**Title:** An Update on Libfabric, a new Network API for User Space Programs

**Session Leaders:** (I expect to include all the tutorial presenters as Session Leaders)

**BoF Topic Area:** ???

**Abstract:**

This session re-convenes the parties to an SC13 BoF titled, “Discussing an I/O Framework”. The results of that BoF motivated the formation by the OpenFabrics Alliance of a project to develop network APIs targeted at specific consumers of network services. The first result of that project was the recent release of libfabric, an API designed to support networking middleware such as MPI and programming models and languages such as PGAS and SHMEM. The objective of the BoF is to re-engage the community of consumers of such network interfaces to checkpoint the progress to date and to discuss future API developments.

**Long Description:**

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:**

- interaction between audience and session leaders? 50%

- what is the primary format for content that does not directly involve audience discussion? A sequence of presentations including a brief overview of the architecture and current status of the software.

- does the BoF topic deal with commercial technology? Vendor-neutral

**Description of the session format:**

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.