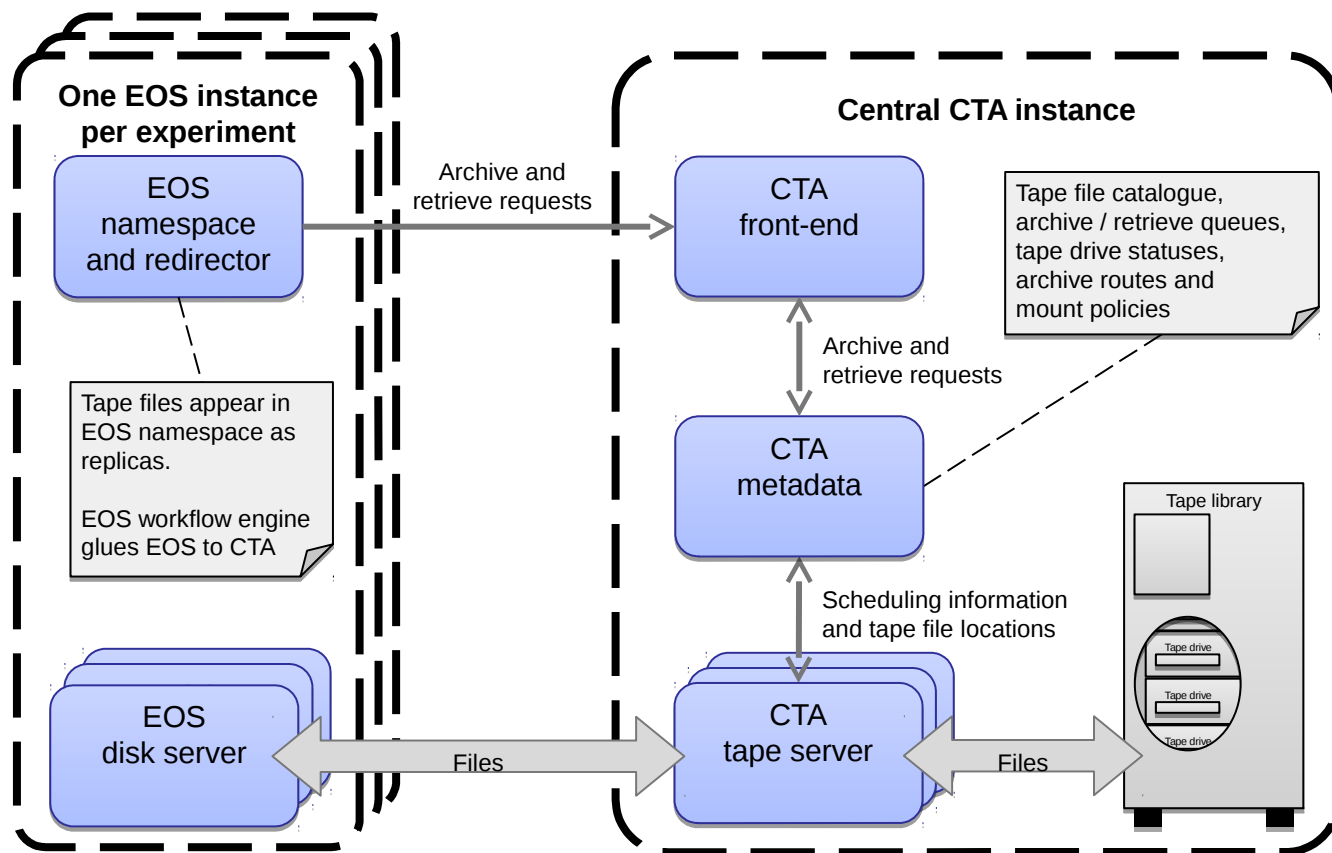# What, why and when

CTA and the Tier 1s

German Cancio, Eric Cano, Julien Leduc and Steven Murray
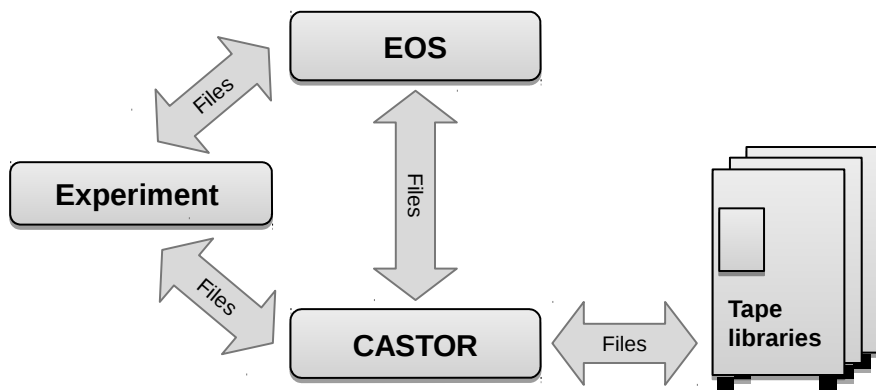
CTA is:

- **Natural evolution of CASTOR**
- **A tape backend for EOS**
- **A preemptive tape drive scheduler**
- **A clean separation between disk and tape**

One EOS instance per experiment

Central CTA instance

EOS namespace and redirector

Archive and retrieve requests

CTA front-end

Tape file catalogue, archive / retrieve queues, tape drive statuses, archive routes and mount policies

Tape files appear in EOS namespace as replicas.

EOS workflow engine glues EOS to CTA

Archive and retrieve requests

CTA metadata

Scheduling information and tape file locations

EOS disk server

Files

CTA tape server

Files

Tape library
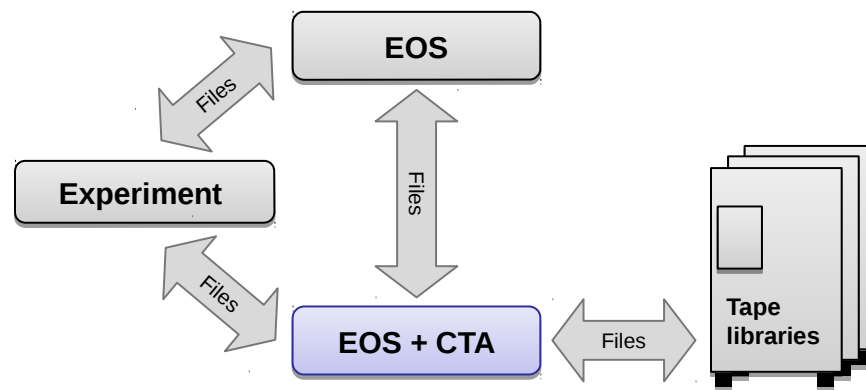
Tape drive

Tape drive

Tape drive

- **EOS plus CTA is a "drop in" replacement for CASTOR**

Current deployments with CASTOR
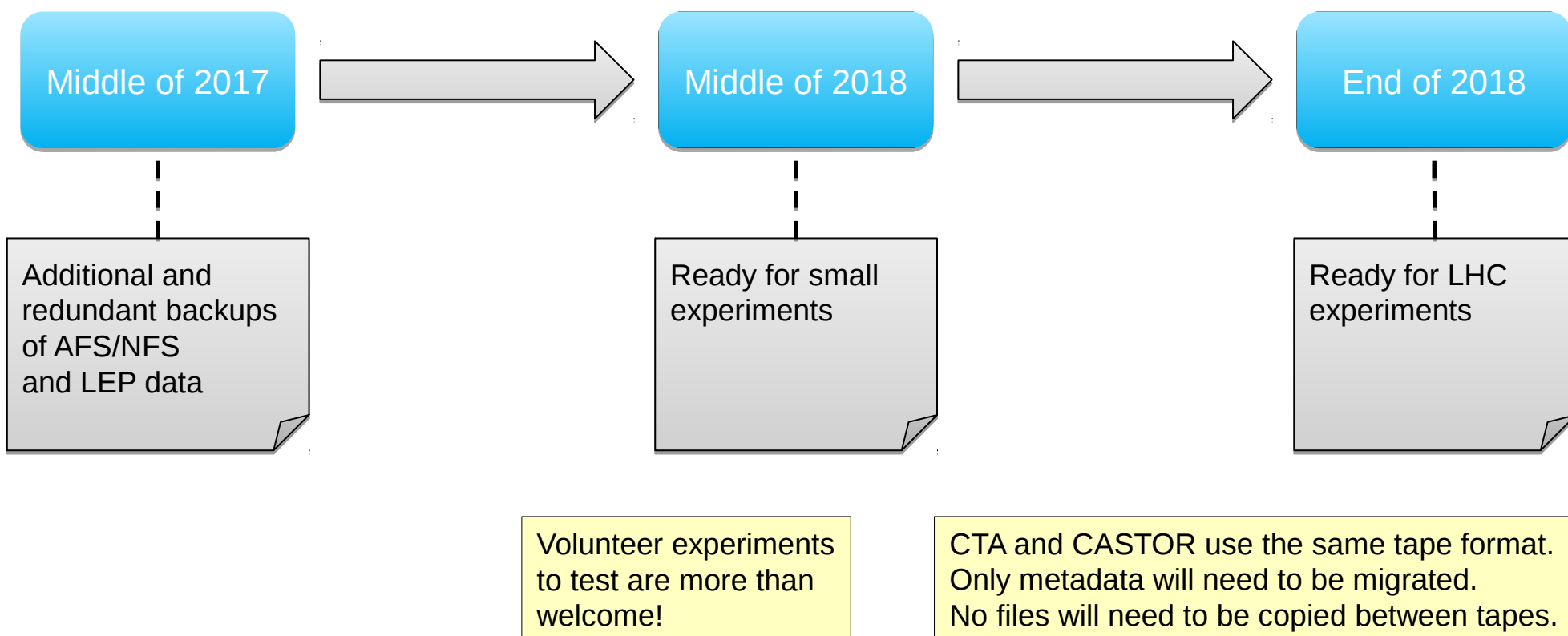
Future deployments with EOS plus CTA

EOS plus CTA is a "drop in" replacement for CASTOR

- **Users access file through EOS protocols (xrootd, GridFTP and http)**

- **CASTOR like file lifecycle implemented by EOS workflow engine**

  - **Immutable tape files**

  - **Implicit archive to tape (directories that are tagged for tape)**

  - **Explicit retrieves from tape (`stager_get` replaced by `xrdfs prepare`)**

  - **Implicit retrieves from tape (open for read blocks until file is retrieved)**

  - **D0T1 – Garbage collected disk cache on top of permanent tape files**

- **EOS has become the de facto disk storage for LHC physics data**

- **Natural evolution from CASTOR**

  - **Remove duplication between CASTOR disk storage and EOS**

  - **Thin layer on top of existing CASTOR tape server**

  - **Stronger and more decoupled separation between disk and tape**

Why CTA – 2 of 2

- **CTA preemptive scheduler**

  - **Use drives at full speed all of the time**

  - **Single step scheduling vs the partial step scheduling of CASTOR**

- **Same tape format as CASTOR – only need to migrate metadata**

- **Full flat catalogue of all tape files can be used for disaster recovery**

- **Less networked components than CASTOR (no CUPV, VDQM or VMGR)**

When is CTA

Middle of 2017 → **Middle of 2018** → **End of 2018**

Additional and redundant backups of AFS/NFS and LEP data

Ready for small experiments

Ready for LHC experiments

Volunteer experiments to test are more than welcome!

CTA and CASTOR use the same tape format.
Only metadata will need to be migrated.
No files will need to be copied between tapes.

CTA and the Tier 1s

- **CTA will be usable anywhere EOS is used**

- **CTA could go behind another disk storage system if:**

  - **The disk storage system manages the disk and tape lifecycle of each file**

  - **The disk storage system can transfer files using one of the protocols supported by the CTA tape server**

  - **The CTA tape server can easily be modified to support other transport protocols**

- **CTA currently uses Oracle for the tape file catalogue**

  - **CTA has a thin RDBMS layer that isolates Oracle specifics from the rest of CTA**

  - **The RDMS layer means CTA could be modified to run with a different database technology**