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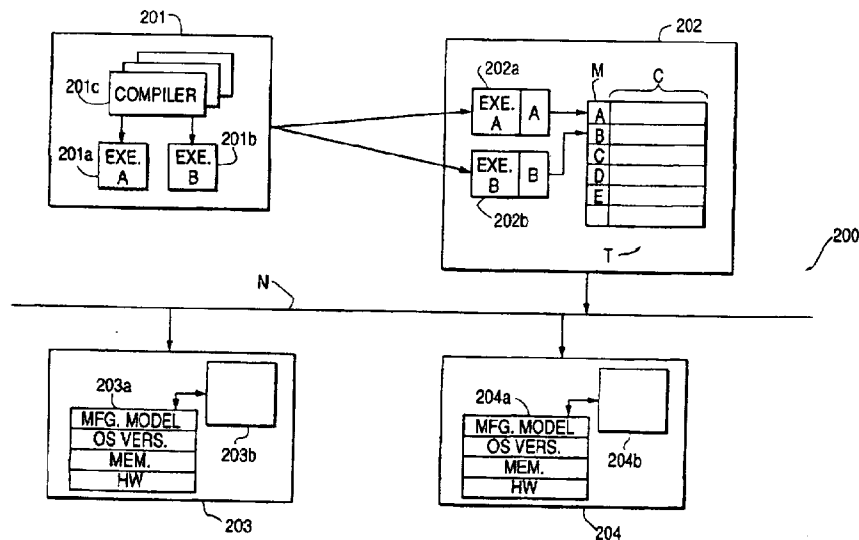
(57) Abstract

A system for downloading different versions of software or data modules into a plurality of terminals having different compatibility interfaces including an authoring component for generating the different module versions (201), a downloading source including a descriptor table which associates each module version with a list of compatibility requirements needed to download the module (202), and a plurality of terminals coupled to the downloading source (202, 203). The downloading source transmits the descriptor table to each terminal and also continuously tranmsits the modules over the network. Each terminal extracts the descriptor table and, based on a match between an entry in the descriptor table and an internally stored table, determines which version of the softw are should be downloaded.

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MULTICAST DOWNLOADING OF SOFTWARE AND DATA MODULES AND THEIR COMPATIBILITY REQUIREMENTS

BACKGROUND OF THE INVENTION

1.   Technical Field

5   This invention relates generally to systems for downloading software and data modules into terminals over a network, such as home communication terminals (HCTs) in a cable television network. More specifically, the invention provides an apparatus and method for selectively downloading different versions of software modules and data modules to a variety of potentially different

10   terminal types, where the differences may be due to variations in hardware, operating system versions, or other parameters.

2.   Related Information

Systems capable of downloading computer software into terminals such as HCTs in a subscription television system are well known. For example, U.S.

15   Patent No. 5,440,632, entitled "Reprogrammable Subscriber Terminal", describes a system including means for reprogramming subscriber terminals by downloading code in a series of transactions. Such systems can be used to add new applications, or to replace outdated or faulty software. Difficulties and inefficiencies may arise, however, in networks having different types of terminals

20   which require different versions of software.

For example, in a cable television network, some subscribers may have the newest HCT model with fast processors, special peripherals and extra memory, while other subscribers may have older HCTs which do not have such

- 2 -

interfaces or capabilities. Additionally, some HCTs may be loaded with the latest version of an operating system, while others may be compatible only with older versions of the operating system. Similarly, HCTs from different suppliers with different designs generally require different versions of software. In such

5   systems, multiple versions of software and data must be downloaded. Thus arises a problem in determining which versions of particular modules should be downloaded into each terminal, and providing an efficient scheme for doing so.

One possible method for solving the aforementioned problem is to provide each terminal with means for requesting only a particular version of a module

10   from the headend. Unfortunately, such a scheme requires two-way communication between the terminals and the headend, which may be expensive and inefficient to provide, particularly since each terminal would require, at least temporarily, a dedicated channel for transmitting the requested version of the software or data.

15   Other downloading schemes involving client-server paradigms in a network environment are also known. For example, in a network comprising a server and a plurality of clients, any particular client on the network requiring a new or updated software module can download such software by making a request to the server, which provides the requested version over the network.

20   However, as noted above, in networks such as subscription television systems, such two-way communication may be expensive and difficult to provide, and may result in increased complexity and reduced download performance. Furthermore,

- 3 -

it may be difficult to coordinate version numbers among different software applications, complicating the task of determining which versions of complementary software should be downloaded into a particular terminal.

Finally, systems which require communication between the downloading source and each terminal impose additional processing requirements upon the downloading source and on the terminal. In a network comprising hundreds of thousands of terminals and a single downloading source, such added processing can slow down the system unacceptably.

The above-described problems will likely worsen as the variety of HCTs expands to provide consumers with a wider range of terminals of varying capabilities and prices, and from multiple suppliers with different designs.

Accordingly, in order to overcome the above and other difficulties, a means of selectively downloading software and data modules without requiring two-way client-server communication is desirable. To date, no such suitable approach has been developed.

SUMMARY OF THE INVENTION

The present invention solves the aforementioned problems by providing a system and method for selectively downloading software and data modules to terminals in a network without requiring communication between the terminal and the downloading source. The term "modules" as used herein includes application programs, subparts of programs, operating systems, "patches", data tables, groups of interpretable instructions, and the like.

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