

Experimental Description

1. Project Background

In Stanford's "Clean Slate Design for the Internet", we are conducting research to answer the two research questions: "With what we know today, if we were to start again with a clean slate, how would we design a global communications infrastructure?", and "How should the Internet look in 15 years?" In particular, our strong interest in mobile networks launched a flagship project, called POMI2020 (Programmable Open Mobile Internet 2020). We plan to demonstrate open programmable mobility control architecture on top of the experimental network. We would like to use WiFi and WiMAX radio technology to study and demonstrate radio technology independent handover because of their openness, availability, low-cost nature.

2. Experimental Description

We use picoChip Design's femto-cell Mobile WiMAX Basestation kit (PC6530) which consists of

- Programmable femto-cell mobile WiMAX basestation, and
- CardBus client card.

We also use NEC Mobile WiMAX Basestation (NWD-046455-001) and CardBus client card (TRP-2GW-2A).

We place the mobile WiMAX basestation and mobile WiMAX clients in the Stanford's Gates Computer Science Building and conduct research on open programmable mobility control. We basically don't touch PHY layer of WiMAX basestation and client card at all. Using the programmability, we only change the way packets are routed, i.e., change the outgoing interface depending on the header field of the incoming packets. To handle mobility of wireless devices nicely, we also expect base stations have some visibility/control into the radio layer, such as, signal quality per mobile and power control (within the allowed range by license) over radio channels. One of our goals is to develop software suite which control WiMAX/WiFi base station and clients so that clients can choose whatever basestations they want and handover between them without communication interruption, which has never been achieved.