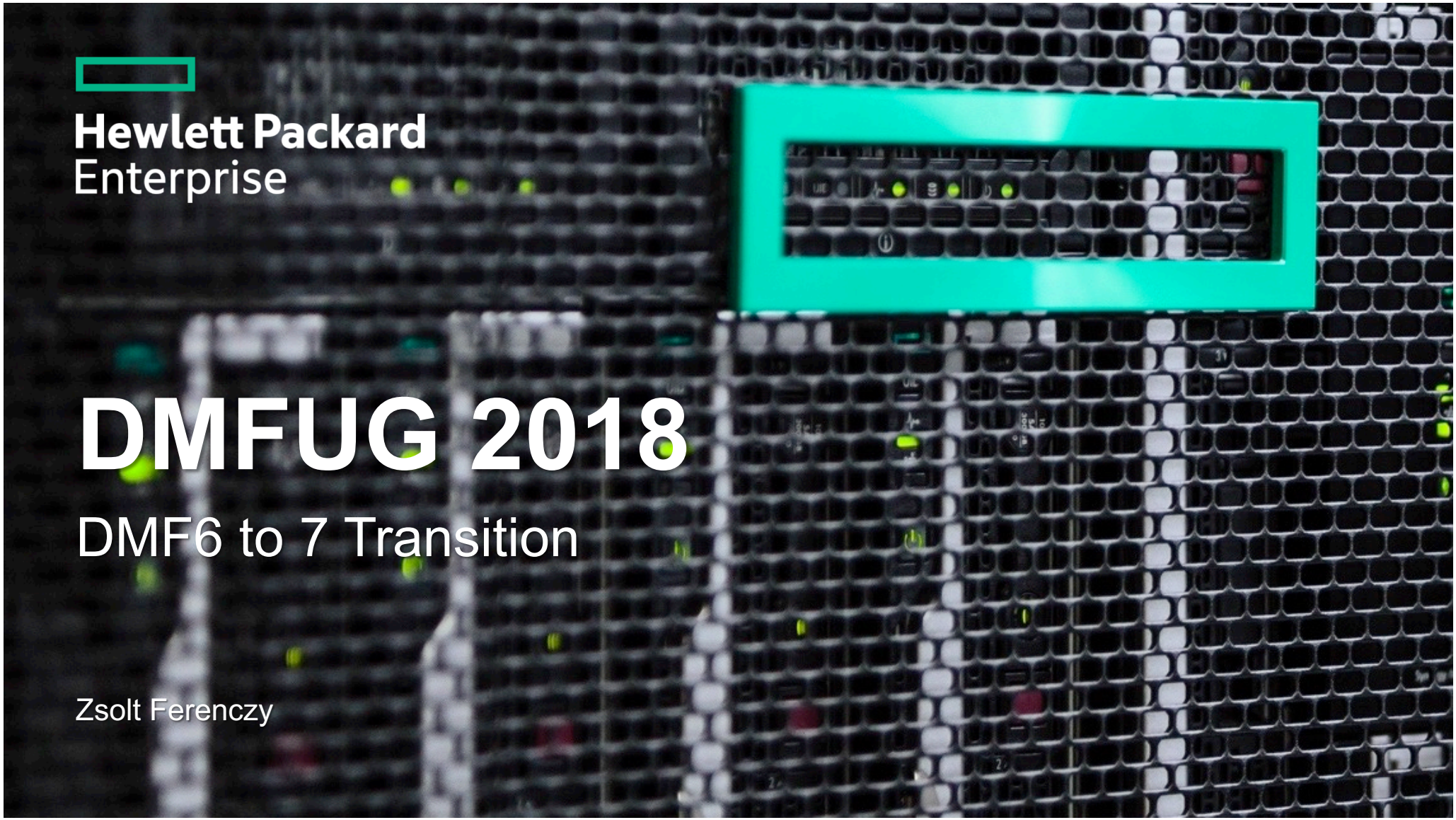
Hewlett Packard
Enterprise
DMFUG 2018
DMF6 to 7 Transition
Zsolt Ferenczy

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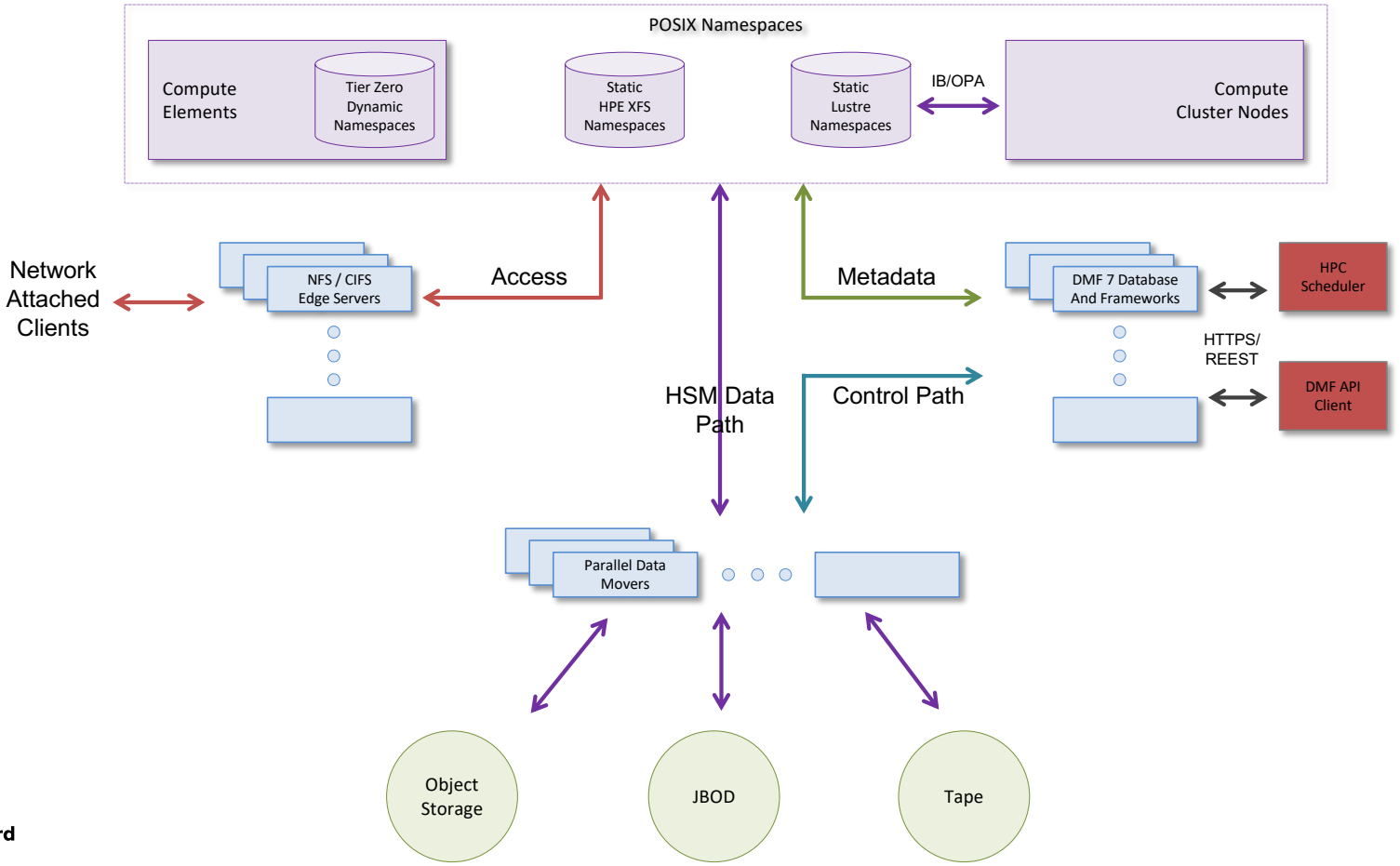
DMF6 to DMF7 | **New Architecture** DMF7 Reference Diagram



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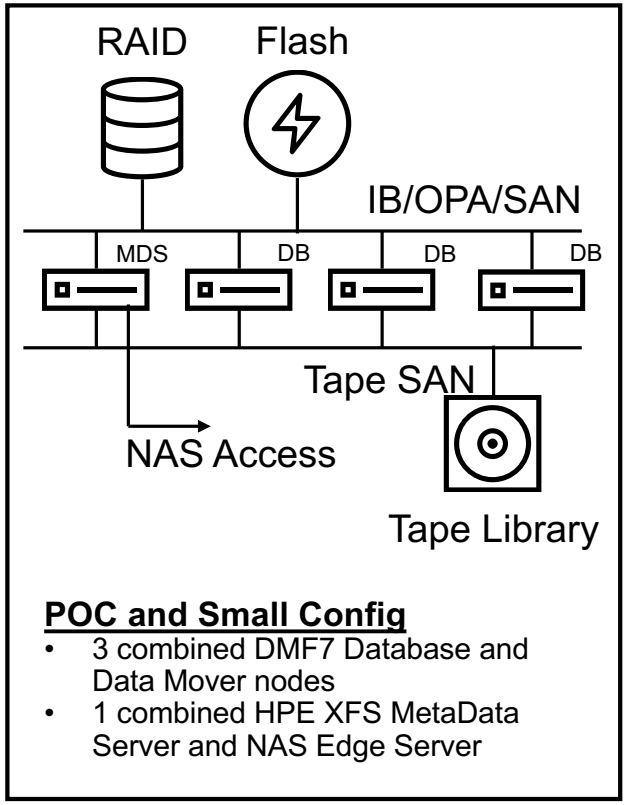
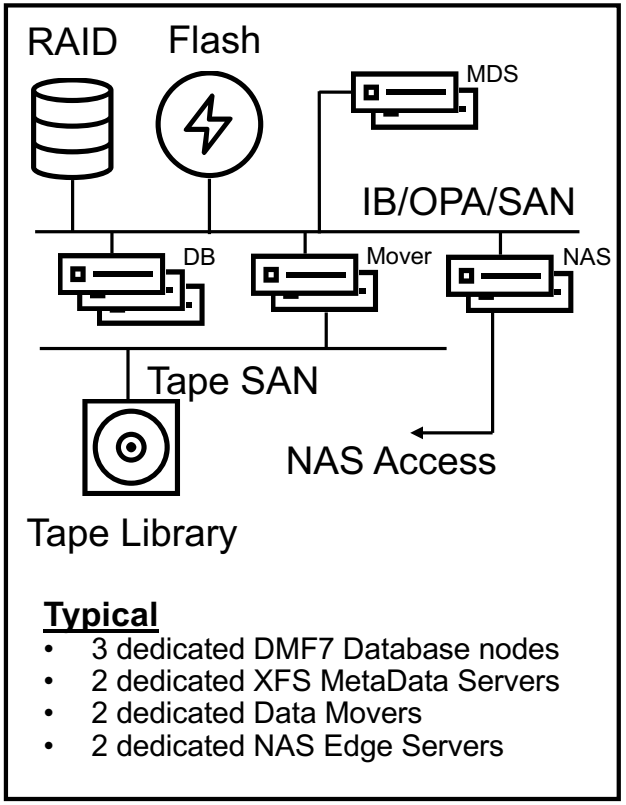
DMF6 to DMF7 | **New Architecture** DMF7 HPE XFS Reference



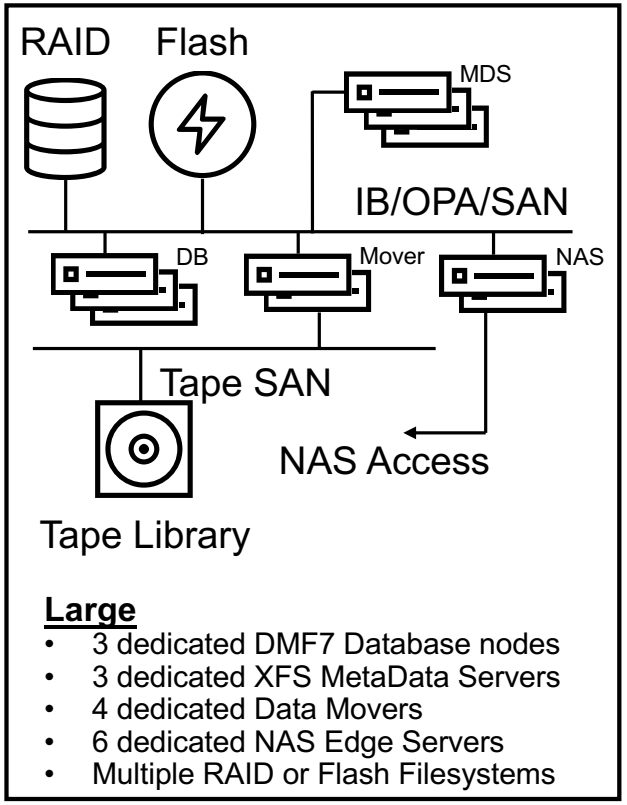
POC and Small Config

- 3 combined DMF7 Database and Data Mover nodes
- 1 combined HPE XFS MetaData Server and NAS Edge Server



Typical

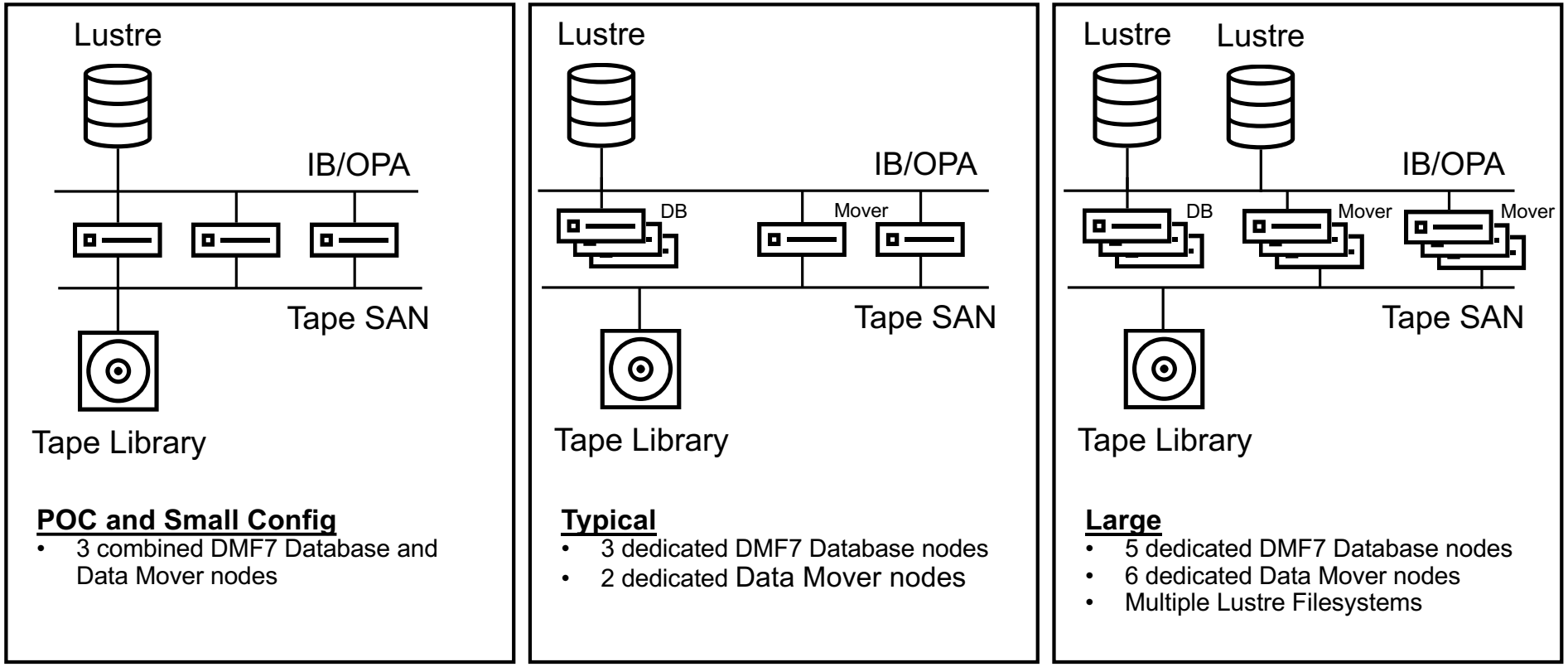
- 3 dedicated DMF7 Database nodes
- 2 dedicated XFS MetaData Servers
- 2 dedicated Data Movers
- 2 dedicated NAS Edge Servers



Large

- 3 dedicated DMF7 Database nodes
- 3 dedicated XFS MetaData Servers
- 4 dedicated Data Movers
- 6 dedicated NAS Edge Servers
- Multiple RAID or Flash Filesystems

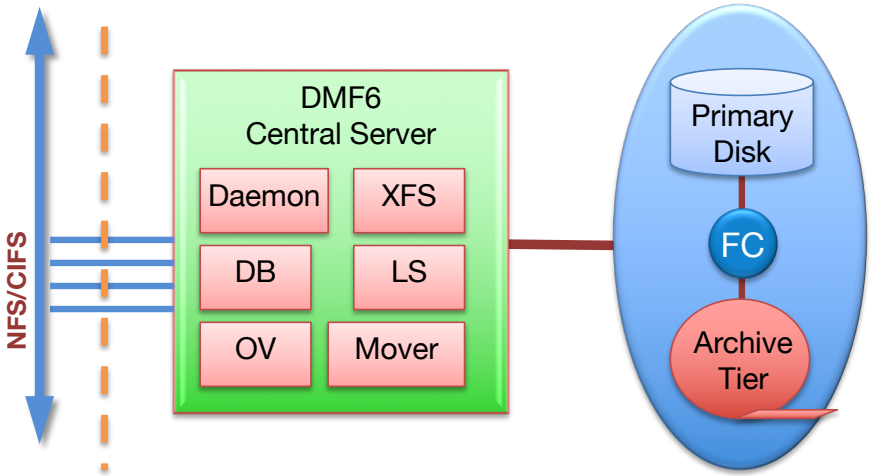
DMF6 to DMF7 | **New Architecture** DMF7 Lustre Reference



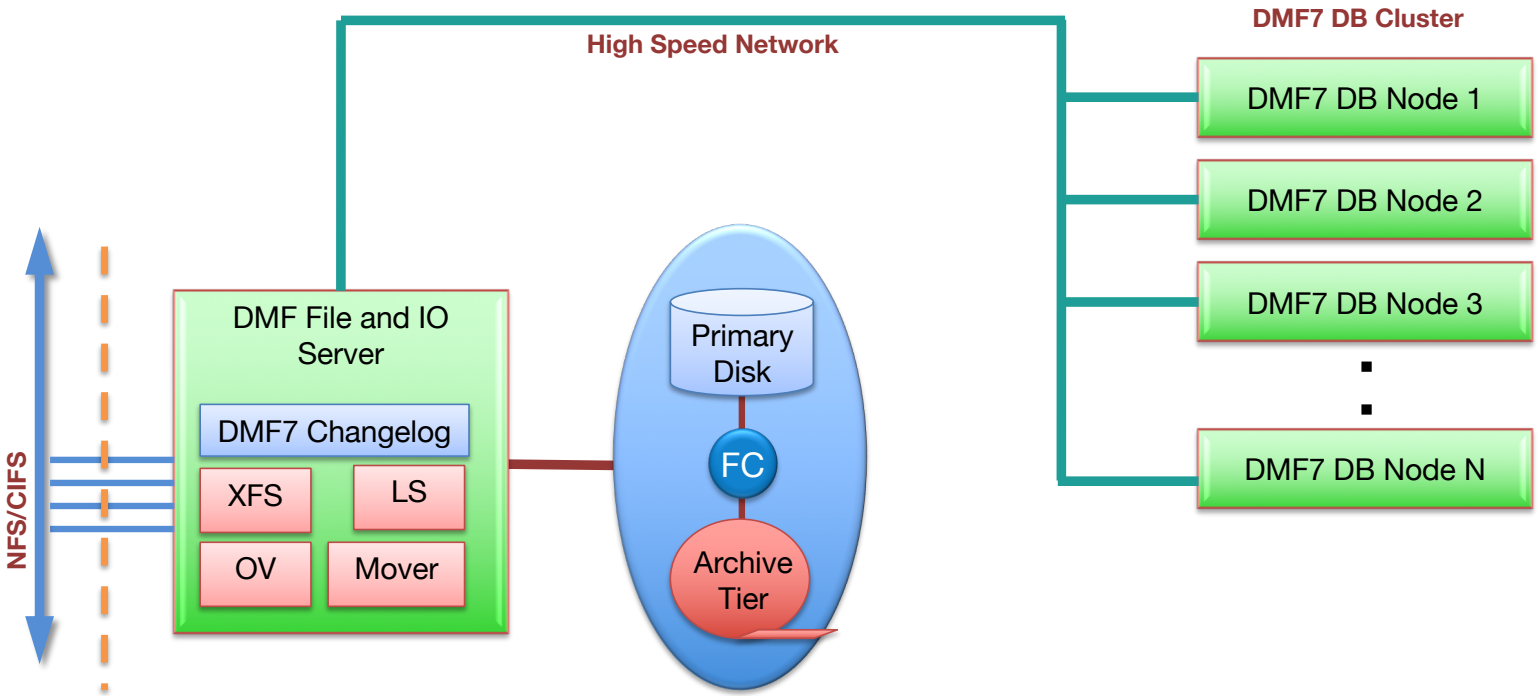
DMF6 to DMF7 | **Cluster** DMF7 Database and Frameworks

- DMF7 scales out and distributes and front end
- A minimum of 3 nodes are needed for the DMF7 DB cluster
- The size of the cluster is scaled out as the managed object count and filesystem transaction rates increase
- This cluster is added to an existing Basic or Parallel DMF system
  - Existing DMF Server, CXFS MDS, PDMO nodes, and Edge Servers continue to be used
- A high speed network interconnects the filesystem servers with the DB cluster
  - The DB cluster does not need access to the managed filesystems for XFS
  - Target to use Infiniband network for this interconnect

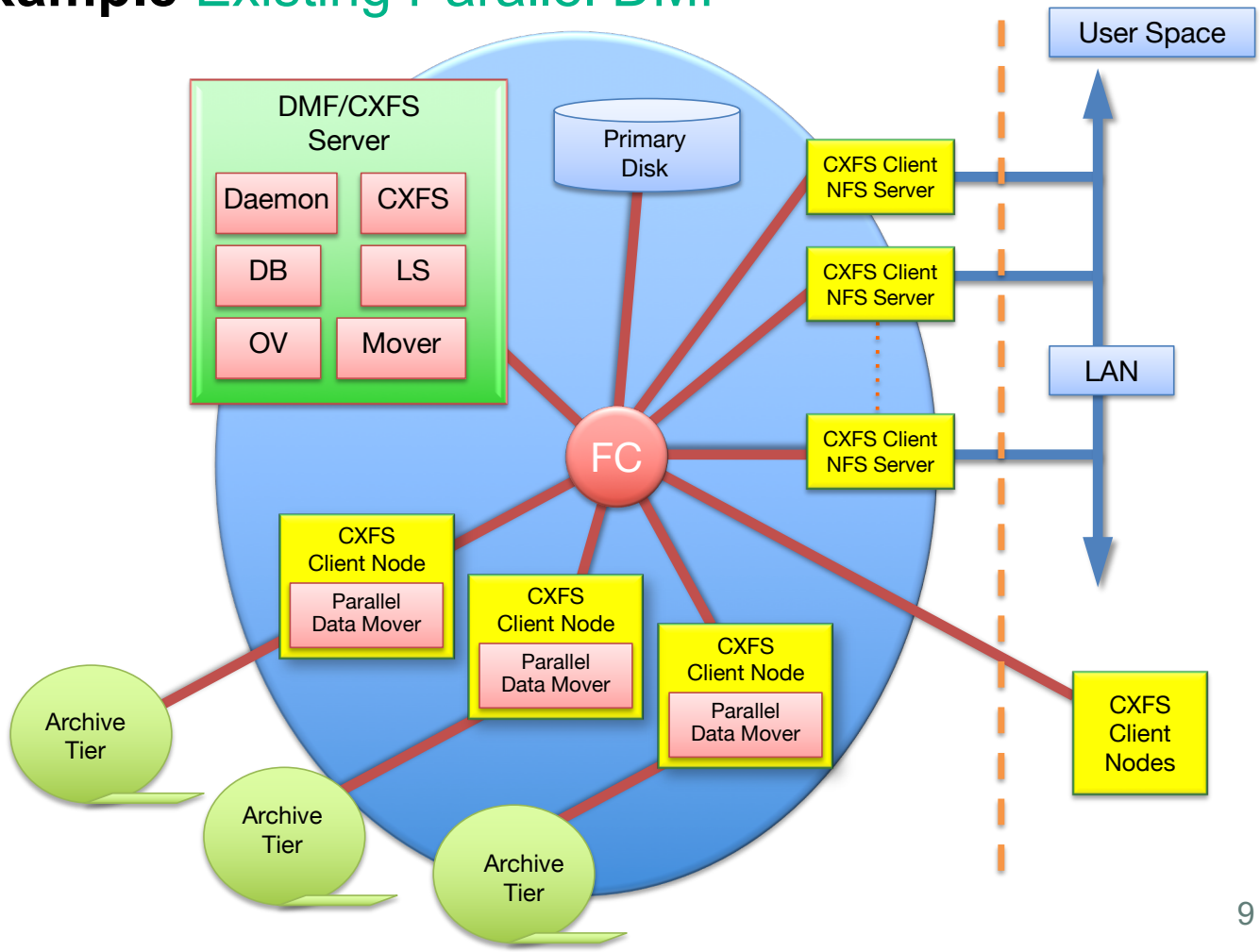
DMF6 to DMF7 | **Example** Existing Basic DMF



DMF6 to DMF7 | **Example** Existing Basic DMF



DMF6 to DMF7 | **Example** Existing Parallel DMF



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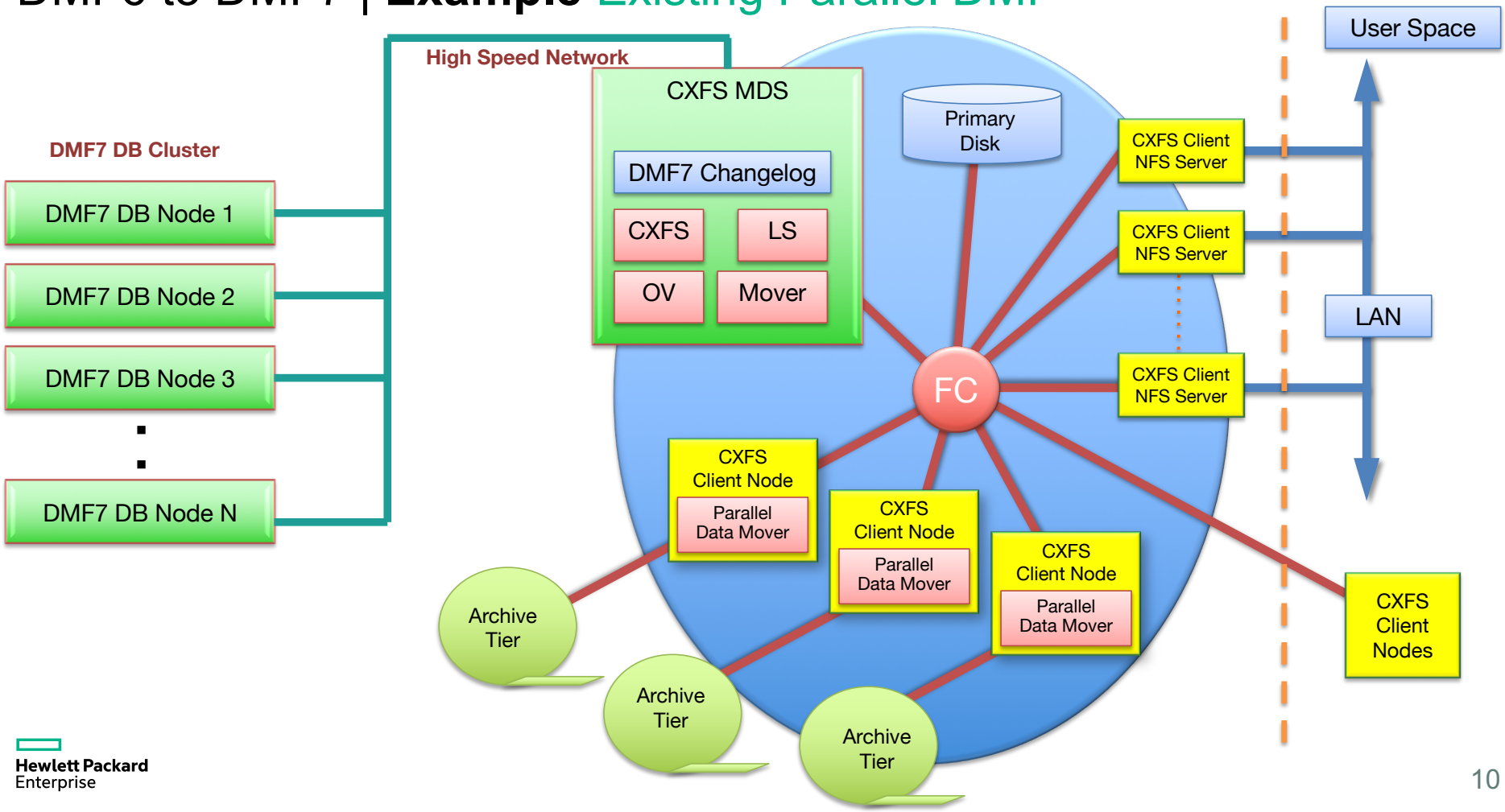
DMF6 to DMF7 | **Example** Existing Parallel DMF



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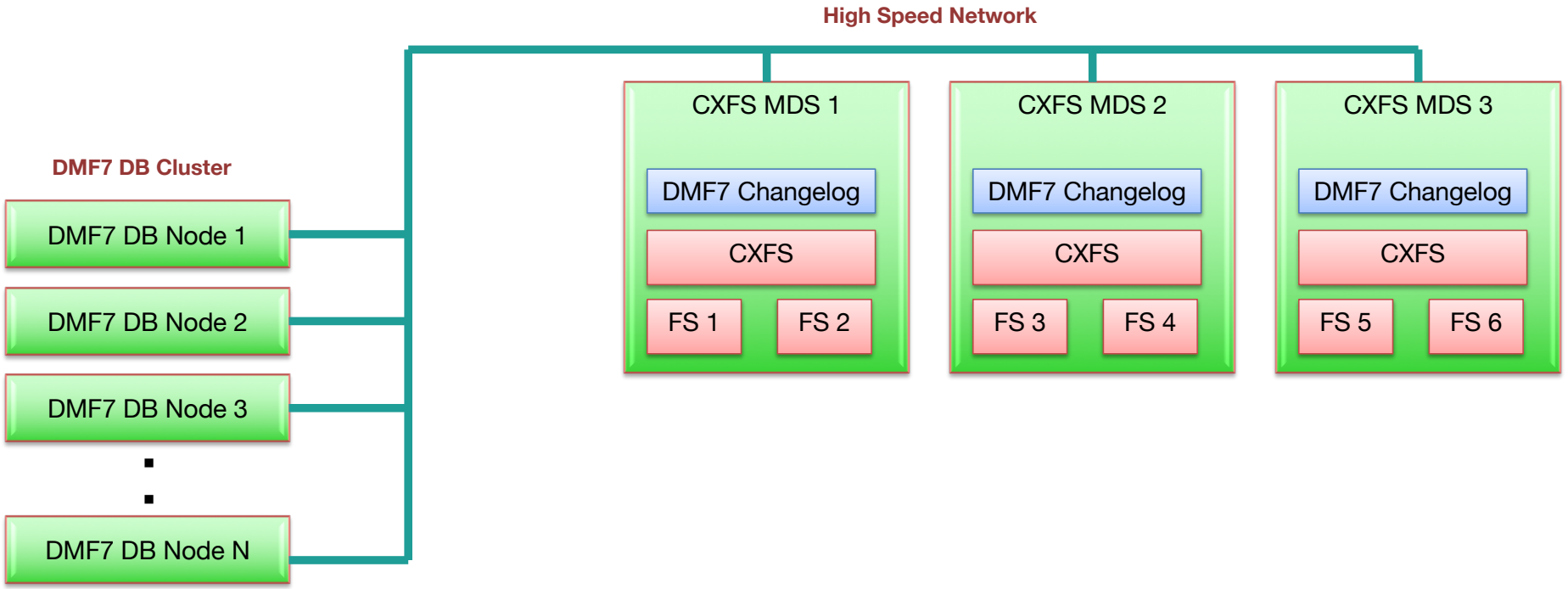
DMF6 to DMF7 | **Example** DMF7 Parallel Front End



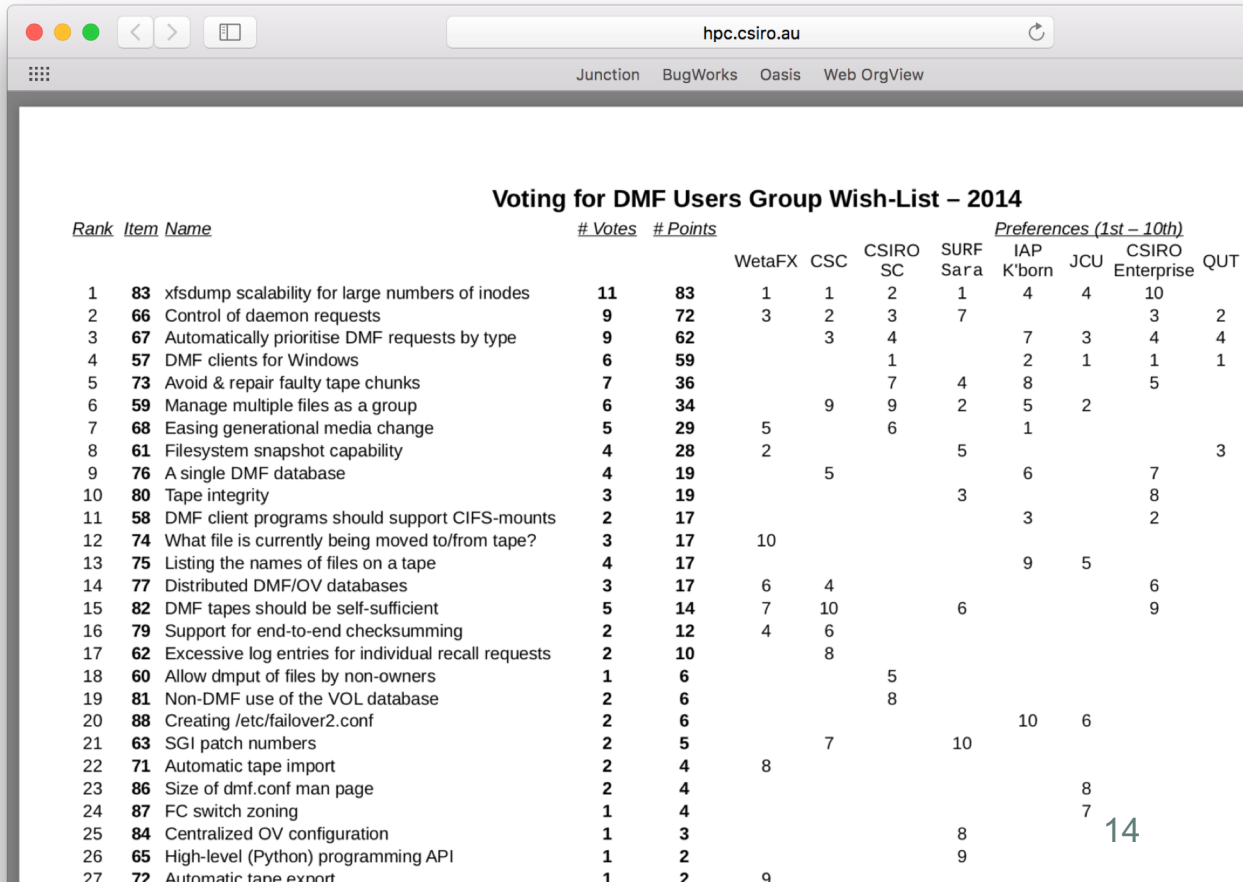
DMF6 to DMF7 | **Prerequisites** for Converting to DMF 7

- Running DMF 6.8 or 6.9
- No database errors in dmaudit or verifymsp
- External backup of the database and file systems
- Using only the OpenVault mounting service
- All migrated data stored only in a Library Server or CloudMSP
  - Tape or JBFS (ZWS)
  - S3
- DMF not controlled by an external application via the dmusrcmd API
  - Arcitecta MediaFlux, Drastic MediaReactor, etc

DMF6 to DMF7 | **DMFUG** Wishlist

DMF7 Natively Allows

- #1: xfsdump scalability
- #6: Manage files as a group
- #8: Filesystem Snapshot
- #9: A single DMF Database
- #12: What file is being moved
- #13: List names of files on tape
- #14: Distributed DMF Database
- #26: High level API
- #29: Read only access to the DB
- #31: Installation Wizard



Voting for DMF Users Group Wish-List – 2014

Rank	Item	Name	# Votes	# Points	Preferences (1st – 10th)							
					WetaFX	CSC	CSIRO SC	SURF Sara	IAP K'born	JCU	CSIRO Enterprise	QUT
1	**83**	xfsdump scalability for large numbers of inodes	**11**	**83**	1	1	2	1	4	4	10	
2	**66**	Control of daemon requests	**9**	**72**	3	2	3	7			3	2
3	**67**	Automatically prioritise DMF requests by type	**9**	**62**		3	4		7	3	4	4
4	**57**	DMF clients for Windows	**6**	**59**			1		2	1	1	1
5	**73**	Avoid & repair faulty tape chunks	**7**	**36**			7	4	8		5	
6	**59**	Manage multiple files as a group	**6**	**34**		9	9	2	5	2		
7	**68**	Easing generational media change	**5**	**29**	5		6		1			
8	**61**	Filesystem snapshot capability	**4**	**28**	2			5				3
9	**76**	A single DMF database	**4**	**19**		5			6		7	
10	**80**	Tape integrity	**3**	**19**				3			8	
11	**58**	DMF client programs should support CIFS-mounts	**2**	**17**					3		2	
12	**74**	What file is currently being moved to/from tape?	**3**	**17**	10							
13	**75**	Listing the names of files on a tape	**4**	**17**					9	5		
14	**77**	Distributed DMF/OV databases	**3**	**17**	6	4					6	
15	**82**	DMF tapes should be self-sufficient	**5**	**14**	7	10		6			9	
16	**79**	Support for end-to-end checksumming	**2**	**12**	4	6						
17	**62**	Excessive log entries for individual recall requests	**2**	**10**		8						
18	**60**	Allow dmput of files by non-owners	**1**	**6**			5					
19	**81**	Non-DMF use of the VOL database	**2**	**6**			8					
20	**88**	Creating /etc/failover2.conf	**2**	**6**					10	6		
21	**63**	SGI patch numbers	**2**	**5**		7		10				
22	**71**	Automatic tape import	**2**	**4**	8							
23	**86**	Size of dmf.conf man page	**2**	**4**						8		
24	**87**	FC switch zoning	**1**	**4**						7		
25	**84**	Centralized OV configuration	**1**	**3**				8				
26	**65**	High-level (Python) programming API	**1**	**2**				9				
27	**72**	Automatic tape export	**1**	**2**	9							

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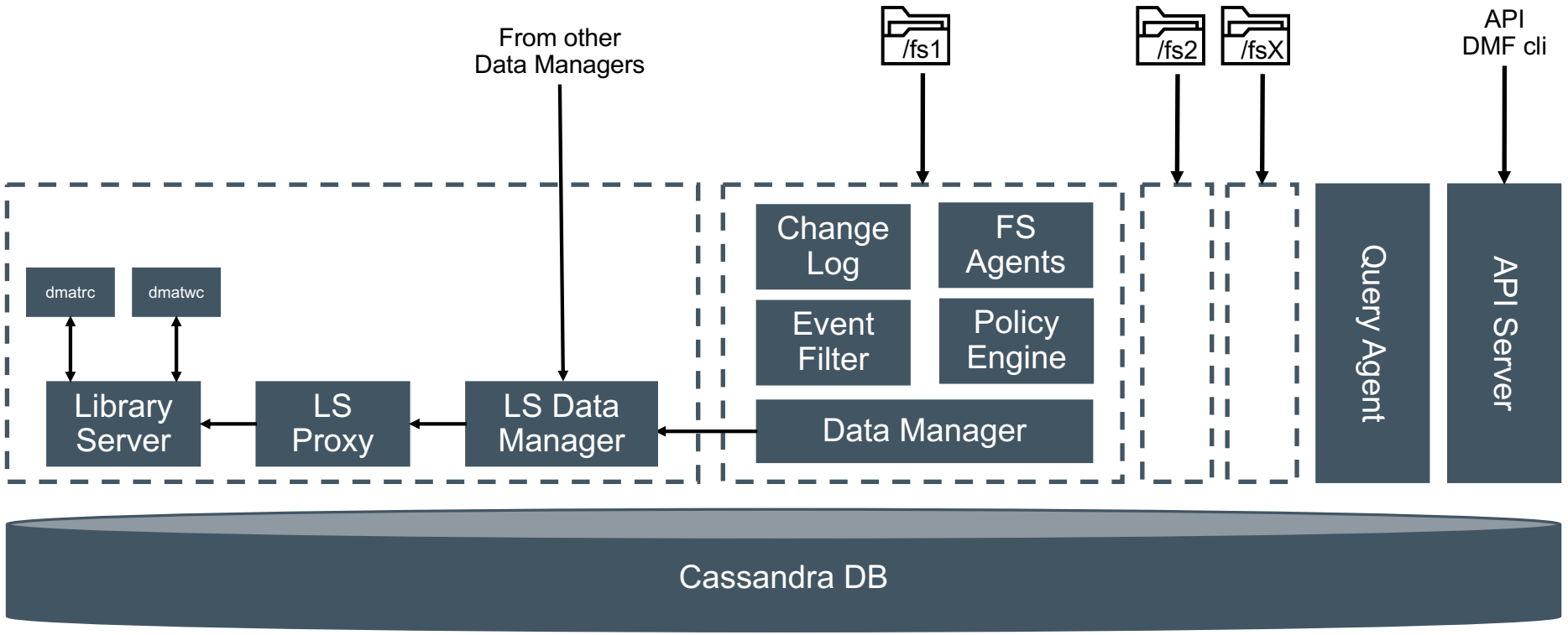
DMF6 to DMF7 | **Library Server** Integration



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Data Management Framework | **DMF 7** Libray Server Integration

- In essence, DMF7 replaces the DMF6 Daemon and integrates directly with Library Server
- Key points:
  - Daemon / LS is the most logical line of separation:
  - DMF-7 implements a new core HSM, metadata DB, new mover control
  - Entire LS, however, can be used AS IS, representing tape/ZWS backend
  - Daemon-to-MSP API dictates programmatic integration requirements
  - We will bring LS DB schema into DMF7 in its current form (CAT and VOL tables)

Data Management Framework | **DMF 7** DMF6 - What Stays

- Components with no Daemon dependencies (will keep):
  - `dmvoladm` - admin services to VOl records (in C*)
  - `dmcatadm` - admin services to CAT records (in C*)
  - `dmtapestat` - displays DMF drive statistics
  - `run_tape_merge.sh` - tape merging (uses dmconfig, dmvoladm)
  - `dmov_loadtapes` - finds and loads unused cartridges into DMF Vol Grp
  - `dmov_makecarts` - make cartridges in openvault for tapes already in the LS databases
  - `dmconfig` - writes DMF Conf to stdout
  - `dmatsnf` - verifies LS Volume Integrity
  - `dmatread` - copies files from a Volume Group to Disk (possible to replace with stage command)

Data Management Framework | **DMF 7** DMF6 – What Changes

- Plans for other components:
  - `dmemptytape` - moves files from a tape volume, making it empty – port to DMF-7
  - `dmmigrate` - migrates files in the specified file systems – replaced by Policy API
  - `dmunput` - remove files from DMF management (recalls if necessary) - implemented
  - `dmmove` - moves file copies to new media – replaced by Data Migrator
  - `dmstat` - display status of DMF (from Arena) – replaced by new status command
  - `dmatvfy` - verifies the LS database contents against Daemon DB – replaced by audit
  - `dmdu` - summarizes managed disk usage – replaced by report command
  - `dmfind` - searches for files in directory hierarchy – replaced by Query API
  - `dmqview` - displays DMF Queue information – new Qview to be implemented on top of Redis

Data Management Framework | **DMF 7** Migrating from DMF 6

- We will work with every customer on customizing this process
- Assumptions for the ideal scenario:
  - DMF7 is installed on new hardware
  - DMF6 filesystems are fully migrated
- Steps:
  - Install DMF7
  - Import CAT/VOL tables (preserve schema)
  - Scan DMF6 managed filesystems to extract metadata
  - Load metadata extract into DMF7 Object tables
  - Create/register new DMF7 filesystems
  - Stage files as needed

DMF6 to DMF7 | **Conversion** Configuration and Policy

- DMF7 stores configuration in the registry
- The Library Server specific parameters move into the DMF7 configuration registry
- The DMF7 policy engine is a superset of DMF6 capabilities
  - Syntax is different from DMF6
  - Existing policies will be converted to DMF7 syntax
- OpenVault configuration remains unchanged

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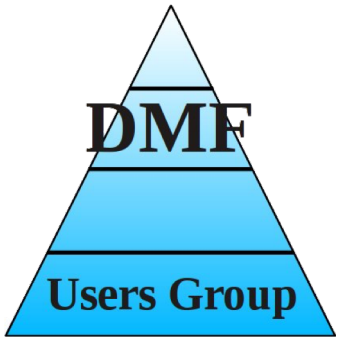

Thank You