WP2 Fortnightly Meeting - CERN XCache

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Overview

- XCache
- CMS XCache - INFN Experience
- CERN Vanilla XCache - Disk Caching Proxy (DCP) Cluster
- Next Steps - To Do List

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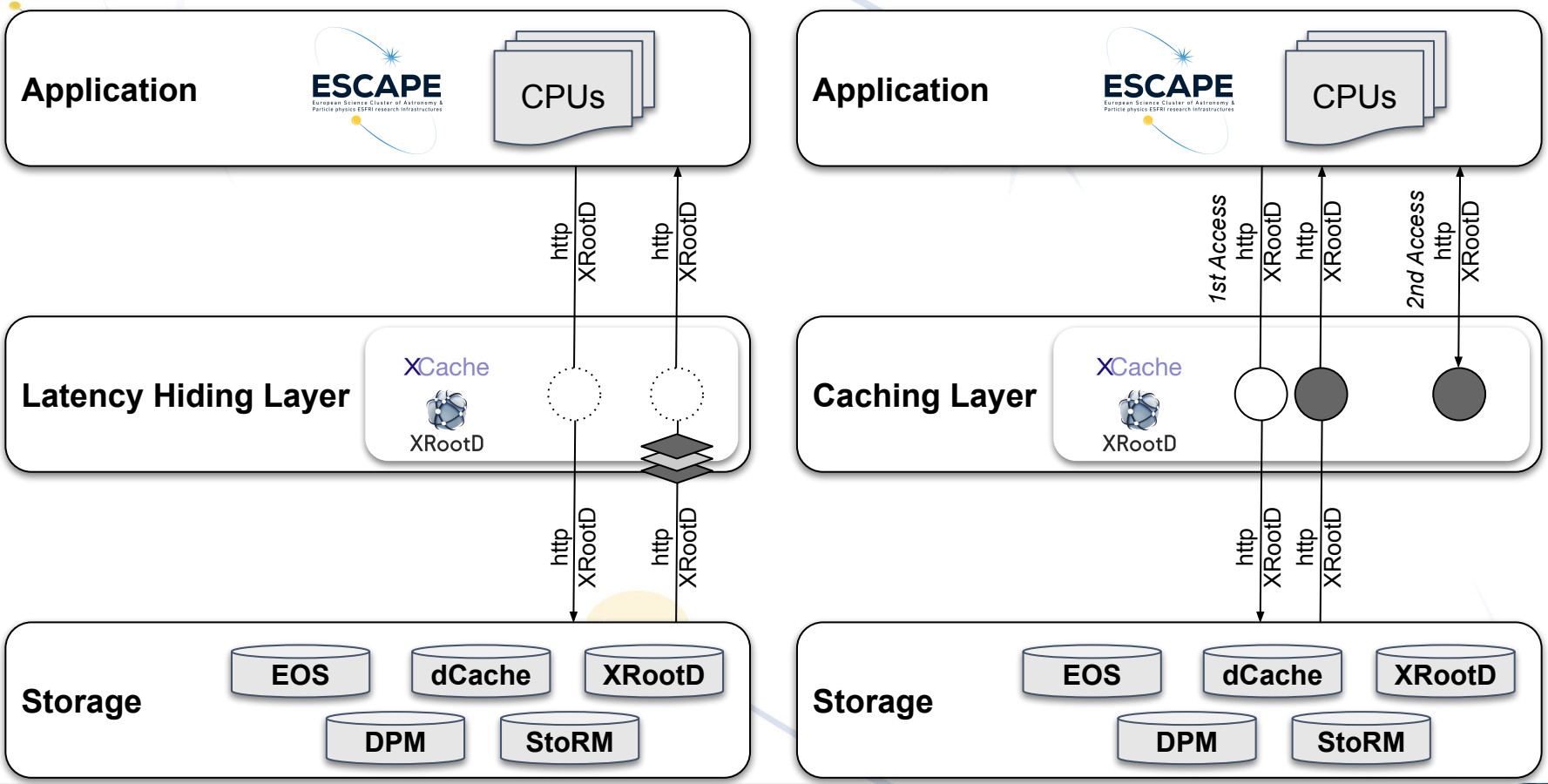
XCache



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CMS XCache - Caching On-Demand Effort

- The goal was to acquire knowledge on XCache by reproducing what INFN is currently deploying for CMS.
  - Simple setup at CERN (VM-based); smooth installation for a non-expert.
- The XCache origin point was set as xrootd-cms.infn.it, i.e. the CMS Italian global redirector.
  - xrdcp -f -v xroot://XCache.cern.ch[//xroot://ORIGIN.cern.ch]//path/file.root /dev/null
- Simple Vanilla implementation easily achieved (cf. with ATLAS/CMS “container” approach).
  - Moving towards a Disk Caching Proxy (DCP) cluster.
- The goal is to eventually deploy a caching layer flexible enough to serve both LHC-based experiments and ESCAPE partner experiments.

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CERN Vanilla XCache - DCP Cluster

- Simple VM-based cluster setup (ie. 2-8 GB RAM and 10-40 GB disk).
- First host established as primary server.
  - Once file cached, future calls always redirected to the same cache.
    - PRO: global national primary server - redundancy needed.
    - CONS: work always carried out by the primary server if files are not yet cached.
  - A test to check the behaviour for overloading should be performed.
- If the origin point of the primary server does not host the file, the client request is routed to other caches until the request is fulfilled.

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CERN Vanilla XCache - To Do List

- Implement monitoring.
- Integration with other storages within ESCAPE DataLake.
  - Investigate horizontal scaling with several stages, load balancing, etc.
- Investigate other protocols such as http.
- XCache stress test using HammerCloud (stability, reliability, etc.):
  - setup HC jobs from existing analysis functional tests;
  - create specific HC test to stress the storage.
- This is a different operational model wrt ATLAS and CMS.
  - investigate the integration with Rucio as a first step;
  - possibly federated solution with multiple caching layers.

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Backup

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ESCAPE Data Infrastructure for Open Science (DIOS)

- Data Lake Infrastructure and Federation Services - Xavier Espinal, CERN
- Data Lake Orchestration Service - Patrick Fuhrmann, DESY
- Integration with Compute Services - Yan Grange, ASTRON-NWO
- Networking - Rosie Bolton, SKAO
- Authentication and Authorization - Andrea Ceccanti, INFN

Simone Campana, CERN as WP leader and Rosie Bolton, SKAO as deputy

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ESCAPE Goals

- Implementing Science Analysis Platforms for EOSC researchers to stage data collections, analyse them, access ESFRIs' software tools, bring their own custom workflows.
- Contributing to the EOSC global resources federation through a Data-Lake concept implementation to manage extremely large data volumes at the multi-Exabyte level.
- Supporting "scientific software" as a major component of ESFRI data to be preserved and exposed in EOSC through dedicated catalogues.
- Implementing a community foundation approach for continuous software shared development and training new generation researchers.
- Extending the Virtual Observatory standards and methods according to FAIR principles to a larger scientific context; demonstrating EOSC capacity to include existing frameworks.
- Further involving SMEs and society in knowledge discovery.

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