The reason for US Ignite

http://www.broadbandmap.gov/technology/fiber-to-the-end-user
The reason for US Ignite

US Ignite is an initiative to spark the development of gigabit applications and services in areas of national priority on an ultra high speed (>100 Mbps symmetric), deeply programmable and sliceable network testbed.

There are three main activities:
1. Stitching together a national at-scale network testbed of cities and campuses with real users, which can be used as a platform to launch novel gigabit applications and services;
2. Creating novel gigabit applications and services by funding researchers, developers, and entrepreneurs working in areas of national priority; and
3. Developing a public private partnership called the US Ignite Partnership that will govern the contributions made by industry to this pre-commercial effort; coordinate developer community efforts; and convene the Partners for strategic planning and sharing of best practices.

... The goal is to create and sustain a flourishing national innovation ecosystem for gigabit application and service development, especially those applications that are not possible to deploy on today’s Internet and that will have potential impact on important national priorities.

• The US IGNITE Initiative will:
  – Link together ultra-high-capacity, low-latency networks of sufficient scale to support meaningful experimentation by researchers and entrepreneurs
  – Facilitate research, experimentation, and entrepreneurship using this network of networks
  – Evaluate and potentially make the best applications available for public benefit or commercial use through the support of US IGNITE partners and funders
  – Disseminate lessons learned

• Will help maintain US global leadership in innovation
  – Initiative allows startups and students the same opportunity as industry and researchers to develop, test, and deploy next-gen apps and services

• Will leverage the combined resources and capabilities of industry, government, and academia
  – The US IGNITE Partnership will be a public-private partnership, supported by NSF, the White House, and leading technology and telecommunications companies
  – Funders and partners will have the opportunity to guide investment priorities and take an active role in developing and growing good ideas developed by US IGNITE efforts

... and this will not require the construction of new infrastructure!
  – Simply a joining together of islands of high-bandwidth connectivity across the country to create a nationwide high-bandwidth test bed
  – Communities that have agreed to participate all have at least 100mbps symmetrical service
Stitching together a network testbed: GENI

US Ignite will enlist GENI

**Global Environment for Network Innovations**: A virtual laboratory for exploring future internets at scale
- Support at-scale experimentation on shared, heterogeneous, highly instrumented infrastructure
- Enable deep programmability throughout the network
- Provide collaborative and exploratory environments for academia, industry, and the public to catalyze groundbreaking discoveries and innovation

In the context of US Ignite, GENI provides:
- An extensible collection of computing resources and network capacity
- Software and tools for configuring the computing resources into networking elements
- A system for defining, configuring and operating custom networks
The US Ignite Initiative will:

- participate with GENI in the expansion of the national testbed network
  - Stitch together campuses and islands of advanced technology infrastructure to allow advanced pre-commercial applications to be demonstrated
  - Peer 10-20 communities that have already deployed 100Mbps or more symmetrical service to consumers, small businesses, and/or anchor institutions
  - Leverage existing high-speed networks connecting research institutions and enterprises

- with a goal to share best practices (US Ignite Partnership):
  - Compile lessons learned for infrastructure deployment, service creation and delivery, application development, and R&D
  - Curate and post online materials donated by partners and maintained by the partnership
  - Develop national network of experts available to offer in-depth support to communities
  - Convene in-person forums
Stitching together a network testbed: GENI

- Active campus participation to date:
  - Trials underway: Stanford, Rutgers, Clemson, Indiana, Georgia Tech
  - Next round campuses: Case Western, Chicago, Colorado, Cornell, Duke, Florida International, Kansas, Kentucky, NYU, Purdue, Tennessee, UDC, University of Houston, UIUC, UMass Lowell, Utah, Washington, Wisconsin

- Strong interest from 6 cities to date: Chattanooga, Cleveland, Lafayette (LA), Philadelphia, Washington DC, Salt Lake City region

- Cities can be GENI-enabled very rapidly
  - GENI rack, OpenFlow, and Layer 2 connectivity assessments completed
  - Once enabled, will be connected to research campuses

- Can support experimental, gigabit applications in GENI slices through cities, creating attractive new research opportunities

Spur the development of new applications

- Fund and support research
  - Run application development prize competitions targeting researchers and entrepreneurs for innovative networking and application design
  - Establish criteria to ensure new applications and digital experiences have the potential to transform focus sectors
  - Offer support for software and application R & D from key agencies and private-sector partners, including grants from NSF and others
  - Allow entrepreneurs access to US IGNITE testbed from application design through pre-commercial testing phases
  - NSF GENI will upgrade capacity available to university students and researchers on GENI-enabled campuses to spur research-based applications

- Mentor application developers throughout innovation process
  - US IGNITE Partnership board members, funders, and partners would help establish priorities for scope and mix of competitions
  - Foster online collaboration and resource sharing among user and developer communities
  - Facilitate new, innovative business model testing
  - Provide entrepreneurship training and funding to support application startups and spinoffs created through this program

Focus sectors

- Healthcare
- Education
- Economic and workforce development
- Energy
- Public safety and homeland security
- Business applications and services
- Advanced manufacturing
Leverage the capabilities of next-generation networks

• 100 Mbps+ and low latency, including for example:
  - Multiple bi-directional streams of uncompressed video
  - Direct access to supercomputer simulations and visualizations
  - Connections to large-array sensors

• Post-IP protocols (layer 2) and OpenFlow
  - Already extensively used in R&E networks
  - Dramatically-improved control over routing and optimization

• GENI-enabled network capabilities
  - Customized virtual network slices to match app requirements
  - Distributed programmable resources within the network

• Integrated with wireless networks to facilitate:
  - Sensor networks
  - Continuous remote monitoring

• Apps built to be open, shared, and extendable

Launch and coordinate multiple application development approaches

Application development will be supported by:

• Competitive proposal submission
  — Balanced mix of competitions across sectors (e.g., health care, education, workforce development)
  — Award criteria designed to ensure high impact, scalability, use of network capabilities

• Open innovation challenges pioneered by Mozilla:
  — Peer-based learning and exchange through structured workshops
  — Iterative development and application with continued support contingent on results
  — Narrowing and launch within target sectors to build scale
  — Process facilitated by Mozilla’s experience and access to 400,000-member developer network

• Other agencies and foundations supporting grants, prizes, and challenges
US Ignite Partnership

• US Ignite Partnership will be a coordinating body that will ensure the long-term viability of the initiative
  - Chaired by “broadband visionary” from high-tech industry
  - Staffed by a strong, experienced ED and a small number of FTEs

• Coordinate investments among program participants to ensure balance and maximum impact across sectors
  - Operational funding for activities may not flow through this central organization, but directly from supporting organizations
  - Overhead covered by membership fees paid by each partner organization

Review and evaluate

The US Ignite Partnership will:

• Review results of application contests and grant programs
  – Develop metrics for evaluating adoption, usage, and success of apps
  – Conduct post-award panel reviews of progress and mentoring sessions with grantees, moderated by interested US Ignite board members and partners
  – Evaluate strategies for further development of winning technologies

• Develop strategies to distribute and/or commercialize technology developed by US Ignite grantees and contest winners
  – Options include:
    • Academic institution funding as a research project
    • Further government funding as a public benefit or service
    • Spin-out of technology with US Ignite encouragement, support, and fundraising
  – US Ignite Partnership board members, funders, and partners would have early exposure to new ideas developed by program participants
US Ignite Partnership

- **Board member**
  - Seat on US Ignite Partnership Board
  - Influence long-term strategic vision for US Ignite Foundation and hence, the Initiative
  - Ability to set priorities and decide direction for organization
  - All Level I benefits
  - $250,000 per year for 3 years

- **Level I Sponsor**
  - Invitation to exclusive “Best of US Ignite” presentations of advanced technologies
  - Seat on sector sub-committee
  - All Level II benefits
  - $150,000 per year for 3 years

- **Level II Sponsor**
  - Two invitations to semi-annual PI meetings to see demonstrations of new technologies in development
  - Opportunity to mentor/co-develop projects
  - All Participant benefits
  - $50,000 per year for 3 years

- **Participant**
  - Opportunity to see how advanced products and services can fit within and propel US Ignite
  - Chance for engineers to work with US Ignite projects
  - Invitation to US Ignite events and conferences
  - Financial contribution per year for 3 years plus significant in-kind contributions

- **In-kind contribution ideas**
  - Network equipment
  - Network engineering expertise
  - Bandwidth and connectivity on critical routes for testbed
  - Mentorship for entrepreneurs or researchers
  - Incubator space and resources for entrepreneurs or researchers
  - Sizeable in-kind contributions may qualify for Level I or Level II Sponsor status

US Ignite Timeline

January 19, 2011, White House Conference Center: *Advancing Applications and Services for Next-Generation Broadband Networks*

US Ignite workshops
- May 16, 2011, Arlington, VA
- June 9-10, 2011, Cleveland, OH
- November 2-3, Kansas City, MO (co-located with GENI Engineering Conference)


*Living the future Today at Case Western Reserve University*

In process: partner solicitation, US Ignite Partnership finalization
In planning: launch event, grants and contests announcements
Thank you!

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