

Provider Access Edge (PAE) Blueprint

Blueprint overview/Introduction

The Provider Access Edge blueprint is part of [Akraio's Kubernetes-Native Infrastructure](#) family of blueprints. As such, it leverages the best-practices and tools from the Kubernetes community to declaratively manage edge computing stacks at scale and with a consistent, uniform user experience from the infrastructure up to the services and from developer environments to production environments on bare metal or on public cloud.

This blueprint targets small footprint deployments able to host NFV (in particular vRAN) and MEC (e.g. AR/VR, machine learning, etc.) workloads. Its key features are:

- Lightweight, self-managing clusters based on CoreOS and Kubernetes (OKD distro).
- Support for VMs (via KubeVirt) and containers on a common infrastructure.
- Application lifecycle management using the Operator Framework.
- Support for multiple networks using Multus, including fast dataplane like SRIOV, DPDK.
- Support for real-time workloads using CentOS-rt*.
- High performance optimizations (hugepages, CPU topology management, etc.)

Documentation

[Architecture](#)

[KNI PAE Installation Guide](#)

[KNI Blueprint User Documentation.](#)

[KNI PAE Test document](#)

Project Team

PTL Self Nomination is open until noon, 10 June 2020 (Pacific Time)

Member	Company	Contact	Role	Photo & Bio	PTL Self Nomination (y/n)
Andrew Bays	Red Hat	Andrew Bays	Committer		
Frank Zdarsky	Red Hat	Frank Zdarsky	Committer	Senior Principal Software Engineer, Red Hat Office of the CTO; Edge Computing and	
Ricardo Noriega	Red Hat	Ricardo Noriega	Committer	Red Hat NFVPE - CTO office - Networking	Y
Sukhdedv Kapur	Juniper	Sukhdev Kapur	Committer	Distinguished Engineer; Contrail Software - CTO Org	
Yolanda Robla	Red Hat	Yolanda Robla Mota	Committer	Red Hat NFVPE - Edge, baremetal provisioning	
Tina Tsou	Arm		Contributor		
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Sheetal	Red Hat	Sheetal Chetan Singala	Committer		

Use Case Template

Attributes	Description	Informational
Type	New	
Industry Sector	Telco and carrier networks	
Business Driver	The need for deploying mobile application on the edge is growing in latest times. Providing a platform that is capable of supporting deployment of mobile applications, using Kubernetes, and based on kubernetes tooling and declarative configuration from end to end is needed.	
Business Use Cases	Edge deployments for 5G, mobile edge applications, vRAN	
Business Cost - Initial Build Cost Target Objective	It can be deployed on libvirt, amazon and baremetal. Deployment on baremetal requires a small footprint POD with just 5 servers (1 bootstrap, 3 masters, 1 worker)	

Business Cost – Target Operational Objective	The POD footprint starts being the same (5 servers), depending on the use case. Typically the cost will be less than \$100k	
Security Need	Kubernetes security monitoring and patching capabilities will be required, they are part of the deployment itself	
Regulations	It will depend on the use case, and the workloads applied on top	
Other Restrictions	-	
Additional Details	-	

Blueprint Template

Attributes	Description	Informational
Type	New	
Blueprint Family - Proposed Name	Kubernetes-Native Infrastructure 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	App Lifecycle Management: Kubernetes Operators 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	
SDN	OpenShift SDN (w/ SR-IOV, DPDK, and multi-i/f)	
SDS	Ceph	
Workload Type	containers, VMs	
Additional Details	-	