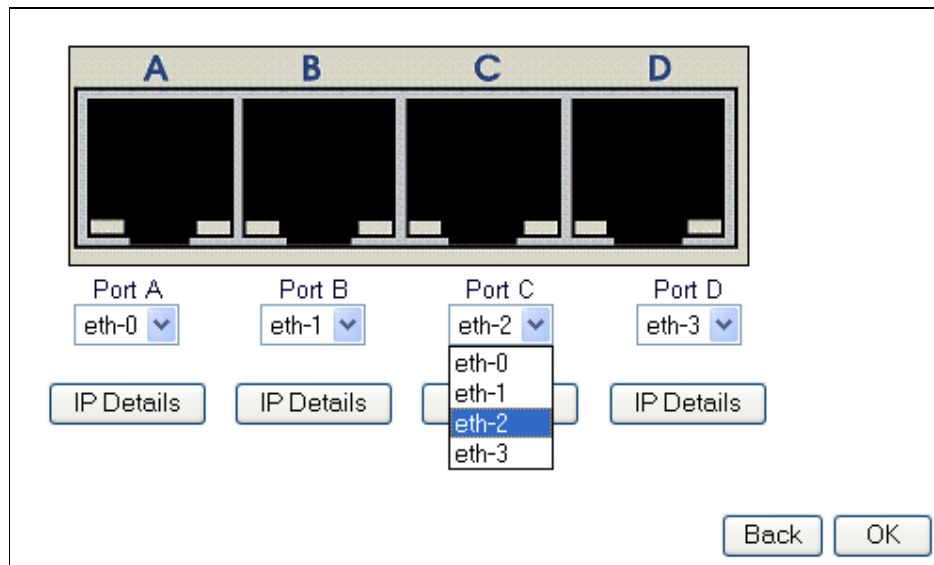


Figure 10: Selecting the Ethernet interface that you want to configure on a port

3.5 Configure local address settings for an Ethernet interface

You may need to configure local address settings for the Ethernet interfaces that you assigned to ports. On the LAN Configuration page, click **IP Details** under the port that you need to specify address settings for.

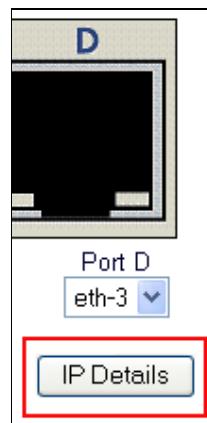


Figure 11: The IP details button, which opens the Ethernet LAN configuration window

Eth-0 LAN Configuration

Service Managed Gateway local address settings:

Ethernet Interface

IP address . . .

IP address mask . . .

Provide DHCP Addresses

Enabled

Addresses from to

Figure 12: The Ethernet LAN configuration window

Type the IP address for the Ethernet interface in the IP address field. Type the IP address mask in the IP address mask field.

To prevent the Dynamic Host Configuration Protocol from automatically assigning addresses to devices on the LAN, select **no** from the Enabled drop-down list in the Provide DHCP Addresses section of the window. No is the default setting.

To automatically assign dynamic IP addresses to the devices on the LAN, select **yes** from the Enabled drop-down list. Specify the range of addresses to be used in the Addresses from and to fields.

Click **OK** to return to the LAN Configuration window.

3.6 Save the Ethernet switch configuration

To save the changes you made using the Ethernet switch, click **OK** in the LAN Configuration window.

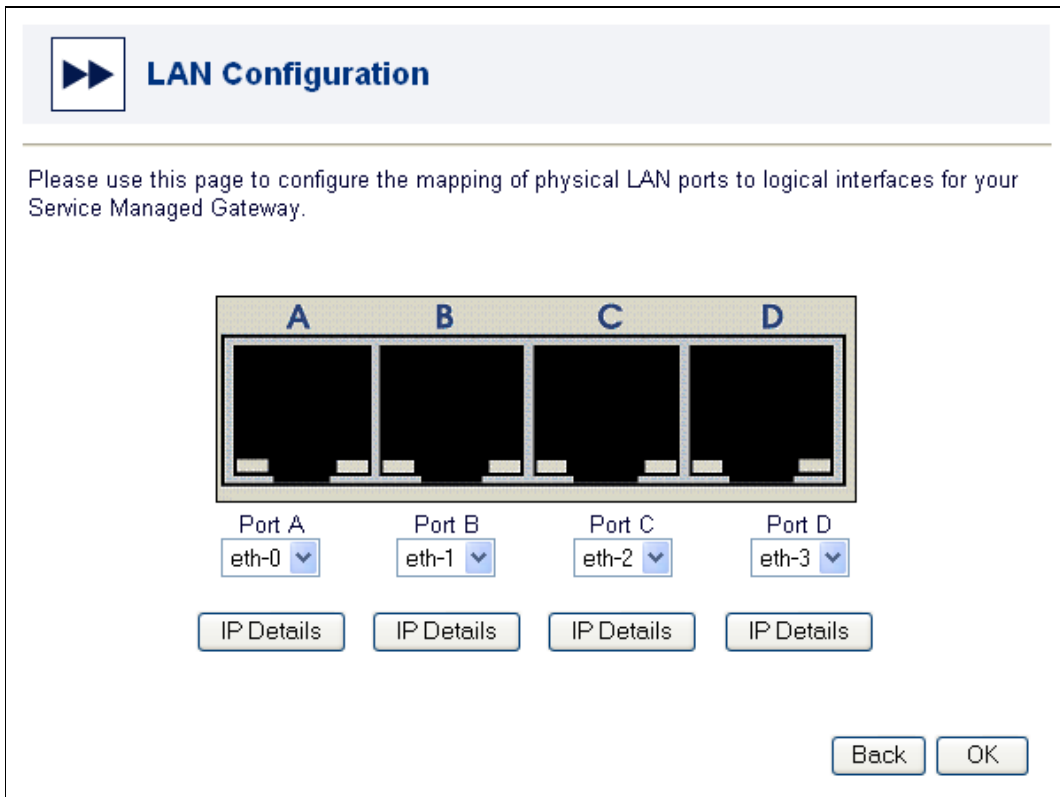


Figure 13: The LAN Configuration window

A dialog box appears.

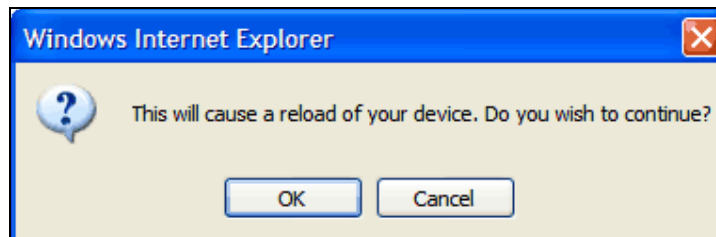


Figure 14: The dialog box that appears when you click OK in the LAN Configuration window

Click **OK** to update the configuration of your SMG. Click **Cancel** to return to the LAN Configuration window.

If you decide that you do not want to change your Ethernet configuration, click the **Back** button in the LAN Configuration window to return to the Fast.Start Welcome window.

4 Configuring firewall rules for each Ethernet interface

We recommend that you configure firewall rules for each Ethernet interface after you configure the Ethernet switch.

Use the Fast.Start Firewall Wizard to configure firewall rules. For more information, please read **Configuring a Firewall**.

5 Examples of LAN configurations using an Ethernet switch

5.1 A simple Ethernet configuration on a 6000 series SMG

Suppose that you must configure an Ethernet SMG for an office with a single LAN. One of the Ethernet ports must be configured as a WAN connection for the Internet. The other three ports can be configured as LANs.

When you assemble the SMG, you connect one Ethernet cable to port A. You connect the WAN cable to port D. Figure 15 shows these physical connections, which are the connections that we recommend for an Ethernet connection with one LAN.

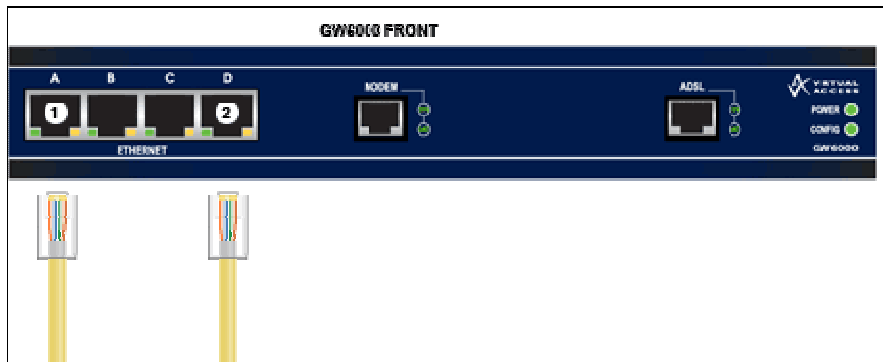


Figure 15: A simple Ethernet connection. The cable below port A is the Ethernet connection. The cable below port D is the WAN Internet connection.

The default setting for port A is Eth-0. When you have only one LAN, it is a good idea to configure the ports that you do not use with the same Ethernet interface that you use for your LAN. This means that you can connect the LAN cable to any of these ports and the LAN will function. So, in this example, you configure port B and C as Eth-0.

If the SMG was automatically activated, Eth-1 was automatically configured as a WAN connection. You decided to configure port D as the Internet connection. So you configure port D as Eth-1. Figure 16 shows this configuration. We recommend that you configure your switch this way if you have only one LAN and you are using an Ethernet SMG.

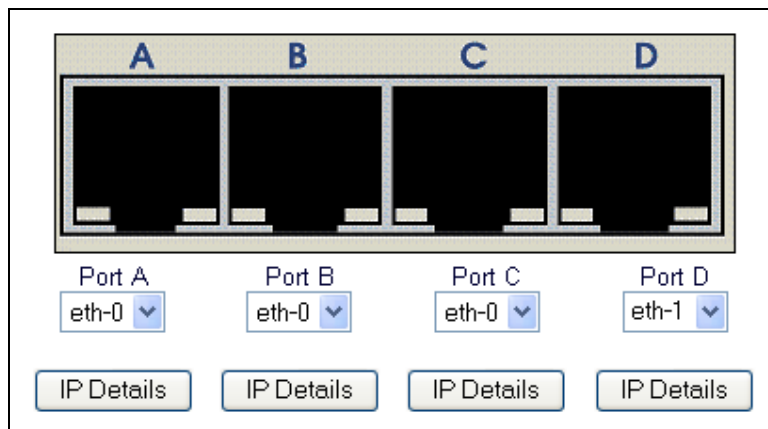


Figure 16: Ports A, B, and C are configured as Eth-0 for the LAN. Port D is configured as Eth-1 for the Internet WAN connection

After you configure the Ethernet connections, you may need to configure IP details for the private Ethernet interface and Dynamic Host Configuration Protocol (DHCP). For more

information, read section 2.5, [How to configure local address settings for an Ethernet interface](#).

After you assign Ethernet ports, you should configure your firewall using the Firewall Wizard. Please read the guide **Configuring a Firewall**.

To read a step-by-step explanation of how to use the Ethernet switch, read section 2.0, [How to use the multiple Ethernet switch to configure Ethernet interfaces](#).

5.2 An example of a complex Ethernet configuration on a GW7000

Suppose that you must configure multiple Ethernet connections on an Ethernet SMG for a school. Your school maintains four LANs:

- a secure LAN for teachers and administrative staff, where they share resources, administrative materials, and student reports;
- a LAN for students that includes Internet filtering software and WAN firewall settings;
- a LAN for the library that has WAN firewall settings because there are publicly accessible servers, such as a web server, on that LAN; and
- a connection to a WIFI access point for visitors and guests.

The multiple Ethernet switch enables you to connect these four LANs to the Internet through a single SMG. The switch ensures that:

- the teachers' LAN is secure,
- the students' LAN is safe from inappropriate material
- the entire school network is less open to outside attacks, and
- visitors have a secure WIFI connection.

You decide that

- the teachers' LAN is on Eth-0;
- the library LAN is on Eth-1;
- the students' LAN is on Eth-2;
- the visitors' WIFI connection is on Eth-3; and
- the Internet WAN connection is on WANETH.

When you install the SMG, you connect the Ethernet ports to the relevant Ethernet switches/devices. Figure 17 shows this physical configuration. We recommend these connections when you have four LANs connecting to an Ethernet SMG.

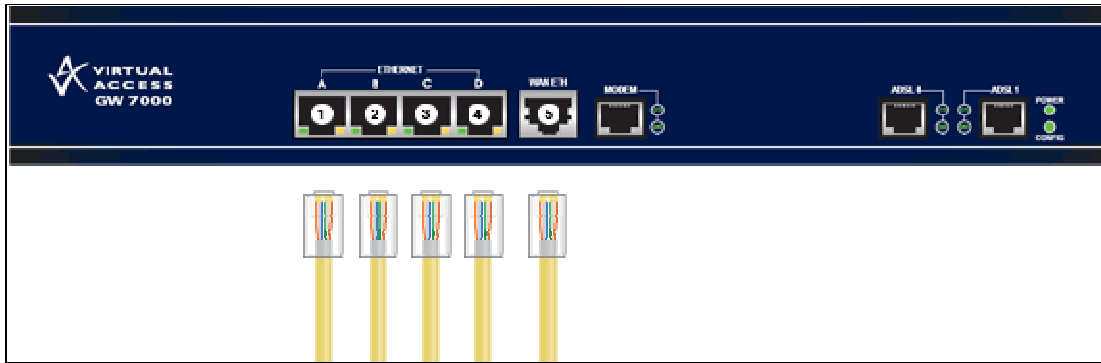


Figure 17: An example of a complex Ethernet connection.

Ports A, B, C are LAN connections.

Port D is a WIFI access point and WANETH is the WAN connection for the Internet

After the SMG has activated, you must configure interfaces on all the ports. You use the Ethernet switch in the SMG web to configure the interfaces on the ports.

The default settings already set for your network configuration, so you do not need to change the settings in the Ethernet switch.

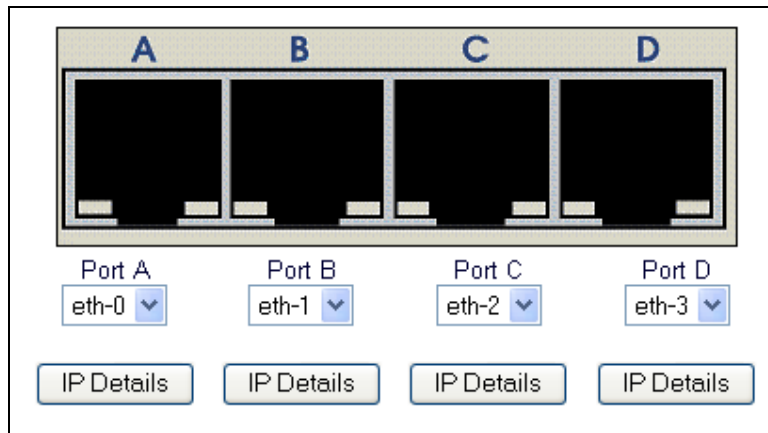
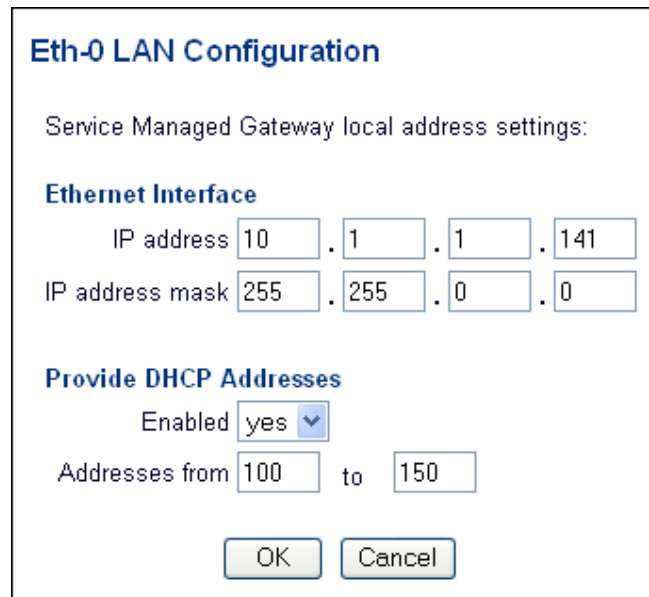


Figure 18: Port A is assigned to the teachers' LAN; port B is assigned to the Internet; port C is assigned to the students' LAN; and port D is connected to the WIFI access point

In this example, you must also assign IP addresses to the different Ethernet interfaces.

You click **IP Details** under Port A to assign an IP address to the teachers' LAN. Suppose that the address is **10.1.1.141**. You type this into the **IP address** field of the Eth-0 LAN Configuration window. The information for the subnet mask and DHCP addressing is correct, so you click **OK** and return to the LAN Configuration window.



The screenshot shows a configuration window titled "Eth-0 LAN Configuration". Under the heading "Service Managed Gateway local address settings:", there are two sections. The first is "Ethernet Interface", which contains two rows of input fields: "IP address" with values 10, 1, 1, 141 and "IP address mask" with values 255, 255, 0, 0. The second section is "Provide DHCP Addresses", which has an "Enabled" dropdown menu set to "yes" and "Addresses from" and "to" fields with values 100 and 150 respectively. At the bottom of the window are "OK" and "Cancel" buttons.

Figure 19: Assigning an IP address to the teachers' LAN

Repeat the steps above for Ethernet segments 1,2 and 3 to configure the library, student and visitor connections. Click **OK** to save your new Ethernet configurations.

The SMG reloads and then closes the web. We recommend that you reopen the SMG web and use the Fast.Start Firewall Wizard to assign firewall rules. Please read the guide '**Configuring a Firewall**'.