

JASMIN Overview

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What is JASMIN for?

Supports data analysis for NERC environmental science community

- Large scale, data-intensive science

Designed for performance

- Tailored to needs of academic community

Compute co-located with the data

- CEDA Archive data (curated)
- Collaborative data (...not)

Flexible compute capabilities

- Cloud provides autonomy, scalability
- Provides researchers with flexible computing environment which they can customize to their needs

How does JASMIN achieve this?

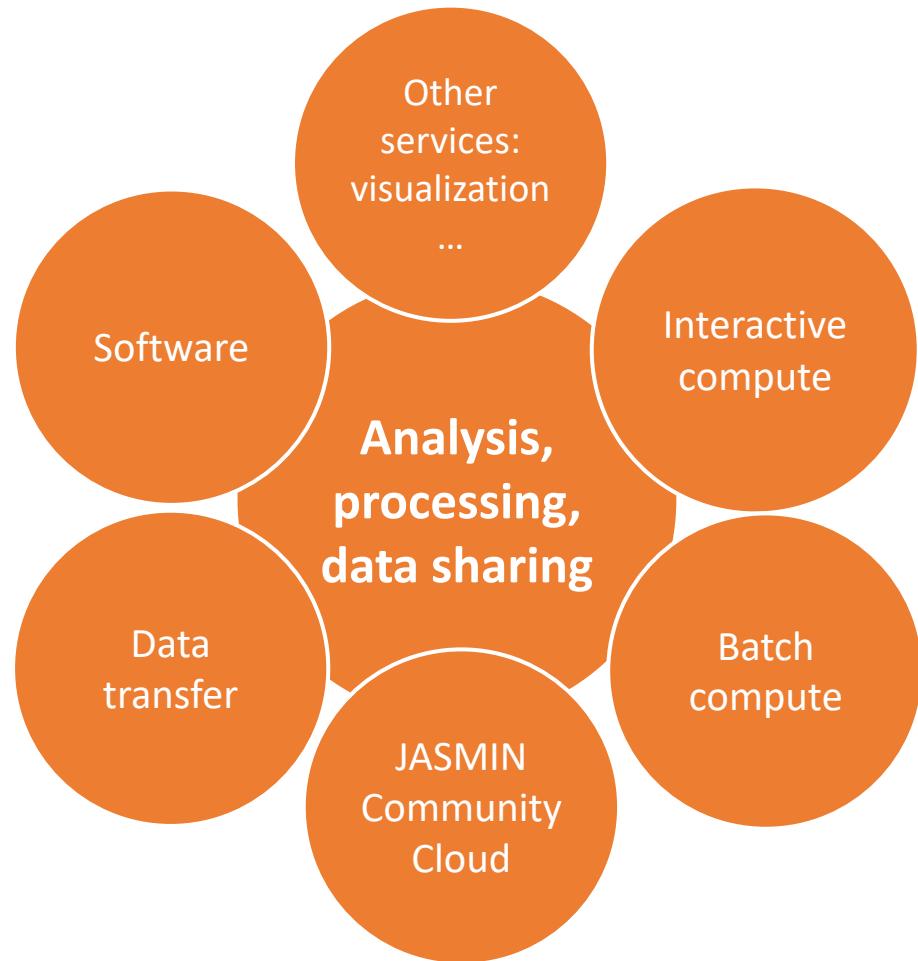
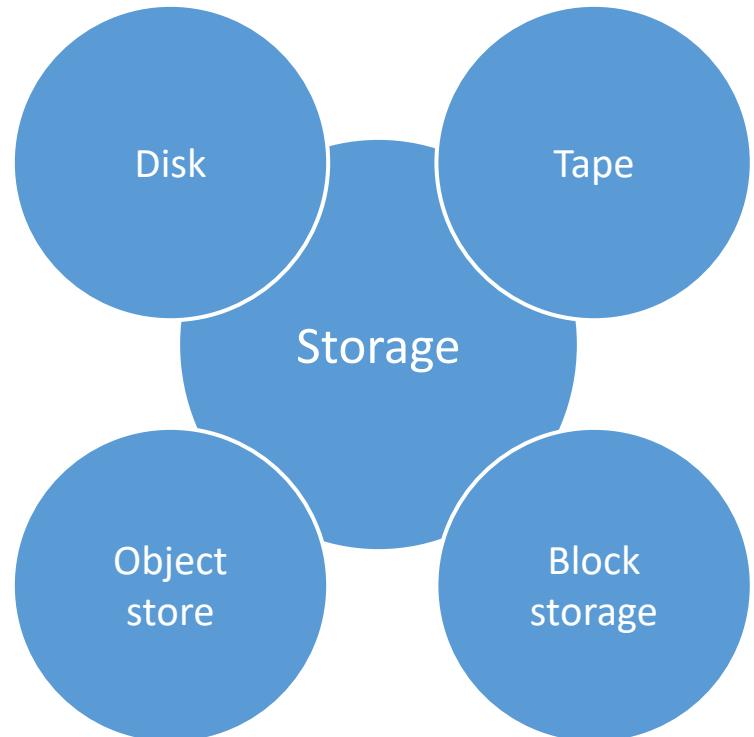
Facility operated by STFC on behalf of NERC

- Architecture: CEDA & STFC Scientific Computing Department (SCD)
- Physical infrastructure: Operated by SCD
- User services: Managed by CEDA (RAL Space)

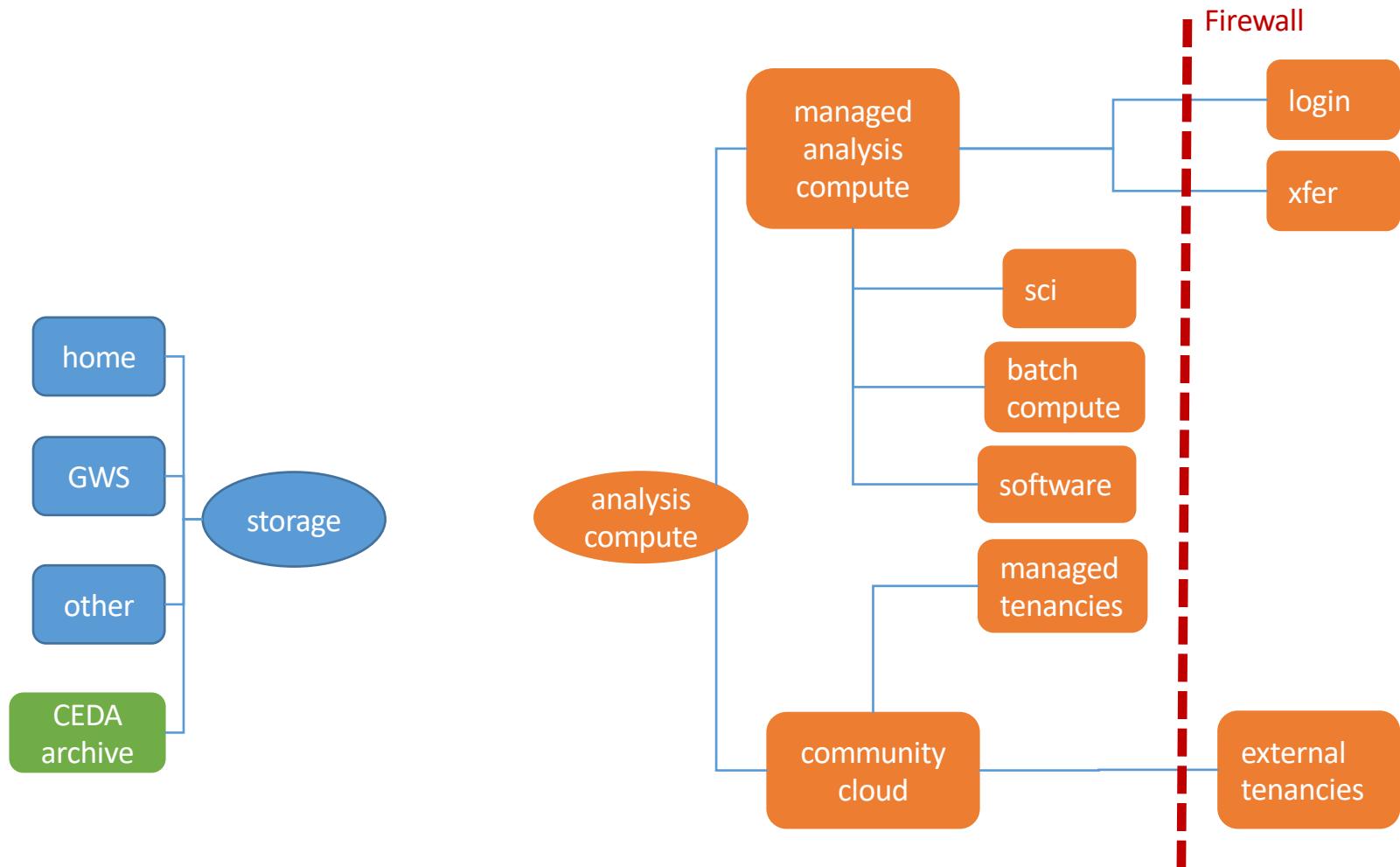
Large-scale, high-performance storage and compute

- Centered more around **storage & data access** than traditional supercomputer
- More flexible environment than supercomputer
- Many component services
- Huge range of workflows

JASMIN components - 1



JASMIN components - 2

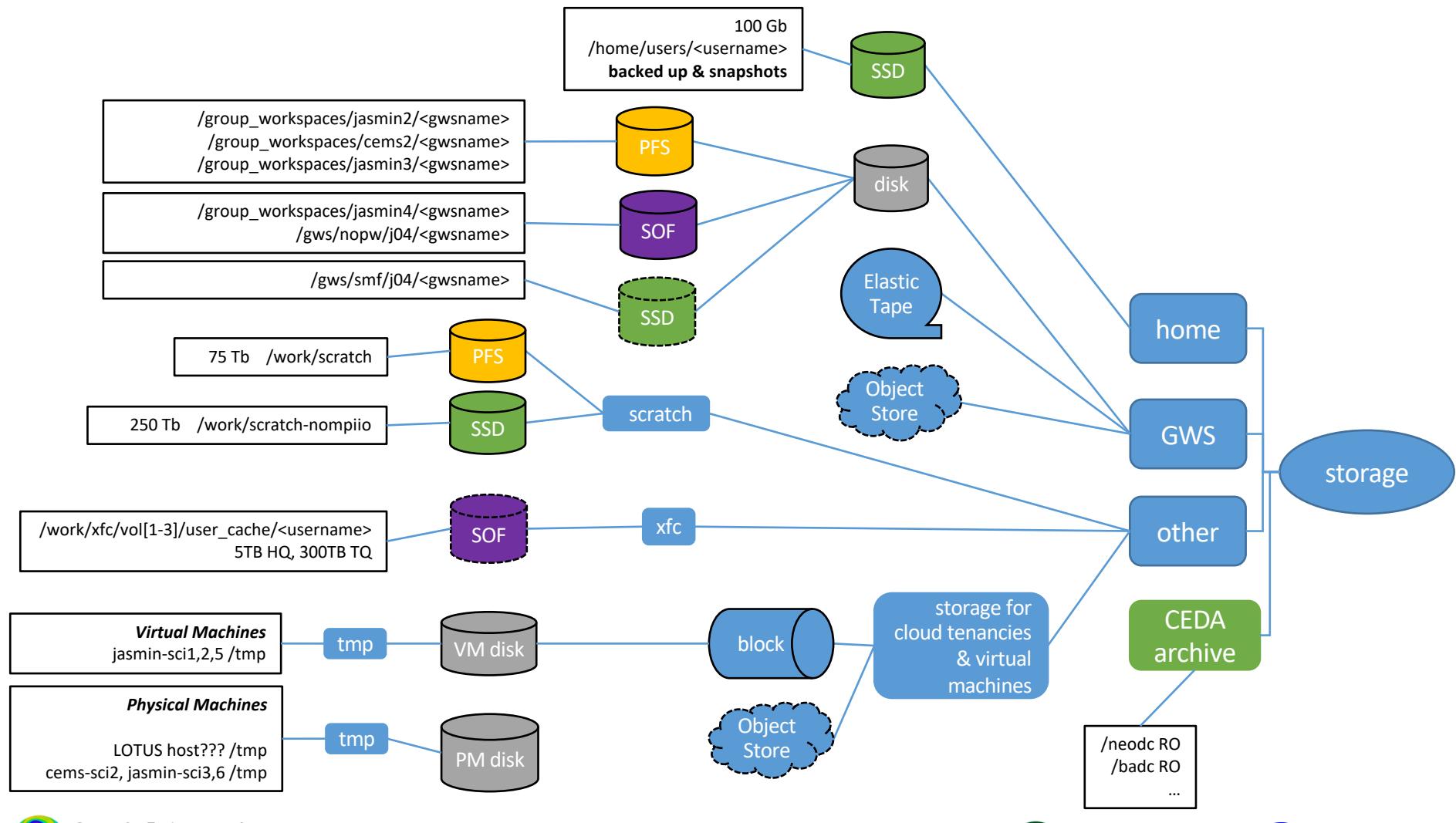


Storage types

	Features	PFS	SOF	SSD
disk	Parallel R	✓	✓	✓
	Parallel W	✓	✗	✗
	Small files	✗	✗*	✓
	Mount type	permanent	automount	automount
tape	Near-line tape	Interfaces for: CEDA Archive data (staging & backup) JASMIN Group Workspace data (Elastic Tape)		
Object	Object store	S3 interface, like Amazon S3 Several planned uses		
block	Block storage	Used for provisioning virtual machine disks JASMIN virtualization estate JASMIN community cloud Other specialist storage : databases		

* Coming soon

Storage deployments



Group Workspaces (GWS)

Collaborative workspace storage provided to a “Project”

- GWS Manager is responsible for
 - Data (not CEDA/JASMIN team)
 - Granting access to their GWS (not CEDA/JASMIN team)
- **Not backed up**
 - Use high-performance, reliable storage systems
 - But tools provided for managing secondary copy (Elastic Tape, JDMA)
- For science-related data only
 - No personal / sensitive / confidential data (true for all of JASMIN)
- Not permanent
 - For duration of project
 - Speak to CEDA Archive team for long-term curation of data
- Consortium Manager
 - Responsible for allocating Projects with GWS resources (CEDA implements!)

<https://help.jasmin.ac.uk/category/195-short-term-project-storage>

What's mounted where?

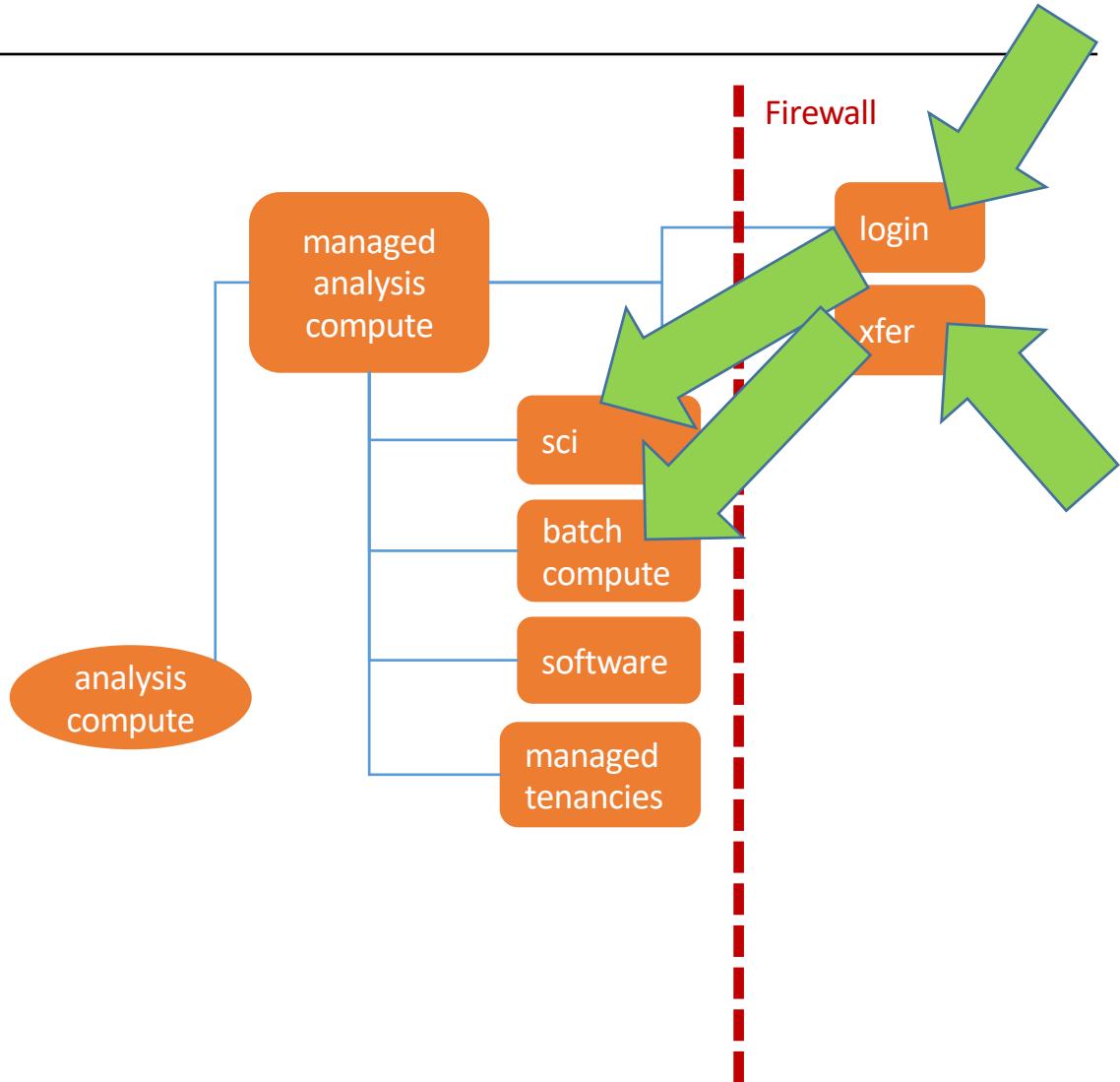
Storage	login	sci	xfer	LOTUS
/home/users/<username>	✓	✓	✓	✓
/group_workspaces/jasmin2/<gwsname> /group_workspaces/jasmin4/<gwsname> /gws/nopw/j04/<gwsname>	✗ ✗ ✗	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓
/work/xfc/volX	✓	✓	✓	✓
/work/scratch /work/scratch-nompiio	✗ ✗	✓ ✓	✗ ✗	✓ ✓
/badc, /neodc (CEDA Archive)	✗	✓ Read Only	✓ Read Only	✓ Read Only

Interactive compute

- Login servers
- Xfer servers
- Sci servers

Use login servers to access most services from outside

Transfer servers can be accessed directly from outside



Scientific analysis servers (sci)

Current specifications

CPU	RAM	Hosts	Type
8	32 GB	jasmin-sci[1,2,4,5].ceda.ac.uk cems-sci1.cems.rl.ac.uk	Virtual
24	384 GB	jasmin-sci6	Physical
48	2117 GB	jasmin-sci3, cems-sci2	Physical

Intended usage of Scientific analysis servers

- Interactive processing
- Testing & prototyping (prior to use LOTUS)
- For job submission to LOTUS (LSF client)
- Common software stack installed

Interactive compute – organized by community

- Coming soon

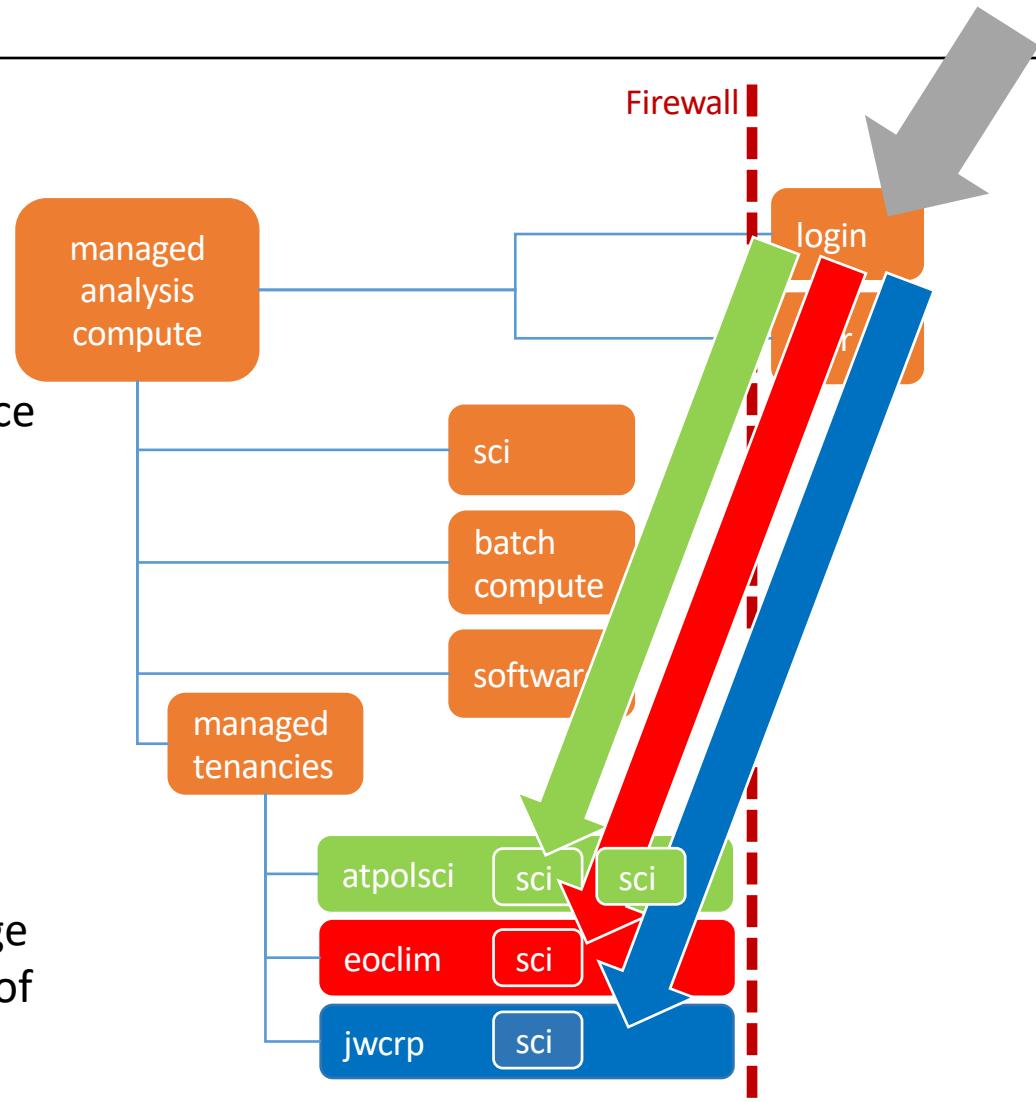
JASMIN users organized into consortia representing main science domains

System manager from each community can:

- Start / stop / restart server
- Deploy additional servers if resources allow

Benefit to you & us:

- Each community able to manage its own machines & behaviour of its own users

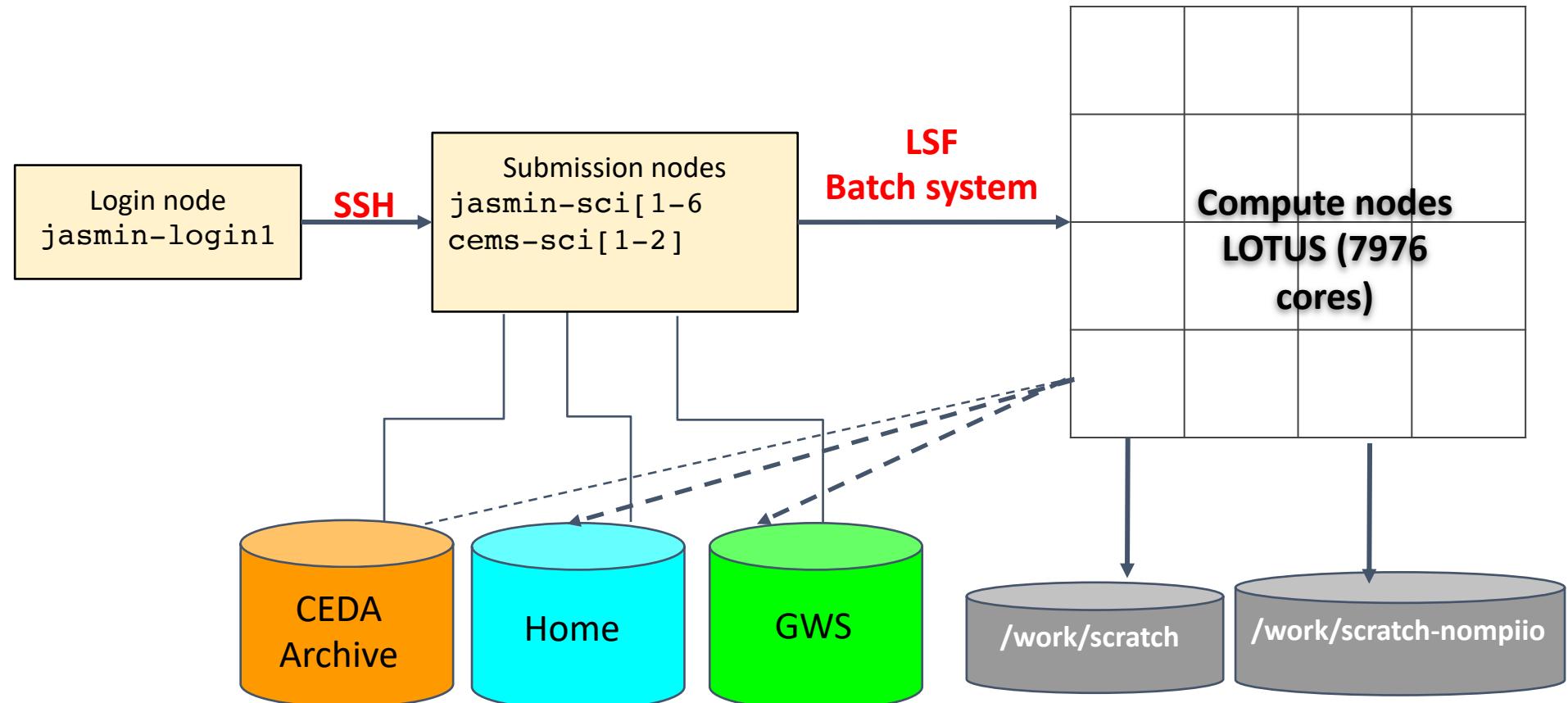


Batch compute cluster: LOTUS

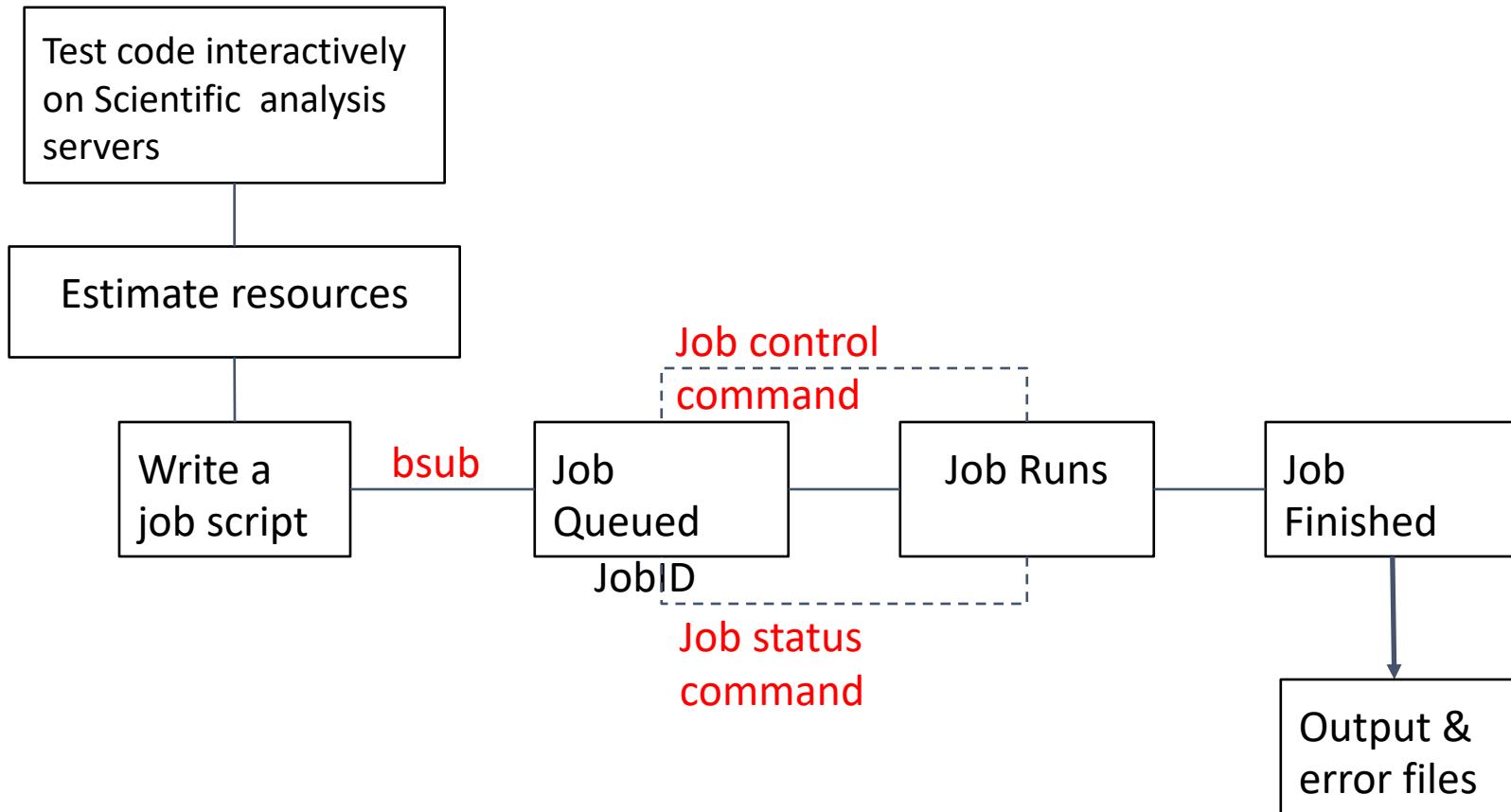
- Cluster of over 400 hosts, ~8000 cores
- Intel processor models:
 - Ivybridge, Haswell, Broadwell and Skylake
- Hosts with a range of memory sizes
 - 128GB to 2048GB
- Allows users to choose the appropriate resource for their applications
 - Memory size, core count, CPU model
- Scheduling system: IBM LSF (Load Sharing Facility)
 - Applies “fair-share” scheduling

Schematic view of LOTUS on JASMIN

Components: submission nodes, compute nodes, storage & LSF



Scientific analysis servers



Access to CEDA Archive data

CEDA archive data is available online in JASMIN

- /badc, /neodc file systems mounted read-only throughout
- Data can be processed in-place (no need to copy)
- Some large datasets are kept partly near-line
 - Use Near-Line Archive (NLA) service to request staging of required data

Access permissions reflect those of your CEDA account

CEDA Archive is a “tenant” of JASMIN

- CEDA Archive services (catalogue, download) hosted on JASMIN

JASMIN ***is not*** the CEDA Archive

- Leaving your data in your GWS ***is not*** long term data curation

Data transfer

- Range of tools provided for transfer of data into/out of JASMIN
 - Data transfer nodes (xfer)
 - scp, rsync, sftp : push or pull data
 - ftp client : pull only
 - lftp
 - High-performance data transfer (hpxfer)
 - “Data Transfer Zone” – special area of network
 - jasmin-xfer[23] : same tools, faster servers + gridftp client tools
 - Globus endpoint
 - Globus = online service for efficient bulk data transfers
 - Other data-intensive services
 - ESGF, CEDA FTP download service, Archive pull services
 - <https://help.jasmin.ac.uk/category/217-data-transfer>

Software

There is a range of software available on JASMIN. We have recently updated our documentation. We define categories of software which help users go to the required Help page:

- Software available to all on JASMIN analysis/batch servers
- Additional tools for compiling and building software
- Restricted software
- Server-specific software
- Data movement software

See: <https://help.jasmin.ac.uk/article/273-software-on-jasmin>

Your account

- Your JASMIN account
 - JASMIN account = profile to attach privileges to
 - <https://accounts.jasmin.ac.uk>
 - “jasmin-login” = what you need for system access
 - (not everyone needs this!)
 - Apply for other roles (GWSs, hpxfer, ..) on accounts portal
 - GWS roles approved by GWS manager (not CEDA/JASMN team)
 - Reminder emails
 - Once a year, need to re-confirm account
 - Each role: 2 month / 2 week / 2 day reminder before expiry
 - You can renew in advance
 - Different to your CEDA account
 - Needs to be linked

Support

- Information
 - Events like this!
 - <https://help.jasmin.ac.uk>
 - Getting started
 - <https://help.jasmin.ac.uk/article/189-get-started-with-jasmin>
 - YouTube channel
 - <https://www.youtube.com/channel/UC11nPZVjDLjYIS7NvbnlmQ>
 - @cedanews on twitter
 - emails
- Helpdesk
 - support@ceda.ac.uk
 - CEDA team does outward user support
 - SCD team looks after the infrastructure

Expectations

- JASMIN is a research infrastructure
 - Not a 24x7x365 enterprise
 - Small team
 - Not as strict as a supercomputer
 - Relies on you being sensible
 - Test stuff before scaling up!
 - Build failure-tolerance into your workflows
 - Please acknowledge JASMIN
 - <https://help.jasmin.ac.uk/article/4693-acknowledging-jasmin>
 - Tell your funding body what you've done with JASMIN
 - Helps ensure continued funding
 - Makes the case for improving the service further ☺