

# Network Challenges in Globalisation

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Network Management refers to overcoming all the issues pertaining to smooth functioning of Networks in organizations, it means all hardware and software functions, characteristics, features, operational procedures, accountability measures, access controls, administrative and management policy required to provide an acceptable level of protection for hardware, software, and information in a network. Over the years it was observed in various articles and white papers that many issues or challenges are found only in network management. Networks being the heart of any organizations needs to be protected from attackers and hackers. Attacks to corporate network are not only come from outside, but also inside the company itself. Organizations must protect and ensure that the networks are capable of handling threats from insiders as well as outsiders. Effective Network Management needs a right tools, right people and correct processes to be in place. The correct training of staff for the use of tools, handling IT people and carrying out the processes may reap benefits to handle the challenges of networks globally.

This article will highlight on some major issues faced globally and preventive measures to ensure smooth functioning of Networks

## Introduction

Networks are the heart of data flow in any organizations. With the increased number of IT users in any company and the overall complexity of enterprise networks, IT professionals are faced with the daunting task of protecting networks from known and unknown malicious activity. To survive and deliver great work efficiently, companies are adopting network management and infrastructure management applications. Faiz(2006) Smooth functioning of the day to day activities in the organizations depends on the health of good functioning of Networks. Managing Networks has always been a challenge for many organizations. The right technologies, timely up

gradations, powerful infrastructure, reduced costs, skilled Network Managers, maximizing network performance has been the core issues in managing excellence in Networks.

### **Definition**

Hegering(1999)et.al defines “Network management as all measures ensuring the effective and efficient operations of a system within its resources in accordance with corporate goals.” To achieve this, network management is tasked with controlling network resources, coordinating network services, monitoring network states, and reporting network status and anomalies.

### **Challenges faced by the Network Manager**

Authors Veal and Kohli( 2002) mentioned that Network managers often experience problems in keeping up-to-date with rapid technological change in terms of new equipment needs, associated staff development and training requirements as well as changes in law, safety requirements and practices. Sydow(2005) observed that as computer networking was getting more complex, there was an increasing need for network professionals to design, implement, and manage networks. Since the objectives of computer network was to share resources and to support business processes, it was essential that network professionals should not only have technical skills but also be abreast with the business concepts. Faiz(2006) commented that Network Managers these days faced with the daunting task of protecting networks from known and unknown malicious activity .It could be concluded from the above statements that over the past three decades, Network Managers are facing with the daunting tasks of protecting, maintaining, controlling networks in the changing business scenario.

### **Key decisions about Network Management**

Schiesser(2002) spells out that before an effective, high-level network management process can be designed, six key decisions are needed to be made to influence the strategy, direction and cost of the network process. These six decisions are taken by answering the questioned mentioned below:

- What will be managed by this process?
- Who will manage it?

- How much authority will this person be given?
- What types of tools and support will be provided?
- To what extent will other processes be integrated with this process?
- What levels of service and quality will be expected?

To carry out the key decisions in an effective manner, it is necessary for organisations to know about the Network Management functions.

### **Previous Work and Studies**

Ehab ALSaher (2009) mentioned that in many ways, network management remains the least understood aspect of computer networking. There is a lack of well-established principles guiding the design of networks for manageability. There is also a lack of scientific understanding of the evolution of network state in real operational environments. A number of organisations have created products to help network managers gain visibility and manage the behavior of their networks. The dimensions and complexities of today's large networks are outstripping the capabilities to manage them in an efficient and cost-effective manner. With the rapid pace of technological advancements, networks have constantly grown in size and consist of a variety of heterogeneous devices and proven systems. These large networks have a large number of nodes interconnected by heterogeneous transmission media (e.g. wired and wireless) and operate at accelerated speeds. Managing such networks has increasingly become very difficult.

A study by Nuangjamnong C et.al(2008) reveals that Network Managers are facing increasing challenges to provide improved and higher rates of system performance. Problems faced by them include unscheduled down time, lack of staff with appropriate expertise, insufficient tools, complex technologies, business consolidation and competitive markets. Capacity planning of network resources become necessary in order to minimize adverse performance or even lack of IT availability which can result in negative impacts on business performance. Most network performance management problems involve capacity issues, which in turn affect network application demands. Therefore, business organizations need to collect relevant networking information as the basis for identifying potential problems, planning changes, and implementing new capacity and performance functionality into their networks. The authors found that Network Management is often viewed as a technical problem that does not include human factors.

However the ultimate responsibility for management exists with people and their requirements and not with machines.

According to Hochhauser(2005) Network Managers face critical challenges like network performance, unexpected network failure, network interruptions, upgrading the networks and planning the network design.

Kalyankar(2009) found that in any computer Network, there are a lot of communication devices trying to access resources and at the same time getting requests to carry out some work for some other device, controlling network traffic requires limiting bandwidth to certain applications, guaranteeing minimum bandwidth to others, and marking traffic with high or low priorities.

Saran(2004), states "Human error is the primary cause of network downtime.", Many experts from different sectors agree to the human error factor, like poor change management, misconfigured devices, unauthorised changes or errors in configuration files.

Faiz(2006) commented that with increased number of IT users and the overall complexity of enterprise networks, Network professionals are faced with the daunting task of protecting networks from known and unknown malicious activities. The IS 2006 survey by IMRB showed that Network security gets the top priority in IT spending for 53 percent of enterprises, 48 percent of companies consider ERP as their priority, while servers top the priority lists for 29 percent of the companies covered. Networked storage is considered as priority spending by 23 percent. It was observed that Network security is a major challenge for any CIO. Among the other challenges faced by organizations whose IT infrastructure is large, availability of services and their solutions are some hurdles in sustaining better Network management. Another observation made by the author is getting quality service from the vendor who support the Network Infrastructure. The author concludes that retention of good and efficient network managers is a major challenge faced by organisations.

In another study by Frost & Sullivan(2009) who carried out a survey on CIOs across industries, mentioned that 85 percent of the respondents believed that Viruses, Worms and Trojan Horses were the major problems in today's IT Network environment. Downtime and physical security were some of the other security concerns for CIOs. According to the survey the authors concluded that Enterprise security is no longer confined to external threats alone. Incidents of

loss of data in organisations are on the rise and organisations need to seriously evaluate the impact such incidents will have on compliance, credibility and competition issues.

Veal and Kohli(2002) in their article observed that Security problems which includes the physical security of the devices, requires staff to be aware of such issues and the required procedures and policies to be followed. This can include all staff entering the premises including outside maintenance staff as well as cleaning staff. The demands of network security have also been increasing at a fast rate where new security protocols and devices need to be introduced to combat new threats. A lack of understanding of the operation of these protocols can lead to security gaps in the network which can have disastrous consequences. The authors further comment about the uptime and backup issue which requires additional equipment that leads to extra costs and in large organizations a large fraction of the annual budgets is consumed by such IT costs.

## **Conclusion**

The studies from experts and authors reveal that Network Management is not an easy task. CTO's globally face a lot of challenges in managing and maintaining it. Network Management is not limited to physical wiring, addressing, routing and monitoring of the core network like departmental networks, remote networks, virtual subnets, virtual private networks (VPNs). It needs efficient use of right tools, right people and correct processes to be in place. A network audit should be carried out which can focus a professional judgment on the key personnel handling networks , evaluation of policies and procedures associated with core business aligning with networks, inventory of resources used in the information systems environment. A checklist of Network Audits should be carried out by Network Managers for overcoming the issues of Networks in organization.

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## *Network Audit Checklist*

### **Tools**

#### Firewalls and Border Routers

- *Modems , Routers , analog lines are identified and justified*
- *Documentation on the brand, type, version and location of firewalls maintained*
- *Vendor websites for current patch levels and other security updates/warnings*
- *Check if the OS is current or updated .*
- *Policies governing the firewalls are reviewed from time to time. Laptops are checked if firewalls are installed.*
- *Anti-virus should be installed with timely updates*

### **People**

- *Network Managers should manage the IP addresses. Regular checks should be done to avoid misuse of IP addresses.*
- *Training should be given to enhance the knowledge pertaining to the areas of responsibility. Network Managers should identify and avoid phishing attempts, he should train the employees so that they don't click suspicious mails.*
- *Regular Penetration tests should be done as dictated by compliance regulations as soon as there are some modifications to the website.*
- *Access to the regular users and privileged users should be defined.*

### **Process**

- *Policies should be created which is approved by management, and made official pertaining to security decisions*
- *Maintain a server list which marks all the IP addresses, Operating system and all matters related to servers and a responsible person. If there are multiple servers assign different persons to handle the responsibility.*
- *Log should be maintained and reviewed periodically.*
- *Documentation of tools, people and processes should be maintained.*
- *Maintaining a history of bygone network problems and possible solutions can be maintained for future use.*