GEN-Z™: AN OPEN MEMORY FABRIC FOR FUTURE DATA PROCESSING NEEDS

Russ Herrell

Hewlett Packard Enterprise
▪ **Overview of Gen-Z**
  * What you need to know about Gen-Z for today

▪ **Gen-Z & the Universal Fabric Manager**
  * Overview of the Gen-Z fabric management architecture and its relationship to UFM

▪ **What’s Next?**
  * Joint effort with OFA
What you can find on the Gen-Z Consortium website:

• Published Specifications
• Training
• Whitepapers
• Press Releases
• Presentations
• List of members
• Draft Gen-Z Fabric Management Specification v0.7

https://genzconsortium.org/
• The Gen-Z Micro Development Kit (µDK) includes an ARM-based Linux host card which can perform load/store native Gen-Z access to a Gen-Z Memory Module (ZMM).

• The Linux ARM host and ZMM are connected with a backplane and cable.
  • The µDK backplane with additional cables allows the Linux ARM host to access up to three ZMMs.
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Gen-Z Consortium has approved making the µDK available to non-members for development only.

E-mail Arthur Sainio Arthur.Sainio@smartm.com to request details, availability, and quotes.
Gen-Z IS:

- Multi-host, memory semantic fabric for composable, shared, multi-host resources
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- Large scale fabric features
  - Congestion management
  - End to End retry
  - Multi-pathing
  - Multiple Hardware Managers
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  - Multi-pathing
  - Multiple Hardware Managers

- Enables composition of total solutions
  - Needs a tool stack to match
GEN-Z FABRIC MANAGEMENT AND THE UFM
The Client: the end user of a total solution package

Cares about the applications

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THE COMPOSABLE FABRIC MANAGEMENT STACK
who cares about what?

The Client: the end user of a total solution package
Cares about the applications

The Solution Provider: Integrates the application with suitable infrastructure and delivers the solution to the Client
Cares about orchestration tools

Applications
Orchestration Tools
Composing Tools
Resource Managers
Universal Fabric Manager

Gen-Z Provider
Fabric Control Plane Services
Device Setup FW
Fabric HW

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The Fabric Admin: produces the fabric specific layers of the fabric management stack
Cares about the fabric management framework

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Orchestration Tools
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Universal Fabric Manager

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Fabric Control Plane Services
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Fabric HW

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The Universal Fabric Manager

- provides a north bound interface to describe the fabric and its resources and services (model)
- allows clients to control host, fabric, and endpoint resources (actions applied to model)
- enables fabric specific providers to program to a common set of APIs
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Common functionality required in the northbound API:
- Crawl fabric, discover and enumerate resources
- Publish the resource inventory,
- Service the client requests for resource configurations
- Provide methods to Enable / Disable Access
- Create / Delete Mappings of Resources to the Fabric
- Create Routes (endpoint A to endpoint B)
- Enable QoS, resiliency, etc. as given
**ROLES OF GEN-Z MANAGEMENT STACK**
(In context of a composable fabric environment)

- **Applications and Orchestration tools**
  - Don't deal with fabric details, not in scope

- **Composability Manager**
  - Keeper of the user intent (grand plan)
  - Initial owner of all fabric resources
  - Authorizer of all requests for binding resources

- **Resource Managers and Services**
  - Allocation and mapping of physical resources to virtual
  - Resource specific algorithms
  - Ex: Storage and FAM pool managers

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ROLES OF GEN-Z MANAGEMENT STACK
(In context of a composable fabric environment)

- Composability Manager
- Resource Managers

Fabric Manager
- Framework interface / provider architecture
- Redfish as a standard north bound interface
- Standard functionality: Enumeration, Discovery, Inventory, Routing, Addressing
- Gen-Z specific low-level implementations

HW Prep
- Low-level Fabric setup, authentication and routing
- Device Power up and Hardware defaults
- Link Training

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*Gen-Z Fabric Management Specification is the blueprint for a UFM provider*
GEN-Z IS BUILDING RELATIONSHIPS

to support a standardized end-to-end approach to networking

The OFA is contemplating the development of an “abstract fabric manager” built on the concepts of Redfish.

The two groups also will create and maintain extensions to DMTF’s Redfish API to support Gen-Z management.

The MOU outlines the formation of common workgroups between both organizations to provide clear cooperation, defining bridging between the protocols while leveraging the strengths of both technologies.

The intention is to use Gen-Z as a strawman target for such a fabric manager.

Similar to libfabric, such a universal fabric manager would likely be built on a ‘framework/provider’ architecture.

DMTF and Gen-Z working together to extend Redfish fabric model

OFA and Gen-Z organizations have agreed to collaborate

CXL and Gen-Z organizations have formed a ‘bridging’ workgroup
NEXT STEPS

• Express your opinion about the Universal Fabric Manager at the Birds of Feather session later today

• Review the Gen-Z Fabric Management Specification and provide feedback

• Take a look at the Gen-Z Micro Development Kit

• Support the formation of the Universal Fabric Manager work group and contribute
THANK YOU

Russ Herrell

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