HSM, Data Movement, Tiering and more

Ben Evans LUG 2019

bevans@cray.com
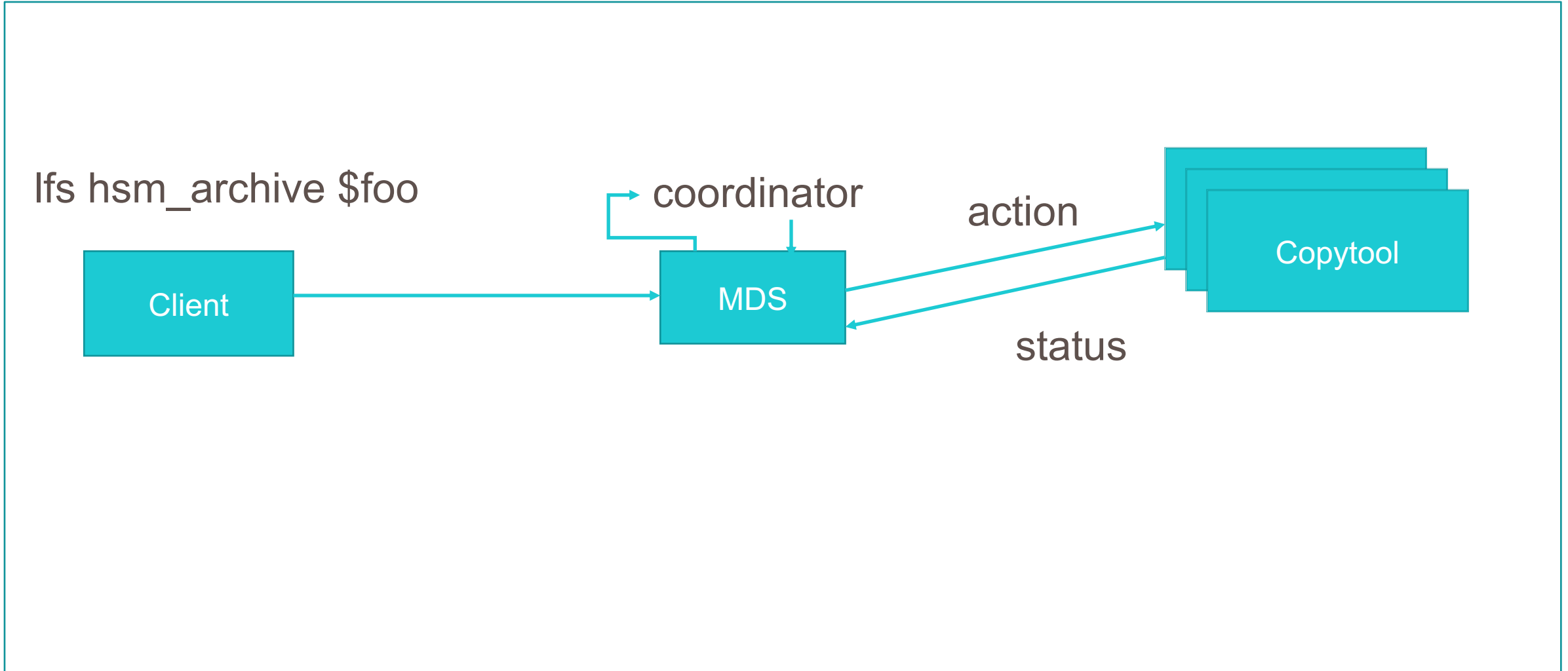
CRAY®
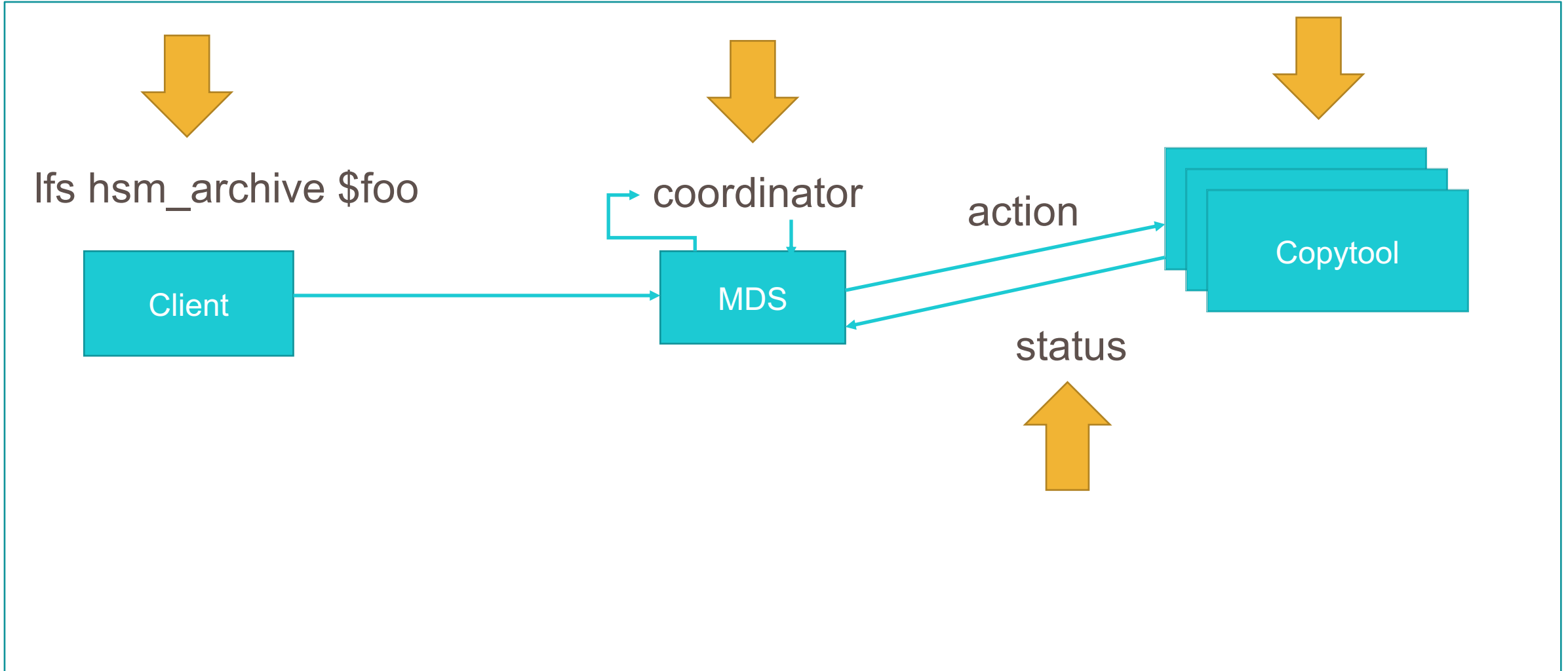
Active Development
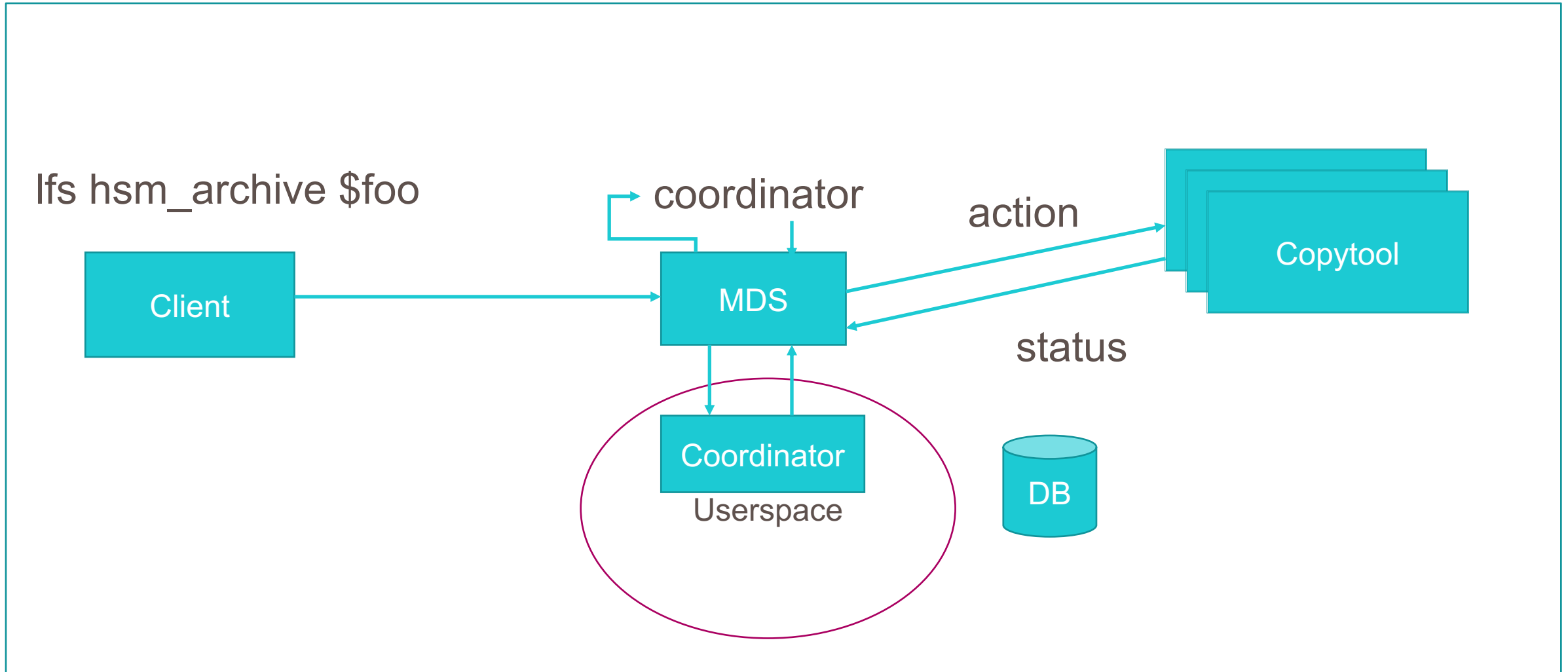
HSM – Current Status
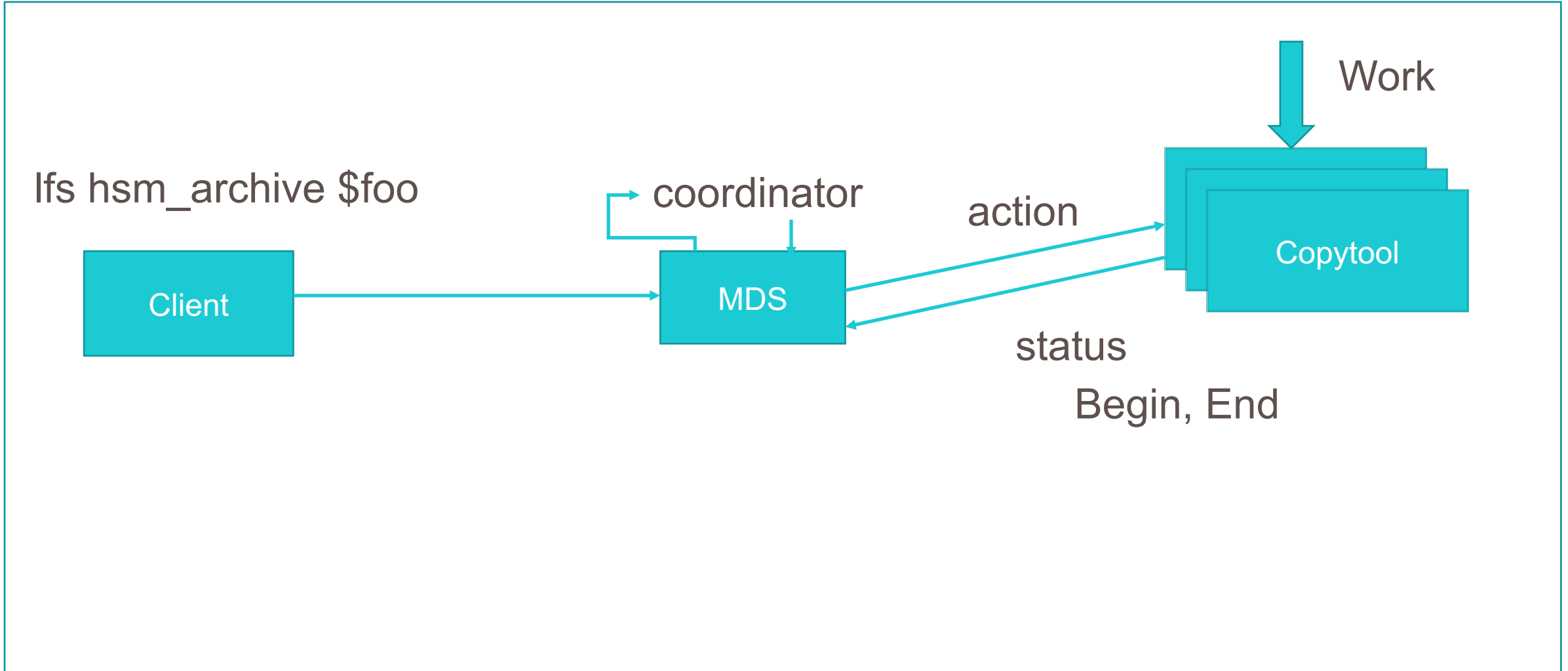
CRAY

lfs hsm_archive $foo

coordinator

action

status

Client

MDS

Copytool

What's Wrong with this Picture

CRAY

lfs hsm_archive $foo

coordinator

action

status

Client

MDS

Copytool

#2 and 3 Coordinator (LU-10986)

lfs hsm_archive $foo

coordinator

action

status

Client

MDS

Copytool

Coordinator

Userspace

DB

#4 Copytool Interfaces

Work

lfs hsm_archive $foo

coordinator

action

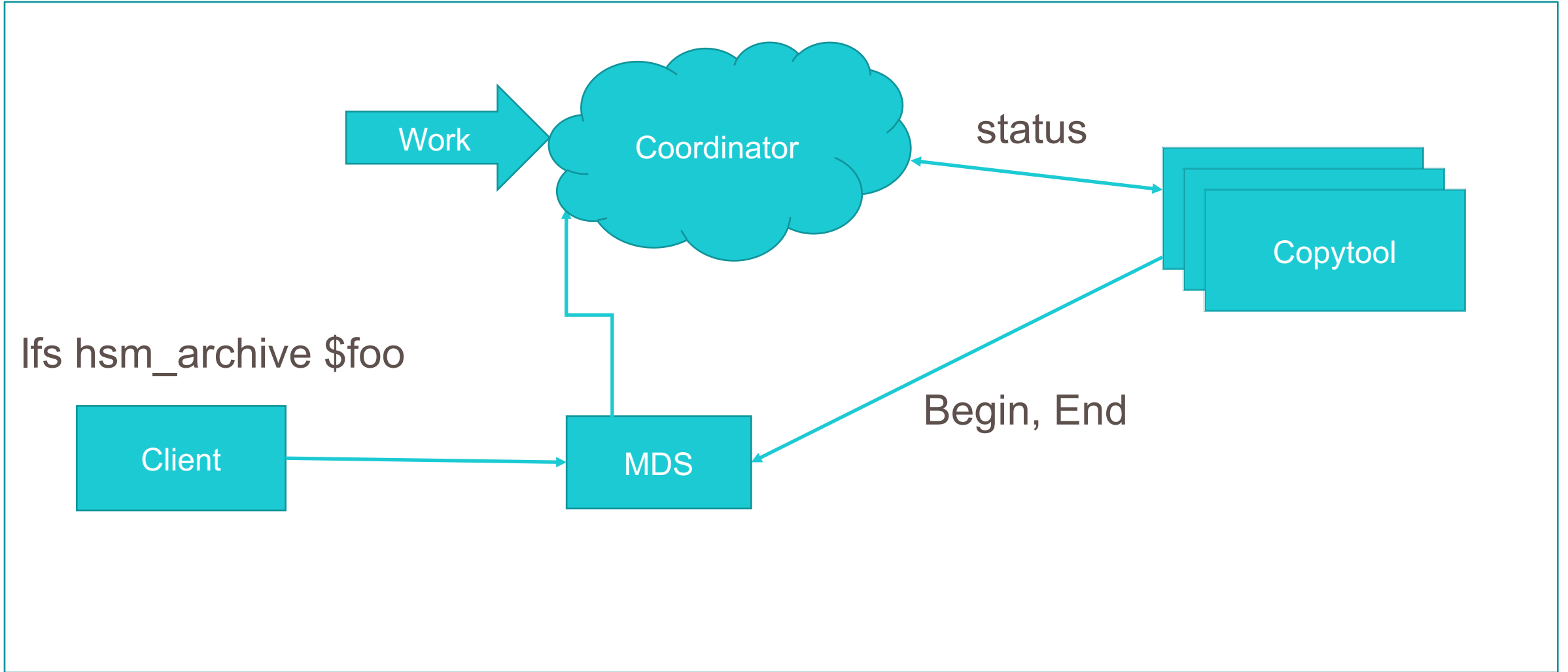Copytool

Client

MDS

status

Begin, End

Archive (New Interface)

CRAY

- Can all be handled by the new data mover

    - Only HSM xattr info needs to be set (ARCHIVED, etc.)

    - Need to check data versions to make sure nothing changed

    - Failovers? Not a problem

    - Locks? Not a problem

    - Multiple backups? All userspace

    - But wait, there's more!

Restore (New Interface)

- Can all be handled by the new data mover
    - Need to check that it can be restored (basically the ARCHIVED flag)
    - Restore data to a temp file, then do a layout swap
    - Remove RELEASED flag
    - Failovers? Not a problem
    - Locks? Not a problem (kind of)

New Picture

CRAY

Work

Coordinator

status

Copytool

lfs hsm_archive $foo

Begin, End

Client

MDS

Migrate LU-9855

- Use current lfs migrate to create a temp file with new striping info
  - Add it to the HSM queue
  - Copytool copies data from the file to the temp file
  - Layout swap
  - Delete the old temp file
- No real coordinator changes needed (internal or external)

Future Work

Migrate LU-9855+

- Leverage stripes
    - Create an HSM mirror sync operation
- Migrate
    - Create a new stripe
    - Migrate data
    - Delete old stripes

Migrate LU-9855++

- Leave old stripes in place
  - At the end, delete all data in the old stripe and mark it as inactive
- Migrate
  - Create or Reactivate stripe
  - Mirror sync
  - Truncate old stripe
  - Deactivate old stripe

Migrate LU-9855+++

- Name the stripes
    - "SSD" or "HDD"
- Migrate
    - Activate "HDD" stripe
    - Mirror sync
    - Truncate "SDD" stripe
    - Deactivate "SSD" stripe

Migrate LU-9855++++

CRAY

- PFL and stripes
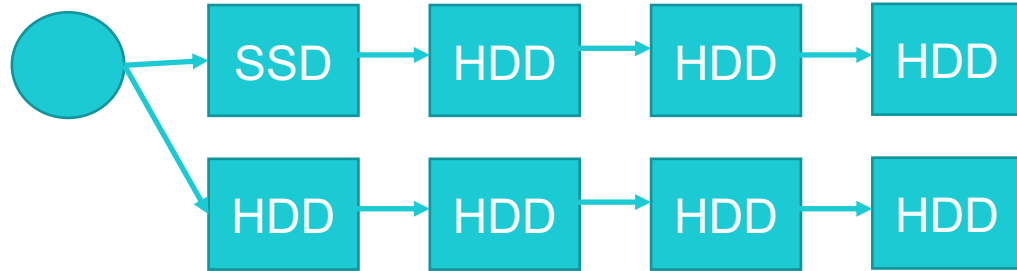
```
( ● ) → [ SSD ] → [ HDD ] → [ HDD ] → [ HDD ]
```
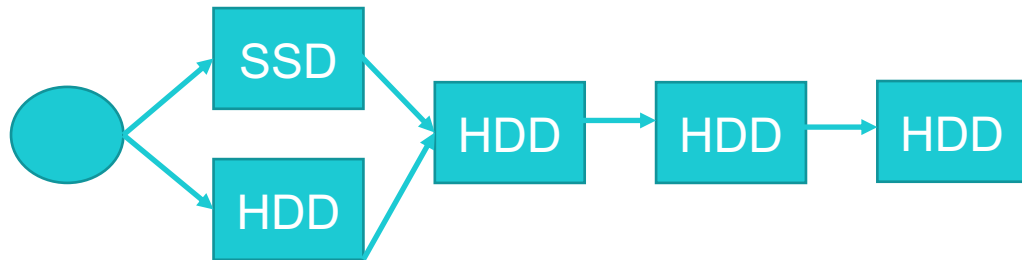
- Migrate off of SSD

  - Copy the file?

  - Mirror sync?

  - Something else?

Migrate LU-9855++++

- Current view of mirrored stripes

- Or could we do this?

QUESTIONS?

bevans@cray.com

cray.com

@cray_inc

linkedin.com/company/cray-inc-/