

Developing the UAB Cloud

CI Day 2010

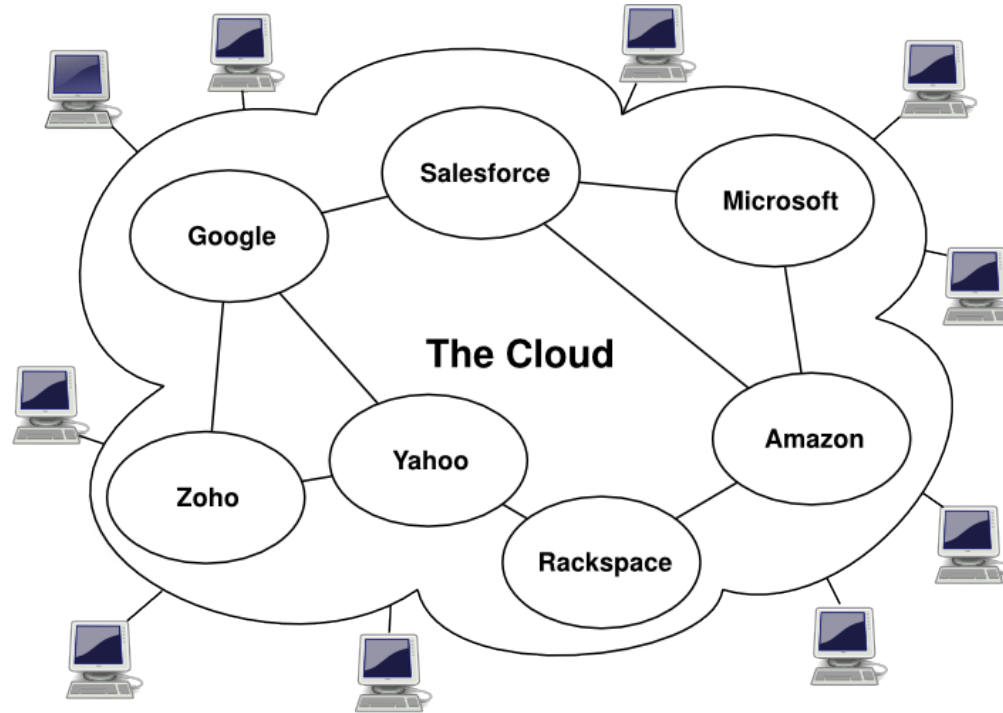
September 16, 2010

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What's a Cloud?

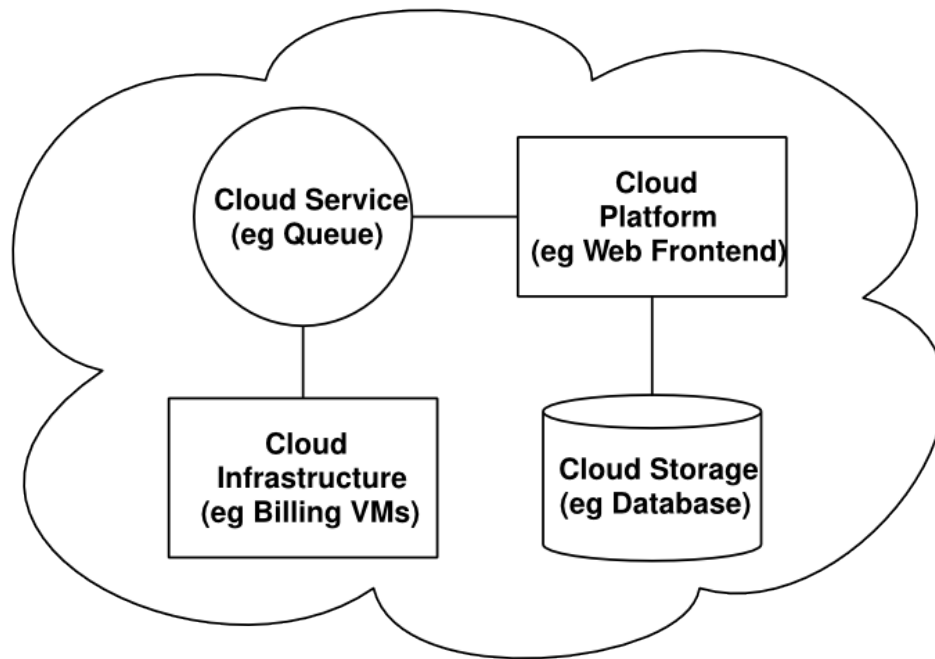


Wikipedia Sez:

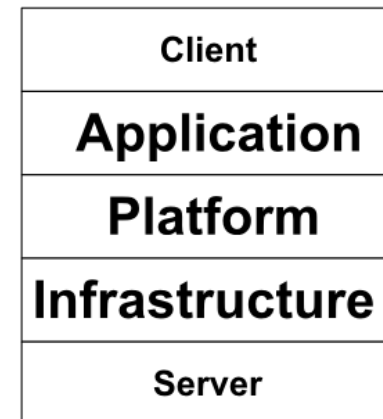
Cloud computing is Internet-based computing, whereby shared resources, software, and information are provided to computers and other devices on demand, like the electricity grid.

The Stuff of Clouds

Clouds have services....



...and clouds have structure



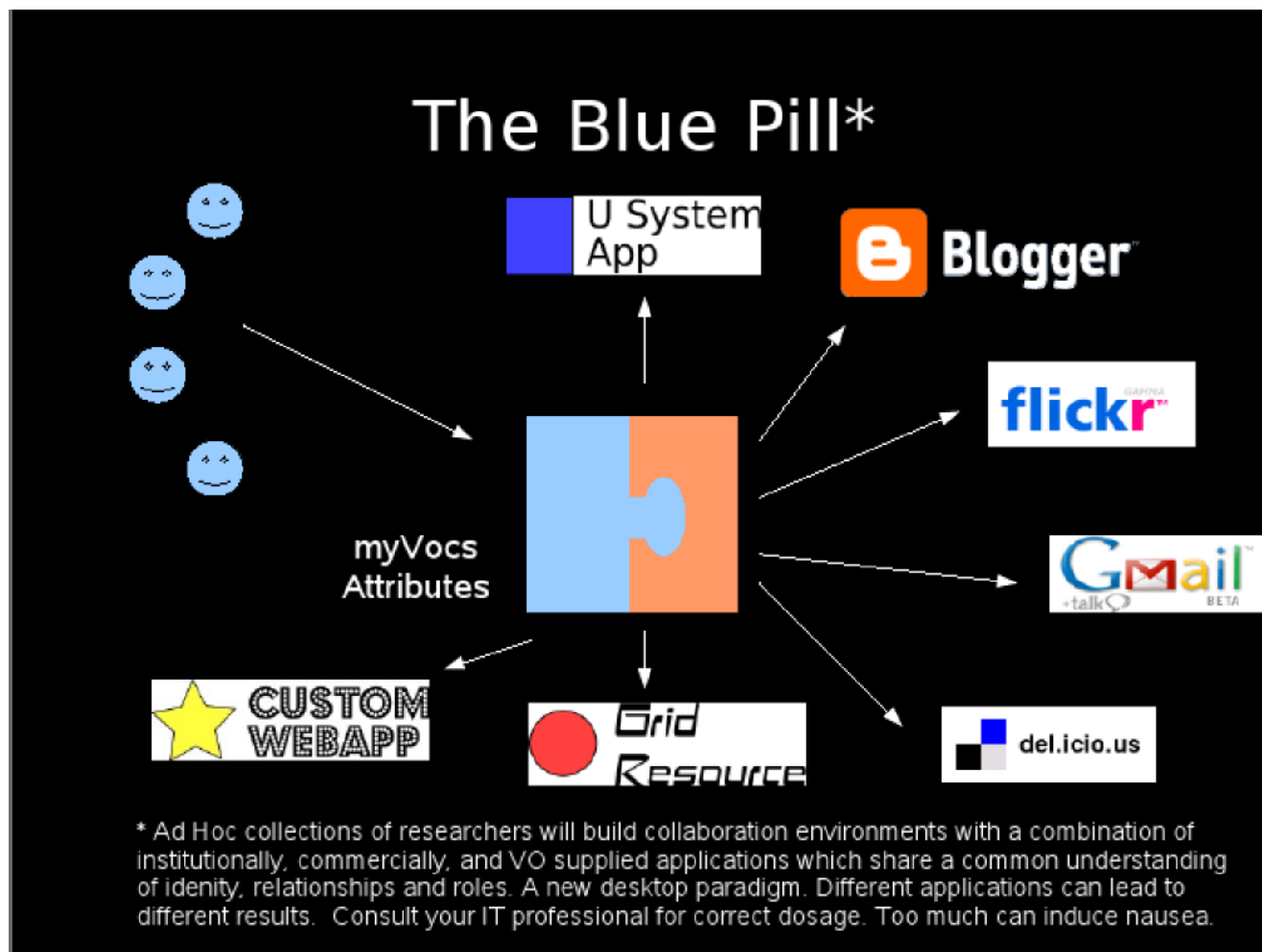
The “aaS” of Clouds

- SaaS – Software as a Service
 - This is the application layer. It's what the ordinary consumer of cloud services sees, typically via their web browser or a dedicated app.
- PaaS – Platform as a Service
 - This is the layer on which applications are built. It's what the ordinary consumer of developer services uses to build the applications delivered in the SaaS layer.
- IaaS – Infrastructure as a Service
 - This is the layer that makes everything possible. It's deep in the stack and not typically seen by the consumer, but it's the layer we're leveraging to build a coherent service stack.

Our Foundations in the Cloud

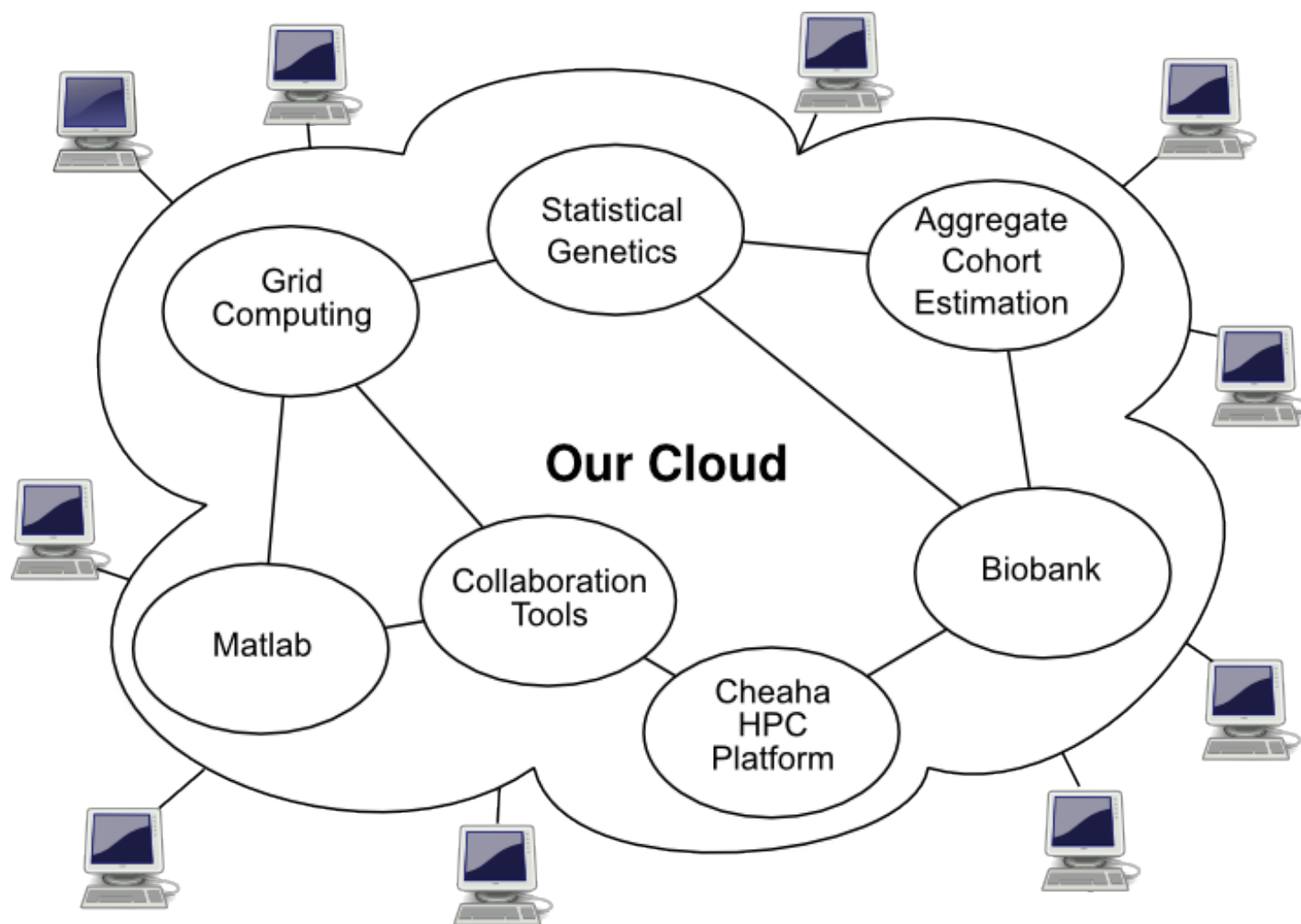
- Service Exploration 2000-2003
 - Early service explorations, Internet2 Connectivity, Cluster Acquisition, NSF Middleware Initiative (NMI) Testbed
- Service Development 2003-2006
 - ANI-0330543 "NMI Enabled Open Source Collaboration Tools for Virtual Organizations"
- Service Pilot 2007-2010
 - UABgrid Pilot
 - Integrated open source tools suite for computing and group collaboration: Globus, MediaWiki, Trac, Mailing List, Revision Control

Our Cloud-y Vision circa 2006



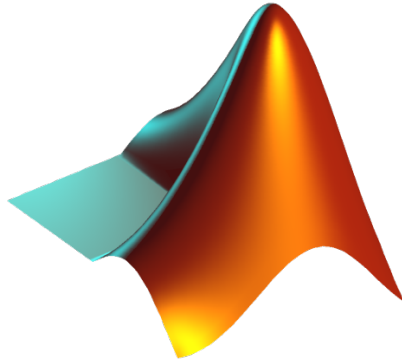
Credit: John-Paul Robinson, Common Solutions Group, invited presentation on [myVocs](http://myVocs.com)

Tour Our Cloud



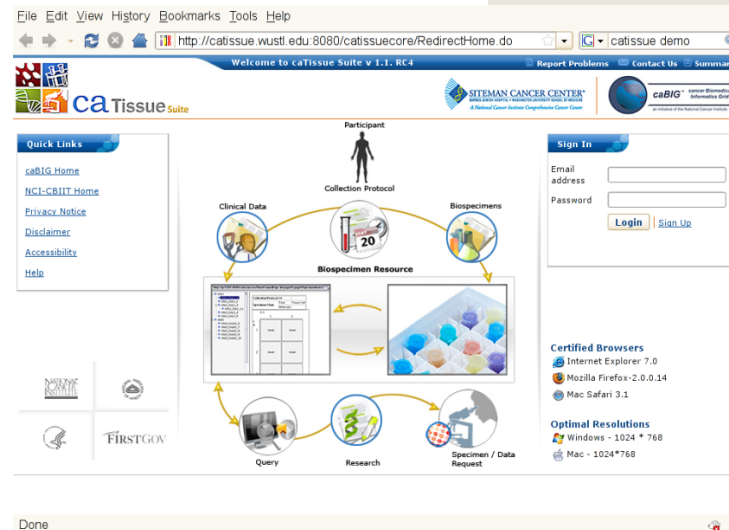
MatLab, Biobank, ACE

Software as Services Experiments



<http://docs.uabgrid.uab.edu/wiki/MatLab>

<https://ace.ccts.uab.edu>



<http://biobank.uabgrid.uab.edu>

Collaboration Tools

Services for Developers Experiments

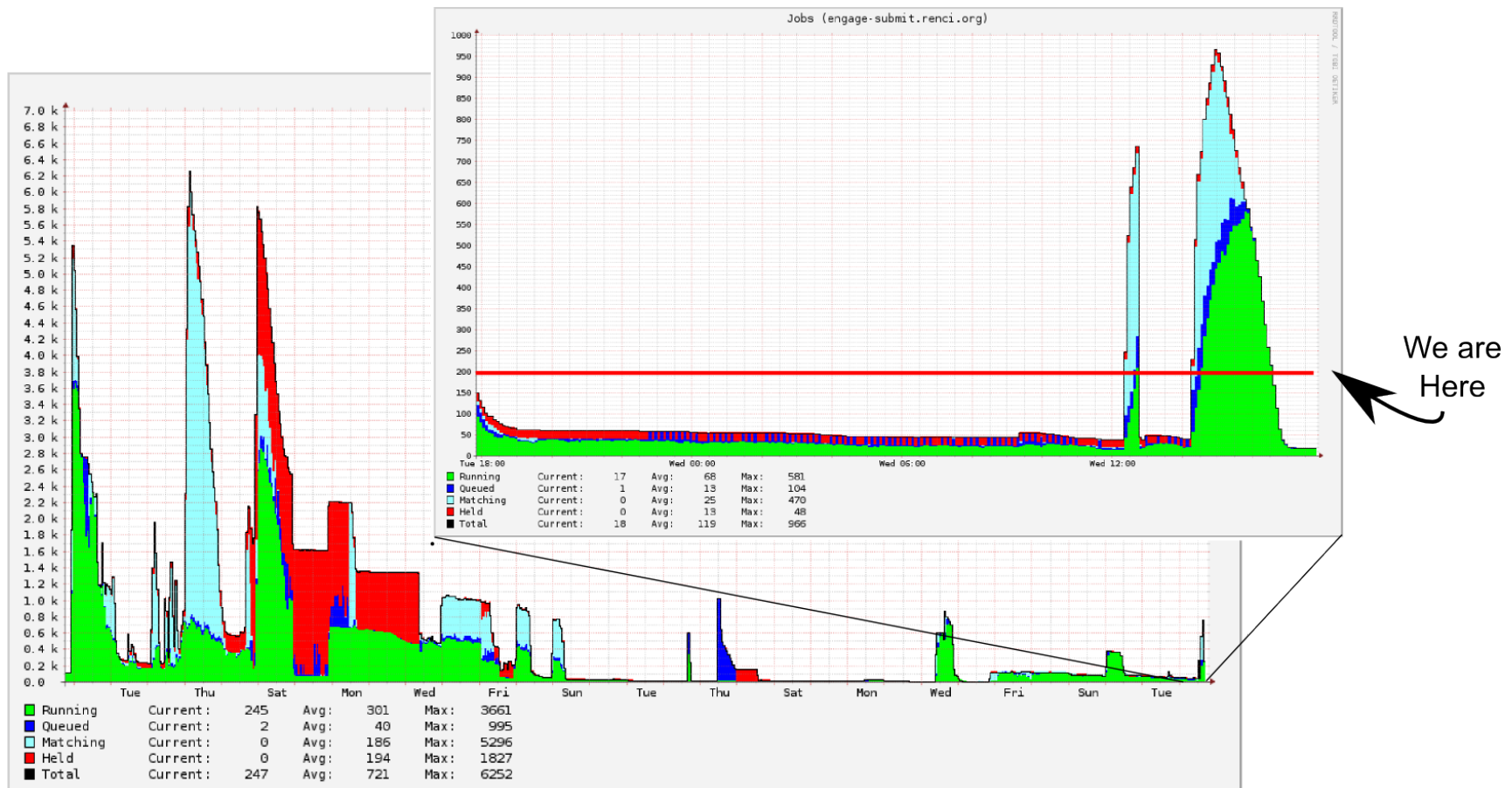
The collage displays five different web interfaces used for project collaboration:

- Trac Source Code Management:** Shows the 'dasi' project's source code browser with a file tree on the left and a list of files with their sizes, revision numbers, and last change dates.
- Trac Active Tickets:** Displays a list of active tickets with columns for ticket ID, summary, component, version, milestone, type, and owner.
- MediaWiki Project Documentation:** Shows a 'Welcome to the UABgrid Development Project' page with an overview of the project's goals and a table of contents.
- WordPress Project News:** Displays a 'migrating project resources: status and notes' article with a detailed description of the project's current status and future plans.
- Mailing List Page:** Shows a 'Done' status for a mailing list subscription, indicating successful registration.

MediaWiki, WordPress, Mailing List, Trac (docs & bugs), Git (file versioning)

<http://docs.uabgrid.uab.edu>; <https://projects.uabgrid.uab.edu/dasi>, <https://projects.uabgrid.uab.edu/r-group>,
<https://projects.uabgrid.uab.edu/sg-osg>, <https://projects.uabgrid.uab.edu/dspace>,
<https://projects.uabgrid.uab.edu/gpir-sge>, <https://projects.uabgrid.uab.edu/sg-submit>,
<https://projects.uabgrid.uab.edu/uabgrid-asa>, <http://dev.uabgrid.uab.edu> ...

Grid and Statistical Genetics: Platform Scaling Experiments

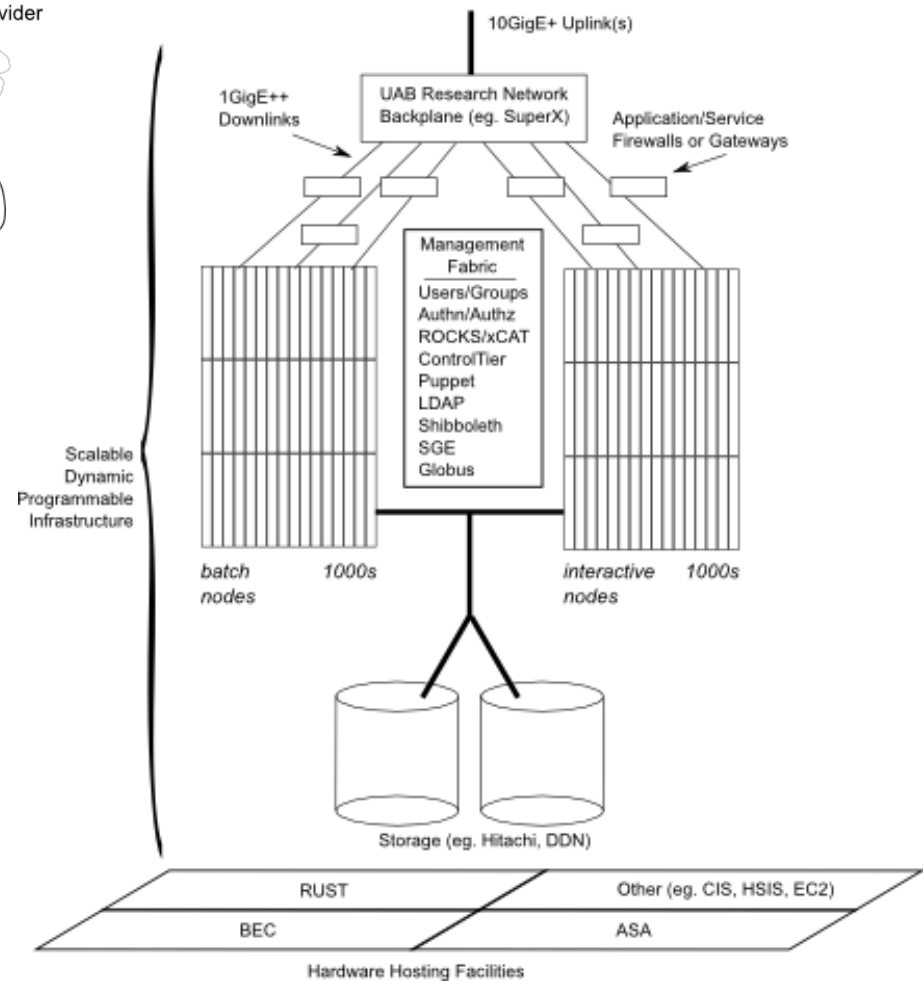
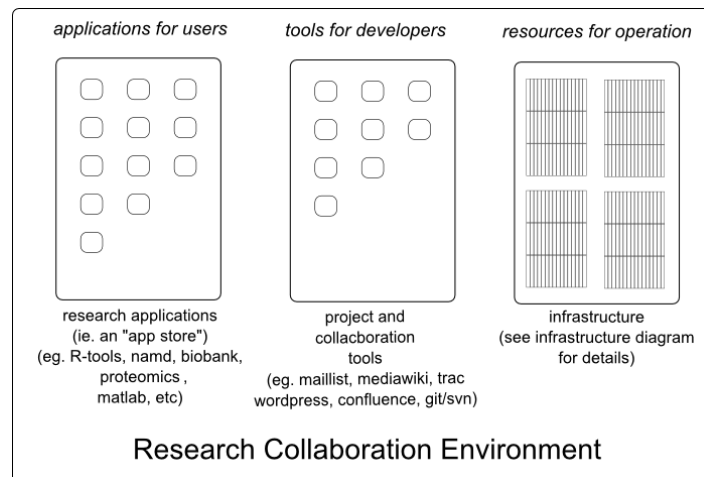
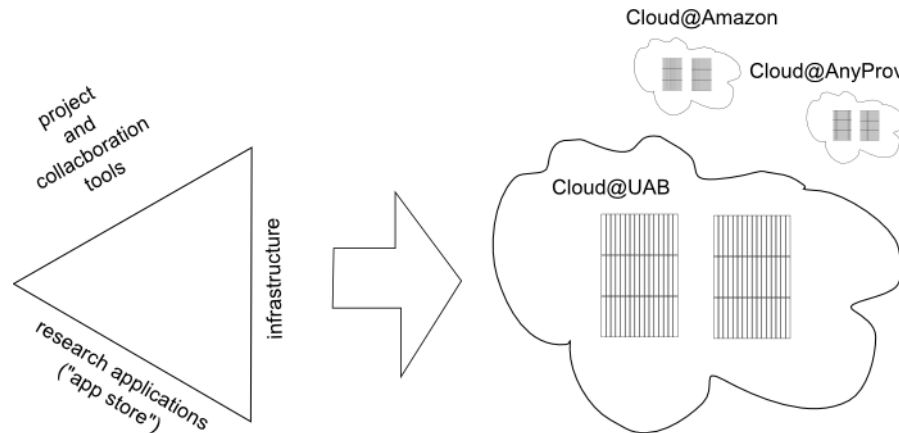


Open Science Grid Capacity

Projects.uabgrid.uab.edu/r-group

Cheaha HPC Platform

Infrastructure Service Experiments



What We're Doing Now...

- In General
 - UABgrid Pilot projects wrapping-up
 - migrate to production
 - report our findings
 - High-bandwidth connectivity expansion
 - across the campus and state
 - Cloud exploration across UA System and the state
 - linked data centers and expanded HPC
- Two Specific Projects
 - Moving the @lab to the cloud
 - support virtual computing labs to build environments in the cloud
 - Extending the research notebook
 - exposing the value of archives, wikis, blogs, and managed development platforms to the research data collection

How to get Involved

Contact Us

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Find Us

<http://www.uab.edu/it/research>

<http://uabgrid.uab.edu>

<http://dev.uabgrid.uab.edu>

Experiments in the Cloud

- Building out Infrastructure
 - Cheaha compute and storage expansion
 - Research Network
 - Continuous resource improvement – non-disruptive
- SSG Project
 - Application Scaling
 - OSG Leveraging
- ASA Integration Exploration
 - Proving the idea of seamless resource access
 - Need to get back to it
- Cancer Center caBIG Support
 - Help complete getting connected – recognition by NCI for our design
 - Biobank: an exploration of caTissue electronic tissue banking solution (SaaS)
- Center for Clinical and Translational Science
 - Design information sharing network based on caGrid elements
 - Provided developer team building, process and tools (SaaS)
- Increase HPC Access to non-traditional users
 - Psychology graduate students under Dr. Taub
 - Training and application support
- Engaging in Research Repository
 - Platform and application development support
- Building Virtual Computing Laboratories
 - Migrating our lab to this fabric
- Building the Research Notebook

Collabortion Tools (SaaS)

- Environment for Developers
 - Trac – managing development process (wiki & tickets)
 - Git – managing software growth
 - MediaWiki – managing documentation
 - Mailing lists – managing communication
 - WordPress – managing activity logs
- Application Platforms
 - Perl, Python, R, C,
 - Adding PHP, Ruby