Cloud Computing Platform Based on the Docker

ZUOCHENG WANG, LIXIA XUE and YANLI LUO

ABSTRACT

With the in-depth study of the cloud, Paas platform, one of the three service of cloud computing models, is being more and more people know and attention. This paper studies the Docker lightweight containers engine technology, using the discovery, cadvisor, influxdb, sky DNS services provide basic business support of cloud computing platform, using the Core OS cluster, developed a cloud computing platform based on the Docker; Complete cloud computing platform for all services distributed configuration, deployment, monitoring; Achieved an open platform with a standard access interface specification, supports rapid installation and operation of all types of applications, provides standard application interfaces and development interface.

INTRODUCTION

Cloud computing is being more and more attention by academics and the business community in recent years. Cloud computing service model is divided into basic service (IaaS), platform services (Paas), and software services (SaaS). Customers can deploy a wide variety of applications, host the application, save a lot of application platform based on construction and maintenance work. Docker as the emerging of virtual technology, as a lightweight container engine, can provide the basis of resource isolation and standardized packaged deployment provides reliable technical support for the construction of Paas.

Cloud computing platform system based on the Docker, the algorithm research, the Docker virtual technology and cloud computing platform support, the construction of the cloud computing platform based on Docker. System adopts
Core OS cluster completion of all of the service configuration, scheduling, discovery, and other functions; Cloud management platform based on Core OS platform to realize the distributed software configuration, deployment, monitoring, etc. on this basis, the development of the Web console, used for visual monitoring cluster. System architecture diagram is figure 1.

1. DOCKER

Docker is cloud open source project based on the Go language, and follow Apache2.0 agreement, is a based on Linux Container vessel engine. Mainstream Linux operating system are now support Docker, has acquired includes companies such as Google, amazon, IBM, Redhat attention and technical support. Docker using lightweight virtualization technology, and through the application of component packaging, distribution, deployment, operation, such as lifecycle management, and easy to transplant and redeployment.

1.1. Docker And Virtualization

Virtualization technology is a general concept, the core is to abstract of resources, the goal is to run multiple systems or applications on the same host, so as to improve the utilization of system resources, and reduce the cost, convenient management and disaster tolerance. Traditional way of virtualization is realized in
hardware level virtualization, the need for additional virtual machine management applications, and virtual machine operating system layer. The Docker container is operating system-level virtualization technology, the kernel by creating multiple virtual operating system instances (kernel and library) to isolate different processes, taking local host operating system directly and more lightweight.

1.2. Application Service Image Libraries

Docker warehouse is responsible for the storage of each function module and the business systems Docker image. Image management is the core of the Docker; all services in the Core OS cluster are through making docker mirror uploaded to the application service in the warehouse, for the cluster host download operation. Customer service did not start with the Docker warehouse; a scheduling order receives the cloud management platform by the Core OS cluster after read from the Docker warehouse, loading, start, and the supervision management of cloud computing platform.

2. CLOUD COMPUTING PLATFORM

2.1. Core OS Cluster

Cloud computing platform adopts the Core OS cluster structures, through the discovery, etc. IO service in networking and registration. Cluster start cadvisor, influxdb, sky DNS services provide basic business support of cloud computing platform, and as the data source of the cloud management platform. Cloud computing platform based on Core OS platform to realize the distributed software configuration, deployment, monitoring, etc.

2.2. Application Service Discovery

The basic ideas of service discovery is an application of any instance to programmatically access the details of the current environment, service discovery tool distributed to store multiple host in infrastructure. This system uses Sky DNS to support service discovery. Sky DNS is a combination of the etcd, on the basis of distributed services for service discovery. By using the DNS query found available services.

2.3. The Cluster Monitoring

Monitoring service using cAdvisor and InfluxDB technology solutions. The cAdvisor responsible for data collection, InfluxDB responsible for data storage.
After two services using the Docker container packaging, running on the Core OS cluster, the cluster real-time monitoring.

3. THE CLOUD MANAGEMENT PLATFORM

Cloud computing platform adopts the Core OS cluster distributed software configuration, deployment, monitoring, etc. On this basis, the cloud management platform is developed, and used for visual monitoring platform and clusters.

4. CONCLUSION

In this paper, the cloud computing platform based on the Docker, is based on Cent OS cluster support, develop the cloud computing platform based on Docker, Achieved an open platform with a standard access interface specification, supports rapid installation and operation of all types of applications, provides standard application interfaces and development interface. For enterprises to build high stability, high scalability, high availability of PaaS platform; at the same time, the reuse rate of many common components of distributed system architecture, the software engineering and academic research has positive significance.

ACKNOWLEDGMENT

This work is partially supported by the Fundamental Research Funds for the Central Universities of China (JZ2014HGBZ0059).

REFERENCES

2. Jiang Wenzhou, Ma Mingli, Li Xianyi. Based on the Cloud Foundry PaaS Cloud platform design and implementation of [J]. Micro computer and application, 02, 2014.