Chapter 28
Role of Agents to Enhance the Security and Scalability in Cloud Environment

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ABSTRACT

Cloud computing is a novel paradigm that changes the industry viewpoint of inventing, developing, deploying, scaling, updating, maintaining, and paying for applications and the infrastructure on which they are deployed. Due to dynamic nature of cloud computing it is quite easy to increase the capacity of hardware or software, even without investing on purchases of it. This feature of cloud computing is named as scalability which is one of the main concern in cloud environment. This chapter presents the architecture of scalability by using mobile agents. It also highlights the other main issues prevailing in cloud paradigm. Further it presents the hybrid architecture for data security which is also the one of major concern of it. This chapter mainly highlights the solution for scalability and security.

INTRODUCTION

Cloud Computing incorporates virtualization, on-demand deployment; Internet based delivery of services and use of open source software. In contrast to the use of already established concepts, approaches and best practices, Cloud Computing is a novel paradigm that changes the industry viewpoint of inventing, developing, deploying, scaling, updating, maintaining, and paying for applications and the infrastructure on which they are deployed. Due to dynamic nature of cloud computing it is quite easy to increase the capacity of hardware or software, even without investing on purchases of it. From last few years, cloud computing has become a promising business concept. All existing business applications are complicated in nature and much too expensive. To run these applications there is a need of data centers having supporting staff and infrastructure like bandwidth, networks and server etc. along with a dedicate team for

its execution. For deploying such kind of applications, organizations have to invest large amount of funds which makes it difficult for small businesses to establish themselves. Therefore, cloud computing provides a simple alternative to start IT based business organization with much less initial investment. Although cloud computing offers significant edge of the traditional computing methods but the data which is being continuously transferred to cloud is actually *Big Data* (Chen et al., 2014). In fact, in order to handle the data received cloud owners need to have skilled analytics and also they must ensure that all clients get their due resources well in time and should satisfy the need. In order to automate the data centers, cloud owners are now moving towards deploying mobile and intelligent agents. The current work has thus been motivated by the emergent requirements of improving resource scheduling and cost optimization algorithms in cloud computing. The work aims to exploit mobile agents to overcome the barriers.

The chapter is therefore structured into three major parts. It begins by providing brief overview of cloud computing and issues prevailing in the cloud computing. The promises of mobile agents have been highlighted justifying them as enablers to the barriers so far projected in the success of cloud computing. Finally, it provides the solution for stringent security in cloud environment.

CLOUD COMPUTING

Cloud basically stands for **C**ommon **L**ocation-independent **O**nline **U**tility service, available on-**D**emand. It supports huge amount of virtual workload of resources including communicative environment for user. Cloud computing thus offers computing technologies being offered at cloud. Cloud computing offer lots of advantages over traditional computing such as online resources, offline access, flexibility, savings, just to name a few (see Figure 1).

Cloud computing includes everything that already exists (Armbrust et al., 2009). It is distributed into three segments namely, applications, platforms and "infrastructure". Majorly, the definition of cloud computing specifically revolves round the terms like scalability, pay-per use model, and virtualization.

In fact, enablers supporting cloud computing are interoperability, portability, integration of components, ease of deployment, pay as per use, economic, rapid provisioning and elasticity and so on.

Figure 1.

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