

## NCTA CERTIFIED CLOUDOPS SPECIALIST (NC0-110)

### Who Should Attend

This course helps students understand the management of cloud operation and addresses the application need for compute power, managing CPU scaling, and meeting both structured and unstructured storage requirements. Students will research cloud operations and what it means to be a Certified Cloud Master; deploy and configure various PaaS and IaaS cloud services; employ automation tools such as Chef™ and Puppet® to manage cloud services; explore data import/export techniques and considerations; manage security and compliance in the cloud; and plan and execute a phased cloud migration.

### Course Objectives

Upon successful completion of this course, students will be able to:

- Prepare for and pass the Certified CloudOps Specialist exam (NC0-110).
- Describe cloud operations.
- Plan cloud services implementation.
- Deploy a cloud application with DigitalOcean.
- Deploy a cloud application with Heroku.
- Deploy website and apps with Microsoft Azure.
- Implement Azure Cloud Services with virtual machines.
- Manage Azure applications with Visual Studio.
- Deploy applications with AWS.
- Deploy applications to Opscode Chef.
- Manage Cloud Services with Chef.
- Describe Puppet.
- Implement Rackspace Cloud Servers.
- Import and Export Data from cloud services.
- Manage security and compliance in cloud solutions.
- Plan and execute a phased cloud migration.

### Course Outline

#### DOMAIN 1 – CLOUD SERVICE IMPLEMENTATION

##### 1.1 Identify Common Cloud Concepts and Service Models

- Core Concepts
  - Service Models

- NIST Principles
- Application Technologies (Native vs. Web)
- Service Models
  - SaaS
  - PaaS
  - IaaS
- Implementation Models
  - Public
  - Private
  - Hybrid
- Service Providers
  - Microsoft Azure
  - Amazon Web Services
  - Opscode Chef
  - DigitalOcean
  - Heroku
  - Puppet
  - Rackspace

## 1.2 Identify Administrative and Business Requirements for Cloud Services.

- Business Requirements
  - Operational Benefits
  - Legal and Regulatory Requirements
  - Service/Cost Optimization
  - Performance Metrics
  - Local/Cloud Integration
  - Risk Assessment
  - SLA's
- Business Trends
  - Virtualization
  - Pay-Per-Use
  - Grid Computing
- Cloud Computing Trends
  - BYOD
  - Big Data
  - Identity Management and Protection
- Administrator Roles
  - IT vs. Business-Focused

- End-User Roles and Requirements
  - Data Needs
  - User Permissions
  - Incident Management/Issue Tracking

### 1.3 Determine Hardware, Software, and Networking Requirements

- Deployment Planning
  - Phased Deployment
- Hardware Requirements
  - Storage
  - Memory
  - Load Balancing
  - Traffic
- Software Requirements
  - End-User Apps
  - OSs
  - Coding Frameworks
  - Web Servers
  - Legacy Software Migration
- Software Updates/Upgrades
- Network Topologies
- Geographical Footprint

### 1.4 Plan Automation and Configuration Management

- Benefits of Automation
- Remote Management
- IPMI
- Puppet

### 1.5 Determine Support and Resource Needs

- Support Resource Types
  - Technical
  - Organizational

## DOMAIN 2 – CLOUD APPLICATION DEPLOYMENT AND MANAGEMENT

### 2.1 Identify Cloud Operation Considerations

- Local File Systems
- Cookies
- HTTP Sessions

- Port Uses

## 2.2 Identify Common Cloud App Languages and Frameworks

- .NET
- Ruby on Rails
- Java
- PHP
- Python

## 2.3 Deploy Apps to Specific Platforms

- DigitalOcean App Deployment
  - Droplets
  - DigitalOcean API's
  - One-Click Apps
    - Mumble
    - Drupal
    - WordPress
- Heroku App Deployment
  - Dynos/Dyno Management
    - Slugs
    - Buildpacks
  - Ephemeral File System
  - Command Line Logging
  - Heroku Routing
  - GitHub Integration
  - Heroku Toolbelt
  - Git Bash
- Azure App Deployment
  - Azure App Services
    - Azure Active Directory
    - Caching
    - CDN
    - Queues
    - Media Services
  - Azure Compute Emulator
  - Azure Marketplace
  - Azure Management Portal
  - Azure vs. Visual Studio/Webmatrix
  - Publish Profiles

- Opscode Chef App Deployment
  - Nodes
    - Cloud-Based
    - Physical
    - Virtual
    - Network
  - Chef Implementation Components
    - Recipe
    - Cookbook
    - Run List
    - Data Bag
  - The Chef Usage Model
  - Ohai
  - Knife

## **DOMAIN 3 – CLOUD WEBSITE AND WEB SERVICE DEPLOYMENT AND MANAGEMENT**

### **3.1 Identify Web Deployment Methods**

- Web Deploy
- Kudu
- FTP/FTPS
- TFS

### **3.2 Deploy Websites and Web Services to Specific Platforms**

- Azure Web Deployment
  - Azure Resource Manager
  - Azure Storage
  - Azure Databases
    - SQL
    - NoSQL
  - Azure Cloud Services
    - Roles
    - Cloud Service Requirements
  - Traffic Manager
  - Failover/Failback
  - Management Certificates
- AWS Deployment
  - AWS Service Types
    - Network
    - Compute
    - Database

- Storage/Content Delivery
- Performance Monitoring
- AWS Deployment Options
  - CodeDeploy
  - Elastic Beanstalk
  - CodePipeline
  - CloudFormation
  - OpsWorks

### 3.3 Manage Azure Services/AWS with Chef

- Knife Azure
- Azure Command Trees
- OpsWorks
  - Stacks and Layers
  - Recipes and Lifecycle Events
  - Instances

## **DOMAIN 4 – VIRTUAL MACHINES AND CLOUD SERVERS**

### 4.1 Implement VM's on Azure

- Windows/Linux
- Azure Stack
- Azure Virtual Networks

### 4.2 Implement Rackspace Cloud Servers

- OpenStack
- OpenStack Principles
  - Simple and Scalable
  - Apache 2.0 Licensing
  - Hypervisor Support
  - Open Standards
  - Open Design Process
- OpenStack Offerings
  - Compute
  - Object Storage
  - Imaging
  - Network
- RackSpace Cloud
- RackSpace Cloud Services
  - Databases

- Sites
- Servers
- Files
- Private Cloud

## DOMAIN 5 – SECURITY AND COMPLIANCE

### 5.1 Identify Common Cloud Security Issues

- User Group Security Ownership
  - End-User
  - Cloud Operator
  - Service Provider
- Threat Types
  - Abuse/Nefarious Actors
  - Malicious Behavior (Insider)
  - Third-Party Technical Failures
  - Hackers
  - Data Loss
- Security Vulnerabilities
  - Operating Systems
  - Hypervisors
  - Load Balancers
  - Hardware
  - Software/Systems

### 5.2 Implement and Manager Cloud Security Solutions

- SSH
  - Public / Private Keys
- Layered Security
  - Controls and Tools
    - WatchGuard
    - McAfee
    - Trustwave
    - Cisco
  - Defense In Depth

### 5.3 Manage Cloud Solution Compliance

- Compliance Types

- Legal/Legislative
  - HIPAA
  - SOX
  - FISMA
  - PCI-DSS
- Self-Imposed
- Compliance Tools and Specifications
  - GRC
  - AWS Config
  - Google Security Model
    - CloudAudit