OPEN
NETWORKING
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SUMMIT

ONAP and Cloud Native

Best of Both Worlds

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THE LINUX FOUNDATION | LF NETWORKING | LF EDGE

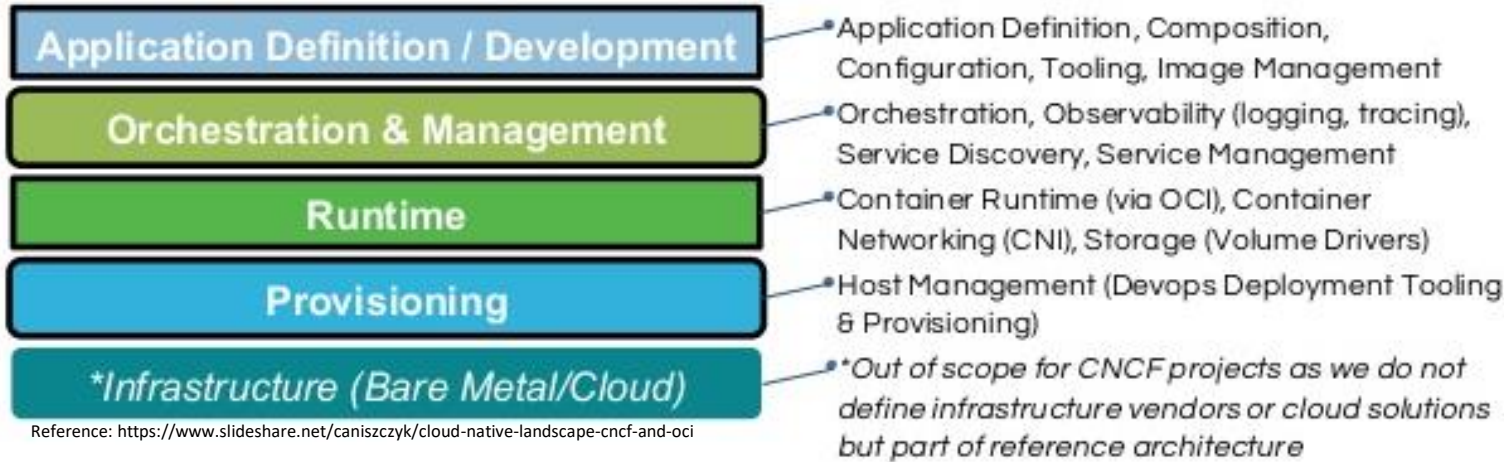# Our ONAP Cloud Native Journey

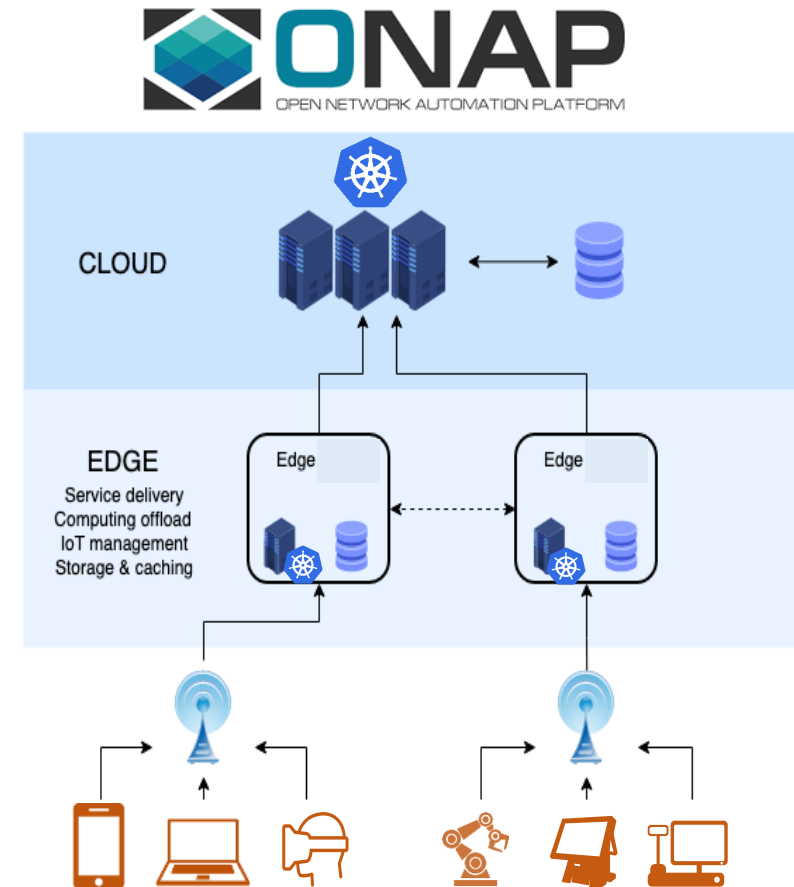*Prepared by Catherine Lefèvre (ONAP TSC Chair) & ONAP CNF Task Force*

Cloud Native Reference Architecture

Layer	Description
Application Definition / Development	• Application Definition, Composition, Configuration, Tooling, Image Management
Orchestration & Management	• Orchestration, Observability (logging, tracing), Service Discovery, Service Management
Runtime	• Container Runtime (via OCI), Container Networking (CNI), Storage (Volume Drivers)
Provisioning	• Host Management (Devops Deployment Tooling & Provisioning)
***Infrastructure (Bare Metal/Cloud)**	• *Out of scope for CNCF projects as we do not define infrastructure vendors or cloud solutions but part of reference architecture

Reference: https://www.slideshare.net/caniszczyk/cloud-native-landscape-cncf-and-oci

Drivers
- Latency/ Physics
- Bandwidth/ Economics
- Context/ Proximity
- Privacy/ Legal

Hybrid
Private
Public

ONAP
OPEN NETWORK AUTOMATION PLATFORM

CLOUD

EDGE
Service delivery
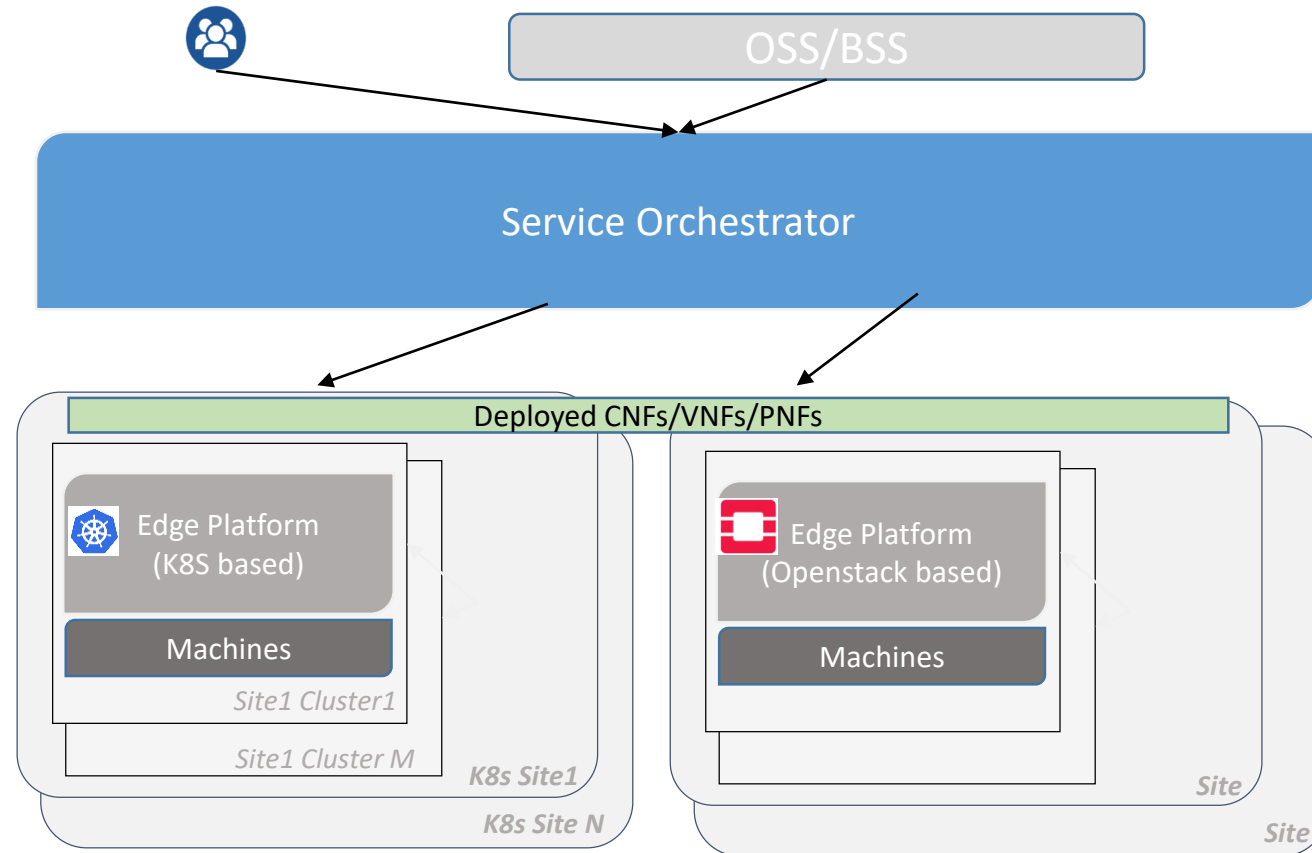Computing offload
IoT management
Storage & caching

Edge

Edge

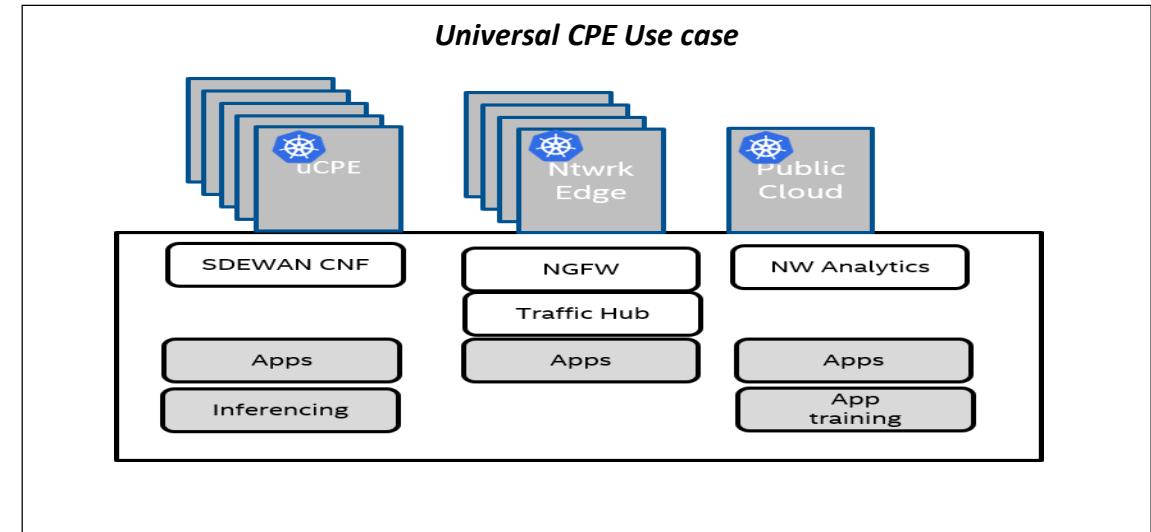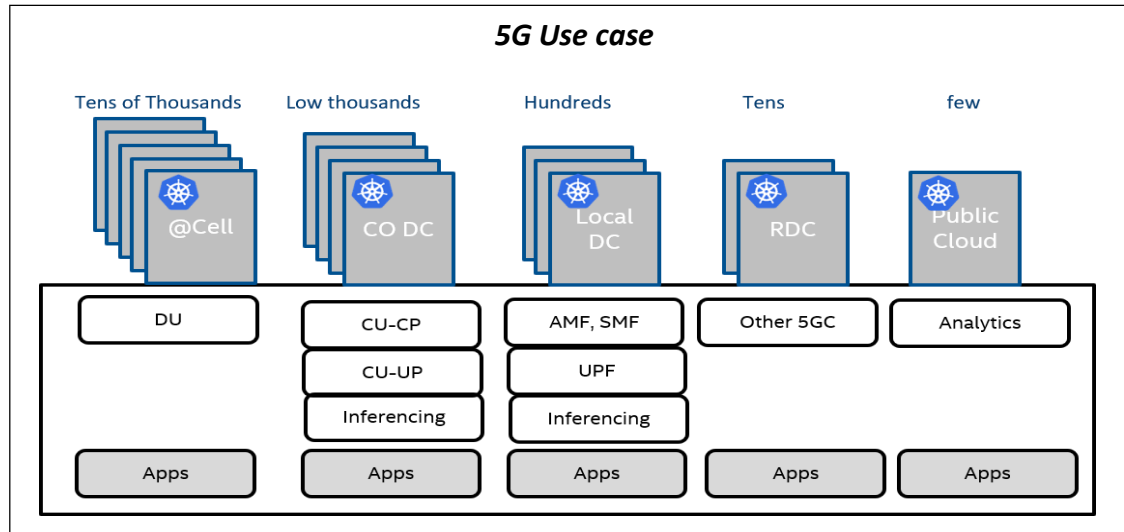# Cloud Native Cornerstone – The Service Orchestration

TIMO

Prepared by Srinivasa Addepalli (Intel), Timo Perala (Nokia)

Why Do You Need Service Orchestrator?

Prepared by Srinivasa Addepalli (Intel)

5G Use case

Tens of Thousands | Low thousands | Hundreds | Tens | few

@Cell | CO DC | Local DC | RDC | Public Cloud

DU	CU-CP	AMF, SMF	Other 5GC	Analytics
	CU-UP	UPF		
	Inferencing	Inferencing		
Apps	Apps	Apps	Apps	Apps

Universal CPE Use case

uCPE | Ntwrk Edge | Public Cloud

SDEWAN CNF	NGFW	NW Analytics
	Traffic Hub	
Apps	Apps	Apps
Inferencing		App training

- *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*

Multi Edge/Cloud computing scale is similar (or even higher) to Hyper-scalers' scale
Now Telcos, Enterprises, MSPs need @scale Orchestration and Automation solutions

What Is The Value Proposition of ONAP?

Prepared by Alla Goldner (AMDOCS), Srinivasa Addepalli (Intel)

*ONAP itself uses Micro-service architecture & uses **Cloud Native principles***

*ONAP Manages **Network-service & application LCM** across Multiple VIMs (Openstack, K8s)*

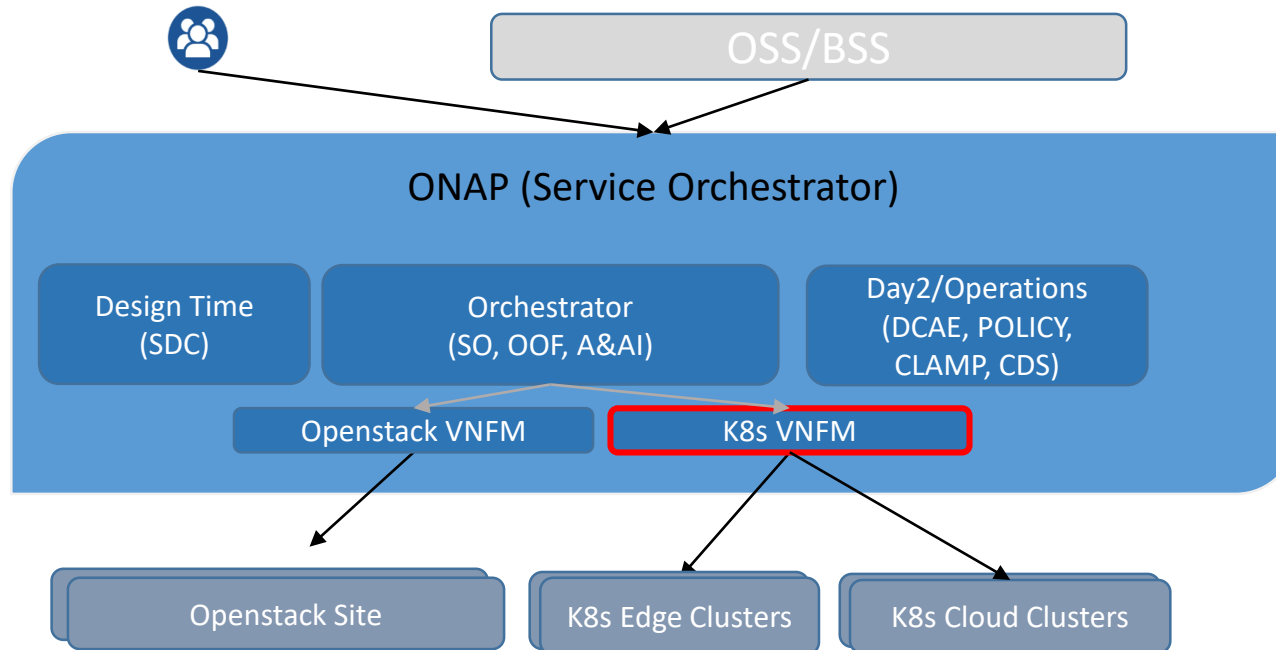*ONAP **Design tools** support multiple descriptions (Helm, TOSCA, HEAT etc.)*

***ONAP OOF (Optimization)** chooses the right locations to place workloads*

***ONAP DCAE** collects telemetry from remote sites, analyzes them and generate any control loop actions (Scale, Heal)*

*ONAP **supports standard models** & APIs as per ETSI, TMF, MEF, 3GPP*

*ONAP enables **Day2 configuration** of Network functions via RESTful API, NetConf, K8s CRDs*

***ONAP AAI** is the central repository that keeps site/network element inventory and network service status.*
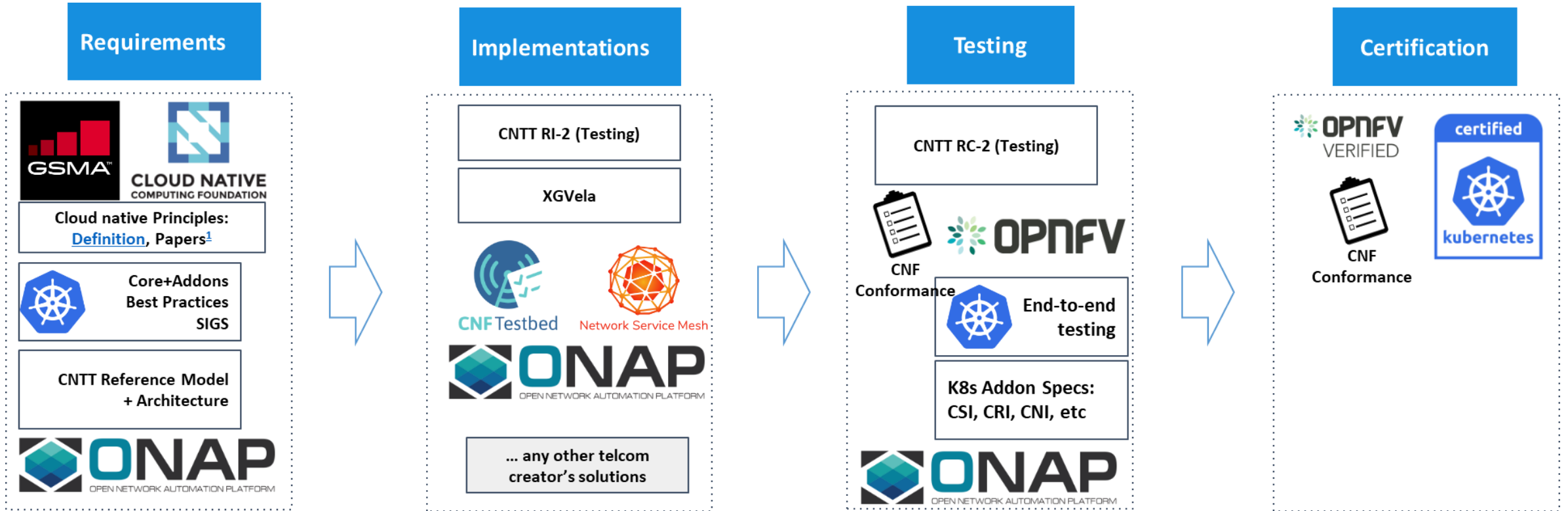
OSS/BSS

ONAP (Service Orchestrator)

| Design Time (SDC) | Orchestrator (SO, OOF, A&AI) | Day2/Operations (DCAE, POLICY, CLAMP, CDS) |

Openstack VNFM

K8s VNFM

Openstack Site

K8s Edge Clusters

K8s Cloud Clusters

ONAP is a comprehensive service orchestrator

Cross-Community CNF Landscape

Prepared by Olivier Smith (Matrixx), Ranny Haiby (Samsung)

Source: https://docs.google.com/presentation/d/1rTUDacKW96IUJYt-QckITmxwRUD1l8pFZe1xCqyK6yo/edit?ts=5f1f18cd#slide=id.g8ecce7b011_2_0

ONAP For ETSI SDO (Conformance to ETSI Specifications)

Prepared by Byung-Woo Jun (Ericsson), Fred Oliveira (Verizon), Seshu Kumar (Huawei)

## NS/VNF/PNF Modeling and Packaging Conformance

- **SOL004** for VNF and PNF packages
- **SOL007** for NS package
- **SOL001** for describing VNF, PNF and NS models
- **SOL003 (IFA007)** for VNF Package Management
- **SOL005 (IFA 013)** for NS/PNF/VNF Package Management
- **SEC022** for ETSI Package and API security

Lifecycle Management Conformance for

- **SDC** for SOL004 and SOL007 package onboarding, design and distribution
- **ONAP NFVO (VFC and SO NFVO) and External NFVO** for ETSI MANO SOL005-compliant NFVO functionalities.
- **SOL003 Adapter** for SOL003-compliant VNF LCM interfaces
- **SOL005 Adapter** for SOL005-compliant NS LCM interfaces
- **SOL002 Adapter** for SOL002-compliant VNF/VNFC LCM interfaces (currently on hold)
- **ETSI Catalog Manager** for ETSI SOL004/SOL007/SOL001 Runtime Package Management and Parsing for NS/VNF/PNF

Ongoing CNF Modeling, Packaging and Orchestration Conformance

- **IFA 011**
  - ONAP VNF/CNF package and models including Helm Charts & Container Images conform to IFA 011
- **IFA 029**
  - ONAP CNF architecture and interfaces for MANO, NFVI, CISM and CIS conform to IFA 029
- **IFA 040**
  - ONAP conforms to the OS container NFV object model, CISM and CIR management, based on IFA 040
- **IFA 010**
  - ONAP NFVO and VNFM orchestration functions conform to IFA 010 requirements
- **IFA 005**
  - ONAP NFVO and VIM interfaces conform to IFA 005 (Or-Vi)/OpenStack
- **IFA 006**
  - ONAP architecture conforms to IFA 006/OpenStack for the interfaces between VNFM and VIM
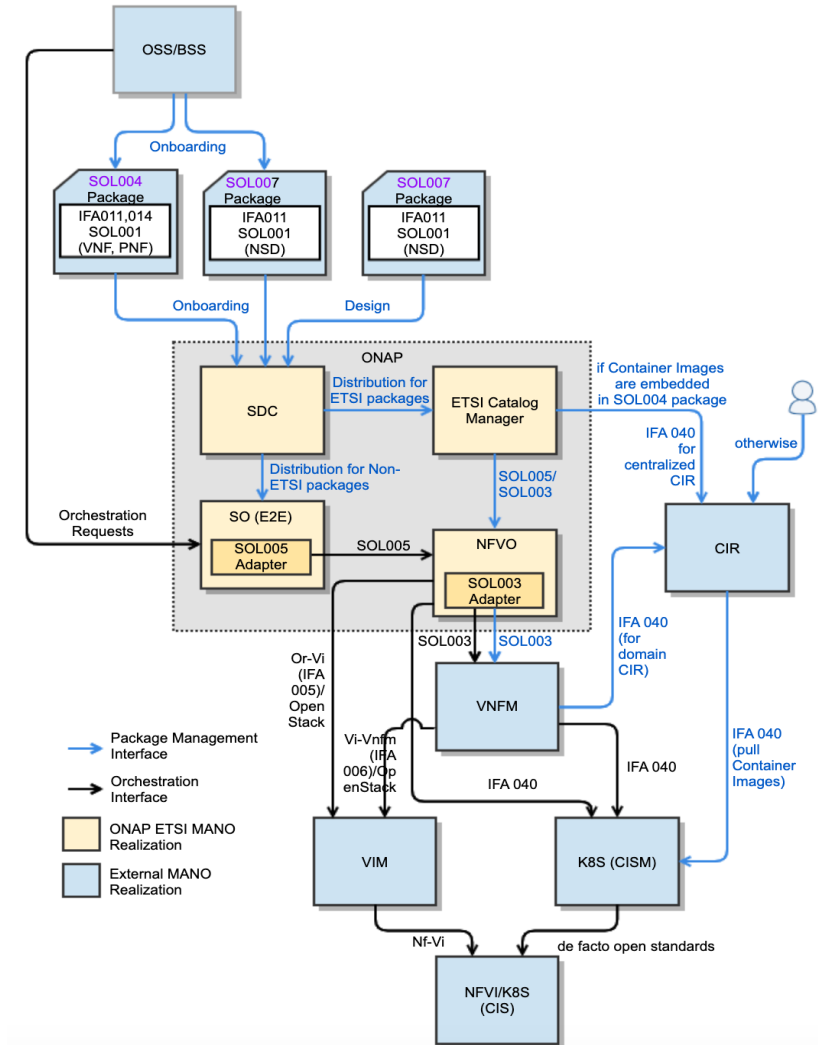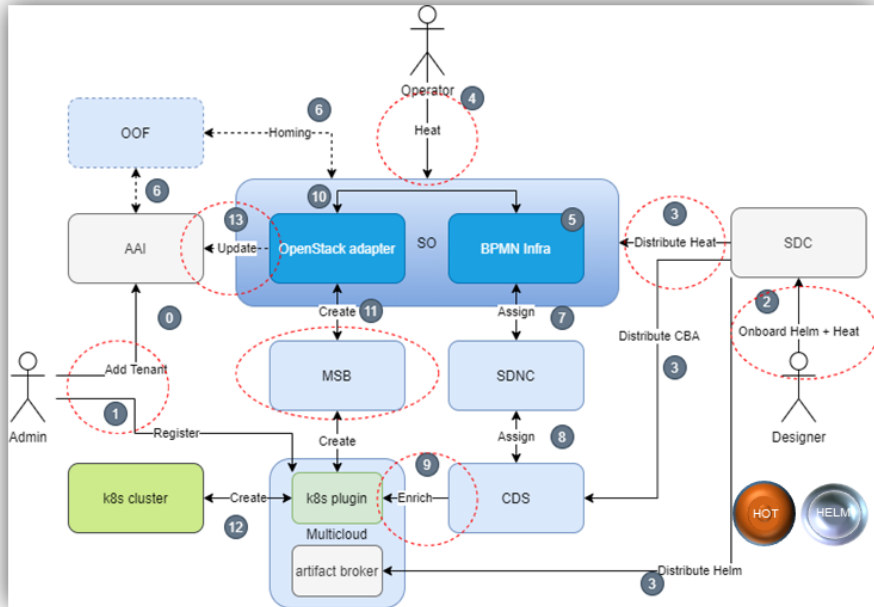
ONAP CNF Evolution

Prepared by Seshu Kumar (Huawei), Lukasz Rajewski (Orange)
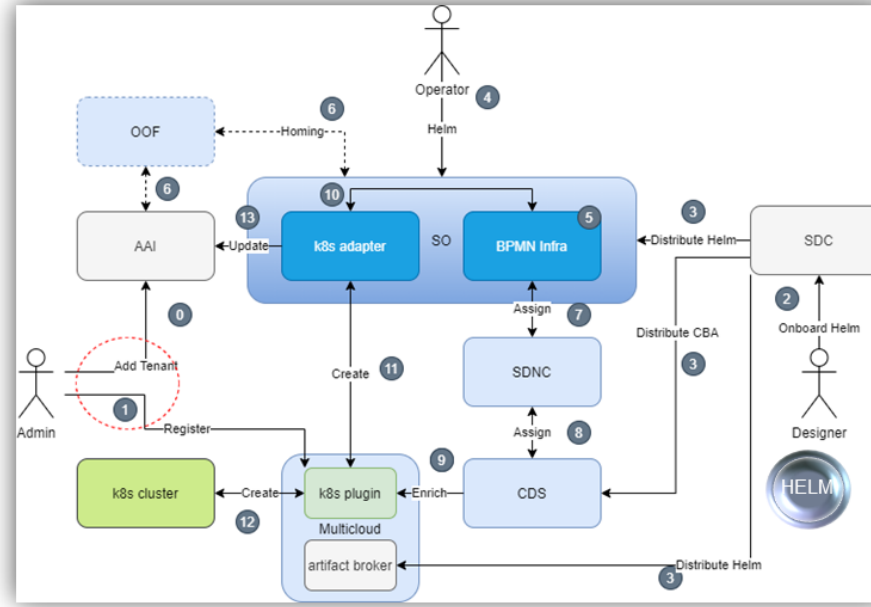

PAST

PRESENT

FUTURE

Frankfurt

- Embedding the helm into the heat package distro
- Installation of Helm package into K8s cluster
- Basic helm enrichment through CDS

What Guilin Will Bring

- Native Helm package support in SDC and SO
- Native Helm enrichment support in Controller Design Studio
- E2E CNF Orchestration chain in all SO components

Beyond

- Extension in AAI CNF model
- Health Check and Monitoring of CNF resources
- CDS Native CNF Configuration
- Discovery of K8S cluster in ONAP
- Cross community Integration