Kubernetes Conformance - Shanghai

Hosted by the CNCF.

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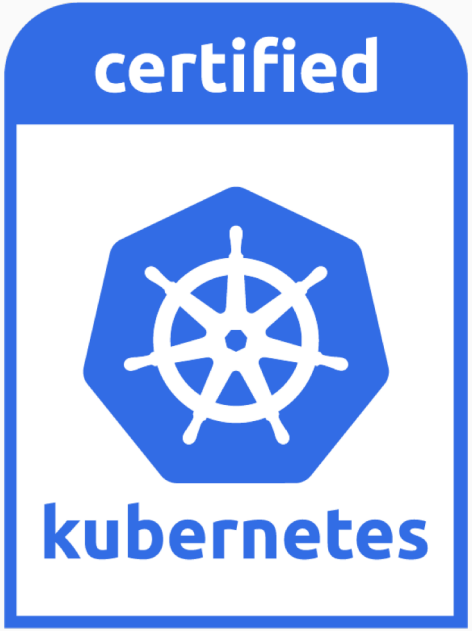
Certification Program

Certified Kubernetes is a software conformance program.

Vendors can certify with CNCF that their Kubernetes products conform to the community test suite.

Launched in Nov 2017, by now more than 80 platforms have been certified



Goals of the Conformance Group

Certification Program:

We all win when user expectations are met. Establish and maintain a Conformance Certification program to drive this.

Improve Conformance Coverage:

Ensure that Conformance covers enough functionality to be meaningful to users.

Goals of Conformance

Consistency, Portability:
End users are able to describe workloads in a common format, and run them everywhere.

Predictability, Behave as expected:
End users can rely on a high level of common functionality.

Participant Requirements

1. Determine goods and services
2. Self-testing for Qualifying Offerings
3. Submit signed Participation Form to LF
4. Submit self-testing results and get accepted
    a. Send pull request to github.com/cncf/k8s-conformance
5. Pay fees (no charge for CNCF members and non-profit organizations)
6. Abide by the terms and conditions

Key Conditions

- Eligible Versions
  - Latest two minor releases
  - E.g. k8s v1.13, v1.14
- Conformance time Period
  - Remains valid up to 12 months after release version that certified
  - Platforms must complete recertification each year with latest two minor versions

E.g. A company “Acme” initially certified its product with v1.7.0 (released on June 30, 2017).
On June 30, 2018, latest minor releases are v1.11.0 and v1.10.5
On or before June 30, 2018, company “Acme” needs to recertify with v1.11.0 or v1.10.5 (or v1.9.9 before v1.11.0 released)

- End user reproducibility
  - End users can run self-tests on a Qualifying Offering themselves
- More details
  - Refer to: Terms and Conditions

Conformance FAQ

- What's the cost of certification?
  - CNCF members: free of charge
  - Commercial organizations (not a CNCF member): same as joining the CNCF
  - Non-profit organizations: free of charge

- How to run self-tests?
  - With kubetest
  - With sonobuoy

Running Conformance Tests with kubetest

```
# ensure kubetest is installed
go get -u k8s.io/test-infra/kubetest

# build test binaries, ginkgo, and kubectl first:
make WHAT="test/e2e/e2e.test vendor/github.com/onsi/ginkgo/ginkgo cmd/kubectl"

# setup for conformance tests
export KUBECONFIG=/path/to/kubeconfig
export KUBERNETES_CONFORMANCE_TEST=y

# Option A: run all conformance tests serially
kubetest --provider=skeleton --test --test_args="--ginkgo.focus=\[Conformance\]"

# Option B: run parallel conformance tests first, then serial conformance tests serially
GINKGO_PARALLEL=y kubetest --provider=skeleton --test --test_args="--
ginkgo.focus=\[Conformance\] --ginkgo.skip=\[Serial\]"
kubetest --provider=skeleton --test --test_args="--ginkgo.focus=\[Serial\].*\[Conformance\]"
```

More details: Conformance Testing in Kubernetes

Running Conformance Tests with Sonobuoy

- Prerequisites
  - Have your k8s cluster ready
  - Have kubectl installed
  - An admin kubeconfig file, and KUBECONFIG environment variable set.
- Run sonobuoy CLI
  - `go get -u -v github.com/heptio/sonobuoy`
  - `sonobuoy run`
- Checkout results
  - Wait until `sonobuoy status` show the run as completed
  - Copy output to a local directory `sonobuoy retrieve {local-dir}`

Adding new conformance tests

Conformance test suite keeps growing on every minor release.

Identify areas of coverage

- Pod spec for example
- Write new tests vs promote old tests

Identify Behavior

- KEP (Behavioral Driven Conformance Testing)

Identify API coverage (proposal)

- Using apisnoop (https://github.com/cncf/apisnoop)

Conformance Test

- Write a e2e test/use existing e2e test
  - Merged by the owning SIG
- Check if that test meets conformance criteria
  - Tests GA feature
  - Works for all providers
  - Works for all architecture
  - Does not rely on internet, other special binaries
  - Stable and Consistent
- Submit PR for SIG Architecture approval

Coverage

Coverage includes many core features

- Node
- Pod
- Volumes
- Networking
- Kubectl
- Security
- ...

Conformance Test Document

Conformance Test

- List of all tests part of each release
- A very high level description of test
- Link to source code
- Versioning information

Conformance document helps

- Coverage
- Basic understanding to help debugging test failures

Example: KubeConformance-1.11

Engage Conformance …

Kubernetes Conformance Program

- CNCF Conformance WG
- Mailing List
- Conformance Office Hours
- Slack: slack.k8s.io #k8s-conformance

Guidelines to Conformance Test Development

Conformance Project Board

Thank You

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