

Training Tools

Enric Tejedor for the ROOT team

ROOT Train-the-Trainers 2022
Fermilab, CERN

ROOT
Data Analysis Framework
<https://root.cern>



- ▶ The training tools used by the ROOT team have evolved quite a bit in the past few years
 - With the goal of reducing installation troubleshooting time
- ▶ Currently, our courses mainly use a combination of three strategies for students to access ROOT:
 - Local installation
 - SSH connection to remote machine
 - Online Jupyter notebook services



Local Installation

- ▶ There are multiple options to install ROOT on your machine (listed [here](#)):
 - From sources
 - From pre-compiled binaries
 - Via a package manager (conda, snap, system package managers)
- ▶ Our goal: make ROOT easier to install
- ▶ Conda is perhaps the option we advertise the most
 - Works on Linux and MacOS
 - `conda create -c conda-forge --name <my-env> root`



- ▶ SSHing into lxplus is an alternative we sometimes use
 - E.g. with summer students
 - ROOT is provided out-of-the-box (as system package and via CVMFS)
- ▶ Latency is usually ok (if student is at CERN)
 - Mostly for terminal work (ROOT prompt, macros), not web browser
 - X11 forwarding for ROOT graphics



Online Notebook Services

- ▶ We rely on a couple of online Jupyter notebook services for our courses:
 - [SWAN](#): CERN service, requires CERN username and password
 - [Binder](#): public service, anonymous sessions, a bit unreliable
- ▶ Some of our courses are notebook-only ([example](#))
 - Zero time spent on installation troubleshooting
- ▶ Limitation: not everything we teach in ROOT is supported in a Jupyter environment
 - Example: TBrowser / RBrowser