

[0031] With reference now to FIG. 2 of the Drawings, there is illustrated a content distribution system (generally designated by the reference numeral 200) according to a preferred embodiment of the present invention. As shown in FIG. 2, content is provided from a number of content providers 210 to the ISPs, LANs and/or WANs (collectively designated by the reference numeral 220) through the Internet 230, as also shown in connection with FIG. 1. However, in this embodiment, the content being provided is intercepted at an intercept point (generally designated by the reference numeral 250), compressed, edited and cached therein. Although the intercept point 250 is shown separate and distinct from the source content providers 210 and designation nodes 220, it should, of course, be understood that the intercept point 250 may also be continuous with either the nodes 210 or the nodes 220 and may be located anywhere along the content travel path 235. By virtue of compressing, editing and caching frequently downloaded content in the manner of the present invention, Internet users 240 experience a significant increase in bandwidth and faster connections. The service providers 220 witness reduction in incoming network traffic due to the caching nature of the interception point or content distribution system 250, thus resulting in large bandwidth savings.

[0032] FIG. 3 illustrates a preferred embodiment of the present invention and preferred interoperation of the network elements (generally designated collectively by the reference numeral 300) in a typical sequence of events. It should, however, be understood that numerous scenarios can occur using the same network element configuration and/or variations of the order of events without departing from the principles of the present invention. In particular, a user 340 first initiates a request, e.g., a Hypertext Transfer Protocol (HTTP) request, with a browser 342 by requesting a web page or a Uniform Resource Locator (URL). The request may be routed directly to a distribution server 322 in an ISP 320 or to an ISP server 324 therein and then to the distribution server 322, using a client application 344 in the user/requester PC 340 or browser 342. The client application 344, before sending the request, tries to fill the request from the local cache in the user PC or client terminal 340 before using the network. The client application 344 preferably checks the header information of the compressed content in its cache to determine whether the content needs updating before being used. However, if the content requested is not in the client's terminal cache or has expired (needs updating), the request is sent to the distribution server 322 of the ISP 320. The distribution server 322 tries to fill the request from the cache manager, and if the content is present and current, the compressed or uncompressed content is provided to the user; otherwise, the distribution server 322 tries to get the content from a control server 350. The control server 350 also checks for the requested content in the cache, and if the content is available and current, it is served to the user through the distribution server 322.

[0033] The control server 350 maintains a list or index 352 of recently used URLs and header information of the URLs in order to keep the content up-to-date before being served to the user. When the content is served to the user through the distribution server 322, it is compressed and cached in the distribution server 322. Thus, if requested again, will be accessed from the distribution server 322. If the content is not available in a cache manager 354 accessible by the control server 350, it is filled from the Internet 330.

[0034] The control server 350 receives, compresses, and indexes the requested content, so that the content is available the next time it is requested. Alternatively, if the content is not available in the control server 350, the distribution server 322 makes a request to receive the content from the Internet 330. Upon receiving the original content, the distribution server serves the content to the user "as is", then compresses and stores the content in the cache so it is available the next time it is requested. The content received from the Internet 330 can optionally be received from another distribution server 312 acting as a proxy for a group of web servers 314. In this instance, the content provided by the second distribution server 312 acting as a web server 314 is served compressed, hence, content will be provided compressed to the user the first time it is requested. Similarly, as mentioned above, if the content is not available in the web server 314, it is provided from the Internet 330 using the original format of the content to the user 340. As will be explained and made clear hereinafter, content may be served edited and compressed the first time requested even if the content is not available in a local cache, in this case, the distribution server compresses and edits the content in realtime.

[0035] FIG. 4 illustrates an overview diagram of the components of the OCD system 400 with Editor according to one embodiment of the invention. In this representation the components of the Distribution/Control Servers are shown separately. However, as is known by those who are skilled in the art, many of these components can be combined in such a way that they can be deployed on far fewer servers. OCDS includes a Proxy Server 408 that is connected to the Internet. The Proxy Server 408 is able to intercept requests from certain Hypertext Transfer Protocol (HTTP) Clients 402, such interception made possible because of the Proxy's logical location between the HTTP Clients 402 and the Internet Content Server 406 serving the requested content. Additionally, the Proxy Server is connected to the Redirector 416, which in turn is connected to the n-Depth Compressor 424 and to the Editor 422. The Editor 422 is connected to the Compressor (the Compression Server) 418 with which it shares a read write directory 420.

[0036] The requester, shown as the HTTP Client 402, makes a request 404 for information from the Internet Content Server 406. The Proxy Server 408 intercepts the request and forwards the request to the Redirector 416. The Redirector 416 checks to see if an edited compressed version of the content is available locally. If an edited and compressed version of the content is available locally then the URL is returned to the Proxy Server 408. The Proxy Server 408 then fetches the URL from the Web Servers Cache 414 and sends the edited and compressed content to the requester where it is viewed with a browser having a Plugin 430. However, if the edited and compressed URL exists in the Proxy's Cache 410 the fetch routine is bypassed and the edited and compressed content is returned to the requester 402.

[0037] In the event that the requested content is not locally available, the Redirector 416 notifies the Proxy Server 408 to obtain the URL from the source, notifies the Editor 422 that a page needs editing and notifies the n-Depth Compressor 424 to perform n-Depth Compression. The Proxy Server 408 fetches the URL from the Internet Content Server 406 on the Internet and returns the original unedited page to the Requestor 402. The Editor 422 checks the page's HTML