

## Vytas Valancius

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### Research Interests

My research lies on the boundary between systems, policy and economics. I'm looking at novel ways to use network virtualization technologies to improve network scalability, security and reliability.

### Education

Ph.D. Computer Science, Georgia Institute of Technology, 2010 (Expected)

- Network virtualization and network economics research.
- GPA 4.0

M.S. Internetworking, Royal Institute of Technology - KTH (Sweden), 2006

- Top (#1) graduate in class of 100, GPA 3.9
- Leader for the ICT project in Tanzania in cooperation with SIDA.
- Thesis: *GMPLS Extensions to BGP*.

B.S. Software Engineering, Vilnius University, 2003

- Cygate/Cisco Network Academy Scholarship, 1999-2003
- Thesis: *SIP and H.323 performance in large VoIP networks*
- TA for Computer Networking Course

### Certifications

- CCIE#14359, CCNP, CCNA, CCDA and MS-CNP.

Self-funded 100% of education since high school through scholarships, full-time and part-time work.

### Research Experience

#### **BGP Multiplexing**

Advisor Professor Nick Feamster

Fall 2007

Georgia Tech

Designed and implemented BGP-Mux - a BGP session multiplexing system for virtual networks. BGP-Mux allows virtual networks to receive inter-domain route feeds from upstream ISPs. The work resulted in successful short paper in CoNEXT'07 conference and one pending submission to USENIX'08. Implementation was done in C on *Quagga* - an open-source routing protocol package.

#### **Better Branch Prediction through Machine Learning**

Supervisor Professor Gabriel Loh

Fall 2007

Georgia Tech

I have preformed study on machine learning methods for branch prediciton in modern CPUs. I have implemented and measured the performance of SVM Kernel mapping to branch history to improve learning on non-linearly-separatable data.

#### **Network Virtualization**

Advisors Professor Jennifer Rexford

Summer 2007

Princeton University

Research on network virtualization using commodity hardware within framework of VINI Project. I have designed and developed extensions to Linux Kernel to support Ethernet tunneling for virtual nodes in VServers environment. The work enabled virtual topology embedding on network built of commodity hardware and Linux operating system.

## Vytas Valancius

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### **Time Dilation for Virtual Machines**

Supervisor Professor Sam King

Spring 2007  
University of Illinois at Urbana-Champaign

Implementation of Xen Virtual Machine Hypervisor modifications to support time dilation. The implemented system was used together with Modelnet network virtualization stack. The research results allowed distributed system researchers to suspend VMs and reconfigure network parameters on the fly.

### **ICTanzania Project with SIDA**

Advisor Professor Bjorn Pehrson

Spring 2005  
KTH - Sweden

Lead the team of the ICTanzania project in Dar Es Salaam, Tanzania. Our team performed fiber infrastructure survey in rural areas of Tanzania and produced a report that got media attention in Sweden. We also deployed working VoIP system between Tanzania's major academic institutions and organized a workshop promoting broadband use. The whole project lasted for 4 months and during 2 of them all team was in Tanzania.

### **GMPLS Extensions to BGP**

Advisor Professor Bjorn Pehrson

Fall 2005  
KTH - Sweden

Design and development of GMPLS extensions to BGP protocol. The extensions allowed GMPLS network updates to be announced on inter-domain BGP links. I have implemented all these extensions in C on *Quagga* open-source routing protocol suite.

### **Research Assistant: LitNET VoIP**

#### **Infrastructure**

Supervisor Algimantas Kutka

Fall 2002  
Vilnius University

Designed and deployed VoIP infrastructure for Lithuanian research network spanning all major Lithuanian Universities. I have implemented significant modifications to Vovida Vocal open-source SIP-based VoIP soft-switch. The bulk of the project was done using Java programming language and Eclipse IDE.

## **Experience and Skills**

### **Programming Languages**

- Java, Eclipse environment sockets, common patterns, source versioning systems.
- Expert with Python. PyDev in Eclipse
- C/C++ in open-source environment: sockets, multithreading, memory debugging, source repository management, Bash/Tcl scripting for testing, etc.

### **Scientific tools**

- Quagga open-source suite, Daytona TCP/IP stack, Matlab, NS-2.
- Xen Hypervisor, VServers and OpenVZ OS level virtualization toolkits. Emulab facility.

### **Systems**

- FreeBSD, Linux, Solaris9, Cisco IOS operational experience
- Linux (both user-land and kernel) operational and development experience

## Vytas Valancius

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Network protocols and technologies (including, but not limited to):

- IEEE developed Ethernet and Wireless technologies: Ethernet, Spanning Tree Protocol (D/w/s and all the other flavors).
- All major IETF developed protocols. STD5, STD6, STD7 and RFC1812; PPP and all its applications (PPPoE, PPPoA, Multilink PPP etc.); RIP&RIPng; OSPF; IS-IS; BGP (MP-BGP, RFC2547bis etc.); HSRP&VRRP; MPLS protocol suite (TDP, LDP, RSVP-TE, GMPLS RSVP-TE etc.).
- Optical networking technologies: ITU-T SONET/SDH, CWDM, DWDM transmission and protection schemes, ROADMs, VOAs etc.

Networking Equipment

- All Cisco routers and switches, beginning with Catalyst 1900 and ending with GSR
- Main Juniper, HP and Enterasys platforms

Languages

- Native fluency in Lithuanian and Russian
- Fluent in English conversational fluency in German

### Teaching Experience

**Teaching Assistant** Spring 2007  
University of Illinois at Urbana-Champaign  
CS 433G Computer System Organization (Graduate Section)

**Teaching Assistant** Fall 2006  
University of Illinois at Urbana-Champaign  
CS 427 Software Engineering I

**Instructor** Spring 2003/2004  
Vilnius University  
Cisco Network Academy: Computer Networks - Routing Protocols

**Instructor** Fall 2003  
Vilnius University  
Cisco Network Academy: Computer Networks - Switching

### Publications

Vytas Valancius and Nick Feamster. “The Design and Implementation of a BGP Session Multiplexer”. USENIX 2008, *in submission*.

Mukarram Bin Tariq, Nick Feamster and Vytas Valancius. “WISE: What if Scenario Evaluatol for Data Centers”. SIGCOMM 2008, *in submission*.

Vytas Valancius and Nick Feamster. “Multiplexing BGP Sessions with BGP-Mux”. CoNEXT 2007.

Sapan Bhatia, Murtaza Motivala, Wolfgang Muhlbauer, Vytas Valancius, Andy Bavier, Nick Feamster, Larry Peterson and Jennifer Rexford. “Hosting Virtual Networks on Commodity Hardware”. Georgia Tech, technical report GT-CS-07-10.

Vytas Valancius and Nick Feamster. “Layering the Interdomain Layer”. Presto 2007.

Vytas Valancius. Masters Degree thesis: “GMPLS Extensions to BGP”. ICT/ECS-2006-62. Royal Institute of Technology (KTH), Sweden.

## Vytas Valancius

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### Work Experience

Network Consultant February 2003 - July 2006  
Santa Monica Networks, Ltd. Vilnius, Lithuania  
Santa Monica Networks, Ltd. is a leading system integrator in Scandinavia and Baltic region.

Duties:

- Designing, planning and deploying complex data and voice networks for ISPs and Enterprises
- Pre-sale and post-sale consulting

Key Projects (partial list):

- Design and deployment of VoIP services for residential users in largest residential ISP in Vilnius city UAB Skynet ([www.skynet.lt](http://www.skynet.lt))
- Feasibility study and design of nation-wide DWDM network for AB Lietuvos Energija. ([www.lpc.lt](http://www.lpc.lt))
- Feasibility study, design and deployment of nation-wide IP/MPLS backbone with L3-VPN services for Lithuanian governmental ISP InfoStruktura ([www.is.lt](http://www.is.lt))
- Design and deployment of nation-wide IP/MPLS backbone with L2/L3-VPN services and advanced traffic engineering for AB Lietuvos Energija ([www.lpc.lt](http://www.lpc.lt))
- Feasibility study, design and deployment of metro FTTH network upgrade based on active Ethernet technology for largest residential ISP in Vilnius city UAB Skynet ([www.skynet.lt](http://www.skynet.lt))
- Design and implementation of redundant data center LANs for largest bank in Baltic region AB Hansa bankas ([www.hansabankas.lt](http://www.hansabankas.lt)).

Network Engineer September 2002 - January 2003  
Bluebridge, Ltd. Vilnius, Lithuania  
BlueBridge is one of the largest IT solution companies in Lithuania.

Duties:

- Designing, planning and deploying data and voice networks for Enterprises
- Supporting Cisco, Enterasys and HP networking equipment
- Pre-sale and post-sale consulting

Key Projects (partial list):

- Design and implementation of redundant data center LANs for second largest mobile operator in Lithuania UAB Bite ([www.bite.lt](http://www.bite.lt)).

Network Administrator July 2000 - September 2002  
Vilnius University NOC Vilnius, Lithuania  
VU Networks Operation Center is providing IT services for Vilnius University. VU NOC is also a local support center for LitNET Lithuanian academic institutions network.

Duties:

- Planning and supporting LitNET WAN
- Managing project on designing and deploying VoIP network between Lithuanian Universities.
- Supporting WWW, DNS and other services on Sun Solaris, Linux and FreeBSD systems

## Vytas Valancius

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### Presentations & Panels

- Graduate student panel: “FOCUS Recruiting Program”. Georgia Institute of Technology, Atlanta GA (January 2008)
- Poster “Multiplexing BGP Sessions with BGP-Mux” in CoNEXT 2007, New York NY (December 2007)
- Invited talk “Diminishing Obstacles to Routing Innovation”. Alcatel-Lucent Bell-Labs, Murray Hill, NJ (August 2007)
- Invited talk “Layering the Interdomain Layer”. PRESTO’07. Princeton University, Princeton NJ (May 2007)
- Guest lecture A Tutorial on Optical Networking. CSD course in Royal Institute of Technology (KTH), Stockholm, Sweden (February 2006)
- Guest lecture “Windows Network Integration“. Computer Networks course in Vilnius University, Faculty of Physics. Vilnius, Lithuania (March 2002)

### Service and Extracurricular activities

- Coordinator. PhD Recruiting. Graduate Student Council, Georgia Institute of Technology (2007-Present)
- Volunteer. HotNets’07. Georgia Institute of Technology (November 2007)
- Member. ACM Special Interest Group for Computer Communications (SIGCOMM)
- Ambassador to Atlanta. “Vilnius Ambassador” program (2008)

### Awards and Honors

- CoNEXT’07 Travel Grant. New York, NY. December 2007.
- Georgia Tech Travel Grant for SOSP’07. October 2007.
- Article about me and KTH project in Tanzania. Largest Lithuanian daily ”Lietuvos Rytas”. June 2005.
- “The Youngest CCIE in Baltic States” article published on - [www.cisco.lt](http://www.cisco.lt). March 2005.
- CCIE#14359. February 2005.
- “The Best Employee”. Santa Monica Networks Ltd.. December 2004.
- “The Best Employee”. Santa Monica Networks Ltd. December 2003.
- “Cygate Scholarship”. Vilnius University. Sponsored by Cygate Lithuania Ltd.. September 2000.
- “Best student in Computer Science”, 1st place. National Chamber of Art and Sciences for Pupils ([www.rmtkr.lt](http://www.rmtkr.lt)). May 1996
- “Best student in Radio Electronics”, 2nd place. National Chamber of Art and Science for Pupils([www.rmtkr.lt](http://www.rmtkr.lt)). May 1995.

### References

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