



*Experimenter Roundtable:*

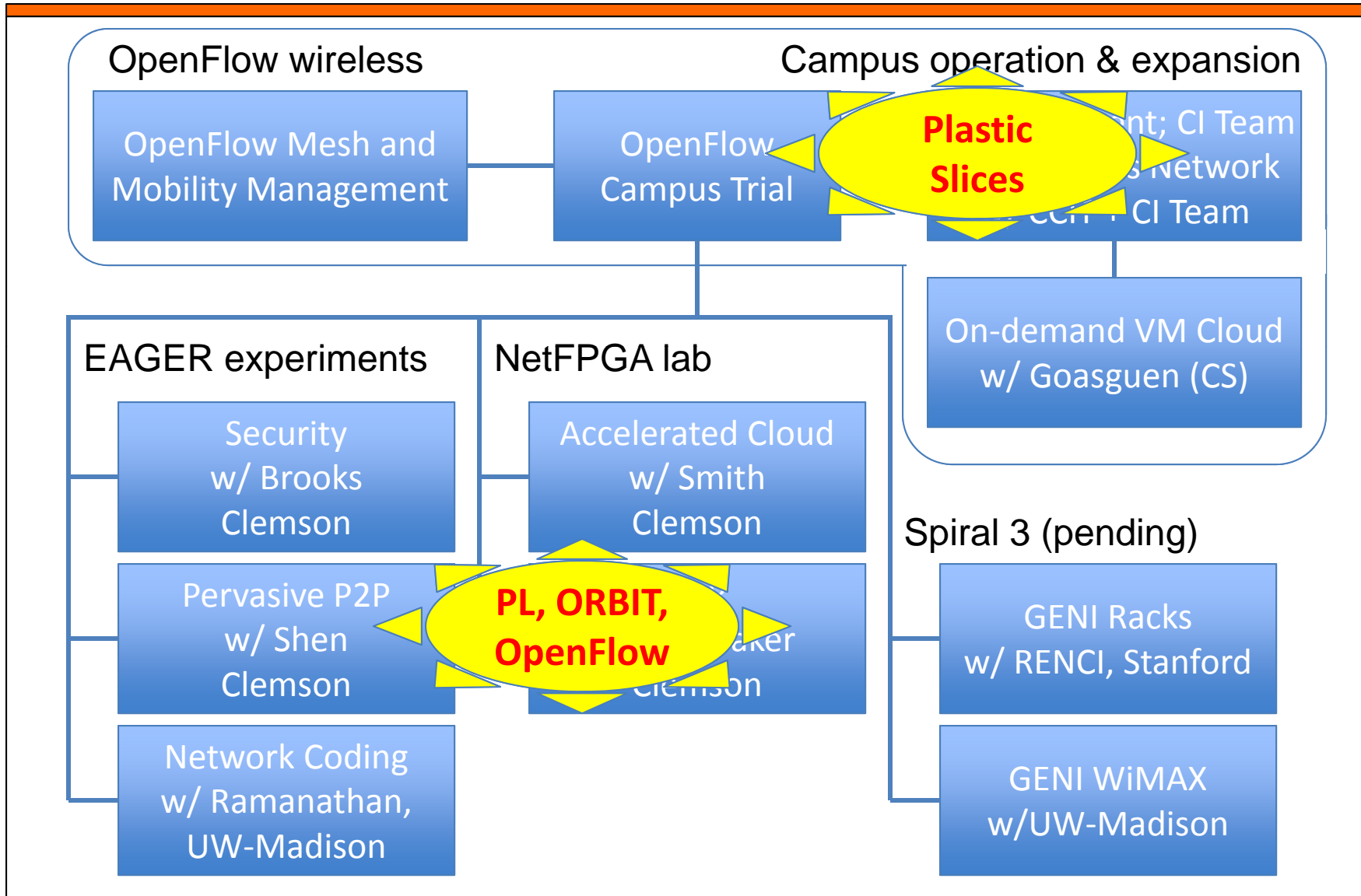
**Pervasive Data Sharing  
over  
Heterogeneous Networks**

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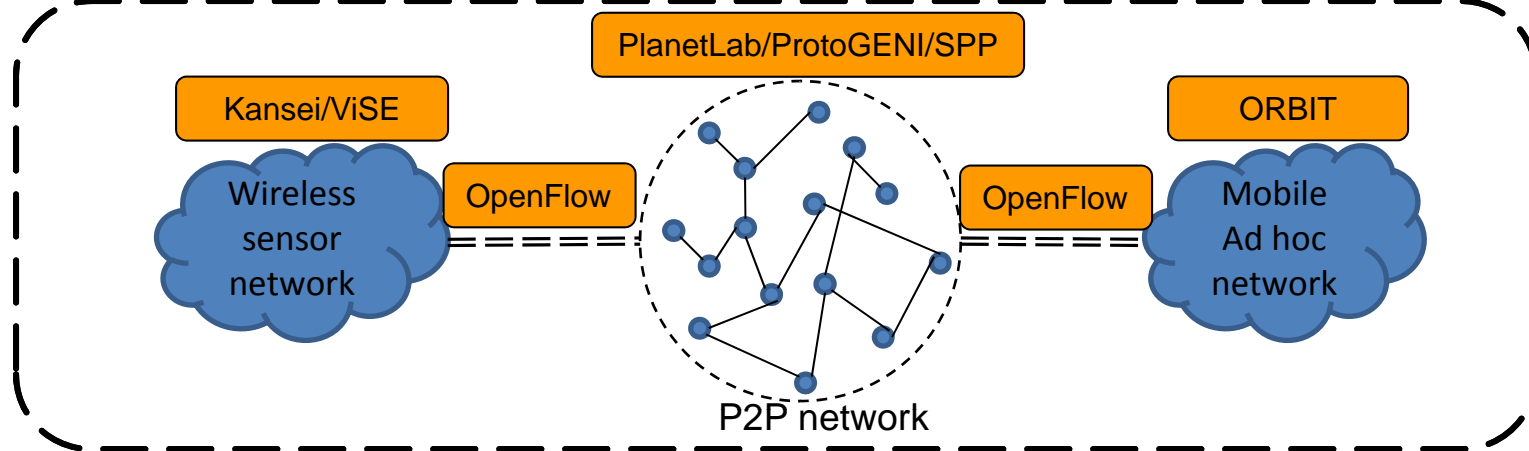
**Students:  
P2P software & experiments  
Steven Winburn, Kang Chen**

**OpenFlow & testbed setup  
Ke Xu, Aaron Rosen**

# Projects Overview

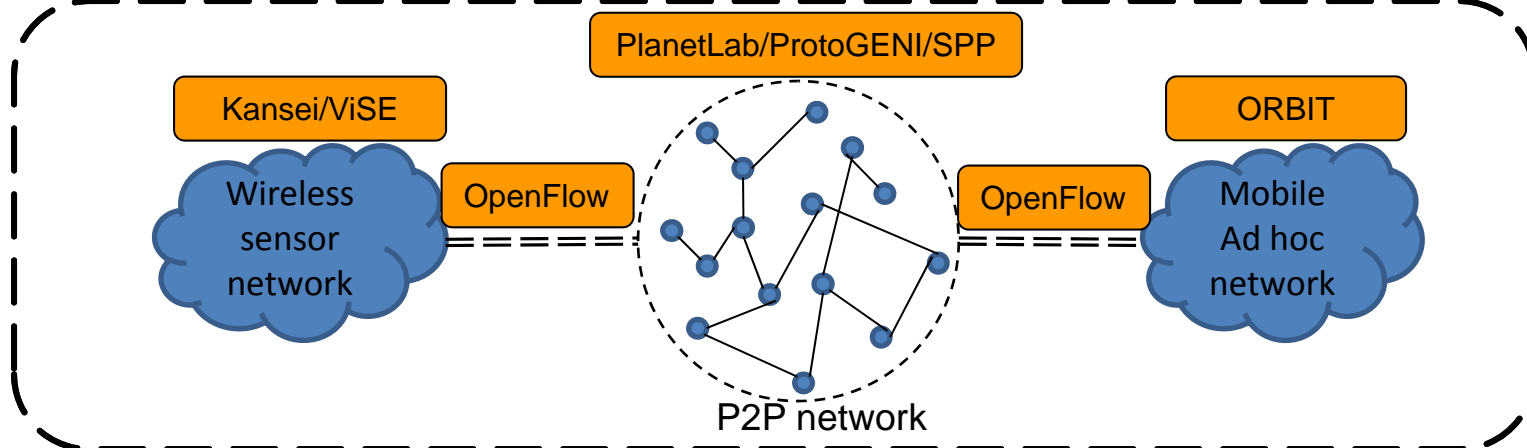


# What We Are Trying to Do



- P2P methods across Internet core, MANET, and WSN
  - PlanetLab (MyPLC) → ProtoGENI/SPP
    - Focus on core Internet properties
  - ORBIT
    - Focus on wireless properties and mobility
  - Kansei
    - Focus on wireless properties and spatial distribution

# What We Have and Have Not Done



- P2P on PlanetLab
  - Worked via public Internet (PLC)
  - Issue: needs hundreds of nodes, long/variable uncontrollable delays
- P2P on ORBIT
  - NOT working yet
  - Issues: wireless not reliable/repeatable, long setup time
- Cross-testbed (PlanetLab + ORBIT)
  - Successful between ORBIT sandbox, Clemson private PL nodes, and NLR OF
  - Issues: manual setup, long opt-in latency, potential conflict

# PlanetLab Experiments

- What worked well
  - Using up to 364 PLC nodes chosen around the globe
  - Using nodes with “typical delays”, results matched simulation
- Problems
  - Seeing nodes with “very long” delays from time to time
    - Not easy to identify causes since these are on PLC – collecting more data now
  - Not as many myplc nodes in the GENI core
- Suggestions
  - GENI rack may solve the need of scale
    - Will need mechanism to dynamically instantiate large number of PL nodes (most likely VMs)

# ORBIT Experiments

- What worked well
  - Easy to reserve and configure with OMF
- Problems
  - Image loading not reliable
  - Wireless interface not reliable – typically 3~4 (out of 20 nodes) fail after successful start
    - Problem in both ad hoc mode and infrastructure mode
    - Tried patch for madwifi – problem not resolved
    - Found “better” ath5k firmware – problem as reported
- Suggestions
  - Main grid reservation is tight, but most experiments use only 10~15
    - Is it possible to support reservations in smaller sets?
  - Image loading and network setup time can take ~90 minutes (counting reloads due to load failures), suggest longer reservation time
  - GPO help identify/maintain known working wireless firmware

# Cross Testbed (PL-ORBIT) Experiments

- What worked well
  - Use Omni to setup slivers for PL nodes and OpenFlow networks
  - Use wget to setup ORBIT nodes
- Problems
  - Longest time spent in waiting for opt-in approvals. Minor changes in experiments need to be opted-in again.
  - Still a multi-step process now: Omni for PL and OpenFlow, wget for ORBIT
- Suggestions
  - Automating approval of previously approved opt-in requests?
  - Connect more ORBIT nodes to OpenFlow switch? (sb9 only now)

# Plastic-Slices Feedback 1/2

- Subnet overlapping problem caused loops
  - Could this be administered by one central authority?

For example:

<http://groups.geni.net/geni/wiki/NetworkCore/SubnetReservations> lists reserved resources for the core. Could expedient communicate with this to see if a user is approved for a specific flowspace and then automatically opt?

- Instead of this page just being for the core perhaps it should be for users across the whole testbed?

This seems like it could eliminate possible instances were one user is using a specific subnet at a site and another user is using the same subnet at another site and across the core.



# Plastic-Slices Feedback 2/2

- Where to run the controller?
  - Now controller must be run outside of campus firewall (in DMZ or with ports open) in order to communicate with FlowVisors

Asking campus IT to open ports may not be easy at all campuses.

- Current experiments rely on private PL nodes with control interfaces facing Internet in DMZ and data interfaces in GENI vlans. Is this the suggested model?
- Now controller always talks to flowvisors over public Internet.

If experimenters need this to take place inside GENI vlans, flowvisors need to run on a non-openflow GENI vlan across campuses.

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**FURTHER QUESTIONS**  
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