Private Cloud Implementation for Centralized Compilation

Mehare Suraj, Paliwal Poonam, Pardeshi Mangesh, Begum Shahnaz

Abstract*— A private cloud is a cloud computing model that involves a distinct and secure cloud based environment in which only the specified client can operate. The paper aims at creating a private cloud over intranet for centralized compilation of codes of languages. Separate compilers of Java, C, C++ and assembly language will be installed on the cloud and the clients can use those compilers for compilation of codes. A web Application is designed for the User authentication and personalized task distribution is provided i. e. the faculty will be able to assign user-id, password & personalized tasks to all the clients. The codes will be compiled centrally and the results will be displayed at client-side application. It is efficient for conducting practical examinations, since every client will be assigned a different login id and password. The faculty may create, edit and delete client profiles anytime.

***Index Terms*—Centralized Compilation, Intranet, Private Cloud.**

I. INTRODUCTION

The Cloud computing builds on decades of research in virtualization, distributed computing, and now in networking, web and software services. There are many advantages that the cloud computing offers some of them can be like better computing, secure and dependable data storage among others. The Cloud Infrastructure (i.e. Architecture) and the Cloud Application are the two main and important aspects of the Cloud Computing providing high scalability and high availability. Scalability accounts with the Cloud Infrastructure and availability with the Cloud Application. There are five known ways of providing Cloud Computing services those are Public, Private, Community, Combined and Hybrid Cloud. Private Cloud offers benefits of public cloud and removes obligations of public cloud such as enterprise control, customer data control and security. In our paper we are using one of the two main aspects of Cloud Computing i.e. the Cloud Infrastructure for implementing Private Cloud. The paper aims at developing a cloud based server for providing Centralized Compilation scheme and other facilities like compilation log and administrator control over Intranet preventing the clients to install separate compilers on each machine.

Manuscript received November, 2013.

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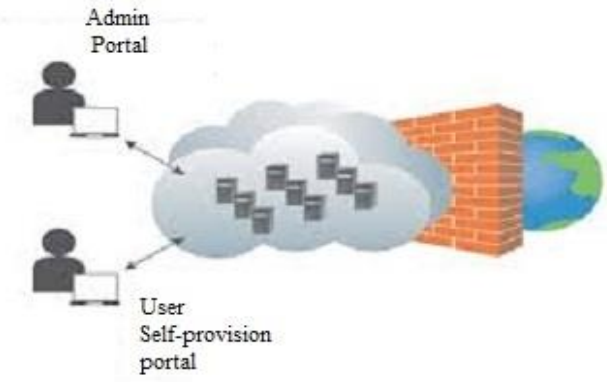


II. RELATED WORK

Private Cloud is a computing architecture that provides hosted services to a limited number of people behind a firewall. Advances in distributed computing have allowed corporate network and data centre administrators to effectively become service providers that meet the requirements of their customers within the corporation. The words private cloud is designed to appeal to an organization that needs or wants more control over their data than they can get by using a third-party hosted service .It provides a distinct and secured cloud based environment where only a specified number of clients can operate. Private cloud services draw their resource from a distinct pool of physical computers but these may be hosted internally

With cloud hosting clients get the flexibility of resources. The resources can be accessed as and when required. The Private cloud hosting provide a higher security and privacy by using techniques like distinct pools of resources with access restricted to the connections made from an organization's firewall, dedicated leased lines and thus ensuring full security. As a Private Cloud is only accessible to a single organization, the organization will have the full authority to configure and manage it with their demands and also alternatively provide the centralized management of the hardware.

III. SYSTEM DESIGN

Technology is applied to generate centralized compilation scheme using Cloud Computing in 3 tier architecture.

A. Data Layer

This layer contains information about user of the system and data base of codes written by users.

B. Business Layer

The decision making layer from the application layer.

C. Application Layer

This layer involves User Interface, showing data to the user, getting input from the user.

IV. IMPLEMENTATION OF SYSTEM

A Private Cloud implementation requires Web service for integration into the application, an Application Server for hosting the web services and to implement Java technologies and a communication Protocol to exchange information over a network.

A. *Web Services*

A Web Service is a software system which supports interoperable interaction between machines over a network. It has an interface stated in a machine-processable format like Web Services Description Language (WSDL) other systems interact with the Web service in a manner prescribed by its description using SOAP messages which are typically conveyed using HTTP with an XML serialization in combination with other Web-related standards.

Fig. 1 Structure of Web Service

B. *Application Server*

An Application Server is a program that hosts all the application operations between users and an organization's backend business applications or the databases. An application server is typically used for complex transaction-based application. An application server has to have built-in redundancy monitor for good availability and good performance distributed application services and support for complex database access to support high-end needs.

C. *Communication Protocol*

Communication Protocol is a specification for the exchange of implementation of Web Services in Computer Networks. SOAP is such a structured communication protocol which relies on XML and relies on HTTP and SMTP for message negotiation and transmission.

V. SYSTEM ARCHITECTURE

The system provides a private cloud based infrastructure for centralized compilation. This system is aimed at eliminating the work of installing compilers on each and every client machine. The compilers of the languages will installed on the cloud server machine and the client machines will get access to these compilers through web services, application servers and communication protocol.

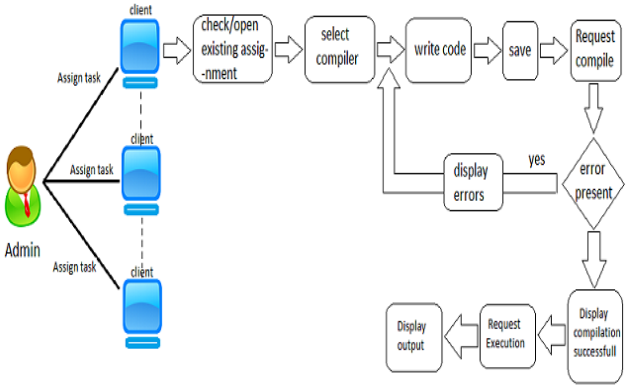
The cloud server will provide the compiler repository and will be connected with database used to store the client data and the client information. Client data more precisely relates to the codes written by client users in different programming language. At server side also present will be a compiler manager for the management of the codes written by the client users. The compiler manager will constantly work in accordance with the database to reflect all the modifications at the client machines in the database.

At the client side a service for sign in and authentication will be provided. An editor which will help clients for writing the code and also a controlled response of the code compiled and the code executed will be provided.

A. *System Flow*

Following sequence of steps will be followed by the system.

- The Administrator will assign task to the students.
- The student will then ask for the desired language compiler.
- With the help of the editor the student will write the code.
- The student will save the code.
- The student will then request the administrator for the compilation of code.
- At the server side the code will be compiled and the obtained result will be displayed at the student machine.
- If there are errors present then the student will again open the editor and perform the required steps.
- If there are no errors present a successful compilation message will be displayed.
- The student will then request the administrator for the execution of code.
- At the server side the code will be executed and the execution result will be displayed at the student machine.



VI. CONCLUSION

As compared to the current scenario where compilers are installed on each and every machine this system will eliminate the need of installing compilers. Also the private cloud infrastructure provided for the centralized compilation will help in an efficient security for the data storage. Thus the combination of private cloud implementation for a centralized compilation approach helps in a secured and efficient working of the cloud based system.

ACKNOWLEDGMENT

We would like to express our gratitude to all those who helped us to complete this work. We want to thank our guide Ms. N. Wankhade and Mr. Swapnil Chaudhari for their continuous help and generous assistance. They helped in a broad range of issues from giving us direction, helping to find the solutions, outlining the requirements and always having the time to see us.

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