Weather Forecast Application on the Sensor Network

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Motivation

- We'd like to enjoy the weather forecast service in narrower area where we lives and shorter period.

- For example
  - It seems to rain. We should put the laundry away or not before we go shopping.

- But…
  - Official weather forecast service is not flexible and is no good with this situation.

Background

- Some people and companies open their data from the weather sensors on their website.

- In Japan, Live-E project is established in order to recognize the environment of the Earth. This project has about 150 points in Japan and neighbor countries and open the weather data by web services (SOAP, xml).

- If we use these data well, we can get the more flexible weather information.

Live E! Site
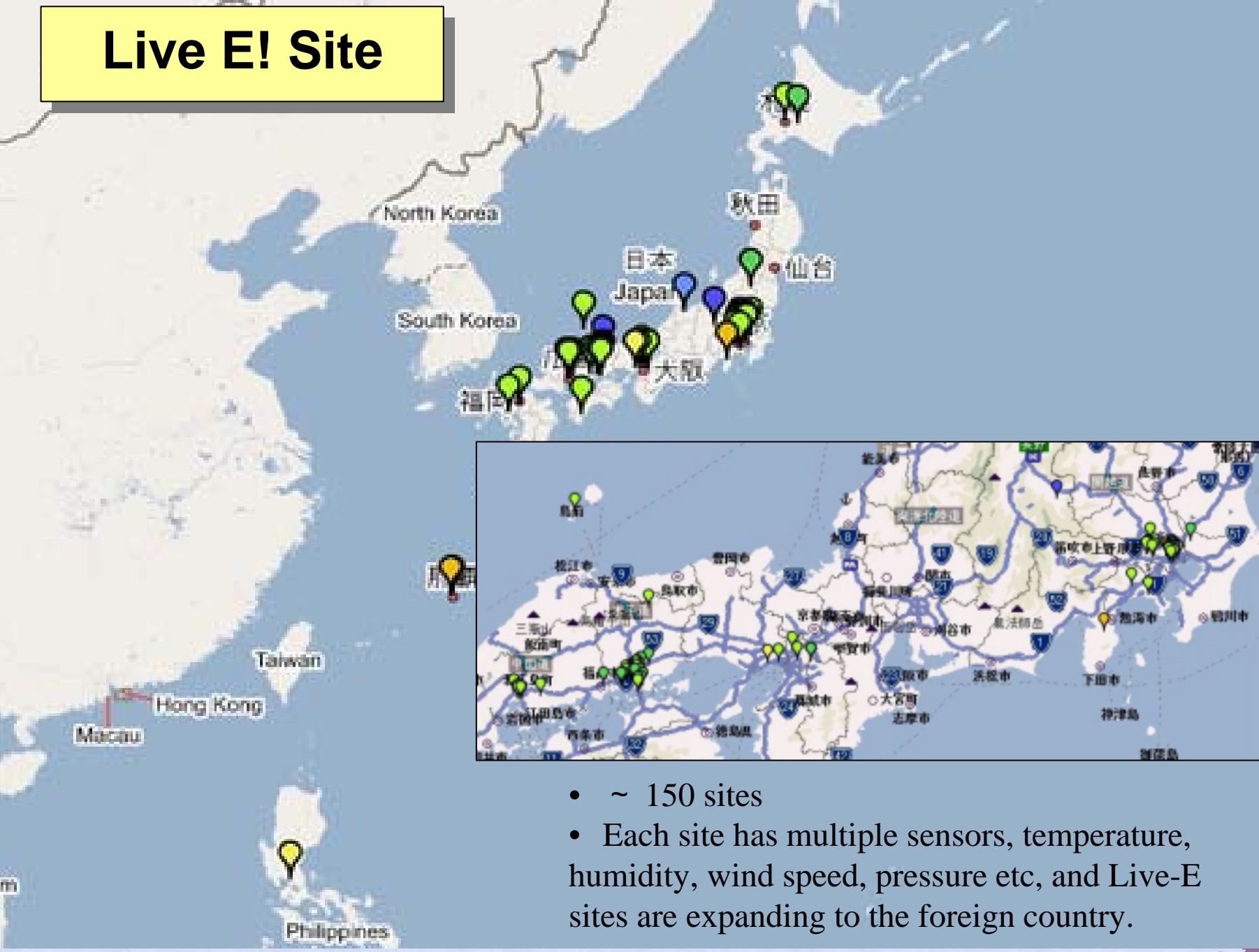
- 150 sites
- Each site has multiple sensors, temperature, humidity, wind speed, pressure etc, and Live-E sites are expanding to the foreign country.

P2P, Grid, Web Services

PIAX A P2P AGENT PLATFORM

- P2P platform developed by CMC.
- Based on Java
- LL-Net DHT
- Web Services
- You can download PIAX from https://sourceforge.net/projects/piax/

P2P network by PIAX
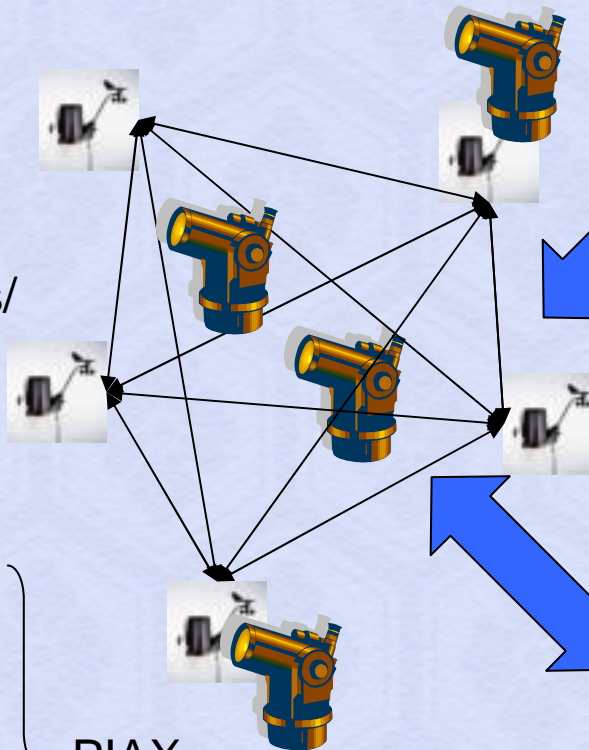
Weather Data
Web services

Live E!

Other
Data providers

Grid Resource

Application

Auth, Secure Support	Web Service	Agents Home
	glue	
	P2P Overlay	LL-Net
		DHT
	RPC / Streaming Wrapper	
	Physical Network	
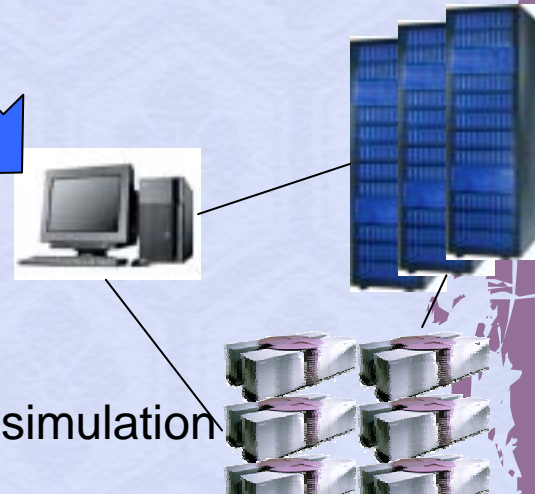
PIAX

Prediction by
Hydrodynamic simulation

Example of our application for weather forecast

Prediction by AR(auto-regressive) model

Historical data

Obs. data

Prediction

Prediction by AR model is independent of the data of the other points.

Spatial interpolation give us the
data of the area where doesn't have the sensor.
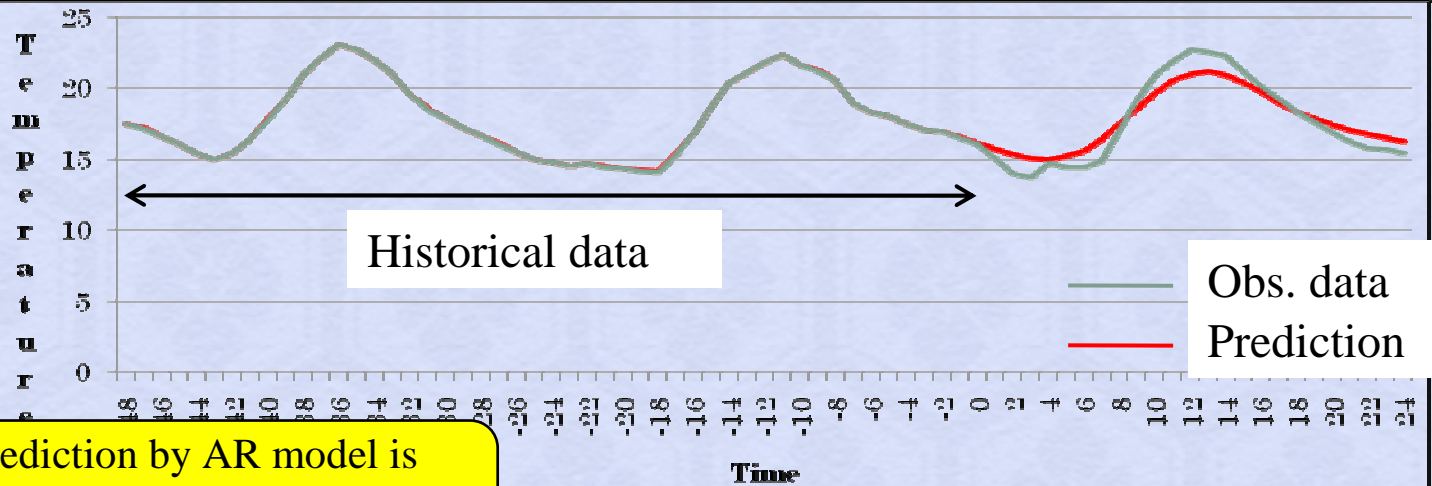
Future plan & Our hope

- Raise the precision of the prediction by the improvement of the model.

- We'd like to use much data because we don't have enough sensors in order to predict the weather. If you know the data sources that we can use in your country, please tell us the information!

  - Can we use the data of EcoGrid or GeoGrid?