

Chapter 40

Security– and Privacy– Aware Computing in Cloud With User Mobility: An Extensive Review

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ABSTRACT

Today's computational model has been undergoing a huge paradigm shift from personalized, local processing using local processing unit (LPU) to remote processing at cloud servers located globally. Advances in sensor-based smart applications such as smart home, smart health, smart transport, smart environment monitoring, etc. are generating huge data which needs to be stored, pre-processed, analyzed using machine learning and deep learning techniques, which are resource-hungry, to generate results to be saved for future reference, and all these need to be done in real time, with scalability support satisfying user data privacy and security that may vary from application to application. In smart applications like remote health monitoring and support, patient data needs utmost privacy besides confidentiality, integrity, and availability.

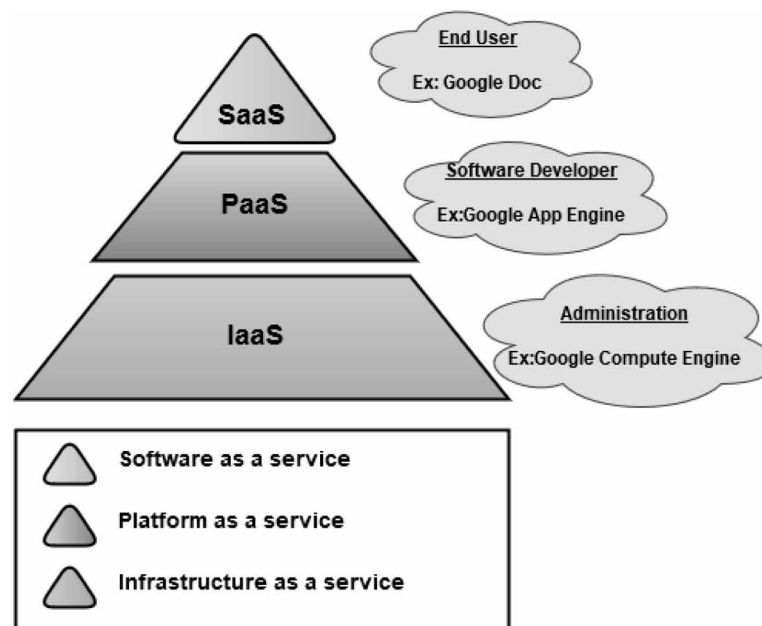
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INTRODUCTION TO SECURITY AND PRIVACY ISSUES OF USER DATA ON CLOUD

The interpretation of ‘Cloud Computing’ according to the National Institute of Standard and Technology (NIST) is cloud computing is a platform which enables on-demand, universal, convenient network access to a shared pool of configurable computing resources. This can be used for minimal management cost and service provider interaction (Leavitt, 2009). For a Cloud Computing environment, both resources and applications are delivered as services with minimal cost by using the underlying Internet connection. The three most well-known services of cloud computing (depicted in Figure 1) are defined below (Amini et al, 2015).

1. **Software as a service (SaaS):** SaaS represent the largest cloud market, where the software and related data of the software are deployed by the cloud service provider. Most of the SaaS applications can be run directly through the web browser without any installations or download.
2. **Platform as a service (PaaS):** In PaaS the service provider makes services easy to the user to perform a specific task. It makes development, testing, and deployment of software easy and cost-effective.
3. **Infrastructure as a service (IaaS):** IaaS provides storage and virtual machine to improve the business applications of the user (Leavitt, 2009).

Figure 1. Services of cloud computing



Cloud computing has few characteristics like service on-demand, worldwide network access, location independence, resource elasticity, and security. These merits make cloud computing more attractive to both the world industrial and academic research. However, there are few problems to be solved for the

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