

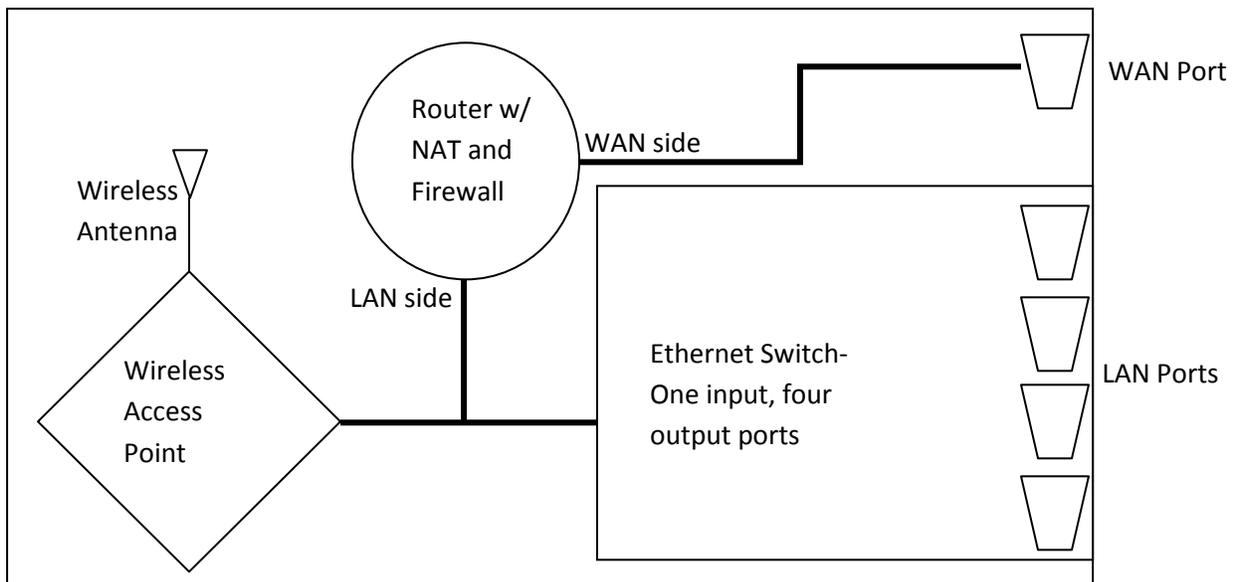


## Note on Residential Gateway Routers

### Introduction

A typical "consumer" router (Linksys, D-Link, NetGear, etc. - including the AyrMesh Router) is a collection of three pieces:

- 1.) A *router* - this is a piece of equipment and code that connects one network (the "Wide Area Network" or "WAN", usually the ISP's Internet connection) to another (the Local Area Network, your home LAN). This piece sets up "Network Address Translation" to provide you with multiple local IP addresses mapped to the one "Public" IP address your ISP gives you, and "Firewalling" to make sure devices on the Internet cannot enter your LAN and interact with the devices there.
- 2.) A *wireless access point* - 802.11 b, g, or n, single or dual-band, single or multi-antenna, etc. - this is connected to the "LAN" side of the router, and
- 3.) An *Ethernet switch*, connected to the LAN side of the router, to provide several "plugs" on your LAN (and you can plug additional switches into that switch if you need additional ports).



### Residential Gateways

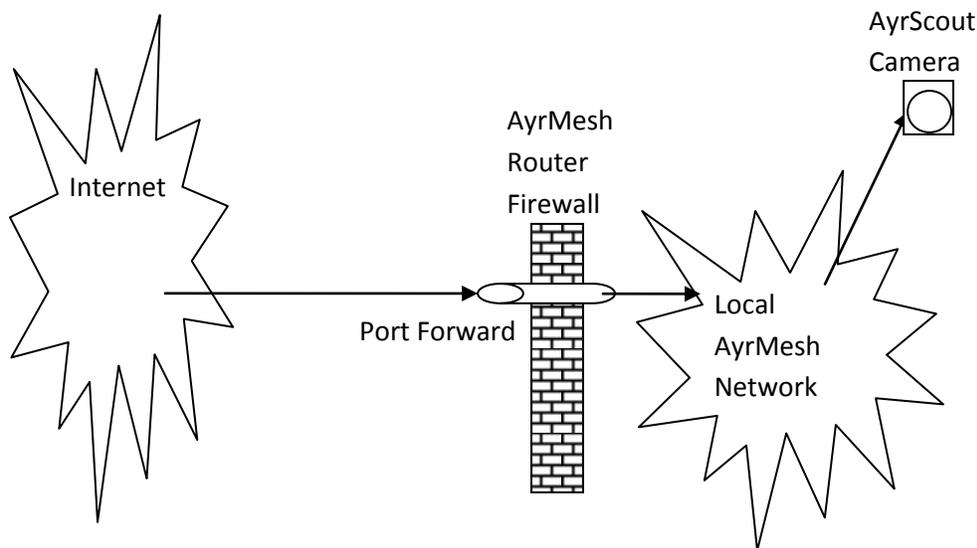
A Residential Gateway Device is a router with at least one additional piece in the box: a "Modem" to turn the signal from your telephone line, TV cable, or

satellite transceiver into data and vice-versa - this connects to (takes the place of) the WAN port of the internal router. They are typically provided by your ISP as "Customer Premises Equipment" (CPE).

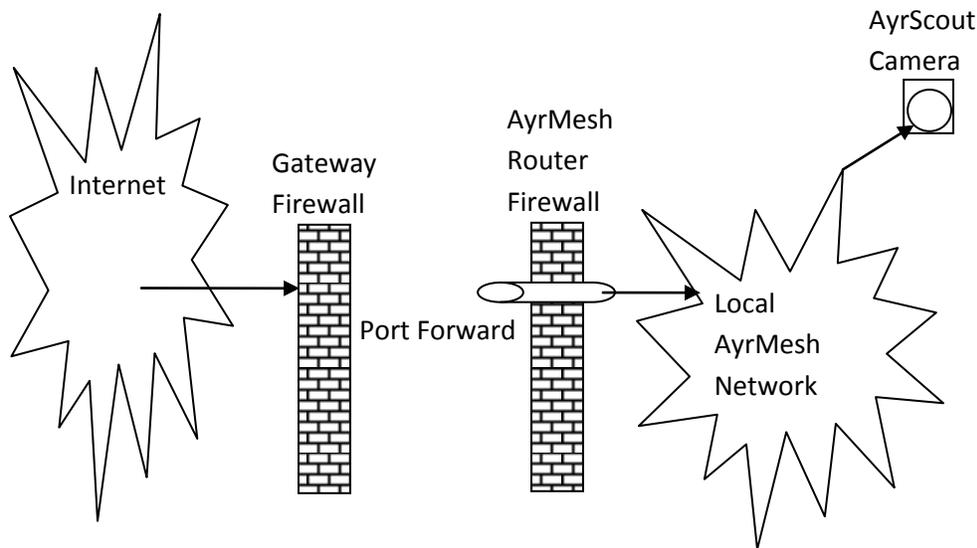
Note that these Residential Gateway devices may have several other functions integrated with them, including television, telephone, and even home automation features.

For the AyrMesh Router to work, it has to be "facing" the Internet, so we have to keep the Modem part of the Gateway (because the AyrMesh Router doesn't have an ADSL modem) but disable or bypass the router part so the AyrMesh Router can take its place. This may also bypass the switch and wireless access point, but the AyrMesh Router has those parts, too.

The AyrMesh router has to be "facing" the Internet (not behind another router) because it opens "holes" in its firewall using Port Forwards so you can access the cameras (and anything else you choose on your home network) from the Internet. If there's a firewall between the AyrMesh router and the Internet, a connection coming from the Internet will be blocked by that firewall and will never reach the AyrMesh Router.



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You have to disable or bypass the router in your Residential Gateway device, but you still need the "Modem" part of the device. The result is that you will end up with the Gateway device still operating as a Modem, but your AyrMesh Router will take the place of the router so you can enable port forwarding.

There are three ways of achieving this:

1. Put the AyrMesh Router into the "DMZ" of the Gateway Router (also called "Static NAT" on. This leaves the Gateway Router enabled, but "pushes" the AyrMesh router in front of it so it can perform the port forwarding and put devices on the AyrMesh network on the Internet. In this case the AyrMesh router is set up with a "DHCP" connection.
2. Put the router in the Residential Gateway into "Bridge mode," thereby disabling the routing capabilities altogether. You will have to configure the AyrMesh Router to take the place of the Residential Gateway; if the Residential Gateway uses PPPoE (typical for DSL connections), the AyrMesh Router will use a PPPoE connection with the same Account name and Account password the Residential Gateway uses in its PPPoE configuration. If the Residential Gateway uses DHCP, then the AyrMesh Router should use a DHCP connection.
3. Forward the appropriate ports of the Residential Gateway to the AyrMesh Router. The AyrScout Cameras will use ports 9001-9999, so you can simply forward those ports on the Residential Gateway to the AyrMesh Router, along with any other ports you may want to open for other devices (non-AyrScout cameras, for instance - we usually use ports 3001-3050 for these). You may want to forward port 80 to the AyrMesh Router so you can configure it from the Internet, and we recommend forwarding port 22 so our service technicians can log in to your router if

necessary. This may be the easiest, but may be troublesome if you want to open and close ports from time to time (you'll have to open them in both devices).

## **Specific Devices**

Here are links to the user manuals for some popular CPE devices of this sort. If you have one of these devices, use this to configure it for your AyrMesh Router.

*Westell "A90" gateway (also known as VersaLink 327):*

<http://onlinehelp.verizon.net/consumer/bin/pdf/VersaLink327WGatewayUserGuide.pdf>

The DMZ capability is called "Static NAT" and is explained on page 116. Using Static NAT, the AyrMesh Router should be set up for a "DHCP Connection"

The procedure for putting it in "Bridging Mode" start on page 17 (for initial setup - choose "Bridge" instead of "PPPoE") or on page 93 (to change an existing unit). If using Bridging, note that the AyrMesh Router needs be set to the same settings at the Westell device was set to before selecting "Bridging Mode" - PPPoE or DHCP.

Page 112 shows how to forward a group of ports.

*2Wire Gateway:*

[http://knowledgebase.pace.com/view/765/2701HG\\_user\\_guide.pdf](http://knowledgebase.pace.com/view/765/2701HG_user_guide.pdf)

Directions for putting a device in the "DMZPlus" start in the bottom half of page 41 (pdf page 46). I found I had to reboot the router to get it to "take" the first time I did it.

Directions for port forwarding are on the same page - you can choose to forward no ports, forward selected ports (albeit with a clumsy interface based on specific applications with known port forwards - you have to create a new "application" and add it to the list), or forward all ports (DMZPlus mode)

This model does have a bridging mode, explained (poorly) on page 77 of the manual (pdf page 82). We do not recommend this.

It also has a "router behind router" alert that blocks a router if it finds one connected to it (page 77, pdf page 82). This has to be disabled even to use this with the Hub.

*ActionTec:*

<http://www.actiontec.com/products/manuals/GT701DSLModem.pdf>

This one is a little different because the router does not contain an Ethernet switch or wireless access point. It does have a DMZ feature, and it's pretty simple (page 46, pdf page 49).

Port Forwarding is covered on page 45 (pdf page 48).

*Verizon DSL Gateway:*

[http://www22.verizon.com/NROneRetail/NR/rdonlyres/0C653DB5-638C-47D6-819C-61FF79E3B714/0/ActiontecGT704WGBUserGuide\\_30150.pdf](http://www22.verizon.com/NROneRetail/NR/rdonlyres/0C653DB5-638C-47D6-819C-61FF79E3B714/0/ActiontecGT704WGBUserGuide_30150.pdf)

DMZ instructions start on page 71 (pdf page 72). Just select "AyrMesh Router" from the pull-down menu of hosts connected to the gateway and click "On" on the next line to put it in the DMZ.

PLEASE NOTE:

These directions must be followed precisely to be successful. If you have trouble, you may need to contact your ISP's tech support department. Just explain that you are installing a router behind the router they have supplied and need to put it in the DMZ. They should be able to help you.