

Network Documentation: Innovation & Advantages to gain competitive advantage inside IT organization

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Abstract

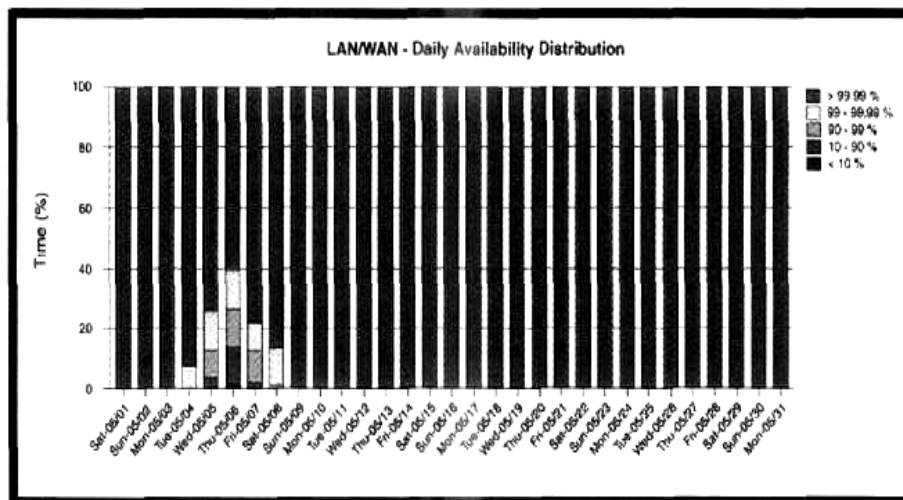
Jaringan computer adalah bukan merupakan suatu issue yang baru di dalam dunia teknologi informasi. Setelah dilakukan riset yang lebih mendalam jaringan computer bukan hanya tergantung pada tools [alat] yang berguna untuk menjalankan jaringan yang telah dirancang tetapi tergantung juga pada sumber daya manusia yang terdapat di dalamnya. Data tentang kinerja jaringan akan sangat berguna untuk manajer jaringan dalam mengatur dan menentukan faktor-faktor apa saja yang penting dalam jaringan guna meningkatkan kinerjanya. Peneliti di sini akan menghadirkan keuntungan, kerugian dan alternatif guna meningkatkan kinerja jaringan komputer dalam suatu organisasi yang bertujuan untuk meningkatkan keunggulan bersainngnya dalam era globalisasi saat ini.

Kata kunci: jaringan komputer, kinerja jaringan, dokumentasi jaringan

I. Introduction

Most organizations use computers to support the activities. Computer networks are needed to connect the computers and network devices – hubs, switches, routers, bridges, printers, etc – in organizations. As a result, computer networks have been growing rapidly and become the essential part of organization infrastructure. According to Rowe [1999, p. 503], network is important because: [1] network as a corporate asset, [2] network as a corporate resource, and [3] the rapid growth of the network itself. Now networking is used in every aspect of business, including advertising, production, shipping, planning, billing, manufacturing, engineering, marketing, research and development, financing, and accounting.

The growth in networking has an economic impact as well. Data networks have made telecommuting available to individuals and have changed business communication. A network manager needs data networks that come from recording performance statistics of a previous network operation. Recording network statistics are considered as an important task for a network manager [see **Figure 1**]. Primarily, the statistics describe broad understanding about the latest network condition in an organization in making management decisions for future planning regardless there are several advantages, disadvantages, and other alternatives exist.



The Network Health LAN/WAN Daily Availability Distribution report shows WAN link uptime statistics at a glance.

Figure 1 [Network performance statistics example]
[Source: Nance B., *Network World*, 2000]

II. Network Manager Analysis

According to Comer's [1999, p. 481] point of view, a network manager is a person who is responsible for monitoring and controlling the hardware and software systems in the organization network. A network manager must be able to handle pressures by detecting and correcting problems that make communication in the organization become inefficient and ineffective. And also a network manager should be able to eliminate conditions that will produce the problem again. Because of problems can be caused either in the hardware or software failures, the network manager must monitor or follow-up both software and hardware as well.

III. Network Management Analysis

Network management is the process of monitoring, operating, and controlling the network to ensure that the network works and gives values to the users. Network managers play an important role in the management of an organization by performing two key tasks: [1] designing new networks and upgrades; and [2] managing the routine or daily operation of the current networks – with the assumption that most organizations generally have LANs, MANs, and/WANs, most network design projects involve in the design of current networks rather than building new networks. Basically, network managers collect their own decision-making information to measure the network performance and fixing problems – by identifying areas of problem, isolating the exact nature of the current problems, restoring the overall network from the cause of the problems, and predicting future problems [Fitzgerald and Dennis, 1999, p. 349].

Network Managers' role such as:

- Manage the day network operations
- Provide Support for network users
- Ensure the reliability of network operation

- Evaluate and acquire network hardware, software and services
 - Manager the network techies
 - Manage the network budget, with emphasis on controlling costs
 - Create a long term strategy networking and voice communication plan to meet the organization's goals and policies
 - Apply and follow-up the latest technology developments in computers, data communication devices, network software and the internet
 - Apply and follow-up the latest technology developments in telephony technology and MAN/WAN services
 - Help top management in understanding the business implementation of network decisions and the network's role in the business activities
- [Fitzgerald and Dennis, 1999, p. 349]

IV. Network Statistics for Network Managers Analysis

It is on every network manager's mind that managing network – monitoring, operating, and controlling – is truly important. Network managers realize that running the network stays on the right track by not facing any problems is unavoidable. To fix or isolate the cause of the problems, managers not always rely on help-desks or network administrators but also rely on network management software [Comer, 1999, p. 483]. Network management software [see **Figure 3**] helps managers to check the status of devices – such as routers, host computers, switches, and bridges – and obtain the prior network statistics. Managers can use those prior statistics to make management decisions for future planning. Network managers must also ensure that the data gathering mechanism – network management architecture – is working properly [see **Figure 4**]. In consequences, there are several advantages and disadvantages as well as alternatives by seeing prior statistics to be utilized in the current system for upcoming network management.

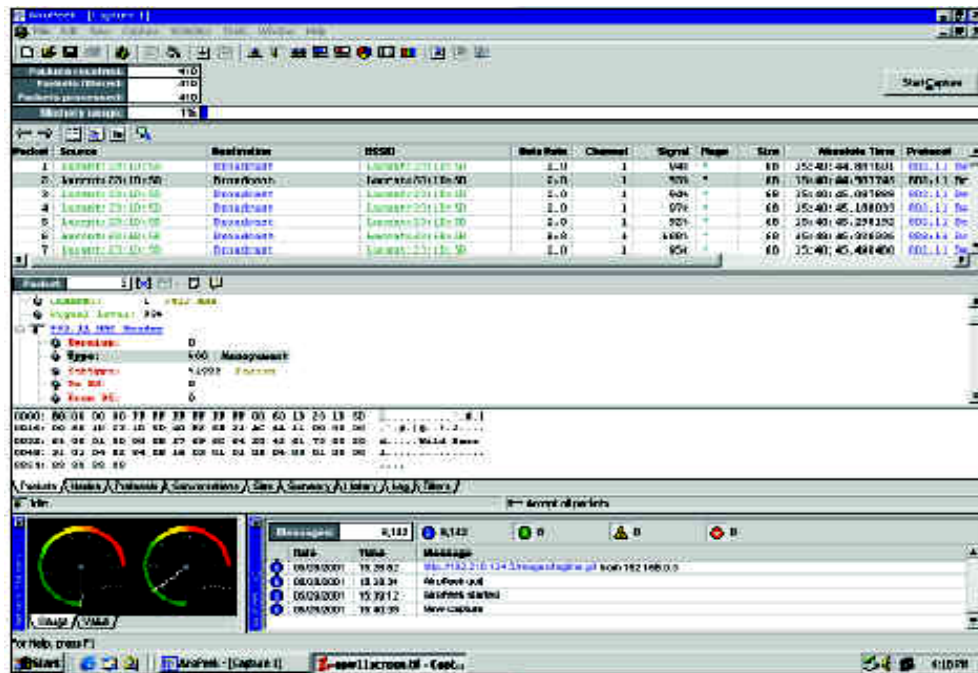


Figure 3 [Network Management Software Example]

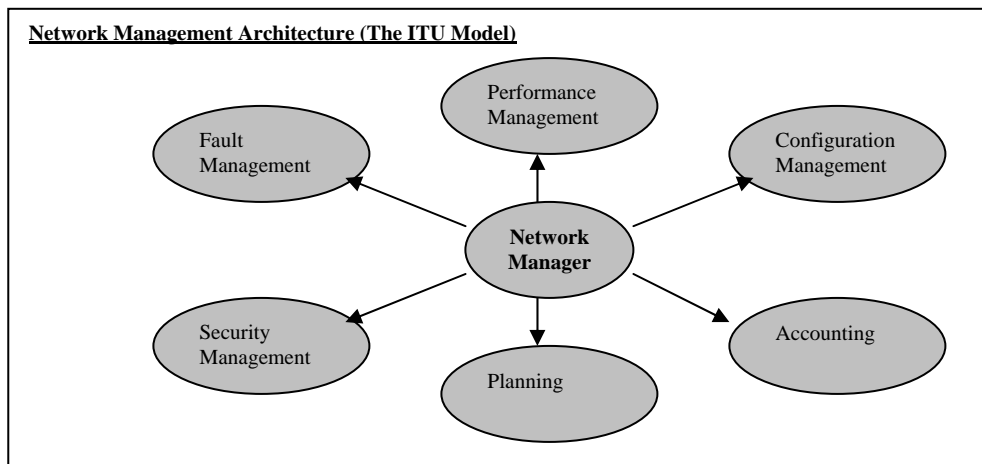


Figure 4 [Network Management Architecture]

V. Advantages

There are three major advantages using prior statistics for future planning:

1. Knowing network SWOT analysis and influences – Crouch diagram
2. Improving the network performance
3. Enhancing the previous network mechanism – network management architecture

There are 6 points mentioned in the Crouch diagram, two of them are closely related with the network management [see **Figure 5**]. Looking at prior statistics should offer clear vision for network managers about the latest position [how are things now] and the expected destination [is the network going where it wants]. The latest position should explain the SWOT [Strength, Weakness, Opportunity, and Threat] analysis that the network was running – by scrutinizing the SWOT, managers should produce greater network performance in the future. And the expected destination should explain the influences – standards, staffs, customers, competitors, etc – that were shaping the network.

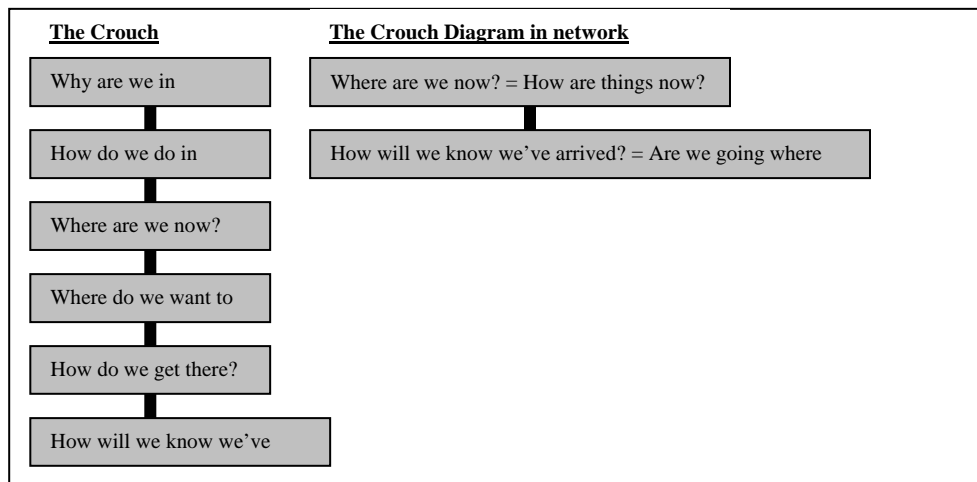


Figure 5 [The Crouch Diagram & the Crouch Diagram in Network Management]

In improving network performance, a network manager should perform important tasks by scrutinizing the prior statistics. According to Hallberg's [2003, p. 5] experience, there are four major questions that need to be considered to augment the network performance for future planning:

1. Are there any areas of the network that hinder the overall organization's goals or accomplish its operation? From the prior statistics, a manager should know about the deficiency in the network that needs improvement – for example: user takes long time to save or sending files.
2. Are there any functions need to be added in the network to speed up the process and give benefits for users? For example, a manager can provide more PCs for users to increase the work productivity.
3. What other automation plans exist that will support the network? Statistics will show the existing applications or features in the network. A manager should evaluate whether to add more applications or features to support the network.
4. What needs to be done to maintain the overall network? From the statistics, a manager should be aware of whether the network needs more storage space or not as the organization grows larger.

From observing the prior statistics, a network manager can enhance the network management architecture. The business aim of network management is to give users – staffs, customers, top management, suppliers, and vendors – satisfaction for the service by offering dependable service, consistently well response time, and quick problems solution. Network managers have a full responsibility of ensuring that the requirements for reliability and availability are fulfilled such as:

- ▶ Ensuring the organization information assets are protected from illegal activity - security
- ▶ Ensuring the data integrity
- ▶ Following the governmental regulation – compliance
- ▶ Protecting the organization privacy
- ▶ Monitoring emails, network and/ Internet usage
- ▶ Documenting all operations
- ▶ Training and mentoring [skills assessment for network users]
- ▶ Maintaining users' authentication – password administration
- ▶ Analyzing factors that influence future network architecture [see **Figure 6**]

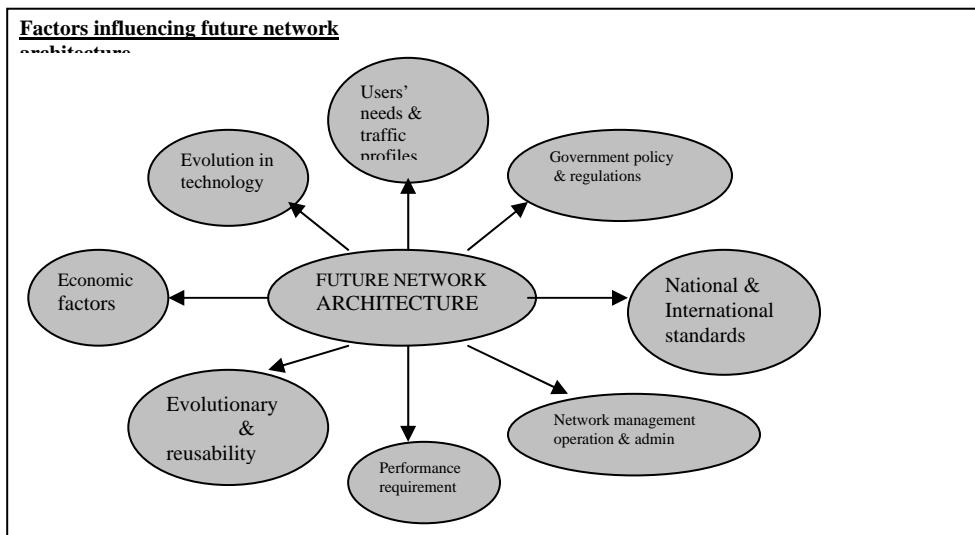


Figure 6 [Factors influencing future network architecture]

[Source: Linfield, R F., 1995, p. 6]

VI. Drawbacks/Disadvantages

There are three disadvantages using prior statistics for future planning:

1. Not all components of prior statistics are proven relevant to the current condition.
2. Changing dynamic forces
3. Lack of information and/ communication from outsiders

Network managers must be aware that using prior statistics sometimes can not always be implemented for the upcoming network management. There are probably some components of the statistics which are irrelevant or inaccurate with the current applications for network operation. The use of those data in the network management may cause serious problems in future network management and eventually will affect the overall organizational structure and goals. For example, last year statistics show that the system used the Windows 98 operating system [OS], and in reality that OS is not compatible anymore with other current applications – while the standard OS now is Windows XP.

The network technologies are dynamic and constantly changing. No matter what a network manager resists change but in reality change is unavoidable. A network manager should follow up and apply the latest technology to be implemented in the network management. By assessing the prior statistics, a network manager should not be satisfied about the current technology, in fact, a network manager must continue upgrading the system to leverage the technology as other competitors do. For example, many telephone companies now are racing to improve the technology by offering better services called digital subscriber line [DSL] to provide high-speed connectivity over standard telephone lines [Gelber, 1997, p. 157]. These lines include asymmetrical digital subscriber line [ADSL], symmetrical digital subscriber line [SDSL], high-speed digital subscriber line [HDSL], and very high-speed digital subscriber line [VDSL] – ADSL and SDSL technology will be the first offered in the market. At the moment, the network runs on a dial-up connection, so a network manager should change [upgrade] the technology to have bigger broadband – firstly apply ADSL and later on SDSL.

A network manager should have known that the network can not always rely on the prior statistics. If a network manager only focuses on the existing network statistics, it is just like 'steering a car by looking at the rear-vision mirror'. There are important resources – outside information and communication – that need to be considered. Managers should gather information – market research, feedback, survey, opinion, interview, etc – perhaps from customers, competitors, and suppliers to assess the current and even the estimated future trend in the market arena. Also managers should communicate with the internal network users to gain deep understanding for what the users actually want. Fail to do so will cause problems or minimize the network performance.

VII. Alternatives and Innovation

Knowing that there are advantages and disadvantages, also there are two alternatives exist using prior statistics for future planning:

1. Consultants involvement
2. Escalation procedure – clearing problems
3. Economic considerations

Network managers should probably seek advice from the professionals – consultants. Involving consultants will add power and/ depth in network management. Some consultants should provide expertise in conducting business approach such as market research, feedback, survey, users and public opinion, interview, questionnaire, etc. Other consultants that might have strong technical skills may offer support in upgrading the design of the current network management.

To manage and clear the problems in the network management, a manager can also apply an escalation procedure [Rowe, 1999, p. 509-510]. Adding highly technical specialists should strengthen the network performance especially for critical problems occurred. For example if there is a short circuit in the particular network cable causing the whole network is completely down, help-desks will seek help from network administrators, and also administrators can not fix it, so there are specialists available to repair right away before the problems are delegated to a manager's hand.

Escalation Procedures, such as:

Technical:

- Level 1 [Help Desk] works on problem for a maximum 15 minutes. If Problem is not resolved pass it to level 2
- Level 2 [Technical] works on problem for up to 1 hour. If the problem is not resolved, notify the help desk supervisor and continue working on the problem
- If the problem is not resolved in 4 hours, get the appropriate level 3 [network specialist] involved. Level 2 retains "ownership" of the problem. It is level 2's responsibility to monitor the progress and to keep the user and the help desk supervisor informed about the status of the problem every 2 hours after level 3 gets involved

Managerial:

- The help desk supervisor is notified by level 2. If the problem has not been resolved in 1 hour.

- If the problem is not resolved in 2 hours, the help desk supervisor notifies the supervisor of network operations
- If the problem is not resolved in 4 hours, the supervisor of network operations notifies the manager of telecommunication. The manager of telecommunication calls manager in the user department to discuss the situation and decide on an extraordinary actions to be taken
- If the problem is not resolved in 8 hours, the manager of telecommunication notifies the Chief Information Officer [or equivalent] and discusses the actions taken to date, and the future plan, to get the problem resolved. The discussion should also include the possibility of contacting vendor management if appropriate.

Notes:

These sample procedures do not account for actions to be taken if the problem continues after normal working hours. The actions to be taken depend on the nature of the problem and the criticality of telecommunications to the company
[Rowe, S H., 1999, p. 510]

Another important point is that network managers should evaluate the economic considerations – costs and benefits comparison. Before the new applications or procedures are implemented or added into the current or upcoming network management, a manager has to calculate the estimation of the each cost occurred. The total estimated cost has to be measured against the expected benefits. If the overall calculated cost is high and can not match the presumed benefits, a network manager has to create other alternatives – at least to balance the cost and benefit – before changing the network management. A network manager can compute the cost explicitly while calculating the expected benefits is tacit because not all measurements can be counted as tangible – such as time efficiency, quick problem resolution, staff working performance, etc.

VIII. Conclusion

Network managers realize that managing the network – monitoring, operating, and controlling – stays on the right track by not facing any problems is unavoidable. To fix the problems, managers not always rely on help-desks or network administrators but also rely on network management software. Network management software helps managers to check the status of devices – routers, host computers, switches, bridges, etc – and obtain the prior network statistics. Network managers must also ensure that the data gathering mechanism – network management architecture – is working properly.

Using prior statistics not always offer advantages but also there are disadvantages that are essential to think about. By examining the statistics, there should be other alternatives exist to be considered for managers. From the detailed explanation above [advantages, disadvantages, and alternatives], network managers can not fully rely by focusing merely on network statistics because there are also other important supporting factors that need to be considered and included in the making of future management decision. Recording network statistics is an important task for managers as to strengthen managers' understanding for what actually happens in the network of organizations. Combining and comprehending the advantages, disadvantages, and alternatives, can be a powerful tool for network managers to make the ultimate management decision for future planning.

Bibliography

Comer, D E. (1999). Computer Networks and Internets, 2nd Edition. Prentice-Hall, New Jersey, USA.

Fitzgerald, J. and Dennis, A. (1999). Business Data Communications and Networking, 6th Edition. John Wiley and Sons, USA.

Gelber, S. (1997). Data Communications Today: Networks, The Internet, and The Enterprise, 2nd Edition. Prentice-Hall, New Jersey, USA.

Hallberg, B A. (2003). Networking: A Beginner's Guide, 3rd Edition. McGraw-Hill, USA.

Molta, D. (2001). 'Wildpackets' AiroPeek provides solids alternative for wireless analysis. *Network Computing*, Vol. 12, Is. 11, p. 22. 28 May 2001.

Available at: <http://80-global.umi.com.ezproxy.uow.edu.au>. Access date: April 8, 2003

Nance, B., April 3, 2000, 'SLA enforcement tools to the rescue', *Network World*, Framingham, Vol. 17, Is. 14, p. 69-73., 3 April 2000.

Available at: <http://80-global.umi.com.ezproxy.uow.edu.au>. Access date: April 9, 2003

Rowe, S H. (1999). Telecommunications for Managers, 4th Edition, Prentice-Hall, New Jersey, USA.

Linfield, R F. (1995). Telecommunications: Present Status and Future Trends. Noyes Data Corporations, USA.