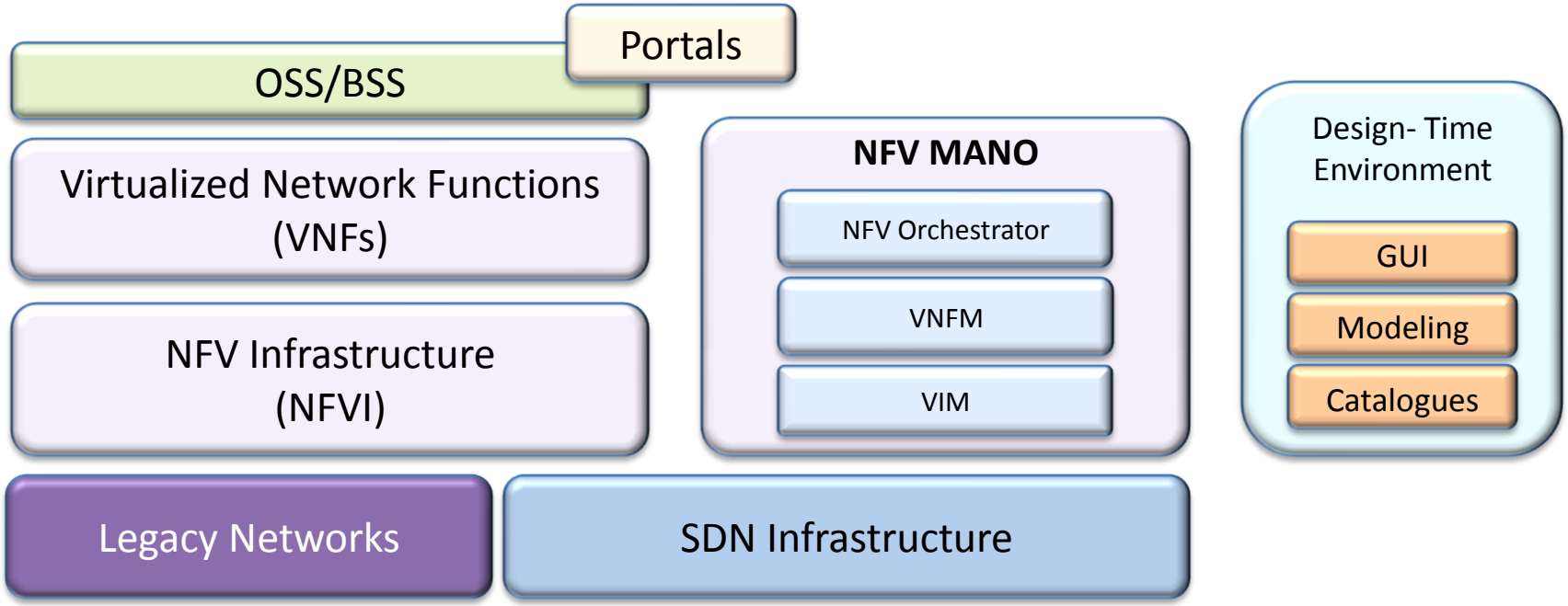
OPEN-O Modeling Directions

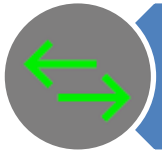
OPEN-O Technical Steering Committee

OPEN-O is more than MANO…



Models need to extend beyond MANO as well…

OPEN-O Direction



It's about the services

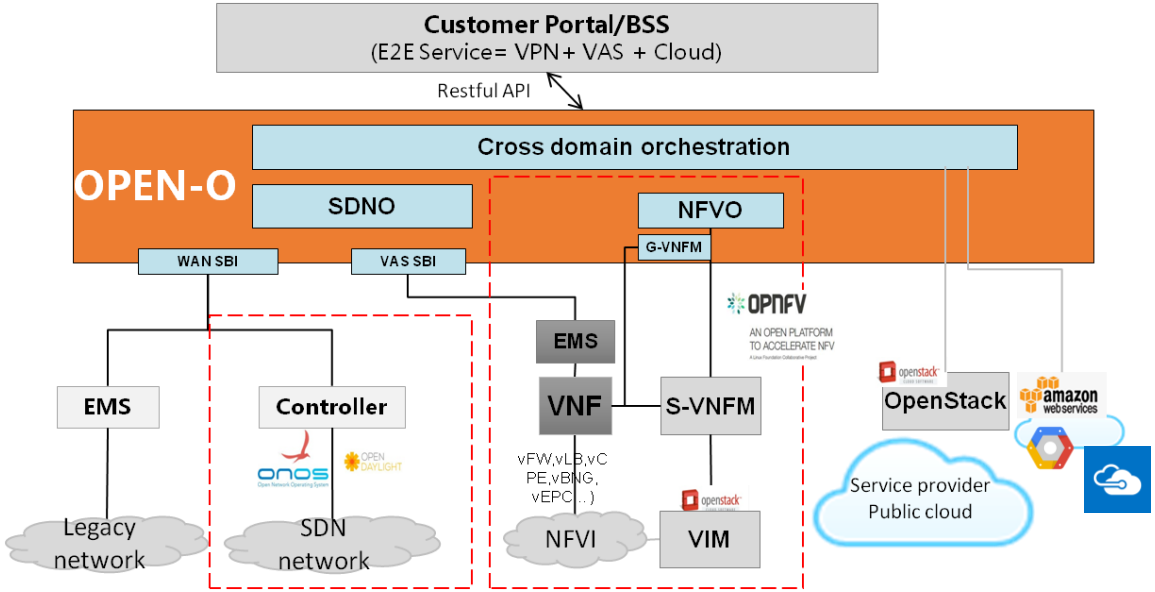
- End-to-end
- Model-driven

Support for brownfields

- Connectivity services

Tailored to the operator

- Modular framework



OPEN-O requires unified information & data models that encompass physical, virtual and cloud based infrastructure, SDN & NFV, applications and complex datacenter and intra-datacenter connectivity

OPEN-O SDO and Open Source Ecosystem

IM/DM – ETSI, MEF, TMF, OASIS, ONF

Architecture – ETSI NFV & MEF LSO

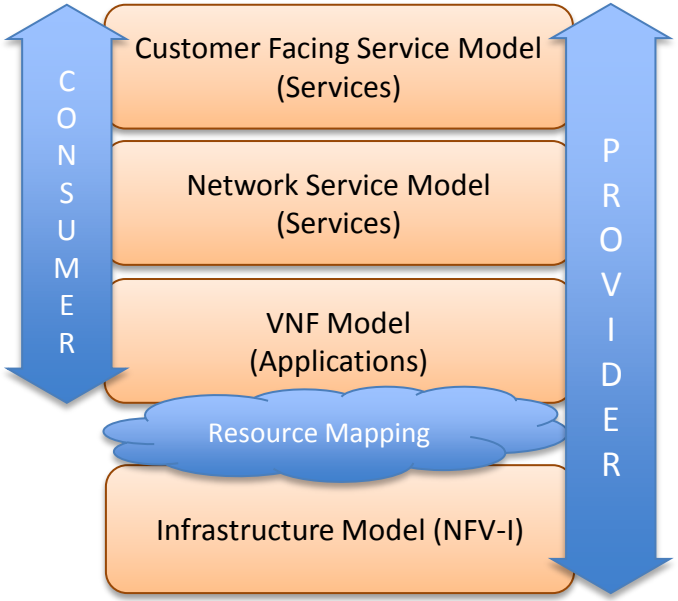
Open Source (NFV) – OPNFV, OpenStack, Aria, etc.

Open Source (SDN) – Open Daylight, ONOS

IETF, Others

Design Time vs Run Time Models…

Design Time View (Desired)
Functional Topology
Deployment Requirements
Functional Requirements
Operational Requirements
Infrastructure Requirements



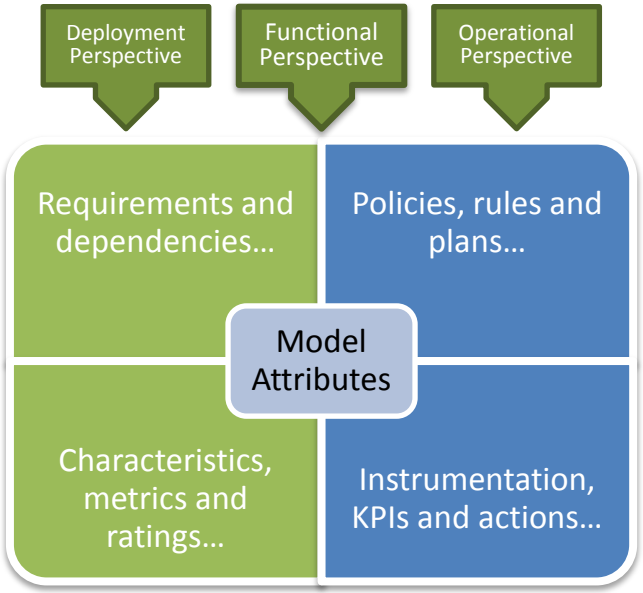
Run-Time View (Actual)
Deployment Topology
Health
SLO's & OLO's
Operational State
Operational Policies

Infrastructure Mappings (Physical/Virtual/Cloud)

Infrastructure Topology
Resource Health
Resource State

Design time is different from run-time
We need to expose run-time models
SDOs: Please ensure alignment between design-time and run-time models

VNF lifecycle modeling and automation challenges…



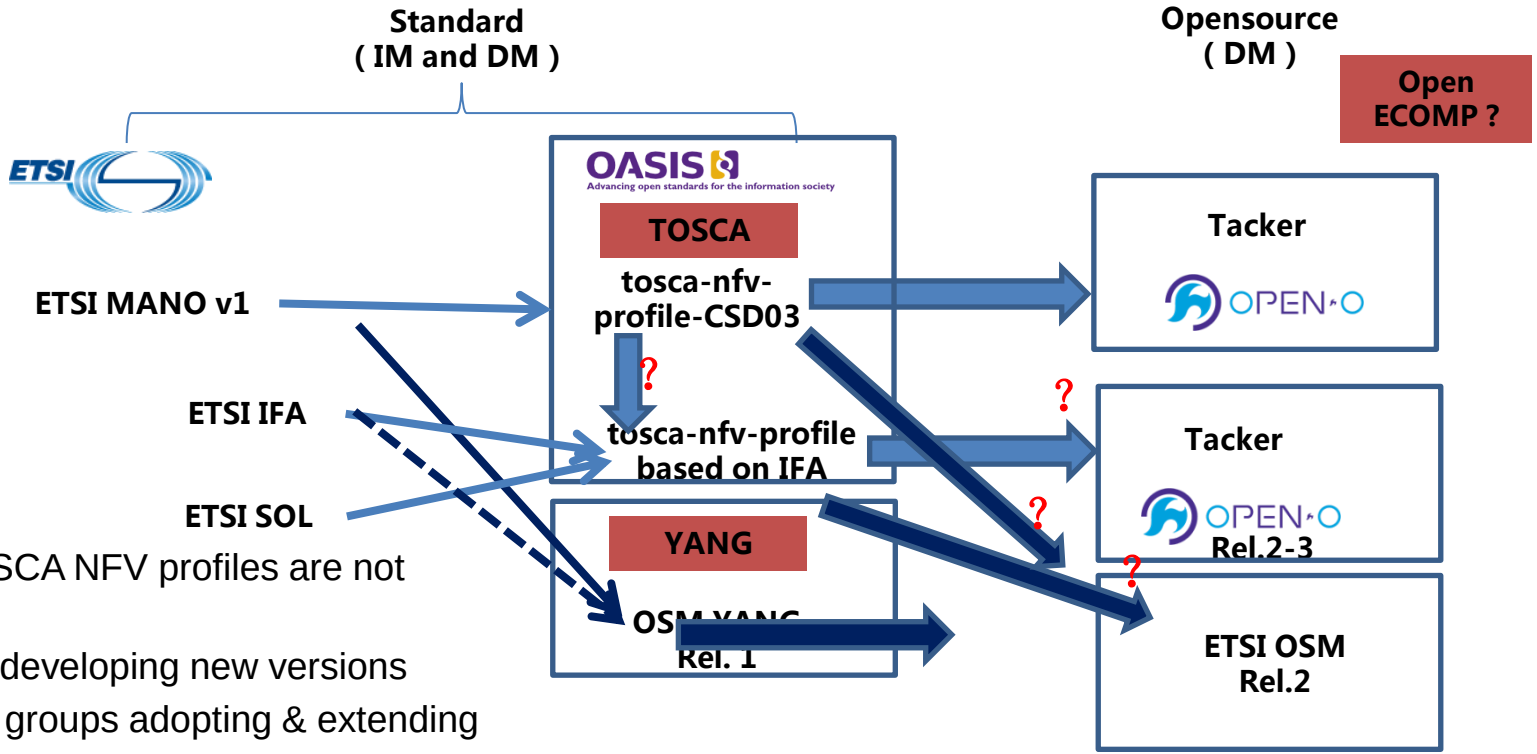
Open-O General Approach:

- Leverage OASIS/TOSCA model – TOSCA NVF Profile
- Leverage ETSI/MANO model for design-time & run-time modeling – VNFD, VNFR, VDU, and VRU
- Use requirement/capability matching for deployment

Identified TOSCA & ETSI/NVF Challenges

- TOSCA and ETSI specifications are evolving at different rates, and maintaining alignment is a challenge
- VNF model is too simplistic – need layers for services, applications, platform, infrastructure
- VNF model is incomplete – missing infrastructure requirements, KPIs, and operational characteristics

Possible Open Source Alignment with ETSI/TOSCA/YANG

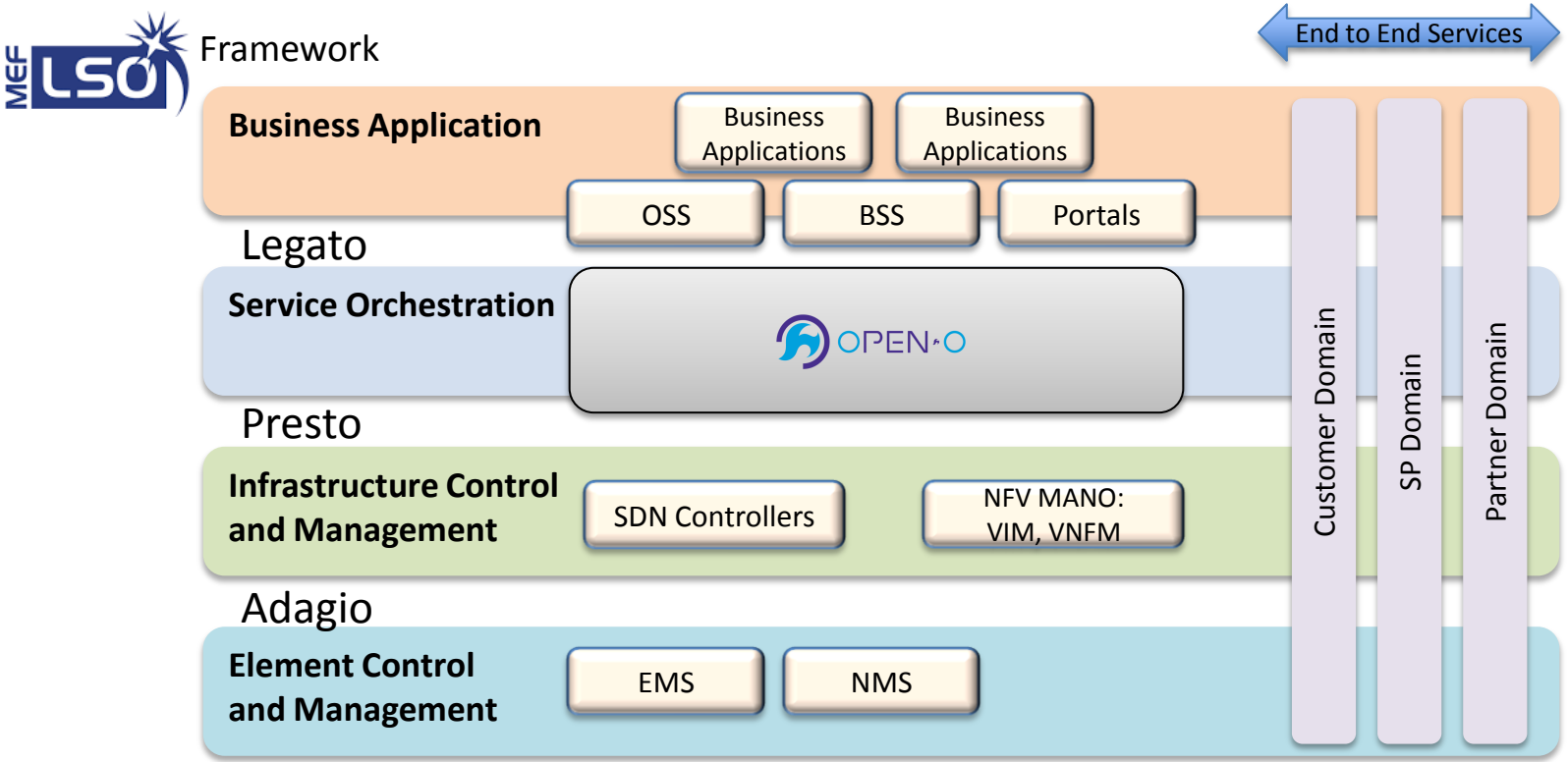


Current ETSI/TOSCA NFV profiles are not sufficient

- ETSI/OASIS developing new versions
- Open source groups adopting & extending
- Possible divergence in the industry

Close the loop from open source to SDOs

Possible alignment with MEF



Simplistic view for discussion

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Open-O Modeling Approach

- Using TOSCA for GS-O, SDN-O, and NFV-O northbound interfaces, VNF packaging
  - NFV-O: ETSI-aligned (existing and emerging)
  - Developing extensions based on specific use cases
- Considering YANG for SDN-O southbound
  - Discussing MEF Presto alignment
- Developing packaging format for VNFs
  - Interested in wider industry alignment

Challenges Ahead

- Models need to extend beyond MANO as well…
  - Services – customer facing, resource facing
  - Applications – middleware, VNFs
  - Infrastructure – physical, virtual, cloud based
  - Network Connectivity
- VNF modeling & packaging
- Service modeling & packaging
- Alignment between SDN & NFV
- PNFs and VNFs
- “Northbound” interoperability across orchestrators