DEISA infrastructure

Distributed European Infrastructure for Supercomputing Applications

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DEISA

Distributed European Infrastructure for Supercomputing Applications

- DEISA (Distributed European Infrastructure for Supercomputer Applications) is an EU funded project.
- *Objective is to enable Europe's terascale science by the integration of Europe's most powerful supercomputing systems.*
- DEISA is an European Supercomputing Service built on top of existing national services. This service is based on the deployment and operation of a persistent, production quality, distributed supercomputing environment with continental scope.
- Main focus is High Performance Computing (HPC).
- DEISA services are deployed on top of a dedicated high speed network infrastructure connecting computing platforms, using selected middleware. Their primordial objective is enabling capability computing across remote computing platforms and data repositories.

THE DEISA SUPERCOMPUTING GRID

Distributed European Infrastructure for Supercomputing Applications

AIX distributed super-cluster

Vector systems (NEC, …)

Linux systems (SGI, IBM, …)

GEANT

Participating Sites

Distributed European Infrastructure for Supercomputing Applications

BSC	***Barcelona Supercomputing Centre***	**Spain**
CINECA	***Consortio Interuniversitario per il Calcolo Automatico***	**Italy**
CSC	***Finnish Information Technology Centre for Science***	**Finland**
EPCC/HPCx	***University of Edinburgh and CCLRC***	**UK**
ECMWF	***European Centre for Medium-Range Weather Forecast***	**UK (int)**
FZJ	***Research Centre Juelich***	**Germany**
HLRS	***High Performance Computing Centre Stuttgart***	**Germany**
IDRIS	***Institut du Développement et des Ressources en Informatique Scientifique - CNRS***	**France**
LRZ	***Leibniz Rechenzentrum Munich***	**Germany**
RZG	***Rechenzentrum Garching of the Max Planck Society***	**Germany**
SARA	***Dutch National High Performance Computing and Networking centre***	**The Netherlands**

Basic services: high performance remote I/O and file transfer

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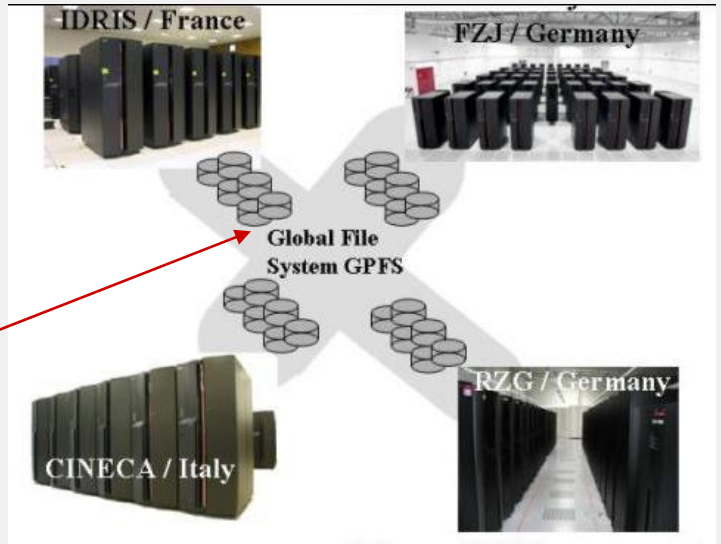


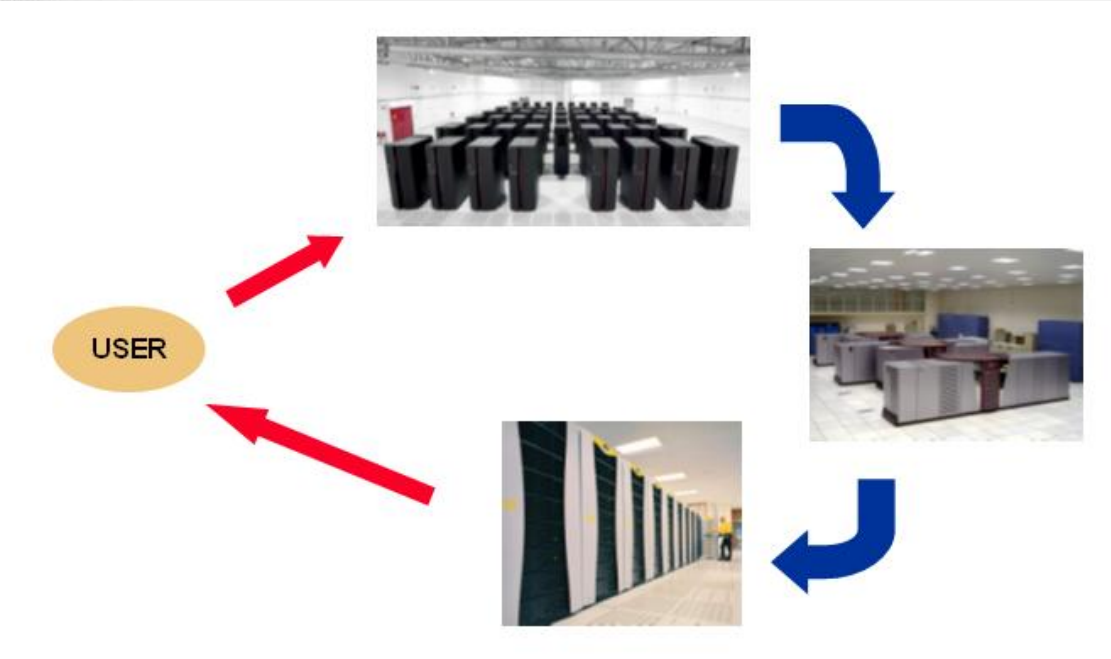
Remote I/O with global file systems implicitly moves data across platforms (in production today)

DATA REPOSITORY

DEISA will also deploy explicit high performance data movers, using GridFTP

GridFTP

Basic services: workflow simulations using UNICORE



UNICORE supports complex simulations that are pipelined over several heterogeneous platforms (workflows).

UNICORE handles workflows as a unique job and transparently moves the output – input data along the pipeline.

UNICORE clients that monitor the application can run in laptops.

UNICORE has a user friendly graphical interface. DEISA has developed a command line interface for UNICORE.

Enabling science

- **Promotion of DEISA users is done via the Extreme Computing Initiative.**
- **European call for proposals for grand challenge simulations every year in May since 2005.**
- **About 50 grand challenge projects supported each year since 2005.**
- **Results of one of the the projects, POLYRES, featured as cover story of Nature, May 24, 2007**
- **Full information about Extreme Computing projects and reports from completed projects can be found in the DEISA Web server: www.deisa.org**

DEISA accounting

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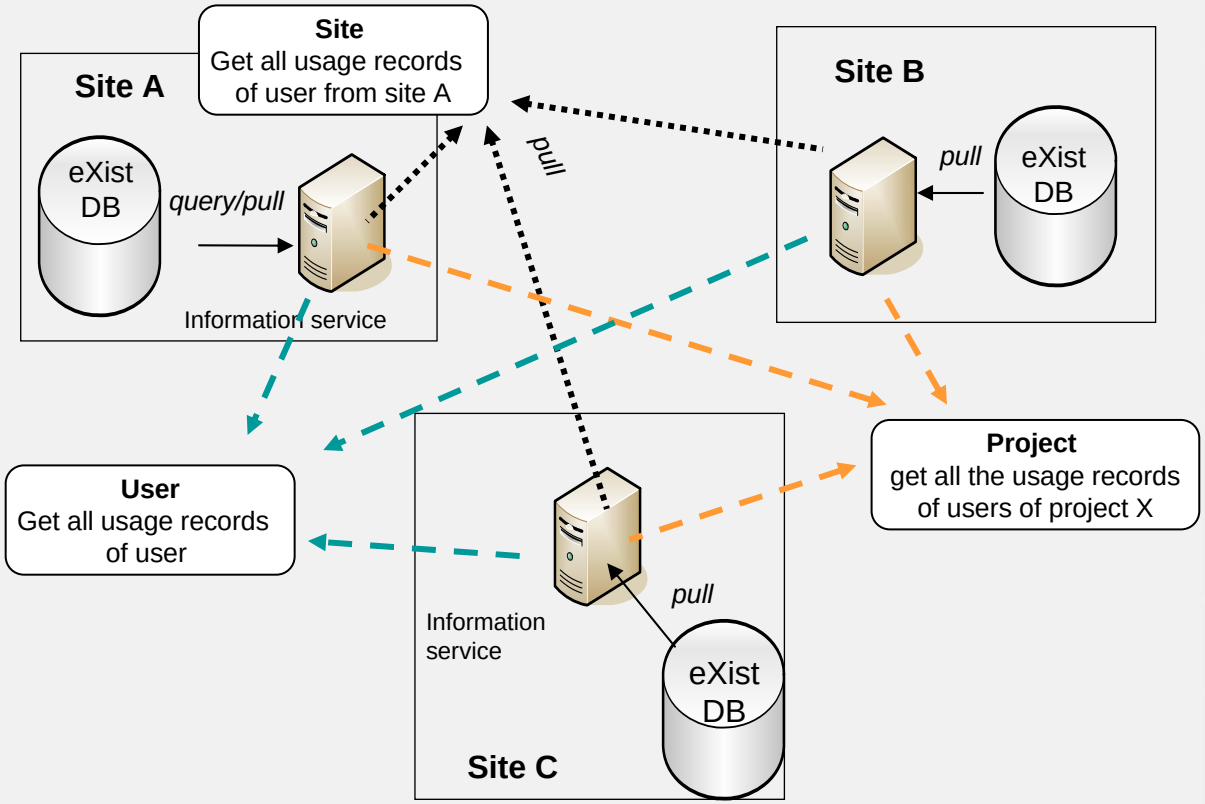
Applications

DEISA Accounting – key properties

- Data is stored in XML database in standard format (following OGF UR-WG recommendation)
- It is a distributed facility, each sites publishes data locally and controls who does have access
- Access to the data is provided through an information server – HTTP server with CGI script
- Authorized access is based on X.509 certificates, using secure communication (https)
  - 4 roles: User, Site administrator, Application project administrator, and DEISA supervisor
  - Access information can be automatically generated from information of UAS, except for supervisors.
    - "/O=dutchgrid/O=users/O=sara/CN=Jules Wolfrat" site-SARA
    - "/O=dutchgrid/O=users/O=sara/CN=Jules Wolfrat" user-sar00005

Accounting - architecture

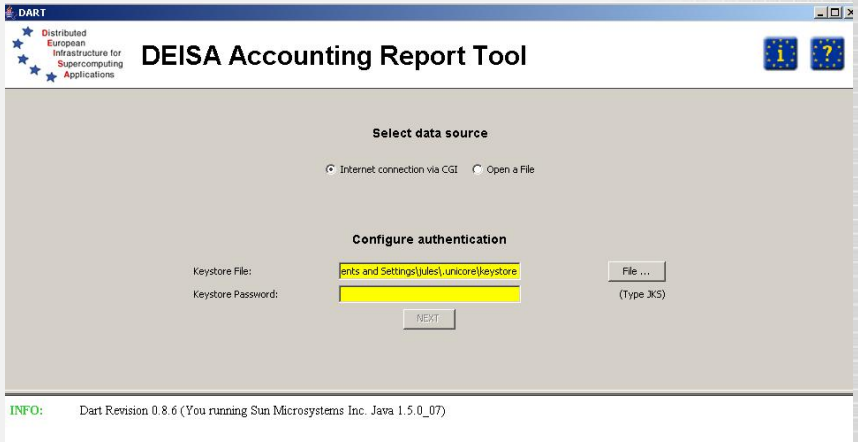


Client tool

DART = DEISA Accounting Reporting Tool

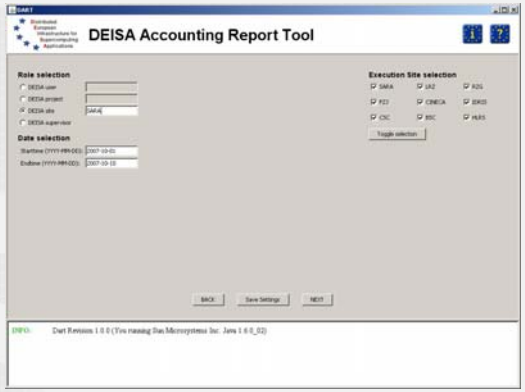
- GUI based client for access of the data
- Connects and processes accounting data from all sites simultaneously
- Java WebStart application, so always up to date and no local configuration needed, e.g. the URLs of the information servers.
- Output displays CPU hours used on the system and normalized values (for comparison between different systems).

DART start up



- http://register.matrix.sara.nl/deisa/DART/

•Java Keystore selection



- Selection can be made for
  - Which role: user, project, site or supervisor
  - Which sites must provide data
  - Which period?

Output for user

DART

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DEISA Accounting Report Tool

Startdate: 2006-09-01
Enddate: 2007-06-25

New Report | Save Settings | Export

Total | October 2006 | November 2006 | May 2007

Project	User	Site / Machine	Jobs	Cpu Time (norm) [h]	Cpu Time [h]	Job Time (norm) [h]	Job Time [h]
ALL	**ALL**	**SUMMARY**	**4**	**0,00**		**0,08**	
staff	**ALL**	**SUMMARY**	**4**	**0,00**		**0,08**	
	Jules Wolfrat (sar00005)	CNE / SP5	1	0,00	0,00	0,03	0,02
	Jules Wolfrat (sar00005)	IDR / ZAHIR	1	0,00	0,00	0,02	0,02
	Jules Wolfrat (sar00005)	RZG / RZG SP4	1	0,00	0,00	0,01	0,02
	Jules Wolfrat (sar00005)	SARA / ASTER	1	0,00	0,00	0,02	0,02

```
INFO:   Dart Revision 0.8.6 (You running Sun Microsystems Inc. Java 1.5.0_07)
INFO:   Retrieve data from https://deisa-accounting.hlrs.de/cgi-bin/accounting
INFO:   Retrieve data from https://deisacc.zam.kfa-juelich.de/cgi-bin/accounting
INFO:   Retrieve data from https://deisa-acct.idris.fr:12443/cgi-bin/accounting
INFO:   Retrieve data from https://ranta.csc.fi/cgi-bin/accounting
INFO:   Retrieve data from https://deisa-acct.cineca.it:12443/cgi-bin/accounting
INFO:   Retrieve data from https://ldeisap.sara.nl/cgi-bin/accounting
INFO:   Retrieve data from https://unigate.rzg.mpg.de/cgi-bin/accounting
```