

# Networking 101: Home Network Basics

If you are building a home network for the first time, you will need to know the basic pieces of a network. This white paper will define the basic components of network.

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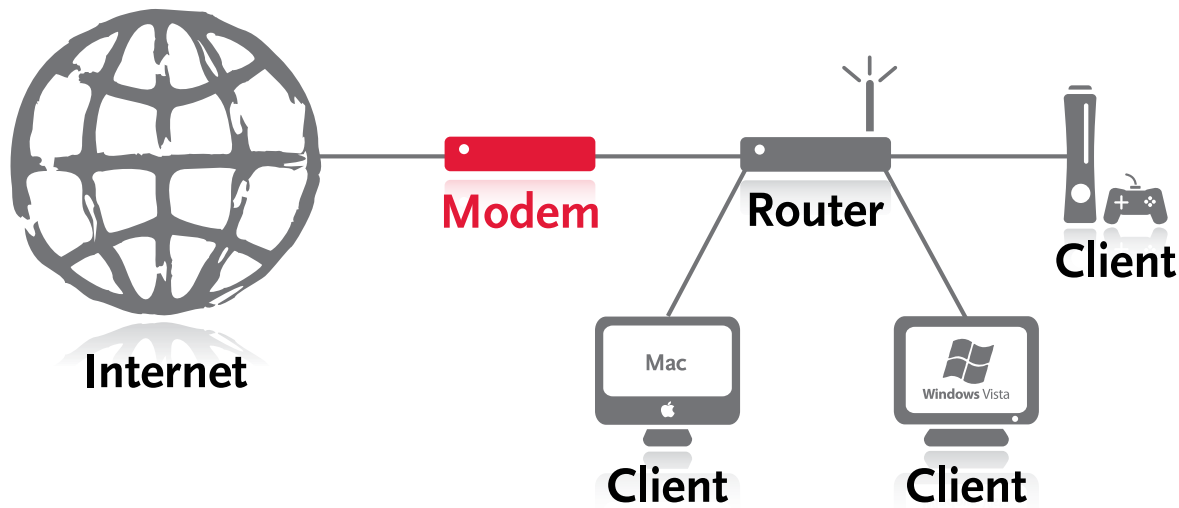


## Introduction

If you are building a home network for the first time, you will need to know the basic pieces of a network. This white paper will define the basic components of network.

- The Modem
- The Router
- The Switch or Hub
- The Client (e.g. Computers, Game Consoles, or Network Attached Storage)

## The Modem



The modem (Modulator-Demodulator) translates carrier signals (such as voiceband and RF video) to network signals that can be understood by your network. Modems are common on DSL, Cable, and Satellite Internet connections, but are not required for all types of network connections. In some cases, the router may be integrated into an Internet gateway that handles to roles of modem, router, and switch. Your home network only requires one modem.

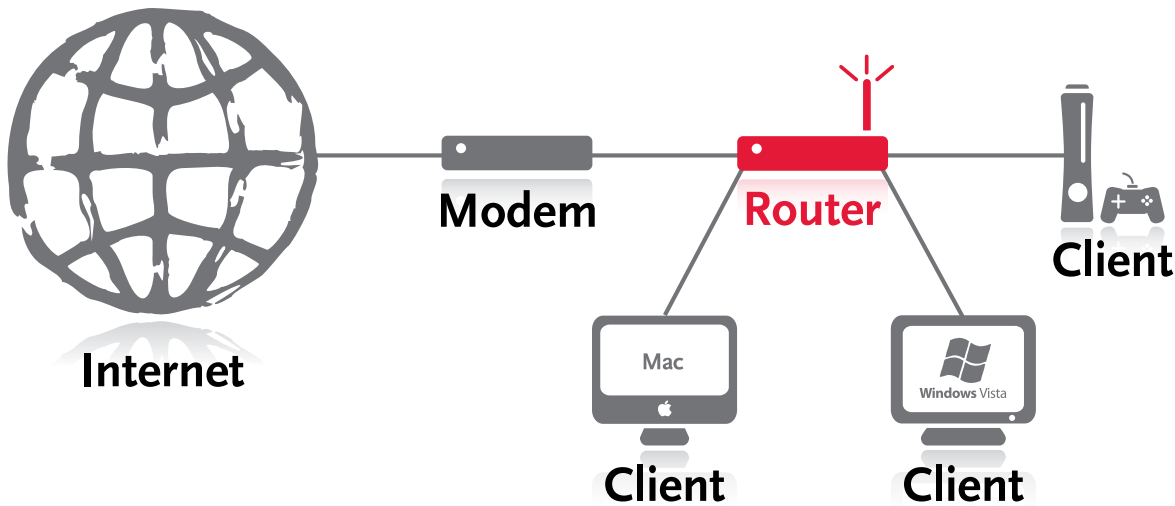
## Routers, Switches, and Hubs

### The Router

The router is the core of your home network. It directs traffic between two networks (such as your home network and the Internet). Most home routers also include the following features:

**DHCP**—(Dynamic Host Configuration Protocol). DHCP distributes network settings, including IP addresses, to devices on your network. Here are some of the important settings configured by DHCP;





**IP Address**—An IP address is a number that is assigned to each computer on the network to help computers communicate. Each device on the network should have a unique IP address. Duplicate IP addresses may cause a disruption in service. Your IP address may look like one of the following: 10.0.x.x, 169.254.x.x, 172.x.x.x, or 192.168.x.x. IP addresses in the 169.254.x.x are self-assigned (APIPA) and may indicate a problem on your network.

**Subnet Mask**—The subnet mask describes the size of your network and lets the router or client know which devices are part of the local network and which belong to a different network. In most cases, your router will be set to a subnet mask of 255.255.255.0. This allows you to create a network with up to 256 devices. Devices with self-assigned IP addresses will have a subnet mask of 255.255.0.0. The subnet mask helps your router decide on the most efficient way to route network traffic between devices.

**NAT**— Most home routers or gateways use a NAT firewall to protect your home network from intruders. NAT or Network Address Translation works by hiding your computer's IP address from Internet devices and replacing it with the gateway IP address. It will then forward Internet traffic to the proper computer. To further protect your home network, the NAT firewall disallows unrequested traffic from the Internet.

**Port Forwarding**— Some applications, such as Torrents and Remote Access, require unrequested inbound connections. To use these features with your StorCenter device, you will need to configure your router to allow inbound connections for these applications. This is known as Port Forwarding. Port forwarding is an extension of NAT that allows external traffic to pass through a specified port to an internal device.

In some cases the router may be integrated into an Internet gateway that handles the roles of modem, router, and switch. In most cases your home network should only have a single router. Extreme caution should be taken when introducing a second router into a network since it may disrupt some services. If your network has more than one router, steps should be taken to ensure that DHCP and NAT services are disabled on the secondary router to avoid Internet network problems.

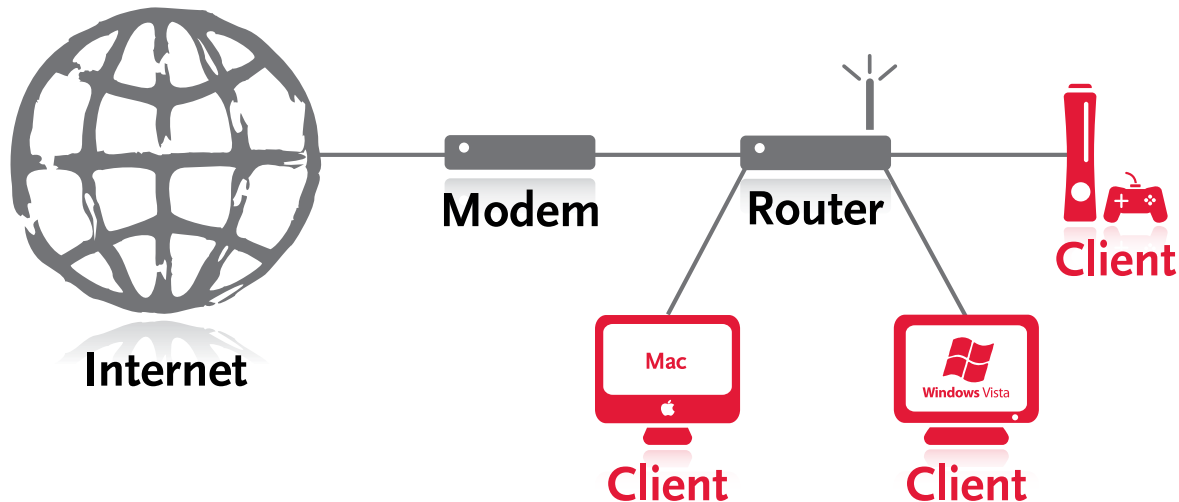
## Switches and Hubs

Switches and Hubs are used to expand the number of computers connected to the network. Although they are both used to expand your network, they act very differently. A hub echoes traffic to all ports. The data is ignored by devices for which it was not intended. This means that a 100Base-T Hub has a total bandwidth of 100 Mbps that it shares with all devices.

A switch connects the communicating devices directly without echoing to all ports. This means that a 100Base-T switch provides 100 Mbps bandwidth for each device.

Your network can have as many switches or hubs as required without causing network problems. Most Internet gateways will include a small switch in addition to a router.

## Clients



Each device on the network that does not extend or directly manage the network is called a Client. Client devices use the network to transmit data between each other in an internal network or use the network to connect to and communicate with the Internet.

Some examples of different Clients are the following:

- Computers
- Game Consoles (Xbox, Playstation, Wii)
- Stand-alone Network Attached Storage (NAS)
- Media Extenders (Appliances that stream or display media from the network)



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