



Getting started on subMIT: Available Resources

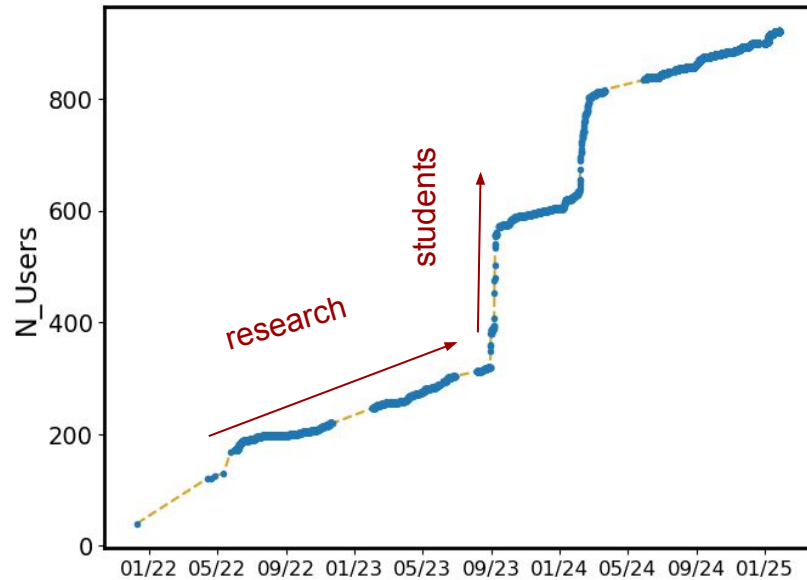
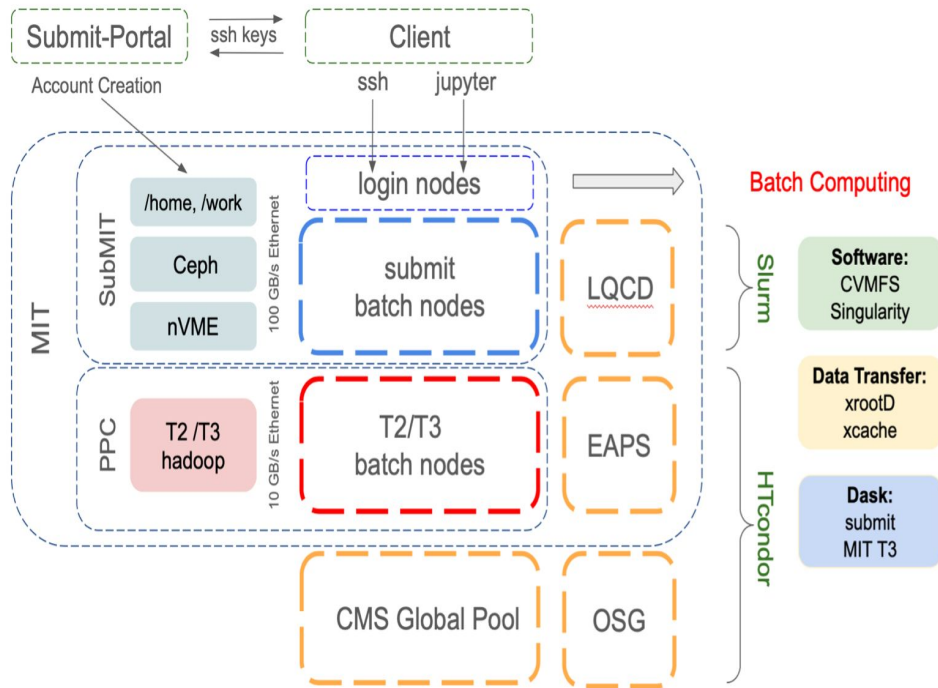
Mariarosaria D'Alfonso

Workshop on Basic computing Services

Jan. 30, 2025



subMIT: A MIT Physics Department Analysis Facility



very flexible system, users utilize the sw/hw according to their requirements



subMIT from the user point of view

Provide flexibility and scalability, allowing your research group to profit from computational resources without the burden of maintaining your own facilities.

Compute



Login nodes



Specialized resources:

- two machines with 384 cores
- 30 nvidia cards (8 A30, 20 1080s)

Scale out resources:



1. submit cores O(2.5k) via 



2. Open Science Grid (OSG) Global Pool via 



3. CMS MIT-Tier2 and CMS-Global Pool 

Data Storage and Access

/home

5GB User's home with backed-up storage notebooks and local code developments

/work

50GB for software installations

Ceph

1TB per user and groups space to store larger datasets

/scratch

NVMe disk with fast access (for short term storage)



local data with fast network – 100 GB/s

data transfers between local systems and remote locations

with XRootD and Xcache

globus endpoint soon will be enabled



XRootD



globus

SW options

What comes pre-installed:

linux alma9, python, C++, Java, Matlab

Users bring additional software:

1. package & environment managers i.e. conda & containers (docker/podman, singularity/appteneir)

→ Environment Management, Reproducibility, Portability

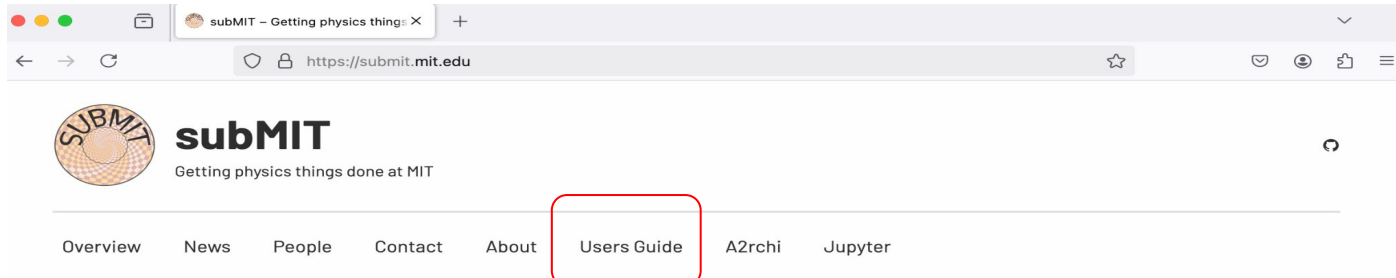
more in Marianne and Luca's tutorials this afternoon

2. CernVM File System (CVMFS)
i.e. ROOT, GEANT4, Singularity



Documentation: Users Guide, GitHub Examples

It includes a main section designed to help users get started, detailing all available resources (storage, software, batch systems, etc.) and providing several examples of workflows and tutorials to facilitate onboarding.





subMIT v1 documentation » User's Guide - subMIT next




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Tutorials and Examples

Tutorials:

- Tutorial 0: Introduction to the UNIX terminal
- Tutorial 1: Common software packages (python, Julia, MATLAB)
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- Tutorial 3: Containers (Podman and Singularity)
- Tutorial 4: Source Control (Git/Github) with Visual Studio Code (VSCode)
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- Tutorial 6: Introduction to Pytorch Lightning
- Tutorial 7: Introduction to Snakemake

Examples of scripts can be found on our [submit-examples GitHub repository.](#)

Search tool and tags

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More this afternoon

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GitHub Examples

<https://github.com/mit-submit/submit-examples>



The screenshot shows the GitHub repository interface for 'mit-submit / submit-examples'. The repository is public and has 4 watchers, 6 forks, and 6 stars. The main branch is 'main' with 5 branches and 0 tags. A table of files is displayed, showing their names, descriptions, and last update times. A 'README' section is visible at the bottom, titled 'Examples for subMIT cluster.' with some code snippets. On the right side, there are sections for 'About', 'Releases', 'Packages', 'Contributors', and 'Languages'. The 'Languages' section shows a bar chart with the following data:

Language	Percentage
Jupyter Notebook	91.2%
Python	5.5%
Shell	2.5%
Other	0.8%

The 'Suggested workflows' section shows two workflows: 'Django' (Build and Test a Django Project) and 'Publish Python'.

Chat bot

Experimental large language model application under development for interactive user support and to augment support ticket handling

