# Data Sheet
FUJITSU Software FEFS V10L30

Enabling high data access throughput with your FUJITSU Storage ETERNUS system.
Ready to use with FUJITSU Software HPC Cluster Suite, helping to deliver innovation for your business.

FUJITSU Software FEFS is a parallel distributed file system that enables high-speed parallel processing of very large amounts of read/write I/O from the compute nodes. Very large-scale file systems with up to 8 Exabyte (8000PB) capacity and 1TB/s are supported. FEFS boasts features such as built-in high availability of all components, fair share I/O management and directory level quotas.
Along with the recent CPU architecture extension, HPC cluster systems provide high computing power with a lot of cores and nodes. To achieve a high application performance, I/O capacity and performance requirement are more and more increasing. To meet these requirements, FEFS provides scalable file system capacity and performance. It has been developed based on open source software "Lustre" and extended / supported by Fujitsu.
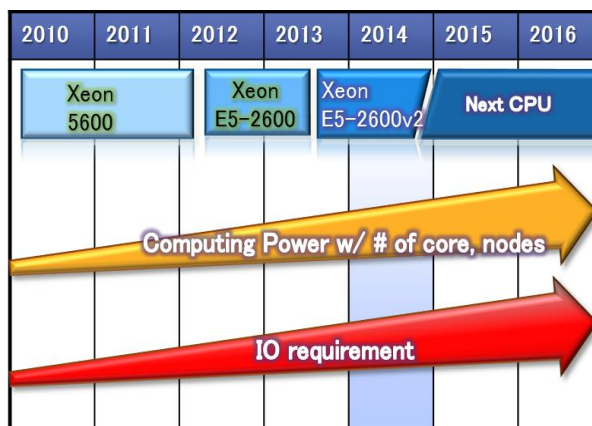
FEFS architecture
FUJITSU Software FEFS provides file sharing among an HPC cluster system with FEFS server and FEFS client. FEFS client works on computing nodes and login nodes connected with high speed interconnect "InfiniBand" and provides transparent file access to FEFS server. FEFS server comprises meta data servers (MDS) and object storage servers (OSS) for high performance data management. With redundant configuration of MDS and OSS, FEFS provides stable system operation by failover. FEFS file system capacity and performance can easily be dynamically extended (scale up) by adding data storage (Object Storage Target=OST) and/or adding OSSs (scale out).
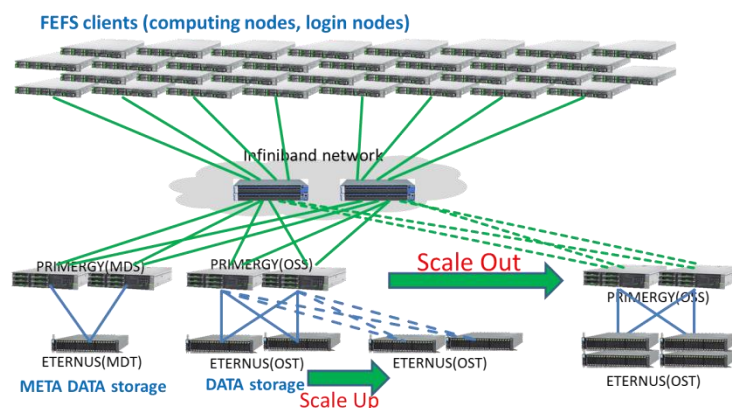
High performance
The FEFS/Luster has an optimized architecture for file sharing such as direct storage access rather than traditional network file system (NFS). Also the FEFS supports InfiniBand multi-rail to achieve a high network file access.

Flexible, stable cluster system operation
File system capacity management and network bandwidth management are also important for flexible and stable cluster system operation. The FEFS extended quota, access control and QoS (Quality of Service) features allows the systems to be shared with many users.
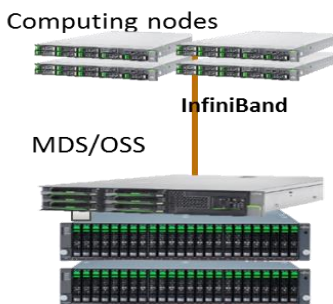
Topics

Typical configurations

Small model
- \# of files: 50M files
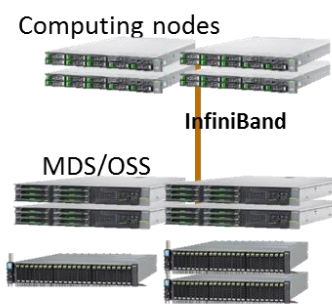- Capacity: -20TB
- Performance: 2GB/s

PRIMERGY RX300 S8 x 1
ETERNUS JX40 x 2

Medium model
- \# of files: 1G files
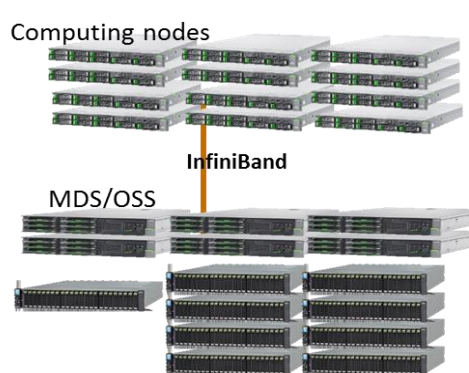- Capacity: -200TB
- Performance: 2GB/s

PRIMERGY RX300 S8 x 2(MDS) + 2(OSS)
ETERNUS DX100 S3 x 1(MDT) x2(OST)

Large model
- \# of files: 8G files
- Capacity: -1PB
- Performance: 12GB/s

PRIMERGY RX300 S8 x 2(MDS) + 4(OSS)
ETERNUS DX200 S3 x 4(MDT) x8(OST)

Key features

FUJITSU Software FEFS advantage from conventional NFS

The FEFS employs direct data access architecture, extremely eliminates latency and extends throughput. NFS supports a lot of platforms but it consists of many software layers and has larger overhead.

FEFS provides small latency and high bandwidth with remote direct memory access between clients and servers and direct I/O to storage.
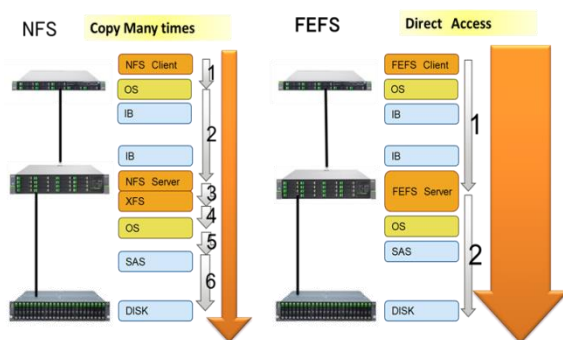
FEFS Specifications

| Feature		
File System	max file system size	8EB
	max file size	8EB
	max #of files	8E
	max OST size	1PB
	max stripe count	20K
	max ACL entries	8191
Server Nodes	max #of OSTs	20k
	max #of clients	1M

Quality of Service (QoS)

In the computing centers or research laboratories, not only single stream file access but also multiple / shared file sharing is important. FUJITSU Software FEFS provides fair and prioritized file access by flow control in the unit for user and node to prevent single user or node occupies most system resource.

The FEFS also provides access control list (ACL) and extended quota feature for data access security and capacity sharing.
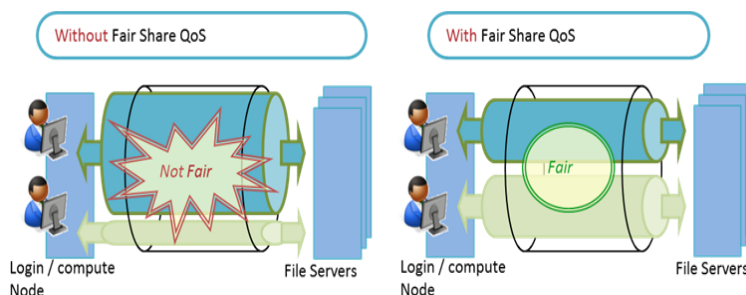
Based on K computer technology

The FUJITSU Software FEFS inherits leading technologies originally developed for the PetaFLOPS class K computer. These cutting edge products help improve the innovation obtained from your cluster.
(K computer has been developed with cooperation Fujitsu and RIKEN)
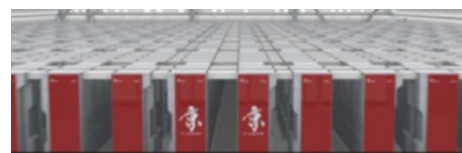
Technical Specifications

Supported platforms

	Server Node (MDS/OSS)	Client Node
Server Platforms	PRIMERGY RX300 S8 PRIMERGY RX350 S8 PRIMERGY RX2540 M1	PRIMERGY RX200 S8 PRIMERGY RX300 S8 PRIMERGY RX350 S8 PRIMERGY CX250 S2 PRIMERGY CX270 S2 PRIMERGY RX2540 M1 PRIMERGY CX2550 M1 PRIMERGY CX2570 M1
Operating Systems	Red Hat Enterprise Linux 6.4 Red Hat Enterprise Linux 6.5	Red Hat Enterprise Linux Server 6.4 Red Hat Enterprise Linux Server 6.5 Red Hat Enterprise Linux HPC compute node 6.4 Red Hat Enterprise Linux HPC compute node 6.5 Cent OS 6.4 Cent OS 6.5
Software Option	HPC Cluster Suite V3.0 Advanced edition/Basic edition	

Supported peripheral hardware

	Storage System	FibreChannel Card	InfiniBand HCA(*)
FEFS V10L30	ETERNUS JX40 ETERNUS JX60 ETERNUS DX80 S2 ETERNUS DX410 S2 ETERNUS DX100 S3 ETERNUS DX200 S3 ETERNUS DX600 S3 DDN SFA12K	Fujitsu Dual port fibre channel card(8Gbps) Fujitsu Dual port fibre channel card(16Gbps)	Mellanox CX3 (40/56Gb, 1/2Ch)

(*)FUJITSU Software FEFS requires InfiniBand interconnect for both server nodes and client nodes.

More information

Fujitsu platform solutions

In addition to FUJITSU Software FEFS, Fujitsu provides a range of platform solutions. They combine reliable Fujitsu products with the best in services, know-how and worldwide partnerships.

Fujitsu Portfolio

Build on industry standards, Fujitsu offers a full portfolio of IT hardware and software products, services, solutions and cloud offering, ranging from clients to datacenter solutions and includes the broad stack of Business Solutions, as well as the full stack of Cloud offering. This allows customers to leverage from alternative sourcing and delivery models to increase their business agility and to improve their IT operation's reliability.

Computing products

www.fujitsu.com/global/products/computing/

Software

www.fujitsu.com/software/

More information

Learn more about FUJITSU Software FEFS, please contact your Fujitsu sales representative, Fujitsu business partner, or visit our website.
www.fujitsu.com/hpc

Fujitsu green policy innovation

Fujitsu Green Policy Innovation is our worldwide project for reducing burdens on the environment.
Using our global know-how, we aim to contribute to the creation of a sustainable environment for future generations through IT. Please find further information at
www.fujitsu.com/global/about/environment/

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