**OFI Data Storage / Data Access Subteam Weekly telecom – 09/15/2015**

**DS/DA Shared Documents:** <http://downloads.openfabrics.org/WorkGroups/ofiwg/>

**Agenda**

* roll call, agenda bashing
* NVM usage models – Chet Douglas

**NVDIMM usage models – see Chet’s slides**

**“Local and Remote byte-addressable NVDIMM High-level Use Cases.pptx”**

- terminology

NVM – more generic term that can be used to refer to either byte addressable memory, or SSD…

NVDIMM – specifically refers to byte addressable NVM, accessed through a load/store memory interface. Usually refers to a DIMM stick. Says nothing about whether the access is local or remote. Also says nothing about PCIe-attached NVM. A synonym for byte addressable memory.

SSD – an NVM device with a block I/O interface

NVMe over Fabrics – block addressable (e.g. iSCSI, iSER) on an NVM device, remotely. Usually implies a network stack, also refers to local PCIe attachment. NVMe is a block-level NVM interface.

- The slides only reflect some use cases, not all.

- Intel moving away from kernel I/O

- Local NVDIMM (slide 2)

memory side cache – capacity is not visible to user, could be used to cache DDR4 or High b/w memory.

hierarchical tiered memory – capacity is not visible to user

- Local NVDIMM – kernel access (slide 3) – don’t take ‘Local’ too literally.

 SW RAID – close the R5 Write Hole

 SW RAID – Cache for SSD RAID Volumes

- Local & Remote NVDIMM (slide 4)

 Synchronous active/passive database replication

- Local & Remote NVDIMM (slide 5)

 Asynchronous active/passive database replication. Logging based

 Similar to above (slide 4), but asynchronous instead of synchronous

- Remote NVDIMM (slide 6)

 Disaggretated network topology – compute nodes, storage processing nodes

 Backend storage is NVDIMM

Communication between compute node (client) and storage processing node (server) could be NVMe over fabric, file I/O, generic block storage, user space loads and stores over the fabric…

In other words, client/server communications could be kernel mode (block, file I/O) or user mode (byte addressable loads/stores)

- Hyper converged network topology (slide 7)

 identical to last picture, but both the client and the storage server are running on the same box.

 so-called ‘software defined storage’

- Enterprise Appliance use case (slide 8)

 Shows two cases based on how the Enterprise Server connects to the appliance

 Could be via a storage protocol, or could be via byte addressable load/store

- HPC – PGA, SHMEM, MPI, Human Brain Project (slide 9)

- HA & HPC

- Not shown – NVDIMM as a burst buffer, checkpoint restart uses

- All the above are more-or-less user space

- An action for this group could be to fill in some of the kernel use cases

**Agenda for next meeting**

- RDMA with persistent memory (Chet again)

- Focus on kernel use cases for NVM

**Webex Recording:** [**Play recording**](https://cisco.webex.com/ciscosales/ldr.php?RCID=040d9da23296bde35ff120322ceab2cc)

**Next regular telecom:**

Next meeting: Tuesday, 09/22/15

8am-9am Pacific daylight time

**NOTE:** We have switched over to using Webex (courtesy of Cisco). The URL for joining meetings is:

[Join WebEx meeting](https://cisco.webex.com/ciscosales/j.php?MTID=m221d8a20185d84b30daa0096aca0f182)

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