2014

ISSN : 0974 - 7435 Volume 10 Issue 19

BioTechnology

An Indian Journal

FULL PAPER

BTAIJ, 10(19), 2014 [11511-11516]

Application research of the tourism services system in browser/server mode

Zhao Gang

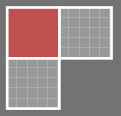
Chongqing University of Education, Chongqing, 400065, (CHINA)

ABSTRACT

With the growth in the living standard of people, tourism industry has been developing rapidly, and people would search for tourism information online prior to travel, therefore, the tourism services system design based on browser/server (BS) mode becomes a hotspot of researches. This research proposes a kind of tourism services system based on BS mode against some disadvantages of traditional Web tourism services systems, such as inconvenient tourism information search, untruthful tourism information of internet communications and unsafe online transaction etc., this kind of system includes: specially probes into the main thought of the extended communication protocol SSL; elaborates the calculation method for the trust value of services, servers and clients.

KEYWORDS

Tourism services; Web services; Trust value of services; Communication protocol SSL.



INTRODUCTION

With the rapid development of the society, the human interaction is becoming closer day by day, thus the traditional web technology emerged, and the literal translation of "Web" originally is net, which is being used generally as the meaning of network and internet etc. it's represented in three types: hypertext, hypermedia (HM) and hypertext transfer protocol (HTTP) etc. Web Services is a new technology derived from the traditional Web technology, its literal translation is Web Services. There are certain distinctions between the traditional Web technology and Web Services, the former is mainly focus on solutions for people to use services provided by Web applications skillfully; and the later is mainly focus on solutions for the computer systems to use services provided by Web applications.

The main services of tourism industry include: search for the weather conditions at the destination, specify reasonable travelling route for clients, find appropriate place for lodging, and choose convenient vehicles and so on. The traditional tourism services system can't offer all needed tourism information for clients, the clients have to log in multiple tourism websites to search for related tourism information firstly, and then make comparisons and select proper tourism information. However, this process is tedious comparatively. This research designs a tourism services system model in BS mode, the related tourism information inquiry services are only provided by one integration server, in this case the clients can simply visit the Web services provided by this system only need to log in the integration server

THE ARCHITECTURE OF BROWSER/SERVER (BS)

The purpose of BS is to provide service-oriented and function-oriented services for clients, and comply with the unified standard, in this way, various application systems can implement the cross-platform data sharing and business collaboration. The services system architecture of BS achieves the interrelation among the service registry center, services requester and services provider, the interrelation as shown in Figure 1.

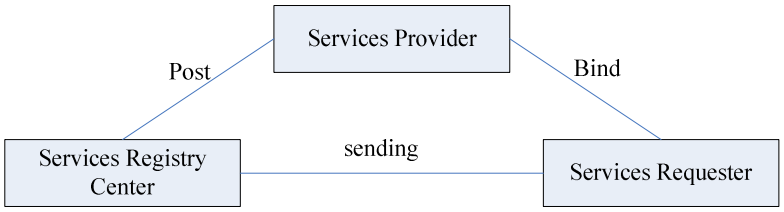


Figure 1 : Web service architecture

As shown in Figure 1, BS architecture also involves the tripartite relationship: 1) services registry center: it's a registry center where you can proceed search services, the services provider can post their services information here, and the services requester can search for the required services information here as well; 2) services provider: firstly register information at services registry center with which to assemble services, post services and provide services; 3) services requester: request to get services by means of posting services request registration and record.

THE TYPICAL TOURISM SERVICES SYSTEM DESIGN

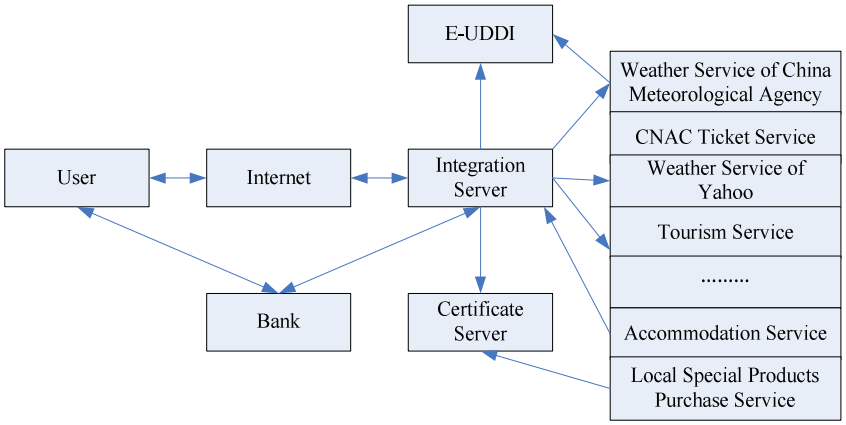


Figure 2 : The typical tourism services system design

See from Figure 2: the typical tourism services include Weather Service of China Meteorological Agency, CNAC Ticket Service, Tourism Service, Accommodation Service and Local Special Products Purchase Service etc, and enjoy special services and safety protections.

To clarify, when the client prepares to travel, he can firstly log in the integration server of the tourism services system, then select necessary services on the layout page, the client's personal information will be registered in the exclusive E-UDDI of the tourism services system, in addition, the client can search tourism information in the tourism services system without repeated identity verification. If the tourism services system is the charges system, the client also can implement transactions by charging.

THE KEY TECHNOLOGY RESEARCH OF TOURISM SERVICES SYSTEM

The extensive application of the communication protocol SSL

The communication protocol SSL can ensure the transmission of the certification and information security between the merchant and client; however, if the third party and multiple parties are involved in the certification, multiple certifications of communication protocol SSL are needed. Hence, the system needs to extend the communication protocol SSL in order to support multiple clients' communications.

The basic principle of the communication protocol SSL is: firstly confirm both set up the communication protocol SSL connection, and then register in the certificate server (the registered information shall have the user name and signal code of the participant), finally the certificate server will distribute an unique identification for this communication protocol, thus forming an exclusive encoded channel between two parties. If there's a third party client requires joining this communication channel, shall inquire each participant's comment in this communication channel, when all of participants agreed, after the third part client get access to the channel, the certificate server will send the password of the communication channel to the third party. In this way, three clients can share communication password and communicate with each other through transmitting encoded messages, it's important to note that the password of the communication channel should be changed at regular time, and inform other participants by the certification server, the communication process please refer to Figure 3.

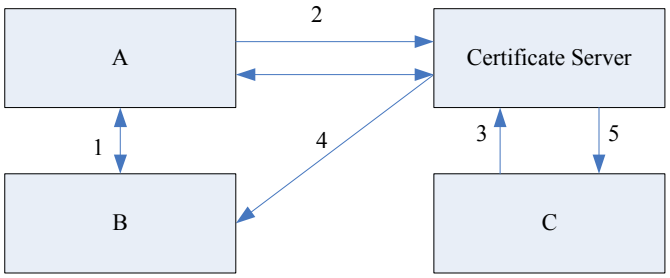


Figure 3 : Extensive SSL process

The detailed process of the communication protocol SSL introduced below:

1. The communication protocol SSL connection will be set up between client A and client B, at this moment the handshake protocol in the communication protocol SSL shall be used.
2. Client B will send an authorization message to client A after receiving a message of "handshake completed" sent by client A according to the handshake protocol in the communication protocol SSL, (note: client B shall make digital signature for this authorization message by this time), and the authorization message indicates that the communication connection is set up between client A and client B. Then client A will also make digital signature for the message after receiving it, and send the authorization message to the certificate server afterwards suggesting that the communication channel P is set up between client A and client B. Finally, after receiving and confirm the message sent by client A, the certificate server will distribute a unique identification to the communication channel P, and will post by the means of Web service
3. Through the certificate server client C finds that the communication channel P has been set up between client A and client B, at this moment client C can request the certificate server to join the communication channel P.
4. After receiving the join request from client C the certificate server will send client C's identity information to client A and client B, and inquire whether agree client C to join or not, client A and client B can make judgments whether agree or not, and sent the decisions to the certificate server.

Trust value

Trust value of services

This research deploys the evaluation method of the mathematical model of the trust evaluation, at first, it takes advantage of the trust evaluation mechanism based on reputation, so that can effectively identify malicious nodes and avoid malicious behaviors, then learns from the trust assessment mechanism based on reputation in the environment of P2P, in the end learns from the calculation method of evaluation, an proposes the calculation method of the trust value.

Assume t_0 is the initial time for calculate the trust value, n is the number of uses for service A in the serial of services, for any arbitrary integer k（0≤k≤n）, set U_k, P_k, D_k and m_k respectively as the evaluation of service A for the k time after t_0 time, the punishment against service cheat, the accurate factor of voting and the total amount of service transaction. Then the calculation formula of the current trust value L_A^k for the service is as shown in formula 1 :

$$L_A^k = \begin{cases} 0.5 & k = 0 \\ \alpha \sum_{i=1}^{k} (\sigma_i U_i + P_i) + \beta D_i & 1 \le k \le n \end{cases} \quad \textbf{(1)}$$

There, the parameter α and β are weights respectively, and $\alpha + \beta = 1$; $\sigma_i = \frac{S_i m_i}{M_i}$ is the proportion of weight for service A uses the service evaluation U_i for the i time after t_0 time in the trust value L_A^k; S_i is the influence degree of the time factor on the trust value, and $\sum_{i=1}^{k} S_i = 1$; formula $M_k = \sum_{i=1}^{k} S_i m_i$ deduce: $S_i = \frac{t_i}{\sum_{i=1}^{k} t_i}$, thereinto $t_i = t_{time\ end} - t_0$, this t_i is the time interval from the time end to the initial time. $P_i = f(i) \cdot \frac{1}{1+e^{-m}}$, value m is the number of service failure at the moment, $f(i) = \begin{cases} -1 & \textit{the i time of service failed due to cheat} \\ 0 & \textit{the i time of service succeed} \end{cases}$, P_i will rapidly reduce the value of the trust value when there's a service cheat, and P_i will increase with the increase of value m, in this way, very serious punishments due to one or two times of harmless cheat can be prevented.

While $D_i = e^{-\frac{1}{m}} \frac{1}{m} \sum_{i=1}^{m} C_i$ represents the accuracy of the client voting, if the higher the client's trust value, the higher the weight of the evaluation, m is the total number of gained evaluations; C is the client's trust value, $e^{-\frac{1}{m}}$ is the impact of the total evaluation number adjustment on the confidence level, the more the participated clients, the closer of the evaluations to the average of the total evaluations.

Trust value of the server

Obviously, the overall trust value of the server is also very important to clients; generally the clients will choose the server with higher trust value, and then select the service items in the server. Below we calculate the trust value of the server via a formula: $S_i = \alpha \cdot \frac{1}{m} \cdot \sum_{i=1}^{k} L_i + \beta H$, thereinto, the parameter α and β are weights respectively, and $\alpha + \beta = 1$; L_i is the trust value of services provided by the current server, H is the average value of all previous trust values when the server doesn't provide services any more, it will calculate the average value only if the server exit. In addition, the system can adjust the proportion of all previous trust value data in the trust value of the server by means of changing the value of parameter β.

Trust value of the client

Client's behavior will have direct impacts on the trust value of the server and service. While the three factors influence the trust value of clients respectively are: the transaction time of the service, the transaction amount of the service and the evaluation of the server on the client. The optional scope of the trust value of the client is[0,1], to calculate the trust value of the client C_i is as shown in formula 2:

$$C_i = \begin{cases} 0.5 & k = 0 \\ \sum_{i=1}^{k} \sigma_i F_i & 1 \le k \le n \end{cases} \quad \textbf{(2)}$$

Thereinto, parameter $\sigma_i = \frac{S_i m_i}{M_i}$ is the proportion of weight for service A uses the service evaluation U_i for the i time after t_0 time in the trust value L_A^k; F_i is the evaluation of the server on the client. Please note, the evaluation of the server on the client will have less impact on the trust value of the client with the service transaction time is further away from the calculation time of the trust value.

Server registration

The system of this research allows BS server to join the system in the way of registration, and the process of BS server is as shown in Figure 4, its specific registration process is as follows:

1) The Web Services server outside the system send a request for joining to the certificate server A, the request contents shall include the identity information of the server, the address of the server and the authentication information of the server at CA.
2) The certificate server communicates with the public CA, and certificate at the Web Services server through digital signature messages.
3) If client A passes the certification, client A has to set its own common password and private password in the system so as to complete his/her own registration information.
4) After client A providing his/her own dedicated services to the server, the client's server will verify the identity of client A and add the services provided by client A to the service list of the user server, in this case other clients can use the services provided by client A.

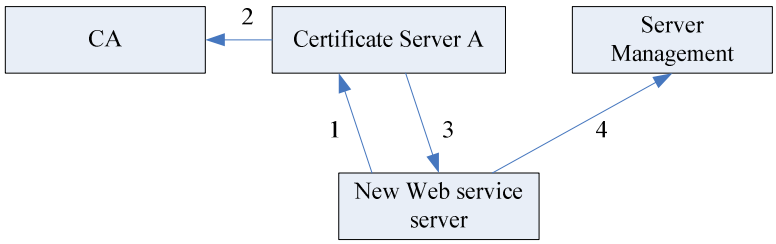


Figure 4 : Server registration

Client single sign-on

As long as the client clicks the login button in the system, he/she can log into the system and visit all services without certificating each service in the server. However, the discrepancies between every system shall be eliminated when logging into the system, and a unified login method can be used to verify the identity of the client.

If client Bob has already been a registered client on the server, when he visits the Web server B of the system (the server client Bob is on and server B can be in different regions), he can click login and enter, its process is as shown in Figure 5:

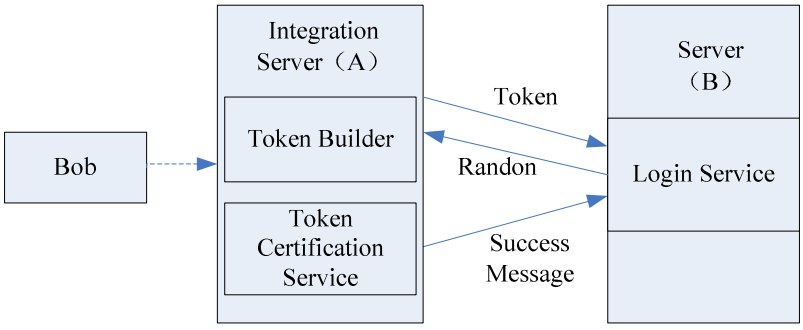


Figure 5 : Click login process

The specific login process is as follows:

1) The integration server generates a Token as per Token creator.
2) Token creator uses the public password of server B to encrypt, and use the private password of the integration server A to get the Message, please note: server B provides the login service by the use of Web server (namely Login Service), but the login service is by the use of Message.
3) After the login service receiving the Message, get the information in Token via decoding, meanwhile, the login service will generate a random character string (can be used for the certification of both communication parties) and insert it

into Token, then the login service will use the integration server A to provide Token certification service, afterwards, encrypt the public password of the integration server A, and sign for its own exclusive private password, at last send the signed message into the integration server A as the critical parameter.

CONCLUSION

Firstly the research introduces the traditional Web technology and Web Services technology, and illustrates their relations and distinctions, then elaborates the architecture of Browser/Server (BS), at last proposes the tourism services system design in BS mode, and mainly focuses on discussing the key technologies required to achieve the tourism services system: 1. In order to ensure the communication security, use the secure sockets layer protocol (SSL) which has been extended (namely extended SSL communication protocol); 2. Design a system about the trust value evaluation of services, can make quantitative evaluations on the service quality of Web Services via the trust value evaluation system, thus can reduce harmful effects of various malicious factors, clients can select service items according to the trust value of Web Services; 3. The research brings in the registration technology of the certificate server, clients can register and certificate via the certificate server, thus increasing the commercial value of the system; 4. The system realizes the login function for clients so that the clients can simply visit all service items in the system. The BS architecture designed in the research shall have certain limitations, there's only one integration server in the overall design, when the visit traffic increases, an integration server will limit the performance of the entire BS architecture, therefore, an additional integration server can be taken into consideration in the follow-up research, in this way the service experience quality can be improved dramatically.

ACKNOWLEDGEMENT

Project Supported by Scientific and Technological Research Program of Chongqing Municipal Education Commission: The Research of Intelligent Tourism Impacts on the Operation Management of Travel Agencies（No.KJ1401410）

REFERENCES

[1] Yan-Qing Cui, De-Hua Yang; Web services and traditional web application[J], Computer Application, **26(1)**, 20-25 **(2005)**.

[2] Yi-Shi Hu, Jin-Peng Huai; The research and implementation of single sign-on system based on web services [J], BUAA Journal, **30(3)**, 236-239 **(2006)**.

[3] Zhang Mei, Hong-Qi Zhang, Xue-Hui Du; The description and security analysis of SSL protocol based on PKI [J], Microcomputer Information, **12(3)**, 51-53 **(2006)**.

[4] Xiao-Lu Zi, Zi-Qi Liang; The technology, Architecture and application of web services [M], Beijing: Electronic Industry Press, **(2007)**.

[5] Shou-Xu Jiang, Jian-Zhong Li; A kind of trust mechanism based on reputation in P2P E-commerce system [J], Journal of Software, **18(10)**, 2551-2563 **(2007)**.

[6] Qian-Yi Wang, Rune Li, Ting-Yan Li; The design implementation of the unified user management and identity certification services [J], Experimental Technology and Management, **21(3)**, 7-12 **(2009)**.

[7] Xiao-Ping Zheng; The service principle and development of web services [M], Beijing: Posts and Telecom Press, **(2008)**.