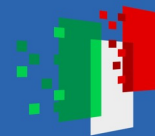




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DI RIPRESA E RESILIENZA



terabit

Impacts on research communities

Training and Exploitation (WP5)

Stefano Salon

Bologna, 25 June 2024

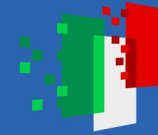
TeRABIT Conference



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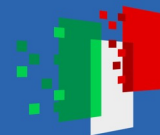


Target and plan: users training and exploitation of federated RIs

Case
studies



Enhancement of the **HPC-TRES (HPC Training and Research for Earth Sciences) network** coordinated by OGS with Cineca and the participation of research groups from CNR, INGV, CMCC, Politecnico Torino, ICTP
=> **FIRST USE CASE** proposed by OGS: **“Urgent computing for seismic risk assessment” => next presentation**



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Organization of **2 workshops** with lessons on computing technologies, discussions and practical sessions
=> **FIRST WORKSHOP TOMORROW** in Room 216 (~40 participants, including 3 from Spoke0 of ICSC)
Organization of **1 hackathon** => the TeRABIT federated services will be tested and demonstrated by use cases proposed by the participants => end of project (2025)



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Master HPC
and PhDs



Higher education: PhD and master HPC students who will become users of TeRABIT services

=> **GRANTS co-funded in agreement with Univ. Trieste, Univ. Bologna, Univ. Milano-Bicocca, Univ. Firenze, Univ. Brescia, PolitecnicoMI, PolitecnicoTO, CNR-ISAC, CNR-ISMAR, SISSA**

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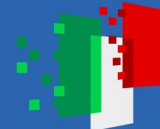


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Students



Next generations: lessons in national High Schools to present the TeRABIT project
=> **Train young researchers and technologists of the future**



Users training and exploitation plans: measuring impacts

Case studies



Key Performance Indicators (KPIs): n. of selected use cases, n. of applications deployed and tested on the Tier-1 system and on the HPC-Bubbles ecosystem, n. of applications testing federated services, results of applications performance tests, n. of relative ISCRA projects awarded and related node-hours allocated

Training of young researchers technologists



KPIs: n. of training events, n. of participants of training events, survey metrics

Master HPC and PhDs



KPIs: n. of master HPC fees awarded, n. of PhD grants awarded

Students



KPIs: n. of dissemination events (schools and other events for general public), n. of participants of workshops and hackathon, n. of accesses to the web page, social media statistics, n. of use cases presented at scientific events

Training and exploitation activities (WP5) in short

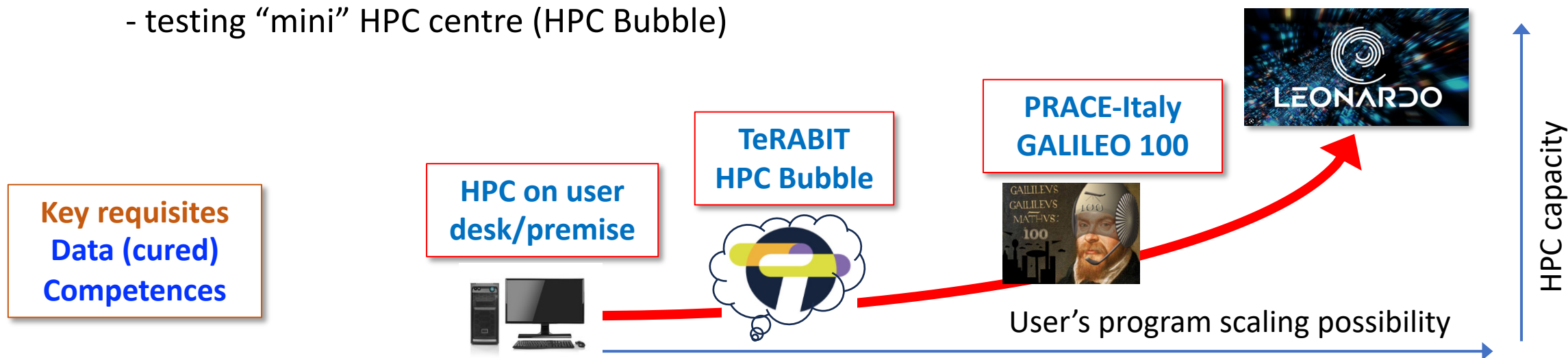
- WP5 main outcome = **demonstration of project achievements through training and exploitation activities**
- **Training activities:**
 - benefit from the vast multi-disciplinary network covered by INFN, OGS, GARR and Cineca: diversity of user requests (researchers and technologists, PhD students, Master HPC students)
- **Exploitation activities:**
 - focus on selected use cases related to pilot users' research applications to exploit new federation capabilities of TeRABIT provided through the synergy of the 3 upgraded IRs
- **Dissemination** to potential users and general public (e.g. schools) is a strategic action of WP5 plans



Planned impact of the project: the user view

A trained, unlimited, distributed access to HPC resources:

- from lab, to PRACE-Italy, to ICSC-Leonardo (EuroHPC)
- testing cloud-HPC interaction
- testing “mini” HPC centre (HPC Bubble)



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A new access mode to services: HPC, VMs, urgent computing, analytics, ML, python notebooks, data storage, user support...

- ⇒ services can be made **available and customized** according to discipline, privacy/security level, data amount, computing and or storage request...
- ⇒ PRACE-Italy and INFN users will be among the first to exploit the new services and perspective **services composition**
- ⇒ Training and dissemination **in synergy with ICSC**

The INFN Cloud services are based on modular components and span the IaaS, PaaS and SaaS models for both computing and data.

- All services are described by [TOSCA templates](#) (which can refer internally to other components such as Ansible playbooks, HELM charts, etc.).
- The services can be [deployed](#) via the INFN Cloud Dashboard or via a command line interface:
 - Automatically by the INFN Cloud Orchestrator on one of the federated Cloud infrastructures, depending on resource availability and policies.
 - Manually by a user on a specific federated Cloud infrastructure.

Service Catalogue

[Join us](#) [Login](#)

Compute Services
A list of services that enable a specific cloud technology

Analytics
A collection of ad-hoc solutions for analytic purpose

Machine Learning
List of ready-to-use Machine Learning services

Data Services
Data management and storage services

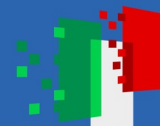
Scientific Community Customizations
Customized environments

Virtual Machine
Launch a compute node getting the IP and SSH credentials to access via ssh

Docker-compose
Run a docker compose file fetched from the specified URL

Kubernetes cluster
Deploy a single master Kubernetes 1.24 cluster

<https://www.cloud.infn.it/service-catalogue/>

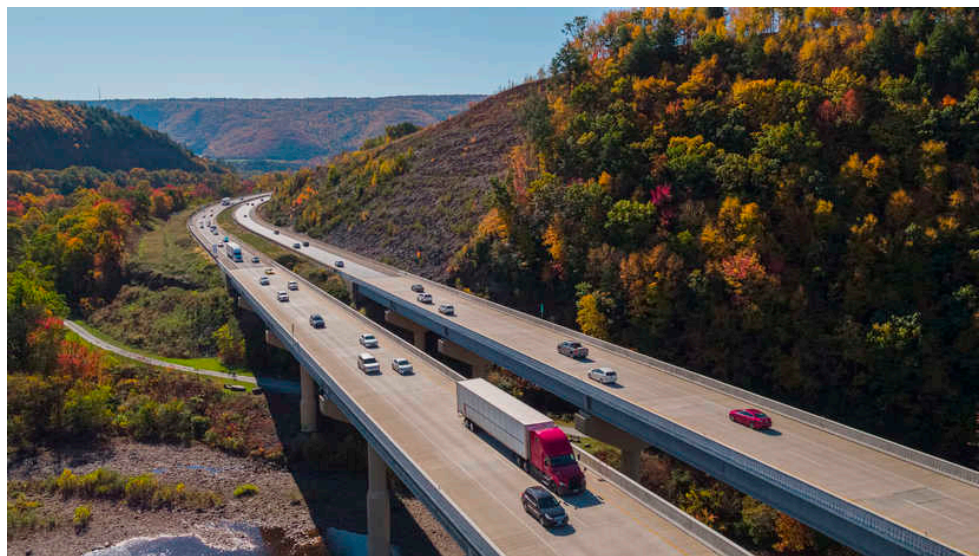


Planned impact of the project: the user view

- NOW: user logs in on PRACE-Italy Tier-1 (Galileo100) => AFTER: user will log in on the “federated marketplace” to exploit resources and services, hiding the complexity of the infrastructure behind
- TeRABIT is building up knowledge support (workshops, hackathons, training events, use cases...)
- **Project legacy:**
 - **Training and exploitation material: will remain after TeRABIT (open science)**
 - **Services built on Research Infrastructures: will remain after TeRABIT**

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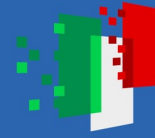


The highway is GARR-T

VANS are VMs on Cloud

BIG TRUCKS are INFN HPC Bubbles

FERRARI is Cineca HPC High-End



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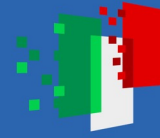
FERRARI is Cineca I



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Thanks for your attention

ssalon@ogs.it

