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An Introduction to IT for the Design Professional

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Learning Objectives

- Learn the roles of the most-common components of a successful computer network
- Learn the production value of infrastructure investments and maintenance
- Learn the basic ideas of network security and where to begin
- Review the effects of the COVID-19 lockdown on industry productivity and preparation for future events

Description

Has your design firm worked hard to get to your current level of success? Has the 2020 lockdown uncovered a lack of understanding preventing maximum flexibility for your staff? Is the IT barrier the only thing preventing you from successfully scaling further? IT doesn't have to be a mystery any longer. Don't miss out on the session that will pull back the curtains and reveal the secrets of successful IT in the design firm. Learn the basics of networks and file management. Get tips on servers, backups, and more. Find out why investing dimes today in prevention and good hardware will return dollars in production uptime. This course will tie up with a primer on preparing for a remote workforce. If you want your tech to work for you, then this is the session to attend! Never feel like a stranger in the server room again.

Speaker(s)

Curt Moreno is the owner and editor of Kung Fu Manager, a blog that is focusing on management and IT in the design world. He is an active freelance content creator for clients such as the Autodesk, Inc.; Hewlett-Packard; and other corporations, large and small. He is former member of the board of directors for Autodesk User Group International (AUGI) and he's an award-winning Autodesk University speaker. He has written and spoken on topics revolving around the CAD profession, management issues, presentation topics, and customer relations for more than 10 years, and hopes to broaden his reach. Moreno currently lives in Houston where he is the IT Manager for a Texas-based engineering firm. He is a public speaker and trainer and enjoys spending time with his dogs. Visit his blog at www.kungfumanager.com or follow him on Twitter at @WKFD.

The Case for Networking

Does the company you work for have an IT staff or formal IT department? Are you the formal IT staff for your company? Or, are you just the person that fills in to fix IT issues when everyone else at work comes to you with questions? Any of these could be true, and it really does not matter because they are all valid.

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Whatever the case, every company has someone who handles IT issues. Because where there is technology there will eventually be IT issues.

It might seem as if building and maintaining a computer network could only add to that list of eventual IT issues. But the truth is that a computer network, like any business system, is a mechanism to automate, expedite, and make the most efficient use of company assets.

Think of the network as a force multiplier that accelerates the value of the effort and data put into it. File sharing, collaboration, printer sharing, and remote access are just a few of the tools that become available once your organization implements a computer network.

So, if networks are so wonderful, why are they so mysterious? Why do we all not have more access to the network and a better understanding of how its intricacies work? Well, one argument for limited access is simple security. By limiting user rights, or access, network administrators can keep sensitive data secure and limit the possibilities of accidental deletions.

As for having a better understanding of what makes up a network and how it works, well we are going to take care of that in the following pages.

The Basics of Networking

The basic definition of a computer network is the connection between two or more computers. This can be achieved through the use of physical cables or wireless connections.

Given this simple definition, it becomes clear that computer networks are almost everywhere that we look. They are present in the workplace, in the supermarkets, and in our homes. Networks scale from the simplest scenario of one computer connected to the internet to vast networks spread out over large distances. Everywhere we find computerized systems and wireless access points there are active computer networks working in the background.

Just 30 years ago computer networks were the sort of tools that only the largest companies and universities employed. Connecting computers allowed these entities to share valuable resources as efficiently as possible. Today the same reasoning still holds true.

Networking allows design firms to share not only files and software licenses but also helps to encourage communication and inspiration. Internet access through office computer networks is essential to keep employees up to speed on the wealth of information and opportunities made available by potential clients and industry bodies. This extravagance turned necessity has accelerated collaboration in a way not seen since the invention of the telegraph.

Even though we may all be familiar with the idea of internet connectivity, email, and file sharing, what are the most specific networking components that may be hiding in your office today?

Networking Hardware

The modern computer network is like any number of other complex systems we interact with every day. It can represent a behemoth of power and capability that we only interact with at a very surface level. So we take it for granted. We also take for granted the myriad of specialized, but widely available, devices that are needed to comprise and operate a computer network.

The Endpoint

Tablets, smartphones, smart televisions, digital voice assistants, door locks, refrigerators, and PCs are just a small number of devices that may serve as an interface of one sort or another to your computer network. Each of them is very different in its particular form and function, but all of them share the important traits of connecting to a network to best fulfill its role and act as a point of contact between a human user and another device connected to the network.

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For the purposes of our examples in this handout, we will assume that the endpoint is some form of workstation, laptop, or tablet. This assumption will provide with a framework that the endpoint is meant to provide input and feedback with a productive goal.

The Modem

There was a time when finding an internet connection was akin to searching for water in a baby powder factory. Today it is almost impossible to escape the multitude of WiFi hotspots and Ethernet connections. Whether you are getting a burger or trying to meditate, the internet is tapping on your shoulder just in case you want to connect. And that connection is made through one of the oldest pieces of networking hardware, the modem.

© Can Pac Swire

The modem is most often some unassuming little black box provided by your internet service provider. It's small and it doesn't seem important but it is the gateway that connects your entire local setup to the rest of the world.

The Router

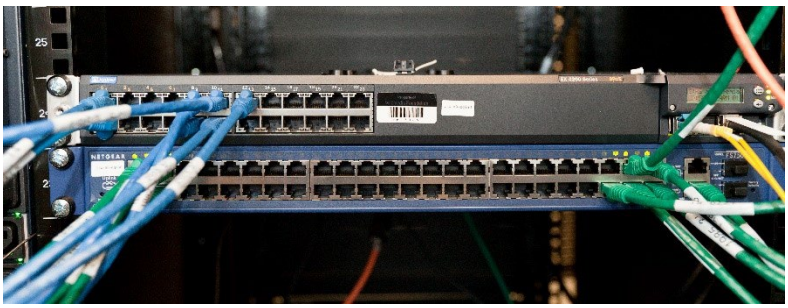
The router is the nexus of your computer network. It is the busy little operator that works to make certain all of the correct information gets to the correct location. The router is capable of this because it has a built-in level of intelligence that can connect separate

computer networks and manage the interchanged traffic. One example of this type of connection is between your workstation and the internet.

Many modern modems are designed with small capacity routers integrated into them. This will sufficient for very small working groups of less than four people, usually working in a small space. Larger groups will require dedicated units that are standalone and will have the modem, along with all other devices, physically connected.

The Switch

A switch is very much the same, in form and function, as a router. Like the router, the switch connects multiple devices to another and transmits data accordingly. However, unlike routers, switches lack the internal intelligence to connect disparate computer networks. The switch is strictly working within the confines of your local setup.



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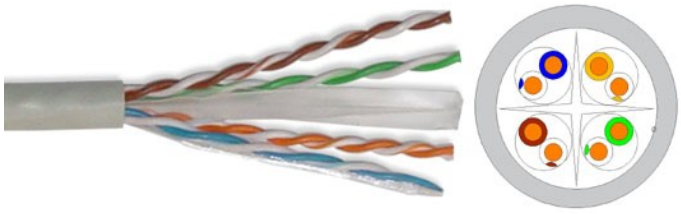
Additionally, switches will often be quite large pieces of hardware with a multitude of cables connect. It is common to see multiple switch devices with 24 or 48 ports, each one connecting to a device on the network via cabling.

The Cabling

What can be said about network cables? Actually, quite a bit. Network cables are akin to the veins and arteries carrying blood throughout your body. They are the literal pathways through which your company's data travels. And like blood vessels, they aren't all equal.

Different grades of cabling will provide different network speeds. In addition, the location of the cabling might determine the type of shielding that is needed so as to not have inference become an issue.



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In the modern workplace the most common network cables found will either be CAT5e or CAT6. Both of these cable types consist of four twisted pairs of wires that work to carry data (and in some cases electrical power) to the connected device.

The main difference between these two cables types is their maximum speed. While CAT5e is capable of providing up to 1 Gbps (very fast), CAT6 is capable of 10 Gbps (ludicrously fast).

Both Cat5e and Cat6 are ubiquitously referred to as “Ethernet” and will be some shade of blue in almost every installation. In practice, unless you are pushing a very large amount of data on a routine basis, you will probably not notice the difference between the cable types. However, if you are “futureproofing” your network, go with CAT6.

The Server

Servers can perform a wide arrange of functions in a computer network. And, while most office networks will have a server in place, it is important to note that a server is not necessary for a computer network to function.

In most professional installations the server will act as the nexus of all your file needs. Project related files will be housed and accessed from the network server. This would include any- and everything from correspondence, meeting notes, video files, and, of course, the all-important drawing files. The server is the single point of access for all of this and any other digital asset that is important to your company.

Since the server is connected to all digital devices, it makes access to files quick and easy. In addition, this centralized structure provides a framework for successful file backups (much more on that later). Given its central positioning, servers can also distribute software licenses among numerous other functions.

Suffice it to say, that in most office networks the server will be the workhorse that your company relies on day in and day out.

Obviously, these six components are just the tip of spear in terms of networking devices. The possibilities are endless and well beyond the scope of this handout. However, these six components are so common that it is almost certain that a network connecting even a small group of coworkers will have most, if not all six devices present.

Knowing what these devices are, what they do, and how they cooperate is important for any person accessing a network.

Evolutionary Stages

Like all organisms, a business will grow in stages. From an embryonic start to a colossal behemoth, any organization has phases where it has different capabilities and different

requirements. Fortunately, computer networks can also be grown in stages to match the needs of the business at each of its phases.

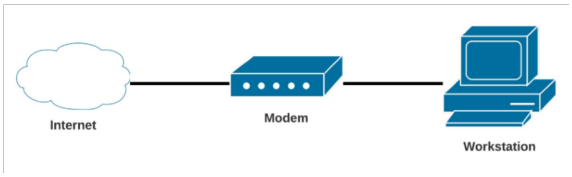
In this section of the handout we are going to follow an imaginary design firm from its genesis as a single employee startup through to a much larger organization. And we will see the different evolutions that the firm's computer network takes at each stage.

But first, let's meet Dave.

Dave Starts

Dave is an engineer who has been working for other people his entire career. Now he has decided that it is time to start his own business. He thinks that he will start off small, maybe get a client or two and see how things work out. One thing he knows for sure is that he wants to keep overhead as low as possible for these first few months.

All of these means that Dave is going to start by working at home, using his current PC. So let's take a look at DaveCo's first network.

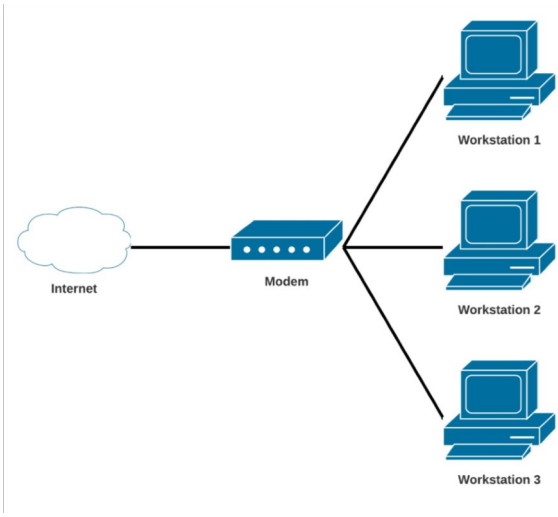


In this initial setup the PC is connected directly to the modem's built in router. That connects Dave to the internet and that is pretty much all there is to it. Dave is using his PC as both the workstation and fileserver. Everything he is working on is saved on the local hard drive in his PC and he is making things work for his first few clients.

DaveCo Grows

Things are going well for Dave and in just a short time he has more work than he can handle on his own. That means it is time to hire some help. The first problem is that he doesn't have room for more people at his house. It's time to get an office.

New employees means more computers and they all need to be connected somehow. At this stage of DaveCo it is enough for their employees to have internet access. Files live on workstations and are shared via email, flash drive, and Dropbox.

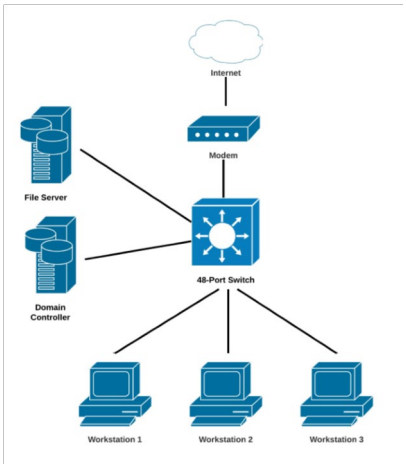


DaveCo's network is set up very much the same as it was in the beginning. The main difference is the addition of a more workstations. All these connect to the modem and then to the internet.

DaveCo Grows More

The years have been good to Dave and his team and now the needs have outgrown the simple setup of sharing projects files by email. Over the past few months some files have gotten overwritten and some have just been lost. The practice of moving "large" files by flash drive has opened up all sort of issues and contributed to the chaos.

After expanding the office and bringing on more staff, Dave realizes that it is time for the network to grow just as like the company. It's time to get rid of the daisy chained routers and it's time to build a "real" network.

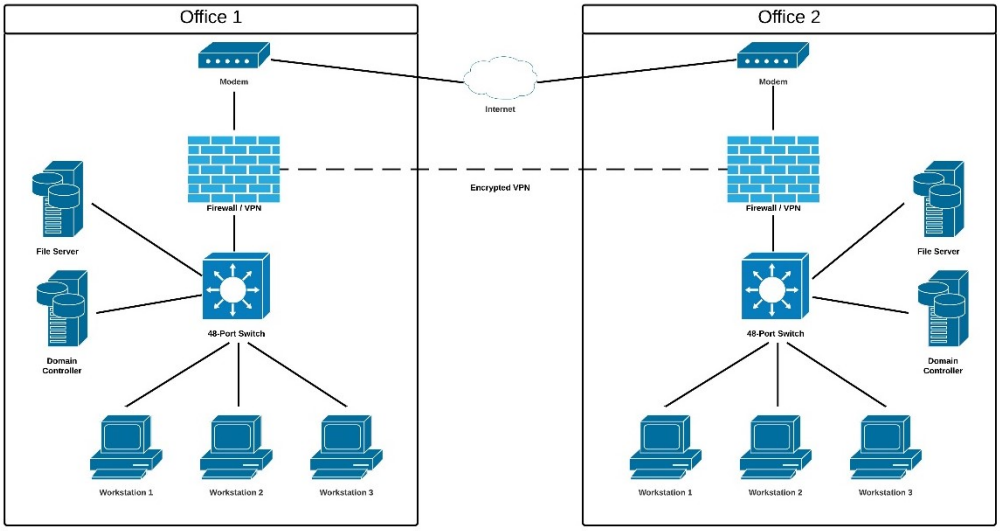


DaveCo's new network build includes a centralized server where all project-related information will be housed. This network is connected to a large 48-port switch that integrates the modem and connects the staff to outside world. This new configuration also introduces an additional server called a "domain controller" that will create a true,

encapsulated network that allows computers to directly address one another without internet access.

DaveCo Opens a New Office

The years have been really good to Dave and his group. So good that they decide it's time to open a new office to better serve their largest client. The decision was made to set up a network in the new office to match the current network at the main office. And of course, they networks will have to communicate securely.



Multiple locations not only means more workstations and a more servers. To connect the individual locations into a single wide area network (WAN) Dave and his team opt for a new class of hardware to create stable, encrypted tunnel that connects the separate office locations as well as provides firewall protection for the network.

Dave and his team have grown DaveCo from a single-person, at home office into a powerhouse design firm with multiple locations. They have numerous workstations, copiers, and other devices connected to a network that spans multiple locations and is stable and secure. It looks like DaveCo is on a pretty good track.

Specific Concepts

So far we've seen several different network layouts for an organization at different tiers of size. It is pretty likely that some familiarities popped out to you. Perhaps it was the manner in which the business growth stage dictated the network configuration. Or maybe it was the name of a particular category of device. Whatever it was, it was all pretty general.

Design is about details and the same holds true for the IT systems that support the design efforts. The time has come to look at a few concepts in greater detail.

Security

Network security is of the utmost importance. Everyone knows it. Full stop.

When the topic of network security arises, it is rare that the elephant in the room is that “no one cares.” The problem is that no one understands. We all see story after story pop up in the news theft of user information from multi-billion dollar corporations. The general news stories make the matter seem like a problem for the 1% and the detailed stories make it seem like a problem only a genius could understand.

So the question always arises, “Where do we start?”

Antivirus

At a bare minimum, no computer should operate without antivirus software. Antivirus software is a suite of applications designed to prevent, detect, and (hopefully) remove any malicious software that has made its way onto your computer.

Different products will offer different tiers of pricing and features ranging from “scanning” for viruses to “full protection” including browser and email scanning. The main feature to look for in any antivirus package is regular update of virus signatures. These signatures are the “fingerprints” that the software uses to recognize malicious software.

Providers

- AVG – AVG is one of the most popular players in the market for antivirus. The software is available as a download for most platforms for free and also has multiple tiers of pricing and features. Enterprise maintenance plans are also available for larger organizations.
- Norton AntiVirus – Norton is one of the oldest players in the antivirus industry offering a wide variety of products. The Norton site is also a very useful resource for information on most aspects of antivirus and computer security.

Endpoint Protection

As a company grows, its data becomes more valuable greater precautions are justified. Endpoint protection takes computer security to a higher level by offering a variety of automated mechanisms that integrate threat intelligence at a system level. This often includes sandboxing techniques that isolate threats in partitioned subsystems to prevent infection of the rest of the working system. At the highest level, an endpoint protection system should offer human support to investigate and remedy even as yet unidentified threats.

Most vendors offering endpoint protection offer support beyond the software package itself. These services often include deployment assistance as well as human support to correct malicious incidents. Endpoint protection packages are often beyond the budgets of small organizations and normally considered an enterprise-level feature.

Providers

- Comodo – Comodo is a full spectrum endpoint protection package offering threat detection, sandboxing, antivirus and a host of other features. Comodo’s control interface requires only a moderate investment of IT effort while still offering full access to controls and settings.
- Barkly – Barkly endpoint protection is one of the more cost effective entrants in the market. While initial startup costs do no vary as much

from other vendors, the control interface is more Spartan and requires less IT interaction.

The Ultimate Security Asset

There is one final note regarding security that cannot be stressed enough. And it is a simple concept:

There is no asset more important to network security than your staff

Your staff's attention and vigilance is the most important security feature you could rely upon. It is your staff that will need to pay attention to not make the most common security flubs:

- Click on links in emails
- Weak password
- Downloading unverified payloads from the web
- Using insecure / unverified flash drives
- Leaving company files in personal email / cloud storage

Training your staff to avoid this common mistakes will have a greater RoI thank almost anything else you can do. In fact, in a perfect world, a company that could avoid these mistakes, and similar ones, would almost negate the need for additional security measures. So take the time to regularly stress to your staff the importance of the role they play in network security!

Backups

You might not think that "backups" belong alongside a section covering "security," but that would be a dangerous assumption. While it is true that a corporate computer network can be protected with technology such as firewalls, antivirus software, and a host of other clever measures, a solid backup system is your only true protection from a data-related doomsday scenario.

The very most basic notion of a backup system is that your organization captures the state of your data at regular intervals. This may, in fact, be the single most important function that your organization can perform for your data.

There is an endless list of issues that could cause your group to have need to access files from a backup. Hardware failure, malicious software, natural disasters, and careless employees are just a few examples. But in every case, having a reliable backup is the difference between "we're down for a bit" and "we're out of business."

Does that seem hyperbolic? Well it isn't. Small Business Trends estimates that more than 58% of small businesses are not prepared for data loss. Of small businesses that do lose large amounts of data, it is estimated that more than 70% never recover and go out of business within 6 months of total data loss. So you see, the threat is very real.

Backup Types

There are two basic categories of backups common in corporate networks:

- Full Backup – A complete backup of every files on the targeted workstation or server. These backups require the most time as each instance copies both files that have been altered since the last backup and even those that have not. A full backup is a wonderful luxury since each instance encapsulates the state of the

data in a complete package. The downside of full backups lie in how long they take to perform and the storage space they require.

- Differential Backup – A far more economical solution in terms of both time and storage space. A differential backup creates an initial full backup of the targeted workstation or server. Subsequent backups will only involve files that are in an altered state in comparison to the initial backup. This process creates a very small and speedy regular backups once the initial seed has completed. As the data footprint grows, differential backups are the process of choice.

Whatever category of backup you choose, the most important aspect of any backup routine is that it is in fact routine. If the backups are not regular and executed on schedule the entire effort will be greatly handicapped. For this reason it is recommended that steps be taken to automate the backup program. Fortunately there are a number of solutions available to help your organization with your backup program.

Providers

- Dropbox – While not a true backup solution, it would be remiss to not mention Dropbox as a manner of doing at least the minimum to protect your data. But Dropbox will offer only the bare minimum of having a copy of your data in case of emergency. Beware though, this solution is only temporary and should not be considered in anything but a solo workstation setup.
- Carbonite – Carbonite is a solution trusted by many small businesses, offering many options and pricing tiers for both workstations and servers. At a minimum, backups can be regularly scheduled and are housed offsite in the company's datacenters to ensure integrity and availability.
- Barracuda – Barracuda is a full-featured backup solution employing not only software but also optional cache devices that can be installed locally. This setup creates a regularly scheduled backups that will be housed in the company's datacenter. In addition, the local cache device creates a high availability version of the backup that can be accessed by network administrators for high-speed recovery of data.
- Veeam – Veeam is a hybrid of DIY and turnkey solutions involving any degree of your company's own effort and hardware as well as vendor-supplied services. In the barest form, Veeam is a widely accepted, top-tier backup solution that can be purchased and configured to regularly execute your backups. Data can be stored locally in a Veeam repository or offsite through any number of Veeam partners.
  For large organizations with any number of IT staff members, Veeam is often the most cost effective solution.

Hardware

One of the most common questions asked in the world of IT for design firms revolves around hardware. For the sake of this conversation we will be discussing workstations and servers and what those categories mean to a production environment.

Workstations

This can be a very confusing matter for anyone but the foolish brave or the crazy geek. The reason is that there are as many different opinions of what is appropriate for a design firm as there are cupcakes under the sun. It seems as if the nomenclature is far too easy to get tripped

up on. So instead of focusing on the machine, let's look at the role it will service in your company.

The Different Workstation Roles

- The Do-Everything Computer – We all know what this computer is because we all have one. It is most likely the computer that you purchased for the family to use. It can run MS Office, surf the web, and even do a bit of AutoCAD work. But in truth it is just a mid-line PC that the kids use to watch YouTube when grounded from their phones.

  This is the computer that ever "freelancer" starts out with because it is available. The main problem does not lie in the hardware, but in the fact that it is not dedicated to work efforts. Who knows what could happen when you are away? This not a suitable hardware solution for anyone but the very nascent entrepreneur.

- The Admin Workstation – This workstation a basic off-the-shelf computer with a mid-tier processor, a moderate (8 GB) amount of RAM, and running onboard graphics. That is, graphics provided by the motherboard and not a dedicated graphics card. Hard drive space is moderate, usually 350 GB to 500 GB.

  This category of computer is considered a workstation mainly due to its case offering room for customization, its power supply offering a greater amount of power at a more reliable rate, and the amount of RAM installed.

  A reasonable service life for the category of workstation is 5 years.

- The CAD Workstation – The workhorse of the design department, the CAD workstation will be beefiest of all your workstations. Configurations will vary widely depending on budget and work being done. For instance, a workstation used to produce 2D AutoCAD project need not be as robust as a workstation performing photorealistic renderings in 3ds Max.

  CAD workstations regularly have at least 16 GB of RAM, one or more dedicated graphics cards, a mixture of solid state and traditional spinning platter hard drives, and multiple displays. Also, consider a power supply no smaller than 500 watts to provide reliable power to the current configuration and any upgrades to come later.

  The trick in CAD workstations is to find a bar that satisfies your working conditions. Once at that satisfactory level, i.e. the minimum requirement, effect a specification that is considered an upgrade. Whether that means installing more RAM or a better graphics card. This strategy will help you find a viable point of efficiency and performance.

Due to the fact that these higher performing workstations can upgraded, the real limitation on service life lies with the processor. While tastes and budgets vary, Intel i7 7th and 8th generation processors are very common at the time of this writing. New alternatives that might be investigated include Intel i9 and AMD Threadripper processors. Given a schedule upgrade path, a CAD workstation can see a service life of 4-7 years.

Servers

The server is a vastly important component of any computer network. But the mystery of what server "does" and what constitutes a server is only increased by the vast variety of server designs and configurations available.

In most computer networks, the server is a component that sits at the top of the network backbone, similar to a human brain at the top of the spinal cord. However, where humans have only one brain, a computer network can have any number of servers performing various tasks. In very small, nascent networks, there may not even be a server present.

So when do you need a server? Good question!

It is almost certainly time to invest in a network server when your organization has grown to employ multiple staff members. While it is possible to have each person working one type of effort (Sam does accounting while Jill creates detention ponds) it is not an efficient means of working. It is also a scenario that spells disaster in terms of backups. A much better solution is to install a server and regulate all data to this new, central access point. Now all staff members have access to all data, eliminating a great deal of inefficiency.

But what exactly makes a computer a "server"? Also a good question!

The simplest answer is that a "server" is a device that provides services (data, functionality, etc.) to another device called a "client." So if your server hosts all of your administrative and project files it becomes your "file server" and provides that data to your staff workstations (the "clients"). And servers have an unbelievable range of services they can provide: file servers, email servers, backup servers, database servers, license servers, and so on.

Server Hardware

Server-level hardware is both different and also very similar to workstation hardware. I know that seems confusing, but it really is not. All of the components present in a workstation (RAM, processors, storage) are present in the server. The differences lie in the configuration and the quality, or durability, of those components.

Smaller organizations may only need one server that performs multiple functions. And due to space or cost that server may closely resemble a workstation. But just grabbing the box will quickly let you know that this is not a workstation because it will almost certainly be much heavier.

The added weight of a server comes from the fact that components like power supplies are not only of a higher quality, but also often are in duplicate. The higher quality of server components is necessary due to the face that they are truly meant to run 24 hours and high demand peaks. The duplication of components is redundancy to compensate for hardware failure. So, for example, if one power supply malfunctions, the

second power supply automatically compensates and the server continues to operate. Another important difference is that often servers look nothing like a workstation. Instead the more closely resemble large, metal pizza boxes. These are called rack-mounted servers and they are designed to be housed in network racks.

Network racks are their own classification of hardware, but suffice to say that once an organization reaches a certain level where multiple servers are in play, a network rack becomes necessary for space and access.

Servers are not cheap and can easily reach into the $5,000+ neighborhood and higher depending on the selected options and storage capacity. This precludes servers from small companies just starting out. But for larger, more established, companies the server should be considered an investment.

One final note on servers. As an organization grows in size and complexity, it is not uncommon to see the number of servers become untenable. At this point, and sometimes before, many larger organizations invest in “virtualized” servers. The concept is more than we can get into here, but suffice to say that many “normal” servers can be virtualized and placed on one robust server appliance. I recommend firms that fit this description investigate the option.

Providers

- HPE – HP is one of the best known technology companies in the world and through their enterprise arm, HPE, provide very robust and reliable server hardware.
- Dell – Dell is another long-term player in the technology market offering a wide range of server equipment for enterprise-level use.

Other Devices

One of the wonderful things about computer networks is that there is no shortage devices that can implemented. In fact, aside from horses, computer networks may be the most expensive area of interest one could have. So this section is going to graze over a few categories of devices that may already be in your server room, or might soon be.

Firewalls

A firewall will provide your organization’s network with an outer perimeter line of defense. Think of it as the tall security fence with barbed wire that some companies have at the edge of their property. Its sole occupation in life is to keep the wrong people out of your network. And, in most cases, it does that job pretty well.

Most quality firewalls will be sold with the option for subscription maintenance. Whatever you think of these arrangements, in the case of the firewall, a subscription is absolutely necessary. This service will keep your network firewall up to date with all the latest threat information. Make no mistake, this is essential and should not be left up to a “we’ll take care of it” schedule. So be sure to account for that annual, ongoing cost in your budget.

Providers

SonicWall – SonicWall is a provider of a wide range of network devices, but their line of firewalls is top-tier. In addition to providing firewall protection, some models also provide VPN services.

Switches

Network switches are the crossroads of your organization's computer network. They appear to be large boxes with numerous ports, some as large as 48-port models. Switches are normally associated with that sea of network cable that starts out clean and ends up snarled.

In the world of network switches there are two major types:

- Unmanaged Switches – These devices are often described as "plug and play" since they require no preparation for use. They are very simple in their operation and are best suited for home-use or other, non-enterprise environments.
- Managed Switches – These devices are enterprise-level appliances that offer the same connecting capability as unmanaged switches, but with added security and configuration. They require setup and occasional attention, but they provide a far deeper level of performance. Managed switches are priced at an enterprise tier.

Providers

Cisco – Cisco is the de facto name brand in networking hardware, including a wide variety of network switches. Offering top-level support and device quality, it is hard to go wrong with these products.

UPS (Uninterruptable Power Supply)

The UPS is an essential component in even the smallest network environment. On the surface, they provide emergency power, in the short-term, for the network in the case of power failure. This will give your staff time to save open files and power the network down to prevent damage or file corruption.

However, and possibly more important, the UPS also provides a supply of continuous, stable power to the attached devices. This is accomplished by powering the onboard battery from the local current. In turn, the battery supplies the network equipment with stable, reliable power. It is a small, but important function that protects your hardware.

Providers

APC – APC is a well-known UPS manufacturer offering a wide range of models suitable for both individual computers and network environments.

Money Talk

It always comes down to money, doesn't it? And when it comes to IT, the money question can be a difficult one. Should you be spending less? Your board of directors would surely be in favor of that. Should you be spending more? There are certainly plenty of directions that you can spread your budget. So, what do you do?

Wouldn't it be great if there were some bellwether that you could use to measure your organization against? Sadly it is up to every company to struggle to find that sweet spot between the two extremes.

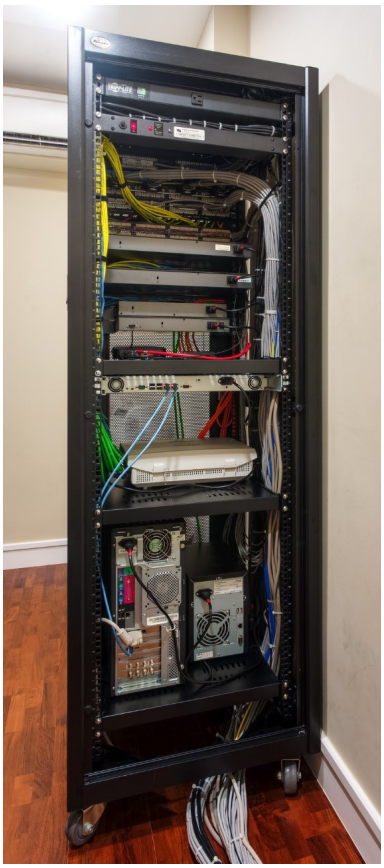
If you do research you may find data regarding companies of your size in your industry and what their IT budgets average. One excellent source of research data is Gartner. Other sources you may check include ZDNet, SpiceWorks, and many others across the internet.

Of course, finding out that the answers are tough doesn't make them any less important or desired. So I will refer to some previous, very approximate, numbers uncovered by Alinean Inc. and reported by SearchCIO:

- Small-sized companies (revenue less than $50 million) spent an average of 6.9% of revenue on their IT budgets
- Medium-sized companies (revenue between $50 million and $2 billion) spent an average of 4.1% of revenue on their IT budgets
- Large-sized companies (revenue more than $2 billion) spent an average of 3.2% of revenue on their IT budgets

Note: Please do not take these numbers as anything more than informational sprinkles on the ice cream cone of due diligence that you should perform to determine your own IT budget.

Service Life



Service life is another question that comes into play, both in network planning and budgetary discussions. And it is another question that is not easily answered. But the fact that it gets brought up is a sign that your organization realizes that these devices will not work at peak efficiency, or perhaps at all, into perpetuity. So how do you go about ferreting out all the various service life expectations of the endless list of devices that comprise your network? Well you certainly could take the time to do research and collect information on expected lifespans. But that takes so very long. And, sadly, it is still just an approximation.

A much more realistic and applicable plan is a simple 5 year life cycle. That's all, five years.

At the end of 5 years the device's performance should be reviewed. This is an important step, because rather than just tossing a server out on Month 60, you may find that it is working just fine or, perhaps, only needs some additional storage space. In that event, schedule to revisit the matter in 12 months.

Perhaps the device in question is not performing up to the current demands. Could it be repurposed to serve a less demanding role in the organization? In the case of workstations, could it be taken out of the taxing role of CAD production and still have a useful service life as an administrative workstation? The important thing is to realize that there are a number of ways to utilize the hardware that was once cutting edge, but is now being replaced by newer, faster devices.

So here is a very loose suggestion for device service life cycles:

- New devices have a 5 year service life
- 5 year old devices suitable for upgrade should be left in service for 1 year and then be reviewed again

- 5 year old devices not suitable for upgrade should be repurposed to less taxing roles for 1-2 years and reviewed again

This 5 year program creates a regular cycle of hardware review, upgrade, and replacement. It is not perfect and may need adjustment for higher or lower demand environments, but what is important is that there is a reasonable, regularly scheduled cycle that can be used to plan IT budgets into the future with some confidence.

What to do Next

So, what's next? What are you supposed to do with all this information?

The first thing you should do is take a moment to go and stand in your server room or closet. Let it all soak in and see if you can begin to identify some of the different components that make up your organization's network. Which black box is the server? Which blue box is the router?

If you have a friendly IT professional, ask them to join you. See how many devices you can correctly name. Ask a few questions. Enjoy the newness of the topic and let it soak in.

Or, if you work in a smaller scenario, you might be the IT person. So look at your small network setup. Is it time to invest in a server? Is your modem completely covered in dust? Maybe just take a moment to untangle that nightmare of cables and extension cords that has set up residence behind your desk.

And, if you are the boss, maybe it is time to look at your IT budget, or even create one. Do the line items make sense? Do you have enough confidence now to ask the questions that you might have hesitated asking before? Perhaps you just need to sit down with a list of your IT assets and review how many of them are past their 5-year checkup point.

While it is true that you will not run out and change your career to "IT professional" with just this information, you also will never have to simply take the word of a technician or sales person as to what something does and why it is needed. And that is the first step to no longer being a stranger in the strange land of Information Technology.

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