CHANNEL CONFIGURATION PROGRAM SERVER ARCHITECTURE

CROSS-REFERENCE TO RELATED APPLICATION

This application claims priority from Provisional Application 60/053,455 filed Jul. 22, 1997, which is hereby incorporated by reference. However, the content of the present application is not identical to that of the priority application.

BACKGROUND AND SUMMARY OF THE INVENTION

The present application relates to computer manufacturing, and particularly to the architecture of hardware for pre-installation of software at remote computer manufacturing and test facilities.

Background: Software Installation

Software installation is normally a burden with new computers, and is often a source of frustration for consumers. Thus, pre-installation of software by the computer manufacturer is very welcome to consumers. Pre-installation also helps to avoid problems which might be caused by software incompatibilities or incorrect installation of software. Pre-installation of software also helps to avoid unnecessary service calls to the computer manufacturer which may be due to the consumer's difficulty in understanding the software installation instructions.

Software Management

Pre-installation of software to prevent incompatibilities or incorrect installation at the consumer level requires careful software management. This management takes place not only prior to but also during the manufacturing process.

Traditionally, pre-installation is accomplished through creation of disk images. A disk image is a file that holds a copy of all of the data, including partitioning and driver information, contained on a given storage medium (usually a hard disk drive). Disk images are usually prepared by a software engineering group once a personal computer has been configured with all of the appropriate components (operating system, applications, utilities, TSRs, etc.). This configured computer is referred to as a "master". The disk images themselves are then replicated and distributed to remote manufacturing sites for installation on consumer machines.

Configuration and installation takes place prior to packing the unit for shipping in order to provide the consumer with a unit that is operable ("ready to run") upon receipt. Configuration of the unit encompasses partitioning the unit's hard drive, setting up boot information, and adding file directory structure information. Installation is the process of writing the physical software files to the hard drive.

Background: Zip Deliverables

The role of a software distribution system is to facilitate the transfer of software, which is to be released to the consumer, to the manufacturing site. Once at the manufacturing site, the software will be installed and configured on a raw (unformatted) hard drive or the hard drive of a newly assembled personal computer.

Current distribution techniques depend on a batch delivery system. The batch is composed of a disk image (namely, the set of files released for installation consisting of all required components) which has been compressed into a single deliverable unit. Compression is a process by which the disk image is condensed in order to take up less storage space. Such a unit is often referred to as a "zip deliverable", which is a reference to the compression utility, PKZIP™, most often used to create the compressed file deliverable.

Currently, zip deliverables are distributed in what is known as the drop method, that is, when any change is made to just one of the files constituting the zip deliverable, the entire deliverable must be rebuilt and redistributed (dropped) to the manufacturing site. Such a distribution method puts an even greater demand on transmission capabilities, since all rebuilt deliverables will need to be redistributed to the manufacturing facilities in a relatively short period of time. Without prompt updates, the manufacturer has to allocate greater resources to post-consumer fixes.

Background: Disk Image Disadvantages

The use of disk images for distribution of software has inherent disadvantages. First, the size of disk images needed to distribute complete system software configurations has grown almost exponentially in the past 10 years, from 30 megabytes to over 400 megabytes, due to the increased hard disk space requirements of more functional operating systems and feature-rich applications. Consequently, the storage media for the disk image must meet ever increasing capacity demands and distribution costs continue to rise.

Second, disk images are limited to one configuration. Changes in disk image configuration can result from any difference in hardware and software combinations. For each change in configuration, no matter how slight, an entirely new disk image must be built, replicated, and distributed. Most installation configurations tend to have one or more files in common, such as the operating system or user applications. This results in many files being duplicated and distributed multiple times. Large amounts of hardware storage space are required to store these common files multiple times, once for each minor difference in configuration.

Third, disk images cannot be updated. Once a disk image is built, it cannot be modified. Components that comprise disk images may need to be changed because of a software bug fix or new revision. If a component is changed, each disk image incorporating that component must be rebuilt, replicated, and distributed.

Fourth, in addition to greater demands on storage space, the amount of time to distribute multiple disk images has greatly increased. With each different configuration, time must be taken to create its disk image. The disk image must then be distributed. The increase in the size of the disk image, even if the distribution system is computer network based, has a corresponding effect on the disk image transmission time. As the number of different computer configurations grows, improved transmission capability in terms of both speed and accuracy is required. Both speed and accuracy factor into maintaining efficient distribution of software to computer manufacturing facilities. Minimizing distribution time for disk images can be critical when updates to components have occurred to fix software bugs: The faster the disk image can be propagated to the installation site, the fewer the number of computers released with faulty software.

Finally, zip deliverables have the inherent disadvantage of a lack of security. During the distribution process, the media which contain the software may not be within the control of