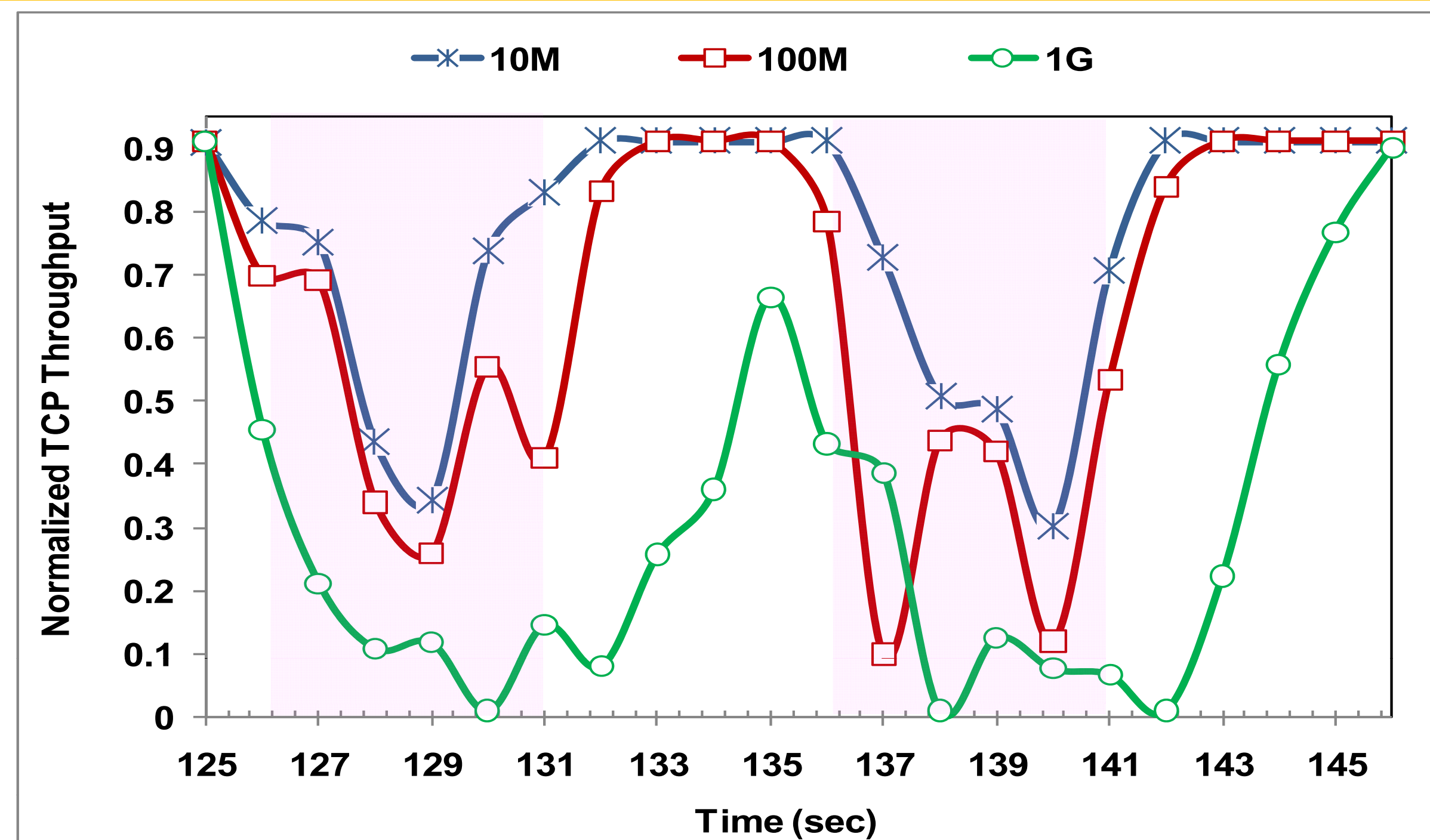


Motivation

- Gigabit wireless access is gaining attraction.
 - WiGig, Cognitive Radios, Widespread femtocell deployments
- Does gigabit wireless access result in gigabit end-to-end throughput? **No.**
- Gigabit flows experience more adverse performance degradation due to
 - Re-routing latency, handoff delays, packet losses.
- Need new network layer strategies to support end-to-end gigabit throughputs to mobile users



Solution Approach : Spare-bandwidth Rate-adaptive Network Coding (SRNC)

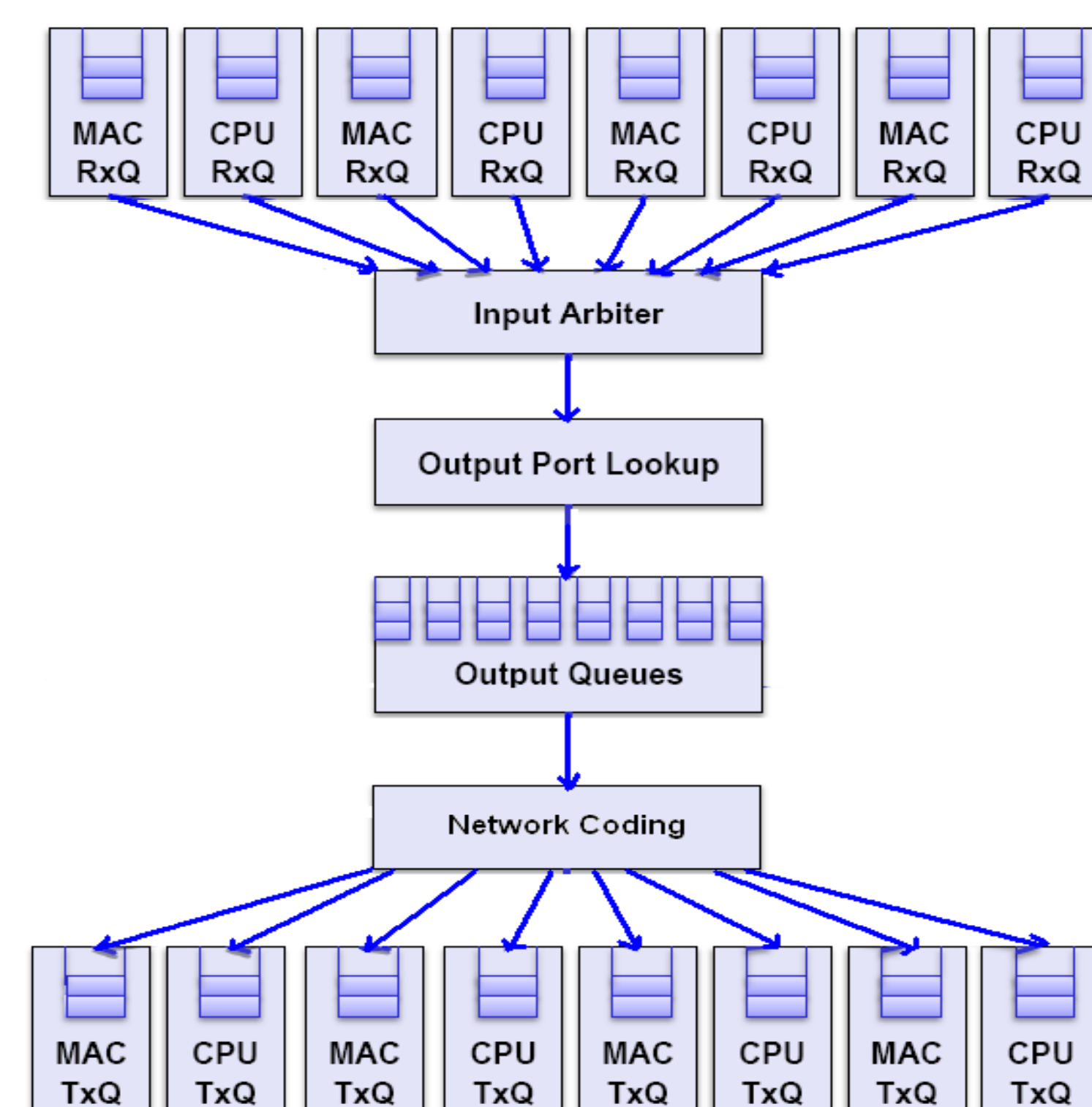
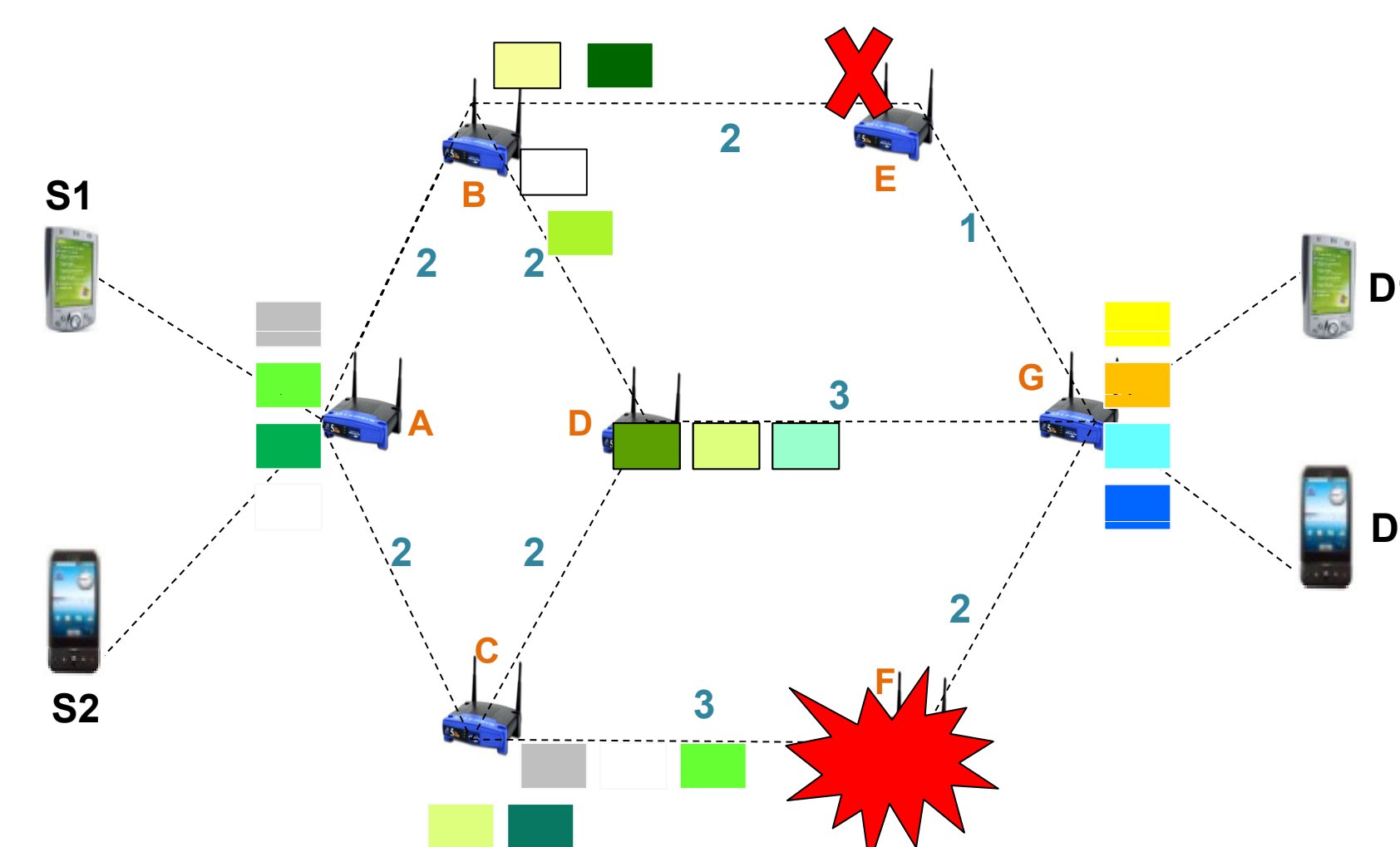
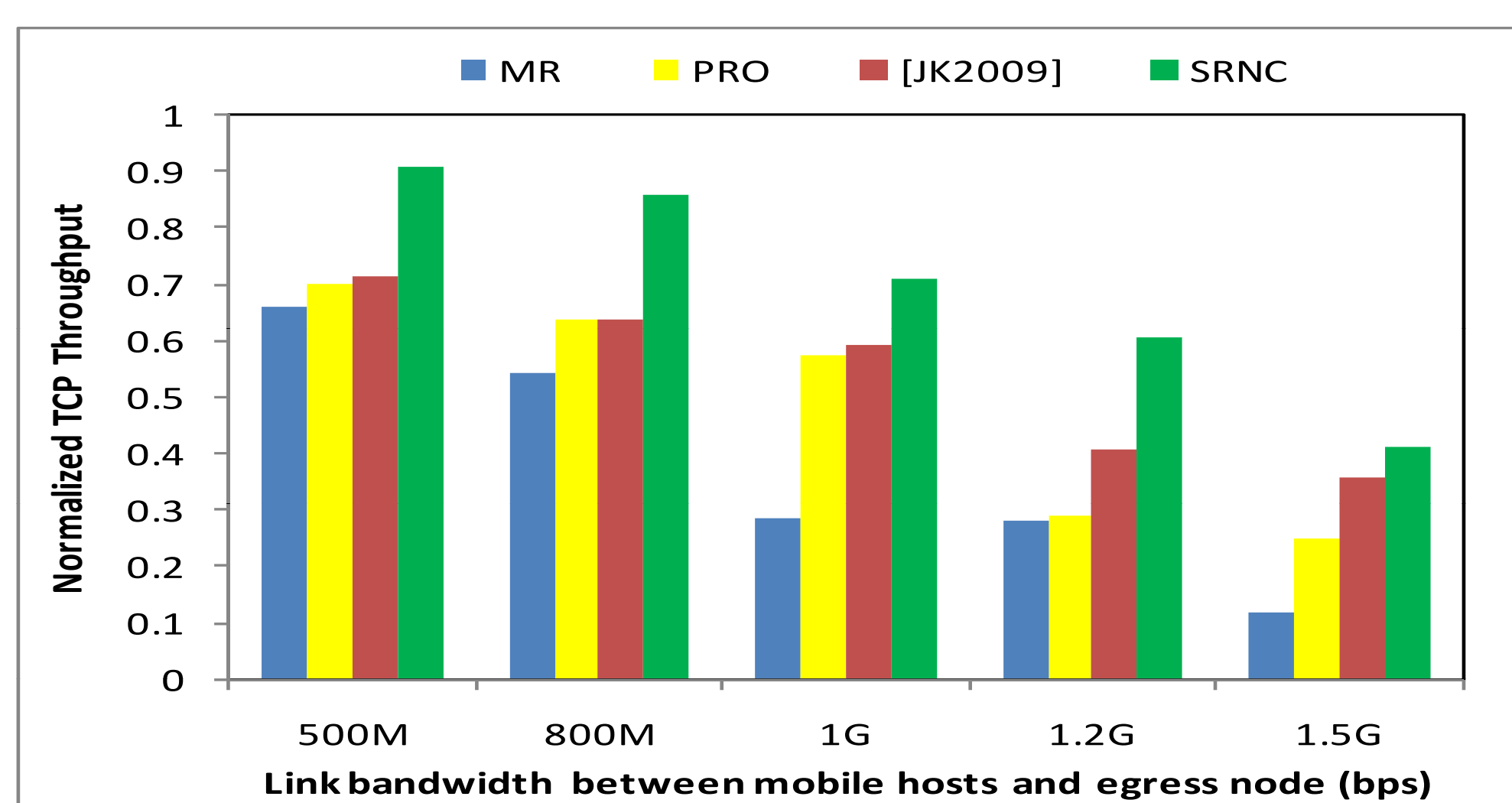
Integrates several ideas

- Inter and Intra Flow Network Coding
- Multiple Route Digraph Diversity
- Spare Bandwidth Exploitation
- Distributed Rate Adaptation
- Prioritized Buffer Management

Each node

- Network encodes before forwarding
- Forwards as many as possible subject to certain constraints

Network Coding integrated with Packet forwarding in NetFPGA based router



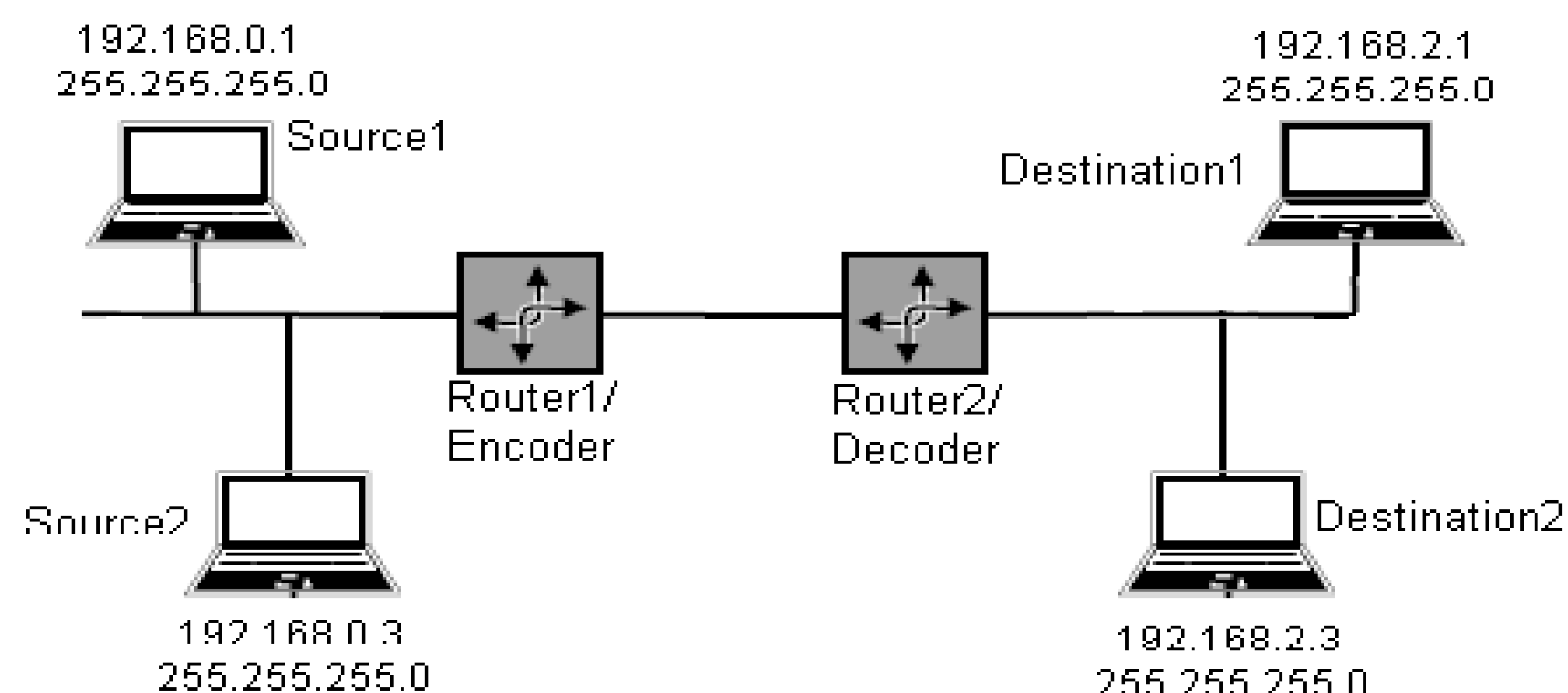
Proposed GENI Experiments and Demonstration

Significance to GENI

- Leverage and push GENI beyond capacity
- Contribute new experimentation methods and tools
 - Network coding & Multipath Routing
 - WiFi and WiMAX Control Tools

Experimental Setups with GENI facilities

- Network Coding on core and wireless networks
 - Streaming traffic from PlanetLab hosts with NetFPGA hardware
 - Core: PlanetLab Overlay
 - Edge: ORBIT and Clemson Mesh Nodes
- Wireless mesh control with OpenFlow
 - Add traffic monitoring
 - Adaptive control of OpenFlow switches



Demonstration

- Network encodes and decodes packets

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