



## Senior Design Project in Electrical & Computer Engineering



# ECE Section Network Redesign

Cadets 1/c Benjamin Litts, 1/c Nathan Shakespeare

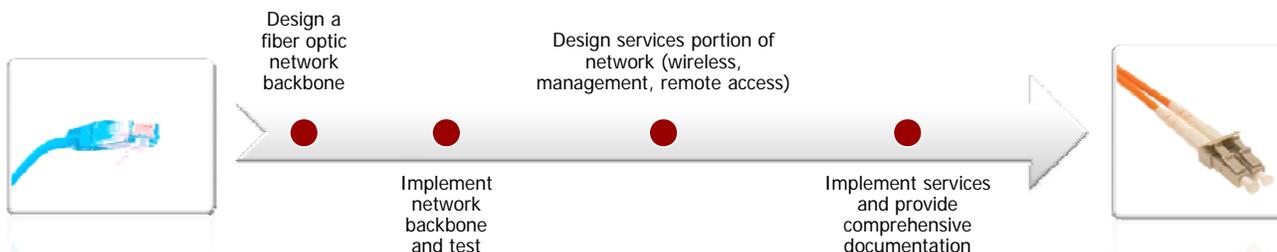
Advisors: LT Joseph Benin, Mr. Keith O'Brien, Cisco Distinguished Systems Engineer

Sponsors: USCGA ECE Section

### Project Goals

Design and implement a computer network, using industry best practice methods, to provide security, management tools, wireless access, and maximize bandwidth.

### Project Objectives



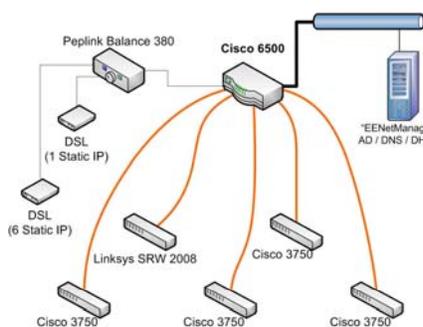
### Background Information

The EEnet is a valuable tool for the ECE Section; not only is it used by Electrical Engineering students, but by over fifty percent of all cadets. Every cadet that graduates from the United States Coast Guard Academy from the Management, Government, Marine Environmental Science, and Electrical Engineering section will, at some point, use the EEnet in their academic career.

This project will improve the design, functionality, and speed of the EEnet to provide a better tool for use by the Electrical and Computer Engineering Section.



Portion of the Original Network



Network Backbone Design

### Progress Thus Far

From Aug 07 – Jan 08 the EEnet backbone was designed and implemented, consolidating two separate unorganized DSL networks.

The EEnet backbone as it is now (left) has over 1000 ft of Multimode Fiber optic cabling (orange), six Cisco Switches, and serves six separate areas of McAllister Hall with cutting-edge Gigabit Ethernet (1000 Megabits per second) internal connectivity.

Over the first month of use in the current configuration the EEnet has logged over 25 Gigabytes of Internet traffic (below); this large volume of traffic is a clear indication of just how widely this network is used by cadets and faculty.

### EEnet Internet Traffic by Connection over One Month



Total Traffic: 25,475 Megabytes

### Future Plans

- The remainder of the project will:
  - Provide wireless connectivity
  - Establish centralized traffic monitoring and management capabilities
  - Develop a media delivery solution for existing hallway displays
  - Create user-friendly manuals / guides for EEnet users / administrators

### Products used in the EEnet

In keeping with the goal of using industry best practice methods the EEnet uses products from popular name brands.

