

Research on Real-time Data Push Technology of Web Server

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Abstract. In order to solve the real-time information of the Web server push and relieve the push server access pressure in high traffic and resource consumption. The method by time control and connection control, connection buffer control, can reduce the pressure and resource consumption of the entrance of the web server. To some extent, tests show that the method can reduce stress of server push and resource consumption.

Introduction

With the continuous development of the Internet, because the Web application is cross-platform, do not need to install the Client, good scalability, making more and more Web applications by the previous C/S (Client/Server, Client/Server) model into a B/S (Browser/Server and browser/Server) mode, and by the Web Server to the browser in real-time delivery data becomes a demand of The Times, so the Web Server push technology with the development of the Internet has produced many implementation way, at the same time is also used in many fields, in agriculture to realize the real-time monitoring of crop of the earth, in some social networking sites online chat, to provide customers in electricity access to historical orientation to the customer to push some of the same goods, etc.

Web server push technology in development, with the increased number of use, the increase of traffic, affordable access to the server pressure also becomes a challenge, so in today many people are fighting with the server access pressure in, so add server access method is more and more pressure, also each are not identical.

The Web server push technology existing implementation scheme

Web server push technology realization method has many, here only introduce three kinds of push technology, in order to better understand the below.

The traditional polling push

This way of push is primarily a browser in a certain time interval send new page request to the server, the server returns the new data, the browser to update all the data of the page. Users can't determine when to refresh is appropriate, only through high frequency refresh request as far as possible to get as close as possible to the real-time data, but the high frequency refresh request can make the load on the server, in the process of continuously to establish links and release, will also increase the pressure of the server, but if the refresh rate is too low, can't make the data is real time. So the best refresh interval time interval is the server to the new data, but for many other reasons, are unable to determine the server time interval of obtaining information.

At the beginning of a web application by add META tags in HTML page refresh the page regularly role, the role of META in HTML is the browser after a certain time interval sends a request to reload the page, polling function to update the data. Concrete implementation way is HEAT tags in HTML page to add a <META HTTP - RQUIV = "Refresh" CONTENT = 5 >, the browser page once every 5 seconds, between the 5 seconds, if there is a new data server, also want to wait until the browser Refresh again bring the data back to the browser to display, there is no guarantee that the data real-time. Secondly, there are times when we need to update may be a certain part of the page, is

likely to be just a piece of text, a numeric value, such as a picture, not the entire page, which makes the do not need to reload the data transmitted between the server and browser, causing a waste of network resources.

Ajax polling

With the continuous development of Internet technology, Ajax became popular, Ajax is using asynchronous data interaction in the form of transfer and request an Ajax application to eliminate intermediaries by JavaScript Ajax engine in between the browser and the Web server of waiting, the user browser and Web server response asynchronous operation. Data processing and validation by the middle tier Ajax processing, only the exchange of the user to specify user and server data. Only need to exchange new data from the server to the Ajax engine submit access request to the server, so as to avoid some unnecessary user request submitted to the server, server processing burden caused by too much. Using Ajax can reduce the burden of the server, do not need to refresh the update page, reduce the waiting time for users, it only and server exchange of useful data, unnecessary data is no longer from the server side load, improve the efficiency of network transmission make the application process is very natural, smooth operation .

Ajax polling is used in the browser the setTimeout JavaScript function called Ajax engine timing and the XMLHttpRequest object to server Chad polling data if there is a change, realize the data update, using Ajax polling and the difference between traditional polling is don't need to refresh the page all the data in the traditional polling can also affect the user other operations, and using Ajax asynchronous request, does not affect users in other operations of the current page.

Ajax long waiting for polling

Ajax long waiting for polling is in an Ajax polling and Ajax long polling on the basis of an improved again. Ajax waiting long polling is Ajax engine through jQuery calls in the browser, using the function recursive calls to send new information returned HTTP requests. The implementation code is as follows:

```
function getdata()
{
    $.post("ShowData",
    {
function(data)
{
    if(data == 0)
    {
        //When the data is equal to 0, there is no new data, in here without a new data processing
    }
    else
    {
        //When the data is not equal to 0, there are new data, new data processing here
    }
    getdata();//Recursive function calls
}
}
```

Above using jQuery calls Ajax engine, using post calling the backend Servlet for data acquisition, the return value of data to determine whether value is defined according to the specific new data determination conditions. When the user starts the function for real-time data acquisition, through Ajax engine asynchronous calls the Servlet class background updating new data. To capture the request in the Servlet class, then assign the request a capture time.

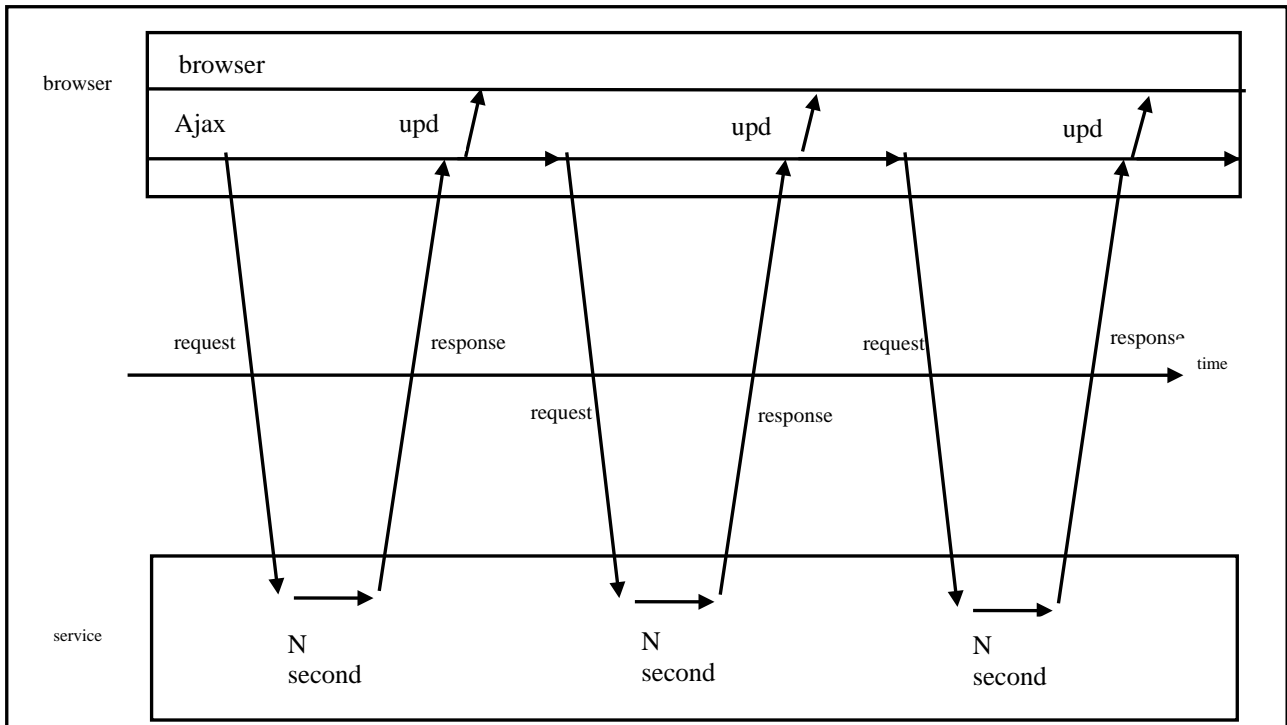


Fig.1 Ajax polling mode

After capture request for data tag (server access to the data to the data after a way to handle it, later) to judge whether the new data read, if new data is tag, read new data through the response will return to the browser, the new data browser to call the function itself again initiated the request. If the data is a new data marking, the system will automatically set the capture time, a request in the capture request time will not release the request, will examine data tag, if it is found that the data for the new data marking, read the new data release request response by the new data back to the browser. If there is no new data, distribution of capture time release request, after the request, the browser will initiate requests again again to invoke the function itself.

Server will have a process to get to the new data, when get the new data, the server will be new data memory storage and marked (mark whether information is a new data, such as setting a static type int variable, make the value of 1 for the new data, the value of 2 for the old data, flag variable set when the new data acquisition and reading), capture, in request by mark to judge whether the new data, when making requests capture waiting time interval is also through the check mark invariant way of judgment.

Reduce the pressure of access to the entrance of the request

Server after the capture request, will judge whether data markup tags for the new data, if it is, return the data. If not, you will be for each request assigned a capture time, at the same time also can according to the length of time for each time period to keep a record number of connections created will add 1, or read to the new data to minus 1.

In the absence of new data request, the server will read the state of the number of connections (the number of connections status will introduce below), determine whether in normal state, if it is normal, can be allocated within the prescribed period of time any waiting time, and then add 1 in this period the number of connections. If the number of connections is beyond the normal number of connections, access to random regulation Time, read buffer 1 state's ban period distribution, judge whether the ban period, if the ban period, shorten the original period (size according to the actual situation, set up, shorten Time forms such as: $\text{Time} * m/n$), again into comparison, until we meet, then get the Time as a percentage of number of connections ($n \% = n * (\text{the Time period of connection data quantity is } 100\% / (N1 + N2 + \dots + Nn))$), read the state 1 in this Time period, the percentage of the number of connections to ban value, if this Time is higher than the set values in state 1, will continue to shorten

the period, until the smallest unit of rules. If the lower than the set values in state 1, create the capture waiting time.

State the number of connections, is one of the number of connections to the system level performance, can be freely defined, for example, the normal state, the server can withstand the number of connections at the same time, the value is according to the specific circumstances; Buffer 1, is when the number of connections than normal number, perform an action, can make the closing of a certain amount of data request waiting for a long period of time, you can also specify the end of the request of some specific time period to reduce the pressure on the request of the server. This state can set the stage, here only set up the normal state and buffer 1 state.

On server startup, will create a thread for connection state monitoring, if beyond the normal connection state of set, by the end of the request of the longest waiting for connection and banned some request too long wait for the connection of the creation.

The above method in the entry of the real-time data update management, through the connection of time management, to a certain extent, ease the pressure on server concurrent access.

Summary

In such a rapid development of the Internet today, server data push is applied more and more sites, implementation of the approach is not the same. The method described above is to push some of the current integration process and improved, while a more integrated feature of some optimization backstage entrance and connection management, to a certain extent, these measures reduce the real-time data updates in concurrent operation on the system pressure.

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