**Title:** Extending the New OpenFabrics Interfaces to Storage and Data Access

**Session Leaders:** Paul Grun, Cray Inc., would like to have another from DS/DA

**BoF Topic Area:** Storage

**Abstract:**

This BoF brings together consumers of network services for storage and data access with OpenFabrics Alliance developers to discuss new APIs for storage, NVM and data access. A key to developing an API is early engagement with the users of network services. This BoF is an opportunity for the storage and data access community including developers and users of block and file storage systems and NVM solutions to discuss requirements, exchange points of view on kernel mode versus user mode APIs and to debate how best to provide network services meeting I/O needs into the future. APIs for NVM will be a hot topic of conversation.

**Long Description:**

A key to developing a successful and widely adopted network API is to ensure that it meets the needs of its consumers, where ‘consumers’ means programs that depend directly on network services for efficient and performant operation. This BoF brings together members of the OpenFabrics Alliance who are engaged in developing new network APIs for storage and data access with designers and users of data storage systems such as file and block storage systems and NVM solutions. The objective of the BoF is to encourage the growth of a community consisting of the developers of network APIs and the consumers of those APIs, all dedicated to creating network solutions that increase the performance, efficiency and scalability of storage systems, including systems for accessing non-volatile memory.

In 2013 the OpenFabrics Alliance launched an effort to develop a family of network APIs carefully tailored to meet the needs of consumers of network services. The initial work was focused on developing user mode libraries primarily targeted at IPC communication for distributed and parallel computing. The OFA recently expanded that work to examine the needs of the providers and users of storage and data access services. Included in those services are object, file and block storage services and access to non-volatile memory. The new API under development in the OFA, which complements the newly released libfabric API, is specifically targeted at meeting the requirements for storage and data access services.

This focus on the consumer of network services is realized by adopting an ‘application-centric’ approach to API development, which simply means that the API is developed in close harmony with the consumers of those APIs. This BoF is designed to encourage this type of close communication thus ensuring that the resulting interfaces are naturally aligned with the needs of its consumers.

This so-called ‘application-centric’ approach differs from more classical network stack developments in two important ways. First, a traditional API is created to expose the features of a particular underlying network with the resulting combination of a network and accompanying interface presented to consumers as a package. And second, classical APIs for RDMA networks are often expressed at the driver level in the kernel stack whereas these new APIs seek to present a more abstract representation of the network which more closely matches the needs of storage and data access applications

Some specific desired outcomes from the BoF include the following:

- A clear view of the various use cases for NVM and the means by which those use cases can be served by a new API,

- A gauge on whether existing kernel filesystems would benefit from a new API,

- A consensus on the need for an abstract API for user mode access, for example for user mode filesystems such as CEPH, or for accesses to byte addressable memory

- A conclusion as to whether such a kernel mode API should be considered an extension of the existing low level drivers or whether it should be considered part of the higher level network system.

**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

- 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 of the project and a short discussion of the breakdown of the work between the various OFA working groups.

Next, the specific charter of the ‘Data Storage / Data Access’ working group is presented.

Finally, a slide deck developed by the DS/DA working group is introduced. This slide deck is used to pose the questions mentioned in the Long Description. These topics are raised one-by-one with an open discussion between members of the OFA who are present at the BoF and other audience/participants.