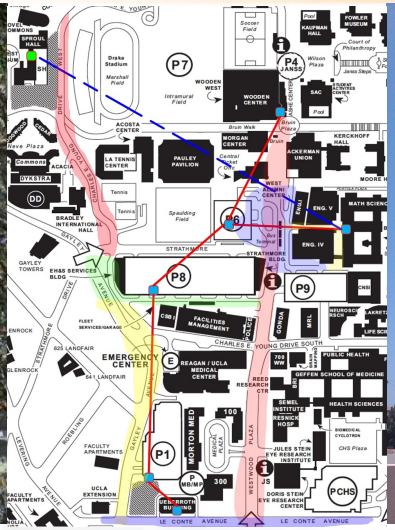
WiMax @ UCLA
Spiral 2 Year-end Project Review

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Project Summary

- This project adds WiMax to the UCLA Campus Vehicular Testbed (C-VeT). The project aims at supporting design, development, deployment and testing of vehicular services and applications over both WiFi and WiMax.
- C-VeT features resource virtualization in order to enable shared access by multiple experimenters using the ORBIT Management Framework (OMF). The campus WiFi Mesh and Nodes have been paid by DURIP GENI provided the WiMaX base station and the part of the integration costs.

- In Bullets:
  - Installation of 1 WiMax Station at UCLA and on the UCLA vehicular nodes
  - Deployment of Dual-Technology nodes (WiFi + WiMAX)
  - Measurements and Tests to assess the coverage and capabilities of the WiMax-WiFi integrated Network.

Milestone & QSR Status

ID	Milestone	Status	On Time?	On Wiki?	GPO signoff?
S2.a	WIMXUCLA: Begin Deployment of Dual Mode Vehicular Nodes	WiMax Installation started on 8/1/2010 after the reception of the WiMax outdoor Kit. So Far: -WiMax Antenna base Installed - Wiring Partially done (ethernet is done power on the way) - Node installation is planned. Initial testing on Lab bench is in progress.	NO	YES	NO
	WIMXUCLA: WiFi Mesh Network Installation	Completed. The network is installed and the control Center Available.	YES	YES	
	QSR: 4Q2009	Identification of Sites and Authorization Process	YES	YES	
	QSR: 1Q2010	FCC License	YES	NO	
	QSR: 2Q2010	Wimax BASE Station Installation	NO	YES	

Accomplishments 1: Advancing GENI Spiral 2 Goals

- The addition of the UCLA Campus Vehicular Testbed to the Geni Spiral Two will introduce a new scenario to consider when designing new protocols and deploying new networks. Vehicular networks are expected to enter in the market in the next 5-10 and are raising interest of the Industrial leaders including CISCO and Microsoft. C-VeT will support Spiral 2 creating a new large scale (campus scale) vehicular testbed that integrates WiFi, WiMax, 3G, and DSRC.

- We hope to stimulate the research community and the industry to use C-VeT. In order to achieve this goal we chosen to instrument C-VeT with OMF and to deploy a Vehicular network Emulator that will allow easy protocol and application prototyping and support a seamless deployment on the actual testbed. At the moment we got Cisco Interested that is using C-VeT in its current status for testing purposes.

Accomplishments 2: Other Project Accomplishments

- In addition to the Spiral 2 Contributions we were able to develop few more tools that are available to the community:
  - Corner Propagation Module: allows to estimate the signal propagation in urban environments considering the presence of buildings and other obstacles. The system has been developed to work with the UCLA VEMU (vehicular network emulator) as well as with Qualnet. Is available on the Internet on our website: http://nrl.cs.ucla.edu/~egiordano/vergiliusJoomla/index.php?option=com_content&view=article&id=47&Itemid=55
  - VERGILIUS: A collection of tools to generate mobility traces for emulation purposes. http://nrl.cs.ucla.edu/~egiordano/vergiliusJoomla/index.php?option=com_content&view=article&id=47&Itemid=55

Issues

- We started the project slightly late due to contractual issues with UCLA OCGA the resulted in signing the contract on 3/10. However we were able to catch up and perform much of the agreed work on year 1.
- At the moment the major concern is the delivery of same critical infrastructure components such as for example the 8' roof-top tower and the mini-PCI WiMax cards for the vehicular integration. We are working closely with our vendors and Rutgers to solve the WiMix Nic issue and the tower issue so that the project will deliver timely.
- The OMF integration in-vehicle may require a major OMF extension. While we are committed to perform the OMF extension we will initially make the testbed available to the community through OMF and directly via SSH/Web.

Plans

- In order to achieve our Spiral 2 Goals we plan to:
  - Finalize the WiMax Installation.
  - Delploy WiMax and WiFi integrated platforms in the vehicles and run extensive experiments.
  - Make the C-VeT available to the Community and perform outreach activities with the Community and the Industry.

- If awarded with a Spiral 3 Grant we will push the concept of Geni in a Box for the WiMax testbeds. We will design and provide a Wi-Rack that allows new campuses to join Geni with a minimal infrastructure effort thus allowing the PI to concentrate on the network research. In particular we plan, in Cooperation with Rutgers-WinLab, to design a set of bssic hand-off and location services that will allow researchers to gain a fine granularity network control. Those mechanisms will be integrated in the Wi-Racks.