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Project 1

Router/Modem (xFi Gateway 3rd Generation)

The router takes all of the information from its connected devices and determines the best pathway to send this information through to communicate with other networks. It also filters through the receiving data packets and determines the best way to send that data to its respective device. Through filtering the outgoing and incoming data packets, the router also contains a firewall which works to protect any unauthorized access to the network. Any information sent through the router is then sent through the modem part of the device, which modulates the digital data into analog and sends this respective data to the Internet (and vice-versa when receiving analog data from the Internet, the modem demodulates it into digital data so that devices that are connected to the router can understand it.

Sony SRS XB-31 Portable Bluetooth Speaker

This audio device functions as a speaker that can play music wirelessly from a user's phone, table, or any other bluetooth capable device.

Linksys WiFi Extender

The WiFi extender works as a signal booster within the physical location of a network. When a network capable device cannot connect to the router or has a poor connection because of the distance in between, an extender can wirelessly connect to the router, copy it's configuration, and mimic it. Any devices connected to the extender will also have its data sent again to the router, where it can then communicate with other networks.

Additional Details

Extenders usually have an ethernet port as well. If one has a network capable device that could not connect wirelessly, they could also connect to the extender physically. For example, my PC connects to my WiFi extender by ethernet as I did not build it with WiFi capability.

Apple iPhone 8+

This personal communication device can connect to the Internet via WiFi or by using cellular data. Like any wireless device, the iPhone connects to the Internet

by first connecting to a local router and thus having access to the local network. Once that connection has been established, as long as the router has access to the Internet by paying the ISP for its service, an iPhone can have the same capability and be able to browse the web, make calls, stream videos, and more.

Additional Details

When an iPhone doesn't have access to a local network, it can still connect to the Internet by using cellular data and connecting to the cellular network. Fixed cell towers are placed over long distances throughout the land to establish enough coverage so that phones can connect to the network with ease. These mobile networks are then connected to the Internet.

PC (Intel Core i5-10500 CPU @ 3.10GHz, 16 GB RAM, EVGA GeForce RTX 3070 XC3 GPU, Windows 10)

Custom built in December 2020, this computer allows the user to browse the web, stream videos, and run programs- all of which require a connection to the Internet at some point in time (i.e. downloading Zoom from the web). The PC connects to my WiFi extender via ethernet, and the extender then connects to the router wirelessly.

Additional Details

This PC was built without any WiFi or Bluetooth capability due to budget constraints, but it has the option to add these functionalities to it. This can be achieved by either purchasing a WiFi adapter dongle to plug into a USB port, installing an adapter onto the motherboard directly via a PCIe port, or upgrading the computer with a new WiFi capable motherboard. A similar process can be done for adding Bluetooth.

Mesh Router (Google Nest)

This device is beneficial in increasing the strength and reliability of connection throughout a large location, such as a house or office. Whereas a normal router acts as a singular point of connectivity for devices to communicate with, mesh routers are different nodes located at different spots which act as one network altogether.

Google Home Mini

A Google Home Mini is a type of "smart-home" device where it can be a personal assistant, wireless speaker, and also communicate with other smart-home devices. Google Home Mini uses WiFi to connect to the Internet and also talk to other devices

Additional Details

While Google Home Mini can connect to smart home devices, such as lighting, A/C units, and more, it can also talk to non-traditional smart home objects. For example, the device can connect to an Xbox One and a user can issue voice commands to control it hands-free. These commands can range from simply turning the console on or off to starting up a particular video game.

Google Chromecast (3rd Generation)

This device allows a user to stream videos and music from their phone. As long as the Chromecast and phone/tablet are on the same WiFi network and if a particular app has “casting” capability, users can stream practically anything, ranging from YouTube to Disney+.

Microsoft Xbox One

This device mainly functions as something to play video games online with. It also allows users to stream their own content online. It can also be controlled wirelessly from personal assistant devices, such as an Amazon Echo or a Google Home. An Xbox One can connect to the Internet via WiFi or Ethernet- both of which must connect to the local network’s router.

Apple Macbook

This portable computer can connect to a home’s network wirelessly. Like any computer, it allows the user to browse the web, run programs, stream videos, and more. One difference is that it does not have an Ethernet port and thus cannot achieve a wired connection to a network. If a user wanted, they could purchase an adapter to obtain such a thing.

Additional Details

In situations where there are no available WiFi access points, users can use their iPhones as personal “hotspots” for their Macbook to connect with. Known as tethering, creating a hotspot works by allowing the Macbook to connect to the Internet via an iPhone’s cellular data. The iPhone essentially acts as a portable router in this case.