Web Based Sensor Network
Monitoring System

October 02, 2006
Kanishk Panwar

Committee: Pr. Leon Reznik
Pr. Hans-peter Bischof
Pr. Roxanne Canosa
Outline

- Introduction
- Background
- Application Architecture
- Implementation
- Demo
Introduction

- Web based monitoring system.
- Passive real time monitoring.
- Secure.
- Maintains data repository.
- Generates reports for analysis.
Technology Background

- Comprised of multiple sensor nodes.
- Gateway connected to the server.
- Runs on real-time operating system called TinyOS.
- Implemented on multiple sensor boards.
Hardware

- Telos Revision B motes.
- Manufactured by Moteiv.
- USB Based.
- Can act as a sensor or gateway.
Application Architecture

• High Level Architecture
Application Architecture

Comprised of 3 Layers

- **Data Access Layer (Database)**
- **Business Logic Layer (Java Classes)**
- **Presentation Layer (User Interface in JSP pages)**
Data Access Layer

- Implemented as a Singleton Pattern.

- Database used - SQL Server 2000.

- Custom Class contains action specific methods.

- Database stores variety of information.
Database Design

- 8 Tables.

- channel_table - Stores channel Id and table name.

- motes - Stores mote IDs.

- users - Stores User information.
Database Design

- reports - Stores PDF Report details.
- humidity/temperature/power/light - Common Structure.
- Stores readings and related information for the respective channels.
Business Logic Layer

- 6 Java Servlets and 8 core Java Classes.

- Core Java Classes
  - WSNUtil - Configuration variables
  - DataReadingLayer - Reads sensor Data.
  - ImageIngine - Creates reading graph image.
Business Logic Layer

- **Core Java Classes**
  - CreatePDF - Creates PDF reports.
  - JDBCLayer - Maintains DB connection.
  - DAOConnection - Thread for JDBCLayer.
  - MyRenderer - Overridden Class.
  - MyDrawingSupplier - Overridden Class.
Business Logic Layer

- **Java Servlets**
  - Main - User Login.
  - Delegator - Toggles monitoring status.
  - MoteManager - Toggles mote status.
  - ServletImageGenerator - Displays image.
  - MyReport - Displays PDF report.
  - UpdateThreshold - Updates channel threshold.
Presentation Layer

- 7 Java Server Pages (JSP)
- HTML and Embedded JSP 2.0 code
- Java Server Pages (JSP)
  - index - Default page. Forwards to Login
  - Login - User Login page.
  - Main - Default page for logged-in user.
Presentation Layer

- Java Server Pages (JSP)
  - Monitor - Page for monitoring a mote.
  - Anomaly - Shows total count of anomalies.
  - AnomalyDetails - Lists all the anomalies.
  - AdminConsole - For changing threshold values of channels.
Demo
Questions ?