Towards a Carrier Grade ONAP Platform
Multi Cloud (MC) Architecture & Enhancements – R2 & Beyond

Key Contributors:

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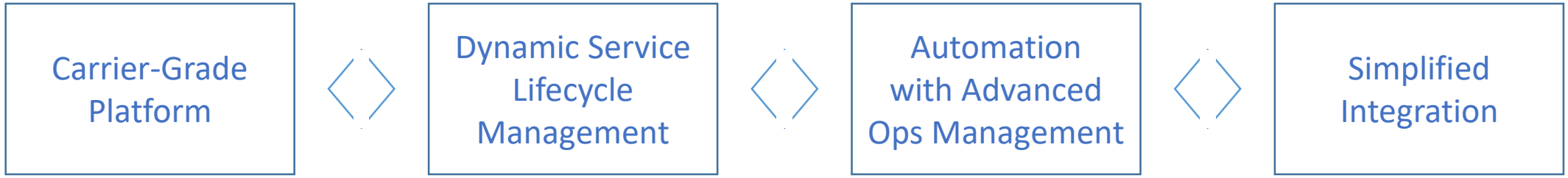
Agenda

- Key MC Challenges and Architecture Direction
- MC Reference Architecture – R2 & Beyond
- Model-driven API Architectural Evolution

Multi-Cloud Evolution in R2 and Beyond



- **Model-driven abstraction** layer for infrastructure providers providing cloud agnostic deployment flexibility
- **Standardized data model** across multiple cloud infrastructures providing cloud agnostic deployment and operational flexibility
- **Hierarchical SDN** approach within a MC instance to address multi-vendor network automation and operational challenges.

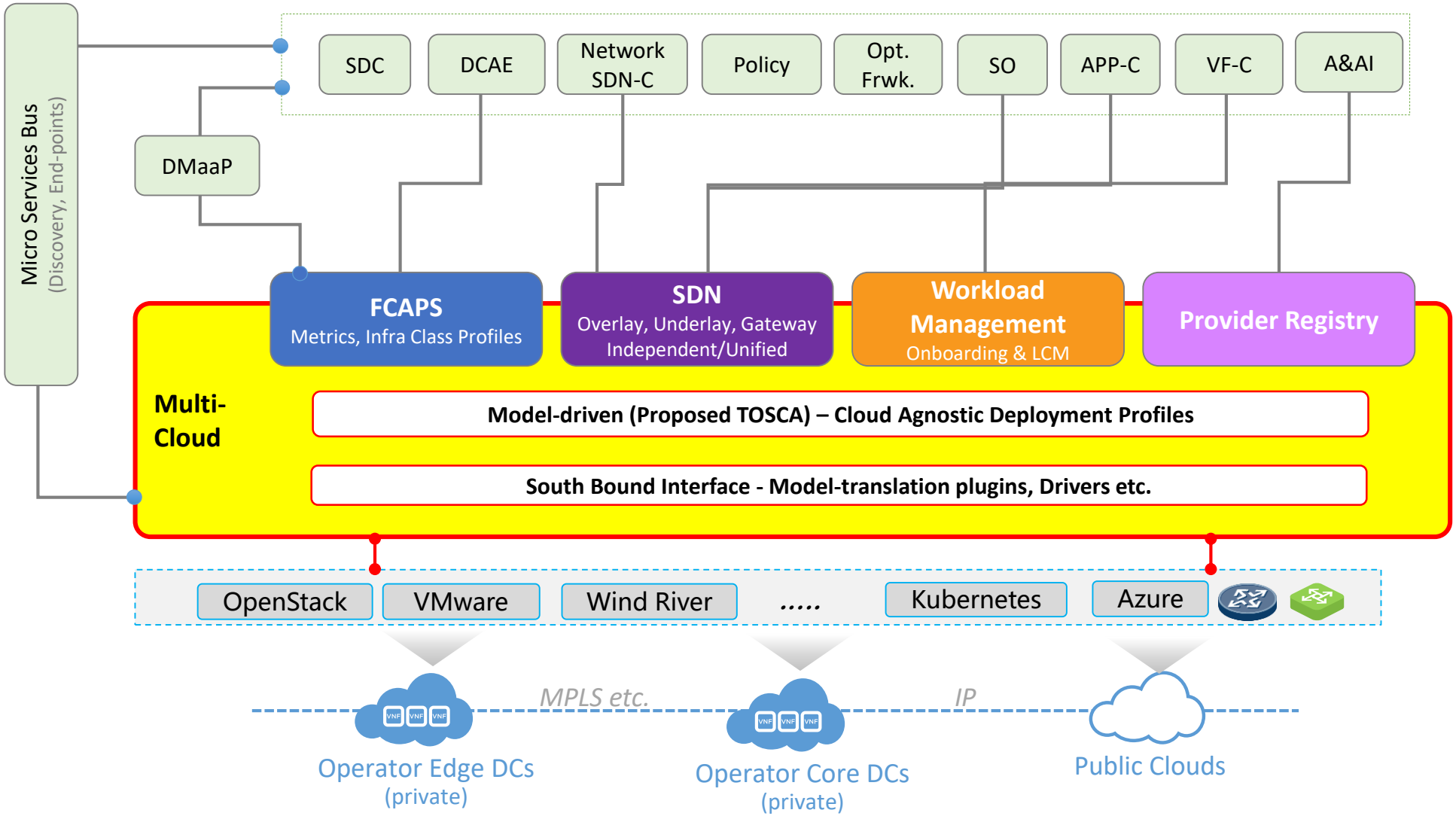
Key MC Challenges & Architecture Direction

- MC is a simple OpenStack Proxy in R1 - Lack of standardized data model for compute/network/storage across Multiple VIMs/Clouds
  - Architecture Direction: Standardize Modelling Language such as TOSCA, Data Structure & Semantics, Model-driven APIs

- PNFs (HW Gateway etc.) and Underlay (HW Leaf/Spine switches/routers) not managed by MC instance
  - Architecture Direction: Hierarchical SDN Controller per MC instance to manage Underlay/Overlay/Gateway Controllers per MC instance

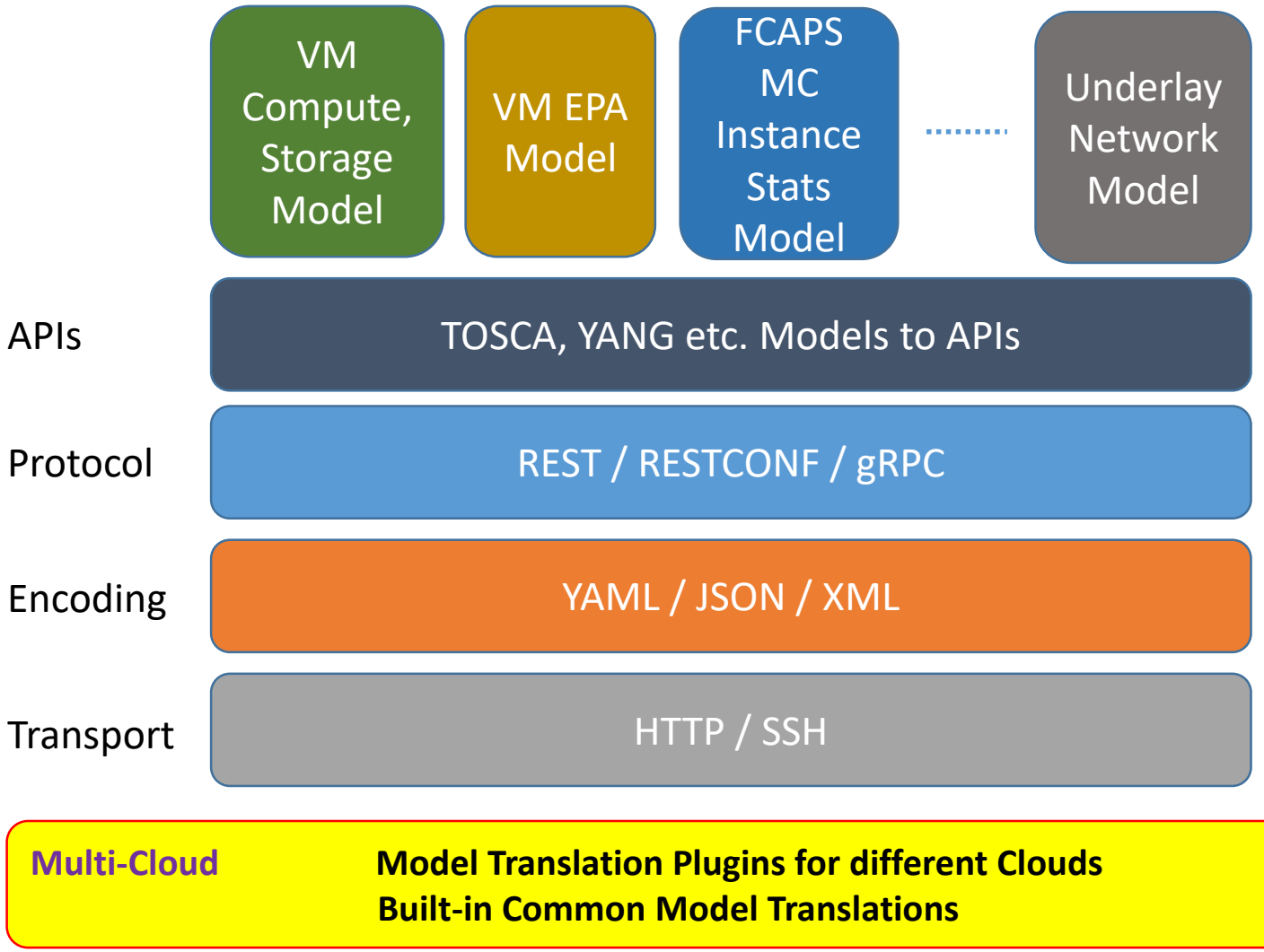
- Static MC instance selection for workload placement/change management leading to higher cost due to under-utilization or poor application QoE due to over-subscription of infrastructure
  - Architecture Direction: Deliver Aggregate FCAPS data at scale to OF for Dynamic workload placement/change management

Multi-Cloud Reference Architecture – R2 & Beyond



Model-drive API Architectural Evolution

MC Model-driven Architecture



Standardize Modelling Language such as TOSCA, Data Structure and Semantics

Key Benefits

- *Models decoupled from transport, protocol and encoding*
- *Multi-language support - Python, Java etc.*

Note: Modelling effort to leverage similar efforts happening in OSM, ETSI NFV and DMTF-CIM

MC – Exemplary TOSCA Models

VM Compute, Storage Model

```
node_templates:
  VMD1:
    type: tosca.nodes.nfv.VMD.xxx
    properties:
      image: cirros-0.3.5-x86_64-disk
    capabilities:
      compute:
        properties:
          disk_size: 40 GB
          mem_size: 4096 MB
          num_cpus: 4
```

VM EPA (Asymmetric NUMA) Model

```
VMD1:
  capabilities:
    compute:
      properties:
        mem_size: 4096 MB
        num_cpus: 4
        numa_nodes:
          node0:
            id: 0
            vcpus: [0,1]
            mem_size: 1024 MB
          node1:
            id: 1
            vcpus: [2,3]
            mem_size: 3072 MB
```