

# InCommon Future Report and Recommendation

Presented to the Internet2 Board of Trustees, July 2009, for discussion

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## Executive Summary

In January 2009, Internet2 and its LLC, InCommon, asked a group of community leaders to develop a three-year strategic plan, including recommendations on how best to organize the federation related to Internet2 governance and the overlapping activities of the Internet2 Middleware Initiative. Organizations and councils represented on the InCommon Future group included the Internet2 Research Advisory Council (RAC); the Internet2 Applications, Middleware and Services Advisory Council (AMSAC); the InCommon Steering Committee; Internet2's Middleware Architecture Committee for Education (MACE); EDUCAUSE; and Internet2 executive leadership (individuals listed in section 11).

During this process, the Future group and Internet2 leadership concluded that the dependencies between the InCommon Federation and Internet2's foundational Middleware Initiative highlighted the need to discuss holistically the longevity and sustainability of the entire strategic effort. These two areas – federation and foundational middleware technologies – are not mature but are both in a stage of rapid growth and development. Even with the tight scope of federated identity management middleware, the landscape of needs and opportunities is currently spreading out faster than our ability to respond. Like other consequential technology development and deployments, at some point both these areas will flatten out in invention and become mature.

After extensive discussion among the committee members, and after gathering substantial community feedback, the InCommon Future group makes the following recommendation concerning InCommon's charter and scope to the Internet2 Board of Directors:

## Recommendations

### Structure

InCommon LLC should expand its scope to include, within one organization, two divisions:

1. A **Trust Services** platform, including first and foremost the core InCommon Identity Federation based on Security Assertion Markup Language (SAML). The capability to add other Trust Services to this platform will also expand InCommon's ability to support higher education Identity, Access Management, Collaboration, and Trust needs. The goal for each service should be financial self-sufficiency. InCommon's Identity Federation should target self-sufficiency by Q4 2012.
2. An InCommon **Foundation**, focused on research, development, and delivery of related services, software, and standards that today comprise the Internet2 Middleware Initiative's core activities, such as Shibboleth Federating and Single Sign-on Software, Grouper Groups Management Toolkit, eduPerson schema, protocol and application enablement, etc. Internet2 should be the initial primary source of funding for the foundation, but other partners with an interest in these R&D activities should be sought to share in the financial and governance commitment to the foundation.

## Governance

The main tenets behind these recommendations support moving InCommon toward stability, growth, and financial and organizational independence. While financial independence will not happen immediately, and investment will be required from Internet2, it is important to establish a governance structure now to manage the organization toward that goal.

3. Establishment of a 13-member InCommon Board of Directors with management and fiduciary responsibility for InCommon. The executive director of InCommon should report to this board, which should include representative directors from Internet2 and its councils, and any other foundation investors. The InCommon Board should report to the Internet2 Board.

## Membership

InCommon's primary constituency should continue to be the US higher education community but should also include other communities. This remains consistent with InCommon's current higher-education-based sponsorship policy. Long-term, InCommon should actively work to foster, both technically and politically, federations within these other communities that can interoperate with InCommon. Additional membership communities include:

- National Science Foundation cyberinfrastructure initiatives and other e-science partners;
- National Institutes of Health and related centers in support of research, education, administration, and patient care.
- Department of Energy national laboratories, associated organizations, and other government agencies;
- State-based and K12 consortia and other education activities at the local, state, and federal agency level.
- Service provider companies and organizations that serve the higher education community's research, educational, and administrative functions.

## Other Specific Recommendations

4. By Q2 2010, InCommon should develop a clear mission statement and a funding plan to ensure the continued success of core federation services and core middleware research and development.
5. Internet2 commits to continued funding, organizational development, and growth of InCommon services and foundation for the next three years. Concurrently, InCommon should work toward financial cost-recovery of the InCommon Identity Federation by Q4 2012 and should seek out additional investment partners, particularly those interested in the foundation's research and development.
6. Internet2 remains committed to the success of this activity and to the growth and stability of InCommon, and should fund additional staff beginning September 2009 as outlined in the Staffing section of this document, with the understanding that all investments should continue to be repaid, as has historically been the case between Internet2 and InCommon.

7. For the duration of this plan, Internet2 should continue to provide operational and administrative staff and services, including secure metadata registry, registration authority support, accounting, grant administration, technical and meeting support, human resources, and office infrastructure at a rate commensurate with costs.
8. Internet2 should strive to bring at least 75 percent of its members into the InCommon Identity Federation by the end of 2010.
9. InCommon should analyze additional service opportunities that relate to or increase the value of its core services. Examples are a server certificate service, core identity federation services for states or regional consortia. Investment and business plans for any new opportunities in 2010 should be articulated by Q3 2009.
10. InCommon should, with additional staff support, develop a training and adoption program (either internally or through community and commercial partnerships) in Q2 2010.
11. InCommon should, with additional staff support, develop a plan by Q1 2010 for engagement and outreach work to build partnerships with agencies, companies, and volunteers to build support for federated partnerships and distributed campus services.
12. InCommon should launch the Bronze and Silver assurance profiles by Q4 2009, with a demonstration pilot ready in September of 2009 and presented at the Internet2 Fall member meeting.
13. InCommon should develop a new pricing plan for the InCommon Identity Federation service that accounts for all actual costs of operating the federation via a price increase in 2010 and a tiered pricing model by calendar year 2011.

**Note:**

This document should be considered a recommended path and set of principles rather than a final plan and end state. This group acknowledges that detailed and evolving plans are required to ensure the success of this set of recommendations. Continued oversight should be provided by the current Internet2 and InCommon governance mechanisms.

# InCommon Future Report and Recommendation

## 1. Background

Higher education continues to look for ways to leverage shared infrastructure for research, scholarship, and administration as a means of improving mission-critical services and controlling costs. InCommon supports a foundational technology that is a necessary first step in the higher education evolution to distributed cloud services.

The Internet2 Middleware Initiative has led the development of a number of critical standards (SAML<sup>1</sup>, eduPerson<sup>2</sup>), technologies (Shibboleth<sup>3</sup>, and Grouper<sup>4</sup>), innovations, and community groups (MACE<sup>5</sup>, CAMP<sup>6</sup> events, and associated working groups) that are now foundational or serve an important role in leading and providing services on campus and within the higher education community both nationally and internationally. These activities have spurred the growth of the InCommon Federation, which is now generally accepted as a key piece of critical infrastructure.

As was hoped when the National Science Foundation funded the NSF National Middleware Initiative grants submitted by Internet2, EDUCAUSE, and SURA<sup>7</sup>, the deployment of middleware now extends beyond Internet2 member institutions and includes all segments of the global higher education community. Increasingly, higher education institutions are dependent on key aspects of our shared middleware environment, such as the InCommon Federation, for critical day-to-day services.

## 2. Charge

In January 2009, Internet2 and InCommon asked a group of community leaders to develop a three-year strategic plan, including recommendations on how best to organize the activities of the federation related to technologies developed as part of the Internet2 Middleware Initiative. Organizations and councils represented on InCommon Future include the Internet2 Research Advisory Council (RAC); the Internet2 Applications, Middleware and Services Advisory Council (AMSAC); the InCommon Steering Committee; Internet2's MACE; EDUCAUSE; and Internet2 executive leadership (listed in section 11).

InCommon Future met bi-weekly to discuss the issues comprehensively and strategically, then held a 1.5-day meeting in Oakland, CA, and thereafter, drafted a preliminary issues document. This document was presented in a variety of settings for community input: two sessions at the Internet2 Spring Member Meeting in April (including remote participation) and a town hall web-and-phone conference soon after. Approximately 160 people participated in the sessions; a

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<sup>1</sup> SAML: Security Assertion Markup Language

<sup>2</sup> eduPerson directory schema for attributes related to higher education

<sup>3</sup> Shibboleth: Federating and Single Sign-on Software

<sup>4</sup> Grouper: Groups Management Toolkit

<sup>5</sup> MACE: Middleware Architecture Committee for Education

<sup>6</sup> CAMP: Campus Architecture and Middleware Planning

<sup>7</sup> SURA: Southeastern Universities Research Association

summary of feedback is provided on the wiki (<https://spaces.internet2.edu/x/y4E0>). In addition, there have been extended discussions at the Common Solutions Group meeting in May and other forums to listen to the community.

Community feedback was substantial and included these two key points:

1. InCommon Federation is viewed as essential for institutional collaboration and shared services and must maintain a robust production service; and
2. It is difficult to separate the broader Internet2 middleware environment from the work of InCommon because of strategic interdependencies and the overlap of community leaders and technical experts supporting both.

### **3. Broader Scope**

During this process, the Future group and Internet2 leadership concluded that the dependencies between the InCommon Federation and Internet2's foundational Middleware Initiative highlighted the need to discuss holistically the longevity and sustainability of the entire strategic effort.

These two areas – federation and foundational middleware technologies – are not mature but are both in a stage of rapid growth and development. The federation has a growing landscape in front of it, including inter-federation, fostering federations in related communities, higher levels of assurance, related new trust services, improved training and support, etc. The foundational technologies are also facing an increasing set of new requirements, such as federated non-web applications, privacy management, enablement of network layer services, integration of social and institutional identity and easier management of the identity aspects of collaboration. Even with the tight scope of federated identity management middleware, the landscape of needs and opportunities is currently spreading out faster than our ability to respond. Like other consequential technology development and deployments, at some point both these areas will flatten out in invention and become mature.

### **4. Recommendation**

The InCommon Future primary recommendation is to re-charter the InCommon LLC to expand its scope. InCommon would encompass two divisions:

1. A Trust Services platform, including first and foremost the core InCommon Identity Federation based on SAML technology. The capability to add other Trust Services should also expand InCommon's ability to support higher education Identity, Access Management, Collaboration, and Trust. The goal for each service should be financial self-sufficiency. InCommon's Identity Federation should target self-sufficiency by Q4 2012.
2. An InCommon Foundation, focused on research, development, and delivery of related services, software, and standards that today constitute the Internet2 Middleware Initiative's core activities, such as Shibboleth, Grouper, eduPerson, et. al. Internet2 should be the initial primary source of funding for the foundation, but other partners with an interest in these R&D activities should be sought to share in the financial and governance commitment of the foundation.

### ***Rationale***

- By creating an InCommon services platform and foundation, Internet2 makes a commitment to the ongoing role that its community has played in these efforts and seeks to establish a more-permanent vehicle for the success of this entire set of activities. A home for the suite of middleware efforts outside of Internet2 itself but still closely linked will allow the Internet2 community to invest in and influence its directions as well as bring other willing partners to the table.
- The future of InCommon and related identity, access, and trust activities should take on a *trajectory* of independence, given that participation is rapidly moving into the broader higher education community.
- Internet2 and InCommon would continue to be linked. This will, in part, avoid duplication of important functions and continue the operational excellence provided thus far in its metadata management and registration authority services. Internet2 and InCommon would also continue to share services including but not limited to accounting, technical and web support, grant administration, human resources, meeting support, communications, and office infrastructure at a rate commensurate with a fair allocation of costs.
- These changes should position InCommon governance, finance, and planning activities to become independent in a measured manner over time. The critical importance of what must continue to be developed and relied upon, coupled with the financial uncertainty and disruptive technological times in which we find ourselves, makes this a prudent approach.

## Values

- **Reliability:** Ensure the reliability and longevity of the core federation metadata services of InCommon.
- **Adoption:** Ensure the continued adoption of InCommon federated identity and authorized access throughout higher education and its partners.
- **Adaptation:** Ensure that InCommon continues to respond to and influence the evolution of identity federations.
- **Community:** Ensure that our community remains strong and continues to build upon our success by leveraging partnerships among campuses, government agencies, and international groups.
- **Sustainability:** Develop a funding model that successfully ensures both operational services and the research and development of the Internet2 Middleware Initiative.
- **Innovation in Identity, Trust, & Collaboration:** Expand the scope of InCommon to include many of the activities within the Internet2 Middleware Initiative that provide higher education with the leadership and influence necessary to chart its own course.

## 5. Services and Foundation Activities

### *Service Tasks for the Identity Federation*

- **Continue:** To build our core trust services based on the SAML identity federation metadata registry.
- **Growth:** Invest judiciously in additional staff and develop partnerships to manage and facilitate the rapid growth in campus deployments.
- **Training & Adoption:** Develop an adoption and training program (either internally or through community and commercial partnerships) beginning Q2 2010.

- **Engagement and Outreach:** Develop a plan by Q1 2010 for engagement and outreach work to build partnerships with agencies, companies, volunteers, and member communities (see Member section below) to build support for federated partnerships and distributed services.
- **Openness:** InCommon should work with vendors and communities to certify compliance and interoperability with other technologies.
- **Assurance Trust Services:** Launch the Bronze and Silver services by Q4 2009, with a demonstrated pilot in September of 2009 and presentation at the Internet2 Fall member meeting
- **Interfederation:** Create the policy, legal, and technical structures to pilot a real-world use case of interfederated activity by Fall 2010 with at least one other national federation.
- **New Trust Services:** In order to support the activities above, *and* to further the needs of higher education in distributed trust efforts, InCommon should analyze further business opportunities in service to higher education such as a server certificate service, core identity federation services for states or regional consortia, and other opportunities within the scope of identity, access management, trust, and collaboration. Funding models and investment requirements for any new opportunities should be articulated by Q3 2009 for fiscal year 2010.

### **Foundation Tasks**

- **Integration of Middleware initiative:** InCommon and Internet2 should develop a clear mission statement and a detailed funding and governance plan for the continued success of community middleware research and development in furthering solutions for higher education's best interests. These activities should be tightly scoped to inter-institutional identity management and the enablement of applications and protocols to leverage federation. These efforts may include: Shibboleth, Grouper, EduPerson, COmanage<sup>8</sup>, MACE-paccman<sup>9</sup>, DKIM<sup>10</sup>, MACE, ITANA<sup>11</sup>, SAML, CAMP events, and an active higher education presence in formal and informal standards communities. A transition plan should be in place by Q2 2010.
- **Shibboleth Development and Support:** The InCommon Foundation should specifically continue to support Shibboleth development and implementation, but should also be open to other SAML technologies, if and when they arise.

### **Initial Principles for Defining Activities in the InCommon Foundation Portfolio:**

- **Relevance:** Support the InCommon vision, to enable seamless interoperability of identity and access management services among the global higher education and research communities and their partners.
- **Deployability:** Technologies must have a reasonable chance of being deployed by multiple sites within one to two years, preferably from a starting point of being already in use by at least one site.
- **Solve significant institutional problems:** Activities must be understandable by most sites as being relevant to one of their "top ten" problems; not of marginal or niche interest.

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<sup>8</sup> COmanage: Collaborative Organization Management Platform

<sup>9</sup> MACE-paccman Privilege and Access Management

<sup>10</sup> DKIM: Domain Keys Identified Mail

<sup>11</sup> ITANA: Information Technology Architects in Academia

- **Standardization:** Activities must be based on industry or community standards, or have a clear path to becoming standards within a reasonable time.

## 6. Members

**Internet2 Community:** Internet2 should strive to have at least 75 percent of its members become InCommon participants by the end of 2010.

**Focus:** InCommon's primary constituency should continue to be the higher education community but should also include other communities. This remains consistent with InCommon's current higher-education-based sponsorship policy. Long-term, InCommon should actively work to foster, both technically and politically, federations within these other communities that can interoperate with InCommon. Additional membership communities include:

- **Resource Partners:** InCommon should partner with service provider companies and organizations to serve the higher education community's research, educational, and administrative functions.
- **Research Labs and Other E-science Partners:** InCommon should continue to actively participate, and enter into appropriate partnerships, in support of National Science Foundation Cyber-Infrastructure initiatives.
- **Government Science and Research Agencies:** InCommon should continue to work with the National Institutes for Health, Department of Energy national labs, and other science and research communities in the adoption of federation.
- **Health Care:** InCommon should work with campus health centers and health agencies to support federated research, education, and administration activities, and to review the feasibility of providing trust services around patient care
- **States and K-12:** InCommon should work with states and statewide K-12 consortia in the emergence of federated activities, and to create new federations that may be operated by InCommon on behalf of other entities.

## 7. Governance

- **Structure:** InCommon should have a Board of Directors that sets overarching direction for the entire organization, including both the Trust Services division and the Foundation. The Board should have fiduciary responsibility and provide management oversight. The executive director of InCommon should report to the InCommon Board of Directors.
- **Transparency:** The InCommon Board should meet at least quarterly and provide minutes to all participant members. InCommon would produce an annual report concerning the activities of both the Trust Service and the Foundation, providing investors, participants, and the broader community with an overview of its priorities and activities.
- **Representation:** The 13-seat InCommon Board of Directors should include seats for investors, including Internet2, through its governance councils. Additional seats should be reserved for other investment partners, certain seats should be nominated by the board, and certain seats should be filled by election from the community.
- **Delegation and Community Involvement:** The InCommon Board of Directors may create committees (such as policy and technical subcommittees charged with the oversight of the identity federation). Continued community input from technical experts such as MACE and the InCommon Technical Advisory Committee (TAC) is critical to

ongoing success. InCommon should formalize the process of developing and supporting the policy and/or technical leadership for each service and foundation project.

- **Management:** The management of InCommon must have budget authority and be able to reallocate resources based on the needs of participants without seeking approval from Internet2
- **Staffing:** It is likely in the near term that many staff will continue to be split between InCommon and Internet2. Management of these staff, their priorities and compensation, must be well defined.
- **Tiered member model:** InCommon should have a tiered model for services and foundation activities that provides flexibility to participants in terms of cost, responsibility, and influence.
- **Investment:** Internet2 should commit to continued funding of the organizational development and growth of InCommon for the next three years, including providing the funds currently allocated to middleware activities. At the same time, InCommon should seek out additional investment partners for the InCommon Foundation based on a shared commitment to delivering trust services.
- **Performance:** The Executive Director, in consultation with the InCommon Board, should develop yearly goals and issue an annual report to all participants documenting the progress of the organization in meeting those goals. The InCommon Board must be responsible for hiring and overseeing the Executive Director.

## 8. Organization and Finances

- **Business Plan:** Time did not allow the InCommon Future Group to develop a comprehensive business plan. InCommon Steering, in partnership with Internet2 governance, should manage a process to develop such a plan.
- **Tiered Pricing Plan:** InCommon should develop a new pricing plan for the InCommon Identity Federation service that accounts for all actual costs via a price increase in 2010 and a tiered pricing model by calendar year 2011.
- **Base Funding:** Internet2 should commit to continued funding of the organizational development and growth of InCommon for the next three years, including providing the funds currently allocated to middleware activities. For the duration of this plan, Internet2 should continue to provide non-core support services, including but not limited to accounting support and office space. InCommon will reimburse Internet2 for these costs.
- **Baseline:** InCommon's Trust Services division (that is, the core Trust Services of federation and associated operations) should endeavor to be self-sustaining by 2012. InCommon services should also allocate a percentage of any income over expenses to support the activities of the InCommon Foundation.
- **Growth:** Internet2 should fund additional InCommon staff positions beginning September 2009 as outlined in the Staffing section, with the understanding that all investments should be repaid by InCommon service activities (as has historically been the case between Internet2 and InCommon).
- **Foundation:** The foundation should focus on supporting the community of technical experts in developing the next generation of trust services, for software development and the innovations derived from community collaboration and involvement in the broader formal and informal standards communities.
- **Seeding New Services:** InCommon should develop the financial capability to launch new cost-recovery services in support of higher education.

## 9. Staffing

Positioning InCommon for success means providing adequate staffing. Internet2 has committed to current staffing levels for InCommon and for the Middleware Initiative. Internet2 should also fund additional staff to ensure the growth, success and, eventually, the financial independence of InCommon.

### ***Current Staff***

#### **InCommon Identity Federation**

- Operations Manager (0.5 FTE)
- Registration Authority & Customer Support (0.3 FTE)
- Technical Operations, Technical Support (0.3 FTE)
- System Development (0.5 FTE)
- Communications (0.5 FTE)

#### **InCommon Foundation**

- Existing Middleware Staff and Consultants in general administration, outreach, and development (10 FTE – fractions of approximately 20 people)

### ***Additional Staff: Suggested Additions for late 2009, 2010***

**[SUBJECT to DETAILED BUSINESS PLAN]**

#### **InCommon Identity Federation**

- Business Manager (0.5 FTE)
- Outreach & Training (1.0 FTE)
- Registration Authority and Customer Support (0.2 FTE)
- Technical Help Desk (0.2 FTE)

#### **InCommon LLC, in support of Trust Service Platform and Foundation**

- Executive Director (0.5 FTE)
- Business Director (0.5 FTE)
- FlyWheel Support – Community Working Group Coordination (0.5 FTE)

## 10. Risks to Success

The following list represents a concise appraisal of identified risks.

- Rapid Growth outpacing resources
- Adoption. Difficulty for campuses and partners due to complexity and institutional rigidity: technical implementation, business transitions, legal control and flexibility in distributed environments
- Turmoil in the economy placing severe limits on new activities within the community
- Key partners continuing to position SAML federation as their distributed platform of service engagement
- Dependence on volunteerism and community engagement
- Evolution/Innovation
- Software vendor support for SAML, SAML metadata, and the more complex capabilities thereof, etc.
- Substitutes: competing applications, standards, approaches
- Scope of membership and available outreach resources

- Brand recognition and confusion for InCommon, Internet2, and transitioning projects

## 11. The InCommon Future Group

Amy Philipson, Pacific NW Gigapop, (Internet2 AMSAC)

Chris Shillum, Elsevier, (InCommon Steering)

Clair Goldsmith, UT System, (InCommon Steering)

Cliff Lynch, CNI, (Internet2 RAC)

Doug Van Houweling, Internet2 CEO

Jack Suess, UMBC, (InCommon Steering, Internet2 AMSAC)

John Krienke, Internet2, InCommon

Ken Klingenstein, Internet2, U Colorado, (InCommon Steering)

Kevin Morooney, Penn State, (InCommon Steering)

Lois Brooks, Stanford, (InCommon Steering)

Richard Katz, EDUCAUSE

Rosio Alvarez, Lawrence Berkeley Labs, (Internet2 RAC)

Ray Ford, U Montana, (Internet2 AMSAC)

RL 'Bob' Morgan, U Washington, (MACE, InCommon TAC -- Technical Advisory Committee)

Rick Summerhill, Internet2 CTO

Sally Jackson, U Illinois, (Internet2 AMSAC)

### Note:

This document should be considered a recommended path and set of principles rather than a final plan and end state. This group acknowledges that detailed and evolving plans are required to ensure the success of this set of recommendations. Continued oversight should be provided by the current Internet2 and InCommon governance mechanisms to ensure long-term success and viability.