

Construction of Local Tourist Information Platform Based on Cloud Computing

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Abstract: The local tourism information platform is often able to meet the needs of the general public travel routes. And more and more passenger platform need to realize the personalized routes customization and corresponding personalized tour guide services according to personal travel needs. So the traditional one-way travel platform tourism route model cannot really meet the individual needs of visitors. This paper presents a new method of building a tourism information platform based on the cloud computing architecture. The purpose of this paper is to realize a new type of tourism service model based on the customization. Using the cloud computing technology, the information platform resources and the process can be optimized continuously to provide a more effective and personalized service experience.

Keywords: Cloud computing, Crowdsourcing, Tourism platform, Personalization, TD_LBA

Introduction

At present, Chinese local tourism market is developing rapidly. Throughout the development of domestic online tourism market platform, from the initial development of ticket booking and hotel reservations to tourist attractions and tourist routes design, as of 2016 self-help travel and travel services to provide online travel platform product spring up. These online travel platforms tend to meet the general needs of the public tourism, but the individual needs of tourists has not yet met well, especially in the context of local economic and social transformation, personalized tourism routes customization cannot only save resources and improve efficiency, but also enhance the tourist experience, in this regard, the traditional online travel platform is not well to meet the growing demand for travel routes planning. A new, customized travel service platform can serve customers in a more dynamic and fast way. Dynamically providing self-service, on-demand providing cloud service, tracking hardware resource consumption through cloud services, and developing original existing IT travel services infrastructure, can more sensitively configure resources, effectively save cost, ensure that crowdsourcing model tourism information platform resources and processes continue to be optimized and service levels have perdurability by the cloud management[1-2]. By the cloud computing technology a simplified tourism information control platform for a variety of users to provide a standardized process can be completed rapidly, the server, data server and network are merged into a defined business travel information portfolio. Cloud computing platform deployment is more important for the local is to reduce the platform from the initial development to the ongoing maintenance of the entire life cycle costs.

System structure design

The purpose of the tourism information platform is to customize the tourist routes for them. As shown in Figure 1, the system is decomposed into three subsystem modules, tour guides and passenger information authentication and evaluation system, tourism information demand release system, travel route recommendation system, and personalized route ranking and management system.

Guide and passenger information authentication and evaluation system. The main tour guide and passenger real name system is an important part of the system. It has the characteristics of reliability, usability, completeness, confidentiality, and authenticity. It plays an important role in the

construction of tourism information platform. In the platform, identity authentication is mainly used for two aspects, one for the system platform user cloud identity certification, and the other for transaction authentication.

Tourism information demand release system. Visitors will travel through the journey to improve the efficiency of tourism resources, so that the public enjoy more information services, combined with tourist travel needs and traffic information dissemination characteristics of the travel route decomposition, the route more in line with travel planning, rationality and scientific, while the cost of the cost can be optimal.

Tourist route recommendation system. After the tourist information is released, when the demand involves multiple tourist sites, the system divides these site into partition by iterations; and the tourists compare all the routes recommended by the system and choose the one that is more satisfactory and suitable for their own actual situation. The personalized services provided include: tourist attractions inquiries, hotel inquiries, passenger site inquiries, parking location and the surrounding shopping, etc. The system can afford more efficient, personalized service information according to the choice of visitors.

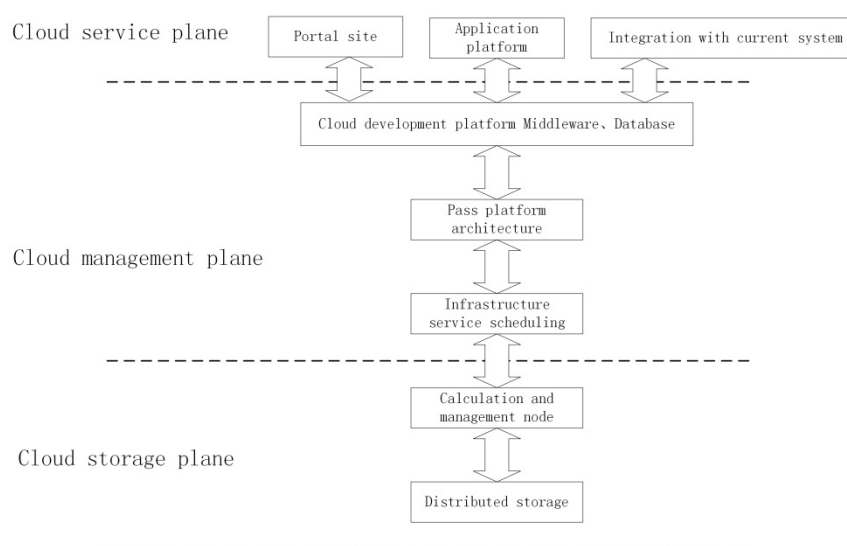


Figure 1. Based on the cloud architecture of the functional platform design

Personalized route ranking and tourism consulting management system. Personalized routes, tourist attractions, services and other information with high evaluation, routes retrieved with high frequency by visitors are stored on the server side. The routes are ranked according to the visitors' awareness of the route and the attractions in it, and then the inquiries with diversified results can be execute using the limitation of high-ranking location, they provide reliable references to the visitors. The software system is mainly designed by the MVC mode and the B/S system architecture . According to the request of system design request, it is divided into three levels, namely, the model, the view, and the controller. Layers are independent and closely connected with each other; a clear division of level ensures that cloud computing supports heterogeneous data.

The model layer is responsible for encapsulating the state of the reference program, responding to the status query and application functions, sending data service requests to the view layer using data and encapsulation results, and feeding the results, such as passenger information, route identification information, back to the view. Business logic model includes the operations of business application, such as route recommendations.

The view layer is used to display the results of the data content to the user. It shows the data of the system. It is mainly responsible for the display of the user interface, interacting with the user, and displaying the same type of model structure in the same display interface. Such as the map interface, data query results, route ranking results, submitted information results displayed in the user interface.

The controller changes the feedback restriction to the view layer and the model layer. After receiving the user operation, the controller calls the function to respond to the user's logical business request and feeds the operation result back to the view layer and the model layer, and the user operation mapping or model update. On the one hand to deal with logical business procedures; on the other hand to deal with data service requests, such as the travel route database updates, insert, modify and so on.

According to the current situation of tourism users and the status quo of data resources, the construction of tourism platform cannot be built independently of each system in the past. Based on the standard system and basic platform of cloud computing architecture, the tourism information cloud platform is designed, Platform application, when the business needs change, can quickly, low cost and efficient to meet business changes shown in Figure 2.

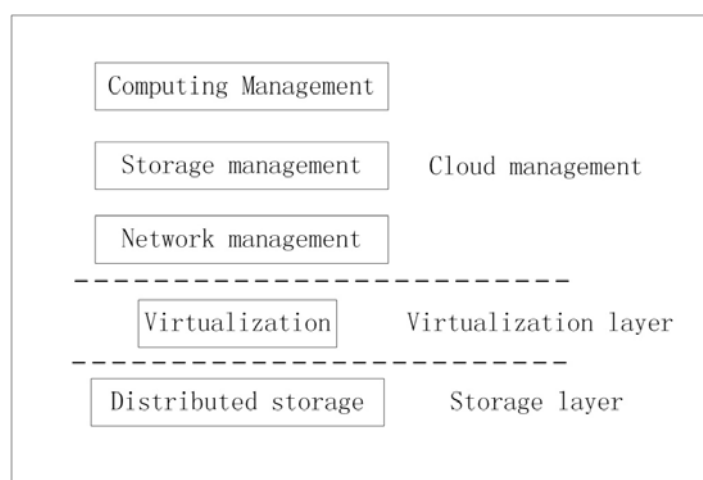


Figure 2. Cloud storage plane layer deployment architecture

The cloud service plane deployment architecture mainly includes three categories, one is the tourism information platform portal system, the website structure uses MVC three-tier structure, the distributed server, provides the information service the port and the agreement, the information business process and the interdepartmental business process cooperation, Need to be functional interface to service, to facilitate the construction of flexible business processes; two types of application platform, through the construction of tourism routes, including management platform, geospatial data management platform, public service management platform management integration platform; Third, with the existing system integration, crowdsourcing model tourism information platform information system planning and construction to have a certain forward-looking, so to maintain a certain degree of flexibility, how multimedia technology in the cloud environment system integration, to meet future business development Need, and the existing system integration will give tourism platform for the rapid development of information opportunities.

Cloud management layer: This layer includes the development platform of the message middleware, public API, Web service API, application development, testing and deployment of workflow equipment, through the pass platform architecture, within the enterprise internal network composed of private pass architecture, Most of the private cloud pass the use of message middleware to build, generally using two delivery model: PTP-Pub/Sub, through the middleware, and pass the full structure of the API for users to use travel routes database, geospatial database and other professional travel information Domain database, to provide a unified global basic support services, and provide a unified standardized application access, tourism business platform application system in the management plane layer through the process, automated deployment and management, to achieve IT operating efficiency.

Virtualization layer: The virtualization layer of the tourism architecture platform uses the hypervisor intermediate software layer to isolate the travel service request from the underlying physical delivery through device virtualization. The key is to make the I/O virtualization and

management of the software more convenient Fast management, the use of logical virtualization x86 architecture, virtual efficiency is about 80%, virtualization loss of about 20% [3]. Through the Hypervisor technology allows multiple users in a small number of virtual machine monitoring under the training server hardware and other shared devices, effectively improve the access to shared devices efficiency, and has the advantages of flexible configuration.

Storage tier - Distributed storage management: In the distributed storage of the travel application platform, the local database is responsible for the persistent storage of the database. The distributed file system is responsible for storing the larger files on multiple local storage nodes, Throughput, large capacity distributed integrated storage features, the same local database CPU, memory, disk physical storage empty and other load conditions are periodically sent to the master server, through the master server to develop a load balancing strategy. In the distributed storage, the distributed application based on the tourism business service is run on multiple servers. Each application service instance is a process. When a large number of service process requests come, it is assumed that the local server cannot deal with the short time Such a large number of service requests, in the service and service processing if a queue, the need for services generated by the message into the queue, the other server idle processing to take the message, so the overall system platform is not because of High-volume data traffic and overwhelming application platform, even in the service order peak, distributed storage management can also be all services in accordance with the queue management, until the response to deal with. By calculating and managing nodes and resource nodes, we can avoid the initial high cost of construction investment, while reducing the initial difficulty of system planning; distributed storage business can also achieve the tourism business process optimization and upgrading.

Crowdsourcing tourism information platform system structure

In the cloud architecture model, the crowdsourcing model tourism platform combines the popular filtering, public creation, public evaluation of public communication and one of the collaborative process, especially in the local personalized travel route selection, but also take into account the individual Hobbies and online reputation, through the crowdsourcing and collaborative process to make full use of external innovation resources and ability to make tourism information through the cloud architecture of information technology, the tourism industry to maintain rapid growth attitude, open up new sources of industrial growth has important significance.

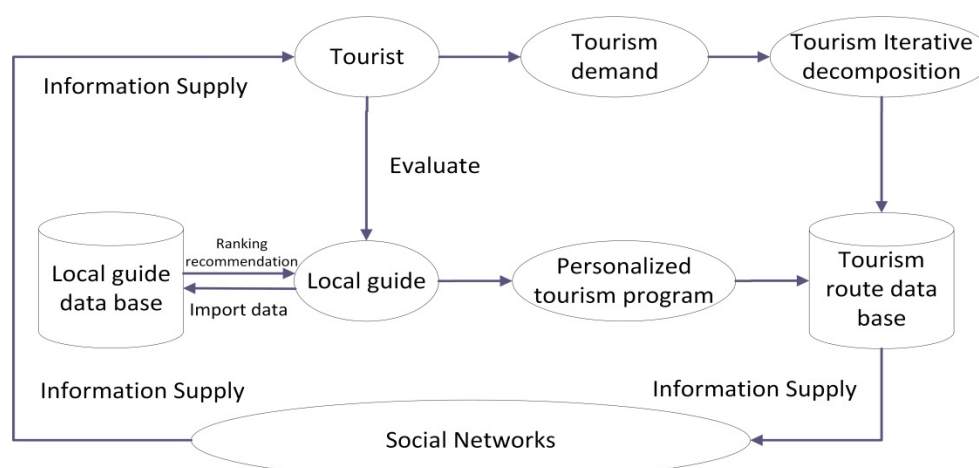


Figure 3.crowdsourcing tourism information platform system framework

Based on the crowdsourcing model of personalized self-help travel platform to maximize the power of social networks, makes the distribution of tourism tasks more targeted. As shown in Figure 3, the first user with social media technology reference to the relevant attractions information pictures, but also can combine their own experience to customize personalized travel programs, and then publish personalized travel needs to the personalized self-service platform, platform pin personalized

Require different users to iterate the service to ensure that the platform provides a different tour guide service. At the same time, visitors can evaluate the tour guide, visitors to the tour guide evaluation will affect the tour guide recommended ranking, the evaluation and tour guide information will be stored in the tour guide database, the platform will be based on the guide database comprehensive information recommended high-quality tour guide to self- service, And to achieve the passenger's personalized travel program, evaluation of high tourism programs stored in the travel route library, and pushed to the social network for users to choose. Using the cloud architecture self-help platform can fully exploit the resources to provide a better user experience.

Experimental Analysis of Tourism Information Platform

When the travel route library and guide library resources enough, or there is a large amount of user visits, there may be a very frequent use of the platform resources caused by excessive server load or server resources lead to paralysis of the platform, using the literature [4] resource load balancing Scheduling algorithm TD_LBA (Trust-Driven-load-Balance-Algorithm) carries on the load schedule to the cloud schema crowd package tourism information platform resources, causes the platform resources to achieve load balance while completing the task set the shortest time.

To six servers for the test platform, of which five Linux servers for virtualization for the 10 virtual machine server, from the logic point of view, this time a total of 11 servers platform, including a server as a resource pool and service bridge The Test experiment to create 200-500 tasks to 50 for the task of the span, the task of computing the workload between 1000MI to 5000MI, each virtual machine memory between 4096 ~ 8192MB, the number of processors for the 2 to 6. Task expected completion time ETC according to the literature [5] to take, $utask = umach = 100$, which used to control the task and the heterogeneity of the resource V_t , value 0.3, V_m value of 0.4. Through the TD_LBA test, the task completion time and load balancing value shown in Figure 4, Figure 5 shows.

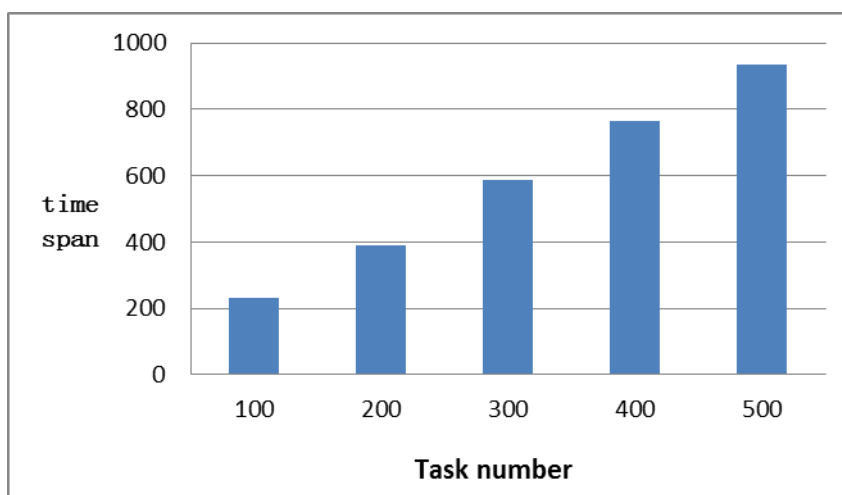


Figure 4. $V_t = 0.3$, $V_m = 0.4$ task completion time

The test results show that the completion time of the task set is within the ideal range when the whole system reaches the load balance, and the utilization rate of the resource reaches the expected running state of the target. In the practical application, the resource allocation and dispatching in the cloud environment is more complicated, and the cloud platform is constructed to meet the needs of the users. Once the local resources are insufficient, the third-party cloud architecture service can be selected.

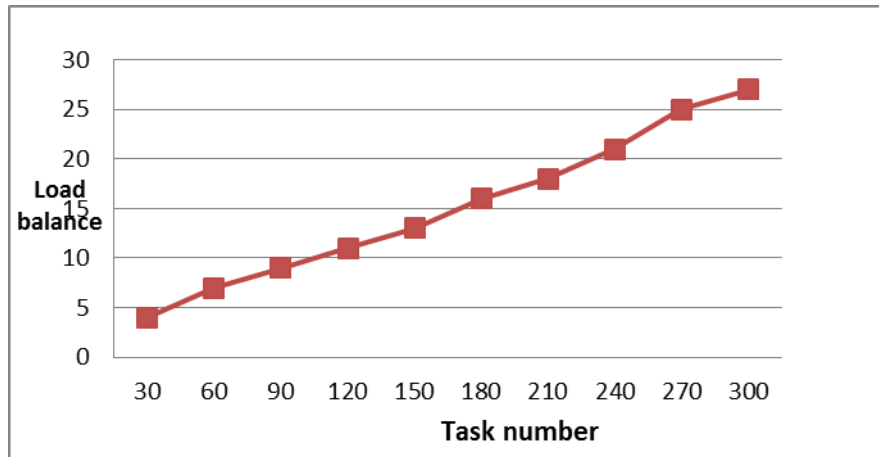


Figure 5. $V_t = 0.3$, $V_m = 0.4$ task load balancing

Conclusion

Based on the cloud computing to build the local crowdsourcing model tourism information platform, the cloud architecture advantage is applied to the local tourism information development practice, according to the cloud business plane deployment function platform; establishes the tourist route and the tour guide resources cloud resource server library, through load balance The results of the TD_LBA simulation experiment show that the cloud architecture package has a good network adaptability and can provide a good recommendation service for the personalized travel of the local travelers.

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