Platform as a Service (PaaS)

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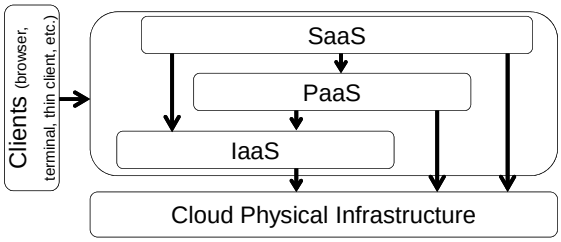
Outline

- Define PaaS
- Pros and Cons
- Case studies

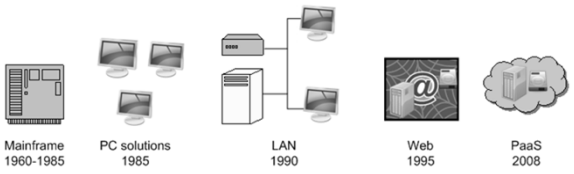
Keep the hierarchy in mind!



Introduction

- Built on the top of IaaS, Platform as a Service (PaaS) is another application delivery model. PaaS supplies all the resources required to build & deploy applications and services
- PaaS services include application design, development, testing, deployment, and hosting
- Cloud Computing Platform

Evolution of technology



From ISP to PaaS

- Internet Services Providers
  - Maintained webservers and high-speed, high-bandwidth connections
  - Reduced cost
  - Less: server administration, hardware to purchase and maintain
  - Greater system uptime
  - Potential scalability
- Used Windows-, Linux-based webservers, laid the groundwork for the eventual creation-> cloud-based PaaS solutions

Internet Service Providers

- First ISP: Australia, 1989
- Services
  - Access (internet access, email box)
    - UPC, Eircom, …
  - Hosting (web, email, storage, VM, servers)
    - Blacknight, Justhost, …
    - Evolved into and influenced by PaaS

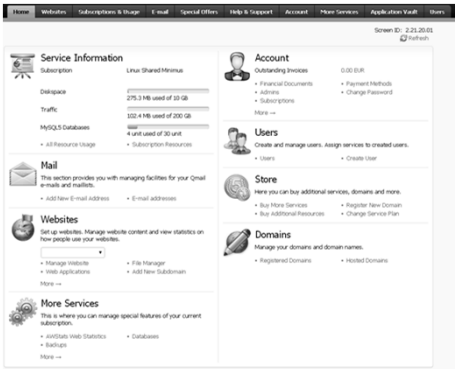
Hosting ISP today

- Shared hosting (pre-PaaS)
  - Basic (web, email, storage), cheap
- Hosted applications (SaaS)
  - MS Exchange, …
- Hosted application frameworks (PaaS)
  - MS SharePoint, GoMobi, …
- Virtual machines (IaaS)
  - Price depends on the amount of resources
- Dedicated servers (IaaS)

ISP: shared hosting

- Shared instance of OS/Web/DB
  - Load and security issues
- Control panel (cPanel, Plesk, …)
  integrated components, often open-source
  - Web server user settings (Apache, IIS, …)
  - Storage + web file browsers + FTP
  - Email + webmail (Roundcube, …)
  - RDBMS(MySQL, …) + web(phpMyAdmin, …)
  - Schedulers (Crontab, …)
  - Backup

ISP: shared hosting



ISP: Service-Level Agreement

- Abandonment Rate
  - Percentage of calls abandoned while waiting to be answered.
- Average Speed to Answer
  - Average time it takes for a call to be answered by the service desk.
- Time Service Factor
  - Percentage of calls answered within a definite timeframe.
- First-Call Resolution
  - Percentage of incoming calls that can be resolved without the use of a callback or without having the caller call back the helpdesk to finish resolving the case.
- Turn-Around Time
  - Time taken to complete a certain task.
- Mean Time To Recover
  - Time taken to recover after an outage of service.

PaaS

The PaaS model can support add-ons to SaaS applications, stand-alone environments for general development, and application delivery-only environments, supporting hosting.

Examples include:

- Google App Engine
- Microsoft's Azure
- VMware's Cloud Foundry
- And many others…

PaaS: abstraction from IaaS

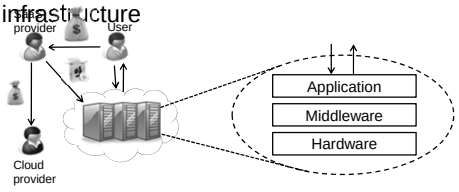
- The Infrastructure layer provides users with direct access to the underlying infrastructure
- Isolate users from the resource interaction to the lower levels of resource interaction
- Allow developers to create new software that is not susceptible to the number of provisioned machines or their network configuration

PaaS: API to support SaaS

- PaaS allows developers to build new software that takes advantage of the available resources.
- PaaS solution is usually designed with a set of APIs that directly influence the programs that can be built on the Cloud.
- PaaS solutions are deeply tied to Cloud vendors.

PaaS and SaaS

- Cloud provides middleware/infrastructure
  - For example, Microsoft Common Language Runtime (CLR)
  - Customer pays SaaS provider for the service; SaaS provider pays the cloud for the infrastructure



Pros of PaaS

- Lower total cost of ownership
- Lower administrative overhead
- More current system software
- Increased business and IT alignment
- Scalable solutions

PaaS Benefits for Developers

- Focus only on innovation that provide real business value instead of infrastructure setup
- Zero infrastructure
- Lower Risk
- Lower cost
- Easy and quick development
- Reusable code
- …

Cons of PaaS Solutions

- Concern about data security
- Challenges to integrating cloud solutions with legacy software
- Risk of breach by PaaS provider

Example: Google App Engine (GAE)

- Let developers create and host web-based applications that reside and run on services managed by Google
- GAE features:
  - Support for dynamic web pages
  - Data storage and query support
  - Load balancing for application scalability
  - API
  - SDK
  - Administrative console for managing applications and databases

Summary

- Describe PaaS
- Pros and Cons
- Example