

# CLOUD COMPUTING ONLINE TRAINING

## COURSE CONTENT:

### 1. INTRODUCTION TO CLOUD COMPUTING

What is Cloud Computing?  
Cloud Computing Defined  
Cloud Computing Architecture  
Cloud Computing Terms  
Communication-as-a-Service (CaaS)  
Infrastructure-as-a-Service (IaaS)  
Monitoring-as-a-Service (MaaS)  
Software-as-a-Service (SaaS)  
Platform-as-a-Service (PaaS)  
Benefits and Limitations of Cloud Computing  
Benefits  
Limitations  
Cloud Computing Case Studies  
How Companies Are Using Cloud Computing  
Implementing Applications and Services in the Cloud  
Using Your Company's Services vs. the Cloud Provider  
A Cloud Service Provider Introduced  
Cloud Computing Risks and Issues

### 2. WHO'S WHO IN TODAY'S CLOUD

Cloud Computing Companies

### 3. THE BUSINESS CASE FOR GOING TO THE CLOUD

Benefits of Cloud Computing

Operational

Economic

Staffing

Should Your Company Invest in Cloud Computing?

What Should Not be Moved to the Cloud

### 4. THE EVOLUTION OF CLOUD COMPUTING

Early Mainframe Environment

Virtualization in Mainframe Architectures and Operating Systems

LANs and the Cloud

Internet and the Cloud

Web Services, Browsers, and the Cloud

Thin Client

Advances in Networking and Processing Speeds that Led to Cloud Computing

Networking Developments

Increased Processing Speeds

Managed Service Provider Model to Cloud Computing and Software as a Service (SaaS)

Single Purpose Architectures Migrate to Multipurpose Architectures

Data Center Virtualization

Collaboration

The Cloud as a Reach Extender

The Cloud as a Communication Enabler  
The Cloud as an Employee Enabler  
Service-Oriented Architecture (SOA)  
Evolving from SOA to the Cloud  
Capacity: Limited Performance  
Availability: Communications Failure and Performance Issues  
Security: Newer Security Protocols Provide More Protection  
What's Next in Cloud Computing

## 5. BUILDING CLOUD NETWORKS

Designing and Implementing a Data Center-Based Cloud  
Using Industry and International Standards  
Independent Components  
Message Base  
Location Independence  
Communication Requirements for Cloud Implementation  
Public Internet  
Private Internet  
Routing to the Datacenter  
Switching within the Data Center  
Bandwidth  
Tools Used to Measure Network Performance  
Using the Protocol Analyzer to Measure Bandwidth  
Using Ping and Traceroute to Measure Network Performance  
Security  
SSL  
VPN  
Overhead

Storage Options for Cloud Computing

Storage Capacity

Data Protection and Partitioning

NAS

SAN

CAS

Redundancy

Replication

Multisiting

Backup and Recovery

Server Software Environments that Support Cloud Computing

Server Capacity

Virtualization

Clustering

Expansion

Server Functions

Application

Web

Database

Vendor Approaches to Cloud Computing

Role of Open Source Software in Data Center

Cost Reduction vs. Reliability

Open Source Server Software

Open Source Database Software

Open Source Applications Software

Open Source System Management Software

Open Source Load-Balancing Software

## 6. VIRTUALIZATION

Student Virtualization Architectures

The Hypervisor

Virtualization as the "Operating System"

Virtualization with a Host Operating System

Virtualization Infections on Virtualized Environments

Type 1 Virtualized Environment

Type 2 Virtualized Environment

Virtualization Environments

Microsoft Virtualization

Sun xVM VirtualBox

Linux/UNIX Virtualization

VMware Products

Data Center and Cloud Infrastructure Products

End-User and Desktop Products

IBM Virtualization

Using VMware to see a Virtualized Server Environment

## 7. FEDERATION, PRESENCE, SECURITY, AND PRIVACY IN THE CLOUD

Federation in the Cloud

What It Is

Permissive Federation

Verified Federation

Encrypted Federation

Trusted Federation

Using XMPP in the Federated Environment

Presence in the Cloud

What It Is

Presence Protocols

Leveraging Presence

Presence Enabled

The Future of Presence

The Interrelation of Identity, Presence, and Location in the Cloud

Identity Management

What It Is

Future of Identity in the Cloud

Privacy and Its Relation to Cloud-Based Information Systems

Personal Information

Privacy-Related Issues

Finding Your Private Information

## 8. CLOUD COMPUTING STANDARDS AND BEST PRACTICES

Open Cloud Consortium

What It Is

Open Cloud Consortium Working Groups

Project Matsu

Project Comet

HPC in the Cloud

The Open Cloud Testbed

The Open Science Data Cloud

Intercloud Testbed

Reporting on an Open Cloud Consortium Working Group

Distributed Management Task Force (DMTF)

What It Is?

DMTK Working Groups Associated with Cloud Computing

Standards for Application Developers

Protocols

Scripting Languages

Content Formatting Standards and Languages

Standards for Security in the Cloud

Confidentiality, Integrity, Availability

Authentication, Authorization, Accountability

Regulations for Privacy

Security Protocols

Establishing a Baseline for Cloud Performance

Best Practices for Selecting a Vendor and Implementing Cloud-Based Applications

Choosing the Right Vendor

Implementing Cloud-Based Applications

## 9. END-USER ACCESS TO CLOUD COMPUTING

Cloud Access Methods Available to End Users

Citrix

Windows Remote Desktop

Vnc

Web Browsers

Server Extensions

Thin Clients

Smart Phones, Pads, Pods, etc.

Virtual Terminal Security Strengths and Weaknesses

Strengths

Weaknesses

## 10. MOBILITY AND THE CLOUD

Mobile Operating Systems for Smartphones

iPhone

Android

BlackBerry

Windows Mobile

Ubuntu Mobile Internet Device

Mobile Platform Virtualization

Kernel-Based Virtual Machine

VMware Mobile Virtualization Platform

Collaboration Applications for Mobile Platforms

Text Messaging

iPhone Applications

BlackBerry Applications

Droid Applications