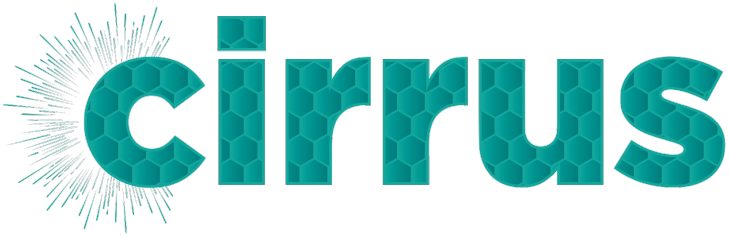

Service Catalogue

1. Document Information and Version History

Version:	1.3
Status	Release
Author(s):	Andy Turner
Reviewer(s)	Donald Scobbie, George Graham, Anne Whiting

Version	Date	Comments, Changes, Status	Authors, contributors, reviewers
0.1	2016-09-16	Initial draft	Andy Turner
0.2	2016-09-22	Added more helpdesk details	Andy Turner
0.3	2016-09-22	Added more details on software	Andy Turner
0.4	2016-09-22	Added suggestions from Anne	Andy Turner
0.5	2016-09-29	Added Irish Marine	Andy Turner
0.6	2017-08-10	Updated to match current system	Andy Turner
0.7	2017-08-23	Added licence server service	Andy Turner
1.0	2017-09-20	Final release version	George Graham, Donald Scobbie
1.1	2017-12-13	Added external licence server and TDS	Andy Turner
1.2	2018-03-04	Added Fluent, HELYX, Matlab, reservations	Andy Turner
1.3	2018-06-27	Added RDF access and parallel data transfer	Andy Turner

2. Introduction

This document describes the services that are current offered on Cirrus.

3. Access, Data Transfer and Storage

Interactive command-line access	
Description	Allow a user to connect remotely to Cirrus and execute command-line instructions.
Class	Core
Responsibility	Systems Team
Service Description/ Technologies	ssh: secure access via password or key pair
Remarks	

Data transfer	
Description	Allow a user to transfer data to/from Cirrus
Class	Core
Responsibility	Systems Team
Service Description/ Technologies	scp: secure data transfer
Remarks	

Data storage	
Description	Store data on Cirrus
Class	Core
Responsibility	Systems Team
Service Description/ Technologies	All users have a defined $HOME space on Cirrus file system
Remarks	500 GiB standard, further storage by discretion or charged

RDF file system access	
Description	Access RDF file systems from Cirrus
Class	Core
Responsibility	Systems Team
Service Description/ Technologies	Projects with space on the RDF can access their data from the Cirrus Data Services Node (DSN)
Remarks	

High performance data transfer	
Description	Use high performance data transfer tools to transfer data to/from Cirrus
Class	Core
Responsibility	Systems Team
Service Description/ Technologies	GridFTP, Globus Online, bbcp
Remarks	Provided by the RDF Data Transfer Nodes (DTN) and then transfer from RDF file systems to Cirrus using the Cirrus DSN

4. Resource Management

Project Administration	
Description	Allow service managers to administer projects and systems team to manage resources and access
Class	Core
Responsibility	USL Team
Service Description/ Technologies	SAFE
Remarks	

Project Management	
Description	Allow PIs and Project Managers to administer users and resources in their projects
Class	Core
Responsibility	USL Team
Service Description/ Technologies	SAFE
Remarks	

Scheduling and Resource Access	
Description	System should schedule resources efficiently according to current outstanding requests and not allow single users/projects to dominate the system
Class	Core
Responsibility	Systems Team
Service Description/ Technologies	PBSPro
Remarks	

Advance Resource Reservations	
Description	System should allow users to reserve resources for specified time periods in advance and support regularly recurring resource reservations.
Class	Core
Responsibility	Systems Team
Service Description/ Technologies	PBSPro
Remarks	

5. System Software, Compilers and Libraries

Software and Environment Configuration	
Description	Allow users to switch between different software on the service in a coherent manner
Class	Core
Responsibility	Systems Team
Service Description/ Technologies	modules: Standard software to control environment
Remarks	

Compilers	
Description	Allow users to compile Fortran, C and C++ source code
Class	Core
Responsibility	Systems Team
Service Description/ Technologies	GCC: Open source compiler suite Intel Compiler Suite
Remarks	

Parallel Software Support	
Description	Software to support parallel applications
Class	Core
Responsibility	Systems Team
Service Description/ Technologies	MPI: SGI MPT Library, Intel MPI
Remarks	

Performance Libraries	
Description	Software to support high performance applications
Class	Core
Responsibility	Systems Team/CSE Team
Service Description/ Technologies	BLAS, LAPACK – Intel MKL BLACS, ScaLAPACK – Intel MKL FFTW PETSc Boost
Remarks	

I/O Libraries	
Description	Software to support high performance applications
Class	Core
Responsibility	Systems Team/CSE Team
Service Description/ Technologies	MPI-IO – from SGI MPI, Intel MPI HDF5 NetCDF
Remarks	

Data Analysis Tools	
Description	Software for data analysis
Class	Core
Responsibility	Systems Team/CSE Team
Service Description/ Technologies	Anaconda Python (Python 2 and Python 3) R
Remarks	

Academic Software Packages	
Description	Centrally-installed academic software packages
Class	Core
Responsibility	CSE Team
Service Description/ Technologies	CASTEP CP2K GROMACS OpenFOAM VASP
Remarks	

Debugging and Profiling	
Description	Tools to support debugging and profiling of parallel applications
Class	Core
Responsibility	CSE Team
Service Description/ Technologies	Allinea DDT Debugger Scalasca Profiler
Remarks	

6. User Support and Liaison

Helpdesk: 1st Level Support	
Description	Contact point for the service
Class	Core
Responsibility	USL Team
Service Description/ Technologies	SAFE
Remarks	1st level support provided by operator 2nd level support by specific team (USL, SDT, CSE, Commerical) as appropriate In process of registering cirrus.ac.uk domain

Helpdesk: 2nd Level USL Support	
Description	In depth support from USL team
Class	Core
Responsibility	USL Team
Service Description/ Technologies	SAFE USL Team cover following query types: • Academic access questions • Academic requests for additional resources • Issues with SAFE technology • Updates to non-technical documentation
Remarks	

Helpdesk: 2nd Level CSE Support	
Description	In depth support from CSE team
Class	Core
Responsibility	CSE Team
Service Description/ Technologies	SAFE CSE Team cover following query types: • Requests to install new non-system software • Help with compiling/running software on Cirrus • Optimisation/benchmarking/profiling of software Cirrus • Fixing broken non-system software installations on Cirrus • Updates to technical documentation
Remarks	CSE team does not generally cover advice on how to use specific applications (other than Cirrus-specific details), these are generally better addressed to the support channels for these applications.

Helpdesk: 2nd Level Systems Support	
Description	In depth support from SDT team
Class	Core
Responsibility	Systems Team
Service Description/ Technologies	Systems Team cover following query types: • Installation/update of system software • Fixing broken system software • Issues with user accounts, access, groups, etc. • Hardware failures/issues
Remarks	

Helpdesk: 2nd Level Commercial Group Support	
Description	In depth support from Commercial group
Class	Core
Responsibility	Commercial Group
Service Description/ Technologies	SAFE Commercial cover following query types: • Commercial access questions • Commercial requests for additional resources • Commercial requests for EPCC consultancy to exploit Cirrus
Remarks	

User Mailing	
Description	Ability to contact all service users
Class	Core
Responsibility	USL Team
Service Description/ Technologies	SAFE
Remarks	

Website	
Description	Website for the service
Class	Core
Responsibility	CSE Team
Service Description/ Technologies	Jekyll GitHub University of Edinburgh cPanel
Remarks	http://www.cirrus.ac.uk

User Documentation	
Description	User guides for the service
Class	Core
Responsibility	CSE Team
Service Description/ Technologies	GitHub Readthedocs Sphinx
Remarks	http://cirrus.readthedocs.io

Internal Documentation	
Description	Internal documentation
Class	Core
Responsibility	All
Service Description/ Technologies	Confluence Wiki
Remarks	Covers internal processes and configurations

Technical Assessment	
Description	Provide technical assessment of the feasibility and suitability of access proposals for the service
Class	Core
Responsibility	CSE Team
Service Description/ Technologies	
Remarks	

Commercial Access	
Description	Allow commercial customers to pay for and access service
Class	Core
Responsibility	Commercial Group
Service Description/ Technologies	
Remarks	

7. External Software

Fire, Explosion, Dispersion Modelling (Gexcon)	
Description	Software and services to support Gexcon modelling tools
Class	Core
Responsibility	All service teams
Service Description/ Technologies	Gexcon (FLACS)
Remarks	http://www.gexcon.com/

Natural Resource Surveying (GSI)	
Description	Natural resource surveying
Class	Core
Responsibility	All service teams
Service Description/ Technologies	GSI software VM supporting job submission and data staging
Remarks	http://www.surfaceintelligence.com/

Weather Forecasting and Ocean Science	
Description	Core software used by ocean modelling and weather forecasting organisations
Class	Core
Responsibility	CSE Team
Service Description/ Technologies	ROMS Application SWAN Application
Remarks	

Modelling and Simulation (Engineering)	
Description	Engineering modelling and simulation software
Class	Core
Responsibility	CSE Team
Service Description/ Technologies	ANSYS Fluent (http://www.ansys.com/Products/Fluids/ANSYS-Fluent) ENGYS HELIX (https://engys.com/products/helyx)
Remarks	User must provide own licences for software or negotiate directly with vendor.

Matlab	
Description	Framework for programming, analysis and modelling
Class	Core
Responsibility	CSE Team
Service Description/ Technologies	Matlab from Mathworks (http://uk.mathworks.com/)
Remarks	Available to all academic users free of charge, commercial users must provide own licence.

8. Other Services

Local Licence Server Hosting	
Description	Run local licence server to supply software licences to Cirrus login and compute nodes
Class	Core
Responsibility	Systems Team
Service Description/ Technologies	e.g. Flexlm
Remarks	

Customer Virtual Machine Hosting	
Description	Host customer VM on service nodes with customer root access
Class	Core
Responsibility	Systems Team
Service Description/ Technologies	See Appendix A for full description
Remarks	

Remote Licence Server Access	
Description	Allow access to external licence servers from Cirrus compute nodes
Class	Core
Responsibility	Systems Team
Service Description/ Technologies	Uses NAT to translate IP addresses
Remarks	All requests come from single IP address: cirrus-login1 (129.215.175.18)

Test and Development System (TDS)	
Description	Provide environment for testing system changes before implementing on production service
Class	Core
Responsibility	Systems Team
Service Description/ Technologies	
Remarks	

Appendix A: Cirrus Virtual Machine Hosting Service

Scope and Objectives

This technical note describes the Cirrus VM hosting service option to be offered to Cirrus users as a supplement to standard the HPC service.

There a several objectives in defining a clear and well understood VM hosting option for Cirrus. Firstly, users of the service option are able to benefit from a certain amount of bespoke customisation of the Cirrus computing environment that may help to address differences between Cirrus and their own systems. Secondly, users have complete autonomy in the administration of the VM environment allowing complete control of a development, test and execution environment within the cluster. And thirdly, users, managers and support groups are aware of the boundaries of responsibility and technical limitations.

Specifications and Characteristics

The Cirrus VMs will be created with the following specifications:

1. 2 CPUs, 8GB RAM, 20GB virtual hard disk and 1 Ethernet interface.
2. The VM mounts the customer or project home directory as /lustre/home/<project> through an NFS export from the hypervisor host.
3. Outbound network access is enabled for the VM through NAT on the hypervisor host external interface.
4. Inbound network access is enabled for the VM only through the internal cluster fabric. Only the Cirrus login nodes and the compute nodes are networked to the VMs.
5. A web proxy gateway is provided so that VM based web services can be exported to external users. A DNS entry cirrus-<project>.epcc.ed.ac.uk will be provisioned to enable this access.

This specification for the Cirrus VMs has certain access and usage restrictions:

1. The absence of an external interface on the VMs means that direct external access to the VMs is not possible. Users must ssh to a Cirrus login node and then ssh to the VM.
2. Only web services may be exported from the VM through a single external 129.215.175.0/25 interface address served by a web proxy and managed by EPCC.

Use of the Cirrus VM service option places certain obligations on the users:

1. The user has root administration rights in the VM and is expected to maintain the VM to ensure that it is secure.
2. The VM must not be used as a network bridge or expose internal cluster resources to external systems and users.
3. The Cirrus Lustre file system is the cluster's primary storage and the VM local disk is purely for container run-time support.
4. The Cirrus backend is the cluster's compute resource and the container should not be used for compute jobs.

Use Cases

The following use cases are considered important in the service option specification:

- Custom file import and export management
- Result presentation and analysis
- Status monitoring and alarm processing

The following user cases not considered important:

- Remote desktop access trough VNC and RDP
- High performance or large-scale database provisioning