Optimized Development of Web Front-end Development Technology

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Abstract: With the widespread use of the Internet in modern social life, the existing Web technology still has a large room for optimization and development in terms of loading time, response speed, and user Internet experience. Therefore, Internet technicians need to fully understand and master various Web front-end development technologies. Besides, through the technical optimization we can reduce the HTTP errors and requests. Moreover, in order to improve the user's Internet experience we are supposed to control the file size, reduce the invalid responses and DNS queries reasonably.

1. Introduction
With the rapid development of Internet technology, the front-end Web development technology that uses the editing language to realize the static function of webpages also needs to be optimized on the basis of providing simple webpage browsing windows and other functions for Internet users. Only in this way can the diversified and personalized demands of web users for web browsing in the new era be met. Therefore, technical developers must fully understand the importance of optimizing Web front-end development technology, and increase research on Web front-end development technology, to fully grasp the various technical paths in the Web front-end development system. At the same time, technology developers should also optimize the existing Web front-end technology in combination with the Internet development technology trends and the user's actual experience and requirements for surfing the Internet, improve web page response speed, and provide users with a smoother online experience.

2. Overview of Web Front-end Development Technology
Web technology is an important technical foundation in web page production. The current Web front-end development technology system mainly includes three development languages and related development technologies. Among them, the development language is mainly include JavaScript language, HTML and CSS. Otherwise, other development technologies include DOM, AJAX, etc. The development technology system of the Web front-end can be seen in Figure 1 [1].
2.1 JavaScript Technology for Web Front-end Development
In Web front-end development technology, JavaScript is an important scripting language. It has the characteristics of simple editing and adaptability to the needs of cross-platform development, and can be directly embedded in the HTML page, and at the same time respond to user needs, thereby making the interaction between the user and the web page more convenient.

2.2 CSS Technology for Web Front-end Development
In the web front-end development technology, CSS is a technical language for displaying XML or HTML file styles, and its main function is to divide the corresponding style information and web page style and web content control system. By optimizing the CSS, the maintenance difficulty of the browser can be reduced, and the response and running speed of the page can be improved.

2.3 HTML Technology Developed by Web Front End
HTML5 language based on HTML is an important Web front-end development technology, which can well adapt to the Web development requirements in mobile terminals. At the same time, because of its good compatibility, it can be used in the development of browsers on PAD, mobile phones and PC.

2.4 DOM Technology Developed by Web Front End
DOM is the technical basis for AJAX to realize dynamic interactive display. At the same time, it can also provide node conversion of abstract XML documents for the web front end and language-independently through the provision of standard APIs. In addition, it can also make the page highly interactive by displaying the tree-shaped data structure, thereby creating conditions for heterogeneous access and access to other components of the page [2]. The main design object of DOM is OMG, which defines the document representation and modification of object relationships.

2.5 AJAX Technology for Web Front-end Development
The so-called AJAX technology is a technical method to speed up network operation and response speed by reducing the amount of information requests. The main technical principle is to use page data and Web server parsing to achieve problem acquisition and dynamic web page construction, so as to reduce the interactive data between the web server and the background and enable asynchronous update of the web page. AJAX is also an important web front-end development technology.

3. The Necessity Analysis of Web Front-end Development Technology Optimized Development
With the widespread use of the Internet, the Web has gradually evolved from the initial static web window to display dynamic content, and users' demands for web browsing have also become more
diverse and personalized. However, the existing WEB development technology has been unable to meet the actual needs of users, and problems such as unresponsive responses, HTTP errors, and page load delays often occur during the user's browsing process. This severely affects the user's online experience, which in turn will cause the loss of some web users, which greatly restricts the growth of web traffic (the relationship between user experience and page load time can be seen in Figure 2). Therefore, the relevant technical personnel must improve the user's online browsing experience through the optimization and development of the Web front-end technology, thereby bringing more traffic to the web page, and then achieving the economic benefits of the web page.

Figure 2: Schematic Diagram of the Relationship Between User Experience and Page Load Delay Time

4. An Analysis of the Optimization and Development of Web Front-end Development Technology

4.1 Optimize Web Front-end Development Technology Language
In the optimization and development of Web front-end technology, the three types of technical languages of JavaScript, HTML and CSS are the main directions of development. Among them, HTML5 in HTML is a commonly used technical language in mobile smart devices, which can optimize the structure of the webpage, make the webpage more concise and clear, and thus meet the webpage browsing requirements of mobile terminals such as smart phones and PADs. Therefore, the optimization of JavaScript should expand its Netscape Navigator and other functions, so as to provide users with a deep level of analysis of web page information. In addition, through the optimization of CSS, the information can be accurately divided, which can enable users to obtain more effective information during web browsing.

4.1.1 Optimize HTML Language
If HTML is mainly used as the editing language in the optimization and development of Web front-end technology, HTML should be simplified according to the actual needs of Web page production, and the code should be more clear and semantic [3]. At the same time, the number of DOM nodes should be reduced as much as possible, and the page redraw should be reduced to avoid page zooming. In the technical optimization, the page rendering speed should also be accelerated to ensure that the label is closed, and the existence of empty attributes should be reduced, so as to place parsing errors. In
addition, JS should also be placed in the header and footer of the Web.

4.1.2 Optimize CSS Language
The optimization of CSS should start from four aspects, that is, to simplify the development process as much as possible, and try to avoid unnecessary CSSE-Felter and CSSExpressions. At the same time, the total amount of code should be reduced by removing duplicate codes and using CSS abbreviations, and the use of CSS character levels should be minimized. In addition, if ID or CLASS is applied during development optimization, YAG tags should be deleted.

4.1.3 Optimize JavaScript Language
JavaScript is dynamic and versatile, and can be optimized on a large scale. Therefore, in optimized development, duplicate JS is deleted, the number of global variables and reflow redraws are minimized. At the same time, the application of function, with and eval should be reduced, especially the use of function and eval should be avoided. Besides, the number of scope chain searches and targeting should be reduced as much as possible.

4.2 Countermeasure Analysis of Optimizing the Development of Web Front-end Development Technology

4.2.1 Reduce the Number of HTTP Requests Through Technical Optimization
An HTTP request includes DNS addressing, sending data, connecting to the server and browser, data transmission and waiting. However, each link in the request process needs to have data correspondence, and will cause different degrees of occupation of bandwidth resources. Because the operation of these request links is basically in a synchronized state, there will be a large amount of data in each HTTP request to generate a multi-level response within it. When the bandwidth is occupied by multiple data responses, the running speed of the webpage will be reduced, and the webpage will be stuck or crashed, which will increase the user's waiting time. Therefore, when optimizing the Web front-end technology for this problem, one or different technical languages should be used to minimize the amount of HTTP requests. In the process of technical optimization, relevant technicians can use a combination of multiple JavaScript and CSS files to keep their operations synchronized. Moreover, the picture architecture is optimized and perfected, so as to ensure the synchronization of text and picture download by inputting different mapping connections into the image and dividing the image into multiple areas [4]. At the same time, CSS background can also be used to absolutely position the background image, so as to achieve the packaging and effective compression of HTTP requests. This can reduce the amount of HTTP requests at the first-level surface level, and convert the inner layer requests into a single queue for processing, so as to achieve the purpose of increasing the web page loading speed and improving the user's browsing experience.

4.2.2 Technology Optimization Reduces HTTP Errors
For the sake of solve the problem of repeated HTTP errors during web browsing and improve user experience, relevant technical personnel should strengthen the connection between the page and the server in the optimization of the web front-end technology. Thus, the Web server can quickly respond to the page search request. And further solve the problem that the Web cannot find the corresponding file quickly when the user uses the keyword to perform the search operation, and the search time is too long, which causes the HTTP error crash of the page and other problems.

4.2.3 Through Technical Optimization to Reduce the File Properly
In order to reduce problems such as page loading delays, slow response times, and unresponsive webpages, stalls, and even crashes caused by oversized files, we must reasonably control the size of webpage files in the optimization of Web front-end development technology. For example, relevant technical personnel can first compress the JavaScript file and delete the redundant HTML tags. Then,
optimize the CSS code and files to achieve the purpose of speeding up the file loading speed. In this way, the first-level running page can be directly presented to the user, so that the user's operation is more smooth and efficient, and the phenomenon of slow response of the page or blanking for a long time under the existing technical state can be avoided.

4.2.4 Reduce the Amount of DNS Queries Through Technical Optimization
In my country, there are widespread DNS search defects in Web front-end development technologies, which results in a large amount of search time for website browsing. Under the current technical conditions, the DNS first-order time is generally between 20ms and 120ms. With the increase of DNS lookup frequency and the increase of request volume, the time required will be further extended, and it will also cause data transmission quality. Adverse effects [5]. In addition, the browser will not be able to complete the download task until it completes a DNS lookup. At this stage, many websites in our country are using the Widget method, which has caused the widespread existence of DNS queries. Therefore, in the optimization of Web front-end development technology, DNS lookup should be optimized, and methods such as reducing the amount of DNS lookups should be combined to speed up the running and loading speed of the webpage, avoiding the user's long wait, and thus achieving the purpose of improving the user experience.

4.2.5 Technology Optimization Reduces Useless Response
At present, when users visit the website, invalid responses such as access denied and 404 errors often occur, which seriously affects the user's operating experience. The main reason for this problem is that the file cannot be found, so the HTTP request time is increased, and the page will appear as an invalid response at this time. In the optimization process of Web front-end development technology, technicians should improve the accuracy of this type of error location, and use multi-layer testing to continuously track the error log information of the Web server connection, thereby reducing the probability of such errors.

4.2.6 Place the Script at the Bottom Through Technical Optimization
Script is a kind of expanded function. Its main function is to be able to batch process files and increase annual protection for plain text. Generally speaking, it is mainly to use Script to analyze the web page request and logical differentiation processing [6]. However, because there will be a lot of inquiry links in the logical branch, and when the branch volume is too large, it will also adversely affect the performance of the web page. Therefore, in the current Web front-end development technology, technical developers usually do not take measures to place Script at the bottom. This has caused many webpages to be restricted by script scripts during the download process and have problems such as limited response delay. Therefore, in the development process of Web front-end development technology, it is necessary to optimize the script development method, and directly use the method of placing script at the bottom to avoid such problems. In this way, the purpose of accelerating the page loading speed and the download speed of page related components is achieved, so that the front-end performance of the website is effectively improved.

5. Conclusion
With the continuous development and maturity of Internet technology, it not only makes people's lives and work more convenient and efficient, but also greatly affects people's life and behavior. At the same time, in the process of using the Internet, people also put forward new requirements for the Internet access experience and the functions of using the Web. Therefore, Web technology developers must fully understand the actual needs of modern network information society for Web technology, and strengthen the learning and mastering of the front-end technology system of Windows. Moreover, on this basis, in order to promote the development of Web front-end technology we are supposed to continuously pursue the technical optimization and innovation, so as to provide people with more diversified and personalized network services.
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