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# File Systems

# Available file systems

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

- the <a href="2JSC GPFS file systems">2JUST</a> 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 <a href="YJuDoor page">YJuDoor page</a>. Alternatively, users can check the projects they are part of with the jutil application:

\$ jutil user projects -o columns

Mount Point	User can write/read tofrom	Cluster	Туре	Glubal / Local	SW Version	Stripe Pattern Details	Maximum Measured Performance (see footnotes)	Description	Other	
phone	(p/home/juser	SOY SEESTEST	GPFS exported via NFS	Global				JUST GPFS Home directory; used only for configuration files.		
pipojed	ppopulation	agy. Okan-sat	GPFS exponed via NFS	Grobal				JUST GPFS Project disectory; GPFS main storage file system; not substite for performance nelevant applications on benchmarking		
hist	and digreject	login rade only (deeps)	GPFS exported via NFS	Giotal				JUST GIFFS ANDNIE GIRCONY, Long-Retm storage	If you plan to use the archive, and to the archive, please get in correct to the system administration (e.g. via the support mailing say). You can find further information and some hints on using the archive.	
lwork	Anath Sprajn co	DEEP-EST	Bee GFS	Giobal	BasGFS 7.12			Work file system, ea backup, hence not meant for permanent		
ikondoh	Acousti	DEEP-EST	ade laced partition	Loar				Scrach file system for temporary data. Will be cleaned up after job finished; Paccommend to use instead of http: for storing temporary files.	ad .	
inume/scrasch	Jovenskoach	DAM partition	local SSD (MI)	Local				Screech file system for temporary date. Will be cleaned up after job finished] "1.5 Till treat Optane SSD bass Center (DC) Pessoox (DC) Pessoox (DC) Pessoox (DC) Pessoox (DC) Pessoox (DC) Pessoox (DC) Pessoox (DC) Pessoox		
inume/scrasch	bhveekoach	DAM partition	local SSD (sad)	Logir				Scratch file system for temporary data. Will be cleaned up after job finished) *1.5 Till treal Optane School (OC) Pessoon (NVMe PCMS x4, 2.51, 30 XPoint)		
ipneniko srd	.pmem/scrand	DAM partition	DCPfille in appdirect mode	Louir			22 GBN single 4d Mar in 4p-dam01		*3 TB is do-dargi21,02 2 TB is do-dargi21-10 2 TB is foreigne 50. President Memory (5CPHM) 256GB DOMMA based on tenefra 30 359 sectors of tenefra 10 30 sectors of tenefra 10 se	
itutte	Jivnetnp	sav	Ni/Me device	Local	Basi650 7.12	Black size: et	T145 Miliku write, 2008 Miliku Hed T285-58 GHZ Gpa'u HEROVY*	1 NVMe device available at each 50V compute node	"Test results and passesses and passesses and passesses and passesses and passesses and passesses and passes a	deng-ra-/ali-kemelmanka/agathikia/ deng-ra-/ali-kemelmanka/agathikia/ deng-ra-/ali-kemelmanka/agathikia/

## **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"
         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 <a href="http://www.beegfs.com/wiki/Striping">http://www.beegfs.com/wiki/Striping</a> 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
- 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
```