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Disk storage at CERN

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CERN IT DSS operates the main storage resources for data taking and physics analysis mainly via three system: AFS, CASTOR and EOS. The total usable space available for users is about 100 PB (with relative ratios 1:20:120). EOS deploys disk resources across the two CERN computer centres (Meyrin and Wigner) with a current ratio 60% to 40%. IT DSS is also providing sizable on-demand resources for general IT services most notably OpenStack and NFS clients. This is provided by our Ceph infrastructure and a few of proprietary servers (NetApp) for a total capacity of ˜1 PB.

We will describe our operational experience and recent changes to these systems with special emphasis to the following items:

- Present usages for LHC data taking (new roles of CASTOR and EOS)
- Convergence to commodity hardware (nodes with 200-TB each with optional SSD) shared across all services
- Detailed study of the failure modes in the different services and approaches (RAID, RAIN, ZFS vs XFS, etc...)
- Disaster recovery strategies (across the two CERN computer centres)
- Experience in coupling commodity and home-grown solution (e.g. Ceph disk pools for AFS, CASTOR and NFS)
- Future evolution of these systems in the WLCG realm and beyond

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