

Interagency Committee for Apprenticeship (IACA)
Occupational Framework for Registered Apprenticeship

Name of Subcommittee:	Click or tap here to enter text.
Occupation	Cloud System Administrator
Job titles	Cloud Administrator, Cloud Operations Specialist
O*NET Codes (include for each job title)	15-1151.00
RAPIDS Codes	2085 CB
Created	March 2021
Revision Timeline	

EEO CONSIDERATIONS

Include here considerations to expand access to the proposed apprenticeable occupation(s) for California's historically underrepresented and underutilized populations through strategic outreach, recruitment, selection, use of pre-apprentice linkage and/or other support. This may include:

- 1. Description of key barriers to entry and/or advancement in this proposed apprenticeable occupation(s) for California's historically underrepresented and underutilized populations.*
- 2. Description of internal processes that ensure equity and inclusion in access and promotion for this proposed apprenticeable occupation(s) for California's historically underrepresented and underutilized populations.*
- 3. Identification of relevant pre-apprentice linkage agreements.*
- 4. Any relevant participant reporting showing inclusion rates of underrepresented and underutilized populations.*

This statement should be reviewed by the EEOC and Pre-Apprenticeship Subcommittees before submission to IACA.

1. LENGTH OF TRAINING

Minimum length of program and hours of OJT

Type	Hours
Classroom Training	Click or tap here to enter text.
On-The-Job Training	Click or tap here to enter text.
Total Hours	Click or tap here to enter text.

2. PROGRAM TYPE

Detail industry definition and criteria for “Competency-Based” and “Hybrid” programs for this occupation.

☐ Competency-Based

☐ Hybrid

Comments: Click or tap here to enter text.

3. CERTIFICATIONS, LICENSURE, AND OTHER CREDENTIAL REQUIREMENTS

List of credential details including Earned Before, During or After Apprenticeship. This should include identifying licensure requirements for occupations in information technology and other industries where there is DCA oversight.

Certification Name	Type	Credentialing Agency(s)
Network+ (or equivalent)	Before	CompTIA
Security+ (or equivalent)	Before	CompTIA
Linux + (or equivalent)	Before	CompTIA
*Cloud Essentials+ (or equivalent)	Before (optional)	CompTIA
Microsoft Certified Solutions Expert (MCSE)	Before (optional)	Microsoft
*Google Cloud Platform (GCP)	Before	Google
*Certified Solutions Architect – Associate	Before	AWS
Server+ (or equivalent)	During	CompTIA
Cloud+ (or equivalent)	During	CompTIA
Cloud Administrator	During	AWS, Microsoft, Google)
Certified Solutions Architect - Professional	After	AWS

**Recommend securing at least one of the cloud industry certifications before entering a Registered Apprenticeship Program for this occupation.*

4. JOB FUNCTION 1: Deploy, configure, and manage cloud services and infrastructure that support specific business processes

Competencies	Core or Optional	RSI (classroom)	OJT (work-based)	Type of Test
Identifies, supports client needs for networking, Windows, Linux, security, devices, deployment, and databases	Core	No	Yes	
Performs support case management using ticket management and documentation	Core	No	Yes	
Performs client database configuration tasks	Core	Yes	Yes	
Deploys and configures a cloud service	Core	Yes	Yes	
Configures virtual networks with IP Address Range, subnets, routing tables and gateways.	Core	Yes	Yes	
Applies knowledge of the differences or similarities between Private, Public, and Hybrid Cloud Implementations.	Core	Yes	Yes	
Applies knowledge of the difference or similarities between Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS) models.	Core	Yes	Yes	
Applies knowledge of microservices and containerization (e.g. Kubernetes, Terraform, CloudFormation and Docker).	Core	Yes	Yes	
Applies understanding of cloud regions and zones.	Core	Yes	Yes	
Applies working knowledge of the different cloud computing database types, how to scale a cloud database, and fail-over best practices.	Core	Yes	Yes	

Competencies	Core or Optional	RSI (classroom)	OJT (work-based)	Type of Test
Applies knowledge of cloud block, object, and file storage.	Core	Yes	Yes	
Deploys cloud storage technologies.	Core	No	Yes	
Analyzes and troubleshoots different cloud storage technologies.	Core	No	Yes	
Performs database maintenance and development.	Optional	No	Yes	
Connects to SQL databases and retrieve data through queries	Core	Yes	Yes	
Manages partitions, file systems, packages and repositories, and kernel service	Core	Yes	Yes	
Implements solutions using bash/shell scripts	Core	Yes	Yes	
Troubleshoots network communication problems	Core	No	Yes	
Deploys a virtual machine using a machine image	Core	Yes	Yes	
Prepares and deploys a cloud database solution that meets application requirements	Core	Yes	Yes	
Deploy a containerized application.	Core	Yes	Yes	

5. JOB FUNCTION 2: Maintain and troubleshoot cloud computing infrastructures

Competencies	Core or Optional	RSI (classroom)	OJT (work-based)	Type of Test
Analyzes and troubleshoots cloud virtual networks.	Core	Yes	Yes	
Analyzes cloud IAM (Identity and Access Management) and applying permissions for IAM user(s).	Core	Yes	Yes	
Applies permissions for IAM Group(s).	Core	No	Yes	
Use a high-level programming language (e.g. Python) to configure and maintain cloud services	Core	Yes	Yes	
Troubleshoots network topologies and VLAN configurations	Core	Yes	Yes	
Administers, maintain, and troubleshoots web servers running on Apache and IIS	Optional	Yes	Yes	
Troubleshoot configuration and communicate issues/gaps in the cloud infrastructure make recommendations to resolve the issue.	Optional	Yes	Yes	
Troubleshoot access and permissions issues	Core	No	Yes	

6. **JOB FUNCTION 3: Knowledge and application of cloud security protocols and best practices**

Competencies	Core or Optional	RSI (classroom)	OJT (work-based)	Type of Test
Applies security protocols to web servers	Core	Yes	Yes	
Performs incident management and response	Core	No	Yes	
Performs basic forensic investigations	Core	Yes	Yes	
Configures access controls and modify firewall settings	Core	Yes	Yes	
Hardens networks and performs intrusion detection and prevention	Core	Yes	Yes	
Configures cloud users, groups, roles and policies using identity and access management (IAM) for access control	Core	Yes	Yes	
Applies best practices for cloud computing shared security responsibility model.	Core	No	Yes	
Applies key security, incidence response, and privacy monitoring when considering or implementing a cloud infrastructure.	Optional	No	Yes	
Applies cyber ethics best practices	Core	Yes	Yes	
Uses cloud security tools offered by organizations like Microsoft, AWS, and Google.	Core	No	Yes	

7. JOB FUNCTION 4: Identify and define technical requirements for cloud migration

Competencies	Core or Optional	RSI (classroom)	OJT (work-based)	Type of Test
Discuss the pros or cons behind using the various cloud frameworks.	Core	Yes	No	
Identify key management and operational challenges potentially faced when considering or implementing a cloud capability of cloud framework concepts, their selection and use.	Optional	No	Yes	
Explain how different data exchange technology are impacted in a cloud migration	Core	Yes	No	
Work within a project team and communicate effectively (written and oral) within and among team members and stakeholders (i.e. different audiences and organizational levels) to identify technical and functional req'ts	Core	No	Yes	
Analyzes and interprets user/client input for expressed and implied requirements.	Core	Yes	Yes	
Reads and interprets technical documents, diagrams, and decision trees	Core	No	Yes	
Measures, analyzes, and makes recommendations based on data.	Optional	Yes	Yes	
Assists clients with migrating and integrating multiple applications to the cloud	Core	Yes	Yes	

8. JOB FUNCTION 5: Optimize performance of core cloud computing services

Competencies	Core or Optional	RSI (classroom)	OJT (work-based)	Type of Test
Monitors and optimizes web server performance	Core	Yes	Yes	
Discuss and explain benefits of auto scaling and load balancing, high availability factors (fault-tolerance, recoverability, and scalability).	Core	Yes	No	
Explain the term resilience and how resilience can be designed into a project, program, infrastructure, or organization.	Core	Yes	No	
Discuss and explain the concept of Service Level Agreements and benchmarks, why they are used, when they are used, and its application within cloud implementations.	Core	Yes	No	
Identify and document root cause failure(s) for items that failed or partially passed	Core	Yes	Yes	
Document results of test cases showing success criteria and status	Core	No	Yes	
Use SysOps tools to enhance and monitor infrastructure performance	Core	Yes	Yes	
Deploy and configure highly-availability and cloud-based solutions for business continuity.	Core	Yes	Yes	
Monitors automated jobs and background processes	Core	Yes	Yes	

LIST OF NAMES OF SUB-COMMITTEE MEMBERS

Must include industry representatives of employers and employees.

Dr. Keith Clement
Kenneth Anyanwu
Miriam Farnbauer
Michael Specchierla
Meredith Stowell
Annie Tahtinen
Katherine Webster
Olivia Herriford
Keith Koo
Liga Hallstrom
Paul Giacomotto
Tsegay Arefaine
Jennifer Prado

Comments, Suggestions, and Feedback: