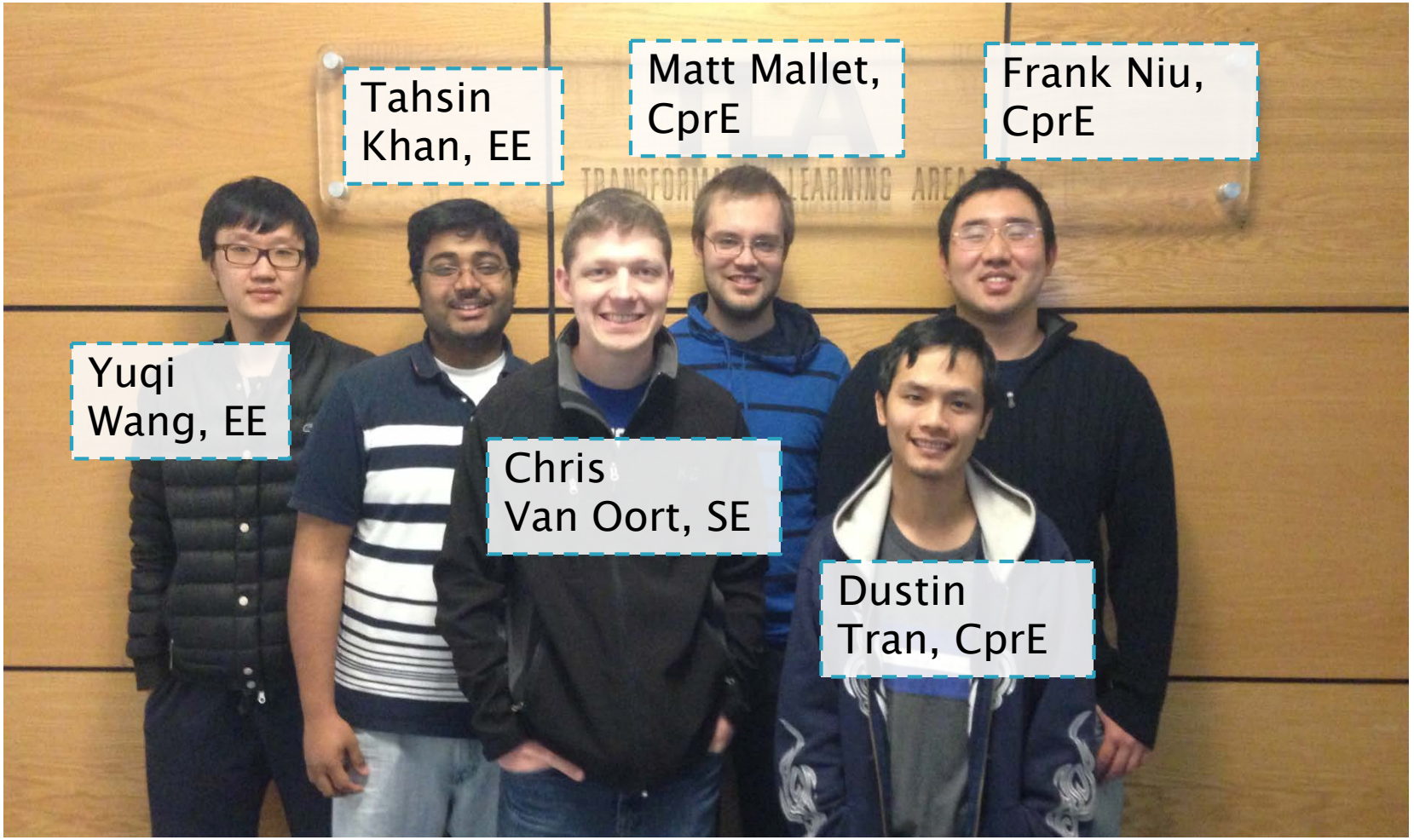
Wireless Security Lab + Open BTS

Group Dec 13-14
CprE/EE 491 Senior Design Project
Advisor/Client: George Amariucai

The Team


Tahsin Khan, EE
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Yuqi Wang, EE
Chris Van Oort, SE
Dustin Tran, CprE

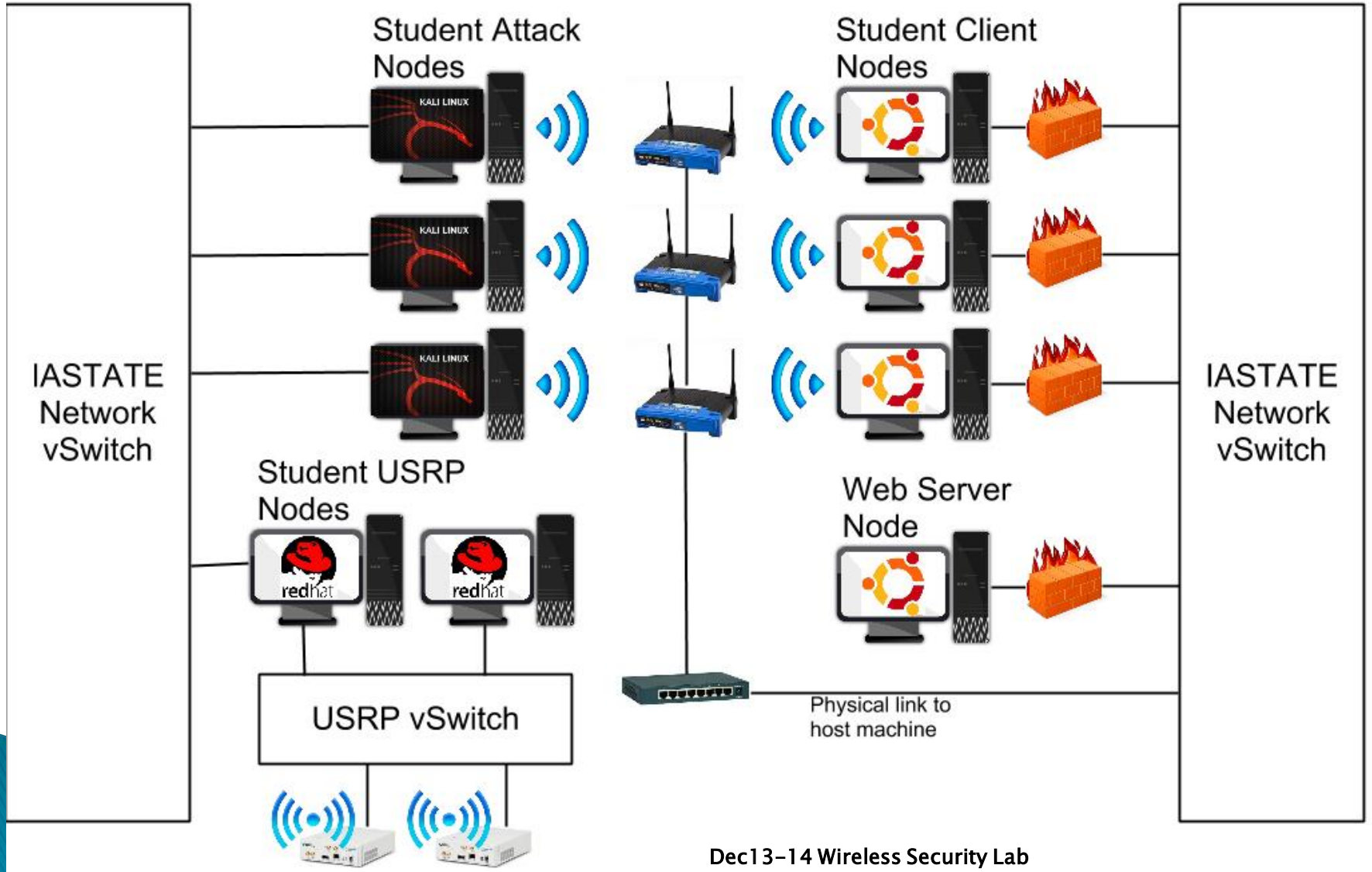
The Plan

- Wireless Security Lab
  - Virtual
  - Accessible
  - Safe
  - Easy to Use
- Open BTS
  - Implement using USRP
  - Skype Call
  - Integrate with Labview

Wireless Lab Implementation

- Vmware
  - Backend Support
- Kali Linux
  - Attack Clients
- Ubuntu Client
  - Data Transmission Client
- Webserver
  - Interface to Launch Clients

Wireless Lab Topography



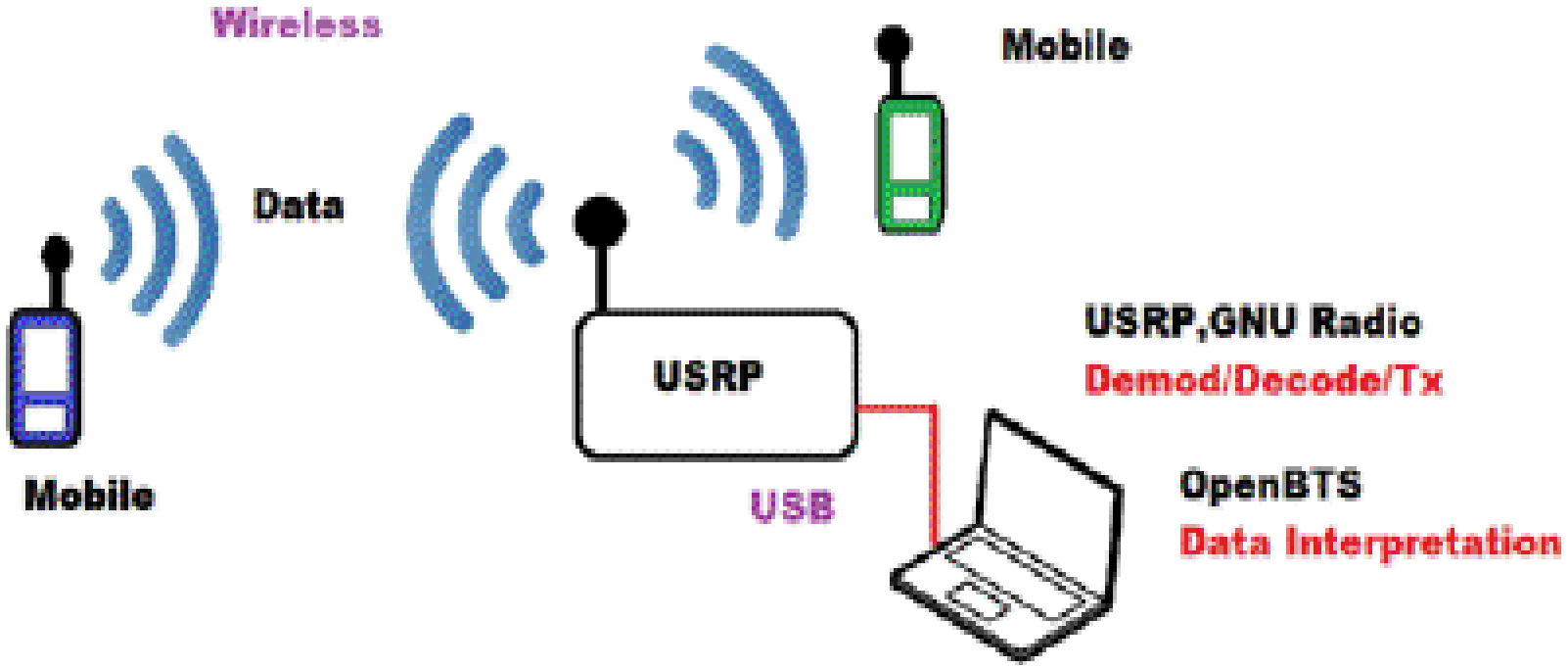
Risks & Mitigations

- USRP's are unable to be assigned static IP's
  - Dynamically connect in VM nodes
- Ubuntu firewall is unable to route traffic between interfaces as desired
  - Dedicated firewall VM / hardware
- VM nodes cannot be assigned IP addresses from pool
  - Dedicated firewall/router + subnetting & port forwarding

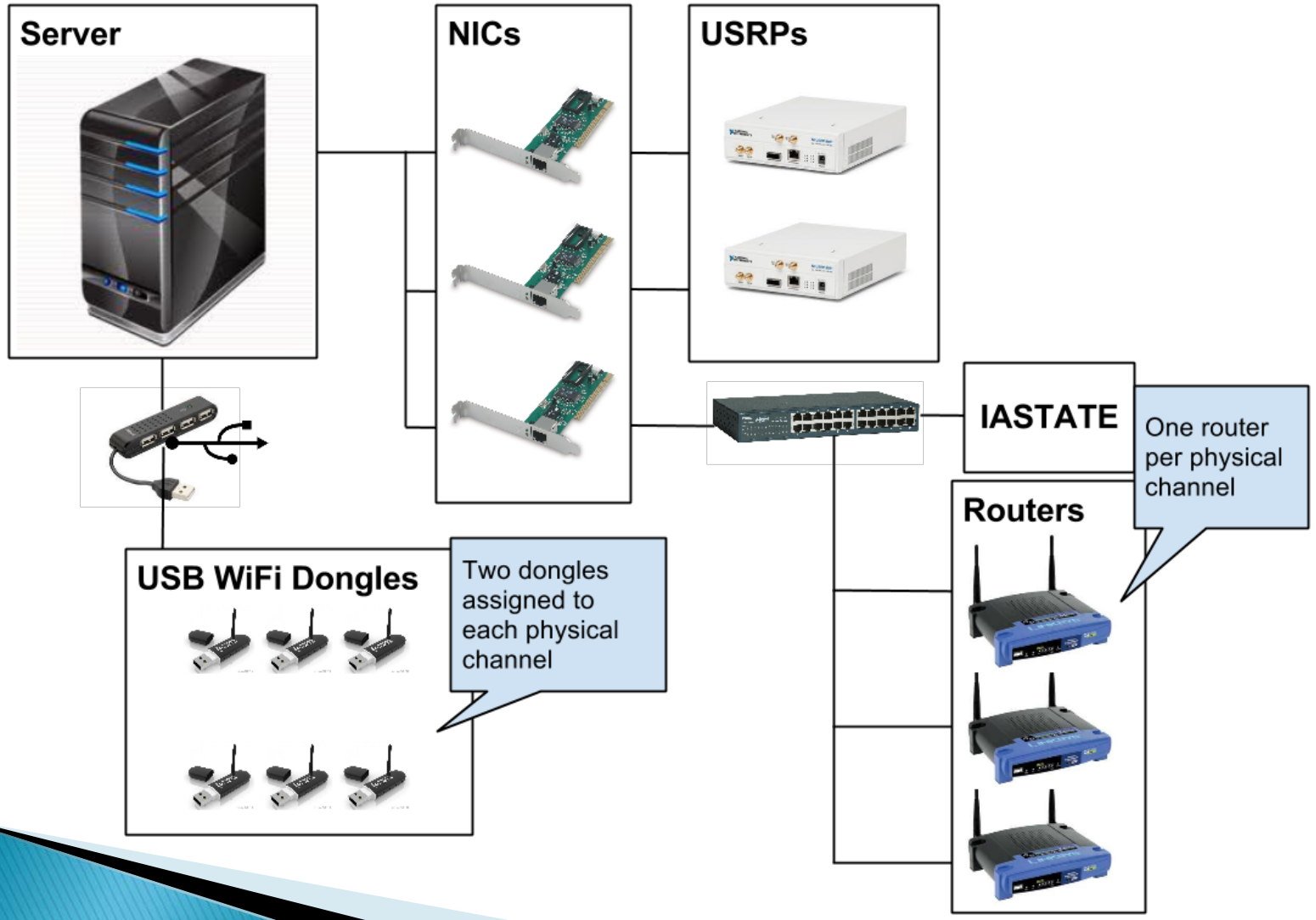
Open BTS Implementation

- USRP
  - Computer-host Software Product
- GNU Radio
  - Software Development toolkit providing the signal process runtime
  - Interface with USRP
- Labview
  - View Wireless Signals

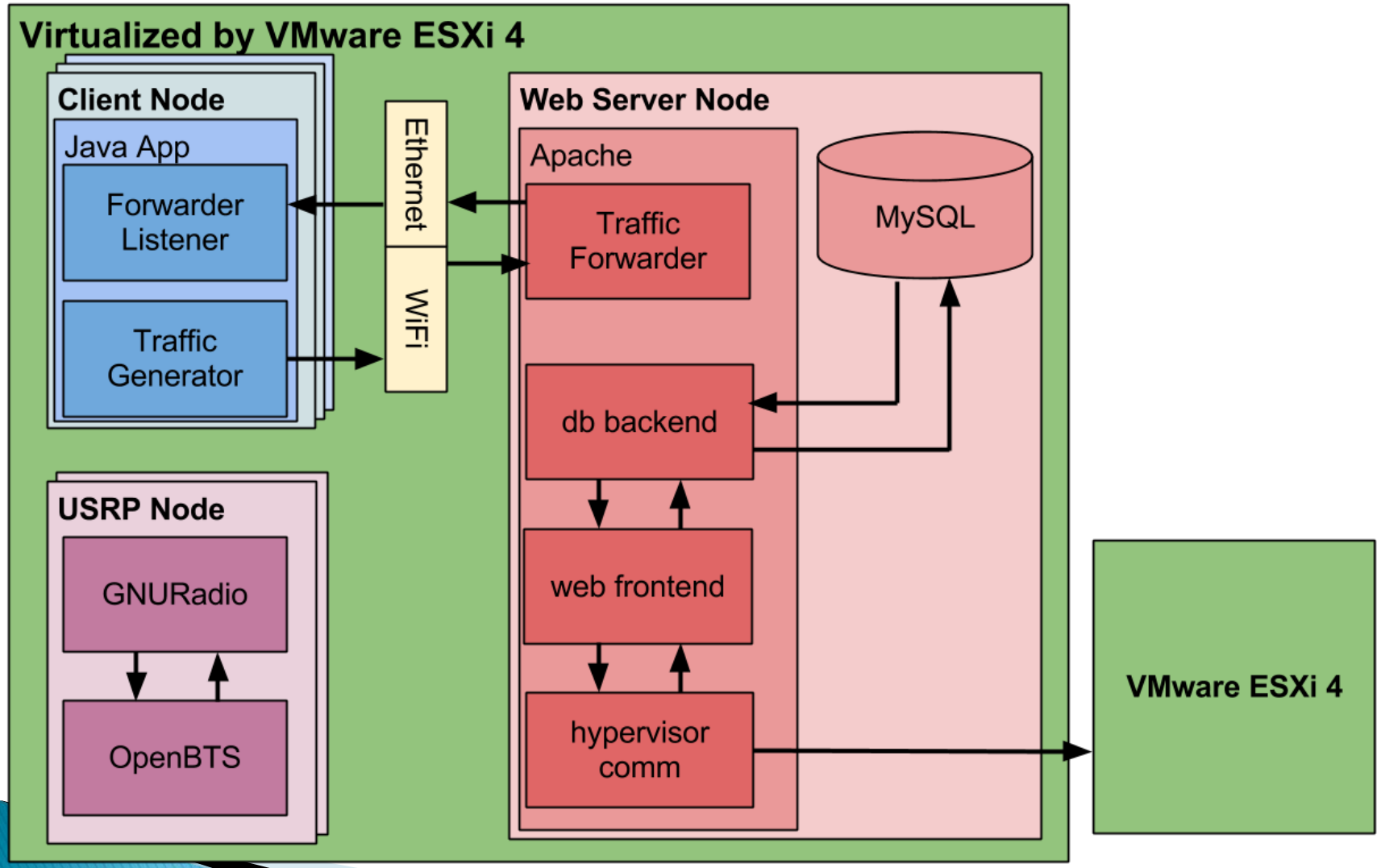
Open BTS Topography



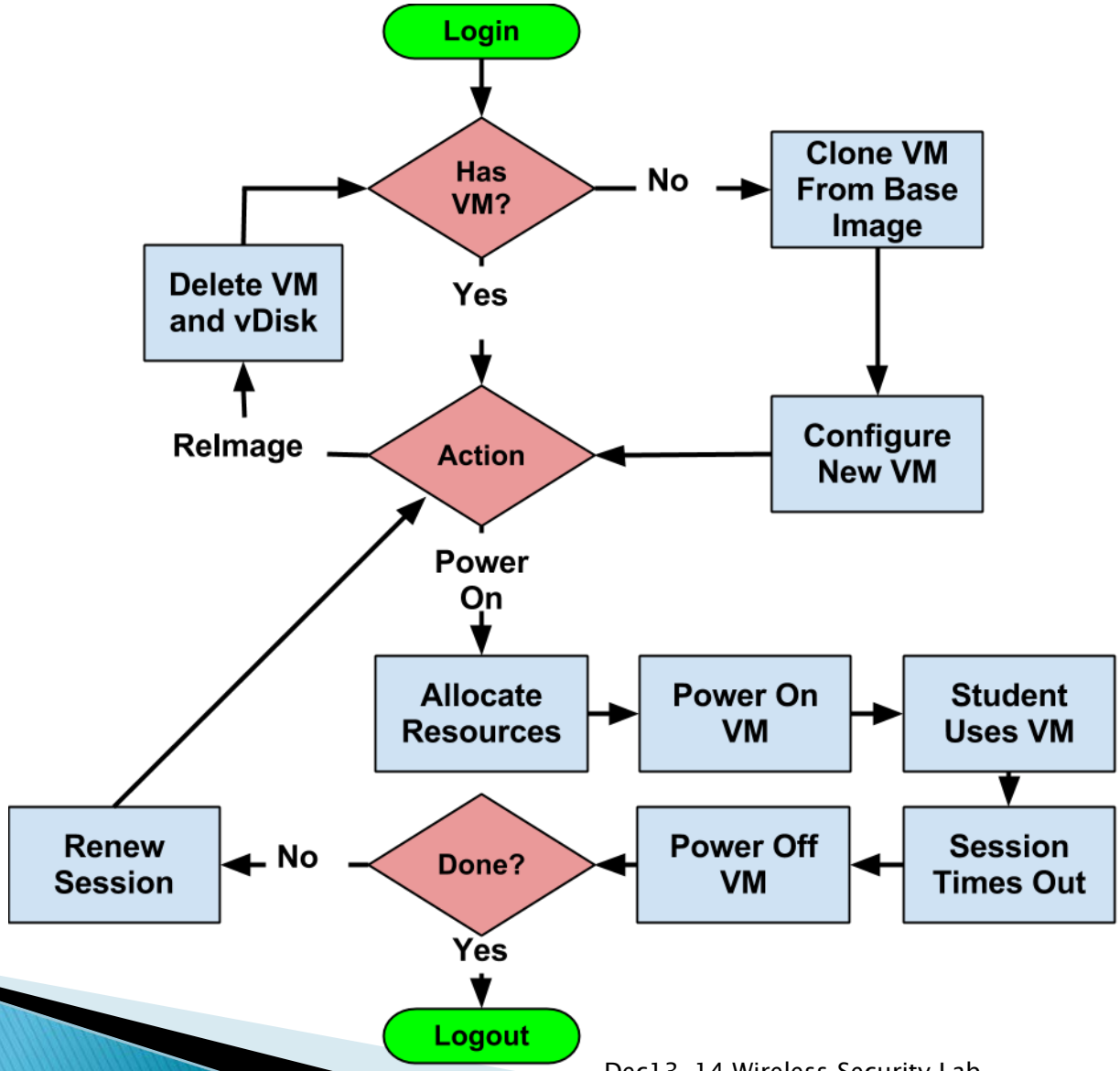
Hardware Architecture Diagram



Software Architecture Diagram



Virtualization Flowchart



Website

- Webserver Location: <http://wsec.ece.iastate.edu/>
- Our Website: <http://seniord.ece.iastate.edu/dec1314/>
- George Amariucai's Website: <http://home.eng.iastate.edu/~gamari/>
- CprE 537 Website: <http://home.eng.iastate.edu/~gamari/CprE537_S12/index.html>

Questions?

Open BTS Implementation

- Open Base Transceiver Station
- Downloading OpenBTS Source Code
- Building and Configuring OpenBTS

  Range Networks (RAD1), Ettus UHD Radios, Fairwaves UmTRX
- Build and Install the Subscriber Registry and SIP Authorization Server
- Running OpenBTS
- Building Smqueue
- Selecting and Configuring a PBX (Asterisk)