Hands-on Liger supercomputer

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CENTRALE NANTES SUPER COMPUTING

Remote visualisation Hands-On

- Overview
  - How remote visualisation can be useful
  - Remote visualisation resources on Liger

- Hands-on
  - Demonstration and questions

Overview

Remote visualization

- Data visualization can be resource consuming, especially if processing the output of a large computational job

- Don't melt your laptop: keep large data on Liger, process on Liger's GPUs, view on your screen!
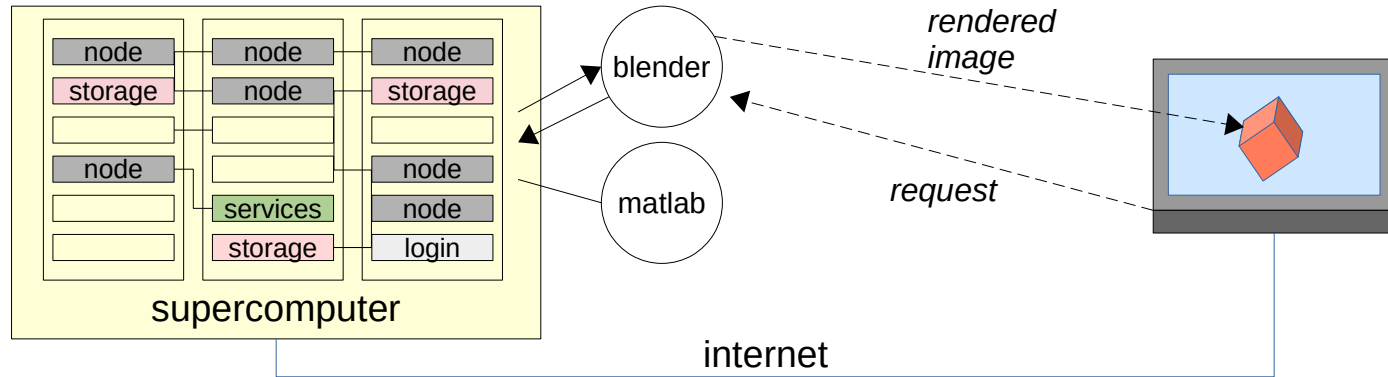
Liger: our sumpercomputer

Request an account

- Know your Rights & Duties as a Liger User
  - https://supercomputing.ec-nantes.fr/charter
  - READ, AGREE & SIGN charters listed above
  - Send ONLY pages with your signature to your teacher.
  - Preferred Scan+PDF to paper.
- Use SVP to send the documents and for any technical problem
 - https://svp.ec-nantes.fr (supercomputing)

Liger: visualisation resources

- 10 servers dedicated to visualisation:
  - Slurm partition: **visu**
  - Nodes: viz[05-10]
  - 2x NVIDIA Tesla K80 GPU
  - 24 CPU cores
- Unlimited sessions per user (if space available)
- Max 10 users at one time
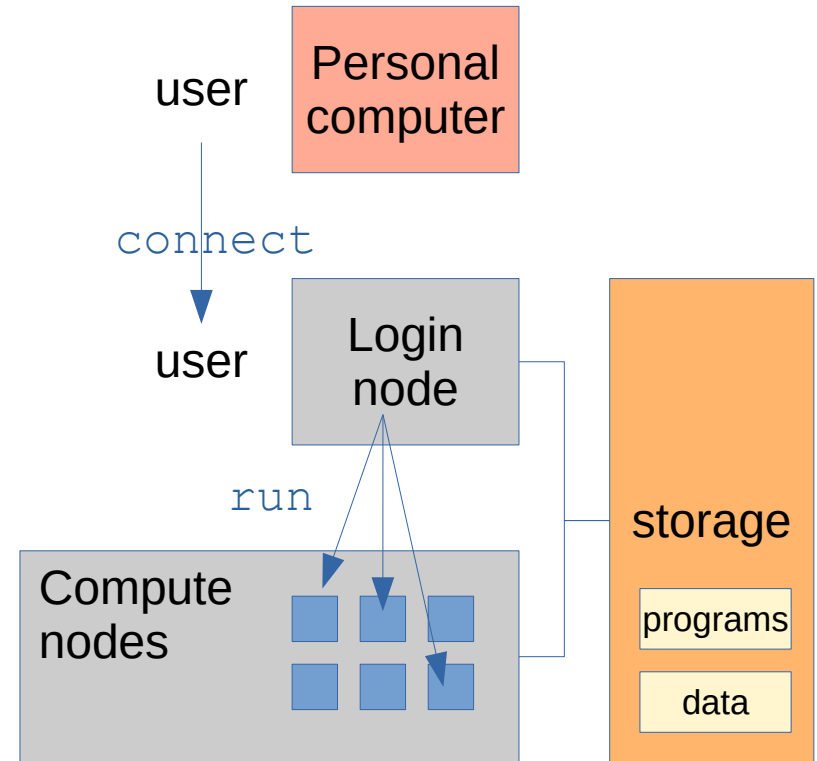
Liger: installed applications

- Visit

- GMSH

- Abaqus (licensed to some labs)

- Matlab (licensed to some labs)

- Geodict

- Blender

- Fiji

- StarCCM+

- AllineaDDT

- Finemarine

- Paraview (coming soon)

- ...open to requests

Liger: system topology
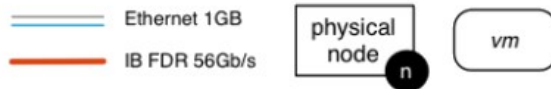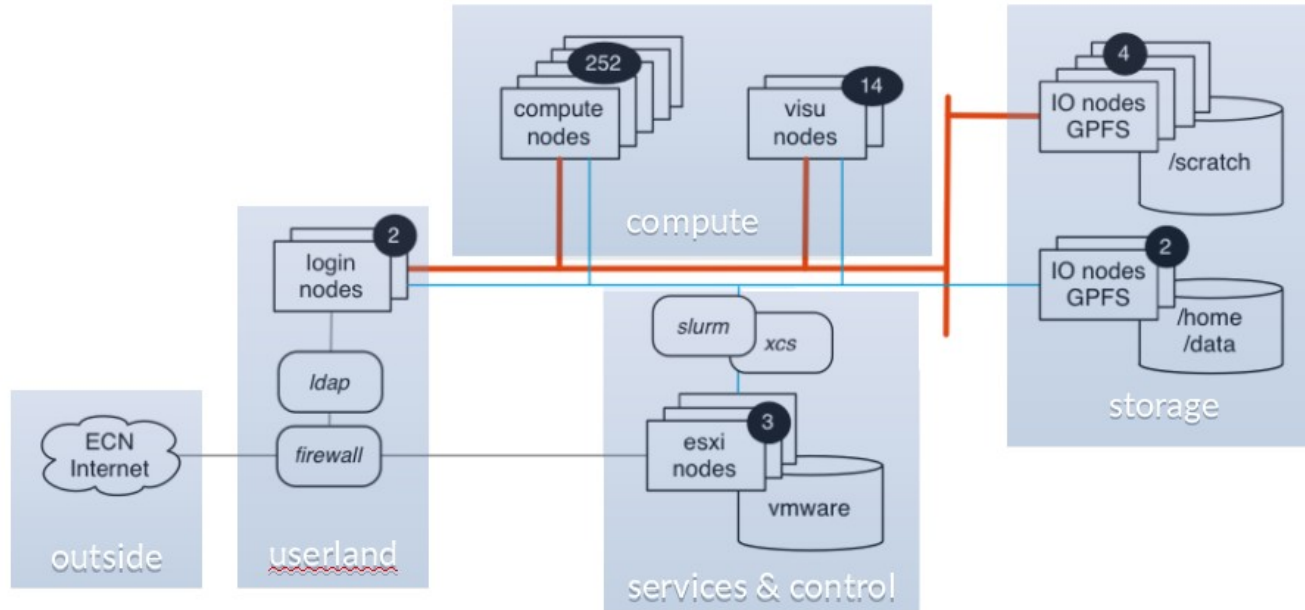
(aside) Liger: compute workflow

- You have 3 directories

- You can compile and test codes on login nodes

- You can use available softwares/libraries

- And you can submit jobs on nodes via **slurm**

user → Personal computer

connect

user → Login node

run

Compute nodes

storage
programs
data

User Env: Filesystems & storage

- /scratch
  - 815 TB, 1 000 000 files quota per user
  - Your directory is $SCRATCHDIR
  - Computations and temporary files
- /home
  - 30 TB, 5GB quota soft per user
  - Your directory is $HOME
  - Sources files
- /data
  - 45 TB, quota per group={100GB and 2 million files}
  - Your project directory is $DATADIR
  - Permanent projects data and group sharing data

User space

Project space

Types of job

- **Visualisation**
  - Launch visual applications through the web portal
  - Use remote visualisation to use the app on Liger
  - *Matlab, Blender, Paraview, Fiji etc...*

- **Pure computation**
  - Connect to Liger via CLI (command line interface)
  - Run programs directly in the system
  - *Python, C++, Rust, optimised scientific framework, non-GUI tools etc.*

new visualisation portal: FastX

- XCS unusable and deprecated, FastX introduced:

  https://liger.ec-nantes.fr:25900

- Accessible only from the ECN network (such as Liger CLI via SSH):

  - Use Centrale Nantes VPN when working from remote

  - Give us a static IP from your usual working station to whitelist

Using graphical apps for batch jobs

- Apps such as matlab and Abaqus, provide a command line program → they can be used for batch jobs, directly via Liger CLI

- If you use them like that, <u>make sure to use the visu partition</u> → slurm option `-p visu`

- If not specified, it is likely to encounter error due to missing graphical libraries

Hands-on

Visualisation portal demo

Demo:

- File transfer: move files to your **scratch** folder

- Launch remote application
  - Browser session → https://liger.ec-nantes.fr:25900
  - FastX client

Job parameters

- *Number of GPUs:* enable GPU for graphic acceleration

- *Number of cores*: increasing cores increases available memory → 10.66 GB x core, max 24 cores

- *Max walltime*: make sure to time your job correctly to avoid disrupting service

- *Version*: the app version, useful or for licensed apps

- *CLI options*: advanced options for the CLI executable

Job monitoring and debugging

- Slurm commands work on visu sessions

  - `squeue`: monitor your job from the CLI

  - `scancel`: kill your session from the CLI

  - `sinfo`: view available resources

- Visualisation session log written to **scratch**, format: *visu-<JOBID>.txt*

  - Debug errors and warnings

  - Can be viewed directly from the portal file manager

Readings

- Remote visualization section in the docs:
  - https://ecn-collaborations.pages.in2p3.fr/liger-docs/visualization/fastx/

- Other tuorials available at
  - supercomputing.ec-nantes.fr/publications/tutorials

Questions?