VRE for regional communities in Southeast Europe and the Eastern Mediterranean

Overview of VI-SEEM services

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VI-SEEM project
Service orientation
Service catalogue / portfolio
List of services
e-Infrastructure services
Data management
Flagship services
Training services
Access to the resources
Success stories
VI-SEEM project

- Provide user-friendly service oriented integrated e-Infrastructure platform for Scientific Communities in Climatology, Life Sciences, and Digital Cultural Heritage for the SEEM region; by linking compute, data, and visualization resources, as well as services, software and tools.

- Diverse computing technologies
- Advent of big data / data services
- Service orientation
Service oriented VRE

- Goal: provide an improved service provisioning for researchers within a unified Virtual Research Environment

- deliver value by facilitating outcomes end users want to achieve

- all underlying e-Infrastructure can be offered to the VRE end users via a set of well defined services
  - constructed in a way that enables the end users to achieve their requirements with minimum additional overhead in terms of service management and workflow definition

- user-friendly integrated e-Infrastructure platform for regional cross-border Scientific Communities
Service management

- underlying components for service composition, management and monitoring
- ITSM guidance to plan, design, develop, deploy and support business aligned IT Services in the federation

Key elements
- Service management system
- Service registry
- Monitoring system
- OLAs and SLAs

support the delivery of IT services
- all processes need to be successfully operating and interacting
IT Infrastructure Library (ITIL)
- descriptive framework of best practices for the delivery of the components of the IT infrastructure as a set of services to the enterprise

FitSM (federated ITSM)
- clear, pragmatic, lightweight and achievable standard that allows for effective IT service management
- version of ITSM that can cope with federated environments
- baseline level of ITSM than can act to support management interoperability in federated environments where disparate or competing organizations must cooperate to manage services
Service orientation

- Strong recommendation by the EC to have service oriented e-Infrastructures
- Introducing the services catalogue and the service portfolio
- Open implementation of the service catalogue/portfolio management system
- Highly rated by the eInfrasCentral project among other e-Infrastructure projects in EU

- Features
  - Integration with the VI-SEEM AAI
  - Read access to the service catalogue, for non-authorizes users
    - Via RESTful API
    - Via UI
  - Read access to the service portfolio, for authorized users
    - Via RESTful API
    - Via UI
  - Write access to the service portfolio, for authorized users
    - Via customized Django admin module
    - Via write UI
Service catalogue

- Service catalogue provides a service discovery and contains all project services
  - Common services and resources operated by WP3
  - Storage/data services operated by WP4
  - Application-level services provided by WP5
- Designed to be compatible with the FitSM standards

- Web interface (https://services.vi-seem.eu/)
- RESTful interface (integration with other components)
- Currently in production: 21 services grouped in 6 categories
- Fully integrated with project’s AAI
Service management – Custom UI admin
Agora API v1.0

This is a demonstration of the API documentation engine. The full Git repository is available at Agora Git where the current development version is available in the DEV branch. The current stable version is available at the MASTER branch.

Terms of service
Contact the developer
Apache 2.0

GET /api/v1/{var}/services/{search_type}/service_details/{version}/service_components/{comp_uuid}/service_component_implementation
Retrieves the list of component implementations for the selected service component.

GET /api/v1/{var}/services/{search_type}/service_details/{version}/service_components/{comp_uuid}/service_component_implementation_details
Retrieves the list of component implementation details for the selected service component implementation.

GET /api/v1/{var}/services/{search_type}/service_details/{version}/service_components/{comp_uuid}/
Retrieves the specified component for the selected service.

GET /api/v1/{var}/services/{search_type}/service_details/{version}/service_components/
Retrieves the list of components for the selected service.

GET /api/v1/{var}/services/{search_type}/service_details/{version}/service_options/sla/{sla_uuid}/sla_parameter/{sla_param_uuid}/parameter
Retrieves the service sla parameter.

GET /api/v1/{var}/services/{search_type}/service_details/{version}/service_options/sla/{sla_uuid}/
Retrieves the service sla.

GET /api/v1/{var}/services/{search_type}/service_details/{version}/service_options/
Retrieves the service options.
List of services

VI-SEEM Service Catalogue

VI-SEEM offers a broad set of generic as well as application specific services in the region of Southeastern Europe and Eastern Mediterranean, with special focus on the scientific communities of Life Sciences, Climatology and Digital Cultural Heritage. Such services are in the areas of Compute resource provisioning (HPC, Grid and Cloud), Storage and Data services provisioning, Data Set provisioning, Software and Scientific Workflow provisioning as well as Application Specific service provisioning. These services creating a unique Virtual Research Environment (VRE), thus improving research productivity and competitiveness on the pan-European level.

Data Storage

- VI-SEEM Data Discovery Service
- VI-SEEM Archival Service
- VI-SEEM Simple Storage
- VI-SEEM Repository
List of services

Application Specific

- Subtract
- ChemBioServer
- VI-SEEM Regional Community Datasets
- VI-SEEM Live Access Server
- AFMM
- VI-SEEM Scientific Application Environment
- VI-SEEM Workflow, software tools repository
- NANO-Crystal
- MC4CH (ARCHES)
- DICOM
- VI-SEEM Chere
- VI-SEEM Clowder
# List of services

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<th>Service</th>
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<td>- VI-SEEM Training</td>
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<td><strong>Compute</strong></td>
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<td>- VI-SEEM Cloud</td>
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<td><strong>Service provisioning</strong></td>
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<tr>
<td>- VI-SEEM Service Portfolio Management System</td>
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</table>
e-Infrastructure services

HPC RESOURCES
- ARIS
- Cy-Tera
- Avitohol
- PARADOX
- NIIFI SC
- Leo
- InfraGRID
- ICAM BlueGene/P

GRID RESOURCES
- Hellas Grid
- BG01-IPP
- AEGIS01-IPB-SCL
- MK-03-FINKI
- MREN01CIS
- MD-GRID
- ArmCluster
- GE-01-GRENA

CLOUD RESOURCES
- Okeanos
- CyI Cloud Facility
- Avitohol
- InfraGRID Cloud
- UPT-Cloud
- ETFBL-CC01
- MK-04-FINKI_CLOUD
- MD-Cloud
- IIAP Cloud
- IUCC InfinityCloud

STORAGE RESOURCES
- Okeanos
- CyI Cloud Facility
- Avitohol
- InfraGRID Cloud
- UPT-Cloud
- ETFBL-CC01
- MK-04-FINKI_CLOUD
- MD-Cloud
- IIAP Cloud
- IUCC InfinityCloud

10,500 VM cores
- 21,500 CPU cores
- 325,000 GP-GPU cores
- 18,500 Intel Xeon Phi cores

11 PB

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e-Infrastructure services

- Project e-Infrastructure
  - HPC sites – clusters and supercomputers (different hardware architectures)
  - Grid sites – interconnected via Grid middleware
  - Cloud sites – virtual machines (VMs) for services and distributed computing
  - Storage sites – short and long term storage
- Modern, state-of-the-art technologies for computing, virtualization and storage are made available to the scientific communities
- Overall infrastructure capacity
  - 23,744 CPU-cores, 1,012,736 GPU-cores, 20,496 Xeon Phi-cores
  - 3,112 Grid CPU-cores
  - 14,152 Cloud VM-cores
  - 18 PB of storage space
e-Infrastructure operations and resource management

Code Repository, UoBL
https://code.viseem.eu/

Helpdesk, UoBL
https://support.vi-seem.eu/

Accounting, IICT-BAS
https://accounting.vi-seem.eu/

GOCDB, UKIM
https://gocdb.vi-seem.eu/

Monitoring, GRNET/UoBL
https://mon.vi-seem.eu/

Technical Wiki, CYI
https://wiki.vi-seem.eu/

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Functions allowing for data management for selected Scientific Communities, engage the full data management lifecycle

- **VSS** – Simple Storage Service (simplestorage.vi-seem.eu)
- **VRS** – Repository Service (repo.vi-seem.eu); integrated with PID service
- **VAS** – Archival Service (deployed at 6 sites – GRNET, IPB, IICT-BAS, NIIF, IUCC, BA)
- **VLS** – Work storage space / local storage and data staging (at 12 sites)
- **VDDS** – Data Discovery Service (search.vi-seem.eu)
- **VDAS** – Data Analysis Service (hadoop.ipb.ac.rs)
- **PIDs** (handle.grnet.gr)
LS Flagship service: ChemBioServer

- ChemBioServer

A web-based pipeline for filtering, clustering and visualization of chemical compounds used in drug discovery.
Climate Flagship service: Live Access Server

- Live Access Server
  http://las.vi-seem.eu/las

A web server providing flexible access to geo-referenced scientific data, offering visualization & post-processing capabilities for climate data.
VI-SEEM Clowder

http://dchrepo.vi-seem.eu/

A Digital Culture Heritage repository which also offers integrated interactive visualization tools
Example services: application specific

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Example services: data discovery

VI-SEEM Data Discovery Service

VI-SEEM data discovery service is provided to VI-SEEM users for flexible searching for data discovery. It is based on SDN technology developed as a task in the ongoing EU项目 (https://nedat.eu) and the open-source CHAN (https://chan.org). This is a powerful data management system that provides publishing, sharing, searching and can use almost any type of data and metadata.

Request procedures

VI-SEEM Simple Storage service is accessible via https://search.vi-seem.eu/ using VI-SEEM credentials.

Service versions

1.0.0
Status: Active

Contact information

URL: http://www.grnet.gr
Email: itaboli@grnet.gr

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Example services: repository

DSpace Repository

DSpace is a digital service that collects, preserves, and distributes digital material. Repositories are important tools for preserving an organization’s legacy; they facilitate digital preservation and scholarly communication.

Communities in DSpace

Select a community to browse its collections.

VI-SEEM Climate Sciences [14]
The VI-SEEM Climate Sciences Community

VI-SEEM Digital Cultural Heritage [5]
The VI-SEEM Digital Cultural Heritage Community

VI-SEEM Life Sciences [9]
The VI-SEEM Life Sciences Community

VI-SEEM Project Community [7]
The VI-SEEM Project Community

Recently Added

Request procedures

Click access the VI-SEEM Repository by using your VI-SEEM Credentials.

Service versions

1.0

Status: Active

Features

This section provides a high level description of the usage of the VI-SEEM repository tailored to the needs of the VI-SEEM project and communities. The VI-SEEM repository identifies three main user roles:  
- The Submitter or Contributor: Submitters are members of the VI-SEEM community that are offering data for storage to the...
Training services

- VI-SEEM Training Portal
- Access via: https://training.vi-seem.eu/
  - Storage services
  - Domain-specific software and tools
    - Climate
    - Digital Cultural Heritage
    - Life Sciences
  - HPC
  - Cloud
  - Data
  - Grid
  - Scientific visualization

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Access to the resources

- Defined the framework for accessing VI-SEEM services and resources
- Opened up the VRE to the widest possible regional communities
- Uses a fair, transparent and trusted mechanism for allocation of VRE resources
- Facilitates access and deployment of new applications in the VRE
- 4 calls envisaged
- 40+ applications have been allocated resources
- 23 applicants, 21 accepted on the 1st call
  - 14M CPU core hours, 3.4M GPU core hours, 1M Phi core hours provided
- 18 applicants, 18 accepted on the 2nd call
  - 14 services already available to the users community
  - 15 million CPU core hours, 370 million GPU core hours and 15 million Phi core hours available
- Third call recently finished evaluation, with 22 received applications
- 14 success stories published resulting from these open calls
- Open call for the SMEs access to the project’s infrastructure and services
VERIFICATION OF THE SYNTHESIZED MOLECULES BY MOLECULAR DYNAMIC SIMULATIONS

17 new and previously unknown molecules were synthetized, which are based on the existence of enol carbonate structural units. Specified unit is a common structural motive of many natural products and physiologically active compounds, which makes molecules suitable and interesting for further analysis. After structural analysis and determination of precise layout of all the atoms in space, molecule was converted into standard chemical format, visualized and prepared for computer simulations.
DREAMCLIMATE DREAM TEAM
Using the DREAMCLIMATE service at PARADOX cluster, IPB team successfully produced a dataset with aerosol optical thickness and surface dust concentration for the period of one year. The model integration area covers wide North Africa, Southern Europe and Middle East regions in 30 km horizontal resolution with 28 vertical levels.
BANATICA VIRTUAL LIBRARY: MAKING OLD PRINTS WIDELY AVAILABLE AND MACHINE PROCESSABLE

Leveraging DCH platform setup in VI-SEEM, this collection was published in five datasets with more than 1000 bibliographic descriptions and 200 full-text scanned books.
Integration

- Future integration with other e-Infrastructures
  - Currently working on integrating it within the e-InfraCentral catalog
- Compatibility of the service catalog
  - Based on standards
- Offering of the services through common service catalogue
  - Integration via open API
- Broadening the user base
  - Increase the visibility in and out of the region
- Sustainability of the regional infrastructure as part of the EOSC
https://vi-seem.eu

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VI-SEEM

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