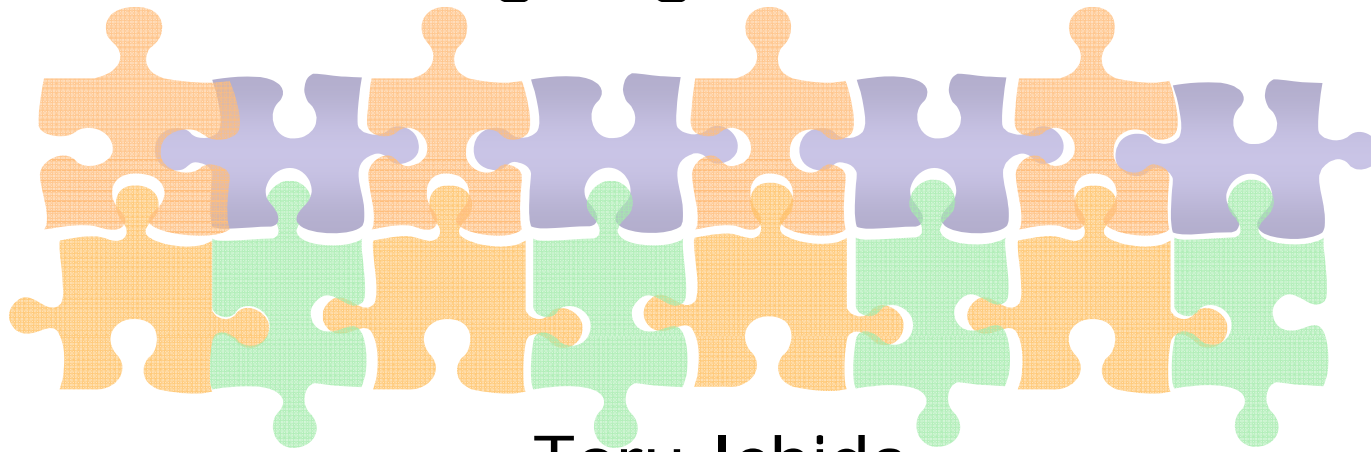
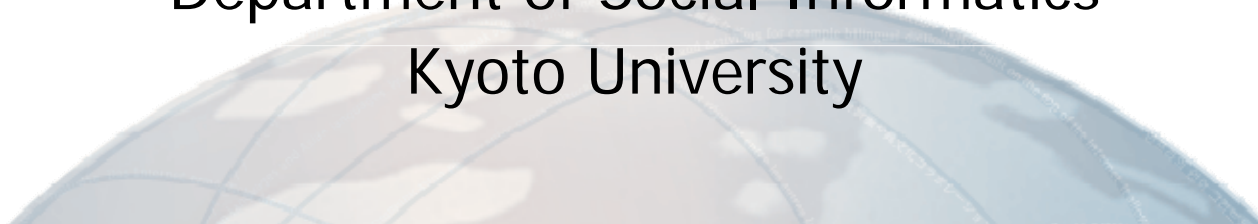


# Socio-Technical Approach to Support Multi-Language Communities



Toru Ishida

Department of Social Informatics  
Kyoto University

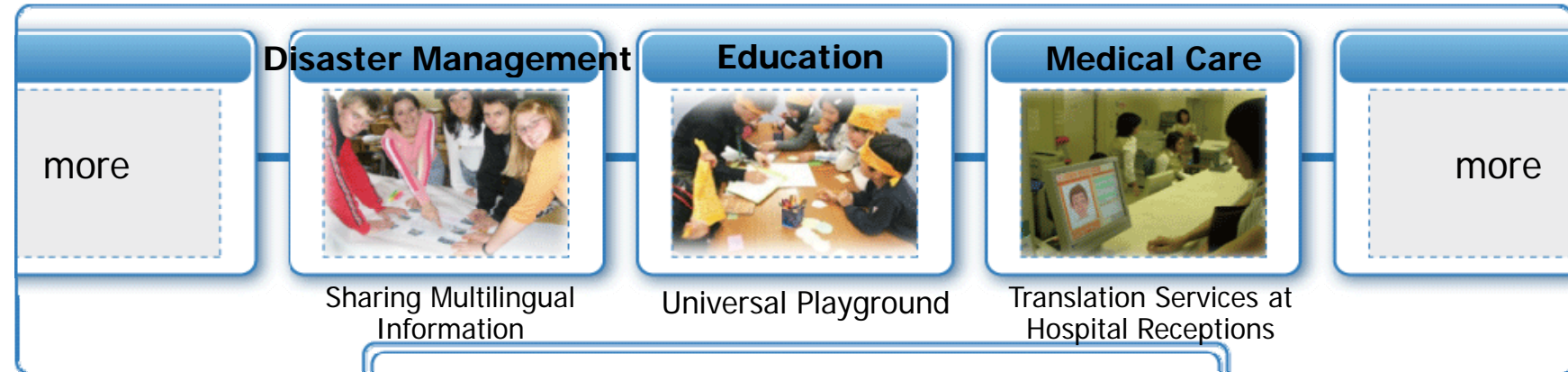


# **The Language Grid**

**- Service Oriented Language Infrastructure -**

# The Language Grid

From Language Resources to Language Services!  
From Possession to Use



Language Support for Multicultural Societies

Language Grid

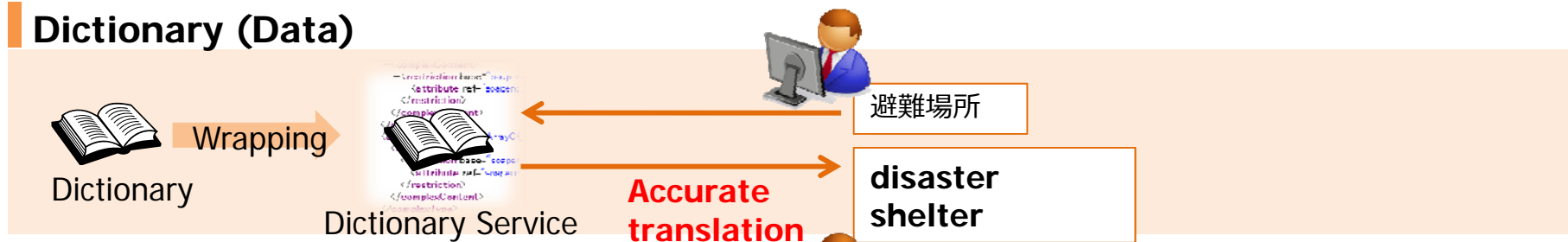
Sharing language services around the world

The map shows the following institutions and their locations:

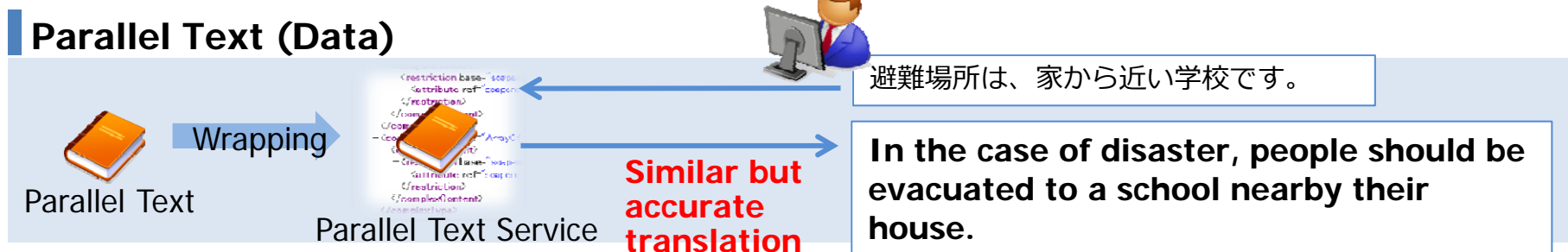
- German Research Center for Artificial Intelligence
- Stuttgart University
- Kookmin University
- National Institute of Informatics
- Princeton University
- National Research Council, Italy
- Chinese Academy of Sciences
- NICT
- Kyoto University
- Google
- NECTEC
- NTT Research Labs
- Asian Disaster Reduction Center
- Univ. of Indonesia

# From Language Resources to Language Services

## Dictionary (Data)



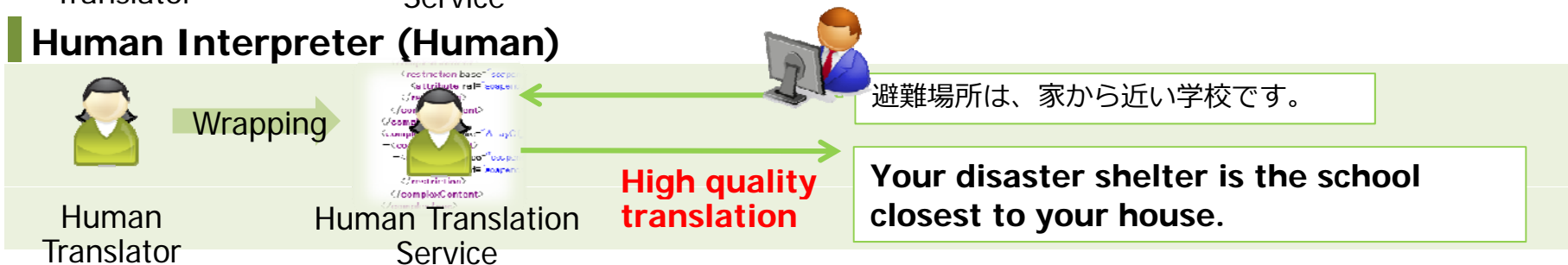
## Parallel Text (Data)



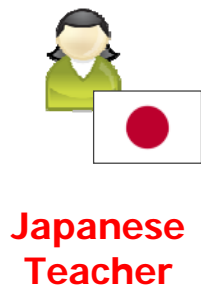
## Machine Translation (Software)



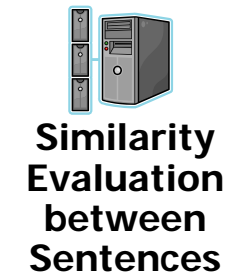
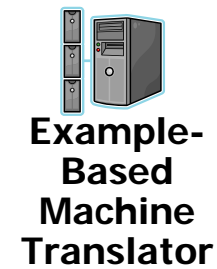
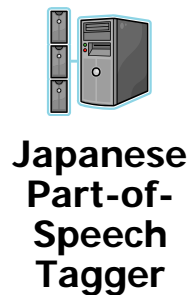
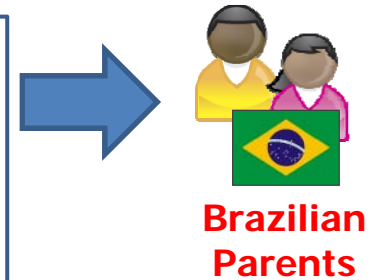
## Human Interpreter (Human)



# Compose Global and Local Services



授業料は無償ですが、教材費や給食費は  
必要です。  
(Tuition is free, but cost of textbooks  
and school meals is required)



# Facts about the Kyoto Operation Center

- **Participants (18 countries, 144 groups)**

- **University/Research Institute**

- Kyoto Univ. (Japan), Shanghai Jiao Tong Univ. (China), Univ. of Stuttgart (Germany), IT Univ. of Copenhagen (Denmark), Princeton Univ. (U.S), DFKI (Germany), CNR (Italy), Chinese Academy of Sciences (China), NECTEC (Thailand), and more.

- **NPO/NGO/Public Sector**

- NGOs for disaster reduction, NGOs for Intercultural exchange, Public Junior-high schools, City Boards of Education, and more.

- **Corporate (CSR activities/language resource providers)**

- NTT, Toshiba, Oki, Google, Kodensha, Translution, and more.

- **Language Services (94 services)**

- **Machine Translator**

- J-Server (ja/en/ko/zh), Web-Transer (ja/en/ko/zh/fr/de/it/es), Toshiba (en/zh), Parsit (en>th), Google Translate (51 languages), and more.

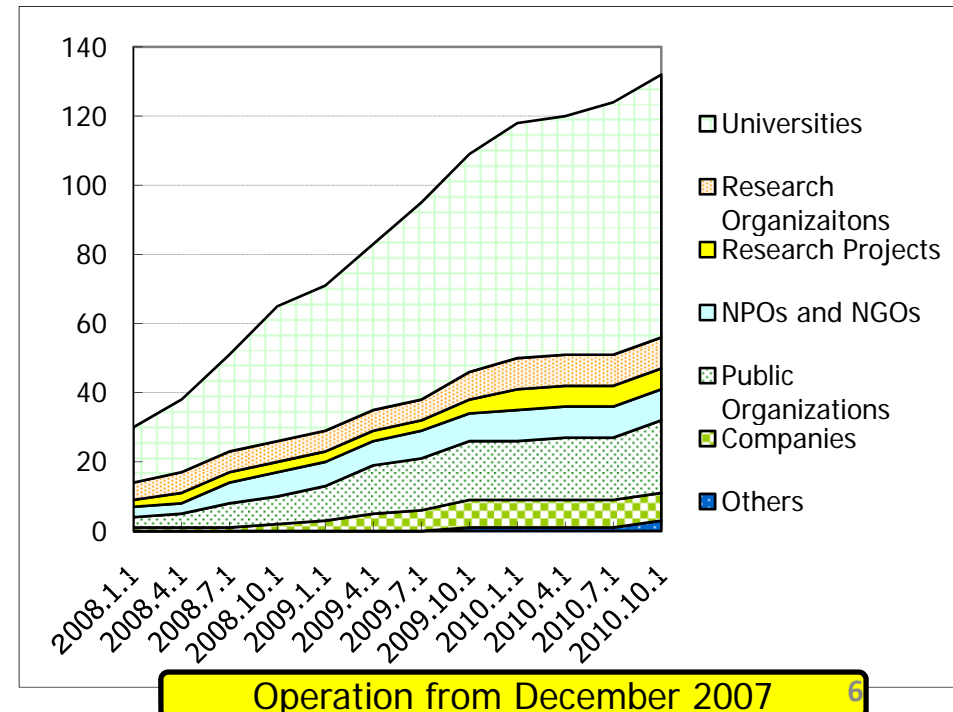
- **Bilingual Dictionary, Concept Dictionary**

- EDR , Wordnet, Life Science Dictionary, Multi-language Glossary on Natural Disasters, and more.

- **Parallel Text**

- **Morphological Analyzer**

- **Dependency Parser**



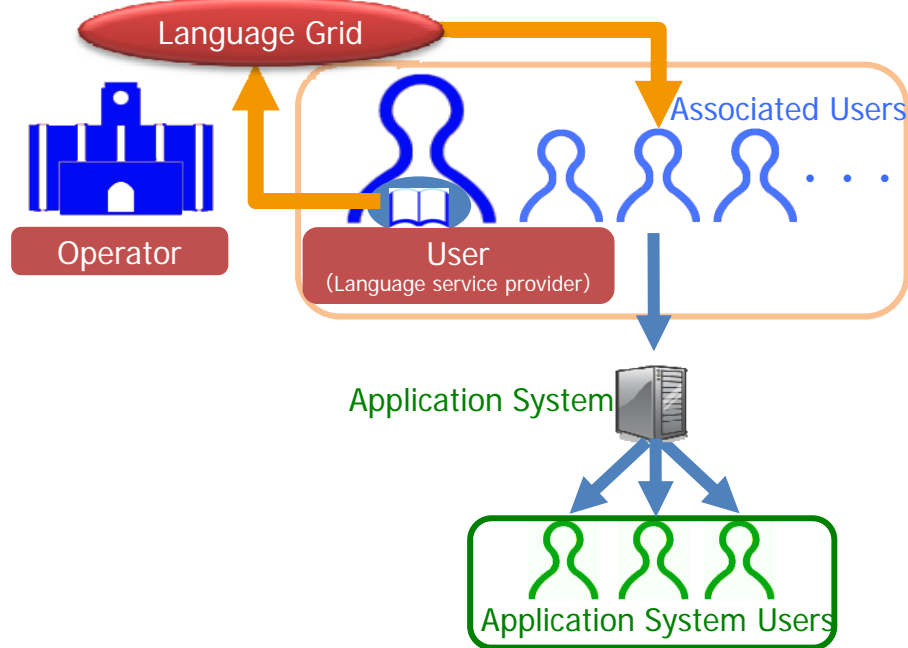
# Federation of Service Grids

## - Socio-Technical Approach -

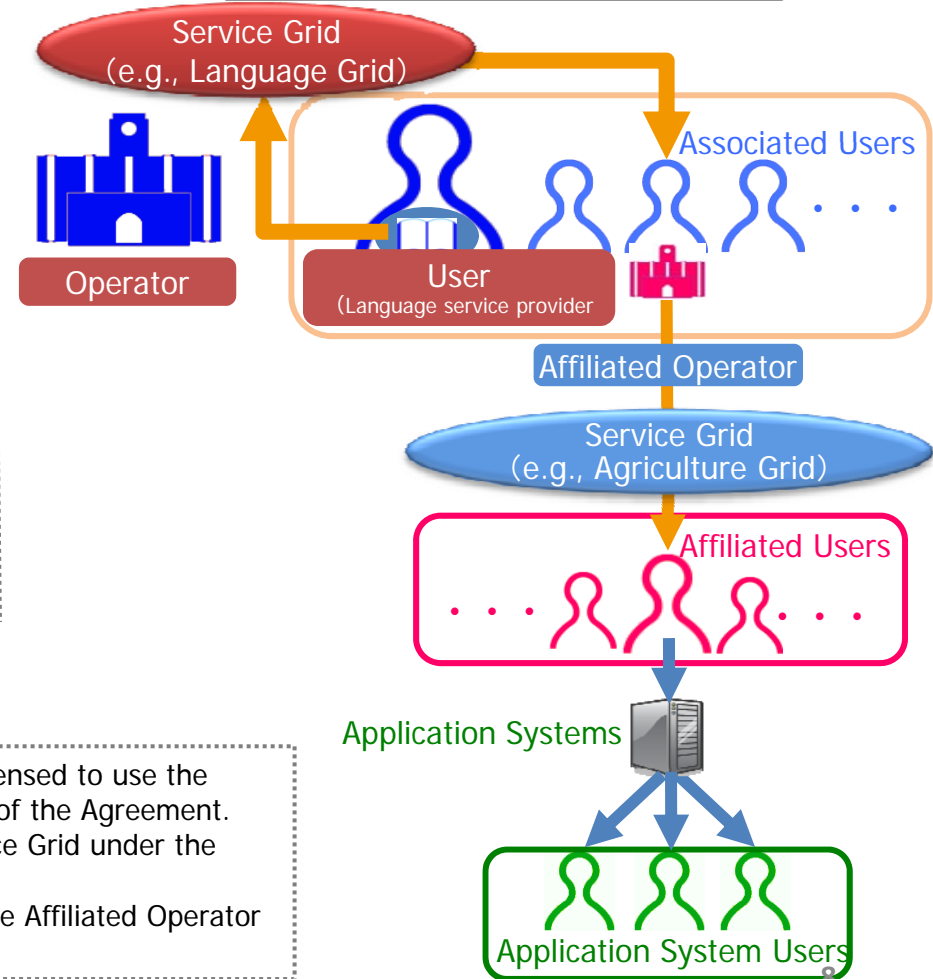
# Peer-to-Peer Approach to Federated Operation

Institutional design for service grids with various intellectual properties.  
Federation of service grid operators.

## Original Agreement (2007-2009)



## New Agreement (2010- )



**Associated Users:** A user, including the Service Grid User, that is licensed to use the Operator's Service Grid by the Service Grid Operator under the terms of the Agreement.

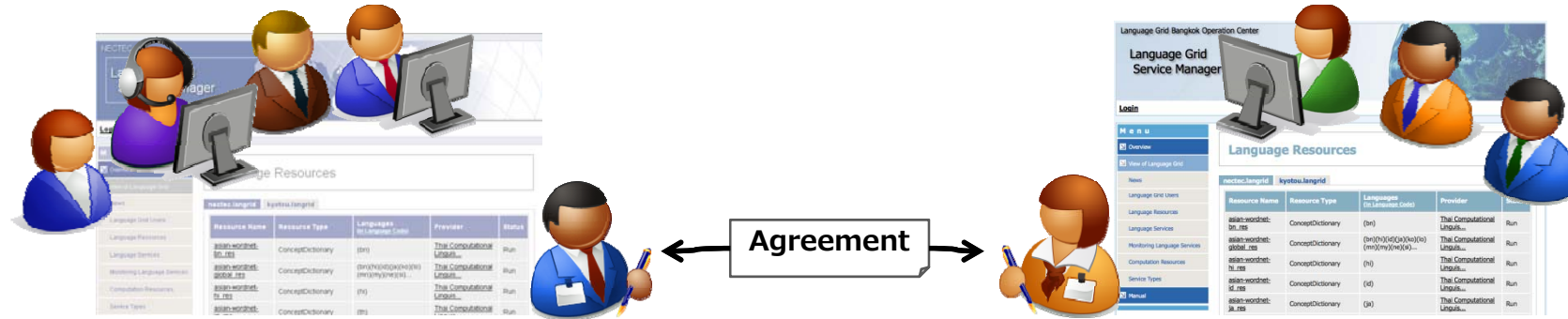
**Affiliated Operator:** An Associated User that operates its own Service Grid under the terms of the Agreement, except for its governing law.

**Affiliated Users:** A user that is licensed to use the Service Grid by the Affiliated Operator under the terms of the Agreement, except for its governing law.



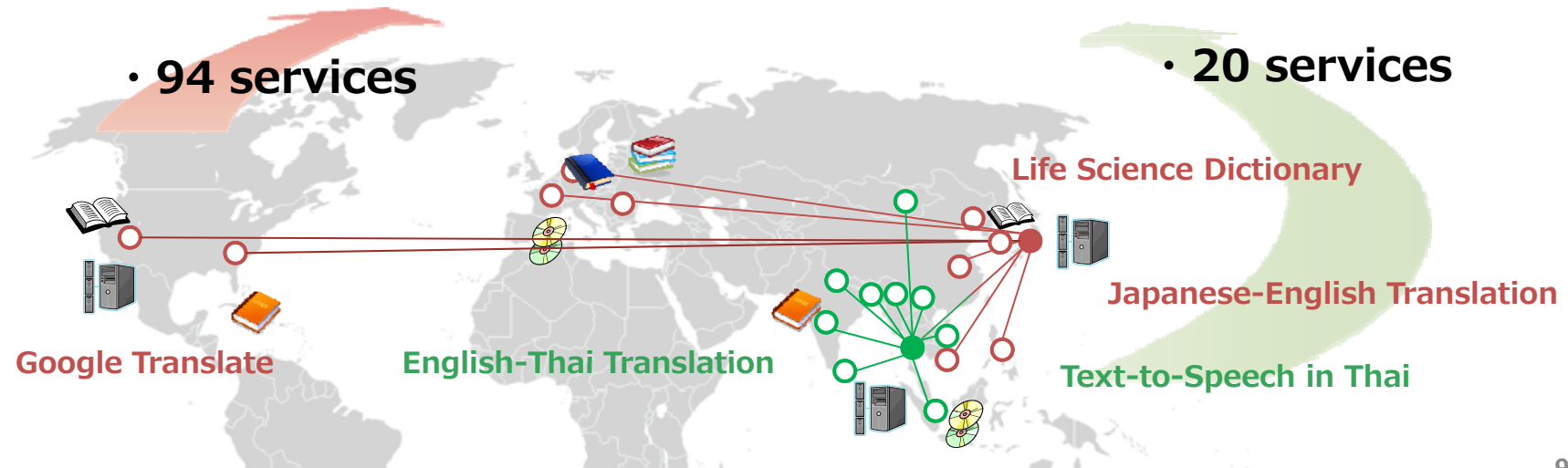
# Federation of the Language Grids

## Federation of the Language Grid Operation Centers



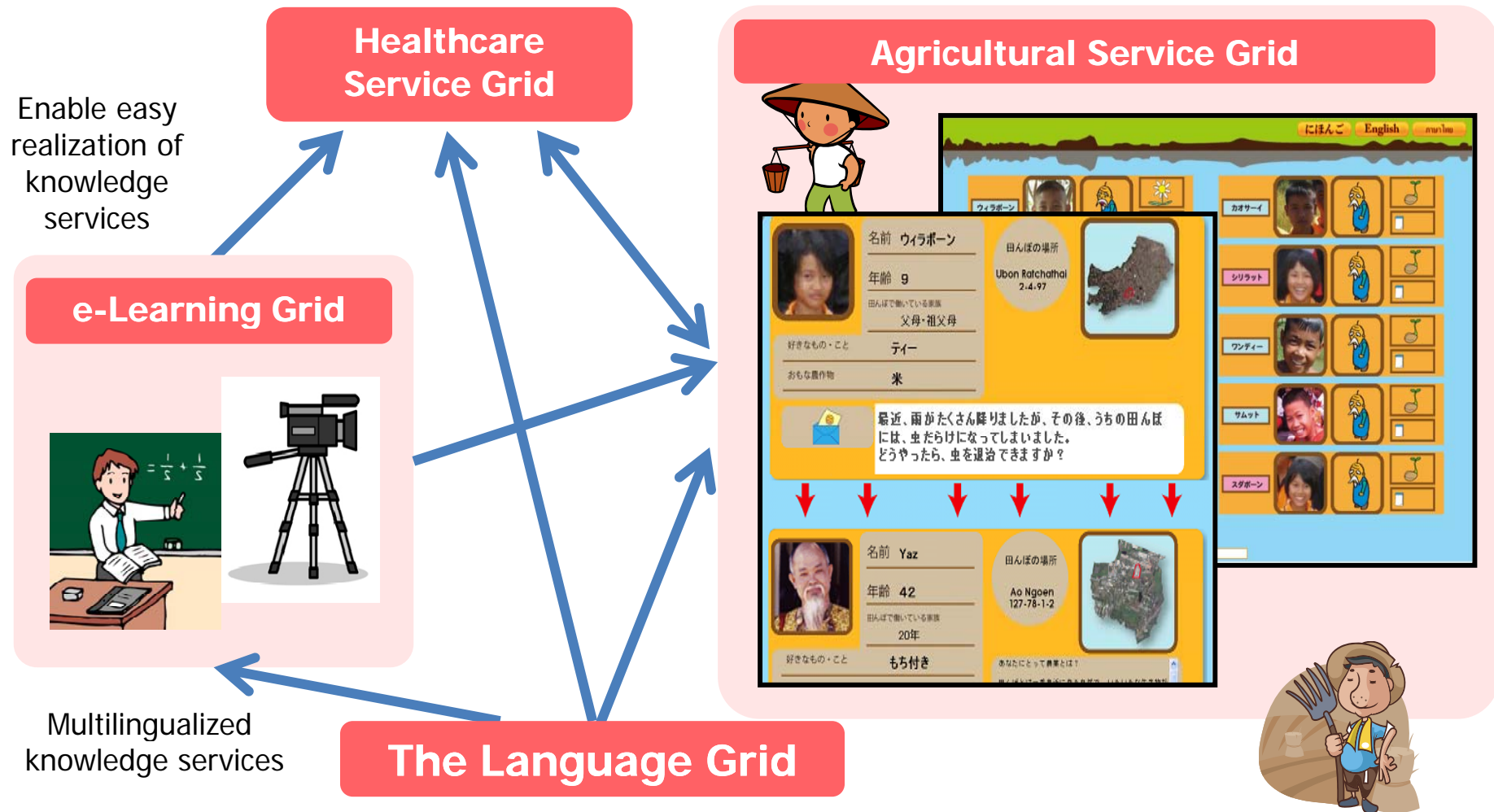
Kyoto Operation Center  
Kyoto University

Bangkok Operation Center  
NECTEC



# Federation of Different Types of Service Grids

## Federation of Different Types of Service Grids



## Federation of Different Types of Service Grids (IEEE TKED 2009)

**Gold Prize (1st place) in "Microsoft Cup" IEEE China Student Paper Contest.**

Yue Suo, Naoki Miyata, Hiroki Morikawa, Toru Ishida and Yuanchun Shi. Open Smart Classroom: Extensible and Scalable Learning System in Smart Space using Web Service Technology. *IEEE Transactions on Knowledge and Data Engineering*, Vol.21, No.6, pp. 814-828, 2009.

Open Smart Classroom in Tsinghua



Open Smart Classroom in Kyoto



Language Grid  
Internet

# How to Develop Multi-Language Environment

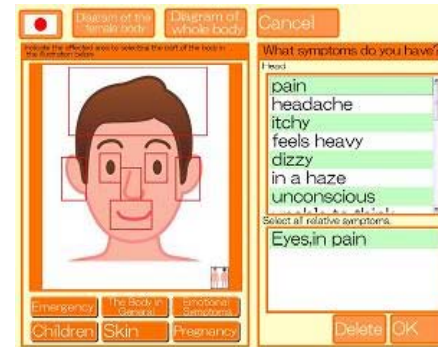
- Socio-Technical Approach -

# Beginners' Stage: Register and Use the Language Grid

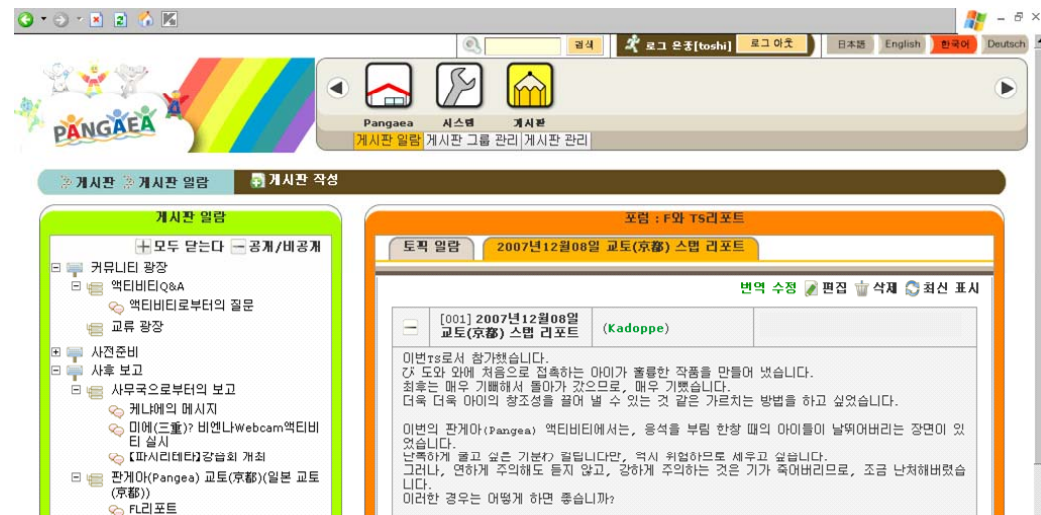
Even for local communities, we need worldwide collaboration!



Shared Screen Multilingual Chat System for Junior High School (2007)  
(Developed by three master students in 10 days)



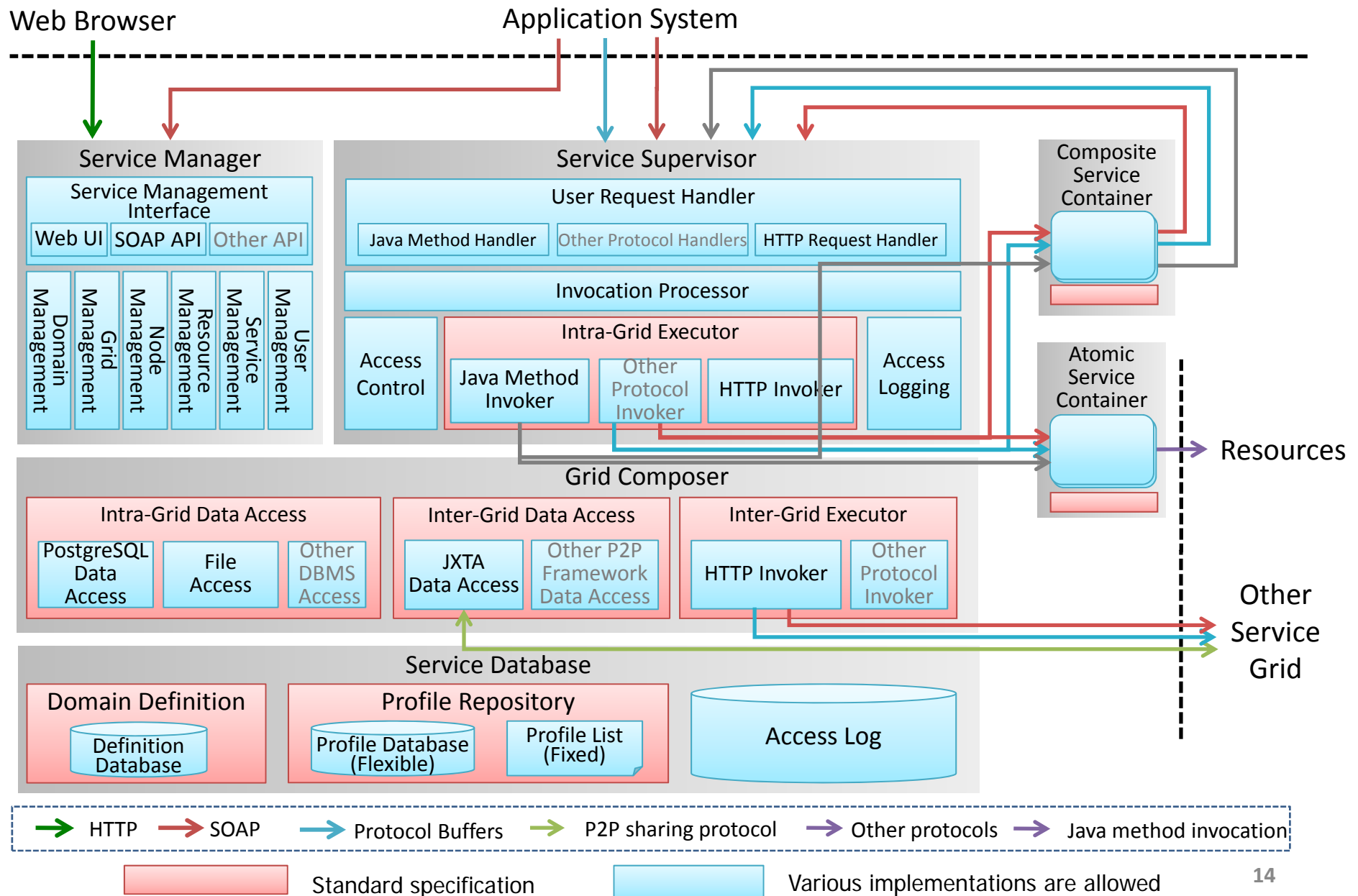
Multilingual Medical Communication Support System (2007)  
(Wakayama University and NPO Center for Multicultural Society, Kyoto)  
Award for Encouragement from the Minister of State for Special Missions at the commendation of the promoter of barrier-free universal design in 2009



Multilingual Community Site for Volunteers Stuffs (2008)  
(NPO Pangaea)

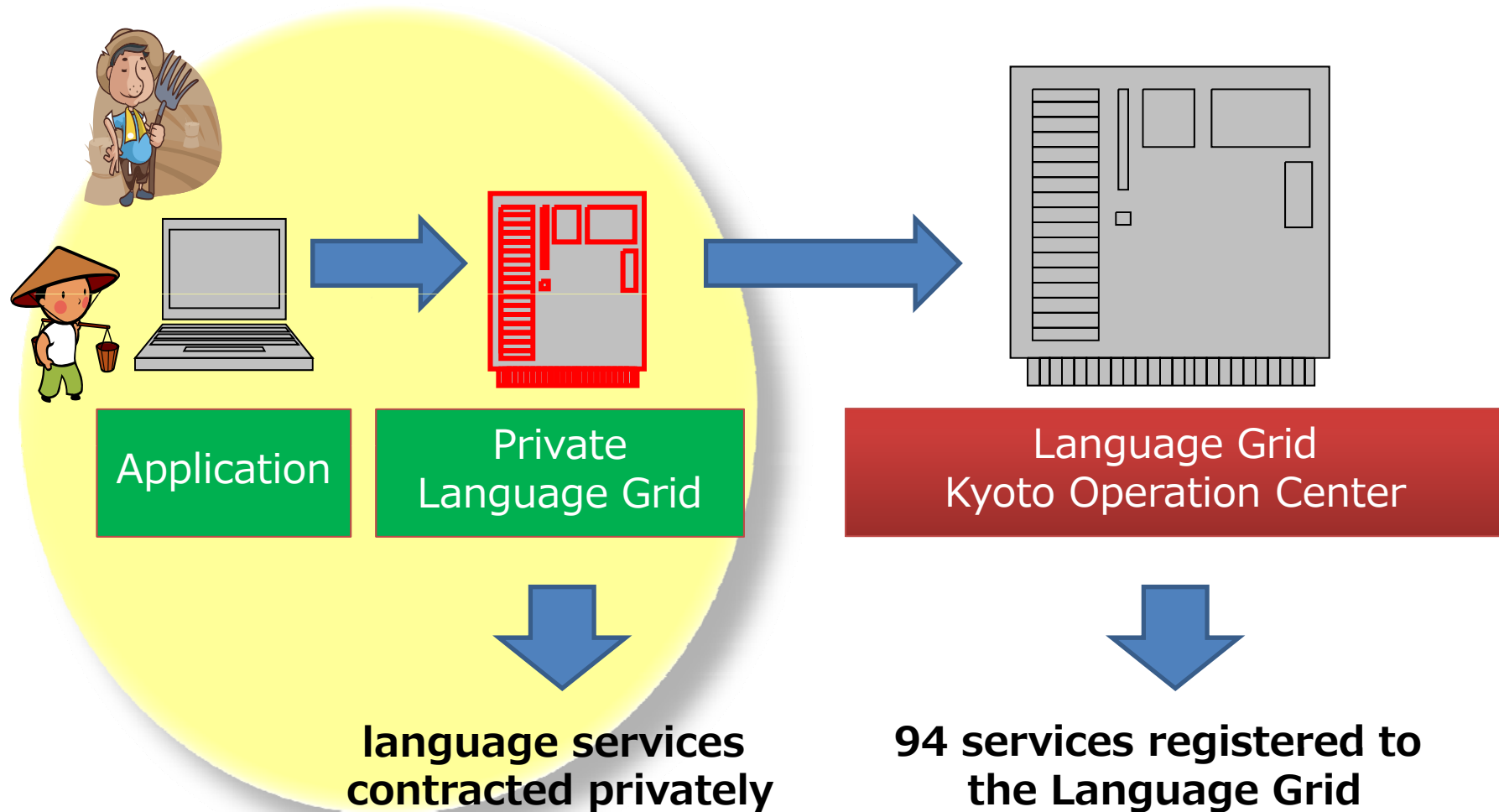


# Silver Stage: Download the Language Grid Software

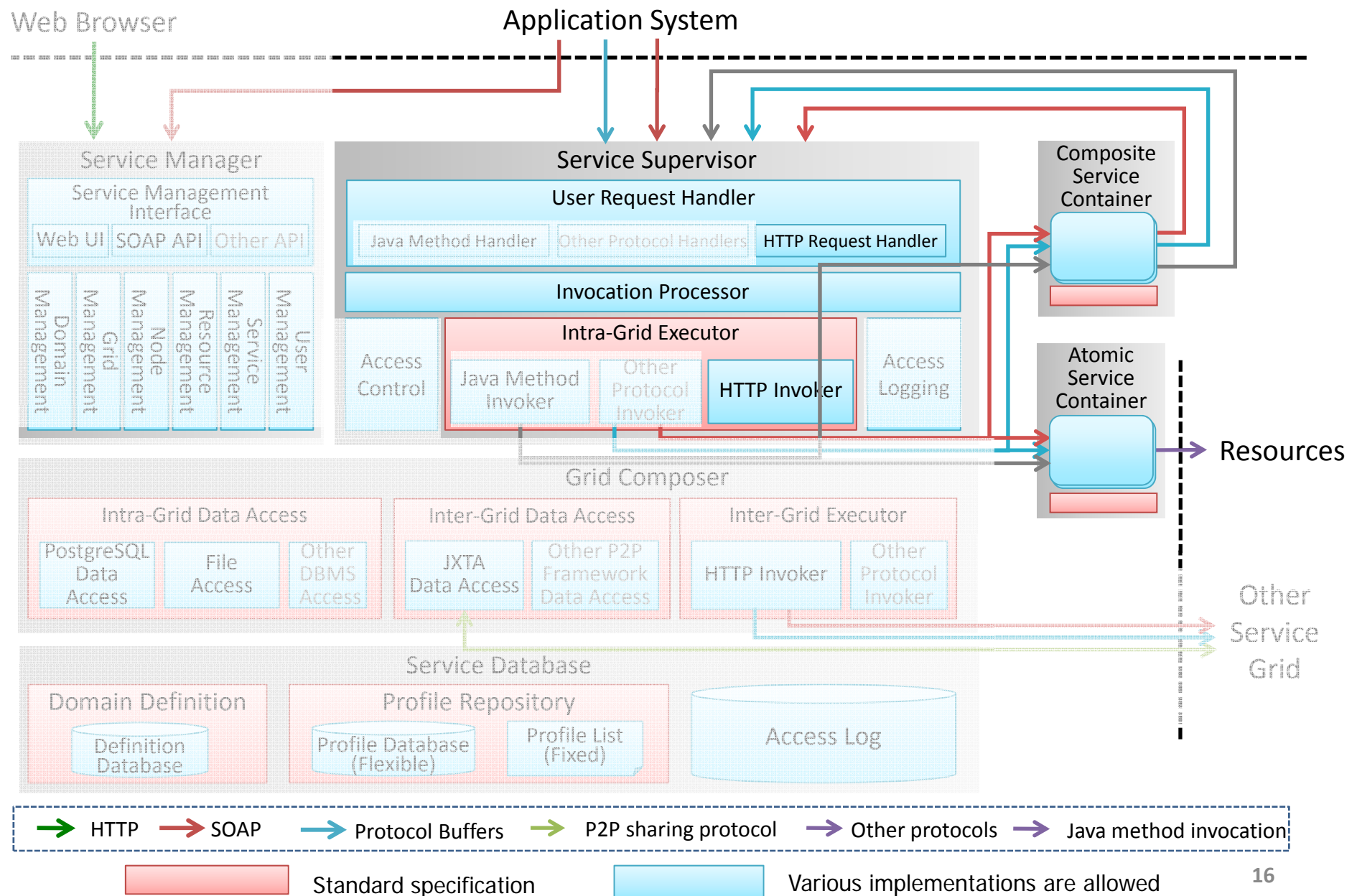


## Advances Stage: Create Your Own Language Grid

It's efficient and flexible, if you can maintain language services.



# Professional Stage: Customize the Language Grid Software





## Example: Language Grid for Wikimedia

Wikimedia BBS is multilingualized for supporting Wikipedia article translation

