
Current Smart-House Business

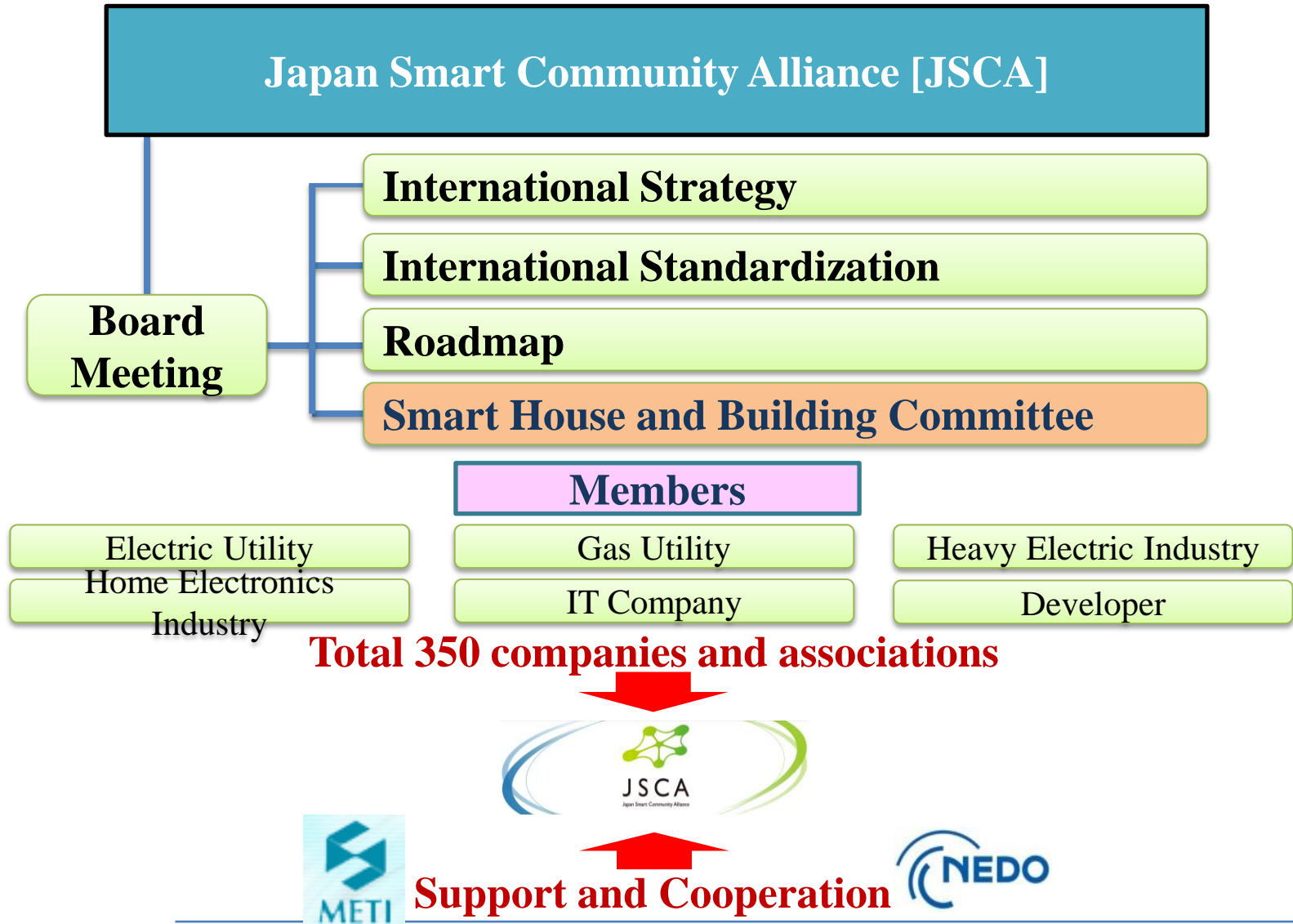
30,Oct,2014

ISSHIKI Masao

Professor and Director of Smart House Research Center

Kanagawa Institute of Technology

JSCA is Japanese government-industry liaison, aiming at making long term collaboration with overseas



Technical perspective: Smart House has three functions

Past

For Saving energy in demand side

NOW

For saving
energy



For generate
energy



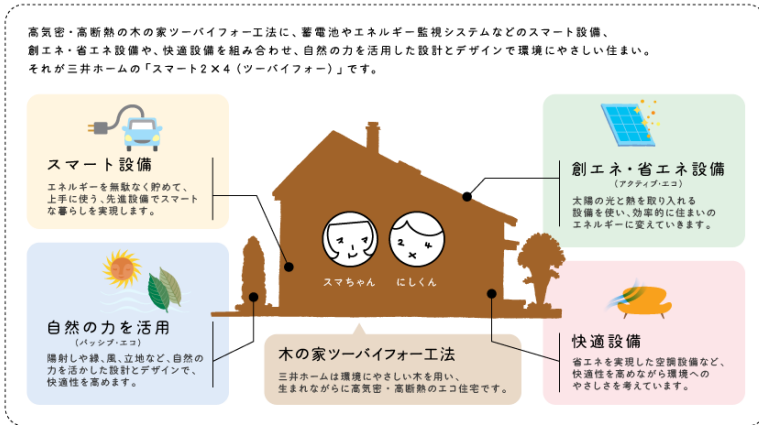
For storing
energy

Innovation

*Consumer has become “Prosumer”
Produce, save, and consume energy in demand side*

Accomplishment: Smart House has been commercialized -1-

三井ホームは、木の家スマートツープイフォー



Mitsui Home Group

MISAWA
スマートハウスに住みたい！
Amenity by SMART
Misawa Homesのスマートハウス

夏を涼しくする「風のスマートハウス」
「体感室温 -3.5℃の家」
Amenity by SMART

体感室温 -3.5℃の家
風のスマートハウス

- 1 先進技術
エネルギー 利用率を効率化する
- 2 微気候デザイン
空調や扇風機を上手に活かす
- 3 IT+人
事前サポートソフトと知識を併用

201X年のミサワホームの暮らし

Misawa Homes

Daiwa House
大和ハウス工業株式会社

資料請求 お問い合わせ サイトマップ English RSS 文字サイズを大きく

住まい 注文住宅・建替え 分譲住宅・宅地 分譲マンション 賃貸住宅のroom リフォーム 田舎暮らし別荘

ダイワハウスの注文住宅・建替え 住宅商品情報 家づくりについて ダイワハウスの特長 まちなかゾーヴ 家づくりのご相談 住宅カタログプレゼント

大和ハウス工業トップ 注文住宅 xevo スマ・エコ オリジナル

つまり、これからはあなたに代わって「家」がエコをがんばる時代。

xevo
【シーヴォ】
スマ・エコ オリジナル
ダイワハウスのスマートハウス、はじまる。

つまり、これからはあなたに代わって「家」がエコをがんばる時代。

Daiwa House

セキスイハイムが考えるスマートハウス「スマートハイム」 設備はハイムシリーズ
SMARTHEIM

スマートハイムとは

太陽光発電 No.1* のセキスイハイムの 大容量ソーラー

住宅のエネルギー性能を引き出すスマートハイム・ナビ

一年中、家じゅう、湿度も涼感もちょうどいい 快適エアリー

Sekisui Chemical

ECHONET Lite delivers network access to all appliances

□ IP based and Media Free

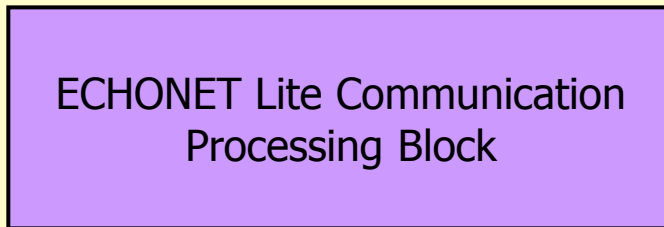
- ECHONET Lite is IP based interface and interoperable to any standardized medias.

□ Open Interface

- ECHONET-Lite, owned by ECHONET Consortium, has become open interface since on Dec 21, 2011.

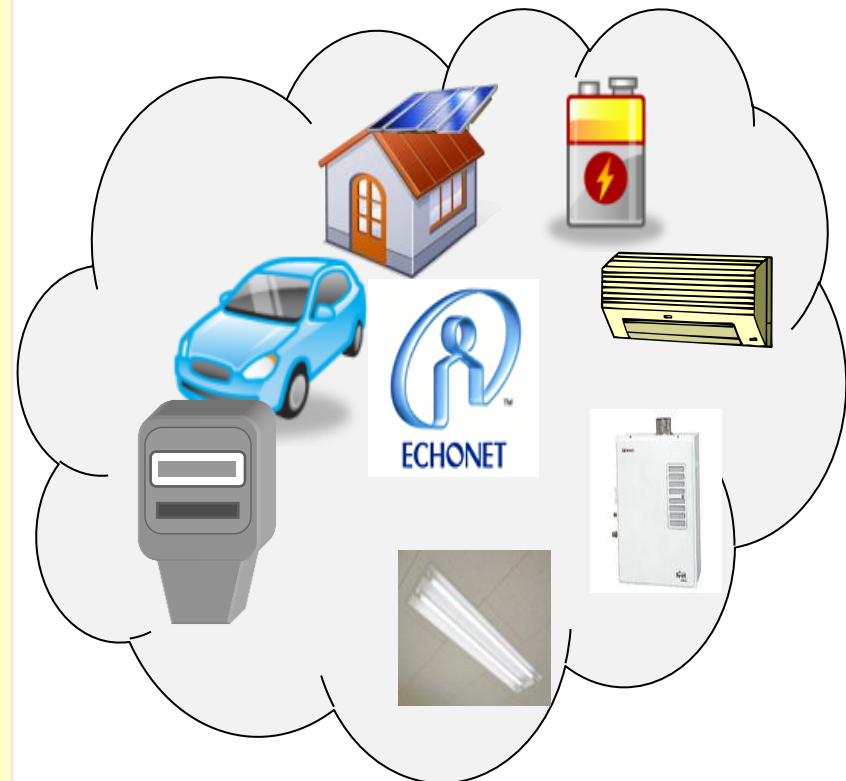
ECHONET Lite

- Specifies OSI Layer 5 - 7
- Communication Address is "MAC Address" or "IP Address" Application



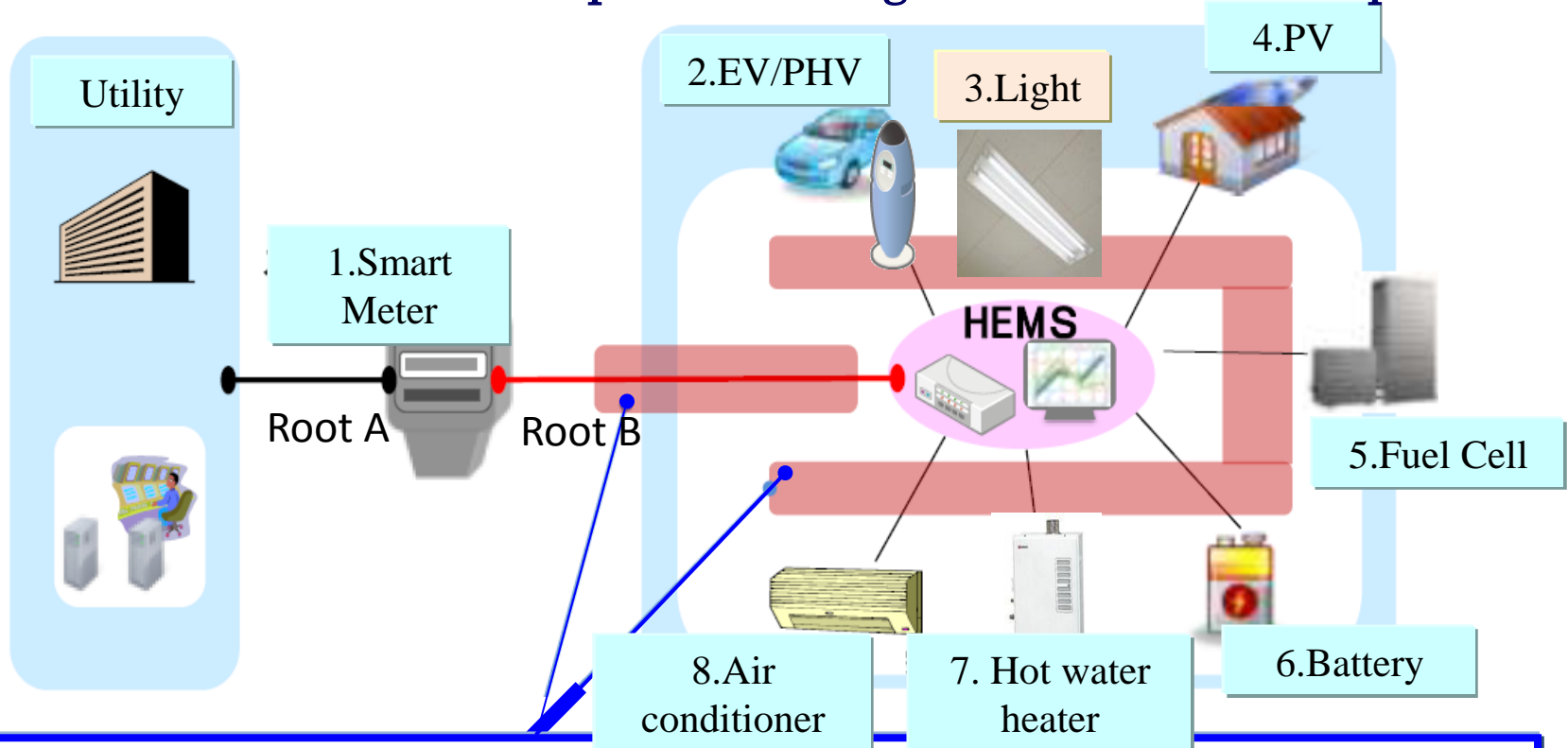
MAC Address or IP Address

Lower Communication Block
(IEEE802.15.4 etc.)
Transmission Medium



8 strategic devices in EMS speak ECHONET Lite

ECHONET-Lite, owned by ECHONET Consortium, has become open interface since on Dec 21, 2011. With following that strategy change, JSCA, government- industry liaison, has decided for 8 strategic devices to speak ECHONET Lite and promote the growth of DSM in Japan



- ECHONET-Lite is recommended as the standard interface for connecting appliances and smart meter.
- Communication protocol between HEMS and devices should be based on IP.

List of ECHONET Lite devices

- 88 kinds of devices is ready to speak ECHONET Lite over IP in Japan. This move is expanding to overseas from Japan
 - FY 2011-2012, several device objects, mainly “energy storage devices” and “energy generation devices”, were newly specified or revised.

Sensor Related

Security Sensor, Human Detect Sensor, Temperature Sensor, CO2 Sensor, Electricity Sensor, etc.

HVAC Related

Air Conditioner, Fan, Ventilator, Air Cleaner, Carpet, Fan Heater, etc.

Facility Related

Blind, Curtain, Boiler, Lock, Storage battery, Fuel cell, Photovoltaic system, Gas Meter, Watt-Hour Meter, EV/PHV, etc.

Cooking Related

Refrigerator, Microwave, Washing Machine, Rice Cooker, Coffee Mill, etc.

Health Related

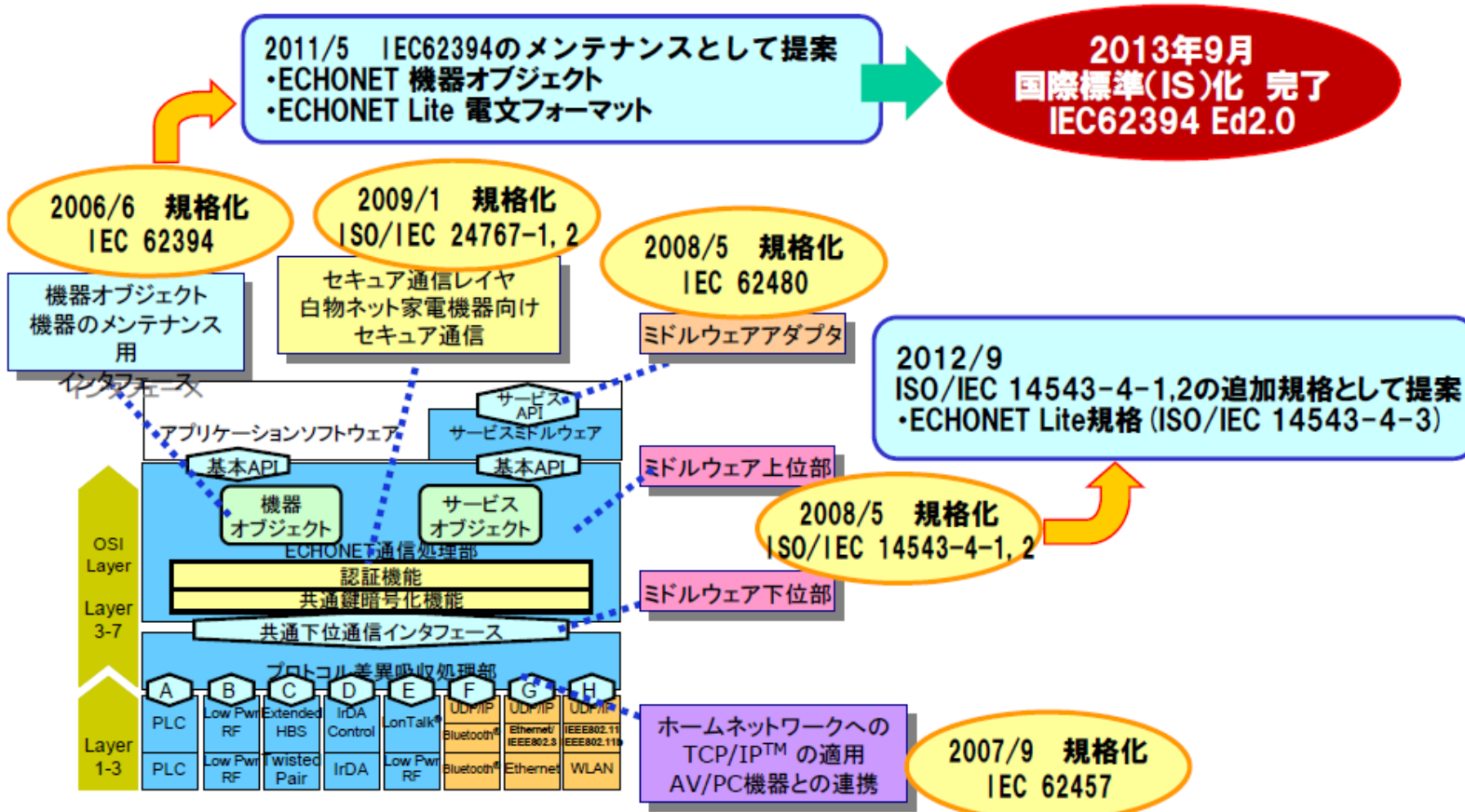
Weighing scales, Clinical thermometer, Blood Pressure Meter, Blood Sugar Meter, etc.

Controller Related

Controller, switch, etc.

Current Status of International Standardization of ECHONET Lite

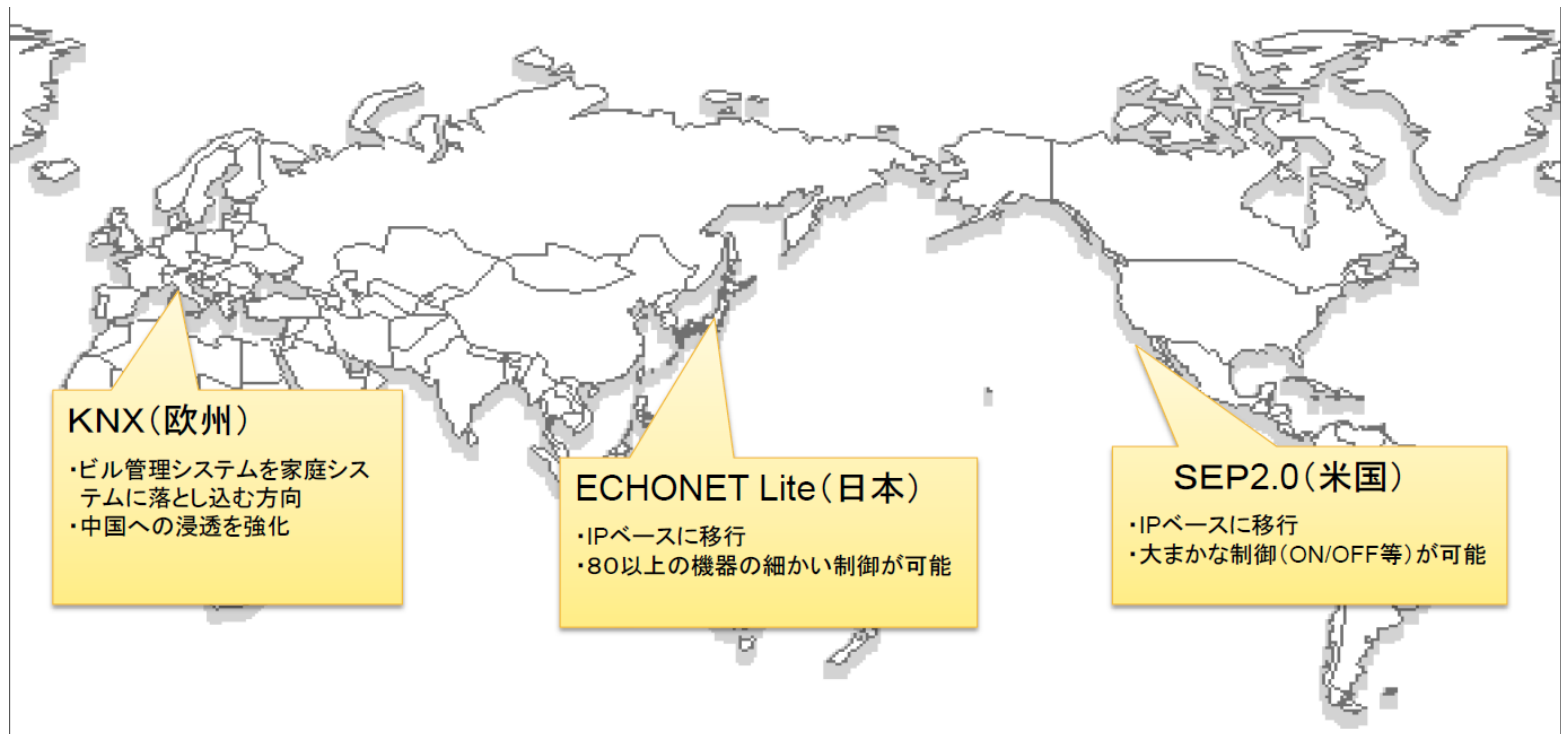
現在、ECHONET Lite規格(通信ミドルウェア)の国際標準化を推進中



ECHONET規格を6つの部分に分けて2002年に国際標準化に提案を開始提案した全規格が2009年までに国際標準となった。

Collaboration with Other Standards

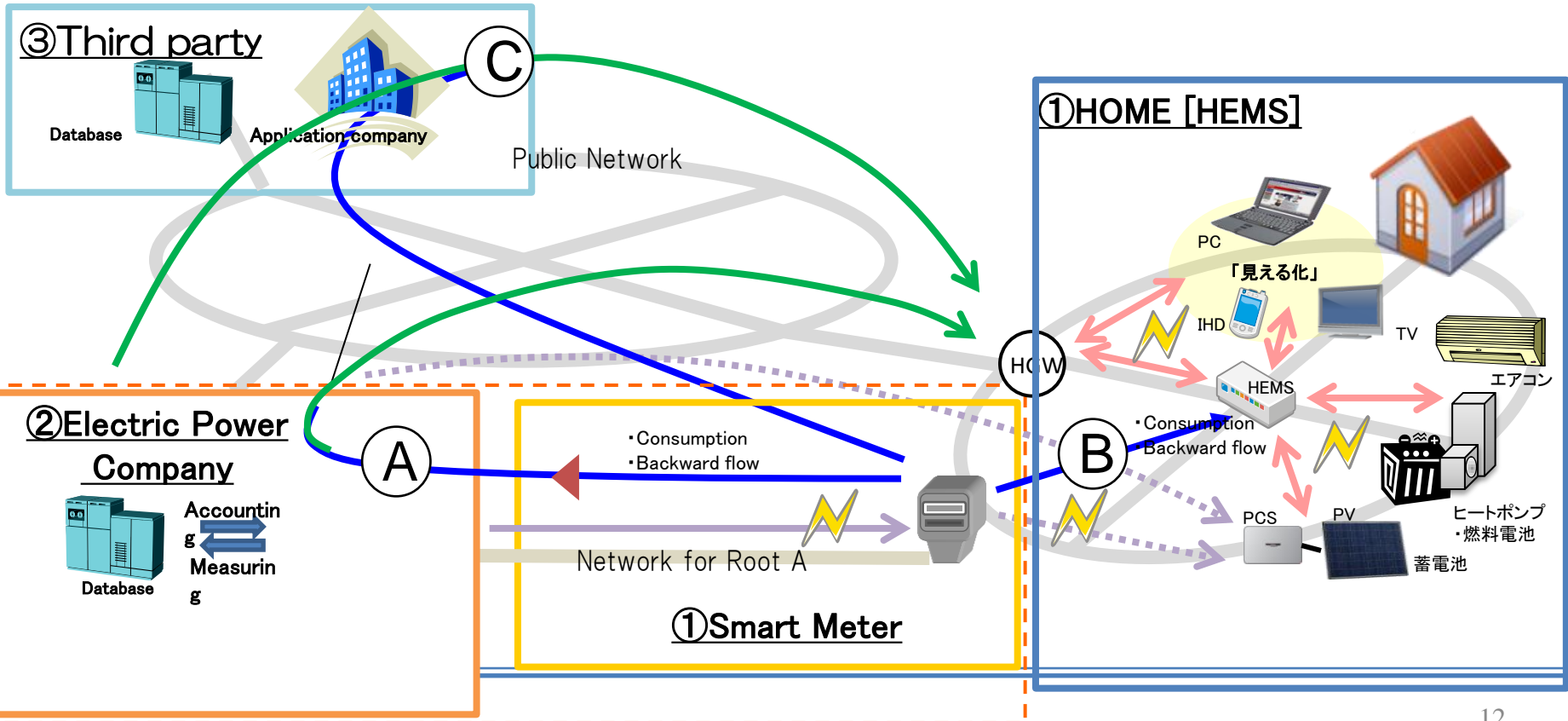
You can realize flexible EMS with ECHONET Lite, because it supports detailed functions of wide range of products. Documents are open to public through the web site. We are also collaborating with other standards worldwide.



reference: スマートハウス標準化検討委員会 中間取りまとめ(案)より
<http://www.meti.go.jp/press/2011/02/20120224007/20120224007-2.pdf>

Smart electricity meter in Japan speaks ECHONET Lite

- **Two communication lines for a smart meter in Japan**
 - **A root is for AMI and DR, connecting meter and utility**
 - **B root is for delivering meter data to demand side:**
(Watt hour, Voltage, Ampere, Power flow, Reverse power flow, Log data)



The Center has started SMA certification

We have certified three products of “SMA” since April 2014.

List of certified products

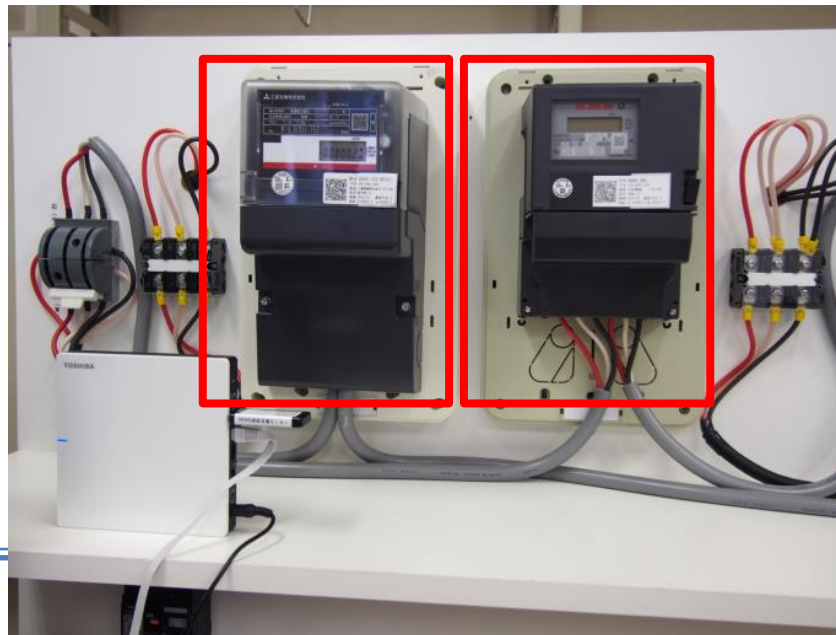
Reference: ECHONET consortium home page (http://www.echonet.gr.jp/kikaku_ninsyo/list_sma/equip_srch)

SMA certification number	Product type	Communication layer	Date of certification	Manufacturer	Product Code
PZ-000001	Smart Electricity Meter	Wi-SUN (WSA 0004)	2014.04.23	Toshiba	SM-3GCOM1
PZ-000002	Smart Electricity Meter	Wi-SUN(WSA0017)	2014.07.29	Mitsubishi	FS-897F
QZ-000001	HEMS Controller	Wi-SUN (WSA 0008)	2014.06.23	Toshiba Lighting Technology	HEM-GW13A

■ SMA Certificate of Registration



■ SMA Certification Products



Smart-House Project at KAIT

- “METI supported program
 – Research of Smart House international standardization”

This project supports positive proof and education of EMS related products with ECHONET Lite in order to promote HEMS.

Three main activities

- 1)Preparing Inter-operability test environment of ECHONET Lite
 - Certification Support Center
- 2)Development of SDK for HEMS service
 - Free Software Development Kits
- 3)Making guidelines of HEMS services and operations
 - Guidelines for HEMS

The Center opened on Nov. 21st, 2012

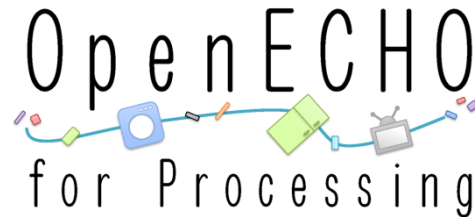


ECHONET Lite SDK [Free!!!]

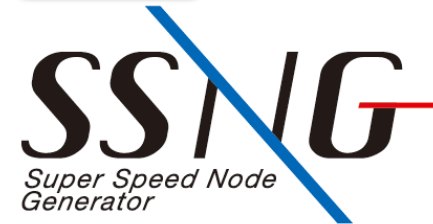
No.1



No.2



No.3



IDE	
Maker: NISSIN SYSTEMS	
Programming Language	C
Target OS	Linux
Target CPU	INTEL x 86

IDE	
Maker: SONY CSL	
Programming Language	Java(Processing)
Target OS	Linux, Windows, Mac
Target CPU	INTEL x 86

IDE	
Maker: KAIT students	
Programming Language	LabVIEW2013
Target OS	Windows
Target CPU	Pentium III / Celeron 866MHz Level


Demo Video -1

SSNG (*) controls an air conditioner

<http://youtu.be/R7hHVkCie6g>

操作手順

1. 通信開始
2. Search
3. IPを選択
4. 送信
5. 電源ON
6. EDT=31
7. 送信
8. 電源OFF
9. 停止



エアコン

全体図
ミドルアダプタ
エアコン
パソコン
ルーター ハブ

パソコンの操作画面

操作画面で作成されたパケットです
1081 0000 05FF 0101 3001 6001 8001 30

1081 00 00 05FF (101 3001 6001 8001 30)

Super Speed Node Generator Ver 2.0.0

[SSNG Tutorial 001] SSNGによるECHONET Lite機器操作 -エアコンの電源ON/OFF-

Demo Video -2

Demonstrated with a smartphone at ENEX2014

<http://t.co/ELhNr6pQxn>

Kadecotで様々な機器を動かすデモ

2014年1月 ENEX
HEMS認証センターブースにて

Sony CSL

Android App (HEMS Controller) controls water heater, air conditioner, light and window shade by variety of manufacturers



Demo Video -3

CG girl RAY-chan controls a light with ECHONET Lite

<http://www.youtube.com/watch?v=TTbMXyG1JQ8>

照明制御の流れ

1. レイちゃんを出現させる
2. 音声を認証させての照明ON
3. 音声を認証させての照明OFF
4. 終わる

操作機器画面



Open platform changes the world

A new world with “ECHONET Lite”, web contents and an air-conditioner

Web Platform

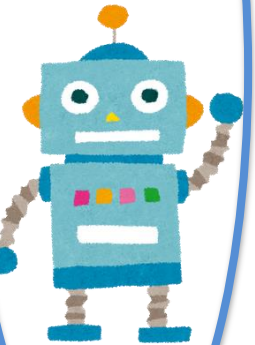
=Open Platform

Service

Service



Intelligent Robot



=Open Platform

ECHONET Lite + Web = Web controller

Devices and Facilities

Air Conditioner, Laundry M, EV/PHV, Lighting, PV, FC, Buttery, fans,,

ECHONET Lite

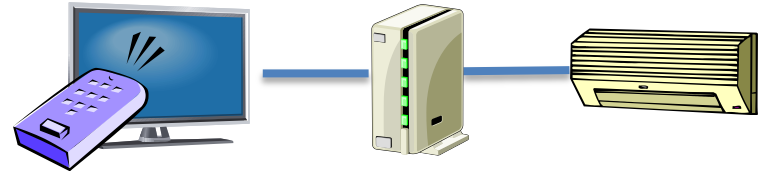
=Open Platform



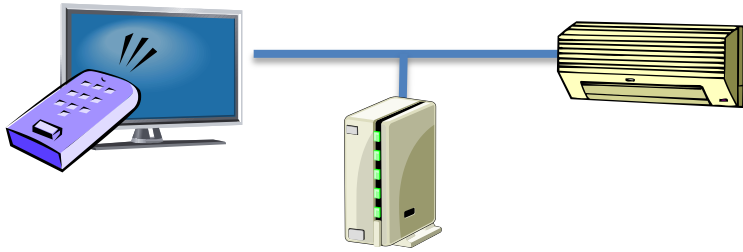
Examples of ECHONET Lite installation



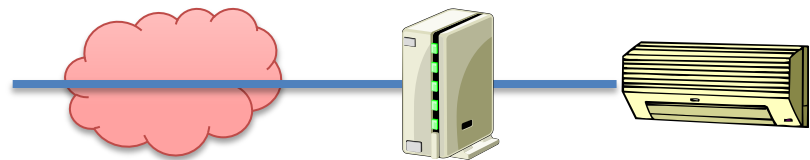
Direct connection model



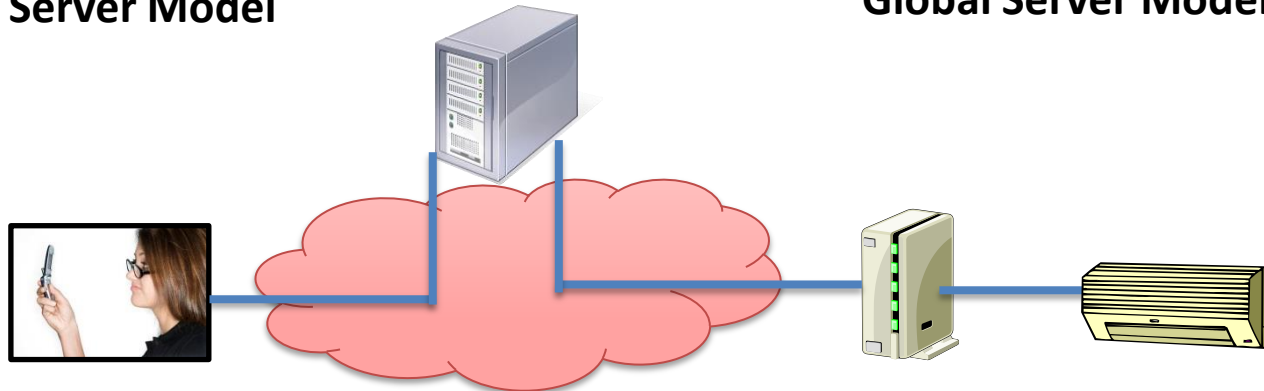
Gateway model



Local Server Model



Global Server Model



Cloud Model

ECHONET Lite Message Structure



- EHD1 ECHONET Lite Header
- EHD2 ECHONET Lite Header
- TID Transaction ID
- SEOJ Sender
- DEOJ Receiver
- ESV Service Type Definition
- OPC Number of property[command]
- EPC ECHONET Lite property [Command]
- PDC Bite of EDT
- EDT Property Data

E.G. Turn On an air conditioner
 EHD1 = 0x10,
 EHD2 = 0x81,
 TID = 0x00, 0x00,
 SEOJ = 0x0E, 0xF0, 0x01,
 DEOJ = 0x01, 0x30, 0x01,
 ESV = 0x61,
 OPC = 0x01,
 EPC = 0x80, PDC = 0x01, EDT = 0x30

※Operate ECHONET Lite device by 15Byte command

More detail

- For more detail information, contact to HEMS Interoperability Test Center, Japan
- <http://sh-center.org/en/>


Japanese

HEMS(ECHONET Lite)Interoperability Test Center

Kanagawa Institute of Technology, Institute for Innovation in Engineering Education Research, Smart House Research Center

What's HEMS(ECHONET Lite)Interoperability Test Center
We support the applications for certification of equipment which has been developed using*ECHONET Lite, or provide a working environment for the development and interconnection of products.

*ECHONET Lite
The standard between HEMS, connected devices and smart meters recommended by the Smart House Standardization Study Group under Ministry of Economy, Trade and Industry



HOME
NEWS
OUR BUSINESS
EVENTS
DATA
FAQ

TestSupport / 認証支援

Software Development Kit/開発キット(SDK)

<Feature>
HEMS Interoperability Test Center Interviews

On this page, you will be introduced to activities or views of the center through interviews with stakeholders of HEMS Interoperability Test Center.

[▶ To the Interview list](#)

Brochure

We made a Certification Support Center brochure.

[▶ Download the brochure](#)

Introduction of equipment tested in HEMS Interoperability Test Center

[▶ To the page of Equipment Introduction tested in the center](#)

検索

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○ NEWS

08/19/2013: [\[INTERVIEW\]](#) [Part6 Prof.Izumi USHIYAMA](#)

08/19/2013: [\[INTERVIEW\]](#) [Part5 Mr. HIROSHI KIMURA](#)

07/04/2013: [\[DATA\]](#) [We made a Interoperability Test Center brochure](#)