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RELIABILITYOF COMPUTER NETWORK SYSTEM AND COMMUNICATION SYSTEM: A STUDY

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Abstract

This paper planned for checking on the latest computer network system and communication system. With this survey, researchers wanted to see if there is a research gap when studying the job of communication in business relationships. Looking at the future development of computer network reliability, security people on the network, the reliability requirements are getting higher and higher, both in daily life computer network or in businesses working network environment, a computer network have been widespread attention and application, computer network reliability is the most important prerequisite to protect people in the online world tour, so the reliability of the computer network to improve security and optimize the network environment, it is imperative.On the off chance that any of these problems get configured, the alerts go to the administrator using email, SMS, pager alerts, or by other disturbing techniques. Therefore utilizing the concept of network monitoring, the network gets efficient being used and builds the performance and improves the reliability of the network. Network monitoring tools are vital for the implementation of the concept of network monitoring. Other output formats and capabilities are not sufficiently detailed or described. Counterbalancing these defects is the fact that several improvements have been made in recent variants, including improved precision and reliability, just as support for perusing in alternative data formats.

1. OVERVIEW

In recent years, with the quickening keeps on being placed into utilization and computer networking process of computer products, the utilization of computer network clients builds each year, however that computer network system has framed a generally complete and sound system, yet in the process of network continually changing, alongside the network of wellbeing and unwavering quality prerequisites are likewise expanding dependability of computer networks a lot of attention, because the dependability of the computer network is a proportion of the general performance of present-day computer network technology indicators[1-4].

In this way, as far as the norm, improve the unwavering quality of the computer network, it is fundamental, has practical noteworthiness. To guarantee the utilization of computer networks from outside interference, to guarantee the smooth running of the earth in the state, we have to guarantee the unwavering quality of the computer network, which has gotten a matter of developing concern. A computer network system to quantify the quality of the benefits of the pointers is the network

dependability.

In the plan and research of computer network technology, the unwavering quality is the most significant issue, just the dependability of the computer network system of research and structure, computer networks will have the option to run in a steady state. Along these lines, dependability is a significant theoretical and practical centrality to improve the computer network[2, 3]. Unwavering quality alludes to a computer network in a constrained time and conditions, a few distinct pieces of the computer connected through a communication devices, in the job of network operation and related network management software, to finish the appointed time and under characterized conditions function to achieve the exchange and sharing of information between the resources to accomplish the operation of the network.

All in all, the various pieces of a computer network are different computers and set a decent outside communication devices connection into an amazing communication system, so the acknowledgment of resource sharing between numerous computers, software, hardware, data, and information sharing. Improve the unwavering quality of the computer network for the steady advancement of the entire nation and society, just as monetary, and property security is of extraordinary centrality, yet additionally to ensure the individual wellbeing of clients of computer networks significantly essential[4].

The Meaning of Exploring Computer Network Reliability

In today's rapid development of information technology, security, and reliability of a computer network are a prerequisite for survival. It is using a computer network to transmit information to the final client, which has brought enormous convenience for people's life and work so that people get resources and information sharing. However, as long as the existence of a computer network, you cannot prevent the invasion of hackers, viruses, harm to the safety and reliability of the network, resulting in the omission of information that people, property, and even endangering national economic security. Therefore, improving the reliability of the network to enhance network security, hacker resists viruses become clean network environment a top priority so that customers can feel at ease, convenient to use the Internet computer network, which is the study of computer networks to achieve the desired reliability.

2. PRINCIPLES OF COMPUTER NETWORK RELIABILITY

To improve the reliability of the computer network, it is necessary to grasp the basic principles of network control principles and design, and design in accordance with the relevant technical specifications, in order to achieve to improve network reliability. The author believes that to achieve the reliability of computer network design should follow the following principles:

- **The Open Network Architecture:** In the design process of the network, according to the technical standards for the use of open computer network architecture, because this

architecture supports heterogeneous systems and interoperability of heterogeneous devices, can effectively improve the ability to expand and upgrade the network.

- **Have Advanced Design Consciousness**: In the design process, cannot be taken rigidly adhere to today's technology and there should be the purpose of forward-thinking design to meet the technical requirements of the future development of the computer and allow the computer network design with high flexibility, compatibility and more space.
- **To Have the Maturity:** On the basis of the advanced design, in conjunction with the existing technology has advanced and practical, choose a relatively mature computer technology, so that the computer network topology application has higher practicability.
- **Follow the Design Ideas of Entire Life Cycle** Computer network design, from the overall to be considered, the overall performance of the computer network designed to take the best performance of the system configuration to achieve optimal network performance.

3. FACTORS AFFECTING THE RELIABILITY OF THE COMPUTER NETWORK

The Impact of Computer Network Equipment on the Network Reliability: The effect of network devices on the network can be divided into user equipment reliability and transmission switching equipment in two ways. Mainly refers to the user equipment for the user terminal users, its network reliability is critical, because it is the key to determine whether the network reliability. It is running the daily maintenance of computer networks. The main task is to ensure the absolute safety of the user terminal; if the ability to interact with the user terminal is higher, less reliable network security is also higher. It should use standard network cabling systems and communication lines, to improve the safety and reliability of computer networks and to facilitate the future development of computer networks, in some important computer networks, and if despite the construction costs.

A hub is a single point of failure equipment; computer network hub will focus on a number of user terminals connected to it via the connected device spaced errors and other parts of the computer network, computer network defense constitute a guarantee of reliability, if a failure occurs hub, along with the user that it is connected also stopped working. Therefore, the computer network hub plays a great significance in improving the reliability of the computer network.

The Impact of Computer Network Management on the Network Reliability: Usually, a vast computer network is constituted by different regions of the manufacturers of equipment and products, large-scale, structure, and changeable. So it should use leading network management technology to ensure the complete transmission of information, reduce the incidence of failure to minimize error in varying degrees, to improve the reliability of computer networks. Moreover, we should timely acquisition parameters of network operation, system operation statistical information to monitor the status of network operators to achieve a network error in time to find fault.

The Impact of Computers Network Topology on the Network Reliability: Computer network

topology profoundly affects the unwavering quality of computer networks; it is discovered that practically speaking, at various levels and in various areas of the scale network situations, regularly fundamentally includes the cooperation of the network topology.

Wherein the network topology is the primary connection between the components of computer networks, as individuals keep on investigating the computer network topology, and found another idea and many network chart theory, for example, confined connectivity, limited edge connectivity, constrained by different idea Fault-tolerant distance across and such. These parameters can be progressively exact and give a theoretical premise to the assurance of computer network dependability.

4. SITUATION OF COMPUTER NETWORK RELIABILITY

Computer Network Reliability alludes to the time and conditions indicated in the necessities, the computer network system is no exemption, keeping up the smooth network connection. That is, under specific conditions, the function indicated in the computer system, a computer network might be given inside the time typically required for the operation of the network capacity[3].

The unwavering quality of computer networks is a key proportion of computer network system planning, structure, and operation. The topology of the computer network system uptime bolster assumes a significant job. At present computer network has been an enormous number of applications in different segments of society and it has become an indispensable piece of individuals' life and production.

In all areas of our nation, we have a ton of utilizing the computer network, which is likewise on the unwavering quality of the network, set forward an exceptional appeal. A computer network system to attempt an enormous number of information stockpiling, transmission, processing, includes a great deal of individual information, business information, security information is the focal point of attention.

Need for the advancement of things, and as long as the different sides chose to secret information, individuals would need to take or wreck. For computer networks, some corrupt offices to get individual information to look for ill-conceived interests, to take countless illicit intends to take information and altering of the more typical strategies are the utilization of network infections or programmer procedures to take, which are on the computer network unwavering quality It represented a serious test.

Use Fault-Tolerant Design: The computer network system according to line parallel lines designed by calculating the design allows the user terminal is connected at two points and so that you can solve the primary network redundancy, it can form a bi-directional network connection, improve network troubleshooting ability. This can effectively avoid the user cannot use the network is faulty.

Dual Network Architecture Design: The excess backup network needs to compute the first network, improve adaptation to the non-critical failure of the whole network system. The arrangement is to utilize double network plan, it is the guideline of the computer network in case of failure of the primary network, resulting in a network system isn't working appropriately, the network backup system will supplant the current network system to guarantee data transmission network to guarantee the safe operation of the computer network.

Through the network issue tolerant plan can ensure the whole computer network security, the system is a steady and solid operation, improves the unwavering quality of the network. Contrasted with issue tolerant plan arrangements, the expense of the double network configuration is moderately high, yet the network structure arrangements capacity to tackle issues all the more altogether, make the system increasingly steady, the sheltered operation of the whole network system security higher. It is shortcoming distinguishing proof quicker and simpler to discover the purpose of failure, troubleshooting is generally simple. The issue tolerant arrangements lower cost, yet contrasted with the twofold assurance system on the network structure is marginally lower, additionally to some degree less capacity to discover deficiency for fix tools and techniques are generally high.

Take the Overall Network System Design: With the progress of the times and social development, users of computer networks have become increasingly demanding, in order to respond to the needs of users, in the form of decentralized network structure of this function. This design can completely replace the centralized network architecture design is the need for the development of computer network technology. This design is the computer network of the extended internal structure to a certain extent, to effectively solve the problems in the operation, improve the reliability and security of the network.

Build a Hierarchy Layout Design Computer network system consists of a network application layer, network services, network operating system, network layer and the physical hardware layer. Service layer is mainly used to provide network services, trying to databases, e-mail; the role of the application layer is mainly to meet the needs of network users; physical hardware layer network is the computer network hardware topology; network operating system is network layer software.

Consider the Life Cycle of the Whole Network Improve the reliability of computer networks and it should also take into account the life cycle of the whole network, which is the need to consider the overall cycle cost of the system. In the management of the entire network system, it is necessary to establish a reasonable network systems, good planning and control. Under the protection of the network system performance without loss situation, taking cost-efficient way, the network system is to achieve the best state, to achieve the best price.

Strengthen the Network Management Monitoring: Improve the reliability of the computer network to strengthen the network management is essential and we must strengthen the overall network maintenance, reliable operation of the network in real-time monitoring and management. Since the development of network technology, a lot of large and complex computer networks are

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formed by different network devices made for such networks to avoid network failures and equipment downtime and other issues, therefore in order to avoid a system crash. This requires that in addition to the daily monitoring, but also professionals for maintenance treatment.

Software characterized networking offers extraordinary chances to expand proficiency while simultaneously decreasing expenses and multifaceted nature. The present cloud computing demands are detonating, and as a result, less vitality utilization and high-security networking are required. Contrasted with traditional networks, Casado et al. (2012)[5] identified the high potential for dynamic allotment of network functions over network nodes. However, the process of testing, testing and propelling is still also tedious and isn't perfect with business needs. The network management framework used in This research consists of three main dimensions, namely network strategies, organization, and working principles, while the network vision and targets are the incentives for the build-up of a network strategy.

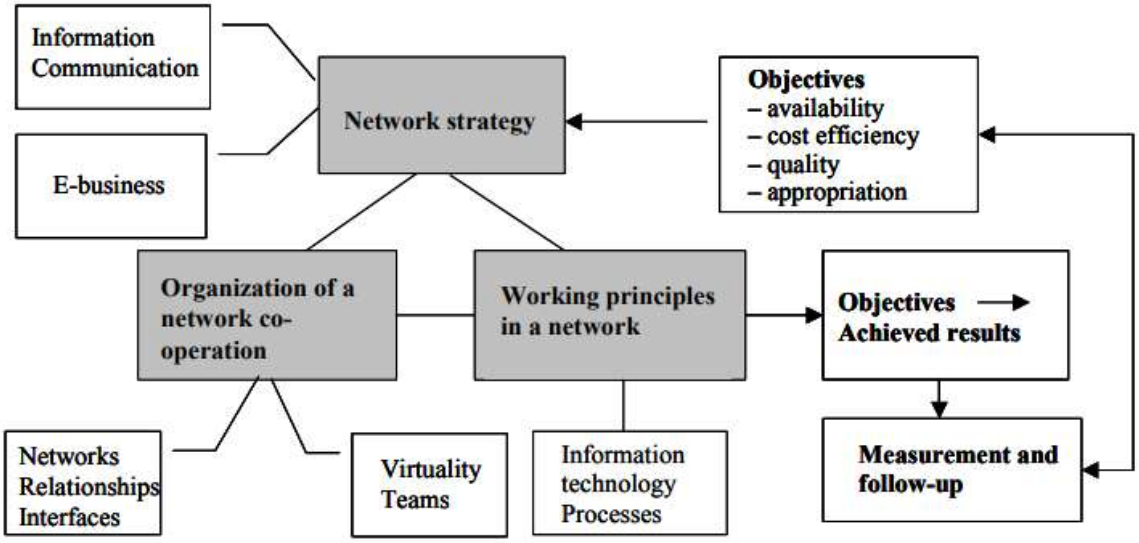

Figure1: Network management framework

With these continually expanding requirements, organizations must be receptive and reconsider their method for overseeing ICT infrastructure to remain gainful and cost-efficient. Network technology has subsequently become a crucial piece of accomplishment for cloud technologies, yet because of the slow advancement of a genuine versatile ICT infrastructure, this can prompt issues in seriousness[6, 7]

Network management

In literature, several definitions of network management, the greater part of this definition are received by institutionalization organizations, which utilize explicit phrasing and point their definitions at explicit fields of application. The first interprets network management as the

monitoring of the activities of a network, following which the information collected is consolidated to display an outline of the state of the network to a human administrator who would then be able to take any activities important to improve the operation and performance of the network, the second view comprehends network management as a completely automated process in which a network is monitored, and the information acquired is consolidated and afterward presented to a substance capable of naturally determining from it the activities important to alter and adapt the network with the goal that it maintains the required levels of operation and performance.

Network management is the assignment of monitoring, designing and maintaining a network domain Network management can be partitioned into various sub-disciplines, for example, shortcoming management, performance management, configurations management, occasion management, and resource management Fault management is the undertaking of monitoring and controlling the network resources. In contrast, performance management implies the collection of performance data for the network.

Configurations management comprises of assignments, for example, installation, administration, and arranging of the network and every one of its components. Occasion management (additionally alluded to as caution management) is performed when states change in the network, and this area includes trouble tickets, work orders, and so forth. The last area recorded here is resource management, which includes stock of both physical elements and of network setup data.

Network configuration

In general, all networks have certain components, functions, and features in common, shown in Figure 3.3. These include: Servers-Computers that provide shared resources to network users, Clients-Computers that access shared network resources provided by a server, Media-The wires that make the physical connections.

Shared data-Files provided to clients by servers across the network. Shared printers and other peripherals-Additional resources provided by servers and Resources-Any service or device, such as files, printers, or other items, made available for use by members of the network.

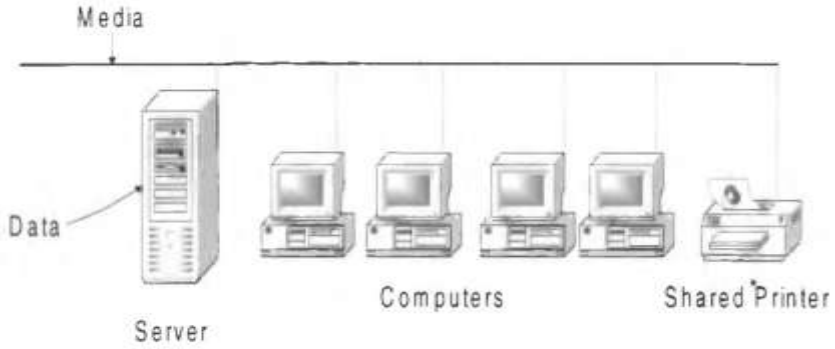

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Figure 2: Common Network Elements

The networks are divided into two broad categories, illustrated in Figure (3.3) Peer-to-peer networks and server-based networks.

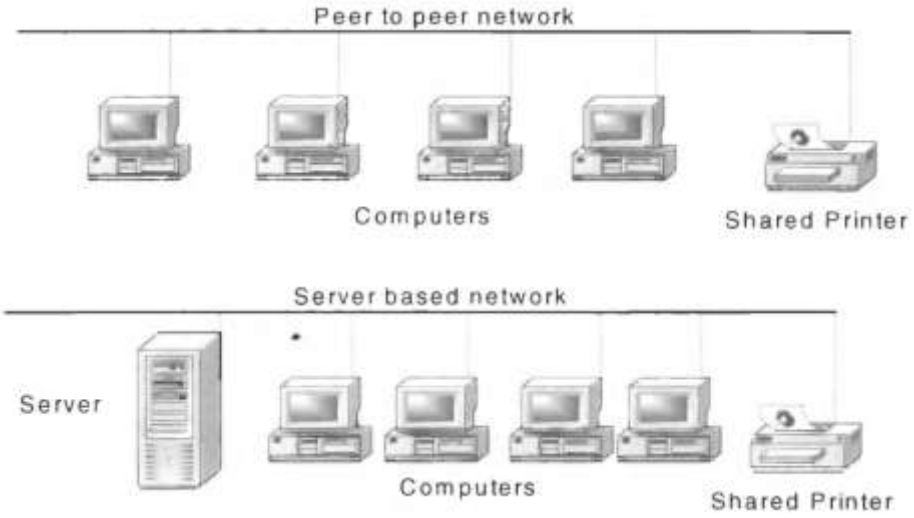

Figure 3: Peer To Peer Network And Server Based Networks

Each type has different capabilities. The type of network which chooses to implement will depend on factors such as the: Size of the organization, university, Level of security required. There are many types of business Level of administrative support available amount of network traffic and needs of the network users and Network budget.

Peer to Peer networks: A peer-to-peer network, there are no committed servers, and there is no chain of command among the computers, all the machines are equivalent and in this manner are known as peers. Every computer functions as both a customer and a server, and there is no administrator answerable for the whole network. The user at every computer figures out what data on that computer is shared on the networks.

Sizes of Peer-to-peer networks are additionally called workgroups. The expression "workgroup" infers a small gathering of individuals. There are commonly ten or fewer computers in a peer-to peer network. Peer-to-peer networks are moderately simple. Since every computer functions as a customer and a server, there is no requirement for a ground-breaking focal server or different components required for a high-capacity network. Peer-to-peer networks can be more affordable than server-based networks that is mean not costly, and there is no levels of security for document accessing.

Server based networks :A dedicated server is one that functions only as a server and is not used as a client or workstation. Servers are described as "dedicated" because they are not themselves

clients, and because they are optimized to service requests from network clients quickly and to ensure the security of files and directories. Server-based networks have become the standard models for networking.

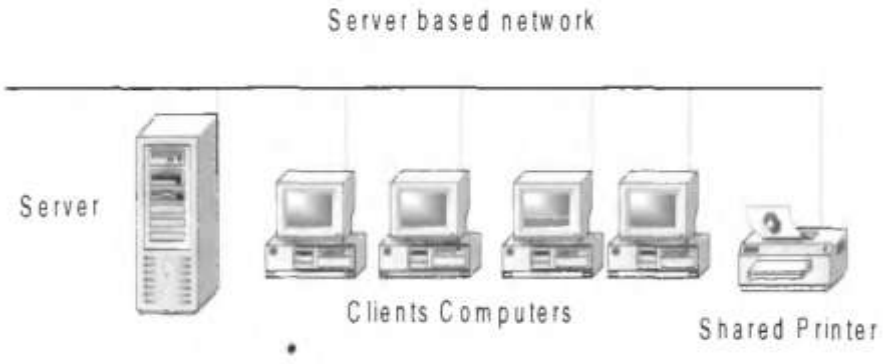

Figure 4: Server based networks

Networks increase in size (as the number of connected computers, and the physical distance and traffic between them, grows), more than one server is usually needed. Spreading the networking tasks among several servers ensures that each task will be performed as efficiently as possible. Servers must perform varied and complex tasks. Servers for large networks have become specialized to accommodate the expanding needs of users. The following are examples of different types of servers included on many large networks.

File and print servers manage user access and use of file and printer resources. For example, when you are running a word-processing application, the word processing application runs on your computer. The Application servers make the server side of client/server applications, as well as the data, available to clients. For example, servers store vast amounts of data that is organized to make it easy to retrieve.

Thus, an application server differs from a file and print server. With a file and print server, the data or file is downloaded to the computer making the request. With an application server, the database stays on the server, and only the results of a request are downloaded to the computer making the request. A client application running locally accesses the data on the application server.

5. CONCLUSION

Networks are collections of computers, software, and hardware that are all connected to help their users work together. A network connects computers by means of cabling systems, specialized software, and devices that manage data traffic. A network enables users to share files and resources, such as printers, as well as send messages electronically (e-mail) to each other. Computer networks fall into two main types; client/server networks and peer-to-peer networks. A client/server network uses one or more dedicated machines (the server) to share the files, printers,

and applications. A peer-to-peer network allows any user to share files with any other user and doesn't require a central, dedicated server the most common networks are Local Area Networks or LANs for short. In literature, several definitions of network management, the greater part of this definition are received by institutionalization organizations, which utilize explicit phrasing and point their definitions at explicit fields of application. The first interprets network management as the monitoring of the activities of a network, following which the information collected is consolidated to display an outline of the state of the network to a human administrator who would then be able to take any activities important to improve the operation and performance of the network, the second view comprehends network management as a completely automated process in which a network is monitored, and the information acquired is consolidated and afterward presented to a substance capable of naturally determining from it the activities important to alter and adapt the network with the goal that it maintains the required levels of operation and performance.

Therefore, the appropriate method is utilizing intelligent methods for risk management in the entire network communication process. The possibility of event and the outcomes of the risk can be limit within the acceptable range, and expand the benefit of the target through the utilization of intelligent analysis and control methods of the level of control. The requirement for Quality of Service (QoS) guarantees it is a growing trend through the public broadband network operators also in the Internet community.

This research has inspected the importance of privacy for individuals as a fundamental human right. Violations of human rights emerge from the unlawful collection and storage of personal data, the problems associated with inaccurate personal data, or the maltreatment, or unauthorized revelation of such data. Right now, it additionally includes the current threats, issues, difficulties, and measures of the IT sector in our society. With the expanding incidents of cyber-attacks, assembling a useful intrusion detection model with great precision and real-time performance is essential. The metaphors implicit in the current mainstream of cyber security thought can illuminate the assumptions, rationale, and perhaps the limitations of that thought. Experimenting with alternative metaphors can lead to different perspectives on the problem and may even stimulate creatively different methods for managing it.

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