

Mobile Virtual Network Operator for the Research Community: Conceptual Idea

Jim Martin,
KC Wang

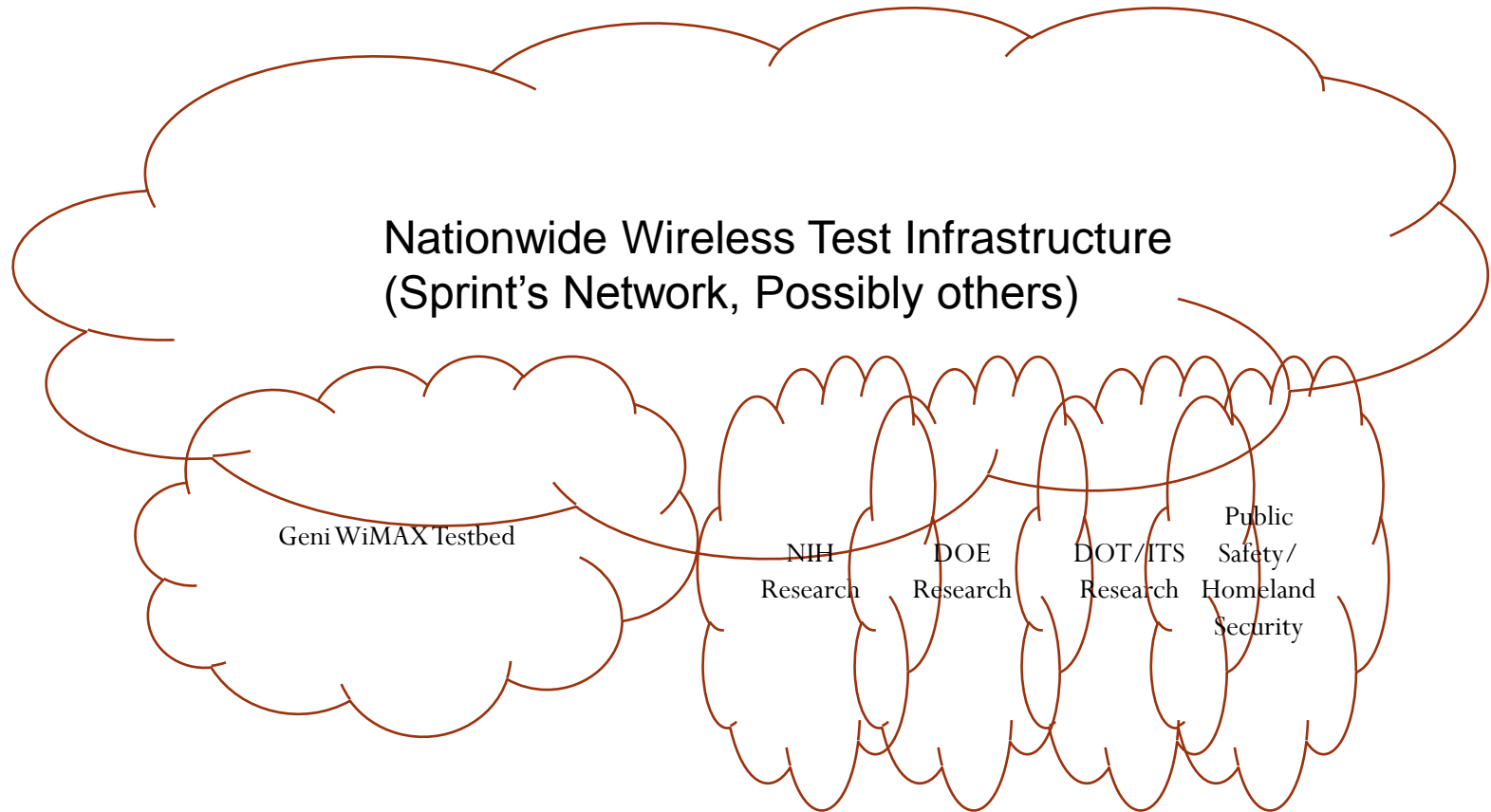
CS and ECE Departments,
Clemson University

jim.martin@cs.clemson.edu

Harry Mussman
hmussman@geni.net

Ivan Seskar
Winlab, Rutgers
seskar@winlab.rutgers.edu

Develop/Deploy a Large Scale Wireless Testbed for Research



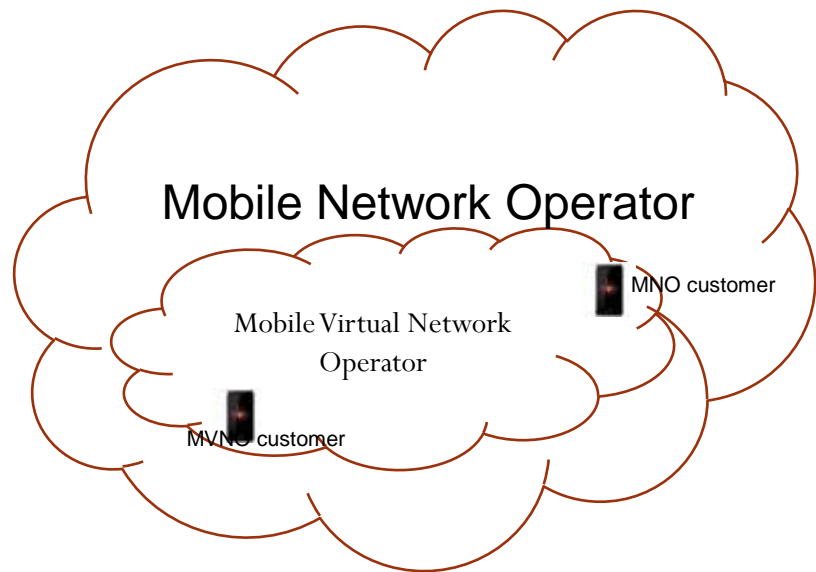
- **Concept:** provide infrastructure to support large scale wireless experiments over current and next generation heterogeneous wireless networks
- **History:** Idea has been around for a LONG time
 - 2009-2011- Workshop on Wireless National Testbed, WiNTeB)

Prior NSF Workshop

- **NSF Workshop : Workshop on Wireless National Testbed, WiNTeB, held May 5-6, 2010. Web site:**
<http://www.kennesaw.edu/ogc/winteb/winteb.html>
 - **Researchers in US universities interested in working on wireless networks have few choices available to them. Most are forced to use WiFi. While many interesting experiments can be done with WiFi, the ability to do at-scale experiments on the dominant wireless technology (cellular), in real world situations, is limited. WiNTeB is a solution to this problem. It leverages special arrangements with cellular network operators to provide a test bed to a broad range of networking and non networking researchers.**
- **One or more NSF proposals were submitted. ...not funded**
- **Intellectual Merit: what is learned about wireless networking applications, and in setting up a testbed as described.**

Mobile Virtual Network Operator (MVNO)

- **Mobile Virtual Network Operator (MVNO) : A wireless service operator that does not own infrastructure**
 - **Example: Ting and FreedomPop use Sprint's infrastructure**
- **The Mobile Network Operator (MNO) is likely to compete with the MVNO for customers**
 - **MVNO services are generally lower cost, presumably a different set of customers.**
 - **Some MVNO's are verticals (very specific users)**



MVNO for the Research Community

- **Form an MVNO whose customers are the research community.**
 - **The MNO is Sprint (they provide a turnkey solution)**
 - **The MVNO is “the project” (at least initially)**
- **Details:**
 - **Seeded by NSF, handed off to Internet2?**
 - **Based on Sprint’s Turnkey Data Solution**
 - **Pricing model involved fees to Sprint for:**
 - **Data usage**
 - **Monthly recurring fee per device**
 - **Per rental fee**
 - **Initial setup costs**
 - **Customers managed in part by Sprint**
 - **It’s possible for a Sprint partner (Arterra) to be the ‘MVNO’ in terms of the tax/license issues. They have a platform/process that would get us going in 4 weeks.**

MVNO for the Research Community

- This provides a scalable testbed for the research community in a timely manner
 - Sprint WiMAX to be replaced with LTE beginning this year
- Why talk about this now (been through this with WiNTeB) ?
 - Still trying to clear up what happened with WiNTeB
 - But....the timing might be better now. With a small investment, we can have a nationwide MVNO operational in 4 weeks (OK....that's from a vendor)
- Moving forward:
 - Continue to develop the idea
 - Potentially submit a proposal to the NSF
 - Research objectives: Develop the model, conduct a trial, develop a better sense of user community's requirements
 - Intellectual merit: similar to the motivations for GENI, this could be an enabler for research and innovation across many disciplines
 - Potentially have Internet 2 involved