

Chapter One

Internet Connection Types

In this chapter you'll learn about the difference between Coax, DSL, Fixed Wireless and Satellite internet connections and what each one means for your speed needs and how you can expect to experience the internet. You'll also learn which WiFi frequency band you should be connecting to based on how you want to use the internet.



Internet Delivery Methods



Coax Cable

Cable Internet is one of the most popular Internet connections. It is the most prevalent option in more densely populated areas. It delivers fast, reliable Internet via a cable straight to your home. The signal travels from a central location called the “head end” and spreads out from there to connect many neighborhoods and homes. Think of a head end as a source, or the signal of origin. The cable goes to your home, then connects to a modem. From there you can either connect to the modem directly or connect a router to provide a wireless connection for your devices.



Aerial Cable



Buried Cable

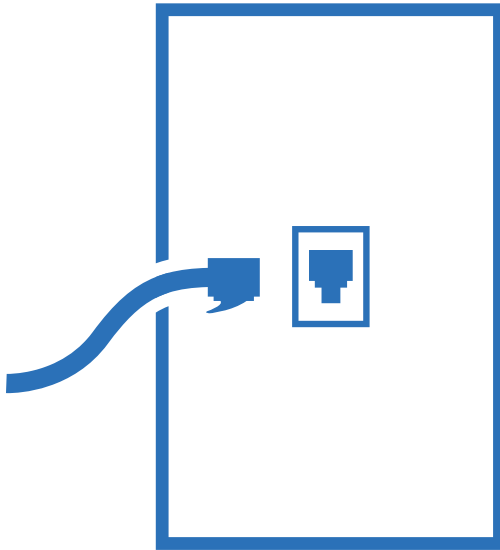


The two ways
you could be
connected to
coax Internet



DSL

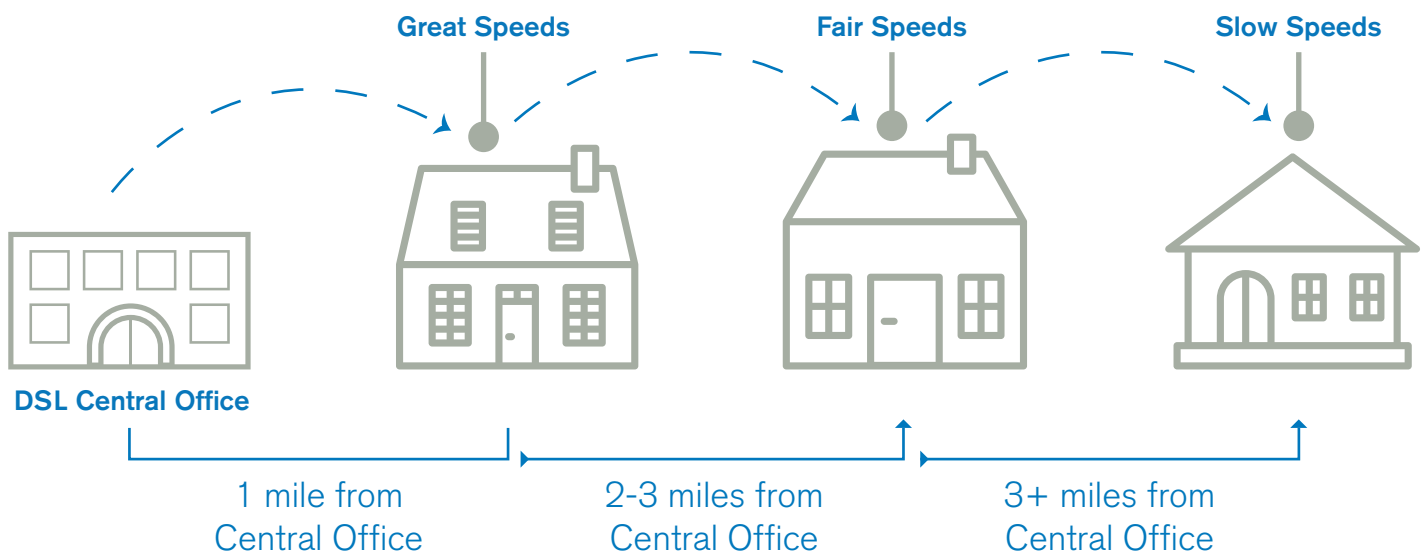
DSL, or Digital Subscriber Line, was great piece of technology when it first came out. It could reach a great number of people and connect them to the Internet. However, it does have a few limitations.

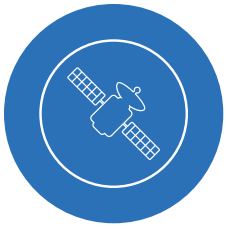


You can get decent speeds with DSL if you are close to the “central office.” Think of a DSL central office as the source, or signal of origin for the Internet connection. From the central office, the connection is distributed out to homes. As the distance increases from the central office, or source of the connection, to your home, the signal weakens, and you may not see the higher speeds.

This is where cable has a marked advantage, not only in speeds available, but consistency in the speeds delivered to your household.

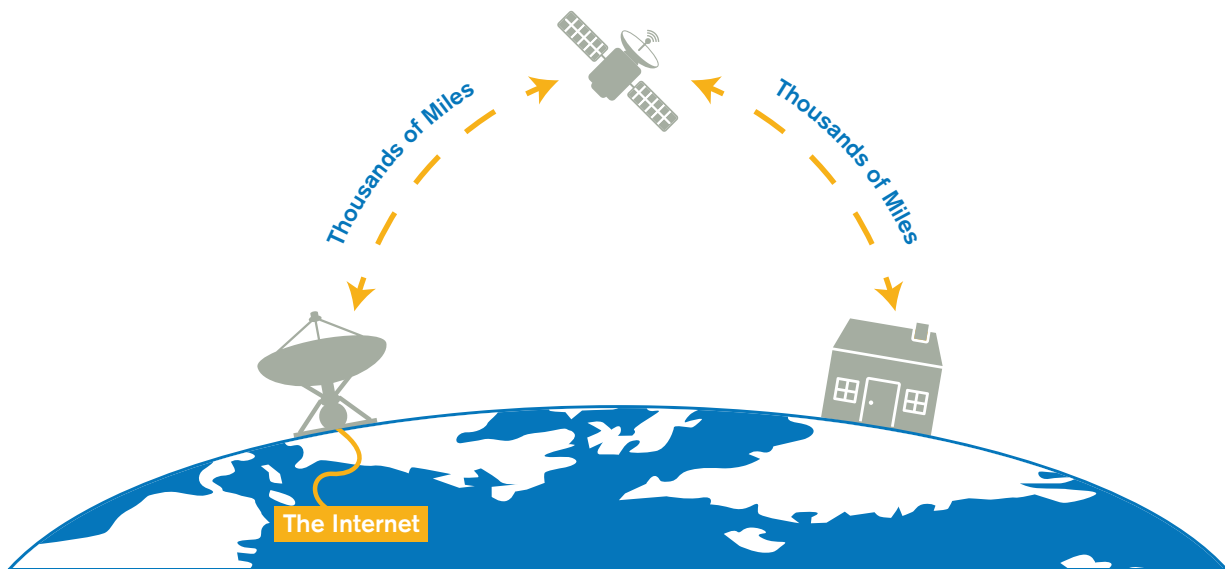
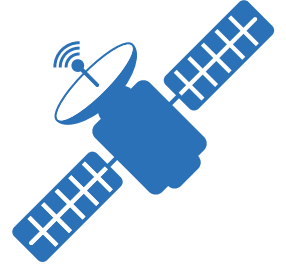
DSL hasn’t been upgraded fast enough to meet the needs of speed and technology for today’s world. It does do a good job getting a high quantity of people a basic connection, especially in more rural parts of America. At this time, Astrea does not offer DSL internet.





Satellite

Satellite Internet is a two-way signal. Satellites built for Internet usage are capable of two way communication so you can interact with the Internet when shopping, checking e-mail, browsing the news and streaming your favorite movie or TV show. You may think that satellite Internet is the same as satellite TV, but you couldn't be further from the truth. Satellite TV only requires a one-way communication whereas satellite Internet requires that two way-signal. Let's break down how a satellite Internet connection sends and receives information from the Internet and gets it to your home.



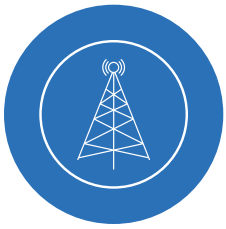
Every time you click a link, button, open a page and so-on, you are requesting information. That request must travel from your house, to the satellite to a receiver. The receiver then retrieves the information you're asking for and sends it back to the satellite, back to your house and then it is displayed on whatever device you're using.

The amount of time it takes for that complete process to occur is what makes satellite less ideal for activities like gaming because the information has to travel thousands of miles back and forth. However, when it comes to activities like streaming a movie, satellite can really excel. That's because you only have a single request: view this movie. Your connection is then solely operating to bring the movie to you. There is no back and forth communication that happens until you're ready for your next movie.



PRO TIP

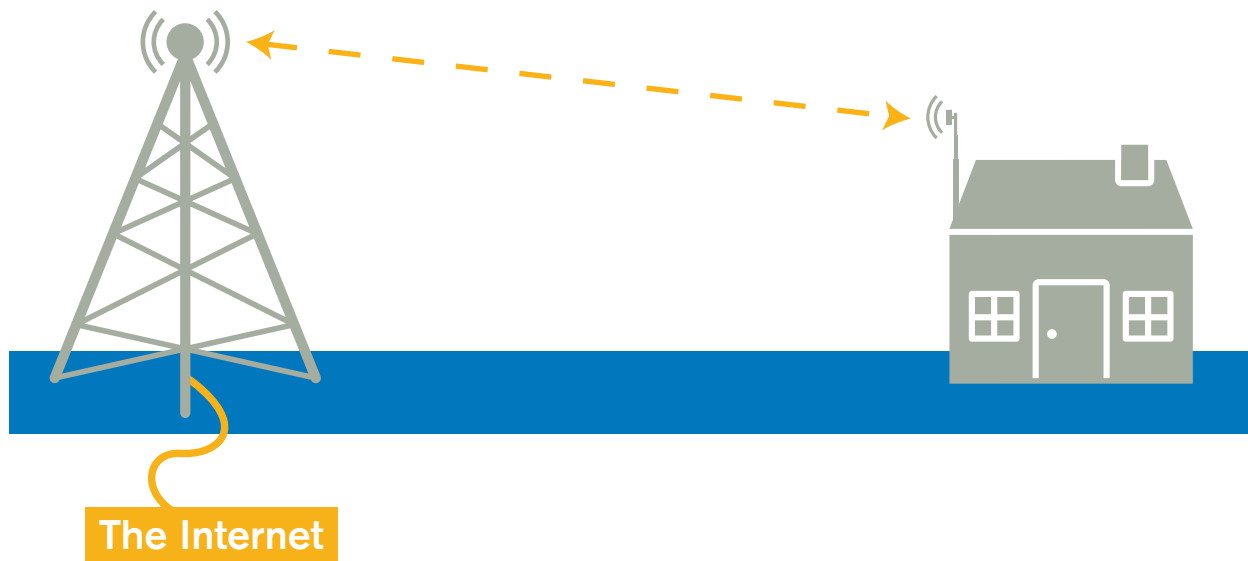
Satellite performs very well for streaming movies or shows, but may not be suitable for all online game due to higher latency times.



Fixed Wireless

This service uses a narrow and steerable beam which is electronically steered towards each subscriber without affecting latency. Latency is essentially the time it takes for a request to travel to a receiver, or source of the data, and for the receiver to then process that request and show you what you want. Simply, it is the round trip from your browser to your server to show you what you're requesting.

When considering fixed wireless there are different types of technologies that can be used, each with their own advantages and limitations. If you're curious about how your specific fixed wireless connection will work, ask your provider and they should be able to give you those details. Below is a basic illustration of how the technology connects to your home:



At Astrea, connecting rural communities with a Internet service is our passion. That's why we offer several different ways to connect based on where you live including coax, satellite and fixed wireless connections.

In Town?



Coax

Near Town?



Fixed Wireless

Out of Town?



Satellite



See if you qualify for an
Astrea connection today:

Check Your Location

www.astreaconnect.com/internet

2.4 vs. 5 WiFi Frequency Bands

When logging into your WiFi network, you'll notice two options available. You'll find a 2.4ghz option and a 5.0ghz option. These are two different frequency bands on your home network and have two different benefits for use depending on what you'd like to do on the internet. **Let's break it down:**

2.4ghz Band

This band is the one that should be used if you need further range when you are not in the same room as the modem or router. Sitting out on your patio or having a fire in the back yard? Buzzing around the house to take care of the kids? You'll want to connect to this band.

Keep in mind, the range and mobility of this connection type does come at a compromise when it comes to speed. On the 2.4ghz connection, you'll be able to pull 70-80mbps max. What does that mean as far as what you can do on your device? Can you shop? Can you send email? Can you stream? Don't worry we'll get there.

Let's talk about how many devices can connect on this band. On the 2.4ghz band, you can connect up to 11 devices depending on the bandwidth usage of the device. However, each device can use different amounts of bandwidth so we don't advise connecting 11 devices at once as speed and performance can suffer.

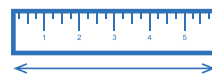
5.0ghz Band

This is the band for speed. Remember, for what you gain in speed, range is reduced. It is not meant to roam around the house, so stay in the room when connected to this frequency band.

Within this band there are 45 channels in which your wireless devices send and receive data, meaning you could have up to 45 devices on this one band. Again, this is not recommended.

Keep in mind, your device may not be capable of seeing or connecting to the 5.0 band. Search for your device specifications online to determine if it is capable of identifying the 5.0ghz band.

2.4ghz Band
Best for Distance



5.0ghz Band
Best for Speed



Band and Speed Connection

These channels also depend upon the speed connection that you have fed into your home. You may have 45 channels on your frequency, however, they are not all going to run at the speed you have purchased.

For example, a device that requires a lot of speed and bandwidth may need to operate on multiple channels. When you have a lot of devices connected on certain bands, they are all competing to use the channels that are available.

Make sure you're connected to the appropriate frequency band for the best experience possible.

Chapter Two

Troubleshooting

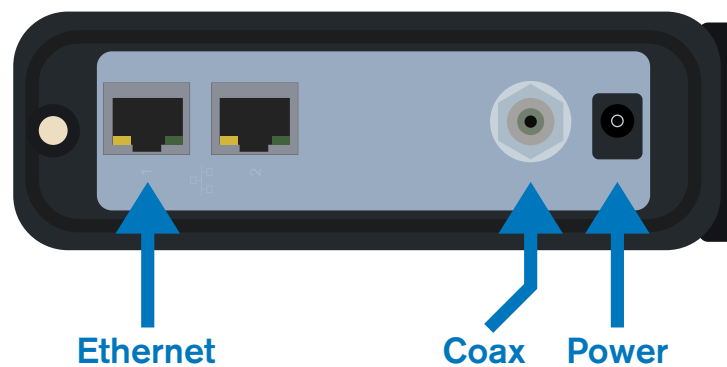
In this chapter you'll learn all the basics on how to troubleshoot your connection and what may be causing a less than desirable experience. Many factors can slow down your internet speeds and many of them are within your control to ensure you get the most out of your speed package.

How to Run a Powercycle

Running a Powercycle

Always start with a powercycle. In other words, try turning it off and turning it back on again. To properly powercycle, disconnect the power supply from your modem or router. Leave it unplugged for about 30-60 seconds. Reconnect the power supply and wait for the modem to reboot.

Disconnecting both cords gives the modem a chance to reset, disconnect from the entire network, remove any static and begin fresh with a new connection. If you're on the phone with us and we do ask you to powercycle, it's because we haven't seen a clean drop from the network



How to Resolve Wireless Connectivity if the Powercycle Fails

If you have your own router, you will need to powercycle that as well. If you cannot find your network connection, ensure your WiFi is enabled on that device or try another device in the house.

If you have your own router you can disconnect the router and directly connect to the modem with an Ethernet cord and a laptop. If you are able to access the internet using the Ethernet cord, the issue lies within either your router, your devices or both. You will need to troubleshoot those for a wireless issue.

None of my devices will connect. Now what?

If none of your devices will connect, give us a call at 1-800-236-8434 We'll have to help resolve this issue on our end.



PRO TIP

Turn your other devices on and off, too. Whether it's a laptop, Xbox, or phone, try turning it off and allow it to connect again.

Top 5 Reasons for Slow Internet Speeds

Because there are several potential causes for slow internet signal, there are several potential solutions. You'll want to run a speed test to help narrow down what is causing your slow speeds. Here are the top 5 reasons we find cause slow speeds:

- 1** | Your modem, router or device may need to be replaced.
- 2** | The amount of connected devices is causing speed interruptions, including background devices. Using aggressive applications, like Netflix, at the same time or while other applications may be using up your bandwidth.
- 3** | Use of the internet connection is too great. For example, online gaming requires a significant amount more speed and bandwidth in comparison to checking email.
- 4** | Modem or home router may need a firmware update.
- 5** | The device is not capable of speed desired.

Make sure to run a speed test to help uncover the reason for slow speeds.

If your speed test results show you that you're currently getting the speeds your package includes, you may have too many connected devices utilizing the connection, your usage needs require more speeds or a combination of the two. Contact us at 1-800-236-8434 to increase your internet speed package.

Another reason for slow internet speeds are WiFi dead spots in your home. Certain spots yield faster speeds than others or some spots go completely dead. If this is what you are experiencing, you may need to consider Whole Home WiFi which gives you wall-to-wall coverage.

On WiFi, you can either select the 2.4G or the 5.0G option. Each has a different use depending on where you need to connect and what you need to use the internet for. Ensure you're connected to the correct band.

Speed Testing Your Internet

How to run a speed test, why you should run one, evaluating your results and the best practices to getting the most accurate results.

Why Should You Test Your Internet Speed?

Identify performance trends

Identify devices that may be causing issues

Ensure you are getting the speeds you purchased

Four Tips to Get the Most Accurate Results

1 Power cycle your modem or router and your device before testing. This is an important step because the speed test needs to utilize parts of your device's hardware to get an accurate speed test.

2 Avoid running a speed test on your gaming console. It does not have the option to verify the connection through your wireless system. Often times, gaming systems will run speeds through their own remote servers which will impair your speed test results.

3 Avoid running a speed test wirelessly. This can be done even if you are experiencing wireless issues. Run the test using a laptop or desktop that is directly connected to the modem. If you must run the speed test wirelessly, you may not see accurate speeds due to device limitations or wireless capability. If you have your own router, be sure to disconnect this device from the modem.

4 Determine how many devices you currently have connected to your wireless network. Even if you are not using that device at the moment, it is likely still connected to the network and passing data on your internet system. If you can, turn off all your connected devices. This will get you the most accurate speed test and minimize excess noise on your network.

Elements of a Speed Test

The elements of your speed test will consist of three major components: download, upload and ping. Let's break down what each of these means:



Download:

The amount of time it takes to obtain data (mbps)



Upload:

The amount of time it takes to send data (mbps)



Ping:

The time it takes between sending and receiving data (ms)



How to Run a Speed Test

We suggest using speedtest.net. It is a very powerful tool and it is easy to read and understand. Simply navigate to their site and follow the prompts.

Evaluating the Results of Your Speed Test

"I'm Getting About The Same Speed as What I Pay For"

If you are receiving the speed that you are paying for, you may be hitting the max of usage for the speed provided. You're using more internet than the speed you have can deliver without buffering or slow load times. This is a key indicator that you may need to upgrade your speed package.

You can test your usage on a laptop in your task manager on a PC or the Activity Monitor on a Mac. From there, you can see the utilization of your network. If you notice peak usage times in your household where the network is nearing 100 percent, you will want to consider a speed upgrade.

Shortcuts to Access the Activity Monitor

MAC

⌘ + ⌘ + ⌘

Windows

Ctrl + Shift + Esc

"I'm Not Getting Near The Same Speed as What I Pay For"

If you are testing wirelessly, you will need to directly connect to your modem and run a speed test directly as the results from testing wirelessly may not be as accurate.

However, if you can't directly connect, try your speed test from another device. Ensure you are physically close to the modem or router. If you are away from the modem or router you may experience a dead spot in your WiFi network. If that is the case, you may want to consider Whole Home, wall-to-wall WiFi service.

Your speeds may be suffering if your modem needs a firmware update. Give us a call at 800-236-8434 and we can update this for you.

If you have your own router, you will need to contact the manufacturer of your router to complete that update. Furthermore, if you have your own router you may simply need a new or faster router.

At this point you can evaluate if your internet is performing to the speeds you've purchased. If not, there may be several causes. Some of these causes may be the number of connected devices you have, how old your device is, or the band frequency you're connected to.



PRO TIP

Other providers may be experiencing issues. For example, if your Xbox is down, it may be Microsoft that's down and not your internet. In times of increased overall usage during the COVID-19 pandemic, many providers are experiencing new challenges and interruptions.

Check downdetector.com for up-to-date information on other providers.

Installing Your Home Router

You've purchased an internet package and now you'd like to get your WiFi network set up. In order to do so, you'll need a router to connect to your modem. Use this guide to get your router set up and to troubleshoot any issues that may arise.

Initial Set-Up

- 1 | First, connect a laptop or desktop to your modem directly with an Ethernet cord to ensure that your internet is online.
- 2 | Next, unpack your router and follow all the instructions given by the manufacturer.
- 3 | Connect your router to a power outlet to power it on.
- 4 | Once your router is powered on, connect it to the modem with an Ethernet cord.
- 5 | On your laptop or desktop, connect directly to your router with an Ethernet cord. Bring up a browser while connected to the router and follow the manufacturer's instructions to set up your WiFi network.

Troubleshooting

Turn the router off and disconnect the router from the modem. Disconnect the router from the power source. Next, unplug your modem from the power source. Let this completely power down for a minute.

Reconnect the modem to the power source. Connect your router back to the power source then connect the router to the modem.

Wait for services to come back online. Note, this could take anywhere from 3 to 5 minutes. While you wait for your services to come back online, powercycle your devices as well.

What to do if the powercycle fails to restore your connection:

Disconnect your router from the modem. Use an Ethernet cord to connect a laptop or a desktop computer directly to the modem. Are you able to connect?

Yes, I'm able to connect.

Contact the manufacturer of your router for assistance. Since your modem is still providing the internet connection properly, the problem lies with your router.

No, I'm not able to connect.

Contact Astrea for assistance. If your modem is not connecting properly to the internet, we have to troubleshoot from our end.

Chapter Three

Speed Education

Learn about each of Astrea's coax speed packages and view our recommendations for usage with each one. You'll get a breakdown of recommended amount of users combined with activities or devices for each package. You can take a deeper dive into which activities use the most bandwidth and can have the biggest impact on speed. You'll also learn what a VPN is and who usually needs one.

Internet 50

The Ideal Household



1-2
people

When considering a speed package you need to consider how many people have the potential to be using the Internet simultaneously. If you have only two people in your household, even if one of you is streaming and one is just browsing online, 50 mbps should be adequate for you.

However, when you start to add even more aggressive applications, like online gaming, just one person using the Internet could be maxing out your speeds. Remember, we don't ever cap your data usage, but once you hit the threshold of your speed package, your speeds will start to suffer simply because you've maxed out your bandwidth

Internet Activities



Streaming Music
(1-5 mbps)



Online Shopping
(1-5 mbps)



Streaming Video
(5-10 mbps)



Video Calls
(10 mbps)

With Internet 50 and only 1-2 people using the Internet simultaneously, you should be able to perform all of these tasks without issue.

As a reminder, with every speed package, it's all about simultaneous usage. If one of you streams video while online shopping, while another is making a video call and streaming music, you are starting to approach your speed capacity.

Internet 100

The Ideal Household



2-4
people

When you start to have more than 2 people in the household, we typically see more aggressive usage of the Internet and also see a spike in simultaneous usage. **These two factors are very important and may even bump your family out of Internet 100 category into 500.**

It's always important to do the math before you select a speed package. Jump to the end of the guide to review the formula to calculate your ideal speed package.

Internet Activities



4K Video Streaming
(25 mbps)



Streaming Music
(1-5 mbps)



Online Shopping
(1-5 mbps)



Streaming Video
(5-10 mbps)



Video Calls
(10 mbps)

With Internet 100 and only 2-4 people using the Internet simultaneously, you should be able to perform these tasks without issue.

As a reminder, with every speed package, it's all about simultaneous usage. When multiple people are using the Internet for multiple activities, you could run into problems if you reach speed capacity.

Internet 500

The Ideal Household



4+
people

When you start to have more than 4 people in the household, you'll definitely need to consider 500 mbps speed package. Especially if you or someone in your household likes online game frequently. The biggest consideration here is the increased use of aggressive applications with greater simultaneous usage.

Internet Activities



4K Video Streaming
(25 mbps)



Video Calls
(10 mbps)



Gaming
(50-75 mbps)



Streaming Music
(1-5 mbps)



Online Shopping
(1-5 mbps)



Streaming Video
(5-10 mbps)

With Internet 500, get the freedom to stream, game and use the Internet with much more capacity than with the other packages. Spouse streaming the game, while your kids game or do homework, all the while you can stream music shop on Amazon.

Internet 1000

The Ideal Household



4+
people

This is the ultimate do-it-all package. This is ideal for families with multiple gamers, those that need to download large files for work or school, use Skype on a regular basis, stream all of your TV and anything else you can think of. If you need to do it all and won't sacrifice speed, this is the package for you.

Internet Activities



4K Video Streaming
(25 mbps)



Video Calls
(10 mbps)



Gaming
(50-75 mbps)



Streaming Music
(1-5 mbps)



Online Shopping
(1-5 mbps)



Streaming Video
(5-10 mbps)



Run the Numbers

Use the following equation to run a quick evaluation on your Internet speed needs.

Total Number of Internet Devices		Multiplied by Usage		Add 50 for EACH virtual assistant or WiFi connected appliance		Your Ideal Speed
	x		+		=	
		Basic (x5) Checking social media, checking email, occasional video streaming. Moderate (x10) In addition to Basic usage, regular video streaming, shopping on Amazon, some gaming. Data-Intense (x15) In addition to Moderate usage, downloading large files for school or work, regular gaming.				

Is your current speed up to the challenge to meet your needs?
Check to see if you qualify to get a faster speed package:



Check Your Location

What Impacts My Speed?

More People More Speed

Typically, more people in a household means more connected devices. The more devices that are connected and simultaneously being used, means your eating up more speed. Here are some recommendations based on how many people are in your household:

People in the Household	Recommended Speeds
 1-2 people	→ 25 - 50 mbps
 2-4 people	→ 50 - 100 mbps
 4+ people	→ 250+ mbps

Connected Devices

As mentioned above, the more connected devices, the more speed required. However, even if you're the only person in your house and your streaming a show on Netflix that you forgot to turn off, browsing on Amazon and streaming music in your kitchen, you could be maxing out your speeds.

What You're Using the Internet For

Different activities require different amounts of speeds. Below are the **minimum speed requirements for one person to enjoy the activity without interruptions:**

 4K Video Streaming (25 mbps)	 Video Calls (10 mbps)	 Gaming (15-25 mbps*)	 Social Media (1-5 mbps per device)	 Email (1-5 mbps)
 Streaming Music (5 mbps)	 Online Shopping (5 mbps)	 Streaming Video (10 mbps)	 Virtual Assistant (1-5 mbps)	 Large File Transfers (50 mbps)

The above are general speeds that are needed for each activity. Actual speed usage will be dependent on a variety of factors. For example, streaming video at standard and HD definition require different amounts of bandwidth. Remember, these are only accounting for one person performing the activity at a time. When you have multiple people in your household, all using multiple devices, you can see you'll need greater speeds.

What You're Using the Internet For (Continued)

A special note on gaming.

With gaming, the most important factor is latency, or the amount of time it takes to request and retrieve information. You'll also want to consider if the game requires any voice connection to talk to other players. Although minimal requirements for gaming aren't usually very high (about 3 mbps - 6 mbps), keep in mind that that is only for one player and doesn't account for any other connections using the speeds in your house. We recommend at least **15 mbps per person** to ensure a consistent gaming experience.

As a reminder, the listed speed requirements don't include other devices running in the background like your phone doing updates, security cameras, smart thermostats, smart watches, smart appliances, smart light bulbs, smart doorbells and anything else running on your Internet connection.

As you can see, just doing one activity alone doesn't require a lot of speed. The biggest impact on your experience is simultaneous Internet usage (several people on multiple devices).



PRO TIP

With more people and devices connected all at once with increased simultaneous activities demanding your bandwidth, your current speed package may not be up to the task anymore.

Visit go.astreaconnect.com/rightspeed for a custom assesment.

What's a VPN and Who Needs One?

A VPN is a Virtual Private Network. Using a VPN adds security and privacy on public networks like hotspots, WiFi connections and more. Usually, if you're working from home and your business wants you on a VPN, it's for security purposes.

There are a few key items to note when using a VPN and how it impacts your connection along with how to troubleshoot on a VPN.

VPN Troubleshooting Tips

Experiencing slow speeds?

First, disconnect from the VPN and ensure you're getting normal speeds. Being on a VPN will generally degrade your service speed and bandwidth by about half.

For example, if you have 100mbps service, on a VPN, you will see speeds around 50mbps. Additionally, if there are two people working on VPNs in the house, this will degrade the service even further.

VPN Connection Issues

First you should check with a co-worker, or several, to see if they are also experiencing issues with the VPN. Generally, when there is increased use of the VPN in your company, the VPN tunnel can get bombarded with users resulting in a poor experience.

Check with your IT department to identify the size of the VPN tunnel to ensure that they have prepped the organization with enough bandwidth for the VPN tunnel.

Simultaneous Connections While on VPN

Ensure other people in your home are conscious of your work. If you are currently using your VPN connection while others in the house are streaming or on their devices, you could experience connectivity issues such as slow speeds or buffering that you typically wouldn't experience while off of a VPN.

Still struggling?

Reach out to your IT department and determine if there are times or situations that you can work off of the VPN or try to determine times that you can work offline.

Astrea is always here to answer any other questions you may have. You can reach us by live chat, email and phone. We also offer a 24/7 extended hours support line so you can always reach someone who can help you.

Live Chat



astreaconnect.com

Email



ask@astreaconnect.com

Phone



800-236-8434