PROJECT NAME: Web Proxy Manager

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TABLE OF CONTENTS

ABSTRACT

(Topic: Web Proxy Manager)

Introduction :

In the internet world with lot of devices at the back bone, it is very essential to ensure the 100% availability of such devices and mission critical business applications. Also need to ensure whether they are performing the best. Hence it is evident that such devices and mission critical applications needs to be managed. The most preferred management protocol known is SNMP (Simple Network Management Protocol): because it is simple, less footprint(memory) and highly suitable for fault and performance management. But SNMP is not preferred to be accessed via internet as it uses UDP transport, which was considered as a major drawback.

Goal :

In this project , our goal is to make SNMP-enabled devices accessible via internet (using WebBrowser like IE, Netscape etc.) through HTTP protocol. Hence this Java-based project is named as "**Web Proxy Management Server**" which proxies the HTTP requests from WebBrowser

as SNMP requests to the device. Similarly alarms (called as 'traps' in SNMP world) received from devices will be translated and served in HTML pages to the web client (WebBrowser). We intentionally included the word 'Server' in the title because the SNMP collected data and received SNMP traps, will be stored in database for serving the web clients.

Benefits :

- Legacy devices (with SNMP enabled) management through Web
- Light weight client for management (HTML pages through Web)
- Managing multiple OS, Devices from single point GUI
- Standard based management (using SNMP, HTTP protocols), and NOT proprietary

Key Features :

- Convert(or Proxy) HTTP requests to SNMP requests
- 3-Tier architecture
- Complete FCPS (fault, configuration, performance, security) support
- Incorporates state-of-the-art technologies like JDBC, XML, JSP
- Multiple web clients (Web-Browser) can connect to this server

- Role based access of management data (Administrator, User roles)

How different the "Web Proxy Management Server" from free/commercially available network management products ?

There are few commercial vendors with products for managing SNMP enabled devices, OS : namely HP, AdventNet, Micromuse etc. These vendor products can contact the SNMP agents and provide thick clients to display the management data pulled from these SNMP agents. Apparently these FAT clients are proprietary and cannot be accessed through internet (i.e not Web-Enabled).

This project, 'Web Proxy Management Server', can pull management data using SNMP protocol, store them in database, and automatically convert them to HTML pages, such that the management information can be accessed via Web (through HTTP). We use Tomcat web-server for serving the HTML pages. Also we use AdventNet's SNMP stack for encoding and decoding SNMP packets. The management data is stored in a database. It supports any database (like Oracle, MySQL) that provides JDBC support.

1. INTRODUCTION TO NETWORK MANAGEMENT

The world we are so accustomed to today is due to man's basic necessity to interact and communicate with his own kind. Language was invented as an outcome of this, and this urge just kept growing. Today, one of the most promising fields is media and communication. This has become such a booming business due to the phenomenon called networking in computers. This later gave birth to presumably the greatest child of man's mind- THE INTERNET.

The key concepts in Network management

- Fault Management
- Configuration Management
- Accounts Management
- Performance Management
- Security

Shortly called as **FCAPS.**

Some of the other areas covered under Management Functional Areas include:

- Chargeback
- Systems Management
- Cost Management

Various protocols are suitable for specific tasks of the FCAPS(eg):-

1.HTTP- Configuration, Accounts, and Security management

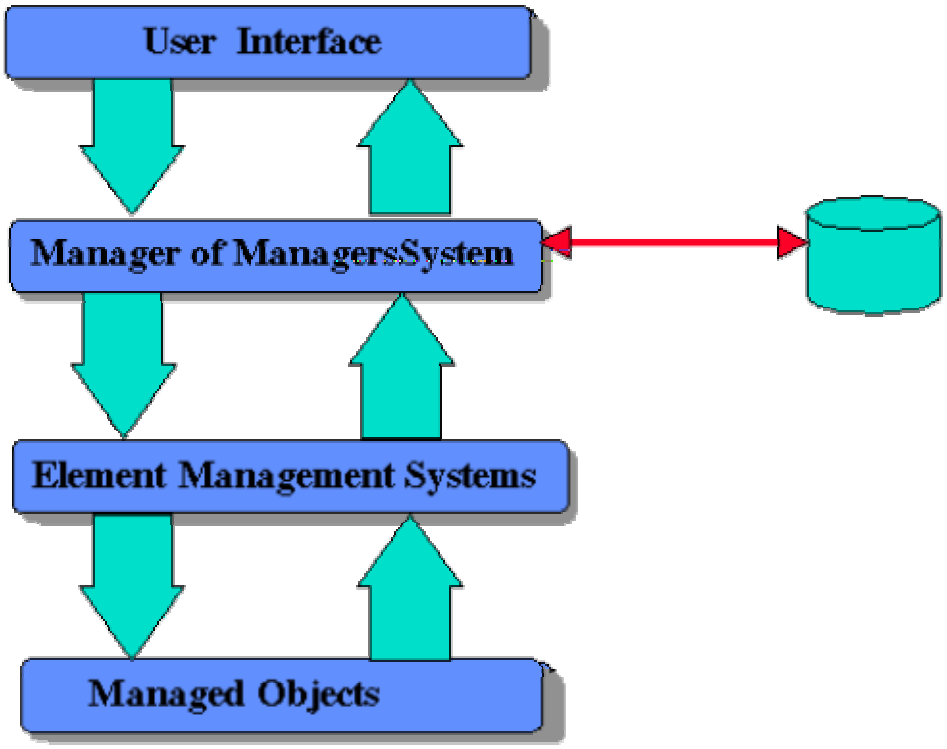
2.SNMP- Fault and Performance Management

3.Telnet- Configuration management

4.CLI(Command line Interface)- Configuration management.

Network management systems have four basic levels of functionality. Each level has a set of tasks defined to provide, format, or collect data necessary to manage the objects. Figure 1 illustrates these four levels of functionality.

Figure 1


User Interface
Manager of ManagersSystem
Element Management Systems
Managed Objects

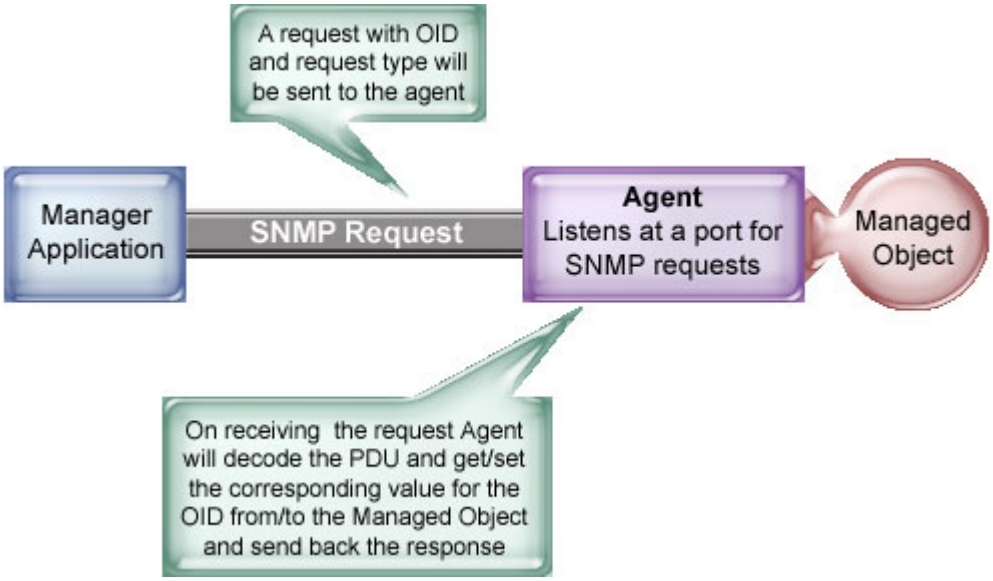
2.OVERVIEW OF SNMP

The Simple Network Management Protocol (SNMP) is by far, the dominant protocol in network management. This Protocol (SNMP) was designed to be an easily implemented, basic network management tool that could be used to meet network management needs.

It is named Simple Network Management Protocol as it is really easy to understand. A key reason for it's widespread acceptance, besides being the chief Internet standard for network management, is it's relative simplicity.There are different versions of SNMP like Snmp V1, Snmp V2c and Snmp V3.

SNMP facilitates communication between a managed device (a device with an SNMP agent, e.g. a router), and an SNMP Manager or management application (represents a user of network management). The SNMP agent on the managed device serves to provide access to data (managed objects) stored on the managed device. The SNMP manager or management application uses this access to monitor and control the managed device.

Fig-2 SNMP Agent Manger relationship



SNMP BUZZWORDS

- **AGENT-** It is a program which will communicate with the Manager on one side and with Device or Application on the other side.

- **MANAGER-** It as an entity which will manage one or many agents from a remote place.

- **MIB (Management Information Base)**

  MIB is nothing but a document about the device or the application.

  MIB which will have information like the variables that should be published outside (to the Manager),

- **OID (Object Identifier)**-Each variable is assigned a unique identifier in SNMP, that is called an object identifier**.**

Thus SNMP has become the dominant standardized network management scheme in use today. The SNMP set of standards provides a framework for the definition of management information along with the information. The SNMP model assumes the existence of Managers and Agents.

3.COMMON PROBLEMS IN SNMP

- The scope of SNMP is restricted only to Intranet.
- SNMP is not suitable for configuration and security of the FCPS.
- SNMP normally requires a thick client.
- SNMP cannot be used in web enabled devices as it uses UDP transport.
- communications systems are considered non-manageable because they are only accessible by an RS-232 port and not by SNMP

PROBLEM STATEMENT FOR OUR PROJECT

Taking into account the fact that SNMP is not suitable to be accessed by web enabled devices but provides a strong n/w management features we came forward to design a WEB PROXY MANAGER that proxies the HTTP requests from WebBrowser as SNMP requests to the device

In this project , our goal is to make SNMP-enabled devices accessible via internet (using WebBrowser like IE, Netscape etc.) through HTTP protocol. Hence this Java-based project is named as "**Web Proxy**

Management Server" which proxies the HTTP requests from WebBrowser as SNMP requests to the device. Similarly alarms (called as 'traps' in SNMP world) received from devices will be translated and served in HTML pages to the web client (WebBrowser). We intentionally included the word 'Server' in the title because the SNMP collected data and received SNMP traps, will be stored in database for serving the web clients.

4.WEB PROXY MANAGER GOALS AND ANTIDOTE TO THE PROBLEM STATED

Goals

- Legacy devices (with SNMP enabled) management through Web
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Key Features :

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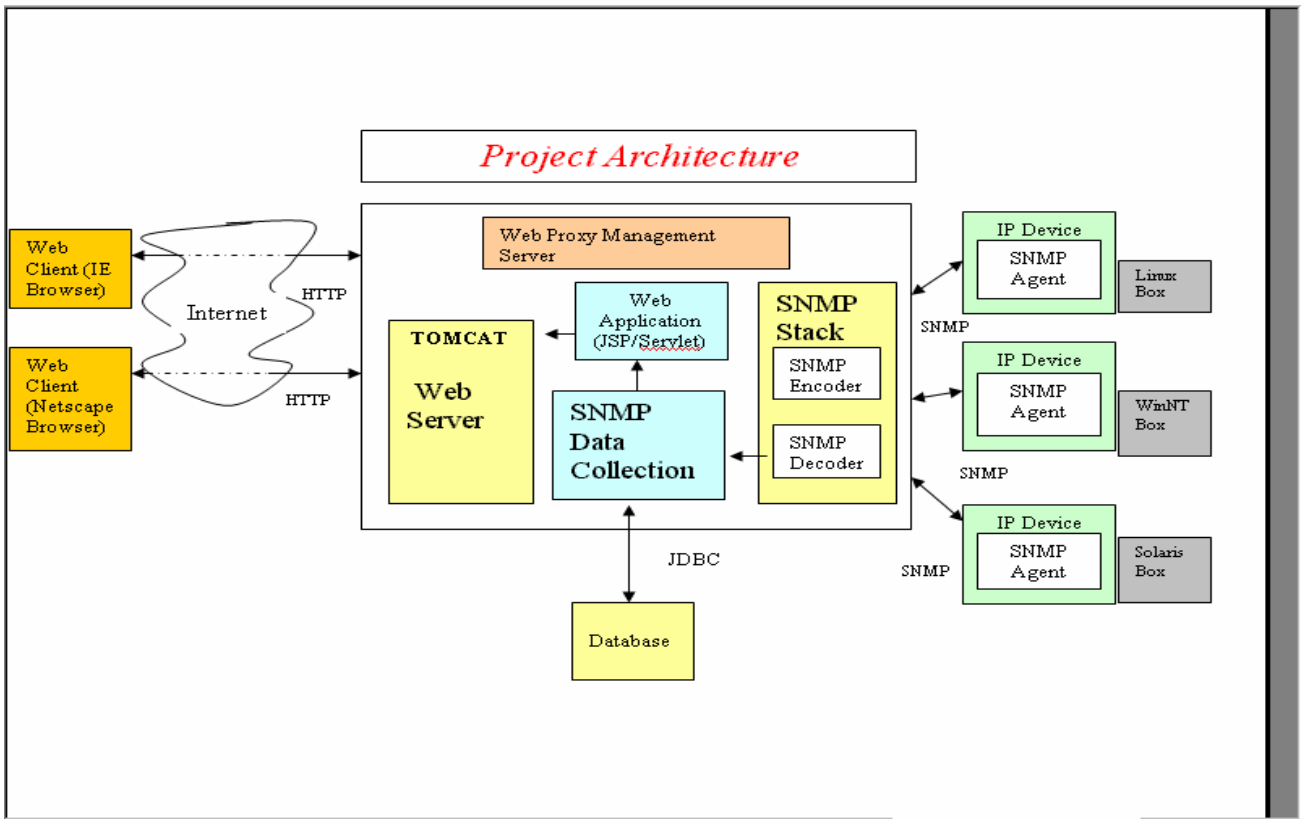
5. HIGH LEVEL ARCHITECTURE OF WEB PROXY MANAGER



6. COMPONENTS OF WEB PROXY MANAGER

- Tomcat web server- for serving the HTML pages :
- AdventNet's SNMP stack- for encoding and decoding SNMP packets
- JDBC supported database-for storing management data.

7. How to Use Web Proxy Manager - Toolbar

The operations allowed with the WPM are available through the series of buttons in Toolbar at the top of the WPM's main window. Click the buttons to get the informations.

- To do a GET operation click on the  . This will get all objects under the selected MIB object, or the specific object if the MIB node and instance are specified.
- To do a GETNEXT operation click on the  . This will get the next object after the specified object, or the specific object instance if a MIB node is specified.
- To do a SET operation click on the  . This enables setting the value of the specified object, based on the value in the **Set Value** field. To

do a SET for Octet String Type in hex format enter the bytes in hex format with each bytes separated by a colon and the entire string within single quotes. For example to give 0xff0a3212 enter 'ff:0a:32:12' in the SetValue field.

- To configure and parse the trap events click on the 
- To clear the TextArea click on the  . It clears the QUERY RESULTS , which sometimes overflows it's capacity and needs to be cleared.
- To see the off-line help of WPM click on the  . This will bring up the help window.
- To exit from the WPM click on the  .

USING TRAP BROWSER

TrapBrowser is used for receiving the traps. Using this you can view the incoming traps to the specified port. The traps can be sent from any host. The port number and the community name has to be set in the Trap Browser. The trap originator should send the trap to the port number specified in the Trap Browser.

Sending trap:

1. Run snmpv2ctrap passing suitable arguments as follows

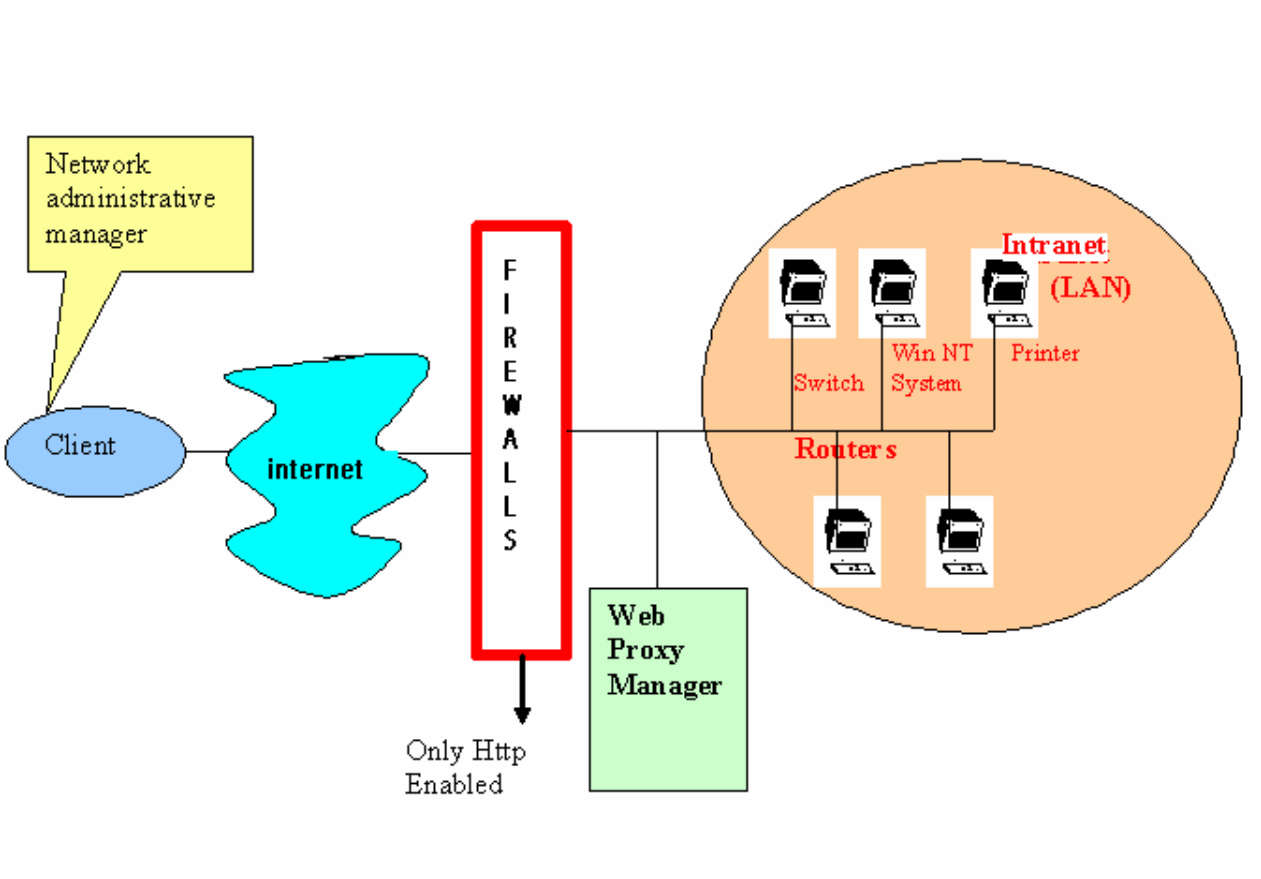
ex: java snpv2ctrap -p 162 -c public localhost 1000 1.2.0.1.5.0 STRING sampletrap

2. The required trap message can be provided instead of sampltrap

Receiving Trap Message

1. Open the Trap Browser
2. Specify the port number and the community string
3. Start the session
4. The trap message is checked for every 5 seconds in the specified port and refreshed.

8.WEB PROXY MANAGER'S USAGE



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9. PRESENT FEATURES OF THE PROJECT

- We have designed this project as a commercially viable one so we have incorporated SNMP-get , SNMP-get next , SNMP-set , SNMP-trap methods
- Have a inbuilt OID mapping feature.
- Increased GUI
- Highly enhanced and more viable trap browser
- High portable WPM Browser in which desired port no: and connecting host can be specified dynamically.
- Comes with a AgentSimulator (Adventnet's SNMP API) case SNMP services is not available in the deployed environment.

10. CONCLUSION

- Thus we believe that our project is successful in simplifying and structuring the scope of managed objects as applicable to a broad range of networks.

- To monitor and control the managed objects in a network from remote location through HTTP protocol.

- To apply the same network management facilities provided by web proxy manager to all kinds of network (Linux, Unix, Windows, Novellnetware).

- This project, 'Web Proxy Management Server', can pull management data using SNMP protocol, store them in database, and automatically convert them to HTML pages, such that the management information can be accessed via Web (through HTTP)