Overview

- Description
- Goals
- Achievements
- Difficulties
- Conclusion
Description

- Track vehicles real-time
- Implemented using GPS technology
- GPS data is transmitted using wireless technology to the internet
- Data is picked up by client applications
- Analyze data using Traffic Model
System Architecture

- Satellite
- Internet
- Laptop
- GPS Receiver
- Vehicle
- Control Center
Essential Components

- **Hardware**
  - Garmin GPS Device
  - Laptop Computer
  - Wireless LAN Cards, HUB and Antenna

- **Software**
  - GPS Reader Software
  - GPS Thing – to map GPS information
GPS Reader software

- Reads information from GPS device
- Creates server to transmit GPS data on the internet
- Multithreaded C-Windows programming using TCP/IP protocol
GPS Thing software

- Behaves like a “client” for the remote server
- Receives the buffer coming through the wireless LAN
- Performs calculations on it to determine the coordinates and then displaying the vehicle moving on a map.
Semester Goals

- Modification of server software to allow for continuous connectivity between the GPS and data terminal
- Improve GPS software by allowing the control server to communicate with multiple vehicles
- Make graphics and interface for all software more user friendly
Team Organization

- Split IPRO team into two parallel groups
- Allows students to have more opportunities in the technical aspects of this project
- Two different solutions gives more options to future IPRO teams
Start thread for each IP entered.
Reconnect

Each connected thread keeps reading data

If thread times out

Program iterates through list of IPs displaying on screen the data from each thread one at a time.
Team B Accomplishments

- GPS Reader software modified to handle loss of network connection
- Multi-vehicle tracking implemented
- Continued use of TCP/IP
**UDP vs. TCP**

**User Datagram Protocol**

- Connectionless protocol that runs on IP networks
- Excellent way to broadcast position information
- Excellent performance under noisy network conditions.
- Very useful for sending information that will be updated at short intervals
Transmission Control Protocol

- Communication protocol used to connect hosts on the internet
- Provides a reliable way to send chat text
- Has high reliability
- Provides clean network environment messaging (through firewalls)
Team A Accomplishments

- Use of UDP protocol instead of TCP/IP
- Removed any lines with no use
- TCP/IP specific code has been taken out
Ingredients for Success

- Team Contribution
- Time Management/Organization
- Weekly Team/Group meetings
- Commitment
- Hard Work
- Enthusiasm
IPRO Experience

- Develop Organization and Responsibility
- Define Goals
- Team Environment
- Leadership
- Out of class experience
Recommendations

- Make interface more user-friendly
- Update display in GPS Thing for multi-vehicle tracking
- Continue to use parallel teams