ESTABLISHING COMMUNICATION FROM A WEB PAGE

Field of the Invention

The present invention relates generally to establishing communication using the Internet Protocol and, in particular, to triggering communication by means of a hyperlinked telephone number on a website.

Background

The Internet is now well established as major means of communicating information. Many companies have established a web presence in order to publicise their business, and an increasing number of commercial transactions are conducted over the Internet. Email is a frequently used option for individuals to communicate with friends and family.

More recently, Voice over Internet Protocol (VoIP) systems have been introduced that enable conversations to be transmitted over the Internet. By May 2005 one VoIP system had three million users online at the same time.

The developing technologies create new possibilities for information transfer, and there is an ongoing need to exploit the new communication resources in an efficient and user-friendly manner.

Summary

According to a first aspect of the invention there is provided a web page comprising a hyperlinked telephone number, wherein selection of the hyperlinked telephone number initiates the display of a further web page.

According to a further aspect of the invention there is provided a method of enabling communication over the Internet comprising the steps of:

creating a web page that includes a telephone number defined as a hyperlink; and

making the web page available for display on the Internet such that, if the web page is displayed on a user device and the telephone number is selected, a data path for

communication over the Internet is established between the user device and a second device designated by the telephone number.

According to a further aspect of the invention there is provided a method of initiating communication from a device connectable to the Internet, the device having a display and a transducer that converts analogue audio signals to electrical signals, the method comprising the steps of:

displaying a web page on the display, the web page comprising a contact number displayed as a hyperlink;

receiving a selection of the displayed hyperlink;

establishing, in response to the selection, a data path between the device and a second device designated by the contact number, wherein an input to the transducer is transferred to the second device via the Internet.

According to a further aspect of the invention there is provided a system for initiating communication comprising:

a device connectable to the Internet, the device having a display and a transducer that converts analogue audio signals to electrical signals;

a second device associated with a contact number;

means for displaying a web page on the display, the web page comprising the contact number displayed as a hyperlink;

means for receiving a selection of the displayed hyperlink;

means for establishing, in response to the selection, a data path between the device and the second device designated by the contact number, wherein an input to the transducer is transferred to the second device via the Internet.

Brief Description of the Drawings

One or more embodiments of the present invention will now be described with reference to the drawings, in which:

Fig. 1 shows a schematic diagram of a communications network in which the described arrangements may be implemented;

Fig. 2 is a schematic block diagram of a general purpose computer which can be used in the network of Fig. 1;

Fig. 3 is a flow diagram of a method of establishing a website having a hyperlinked telephone number; and

Fig. 4 is a flow diagram of a method of establishing communication via the website of Fig. 3.

Detailed Description including Best Mode

Many companies have set up websites to present information about their business. Typically, such websites provide contact information to permit a user to contact the company, for example to request further information or to purchase products or services. The contact information generally includes an email address. The email address may be presented as an active hyperlink. Clicking on the address may cause a form to be displayed, enabling the user to type in a message to send by email.

The contact information presented on the website often includes one or more contact telephone numbers and/or fax numbers. However, such telephone numbers are presented as text, and if a user wishes to phone the number, it is necessary to dial the number into a telephone system. For example, the user may dial the contact number on a mobile phone or fax machine, or key the number into a VoIP software package.

In the arrangement described herein, the contact telephone numbers are presented on the website as hyperlinks. Consequently, as described in more detail below, a user viewing the website may initiate voice communication or the sending of a fax by clicking on the hyperlinked telephone number.

Operating Environment

Fig. 1 shows schematically a communications network 1 that enables voice communication over the Internet 10. Computers 12, 14 are connected to the Internet 10. The computers 12, 14 are associated with microphones so that analogue audio signals such as speech may be received, converted to digital signals and transmitted via the Internet 10. The computers 12, 14 also have associated speakers such that digital signals may be received via the Internet 10, converted to analogue signals and played over the speakers.

Devices connecting to the Internet have individual addresses. Internet communication uses packet switching, in which data from a source computer is chopped into packages and each package is provided with an address to tell the network devices where to send the package. The source computer sends each package to a nearby router, which sends the package to the destination address via intermediate routers. Thus, each package may follow a different path to the destination. The destination computer uses information within the packages to reassemble the data into its original form.

For convenience, Fig. 1 shows only two computers 12 and 14 connected to the Internet 10. In practice, there are millions of such computers, located all around the world. The computers 12, 14 each have software 30 to manage the VoIP communications over the Internet 10. The VoIP communication may use a peer-to-peer model, in which data is transferred from source to destination via intermediate peer nodes running the same VoIP software 30 and simultaneously connected to the Internet. Alternatively, the VoIP communication may use a server-client model in which communications are routed via a server, for example server 18. The server-client model has the disadvantage that the server system must have sufficient capacity to handle all the communications.

The VoIP software 30 is typically downloaded over the Internet 10, for example from server 18. The VoIP system 1 thus supports voice communication between users of

computers 12, 14, who may each be located anywhere in the world where there is an internet connection. Such communication avoids the costs traditionally associated with long-distance telephone calls. The arrangements described herein are not limited to any particular VoIP software, however a suitable package is TTMessenger ™ supplied by TraiTel Telecommunications Pty Ltd.

The VoIP communication pathway also has portals to conventional telephony networks 22, which may be public switched telephone networks (PSTN) or cellular networks. Thus, server 18 may direct a call over telephone network 22 to a telephone 24. A user of telephone 24 may also direct a call to a user of computer 12 or 14. In this case the telephone user dials a number associated with the server 18, and establishes a connection via the telephone network 22. The server 22 maps the number to an IP address associated, for example, with computer 12. Voice communication may then take place between the telephone 24 and the computer 12, routed over both telephone network 22 and the Internet 10.

For convenience, a single server 18, telephone network 22 and telephone 24 are illustrated. In practice there are many such servers 18, telephones 24 and telephone networks 22. Preferably, the telephone 24 and the server 18 acting as a portal to the Internet are close to one another geographically so that the telephone call over network 22 is a local call. The VoIP system 1 preferably has multiple servers 18 in different cities and countries to facilitate cheap communication via the system 1.

Structure of a General-Purpose Computer

The computers 12, 14 and server 18 are typically general-purpose computers having a structure like that represented schematically in Fig. 2. The system 1 is not limited to any particular computing devices or software.

The computer programs running on computer 12, 14 and 18 may be stored on any computer readable medium. The computer readable medium may include storage devices

such as magnetic or optical disks, memory chips, or other storage devices suitable for interfacing with a general purpose computer. The computer readable medium may also include a hard-wired medium such as exemplified in the Internet system, or wireless medium such as exemplified in the GSM mobile telephone system. The computer program when loaded and executed on such a general-purpose computer effectively results in an apparatus that implements the steps of the preferred method.

The software may be stored in a computer readable medium, including the storage devices described below. The software is loaded into the computer from the computer readable medium, and then executed by the computer. A computer readable medium having such software or computer program recorded on it is a computer program product. The use of the computer program product in the computer preferably effects an advantageous apparatus for establishing voice communication via the Internet 10 .

The computer system 100 is formed by a computer module 101, input devices such as a keyboard 102, mouse 103 or microphone (not shown), output devices including a printer 115, a display device 114 and loudspeakers 117. A Modulator-Demodulator (Modem) transceiver device 116 is used by the computer module 101 for communicating to and from a communications network 120, for example connectable via a telephone line 121 or other functional medium. The modem 116 can be used to obtain access to the Internet, and other network systems, such as a Local Area Network (LAN) or a Wide Area Network (WAN), and may be incorporated into the computer module 101 in some implementations.

The computer module 101 typically includes at least one processor unit 105, and a memory unit 106, for example formed from semiconductor random access memory (RAM) and read only memory (ROM). The module 101 also includes an number of input/output (I/O) interfaces including an audio-video interface 107 that couples to the video display 114, loudspeakers 117 and microphone, an I/O interface 113 for the

keyboard 102 and mouse 103, and an interface 108 for the modem 116 and printer 115. In some implementations, the modem 116 may be incorporated within the computer module 101, for example within the interface 108. A storage device 109 is provided and typically includes a hard disk drive 110. A CD-ROM drive 112 and/or DVD drive is typically provided as a non-volatile source of data. The components 105 to 113 of the computer module 101, typically communicate via an interconnected bus 104 and in a manner which results in a conventional mode of operation of the computer system 100 known to those in the relevant art.

Typically, the application program is resident on the hard disk drive 110 and read and controlled in its execution by the processor 105. Intermediate storage of the program and any data fetched from the network 120 may be accomplished using the semiconductor memory 106, possibly in concert with the hard disk drive 110. In some instances, the application program may be supplied to the user encoded on a CD-ROM and read via the corresponding drive 112, or alternatively may be read by the user from the network 120 via the modem device 116. Still further, the software can also be loaded into the computer system 100 from other computer readable media. The term "computer readable medium" as used herein refers to any storage or transmission medium that participates in providing instructions and/or data to the computer system 100 for execution and/or processing. Examples of storage media include CD-ROM, a hard disk drive, a ROM or integrated circuit, a magneto-optical disk, or a computer readable card such as a PCMCIA card and the like, whether or not such devices are internal or external of the computer module 101. Examples of transmission media include radio or infra-red transmission channels as well as a network connection to another computer or networked device, and the Internet or Intranets including e-mail transmissions and information recorded on Websites and the like.

Creating a hyperlink to a voice communication path

The VoIP system 1 provides a cheap and flexible way of establishing voice communication or sending a fax. A method is now described of providing access to the VoIP system 1 via hyperlinked telephone numbers on websites.

Many companies and individuals maintain websites on the World Wide Web (WWW). The WWW is a system of Internet servers that support documents formatted in the HyperText Markup Language (HTML). Browsing and searching software including Netscape Navigator and Microsoft's Internet Explorer makes such websites easy to find and access. Information, services and products may thus be obtained around the world.

HTML defines the structure and layout of a WWW document. The language uses tags and attributes to define and format the information on a page. Tags may be used to establish hypertext links. Selecting a hypertext link, for example by clicking on a specified location using mouse 103, directs a user to another web page.

Fig. 3 shows a method in which a user, either a company or an individual, may create a web page having a hyperlink to a VoIP or software-based fax connection.

Firstly, in step 202, the user must obtain one or more telephones numbers defined within the VoIP system 1. Typically, such numbers are provided by the company supplying and managing the VoIP software 30. The numbers provided by the company may be defined to have a similar format to numbers used in public networks in locations chosen by the user. For example, if the user is based in a suburb of Sydney, the user may wish to use a VoIP number similar to PSTN numbers used in the suburb. Alternatively, the user may choose to have the numbers displayed on the website identical to their PSTN numbers but only operational for voice or fax communication over the Internet 10.

In step 204 the user, or a web designer appointed by the user, creates a web site using the standard techniques known in the art, defining web pages using HTML tags and attributes.

The web pages include contact information such as an email address and possibly a physical or postal address, enabling people viewing the web pages to contact the user. In step 206 the one or more telephone numbers defined in step 202 are added to the web pages as hyperlinks. Thus, when the web pages are viewed using a Web browser, it will be apparent that the telephone numbers are active, and that clicking on the numbers will cause further actions to occur. The actions may include connecting the viewer to the contact number using the VoIP software 30, and/or connecting the viewer to further web pages. Hyperlinks are typically indicated by differences in font, and/or by diacritical features such as underlining or varying a screen cursor as the cursor is moved over the hyperlink.

The contact number may displayed in a ‘Contact Details’ portion of a web page and have an associated designation indicating that the number is a telephone or fax number. For example, if the format of a number in Sydney, Australia is used, the displayed number may have the form:

‘Tel: +61 2 90321234’

Fig. 4 shows a flow chart illustrating steps that occur when a user views a web site having the active VoIP hyperlink described above.

In step 302 the user accesses the web site using browser software running on the user’s computer (e.g. computer 12). The user reviews the contents of the web site and, if the contents are of sufficient interest, in step 304 the user clicks on the contact number.

Next, in step 306, software running on the computer 12 checks to see whether the VoIP software 30 has been loaded onto the computer 12. The checking may be performed using a script created in a scripting language such as Perl. The language creates a virtual window between the browser and the software 30 (such as TTMessenger™) if present on the computer. The hyperlinked number is itself linked to

the script, which checks for the presence of software 30 on the computer 12 and/or links to a website from which the software 30 may be downloaded.

If the software 30 is not loaded (the NO option of step 306), in step 310 data is transferred from the server 18 to provide information about the VoIP software 30. The data is displayed on the screen of computer 12, and includes the question "Do you wish to download the VoIP software?" "Yes" and "No" buttons are displayed on the user's screen associated with the question, using standard techniques known in HTML programming. The user may select one of the options by clicking on the displayed button.

If the user chooses to download the VoIP software 30, then in step 312 the software 30 is transferred from server 18 to computer 12 over the Internet 10. Once the software 30 is loaded on computer 12, the user may, in step 308, establish voice communication over the VoIP system 1 with a representative of the company that set up the web site. The communication may, for example, link to a call centre staffed by a team of operators. The VoIP system 1 may also be used by an individual to set up a web page with an active voice link. However, in this case, voice communication can only be established when the individual is connected to the Internet 10 and chooses to answer the VoIP call.

If the VoIP software 30 is already loaded on the user's computer 12 (the YES option of step 306), then process flow proceeds directly to step 308, in which the software 30 puts a call through to the VoIP number published on the web site. The VoIP software may be provided to the user and loaded onto the computer 12 by other methods than downloading over the Internet. For example, the software may be purchased on a CD and loaded onto the computer using a CD drive 112.

The operation of the VoIP software is not discussed in further detail, as the functioning of such software will be apparent to one skilled in the art of Internet telephony.

In an alternative arrangement, the telephone number provided on the web site is an actual telephone number, associated, for example, with telephone 24 (which may be a company's PABX). In this case establishing voice communication in step 308 involves a VoIP link from computer 12 to the server 18 and then a link over telephone network 22 to telephone 24. The user of computer 12 will be charged a fee for use of the network 22, and the user is preferably made aware of this cost before the voice connection is established.

A fax number displayed on the website may be an actual fax number that is associated with a fax number. In this case, by clicking on the hyperlinked fax number, the user is able to initiate the process of sending a document to the fax machine.

Method of promoting the distribution of VoIP software

The system described above may also be used to promote the distribution of the VoIP software 30. The software 30 may be marketed to companies and individuals that have a web presence or intend to establish a web presence. A benefit of the described system is that the hyperlinked telephone number encourages potential clients to contact the company that has posted the web page. Some clients may prefer to communicate by talking rather than by typing emails or facsimiles. Providing a wider range of contact options makes it more likely that an Internet user will follow up on information displayed on the Internet.

Once there are many web sites available for viewing on the Internet and having hyperlinked contact numbers as described herein, it becomes more probable that Internet users will attempt to use the hyperlinked contact numbers. When the contact numbers are selected, the Internet user is offered the choice of downloading the associated VoIP software 30. As more users download and use the software 30, the software will gain greater market acceptance, which in turn may lead to wider usage of the software.

Industrial Applicability

It is apparent from the above that the arrangements described are applicable to the data communication industries.

The foregoing describes only some embodiments of the present invention, and modifications and/or changes can be made thereto without departing from the scope and spirit of the invention, the embodiments being illustrative and not restrictive.

In the context of this specification, the word “comprising” means “including principally but not necessarily solely” or “having” or “including”, and not “consisting only of”. Variations of the word "comprising", such as “comprise” and “comprises” have correspondingly varied meanings.

The claims defining the invention are as follows:

1. A web page comprising a hyperlinked telephone number, wherein selection of the hyperlinked telephone number initiates the display of a further web page.

2. A method of enabling communication over the Internet comprising the steps of:

creating a web page that includes a telephone number defined as a hyperlink; and

making the web page available for display on the Internet such that, if the web page is displayed on a user device and the telephone number is selected, a data path for communication over the Internet is established between the user device and a second device designated by the telephone number.

3. A method according to claim 2 wherein the data path is used for communication selected from the group consisting of:

voice communication; and

a facsimile message.

4. A method of initiating communication from a device connectable to the Internet, the device having a display and a transducer that converts analogue audio signals to electrical signals, the method comprising the steps of:

displaying a web page on the display, the web page comprising a contact number displayed as a hyperlink;

receiving a selection of the displayed hyperlink;

establishing, in response to the selection, a data path between the device and a second device designated by the contact number, wherein an input to the transducer is transferred to the second device via the Internet.

5. A system for initiating communication comprising:

a device connectable to the Internet, the device having a display and a transducer that converts analogue audio signals to electrical signals;

a second device associated with a contact number;

means for displaying a web page on the display, the web page comprising the contact number displayed as a hyperlink;

means for receiving a selection of the displayed hyperlink;

means for establishing, in response to the selection, a data path between the device and the second device designated by the contact number, wherein an input to the transducer is transferred to the second device via the Internet.

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