Grant Agreement No: 101057511

EURO-LABS

EUROpean Laboratories for Accelerator Based Science
HORIZON-INFRA-2021-SERV-01-07 Project EURO-LABS

MILESTONE REPORT

COMPLETED DATABASE CONTAINING SELECTED FEATURES OF REMOTE-ACCESS TOOLKIT

MILESTONE: MS12

Document identifier:	EURO-LABS-MS12-GSI
Due date of milestone:	End of Month 18 (February 2024)
Justification for delay:	No delay
Report release date:	29/02/2024
Work package:	WP2: Access to RI for Physics, Task 5.C1, Service Improvements, Streamlined Procedures and Remote Access
Lead beneficiary:	GSI
Document status:	Final

Abstract:

This report describes the scope and functionality of the EURO-LABS remote-access toolkit, which is in the form of a web-accessed database. The database contains information and (where applicable) documentation related to a wide variety of tools that enable (or improve) remote access to research institutions.

For more information on EURO-LABS, its partners and contributors please see https://web.infn.it/EURO-LABS/

Delivery Slip

	Name	**Partner**	**Date**
Authored by	H.M. Albers	GSI	21/02/24
	G. Benzoni	INFN Milano	21/02/24
	N. Hubbard	GSI	21/02/24
	J. Pellumaj	INFN Milano	21/02/24
Edited by	P. Dendooven	UMCG	27/02/24
	T. Kormoll	TU Dresden	27/02/24
	C. Mihai	IFIN-HH	27/02/24
Reviewed by	M. Durante [Task coordinator]	GSI	27/02/24
	A. Maj [WP coordinator]	IFJ-PAN	27/02/24
Approved by	A. Navin [Scientific coordinator]	GANIL	27/02/24

TABLE OF CONTENTS

Executive summary

This report provides the technical details and a description of the functionality of the remote-access toolkit database developed as a part of the subtask 1 in the task 5 of the Service Improvements task of WP2 in the EURO-LABS framework.

1. INTRODUCTION

Many research groups within the EURO-LABS consortium have developed remote-access infrastructures in recent years, in order to enhance and optimise experimental programmes. "Remote access" is defined, in this context, as any kind of accessibility to experimental operation from <u>outside of experimental areas,</u> i.e. of relevance to local experts and external participants. Several different aspects of remote operation can be considered, including video- and messaging-based communication platforms, beam and irradiation control, detector monitoring and other diagnostics, data acquisition (DAQ) control, data visualisation and analysis, comprehensive online documentation, online shift scheduling and more.

The main goals of the remote-access subtask (within the WP2 Service Improvements framework) are to:

i) minimise required access to experimental areas and minimise travel time for on-call experts,

ii) maximise external participation, and

iii) standardise generally-endorsed approaches and procedures,

leading to reduced load on expert resources (local and external), early problem recognition and timely intervention, and improved training opportunities of early-career researchers and inter-institutional knowledge transfer.

A web-accessed database containing information and (where applicable) documentation regarding a wide variety of remote-access tools has been developed by the partner institutions (GSI, IFIN-HH, INFN, UMCG and TU Dresden). The content of the database is based upon the results of a comprehensive survey targeting EURO-LABS research infrastructures that was carried out in early 2023, where a number of key topics of interest to the EURO-LABS community were identified. The results of the survey can be found here: https://data.192.135.24.99.myip.cloud.infn.it/s/p3WXj00P2cfD1GB under Milestone M12. A description of the database architecture and functionality can be found in Section 2.
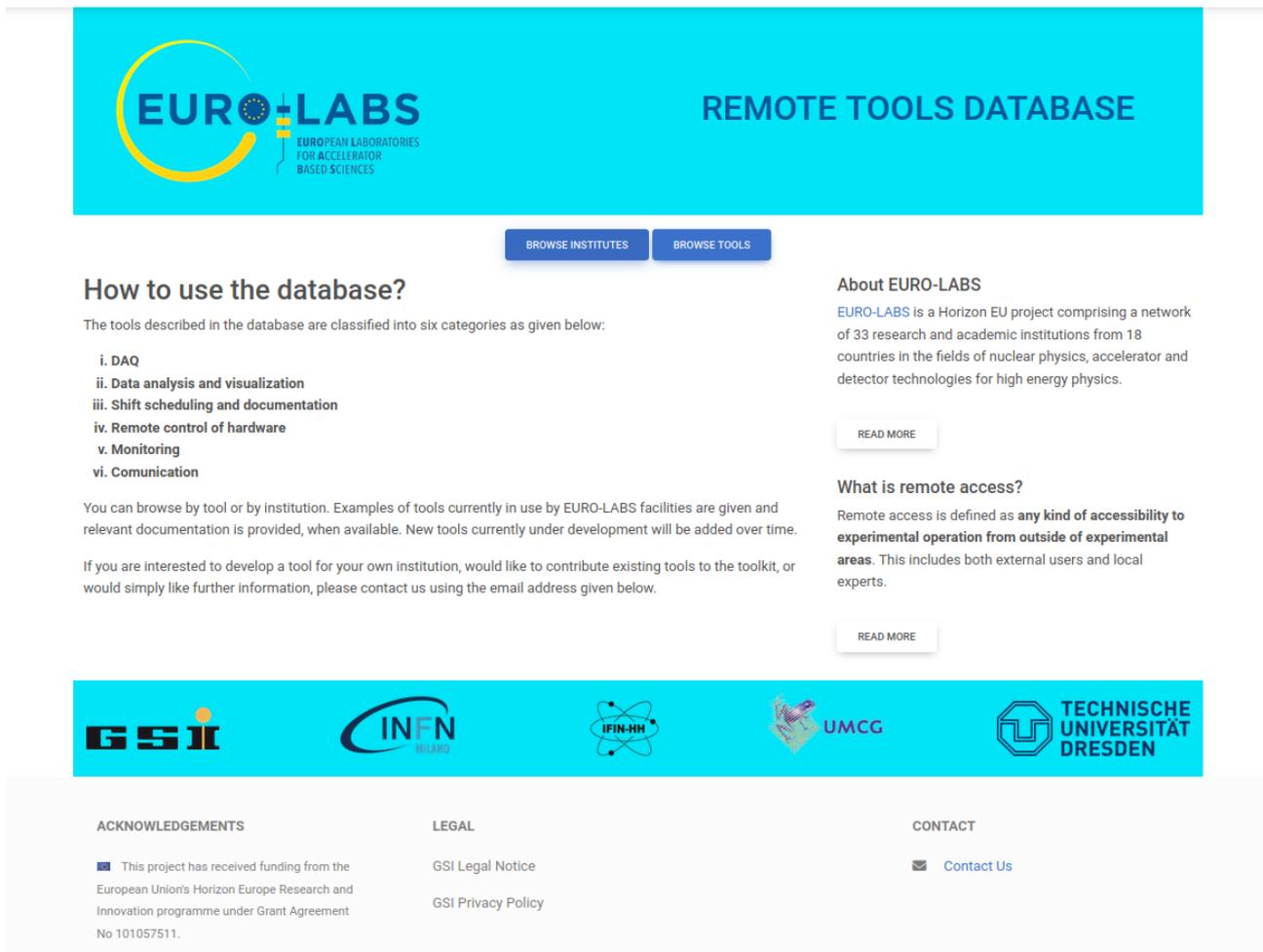
2. REMOTE-ACCESS TOOLKIT DATABASE

2.1. TECHNICAL DESCRIPTION

Information about the remote-access tools is stored in a PostgreSQL relational database [1], with cross-referenced tables allowing efficient lookup and searching of data (such as by institute or by category). This database is running on a virtual machine server hosted by the IT department of GSI, Germany. Additional resources such as PDF documents and screenshots are hosted on this server and linked to in the database. Read-only public access is provided by a Flask [2] Python web application which provides a web interface to browse and query the database.

The database is accessible via https://eurolabs-remote.gsi.de/. An image showing the website design is given in Figure 1. Technical issues, requests for information or general comments can be communicated via the email address eurolabs-remote-request@lists.infn.it. In the spirit of open science and collaboration, the database is openly accessible without any need for login. Therefore, care is taken that all information provided is open access and that the relevant licensing conditions are followed. In cases where content or documentation is sensitive or closed-access, only information on how to gain access will be provided in place of the information itself.

The database services are managed at GSI. As such, it is only readable for users. Users wishing to input information regarding existing tools at their research institutions will achieve this by contacting the general mailing address with the relevant information, which will then be inserted into the database by the local GSI service managers. Those EURO-LABS users that filled in the 2023 survey about existing tools and indicated that they consent for their contact details to be visible will be contacted during Q2 2024 for content to be added to the database.

Figure 1: Image showing the start page of the Remote Access database.

2.2 DATABASE FUNCTIONALITY

The main purposes of the database are to provide:

i) comprehensive information about existing remote-access tools,

ii) example use cases,

iii) easily-accessible documentation and user manuals,

iv) contact information for experts in the respective topics.

The tools are grouped by category (e.g. DAQ, Communication, Data visualisation and analysis, etc). A single tool can, in principle, belong to several categories. A list of categories and example tools can be seen in the table below. Example information on the tool 'Grafana' found under the category 'Monitoring' can be seen in Figure 2.

Tool Type (Category)	Example tool
Data Acquisition (DAQ)	VPN
Remote control of hardware	VNC viewer
Communication	Zoom
Data visualisation and analysis	JSROOT
Shift scheduling and documentation	E-log
Monitoring	Grafana

Information for Grafana

Tool Category
Monitoring

License
AGPLv3

Requirements
- Some requirements

Institutes Using This Tool
GSI, INFN-LNL
More information

Description

Grafana - is an open source tool which can visualize, monitor, alert on and explore time-series databases. This software can collect, correlate and visualize the data and help to enhance system performance and troubleshooting. Grafana is a web-based application, and every team members equipped with a username and password can access the database, visualize the data or customize the dashboard.

Documents
TBD

Figure 2: Example for a remote access tool Grafana under the category Monitoring.

The database can be browsed in one of two ways: by institute or by category. For example, a user interested in data visualisation would browse by category, select the corresponding entry and access which facilities are using related tools, in which way they are being used, relevant user manuals and documentation, example cases and a contact person when more information is needed. Another example is a user interested in learning which tools a specific institute is using and in what way, wherein the information would be accessible via the "browse by institute" function.

3.   SUMMARY

Users are able to access the information of interest in a highly-efficient way via the browsing features, described above and can easily find further resources (such as relevant documentation) and contact persons using this Remote access toolkit. The overall goal is the development and improvement of existing (and/or new) remote access tools at the EURO-LABS facilities, leading to an increase in beam-on-target and scientific output, as well as reducing the load on local/external experts.

4.   REFERENCES

[1] https://www.postgresql.org/

[2] https://flask.palletsprojects.com/