

# COMPUTER NETWORKING

C O N C E P T S



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# Table Of Contents

Foreword

Chapter 1:

Basics of computer networking

Chapter 2:

Computer networking design and solutions

Chapter 3:

Getting the right computer network hardware.

Chapter 4:

Setting up your computer network

Chapter 5:

Wireless vs wired

Chapter 6:

Cable management for wired computer network

Chapter 7:

Managing your network with network monitoring tools

Chapter 8:

Computer network maintenance and repair

Chapter 9:

Troubleshooting computer network

Wrapping Up

# Foreword

When it comes to understanding the fundamentals of computer networking the user would have to be able to link several different relevant and connective element to create the ideal computing network. This networking is the proactive of linking two or more computing devices to enable the sharing of data conveniently and safely. Ideally this is achieved with the combined use of both computer hardware and computer software. Get all the info you need [here](#).

# ***Computer Networking Concepts***

# Chapter 1:

## *Basics of computer networking*

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Networks are usually categorized in several different ways and this could span over elements such as the geographics to particular designs it adopts. When it comes to the network designs, this too would differ into two high level types' referred to as the client server and peer to peer platforms.

The client server networks usually feature around the centralized server computers that will enable to actions of storing emails, web pages, files and applications.

In the peer to peer network, conversely would support the same functions where the server network have all the common elements in business and peer to peer network which would be common to homes.

Network protocols are also something to consider as it has to do with the communication language used by the varying computer devices and this is usually referred to as the protocol.

This is yet another way to differentiate the networks used. Often the networks will implement multiple protocols to support specific application for the convenience of the user as they choose the particular network as their assisting tool.

There are also the wired and wireless networks that can be considered for its various individual contributing factors which would include the likes of Ethernet cables predominated in businesses, schools, and homes for the longest time. Of late however the introduction of the wireless networking alternative has made a favorable impact on the users by far.

# Chapter 2:

## *Computer networking design and solutions*

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To stay competitive in today's business environment, the individual would have to use as many innovative ways as possible to ensure the business in reaching its desired target audience in an optimal way.

Therefore the heart of most businesses today lies in the computer network chosen to represent all the various aspects of the business.

Basically the network design and solutions formed is the key to the digital information and communication that links all connected parties on the same "page".

When the appropriate computer network design and solutions are chosen then the productivity to be expected with such a choice would vastly improve and also help to reduce the threat of loss or possible theft of data.

However in order for the computer network to function well there are certain requirements that should be monitored such as the proper maintenance done periodically. Without this periodic inspection, the system becomes vulnerable to possible security risks, money wasters and unreliable functions.

The computer networking design and solutions chosen would ideally be able to provide some of the following element without any need for



other additional support. These would include the back end system integration, front office implementation, network architecture design, an active directory design and migration, IT infrastructure/IT governance, local and wide area network, VPN, Microsoft exchange planning and implementation, Novell directory services design and secure network computing facilities.

All or some of the above would ideally help to create the ideal scenario for the smooth running of the business entity in the competitive platform, of today.

Most new startup businesses would have to seek out the services of others to provide some of the above elements as these would be deemed important to the eventual progress and success of the business entity..

# Chapter 3:

## *Getting the right computer network hardware.*

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There are several different elements that should be examined before deciding on the most suitable computer network hardware that would be needed to ensure the business entity is well run and complete.

Understanding the various functions within the business workings will give the individual an idea of what types of computer network hardware would be needed to assist in the areas of need.

Understanding that simply walking into a store and buying the first system that is introduced would not in any way help the individual business owner eventually, and even worse it may be found that the initial choice made could be entirely unsuitable and therefore redundant. Understanding that all computer systems are not designed to be equal would be a good place to start. There are computer network hardwares that are available to suit various different types of businesses.

The following are some areas to consider when looking into the computer network hardware platform:

- Business computers – these machines would usually have to run for long hours and perhaps even infinitely. Therefore there would be a need to consider a computer networking hardware system that can accommodate such needs without causing any negative effects to the business as a whole.

- Business servers – ideally these should be able to make reliable, share and manage all of the business data as it is specially designed to hold, manage, send and process data. The technology behind these servers should be able to be more reliable than desktop systems, helps in the processing of data at a faster pace and with a heightened level of efficiency, is able to reduce the data bottle necks for the information flow and ensure it is not disturbed or overloaded. The computer network hardware is also designed to scale as according to the needs of the particular business.

# Chapter 4:

## *Setting up your computer network*

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Due to the advancement in technological breakthroughs, it is becoming more popular to set up one's own computer network without having to enlist the expertise of others. However in doing so, the individual should be aware of all the elements that contribute to a complete computer network.

The following are some instructions that can be easily managed should the individual decide to set up a computer network:

- Perhaps the first step would be to determine the need for either a wired or wireless network. This will eventually be a very pivotal point for the business entity. Points that would help to determine this would include considerations such as budget and security. Wired networks would be more suitable for higher security needs.
- There would also be a need to acquire the necessary equipment based on the infrastructure of the business entity. If there is a need to have a wired network that would have to accommodate large number devices, then there may be a need to have the support of those who are able to handle such tasks. If a wireless network is chosen, then there would be a need to have wireless access points, and ideally this should include internet connectivity that is both reliable and consistent.

- Determining the IP address scheme to be used and the corresponding IP addresses to the servers on the network would be another task that would need attention as this is an important element that facilitates the connectivity of the business. Among the more popular choices would be Vista, and Windows 7 which are based on operating systems that determine the network discovery processes.
- There would also be a need to select the workgroup name and assign it to all the computers on the network. This can be done by following the steps recommended for this action.

# Chapter 5:

## *Wireless vs wired*

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Being able to network efficiently and conveniently is something that all business and personal computers usages should be able to ensure and provide. This is a very basic element to create, but the main question in this exercise would be if there should be a wireless or wired system in place.

The following material should be able to give the individual some idea of the implications of each system and its connections to the individual's needs:

- Today the individual is quite spoilt for choice as there would generally be four basic types of networking hardware to choose from and this would include Ethernet, phone line, power line and wireless. The peer to peer network allows connections between the computers being used to access shared resources at any given time.
- The network interface card is used to accommodate the building of networks or for the computer and to be able to adapt to the medium through wire or radio frequency where there is free flow of data. The network topology will dictate the computer's connection needs which could be in the form of a hub or a router.
- Then there is also the speed this data is accessed at and this would depend on the kinds of networks being used. The fastest

dial up modems connect at about 50,000 bits per second, and calculating on the concept, the user will be able to make an informed decision on the needs of his or her own network.

- When it comes to network computing activities, the user would have to consider the speed in which the files needed, can be downloaded for use. The various different types of downloading material would require different time frames, thus the need for the individual to take this into consideration when choosing the appropriate accompanying system.

# Chapter 6:

## *Cable management for wired computer network*

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This may seem like an inconsequential issue to most but is very much an integral part of ensuring the eventual productivity and working platforms of the systems being used.

Cable and wire management is often a very much overlooked exercise as the basic thought process is, to tuck everything out of sight and that alone would be sufficient.

This is far from true as inadequate cable and wire management will eventually lead to a lot of problems and frustrating exercises that could affect the quality of the delivery system being used.

When a particular problem, then user may resort of pulling out a few connections just to address the problem and here is lies the confusion and the frustrations that would become evident with this seemingly simple task.

It is important to consider the process of setting up proper and neat cable managements as it creates several essential accommodating factors that would contribute to the overall access to information reaching the user.

The most significant of which would be that this will allow better airflow thus creating better delivery of high level performance, where



100% efficiency is required. With blockages and tangles, this level of efficiency is dramatically disturbed thus causing the delivery to be either disrupted or considerably staggered.

There is also the possibility of the fans spinner blades causing the messy wire system to be wrenched out of its original place, thus needing the user to get in to rewire the system.

This of course would be even harder if the user is greeted with a whole mess of wires, as this would further complicate the task of sorting through the tangles. Besides the actual end look needed to make the entire presentation of the wire system, the user should be well aware of the real decreasing possibility of the quality of accessing material.

# Chapter 7:

## *Managing your network with network monitoring tools*

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When it comes to managing a network, the user would ideally have to consider several connecting issues and this would include methods, processes, procedures and toll that would ideally assist in maintaining and provisioning the system in place.

Elements such as operation deals with keeping the network functioning smoothly and efficiently would require the monitoring of the network to spot problems before they create dire consequences and address them accordingly.

The administration deals with keeping a firm hold on the resources within the network and how the assignment processes are decided would ensure the network is kept under control and manageable.

The issues of maintenance is also another common concern with the need to perform repairs and upgrades being the main focus most of the time. This could take on many forms and there should ideally be a good support system in place to ensure these are done in an efficient and quick manner.

The support for the network to be able to provide optimal service platforms is also something that is important enough to be a concern for the user. Provisioning elements are concerned with configuration of resources within the network as the support given would have to

include the setting up of the network to ensure new customers are kept in the loop always.

The FCAPS also depicted to represent fault, configuration, accounting, performance and security are all functions that are performed as part of the network management coordination. This exercise would entails other works such as controlling, planning, allocating, deploying, coordinating and monitoring of the resources that pass through the network simultaneously as any given time.

Data management is often collected through several mechanism where there are agents installed within the infrastructure, synthetic monitoring that simulate transactions, log activity and real user monitoring.

# Chapter 8:

## *Computer network maintenance and repair*

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Computer network maintenance and repair are elements that should ideally be factored in very early on within the exercise of acquiring any system to be used by the individual or business entity.

Today computer networks often function as the primary communicating, research and sourcing for information tool, thus it needs the attention of good maintenance and repair allocations, to ensure this is not disrupted in any way for longer than necessary.

This maintenance would include issues such as security measure within the networks. Competitors are often engaged in accessing delicate information that can be used against businesses for their own obvious gain and this is quite prevalent online. Identity theft is fairly common as hackers usually make a living by extending such services to interested parties, thus the need to step up the maintenance and repair levels to ensure consistent monitoring of this.

The general malfunctioning of the system being used can cause a lot of damage to the user's business or personal usage, thus the need to have some recourse action plans in place.

The following are some areas that could be monitored to minimize any unwanted hiccups in the system being used:

- The user should make it a habit to block any unwanted junk from getting to the network in use, with tools such as Gateway

Appliance. In place within the system and the incoming information, this tool is able to control the number of unwanted material form getting into the system.

- Ensuring the antivirus system is use is always kept current and updated is important. There are a lot of choices which include AVAST and AVG which are relatively cheap to acquire. Generally the user should be keen to avoid any form of problems that could contribute to the need to acquire the services of a computer network repair team.

# Chapter 9:

## *Troubleshooting computer network*

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There are many possible reasons when a computer is unable to connect to a network or see other computers on the network. Understanding some of the possible reasons will allow the user to conduct some troubleshooting exercises to try and rectify the situation.

Some of the reasons that can be handled by the right troubleshooting measures would include the network card not being connected properly, bad network card drivers or software settings, firewall preventing computers from seeing other computers on the same network and also connections related to users and bad network hardware.

Accompanying these are some possible solutions that can be addressed using the troubleshooting exercise mainly due to the fact that a large variety of network configurations, operation systems, setups and other connecting services may not always be something to do with the network operating system in current use.

The user should ideally be able to be connected to a company or large network to facilitate administration of the said network and resolving such issues would require some recommendations done through the troubleshooting exercise.

Some of these troubleshooting exercises would include the verifying of connections and LEDs where the network cable is checked to ensure it is properly connected to the back of the computer. In addition to this there would also be a need to ensure the LEDs on the network is properly illuminated in solid green.

Adapter resources are also something to look into through the troubleshooting exercise when a new network card is being installed into the computer system.

The card's resources should be properly set and should not be conflicting with any hardware in the computer. Adapter functionality is also an exercise to conduct where the network card should be capable of pinging or seeing itself by using the ping command.

# Wrapping Up

For any business or personal use the computer system adopted has to be able to provide a level of security measure that is acceptable to the user. Without these measure securely in place a lot of data can be made vulnerable and therefore unsafe for use.

The following are some of the measure that a good network security system should ideally be addressing:

- Choosing a good security policy and ensuring it is incorporated into the chosen system is important, as this will eventually dictate how the implementation process is tackled. Ideally the security policy chosen should be able to define the levels of security and the roles and responsibilities played by the user, administrators and managers of the said system.
- Ensuring all the operating systems and applications are patched with the latest service packs and hotfixes is helpful as these will help to close off any vulnerability that usually become the prey for hackers. Keeping the inventory of the network devices will also help to develop and maintain an up-to-date list of the hardware and software components in use. Being knowledgeable enough to be able to identify and understand which default software installations are causing the weak security configurations will allow the necessary corresponding actions to be taken swiftly.



- A scan TCP/UDP services should also be conducted periodically as this would help to identify and either turn off or remove unnecessary services. These unnecessary services could be instrumental in creating entries that could end up “blocking” the system, thus the need to obstruct all these immediately.
- Installing some of the required software that will assist in this particular quest to keep the security measures at its optimal would defiantly be worth the initial investment and effort.