



FENIX

RESEARCH INFRASTRUCTURE

ICEI services and equipment

HBP summit 2021

Thomas Leibovici (CEA) – October 12, 2021



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Fenix Services

■ Scalable Computing Services

- Massively parallel HPC systems - **supercomputers** - that are suitable for highly parallel brain simulations or for high-throughput data analysis tasks

■ Interactive Computing Services

- Quick access to single compute servers to **analyse and visualise data interactively**, or to **connect to running simulations** on supercomputers

■ Virtual Machine (VM) Services

- Service for **deploying VMs** in a **stable and controlled environment**, e.g. platform services like the HBP Collaboratory

■ Active Data Repositories

- **Site-local** data repositories for **storing temporary** slave replicas of large data sets

■ Archival Data Repositories

- **Federated data store** for **long-term storage** and sharing of large data sets

Available services per site

Provided services	BSC	CEA	CINECA	CSCS	JSC
Scalable Compute Services		✓	✓	✓	✓
Interactive Compute Services	✓	✓	✓	✓	✓
Active Data Repositories	✓	✓	✓	✓	✓
Archival Data Repositories	✓	✓	✓	✓	
Virtual Machine Service	✓	✓	✓	✓	✓

Scalable computing : 785 compute nodes

Site	Provisioned ICEI resources	Details
CSCS (CH)	250 nodes	CPUs: 2 x 18 cores @ 2.1GHz (Intel Xeon) Memory per node: 64 to 128GB Interconnect configuration: Cray Aries
JSC (DE)	195 nodes*	CPUs : 2 x 64 cores @2.2GHz (AMD EPYC Rome) GPU : NVidia V100 – 16GB mem Memory per node: 256GB Local storage: NVMe 960GB Interconnect HDR100
CINECA (IT)	340 nodes	CPUs: 2 x 24 cores @2.4GHz (Intel CascadeLake) Memory per node: 384GB Local storage: 480GB SSD

Interactive computing : 654 nodes

Site	Provisioned ICEI resources	Détails
CSCS (CH)	400 nodes	<p>CPUs : Intel Xeon 12 cores @2.6 Ghz GPU Nvidia Tesla P100 – 16GB mem Memory per node: 64 GB Interconnect configuration: Cray Aries</p>
JSC (DE)	5 nodes* *usable as SCC	<p>CPUs : 2 x 64 cores @2.2GHz (AMD EPYC Rome) GPU : NVidia V100 – 16GB mem Memory per node: 256GB Local storage: NVMe 960GB Infiniband HDR100 interconnect</p>
CEA (FR)	32 nodes	<p>CPUs : 2x 18 cores @2.6GHz GPU: Nvidia V100 – 32GB mem Memory per node : 384GB 2 nodes with extra large memory : 3 072GB, 4 CPUs, 1 GPU. Infiniband HDR100 interconnect</p>
CINECA (IT)	214 nodes	<p>CPUs : 2x 24 cores @2.4GHz (Intel CascadeLake) 34 nodes with 2x NVIDIA GPU V100 Memory per node: 384 GB Local disks: 2 TB SSD</p>
BSC (ES)	3 nodes	<p>IBM Power System AC922 System 2x IBM POWER9 16-core 2.6GHz Memory 1024 GB DDR4 2x NVIDIA Tesla V100 SXM2 16GB Accelerator 2x 960 GB SSD Disks</p>

Virtual Machines Service : 221 servers

Site	Provisioned ICEI resources	Description
CSCS (CH)	35 servers	CPU: 2 x 14 cores (Intel) RAM: 512 GB ----- or ----- CPU: 2 x 8 cores @3.2GHz (Intel) RAM: 768 GB
JSC (DE)	5 servers	CPU: 2x 64 cores @2.2GHz (AMD EPYC ROME) Memory: 256 GBytes GPU (some nodes): NVidia V100 – 16GB Local storage: 960 GBytes NVMe Interconnect: Ethernet 40Gb
BSC (ES)	84 servers* *usable as SCC	CPU: 2x 8 cores @2.6GHz (Intel) Memory 32GB
CEA (FR)	20 servers	CPU: 2 x 18 cores @ 2.6GHz (Intel) Memory : 192GB
CINECA (IT)	77 servers	CPU: 2x 24 cores @2.4GHz (Intel) Memory : 768 GB Local storage : 2 TB SSD

Archival data repository: 34.5 PetaBytes

Site	Provisioned ICEI resources	Description
CSCS (CH)	4000 TBytes	Stores POSIX and Object, including backup on Tape library (2x).
CEA (FR)	7500 TBytes+	Lustre filesystem with HPSS storage backend on tapes.
CEA (FR)	7000 TBytes	OpenIO object store with Swift interface
CINECA (IT)	10 000 TBytes	Object storage with Swift/S3 interface
BSC (ES)	6 000 TBytes	

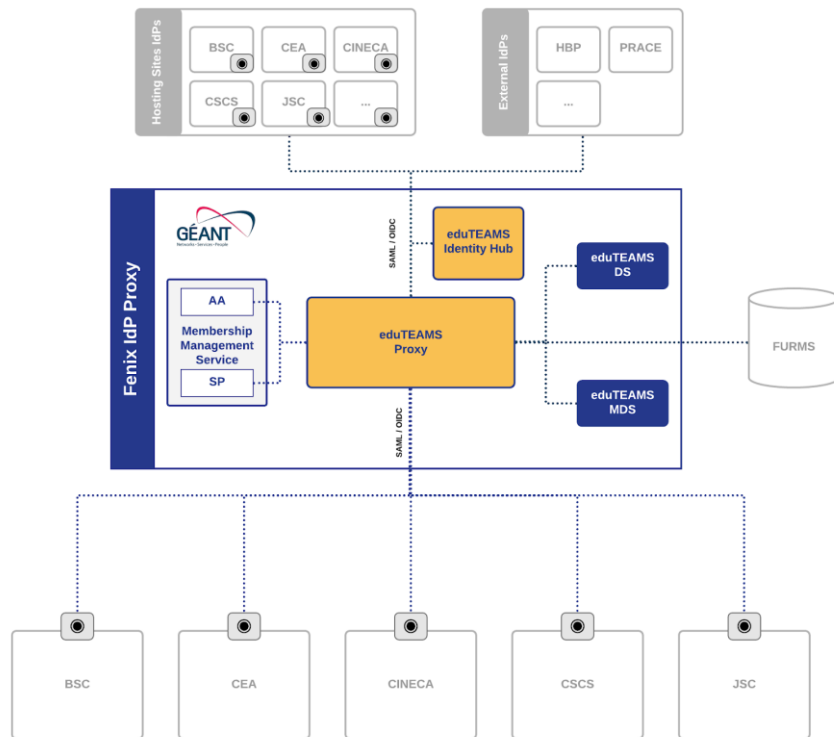
Active data repository: 17.1 PetaBytes

Site	Provisioned ICEI resources	Description
CSCS (CH)	80 TBytes	Non-Volatile Memory
JSC (DE)	2 000 TBytes	Flash-based data cache based on DDN's IME technology
CEA (FR)	3 500 TBytes	Lustre filesystem
CEA (FR)	970 TBytes	Full-flash Lustre filesystem
CINECA (IT)	10 500 TBytes	Storage for hot data (w DDN IME) accessed from SCC, IAC and VM services
BSC (ES)	70 TBytes	GPFS Storage accessed from HPC clusters

Federation services

Fenix Central Proxy (IdP)

- Common authentication mechanism to access ICEI resources



Choose Your Identity Provider

Examples: Science Institute, Lee@uni.edu, UCLA

CINECA - Cineca Supercomputing Center
fenix-ri.eu

CSCS - Swiss National Supercomputing ...
fenix-ri.eu

CEA - French Alternative Energies and A...
fenix-ri.eu

BSC - Barcelona Super Computing Center
fenix-ri.eu

FZJ - JSC - Juelich Supercomputing Ce...
fenix-ri.eu

Federated User and Resource Management Service (FURMS)

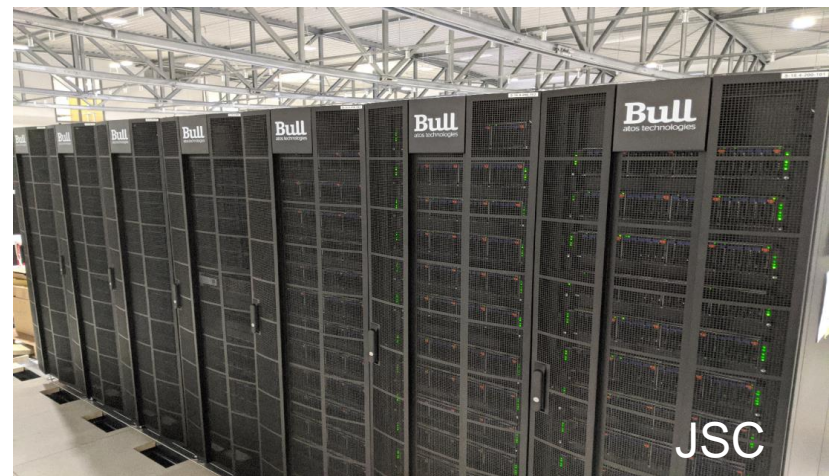
- Group/budgets membership management
- Authorization attributes provider
- SSH public keys management
- Managing site specific Usage Agreements
- Reporting and metering

→ Information on **available resources** is published on the Fenix website: <https://fenix-ri.eu/infrastructure/resources>

→ All details on **access to Fenix resources**:
<https://fenix-ri.eu/access>



CSCS



JSC



CEA



BSC



CINECA



Thank you for you attention!