Cloud Computing: Concepts and Technology

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Cloud computing has become the dominant approach for the implementation of information systems with many government and private organizations migrating their entire IT infrastructure to the cloud. Most recently, AI and ML (Machine Learning) services, available on leading cloud platforms, have provided a new motivation for the adoption of cloud computing. Most experts today recognize the benefits of cloud computing that include fast implementation, cost reduction and a potential for rapid innovation. However, the fast rate of evolution of cloud technologies and the complexity of managing large-scale cloud deployments represent a challenge for organizations making the transition into the cloud. This three-day course aims to provide the attendees with a balanced view of cloud computing covering the basic cloud concepts and terminology and discussing the benefits and challenges of cloud adoption. The course includes demonstrations and practical hands-on exercises using Amazon Web Services, including EC2, S3, Lambda, RDS and NoSQL databases and a range of AI and ML services.

Course Content

- ***Introduction to cloud computing****: current IT technology trends, business motivations and technology drivers, benefits and challenges, cloud vs on premises IT, cloud computing in a historical context, cloud computing case studies*
- ***Cloud computing concepts and terminology****: SOA services, APIs, virtual machines and containers, serverless computing, DevOps and microservices, cloud computing service models (SaaS, IaaS, PaaS, etc.), cloud computing deployment models (public, private, and hybrid clouds), multitenancy and polymorphic applications, etc.*
- ***Cloud databases****: SQL and NoSQL databases, document databases, column databases, graph databases, etc. CAP theorem and BASE consistency, tunable consistency, NoSQL examples: MongoDB, Amazon DynamoDB, Neo4J, AWS Athena, etc.*
- ***Public cloud platforms****: AWS, Azure, Google Cloud Platform. AWS core services: EC2, EBS, S3, RDS (Oracle, DynamoDB, Amazon Aurora), ML, etc.*
- ***Cloud computing architectures and open source frameworks****: NIST Reference Architecture, Kubernetes, Cloud Foundry, etc.*
- ***Cloud computing adoption****: migration readiness and planning, migration strategies, AWS Adoption Framework*
- ***Future directions****: Industrialization of IT, IoT, Machine Learning, etc.*

Presenter

Dr George Feuerlicht is a visiting lecturer at the Department of Information Technologies, Prague University of Economics. George has been actively following cloud computing developments for over a decade and has published a number of recent articles dealing with cloud computing topics. He has presented seminars and professional development courses in Australia, Europe, Asia and USA and is the author of over 100 publications across a range of topics in computer science. He holds a PhD in Electrical Engineering from the Imperial College, London University, U.K.