



# Telco And Edge Cloud Full Stack Automation

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# Topics



Introduction



Why Automation Matters



MANO Evolution ( Standards )



Cloud-Native Full Stack  
Automation



SMI-BM ( Cloud-Native Platform )

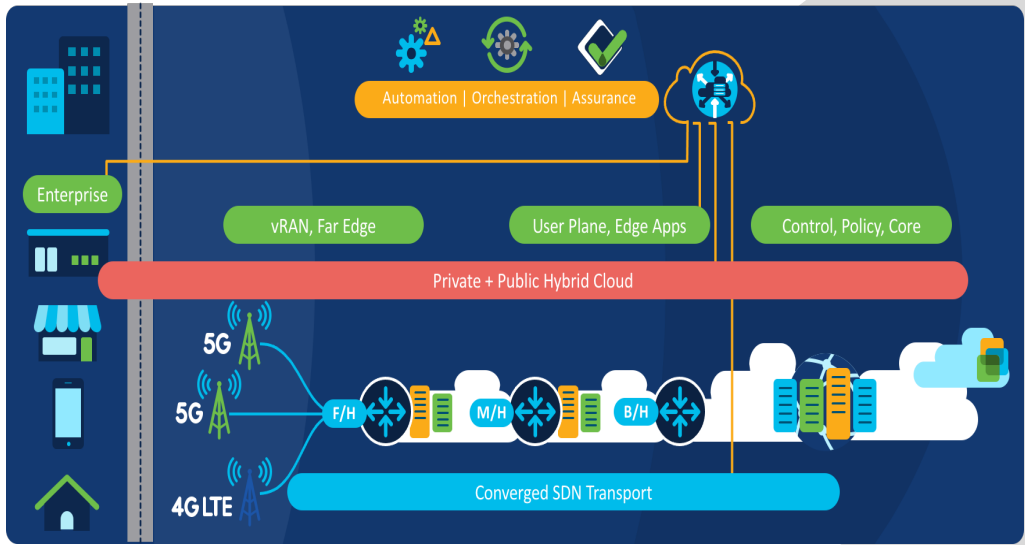


Case Study

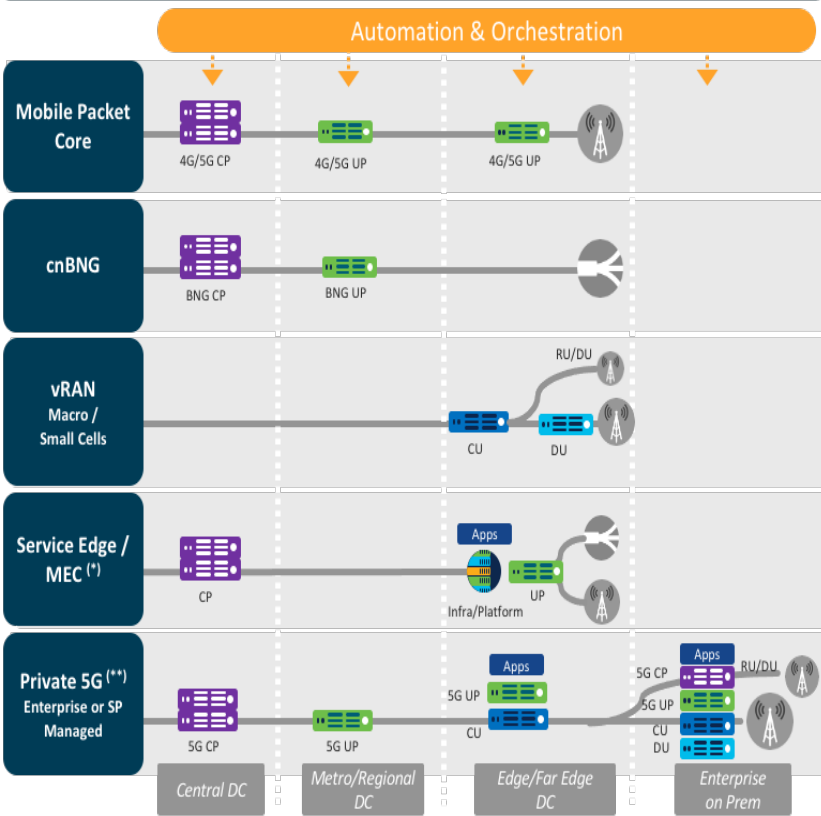


# Cloud And Automation Strategy Key Enabler's for 5G Transformation

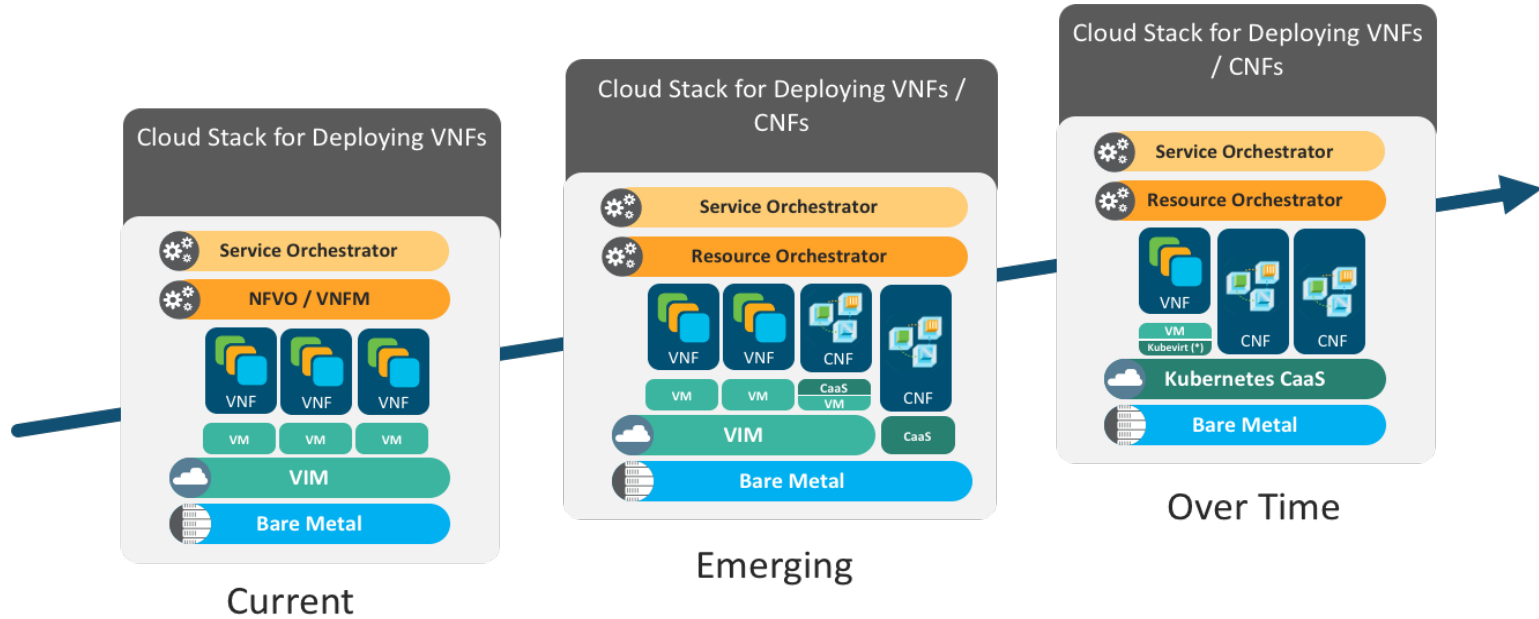
## E2E Software Defined Programmable 5G Architecture



## Use Cases



# Cloud Platform Evolution to Cloud-Native Infrastructure



(\*) example of technology under evaluation

Telco Cloud Platform strategy to support both VNF's and CNF's is key for 5G Transformation

# Why Automation Matters ( Business Benefits )

## Service Agility

Service Agility and Service Velocity results in faster Go-To-Market strategy and increase in top line revenue

## Reduce OpEx

Automated operations reduces manual tasks results in reduce OpEx and improve service availability

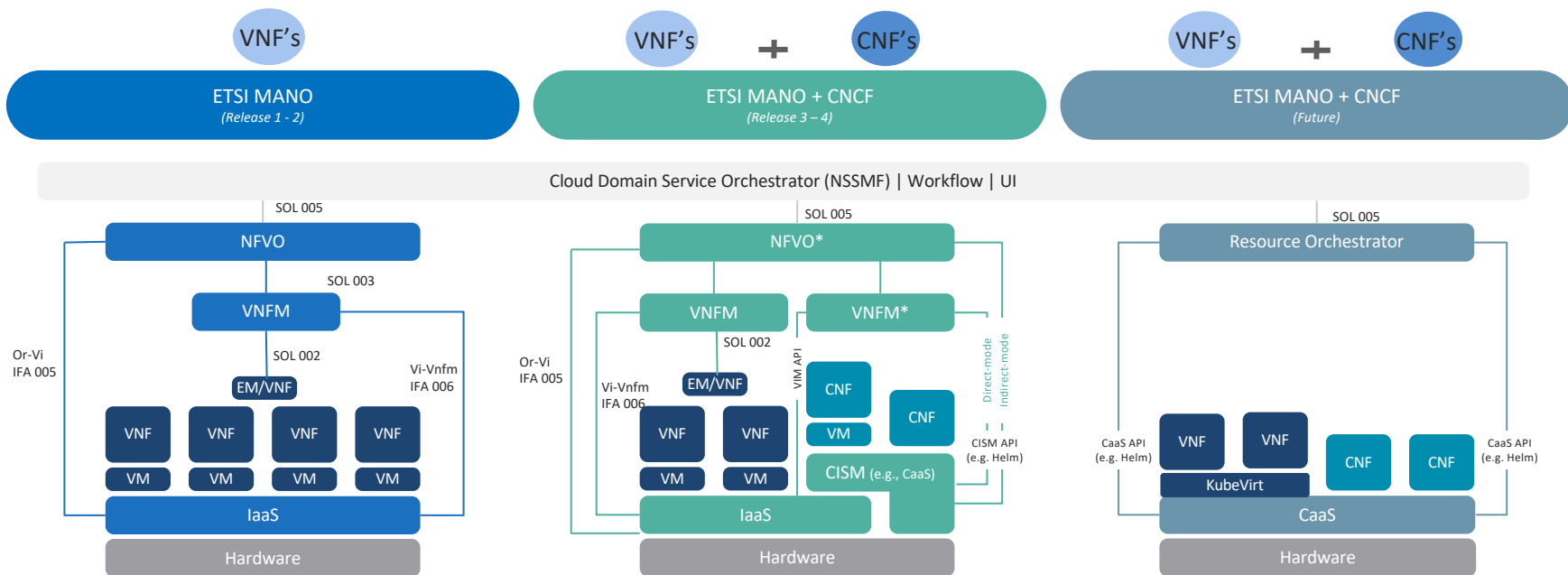
## Reduce CapEx

Better packing of VNFs and CNFs into services improve utilization of H/W resources and reduce CapEx

## Customer Experience

Improved network reliability and availability result in better customer experience and lower churn rates

# MANO Evolution VNF to CNF ( Inline with Standards )



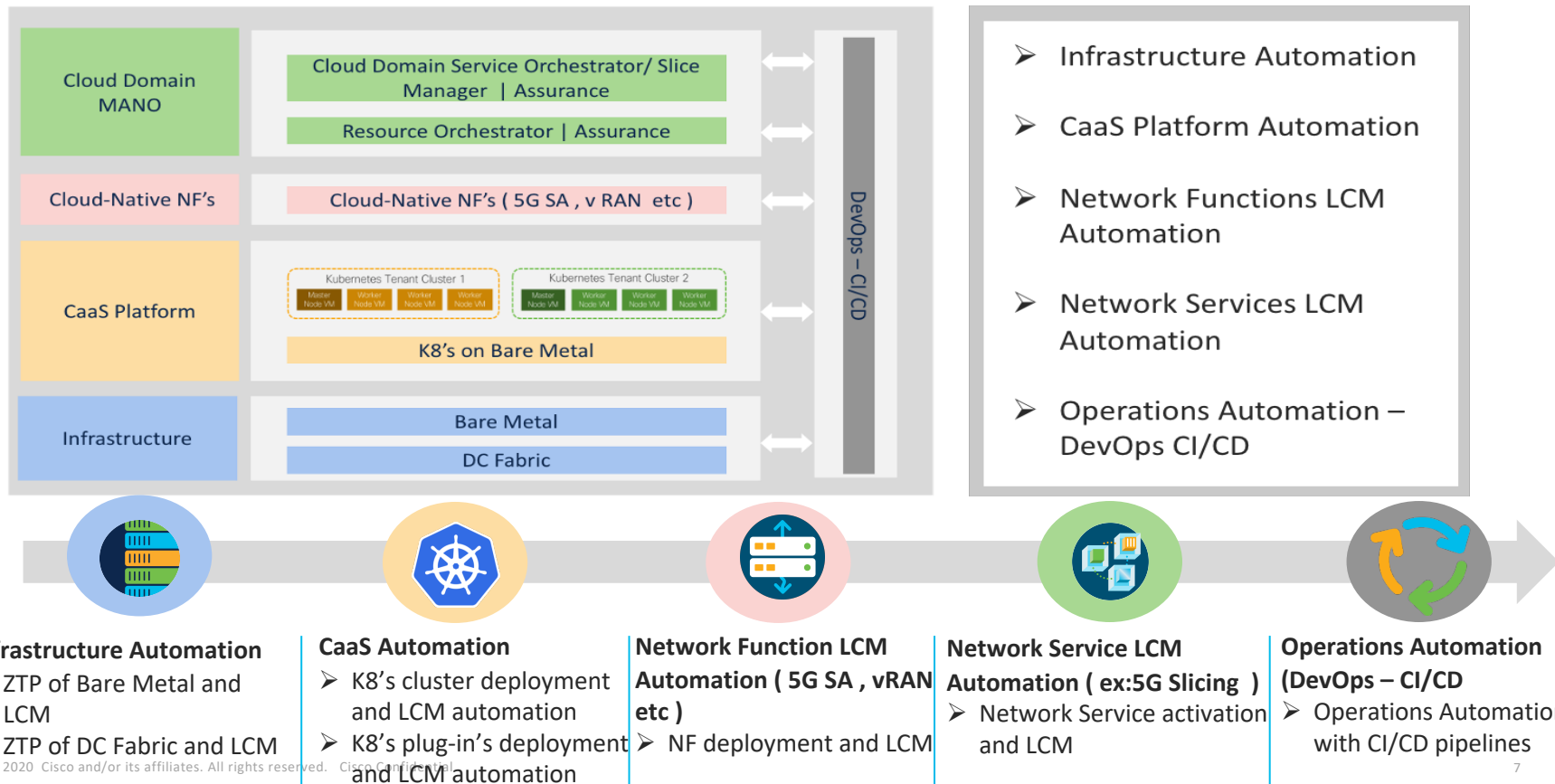
- ETSI Release 1-2 focus on NFV MANO Architecture and interoperability of solutions ( VNF Packages – SOL 004 , VNF and NS Descriptors – SOL 001 )
- Standardized internal and external MANO Interfaces ( SOL 003 , SOL 002 , SOL 005 , IFA 005 , IFA 006 )

- ETSI NFV Working Group has been working on CNF support under FEAT17 ( IFA 010, 011, 029, 036, 040 ).
- IFA029 :Enhancements of NFV architecture towards cloud-native
- IFA040:Service interface for container management and orchestration
- IFA011:VNF descriptor and packaging specification

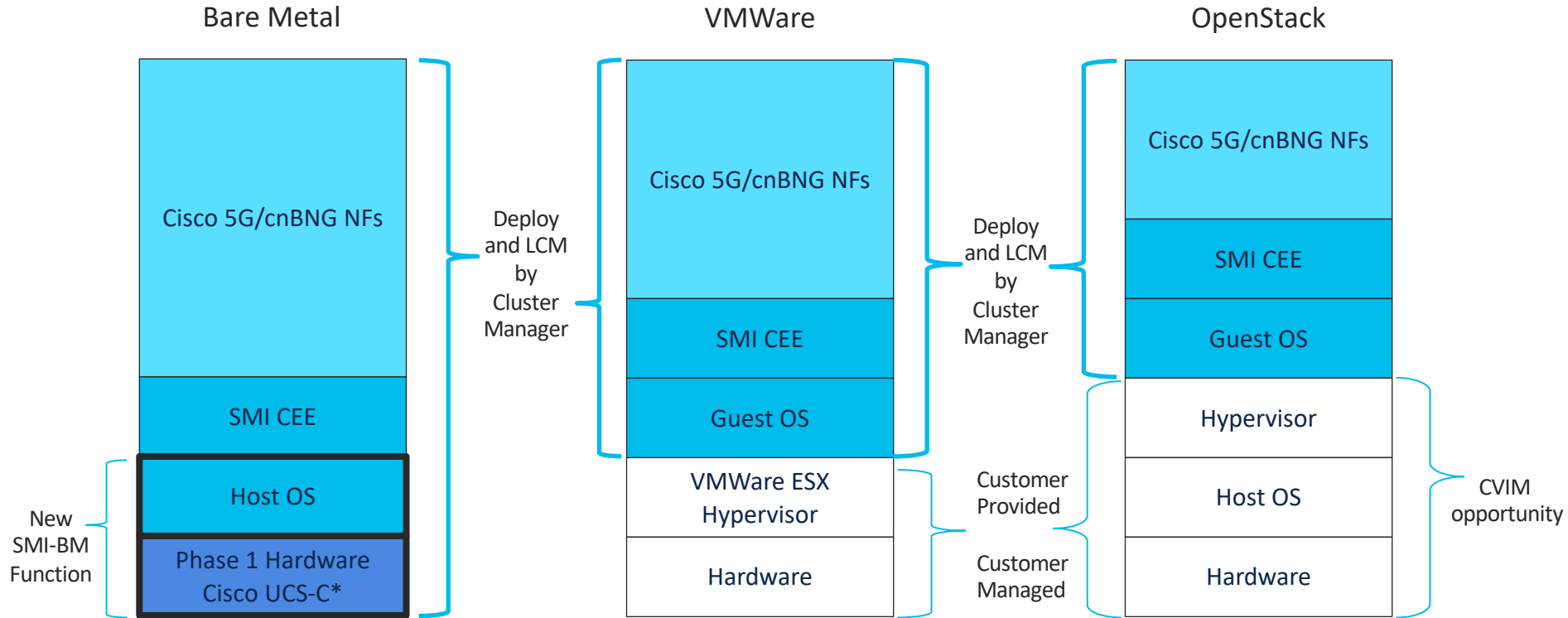
- CaaS Platform managing both VNF's and CNF's
- CaaS API's integrated with Orchestrator and manage both VNF's and CNF's
- Standards yet to mature to support this model ( ETSI , CNCF )

# Cloud-Native Full Stack Automation

## Infrastructure to Network Services And Operations Automation



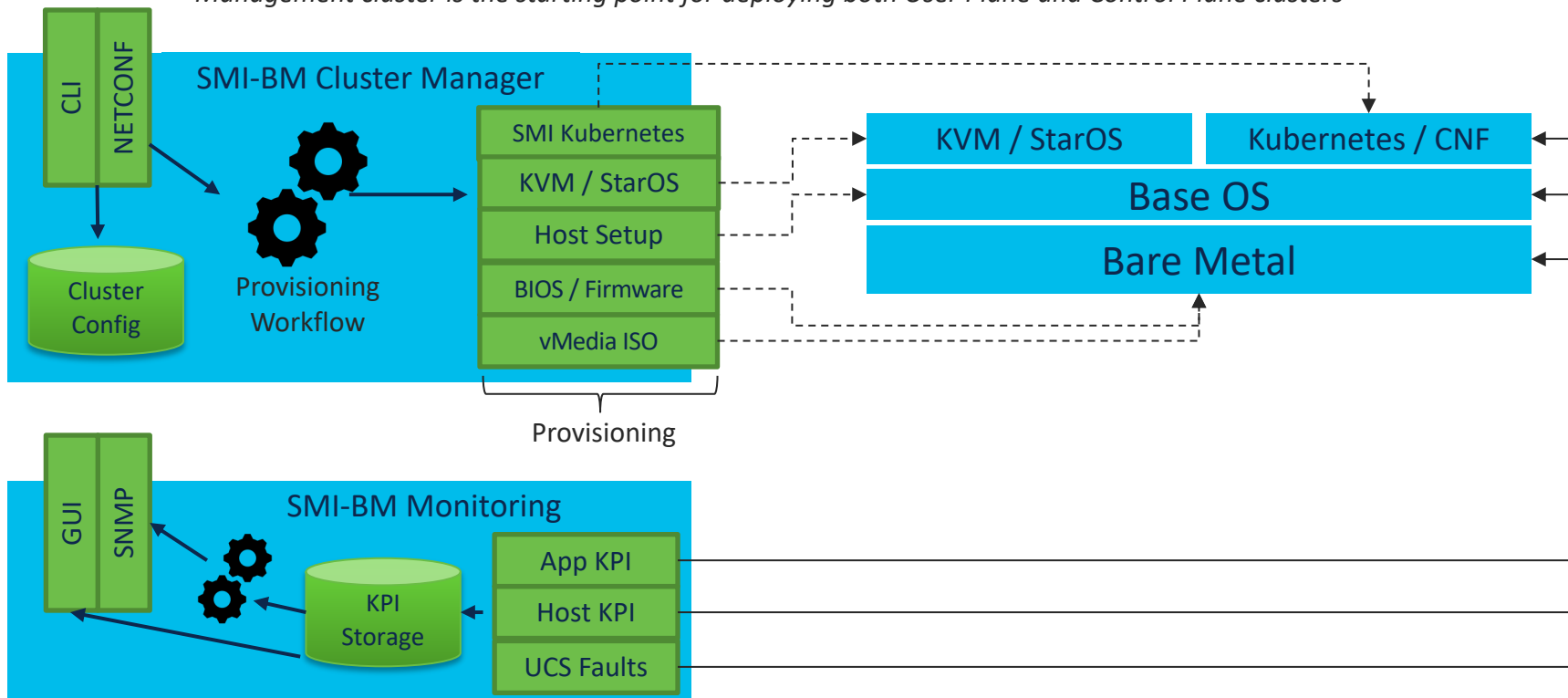
# SMI-BM 5G/cnBNG Deployment Environments



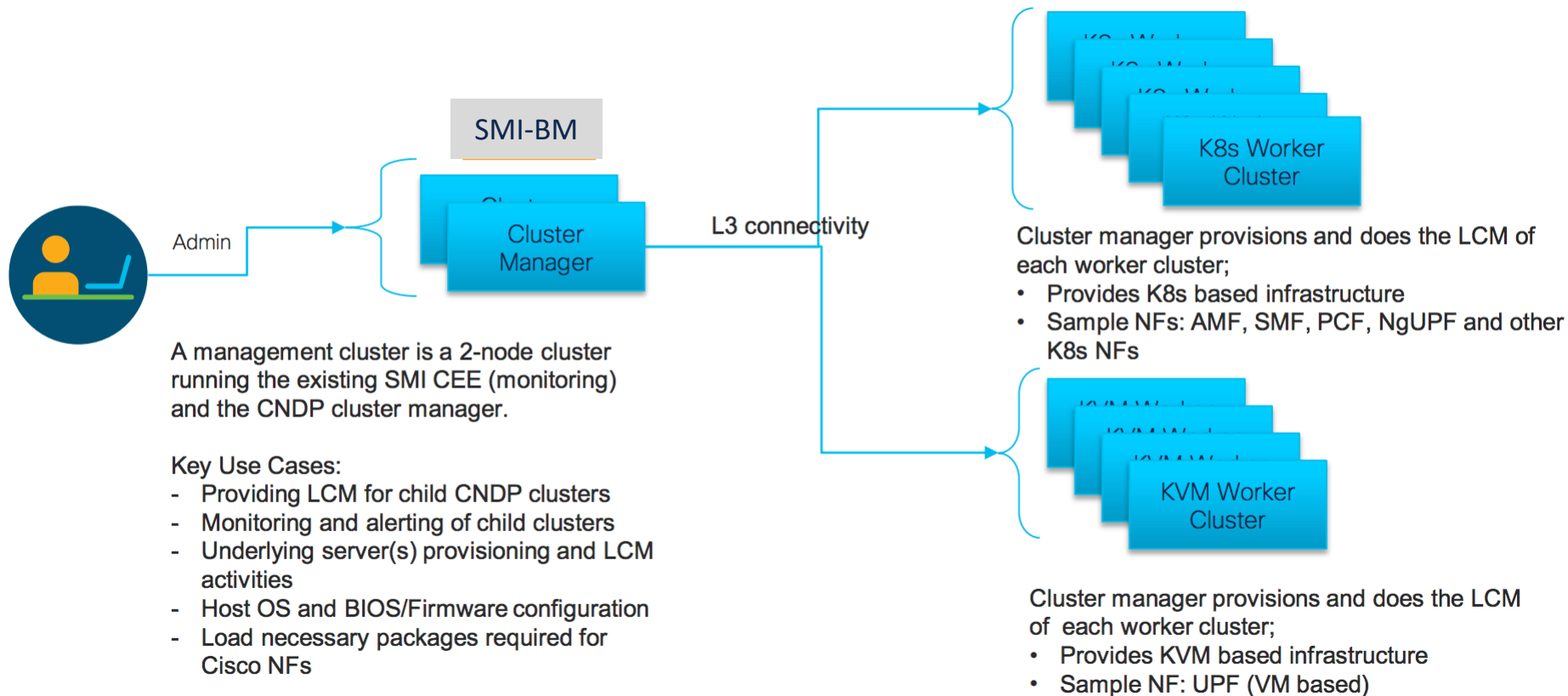


# SMI-BM Architecture – Management Cluster

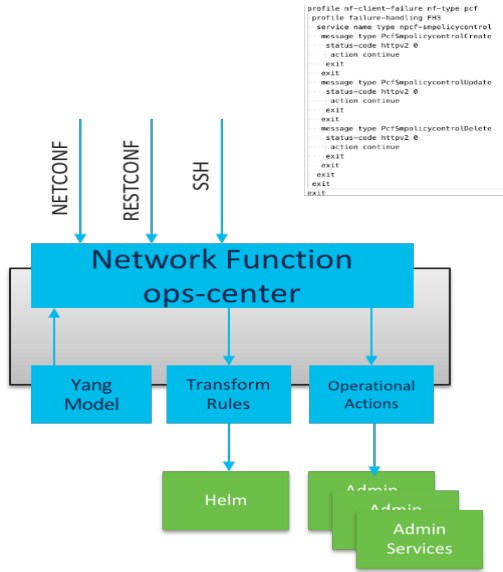
*Management cluster is the starting point for deploying both User Plane and Control Plane clusters*



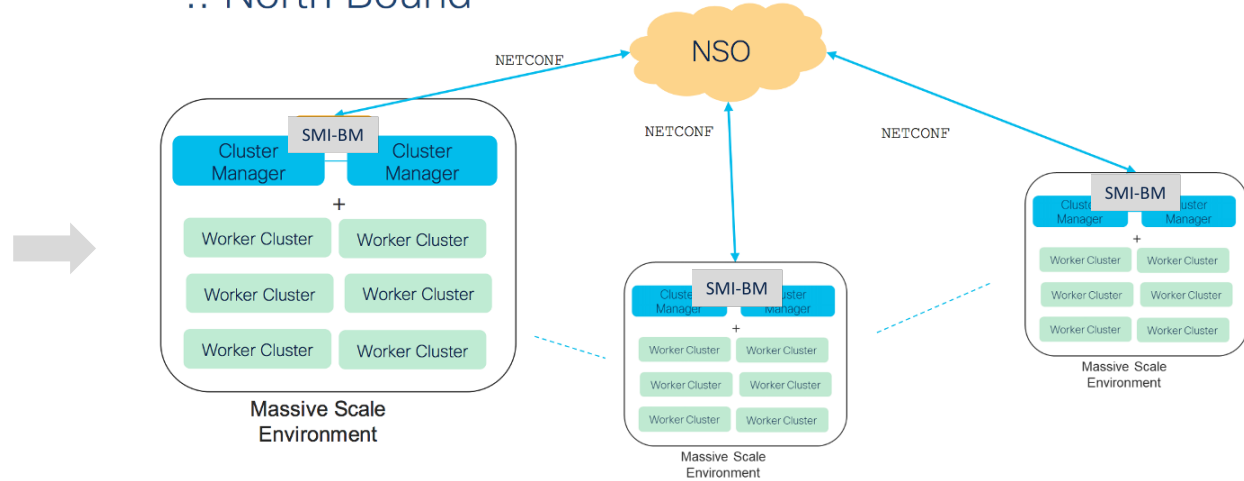
# SMI-BM Deployment Architecture (K8s v/s KVM)



# SMI-BM Automation

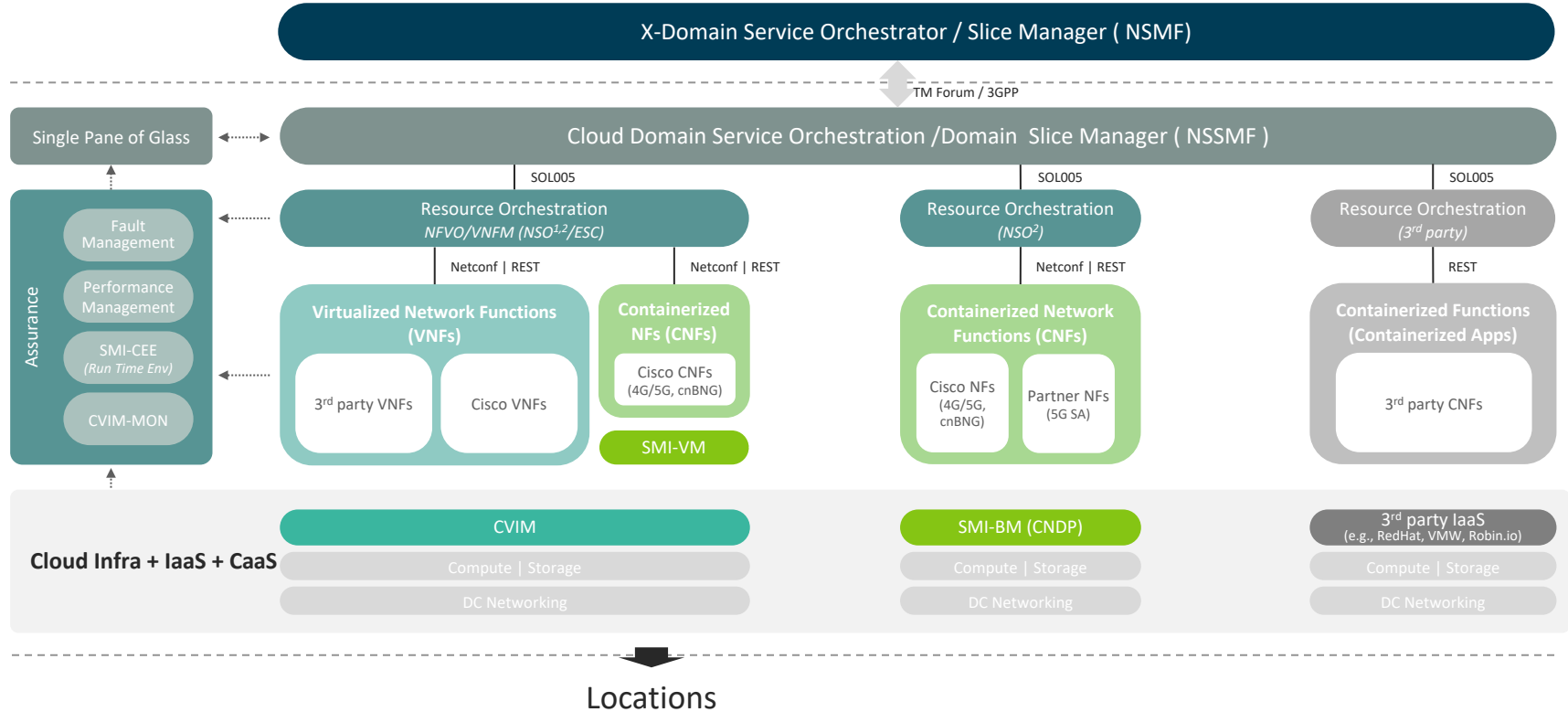


.. North Bound



- The network function can be fully automated via NETCONF or REST interfaces ( Integrates Directly to NSO )
- CFP to automate SMI-BM stack ( BM , K8's CM/Clusters , NF's )

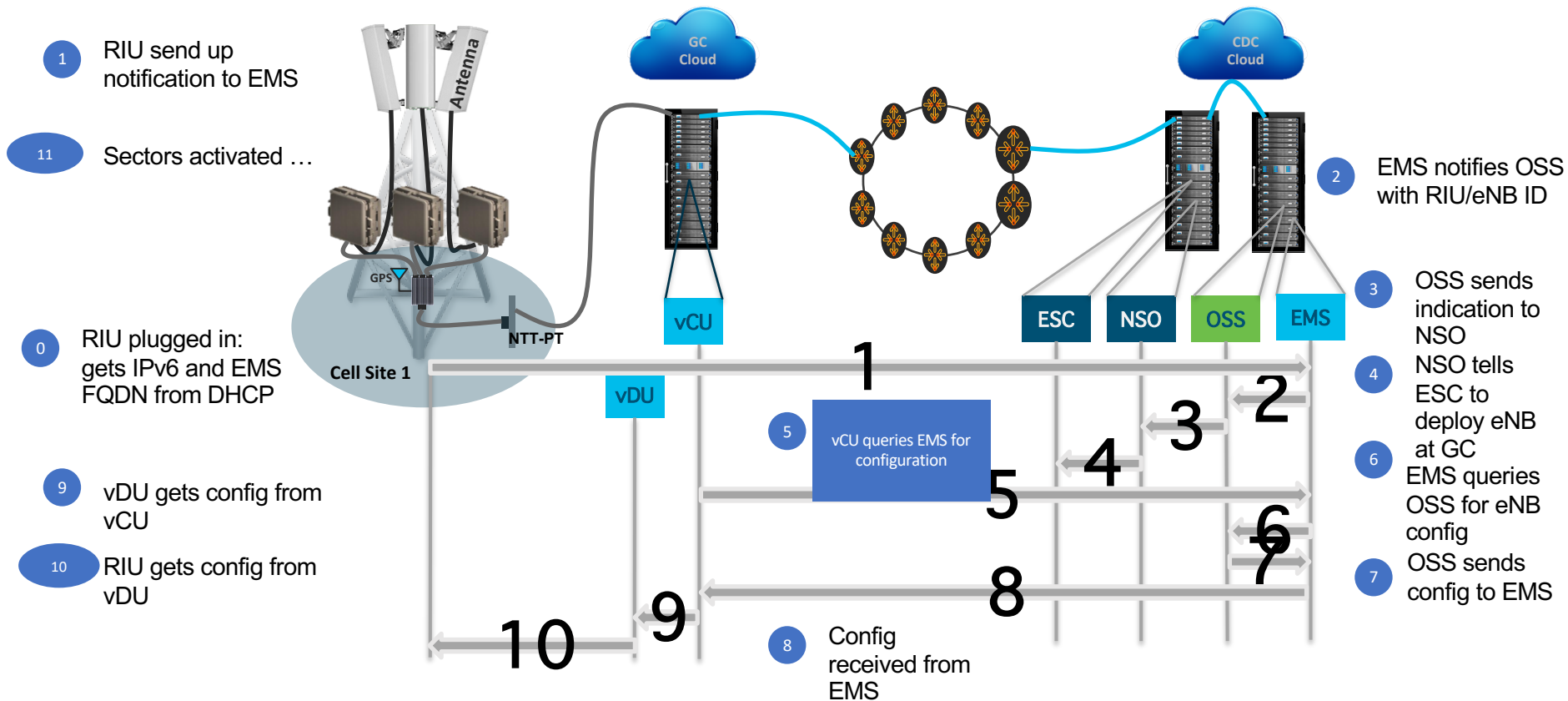
# Cloud Domain Automation Reference Framework



Automation strategy is key to integrate multiple Horizontal and Vertical Cloud platforms

# Automated vRAN Use Case

## Zero-Touch Cell Sector Activation



# Automation of Enterprise 5G Slice with MEC

