

Final Project

Home Network

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Abstract

Home web networks are vital to our lives currently because of the pandemic and social removing from companions and working from home for work if our boss permits us to. I took a potential customer's home web network how it is currently delineated in a home internet network outline to perceive the number of gadgets she genuinely has in her organization. I talk about updating it to adaptation 2.0. Quotes of the organization now and what it would cost to overhaul it to adaptation 2.0—referenced a few things that would make the home internet network safer until the potential customer is prepared to redesign completely to rendition 2.0. I also mentioned some common troubleshooting steps that I had come across when I have gotten booted off the wireless network or when the modem/router stopped working, and that is, did you unplug it first? This is genuinely the first question any IT Help Desk Support Person would ask an internet consumer on the other end of the phone line. Here is a quote from one of the biggest names in the IT field. Steve Jobs said once, "It's not a faith in technology. It's faith in people." We shouldn't always rely on technology for everything in our lives. We should step away from our devices and away from our desks or chair. My advice would be to go outside for a walk to stretch out those muscles and eyes. Please take time away from the screen and get some fresh air. It may help the body, mind, and soul.

Table of Contents

	Page #
Cover Page	1
Abstract	2
Table of Contents	3
Phase 1 – Planning and Project Selection	4
Phase 2 – Requirements Gathering and Data Analysis	7
Phase 3 – Designing the Solution	11
Phase 4 – Implementation	18
Phase 5 – Ongoing Maintenance and Support	20
Conclusion	22
References	24

Home Network

Phase 1 – Planning and Project Selection

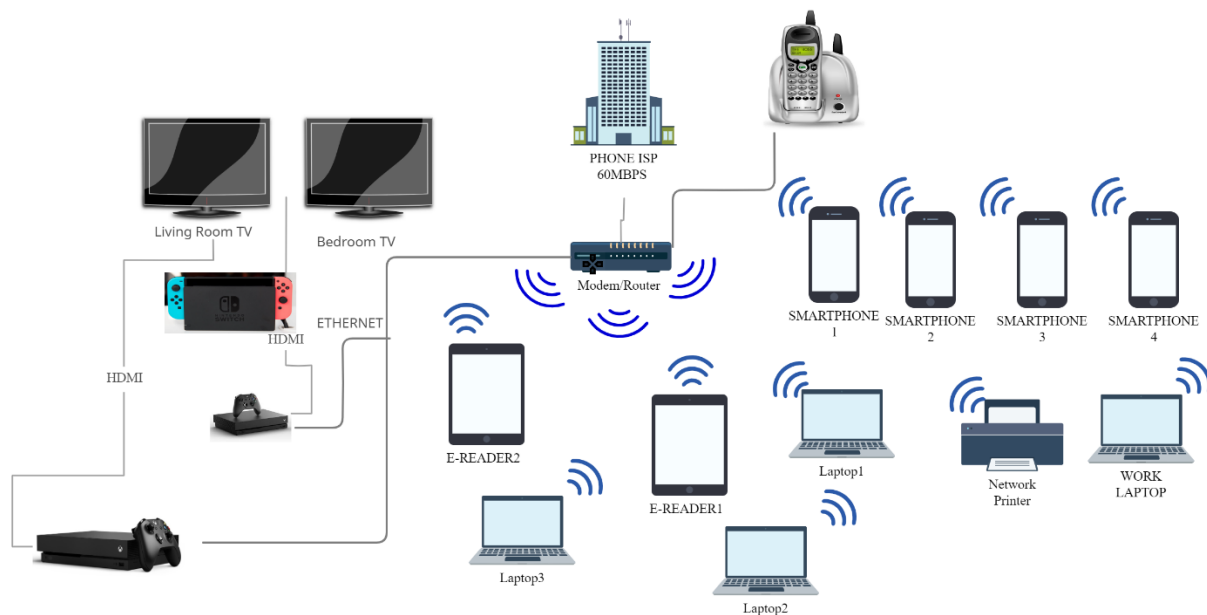
I didn't pick a business to talk about; notwithstanding, I decided to transform into an advising firm. The name is "Matt's Computer Consulting Place." That's simply the start at "Matt's Computer Consulting Place," we work on PC issues. We, in like manner, offer tutoring gatherings for people who are new to PCs since we were all there once when PCs were so tremendous and startling. It gave us stress and strain. I understand I did when I first started using a PC when I was an adolescent. We additionally offer help in overhauling or patching up a customer's network, whether it's a home organization or a private venture organization.

"Our home networks are increasing and more associated, yet this energizing opportunity shows up with its downsides. As our lives move into the advanced circle, so do the hoodlums. Cybercrime is on the ascent, and our home networks are the objective." (A. 2016) I know a family that needs a significant organizational upgrade, and I will make them my exhibition in the paper. I won't unveil any names, individual data, or gadgets they have. The motivation behind why I chose this is because I need to shield them all that can be expected from getting hacked by somebody.

They have a 2-1 modem/router device from their Internet Service Provider (ISP). The Internet Service Provider (ISP) is a neighborhood phone organization, so the modem/switch combo is associated through the telephone line. They are supposed to be getting 60Mbps down. Those who don't under it are 60 Megabits per second down, which means it's pulling information from the internet. It has two different Wi-Fi signal speeds, 2.4 GHz and 5.0 GHz. Did you know that all devices will not see the 5.0 GHz, so most of the devices end up only seeing the 2.4 GHz, and that is because of the tech used to build the devices? My companions are

a group of four two grown-ups and their two adult children. Among them, they have two Xbox One Consoles connected via Ethernet cables. Four smartphones, two E-readers, four Windows Laptops (one is for telecommuting for work), one Nintendo Switch, and finally, one cordless home phone, and one remote printer. That is an aggregate of fifteen gadgets connected to the internet at any given time throughout the day, whether via Wi-Fi or Ethernet connection.

I came across a great site that permits individuals to make network outlines from the fundamental to the highly unpredictable. I had the option to duplicate my companion's home organization for nothing. I just needed to make a record so I could save it. The site is www.creately.com. "Creately is a simple to utilize outline and flowchart programming worked for group cooperation. Supports over 40+ graph types and has 1000's of expertly drawn formats." (Creately, n.d.) Here are every one of those gadgets that I referenced before drawn out so you can picture it.



For the vast majority, 60 Mbps web speed is rapid as of now. Anything over 25 Mbps can be viewed as quick by most guidelines if we are discussing download speed. For web surfing or continuous visits to web-based media locales like Facebook or Twitter, you ought to have the option to stack them in your program or through applications on your cell phone easily.

Notwithstanding, on the off chance that you have numerous gadgets running or other relatives in the house simultaneously utilize the web, you may then consider getting more than 60 Mbps.

Here is another interesting fact that I learned when I was taking computer classes. If you have too many devices on the Wi-Fi network, each device takes a chunk of the Wi-Fi speed.

Sometimes, the modem/router has crashed from the bandwidth overload and must unplug the modem/router to reset the connection and cause many issues.

Let's break down the cost of everything that is on the home network.

<u>Devices</u>	<u>Cost</u>
Modem/Router	\$150.00
Cordless Phone	\$85.00
2x TV's	\$300.00 each \$600.00 total
2x Xbox One Game Consoles	\$350.00 each \$700.00 total
Nintendo Switch	\$350.00
4x smartphones	\$500.00 each \$2,000.00 total
4x laptops	\$450.00 each \$1,800.00 total
2x E-Readers	\$250.00 each \$500.00 total
Wireless Printer	\$80.00
<u>Hardware Cost Estimate</u>	\$6,265 Grand Total

Phase 2 – Requirements Gathering and Data Analysis

Since I have made an organization graph of my companion's home web network, let's see how to improve everybody's web speed and association and their gadgets. Nobody likes being knock off the Wi-Fi or have moderate web speed. Did you know for having had fifth high schooler gadgets on a home organization prescribed to have your web accelerate to at least 150 Mbps? I honestly didn't realize that. "If you have several people in your home trying to access at the same time, you will feel needing for more speed once you experience slacking. If so, don't keep down. Go for a higher arrangement at 100 Mbps or perhaps the 500 Mbps plan."

(DroidRant, 2020)

Sometimes to get more bandwidth, you may have to bundle your services or change your Internet Service Provider. We all know the saying, "you get what you pay for." Here is an exciting fact there is such thing as too much bandwidth. According to Lincoln Lavoie, a senior engineer of broadband technologies at the University of New Hampshire InterOperability Laboratory he said that "to select the best services or package for your usage, you must understand your bandwidth needs." (Reisinger & Westover, 2020)

One fantastic element that many Internet Service Providers have done in the last fifth teen or so years is that each organization has a rundown of good gadgets that individuals can buy inside and out from like Best Buy, Amazon, Newegg.com, or TigerDirect. Having this posted on their site helps the customer out so they can purchase their gear and not get charged each month on their bill for the expense of renting the hardware. The disadvantage is that there is consistently a drawback, and that is if the hardware breaks, it is on you to fix it where on the off chance you were renting the gear from the ISP and had their insurance plan. If it quit working or

broke down on their end, and you didn't do anything to the equipment, it would cover by the protection plan, and you would get a revamped substitution.

I took at the ISP's list of compatible devices, and they are all "gateway" devices. Those of you who don't under what a gateway device means are a unique way of saying it's a modem and router combined. I took the list of comparing a gateway device versus a separate modem and router.

Gateway Devices		Modems and Routers Separate	
Pros	Cons	Pros	Cons
The added convenience of a single machine	Hard to upgrade	Easier to upgrade your home network	Takes up more space/bulky
If you rent it from your ISP, you get customer and technical support	More costly to replace than an individual modem or router.	Greater control over your home network	The more involved setup process
Simpler and easier setup	Difficult to diagnose and repair	Improved security features	More cords, wires, and outlets
It takes up less space	Limited security features	More settings and customization options	

It looks like the days of having modems and routers for a network isn't as common as it was ten or twenty years ago because the gateway devices have taken over and supposedly made it simpler for people to set up a home network. I am not going to talk bad about the gateway devices. They are suitable for people who are beginners at home networking and don't know much about technology. While I was doing some research on gateway devices, I found something interesting. You can turn on "Bridge" mode and your router. I must mention it may not work with all gateway devices or ISP's. I came across the "Bridge" mode on Support.com for Comcast/Xfinity self-help page. "They list the following warnings when it comes to turning on bridge mode." (Support.com Tech Pro Team, n.d.)

- Will not provide Wi-Fi; this must be taken care of by your router
- Will not offer multiple wired ports; only one will be active
- Will not provide any routing services; only one device may be connected to your gateway
- Will not provide any form of security to your devices
- In effect, it will act as a standard modem

Turning the “Bridge” mode on the gateway device turns it into a modem where we can now use a router and a switch.

I watched a good video that helped me understand home networking better, and it made a lot of sense to me. I will admit not all computer technicians will know the answer to things. We sometimes will use Google and YouTube to help us find the solution to the problem. What I found out from Ultimate Tech Hub and their video. “CAN I PLUG A SWITCH INTO MY MODEM? HOME NETWORKING 101” is that if you use a switch on your network, it has no security benefits. Hence, you want to plug the switch into the gateway device because it has security measures to protect you and your network from hackers. It will give you the added benefit of having more Ethernet ports for your devices.



To get the home network started, I have chosen the 2-1 modem/router, which will be the **Actiontec C3000A**. “The C3000A is a single platform device that supports universal WAN access. FTTN, FTTdp, FTTB or FTTP – the C3000A can handle it all. With premium

dual-band Wi-Fi 6, customers get wireless speeds up to 6 Gbps* for brilliant 4K video streaming, Voice over IP media sharing, online gaming, and a superb broadband experience.” (Actiontec, 2020)



For the Ethernet switch, I chose **Linksys SE3008 8-Port Metallic Gigabit Switch**. I will have plenty of Ethernet ports for all the devices they want a hardwired connection to the internet. One cool feature I like about the switch is that it has a “Power Save: Advanced power-saving mode detects unused ports.” (Linksys, 2020)

Phase 3 – Designing the Solution

We are going to take a gander at upgrading three of the four Windows laptops. We will be connecting three laptops and three gaming consoles associated using an Ethernet association from the gadgets back to the switch, associated with the 2-1 modem/switch, otherwise called an entryway gadget. We are also looking at upgrading the cordless home phone system on the network. We can't forget security for our devices. That's especially big now because of the pandemic, and almost two-thirds of the regular office workforce is telecommuting from home.

Each of the three laptops will be redesigned because they are obsolete for what the client needs to do from what they have advised me—one individual, to transfer recordings and play PC games on the web. The subsequent individual is into game craftsmanship configuration, real-time his computer games feed and watching on the web recordings like Netflix and Hulu. Finally, the third individual requires a PC to do fundamental things to keep the family coordinated. I will pick things that are in a sensible value range for your typical ordinary customer.



I chose the following laptop “Lenovo Ideapad L340 Gaming Laptop” (Amazon.com, n.d.) On Amazon right now, it is posting the PC at **\$711.99** before any duties. The “Lenovo Ideapad L340 is an absolute necessity have passage level, spending gaming PC. As force loaded with Core i5-9300H processor and 4GB Nvidia GeForce GTX 1650 designs card, it pushes well over the principles. Consequently, it has made a confided in name in the market of gaming.” (Khan, 2021) The PC would be one of the numerous gadgets associated with the Ethernet switch.



The person who wants a laptop for everyday use like budgeting, checking e-mail, social media, and watching videos on YouTube. I would suggest that he get the “Dell - Inspiron 15 3501 15.6” FHD Laptop - Intel Core i3 - 8GB Memory - 256 GB Solid State Drive” (Bestbuy.com, n.d.) It sells for **\$519.99** before charges. The PC sneaks up suddenly with the Solid-State Drive and the 8GB of Memory. On the off chance that he ever needs more space, he can generally move up to a more incredible hard drive on the off chance that it permits him to, or he can get an external hard drive which can run somewhere in the range of \$50 - \$100 for a nice size external hard drive.



For the third laptop, I chose the “MSI - GF63 15.6” Gaming Laptop” it has “Intel Core i5 - NVIDIA GeForce GTX1650 - 256GB SSD - 8GB Memory.” (Bestbuy.com, n.d.) The laptop sells for **\$699.99** before taxes, and I think thank is a good deal for an MSI branded laptop. Because MSI is an excellent brand for online gaming, I know that the third person in the family

would love it for his online gaming and video streaming. He has even mentioned that he wants to learn coding for games on a mobile device, and you will need speed and accuracy, and that is what the laptop brings.



Since we are upgrading the devices, I decided why not upgrade the home phone while we are at it. I chose the “PANASONIC Expandable Cordless Phone System with Answering Machine and Call Block - 3 Cordless Handsets - KX-TGD533W.” (Amazon.com 2017) I found it on Amazon for **\$69.95** before any possible taxes and shipping. I read the specifications and reviews, and it meets my client’s everyday needs. I know that they won’t fill all 100 spots, but I think this feature is kind of intriguing, “With the Panasonic KX-TGD533W system, you can program and store up to 100 numbers in your phonebook and enjoy the time-saving convenience of nine-speed dial settings.” (Amazon.com, 2017)



The Actiontec C3000A is on the expensive side. On Amazon.com, it is going for **\$289.90** before any duties. While investigating items to purchase, I take a gander at, and read purchaser audits the great, the awful, and the appalling. One commentator said this, “So I took a risk and requested this one. The Seller sent it rapidly, and under 36hours later, I got it, new in box, and a genuine CenturyLink co-marked modem. The arrangement was simple and took all five minutes, and you don’t need to converse with technical support. All you need is either your account number or another identifier, for example, a telephone number. If you have that information, it strolls you through the standard CenturyLink self-introduce measure (the solitary disadvantage is that you initially need to utilize a real ethernet link - I needed to pull an old PC out of the wardrobe to do as such). It’s quick and dependable up until now. However, it has any arrangement/security or radio organization you could need. It’s additionally entirely adaptable - you can undoubtedly kill one of the frequencies on the off chance that you need, change the force of the other one, and change scope of boundaries from access times to the firewall to safelists.” (Amazon.com, 2018)

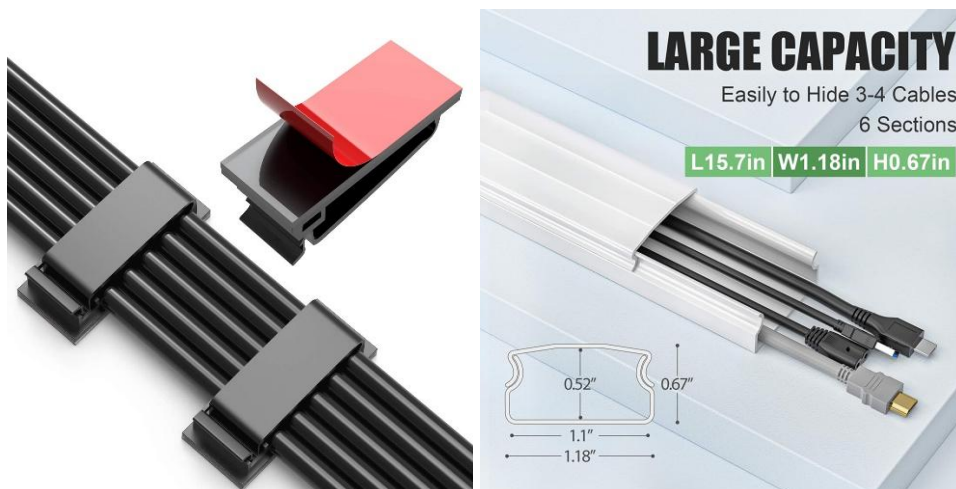


The Linksys SE3008 8-Port Metallic Gigabit Switch is a decent starter. Ethernet change to utilize. I discovered the switch available to be purchased at Bestbuy.com for **\$44.99** before any conceivable duties and delivery charges. Linksys is a decent sold brand that has been around for a long time. You generally need to ascertain the number of Ethernet ports you will require for your web organization. For this web organization, we need five Ethernet ports, two for two workstations, and three for the gaming comforts. I found something fascinating in Best Buy audits: “an overall did eight-port switch all-metal development even at the link inputs. Being made of metal give it a quality form. However, it additionally shut out EMI impedance even where the link connects the metal information safeguard. It protected there.” (Bestbuy.com, n.d.)

We like to keep our homes and belongings safe, and we should feel the same way when it comes to our digital lives. Nobody wants to lose anything, regardless of whether it’s a cataclysmic event like a twister, fire, or a seismic tremor. Regarding our computerized lives, we need to pay exceptional minds to phishing messages and promotions, odd connections since they could have destructive codes that could deliver an infection, ransomware, spyware, or even malware. I have had people bot IT, and non-IT people recommend being a company/product called Bitdefender. What I like about Bitdefender is that “they are led by a vision to be the most trusted cybersecurity technology provider in the world, which means we constantly anticipate,

innovate and go the extra mile.” (Bitdefender, n.d.) They have a product that would be great for my client because they have multiple laptops and smartphones. It’s called Bitdefender Family Pack. It is suitable for up to 15 devices that work on Windows, Macs, iOS, and Android operating systems. I suggest going for the three-year deal for peace of mind, and they have a special going. The price right now is **\$162.49** before any taxes. You are saving 35% off the regular price, which is \$249.99

No one loves seeing them hung about for the Ethernet cables, so I am taking a gander at getting cable ties and cable covers to veil the ideal Ethernet cables. It’s an apartment, so I can’t make any adjustment without a composed endorsement from the property, the board, and the landowner. I will set it up with the new cordless telephone with the primary base for the gateway device. Since the phone and the gateway will be having a similar telephone line, I should utilize a telephone splitter. I will plug the Linksys Ethernet switch into the gateway. Since this is a limited quantity of hardware and I would prefer not to occupy the counter room, I will put the devices onto a small shelf to mount to the wall. Here are some photos of some of the equipment that I will be using on the project.



Home Internet Network Revamp	Cost
3x Laptop	\$1,931.97 before taxes and shipping
Security software	\$162.49 before taxes
Cordless phone system	\$69.95 before taxes and shipping
Gateway Device	\$289.99 before taxes and shipping
Ethernet switch	\$44.99 before taxes and shipping
Parts	\$75.00 before taxes and shipping
Labor 5 hours and two people	\$6500 before taxes
Estimated Total	\$3,224.87 before taxes and shipping charges

Phase 4 – Implementation

To get the new home internet network up and running as soon as possible, I would meet with my client and ask the following W questions

- Who would you like to buy the gear, the organization you recruited, or yourself?
- When might you want to get the new internet network ready for action?
- What is the most fabulous day for my group, and I stop by to take estimations and photographs of how everything is set up at this moment?
- Would you consider changing your web access supplier (ISP)?

The inquiries I recorded are altogether acceptable inquiries to pose to your customer since you would prefer not to make hasty judgments, think for their benefit, or expect anything. They employed me, so I need to understand what they need and what they are alright with, and what they aren't happy with. Suppose the client needed time to set aside cash for the gear and prepare the spot to make the network's revamping possible. In that case, I can regard that I need to tell them in advance that the costs and the hardware that I should them in the arrangement are liable to change since they are either unavailable or the prices went up for the proposition's things.

Suppose they weren't prepared to buy anything. In that case, I could investigate the workstations and see how I could deal with accelerating the PCs and Wi-Fi by doing a circle tidy up, plate defrag to move stuff around clear up space, check for any Windows or drivers refreshes. A portion of the property that I have recently referenced, suitable about 66% of PC proprietors, don't have the foggiest idea of doing all the notice appropriately. In the wake of checking the laptops and doing a kindness execution check, I would take a gander at the gateway device settings. What I would do next is I would commence every one of the current gadgets,

change the Wi-Fi secret word, and may even change the SSID if my customer would permit me. I would mention what I am doing: making a transitory new organization until you need to make the Home Internet Network 2.0. By doing this, you will understand what gadgets will join the organization, and it would kick anybody off if anybody were leeching off your Wi-Fi.

I would want to sit down with one or two individuals from the family who may get PCs or is anxious to adapt. I can tell them the best way to sign in to switch settings and search for dubious gadgets, redesign the gateway firmware, Now on the off chance that they don't feel great or need seriously preparing, I would be glad to offer it to them. I love to continue to learn, and I don't should be in school for it. LinkedIn has a beautiful asset called LinkedIn Learning, and they have many workable instructional classes and recordings accessible that individuals can take. You could get free access as well. You need to check with your neighborhood library.

Phase 5 – Ongoing Maintenance and Support

Updates, updates, updates. The reason why I say that is because Microsoft is notorious for pushing out updates to their operating systems every week, and people in the computer field call it “Patch Tuesday.” If you don’t know how to check for updates, you can click on the windows icon > Settings > Updates & Security. It should bring you to “Updates” once you can left-click on the box check for updates. It may take a few moments sometimes, and it will either come back with updates or say, “You’re up to date.” You will want to do that for all the devices and even check your phones for possible updates as well

Keeping your PCs and different gadgets on your home organization refreshed will help keep hackers from attempting to admit your organization. You need to check month to month if there is a firmware update for your entryway gadget now. You should need to stress it on the off chance that you are leasing it through your network access supplier since they should push it through. You should look at yourself, and you do that by going to the IP address on the sticker under the passage gadget and sign in with the username and secret phrase.

On the off chance that you don’t feel good doing that since you dread you may wreck something, you can call Matt’s Computer Consulting Place, and we would be glad to plan a future time out and do a standard check for you. To tell you, a routine inspection of the entire home organization would be an hour and cost **\$75.00** in addition to mileage, and we can set that up on a recurrent timetable like every thirty or sixty days.

I additionally suggest doing an infection examination for a little while and a profound output at regular intervals. Again, if you’re not happy with that, we can do that as well, and Matt’s Computer Consulting Place can do that distantly, and that would be **\$50.00** for all close-to-home workstations. We aren’t permitted to contact business supplier gear.

We all hear the dread words, “I lost my internet connection.” Or “why isn’t the modem/router working?” Here is some helpful advice. Now and then, it occurs. It doesn’t function true to form. Without thinking a lot about organizations or switches, this can be not very pleasant, and I needed to have a part attempting to help you if you are at present hollering at the modem/router to begin working (we’ll all been there).

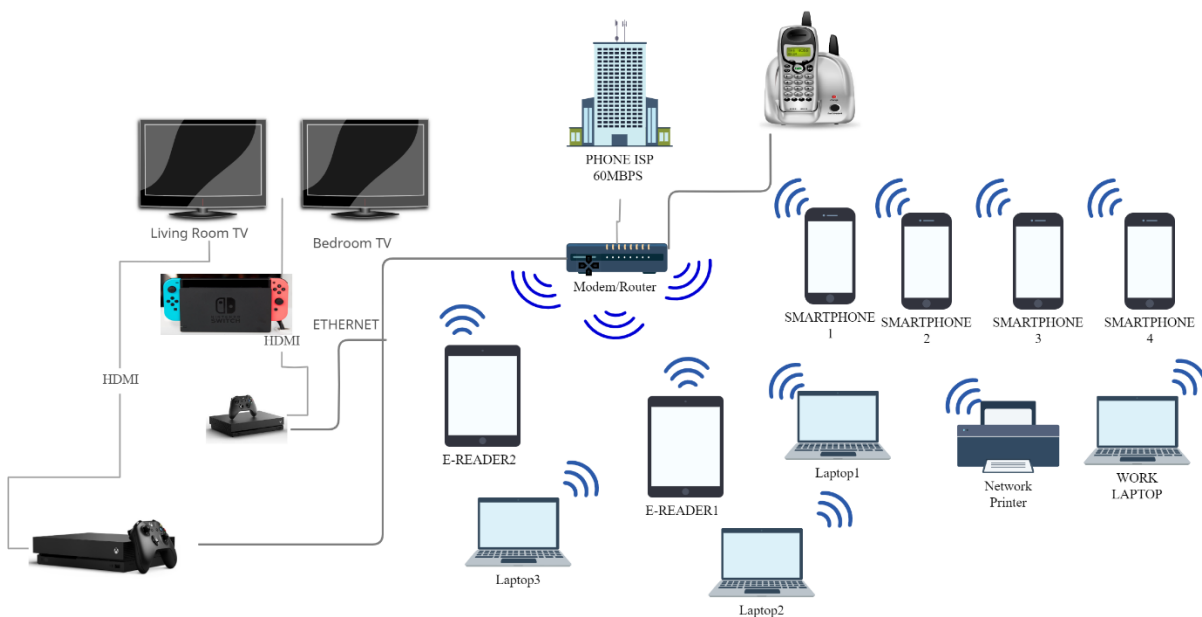
I realize this seems like a platitude and pointless. However, restarting the modem/router will tackle many of the issues. I’ve been working with IT support, so I’ve utilized that express for a long while; however, there is a motivation behind why the IT helpdesk consistently advises you to reboot. Does the issue endure even after the switch has been rebooted? There are different things you can do to investigate. Presently it’s an ideal opportunity to disconnect the case. Since a restart didn’t help, we need to burrow further, and one approach to do that is to sidestep the switch to ensure that the web is functioning as it should do.

How you do this is to take the ethernet link from the modem to the switch and put it between a PC and the modem, all things being equal. On the off chance that you get web access by doing this current, it’s the switch. In any case, on the off chance that you don’t have web, you should call your ISP because it’s most probable on their side.

You ought to likewise attempt with numerous PCs on the off chance that you experience issues. It has happened more than once for me when you take a stab at investigating something, and it winds up being the PC that doesn’t work on the off chance that you have more than one accessible, attempt the two of them to check whether the two of them have a similar issue.

Conclusion

We got the lay of the land, as they would say. Meaning we looked at the client's current home network, and we spoke to them and found out what they were experiencing and what they want to change. I drew up a network diagram of the home internet network. Here it is again if you need to see it.



I determined an expected expense of the multitude of gadgets on the organization so my customer could improve viewpoint of how costly their organization is. Then, I figured out what they expected to enhance their home organization and what I mean by data transfer capacity, modem/router, and if they required an Ethernet switch. I discovered that an Ethernet switch has no proactive security highlights like firewalls. From a video on YouTube, I found that you should plug the Ethernet switch into the router or the gateway.

For the third step in the proposition to my customer, I recommend that laptops and mobile devices be checked for any updates. I gave her a few choices with the expense and portrayals likewise showed her photographs of a portion of the hardware I would use to redo the

home internet network to adaptation 2.0. I again gave her a breakdown quote of the internet network's remodeling to variant 2.0 would cost after hardware cost, parts, and work. In the fourth stage, I posed inquiries to explain when my customer might want to do the organization's total update and recommend that I help them while they needed to pause.

Ultimately, I discussed fundamental investigating tips and how to protect the home internet network—offered remote and in-person observing and tuning of the gadgets and the home internet network and proposed methods of self-finding out about PCs and home web organizations.

I want to end with a quote from one of the biggest names in the IT field. Steve Jobs said once, "It's not a faith in technology. It's faith in people." We shouldn't always rely on technology for everything in our lives. We should step away from our devices and away from our desks or chair. My advice would be to go outside for a walk to stretch out those muscles and eyes. Please take time away from the screen and get some fresh air. It may help the body, mind, and soul.

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