

## A Logistics Distribution Plan Based on Cloud Computing

**Zhou Feng**

Department of Information Technology, Shandong Institute of Commerce and Technology,

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### ABSTRACT

Aiming at the problems of lowing informatization level and degree of specialization, high consumption and low efficiency in logistics and distribution industry, this paper analyzes the characteristics of cloud computing and the actual needs of enterprise logistics. On this basis, depth study of the logistics and distribution needs of the cloud computing architecture, depth study of the cloud computing architecture in the logistics and distribution needs, and then propose a cloud-based modern logistics solutions, for the development of modern logistics provides a new operating mode.

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### Corresponding Author:

Zhou Feng,

Department of Information Technology,

Shandong Institute of Commerce and Technology,

4516 Lvyou Road, Jinan, Shandong, PRC 250103.

Email: zhoufengkey@163.com

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### 1. INTRODUCTION (10 PT)

In the field of logistics distribution, the enterprise whether can stand out or not, depends on how to quickly and efficiently to adapt to the changes in the market mainly, help enterprises to grasp the dynamic of business opportunities. There are problems access to information, processing, use of capacity is not strong particularly prominent in the logistics and distribution industry, and difficult to meet customer demand; restrict the further development of logistics industry in China.

The cloud computing applications in the field of logistics can effectively solve these problems, and make the logistics enterprises according to their actual size and requirements, selecting visual resources and services from the cloud dynamically, companies can have high reliability, scalability, interactive and good service just spend a low cost. Without expensive infrastructure, complex software and tedious maintenance and management. Using cloud computing, can upgrade the level of information in logistics industry as a whole.

### 2. CLOUD COMPUTING AND ADVANTAGE

Cloud Computing is a supercomputing as a data-centric intensive, extensible ability of information technology to external clients a way of calculation in great scale; Cloud Computing can compose the dispersed software and hardware resources on a shared computing resources pool, and then according to need to provide services dynamically. Cloud computing is a virtualization Web services network protocol for the integration of the on-demand access mode; Cloud computing technology framework to provide services capabilities through in three ways such as infrastructure as a service, platform as a service, software as a service.

Cloud computing can meet the demand of a large amount of data that more computing and virtualization of the hardware and software; there are great advantages in logistics and distribution , reduce operating costs, simplify management, and rapid response to market changes and so on.

1. Data in the cloud: not afraid of losing, without a backup, you can restore at any point;
2. Software in the cloud: No need to download automatically upgrade;
3. Ubiquitous computing: At any time, any place, any device can be calculated after login service;
4. Infinitely powerful cloud computing: With infinite space, infinite speed.

### 3. CLOUD COMPUTING LAYERED ARCHITECTURE

The essence of cloud computing is to provide services through the network; Therefore, its architecture is based on service as the core, the use of sub-level, tightly coupled architecture. There are composed of five parts, the application layer, the platform layer, resource layer, user access and management layer, as shown in Figure 1.

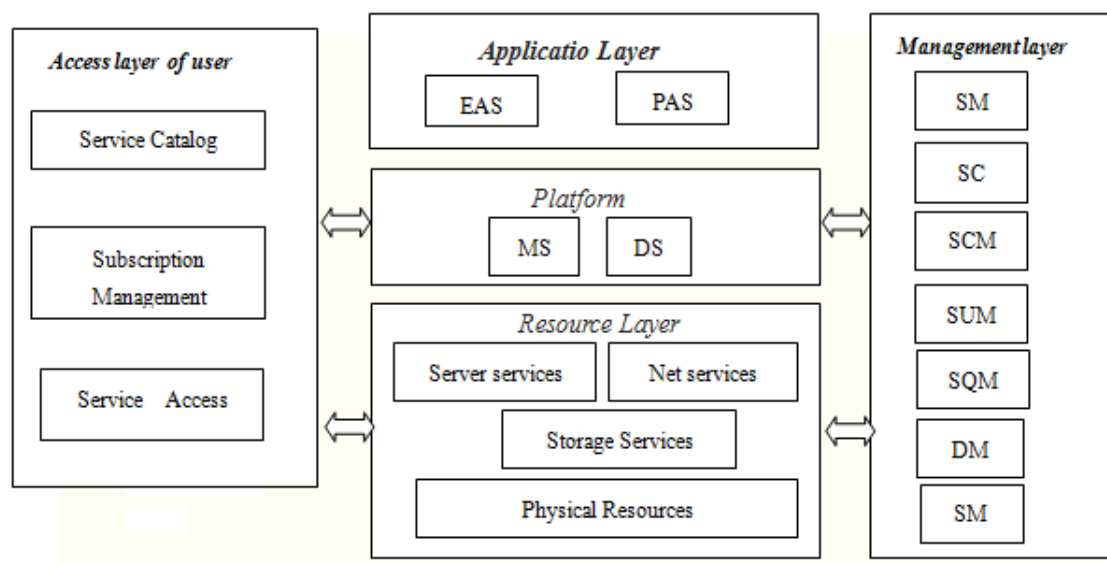


Figure1. Cloud computing architecture

The resource layer is the cloud computing services inside infrastructure. These services can provide virtualized resources, so as to hide the complexity of physical resources. Resources layer to support upper cloud computing services of all kinds of physical devices, such as server network equipment, storage devices, etc.; The physical equipment, through virtualization technology form the dynamic resource pool, and manage the resource pool of resources, Through a web service interface will storage capacity computing power network capacity as a service to users, infrastructure as a service(IaaS).

Furthermore, the platform layer provide users with services of encapsulation of resource layer, allows users to build their own application. Platform layer is the core layer of the cloud computing system, including parallel program design and development environment, a number of management systems(MS), database service (DS) and management tools, namely platform services. Meanwhile, the application layer provides software services, including personal Application service (PAS) and enterprise application service( EAS). The application layer provide software services and user interaction interface, it is the user information platform. Through need all software, hardware and network infrastructure operation platform; Responsible for all the early implementation and the late maintenance and a series of work, The user can lease software services according to their needs freely, do not have to purchase hardware and software, equipment room and equipped with maintenance personnel, namely Software as a Service(SaaS).

The user interface allow users to select a service through a service catalog, and after the service request is send and verified that management system to find the correct resources, and then call the service provides tools for mining services resources from the cloud. Finally, Management laye is to provide management to all levels of of cloud computing services; Including security management(SM), deployment management(DM), service quality management(SQM), and other service functions, and so on.

As a result of the hierarchical architecture, so a clear structure, flexibility is very good, easy to implement and maintain, open interfaces, standards, easy to set up and manage, at the same time can satisfy the following conditions:

1. A full range of IT services. Cloud computing can provide a unified and comprehensive IT services for all the enterprises and customers of logistics distribution industry.
2. Logistics and distribution integration, to achieve its the integration and overall ability, to make the close coordination in all aspects and optimize the allocation of resources, improve service efficiency.
3. Standardize the regulation. Standardize the logistics process, so as to supervision department manage it; further it can make cloud computing platform provides services; to achieve unified management, standardize processes, improve system efficiency sector.
4. It is changes following the market demands. It openness of the cloud computing allows users to deploy the application on the platform, and the integration between for each application.

#### 4. DISTRIBUTION SCHEME

This paper presents a cloud computing model about logistics and distribution, combined with cloud computing architecture and the characteristics of business logistics enterprises. Using a hierarchical design the architecture, consists of three parts: Infrastructure Services Layer (physical layer), Business Layer Service (Data core layer), Application Layer Services. As shown in Figure 2.

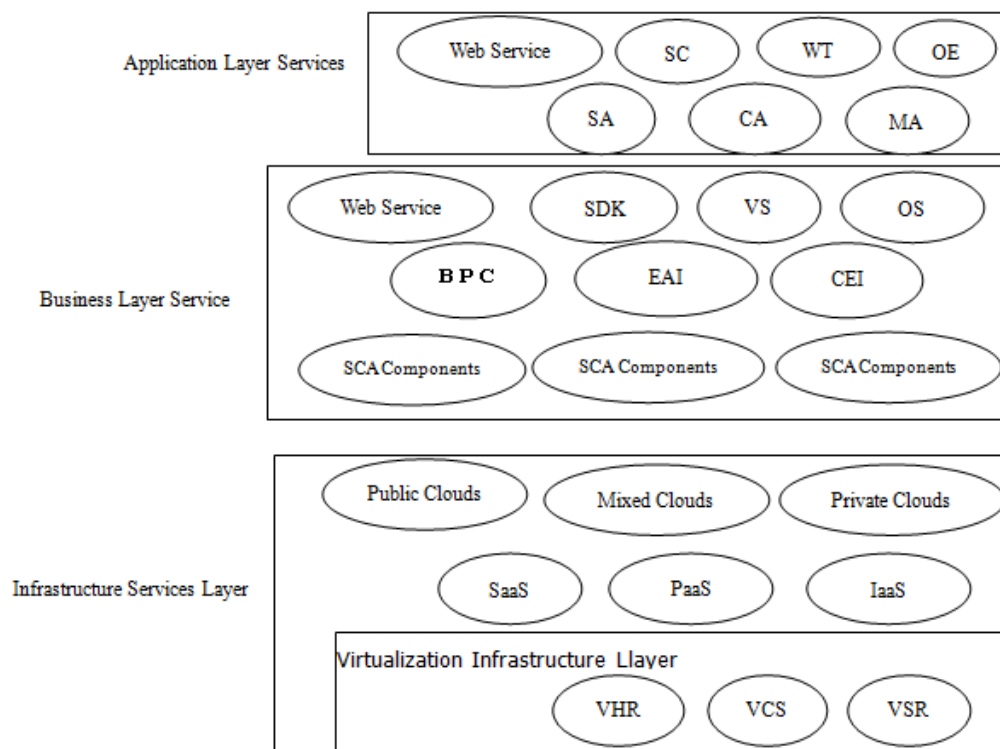


Figure 2. Overall architecture model

##### 4.1 Infrastructure Service Layer

Infrastructure layer includes hardware resources and software resources to play a supportive role to the platform. Hardware resources include: computer storage devices such as network equipment. Hardware resources includes computer storage devices such as network equipment. According to the characteristics of enterprises, cloud computing is divided into three layers: First virtualized infrastructure layer, includes a variety of software resources(VHR) ,hardware resources, variety of cyber source(VCS) and variety of software resources (VSR).The second is based on the virtualization services, namely Infrastructure as a Service(IaaS), Platform as a service(PaaS) and software as a service (SaaS)and other functions.Third, on this basis, to provide Private Clouds, Public Clouds and Hybrid Clouds three categories of cloud services.

Meanwhile with server virtualization technology can be a physical server into several virtual cloud servers and also to be multiple physical servers into a virtual cloud server. Storage virtualization technology can be all storage resources in the enterprise for integration, segmentation, scheduling and management, for users, databases and applications to provide a unified, standardized cloud storage space; Through load balancing management can be a large number of concurrent access or share to more than one data flow on the cloud server to process respectively, to reduce the time to wait for a response, also can make the single heavy cloud server share to more than one cloud on the server to do parallel processing, after each cloud server treatment, the results summary, returned to the user, this can enhance the system capacity significantly; Through the definition of the data backup strategy, the system will call the backup service automatically, to ensure that the cloud server the stored data safe and reliable.

#### 4.2 The Business Layer Service

Service management provide process orchestration services from is assembly services mainly, unified incident support, and related services rules, task scheduling, selection and so on. Make assignment working through process orchestration and management. The business layer service includes various services(VS),business process choreographer(BPC),enterprise application integration(EAI),common event infrastructure(CEI),and etc.The author believes that this scheme can meet the needs of logistics enterprises for IT services effectively, there are many advantages. It is show in two aspects: the business areas and information technology areas. (1) Advantages of the information technology areas . Design of this architecture is used in specific system integration commonly; there are the good packaging and design in the interface design. (2) Advantages of the business areas. Based on the characteristics of logistics distribution business, it is to segment of business appropriately, to encapsulate into serviced component, facilitating component reuse and assembly process, improve the flexibility of the system and maintainability.

#### 4.3 Application Layer

Application layer of cloud computing is assemble of the cloud application. Due to the needs of users tend to be comprehensive, cloud applications can be a very good resource integration application. User is through the cloud services from application layer provide a variety of integrated services.

### 5. CONCLUSION

This paper presents logistics solutions from to the cloud computing technology, because of cloud computing with leading edge technology, can reduce operational capital investment greatly, reducing operating expenses of logistics enterprises. Meets the requirements of customer diversified logistics transportation services, and optimize the operation for the enterprise, reducing the cost. And providing valued services to customers; For small and medium enterprises to provide new platform and innovative services that can achieve logistics information resources sharing.It can create value in the aspects that cross-industry, cross-regional, transnational logistics enterprise.

### REFERENCES

- [1] Xiaofeng XU, Introduction to cloud computing and its applications, informatization research, 2010(11).
- [2] Hongya Zhang, Lihua Zheng, etc. Information security Discussion of Cloud computing environment, Network Security Technology and Application, 2010(10).
- [3] Dongqing Zhang, Cloud computing's impact on the development of e-commerce in the future, academic communication 2012(04).
- [4] QianWang, Jinggui Huang, Future of e-commerce development by exploring the impact of cloud computing, Science & Technology Information, 2011(08).
- [5] Weibin Zhong, The present situation and development trend of cloud computing terminal, Telecommunications Science, 2010(03).
- [6] He Huang,, Discusses cloud computing architecture, Modern Business Trade Industry, 2010, 22(5).
- [7] You Shi, Zhiyong Zhang, Cloud computing architecture, Computer Knowledge and Technology, 2011, 07(1).
- [8] Kuang Shenghui, Li Bo, Cloud computing architecture and application example analysis, Computer and Digital Engineering, 2011, 38(3).
- [9] Li Ren, cloud computing architecture and its applications, Silicon Valley, 2010(9).

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**BIOGRAPHY OF AUTHOR**

Zhou Feng was born in 1973. He graduated from Shandong Normal University of China and got a bachelor degree in computer science education in July 1996. He was later admitted to Shandong University of China and received his master degree of computer application technology in 2002. He is an Associate Professor in Department of Information Technology Shandong Institute of Commerce and Technology. He is currently pursuing his Ph.D. degree in Suwon University in Korea. His research interests are robotics, cloud business, cloud computing and artificial intelligence. He has made a lot of research work and published more than 15 papers, he has participated in four provincial-level research projects and published 4 Text Books.