Lessons for Open Source Networking from the Growth of Cloud Native

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Cloud Native Computing Foundation

• Nonprofit, part of the Linux Foundation; founded Dec 2015

Graduated
- kubernetes
  - Orchestration
- Prometheus
  - Monitoring
- envoy
  - Service Proxy
- CoreDNS
  - Service Discovery
- containerd
  - Container Runtime

Incubating
- OPENTRACING
  - Distributed Tracing API
- fluentd
  - Logging
- GRPC
  - Remote Procedure Call
- rkt
  - Container Runtime
- CNI
  - Networking API
- Jaeger
  - Distributed Tracing
- TUF
  - Software Update Spec
- Notary
  - Security

- VITESS
  - Storage
- NATS
  - Messaging
- LINKERD
  - Service Mesh
- HELM
  - Package Management
- ROOK
  - Storage
- Harbor
  - Registry
- etcd
  - Key/Value Store
- Open Policy Agent
  - Policy

• Platinum members:
  - Alibaba Cloud
  - Amazon Web Services (AWS)
  - Cisco
  - Dell Technologies
  - Fujitsu
  - Google Cloud
  - HUAWEI
  - IBM Cloud
  - Intel
  - JD.COM
  - Microsoft Azure
  - Oracle
  - Pivotal
  - Red Hat
  - Samsung
  - SAP
  - VMware
Kubernetes in Search Trends

Google Trends

WeChat

Kubernetes
OpenStack
Mesos
Docker Swarm
Cloud Foundry

Kubernetes
OpenStack
83 Certified Kubernetes Partners
1. Loose coupling

Host a number of loosely integrated projects
2. Minimize toil

Provide the infrastructure for collaboration
3. Market a vision

Show the options but offer a recommended path
Cloud Native Trail Map

Trail Map: lcncf.io

Cloud Native Trail Map

The Cloud Native Landscape (CNCL) has a large number of options. The Cloud Native Trail Map is a recommended process for leveraging open-source cloud-native technologies. At each step, you can choose a vendor-supported offering or do it yourself, and everything after step 5 is optional based on your circumstances.

HELP ALONG THE WAY

A. Training and Certification

Consider training programs from CNCF and then take the exams to become a Certified Kubernetes Administrator or a Certified Kubernetes Application Developer and champion.

B. Consulting Help

If you want assistance with Kubernetes and the surrounding ecosystem, consider leveraging a Kubernetes Certified Service Provider.

cncf/certified

C. Join CNCF’s End User Community

For companies that don’t offer cloud-native services externally.

cncf/enduser

WHAT IS CLOUD NATIVE?

Cloud-native technologies empower organizations to build and run scalable applications in modern, dynamic environments such as public, private, and hybrid clouds. Containers, service meshes, microservices, immutable infrastructures, and declarative APIs are the key to this approach.

These technologies enable loosely coupled systems that are resilient, efficient, and easy to test and monitor. They allow developers to make high-impact changes frequently and predictably with minimal cost.

The Cloud Native Computing Foundation seeks to drive the adoption of these paradigms by fostering and sustaining an ecosystem of open-source, vendor-neutral projects. It also provides a clear and consistent set of patterns to make these technologies accessible for everyone.

1. CONTAINERIZATION

- Containerizing apps with Docker containers
- Any app application and dependencies (even Docker) can be containerized

2. CI/CD

- Gitops for infrastructure automation
- Automated testing, build, and delivery
- Continuous Delivery and integration (CD/CI) automation

3. ORCHESTRATION & APPLICATION DEFINITION

- Kubernetes: The de facto cloud orchestration solution
- You should select a Certified Kubernetes Distribution
- Helm helps manage, install, and upgrade your most complex Kubernetes applications

4. SERVICE DISCOVERY & MESH

- Service discovery to locate applications
- Kubernetes Service, Ingress Controller, and Network Policies

5. SERVICE DISCOVERY, & MESH

- Consul, Kiali, and Prometheus
- Load balancing and monitoring
- Envoy, Linkerd, and more

6. NETWORKING & POLICY

- OpenShift, Kubernetes, or your own fabric
- Kubernetes Policy and Service Mesh

7. DISTRIBUTED DATABASE & STORAGE

- MySQL, NoSQL, and other database choices
- Persistent storage solutions
- Stateful sets and stateful applications

8. STREAMING & MESSAGING

- Vote for Kafka
- Messaging, pub/sub, and more

9. CONTAINER REGISTRY & RUNTIME

- Build with containers
- Container runtime for Kubernetes

10. SOFTWARE DISTRIBUTION

- OpenShift, Kubernetes, or your own fabric
- Software distribution and governance
CNF Testbed

• Open source initiative from CNCF
• Compare performance of:
  – Virtual Network Functions (VNFs) on OpenStack, and
  – Cloud native Network Functions (CNFs) on Kubernetes
• Identical networking code packaged as:
  – containers, or
  – virtual machines (VMs)
• Running on top of identical on-demand hardware from the bare metal hosting company Packet
• See presentation for more information
KubeCon + CloudNativeCon

• Europe 2019 (sponsorships open)
  – Barcelona: May 20-23, 2019

• China 2019 (sponsorships open)
  – Shanghai: June 24-26, 2019

• North America 2019 (sponsorships open)
  – San Diego: November 18-21, 2019
KubeCon + CloudNativeCon Attendance

First CNCF-organized event

- North America
- Europe
- China

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<td>London Mar '16</td>
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<td>Seattle Nov '16</td>
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Please follow up with Dan Kohn
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This presentation is available at:
https://github.com/cncf/presentations