

This one-day course provides foundational knowledge in Cloud Computing components, foundational technologies, architecture, design, and business value. Attendees are provided with a broad survey of Cloud Computing concepts and given an opportunity to explore Cloud from multiple angles. Concepts are reinforced through analysis of real world case studies and group discussion.

**Course Objectives:**

- **Learn Cloud Computing Components**
- **Foundational technologies**
- **Explore architecture and design for the Cloud**
- **Learn Cloud Infrastructure and concepts**

**Audience:** General audience including business and technology team leaders.

**Prerequisites:** No formal knowledge or skill requirements.

**Number of Days:** 1 day

**1 Defining The Cloud**

- Bit of History
- Wikipedia Entry
- Cloud Computing at a Glance
- Gartner Research on Cloud
- Electrical Power Grid Service Analogy
- The NIST Perspective
- Five Characteristics
- On-demand Self-Service (NIST Characteristic)
- Broad Network Access (NIST Characteristic)
- Resource Pooling (NIST Characteristic)
- Rapid Elasticity (NIST Characteristic)
- Measured Service (NIST Characteristic)
- The Three Cloud Service Models (NIST)
- The Cloud Computing Spectrum: IaaS, PaaS and SaaS
- The Four Cloud Deployment Models (NIST)
- The NIST Cloud Definition Framework
- Cloud Deployment Model Dynamics

**2 The Cloud Enablers**

- The Origin of the Cloud Computing
- Virtualization
- Hypervisors
- Hypervisor Types

- Type 1 vs Type 2 Processing
- Paravirtualization
- Applying Virtualization to the Cloud
- Virtualization Qualities
- Grid Computing vs Cloud Computing
- Myth: Cloud is SaaS
- SOA and the Cloud

**3 Cloud Reference Model**

- The Need for a Cloud Reference Model
- Cloud Infrastructure
- A Bootable OS Image
- Defining a "Compute Unit"
- Instance Templates (Flavors)
- Launching an Instance in OpenStack
- Block Storage for Instances
- Cloud Infrastructure - Cloud Object Storage
- Additional Data Storage Options
- Cloud Multi-Tenancy Model
- Common Characteristics of Multi-tenant Applications
- The PaaS Platform
- Google App Engine (GAE) PaaS Overview
- GAE's Stats
- Google Cloud Storage
- The SaaS Platform

	Google Compute Engine's Simplified Architecture	
	Google Cloud Platform	
<b>4</b>	<b>The Cloud Economics</b>	
	The Cloud Computing Stack	
	Cloud Computing Components	
	Tightly Coupled Enterprise	
	Breaking the Silos	
	Understanding the SOA	
	Applying SOA to the Cloud	
	Cloud Computing – SaaS	
	Applying SaaS to the Cloud	
	Web 2.0 Should I upgrade?	
	Web 1.0 vs Web 2.0	
	Applying Web 2.0 to the Cloud	
<b>5</b>	<b>Cloud Security</b>	
	The Heartbleed OpenSSL Bug	
	Cloud Vendor Security Certifications	
	Google Compute Engine Data Security	
	Cloud Access Security Features	
	Security of Cloud Vendor Networks	
	Insecure Interfaces	
	Top Threats for Cloud Computing	
	The Common Cloud Security Concerns	
	Authorization and Data Access Constraints	
	Cloud Security Domains	
	The CIAs of Security	
	Access Control: Physical Security	
	Access Control: Authentication & Authorization	
	Federated Identity Management	
	Access Control: Auditing	
	Identity Management	
	AWS Identity and Access Management Service	
	Security in the Google Cloud	
	GAE Cloud Security Module	<b>7</b>
	Application Security	
	Application Multi-Layer Security Design	
	Access Control List Extensions	
	Information and Data Security	
	Data-at-rest Security	
	Amazon S3 Security	
	Network Security	
	Operational Security	
	DevOps Security Concerns	
<b>6</b>	<b>Cloud Services</b>	
	Defining Cloud Services	
	User-Cloud Interaction	
	Cloud Service Characteristics	
	The Typical Cloud Services	
	Application Services	
	Messaging Application Service	
	Email Application Service	
	Cache Application Service	
	Specialized Application Services	
	AWS Analytics Systems	
	Google App Engine (GAE) MapReduce Service	
	Use Cases for MapReduce Jobs	
	Integration Platform as a Service (IPaaS)	
	Storage Services	
	Object Storage	
	Archive Storage	
	Relational Storage	
	NoSQL Storage	
	Some AWS Storage Services	
	Data Warehouses in the Cloud	
	Cloud Utility Services	
	Scalability and HA of Your Applications in the Cloud	
	The Auto-scaling Service	
	Monitoring Services	
	Configuring Instance Health Check in AWS	
	Amazon Web Services Integration Diagram	
	Google App Engine (GAE) Services Integration Diagram	
	Microsoft Azure Services	
	Comparing Cloud Service Stacks	