Method and Apparatus for Playing Online Video on Multi-page Browser

Field of the Invention

The present invention relates to display technologies of online videos, and more particularly to a method and apparatus for playing an online video on a multi-page browser.

Background of the Invention

At present, network bandwidth is broadened increasingly, and online videos attract numerous network users because of convenient access experiences, various film sources and real-time update speed, and become a necessary and important part of network life. Currently, there are multiple professional video websites in China, for example, www.tudou.com, www.youku.com, www.ku6.com etc, in which one visible video is provided on one page.

Usually, a user may need to browse a page when watching a video on a multi-page browser. For example, when the user is watching the video, if the user needs to browse user opinions on this video which is located below the video window, it is needed to pull down a scroll bar to show the user opinions, and thus the video can not be watched as a whole, so as to influence the effect of watching the video. Therefore, in order that the user can watch the video and browse other pages at the same time, a method for partitioning a browser window is provided in the prior art. In this method, the browser window may be partitioned into a left part and a right part or partitioned into an upper part and a lower part. Thus, one of the left part and the right part or one of the upper part and the lower part is taken as a window for displaying the video, and correspondingly, the other one is a window for displaying other pages, as shown in Figure 1. In Figure 1, the whole window is the browser window, a left sub-window is the window for displaying the video and a right sub-window is the window for displaying other pages.

As can be seen, the above method for partitioning the browser window can make the user watch the video and browse other pages at the same time, but the window for displaying the video usually can not bestrew the separated window, and thus the separated

window can not be fully utilized. For example, in Figure 1, the lower area of the left sub-window is not utilized, thereby greatly wasting the window area resources.

Summary of the Invention

The examples of the present invention provide a method and apparatus for playing an online video on a multi-page browser, so as to fully utilize window area resources when a user watches the online video and browses other pages at the same time on the multi-page browser.

The method for playing an online video on a multi-page browser provided by the examples of the present invention includes:

determining whether there is a video window in a window where a multi-page browser is located, if there is a video window in the window where the multi-page browser is located and the video window is a target video window, creating a separate display window for the target video window, and playing a video in the separate display window.

The apparatus for playing an online video on a multi-page browser provided by the examples of the present invention includes:

a determining module, configured to determine whether there is a video window in a window where a multi-page browser is located;

a window creating module, configured to create a separate display window for the video window when the determining module determines that there is a video window in the window where the multi-page browser is located and the video window is a target video window;

a relocating module, configured to play a video in the separate display window.

It is can be seen that, in the examples of the present invention, when there is a video window in the window where the multi-page browser is located and the video window is a target video window, a separate display window is created for the target video window, and the video is played in the separate display window. That is, in the examples of the present invention, by creating the separate display window, the video in a web page is relocated to the newly created separate display window to be played, so that the user can watch the video and perform other operations at the same time without influencing the

effect of watching the video in the video window. At the same time, the video is played in the newly created separated display window, and thus other area of the original single window is not occupied, thereby fully utilizing the area of the original single window.

Brief Description of the Drawings

Figure 1 is a schematic diagram illustrating a browser window partitioned into a left part and a right part in the prior art.

Figure 2a is a general flowchart illustrating a method for playing an online video on a multi-page browser according to an example of the present invention.

Figure 2b is a detailed flowchart illustrating a method for playing an online video on a multi-page browser according to an example of the present invention.

Figure 3 is a schematic diagram illustrating a general structure of an apparatus for playing an online video on a multi-page browser according to an example of the present invention.

Figure 4 is a schematic diagram illustrating a detailed structure of an apparatus for playing an online video on a multi-page browser according to an example of the present invention.

Detailed Description of the Invention

In the examples of the present invention, in order to fully utilize window area resources when a user watches a video and browses other pages at the same time, the video in a web page is extracted and is played in a new window. Usually, the video in the web page is played in a fixed playing mode (such as a flash playing mode), and is displayed by a designated type of player and a designated type of file in the web page. In most applications, the player is a network player designated by a website, e.g., the video window in the web page is in fact a network player, and the file is a video file which is downloaded from a network and is to be played locally. Herein, the video file usually is an flv (flash video) file in the network. Before the video file is played, it is usually needed to transform an ID of the video file to be played into a network address of the video file first, and then download and play the video file. The process of transforming the ID into

the network address is implemented by the network player, and can not be implemented by a local player, that is, the local player can not play the video file successfully. Therefore, the local player needs to create a playing environment similar to that of the network, so as to play the video extracted from the web page successfully.

Referring to Figure 2a, Figure 2a is a general flowchart illustrating a method for playing an online video on a multi-page browser according to an example of the present invention. As shown in Figure 2a, the method includes the following steps.

Step 201a, it is determined whether there is a video window in a window where a multi-page browser is located; if yes, step 202a is performed; otherwise, the current procedure is terminated.

Step 202a, when the video window is a target video window, a separate display window is created for the target video window, and a video is played in the separate display window.

The above procedure is a general description of the method provided by the examples of the present invention, and the method provided by the examples of present invention will be illustrated in detail hereinafter with reference to the accompanying drawings.

Referring to Figure 2b, Figure 2b is a detailed flowchart illustrating a method for playing an online video on a multi-page browser according to an example of the present invention. The method for playing the online video on the multi-page browser mainly includes searching for a video, extracting the video and creating a separate display window.

For the multi-page browser, multiple pages are usually displayed in sub-windows of a single window respectively. In the example of the present invention, at first, it is determined through the following steps whether there is a video to be extracted in each page of the multi-page browser: the sub-windows of the current window of the multi-page browser are traversed; if a control is found out in a sub-window, it is determined according to an ID of the control whether there is a video window in the sub-window (step 201b). Since the video is usually implemented through the control, the type of the

control can be known when the ID of the control is obtained. Specifically, it is determined whether the obtained ID of the control is a flashID for representing the video; if yes, it is determined that there is a flash being played in the current web page. If there is a flash being played in the current web page, it is determined according to a predefined rule whether the video window is a target video window (step 202b). Herein, the target video window is a video window to be extracted by a user and displayed in a new separate display window; the predefined rule for determining whether the video window is the target video window may be predefined according to different requirements. For example, the predefined rule may include that the target video window is a video window currently triggered by a mouse of the user or a video window clicked or dragged by the right key of the mouse.

After it is determined that the video window is the target video window through the above procedure, the new separate display window is created (step 203b), so as to extract the video from the original target video window. Through an API function SetParent of Windows SDK, a father window of a window may be designated again (the father window may also be designed through other functions). In the example of the present invention, when the target video window is extracted from the original window, the father window of the target video window is designated as the newly created separate display window (step 204b), i.e., the video may be displayed in the new separate display window. The step 204b may include: obtaining a window handle of the target video window, and designating the father window of the target video window as the separate display window according to the window handle.

It should be noted that, the ID of the control in the step 201b refers to any ID information that can represent the type of the control. A Windows operation system is taken as an example, and the type of the control is represented by the ID of the control, i.e., CLASSID, on the Windows platform. In addition, for a control implemented by an Embed object, the type of the control is represented by a Type attribute.

Since a relocating method of the video window is adopted in the examples of the present invention, the video window is not really separated from the original single window, and thus playing schedule does not change during the switch between the two windows.

At present, besides the above video of the window type, there are videos implemented through an Object object, an Embed object and the like in the web page. Therefore, the examples of the present invention also provide an implementation of transforming a video of the non-window type into a video of the window type, so that the examples of the present invention can also be applicable for the video of the non-window type. In a video control running in the web page, there is a parameter for describing whether there is a window corresponding to the video control. Specifically, the parameter may be a Wmode parameter or other implementation parameters, which is not limited in the examples of the present invention. When the parameter is equal to a certain value, there is a window corresponding to the video in the web page. For example, in the prior art, when Wmode=Window, there is a window corresponding to the video in the web page. In addition, for a Flash object in the web page, the following functions are used to obtain a Class Factory interface for creating the object:

HRESULT CoGetClassObjectFromURL(

REFCLSID rclsid, // Classid of an Activex control to be created, through which it can be determined whether a video control is created

LPCWSTR szCodeURL,

DWORD dwFileVersionMS,

DWORD dwFileVersionLS,

LPCWSTR szContentType,

LPBINDCTX pBindCtx,

DWORD dwClsContext,

LPVOID pvReserved,

REFIID riid,//

VOID**ppv// a return value, an object Class Factory interface, through which an object is created

);

As an example of the present invention, when the control to run in the multi-page browser is created, the procedure of creating the control may be monitored by using a hook mode. Hook is a system mechanism which is provided by Windows to replace the "interrupt" in DOS. After the hook is performed for a certain system event, once a hook event happens, the program performing the hook for the event will receives a notification from the system, so as to response to the event instantly. In the hook mode, a system function in a process is usually shared globally, which is mainly represented by that an entrance address is unique in the process. When the program runs, if a library file containing the above function is loaded in advance, the entrance address of the function can be obtained after the function is loaded to the process; the location for storing the entrance address is replaced with another address of a global function which has a parameter list completely identical with that of the function, and the address of the original function is stored; when the function is called through an original call path, the global function will be called. In other words, when the control is created, it is determined whether the control to be created is a video control according to the ID of the control; if the control to be created is a video control, the Wmode parameter of the video control is configured as a predefined value, and the predefined value may be Window or another predefined value representing that the control has a window. Therefore, the video control without a window can be transformed into a video control with a window.

The above description illustrates the method provided by the examples of the present invention, and an apparatus provided by the examples of present invention will be illustrated in detail hereinafter with reference to the examples.

Referring to Figure 3, Figure 3 is a schematic diagram illustrating a general structure of an apparatus for playing an online video on a multi-page browser according to an example of the present invention. The apparatus corresponds to the method for playing an online video on a multi-page browser, and as shown in Figure 3, the apparatus includes a determining module, a window creating module connected with the determining module, and a relocating module connected with the window creating module.

The determining module is configured to determine whether there is a video window

in a window where a multi-page browser is located.

The window creating module is configured to create a separate display window for the video window when the determining module determines that there is a video window in the window where the multi-page browser is located and the video window is a target video window.

The relocating module is configured to play a video in the separate display window.

In order to make the present invention clearer, the examples of the present invention also provide a specific structure of an apparatus for playing an online video on a multi-page browser, as shown in Figure 4. Referring to Figure 4, the apparatus includes a determining module, a window creating module and a relocating module. The functions of the three modules are similar with those of the modules shown in Figure 3, and will not be described in detail herein.

Preferably, as shown in Figure 4, the determining module includes:

a sub-window obtaining unit, configured to obtain sub-windows of the window where the multi-page browser is located; and

a determining unit, configured to traverse the sub-windows, determine whether there is a video window in a sub-window according to an ID of a control; if there is a video window in the sub-window, determine that there is a video window in the window where the multi-page browser is located; if none of the sub-windows of the window where the multi-page browser is located has a video window, determine that there is no video window in the window where the multi-page browser is located.

The relocating module playing the video in the separate display window includes: obtaining a window handle of the target video window, designating a father window of the target video window as the separate display window according to the window handle.

As an improvement of the present invention, corresponding to the method for playing the online video on the multi-page browser described above, in order to transform a video without a window into a video with a window, the apparatus may further includes a control creating module and a monitoring module. When the control creating module

creates a control in the multi-page browser, the monitoring module monitors the created control by using a hook mode, determines whether the control is a video control according to the ID of the control; if yes, configures the Wmode parameter of the video control as a predefined value.

The foregoing are only preferred embodiments of the present invention and are not for use in limiting the protection scope of the present invention. Any modification, equivalent replacement and improvement made within the scope of the present invention should be covered under the protection scope of the present invention.

Claims

1. A method for playing an online video on a multi-page browser, comprising:

determining whether there is a video window in a window where a multi-page browser is located, if there is a video window in the window where the multi-page browser is located and the video window is a target video window, creating a separate display window for the target video window, and playing a video in the separate display window.

2. The method of claim 1, wherein determining whether there is a video window in a window where a multi-page browser is located comprises:

traversing sub-windows of the window where the multi-page browser is located, determining whether there is a video window in a sub-window according to an ID of a control, if there is a video window in the sub-window, determining that there is a video window in the window where the multi-page browser is located; if none of the sub-windows of the window where the multi-page browser is located has a video window, determining that there is no video window in the window where the multi-page browser is located.

3. The method of claim 1, wherein the video window being a target video window comprises:

determining whether the video window is a video window triggered by a mouse, if the video window is a video window triggered by the mouse, determining that the video window is the target video window.

4. The method of claim 2, before traversing the sub-windows of the window where the multi-page browser is located, further comprising:

monitoring the control by using a hook mode when the multi-page browser creates the control; determining whether the control is a video control according to the ID of the control; if the control is a video control, configuring a Wmode parameter of the video control as Window.

5. The method of claim 1, wherein playing a video in the separate display window comprises:

obtaining a window handle of the target video window, designating a father window of the target video window as the separate display window according to the window handle.

6. The method of any of claims 1 to 5, wherein the ID of the control comprises CLASSID or a type parameter value.

7. An apparatus for playing an online video on a multi-page browser, comprising:

a determining module, configured to determine whether there is a video window in a window where a multi-page browser is located;

a window creating module, configured to create a separate display window for the video window when the determining module determines that there is a video window in the window where the multi-page browser is located and the video window is a target video window;

a relocating module, configured to play a video in the separate display window.

8. The apparatus of claim 7, wherein the determining module comprises:

a sub-window obtaining unit, configured to obtain sub-windows of the window where the multi-page browser is located;

a determining unit, configured to traverse the sub-windows, determine whether there is a video window in a sub-window according to an ID of a control, if there is a video window in the sub-window, determine that there is a video window in the window where the multi-page browser is located; if none of the sub-windows of the window where the multi-page browser is located has a video window, determine that there is no video window in the window where the multi-page browser is located.

9. The apparatus of claim 7, further comprising: a control creating module, configured to create the control in the multi-page browser, and

a monitoring module, configured to monitor the control by using a hook mode, determine whether the control is a video control according to the ID of the control; if the control is a video control, configure a Wmode parameter of the video control as Window.

10. The apparatus of claim 7, wherein the relocating module is configured to obtain a window handle of the target video window, and designate a father window of the target video window as the separate display window according to the window handle.