Webpage Browsing Method and Device

This application claims the benefit of priority from Chinese Patent Application, No. 201110190961.X, entitled "webpage browsing method and device" and filed on July 8, 2011, the entire content of which is hereby incorporated by reference.

Field of the Invention

The present disclosure relates to computer technologies, and more particularly to a webpage browsing method and device.

Background of the Invention

With the development of computer communication technologies and Internet technologies, more and more users would like to obtain information from the Internet in daily life and work. For example, making use of a mobile terminal device, a user sends a Hypertext Transfer Protocol (HTTP) request or a Wireless Application Protocol (WAP) request to a web server according to a Uniform Resource Locator (URL), and obtains graphic information including a rich text from the web server. The mobile terminal device may be a personal computer or a mobile phone which includes a built-in wired or wireless browser. The web server may provide a webpage link including a rich text.

Taking a mobile terminal device for instance, a method for browsing a rich text through a browser of the mobile terminal device is illustrated hereinafter. Herein, the mobile terminal may be a mobile phone or a Personal Digital Assistant (PDA).

Fig. 1 is a schematic flowchart illustrating a method for browsing a rich text through a browser of a mobile terminal device according to an example. The method includes following blocks.

At block 101, a browser of a mobile terminal device accesses a webpage including a rich text.

In this block, a user opens the browser of the mobile terminal device. At this time, the browser may access the webpage including the rich text according to a link address of the webpage inputted by the user.

At block, 102, data of a current page on the webpage is downloaded online.

In this block, the browser of the mobile terminal device downloads data of the rich text included in the current page.

In an implementation, if the data of the rich text to be browsed by the user is too much, the data of the rich text may be divided into multiple pages according to the screen size of the browser of the mobile terminal device, and each page is configured with a link control of next page, a link control of last page and a close link control. For example, when the user clicks the link control of next page set on the current page, the browser of the mobile terminal device is triggered to open the next page of the current page, and downloads the data of the rich text on the next page. Link information of next page is link address information of next page on the webpage.

At block 103, the browser of the mobile terminal device displays the downloaded current page, thereby being browsed by the user.

In this block, when the browser of the mobile terminal device downloads the data of the current page, the mobile terminal device is always connected to the Internet.

At block 104, the link information of next page is responded, the data of the next page is downloaded and the next page is displayed.

In this block, after browsing the downloaded current page, the user may click the link control of next page set on the current page, downloads the data of the next page and displays the next page, thereby being browsed by the user. And so the cycle until the rich text has been browsed or the user stops browsing.

At block 105, close information inputted by the user is received, the webpage is disconnected and the browsing is stopped.

In this block, when the user has browsed the last page of the rich text or determines to stop browsing, the user may click the close control set on the current page, so as to output close information, stop browsing and disconnect the Internet.

As can be seen, in the method for browsing the rich text through the browser of the mobile terminal device, it is required that the mobile terminal device is always connected

to the Internet during the process of browsing the page data of the webpage. Accordingly, the spending of user traffic is high, and a large amount of Internet resources is used, which is disadvantageous for the effective use of Internet resources. When the signal of the Internet is unstable or the webpage communication is interrupted, the user is unable to update or browse new webpage contents.

Summary of the Invention

Examples of the present disclosure provide a webpage browsing method and device, so as to decrease the spending of user traffic and improve browsing exercises of user.

The webpage browsing method includes:

switching a browser into a first working state, and accessing, by the browser, a server through Internet in the first working state;

downloading data of a current page and data of predefined N pages subsequent to the current page orderly from the server, caching the downloaded data and displaying the current page, wherein N is a natural number;

updating a link address of each page on the server into a cache address corresponding to data of the page;

disconnecting the Internet after the data of the current page and the data of the N pages subsequent to the current page have been cached; and

switching the browser to a second working state, selecting one page of the cached current page and the N pages subsequent to the current page, reading the data of the selected page from a cache memory according to a cache address corresponding to data of the selected page, and displaying the selected page.

A webpage browsing device includes:

a downloading module, configured to download data of a current page and data of predefined N pages subsequent to the current page orderly from a server when a browsing module is in a first working state, wherein N is a natural number;

a caching module, configured to receive the data downloaded by the downloading module, assign a cache address to data of each page and cache the downloaded data;

the browsing module, configured to access the server through Internet in the first working state, read data of a selected page from the caching module in a second working state according to a cache address corresponding to the data of the selected page, output

the read data and disconnect the Internet after the data of the current page and the data of the N pages subsequent to the current page have been cached;

an updating module, configured to update, according to the cache address assigned to the data of each page by the caching module, a link address of the page on the server into the cache address;

a state switching module, configured to switch the browsing module from the first working state to the second working state, or switch the browsing module from the second working state to the first working state; and

a displaying module, configured to receive the data outputted by the browsing module, and display the selected page.

By the webpage browsing method and device provided by the examples of the present disclosure, the browser may download the data of other pages when the user browses a certain page, and is disconnected to the Internet after finishing the downloading. In this way, the bandwidth resources of the Internet may be saved, and the spending of user traffic may be decreased. Through caching the downloaded page data, the user may browse the cached page data even if the signal of the Internet is unstable or the webpage communication is interrupted, which facilitates to improve the browsing exercises of user.

Brief Description of the Drawings

Fig. 1 is a schematic flowchart illustrating a method for browsing a rich text through a browser of a mobile terminal device according to an example.

Fig. 2 is a schematic flowchart illustrating a webpage browsing method according to an example of the present disclosure.

Fig. 3 is a schematic flowchart illustrating a working process of browser in a first working state according to an example of the present disclosure.

Fig. 4 is a schematic flowchart illustrating a working process of browser in a second working state according to an example of the present disclosure.

Fig. 5 is a schematic diagram illustrating the structure of a webpage browsing device according to an example of the present disclosure.

Detailed Description of the Invention

In order to make the technical solution and merits of the present disclosure clearer, the present disclosure will be illustrated in detail hereinafter with reference to the accompanying drawings and specific examples.

Fig. 2 is a schematic flowchart illustrating a webpage browsing method according to an example of the present disclosure. Referring to Fig. 2, the method includes following blocks 201-205.

At block 201, a browser of a mobile terminal device switches to a first working state and accesses a server in the first working state through Internet.

As shown in Figure 3, a user clicks the browser of the mobile terminal device, for example, clicks a reading mode switching button on the browser of the mobile terminal device. At this time, the browser of the mobile terminal device switches to an offline downloading mode, i.e., the first working state. The browser of the mobile terminal device is connected to a webpage, and accesses the webpage according to a to-be-accessed link address inputted by the user, and downloads the data of a rich text data included in the webpage.

In an implementation, after being connected to the webpage and accessing the webpage in the offline downloading mode, the browser of the mobile terminal device may obtain traffic information and bandwidth information to determine a state of Internet environment where the user is located. When the state of the Internet environment is unsatisfied, the browser of the mobile terminal device online downloads the data of current page of the rich text included in the webpage. If the state of the Internet environment is satisfied, blocks 202 is performed. Herein, the state of the Internet environment being satisfied includes at least one case of that the tariff of access point is cheap, network speed is fast and a channel has not been occupied. The state of the Internet environment being unsatisfied includes at least one case of that the tariff of access point is expensive, the network speed is slow and the channel has been occupied.

For example, in the current Internet environment, when the access point is a Wireless Fidelity (WIFI) access point, block 202 may be performed because the tariff of accessing the WIFI access point is free and the network speed is fast.

At block 202, the data of current page and the data of preset N pages subsequent to

the current page are downloaded orderly from a server, the downloaded data is cached, and the current page is displayed.

Referring Fig. 3, the browser of the mobile terminal device obtains the data of the current page and the data of N pages subsequent to the current page from the server. N is a natural number. For example, when the user browses a home page of chapter novel, a prompt may be popped up from the home page to ask the user whether to download page data and how many pages are to be downloaded. When the user inputs the number of to-be-downloaded pages, the browser of the mobile terminal device begins to download the page data, and caches the downloaded page data orderly into a preset cache memory. The data of each page corresponds to a unique cache address of the cache memory.

At block 203, a link address of each page on the server is updated into the cache address corresponding to the data of the page.

At block 204, after the data of the current page and the data of N pages subsequent to the current page are cached, the browser of the mobile terminal device is disconnected to the Internet.

In this block, after the data of preset N pages subsequent to the current page has been downloaded, the browser of the mobile terminal device is disconnected to the Internet, thereby decreasing the spending of user traffic.

In an implementation, after being disconnected to the Internet, the browser of the mobile terminal device may provide prompting information for the user. The prompting information may prompt the user that the browser enters an offline state.

At block 205, the browser of the mobile terminal device switches to a second working state, selects one page of the cached current page and N pages subsequent to the current page, opens the selected page, reads data from the cache memory according to the cache address corresponding to the selected page, and displays the selected page.

In an example, the second working state may be an offline reading state of the browser. After being disconnected to the Internet, the browser may automatically switch to the offline reading state, or may be switched to the offline reading state by the user through pressing a button on the interface of the browser.

In an offline reading state, after the user has browsed the displayed current page, the user may click the link control of next page set on the current page. According to the cache address corresponding to the link information of the next page, the browser may obtain the data of the next page from the cache memory, and displays the next page, thereby being browsed by the user.

As shown in Fig. 4, in another offline reading state, the user may browse the rich text by following processes.

The user browses the X^{th} page through the browser of the mobile terminal device. Herein, X is a natural number.

The browser determines whether the data of the $(X+1)^{th}$ page has been cached into a local cache memory. If the data of the $(X+1)^{th}$ page has not been cached into the local cache memory, the browser requests the Internet for the data of the $(X+1)^{th}$ page. If the data of the $(X+1)^{th}$ page has been cached into the local cache memory, the browser obtains the data of the $(X+1)^{th}$ page.

In this case, if the data of the $(X+1)^{th}$ page has not been cached into the local cache memory, it is indicated that the browser needs to be reconnected to the Internet. And then, the browser may download page data from the Internet according to a predefined policy and cache the page data into the local cache memory. For example, the predefined policy may indicate to download N pages every time. After the browser has downloaded the page data, the mobile terminal device automatically disconnect the Internet.

The browser displays the $(X+1)^{th}$ page, thereby being browsed by the user.

In this case, after the user browses the $(X+1)^{th}$ page and when the user triggers to browse the $(X+2)^{th}$ page, a process similar to the process of determining whether the data of the $(X+1)^{th}$ page has been cached into the local cache memory is performed. Different from the process of determining whether the data of the $(X+1)^{th}$ page has been cached into the local cache memory, it is the data of the $(X+2)^{th}$ page that is determined. And so the cycle until the user triggers to browse the $(X+Y)^{th}$ page, wherein Y is a natural number larger than 1.

The browser determines whether the data of the $(X+Y)^{th}$ page has been cached into the local cache memory. If the data of the $(X+Y)^{th}$ page has not been cached into the local

cache memory, the browser requests the Internet for the data of the $(X+Y)^{th}$ page. If the data of the $(X+Y)^{th}$ page has been cached into the local cache memory, the browser obtains the data of the $(X+Y)^{th}$ page and displays the $(X+Y)^{th}$ page, thereby being browsed by the user.

In this case, if the data of the $(X+Y)^{th}$ page has not been cached into the local cache memory, it is indicated that the browser needs to be reconnected to the Internet. And then, the browser may download page data of the rich text included in the webpage again according to the predefined policy and cache the downloaded page data into the local cache memory. After the browser downloads the page data according to the predefined policy, the mobile terminal device automatically disconnect the Internet.

In the offline reading state, the browser determines whether the data of the selected page has been cached into the cache memory and has a cache address. If the selected page has been cached into the cache memory and has the cache address, the browser reads the data of the selected page from the cache memory according to the cache address, and displays the selected page. If the selected page has not been cached into the cache memory or has no cache address, the browser is reconnected to the Internet.

When the browser of the mobile terminal device is in an offline state, the browser may read page data from the cache memory so that the user browses subsequent N pages. Until reading the data of the last page, the browser of the mobile terminal device tries to reconnect the Internet.

In the webpage browsing method, the browser switches to the first working state and accesses the server through the Internet in the first working state. The browser downloads the data of the current page and the data of the predefined N pages subsequent to the current page orderly from the server, caches the downloaded data and displays the current page, wherein N is a natural number. The browser updates the link address of each page on the server into the cache address corresponding to the data of the page. After the data of the current page and the data of the N pages subsequent to the current page have been cached, the browser is disconnected to the Internet. The browser switches to the second working state, selects and opens one page of the cached current page and the N pages subsequent to the current page, reads the data of the selected page from the cache memory according to the cache address corresponding to the selected page, and displays the

selected page. In this way, the browser may download the data of other pages when the user browses a certain page, and is disconnected to the Internet after finishing the downloading. When the Internet environment is satisfied, the browser may download non-browsed pages fast. Accordingly, the usability of the browser of the mobile terminal device may be improved greatly, the bandwidth resources of the Internet may be saved, and the spending of user traffic may be decreased. Through caching the downloaded page data and setting the link control of next page on the current page, the user may browse the cached rich text even if the signal of the Internet is unstable or the webpage communication is interrupted, which implements offline browsing and thus improves the browsing exercises of user. Moreover, when the user is to browse the next page, the browser may read the data of the next page from the cache memory without downloading the data of the next page from the server, thereby avoiding the influence of Internet delay on the browsing continuity.

Fig. 5 is a schematic diagram illustrating the structure of a webpage browsing device according to an example of the present disclosure. As shown in Fig. 5, the webpage browsing device includes following modules.

A downloading module is configured to download data of a current page and data of predefined N pages subsequent to the current page orderly from a server when a browsing module is in a first working state, wherein N is a natural number.

A caching module is configured to receive the data downloaded by the downloading module, assign a cache address to data of each page and cache the downloaded data.

The browsing module is configured to access the server through Internet in the first working state, read data of a selected page from the caching module in a second working state according to a cache address corresponding to the data of the selected page, output the read data and disconnect the Internet after the data of the current page and the data of the N pages subsequent to the current page have been cached.

An updating module is configured to update, according to the cache address assigned to the data of each page by the caching module, a link address of the page on the server into the cache address.

A state switching module is configured to switch the browsing module from the first

working state to the second working state, or switch the browsing module from the second working state to the first working state.

A displaying module is configured to receive the data outputted by the browsing module, and display the selected page.

The webpage browsing device further includes an Internet environment detecting module, configured to detect whether the Internet environment is satisfied, and send a detection result to the state switching module. The Internet environment being satisfied includes at least one case of that the tariff of access point is cheap, network speed is fast and a channel has not been occupied.

The foregoing is only preferred examples of the present disclosure and is not used to limit the protection scope of the present disclosure. Any modification, equivalent substitution and improvement without departing from the spirit and principle of the present disclosure are within the protection scope of the present disclosure.

Claims

What is claimed is:

1. A webpage browsing method, comprising:

accessing, by a browser of a mobile terminal device, a server through Internet in a first working state;

downloading data of a current page and data of predefined N pages subsequent to the current page orderly from the server, caching the downloaded data and displaying the current page, wherein N is a natural number;

updating a link address of each page on the server into a cache address corresponding to data of the page;

disconnecting the Internet after the data of the current page and the data of the N pages subsequent to the current page have been cached; and

switching the browser to a second working state, selecting one page of the cached current page and the N pages subsequent to the current page, reading the data of the selected page from a cache memory according to a cache address corresponding to data of the selected page, and displaying the selected page.

2. The method of claim 1, after selecting one page of the cached current page and the N pages subsequent to the current page, further comprising:

determining whether the data of the selected page has been cached and has a cache address; if the selected page been cached and has the cache address, reading the data of the selected page from the cache memory according to the cache address corresponding to the data of the selected page, and displaying the selected page.

3. The method of claim 1 or 2, after the browser accesses the server through the Internet in the first working state, further comprising:

determining whether an state of Internet environment is satisfied; if the state of Internet environment is satisfied, downloading the data of the current page and the data of the predefined N pages subsequent to the current page orderly from the server, and caching the downloaded data, wherein the state of Internet environment being satisfied comprises at least on of that tariff of access point is cheap, network speed is fast and a channel has not been occupied.

4. The method of claim 1, wherein the first working state is an offline downloading mode and the second working state is an offline reading state.

5. A webpage browsing device, comprising:

a downloading module, configured to download data of a current page and data of predefined N pages subsequent to the current page orderly from a server when a browsing module is in a first working state, wherein N is a natural number;

a caching module, configured to receive the data downloaded by the downloading module, assign a cache address to data of each page and cache the downloaded data;

the browsing module, configured to access the server through Internet in the first working state, read data of a selected page from the caching module in a second working state according to a cache address corresponding to the data of the selected page, output the read data and disconnect the Internet after the data of the current page and the data of the N pages subsequent to the current page have been cached;

an updating module, configured to update, according to the cache address assigned to the data of each page by the caching module, a link address of the page on the server into the cache address;

a state switching module, configured to switch the browsing module from the first working state to the second working state, or switch the browsing module from the second working state to the first working state; and

a displaying module, configured to receive the data outputted by the browsing module, and display the selected page.

6. The device of claim 5, further comprising an Internet environment detecting module, configured to detect whether Internet environment is satisfied, and send a detection result to the state switching module, wherein the Internet environment being satisfied comprises at least one case of that tariff of access point is cheap, network speed is fast and a channel has not been occupied.

7. The device of claim 5, wherein the first working state is an offline downloading mode and the second working state is an offline reading state.