

Network Traffic Monitoring Analysis System with Built-in Monitoring Data Gathering

S.Pothumani, N.Priya, T.S.M.Aditya

ABSTRACT - Networking, that is one among the foremost vital aspects of knowledge technology revolution, is developing progressively day when day. this is often as a result of it offers an enormous quantity of information, resources and human experiences. On the one hand, it contains a substantial quantity of harmful content, due to misusing. On the opposite hand, sitting for an extended time ahead of PC's or alternative network-based devices will have an effect on body badly. As enterprise computing environments become a lot of network-oriented, the importance of network traffic observation and analysis intensifies. Most existing traffic observation and analysis tools specialise in measure the traffic a lot of individual network segments. Further, they generally have sophisticated user interfaces. This paper introduces associated presents the planning associate application and implementation of an MS Windows-compatible software system tool that's accustomed manage networks usage and keep track of each network user activity. associate application consists of 2 components consumer and server. The consumer aspect could be a background application runs whenever the computer is run, it turns off only if the computer is turned off and launched with its startup. The server aspect is a lot of complex-GUI application that's accountable in the main for receiving information sent by purchasers cluster, managing and change information to produce network owner up to this point read. The effectiveness of associate application has been verified by applying it to associate enterprise network atmosphere.

Keywords - Network traffic observation and analysis; Traffic management; Enterprise network management

I. INTRODUCTION

As enterprise computing environments become additional network-oriented, the importance of network traffic observance and analysis intensifies. Most existing traffic observance and analysis tools specialise in measurement the traffic numerous individual network segments. Further, they generally have sophisticated user interfaces [Daadoo, M., Tarapiah, S., & Atalla, S. (2016), Evaluating], [Daadoo, M., & Daraghmi, Y., (2015), Searching].

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S.Pothumani, Assistant Professor, Department of CSE, Bharath Institute of Higher Education and Research, Tamilnadu, India

N.Priya, Assistant Professor, Department of CSE, Bharath Institute of Higher Education and Research Tamilnadu, India

T.S.M.Aditya Student, Department of Computer Science & Engineering, Bharath Institute of Higher Education and Research, Chennai, India Tamilnadu, India

The objective of the planned project here that it's designed associate degree application to assist networks homeowners to regulate their networks in a very correct manner by providing them necessary knowledge and dominant permissions over their shoppers. If conjointly aims to optimize accessibility and usefulness of management by providing a set of variable demands. This work is completed victimization 3 main well-known network protocols, that square measure communications protocol, RDP (Remote Desktop association Protocol) and hypertext transfer protocol. the primary one is employed to realize reliable transmission of shoppers running apps, IPs, MACs and snapshots. The second, that is RDP, is employed to offer server-part full management of needed shoppers. The third one is employed for communication with router to introduce additional management privileges[Bär, A, et al., (2014)], [Fusco, F, et al., (2010)].

The planned system consists of 2 parts: shopper and server. The shopper aspect may be a background application runs whenever the computer is run, it turns off only if the computer is turned off and launched with its startup. It contains set of categories designed to supply data regarding client's standing bestowed by: its basic access data (MAC and IP) addresses, a listing of running applications and on-demand live snapshots. Firstly, the server aspect is additional complex-GUI application that's accountable primarily for receiving knowledge sent by shoppers cluster, managing and change knowledge to supply network owner up thus far read. Secondly, it's accountable for causation management commands like work off and movement right down to needed station with ability to see a amount once that the command takes place. Thirdly, it provides facility of full management of the shoppers by victimization RDP protocol. Finally, it uses router data taken by hypertext transfer protocol requests to indicate a listing of doable criminal users, WHO have access to the network while not having shopper program put in on their machines, and provides chance of depriving them from accessing network any longer.

II. LITERATURE SURVEY

In a Network, LAN/WAN, maintaining the software remotely could be a crucial job for associate administrator.

Our planned project could be a remote desktop application that is providing remote service to its entire shopper over the network and offers answer to the network administrator to observe the Network Traffic that is provided at the server aspect and also the administrator will build firewall for LAN/WAN by providing some rules.

It acts as a network administrator to its shopper

by providing remote services like Remote Chat, Windows soul, Remote Desktop, Task Manager and board. Network Traffic observation lists all the network connections at the side of information science Address of native / remote machines with port numbers , shows the destination information science address and its port variety , displays all the method, even that aren't visible in Task Manager and additionally communicates with the computers on a network. RemoteChat is employed to speak with the required host within the network.Windows soul is employed to soul the network files. Remote Desktop captures the desktop of a mere host within the network. Task Manager provides data concerning programs and processes running on remote laptop Finally if we have a tendency to don't need any program we will stop that from obtaining dead within the machine by adding the program name within the Blocked program list.

Proposed project result's a whole tool that collects all info regarding your network and in a very very-well organized theme. This forms a friendly mechanism to watch a network and manage its configurations.

Precisely exploitation this technique, you can: Get useful info regarding your network. Keep a track of clients' activities. Control purchasers operational periods. Organize access to the web by piece of writing permissions and denying amerciable access. Share a shopper screen and monitor them. Send files to purchasers. Get a far off full management of purchasers at the same time.

All of this can be given in one place and in a very high performance and fast results.

The following snapshots represent the most screens accustomed perform the application: This is that the main interface it contains all management buttons in purchasers and router and displays network state and hosts information.

III. EXISTING SYSTEM

A.Router primarily based observation Techniques

Router primarily based observation Techniques area unit hard-coded into the routers and so provide very little flexibility. a short rationalization of the foremost ordinarily used observation techniques is given below. every technique has undergone years of development to become the same model.

B.Straightforward Network observation Protocol (SNMP) RFC one57

SNMP [Cisco5606] is associate application layer protocol that's a part of the TCP/IP protocol suite. It permits directors to manage network performance, notice and solve network issues, and arrange for network growth. It gathers traffic statistics through passive sensors that area unit enforced from router to finish host. whereas 2 versions exist, SNMPv1 and SNMPv2, this section deals with SNMPv1. SNMPv2 builds upon SNMPv1 and offers enhancements, like extra protocol operations. Standardization of yet one more version of SNMP. SNMP Version three - (SNMPv3)is unfinished There area unit three key elements to SNMP: Managed Devices, Agents, and Network Management Systems (NMSs).

The Managed Devices contain the SNMP Agent and may carries with it routers, switches, hubs, pcs, printers, and things like these. they're chargeable for assembling info and creating it out there to the NMSs.

The Agents contain computer code that have information of management info and interprets this info into a kind compatible with SNMP. they're placed on a managed device. The NMSs execute applications that monitor and management the managed devices. process and memory resources that area unit required for network management area unit provided by the NMSs. A minimum of 1 NMS should exist on any managed network. SNMP will act alone as a NMS or associate agent, or will perform the duties of each. There area unit four basic commands utilized by SNMP NMS to watch and management the managed devices: scan, write, trap, and traversal operations. The scan command examines the variables that area unit unbroken by the managed devices. The write command changes the values of the variables keep by the managed devices. Traversal operations look to seek out out what variables a managed devices supports and gathers info from the supported variable tables.The entice command is employed by the managed devices to report the incidence of bound events to the NMS. SNMP uses four protocol operations so as to operate: Get, GetNext, Set, and Trap. The Get command is employed once the NMS problems missive of invitation for info to managed devices. The SNMPv1 message (request) that's sent consists of a message header and a Protocol knowledge Unit (PDU). The PDU of the message contains {the info|the knowledge|the data} that's required to with success complete missive of invitation which will either retrieve information from the agent or set a worth at intervals the agent. The managed devices use the SNMP agents placed on them to retrieve the required info, so reply to the NMS with a solution to the request. If the agent doesn't have any info with reference to the request, it doesn't come back something. The GetNext command can then retrieve the worth of consecutive object instance. it's conjointly doable for the NMS to send missive of invitation (Set operation) that sets the values of things at intervals the agents. once associate agent has to inform the NMS of an occurrence, it'll use the entice operation.

As mentioned, SNMP is associate Application Layer protocol that uses passive sensors to assist directors monitor network traffic and performance. though SNMP may be a useful tool to Network directors it will produce a vulnerability to security threats as a **result** of it lacks any authentication capabilities. it's not like Remote observation (RMON) that's mentioned within the following section therein RMON monitors at the Network Layer and below, instead of at the appliance Layer.

C.Remote observation (RMON) RFC 1757

RMON [Cisco5506] allows numerous network monitors and console systems to exchange network-monitoring knowledge. it's associate extension of the SNMP Management info information (MIB). not like SNMP that has to channelize missive of invitation for info, RMON is ready to line alarms which will monitor the network supported bound criteria. RMON permits directors to manage native networks still as remote sites from one central location. It monitors

at the Network Layer and below. RMON has a pair of versions RMON and RMON2 this paper solely deals with RMON. RMON2 permits for observation of packets on all network layers. It focuses on information processing traffic and application level traffic.

IV. PROPOSED SYSTEM

projected Model for Network watching System
As shown in Figure one, the projected model has bidirectional communication theme, within which each server and consumer are operating as sender and receiver at the same time. The server receives a proof verify consumer state and bunch of basic info, then it sends management commands. Besides, to the consumer will a reversed job by causation its info to the server and receiving commands from it. Moreover, network's router or access purpose plays a very important role once it communicates with server over HTTP requests giving information regarding network users and receiving commands of hosts filtering.

A. Code style

Software may be primarily thought of in 2 components that are consumer and server components. every of them has its structure and its own device. The study goes to debate consumer aspect and therefore the server.

B. Consumer aspect

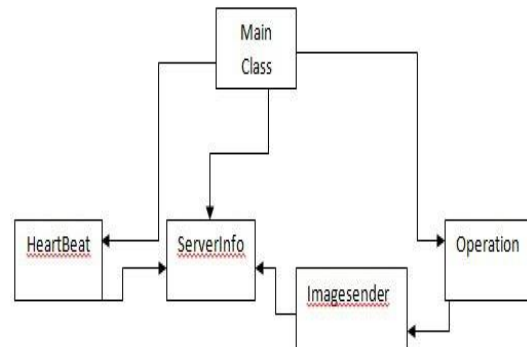
The consumer half represents a non-interface background-running method that does not would like any user interaction. consumer code usually needs to do 3 basic operations that are:

- Maintaining the server informatics.
- Sending the heartbeat (a set {of info|of data|of understandledge} makes server know that this consumer lives additionally to providing it client's access information and list of processes running in it).
- Sending a screenshots upon request in order that server will track client's screen on demand.
- To perform these operations, consumer half consists of 5 categories as follows:
 - Heartbeat category: This class is answerable for providing the server access info (IP and waterproof addresses), and standing info (List of running processes). This work is finished unceasingly each twenty seconds to stay server up to this point.
 - Image sender category: This class is answerable for causation a picture to the server that is decreased 1st before being sent to induce a lot of performance. Image is provided once a command is received from the server. This operation is named from the server each 0.5 second to create like-video streaming.
 - ServerInfo category: This class is answerable for providing server informatics to the category that needs it. It 1st reads server informatics from external file to keep up code flexibility and provide dynamic changes.
 - Operation category: This class contains implementation to manage commands that server sent. Operations supported are logoff, shutdown, mouse clicks, and take snap operation that take a snapshots and invoke image sender technique to send it.
 - Main Class: this can be answerable for providing a receiver

with commands sent to the consumer. It forms the registered lines of text returning in messages are taken and into handled commands.

The following Figure a pair of is showing the category diagram of the client:

Figure 2: consumer category diagram



As shown within the Figure higher than, the most category is maintaining either direct or indirect relationship with every of different categories. It initializes AN object of HeartBeat category within the 1st place with associated server info taken from ServerInfo category. HeartBeat operation may be a continuous operation that has got to be control all the time as AN indicator of consumer method health, thus each twenty seconds this operation is finished unceasingly. Then it becomes able to hear commands from the server in any time, during this case it's necessary to decision the Operation category with the specified operation that's triggered by the server. Technical aspects of the most components of the consumer aspect are projected within the a part of projected technique within the following pages.

Note: any consumer that accesses the network however not causation HeartBeat can seem within the server as a felon thus consumer program ought to be run as presently because the consumer computer is running, thus it's placed within the startup programs in windows to be lunched once the windows boots up.

In the consumer half we have a tendency to use The communications protocol protocol due to its dependableness options. It plays a very important role in each causation and receiving information to and from the server. It provides a reliable info delivery for the commands sent from the server. However, it insures that the consumer heart beat is accessing the server with none issues.

A. Server aspect

The server aspect may be a bit sophisticated than consumer. This half may be a GUI-based application that gives the user with the interface that concludes the state of network usually therefore the consumer elite by admin dominant information. It consists of 2 main components because it is answerable for doing 2 major jobs:

- Communicate with router to induce network standing.
- Monitor and send commands to the consumer.
- So it contains 2 categories that are:
 - Main category (Form): This category contains functions that are answerable for causation commands to the purchasers and maintains a user read for what's happening on them.
 - Raw Info category: This class is answerable for communication with router

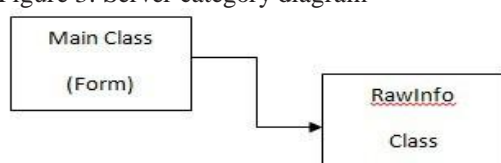
and it's the one that collects info from the router regarding the standing of hosts connected presently to the router. It contains components that handle router communication info and take care of basic authorization with HTTP protocol.

Most of the server practicality, that is concerned within the grammatical category in elaborated description, will be the following:

- Shutdown or logoff a consumer either presently or when a particular amount.
- Show list of each valid and invalid hosts.
- Provide ability of waterproof filtering to forestall embezzled users.
- Take snapshots from a consumer.
- Control a consumer remotely.
- Show a listing of running processes on a specific consumer.

The following Figure three is showing the category diagram of the server:

Figure 3: Server category diagram



Even it's less variety of categories and {simpler|easier|less sophisticated} outer relations server categories are a lot of complicated internally and are having a lot of details compared with the consumer one's.

As category diagram illustrates the most category instantiates AN instance of RawInfo category in order that it'll be ready to get info from the router or access purpose regarding the network state and therefore the active purchasers. and therefore the remainder of management and watching operations are encapsulated within the shape category. In the server half 3 network protocols are used:

- TCP (Transmission management Protocol): It provides reliable transmission of the server commands to the consumer. additionally to providing server connections info from the purchasers, the applications run on every consumer and on demand snapshots from the client's screen.
- HTTP (Hyper Text Transfer Protocol): This protocol is especially used for communication with router. as a result of router provides its info within the type of websites thus HTTP requests are the candidate tool to speak with router. Doing this, authorization header of the HTTP protocol ought to be manipulated as a result of accessing to router has to bypass router credentials that are enforced mistreatment basic access authentication. .net provides AN HttpRequest category with necessary attributes to simply put together authorization half to take care of such cases.
- RDP (Remote Desktop Protocol): it's a secure network communication protocol for Windows-based applications. RDP permits network directors to remotely diagnose and resolve issues encountered by individual subscribers. RDP is obtainable for many versions of the Windows OS in addition as waterproof OS X and open supply version is obtainable. Properties of RDP embody secret writing, open-end credit authentication, information measure reduction, resource sharing, the power to use multiple displays and therefore the ability to disconnect quickly while not work off. RDP additionally permits redirection of functions like audio and printing. This project uses the RDP protocol to produce

admin to log in any of his purchasers and have a full management thereon remotely which can greatly facilitate once purchasers face some issues that require facilitate to unravel while not efforts. Moreover, it provides a straightforward facility to transfer files any of the purchasers would like from the server. However, .net particularly C# doesn't totally support remote desktop image therefore the man of science uses ActiveX management to accomplish that half.

V. MODULES DESCRIPTION

A. List of Modules

- Monitoring
- Remote Chat
- Windows soul
- Remote Desktop
- Task Manager
- Control Panel

B. Modules Description

Monitoring: Monitoring shows the history of incoming and outgoing packets during a network. It additionally shows destination information science address and its port variety, besides that we will see the data point of a network.

Remote Chat: Remote Chat module provides communication with the required host within the network. Chat is meant for time period, unstructured conversations with users United Nations agency square measure signed on to the positioning at identical time. Remote chat is associate application that facilitates communication between completely different hosts on identical native space network. It doesn't need a central server and uses little information measure by taking advantage of a light-weight protocol and UDP packets.

C. Windows Explorer:

Windows soul module is employed to manage the files of a mere host within the network. Windows soul is associate application that has careful data concerning our files, folders, and drives. {we can|we will|we square measure able to} use it to envision however our files are organized and to repeat, move, and rename files, still as perform alternative tasks bearing on files, folders, and drives.

C. Remote Desktop:

Remote Desktop module captures the desktop of a mere host within the network. With Remote Desktop {we can|we will|we square measure able to} have access to a Windows session that's running on our laptop after we are at another laptop. This means, as an example, that we will connect with our work laptop from home and have access to any or all of our applications, files, and network resources like we have a tendency to were ahead of our laptop at work. we will leave programs running at work and after we get home, we can see our desktop at work displayed on our computing device, with identical programs running.

D. Task Manager:

Task Manager module provides data concerning

programs and processes running on remote laptop.it is providing remote operations like kill task and refresh list. Task Manager provides data concerning programs and processes running on our laptop. It additionally displays the foremost normally used performance measures for processes.

F .Control Panel:

Control Panel module provides remote operations like remote lock system, remote logoff, remote restart, remote ending, obtaining system data , obtaining username obtaining login time it request arrives from shopper . initial it parses the request and provides service to its corresponding shopper. it's additionally providing some fun operations like swap push button , clip mouse pointer, crazy mouse , traditional mouse , figure , set mouse Dbt click speed , open CD door , run game , run paint , run pad of paper.

VI. CONCLUSION

In this study of network management system, the projected approach is implementing a collection of wellknown networking protocols to search out everything concerning them and monitor the complete state of the network. it's associate degree economical methodology that has all required information concerning network appropriate manner that optimizes the required owner interactions that's necessary to tack together things as desired. the answer is programmatically sculptural by employing a set of straightforward and effective algorithmic techniques that manage client's communications do requests to the router pages, file transferring and screen sharing with basic dominant.

Moreover, the manner within which application designed improves user management potency once exploitation remote techniques, thanks to providing management of up to 5 devices at the same time adjacent tabs that management devices from remote sessions and windows remote affiliation utility, that provides every remote session in associate degree freelance window that causes problem in managing them by 2 remote sessions.

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AUTHORS PROFILE



S.Pothumani, Assistant Professor, Department of Computer Science & Engineering, Bharath Institute of Higher Education and Research, Chennai, India



N.Priya Assistant Professor, Department of Computer Science & Engineering, Bharath Institute of Higher Education and Research, Chennai, India.



T.S.M.Aditya Student, Department of Computer Science & Engineering,