

Storage on Maxwell

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Overview of storage systems

The administration and troubleshooting slightly varies across installations. The table below summarizes responsibilities. If in doubt it's always a good idea to contact uco@desy.de.

Filesystem	Remarks	Mounts	Contact
AFS	Good for static data/documents and software. Not good for multi-threaded applications and log running jobs (> 24h)	/afs/desy.de/	DESY IT uco@desy.de for questions about increasing quote, general problems
dCache	Good for mass storage of scientific data. Not suitable for volatile data.	/pnfs/desy.de/	DESY IT maxwell.service@desy.de to arrange (missing) mounts. uco@desy.de for general problems
DESY beegfs	Fast. Without backup or snapshots. Deleted files are not recoverable.. Not intended for archiving data, only for actively used data! It's scratch space really! Do not use more than 10 TB over a longer period (more than 2 weeks). If you have an ongoing project that requires more space in the long term, please send us an email	/beegfs/desy/	DESY IT Generating a folder: execute <code>mk-beegfs</code> on maxwell. Contact maxwell.service@desy.de for all other issues.
CSSB beegfs	Fast. Without backup or snapshots. Deleted files are not recoverable. Lifetime of data is up to CSSB policy. Get in touch with CSSB admins for details!	/beegfs/cssb/	CSSB IT / DESY IT it@cssb-hamburg.de for access/usage rights. maxwell.service@desy.de for issues.
sync&share	Good for data sharing.	none	DESY IT uco@desy.de for all issues
CFEL GPFS	Fast. Good for scientific data of CFEL.	see below	CFEL IT / DESY IT DESY CFEL admins for access/usage issues. maxwell.service@desy.de for technical issues
EXFEL GPFS		see below	EXFEL IT / DESY IT EXFEL admins for access/usage issues. maxwell.service@desy.de for technical issues
FS GPFS	Fast. Good for scientific data from PETRA III and FLASH experiments and analysis.	see below	ASAP3 Team it-asap3@desy.de ASAP3 team for all issues.
Scratch / TMP	Scratch. Limited space and subject to erasure without prior notice.	/scratch/tmp	DESY IT Unmanaged temporary space.
HOME		/home	DESY IT maxwell.service@desy.de for all issues. Quota will not be extended!

Characteristics of storage systems substantially differ for different storage systems. Tables below give a rough overview. Contact maxwell.service@desy.de for open questions.

Filesystem	Mount Point	Quota	Size	Lifetime	tokens	Backup	Snapshot	Network	Protocol	Throughput	Availability	Remote
AFS	/afs/	per Volume	per Volume	unlimited	yes	yes ¹	yes ²	eth	afs	slow	yes	yes
BeeGFS	/beegfs/desy/	no (see Remarks)	1.2PB	unlimited	no	no	no	ib	beegfs	>10GB/s	yes	no
CSSB BeeGFS	/beegfs/cssb/	no	3.2PB	unlimited	no	no	no	ib	beegfs		CSSB only	no
dCache	/pnfs	no	unlimited	unlimited	no	no	no	eth	nfs	varies	yes	yes
sync&share	none	90TB	unlimited	unlimited	no	no	no	eth	https	slow	webdav sync-client	yes

GPFS EXFL	/gpfs/xfel/d		13PB										
	/gpfs/xfel/data		516TB										
	/gpfs/xfel/exp		42GB										
	/gpfs/xfel/u		1.4PB										
GPFS FS	/asap3/petra3/gpfs /asap3/flash/gpfs /asap3/spec. instruments/gpfs	no	4.7PB	unlimited	no	yes	yes ³	ib	gpfs, nfs	>10GB/s	FS only	no	
	/gpfs/petra3 /scratch	no	30TB	3 month	no	no	no				FS only	no	
GPFS CFEL	gpfs-data	no	501TB	unlimited	no	?	?	ib	gpfs, nfs	>10GB/s	CFEL only	no	
	gpfs-scratch	no	49TB	n.a.	no	no	no					no	
scratch	/scratch	no	few GB	none	no	no	no	-	local	fast	yes	no	
HOME	/home on FS GPFS	20GB hard	30TB	account	no	no	yes ⁴	ib	gpfs	>10GB/s	yes	no	



IMPORTANT

Any files without any associated user (account does not exist anymore) will be **removed** from BEEGFS, HOME, GPFS-FS-SCRATCH without prior notifications! Similar policies might apply for group-storages, please verify with your admins! if in doubt!

IMPORTANT: Snapshots

1. For information about backup & recovery: check [IT-Services](#)
2. AFS-snapshots are located in <afs-home>/OldFiles
3. GPFS Snapshots are located in /asap3/.snapshots/@<time-stamp>
4. GPFS-Home snapshots are located in /home/.snapshots/@<time-stamp>/\$USER

Where to store Scientific data

Available for everyone are AFS, BeeGFS, Desycloud and dCache.

- **AFS** is secure but suitable only for rather small data volumes.
- **Desycloud** offers significantly more space, but uploads or downloads are very slow.
- **BeeGFS** and **GPFS-Scratch** are fast, but exclusively for **temporary data** without any level of security. Please note the policy!
- **dCache**: is the only option for long-term storage of larger amounts of data. If your group doesn't have dCache storage space but would like to "buy in", get in touch with osm.service@desy.de.
- **GPFS** home-directories: 20GB hard limit (can't be increased), don't store data in the home-directory.

In addition to generic storage resources, some group specific resources are available:

- **CSSB BeeGFS**: space dedicated to CSSB
- **GPFS-FS** resources: space dedicated to FS-experiments.
- **GPFS-CFEL** resources: space dedicated to CFEL.
- **GPFS-EXFL** resources: space dedicated to European XFEL.
- IF your group needs large amounts of fast, secure storage space, a group-owned GPFS appliance might be a solution. Get in touch with max.well.service@desy.de if you need to know more.

Where to store Software

Most applications are small enough to be deployed in (almost) arbitrary locations. Suitable storage systems are

- **AFS**: globally accessible space. Good for software needed on Maxwell, Desktop, BIRD likewise. Keep in mind, that restrictive ACLs will cause problems on Maxwell! AFS is not suitable for multi-host application, it will have horrible side-effects on performance!
- **GPFS-home**: apart from the space limitations well suited for software installations. Don't use it for group-shared installations!
- **BeeGFS**: For Applications shared within a group use group directories.
- **dCache** DO NOT use for software installations.

Where to store Documents

Assuming that documents are usually small

- **AFS**: secure with flexible ACLs. Globally accessible. Prime choice for documents.
- **Desycloud**: well suited for sharing documents. Globally accessible. Not convenient to use in the HPC environment. No backups whatsoever, make sure to secure any valuable or sensitive data.
- **Don't** store documents on BeeGFS, dCache or GPFS (except for documenting experiments).

Where to store Temporary data

- **BeeGFS**: designed as scratch it's perfect for large temporary data.
- **scratch**: local space, but fairly limited volumes.

- Don't store temporary data on dCache or AFS.

Best Place(s) for storing information - overview

	AFS	BeeGFS	dCache	DESY-Cloud	HOME	Local Scratch	GPFS-Scratch
scientific data	-	-	+	(+)	-	-	-
temporary data	-	+	-	-	-	+	+
software	(+)	(+)	-	-	+	-	-
documents	+	-	-	+	-	-	-