

Overview of the Generic Sensor Kit (GSK)

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Outline

- Goals
- Usage Model and Tool Set
- Architecture
- Description of components
- Status and Future Work
- Sneak Preview

Overall Goals

- Provide an end-to-end software suite for rapid sensor network deployment
- Break down the barrier to entry to sensor network applications for non-computer sophisticated users: biologists, vineyard managers, facility managers, civil engineers, etc. ...
- Integrate and drive our research

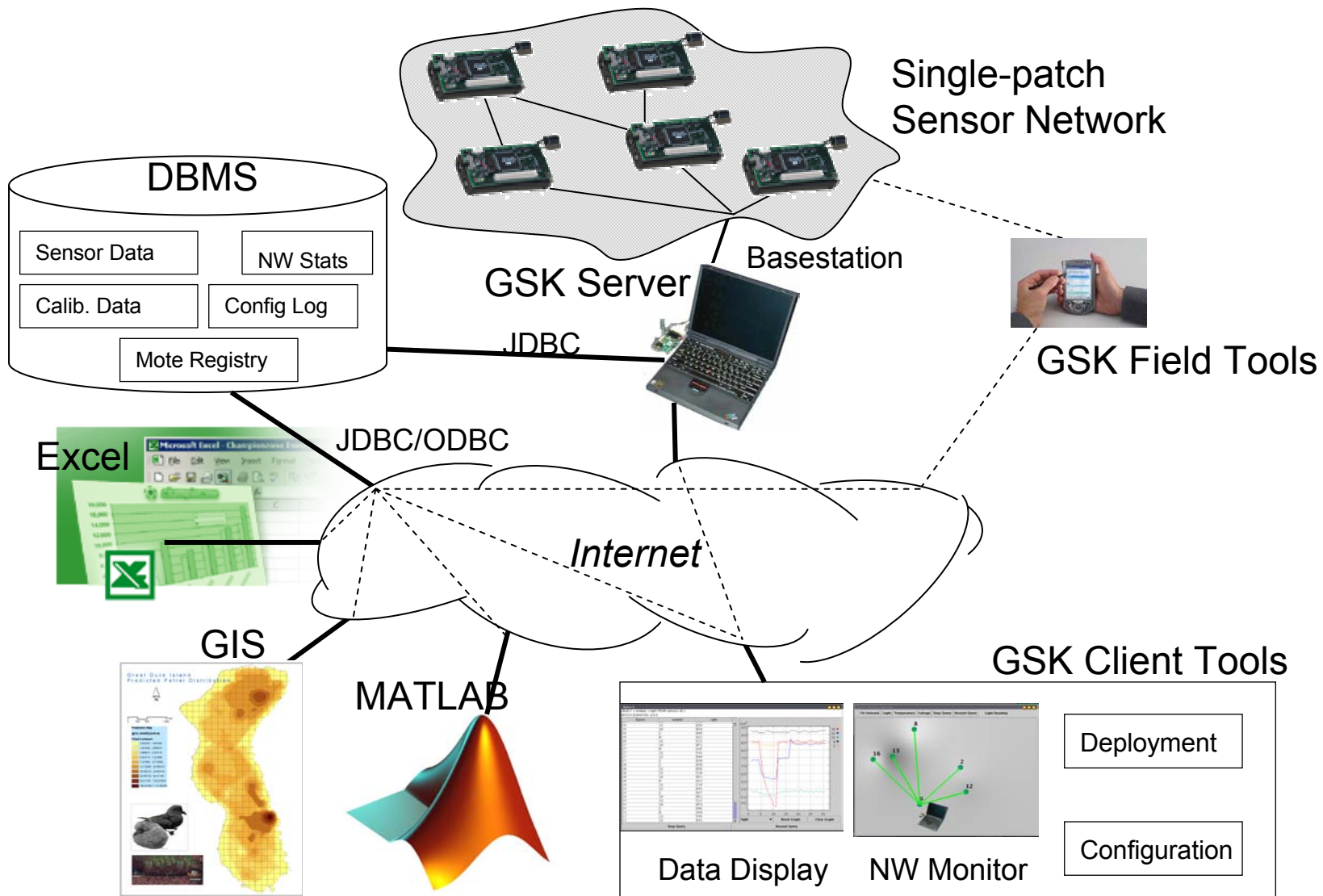
Immediate Goals

- No Mote programming or code downloading
- Focus on data collection applications
- Single integrated package with minimal configuration
- Easy integration with popular data analysis tools
- Scale: up to 100 nodes
- Longevity: 6 months at 1-2% duty cycle

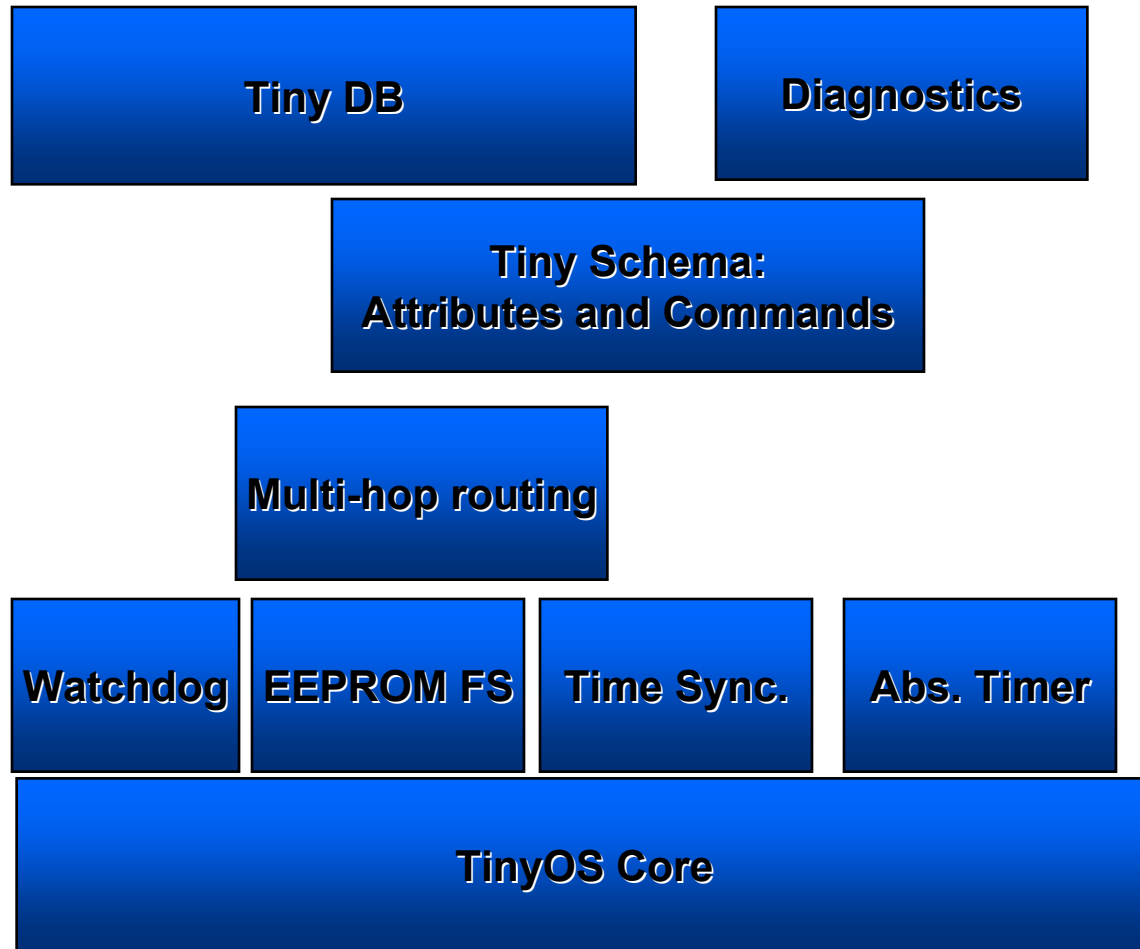
GSK Usage Model

- 1) Deploy pre-programmed sensor nodes → **Deployment Tool**
- 2) Configure data collection criteria → **Configuration Tool**
- 3) Collect sensor data and monitor network statistics → **Logging to DBMS**
- 4) Visualize and analyze sensor data and network data → **NW Monitoring Tool, External Tool**
- 5) Diagnose problems and refine data collection criteria and network configuration → **Diagnostics Tool**

GSK Architecture



GSK Mote Side Components



GSK Server

- Provide (Java) API to all client tools
- Inject queries and commands into sensor network
- Deliver live data from sensor network and to interested clients
- Log all data, queries and commands to DBMS
- Metadata management
 - Mote locations and maps
 - Mote capabilities: type of sensors
 - Mote characteristics: power consumption
 - Sensor calibration/conversion parameters

GSK Field Tool

- Run on a hand-held device
- Diagnostics:
 - Only communicate with motes in radio range
 - Pull motes out of sleep
 - Ping a node and collect vital signs
 - A small number of other commands: reset, buzz, etc.
- Deployment
 - Placing Motes on a map and record locations

GSK Client Tools

- Deployment and Diagnostics
- Configuration
 - Select attributes, filters and aggregates
 - Set sample rate or network lifetime
- Network Monitoring
 - Visualization of network topology and other health statistics

Current Status

- Developed most pieces
- Remaining tasks:
 - Integration between TinyDB, new multi-hop routing, time sync, snooze
 - More polished GUI
- General Availability: early Q1 2003

Future Work

- Apps, apps, apps, ... no hand holding
- Deployment Tool
 - Network formation advisor
 - Run on handheld
 - Data synchronization with DBMS
- Web-based Client Tools
- Network monitoring triggers and alerts
- Unified interface to access live and historical sensor data
- Support for heterogeneous sensor networks
- Failover of GSKServer and DBMS
- Beyond data collections

Demo Time