

Research and Implementation of SOA-Based E-Commerce Platform

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Abstract. SOA (Service-Oriented Architecture) is an architectural model that can deploy, compose and use loosely coupled, coarse-grained application components through the network. In this paper, taken some travel site as an example, it analyzes the SOA technology applied in the development of e-commerce platform based on the needs of e-commerce with the characteristics and the advantages of SOA architecture of the system.

Keywords: SOA, E-commerce, Web Service.

1 Introduction

E-commerce is to transfer the original traditional sales and shopping channels into the Internet by means of electronic and its technology, where production enterprises break the national, regional visible and invisible barriers to realize globalization, network, intangibility and individuality.

With the rapid development of computer hardware technology in recent years, e-business environment has been improved immensely that network bandwidth, network speed and network usage costs is no longer a stumbling block to development of electronic commerce; but in e-commerce software environment, the relevant standards always lag behind the pace of the development of related applications, which has resulted in wide variety of inter-enterprise e-business solutions and information storage formats. Construction of traditional technology-based business environment, there are two prominent problems: first, the participants did not use the e-uniform technical standards or system architecture as a way to contact each service. The lack of a unified commercial release and discovery mechanism, make the mutual exchange of information and cooperation very difficult; second is the system itself. The problems include long cycle of development, poor reconstruction, upgrade and maintenance problems and so on. These have greatly limited the further development of e-commerce.

To address these problems, we follow-up study in related fields at home and abroad based on the latest research results, build a service-oriented architecture based (Service Oriented Architecture, SOA) e-commerce platform for dynamic e-business application framework. E-commerce platform developed with SOA technology, can improve the reusability of existing software. It can also improve the adaptability of e-commerce platform. SOA e-commerce application platform makes e-business applications unified and open platform so that the e-commerce system in

the enterprise has the quick service, fast reconstruction, safe reliability, reusable and free expansion to provide a new application program for the further development of e-commerce.

2 Service-Oriented Architecture (SOA)

At present Service-oriented architecture (SOA) is no uniform definition. The more influential SOA is defined as: "essentially a collection of services. Mutual communication between services may be simple data transferred; it may be conduct two or more coordinating services active. It needs some method of inter-service connections. The so-called service is a function with a precise definition, perfect package, independent of other the environment and state serving. "

Service-oriented architecture (SOA) is an organization based on service computing resources, with loosely coupled services and indirect addressing capability of the software architecture. In essence, SOA is service-oriented software architecture, to design and build a loosely coupled software solutions approach. The basic elements of SOA architecture is service for business processes as reusable components that simplify the information services or the state of the data migration process, to respond to customer requests and provide high quality services.

2.1 SOA in Three Roles

According to the conception of Service-architecture. corn, SOA is essentially a collection of services. Between services communicate with each other, this communication may be simple data transmission, or it may be two or more services coordinating certain activities. It needs to connect between services in some way. So-called service is a function with precise definition sound packaging, and independent of other services, of the environment and the state.

In the SOA architecture, there is collaboration in three roles, namely service consumers, service agents and service providers as shown in Figure 1. Service provider (provider) register and publish through a service agent (broker); service consumers (consumer) can find the required service through the service agent (find), and bind to their applications.

Service providers is to provide services and to post information to the service registry, such as service interface, service access address and other information services, service description and other related meta-information (information such as service providers, quality of service features).

Indirect addressing function provided by service registry provides is to help consumers find and locate the appropriate "intermediary services" .The existence of registry services, stripping the service consumers and service providers rely on direct addressing between the services so that the address change of services will not affect consumers. In addition service registry enables service consumers to realize dynamic service configuration, among many of which matches the selection criteria best, or form service composition.

Service requester can have indirectly or directly obtain service description through registry or through the service provider, and follow the service description and address of the interface and service providers to achieve the interaction.

2.2 SOA Characteristics

SOA has a loosely coupled, coarse-grained services, standardization of interfaces and message-based communication features. The service does not involve low-level communication between the programming interface and communications model.

Loosely coupled is a service interface independent of the service to achieve the hardware platform, operating system or programming language. Loosely coupled SOA is a "loosely coupled" component services, isolation of the service users and service providers to use in the service implementation and client services. Service providers and service users loose coupling between the key point behind the service interface and service implementation as a separate entity exists. If the module changes in the system, it only modifies the module's internal procedures, without impact on other modules, which makes the service implementation not be affected in case that service users were modified to be more flexible to meet business changing needs.

Service granularity refers to the function of a service included the complexity of the services. The greater size means that the service functions. The great size service is, the more complex function is. SOA advocates loosely coupled coarse-grained services, particularly in the design phase, with a reasonable coarse-grained effectively reflecting the new business processes. SOA service interface includes the standardization of message formats, transport protocols and location, which the interaction between services need a variety of criteria. But the hidden details of service implementation allow the interface independent of the hardware platform, operating system or programming language service implements.

SOA services communicate through messages between the uses of pre-defined message. When the service requesters and providers communicate, they do not have to understand the environment in which service providers. To the caller service is transparent, which the client calling the service on the SOA is not necessary to know the concrete implementation of the service, because SOA has encapsulated these services, and publish all services together. When the client calls through the SOA platform, these services architecture, SOA platform invoke these services with the agency and the needs of the business according to the actual input and output parameters for services, transmission agreements to be amended accordingly.

3 The Complexity Demand of e-Commerce Platform

E-commerce platform has developed into an established business platform on the Internet, where the different businesses (buyers and sellers) are gathered in a virtual space for business. The development of E-commerce platform is rather complex with the following features.

E-commerce platform serves for strong dynamic e-commerce platform which is also gathered at a central site of this network, including not only e-commerce businesses, customers, including financial institutions, and tax and administration and

other government departments. It is a very common for e-commerce business clients to change. Fixed though a target is, the company's business may also change with the market demand and e-commerce services business. Only by constantly improving the flexibility of management, e-commerce services businesses respond to the change of user needs.

The electronic market on the e-commerce platform supports all the different enterprises and trade-related activities, but also allows the supply chain aspects of the implementation of cooperation between each other in the design, development, production and distribution. E-business supply chain is almost unable to appear the role of the main chain, which is determined by the nature of e-business services. The more successful e-commerce businesses do, the more diversified clients face, the more extensive services, but also difficult to manage A. Only by constantly improving the management flexibility, it can be brought to the new challenges of the enterprise e-business information management.

E-commerce platform faces more and more severe the security situation. B2B e-commerce transfer the electronic market up to e- market, which requires some of the resources enterprises provided for the development of IT infrastructure applications and internal processes. So a higher level of supply chain integration gradually improved as business systems are connected to an electronic trading platform; electronic market liberalization leads to an increased risk of privacy (such as leakage of sensitive business information), and many transactions improve the complexity of system integration, the cooperation of business process and so on.

It is not difficult for enterprises to understand the analysis above. Fully absorbing the existing knowledge of e-commerce businesses, enterprises might rapidly improve their management level, and actively adapt to the requirements of clients, e-commerce business to survive. For the relatively stable business enterprise, the enterprise e-commerce platform focuses on constantly improving the management of existing business, while the most e-commerce businesses, will have to emphasize flexibility and synergy between objects and services. The development of the traditional idea of e-commerce platform, often confined to certain specific functions resulting in a serious obstacle to the improvement of management efficiency, such as quite conspicuous "information island ", information processing ability, cross-platform exchange of information barriers. Faced with these problems, enterprises need to introduce new software architecture, software re-construct the elements of the external visible properties and relationships between elements in order to adapt to external multilateral business needs., it is SOA service-oriented architecture technology precisely provides a new perspective solution to the problem.

4 E-Commerce Platform Based on SOA Design (with a Travel e-Commerce Platform as an Example)

Some travel website need to build a cross-boundary, cross-platform, easily expand e-commerce system, by which using different hardware and software platform of travel agencies, hotels, transportation departments to establish a unified data platform and achieve their arrival, pre-sale tickets, intelligent group of business strategy. During the system architecture design, the SOA is selected based Web Service model

to solve the business problems, such as the heterogeneous system interconnection, low cost, highly scalable demand.

Running on multiple distributed servers across the country, platform from the structure and function can be divided into: travel portal, Web Service application services, systems data services UDDI, data services, travel agencies, hotel data services, data services, shipping stations, Online banking settlement services and so on. Each type of service consists of different parts of different platforms servers.

The main part of the system and center of gravity respond to the user's request accordingly in the tourism portal and Web Service application service travel portal, while data services are all from the Web Service applications. Cooperation with travel websites, travel agencies, hotels and transportation units publish interfaces to communicate through Web service, according to the principle of proximity to the business data to travel data server cluster. It is unified billing to settle the balance sheet data from the travel gateway while temporary data is stored locally. The system architecture is a distributed computing architecture as well as a typical multi-layer structure:

The user interface layer is tourism web portal to draw with the end-user interface and interaction, and is some aspx pages and related to the page code in the application; business logic layer is to encapsulate business logic and rules, and to call each server's Web service on each server; to provide for the provision of user requests units of response and communication and cooperation; to provide data for the co-operation with uniform access, in a heterogeneous between systems providing support services in the application for the .NET components.

Web services proxy Web service layer calls the production of each proxy class to generate proxy object; data access layer is to complete the interaction between the bottom and the database, in which the underlying data for all Web applications have adopted the same set of operating the business code in order to achieve the purpose of reuse; physical data layer consists of scattered clusters and database services co-operating with the database over the composition, in which uses abstract data access interface to make good use of the class data resources. UDDI Services is all the found and release of Web services in the system to achieve better cooperation between partners in the system.

5 Conclusion

The development of E-commerce platform is a complex process from which ideas, methods and technology are applied to practical management. This paper introduces the idea of serving the development of e-commerce platform, through the SOA framework to deal with the problems existing in the current e-commerce systems, such as integration process, lack of flexibility, scalability and business agility. It has a loosely coupled, business agility, scalability and other advantages, greatly improving the IT capital in the enterprise value.

References

- [1] Bi, X., Tan, W.: SOA-based Framework for DDoS Attack Defense Network. *Computer Engineering* (13) (2009)
- [2] Bi, X.: Boundary Feedback Based on Autonomous Distributed DDoS Defense Methods. *Computer Engineering* (11) (2009)
- [3] Zhang, X., Hu, H.: SOA-based Enterprise Application Integration and Implementation. *Computer Knowledge and Technology (Natural Science)* (17) (2007)
- [4] Mei, J.: SOA in the B2B E-commerce Application. Dalian Maritime University (2007)