Jun 25th, 2014

Consumer Electronics and Web of Things

Kazuo Kajimoto

Cloud Systems Solution Center
Panasonic Corporation

WoT Applications around CEs

Panasonic

Game Entertainment
http://panasonic.net/center/tokyo/

Business Service
http://www.panasonic.com/business/toughpad/
us/best-rugged-tablet.asp

Advertisement
http://news.panasonic.net/japanstory/
2014/0108_26069.html

Security
http://www.panasonic.com/business-solutions/
security-surveillance-solutions.asp

Energy Management
http://news.panasonic.net/archives/2010/0915_1748.html

Consumer Electronics

Age Care
http://panasonic.biz/healthcare/afsh/reform/
reform_condition/index.html

Education
http://panasonic.co.jp/ad/pks/global/index.html

Travel Assistance
http://panasonic.jp/car/special/tabinavi/

Wellness Healthcare
http://www.massage-sessel-berlin.de/
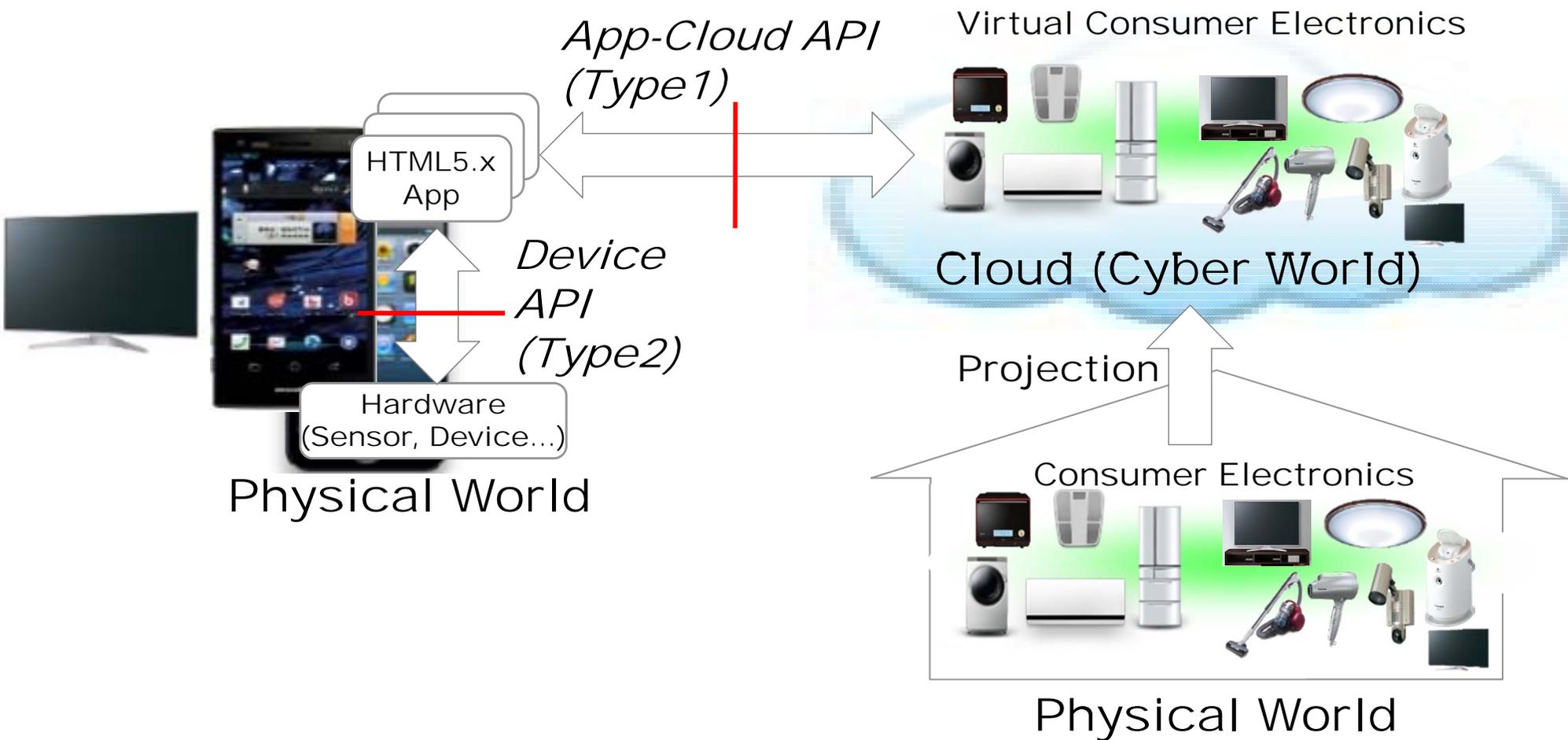
2

Wonder Life Box 2020

Panasonic has already started the smart home business globally.

Panasonic has opened Cloud Life Experience Show Room at Tokyo in Jun 7th, 2014. That is named "Wonder Life Box 2020".

The concept of Panasonic Show Room is that thanks to "Internet of Things" technology, visitors really experience Convenient, Exciting, Relaxed high quality life in 2020.

WoT Model Description and APIs

App-Cloud API (Type1)

Virtual Consumer Electronics

HTML5.x App

Device API (Type2)

Hardware (Sensor, Device...)

Physical World

Cloud (Cyber World)

Projection

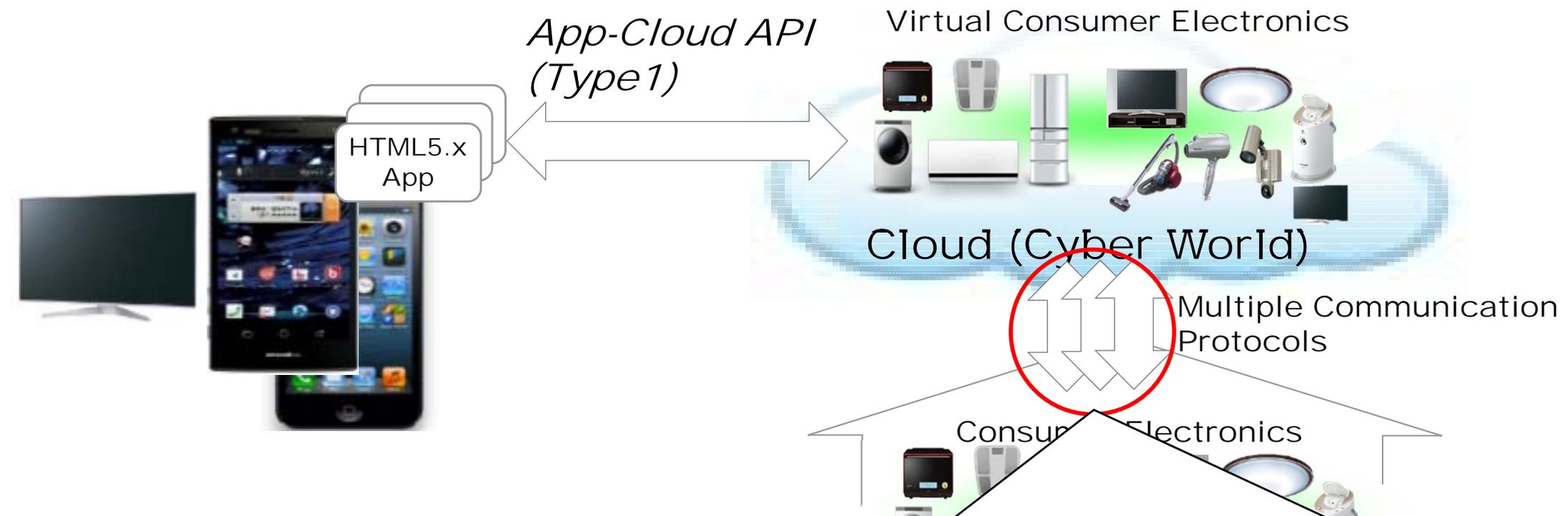**Consumer Electronics**

Physical World

WoT could assume both App-Cloud API(Type1) and Device API(Type2) as its API to access physical Sensors, Devices and Sets such as CEs.

Comparison of App-Cloud API and Device API

	App-Cloud API (Type1)	Device API (Type2)
Network Type	Cloud-Client	None(Embedded) and/or P2P
Connected Device Ability Assumption	Web Server (Cloud might be agent of deice)	Low Device
Overall System Complexity	Complicated	Simple
API Granularity	Relatively Abstract	Relatively Concrete
Number of Standardization Points	Relatively Less	Relatively More
Performance Requirement for UX device	Low	High
Main Standardization Partners	Set Manufactures, Cloud Servicers	Device Manufactures

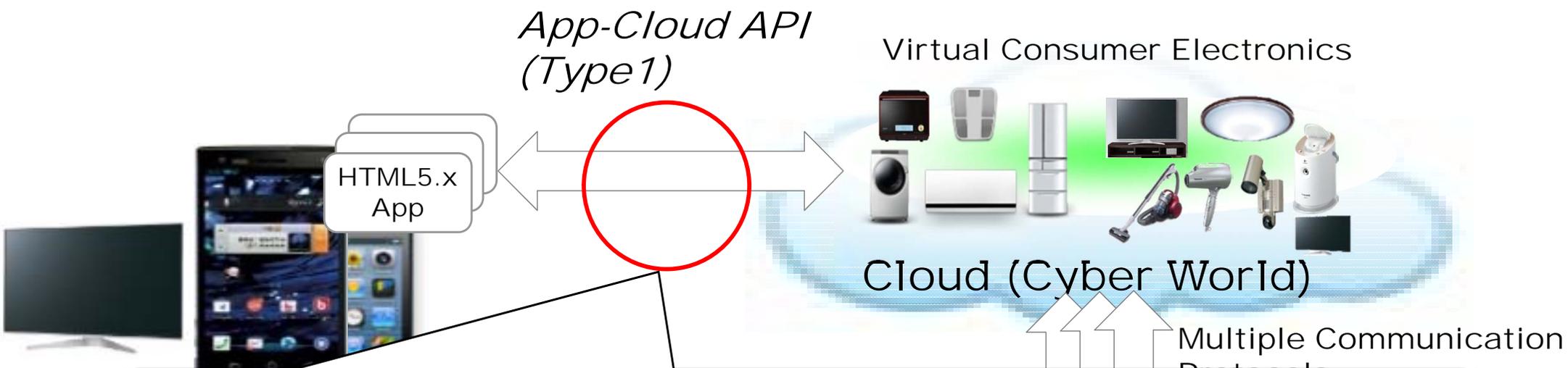**Both App-Cloud API(Type1) and Device API(Type2) are important and co-exists.**

Panasonic would like to contribute to define App-Cloud API(Type1).

Physical Control Protocol Independency

App-Cloud API (Type1)

HTML5.x App

Virtual Consumer Electronics

Cloud (Cyber World)

Multiple Communication Protocols

Consumer Electronics

Physical CE Control Protocols such as Echonet Lite, EE-Bus, IR Control and so on are independent from APP-Cloud API.

Harmonizing a variety of multiple CE control protocols is out of scope of APP-Cloud API standardization, however, the model of some CE Control Protocols could be referred as App-Cloud API object model.

6

Variety of App-Coud API Description

App-Cloud API (Type1)

Virtual Consumer Electronics

HTML5.x App

Cloud (Cyber World)

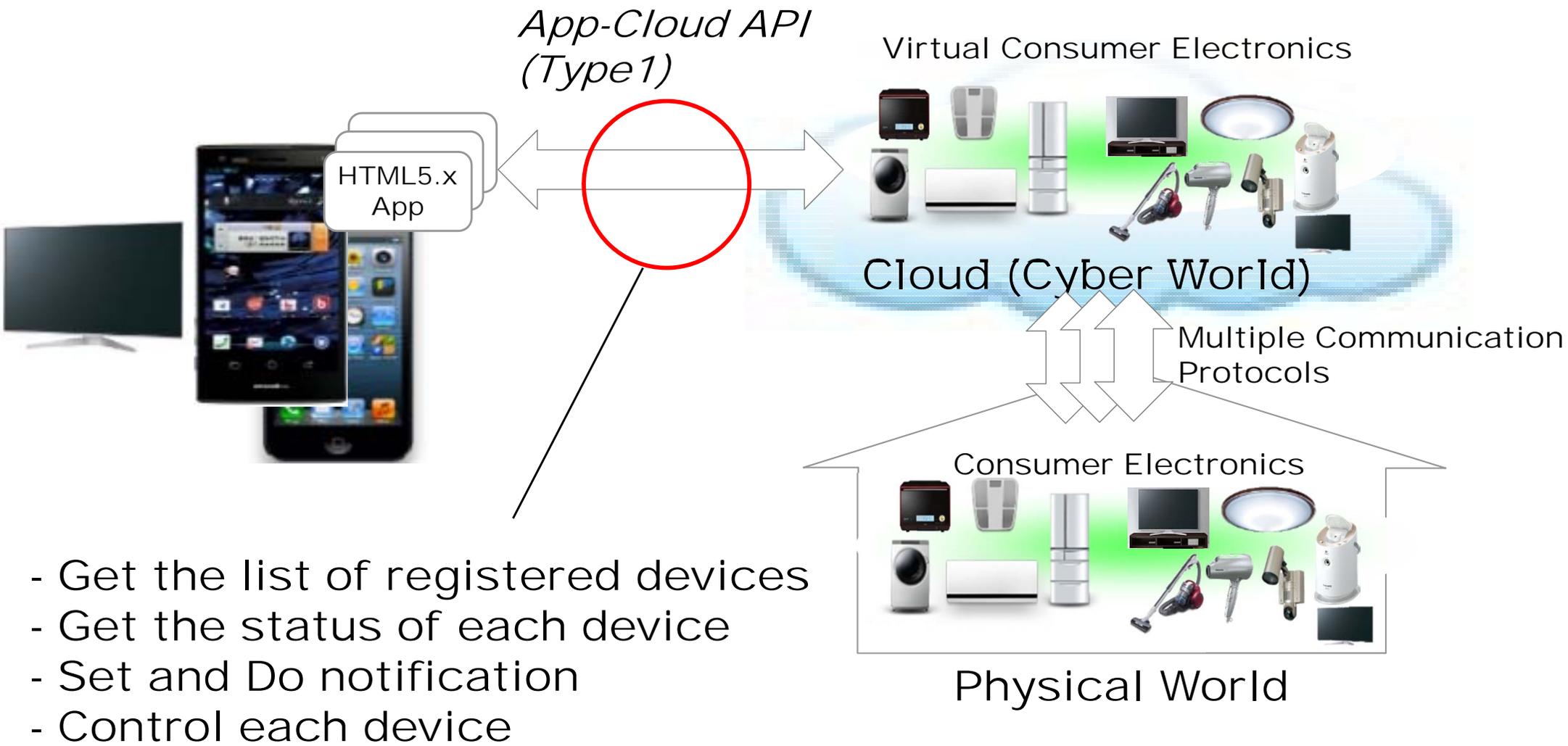**Multiple Communication**

A variety of App-Cloud API description should be supported.

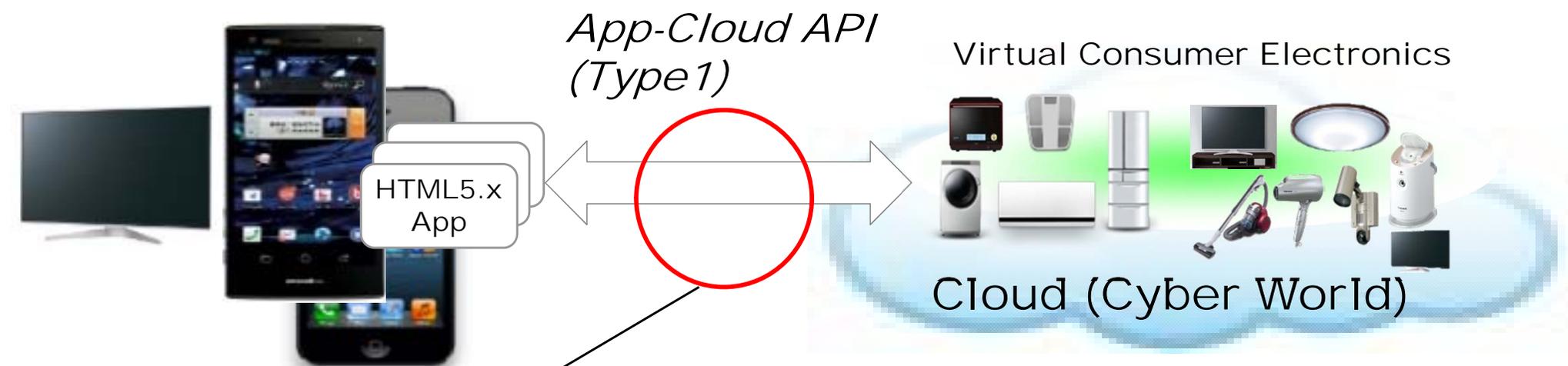**HTTPS** GET https:// apipanasonic.com/remote/v1/111111/setOperationStatus?params=[ON] HTTP/1.1

WebSocket
```
{
    "id": 1
    "device_id": 111111,
    "method": "setOperationStatus",
    "params": ["ON"],
}
```

JavaScript aircon.setOperationStatus("ON", function receive() {

});

Type of App-Cloud API

App-Cloud API (Type1)

Virtual Consumer Electronics

HTML5.x App

Cloud (Cyber World)

Multiple Communication Protocols

Consumer Electronics

Physical World

- Get the list of registered devices
- Get the status of each device
- Set and Do notification
- Control each device

8

App-Cloud API (Type1)

Virtual Consumer Electronics

HTML5.x App

Cloud (Cyber World)

Safety Issue
   e.g. Some CEs treat heat cycle. App might be able to make fire.

Privacy Issue
   e.g. App might be able to peep other person's house through
         Robot Cleaner which has camera.

Business and Security Issue
   e.g. User and/or Device Authentication might be better as close
         API because of vendor business dependency and security.

It might be better provide both Open API and Authority Managed API.

Panasonic

A Better Life, A Better World