Thomas B. Golisano College of Computing and Information Sciences

geni
Exploring Networks
of the Future

The 2012 GENI Research and Educational Experiment Summer Camp

The Organizing Committee

Mark Berman, BBN
Yong Guan, Iowa State
Yin Pan, RIT
Niky Riga, BBN
Bing Wang, UConn
Kaiqi Xiong, Leader, RIT

ACKNOWLEDGEMENT

Kaiqi Xiong

On behalf of the Summer Camp Organizing Committee

Sponsors of the Summer Camp

Welcome Message

We sincerely welcome you to participate in the 2012 GENI Research and Educational Experiment Summer Camp (GREE-SC2012) hosted at Rochester Institute of Technology on May 29 – June 2, 2012.

The Global Environment for Network Innovation (GENI) infrastructure is becoming a mature virtual laboratory for exploring future Internet at-scale. It supports at-scale experimentation on shared and heterogeneous GENI resources among multiple users, permits users to do deep programmability throughout the network, and offers collaborative and exploratory environments for innovative research and education. More and more researchers, educators, and students have started or are starting to conduct research and educational experiments on the GENI infrastructure. NSF has sponsored more than 15 GENI experiment projects since September 2010.

This one-week long summer camp will provide you the opportunity to learn and experiment various tools available in the GENI environment through well-structured tutorials, labs and project including:

- Introduction to GENI racks and GENI resources: ProtoGENI and PlanetLab.
- OS installation and configuration for GENI experiments.
- Familiarity of OMNI tools: introduction to Flack, INSTOOLS, GUSH, OpenFLow, and PrimoGENI.
- Gain hands-on lab experience with multiple GENI resources and use them to develop a team-based project.
- Lab sessions with GENI experts who will help you design and begin your experiment.

We hope that all of you will find this summer camp to be an interesting, enriching, and informative experience and continue to use GENI in your research and educational projects. You are **strongly encouraged** to submit papers to the 2012 GENI Research and Educational Experiment Workshop (GREE2013). We look forward to seeing you in GREE2013.

Sincerely,

The First GENI Summer Camp Committee:
Kaiqi Xiong and Yin Pan, RIT
Yong Guan, Iowa State
Bing Wang, UConn
Mark Berman and Niky Riga, BBN

The Agenda of the Summer Camp

	Tuesday	Wednesday	Thursday	Friday	Saturday
Block I	Welcome and expectations, pre-evaluation, etc. Intro to GENI (Andrew Sears & Mark Berman; 0.5 hr)	OpenFlow Tutorial and team labs/project (KC Wang & Reece Johnson)	PrimoGENI tutorial (Jason Liu & Miguel Erazo)	Future internet architecture (Nirmala Shenoy) Continue the team project	Continue the project presentation preparation
Block II	FLACK and INSTOOLS (Zongming Fei and Hussamudin Nasir 2.5 hrs)	OpenFlow (KC Wang & Reece Johnson) – cont. NSF Advices (Bryan Lyles)	Team labs/projects using PrimoGENI (Jason Liu & Miguel Erazo)	Continue the team project	Team project presentations, and post-evaluation
Lunch					
Block III	Intro to GENI Technologies (Mark Berman & Niky Riga; 1.5 hrs) Omni tutorial Tutorial (KC Wang & Reece Johnson; 1 hr)	Gush Tutorial (Jeannie Albrecht; 2.5 hrs)	Tour to RIT computing facility ("Tell and Show,"1 hr)	One-on-one meeting with GPO and Continue the team project	
Project	Introduction to team projects and team formation (1 hr)	Project brainstorming and practice (1 hrs)	The team project	Project presentation preparation	

Technical Preparations:

Get a GENI account

This account will also give you access to GENI for further experimentation after the summer camp. If you already have an account with pgeni.gpolab.bbn.com then there is nothing more you need to do. If you do not have an account, please follow instructions in the end of the email. In order for you to get a GENI account you will have to follow these instructions. Make sure that in all the forms real email addresses are used, since further instructions are going to be sent through email:

1. If you are a student as your adviser to create a project by filling out this form: https://www.pgeni.gpolab.bbn.com/newproject.php3 . In the last box, please provide a couple of sentences about how you plan to use GENI for your research.
2. Once the project is approved you should apply for an account at: https://www.pgeni.gpolab.bbn.com/joinproject.php3 , using as project name the same project name used by your adviser in the previous form.
3. Your adviser should approve your request.

Get the GENI VM

1. Download and install VirtualBox (www.virtualbox.org) on a machine that you will bring to the summer camp. If your computer runs Ubuntu 10.04 which comes with VirtualBox 3.1.6_OSE, please download the latest version of VirtualBox.
2. Download the VM image.
3. Run VirtualBox and Import Appliance (File->Import Appliance), accept the default settings for the VM.
    o If you are using a FAT32 filesystem you will NOT be able to load the image.
4. Start the VM and log in
5. Change the default password, on the task bar on the top, click on the right on the user 'geni', and choose the Change Password button.
6. Verify that the VM has connectivity. Start Firefox (shortcut on the top bar) and try to load Google. If you can't reach any website, restore VM's Network connection.
    o On the far right on the top bar, there is the network icon (two opposite facing arrows).
    o Click that icon and choose 'Auto eth0'.
    o Try loading the webpage again.

Configure your account

1. Open a browser in the VM and go to http://www.pgeni.gpolab.bbn.com and login with your account.
2. Click on the Generate an SSL cert link on the left of your screen. Make sure you remember the passphrase you used.
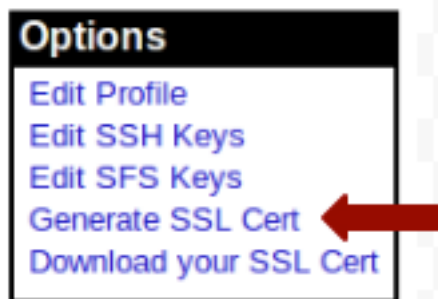
3. Click on the Download cert link on the left of your screen. Click on that and select the option about downloading as a pem file. Save this page under ~/.ssl/geni_cert.pem. You will need to type the path, instead of navigating to the folder.
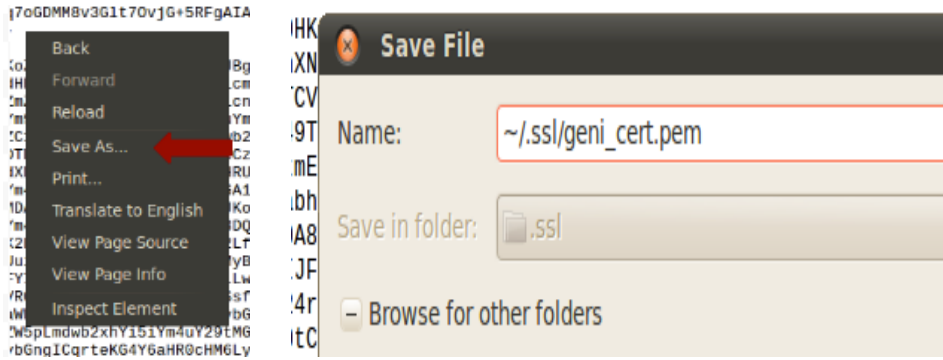
4. Open a terminal window and type: omni-configure.py
   You will be asked for your passphrase multiple times, this is the passphrase you used when generating your cert.

5. **OPTIONAL.** During the tutorials, you might be asked for you passphrase multiple times. If you want to save time, remove the passphrase from your cert and your ssh key.
   Run : clear-passphrases.py

Use the same passphrase as above.

Camp details:

GENI Summer Camp location: The summer camp will be held on Rochester Institute of Technologies campus in the Louise Slaughter (CIMS) building number 78. The room number is 2240. The class will run every day from 8:30AM-5PM, with an hour-lunch break each day. Please note that Saturday's class will end after lunch at noon.

Bldg 078 Louise Slaughter Cntr For Integrated MFG Studies
2nd Floor Plan
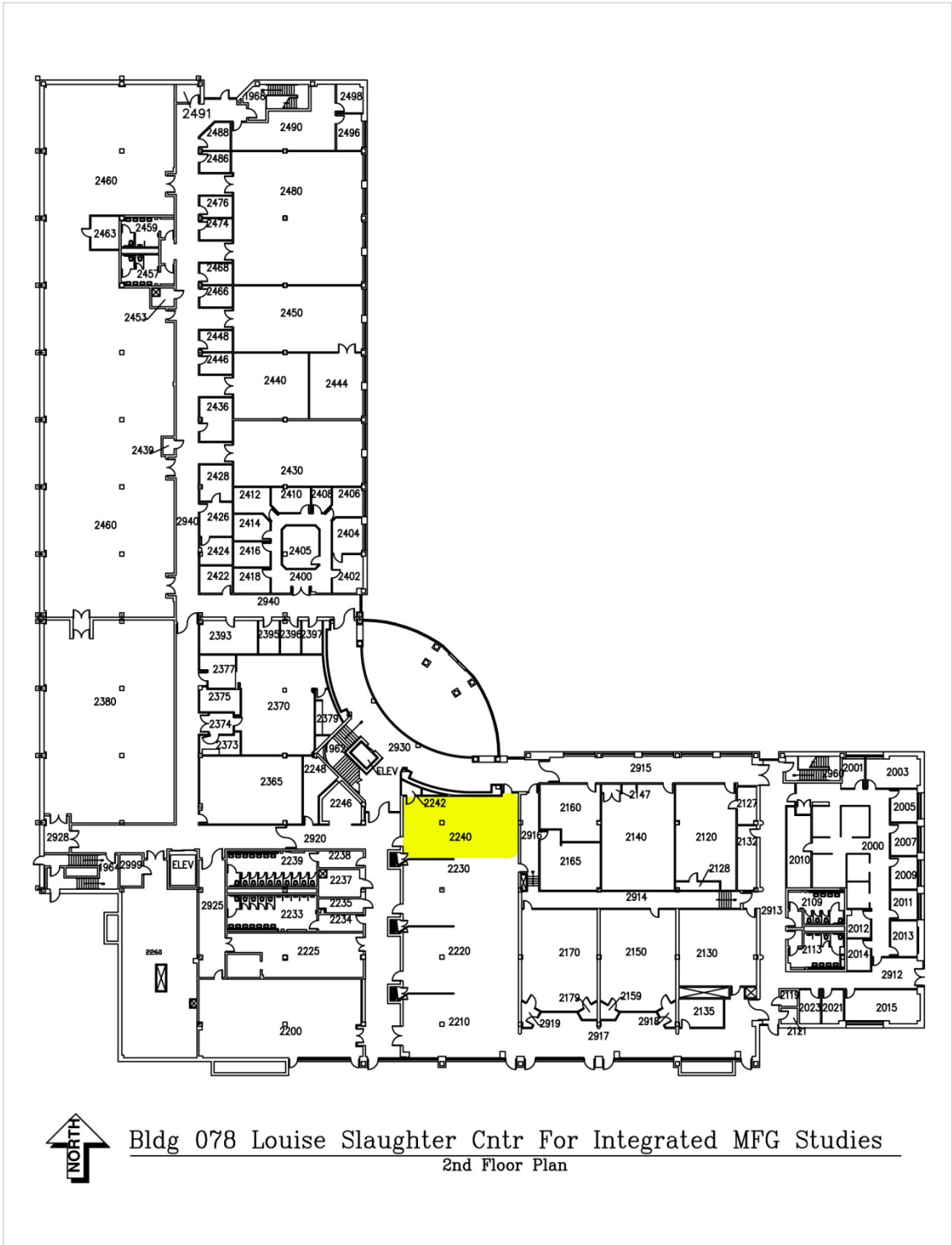
Meals: Every day the funded participants and GPO staff in the program are invited to Golisano College, building number 70 Room 2500. This will be the room that participants with meet at 8AM for breakfast,

and again at noon for Lunch.

Bldg. 070 Golisano College Of Computing & Info Sciences
2nd Floor Plan
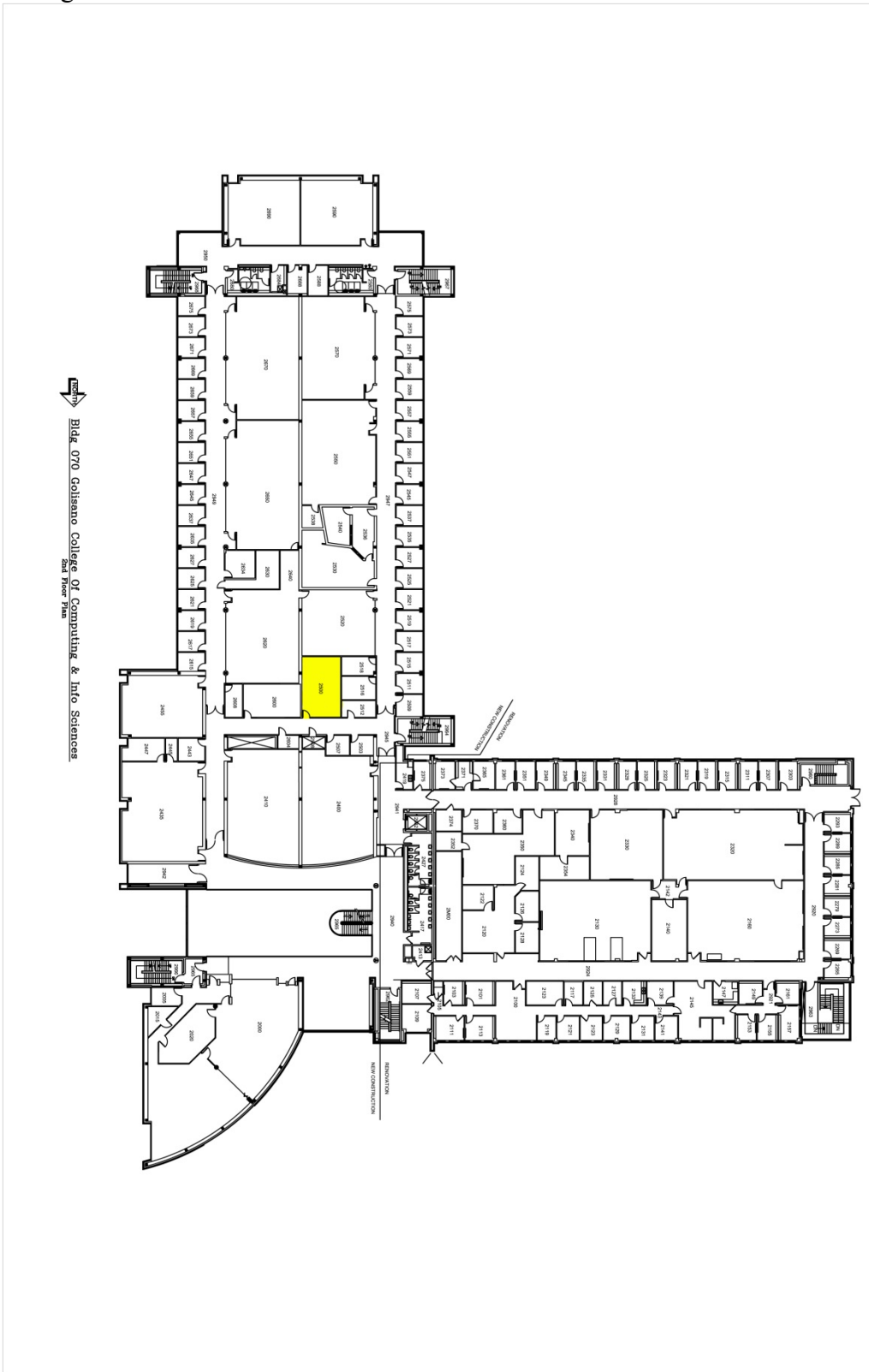
Food provided will vary throughout the week. For breakfast every morning there will be hot regular and decaffeinated coffee and tea provided. There will also be a choice of Orange or Cranberry Juice. Food will include a variety of bagels, muffins and danishes.

Lunches will include a variety of 20oz drinks, and chips every day. Half the days will be box lunches that will have a variety of sandwiches (different meats, veggies, cheeses), hand fruit, bags of chips and a cookie. The opposite days will be a sub tray that has a variety of sub options.

Rochester weather information:
http://www.weather.com/weather/right-now/Rochester+NY+14623

Visit Rochester
- George Eastman House: http://www.eastmanhouse.org/
- George Eastman School of Music: http://www.esm.rochester.edu/
- Ontario Beach Park: http://www.monroecounty.gov/parks-ontariobeach.php
- Other attractions: http://www.visitrochester.com/

A List of Speakers and Participants

Name:	University/Company	Status
Anand Akella	RIT	Graduate Student
Jeannie Albrecht	Williams College	Faculty/speaker
Mark Berman	BBN/GPO	Experimentation Director/speaker
Biswajit Biswal	Tennessee State University	Ph D student
Marc Daniels	Xerox	Research Team Leader
Miguel Erazo	Florida International Univ.	Ph D Student/speaker
Zongming Fei	University of Kentucky	Faculty/speaker
Megan Fritts	RIT	Sr. Staff
Ruiling Gao	Tufts University	Ph D Student
Xinjie Guan	University of Missouri	Ph D Student
Mohammad Husain	SUNY Buffalo	Ph D Student
Praveen Iyengar	RIT	Graduate Student
Ruofan Jin	University of Connecticut	Ph D student
Reece Johnson	Clemson University	Ph D Student/speaker
Minseok Kwon	RIT	Faculty
Jason Liu	Florida International Univ.	Faculty/speaker
Lokesh Mandvekar	SUNY Buffalo	Ph D Student
Sumita Mishra	RIT	Faculty
Hussamuddin Nasir	University of Kentucky	Engineer/speaker
Binh-Yen Nguyen	RIT	Graduate Student
Tom Oh	RIT	Faculty
Derek O'Neill	University of North Carolina	Undergrad
Yin Pan	RIT	Faculty
Jiten Patel	RIT	Graduate Student
Akshada Pol	RIT	Graduate Student
Niky Riga	BBN/GPO	Network Scientist/speaker
Librania Santos	RIT	Graduate Student
Nirmala Shenoy	RIT	Faculty/speaker
Benjamin E. Ujcich	Clemson	Undergrad
Xili Wan	University of Missouri	Ph D Student
Bing Wang	University of Connecticut	Faculty
Cong Wang	University of Massachusetts	Ph D Student
Kuang-Ching Wang	Clemson University	Faculty/speaker
Yuefeng Wang	Boston University	Ph D student
Terry Xing	Arizona State University	Ph D student
Kaiqi Xiong	RIT	Faculty
Yong Guan	Iowa State University	Faculty (remote)
Bryan Lyles	NSF	Program Director/speaker (remote)