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Network Infrastructure Management: Its Importance to the Organization

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ABSTRACT

With the advent of the latest technological advancements that shape today's world into a more dynamic and interconnected environment, a scrutiny examination of network resources as part of the information and technology (IT) infrastructure is a must-include consideration on the side of every organization. Network infrastructures are designed not just to provide backbone connectivity but must ensure reliability in accordance with the security measures and standards accepted in the field of information and communications technology. This literature review aimed to describe the management of network infrastructure as important in every organization as its communication backbone. Management of the resources deployed in the implementation of the infrastructure should be observed in order to serve its purpose, and that is to provide a high-performing IT environment that promotes secured and uninterrupted communication line to the stakeholders of the organization, leaving each and every one of them satisfied and protected while connected in the network. In conclusion, having a quality IT infrastructure ensures reliability on the part of information transmission and security within the scope of the organization's internal operations. Regardless of the organization's nature, administrators or managers must invest in building a standardized infrastructure that is scalable, credible, and cost-effective.

1. Introduction

Communication is very crucial, whether it is a one-to-one form or a group approach. There is no goal achieved, and there is no unity attained when there is no communication between the entities of a concerned party. For organizations, communication is supported through the building of a communication structure. Network infrastructure is the term used in Information technology (IT) to describe the communication spine of an organization. It is the central structure of an organization in the conduct of an intercommunicated environment. Without its presence, a communication barrier is created within an organization. Likewise, the lack of management, whether in the form of configurations or human and device assets, can lead to disruptions in the organization's processes.^{1,2} For corporate businesses, the absence of a managed

network infrastructure delays their operation and business transactions. A delayed process in just a second is a loss factor of profits, income, growth, and progress for an organization. The banking industry loses millions or billions for a 60 seconds downtime in the network. For academic institutions, enrollment procedures are affected, which causes delays in the opening of classes, interruptions in online learning, and other school transactions.

When communication and interconnection are hindered in an organization, a conflict is created. Like in typical human connections, misunderstandings and unclear rumors spread all over the institution. When not prevented and addressed immediately, slow progress can be clearly seen in the organization's move toward its goal. The worst is that objectives may not be accomplished.³⁻⁵ This literature review aimed to

describe the management of network infrastructure as important in every organization as its communication backbone.

Defining network infrastructure

Network infrastructure is defined as the organization's network resources that make interconnectivity, operations, and communication link possible.⁶ Its effectiveness is measured when it assures an uninterrupted communication path for all services running within the organization. These services are not limited to the usual daily operation of an organization, regardless of the nature of the establishment. Thus, it also covers addressing abrupt requests or needs of a user that usually occurs in information retrieval. Such an act is only possible when a reliable network connection is implemented.

Considering the process of retrieval of information, which requires a centralized database installed in the organization's data center, the network medium utilized for its connectivity purposes must align with the standards recognized in the field of Information and Communications Technology. Administrators who are not into quality performance forget that the credibility of network infrastructure can't be determined by the creation of a connection, the brands of the devices, the names of the cables used, or the prices of the mentioned materials. Hence it is the specification-capability that meets the organization's IT requirements.^{7,8} In building a network infrastructure, there are known considerations that every organization should look into to enjoy a quality performing communication backbone that is definite in meeting what the organization wants and requires.

When managers or administrators can identify the need of their organization, designing the network is easy to accomplish than just saying it. In order to have a balance and guaranteed infrastructure, it is important when declaring the need of the organization, which is the primary basis of the building of the networks. Managers must have their sides in the presence of an IT specialist who will be analyzing the layman's requirement and have it converted into a

technical requisite.

When the need is defined, the budget allocation comes next. To achieve cost-effective planning for the building of the network infrastructure, the organization must scout and consider benchmarking the possible expenses and cost to be consumed during the establishment of the backbone communication. The budget appropriation includes all the network resources to be installed, from the core networking devices, transmission media, computer systems, manpower needs, and facilities.

When technology is brought into an organization, every man designated to look into these devices should undergo training. Skills are not given by birth, and knowledge of a particular technology is not earned by the organization's workforce during their stay in college. Therefore, a special training session should be given to the employees so that they may manage your network properly in the long run. It is a must for every organization to consider the scalability capabilities of the network to be structured. Scalability is defined as the capacity of the network infrastructure to adapt to changes, especially when they need to grow and expand is inevitable. Scalability in the presence of infrastructure comes in two forms. It may be in the competencies of the devices and transmission media or the facilities holding these devices.

Support and maintenance

Common problems encountered by most organizations when initiating projects in the building of network infrastructure is the nonexistence of technical support and maintenance to be provided by the service contractor in charge of building their network. As such, when a single failure occurs within the lines of the connection and no one is there to inspect and check, communication is interrupted. That is why an organization must plan ahead and assign people to man the network operation so that even when the contract between the service provider and the organization is terminated, the organization can still ensure smooth operation.

Components of network infrastructure

Network infrastructure is the backbone of data transmission within the organization. It is the supporting information and communication technology (ICT) facility for information dissemination. A network infrastructure's fuel to have it working comprises both hardware and software. The cables used in connecting the devices to the application programs taking control of it are part of the network system. To excellently build an infrastructure, components to it must be present. One missing piece from it will not define the system as a successful network frame. The following are the components of network infrastructure;

Hardware

These are the tangible materials or equipment that physically make the infrastructure work. Cables, routers, switches, computers, and wireless access points are some of the common devices and resources that are widely used in a computer network implementation. These devices are assigned with internet protocol (IP) addresses for them to initiate communication between them, while cables and access points are the responsible ingredients in providing the means of interconnection.⁸

Software

These refer to the application programs, firmware, and software that are used in managing the hardware components. Software is nothing as a component in a network when they are not configured for its purpose. Devices, even if they are attached with cables, cannot establish a connection when they are not managed well with a good configuration. When compared to the human structure, if the hardware is the physical body of man, the software is the soul that powers the body.

Services

These are the network protocols that co-exist and jive with the software of every network device. Normally, services provide the functionality that is needed by both endpoint and non-infrastructure

devices. Numerous network services are not just accessible within a local area network (LAN) but are also available on the internet. Other protocols are both accessible in LAN and WAN. Regardless of the type of network setup, may it be in a small-office and home-office (SOHO) type, medium or large enterprise type, components to network infrastructure will always enclose to it.

Network infrastructure challenges

The actuality of a network infrastructure does not guarantee an organization that its operation can readily work smoothly. Although most transactions or processes of an organization rely on the network functions, when the established network is unreliable, it can severely affect the whole operation of the body. When network infrastructure is built just for the sake of connecting the nodes and the users, setting aside all possible downsides may not just let your organization delay its operation else, it might make it inoperable.⁹ Like, for example, in businesses, when an unsecured network is the steering assembly of the company, its data that is very confidential may be exposed to threats. Earnings may drop since productivity output is affected by the attacks made by the intruders. For educational institutions, the privacy of the stakeholders, such as the faculty members and the students, may be placed at risk. Their identity may be stolen and used by identity thefts to illegal businesses. Not just that, when data are widely open to attackers, they may use this to their advantage and initiate a ransomware attack on the organization.^{10,11}

Aside from security concerns, having a network that did not undergo planning also disturbs the user's experience. Such as, with the likes of voice over IP (VoIP), telephone users that are commonly acted by front liners taking charge of the quick response delivery to clients, may get irritated by the disruption of the voice. As such, workers are hampered from executing their best for their job, and clients likewise may not be satisfied with the services delivered by your organization. Moreover, a network that is not standardly designed promotes slow data transmission,

hence affecting the employee's productivity.

Importance of network infrastructure in an organization

When an organization grows, likewise, its requirement also grows. Since modernization is the driving factor for the organization to cope-up with globalization, organizations nowadays venture into computerization of their operation as a stepping approach for upgrades and innovation. The utilization of systems and programs that makes their processes at ease are common in today's organization's structure. However, the efficiency and effectiveness of the systems used by the stakeholders of the organization are attained, provided that data retrieval and information sharing are not hampered. A system that is integrated with an organization possesses a centralized database that keeps every record and information securely stored. Thus, the only means of access to this information is through active connectivity within the network.^{4,5}

The standing provided by the network infrastructure enables every member of the group to share files and information to convey positive, constructive outputs.³ It means that organizational goals can be uniformly done and executed by group members through a meaningful distribution of data via communication lines delivered by the network. As such, every organization needs to establish a reliable network infrastructure to successfully meet the demands of the organization. In addition, its creation should meet the global standard to prepare for possible expansion and to have a ready environment that can still predict possible changes and diverse needs of tomorrow, as well as prepare for emerging threats that may disturb the operation of the body in the future.^{1,3}

Considering the advantages of putting and setting up an infrastructure, every head of the organization should also bear in mind that its existence should not merely focus on providing links to all users. Hence it should also promote quality service and satisfaction among beneficent. The job of managing the network is

usually performed by a network administrator or engineer. These IT Specialists are the responsible manpower for ensuring high-performing network infrastructure. The following is the importance of designing and implementing a managed network infrastructure.^{5,6}

Minimal operating costs

When network resources are of quality and the devices being used are configured well, in the part of physical and software aspects, the infrastructure is considered managed. As soon as network resources are managed, it ensures long-term usage. And when this equipment is still capable of doing its job, and its performance is still observable, the elimination of possible expenses that are only necessary when devices are failing to be functional is observed, thus reducing the cost of the operational services like additional infrastructure cost.^{1,6}

Proactive maintenance of the network

An organization with a managed network promotes proactive maintenance. In this process, organizations can easily detect issues in an automated way, as such threats are handled and avoided immediately without causing the whole state of the organization at risk. Continuous network monitoring and maintenance scheduling through a notification system configured within the infrastructure to prevent system halting before affecting the regular operations of the organization is what describes the process.⁷⁻⁸

Organization's security

A managed network prevents data loss and assures safe cyberspace for all users. It is commonly attained through the implementation of security appliances with the likes of firewall devices and the integration of intrusion detection systems within the organization. A secured organization in cyberspace boosts the confidence of members of the group while being connected to the network.

User's convenience

Convenience is achieved when users in an organization get a better experience while connected to the network. It means they are making themselves satisfied with the services that the network has extended to them, whether it is just a simple connection in information retrieval or the involvement of the internet. With a managed network, downtime is prevented, thus giving all users a continuous and unbreakable connection. After all, how users define network reliability is when they are enjoying their connection as uninterrupted. Likewise, if a network is managed, network traffic is not a problem since it can be clustered into a separate virtual grouping known as VLAN that improves the communication experience of every user.^{9,10}

Network availability

A managed network always ensures its availability. When a network infrastructure is configured and managed, there is an assurance that the services needed by the end-users, no matter what type of situation they are in, will always be available and that organizations are guaranteed a flexible and scalable network environment that can still be experienced in the years to come.

Standard and compliance preservation

In the world of information technology, there are several standards set by a regulatory body that considers technology as good, safe, and excellent for users. As practiced, network engineers and administrators consider these standards as guides for them in building an infrastructure. A standardized infra ensures that the performance of the network is into the passing criterion and that a better user experience is definite. Managed network infrastructure warrants standards. As such, when they have met the standards, compliance required by some ruling agencies in private and government institutions is preserved. When an organization acquires compliance, the client's trust is earned towards your organization.^{10,11}

2. Conclusion

Since that today's world is moving into modernization, the building of network infrastructure is a must to consider in every organization. Technologies used must jive with the global challenges presented by the era of globalization. Network infrastructure is created when the three major components are present within the cycle, and one missing part of it will deteriorate the structuring of a path of connection. Thus, once installed already, network management must be performed in all network resources. When network infrastructure is managed, benefits are enjoyed by the group. These benefits are what justify the importance of management in the communication backbone as a technology entity of the organization.

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