

# Software as a Service (SaaS)

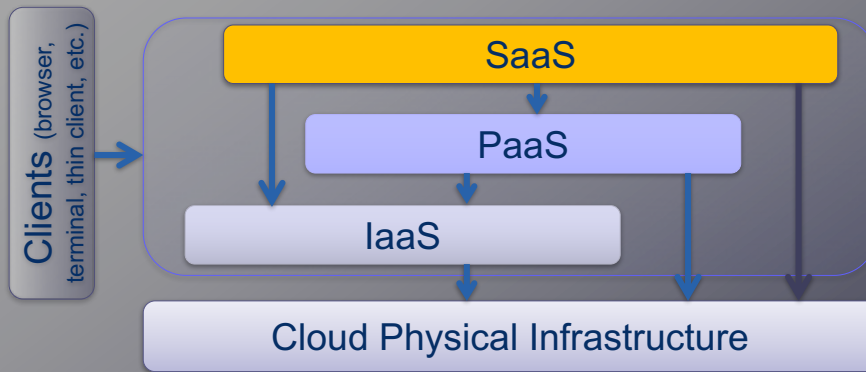
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## Learning Outcomes

- Define Software as a Service (SaaS)
- SaaS Advantages & Disadvantages
- Case studies

## Keep the hierarchy in mind!



## SaaS: An Overview

### ● SaaS Model

- A model in which an application is hosted as a service to users who can access it via the Internet
- No installation is required
- The user does not have to maintain it or support it
- The software is not license-based product

### ● SaaS Usage

- Service is used out-of-box
- No need to be changed or integrated into in-house systems

## Why SaaS?

### ● Applications

- Users not interested in developing software
- Need for high-powered applications

### ● Examples

- Customer resource management (CRM)
- Video conferencing
- IT service management
- Accounting
- Web analytics
- Web content management

## History of SaaS

### ● Past: 19xx

- Applications were installed on the same machines on which they were used
- Internet connections were very slow
- SaaS was a very expensive solution

### ● After 20xx

- High speed Internet connections, advanced hardware, and availability of commodity computing
- SaaS can be implemented cheaply and work efficiently without any lag or time delays

### ● Different perspectives

- **Providers:** offering software services to users on a subscription-based model
- **Consumers:** use and pay as you need.

## Objectives of SaaS

- **Management**
  - Make the management and control of software easier
  - Take the management strain away from consumers
- **Ubiquitous Software**
  - Make software services available globally
- **Multi-user Platform**
  - Provide a single instance of a software service to multiple users
  - Create flexible payment models for software services

## What SaaS is and what it is not

- **SaaS is not Software + Service**
- **SaaS is not an offline application**
- **SaaS is Customisable**
- **SaaS does not require to install any application on local machine**
  - certain features are currently just too difficult to implement across the Internet or run within web browsers efficiently
- **Privacy concerns**
  - SaaS does not guarantee privacy

## Multitenant of SaaS Solutions

- One to Many
  - Two or more clients may share the same server resources
- Share database resource:
  - Depending on size, fees, etc.
- Multitenant solution may be difficult, expensive or impossible.

## Service-oriented Architecture (SOA)

- Application development methodology
- Integrating one or more web services
  - Web services are solutions that programs can call across the web to perform specific tasks.
- A set of web services: API
- SaaS application interacts with a user – a web service interacts with a program.

## Mashup

- **Model**

- Collection of services joined to create an overall solution.

- **Web-based**

- User's browser combines the various content sources to create a unified display

- **Server-based**

- An application running on a server combines the data

## OpenSaaS

- **SaaS solution:**

- Use a specific programming language
- Run on a specific OS
- Use a specific DBMS

- **OpenSaaS:**

- Use an open source programming language
- Run on an open source OS and DBMS
- Move data to different applications



## SaaS – Examples

- **Business Services**
  - Examples: ERP, CRM, Sales, HR
- **Social Networks**
  - They adopted SaaS for their sustainability
- **Document management**
  - Provide users with SaaS to create, manage, and track electronic documents
- **Mail Services**
  - E-mail is offered as SaaS to cope unpredictable number of users and the load on email services

## SaaS Characteristics

- **One to many**
  - Single instance of an application can be shared by multiple users/tenants
- **Web Access**
  - Access from any location if the device is connected to the Internet
- **Centralised management**
  - Services are hosted and managed from a central location
  - Perform automatic updates, etc.
- **Multidevice Support**
  - Access from any devices such as desktop, laptop, tablets, smartphones, ...

## SaaS Characteristics (2)

- **Better Scalability**
  - Dynamic scaling of resources makes SaaS applications work efficiently even with varying loads
- **High Availability**
  - SaaS services ensure the 99.99% availability of user data as proper backup and recovery mechanisms are implemented at the back end
- **API Integration**
  - SaaS applications have the capability of integrating with other software or service through standard APIs

## SaaS – Suitability

- **On-demand Software**
  - No need to buy full packaged software
- **Software for start-up companies**
  - Suitable for start-ups as it does not need high-end infrastructure for accessing it
- **Software compatible with multiple devices**
  - SaaS applications are adaptable with almost all devices
- **Software with varying loads**
  - SaaS applications can handle varying loads efficiently without disrupting the normal behaviour of the application.



## SaaS – Not suitable

- **Real-time applications**
  - SaaS depends on Internet connectivity which cannot guarantee real-time requirements
- **Applications with confidential data**
  - Data security, data governance, and data compliance are always issues with SaaS applications
- **Better on-premise application**
  - Some on-premise applications might fulfill all the requirements of the organisation
  - SaaS may not be the best in this case

## SaaS Advantages

- **Maintenance**
  - Reduce or eliminate the need for an on-site data centre
  - Eliminate the need for application administration
- **Pay as you use (Cost saving)**
  - Allow customers to pay on demand for software use, normally on a per-user basis
- **Scalability**
  - application, processor and data storage
- **Multitenancy**
- **Reliability and disaster recovery**
  - Increase disaster recovery and business continuity
- **Ease of access**

## SaaS Disadvantages

- **Security**
  - Data is stored on Cloud
- **Internet connection**
  - No connection, no application
  - Latency: Data is far away from the end users
  - Not suitable for real time applications
- **Flexibility**
  - Not easy to switch between SaaS vendors
- **Compliance**
  - Regulation relating to data storage (national/international level)
- **Loss of control**
  - The user does have any control over the data

## Example: Microsoft Office 365

- **Microsoft Office vs. Open Office**
- **Office 365:**
  - Pay-by-the-month subscription to Office apps
  - Access, edit documents from any computers
  - Collaborate and share documents easily