

## MONITORING NETWORK MANAGEMENT USING CLIENT/SERVER PERFORMANCE

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### Abstract

Here we focus on SNMP Network Management system specially tailored for deployment in internet works that relay on low bandwidth backbone networks. The network management system developed uses one top-level communication with multilevel management application strategically distributed with throughout the internet work. .The server makes connection with clients by making a intelligent use the limited band width available on the backbone network. The solution must be easy to integrate the existing SNMP based network management solution. Contemporary network management systems as represented by simple network management protocol are based on the client-server centralized paradigm which may lead to inefficiency when the managed network is large in scale. Speed and throughput are calculated with the server and clients. A graph estimates the how each client communication time vary when the communicate with the server The use of cpu utilization may also differ from client to client In order of using TCP/IP protocols we integrate SNMP to trap the messages from the client to the user.

**Keywords:** SNMP, TCP/UDP, Client/Server, CPU Utilization, Client contacting

### I. INTRODUCTION

A Network Management system is the collection of tools for network monitoring and controls that is integrated in the following senses.

- Set of commands for performing most of the network management tasks.
- A most of the hardware and software required for network management is incorporated into the existing user equipment.

Network Management system based on Client/Server paradigm normally requires transferring large amount of management data between the manager and agents. The large amount of management data not only requires considerable bandwidth, but also can cause a processing bottleneck at the manager.

As current network grow larger and more complicated, the problem becomes more severe.

The details of a network include the users and their access privileges, the software that runs on the user workstation, the software that provides services from the network resources, and hardware devices that

Offer access to those resources. Many network managers will focus on less attention on managing the workstations. They consider the network resources more important to manage as each resources supports more than one user. The network Management software that allows a manager to monitor and control remote network components.

### II. ARCHITECTURE OF NETWORK MANAGEMENT SYSTEM

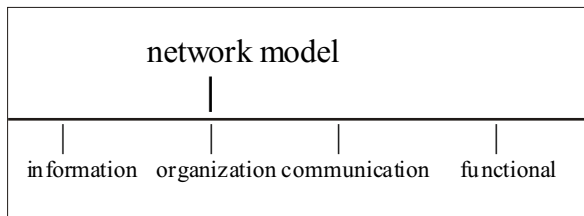
The basic element of any network management system is the manager agent managed object method manager agent managed object method based on the method ,it is possible to build systems of any complexity, comprising any number of managers agents and resources of various types.A network Management system consists used in accomplishing the network management task resides in the host computer and communication process .It is designed to view the entire network management task resides in the host computer and communication process. It is designed to view the entire network as a unified architecture with address and labels assigned to each point and specific attributes of the each element and link known to the system. The active element of the Network provide regular feedback of status information to network control centre

#### Tasks

1. Collect statistics to network control centre.
2. Store statistics locally
3. Response to commands from network control centre.
4. Transmit collected statistical
5. change the parameter
  - provide status information
  - Generate artificial traffic
  - Send message to network layers

### III. NETWORK MANAGEMENT MODEL

It describes the components of the network management system their function and their infra structure. It defines object, agent and Manager.



The manager, agent managed object method allows for distributed management systems to be built with sophisticated structure. Each agent controls a specific network element whose parameters are stored in MIB. Managers retrieve the MIB data of their Agents, process them. Operators working at workstation can connect to any manager and using GUI, view information about the managed network or send controlling commands to managers to manage entire network.

The manager and agents communicate through the network using application layer protocol. This protocol allows the manager to request parameter stored in Mib and to supply the agent with information. On the basis of which it must control the object.

#### TOP CHALLENGES IN MANAGING NETWORK

- Acquiring resources
- Managing the client/server environment.

#### GOALS OF NETWORK MANAGEMENT

It involves strategic and tractical planning of the engineering, operations and Maintance of network.

It has its lowest layer as network management data transport services. A network management protocol used to exchange management information among managers and agents and service interface to the application elements. In the area of performance management ,the most importance categories of management information are Availability, Response time,Accurancy,Throughput and utilization.

Current network management:- The current network management systems are based on the SNMP protocol. Most of the commercial protocol components have embedded SNMP agents. Another limit of a SNMP based management system is that the values of the managed object should be defined as scalar values. The SNMP based Management system is the poll based system. Communication can be in to ways ,Manager asking agent

for a specific values and manager should be used to able to set variables in the agent.

1. A Management Information base what Variables the network maintained
2. Set of common structure and an identification scheme used to reference the variables in MIB.
3. The protocol between manager and element called simple network management.

Once an organization owns a particular domain the organization can decide whether to introduce addition hierarchical structure. Each computer has its own name. The system is designed to allow each organization to assign names to computers. The naming hierarchy helps achieve autonomy by allowing an organization to control all names with particular suffixes.

		DATA	
APPLICATION	VERSION	COMM	SNMP
UDP		SNMP	
IP HEADER		TRANSPORT	
DLC		NETWORK PDU	

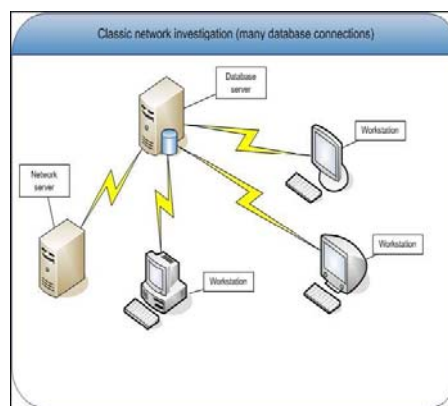


Fig. 1. Network investigation with different clients

### IV. SNMP PROTOCOL

The standard protocol used to manage an internet is known as Simple Network Management ptotocol.the current standard version is written as SNMPV3.The SNMP protocol defines exactly how a manger communicates with an agent. The Simple Network Management Protocol was designed to make networks and networked devices manageable using a simple protocol and standardized methods of representing management data. Until now, research on SNMP was based on some widespread assumptions on the usage of SNMP in practice. What the

actual usage patterns are was never the subject of research. Recently, research was started on how SNMP is used in practice and what the typical usage patterns are. This research has currently resulted in file formats and tools that make it easier to store and analyze traces containing SNMP traffic. This thesis discusses a part of this research on SNMP usage, namely the use of traces to generate statistics about the contents of these traces and draw conclusions from these statistics. In particular, this thesis is targeted at the following questions related to SNMP usage:

An SNMP message consists of a version identifier, an SNMP community name and protocol data unit. The UDP header is added at the transport layer which then forms the transport PDU for network layer. Version and community name are adds to the data PDU and along with the application header and entire message is passed on the transport layer at SNMP PDU. The UDP header is added at the transport layer, which then forms the network layer PDU for the data link layer.

Operations of protocol entity involves following steps as a guide.

```

RFC1157-SNMP DEFINITION: ::=BEGIN
IMPORTS
    OBJECT NAME, OBJECT SYNTAX, NETWORK
    ADDRESS, IPADDRESS, and TIMETICKS FROM
    RFC1155-SMI
-top level message
    MESSAGE::=
        SEQUENCE }
            VERSION
            INTEGER }
VERSION-1(0)
....
COMMUNITY=COMMUNITY NAME OCTET,STRING
DATA
PDU::=
CHOICE}
                Get-request
GETREQUEST-PDU
                Get-next-request
GETPREREQUEST-PDU
                Get response
GETRESPONSE-PDU
    
```

```

                Set-response          SET
REQUEST
                TRAP                  TRAP
-PDU
    
```

We sent the data by giving datagram packet which gives position inet address and local host number.

A datagram socket number is given by socket. In TCP/IP they send data through 192 server socket we use inet address to get the name of the computer.

DEVELOP REMOTE TASKLEVEL MANGER

It uses a two level hierarchy. The toplevel manager is built as a group of cooperating application. The Toplevel manager is built as a network monitoring application. Top level manager passes messages to the clients . The clients immediantly give response as time slot is calculated. Suppose one of the clients did not response or lack of time the data is rebound . SNMP Traps to report critical

information to top level manager.the top level manager has the responsibilities check the capacity available on the backbone of networkmanagement. The system uses IP/UDP to secure communication across the backbone network. First the client can view the currently running process in the connected system.The server will send details as a response to the client.

V. THE EXPERIMENTS AND RESULT

**The network technologies** calculate the speed they do not use qualitative forms they use quantitative forms . A server sent messages to the different clients and the messages is sent at a time to all the clients and the time taken is measured in seconds.Ftp uses the client server paradigm. A user runs a local FTP application which interprets commands that the user enters. When the user enters open command and specifies a remote computer.

In general an architecture in which an organization uses a single server in the simplest can minimize cost by domain in information in a single server. Large organization usually finds that a single centralized server does not suffice for two reasons (ie) Single server and computer on which it runs cannot handle arbitrary request at high speed. Large organization often finds it difficult to administer a central database.

DELAY:

The delay of a network specifies how long it takes for a bit of data to travel across the network from one computer to another, delay is measured in seconds .Delay may differ slightly, depending on the location of the specified pair of the computers that communicate. Propagation delay occurs Server sends messages to the client and it

responses .during this operations, we calculate the full utilization of cpu ie, periods in seconds .utilization of memory is also calculated. Some delay in a network arises because a signal requires a small amount of time to travel across a wire or optical fiber is propagation delay which is in milliseconds. Each packet switching enquires incoming packet as apart of store and forward. I it contains packets, it should wait while cpu forwards packet such delay is queuing delay utilization .

**Throughput:**

The second fundamental property of network that can be measured quantitatively is throughput. It measures the rate at which data can be sent through network and is usually specified in bits per seconds. Throughput can be measured in several ways ,the rate at which the data is sent through bandwidth, each frame has a header which means effective throughput is less than the bandwidth. Throughput is the measure of capacity. It differ from speed in such a way it takes the second when it enters .To understand the relationship imagine a large server and client network was sending messages through the protocol ,the throughput says how many messages enter in client and server. The server enters two times then the client. The expected delay can be estimated from the current percentage of network capacity being used. If D1 denotes the delay when the network is idle and u is value between 0 and 1 that denotes the current utilization effective analysis.

**Table 1. Main processing time for all clients**

Client time	Response	get	Total
Client-1	124	234	358
Client-2	100	67	167
Client-3	400	234	634

From this time of get request and request we can calculate processing interval between the clients. This result can show us how much capacity is involved by the processor

**VI. SUMMARY AND CONCLUSION**

The following general conclusion is achieved by implementation. When the server interacts with the clients in large amount of data the time is calculated in milliseconds. The time is calculated. Propagation delay and queuing delays calculated. The cpu utilization is seen if it is wasted and waiting time is minimized. All the clients who interact with the same server in large amount of data should use SNMP protocol in network management to minimize this problem.



This output shows how the message is sent and time periods is calculated in milliseconds

With this message is calculated and the cpu utilization is measured. The other further research is how we should tackle to send same messages in a same path in server.

We are monitoring the network using SNMP

In our Network management. We compare the clients and server interaction in milliseconds.

We have developed in c sharp and xml for the network interaction .each client can be easily maintained through the message system. Remote system can be easily maintained through the channel, task manager and server.

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**V. Vallinayagi** I amdoing research on SNMP under the guidance of DR.VICTORPAUL from Xavier's college And received M.SC, M.PHIL degree. I was working as lecturer in computer department in sarada college for 12 years. I have guided 6 students for M.PHIL in various university.