Client Server based Fault Management System for LAN

Khin Khin Su
Lecturer
University of Computer Studies (Dawei)
Dawei,Myanmar

Abstract: This paper aims to implement the client server based fault management system. The user who uses this system can ping the clients within a network and the user can view the result of the message. It also provides to check the network card and this system can show the Network Card Setting. This system has two portions: client side and server side. The server listen the entire requests of the clients and response to them,

Keywords: Fault management system, Network Management System, Client/Server Network, Local Area Network

1. INTRODUCTION

The International Organization for Standardization (ISO) network management model defines five functional areas of network management. Among many types of Network Management Systems todays, the purpose of fault management is to detect, isolate, notify, and correct faults encountered in the network. Network devices are capable of alerting management stations when a fault occurs on the systems. An effective fault management system consists of several subsystems.[1] This objectives of this paper is to integrate network management information, to manage fault, configuration and security management, to track the client/server information and to detect hardware and software port of the server and USB.

2. METHODOLOGY

2.1 Overview of Network Management System

Network management involves a distributed database, auto polling of network devices, and high-end workstations generating real-time graphical views of network topology changes and traffic. In general, network management is a service that employs a variety of tools, applications, and devices to assist human network managers in monitoring and maintaining networks. The combination of equipment, hardware and software used in monitoring, controlling and managing a data communication network. The overall purpose is to provide practical recommendations on each functional area to increase the overall effectiveness of current management tools and practices. It also provides design guidelines for future implementation of network management tools and technologies. The early 1980s saw tremendous expansion in the area of network deployment. As companies realized the cost benefits and productivity gains created by network technology, they began to add networks and expand existing networks almost as rapidly as new network technologies and products were introduced. By the mid-1980s, certain companies were experiencing growing pains from deploying many different (and sometimes incompatible) network technologies. The problems associated with network extension affect both day-to-day network operation management and strategic network growth planning. Each new network technology requires its own set of experts. In the early 1980s, the staffing requirements alone for managing large, networks created for many organizations. An urgent need for automated network management (including what is typically called network capacity planning) integrated across diverse environments..

2.2 Network Management Functional Areas

The ISO network management model's five functional areas each of which represents a set of activities performed by operations personnel or customers. The network management system and the Intelligent Network Elements are involved in accomplishing the functioned task. These areas are

- Configuration Management
- Fault Management
- Performance Management
- Security Management
- Accounting Management

2.2.1 Fault management

Detect, isolate, notify, and correct faults encountered in the network. Fault Management applications include processing all events and determining if a fault is detected. Fault detection requires other functions including filter events, logging to maintain historical records that detect long-term trends, monitoring, notification, and reporting by generating alarms. The goal of fault management is to fix network problems to keep the network running effectively. Because faults can cause downtime or unacceptable network degradation, fault management is perhaps the most widely implemented of the ISO network management elements. Fault management involves first determining symptoms and isolating the problem. Then the problem is fixed and the solution is tested on all-important subsystems. Finally, the detection and resolution of the problem is recorded.

Fault management is the process of identifying and correcting network problems, otherwise known as faults. Faults typically manifest themselves as transmission errors or failures in the equipment or interface. Faults result in unexpected downtime, performance degradation and loss of data. Generally, fault conditions need to be resolved as quickly as possible. Comprehensive fault management is the most important task in network management. Fault management tools can help increase the reliability of the network by quickly identifying the fault, and then help initiate the recovery process. The first step is to identify the fault, isolate the cause of the fault, and then, if possible, correct the fault. This three step process requires predetermining which faults should be managed and be given higher priorities than others, and then utilizing a set of tools to resolve the fault through the network manager.
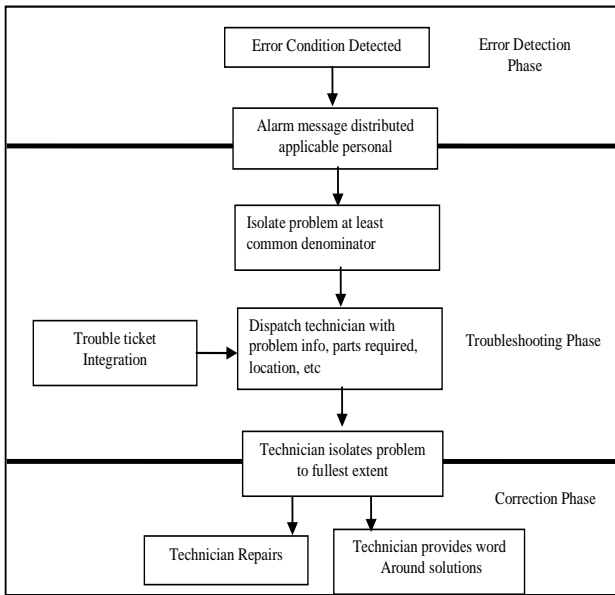
Figure 1. Fault Management System

2.3 Local Area Network

In general terms, LAN (Local Area Network) refers to a group of computers interconnected into a network so that they are able to communicate, exchange information and share resources (e.g. printers, application programs, database etc). In other words, the same computer resources can be used by multiple users in the network, regardless of the physical location of the resources.

Each computer in a LAN can effectively send and receive any information addressed to it. This information is in the form of data 'packets'. The standards followed to regularize the transmission of packets, are called LAN standards. There are many LAN standards as Ethernet, Token Ring and FDDI etc. Usually LAN standards differ due to their media access technology and the physical transmission medium.

A local area network (LAN) is a group of computers and associated devices that share a common communications line or wireless link. Typically, connected devices share the resources of a single processor or server within a small geographic area (for example, within an office building). Usually, the server has applications and data storage that are public in common by multiple computer users. A local area network may serve as few as two or three users (for example, in a home network) or as many as thousands of users (for example, in an FDDI network). Major local area network technologies are: Ethernet, Token Ring and FDDI.

Ethernet is by far the most commonly used LAN technology. A number of corporations use the Token Ring technology. FDDI is sometimes used as a backbone LAN interconnecting Ethernet or Token Ring LANs. Another LAN technology, ARCNET, once the most commonly installed LAN technology. A suite of application programs can be kept on the LAN server. Users can order printing and other services as needed through applications run on the LAN server. A user can share files with others at the LAN server; read and write access is maintained by a LAN administrator. A LAN server may also be used as a Web server if safeguards are taken to secure internal applications and data from outside access.

A Local Area Network (LAN) is the result of connecting a number of computers or other IP devices together in a

localized geographic area – for example in one room, building or several buildings. LANs are typically connected to each other via cable and more recently via radio waves. In an office building for example, workstations and personal computers (PCs) are commonly connected to each other with a Local Area Network. This allows an employees' equipment to communicate - send and receive files, share access to the files or data on another workstation even share applications. One obvious benefit of building a LAN is the efficiency of transporting data from one location to another. The transmission speed of data, across the LAN, can be measured at more than 1,000 times the speed in which transfer files using a standard 56k modem. [2]

2.4 Client Server Network

Client/Server network uses a network operation system designed to manage the entire network from a centralized point, which is the server. Clients make requests of the server and the server responds with the information or access to a resource. Client/Server networks have some definite advantages over peer-to-peer networks. It is easier to find files and resources because they are stored on the server. Also have much tighter security .All usernames and passwords are stored in the same database (on the server), and individual users can't use the server as a workstation. The server holds the database of user accounts, passwords, and access rights.

Establishing the right kind of network for the user's organization is important to make the most of their time and money. While peer-to-peer network is often a good choice for small networks, in an environment with more than 10-15 computers, a peer-to-peer network begins to become more trouble than it is worth: their computers start to slow down, they can never find the file they are looking for, and security is non-existent. If this is happening in their organization, it is probably time to switch to a client-server network by bringing in a dedicated server to handle the load. The server is called "dedicated" because it is optimized to serve requests from the "client" computers quickly. The diagram below shows a simple client-server network. [3]
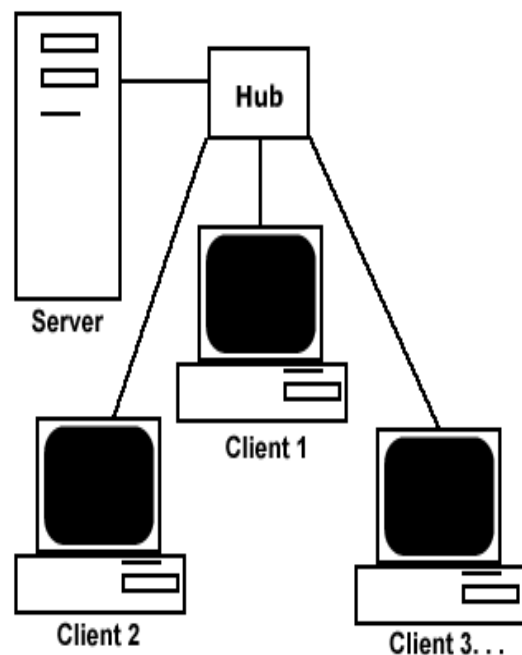

Figure 2. Simple Client Server Network

3. DESIGN AND IMPLEMENTATION OF FAULT MANAGEMENT SYSTEM

3.1 Overview System of Fault Management

There are many managements such as configuration management, fault management, performance management, security management, accounting management and etc. These are essential and useful in any fields. Among them, this system is designed for fault management system. Fault management is to detect and troubleshoot the system.

This system can track the all of the fault event of the client server network management system. It provides the user authentication fault and network card fault.
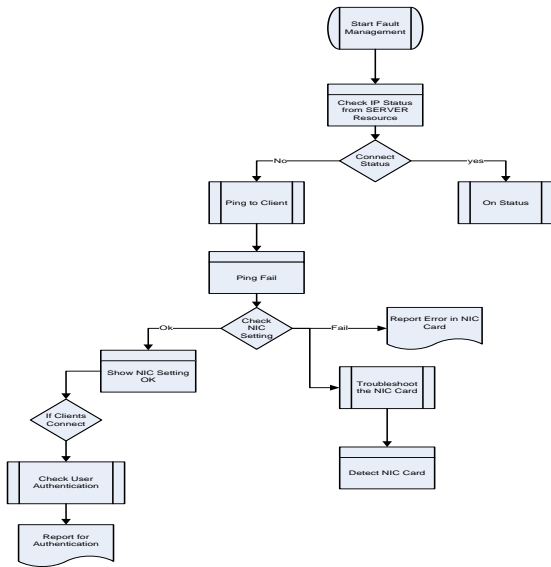
Figure 3. Fault Management System Design

4. TEST AND RESULTS OF CLIENT SERVER FAULT MANAGEMENT SYSTEM

In this system, there are two main components such as server program which is listening the entire request of the clients and client which are sending request to server. In the fault management, this system can trace which invalid user is connecting and connected and user authentication.

4.1 NIC Card menu Program

In this program when the user press the check NIC card button this program will show the history of the network card.
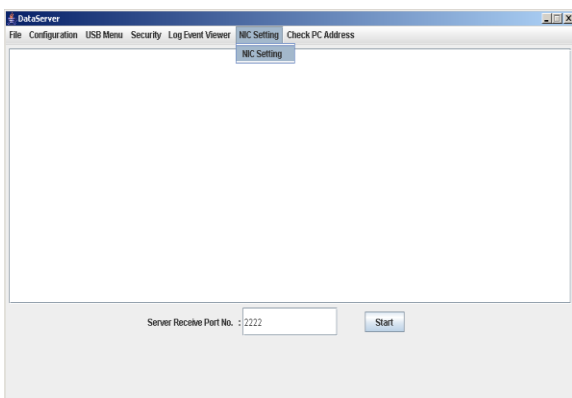

Figure 4. NIC Card Menu

From this menu, NIC setting checking program will show when the NIC setting sub menu will be clicked.
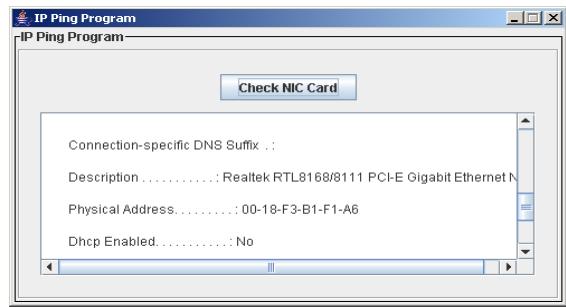

Figure 5. NIC Card Setting Menu

4.2 Check PC Address Menu Program

From this menu, PC address checking program will show when the Check PC Address sub menu will be clicked.
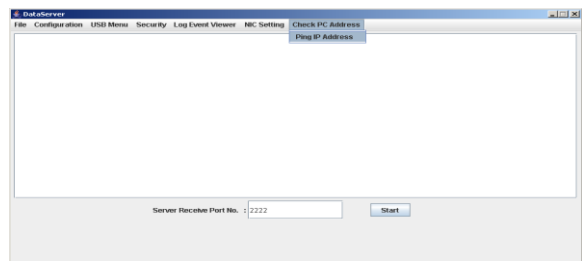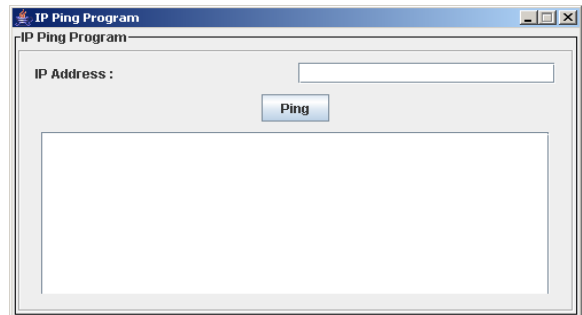

Figure 6. PC Address Check Menu

Figure 7. IP Ping Program Menu

In this program, if the user wants to know which PC is reached on the network, the user must to enter the required IP at the IP Address text box and press ping button. The result of the message will show at the text box area of the program.
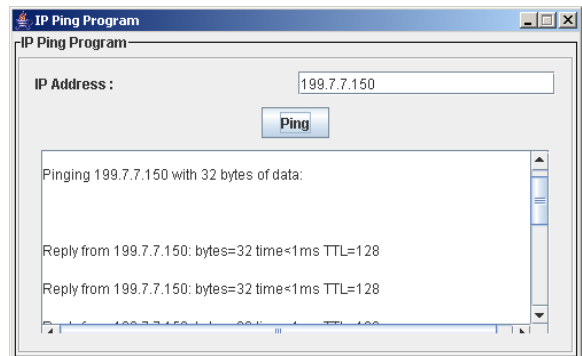

Figure 8. IP Checking Program Menu

4.3 Starting the Server

When the user want start the server, press start button and the server will start. And listen all of the request of the client.
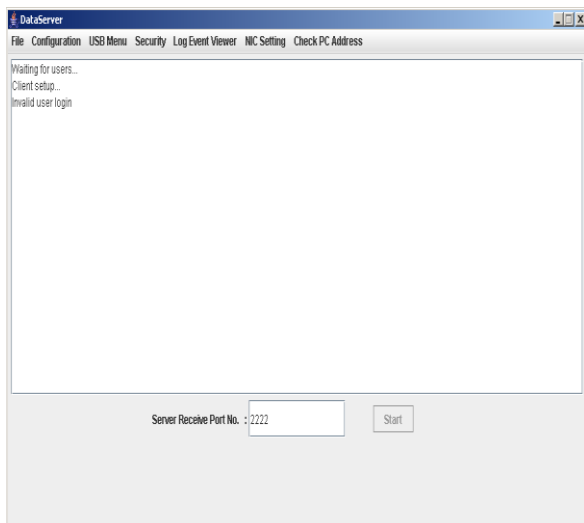

Figure 9. Starting the Server Menu

4.4 Starting the Client Program

When the user wants to start the client program, the user must be run the client program. The client program will run like this.
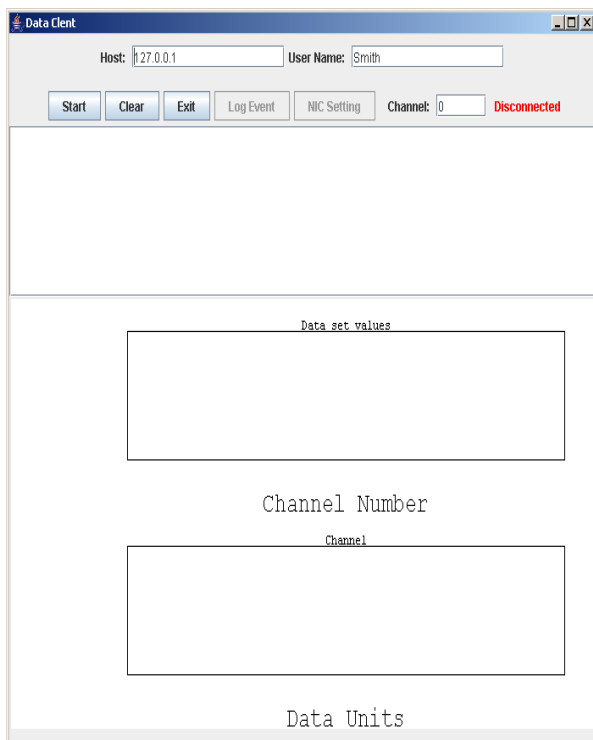

Figure 10. Starting the Client Menu

In this program the user must be enter the server IP address at the host text box and at user name textbox, the user must be typed the user id which are reserved at the server. If the user id is invalid or user is disabling at the server side, the user cannot connect the server and get the message from the server. If the user want to start the client program, user must be pressed the start button and if the user want to clear all of the message the user must pressed clear and if the user want to exit the client, press the exit button.

5. DISCUSSIONS AND CONCLUSION

In this client server based fault management system, the server can listen all of the requests of the clients and response to the clients. And when the server is start up, the server listen the client request and can show the message about which client connect with which user and which client are connecting and which cannot connect. The data channel is to register in the server. And when the client is start up and connect to the server, the client request the server with the user name, if the server accept the request the response message of the server will show at the display area of the client. And also show the message of the client is connecting with how many data channel to server.

This system is suit to use in the client server network system with java environment. Because all of the programs in the system are developed by java language and native dll file. So in the client server data sending environment and client server messaging environment, this system can give fully support and moreover for the USB data access, this system can support the USB ports and devices to detect and read devices configuration.

6. ACKNOWLEDGMENTS

The author would like to express thanks to the people who help her to support and valuable knowledge to do this paper.

REFERENCES

[1] Network Management System: Best Practices

White Paper

<https://www.cisco.com/c/en/us/support/docs/availability/high-availability/15114-NMSbestpractice.html#faultde>

[2] Local Area Network

<http://en.wikipedia.org/wiki/Local_area_network">

[3] Client Server Network

<http://compnetworking.about.com/od/networkdesign/l/aa050201a.htm>

<http://compnetworking.about.com/od/basicnetworkingconcepts/g/network_servers.htm>

<http://compnetworking.about.com/cs/clientserver>