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Italiadomani PIANO NAZIONALE DI RIPRESA E RESILIENZA
INFN

CTLab4ET

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ET ITALY Einstein Telescope

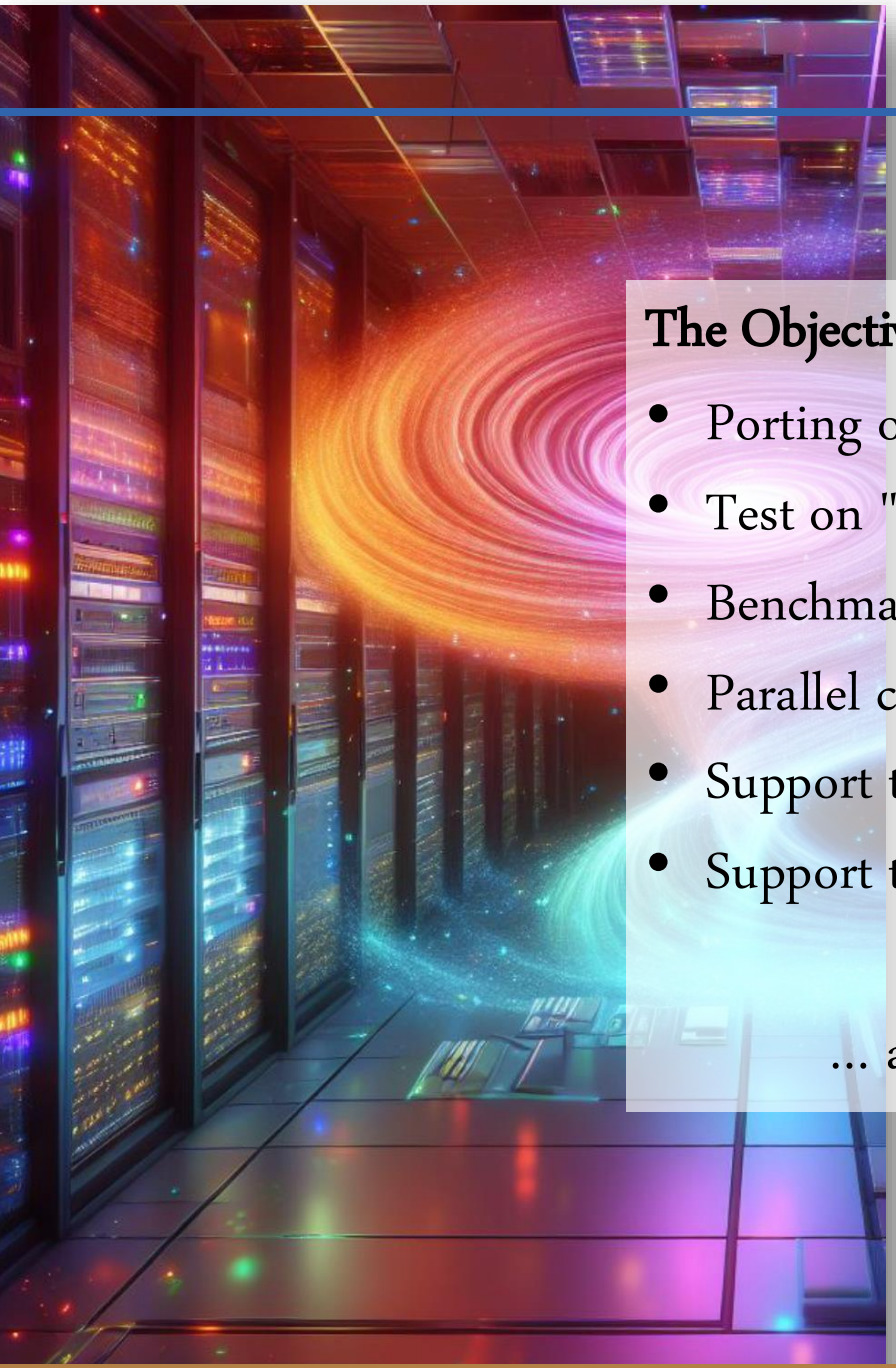
The speaker's contract is funded by the project ETIC:
Einstein Telescope Infrastructure Consortium (ETIC - IR0000004)
PNRR MISSIONE 4, COMPONENTE 2, INVESTIMENTO 3.1

Computing Technology Laboratory for ET

Funded by **ETIC: Einstein Telescope Infrastructure Consortium** (PNRR, Italian post-covid recovery plan)

Heterogeneous cluster devoted to **technology R&D activities** in computing and support to Technology Tracking, instrumental for the definition of the **Computing Model**

It will showcase many different technologies ⇨ we dubbed it TechZoo



Computing Technology Laboratory for ET

The Objectives

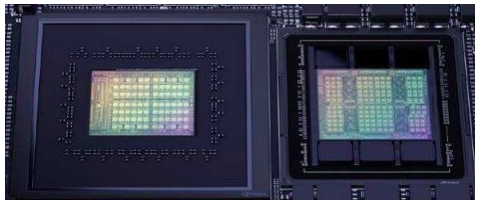
- Porting of code on architectures else than x86 (GPU, Arm…)
- Test on "unusual" configurations (large-RAM to hold large templates…)
- Benchmarking and architecture evaluation for sustainability (carbon footprint…)
- Parallel computing and HPC in a fully controlled and customizable environment
- Support to development of middleware and framework for ET
- Support to computing needs for site characterization

… and obviously for "standard" computing activities (MDC, waveform, analysis)

Hardware Resources

- 4x server Dell PowerEdge R7525, 64 CPUs
  with various GPU types:
  - 2x AMD MI100, 32GB
  - 1x NVIDIA A16, 4x16GB
  - 2x NVIDIA A5000, 24GB
  - 10 free slots

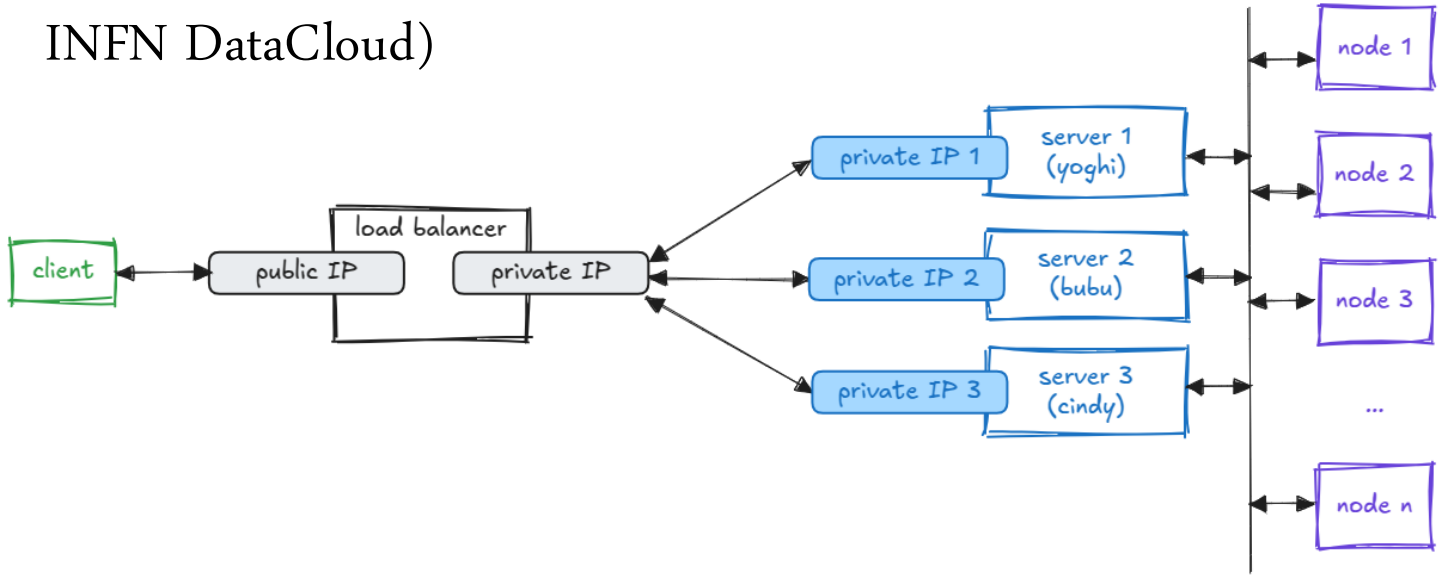
- 1x **nVidia GraceHopper** evaluation system by E4
  - CPU+GPU coherent memory model
  - 900 GB/s coherent interface NVLink–C2C



- 3x server Lenovo SR675v3, 64 CPUs
  - 1TB RAM, expandable
  - 2x NVIDIA L40S 48GB
  - free GPU slots
- Connectivity upgrade (**InfiniBand** + NVIDIA ConnectX–7 NDR 400Gb/s)

Design

- **Kubernetes** in High Availability (three master nodes)
- **Storage**
  - dedicated storage for data, provided by site
  - /home on glusterfs from machines disks
- **Authentication** via ET AAI (ongoing @CNAF)
- User **access** via Jupyter Notebooks (as a first solution)
- Possibility to use resources from the local cloud (federated with INFN DataCloud)



Discussion

What additional tool do we want/need?

- Only interactive analysis or also pipelines?
- Dask https://www.dask.org/
- VRE, from OSCARS project ETAP
- REANA https://reanahub.io/
- Snakemake https://snakemake.github.io/
- Spark https://spark.apache.org/
- Rucio https://rucio.cern.ch/
- ML tools

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Thank you