Problem: Control Systems for a Smarter Planet

*Smarter Planet:* An IBM initiative to instrument and interconnect the world’s systems.

Current developers find it difficult to design, build, and diagnose worldwide control systems on insecure, unreliable networks.

Solution: Comprehensive Platform

*Olingua Franca:* unified architecture for trustworthy distributed control systems.

**Programming Model**

Instead of the existing monolithic approach which forces developers to anticipate and handle all risks of distributed systems, we propose a new approach.

**What developers do...**
- Define modular control systems with simple, contained logic
- Prioritize hierarchy of modules

**What Olingua does...**
- Provide a safe sandbox environment in which user modules run
- Factor out problems common to by distributed systems

**Security**
- handled by Olingua, not programmer
- all traffic is secure by default
- use proven underlying technology: RSA encryption, PKI infrastructure

**Resilience**
- universal response to any failure: fall back to prioritized module and rebuild functionality
- no error-handling code required

Prototype: Reduction to Practice

To demonstrate Olingua’s advantages, we designed an example control system that could efficiently govern home heating for a model neighborhood on the Smart Grid. We then simulated this system on top of Olingua across networked distributed hardware devices.