

Sponsored Educational Group Participation (SEGP) In Internet2 White Paper

What is Internet2?

Internet2 is a consortium being led by over 180 universities working in partnership with industry and government to develop and deploy advanced network applications and technologies, accelerating the creation of tomorrow's Internet. Internet2 is recreating the partnership among academia, industry and government that fostered today's Internet in its infancy. The primary goals of Internet2 are to:

Create a leading edge network capability for the national research community

Enable revolutionary Internet applications

Ensure the rapid transfer of new network services and applications to the broader Internet community.

What is Internet2 K20 Initiative?

The Internet2 K20 Initiative brings together Internet2 member institutions, primary and secondary schools, colleges and universities, libraries, and museums to get new technologies—advanced networking tools, applications, middleware, and content—into the hands of innovators, across all educational sectors in the United States, as quickly and as “connectedly” as possible.

What are Internet2 K20 Goals?

- To bring innovators in K-12, community colleges, universities, libraries, and museums into appropriate regional, national, and international advanced networking efforts, via the "Sponsored Education Group Participant" (SEGP) process.
- To encourage and help sustain partnerships among these education institutions, the private sector, and government
- To enhance teaching and learning by facilitating projects that explore the ways in which advanced network applications, services, tools, and digital content can extend access to education and educational resources.
- To develop mechanisms for timely communication across all educational sectors and regions in order to enable quick, pervasive technology diffusion

What prompted the Internet2 K20 Initiative?

The decision by the Internet2 community to extend access to *Abilene*, the Internet2 national network backbone, to the broad educational community and thereby engage innovators from all sectors of education in the development and deployment of advanced network services and applications, evolved through conversations among various Internet2-related councils and groups and discussions among Internet2 members. This decision, however, was neither rooted in broadly shared goals for, or exuberant optimism about, “reforming” or “transforming” K-12 education (or even higher education!).

Instead, this invitation was shaped by Internet2's goals, which are intrinsically technology related, and which would be best served by enabling Internet2 member institutions and “connectors” to bring the many innovators and innovative schools who do exist in K-12 (and in K-20) to the table – innovators who share interests in, and commitments to, advanced networking, content, services, and applications. Many in the Internet2 community believe that an important lesson learned from previous networking and technology experiences (e.g., World Wide Web) is that big payoffs come from getting tomorrow's technologies (and often preferred, open standard-based versions) into the hands of as many innovators and sectors as quickly and as “connectedly”

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as possible. This time, with the Internet2 K20 Initiative, it seems possible to bring in the broader education community much closer to launch by inviting innovators across the educational spectrum to engage in initiatives involving Internet2 technologies – without over-promising, over-extending, or losing focus on its advanced technology missions.

The approach developed to connect the broader education community to Internet2 is through a process called, “Sponsored Education Group Participants” (SEGPs). The new SEGP program is intended to allow expanded access to Abilene for state and regional education networks, through sponsorship by Internet2 university members. State and regional networks may include non-profit and for-profit K-20 educational institutions, museums, libraries, art galleries, or hospitals that require routine collaboration on instructional, clinical and/or research projects, services and content with Internet2 members or with other sponsored participants. The program began in early 2001 and, as of 1 August 2001, there are already fourteen state K-12/K-20 networks participating: California, Indiana, Louisiana, Maryland, Michigan, Missouri, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, Virginia, Washington, and Wisconsin. An additional ten states have expressed interest and it appears that by the end of the 2001-02 academic year, there may be as many as twenty-five states participating as SEGPs. If so, that will bring an extraordinary number of K-12/K-20, museum, and library innovators to the table and enable a sweeping range of diverse initiatives and, eventually, very broad participation across a large number of schools and districts.

The fundamental Internet2 K20 issue remains how to achieve Internet2's goals of rapid technology creation, diffusion, transfer and evolution. These goals are the defining criteria for determining Internet2's relationships and roles in Internet2 K20 initiatives and partnerships. School technology leaders, leaders from the library and museum worlds, and Internet2 innovators agree that a well-conceived and realistic approach to K-20 can be a win for both the Internet2 *and* K-20 communities.

What is a Sponsored Educational Group Participant (SEGP)

A SEGP is an aggregate of educational and education-related organizations (museums, libraries, etc.) interconnected by one or more networks within a state that is approved for participation in Abilene. To become a SEGP, the group of organizations must be sponsored by an Internet2 university member that is an Abilene primary participant (such as WPI). The SEGP and the university must be located in the same state (Massachusetts), and must attach to Abilene through the same connector (such as the Goddard GigaPop, L.L.C at 474 Main Street, Worcester).

Candidates for SEGP include networked aggregates of educational institutions (including non-profit and for-profit K – 20, technical, and trade schools) which may also include museums, art galleries, libraries, or hospitals that require routine collaboration on instructional, clinical, and/or research projects, services, and content with Primary participants or with other Sponsored participants.

What does becoming a SEGP provide?

SEGP status allows members of the aggregation to send and receive traffic over the Abilene network.

The initiative is just getting started, so there are not really any concrete projects or proof-of-concepts at this time.

What is the relationship of SEGPs to Internet2?

SEGPs have no relationship to, and are not members of, Internet2.

What difference will the connection to Abilene provide to the average school?

The connection to the backbone network does not alone guarantee any improvement in network performance over existing Internet connections. In addition to the backbone, local and regional networks at both ends of the network connection being used must be high-performance for users to experience improved performance.

What states have a SEGP?

- Auburn University sponsors Lee County Board of Education
- MichNet the state network in Michigan
- California, Indiana, Louisiana, Maryland, Michigan, Missouri, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, Virginia, Washington, and Wisconsin.
- October 2, 2001 Press release
[Drexel to Provide Internet2 Access for Pennsylvania's 14-School State System of Higher Education](#)

What are some examples of an Internet2 application?

The following eleven descriptions of potential applications are described on WPI's Internet2 web site: <http://www.wpi.edu/Admin/IT/Internet2/>. They were developed by Greg Marks, Special Assistant for the K-12 Outreach, Merit Network.

1. Language Students Talk with Students in a Foreign Country
2. Music students coached by virtuoso teachers from a distant site.
3. Virtual field trips to museums or remote sites made more meaningful because of greater detail, responsiveness, and "virtual reality" exploration of a room or space.
4. Interaction between a student teacher and an established classroom teacher, or involving college faculty
5. Science students who utilize rare or expensive remote instruments such as electron microscopes, telescopes, or other devices that allow them to explore worlds outside their classroom.
6. High quality video interaction with remote experts at the Smithsonian or astronauts working on the international space station.
7. Using multicast video technology to deliver lectures, demonstrations, and performances to large audiences distributed across the country that would normally require broadcast television or satellite video delivery.
8. The University of Michigan's Visible Human Project that makes it possible to "fly" through and view the detailed digital anatomical database of the human body that is being created by the National Library of Medicine.
9. Access to extensive photographic and video archives maintained by NASA and many other organizations.
10. Access to extensive archives of environmental, social, and other science data
11. Access to high performance computational clusters and other forms of "Grid" computing where computers, data, and other resources from many separate locations are coordinated to work on problems that are too large for any single site or organization to take on alone.

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How have other states created a network?

The states that were the first to connect typically had robust state education networks that already provided I2 transport for their research institutions. Then, it was just a matter of paying the I2 SEGP fees and opening up the routes. The cost may have been borne by the state education network from existing funds. Other states, such as Massachusetts that do not have their state education network already connected to I2 will incur telecommunications expenses, and they may very well need legislative assistance.

Who can sponsor a Sponsored Educational Group Participant?

Internet2 Regular (University) members can sponsor networked aggregations of educational organizations as Sponsored Educational Group Participants in Abilene. The sponsor must be in the same state as the networked aggregate. Requests for exceptions to the same-state requirement should be referred to the Internet2 Director of Member Activities.

Can more than one Regular (University) Member of Internet2 in the same state sponsor a Sponsored Educational Group Participant?

Yes. These types of collaborations are encouraged.

What is the process for adding a Sponsored Educational Group Participant to Abilene?

An Internet2 Regular member that is also an Abilene Primary Participant, or a group of Internet2 Regular members and Primary Participants, can submit an application to sponsor a networked aggregate of educational organizations, such as a state K-20 network. The sponsor(s) submits an application to Internet2 that describes the network's applications, projects, and other activities involving Internet2, and documents its commitment towards implementing advanced networking capabilities. The Regular Member also submits a letter agreeing to the conditions of sponsorship. Internet2 senior staff reviews the application. Upon acceptance of the application, the sponsor is notified and the necessary network routing is enabled to allow the Sponsored Participant to use Abilene. A description of the process and application materials can be found at <http://www.ucaid.edu/abilene/html/sponsored-application.html>

How is a Sponsored Educational Group Participant different than a Sponsored Individual Institution Participant?

Sponsored Educational Group Participants are aggregates of organizations brought together in a statewide or other wide-area network within a state. The network serves as a means of connecting these organizations to each other as well as to external networks where all can share the cost of connection. Examples of these aggregates are statewide K-12 networks, community college networks, and similar collectives of educational organizations. These networks are engaged in applications development and other projects designed to enhance their use of advanced networking infrastructure and services. Sponsored Participants are individual research and education organizations that are engaged in collaboration with an Internet2 member or other sponsored participants on instructional, research, clinical or content-related projects.

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Are there any requirements of the Sponsored Educational Group Participant?

Potential Sponsored Educational Group Participants are expected to be engaged in activities that make use of advanced network services and be able to document a commitment to deploying advanced networking capabilities.

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What are the costs associated with Sponsored Educational Group Participation and who pays them?

Internet2 will charge the Connector for the Sponsored Educational Group Participant an annual fee of \$30,000 per connector per state, plus a variable fee of \$2,000 times the current number of Congressional representatives for that state. We estimate Massachusetts's costs at \$50,000 for the combined connector and variable fees. Sponsored Educational Group Participants may pay fees to the Connector and/or to the sponsoring Internet2 member, where these fees apply to the specific conditions of connection. Internet2 does not assess fees directly to the Sponsored Educational Group Participant. This fee structure will be assessed on an annual basis. Any questions about how this fee applies in specific situations should be referred to the Internet2 Director of Backbone Network Infrastructure.

What other ongoing costs would the state incur?

- Increase in fees to accommodate upgraded lines.
- TBD

What are the start-up costs for Massachusetts?

- Upgrade lines from T1.
- TBD

Can the Connectors apply E-rate to this fee?

This fee is not eligible for any discounting under the K-12 Schools and Libraries program of the Universal Services Fund.

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What are the responsibilities of the sponsor?

Sponsors are principally responsible for:

- Ensuring that the potential Sponsored Educational Group Participant is appropriate for sponsorship, as described in the Abilene COU. If the Sponsored Educational Group Participant ceases to be so, the sponsor agrees to inform Internet2 in writing and arrange to have it disconnected from Abilene.
- Identifying an Abilene connector that will provide the proposed network's connectivity to Abilene
- Describing one or more advanced application for which either the sponsored network or schools therein will utilize Abilene
- Reporting periodically on the proposed participant's activities that make use of advanced network services and its commitment to deploying advanced networking capabilities
- Identifying any Carnegie Doctoral/Research-Extensive (D/R-E) institutions within the sponsored network that are not eligible to participate in Abilene without first becoming an Internet2 member

What are the increased technical requirements for Abilene connectors supporting one or more Sponsored Educational Group Participants?

A Connector supporting the Sponsored Educational Group Participant(s) must:

- Maintain a 7x24 Network Operations Center (NOC) that is accessible to the Abilene NOC
- Register its routing information and that of the Participant(s) in the Internet2 Routing Registry (I2db) or equivalent provide UCAID a quarterly report on the relative utilization of the Abilene connection by the Sponsored Education Group Participant(s)
- Assure compliance with the Abilene CoU by the Participant(s)
- Inform the Participant(s) that Abilene does not provide transit to the commodity Internet
- Use a distinct origin Autonomous System Number (ASN) so as to distinguish its routing information for that of other Participants using the same connection
- Not use Abilene to transit any intra-state traffic within its own network (in cases where the Sponsored Education Group Participant is multiply homed to Abilene)
- Take steps to avoid causing Abilene to establish any additional ATM permanent virtual circuits or BGP parings to the Connector.

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References

- The Internet2 web site provided a significant portion of the above text.
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 - SEGP <http://www.internet2.edu/abilene/html/faq-sponsored.html>
 - K/20 Initiative <http://www.internet2.edu/k20/>
 - Sponsored Participant Application <http://www.internet2.edu/abilene/html/sponsorship-application.html>
- WPI
 - Worcester Polytechnic Institute <http://www.wpi.edu/>
 - WPI's Internet2 pages <http://www.wpi.edu/Admin/IT/Internet2/>