EMCO, OVN4NFV and SDEWAN Update

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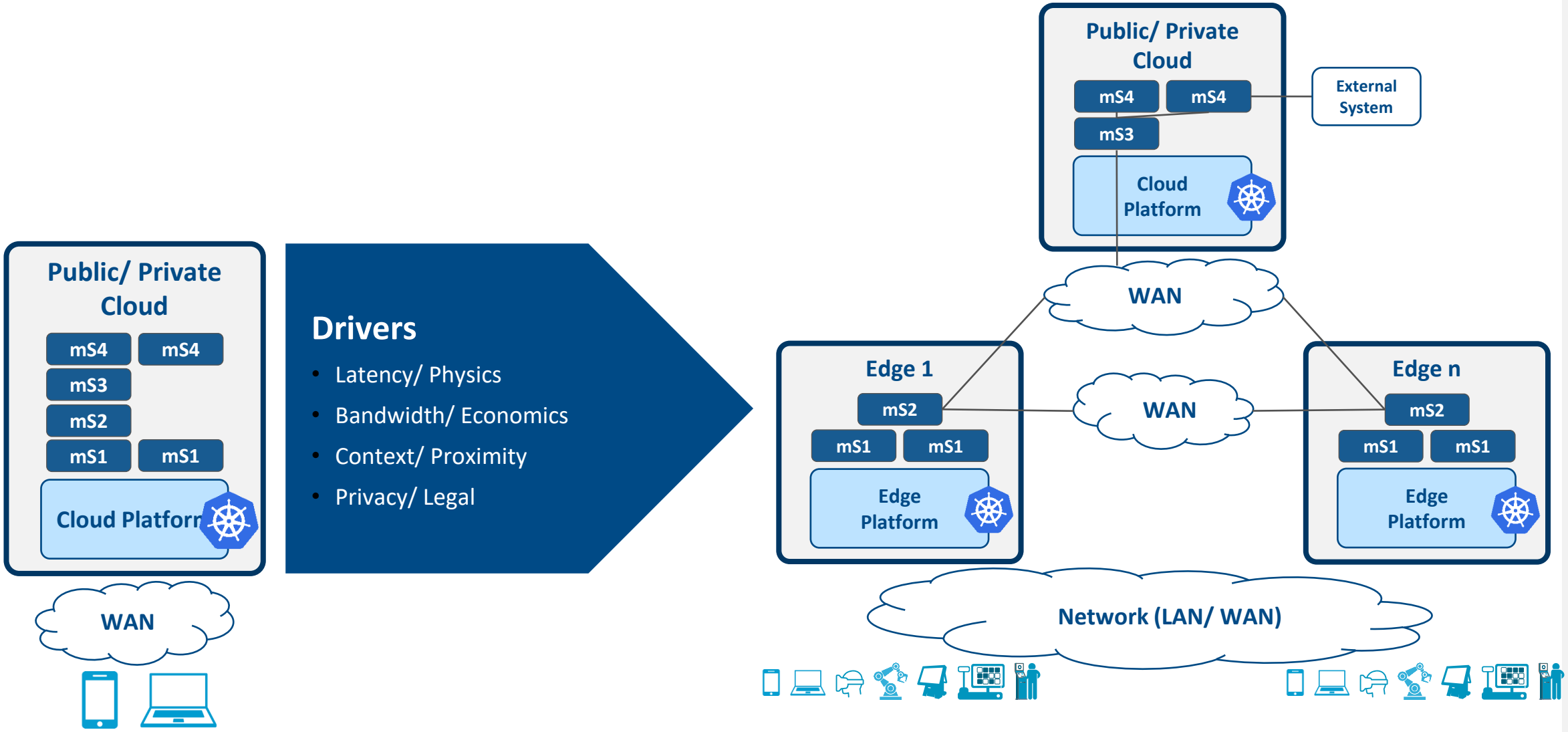
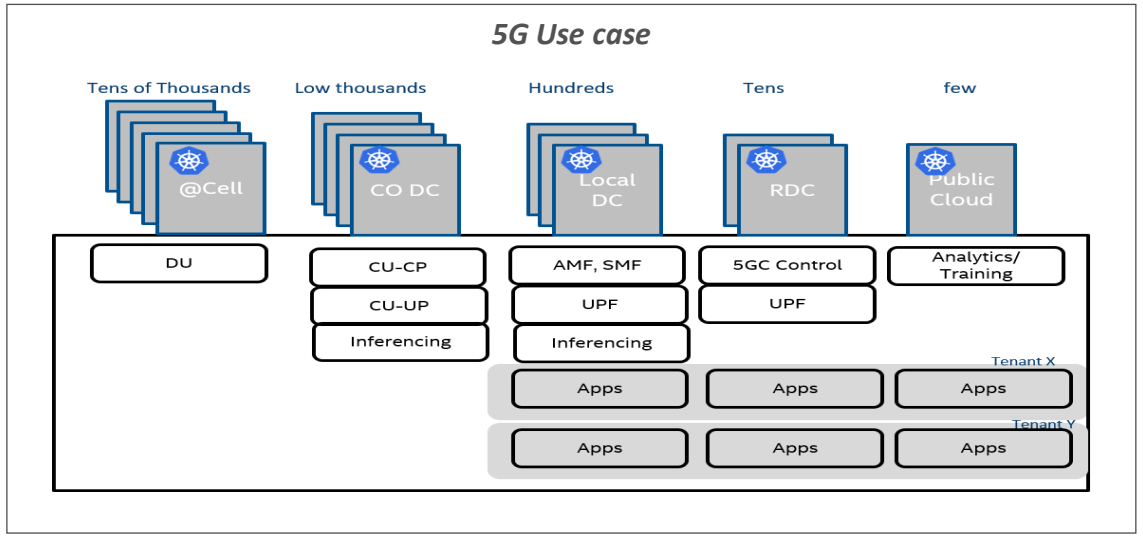
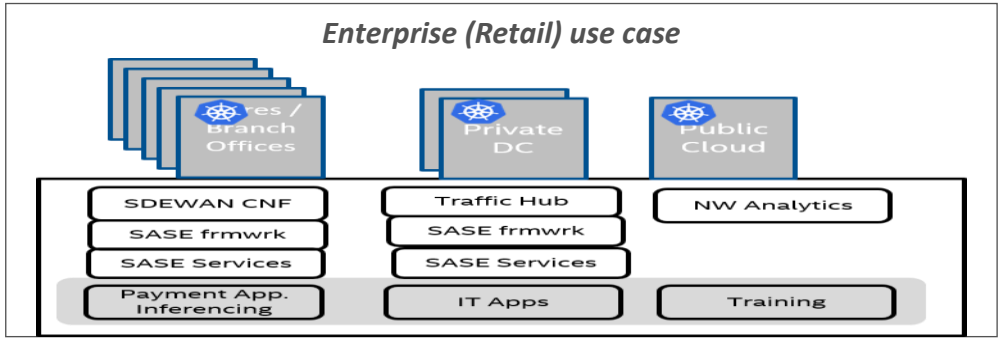
Trend : Geo Distributed Computing trend with Edge-computing



Geo-Distributed Computing - few use cases





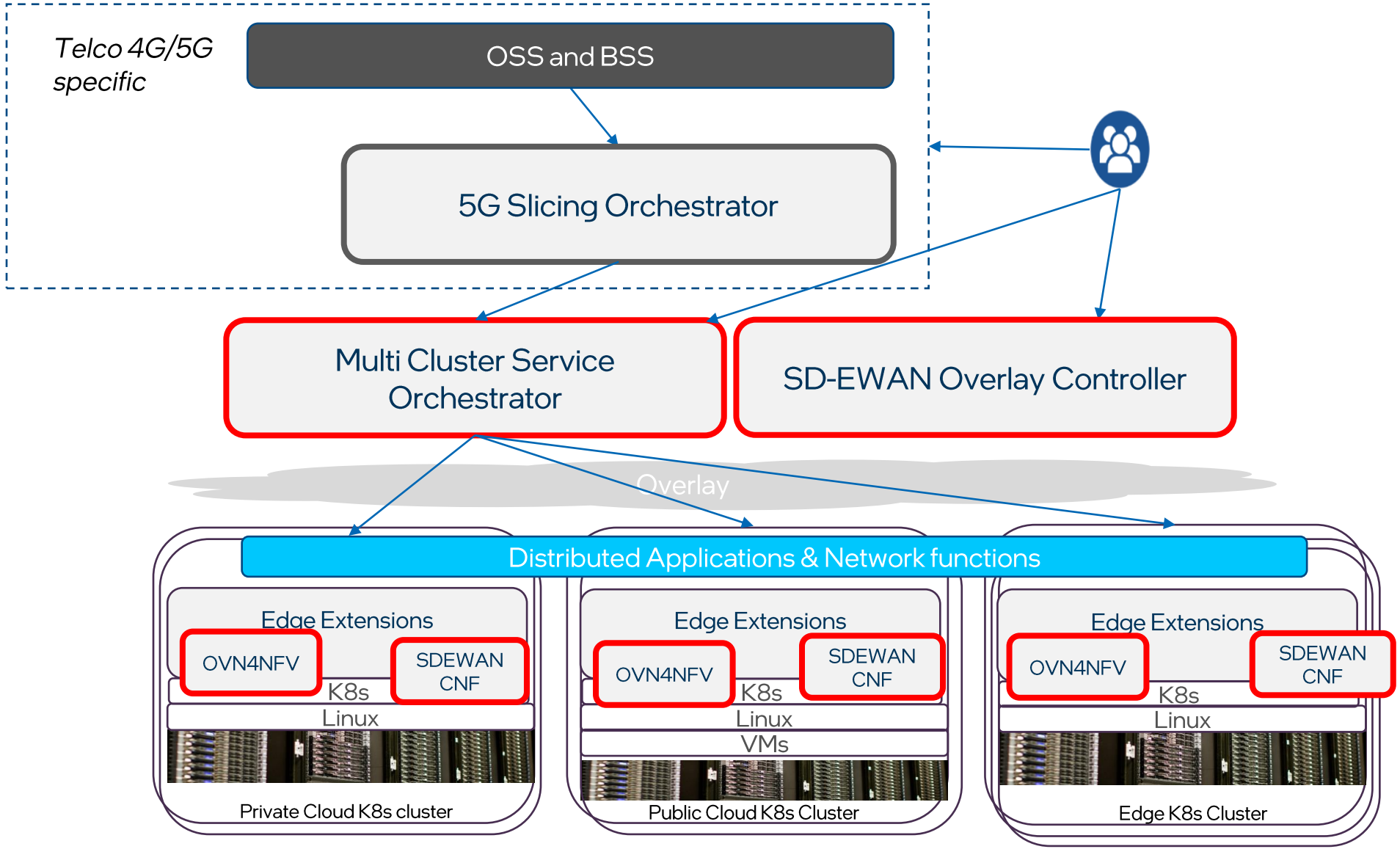
- *Large Number of sites*
- *Computing (Apps across sites) – MEC*
- *Multiple tenant applications along with operator CNFs.*
- *Workload types - VMs, VNFs, CNFs, CNAs and Functions (FaaS)*
- *Note: K8s is becoming choice of workload orchestrator in each cluster*

Edge Computing – Similar to Cloud-computing, but with some special needs

Uniform Developer Experience across Clouds and Edges	*Support for all kinds of workloads (VM, Containers and Serverless functions)*
	Easy migration of workloads among Edges and Clouds
	Multi Cloud Uniform Networking (Overlay)
Resource Constraints (Power, Cost, Space)	*Converged Edge supporting IT, OT applications & Network functions*
	Optimized infrastructure software
	Accelerator usage (Hence, awareness without losing platform independence property
Edge requires high security assurance (No physical security in far edges)	*Platform attestation; Confidentiality*
	Service Function Chaining of Security & other network functions (SASE to the Edge)
	Multi-tenancy isolation, Slice isolation
Ease-of-Use (@Scale requirements are higher than the clouds)	*Infrastructure Orchestration (K8s Cluster Life cycle management)*
	Multi Cluster Service Orchestration (LCM, Slicing, MEC Orchestration, Service assurnace
5G based Edge	*5G dUPF, RAN Acceleration; Analytics (RIC, Non real time RIC)*
	Slicing – Performance & Security isolation; Per Slice SFC of security CNFs

About EMCO, OVN4NFV and SD-EWAN

E2E Edge Stack



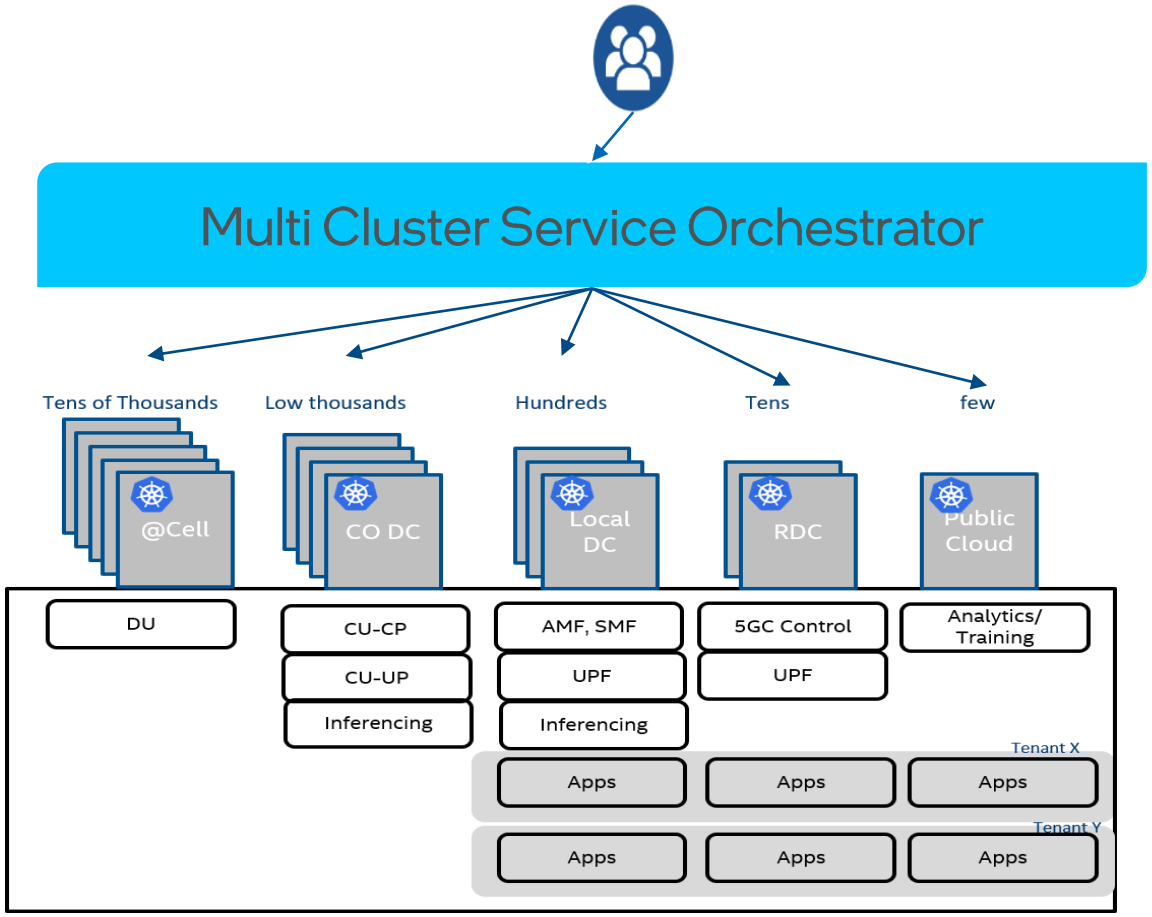
Purpose of Service Orchestrator

To deploy composite Applications and Network Services across multiple K8s clusters (Edge, Public, Private)

Via

- Distributed Life cycle management
- Distributed Monitoring
- Distributed Day2 configuration management

EMCO – High level features



One Click deployment of complex applications & network services across multiple K8s clusters

Comprehensive Status monitoring of deployed complex applications

One Service Orchestrator for both CNFs and Applications

Self Service Portal for multiple tenants

Comprehensive Analytics platform for Day2 operations, Closed loops (TBD)

Single pane of glass for Day0/Day1/Day2 configuration of CNFs and Apps. (TBD)

Purpose of Overlay

Enable Secure connecivity among the Micro-services in various K8s clusters.

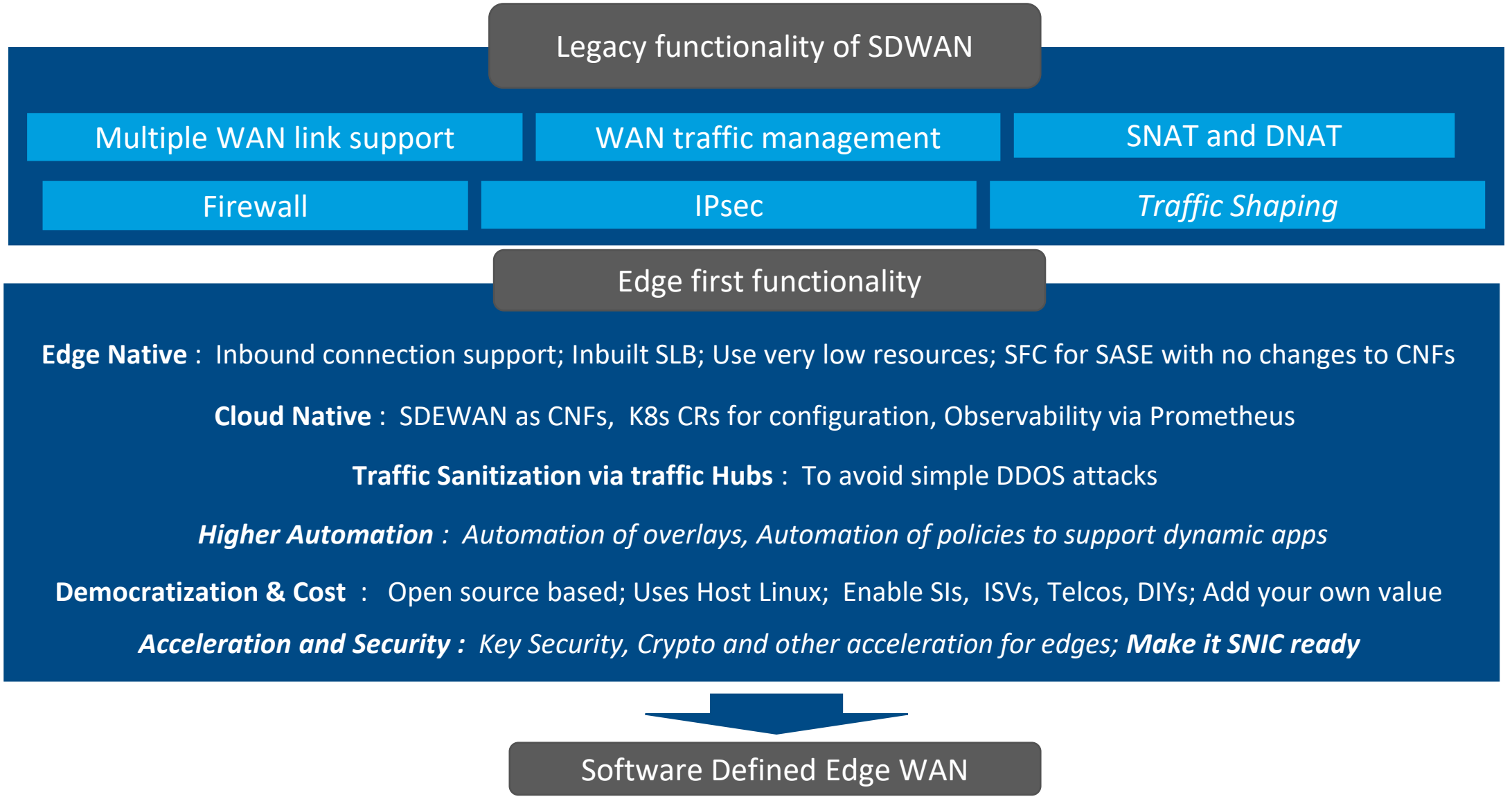
That support clusters with following constraints

- ✓ K8s clusters have overlapping POD Subnets.
- ✓ K8s clusters that don’t have static or dynamic public IP addresses

Without compromising on

- ✓ Security
- ✓ Latency

SD-EWAN facilitates overlay. Features include



Purpose of OVN4NFV Network Controller

To deploy CNFs can be deployed alongside with the applications and provide service function chaining capability

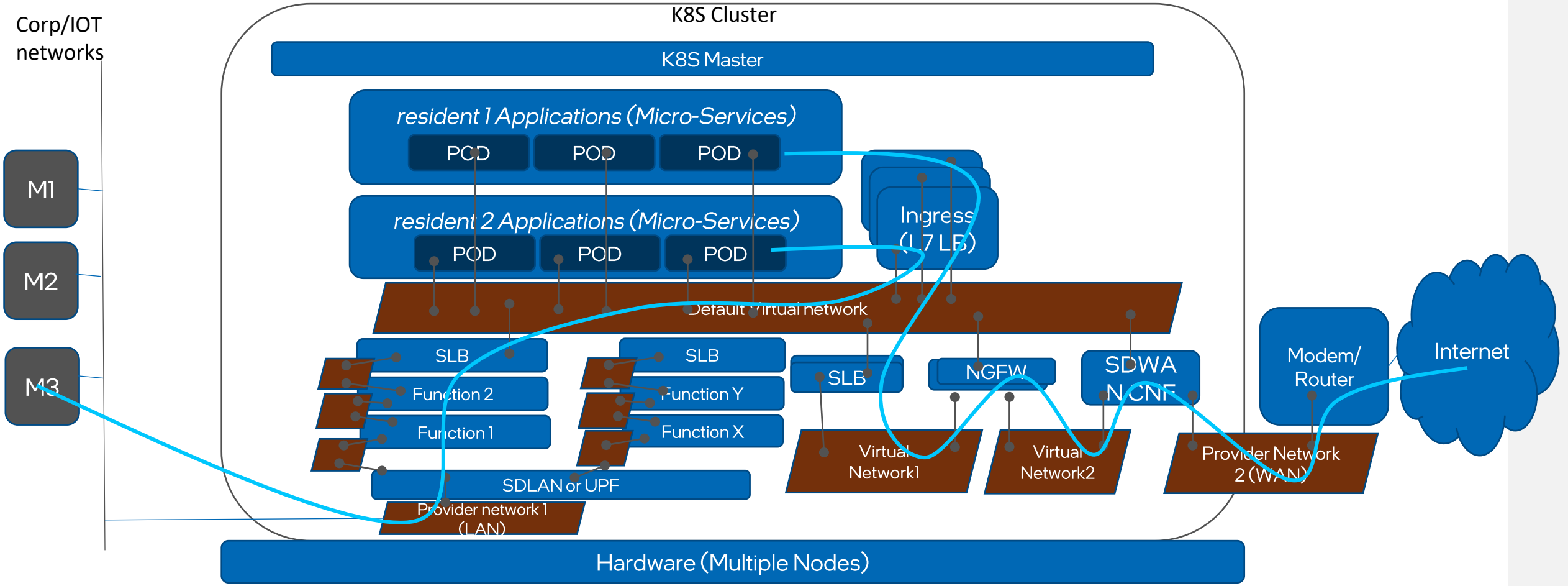
Satisfying CNF requirements such as

- ✓ CNFs requiring dedicated management network
- ✓ CNFs that acts router between provider networks and K8s networks

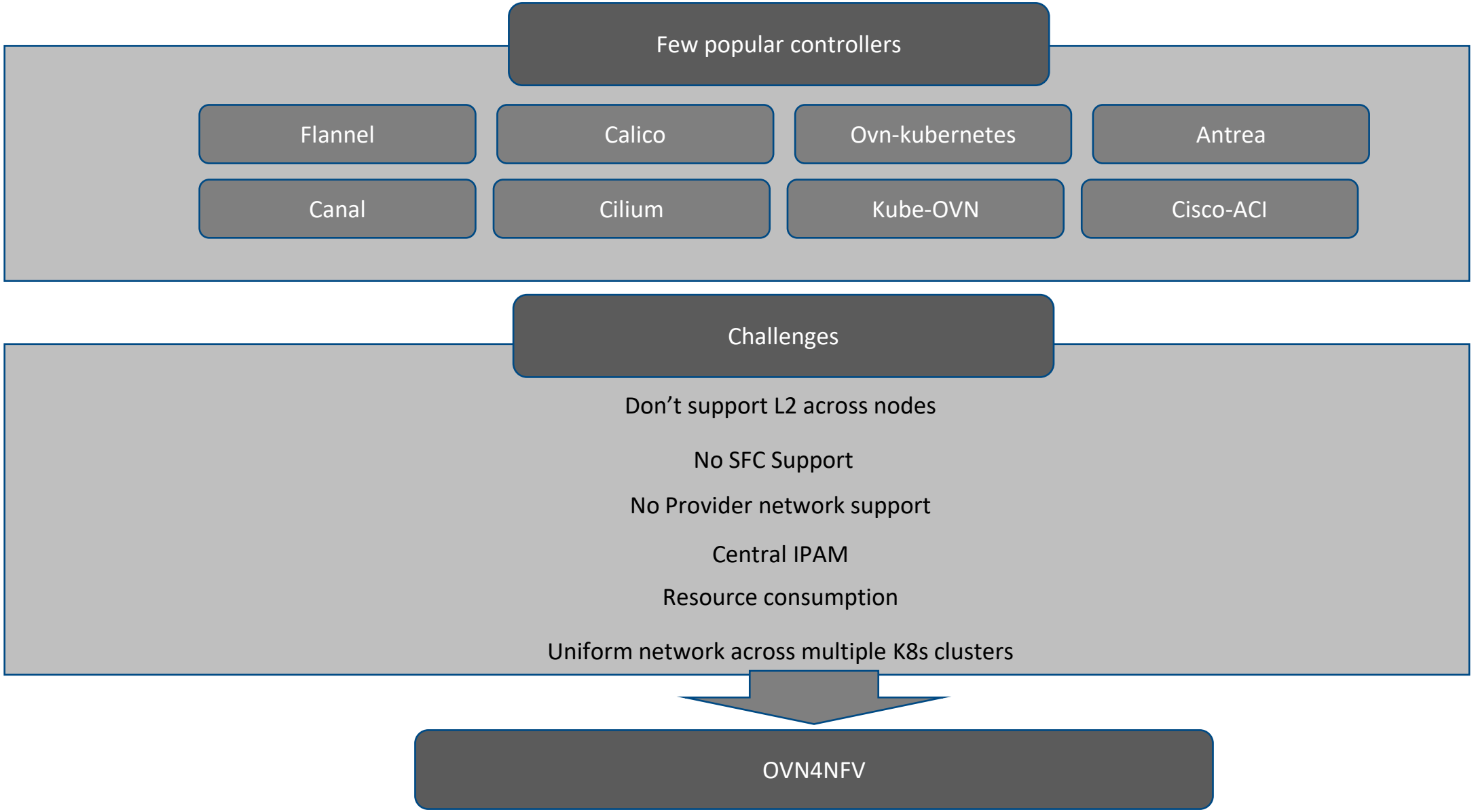
Satisfying SFC requirements

- ✓ Multiple Service functions in the chain coming from different vendors
- ✓ Without requiring any changes to the service functions

Need : K8s for both applications and network functions
Need: Support for data plane network functions requiring multiple networks/interfaces
Need: Service function chaining
Need: Provider network support
Example: Enterprise MEC as shown below



K8s Networking controllers – Open Source



OVN4NFV features

OVN4NFV features	Use case / Advantages
Provider Networks	- 5G-RAN (as DUs, CU-UP require provider networks) - Private 5G, Network Edge (as UPF require to be placed on provider networks) - SD-WAN (as CNF needs to be on WAN provider networks)
Multiple Virtual Networks	- Telco use cases (as they require management network) - Security CNFs
Service Function Chaining	- MEC use case - Cloud Native Security for applications
OVS based	- SmartNIC friendly
Single logical switch per network	- Uniform irrespective of workload/node placement
Namespace based networking	- Simpler isolation : Avoid challenges associated with traffic policy for isolation

Akraino Mapping

1. All projects have quarterly cadence (Next release is 21.03 – March 2021)
2. Akraino ICN BP family BPs use these projects today.
3. PCEI BP is exploring EMCO to be part of BP.
4. We encourage other BPs to include these projects as they are solving issues.

Summary

EMCO – To deploy applications across multiple sites.
SDEWAN – To create overlay among sites.
OVN4NFV – To enable CNFs that require to be placed in multiple networks and to satisfy SFC in Cloud Native world.

Q&A

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