

The P2P Universal Computing Consortium (P U C C) Organization / Protocol / Metadata



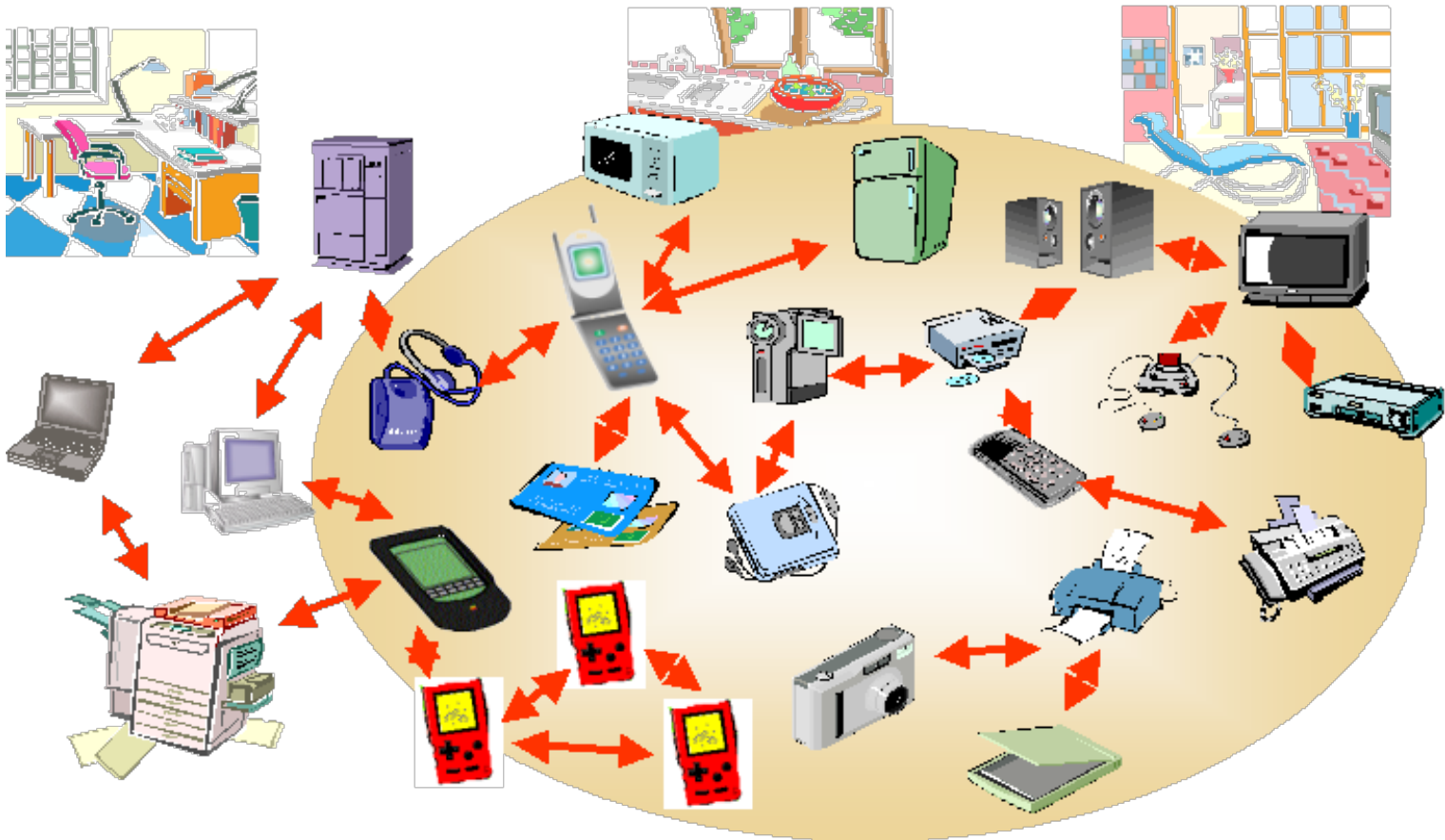
June 2007

- Organization
- Vision/Goals
- Protocol Overview
- Current Work Areas
- Proof of Concept Demonstrations
- PUCC Service Metadata Overview

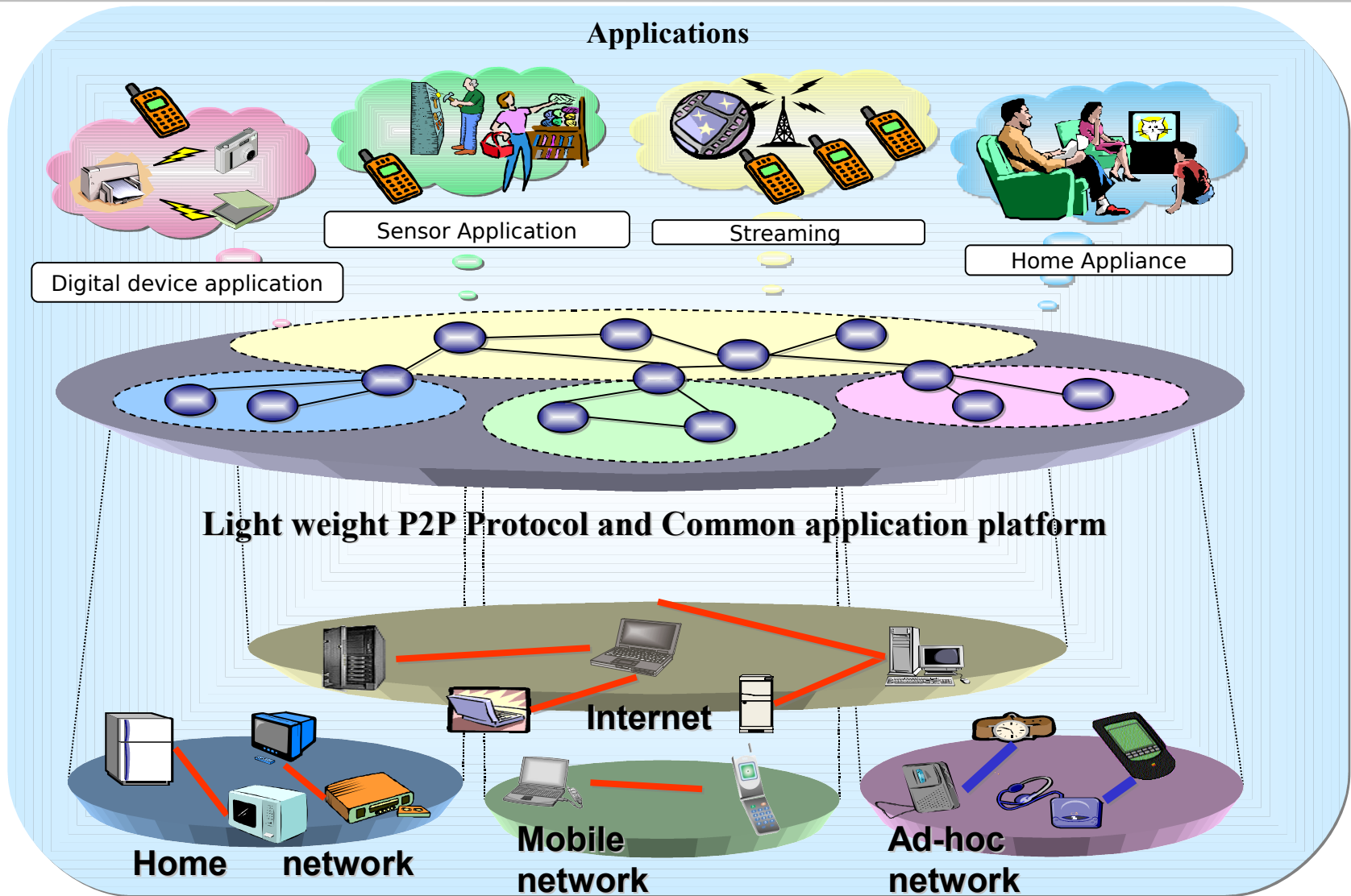
- **PUCC: Peer-to-Peer Universal Computing Consortium**
 - International non-profit R&D organization focusing on overlay P2P networking
 - Development of cross industry specifications (e.g. PC, Printer, Home Appliance, Digital Camera)
- **Objectives:**
 - Connect various types of digital devices over heterogeneous networks
 - Utilize and bridge existing networking standards (e.g. Mobile, Internet, UPnP/DLNA, IEEE 1394)
 - Develop widely adopted global P2P networking standards

PUCC Vision

- Every device communicates with each other seamlessly using P2P networking technology



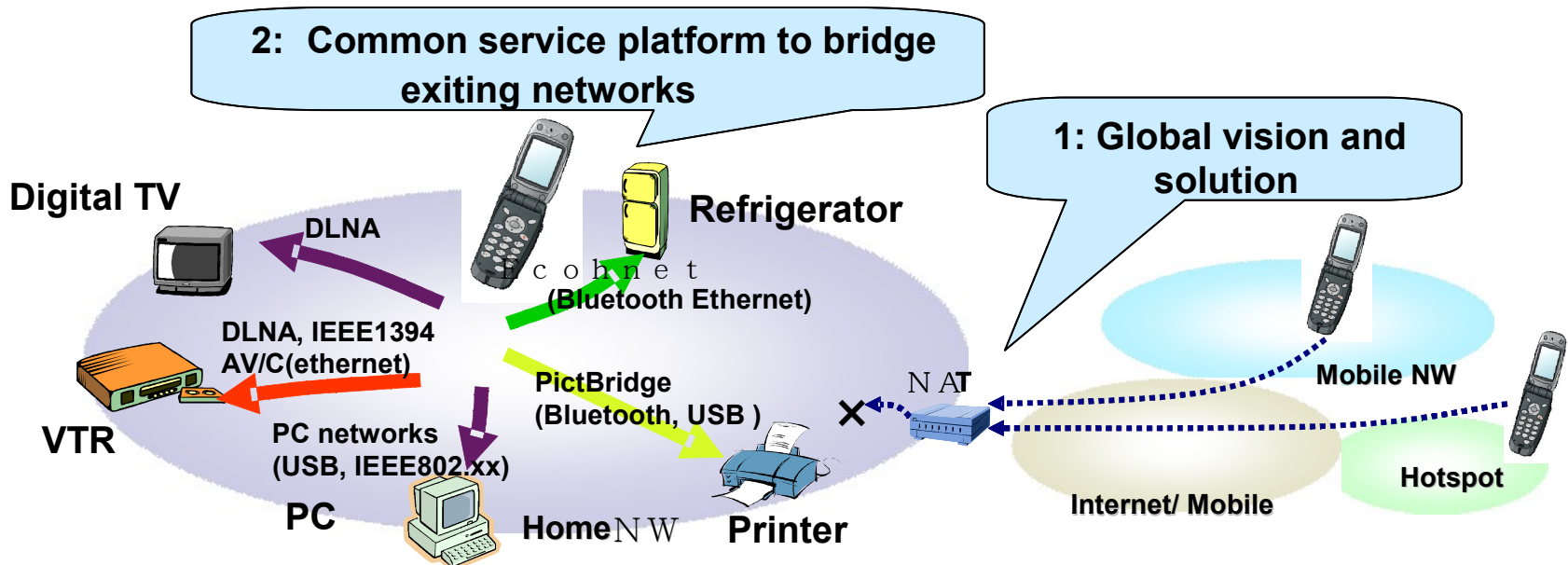
PUCC Technical Goals



PUCC Technical Goals (2)

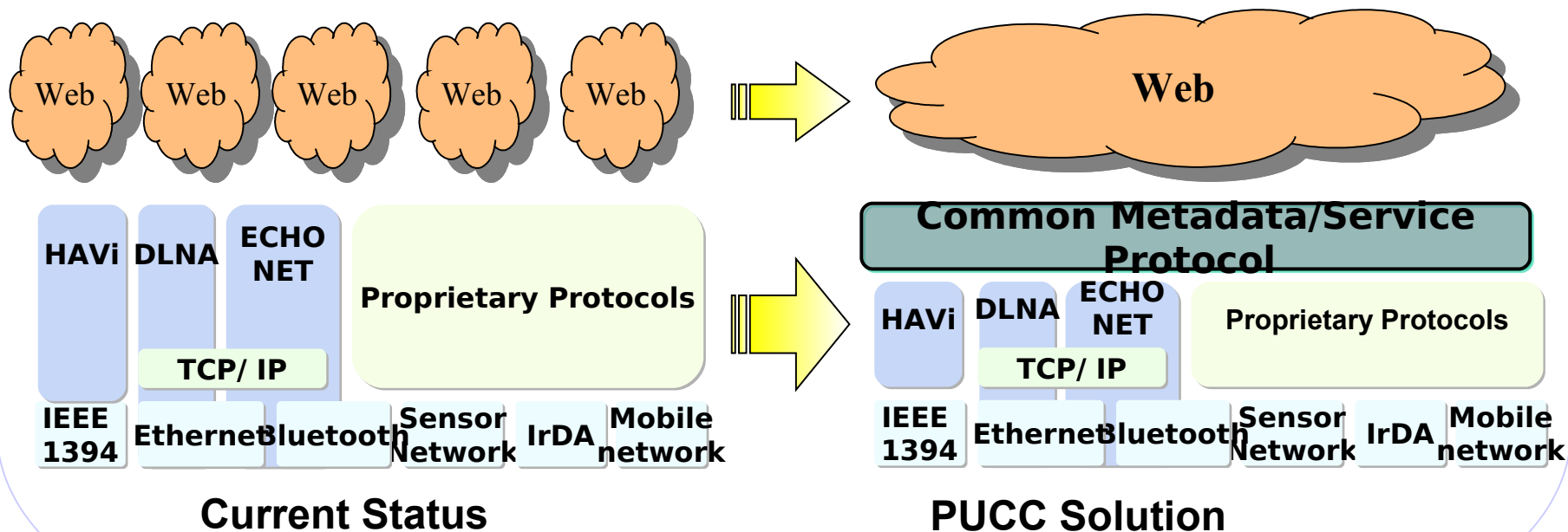
- Connecting digital devices without digital hubs (i.e. PCs)
- Automatic service/device discovery and service execution using meta data
- Overlay and multi-hop networking technology among devices over heterogeneous networks (e.g. Internet, home NW, Sensor NW, ad hoc NW) without changes

- Issue-1: No solution for accessing home appliances from other types of device
- Issue-2: No device-independent protocols for home appliances and digital devices
 - Digital TV, DVD/HDD recorder: UPnP(DLNA), IEEE 1394 AVC
 - Air-Conditioning, Refrigerator : ECHONET
 - Printing: PICTBRIDGE



PUCC and Existing Networks

- Defining metadata and application level protocol to establish communications
- Common P2P protocol: Bridge existing networks with minimum changes
- Common application-independent unified platform
- Common metadata framework to discover services/devices and execute services



More About the Consortium

- Japanese Legal entity with headquarters in Tokyo
- Technical Specifications/Requirements published in English
- P2P Universal Computing Consortium maintains copyright of specifications

Industry

- Aplix
- Epson
- NTT DoCoMo
- Ericsson
- Mitsubishi
- HP
- I/O Data
- FRACTALIST
- Toshiba
- SCCJ
- Sharp
- MCTI
- Fujisoft
- NEC Tokin
- etc.

Universities

- Univ. of Tokyo
- Kyoto Univ.
- Keio Univ.
- Waseda Univ.
- Shizuoka Univ.
- Hakodate Mirai Univ.
- Doshisha Univ.
- Ritsumeikan Univ.
- etc.

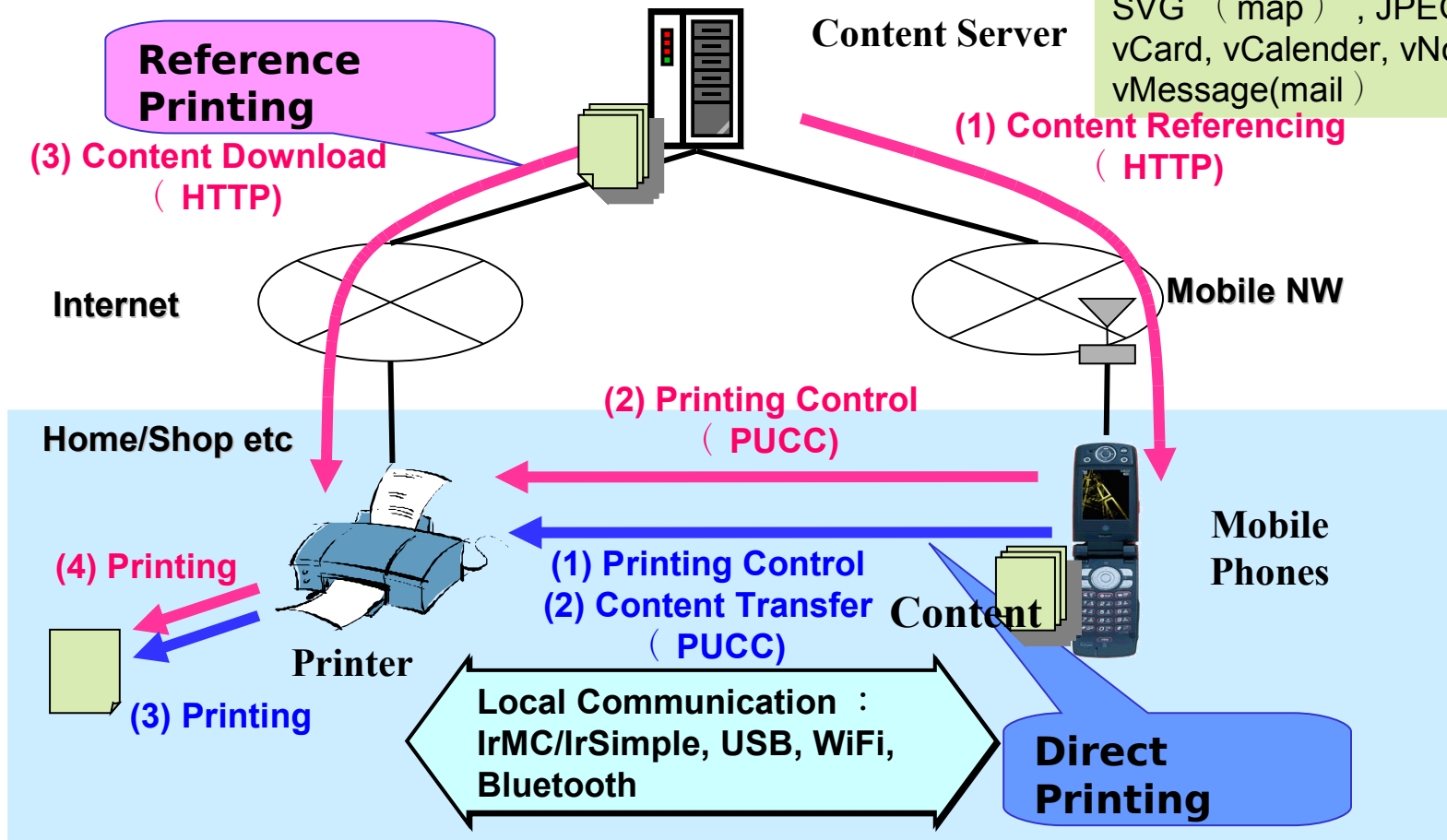
- Pucc is developing specifications for:
 - Common core protocol
 - Common Metadata Framework
 - Printing
 - Home appliance
 - Sensor network
 - Streaming
 - Security
- Pucc is planning to make the specifications publicly available

- Several Proof of Concept Implementations have been developed and demonstrated at industry events (CEATEC 2006, CES 2007, Hanover Messe 2007):
 - Mobile Printing
 - Mobile Reference Printing
 - Mobile to TV Streaming
 - Remote Control of Home Appliances

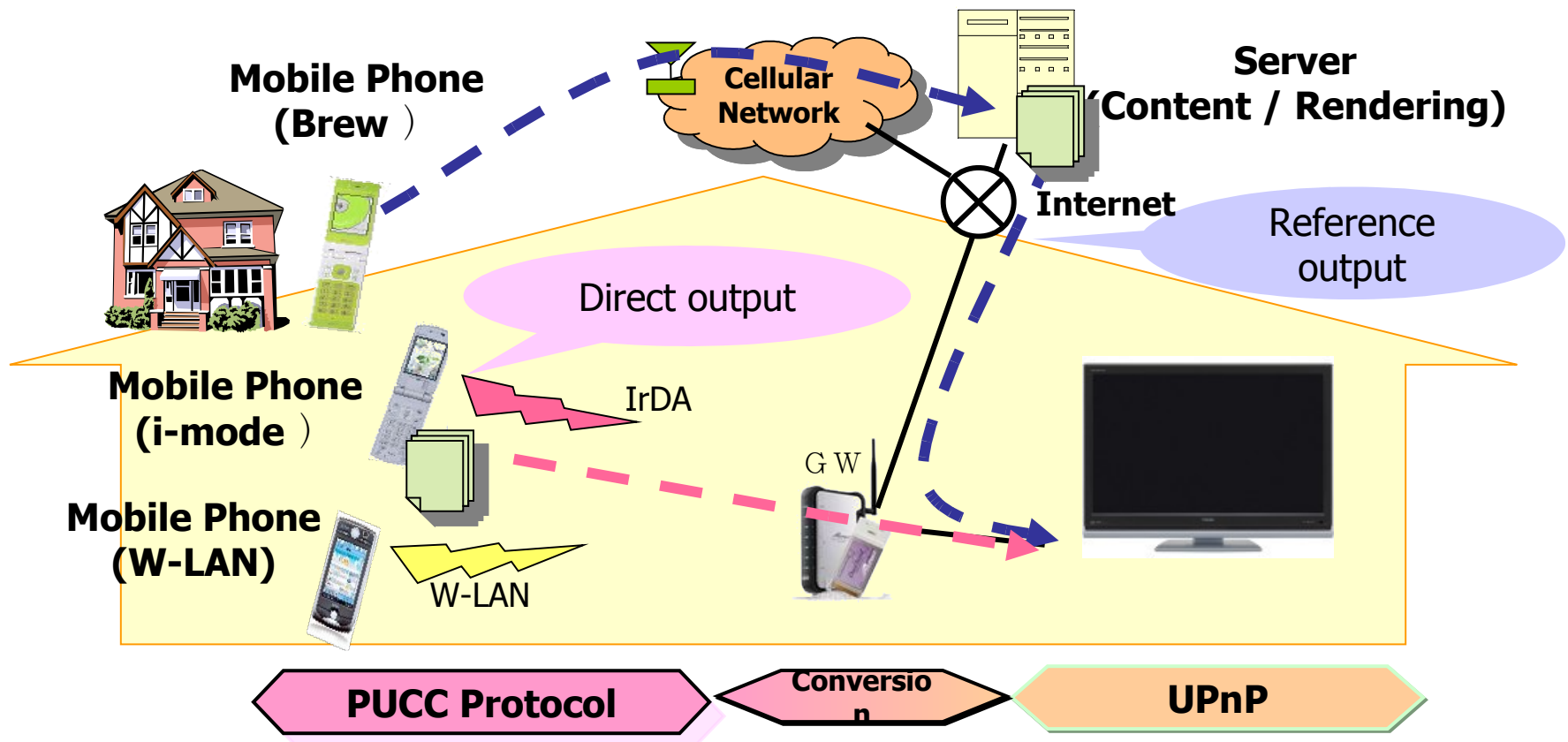
Printing Content from mobile phones

- Direct Printing from mobile phones
- Reference Printing from Content Servers

Content types :
 PDF, XHTML,
 SVG (map) , JPEG,
 vCard, vCalender, vNote,
 vMessage(mail)

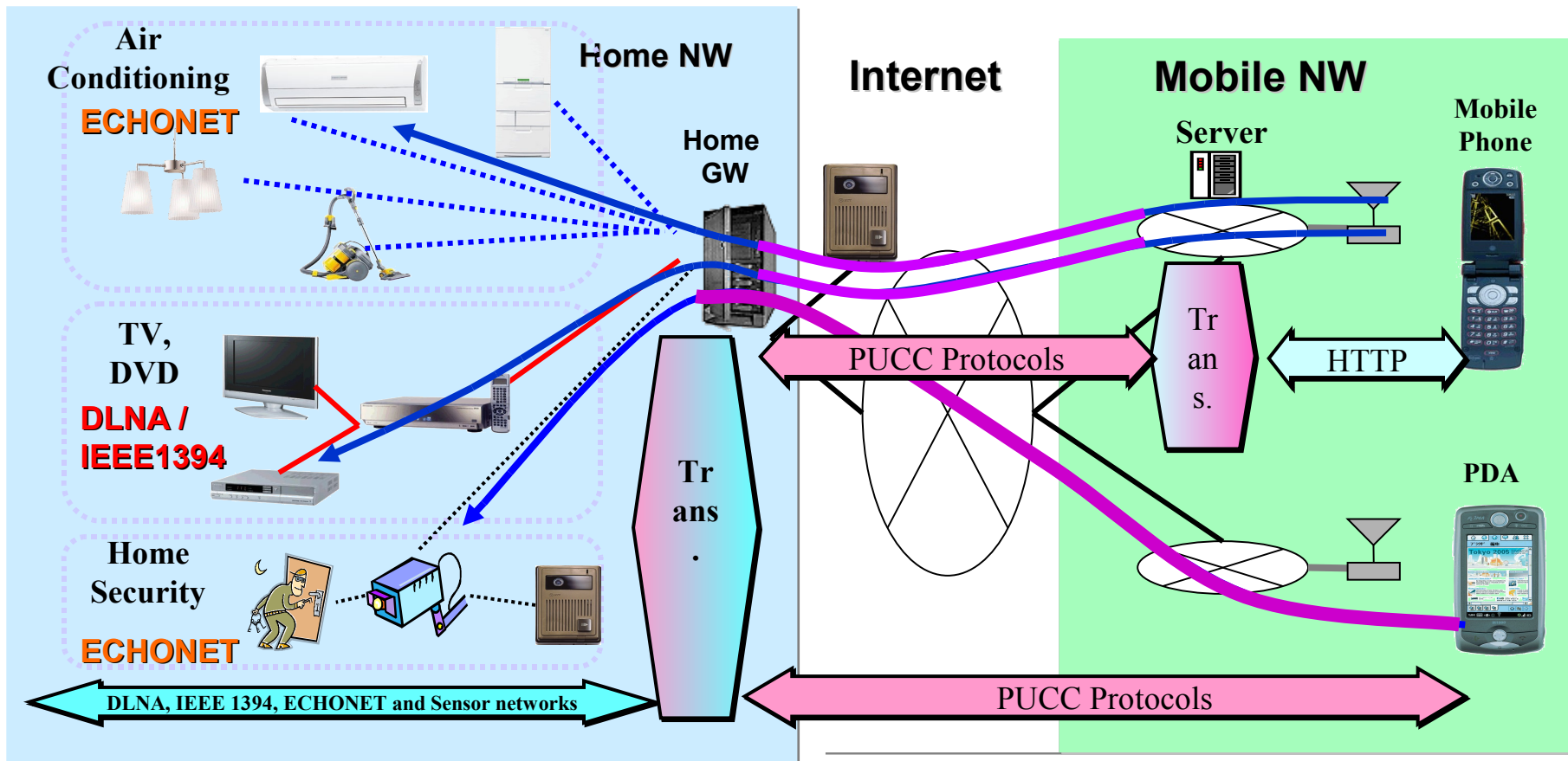


Displaying Content from mobile phones



Home Appliances Control

- Controlling home appliances from mobile phones
- Viewing content in home NW from mobile phones



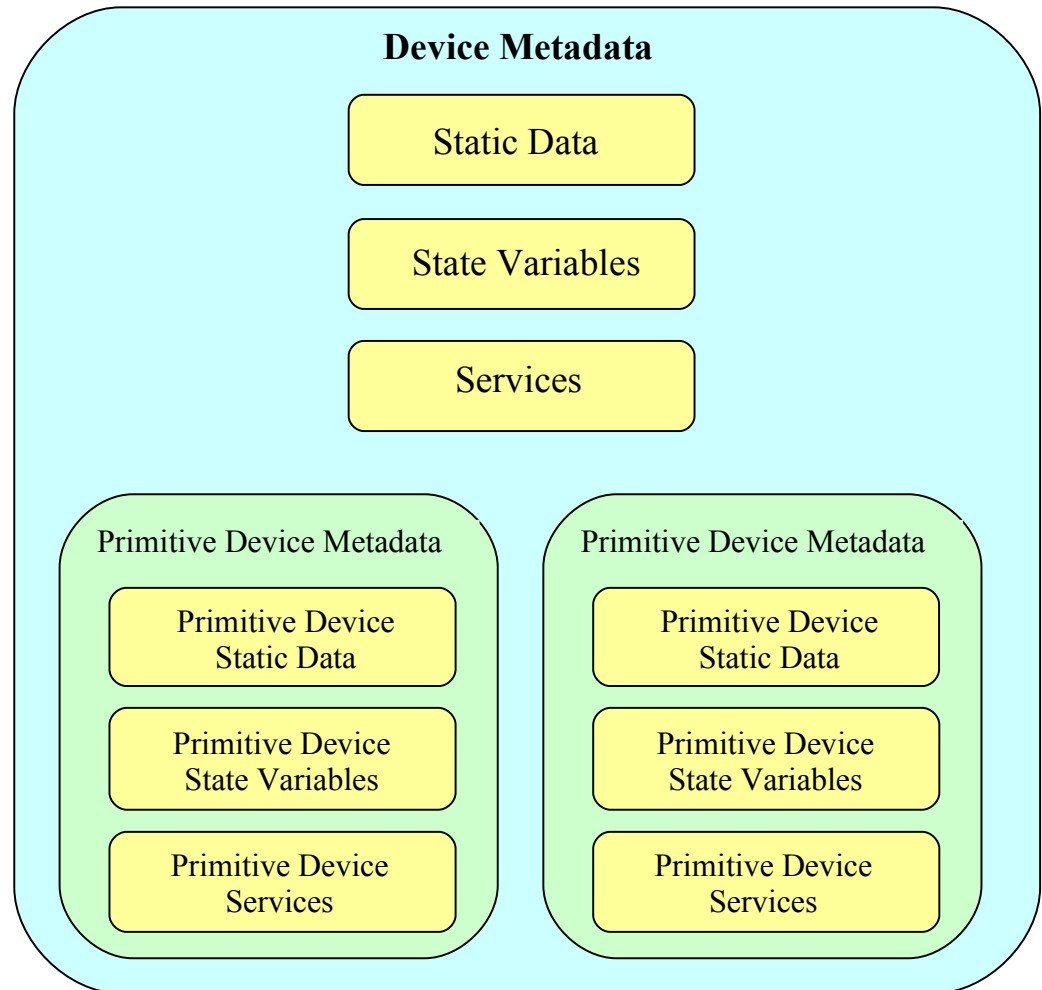
Device Metadata Overview

Metadata consists of:

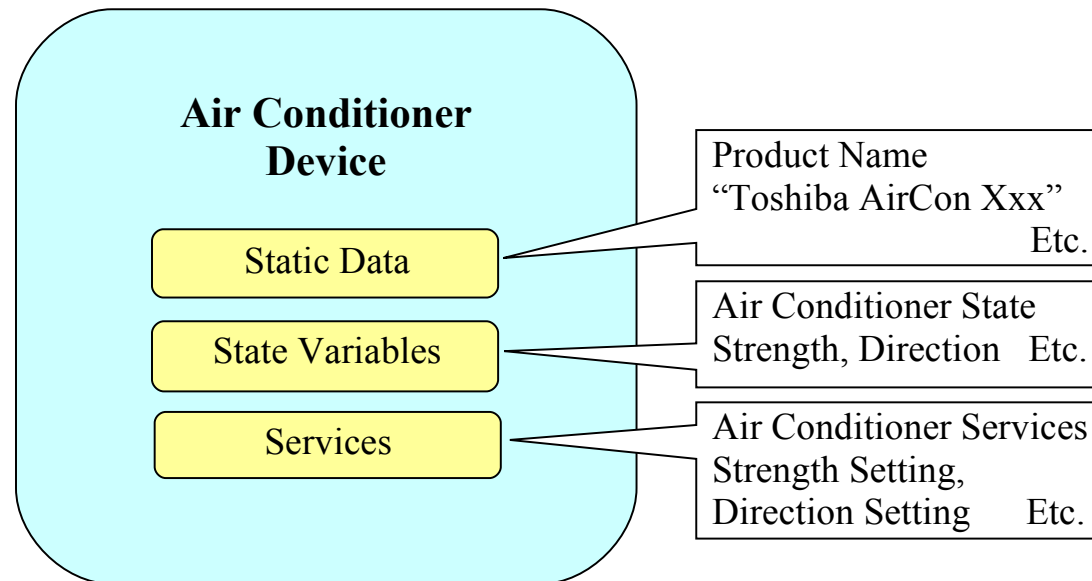
- a list of Static Data
- a list of State Variables
- a list of Services

A Device may contain one or more Primitive Devices

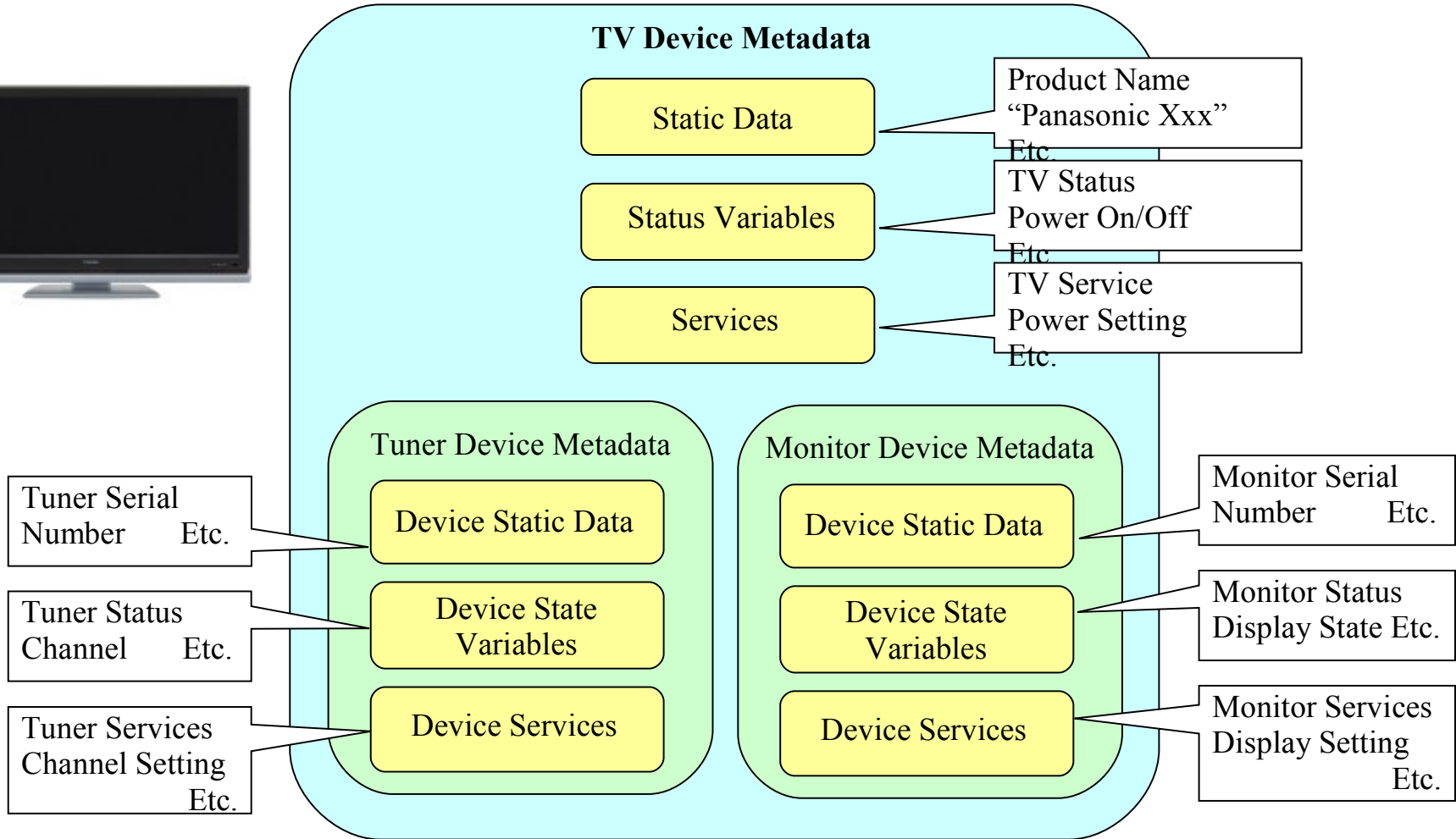
The Pucc Metadata is a high level, semantically rich description of device/ service capabilities.



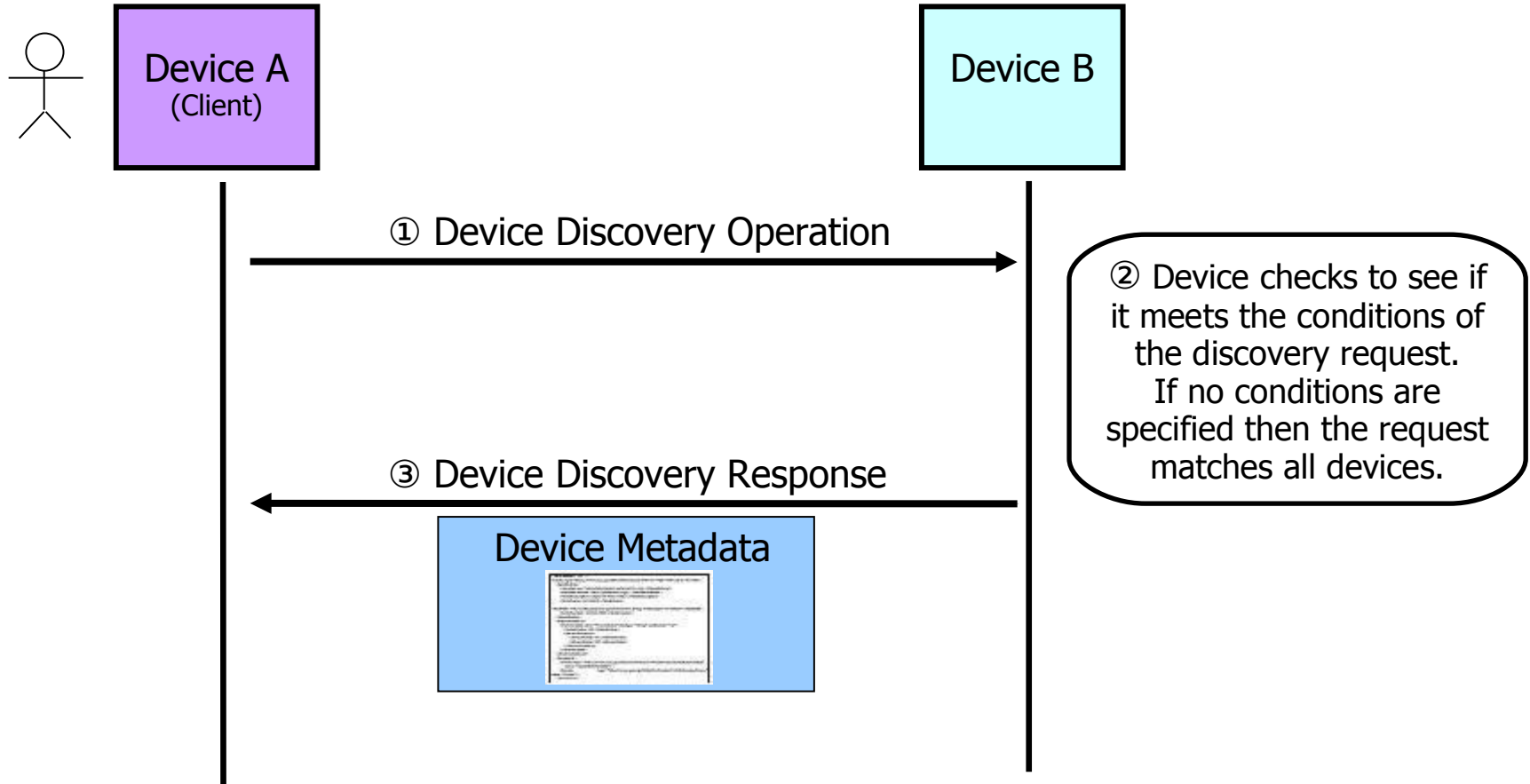
Example Device(1): Air Conditioner



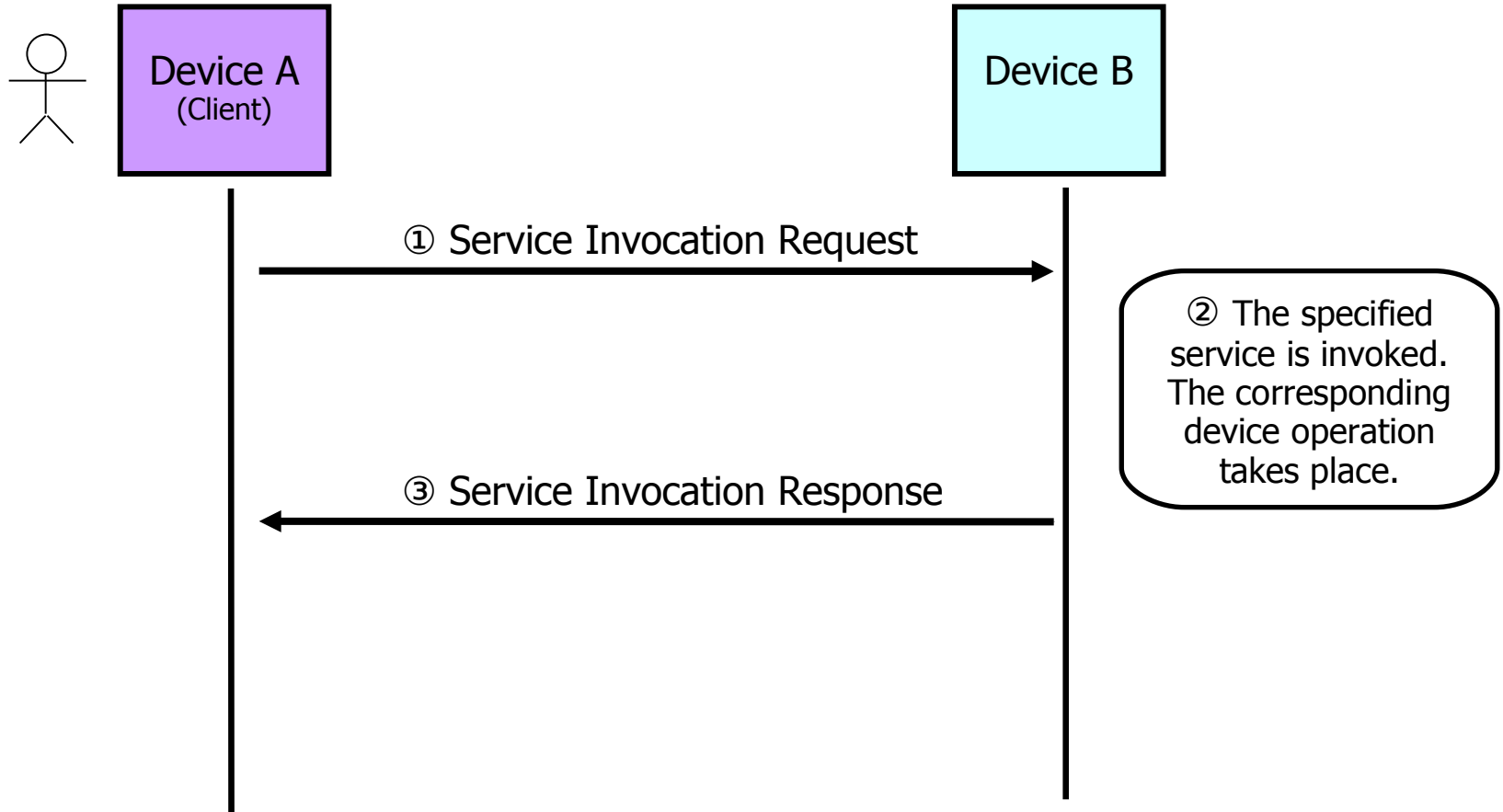
Example Device(2): TV



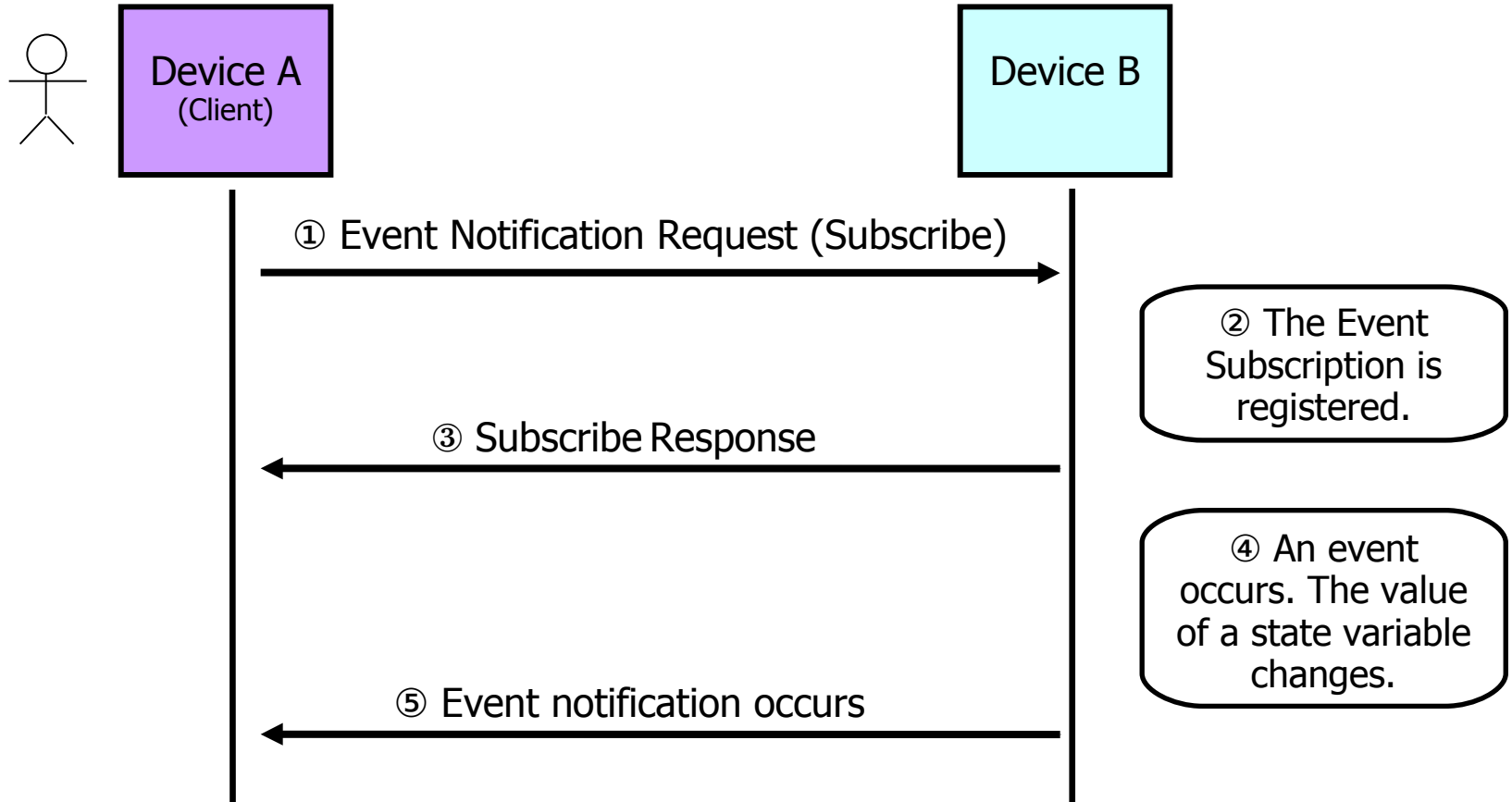
Service Discovery



Service Invocation



Event Handling



- **PUCC provides specifications for:**
 - Common transport independent application platform
 - Common transport independent service platform
 - Common metadata framework
- PUCC specifications integrate different types of networks into one application platform and provide transparent access to different networks
 - PUCC protocol allows ubiquitous communication between various types of devices over the web
- PUCC technologies allow a number of new business opportunities with web to be realized
- **PUCC Metadata specification provides:**
 - provides an expressive method of service description
 - facilitates dynamic service discovery
 - can help enable the ubiquitous web