All About Kubernetes Certification Programs

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Why Participate?

**Individuals**

Certification allows Administrators and Developers to establish credibility, expertise and value in the competitive job market (not to mention keywords!)

**Partner Organizations**

Differentiate your professional services organization by demonstrating expertise in helping enterprises adopt Kubernetes

**Platform Vendors**

Gives end users the confidence that when they use a Certified Kubernetes product they can rely on a high level of common functionality

Gives Independent Software Vendors confidence that if their customer is using a Certified Kubernetes platform that their software will behave as expected
The Programs

Certified Kubernetes Administrator (CKA) Program
Focuses on the deployment, configuration, and troubleshooting skills required to successfully administer a Kubernetes cluster

Certified Kubernetes Application Developer (CKAD) Program
Focuses on defining application resources and using core primitives to build, monitor, and troubleshoot applications in Kubernetes

Kubernetes Certified Service Provider (KCSP) Program
Partner organizations that offer Kubernetes support, consulting, professional services and training

Certified Kubernetes Conformance Program (CKCP)
Ensures vendor versions of Kubernetes support the required APIs and guarantees interoperability from one Kubernetes installation to the next
Candidates demonstrate their competence by solving a set of performance-based problems in a command-line environment that tests their Kubernetes Administrator and Application Developer skills

CKA includes 24 problems
CKAD consists of 19 problems

Online, proctored exam – take your test from any computer with reliable internet and a webcam (a quiet environment is recommended)

CKA candidates have 3 hours to complete the exam
CKAD candidates have 2 hours to complete the exam

Candidates may use their browser to access information at https://kubernetes.io/docs/ or https://kubernetes.io/blog/

CKA was the first of the programs and currently most popular—more than 3200 registrations for the CKA exam as of Oct 2018
CKA / CKAD Exam Details

How much do the exams cost?
Each exam is $300 USD and include a free retake

What version of Kubernetes is used in the exam?
Quarterly exam updates match Kubernetes releases so that the exam reflects the latest version of Kubernetes

How are the exams proctored?
Remotely via streaming audio, video, and screensharing, allowing proctors to view candidates’ desktops

What language(s) are the exams offered In?
The CKA and CKAD exams are currently offered in English only

How are the exams scored?
Scoring is automated and results are emailed within 36 hours from the time that the Exam was completed and

How long is the certification valid?
The certification is valid for 2 years starting on the date the exam is passed
What's on the CKA Exam?

**Application Lifecycle:** rollouts and rollbacks, scaling - 8%

**Installation, Configuration & Validation:** HA cluster config, install from binaries, infra deployment - 12%

**Core Concepts:** API primitives, cluster architecture, network primitives - 19%

**Networking:** Ingress, cluster DNS, Pod and node networking configuration, load balancing - 11%

**Scheduling:** using labels for scheduling, DaemonSets, configure one or more schedulers - 5%

**Security:** configure authN & authZ, NetworkPolicies, set up TLS certificates for cluster components - 12%

**Cluster Maintenance:** cluster upgrades, backup and restore procedures - 11%

**Logging / Monitoring:** monitor & manage logs for cluster components and applications - 5%

**Storage:** PersistentVolumes, PersistentVolumeClaims, volume access modes - 7%

**Troubleshooting:** application and cluster component failure, network troubleshooting - 10%

There may be more than one way to solve a given problem; with only 7 minutes per question, utilize the quickest solution!

For example, installing Kubernetes can be done a number of ways, which is best?
What's on the CKAD Exam?

**Core Concepts**: API primitives & basic Pods - 13%

**Configuration**: resource requests & limits, SecurityContexts, ConfigMaps, Secrets, ServiceAccounts - 18%

**Multi-Container Pods**: ambassador, adapter, and sidecar patterns - 10%

**Observability**: liveness & readiness probes, logging, monitoring - 18%

**Pod Design**: rollouts & rollbacks, Jobs & CronJobs, metadata (labels, selectors, annotations) - 20%

**Services & Networking**: Service configs, NetworkPolicies - 13%

**State Persistence**: PersistentVolumeClaims - 8%

Practice the most efficient techniques for creating, editing, and patching specs

Use imperative commands and flags to avoid yaml

The CKAD only allows 6 minutes per question!
How Heptio Engineers Ace the Certified Kubernetes Administrator Exam

Read the Manual – CKA website, FAQ, Candidate Handbook

Study the Learning Materials – Linux foundation training, *Kubernetes Up & Running* by Hightower, Burns, and Beda

Practice, Practice, Practice – with Kubernetes the Hard Way, Kubernetes from Scratch docs and the Katacoda interactive browser-based scenarios

– Ross Kukulinski, Heptio

**Exam curriculum guides:** https://github.com/cncf/curriculum

**Certification FAQ:** https://www.cncf.io/certification/cka/faq/

**Candidate Handbook:** https://www.cncf.io/certification/candidate-handbook

**Exam tips:** https://www.cncf.io/certification/tips

**Kubernetes from Scratch:** https://kubernetes.io/docs/setup/scratch/

**Kubernetes Up & Running:**
http://shop.oreilly.com/product/0636920043874.do

**Kubernetes the Hard Way:**
https://github.com/kelseyhightower/kubernetes-the-hard-way

**Katacoda Interactive Browser-Based Scenarios:**
https://www.katacoda.com/courses/kubernetes
Get Trained!

Introduction to Kubernetes (LFS158) – free edX course!!
https://www.edx.org/course/introduction-to-kubernetes#!
   Online, self-paced, ~15 hours of content

Kubernetes Fundamentals (LFS258)
https://training.linuxfoundation.org/training/kubernetes-fundamentals/
   Online, self-paced, 35 hours of content, including hands-on labs and videos
   Includes 12 months of access

Kubernetes for Developers (LFD259)
https://training.linuxfoundation.org/training/kubernetes-for-developers/
   Online, self-paced, 35 hours of content, including hands-on labs and videos
   Includes 12 months of access

Kubernetes Administration (LFS458)
https://training.linuxfoundation.org/training/kubernetes-administration/
   Instructor-led training delivered online or in-person by Linux Foundation instructors
   and/or authorized training partners
   Designed as preparation for the Kubernetes Certified Administrator Exam
KCSP Program Details

Program requirements:

- Three or more engineers who pass the CKA exam
- Demonstrable activity in the Kubernetes community
- A business model to support enterprise end users
- CNCF membership

Benefits to participating organizations:

- Placement on the Kubernetes partner web page
- Monthly meetings with the TOC, CNCF project leadership and Governing Board
- Access to leads from end users inquiring about support

Benefits to engaging a KCSP services organization:

- Proven expertise helping enterprises move to a cloud native platform
- Trusted and vetted partner to support your production and operational needs
- Demonstrated ability distributing and operating Kubernetes
Software Conformance

There are currently over 80 Kubernetes platforms and distributions!

**Guaranteed Portability & Interoperability**: conformance ensures that vendor versions of Kubernetes support the required APIs so that user workloads can run without having to test against every K8s environment.

**Timely Updates**: certification is versioned, as Kubernetes architecture changes, certification requirements will change. Platforms must complete a recertification each year for the current or previous version of Kubernetes to remain certified.

Previously certified implementations remain certified as long as a newer version is certified at least once a year.

**Confirmability**: end users can confirm that their distribution or platform remains conformant by running the identical open source conformance application (Sonobuoy) that was used to certify.
Finding a Certified Vendor

Look for the logo! Most vendors are proud of their certification.

CNCF manages a spreadsheet of certified distributions and platforms: https://docs.google.com/spreadsheets/d/1LxSqBzjOxfGx3cmtZ4EbB_BGCxT_wlxW_xgHVVa23es/

A **Distribution** is software based on Kubernetes that can be installed by an end user on to a public cloud or bare metal and includes patches, additional software, or both.

A **Hosted** platform is a Kubernetes service provided and managed by a vendor.

An **Installer** downloads and then installs vanilla upstream Kubernetes.

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| CoreOS        | X   | X   | X   |      |      |      | X    | 3 CoreOS        | Distribution       | Tectonic                              |
Achieving Conformance

Confirm through self-testing (https://github.com/cncf/k8s-conformance/blob/master/instructions.md) that the platform/distribution/installer is a qualifying offering

Submit and have results accepted by the CNCF

Abide by the terms and conditions of the Conformance Program (https://github.com/cncf/k8s-conformance/blob/master/terms-conditions/Certified_Kubernetes_Terms.md), including subsequent re-testing

End user independent tests must pass; if an end user test fails, you must fix issues it identifies