Technology Explore for Cloud Computing and SOA Convergence

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Abstract: SOA as technology of software architecture, which have some similarity and relation with cloud computing; and they also have common keywords, namely service. This article research cloud computing through the explore method and SOA convergence technology, analyze and combine the advantages of both in service design, service scalability, service management and architecture-driven, etc.. It also explored how to apply SOA in the cloud deployment platform. Through SOA and cloud computing convergence, it combined the advantages of both SOA and cloud computing, develop standards which not only suitable for SOA, but also suitable for cloud computing, will has great benefits to IT and enterprise.

Key words: Cloud computing, SOA, service, cloud computing SOA convergence.

1. Introduction

After grid computing, parallel computing, distributed computing, there was a new computational model, is called “cloud computing”. It is based on a new share method of infrastructure; through Internet provides services to customers. It makes calculation be assigned to a large number of distributed computers, rather than assigned to the local computer or remote. Through enhancing coordination, flexibility, scalability and usability, cloud computing can provide optimized and efficient computing. The evolution of experience shared in the Cloud: network, network sharing, information sharing, and resource sharing and shared services [1].

Due to the development of modern information technology, software complexity continues to increase. SOA technology is a modular service of architecture; it is the logical evolution of software modularization techniques [2]. SOA design principles including service agreement, loose coupling, abstract, reusability, automation, stateless, can find and combination. It supports distributed heterogeneous environment in business transactions [3].

An effective cloud service component method should dynamically select the appropriate service. SOA, cloud service architecture is Web service, service agreements, service providers, service registry and service users. SOA can be the most effective use of Web services in the cloud platform environment. It can restructuring different forms of service, and provides a stable interface service. Integration advantages and technologies of cloud computing in SOA technology, make enterprises have the more benefit in the IT environment. The paper is organized as follows: Section 2 described Cloud Computing and SOA. Section 3 analyzed and combined the advantages of both in service design, service scalability, service management and architecture-driven by the explored method research cloud computing and SOA convergence technology. Section 4 gives conclusions.
2. Cloud Computing and SOA

2.1 Cloud Computing

A large number of computing researchers and practitioners are trying to define cloud computing in various ways. The authoritative definition is: Cloud computing is connected by internal collections and virtual computer and composed of parallel and distributed systems [4].

Cloud computing is parallel and distributed type of system by internal set of connections and virtualized computer, it is based on the consultation to establish service level agreements between service providers and users, one or more unified computing resources dynamic allocated.

Although researchers and commercial areas have a different point of view for cloud computing, but the types of cloud services recognized there are three: infrastructure as a service; platform as a service; software as a service [1]. Cloud deployment model has three categories: private cloud, public cloud and hybrid cloud [5].

2.2 SOA

SOA is service and sharing as the core, can be application functions as a set of service on the web; it has the characteristics of loose coupled [6]. It is packing in logic service of an application of a unified interface, and these services are the public use through discovery mechanism. The main driving force based on SOA architecture is conducive to the manageable growth of large-scale enterprise systems, to be helpful for Internet-scale configuration and coordination of the use of services and reduce costs between enterprises and there ever-expanding [2].

Integrated SOA application has the following advantages: full use of existing resources, reduce costs and shelf reuse; easier to integrate and meet the dynamic needs; based on open standards, strong scalability.

3. Cloud Computing-SOA

At present SOA and cloud computing is not mature, their service and standard are different. SOA and cloud computing the relevant technology can be seen that they have the same key words, as a service. Although the scope of service which SOA and cloud computing described are different, but this is also their biggest contact. Only well-defined and well-designed services, sales in the on-demand delivery, Cloud service providers must pay sufficient attention to the design services, including the practicality and sustainability of the services. Timely access to required services for the client, the installation of services should be scalable. Expansion of services provided in SOA often time-consuming and expensive. Services designed by SOA often not designed in accordance with the scalability. Therefore, many companies did not really turn into the world of cloud computing. But good governance in SOA is an indisputable fact.SOA through service governance in response to change the structure of IT enterprise, and make adjustments to the existing structure or services. In terms of architecture-driven cloud computing and the traditional system is the same, and requires well-thought-out architecture, because architecture need to be extended to outside the firewall. But cloud computing is only can use the new platform and the new environment but does not belong to you. In addition, you still have to properly implementing the framework. Good architecture technology to better contribute to the cloud providers to offer cloud services. Correct implementation of SOA means a good architecture and technology-driven.And SOA will consider the actual business to architecture; its loose coupling can ensure that enterprises and users demand the use of resources and services.

By successor SOA and cloud computing technologies and standards development, application of the principle of SOA architecture to achieve service scope of application is broader, and applies not only within the enterprise, and can be extended to the entire industry sectors. Application seamlessly integrated technology; SOA services (components) provided the
service requester via the IaaS, PaaS or SaaS platform. SOA and SaaS are inevitable connections, there is a clear distinction, and SaaS more focuses on the operations and delivery, SOA focuses on choosing technology. SOA has more advantages for the integration of technology platform, and to unify technical standards, and promote coordination among the members of the software industry value chain, this towards PaaS to the end-to-end distributed software development, testing, deployment, operating environment, as well as complex application as a service to provide more convenient to users. SOA supports heterogeneous distribution environment, the use of cloud storage technology can better obtain access and maintain data. However, when using the database as a service, security may be a problem. If you use right method and right security technology for SOA, then data has security for stored in the database as a service cloud platform.

SOA can reorganize the different forms of service, allowing cross-organizational integration services, and promote integration between different services within the enterprise or enterprise. Through cloud computing cloud service platform using the Internet more convenient and more effective integration of services, which enables enterprises to reduce the cost of developing new services. Cloud computing has fault-tolerance, high security, which makes SOA services in the cloud platform have certain degree of security, and the service requester is able to secure use of services. Cloud computing and SOA are provide services through the Internet, when using SOA architecture implement service and through cloud computing platform to release SOA services and cloud services, with a unified communication protocols and access interfaces, it will help service providers and users.

SOA and cloud computing in addition to have the same keyword, there are many similar characters, such as use of large-scale component in the open network combination and recombination, and components are modular; have self-contained service; support for interoperability; loose coupling, etc. Because SOA and cloud computing standards are different, the integration between them needs a good practice to verify.

4. Conclusions

Cloud computing is a new computing model, SOA as a software architecture approach appears not very short, but they are not mature, and their service and standard has differences. SOA and cloud computing has similarity in certain characteristics and attributes; and its convergence is the inquiry of possibility. Part of the integration can bring greater benefits to enterprises and network environment, such as reduced costs, efficient use of resources, and reduce network congestion. To details of technical integration, but also find standard that apply to SOA and apply to cloud computing. And integration still needs to practice for validation.

References