



Web Enabled Wind Tunnel System



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Presentation Outline

- Overall Project Summary
- Wind Tunnel Description
- Functional Requirements and Specifications
- Overall System Block Diagram
 - Subsystems
- Progress
- Schedule
- Equipment
- Questions

Overall Project Summary

- Web Interface for User Interaction
- Controller for Wind Tunnel Operation
- Networking Setup to Support Aforementioned Functions

Goals

- Allow for Remote Starting, Stopping, and Control of Wind Tunnel
- Improve Existing Capabilities of the Wind Tunnel
- Create an Interface that is Intuitive and Easy to Use
- Design an Embedded Controller for use in Similar Control Type Projects*

*If Time Allows

Wind Tunnel Description

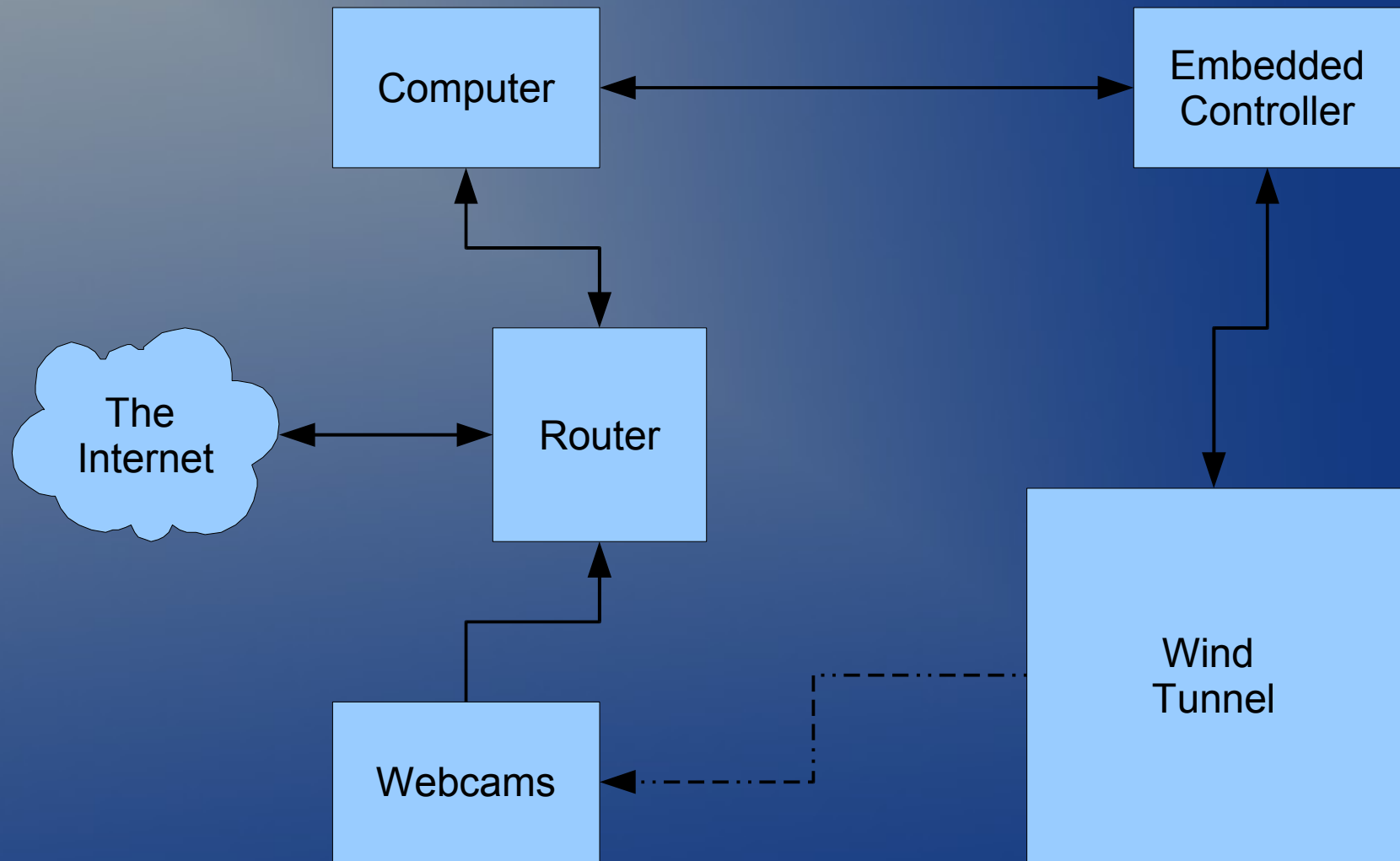
- Blower
- Damper
- Platform
- Actuators
- Pressure Sensors
- Fog Machine



Functional Requirements

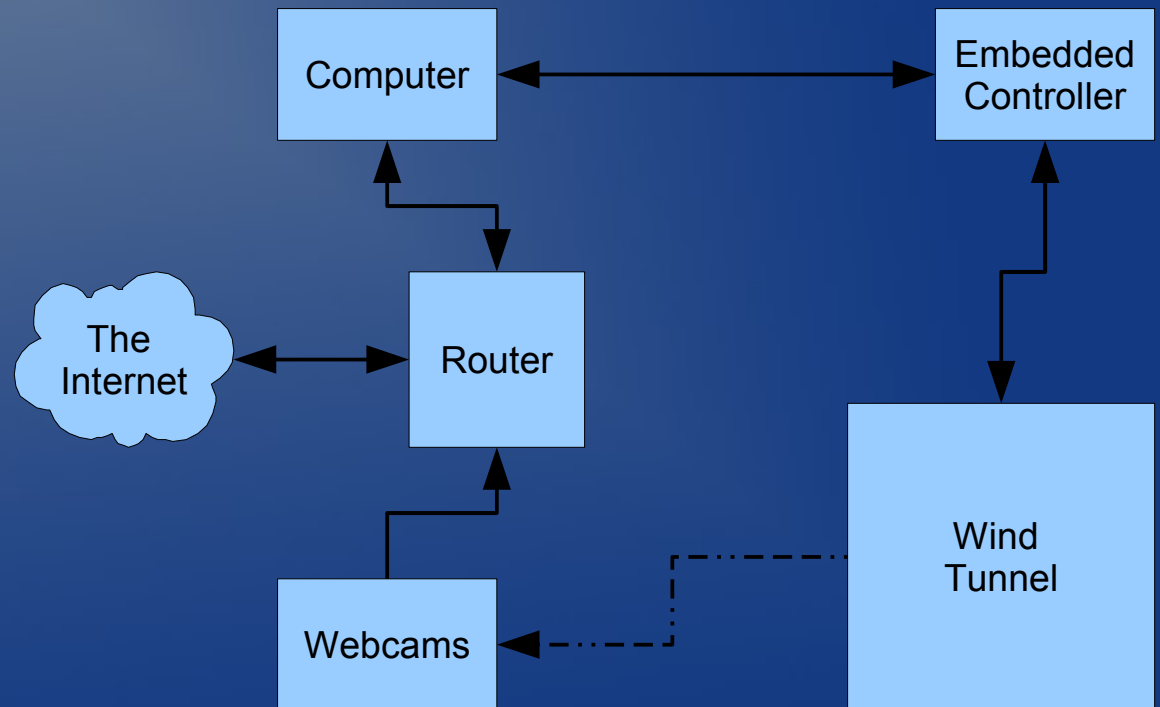
- Controlling wind speed within 5%
- Data rate of at least 10hz
- Controlling the angle of the test bed to 5°
- Support for at least 10 simultaneous clients

Overall System Block Diagram



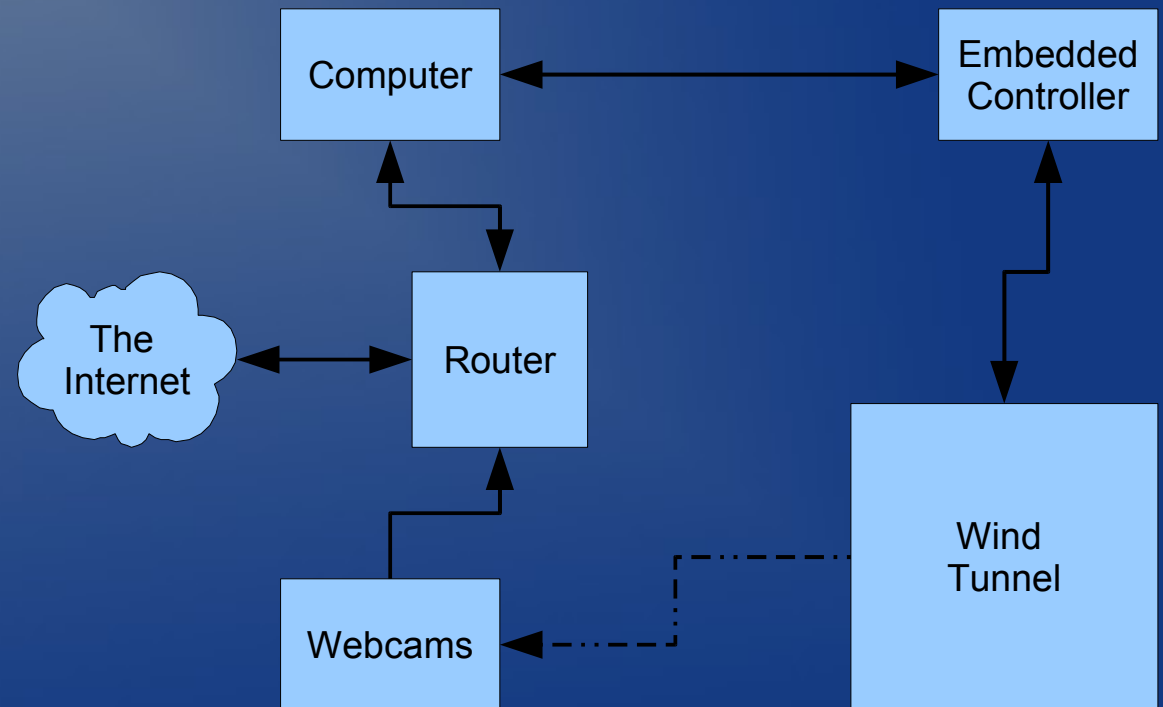
Subsystems

- Webcams
- Router
- Microcontroller
- User Interface



Subsystems Cont.

- Input from Microcontroller
- Output Sensor Data
- PI Control for Position
- Velocity Controller



Progress Made

- Researched Webcam/Router
- Installing and configuring VPN router
- Installing and configuring camera
- Preliminary testing of the camera streaming capability

Project Schedule

ID	Task Name	Start	Finish	Dec 2009		Jan 2010				Feb 2010				Mar 2010	
				12/20	12/27	1/3	1/10	1/17	1/24	1/31	2/7	2/14	2/21	2/28	3/7
1	Choose Microcontroller	12/18/2009	1/20/2010												
2	Purchase Linear Actuator	12/18/2009	1/20/2010												
3	Purchase Additional Webcams	12/18/2009	1/20/2010												
4	Purchase Limit Switches	12/18/2009	1/20/2010												
5	Setup Apache Webserver	12/18/2009	1/20/2010												
6	Develop Webpage and UI	12/18/2009	1/20/2010												
7	Test Linear Actuator	1/26/2010	2/2/2010												
8	Design Interfacing Circuitry	2/2/2010	2/23/2010												
9	Develop Controller Code	1/26/2010	2/23/2010												
10	Design PI Controllers	2/23/2010	3/9/2010												
11	Develop Data /Control Server Application	2/23/2010	3/9/2010												
12	Overall System Testing and Integration	3/9/2010	3/16/2010												

Equipment List

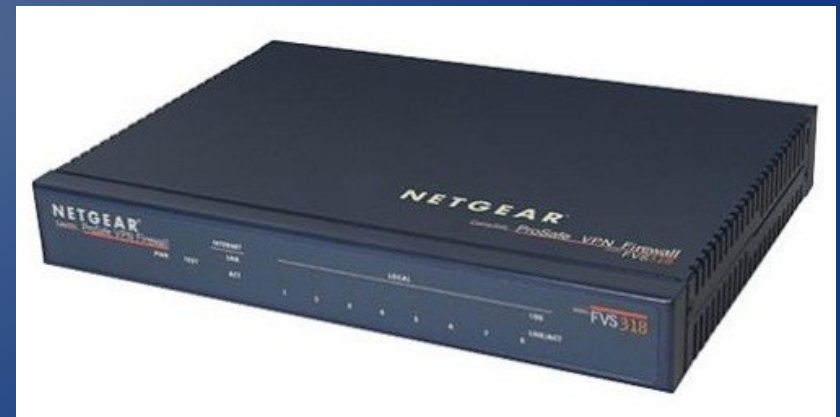
- Wind Tunnel
- Microcontroller
- Sensors and Interfacing Components
- H-Bridges and Other Controller Items
- Networking Components

Equipment Purchased

- DCS-910
 - Price: 67\$
 - IP Ethernet Webcam



- FVS-318
 - Price: 89\$
 - VPN Firewall Router



Existing Equipment

- Wind Tunnel
- Linear Actuator
- Lift and Drag Sensors

Questions?

