

T&I PAG Meeting

12 Feb 2018

Business models review

PAG Confidential

Portfolio

- eduroam
- Certificate service
- InCommon Federation
- Software engineering, development and TIER

eduroam

eduroam

- ~560 subscribers
- \$700 one time registration fee. Fee is waived if there are no changes to the contracts.
- \$0.10/Student FTE as reported by <http://nces.ed.gov/ipeds>,
- Internet2 members receive eduroam as a benefit of membership. Certificate service revenue helps with this.
- Technical delivery and support provided by Anyroam. Contracting, invoicing by Internet2. Service management is integrated.

eduroam

- Since spring 2016, have been moving all subscribers from an unmanaged, uncontracted service to a service managed with contracts. About 30 stragglers remain. Meanwhile, new subscribers trickle on board.
- Have had to eat some past costs (“back pay”) because of the slowness of getting through all subscribers.
- Initial discussions with Regional and State networks about being “channel resellers” for (mostly) K-12
- Having internal conversations about strategies for reducing variance among systems of universities (solving the snowflake problem)

Certificate Service

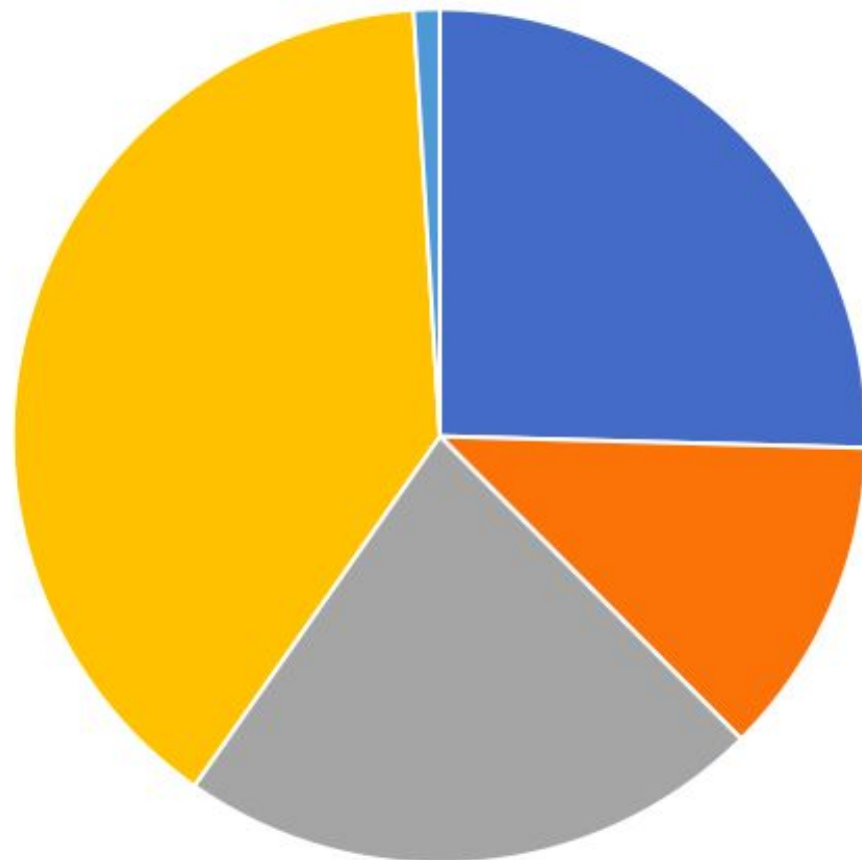
Certificate Service

- About 450 subscribers
- Six fee levels based on Carnegie Classification (from \$20K to \$2K)
- Internet2 members get a 25% discount
- Special pricing for university systems
- Regional and state networks are eligible

Certificate Service

- Pays for itself
- Helps to pay for eduroam and some general Trust and Identity functions activities
- About 30% of the total T&I annual operating budget comes from Certificate Service revenue

Certificate Service Subscribers by Fee level



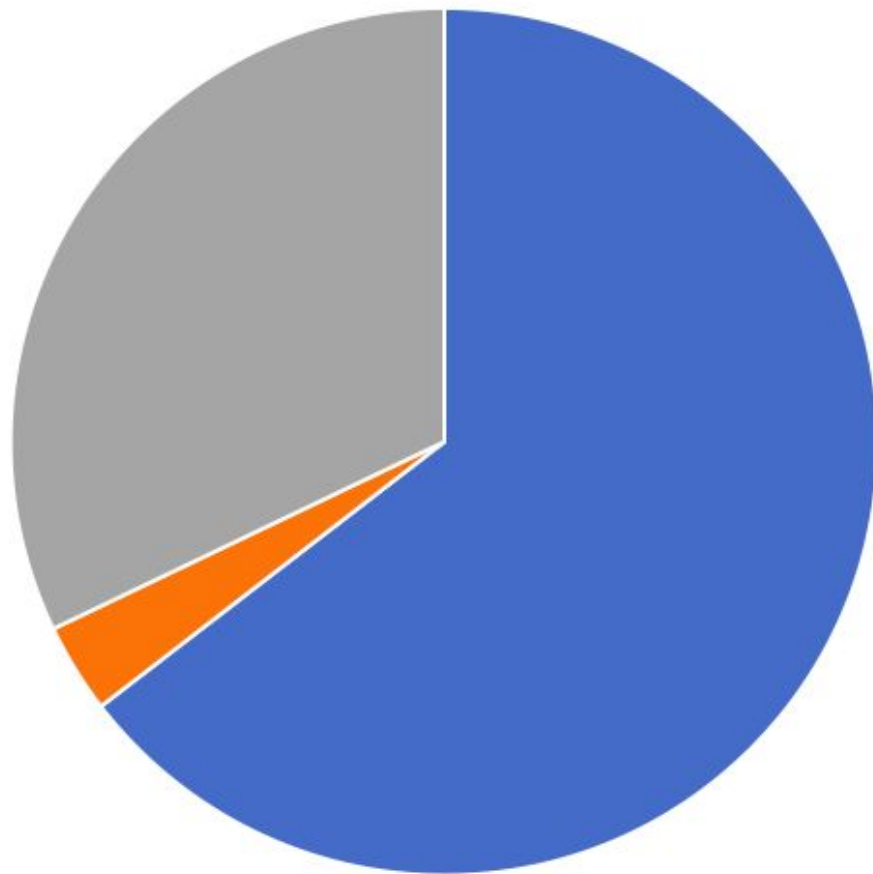
■ Level 1 ■ Level 2 ■ Level 3 ■ Level 4 ■ Systems

InCommon Federation

InCommon Federation

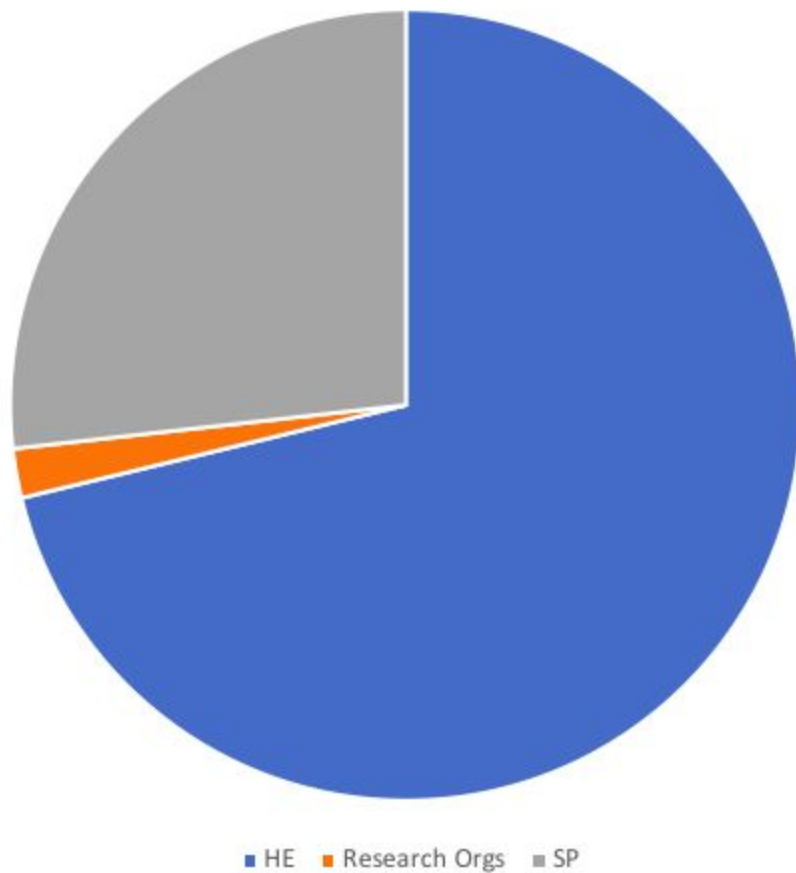
- Almost 900 “participants”
 - ~575 universities actively use the federation
 - ~200 sponsored participants actively use the federation
 - Remaining Higher Ed “participants” (~125) are Certificate Service subscribers who have signed the Participation Agreement and paid InCommon service fees, but they only use the Certificate Service.
- Fees collected for InCommon Services directly support InCommon services and activities
- Fees were increased in 2017 to close gaps in operational maturity, service maturity, scaling, and security
- There is no persistent business model for regularly addressing service and technical debt

Participation by participant class

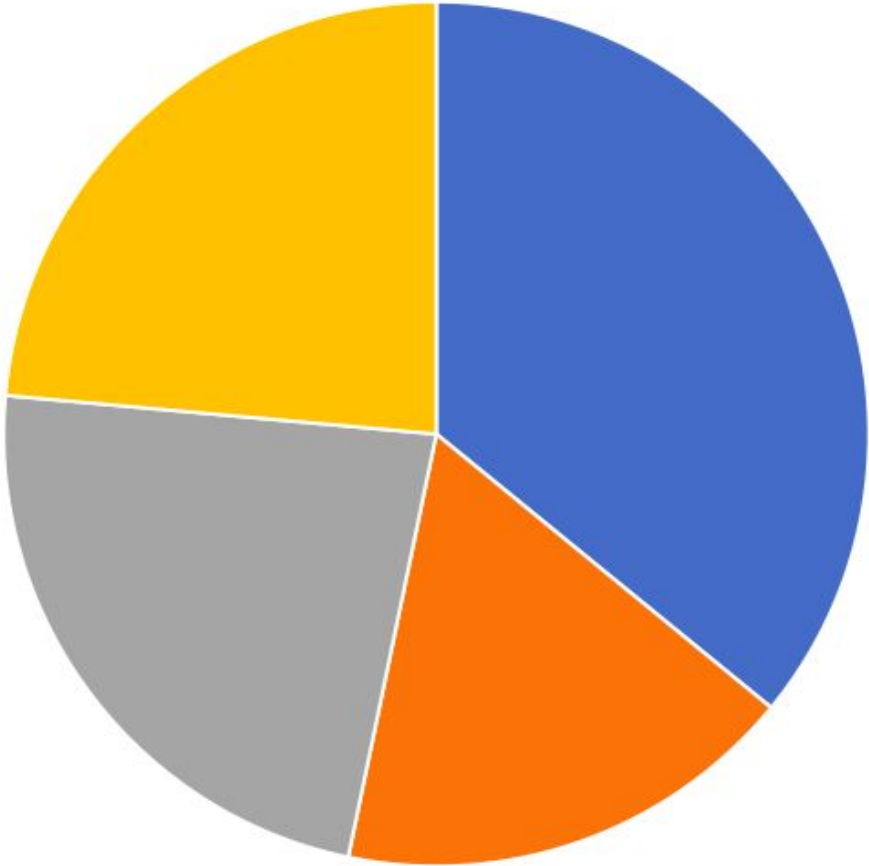


■ Higher Ed ■ Research Organizations ■ Sponsored Partners

Total revenue by participant class

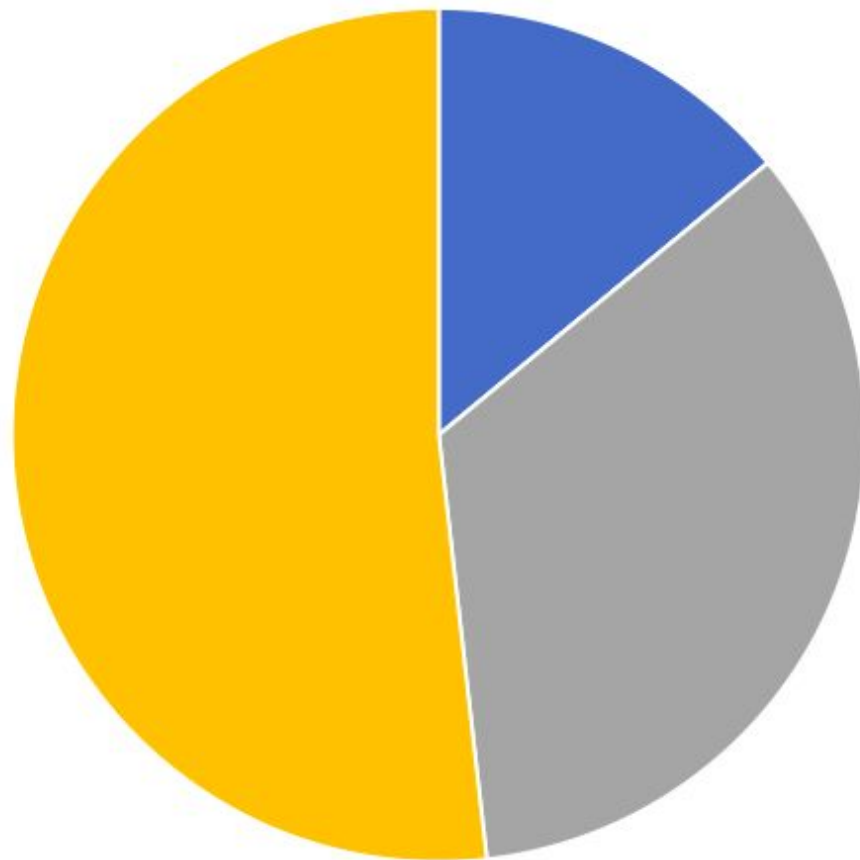


Higher Ed Revenue by level



■ Level 1 ■ Level 2 ■ Level 3 ■ Level 4

Sponsored Partner Revenue by level



■ Level 1 ■ Level 2 ■ Level 3 ■ Level 4

Software engineering, development and TIER

Software eng/dev, TIER

- The core software components of the Internet2 community software engineering and development efforts (Shibboleth, Grouper, COmanage) all originated with funding from the National Science Foundation (over \$10M over the years)
- As it is with NSF funded software projects, maintenance, security and new features are more than a challenge once the grant funding is exhausted
- The core components are connected, yet independent, open source software projects. Internet2 helps with the connections but not exclusively.

Software eng/dev, TIER

- Up until 2016, Internet2 supported middleware development (and other activities) via an approximate \$900K allocation
- In 2016, following an increase to Internet2 member fees, the annual allocation increased to \$1.65M annually
- In 2015-16, the TIER investor revenue (\$1.25M annually for three years) became available to address the requirements defined by the TIER investor universities
- The combination of the '16 standing increase and TIER investment has contributed to a significant improvement in the predictability of quality and enhancement - a key improvement

COmanage

- Newest of the core components (v1.0 2015)
- Originally designed to be a product to enable research virtual organization to more easily create collaborative environments
 - For example, LIGO has over 1,600 researchers at nearly 130 different institutions who rely upon it
 - There has been strong uptake in Europe as well
- The registry and enrollment work flows have turned out to be useful for university IAM infrastructures
- Development lead is with the Spherical Cow Group

Grouper

- Middle “child of the core components (version 1.0 2009)
- Founding leadership provided by Tom Barton (University of Chicago). Tom was on partial assignment to Internet2 to help provide this leadership
- Over time, leadership of the project moved to Chris Hyzer (University of Pennsylvania) and custodianship migrated to Internet2
- It is estimated that Grouper’s install footprint is well beyond 100 institutions

Shibboleth

- Oldest core component (version 1.0 2003)
- Arguably the first reference implementation of its kind helping to lead to steady, broad, international adoption
- Custodianship eventually moved to an international consortium
- Internet2 has two representatives on the Shibboleth Consortium board
- Revenue is generated through membership in the consortium
- Recent financial struggles have been overcome by modestly increasing membership fees and an influx of new membership motivated by a change in support model
- The TIER program has influenced new activities such as a UI for configuration and documentation (among other things)

TIER Program impact

- Improved predictability of maintenance and feature requests
- Improved confidence in the sustainability of each project
- Movement from legacy configuration, installation, maintenance to a modern DevOps environment (VMs, containers, etc. - packaging)
- Development of APIs and data structures to improve interoperability among the components **and other components that universities must deploy to succeed in the development of a comprehensive IAM infrastructure**
- Major and strategic improvements to the “Federation Manager”, the portal that InCommon site administrators use to publish and manage their metadata