OpenSEES Workshop Sept 2 and 3, 2010

9:45-11:00 Cloud Computing, NEEShub & OpenSees
11:00-12:00 NEEShub Hands-On

Gregory P. Rodgers Ph.D.
NEESComm IT

Agenda:
Introduction to HUB technology
  More than a new website
NEEShub: the New nees.org
  1. Website
  2. Resources
  3. Tools and Tool-Data Management
     webdav
     rappture
     Synchronizes
  4. NEES Project Warehouse
Opensees in nees.org
  opensees2
  openseeslab
  openseesbuild
Future
  Batch Strawman for OpenSees
  Integration with plotting tools
Introduction to HUBzero

- HUBzero™ is a platform used to create dynamic web sites for scientific research and educational activities. With HUBzero, you can easily publish your research software and related educational materials on the web.
- Powerful middleware serves up interactive simulation and modeling tools via your web browser. These tools connect you with rendering farms and powerful Grid computing resources.
- Proven with the nanoHUB. nanoHUB supports over 100,000 worldwide users, hundreds of nanotechnology tools, and constant worldwide collaboration. Also supported by NSF. Many smaller hubs also exist.
- NEEScomm IT has adopted HUBzero technology to transition nees.org to NEEShub. The URL is the same, the infrastructure is completely updated.

NEEShub: The new nees.org

<table>
<thead>
<tr>
<th>Dynamic / Transient</th>
<th>Static / Permanent</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEES Communications &amp; Support</td>
<td>NEES Engineering, Research, &amp; Development</td>
</tr>
<tr>
<td>1. Joomla Website</td>
<td>3. HUB tools with personal and group data</td>
</tr>
<tr>
<td>2. HUB Resources</td>
<td>4. NEES Project Warehouse</td>
</tr>
</tbody>
</table>
Main Menu Organization

- Tools & Resources – User and NEES contributed content (e.g. videos, publications, simulation tools)
- Education & Training – NEES Academy
- Project Warehouse - Perpetual database of research projects
- Sites- NEES Sites and related information
- Collaborate – User oriented collaboration options
- Explore – Information managed by NEESComm
1. The nees.org website

- NEES Communication Portal
  - Activities
  - Calendar
  - News and Reports
  - Videos
  - nees.org general content Contact: Allegra East
- NEES Education Outreach and Training
  - Education organized for Teachers, Students, Professionals, and the Public
  - Initial Source of many HUB Resources
  - Contact: Sean Brophy

2. Resources

- Resource Types
  - Documents Library
  - Learning Objects
  - Series
  - Citations
  - Tools
- Organization by Resource Types and tags.
  - Parent tags coming soon.
- Searchable
- Each resource has a permanent URL.
- Anyone can contribute but publication is monitored.
3. NEES Tools and Workspace Data Management

- HUB tools run in a virtual machine with access to a persistent file system. No installation required.
- Anyone can contribute a tool.
- Organization of NEES tools is a work-in-progress.
  - Hundreds of Tools in NanoHub
  - Tags defined by tool owner help to organize tools
- One very important tool: Workspace
  - A Linux desktop with access to personal HOME and shared group data.
  - This is where tool developers build and test tools.
- Please consider contributing tool with graphical interface to your OpenSees simulation model.
  - TCL extension available to OpenSees TCL for building GUI. This is called Rappture.
- Two types of data
  - HOME directory, Quota is 1GB but extendable with a ticket
  - Group space

4. NEES Project Warehouse

- Perpetual Database for NEES Research Projects
  - Required for NEES funded projects
  - Migrated from old NEES Central
  - A combination of Oracle database and filesystem
  - Access managed by PIs who create projects.
- Three access methods to Warehouse
  - Nees.org project warehouse http://nees.org/warehouse
  - PEN, a Java tool for moving data in and out of the warehouse from HUB or local workstation.
  - Web services (API).
- New for NEEShub.
  - HUB Tools have read-access to data stored in Warehouse file system.
    /nees/home/<PROJECT NAME>.groups/
  - Read-only ftp server authenticated with your nees.org userid and password
    ftp neesws.neeshub.org
OpenSees in nees.org

- The OpenSees binary was built for Debian Linux
  - Not directly executable (except through workspace).
  - User interface tools use this binary to run OpenSees
- A Rappture-based developer interface was created to manage a set of simulation models stored in a user’s home directory. (Called opensees2)
  - One model per directory in $HOME/opensees2/<name>/<name>.tcl
  - 5 examples copied to $HOME/opensees2 that show GUI and non-GUI models
- Frank built a more elaborate GUI framework for specific models. No need to understand TCL to operate. (Called OpenSees Lab)
- We expect TCL model developers to contribute reusable models with GUIs as new HUB tools for easier execution by users who are not TCL developers.
Batch Strawman for OpenSees in NEEShub.

- **Three Options**
  - Default: Run OpenSees in the HUB interactively
  - Medium: Submit 4-processor job to Purdue Condor pool.
  - Large: Submit 16-processor job to Terragrid
- **Medium and Large options would not be generally available.**
11:00-12:00 NEESHub Hands-On

Agenda:
- Account Registration
- Quick tour of 4 segments described earlier
  - myneesub
- Tool execution
  - open sees2 – Run the examples and create a new TCL simulation directory
  - open sees lab – Frank to demo
  - workspace – How to run the OpenSees binary.
- Data Transfer
  - Webdav
  - File import/export.
- Communication
  - Tickets
  - Questions and Answers
- Wishlist
- Sharing sessions
- Tool Contribution and Development
**NEEShub Registration Form**

### Login Information
- **User Login**: REQUIRED
- **Password**: REQUIRED
- **Confirm Password**: REQUIRED
- Password rules:
  - Must contain at least 1 letter.
  - Must contain at least 1 number or punctuation mark.
  - Must be between 8 and 16 characters long.
  - Must contain more than 4 unique characters.
  - Must not contain any password words.
  - Must not contain your name or parts of your name.
  - Must not be different than the previous password meaning the same password will not be allowed for one (1) year.
  - Must be changed at least every 120 days.

### Contact Information
- **First Name**: REQUIRED
- **Last Name**: REQUIRED
- **Mobile Name**: REQUIRED
- **Last Name**: REQUIRED
- **Valid E-mail**: REQUIRED
- **Confirm E-mail**: REQUIRED

A message: "It is important that you must confirm receipt of confirmation e-mail from support@neeshub.org in order to complete registration."

### NEES Information
- **NEES Affiliation**: REQUIRED
- **Not Affiliated**

### Terms & Conditions
- **Agreed**: Yes, I have read and agree to the Terms of Use.

---

**Optional Information after you have account**

**Contact Information**
- [ ] [ ] [ ]

**NEES Information**
- [ ] [ ]

**Personal Information**
- [ ]

---

**NEEShub**

[Image]
The Tools (and Resources) Trifold

Resources: Tools

<table>
<thead>
<tr>
<th>Tag</th>
<th>Resources</th>
<th>Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>CoS (1)</td>
<td>CoS (1)</td>
<td></td>
</tr>
<tr>
<td>Analyze (1)</td>
<td>Analyze (1)</td>
<td></td>
</tr>
<tr>
<td>Earthquake Engineering (1)</td>
<td>Earthquake Engineering (1)</td>
<td></td>
</tr>
<tr>
<td>EST (3)</td>
<td>EST (3)</td>
<td></td>
</tr>
<tr>
<td>OpenSees Demo (2)</td>
<td>OpenSees Demo (2)</td>
<td></td>
</tr>
<tr>
<td>OpenSees Demo (2)</td>
<td>OpenSees Demo (2)</td>
<td></td>
</tr>
<tr>
<td>Simulation (3)</td>
<td>Simulation (3)</td>
<td></td>
</tr>
<tr>
<td>Virtualized (2)</td>
<td>Virtualized (2)</td>
<td></td>
</tr>
<tr>
<td>Visualization (3)</td>
<td>Visualization (3)</td>
<td></td>
</tr>
</tbody>
</table>

Top Rated

Opensees developer interface

Used to develop models and GUIs.

Five examples will be placed in your HOME directory the first time you start tool.

This interface will be extended for batch submission.
Using Windows Webdav to access your HOME directory on the NEEShub
How to Build A GUI with OpenSees, Rappture, and TCL

- Build an xml file (tool.xml) that defines the driver for your simulation model.
- Modify tcl script to read and write values from a “driver”.

```
tool.xml + sine.tcl
```
OpenSees in nees.org

- The OpenSees binary was built for Debian Linux
  - Not directly executable (except through workspace).
  - User interface tools use this binary to run OpenSees
- A Rapture-based developer interface was created to manage a set of simulation models stored in a user's home directory. (Called opensees2)
  - [http://nees.org/resources/opensees2](http://nees.org/resources/opensees2)
- A one model per directory in $HOME/opensees2/<name>/<name>.tcl
- 5 examples copied to $HOME/opensees2 that show GUI and non-GUI models
- Frank built a more elaborate GUI framework for specific models. No need to understand TCL to operate. (Called OpenSees Lab)
  - [http://nees.org/resources/openseeslab](http://nees.org/resources/openseeslab)
- We expect TCL model developers to contribute reusable models with GUIs as new HUB tools for easier execution by users who are not TCL developers.
  - [http://nees.org/resources/???](http://nees.org/resources/???)
  - Or Frank could include GUIs and models in OpenSees Lab.