



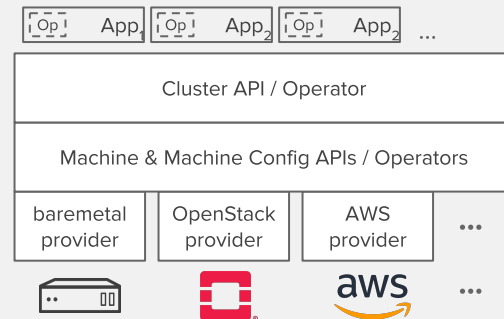
AKRAINO BLUEPRINT FAMILY PROPOSAL “KUBERNETES-NATIVE INFRA FOR EDGE”

2018-12-06

Kubernetes-Native Infra for Edge (KNI-Edge) Family

The KNI-Edge Family unites edge computing blueprints sharing the following characteristics:

- Implement the Kubernetes community's [Cluster API](#)
 - declaratively configure and consistently deploy and lifecycle manage Kubernetes clusters on-prem or public cloud, on VMs or bare metal, at the edge or at the core.
- Leverage the community's Operator Framework for app LCM
 - applications lifecycle managed as Kubernetes resources, in event-driven manner, and fully RBAC-controlled
 - more than deployment+upgrades, e.g. metering, analytics
 - created from Helm Charts, using Ansible or Go
- Optimize for Kubernetes-native container workloads
 - but allow mixing in VM-based workloads via KubeVirt as needed.



KNI-Edge Family - Proposal Template

| Case Attributes | Description |
|--|---|
| Type | New |
| Blueprint Family - Proposed Name | Kubernetes-Native Infrastructure for Edge (KNI-Edge) |
| Use Case | various, e.g.: <ul style="list-style-type: none"> ● Provider Access Edge (Far/Near), MEC ● Industrial Automation ● Enterprise Edge ● ... |
| Blueprint proposed | various; initially: <ul style="list-style-type: none"> ● Provider Access Edge (PAE) ● Industrial Edge (IE) |
| Initial POD Cost (capex) | (depends on blueprint) |
| Scale | 1 to hundreds of nodes, 1 to thousands of sites. |
| Applications | any type of workloads: <ul style="list-style-type: none"> ● containerized or VM-based ● real-time, ultra-low latency or high-throughput ● NFV, IoT, AI/ML, Serverless, ... |
| Power Restrictions | (depends on blueprint) |
| Preferred Infrastructure orchestration | End-to-end Service Orchestration: depends on use case; e.g. ONAP App Lifecycle Management: Kubernetes Operators Cluster Lifecycle Management: Kubernetes Cluster API/Controller Container Platform: Kubernetes (OKD) Container Runtime: CRI-O w/compatible backends VM Runtime: KubeVirt OS: CentOS, CentOS-rt, or CoreOS |
| Additional Details | |

Provider Access Edge (PAE) Blueprint Overview

for vRAN + MEC use cases

Project contributors:

- Red Hat (contact: Frank Zdarsky, fzdarsky@redhat.com)
- Intel (contact: Jenny Koerv, jenny.koerv@intel.com)
- Juniper (contact: Sukhdev Kapur, sukhdev@juniper.com)

Project committers:

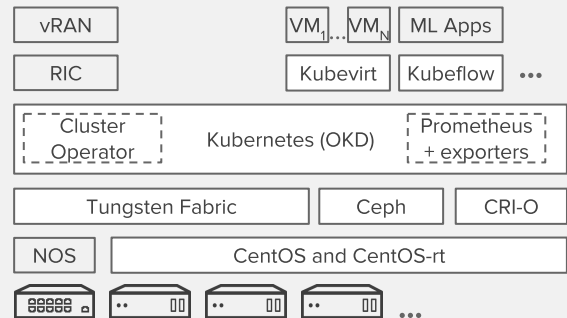
- to be identified once the proposal is accepted

Project plan:

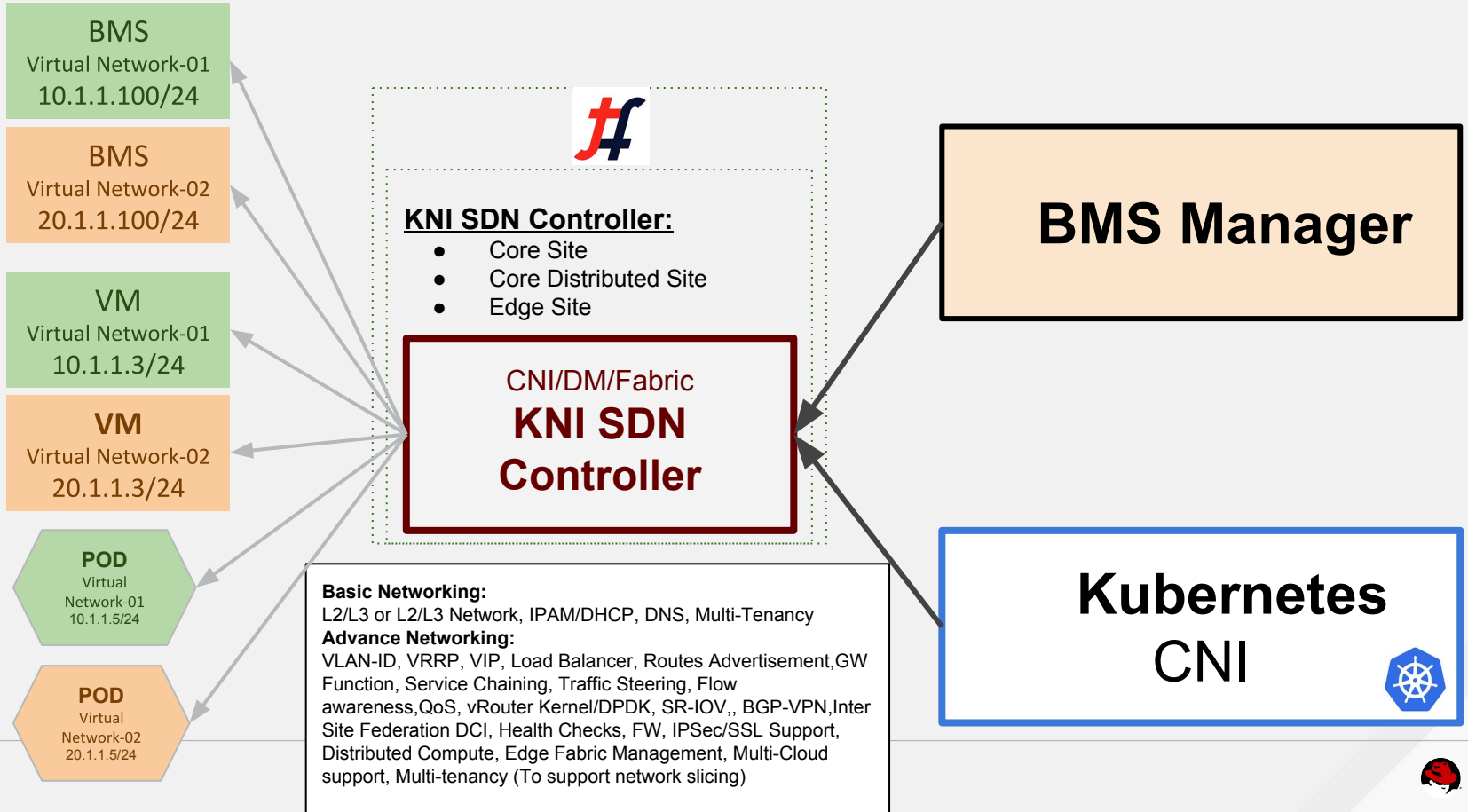
- to be developed once the proposal is accepted

Resourcing:

- will be established once the proposal is accepted



KNI TF SDN Controller



Provider Access Edge (PAE) Blueprint Template

| Attributes | Description |
|----------------------------------|--|
| Type | New |
| Blueprint Family - Proposed Name | Kubernetes-Native Infra for Edge (KNI-Edge) |
| Use Case | Provider Access Edge (PAE) |
| Blueprint - Proposed Name | Provider Access Edge (PAE) |
| Initial POD Cost (capex) | less than \$150k (TBC) |
| Scale & Type | 3 to 7 x86 servers (Xeon class) |
| Applications | vRAN (RIC), MEC apps (CDN, AI/ML, ...) |
| Power Restrictions | less than 10kW (TBC) |
| Infrastructure orchestration | End-to-end Service Orchestration: ONAP Middlewares: Kubeflow (AI/ML), NEV SDK (TBC) App Lifecycle Management: Kubernetes Operators (mix of Helm and native) Cluster Lifecycle Management: Kubernetes Cluster API/Controller Cluster Monitoring: Prometheus Container Platform: Kubernetes (OKD 4.0) Container Runtime: CRI-O VM Runtime: KubeVirt OS: CentOS/CentOS-rt 7.6 |
| SDN | Tungsten CNI w/SR-IOV, DPDK, and multi-i/f support; leaf-and-spine fabric |
| SDS | Ceph |
| Workload Type | containers, VMs |
| Additional Details | |

KNI for Industrial Edge (IE) Blueprint

for Industrial Automation and Analytics use cases

Project contributors:

- Red Hat (contact: Frank Zdarsky, fzdarsky@redhat.com)
- Intel (contact: Jenny Koerv, jenny.koerv@intel.com)

Project committers:

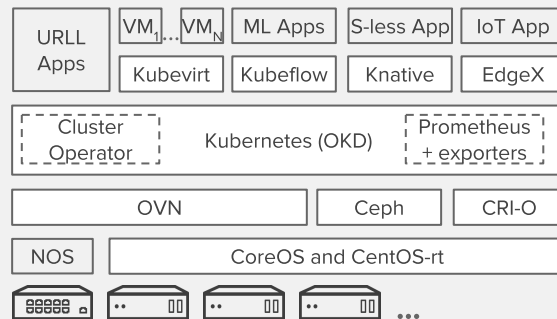
- to be identified once the proposal is accepted

Project plan:

- to be developed once the proposal is accepted

Resourcing:

- will be established once the proposal is accepted.



Industrial Edge (IE) Blueprint Template

| Attributes | Description |
|----------------------------------|--|
| Type | New |
| Blueprint Family - Proposed Name | Kubernetes-Native Infra for Edge (KNI-Edge) |
| Use Case | Industrial Edge |
| Blueprint - Proposed Name | Industrial Edge |
| Initial POD Cost (CAPEX) | (TBC) |
| Scale & Type | 3 servers to 1 rack; x86 servers (Xeon class) |
| Applications | IoT Cloud Platform, Analytics/AI/ML, AR/VR, ultra-low latency control |
| Power Restrictions | (TBC) |
| Infrastructure orchestration | End-to-end Service Orchestration: n/a Middlewares: Knative (serverless), Kubeflow (AI/ML), EdgeX (IoT) App Lifecycle Management: Kubernetes Operators (mix of Helm and native) Cluster Lifecycle Management: Kubernetes Cluster API/Controller Cluster Monitoring: Prometheus Container Platform: Kubernetes (OKD 4.0) Container Runtime: CRI-O VM Runtime: KubeVirt OS: CoreOS, CentOS-rt |
| SDN | OVN |
| SDS | Ceph |
| Workload Type | containers, VMs |
| Additional Details | |