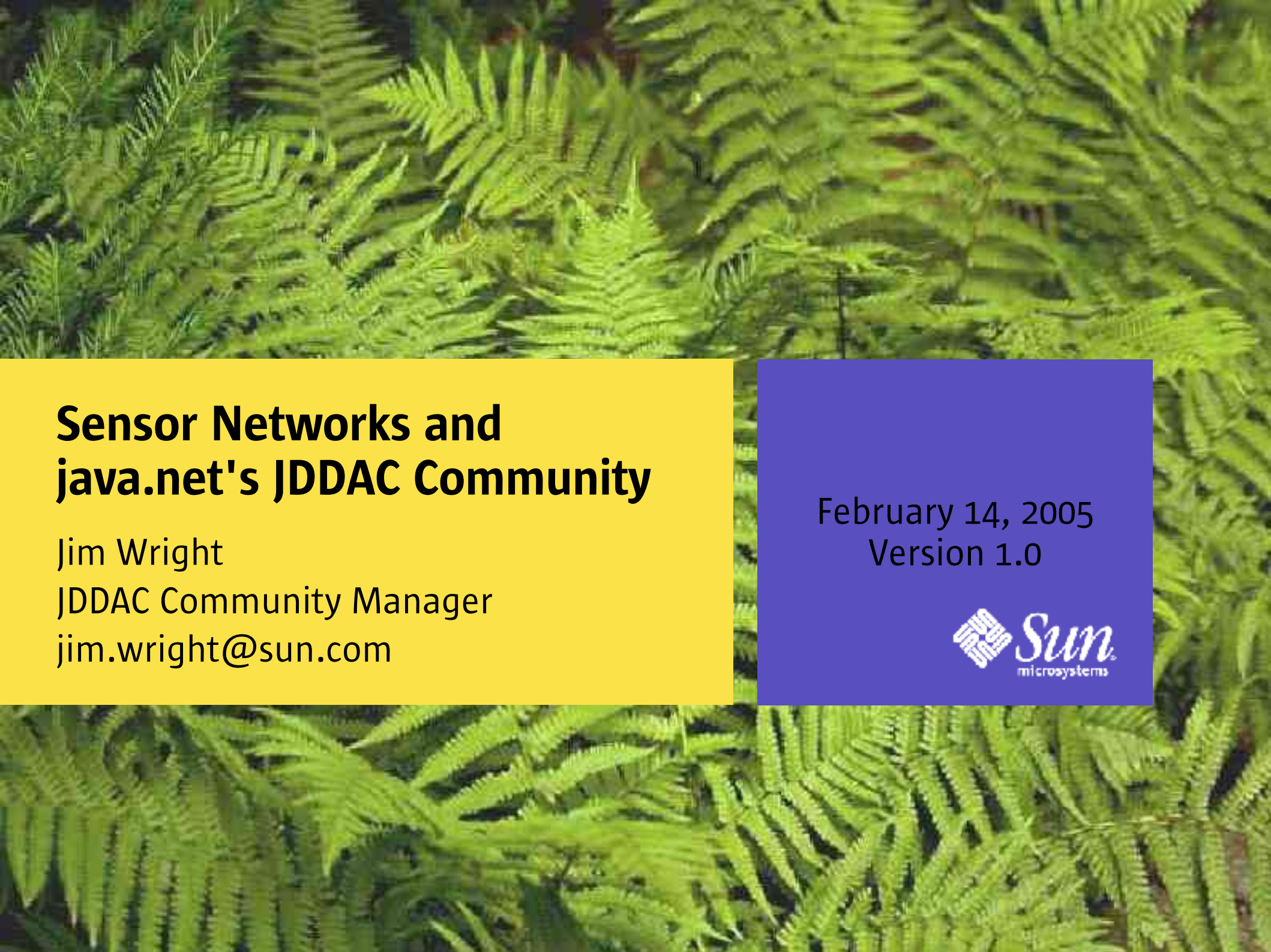

Sensor Networks and java.net's JDDAC Community

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Version 1.0

Sun microsystems

JDDAC - Distributed Data Acquisition and Control for Java

JDDAC – An Open Source Community of Developers for Java Sensor Networks

- Develop open source Java sensor network software
  - Self-describing measurements
  - Plug 'n Play sensor integration
- Base on IEEE 1451 Standards
  - NIST-supported
- Support different network types
  - Cellular, TCP/IP, etc.

JDDAC Board Members

Agilent Technologies

Sun microsystems

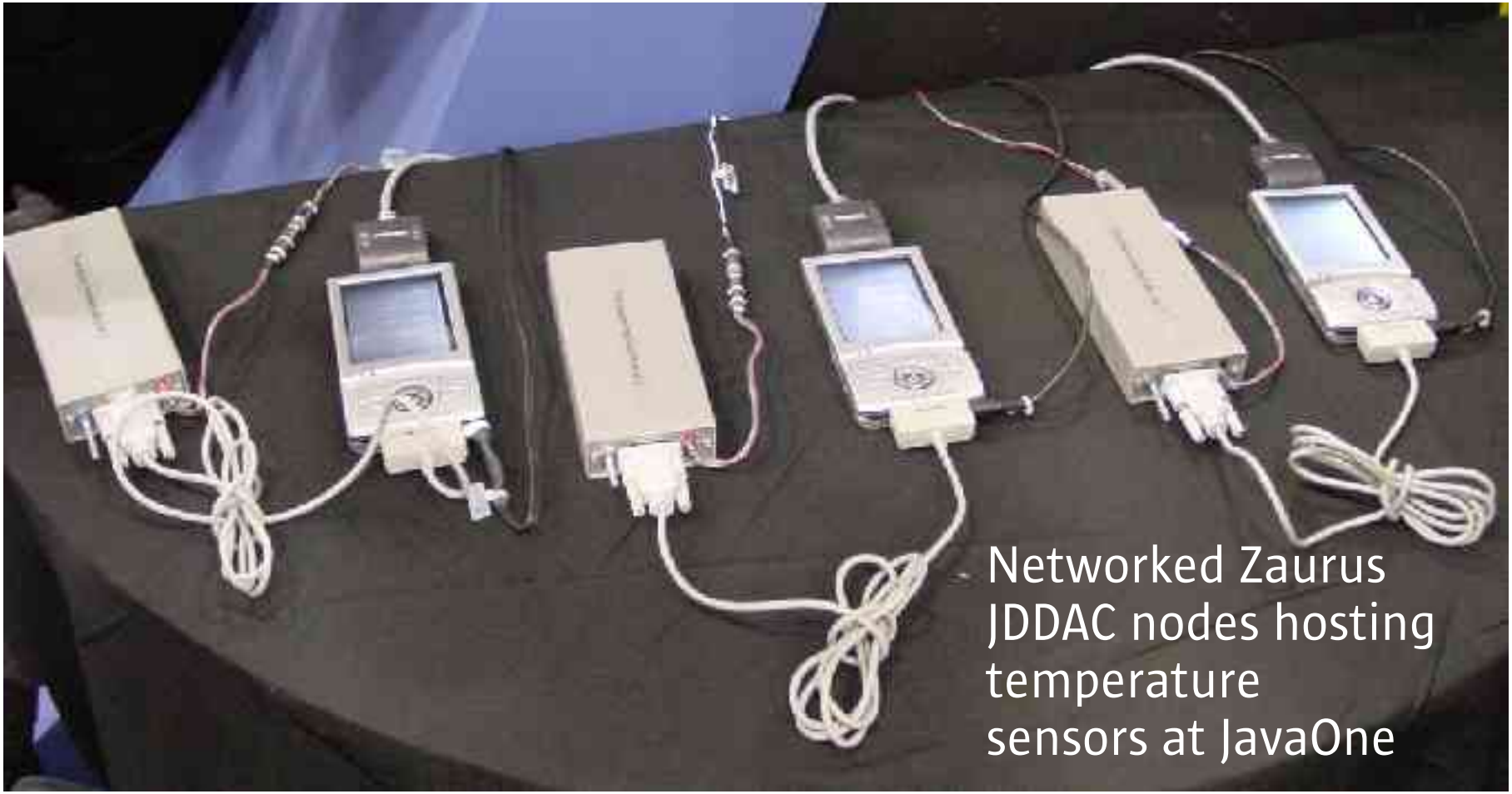
San Francisco State University

accenture

SYSTRONIX
Embedded Java Spoken Here

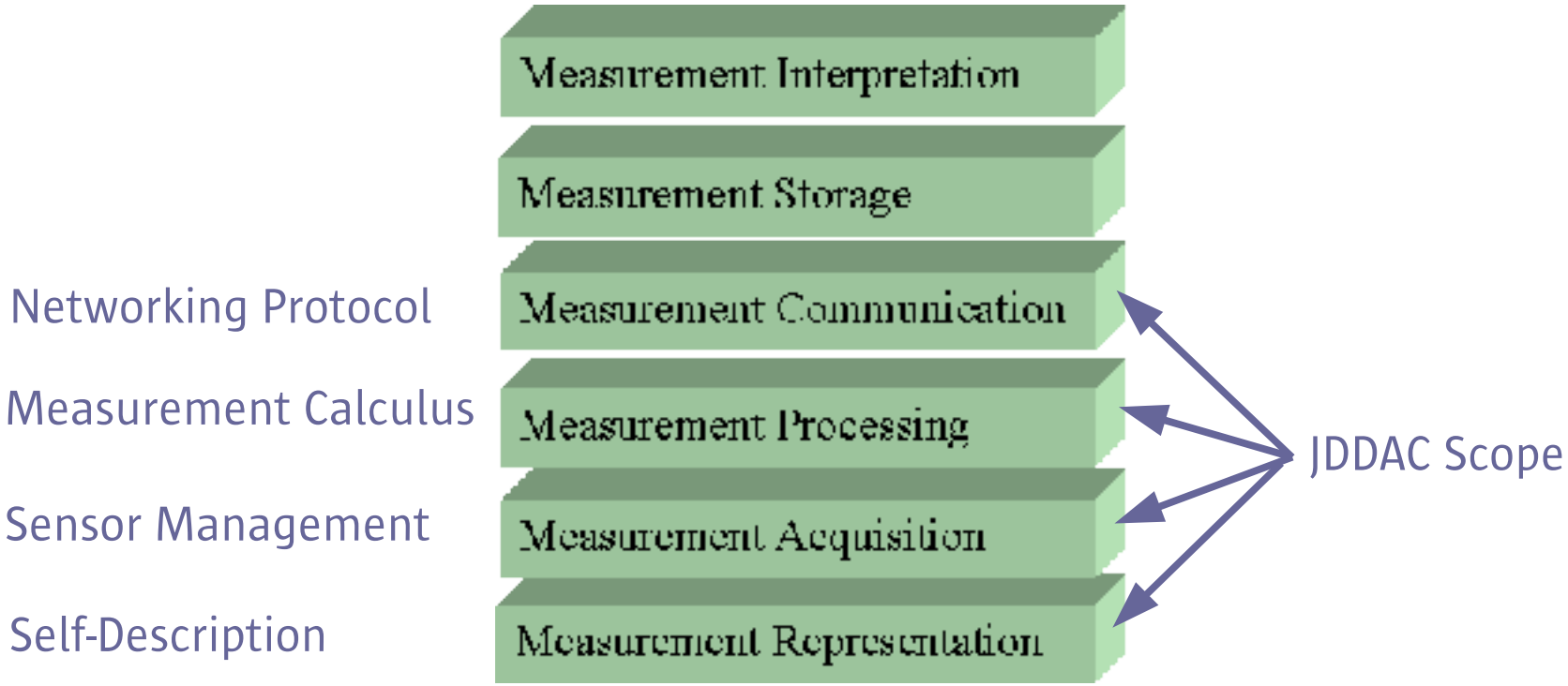
Virtualizing Sensors and Actuators

Java + IEEE 1451 + Open Source



Anatomy of the Measurement Process

JDDAC represents, acquires, processes, and communicates

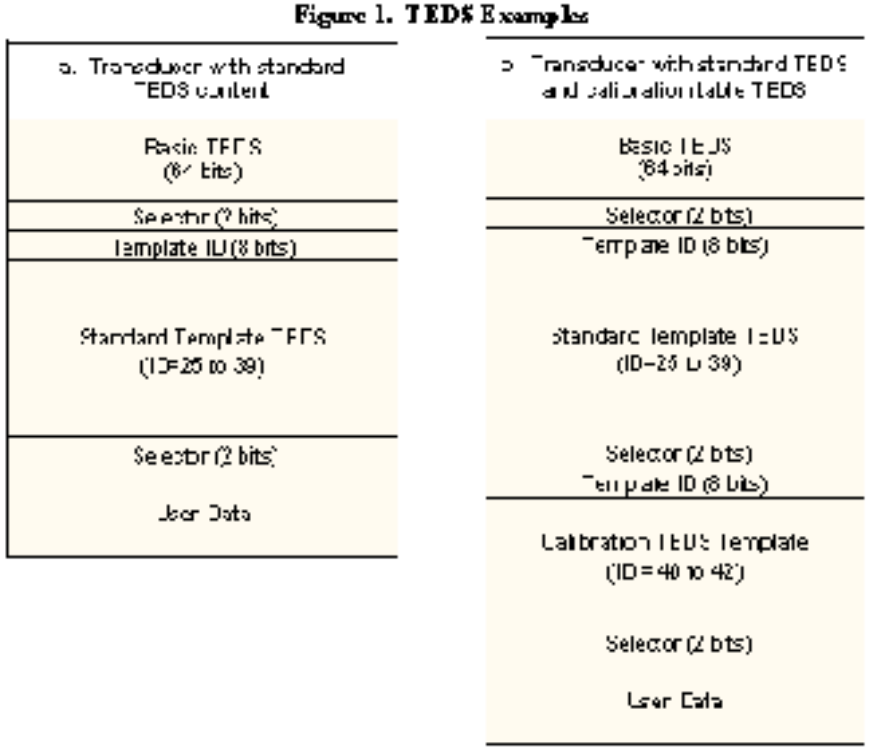


Need a dataflow-oriented computation and communication framework...

Self-Description

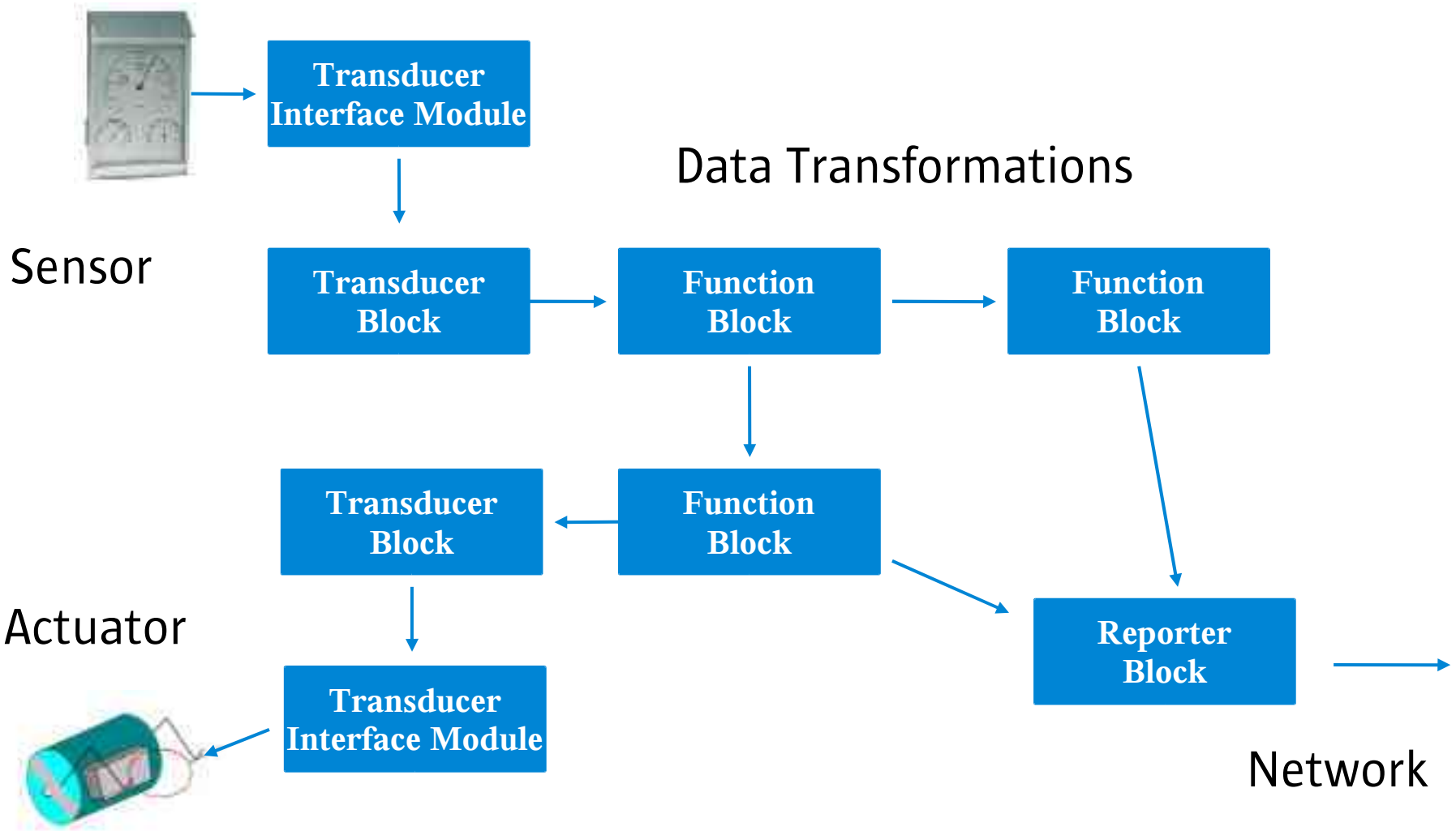
The Transducer Electronic Datasheet (TEDS)

- IEEE 1451.4 “Plug and play” capabilities for analog transducers
- Information needed by an instrument to identify, characterize, interface, and use the signal
- Embedded in the sensor



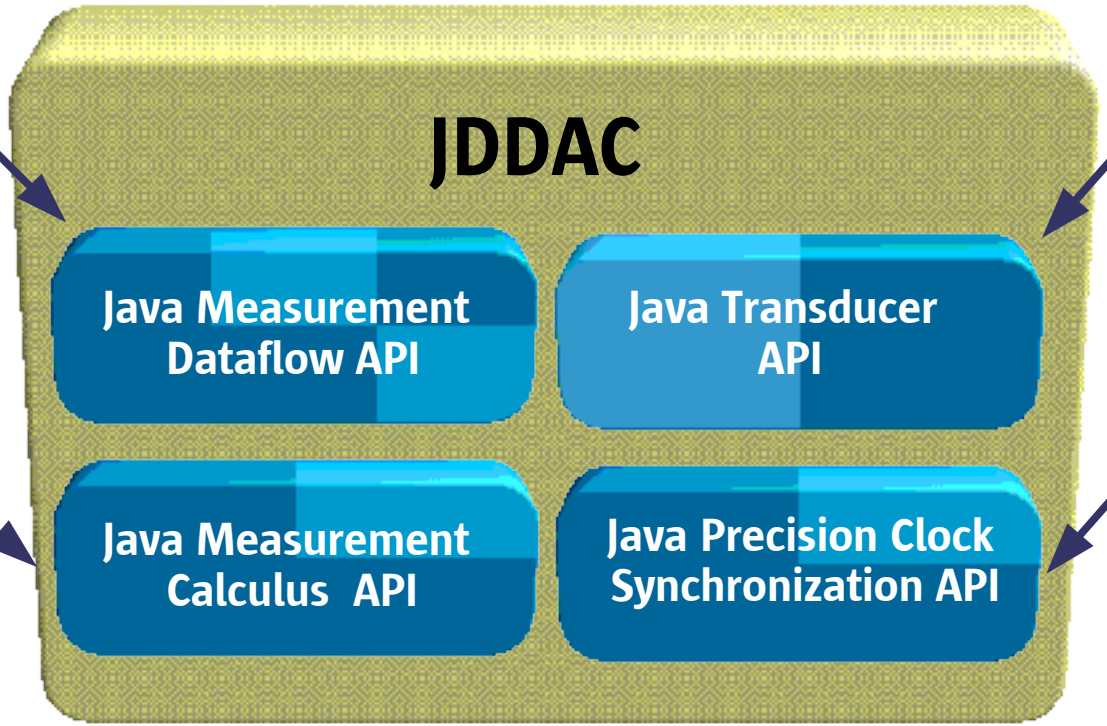
Putting it Together

Data Flow, Transformations and Reporting at the Node



JDDAC Component Projects

Java API's to Build Measurement Nodes



JMDI Project

Dataflow framework where measurement data are processed and transformed

JTI Project

Interface for applications to address transducers and an electronic datasheet to characterize transducers and their measurements

JMCI Project

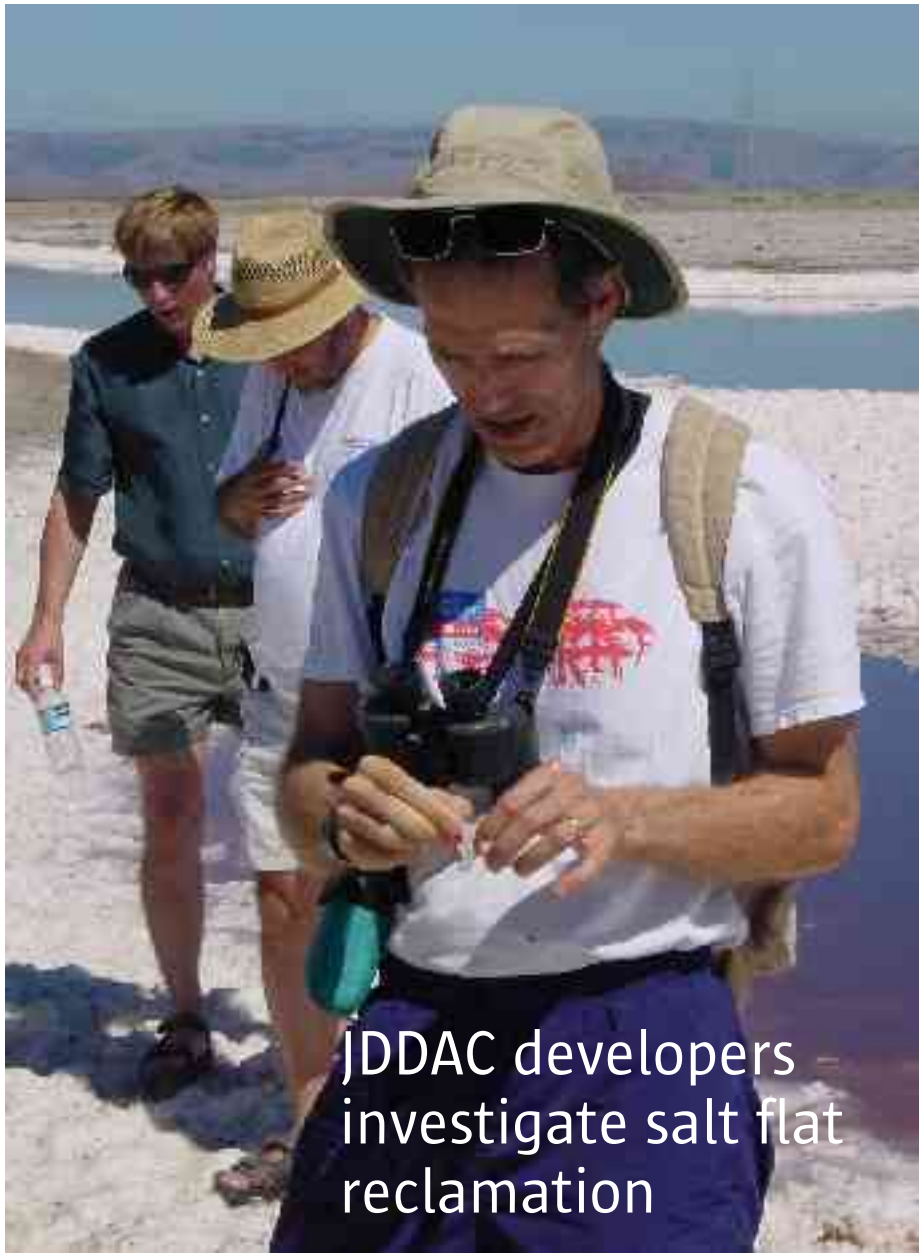
Common data representation for all types of measurements and a measurement calculus to operate on the common data representation

JCPSI Project

Interface to manage and utilize synchronized clocks in a distributed system (IEEE 1588)

Real-World Sensor Networks

- Deployment means adding node management, data distribution, storage and display
- Applications
  - Environmental monitoring, seismic and tsunami warning
  - Building automation, energy management



JDDAC developers investigate salt flat reclamation

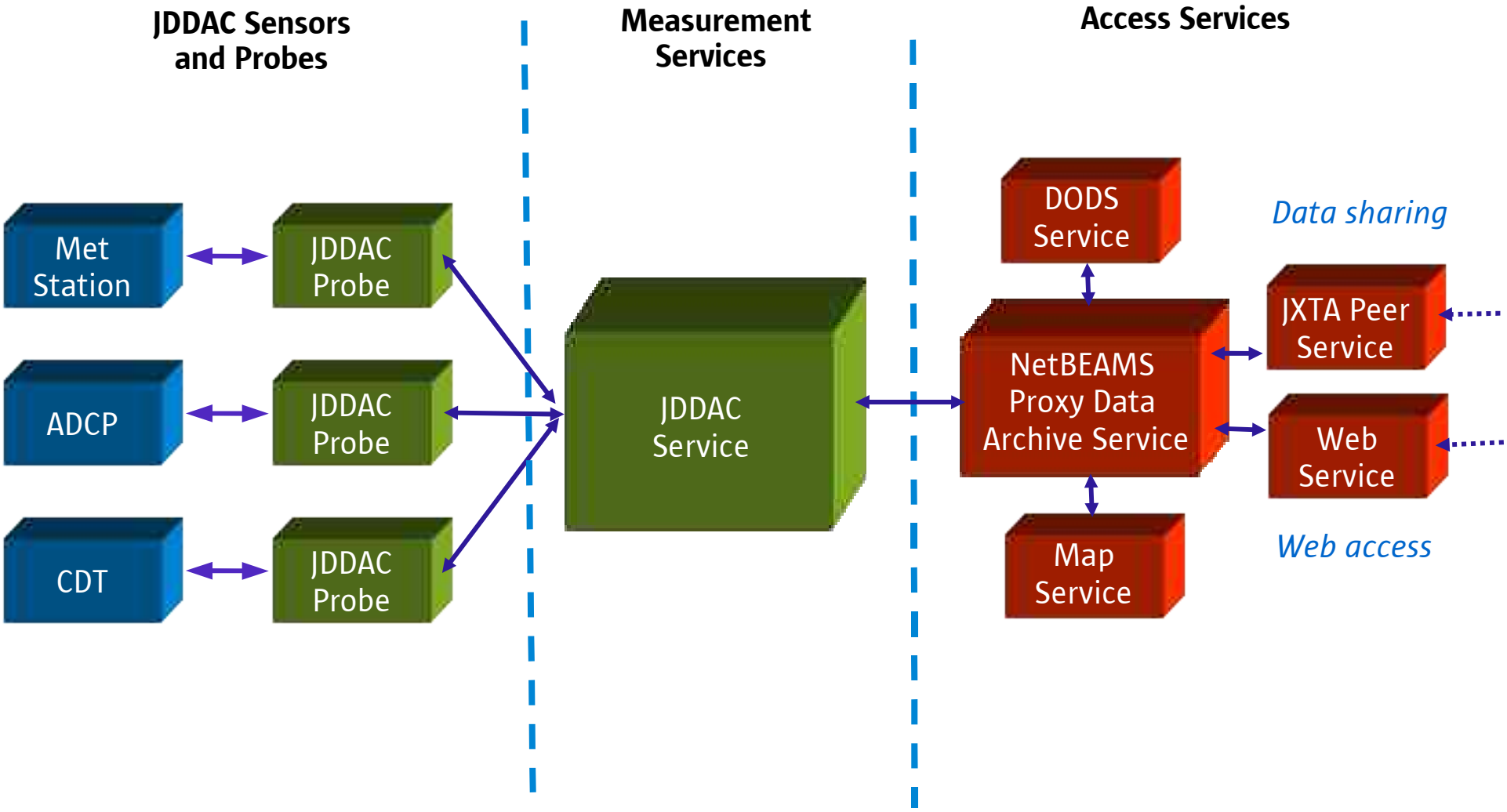
NetBEAMS - Networked Bay Environmental Assessment and Monitoring Stations

- Joint project with Sun, Agilent, SFSU, the Romberg Tiberon Institute and the JDDAC community
- Monitors SF Bay water quality

Contributes to the environmental monitoring capabilities of CICORE, the Center for Integrative Coastal Observation, Research and Education in SF Bay and along the Pacific coast

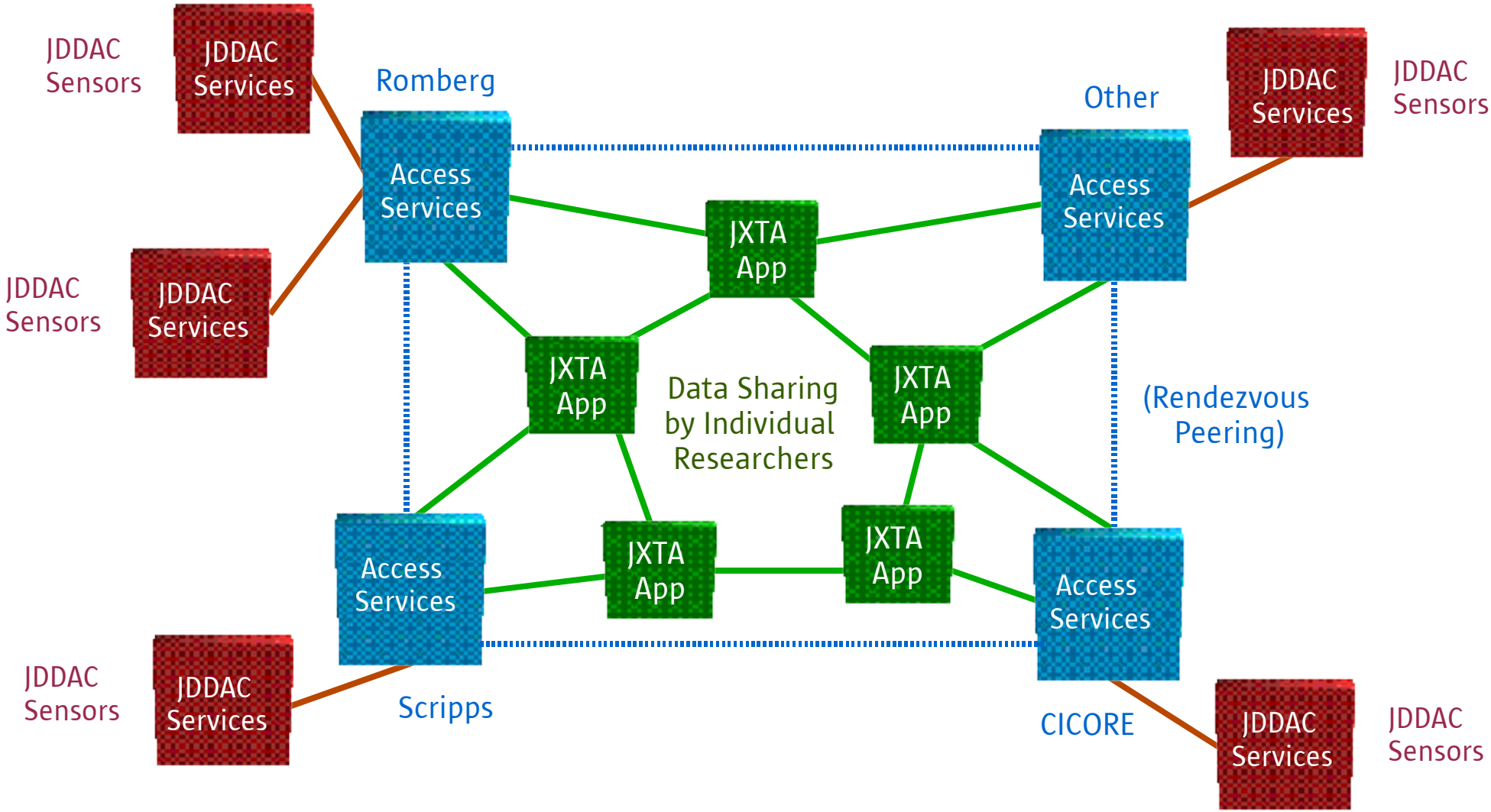
NetBEAMS Architecture

End-to-end data collection and sharing



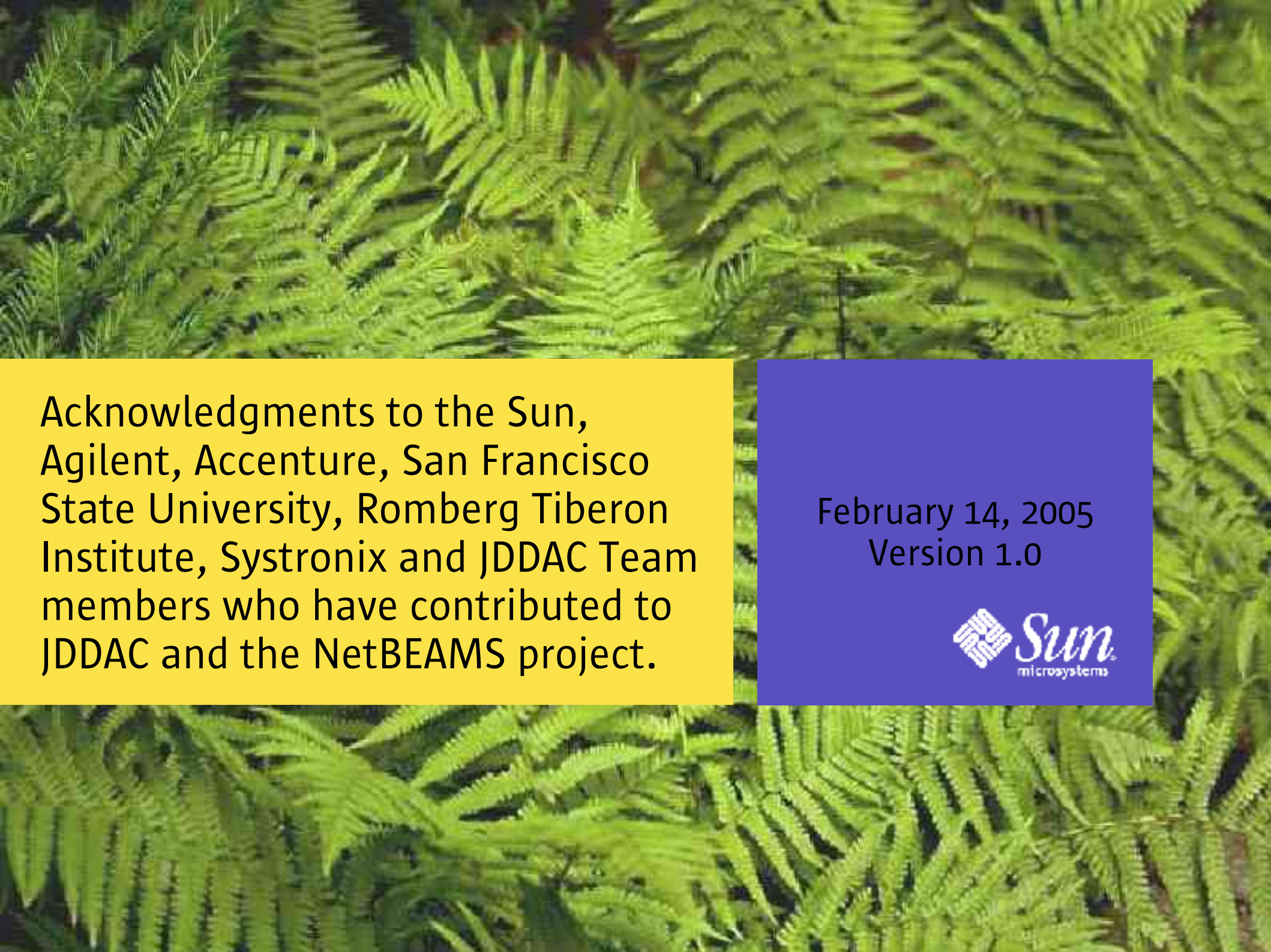
NetBEAMS Data Sharing

Using JXTA Peer Services



References

- JDDAC java.net project
  - http://jddac.dev.java.net
- NetBEAMS java.net project
  - http://netbeams.dev.java.net
- JXTA java.net project
  - http://jxta.dev.java.net
- NetBEAMS Architecture
  - http://netbeams.dev.java.net (Documents & Files)



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