Cloud Computing: A Summary

Seminar of 2 days - 14h
Ref.: AAS - Price 2025: 2 140 (excl. taxes)

TEACHING METHODS

Illustration through concrete cases, discussion and feedback from actual cases.

THE PROGRAMME

last updated: 08/2024

1) Introduction

- Defining Cloud Computing and SaaS
- History leading to the emergence of cloud computing and SaaS.
- Positioning of cloud computing versus classical hosting providers.
- Positioning of SaaS (Software as a Service) with regard to the concept of ASP.
- Relationship between Virtualization and Cloud Computing.
- Impact of SOA on the adoption of Cloud Computing solutions by company.

2) SaaS and cloud computing

- SaaS vs Cloud Computing.
- SaaS and Cloud Computing, what usages do they provide solutions for.
- Align costs and usage.
- Benefits of Cloud Computing: dynamic outsourced resource allocation, logical isolation ...
- Main Cloud computing drawbacks : Privacy, legislation ...
- Estimation and cost tracking challenges with Cloud and SaaS.
- Issues and benefits of the proliferation of unofficial Cloud ussage (Shadow IT)
- Managing backups. What's the impact on the backup strategy?
- Reversibility. Various strategies. Which one to choose.
- What are the main blocking factors for entreprise adoption of the Cloud, how to overcome the reluctance?

3) Market solutions - Overview

- Public Cloud Computing. Private Cloud Computing. Hybrid cloud. Cloud Computing Communityoffering.
- Public cloud services. Amazon AWS and EC2 services, S3, SQS, SimpleDB, RDS, SNS, ELB, mail, ...
- Google Cloud AppEngine and Compute Engine / BigQuery / CloudSQL / etc. Microsoft Windows Azure PaaS and IaaS.
- OpenStack based clouds : HPCloud, Rackspace, IBM / Softlayer, etc. OVH "Public Cloud" and "Dedicated Cloud".
- Offers VDC: VMware vCloud ServiceHybrid.
- Other cloud offerings: DigitalOcean, Cloudwatt, Numergy Orange Flexible Computing SFR Cloud.
- Private Cloud solutions. OpenStack, Eucalyptus and CloudStackCloudBees. VMware vCloud Director / vFabric.
- Cloud Management solutions. RightScale, Scalr, Heroku, ...

4) Usage scenarios for Cloud Computing

- Technically oriented usage scenarios (IaaS, PaaS).
- Usage oriented scenarios (automation, mobility, Web integration ...).

- Eligibility of applications for a cloud outsourcing: business, collaborative applications, human resources management...
- Impact of SaaS and Cloud Computing on GreenIT.

5) Security and Privacy
- Differentiation between Security and Privacy.
- Levels where security can be implemented.
- Key issues.
- Main concerns.
- Legal aspects.
- Practical and technical aspects of data protection.
- Supplier Selection and contracting.
- Policy for password and keys management.
- Authentication Delegation.

6) Integration of Cloud and SaaS solutions with enterprise IT
- Technical aspects: communication between the IS and Cloud/SaaS solutions.
- Issues of bandwidth and QoS the link between internal and external IF.
- Software Licenses.
- Single Sign On.
- Internal management accounts and external access.
- Choose the billing mode (credit cards, monthly bills, ...)

7) Information system architecture integrating Cloud Computing solutions
- IT Architecture and SOA.
- Schematic of an globale IS with some internal and SaaS and Cloud resources.
- Patterns of Cloud application architectures.
- Integration between the internal IS and SaaS solutions.
- Issues with the integration between the interal IS and Cloud.
- Issues of integration between different Cloud services.
- Migration internal IS services to the Cloud.
- Manage the increased dependency toward the network.

8) Private Clouds
- Private Cloud, what for ?
- Definition of private cloud computing.
- Reminder about the basics of virtualization (para-virtualization, ...).
- Difference with regard to virtualization inside an internal or external Datacenter.
- Difference with regard to classical datacenters or "compute grids".
- Pros and cons. The economic equation. The main virtualization technologies.
- Open-source tools for the private cloud (OpenStack, CloudStack, KVM, libvirt, ...).
- Proprietary technologies.

9) The technical solutions and NoSQL Cloud
- Databases for the Cloud.
- Emergence of NoSQL databases. Differences with RDBMS.
- Foundations for NoSQL database.
- Features and limits of RDBMS.
- Main opensource NoSQL databases (Cassandra, MongoDB, HBase, ...).
- Main integrated cloud NoSQL databases (Google Datastore / CloudSQL, Amazon DynamoDB / SimpleDB, Google BigQuery).

DATES

REMOTE CLASS
2025 : 14 oct., 09 déc.