# GEC 20 Handoff Tutorial

Professor: Kuang-Ching Wang

PhD students: Ke Xu, Ryan Izard

{kwang,kxu,rizard}@clemson.edu

June 22, 2014

ECE
Clemson University
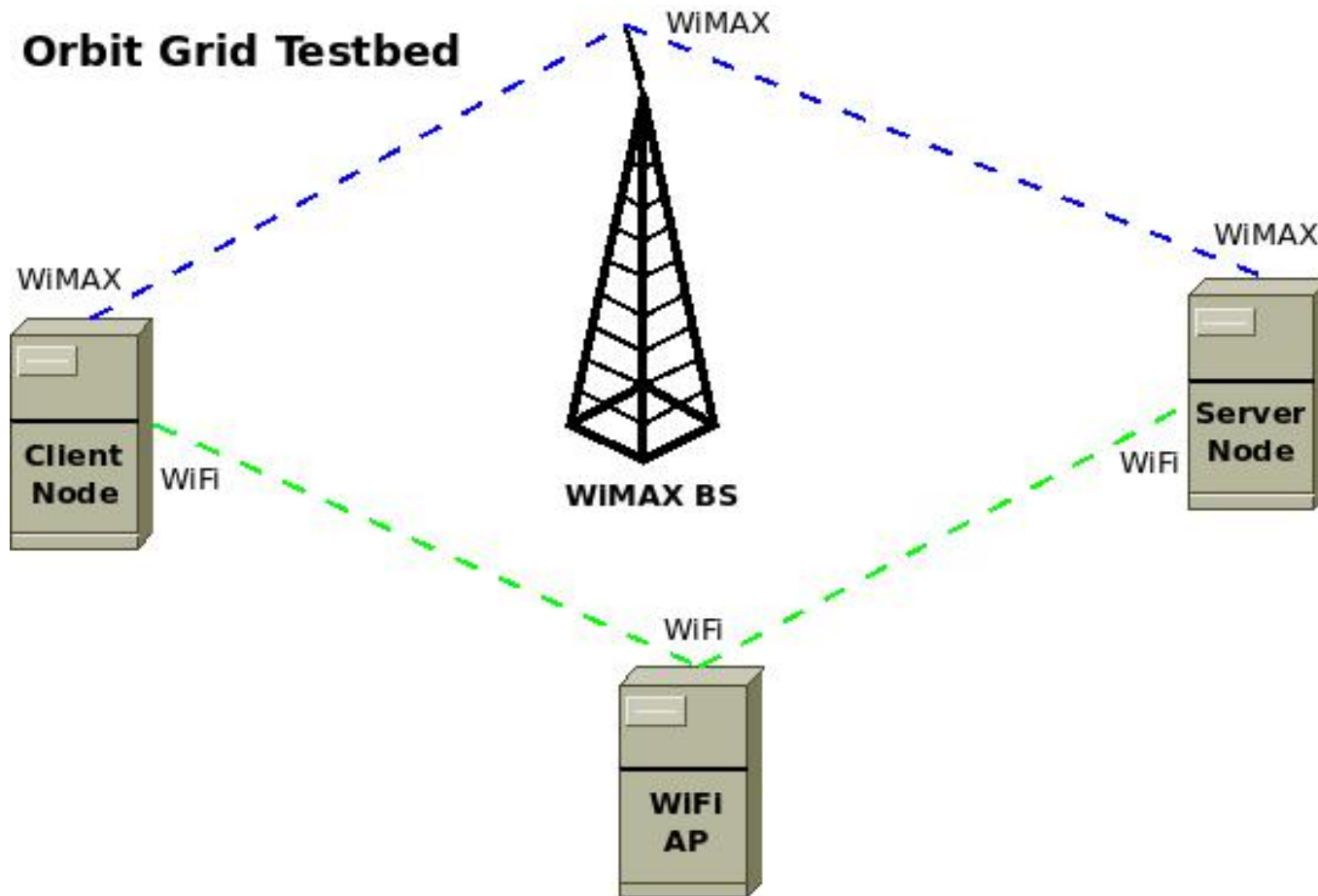
# Introduction

- Vertical handoff

- Client-initiated handoff

- A vertical handoff solution leveraging OpenFlow


- Clemson GENI Wi-Fi/WiMAX testbed

  *Our TRIDENTCOM2014 paper*: An OpenFlow Testbed for the Evaluation of Vertical Handover Decision Algorithms in Heterogeneous Wireless Networks

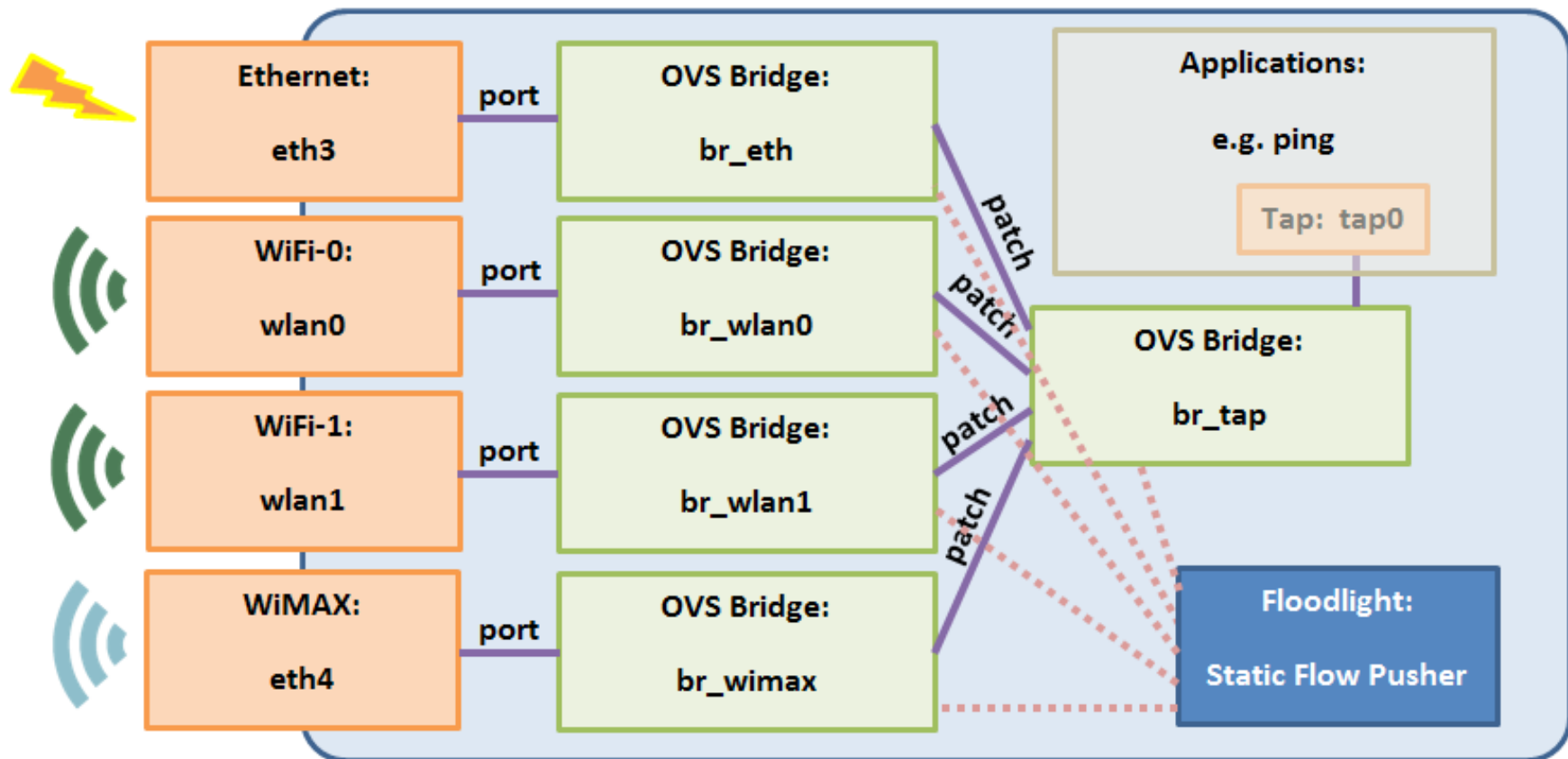- This tutorial will conduct handoff in ORBIT testbed

# Topology in the Tutorial

# Hardware and Software

- Server/Client
  - WiMAX adapter: Intel 6250
  - Wi-Fi adapter: Atheros 5000 series
  - OpenVPN, Open vSwitch (OVS), FloodLight
- AP
  - Wi-Fi adapter: Atheros 5000 series
  - Hostapd
- WiMAX BS
  - Pre-configured

# Networking Configuration for Client

# Information in Your Handouts

- Server IP & MAC
- Client node ID, IP & MAC

# Step 1   Login

You should have a userid for ORBIT:

- Login to GENI Portal: portal.geni.net/

- Login to ORBIT: geni.orbit-lab.org

- Find your userid


- ssh userid@console.grid.orbit-lab.org

- ssh root@nodeX-X (use your node ID)

# Step 2  Remove FloodLight Forwarding Module

- cd ~/floodlight-0.90/src/main/resources/

- vim floodlightdefault.properties

- remove the line
  <span style="color:red">net.floodlightcontroller.forwarding.Forwarding,\</span>

# Step 3   Open gec20_setup.sh

- cd ~/StartupScripts
- vim gec20_setup.sh

# Step 4　Edit SERVER Param

- ln19: <span style="color:red">SERVER_IP</span>
- ln20: <span style="color:red">SERVER_MAC</span>

# Step 5  Edit Tap IP

- ln27: <span style="color:red">IFACE_bridge_E_IP (use Client's IP)</span>

# Step 6   Edit Client MAC

- ln41: IFACE_D_MAC
  (use Client's MAC)

- :wq   Save and quit

# Step 7   Edit Switching Scripts

- cd ~/SwitchingScripts


- vim gec20_switch_to_wifi.py
- ln36: <span style="color:red">wifi_mac (use Client's MAC)</span>


- vim gec20_switch_to_wimax.py
- ln36: <span style="color:red">wimax_mac (use Client's MAC)</span>

# Step 8   Execute Setup Script

- cd ~/StartupScripts
- ./gec20_setup.sh

# Step 9   Ping Test

- Open a new terminal
- ssh userid@console.grid.orbit-lab.org
- ssh root@nodeX-X (Client node ID)
- ping 10.41.105.105 (Server IP)

# Step 10   Handoff Test

In your <span style="color:red">old</span> client terminal

Handoff to WiMAX

- cd ~/SwitchingScripts
- ./gec20_switch_to_wimax.sh

Switch back to Wi-Fi

- ./gec20_switch_to_wifi.sh

# Step 11   Observation

- Do you see any difference for ping?

# Step 12   Cleanup

Congratulations!

- cd ~/StartupScripts
- ./gec20_teardown.sh

# If you are interested in...

- Detailed instructions at:

  http://groups.geni.net/geni/wiki/GENIExperime
  nter/Tutorials/WiMAXOpenFlow


- Technical support:

  Ryan Izard <rizard@clemson.edu>