NICT collaborates with ASEAN Countries

- Social Renovation by ICT from Asia at the Entrance of the Smarter Communication World -

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Collaboration Items
-illustrations-

1. Regional distributed wireless network (NerveNet)
2. Voice multilingual translation
3. NTP server
4. ICT paradigm shift from Asia
NerveNet – a regional network like a nervous system

1. Provides universal access to the Internet at low cost
NerveNet – a regional network like a nervous system

2. Gives security against disasters and sensing/alert services
Universal Net Access and Security with NerveNet

NerveNet – a regional network like a nervous system

3. Allows **local communications** without cell-phone network and the Internet

![Diagram of NerveNet network](image)

- Water level sensing
- Security camera
- Mountains, rivers, lakes, etc.
- Villages and rural areas
- Cities and urban areas

**Telephone & Internet**

*NICT Collaboration with ASEAN Countries, Tomita, July, 2014*
Cambodia: Tele Centers (TC) Along National Road No.6

- Chealea Tele-Center: 11.911285, 104.927422
- Sampong Chey Tele-Center: 11.911285, 104.927422
- Chhrob Tele-Center: 12°35’25.0”N 105°01’14.2”E
- Kchas Tele-Center: 13°16’28.2”N 104°04’49.8”E
- Chong Kneas Tele-Center: 13°16’28.2”N 104°04’49.8”E
- Svay chek Tele-Center: 13°31’55.2”N 103°48’55.3”E

Ministry of Post and Telecommunication
Svay chek TC near Angkor Watt

- Solar panel
- GSM signal
- No fiber
Inside TC

~10 PCs

Storage battery
(2000VA)
Outside TC (Svay chek)

Information board

A list of cell-phone numbers of persons in the village
NerveNet Basestation

Main unit: 1 piece
Pairs of radio transceiver and antenna: 2 – 4 pairs
  - one pair for accommodating WiFi appliances
  - others for interconnecting basestations (mesh link)

Less than 50Watt

Variations of mesh link
  - WiFi
  - FWA
  - Satellite
  - Ethernet
BaseStation Main Unit

Communications and Networking
- Layer2 Packet Switch
- Mesh topology configuration

Information Processing
- Database
  user info., maps, evacuation routes, sensor data,.
- Service Functions
  Web server, device discovery, call management, handover,.

① Strong against link disconnections, failures of base stations, and blackout
② Easy to expand service area
③ Data access in emergency
④ Data sharing and voice call without Internet
Variations of NerveNet BS

Locations
  Public buildings, schools, hospitals, stations, evacuation areas,

Shapes
  Digital Signage, car and bike sharing stations, bus stops, solar power generation units, wind power generation units, electrical vehicle charging stations, LED lamp posts,
**Voice Multilingual Translation**

**Guideline**

1. **Single Mode**
   Tap the 'mic icon' at the bottom.

2. **Input Speech**
   Speak into the mic when the above screen is displayed. Tap "Finish" when you're finished.

3. **See Translation Results**
   Tap the 'language icon' at the bottom right to switch languages.
Protocols of Network-based Speech-to-Speech Translation
Currently, more than 60 countries are maintaining own National Standard Time. The other countries are relying on accurate time information from Global Navigation Satellite System (GNSS) and public NTP services from other countries.

Accurate time is necessary for many social activities: Scientific Research, Economy (Bank Transaction, Stock Exchange), Transportation, Satellite Navigation, Telecommunication, etc.
Concept of NTP Service

NICT

Japan Standard Time UTC (NICT)

NTP stratum 1 Server

Leased line

NTP stratum 2 server

Time information service by Networks

NTP service

Internet and others

user

Internet and others

NTP stratum 2 server

Time information service by Internet (open NTP)
Public NTP Service

High Performance Hardware NTP Server developed by NICT.

- Can handle 1 million requests / sec and secure.
- Operational since June 2006: High Reliability.
- Can be equipped with Rubidium Oscillator (Atomic Clock).
- Can ensure traceability to UTC through time comparisons.
- Available from E3-Design Inc. at the price of ~20k USD.
Summary

- National Metrology System and Standard Time is a key infrastructure for economy and social life.
- Second (Unit of Time) is the most accurate unit in the 7 SI Units.
- NICT can contribute your country to establish National Standard Time and disseminate it through a public NTP server.

- As the first step of standard time generation, this NTP server is very useful. However, since this system is originally the time dissemination system, it is the minimum system of time generation, and cannot be controlled actively.
Phase 1 ( - 1990):
Creation of Computer and Network Systems

Phase 2 (1990 – 2010):
Creation of Cyber-world

Phase 3 (2010 - ):
Value Creation on the Fusion of Real World & Cyber World
by Commercial Solutions and Academic Solutions, and Social Solutions

**Good technology attracts mass users**

R & D → New Products & Service → Society

**Good chef attracts good guests**
Phase 2 (1990 - 2010): Creation of Cyber-world

Users select the good Services

R & D  →  New Products & Service  ←  Society

Guests select the good foods
Phase 3 (2010 - ):
Value Creation on the Fusion of Cyber World and Real World

R & D ↔ New Products & Service ↔ Society

Field oriented innovation and wide variety of users

Value Creation by Commercial Solutions
or Academic Solutions
or Social Solutions
ICT Paradigm Shift from Asia

Wide variety of guests in Asian market and in the food court
Field-Oriented OPEN PLATFORM and Inter-Connection

SOCIAL - BIG - DATA

BIG BUSINESS

REAL WORLD

ACADEMIA

SMALL BUSINESS

GOVERNMENT

CYBER WORLD

ICT for Sustainable World Human Happiness

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Collaboration with Domestic & International Society

• Frontline of Social Issue = Local Governments
  • Regional ICT Forum; Collaborations with Domestic Local Govs.

• ASEAN Region
  • Establishing a new academic office in Chulalongkorn University (Thailand)

• Roundtable with MOU Partners in ASEAN Region

Roundtable with MOU Partners (November 2013)
Exchange of Researchers (to NICT)

- **Internship Trainee**
  - Period: one month to 1 year
  - Support: Air Tickets, Apartment, Living Allowance
  - Master course and PhD students, Post Doctorates.

- **Invited Advisor**
  - Short time period (typically < 1 month)
  - Support: Air Tickets, Accommodations, Living Allowance

- **Cooperative Visiting Researcher**
  - Maximum Period: 1 year (renewable)
  - No financial supports from NICT
For World Human Happiness and Endurable ICT

Let’s Start Friendly Communication for Cooperative Innovation

ご静聴感謝いたします

Thank you very much

http://www.nict.go.jp/en/