

**-ITU/MIC Training on Bridging the Standardization Gap-**

# **Home Networking and Home Gateway Technologies in Today and Tomorrow**

**19, June, 2007**

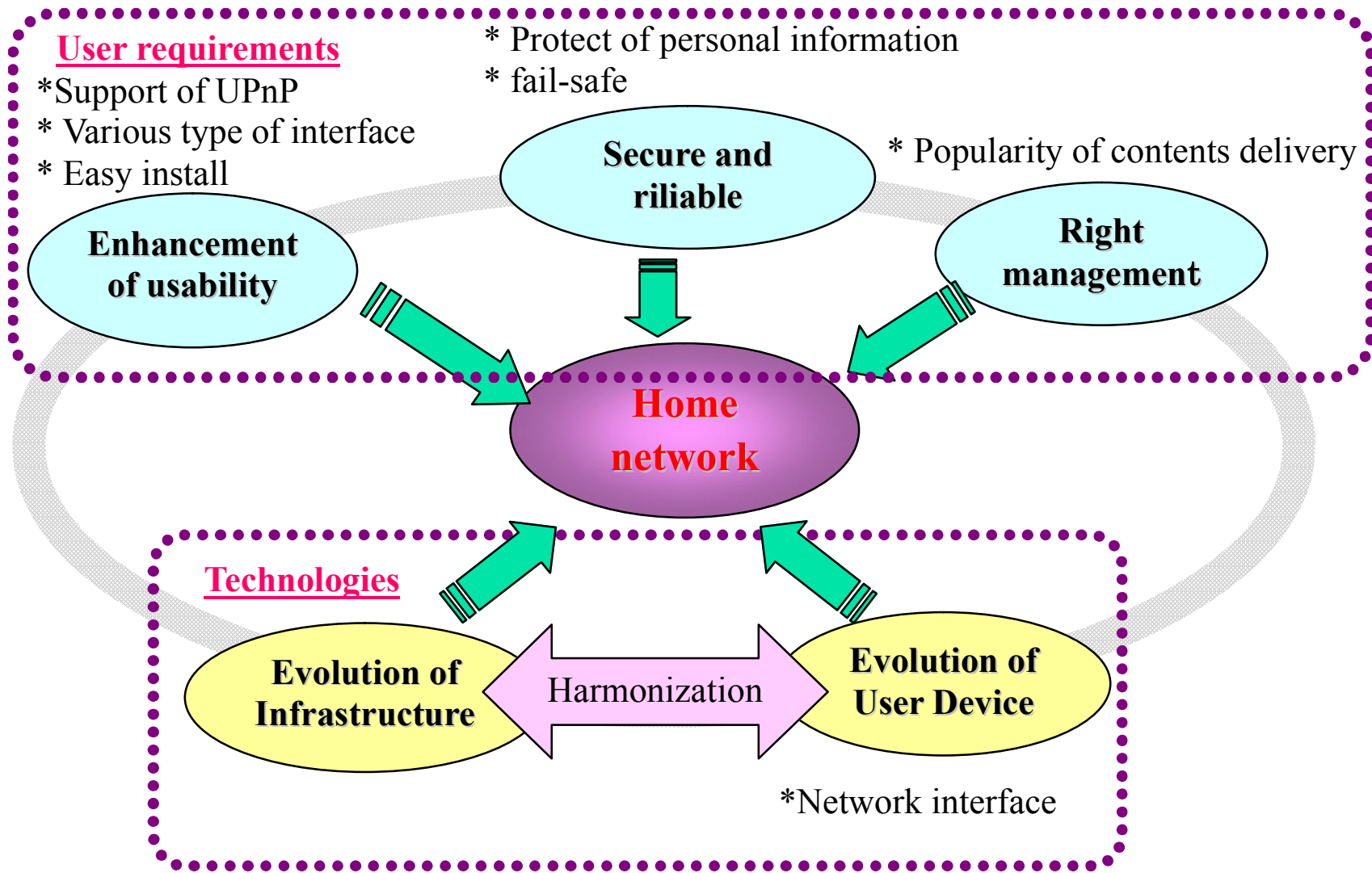
**Tetsuya Yokotani**

**Information Technology R&D Center  
Mitsubishi Electric Corp.**

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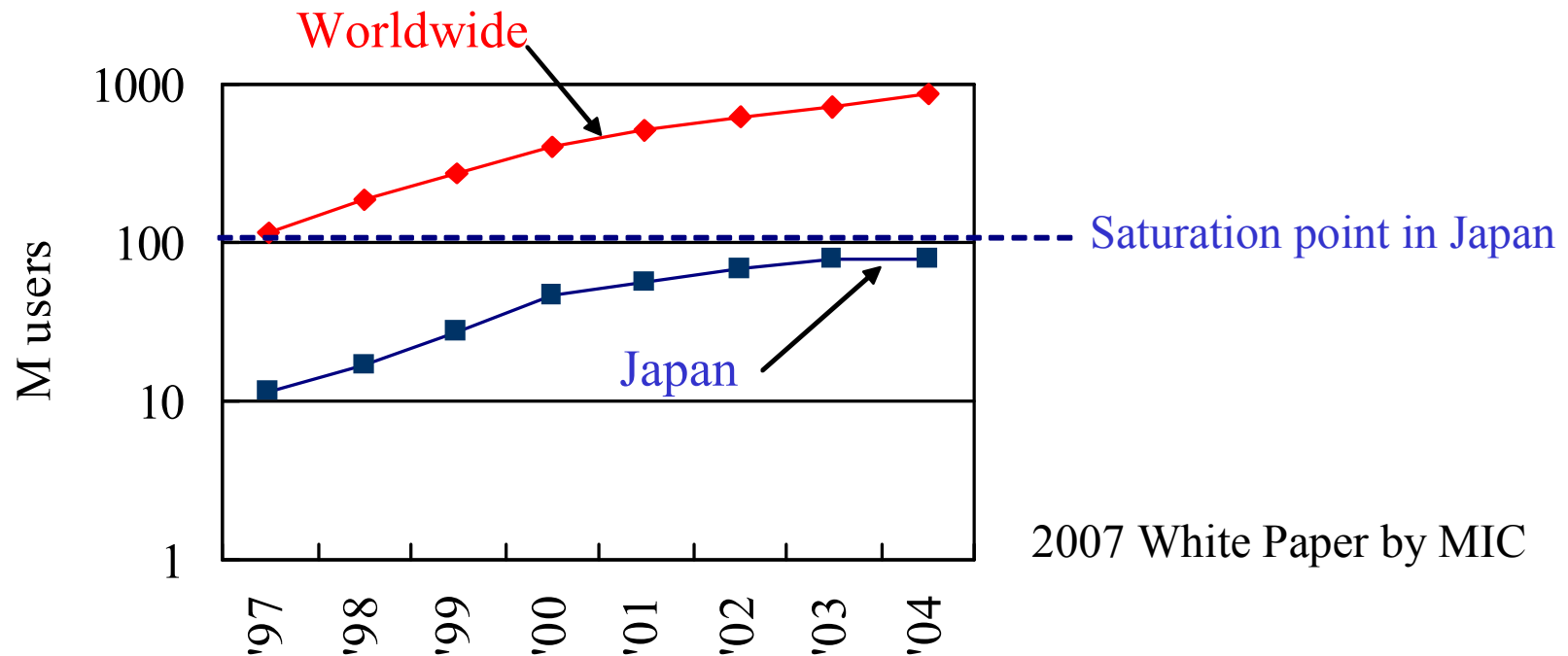
- “Home network” and “Home gateway” have been “existing” for long time.
- But, recently, these words have been widely accepted by the following popularity
  - **Technologies**
    - **Infrastructure: Internet, especially broadband services by fixed fare**
    - Terminal: Networked home appliance
  - Lifestyle using network by end users
    - Easy networking (enhancement of usability)
    - Secure and reliable
  - Various contents with right management



- This presentation surveys home network and home gateway from several points of view, such as standardization, services, and implementation. Moreover, it mentions their future evolution.

# Popularity of Internet

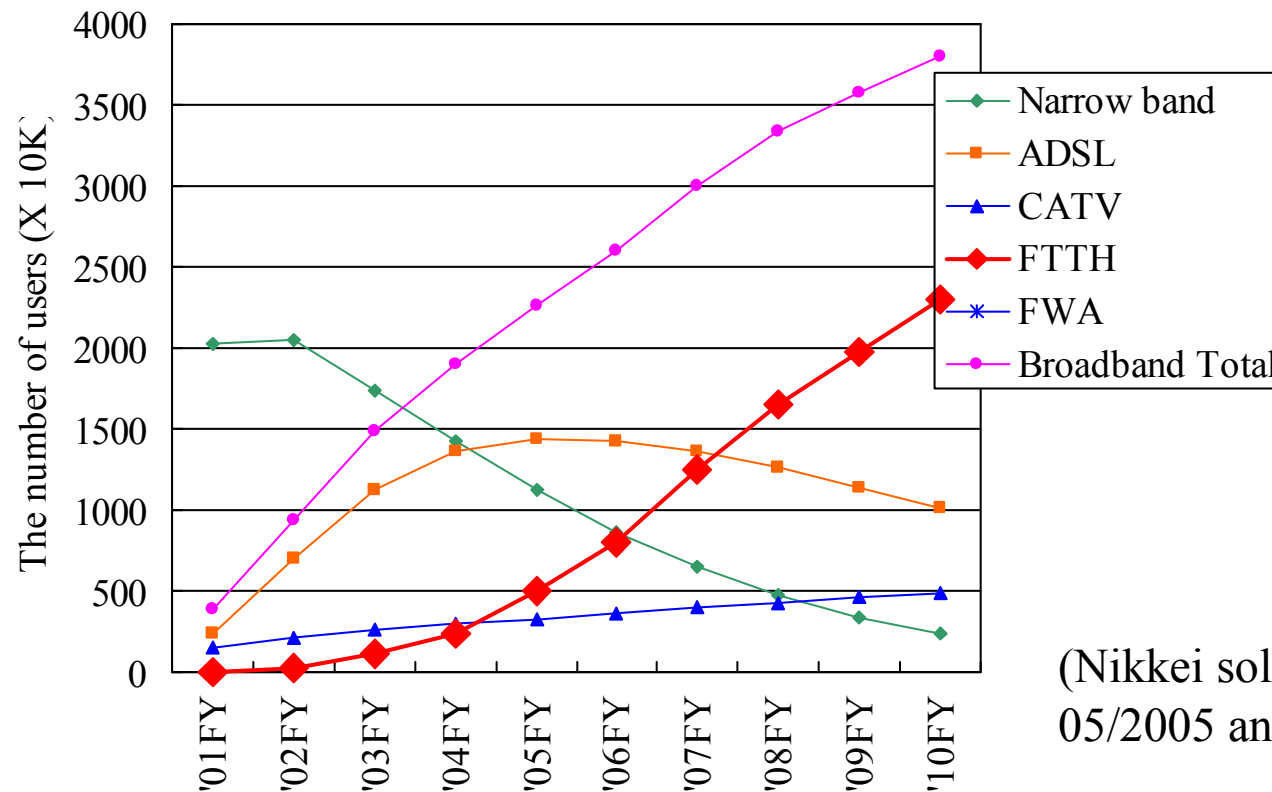
- Popularity of Internet in worldwide as strong motivation to install home network



Internet has been widely popularized Worldwide including Japan

# Popularity of Internet

- Particularly, home network is required, if broadband services based on fixed fare, e.g. FTTH, are installed.

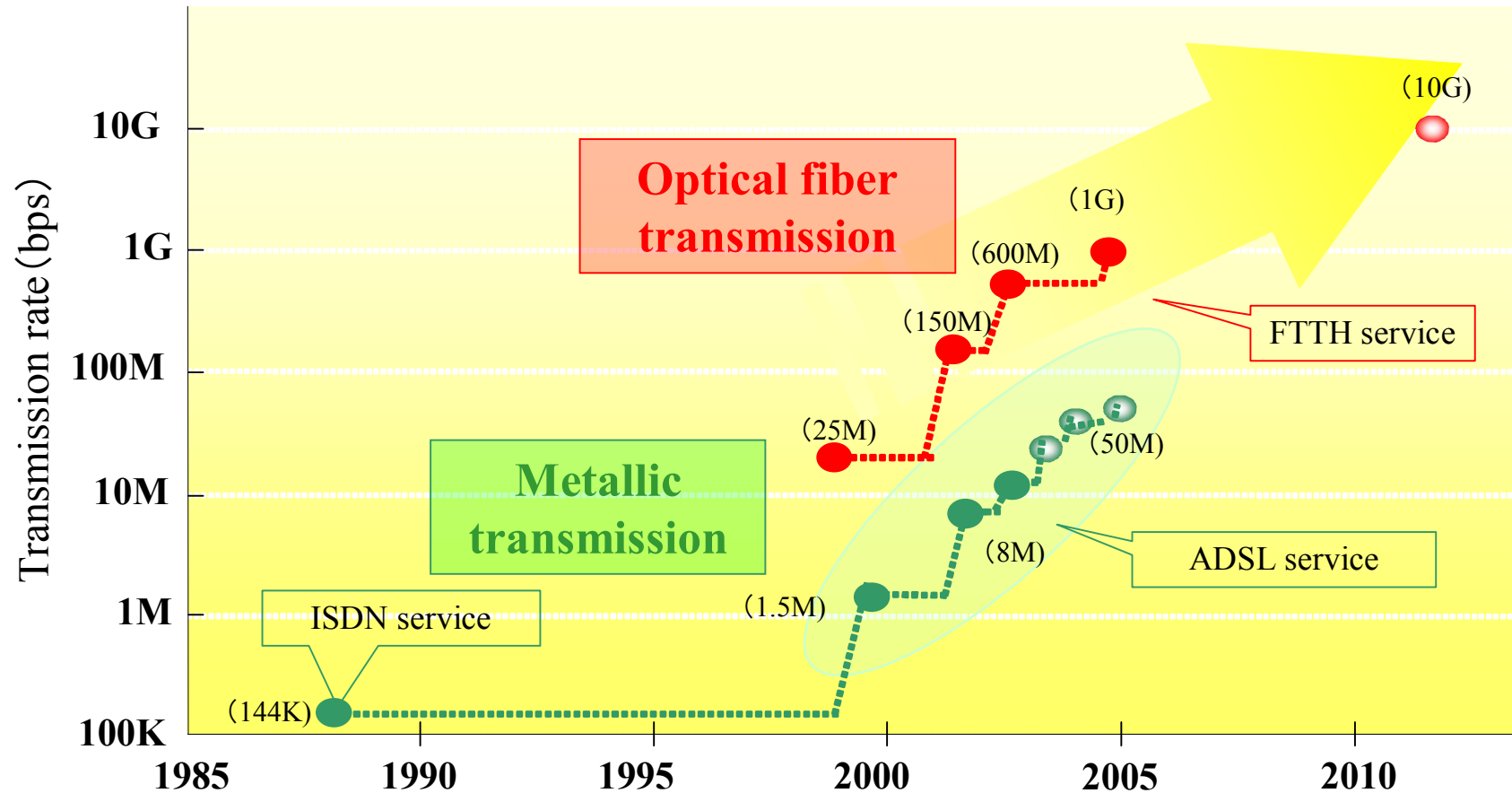


(Nikkei solution business, 05/2005 and others)

The number of users including prospect for broadband services in Japan

# Popularity of Internet

- Evolution of transmission rate in Japan





# Standardization for home network

*Architecture*  
ITU-T (SGs, JCA-HN)

*Infrastructure*  
ITU-T  
DSL Forum

*Home Gateway*  
HGI  
OSGi

*Terminal*  
UPnP  
DLNA  
UOPF\*  
ECHONET\*

*Home network transmission*  
Home plug, CEPCA, IEEE1901 (PLC)  
Home PNA (Phone line)  
ZigBee, IEEE802.11 (Wireless)  
IEEE802.3 (Ethernet)  
IEEE1394 (Others)

\* Japanese domestic alliance

# Standardization for home network

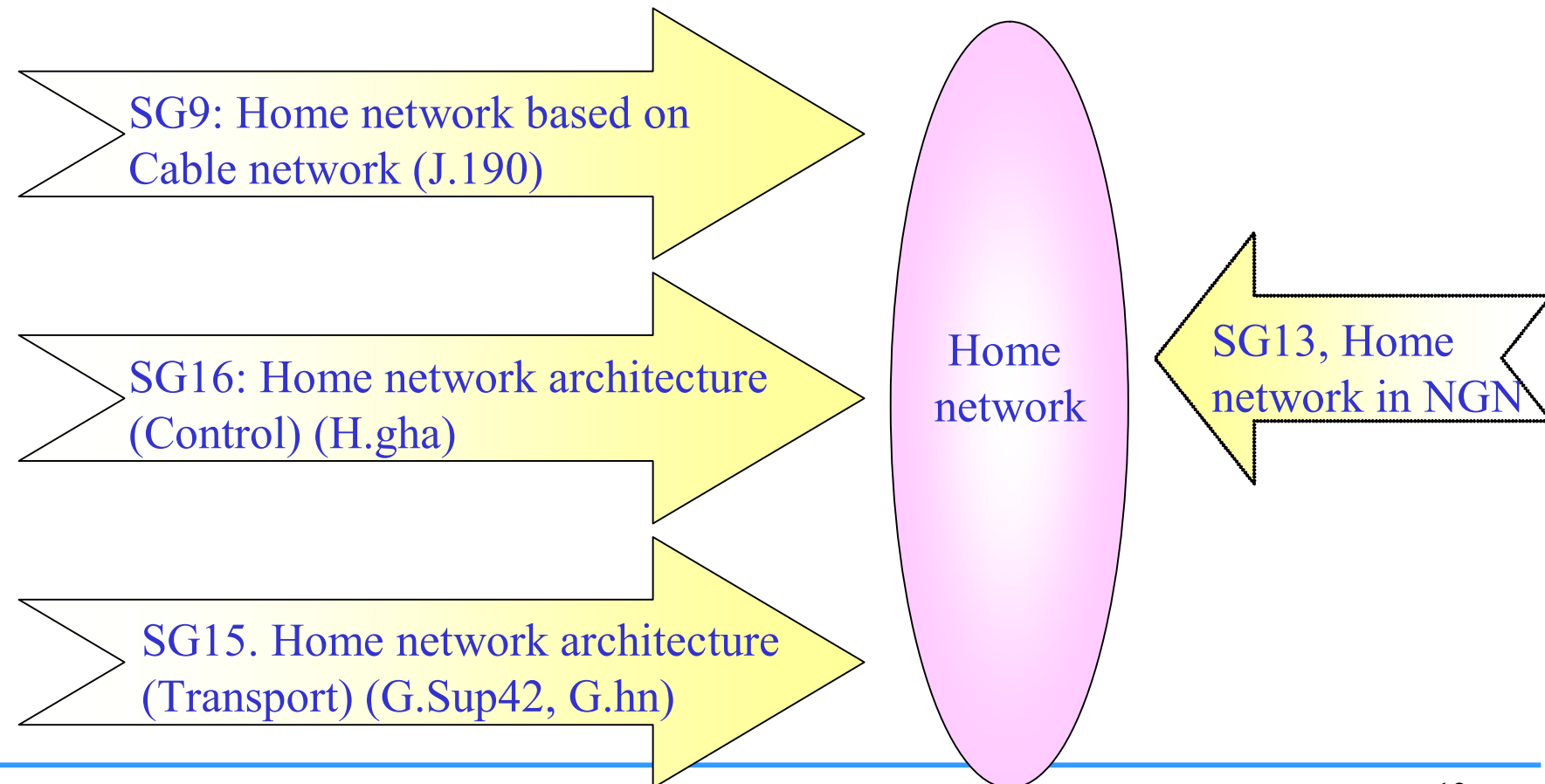
- ITU-T
  - SGs: <http://www.itu.int/ITU-T/studygroups/com#/index.asp> (#: SG No. )
  - JCA-HN (Joint Coordination Activity on Home Networking)  
<http://www.itu.int/ITU-T/special-projects/jca-hn/>
- DSL Forum
  - <http://www.dslforum.org>
- HGI (Home Gateway Initiative)
  - <http://www.homegateway.org>
- OSGi (Open Service Gateway initiative)
  - <http://www.osgi.org>
- UPnP (Universal Plug and Play)
  - <http://www.upnp.org>
- DLNA (Digital Living Network Alliance)
  - <http://www.dlna.org>

## Standardization for home network

- UOPF (Ubiquitous Open Platform Forum)
- Home Plug
  - <http://www.homeplug.org>
- CEPCA (CE Power line Communication Alliance)
  - <http://www.cepca.org>
- Home PNA (Home Phone line Network Alliance)
  - <http://www.homepna.org>
- ZigBee
  - <http://www.zigbee.org>
- IEEE802.3, IEEE802.11
  - <http://grouper.ieee.org/groups/802/dots.html>

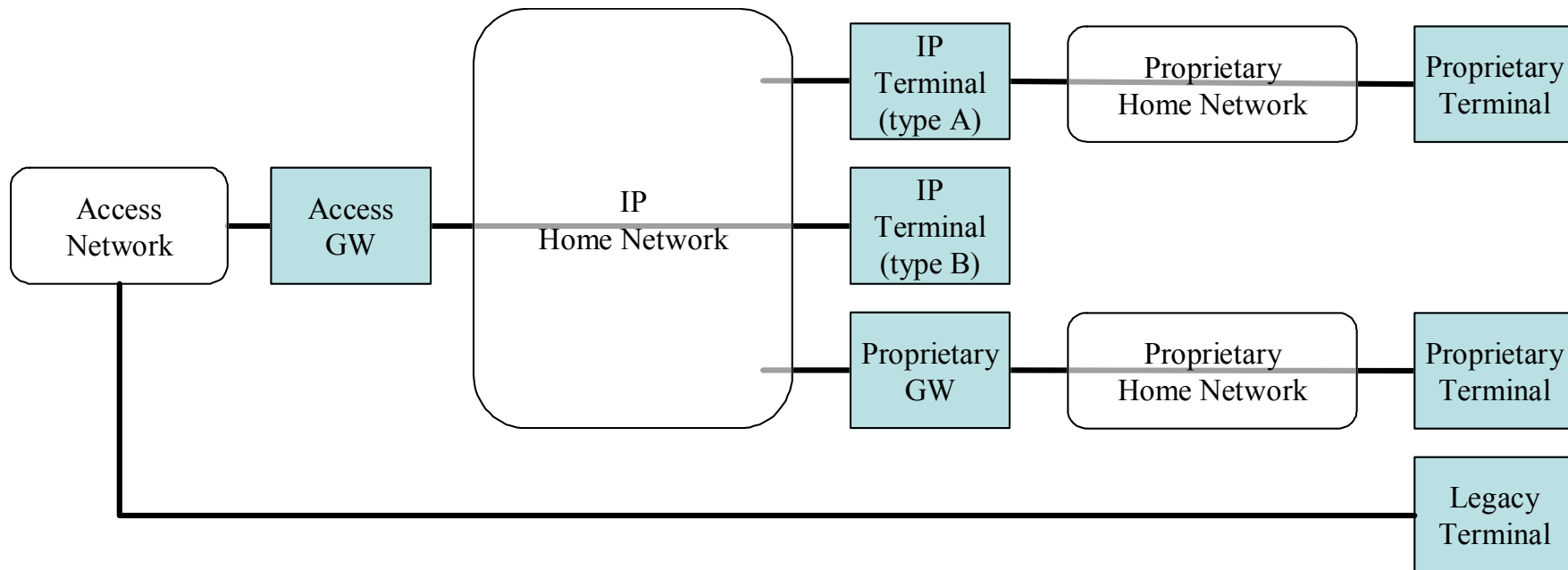
# Study on home network in ITU-T

- Several SGs are interested in home networks from several points of view.
- Studies in each SG has been started.
- In the next study period (2009-2012), it will be one of main topics

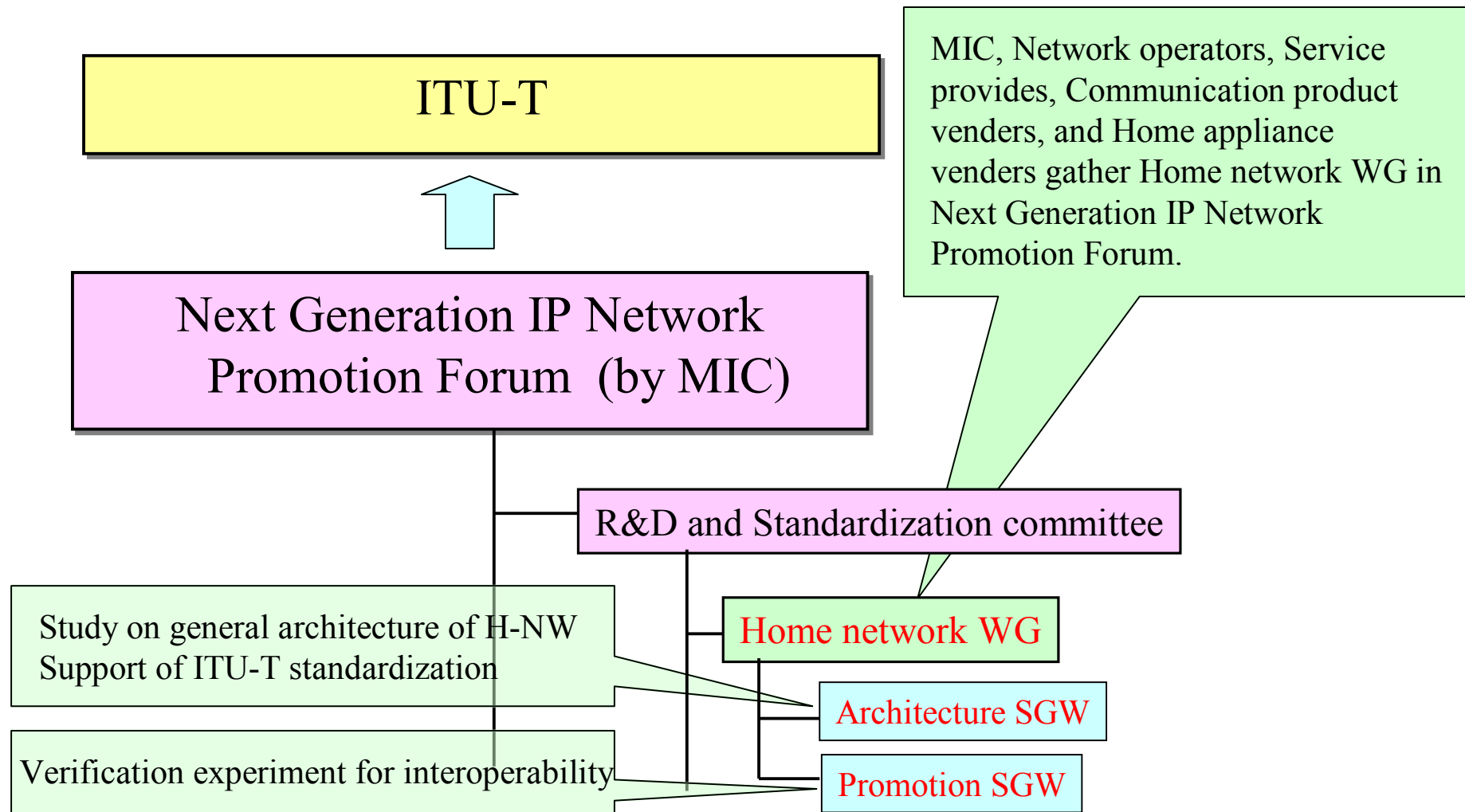


# Study on home network in ITU-T

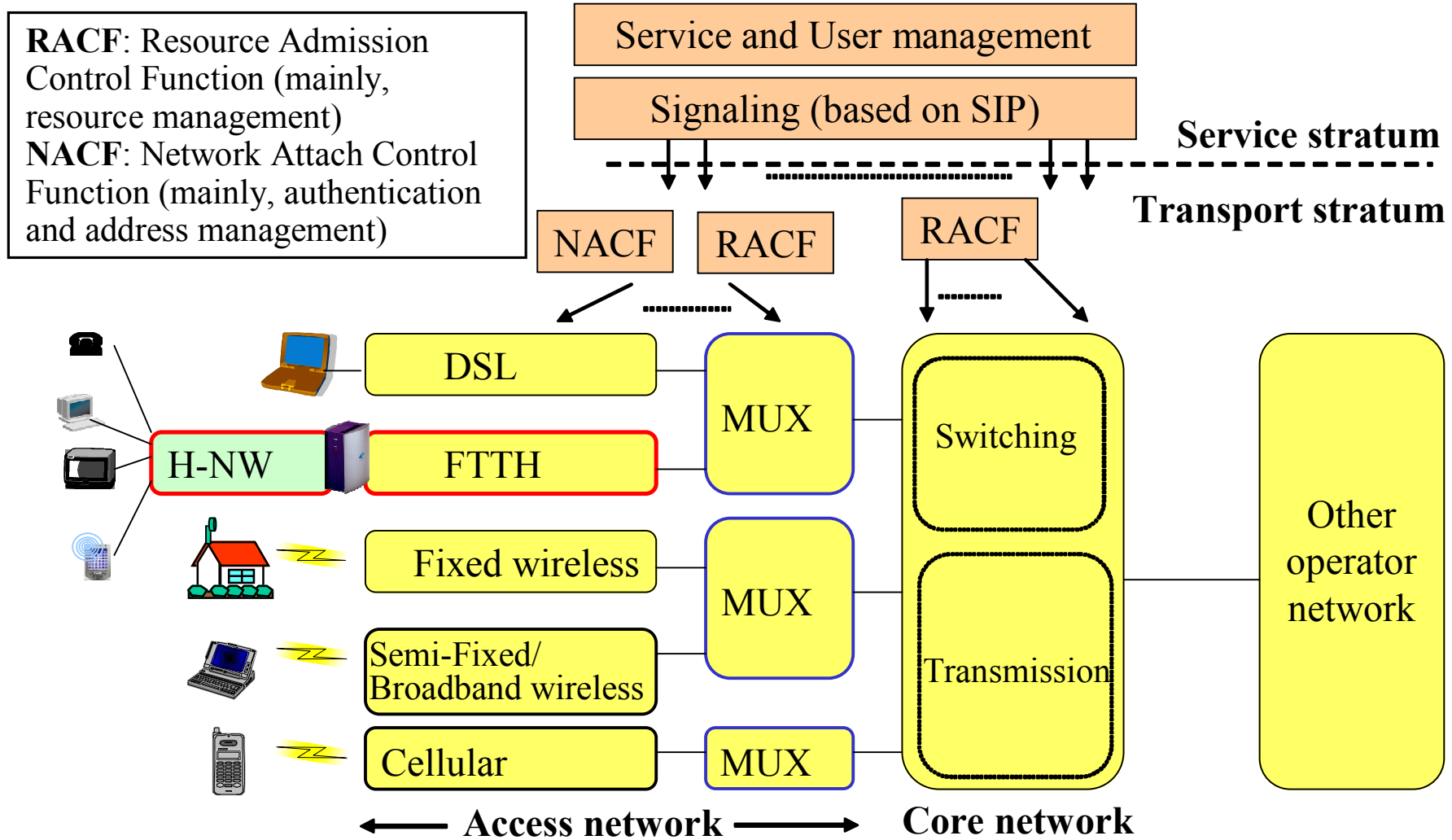
- Example in home network architecture and functional definitions in each component



# Study on home network Japan

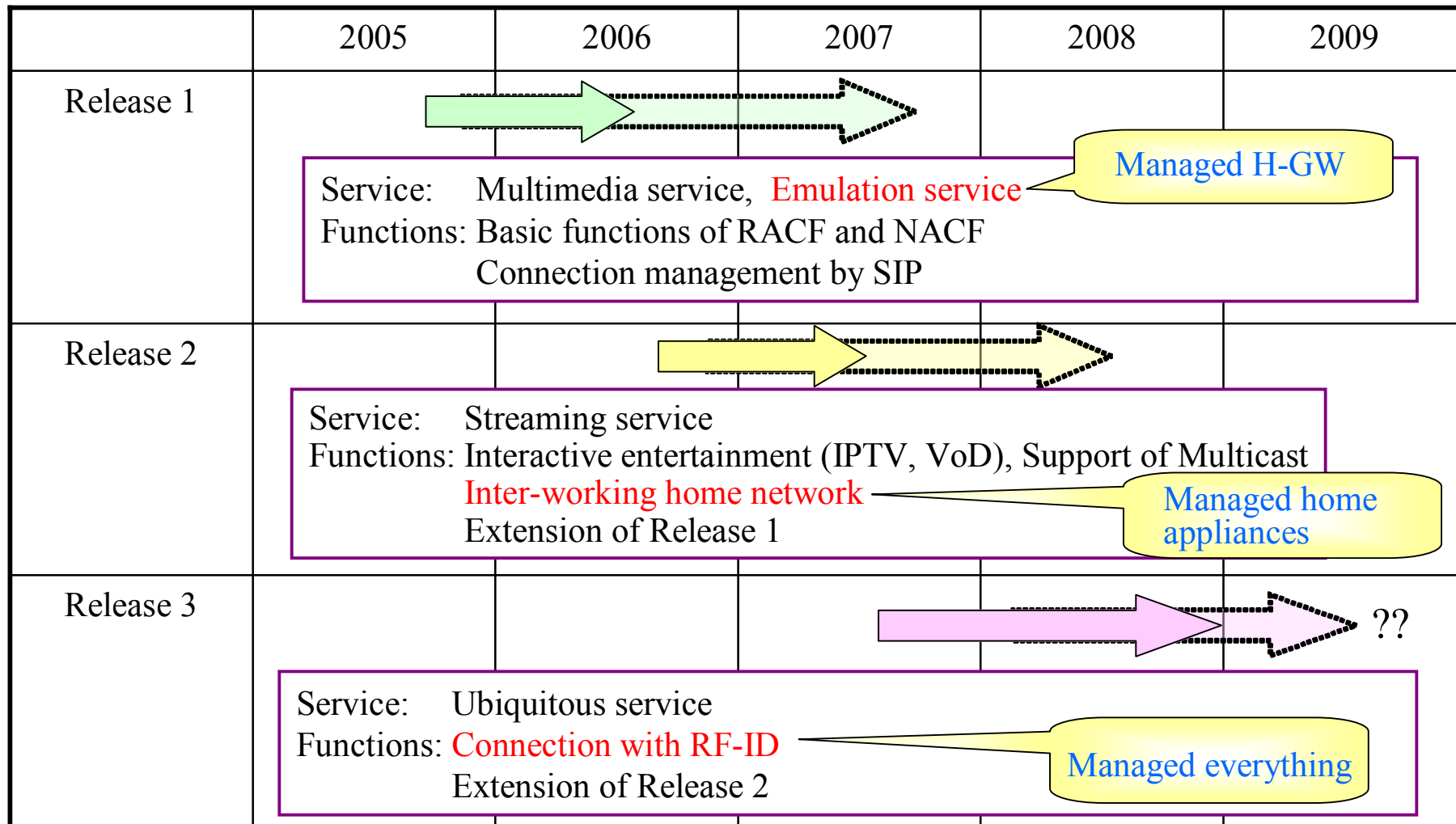


- Generic NGN configuration



**H-NW provides End-End NGN class service, and flexible home networking as “the Key Player”**

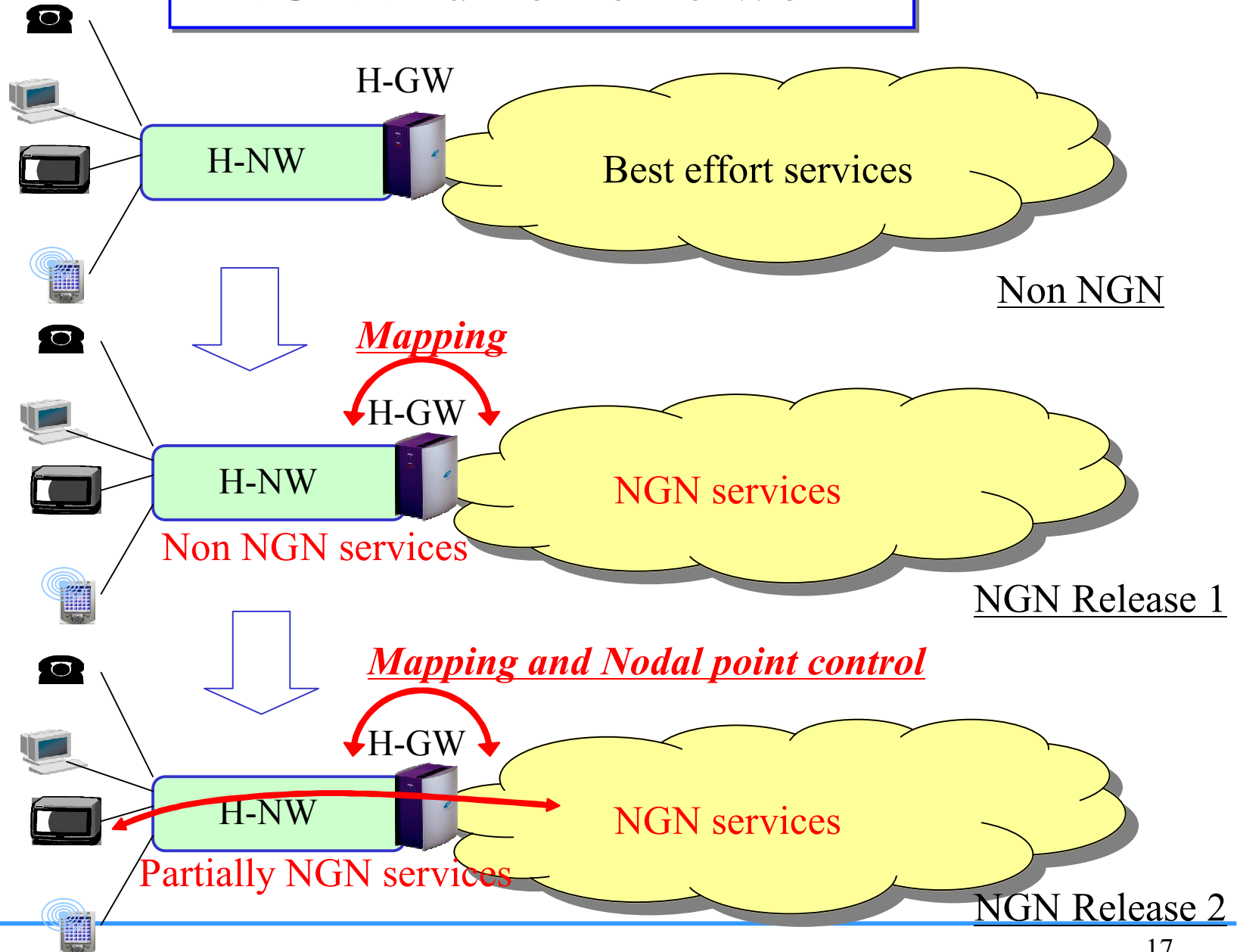
## •NGN Release roadmap





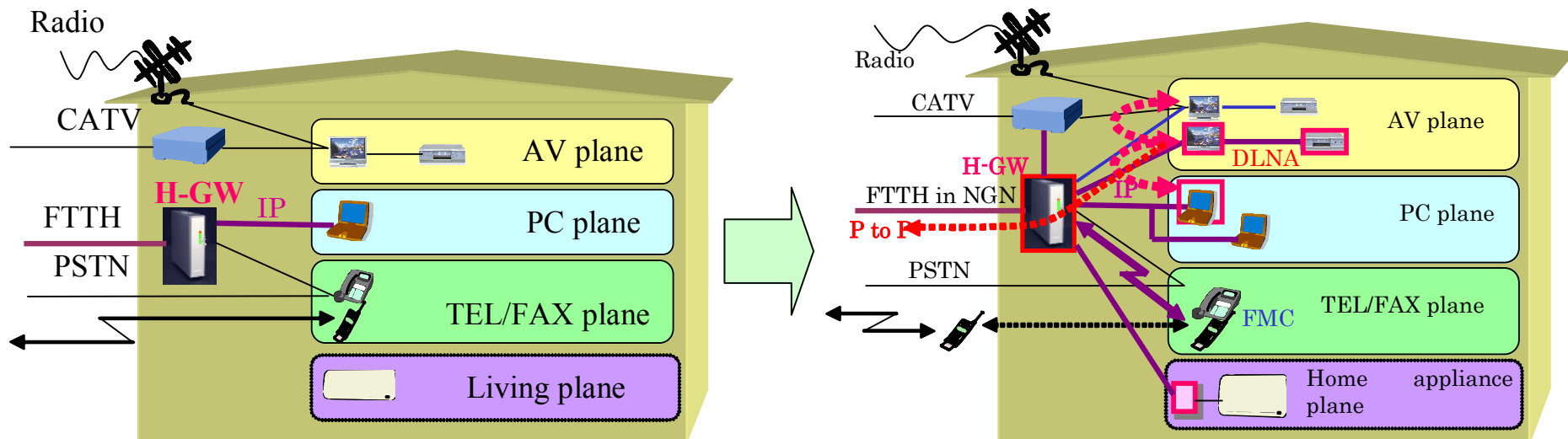
# NGN and home network

*Changes for the Better*



# Home network configuration and services

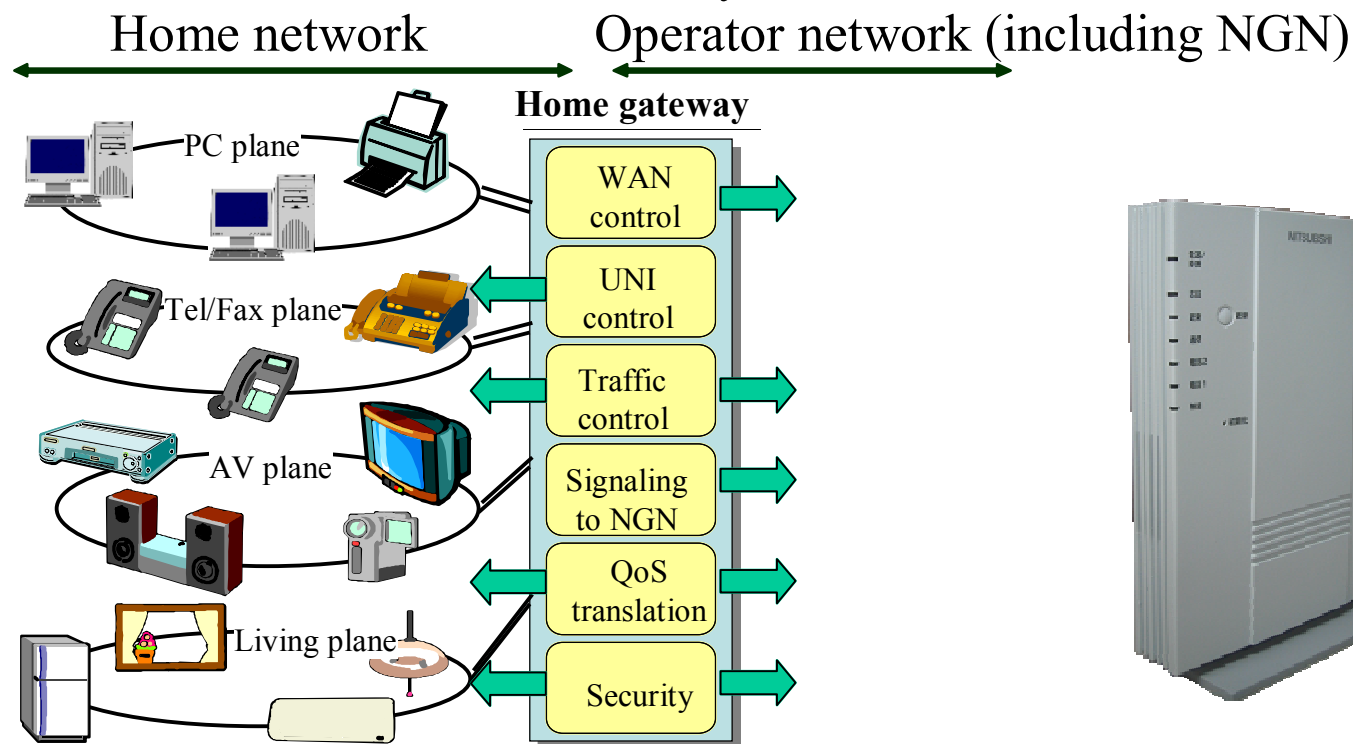
- Physical home network configuration is typically “Tree” or “Star” centralized by gateway, such as home gateway.
- Logically, terminals or home appliances are categorized into 4 planes, such as PC, Phone/fax, AV, and living planes.



# Technical summary of home gateway

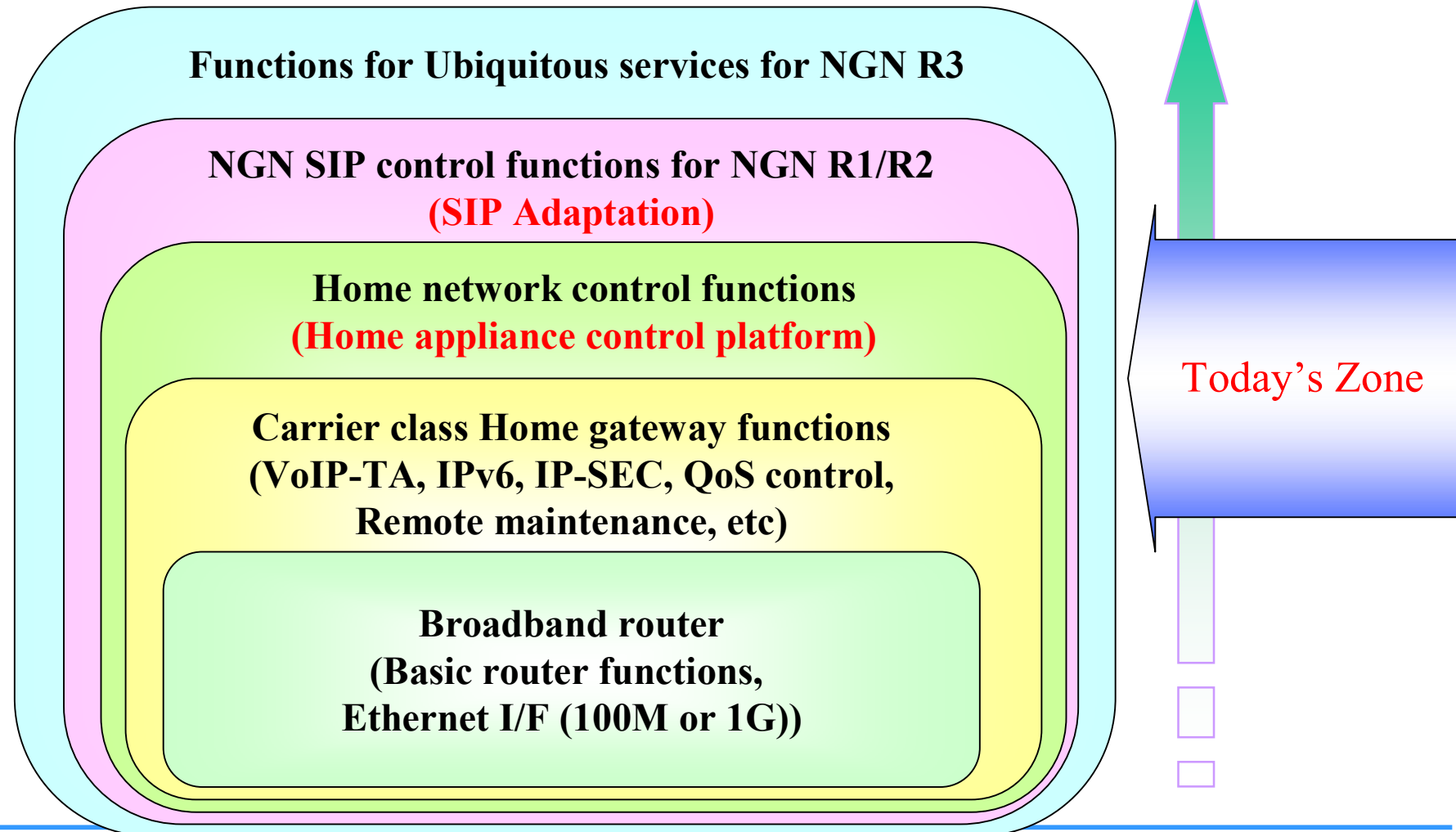
- Home gateway is a “key player” for home network.
- Home GW has a lot of functions, is categorized into several types, and has several evolution steps

## Generic functionality in H-GW



# Technical summary of home gateway

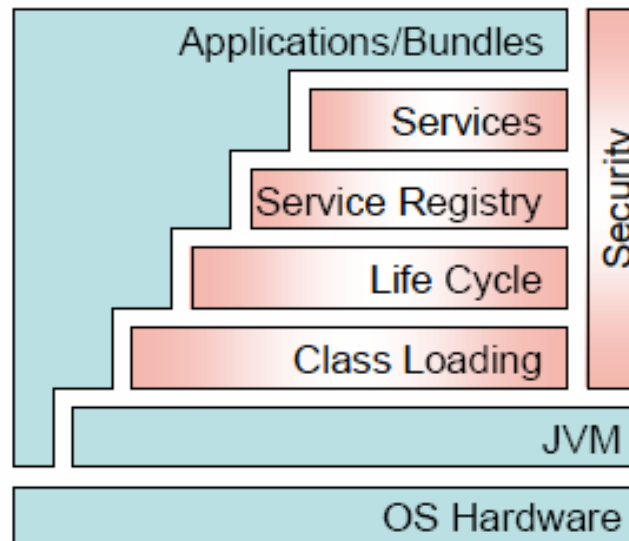
- Evolution steps of home gateway



# Technical summary of home gateway

- Key technology #1: Home appliance control platform
  - OSGi architecture
    - Open architecture over JAVA
    - Applications named “Bundle” across open interface of flame work

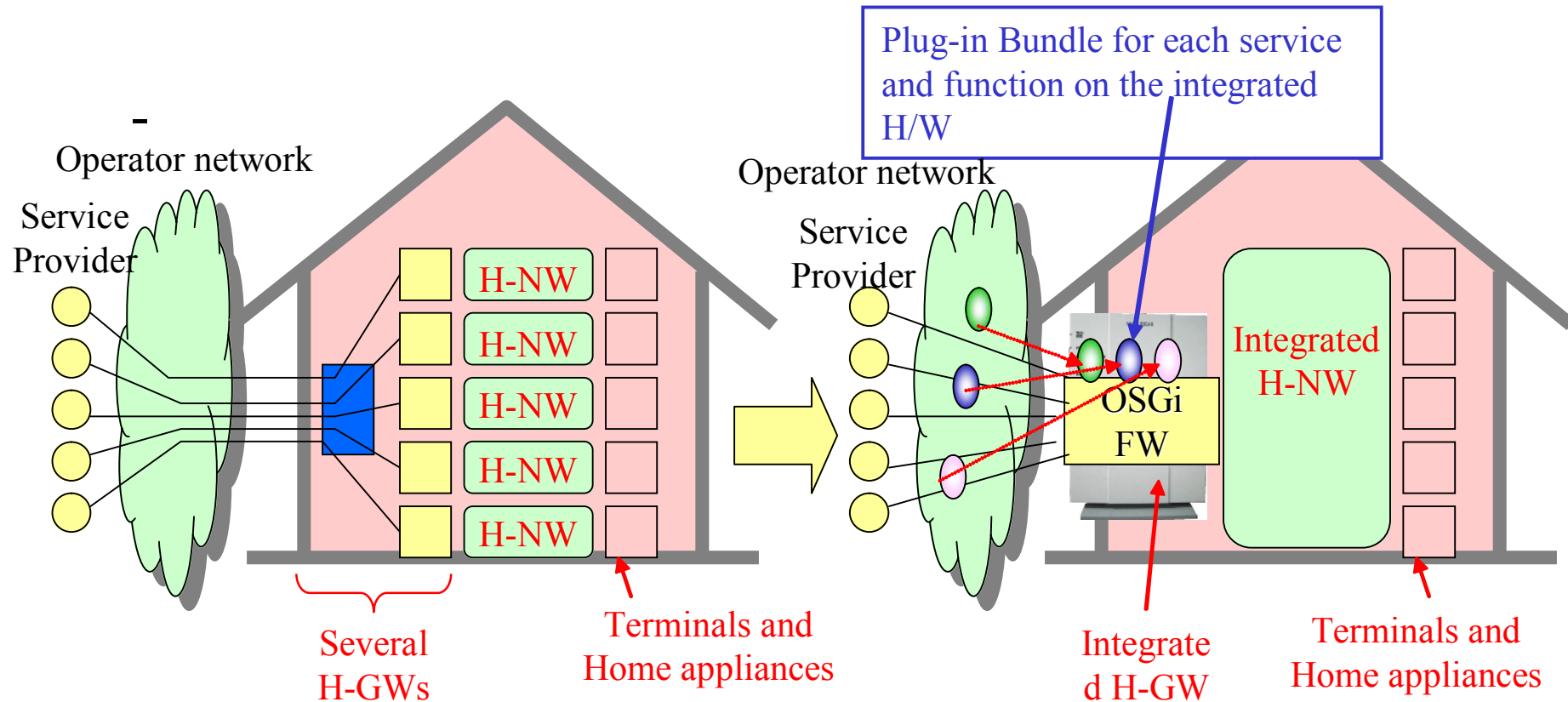
## *OSGi Architecture*



(by OSGi HP)

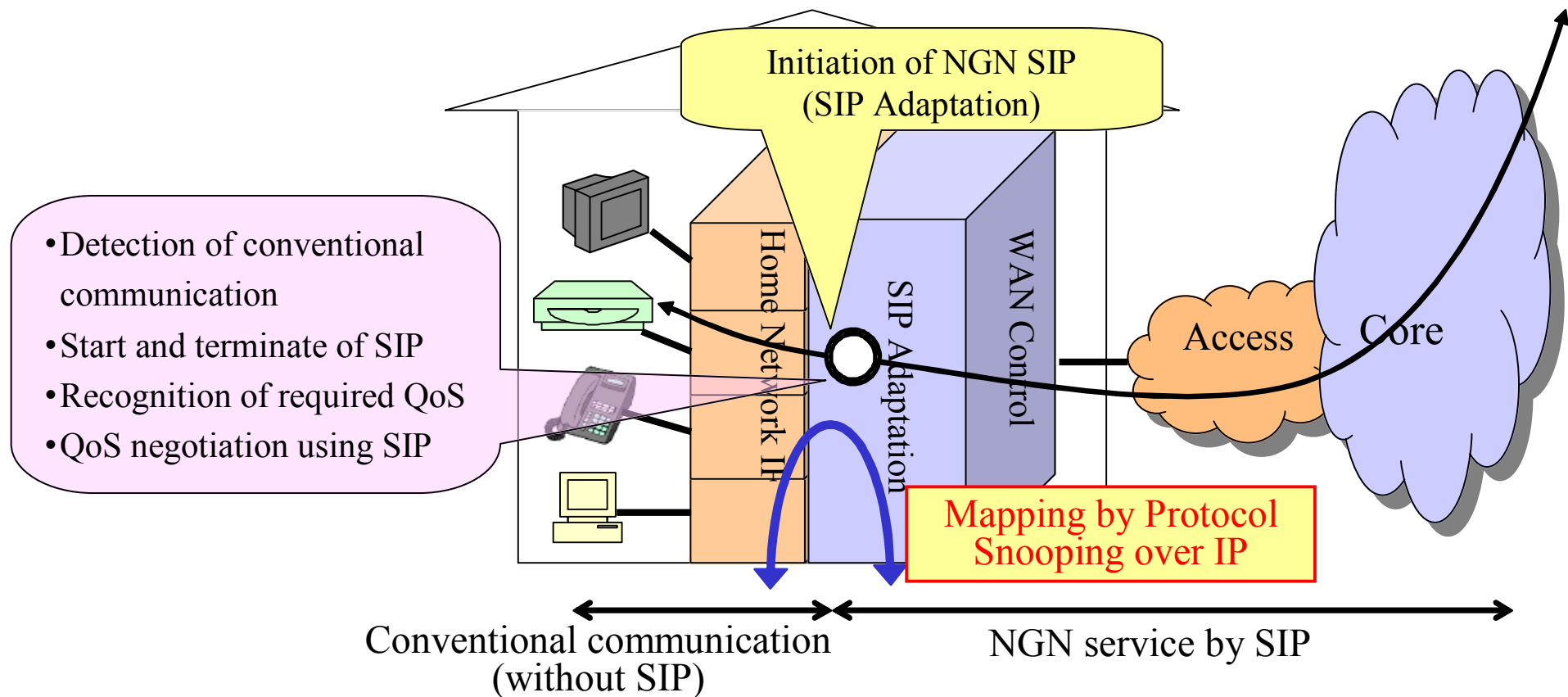
# Technical summary of home gateway

- Key technology #1: Home appliance control platform
  - Advantages of home network by OSGi architecture



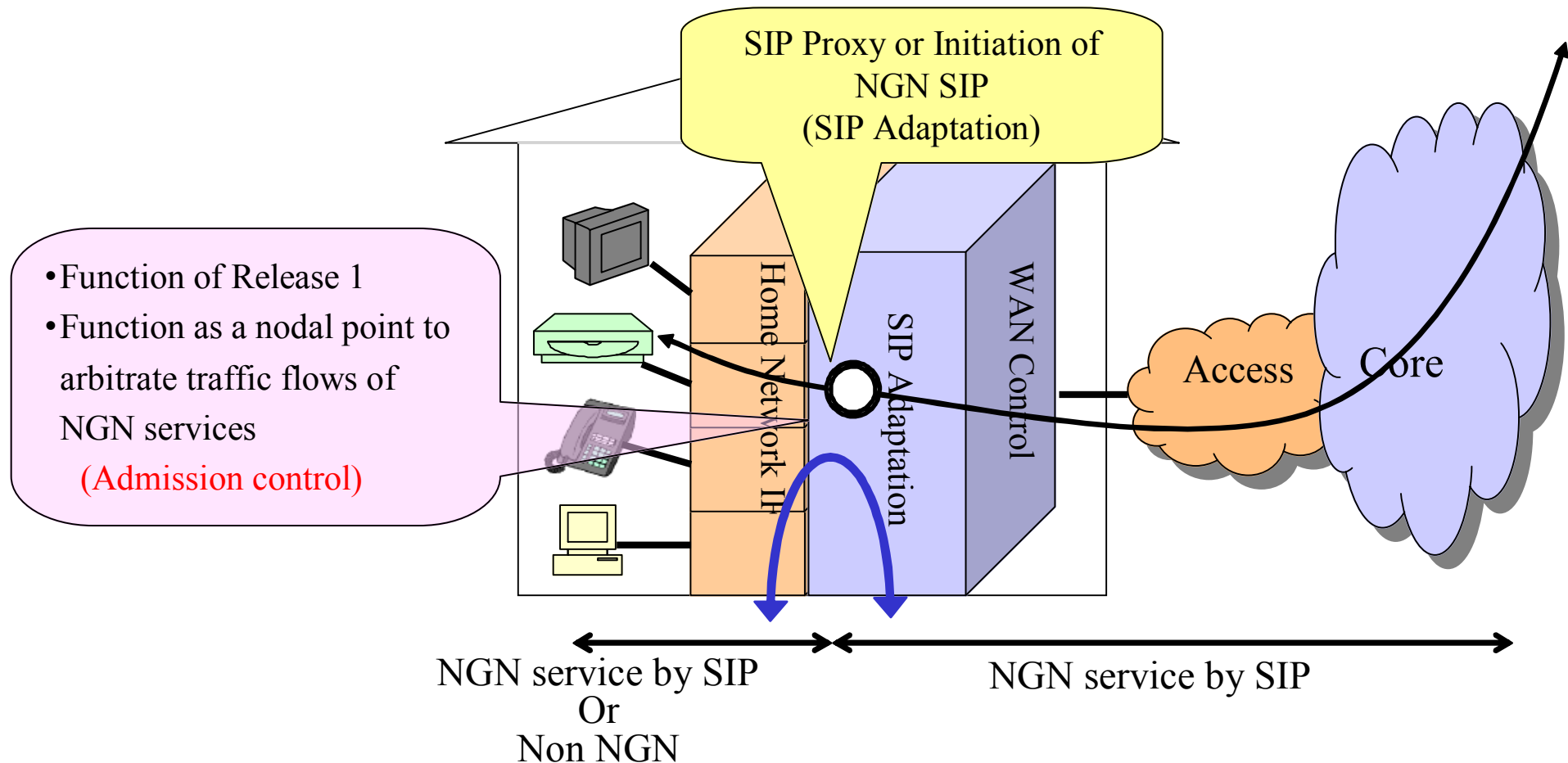
# Technical summary of home gateway

- Key technology #2: SIP adaptation
  - NGN Release 1



# Technical summary of home gateway

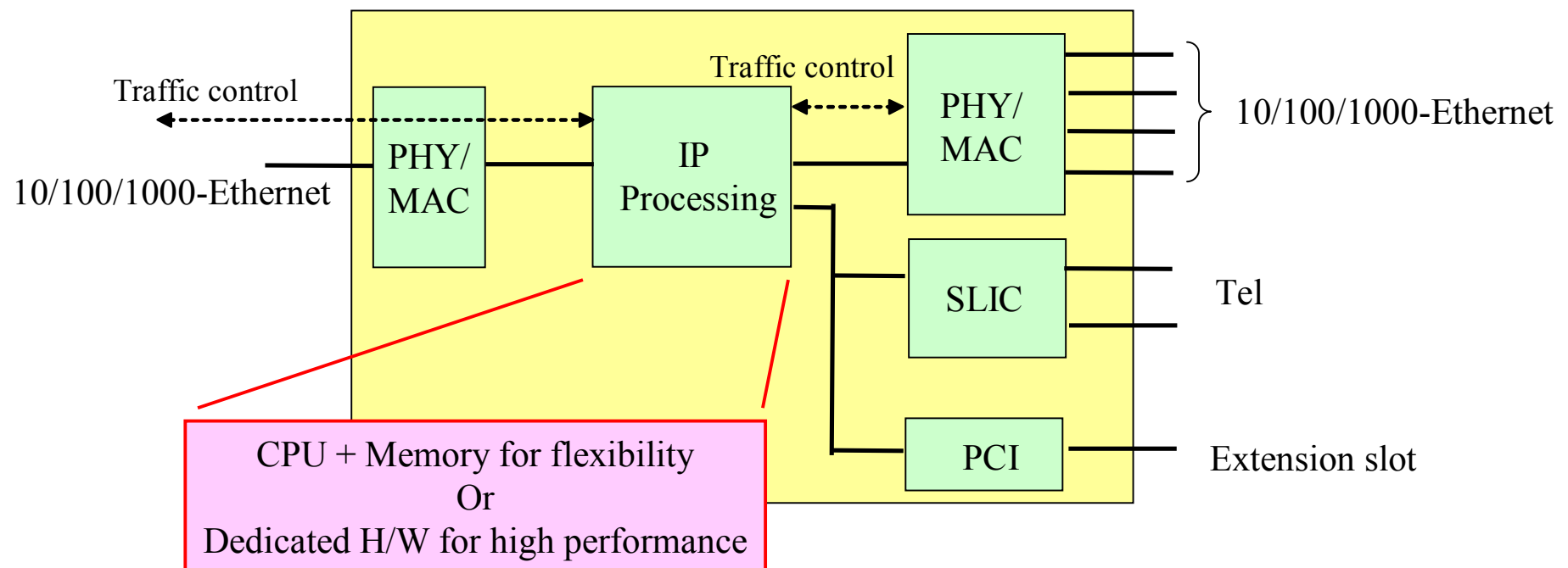
- Key technology #2: SIP adaptation
  - NGN Release 2





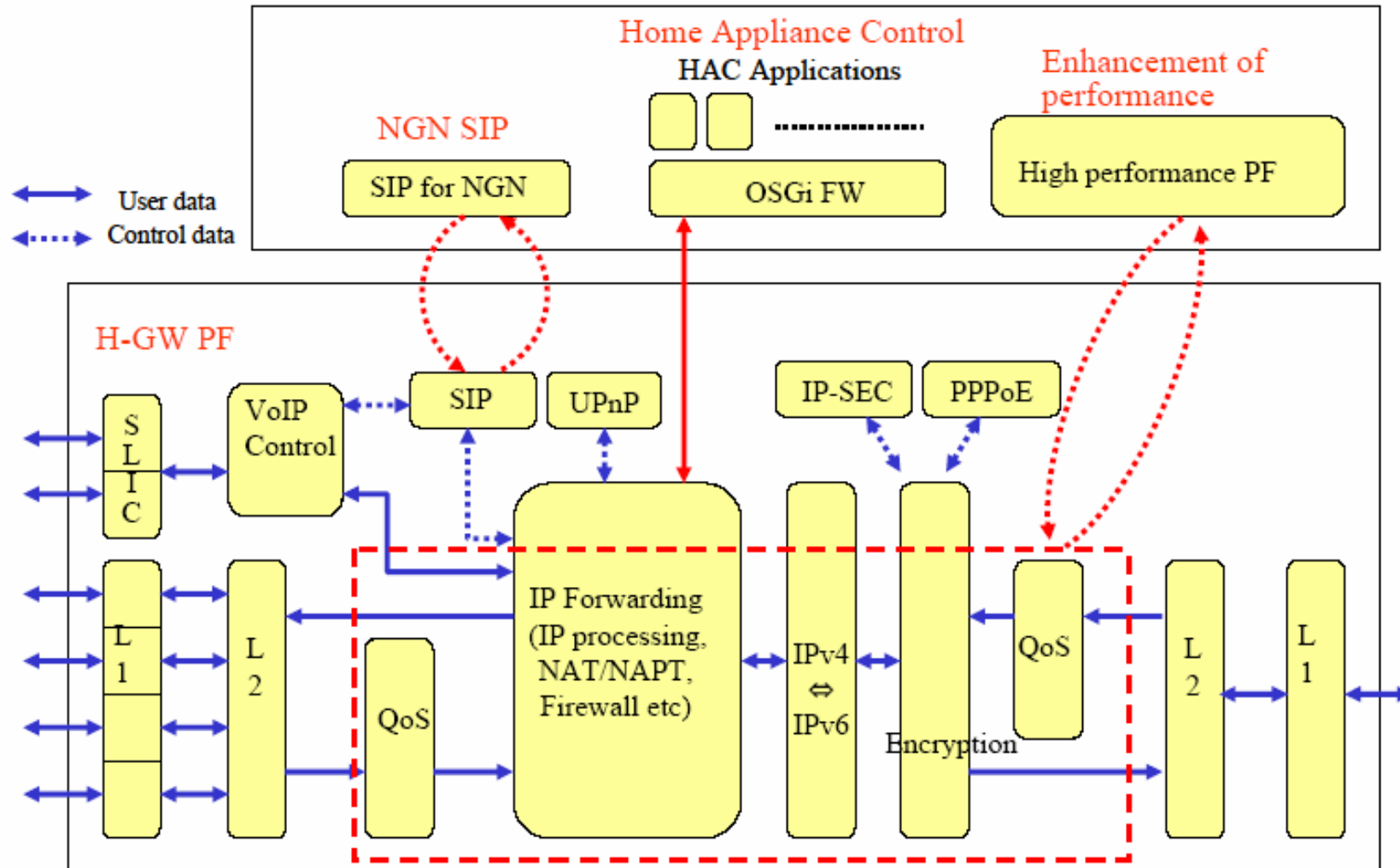
# Home gateway implementation

- Typically H/W configuration of H-GW



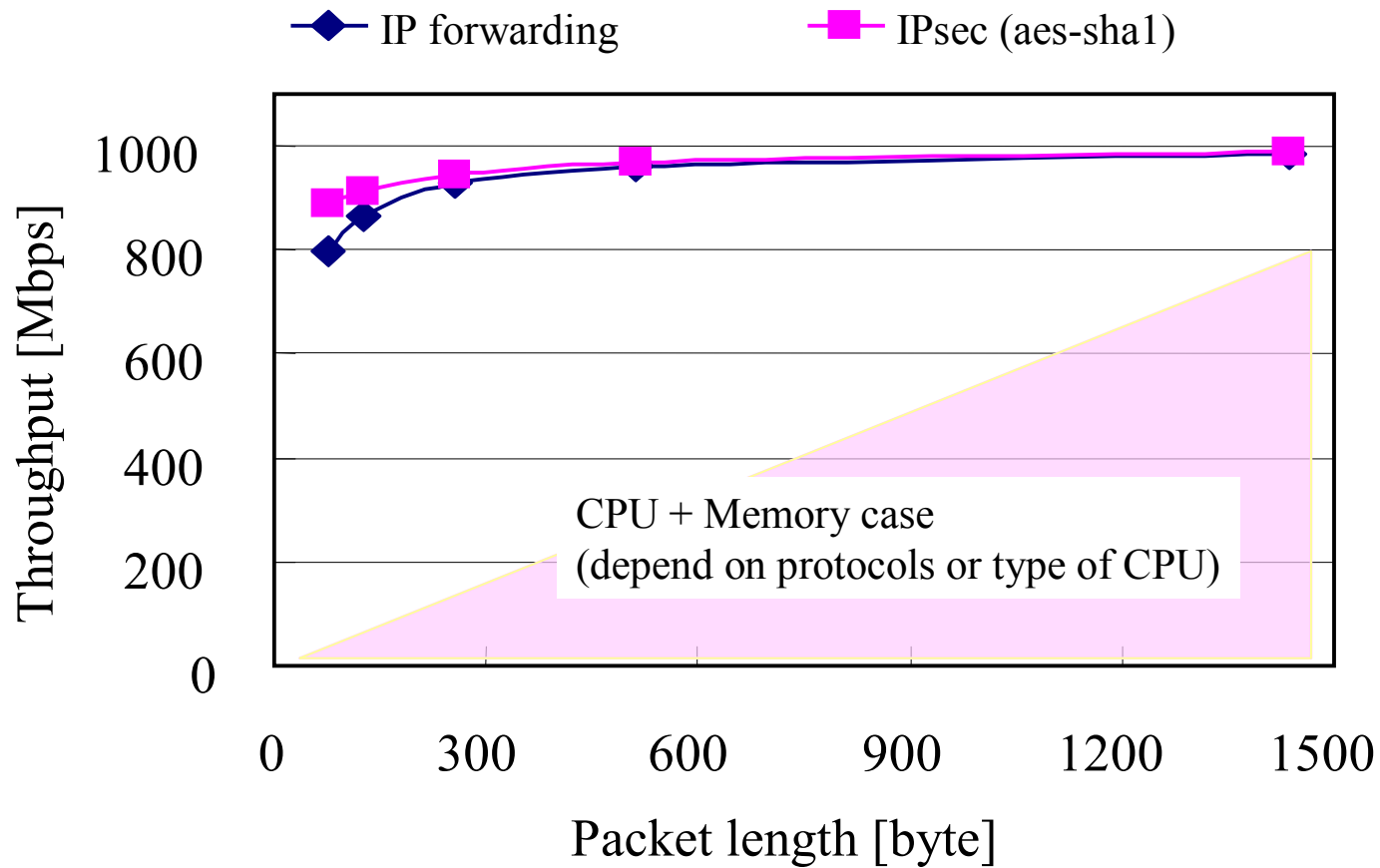
# Home gateway implementation

- Functional architecture of H-GW



# Home gateway implementation

- Example of performance by dedicated forwarder



# Home gateway implementation

- Example of appearance of H-GW product



- Basic type
- High performance type
- PLC Interface type

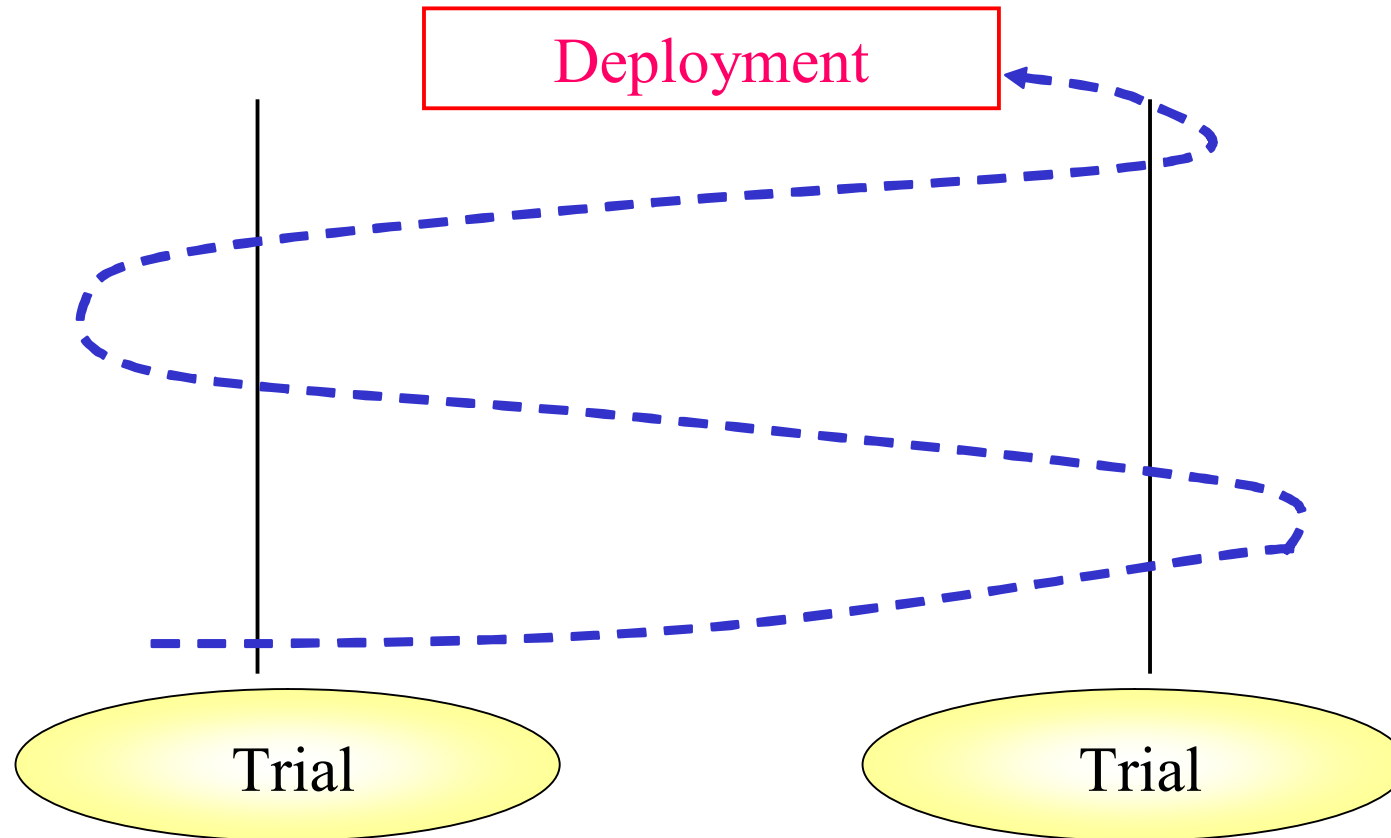
**34(W) × 220(H) × 160(D) (mm)**



- OSGi type

**50(W) × 200(H) × 160(D) (mm)**

# Proposals to solve standard gap



- Deployment is supported by Standardization and Trial.
- The first Step of deployment is “Trial” using existing standard.

## Proposals to solve standard gap

- Collaboration beyond territories for trial and popularity of services
- Home network case
  - Useful for collaboration with housing vender, housing builder, life line supplier, and city council

- “Next generation home network and development of home gateway” as one of panel session in “Access 07” associated with IEEE GLOBECOM 2007
- Please participate this session.



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D&D and ACCESS FORUM PRESENTATION SUBMISSION	<b>ACCESS '07 BUSINESS FORUM</b>
Patronage Power Packages	The Access '07 Business Forum is a new multi-disciplinary executive forum focused on the broad range of "last mile" access technologies being pursued by broadband and wireless service providers, municipalities, and other user communities. Topics of the forum include technology and business issues surrounding the introduction of FTTH, xDSL, cable, broadband over power line, WiFi, WiMax, 3G and beyond in broadband access networks.
EXPO	The Format of the Access '07 Business Forum will consist of a three-day program consisting of parallel technical sessions and plenary sessions.
ACCESS '07 Executive Business Forum	The forum is designed to meet the needs of the industry and to provide attendees a broad interest programming focused on telecommunication industry participation and attendance. One page proposals and/or full paper submissions addressing business applications of communication and network technologies are invited. These should be forwarded to Dave Waring (waring@research.telcordia.com) and Dilip Krishnaswamy (dilip@ieee.org) for review.
Design & Developers Forum	
Tutorials and Workshops	
Information for Authors/Speakers	

- Survey of standardization of home network
- Home network and home network toward NGN
- Key technologies for NGN home gateway
- Home gateway implementation and products example
- Proposal to solve standard gap





**Thank you for your attention!!**

**Contact: Tetsuya Yokotani  
Information Technology R&D Center  
Mitsubishi Electric Corporation  
Yokotani.Tetsuya@eb.MitsubishiElectric.co.jp**