Cloud Computing Architectural Model

Dr. Prasenjit Chanak
Assistant Professor

Department of Computer Science and Engineering
Indian Institute of Technology (BHU), Varanasi-221005

Software as a Service (SaaS)

- Software-as-a-Service (SaaS) is a software delivery model that provides access to application through the Internet as a Web-based service
- It provides a means to free users from complex hardware and software management by offloading such tasks to third parties, which build applications accessible to multiple users through a Web browser
- In this scenario, customers neither need install anything on their premises nor have to pay considerable up-front costs to purchase the software and the required licenses
- They simply access the application website, enter their credentials and billing details, and can instantly use the application, which, in most of the cases, can be further customized for their needs
- On the provider side, the specific details and features of each customer's application are maintained in the infrastructure and made available on demand

Software as a Service (SaaS)

- The SaaS model is appealing for applications serving a wide range of users and that can be adapted to specific needs with little further customization
- This requirement characterizes SaaS as a “one-to-many” software delivery model, whereby an application is shared across multiple users
- Software-as-a-Service applications can serve different needs. CRM, ERP, and social networking applications are definitely the most popular ones
- SalesForce.com is probably the most successful and popular example of a CRM service

Software as a Service (SaaS)

- The concept of software as a service preceded cloud computing, starting to circulate at the end of the 1990s, when it began to gain marketplace acceptance. The acronym SaaS was then coined in 2001 by the Software Information & Industry Association (SIIA) with the following connotation:
  - *In the software as a service model, the application, or service, is deployed from a centralized datacenter across a network—Internet, Intranet, LAN, or VPN—providing access and use on a recurring fee basis. Users "rent," "subscribe to," "are assigned," or "are granted access to" the applications from a central provider. Business models vary according to the level to which the software is streamlined, to lower price and increase efficiency, or value-added through customization to further improve digitized business processes*

Software as a Service (SaaS)

- The analysis carried out by SIIA was mainly oriented to cover application service providers (ASPs) and all their variations, which capture the concept of software applications consumed as a service in a broader sense. ASPs already had some of the core characteristics of SaaS:
  - The product sold to customer is application access
  - The application is centrally managed
  - The service delivered is one-to-many
  - The service delivered is an integrated solution delivered on the contract, which means provided as promised
- Initially ASPs offered hosting solutions for packaged applications, which were served to multiple customers
- Successively, other options, such as Web-based integration of third-party application services, started to gain interest and a new range of opportunities open up to independent software vendors and service providers

Software as a Service (SaaS)

- The SaaS approach lays on top of the cloud computing stack. It fits into the cloud computing vision expressed by the XaaS acronym, Everything-as-a-Service; and with SaaS, applications are delivered as a service. Initially the SaaS model was of Initially the SaaS model was of interest only for lead users and early adopters. The benefits delivered at that stage were the following:
  - Software cost reduction and total cost of ownership (TCO) were paramount
  - Service-level improvements
  - Rapid implementation
  - Standalone and configurable applications
  - Rudimentary application and data integration
  - Subscription and pay-as-you-go (PAYG) pricing

Software as a Service (SaaS)

- SaaS 2.0 is focused on providing a more robust infrastructure and application platforms driven by SLAs
- Rather than being characterized as a more rapid implementation and deployment environment, SaaS 2.0 will focus on the rapid achievement of business objectives
- This is why such evolution does not introduce any new technology: The existing technologies are composed together in order to achieve business goals efficiently
- Fundamental to this perspective is the ability to leverage existing solutions and integrate value-added business services
- The existing SaaS infrastructures not only allow the development and customization of applications, but they also facilitate the integration of services that are exposed by other parties

Software as a Service (SaaS)

- SaaS applications are then the result of the interconnection and the synergy of different applications and components that together provide customers with added value.
- This approach dramatically changes the software ecosystem of the SaaS market, which is no longer monopolized by a few vendors but is now a fully interconnected network of service providers, clustered around some “big hubs” that deliver the application to the customer
- In this scenario, each single component integrated into the SaaS application becomes responsible to the user for ensuring the attached SLA and at the same time could be priced differently
- Customers can then choose how to specialize their applications by deciding which components and services they want to integrate

Software as a Service (SaaS)

- Important class of popular SaaS applications comprises social networking applications such as Facebook and professional networking sites such as LinkedIn
- Other than providing the basic features of networking, they allow incorporating and extending their capabilities by integrating third-party applications
- These can be developed as plug-ins for the hosting platform, as happens for Facebook, and made available to users, who can select which applications they want to add to their profile
- As a result, the integrated applications get full access to the network of contacts and users' profile data

Software as a Service (SaaS)

- The nature of these applications can be of different types: office automation components, games, or integration with other existing services
- Office automation applications are also an important representative for SaaS applications: Google Documents and Zoho Office are examples of Web-based applications that aim to address all user needs for documents, spreadsheets, and presentation management
- They offer a Web-based interface for creating, managing, and modifying documents that can be easily shared among users and made accessible from anywhere