

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION

FILED

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CLERK US DISTRICT COURT
WESTERN DISTRICT OF TEXAS

BY _____
DEPUTY

CONTENT DELIVERY SOLUTIONS LLC,

Plaintiff,

v.

AKAMAI TECHNOLOGIES, INC.;
AOL, INC.;
AT&T INC.;
CDNETWORKS INC.;
GOOGLE INC.;
LIMELIGHT NETWORKS, INC.;
RESEARCH IN MOTION CORPORATION;
SAVVIS, INC.;
VERIZON COMMUNICATIONS INC.;
YAHOO! INC.;

Defendants.

C.A. No: _____

A11CA216 LY

JURY TRIAL DEMANDED

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Content Delivery Solutions LLC complains of the Defendants as follows:

PARTIES

1. Plaintiff Content Delivery Solutions LLC ("CDS") is a Texas limited liability company having offices at 6136 Frisco Square Boulevard, Suite 385, Frisco, Texas 75034.
2. Upon information and belief, Defendant Akamai Technologies, Inc., ("Akamai") is a Delaware corporation with its principal place of business at 8 Cambridge Center, Cambridge, MA 02142.
3. Upon information and belief, Defendant AOL, Inc., ("AOL") is a Delaware corporation with its principal place of business at 22000 AOL Way, Dulles, Virginia 20166.
4. Upon information and belief, Defendant AT&T Inc. ("AT&T") is a Delaware corporation with its principal place of business at 208 South Akard Street, Dallas, Texas 75202.

5. Upon information and belief, Defendant CDNetworks Inc. (“CDNetworks”) is a California corporation with its principal place of business at 441 West Trimble Road, San Jose, California 95131.

6. Upon information and belief, Defendant Google Inc. (“Google”) is a Delaware corporation with its principal place of business at 1600 Amhitheatre Parkway, Mountain View, California 94043.

7. Upon information and belief, Defendant Limelight Networks, Inc., (“Limelight Networks”) is a Delaware corporation with its principal place of business at 1614 Sidney Baker Street, Kerrville, TX 78028.

8. Upon information and belief, Defendant Research In Motion Corporation (“RIM”) is a Delaware corporation with its principal place of business at 122 West John Carpenter Parkway, Suite 430, Irving, TX 75039.

9. Upon information and belief, Defendant SAVVIS, Inc., (“SAVVIS”) is a Delaware corporation with its principal place of business at 1 SAVVIS Parkway, Chesterfield, Missouri 63017.

10. Upon information and belief, Defendant Verizon Communications Inc. (“Verizon”) is a Delaware corporation with its principal place of business at 140 West Street, New York, NY 10007.

11. Upon information and belief, Defendant Yahoo! Inc. (“Yahoo”) is a Delaware corporation with its principal place of business at 701 First Avenue, Sunnyvale, California 94089.

JURISDICTION AND VENUE

12. This is an action for patent infringement arising under the laws of the United States, 35 U.S.C. § 1, *et seq.* Jurisdiction in this district is proper pursuant to 28 U.S.C. §§ 1331 and 1338(a).

13. This Court has personal jurisdiction over the Defendants. Upon information and belief, each of the Defendants has transacted business in this judicial district and/or has committed, contributed to, or induced acts of patent infringement in this judicial district.

14. Venue in this judicial district is proper pursuant to 28 U.S.C. §§ 1391 and 1400(b).

THE PATENTS IN SUIT

15. The Plaintiff is the exclusive licensee with standing to sue for infringement of United States patents No. 6,058,418 (“the ‘418 patent”) entitled “Marketing Data Delivery System” was duly and legally issued on May 2, 2002, to named inventor Hiroshi Kobata. A copy of the ‘418 patent is attached as Plaintiff’s Exhibit 1.

16. The Plaintiff is the exclusive licensee with standing to sue for infringement of United States patents No. 6,393,471 (“the ‘471 patent”) entitled “Marketing Data Delivery System” was duly and legally issued on May 21, 2002, to named inventor Hiroshi Kobata. A copy of the ‘471 patent is attached as Plaintiff’s Exhibit 2.

CLAIM FOR RELIEF OF INFRINGEMENT

17. The Defendants as specified below as acts of infringement have infringed and are infringing one or more claims of the ‘418 patent and/or the ‘471 patent in violation of 35 U.S.C. § 271(c) by making, using, and selling products and services of networked client/server marketing data delivery systems that select marketing content or other content on the basis of client demographics, client configuration, or client infrastructure and provide the selected content to client-users of the systems – or by making, using, and selling products and services of marketing data delivery systems that make marketing decisions based on demographic information received from client subsystems including determining which client-users should be targeted to receive specific information content or determining whether particular client-users would welcome receipt of specific information content.

18. Akamai’s acts of infringement as covered by one or more claims of the ‘418 patent include making, using, and selling Akamai’s products and services labeled by Akamai as “Akamai Media Delivery” and Akamai NetSession,” which is a system for delivering content to a client system in which a service provider selects content to transmit to the client system on the basis of client configuration or infrastructure. Akamai’s acts of infringement as covered by one or more claims of the ‘471 patent include making, using, and selling Akamai’s products and services labeled by Akamai as “Edgescape,” which is a networked client/server marketing data delivery system that selects marketing content on the basis of client demographics and provides the selected marketing content to client-users of the system.

19. AOL’s acts of infringement as covered by one or more claims of the ‘418 patent include making, using, and selling AOL’s products and services labeled by AOL as “AOL Advertising,” which is a system for delivering content to a client system in which a service provider selects content to transmit to the client system on the basis of client configuration or infrastructure. AOL’s acts of infringement as covered by one or more claims of the ‘471 patent include making, using, and selling AOL’s products and services labeled by AOL as “AOL Advertising,” which is a networked client/server marketing data delivery system that selects marketing content on the basis of client demographics and provides the selected marketing content to client-users of the system.

20. AT&T’s acts of infringement as covered by one or more claims of the ‘471 patent include making, using, and selling AT&T’s products and services labeled by AT&T as “AT&T U-verse Television,” which is a networked client/server marketing data delivery system that selects marketing content on the basis of client demographics and provides the selected marketing content to client-users of the system.

21. CDNetworks’ acts of infringement as covered by one or more claims of the ‘418 patent include making, using, and selling CDNetworks’ products and services labeled by

CDNetworks as “Content Acceleration,” which is a system for delivering content to a client system in which a service provider selects content to transmit to the client system on the basis of client configuration or infrastructure. CDNetwork’s acts of infringement as covered by one or more claims of the ‘471 patent include making, using, and selling CDNetwork’s products and services labeled by CDNetworks as “Content Acceleration,” which is a networked client/server marketing data delivery system that selects marketing content on the basis of client demographics and provides the selected marketing content to client-users of the system.

22. Google’s acts of infringement as covered by one or more claims of the ‘471 patent include making, using, and selling Google’s products and services labeled by Google as “Google AdWords,” which is a marketing data delivery system that makes marketing decisions based on demographic information in a database, where the marketing decisions include determining which client-users of the system should be targeted to receive specific information content based on locations of said client-users or determining whether a particular one of said client-users would welcome receipt of specific information content from a content-provider.

23. Limelight’s acts of infringement as covered by one or more claims of the ‘418 patent include making, using, and selling Limelight’s products and services labeled by Limelight as “Limelight Networks XD Platform,” which is a system for delivering content to a client system in which a service provider selects content to transmit to the client system on the basis of client configuration or infrastructure.

24. RIM’s acts of infringement as covered by one or more claims of the ‘471 patent include making, using, and selling RIM’s products and services including those labeled by RIM as “Blackberry Advertising Service” and “Blackberry Advertising Service Framework,” which compose a networked client/server marketing data delivery system that selects marketing content on the basis of client demographics and provides the selected marketing content to client-users of the system.

25. SAVVIS’s acts of infringement as covered by one or more claims of the ‘418 patent include making, using, and selling SAVVIS’s products and services labeled by SAVVIS as “Intelligent Monitoring,” which is a system for delivering content to a client system in which a service provider selects content to transmit to the client system on the basis of client configuration or infrastructure.

26. Verizon’s acts of infringement as covered by one or more claims of the ‘471 patent include making, using, and selling Verizon’s products and services including those labeled by Verizon as “Verizon FiOS TV,” which composes a networked client/server marketing data delivery system that selects marketing content on the basis of client demographics and provides the selected marketing content to client-users of the system.

27. Yahoo’s acts of infringement as covered by one or more claims of the ‘471 patent include making, using, and selling Yahoo’s products and services including those labeled by Yahoo as “Right Media Exchange,” which composes a networked client/server marketing data delivery system that selects marketing content on the basis of client demographics and provides the selected marketing content to client-users of the system.

DEMAND FOR JUDGMENT

WHEREFORE, Plaintiff CDS respectfully requests this Court to enter judgment against the defendants and against their subsidiaries, successors, parents, affiliates, officers, directors, agents, servant, employees, and all persons acting in concert or participating with the defendants, granting the following relief:

- A. The entry of judgment in favor of Plaintiffs and against each of the defendants;
- B. A judgment that each of the defendants' making, using, and/or selling, within the State of State and elsewhere in the United States the defendants' accused products and services infringes, actively induces others to infringe, and/or contributorily infringes the '418 and/or the '471 patent;
- C. An award of damages adequate to compensate the Plaintiff for the infringement that has occurred, together with prejudgment interest from the date the infringement began, but in no event less than a reasonable royalty as permitted by 35 U.S.C. § 284;
- D. A finding that each of the defendants' infringement has been willful and an award of increased damages as provided by 35 U.S.C. § 284;
- E. A finding that each of the defendants' infringement has been willful and an award of increased damages as provided by 35 U.S.C. § 285;
- F. A permanent injunction prohibiting further infringement, inducement, and/or contributory infringement of the '418 and '471 patents;
- G. Costs and expenses in this action; and
- H. Such other relief that Plaintiff is entitled to under law and any other further relief that the Court may deem just and proper.

DEMAND FOR JURY TRIAL

Plaintiff CDS demands a trial by jury on all issues presented in this complaint.

Respectfully submitted,

Date: 3-18-2011

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ATTORNEYS FOR PLAINTIFF
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US006098180A

United States Patent [19]
Kobata et al.

[11] **Patent Number:** **6,098,180**
 [45] **Date of Patent:** **Aug. 1, 2000**

- [54] **ROBUST DELIVERY SYSTEM**
- [75] Inventors: **Hiroshi Kobata**, Brookline; **Theodore G. Tonchev**, Cambridge, both of Mass.
- [73] Assignee: **e-Parcel, LLC**, Newton, Mass.
- [21] Appl. No.: **08/804,114**
- [22] Filed: **Feb. 18, 1997**
- [51] Int. Cl.⁷ **G06F 13/00**
- [52] U.S. Cl. **714/18; 371/32**
- [58] Field of Search **371/32; 714/18**

“ITU-T White Book.” (Japanese Version Only).
 “Data Communication Networks: Services and Facilities, Interfaces,” CCITT (The International Telegraph and Telephone Consultative Committee) (1989).

Primary Examiner—David Y. Eng
Attorney, Agent, or Firm—Testa, Hurwitz & Thibault, LLP

[57] **ABSTRACT**

A system is provided for the safe transfer of large data files over an unreliable network link in which the connection can be interrupted for a long period of time. In the subject system, the sender sends a file with a unique signature which is recognized by the receiver, with the signature providing information as to file size. Upon the occasion of an interrupted communication over the link, the receive side waits for another connection. Upon the establishment of the connection, the receive side recognizes the signature of the file as the file which was being transmitted at the time of the interruption and requests blocks of data from the sender from the point at which the interruption occurred, with the point being established by the file size and the time of the interruption. The result is a restartable transfer of the transmission of information from the sender to receiver from the place where it left off, thus eliminating the annoyance of having to restart the transmission from the beginning.

[56] **References Cited**

U.S. PATENT DOCUMENTS

| | | | | |
|-----------|---------|---------------|-------|------------|
| 4,630,108 | 12/1986 | Gomersall | | 358/84 |
| 5,457,680 | 10/1995 | Kamm et al. | | 370/17 |
| 5,768,528 | 6/1998 | Stumm | | 395/200.61 |
| 5,812,784 | 1/1995 | Watson et al. | | 395/200.75 |
| 5,913,040 | 6/1999 | Rakavy et al. | | 395/200.62 |

FOREIGN PATENT DOCUMENTS

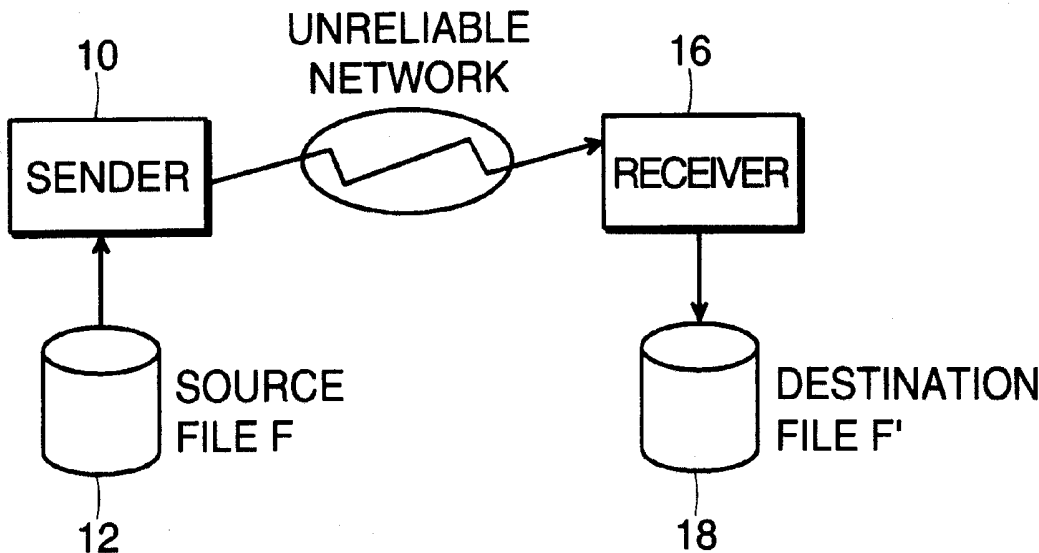
| | | | | |
|--------------|--------|--------------------|-------|------------|
| 0 862 304 A2 | 9/1998 | European Pat. Off. | | H04L 29/06 |
| 5-022382 | 8/1994 | Japan | . | |
| 6-150217 | 1/1996 | Japan | . | |

OTHER PUBLICATIONS

“Protocol Handbook for Personal Computer/Data Communication,” published by the Asahi Newspaper (Japan) in 1985. (Japanese Version Only).

21 Claims, 2 Drawing Sheets

Microfiche Appendix Included
 (3 Microfiche, 202 Pages)



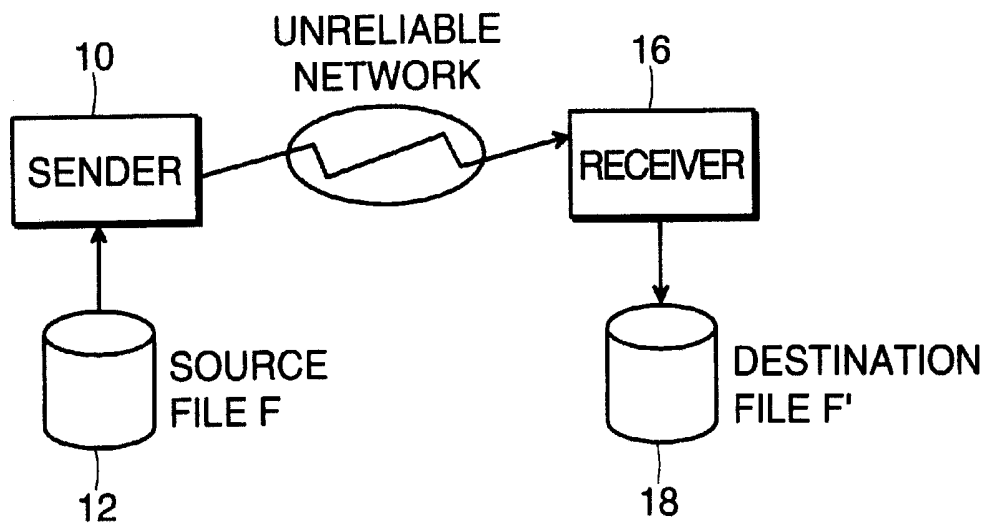


FIG. 1

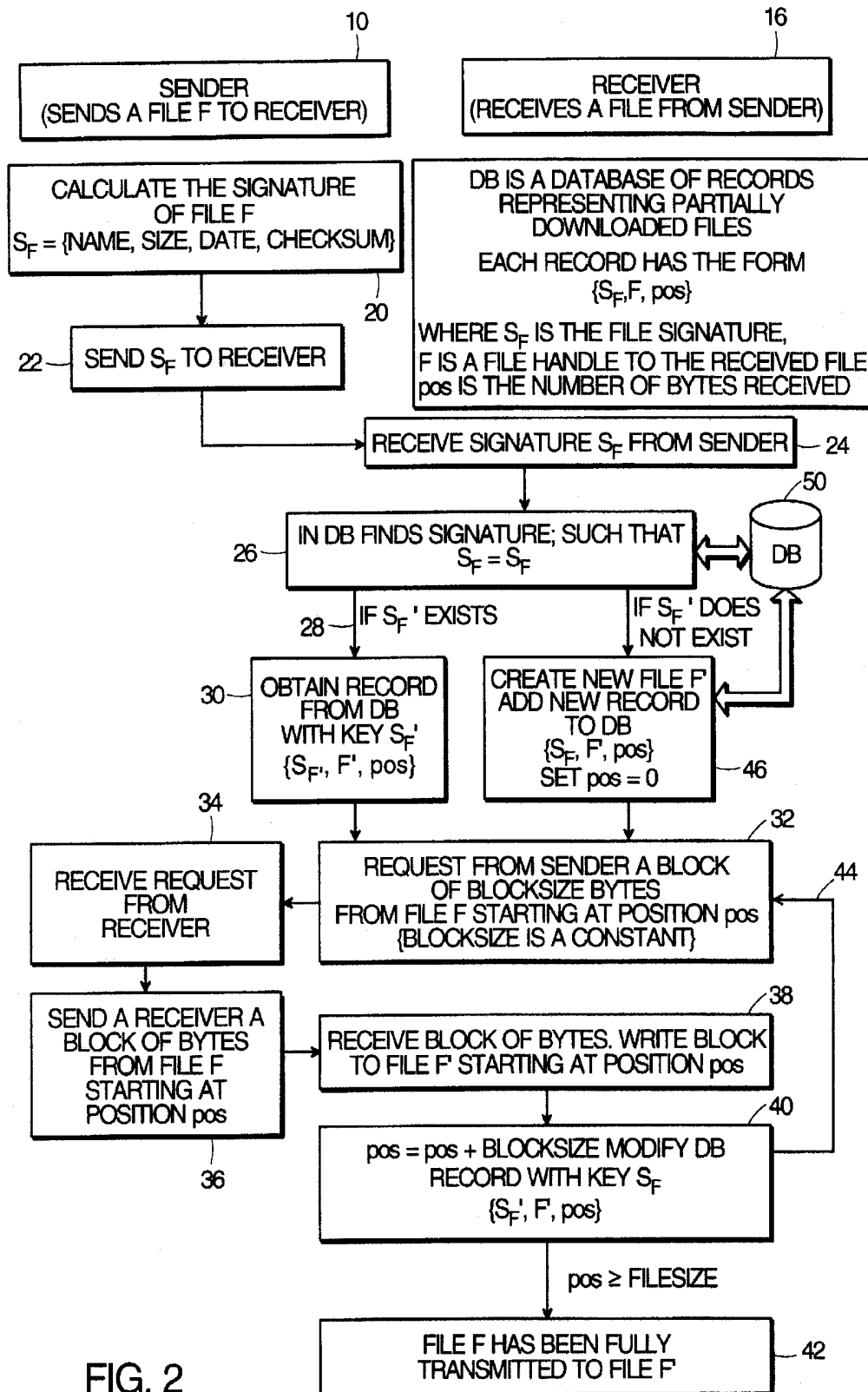


FIG. 2

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ROBUST DELIVERY SYSTEM**FIELD OF INVENTION**

A program listing of the invention, written in the C++ programming language, is provided in the Microfiche Appendix, which includes three microfiche having a total number of 202 frames.

This invention relates to the transfer of information from a sender to a receiver over the internet and, more particularly, to a robust delivery system in which interrupted information transfer can be reestablished without the necessity of resending the entire file.

BACKGROUND OF THE INVENTION

It will be appreciated that due to capacity and other problems with respect to the internet, internet connections are often lost during the transfer of files from sender to receiver or, alternatively, from server to client. This type of interruption is exceedingly annoying due to the fact that a large amount of the information may have already been transmitted at the time of the interruption. Current systems do not allow for the transmission of only information that occurred after the interruption, but rather require that the entire file be transferred from its beginning. In the past, information transfer from sender to receiver over the internet was accomplished in blocks or packets of information. The blocks were not transferred with interrupted links in mind, but were rather coded with information for flow control to accommodate bandwidth limitations or usable bandwidth associated with capacity of network switches to store and transmit data. Flow control systems have been utilized both in synchronous and asynchronous systems to be able to accommodate switches and to recognize when buffer space, either at a switch or at the recipient, was incapable of responding adequately to the inflow of information.

In the case of the transfer of large files such as MPEG or JPEG in which images are to be transmitted from the sender to receiver, interruption of the link may result in the necessity of transmitting the entire image. Depending on the size of the image and its complexity, it may take 18 to 20 minutes to be able to transfer the file to the receive side. If the interruption occurs close to the end of the transmission, it would be convenient to be able to restart the transmission and not have to transmit data that has already been received.

The problem is exceedingly severe in the transmission of video images. It is desirable, bandwidth available, to be able to transmit realtime video across the internet. However, due to bandwidth limitations, this is neither practical now nor in the future for high quality video transmission to be transmitted on a real-time basis. As a result, it takes long periods of time to transmit video images. As a result, the loss of a link during a video transmission results in a major disruption at the receive side, with the interruption causing more problems than the limited bandwidth of the network due to the requirement of restarting the entire process during a communications outage. Moreover, due to the increasing usage of the internet, oftentimes with multiple users, the amount of interruption increases. For a single server serving as many as 200-500 clients, interruptions are frequent, with there being no convenient way, presently, to overcome the restart problem.

Moreover, for those systems in which the client side can interrupt the server side upon sensing of excessive load, this constitutes an interruption which nonetheless must be compensated for when it is appropriate to reestablish the connection.

One such client-side interruption system is described in U.S. patent application Ser. No. 08/755,029, filed by Hiroshi

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Kobata on Nov. 22, 1996. Here, a system for regulating the time of transmission of information from a server to a client is described in which network occupation is sensed and the transmission is caused to cease when insufficient bandwidth is available. Whether the interruption of a large file is caused by sensing network overload by the particular client or server, or whether it is due to network breakdowns, the problem is still the same. Large files must be restarted from the beginning.

SUMMARY OF THE INVENTION

In order to be able to start the transmission of information in a large file after the link has been interrupted, in the subject invention, a signature is transmitted along with the file in which the signature includes the length of the file. This signature is detected at the receive side where it is stored. Upon interruption of the communications link, the receive side waits again for the establishment of a connection and for the particular unique signature which is transmitted from the send side to the receive side. In order for information to be transmitted from the send side to the receive side, there must be a request of a block of information from the receive side to the send side which allows the receive side to control which parts of the file are to be transmitted. Since the receiver, due to the signature, knows the length of the file transmitted and when the transmission was interrupted, it is relatively easy, upon sensing an interrupt, to have the sender start sending those packets or blocks which are a given distance from the start of the file. As a result, it is part of the subject system that the receive side requests only those parts of the file which it does not have in memory.

It will be appreciated that this system permits simplification of the send side due to the fact that the send side need not store information about the transfer state. Rather, the send side merely starts up its transmission of only the blocks requested by the receive side. This permits a simplified unidirectional communications link in which the control signals for the transmission of data are generated at the receive side without any interaction with the send side.

In summary, a system is provided for the safe transfer of large source files over an unreliable network link in which the connection is interrupted for a long period of time. In the subject system, the sender sends a file with a unique signature which is recognized by the receiver, with the signature providing information as to file size. Upon the occasion of an interrupted communication over the link, the receive side waits for another connection. Upon the establishment of the connection, the receive side recognizes the signature of the file as the file which was being transmitted at the time of the interruption and requests blocks of data from the sender from the point at which the interruption occurred, with the point being established by the file size and the time of the interruption. The result is a restartable transfer of the transmission of information from the sender to receiver from the place where it left off, thus eliminating the annoyance of having to restart the transmission from the beginning.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features of the subject invention will be better understood taken in conjunction with the Detailed Description in conjunction with the Drawings of which:

FIG. 1 is a block diagram of the subject system illustrating the effect of an unreliable network; and,

FIG. 2 is a flow chart of the subject system indicating the utilization of signatures to uniquely identify a file as to the name, size, and date.

DETAILED DESCRIPTION

Referring now to FIG. 1, a sender 10 at the send side transmits the contents of a file 12 over a network 14 to a

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receiver 16 which stores the information locally at 18. Storage 18, as will be seen in connection with FIG. 2, includes a database of records representing partially downloaded files with each record having an associated file signature, a file handle and a position representative of the number of bytes received.

The purpose of the subject system is to provide the signature, in one embodiment at the header, every time that the file is to be transferred. Thus the objective is to transfer a File F over an unreliable network link. Given two computers connected over a network link, one computer, the sender, must transfer a large file to the other computer, the receiver, over the network link.

As mentioned hereinbefore, the largest of the files currently to be transferred are MPEG files which refers to motion picture and coding group, which is a format that is typically used for the transfer of such data. Other large format files include such files WAVI, which refers to audio/video files; AU, which is an audio format; and AVI, which is a video format.

Referring now to FIG. 2, in one embodiment, sender 10 seeks to send a File F to receiver 16. In order to do so, means at the sender calculate the signature of File F, which, in one embodiment, includes the name, size, date and check sum unique to this file. This is accomplished at calculation module 20 which is coupled to a transmit module 22 which sends the file S_f to the receiver. At the receiver, means 24 are provided to strip off the signature of the file, whereas at 26 within the database, the signature is matched to the stored signatures such that if a match exists, as illustrated at 28, then the records are obtained from the database with the key, S_f , F, and POS, as illustrated at 30. In short, $[S_f, F, POS]$ refers to the record containing a signature matching that of the transmitted data. In such a case, there is a request from the sender at 32 for a block of information in block size bytes from File F starting at Position POS. Note that the block size is constant, such that when this request is received at 34 by the sender, the sender transmits a block of bytes from File F starting at Position POS as illustrated at 36.

It will be appreciated that while the above is described with block size being constant, this does not necessarily have to be the case.

Upon receipt of a request from the receiver, the send side transmits the above-identified data which is received at 38 in which a block of bytes that are received are written into file F' starting at Position POS.

As shown at 40, on the receive side, the database record is modified with the key S_f to $[S_f, F', POS]$.

If the position is greater than the transmitted file size from the signature, then File F has been fully transmitted to File F' as illustrated at 42.

If not, as illustrated by line 44, a further request is initiated on the receive side and transmitted to the send side for a further block of bytes from File F starting at the position denoting the end of the last block that has been received at the receive side.

If, in the database, S_f does not exist, then as illustrated at 46, a new record is added to the database in the form $[S_f, F', 0]$ with the position being set to zero. The result of this is that there is a request from the receive side indicating that no data exists at all at the receive side and that the send side should commence transmitting the file in question.

It will be appreciated that there is a database 50 which is coupled to the system at the receive side to enable the query of the database as to whether or not there is a signature of the file that has already been entered into the database. The database is also coupled to the block 46 which loads a vector indicating the new file into the database.

There is also a connection between the database and block 40 which updates the state of the current and transferred file

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so as to indicate that new data has been received. As a result, the receive side will not generate a request to the send side for data that has already been received.

The subject system thus not only provides for the robust delivery information due to the fact that interrupted transmissions can be restarted at the point of interruption, it also provides a system for the request of information from the sender in blocks which are determined by the receive side.

While the subject system has been described as having a single send and a single receive side, in one embodiment, the receiver can respond to multiple servers simultaneously. This permits transmission of a given file from more than one server to the receive side so that if a link is broken between a particular server and client, the client can nonetheless receive the same data from another server, with the start up of being accomplished in the manner described above.

Note also that since the client bandwidth is much larger than that of the server, it possible to simultaneously transmit the same file from multiple servers, thus to eliminate bandwidth limitations. This problem occurs most frequently when there are extremely loaded servers, which limits the bandwidth on the server side as opposed to the client side. While not rare, this is less of a problem. This problem occurs most frequently in a client server scenario such as NETSCAPE, in which the server, NETSCAPE, can not keep up with the demand for information from its associated client. It is often times the case, the FTP server at NETSCAPE is required to download the NETSCAPE content simultaneously which results in an overload condition at the server. Where it is possible to transmit the same information from multiple servers, then this problem is eliminated because the subject system requires only that which has not been transmitted from one server to be transmitted from a non-down server. This assumes the file signatures are identical and the data is identical with the data being deposited at multiple servers.

In the case of NETSCAPE's web server at WWW.NETSCAPE.COM, it is clear that users seek multiple connections to the server, with the server being unable to select which connections to serve. As a result, the server tries to send data to each of the receivers. This leads to significant overhead for the switches and the links and the servers themselves. With the utilization of the subject system and its attendant protocol, this situation can be avoided by interrupting the sending of information in peek periods until such time as the number of users seeking connections is decreased. The effect of interrupting the transmission is to delay the transmission such that data transfer from sender to receiver is both efficient and non-annoying.

Having now described a few embodiments of the invention, and some modifications and variations thereto, it should be apparent to those skilled in the art that the foregoing is merely illustrative and not limiting, having been presented by the way of example only. Numerous modifications and other embodiments are within the scope of one of ordinary skill in the art and are contemplated as falling within the scope of the invention as limited only by the appended claims and equivalents thereto.

What is claimed is:

1. A system for resuming an interrupted transmission of a file over a network, comprising:
 - a sending node comprising a file comprising a plurality of data portions and a processor executing a first application program, the first application program comprising a calculator module that generates a signature uniquely associated with the file; and
 - a receiving node receiving the signature and an incomplete copy of the file over the network from the sending node, the receiving node comprising a processor

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executing a second application program and memory storing a data record identifying the file as incompletely received by the receiving node, the data record including an indicator identifying an unreceived data portion of the file;

wherein the second application program executing on the receiving node requests transmission of the unreceived data portion identified by the indicator in response to determining from the signature and the data record that the receiving node lacks a complete copy of the file.

2. The system of claim 1 wherein said receiving node stores in the memory signatures associated with files incompletely received by the receiving node and further comprises a comparator, said comparator comparing said signature received from said sending node with the signatures stored in the memory to determine whether the receiving node has an incomplete copy of the file.

3. The system of claim 1 wherein the indicator identifies a position of the unreceived data portion in the file.

4. The system of claim 1 wherein the request for transmission of the unreceived data portion is a request for transmission of a block of unreceived data portions starting with the unreceived data portion identified by the indicator.

5. The system of claim 1 wherein the indicator represents a count of the number of data bytes of the file at the receiving node.

6. The system of claim 5 wherein the signature comprises an indicator of the size of the file and the receiving node continues to request transmission of unreceived data portions as long as the file size indicator is greater in value than the count of the number of data bytes received.

7. The system of claim 1 further comprising:

a second sending node in communication with the receiving node over the network, the second sending node comprising a copy of the file and a processor executing a third application program;

wherein the third application program executing on the second sending node responds to the request by transmitting the unreceived data portion to the receiving node.

8. The system of claim 1 wherein the signature includes an indicator of a size of the file and the receiving node further comprises a comparator comparing the indicator of the file size with the indicator of the data record to determine if the receiving node has received all data portions of the file.

9. The system of claim 8 wherein said receiving node comprises a clock and establishes the time of an interruption in said receipt of said file, and wherein said receiving node determines a block of unreceived data portions to request in response to said file size and the time of said interruption in said receipt of said file.

10. The system of claim 1 further comprising a database in communication with the second application program executing on the receiving node, the database storing records identifying files incompletely received by the receiving node and including the data record.

11. A method for resuming transmission of a file having data portions over a network, comprising the steps of:

receiving at a receiving node a signature uniquely associated with the file;

maintaining by the receiving node a data record identifying the file as incompletely received by the receiving node and including an indicator identifying an unreceived data portion of the file; and

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determining by the receiving node in response to the signature and the record that the receiving node lacks a complete copy of the file; and

requesting by the receiving node transmission of the unreceived data portion identified by the indicator in response to determining that the receiving node lacks a complete copy of the file.

12. The method of claim 11 further comprising the steps of determining the time at which transmission of data portions of the file from said sending node to said receiving node is interrupted and wherein said request by said receiving node is made in response to said time at which said transmission of data portions is interrupted.

13. The method of claim 11 wherein the step of determining whether the receiving node lacks a complete copy of the file comprises the step of determining whether said received signature corresponds to a stored signature on said receiving node.

14. The method of claim 13 further comprising the step of opening a new file on said receiving node if said signature received from said sending node does not correspond to a signature stored on said receiving node.

15. The method of claim 11 further comprising the steps of:

detecting by the receiving node an interruption in the receipt of the copy of the file;

establishing a connection between a sending node and the receiving node; and

transmitting the signature from the sending node to the receiving node after establishing the connection.

16. The method of claim 11 further comprising the steps of:

providing an indicator of a size of the file in the signature; and

comparing, by the receiving node, the indicator of the file size with the indicator of the data record to determine if the receiving node has received all data portions of the file.

17. The method of claim 11 comprising the step of requesting a block of unreceived data portions starting with the unreceived data portion identified by the indicator.

18. The method of claim 17 further comprising the steps of:

(a) receiving the block of unreceived data portions;

(b) updating the indicator of the data record in response to the received block of unreceived data portions; and

(c) requesting transmission of a subsequent block of unreceived data portions; and

(d) repeating the steps of (a), (b), (c) until the receiving node receives all unreceived data portions.

19. The method of claim 17 wherein each requested block of unreceived data portions includes a constant number of data portions.

20. The system of claim 17 wherein a number of unreceived data portions in each requested block of unreceived data portions varies from block to block.

21. The method of claim 11 further comprising the steps of maintaining a database of records identifying incompletely received files and storing the data record in the database.

* * * * *



US006058418A

United States Patent [19]
Kobata

[11] **Patent Number:** **6,058,418**
 [45] **Date of Patent:** ***May 2, 2000**

[54] **MARKETING DATA DELIVERY SYSTEM**

5,878,384 3/1999 Johnson et al. 702/187

[75] Inventor: **Hiroshi Kobata**, Brookline, Mass.

Primary Examiner—Viet D. Vu

Assistant Examiner—Hiev C. Le

[73] Assignee: **E-Parcel, LLC**, Newton, Mass.

Attorney, Agent, or Firm—Fish & Richardson P.C.

[*] Notice: This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

[57] **ABSTRACT**

In an Internet-based client/server application, a system is provided which detects demographics of a client including CPU power, hard disk space, applications installed, network connectivity and log-in history so as to provide this infrastructure related information detailing client usage of the Internet to the service provider. In one embodiment, each user is provided with software having a unique serial number. Having the serial number, infrastructure data is checked at the client side and reported to the server periodically, with the server updating a database with the infrastructure data from each PC. In one embodiment, the database is filtered by factors such as location of the client and an indication of which providers delivered software to a client. After filtering, the service provider can obtain various demographics such as the demography of hard disk space, CPU power and viewers. In one embodiment, the demographics are used at the server to automatically select the contents to be transmitted to the particular client. Thus the provider can send the most appropriate contents to the most appropriate client based on demographic information of the client's infrastructure.

[21] Appl. No.: **08/801,458**

[22] Filed: **Feb. 18, 1997**

[51] **Int. Cl.⁷** **G06F 13/00**

[52] **U.S. Cl.** **709/221; 709/220; 709/221; 709/224; 709/223; 709/247; 709/248; 709/249; 709/229**

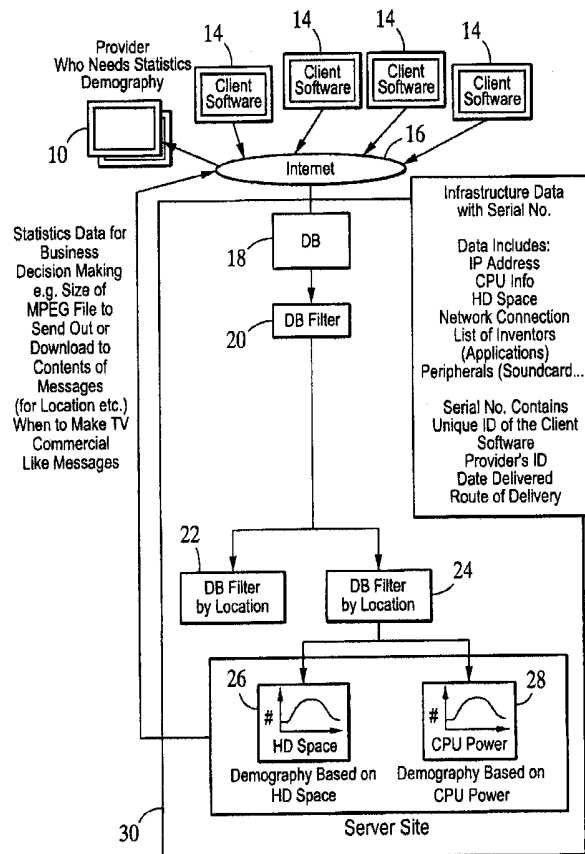
[58] **Field of Search** **395/200.32, 200.47, 395/200.48, 200.53, 200.54, 200.59, 200.5, 200.51, 200.52; 709/202, 220, 221, 222, 247, 248, 249, 223, 224, 229**

[56] **References Cited**

U.S. PATENT DOCUMENTS

5,421,009 5/1995 Platt 709/221
 5,758,072 5/1998 Filepp et al. 395/200.5
 5,845,090 12/1998 Collins, III et al. 395/200.51

22 Claims, 4 Drawing Sheets



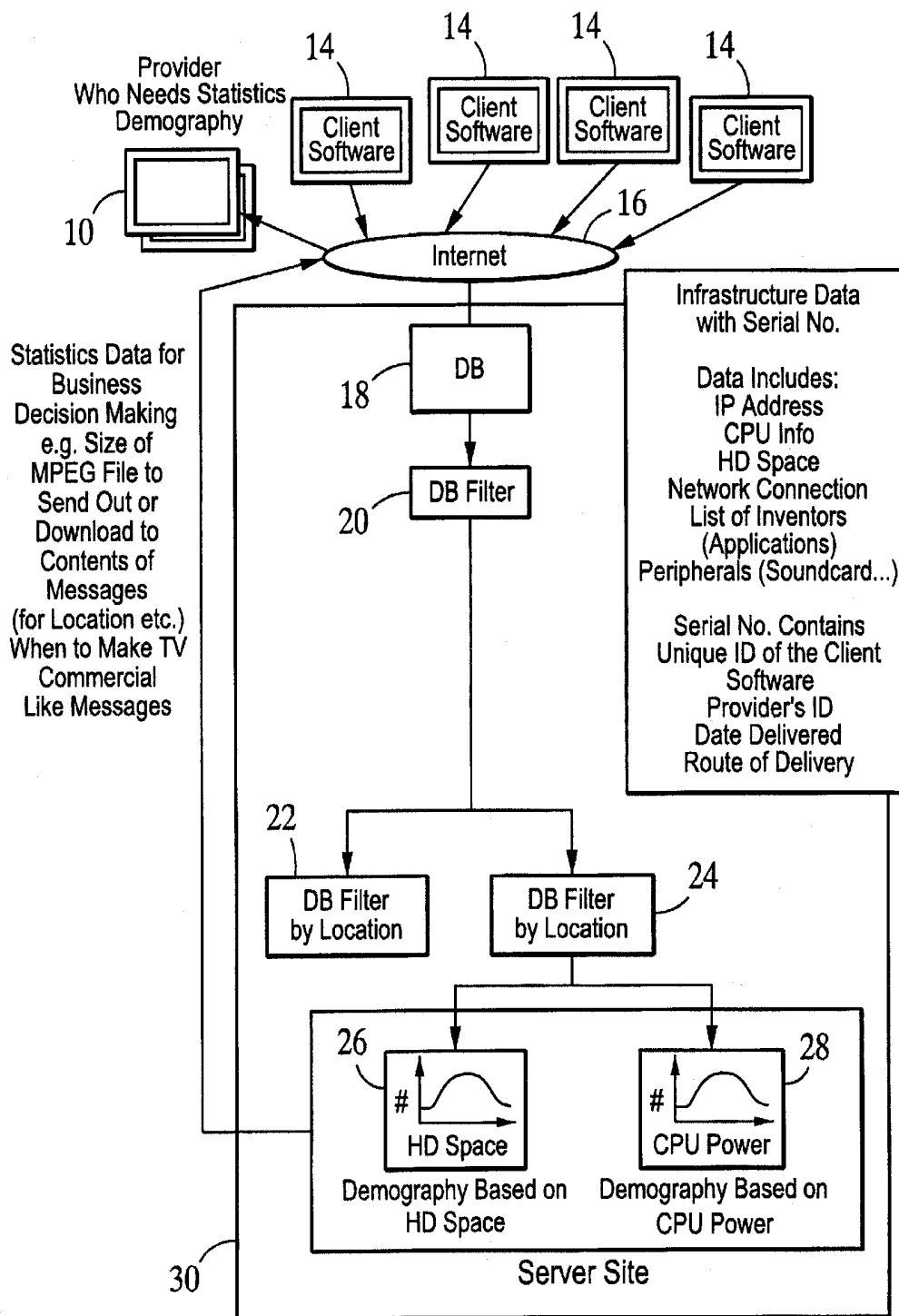


FIG. 1

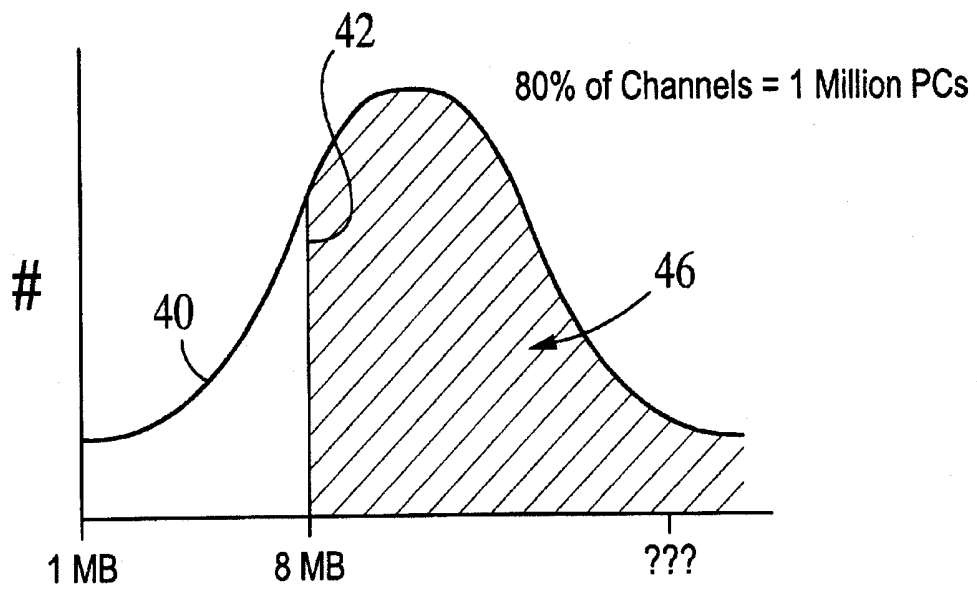


FIG. 2

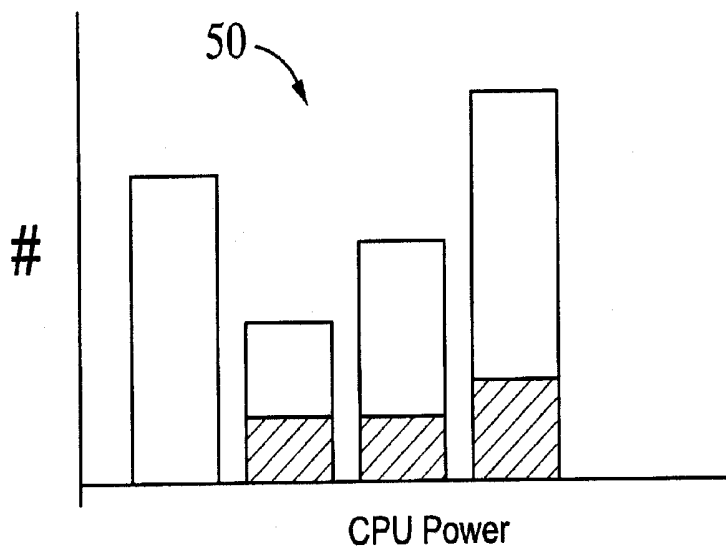


FIG. 3

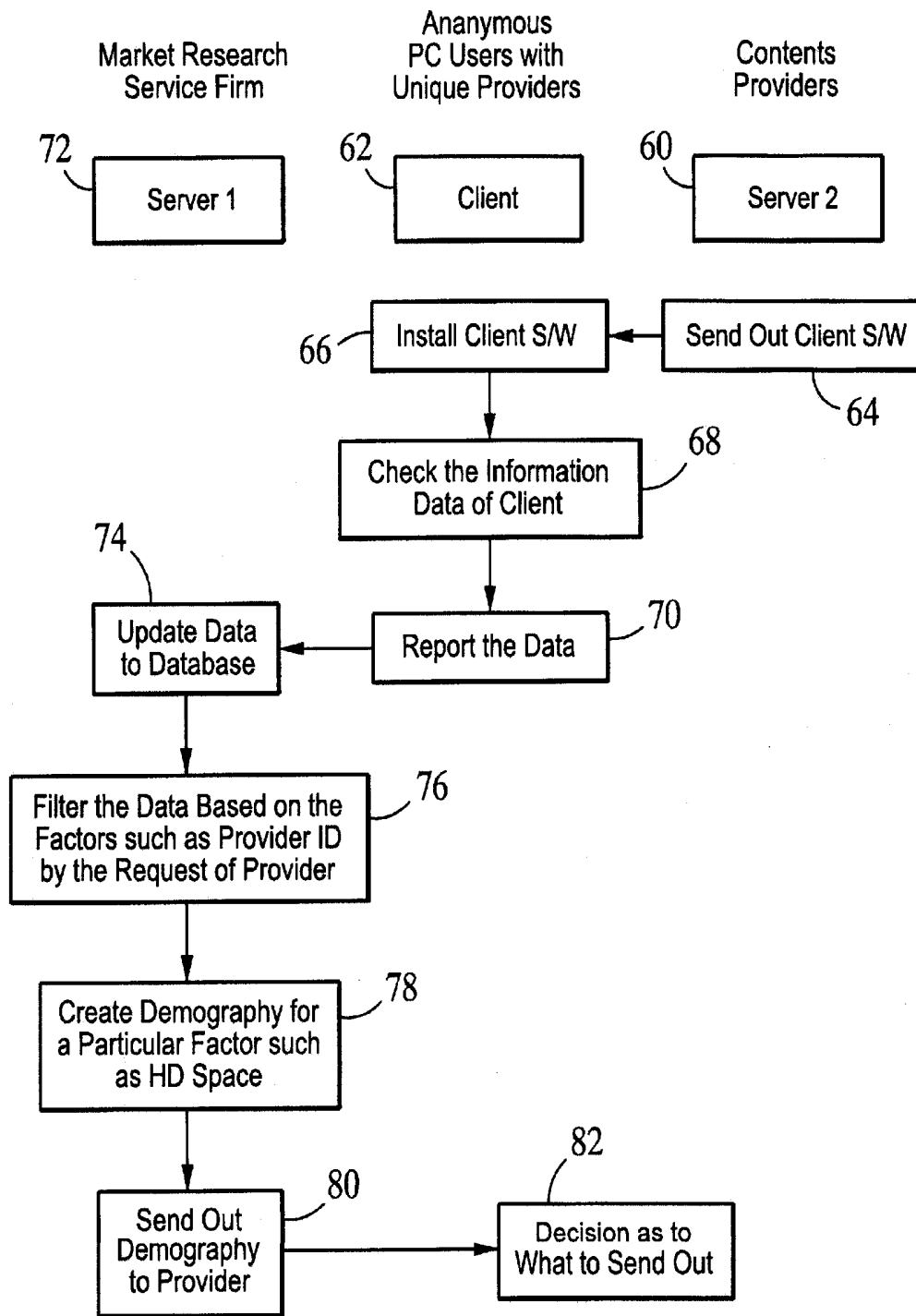


FIG. 4

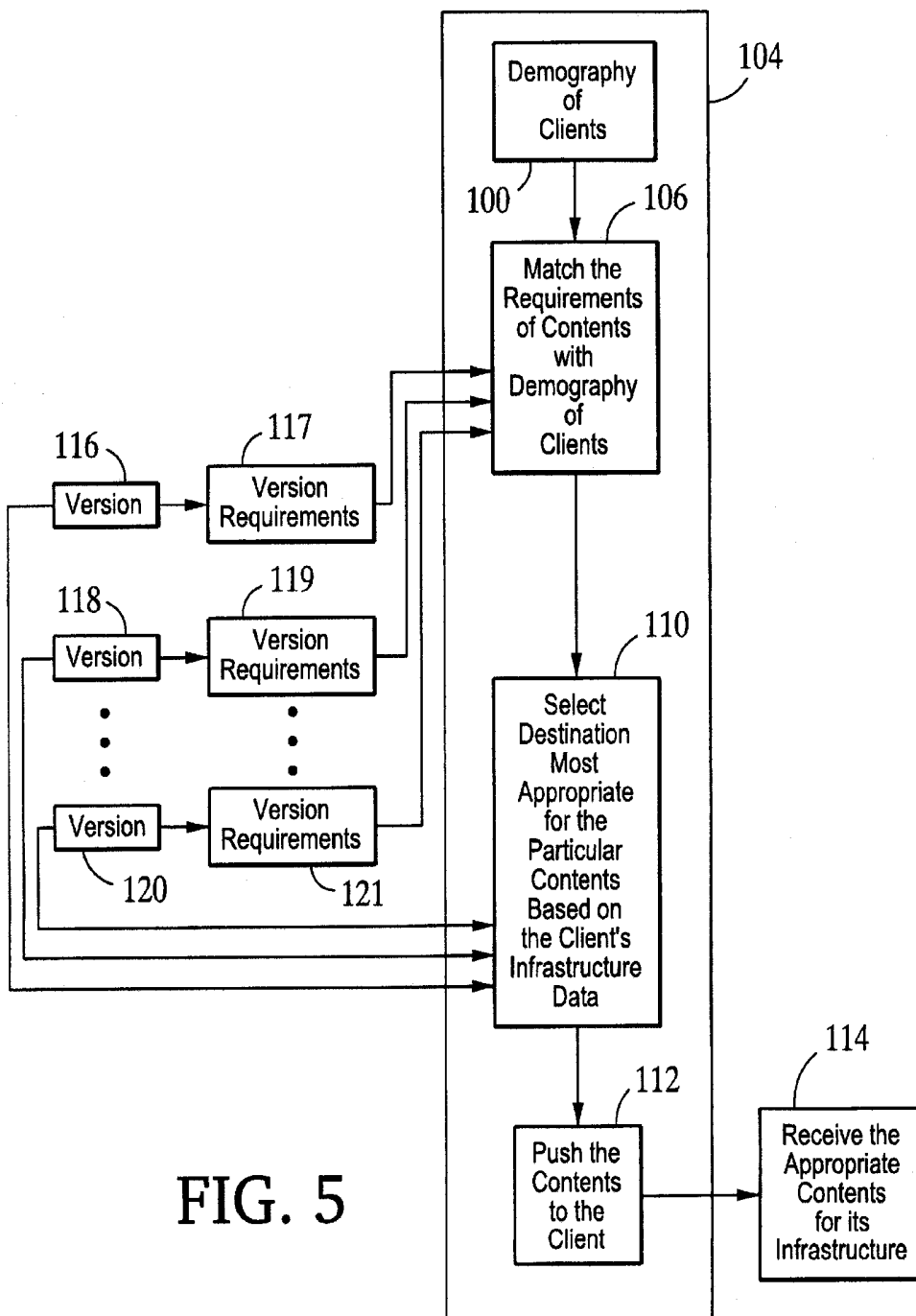


FIG. 5

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MARKETING DATA DELIVERY SYSTEM**FIELD OF INVENTION**

This invention relates to the provision of data over the Internet and, more particularly, to a system for ascertaining the demography of the users of the Internet.

BACKGROUND OF THE INVENTION

With the increased usage of the Internet comes the problem of deciding how and where to direct the information from the provider's point of view. With the advent of so-called "push" systems in which providers have direct access to the PC at the client side in a client/server application, it is increasingly important that the provider be provided with information so as to be able to direct the services to those users who are most likely to be interested.

In the past, the only type of demographic information that was available was to "guess" the usage of the system through use of sampling research data. In systems in which sampling research data is involved, a given research company will ask a major provider how many pieces of software were sold to the various users. Based on the data of the sales of the enabling software, the research company, utilizing mathematical techniques, provides demographic information to the provider based on a series of assumptions about the user.

However, the utilization of statistics alone based on the sales of software, for example, is not at all accurate in terms of providing the provider with targeted information as to the "real" demography of the user or client. For instance, it is impossible through statistics alone based on a single input such as sales to derive information relating to the CPU size and speed at the user, hard disk space available, information relating to the network connection such as dial-up cable modem connection information and ISDN connections, a list of the inventories indicating the applications running on the particular computer involved, as well as peripherals such as sound cards connected to the computer at the client side. Moreover, there is no way to ascertain the log-in history for each of the Internet users, such that critical information for the providers is not existent.

Critical information which is not available from traditional research is infrastructure information for a particular PC, such as CPU power, viewer, sound card and Internet connection information.

What is meant by the term "viewer" is what type of protocol is being run on the machine such as MPEG, QUICKTIME, AVI, and PDF.

The sum total of this infrastructure information would be useful for the decision maker at the provider as to decide whether or not, for instance, it is worth the money to make 3 megabytes of MPEG video available for advertising based on the above infrastructure demography. Thus, it is impossible for this decision maker to ascertain whether the Internet advertisement delivery will be efficient and worth enough to justify the cost, much less, for instance, providing an Internet video advertisement, the cost of which must be justified by assuring a number of targeted viewers for the subject matter of the video advertisement.

SUMMARY OF THE INVENTION

In order to provide such needed data to a content provider that wants to use the Internet connection, in one embodiment, client software is installed at each PC which can detect the infrastructure of the PC. The software which

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is provided by the provider to the user enables sensing CPU power, hard disk space, the applications running or installed, network connectivity and the log-in history. Since each client software has a unique serial number, sensing the serial number at the server side provides for rapid transfer and loading of a database with infrastructure data which is reported to the server periodically, for instance, every two seconds. At the server side, the database can be updated frequently to provide instant demographics of the particular user. It will be appreciated that the database can be filtered by such factors as location so that the provider can be apprised of what locations would be most interested in the content that the provider wishes to transmit. This permits the provider to be able to limit the broadcast of the data to selected locations.

It will be noted that the client software is delivered by the provider to the end user. By so doing, each provider is apprised of its own members, thus to provide the provider with the demographics of its own members or subscribers. This enables the content providers to be able to decide the content size to be delivered, as well as the viewer software, and makes the decision as to how much and what should be provided to an individual user tailored to the particular user's requirements.

For instance, in one operative embodiment, if a provider wants to make a two minute commercial, this can take as much eight megabytes to transmit. At this point, the provider must select what type of viewer software is required to play the eight megabytes of information, whether it is MPEG, QUICKTIME: or some other format. By this manner, the provider can ascertain in real time whether or not the hard disk space is available at the user.

The distribution curve that is generatable through the utilization of the subject system, permits a bell curve to be formed in which hard disk space can be presented in terms of the number of users. Assuming that 8 megabytes is required, it can be determined what percentage of the channels are occupied by the information to be transmitted, and thus the number of PC's that are available to receive the intended transmission. If, for instance, 8 megabytes represent 80% of the channels, then the provider may well be advised that there is a sufficient number of PCs that can receive the information to commit the resources to providing the content and transmitting it.

As will be appreciated, the subject system permits the content provider to make a decision as to whether or not to invest in a given project based on real-time demographics of users connected to the Internet. Note that in general, demographics are from members of the provider since the provider provides the client software to the end user. As a result, not only can content be tailored to the audience which could receive it, but critical decisions can be made as to whether to provide the content at all based on real-time sensing of the demography of the users.

The result is that by use of the subject system, providers can make business decisions such as the size of the video message, the viewer of the video/audio message, and the timing for hyper-advertisements through pulling or pushing at appropriate times. The subject system also makes possible other decisions which are critical to the economic utilization of the Internet. Furthermore, the demographic information permits marketing decisions as to where to sell the software and hardware based on the infrastructure data and the destination of the PC, namely its IP address.

In summary, in an Internet-based client/server application, a system is provided which detects demograph-

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ics of a client including CPU power, hard disk space, applications installed, network connectivity and log-in history so as to provide this infrastructure related information detailing client usage of the Internet to the service provider. In one embodiment, each user is provided with software having a unique serial number. Having the serial number, infrastructure data is checked at the client side and reported to the server periodically, with the server updating a database with the infrastructure data from each PC. In one embodiment, the database is filtered by factors such as location of the client and an indication of which providers delivered software to a client. After filtering, the service provider can obtain various demographics such as the demography of hard disk space, CPU power and viewers. In one embodiment, the demographics are used at the server to automatically select the contents to be transmitted to the particular client. Thus the provider can send the most appropriate contents to the most appropriate client based on demographic information of the client's infrastructure.

Moreover, having derived the above demographic information, in one embodiment, an automatic selection system uses the demographics to provide specially tailored contents to the client. Files can thus be tailored to the client's ability to receive the file or even as to what content should be delivered. Thus whether full frame video should be sent, whether audio should be sent, or indeed what format is appropriate can be selected.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features of the subject invention will be better understood taken in conjunction with the Detailed Description in conjunction with the figures of which:

FIG. 1 is a block diagram of the subject system illustrating the ability to provide a database with real-time demographic information from the users, along with a filter system to be able to tailor the demographic output to be the most useful to the provider;

FIG. 2 is a graph illustrating the results of the subject system in which hard disk space is graphed against the number of users;

FIG. 3 is a bar graph illustrating CPU power as a function of the number of users;

FIG. 4 is a block diagram and flow chart illustrating one embodiment of the subject system indicating client-initiated data reporting based on client-installed software from the provider; and,

FIG. 5 is a block diagram of the use of the demographic information for automatic delivery selection by the server.

DETAILED DESCRIPTION

Referring now to FIG. 1, in the subject system, a provider 10 provides software to each of clients 14 which causes the associated computer connected to the Internet to transmit not only a serial number, but also the IP address, CPU information, hard disk space, network connection, a list of inventories, peripherals such as sound cards, and the log-in history associated with each individual client. Client and server are connected via the Internet, here diagrammatically illustrated at 16.

The information is passed to a database 18 at the provider which, optionally, is provided with a database filter 20 so that the data may be filtered as to location as illustrated at 22 or is further filtered by the provider as illustrated at 24. It will be appreciated that there are other filter functions that can be applied to the database for the filtering of the statistics garnered by the subject system.

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If, as illustrated, the statistics come from members of the provider because the provider provides the client software, then the provider is provided with information relating to his members and his members alone.

The data, when retrieved, may be in the form of a graph 26 of hard disk space versus number of CPU's or, alternatively, can be provided in terms of CPU power as illustrated at 28, with the information being developed at the server side, here illustrated at 30, and with the information from the server side being delivered to the provider after it has been derived.

Referring now to FIG. 2, a graph is shown of hard disk space versus the number of users which, as will be appreciated, is developed in a bell shaped curve 40 with one end of the curve illustrating the number of users having only 1 kilobyte of disk space and with the other end reflecting 1 gigabyte of disk space. As mentioned hereinbefore, it can be seen that with 8 megabytes of information to be transmitted as illustrated by line 42, shaded area 46 represents approximately 80% of the channels and thus, in one instance, over a million PC's having the capability of receiving 8 megabyte transmissions. From this graph, a decision maker can decide that it is worth the time, effort and money to invest in the aforementioned two minute advertising sequence, with the graph giving the provider an instant view of his audience.

Referring now to FIG. 3, what is shown is a bar graph 50 which charts CPU power versus number of CPU's, knowing computer power can lead to deductions about peripherals. For instance, one can deduce whether or not there is a sound card associated with a given PC. Thus in terms of CPU power, one can deduce- if there is a 155 megahertz 486 processor installed, and/or if a sound card is in existence, because such computers usually come with a sound card installed. This being the case, it can be assumed that multimedia transmissions can be handled by such a CPU.

Additionally, not only will the providers be provided with information regarding the capability of the particular CPU to receive multimedia transmissions, these user's are also a very good target for the sales of sound cards. As a result, messages advertising sound cards can be sent directly only to those users which have sufficient CPU power.

In general, the client software is delivered along with applications software by the provider and is transparent to the user. At the provider's election, data relating user's identity can be inhibited so that the system is a pure anonymous demographics system. The system can be made anonymous simply by sensing only the IP address of the user as opposed to the user's identity. Thus, while the user's identity remains anonymous, his buying habits and usage create a powerful tool to direct advertising and other content to the user based on his prior usage, the ability of a CPU to receive the intended message and other factors. Note, however, that providers may seek to provide targeted advertisement and content to a particular user, assuming that the provider has the user's permission to do so.

Referring now to FIG. 4, a flow chart is presented in which server 2, here illustrated at 60, sends out to client 62 a client software package 64 which is installed as illustrated, at 66 at the client's PC. The software checks the infrastructure data of the client as illustrated at 68 and reports the data as illustrated at 70 through the Internet through server 1, here illustrated at 72, which updates the data to its database as illustrated at 74. The output of the database is filtered at 76 based on functions such as provider ID or other factors. The filtered data is used at 78 to create a demography for the particular filtered factor such as hard disk space.

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As illustrated at 80, the result of the demography is provided to provider by sending this demography to server 60 such that a decision maker 82 relying on data from Server 2 can make the appropriate decisions as to what to send out, e.g. 4 MB MPEG, 300 kB PDF etc.

Referring now to FIG. 5, having derived the infrastructure demographics of a client's PC, it is possible to tailor the contents and delivery from a server to a given client in a so-called "push" system. First, based on log-in history, hard disk space and a variety of factors such as available as demography 100, a content provider can decide whether the proposed content would be suitable to the infrastructure of the client. Based on infrastructure information relating to actual use of a client's PC, including applications previously run, it is possible to ascertain the user's willingness or receptiveness to receiving the proposed content. Thus the content need only be pushed to users who in all likelihood would welcome receipt.

Additionally, it is possible for the content provider to have several different versions of the content. One version might require MPEG compatibility and a sound card. Another version might be a reduced file size or just a document.

As can be seen from FIG. 5, an automatic delivery system 104 is provided which selects the destination of the contents based on the ability of a client to receive a given version of the contents. This is done by matching the requirements of the particular version of the contents with the demography of the client as shown at 106. Assuming only one version 116 of the contents, version requirements 117 for this version are matched at module 106 with the infrastructure of the clients. For those clients having infrastructure which can handle the particular version, destination selection module 110 switches version 116 to the appropriate clients.

Thus, upon a match, selection module 110 selects the destinations most appropriate for particular version of use the contents, at which time the version 116 is transmitted directly to the client's PC in a push operation as illustrated at 112.

The result is the receipt of a version appropriate for the infrastructure of the particular client as illustrated at 114.

As mentioned above, for contents available in different versions, it is possible to select from different versions of the contents, here shown at 118 and 120, in order to match the pushed version to the client's infrastructure.

Each version has a set of corresponding version requirements 119 and 121. These version requirements are supplied to matching module 106 which determines not which clients can receive a given version, but rather which versions can be sent to which clients. Selection module 110 then couples the appropriate version to the appropriate clients in a push operation.

What is now presented is a series of programs and C++ with the first of the programs being that which is provided to the client to query his particular PC and with the second program illustrating the retrieval of the data, the creation of the demography, and the transmission of the demography over the net to the server associated with the content provider:

Having now described a few embodiments of the invention, and some modifications and variations thereto, it should be apparent to those skilled in the art that the foregoing is merely illustrative and not limiting, having been presented by the way of example only. Numerous modifications and other embodiments are within the scope of one of ordinary skill in the art and are contemplated as falling within the scope of the invention as limited only by the appended claims and equivalents thereto.

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What is claimed is:

1. A system for delivering content to a client system, the system for delivering content comprising:
 - a service provider in electrical communication with the client system; and
 - software transmitted to the client system from the service provider, the software ascertaining infrastructure-related information regarding the client system when the client system executes the software, the service provider selecting content to transmit to the client system in response to the configuration of the client system as indicated by the infrastructure-related information ascertained by the software.
2. The system of claim 1 wherein the client system includes a processor (CPU) and wherein said infrastructure-related information includes the power of the CPU at said client system.
3. The system of claim 1 wherein the client system includes a hard disk and wherein said infrastructure-related information includes the hard disk space available at said client system.
4. The system of claim 1 wherein said client system includes applications installed therein and wherein said infrastructure-related information includes the identity of the applications installed in said client system.
5. The system of claim 1 wherein said client system includes a modem having a predetermined bandwidth connected thereto and wherein said infrastructure-related information includes the speed of said modem.
6. The system of claim 1 wherein said client system maintains a log-in history and wherein said infrastructure-related information includes the log-in history of said client system.
7. The system of claim 1 wherein said software has a unique serial number associated therewith and wherein said infrastructure-related information includes said serial number.
8. The system of claim 7 wherein the service provider maintains anonymity of said client system.
9. The system of claim 1 further comprising:
 - a second client system in electrical communication with the service provider, the service provider transmitting software to the second client system, such software ascertaining infrastructure-related information regarding the second client system when the second client system executes such software; and
 - a selection module selecting to which of the client systems, if any the content is to be transmitted in response to the configuration of each client system as indicated by the infrastructure-related information ascertained for each of the client systems.
10. The system of claim 9 wherein said service provider has multiple versions of the content to be transmitted to each selected client system and wherein said selection module selects one of the versions for transmission to each selected client system based on the configuration on of that client system to receive that selected version.
11. The system of claim 10 wherein that version selected is the most complex possible for receipt by that client system.
12. The system of claim 9 wherein said selection module determines whether each of the client systems is a member of the service provider, the service provider transmitting said content only to said members.
13. The system of claim 1 further including means at said service provider for controlling when said client system transmits said infrastructure-related information to said service provider.

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- 14. The system of claim 1 further comprising:
 - a database storing the ascertained infrastructure-related information; and
 - a filter for selecting portions of the infrastructure-related information stored in the database according to parameters provided by the service provider; and
 - a display device for displaying the selected portions of the infrastructure-related information.
- 15. A system for delivering content to a plurality of client systems comprising:
 - a server;
 - software delivered by the server to each of the client systems, the software determining infrastructure-related information regarding each of the client systems when that client system executes the software;
 - a data structure storing the infrastructure-related information that is determined by each of the client systems; and
 - a selection module determining from the infrastructure-related information stored in the data structure whether a configuration of each client system is capable of processing content, the server selecting content to transmit to each client system based upon the determined capability of that client system.
- 16. In a network including a server in electrical communication with a client system, a method for providing content to the client system, comprising the steps of:
 - providing software from the server to the client system, the software determining infrastructure-related information of the client system when executed by the client system;
 - executing the software at the client system to ascertain infrastructure-related information regarding the client system;

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- transmitting the ascertained infrastructure-related information from the client system to the server; and
- selecting content to transmit to the client system based upon the configuration of the client system as indicated by the infrastructure-related information.
- 17. The method of claim 16 further comprising the steps of:
 - building a database with the infrastructure-related information transmitted from the client system to the server;
 - filtering the database to select portions of the infrastructure-related information; and
 - displaying the selected portions of the infrastructure-related information.
- 18. The method of claim 16 wherein the infrastructure-related information of the client system is selected from the group consisting of processing power, hard disk capacity, identities of installed applications, modem speed, log-in history, and serial numbers of software delivered to the client system.
- 19. The method of claim 16 further comprising the step of maintaining anonymity of the client system.
- 20. The method of claim 16 further comprising the step of selecting one of multiple versions of the content based on whether the configuration of the client system is capable of processing that version of the content.
- 21. The method of claim 16 further comprising the steps of:
 - determining whether the client system is a member of a service provided by the server; and
 - transmitting the content to the client system if the client system is a member.
- 22. The method of claim 16 further comprising the step of controlling by the server when the client system transmits the infrastructure-related information to the server.

* * * * *



US006393471B1

(12) **United States Patent**
Kobata

(10) **Patent No.:** US 6,393,471 B1
(45) **Date of Patent:** *May 21, 2002

(54) **MARKETING DATA DELIVERY SYSTEM**

5,845,090 A 12/1998 Collins, III et al. 395/200.51
5,878,384 A * 3/1999 Tohson et al. 709/224
6,058,418 A * 5/2000 Kobata 709/221

(75) **Inventor:** Hiroshi Kobata, Brookline, MA (US)

* cited by examiner

(73) **Assignee:** Atabok, Inc., Newton, MA (US)

Primary Examiner—Krisna Lim

Assistant Examiner—Hieu C. Le

(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(74) *Attorney, Agent, or Firm*—Fish & Richardson, P.C.

This patent is subject to a terminal disclaimer.

(57) **ABSTRACT**

In an Internet-based client/server application, a system is provided which detects demographics of a client including CPU power, hard disk space, applications installed, network connectivity and log-in history so as to provide this infrastructure related information detailing client usage of the Internet to the service provider. In one embodiment, each user is provided with software having a unique serial number. Having the serial number, infrastructure data is checked at the client side and reported to the server periodically, with the server updating a database with the infrastructure data from each PC. In one embodiment, the database is filtered by factors such as location of the client and an indication of which providers delivered software to a client. After filtering, the service provider can obtain various demographics such as the demography of hard disk space, CPU power and viewers. In one embodiment, the demographics are used at the server to automatically select the contents to be transmitted to the particular client. Thus the provider can send the most appropriate contents to the most appropriate client based on demographic information of the client's infrastructure.

(21) **Appl. No.:** 09/518,378

(22) **Filed:** Mar. 3, 2000

Related U.S. Application Data

(63) Continuation of application No. 08/801,458, filed on Feb. 18, 1997, now Pat. No. 6,058,418.

(51) **Int. Cl.**⁷ G06F 15/177

(52) **U.S. Cl.** 709/221; 709/201; 709/202; 709/203; 709/222; 709/223; 709/214; 709/217; 709/218; 705/10; 705/14; 705/5; 707/10

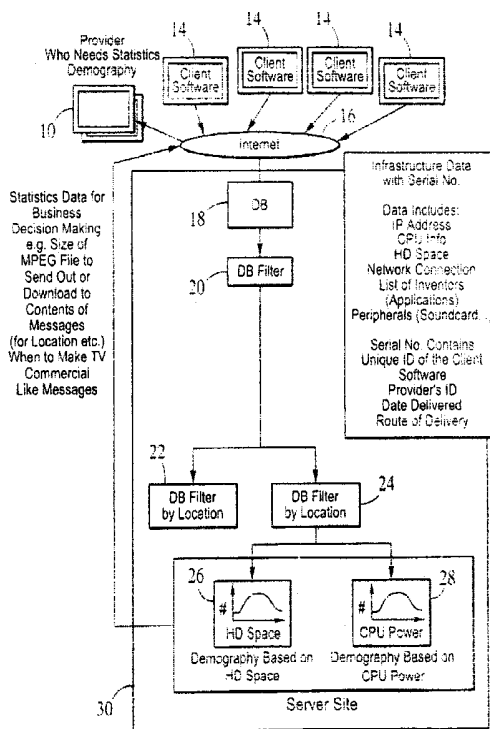
(58) **Field of Search** 709/201–203, 709/220–221, 223–224, 217–218; 705/10, 14, 5; 707/10; 725/34–35

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,421,009 A 5/1995 Platt 709/221
5,758,072 A 5/1998 Filepp et al. 395/200.5

20 Claims, 4 Drawing Sheets



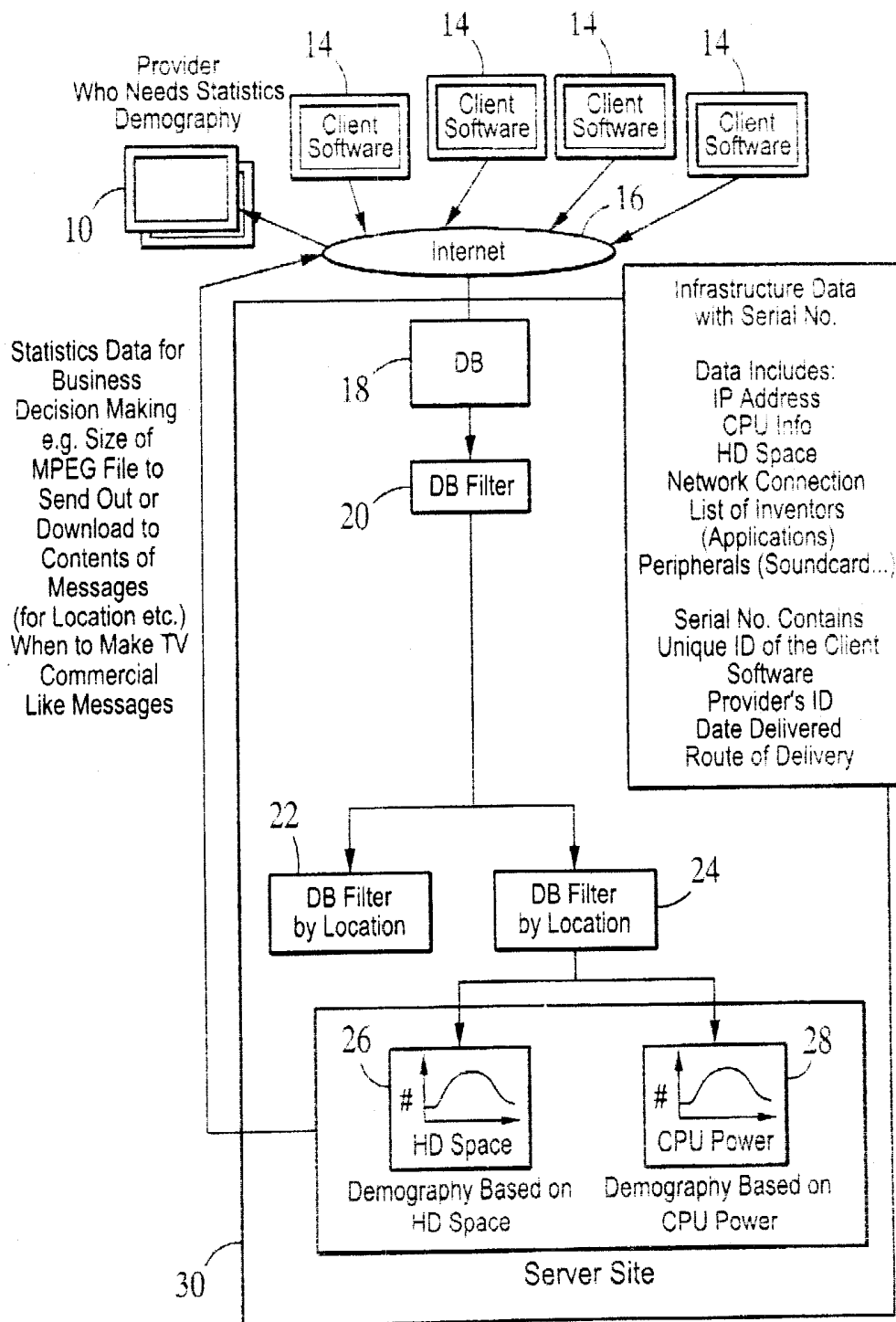


FIG. 1

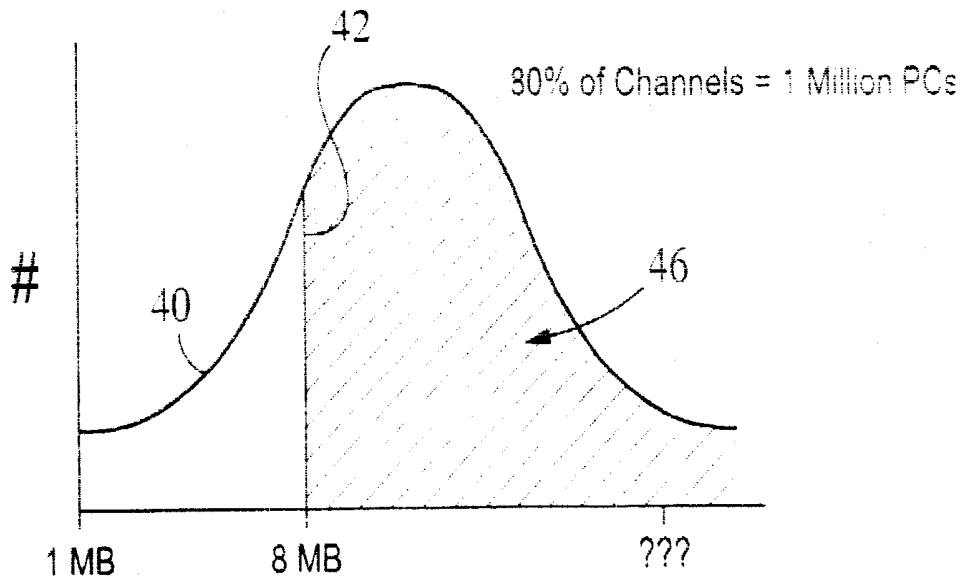


FIG. 2

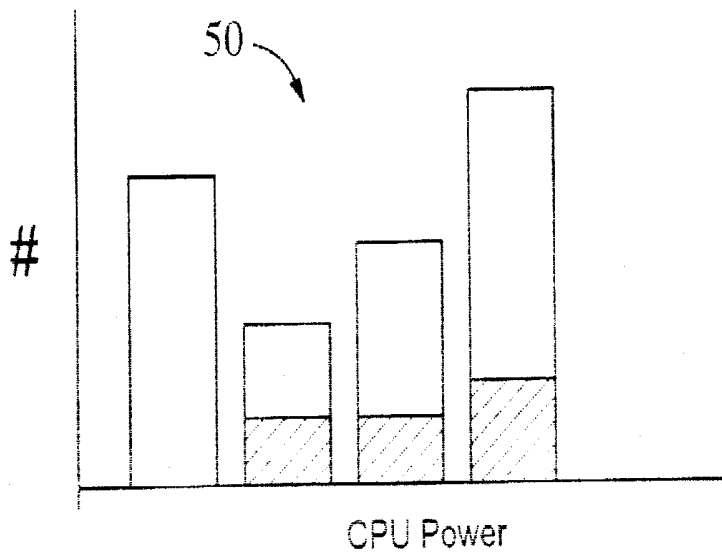


FIG. 3

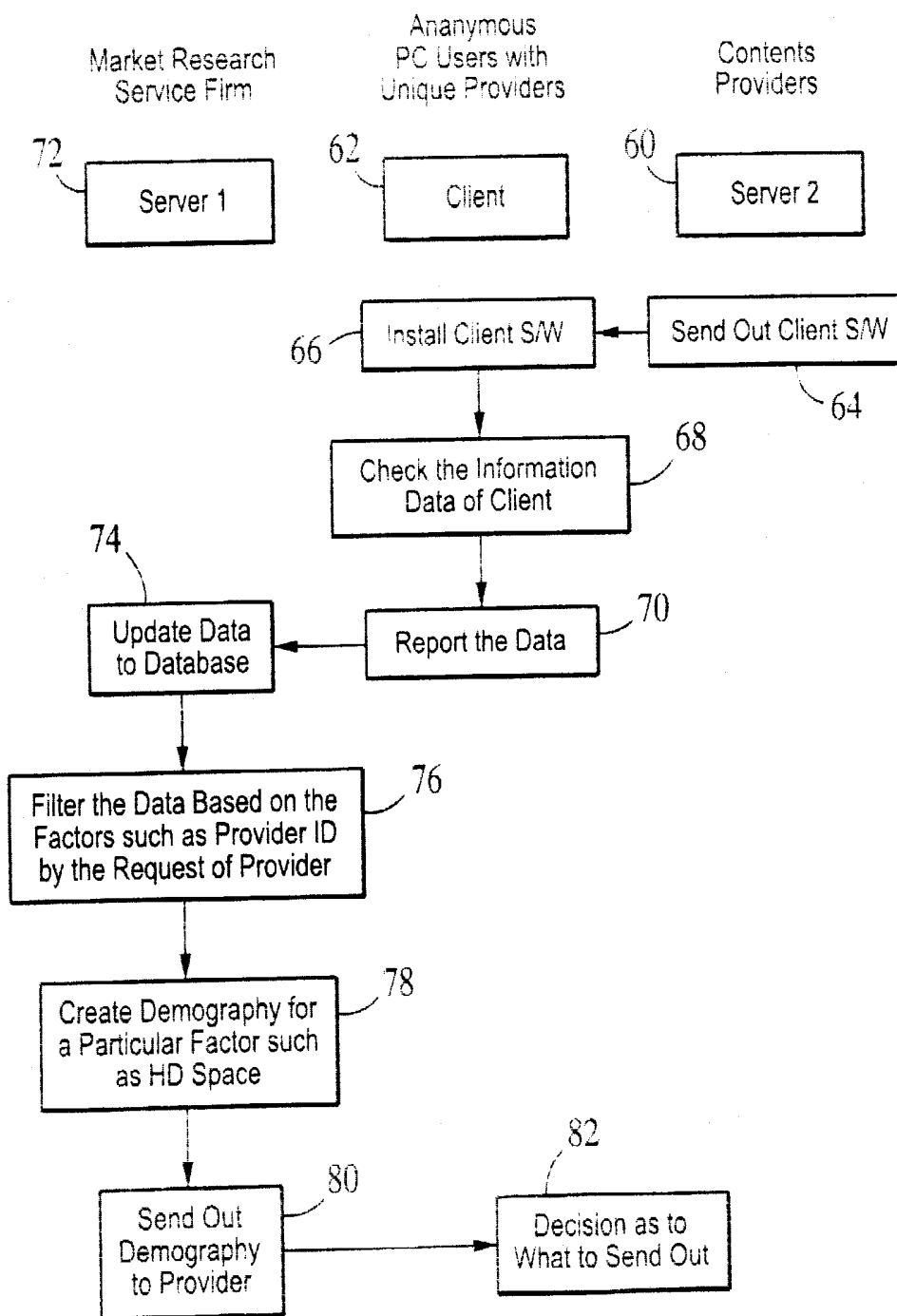


FIG. 4

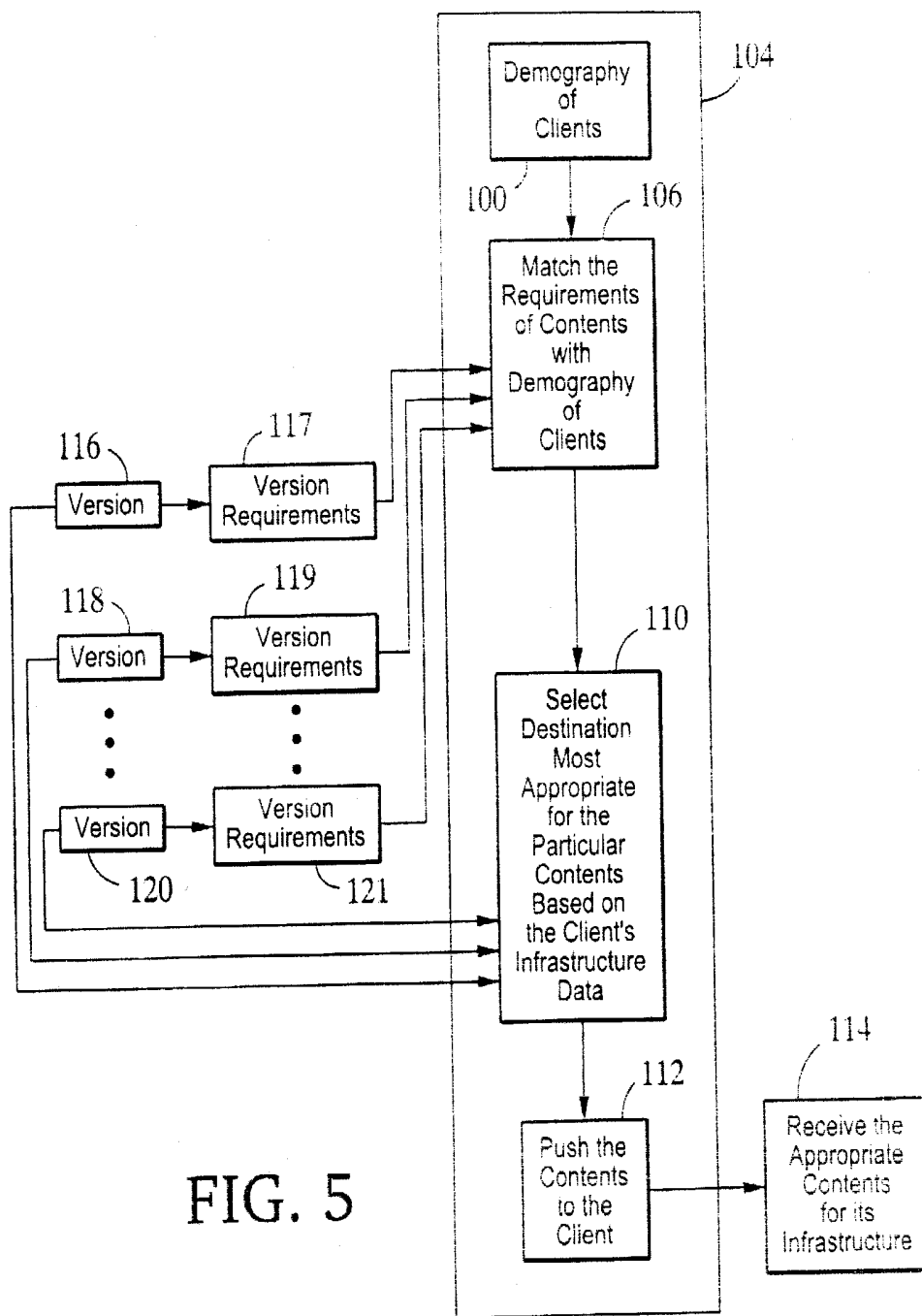


FIG. 5

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MARKETING DATA DELIVERY SYSTEM

This application is a continuation of Ser. No. 08/801,458 filed Feb. 18, 1997, now U.S. Pat. No. 6,058,418.

FIELD OF INVENTION

This invention relates to the provision of data over the Internet and, more particularly, to a system for ascertaining the demography of the users of the Internet.

BACKGROUND OF THE INVENTION

With the increased usage of the Internet comes the problem of deciding how and where to direct the information from the provider's point of view. With the advent of so-called "push" systems in which providers have direct access to the PC at the client side in a client/server application, it is increasingly important that the provider be provided with information so as to be able to direct the services to those users who are most likely to be interested.

In the past, the only type of demographic information that was available was to "guess" the usage of the system through use of sampling research data. In systems in which sampling research data is involved, a given research company will ask a major provider how many pieces of software were sold to the various users. Based on the data of the sales of the enabling software, the research company, utilizing mathematical techniques, provides demographic information to the provider based on a series of assumptions about the user.

However, the utilization of statistics alone based on the sales of software, for example, is not at all accurate in terms of providing the provider with targeted information as to the "real" demography of the user or client. For instance, it is impossible through statistics alone based on a single input such as sales to derive information relating to the CPU size and seed at the user, hard disk space available, information relating to the network connection such as dial-up cable modem connection information and ISDN connections, a list of the inventories indicating the applications running on the particular computer involved, as well as peripherals such as sound cards connected to the computer at the client side. Moreover, there is no way to ascertain the log-in history for each of the Internet users, such that critical information for the providers is not existent.

Critical information which is not available from traditional research is infrastructure information for a particular PC, such as CPU power, viewer, sound card and Internet connection information.

What is meant by the term "viewer" is what type of protocol is being run on the machine such as MPEG, QUICKTIME, AVI, and PDF.

The sum total of this infrastructure information would be useful for the decision maker at the provider as to decide whether or not, for instance, it is worth the money to make 3 megabytes of MPEG video available for advertising based on the above infrastructure demography. Thus, it is impossible for this decision maker to ascertain whether the Internet advertisement delivery will be efficient and worth enough to justify the cost, much less, for instance, providing an Internet video advertisement, the cost of which must be justified by assuring a number of targeted viewers for the subject matter of the video advertisement.

SUMMARY OF THE INVENTION

In order to provide such needed data to a content provider that wants to use the Internet connection, in one

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embodiment, client software is installed at each PC which can detect the infrastructure of the PC. The software which is provided by the provider to the user enables sensing CPU power, hard disk space, the applications running or installed, network connectivity and the log-in history. Since each client software has a unique serial number, sensing the serial number at the server side provides for rapid transfer and loading of a database with infrastructure data which is reported to the server periodically, for instance, every two seconds. At the server side, the database can be updated frequently to provide instant demographics of the particular user. It will be appreciated that the database can be filtered by such factors as location so that the provider can be apprised of what locations would be most interested in the content that the provider wishes to transmit. This permits the provider to be able to limit the broadcast of the data to selected locations.

It will be noted that the client software is delivered by the provider to the end user. By so doing, each provider is apprised of its own members, thus to provide the provider with the demographics of its own members or subscribers. This enables the content providers to be able to decide the content size to be delivered, as well as the viewer software, and makes the decision as to how much and what should be provided to an individual user tailored to the particular user's requirements.

For instance, in one operative embodiment, if a provider wants to make a two minute commercial, this can take as much eight megabytes to transmit. At this point, the provider must select what type of viewer software is required to play the eight megabytes of information, whether it is MPEG, QUICKTIME or some other format. By this manner, the provider can ascertain in real time whether or not the hard disk space is available at the user.

The distribution curve that is generatable through the utilization of the subject system, permits a bell curve to be formed in which hard disk space can be presented in terms of the number of users. Assuming that 8 megabytes is required, it can be determined what percentage of the channels are occupied by the information to be transmitted, and thus the number of PC's that are available to receive the intended transmission. If, for instance, 8 megabytes represent 80% of the channels, then the provider may well be advised that there is a sufficient number of PCs that can receive the information to commit the resources to providing the content-and transmitting it.

As will be appreciated, the subject system permits the content provider to make a decision as to whether or not to invest in a given project based on real-time demographics of users connected to the Internet. Note that in general, demographics are from members of the provider since the provider provides the client software to the end user. As a result, not only can content be tailored to the audience which could receive it, but critical decisions can be made as to whether to provide the content at all based on real-time sensing of the demography of the users.

The result is that by use of the subject system, provider can make business decisions such as the size of the video message, the viewer of the video/audio message, and the timing for hyper-advertisements through pulling or pushing at appropriate times. The subject system also makes possible other decisions which are critical to the economic utilization of the Internet. Furthermore, the demographic information permits marketing decisions as to where to sell the software and hardware based on the infrastructure data and the destination of the PC, namely its IP address.

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In summary, in an Internet-based client/server application, a system is provided which detects demographics of a client including CPU power, hard disk space, applications installed, network connectivity and log-in history so as to provide this infrastructure related information detailing client usage of the Internet to the service provider. In one embodiment, each user is provided with software having a unique serial number. Having the serial number, infrastructure data is checked at the client side and reported to the server periodically, with the server updating a database with the infrastructure data from each PC. In one embodiment, the database is filtered by factors such as location of the client and an indication of which providers delivered software to a client. After filtering, the service provider can obtain various demographics such as the demography of hard disk space, CPU power and viewers. In one embodiment, the demographics are used at the server to automatically select the contents to be transmitted to the particular client. Thus the provider can send the most appropriate contents to the most appropriate client based on demographic information of the client's infrastructure.

Moreover, having derived the above demographic information, in one embodiment, an automatic selection system uses the demographics to provide specially tailored contents to the client. Files can thus be tailored to the client's ability to receive the file or even as to what content should be delivered. Thus whether full frame video should be sent, whether audio should be sent, or indeed what format is appropriate can be selected.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features of the subject invention will be better understood taken in conjunction with the Detailed Description in conjunction with the figures of which:

FIG. 1 is a block diagram of the subject system illustrating the ability to provide a database with real-time demographic information from the users, along with a filter system to be able to tailor the demographic output to be the most useful to the provider;

FIG. 2 is a graph illustrating the results of the subject system in which hard disk space is graphed against the number of users;

FIG. 3 is a bar graph illustrating CPU power as a function of the number of users;

FIG. 4 is a block diagram and flow chart illustrating one embodiment of the subject system indicating client-initiated data reporting based on client-installed software from the provider; and,

FIG. 5 is a block diagram of the use of the demographic information for automatic delivery selection by the server.

DETAILED DESCRIPTION

Referring now to FIG. 1, in the subject system, a provider 10 provides software to each of clients 14 which causes the associated computer connected to the Internet to transmit not only a serial number, but also the IP address, CPU information, hard disk space, network connection, a list of inventories, peripherals such as sound cards, and the log-in history associated with each individual client. Client and server are connected via the Internet, here diagrammatically illustrated at 16.

The information is passed to a database 18 at the provider which, optionally, is provided with a database filter 20 so that the data may be filtered as to location as illustrated at 22 or is further filtered by the provider as illustrated at 24. It

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will be appreciated that there are other filter functions that can be applied to the database for the filtering of the statistics garnered by the subject system.

If, as illustrated, the statistics come from members of the provider because the provider provides the client software, then the provider is provided with information relating to his members and his members alone.

The data, when retrieved, may be in the form of a graph 26 of hard disk space versus number of CPU's or, alternatively, can be provided in terms of CPU power as illustrated at 28, with the information being developed at the server side, here illustrated at 30, and with the information from the server side being delivered to the provider after it has been derived.

Referring now to FIG. 2, a graph is shown of hard disk space versus the number of users which, as will be appreciated, is developed in a bell shaped curve 40 with one end of the curve illustrating the number of users having only 1 kilobyte of disk space and with the other end reflecting 1 gigabyte of disk space. As mentioned hereinbefore, it can be seen that with 8 megabytes of information to be transmitted as illustrated by line 42, shaded area 46 represents approximately 80% of the channels and thus, in one instance, over a million PC's having the capability of receiving 8 megabyte transmissions. From this graph, a decision maker can decide that it is worth the time, effort and money to invest in the aforementioned two minute advertising sequence, with the graph giving the provider an instant view of his audience.

Referring now to FIG. 3, what is shown is a bar graph 50 which charts CPU power versus number of CPU's, knowing computer power can lead to deductions about peripherals. For instance, one can deduce whether or not there is a sound card associated with a given PC. Thus in terms of CPU power, one can deduce if there is a 155 megahertz 486 processor installed, and/or if a sound card is in existence, because such computers usually come with a sound card installed. This being the case, it can be assumed that multimedia transmissions can be handled by such a CPU.

Additionally, not only will the providers be provided with information regarding the capability of the particular CPU to receive multimedia transmissions, these user's are also a very good target for the sales of sound cards. As a result, messages advertising sound cards can be sent directly only to those users which have sufficient CPU power.

In general, the client software is delivered along with applications software by the provider and is transparent to the user. At the provider's election, data relating user's identity can be inhibited so that the system is a pure anonymous demographics system. The system can be made anonymous simply by sensing only the IP address of the user as opposed to the user's identity. Thus, while the user's identity remains anonymous, his buying habits and usage create a powerful tool to direct advertising and other content to the user based on his prior usage, the ability of a CPU to receive the intended message and other factors. Note, however, that providers may seek to provide targeted advertisement and content to a particular user, assuming that the provider has the user's permission to do so.

Referring now to FIG. 4, a flow chart is presented in which server 2, here illustrated at 60, sends out to client 62 a client software package 64 which is installed as illustrated at 66 at the client's PC. The software checks the infrastructure data of the client as illustrated at 68 and reports the data as illustrated at 70 through the Internet through server 1, here illustrated at 72, which updates the data to its database as illustrated at 74. The output of the database is filtered at

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76 based on functions such as provider ID or other factors. The filtered data is used at 78 to create a demography for the particular filtered factor such as hard disk space. As illustrated at 80, the result of the demography is provided to provider by sending this demography to server 6 such that a decision maker 82 relying on data from Server 2 can make the appropriate decisions as to what to send out, e.g. 4 MB MPEG, 300 kB PDF etc.

Referring now to FIG. 5, having derived the infrastructure demographics of a client's PC, it is possible to tailor the contents and delivery from a server to a given client in a so-called "push" system. First, based on log-in history, hard disk space and a variety of factors such as available as demography 100, a content provider can decide whether the proposed content would be suitable to the infrastructure of the client. Based on infrastructure information relating to actual use of a client's PC, including applications previously run, it is possible to ascertain the user's willingness or receptiveness to receiving the proposed content. Thus the content need only be pushed to users who in all likelihood would welcome receipt.

Additionally, it is possible for the content provider to have several different versions of the content. One version might require MPEG compatibility and a sound card. Another version might be a reduced file size or just a document.

As can be seen from FIG. 5, an automatic delivery system 104 is provided which selects the destination of the contents based on the ability of a client to receive a given version of the contents. This is done by matching the requirements of the particular version of the contents with the demography of the client as shown at 106. Assuming only one version 116 of the contents, version requirements 117 for this version are matched at module 106 with the infrastructure of the clients. For those clients having infrastructure which can handle the particular version, destination selection module 110 switches version 116 to the appropriate clients.

Thus, upon a match, selection module 110 selects the destinations most appropriate for particular version of use the contents, at which time the version 116 is transmitted directly to the client's PC in a push operation as illustrated at 112.

The result is the receipt of a version appropriate for the infrastructure of the particular client as illustrated at 114.

As mentioned above, for contents available in different versions, it is possible to select from different versions of the contents, here shown at 118 and 120, in order to match the pushed version to the client's infrastructure.

Each version has a set of corresponding version requirements 119 and 121. These version requirements are supplied to, matching module 106 which determines not which clients can receive a given version, but rather which versions can be sent to which clients. Selection module 110 then couples the appropriate version to the appropriate clients in a push operation.

Having now described a few embodiments of the invention, and some modifications and variations thereto, it should be apparent to those skilled in the art that the foregoing is merely illustrative and not limiting, having been presented by the way of example only. Numerous modifications and other embodiments are within the scope of one of ordinary skill in the art and are contemplated as falling within the scope of the invention as limited only by the appended claims and equivalents thereto.

What is claimed is:

1. A marketing data delivery system for in a client/server system connected by a network in which information is

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transmitted by a service provider over the network via a server, the marketing data delivery system comprising:

means at said client including a computer for running client software;

client software provided by said service provider to said client to be run on the associated computer for ascertaining demographic information related to said client and for periodic transmission thereof back to said server;

means at said client for periodically transmitting said demographic information to said server; and,

means at said server for creating a database of information transmitted from said client, for filtering the data in said database as to demographic parameters and for displaying the resultant information; and

means for automatically making marketing decisions based on results of the filtering of said database, wherein said marketing decisions comprise at least one of determining which of a plurality of client-users should be targeted to receive specific information content based on locations of said client-users and determining whether a particular one of said client-users would welcome receipt of specific information content from a content-provider.

2. The marketing data delivery system as recited in claim 1, wherein said marketing decisions further comprise determining a complexity of marketing information content to be transmitted to said client.

3. The marketing data delivery system as recited in claim 2, wherein said means for automatically making marketing decisions comprises:

a matching module having an input for receiving data from said means for creating said database, wherein said matching module is operable to match a version of said marketing information content to clients capable of receiving and processing said version of said marketing information; and

a selection module having an input connected to said matching module, wherein said selection module is operable to select destinations of the clients capable of receiving and processing said version of said marketing information.

4. The marketing data delivery system as recited in claim 1, wherein said marketing decisions comprise determining which of said plurality of client-users should be targeted to receive said specific information content based on said locations of said client-users.

5. The marketing data delivery system as recited in claim 1, wherein said marketing decisions comprise determining whether said particular one of said client-users would welcome receipt of said specific information content from said content-provider.

6. A marketing data delivery system for a client/server system connected by a network in which information is transmitted by a service provider over the network via a server, the marketing data delivery system comprising:

a client subsystem for interfacing with a client-user, wherein said client subsystem comprises:

a computer,

client software to be run on said computer, wherein said client software ascertains demographic information related to said client subsystem, wherein said demographic information includes at least one of a client usage pattern and client infrastructure resources, and

a transmitter connected to said computer, wherein said transmitter is operable to periodically transmit said demographic information to said server; and

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- a server subsystem that includes said server, further comprising:
- a database generator for creating a database of demographic information transmitted from said client subsystem, and for filtering said demographic information in said database according to demographic parameters, and
 - a marketing decision module operable to automatically make marketing decisions based on results of the filtering of said database, wherein said marketing decisions comprise at least one of determining which of a plurality of client-users should be targeted to receive specific information content based on locations of said client-users and determining whether a particular one of said client-users would welcome receipt of specific information content from a content-provider.
7. The marketing data delivery system as recited in claim 6, wherein said marketing decisions further comprise determining a complexity of marketing information content to be transmitted to said client.
8. The marketing data delivery system as recited in claim 7, wherein said marketing decision module comprises:
- a matching module having an input for receiving data from said database generator, wherein said matching module is operable to match a version of said marketing information content to clients capable of receiving and processing said version of said marketing information; and
 - a selection module having an input connected to said matching module, wherein said selection module is operable to select destinations of the clients that are capable of receiving and processing said version of said marketing information.
9. The marketing data delivery system as recited in claim 6, wherein said marketing decisions comprise determining which of said plurality of client-users should be targeted to receive said specific information content based on said locations of said client-users.
10. The marketing data delivery system as recited in claim 6, wherein said marketing decisions comprise determining whether said particular one of said client-users would welcome receipt of said specific information content from said content-provider.
11. The marketing data delivery system as recited in claim 6, wherein said client software controls periodic transmission of said demographic information back to said server.
12. A marketing data delivery system for a client/server system connected by a network in which information is transmitted by a service provider over the network via a server, the marketing data delivery system comprising:
- a client subsystem for interfacing with a client-user, wherein said client subsystem comprises:
 - a computer;
 - client software to be run on said computer, wherein said client software ascertains demographic information related to said client subsystem, wherein said demographic information includes at least one of an existence of a sound card and types of viewer protocols said computer is configured to process; and
 - a transmitter connected to said computer, wherein said transmitter is operable to periodically transmit said demographic information to said server; and

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- a server subsystem, which includes said server, further comprising a database generator for creating a database of information transmitted from said client subsystem, and for filtering the data in said database according to demographic parameters.
13. The marketing data delivery system as recited in claim 12, wherein said server subsystem further comprises a decision making module operable to determine a complexity of marketing information content to be transmitted to said client based on said demographic information of said client subsystem.
14. The marketing data delivery system as recited in claim 12, wherein said demographic information optionally further includes CPU processing power, hard disk capacity, identities of installed applications, modem speed, log-in history, and serial numbers of said client software.
15. The marketing data delivery system as recited in claim 12, wherein said client software controls periodic transmission of said demographic information back to said server.
16. The marketing data delivery system as recited in claim 14, wherein said marketing decisions further comprise determining a complexity of marketing information content to be transmitted to said client subsystem.
17. The marketing data delivery system as recited in claim 15, wherein said marketing decision module comprises:
- a matching module having an input for receiving data from said database generator, wherein said matching module is operable to match a version of said marketing information content to clients capable of receiving and processing said version of said marketing information; and
 - a selection module having an input connected to said matching module, wherein said selection module is operable to select destinations of the clients that are capable of receiving and processing said version of said marketing information.
18. The marketing data delivery system as recited in claim 14, wherein said marketing decisions comprise determining which of said plurality of client-users should be targeted to receive said specific information content based on said locations of said client-users.
19. The marketing data delivery system as recited in claim 14, wherein said marketing decisions comprise determining whether said particular one of said client-users would welcome receipt of said specific information content from said content-provider.
20. A marketing data delivery system for delivering marketing data via a server subsystem, comprising:
- software for receiving demographic information related to a client subsystem communicated by said client subsystem;
 - a database generator for creating a database of said demographic information; and
 - a marketing decision module operable to automatically make marketing decisions based on said demographic information in said database, wherein said marketing decisions comprise at least one of determining which of a plurality of client-users should be targeted to receive specific information content based on locations of said client-users and determining whether a particular one of said client-users would welcome receipt of specific information content from a content-provider.

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