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# ACCESS SPECIFIC UNIFORM RESOURCE LOCATORS (URL) USING NUMBERICAL INPUT

## Technical Field

The present invention relates generally to data processing systems and more particularly to a method for simplifying the process of accessing computer resources in a distributed environment. Particularly, the present invention pertains to structures and methods of interactions arranged such that practical access to hypermedia servers is available to a wider range of devices such as wireless telephones, web television, etc.

## Background of the Invention

Networks such as the Internet have been in existence since the 1960s and grew out of work funded by the U.S. Defence Department's Advanced Research Projects Agency. The internet was mainly used by academic and research communities, and until relatively recently was not a popular medium of information exchange. In 1989, a new type of information system know as the World-Wide-Web (the Web) was introduced to the Internet. The Web is an information retrieval system which arose in a large part from the development of devices and methods that simplified the actions that a user must take to access the information stored by servers that are connected to a network. One significant development is the use of hyperlinks which allows disparate pieces of information to be organised in nonessential ways and which allow a user to easily navigate among the linked information. By assigning a unique identifier to each distinct piece of information available throughout the network, information can be readily accessed without regard to where it is stored in the network. The unique identifier known as a Uniform Resource Locator (URL), specifies the location of a resource that can be accessed from anywhere in the network.

Use of distributed computer environments is becoming increasingly popular, and Internet use is even more popular. A user can access the Internet from a

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"client" computer that runs a web browser (eg. Internet Explorer or Netscape Communicator, etc.). The terms "client" and "server" denote a computers role as a requester of data (client) or a provider of data (server). The web browser includes software that enables a client computer to communicate with server computers on the Internet. In a typical internet transaction a user sends a request from the client computer to a server computer that is located on the Internet. The request identifies a web site on the server computer that the user wishes to access. In response to the request, the server returns a copy of a web page, which may be in Hypertext Markup Language (HTML) and includes links to other web sites. The web browser includes software for rendering the web page on the client computer so that the user may view the web page.

Some servers provide a means for searching a collection of documents. Following an initial request, the server supplies a form or box to the browser. The user, using the browser, enters data such as keywords and/or other data on this form as part of a search query and then opens a new connection to the server and submits this data to the server. The server responds to this request and a search engine associated with the server searches the database, and returns with a new document listing some or all documents matching the keywords or other data requested by the browser. Each document listed normally includes a hypertext link to the actual document so that the user may easily retrieve that document.

**How Search Engines Work**

The term "search engine" is often used generically to describe both true search engines and directories. They are not the same. The difference is how listings are compiled.

**Search Engines:** Search engines, such as HotBot, create their listings automatically. Search engines crawl the web, then people search through what they have found. If web pages are changed, search engines eventually find these changes, and that can affect how they are listed. Page titles, body content and other elements all play a role.

**Directories:** A directory such as Yahoo depends on people for its listings. One can submit a short description to the directory for an entire site, or editors can write one for sites they review. A search looks for matches only in the descriptions submitted. Changing web pages has no effect on a listing. Things that are useful for improving a listing with a search engine have nothing to do with improving a listing in a directory. The only exception is that a good site, with good content, may be more likely to get reviewed than a poor site.

**Hybrid Search Engines:** Some search engines maintain an associated directory. Being included in a search engine's directory is usually a combination of luck and quality. Sometimes one can "submit" a site for review, but there is no guarantee that it will be included. Reviewers often keep an eye on sites submitted to announcement places, then choose to add those that look appealing.

The present World-Wide-Web uses the URL as an address to locate resources in the Internet. A user needs to remember the exact spelling of the address, which is typically very long, and difficult to remember. This presents a problem for many users, and particularly for users whose native language is not English. Moreover, as the Internet grows almost all meaningful words have been taken up, and newcomers have had to resort to using odd, meaningless, or long words, to represent their sites.

An object of the present invention is to alleviate the disadvantages of URLs.

The present invention provides a method for accessing a web site by means of a Numerical Locator (NL). The NL may include the use of any number to represent the URL. It can be the telephone number or any combination of numbers that can represent the owner of the web site and may be easy to remember by everyone. In one form the NL may include an exiting telephone number, including the country code, area code, telephone number and extension. In another form the NL may include an assigned industrial number, including country, main industry, sub-industry, and a lot number. The basic

principle is that any meaningful number may be used to represent the long and difficult to remember URL.

In accordance with a preferred embodiment of the present invention, a user may gain access to a specific web page by entering the phone number of the web page owner, instead of inputting the long and difficult to remember URL. The user may input the telephone number of the web site owner not unlike making a local phone call, or long distance or overseas call, and this request will initiate a search of the server database for the corresponding URL. If the request is positive, the server will return the corresponding HTML document. If the request is negative, the server may reply with an error message and a request for corrective action, eg. by asking the user to re-enter the phone number, fax number or company name, etc.

According to one aspect of the present invention there is provided a method of accessing a network site comprising the steps of:

establishing communication between a device and a directory server;

sending a request including a numerical locator (NL) to said directory server to locate an associated Uniform Resource Locator (URL);

executing a first program when said directory can locate the associated URL and executing a second program when said directory cannot locate the associated URL.

According to a further aspect of the present invention there is provided a directory server for storing data comprising:

a Numerical Locator (NL) for denoting an associated Uniform Resource Locator (URL) and information identifying the owner of the NL;

a first program for searching the NL; and

a second program for searching a database.

**Detailed description of the invention**

A preferred embodiment of the present invention will now be described with reference to the accompanying drawings wherein:

Fig. 1 is a block diagram showing a distributed computer environment suitable for practicing a preferred embodiment of the present invention;

Fig. 2 is a flow chart that provides an overview of the steps performed by a preferred embodiment of the present invention;

Fig. 3 is a flow chart of the steps performed by a preferred embodiment of the present invention when an associated URL cannot be found;

Fig. 4 is an example of a web browser screen; and

Fig. 5 is an example of a desktop screen.

Referring to Fig. 1, client computer 2 is connected with a server 10 via Internet connection 8. The role of server 10 will be discussed in more detail below. Client computer 2 holds a copy of a web browser 4. Client 2 executes a request 6 through Internet connection 8 to server 10. Server 10 searches a directory database 12 and returns the result to server 10 typically in the form of a text document coded in Hypertext Markup Language (HTML). Each hypertext link is associated with a URL. When the client selects a hypertext link, the server associated with a URL web site 14 forwards a HTML page 16 to client 2 and web browser 4 displays the URL web page on client computer 2. Those skilled in the art will appreciate that the computer environment shown in FIG. 1 is intended to be merely illustrative and that the present invention may also be practiced in other computer environments and wireless communications eg. WAP.

The present invention may provide an intelligent mechanism for automatically initiating a search when a user enters a numerical locator (NL) address eg. a telephone number, in place of a URL address. Referring to Fig. 2 a preferred embodiment of the present invention may include an NL box 24 (refer FIG.4) in which a user enters an address eg. a telephone number (40) to access a particular web site. This action sends a request to a server (42) to search the

directory database (44) and determine (46) whether the NL associated with URL is in the directory database. Assuming that the NL the user enters in the NL box is an NL with a valid URL, the user request will be forwarded to a server as specified in the URL (50) and will return an HTML page (56) to the user browser. If the NL does not have a valid URL, it will return an error message (54) with detailed information relating to the NL. If the directory does not find the associated URL, if will perform process (48) as shown in Fig. 3. The process of Fig. 3 is an intelligent search to determine an invalid NL (64) and display a summary search result (66) to allow the user to select the correct URL. Fig. 3 shows the process when the NL is a valid number (60), but without a URL associated with it. In such an event it will return an advice message (67) to inform the user that the NL is correct but has no web site. If the NL is an invalid number (60), the server will perform an intelligent search (64) to determine the possibility of an invalid NL and display summary search result (66) to allow the user to determine the finding.

FIG. 4 shows an example of a web browser screen 20 associated with web browser 4 including URL bar 22, NL bar 24 and web page 26 while Fig. 5 shows an example of desktop screen 28. The desktop screen 28 includes icon 34 representing the NL program on the action bar and icon 36 representing the NL program on the desktop screen. When user clicks icon 34 or 36 the program will activate an action box 32 that will allow the user to enter the NL 38 such as a telephone number. When the user clicks on the go button, the program will activate the dialup modem or LAN to access the Internet and send a request to the server to start the search process (refer step 42 in Fig.2).

Alternatively the user may download a plug-in program provider by the NL operator, which adds an NL address bar to the URL bar under the browser screen. When the user types in the NL 40 in bar 24, it will send a request to the server and start the search process. The server then processes the NL entered by the user, and determines if an auto search is warranted or not (i.e., step 64). If the input NL is associated with a valid URL, the server will return a HTML page to the user and bring the user to the web site. However, if the input NL is valid but does not have an associated URL, the server will send a message to

the user that the number is valid but does not have a web site associated with the NL. If the server searches the database and finds that the input NL is not a valid number, it will respond with a message to the user and a request for further information. A new box with more options may be shown on the user screen, including but not limited to fax number, company name, industry, URL, etc.

Finally, it is to be understood that various alterations, modifications and/or additions may be introduced into the constructions and arrangements of parts previously described without departing from the spirit or ambit of the invention.

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CLAIMS

1. A method of accessing a network site comprising the steps of:

establishing communication between a device and a directory server;

sending a request including a numerical locator (NL) to said directory server to locate an associated Uniform Resource Locator (URL);

executing a first program when said directory can locate the associated URL and executing a second program when said directory cannot locate the associated URL.

2. A method according to claim 1 wherein said NL comprises a telephone number, including a country code, area code, local telephone number and extension.

3. A method according to claim 1 wherein said NL comprises an assigned number, including a country code, industry code, sub-industry code, and a company number.

4. A method according to claim 1 when said first program includes means for searching said directory and returning a Hypertext Markup Language (HTML) document to said device.

5. A method according to claim 1 when said second program includes the step of executing a third program when the NL is a valid NL and the step of executing a fourth program when the NL is not a valid NL.

6. A method according to claim 5 wherein said third program includes means for displaying an error message including detailed information relating to said NL.

7. A method according to claim 5 wherein said fourth program includes means for performing an intelligent search to determine an invalid NL and for displaying a search result including a request for further information.

8. A method according to claim 1 wherein said device includes a computer.

9. A method according to claim 1 wherein said device includes a handheld device.

10. A method according to claim 1 wherein said device includes a wireless telephone.

11. A method according to claim 1 wherein said device includes a web television.

12. A method according to claim 1 wherein said device includes a telephone.

13. A method according to claim 1 wherein said device includes a facsimile machine.

14. A directory server for storing data comprising:

a Numerical Locator (NL) for denoting an associated Uniform Resource Locator (URL) and Information identifying the owner of the NL;

a first program for searching the NL; and

a second program for searching a database.

15. A directory server according to claim 14 wherein said information includes a company name, owner name, fax number, address, industrial code, person to contact, financial status, etc.

16. A directory server according to claim 14 wherein said NL comprises a telephone number, including a country code, area code, local telephone number and extension.

17. A directory server according to claim 14 wherein said NL comprises an assigned number including a country code, industry code, sub-industry code and a company number.

18. A method according to claim 14 wherein said NL comprises an assigned number including a country code and company registration number.

19. A method according to claim 14 wherein said NL comprises an assigned number including a country code and a personal identification number.