

***NETWORK MONITORING SYSTEM IN LOCAL AREA NETWORK USING
REMOTE METHOD INVOCATION***

By Reshma Dhande

Abstract

Today complexity of network is increased due to the diversity of the technology and other application. Network Monitoring System includes supervising all the computers that are connected in LAN. Network were assumed to be private, isolated and physically secure or else completely public because this assumption is no longer true due to use of internet in small areas for the purpose of sharing; a considerable amount of private information is being sent over the public network. Network monitoring system consists of two terms that are monitoring and controlling, Monitoring includes observation and Controlling includes managing various task. As the numbers of workstation are many in the network, it is difficult task for the network administrator to off each and every workstation individually. Network monitoring system is Client Server based systems in which server monitors all the Client that are connected in LAN. As it is client server based system server has abilities for terminating remote task, server also sees what is happening at the client side by taking images of the client desktop. This system also provides file transfer. The aim of this paper is to provide reliable, efficient and secure computing environment in LAN by using various protocols for communication.

Keywords

RMI, LAN, Monitoring, Security, Java, Client, Server.

Introduction

“**NETWORK MONITORING SYSTEM**” is the client-server based project. In this project administrator can keep the track of user’s running processes, time of login and time of logout.

As the numbers of workstations are more in the network, it is the difficult task for the network administrator to off each and every workstation computer individually. To simplify this in our project there is a provision for remote shutdown, reboot and logoff the workstation from the server. In addition to all this finally the report of login and logoff from particular workstation can be generated on server computer.

How NMS is invoked through java

Today the world is rapidly changing the statement “we are in the world” to “world is in our hand”¹. Monitoring and networking through LAN is done by RMI i.e Remote Method Invocation which allows the java object invoke on anther machine and execute on another machine. This allows us to build distributed application. Before the use of client and server, the necessary stubs are generated³.

In context of RMI, a stub is a java object that resides on the client machine. Its function is to present the same interface as the remote server. Remote method calls initiated by the client are actually directed to the stub. The stub works with the other parts of the RMI system to formulate a request that is sent to the remote machine. All of this information must be sent to the remote machine. That is, an object pass as an argument to remote method call must be serialized and sent to remote machine. Hence the administrator can view the dynamic and static snapshot of user’s desktop and then sends warning messages to the user to stop that operation immediately³. Even than if client do not stop the work the administrator has the facility to abort the system whatever necessary he thinks.

Network management and monitoring

The main goal of network management system is to ensure the quality of services (Qos) that the network provides. To achieve this, network managers must monitor and control the connected

elements in the network. The network monitoring portion of network management is concerned with observing and analyzing the status and behavior of the network devices that make up the configuration to be managed. Accurate and effective monitoring is therefore fundamental and critical for the implementation of various network management functions.

Network management systems handle problems related to the configurability, reliability, efficiency, security and accountability of the managed distributed computing environments, and is concerned with monitoring and control of network behaviors to ensure smooth network operations².

Components of Network Monitoring System:

A conventional network management system consists of two classes of components: *Client and server*³.

Features Controlled By Proposed System:

1. **MANAGE_REMOTE_TASK:** Remote task manager manages processes running on all clients. By using this task manager server can stop any process running on client terminal forcefully.
2. **CAPTURE_SCREENSHOT:** It capture remote desktop screen of client for observing whatever activity perform at that instant.
3. **DO_CHATTING:** It is used for administrator and clients for chatting with each other. It also used for chatting between client and client.

Architecture of Proposed System

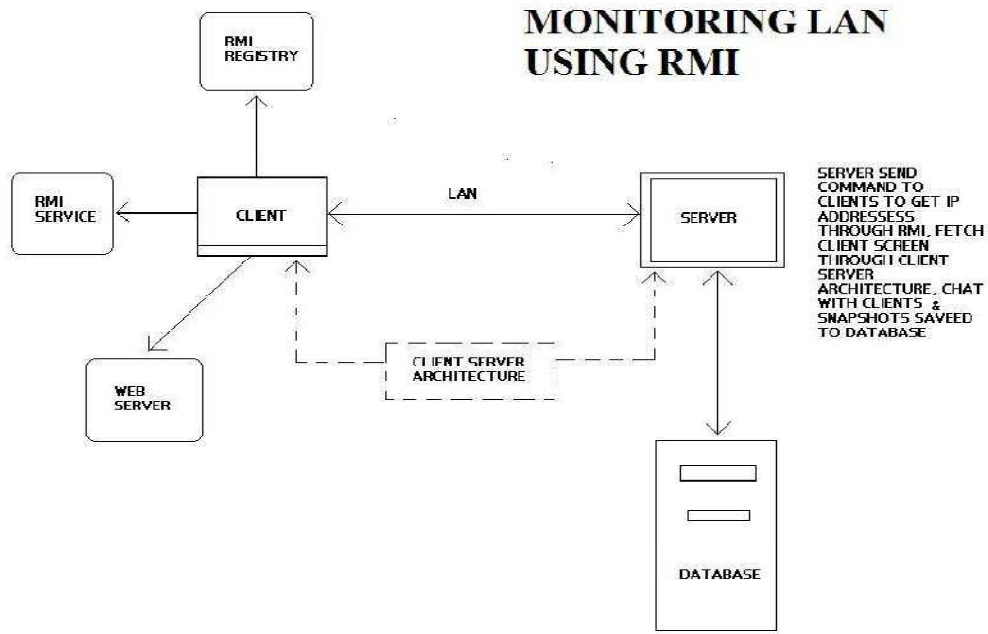


Figure 1

The diagram shows architecture of Network Monitoring System using RMI. The Client and Server are connected with each other through LAN. Once the Clients are connected server gets all the IP address Of Clients. After configuring Network adapter (Ethernet) card with proper IP address settings, the connectivity in computers in the LAN are tested using PING command. Execute the server first and then specify the IP address/DNS name in the client side. After checking the server is listening, sending request for connection from client side and connection is established between server and client. To get static images of Client desktop we need two applications: Client application runs on Client machine and Server application runs on server machine. (By viewing the images of the client's desktop, the server can know whatever happens at client desktop. if there is any illegal thing is happens then send warning message to the client. The client cannot send back or communicate to the server. The communication is unidirectional, it is not two way.). Server and clients are chat with each other. Database is used to store snapshot of the images.

Block Diagram of Proposed system

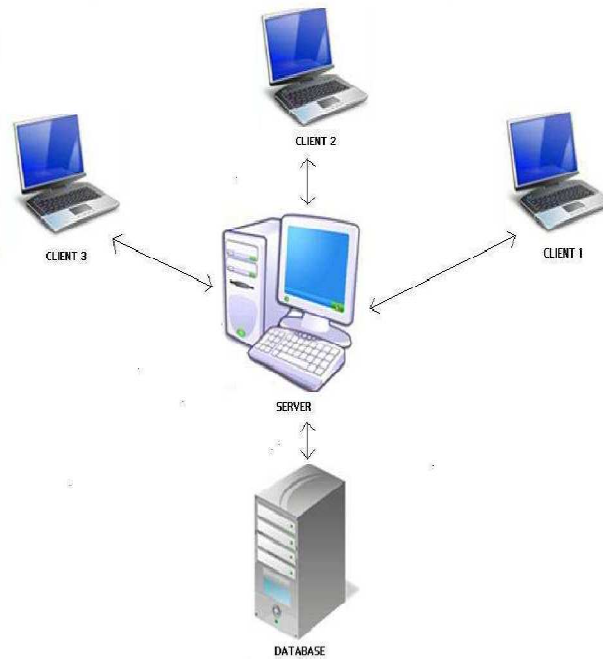


Figure 2

From the above block diagram we see that server has abilities to monitor all the clients. Server or administrator sends the request message to the client through RMI. But the client does not know there is a remote request came and without knowledge of client the automatically response message generate on behalf of request in the form of IP addresses and this will send to the server. Now with the use of client server architecture, the server gets the static image of any of the clients desktop. If server or administrator finds anything objectionable in the network or any particular system, an administrator has the power to abort that operation by sending warning messages to the user to stop that operation immediately. Even than if client do not stops than administrator has the facility to abort the system remotely or restart the system whatever necessary he thinks When the server shutdown the client, at that instant of images are saved to the

Databases a record 3.

Working of proposed system

Working of RTM(Remote Task Manager)

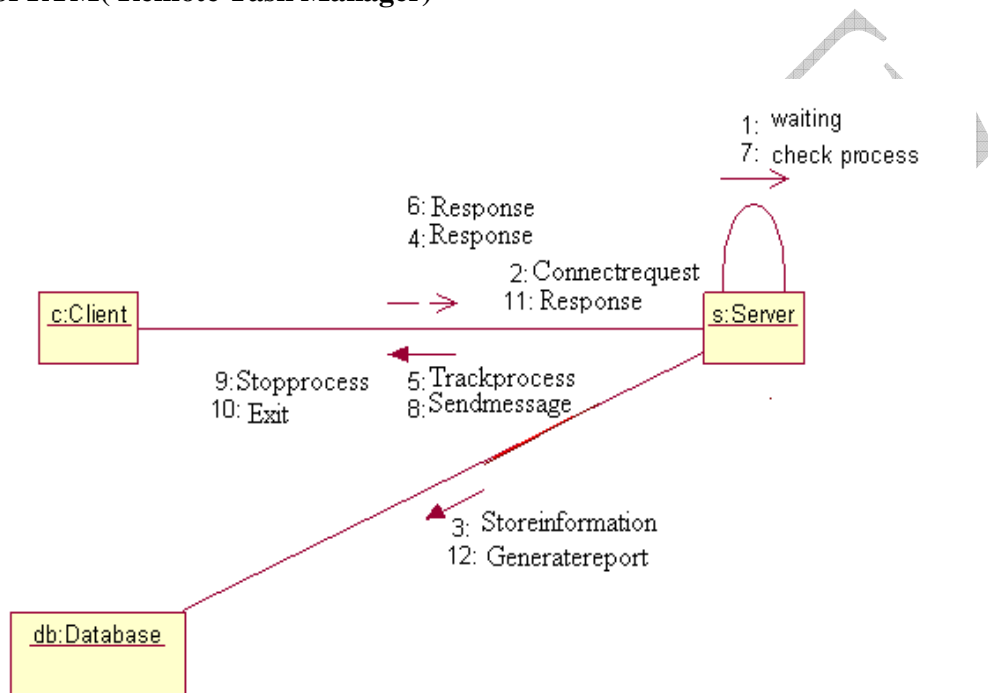


Figure 3

The **Remote Task Manager** is used to access the task manager of the client. The name of the task running on the client's side is enlisted along with its process id. RTM can kill process or it send warning message to client to close the respective process.

Working Of Screen Capturing

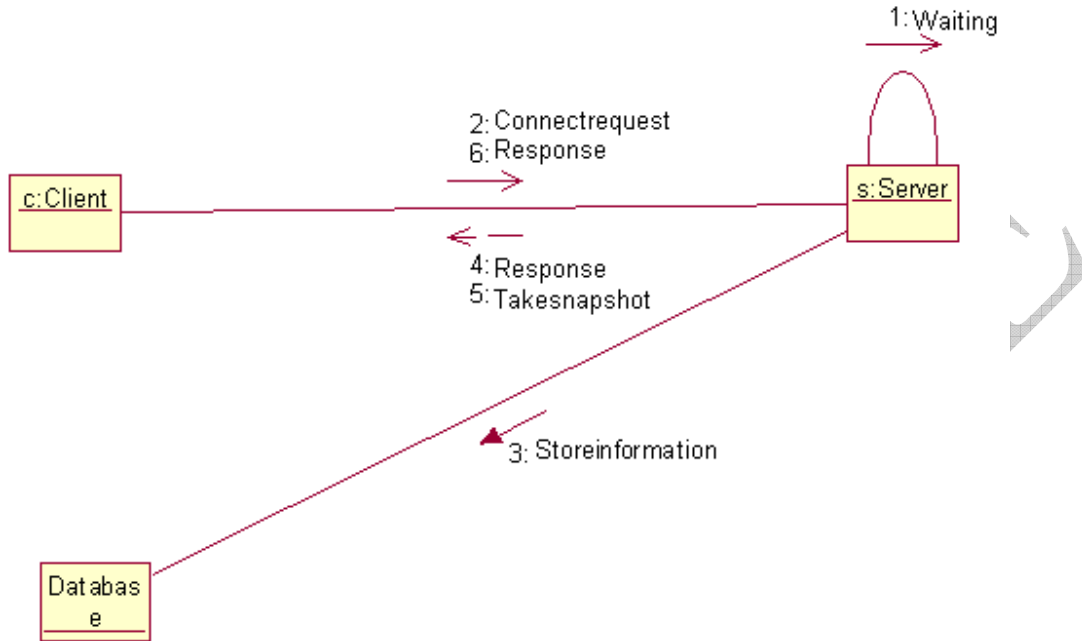


Figure 4

Screen capturing module has two subparts. They are **static** and **DynamicCapture**.

By using static Capturing static image of the client's terminal is shot. Whereas using Dynamic Capture, images of client's terminal is captured dynamically i.e after a specified time interval the captured image gets updated automatically and is stored in a folder named after the respective client at server side.

Moreover, for effective use of disk space, after 25 images are stored, the entire collection is erased and the 26th image is stored at the first location.

Result and analysis

Testing has been performed for verification of user name and password, connection establishment, chatting application, remote task manager, screen capturing and general utility. In login form testing the administrator ID and Password are checked. The ID is also tested for different passwords and vice versa. An error message is displayed unless entered with correct specified ID and password. After Verifying ID and Password he can get access to system.

After configuring Network adapter (Ethernet) card with proper IP address settings, the connectivity in computers in the LAN are tested using PING command. Execute the server first and then specify the IP address/DNS name in the client side. After checking the server is listening, sending request for connection from client side and connection is established between server and client.

After initiating the chat application at client and server side, it is checked that whether messages are passed correctly. If yes then Chat application was tested successfully.

In Remote task manager testing new process is made to execute at client's side and we see whether the task list at the server side is updated. After this is verified, a warning message is sent to client to shutdown the process. If the client doesn't respond to the warning message, the process is killed by server. In this way we can get required result.

In screen capturing the capturing and actually viewing the remote screen depends on the performance of the network (LAN). Screen can be captured without any delay as well as it can be viewed in real-time. Here also we got the required result.

Also in general utility testing the system gives required result.

After testing it was found that the output for given set of input was as expected. Hence gives the positive result.

Applications of proposed system

- Network monitoring at the office level can be used to monitor the office LAN by the administrator at any time. This Project is to maintain confidentiality, integrity and availability of the network infrastructure. Server or administrator does not have to depend on any third party information regarding the LAN and can instead check the LAN status himself.
- Network monitoring is very effective as a monitoring tool in offices/commercial places. For instance, if an employee is watching a movie on media player during office hours, it can be brought to light immediately and can be forced to close it.
- Network monitoring can be used in cyber cafes; hence can help to reduce Cyber Crimes.
- Network monitoring can be used in practical laboratories of schools and colleges so that a single person can keep a track of all the students of what he or she is doing without having to visit each and every terminal.

Conclusion

Security is an important aspect in the world of network. Various business organizations are providing special attention for confidentiality in VPN's. Also monitoring each and every computer individually is very tedious job for Administrator. Hence, a monitoring system plays a crucial role for administrating such networks.

Our project, 'NETWORK MONITORING SYSTEM' is designed taking into account these aspects. The application provides a very friendly interface for remote administration. The application can be easily enhanced with some additional features like controlling remote computers via SMS, getting the remote computer screens on GPRS enabled mobile phones.

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MONITORING LOCAL AREA NETWORK

USING REMOTE METHOD INVOCATION Harsh Mittal, Manoj
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Bio

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