A Brief Update on Cloud Native Telecom

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Cloud Native Computing Foundation

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

Graduated

- kubernetes
  Orchestration
- Prometheus
  Monitoring
- envoy
  Network Proxy
- CoreDNS
  Service Discovery
- fluentd
  Container Runtime
- LINKERD
  Service Mesh
- gRPC
  Distributed Tracing
- OPENTRACING
  API
- HELM
  Package Management

Incubating

- gRPC
  Networking API
- CNI
  Distributed Tracing
- JAEGAR
  Software Update Spec
- TURF
  Security
- Vitess
  Storage
- NATS
  Messaging
- Service Mesh
- Policy
- Key/Value Store
- Container Runtime
- Key/Value Store
- Storage
- Messaging
- Container Runtime
- Key/Value Store
- Storage

• Platinum members:

- Alibaba Cloud
- AWS
- Apple
- CISCO
- Dell Technologies
- FUJITSU
- Google Cloud
- IBM Cloud
- INTEL
- JD.COM
- Microsoft Azure
- Oracle
- Pivotal
- Red Hat
- Samsung
- SAMSUNG SDS
- SAP
- VMware
Cloud Native Trail Map

Trail Map: lcnf.io

1. CONTAINERIZATION
   - Containerizing apps with Docker containers
   - Any on-premises applications (even CDF, I) applications (even CDF). For example, on-premises code can be containerized.
   - Application architecture and development practices.
   - On-premises application and cloud-native applications and writing future functionality in microservices

2. CI/CD
   - Infrastructure as Code (IAC) by defining the infrastructure as code
   - Enabling automation for infrastructure management.
   - Setting up continuous integration/continuous delivery (CI/CD)
   - Setting up a CI/CD pipeline

3. ORCHESTRATION & APPLICATION DEFINITION
   - Kubernetes is an orchestrator for a containerized application
   - You should select a certified Kubernetes Distribution, such as:
     - Helm, which helps you install and upgrade the latest, complete Kubernetes application

4. SERVICE DISCOVERY & MESH
   - Consul/Fluent is a flexible and easy tool that is useful for services discovery
   - Envoy and Linkerd enable services mesh architectures
   - They offer health checking, routing, and load balancing

5. SERVICE PROXY, DISCOVERY, & MESH
   - Consul/Fluent is a flexible and easy tool that is useful for services discovery
   - Envoy and Linkerd enable services mesh architectures
   - They offer health checking, routing, and load balancing

6. DISTRIBUTED DATABASE & STORAGE
   - When you need more resiliency and scalability than you can get from a single database, NoSQL is a good option for running MySQL, or scale through sharding to handle the load
   - The Cloud Native Computing Foundation seeks to drive adoption of this platform by fostering and sustaining an ecosystem of open source, vendor-neutral projects. Its open source state of the art patterns to make those innovations accessible for everyone.

7. CONTAINER REGISTRY & RUNTIME
   - Docker is a registry that stores, signs, and scans container images
   - You can see container container images
   - The most common container registries are Docker Hub, Docker Registry, and GHCR

8. STREAMING & MESSAGING
   - When you need high performance than JMS/WE, consider using Apache Kafka.

9. SOFTWARE DISTRIBUTION
   - If you need to secure software distribution, evaluate a library, or an implementation of The Updated Framework.
Kubernetes in Search Trends

Google Trends

Kubernetes  OpenStack  Mesos  Docker Swarm  Cloud Foundry
115 Companies in the End User Community

Plus 15 non-public members
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
- Please join: https://github.com/cncf/telecom-user-group
## [CNF Testbed] Review of June to Sept 2019

<table>
<thead>
<tr>
<th>Month</th>
<th>Description</th>
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| June 2019 | - Single-node IPsec use case  
            - Planned NSM use case and requirements  
            - Maintenance: version updates and bug fixes  
            - Intro + Deep Dive BoF at KubeCon China |
| July 2019 | - Deutsche Telekom reproduced CNF Testbed  
            - Successfully tested the Intel container kit on Packet  
            - WIP Support for NSM use cases |
| Aug 2019  | - NSM Packet filter use case  
            - WIP NSM Physical NIC Gateway use case  
            - Containerized VPP vSwitch on Mellanox  
            - Maintenance: Fix OpenStack deploy, updates, bug fixes |
| Sept 2019 | - New helm-based use cases: IPsec single node, IPFwd Performance Snake and Pipeline  
            - NSM physical NIC gateway use case  
            - Tutorial + walkthrough using the CNF Testbed |
## [CNF Testbed] Roadmap for Oct 2019 to Jan 2020

<table>
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<tr>
<th>Month</th>
<th>Tasks</th>
<th>Notes</th>
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| Oct 2019 | - NSM IPSec single-node use case  
- NSM 2-node IPsec use case  
- NSM IPFwd Service Chain benchmark test  
- Separate hardware and workload provisioning stages + Kubespray for K8s | [TBD] |
| Nov 2019 | - NSM Hybrid K8s+Openstack use case  
- DANM SR-IOV use case | NSMCon, KubeCon NA (Nov 18-21) |
| Dec 2019 | - NSM SR-IOV Use Case  
- Intel Multus + CPU-Manager use case  
- TBD: Kolla/Openstack-helm (TBD) | [TBD] |
| Jan 2020 | - GSM/5G GW use case with NSM | [TBD] |
The Future of the CNF Testbed

- Evolve the CNF Testbed to be a development platform for CNFs
  - Both open and closed source
- In partnership with OPNFV Verification Program (OVP), explore using the CNF Testbed as a platform for certification
KubeCon + CloudNativeCon

- North America 2019
  - **San Diego**: November 18-21, 2019

- Europe 2020
  - Amsterdam: March 30 - April 2, 2020

- China 2020
  - Shanghai: July 28-30, 2020

- North America 2020
  - Boston: November 17-20, 2020

kubecon.io
KubeCon + CloudNativeCon Attendance

- **North America**
  - SF Nov ’15: 550
  - Seattle Nov ’16: 1,580
  - Austin Dec ’17: 4,100
  - Seattle Dec ’18: 14,800
  - San Diego ’19: 12,000

- **China**
  - London Mar ’16: 1,080
  - Berlin Mar ’17: 1,500
  - Shanghai Nov ’18: 2,500

- **Europe**
  - Copenhagen May ’18: 4,300
  - Barcelona May ’19: 7,700

Total Attendance:
- **23,200**
Please follow up with Dan Kohn

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