

File Systems

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

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

The users home folders are placed on the shared GPFS filesystems. With the advent of the new user model at JSC ([JUMO](#)), the shared filesystems 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 has a folder within each of the projects he/she is part of. For the DEEP project, such 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 `$SCRATCH` and `$ARCHIVE` filesystems, as it is expected to provide similar functionalities with its own parallel filesystems.

The following table summarizes the characteristics of the file systems available in the DEEP and DEEP-ER systems:

Mount Point	User can write/read to/from	Cluster	Type	Global / Local	SW Version	Stripe Pattern Details	Maximum Measured Performance (see footnotes)	Other
/p/home	/p/home/jusers/\$USER	DEEP	GPFS exported via NFS	Global				Home directory; used only for configuration files.
/p/project	/p/project/cdeep/\$USER	DEEP	GPFS exported via NFS	Global				Project directory; GPFS main storage file system; not suitable for performance relevant applications or benchmarking
/gdfs-work	/gdfs-work/\$USER	DEEP, SDV	GPFS exported via NFS	Global				GPFS work file system; not suitable for performance relevant applications or benchmarking
/work	/work/\$USER	DEEP	BeeGFS	Global	2015.03.l11	Type: RAID0, Chunksize: 512K, Number of storage targets: desired: 4	2170 MiB/s write, 2111 MiB/s read ~21000 ops/s create !{1}	Work file system
/sdv-work	/sdv-work/\$USER	SDV	BeeGFS	Global	2015.03.l10	Type: RAID0, Chunksize: 512K, Number of storage targets: desired: 4	425 MiB/s write, 67 MiB/s read 15202 ops/s create, 5111 ops/s remove !{2}	Work file system
/nvme	/nvme/tmp	SDV	NVMe device	Local		Block size: 4K	1145 MiB/s write, 3108 MiB/s read 139148 ops/s create, 62587 ops/s remove !{2}	1 NVMe device available at each SDV compute node
/mnt/beeond	/mnt/beeond	SDV	BeeGFS On Demand running on the NVMe	Local	2015.03.l10	Block size: 512K	1130 MiB/s write, 2447 MiB/s read 12511 ops/s create, 18424 ops/s remove !{2}	1 BeeOND instance running on each NVMe device

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](#).

Footnotes

[1] 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>

[2] Test results and parameters used 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
```