

WISDOM: Welcome!

(Spring '14)

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Outline

Who

What

Collaborations

Accolades

Springboard

Workshop

Who

Who

WISDOM =

Professors + Students + Collaborators

Professors

Professors (original)

- Aditya Akella*, Andrea Arpaci-Dusseau, Remzi Arpaci-Dusseau, Paul Barford, Somesh Jha, Tom Ristenpart, Mike Swift* (expertise in networking, systems, security)

Professors (new)

- Suman Banerjee (expertise in mobility and wireless)

Students and Post-Docs

Samer Al-Kiswany, Ram Alagappan, Scott Alfeld, Leo Arulraj, Ben Bramble, Aaron Cahn, Shoban Chandrabose, Vijay Chidambaran, Weiyang Chiew, Sourav Das, Drew Davidson, Brandon Davis, Dongdong Deng, Ram Durairajan, Adam Everspaugh, Matthew Fredrikson, Jayneel Gandhi, Aaron Gember, Robert Grandl, Mukta Gupta, Tyler Harter, Jun He, Keqiang He, Robert Jellinek, Lei Kang, Junaid Khalid, Anand Krishnamurthy, Daniel Lauchup, Lanyue Lu, Sanketh Nalli, Sankar Panneerselvam, Ashish Patro, Thanu Pillai, Chaitan Prakash, Prashant Saxena, Linhai Song, Venkat Varadarajan, Liang Wang, Zev Weiss, Wenfei Wu, Suli Yang, Yan Zhai, Tan Zhang, Yupu Zhang

Collaborators

amazon.com



EMC²



Google



IBM



NetApp™

SONY



Symantec.

vmware®

What

What We Do

WISDOM is a **research coalition**

- Many interesting paths
(not one single system)
- Carve out deep and interesting research topics
(not just building infrastructure)
- Impromptu sub-collaborations internally
(not everyone works on everything)
- Work with industry/national labs
(not just limited to within Wisconsin)

Focus: Software in the DC

Common theme: **Software in the Datacenter**

- New levels of **programmability** in networks, storage layers, security systems
- Examples: software-defined network functions, split-level I/O scheduling and isolation, etc.
- General approach
 - What are the key problems?
 - What are the necessary solutions?
- But also, reaching beyond the SDC

Collaborations

How We Work with Industry and Labs

Short answer: Closely

- We're here to **build new bridges** (hopefully, so are you)

Many examples

- **Facebook** messages storage system
- **Microsoft** datacenter scheduling
- Next-generation **Fusion-io** FTLs for SSDs
- etc.

Accolades

Awards and Honors

Students

- Samer Al-Kiswany - NSERC Postdoctoral fellowship
- Ashok Anand - SIGCOMM Dissertation Award (runner up)
- Vijay Chidambaran - Microsoft Graduate Fellowship
- Aaron Gember - IBM PhD Fellowship
- Lanyue Lu - VMware Graduate Fellowship
- Wenfei Wu - Landweber Fellowship in Distributed Systems
- Tan Zang - First prize SIGMOBILE student research competition

Professors

- Suman Banerjee - ACM SIGMOBILE Rock Star Researcher
- Paul Barford - Carolyn Rosner Educator of the Year
- Mike Swift - Tenure!

Best paper awards

- SIGKDD, HotPlanet, CoNEXT, SOCC '13, FAST '13, EuroSys '14,...

Springboard

Project Silver

Project Silver

Faculty: Akella, Ristenpart, Swift



Three foci:

- **Re-envisioning trust management** via a new authorization and audit framework
- **Uncovering new opportunities for monitoring and diagnosis** of a range of behaviors, using the provider to facilitate the aggregation of relevant data across the broad tenant base
- **Realize all this with an agile security platform** that enables fluid, automated insertion of security monitors into appropriate loci within the cloud infrastructure

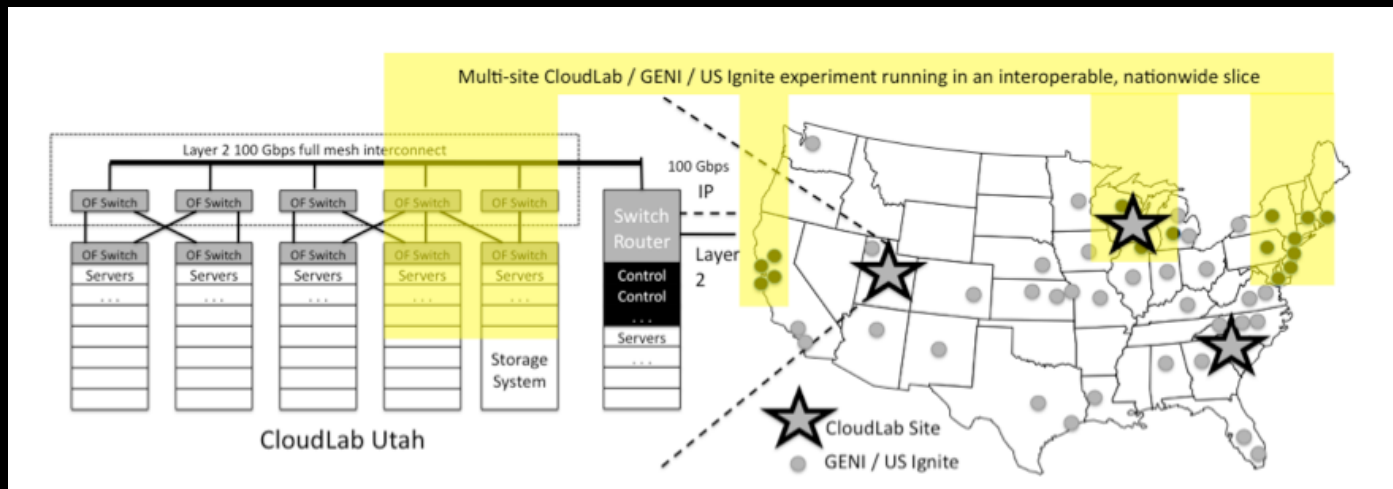
CloudLab

CloudLab

Professors Akella, Arpaci-Dusseau, others



A large-scale, **distributed scientific infrastructure** on top of which many different clouds can be built



CDSET

CDSET

Professors (many)



Bringing together the Department of **Statistics**, **Computer Sciences**, and **Computer Engineering** to enable the next generation of cloud-based **data science** and engineering

Traineeship: Students work across the “data science software stack”, learning both @ high level (e.g., machine learning) and @ low (e.g., how systems work and scale)

“Bridge” classes: Mixing stats and CS students to work on joint projects

Data science consulting lab: Open hours to help on-campus researchers with data science needs

Workshop

General Organization

Goals

- Have both **student** and **faculty** talks
- Represent the **diversity** of research
- Pack as much stuff into 1.5 days as possible

Day 1

Morning

- Opening: Faculty talk by **Remzi Arpaci-Dusseau**
- Session 1: Cloud security, storage, networking
- Session 2: Virtualized data center

Lunch: Faculty talk by **Aditya Akella** on “OpenNF”

Afternoon

- Session 3: Software-defined networks
- Session 4: Layering in storage systems
- Faculty talk by **Paul Barford** on “Online Ads”

Evening

- Poster session (and buffet dinner)
- Session 5: Open mic for your crazy ideas/suggestions

Day 2

Morning

- Faculty talk: **Tom Ristenpart** on “Rethinking Security”
- Session 6: Working with Industry
- Session 7: New storage technologies

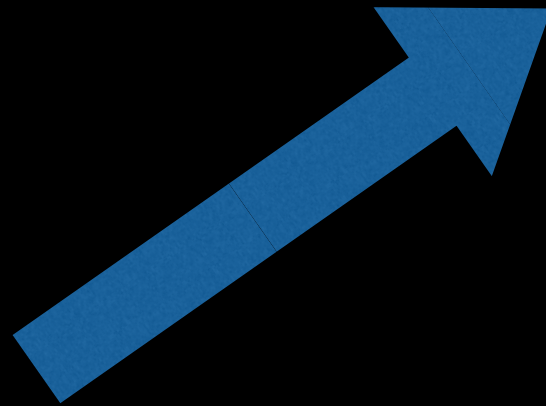
Lunch*: Faculty talk by **Suman Banerjee** on
“Wireless Interference (an SDN-centric approach)”

Afternoon

- Session 8: Security
- Session 9: Wireless, debugging, beyond
- Open time

One More Thing

Bathrooms



Out the door,
past the WID front desk,
near the elevators

Thank you