



Farber End-of-Life Plan and Policies

The Farber cluster was deployed in early 2014 and was turned over to investors in September of that year. The cluster had a proposed four year lifespan, putting its end-of-life in the September 2018 time frame. That date has long been surpassed by the system: at this time the only hardware still under a support contract is the storage system that holds user home directories and workgroup directories. With power and cooling capacity of the UD Datacenter a major concern with respect to the addition of new hardware like DARWIN and the current and future Caviness expansions, the time has come to plan for taking Farber offline. Dates of importance include:

- **January 2023:** All compute nodes will be shut down and the job scheduler taken offline
- **July 2023:** Hardware will be removed from the Datacenter

The remainder of this document includes additional information about these dates and the policies surrounding the end-of-life of the Farber cluster.

Hardware Failures — Policies

Enough nodes must remain online to service the workload without producing a sizable backlog of jobs. ***If at any time henceforth greater than 40% of the cores in Farber have failed and are offline, the cluster will be considered “dead” and its shutdown schedule will be accelerated.*** A compute node is deemed “failed” when any of the following conditions exist:

- ***Node does not power on or does not pass POST (power-on self test)***
- ***Failed network adapter (InfiniBand or ethernet)***
- ***Failed memory***
- ***Failed processor***
- ***Failed hard disk***

The head node of Farber is a special case: without it, the cluster cannot function. ***If the head node fails efforts will be made to repair or replace it.***

Besides the compute nodes, the cluster also includes networking and storage hardware that is no longer under a support contract:

- ***No attempts will be made to replace failed ethernet switches within the cluster.*** Failure of an in-rack ethernet switch will imply the failure of all compute nodes in that rack. Failure of a central (core) ethernet switch will imply failure of the cluster in its entirety.
- ***No service contract is present on the Mellanox InfiniBand network.*** Failure of an in-rack InfiniBand switch will imply the failure of all compute nodes in that rack. Failure of a central (spine) InfiniBand switch will imply failure of the cluster in its entirety.

- The /lustre file system exists on hardware for which there is no support contract. **Failure of one MDS/OSS server within each high-availability pair can be sustained with degraded performance. Failure of both servers in a high-availability pair will leave the file system unusable for the remainder of Farber's lifespan.**
 - The Lustre metadata target (MDT) and object storage targets (OSTs) are backed by storage pools that can survive with up to two failed disks. **Failed hard disks will not be replaced.**
 - The full failure of any OST makes the files and directories stored on that OST unusable by the /lustre file system. **If an OST fails, the file system will operate in a degraded state in which any content residing in whole or in part on the failed OST is unusable.**
 - **The failure of the MDT constitutes a terminal failure of the file system.**
- The /home/work file system exists on hardware for which there is no support contract.
 - **Failure of the production server will necessitate the move of its disaster-recovery partner into a production role, with no further offsite replication of the data.**
 - **Failure of the disaster-recovery server will end offsite replication of the data.**
 - **Best efforts will be made to replace failed component hard disks through July 2023 to prevent data loss and overall failure of the file system.**

With these policies in place, IT is optimistic that Farber will remain online through July 2023.

Shutdown Schedule

In January 2023 (or under a failure that marks the cluster “dead”) IT will cease to offer support for Farber:

- **No further updates to the operating system**
- **No further updates to any software packages maintained by IT**
- **No new user accounts will be created**
- **Support will occur at the discretion of IT staff for diagnosis of user issues**

At that time the job scheduler on Farber will be terminated and all compute nodes will be powered-down.

Starting in July 2023, IT will begin to dismantle the cluster and dispose of the hardware still in its possession. The /lustre file system (if still online) will be shut down immediately as it constitutes scratch (temporary) storage. The head node will remain online for up to six months to allow ongoing access to data resident in:

- User home directories
- /home/work workgroup directories

Important!

Investors are urged to begin planning now with respect to their data resident on file systems in the Farber cluster. IT has no plans to mass-migrate any of the data present in /home/work or in home directories to longer-term storage systems. It is up to individuals and/or workgroups to determine:

- What data is expendable versus what data must be retained
- Where to store the data that must be retained

IT staff will gladly meet with workgroups to discuss options for archival of the necessary data as well as mechanisms by which the data can be moved into whatever longer-term solution is chosen.