STRANDS AND STANDARDS
CLOUD COMPUTING

Course Description
Understanding cloud technologies tops the list of most important skills for any developer, system administrator or network computing professional seeking a lucrative career in technology. However, getting started and researching all things related to cloud infrastructure technologies can be complicated and time-consuming. This course maps out the entire cloud landscape and explains how various tools and platforms fit together.
This course gives you a primer on cloud computing and the use of open source software to maximize development and operations.

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<th>Intended Grade Level</th>
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ADA Compliant: April 2019
**STRAND 1**

The Basics of Cloud Computing

**Standard 1**
Virtualization
- KVM
- VirtualBox
- Vagrant

**Standard 2**
Infrastructure as a Service (IaaS)
- Amazon EC2
- Azure Virtual Machine
- DigitalOcean
- Google Compute Engine
- OpenStack

**Standard 3**
Platform as a Service (PaaS)
- Cloud Foundry
- Openshift
- The Heroku Platform

**Performance Skills**
Explain how different components of cloud computing work together.

**STRAND 2**

Why Containers are becoming mainstream – Project Moby

**Standard 1**
Micro OSes for Containers
- Atomic Host and Red Hat CoreOS
- VMWare Photon
- RancherOS

**Standard 2**
Container Orchestration
- Docker Swarm
- Kubernetes
- Deploying Containers with Mesos
- Nomad by HashiCorp
- Kubernetes Hosted Solutions
- Amazon ECS
Standard 3
Unikernels

Standard 4
Microservices

Standard 5
Software-Defined Networking and Networking for Containers.
- Software-Defined Networking (SDN)
- Networking for Containers
- Docker Single-Host Networking
- Docker Multi-Host Networking
- Docker Network Driver Plugins
- Kubernetes Networking
- Cloud Foundry: Container to Container Networking

Standard 6
Software-Defined Storage and Storage Management for Containers.
- Ceph
- GlusterFS
- Storage Management for Containers
- Volume Plugins for Docker
- Volume Management in Kubernetes
- Container Storage Interface (CSI)
- Cloud Foundry Volume Service

Performance Skills
Explain why the container technology is becoming mainstream.

STRAND 3
DevOps and Continuous Integration/Continuous Deployment (CI/CD)

Standard 1
Introduction and Learning Objectives
- CI/CD: Jenkins
- CI/CD: Travis CI
- CI/CD Shippable
- CI/CD: Concourse
- Cloud Native CI/CD

Standard 2
Tools for Cloud Infrastructure 1 (Configuration Management)
- Ansible
- Puppet
• Chef
• Salt Open

**Standard 3**
Tools for Cloud Infrastructure 2 (Build and Release).
• Terraform
• BOSH

**Standard 4**
Tools for Cloud Infrastructure 4 (Key – Value Pair Store).
• etcd
• Consul

**Standard 5**
• Building Docker Images
• Packer

**Standard 6**
Tools for Cloud Infrastructure 6 (Debugging, Logging, and Monitoring for Containerized Applications).
• Sysdig
• cAdvisor and Heapster
• Fluentd
• Datadog
• Prometheus

**Performance Skills**
• Explain DevOps and Continuous Integration/Continuous Deployment (CI/CD).
• Deploy applications with just one click.
• Differentiate between and use various tools for cloud infrastructure technology.

**STRAND 4**
The skill set required to meet business needs with modern cloud computing technologies and the challenges associated with the adoption of the cloud.

**Standard 1**
Features and Implementation of Service Mash
• Envoy
• Istio
• Linkerd

**Standard 2**
Internet of Things.
Standard 3
Serverless Computing
- AWS Lambda
- Google Cloud Functions
- Azure Functions
- Serverless and Containers

Standard 4
OpenTracing - Jaeger

Standard
How to Be Successful in the Cloud
- Developing Skills and Challenges

Performance Skills
- Describe the skill set required to meet business needs with modern cloud computing technologies.
- Discuss the challenges associated with the adoption of the cloud.

Skill Certificate Test Points by Strand

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