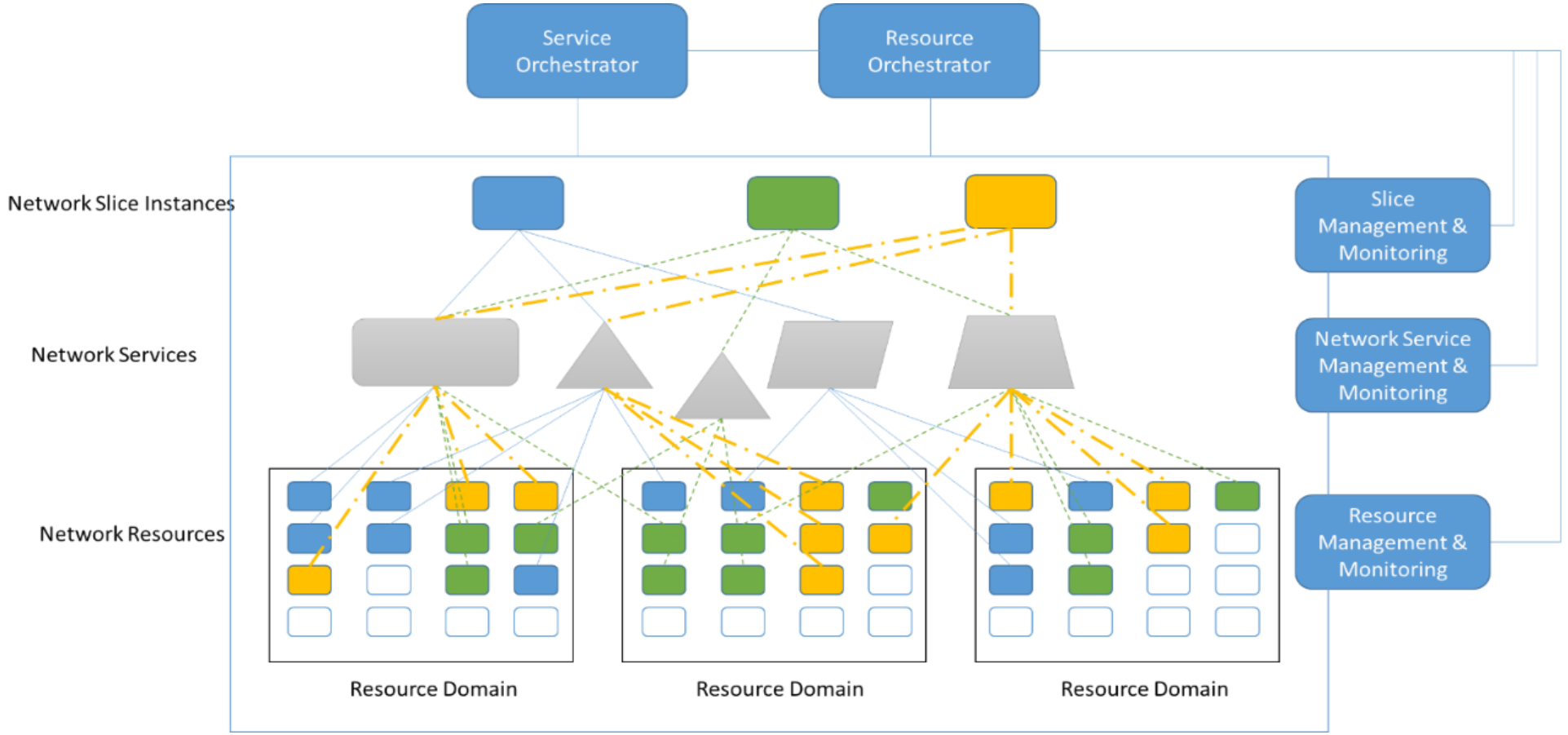
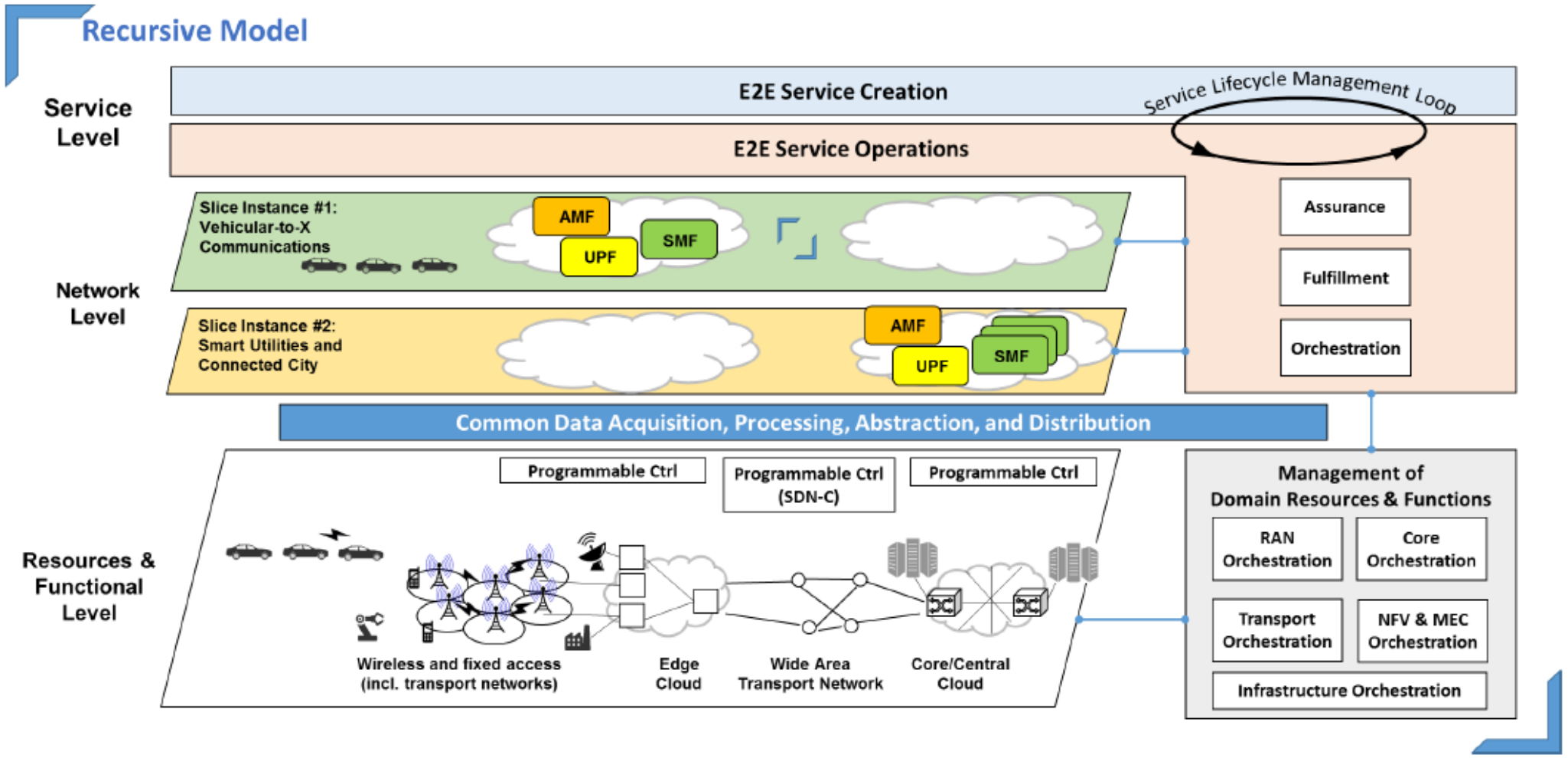
Service orchestration in 5G networks

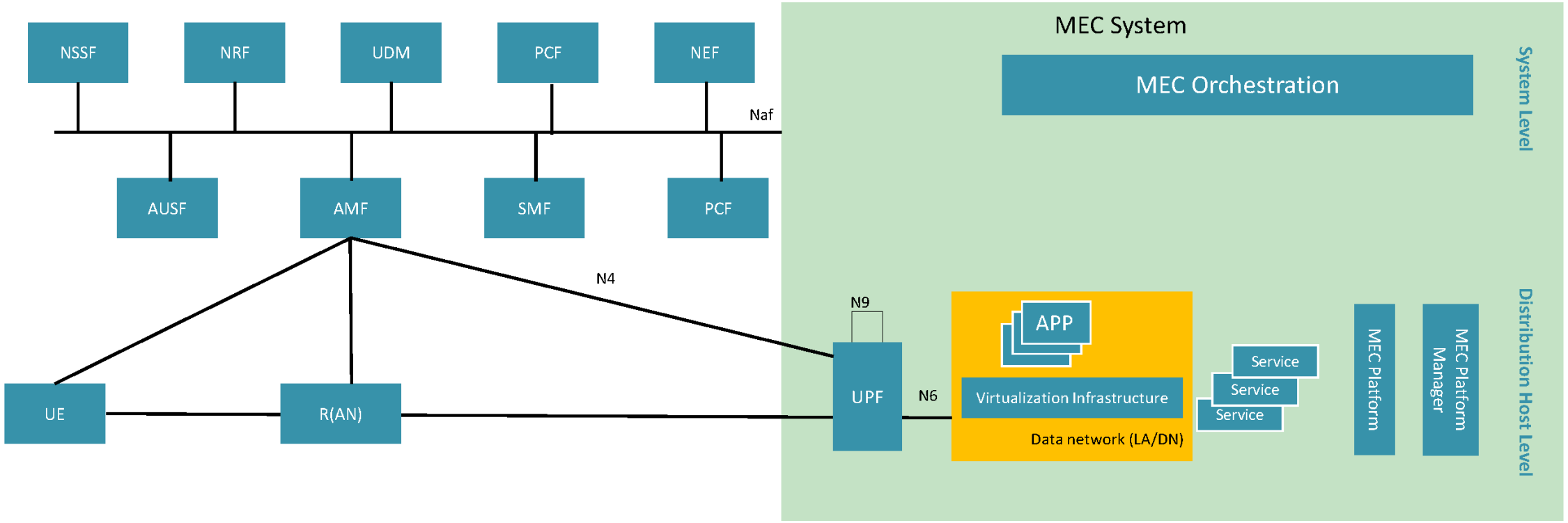
Centralized Service Assurance System for a Wireless Network



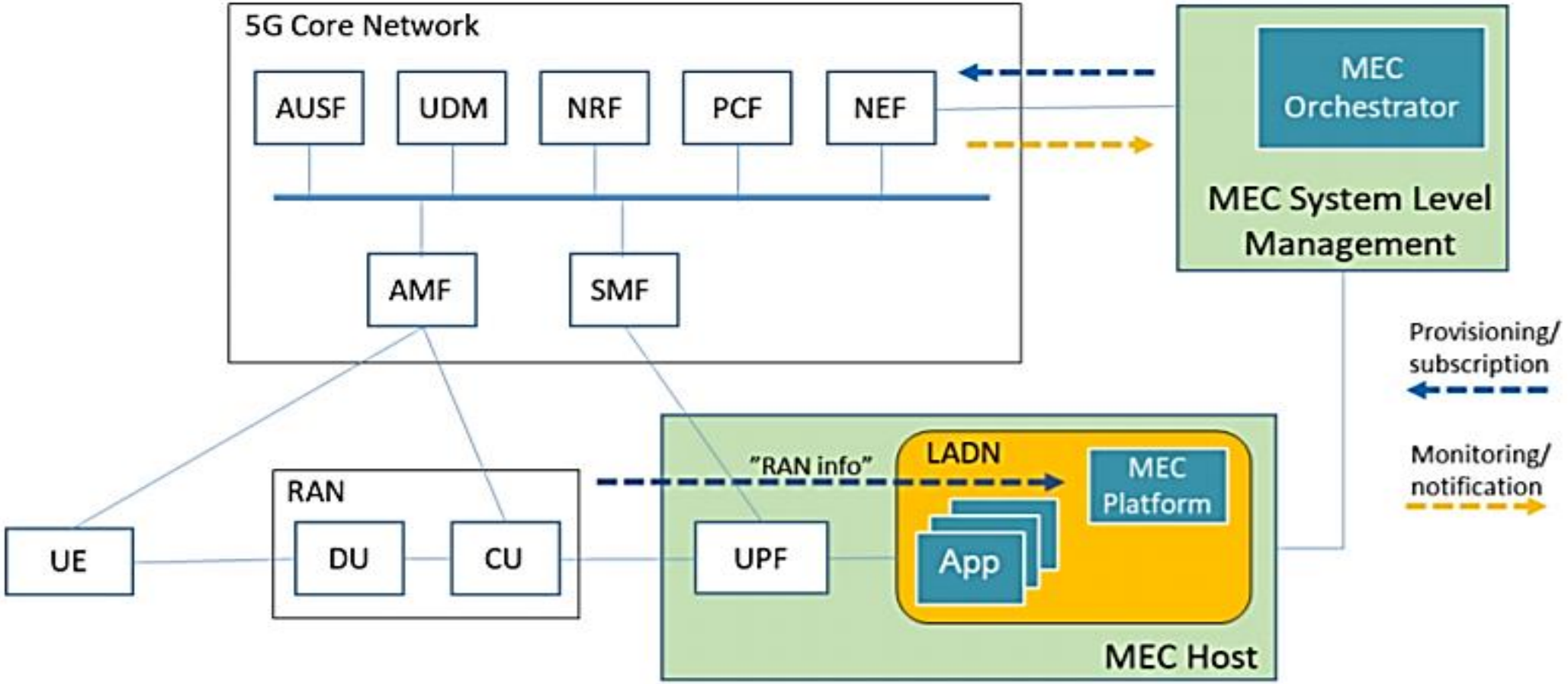
Service and Resource Orchestration



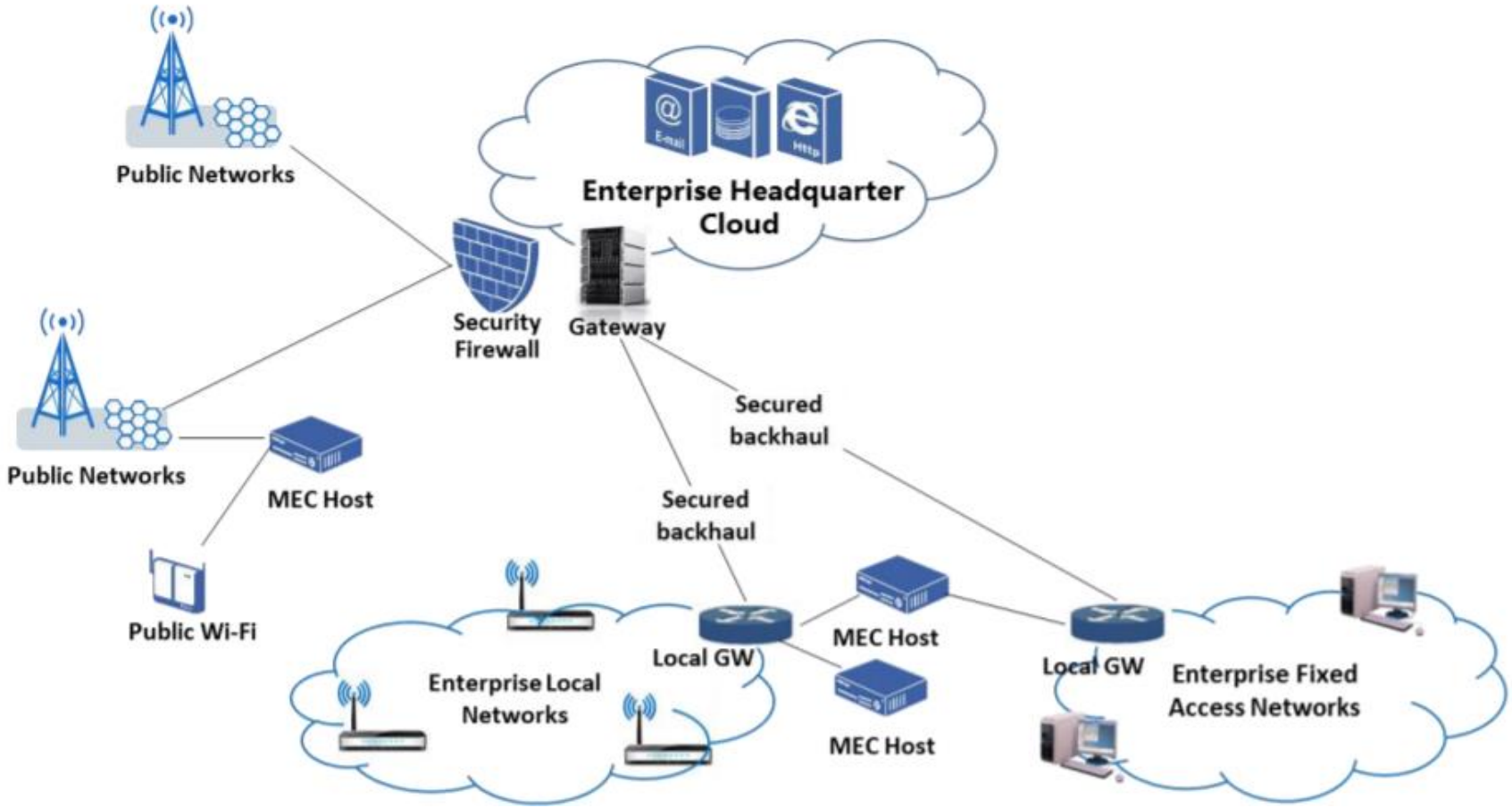
Integrated MEC Deployment in 5G Networks



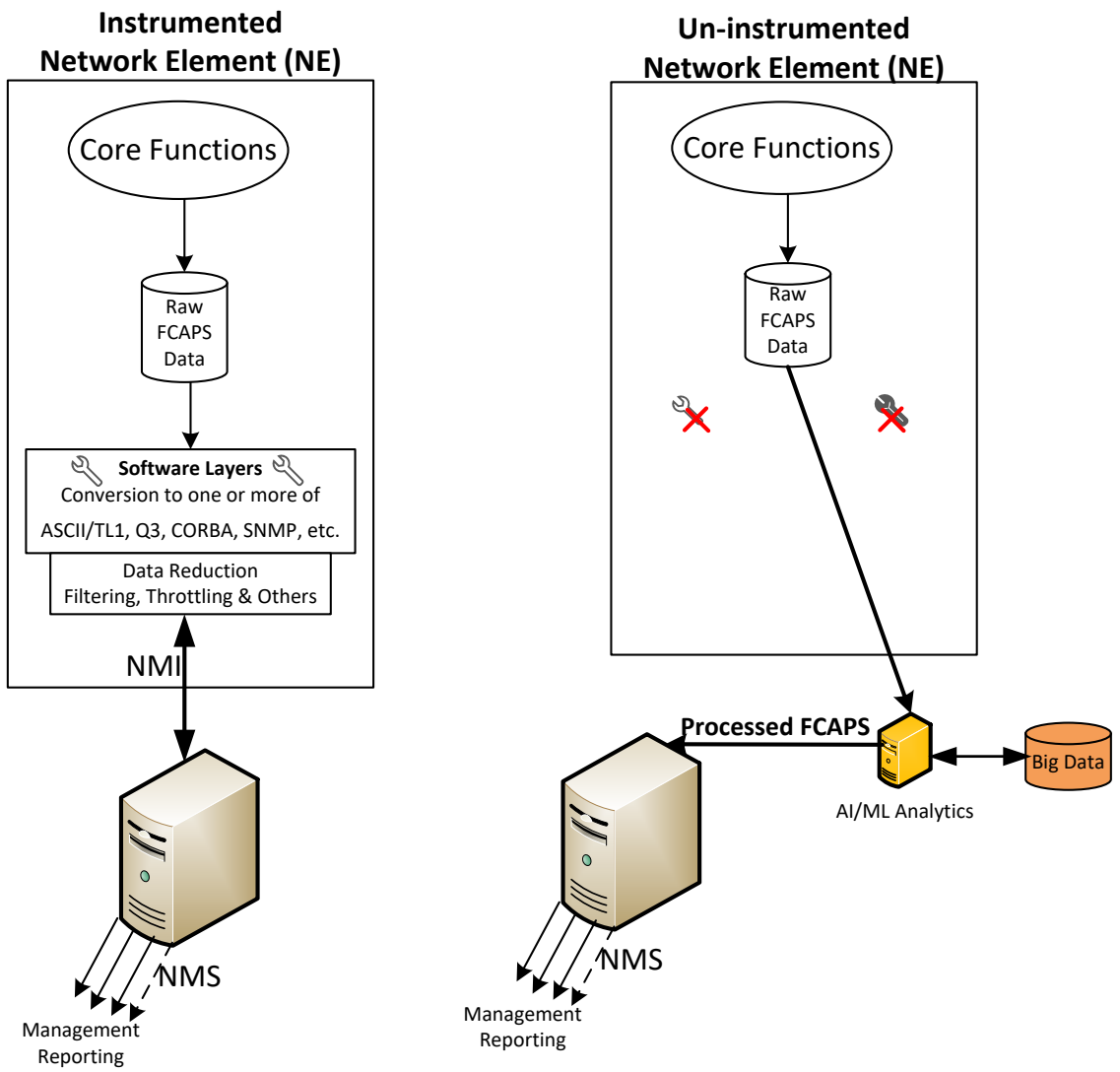
Capabilities Exposure

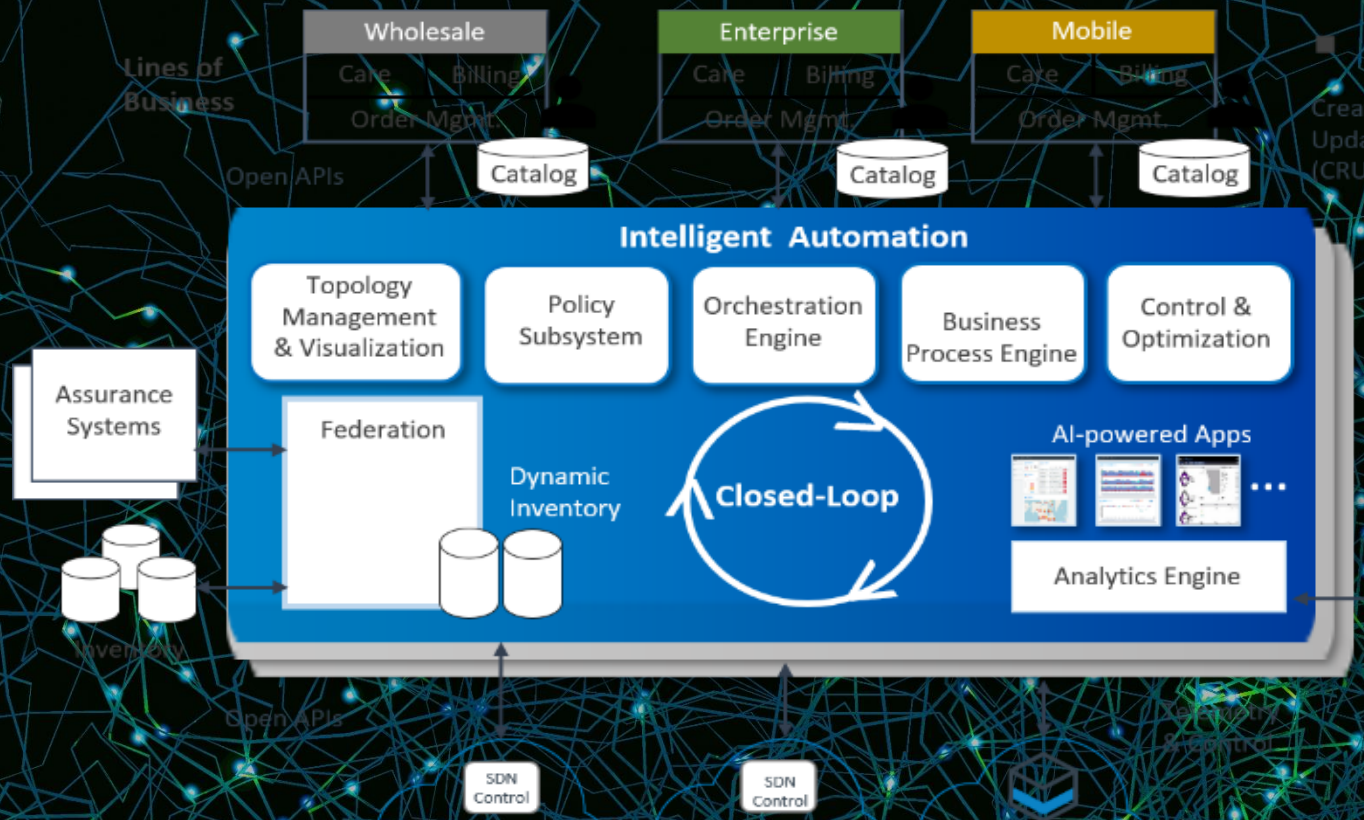


MEC Deployment Across Different Enterprise Networks



Instrumented & Un-Instrumented Management Data

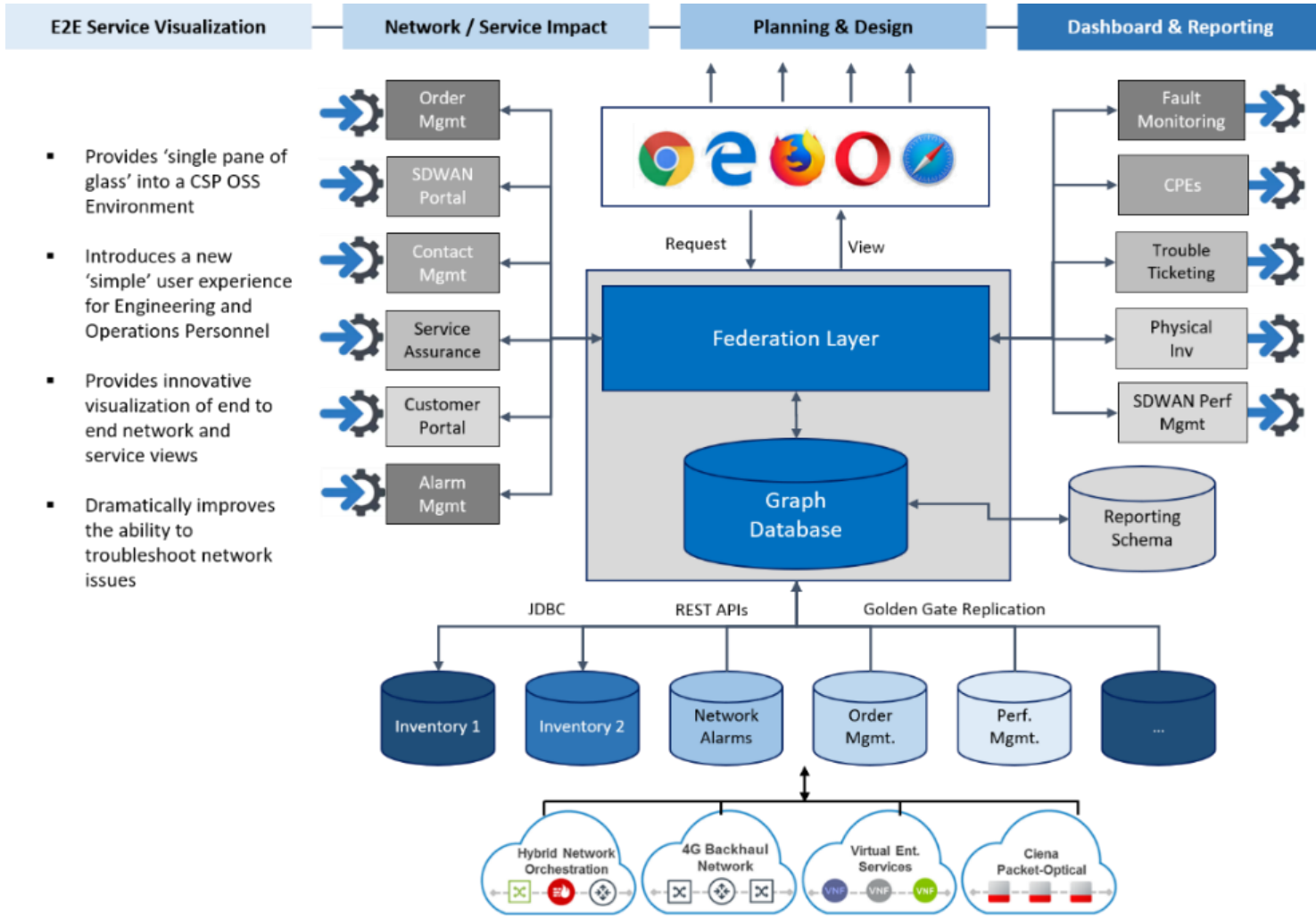




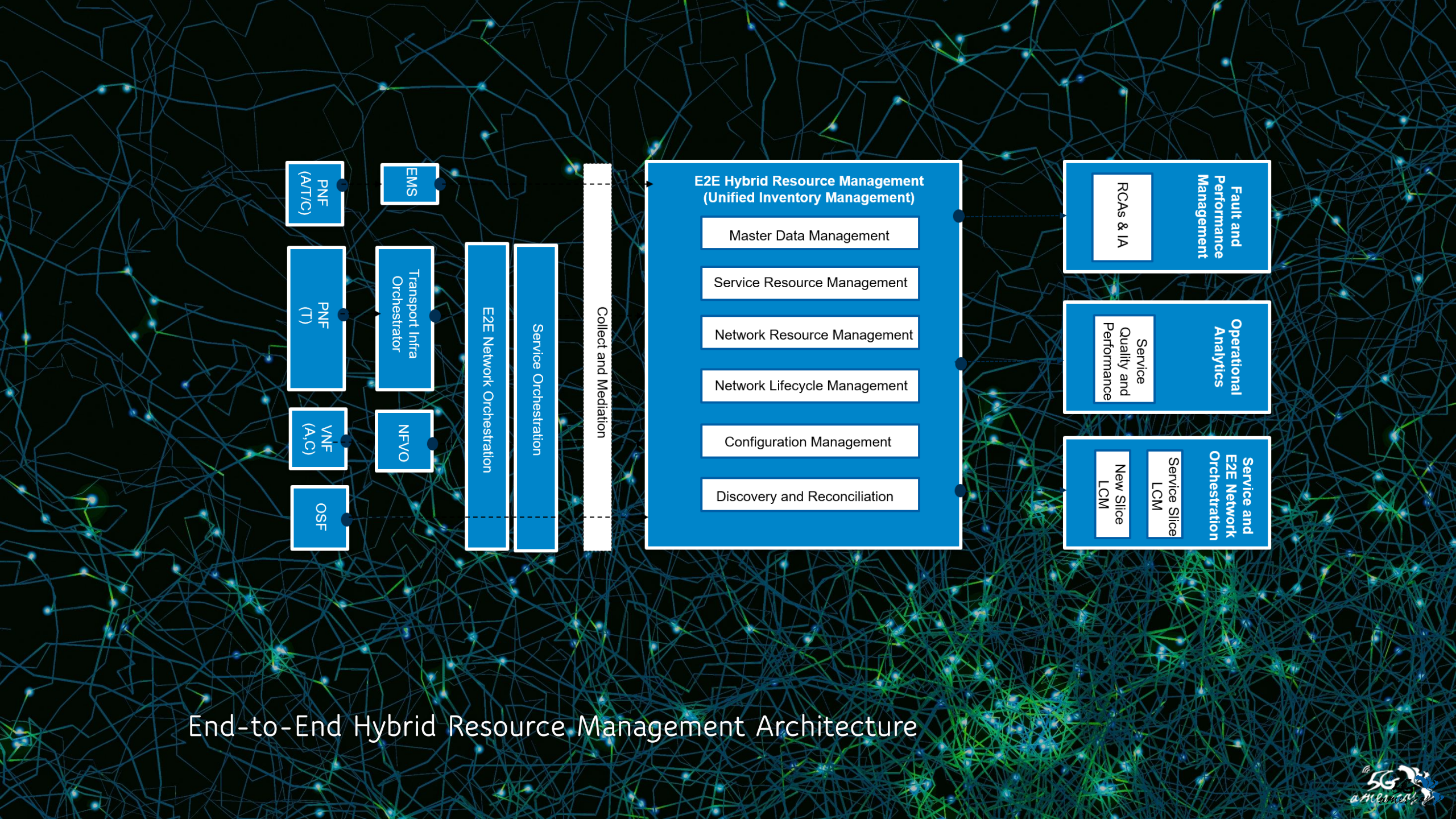
Dynamic Inventory in Closed Loop Automation

Unified Inventory

- Provides 'single pane of glass' into a CSP OSS Environment
- Introduces a new 'simple' user experience for Engineering and Operations Personnel
- Provides innovative visualization of end to end network and service views
- Dramatically improves the ability to troubleshoot network issues



- Allows CSPs to leave their existing system investments in place while introducing a next generation user experience
- Support for federated planning and design processes
- Integrates with existing data discrepancy management processes
- Open standards to allow for simple integration to other systems in the OSS



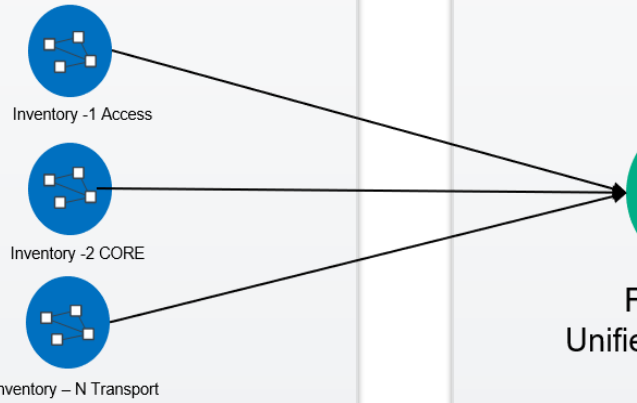
End-to-End Hybrid Resource Management Architecture

Discovery & Reconciliation Architecture Model

Discover

Gain real-time, accurate visibility of network resources & services across the entire Network

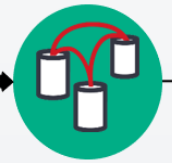
- Automated and proactive discovery of network equipment, circuits, PNFs, VNFs and services across multiple layers
- Support for all network technologies and vendors
- Integration with EMS/NMS/Device



Federation

Federate OSS/BSS systems and network data into a single, unified model

- Integration of OSS/BSS data
- Integration of Network Data
- Normalization of data into a single federated data model

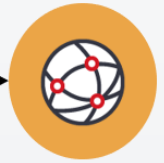


Federation
Unified Data Model

Reconcile

Auto-reconcile data discrepancies between OSS/BSS and the network

- Discrepancies are displayed, grouped and filtered using the GUI
- Automated resolution of discrepancies between OSS System(s) and network data sources
- Based on business rules – updates are made from "source of truth"
- Exceptions outside business rules are handled via User Interface



Reconcile

Inventory – N Transport

Local & Global Learning & Decision Making in Distributed Networks

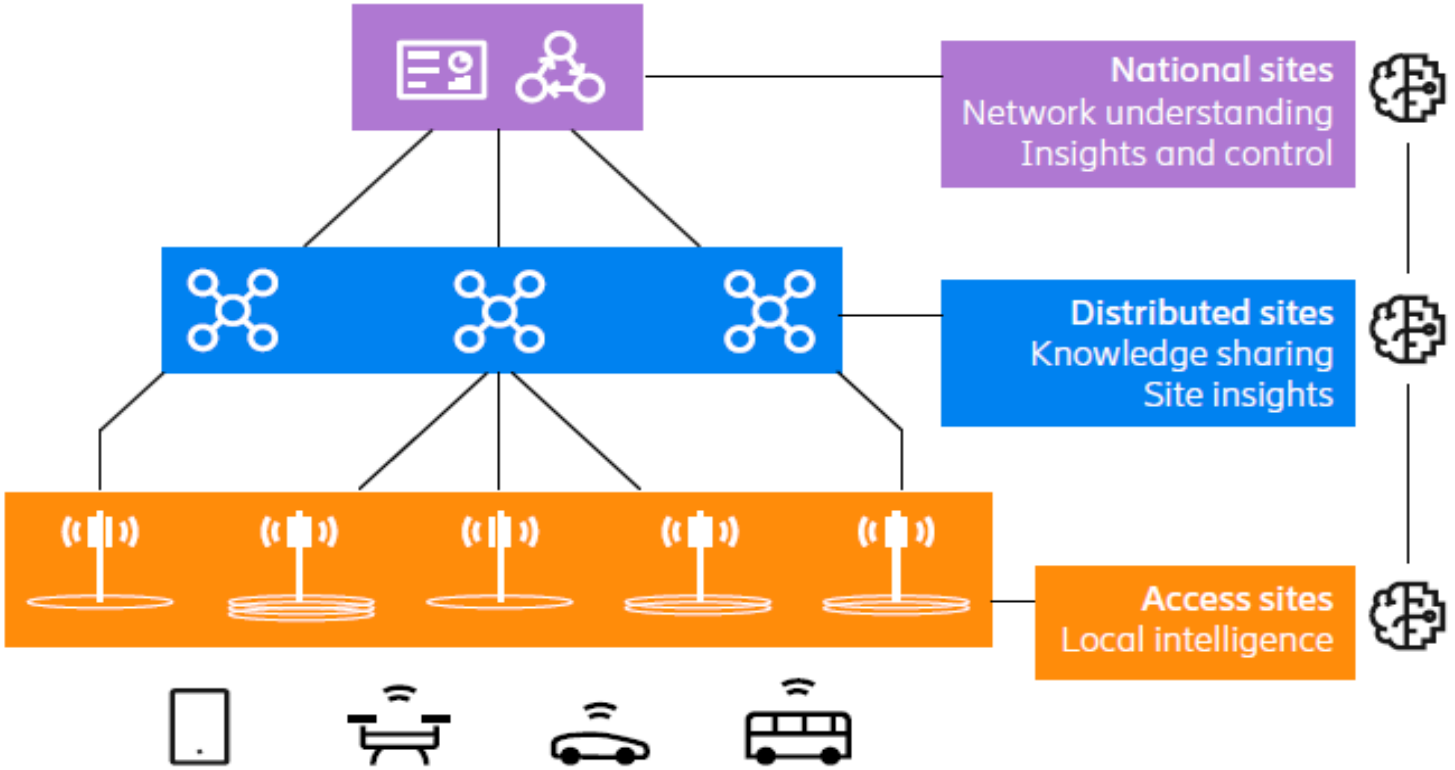
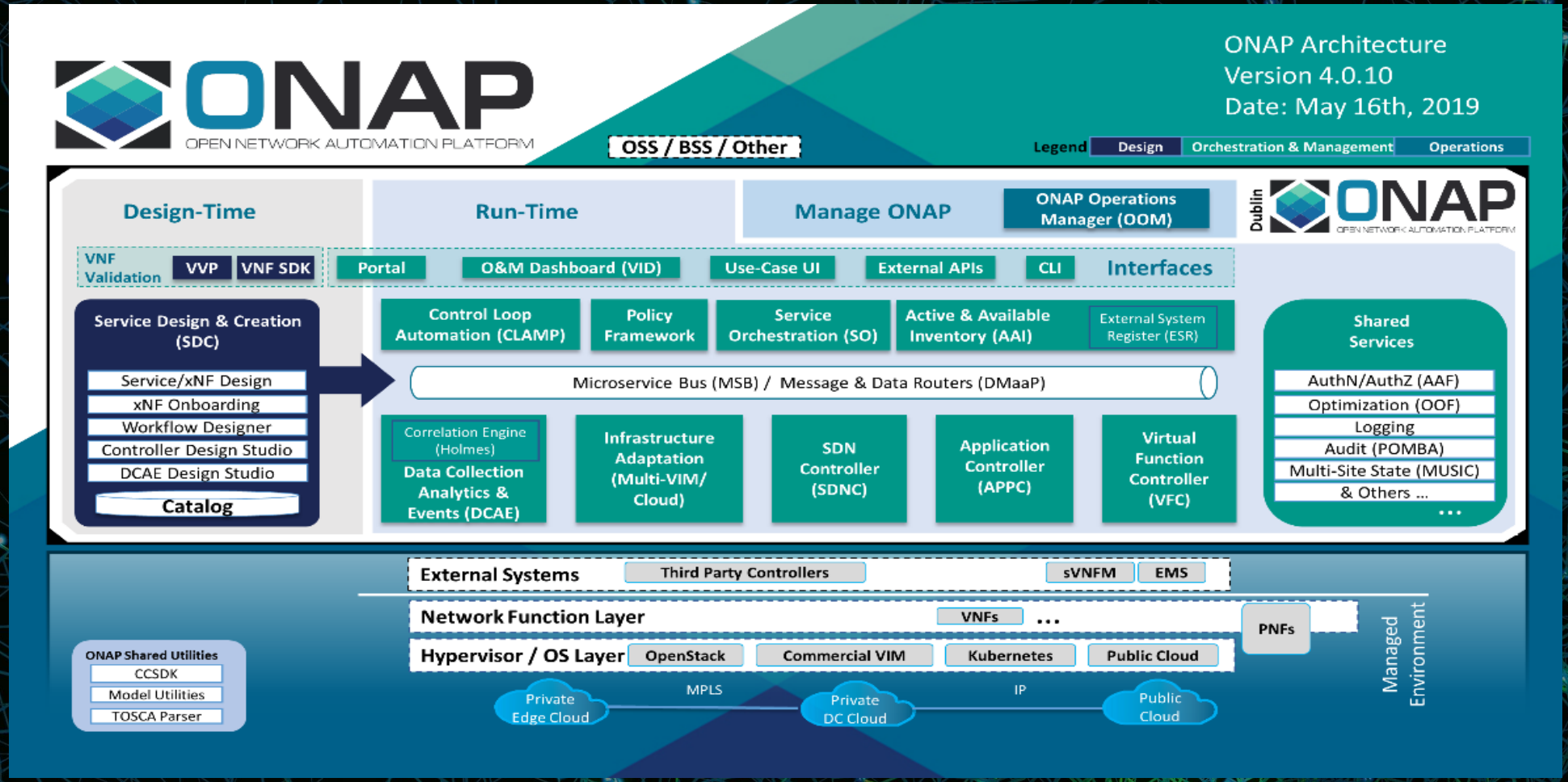
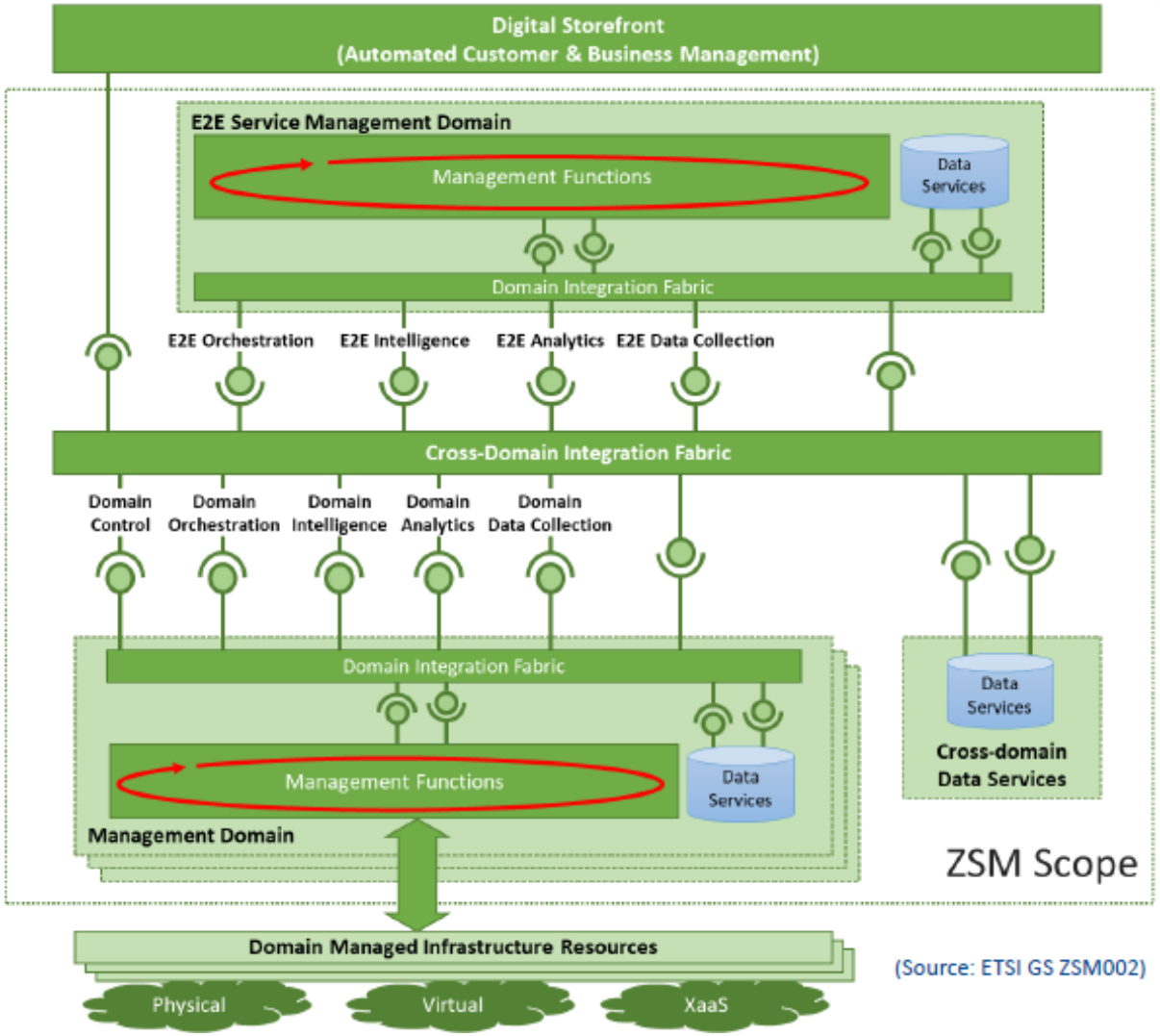


Figure 1: Local and global learning and decision making in large distributed networks

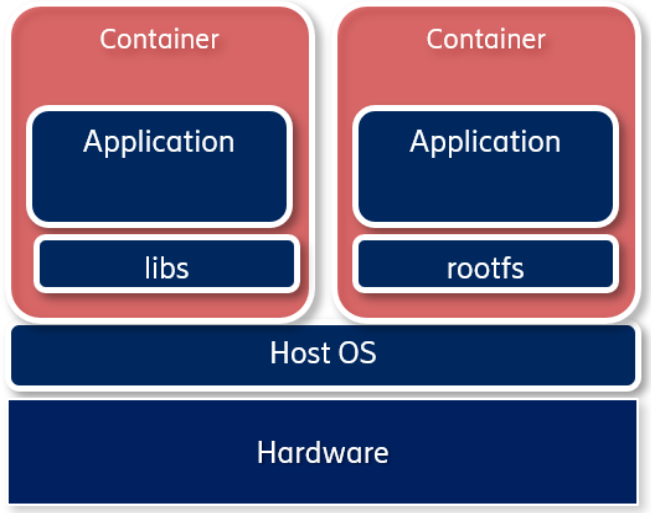
ONAP Software Architecture

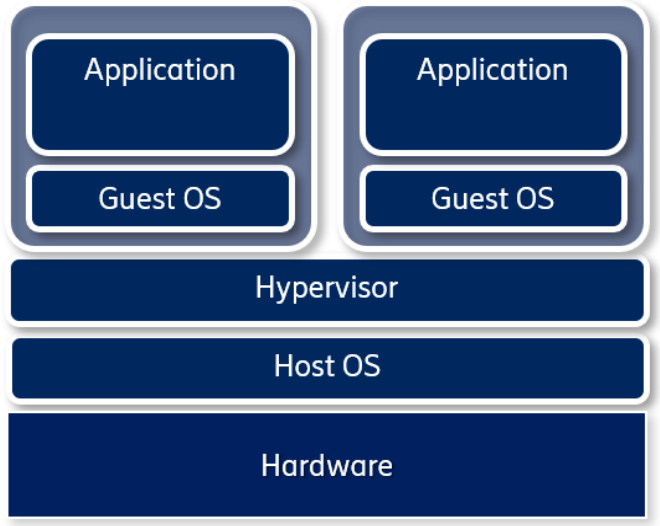


ZSM Architecture Framework



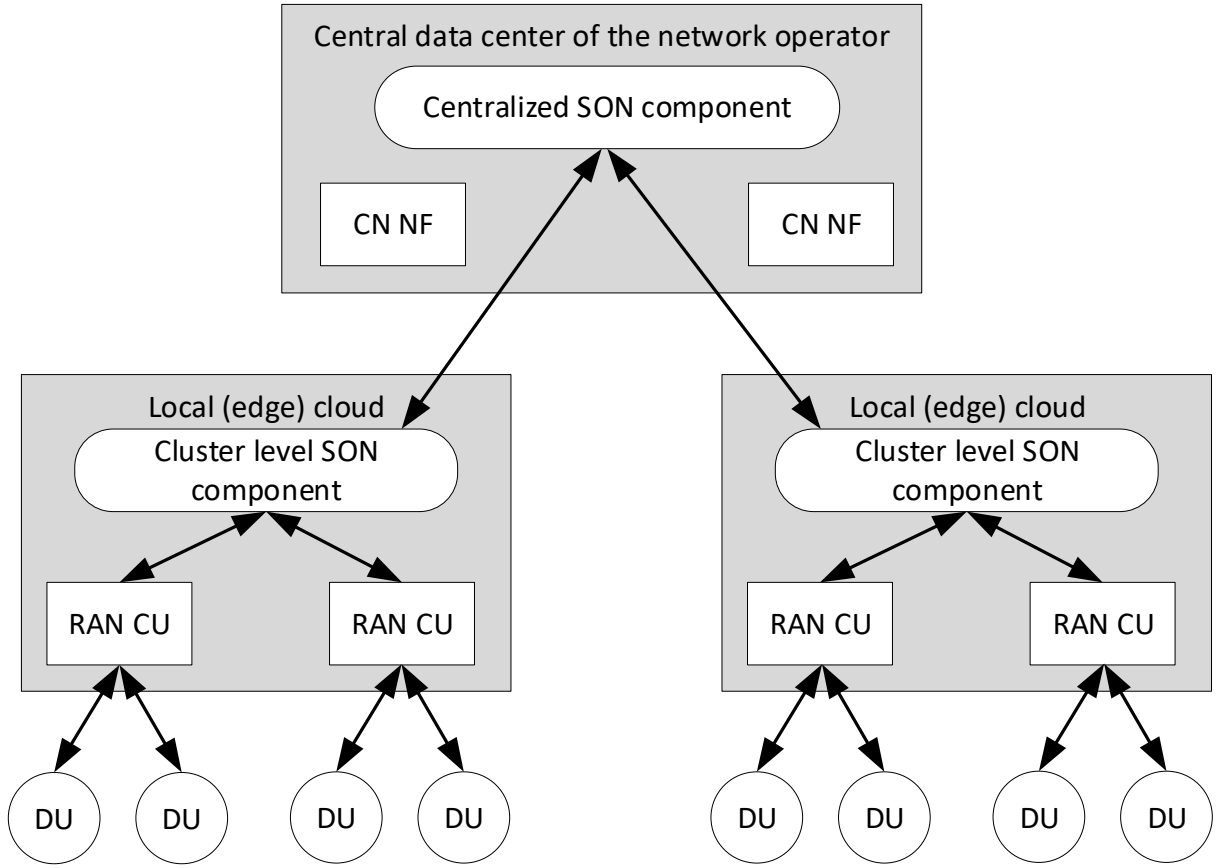
(Source: ETSI GS ZSM002)





	Container	Virtual Machine
Advantages	• More efficient, high concentration of containers per hardware node, low overhead • Each container is a partial instance of the operating system (OS), not a complete OS	• Free choice & full control on the OS & its parameters • Full control over OS version upgrades • Fully dedicated resources (CPU, RAM, DISK)
Disadvantages	• No control of the kernel (provider controls/upgrades the kernel) • Only one kernel per hardware node – no mixing OS	• Higher overhead per VM • Less VMs can run on a hardware node

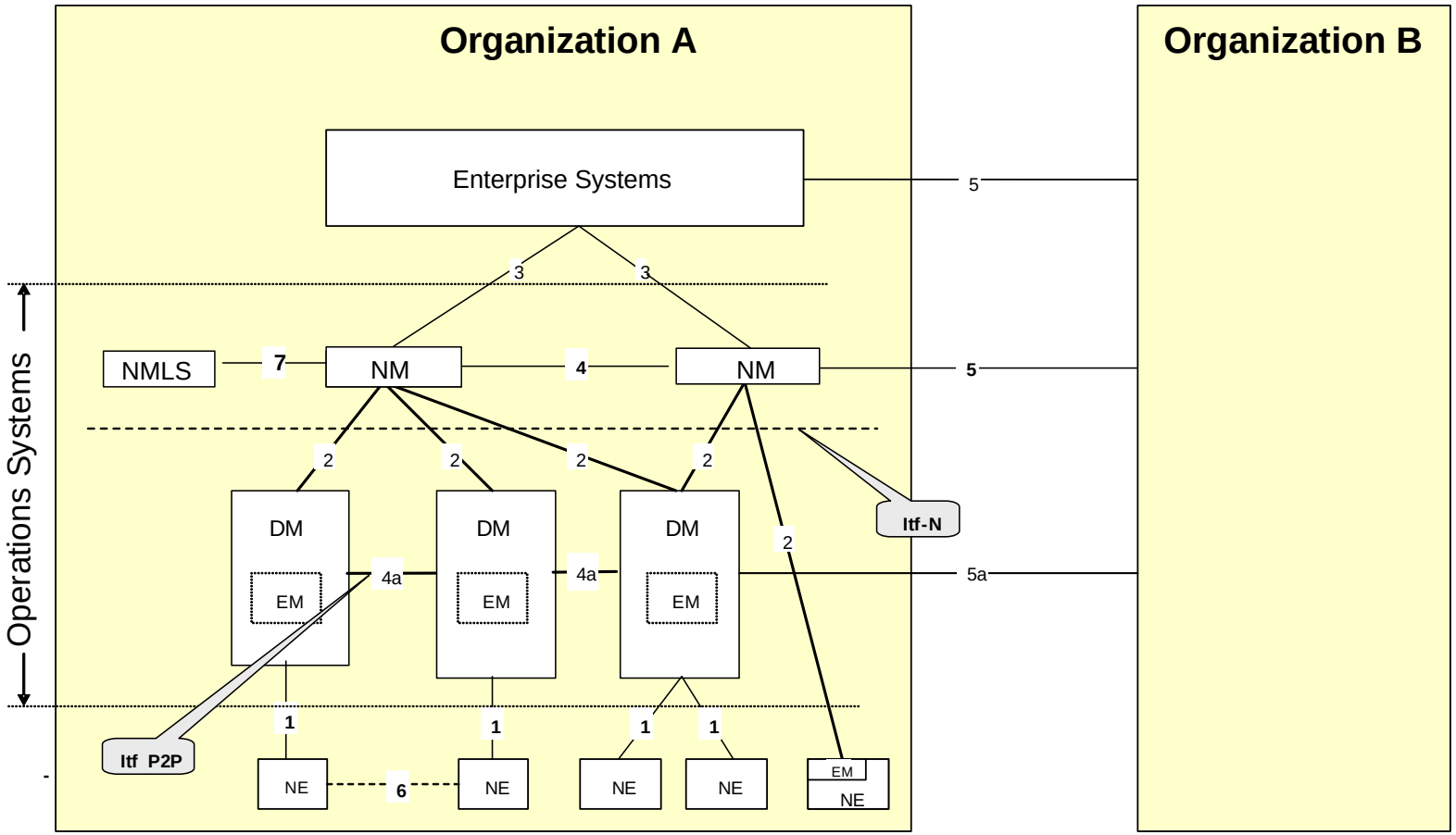
Hierarchical Cross Domain SON Architecture



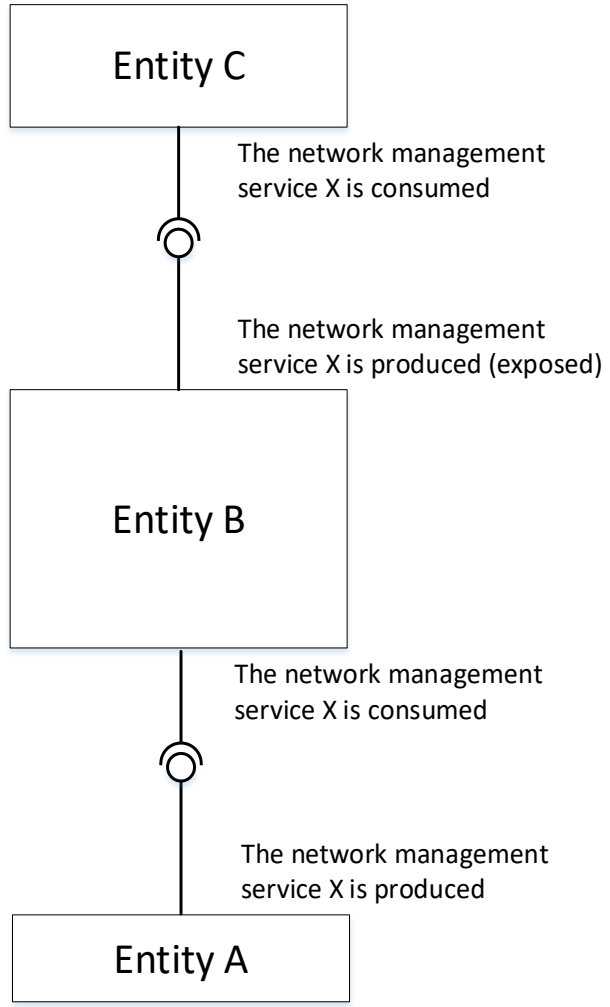
CN: Core Network
RAN: Radio Access Network

CU: Central Unit of the RAN
DU: Distributed Unit of the RAN

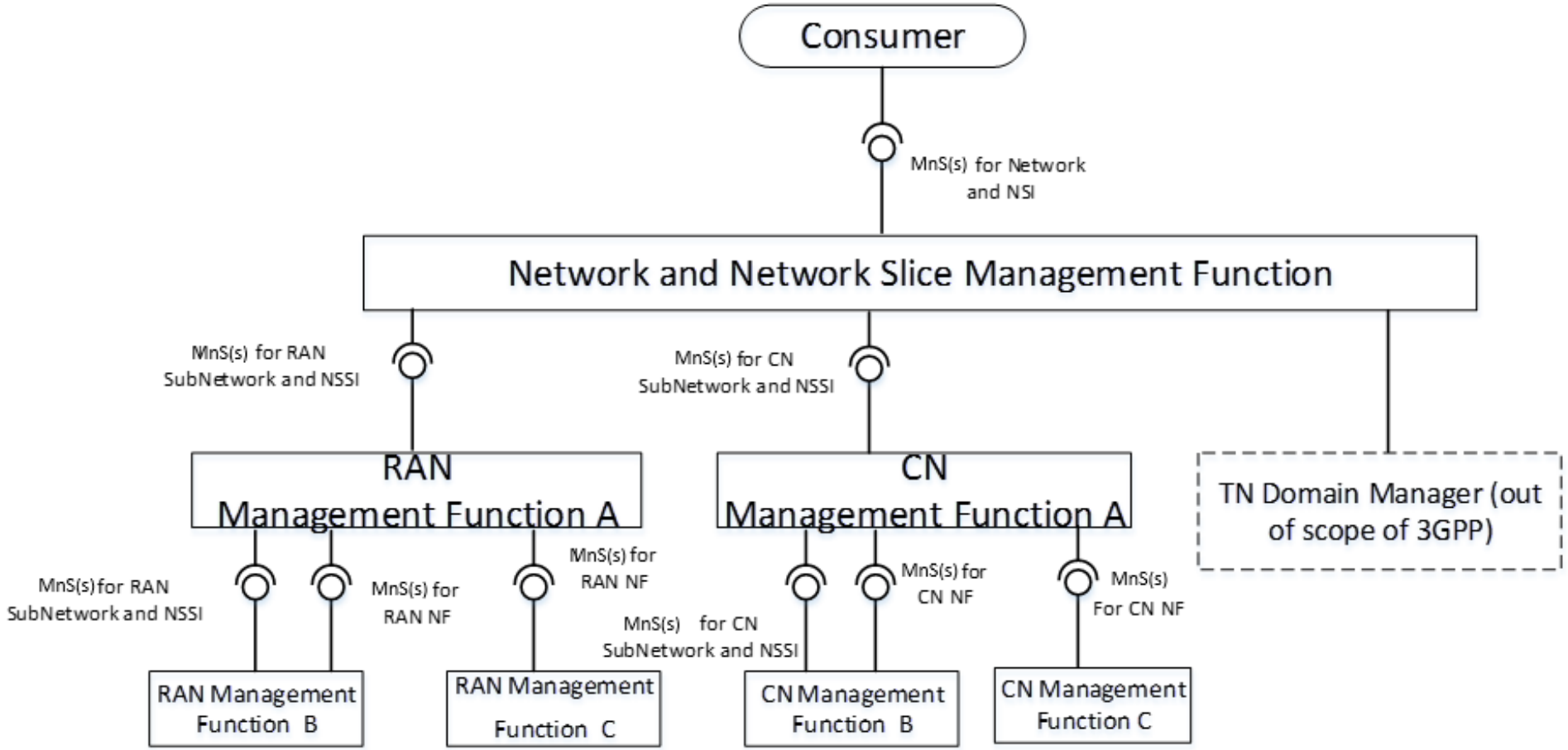
3GPP Network Management Reference Model



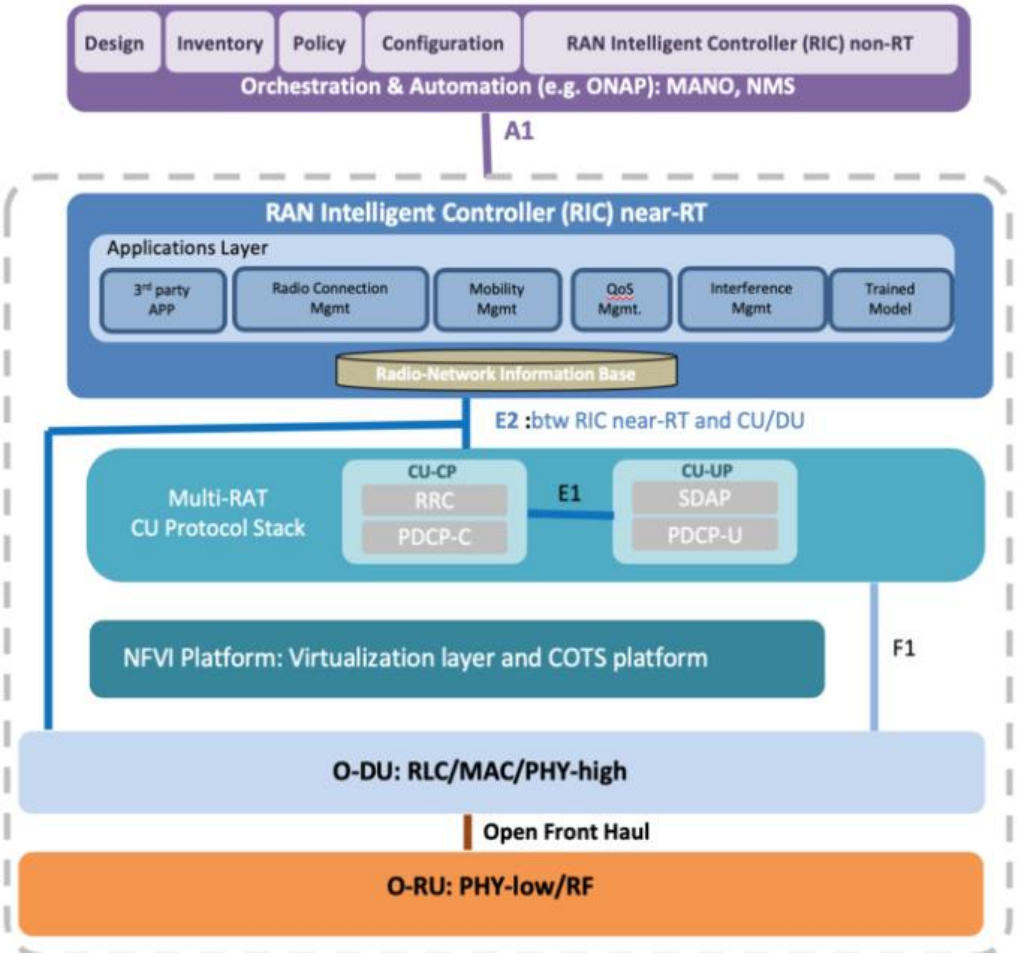
Exposure of Network Management Services



Deployment Scenario for Management of a Mobile Network with Network Slicing

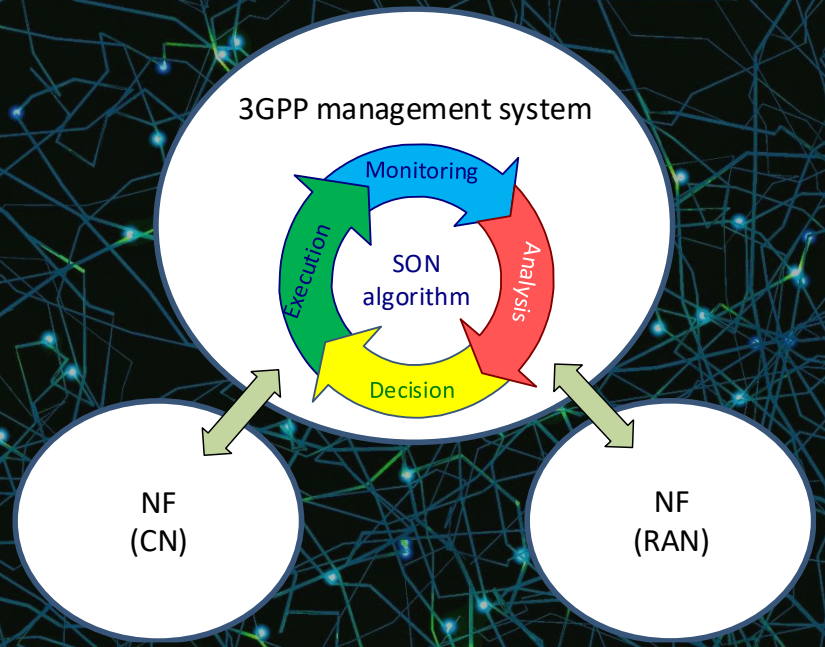


O-RAN Architecture Schematic Diagram

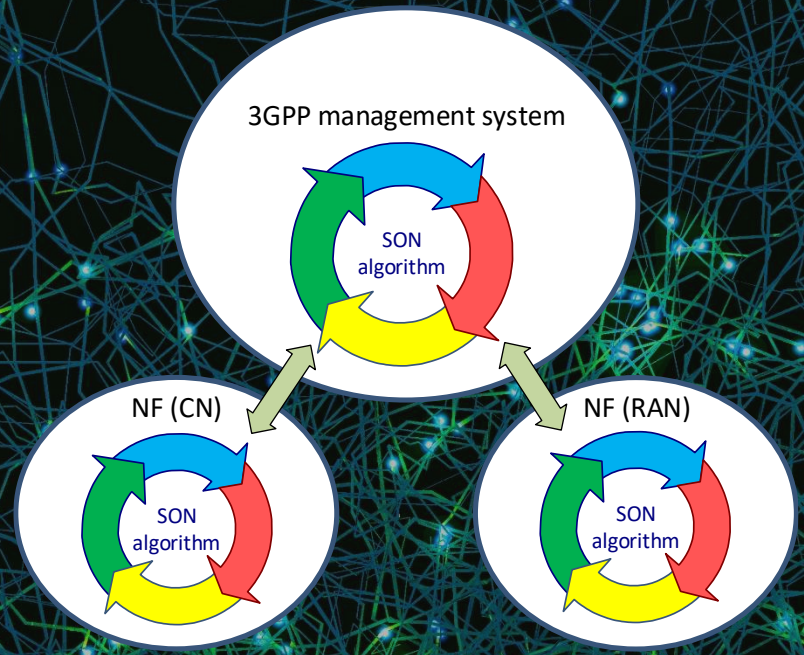


Centralized vs. Hybrid SON

Centralized SON Solution



Hybrid SON Solution



Multi-Domain Service Optimization