



aix*celerate*

Tips, Tricks & Tools with Respect to I/O

Tuning Workshop 2025

December 2nd, 2025 | Aachen

Philipp Martin

Agenda for Today (Dec 2nd, 2025)

Time	Topic	Speaker
9:00 – 9:05	Welcome	Sandra Wienke (RWTH)
9:05 – 10:00	Does I/O Matter to Me?	Philipp Martin (RWTH)
10:00 – 10:30	Storage and I/O Technologies on CLAIX	Philipp Martin (RWTH)
10:30 – 11:00	Coffee Break	
11:00 – 12:00	Tips & Tricks & Tools with respect to I/O	Philipp Martin (RWTH)
12:00 – 12:30	From Thousands of Small Files to Few Very Big Files	Jannis Klinkenberg (RWTH)

Contents

- **Filesystem Choice**
 - Performance Numbers
- **BeeOND**
 - How to invoke
 - How to stage data
- **Lustre Striping**
- **Performance Analysis**
 - Perfmon
 - Darshan
 - fs-stat

Contents

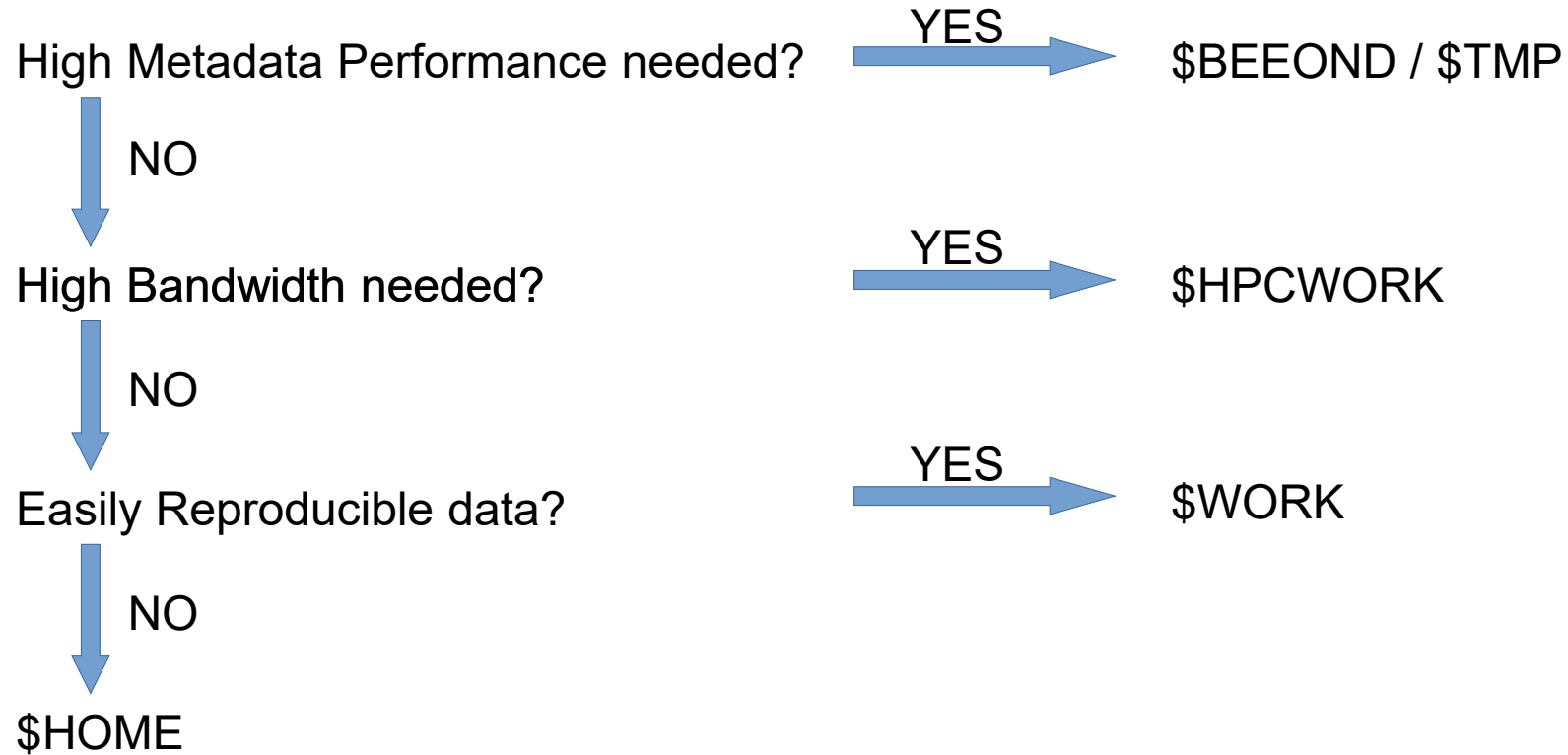
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Filesystem Choice

Access	Filesystem	Max. Quota	File Quota	Backup	Pros	Cons
\$HOME	GPFS	150 GB*	~ 1 Mio.*	Tape (off-site)	● Reliable ● Backup	● Limited quota and BW
\$WORK	GPFS	250 GB*	~ 1 Mio.*	Snapshots	● Reliable	● Limited quota and BW
\$HPCWORK	Lustre	1000 GB*	~ 1 Mio.*	-	● High quota and BW	● Less reliable ● Not always good for metadata
\$BEEOND	BeeGFS	1.5 TB / 700 GB p. N.	-	-	● High BW and metadata ● Combined storage	● Temporary ● Only exclusive nodes ● Transfers required
\$TMP	XFS	1.5 TB / 700 GB p. N.	-	-	● High BW and metadata	● Temporary ● Transfers required

* Default quota

Filesystem Choice



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- **How to invoke**

- #SBATCH --beeond
- #SBATCH --switches=1

- **How to stage**

- cp -r \$WORK/yourfiles \$BEEOND
- cp -r BEEOND/yourfiles/results \$WORK/yourfiles

- **Tips**

- You can use more nodes for more storage
- beegfs entry set --num-targets=4 --chunk-size=4MiB /mnt/beegfs

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Lustre Striping

- **Defaults**

- Stripe Size: 16 MiB
- 0-1024 MiB: 1 Target
- 1024 MiB – 64 GiB: 4 Targets
- > 64 GiB: 16 Targets

- **Lustre commands**

- `lfs getstripe -d /path/to/directory`
- `lfs setstripe -S 4M -c 2 /path/to/directory/or/file`

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Live Demo

- **Documentation**

- <https://darshan.readthedocs.io/en/latest/>

- **Usage**

- LD_PRELOAD
- (Instrumentation)

- **Settings**

- DXT
- ENABLE_NONMPI
- NAMEMEM
- MODMEM
- MAX_RECORDS
- INCLUDE/EXCLUDE

Live Demo

- **Operation**

- NOT AVAILABLE YET
- #SBATCH –fs-stat
- \$HOME/fsstat_%j
- postprocess.py

Performance Analysis - fs-stat

