OPEN FABRICS MANAGEMENT FRAMEWORK

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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 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
**EXAMPLE: CREATE A ZONE USE-CASE DESCRIPTION**

<table>
<thead>
<tr>
<th>Use Case Description</th>
<th>Create a zone to host a cluster within a composable DC fabric</th>
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<tbody>
<tr>
<td><strong>Actors</strong></td>
<td>OFMF, Fabric Manager provider, Resource manager, Composer, Administrator</td>
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<tr>
<td><strong>Description</strong></td>
<td>Use Redfish ‘zone’ object to define a virtual, private network within the larger fabric</td>
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| **Preconditions**    | • Provider(s) have working fabrics with endpoints and switches  
                          • Provider(s) have a working and functional topology ---online high speed Networks are running  
                          • Diverse free pools of compute, memory, GPU, High-Speed Networks, and storage resources are in power savings mode (offline)  
                          • Other virtual clusters running on the ‘online’ machines  
                          • List of cluster members defined. Resources reserved by Composing Manager  
                          • Resource data locality-determined |
| **Postconditions**   | • Client has URI to valid zone object in the OFMF Redfish tree |
| **Normal Flow**      | • Create a Redfish fabric zone  
                          o Validate Diverse pools of compute, memory, GPU, High-Speed Networks, and storage resources are available in existing clusters currently in service (online)  
                          o Parses members to make sure that we have free non-associated members  
                          o Post new ‘zone’ to the Redfish server, pass in list of endpoints  
                            o Tracked by MAC addresses, IP addresses, LIDs, etc.  
                            o Zone type—zone of zones or zone of endpoints  
                            o Eg. Binding IO zones with compute zones  
                            o Address pools with overlay and underlay addressing |
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
Time for Discussion, Questions, and Answers
THANK YOU

Open Fabric Manager Framework Work Group

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