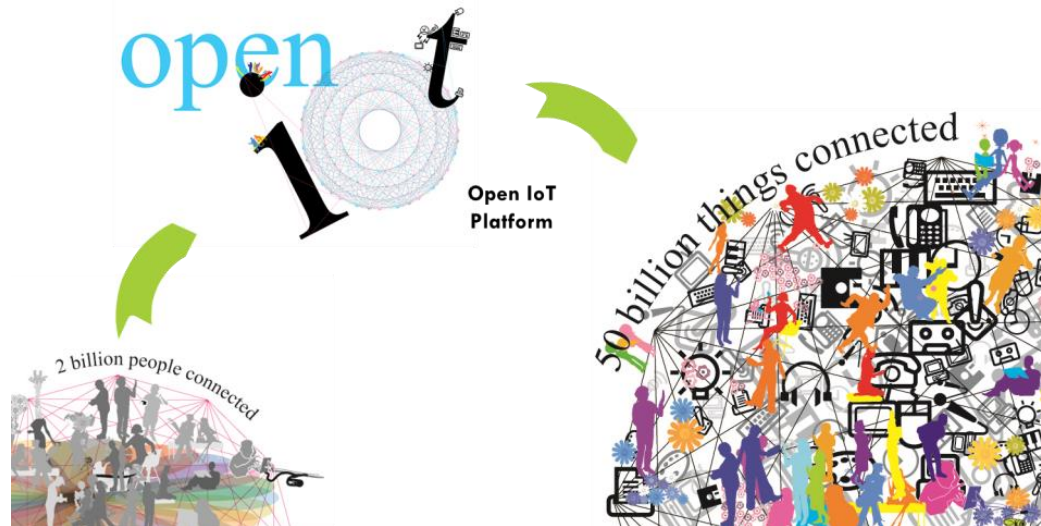


[KIOT 교육]

“사물인터넷 디바이스 개발”



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1. 개 요

1.1 오픈소스 종류 및 oneM2M 표준 준수

1.2 &Cube: Thyme 활용 디바이스 개발 방법

1.3 &Cube 연동 구조

- <http://www.iotocean.org>
- Have more platforms → become complicated

[illegible]

1.1 오픈소스 종류 및 oneM2M 표준 준수

■ 오픈소스 종류 별 oneM2M 표준 지원 여부

		AE	CSE			Framework
			ASN	MN	IN	
Mobius	Blue Octopus				√	Spring
	Yellow Turtle				√	Node.js
nCube	Rosemary			√		Java
				√		Node.js
	Lavender		√			Java
			√			Node.js
	Thyme	√				Java
		√				Node.js

■ Latest Release

	oneM2M Release 1				
	Software name	Framework	version	Publication date	Standard
Server(IN-CSE)	Mobius : Blue Octopus	Spring Framework	v1.1	2015-09-10	TS-0001 Functional Architecture v1.6.1 TS-0004 Service Layer Core Protocol v1.0.1 TS-0009 HTTP Protocol Binding v1.0.1 TS-0010 MQTT Protocol Binding v1.0.1
	Mobius : Yellow Turtle	Node.js	v1.1	2015-09-10	
Gateway(MN-CSE)	&Cube : Rosemary	Node.js	v1.0	2015-10	
Device(ASN-CSE)	&Cube : Lavender	Java	v1.0	2015-08-11	
Application(AE)	&Cube : Thyme	Node.js	v1.0	2015-10	

1.1 오픈소스 종류 및 oneM2M 표준 준수

■ Mobius: Blue Octopus

- Spring Framework 기반 IoT Server Platform (oneM2M IN-CSE)
- Java Virtual Machine 위에서 동작
- 시스템 요구사항

System requirements	Remarks
Operating System	WindowsX, Linux Redhat and CentOS
Java Virtual Machine	Java 7
Open Source Framework	Spring 3.06
Web Application Server	Spring MVC 3.0
Database	Tomcat 7
CoAP Framework	Mongo 2.6 Redis 2.8
CoAP Framework	Californium
MQTT Broker	Mosquitto 1.4.x

- 표준 리소스 지원
 - CSEBase, remoteCSE, AE, node, container, contentInstance, subscription, notification, mgmtCmd, execInstance, mgmtObj, group
- 표준 Primitive 지원
 - XML/Json 지원
 - Short-name 리소스 지원

1.1 오픈소스 종류 및 oneM2M 표준 준수

■ Mobius: Yellow Turtle

- Node.js Java Script 기반 IoT Server Platform (oneM2M IN-CSE)
- 경량/저용량 시스템으로 간편한 설치 가능
- 시스템 요구사항

System requirements	Remarks
Operating System	WindowsX, Linux Redhat and CentOS, Mac, Raspbian
Open Source Framework	Node.js
Web Application Server	Node.js
Database	MySQL
CoAP Framework	-
MQTT Broker	Mosquitto 1.4.x

- 표준 리소스 지원
 - CSEBase, remoteCSE, AE, container, contentInstance, subscription, notification, group
- 표준 Primitive 지원
 - XML/Json 지원
 - Long/Short-name 리소스 지원

1.1 오픈소스 종류 및 oneM2M 표준 준수

■ &Cube: Rosemary

- Node.js Java Script 기반 IoT Gateway Platform (oneM2M MN-CSE)
- 경량/저용량 시스템으로 간편한 설치 가능
- 시스템 요구사항

System requirements	Remarks
Operating System	WindowsX, Linux Redhat and CentOS, Mac, Raspbian
Open Source Framework	Node.js
Web Application Server	Node.js
Database	MySQL
CoAP Framework	-
MQTT Broker	Mosquitto 1.4.x

- 표준 리소스 지원
 - CSEBase, remoteCSE, AE, container, contentInstance, subscription, notification, group
- 표준 Primitive 지원
 - XML/Json 지원
 - Long/Short-name 리소스 지원

1.1 오픈소스 종류 및 oneM2M 표준 준수

■ &Cube: Lavender

- Java 기반 IoT Device Platform (oneM2M ASN-CSE)
- 경량/저용량 시스템으로 간편한 설치 가능
- Java Virtual Machine 위에서 동작
- 자체적으로 HTTP 서버를 소스 내부에 탑재하여 리소스 최소화
- 시스템 요구사항

System requirements	Remarks
Operating System	Windows, Linux, Mac OSX, Raspbian
Java Virtual Machine	Java 7 / 8
MQTT Broker	Mosquitto 1.4.x

- 표준 리소스 지원
 - CSEBase, remoteCSE, AE, node, container, contentInstance, mgmtCmd, execInstance, mgmtObj
- 표준 Primitive 지원
 - XML/Json 지원
 - Long/Short-name 리소스 지원

1.1 오픈소스 종류 및 oneM2M 표준 준수

■ &Cube: Thyme

- Node.js Java Script 기반 IoT Application (oneM2M AE)
- 경량/저용량 시스템으로 간편한 설치 가능
- 시스템 요구사항

System requirements	Remarks
Operating System	WindowsX, Linux Redhat and CentOS, Mac, Raspbian
Open Source Framework	Node.js
Web Application Server	Node.js
Database	MySQL
CoAP Framework	-
MQTT Broker	Mosquitto 1.4.x

- 표준 리소스 지원
 - CSEBase, remoteCSE, AE, container, contentInstance, subscription, notification, group
- 표준 Primitive 지원
 - XML/Json 지원
 - Long/Short-name 리소스 지원

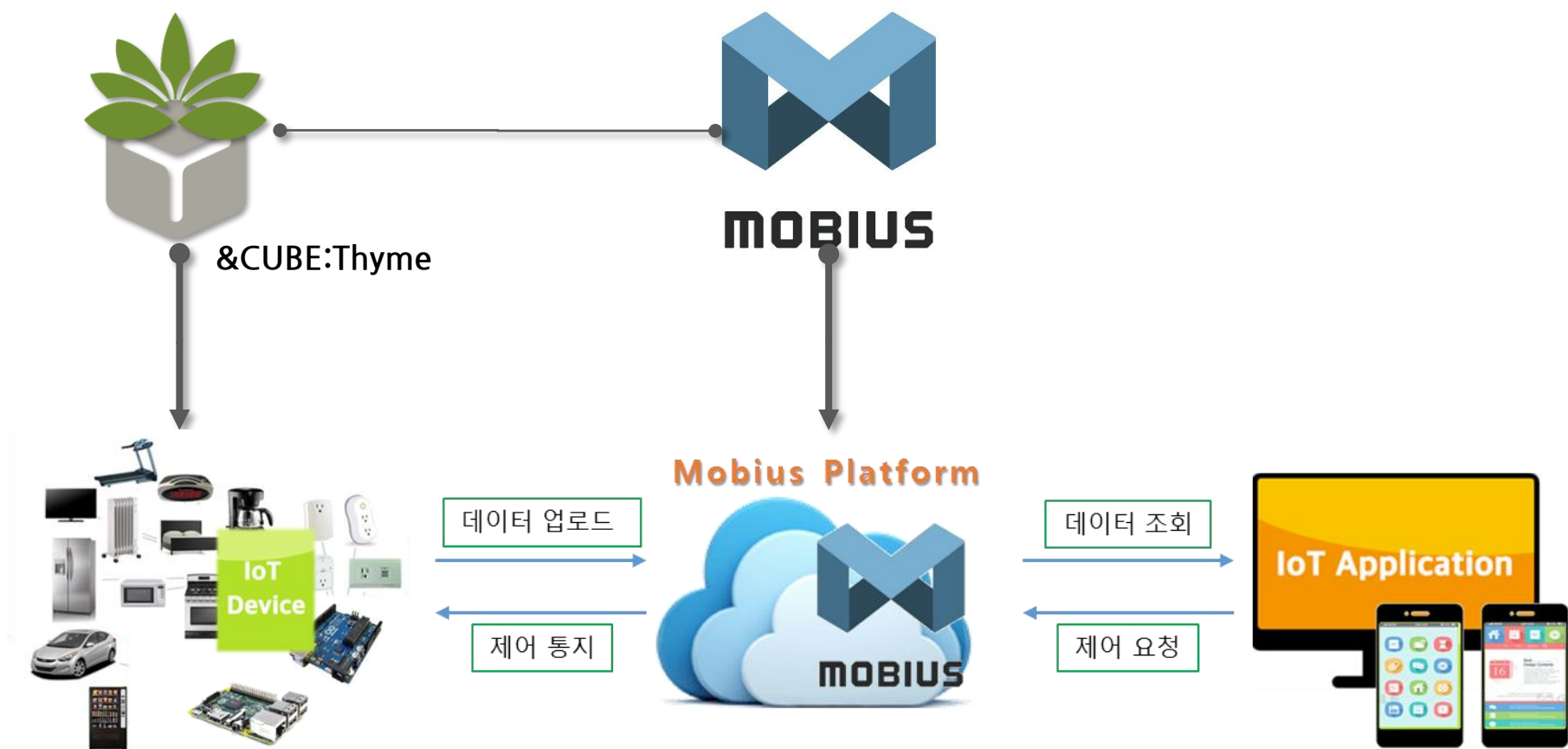
1. 개 요

1.1 오픈소스 종류 및 oneM2M 표준 준수

1.2 &Cube: Thyme 활용 디바이스 개발 방법

1.3 &Cube 연동 구조

1.2 &Cube:Thyme 활용 디바이스 개발 방법



Construction Server Platform

S/W name \ oneM2M Nodes		AE	CSE		IN	Framework
			ASN	MN		
Mobius	Blue Octopus				√	Spring
	Yellow Turtle				√	Node.js
&Cube	Rosemary			√		Java
				√		Node.js
	Lavender		√			Java
			√			Node.js
	Thyme	√				Java
		√				Node.js

Construction Device Platform

S/W name \ oneM2M Nodes		AE		CSE		Framework
			ASN	MN	IN	
Mobius	Blue Octopus				√	Spring
	Yellow Turtle				√	Node.js
	Rosemary			√		Java
				√		Node.js
&Cube	Lavender		√			Java
			√			Node.js
	Thyme	√				Java
		√				Node.js

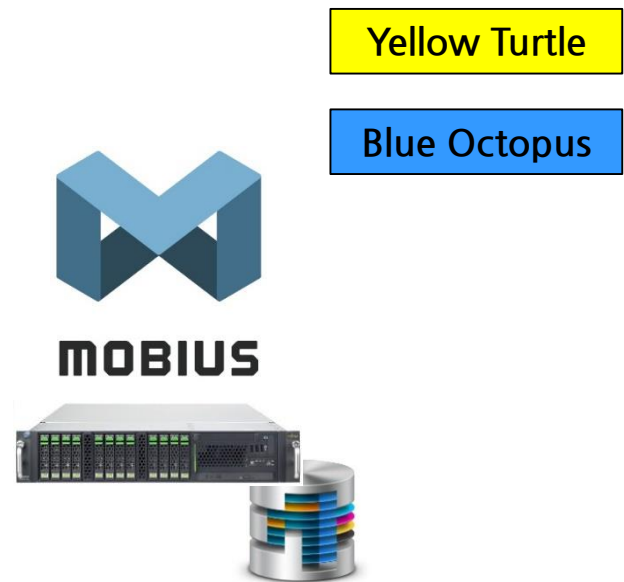
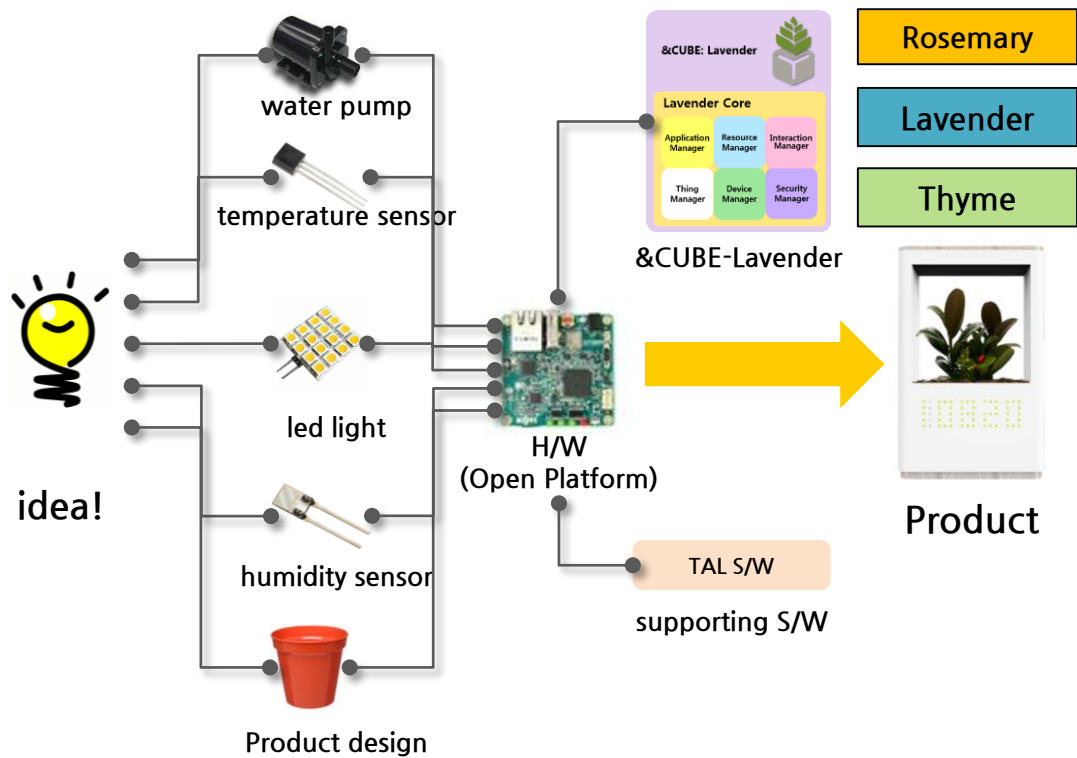
Construction Device Application Platform

S/W name \ oneM2M Nodes		AE	CSE			Framework
			ASN	MN	IN	
Mobius	Blue Octopus				√	Spring
	Yellow Turtle				√	Node.js
&Cube	Rosemary			√		Java
				√		Node.js
	Lavender		√			Java
			√			Node.js
	Thyme	√				Java
		√				Node.js

1.2 &Cube:Thyme 활용 디바이스 개발 방법

Product = Idea + H/W + &CUBE + TAS

IoT Server = Server(H/W) + Mobius



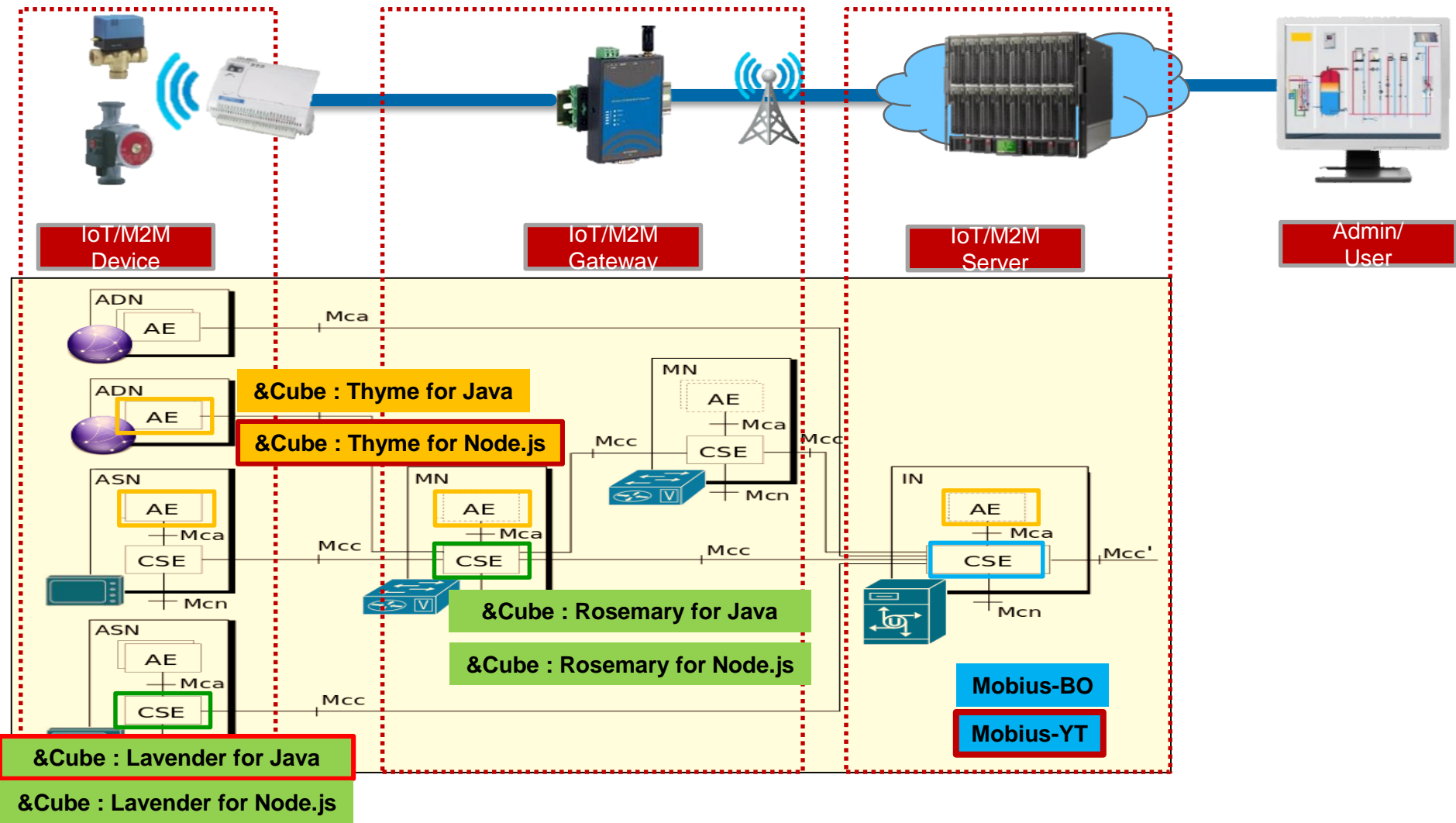
1. 개 요

1.1 오픈소스 종류 및 oneM2M 표준 준수

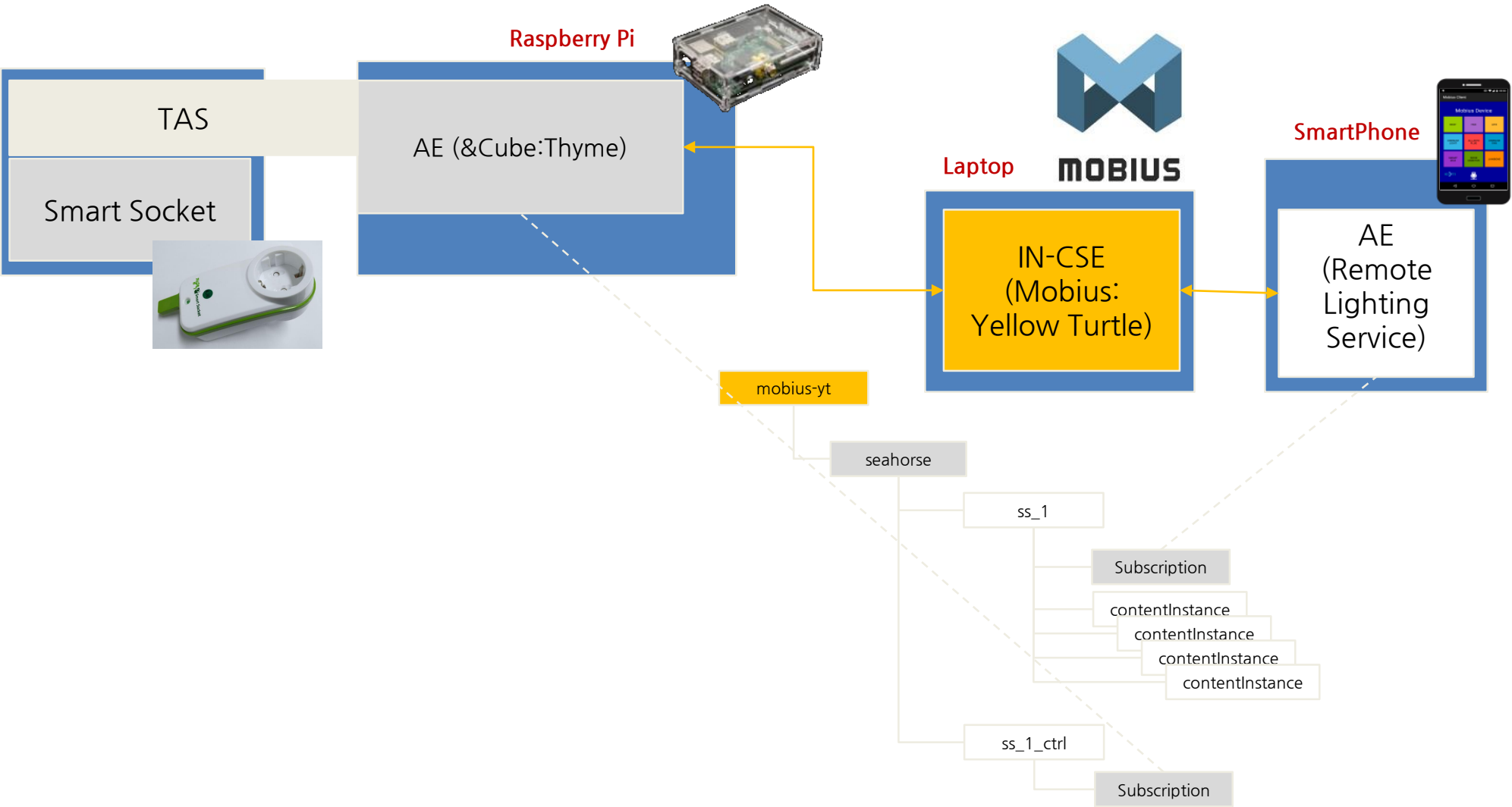
1.2 &Cube: Thyme 활용 디바이스 개발 방법

1.3 &Cube 연동 구조

1.3 Select open source platform in OCEAN to build the use case with oneM2M



1.3 &Cube 연동 구조



2. 사물인터넷 디바이스 개발환경 구축

2.1 사물인터넷 디바이스 Open H/W 소개

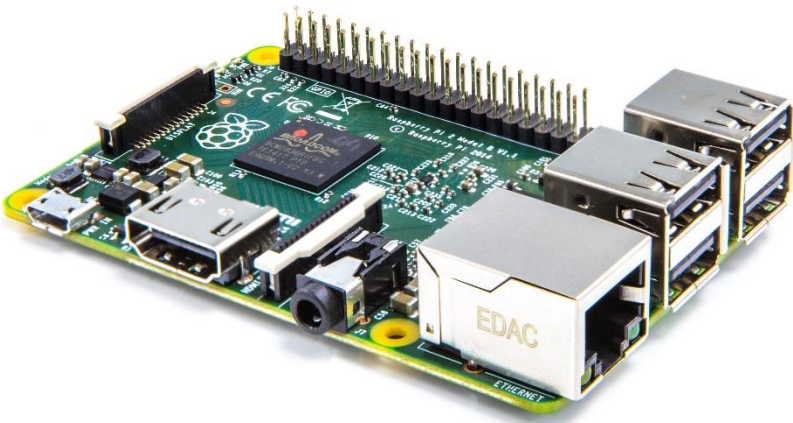
2.2 Open H/W 기반 개발환경 구축

2.3 &Cube: Thyme 구동환경 구축

2.1 사물인터넷 디바이스 Open H/W 소개

■ Raspberry Pi 2 Model B

- 영국의 라즈베리 파이 재단이 개발
- 기초 컴퓨터 과학 교육을 증진시키기 위해 만든 싱글 보드 컴퓨터
- Raspbian (Debian 계열 Linux) 운영체제 사용
- 기타 운영체제 포팅 가능
- 상세 정보는 <http://www.raspberrypi.org/> 홈페이지에서 확인 가능



Item	Name	Feature
Processor	BCM2836	Broadcom BCM2836 SoC - 900Mhz ARM Cortex-A7 Quad core - Broadcom VideoCore IV Dual core - 1GByte Memory
Ethernet	LAN9514	SMSC LAN9514-jzx 10/100Mbps Ethernet Port - RJ-45 connector
USB	Host	USB 2.0 HS/FS/LS Host Port x 4
SD/MMC	microSD	1 microSD Socket (SDMMC2—BOOT)
Video Input	Connector	15Pin MIFI Camera interface connector x 2 - Raspberry Pi Camera - NoIR Camera
Video Output	HDMI	PAL/NTSC 640x350 ~ 1920x1200 resolution
	RCA	PAL/NTSC, Audio output
Audio Input	I2S	Inter-IC Sound, Integrated Interchip Sound
Audio Output	I2S	Inter-IC Sound, Integrated Interchip Sound - 3.5mm Audio jack - HDMI Digital Audio
Power	DC 5V	5V 800mA DC Input (Micro 5pin connector)
Expansion	Connector	GPIO 17 port, UART bus, I2C bus, SPI 2 port, I2S Audio port, +3.3V, +5V, Ground, HAT ID bus
Dimension	width x height	85.6 x 56.5 (mm)

2.1 사물인터넷 디바이스 Open H/W 소개

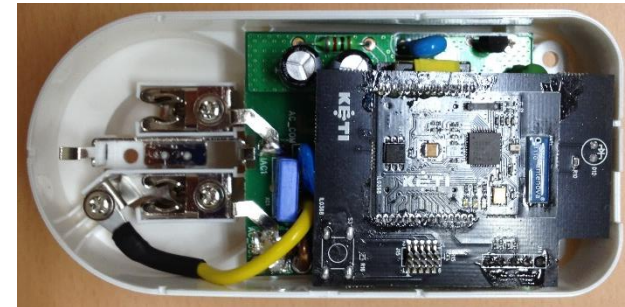
■ Smart Socket

- 전력량 측정을 수행하고 ON/OFF 신호를 통해 전력차단이 가능한 디바이스
- 실제 전력 측정 및 전력차단을 수행하는 보드와 무선 통신으로 데이터 송신 및 제어 수신을 수행하는 보드의 2중 보드 형태
- TI CC2530을 이용한 ZigBee RF 무선 통신 수행
- 주기적으로 현재 전력량을 측정하여 Sink node로 전송
- Sink node로부터 제어 신호 수신 시 전원공급/차단 수행



■ Sink node

- TI CC2530
- CP2103 USB-to-Serial
- Mini USB 활용 연결 인터페이스 제공



2. 사물인터넷 디바이스 개발환경 구축

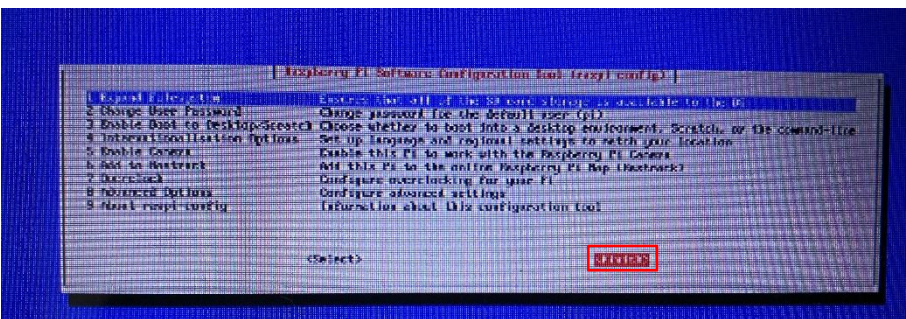
2.1 사물인터넷 디바이스 Open H/W 소개

2.2 Open H/W 기반 개발환경 구축

2.3 &Cube: Thyme 구동환경 구축

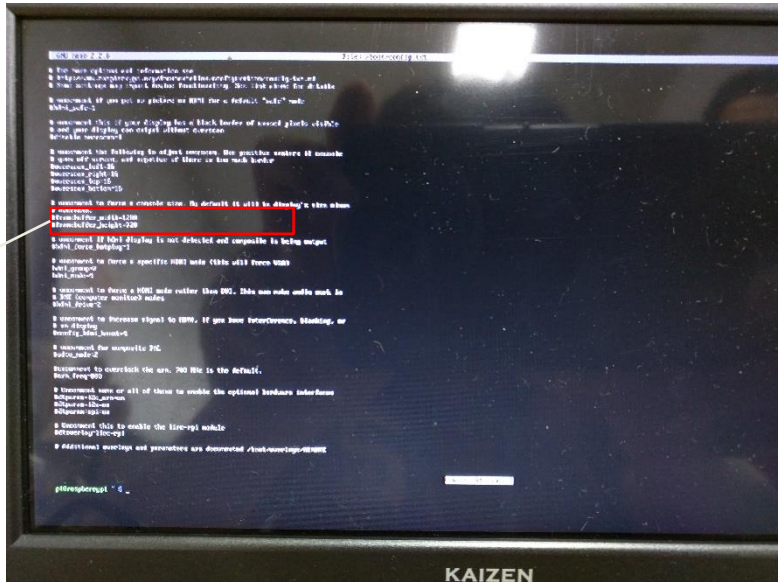
2.2 Open H/W 기반 개발환경 구축

- Raspberry-Pi 부팅
 - HDMI 케이블 및 전원케이블 연결
 - 초기 설정에서 Finish 선택



- Raspberry-Pi 해상도 설정 (# 삭제 및 숫자 변경)

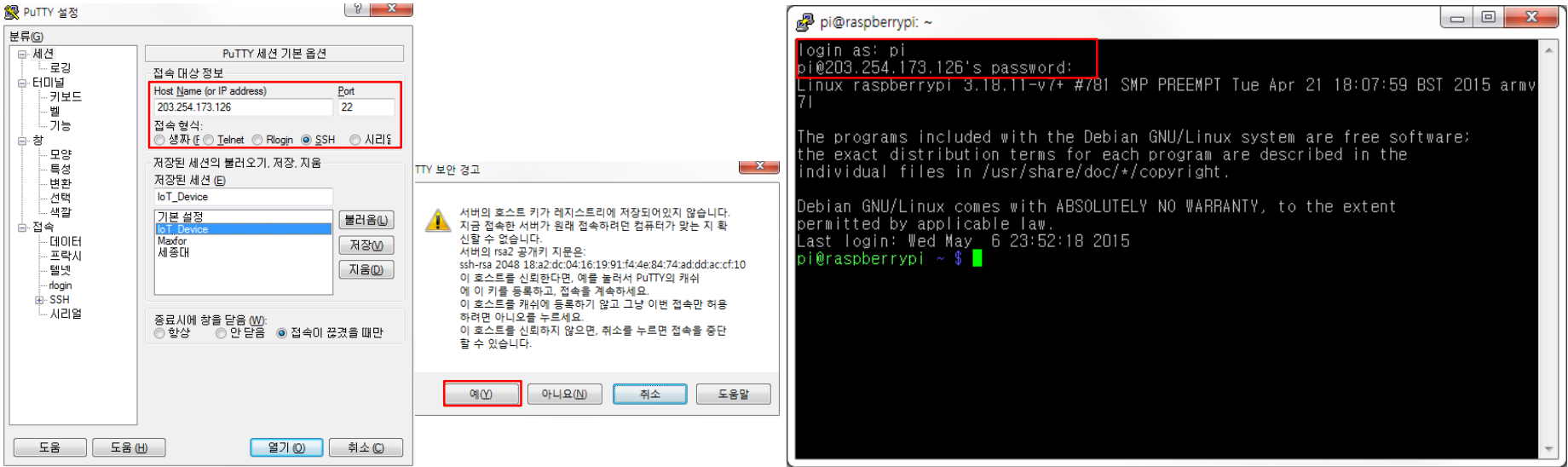
```
pi@raspberrypi ~ $ sudo nano /boot/config.txt
.....
framebuffer_width=800
framebuffer_height=480
.....
<Ctrl> + <X> → Y → <Enter>
```



2.2 Open H/W 기반 개발환경 구축

■ 원격 접속환경 구축 (SSH client 사용)

- SSH client 프로그램 다운로드 및 설치 (PuTTY)
 - <http://www.chiark.greenend.org.uk/~sgtatham/putty/>
- PuTTY 프로그램 설정 및 연결
 - Raspberry-Pi의 IP address 입력을 통해 접속
 - 호스트 키 확인 메시지 출력 시 '예'를 눌러 캐쉬에 등록
 - 접속 완료 시 로그인 진행 (Raspberry-Pi 초기 설정 → ID : pi, PW : raspberry)



2.2 Open H/W 기반 개발환경 구축

■ Samba 서버 구축

● Repository 업데이트

```
pi@raspberrypi ~ $ sudo apt-get update
```

```
.....
```

```
Reading package lists... Done
```

● Samba 서버 설치

```
pi@raspberrypi ~ $ sudo apt-get install samba samba-common-bin
```

```
.....
```

```
Do you want to continue [Y/n]? Y
```

```
pi@raspberrypi: ~
login as: pi
pi@203.254.173.126's password:
Linux raspberrypi 3.18.11-v7+ #781 SMP PREEMPT Tue Apr 21 18:07:59 BST 2015 armv7l

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Wed May  6 23:52:18 2015
pi@raspberrypi ~ $ sudo apt-get update
Hit http://raspberrypi.collabora.com wheezy Release.gpg
Hit http://raspberrypi.collabora.com wheezy Release
Get:1 http://mirrordirector.raspbian.org wheezy Release.gpg [490 B]
Get:2 http://archive.raspberrypi.org wheezy Release.gpg [490 B]
Get:3 http://mirrordirector.raspbian.org wheezy Release [14.4 kB]
Hit http://raspberrypi.collabora.com wheezy/rpi armhf Packages
Get:4 http://archive.raspberrypi.org wheezy Release [15.4 kB]
Get:5 http://mirrordirector.raspbian.org wheezy/main armhf Packages [6,904 kB]
Get:6 http://archive.raspberrypi.org wheezy/main armhf Packages [129 kB]
1% [5 Packages 17.1 kB/6,904 kB 0%] [Waiting for headers] [6 Packages 15.4 kB/1
```

```
pi@raspberrypi: ~
Ign http://mirrordirector.raspbian.org wheezy/main Translation-en
Ign http://mirrordirector.raspbian.org wheezy/non-free Translation-en_GB
Ign http://mirrordirector.raspbian.org wheezy/non-free Translation-en
Ign http://mirrordirector.raspbian.org wheezy/rpi Translation-en_GB
Ign http://mirrordirector.raspbian.org wheezy/rpi Translation-en
Fetched 7,137 kB in 35s (198 kB/s)
Reading package lists... Done
pi@raspberrypi ~ $ sudo apt-get install samba samba-common-bin
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following extra packages will be installed:
  tdb-tools
Suggested packages:
  openssh-inetd inet-superserver smbldap-tools ldb-tools ctdb
The following NEW packages will be installed:
  samba samba-common-bin tdb-tools
0 upgraded, 3 newly installed, 0 to remove and 11 not upgraded.
Need to get 6,119 kB of archives.
After this operation, 36.1 MB of additional disk space will be used.
Do you want to continue [Y/n]? Y
Get:1 http://mirrordirector.raspbian.org/raspbian/ wheezy/main samba armhf 2:3.6
.6-6+deb7u5 [3,356 kB]
6% [1 samba 391 kB/3,356 kB 12%]
```

2.2 Open H/W 기반 개발환경 구축

■ Samba 서버 구축

● Samba 서버 사용자 추가

```
pi@raspberrypi ~ $ sudo smbpasswd -a pi
New SMB password: (원하는 패스워드 입력)
Retype new SMB password: (원하는 패스워드 입력)
Added user pi.
```

```
pi@raspberrypi: ~
Unpacking tdb-tools (from .../tdb-tools_1.2.10-2_armhf.deb) ...
Processing triggers for man-db ...
Setting up samba (2:3.6.6-6+deb7u5) ...
Generating /etc/default/samba,...
Adding group 'sambashare' (GID 111) ...
Done.
update-alternatives: using /usr/bin/smbstatus.samba3 to provide /usr/bin/smbstat
us (smbstatus) in auto mode
[ ok ] Starting Samba daemons: nmbd smbd.
Setting up samba-common-bin (2:3.6.6-6+deb7u5) ...
update-alternatives: using /usr/bin/nmblookup.samba3 to provide /usr/bin/nmblook
up (nmblookup) in auto mode
update-alternatives: using /usr/bin/net.samba3 to provide /usr/bin/net (net) in
auto mode
update-alternatives: using /usr/bin/testparm.samba3 to provide /usr/bin/testparm
(testparm) in auto mode
Setting up tdb-tools (1.2.10-2) ...
update-alternatives: using /usr/bin/tdbbackup.tdbtools to provide /usr/bin/tdbba
ckup (tdbbackup) in auto mode
pi@raspberrypi ~ $ sudo smbpasswd -a pi
New SMB password:
Retype new SMB password:
Added user pi.
pi@raspberrypi ~ $
```

● Samba 서버 사용자 설정

```
pi@raspberrypi ~ $ sudo nano /etc/samba/smb.conf
..... (가장 마지막 줄 밑에)
[pi]
comment = raspberry pi folder
path = /home/pi
valid user = pi
writable = yes
browseable = yes
<Ctrl>+<X> → Y → <Enter>
```

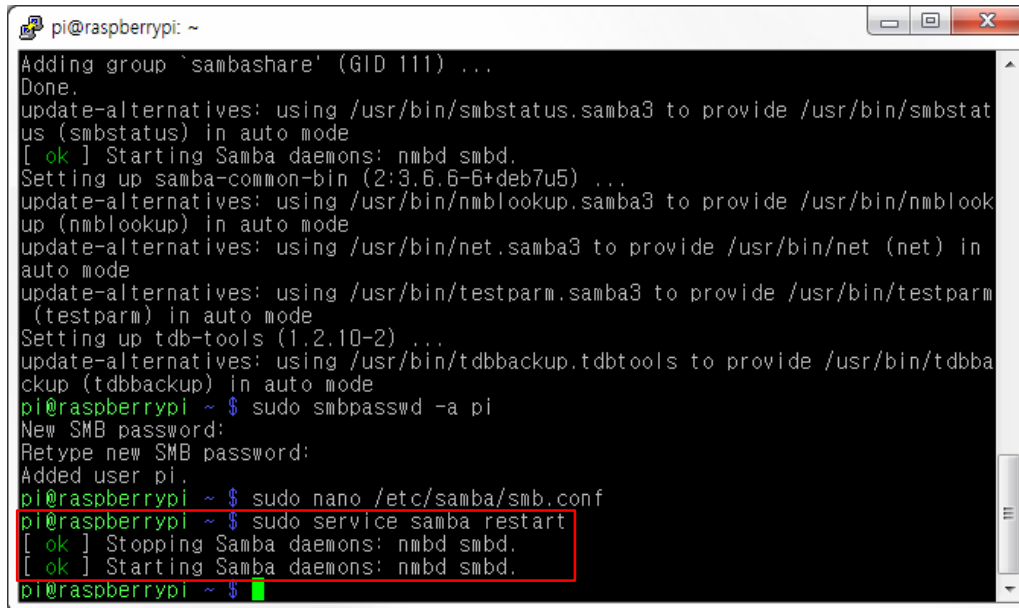
```
pi@raspberrypi: ~
GNU nano 2.2.6 File: /etc/samba/smb.conf Modified
#
# /dev/scd0 /cdrom iso9660 defaults,noauto,ro,user 0 0
#
# The CD-ROM gets unmounted automatically after the connection to the
#
# If you don't want to use auto-mounting/unmounting make sure the CD
# is mounted on /cdrom
#
: preexec = /bin/mount /cdrom
: postexec = /bin/umount /cdrom
[pi]
comment = raspberry pi folder
path = /home/pi
valid user = pi
writable = yes
browseable = yes
^G Get Help ^O WriteOut ^R Read File ^V Prev Page ^K Cut Text ^C Cur_Pos
^X Exit ^J Justify ^W Where Is ^Y Next Page ^U UnCut Text ^T To Spell
```

2.2 Open H/W 기반 개발환경 구축

■ Samba 서버 구축

- Samba 서버 재시작

```
pi@raspberrypi ~ $ sudo service samba restart  
[ ok ] Stopping Samba daemons: nmbd smbd.  
[ ok ] Starting Samba daemons: nmbd smbd.
```

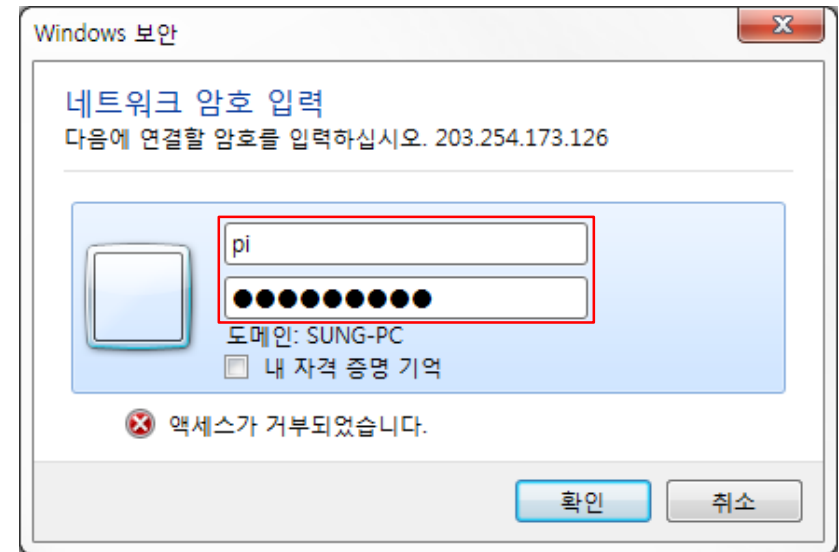
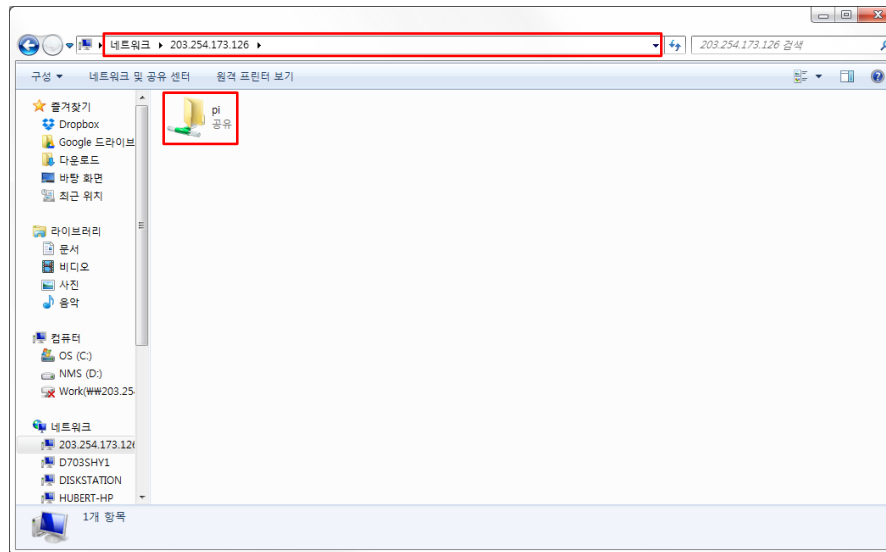


```
pi@raspberrypi: ~  
Adding group `sambashare' (GID 111) ...  
Done.  
update-alternatives: using /usr/bin/smbstatus.samba3 to provide /usr/bin/smbstat  
us (smbstatus) in auto mode  
[ ok ] Starting Samba daemons: nmbd smbd.  
Setting up samba-common-bin (2:3.6.6-6+deb7u5) ...  
update-alternatives: using /usr/bin/nmblookup.samba3 to provide /usr/bin/nmblook  
up (nmblookup) in auto mode  
update-alternatives: using /usr/bin/net.samba3 to provide /usr/bin/net (net) in  
auto mode  
update-alternatives: using /usr/bin/testparm.samba3 to provide /usr/bin/testparm  
(testparm) in auto mode  
Setting up tdb-tools (1.2.10-2) ...  
update-alternatives: using /usr/bin/tdbbackup.tdbtools to provide /usr/bin/tdbba  
ckup (tdbbackup) in auto mode  
pi@raspberrypi ~ $ sudo smbpasswd -a pi  
New SMB password:  
Retype new SMB password:  
Added user pi.  
pi@raspberrypi ~ $ sudo nano /etc/samba/smb.conf  
pi@raspberrypi ~ $ sudo service samba restart  
[ ok ] Stopping Samba daemons: nmbd smbd.  
[ ok ] Starting Samba daemons: nmbd smbd.  
pi@raspberrypi ~ $
```

2.2 Open H/W 기반 개발환경 구축

■ Samba 폴더 연결

- Windows 탐색기 실행
- 주소입력 창에 \\W\\Raspberry-Pi IP 주소 입력
 - 예) \\W\\203.254.173.126
- pi 폴더 더블클릭
- 계정 및 패스워드 입력
 - 계정 : pi, 패스워드 : Samba서버 설치 시 지정한 패스워드



2. 사물인터넷 디바이스 개발환경 구축

2.1 사물인터넷 디바이스 Open H/W 소개

2.2 Open H/W 기반 개발환경 구축

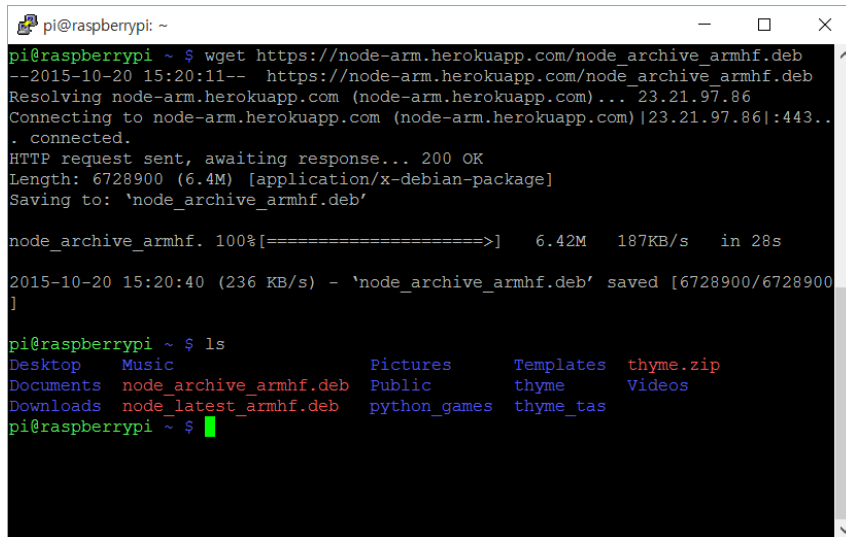
2.3 &Cube: Thyme 구동환경 구축

2.3 &Cube: Thyme 구동환경 구축

■ Node.js 패키지 설치

- Node.js 다운로드 및 설치

```
pi@raspberrypi ~ $ mkdir node
pi@raspberrypi ~ $ cd node
pi@raspberrypi ~/node $ sudo wget https://node-arm.herokuapp.com/node_archive_armhf.deb
pi@raspberrypi ~/node $ sudo dpkg -i node_archive_armhf.deb (패키지 설치 명령어)
pi@raspberrypi ~/node $ node -v (버전 확인 명령어)
pi@raspberrypi ~/node $ npm -v (추가 라이브러리 설치도구 버전 확인 명령어)
```

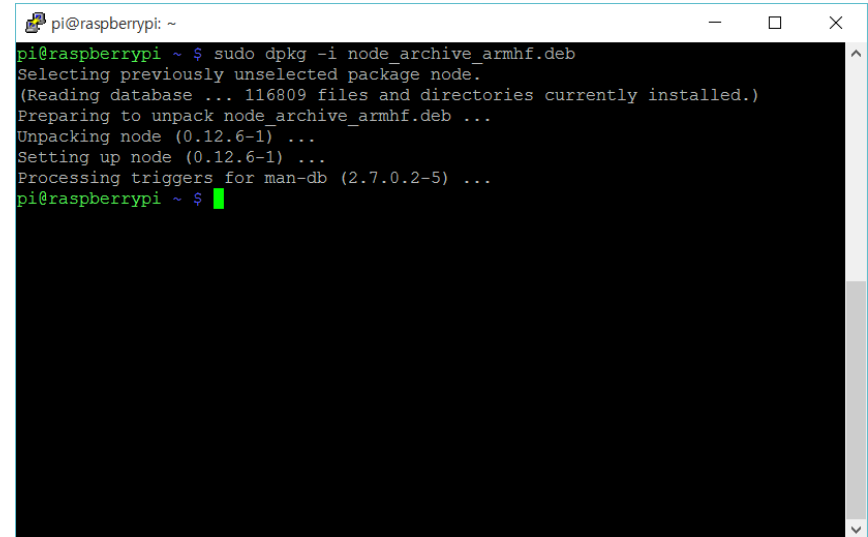


```
pi@raspberrypi: ~
pi@raspberrypi ~ $ wget https://node-arm.herokuapp.com/node_archive_armhf.deb
--2015-10-20 15:20:11-- https://node-arm.herokuapp.com/node_archive_armhf.deb
Resolving node-arm.herokuapp.com (node-arm.herokuapp.com)... 23.21.97.86
Connecting to node-arm.herokuapp.com (node-arm.herokuapp.com)|23.21.97.86|:443..
. connected.
HTTP request sent, awaiting response... 200 OK
Length: 6728900 (6.4M) [application/x-debian-package]
Saving to: 'node_archive_armhf.deb'

node_archive_armhf. 100%[=====] 6.42M 187KB/s in 28s

2015-10-20 15:20:40 (236 KB/s) - 'node_archive_armhf.deb' saved [6728900/6728900]

pi@raspberrypi ~ $ ls
Desktop  Music      Pictures  Templates thyme.zip
Documents node_archive_armhf.deb Public     thyme     Videos
Downloads node_latest_armhf.deb python_games thyme_tas
pi@raspberrypi ~ $
```



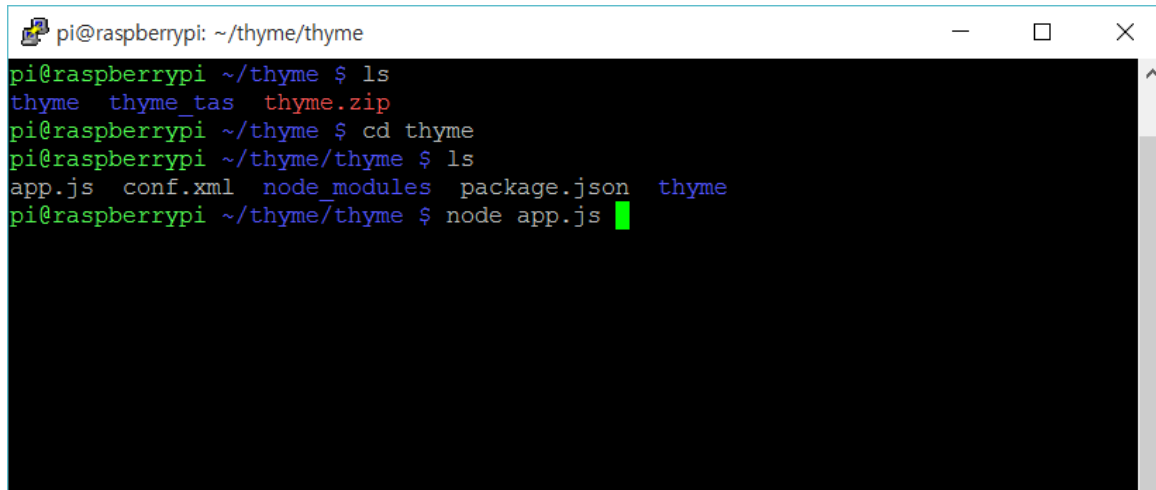
```
pi@raspberrypi ~ $ sudo dpkg -i node_archive_armhf.deb
Selecting previously unselected package node.
(Reading database ... 116809 files and directories currently installed.)
Preparing to unpack node_archive_armhf.deb ...
Unpacking node (0.12.6-1) ...
Setting up node (0.12.6-1) ...
Processing triggers for man-db (2.7.0.2-5) ...
pi@raspberrypi ~ $
```

2.3 &Cube: Thyme 구동환경 구축

■ &Cube: Thyme 샘플 다운로드 및 구동 테스트

- www.iotocean.org 에서 &Cube:Thyme 다운로드
- 구동 테스트 → &Cube: Thyme 실행

```
pi@raspberrypi ~/node/thyme $ sudo npm install (추가 라이브러리 설치 명령)  
pi@raspberrypi ~/node/thyme $ node app.js (실행 명령)
```



```
pi@raspberrypi: ~/thyme/thyme  
pi@raspberrypi ~/thyme $ ls  
thyme  thyme_tas  thyme.zip  
pi@raspberrypi ~/thyme $ cd thyme  
pi@raspberrypi ~/thyme/thyme $ ls  
app.js  conf.xml  node_modules  package.json  thyme  
pi@raspberrypi ~/thyme/thyme $ node app.js
```

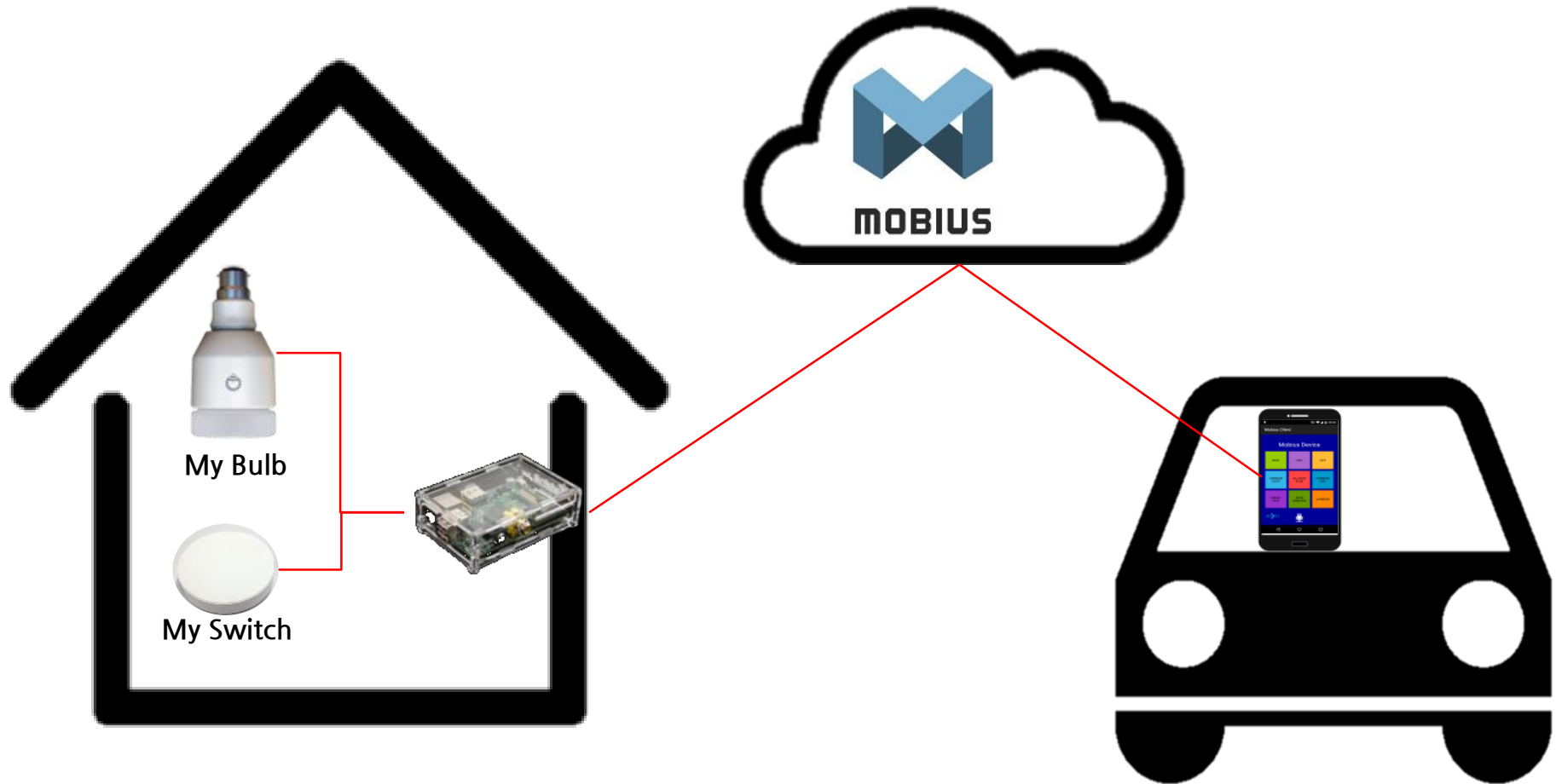
3. 사물인터넷 디바이스 개발 시연

3.1 서비스 시나리오

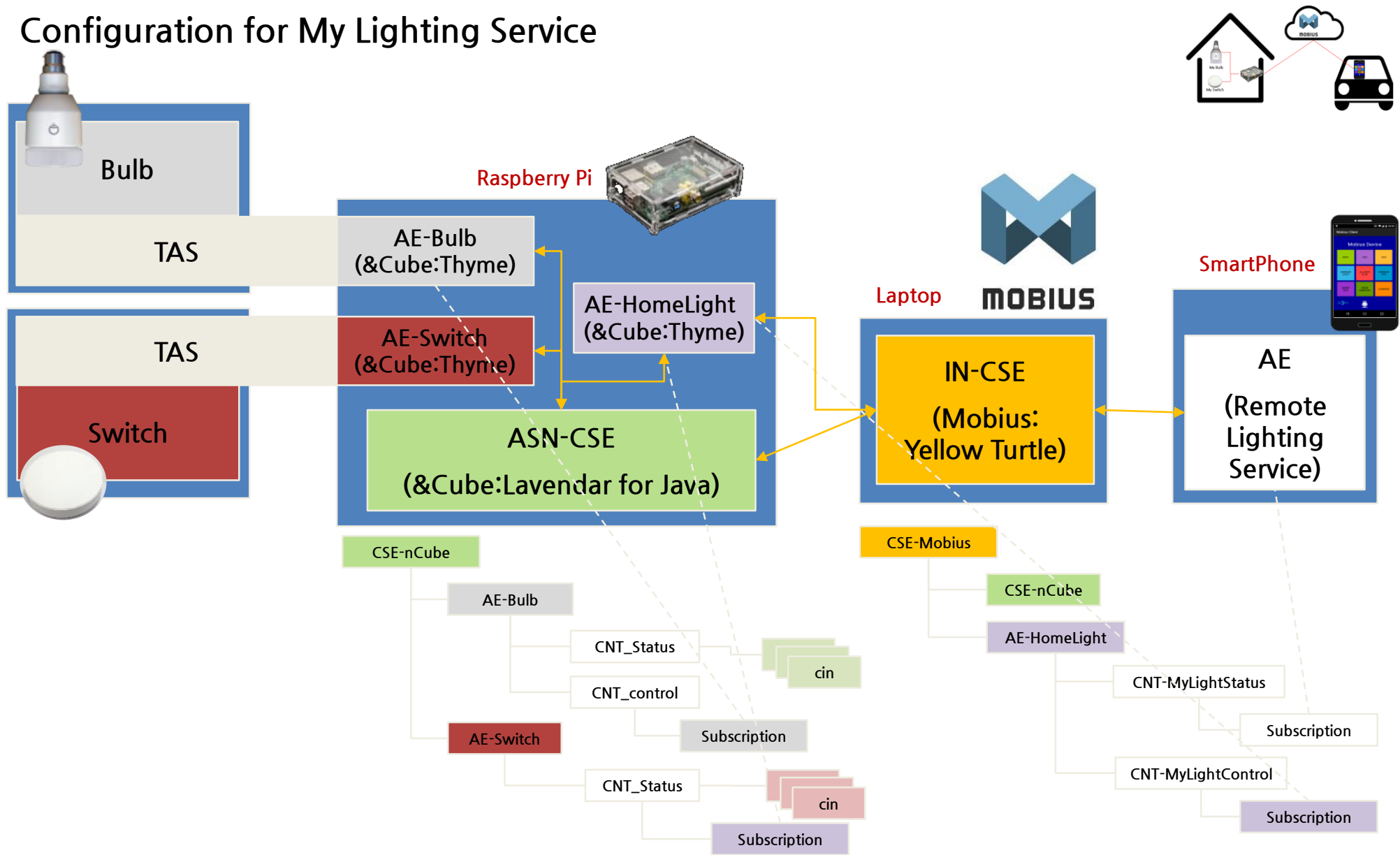
3.2 Yellow Turtle 구축 시연

3.3 &Cube: Thyme 구동 시연

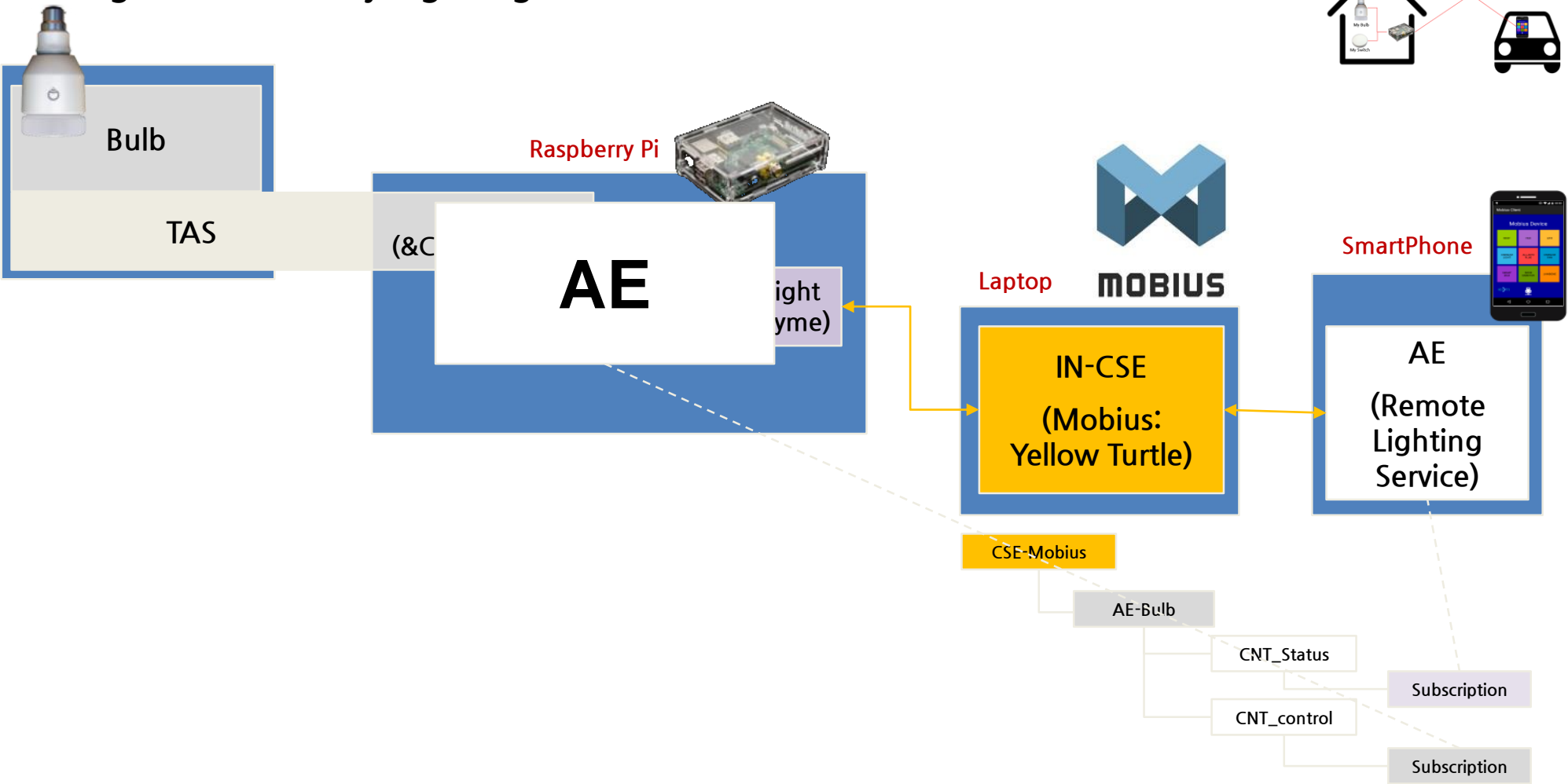
Case study for My Lighting Service



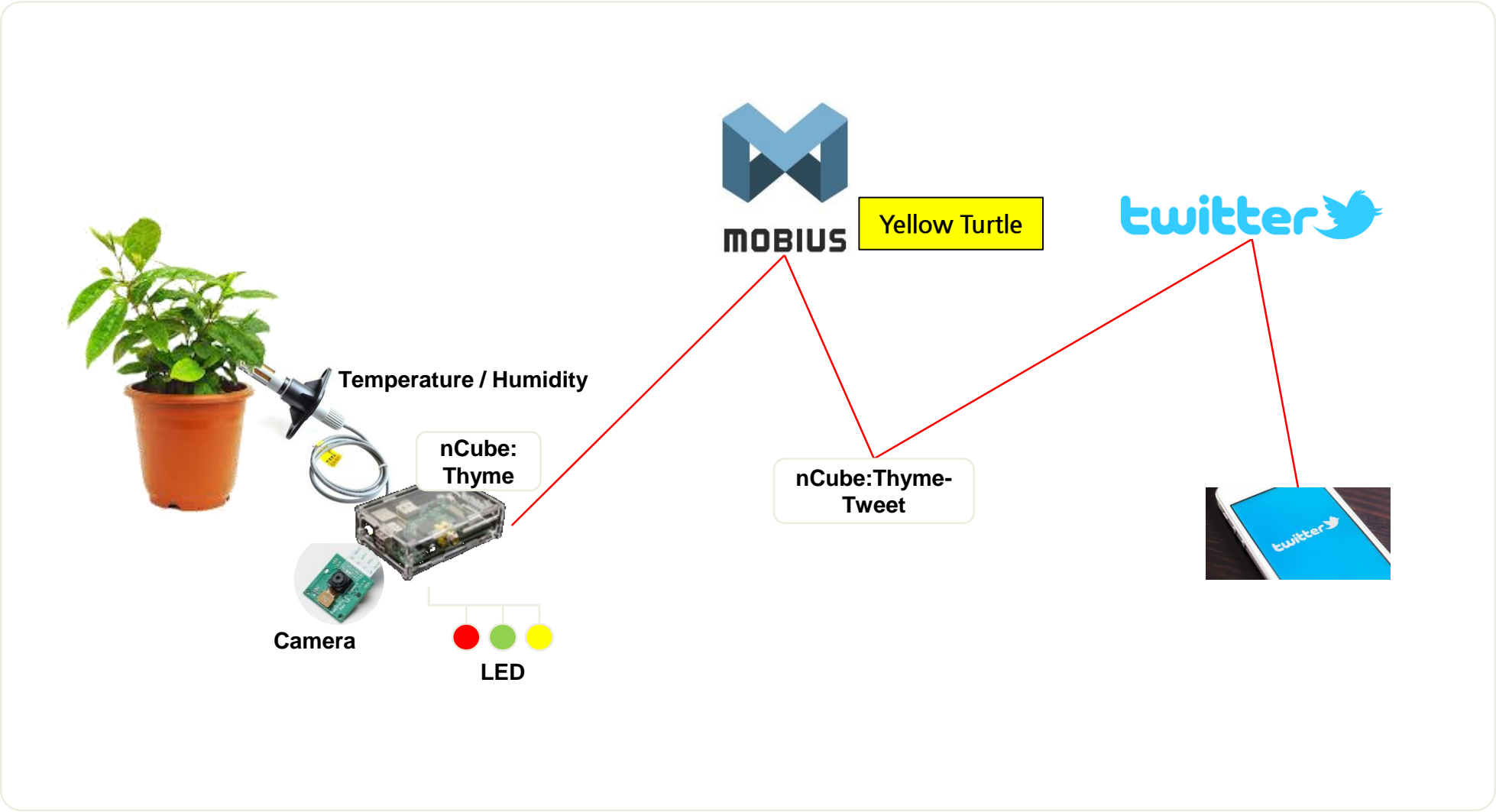
Configuration for My Lighting Service



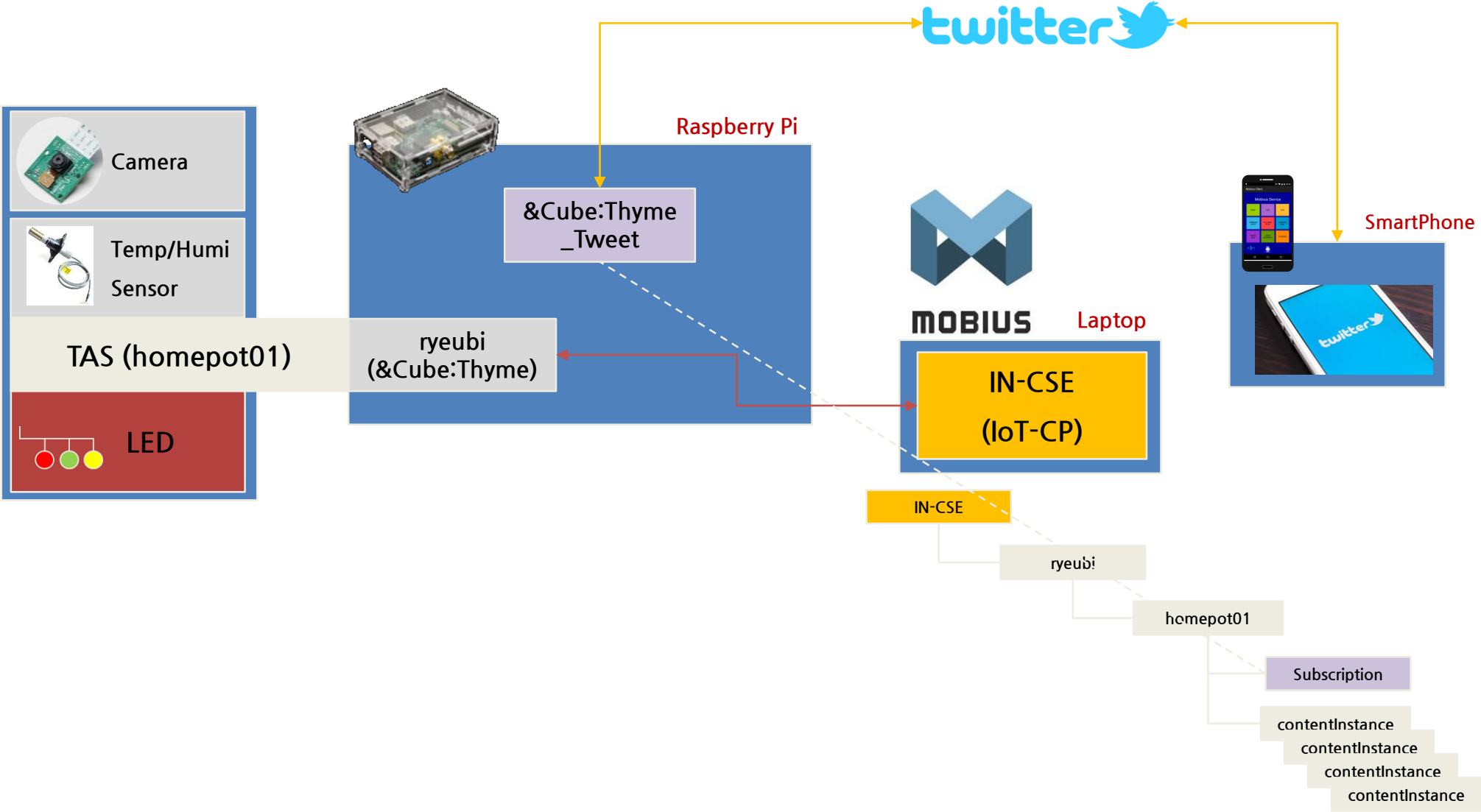
Configuration for My Lighting Service



Case study for Smart Pot Service (Demo)



Configuration for Smart Pot Service (Demo)



3. 사물인터넷 디바이스 개발 시연

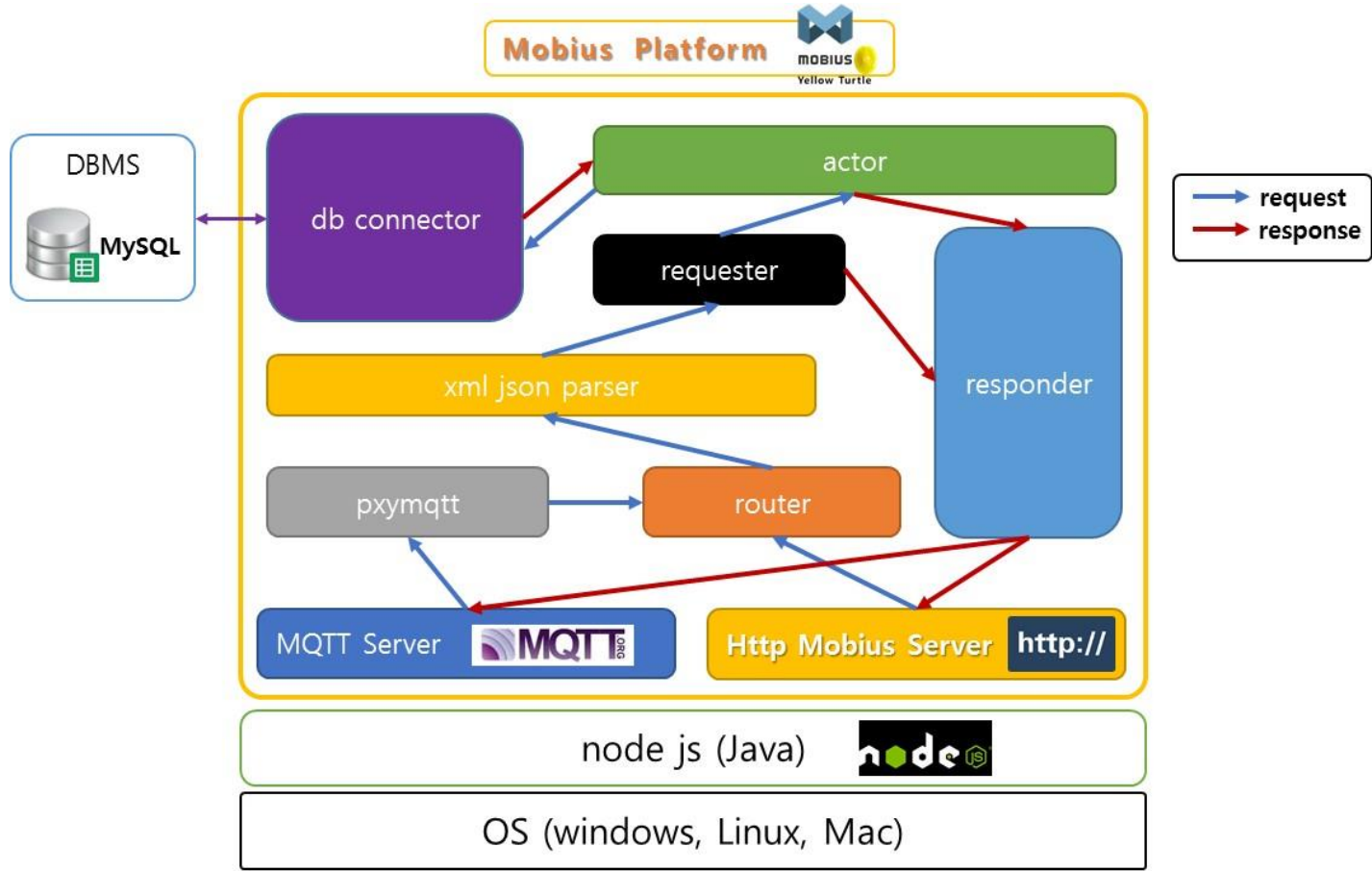
3.1 서비스 시나리오

3.2 Yellow Turtle 구축 시연

3.3 &Cube: Thyme 구동 시연

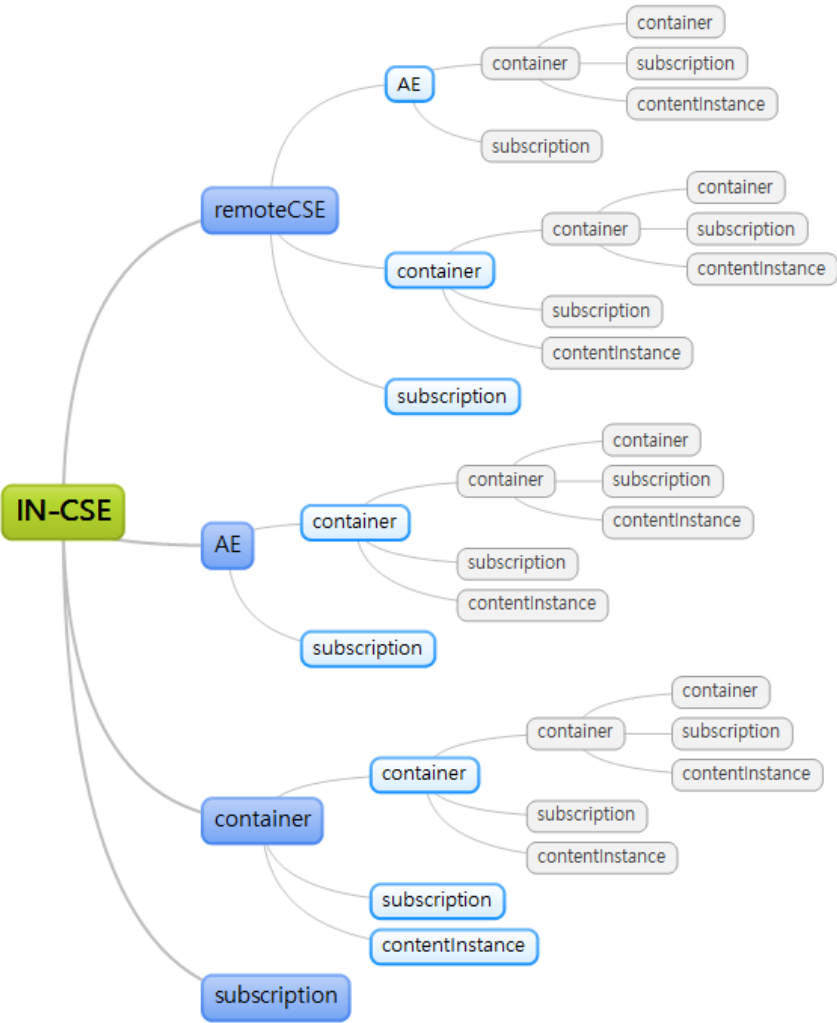
Mobius Yellow Turtle 서버 플랫폼 S/W 아키텍처

- Mobius Yellow Turtle : Node JS를 기반으로 Java Script로 개발
- DB는 MySQL을 지원하고 있으며 통신 프로토콜은 HTTP, MQTT를 지원



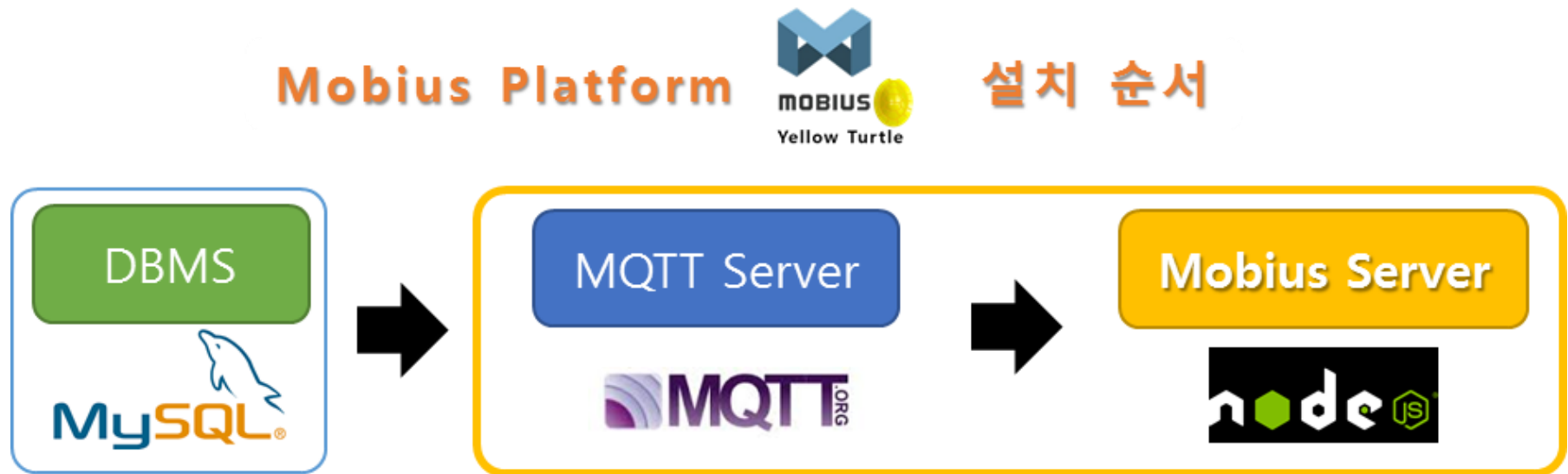
Mobius Yellow Turtle 서버 지원 Resource 구조

http://hostname:port/IN-CSE_name/AE_name/container_name/contentInstance_name



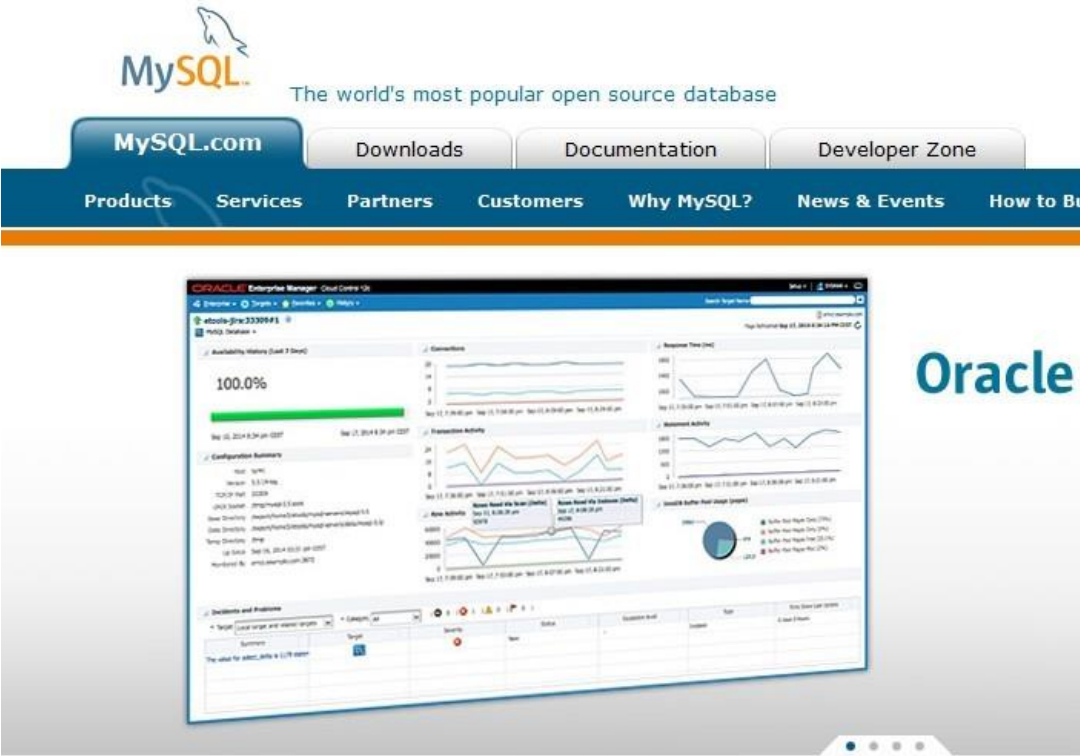
Construction Server Platform with Mobius : Yellow Turtle

- Reference install guide of Yellow Turtle in OCEAN



Construction Server Platform with Mobius : Yellow Turtle

■ MySQL 설치 (MySQL Server , MySQL Workbench)



[Generally Available \(GA\) Releases](#)
[Development Releases](#)

MySQL Community Server 5.6.22

Select Platform:

Looking for previous GA versions?

Recommended Download:

MySQL Installer 5.6 for Windows

All MySQL Products. For All Windows Platforms. In One Package.

Starting with MySQL 5.6 the MySQL Installer package replaces the server-only MSI packages.

Windows (x86, 64-bit), MySQL Installer MSI [Download](#)

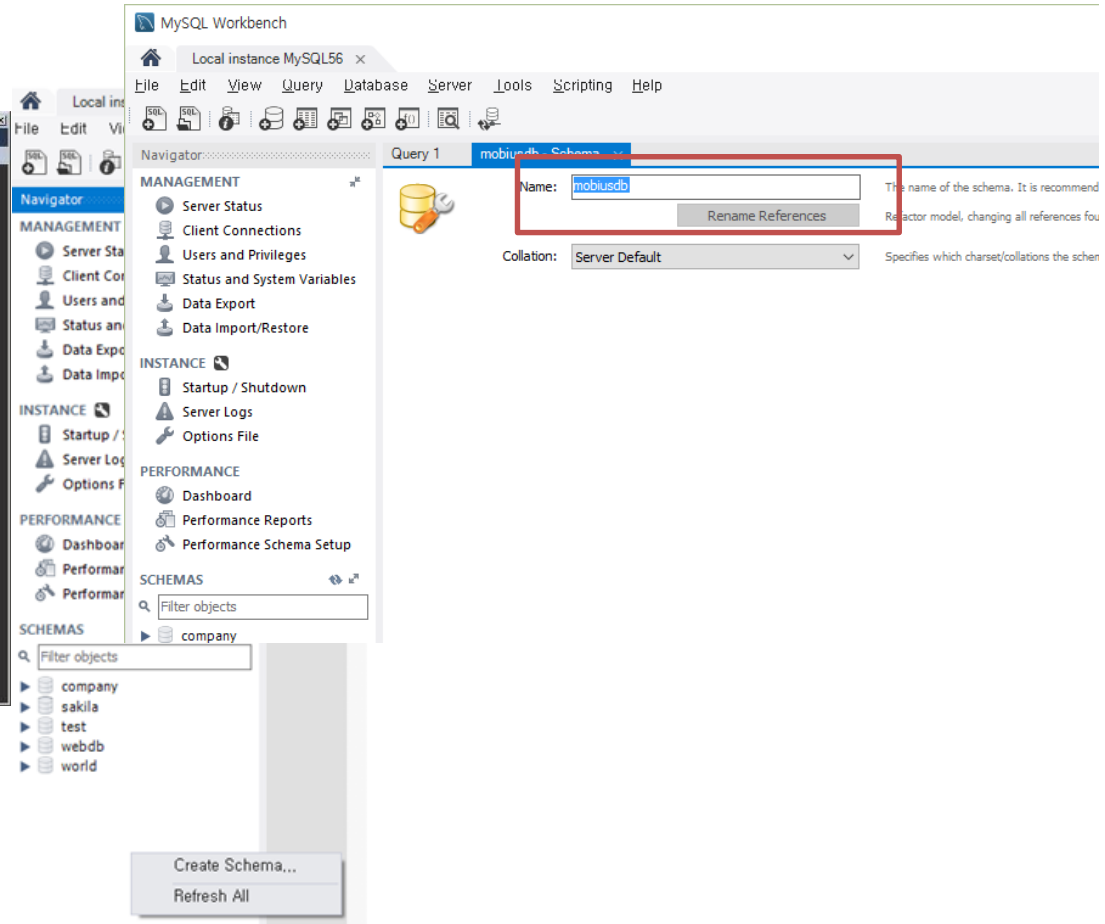
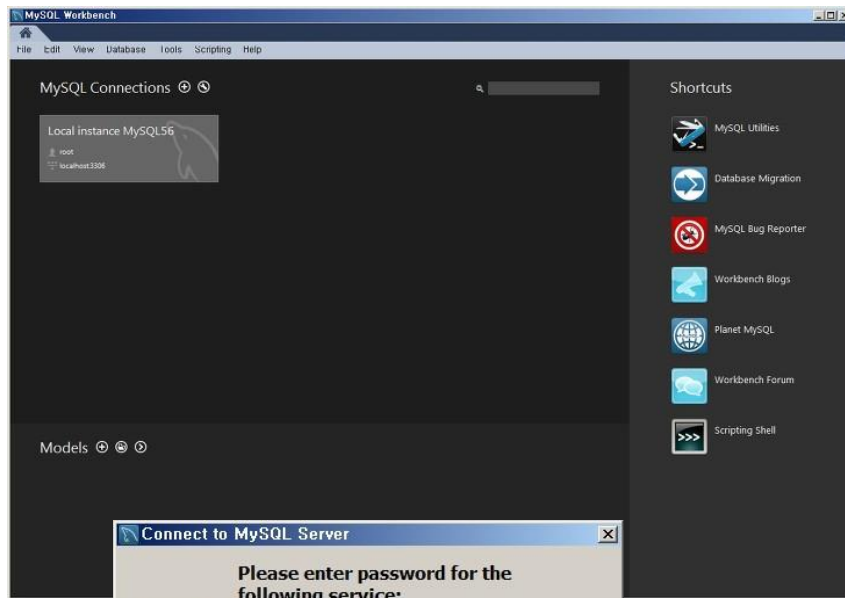
Other Downloads:

Platform	Version	Size	Download
Windows (x86, 32-bit), ZIP Archive	5.6.22	342.0M	Download
<small>(mysql-5.6.22-win32.zip) MD5: 00abcb99a71708d372ff073f870deabd Signature</small>			
Windows (x86, 64-bit), ZIP Archive	5.6.22	347.5M	Download
<small>(mysql-5.6.22-winx64.zip) MD5: 8810b875ff1651e3c91473faa7ed6509 Signature</small>			

We suggest that you use the MD5 checksums and GnuPG signatures to verify the integrity of the packages you download.


Construction Server Platform with Mobius : Yellow Turtle

■ MySQL 데이터베이스 생성 (mobiusdb)





Construction Server Platform with Mobius : Yellow Turtle

■ MySQL mobiusdb 테이블 가져오기 (www.iotocean.org)

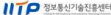


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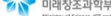




한국전자통신연구원



정보통신기술진흥센터



미래창조과학부

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Mobius

Blue Octopus

Yellow Turtle

&Cube

Open Contribution

Yellow Turtle v1.0

Mobius: Yellow Turtle

Yellow Turtle is an open source software of oneM2M-based IoT Server Platform. The source code and files of Yellow Turtle are under the OCEAN license BSD open source license.

Code Name	Framework	Version	Ref. Standard
Yellow Turtle	Node.js JavaScript	1.0	oneM2M Release 1.0.0

PREREQUISITES

SYSTEM REQUIREMENTS

System Requirements	Remarks
Operating System	WindowsX, Linux Redhat and CentOS
Open Source Framework	Node.js
Web Application Server	Node.js
Database	MySQL
CoAP Framework	
MQTT Broker	Mosquitto 1.4.x

Files

Name	Download Link
Mobius Installation Guide Korea	Installation Guide_Yellow Turtle_v1.0_KR.pdf
Mobius Source 1.0	Mobius_Yellow_Turtle_v1.0.zip
MySQL Script	YellowTurtle_script.sql

File : Installation Guide_Mobius_Yellow_Turtle_v1.0_KR.pdf | Mobius YellowTurtle.zip | YellowTurtle_script.sql

Local Instance MySQL56

Data Import

Import from Disk

Import Progress

Options

☐ Import from Dump Project Folder

C:\Users\Wryeub\Documents\Wdumps

Load Folder Contents

☒ Import from Self-Contained File

C:\Users\Wryeub\Documents\Wdumps\Wexport.sql

Select the SQL dump file to import. Please note that the whole file will be imported.

Default Schema to be Imported To

Default Target Schema:

New...

The default schema to import the dump into. NOTE: this is only used if the dump file does otherwise it is ignored.

Select Database Objects to Import (only available for Project Folders)

Imp... Schema

Imp... Schema Objects

Select Tables

Press [Start Import] to start...

Performance Schema Setup

SCHEMAS

Filter objects

company

mobiusdb

Tables

lv0

lv1

lv2

lv3

lv4

lv5

lv6

lv7

lv8

lv9

Views

Stored Procedures

Functions

Information

Schema: mobiusdb

Select Database Objects to Import

Imp... Schema

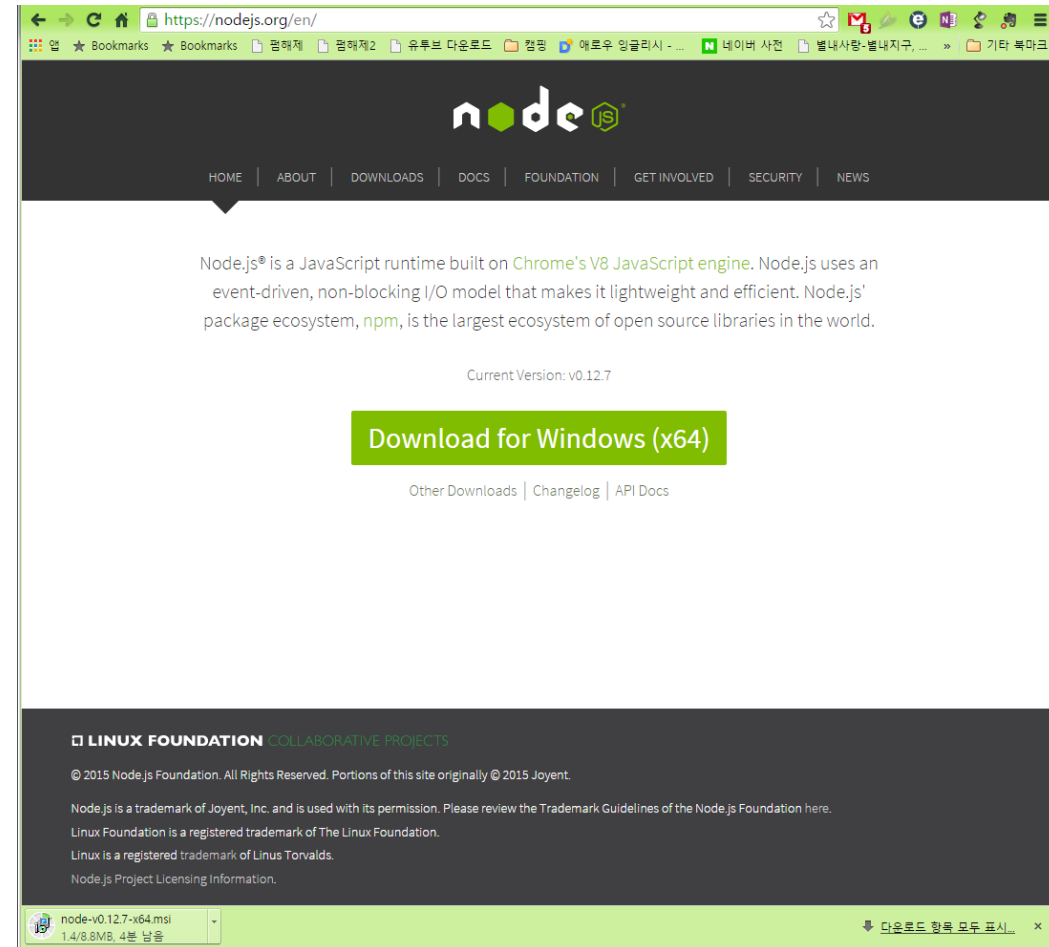
Construction Server Platform with Mobius : Yellow Turtle

■ Node.js

- 고성능의 비동기 IO (Async/Non-blocking IO)를 지원하는 single thread 기반 네트워크 서버
- 2009년 Ryan Dahl에 의해 개발이 시작되었고 현재 수많은 지원 모듈을 가지고 있는 오픈 소스 프로젝트 중 하나
- Google Chrome V8 엔진으로 개발되어 있고 Event 기반의 프로그래밍 모델로써 프로그래밍 언어로는 Java script를 사용
- 현재 많은 인터넷 기업들이 node.js를 도입

■ Node.js 설치


- <http://www.nodejs.org>




Construction Server Platform with Mobius : Yellow Turtle


■ Mobius-YT 서버 설치


- OCEAN Alliance 사이트
(<http://www.iotocean.org>)
- Download Mobius:Yellow Turtle from OCEAN




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Future Planning

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Mobius

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- Yellow Turtle

&Cube

Open Contribution

- Yellow Turtle

Yellow Turtle v1.0

2015-09-03 16:16

Mobius: Yellow Turtle

Yellow Turtle is an open source software of oneM2M-based IoT Server Platform based on Node.js JavaScript.

The source code and files of Yellow Turtle are under the OCEAN license terms and conditions, i.e., 3-clause BSD open source license.

Versions

Code Name	Framework	Version	Ref. Standards
Yellow Turtle	Node.js JavaScript	1.0	oneM2M Release 1

PREREQUISITES

-

SYSTEM REQUIREMENTS

System Requirements	Remarks
Operating System	WindowsX, Linux Redhat and CentOS, Mac, Raspbian
Open Source Framework	Node.js
Web Application Server	Node.js
Database	MySQL
CoAP Framework	
MQTT Broker	Mosquitto 1.4.x

Files

Name	Download Link
Mobius Installation Guide Korea	Installation Guide_Yellow Turtle_v1.0_KR.pdf
Mobius Source 1.0	Mobius_Yellow_Turtle_v1.0.zip
Mysql Script	YellowTurtle_script.sql

file : [Installation Guide_Mobius_Yellow_Turtle_v1.0_KR.pdf](#) | [Mobius Yellow Turtle.zip](#) | [YellowTurtle_script.sql](#)

LAST PAGE

Construction of Mobius:Yellow Turtle

- Extract zip and run 'npm install' in command prompt at the folder of mobius

이름	수정된 날짜	유형	크기
mobius	2015-10-09 오후...	파일 폴더	
app.js	2015-10-02 오후...	JetBrains WebS...	
conf.json	2015-09-25 오전...	JSON File	
package.json	2015-09-03 오전...	JSON File	
pxymqtt.js	2015-09-15 오전...	JetBrains WebS...	

mobius yellow turtle

이름	수정된 날짜	유형
mobius	2015-09-03 오전...	파일 폴더
node_modules	2015-09-03 오전...	파일 폴더
app.js	2015-09-03 오전...	JetBrains WebStor...
conf.xml	2015-09-02 오후...	XML 파일
package.json	2015-09-03 오전...	JSON File
pxymqtt.js	2015-08-26 오후...	JetBrains WebStor...

명령 프롬프트

```
finalhandler@0.4.0 (unpipe@1.0.0)
proxy-addr@1.0.8 (forwarded@0.1.0, ipaddr.js@1.0.1)
send@0.13.0 (destroy@1.0.3, statuses@1.2.1, ms@0.7.1, http-errors@1.3.1,
mime@1.3.4)
type-is@1.6.7 (media-typer@0.3.0, mime-types@2.1.5)
accepts@1.2.12 (negotiator@0.5.3, mime-types@2.1.5)

xmlbuilder@2.6.4 node_modules\xmlbuilder
└── lodash@3.10.1

mqtt@1.4.0 node_modules\mqtt
├── inherits@2.0.1
├── xtend@4.0.0
├── minimist@1.2.0
├── readable-stream@1.0.33 (isarray@0.0.1, string_decoder@0.10.31, core-util-
is@1.0.1)
├── commist@1.0.0 (leven@1.0.2)
├── mqtt-packet@3.3.1 (bl@0.9.4)
├── end-of-stream@1.1.0 (once@1.3.2)
├── help-me@0.1.0 (pump@1.0.0)
├── concat-stream@1.5.0 (typedarray@0.0.6, readable-stream@2.0.2)
├── mqtt-connection@2.1.1 (through2@0.6.5, reduplexer@1.1.0)
└── websocket-stream@2.0.2 (through2@0.6.5, duplexify@3.4.2, ws@0.8.0)

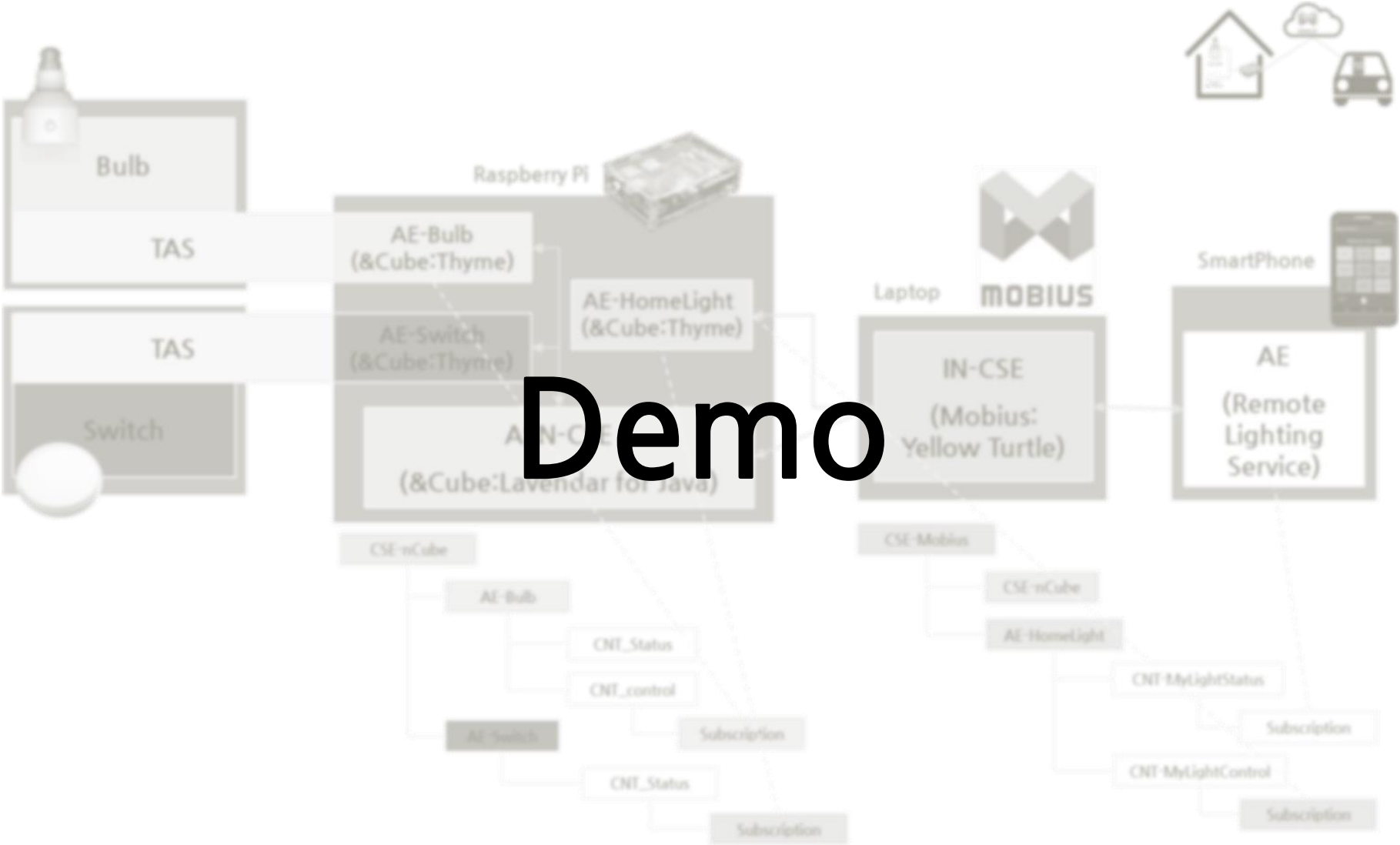
C:\Users\Wryeubi\Dropbox\Downloads\mobius yellow turtle>node app.js
server running at 7579 port
[IC create] - 2015-09-03T01:29:50+09:00
```

Construction of Mobius:Yellow Turtle

■ Setting of configuration file (conf.json) for mobius

- cbtype: CSE 타입 설정 (in or mn)
- nmtype: name type 설정 (long or short)
- bodytype: body content type 설정 (xml or json)
- in-cse: 서버의 정보 설정
 - cseid
 - csebase: 서버의 root 이름, root path
 - cseport : 서버가 오픈하는 포트 번호
 - dbhost: DB 서버 주소
 - dbpass: DB 접속 암호
 - mqttproxy: mqtt proxy 호스트 주소
 - mqttproxyport: mqtt proxy 포트 번호
- mn-cse: 미들노드일 때 in-cse의 정보
 - cbhost: in-cse 주소
 - cbport: in-cse 포트 번호
 - cbname: in-cse base name
 - cbcseid: in-cse의 cseid

```
{
  "m2m:conf": {
    "cbtype": "in",
    "nmtype": "short",
    "bodytype": "json",
    "in-cse": {
      "cseid": "/0.2.481.1.1.1.1",
      "csebase": "mobius-yt",
      "cseport": "7579",
      "dbhost": "localhost",
      "dbpass": "dksdlfduq2",
      "mqttproxy": "localhost",
      "mqttproxyport": "9726"
    },
    "mn-cse": {
      "cbhost": "203.253.128.150",
      "cbport": "9000",
      "cbname": "mobius",
      "cbcseid": "mobius"
    }
  }
}
```

3. 사물인터넷 디바이스 개발 시연

3.1 서비스 시나리오

3.2 Yellow Turtle 구축 시연

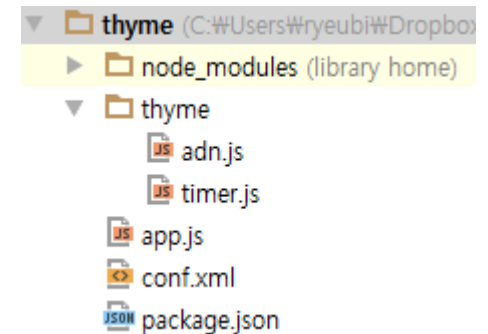
3.3 &Cube: Thyme 구동 시연

Development Device Platform with &Cube : Thyme

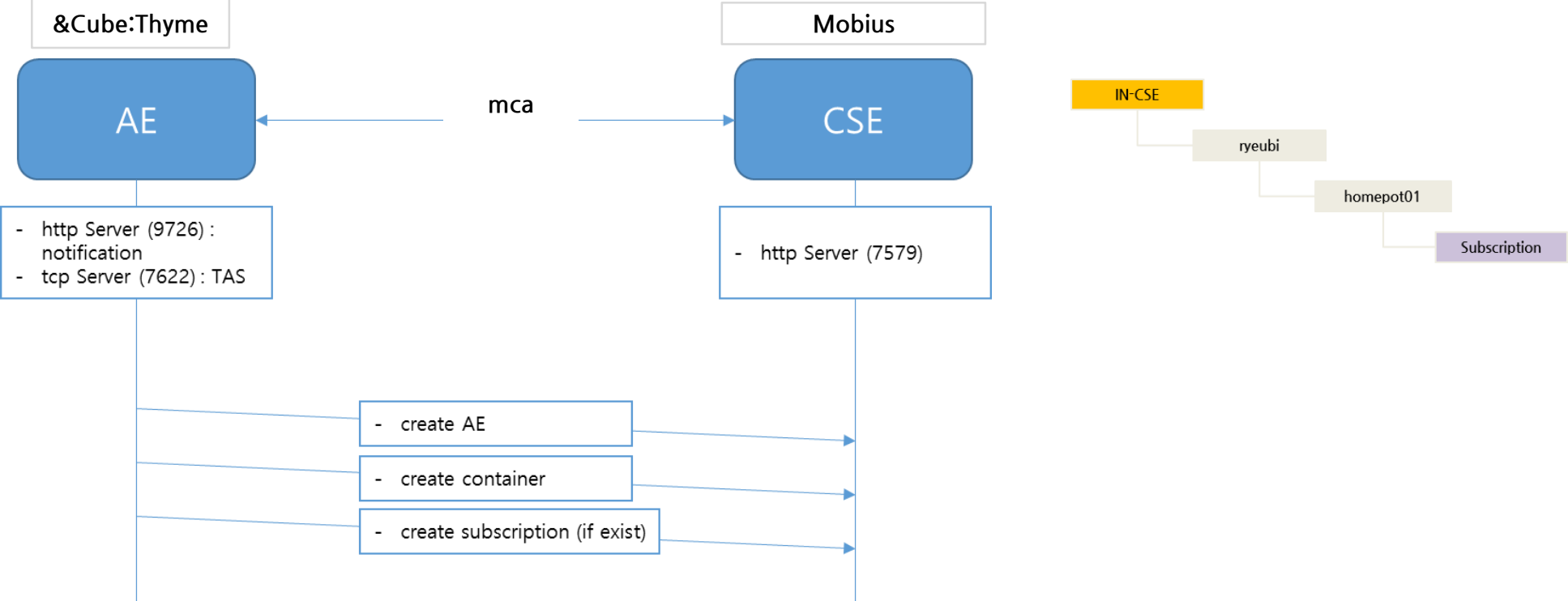
■ Reference development guide of &Cube : Thyme in OCEAN

- Install Node.js in device and Download &Cube:Thyme source files into device from OCEAN
- Install modules needed with 'npm install' at prompt at device then Configure conf.xml
- Run &Cube:Thyme through 'node app.js'

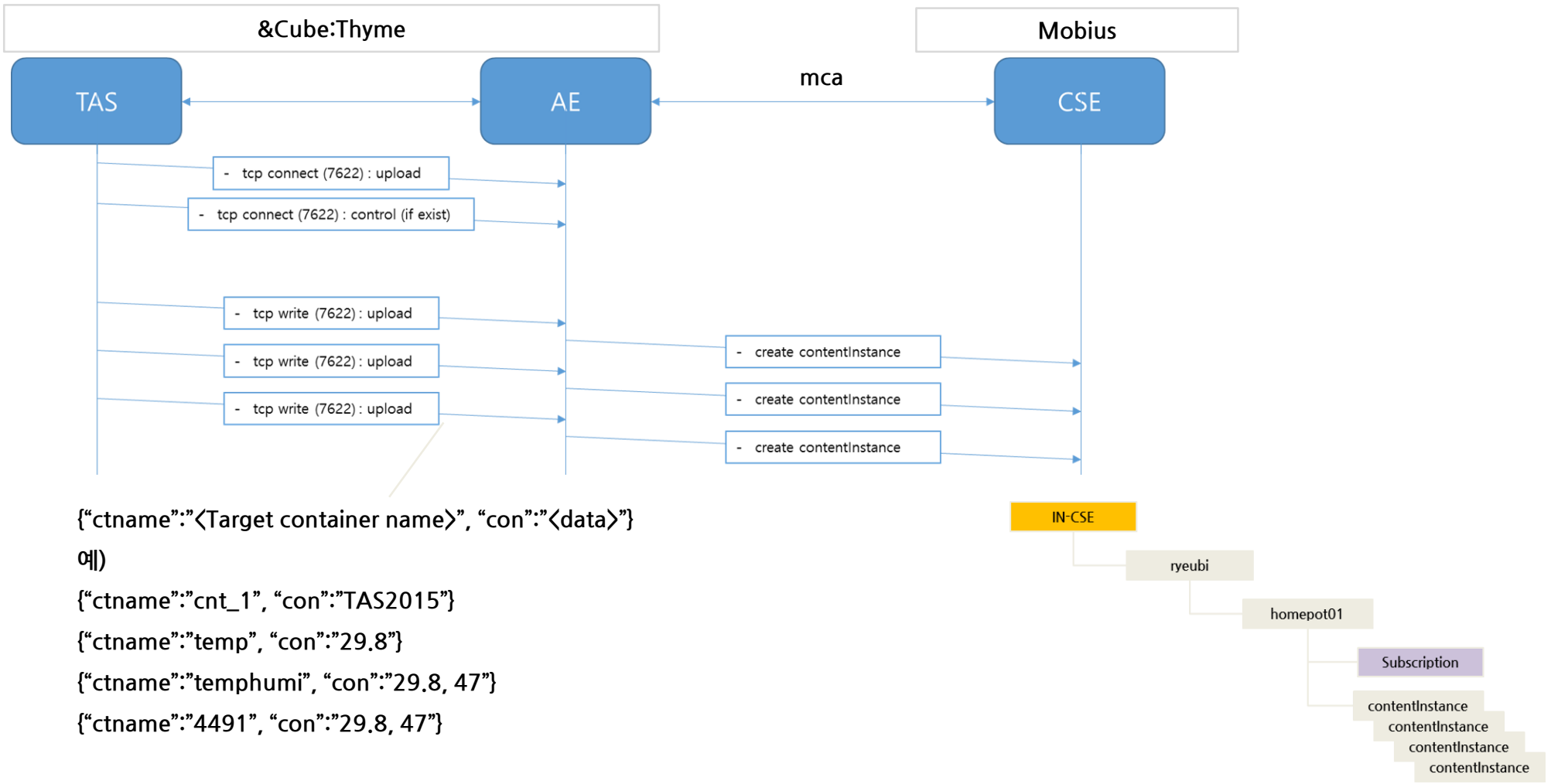
```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<m2m:conf xmlns:m2m="http://www.onem2m.org/xml/protocols" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <cse>
    <cbhost>localhost</cbhost>
    <cbport>7579</cbport>
    <cbname>mobius-yt</cbname>
  </cse>
  <ae>
    <appid>0.2.481.1.0001.001.75797579</appid>
    <appname>ryeubi</appname>
    <appport>9726</appport> <!-- for notification through http -->
    <appprotocol>json</appprotocol>
    <tasport>7622</tasport>
  </ae>
  <cnt>
    <ctname>homepot01</ctname>
  </cnt>
  <cnt>
    <ctname>cnt_2</ctname>
    <subname>sub_1</subname>
    <nu>mqtt://AUTOSET</nu>
  </cnt>
</m2m:conf>
```



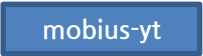
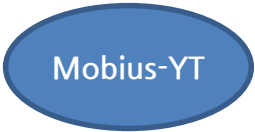
AE-CSE (&Cube-Mobius) MSC Example



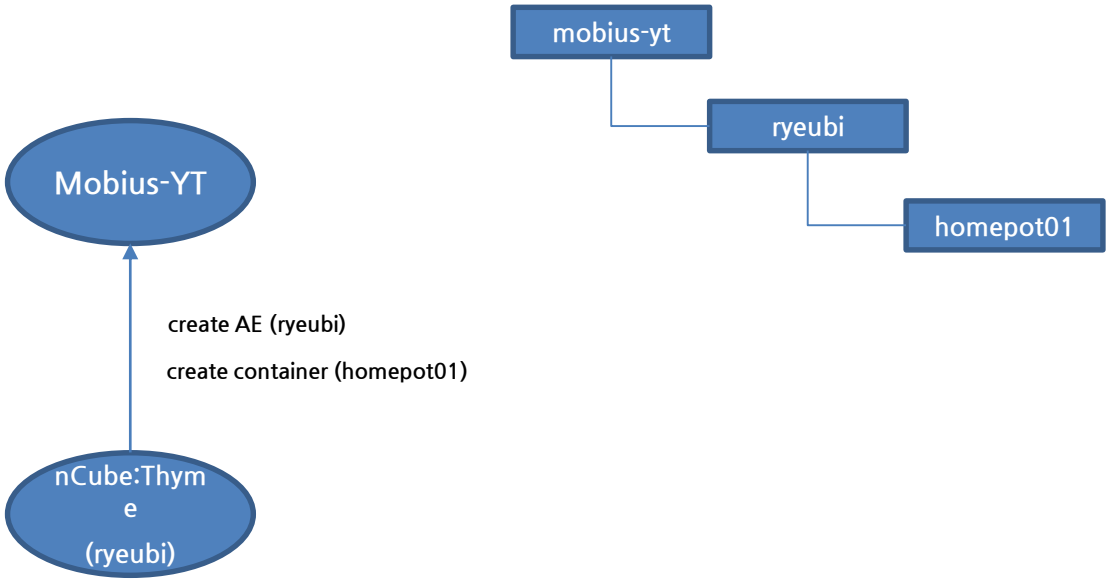
TAS (Thing Adaptation Software) Example



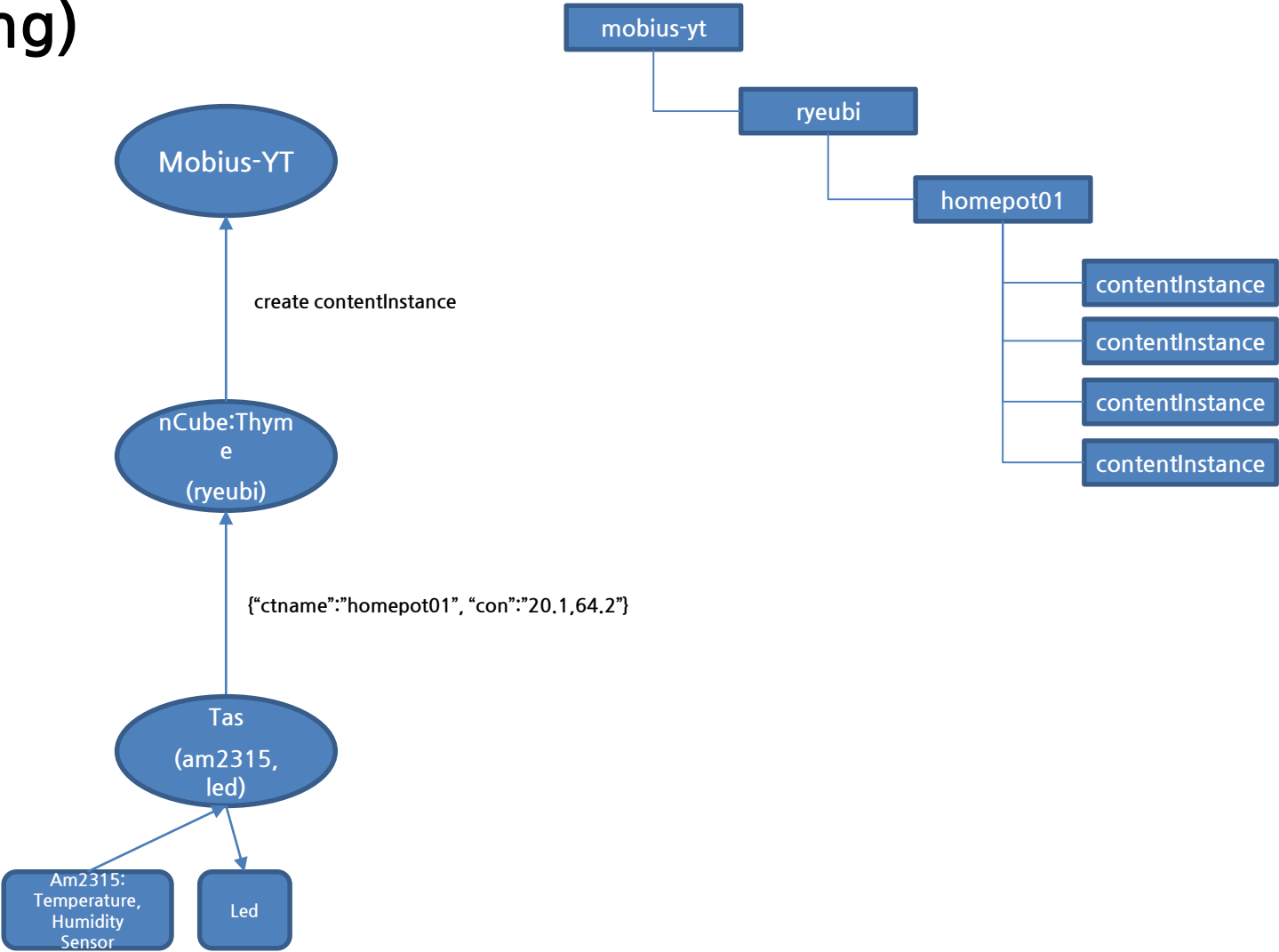
ToT (Tweet of Thing)



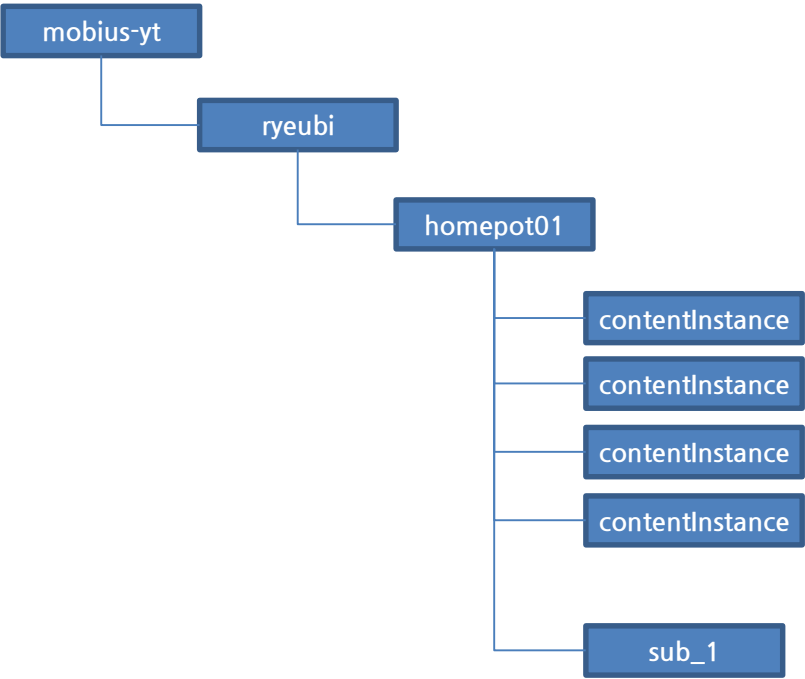
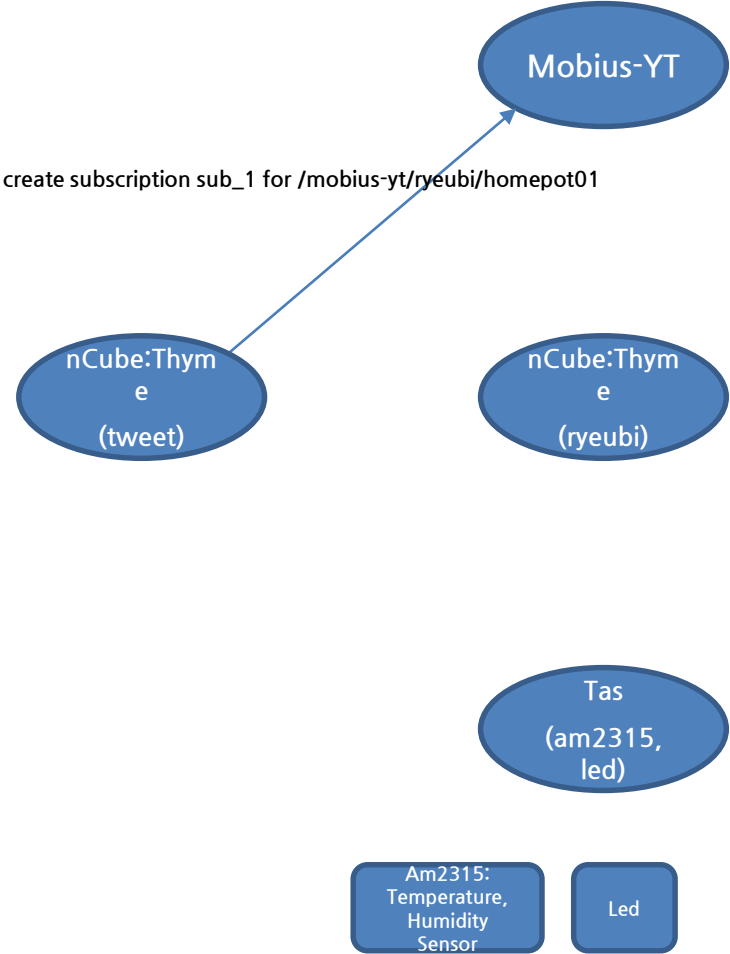
ToT (Tweet of Thing)



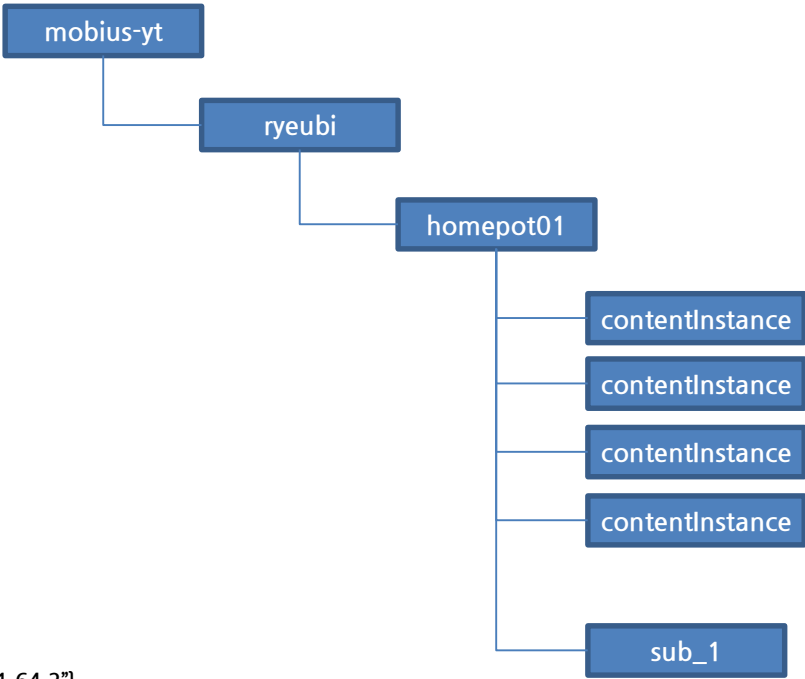
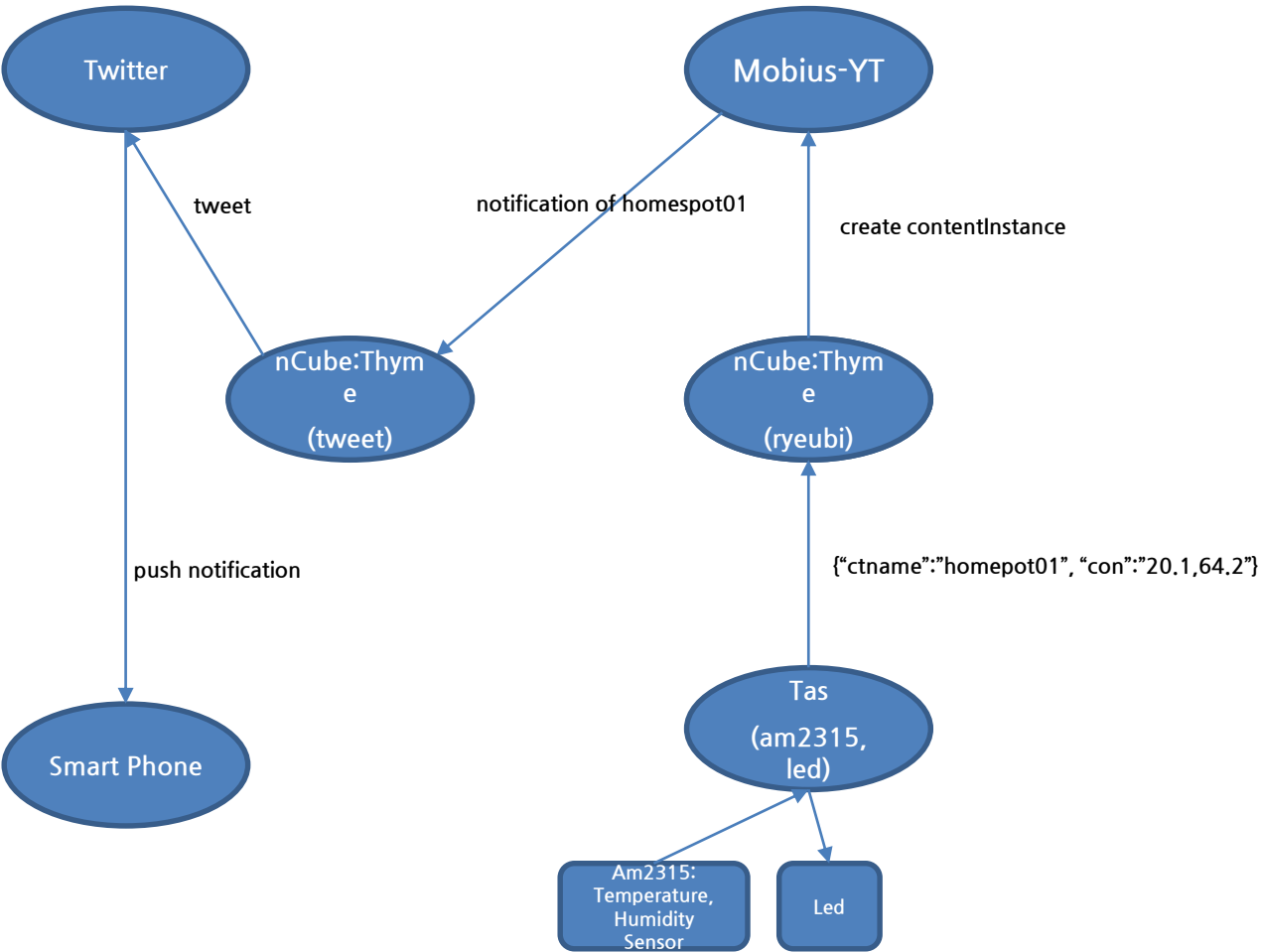
ToT (Tweet of Thing)

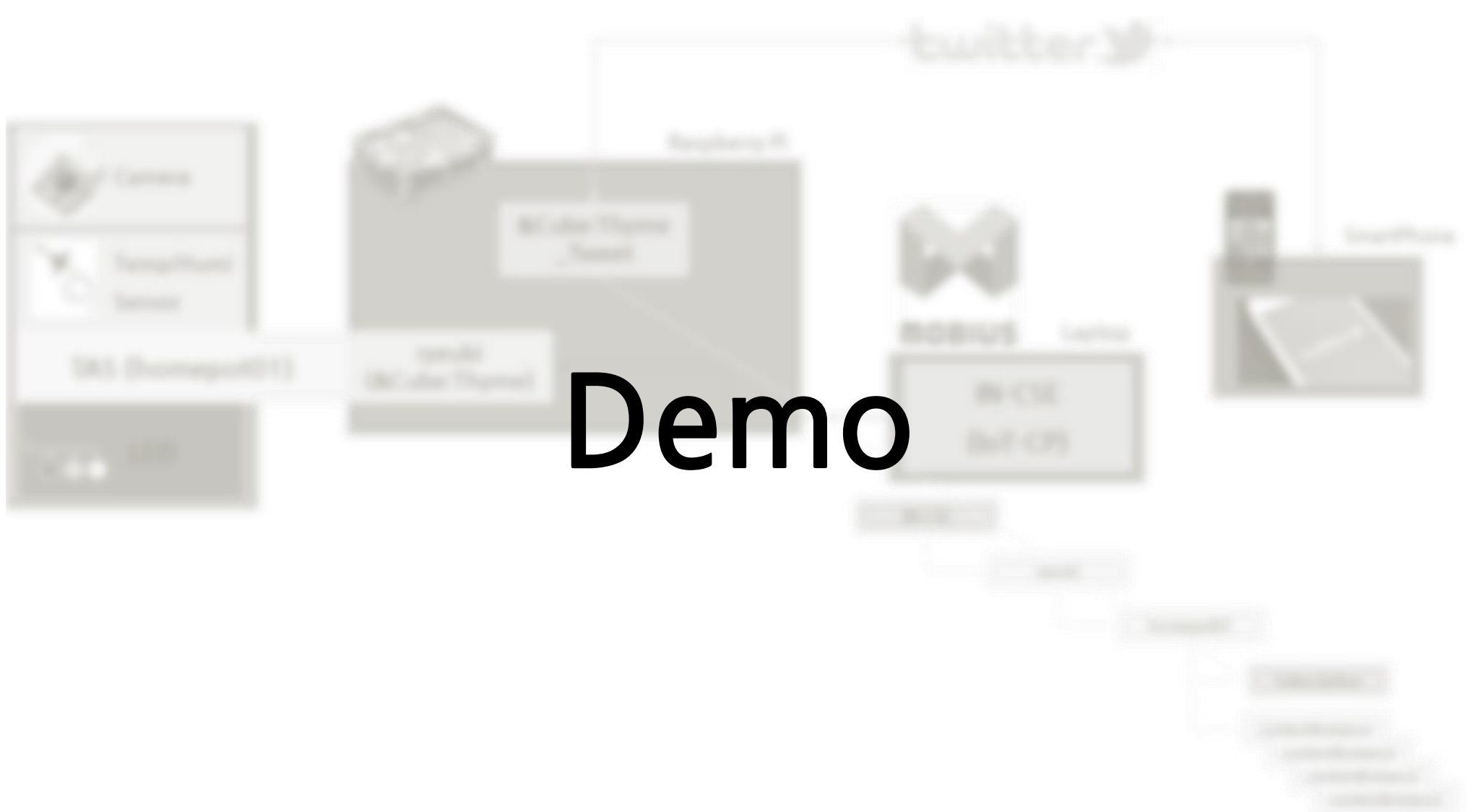


ToT (Tweet of Thing)



ToT (Tweet of Thing)

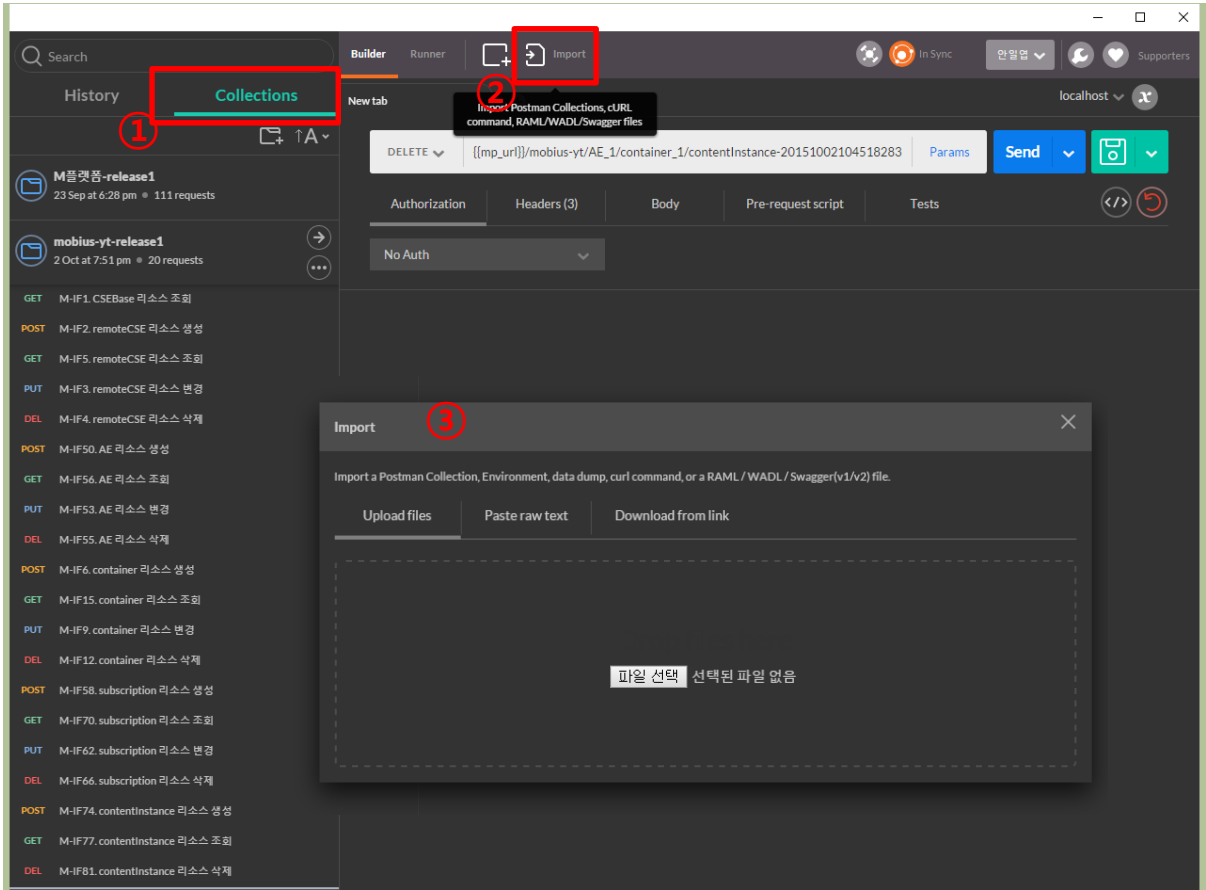




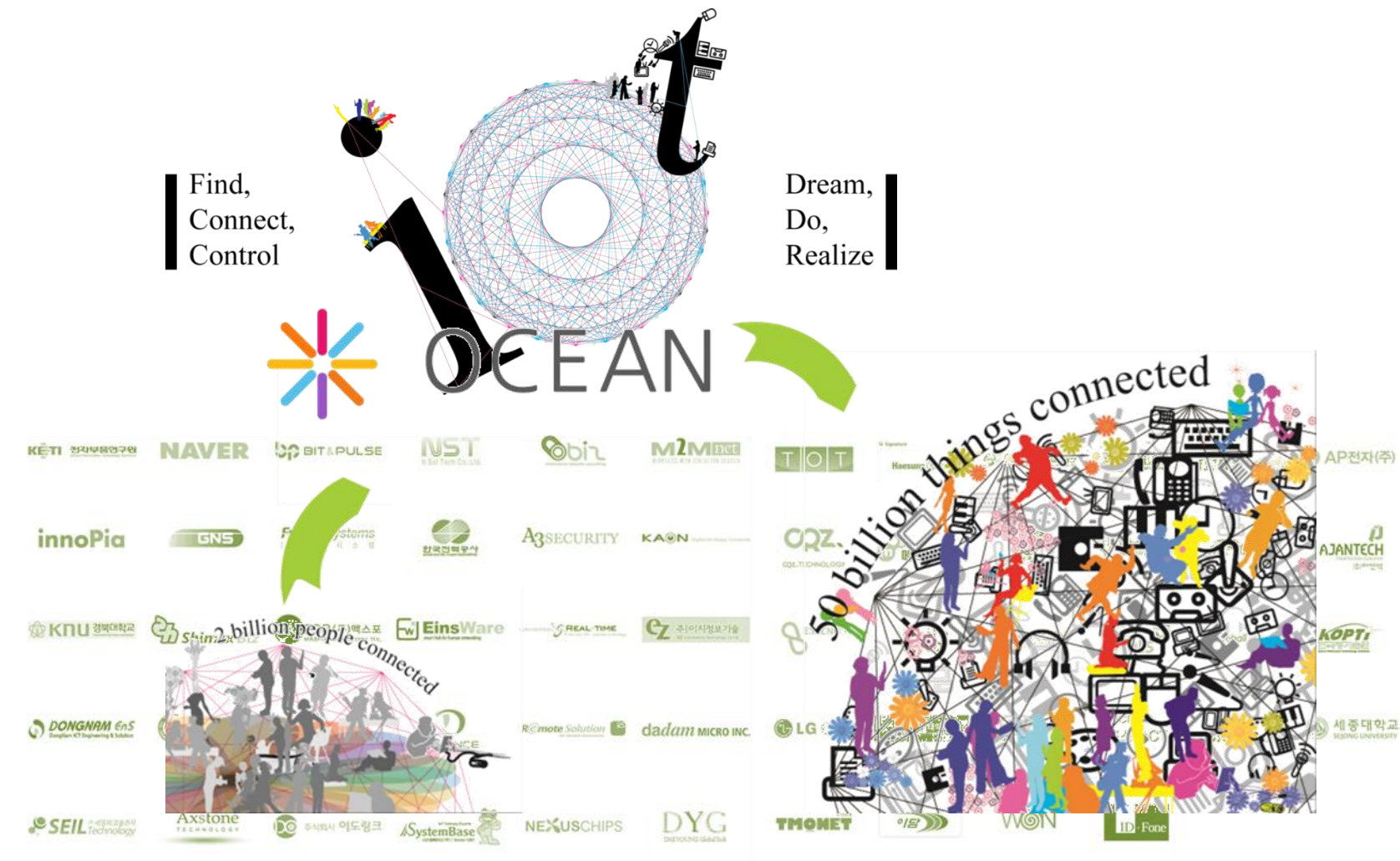
Demo

Test for Server Platform constructed though Postman

- Test Server Platform working well
 - Download script file of postman from OCEAN



Conclusion - OCEAN (Open alliance for iot stANdard) - <http://iotocean.org>



To Be Continue...

감 사 합 니 다.

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