# Tiering and Unified Namespace

## Unified Namespace

The DAOS tier can be tightly integrated with the Lustre parallel filesystem, in which DAOS containers will be represented through the Lustre namespace. This capability is under development and is scheduled for DAOS v1.2.

The current state of work can be summarized as follow :

* DAOS integration with Lustre uses the Lustre foreign file/dir feature (from LU-11376 and associated patches).
* Each time a DAOS POSIX container is created, using the daos utility and its ‘–path’ UNS option, a Lustre foreign file/dir of ‘daos’ type is being created with a specific LOV/LMV EA content that will allow to store the DAOS pool and containers UUIDs.
* Lustre Client patch for LU-12682, adds DAOS specific support to the Lustre foreign file/dir feature. It allows for foreign file/dir of daos type to be presented and act as an <absolute-prefix>/<pool-uuid>/<container-uuid> symlink to the Linux Kernel/VFS.
* The can be specified as the new daos=<absolute-prefix> Lustre Client mount option, or also through the new llite.\*.daos\_prefix Lustre dynamic tuneable. Both and are extracted from foreign file/dir LOV/LMV EA.
* To allow for symlink resolution and transparent access to DAOS container content, it is expected that a DFuse/DFS instance/mount, of DAOS Server root, exists on presenting all served pools/containers as <pool-uuid>/<container-uuid> relative paths.
* daos foreign support is enabled at mount time with the daos= option present, or dynamically through llite.\*.daos\_enable setting.

## Data Migration

### Migration to/from a POSIX filesystem

A dataset mover tool is under development to move a snapshot of a DAOS POSIX container or DAOS HDF5 container to a POSIX filesystem and vice versa. The copy will be performed at the POSIX or HDF5 level. (The MPI-IO ROMIO ADIO driver for DAOS also uses DAOS POSIX containers.) For DAOS HDF5 containers, the resulting HDF5 file in the POSIX filesystem will be accessible through the native HDF5 connector with the POSIX VFD.

The first version of the data mover tool is currently scheduled for DAOS v1.4.

### Container Parking

The mover tool will also eventually support the ability to serialize and deserialize a DAOS container to a set of POSIX files that can be stored or “parked” in an external POSIX filesystem. This transformation is agnostic to the data model and container type, and will retain all DAOS internal metadata.