Cloud Service Models

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Foreword

- Cloud computing is the use of computing resources (hardware and software) that are delivered as a service over a network (typically the Internet).
- Cloud computing entrusts remote services with a user's data, software and computation.
- The business model, using software as a service, users also rent application software and databases.
- Cloud computing relies on sharing of resources to achieve coherence and economies of scale similar to a utility over a network.

- End users access cloud-based applications through
  - A web browser
  - Light-weight desktop
  - Mobile app

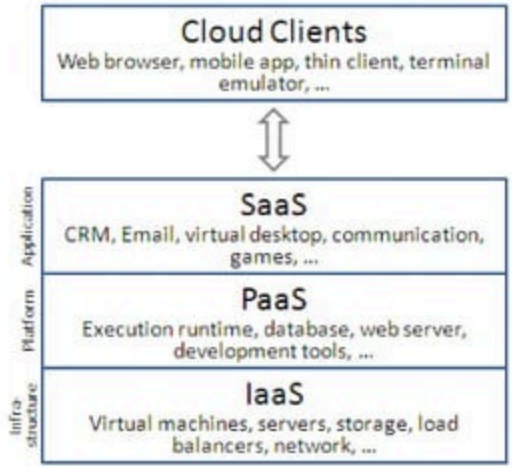
- Proponents claim that cloud computing allows enterprises
  - To get their applications up
  - Running faster
  - Improved manageability and
  - Less maintenance, and
  - Enables IT to more rapidly adjust resources
    - To meet fluctuating and
    - Unpredictable business demand..

Types of Public Cloud Computing

- Infrastructure as a service (IaaS)
- Platform as a service (PaaS)
- Software as a service (SaaS)
- Storage as a service (STaaS)
- Security as a service (SECaaS)
- Data as a service (DaaS)
- Test environment as a service (TEaaS)
- Desktop as a service (DaaS)
- API as a service (APIaaS)
- Backend as a service (Baas)

Service models

- Cloud computing providers offer their services according to three fundamental models:
  - Infrastructure as a service (IaaS)
  - Platform as a service (PaaS)
  - Software as a service (SaaS)
- IaaS is most basic.



- Lower Model —**abstracts**→ Higher Model

IaaS

- Cloud providers offer computers,
  - as physical or
  - more often as virtual machines, and
  - other resources
- The virtual machines are run as guests by a hypervisor (such as Xen or KVM)
- Scale to support a large number of virtual machines
- It is not a machine
  - Simply to a facility given to businesses that offers users the leverage of extra storage space in servers and data centers.

- Cloud users install operating system images on the machines as well as their application software.

- Client is responsible
  - Patching and maintaining of the operating systems and application software

- STaaS - STorage As A Service. This service comes under IaaS, which manages all the storage services in cloud computing.

Resources

- Images in a virtual machine image library,
- Raw (block) and file-based storage,
- Firewalls,
- Load balancers,
- IP addresses,
- Virtual local area networks (VLANs),
- Software bundles

Security issues

- Data Integrity
- Confidentiality
- Reliability,

Examples

- Amazon Cloud Formation (and underlying services such as Amazon EC2),
- Rackspace Cloud,
- Terremark,
- Windows Azure Virtual Machines,
- Google Compute Engine
- Joyent.

PaaS

- Provides following services
  - Computing platform
  - A solution stack
- In this the consumer creates the software using tools and/or libraries from the provider.
- The provider provides
  - The networks,
  - Servers,
  - Storage and
  - Other services

- The consumer controls
  - Software deployment
  - Configuration settings
- Offerings
  - Facilitate the deployment of applications without
    - The cost and
    - Complexity of buying and managing the underlying hardware and software
  - Provisioning hosting capabilities
- Services are generally provisioned as an integrated solution over the web.

Types

- **Add-on development facilities**
  - These facilities allow customization of existing software-as-a-service (SaaS) applications.
- **Stand alone development environments**
  - They do not include technical, licensing or financial dependencies on specific SaaS applications or web services
  - Intended to provide a generalized development environment
- **Application delivery-only environments**
  - They do not include development, debugging and test capabilities as part of the service, though they may be supplied offline
  - The services provided generally focus on
    - Security & On-demand scalability.
- **Open platform as a service**
  - It provides open source software to allow a PaaS provider to run applications.
  - Some open platforms let the developer use any programming language, any database, any operating system, any server, etc. to deploy their applications.

Key Characteristics

- **Multi-tenant architecture**
  - PaaS offerings typically attempt to support use of the application by many concurrent users, by providing concurrency management, scalability, fail-over and security.

- **Integration with web services and databases**
  - Support for SOAP and REST interfaces allow PaaS offerings to create compositions of multiple web services, sometimes called "mashups" as well as access databases and re-use services maintained inside private networks.

SaaS

- Sometimes referred to as "on-demand software“
- Typically accessed by users using a thin client via a web browser.
- Common delivery model for many business applications,
  - Accounting
  - Collaboration
  - Customer relationship management (CRM),
  - Management information systems(MIS),
  - Enterprise resource planning (ERP), invoicing,
  - Human resource management (HRM),
  - Content management(CM) and
  - Service desk management.

Notable Service Providers

- iCloud
- Google Apps
- Salesforce
- Amazon Web Services

Characterstics

- Configuration and customization
- Accelerated feature delivery
- Open integration protocols
- Collaborative (and "social") functionality


Thank
You