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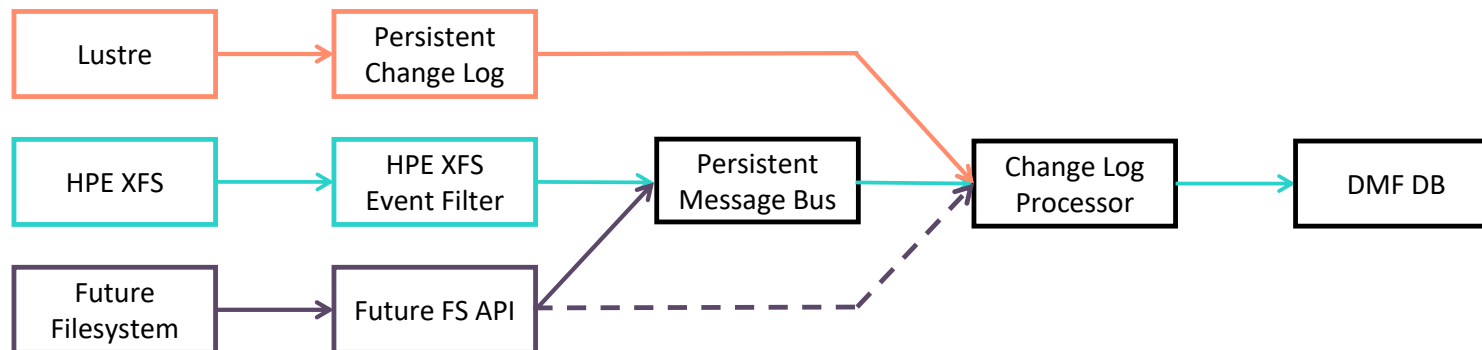# Data Management Framework | **DMF 7** Change Log

- For HPE XFS:

  - Use DMAPI events to drive filesystem change log and filesystem reflection

  - Removes the need to scan the filesystem to drive the policy engine

  - Removes the need to backup (e.g. xfsdump) the filesystem to preserve the namespace

- For Lustre:

  - Natively process Lustre persistent change log via API

  - Policy engine and filesystem reflection directly out of DMF7 scale out database without needing RobinHood

- Others filesystems support:

  - Makes the DMF front-end filesystem independent

  - Persistent message bus use depends on filesystem API

 - Unified DMF policy engine for all filesystem types

Data Management Framework | **Lustre ChangeLog Processing**

- ChangeLog feature records events that change the file system namespace or file metadata
  - See table on the right

- Changes such as file creation, deletion, renaming, attribute changes, etc. are recorded with the target and parent file identifiers (FIDs), the name of the target, and a timestamp

- DMF 7 specific "PathFinder" code for directories

- DMF 7 uses ChangeLog entries to exactly replicate changes in the file system reflection
  - No additional software (such as RobinHood) is necessary, all work is done natively by DMF 7 ChangeLog processor
  - Native processing of ChangeLog into distributed database enables scalability and Spark queries

Event Type	Description
MARK	Internal recordkeeping
CREAT	Regular file creation
MKDIR	Directory creation
HLINK	Hard link
SLINK	Soft link
MKNOD	Other file creation
UNLNK	Regular file removal
RMDIR	Directory removal
RNMFM	Rename, original
RNMTO	Rename, final
IOCTL	ioctl on file or directory
TRUNC	Regular file truncated
SATTR	Attribute change
XATTR	Extended attribute change
UNKNW	Unknown operation

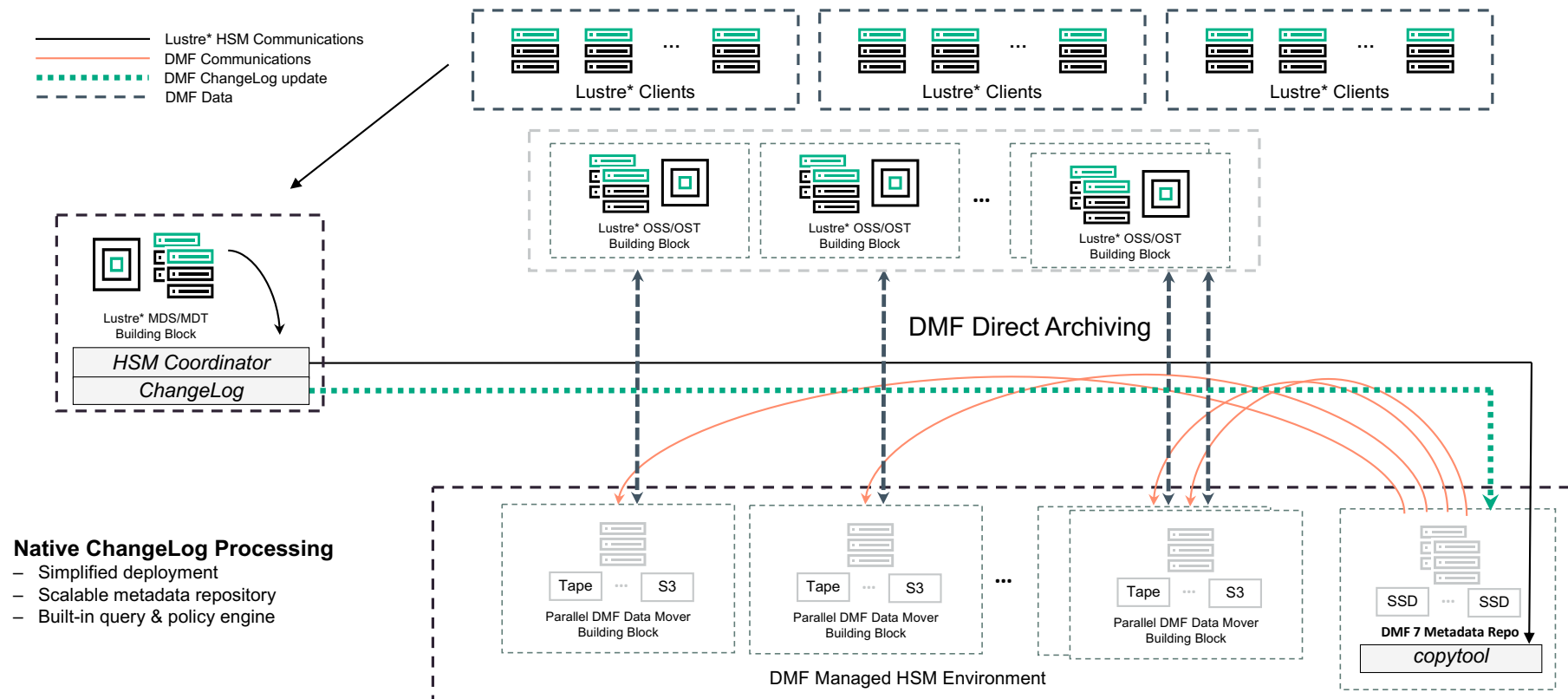# Data Management Framework | **DMF for Lustre** Comparison
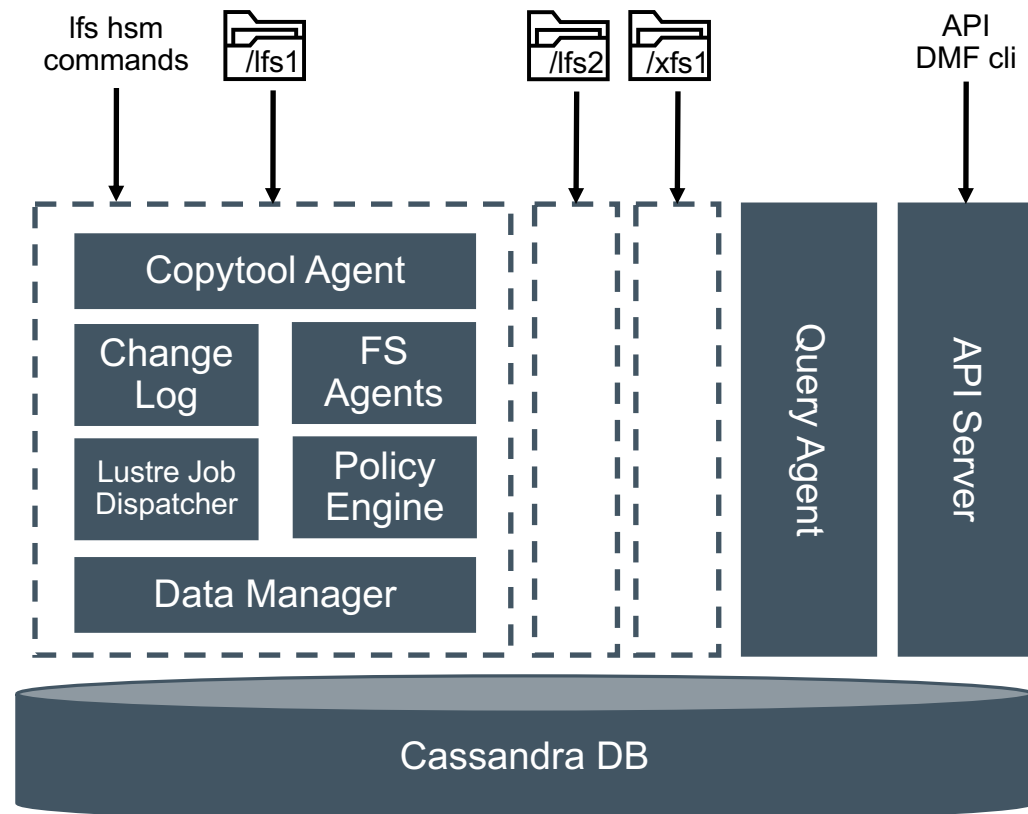

DMF6|Lustre
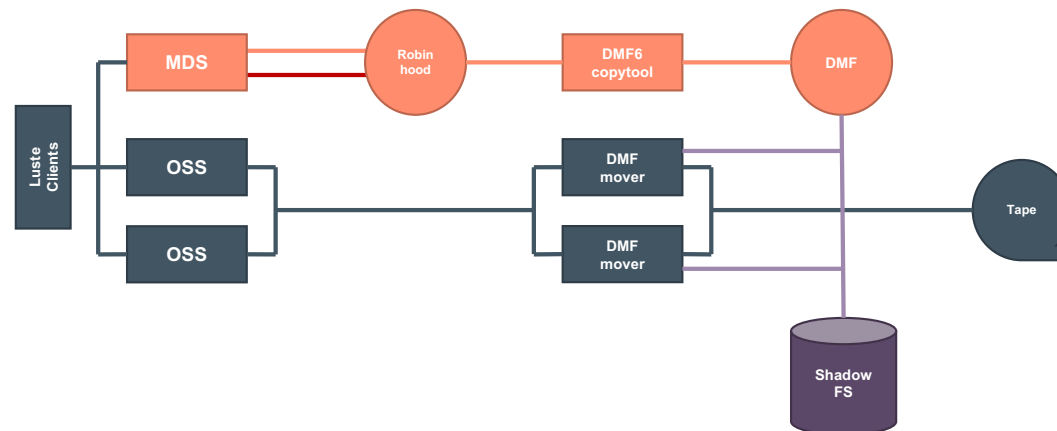
DMF7|Lustre
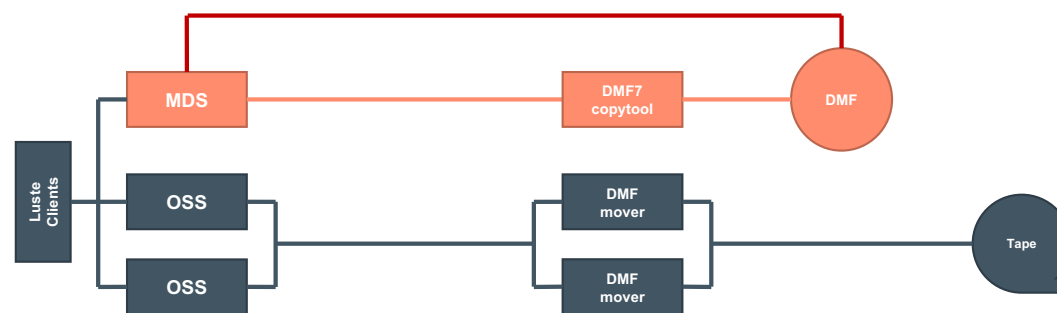
Legend:
— Data
— Lustre HSM API
— DMF Internal
— Changelog

Data Management | **DMF 7 & Lustre** Communication & Data Flow

Lustre* HSM Communications
DMF Communications
DMF ChangeLog update
DMF Data

Lustre* Clients

Lustre* Clients

Lustre* Clients

Lustre* OSS/OST Building Block

Lustre* OSS/OST Building Block

Lustre* OSS/OST Building Block

Lustre* MDS/MDT Building Block

HSM Coordinator

ChangeLog

DMF Direct Archiving

Native ChangeLog Processing
– Simplified deployment
– Scalable metadata repository
– Built-in query & policy engine

| Tape | S3 |

Parallel DMF Data Mover Building Block

| Tape | S3 |

Parallel DMF Data Mover Building Block

| Tape | S3 |

Parallel DMF Data Mover Building Block

| SSD | SSD |

DMF 7 Metadata Repo

copytool

DMF Managed HSM Environment

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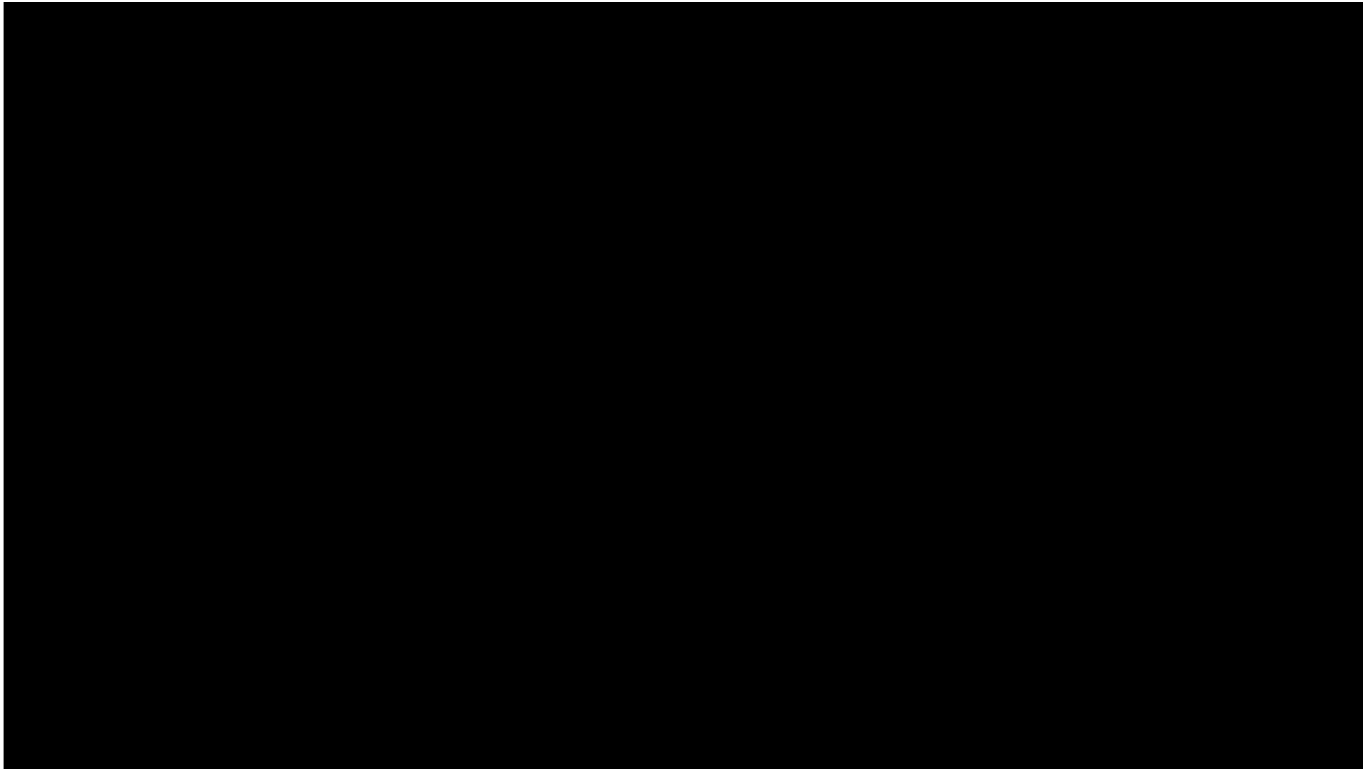# Data Management Framework | **DMF 7** Unified Scalable Front End

- DMF7 has a unified scalable front end for both HPE XFS and Lustre

- Same Query and Policy engine for the all filesystem types

- Same DMF CLI for all filesystem types

- Lustre lfs hsm commands are supported along with the native DMF CLI

lfs hsm commands → /lfs1

/lfs2 /xfs1

API DMF cli

Copytool Agent

| Change Log | FS Agents |
| Lustre Job Dispatcher | Policy Engine |

Data Manager

Query Agent

API Server

Cassandra DB

Hewlett Packard Enterprise

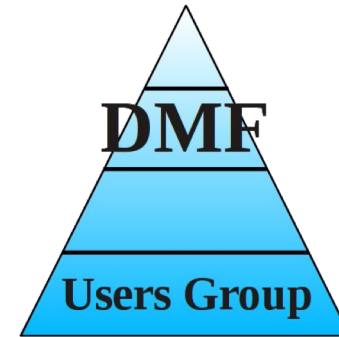# Data Management Framework | **DMF 7** Lustre Compatibility

- Targeting Lustre 2.10 and later

- Internal QA and Compatibility Testing for:

  - HPE provided Lustre for Apollo 4510 and follow-on

  - DDN EXAScaler

  - Cray / Seagate ClusterStor

Data Management Framework | **DMF 7** Lustre Demo

Thank You