RosettaHUB, governance, e-research and e-learning platform for the cloud

The pathway to

Cloud mass adoption in Higher Education and research.

Pervasive cloud, data science, machine learning, big data and HPC education.

Collaborative and reproducible big data/HPC-enabled research and ResOps.

Who we are

A London based company:

Created about 10 years ago

Research-focused:

Bridge the gap between infrastructure and end users (scientists, students, teachers etc.)

Infrastructure orchestrator: Easy composition of services by anyone

Public cloud focused:

Close partnership with AWS, we also support other public clouds as well as private clouds

Education focused:

Close collaboration with the AWS Educate team over the last 2 years

RosettaHUB for AWS Educate

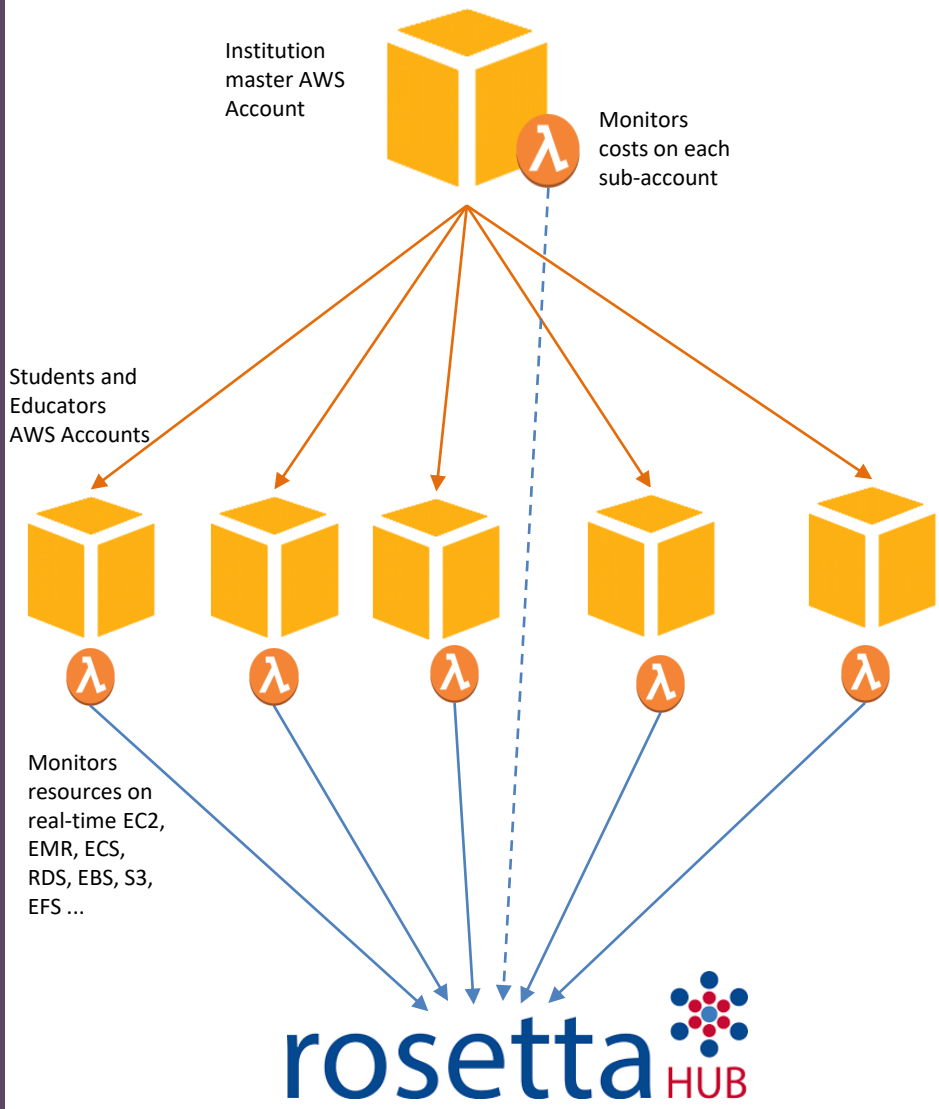
76 higher education institutions including 4 among the top 10 universities in the World.

20,000+ students, educators and researchers

$2M+ of managed AWS credits renewable every year

16 Countries including the UK, Ireland, France, Tunisia, Algeria and Bahrain

RosettaHUB fully automates the onboarding processes. It collects and aggregates the grants provided by AWS Educate ($100 per student per year and $200 per educator per year) and gives institutions flexibility on accounts and credits allocation.



What are the use cases of RosettaHUB

1. Teaching cloud computing at scale: A dedicated AWS account for each student and educator which is fully monitored, under the control and supervision of the institution

2. Virtual Labs: Migration to a digital university model.

3. Machine Learning Labs: At scale usage of GPU instances

4. Data science at scale: One-click access to Jupyter Notebooks, Rstudio, Zeppelin etc.

5. Big data made easy:

Spark, Hadoop clusters based on AWS EMR can be easily created, configured and shared.

RosettaHUB, state of the art governance and management platform for AWS

Account Management

- Do
  - Implement a hierarchy
  - Use AWS Organizations
  - Use a consolidated Admin AWS account
  - Automate AWS account provisioning
  - Implement “single sign-on” through federation

By Douglas Vanderpool, Principal Global Advisor at AWS

Cost Management

- Do
  - Implement a hierarchy
  - Use AWS Budgets or equivalent
  - Start tracking spend by application and environment
  - Start tracking spend against budgets
  - Use alerts to inform stakeholders of potential budget overruns (and potentially take actions to stop it)
  - Automate actions to avoid budget overruns

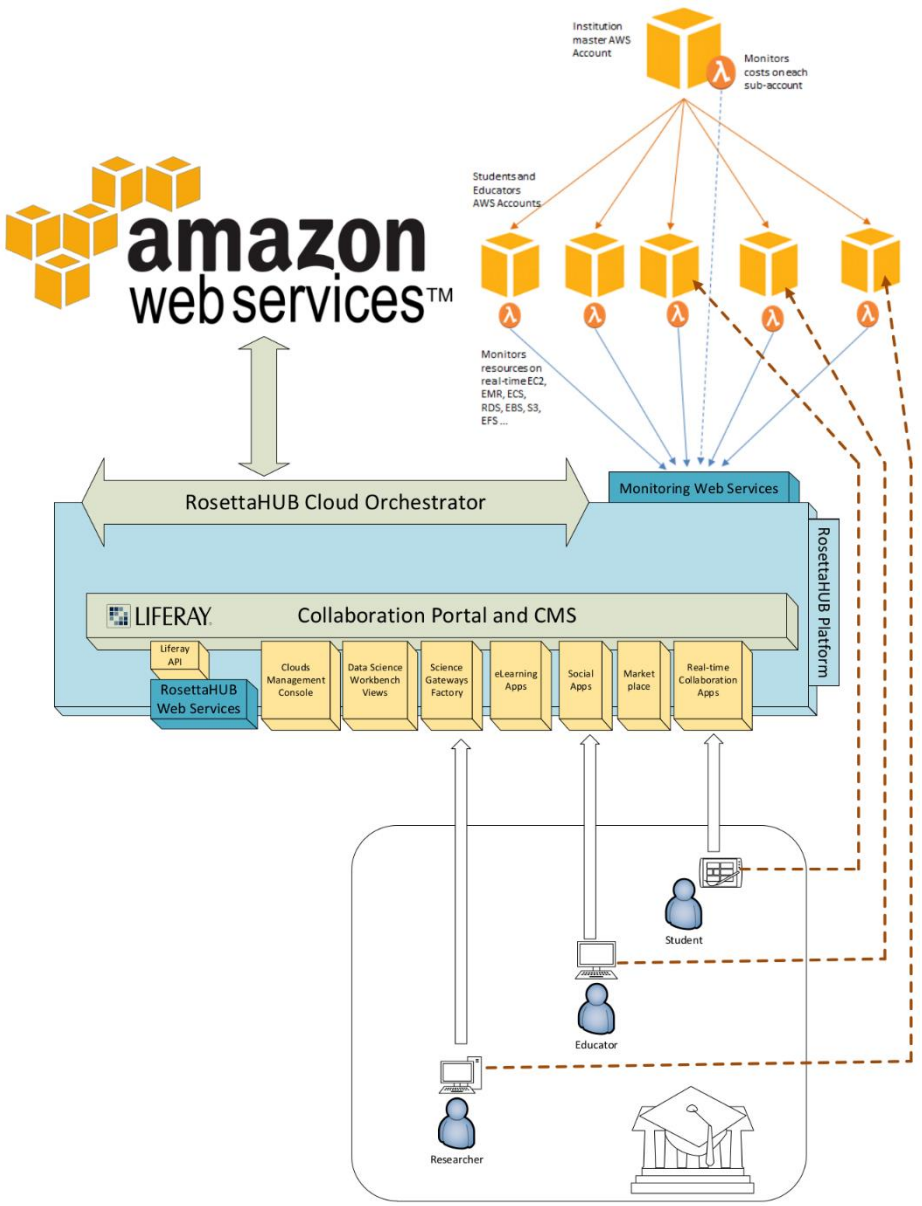
Compliance Management

- Do
  - Implement a hierarchy
  - Use Service Catalog and Landing Zones as a starting point
  - Automate compliance at account/environment creation
  - Continuously monitor for compliance
  - Work towards automating actions when deviations are found

The building blocks of AWS democratization

RosettaHUB provides every student and every educator with an account on a social collaboration portal. Each portal account is linked to a private AWS account created, managed and monitored by RosettaHUB.

The portal makes advanced AWS capabilities easy to understand and operate by students and educators. It also makes all cloud artifacts easy to share.



End-to-end monitoring, management and audit

The institution's Central Point Of Contact (CPOC) and educators can monitor on real-time the students' interaction with AWS and the portal.

The CPOC can manage students: adjust their budgets, their rights on AWS, their resources allowances, etc.

The CPOC can create sub-organizations and assign roles to colleagues for a multi-tenant management of students.

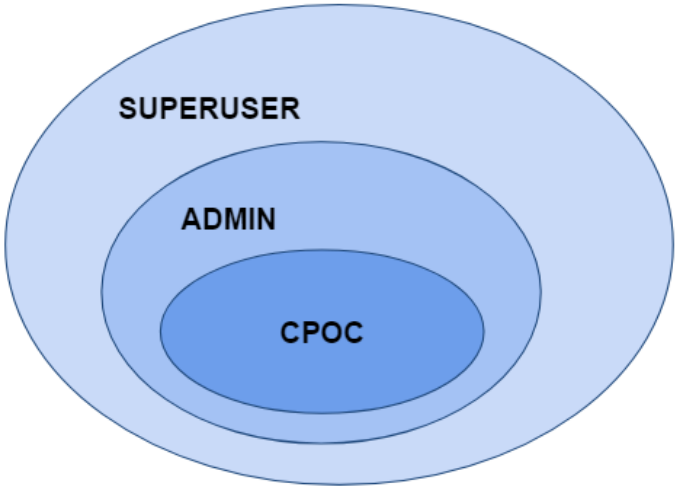
System administrators can generate reports on users activities and cloud usage. They can measure and assess effectiveness of the use of cloud resources.

Repositories of pedagogic cloud artifacts can be prepared and shared with students.

Managing Users

Actions/Role	CPOC	ADMIN	SUPERUSER	ROOT SUPERUSER (*)
Set Budget, Regions, Capacities	✓	✓	✓	✓
Stop All, Terminate All, Cleanup All			✓	✓
Go to Aws Console			✓	✓
Masquerade as user			✓	✓
Download, Reset credentials			✓	✓
Reset All				✓
Go to Aws Console as admin				✓

(*) Superuser of the Root Organization



Managing Organizations

Actions/Role	CPOC	ADMIN	SUPERUSER
Delete the organization		✓	✓
Create a sub-organization	✓	✓	✓
Add a user		✓	✓
Remove a user		✓	✓
View the organization managers	✓	✓	✓
Add a manager	✓	✓	✓
Remove a manger	✓	✓	✓

RosettaHUB,
Next generation e-research and e-learning platform

Virtual labs at scale

- Virtual desktop access in the browser, Linux or Windows machines
- Can run on spot instances, saving 70%-90% of costs
- Can be easily configured by professors
- Embedded security
- Sharing with an organization that maps a lab or a class
- One-click launch and one-click access

- **Do it for me -> I can do It myself**
- **Manual -> Automation**

One-click access to AWS-powered data science

The RosettaHUB dashboard displays the cloud and data science related artifacts as customizable icons structured in categories.

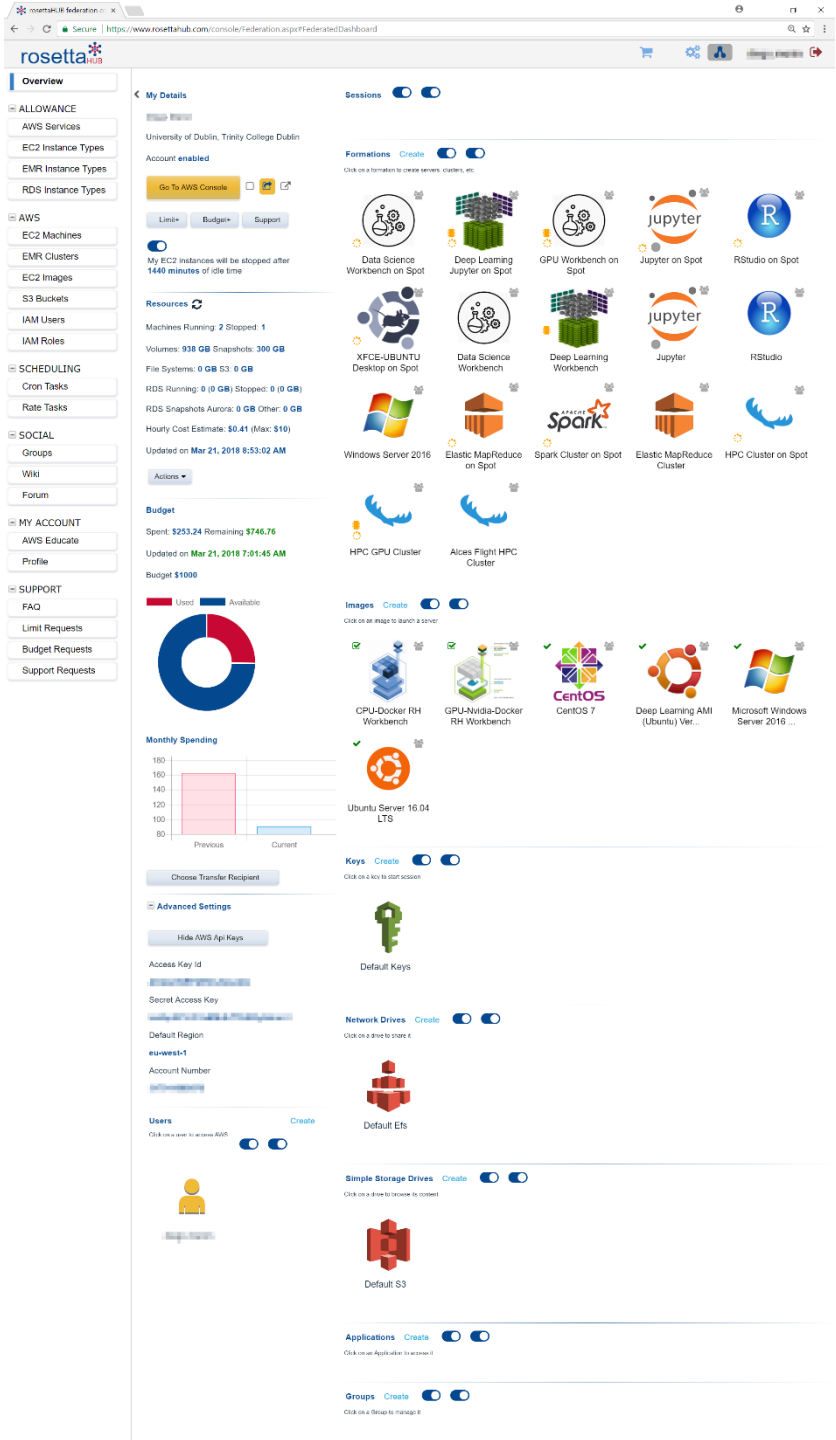
RosettaHUB meta-formations: they enable one-click provisioning and access to fully-managed complex infrastructures for e-learning and e-Research.

RosettaHUB meta-keys: they map AWS access keys and a default VPC, they allow rapid access to AWS services and they can be shared.

RosettaHUB meta-images:

- Managed: they come with agents to orchestrate all service components and expose a composable virtual workbench to the end user
- Semi-managed: they map any EC2 AMI

RosettaHUB meta-storages: they map S3 buckets, EFS or EBS volumes. They can be used as the working or reference volumes for managed instances and clusters.



Democratic and pervasive data science

The RosettaHUB platform closes the technology gap between clouds, containers, data science software, real-time collaboration frameworks, social portals and people.

The RosettaHUB data science platform makes it easy for educators to compose containers-based virtual e-learning environments and for researchers to compose virtual e-science environments.

Jupyter, RStudio, Spark, Zeppelin, Shiny Apps, virtual desktops, HPC clusters, etc. can be added to the virtual environments and made accessible in a secure and highly scalable-manner to thousands of students or collaborating researchers.

User-friendly Spark and Hadoop clusters for research and education

Seamless creation of Hadoop and Spark clusters based on AWS EMR, the RosettaHUB smart proxies and the RosettaHUB workbench.

Support for both on-demand and spot.

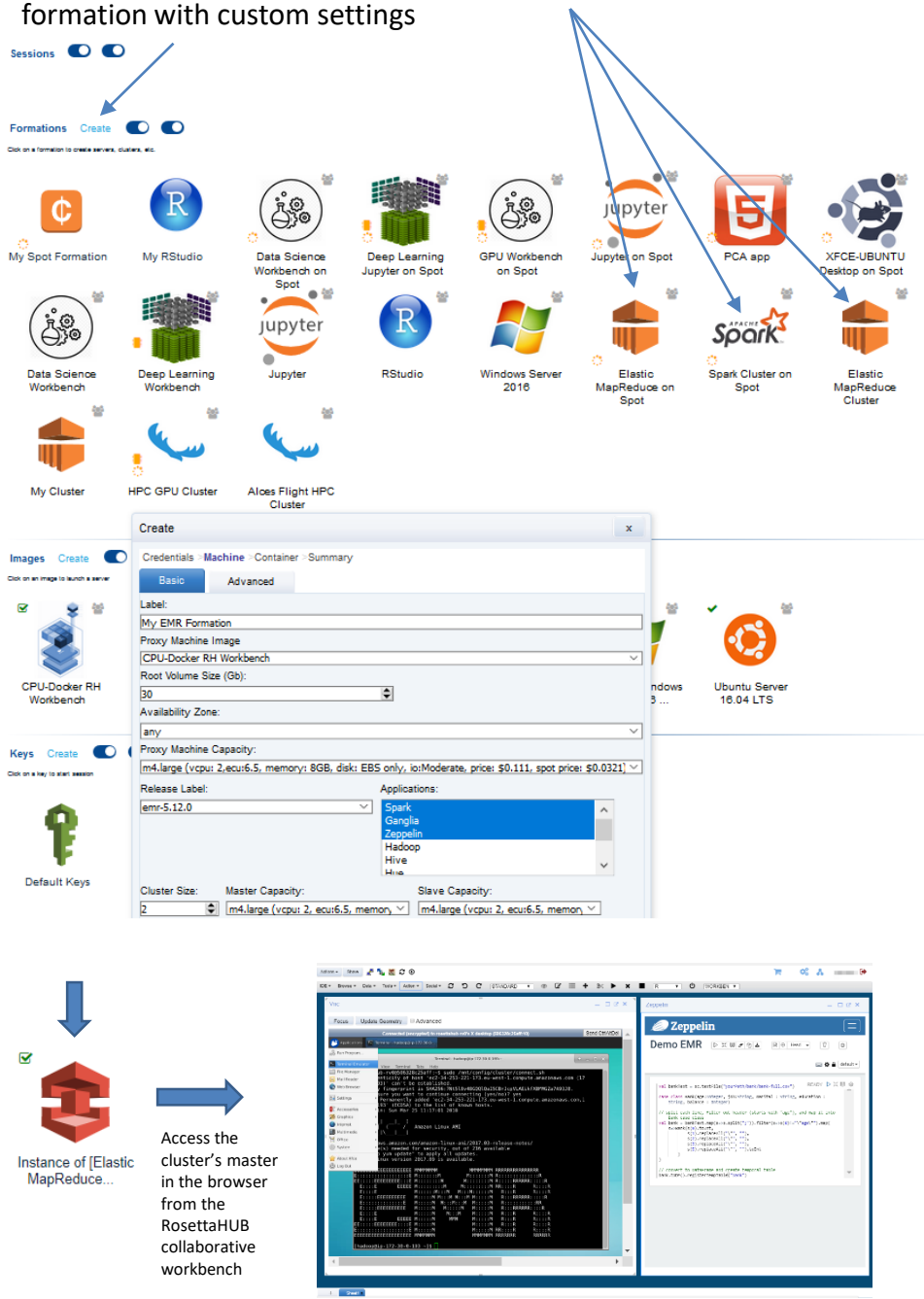
Seamless access to clusters with shells and notebooks including RosettaHUB notebooks, Zeppelin, Jupyter, Spark-Notebook, etc.

Real-time collaborative access, cluster sharing, security and access control for Hadoop and Spark.

Seamless data management, seamless mounting of S3 and EFS volumes on master and slave nodes.

Very rapid big data applications prototyping using the RosettaHUB reactive programming frameworks, web applications designers and spreadsheet engines.

Launching an EMR cluster can be done in one click by choosing an available formation or by creating a custom formation with custom settings



Access the cluster's master in the browser from the RosettaHUB collaborative workbench

User-friendly managed HPC for research and education

Seamless creation of NVIDIA-docker based virtual environments for deep learning on GPU.

Seamless creation and access to HPC clusters based on Alces Flight or cfnCluster, the RosettaHUB smart proxies and the RosettaHUB workbench.

Real-time eagle-view on resources, billing and hourly cost for HPC clusters.

Seamless data management, seamless mounting of S3 and EFS volumes on master and slave nodes.

Extended support for spot and autoscaling.

Out-of-the-box cluster security and access control.

Notebooks, cluster sharing and real-time collaboration for Alces Flight and cfnCluster.

Seamless scheduling using cron and rate tasks.

Interactive Scientific Web UIs and reactive programming frameworks for HPC clusters.

Launching a HPC cluster can be done in one click by choosing an available formation or by creating a formation with custom settings

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