Gen-Z / OFA Memorandum of Understanding

This Memorandum of Understanding (MoU) is created between the Gen-Z Consortium (Gen-Z) and the OpenFabrics Alliance (OFA) to formally define the scope, benefits, and deliverables of a collaboration between the two organizations. The MoU helps each organization focus its efforts to achieve the stated goals and objectives. This MoU is an expression of intent and is non-binding.

Alliance Organizations

The Gen-Z Consortium (Gen-Z), and the OpenFabrics Alliance (OFA).

Background

The Gen-Z Consortium is a consortium of leading companies dedicated to creating and commercializing a new data access technology.

Gen-Z is an open systems interconnect designed to provide memory semantic access to data and devices via direct-attached, switched, or fabric topologies. Implementing such a memory semantic across a network requires a sophisticated approach to the network, and most importantly to the way that applications and devices access the network service.

The Gen-Z consortium strongly believes in developing an open ecosystem where members, the broader industry, and customers can work together to deliver robust, high-quality specifications that meet solution needs. The Gen-Z consortium periodically publicly posts draft specifications and technical concepts to elicit input from the broader industry and directly from customers.

The OpenFabrics Alliance (OFA) is focused on accelerating the development and adoption of advanced fabrics for the benefit of the advanced networks ecosystem. It focuses on, among other things, the definition and implementation of APIs used by consumers of network services to access those services.

The OFA's mission is accomplished by; creating opportunities for collaboration among those who develop and deploy such fabrics, incubating and evolving vendor independent open source software for fabrics, and supporting and promoting the use of such fabric technology software.

The OFA is an "open" alliance, meaning that participation in its technical activities is open to all, regardless of membership in the Alliance. Under certain circumstances, an OFA working group may use a voting scheme to ensure the orderly progression of the working group's activities; in such a case, voting may be limited to members. This has been a rare occurrence over the past decade as it is generally inconsistent with the OFA's open source orientation.

At present, the OFA does not hire contractors or employees to create software or libraries, generally relying instead on participants in its technical working groups, either members or non-members, to provide intellectual property such as software or libraries. As such, the OFA does not, itself, generally copyright software although there is an expectation that software developed by participants in an OFA program is made available under one or more commonly available software licenses.

Terminology

- Consumer, or Network Consumer: a software library, middleware, or application that consumes network services. May also refer to end user customers who deploy and utilize computing systems.

- Provider, or libfabric Provider: A software layer, akin to a classical driver, that conforms to the libfabric framework and which implements the functions implied by libfabric's function calls. A provider is specific to a given underlying network implementation. The use of a provider architecture enables libfabric to present a 'transport agnostic' API to network consumers and thus enables the same API to be deployed across multiple fabric architectures.

- Advanced Fabrics, or Advanced Networks: a system of interconnects that typically includes operations involving networking layers up to and including the application layer. As distinct from commodity networks which are typically confined to layers 0,1,2,3, and to some extent layer 4 in the Open Systems Interconnection (OSI) reference model.

Mutual Benefits

Gen-Z and the OFA share a mutual interest in advancing the state of the art in high performance interconnects. In the case of Gen-Z, the interest is motivated by a requirement to implement memory-like semantics across fabric topologies to support the Gen-Z vision for a distributed memory architecture. Such a data access model implies a requirement for an unusually sophisticated interconnect exhibiting extraordinarily low end-to-end latencies.

The OFA's interest is driven by its basic mission statement, which is to accelerate the development, support, and adoption of new generation fabrics and fabric interfaces for the benefit of the advanced networks ecosystem, including interconnects such as Gen-Z. At the heart of the OFA's mission is an implied reliance on the consumers of network services to help define the relevant characteristics of the interconnect, and the mechanisms (APIs) used by consumers to access those services.

Gen-Z Overview and Assets

The Gen-Z Consortium develops and maintains a series of specifications governing the Gen-Z technology. Of particular relevance to this MoU is the Gen-Z Core Specification

which describes in detail the Gen-Z architecture and its implementation across a fabric. Also relevant is the Gen-Z Management Architecture Specification focused on the in-band management of a Gen-Z fabric which supports disaggregated infrastructure and remote accesses among any type of Gen-Z endpoint.

In addition, Gen-Z Consortium members possess detailed knowledge of the Gen-Z architecture as well as expertise in how applications are expected to leverage the characteristics of Gen-Z to achieve application performance, efficiency, and scalability goals.

OFA Overview and Assets

The OFA has a long history in developing and implementing vendor-neutral APIs and associated software components to support commercially available high-performance networks.

Beginning in 2013, the OFA expanded its scope beyond its traditional focus on verbs-based architectures by creating the OpenFabrics Interfaces (OFI) project to define a new family of transport agnostic APIs. The design of these APIs is motivated by the requirements of network consumers.

The goal of OFI is to define a family of interfaces that enable a tight semantic mapping between user or kernel applications and underlying fabric services. It consists of a framework supporting a collection of libraries and applications that export fabric services to user or kernel applications. Beside the framework, OFI defines application interfaces, provider libraries, kernel services, daemons, and test applications.

OFI is managed by an OFA working group, the OpenFabrics Interfaces Working Group (OFIWG). Its primary focus so far is on user space applications.

libfabric is a core component of OFI. It is the user space library that defines and exports OFI's user space APIs. The initial focus for libfabric is on distributed and parallel programming applications. Provider libraries, developed by vendors of those libraries, implement the functions described by the API. libfabric is developed and maintained by OFIWG. Each provider library is under the control of its vendor or developer.

A companion working group, the Data Storage/Data Access (DS/DA) working group, focuses on kernel level applications, including kernel space storage applications. The function that corresponds to libfabric is known as kfabric

Collaboration Benefits

Potential Benefits Accruing to Gen-Z

- Direct engagement with OFA working groups engaged in developing software, libraries and APIs supporting advanced networks such as Gen-Z.
- Ability to leverage the OFI ecosystem that has emerged in the industry
- Entrance of Gen-Z into libfabric-based user space markets via the creation of a Gen-Z libfabric provider

- Creation of an open source fabric management architecture capable of supporting a Gen-Z fabric
- Ability to leverage the OFA's existing infrastructure to support the above development.
- Creation of a fabric management architecture and implementation suitable for use in managing a Gen-Z fabric.
- Co-marketing opportunities

Potential Benefits Accruing to the OFA

OFI is intended to be "transport agnostic" meaning that it can support a number of underlying fabrics. The OFA believes that its members and the industry as a whole benefit as the number and type of fabrics supported by OFI grows. As such, the Alliance recognizes the importance of collaborating with both the consumers of network services, and the provider of network services. Furthermore, a guiding principle of the OFI project has been its 'consumer driven' approach, whereby development of the libfabric suite is driven by requirements articulated by its consumers. Thus the OFA believes that collaboration with Gen-Z will provide further valuable insights into the uses and applications of the libfabric API, leading to continued improvement in the suite as a whole.

Activities

This MoU is intended to cover both technical activities and marketing activities.

Technical Activities

1. Technical Exchange: The OFA and Gen-Z agree to a series of cross-organizational technical exchange meetings (TEMs) for the purpose of cross-education on each other's technology, current and expected future activities. In keeping with the OFA's open source orientation, these meetings will be held in an open environment, likely under the umbrella of the existing OFIWG. During these exchanges, Gen-Z is not expected to discuss or expose information which is proprietary to the Gen-Z Consortium or its members.
2. Roadmap, Enhancements to libfabric: Depending on the outcome of these meetings, the two organizations agree to jointly develop a roadmap guiding the future development of the libfabric API as needed to fully support the current and future development of Gen-Z. Such a roadmap shall not be binding on either party, but rather shall serve as the basis for discussing future enhancements to the libfabric API.
3. Gen-Z Provider: If appropriate, the Gen-Z Consortium agrees to sponsor the development of a Gen-Z libfabric provider. Such development could take place under the auspices of the OFA's OFIWG, or in any other venue agreeable to the Consortium.
4. Abstract Fabric Manager: The OFA is contemplating the development of an "abstract fabric manager" built on the concepts of Redfish. The intention is to use Gen-Z as a

strawman target for such a fabric manager. Similar to libfabric, such an abstract fabric manager would likely be built on a 'framework/provider' architecture. The OFA and Gen-Z agree to collaborate on an investigation into the feasibility of such an abstract fabric manager.

5. Gen-Z Manager Plug-In: If the previous activity proves the feasibility of such an approach, the OFA and the Consortium agree to work together, along with others, to develop both the management framework as well as a Gen-Z Plug-in. This work is to be carried out in the context of an open OFA working group, to be defined.

Marketing Activities

1. OFA and Gen-Z may share booths and/or participate jointly at industry events. They will agree on an event-by-event basis on which industry events in which to jointly participate, how to divide costs, displays and materials for any such booth or participation, and staffing of any such booth.
2. OFA and Gen-Z may promote each other's events, publications, specifications, and services. Each party agrees to do so in compliance with all applicable laws, including without limitation laws governing e-mail marketing and personal data privacy. Each party shall, prior to distribution or publication thereof, obtain the other party's consent to any materials promoting the other party's events, publications, specifications, or services. Any previously granted approval may be revoked at any time. The parties will license their respective trademarks and service marks to each other for the foregoing purposes.
3. OFA and Gen-Z may jointly develop white papers, marketing materials, presentations, and educational materials. Any such jointly developed works will be jointly owned by OFA and Gen-Z, and either party shall have the right to use, reproduce, distribute, publish, create derivative works of, or otherwise exploit such jointly developed works.
4. OFA and Gen-Z may each, in its own specifications, incorporate portions of the other party's specifications by reference; however, OFA and Gen-Z may not reproduce parts of the other party's specifications in its own specifications without the other party's prior written approval.
5. OFA may publicly provide feedback to Gen-Z regarding Gen-Z's Management Architecture specification, which specification shall be deemed confidential information of Gen-Z unless and until it is made publicly available by Gen-Z. Any such feedback provided by OFA shall be owned by Gen-Z.

Limitations

Each organization's contributions are necessarily limited by the availability of volunteer resources.

OFIWG does not control the implementation of the API in any given provider.

Access

In support of the above activities the following apply:

Gen-Z

All Gen-Z specification are available on the Gen-Z Website genconsortium.org/specifications:

- Gen-Z's Management Architecture Specification Draft 0.7 which is made available on the Gen-Z Website

OFIWG Support:

All OFIWG meetings, code bases, and collateral are open source. Existing code is generally dual licenced GPLv2 and BSD.

MoU Review Date

The MoU will be reviewed by both organizations quarterly or as agreed by both organizations.

Primary Points of Contact:

Gen-Z:

- Jeff Hilland Co-chair Software and Management WG (jeff.hilland@hpe.com)
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- Barry McAuliffe Gen-Z VP and Secretary (barry.mcauliffe@hpe.com)

OFA:

- Michael Aguilar OFA Secretary (mjaguil@sandia.gov)
- Jim Ryan OFA Executive Director (jimdryan@gmail.com
- Sean Hefty Co-chair OFIWG (sean.hefty@intel.com)
- Divya Kolar MWG Chair (divya.kolar@intel.com)
- Paul Grun OFA Chair (paul.grun@hpe.com)

Gen-Z Document Approval

The document is subject to review and approval by the Gen-Z Executive Team

OFA Document Approval

The document is subject to review and approval by the OFA Board of Directors

Non-Binding Nature of this MoU

This MoU is a non-binding expression of intent. The parties shall have no rights, obligations, or liabilities with respect to the proposed relationship and proposed activities described herein unless and until the parties execute a definitive written agreement regarding the same.

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Executed on April 27, 2020

Gen-Z Consortium, Inc.	**OpenFabrics Alliance (OFA)**
Kurtis J Bowman	Paul Grun
By: Kurtis Bowman	By: Paul Grun
Its: President	Its: Chair, OpenFabrics, Inc.

Appendix A - Milestones

For purposes of this MoU establishment of relevant milestones will be recorded in this Appendix.

Milestone/Deliverables	**Timeframe**
TBD	TBD