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File Systems

Available file systems

On the DEEP-EST system, three different groups of file systems are available:

- the [JSC GPFS file systems](#), provided via [JUST](#) and mounted on all JSC systems;
- the DEEP-EST parallel BeeGFS file systems, available on all the nodes of the DEEP-EST system;
- the file systems local to each node.

The users home folders are placed on the shared GPFS file systems. With the advent of the new user model at JSC ([?JUMO](#)), the shared file systems are structured as follows:

- **\$HOME:** each JSC user has a folder under `/p/home/jusers/`, in which different home folders are available, one per system he/she has access to. These home folders have a low space quota and are reserved for configuration files, ssh keys, etc.
- **\$PROJECT:** In JUMO, data and computational resources are assigned to projects: users can request access to a project and use the resources associated to it. As a consequence, each user can create folders within each of the projects he/she is part of (with either personal or permissions to share with other project members). For the DEEP project, the project folder is located under `/p/project/cdeep/`. Here is where the user should place data, and where the old files generated in the home folder before the JUMO transition can be found.

The DEEP-EST system doesn't mount the \$SCRATCH file systems from GPFS, as it is expected to provide similar functionalities with its own parallel and local file systems.

The following table summarizes the characteristics of the file systems available in the DEEP-EST and DEEP-ER (SDV) systems. **Please beware that the `$project` (all lowercase) variable used in the table only represents any JuDoor project the user might have access to, and that it is not really exported on the system environment.** For a list of all projects a user belongs to, please refer to the user's [JuDoor page](#). Alternatively, users can check the projects they are part of with the `jutil` application:

```
$ jutil user projects -o columns
```

Report Period	Project Name	Client	Type	Status / End	MS Services	Service Provider	Business Impact / Notes	Owner	Date
2023-01-01 to 2023-03-31	Project Alpha	ABC Corp	Software Development	Completed	Development, Testing, Deployment	ABC Corp	Successful launch of new product line, increased revenue by 15%.	John Doe	2023-04-01
2023-04-01 to 2023-06-30	Project Beta	XYZ Inc	Cloud Migration	In Progress	Cloud Migration, Infrastructure Setup	XYZ Inc	Partial migration completed, some data transfer issues.	Jane Smith	2023-07-01
2023-07-01 to 2023-09-30	Project Gamma	DEF Ltd	System Integration	On Hold	System Integration, Data Migration	DEF Ltd	Integration halted due to budget constraints.	Mike Johnson	2023-10-01
2023-10-01 to 2023-12-31	Project Delta	GHI Corp	Security Audit	Completed	Security Audit, Vulnerability Assessment	GHI Corp	Identified and patched several vulnerabilities, improved security posture.	Sarah Lee	2024-01-01
2024-01-01 to 2024-03-31	Project Epsilon	JKL Inc	Mobile App Development	In Progress	Mobile App Development, UI/UX Design	JKL Inc	App development progressing well, user testing scheduled.	David Kim	2024-04-01
2024-04-01 to 2024-06-30	Project Zeta	MNO Corp	Infrastructure Upgrade	On Hold	Infrastructure Upgrade, Network Optimization	MNO Corp	Upgrade postponed due to hardware availability issues.	Emily White	2024-07-01
2024-07-01 to 2024-09-30	Project Eta	PQR Ltd	Data Analytics Implementation	Completed	Data Analytics Implementation, Reporting Setup	PQR Ltd	Analytics dashboard live, providing valuable insights into customer behavior.	Chris Brown	2024-10-01
2024-10-01 to 2024-12-31	Project Theta	STU Inc	CRM System Rollout	In Progress	CRM System Rollout, User Training	STU Inc	CRM rollout in progress, training sessions ongoing.	Alex Green	2025-01-01
2025-01-01 to 2025-03-31	Project Iota	VWX Corp	AI Integration Research	On Hold	AI Integration Research, Proof of Concept	VWX Corp	Research phase for AI integration, no immediate plans for implementation.	Olivia Black	2025-04-01
2025-04-01 to 2025-06-30	Project Kappa	YZA Inc	Blockchain Pilot Program	Completed	Blockchain Pilot Program, Blockchain Development	YZA Inc	Pilot program for blockchain-based supply chain management successful.	Noah Grey	2025-07-01
2025-07-01 to 2025-09-30	Project Lambda	BCD Ltd	IoT Sensor Network Deployment	In Progress	IoT Sensor Network Deployment, Data Collection	BCD Ltd	IoT sensor network deployment in progress, data collection starting.	Isabella Blue	2025-10-01
2025-10-01 to 2025-12-31	Project Mu	EFG Corp	Quantum Computing Research	On Hold	Quantum Computing Research, Quantum Algorithm Development	EFG Corp	Research into quantum computing for optimization problems.	Liam Red	2026-01-01
2026-01-01 to 2026-03-31	Project Nu	HIJ Inc	AR/VR Experience Development	Completed	AR/VR Experience Development, Content Creation	HIJ Inc	AR/VR experience developed for product demonstration, highly engaging.	Mia Yellow	2026-04-01
2026-04-01 to 2026-06-30	Project Xi	KLM Corp	Edge Computing Implementation	In Progress	Edge Computing Implementation, Edge Device Setup	KLM Corp	Edge computing implementation for real-time data processing.	Ben Orange	2026-07-01
2026-07-01 to 2026-09-30	Project Omicron	NOP Ltd	Biometric Authentication System	On Hold	Biometric Authentication System, Security Protocol Development	NOP Ltd	Development of biometric authentication system for secure access.	Charlotte Purple	2026-10-01
2026-10-01 to 2026-12-31	Project Pi	QRS Inc	Autonomous Vehicle Testing	Completed	Autonomous Vehicle Testing, Sensor Calibration	QRS Inc	Autonomous vehicle testing completed, safety protocols established.	Ethan Green	2027-01-01
2027-01-01 to 2027-03-31	Project Rho	TUV Corp	Space-Based Communication System	In Progress	Space-Based Communication System, Satellite Launch	TUV Corp	Space-based communication system launch in progress.	Fiona Blue	2027-04-01
2027-04-01 to 2027-06-30	Project Sigma	WXY Inc	Quantum Cryptography Research	On Hold	Quantum Cryptography Research, Quantum Key Distribution	WXY Inc	Research into quantum cryptography for secure communications.	Harry Red	2027-07-01
2027-07-01 to 2027-09-30	Project Tau	ZAB Ltd	AI-Powered Customer Service Chatbot	Completed	AI-Powered Customer Service Chatbot, Chatbot Training	ZAB Ltd	AI-powered chatbot deployed, improving customer service efficiency.	Ivy Yellow	2027-10-01
2027-10-01 to 2027-12-31	Project Upsilon	ACD Corp	Blockchain-Based Digital Identity System	In Progress	Blockchain-Based Digital Identity System, Identity Management	ACD Corp	Blockchain-based digital identity system development in progress.	Jack Orange	2028-01-01
2028-01-01 to 2028-03-31	Project Phi	EFG Inc	Quantum Sensing Research	On Hold	Quantum Sensing Research, Quantum Sensor Development	EFG Inc	Research into quantum sensing for precision measurements.	Karen Purple	2028-04-01
2028-04-01 to 2028-06-30	Project Chi	HIJ Corp	AI-Driven Drug Discovery	Completed	AI-Driven Drug Discovery, Drug Simulation	HIJ Corp	AI-driven drug discovery process identified potential new drug candidates.	Leo Green	2028-07-01
2028-07-01 to 2028-09-30	Project Psi	KLM Ltd	Space-Based Solar Power Research	In Progress	Space-Based Solar Power Research, Solar Panel Development	KLM Ltd	Space-based solar power research for sustainable energy.	Mia Blue	2028-10-01
2028-10-01 to 2028-12-31	Project Omega	NOP Inc	Quantum Computing Application Development	On Hold	Quantum Computing Application Development, Quantum Algorithm Optimization	NOP Inc	Development of quantum computing applications for optimization problems.	Noah Red	2029-01-01

Stripe Pattern Details

It is possible to query this information from the deep login node, for instance:

```
manzano@deep $ fhgfs-ctl --getentryinfo /work/manzano
Path: /manzano
Mount: /work
EntryID: 1D-53BA4FF8-3BD3
Metadata node: deep-fs02 [ID: 15315]
Stripe pattern details:
+ Type: RAID0
+ Chunksize: 512K
+ Number of storage targets: desired: 4

manzano@deep $ beegfs-ctl --getentryinfo /sdv-work/manzano
Path: /manzano
Mount: /sdv-work
EntryID: 0-565C499C-1
Metadata node: deeper-fs01 [ID: 1]
Stripe pattern details:
+ Type: RAID0
+ Chunksize: 512K
+ Number of storage targets: desired: 4
```

Or like this:

```
manzano@deep $ stat -f /work/manzano
File: "/work/manzano"
ID: 0      Namelen: 255      Type: fhgfs
Block size: 524288      Fundamental block size: 524288
Blocks: Total: 120178676 Free: 65045470 Available: 65045470
Inodes: Total: 0      Free: 0

manzano@deep $ stat -f /sdv-work/manzano
File: "/sdv-work/manzano"
ID: 0      Namelen: 255      Type: fhgfs
Block size: 524288      Fundamental block size: 524288
Blocks: Total: 120154793 Free: 110378947 Available: 110378947
Inodes: Total: 0      Free: 0
```

See <http://www.beegfs.com/wiki/Striping> for more information.

Additional infos

Detailed information on the **BeeGFS Configuration** can be found [?here](#).

Detailed information on the **BeeOND Configuration** can be found [?here](#).

Detailed information on the **Storage Configuration** can be found [?here](#).

Detailed information on the **Storage Performance** can be found [?here](#).

Notes

- dd test @dp-dam01 of the DCPMM in appdirect mode:

```
[root@dp-dam01 scratch]# dd if=/dev/zero of=./delme bs=4M count=1024 conv=sync
1024+0 records in
1024+0 records out
4294967296 bytes (4.3 GB) copied, 1.94668 s, 2.2 GB/s
```

- The /work file system which is available in the DEEP-EST prototype, is as well reachable from the nodes in the SDV (including KNLs and ml-gpu nodes) but through a slower connection of 1 Gb/s. The file system is therefore not suitable for benchmarking or I/O task intensive jobs from those nodes
- Performance tests (IOR and mdtest) reports are available in the BSCW under DEEP-ER → Work Packages (WPs) → WP4 → T4.5 - Performance measurement and evaluation of I/O software → Jülich DEEP Cluster → Benchmarking reports:
[?https://bscw.zam.kfa-juelich.de/bscw/bscw.cgi/1382059](https://bscw.zam.kfa-juelich.de/bscw/bscw.cgi/1382059)
- Test results and parameters used are stored in JUBE:

```
user@deep $ cd /usr/local/deep-er/sdv-benchmarks/synthetic/ior
user@deep $ jube2 result benchmarks

user@deep $ cd /usr/local/deep-er/sdv-benchmarks/synthetic/mdtest
user@deep $ jube2 result benchmarks
```