



Connecting people and resources
to accelerate discovery by empowering
the science gateway community

Science Gateways Community Institute: Accelerating Science by Addressing Sustainability Issues

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Xpert Network call

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sciencegateways.org

Award Number
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Research Software



Use

90%

95%

Can't
continue
without

70%

63%



Research Software

> 50% neither formal nor informal training
in software engineering



Use

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Technology-Enhanced Research

- Increased complexity of
 - today's research questions
 - hardware and software
 - skills required
- Greater need for openness and reproducibility
 - Science increasingly driving policy questions
- Opportunity to integrate research with teaching
 - Better workforce preparation

*We need end-to-end solutions that provide **broad access** to advanced resources and allow **all** to tackle today's challenging science questions*

→ Science Gateways

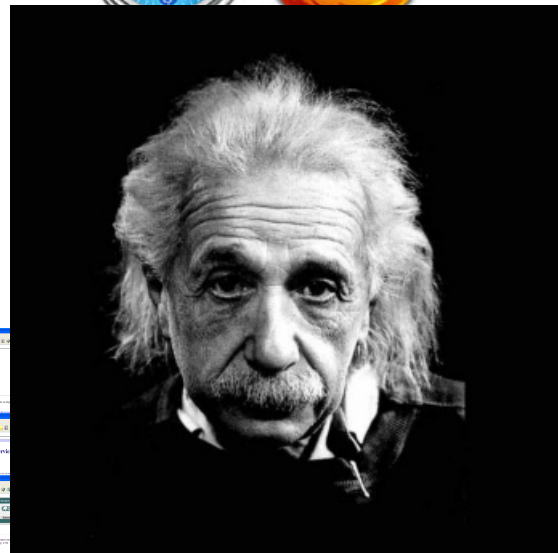


Data- and compute-intensive problems

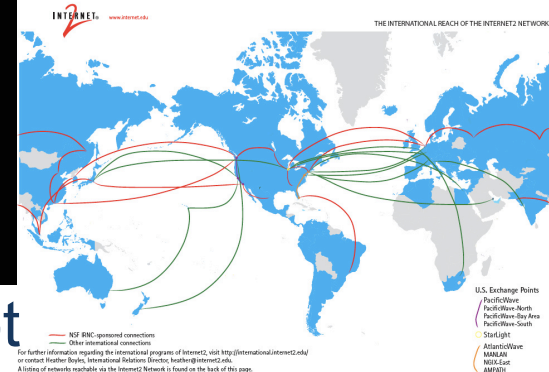
Web-based agile frameworks



Distributed data and computing infrastructures

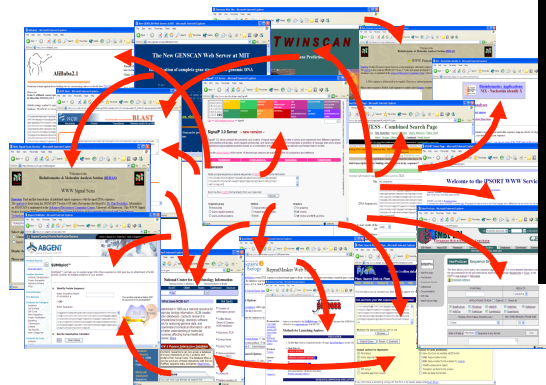


Users generally not IT specialists



High-speed networks

Tools and workflow engines





Data and compute-intensive problems



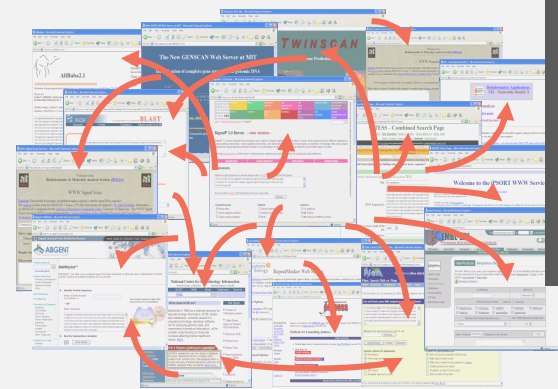
Web-based agile frameworks



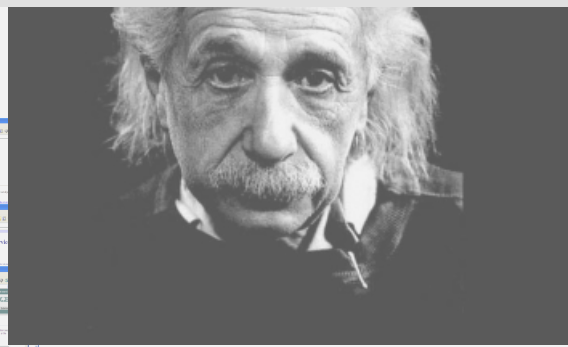
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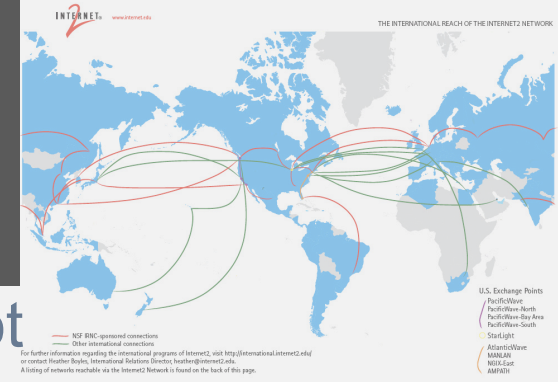
Need for science gateways!



Tools and workflow engines



Users generally not IT specialists

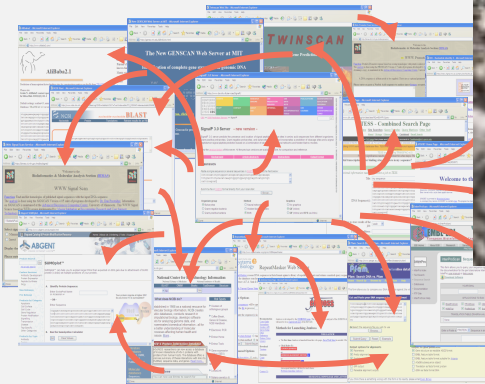
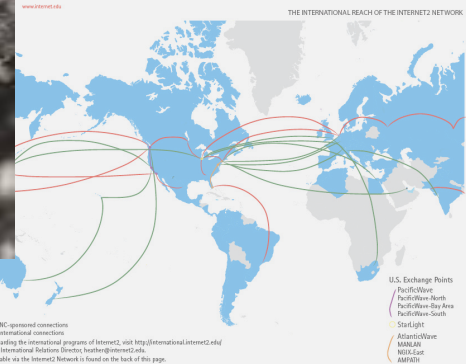
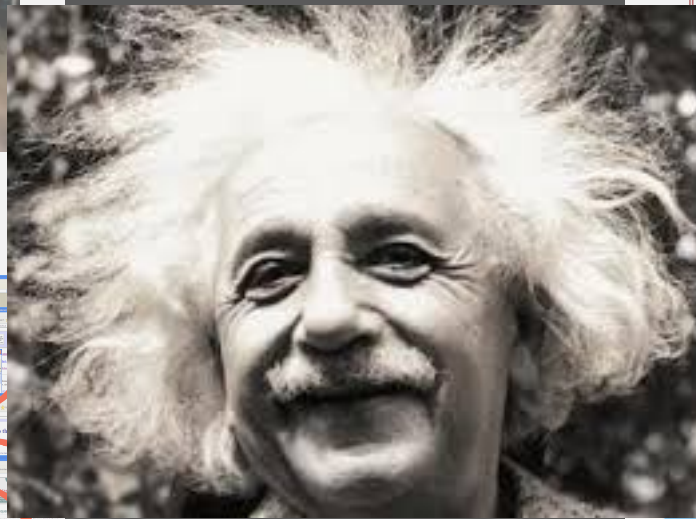
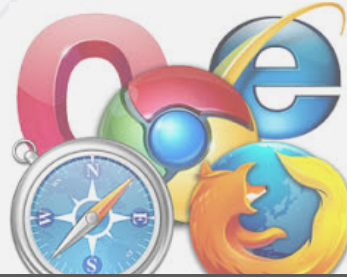


High-speed networks

Data and compute-intensive problems

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Users generally not IT specialists

High-speed networks

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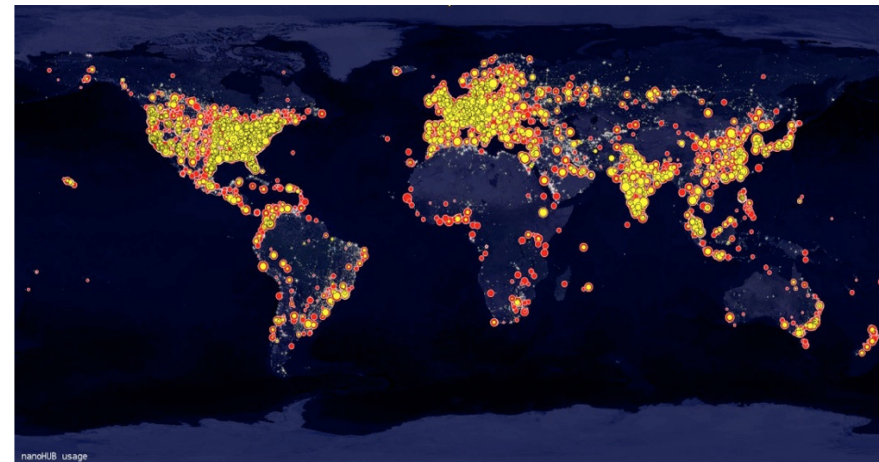
Technologies

- Widely used complete frameworks (HUBzero, Galaxy, Globus Data Portal, etc.)
- RESTful APIs and support of multiple programming languages in widely used frameworks (Apache Airavata, the Agave platform, etc.)
- Reused interface implementations (CIPRES, etc.)
- Science gateways as a service with provision of hardware in the background (SciGap, etc.)

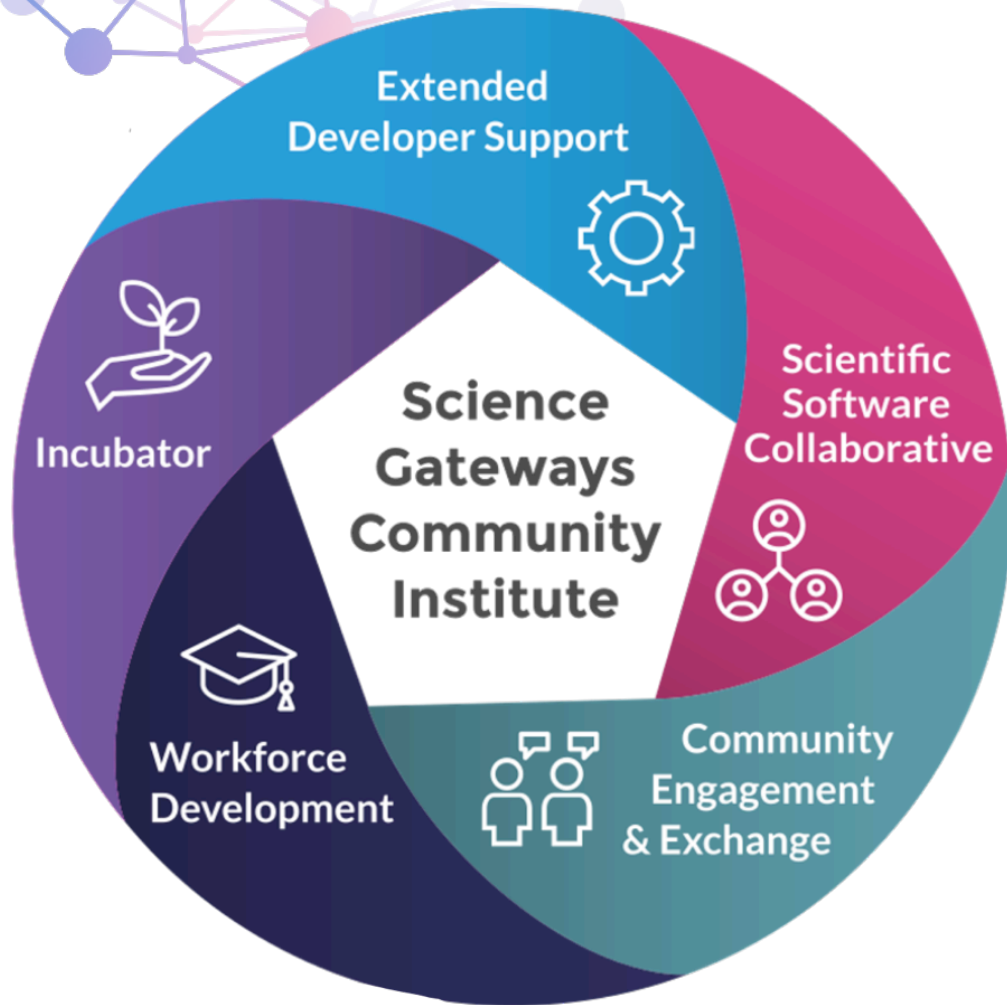
Lessons learned: approaches should be technology agnostic, using APIs and standard web technologies OR deliver a complete solution

Community Engagement is key

HUBzero instances world wide



Science Gateways Community Institute



- Diverse expertise on demand
- Longer term support engagements
- Software and visibility for gateways
- Information exchange in a community environment
- Student opportunities and more stable career paths



Incubator

A Framework for Decision Making

Technology Planning

- Choosing technologies
- Cybersecurity
- Software engineering
- Interfaces to compute and data

Business Planning

- Business model development
- Financial planning
- Project management
- Software licensing
- Staff and sustainability planning

Client Interaction Planning

- Usability studies
- Web/visual/graphic design
- Impact measurement
- Community engagement
- Support for education

Specialized Expertise

Security

Sustainability

Evaluation & Impact Measurement

Campus Resource Development

Network / Cohort Formation

Common Experiences

- Training sessions
- Group interactions

Continuing Engagement

- Customized structure, content, goals
- Mentoring
- Pay It Forward

An Ongoing
Dispassionate
Ear



I have an idea!



Articulate the value of your gateway and how it's distinctively different from what already exists.

Who benefits?



Identify audience and stakeholder groups and consider how they impact your success.

Where does it fit in?



Establish where your gateway solution fits within the existing market landscape of partners and competitors.

How do I make it happen?



Define measurable goals for success and sustainability. Consider multiple needs such as technology, security, project management, usability, and funding.

How do I sell it?



Spread the word!
Plan how to tell the unique story of your gateway.

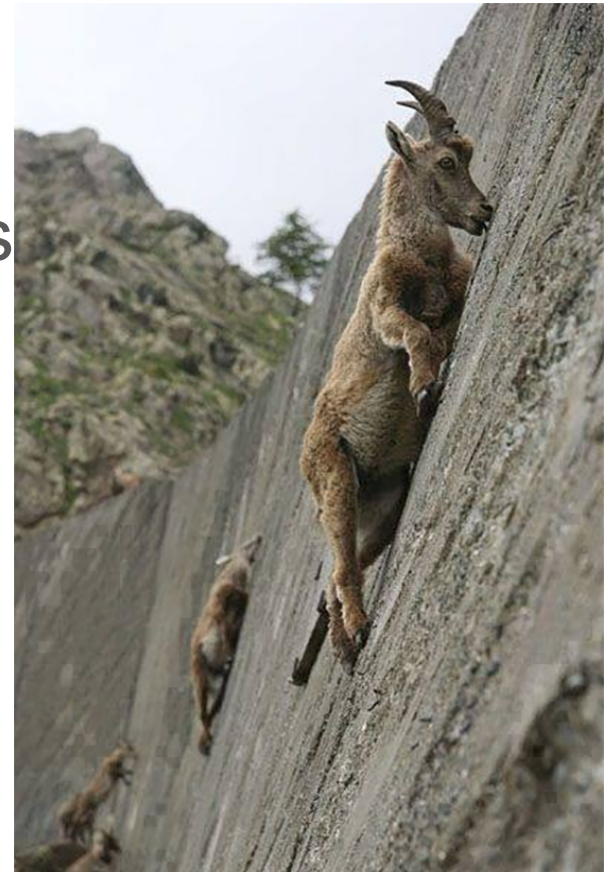
Bootcamp at a Glance

- 5 days
- Knowledge dissemination
- Interactivity
- Community formation
- Putting away the normal daily routine
- Homework



On-Campus Teams

- Great visibility for the institution's research activities
- Synergy effects between projects
- Shared resources, costs and expertise across departments
- Lower learning curves
- Expertise that is otherwise difficult for individual projects to obtain



Collaborations make challenges
less steep



Extended Developer Support

Focus

- Front-end development
- Gateways using all types of C
- Both sides give 2-month to 1-year commitment
- Well-defined engagements with work plans
- Technology agnostic

Data Education Analysis Tools
Instruments Computation
Collaboration Workflows Sensor

Airavata HUBzero
AGAVE
Galaxy Jupyter
And more...

Mission

- Bring new gateways into existence
- Adapt existing gateways to new resources and technologies
- Provide “burst” support to help gateways with smaller issues

Benefits

- Reinforce Incubator lessons
- Develop deep understanding of community needs that feed into other Institute areas
- Capture and document support efforts for scalability
- Hands-on opportunities for student participants

Lessons Learned

- Scope EDS to 6 months instead of 12 months
- Bootcamp is now called Focus Week
- On-campus team consultancy led to Gateway Ambassador program



"We like to bring together people from radically different fields and wait for the friction to produce heat, light and magic. Sometimes it takes a while."

Gateway Ambassadors

Are you enthusiastic about sharing advanced software or digital products for research or teaching with a community?

Do you see the need for such a community at your institution?





Gateway Ambassadors

Community builders

- creating a network between people, experts, and resources

Members of a professional community

- Community activities
 - learning from peers
 - sharing information
- Ambassador activities
 - meeting with individuals
 - hosting awareness sessions



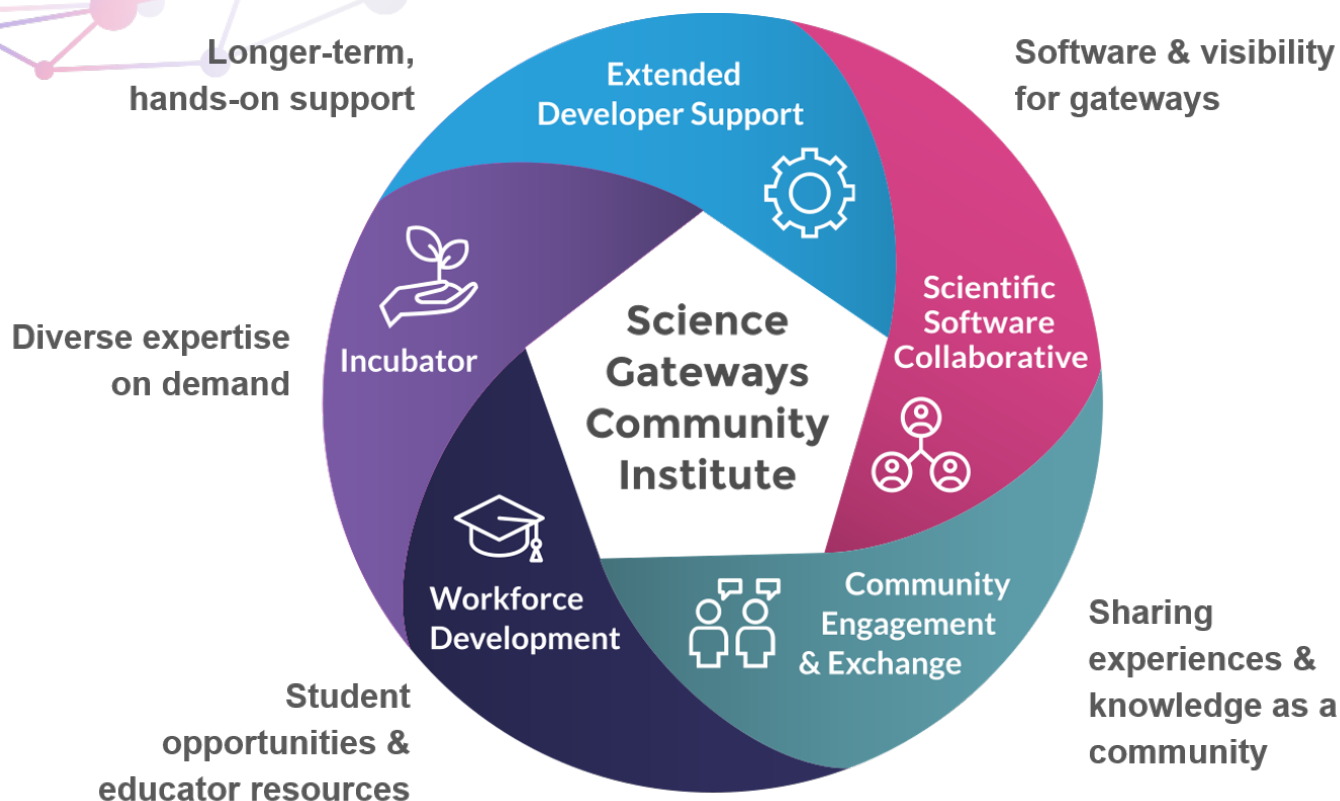
Lessons Learned

Eating our own dog food!

Sustainability of SGCI

- Diversification of funding with charges for services after NSF funding ends for SGCI (EDS services, focus week, student support)
- Scaling of services
- Service- and product-oriented tasks
- Community driven

You Are in Good Company!



<https://sciencegateways.org/>