

Open IRIS: A Free Platform to Enable Resource Sharing for Labs and Core Facilities



The S-Lab Award for Excellence in Laboratory Design, Management and Operation

2017 Award for innovation in “Laboratory Effectiveness”

Awarded by S-LAB (S-Lab is a not for profit initiative that is primarily funded by the Higher Education Funding Council for England) and UKSPA (UK Science Park Association)



Presented by JISC (National research network for academics in the UK)



Open IRIS is a Collaborative Effort

- Open IRIS is an ambitious collaborative project to reach these goals and beyond.
- It is open to other organizations to use for free or join as a partner.
- It is already in daily productive use by hundreds of other researchers.



Primary Goal of Open IRIS

The goal of Open IRIS is to design a simple entry point for researchers and resource providers to share, discover, access, and manage resources and services, either as central portal or as custom views for and across organizations and communities.

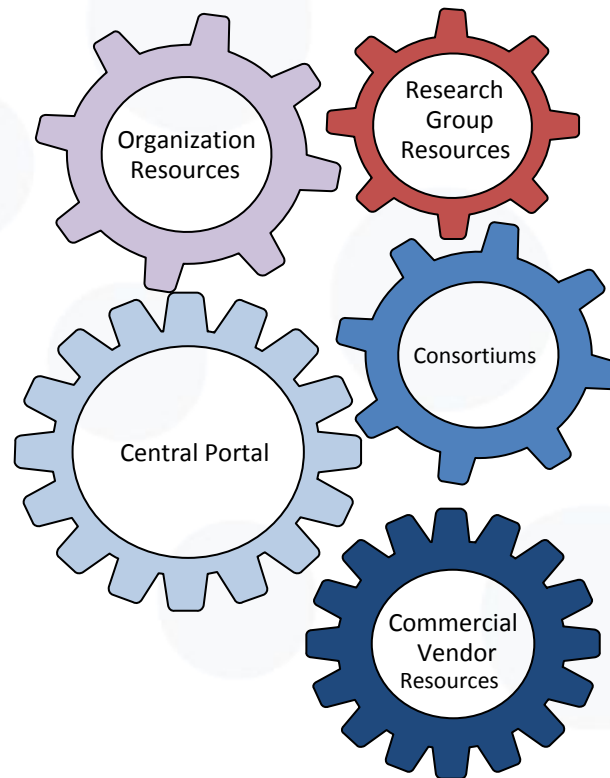
Why Open IRIS

- Open IRIS is a free non-commercial platform to enable resource discovery and sharing for researchers.
- It is a collection of best practices for resource management and optimization.
- Facilitates collaboration and resource sharing within and across labs and organizations.

Software development and ownership

- Software development is outsourced
 - CodeFirst (www.codefirst.net) provides developers, development platform and hosting
 - quality guaranteed
 - no interest or rights to the code
- Currently project is structured as a working group within EGI
- In process of forming a legal consortium (~months)
- Code always given out when there is a legitimate request (not for commercialization).

Long Term Vision



Goal to have a *“one stop shop for resources”* for researchers.

Benefits of Open IRIS



Optimize

Help optimize resource utilization by sharing of resources and tools to manage resources.



Discover

To help researchers discover local, national, and international resources available to them.



Accelerate

In allowing researchers to discover and access cutting edge resources they will be able to accelerate their research activities.

Overview of Open IRIS

- A free tool to empower researchers to share resources within and across institutions.
- Expose resources to more researchers.
- Create a virtual pools of resources for collaborations and communities.
- Supports: instruments, service requests, applications, etc.
- Usage restrictions and metering/billing can be enforced on resources.
- Directory of resources, people, groups, communities, and organizations.
- With the goal to provide integration into data management plans.

The screenshot displays the Open IRIS web interface. At the top, there is a navigation bar with the 'IRIS' logo and a user profile icon. Below this is a secondary navigation bar with tabs for 'Browse', 'Scheduler', 'Services', 'Dashboard', and 'Admin'. The main content area is titled 'Resources' and includes a search bar and a 'Refresh' button. On the left side, there is a 'Filter' section with dropdown menus for 'Type', 'Country', 'Organization', 'Provider', and 'Category', each with 'Submit' and 'Reset' buttons. Below the filters is a '+ New resource' button. The main area contains a grid of resource cards, each with a thumbnail image, a title, provider information, affiliations, and resource type. The cards are arranged in two columns and five rows. The bottom right corner of the grid shows '1 - 10 of 11 items'.

Name	Provider	Affiliations	Resource Type
2 photon setup A	Friedrich Lab	FMI	Microscope
2 photon setup B	Friedrich Lab	FMI	Microscope
Continuous Linear S...	DBM Histology	Unibas,USB	Histology
Leica Cryostat CM19...	DBM Histology	Unibas,USB	Histology
Megafrage 2.0r	Keller Lab	FMI	Centrifuge
MolBiol Bench 4.10	Keller Lab	FMI	Lab Space
SJIT Usecases consul...	SJIT	UZH	Project
TES Valida	DBM Histology	Unibas,USB	Histology
Two-photon Rig1 4.10	Keller Lab	FMI	Microscope
Two-photon Rig2	Keller Lab	FMI	Microscope

List of Key Functionality



Dynamic Forms

Create custom forms for requests and scheduling of resources.



Advanced Statistics

Determine resource usage with complex queries and various formats.



Project Management

Set milestones and assign tasks on requests.



Multi-facility

Support for working across multiple facilities.



Calendar Integration

Ability to integrate resources into calendars and determine availability of technical staff when booking resources.



Resource Restrictions

Ability to restriction resource utilization by date, time, user, quotas, etc. Installable agent to control access to resources.



Pricing Rules

Define complex pricing rules by date, time, users, groups, organization, etc.



Directory Management

Support complex organizational relationships. Including support for groups, departments, organizations, communities, and projects.



Custom Portals

Custom portals that allows for custom web site address with control of access and resources listed.



Scheduling

Schedule resources with support for recurring events, maintenance, etc.



Service Requests

Submit and track service requests.



Issue Tracking

Track issues directly on resources.

Features: Customizable Portals

The desktop interface features a top navigation bar with links for HOME, RESOURCES, PROVIDERS, and ABOUT. A search bar is positioned in the center, and 'Sign in / Register' and 'Contact' buttons are on the right. Below this is a large banner with the text 'Share, discover and collaborate for better science.' and a search bar. The main content area is divided into two columns: 'Resources' and 'Providers'. Each column includes a description and an 'Explore...' link. A 'Statistics' section is highlighted with a red box, displaying icons and counts for users (4273), resources (1438), providers (202), organizations (172), and countries (46). The footer contains logos for FMI, institutCurie, University of Basel, and ETH.

Desktop

The mobile interface is a vertical stack. It starts with a search bar and a menu icon. Below is a section titled 'IRIS' with a search bar. The main content is organized into sections: 'Resources', 'Providers', and 'Partners'. Each section has a brief description and an 'Explore...' link. The bottom of the page features the institutCurie logo and navigation arrows.

Mobile

Features: Public Facing Discovery of Resources, Services, and Applications

The desktop interface features a top navigation bar with links for HOME, BROWSE, RESOURCES, PROVIDERS, ABOUT, and GETTING STARTED. A search bar is located in the top right corner. The main content area is divided into a left sidebar and a central grid of resource cards. The sidebar contains a 'Filter text' input and a list of filter categories with counts: ALL (195), 2-PHOTON (3), 3D PRINTER (1), ACTIVITY (1), ANALYSIS PROGRAM (2), ANALYSIS WORKSTATION (22), BLOTTING EQUIPMENT (1), CELL ANALYZER (9), CHEMICAL LIBRARY (1), COMPUTE (1), CONFOCAL MICROSCOPE (7), CRYOSTAT (1), FLOW CYTOMETRY ANALYZER (7), and FLOW CYTOMETRY SORTER (4). The central grid displays 12 resource cards, each with a thumbnail image, a title, provider information, affiliations, communities, and resource type. A 'Feedback' button is visible on the right side of the grid.

Desktop

The mobile interface features a top navigation bar with the IRIS logo and a hamburger menu icon. A search bar is located below the navigation bar. The main content area displays a vertical list of resource cards, each with a thumbnail image, a title, provider information, affiliations, and resource type. The layout is optimized for a smaller screen, with the filter sidebar removed.

Mobile

Features: Resource Discovery and Usage

The screenshot displays the IRIS web application interface, which is used for resource discovery and booking. The main interface is divided into several sections:

- Navigation:** Includes tabs for Browse, Scheduler, Services, Dashboard, and Admin. Below these are links for Resources, Providers, People, Groups, Departments/Institutes, Organizations, Projects, and Communities.
- Filtering:** A sidebar on the left allows users to filter resources by Access (Public, Last used), Type (Any type), Country (Any country), Organization (Any organization), and Provider (Any provider).
- Resource List:** A central list of resources is shown, including:
 - MMI LDM:** Provider: Histology, Affiliations: FMI, Resource Type: Microscope.
 - SPINNING DISK WIDE:** Provider: PICT-LM@BDD, Affiliations: Institut Curie, Resource Type: Spinning-disk c...
 - UltraTrim:** Provider: PICT-EM@Burg, Affiliations: Institut Curie, Resource Type: Sample Prepara...
 - Data Analysis Services:** Provider: Nexus, Affiliations: ETHZ, Resource Type: Activity.
- Resource Details (MMI LDM):** A detailed view of the MMI LDM resource, showing:
 - Description:** Laser dissection microscope.
 - Comments:** Please contact Tim Roloff with questions.
 - Permalink:** A link to the resource's page.
 - Show iCal Feed:** A button to view the resource's availability.
- Resource booking (MMI LDM):** A booking interface for the MMI LDM resource, showing:
 - Status:** Online.
 - Comments:** Please contact Tim Roloff with questions.
 - Calendar:** A calendar view showing the resource's availability for Tuesday, November 03, 2015, from 0:00 to 23:00.

Features: Request Management

The image displays the IRIS web application interface. On the left, a sidebar shows a list of services with their respective icons, provider names, contact information, and resource types. The services listed are:

- PROJECT REQUEST 3DEM**: Provider: FAIM, Contact: help.em@fmi.ch, Resource Type: Request, Status: Online.
- PROJECT REQUEST Image Process...**: Provider: FAIM, Contact: help.imaging@fmi.ch, Resource Type: Request, Status: Online.
- Data Analysis Services**: Provider: Nexus, Contact: pmict@nexus.ethz.ch, Resource Type: Activity, Status: Online.
- Data Integration Service**: Provider: Nexus, Contact: pmict@nexus.ethz.ch, Resource Type: Activity, Status: Online.
- Chemical Library**: Provider: Chemical Library, Contact: claire.beauvineau@curie.fr, Resource Type: Chemical Library, Status: Online.

On the right, a detailed view of the 'PROJECT REQUEST Image Processing' form is shown. The form includes the following fields and options:

- Title**: A text input field.
- Request for**: iris@science-it.ch, with a 'Change user' button.
- Group**: N/A.
- Comments**: A text area.
- Attachments**: A 'Select file' button.
- External collaboration**: A checkbox.
- Expected data format**: Radio buttons for 2D, 3D, Multi-positions, Tile, Time, and Slide scanning.
- Image /Data Processing**: A section with checkboxes for Deconvolution, Stitching, Registration, and Correction.
- Processing**: A section with checkboxes for Visualization, Morphometry, Counting, Tracking, Tracing, Colocalization, Statistics, and Other.
- Start Date**: A date picker.
- Disclaimer**: A note stating 'The project will default to end 3 months after the start date, you will need to contact the respective service in order to review the experiment.'
- Terms**: A checkbox for 'I have read, signed, and returned the FAIM Rules to Human Resources.'
- Buttons**: 'SUBMIT' and 'CANCEL' buttons.

At the bottom of the form, there are 'SUBMIT REQUEST' and 'DETAILS' buttons. The bottom of the page shows a pagination bar with '1 - 5 of 5 items' and a '5 items per page' dropdown.

Features: Application Store

The IRIS application store interface features a top navigation bar with 'Browse', 'Scheduler', 'Services', 'Dashboard', and 'Admin'. Below this is a secondary navigation bar with 'Resources', 'Providers', 'People', 'Groups', 'Departments/Institutes', 'Organizations', 'Projects', and 'Communities'. A filter section on the left includes buttons for 'Access' (Public, Last used), a search bar, and dropdown menus for 'Type', 'Country', 'Organization', 'Provider', and 'Category'. A 'NEW RESOURCE' button is located at the bottom left. The main content area displays a list of resources, each with a logo, name, provider, affiliations, and resource type.

Name	Provider	Affiliations	Resource Type
FluidSurveys	Informatics	FMI	Software
Huygens Remote Manager	Single Cell Unit	ETHZ	Software
UZH Science Cloud	S3IT	UZH	Analysis Works...
Galaxy Server	IMB Bioinformatics C...	IMB	Software

The Huygens Remote Manager v3.2 interface is displayed in a browser window. It features a blue header with the application name and version. Below the header is a 'Welcome' section with a brief description of the software. A 'Login' section on the right prompts users to enter their credentials (Username: deanf, Password: *****). A 'Collaborators' section lists various research institutions and their logos, including EPFL, FMI, MRI WB, D-BSSE, EPF Lausanne, Friedrich Miescher Institute, Montpellier RIO, Scientific Volume Imaging, Leibniz Institute for Neurobiology, Biozentrum, and Combinatorial Neuroimaging.

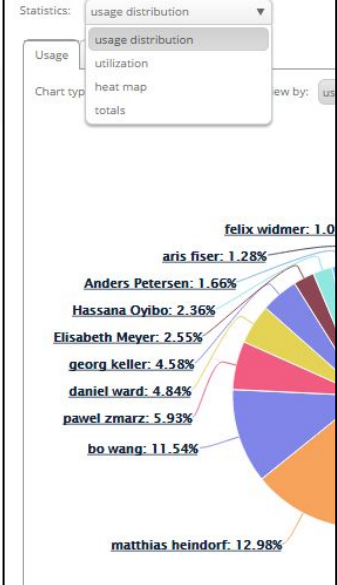
Features: Resource Usage Statistics

IRIS dean.flanders@fmi.ch (Integrated), Friedrich Miescher Institute My account

Dashboard Scheduler Services Applications Directory Admin

Inbox Providers Resources Resource types Charges Invoices **Statistics** Portals Refresh

Resources (6) Filter (0) Exclusions (0) November 3, 2014 - November 3, 2015 Distribution list



IRIS dean.flanders@fmi.ch (Integrated), Friedrich Miescher Institute My account

Dashboard Scheduler Services Applications Directory Admin

Inbox Providers Resources Resource types Charges Invoices **Statistics** Portals Refresh

Resources (6) Filter (0) Exclusions (0) November 3, 2014 - November 3, 2015

Statistics: heat map

Resource	2014-12 (Total: 311 hrs)	2015-01 (Total: 552.5 hrs)
Two-photon Rig1 4.10	208.5	324
Two-photon Rig2	0	0
Surgery setup 4.10	88	228.5
Two-photon Rig3 4.28	14.5	0
MolBiol Bench 4.10	0	0
VR Training setup	0	0

IRIS My account

Browse Scheduler Services Dashboard Admin

Inbox Resources Providers Resource types Charges Invoices **Statistics** Portals Refresh

Resources (6) Filter (0) Exclusions (0) January 27, 2016 - January 27, 2017

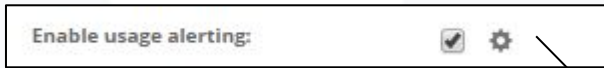
Statistics: utilization

View by: weeks Chart type: area chart Show: working hours + off hours

Utilization of:

- Server_luthi-rig1-VM1
- Server_luthi-rig2-VM1
- Server_luthi-rig2-VM2
- Server_luthi-rig2-VM3
- VCW1010
- VCW1011

Features: Alerting on Resource Usage



IRIS iris@science-it.ch (Local), Swiss National Grid Association My account

Browse Scheduler Dashboard Admin

Timeline List (Time) List (Day) Personal Overview Bookings

Any organization FAIM Any type Filter text

Monday, November 28 2016

2.07 LSM710 ★
Provider: FAIM (FMI)
Contact: help.imaging@fmi.ch
Resource Type: Microscopy
Location: TEST OF LOCATION

Status: **Online**
Comments: Reservations must exceed 3hrs per day & per user. Please negotiate exceptions with FAIM.

Usage count: 2 Booking(s) Reset
Usage since: 2016-11-05 10:07
Alert at: 20

Day Week Month

Mon 11/28 x x x x x x x

Usage alert

Usage count: - 2 + Bookings Usage set: 2016/11/05 09:07 by iris@science-it.ch

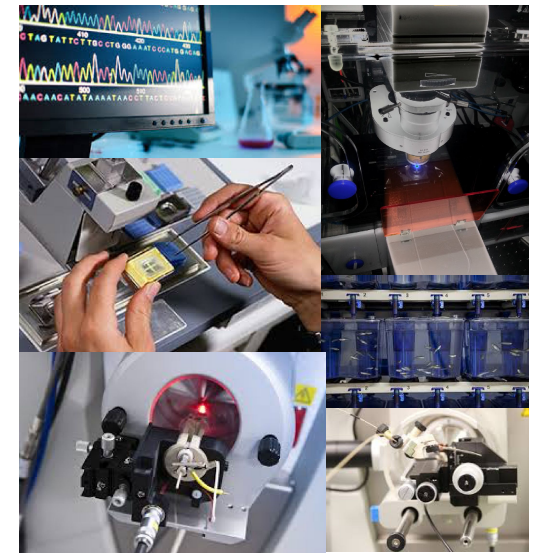
Alert at: 20 Email: dean.flanders@fmi.ch

Disable alerting: (re-enable alerting on the resource admin Settings tab)

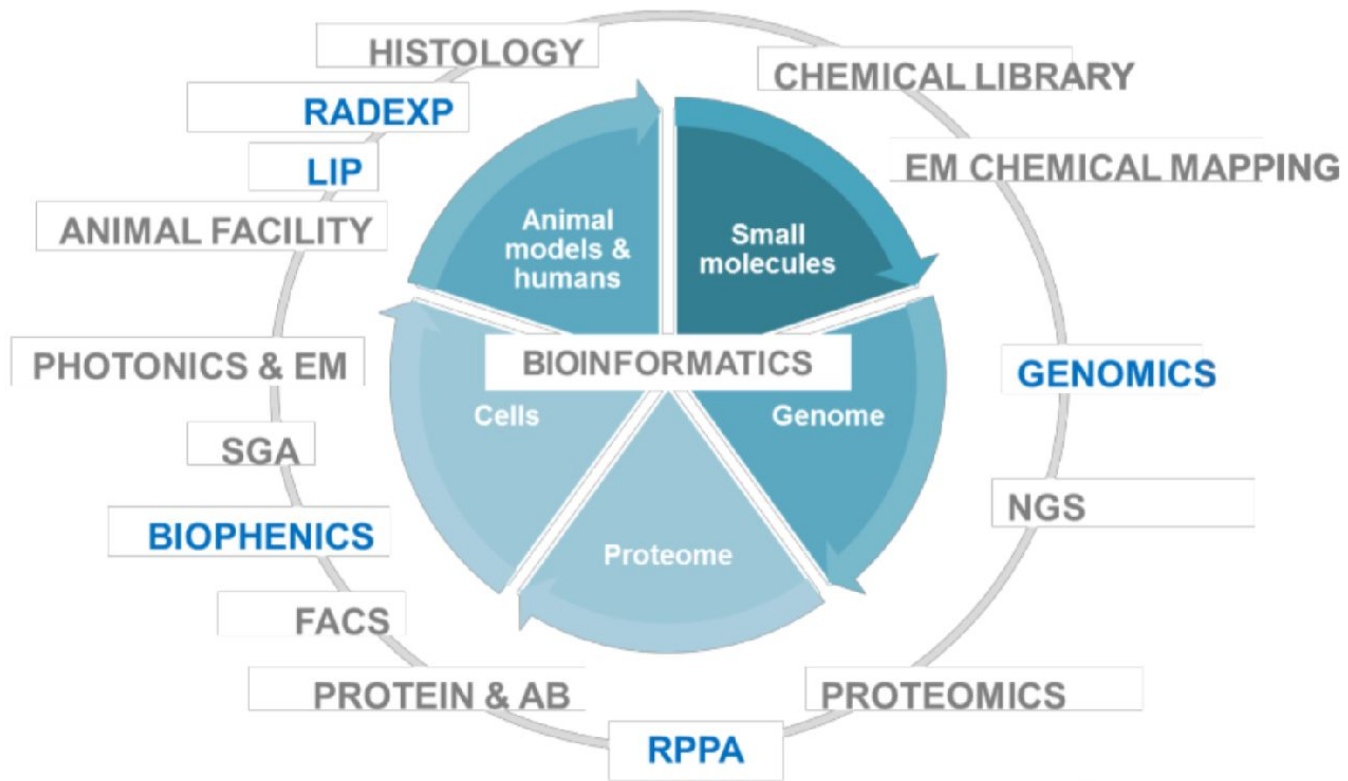
Update Close

Case Study: Institut Curie

- Institut Curie is a hospital and research center focused on cancer.
- Missions: care, research, teaching
- Foundation created in 1909 by Marie Curie
- Key figures of Institut Curie
 - 3300 employees
 - 83 research teams
 - 21 technology facilities
 - 650 medical scientific publications
 - 3 locations in Paris (central Paris, Orsay, Saint-Cloud)






Institut Curie: Core Facility Technologies



Institute Curie: Requirements

- Service requests
- Equipment management
- Complex project management
- Inventory management
- Billing / invoicing
- Reporting
- Communication
- Easy to use
- Upgrades / sustainability
- A single solution for all facilities (application modules)

Institut Curie: Evaluated Options

 Commercial Software	 Collaborative Software	 Home-made Software
<p>Disadvantages:</p> <ul style="list-style-type: none"> ✓ High Cost ✓ Software as service ✓ Data confidentiality ✓ No specific development ✓ Commercial Software <p>Advantages:</p> <ul style="list-style-type: none"> ✓ Turnkey software ✓ Available for all facilities 	<p>Disadvantages:</p> <ul style="list-style-type: none"> ✓ New and risky <p>Advantages:</p> <ul style="list-style-type: none"> ✓ Shared cost ✓ No limitation in number of equipment ✓ Continuous and specific improvements ✓ Feed-backs of users ✓ Available for all facilities 	<p>Disadvantages:</p> <ul style="list-style-type: none"> ✓ Cost of staff ✓ Often depends on a single person developing it ✓ Code is often not robust ✓ Often developed for a specific need of an institute / service ✓ Not much evolution
iLab, Stratocore, Ideaelan, Bookitlab, Lexmark, Capitechnic, etc.	Open IRIS	phpScheduleIt, Google Docs, Google agenda, GRR, PLAGÉ 2.3 and hundreds of home-made developments

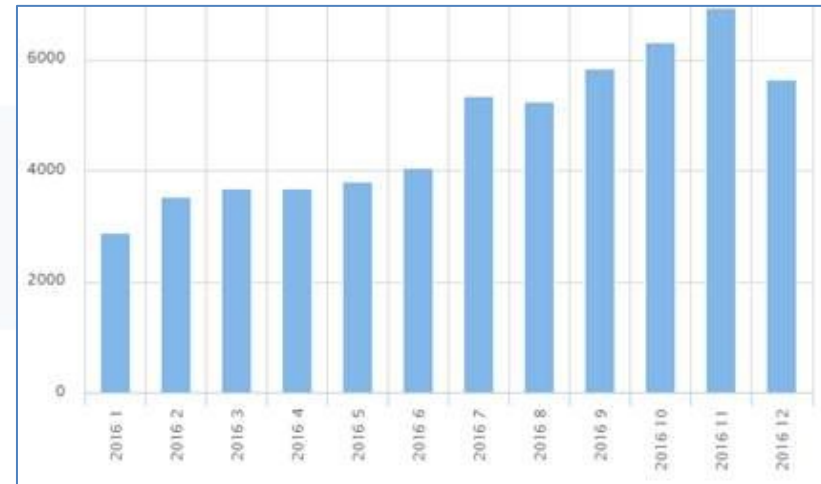
Case Study: Department of Biomedicine University of Basel

- In daily productive use and provides a “one stop shop” for resources and events.
- Enhanced visibility of all resources.
- Statistics:
 - 910 users (Unibas, Uni. Basel Hospital, UKBB)
 - 18 resource providers defined
 - 130 resources registered
 - -150 resource requests per day
- Provided integration between Uni. Basel Hospital, Unibas, and UKBB
- Optimized resource usage
- Improved processes for room bookings and seminars



Open IRIS Metrics

- Doubling of users in 2015 and 2016, over 4200 users currently on the platform.
- Doubling of resource usage requests in 2016, over 6000 per month at the end of 2016.
- 85 organizations in 12 countries with hundreds of logins per day.
- It has approximately 150 resource providers registered with a total of over 1000 resources in the system.
- Usage spans universities, institutes, hospitals, and commercial entities.



Resource Booking Requests 2016

Conclusions and Status

- In daily productive use by hundreds of researchers and provides a “one stop shop” for their needs.
- Already becoming a collection of best practices for resource management and sharing in research helping to optimize resource utilization.
- Enhances visibility of resources and provides integration between organizations.
- Open IRIS is still evolving, but has become an ambitious collaborative project and open to other organizations to use and join.
- Funded in part from efforts in: EGI, SystemsX.ch, eSCT (Swiss eScience Team)