

Smart House Strategy empowered by ECHONET Lite ,device oriented approach

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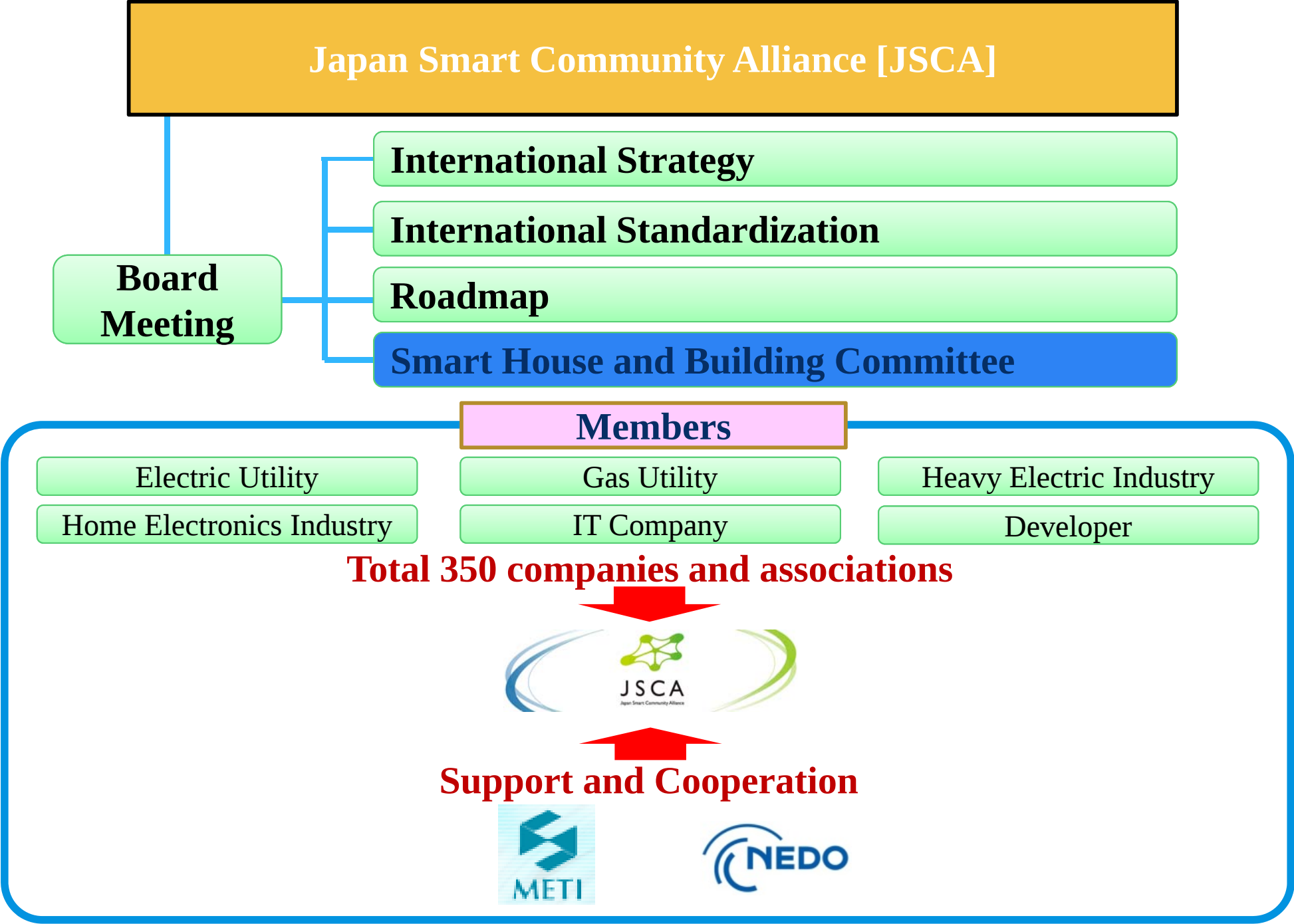
Masaki Umejima

Who we are? JSCA



- JSCA is government-industry collaboration for addressing Smart house as national strategy in Japan.
- Membership exceeds 350 organizations in Japan and overseas, diversified to IT integration, automobile, telecommunication, home appliance, network device, utility, academia, and government.
- Masao Isshiki [masao@keio.w3.org] is chairman of Smart House and Building Committee and in charge of interoperability test center
- Masaki Umejima [umejima@autoid.sfc.keio.ac.jp] is deputy chairman and in charge of int'l strategy and specification development.

Organizational structure in JSCA, government-industry liaison



Who we are? ECHONET Consortium



Since 1970's

For saving
energy



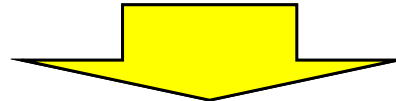
Since 2010's

For generate
energy

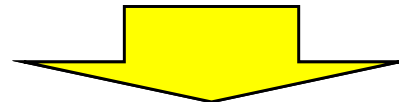


Since 2010's

For storing
energy



High expectation to connect home appliances
by common and trustful interface.

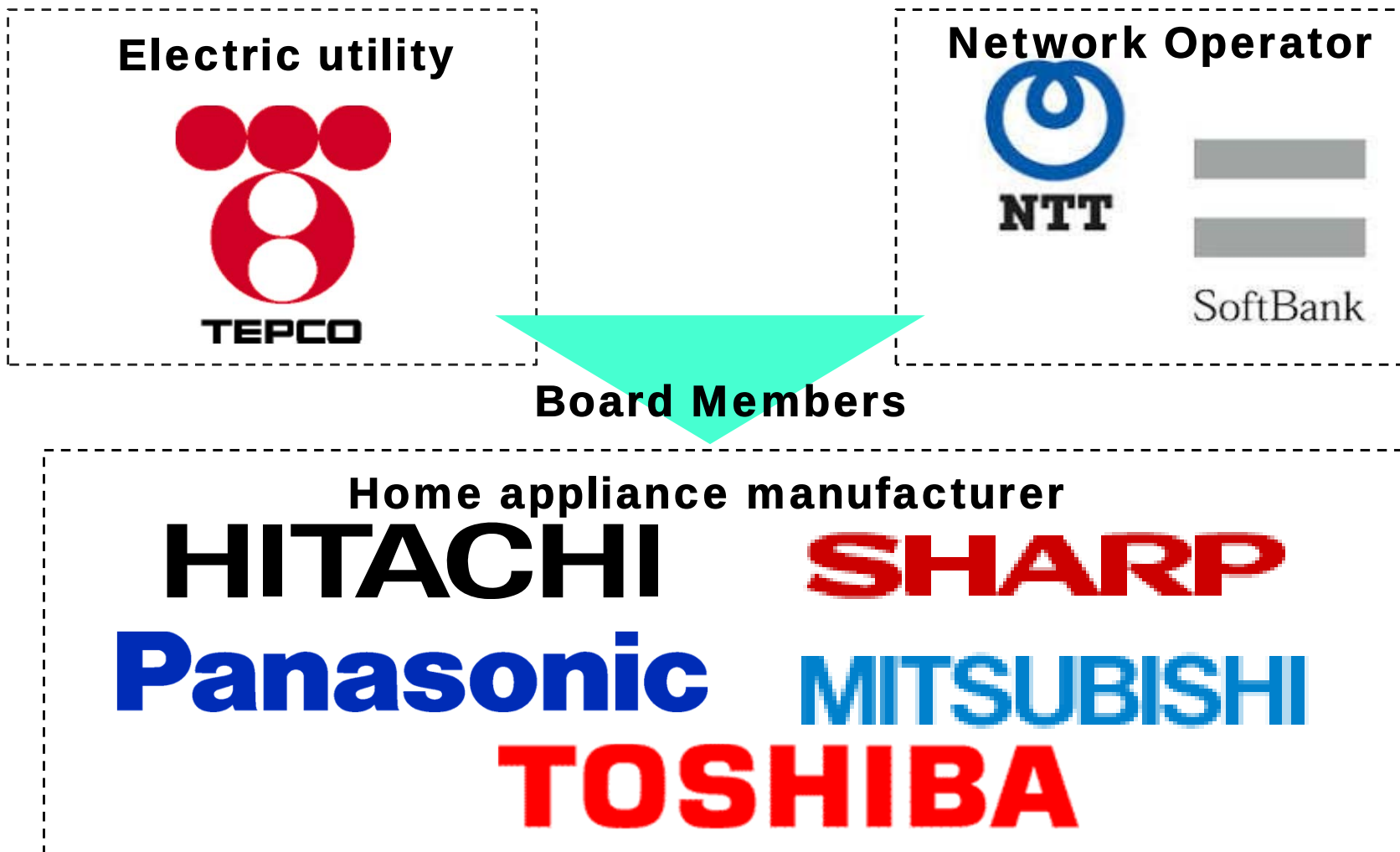


In 2012, ECHONET Consortium announced ECHONET
Lite as open standardized interface.

Technical specification is downloaded at
<http://www.echonet.gr.jp/english/spec/index.htm>

Organizational Structure in ECHONET Consortium

- Since launching in 1997, ECHONET has expanded membership, exceeding 200 companies and institutions including overseas institutions such as IBM and TI



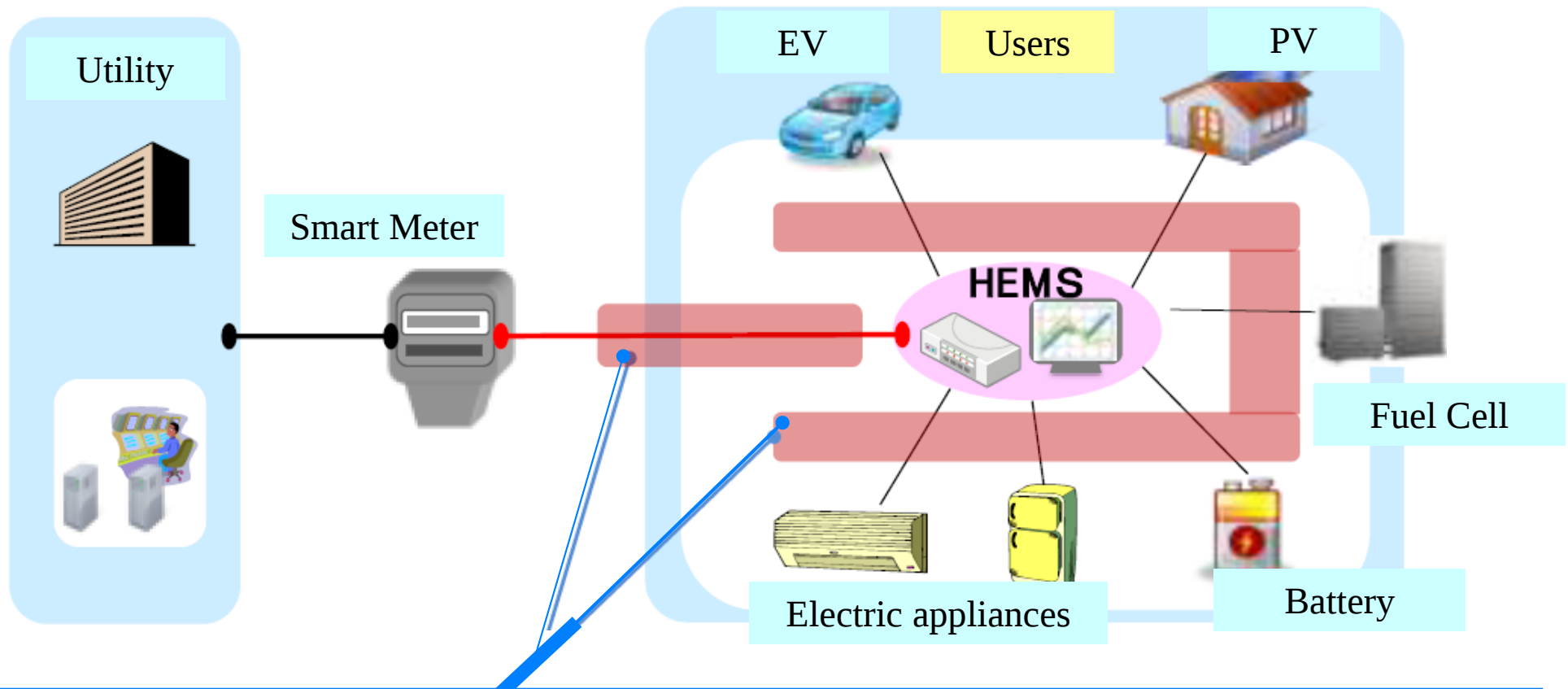
ECHONET Consortium in Asia

Malaysian national research institution has joined ECHONET Consortium



“ECHONET Lite” for connecting all home appliances

ECHONET-Lite, owned by ECHONET Consortium, has become open interface since on Dec 21, 2011. ECHONET Lite has provided network access to over 80 devices, including home appliances, power meter, EV, and PV.



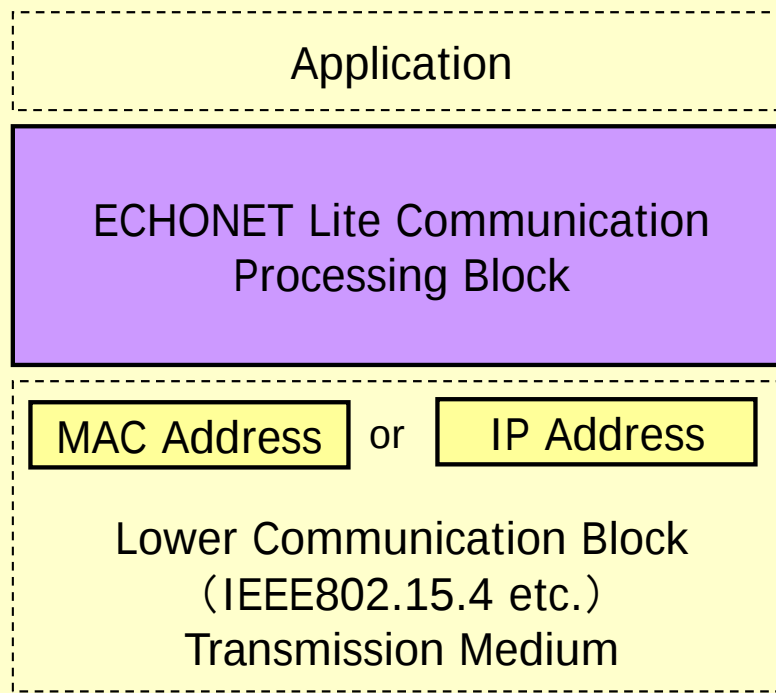
- ECHONET-Lite is recommended as the standard interface for connecting appliances and smart meter.
- Communication protocol between HEMS and devices should be based on IP.

Scope of ECHONET Lite Specifications

- **ECHONET Lite is IP based and media free**

ECHONET Lite

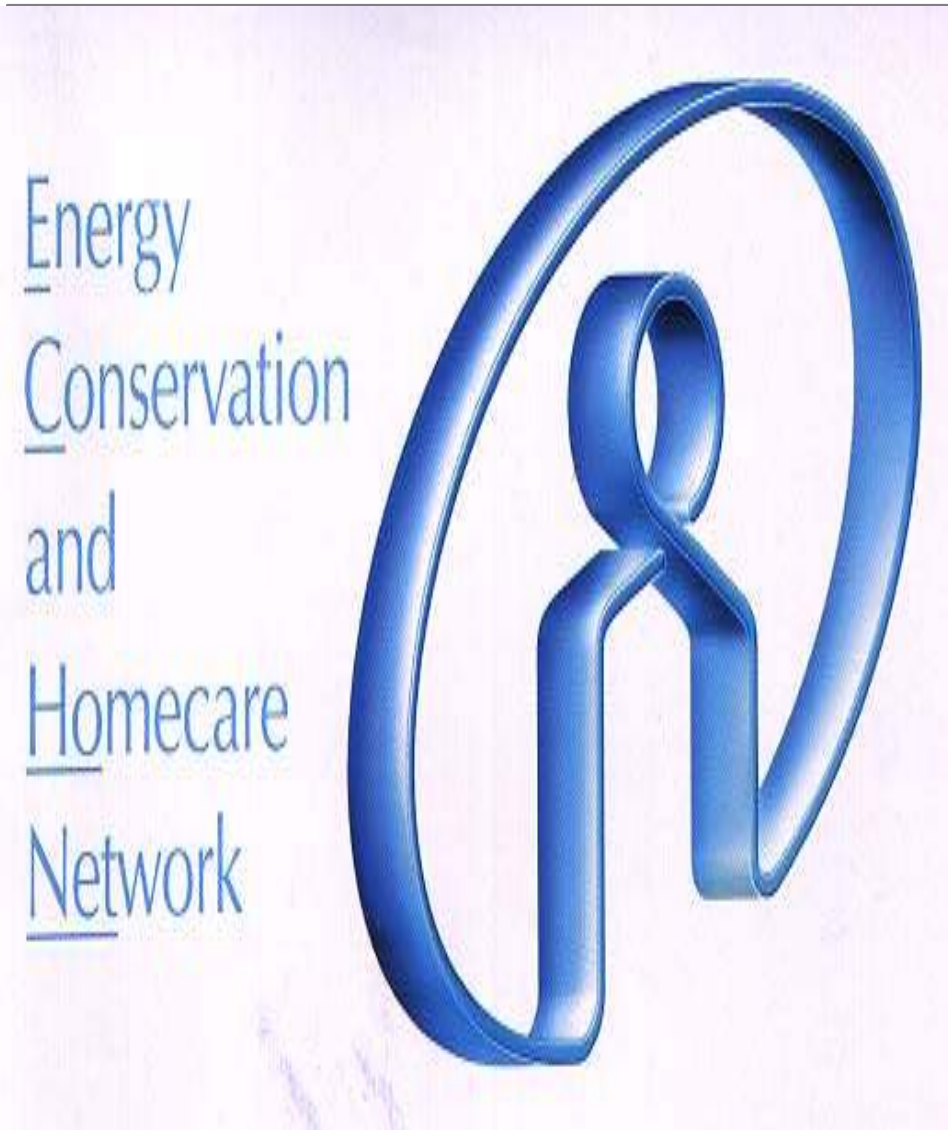
- Specifies OSI Layer 5 - 7
- Communication Address is "MAC Address" or "IP Address".



OSI
Layer

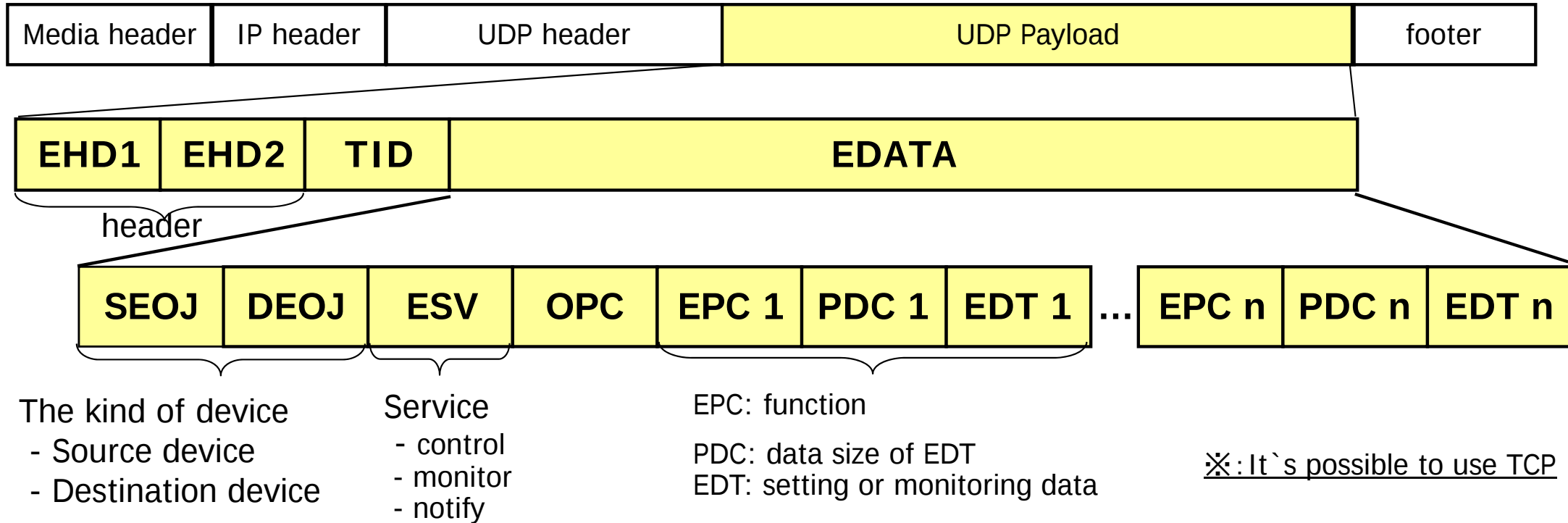
Layer
5-7

Layer
1-4



Message structure of ECHONET Lite device

Example: ECHONET Lite over UDP/IP



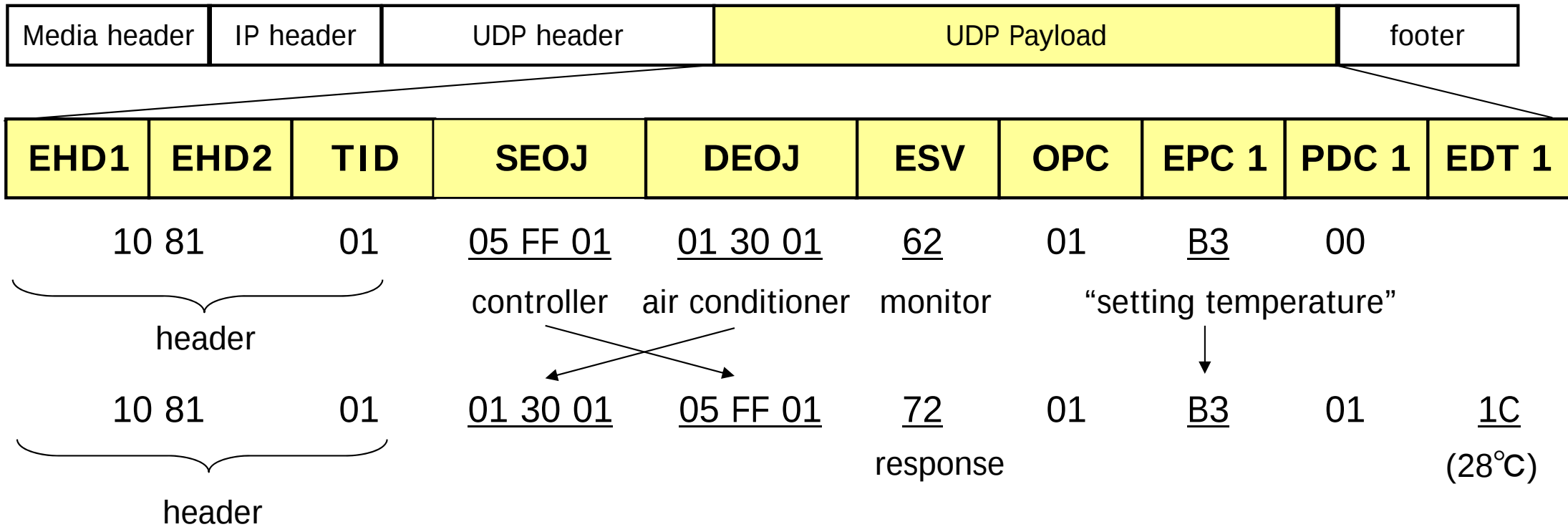
Exercise1 Monitor your air conditioner



(1) Monitoring request



(2) response



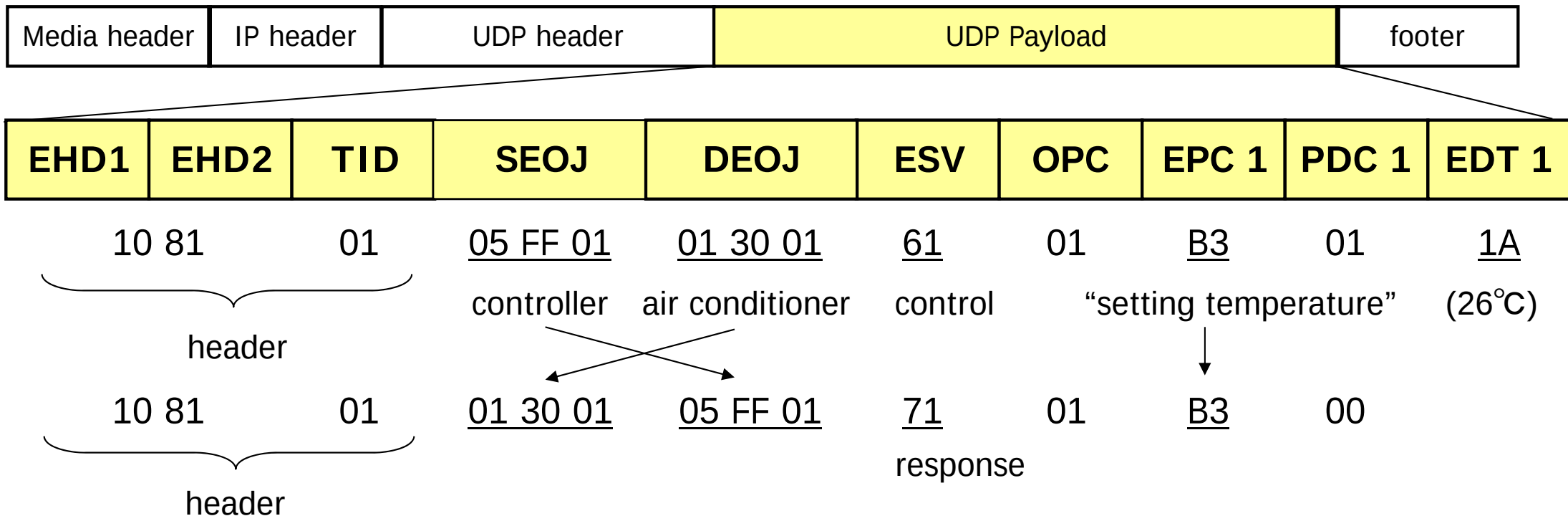
Exercise 2 Control your air conditioner



(1) Control request



(2) response



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.

Cocking Related

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

Health Related

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

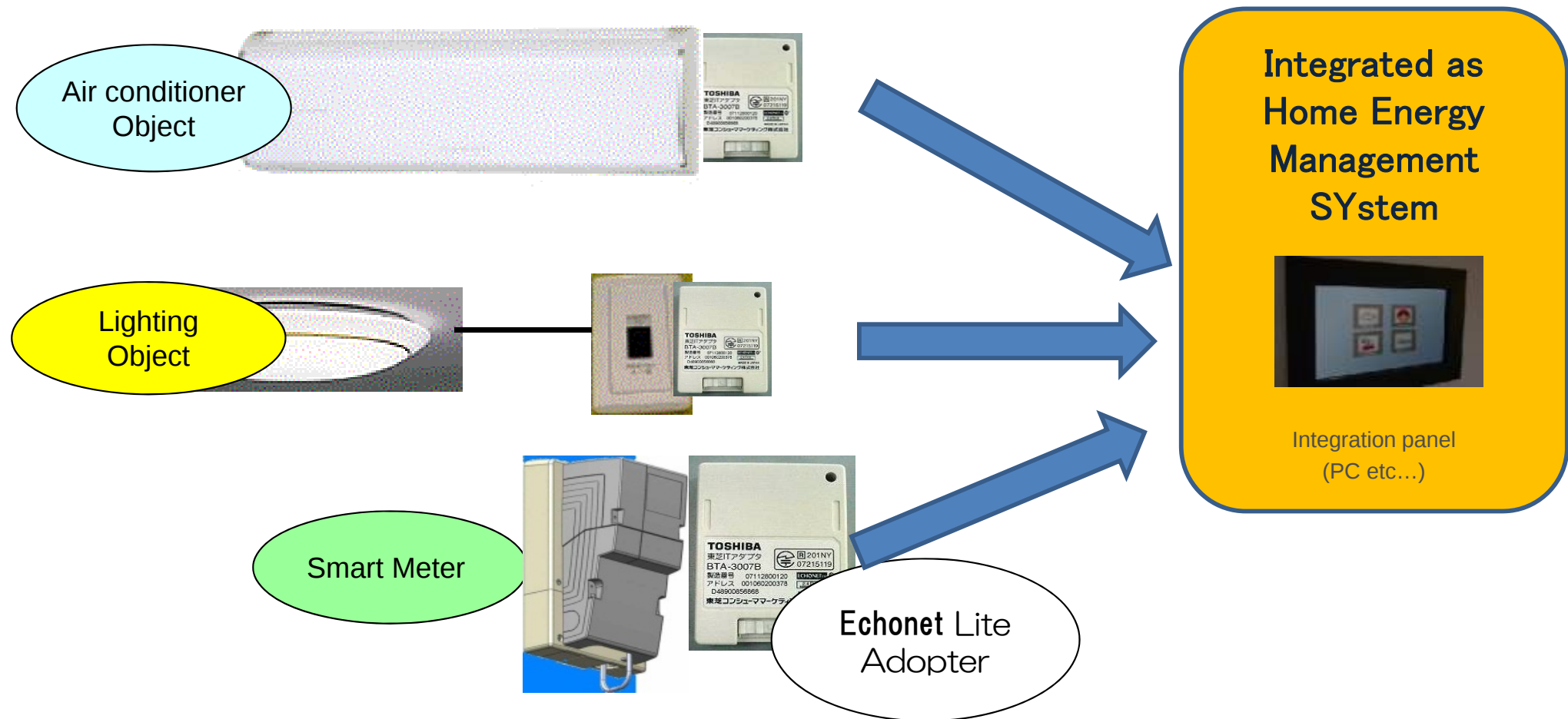
Controller Related

Controller, switch, etc.

Accomplishment:

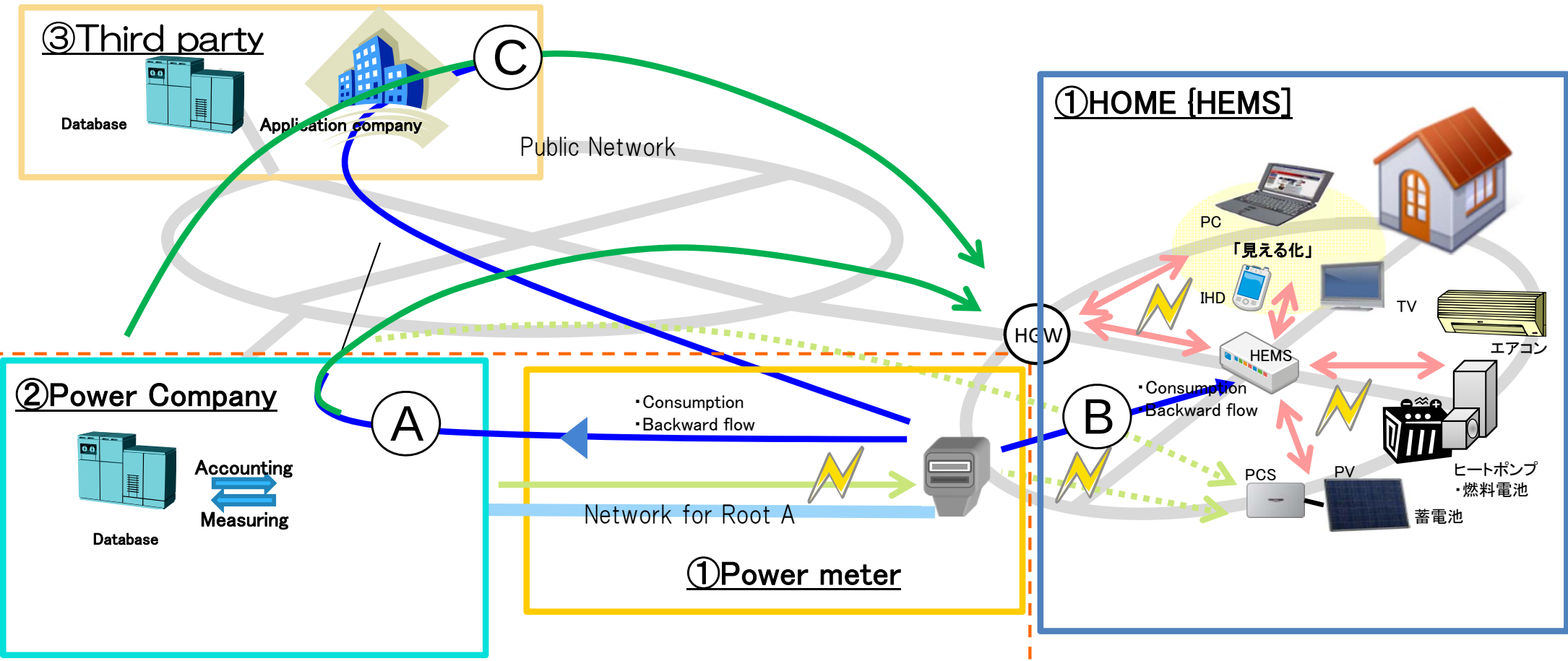
10million Toshiba's air conditioners are ready to speak ECHONET Lite

- In attaching ECHONET Lite middleware adopter, Toshiba's air conditioner enables to get network access.
- ECHONET Lite middleware adopter is such a communication card, enabling network access.



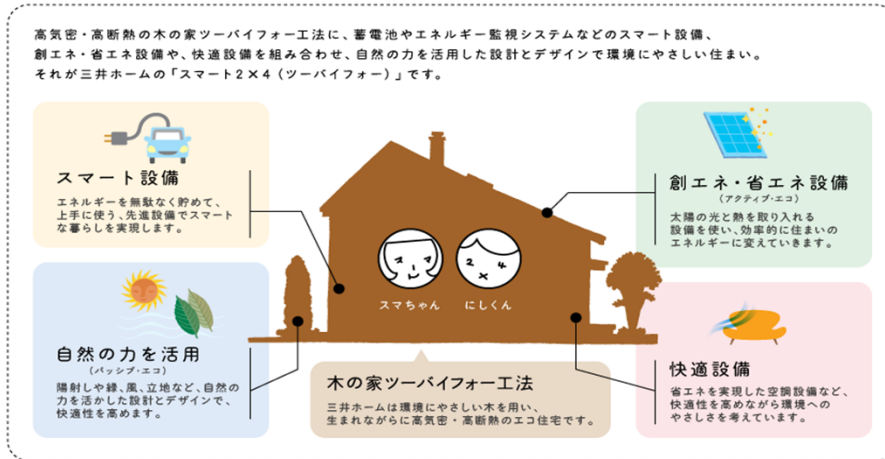
All Japan's power meter can speak ECHONET Lite over IP

- **Japanese Power meter has two interfaces: A root is to connect meter and utility and B root is to connect meter and demand side such as user's home.**
- **B roots must be applicable to IP and ECHONET Lite and talk ampere[real time], Voltage[real time], backward flow , and electricity consumption for pricing [30 minutes]**



Accomplishment: Smart House is commercialized -1-

三井ホームは、木の家スマートツゥバイフォー



Mitsui Home Group



Misawa Homes



Daiwa House



Sekisui Chemical

Accomplishment: Smart House is commercialized -2-



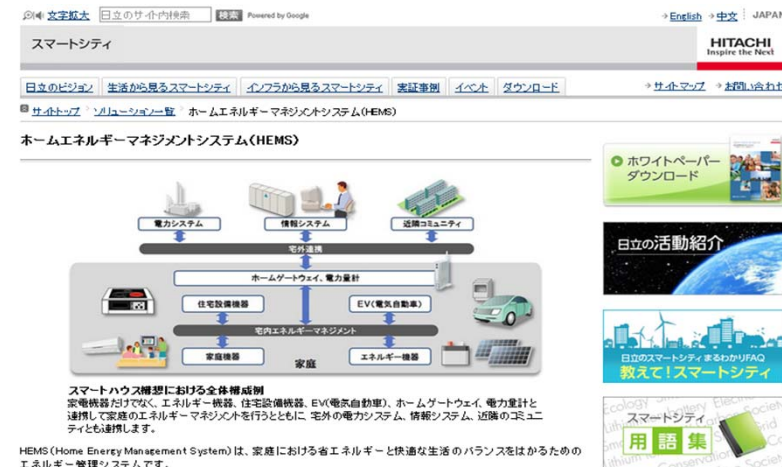
Panasonic



Sharp

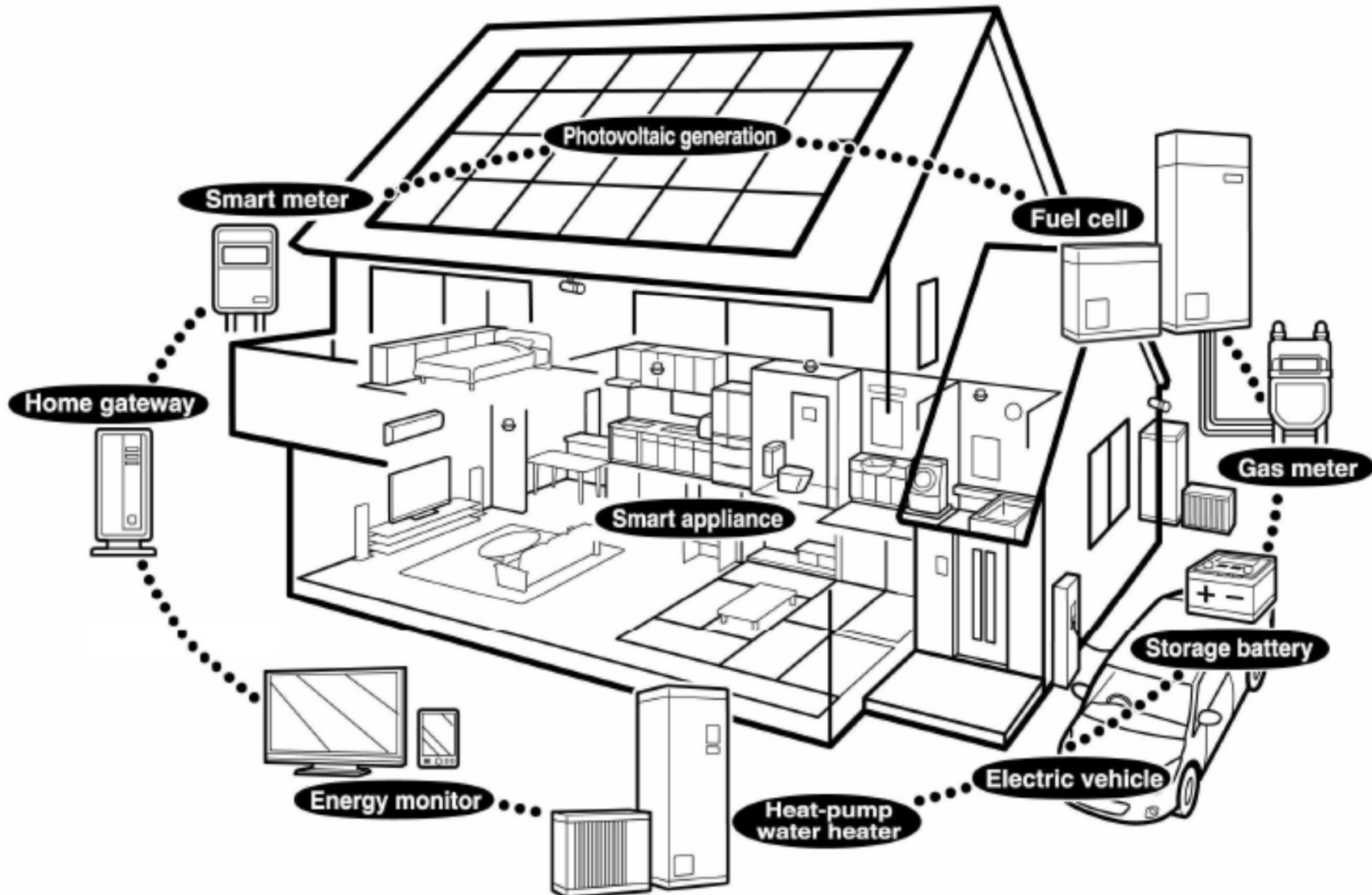


Toshiba



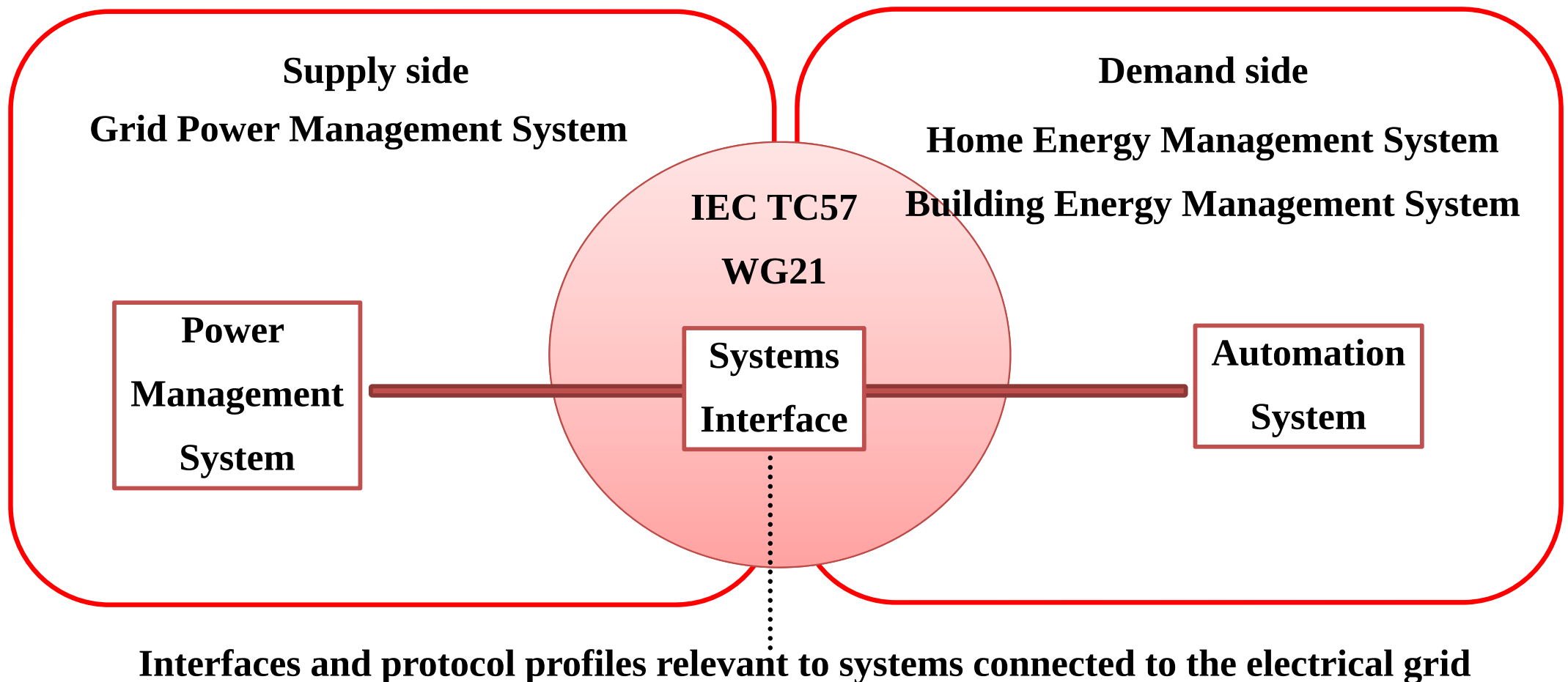
Hitachi

ECHONET Lite enables Smart house over standardized interface



International Liaison of ECHONET Lite

- ECHONET lite has addressed international standardization having allied with Japanese government and industry[JSCA],
 - Ongoing discussion in TC57 WG21, IEC
 - Ongoing liaison with other standardization bodies and research institutions: W3C[WEB] , IETF, APAN[IP], and so on



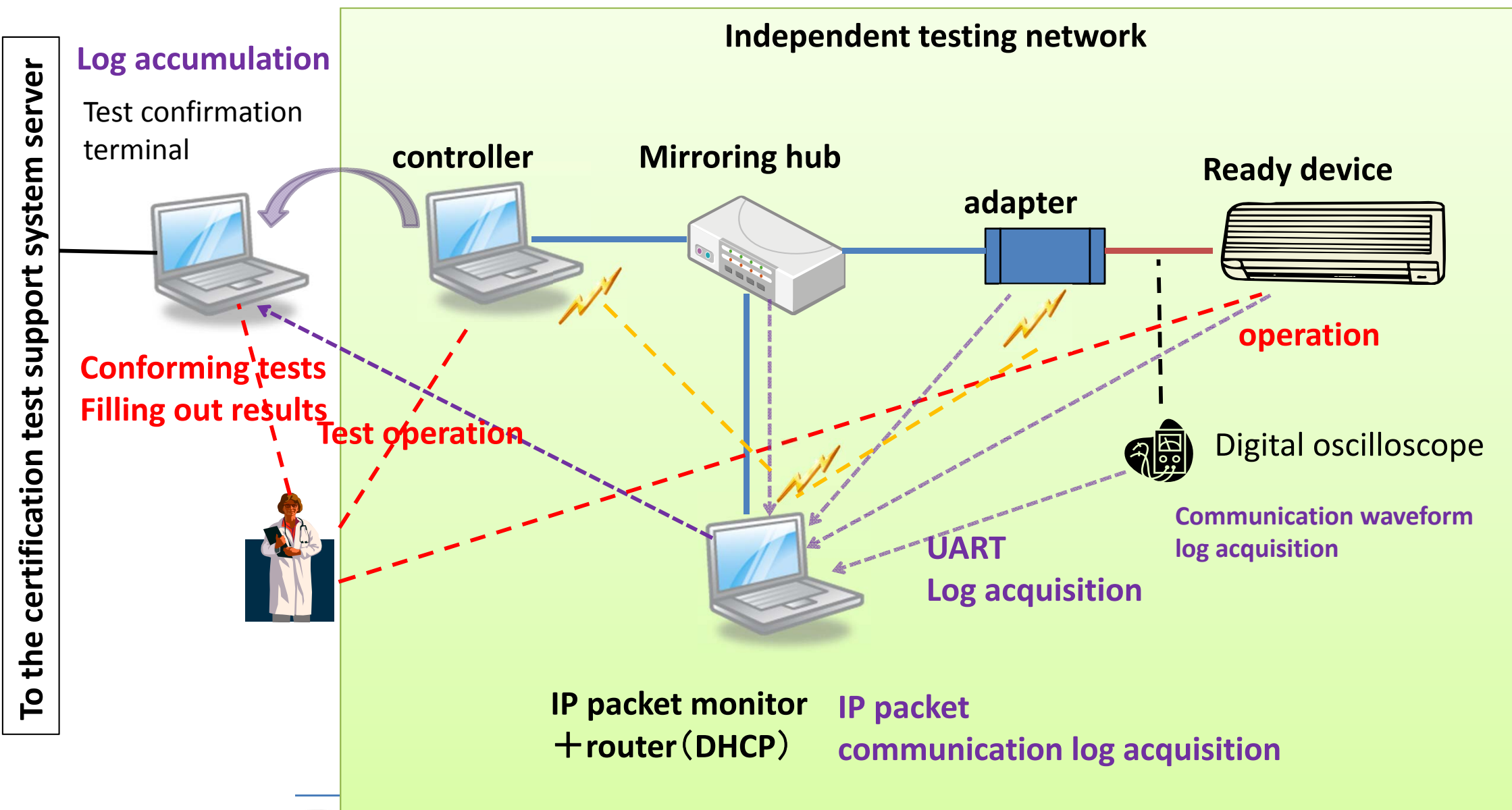
Launched HEMS Interoperability Test Center in 2012

- ① **For the companies providing service:** HEMS equipment, a place for actual examination, opportunities of information dissemination
- ② **For the companies developing equipment:** permanent Plug Festa location, software development kit, introduction of technical consultants or certification bodies

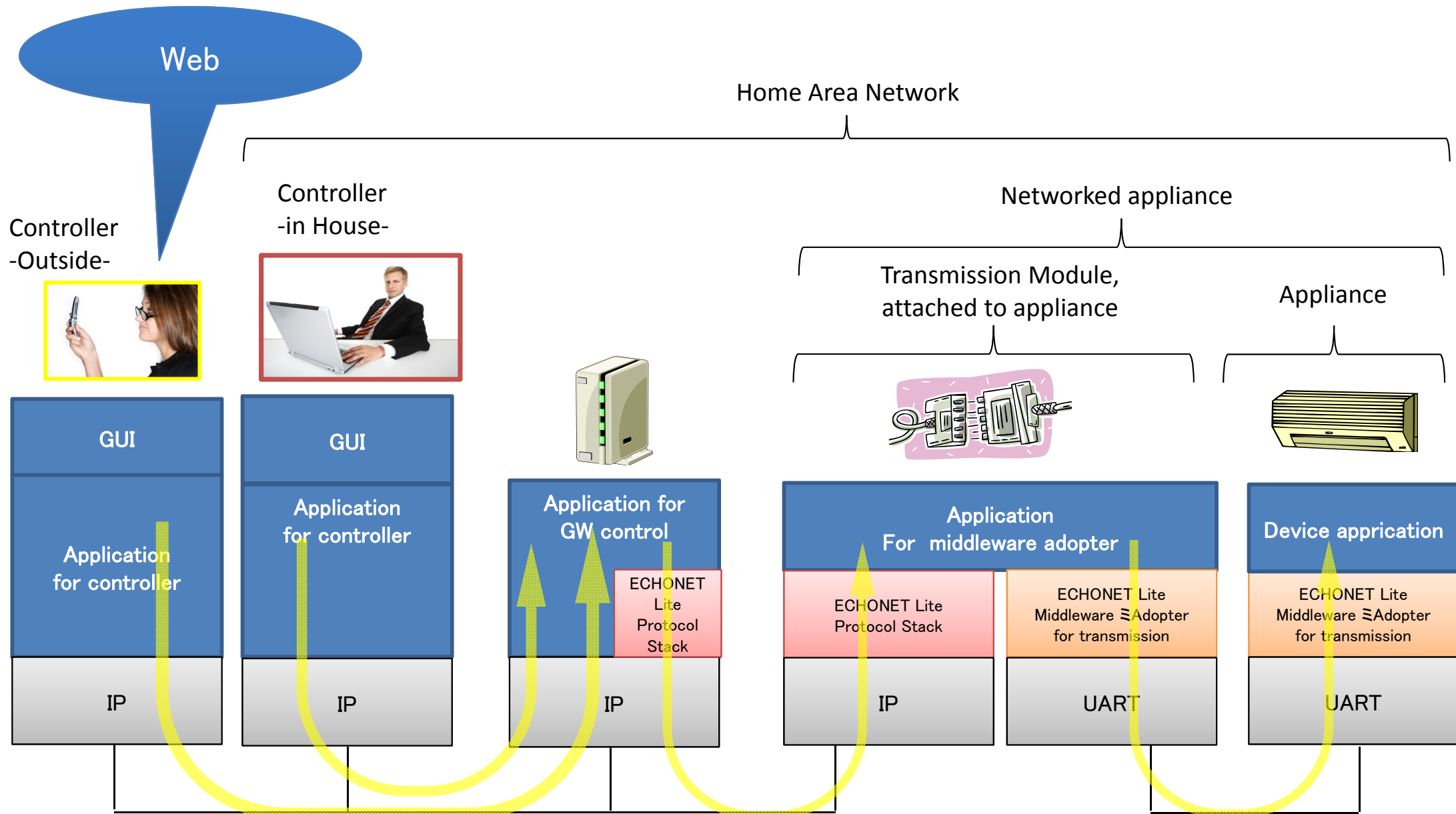
Image of the center



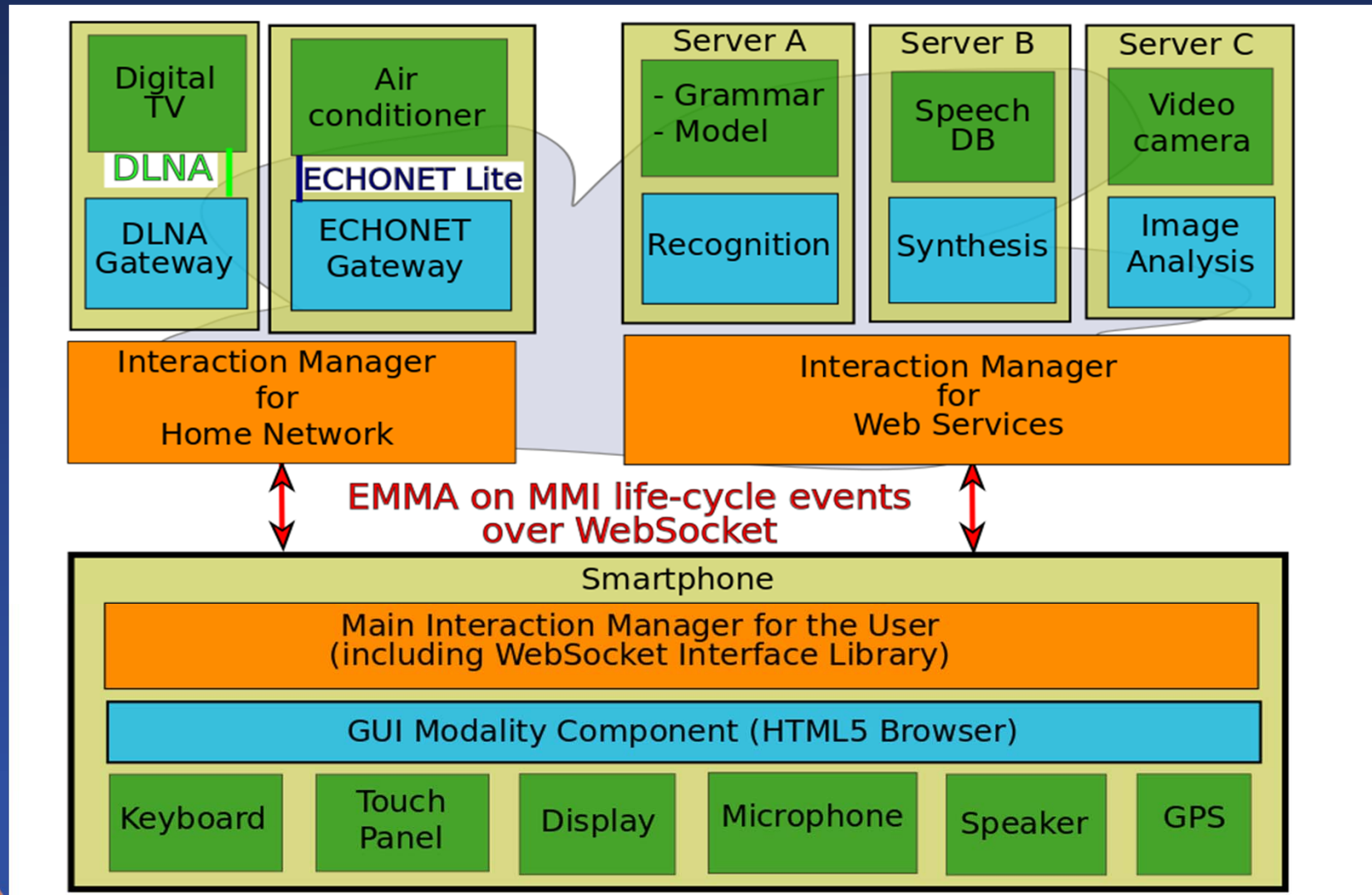
Basic test network diagram



Application deployment to control ECHONET Lite device



Expectation to compatibility ECHONET lite and Web is high. Web based smart house has become real?



ECHONET Lite delivers network connection to all appliances

- ECHONET Lite offers Services by Correlating Home Appliances, Facility Devices and Sensors.
- ECHONET Lite offers Various Services via World Wide Network

Remote appliance maintenance services

- Remote diagnosis and maintenance of home appliances
- Remote consulting for home appliances

I can get maintenance service without visits by a repairman.



Mobile services

- Remote monitors for home appliances
- Remote operation of home appliances and locking of doors
- Remote monitoring of visitors and elderly residents

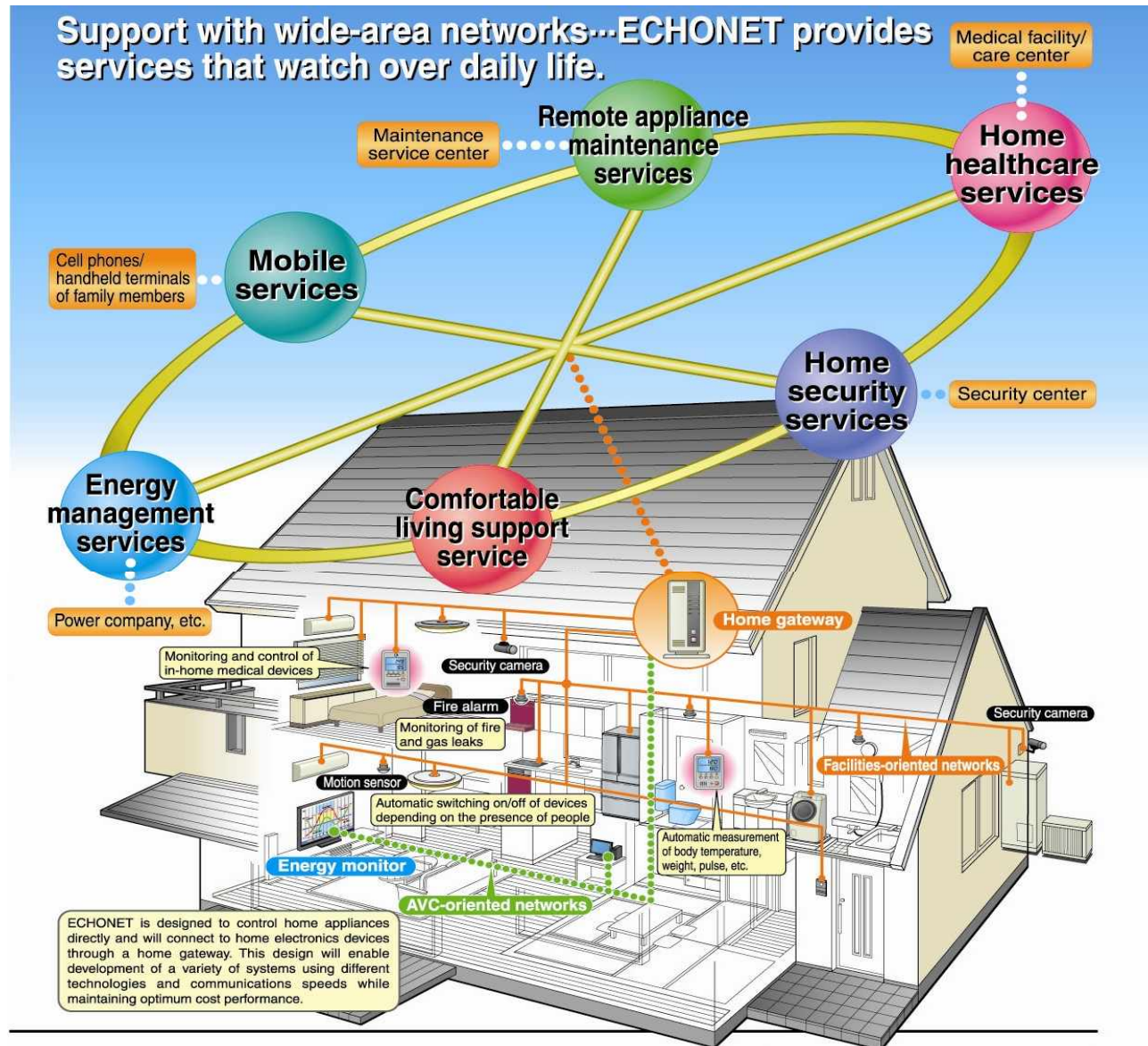
I can turn on my air conditioner with my cell phone when I'm out.
I love coming home to a comfortable house.



Energy management services

- Monitoring of power consumption and electric bill
- Energy-conserving operation of air conditioners, ventilation fans, lighting, and window blinds
- Demand-side management of power

I know what my electricity fees are at a glance.

Home healthcare services

- Health monitoring service (in conjunction with hospitals and health advisors)
- Elderly care services
- Monitoring and control of home medical devices

I feel relieved knowing I can get advice from my doctor.



Home security services

- Fire prevention (monitoring of gas and electrical leaks and fire)
- Disaster prevention (monitoring of water leaks, response to earthquakes, prevention of freezing)
- Crime prevention (monitoring of visitors, burglar alarm system)

The security services give me peace of mind.



Comfortable living support service

- Central operation of window blinds, ventilation fans, and lighting
- Scheduled operation of home appliances (e.g., heating and cooling systems)

The central operation keeps rooms comfortable all day long.

