

Abacus Computer Services
White Paper

Servers: Say What?
Or

What is a server and do I need one?

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Do I use a server?

We all use servers, almost everyday. When we get our email we get it from an email server. When we surf the web we are getting content from web servers. When we download last night's songs onto our iPod, our PC is acting as a music server. Servers are alive and well in homes and businesses across the country and around the world. Unless you do not use a computer either at home or at a business and live your life without coming into contact with server resources, you use servers somehow, knowingly or not.

Do I need a server?

Servers acting in their particular capacity are what make the sharing of resources possible. We all need servers in order to access our email, surf the web, print to the printer down the hall or access information in the form of documents or files on a network. So chances are, whether you know it or not, you need servers.

What is a server?

So, what is a server? Now that we have established your use and need for servers, we can discuss a little bit about what a server is, what makes a server and what kinds of servers are out there.

Any computer can be a server. Although some computers are built specifically with the role of server in mind, there is nothing unique or special about the hardware used to build a server computer. What really makes a server a server is software. What makes the computer answer requests from other computers on a network is a server program.

A server then, is a computer attached to a network with other computers. The server runs software allowing it to share some resource it has with the other attached computers. It is this sharing attribute that really constitutes a server.

What kinds of servers are there?

File servers share files. Documents, spread sheets, databases, pictures and music are all examples of files that can be shared. If a computer has a printer attached and that printer is shared on the network, the computer sharing the printer becomes a print server. Computers which host and share web content are web servers. Sometimes these functions are combined if one computer is capable of handling the load. A server in a small office may be sharing files and an attached printer. That computer would be called a file and print server. In larger companies, there may be many file servers, database servers and print servers. There may be an email server to handle interoffice email and act as a liaison with external email servers to collect and deliver email outside the company.

Where do I get a server?

Because any computer can be a server, you can find them pretty much anywhere from the local office store, to the local computer builder and on the Internet at shopping sites across the globe. Which of the sources you use is up to you and your comfort level with each one. If you want someone you can call locally for some hand holding then you may consider having your server built by a local computer builder. All your support would come from a vendor physically near you. If you are comfortable with contacting someone in a distant (overseas sometimes) call center, then you can purchase your server from an Internet vendor. Retail stores are an option where your purchase is local but your support will come from the manufacturer which again might be a distant call center.

How much server is enough or how much server do I need?

This is where the big differences of opinion really start to show up. While some people believe that a server must come in a black case with extra fans and lights flashing, there is nothing fixed about the physical appearance of a server. In fact servers come in a rack mountable form factor in cases only a few inches high. These units might not even be recognized by most people as a computer at all. The key question is one of reliability and redundancy. Your server may be sharing a printer on a small home network. If something happened to that computer, the printer could be easily moved and shared by another computer. No backup is really needed. On the other hand, if your server is sharing a mission critical database with 1000 employees and your entire business relies on the availability of the data 24 hours a day seven days a week, then you should have enough redundancy built into your hardware so that a single point of failure is not going to put you out of business. You may have redundant drives because hard drive failures are a common problem. But you may also want some spare parts on hand like a power supply and a memory module. Central processors and motherboards fail but not as frequently. What follows is kind of an escalating list of servers with greater and greater redundancy.

Scenario #1

Single PC with no extra parts, no backup device, and no redundancy. Any failure will result in downtime while waiting for recovery of data and repair.

Scenario #2

Single PC with redundant hard drives. A single hard drive failure results only in scheduled downtime at off peak or closed hours when technicians replace the drive. No operational time is lost. Any other failure results in downtime waiting for repairs to be made but data is secure.

Scenario #3

Single PC with redundant hard drives and power supplies. A failure of a single hard drive or power supply results only in off peak or closed hours repairs. Other major parts such as memory, processor or motherboard will result in downtime but failures are less likely. Adding on-site spares for items that are not redundant reduces downtime further.

Scenario #4

Duplicate computers. Data is mirrored in real-time or in snapshots at a set time interval. Only multiple failures in both machines can result in downtime and this is rare. No single point failures result in downtime other than to switch network users over to the redundant computer. This can be done in 5 minutes. Data loss is based on interval of snapshot.

Scenario #5

Duplicate computers with redundant drives and/or power supplies in both computers. Extreme reliability with downtime due to failures unlikely but not impossible. Failures would have to be catastrophic and likely caused by outside events like weather or fire which would affect the entire business.

Scenario #6 - The backup Factor

Adding backup to any of the aforementioned scenarios provides a way to “get it all back” should something terrible happen. Even under scenario #1, data could be restored onto a new computer and eliminate having to attempt recovery of data.

More fans and more lights do not a server make. But the size and contents of your server box will dictate whether or not you need more cool air blowing through it to prevent over heating of the components. Most tower cases have ample void spaces (areas with no parts, just space) and a single case fan is enough to exhaust the warm air out. Rack mount server enclosures on the other hand are packed very tightly and will need rack fans sufficient to keep a cool flow of air moving through the chassis. Hard drives, memory, processors, videos card, in fact all electronic parts generate and contribute heat into the computer case.

So, let’s get back to the topic of this section. How much server you need will be based on your requirement for up time, or worded another way, **your tolerance for downtime**.

What about security?

This is where what kind of software comes into play. All versions of Microsoft Windows™ have a server built in. Even your basic home versions can share files and printers. But when you need to restrict access to certain information or you need to restrict the time of day a user can login, then you need something more. Server software with higher levels of security are available from a number of vendors. Microsoft's Windows™ operating systems are all peer-to-peer operating systems. From the basic home desktop to the sophisticated server versions, there is always a desktop to work from. This means that even at the server, someone could be using an application, typing a document or editing a picture. The server may be in a separate room and not being used by anyone, but it still has a desktop and can run user applications. Novell Netware™ is an example of server only software. There is no desktop on a Novell server. There is a user interface but it is specialized for running functions that relate only to the operation of the server computer. Other server operating systems exist such as UNIX™, LINUX and BSD. They each have their own strengths and weaknesses. Apple's MAC™ OSs also have server software built-in. Due to the huge market share held by Microsoft, it is most likely you will use a Microsoft product on your server unless you specifically choose to use an alternative operating system.

Conclusions

Well, we hope this information will answers a lot of questions. The particulars of memory and hard drives don't even factor in. They will be different based on need. Every server will be tailored to the data and storage requirements of the function it will perform. If your server is also your desktop computer in a small home or office network, then be sure to get a large enough hard drive to hold your data as well as the other network users' data. If all you are doing is sharing a printer, then hard drive size is not even a server issue. It is also rather surprising but many dedicated servers (a server that will NOT be at someone's desk) do not need the processor power of a client desktop computer. Why? Because no applications will be run on the server, its need for fast desktop response and high-end video doesn't exist. It can even have a small 15 inch monitor because no one will be sitting and looking at it except occasionally. In companies with large server farms, they use KVM (keyboard, video, mouse) switches to share a single keyboard, mouse and monitor between 2, 4 or even 16 servers. The support personnel push a button and work with each server as the need arises, the rest of the time no one is even in the room.

If you have questions about servers, do some research. All the information presented here comes from our own experiences here at Abacus as well as various Internet sources such as Microsoft.com and Serverwatch.com to name a couple. You can also contact us here at Abacus Computer Services and we will do our best to help you with your server needs.

These website references also appeared in numerous background articles we read in preparing for this white paper.

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