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A COMPUTER SOFTWARE SYSTEM FOR ELIMINATING OPERATING SYSTEM MULTIPLE LOGINS UNDER REMOTE PROGRAM LOAD WITH NETWORK PROVIDER DYNAMIC LINK LIBRARY

Technical Field

The present invention relates to a method and computer program for the configuration of a computer network. In particular it relates to a local network of server computers and client computers and the modification of the configuration of such a network in a manner which is expeditious and reduces unnecessary loss of time.

Specifically, the present invention pertains to a program and method for eliminating operating system's multiple logins under remote program load with network provider dynamic link library. While a major embodiment of the present invention involves the use of the Windows '95(TM) operating system used in conjunction with Windows NT(TM) Server, other major operating systems can also be readily substituted for both the Windows '95 and the Windows NT Server, respectively (both Windows '95 and Windows NT are trademarks of Microsoft Corporation).

Background of the Invention

Computers and their application programs are used in all aspects of business, industry and academic endeavors. In recent years, there has been a technological revolution driven by the convergence of the data

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processing industry with the consumer electronics industry. This advance has been even further accelerated by the extensive consumer and business involvement in the Internet in recent years. As a result of these changes, it seems as if virtually all aspects of human productivity in the industrialized world requires human and computer interaction. The computer industry has been a force for bringing about great increases in business and industrial productivity. Almost every week seems to bring computer industry advances which promise even further increases in productivity. These advances offer to drive down business and industry costs and increase efficiency, in addition to increasing productivity. In addition, the cost of "computer power" continues to drop as a result of rapid advances in computer related technologies.

Despite all of these advantages, there still remains great resistance in all industries and business fields to new computer systems and significant system upgrades which offer much in productivity increases. This resistance results from past experience, which equates to installing new computer systems or significant upgrades in existing systems with large amounts of down time during which the business, manufacturing facility or individual worker functions are inoperative or operate at diminished levels. When a business or production facility is trying to decide whether to install a new or significantly upgraded computer system, the concern about

down time, the possible loss of business, as well as stress on the workers involved very often outweighs the cost of the installation in influencing the decision.

The concern about business and production delays resulting from installation has become so great that fewer and fewer of even small businesses are still trying to make system and program changes on their own. The professional computer service industry which carries out and supports installations and upgrades for the business and industrial sector has been rapidly expanding over the past decade. However, even with such computer professional support, the threat of such down time coupled with the costs of such professional services caused by installation delays remains of great concern.

Thus, any method or procedure which will reduce the complexity, loss of time and increase efficiency to the small business for Internet connections and usage is highly desirable. Such is the case with the present invention. However, before going into the details of the present invention, it would be most helpful to define several generally accepted industry terms of art in order to provide a clear understanding of the invention.

The term DLL as used extensively in this application (dynamic link library) is defined as the MS-DOS file name extension attached to a collection of library routines. It is a feature of the Windows(TM) (Windows is a trademark of Microsoft Corporation) family of operating systems and OS/2(TM) (OS/2 is a trademark of

International Business Machines Corporation) that allows executable routines to be stored separately as files with DLL extensions and to be loaded only when needed by a program. A DLL has several advantages. First, it does not consume any memory until it is used. Second, because a DLL is a separate file, a programmer can make corrections or improvements to only that module without affecting the operation of the calling program or other DLL. Finally, a programmer can use the same DLL with other programs.

Login or logon in a computer network is the authentication process in which a user supplies a login name and password. In a network, a unique name is assigned to the user by the system administrator that is used as a means of initial identification. The user must type this name and also their password to gain access to the system and this is somewhat time consuming.

A Turnkey System can be defined as a finished system, complete with all the necessary hardware, documentation and software installed and ready for use. It can further be considered as a computer system developed for a specific application, such as a point-of-sale terminal, and delivered ready to run, with all the necessary application programs and peripherals. Additionally, the term RPL which is used throughout this patent application is defined as "Remote Program load".

As noted above, a major embodiment of the current invention is based on the Windows '95 client operating

system used in conjunction with the Windows NT Server. The NT Server represents a superset of Windows NT that provides centralized, domain based network management and security. Windows NT's Advanced Server also offers advanced hard disk fault tolerance features, such as monitoring and additional connectivity. Windows NT is a 32-bit preemptive multitasking operating system that features networking, symmetric multiprocessing, multithreading and security. It is a portable operating system that can run on a variety of hardware platforms including those based on Intel's I80386, i486 and Pentium microprocessors and MIPS microprocessors; it can also run on multiprocessor computers. Windows NT supports up to four gigabytes of virtual memory and can run MS-DOS, POSIX and OS/2 (character-mode) applications.

At this point, a brief discussion of the relationship of different desktop "operating systems" and "server" systems is appropriate. Therefore, let us first define what is meant by the term "server". In a general definition, it is a powerful computer that shares resources with other computers on a network. However, a server does a great deal more than a desktop computer. It is built around two primary needs: (1) moving data quickly; and (2) ensuring the safety and integrity of that data. A server has a powerful processor.

Just as a network client must have operating systems loaded for client machines to function, a "network server" must have an "Operating System". The chief

difference between desktop operating systems and network operating systems are scale and resources. Generally, network operating systems are optimized differently than desktop operating systems. Desktop operating systems are designed to provide a user with the best possible performance for the application currently being used. By contrast, a network operating system's charge is to balance the needs of all the users accessing the server rather than giving priority to any one of them. Typical of network operating systems for servers is Windows NT Server. In the 1980's, Microsoft decided that it needed a high end operating system to compare with NetWare(™) (NetWare is a trademark of Novell) and UNIX(™) (UNIX is a trademark of Bell Laboratories) systems, as well as OS/2. Two different versions were created as operating systems: "Windows NT Workstation" and "Windows NT Server". Both are built around the same basic platform, but Windows NT Server has a rich set of utilities and tools that the Windows NT Workstation lacks.

Regarding which operating system to use for small business desktop needs, Windows '95 is an excellent choice for a small peer-peer client network. Windows NT Workstation is another excellent operating system for small businesses' small peer-peer high performance networks. Equally as good are OS/2, OS/2 Warp or Merlin OS/2.4connect(™) (Merlin OS/2.4connect is a trademark of International Business Machines Corporation) operating systems.

With respect to client server network operating systems, the typical group includes: Windows NT Server, Netware, UNIX and OS/2 Warp.

Summary of the Invention

The present invention represents a method to resolve the problems of the loss of some usability or inefficiency if it is required that the user enter the user's name and password multiple times; as well as the problem of the elimination of the need for logging in the second user name and password into the operating system.

A current computer related business objective is to offer a turnkey network computing environment for small and medium size businesses. Toward this end, the RPL technology was used for several reasons. Employing RPL, the machines offered could be inexpensive hard diskless systems. Several client machines could be loaded with a single operating system image required to run the machine and the ability to offer true and full capability for a user to have their desktop settings follow from one machine to the next as they "logged on."

When logging into a RPL based shared Windows '95 multiple system, logging screens are presented to the end user. RPL must be configured to first boot under DOS 7.0. A network session is established for the connection. DOS 7.0 requires an actual user name and password to be entered in the logging screen. This provides the session with the proper user privileges to

the Windows NT network. Two additional logging screens are presented after the first logging screen that establishes the DOS 7.0 network session. The Network logging screen, which names the NT domain user at the Windows '95 level (this user name and password must match the DOS user name and password) and the Windows login, which requests the password for the particular Windows user. For the Network computing solution, the requirement to allow multiple users to logon with the same shared Windows image required that the second screen, the network logging screen that established the Windows NT domain user matches the DOS user name and password.

However, the system would have lost some usability if it required the user to enter the user name and password multiple times. The third user name and password was easily eliminated, but the second user name and password could not be eliminated. The present invention readily resolves these problems.

In is broadest aspects, we believe the invention involves the following: a computer network having at least one server computer and at least one client computer, an apparatus for logging a user of the server onto a plurality of operating systems in the server; which comprises an interactive user display logon for activating a first operating system in the server and employing a DLL means which is responsive to the logon procedure to activate a second operating system in the

server. Thereby bypassing any additional user logon for activation of a second operating system.

The present invention also includes a method for logging the user of the server onto a plurality of operating systems in the server which comprises, activating a second operating system in said server through a DLL in response to the user logon. Thereby bypassing any additional user logon for activation of the second operating system.

Brief Description of the Drawings

Fig. 1 is a generalized diagrammatic view of a network of server and client computers which may be configured using the data file and programming applications preloaded according to the present invention;

Fig. 2 is a block diagram of an interactive data processor controlled workstation display system including a central processing unit which is capable of serving as the primary server through which the applications may be distributed and settings made throughout the network based upon the data file profile;

Fig. 3 represents a flowchart of the overall method of the present invention; and

Fig. 4 illustrates the details of the DOS login process.

Detailed Description of the Preferred Embodiment

With reference to Fig. 1, there is shown a representative diagram of a local network 52. There are two server computers 50 and 56 of which server 50 is to function as the primary server. Each server respectively has a plurality of client computers: clients 51, 53 and 54 are served by primary server 50 while server 56 serves clients 58, 59 and 60. All configuration entries and settings are made into and stored in primary server 50 through its display interface 51. All programs for the network and for the computers in the network are also loaded into server 50 and stored for subsequent installation. Data file 62 is a diagrammatic representation of the stored record of keystroke and cursor selections, and storage facility 63 is for the preliminary loading of network computer applications prior to their distribution, as selected throughout the network.

Fig. 2 is a diagram of a display interface workstation which can function as the primary server 50. A central processing unit (CPU), such as one of the PC Server series of workstations available from International Business Machines Corporation or the Poweredge 2200(TM) Server (Poweredge 2200 is a tradmark of Dell Corporation), is provided and interconnected to various other components by system bus 12. An operating system 41 runs on CPU 10 and provides control and is used to coordinate the function of the various components of Fig. 2. Operating system 41 may be one of the

commercially available operating systems such as Windows NT, OS/2, Windows '95, as well as UNIX or AIX operating systems. A read only memory (ROM) 16 is connected to CPU 10 via bus 12 and includes the basic input/output system (BIOS) that controls the basic computer functions. Random access memory (RAM) 14, which will provide for a portion of the basic storage of entries to be subsequently described, I/O adapter 18 and communications adapter 34 are also interconnected to system bus 12. It should be noted that software components, including the operating system 41 and the application 40, are loaded into RAM 14, which is the computer system's main memory. I/O adapter 18 conventionally communicates with the disk storage device 20. Communications adapter 34 interconnects bus 12 with the rest of the local network described in Fig. 1 enabling the data processing system to communicate with its client computers, as well as other servers and client computers to control entries, configurations and installations to be subsequently described. I/O devices are also connected to system bus 12 via user interface adapter 22 and display adapter 36. Keyboard 24, trackball 32, mouse 26 and speaker 28 are all interconnected to bus 12 through user interface adapter 22. It is through such input devices that the user interactive functions involved in the present invention may be implemented. Display adapter 36 includes a frame buffer 39 which is a storage device that holds a representation of each pixel on the display

screen 38. Images may be stored in frame buffer 39 for display on monitor 38 through various components, such as a digital to analog converter (not shown) and the like. By using the aforementioned I/O devices, a user is capable of inputting information to the system through the keyboard 24, trackball 32 or mouse 26 and receiving output information from the system via speaker 28 and display 38.

The method of the present invention involves the use of the DOS logging session to logon to the network, establish a network session, and trigger a new user addition to the network. A custom built login screen was created to replace the DOS logging screen. The custom built logging screen replaced the Windows '95 logging screen. A network provider service was created in a DLL to replace the Windows '95 network provider service. The network provider service then sends a message to the NT Server telling it that the Windows '95 network session is being established with the same user as that used during the DOS network session.

As noted above, the present invention represents a method to resolve the problems of the loss of some usability or inefficiency, if the user is required to enter the user name and password multiple times, as well as the problem of the elimination of the need for logging in the second user name and password. The following discussion outlines the method to resolve these problems.

The present invention is initiated as demonstrated in the flowchart shown in Fig. 3 at 100. The initial action at 101 calls for the use of the DOS logging session to logon to the network session at 101, then establish a network session and trigger a new user addition to the network at 102. The next action is to create a custom built login screen to replace the DOS logging screen at 103. The custom built logging screen replaced the Windows '95 logging screen at 104. A network provider service is created in a DLL at 105 to replace the Windows '95 network provider service.

The network provider service 106 then sends a message to the NT Server telling it that the Windows '95 network session is being established with the same user as that used during the DOS network session. Since the network provider service is replaced 104, the new service does not present the user with a login screen 107, which would be unnecessary given the fact that the user was already logged on through the custom built login screen 103.

Fig. 4 illustrates the DOS login process. The first action in the process is the user powers up 400 and the logon screen appears. The user then enters his name and password at 402. The query is raised at 408 as to whether this is a new user. If the answer to this query is yes, then the password is confirmed 409 and a request is made to enter the user's full name. The user is then informed to send a message to the NT Server by dropping a

message onto server 410. The question is then asked at 411 whether the message file is removed. If the answer is no, then the process returns to 411 until it is removed. Once this is accomplished, the process moves to a successful login 412 and the process is completed 413.

If the answer to the query at 408, "Is this is a new user?", is no, then the process at 407 is an attempt to login. The next query is whether the logon was successful. If the answer is yes, then the process moves to completion as a successful login 412. If the answer to 405 query is no, then the system asks another question as to whether this is the third attempt 404. If the answer to 404 is yes, then the login has failed 406 and the system must be rebooted.

If the answer to 404 is no, it is not the third attempt, then the process moves on to 403 which asks to identify the failure via message and response to and from NT Service. Then, at 401, the message suggests another try and the process is repeated 402.

While the invention has been shown and described with reference to particular embodiments thereof, it will be understood by those skilled in the art that the foregoing and other changes in form and detail may be made therein without departing from the spirit and scope of the invention.

Claims

1. In a computer network environment having at least one server and at least one client, the server executing an operating system having a logon screen entry after logging onto the network, an apparatus for eliminating the logon screen entry, the apparatus using a remote program load and a network provider dynamic link library, the apparatus comprising:

a means for logging onto a network session on the at least one server and for triggering a new user addition to the computer network environment;

a means for employing a DOS network logging session to logon onto the network and an operating system logging screen;

a means for creating a custom built login screen to replace both the DOS and said operating system's logon screen, after logging onto a network;

a means for replacing said operating system with a network provider service, the network provider service being created from a dynamic link library;

a means for informing, via the network provider service, the at least one server that said operating system's network session will employ the same user as had been used in said DOS network.

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2. The system of claim 1 wherein said operating system is Windows '95 and said network server is Windows NT Server.

3. The system of claim 1 wherein said operating system is OS/2 Warp and said network server is Windows NT Server.

4. The system of claim 1 wherein said operating system is Windows NT and said network server is Windows NT Server.

5. The system of claim 1 wherein said operating system is Windows '95 and said network server is Windows NT Server.

6. The system of claim 1 wherein said operating system is UNIX and said network server is Windows NT Server.

7. The system of claim 1 wherein said operating system is Windows '95 and said network server is selected from the group consisting of; Windows NT Server, OS/2 and UNIX.

8. The system of claim 1 wherein said operating system is Windows '95 and said network server is selected from the group consisting of: Windows NT Server, Netware, OS/2 and UNIX.

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9. The system of claim 1 wherein said operating system is Windows NT workstation and said network server is selected from the group consisting of: Windows NT Server, Netware, OS/2 and UNIX.

10. The system of claim 1 wherein said operating system is OS/2 Warp and said network server is selected from the group consisting of: Windows NT Server, Netware, OS/2 and UNIX.

11. The system of claim 1 wherein said operating system is UNIX and said network server is selected from the group consisting of: Windows NT Server, Netware, OS/2 and UNIX.

12. In a computer network environment having at least one server and at least one client, the server executing an operating system having a logon screen entry after logging onto the network, a method for eliminating the logon screen entry, said method uses a remote program load and a network provider dynamic link library, the method comprising the steps of:

logging onto network session and triggering a new user addition to the network;

employing a DOS network logging session to logon to the network and an operating system logging screen;



creating a custom built login screen to replace both the DOS and the operating system's logon screen after logging onto network;

replacing said operating system with a network provider service, the network provider service being created from a dynamic link library;

informing, via the network provider service, the at least one server that said operating system's network session will employ the same user as had been used in said DOS network.

13. The method of claim 12 is Windows '95 and said network server is Windows NT Server.

14. The method of claim 12 wherein said operating system is Windows '95 and said network server is Windows NT Server.

15. The method of claim 12 wherein said operating system is OS/2 Warp and said network server is Windows NT Server.

16. In a computer network environment having at least one server and at least one client, the server executing an operating system having a logon screen entry after logging onto the network, a computer readable program having data structures included on a computer readable medium for eliminating the logon screen entry, said

computer readable program uses a remote program load and a network provider dynamic link library, the program comprising:

a means for logging onto a network session on the at least one server and for triggering a new user addition to the computer network environment;

a means for employing a DOS network logging session to logon to the network and an operating system logging screen;

a means for creating a custom built login screen to replace both the DOS and the operating system's logon screen, after logging onto the network;

a means for replacing said operating system with a network provider service, the network provider service being created from a dynamic link library; and

a means for informing, via the network provider service, the at least one server that said operating system's network session will employ the same user as had been used in said DOS network.

17. The computer readable program of claim 16 wherein said operating system is Windows '95 and said network server is Windows NT Server.

18. The computer readable program of claim 16 wherein said operating system is OS/2 Warp and said network server is Windows NT Server.

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19. The computer readable program of claim 16 wherein said operating system is Windows NT workstation and said network server is Windows NT Server.

20. The computer readable program of claim 16 wherein said operating system is UNIX and said network server is Windows NT Server.

21. In a computer network environment having at least one server and at least one client, the server executing an operating system having a logon screen entry after logging onto the network, an apparatus for eliminating the logon screen entry, the apparatus using a remote program load and a network provider dynamic link library, the apparatus comprising:

a mechanism for logging onto a network session on the at least one server and for triggering a new user addition to the computer network environment;

a mechanism for employing a DOS network logging session to logon to the network and an operating system logging screen;

a mechanism for creating a custom built login screen to replace both the DOS and the operating system's logon screen, after logging onto network;

a mechanism for replacing said operating system with a network provider service, the network provider service being created from a dynamic link library; and



a mechanism for informing, via the network provider service, the at least one server that said operating system's network session will employ the same user as had been used in said DOS network.

22. In a computer network having at least one server computer and at least one client computer, apparatus for logging a user of said server onto a plurality of operating systems in said server comprising:

interactive user display logon means for activating a first operating system in said server; and

dynamic link library means responsive to said logon means to activate a second operating system in said server and thereby bypass any additional user logon for activation of a second operating system.

23. In a computer network having at least one server computer and at least one client computer, a method for logging a user of said server onto a plurality of operating systems in said server comprising:

activating a first operating system in said server through an interactive display user logon; and

activating a second operating system in said server through a dynamic link library in response to said user logon to thereby bypass any additional user logon for activation of said second operating system.

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