



Storage QoS Workshop  
*CERN, 2020-02-07*

# Storage QoS in StoRM

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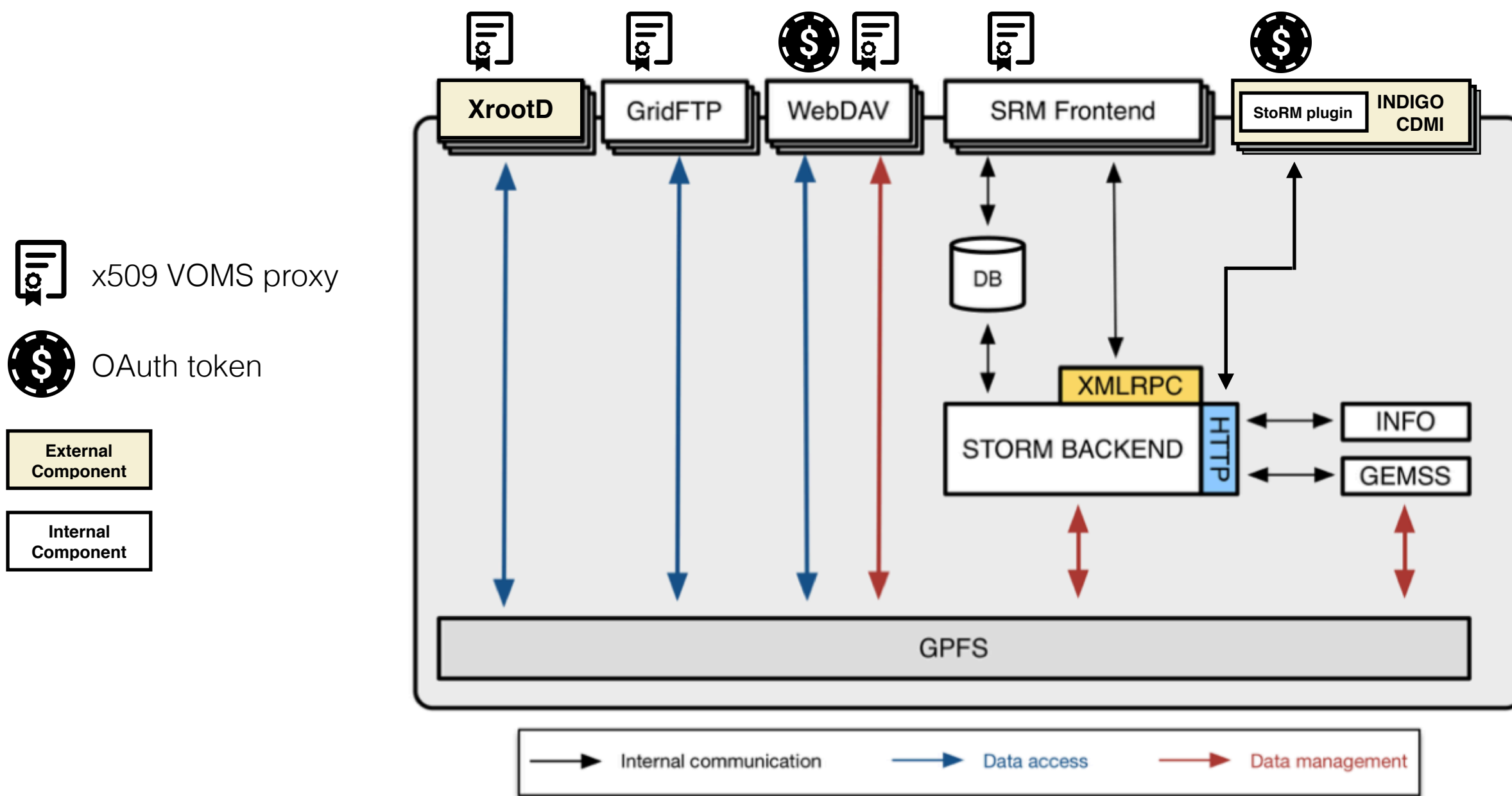


## What is StoRM?

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- StoRM is a storage resource manager for disk based storage systems
- Provides a "thin" management layer (SRM, WebDAV) over a POSIX FS
  - Typically IBM GPFS or Lustre
- Supports tape through integration with GEMSS, a tape library manager component also developed @ INFN-CNAF
- Provides flexible AuthN/Z support:
  - VOMS & OAuth tokens (WebDAV & CDMI)
  - File access control is enforced via POSIX ACLs

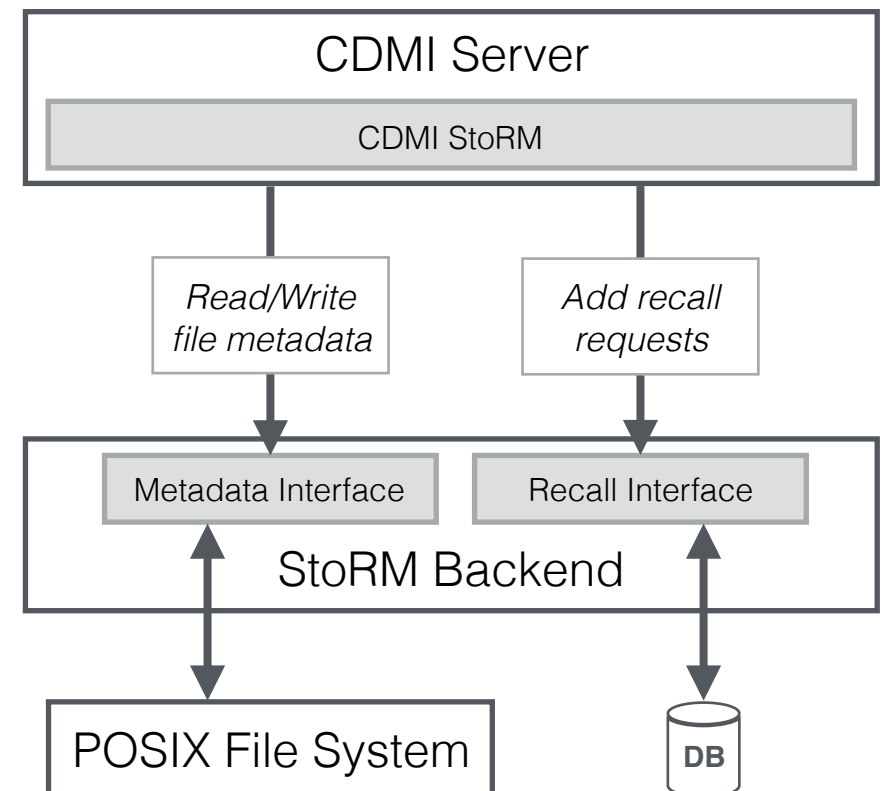
# StoRM - a typical deployment architecture





# StoRM - Quality of Service

- Alternative to SRM “bringOnline”, the support to manage QoS is done through a CDMI endpoint
  - CDMI StoRM is a plugin for the INDIGO DataCloud CDMI server which implements an extension of the CDMI protocol
  - Three class of QoS are supported:
    - DISKONLY, TAPEONLY, DISKANDTAPE
  - We supports changing the QoS of a single file/resource at a time
    - a clear limitation of CDMI protocol
    - CDMI has never been used in production
    - users need to change QoS of multiple files with one single request and monitor it





# CDMI StoRM + GEMSS (TSM) Data Life Cycle

transition triggered by user

automatic transition



CDMI StoRM  
QoS classes

**DiskOnly**

automatic transition

**DiskAndTape**

automatic transition

**TapeOnly**

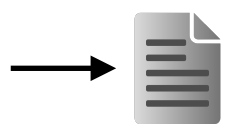
**TapeOnly**

triggered by user

PUT

**DiskAndTape**

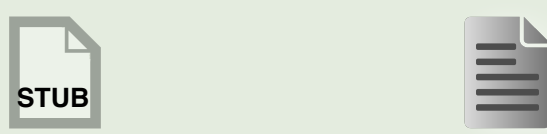
File is stored on disk



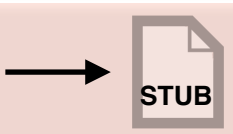
File is automatically migrated to tape



When a predefined occupancy size is reached on disk, file is automatically converted to a stub



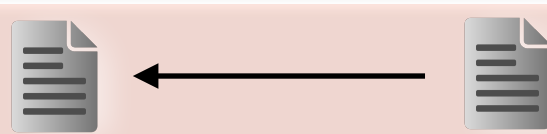
User requests the file



File is recalled from tape



File comes back online



time





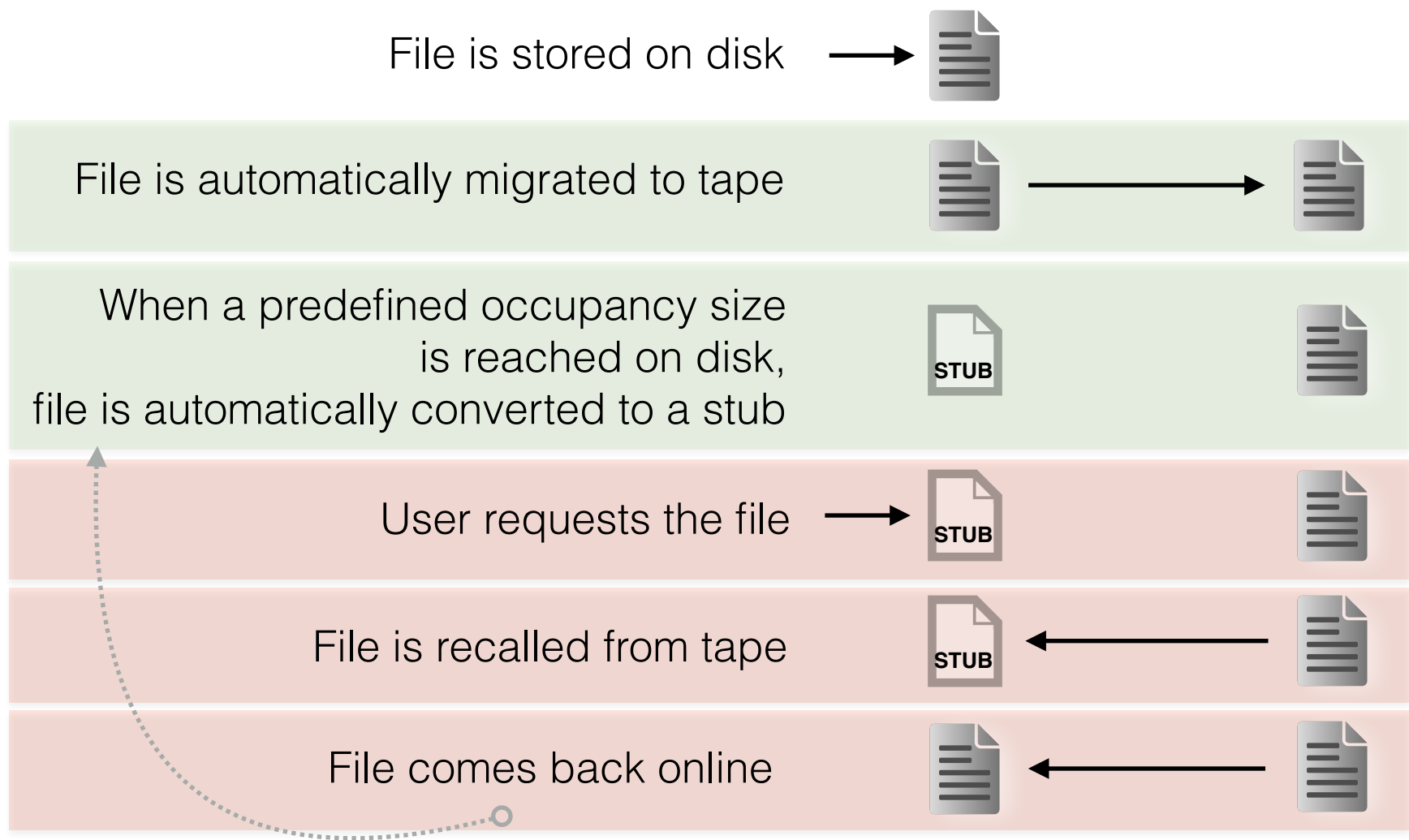
# Discrete Storage QoS Classes Model - Data Life Cycle

transition triggered by user

automatic transition

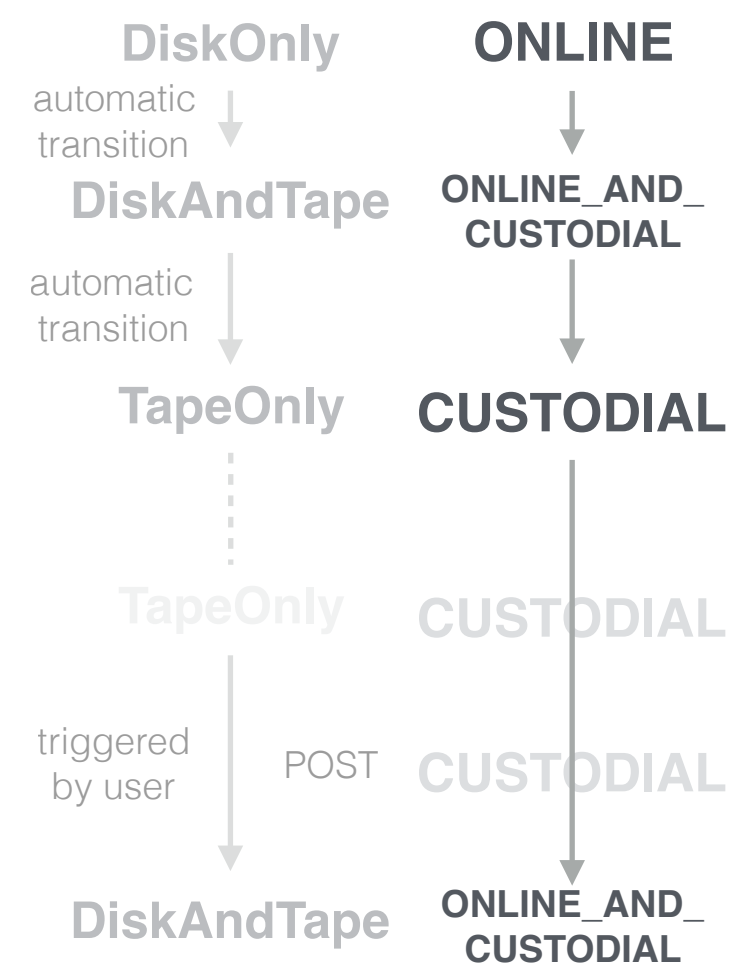


time



CDMI StoRM QoS classes

Storage QoS Classes<sup>2</sup>



<sup>2</sup> According to [DOMA white paper](#) "Quality of Service in WLCG"



## So, what are we interested in?

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- Understand what are the requirements for QoS management that StoRM needs to meet
- In practice:
  - Which interface should StoRM offer (besides SRM and CDMI) to provide support for managing QoS ?
  - Will there be a standardisation effort similar to the SRM one to define such interface/protocol in the coming months/years ?



Questions?





# Credits

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- StoRM @ GitHub: <https://github.com/italiangrid/storm>
- StoRM documentation: <http://italiangrid.github.io/storm/>
- CDMI StoRM: <https://github.com/italiangrid/cdmi-storm>
  
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