**Submission Details: bof231s1**

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**Title**

*Title:* Advancing the State of the Art in Network APIs - The OpenFabrics Interfaces APIs

**Primary Session Leader Information**

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**BOF Topic Area**

*BOF Topic Area:* Other

**Abstract**

*Abstract (Maximum 100 words):*

Following a BoF held at SC13, the OpenFabrics Alliance launched an open source effort to develop a family of network APIs targeting multiple consumer models. The first result was the recent release of libfabric, an API designed to support MPI for distributed and parallel computing. Close behind is development of APIs for storage, NVM and data access. This BoF is an opportunity for consumers of network services to review the state of development of these APIs and to debate how best to provide network services into the future, particularly in light of emerging technologies such as NVM.

**Long Description**

*Long Description (Maximum 500 words):*

Since the advent of RDMA-enabled networks more than a decade ago, much progress has been made in developing network stacks to enable communication over those networks. Consistent with common network development practice at the time those APIs were expressly designed to expose the capabilities of the specific underlying RDMA network. This meant in many cases that the API was tailored to the architecture of the underlying network. For example, the implementation of the verbs API is based on a series of so-called queue pairs. The result in some cases is that the API is not well-aligned with the actual needs of the consumer of network services meaning that the API may be difficult to use or may leave opportunities for performance or scalability unaddressed. Partly as a result of inputs received from a BoF held at SC13, the OpenFabrics Alliance (OFA) began a review of its approach to developing APIs with the goal of learning how to do so while optimizing the API to the requirements of the consumers of network services. The result of that review was the establishment of a new project called OpenFabrics Interfaces (OFI) which had as a particular goal the development of a new API using a so-called ‘application centric’ approach. This approach puts into practice the simple idea that the development of the API should be driven by the needs of its consumers, independent of the architecture of the underlying network. The first result of that development effort is the recently released libfabric which is a user mode library carefully designed for networking middleware, programming models and languages such as MPI, PGAS and SHMEM. Following an extensive requirements gathering phase involving many of the participants of that first BoF, libfabric has been developed by an open source working group comprising members from a broad spectrum of commercial network developers, academic researchers and representatives of government labs. The objective of this BoF is to re-convene that community to review our progress to date, to gather further input from the community, and to collaborate on charting the future direction of this and related APIs now under consideration in the OFA. Libfabric is also the topic of a tutorial being presented at SC15 titled “’An Introduction to the OpenFabrics Interfaces APIs”. The desired outcomes of this BoF are: - Gather feedback from this community on the results of the collaboration that produced libfabric, - Provide an update to the community on the current state of the API and its accompanying network providers, as well as plans to expand the list of supported networks, - Develop a consensus among network developers and consumers of the API on future development efforts and priorities.

**Session format**

*How much of the session will be used for interaction between audience and session leaders/presenters?* 50%  
*What is the primary format for content that does not directly involve audience discussion?* Sequence of presentations  
*Does the BOF topic deal with commercial technology?* Vendor-neutral

**Description of the session format**

*Description of the session format (Maximum 150 words):*

The BoF begins with a brief description of the OpenFabrics Interfaces project to include motivations and objectives and a short discussion of the breakdown of the work between the various OFA working groups. This is important since each working group is targeting a particular class of consumer. Next, the high level architecture of the API framework is presented, including the current status of the software. Included in the discussion are pointers to the GitHub repository and the OFA website containing working documents. Finally, an open discussion is facilitated by members of the OFA among all participants in the BoF focused on developing a consensus on future developments.

**BOFs at recent SCs**

*Has your BOF been held at recent SC conferences?* SC13  
*If so, approximately how many attendees did your BOF attract the most recent year it was held?* 50-74

**Scheduling Information**

*Preferred date and time:* Tuesday 1:30 - 3:00pm  
*Amount of time requested:* 1 hr  
*Expected Attendance:* 50  
*Keyword/Phrase 1:* network API  
*Keyword/Phrase 2:* RDMA network  
*Keyword/Phrase 3:* libfabric

**Conference Presentations**

*Can SC archive and distribute your conference presentation?* Yes

**Acknowledgement**

*Acknowledgement:* yes