CERN

New CTA tape state lifecycle

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Overview

Old tape states

New changes

Example

Overview

The tape state lifecycle inside the CTA code has been restructured:

- New tape states for *repacking* and *exported* tapes
- Distinction between *repacking* and *user* retrieve requests
- Automatic cleanup of retrieve requests from tape queues

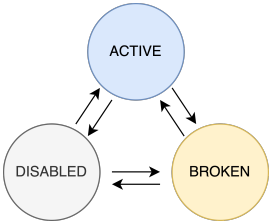
User retrieve requests:

- Submitted by *users* to retrieve files from tape to disk

Repack retrieve requests:

- Submitted by the *operator* to move files between tapes

Old tape states



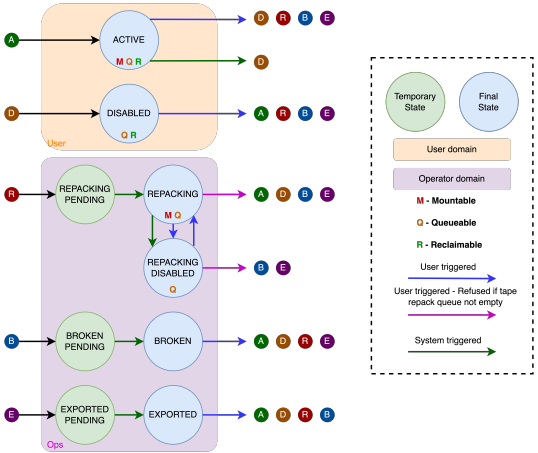
The previous lifecycle was problematic:

- *Repack* did not have a clear state
- *User* requests can get mixed with *repack* requests
  - User not notified of delay, unclear message
- If tape state is no longer ACTIVE, user requests may be kept on queue indefinitely
  - User not notified, unclear message
- No state for *exported* tapes

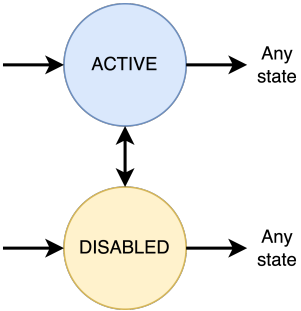
New changes

- New final states:
  - REPACKING, REPACKING_DISABLED, EXPORTED
- *User* requests only possible on:
  - ACTIVE, DISABLED
- *Repack* requests only possible on:
  - REPACKING, REPACKING_DISABLED
- No requests on:
  - BROKEN, EXPORTED
- When tape state is moved out of ACTIVE/DISABLED:
  - *User* requests are removed automatically from retrieve queue
  - Requests will be requeued (if another replica exists on tape), or reported back to user as error

Full new state diagram



User domain



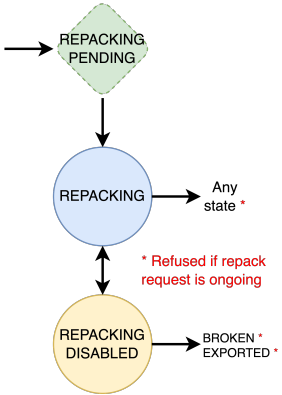
ACTIVE:

- Can queue only *user* requests
- Can be mounted

DISABLED:

- Can queue only *user* requests
- **Can't** be mounted

Operator domain - repacking



REPACKING_PENDING:

- Temporary state
- Tape server cleans any *user* requests from queue, before changing state to REPACKING

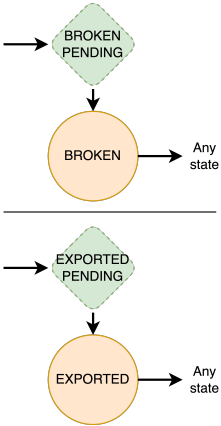
REPACKING:

- Can queue only *repack* requests
- Can be mounted

REPACKING_DISABLED:

- Can queue only *repack* requests
- **Can't** be mounted

Operator domain - tape end of life



BROKEN (BROKEN_PENDING):

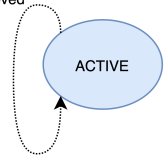
- Unusable tape

EXPORTED (EXPORTED_PENDING):

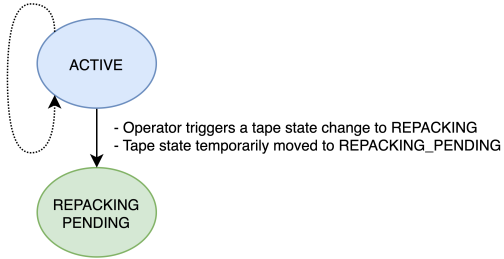
- Tape moved out of the CTA library (physically or logically) but still on the catalogue

Example

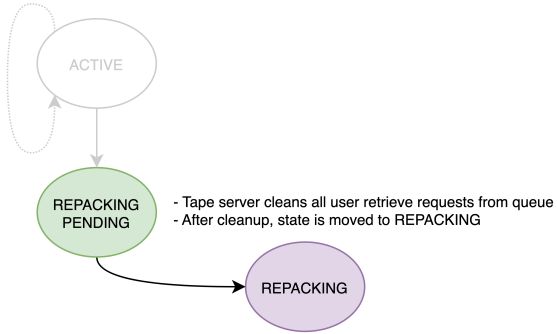
- Users can submit requests
- Tapes are mounted
- Files are retrieved



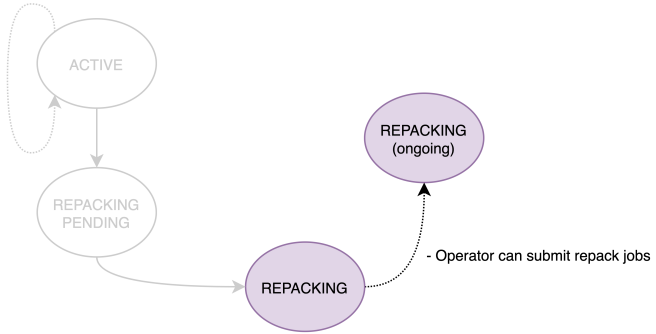
Example


ACTIVE
- Operator triggers a tape state change to REPACKING
- Tape state temporarily moved to REPACKING_PENDING
REPACKING
PENDING

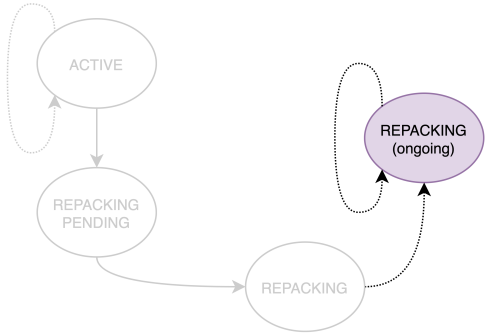
Example


ACTIVE
REPACKING PENDING
- Tape server cleans all user retrieve requests from queue
- After cleanup, state is moved to REPACKING
REPACKING

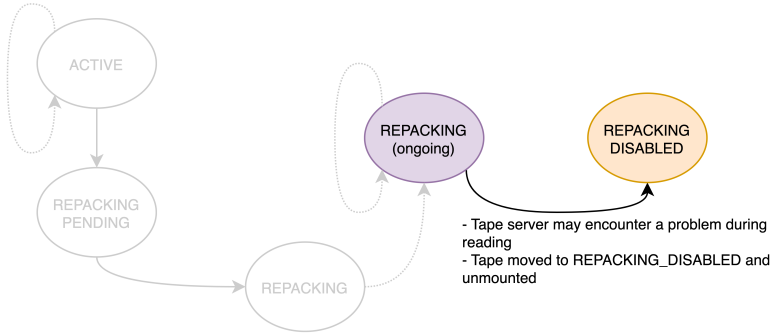
Example


ACTIVE
REPACKING PENDING
REPACKING
REPACKING (ongoing)
- Operator can submit repack jobs

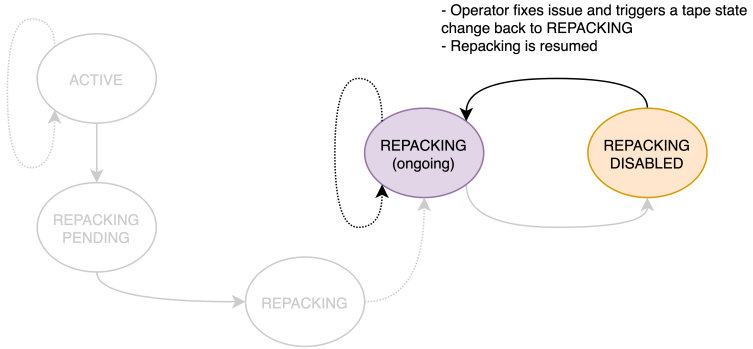
Example


ACTIVE
REPACKING PENDING
REPACKING
REPACKING (ongoing)
- Repack sub-requests unpacked and enqueued
- Files moved between tapes

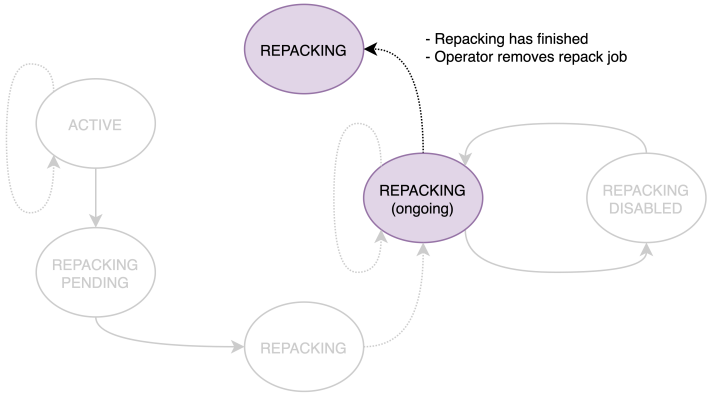
Example


ACTIVE
REPACKING PENDING
REPACKING
REPACKING (ongoing)
REPACKING DISABLED
- Tape server may encounter a problem during reading
- Tape moved to REPACKING_DISABLED and unmounted

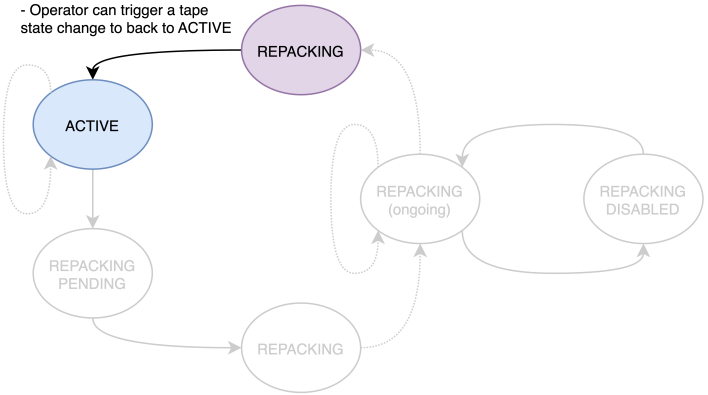
Example


- Operator fixes issue and triggers a tape state change back to REPACKING
- Repacking is resumed
ACTIVE
REPACKING PENDING
REPACKING
REPACKING (ongoing)
REPACKING DISABLED

Example


REPACKING
- Repacking has finished
- Operator removes repack job
ACTIVE
REPACKING
(ongoing)
REPACKING
DISABLED
REPACKING
PENDING
REPACKING

Example


- Operator can trigger a tape state change to back to ACTIVE
REPACKING
ACTIVE
REPACKING (ongoing)
REPACKING DISABLED
REPACKING PENDING
REPACKING

Conclusion

New tape states available on CTA versions $\geq$ *4.8.0*.
We recommend last CTA public release version (*4.8.7-1*).

For more details check our CTA tape state documentation:
https://eoscta.docs.cern.ch/tape/tape_lifecycle/

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