



FENIX

RESEARCH INFRASTRUCTURE

FURMS

Fenix User and Resource Management Service

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2020 research and innovation programme under the grant agreement No 800858.

www.fenix-ri.eu

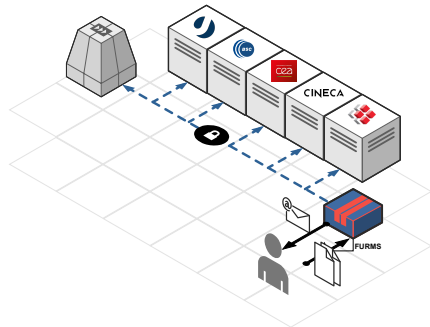
Overview

- Introduction
- Status of development
 - FURMS
 - site-local agent
- Site-local agent
- Deployment
- Roles
 - User
 - Fenix administrator
 - Project administrator
 - Site administrator
 - Site staff
- Commandline interface
- Example workflows

Introduction

Fenix **U**ser and **R**esource **M**anagement **S**ervice

- One-stop-shop for users and administrators of the federated infrastructure
 - Manage community and project membership
 - Manage resource allocations for communities and projects
 - SSH key management
 - Policy documents incl. paper-based workflows
- Accounting
 - Ingest accounting information from sites
 - Visualize consumed budgets
- Logic
 - Budget notifications
 - Site integration



Stakeholders

Community

- A (virtual) organization of scientists that is entitled to use a given fraction of resource available within the Fenix infrastructure
- Initially HBP (25%) and PRACE (15%)

Project

- Communities create projects to which they allocate resources at their own discretion
- Peer-review process should be established

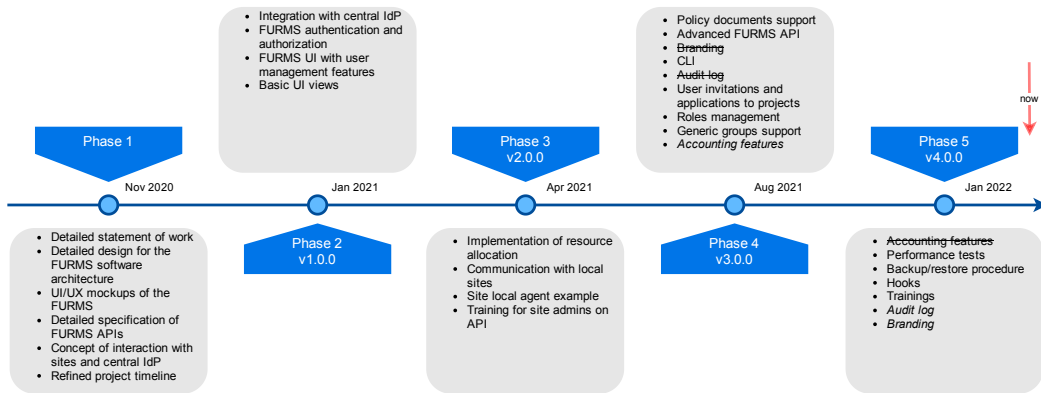
User

- Users are associated with communities and projects
- Privileged users will have special permissions to manage the Fenix infrastructure

Site

- 5 initial sites: BSC, CEA, CINECA, CSCS, JUELICH
- Sites contribute their resources to Fenix
- Accounting information for consumed Fenix credits sent to FURMS

Status and timeline



Site-local agent

- Disparate user and resource management at each site, grown over many years and very specific
 - Requires a mapping at each local site
 - Each site is responsible to implement their own agent
 - Template agent has been provided by developer of FURMS solution
 - New sites will have to implement their own agent as part of the onboarding process
- Status
 - BSC → *production*
 - CEA → development
 - CINECA → pre-production
 - CSCS → *production*
 - JSC → pre-production

Site-local agent

Actions and communication

Actions

- 1 Project provisioning and deprovisioning
- 2 User suspension
- 3 SSH key provisioning and deprovisioning
- 4 Adding and removing users to and from projects
- 5 Resource allocation to projects
- 6 Granting users access to allocations

- 7 Reporting resource consumption (accounting)
- 8 Policy acceptance
- 9 Ping agent

Communication




- Message broker (RabbitMQ)
- Dedicated queues per site
- Broker permissions set to prevent interference with other sites

Asynchronous communication

- message exchanges trigger potentially long-running operations
- communication can be triggered by either party
- polling may be inappropriate
 - causing unnecessary load
 - no timely propagation of information
- unfit for synchronous request/response patterns
- messaging based approach
 - supported by `messageCorrelationId`
 - immediate responses or acknowledgements
 - protocol versioning supported

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	Operation type	Status ▾	Sent at ▾	Acknowledged at ▾	Retry amount ▾	Actions
	> Ping	waiting for reception	2022-09-29 14:54		0	 

Deployment

Deployed in two separate environments

Staging environment

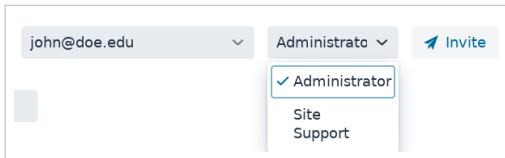
- development and integration testing
- 1 central instance for all sites and site-local agent developers
- +1 instance per site and site-local agent developers
- easy to revert baseline state per site (useful for development)
- connected to Fenix AAI acceptance environment

Production environment

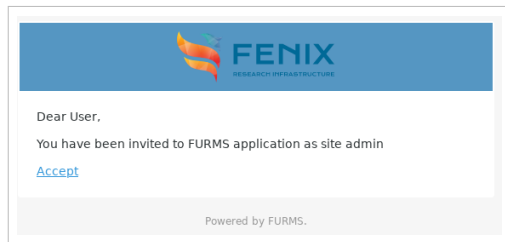
- RabbitMQ: secure connection and only accessible from participating sites' IP ranges
- Hosted in highly-available VMWare cluster at JSC
- connected to Fenix AAI
- 4 daily backups
- <https://furms.fz-juelich.de/>

User onboarding

- Invitations to users can be sent by email
- Users can login using an account from any of the participating sites
- Users already known to the system can typically be found within the same context



A user invitation form with a text input field containing 'john@doe.edu', a dropdown menu showing 'Administrator' with a checkmark, and an 'Invite' button with a right-pointing arrow.



User interface

Generic layout

The screenshot displays the FENIX user interface. The top header features the FENIX logo on the left and a 'View' button on the right. The left sidebar contains navigation links: 'Dashboard' (highlighted), 'Sites', 'Communities', 'Audit Log', and 'Fenix administrators'. The main content area is titled 'Dashboard' and 'Overview of credits provided by sites'. It includes two filter checkboxes: 'include fully distributed' and 'include expired'. Below the filters is a table with columns: Site, Name, Credit, Distributed, Remaining, Created, Valid from, and Va. The table contains four rows of data for CSCS sites. The right sidebar shows a user menu for 'Fenix admin' with a dropdown list of roles: BSC admin, CEA admin, CSCS admin, JSC admin, and a section for 'Communities' (Acceptance Tests admin, CSCS-testing admin) and 'Projects' (AT3-A-1 admin, AT3-C-9 admin, prj307 admin, TestP22 admin). A 'User settings' link is at the bottom of the menu. A notification bell icon with a red badge is also present.

Dashboard

Overview of credits provided by sites

☐ include fully distributed

☐ include expired

Site	Name	Credit	Distributed	Remaining	Created	Valid from	Va
CSCS	resource2-credit1	1000000	0	1000000	2021-10-20	2021-10-20	20
CSCS	mycredit1	222222	0	222222	2021-10-26	2021-10-26	20
CSCS	rescredit-1	1000000	0	1000000	2021-10-27	2021-10-27	20
CSCS	resource1-credit2	800000	0	800000	2021-10-20	2021-10-20	20

Communities

Acceptance Tests admin

CSCS-testing admin

Projects

AT3-A-1 admin

AT3-C-9 admin

prj307 admin

TestP22 admin

User settings



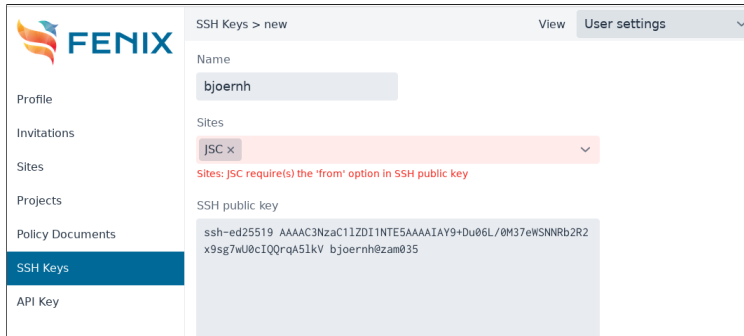
ROLES AND RESPONSIBILITIES

Roles and responsibilities

Overview

- Users (all)
 - Register
 - Apply for community or project roles
 - Confirm compliance with infrastructures and site rules
 - SSH key management
- Fenix administrator
 - Setup communities
 - Grant permissions to community managers
- Community administrator
 - Setup projects
 - Grant permissions to project managers
- Project administrator
 - Grant permissions to project users
- Site administrators
 - Policy documents
 - Services
 - Resources
 - Other site administrators
 - Settings
- Site support
 - Record policy acceptance in paper-based policy workflow

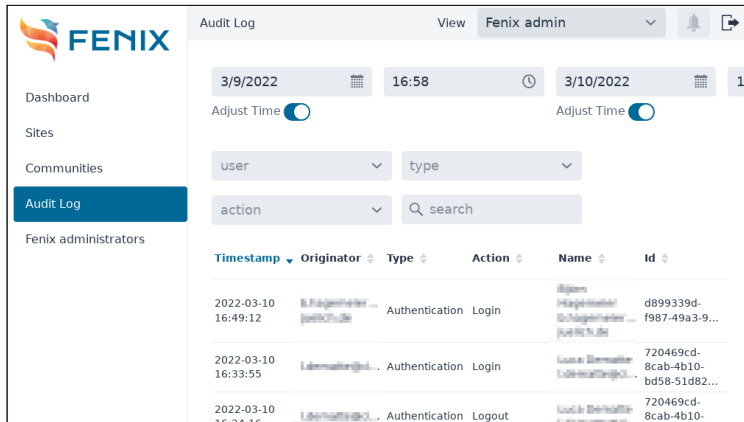
User



The screenshot shows the FENIX user interface. On the left is a sidebar with the FENIX logo and a list of navigation items: Profile, Invitations, Sites, Projects, Policy Documents, SSH Keys (highlighted in blue), and API Key. The main content area is titled 'SSH Keys > new' and has tabs for 'View' and 'User settings'. The 'User settings' tab is active. It contains a 'Name' field with the value 'bjoernh'. Below it is a 'Sites' dropdown menu with 'JSC x' selected. A red error message below the dropdown reads: 'Sites: JSC require(s) the 'from' option in SSH public key'. At the bottom is an 'SSH public key' text area containing the text: 'ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAIAY9+Du06L/0M37eWSNNRb2R2x9sg7wU0cIQqrqA51kV bjoernh@zam035'.

- Invitations
- Site connection info
- Projects
- Policies
- SSH keys
- API key (really useful only for administrators)

Fenix administrator

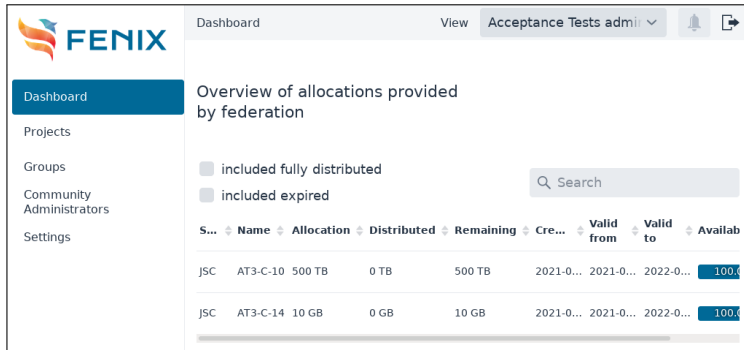


The screenshot displays the Fenix administrator interface. On the left is a sidebar with navigation links: Dashboard, Sites, Communities, Audit Log (highlighted), and Fenix administrators. The main content area is titled 'Audit Log' and includes a 'View' dropdown set to 'Fenix admin'. It features filters for date (3/9/2022 to 3/10/2022), time (16:58), and 'Adjust Time' toggle switches. There are also dropdowns for 'user' and 'type', and an 'action' dropdown with a search bar. Below these filters is a table of audit log entries.

Timestamp	Originator	Type	Action	Name	Id
2022-03-10 16:49:12	B. Rajan...	Authentication	Login	B. Rajan...	d899339d-f987-49a3-9...
2022-03-10 16:33:55	L. B. ...	Authentication	Login	L. B. ...	720469cd-8cab-4b10-bd58-51d82...
2022-03-10 16:34:16	L. B. ...	Authentication	Logout	L. B. ...	720469cd-8cab-4b10-

- allocate resources to communities
- manage sites, communities, and federation
- access to audit log

Community administrator



The screenshot shows the FENIX Community Administrator interface. On the left is a sidebar with navigation links: Dashboard (selected), Projects, Groups, Community Administrators, and Settings. The main content area is titled 'Overview of allocations provided by federation'. It includes two filter checkboxes: 'included fully distributed' and 'included expired'. A search bar is present. Below the filters is a table with columns: S..., Name, Allocation, Distributed, Remaining, Cre..., Valid from, Valid to, and Availab. The table contains two rows of allocation data.

S...	Name	Allocation	Distributed	Remaining	Cre...	Valid from	Valid to	Availab
JSC	AT3-C-10	500 TB	0 TB	500 TB	2021-0...	2021-0...	2022-0...	100.0
JSC	AT3-C-14	10 GB	0 GB	10 GB	2021-0...	2021-0...	2022-0...	100.0

- manage projects and groups
- resource allocation

Groups

FENIX

Dashboard

Projects

Groups

Community Administrators

Settings

Groups > data-curators > Members View HBP admin

data-curators members

+ Add

search

Name ▲	Email ↕	Member since ↕	Actions
Björn Hagemeyer	b.hagemeyer@hbp.it	2022-10-18 14:18:19	

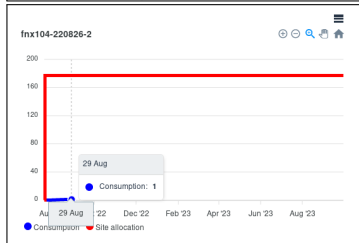
- intended for cross-project groups
- no allocation of resources, but potential access to services
- currently no use-case realized

Project administrator



The screenshot shows the FENIX web interface for Resource Allocations. The left sidebar contains navigation links: Users, Sites, Resource Access, Resource Allocations (highlighted), Alarms, Project Administrators, and Settings. The main content area is titled 'Resource Allocations' and includes a 'View' dropdown set to 'AT3-A-1 admin'. Below the title is a table of resource allocations.

Site	Name	Resource Type	Amount	Consumed	Remain...	Status	Consump...	Actions
✓ JSC	AT3-C-16	AT3-B-5	400 TB	0 TB	400 TB	Installed		
Site allocation		Received on	Valid from		Valid to			
200.0 TB		2021-07-23 17:41:32	2021-07-23 00:00:00		2021-07-23 11:59:59			
200.0 TB		2021-07-23 17:41:32	2021-07-23 11:59:59		2021-07-23 23:59:59			



- view allocations and consumption
- alarm management
- further administrators
- user and access management

Site administrator



Policy Documents

Services

Resource Types

Resource Credits

Site connection

Site Administrators

Settings

Resource Credits

View JSC admin



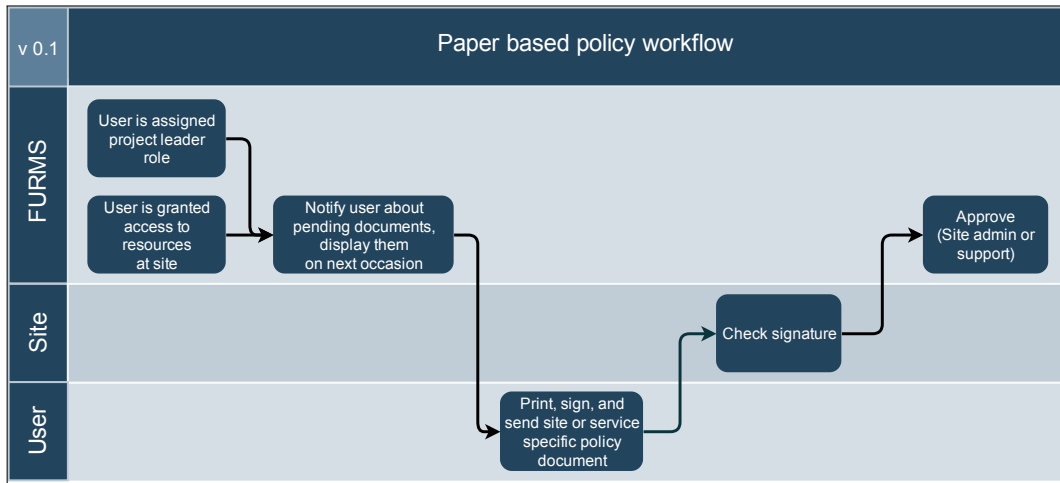
Resource Credits

 Add

Name	Identifier	Resource Type	Credit	Distrib...	Remain...	Created	Valid for
AT-4-A-2	df12fa10-6... be04- e5188abb...	VMs	500	500	0	2021-10-15	202
AT3-B-5	17069bd8-... 47ec-af8c- c35b3022...	AT3-B-5	600 TB	600 TB	0 TB	2021-07-23	202
AT3-C-10	fe8498f4- f16a-4b7c- 8f04-094c...	AT3-B-5	500 TB	500 TB	0 TB	2021-07-23	202
AT3-C-14	d7842e09- fc89-4bf2-...	AC3-C-14	10 GB	10 GB	0 GB	2021-07-23	202
AT3-C-2	11df7b4d- 9ddb-4e34- a87c-86d6...	AT3-C-2	50 s	50 s	0 s	2021-08-25	202

- define and register available resources and services
- manage policy documents linked to site and services
- test agent connection
- general settings

Site support

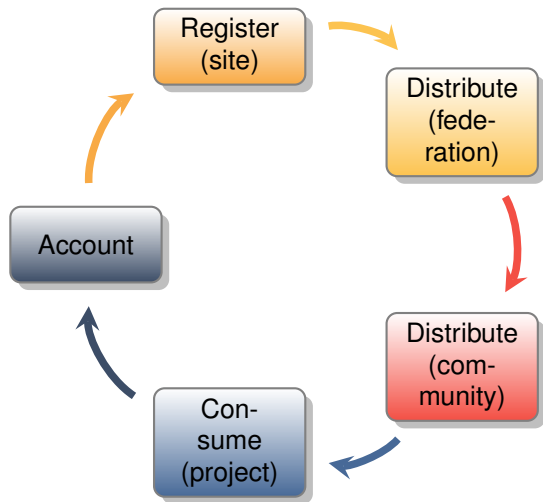




FLOW OF EVENTS (EXAMPLES)

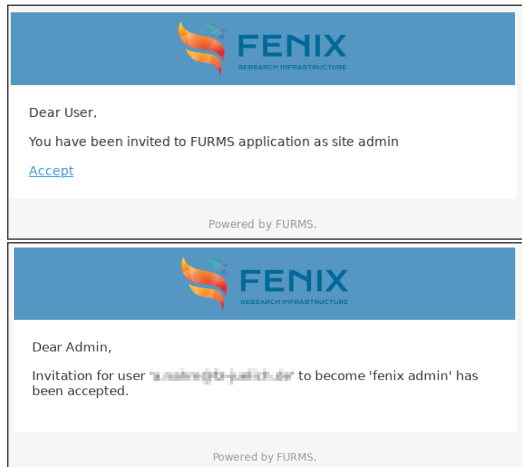
Resource allocation

- 1 sites register resources
- 2 Fenix distributes resources to communities
- 3 communities split resources among their projects after peer review
- 4 users consume resources of their respective projects at sites
- 5 sites send accounting information to Fenix



User invitation

- 1 administrator invites a user (via email)
- 2 user responds by following temporary link
 - optional registration
 - registered users also receive notification in web interface
 - accept invitation
- 3 administrator is notified about successful invitation



Project provisioning

Definition

- **FURMS project:** project at federation level, may or may not have an expression at sites
- **local project:** project at site instantiated from FURMS project

Site resources added to project:

- notification of site
- if existing local project
 - 1 add resources to local project
- if new local project
 - 1 create local project
 - 2 add resources to project
 - 3 add users of FURMS project to local project according to resource access

CLI

- a CLI is available to access the REST API
- authentication through user id and API key
- predominantly for admin access

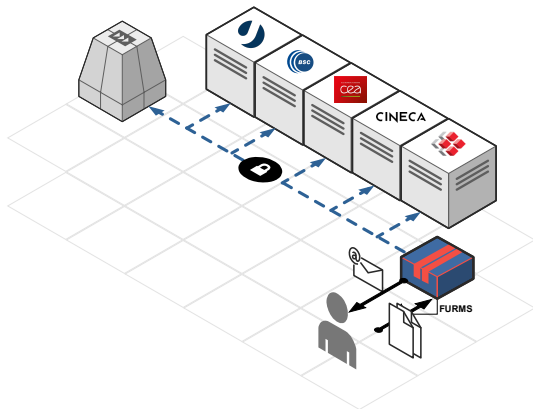
```
$ furms site show
↪ cee47020-d6d5-4b25-ab68-78642f1bc428
{
  "id" :
  ↪ "cee47020-d6d5-4b25-ab68-78642f1bc428",
  "name" : "JSC",
  "sitePolicyId" : null,
  "resourceCredits" : [ ],
  "resourceTypes" : [ ],
  "services" : [ ],
  "policies" : [ ]
}
```



SUMMARY

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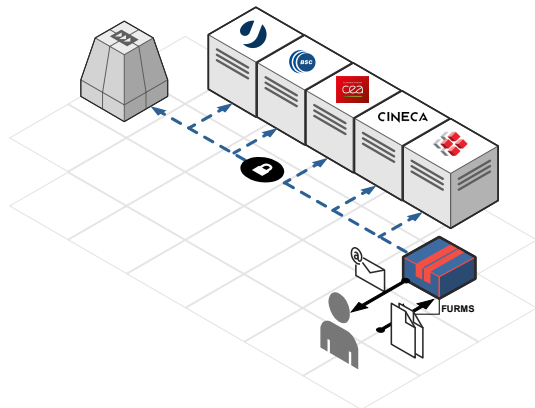


Pointers

- FURMS: <https://furms.fz-juelich.de/>
- Documentation: <https://unity-idm.github.io/furms/>

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THANK YOU