Design of the Remote Management System in the Windows Operating System

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Summary
In this paper, I designed the remote management system on the Windows Operating System. Remote management system in the Windows operating system was designed for the client and server function. A client function has the ability to allow the system to access from the server. This feature is responsible for monitoring the packet to request access to the client on the network. Remote management capability of the server system has the ability to connect to the system. The connection is made when we direct the client's IP address which we want to access in the server program. The experiment for the proposed functions was conducted. We confirmed that the proposing system worked normally after the experiments.

Key words:
Remote Management System, Windows O.S, Client/Sever System, Experiment

1. Introduction

Recent IT technology has developed spectacularly. In 2010, Smart phones are the topic of next-generation IT technologies. According to the advance of these IT technologies, software technology pursues convenience using mobile phones. In this paper, among the software technologies pursuing convenience, I review the technology of remote management system and relevant technology. This technology has two aspects. One convenient side of this function is to overcome time and space constraints. Another bad side of this function is that opponents can eavesdrop this computer using this technique. This paper focuses on explaining the details of remote management systems using the technology.

This paper designed and implemented a program of remote management system on the Windows Operating System. The proposed remote management system program was designed using the network program. There are a number of ways to manage the remote system on the Windows operating system. This paper used the Windows Sockets Protocol among several ways. The functions of remote management system are composed of server and client.

The server function in remote management system is to process the client data when it receives the IP address of the client system. The server system makes it possible to check the remote client's system failure or deal with these data. Client feature is designed to operate as a daemon process. It monitors whether the server system requires connection. It permits the connection when server requests connection. After the connection between server and client system, Windows O.S running information of the client system will be sent to the server. The server system receives information from the client and displays it on the screen. This paper proposes the remote management system on a Windows Operating System and the experiment was done. The actual implementation programs were tested on the client and server system running. The experimental results were confirmed to operate normally.

This paper is composed of related study in chapter 2. In chapter 3, the proposed designing remote control system in the Windows operating system was explained. Chapter 4 focused on the experimental results for design of this paper. Finally, Chapter 5 refers to the conclusions.

2. Related Studies

There are many versions of the remote management system program. There are commercial versions and the freeware versions of this program. The following Table 1 shows that is used as a remote management systems application.

Table 1 :Remote Management System Protocol

Software	***Protocol***	***License***	***Client/server***	***Linux client***	***Microsoft Windows client***
AnywhereTS	RDP, ICA	Proprietary	Client Only	×	○
Apple Remote Desktop	RFB(VNC)	Proprietary	Client & Server	×	×
Apple Screen Sharing (iChat)	Proprietary, RFB(VNC)	Proprietary	Client & Server	×	×
Chicken of the VNC	RFB(VNC)	GPL	Client Only	×	×
Citrix XenApp	RDP, ICA	Proprietary	Client &	○	○

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			Server		
Crossloop	RFB(VNC)	Proprietary	Client & Server	×	○
DameWare Mini Remote Control	RDP, Proprietary	Proprietary	Client & Server	×	○
EchoVNC	RFB(VNC)	GPL	Client & Server	○	○
FreeNX	NX, RDP, RFB(VNC)	GPL	Client & Server	○	○
GoToMyPC	Proprietary	Proprietary	Client & Server	○	○
IBM Director Remote Control	Proprietary	Proprietary	Client & Server	×	○
LogMeIn Free	Proprietary	Proprietary	Client & Server	×	○
LogMeIn Pro	Proprietary	Proprietary	Client & Server	×	○
Netman	Proprietary	Proprietary	Client & Server	×	○
Netsupport Manager	Proprietary	Proprietary	Client & Server	○	○
rdesktop	RDP	GPL	Client Only	○	○
RealVNC Free	RFB(VNC)	GPL	Client & Server	○	○
RealVNC Personal	RFB(VNC)	Proprietary	Client & Server	×	○
Remote Administrator	Proprietary	Proprietary	Client & Server	○	○
Remote Desktop Connection/ Terminal Services	RDP	Proprietary	Client & Server	○	○
Remote Graphics Software	Proprietary	Proprietary	Client & Server	○	○
RemoteVNC	RFB(VNC)	GPL	Client & Server	×	○
SSH with X forwarding	X11	BSD	Client & Server	○	○

As shown above Table 1, there are several protocols which are used in remote management systems application. Among them, RFB (Remote Frame Buffer) protocol and the RDP(Remote Desktop Protocol) protocol are mainly used. The next chapter will organize these two protocols.
RFB (Remote Frame Buffer) and RDP are the most used international standard network protocols for remote management systems application. This paper describes these two network protocols and related researches.

2.1 RFB(Remote Frame Buffer) Protocol

RFB protocol has been used in other programs, i.e. VNC, RealVNC, UltraVNC. RFB is a simple structure using the GUI(Graphic User Interface) features that allow access to the remote system. It operates at the level of the frame buffer and uses at the X11 Windows, Windows systems, and Macintosh Operating System application. Specifically, the RFB is used at the VNC (Virtual Network Computing). Termination of the remote system is called the RFB client or viewer RFB. Termination of modifying frame buffer is called the termination RFB server [7].
RFB protocol is a very slim network protocol. RFB protocol was designed to ask the minimum requirement to the client. Thus, the client program can run on various different hardware.

2.2 RDP(Remote Desktop Protocol) Protocol

The RDP protocols are basically designed to satisfy the graphic features in connection with a remote computer system. RDP protocol supports an expansion transmission mechanism between the user's computer and the remote computer. A standard connection order of the RDP protocol is the exchange of settings information, graphics information, and data between the client and the server. The following figure shows the progress of the RDP protocol [4-6, 8-11].

3. Design of the Remote Management System

This paper designs remote monitoring(management) system using a network protocol in Windows Operating Systems. The proposed structure of the program is as follows Fig. 1.

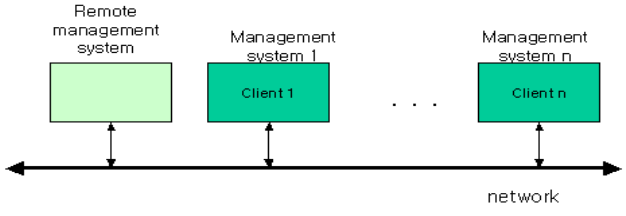

Fig. 1 Remote Management System Structure

The proposed remote management system is divided into a server functions and client functions. The server function enables you to manage the client system remotely by specifying a controlling system. Server function has remote management capabilities for managing the target(client) system. This operating feature is the following structure

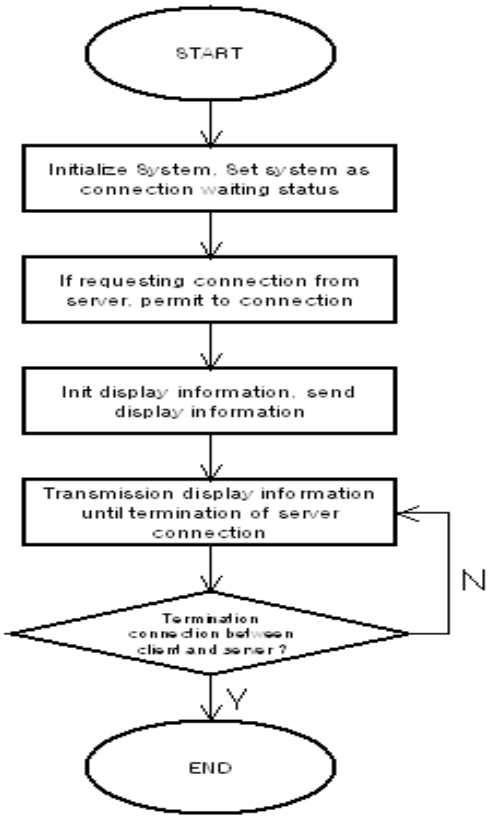

Fig. 2 Work Flow of Server Function

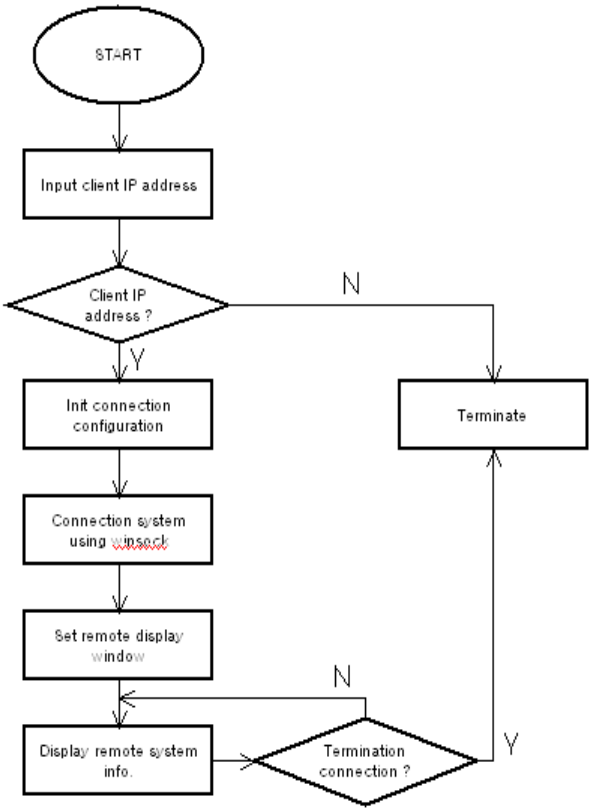

Fig. 3 Flow Behavior of the Client Features

Work flow of the server is shown above Fig. 2. The client machine's IP address is entered on program of the server machine. If the client system is found, initialization tasks for setting up the connection. If the client is not found, the system will terminate the connection. When the system is initialized by the client connection settings, the server system will connect using Winsocket.

The program feature of clients function is running in the client system. The flow behavior of the client functions are shown Fig. 3.

To control remote client system, work flow of the server is shown above Fig. 2. The client machine's IP address which is entered on the client's program is transferred into the server machine. If the client system is found, initialization tasks for setting up the connection to the client system. If the client is not found, the server system will terminate the connection. When the system is initialized by the client connection settings, the server system will connect using Winsocket network protocol. The program feature of client function is running in the client system. The flow behavior of the client functions are shown Fig. 3.

The startup operation flow of client application is shown Fig. 3. The client program is initialized first. After initializing the client program, the client system allows to access from the server system. If there is a request to connect from the server system, the client program should be allowed to connect from the server system. After connection from the server, it initializes the display information and display information of the client system is transmitted to the server system. If a server or a client system requests a connection termination, the connection is terminated from both systems. Otherwise, the display information of client system is sent to the server system continuously.

4. Experiment and Evaluation

The design of the proposed system was actually implemented on the system. The designing implementation was experimented how the system is operating normally. The experiment environment is as follows. In order to implement the proposed idea, I used the system which has Windows XP Operating System, Core 2 duo 2.13GHz CPU and 2 GBytes of memory. The

program development environment was MS VBasic. The experiments for the implementation system was composed of the client drive capability, the server drive capability, and an integrated environment driving capability. To test the client drive capability, the server program specifies the client computer IP address, and the client program is installed at the client system. The actual program was run on the client system like Fig. 4.

Fig. 4 The Client Application Program

The client program is running on the client system to manage like the Fig. 4. When running the above Fig. 4 program, a remote server system can access the system that running the client program. The program runs as a sort of daemon process. If the other party is made connection, the program responds to a connection. When a remote server connects to the client system, the following text message which is "waiting for connection" is changed to "Connected".

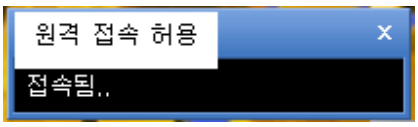

Fig. 5 Connection Client from Server

The conditions as above mean that all the contents of the client system can be accessed to enable remote management permission. Contrary the behavior of the client system, when a server program is operating on the server machine, the following screen will display like Fig. 6. As shown in this screen control, if entering the IP address of the remote access system, the remote system will be connected.

After successful login from server to the remote(client) systems, the environment will operate like that the server computer will be directly connected to a remote system. After successful conduction to the remote system, behavior screen of the program is as follows Fig. 6.

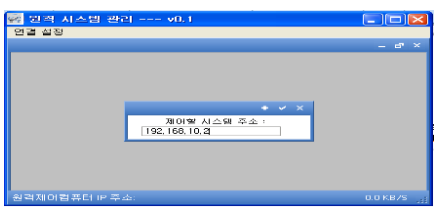

Fig. 6 The Client IP Address Input Screen

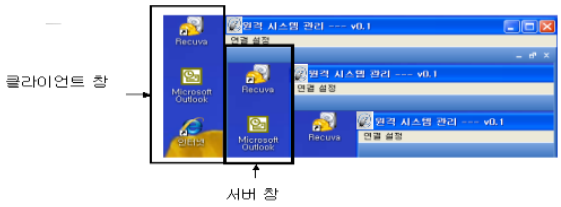

Fig. 7 Client Window Behavior Screen

Fig. 6, Fig. 7 is showing the screen of the connecting procedure from the server system to the client system. In Fig. 6, the IP address of the remote client system will be entered. If entering the IP address, the client will be allowed to access to the system. If the client systems are allowed to connect, the server windows display the client's sending information. The window of the server system will output unchanged information from the client system. The results output are Fig. 7. As the above experiment, the design of remote management information system which are proposed in this study was tested completely. The experiments were divided into client and server function. The client features and server capabilities operate normally as the above experiments.

5. Conclusions

In this paper, I designed the remote management system for the Windows operating system. The design of remote management system in the Windows operating system was classified into the client and the server features. The client function has the ability to allow access from the server system.

This feature is responsible for monitoring the packet to request access to itself on the network. The server has the ability to connect to the system which it wants to manage remotely. When the connection is made, the server program sets the client machine's IP address.

The proposed functions in this paper was conducted in the experiment. The experiment was divided into the client function and server function. The client function has the ability to allow to connect in case of requesting from a remote server. As a result of experiments, I confirmed that this feature operates normally.

Similarly, experiment on server function was worked out after entering the client machine's IP address. As a result of experiments, I confirmed that the client system was connected normally.

In this paper, I designed the remote management system in the Windows operating system that can be used for the purpose of convenience. This system can be managed remotely and conveniently between geographically

separated people. It is convenient, but it has disadvantage of the security vulnerability. Future research in the remote management system will be made to enhance the security features.

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