BPING – A MULTIPLE PING SOFTWARE

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ABSTRACT

B Ping provides unique value for monitoring a network and troubleshooting. Most of the times network has fluctuating nature which leads to hindered service .BPing allows monitoring numerous routers simultaneously. This enables selection between multiple possible hosts to monitor uptime and performance, or for the purpose of keeping track of general connectivity .The report generation which this software aims to implement allows the user to understand performance metrics on a daily basis through reports. These reports will be generated automatically using the data extracted from the simultaneous multiple pinging of the TCP/IP hosts. This proposed technology will drastically reduce the manual labor of report generation, thus allowing user to make better use of resources and time.

Keywords: Connectivity, ICMP (Internet Control Message Protocol), Latency, Ping (Packet Internet or Inter-Network Groper), Report, TCP/IP.

I. INTRODUCTION

Network monitoring is the process of using a system which constantly monitors a computer network for lagging or straggling elements and notifies the network administrator (through email, SMS or warning devices) if necessary, in case of outages. It is an essential activity in network management.

The basic intrusion detection system monitors a network for attacks or threats from the exterior environment whereas a network monitoring system monitors the network for problems caused by overburdened and/or slow servers, network connections or other elements in a network.

For example, to check the status of a web server, the software may periodically send an HTTP request to fetch a page. For email servers, a test message might be sent through SMTP and retrieved by IMAP or POP3.

Commonly used metrics in network monitoring are response time, availability and uptime. Nowadays consistency and reliability metrics are also starting to gain popularity. The ubiquitous use of WAN optimization devices is having an unfavorable effect on most network monitoring tools -- especially when it comes to measuring accurate end-to-end response time because they limit round trip visibility.

Status request failures - such as when a connection cannot be established, it times-out, or the document or message cannot be retrieved - usually produce an action from the monitoring system. The various actions could be -- an alarm may be sent (via SMS, email, etc.) to the resident system admin, automatic failover systems may be activated to remove the troubled server from duty until the problem is rectified.

Observing the performance of a network uplink is commonly known as network traffic measurement. When monitoring an internet server, its owner should always know if one or all of his services go down. Server

monitoring can be of two types, internal and external. In internal the web server software checks its status and notifies the owner if some services go down whereas in external the web server monitoring companies check the services status with a certain frequency. Server monitoring has various other activities involved like examining system metrics, for example CPU usage, memory usage, disk space and network performance. It could include application monitoring feature like checking the processes of programs. These programs could be the basic ones like MySQL, Apache, Postgres or Nginx.

External monitoring can be considered more reliable, as it keeps on working even when the server completely goes down. A good server monitoring tool should also have additional features like alerting tools, performance benchmarking and a way to link certain thresholds with automated server jobs like performing a backup or providing more memory.

1.1 Services Worldwide

Network monitoring services usually have a number of servers across various countries spread around the globe. It could be Europe, America, Australia, Asia or any other locations. When a monitoring service has multiple servers in different geographical locations, it can easily check the status and diagnose a Web server if it is available across different networks worldwide. With more widespread locations we get a more complete picture on network availability.

1.2 Web Server Monitoring Process [1]

When a web server is being monitored for the likely threats or network problems, an external web monitoring service checks a number of parameters. First, it monitors for a proper HTTP return code. By HTTP specifications RFC 2616, any web server returns several HTTP codes. Analysis of the HTTP codes is by far the fastest way to determine the current status of the monitored web server. Market available third-party application performance monitoring tools have capabilities like alerting, additional web server monitoring, and reporting capabilities.

II. WHAT IS PING?

Ping is a basic Internet program that allows a user to verify that a particular IP address exists and can accept requests [2]. Ping is used to ensure that a host computer the user is trying to reach is actually operating. Ping works by sending an ICMP Echo Request to a specified interface on the network and waiting for a reply.

Ping can be used for troubleshooting to test connectivity and determine response time. As a verb, ping means "to get the attention of" or "to check for the presence of" another party if it is up or down. The acronym for PING is Packet Internet or Inter-Network Groper which was contrived to match the submariners' term for the sound of a returned sonar pulse.

III. POTENTIAL USES OF PINGING IN SOFTWARE

Ping is a crucial security tool for any network administrator .This TCP/IP diagnostic utility gives us an insight into how ping works, and what it means when a ping request times out or reaches a network host. Various uses of ping could be as follows [3]:

- Monitoring many IP addresses simultaneously.

- The software allows users to keep track of which of IP cameras are responding, and can alert you if one (or more) goes down - so that the user can get it fixed before it becomes an issue.
- It can monitor key servers/routers/machines to check their status, if they are responding. If yes, then how quickly they're responding. If there is a large network with a lot of connected devices the network monitoring software makes it more convenient to record and observe the whole network.
- The software can help pick the best server to make sure that the user gets the best performance that can be achieved. It is also possible to keep a list of potential servers that the users might use, and sort them by packet loss, latency or other factors.

IV. REPORT GENERATION

A report generator is a computer program whose task is to take the data from a source such as a database, XML stream or a spreadsheet, and use it to produce a documents or reports in format which makes deciphering and extracting information easier for humans [4].

Report generation facility is always provided with the well known database systems. Here the source of the data is the database itself. Sometimes it is said that report generation is part of the purpose of a Spreadsheet. Standalone report generators have capabilities of working with multiple data sources and distribute reports in different document formats.

It is said in Information Systems theory that the information which is provided to a user or human reader should be Timely, Accurate and Relevant. Report generation utility satisfies the requirement of target users who desire to reduce the manual labor of preparing reports which involves wasting human resources dedicated to this work alone. These human resources can be better used elsewhere when the reports are generated automatically by the software.

V. DESCRIPTION OF THE PROPOSED DESIGN OF BPING

5.1 Sequence Diagram

Explanation of sequence diagram in Fig. 3:

- The sequence diagram shows the flow of the software in a proper sequence.
- First the User provides the IP address to the software for checking its status.
- Then software pings the IP address/host, and receives reply data from the particular IP address.
- Software sends the ping status to the user (up or down) and stores the latency details (in milliseconds) in the database.
- When the user requests to generate reports, the software provides it by searching the database.

5.2 Report Generation Technique Proposed

Through our software we plan to implement a report generation technique to help professionals at the management level in organizations who could use this software by utilizing human resources more efficiently and also to keep a check on the internet service providers at the organization's various outlets.

Various other proposed features are:

- Monitors the performance of the desired targets, allowing easy comparison of the performance of the targets simultaneously.
- Minimize system tray functionality.

- Can save lists of IP targets to monitor for later use.
- A graph of packet loss is visible.

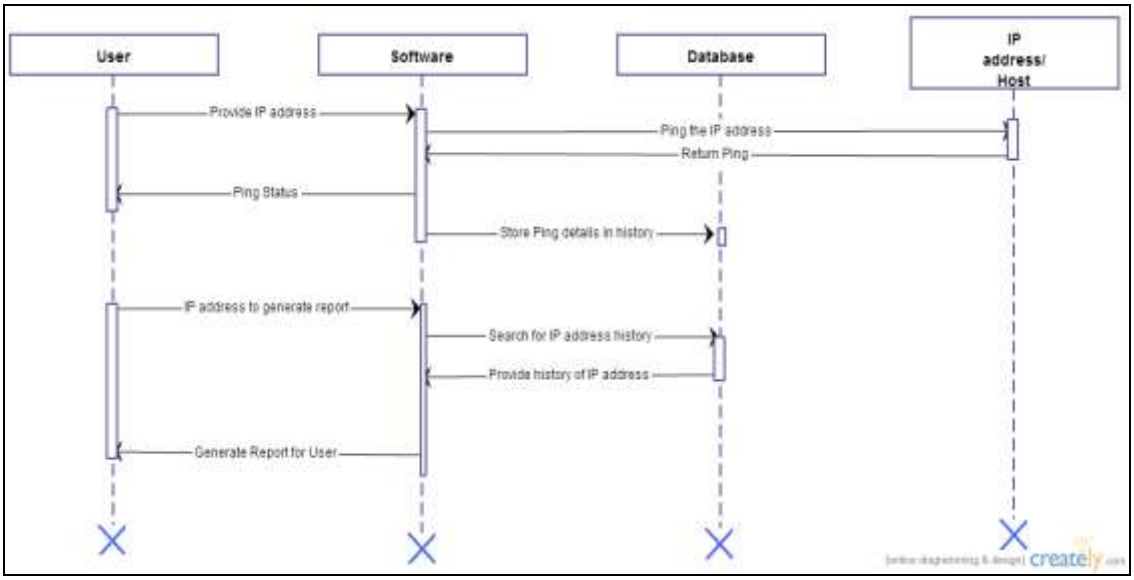

Fig. 3 Sequence Diagram of the proposed design of BPing

5.3 Platform Description

The network monitoring utility software was tested on x86 architecture machine. The application is built using Java programming language making it easily available across most heterogeneous environments and configurations.

VI. CONCLUSION

When we measure the time taken by a packet to reach a target and return back to the origin it is called as the latency or ping time. In the most broad understanding, every user wants this ping time to be as low as possible to ensure a good connection to that pinging target. This ping time is displayed in BPing as the response time in milliseconds (also called "Round Trip Time" - the time it takes for the packet to travel towards the destination and back to the origin). Thus the feature is ultimately used in monitoring the IPs and alert the user if the target fails to respond (which will show up as a lost packet, red, in BPing), or is responding slowly.

BPing's guarantees high performance since it consumes minimal resources and is built using Java technology. Its lightweight code and user friendly GUI allows the user to send multiple ping requests to multiple targets simultaneously at a periodic interval of his/her choosing. All of this ping information is further stored in backend database which can also be depicted in graph format for better information interpretation. The built in report generation utility reduces the manual labor required at any organization thus making it an essential and efficient software.

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