

## **US Ignite: Enabling Cross-Community Applications**

### **Frequently Asked Questions**

February 20, 2014

#### **What's Going On?**

US Ignite would like to encourage the development and sharing of compelling US Ignite applications that can serve multiple communities (usually cities). These applications will provide acknowledged public benefit to multiple communities and require an advanced infrastructure (e.g., to support low latency, big data, ultra-high resolution, local cloud computing, gigabit to the end user, sensor networks, etc.) To support these inter-community applications, we will need compatible connected application execution infrastructure in the participating communities. To take advantage of existing infrastructure and allow for both distributed and local cloud applications, US Ignite is preparing a proposal to the National Science Foundation to extend the US Ignite and GENI rack and network infrastructure as needed to include participating cities. Funding will also be requested to adapt existing applications to this infrastructure and to share them with other communities. Funding for new application development may be available separately (please see the section below addressing this topic).

#### **What types of applications are you looking for?**

US Ignite applications use advanced infrastructure (e.g., gigabit to the end user, local cloud computing, sensor networks, ultra-low latency, very high resolution video, etc.) to provide new and compelling public benefits in education and job training, healthcare, transportation, clean energy, public safety, or advanced manufacturing. The extension we are seeking in the present effort is to take these applications to multiple communities so they can provide wider benefits. Some applications may have a single instance which is distributed among multiple communities. These are called “distributed” applications and use the geographic, cultural, and skill diversity present in multiple communities to provide benefits that no one community could provide for itself. Other applications may have value in a single community, but also be valuable in other communities. These are called “shared” applications and multiply the benefit of using them because they are applicable and useful in several communities. Both distributed and shared applications are encouraged.

### How will this help participating communities?

1. Your community will have access to advanced US Ignite applications including those developed in or on behalf of your own community as well as those developed at other participating communities. These may improve healthcare, education, job training, public safety, transportation, advanced manufacturing, and clean energy in your community.
2. Applications developed in your community may help promote job growth in your community and create new startups. Three new companies have already been formed to pursue US Ignite applications.
3. Developing and deploying US Ignite applications will increase the skill base in your community for generating, deploying, and supporting next generation applications.
4. If your community doesn't already have a GENI rack (aka US Ignite rack) which can be used for developmental and experimental purposes related to US Ignite, one will be requested for you. The size and configuration of the rack will be designed to be sufficient for the development and experimental deployment of the applications you propose to develop in your community and for the applications you commit to testing and deploying which are developed in other participating communities.
5. If your community is not already connected to the national GENI network, a connection will be requested for you. The speed and configuration of the connection will be designed to be sufficient for the development and experimental deployment of the applications you propose to develop in your community and for the applications you commit to testing and deploying which are developed in other participating communities.
6. We encourage the community to use its rack and its connections for (a) development, deployment, and support of US Ignite applications, (b) GENI and related academic research projects, (c) education and particularly education on advanced networking, (d) sharing with other communities, (e) supporting startups based on advanced networking that has public benefit, (f) student projects and experimentation. Resources in the rack are controlled by an Aggregate Manager which will be under the control of the community. A default Aggregate Manager policy will be provided.
7. The software to manage the rack is provided by GENI.

### What are the participating community responsibilities?

1. If not already done, organize to support US Ignite activities in your community including application development and deployment, local cloud computing via US Ignite Rack (aka GENI rack), software-defined-networking, gigabit to the end-user, and other advanced networking capabilities.
2. Be the primary or donor community for two (2) US Ignite shared or distributed applications that can be (or by nature must be) used in multiple communities. Funding to help create or refine these applications may be available from several sources including the NSF US Ignite "Dear Colleague" letter ([found here](#)), local foundations, volunteers (e.g., Code for America), local hackathon sponsors, some US Ignite industry members, and calls for innovation from other federal agencies.

3. Ideally, at least one of the two proposed shared or distributed applications should be on track to demo at the 2014 US Ignite Applications Summit June 24-27 in Sunnyvale, CA. It does not have to be complete and ready for deployment. If this appears to be unreasonable, please let us know.
4. Applications should be adapted as necessary to run on US Ignite racks (aka GENI racks). This should not be a significant burden because the racks can allocate virtual servers as needed with common operating systems of your choice. Licensing for Windows operating systems is the responsibility of the community.
5. Applications should be made ready for use by teams in other cities. This may mean resolving known and reported bugs, preparing documentation (if it doesn't already exist). Some funding (currently expected to be \$10,000 per application) will be made available through the proposal to help partially defray the costs of tasks #4 and #5.
6. At least one of the two proposed shared or distributed applications must be planned for initial multi-community testing no later than January 15, 2015. The other must be planned for initial multi-community testing no later than June 1, 2015. Multi-community deployment should be planned for no more than 90 days after multi-community testing.
7. Your community must plan to accept the costs for rack installation, insurance, operations, maintenance, and connecting it to the normal Internet facilities available in the datacenter in which it's located. These are normal costs for a datacenter or head-end. If they understand the value of US Ignite applications to their community, many datacenters and head-ends will accept this equipment, place it under their existing insurance, add it to the facilities managed by their own staff, and add it to an existing maintenance contract or parts swap.
8. If a new layer 2 connection to the GENI network is needed, US Ignite will propose that the NSF pay 100% of the cost in years 1 and 2, 50% in year 3, and 0% in years 4 and after. However, the community must commit to the remainder of the costs for years 3 and 4 and show a source of sustainable funding. The costs will vary wildly based on how an individual community connection to the GENI network is made. These costs will be discussed with each community as part of deciding how to connect currently disconnected communities. In some cases, local cross-connects or tails will need to be paid by the participating community.
9. The applications should be demonstrated at the 2015 US Ignite Applications Summit. One of the applications should be demonstrated (though perhaps not fully developed or ready to deploy) at the 2014 US Ignite Applications Summit (June 24-27 in Sunnyvale, CA).

### **What about R&E Networks?**

We encourage US Ignite R&E networks to define an appropriate community and participate.

### **How can I find other communities interested in using my app?**

US Ignite will attempt to match each of your apps with two or more other participating communities. You may have some ideas on which other communities might be best. Please let us know.

### Who can I get to develop my apps?

We think that there will be many paths. We recommend teams that include subject matter experts and users as well as software engineers, a project leader, and a marketing/documentation person. Other roles may also be important to your app.

Perhaps a master's student (or group of students) will take on parts of an app to develop and test as part of their thesis. Or a Code for America brigade may take on the development of the app. Perhaps you will have volunteer software developers from a major employer who will use some of their nights and weekends to make a positive difference in their community. An academic institution may think an application is a great capstone project for a student, or perhaps a good class project. A start-up accelerator or incubator may be the perfect venue in your city. We'd love to see a bunch of scrappy startups with great ideas they will develop into applications.

### Who owns the applications?

Generally, the authors and teams who create applications own any intellectual property rights. However, we encourage the development of open-source software that lets others benefit from your work. We also encourage the formation of new companies who will vigorously pursue their application and make it available to more Americans more quickly. For teams receiving application development funding, please check on the rules from the party providing the funding.

### Is there funding available to develop and integrate applications that might be used on an inter-community basis?

Funding for application development is available from multiple sources including the NSF US Ignite "Dear Colleague" letter ([here](#)), local foundations, volunteers (e.g., [Code for America](#)), local hackathon sponsors, some US Ignite industry members, and calls for innovation from other federal agencies.

### I'm in! What do I need to do to participate?

- A. Designate a point of contact in your US Ignite member community for the purposes of this multi-community applications effort and proposal.
- B. Think about what kinds of US Ignite applications might best benefit your community. These applications should be recently made feasible because of advanced networking (e.g., because they need low latency, big data, ultra-high resolution, local cloud computing, gigabit to the end user, sensor networks, etc.) **Pick two.** Ideally one should already be started and potentially the subject of a demo at the 2014 US Ignite Applications Summit June 24-27. The other can be a bit more ambitious. In any case, they should address a public benefit area such as public safety, transportation, healthcare, education and job training, advanced manufacturing, and clean energy. For this proposal, they should also be useful in other cities, or, by their nature, require multiple cities to be involved.
- C. Define the players in your community. These would normally include:
  - a. The teams that will be developing, adapting, and deploying the applications.
  - b. Their support network including:
    - i. a community US Ignite organizer to call meetings and push things along;

- ii. an academic institution who can involve faculty, staff and students in US Ignite applications as part of their research, education, and service missions;
  - iii. local political and civic support (e.g., mayor, chamber of commerce, local foundations, etc.);
  - iv. existing groups of volunteers (e.g., Code for America brigades, HackSLC, etc.);
  - v. incubators, accelerators, and research parks;
  - vi. angel investors and venture capitalists;
  - vii. subject matter experts
  - viii. groups of forgiving testers and early adopters
  - ix. the local carrier or other party who will be providing gigabit to the end user and housing the rack at their datacenter or head-end
- D. Develop some planning for the projects needed to make these applications real. The items below should be documented for each project so it can be included in the overall proposal.
- a. Identify teams for each project and a project leader and alternate.
  - b. Write clear objectives for the project. Keep it simple. You can always add things later.
  - c. Involve subject matter experts from day one. They should be excited about the possibility of this application making a big difference in their field. They should be willing to provide feedback during the entire process and be one of the first users.
  - d. Break down the project into manageable tasks and assign responsibilities and timelines
  - e. Define the application scope in simple and clear language to help avoid “scope creep”
  - f. Write it all down. It will be needed for the proposal.
  - g. Working with US Ignite, figure out which other communities might also benefit.
  - h. This proposal will provide \$10,000 per application for adapting it to the US Ignite (GENI) platform and doing other work related to distributing it to other communities.
  - i. Plan for additional sources of funding (if needed).
  - j. Plan for testing and re-work (sometimes called re-factoring). See element “d” above.
  - k. Think about project risks and the risk mitigation strategy.
  - l. Think about and document how this application can be more widely disseminated. Will you make it Open Source? Plan to raise venture capital funding? Request government STTR funding?
  - m. Plan to attend the US Ignite Application Summits in 2014 and 2015.
- E. Iterate the above with US Ignite so that there can be a single, overall proposal with a variety of multiple-community applications being proposed and infrastructure to support it.
- F. Talk to US Ignite about your infrastructure needs to run shared and distributed multi-community applications.

### **When do I need to tell you this?**

The sooner the better. We’ll consider everything we get by March 7, 2014.

### **Do you have a form I could fill out with my info?**

Yes – you should have received it. If not, please contact someone at US Ignite.