

Course code: **AWS**

Course title: **Architecture of cloud-based systems illustrated by Amazon Web Services**

Days: 2

## Description:

### Course intended for:

The training is intended mainly for architects, as well as IT project managers, analysts and programmers, wishing to get familiar with the system design techniques based on the infrastructure and services of cloud computing.

### Course objective:

The training objectives include:

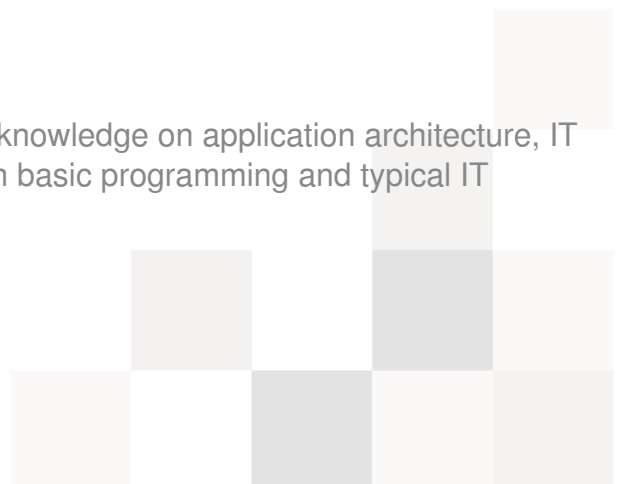
1. Getting the users familiar with basic terms and standards of cloud computing,
2. Getting familiar with the best practices,
3. Introduction to the issue of design of distributed applications based on cloud computing infrastructure,
4. Getting familiar with the issues associated with Amazon Web Services.

The training puts emphasis mainly on the system architecture and design issues. It consists of theoretical presentations of best practices and exemplary systems and practical system design workshops. The curriculum also includes exercises in basic configuration and administration of key services in cloud computing – these are aimed at practical learning of the basic services and getting familiar with the technical context (however, the training as such is not dedicated to AWS services administration).

### Requirements:

The participants are required to have at least basic knowledge on application architecture, IT systems design and design patterns. Familiarity with basic programming and typical IT infrastructure components is also recommended.

### Course parameters:



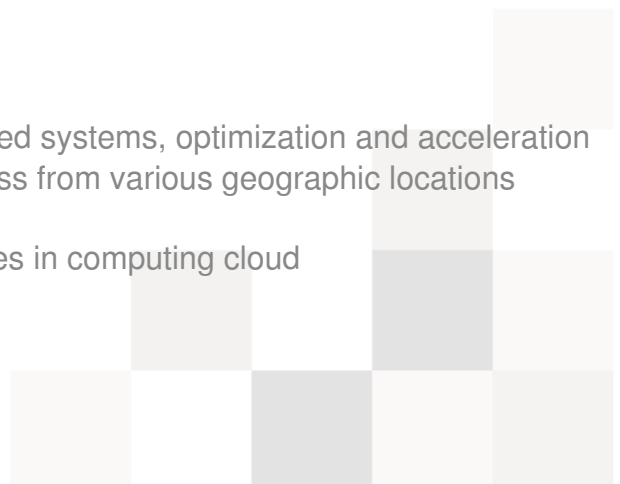
2\*8 hours (2\*7 net hours) of lectures and workshops. During the workshops, exemplary systems are designed, illustrating fulfillment of the most common requirements, defined for IT systems.

Group size: no more than 12-15 participants.

## Course curriculum:

- Introduction to cloud computing
  - Cloud computing definition
  - Cloud computing models (IaaS, PaaS, SaaS, ..., Everything as a Service)
  - Cloud computing architecture (SOA, microservices, compute, storage, networking, application services)
  - Cloud computing types: public, private, hybrid clouds
  - Key properties of public clouds: self-service, flexibility, scalability, payment for use, multi-tenancy, resources on demand, automation, API, virtual administration
  - Trends: DevOps, Software Defined Everything, Everything as a Service, Infrastructure as Code
  - Advantages and challenges associated with cloud computing
  - Examples and comparison of clouds: AWS, OpenStack, Jelastic, Azure, Google App Engine, Cloudify ....
  - Cloud applications (applications that they are fit/unfit for)
- Review of the basic components of Amazon Web Services
  - Compute (including EC2, AutoScaling, EMR)
  - Storage (S3, EBS, RDS DB, DynamoDB, SimpleDB, ElastiCache, Glacier)
  - Networking (including Route 53 DNS, CloudFront CDN, ELB - Elastic Load Balancer, VPC – Virtual Private Cloud)
  - Application services PaaS/SaaS (including SQS, SNS, Beanstalk, IAM)

- Global infrastructure (including regions, availability zones, boundary locations), service types (global, regional, local)
- Tools and services facilitating cloud use in the DevOps model (including REST API, CLI, SDK, IDE, CloudFormation, OpsWorks, CloudWatch)
- General best practices in application design
  - Design aimed at failures and exceptional circumstances
  - Loose coupling
  - Automation
  - Parallel calculation
  - Statefulness and statelessness of components
  - Data storage location optimization
- Cloud computing security
  - Legal aspects
  - Shared responsibility model
  - Security mechanisms provided by AWS
  - IAM (Identity and Access Management) issues
  - Best security practices in AWS cloud
- Application designing in cloud
  - Designing of scalable and high-availability (HA) Web applications
  - Designing of scalable applications for batch and asynchronous data processing
  - Disaster recovery scenarios
  - Designing of geographically distributed systems, optimization and acceleration of Web applications in terms of access from various geographic locations
- Monitoring and settlement of costs of services in computing cloud



- Models of payment for use (pre-paid, post-paid, subscription fees etc.)
- Methods of cost optimization in AWS cloud

