Method of Managing Bookmarks in an Internet Browser

This invention relates to a method of managing bookmarks in an Internet browser as set forth in the preamble of claim 1, and to a workstation with an Internet browser as set forth in the preamble of claim 12.

Internet browsers are generally known and in common use. A browser is a program that gives access to Internet resources. Using an Internet browser, files in the Hypertext Markup Language (HTML) format can be loaded and displayed. An Internet browser also permits access to file servers using the file transfer protocol (FTP). Furthermore, an e-mail program can be called from an Internet browser to send electronic mail to addressees in the Internet. Such an Internet browser can also be used in smaller data networks, such as a corporate network, a so-called Intranet.

To organize the large number of resources available in the Internet and remember important sources, a user can leave so-called bookmarks in his Internet browser. The bookmarks are stored in the form of a list or a hierarchical tree structure, and by calling the list and

simply clicking his mouse on an entry, the user can return to the "remembered" source at any time. Both the Microsoft Internet Explorer and the Netscape Communicator operate in this way.

One disadvantage of this method is that Internet addresses frequently change, so that stored bookmarks often are no longer up to date. Furthermore, the method lacks flexibility, since the bookmarks are available to the user only at his own workstation. At other workstations or after reinstallation of the Internet browser, the bookmarks are missing. Thus, important resources in the Internet frequently cannot be found again or can only be found again after a long search.

From an article by Richard M. Keller et al, "A bookmarking service for organizing and sharing URLs", Computer Networks and ISDN Systems 29 (1997), pp. 1103-1114, a service for providing network-based access to bookmarks is known. The service can be accessed from anywhere on the Internet and is offered by a proxy server. The proxy server has a first memory area for personal bookmarks and an optional, second memory area for bookmarks that are assigned to a user group. Queries for the bookmarks are made in the manner of a keyword search. The query is complicated and resembles a database query or an Internet search engine rather than the list-based display of the personal bookmarks, with which users have been familiar so far. Therefore, this solution will not find general acceptance. Since the bookmarks are stored on the proxy server and must therefore be transmitted over the Internet on each access, a speed penalty results in comparison with the locally stored bookmark file.

It is therefore an object of the invention to provide a method of managing bookmarks which is more flexible and involves no significant losses of speed compared to

prior-art methods. Another object of the invention is to provide a workstation having an Internet browser with which bookmarks can be managed more flexibly and not appreciably slower than in the prior art. A further object of the invention is to provide a server for carrying out the method.

These objects are attained by the features of claims 1, 12, and 13, respectively. Further advantageous aspects of the invention are defined in the dependent claims.

The invention will become more apparent by reference to the following description of two embodiments of the invention taken in conjunction with the accompanying drawings, in which:

Fig. 1 shows a workstation and a server which interact by the method in accordance with the invention;
Fig. 2 is a block diagram of the workstation in accordance with the invention; and
Fig. 3 shows a network with several servers which compare their reference files.

A fundamental idea of the invention is to store the bookmarks on the workstation locally in a bookmark file as has been customary, but to regularly update this bookmark file with information that is downloaded from a remote server. The updating may be done on each call of the Internet browser or only once a day, for example.

Referring to Fig. 1, there is shown a workstation 1 which is connected to a data network 3. Data network 3 may be the Internet or a corporate network, an Intranet. Also connected to the data network is a server 2. Server 2 is located remotely from workstation 1.

On workstation 1, an Internet browser has been installed, which can be used to access resources, e.g. HTML pages,

in the data network. The address of a resource can be stored as a bookmark in the form of a URL (uniform resource locator) in a local bookmark file for subsequent reference. The bookmark file is stored in a nonvolatile storage of the workstation.

In the method according to the invention, the bookmark file is regularly updated with data from the remote server. In this embodiment, this is done on each call of the Internet browser.

Server 2 makes the updating data available in the form of a reference file containing reference bookmarks over the data network. Workstation 1 accesses server 2 over the data network and downloads the reference file. For the updating operation, the local bookmark file is compared with the downloaded reference file. Entries that are only contained in the reference file are imported into the bookmark file. Entries which are contained in both files but which were updated in the reference file are also updated in the bookmark file. On the one hand, this ensures that after the bookmark file has been updated, a user receives at least a basic set of bookmarks that are predefined in the reference file. On the other hand, this approach makes it possible to maintain and, if Internet addresses are changed, update the bookmarks at a central location, namely in the server. Thus, the user always has current bookmarks at his disposal.

Each bookmark refers to a resource in the data network. As the bookmark, the uniform resource locator (URL) of the resource referred to is stored. A URL consists of a scheme, which specifies the protocol to be used, a server name, a path, and a file name. As the scheme, the following types are currently permitted:

Scheme	Usage
ftp	File transfer protocol
http	Hypertext transfer protocol
gopher	Gopher protocol
mailto	Electronic-mail address
news	USENET news
nntp	USENET news using NNTP access
telnet	Reference to interactive sessions
wais	Wide Area Information Service
file	Host-specific file names
prospero	Prospero directory service

Table 1: Types of schemes

One example of an URL is

http://www.alcatel.com/news/983010.htm

"http" specifies the scheme, which is followed by a colon as a separator. "www.alcatel.com" specifies the server on which the resource is located. The path is the directory "/news", and the resource itself is defined by the file name "983010.htm".

A future, improved syntax for Internet resources is already under consideration. It is referred to as URN (uniform resource name) and is currently being discussed by the IETF (Internet Engineering Task Force). This URN would be equally suited as a bookmark for the method according to the invention.

Advantageously, prior to the updating of the bookmark file, the user is authenticated through his name and/or a password. The subsequent updating of the bookmark file is then user-dependent, i.e., the server will make available

different reference files depending on the user or on the user group the respective user belongs to.

Fig. 2 is a schematic block diagram of a workstation 1 from which the method according to the invention is carried out. Workstation 1 is connected to a data network. It has a nonvolatile storage HDD, 12, which contains an Internet browser 14 and a bookmark file 15. On a call of Internet browser 14, the latter is loaded into a main memory RAM, 13, of workstation 1 and executed by a processor CPU, 11. At regular intervals, i.e., either on each call of Internet browser 14 or once a day, the server that makes available the data for updating the bookmark file is accessed via the data network. The data are loaded over the data network into main memory 13 and compared with bookmark file 15 to update the latter with the data. Nonvolatile storage 12 contains a program routine or a program module 16 which performs the comparison and updating when it is loaded into main memory 13 and executed.

According to a particularly advantageous aspect of the invention, the updating is performed prior to the start of the Internet browser. This may be accomplished by batch processing using a batch file, which, when being executed, first performs the updating and then starts the Internet browser. In this way, conventional Internet browsers can be operated by the method according to the invention.

Advantageously, the bookmark file contains a version number. This makes it possible to determine whether the bookmark file is more current than the reference file downloaded from the server. If that is not the case, updating of the bookmark file will take place.

In the bookmark file, the user can assign a descriptive title to each bookmark. This descriptive title is only

part of the bookmark file and is not updated with the reference file, i.e., it does not change when an address in the data network changes. For the user, therefore, bookmarks provided with such a descriptive title are easier to handle. In that case, the local bookmark file forms a meta level between the reference file and the bookmarks actually available in the Internet browser, and it is not necessary to store the updated bookmark file in the nonvolatile storage. It suffices to update the entries of the bookmark file, i.e., the bookmarks themselves, in the main memory only temporarily. These entries are then preserved until completion of the Internet browser and are loaded again from the server on a new call. It is also possible to perform an updating operation according to the invention on each access to a bookmark.

The bookmarks may also be stored in two or more bookmark files and be combined by the Internet browser. It is also possible that the server offers two or more different reference files with bookmarks. This is appropriate, for example, if a reference file for the user, a reference file for the user group to which the user belongs, and a general reference file are offered. In that case, the representation of the bookmarks in the Internet browser is advantageously chosen so that the user can distinguish which reference file the respective bookmark originates from, for instance by highlighting the bookmarks using different colors.

Through the reference files provided by the server it is ensured that a user finds at least one predefined basic set of bookmarks at each workstation where he starts an Internet browser. In addition, the reference files can be maintained centrally, i.e., bookmarks on no longer existing or modified addresses can be amended or erased at a central location. It may also be advantageous if the user is given write permission on the server for at least

his personal reference file. In this way, the user himself can add new bookmarks to his personal reference file.

Fig. 3 shows another preferred embodiment of the invention. A workstation 1 is connected to a data network 3. Via this data network 3, the workstation can access a first remote server 2 and download a reference file for updating its internal bookmark file. First server 2, in turn, can access two further servers 31 and 32 to download data in the form of further reference files, with which the reference file of the first server is updated. In this way, automatic updating of the reference file of first server 2 is possible.

The further servers may be database servers, such as Lotus Domino servers, that automatically generate and make available HTML pages. From the contents of the databases on a database server, a reference file can be derived which comprises all currently valid bookmarks that point to this server. With such further reference files, the reference file of the first server can be regularly and automatically updated in an advantageous manner. If this method is carried out among several servers, a logical network is created in which bookmarks are automatically updated.

Patent Claims

1. A method of managing bookmarks in an Internet browser (14) wherein the bookmarks are stored in a local bookmark file (15),

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the local bookmark file (15) is regularly updated with data from a remote server (2).

2. A method as claimed in claim 1 wherein at least part of the bookmarks are each assigned a descriptive title, which is stored together with the associated bookmark in the bookmark file (15), and wherein only the respective associated bookmark is updated, but not the descriptive title.

3. A method as claimed in claim 1 wherein the bookmark file (15) is updated on each call of the Internet browser (14).

4. A method as claimed in claim 1 wherein the bookmark file (15) is updated on each call of the Internet browser (14), but once a day at the most.

5. A method as claimed in claim 1 wherein the bookmarks are URLs which each consist of a scheme specifying the protocol to be used, a server name, a path, and a file name.

6. A method as claimed in claim 1 wherein a reference file is loaded from the remote server (2), wherein the reference file is compared with the bookmark file (15), wherein entries contained only in the reference file are transferred to the bookmark file (15), and wherein entries that are contained in both files but were updated in the reference file are also updated in the bookmark file (15).

7. A method as claimed in claim 1 wherein prior to the updating of the bookmark file (15), user authentication is performed, and wherein the updating of the bookmark file (15) is user-dependent.

8. A method as claimed in claim 1 wherein the updating of the bookmark file (15) is performed prior to calling the Internet browser (14).

9. A method as claimed in claim 8 wherein the updating and calling of the Internet browser (14) are performed successively using a batch file.

10. A method as claimed in claim 8 wherein the bookmark file (15) contains a version number.

11. A method as claimed in claim 1 wherein the data of the remote server are compared with data from further remote servers.

12. A workstation (1) comprising and Internet browser (14) and a nonvolatile storage (12) containing a bookmark

file (15) for the Internet browser (14), the workstation (1) being connected to a data network (3),

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means for accessing a remote server (2) over the data network (3), and means for updating the bookmark file (15) with data from the remote server (2).

13. A server (2) for providing data for updating a bookmark file (15) using the method according to claim 1 or 11.

