The Second GENI Research and Educational Experiment Workshop (GREE2013)

Co-located with GENI Engineering Conference (GEC16)
Salt Lake City, Utah
March 21 - 22

Technical Program

Thursday, March 21
City Creek, University Guest House

1:00-1:10pm

Welcome and Opening Remarks
Chip Elliott & Mark Berman

1:10-2:00pm

Keynote Speech
Prototyping and Evaluation of the MobilityFirst Future Internet Architecture Using ORBIT and GENI Testbeds
Dipankar Raychaudhuri, Director of WINLAB, Rutgers University

2:00-3:10pm

Application and Tools for GENI – I
Session Chair: Harry Mussman

- **Fast-tracking GENI Experiments using HyperNets (full paper)**
  ***Shufeng Huang**, James Griffioen, and Kenneth L. Calvert*
- **Experiment Replication using ProtoGENI nodes (full paper)**
  ***Derek O'Neill**, Jay Aikat, and Kevin Jeffay*
- **Hardware-in-the-Loop Simulations and Verifications of Smart Power Systems Over an Exo-GENI Testbed (short paper)**
  ***Aranya Chakrabortty** and Yufeng Xin*
- **Advanced Manufacturing Use Cases and Early Results in GENI Infrastructure (short paper)**
  *Alex Berryman, **Prasad Calyam**, Joe Cecil, George B. Adams III, and Douglas Comer*
- **ExoApp: Performance Evaluation of Data-Intensive Applications on ExoGENI (short paper)**
  *Ze Yu, Xinxin Liu, **Min Li**, Kaikai Liu, and Xiaolin Li*

3:10-3:30pm

Break

3:30-4:15pm

NSF Advice for New GENI Experimenters & Panel Session
Panel Chair: Niky Riga

- Bryan Lyles (NSF)
- Jay Aikat (University of North Carolina at Chapel Hill)
- Rick McGeer (HP Labs)
- Dipankar Raychaudhuri (Rutgers University)
- Niky Riga (GPO)
- Matt Strum (University of Utah)
- Yufeng Xin (RENCI)

4:15-5:00pm

GENI for Education – I
Session Chair: Vicraj Thomas

- **Building Green Systems with Green Students: An Educational Experiment with GENI Infrastructure (full paper)**
  ***Stephen Tredger**, Yanyan Zhuang, Chris Matthews, Jesse Short-Gershman, Yvonne Coady, and Rick McGeer*
- **Experience with Seattle: A Community Platform for Research and Education (full paper)**
  *Yanyan Zhuang, Albert Rafetseder, and **Justin Cappos***

Application and Tools for GENI – II

Session Chair: Rick McGeer

- **Cloud-based Handoff as a Service for Heterogeneous Vehicular Networks with OpenFlow (short paper)**
  *Ke Xu, **Ryan Izard**, Kuang-Ching Wang, and Jim Martin*
- **DoS Detection is Easier Now (short paper)**
  *Ilker Ozcelik, **Yu Fu**, and Richard R. Brooks*
- **Network Coding for Efficient Broadband Data Delivery in Infrastructure-based Vehicular Networks with OpenFlow (short paper)**
  5:05-5:50pm
  ***Ke Xu**, Saravanan Sampathkumar, Kuang-Ching Wang, and Parmesh Ramanathan*
- **Supporting Extensions of VLAN tagged-traffic across OpenFlow Networks (short paper)**
  *Pang-Wei Tsai, Pei-wen Cheng, Mon-Yen Luo, **Jim Chen**, and Chu-Sing Yang*
- **OpenFlow Configuration (OFConfig) Protocol: Implementation for the OF Management Plane (work-in-progress)**
  *RajaRevanth Narisetty, Levent Dane, **Deniz Gurkan**, Stuart Bailey, Sandhya Narayan, and Shivaram Mysore*

Friday, March 22

City Creek, University Guest House

Special Session for Summer Camp Students

Session Chair: Kaiqi Xiong

- **RIT Summer Camp (GREE-SC2012) Highlights**
  ***Kaiqi Xiong** and Yin Pan*
- **GENI WiMAX Performance: Evaluation and Comparison of Two Campus Testbeds (full paper)**
  *Fraida Fund, **Cong Wang**, Thanasis Korakis, Michael Zink, and Shivendra Panwar*
- **Malware Detection for Mobile Devices Using Software Defined Networking (full paper)**
  ***Ruofan Jin** and Bing Wang*
- **SnortFlow: A OpenFlow-based Intrusion Prevention System in Cloud Environment (short paper)**
  8:00-9:15am
  *Tianyi Xing, Dijiang Huang, **Le Xu**, Chun-Jen Chung, and Pankaj Khatkar*
- **Demonstrating RINA using the GENI Testbed (short paper)**
  ***Yuefeng Wang**, Flavio Esposito, and Ibrahim Matta*
- **Enabling Wide Area Single System Image Experimentation on the GENI Platform (short paper)**
  ***Lokesh Mandvekar,** Chunming Qiao, and Mohammad Iftekhar Husain*
- **Reliability and Scalability Issues in Software Defined Network Frameworks (work-in-progress)**
  ***Xinjie Guan**, Baek-Young Choi, and Sejun Song*

9:20-10:10am

GENI for Education – II

Session Chair: Justin Cappos

- **WiMAX in the Classroom: Designing a Cellular Networking Hands-on Lab (full paper)**
  Jelena Marasevic*, Jan Janak, Henning Schulzrinne, Gil Zussman*
- **GENI-enabled Programming Experiments for Networking Classes (full paper)**
  James Griffioen, Zongming Fei, ***Hussamuddin Nasir****, Xiongqi Wu, Jeremy Reed, and Charles Carpenter*
- **Understanding ProtoGENI in Networking Courses for Research and Education (short paper)**
  Kaiqi Xiong *and Ying Pan*

10:10-10:30am **Break**

10:30-12:30pm

ExoGENI Tutorial

Victor J. Orlikowski and Yufeng Xin

12:30pm

Closing Remarks & Best Paper Awards

Bing Wang, Kaiqi Xiong, and Mark Berman

Prototyping and Evaluation of the MobilityFirst Future Internet Architecture Using ORBIT and GENI Testbeds

Dipankar Raychaudhuri
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Abstract

This talk provides a perspective on prototyping and evaluation of a clean-slate future Internet architecture (*MobilityFirst*) now under development at Rutgers and collaborating institutions. The *MobilityFirst* network is designed to efficiently handle emerging mobility service requirements such as resilience against wireless channel impairments, disconnection tolerance, user and network mobility, multi-homing, content caching/retrieval and context-aware message delivery. Key protocol components of the proposed architecture are introduced and explained with specific examples - these include the global name resolution service (GNRS), generalized storage-aware routing (GSTAR) with disconnection tolerance, edge-aware inter-domain routing (EIR), and content- or context-aware services. Prototyping and evaluation approaches based on ORBIT or GENI testbeds are discussed for each of these protocol components, and sample evaluation results from work-in-progress are given. The talk concludes with an outline of the large-scale GENI prototype of MobilityFirst currently being deployed across a number of campus networks. This deployment is intended as a long-term GENI slice supporting seamless mobility, content and cloud services initially on Linux PC and Android smartphone platforms with dual-mode WiFi and WiMAX/4G access capabilities.

Biography

Dipankar Raychaudhuri is Professor-II, Electrical & Computer Engineering and Director, WINLAB (Wireless Information Network Lab) at Rutgers University. As WINLAB's Director, he is responsible for an internationally recognized industry-university research center specializing in wireless technology. His research group at WINLAB has been working on design and implementation of next-generation wireless networks covering a number of emerging usage scenarios such as ad hoc mesh, vehicular, cognitive radio, 4G and mobile Internet. He is the principal investigator for several large projects funded by the US National Science Foundation (NSF) including the "ORBIT" open-access next-generation wireless network testbed, and the "*MobilityFirst*" future Internet architecture (FIA) project. He also helped to initiate the ongoing GENI program for deployment of a global-scale experimental infrastructure for Internet research, and is currently involved with the "Open GENI Base Station" project aimed at deploying programmable 4G wireless networks at several university campuses across the US.

Dr. Raychaudhuri has previously held corporate R&D positions in the telecom/networking industry including: Chief Scientist, Iospan Wireless (2000-01), Assistant General Manager & Dept Head-Systems Architecture, NEC USA C&C Research Laboratories (1993-99) and Head, Broadband Communications Research, Sarnoff Corp (1990-92). He obtained his B.Tech (Hons) from the Indian Institute of Technology, Kharagpur in 1976 and the M.S. and Ph.D degrees from SUNY, Stony Brook in 1978, 79. Dr. Raychaudhuri is a Fellow of the IEEE.