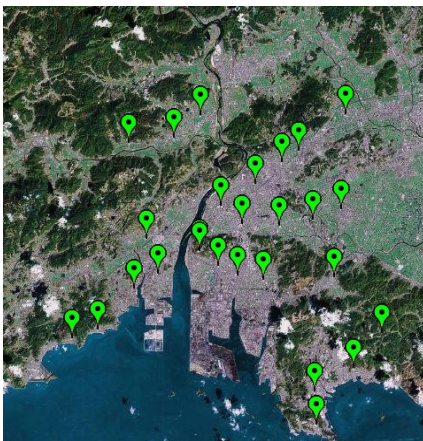# Introduction to Live E! Project

Live E! project is a community of those who are interested in sharing sensor data. Sensors are an essential tool for many activities: i.e., agricultures, provisions for natural disasters, facility management, statistical analysis, and educational tools for schools. Many organizations have their own sensor system for their activity. If these data were easily exchanged on a standard platform, their data would contribute to other applications and they could also take advantage of third-party application software for their activity. A goal of the project is the establishment of such a platform. Please refer to http://www.live-e.org/ for detail.

## 1. Live E! Application

Live E! project has started three years ago. We here demonstrate two primary achievements in terms of applications (though there are a number of achievements).
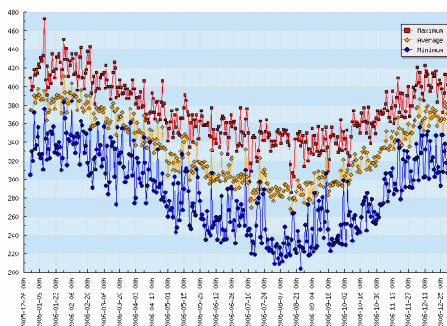
### Provisions for natual disaster:

Kurashiki-city, Okayama, Japan

26 points: elementary school & junior high school

Rainfall has a locality; i.e., many sensors are needed to monitor the area for predicting flooding correctly.

The local government uses these sensor data for flooding prediction.

### Educational tools for schools:

The graph shows an annual transition of $CO_2$ density at Hiroshima, Japan. The density in January is higher than that in August. Let's consider why this happens….

Sensor data can also be used for this purpose.

For the next stage of Live E!, we seek contributions for other applications such as agriculture, facility management, outdoor activity, power supply, and so on.
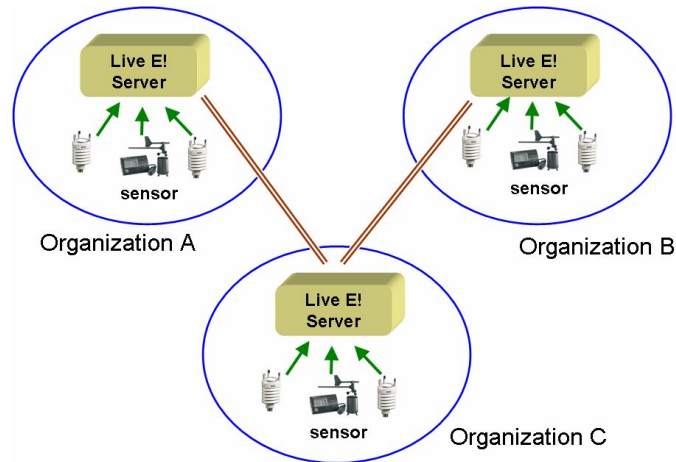
## 2. Live E! System Architecture Overview



**Figure 1: Autonomously Distributed Server Architecture**

Live E! sensor network is constructed with autonomously distributed servers(Figure 1). Live E! servers can be set up and operated by different organizations, and these servers are linked to each other exchanging sensor information for query routing. Users can request to their server to retrieve sensor data from the network. Each organization can manage their server and data by themself.

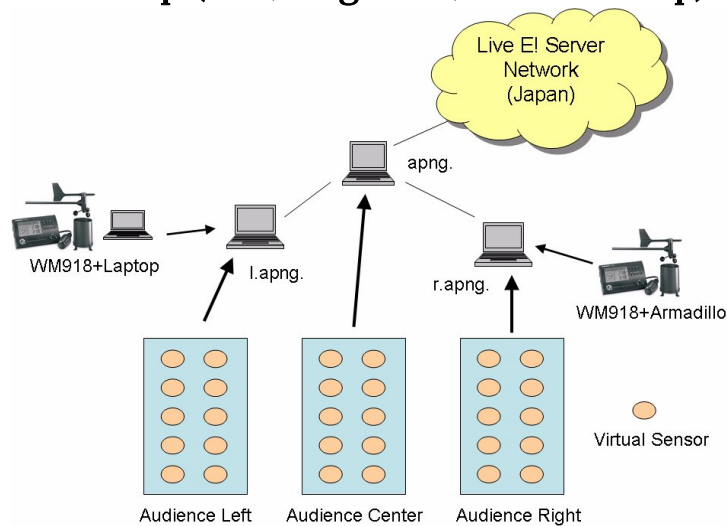## 3. Live E! Workshop (30th, Aug 2007, APNG Camp)



**Figure 2: Live E! Workshop Scenario**

In the Live E! workshop, we will set up three servers in the meeting place and bind them to the Live E! authorized root server in Japan(Figure 2). We will show some demonstrations using the network with some sensors. The goal of the workshop is understandings of effectiveness of sensor data sharing, and the architecture of Live E! system. We are also planning to include audiences in the workshop. Audiences are

expected to submit their sensor data with a virtual sensor. However, since the value itself generated by the virtual sensor probably has no interest, we propose they set the value depending on their emotional factors: e.g., anxiousness, aggressiveness, stress and so on. Sensor data published to different servers will be merged and shared as Figure 3 shows.



**APNG Camp --- Live E! Workshop ---**

**Sensors in Xi'an**

| Name | Sensor ID | Time | Temperature | Humidity | Pressure | RainFall | WindDir | WindSpeed |
|---|---|---|---|---|---|---|---|---|
| Akihiro Sugiyama | hongo.wide.ad.jp/WM918/sugi/ | 2007-08-23 14:47:28 | 49.6 | 7.4 | 956.7 | | 190 | |
| Hideya Ochiai | hongo.wide.ad.jp/WM918/test/ | 2007-08-23 17:19:09 | 32.2 | 57.1 | 1050 | 14.5 | 207.7 | 48.9 |
| Masato Yamanouchi | live-e.org/Virtual/01000001/ | 2007-08-23 17:19:15 | 16.4 | 46.2 | 1024.7 | 3.5 | 306.9 | 9.4 |

**Figure 3: Sensor data published by audiences and real sensors will be displayed like this.**

Here are the steps that audiences are expected to do in the workshop. Please, follow the instructions.

## 3.1. Server and Sensor ID Allocation (Accounting)

Sensor account will be provided in the meeting place by ID cards as Figure 4 shows. This card shows the allocated ID, and service URLs for profile registration and data upload.

Profile Registration Service: http://_____/axis/services/ProfileManagement200703
Data Upload Service:          http://_____/axis/services/DataUpload200703
ID:                l.apng.live-e.org/Virtual/0xx/

**Figure 4: Sensor Account ID Card Example**

Please use this information, in the following steps.

## 3.2. Sensor Profile Registration

Please, download a profile registration tool from:

http://live-e.naist.jp/SensorRegisterDX/   (requires JRE5.0)

### 3.2.1. Registration Service Setting

Please set profile registration service URL by "change service".

### 3.2.2. Sensor Selection

Please type "apng" in the keyword textbox, then Enter. Choose your sensor id allocated, correctly, then click "OK".
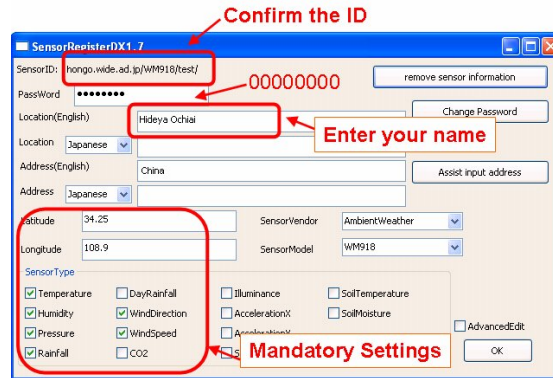
### 3.2.3. Sensor Profile Setting



**Figure 5: Profile Setting**

Please set sensor profile as follows (also see Figure 5),

- location(English): your name
- latitude: 34.25
- longitude: 108.9

Your name entered here will appear later as Figure 3 shows. The settings of "latitude=34.25" and "longitude=108.9" mean that your sensor is located in Xi'an city.

Please just set the following items. Do not care about the meaning here.

- address(English): any words are OK. (except "null" character)
- sensorVendor: AmbientWeather
- sensorModel: WM918
- sensorType: Temperature, Humidity, Pressure, RainFall, WindDir, WindSpeed

The password is "00000000".

## 3.3.　Sensor Data Upload

Please download Live E! virtual sensor from:

http://live-e2.hongo.wide.ad.jp/virtualsensor/

GUI version requires .NET Framework 1.1 to run. Console version can run on JRE 1.4. Set the data upload URL and your sensor ID, then "Start".

## 3.4. Getting Sensor Data via SOAP Web Service

If you have any chances, please try to get sensor data via a SOAP Web service. A Live E! server has a GlobalDataProvider200703 interface that searches and retrieves data

from the Live E! network.

The WSDL is http://_____/axis/services/GlobalDataProvider200703?wsdl

# 4. Live E! Software, Service and Documentation
## 4.1. Live E! Documentation
- A tutorial of Live E! server installation and operation: http://www.live-e.org/

## 4.2. Live E! Software
- Live E! Server Component: http://live-e.hongo.wide.ad.jp/dist/
- Sensor Development Toolkit: http://live-e.hongo.wide.ad.jp/DataUpload200703/
- Profile Registration Tool: http://live-e.naist.jp/SensorRegisterDX/
- Virtual Sensor: http://live-e2.hongo.wide.ad.jp/virtualsensor.html

## 4.3. Live E! Service
- Google Portal
  - http://www.map-asp.net/Spatial_Gateway/pl/Gate_100eng.html
  - http://www.map-asp.net/Spatial_Gateway/pl/Live-E_v2.html
  - http://live-e.naist.jp/map/
- Sensor List
  - http://live-e2.hongo.wide.ad.jp/globalsensorlist.php
  - http://live-e.naist.jp/

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