

DSC PRESENTS

# THE ULTIMATE GUIDE TO BUSINESS INTERNET

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**Free eBook**



# The Ultimate Guide to Business Internet

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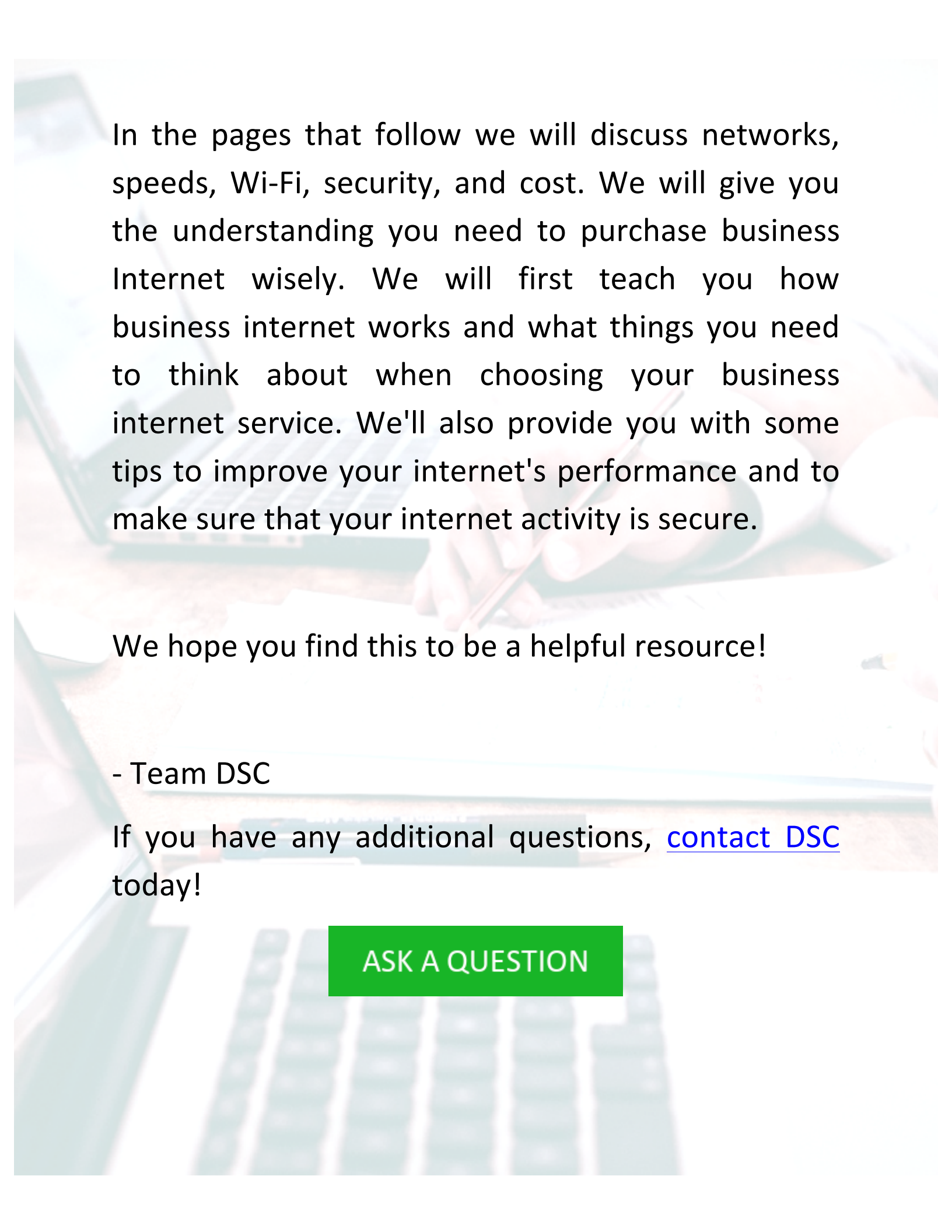
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# Introduction

The internet is most likely a vital part of your business, but it can be a very confusing and complicated thing when it comes to knowing how to choose the speed you need, the bandwidth, and a number of other choices that you maybe don't even understand yet. Keeping close tabs on your bottom line is important for the success of your business so you don't want to be paying extra for Internet services that you don't need and yet you don't want an inadequate service that isn't going to meet your needs.

That's why DSC has created this eBook. It's for small business owners who want to better understand what you are buying when it comes to Internet services and to have it explained to you in simple, easy to understand terms.



In the pages that follow we will discuss networks, speeds, Wi-Fi, security, and cost. We will give you the understanding you need to purchase business Internet wisely. We will first teach you how business internet works and what things you need to think about when choosing your business internet service. We'll also provide you with some tips to improve your internet's performance and to make sure that your internet activity is secure.

We hope you find this to be a helpful resource!

- Team DSC

If you have any additional questions, [contact DSC](#) today!

ASK A QUESTION



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# Networks

The biggest factor that determines how your internet performs is the [network](#) that you use including what it's made of, how it's configured, and how quickly and efficiently it sends and receives your [data packets](#).

There are 46 main types of internet networks, including:

- Fiber-optic
- Cable
- DSL
- Satellite
- Copper T1
- Wireless

## Fiber-optic



**Definition:** Instead of using metal wiring, fiber-optic networks use long strands of fiberglass. The data is transferred through the fiberglass by pulses of light. A fiber-optic network can be set up to send data through either direct lines or nodes.

**Download Speeds:** 75 to 40 Gigabit

**Upload Speeds:** 75 Kbps to 40 Gigabit (equal upload and download speeds is unique to fiber internet)

**Reliability:** Fiber-optic is actually more reliable than copper or coaxial because light is an extremely efficient transmitter, making these lines quite high speed. When fiber cuts occur, though, it may result in a number of people losing connection and difficulty resorting service.

**Availability:** Urban and suburban areas



"Fiber-optic is actually more reliable than copper or coaxial cabling."

## Cable

**Definition:** Cable networks usually consist of a combination of [coaxial cabling](#) and sometimes [fiber cabling](#). They are set up similar to a tree where there is a main trunk from which lines branch out to [nodes](#) and then on to the individual customers.

**Download Speeds:** 15 to 300 Mbps

**Upload Speeds:** 768 Kbps to 35 Mbps

**Reliability:** In terms of reliability, cable is often hit or miss. You may find that your service slows down during peak times of usage. Security can also be very poor, as people near you on the same segment have the potential to see your data.

**Availability:** Urban and suburban areas as well as some rural areas

## DSL

**Definition:** DSL stands for "digital subscriber line." It runs on the copper telephone infrastructure sending a signal to the customers by a direct line. Unlike the old dial-up system of the early days of the internet, DSL sends its internet signals over the phone line without interrupting the phone signal; they can operate at the same time.

**Download Speeds:** 0.5 to 45 Mbps (often less than 30 Mbps)

**Upload Speeds:** 384 Kbps to 6 Mbps

**Reliability:** Because DSL provides a direct path from the provider to the customer through the phone line, it is usually quite reliable.

**Availability:** Urban and suburban areas as well as most rural areas



"DSL works over the phone line without interrupting the phone signal"

## Satellite

**Definition:** With satellite internet, your provider transmits your internet signal to a satellite that is orbiting the Earth. The signal is then sent from the satellite to a dish that has been set up outside of your business's location.

**Download Speeds:** 5 to 12 Mbps

**Upload Speeds:** 1 to 3 Mbps

**Reliability:** Satellite is the least reliable as the signal can be interrupted by weather and even landforms such as mountains.

**Availability:** Urban and suburban areas and in rural areas where the only other option is dial-up service. The service is more populated



areas is less reliable as there are more physical barriers there to affect the signal

## Copper T1

**Definition:** Copper T1 networks run on the copper telephone infrastructure, sending signals to customers via direct private lines.

**Download Speeds:** 1.5 Mbps per T1, bonding up to 8

**Upload Speeds:** 1.5 Mbps per T1, bonding up to 8

**Reliability:** Copper T1 is an older technology that the internet was formally run on. It is extremely reliable and secure, and because most telecom technicians are familiar with this network, issues are rare and are typically fixed quickly. However, this network is characteristically slower than others.

**Availability:** Global availability

## Wireless

**Definition:** With wireless internet, your provider transmits your internet signal to a satellite that sends information to local towers. From the tower, the signal will be relayed directly to your receiver,

often installed on-site at your business. Sometimes, there are also local line-of-sight direct wireless connections.

**Download Speeds:** 1 to 100 Mbps

**Upload Speeds:** 1 to 100 Mbps

**Reliability:** Of the networks mentioned, wireless internet is the 2<sup>nd</sup> least reliable. The signal is often interrupted by weather and even landforms such as mountains.

**Availability:** Urban and suburban areas and in rural areas where the only other option is dial-up service.

Networks

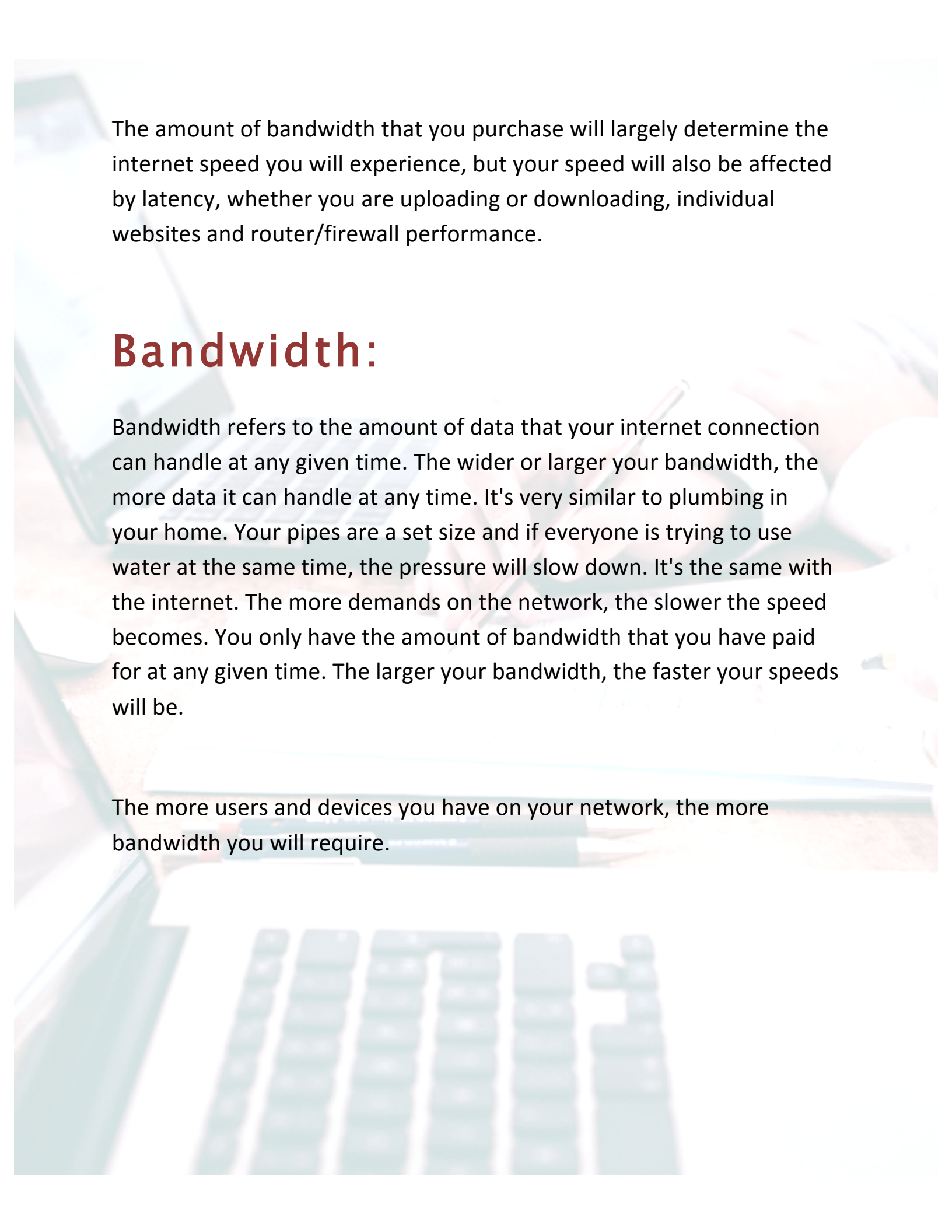
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# Speeds



The amount of bandwidth that you purchase will largely determine the internet speed you will experience, but your speed will also be affected by latency, whether you are uploading or downloading, individual websites and router/firewall performance.

## Bandwidth:

Bandwidth refers to the amount of data that your internet connection can handle at any given time. The wider or larger your bandwidth, the more data it can handle at any time. It's very similar to plumbing in your home. Your pipes are a set size and if everyone is trying to use water at the same time, the pressure will slow down. It's the same with the internet. The more demands on the network, the slower the speed becomes. You only have the amount of bandwidth that you have paid for at any given time. The larger your bandwidth, the faster your speeds will be.

The more users and devices you have on your network, the more bandwidth you will require.



"The larger your bandwidth, the faster your speeds will be."

## Uploading and Downloading:

Different activities take up different amounts of bandwidth. Here is a general idea of what types of activities require what types of bandwidth.

- **Low to medium speed downloads:** internet browsing, email, text chats, small file sharing
- **Low to medium speed uploads:** posting text to social media, email, text chats, small file sharing
- **Medium to high speed downloads:** streaming audio, streaming video, large file sharing, videoconferencing, digital phone systems, other cloud-hosted applications
- **Medium to high speed uploads:** cloud backup, streaming video, large file sharing, videoconferencing, digital phone systems, other cloud-hosted applications

## Latency:

Latency refers to the length of time it takes for you to receive the information that you have requested once you have clicked. That means the time it takes for your data to travel from one location to the next. Each type of network has a different latency rate. According to the [Measuring Broadband America Fixed Broadband Report](#), the rates range as follows:

- **DSL:** 28 ms (milliseconds) to 58 ms
- **Cable:** 12 ms to 30 ms
- **Fiber-Optic:** 12 ms to 30 ms
- **Satellite:** 599 ms to 629 ms
- **Copper T1:** 2ms to 5ms
- **Wireless:** 20ms to 500 ms

As you can see, the latency of a satellite is very high compared to the other types of networks, with copper, cable and fiber being the lowest and therefore the fastest.



"Copper, Cable and Fiber-optic have the lowest latency rates.""



## Your Router/Firewall:

The router/firewall you use can affect the speed that you achieve. If you have paid for internet bandwidth of 100 Mbps and your older router/firewall can only handle 50 Mbps, you will in effect be paying for bandwidth that you can't use. Check to see what your router/firewall capabilities are and make sure it can handle the type of bandwidth that you need.

## Other Websites:

Even though you may have a fast connection speed from your provider, if the website that you are connecting to is slower, you will experience slower speeds. For example if you are trying to do a videoconference with a partner and the connection on their website is slow, your total connection will be slow.

## When Will You Need to Purchase More Bandwidth?

In certain situations, you may find that it is necessary to increase your bandwidth. These include:

- Hiring more employees and you want to maintain your current network speeds.
- You want to switch from a traditional landline phone system to a [VoIP](#).
- You are switching to cloud-based applications and backups and will be therefore doing more uploading of files.
- You will be sending and receiving larger files than before especially large video or graphics files.
- Your current speed is too slow and you want to increase your employees' productivity by reducing lag time.



"If your current speed is too slow it may be time to purchase more bandwidth."



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# Wi-Fi

Physically connecting your devices to your network by using cables is more reliable than using a wireless connection, however [Wi-Fi](#) is still a very important part of what will make your business successful in the technical age we're living in.

## Why Your Business Needs Wi-Fi

### **Wi-Fi can make you more productive:**

People today have become used to working wherever they are; they are no longer stuck working at their desks. Wi-Fi makes this possible and it is a good thing. It means that you and your employees can work from conference rooms, in hallways as they walk to another meeting, at home or anywhere outside of the office.

### **It can improve your customers' satisfaction:**

Customers have become used to being able to use free Wi-Fi wherever they are and they will be asking for it at your place of business.

Providing free Wi-Fi to your customers will ensure that they:

- will enjoy the time they spend at your location
- will stay longer when they visit
- will come back again and more frequently

### **It can build rapport with your business partners:**

If you provide Wi-Fi access for your business partners, they will feel more comfortable at your location as it will allow them to do work and connect with their place of business from their mobile devices.



"Customers have come to expect free Wi-Fi access at businesses."

# What You Need to Set-Up Business Wi-Fi

You will need a [router](#), [modem](#) or a combination of both in order to provide a wireless signal. It is also recommended that you have a firewall to protect your data and your network. The type of devices you will need will depend on the type of internet service you have.

## **DSL and Fiber Connections:**

These types of connections can use a router to receive a signal from your existing wired connections. The router then emits a signal that devices nearby can connect to wirelessly.

## **Cable and Satellite Connections:**

These types of connections require a router and a modem since most routers are not compatible with the [coaxial cables](#). Combining a modem with the router will allow you to provide and emit a wireless signal.



# How to Keep Business Wi-Fi Secure

You may be concerned about allowing customers or business partners to access your network and the security issues that will bring up. You should [set up a separate guest Wi-Fi](#) to keep your network secure. Most routers will allow you to create more than one network. You can set up the guest network to only have limited access with no access to any data or information from your business. You should also password protect your networks and change those passwords frequently, as well as invest in hardwall firewall.



"Password protect your networks and change those passwords frequently."



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# Security

Any business, whether small or large may at some time experience a cyber attack. Keeping your data secure should be a priority for you.

## VPNs Can Help Protect You from Cyber Attacks:

One of the ways that your internet provider can help to protect you from an attack is by setting you up with a [Virtual Private Network, VPN](#).

## How a VPN Can Help:

A router protects your physical network at your business by password protecting it and allowing users to share files safely by [encrypting](#) any traffic on your network. A VPN can do the same for your employees who connect to your network wirelessly by providing password protection and encryption in the [cloud](#). If your employees connect to an

unsecure network your company's data can be compromised. If however, they connect to an unsecure network through a VPN, the VPN will encrypt all of the internet traffic that is being accessed and sent.

## Additional Steps to Take to Ensure Security:

In addition to using a VPN, the following are some basic security measures you should take to ensure that your data is not vulnerable:

- Password-protect all your devices, accounts and networks
- Make sure that the passwords you use are [strong passwords](#)
- Install and run industry-standard [firewalls](#) and [antivirus software](#)
- Train and remind your employees not to click on any unknown or suspicious links



"A VPN can provide password protection and encryption in the cloud."



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# Cost

The general rule of thumb is the higher the speed, the more you will pay for your internet service. In addition to speed, network type, population density and geography will also affect the price you will pay.

## Different Network Types:

**DSL:** Because DSL speeds are limited and their networks are reliable to maintain, you'll probably find that their prices are low to medium.

**Cable:** Because cable offers higher speeds and their networks may have a slightly higher cost, you will probably find that their prices are slightly higher than DSL.

**Fiber:** Fiber optic offers the highest speeds, but fiberglass is more expensive to make than copper or coaxial and because it is a more advanced and newer technology the infrastructure costs are higher so you will expect to pay more. Having said this, the cost is becoming more affordable.

**Satellite:** Even though satellite offers lower speeds, it is often not cheaper because its networks are costly and difficult to maintain.

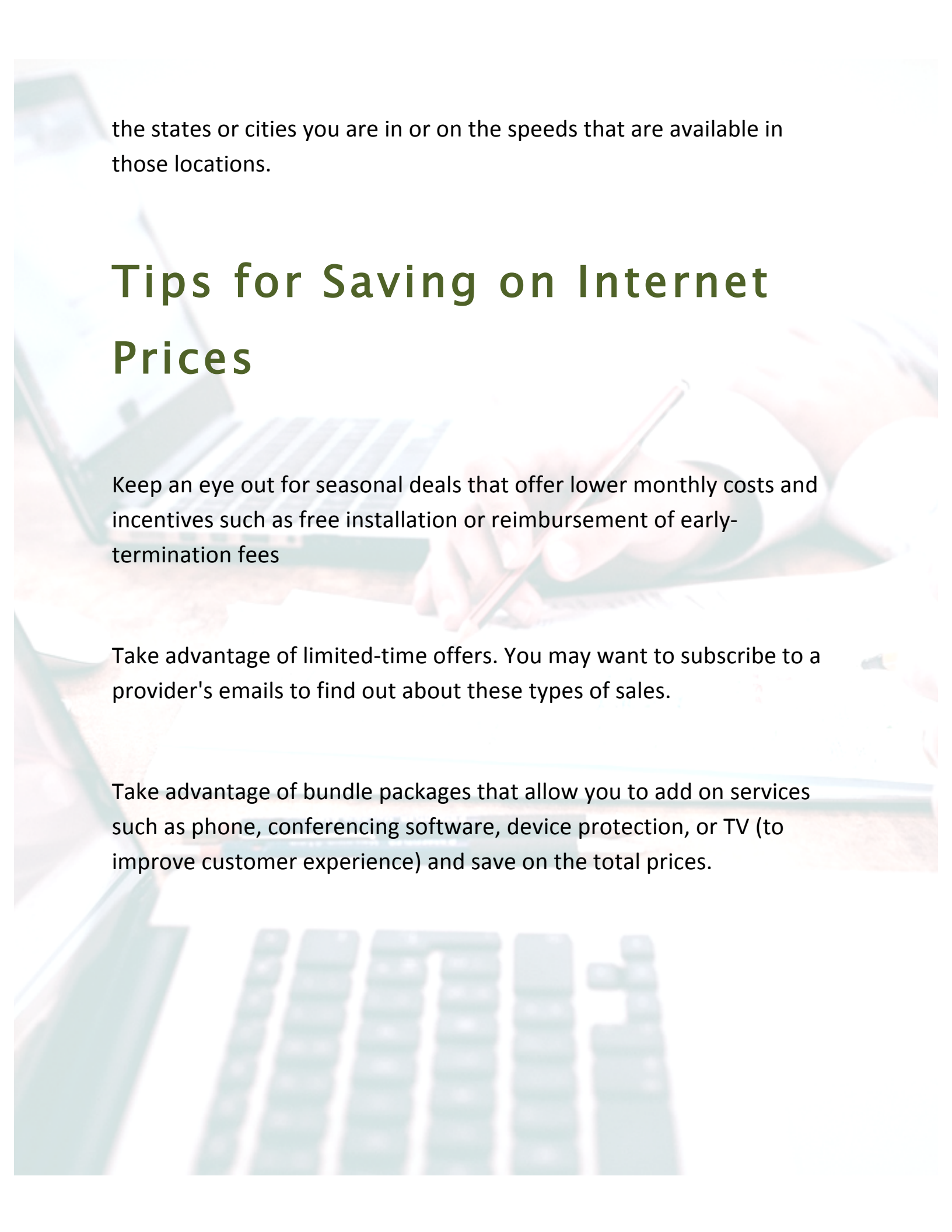


"The higher the speed the more you will pay for internet service."

## Prices May Be Higher Depending on Where You Are

Some internet providers will offer consistent prices all across the country, however others may have lower or higher prices depending on





the states or cities you are in or on the speeds that are available in those locations.

## Tips for Saving on Internet Prices

Keep an eye out for seasonal deals that offer lower monthly costs and incentives such as free installation or reimbursement of early-termination fees

Take advantage of limited-time offers. You may want to subscribe to a provider's emails to find out about these types of sales.

Take advantage of bundle packages that allow you to add on services such as phone, conferencing software, device protection, or TV (to improve customer experience) and save on the total prices.



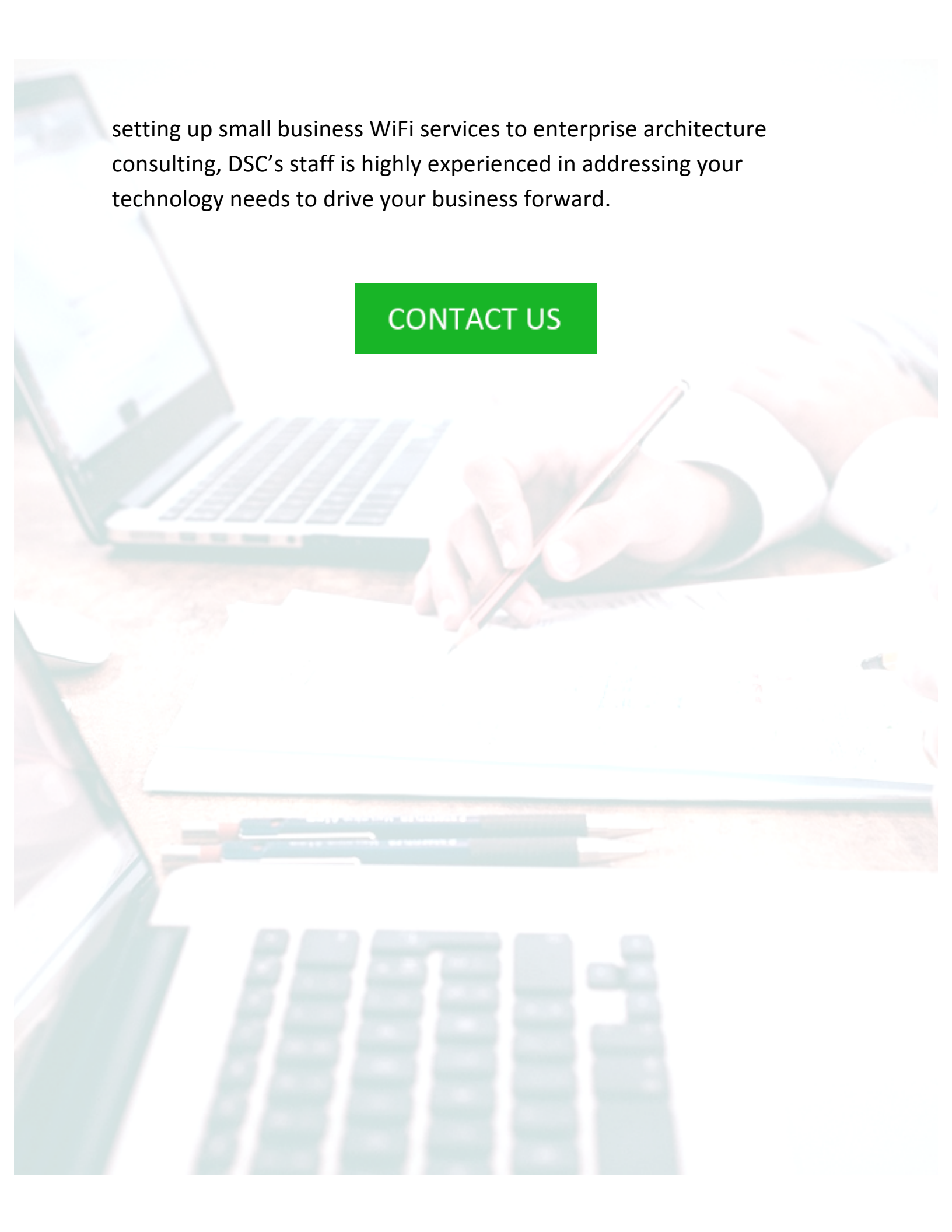
"Take advantage of seasonal specials, limited time offers, and bundling."

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## **Your Digital Solutions Provider**

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setting up small business WiFi services to enterprise architecture consulting, DSC's staff is highly experienced in addressing your technology needs to drive your business forward.

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