



2021 OFA Virtual Workshop

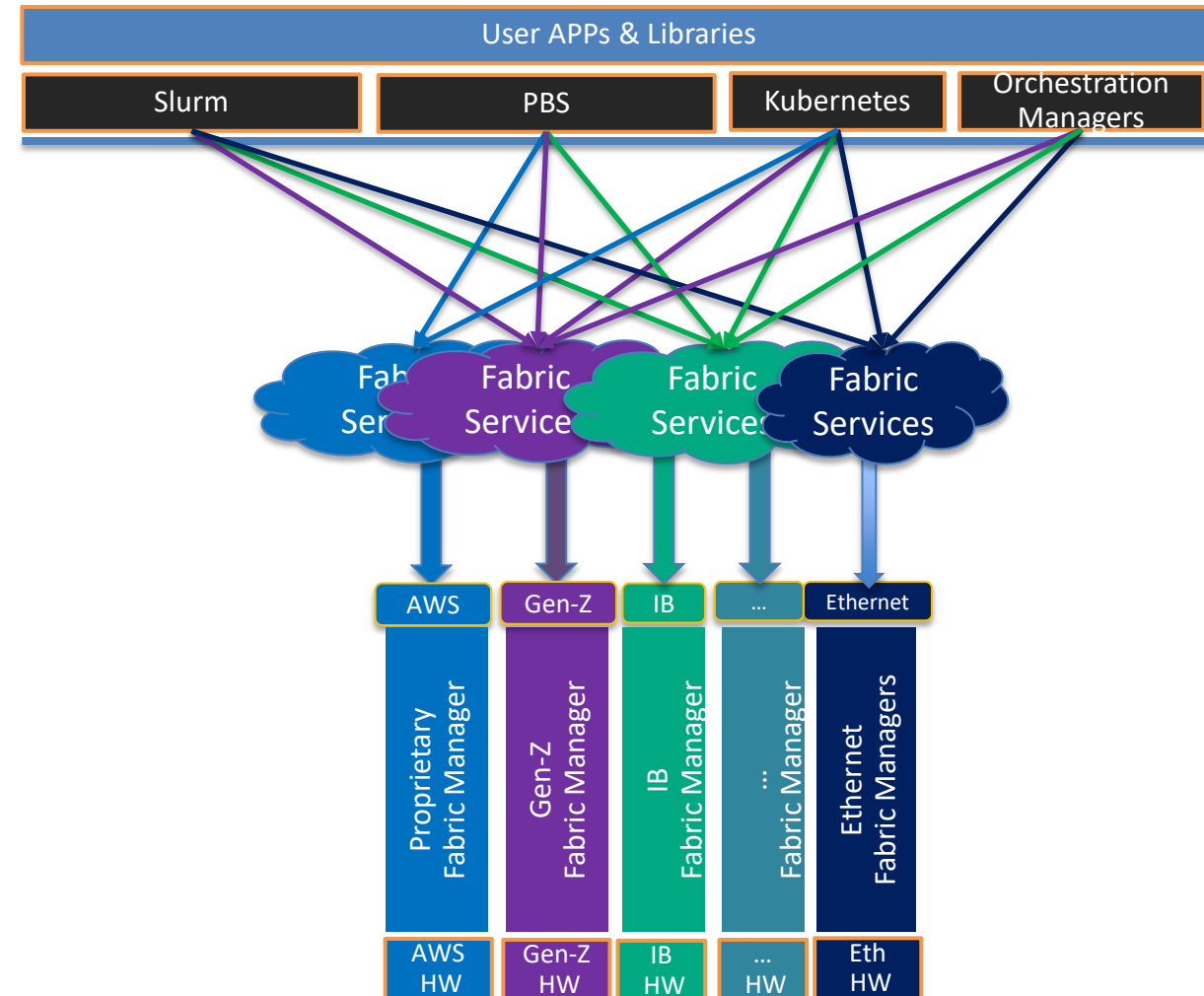
# OPEN FABRICS MANAGEMENT FRAMEWORK

**Panellists: Michael Aguilar, Paul Grun, Russ Herrell, Jeff Hilland**

# HETEROGENEOUS COMPUTING FABRICS REQUIRE STANDARDS

## Fabrics are changing

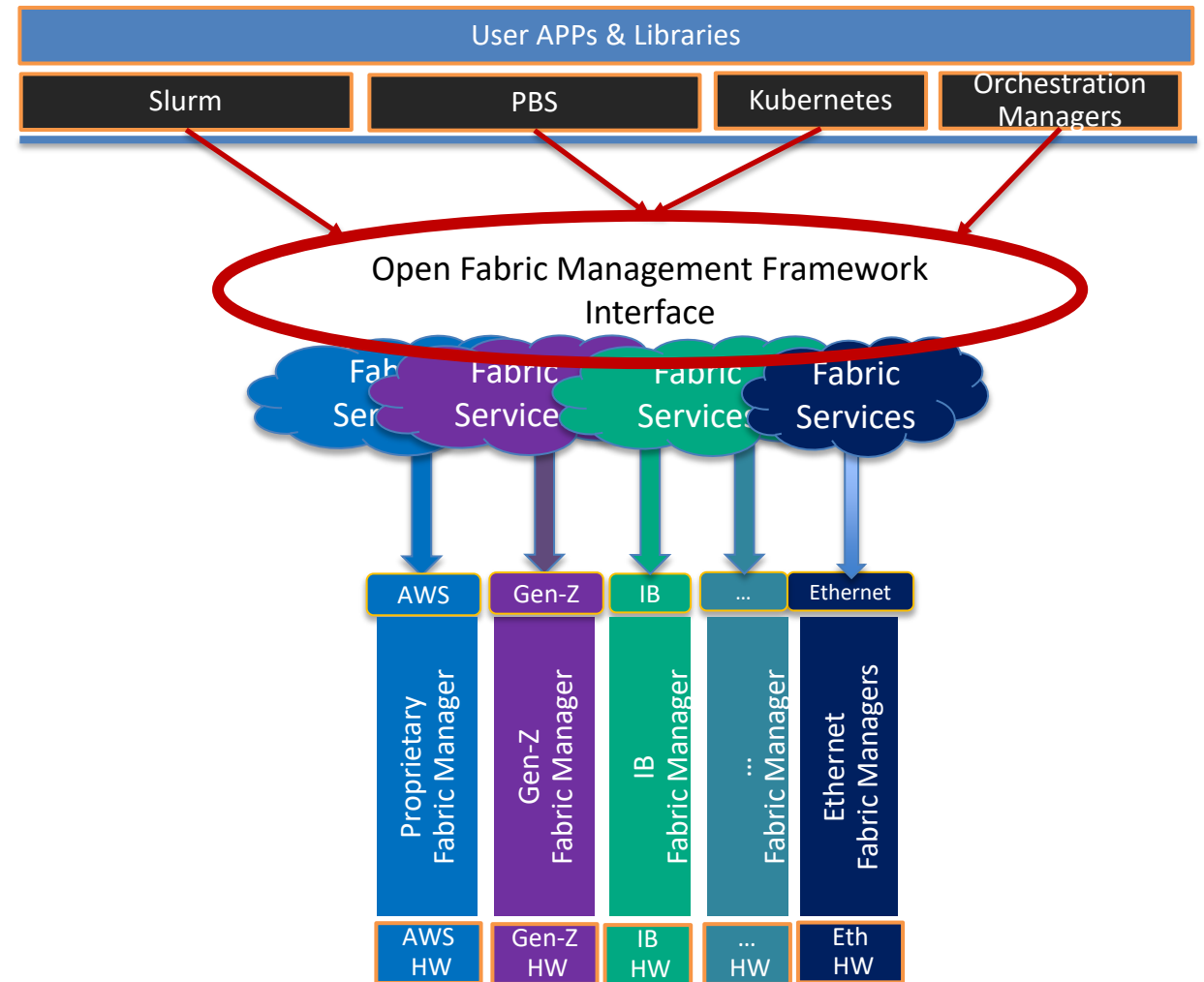
- HPC clusters and cloud computing environments are running increasingly diverse and dynamic workloads
- More numbers of and types of messaging and storage fabrics
- New interconnect capabilities such as memory semantic fabrics
- Orchestration tools and workload managers do not deal well with multiple fabrics
- There is an explosion of fabrics, resources, and clients, yet no common fabric manager interfaces and fabric models available
- Hence, the Open Fabrics Management Framework



# THE FABRIC ADMIN PROBLEM EASED BY THE OFMF

## The Open Fabric Management Framework

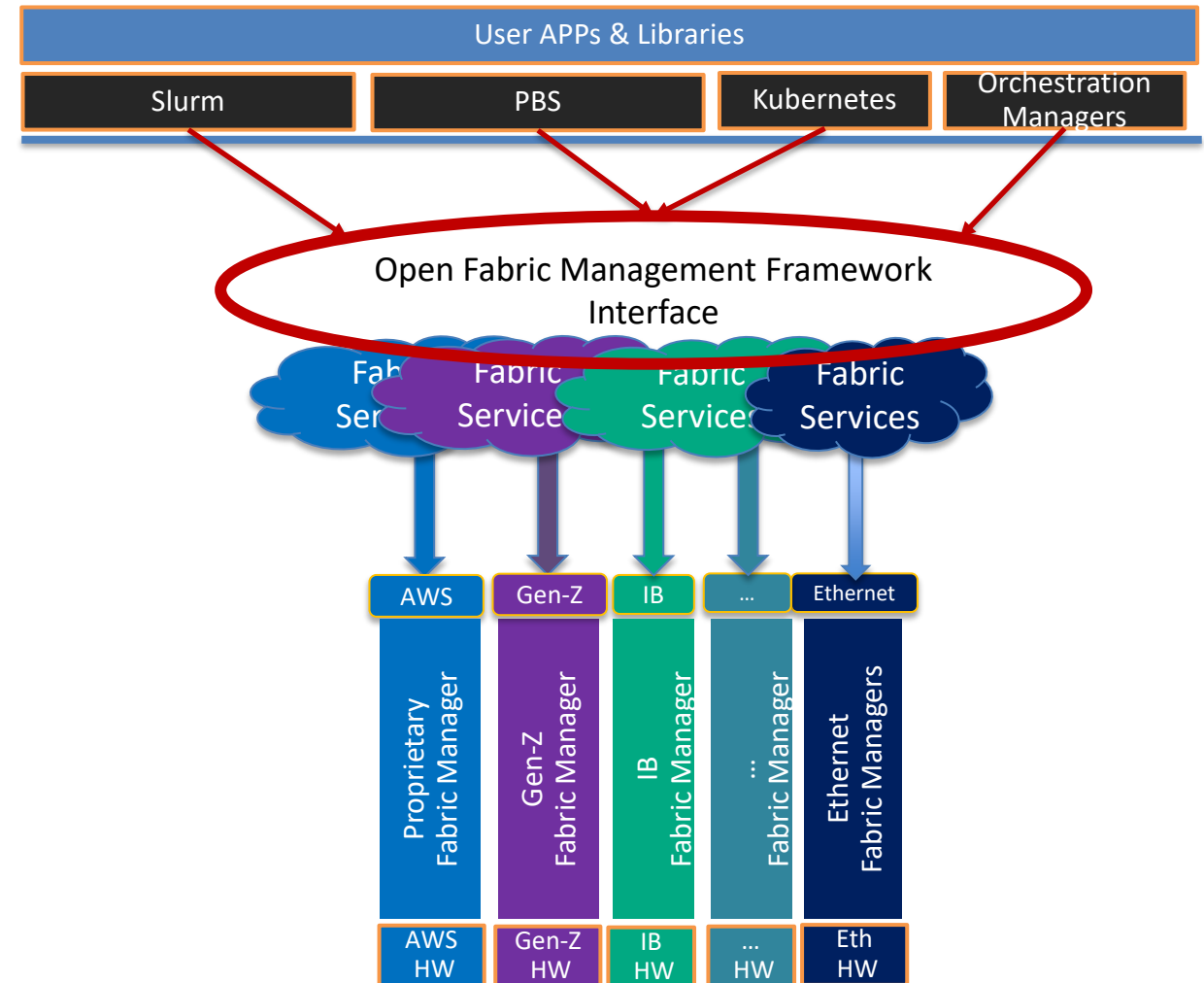
- Without the OFMF every tool and every middleware library provider needs a unique call to a specific fabric management stack for each different fabric supported
- With the OFMF, everyone calls common fabric services to manipulate the Redfish fabric model
- OFMF triggers fabric specific providers to make the actual changes in the fabric



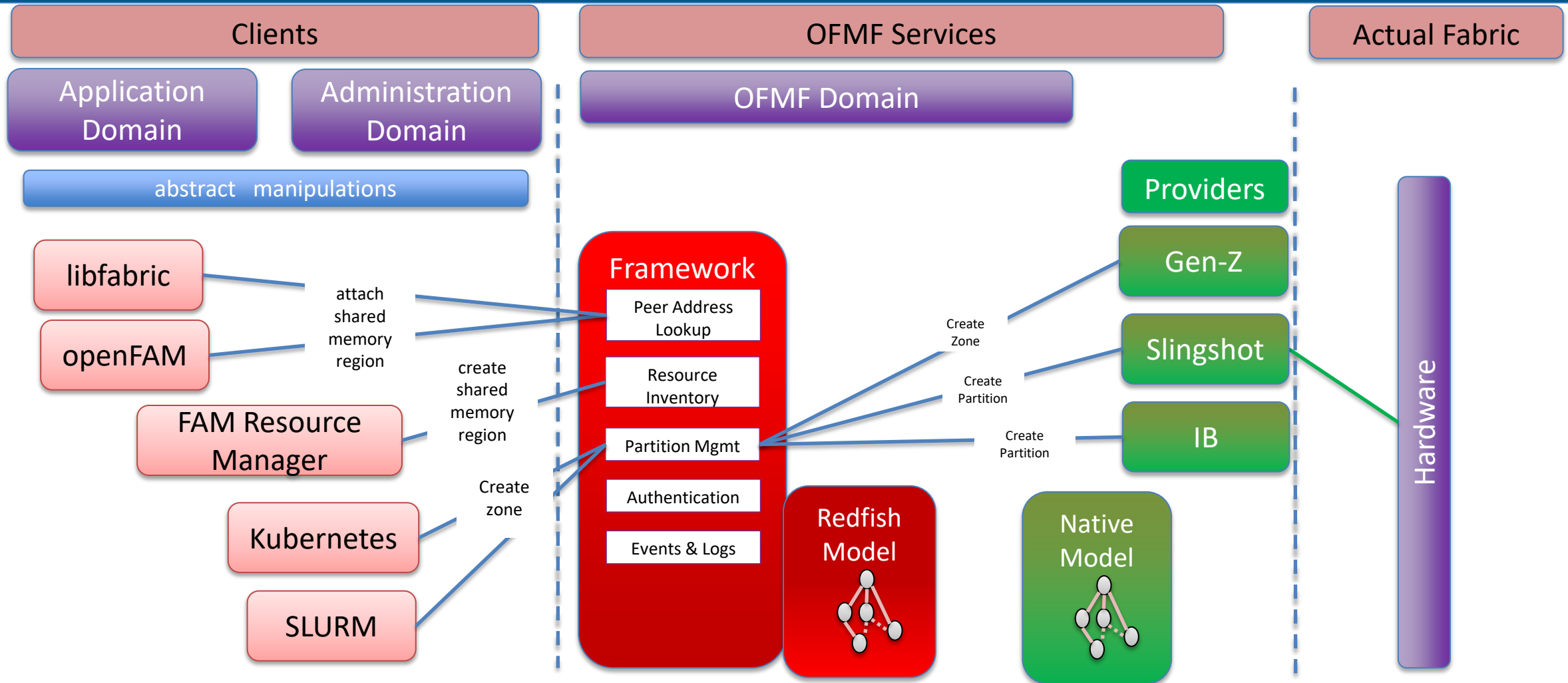
# EXAMPLES OF THE FABRIC ADMIN SERVICES OFFERED BY THE OFMF

## The Open Fabric Management Framework

- Control Services
  - Discovery
  - Inventory
- Communication Services
  - Connection management
    - App to app, manager to manager
  - Address Vectors
    - Managing fabric addresses
- Partitioning Services
  - Zones (subnets, vLans)
  - Connections (permitted paths)
- Messaging Services
  - Queues and contexts
  - Events and errors
  - Atomics and other synchronizations
- Security



# OPEN FABRIC MANAGEMENT FRAMEWORK ARCHITECTURE

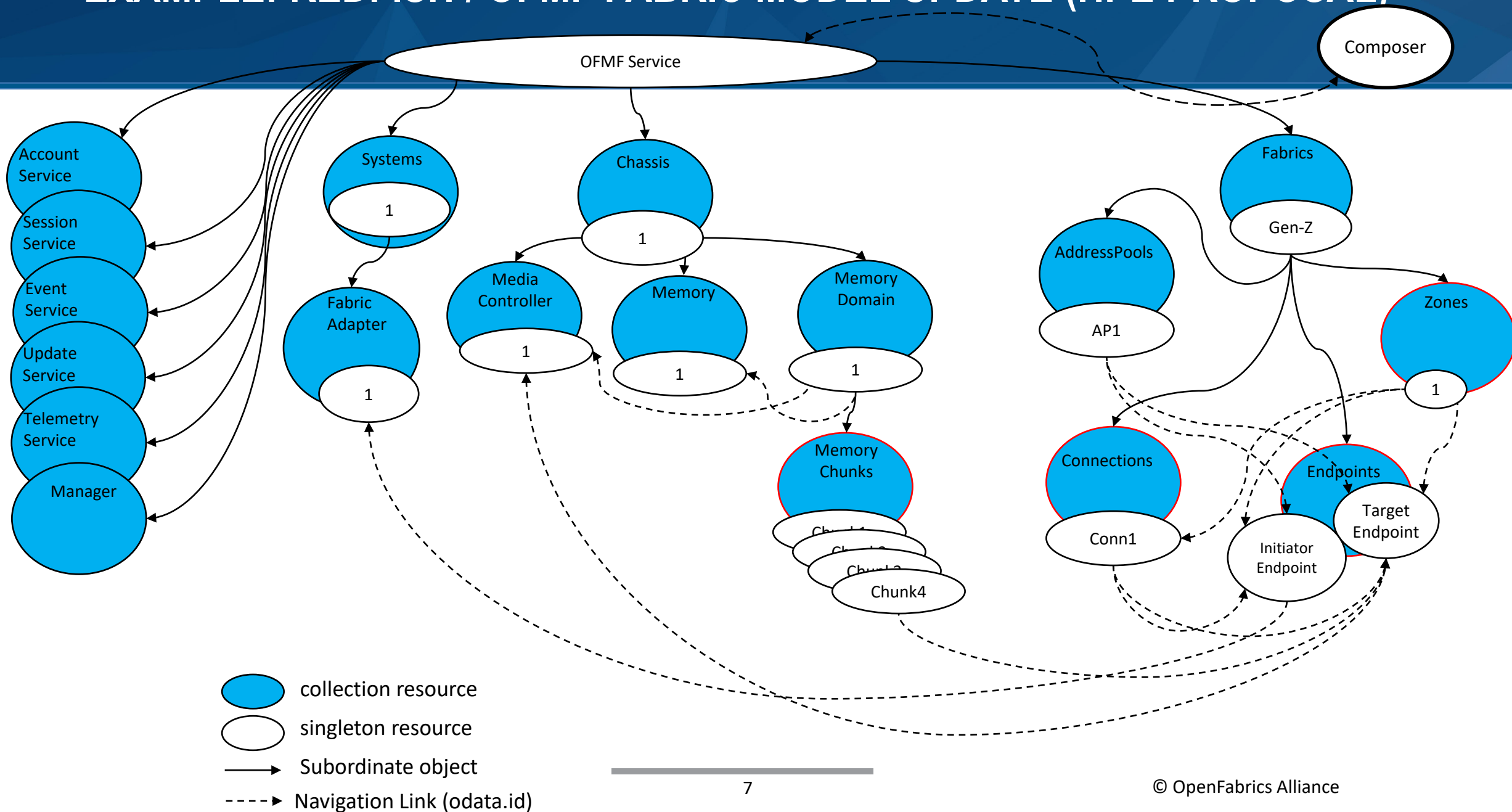


# EXAMPLE: CREATE A ZONE USE-CASE DESCRIPTION

Use Case Description	Create a zone to host a cluster within a composable DC fabric
Actors	OFMF, Fabric Manager provider, Resource manager, Composer, Administrator
Description	Use Redfish 'zone' object to define a virtual, private network within the larger fabric
Preconditions	<ul style="list-style-type: none"><li>• Provider(s) have working fabrics with endpoints and switches</li><li>• Provider(s) have a working and functional topology ---online high speed Networks are running</li><li>• Diverse free pools of compute, memory, GPU, High-Speed Networks, and storage resources are in power savings mode (offline)</li><li>• Other virtual clusters running on the 'online' machines</li><li>• List of cluster members defined. Resources reserved by Composing Manager</li><li>• Resource data locality-determined</li></ul>
Postconditions	<ul style="list-style-type: none"><li>• Client has URI to valid zone object in the OFMF Redfish tree</li></ul>
Normal Flow	<ul style="list-style-type: none"><li>• Create a Redfish fabric zone<ul style="list-style-type: none"><li>○ Validate Diverse pools of compute, memory, GPU, High-Speed Networks, and storage resources are available in existing clusters currently in service (online)</li><li>○ Parses members to make sure that we have free non-associated members</li><li>○ Post new 'zone' to the Redfish server, pass in list of endpoints<ul style="list-style-type: none"><li>○ Tracked by MAC addresses, IP addresses, LIDs, etc.</li><li>○ Zone type—zone of zones or zone of endpoints</li><li>○ Eg. Binding IO zones with compute zones</li></ul></li><li>○ Address pools with overlay and underlay addressing</li></ul></li></ul>

Edited for content and to fit in the space allowed!

# EXAMPLE: REDFISH / OFMF FABRIC MODEL UPDATE (HPE PROPOSAL)



# CALL TO ACTION

- **OFMF Work Group needs more Client driven use case input**
  - Ex: Contribute specific use cases for which the OFMF Services should have an easy button interface
- **OFMF Work Group needs Provider driven use case input**
  - Ex: Contribute use cases for Routing updates as an outgrowth of creating a fabric partition
- **OFMF Work Group needs to step through the use cases to validate Redfish fabric extensions**
  - Work with DMTF to modify Redfish schema and objects
- **OFMF Work Group needs contributors to a proof of concept code**
  - Goal of basic OFMF services to support Proof of Concept demo at SuperCompute '21 in November



# OPEN FABRIC MANAGER FRAMEWORK

Time for Discussion, Questions, and Answers



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**THANK YOU**

Open Fabric Manager Framework Work Group

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