3rd GENI Engineering Conference
Opt-In Working Group Meeting Minutes

Prepared by Opt-In Systems Engineer:
Harry Mussman at GENI Project Office   hmussman@bbn.com,
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Content:
The agenda for the conference can be found at:  http://www.geni.net/GEC3-GEC3-Agenda.pdf

All slides from the conference can be found at:
http://groups.geni.net/geni/wiki/presentations

On the first day of the conference, there were two talks in plenary session that summarized NSF-sponsored workshops, including one on the "User Opt-In Workshop". Notes on this workshop are presented first in this report.

Then, on the second day of the conference, the Opt-In WG met.  It heard one short "lightning" talk, three related Spiral 1 project talks, the system engineering report, and had a period of open discussion.  Notes from this meeting conclude this report.

One action item was identified:
**Agree:  WG should consider producing:  "Best practices for involving an Institutional Review Board when starting a GENI networking experiment".  How can we get this started?**

Plenary Session:  Workshop Reports
Tuesday, October 28, 4:15pm – 5pm.
Building 20 Auditorium, Hewlett Packard, Palo Alto, CA
For an audio recording of this session, go to:  TBD

 "Report from the GENI User Opt-IN Workshop"
Speaker and workshop chair:  GENI Outreach Director Craig Partridge at GENI Project Office   craig@bbn.com
Slides:  http://groups.geni.net/geni/attachment/wiki/presentations/Partridge-Opt-In-Workshop-v1.0.ppt
Related workshop report at:  TBD

This talk reviewed a one-day workshop (held on July 22, 2008 in Cambridge, MA) that was structured to solicit ideas from experts interested in technology, and its impact on society.  Conclusions include:  the way to users is (mostly) through getting great applications into GENI slices.  Thus, we need to think about how to ensure GENI is application-friendly.

Opt-In Working Group Breakout Session
Wednesday, October 29, 2pm – 5pm.
Bldg 5M Spyglass Auditorium, Hewlett Packard, Palo Alto, CA
For an audio recording of this session, go to:  TBD

1)  WG Co-Chair:  Henning Schulzrinne at Columbia hgs@cs.columbia.edu
        Review of agenda
        Introductions
        (Note:  WG Co-Chair Helen Nissenbaum was unable to attend.)

2)  "Lightning talk" relevant to WG.  (Invited by WG Chairs)

a)  "PlanetLab Policies:  Learning on the Job"
Speaker:  Larry Peterson at Princeton llp@cs.princeton.edu
Slides:
http://groups.geni.net/geni/attachment/wiki/presentations/OptIn%20WG%20%202a%20
%20llp_policy.ppt

This talk summarized PlanetLab experience, starting with the actors and how experiments
lead to complaints.  It ended with a review of suggested policies and advice.

Here is a summary of the slides:

- PlanetLab Policies:
  Learning on the Job
- Acronym Soup
- CALEA
    - CFAA
    - CMA
    - DMCA
    - ECPA
    - SCA
    - Acronym Soup
- CALEA
    - Communication Assistance for Law Enforcement Act
- CFAA
    - Computer Fraud & Abuse Act
- CMA
    - Computer Misuse Act (UK)
- DMCA
    - Digital Millennium Copyright Act
- ECPA
    - Electronic Communications Protection Act
- SCA
    - Stored Communications Act

- Actors
- PlanetLab Central
  - testbed operator / trusted intermediary
- Hosting Sites
- Researchers
- Third Parties
  - end-users
  - content providers
  - attackers
  - ISPs
  - Experiments    Complaints
- Measurement Studies
  - network probes
  - application probes
  - edge probes
- Deployment Studies
  - opt-in strategy
  - privacy
  - abusing services
  - bandwidth shifting
  - financial gain
- Policies/Advice
- Do not police content
  - DMCA is relevant
- Prefer opt-out to opt-in
  - IRB oversight (of human studies) not required
- Protect privacy of log files
  - ECPA & SCA are relevant
- Research is distinctive
  - CALEA is not relevant
- Adhere to best practices
  - avoid random probes (CMA - UK)
  - prevent service abuse (CFAA)

Questions from the audience:
Q: What should you do if asked to capture more per CALEA?
A: Argue that it is not appropriate, or shut down the experiment.

Q: (Craig Partridge) we need to protect privacy of log files; is there a way to make them publically accessible?
A: Keep them private, or modify data to be anonymous.

Q: What does opt-out mean?
A: Make sure that you are not included or touched by the experiment.

Comment: Matt at Internet2: We are looking at a process for releasing data.

Q:  (Heidi Dempsey) what are EU requirements?  The need to be able to delete their own records?  Do you do it?
A:  Not yet.

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3)  Talks by related Spiral 1 projects:

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a)  "Seattle:  Building a Million-Node Testbed".
PIs:  Thomas Anderson and Arvind Krishnamurthy at the University of Washington – Seattle
Speaker:  Thomas Anderson at the University of Washington – Seattle
Slides:
http://groups.geni.net/geni/attachment/wiki/presentations/OptIn%20WG%20%203a%20%20seattle.pptx

This talk presented the case that existing testbeds don't model the Internet.  Instead, we should use resource donation and end user applications to build a million node testbed to realize:  platform diversity; network diversity; and scale.  See
https://seattle.cs.washington.edu

Questions from the audience:
Q:  (Henning Schulzrinne) what do you suggest for incentives?
A:  Diversity of opinion:  1) Give away app, but take 10% of resources.  2)  Make it easy to write an app.

Q:  (Larry Peterson) How does GENI workflow fit this model?
A:  Not well.  User has to do it; it is not driven from the network.

Q:  (Rob Ricci) this is good if research app provides a benefit to end users.  But, does this exclude research apps that do not benefit end users, e.g., a measurement app?
A:  Measurement works only when it is integrated into another application.

Q:  (Henning Schulzrinne) But, DIMES is a client downloaded to your PC to make measurements, and it is used.
A:  Yes, but there are only a few 1000s of users, via volunteerism.

Comment by John Wroclawski:  Consider not just volunteers, but also viral marketing.

Q:  (Henning Schulzrinne) Can user benefit include access to I/O devices?
A:  Yes, but not important.

Q:  (Max Ott) how do you know if users are representative?
A:   We don't know.

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b)  "Bringing External Connectivity and Experimenters to GENI".
PI and speaker:  Nick Feamster at Georgia Tech.

Slides:
http://groups.geni.net/geni/attachment/wiki/presentations/OptIn%20WG%20%203b%20bgp-mux-gec3.ppt

This project will provide for connectivity to and from the Internet, via a BGP mux platform that provides BGP interconnects and tunnels.  It is based on the Quagga routing suite.

Questions from the audience:
Q:  With a big AS, you can have multiple BGP sessions, at multiple locations.  How will mux do this?
A:  Like any AS does it.

Comment by Heidi Dempsey:  We will not have any upstream connectivity until Internet2 agrees to provide it.

Q:  Will mux be used only for BGP routing, or in a more general case?
A:  Whenever you want upstream connectivity, reachable form this network, you need upstream via this mux.

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c)  "Regional Opt-In".
PIs:  Matt Mathis and Ken Goodwin at Pittsburg Supercomputing Center and Three rivers Optical Exchange
PI and speaker:   Matt Mathis at Pittsburg Supercomputing Center and Three rivers Optical Exchange
Slides:
http://groups.geni.net/geni/attachment/wiki/presentations/OptIn%20WG%20%203c%20%20Mathis-regOPT.pdf

This talk presented a technique to allow regional Internet traffic flows to be directed into a GENI experiment, and reviewed how such a process could be managed on a day-to-day basis, including failure or success scenarios.

Questions from the audience:
Q:  (Heidi Dempsey) Open flow switching is another way to do large-scale opt-in.  Can you compare?
A:  Yes, but opt-in via open flow switch is local; is L2; and is specifically selected.  This is L3, and can be used at anywhere from campus exit router (relatively easy) to backbone router (very difficult).  They are complementary in functions

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4)  "Opt-In System Engineering Report"
Speaker:  Harry Mussman at GENI Project Office hmussman@bbn.com
Slides:
http://groups.geni.net/geni/attachment/wiki/presentations/Opt_in%20WG%20%204%20%20102908%20%20SE_Report_OptInWG_GEC3.ppt

This talk first provided an introduction to the role of the Opt-In WG system engineer:

- Harry Mussman
    - Current: Senior Systems Engineer in the GPO at BBN
    - Last: Voice-over-IP architect at BridgePort Networks (a startup) and GTE Internetworking/Genuity
    - BSEE Univ Michigan, MSEE Northwestern Univ, PhD Stanford Univ
    - hmussman@bbn.com
- Role of Opt-in WG SE
- Frame technical issues from top-down
    - Collect issues from WG, organize and revise
    - Use to identify and structure WG documents
- Synthesize input from bottom-up
    - Collect input from WG, compile and distribute
    - Look for and summarize consensus (or lack of it)
- Draft WG documents…
    - Manage process to completion
- Assist WG communications
    - Take and distribute notes
    - Maintain wiki


Then, a possible way to summarize opt-in scenarios and capabilities was presented:

- Overview of GENI
    Opt-in Scenarios and Capabilities
- "GENI end-user opt-in is defined by scenarios where end users (not researchers) become involved with GENI experiments, and by the capabilities necessary to support them."
- Each opt-in scenario involves:
    - One or more use cases.
    - A set of players, with differing motivations.
    - Unique issues.
- Each opt-in scenario requires:
    - A set of policies and best practices.
    - One or more underlying GENI capabilities to make it work.
- Opt-in Scenarios
- Have currently identified four distinct scenarios (which can overlap).
- Scenario 1: An experiment on GENI that provides a service to users and/or others
- Scenario 2: An experiment on GENI that can affect and disrupt users and/or others
- Scenario 3: When users (or others) contribute (or associate) resources to (with) experiments on GENI
- Scenario 4: When experiment data involving users is gathered on GENI, and made available to researchers, and possibly others
- Other scenarios?
- Opt-in Capabilities
- Have currently identified three basic capabilities that will be required.
- Capability 1: Gateway from GENI to another network, e.g., the Internet

- Capability 2:  Contribution (or association) of a user's node to an experiment on GENI
- Capability 3:  Gathering logs and experiment data on GENI, and managing their distribution
- Other capabilities?
- Current Spiral 1 projects are focused primarily on providing a capability.
- Capability 1:  Gateway from GENI to another network, e.g., the Internet
  – 1601 Virtual Tunnels
  – 1650 Regional Opt-In
- Capability 2:  Contribution (or association) of a user's node to an experiment on GENI
  – 1645  Million Node GENI

Next, it presented an overview of related Spiral 1 projects.
 (See slides)
Then, current opt-in issues were reviewed:

- Current Opt-in Issues and Tasks
- Scenario list:
  – Review, and affirm or change.
- For each scenario:
  – Formulate in more detail, and sub-divide as needed.
  – Understand the players, their relationships and their motivations.
  – Formulate proposed policies and best practices.
  – Clearly identify and define key issues.
  – Determine required capabilities.
  – Reference current implementations, research and projects.
- Who in WG wants to contribute?
- continued (2)
- Capability list:
  – Review, and affirm or change.
- For each capability:
  – Formulate in more detail, and sub-divide as needed.
  – Formulate requirements.
  – Suggest design approaches.
  – Reference current implementations, research and projects.
- Who in WG wants to contribute?

- Work towards defining and understanding scenarios is underway.
- Scenario 1:  An experiment on GENI that provides a service to users
  – See Opt-in Workshop report by Craig Partridge.
- Scenario 2:  An experiment on GENI that can affect and disrupt users and/or others
  – Consider experience from PlanetLab, by Larry Peterson.
- Scenario 3:  When users contribute (or associate) resources to (with) experiments on GENI
  – Studied as part of Spiral 1 project, 1645  Million Node GENI.

Finally, the documents planned for the next year were reviewed.

- Planned Opt-in Documents
- Architecture:
  - Opt-in Architecture, v1       DRAFT due 3/1/09
- Scenarios?
- Capabilities?
- References?
- Who in WG wants to be an author?  Editor?
- Who in WG wants to be an editor?
- Who in WG wants to be a reviewer?

- How WG Creates Document
- SE drafts document, with input from WG
- GPO does internal review
- SE posts first draft
  - On wiki (to start); repository up RSN
- WG discusses document on WG list
  - Possible one-on-one follow-ups
- SE assembles changes, and revises
- SE posts revision
- (Repeat, until document completed)

- Next…
- Notes, slides, action items, etc will be sent to the working group mail list and posted on the wiki page:

  http://groups.geni.net/geni/wiki/GeniOptIn

Question:
Q:  (Harry Mussman) we heard about the PlanetLab issues; what about Emulab and DETER?
A:  (Ted Faber) Emulab has many fewer issues, because more self contained.  DETER has no issues, since completely isolated.

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5)  Discussion, including comments and questions from the audience:

Q:  (Henning Schulzrinne) who is audience for documents?
A:  Future builders and experimenters.  Those who provide required software and hardware.

Comment from Josh Bers at BBN:   As a member of the operations community, would like you to consider use of GENI to try out novel techniques to monitor network.

Topic for discussion:  The need to involve an Institutional Review Board when starting a GENI networking experiment.

Q:  (Matt Mathis) How much of the personality of an IRB is institution specific?
A:  Quite a bit.

Comment by?:  Had to go through an IRB to survey students; went very badly, but eventually it was judged to not be needed.

Comment by Matt Mathis:  Had submitted a short proposal that has not been funded: Produce a white paper titled "Networking for IRB Members", Work has not yet started.

Comment by Heidi Dempsey:  IRB interface should be responsibility of experimenters.

**Agree:  WG should consider producing:  "Best practices for involving an Institutional Review Board when starting a GENI networking experiment".  How can we get this started?**

Q:  (Henning Schulzrinne) How much disclosure is due users in the million-node scenario?
A:  Based on Sony activity that left active software on platform without user's consent, you must at least inform them.

Comment by Heidi Dempsey:  OMIS WG is working of security policies needed for Spiral 1 operation; this overlaps with User Opt-In.

Q:  (Henning Schulzrinne) Do we need architecture?  Data format work?  Standard disclosure?
A:  Yes. Yes.  Yes.

Q:  (Harry Mussman) How many are on Opt-In WG mailing list?
A:  Small minority of audience.

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