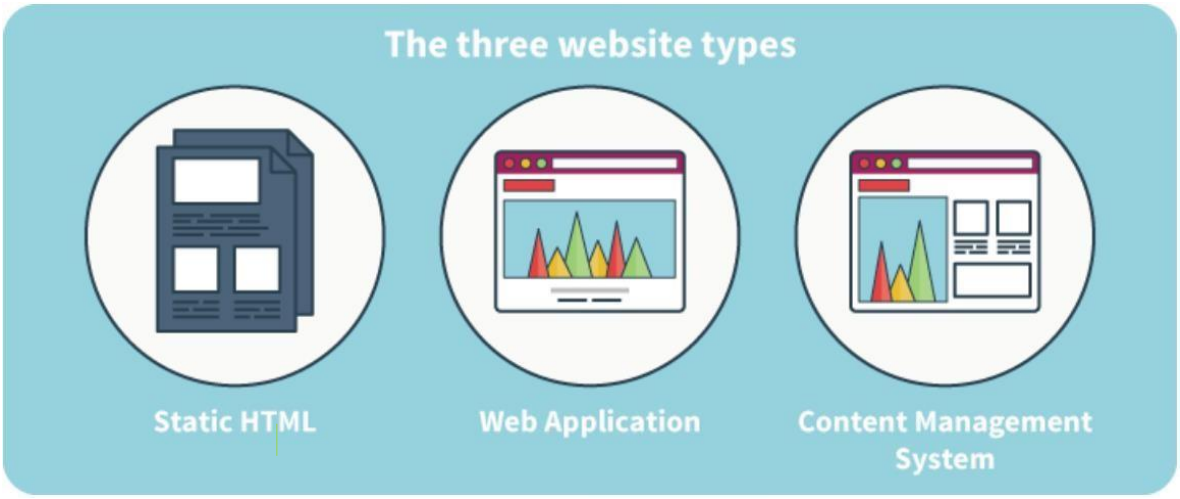
AL-FARABI UNIVERSITY COLLEGE
Computer Engineering
Department 4th Class Subject:
Internet Technology

Lecture 3

Web Hostign

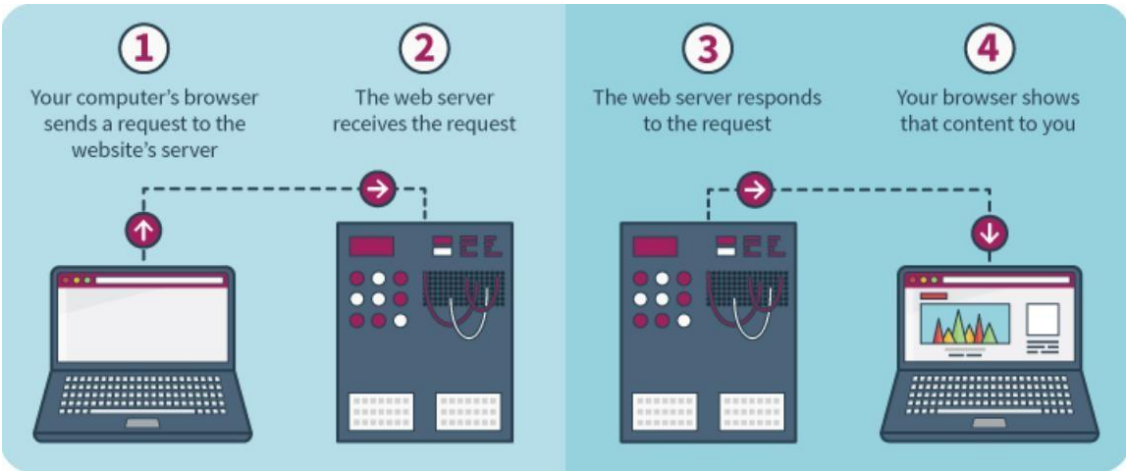
A Website

A website is a collection of documents, a web application, or content management system that sit on a computer.

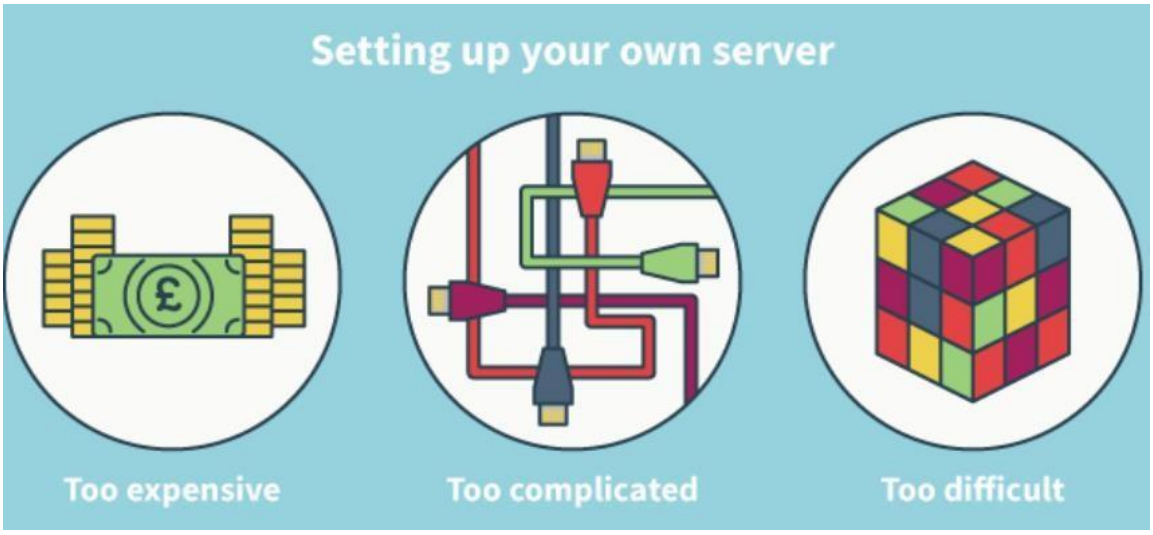


- when you visit a website, a series of things are happening:

1. Your computer's browser sends a request to the website's server for something — a page, a document, a file for running an application.
2. The web server receives the request and pulls together whatever it needs to deliver back to you what you requested. This might just be an existing file, or it might be a piece of a web application, or it might be an assembled document from a content management system.
3. The web server responds to the request with some kind of content.
4. Your browser shows that content to you.



- So, in order to run a website, you need a computer connected to the internet, that is capable of receiving requests, taking appropriate action, and responding, which is a "server".



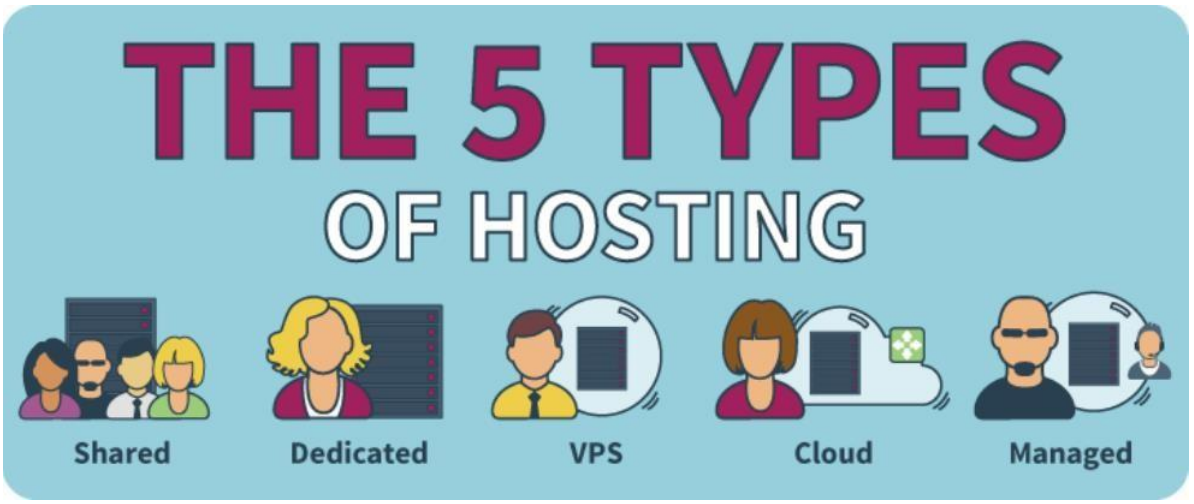
- You could, in theory, run a website from your home desktop computer, but that would be a terrible idea, because it is too expensive, too complicated, and too difficult.
  - First off, you'd have to know how to set it up properly to run a website (which is not a trivial matter).
  - You'd have to leave it ON and connected to the internet all the time.
  - Your computer at home is only designed to deal with one user at a time. If a lot of people started trying to look at your website, your computer and your internet connection would both reach their limits and your website would stop working.

- For a website to work well, a regular desktop computer isn't a good choice. Web hosting companies provide fast, powerful computers so that anyone can run a website without having any special knowledge or buying any special equipment.

- Therefore, web hosting companies have solved this problem. They have bought the big expensive computers, they have set them up to work for running a website, they have made sure they have a fast connection to the internet. They've done all the work.

Types of Web Hosting

There are five different types of hosting plans as shown in Figure below. In this section we will show the differences between them and how to decide the right choice for you.

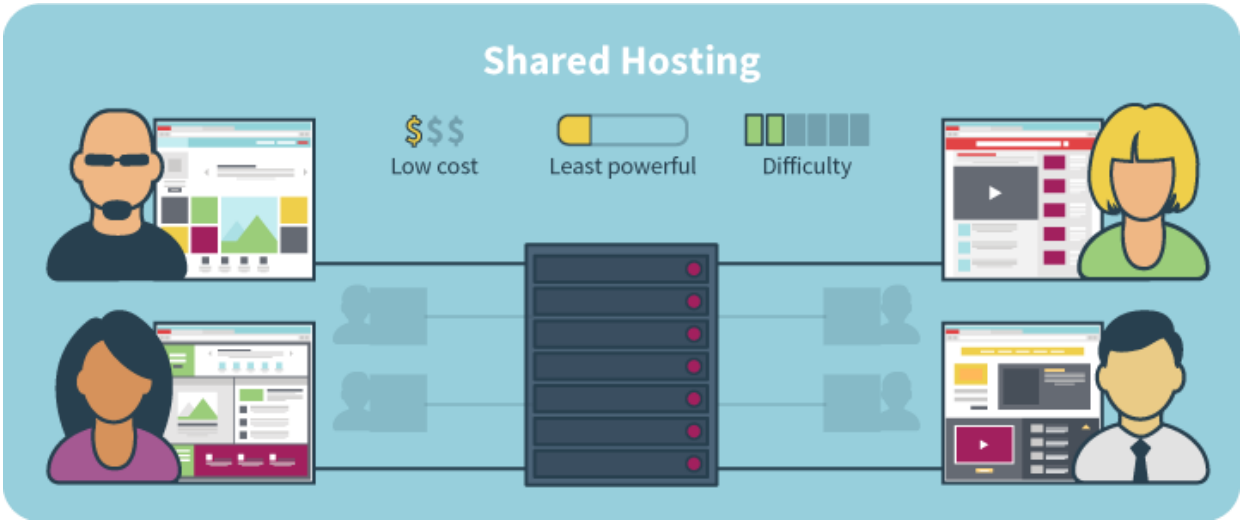


1. Shared Hosting

- The most common form of web hosting is called "shared hosting." It is the least expensive and, as you might guess, the least powerful.

- With shared hosting, several web hosting customers share the same computer. All of the websites of all the different accounts are stored in the same drive, processed by the same CPU, and delivered by the same web server.

- It's easy to see why this is less expensive than other options. The hosting company is allocating relatively few resources to you.



- Of course, there are downsides. All the websites from all of the accounts are all competing for the same scarce computer resources.
- The servers that hold shared hosting plan sites are much larger and more powerful than your home computer, so they can host hundred of websites without any problem — as long as none of the sites are too popular or need too many resources.

The downsides of Shared Hosting

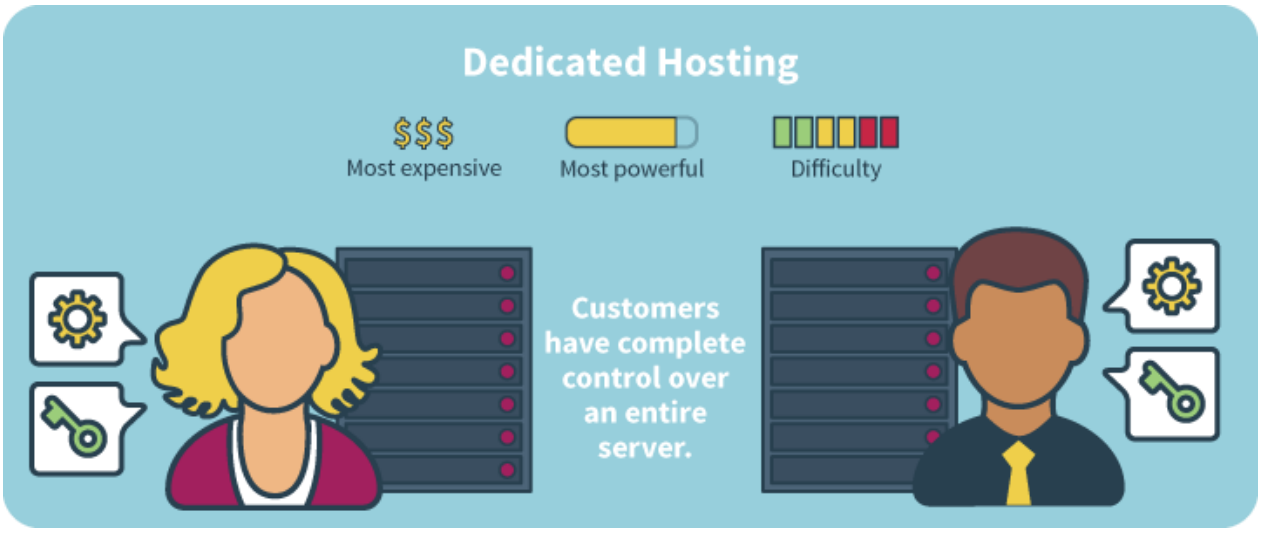
- Users experience performance lags and downtime when the server you subscribed with is loaded with too many sites and has got a lot of traffic.
- The other downside to shared hosting is the inability to customize the hosting environment.
- it also opens your website up to a certain amount of risk. No matter how careful you are in securing your web applications, other people might leave their software exposed to attack and provide an entry point for attacks that affect your site as well.

Shared hosting is ideal if you're:

- Starting your first website
- Running a small business or startup
- Experimenting with coding and web design
- Making sites for family and friends
- Making the most of a limited budget for hosting

2. Dedicated Server Hosting

With dedicated server hosting, you have complete control over an entire server. This has many advantages, but it is also more expensive and more complicated.



When you select this kind of hosting, you get, as the name suggests, a dedicated server all to yourself. No other website lives on that server but yours.

The Advantages of getting a dedicated server are:

- All the server's storage space and speed are there for the benefit of your site alone.
- No one to compete with for page load speed. No one to compete with for uptime.
- you have complete control over an entire server
- You get to choose your operating system, and all other related resources.

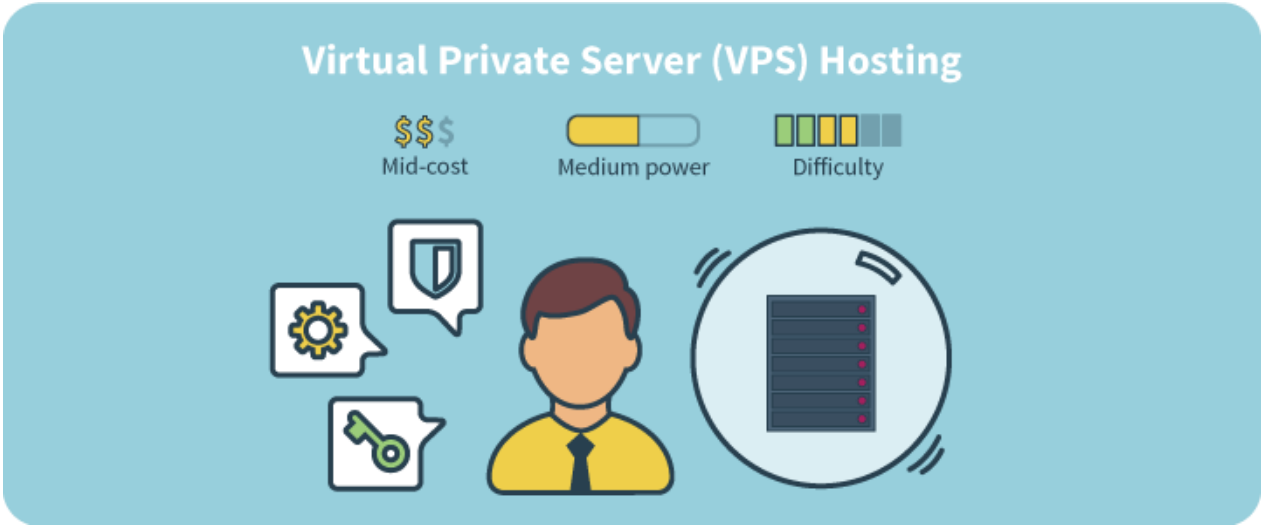
The disadvantages of buying a dedicated server plan are:

- They're expensive
- They can be difficult for non-technical people to set up
- You really need management, or an in-house technician, if you want to avoid catastrophe
- Dedicated servers don't give you the peace of mind that cloud hosting can offer (although some hosts do market hybrid dedicated plans
- Like all computers, they crash, and they're difficult to bring back online

Dedicated servers are sold with fixed resources. Some hosts offer several arrays of options, allowing you to choose the brand of server, operating system, RAM, disk space and software. Additionally, you can choose between managed and unmanaged; the latter is pretty risky unless you're a server administrator.

3. Virtual Private Server

Somewhere between shared hosting (a lot of people on one server) and dedicated hosting (one account on a server), is Virtual Private Server (VPS) hosting. In this model you have your own dedicated server, but the server is a virtual machine, not a physical one.



This provides a mix of the benefits (and disadvantages) of both shared and dedicated hosting plans.

With VPS hosting, you have complete control over the environment, just as you would with a dedicated server. This is especially helpful if you are developing custom applications or are running a SaaS (software-as-as-service) business.

You generally have much more access to server resources with VPS hosting as compared to shared hosting. While the various virtual machines are all sharing server resources, there are usually many fewer of them on a server in a VPS environment. You are alloted a much larger portion of the overall computing power and bandwidth.

Pros and Cons

VPS hosting is a great compromise between shared and dedicated hosting:

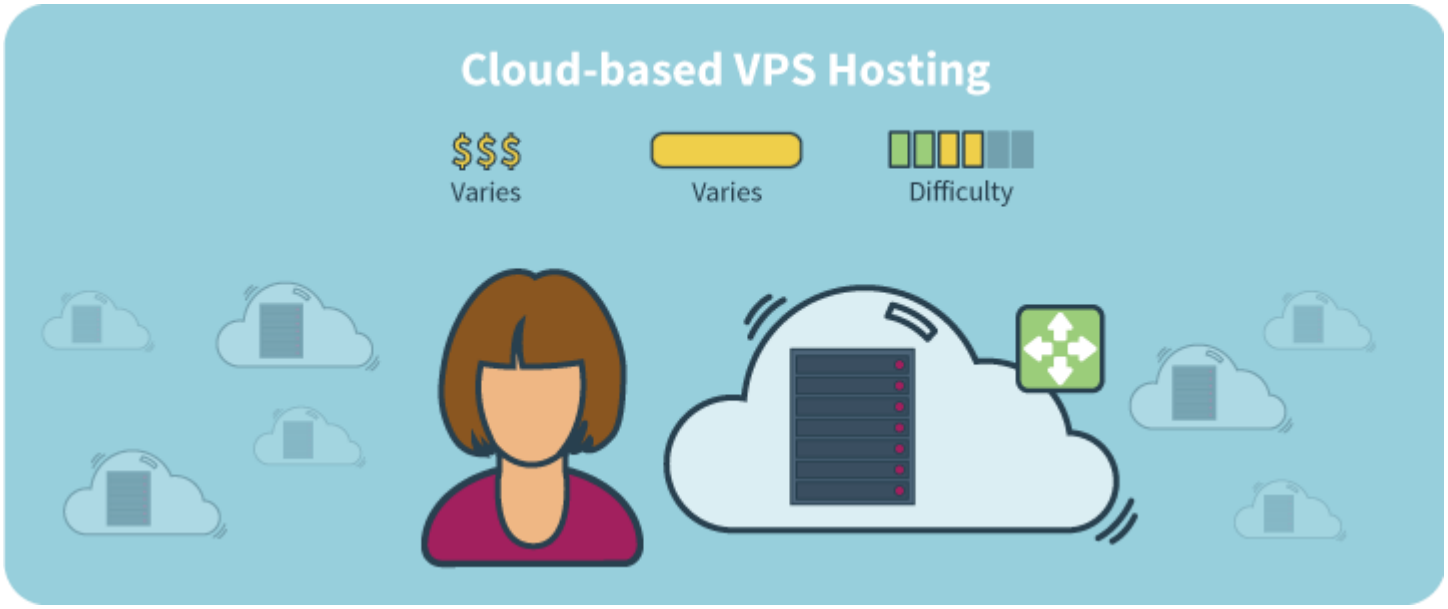
- It's affordable
- The VPS can be set up in a few minutes
- VPS hosting tends to be more reliable than shared hosting, since your site can't be affected by another resource-hogging customer
- This kind of hosting gives you more access to the server's configuration, so you can control settings yourself.
- You can create and remove sites from your VPS,
- Each site can have its own control panel,
- Software can be installed and modified
- It's more secure
- Another advantage of VPS hosting is the ability to customize your operating system, something you can do with a dedicated server, too, but not with shared hosting.

There are a few downsides to VPS hosting:

- You need to know a little more about server administration
- There's quite a jump in cost
- An unmanaged VPS may look like a cheap option, but if you don't know what you're doing, fixing a fault gets expensive fast
- Choosing a plan can be complicated.

4. Cloud-based VPS Hosting

The problem with both dedicated servers, conventional VPS and shared hosting plans is that eventually you will hit the physical limitations of the actual server. We're talking about a real machine with real limitations on how much memory it can use, how much storage it can hold, and how many requests it can handle.



Most websites never hit these limits, and shared or VPS hosting is more than adequate. But some sites regularly get tens of thousands of visits a day, and other sites with less regular traffic occasionally have huge spikes that can't be predicted, like when a piece of content suddenly goes viral.

Because of these hosting realities, hosting companies offer something that usually goes by a name like "scalable VPS hosting" or "cloud based hosting" or "scalable cloud-based hosting."

Generally, with regards to web hosting, "cloud" means that a large number of computers are all clustered together, and any applications running on them can make use of their combined computing resources.

The other advantage of cloud hosting is increased reliability. By placing a copy of the site in more than one place, there's always a second node ready to take over if the primary node fails. Some hosts offering cloud hosting advertise much better uptime guarantees – 100 percent, in some cases.

Different hosts provide this redundancy in different ways; some will place the site on multiple storage devices, while some will use multiple virtual servers. Some hosts use load balancing technology to make sure the virtual data center can cope with demand as it increases and decreases.

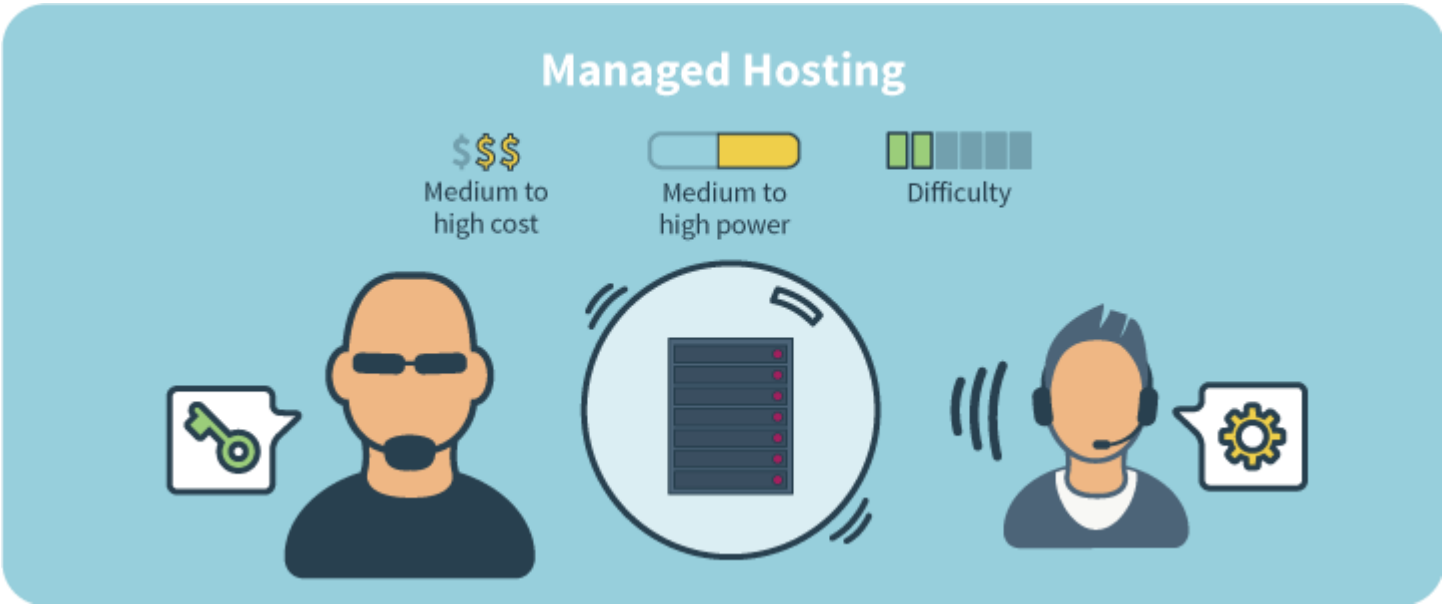
Pros and Cons

The main pros of the cloud are:

- Access to a pool of resources, rather than just one machine
- Virtual servers can be quickly (sometimes instantly) scaled up and down
- Uptime may be better
- You can often clone, deploy and remove servers in an instant.
- will never be restricted by the spec of a physical machine
- Your site Many hosts only charge for the capacity you use, so it's cheaper for some sites.

5. Managed Hosting

If you need the bandwidth and power of a VPS or Dedicated Server, but don't have the technical skills (or the inclination) to do serious server administration, you can get a managed hosting plan.



With some managed hosting plans, you have direct access to a VPS or a dedicated server, and the hosting company provides support in addition to that core hosting service. This gives you the flexibility to do what you want or need to do, but without needing to know everything about server administration.

Other managed hosting plans are geared toward specific applications like WordPress, and your interaction with them is limited to the one installation. The entire environment has been configured to provide the best experience with one application, and there isn't really anything else for you to do. This is great if that's the application you need, but it doesn't give you much flexibility.

Common features of managed hosting plans can include:

- 100% Uptime Guarantees: Dedicated staff monitor your website 24/7 to immediately fix any issues causing downtime
- A dedicated support team you can contact 24/7 for immediate assistance with your website
- Security features like SSL certificates and hardware firewalls to protect your website from hackers
- Detailed logging of threats and security actions
- Managed databases for peak performance and speed
- Complete backup and storage solutions, including disaster recovery

Managed hosting is a great solution for:

- eCommerce websites
- SaaS (Software as a Service) businesses
- Web-based or mobile apps
- Large, media-rich websites
- Online gaming websites
- Any website that must be available 24/7

Which type of hosting is right for me?

	Cost	Power	Difficulty	User Control	Flexible	Reliability
 **Shared Hosting**	$			—	—	★
 **VPS Hosting**	$$				—	★★
 **Dedicated Hosting**	$$$				✓+	★★
 **Cloud VPS**	$$	Varies			✓	★★★
 **Managed**	$$$				✓	★★★

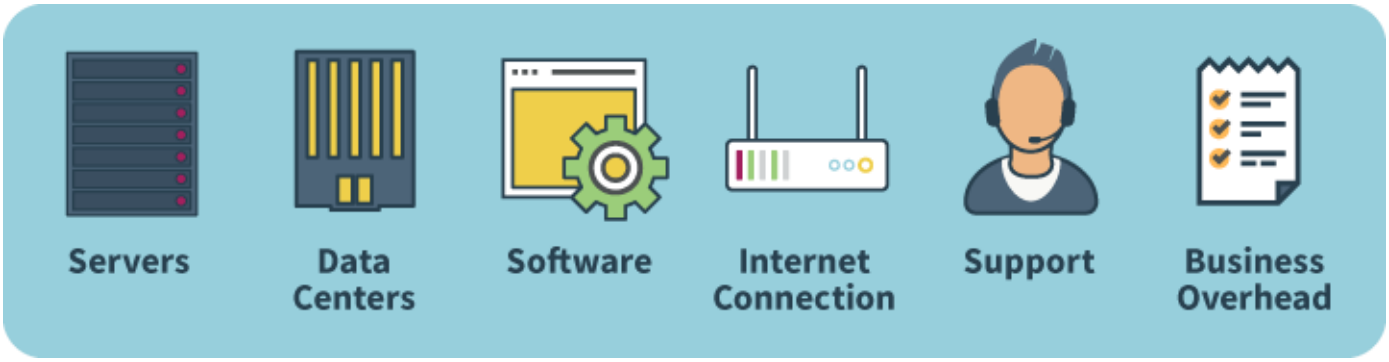
Ideal for...

Shared Hosting	Simple, low-cost hosting for small businesses or new websites - suitable for most websites without specialized needs or major traffic spikes
VPS Hosting	For websites that have outgrown shared hosting, and need more control and server resources
Dedicated Hosting	Most powerful, full control over all aspects of server administration
Cloud VPS	Allows hosting resources to be adjusted in real-time - ultimate flexibility. Good for websites that have intermediate traffic spikes
Managed Hosting	Sites which need the bandwidth and power of a VPS or Dedicated Server, without needing to have the technical know-how

What are you buying when you buy web hosting?

Web hosting is an intangible service. You can't really see it or touch it. Because of that, its easy to think that all web hosting plans are the same, or that web hosting isn't worth paying for.

In order to make the most of your web hosting, and understand the various pricing schemes available, it's helpful to know what you are actually buying when you buy web hosting, and what the company is spending your fees on.



1. Servers

Though you will never see it, one of the biggest expenses of web hosting is the physical equipment, the servers themselves. These are very fast and powerful rack-mounted computers.

Of the many things that premium web hosting companies can do to improve their service, using better (and more expensive) equipment is one of the most impactful. Faster equipment means faster website load times, which is good for you and for your website visitors.

2. Data Centers

Servers have to sit somewhere, so an included expense is the physical building where a server is located. These are usually very large buildings housing hundreds or thousands of servers.

These buildings, and the equipment in them, have to be cooled, maintained, and guarded. Datacenters use a lot of electricity, and they have to be located somewhere that very high speed, high bandwidth internet access is available.

3. Software

While much of the software used in web hosting is Open Source (like all four elements of the LAMP stack), not all of it is. Notably, the most popular control panel available for web hosting accounting management (CPanel) is proprietary software that must be licensed and paid for.

If you need a Windows hosting plan, most of the software on the server is proprietary, which is why Windows hosting is usually much more expensive than Linux hosting. This is why you should only use Windows hosting if you have a very specific need for that platform. (Most people do not.)

4. Internet Connection

Web hosting companies are not internet access service providers — they have to purchase internet connectivity just like you do, and run their connections over someone else's cables.

Actually, it's more expensive than your own internet service because web hosting data centers need speed and bandwidth at orders of magnitude higher than you have in your home or business. They are running hundreds or

thousands (or hundreds of thousands) of servers, each one requiring internet connectivity at least as fast as your home or workplace service.

5. Support

If you want to call someone, or get a prompt answer when you email, you're going to have to use a hosting company that provides at least some level of support.

Support might come in the form of FAQs, knowledge base articles, detailed guides, phone support, email support, or a help desk ticketing system. Proactive server management can be thought of as a form of support.

As with all things, you can expect that a more comprehensive support program is going to cost more than an otherwise equal hosting package without a support plan.

6. Business Overhead

Naturally, web hosting businesses have all the usual expenses of a business — from office space to taxes. This is not terribly relevant to you as a customer, but it does explain why some hosting companies are able to provide more service for less cost. You shouldn't assume that less expensive always means less value. Some companies are just better managed.

How a Web Hosting Server Works?

To get the server up and ready to go, the following stuff are required

1. Server Operating Systems

The operating system is the primary interface between applications, users, and the physical computer. Just like you home or office computer, servers need an operating system. The most common operating system for servers is Linux.

Some hosting plans provide servers running the Windows Server operating system. Do not get confused here. Even if you are running Windows on your own computer, that is no reason to use Windows on the server as well. There's no real benefit to matching those operating systems.

The only reason to use Windows for your server is if you need it to run some proprietary software that simply won't run on Linux, like .NET, ASP, or Microsoft Silverlight.

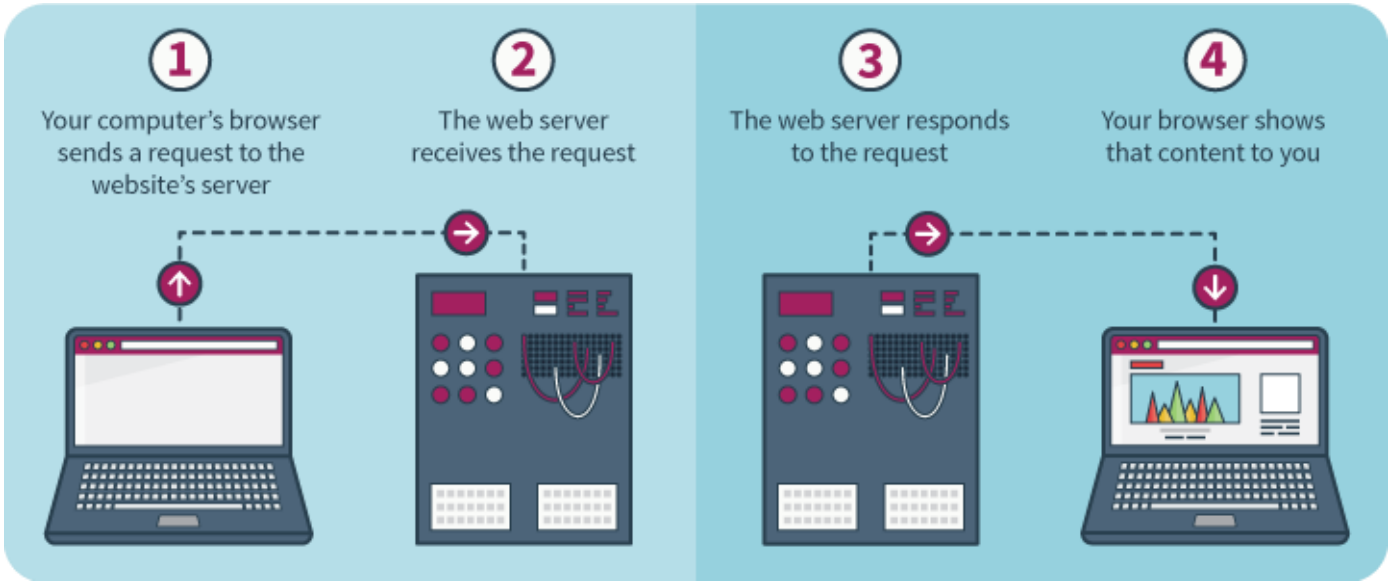
For anything else — WordPress, Drupal, Joomla, any app written in PHP, anything built with Ruby or Python — Linux is the preferred operating system.

2. Web server

The web server is the software program that is responsible for handling requests from the internet.

When you type a URL into the address bar of your browser, that gets translated into a request that is routed to the computer that hosts the website you are looking for. The web server — that is, the software program called the

web server — handles the request. It reads the request, figures out what other applications need to get run or files accessed, and then once that is completed, it sends a response back to the browser. The response it sends back is (usually) the page of the website you are trying to look at. The webserver software acts as a mediator between the internet and the files on the server.



The most common web server is an Open Source program called Apache. You will find it in most web hosting plans. Unless you have some incredibly specific needs, Apache is perfectly fine. For the most part, you will never notice or care much about your web server.

3. Database Management System

Most websites require a database management system in order to store content and other information. That could be blog posts, pages, product information, data on customers, or any other kind of content, depending on the kind of website you are running.

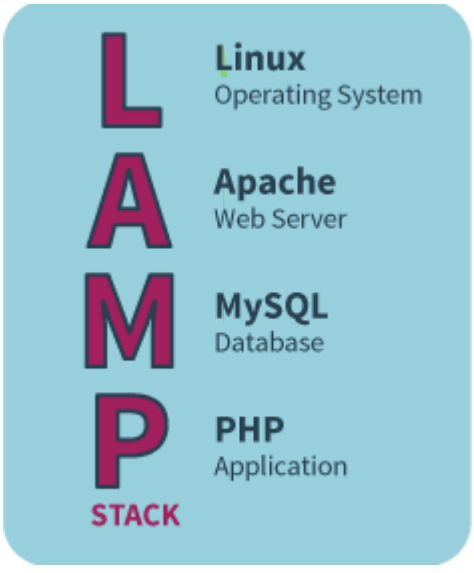
The most common database management system is MySQL. This is a very powerful, Open Source software tool for running complex relational databases. It is free to use, and is already available on many web hosting plans.

4. Application Layer — Scripting Languages

Most websites today are dynamic in some way. Thinking back to the database and the web server in the last two sections, it's clear that there needs to be some software that fetches content from the database and sends it to the web server.

websites with interactive features and dynamic content are computer programs, and they have to be written in a programming language. The most popular language for dynamic web applications is PHP, and you will find that the vast majority of web hosts support this language. If you need to use an application (or develop an application) in another language (Ruby and Python are both popular) make sure that you find a web hosting company that supports the language you need.

LAMP Stack



We identified the most commonly used option in each category: Linux for the operating system, Apache for the web server, MySQL for the database, and PHP for the application, which are sometimes referred to as the "LAMP stack".