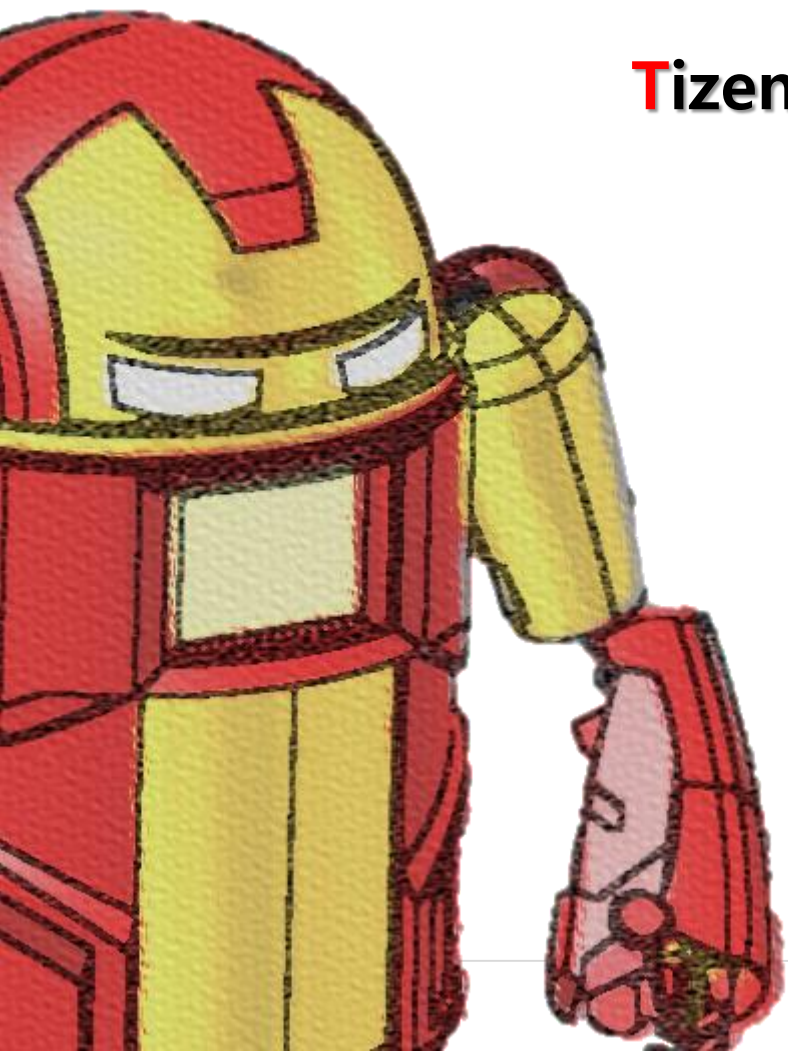


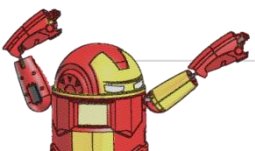


NFC를 활용한 Tizen Multi docking Station Robot

❖ **Dokuzen**

23-2th. Hong Jae Sub(PL)
22-2th. Jung Yu Seok
23-1th. Baek Seung Hoon
23-2th. Kim Dong Min

- **Introduction**
- **System Architecture**
- **Members Role**
- **Private Parts**
- **Check List**
- **Demo & Q/A**



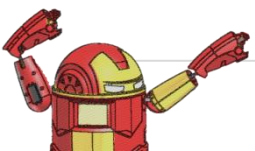
❖ Introduction

Period

- 2014.05 ~ 2014.08 (4 month)

Environment

- OS : Windows 7, Raspbian Linux
- Kernel Version : 3.6.11+
- Tool : G++, VIM, Qt creator, Tizen IDE,
Visual studio 2012, IAR Workbench for ARM
- Library : Qt 4
- Language : C, C++
- Devices : Raspberry pi, Tizen RD-PQ, ARM cortex-M3



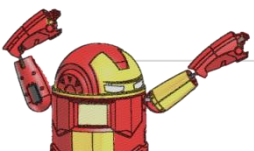


- 스마트폰 액세서리의 활용성 증가
- 타이젠 플랫폼의 확장성

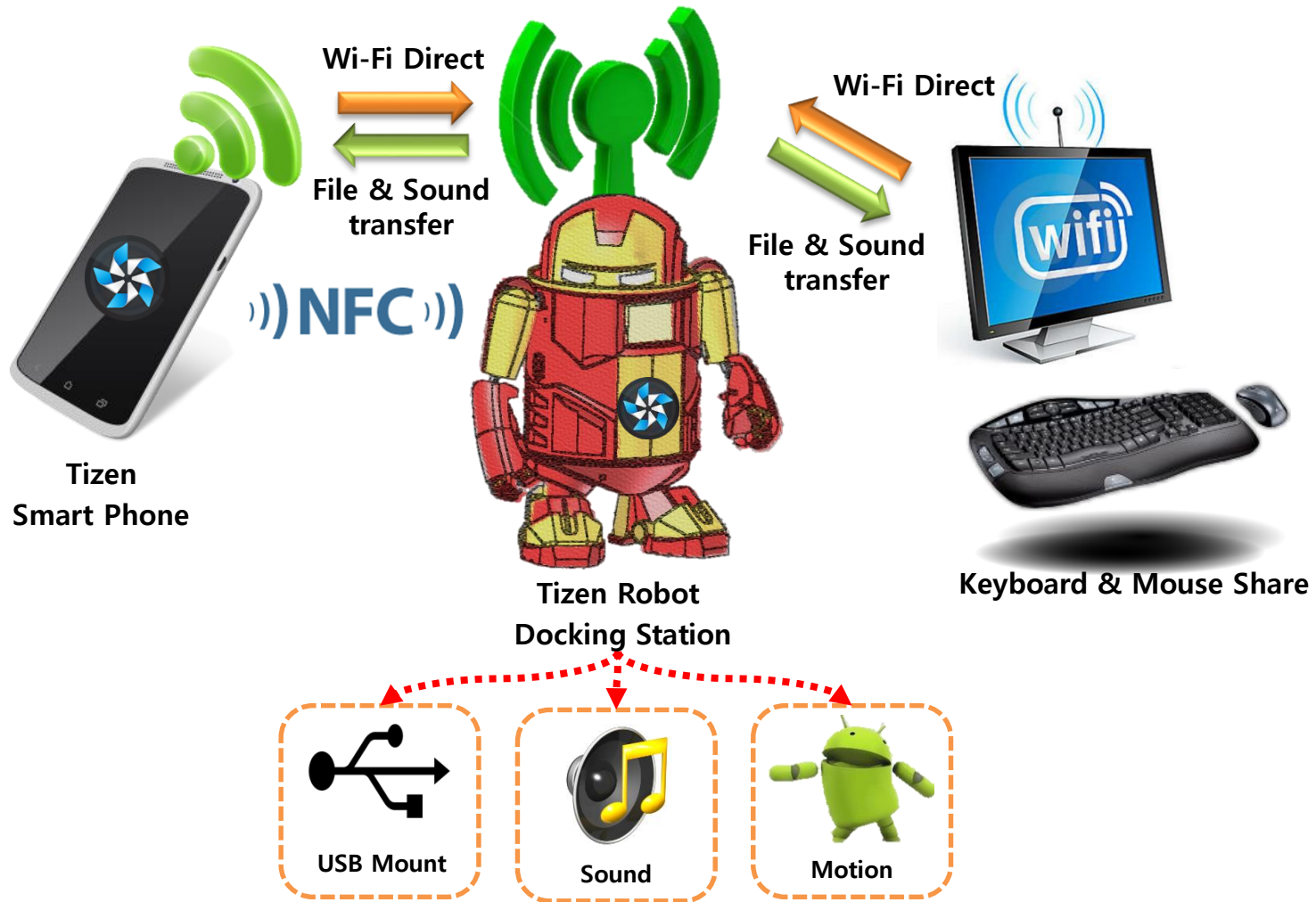


삼성전자,
타이젠 운영체제(OS) 적용 현황

스마트워치	기어2, 기어2네오에 적용 중, 기어솔로(9월 출시)에도 적용 예정
카메라	미러리스카메라 NX300'에 적용중
TV	타이젠TV 출시를 올 하반기에서 내년 초로 연기
스마트폰	'타이젠폰' 출시 예정



Architecture



Members Role

23th **Hong, jaesub (PL)**

- Sharing Clipboard
- Create & Control Mouse, Kbd in Tizen

22th **Jung, yuseok**

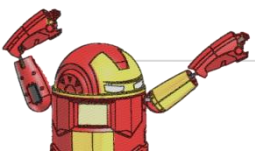
- Design Robot docking station
- TFT LCD UI Implement at Reapberry

23th **Baek, seunghoon**

- RTP / RTSP Streaming
- MP3 Frame Analysis and Transport

23th **Kim, dongmin**

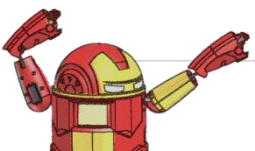
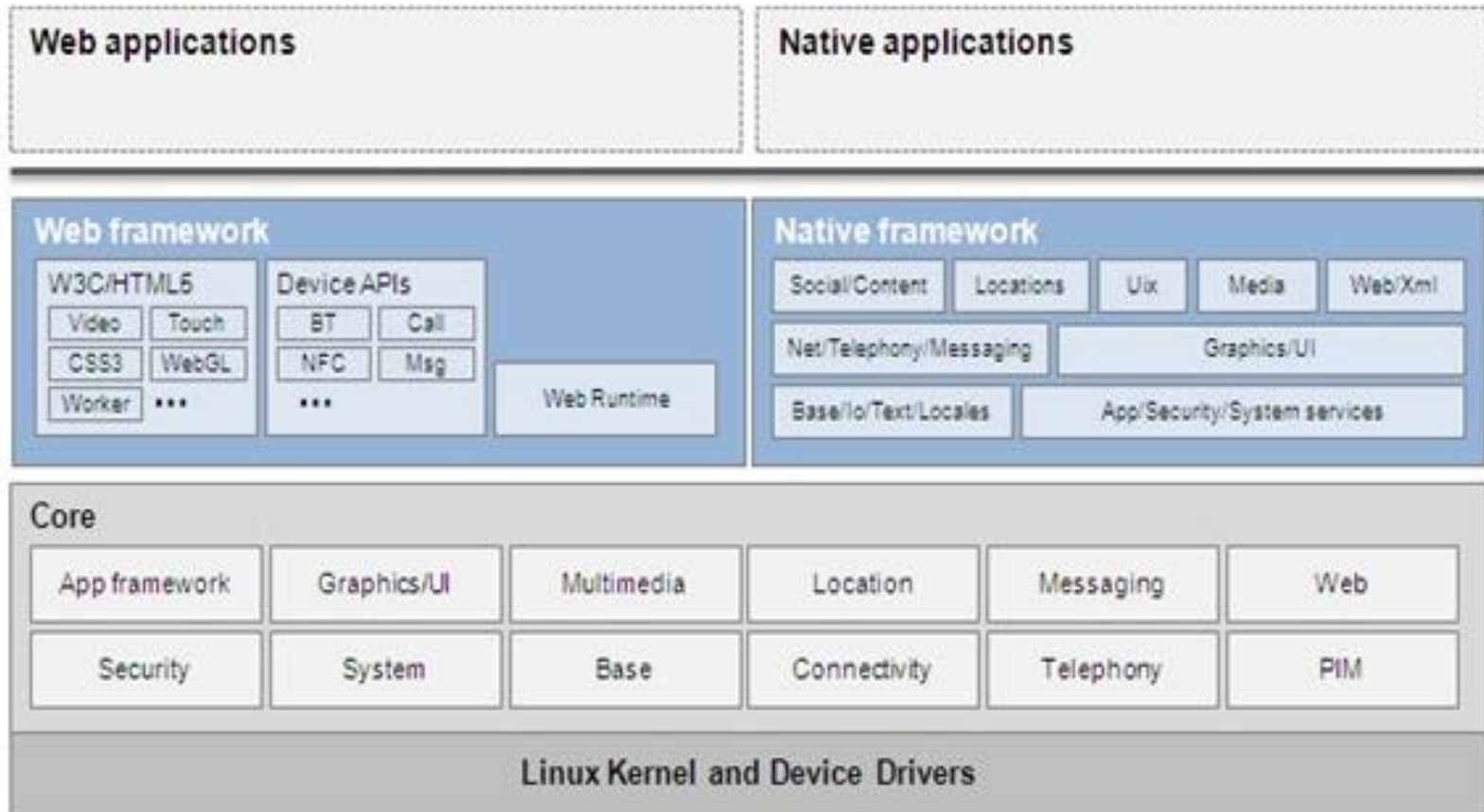
- Wi-Fi Direct & Network
- Packet design



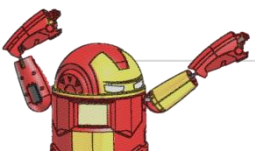
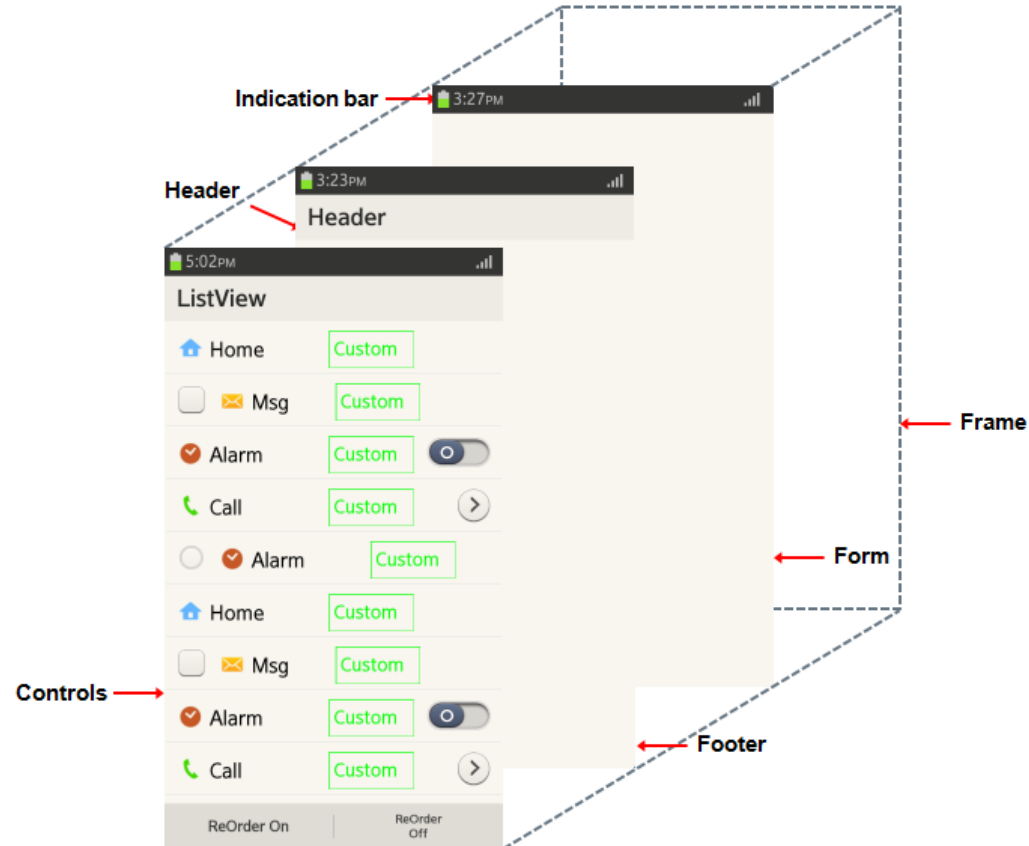
Tizen App.

23-2th. Hong, jaesub

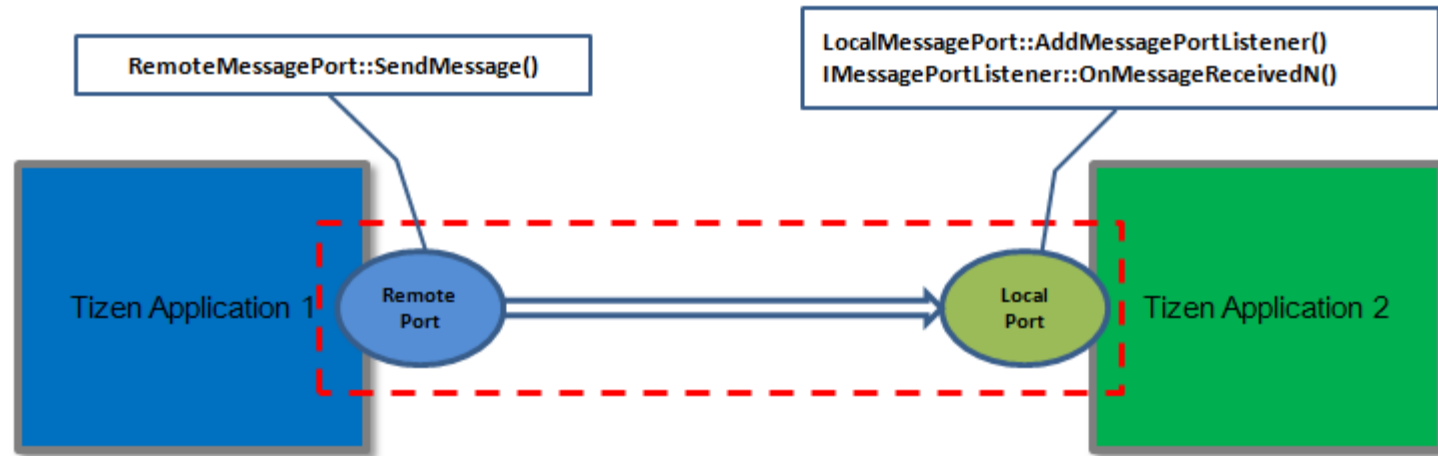
❖ Tizen Platform



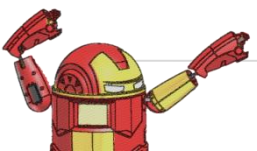
❖ Ui App vs Service App



MessagePort



- IPC 와 유사한 개념
- Named Pipeline



Uinput & XTest

GETTING STARTED WITH UINPUT: THE USER LEVEL INPUT SUBSYSTEM

uinput is a linux kernel module that allows to handle the input subsystem from user land. It can be used to create and to handle input device in `/dev/input` directory. The device is a virtual interface, it doesn't belong to a physical device.

In this document, we will see how to create a such input device and how it can be used.

1. CREATING AN INPUT DEVICE

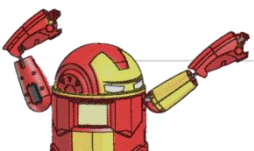
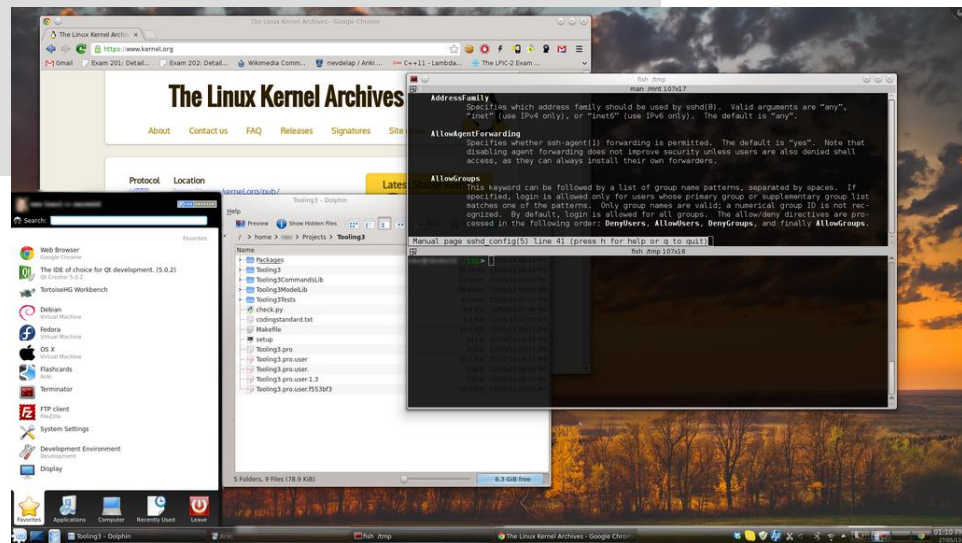
Once the **uinput** module is installed (via *modprobe* or *insmod*), a character device is created, named as `/dev/input/uinput` (or `/dev/uinput`) interface between the application and the kernel input subsystem.

To use **uinput**, we need to open the character device in write-only and non-blocking mode:

```
#include <linux/input.h>
#include <linux/uinput.h>
...

int fd;

fd = open("/dev/input/uinput", O_WRONLY | O_NONBLOCK);
if (fd < 0) {
```



❖ Catch Communication Event

How to call signal generating for RD-PQ device.

BY JS Hong, 3 J



BY Marco Buettner, 7 Aug 2013, 06:09

RD-PQ and RD-210 doesn't support SIM because of licence issues.

[LOG IN TO POST COMMENTS](#)



BY Marco Buettner, 8 Aug 2013, 01:16

A small example: If you get the device as import Samsung/Linux Foundation has to clarify it as smartphone because you have a GSM-Modem which work. But without a functional GSM-Modem you can deliver it as "Multimedia" device. Its cheaper and doesn't need more test for your mobile network. So its easier. Thats one of the reason.

[LOG IN TO POST COMMENTS](#)

Thank you.

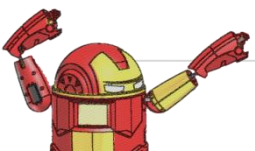
[LOG IN TO POST COMMENTS](#)



BY Marco Buettner, 15 Oct 2013, 02:44

No

[LOG IN TO POST COMMENTS](#)



❖ Get Clipboard at Tizen

▼  Munseok Choi added a comment - 29/Aug/13 8:03 PM

For using Tizen::Ui::Clipboard in a service application,

(1) manifest.xml > Advanced > Miscellaneous Options > Please check "Use UI components in a service application"

(2) Because a Clipboard data is sent and received with X window which is created by a Frame, please create and show a Frame.

Thanks.

▼  ltou added a comment - 29/Aug/13 10:00 PM

Thank you for your confirmation.

> (1) manifest.xml> Advanced> Miscellaneous Options> Please check "Use UI components in a service application"

The application no longer kill in a way that had you taught.

Clipboard :: CopyItem also ends with E_SUCCESS.

However, the string is not copied to the clipboard.

Again, I ask for confirmation.

▼  Munseok Choi added a comment - 29/Aug/13 10:21 PM

For succeeding copying a string to Clipboard, App should have a Frame to be shown. Because a X window is needed for sending and receiving a data between App and Clipboard daemon. We will fix that the result is E_SUCCESS without creating and showing a Frame.

Thanks.

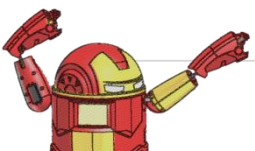
▼  ltou added a comment - 29/Aug/13 11:02 PM

Thank you.

The service application, and I understand that you can not copy a string to the clipboard.

I will close the status.

ref. <https://bugs.tizen.org/jira/browse/TDIST-299>



Network

23-2th. Kim Dong Min

WiFi-Direct



Modem



Wireless LAN

result WifiDirectService::InitializeWifiDirect(const Tizen::Base::String&)(114) > [E_SYSTEM] Initializing Wi-Fi Direct has failed. [0xFFFF8202]

result Tizen::Net::Wifi::_WifiIpcProxy::InitializeWifiDirect() const(774) > [E_SYSTEM] Propagating through IPC.

bool Tizen::Net::Wifi::_WifiDirectSystemAdapter::Construct()(1174) > [E_SYSTEM] Failed result from wifi_direct_initialize() is 0xffff8207.

static void Tizen::Net::Wifi::_WifiDirectSystemAdapter::InitSingleton()(79) > Error occured in construct.

static Tizen::Net::Wifi::WifiDirectDevice* Tizen::Net::Wifi::_WifiDirectDeviceImpl::GetWifiDirectDeviceInstanceN(const Tizen::Net::Wifi::WifiDirectDev

static Tizen::Net::Wifi::WifiDirectDevice* Tizen::Net::Wifi::WifiDirectDeviceManager::GetWifiDirectDeviceN(const Tizen::Net::Wifi::WifiDirectDeviceIr

bool MainForm::UpdateCurrentState()(769) > Failed to get Wifi Direct Device

virtual result MainForm::OnInitializing()(113) > Failed to initialize the current state





Wi-Fi CERTIFIED™ Interoperability Certificate



Certification ID: WFA16603

This certificate lists the capabilities and features that have successfully completed Wi-Fi Alliance interoperability testing. Additional information about Wi-Fi Alliance certification programs is available at www.wi-fi.org/certification_programs.php.

Tested Spatial Streams	Dual-Band Selectable	
	2.4 GHz	5.0 GHz
Transmit	1	1
Receive	1	1

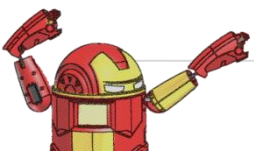
Certificate Date: September 13, 2012

Company: Samsung Electronics

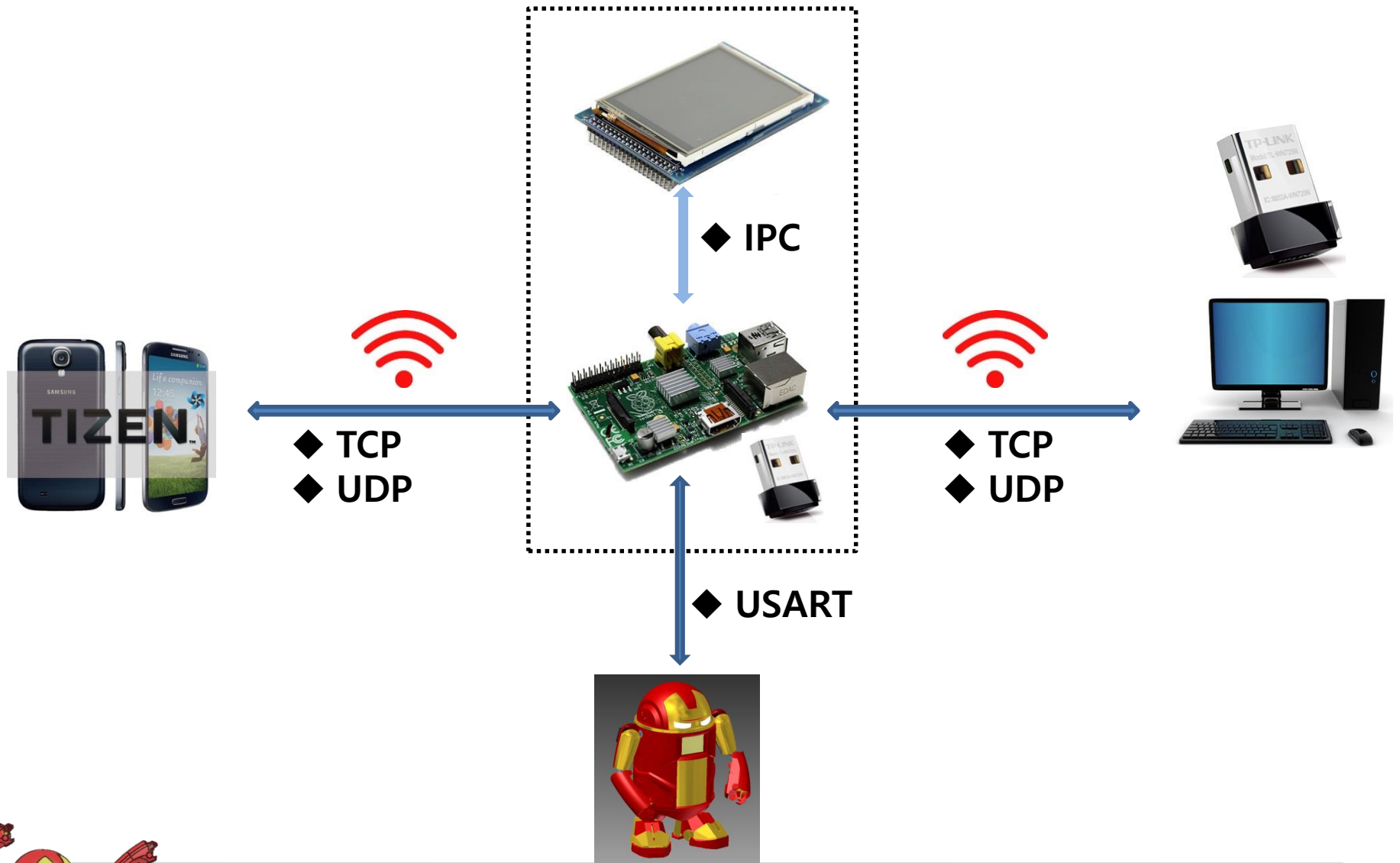
Product: GT-I9300_TIZEN

Model/SKU #: GT-I9300_TIZEN/

Category: Smartphone, multi-mode (Wi-Fi and other)



System architecture



Server ,Client



Server

- Multi Thread
- Usart
- IPC
- 파일입출력을 이용한 사용자관리
- USB 파일 전송



- TCP(파일전송, 마우스클릭, Phone 이벤트, 클립보드, 로봇 모션, 사용자정보전송)
- UDP(마우스 좌표)



- TCP(파일전송)
- TCP(마우스 클릭, 클립보드)
- UDP(마우스 좌표)



- IPC
- 발생한 이벤트에 맞는 화면 출력을 위한 패킷 전송



- Usart를 이용한 모션 패킷 전송 및 Arm에서 발생한 이벤트 전송

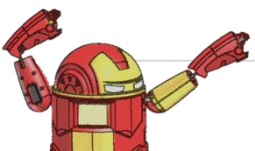
RTSP Streaming & Extract MP3 Frame

23-1st SeungHoon Baek

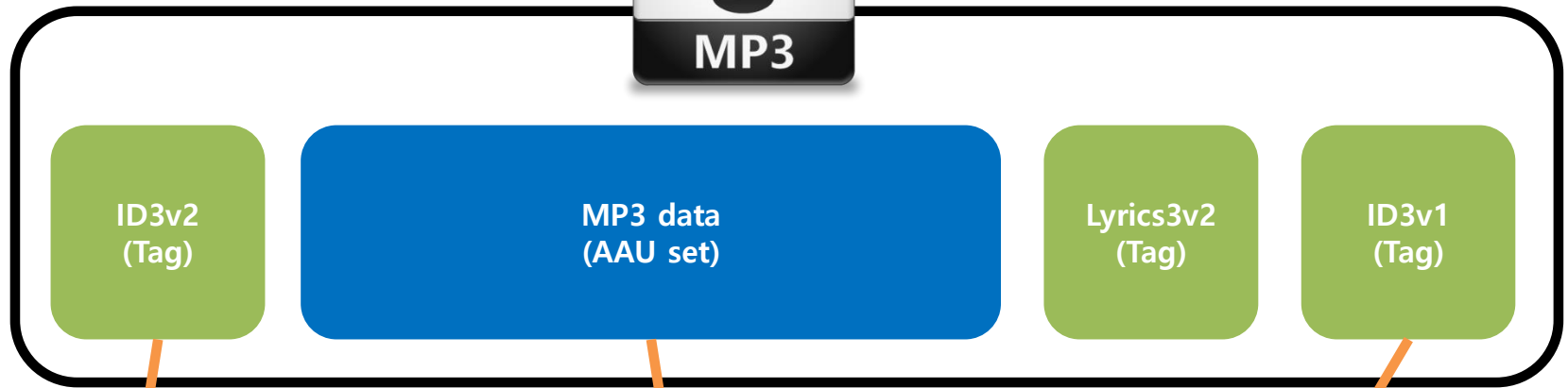
❖ MPEG-1 or MPEG-2 Audio Layer III



- **Commonly referred to as MPEG-1 Audio Format and loss original data**
- AAU(Audio Access Unit), Audio Tag
- AAU consists of some format



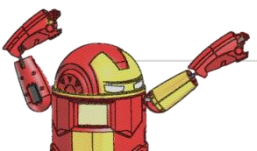
❖ MPEG-1 or MPEG-2 Audio Layer III



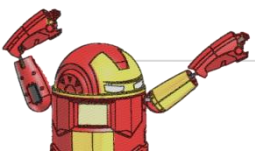
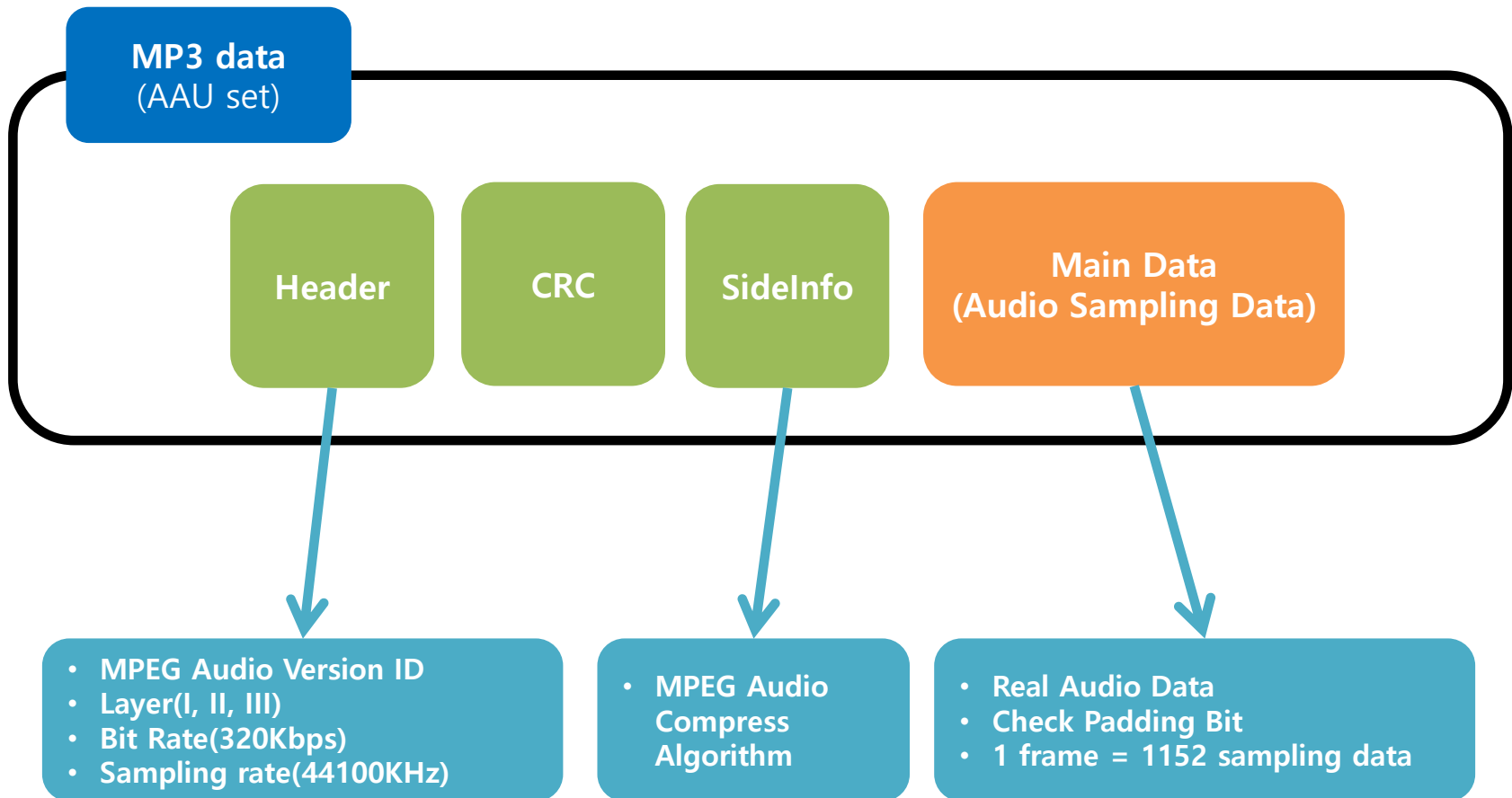
- Variable Length Tag
- A lots of Frames

- A lots of Frames
- 4-Bytes Header of each frame
- Synchronized Bit

- End of Files 128 bytes
- Encoding Error



❖ MPEG-1 or MPEG-2 Audio Layer III



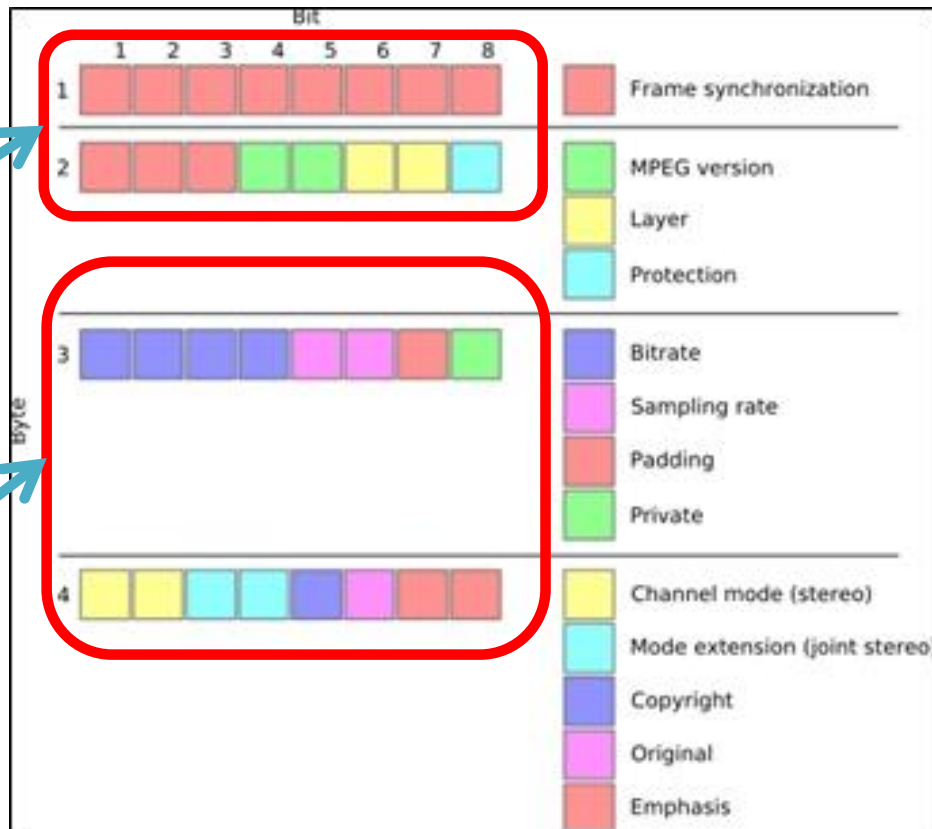
❖ MPEG-1 or MPEG-2 Audio Layer III

MP3 data
(AAU set)

Header

11-bytes is
Synchronization bit

Another Bit is AAU
Information Data



❖ How can I extract mp3 data for streaming?



현아 - 내일은없어.mp3

Extract
ID3v2
Block

Find First
AAU
Header

...

Find End
AAU
Header

Extract
ID3v1
Block

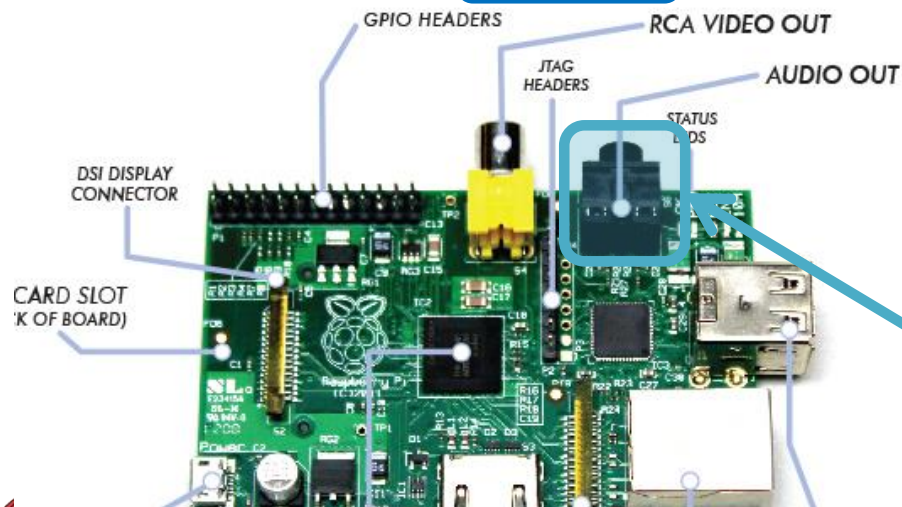
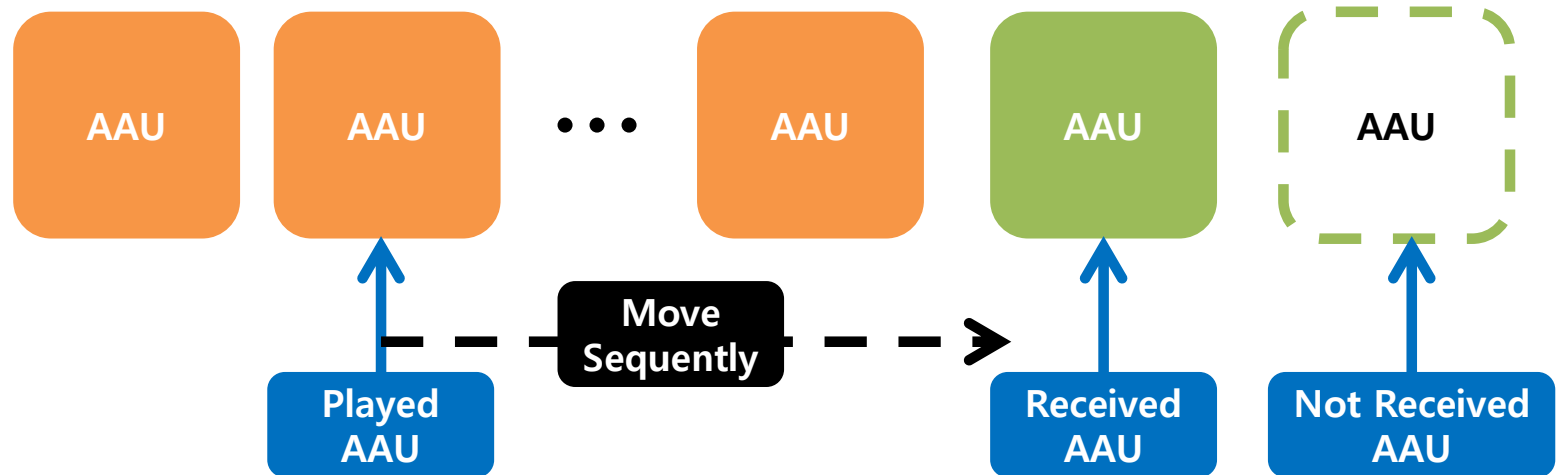
Sequence searching

ID3v2 Tag Area

First AAU Data
(‘FF FE’ is Synchronized
bits)

Offset (h)	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	
00000000	49	44	33	03	00	00	00	04	78	09	54	52	43	4B	00	00	ID3.....x.TRCK..
00000010	00	02	00	00	00	32	54	50	4F	53	00	00	00	02	00	00	2TPOS.....
00000020	00	31	54	49	54	32	00	00	00	0C	00	00	00	B3	BB	C0	..1TIT2.....'»À
00000030	CF	C0	BA	20	BE	F8	BE	EE	54	50	45	31	00	00	00	0D	À° %%%iTPe1....
00000040	00	00	00	C6	AE	B7	AF	BA	ED	B8	DE	C0	CC	C4	BF	54	...E0-°i,PAiA,T
00000050	41	4C	42	00	00	00	0A	00	00	00	43	68	65	6D	69	73	ALB.....Chemis
00000060	74	72	79	54	59	45	52	00	00	00	09	00	00	00	32	30	cryTYER.....20
00000070	31	33	31	30	32	38	54	43	4F	4E	00	00	00	06	00	00	131028TCON.....
00000080	00	44	61	6E	63	65	55	53	4C	54	00	00	08	04	00	00	.DanceUSLT.....
00000090	01	6B	6E	72	00	00	00	00	00	00	00	00	00	00	00	00	.kor..Vpÿp°E°E°E
000000A0	B0	C6	20	00	54	00	65	00	6C	00	6C	00	20	00	6D	00	°E .T.e.l.l. .m.
000000B0	65	00	20	00	6E	00	6F	00	77	00	20	00	6E	00	6F	00	e. .n.o.w. .n.o.
000000C0	77	00	20	00	6E	00	6F	00	77	00	0D	00	0A	00	B0	C6	w. .n.o.w.....°E
000000D0	B0	C6	B0	C6	B0	C6	20	00	54	00	65	00	6C	00	6C	00	°E°E°E .T.e.l.l.

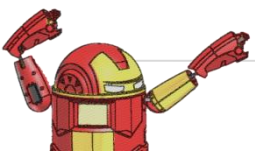
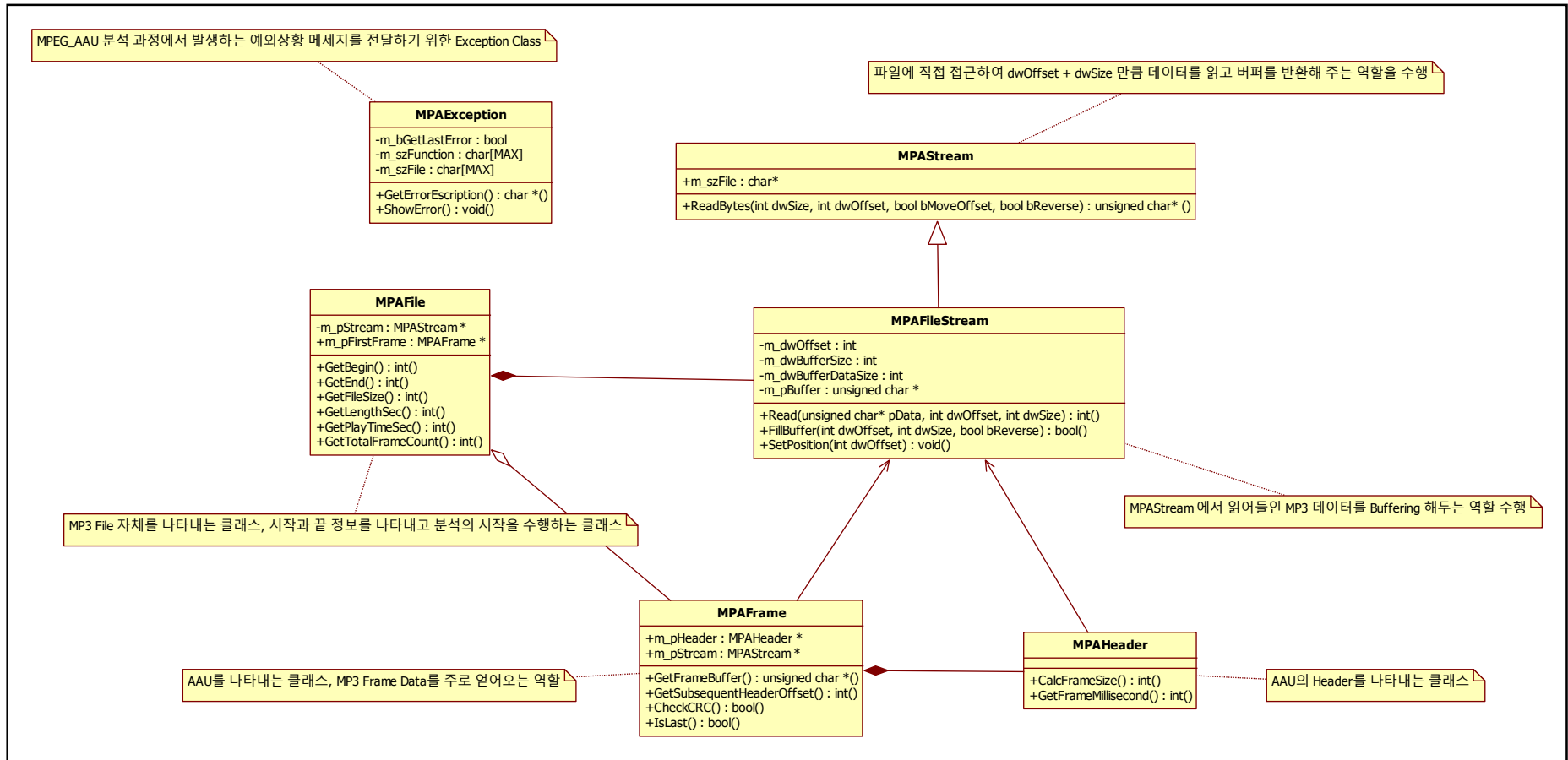
❖ How can I extract mp3 data for streaming?



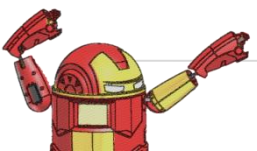
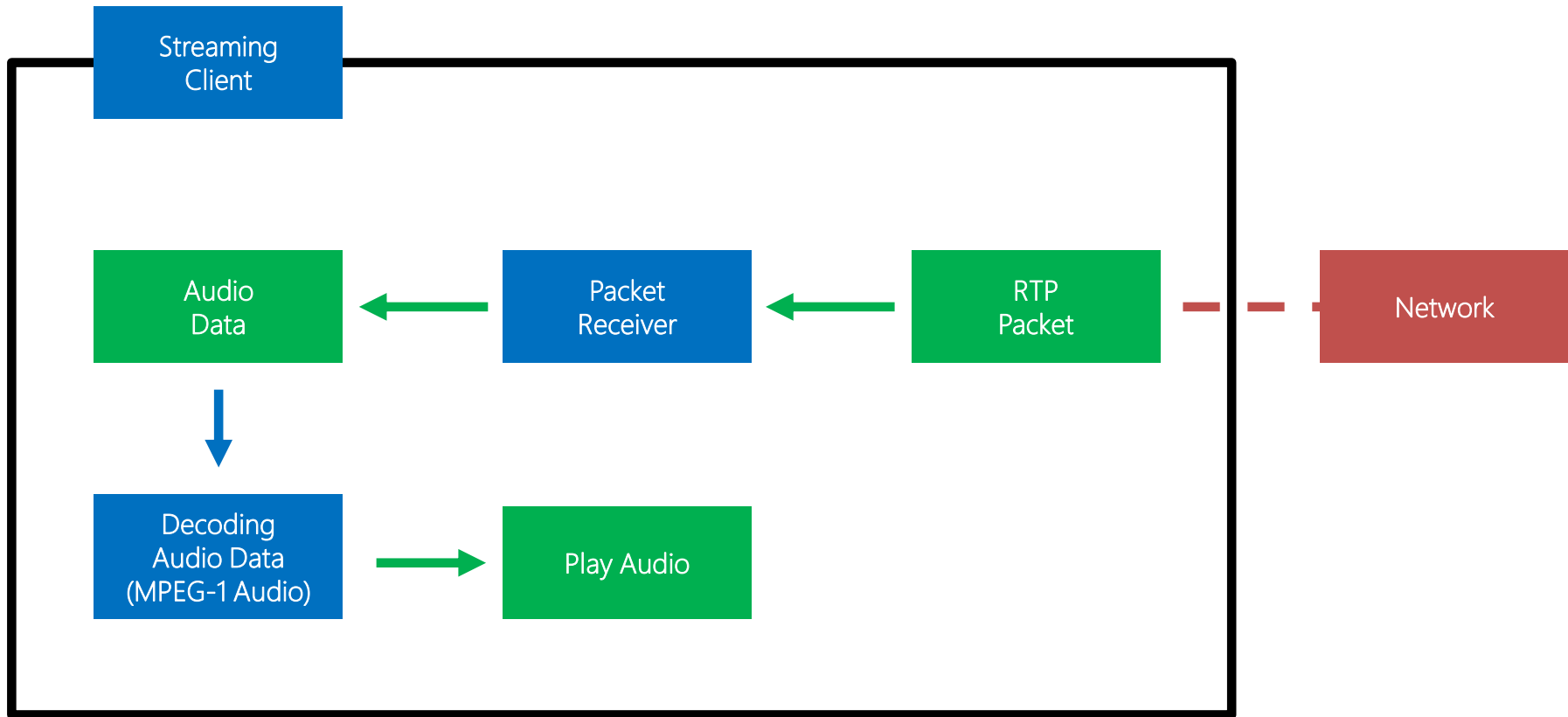
- Alsa Audio Frameworks
- Output audio-jack using mplayer



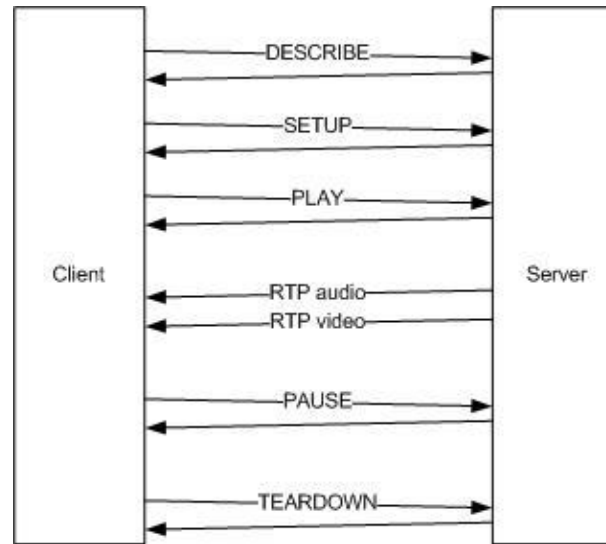
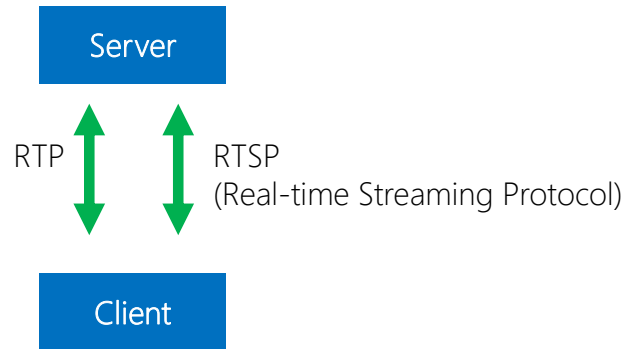
❖ How can I extract mp3 data for streaming?



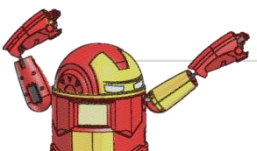
RTSP + RTP(Streaming Protocol)



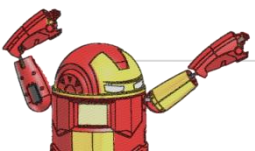
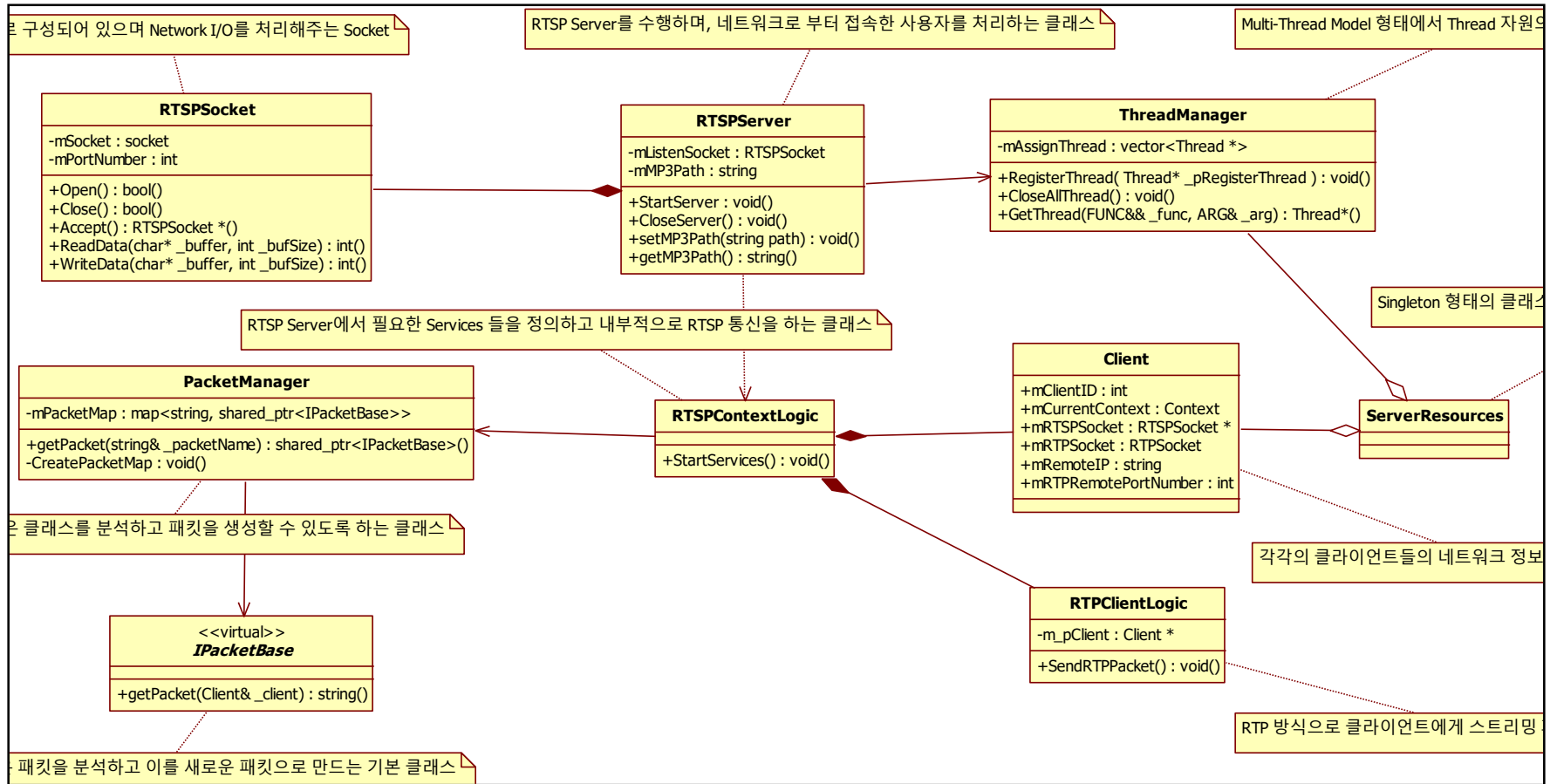
❖ RTSP + RTP(Streaming Protocol)



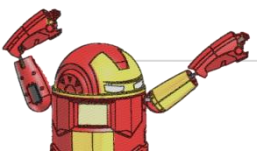
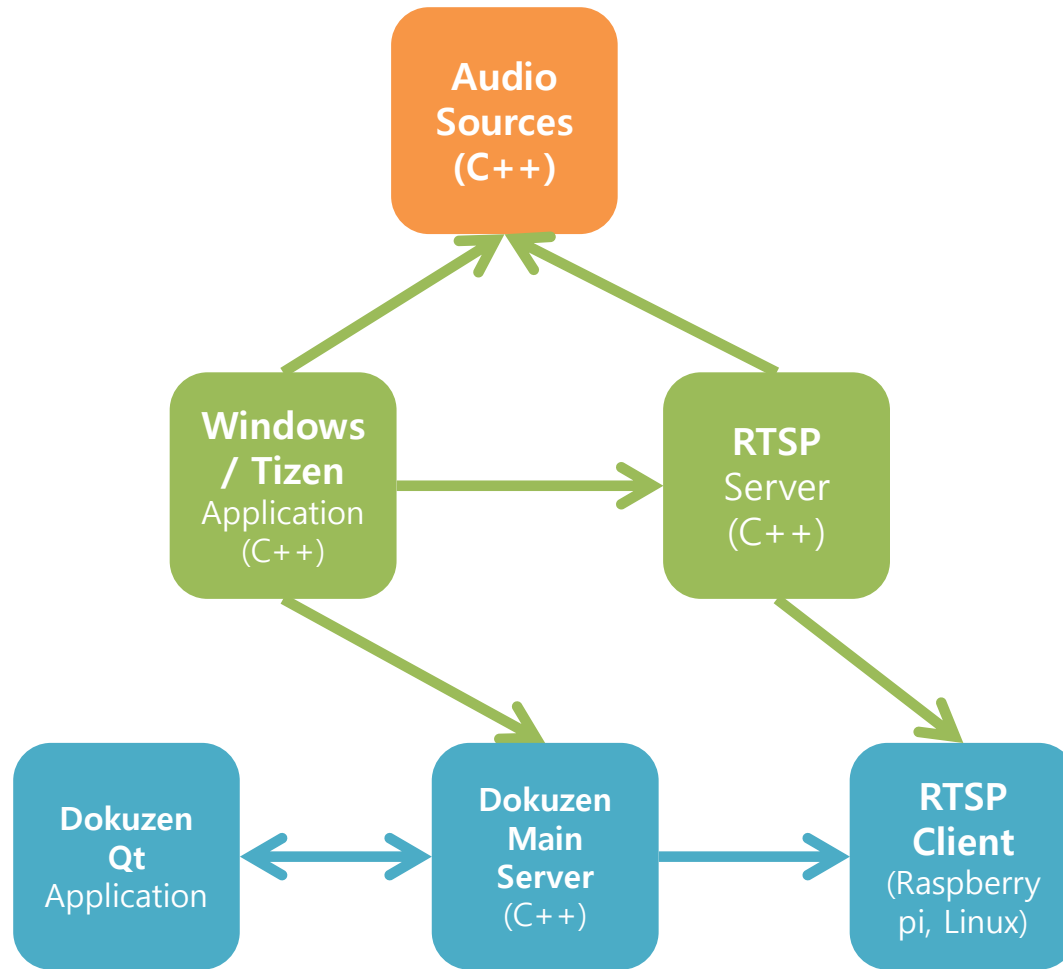
1. Control Streaming Data for real-time Transporting
2. RTSP don't transport Streaming Data,
Only controls Streaming Datas



RTSP + RTP(Streaming Protocol)



❖ Dokuzen Streaming



Dokuzen Streaming

**Audio
Source**
(MPA)

Describe
(Response)

Option
(Response)

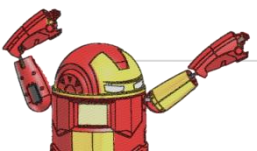
Setup
(Response)

Play
(Response/
Request)

Pause
(Response/
Request)

Teardown
(Response/
Request)

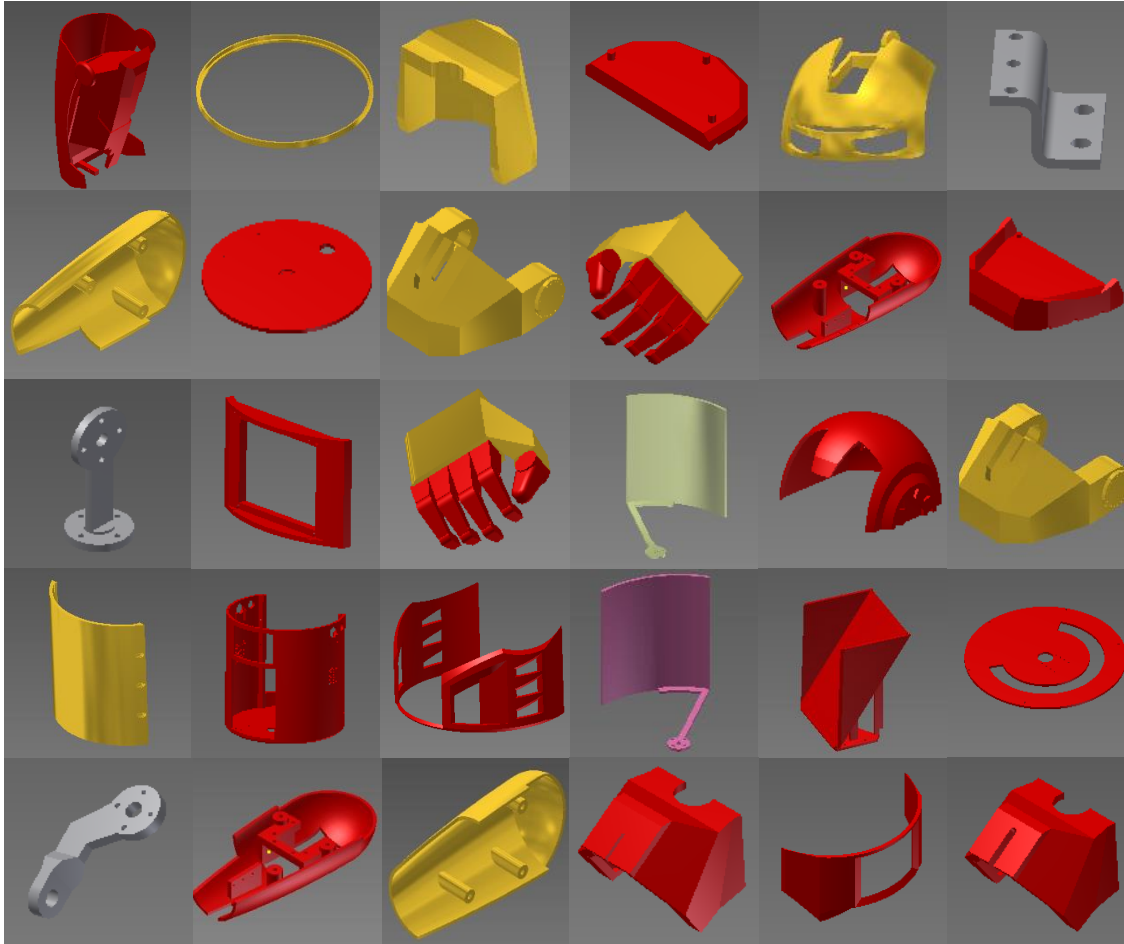
RTP
(Transform)



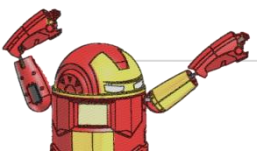
Robot design, Control & **Q**T User Interface

22-2th. Jung Yu Seok

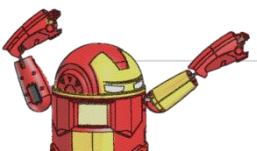
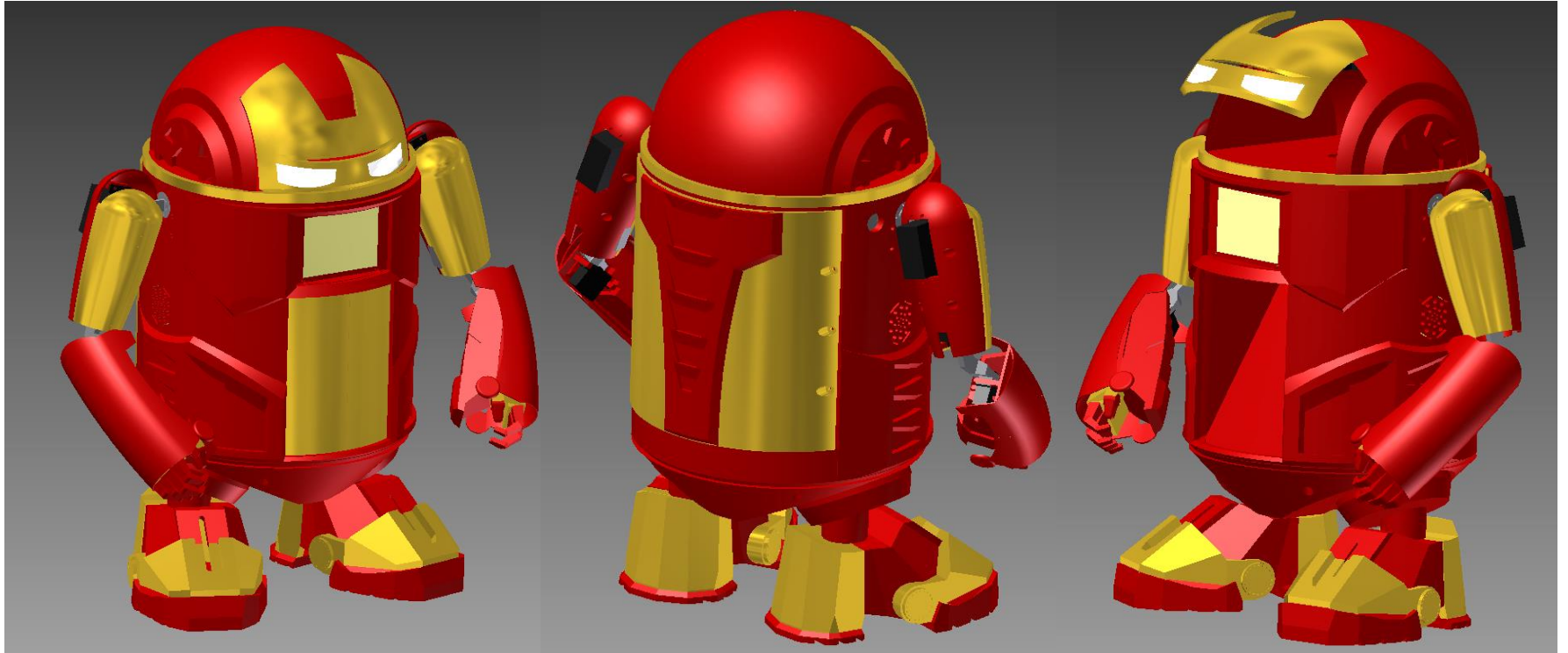
❖ Frame Design



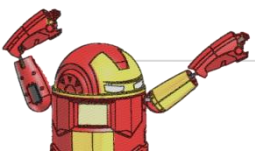
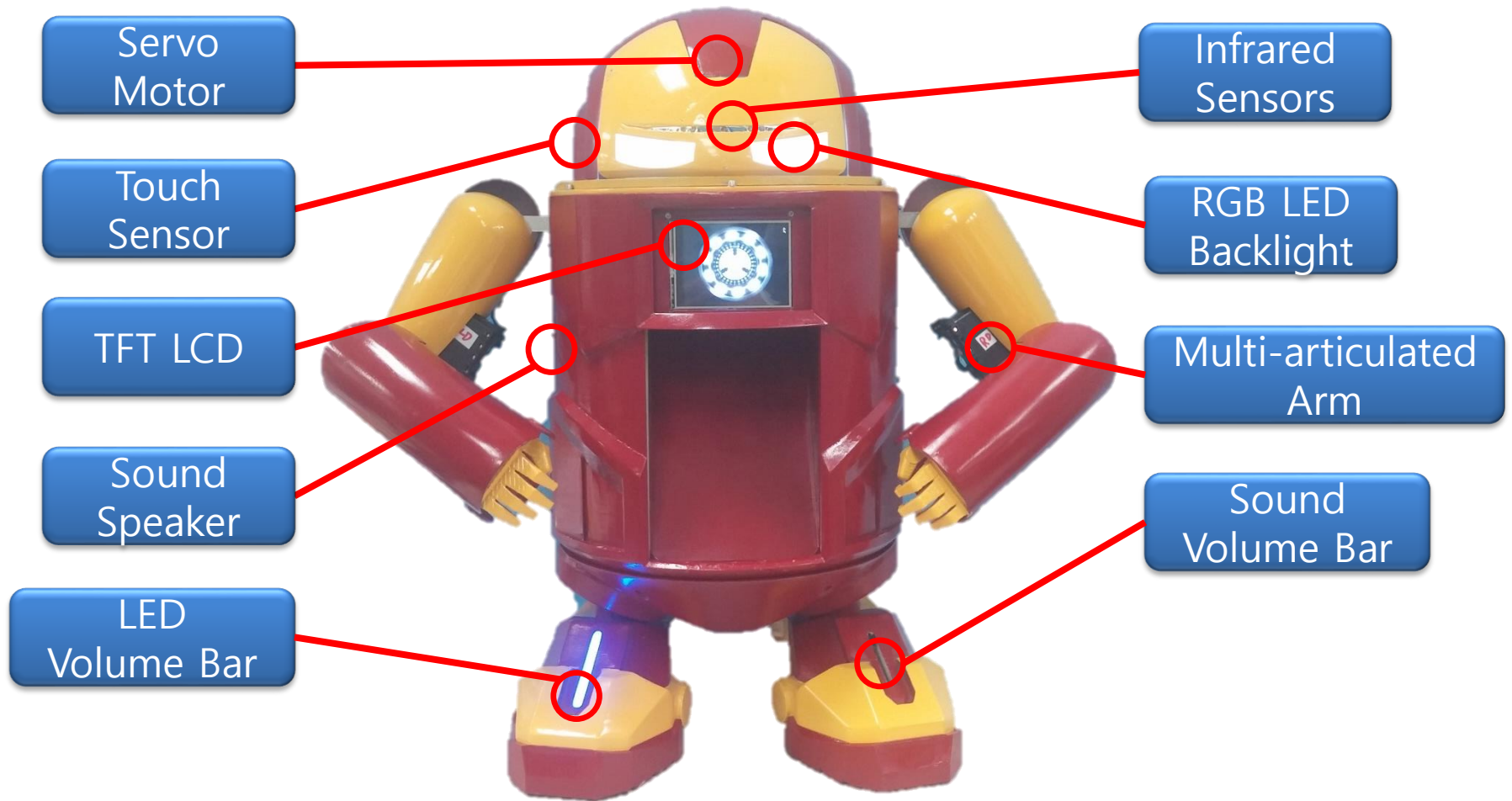
- 3D Inventor Design
- 52 objects
- 3D printer output



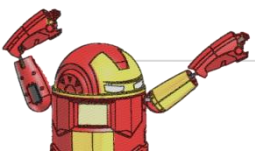
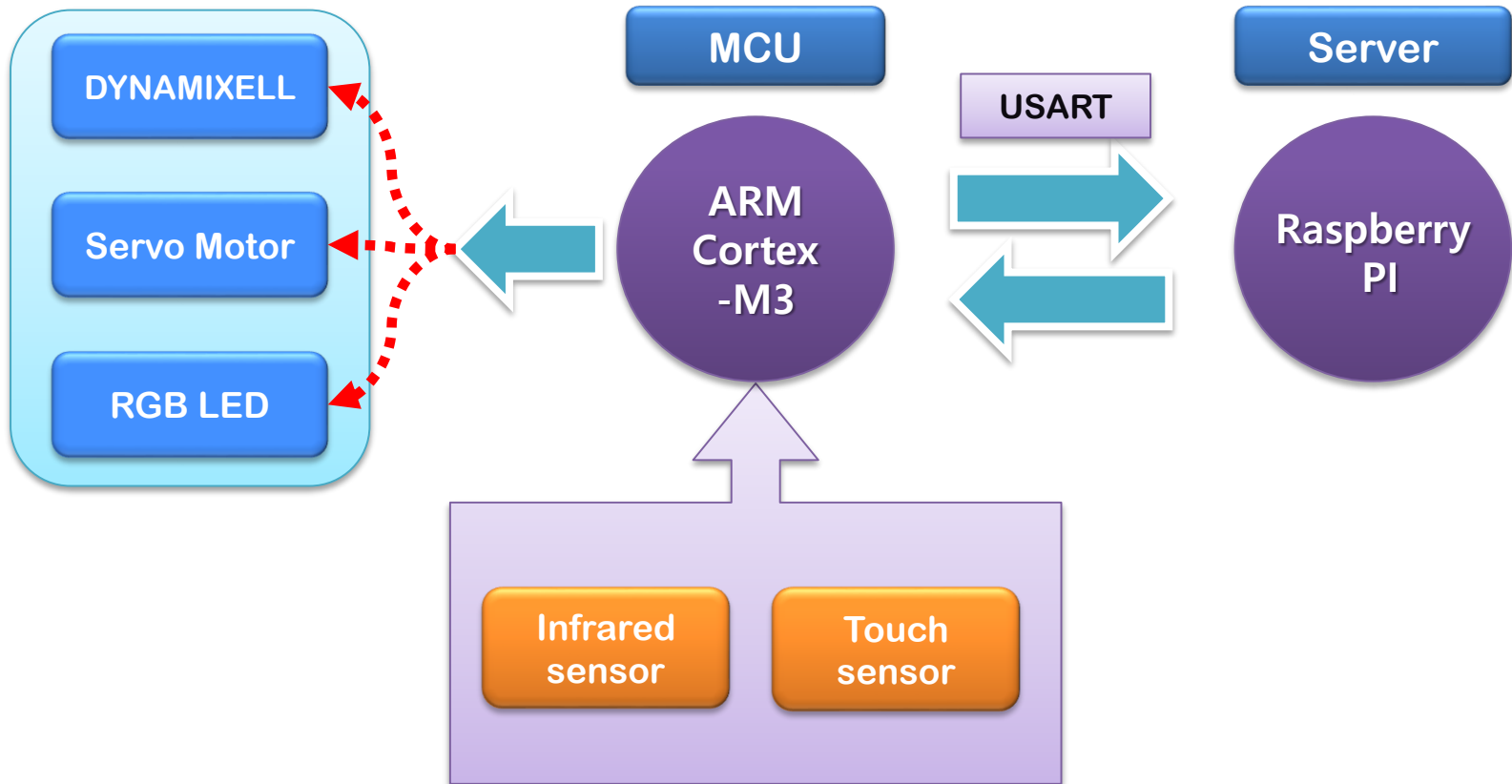
❖ Frame Design



❖ Docking Station Robot



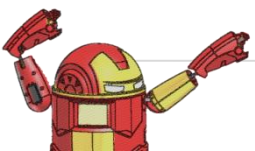
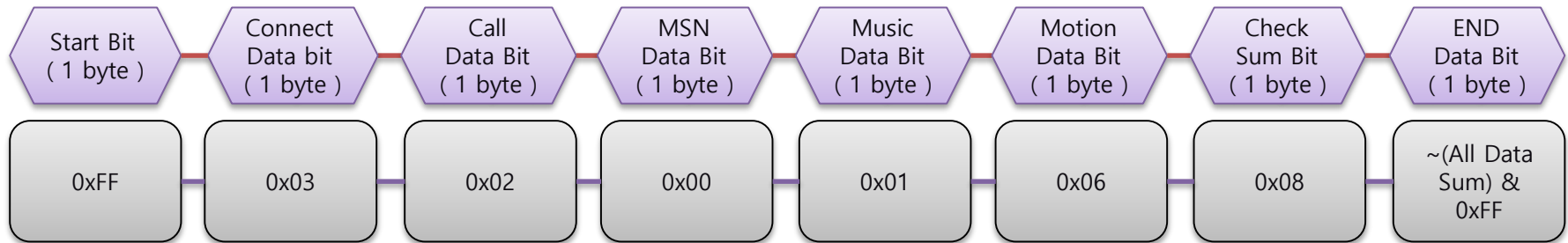
System architecture



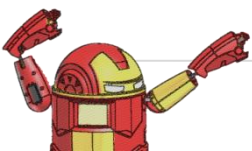
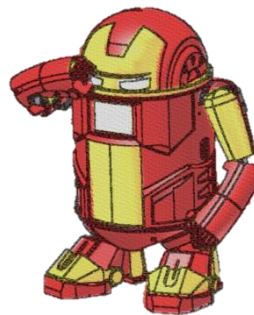
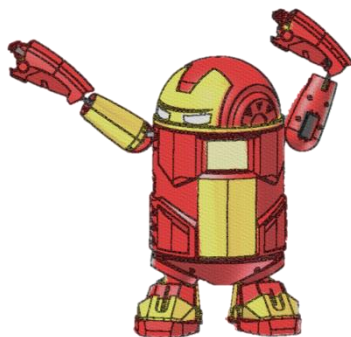
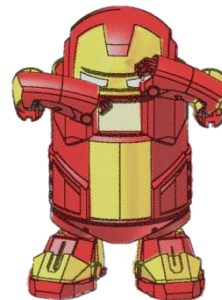
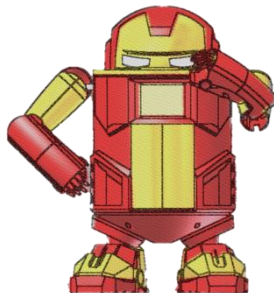
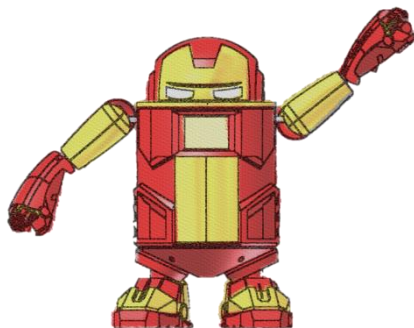
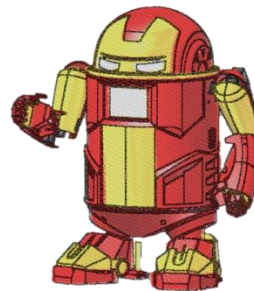
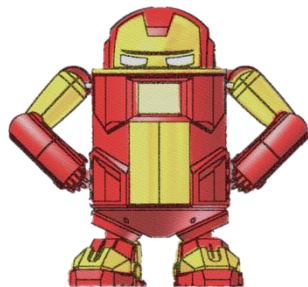


Communication Parts

DATA Packet



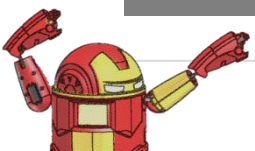
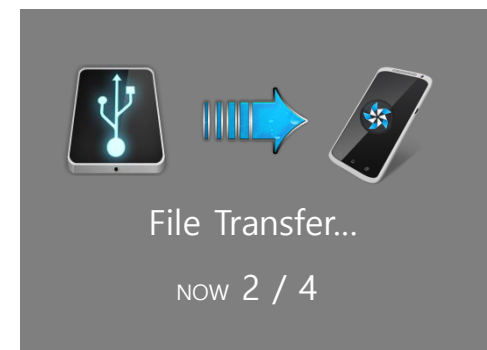
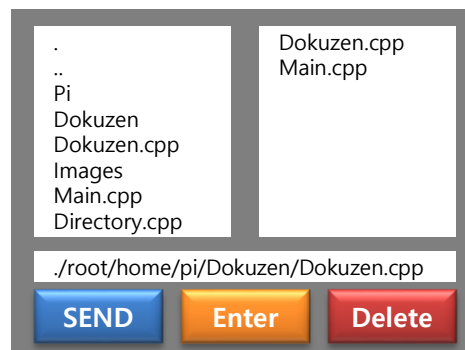
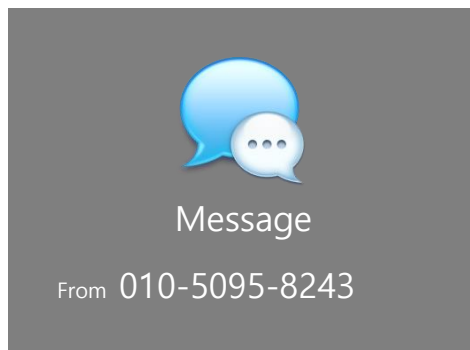
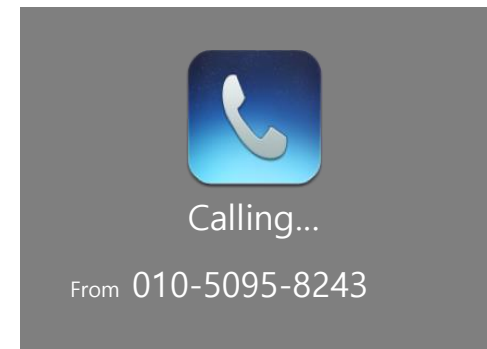
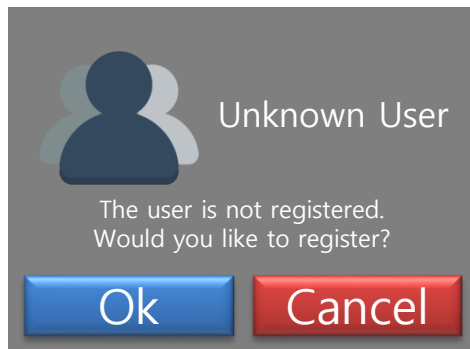
Robot Motion



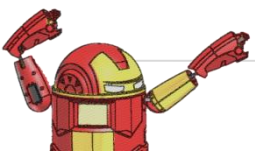
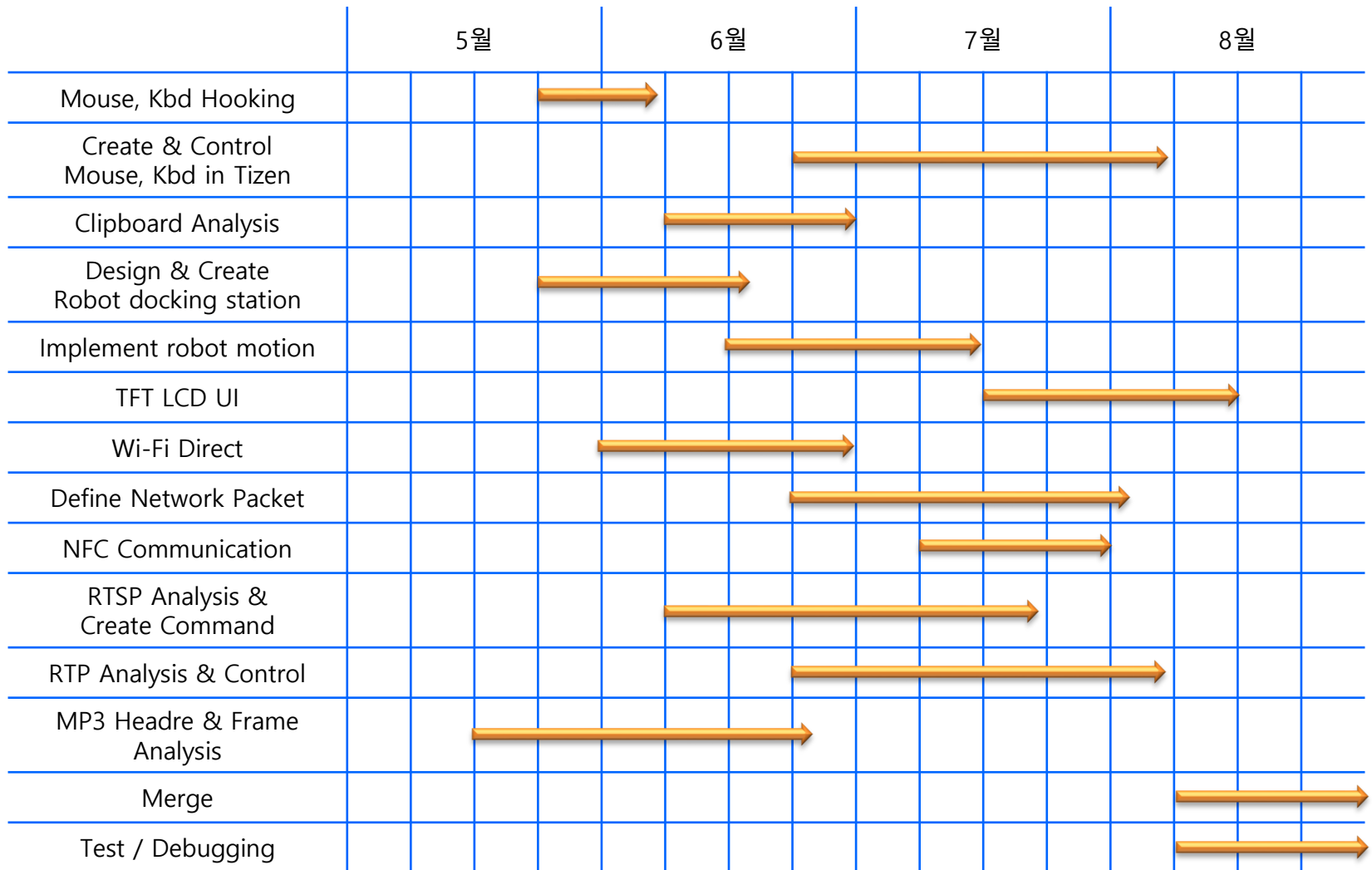
QT User Interface



Code less.
Create more.
Deploy everywhere.

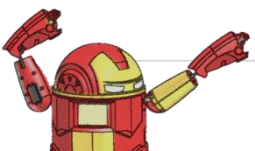


Schedule



❖ Check List

No	Function	Priority	
1	Create and Control Mouse & Kbd in Tizen	A	✓
2	Windows Mouse, Kbd Hooking	A	✓
3	Clipboard Analysis & sharing	B	▲
4	Catch Communication Event in Tizen	B	▲
5	Design Robot Docking station	A	✓
6	TFT LCD UI in Raspberry	A	✓
7	Robot Motion definition	A	✓
8	Wi-Fi Direct	A	✓
9	File Transfer	B	✓
10	NFC Communication	A	✓
11	RTSP Analysis & Control	A	✓
12	RTP packet implement & control	A	✓
13	MP3 Header & Frame Analysis	A	✓
14	Streaming	A	✓



❖ Reference

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- http://forum.falinux.com/zbxe/index.php?document_srl=406064&mid=network_programming

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- <http://www.mendrugox.net/2013/08/tp-link-tl-wn725n-v2-working-on-raspberry-raspbian/>

4. Professional Tizen Application Development, Hojun Jaygarl 외 5명, Wrox

5. Tizen 애플리케이션 프로그래밍, 서영진, 프리렉

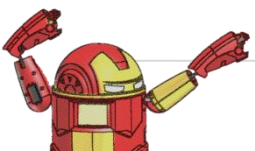
6. Tizen Developer Forum

- <https://developer.tizen.org/forums>

7. Tizen Namespace

- <https://developer.tizen.org/dev-guide/2.2.0/org.tizen.native.apireference/namespaceTizen.html>

7. 열혈강의 Qt Programming, 서영진, 프리렉



Any questions?

