

# A Distributed Large Sensor Network Observing Global Environment



Satoshi MATSUURA

[matsuura@is.naist.jp](mailto:matsuura@is.naist.jp)

( NAIST / NICT )

Our belief

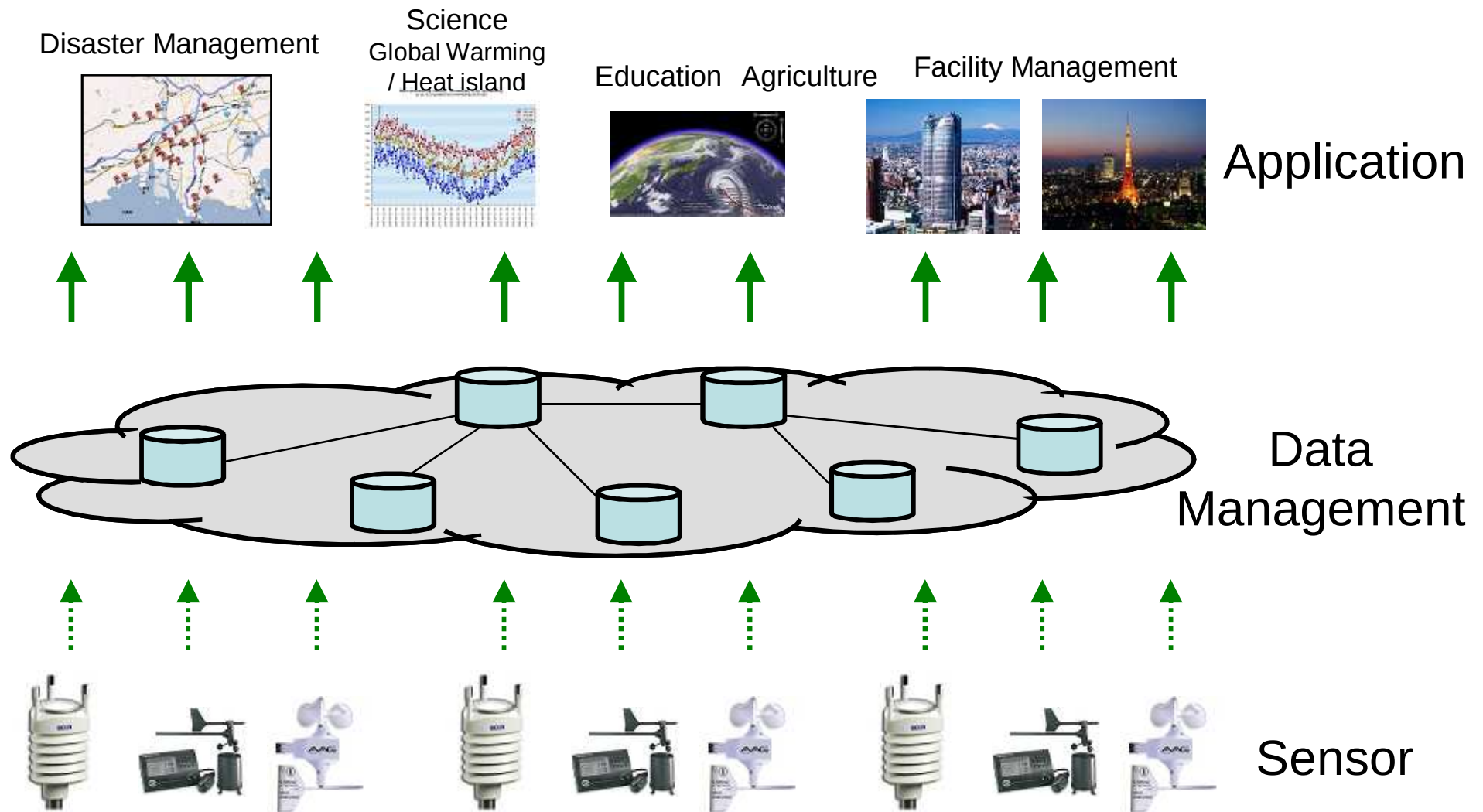
**Sensor data**

is

**Common property**

**Live!**

# A Large Scale Sensor Network



# Weather Sensors

- attributes
  - temperature
  - humidity
  - pressure
  - rainfall
  - wind direction
  - wind speed
  - CO2



**Vaisala WXT510**



**WM918**



**WMR968**



**VantagePRO2**



**One-Wire Weather Station**

# Live E! sensor installations

2008 Sep.



Europe



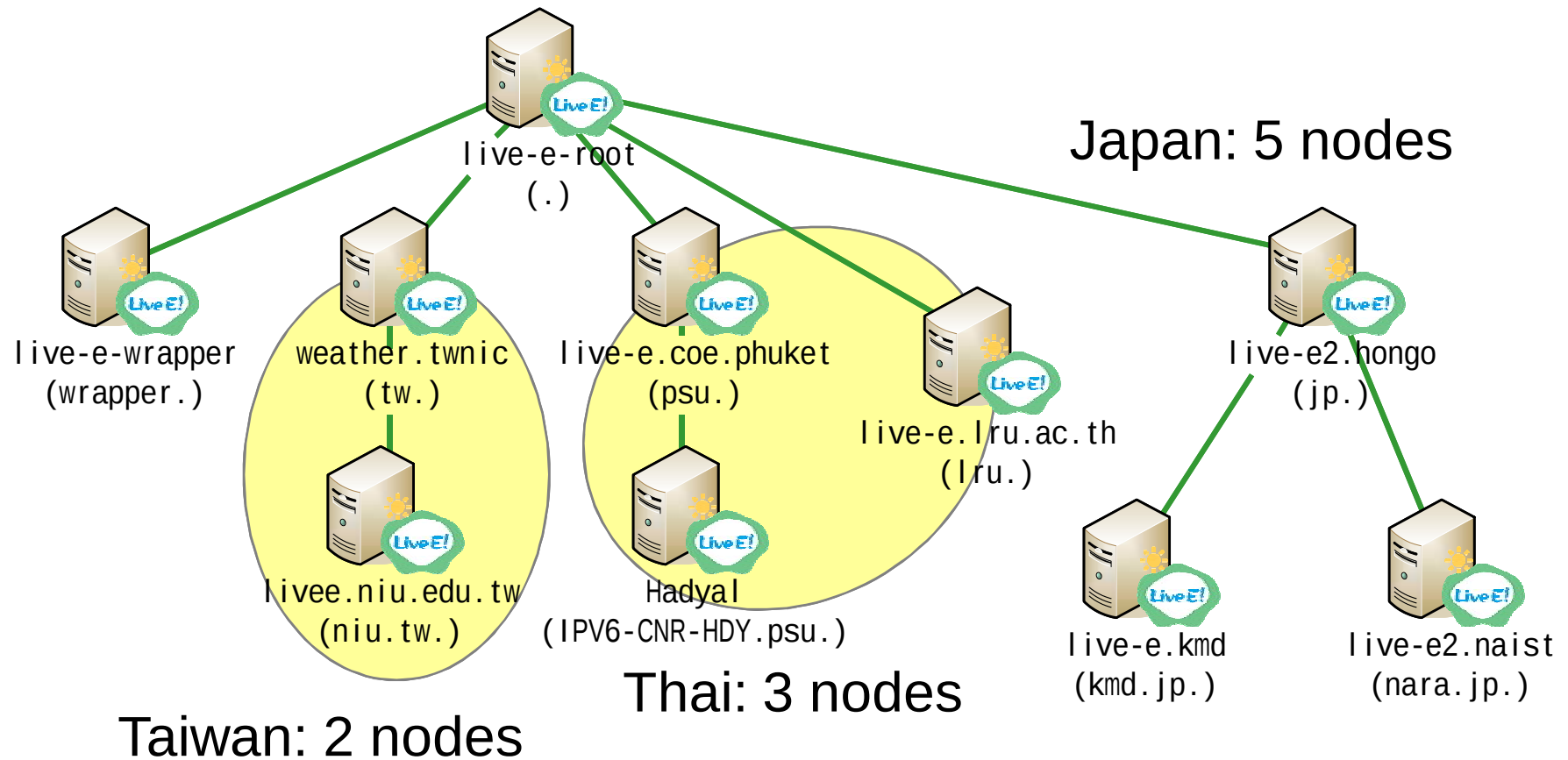
North America



Asia

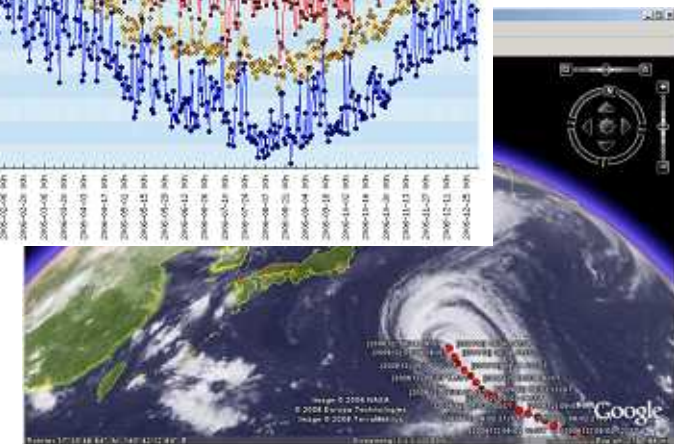
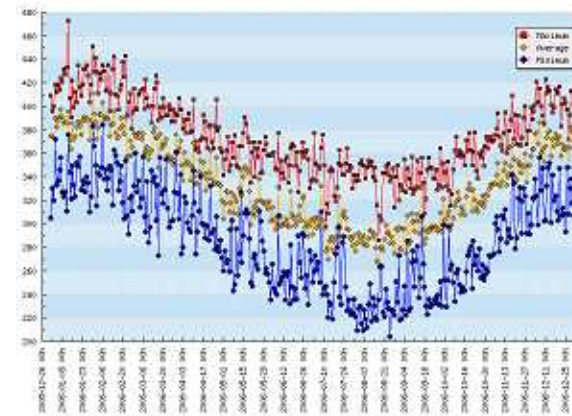
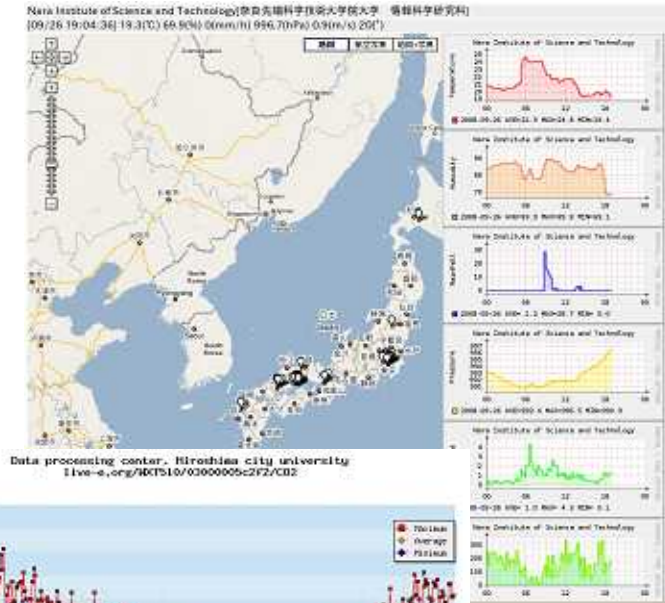
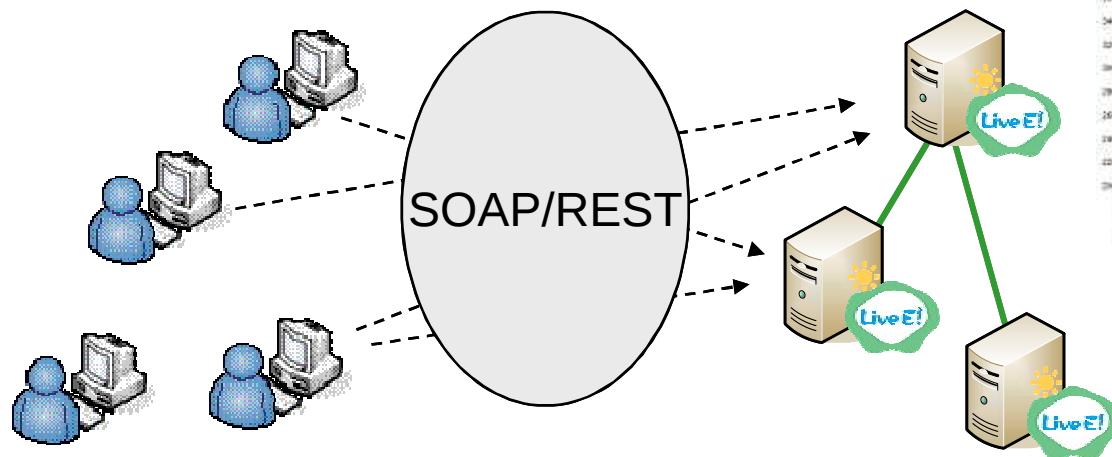
# Live E! distributed servers

## 2008 Sep.



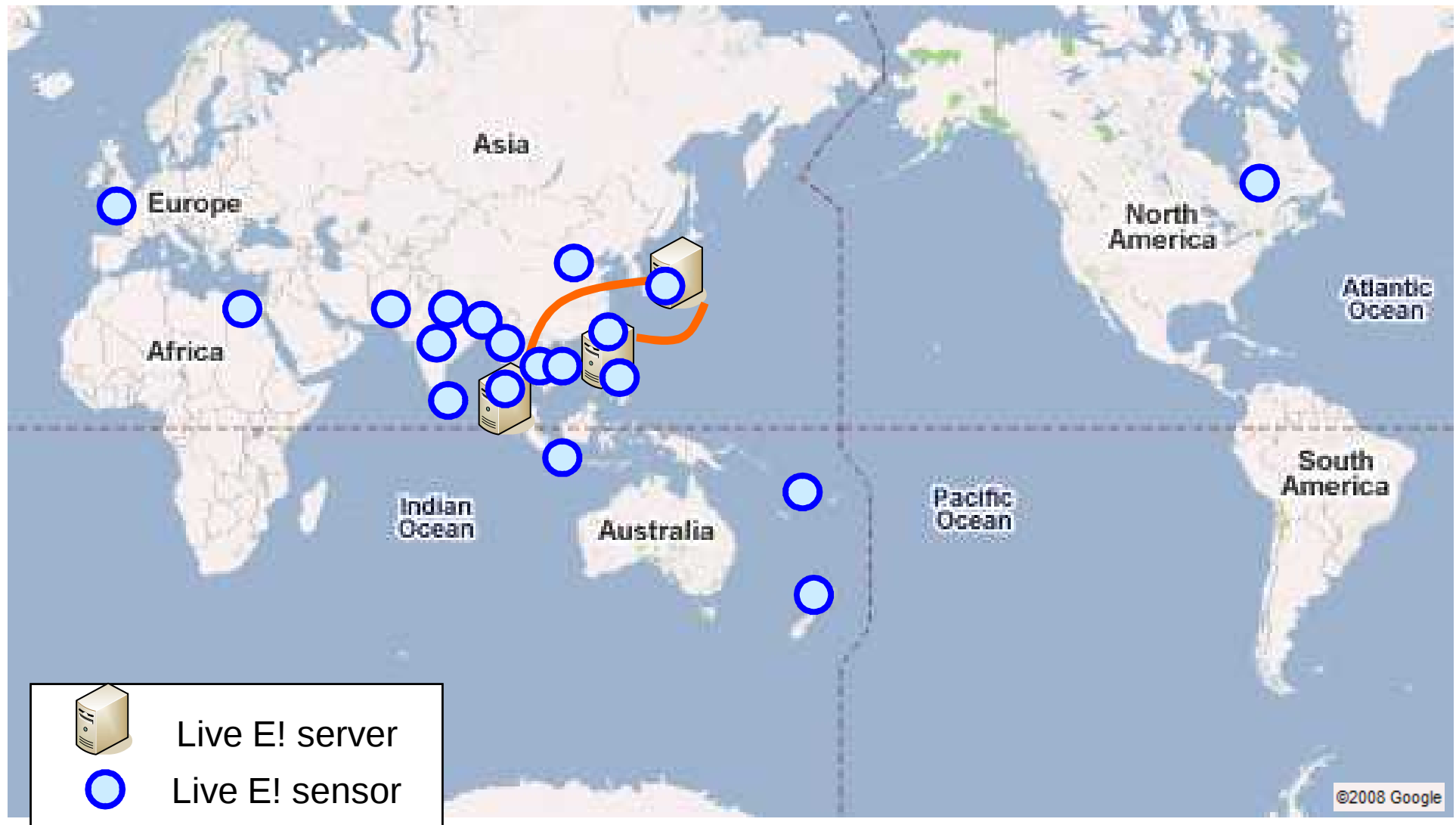
# How to provide sensor data

- Data access by SOAP/REST
  - “XML” or “JSON” format
- Process sensor data, redistribute
- There are lots of services
  - mainly web applications



# Auxiliary slides

# Live E! sensor installation plan (country base) 2008 Des.

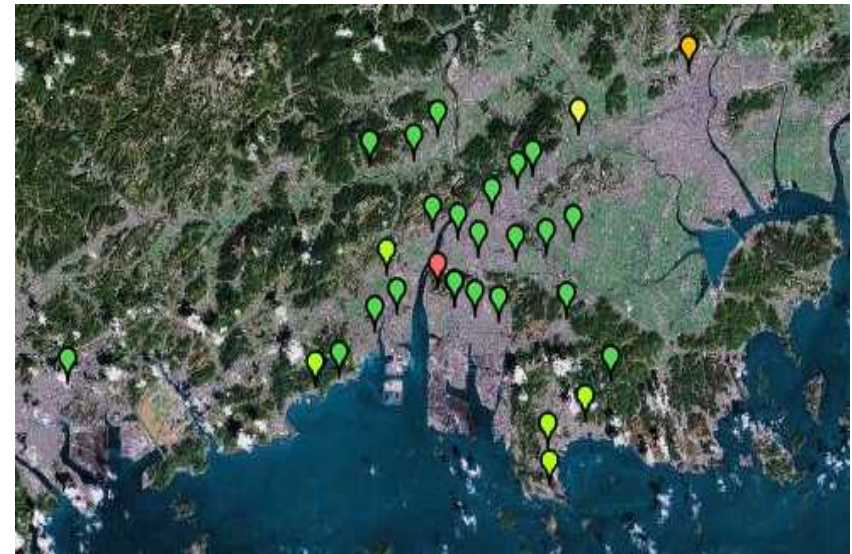


# Research topics @ Live E!

- Data management
  - Distributed servers system
  - Peer-to-peer system
- Embedded machine
  - Analyze sensor data, communicate servers
  - Auto configurations
- Wireless environment
  - Ad-hoc networks, delay tolerant networks
- Etc.

# Disaster prevention

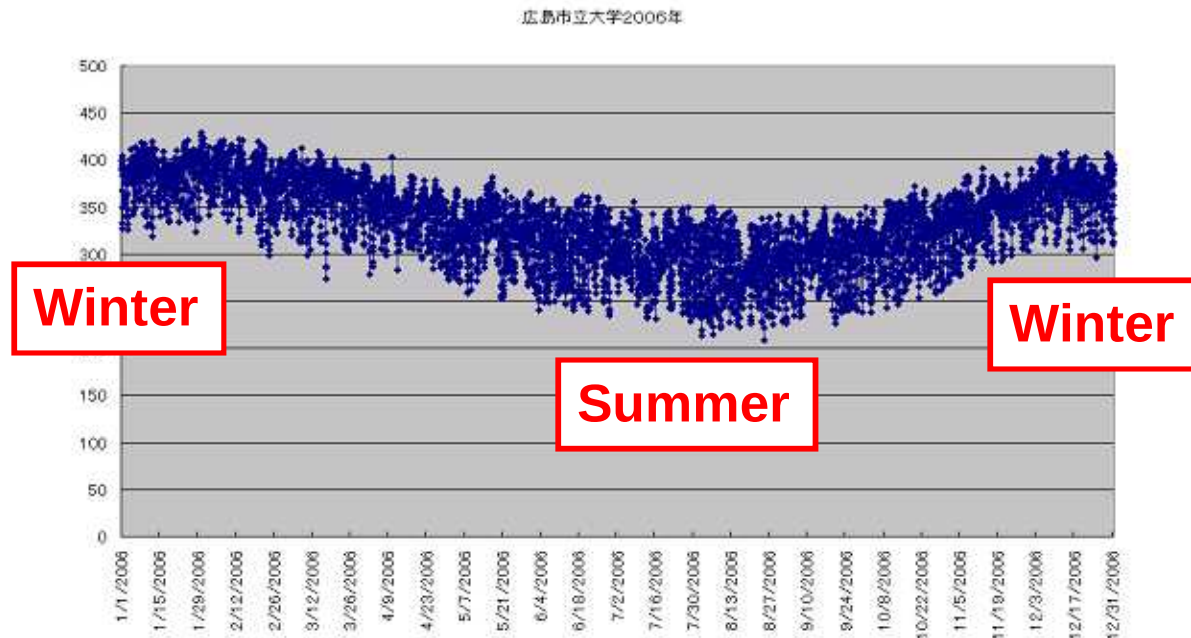
- Kurashiki City (Japan)
  - Evacuation instructions
  - Weather sensors at schools
    - 3km × 3km
    - 20, 30 times than AMeDASs



<http://live-e.naist.jp/map/>

# Educational materials

- Hiroshima Pref. (in Japan)
  - Educational applications
  - Making graphs of CO2 data
- Remote school between Japan & Thai

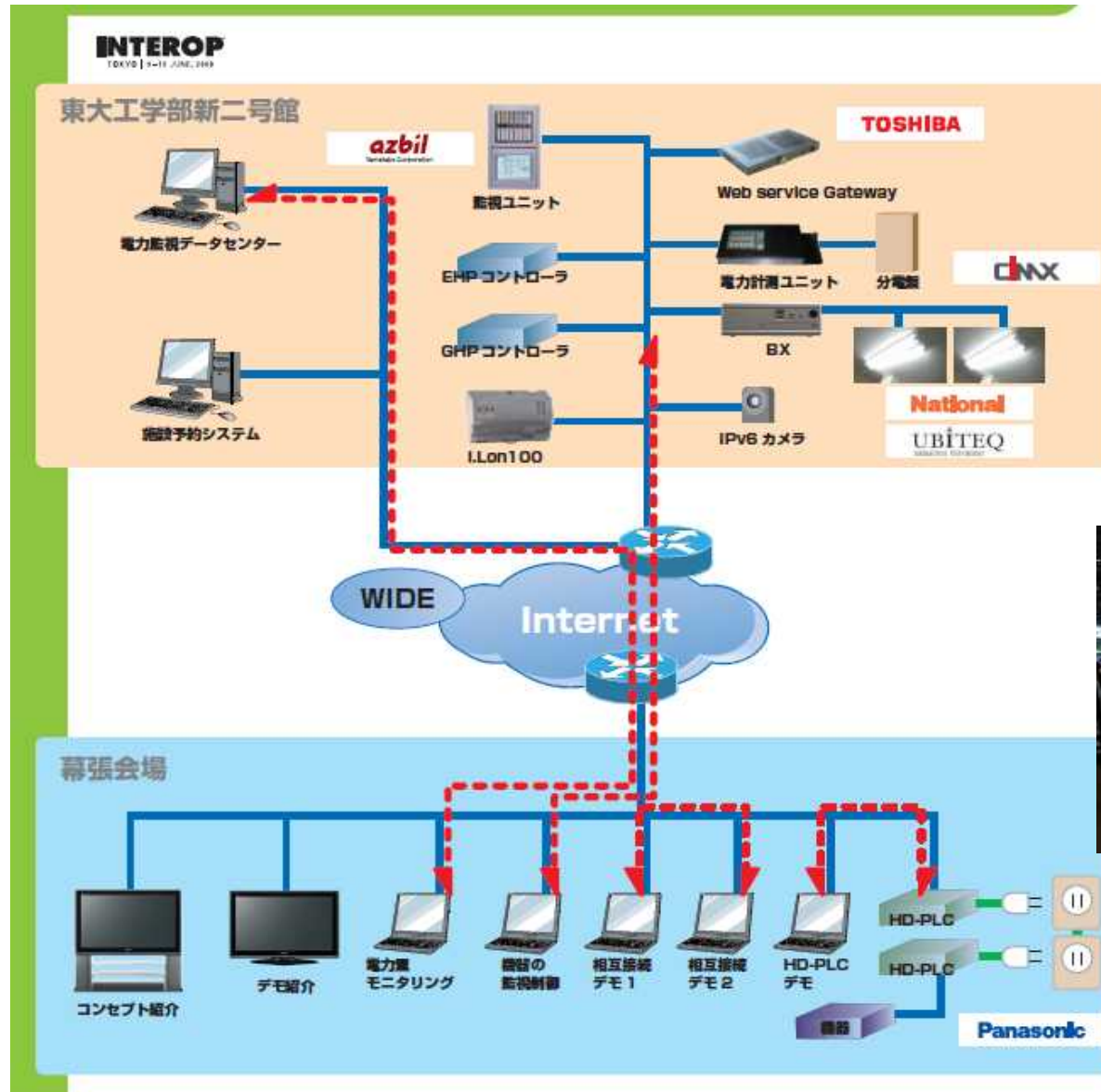


<http://center2.ipc.hiroshima-cu.ac.jp/~kaori/live-e/CO2/>

# Visualize power consumption



# Live Demonstration at INTEROP Tokyo 2008 (June 11-13)



# 2nd Live E! Workshop

## Jan. 2008 (in Thai-UniNet)



# 3rd Live E! Workshop Aug. 2008 (in APNG-CAMP)

