**Pervasive Computing**

- **Ubiquitous smart devices**
  - Deployed in working and living spaces
  - Some mobile, some stationary
- **Powerful network services**
  - Shared within the infrastructure
- **Devices and services are context aware and coordinate with each other**
  - Provide immediate and universal access to information
  - Support users in completing their tasks

**Problem**

- **Giant, ad-hoc distributed system**
  - Tens of thousands of devices and services come and go
- **Yet, applications need to work continuously**
  - Adapt to a changing environment
  - Run even if
    - Devices are roaming
    - Users switch devices
    - Network provides only limited services, or none at all

**Approach**

- **Alter way programmers think about applications**
  - Programming for change in
    - Remote resources
    - Local resources
    - Application data
- **Provide system support**
  - Integrated architecture
  - Designed to support pervasive applications
  - Provides powerful primitives to help programmers

**Features**

- **Structured I/O**
  - Preserve structure of application data
  - Data represented as tuples
  - Strongly typed records
  - Common interface to storage and communications
    - Atomic read and write operations
    - Storage only
    - Transactions
    - Searches
- **Asynchronous events**
  - Scale better than threads
  - Make execution state explicit
  - Provide control over scheduling
  - Have been used successfully across a wide range of other systems:
    - Tiny OS
    - Palm OS
    - Chinook
    - Windows
    - Ninja
- **Encapsulation**
  - Control storage and computations
  - Hierarchical environments
  - Containers for stored tuples, active computations, and other environments
  - Provide isolation and resource controls

**Status**

- **Core implemented in Java**
- **Uses Berkeley DB for tuple storage**
- **Missing**: transactions, class loading from environments, and resource control
- **Exploring applications**
  - digime – PIM on steroids
  - Conducting an experiment: 490dp
  - Projects compare Java & one.world
- **Made source release (v0.4)**