



WiMAX Deployment at Polytechnic Institute of NYU Spiral 2 Year-end Project Review



Polytechnic Institute of NYU

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- The goal of the project is the deployment of a meso-scale, open/programmable WiMax testbed on the campus of Polytechnic Institute of NYU.
- For the development we received the "Open GENI WiMax Base Station Kit for Campus Deployments" provided by the associated project led by Rutgers and NEC.
- It provides for the installation, maintenance and integration of the WiMax base station kit with existing experimentation facilities at the university.
- Right now we have finished with the installation, the testbed is functional and we are in the process of testing and conducting measurements in the area around the school.
- In the next slides we give some details and pics on the deployment and the installation of the testbed

Base Station Installation

- The BS (server, IDU) have been installed in the network room of the Library in the ECE Dept Building (5 Metrotech Center)
- The outdoor parts (sector antenna, GPS antenna, ODU) have been installed on the roof of the ECE Dept Building

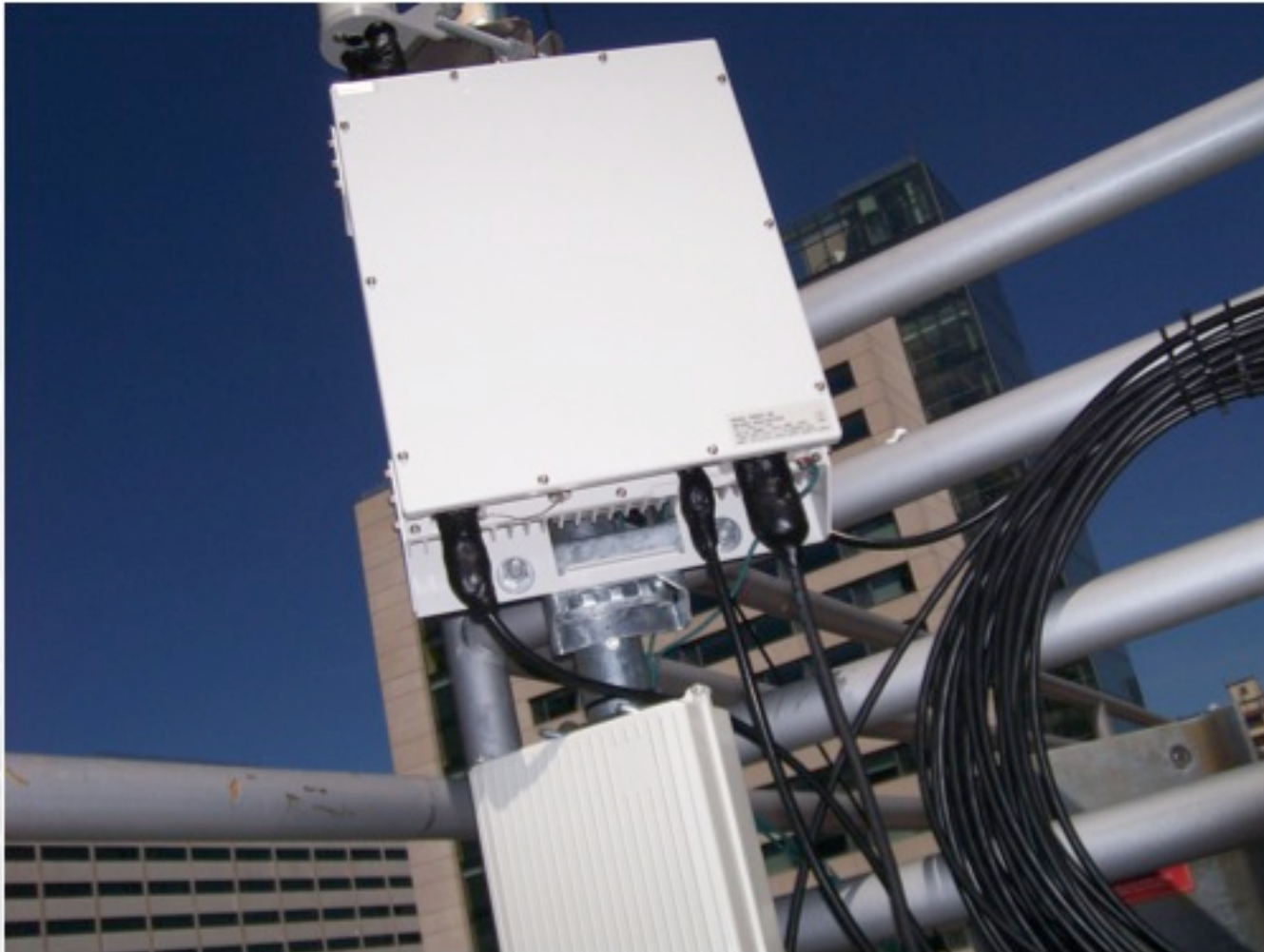
Base Station Installation

- Sector antenna and GPS antenna installation



Base Station Installation

- ODU installation



We are using two different kinds of clients:

- Laptops with the Beceem USB clients
- HTC EVO phone (We bought one from E-Bay)



- We are planning to buy several NC10 Samsung laptops

- For the measurements we are using a client (Laptop+USP dongle) equipped with GPS in order to track the location of the measurement
- For the moment we are measuring by using the Windows application that came together with the Beceem clients
 - For the channel strength measurements we record the signal strength indicated in the Beceem software
- Next step: To do measurements through the BS, using OMF

- Configure OMF in the BS
- Conduct detailed and accurate measurements using OMF
- Develop connectivity maps in the area of Metrotech and Downtown Brooklyn
- Work with Winlab and BBN to develop a joint demo
- Study the parameters of the BS through OMF
- Contribute to the OMF WiMAX framework
- Start working on research oriented experiments

Milestone & QSR Status

ID	Milestone	Status	On Time?	On Wiki?	GPO signoff?
S2.a	Complete Installation of server, IDU, ODU and Antenna	The installation is complete	< 2 months late	yes	no
S2.b	Multicampus demo	We are in the process of putting together a multicampus demo together with Rutgers and BBN	Not yet due	No	N/A
	QSR: 4Q2009				
	QSR: 1Q2010				
	QSR: 2Q2010				

Accomplishments 1: Advancing GENI Spiral 2 Goals

- Project accomplishments this year that contribute to the Spiral 2 goals:
- *Integration*: Our contribution to the Spiral 2 goal of integration is twofold:
 - We worked closely with Winlab, Rutgers in order to develop the WiMax testbed in our campus, with the goal of integrating the setup of the testbeds.
 - Our lessons learned from the installation/development process will be used by other campuses that build WiMax testbeds
- *Instrumentation and Measurement*: We have already started conducting some measurements in order to understand the dynamics of the testbed in the urban area of Downtown Brooklyn. We are in the process of installing OMF in our WiMax Base Station. Through OMF we will be able to do organized measurements by using the capabilities of the Base Station. We will also extend OMF in order to support particular measurements and recording of particular parameters in the Base Station. In this way we contribute toward the Spiral 2 goal of Instrumentation and Measurement.

Accomplishments 2: Other Project Accomplishments

- We are working on developing connectivity maps of the WiMAX testbed in the area of Metrotech and Downtown Brooklyn
- We are working together with Winlab and BBN to develop a joint, multicampus demo

- Although the project involved several non trivial procedures (applying for research licenses to FCC, get all the components – connectors etc - for installing the BS, install the server, IDU, ODU, etc), the help from the GPO and Winlab, sometimes as reported description in the Wiki and sometimes through direct discussions over the phone or even face-to-face allowed us to complete the whole procedure without any problem (particular credit should be given to Ivan Seskar for his close and continued support from day one of the project. Without his help it would have been impossible to complete the installation in such a sort time).

Our plans for the remainder of Spiral 2 are the following:

- Configure OMF in the BS
- Conduct detailed and accurate channel measurements using OMF
- Develop connectivity maps in the area of Metrotech and Downtown Brooklyn
- Work with Winlab and BBN to develop a joint, multicampus demo
- Study the parameters of the BS through OMF
- Contribute to the OMF WiMAX framework
- Start working on research oriented experiments

The GPO is starting to formulate goals for Spiral 3. What are your thoughts regarding potential Spiral 3 work?

- We are planning to work on the development of a Large-scale GENI Instrumentation and Measurement Infrastructure, together with University of Massachusetts Amherst, NICTA, UNC-Chapel Hill-RENCI, North Carolina State University and University of Houston.
- The goal of this work is to develop a Large-scale I&M infrastructure we call GEMI. Our work on the project will be to develop the framework for supporting the I&M infrastructure in the GENI WiMax platform and integrate it with the overall GEMI framework.