

# Industry Harmonization for Shaping a Management Ecosystem and Promote Innovation

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# New Market Realities

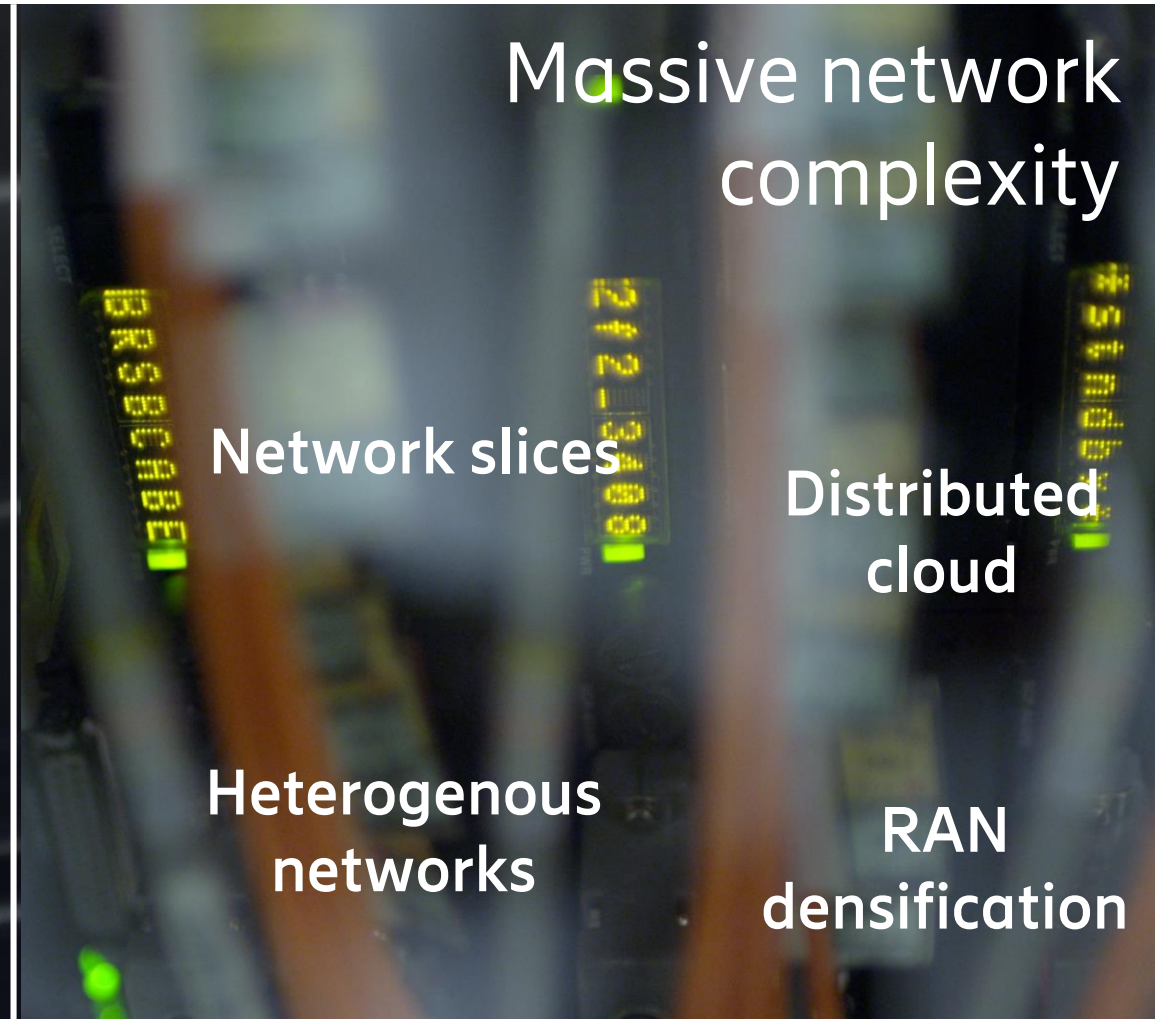


New use cases

Ultra coverage and bandwidth

Ultra reliable

Ultra low cost



Massive network complexity

Network slices

Distributed cloud

Heterogenous networks

RAN densification

# Why 5G need Cloud Native Applications



## Speed

- Fast, low-cost introduction of new services in small scale

## Scale

- Scale fast at low cost from hundreds of users to millions

## Efficient operations

- Automation, no-touch operations
- Legacy and new services
- Life-cycle independence (services/infrastructure)

## Performance and capacity

- Optimized capacity throughput and resource utilization

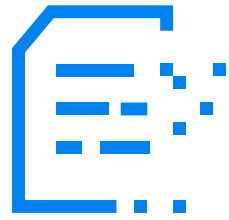
Rapid Innovation

Software development in fast-moving, independent and empowered teams

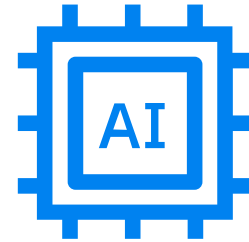
# Technologies Enabling Business Transformation



Cloudification



Model based  
Management

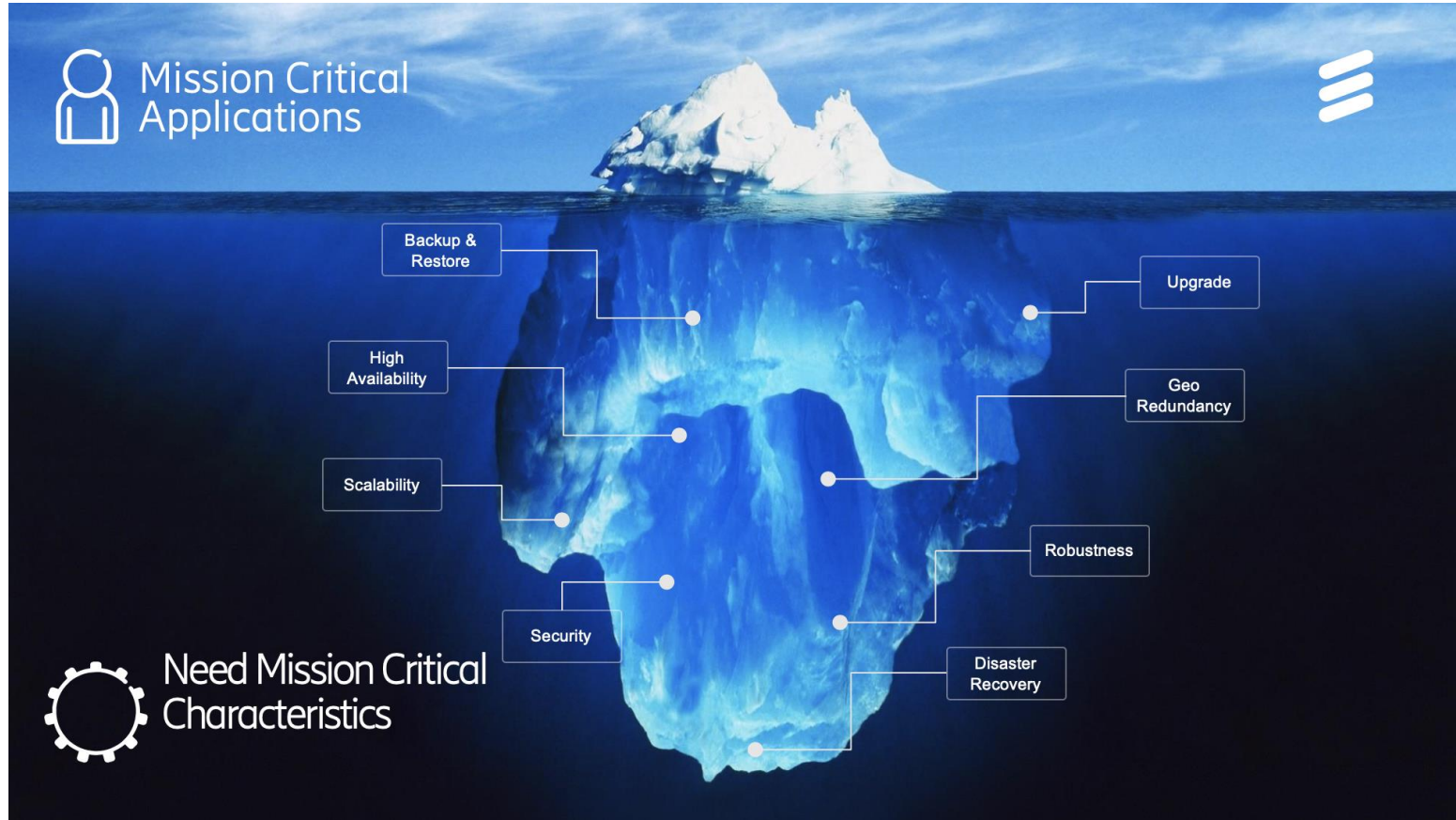


Automation, AI/ML



Open Source

# In Ericsson 'Productification' generally means:



...at volume.

...but open source can reduce cost and harmonize

# Open Source Enables 5G cloud native applications and infrastructure



 **LF** NETWORKING

 **LF** EDGE

 OPEN DAYLIGHT

 **AKRAINO**  
EDGE STACK

 **CLOUD NATIVE**  
COMPUTING FOUNDATION

 **OPNFV**

 **ONAP**  
OPEN NETWORK AUTOMATION PLATFORM



kubernetes

 **LF** DEEP LEARNING

 **airship**

 **Acumos AI**

 **O-RAN**  
ALLIANCE

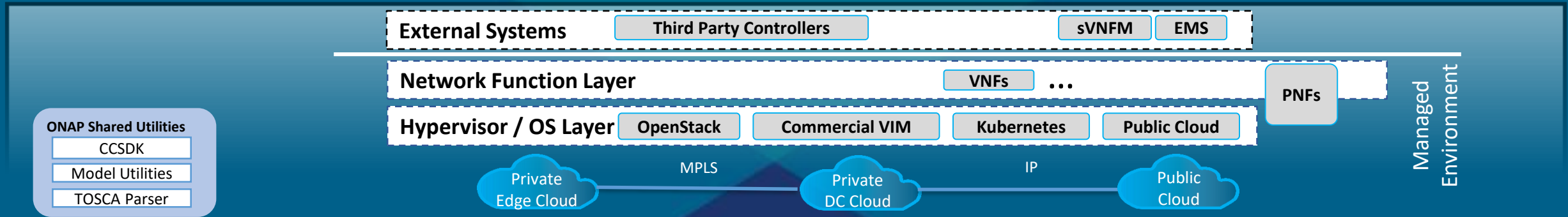
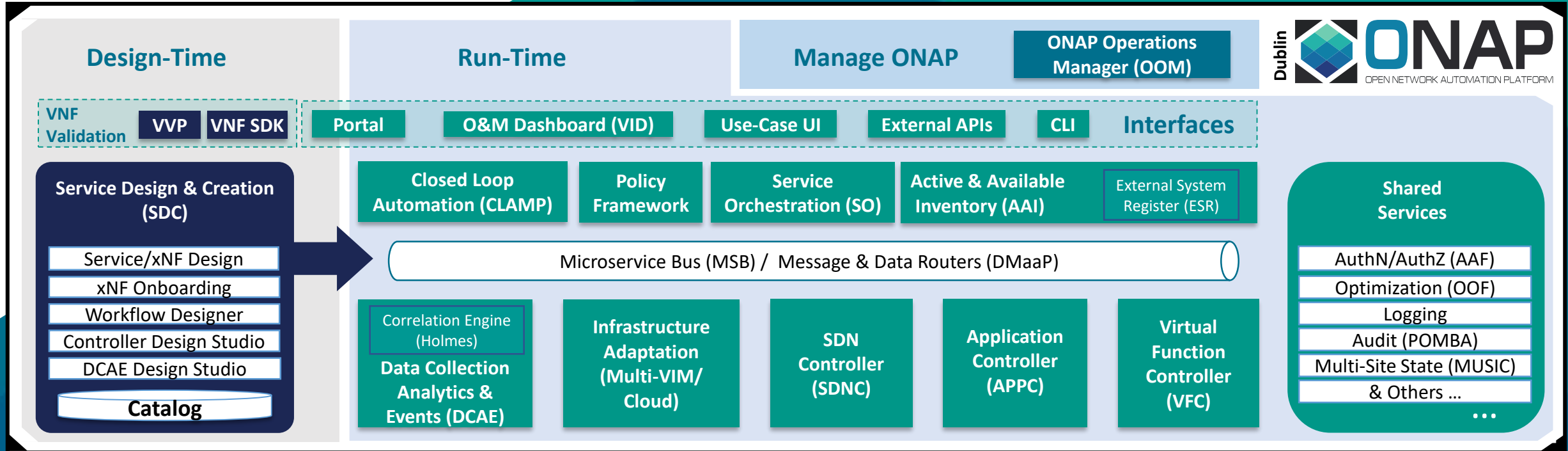
# Combining the best of two worlds



Let's enable the next generation of advanced automation

OSS / BSS / Other

Legend **Design** **Orchestration & Management** **Operations**





# ONAP Overview – Three Aspects

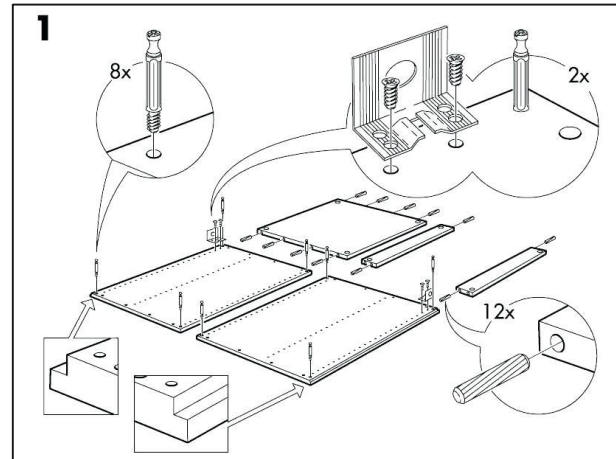


## Functional Architecture



Overall Automation Platform architecture  
A common industry view on Operational Support Systems

## Component and Interface Definitions



Defines the components in terms of interfaces and capabilities

## Technology Source/Realization



Open source technology to use:

1. directly - community version
2. from a distributor - in the future

# ... but there is need for more



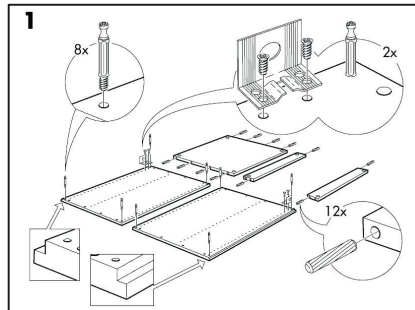
The Secret Sauce



Functional  
Architecture



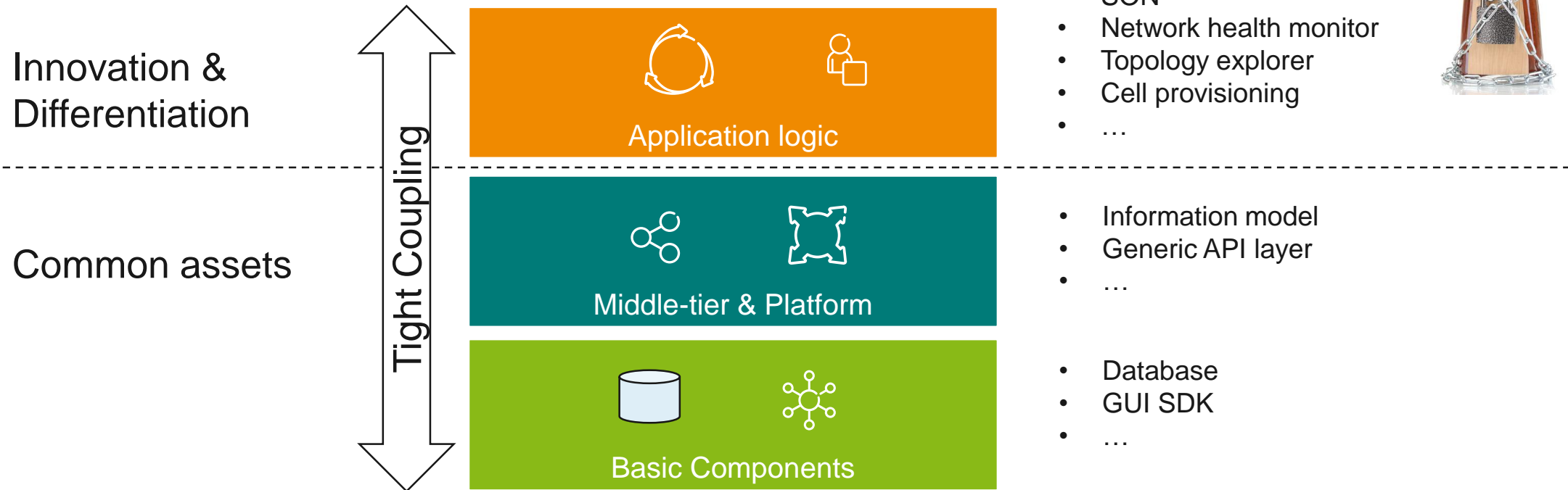
Component and  
Interface Definitions



Technology  
Source/Realization



# Who does what ?



typically sourced from 3PP, open source (e.g. Cassandra, Camunda)

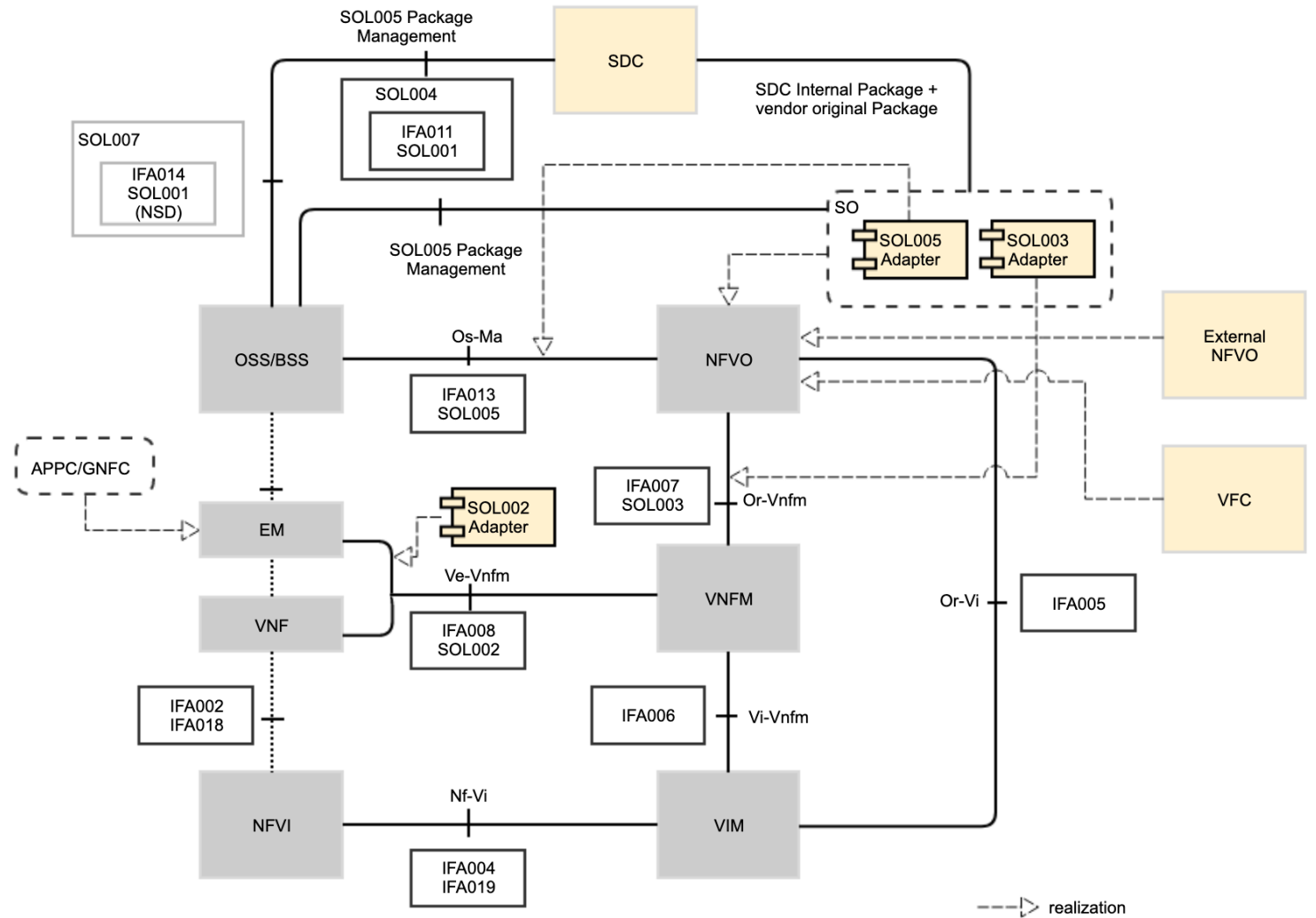
# ETSI MANO and ONAP ETSI Alignment Landscape

As part of aligning ONAP to ETSI MANO, ONAP will support ETSI standards for packaging, operations, security and monitoring for managing VNF, PNF and NS.

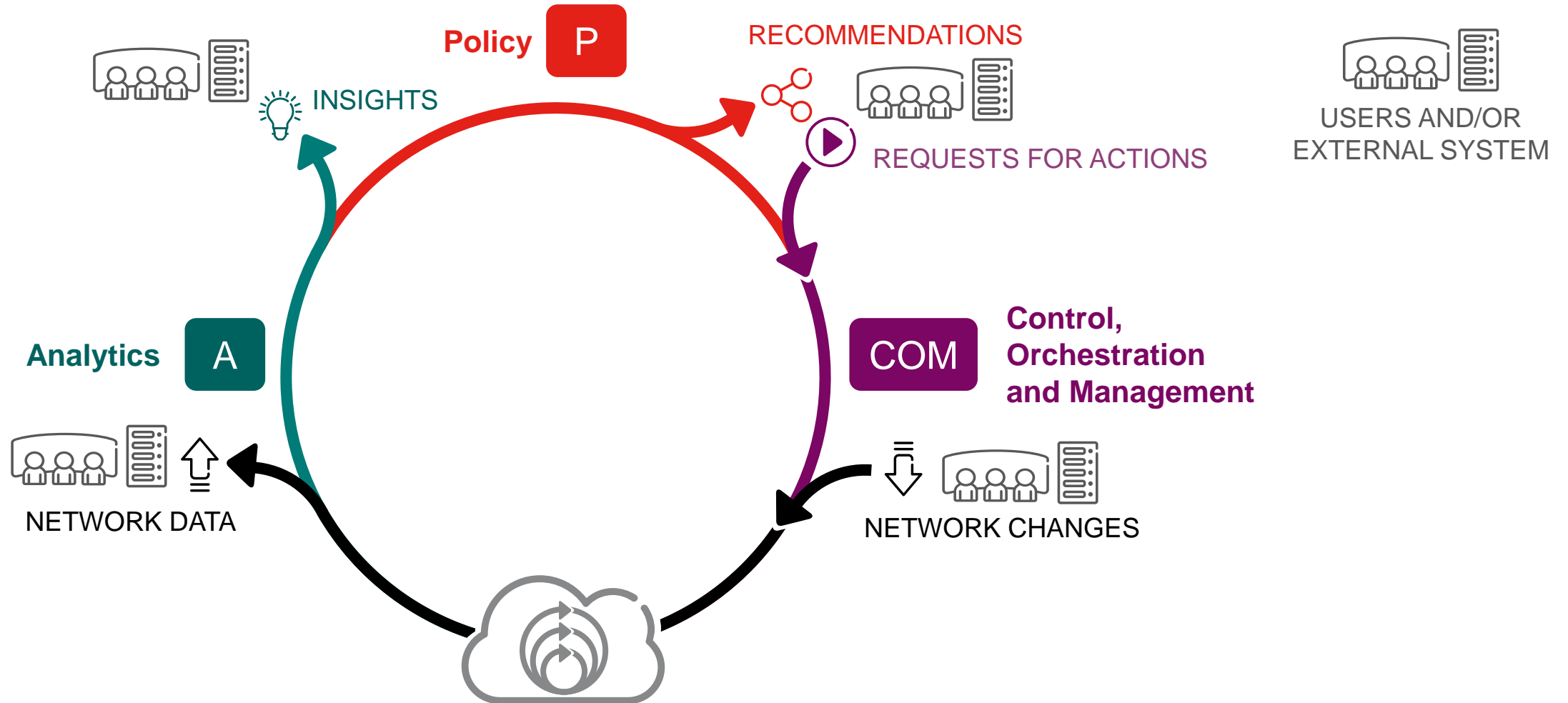
- For packaging, the SOL004 standard is used for the VNF and PNF package, and the SOL007 standard will be used for the NS package
- VNF, PNF and NS will be described by SOL001 standard.
- For VNF LCM, Package Management, LCM operations and Monitoring, SOL003 standard is used.
- For NS LCM and Package Management, LCM operations and Monitoring, SOL005 standard is used.
- For EM triggered scenarios (LCM, Fault, Performance, Configuration), SOL002 standard is used.
- ETSI Package and communication security will be supported.

## ONAP components realization of ETSI MANO

- SDC will realize SOL004 and SOL007 package onboarding, design and distribution functionalities.
- External NFVO and VFC will realize the NFVO functionalities.
- SOL003 Adapter will realize the Or-Vnfm (SOL003) interface.
- SOL005 Adapter will realize the Os-Ma (SOL005) interface.
- SOL002 Adapter will realize the Ve-Vnfm (SOL002) interface.



# Closed Loop Management



# Closed Loop

## 3GPP SA5

3GPP TSG-SA5 Meeting #126  
Bruges, Belgium 19-23 August 2019

**S5-195530**  
Revision of S5-19xxxx

Source: Ericsson, Deutsche Telekom AG, Cisco  
Title: New WID on Closed loop SLS Assurance  
Document for: Approval  
Agenda Item: 6.2

### 3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>  
See also the [3GPP Working Procedures](#), article 39 and the TSG Working Methods in [3GPP TR 21.900](#)

Title: Closed loop SLS Assurance

Closed loop assurance helps an operator to continuously deliver the expected level of communication service quality, by automatically reconfiguring the mobile network resources when a performance degradation impacts the communication service SLS (Service Level Specification).

Management data analytics is an enabler of closed loop assurance of communication service.

## ETSI ZSM

ETSI GS ZSM-009-1 V0.0.1 (2019-07)



**Zero-Touch Network and Service Management (ZSM);  
Closed-loop automation;  
Enablers**

- Closed loop as an entity
- Interactions between different closed loops
  - Interactions between peer closed loops
  - Interactions between hierarchical closed loops
- Interactions between closed loops and external entities
  - Interactions based on policies
  - Interactions based on intents
- Closed loops interfaces
- Lifecycle management of closed loops

# Control Loop

[Dashboard](#) / ... / [Control Loop Sub Committee Dublin Release Planning](#)

## Model driven Control Loop Design

Skapad av Gervais-Martial Ngueko, senast ändrad av Marco Platania den apr 15, 2019

### Overview

This functional requirement is intended to further advance the ease and ability of creating control loops in Dublin by addressing the following:

[Dashboard](#) / ... / [Control Loop Subcommittee](#)

## Control Loop Sub Committee Frankfurt Release Planning

Skapad av Pamela Dragosh, senast ändrad den aug 14, 2019

Each of these line items should be considered as a Functional Requirements line item in the Use Case Subcommittee

# ONAP

[Dashboard](#) / ... / [Approved Projects](#)

## CLAMP Project

Skapad av Kenny Paul, senast ändrad av Gervais-Martial Ngueko den aug 06, 2019

This is the project welcome page for CLAMP (Control Loop Automation Management Platform)

[Dashboard](#) / ... / [Control Loop Sub Committee Frankfurt Release Planning](#)

## PNF support in Control Loops

Skapad av Liam Fallon, senast ändrad den aug 16, 2019

### Overview

Currently, control loops are VNF oriented, more specifically on VNF orchestration use cases. Here, we are examining how the control loop concept and implementation might be expanded so that it could be used to support PNF use cases.

[Dashboard](#) / ... / [Control Loop Sub Committee Frankfurt Release Planning](#)

## Metadata Driven Control Loops

Skapad av Liam Fallon, senast ändrad den jun 12, 2019

### Overview

Currently, control loops are triggered by DCAE (Analytics) microservices, trigger a policy, which in turn triggers an action on a controller (actor). The trigger could be any component, not necessarily be a DCAE microservice.

# External APIs



Open Digital Architecture (ODA) Project

TMF641 – Service Ordering





