Certified Cloud Computing Specialist

(CCCS)

Course Outline

www.globalicttraining.com

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DURATION

40 Hours (5 Days) Classroom Training

INTRODUCTION & OVERVIEW

Certified Cloud Computing Specialist is a 5-day intensive training program with hands-on and project work component (PWC) that participants will carry out at the end of the training. This program is specially designed to address the growing need for developing skills and expertise in this emerging Infocomm area Cloud Computing. The program will help the participants gain comprehensive understanding of cloud computing, various types of clouds and current cloud offerings that they can make use for different kinds of applications in various business sectors. They will also gain the skills they need to identify cloud computing's potential, benefits and risks and to evaluate cloud's various offerings.

In particular, it will also impart participant an in-depth knowledge of cloud computing – architectures, technologies, application development on clouds, emerging cloud standards, and performance monitoring and evaluation. The program will provide participants essential skills to examine cloud computing as well the technologies and framework that support cloud computing, the ability to apply cloud computing in different application contexts, and the ability to review and recommend suitability of, as well as implications of, cloud computing for a given application considering several technical and non-technical aspects.

Participants will gain requisite skills to review in-depth a variety of currently available cloud computing options, satisfactorily address the issue and challenges, develop cloud-based applications, offer cloud computing services, and deploy applications in clouds, addressing the cloud challenges. In addition, participants will develop the following skills:

- Develop an understanding of business aspects of cloud computing including decisions/issues in its successful adoption.
- Understand the impact and changes of cloud computing on IT Service Management.
- Identify the possible risks involved in cloud computing and the risk mitigation measures.

Course Outcome

- An in-depth understanding of cloud computing service models, deployment models, architecture with cloud service providers and the business aspects of adapting cloud into organization

- Understand the various reasons behind cloud application deployment considerations, cloud economics and ROI with case studies

- Acquire knowledge on virtualization, identity management, cloud testing, cloud monitoring and management

- Understand cloud security and privacy issues

- Learn the complete process of how to build and manage a private cloud with real time scenarios

- Learn IaaS and PaaS cloud tools including cloud infrastructure management, cloud coding/programming and application deployment capabilities

JOB ROLES IN NICF / TARGETED AUDIENCE

- Cloud Operations Engineer

- Cloud Infrastructure Engineer

- Cloud Operations Manager

- Information/ Database Architect

- Infrastructure Architect

- Integration Architect

- IT Professionals

- IHL students

- Cloud Software Engineer (Solution/Database)

PRE-REQUISITES

Participants are recommended to have prior knowledge and/or understanding in Cloud Computing.

PROGRAM STRUCTURE

Certified Cloud Computing Specialist is a 5-day intensive training program with the following assessment components.

       Component 1.   Written Examination (MCQ)

       Component 2.   Project Work Component (PWC)

These components are individual based. Participants will need to obtain 65% in both the components in order to qualify for this certification. If the participant fails one of the components, they will not pass the course and have to re-take that particular failed component. If they fail both components, they will have to re-take the assessment.

COURSE SESSION SCHEDULE

Day	Session 1 (9:00 – 10:30)	Session 2 (10:40 – 12.40)	Session 3 (13:40 – 14:10)	Session 4 (14:10 – 18:10)
Day 1	Cloud Computing: Concepts and Overview	Cloud Computing: Concepts and Overview	Cloud Computing: Concepts and Overview	A Closer Look: Cloud Computing
Day 2	Session 1 (9:00 – 10:30) — Cloud Computing: Service & Deployment Models	Session 2 (10:40 – 12.40) — Cloud Computing: Service & Deployment Models	Session 3 (13:40 – 14:10) — Cloud Computing: Service & Deployment Models	Session 4 (14:10 – 18:10) — Cloud Architecture
Day 3	Session 1 (9:00 – 10:30) — Cloud Service Providers & Services	Session 2 (10:40 – 12.40) — Cloud Service Providers & Services	Session 3 (13:40 – 14:10) — Cloud Service Providers & Services	Session 4 (14:10 – 18:10) — Business Aspects of Cloud Computing & Adoption
Day 4	Session 1 (9:00 – 10:30) — Cloud Application deployment considerations	Session 2 (10:40 – 12.40) — Cloud Application deployment considerations	Session 3 (13:40 – 14:40) — Cloud Application deployment considerations	Session 4 (14:40 – 18:40) — Cloud Computing: Economics and ROI
Day 5	Session 1 (9:00 – 10:30) — Building a Private Cloud	Session 2 (10:40 – 12.40) — Building a Private Cloud	Session 3 (13:40 – 15:10) — Building a Private Cloud	Session 4 (15:10 – 17:40) — CCCS examination

COURSE OUTLINE

Cloud Computing: Concepts and Overview

- History of Computing

- Introduction: Cloud Computing

- Hype Cycle: Cloud

- The Beginning of Cloud Computing & Evolution

A Closer Look: Cloud Computing

- Definition & Concepts

- Five Characteristics: NIST

- The Cloud Cube model

- Benefits & Demerits of cloud computing

- Foundation & Precursors: Cloud Computing

  - Utility Computing

  - Grid Computing

  - Autonomic computing

  - Platform Virtualization

  - Service Oriented Architectures

Cloud Computing: Service & Deployment Models

- Cloud: Service Models

  - SaaS

  - PaaS

  - IaaS

  - Other significant service models

  - Market Trends and Abstract Interaction Dynamics for XaaS

- The Cloud Reference Model

- Scope of Control: Service Models

- Deployment Models

  - Private cloud

  - Community cloud

  - Public cloud

- Hybrid cloud
- Cloud Computing: The need
  - Implications for business
  - Impact of cloud on business operations
- Open Cloud Manifesto
- Cloud Washing

Cloud Architecture

- Architecture Basics
- SPI Model
- High Level Architectural Approach
- Cloud Reference Model
- A zoomed architecture: Case Study
- Cloud Storage
  - Pay-per-use model
  - Software agnostic
  - Reservation-less provisioning
  - Provider owned
- Scope of Control: Service Models
- SaaS, PaaS and IaaS in Detail

Cloud Service Providers & Services

- Scope for Cloud Service Providers
- Cloud Computing Taxonomy
- Cloud Overview
  - Microsoft
  - Amazon
  - Google
  - Others
  - Comparison of Service Providers
- Common Questions for choosing Service Provider
- Open Source Cloud Platforms

- SaaS, PaaS and IaaS Service Providers in Details

Business Aspects of Cloud Computing & Adoption

- Cloud Adoption Drivers

- Creative Destruction Theory

- A business strategy based on agility

- Potential Candidates for Cloud Computing

- Key Characteristics: Cloud Adoption

- Service Providers: What to look for?

- Business Aspects

  - Cloud-based Business network

  - Implications of the transition to Cloud Computing

Cloud Application deployment considerations

- Cloud Computing Problems

- Loss of Control in the Cloud

- Taxonomy of Fear

- Seven Cloud Risks – Gartner

- Threats and vulnerabilities

- Common networked system attacks

- Cloud Service Provider Risks

- Privacy Issues: Cloud Computing

  - Data life cycle

  - Storage

  - Retention

  - Destruction

  - Auditing, monitoring and risk management

  - Privacy breaches

  - Who is responsible for protecting privacy?

- Security in Cloud

  - Security Breaches

- Security management

- Multi Level Cloud Security

- Stakeholder Perspective

- Case Study

- Information Classification

    - Integrity of information stored in cloud

- Amazon EC2 outage

Cloud Computing: Economics and ROI

- New Economics of IT

- Measuring the Cloud's value

- The Ten laws of Cloudonomics

- The Ten laws of Behavioral Cloudonomics

- Cost of Cloud Computing

- Avoiding capital expenditures

- Total cost of ownership (TCO)

- Identification of Company's Suitability for Cloud

- Cloud ROI

Case Studies: Cloud Computing

- SaaS Case Study

- PaaS Case Study

- IaaS Case Study

Virtualization & Other Technologies

- Introduction: Virtualization

- Types

    - Platform virtualization

    - Resource virtualization

- Uses of virtualization

- Evolution of Virtualization

- Traditional Server Concept Vs. Virtualization

- Approaches to Platform Virtualization

    - Emulation or simulation

    - Native virtualization and full virtualization

    - Paravirtualization

    - Operating system-level virtualization

- Hypervisor – Types

- Resource Virtualization

- Storage Virtualization in Detail

- Block Virtualization: Deployment Models

    - Host Based

    - Storage device-based

    - Network Based Virtualization

- Abstraction Methods

    - Disk address redirection

    - Mapping Table

    - I/O redirection

- Key Players: Virtualization

- Case Study: Virtualization @ Dell

Cloud Computing: Security, Privacy and Risks

- Security: Introduction

- Defining Security in Cloud

- Infrastructure Security: The Network Level

- Data Security and Storage

- Customer and CSP Responsibilities: SaaS, PaaS and IaaS

- Privacy in Cloud

- Virtualization and Security

- SSL in Cloud Computing

- Modeling Risk and Vulnerabilities

- SECaaS: Introduction

- Cloud Audit

Cloud Computing: Identity and Access Management

- Identity and Access Management: Introduction

- The three 'A's: Authentication, Authorization & Auditing

- IAM & Cloud

- On Premise Identity Management Vs. On Cloud Identity Management

  - Kerberos

  - Active Directory

- Identity as a service (IDaaS)

- Standards

Cloud Monitoring, Management & Testing

- Cloud Testing

- Forms of Cloud-Based Software Testing

- Types of Testing

- Steps for Cloud Testing (Wiki)

- Testing as a Service (TaaS)

- Monitoring & Management

Pricing of Cloud Services and SLA in Cloud

- Cloud Services Pricing Pyramid

- Pricing for XaaS

- Service Level Agreement

  - Common performance metrics

  - Rules of thumb on reliability

- SLA

  - Google App

  - Microsoft

  - Amazon

Building a Private Cloud

- Private Cloud: Basics

- Types

    - Internal Private Cloud

    - External Private Cloud

    - Virtual Private Cloud

- Virtualization & Private Cloud

- Preferred components in Private Cloud: Gartner

- Setting up Private Cloud

    - Capacity Planning

    - Security

    - The case for management tools

    - Hurdles in building private cloud

- Issues in Private Cloud: Organizational Readiness, Designing Private Cloud

- Designing Private Cloud

    - Consolidated Infrastructure

    - Dynamic Resource Pooling

    - Resource Management

    - Self Service interface

    - IT Service Management

    - Metered Service

- Case Study: Case: Creating a Private Cloud with System Center 2012

HANDS-ON

Participants will have guided hands-on sessions on cloud to get firsthand knowledge about clouds and skills needed to explore and evaluate different types of computing clouds and to deploy cloud computing applications on chosen clouds. During this session they will gain understanding of several current offerings from cloud providers and evaluate their merits and demerits.

The program consists of two sessions of hands-on, three hours duration each.

Hands-on 1: Understanding the business benefits of cloud platforms such as IaaS, PaaS and SaaS. Working with Google App Engine, a PaaS cloud platform to appreciate the development/deployment of sample applications meeting specific business requirements – communication, collaboration, and other business applications.

Hands-on 2: Real-time explorations on private cloud IaaS setup and configuration using an open source cloud tool, Open Nebula. The aim is to work on real-time virtualization using open source platform. Participants are expected to install the virtual sandbox cloud infrastructure and also the pre-configured virtual machine OS image on their personal laptop. They would then work on the installed cloud IaaS infrastructure. Participants are also expected to see/use the dashboard, create/launch new VM/instances, perform cloud administrator/user roles, etc.

WRITTEN EXAMINATION

As part of the written examination, each participant will be assessed individually on the last day of the training for their understanding of the subject matter and ability to evaluate, choose and apply them in specific context and also the ability to identify and manage risks. The assessment focuses on higher levels of learning in Bloom's taxonomy: Application, Analysis, Synthesis and Evaluation.

This written examination will primarily consist of 40 multiple choice questions spanning various aspects as covered in the program. It is an individual, competency-based assessment.

Tools/Software used:
- OpenNebula
- Docker
- Kubernetes
- Jenkins