

the data to the 3D client.

**[0018]** A LAN (Local Area Network) 9 is connected to the Internet 7 through a router 8. Connected to the LAN 9 are the WWW server 10, a WLS (World Location Server) 11, the shared server 12, AO (Application Object) servers 13 and 14, a mail server 15 and a communication server 16. The WWW server 10 has hard discs (HDDs) 10a and 10b whereas the other servers 11 to 16 have HDDs 11a to 16a, respectively.

**[0019]** It should be noted that the AO server 13 has a program for communicating with the shared server 12 to present an application object (AO) such as a robot or an electronic pet which moves autonomously in a virtual space, for example. Much like the 3D-client, the AO server 13 communicates with the shared server 12 to report information on itself and to receive information shared by other 3D objects.

**[0020]** The communication server 16 is connected to a telephone 18 or a facsimile 19 through a public telephone line network 17, and is radio-connected to a PHS (Personal Handyphone System) terminal 23 through a PHS service provider 20 and to a pager terminal 24 through a pager service provider 21.

**[0021]** Fig. 2 is a block diagram showing a typical configuration of hardware of the client PC 1. In this configuration, a CPU 30 carries out various kinds of processing by executing a program stored in a ROM 34. A HDD 31 is used for storing, among other information, VRML contents such as VRML2.0 files and predetermined script programs written in the Java language (a trademark of Sun Microsystems, Inc.). A CD-ROM drive 32 reads out VRML contents stored in a CD-ROM disc 33.

**[0022]** Connected to a microphone 36 as well as a right and a left speakers 37 and 38, a sound processing circuit 35 inputs a sound from the microphone 36 or outputs sounds such as music and sound effects to the speakers 37 and 38. A modem 39 connected to the Internet 7 is used for exchanging data with the Internet 7. An I/O (input/output) interface 40 receives operation signals from a mouse 41 and a keyboard 42. A graphics circuit 43 includes an embedded VRAM 44 for storing picture data completing various kinds of processing. The graphics circuit 43 reads out data from the VRAM 44, outputting the data to a CRT monitor 45.

**[0023]** A Netscape Navigator browser, a Java interpreter and the Community Place Browser are loaded into a RAM 46 to be executed by the CPU 30. The Netscape Navigator is a WWW browser running under the Windows 95 (a trademark of Microsoft Corp.) and the Community Place Browser is a VRML2.0 browser developed by Sony Corporation, the assignee of the present application.

**[0024]** The VRML2.0 browser implements QvLib (which is a library, or a parser, for interpreting the VRML syntax developed and gratuitously released by Silicon Graphics, Inc.) and RenderWare (which is a software renderer developed by Criterion Software Ltd., UK) or a parser and a renderer having capabilities equivalent to

those of QvLib and RenderWare, respectively.

**[0025]** As shown in Fig. 1, the Community Place Browser exchanges various kinds of data with the Netscape Navigator browser serving as a WWW browser in accordance with a NCAPI (Netscape Client Application Programming Interface, a trademark).

**[0026]** The Netscape Navigator browser receives an HTML file and VRML contents (including a VRML file and a script program written in the Java) transmitted by the WWW server 10 by way of the Internet 7, storing the HTML file and the VRML contents in the local HDD 31. The Netscape Navigator browser processes the HTML file, displaying a text and a picture obtained as a result of the processing on a CRT monitor 45. On the other hand, the Community Place Browser processes the VRML file to display a 3-dimensional virtual space on the CRT monitor 45 and changes behaviors of objects in the 3-dimensional virtual space and other display states in accordance with a result of execution of the script program by the Java interpreter.

**[0027]** It should be noted that the other client PC 2 and PC 3 each have the same configuration as the client PC 1 even though the configurations of the PC 2 and PC 3 are not shown explicitly in the figure.

**[0028]** Next, the operation of the embodiment described above is explained by referring to Figs. 3 to 5. In the state shown in Fig. 3, first of all, a homepage on a web site providing VRML contents is browsed by using the WWW browser as shown by reference number A1. In this example, the homepage is accessed at <http://pc.sony.co.jp/sapari/>. Then, the user of the client PC 1 or 2 downloads VRML contents comprising a VRML2.0 file and a script program written in the Java to enable autonomous motions in a VRML space as shown by reference number A2.

**[0029]** It is needless to say that VRML contents can also be obtained by letting the CD-ROM drive 32 read out the contents from the CD-ROM disc 33.

**[0030]** Then, the Community Place Browser serving as a VRML2.0 browser in the client PC 1 or PC 2 interprets and executes the VRML2.0 file downloaded and temporarily stored in the local HDD 31 as shown in Fig. 4 and, as indicated by reference number A3, an inquiry about the URL of the shared server 12 is transmitted to the WLS 11 in accordance with a VSCP (Virtual Society Server Client Protocol). Upon receiving the inquiry, the WLS 11 searches a shared server URL management table stored in the HDD 11a of the shared server 12 and transmits the requested URL to the client PC 1 or PC 2 in response to the inquiry as indicated by reference number A4.

**[0031]** The URL thus found is used to connect the client PCs 1 and 2 to the shared server 12 as shown in Fig. 5. As a result, a shared message on attributes of a shared 3D object such as the position and the motion thereof is transmitted by way of the shared server 12 as indicated by reference number A5 and the shared message is forwarded to other client PC as indicated by ref-