

The background of the slide is a light blue color with a white network of lines and nodes. A teal-colored world map is centered in the background, showing the continents. Overlaid on the map is the text "POWERED BY" in large, bold, dark blue, sans-serif, all-caps font. Below "POWERED BY" is the word "COMMUNITY" in a larger, bold, dark blue, sans-serif, all-caps font. Between "POWERED BY" and "COMMUNITY" is the phrase "BOUNDLESS COLLABORATION." in a smaller, dark blue, sans-serif, all-caps font.

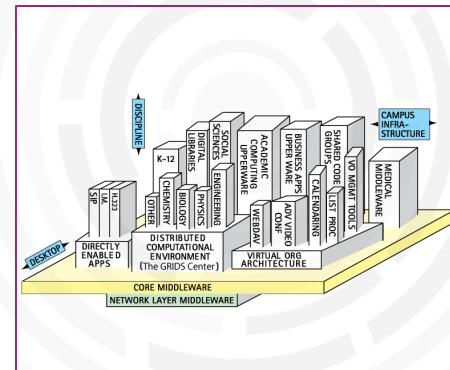
POWERED BY BOUNDLESS COLLABORATION. COMMUNITY

CONNECTED RESEARCH. ACCELERATED DISCOVERY.

www.internet2.edu  [@internet2](https://twitter.com/internet2)



Today, there are 328 higher education members.



1998 – Internet2 launches Middleware Initiative

Today Internet2 **exists to...**

facilitate collaborative effort of U.S. higher education institutions to design and provide selected mission-critical services required to advance all aspects of their academic and service missions.

Internet2 **works by...**

engaging mutual-interest collaboration across diverse communities to advance scholarship and accelerate discovery.

higher education

industry

regional networks

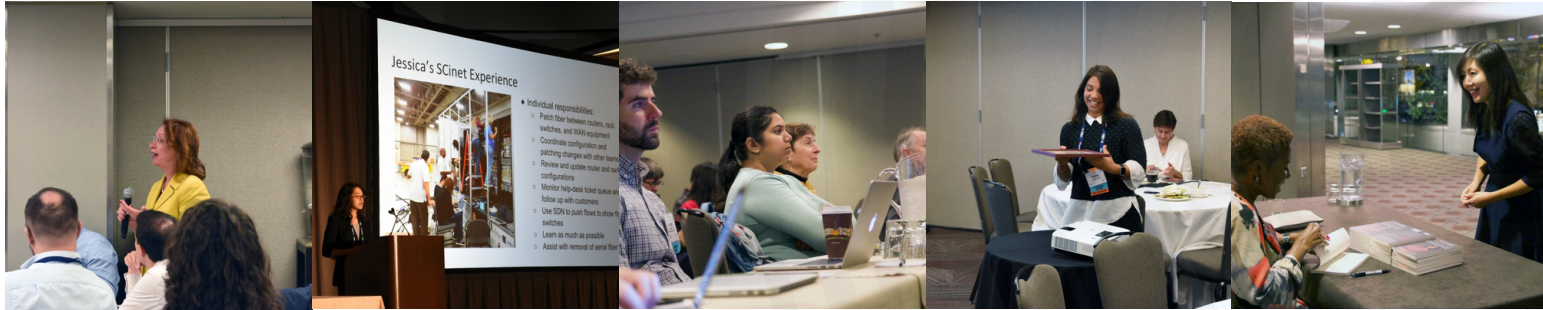
international networks

government agencies

research and cultural institutions



The Internet2 Community: **an unparalleled human network**



- 499 member institutions and organizations
- 100,000+ community anchor institutions
- Over 900 InCommon participants
- Initiatives, working groups, program advisory committees and community award programs
- International partners
- Inclusivity and diversity
- Convening through two major events

Internet2 Core Components

Advanced Networks

Designed for abundant bandwidth, zero congestion, capacity for innovation, and peered to global research and education networks reaching over 100 countries

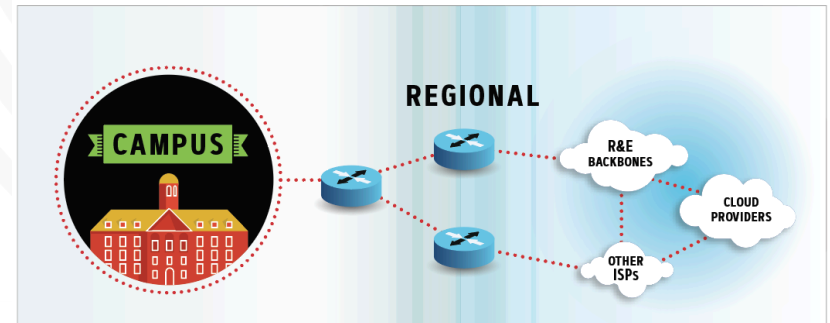
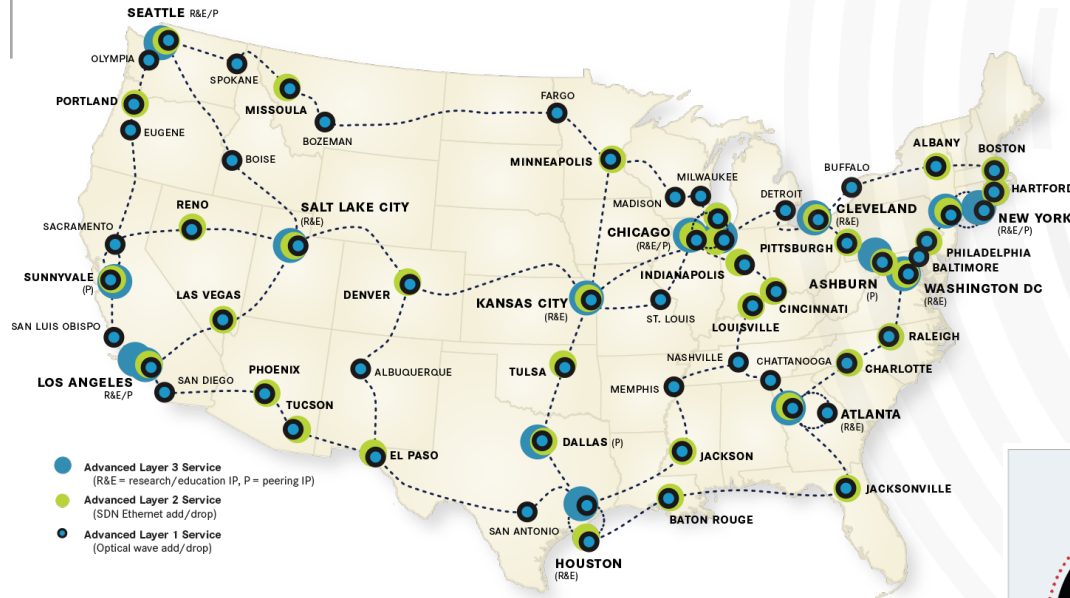
Integrated Trust and Identity Services

Designed to support collaboration and enhance interoperability among campuses and services

NET+ Cloud Services

A unified portfolio of cloud and trust solutions tailored for R&E's diverse community of users

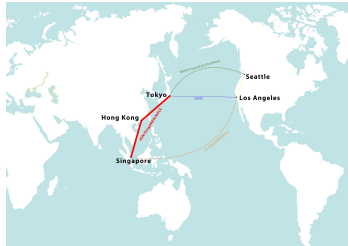
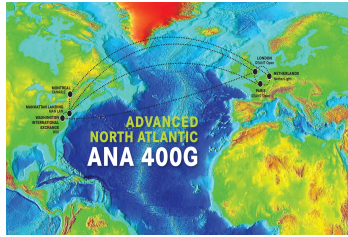
R & E Network Ecosystem: **secure, stable and trusted network for R&E**



Global Collaborations: in support of R&E

Strengthening relationships with international partners around the world

Network Infrastructure



Trust & Identity Framework



Collaboration & Participation



.....and more

Trust and Identity in Research and Education

Identity management locally, nationally and internationally



Campus IAM

A community-driven approach to identity and access management

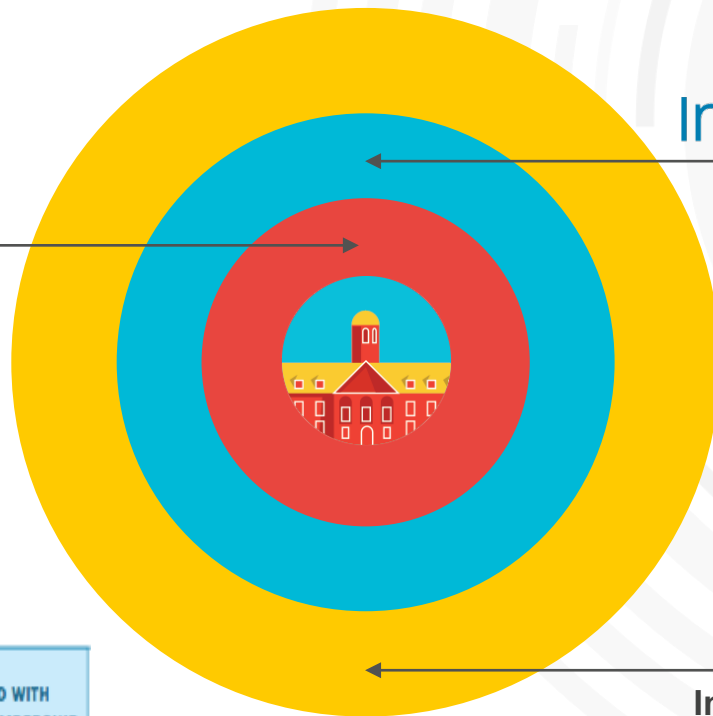


National IAM

A framework for trusted, shared management of access to online resources

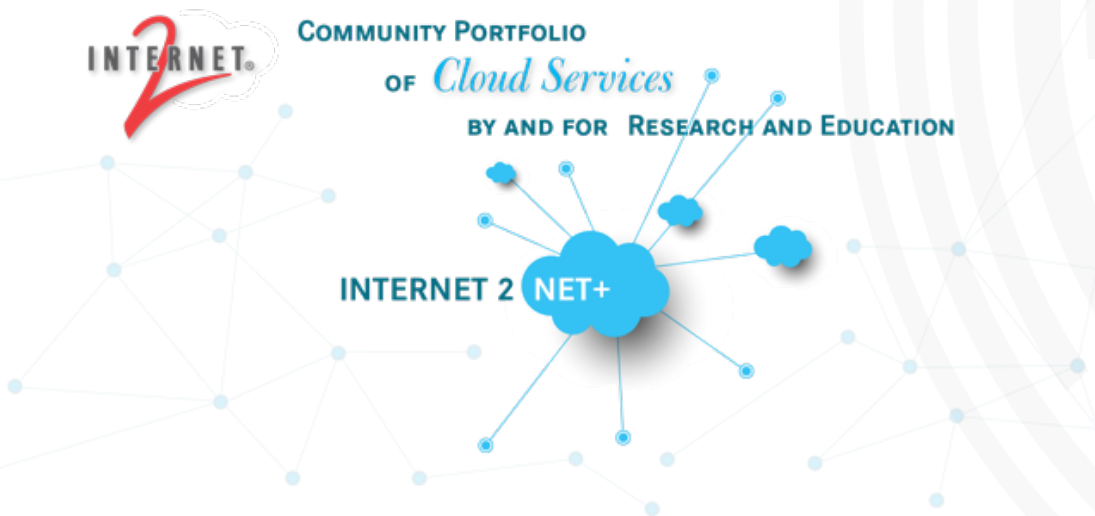


International IAM



Enabling Cloud Access and Services

Strategies to enable researchers and campuses



Cloud Exchange

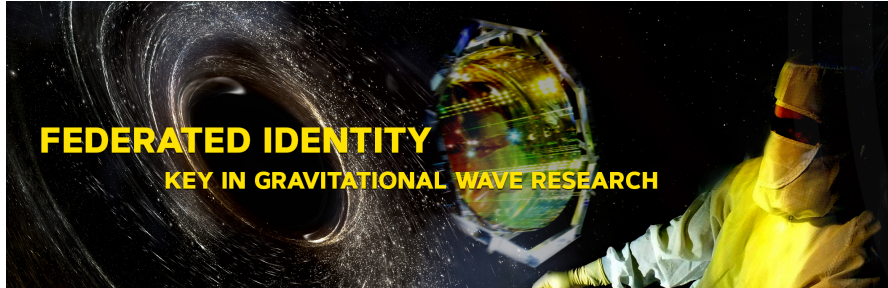
Cloud Connect

Microsoft Azure



Google Cloud Platform

Research Engagement and Support: **case study examples**



Gravitational wave research boosted by seamless virtual Identity and Access Management (IAM)

Researchers collaborate to optimize the transfer of genomics data between two endpoints connected by Advanced Layer 2 Service



Community Engagement, Collaboration and Convening: services and supporting programs



OCTOBER 15-18
ORLANDO FL

Community Anchor Program: **Presidential Primary Sources Project**



THE PRESIDENT
WOODROW WILSON HOUSE

THE PRESIDENTIAL PRIMARY SOURCES PROJECT ★ 1.18–3.18

PRESIDENTIAL

Actions that carved
out the present and
influence the future

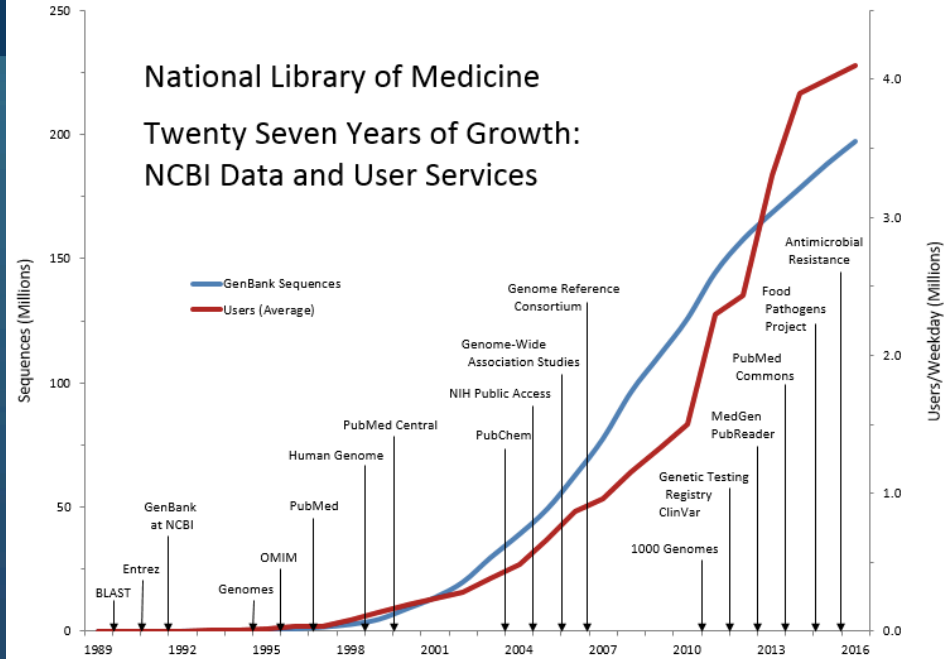
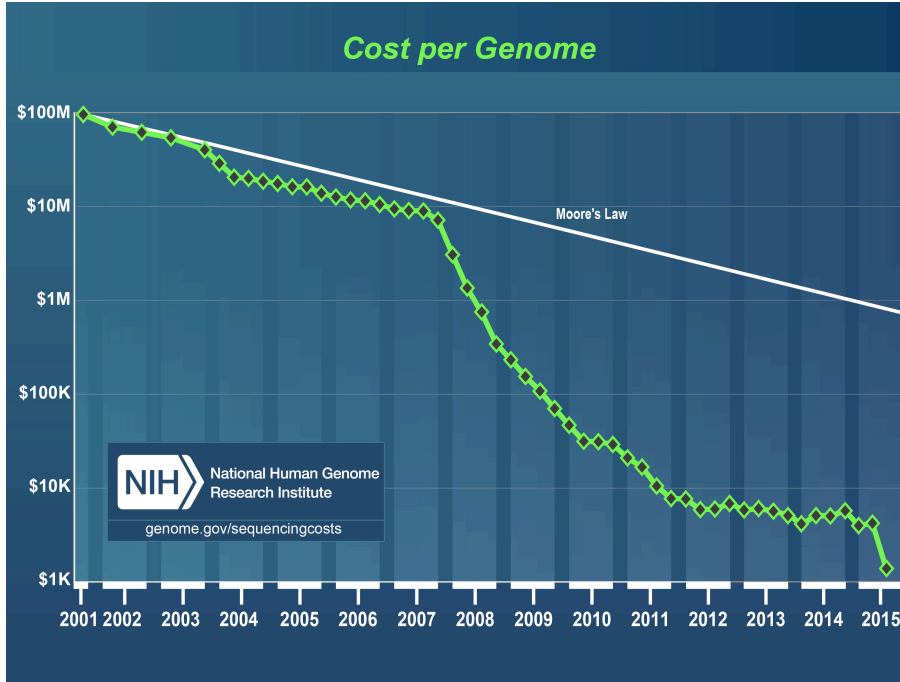
LEGACY

A FREE, INTERACTIVE CLASSROOM
VIDEOCONFERENCING PROGRAM
FOR GRADES 6-12



Collaborative Computational and Data-Driven Science

- Advances in scientific technology has driven an exponential growth data



Big Data On Campus

- Student Success
- Purdue University - Integrative Data Science Initiative (IDSI)
 - The creation of a “data science for all” ecosystem is the goal of a new initiative at Purdue University that will make data science education part of every student’s learning experience on campus while also boosting research and partnerships to help grow the data-driven economy. - Jay Akridge, Provost and EVP for Academic Affairs and Diversity
- Smart Campus

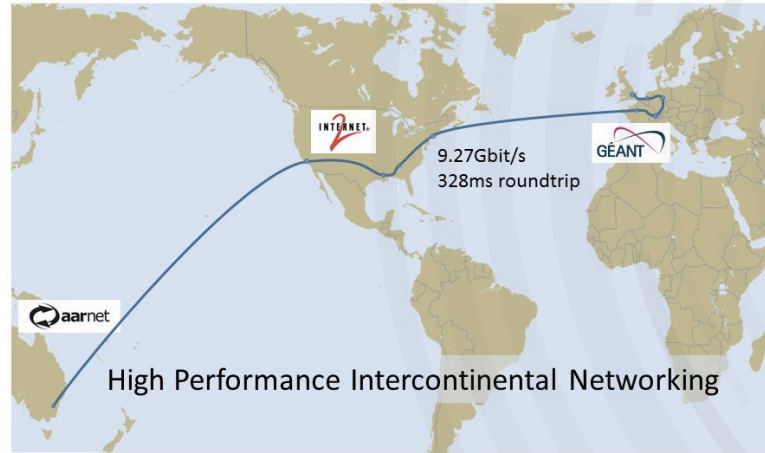
Cyberinfrastructure Challenges

- Storage demand vs. supply
- CPUs, GPUs and ASICs
 - GPU shortage driven by crypto currency mining
 - Google's TPU
 - Alibaba and Facebook exploring AI chip development
- Power consumption
- Security
- CI workforce
- Digital divide

The R&E Cyberinfrastructure Ecosystem

- Flexibility is critical
 - Transparent, Trusted, High performance networks
 - Trust & Identity services enable privacy-preserving collaboration
- The R&E advantage
 - Purpose built
 - Community driven and lead

The R&E Community at work



Comparative Times for a 100TByte data transfer.

File Size (TB)	Data rate (Gbit/s)	Time taken (Hours)	Time Taken (Days)
NREN 100	9.27	34.0	1.4
ISP A 100	1.72	183.2	7.6
ISP B 100	0.11	2864.3	119.3

<https://blog.geant.org/2017/05/15/taking-it-to-the-limit-testing-the-performance-of-re-networking>



THANK YOU!