INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 7.542

A Study on Network Traffic Management

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ABSTRACT: The purpose of this seminar is to discuss issues related to Network Traffic Management. A relatively new category of network management is fast becoming a necessity in converged business Networks. Mid-sized and large organizations are finding they must control network traffic behaviour to assure that their strategic applications always get the resources they need to perform optimally.

Controlling network traffic requires limiting bandwidth to certain applications, guaranteeing minimum bandwidth to others, and marking traffic with high or low priorities. This exercise is called Network Traffic Management.

In the simplest manner we can define it as the density of data present in any Network. 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. Also at the same time certain types of communication devices may be busy to respond to the request being made to them. So there is lot of information exchange in the Network in form of request, response and control data. This data is basically in the form of a huge number of packets floating around in the Network. This huge amount of data acts as a load on the Network, which results in slowing down the operations of other communication devices.

Due to this there is a lot of delay in communication activities. This ultimately results in congestion of the Network. This is the description of Network Traffic in its simplest form.

I. INTRODUCTION

In computer networking, network traffic control is the process of managing, controlling or reducing the network traffic, particularly Internet bandwidth, e.g. by the network scheduler. It is used by network administrators, to reduce congestion and packet loss. This is part of bandwidth management. In order to use these tools effectively, it is necessary to measure the network traffic to determine the causes of network congestion and attack those problems specifically. Network traffic management deals with the process of **monitoring and controlling** the activities of network besides transforming the network into a managed resource by improving performance, efficiency, and security. It also helps to operate, administer, and maintain the network systems.

II. WHAT IS NETWORK?

A network is a collection of computers, servers, mainframes, network devices, peripherals, or other devices connected to one another to allow the sharing of data. An example of a network is the Internet, which connects millions of people all over the world.
A computer network is a data communications system which interconnects computer systems at various different sites. A network may be composed of any combination of LANs, or WANs.

III. WHAT IS NETWORK TRAFFIC?

Network traffic can be defined in a number of ways.

- In the simplest manner we can define it as the density of data present in any Network.

- Network traffic is the amount of data moving across a computer network at any given time. Network traffic, also called data traffic, is broken down into data packets and sent over a network before being reassembled by the receiving device or computer.

- Network traffic refers to the amount of data moving across a network at a given point of time. Network data is mostly encapsulated in network packets, which provide the load in the network. Network traffic is the main component for network traffic measurement, network traffic control and simulation. The proper organization of network traffic helps in ensuring the quality of service in a given network.

   Network traffic is also known as data traffic.

A.Network traffic can be broadly classified into the following categories:

- Busy/heavy traffic - High bandwidth is consumed in this traffic
- Non-real-time traffic - Consumption of bandwidth during working hours
- Interactive traffic - Is subject to competition for bandwidth and could result in poor response times if prioritization of applications and traffic is not set
- Latency-sensitive traffic - Is subject to competition for bandwidth and could result in poor response times.

IV. BENEFITS OF BETTER NETWORK TRAFFIC MANAGEMENT.

- **Improved quality of service:**   A cloud managed network provides a higher level of control, allowing you to prioritise traffic between your network and the internet so that more bandwidth is available for important users and applications.
- **Control access to online content:**   Cloud management also gives you the ability to remotely control access to content across your network, restricting access to categories, specific websites or applications. Different levels of filtering can even be applied to specific groups or devices. Intrusion attacks can be detected and prevented, and malware can be blocked before it has a chance to access your corporate network.
- **Securely enable staff to bring their own device:**   Allow staff to bring their own device to work and connect to the network without security concerns. A cloud managed network could enable you to centrally manage access for all mobile devices, Mac and PCs, applying device-specific policies as required.
- **Manage networks centrally for multiple sites:**   One area where cloud managed networks really come in handy is for businesses with multiple offices or branches. Cloud managed networks allow you to virtually manage networks across all your sites at once.
- **Easier management:** A centralised cloud-based management system means that network administration can easily be completed from anywhere, reducing the need for IT support on site. It's also easier to keep track of company devices, which can be tracked, and if needed, wiped, anywhere in the world.
- **Secure free WiFi for visitors and customers:**   Allowing visitors to connect to your WiFi can pose a security risk, but with a cloud managed network you can allow visitors to connect to your network securely, without access to internal applications. It also provides an easy way to offer free WiFi to customers, which can be a powerful marketing tactic.

V. DISADVANTAGES OF NETWORK MONITORING

A) Purchasing the network wiring and file servers can be high-priced.
B) Handling a substantial network is complicated, requires a network supervisor and   training generally needs to be employed
C) When the file server reduces the files to the file server become inaccessible.
D) Electronic Mail might still function if it's on a separate server.
E)Viruses can spread to other computers throughout a pc network.
F)There's A danger of hacking, especially with wide-area networks. Security methods are necessary to prevent such exploitation, eg a firewall.

VI. GENERAL PROCESS OF TRAFFIC MANAGMENT
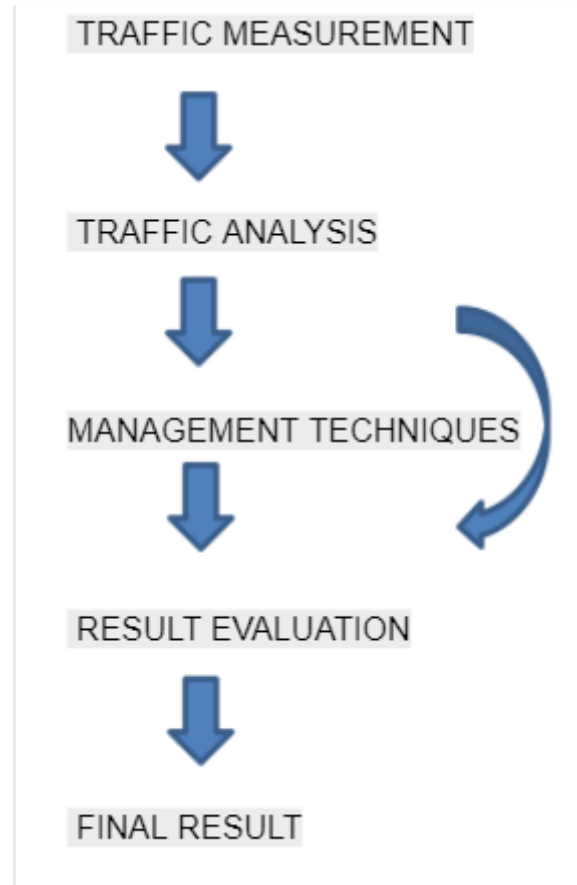
VII. WHY SHOLD I MEASURE NETWORK TRAFFIC

a) Service monitoring - making sure things keep working.

b) Network planning - deciding when more capacity is needed.

c) Cost recovery - session times and traffic volumes can provide billing data.

d) Research - an improved understanding of what's happening should allow us to improve network performance.

VIII. APPROCHES TO TRAFFIC MEASURMENT

• Active Measurement of Traffic: The active approach relies on the capability to inject test packets into the network or send packets to servers and applications, following them and measuring service obtained from the network.

• Passive Measurement of Traffic: The passive approach uses devices to watch the traffic as it passes by. The passive approach does not increase the traffic on the network for the measurements. It also measures real traffic.

IX. TYPES OF MEASURING TOOLS

– NETSTAT

– TCPDUMP

– ETHREAL

– NTOP

X. TRAFFIC ANALYSIS

LAN Traffic: Traffic on a LAN has shown to be self similar in nature. Those means if I measure the traffic over a period of one hour and plot it, it will be similar to the graph for the traffic plotted over a period of one day.

WAN Traffic:Traffic on the WAN has been found to vary as per the following models.

Poisson's Model

Bursty Traffic

XI. CONCLUSION

To conclude I would like to reemphasize that, in today's changing scenario, where the conventional way of doing things no longer holds good, organizations are fast realizing that in order that they stay in step with others in the race, they must embrace this concept of Network Management.

Also the manner in which both the size of networks and the data which rides on them is increasing by the day, it has become imperative to monitor the kind of traffic flowing, priorities it and then manage the traffic accordingly.

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