

# Web Based Sensor Network Monitoring System

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# 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

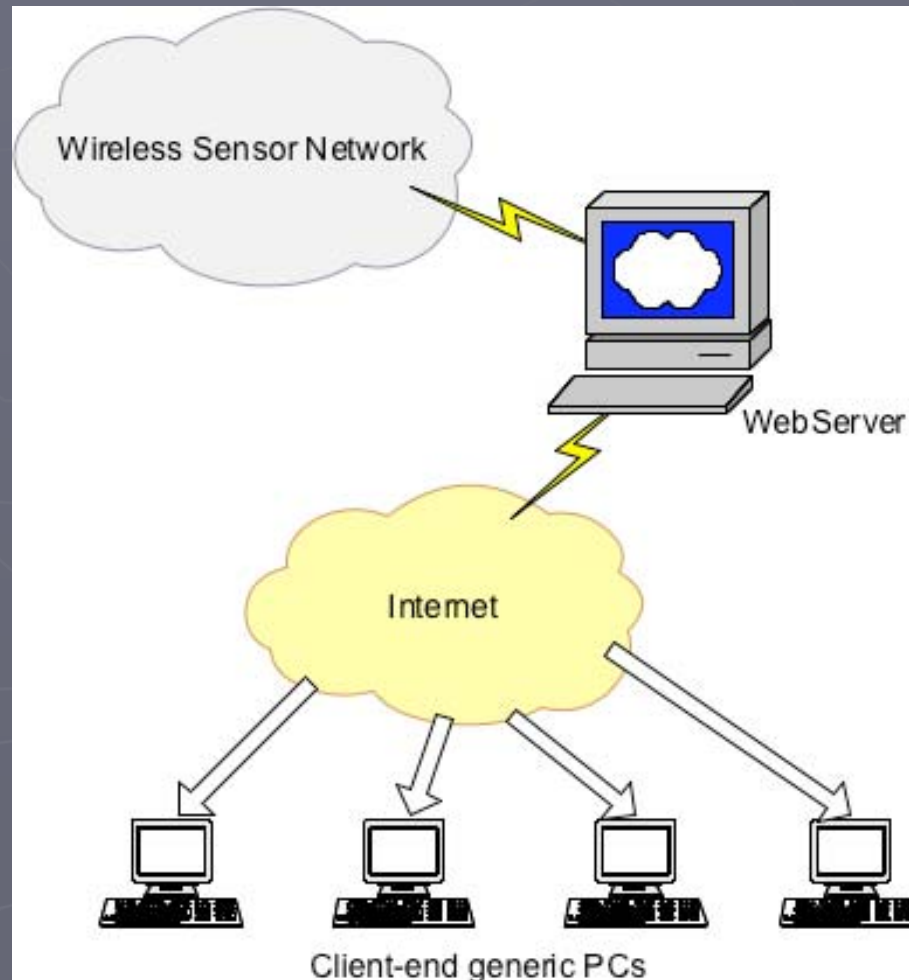
- Comprised of multiple sensor nodes.
- Gateway connected to the server.
- Runs on real-time operating system called TinyOS.
- Implemented on multiple sensor boards.

# 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.
  - ImageEngine - Creates reading graph image.

# Business Logic Layer

- Core Java Classes
  - CreatePDF - Creates PDF reports.
  - JDBCLayer - Maintains DB connection.
  - DAOConnection - Thread for JDBCLayer.
  - MyRenderer - Overriden Class.
  - MyDrawingSupplier - Overriden 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 ?

