# ODIM Community Webinar

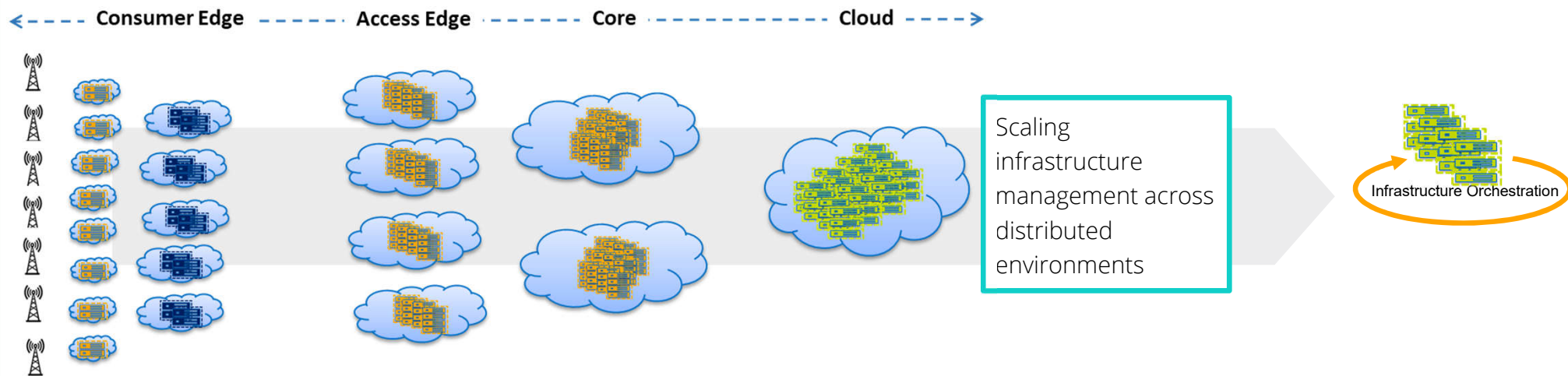Formation Proposal

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# Motivations & Rationale

# Emergence Of Multi-Edge Computing Environments



Consumer Edge — Access Edge — Core — Cloud

Scaling infrastructure management across distributed environments

Infrastructure Orchestration

Sources: GSMA Intelligence, ACG Research, 2019

Increasing numbers of distributed data centers as businesses move to the Edge

# Infrastructure Requirement Diversity

Consumer Edge · · · Access Edge · · Core · · Cloud · · ·

Space Constraints

Data plane optimization

Environmental Needs

Data Processing

Cost Constraints

Scale out

Reduce Vendor Lock-in

Easing the management of heterogeneous infrastructure stacks
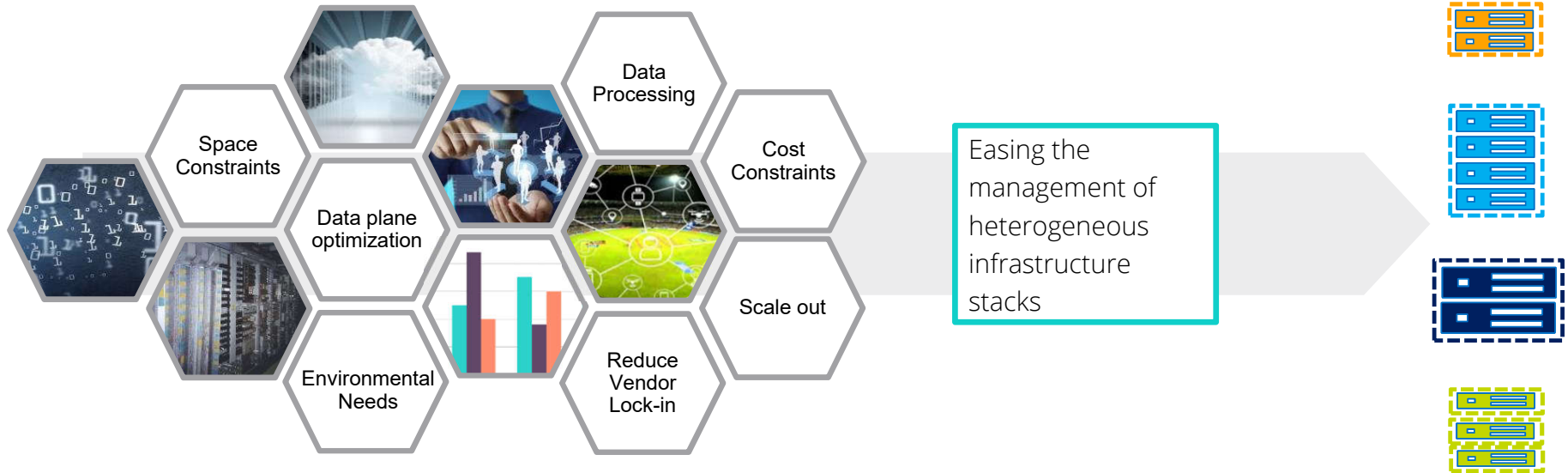
Workload and commercial demands can vary massively per location

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# Proliferation Of Infrastructure Management APIs



Reduce the number of Infrastructure management APIs

**Infrastructure Management APIs**

SNMP · Redfish · IPMI · YANG · NETCONF · OEM · SNIA Swordfish
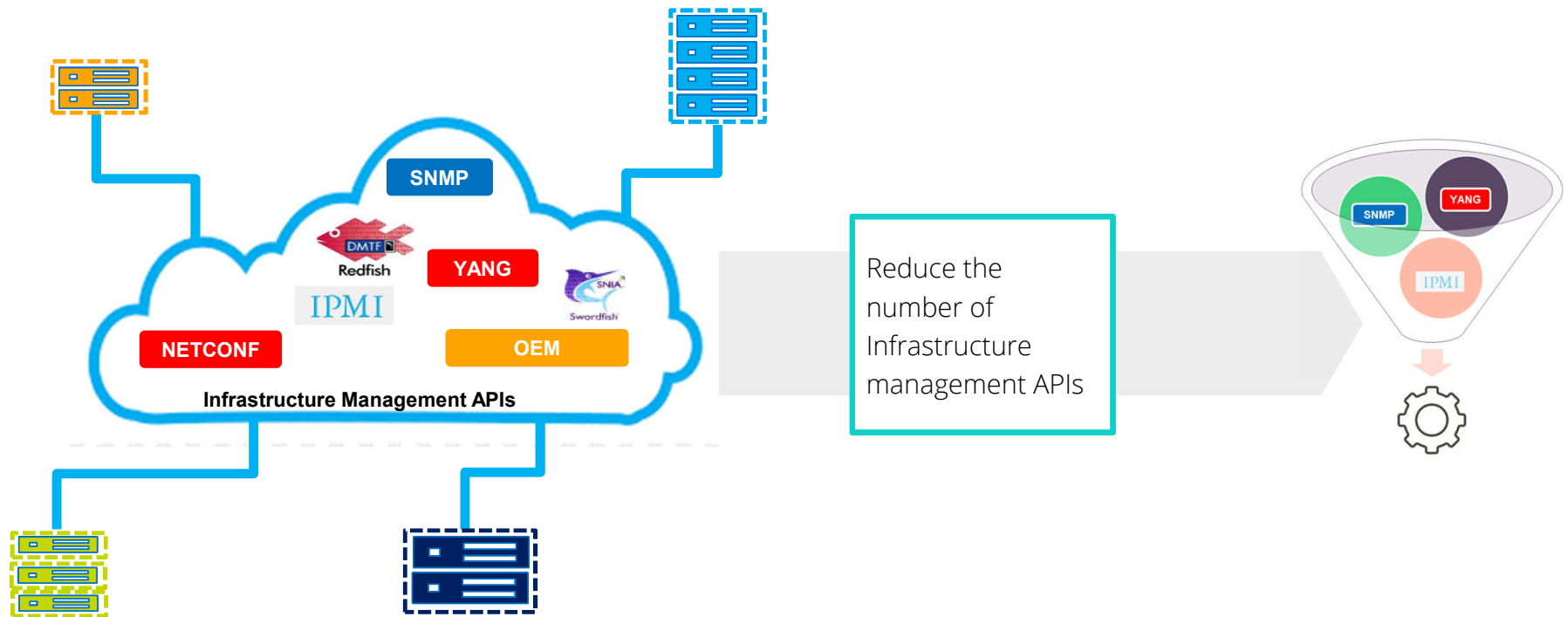
Minimal alignment across compute, storage, networking and vendor implementations

# Lack of Physical Infrastructure Management Consistency

Upstream COTS/OSS service/resource MANO stacks

| OS | OpenStack | Kubernetes | ONAP | COTS/OSS MANO Offerings |

Bespoke Integration

Physical Infrastructure Management

**Vendor A**
Physical Resource Management and Orchestration

**Vendor B**
Physical Resource Management and Orchestration

**Vendor C**
Physical Resource Management and Orchestration

Bespoke Integration

Physical Infrastructure Resources

Redfish plus OEM, Netcorf, Yang, SNMP

IPMI, gNMI, OEM

Redfish, Swordfish, OEM

RESTCONF / YANG & OEM

Native Physical Resource/Device Interfaces

IT Vendor A – Compute, Networking

IT Vendor B – Compute, Storage, Networking

IT Vendor C – Compute, Storage

IT Vendor D – Networking

Too many integration points, rigid, brittle architectures

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# Open Distributed Infrastructure Management (ODIM)

**Open Source Objectives:**

- Implement critical open source functional blocks that create a bridge to upper layers of orchestration as we transition to end-to-end automation

- Make use of a standardized, widely adopted data model for all infrastructure resources

- Provide consistent interfaces to discovering and consuming distributed, heterogeneous infrastructure resources

Open Infrastructure Management Interfaces

**Standards Based Infrastructure Data Model**

Resource Management Interfaces

Native Physical Resource/Device Interfaces
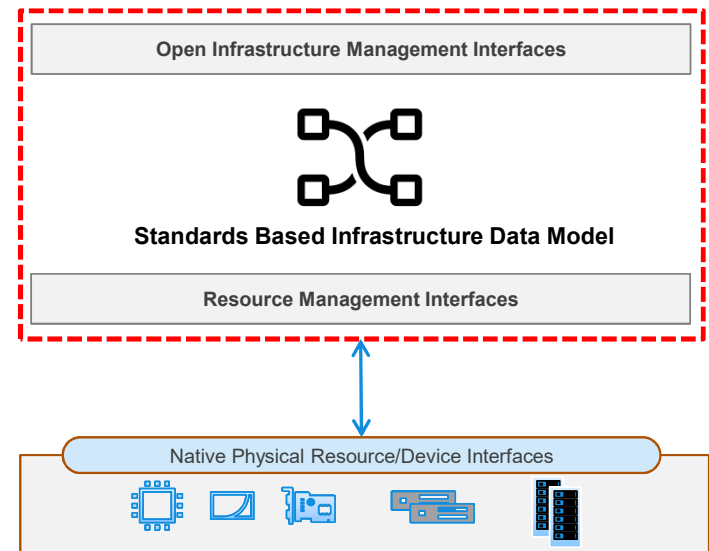
ODIM

# ODIM Intends to simplify and scale open infrastructure management

Upstream
COTS/OSS
service/resource
MANO stacks

| OS | OpenStack | Kubernetes | ONAP | COTS/OSS MANO Offerings |

Declarative Interfaces, Infrastructure lifecycle specific functions

**ODIM**
Presents consistent
on/off-premises
**HWaaS** interfaces
for
Physical
Infrastructure
management

Open Infrastructure Management Interfaces and Functions

DMTF Redfish® Data Model

Resource Management Interfaces

Native Resource APIs and Data Models

Physical
Infrastructure
Resources

| Redfish plus OEM, Netconf, Yang, SNMP | IPMI, gNMI, OEM | Redfish, Swordfish, OEM | RESTCONF / YANG & OEM |

Native Physical Resource/Device Interfaces

| IT Vendor A – Compute, Networking | IT Vendor B – Compute, Storage, Networking | IT Vendor C – Compute, Storage | IT Vendor D – Networking |

Reduce the number of disparate, reinvented shims, adaptors and plug-ins

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# ODIM: DMTF Redfish® compliant functions and interfaces

**Upstream COTS/OSS service/resource MANO stacks**

| OS | OpenStack | Kubernetes | ONAP | COTS/OSS MANO Offerings |
|---|---|---|---|---|

**ODIM**
Presents consistent on/off-premises **HWaaS** interfaces for Physical Infrastructure management

| Composition | Inventory | Telemetry | Metering | Events | Policies | Action(s) | ... |
|---|---|---|---|---|---|---|---|

**Example Upstream Integration Functions and Interfaces**

**DMTF Redfish® Interfaces**

**DMTF Redfish® Data Model**

| Account | Event | Aggregation | Session | Composition | ... |
|---|---|---|---|---|---|

**DMTF Redfish® Based Services**

**ODIM Resource Management Interfaces**

**Resource API Adapters**

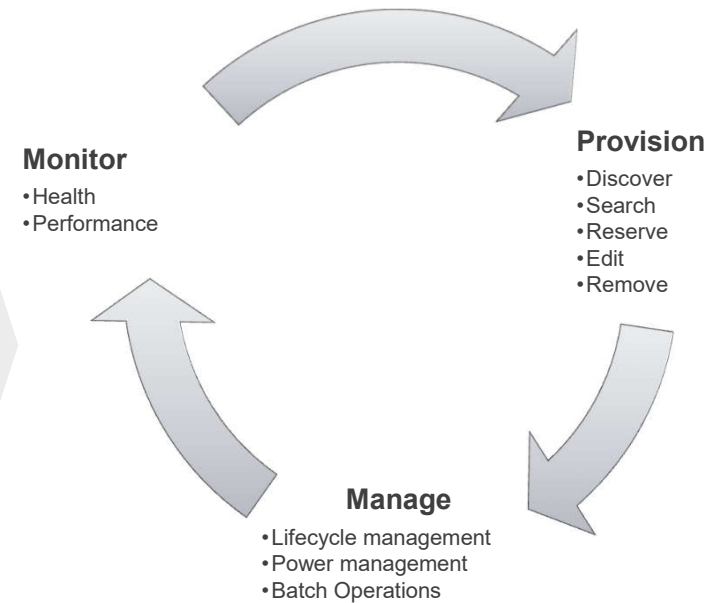Native Physical Resource/Device Interfaces
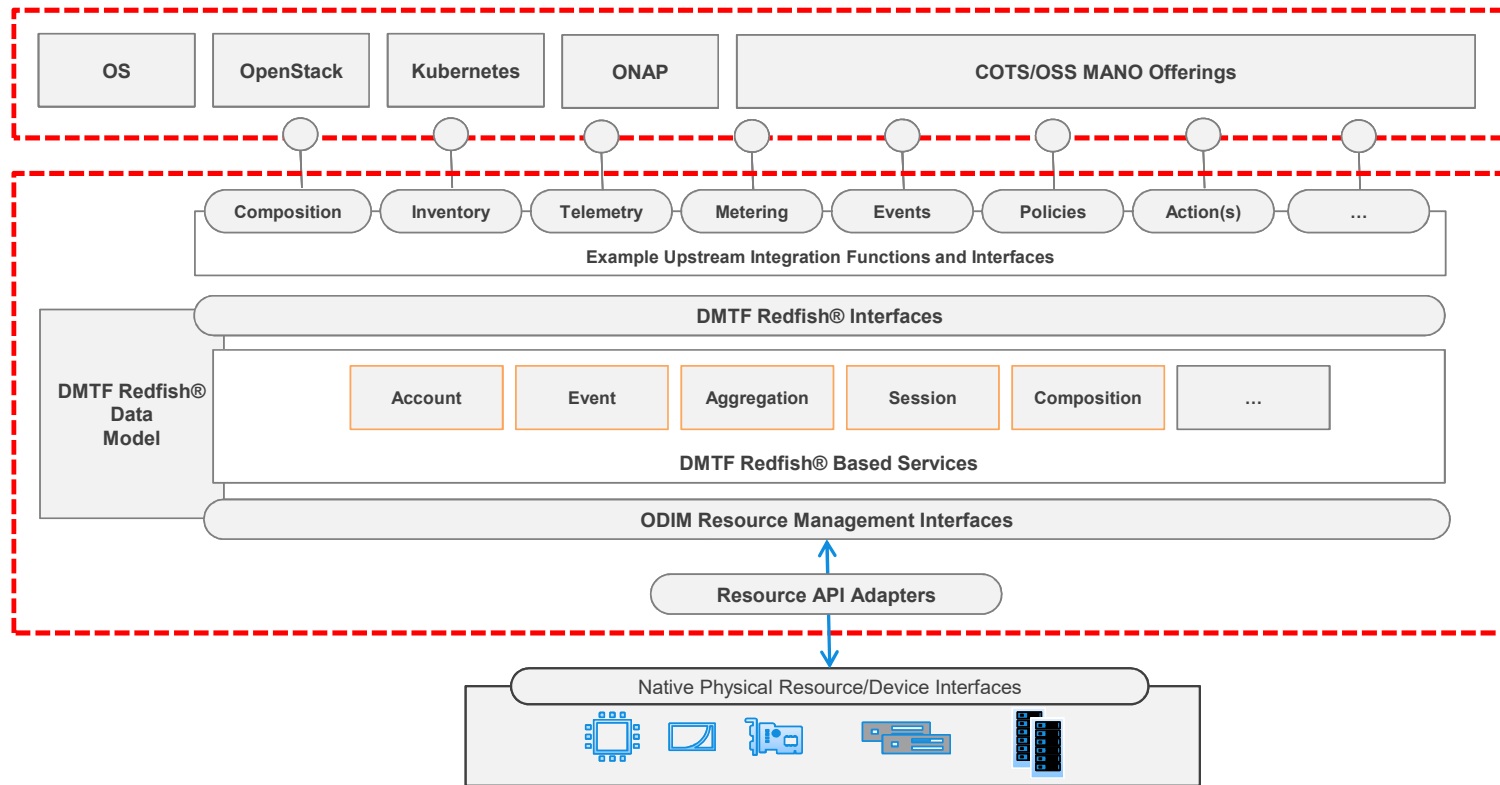
# ODIM community consumers and contributors
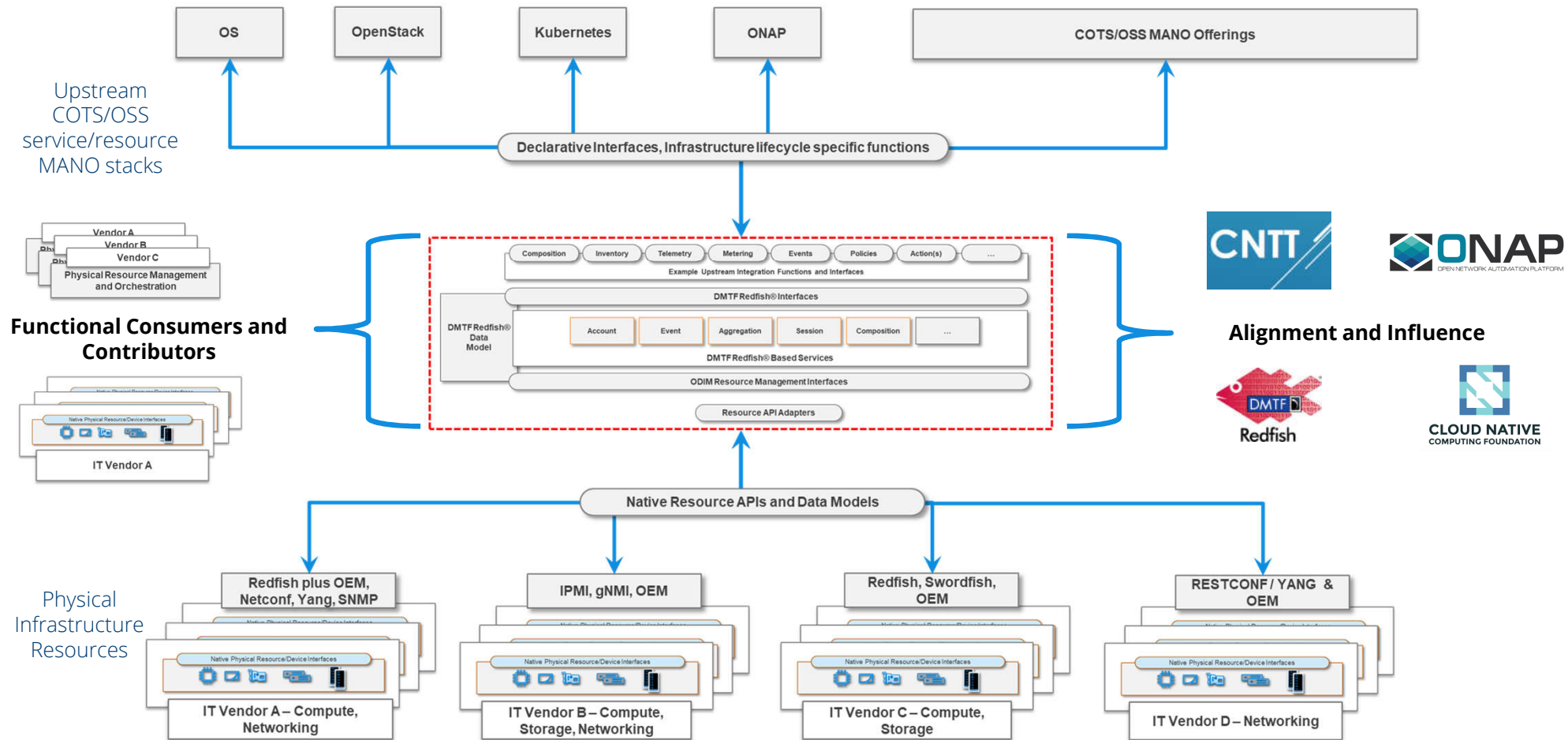
# Key Use Cases

## Project-wide use cases enable:

- Multi-site, multi-vendor physical infrastructure management

- Remote distributed management across multiple deployment locations

- Vendor-neutral discovery of infrastructure resources and their capabilities

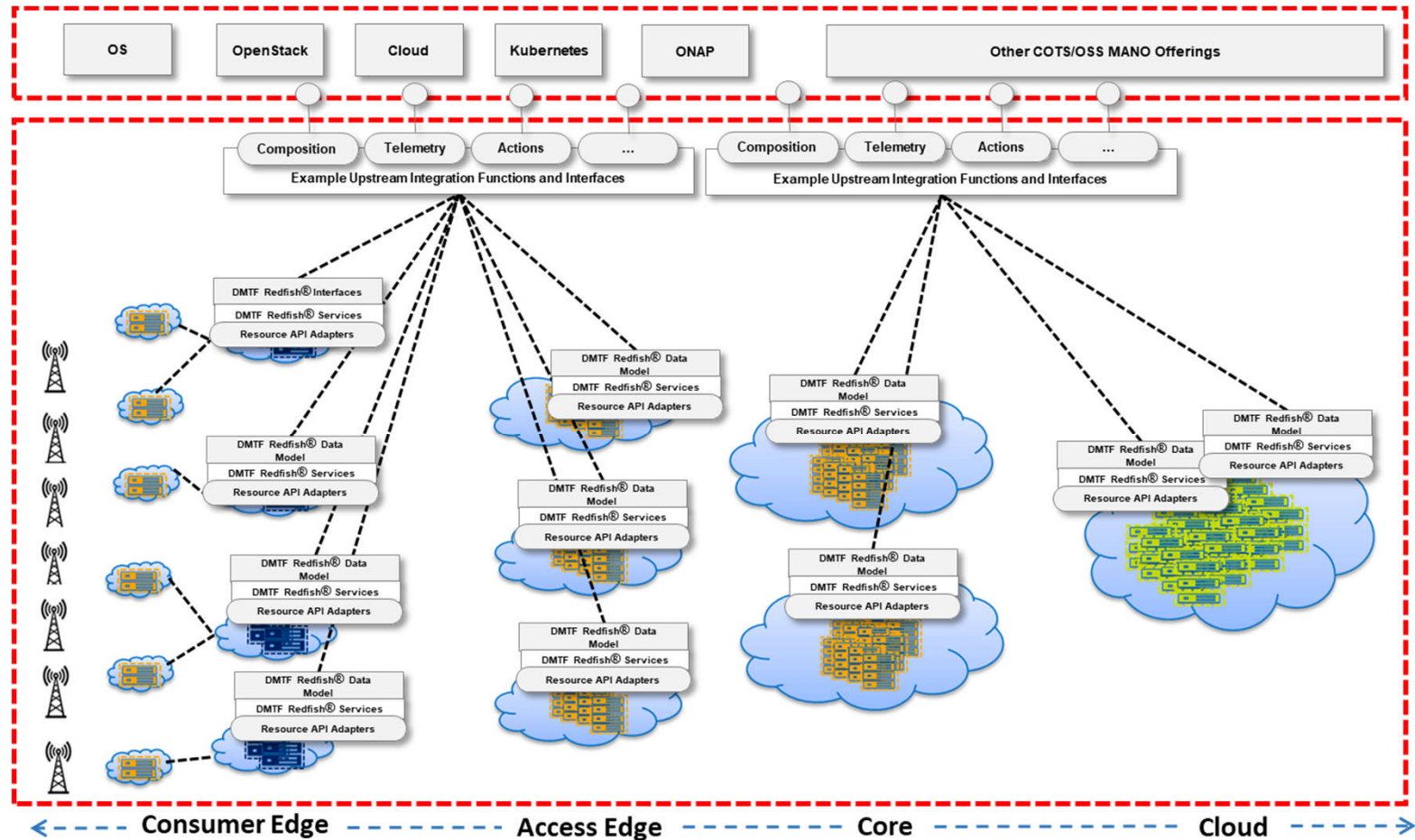- Physical infrastructure closed-loop management automation

**Monitor**
- Health
- Performance

**Provision**
- Discover
- Search
- Reserve
- Edit
- Remove

**Manage**
- Lifecycle management
- Power management
- Batch Operations

Infrastructure Lifecycle Use Cases

# Starting Assumptions

›  DMTF Redfish® APIs and data model are foundational to ODIM

›  DMTF Redfish® data model enables a consistent, aggregated physical view across all ODIM management functions

›  Downstream physical infrastructure resources may not be DMTF Redfish® aligned and the architecture will need to accommodate this

›  ODIM upstream integration APIs don't need to be exposed via DMTF Redfish® bindings

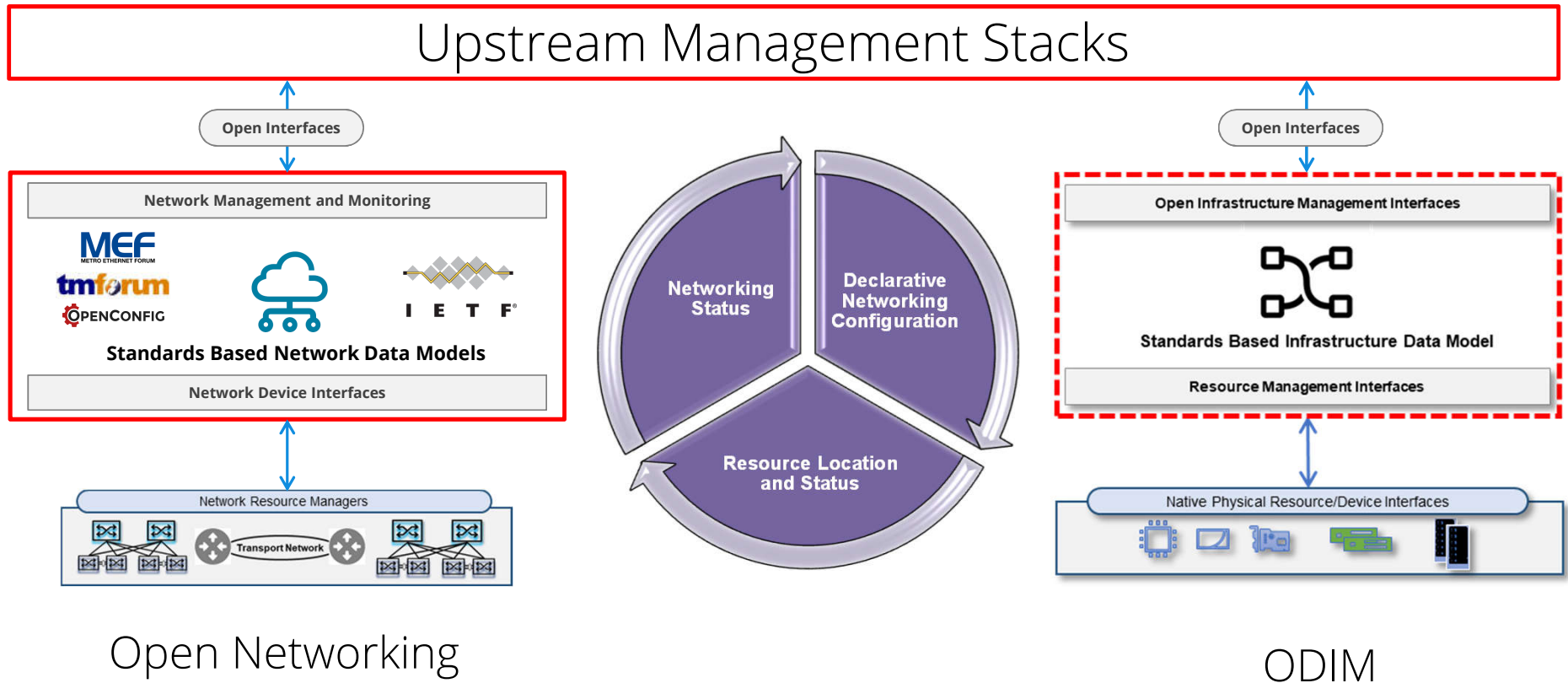›  Initial focus will be on Compute, Storage, Acceleration and Fabrics

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# Functional distribution scales infrastructure management

# ODIM is Complementary to Networking Standards



Upstream Management Stacks

Open Interfaces

**Network Management and Monitoring**

MEF
METRO ETHERNET FORUM

tmforum

OPENCONFIG

I E T F

**Standards Based Network Data Models**

**Network Device Interfaces**

Network Resource Managers

Transport Network

Open Networking

Networking Status

Declarative Networking Configuration

Resource Location and Status

Open Interfaces

Open Infrastructure Management Interfaces

Standards Based Infrastructure Data Model

Resource Management Interfaces

Native Physical Resource/Device Interfaces

ODIM

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# Project Seed Code

Upstream COTS/OSS service/resource MANO stacks

| OS | OpenStack | Kubernetes | ONAP | COTS/OSS MANO Offerings |
|----|-----------|------------|------|--------------------------|

**AMI / Intel Contribution**

| Composition | Inventory | Telemetry | Metering | Events | Policies | Action(s) | ... |
|-------------|-----------|-----------|----------|--------|----------|-----------|-----|

**Example Upstream Integration Functions and Interfaces**

**DMTF Redfish® Interfaces**

**HPE Seed Contribution**

**DMTF Redfish® Data Model**

| Account | Event | Aggregation | Session | Composition | ... |
|---------|-------|-------------|---------|-------------|-----|

**DMTF Redfish® Services**

**ODIM Resource Management Interfaces**

**Resource API Adapters**

**Native Physical Resource/Device Interfaces**

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# Formation Logistics

› An independent **unfunded project** under the Linux Foundation, not part of any LF "umbrella" community.

› Aligned with other emerging infrastructure related activities

› Community Open Invitation Webinars June 30 (vendors) & July 8 (End Users+ Open)

› Once the project has traction, will determine whether to join one of the existing LF umbrella communities or to establish a new one.

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# ODIM Governance (Proposed)

› Governance Structure
  › Technical Steering Committee (TSC)
› Initially Participating Company Benefits
  › Guaranteed seats on TSC for the first 4 releases
  › Opportunity to shape architecture and output/deliverables
  › Simple Majority Voting for Ratification, other decisions

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# ODIM Community Participants

## ODIM Community

- Communications Services Providers
- Enterprises
- Cloud Service Providers
- Managed Hosting
- TEMs
- IT Vendors
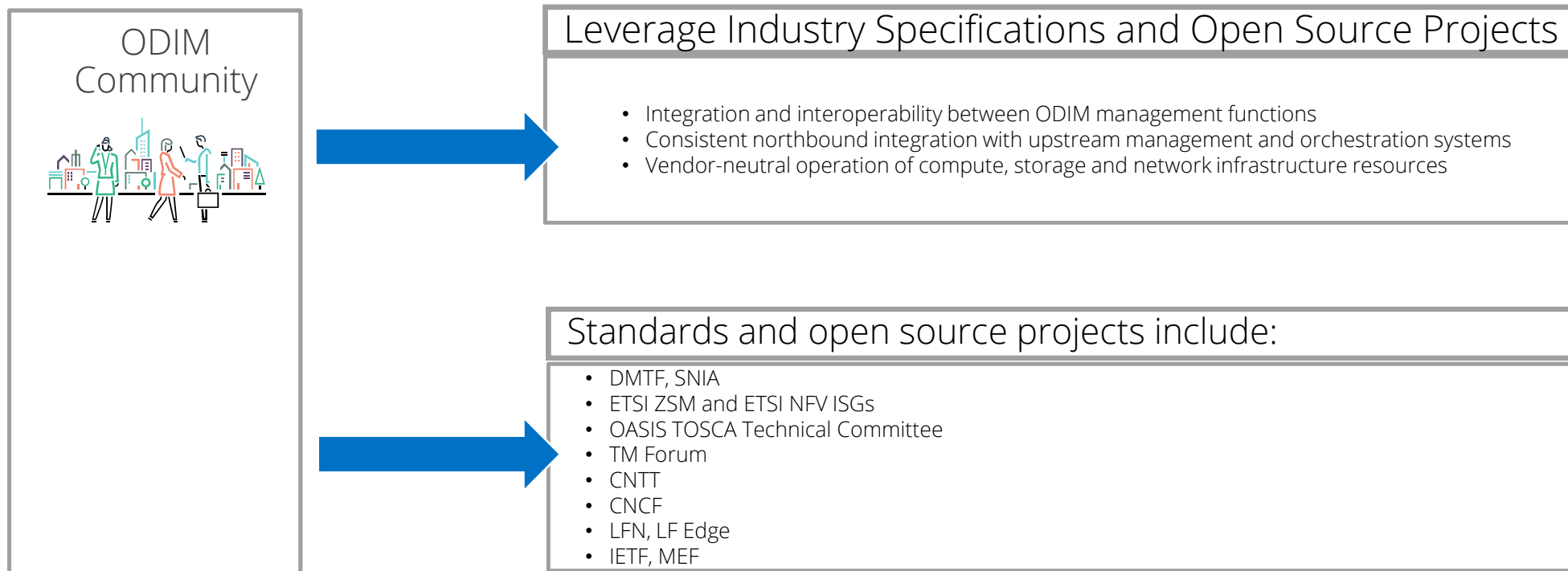- Orchestration Software Providers

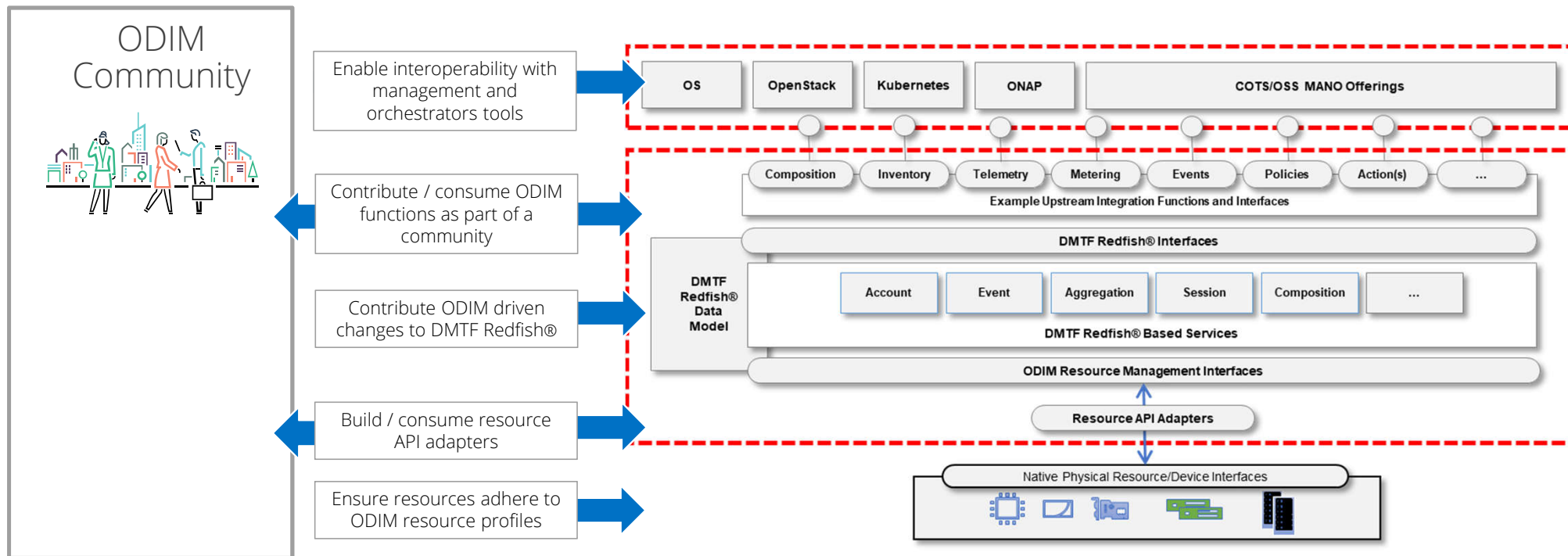## Critical to have a cross section of stakeholders

Advantages
- Leveled playing field
- Room for value-add and differentiation
- Influence open standards
- Time to market
- Vendor neutrality
- Easier and more scalable management solutions
- Influencing features

# Use Of Industry Standards And Open Source

ODIM
Community

## Leverage Industry Specifications and Open Source Projects

- Integration and interoperability between ODIM management functions
- Consistent northbound integration with upstream management and orchestration systems
- Vendor-neutral operation of compute, storage and network infrastructure resources

## Standards and open source projects include:

- DMTF, SNIA
- ETSI ZSM and ETSI NFV ISGs
- OASIS TOSCA Technical Committee
- TM Forum
- CNTT
- CNCF
- LFN, LF Edge
- IETF, MEF

# ODIM Contribution Areas



**ODIM Community**

Enable interoperability with management and orchestrators tools

Contribute / consume ODIM functions as part of a community

Contribute ODIM driven changes to DMTF Redfish®

Build / consume resource API adapters

Ensure resources adhere to ODIM resource profiles

OS | OpenStack | Kubernetes | ONAP | COTS/OSS MANO Offerings

Composition | Inventory | Telemetry | Metering | Events | Policies | Action(s) | ...
Example Upstream Integration Functions and Interfaces

DMTF Redfish® Interfaces

**DMTF Redfish® Data Model**

Account | Event | Aggregation | Session | Composition | ...
DMTF Redfish® Based Services

ODIM Resource Management Interfaces

Resource API Adapters

Native Physical Resource/Device Interfaces

# ODIM Status

› The project has been created in the LF as a series project on June 11th

› The target date for the initial participants to meet and form the TSC is July 15th.

› The target date for aggregation seed code will be contributed by HPE on July 15th.

› Seed code for composition will be contributed by AMI within three months

› We invite community and TSC participation.

› Mailing list: https://lists.odim.io/g/odim-general

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Q&A

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