

# WIPI

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■ WIPI

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**WIPI**

## *Wireless Internet Platform for Interoperability*

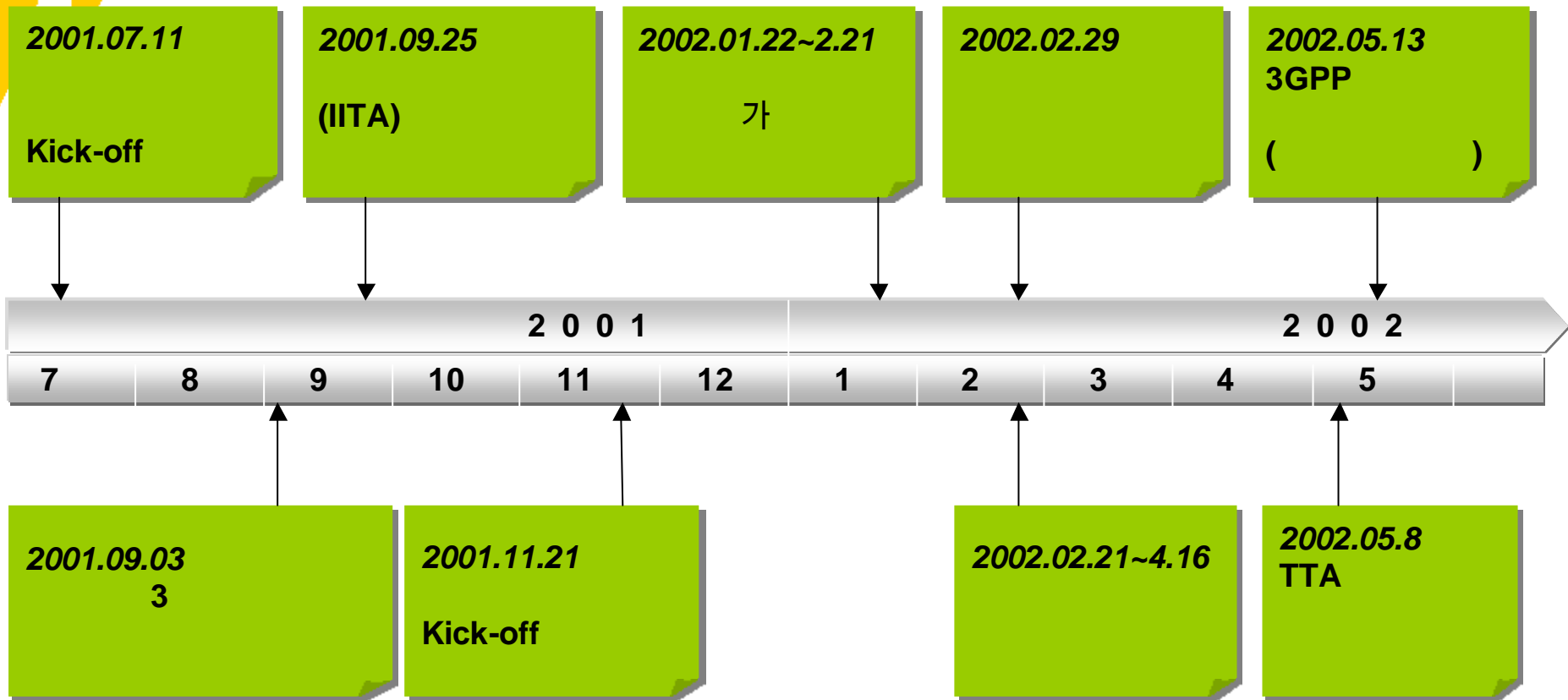
- 
- (KWISF : Korea Wireless Internet Standardization Forum) (ETRI : Electronics and Telecommunications Research Institute)
- (TTA : Telecommunication Technology Association) (2002. 5. 7)
- , Content ,



# 3GPPs

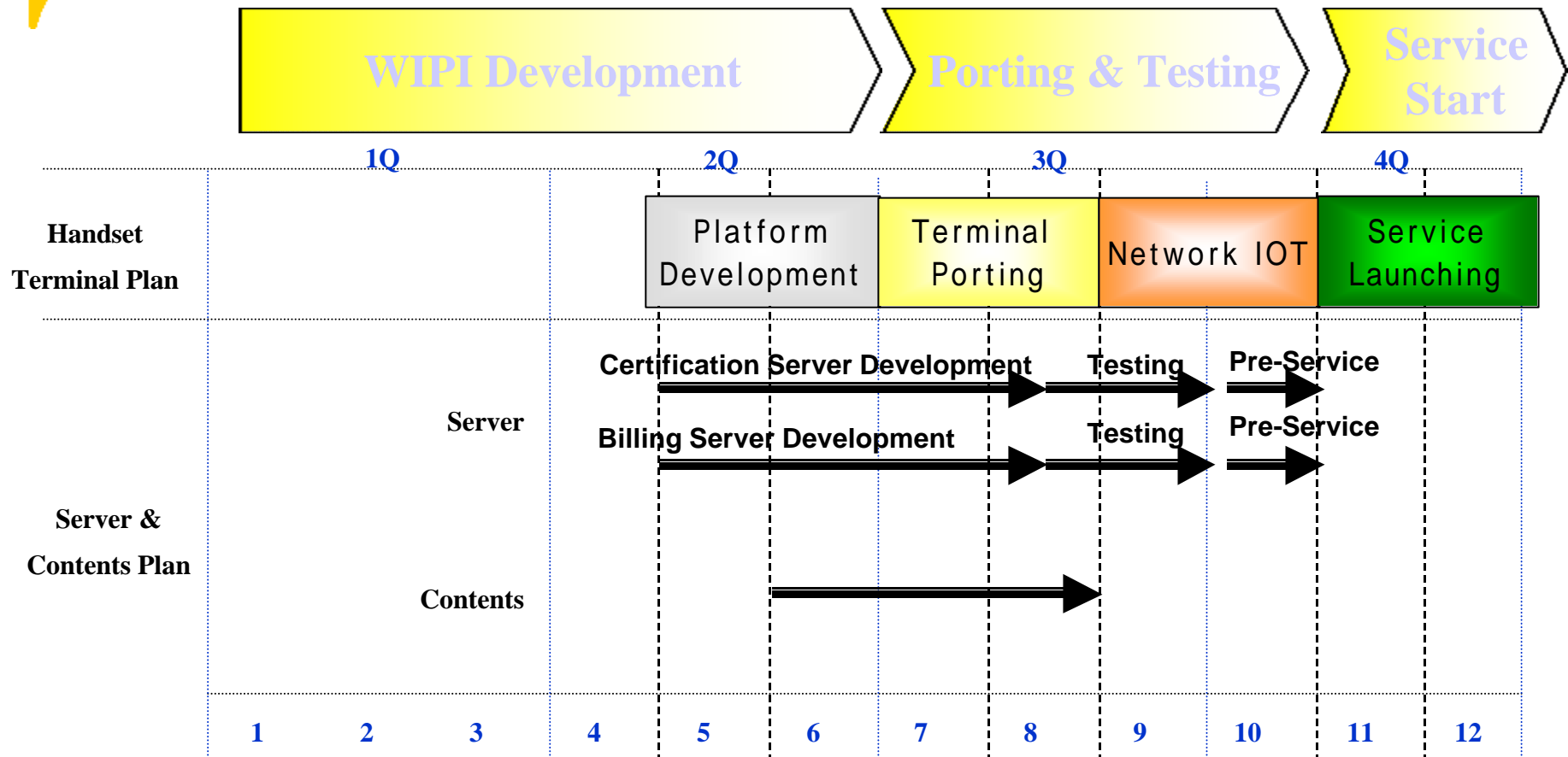
- 3GPP
  - TS 22.057 “ Mobile Station Application Execution Environment(MExE) : Stage1
  - Classmark
    - WAP : Classmark 1, R99 (2000.3)
    - P-java : Classmark 2, R99 (2000.3)
    - K-java : Classmark 3, R4 (2001.3)
    - CLI : Classmark 4, R6 (2002.3)
    - BREW : TWG2 Presentation (2002. 5. 13)
    - WIPI : TWG2 Presentation (2002.5.13)
- 3GPP2
  -

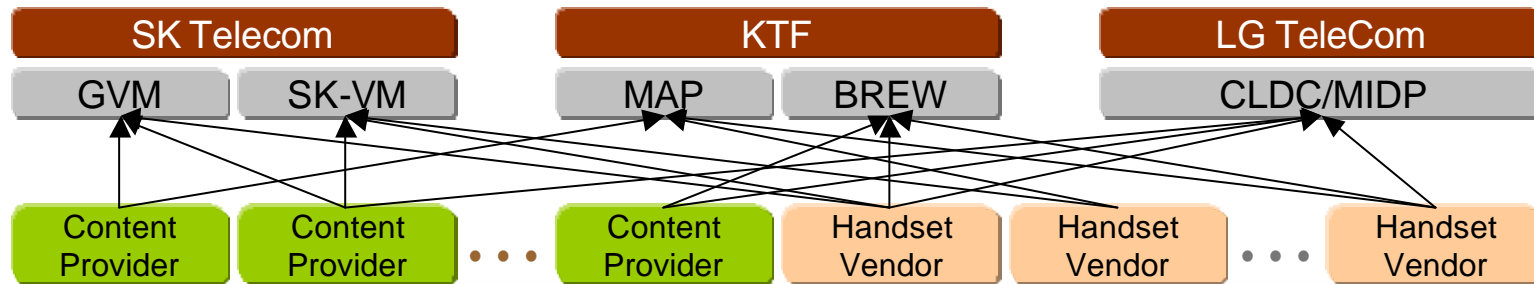
# WIPI



# WIPI

## WIPI Development Process





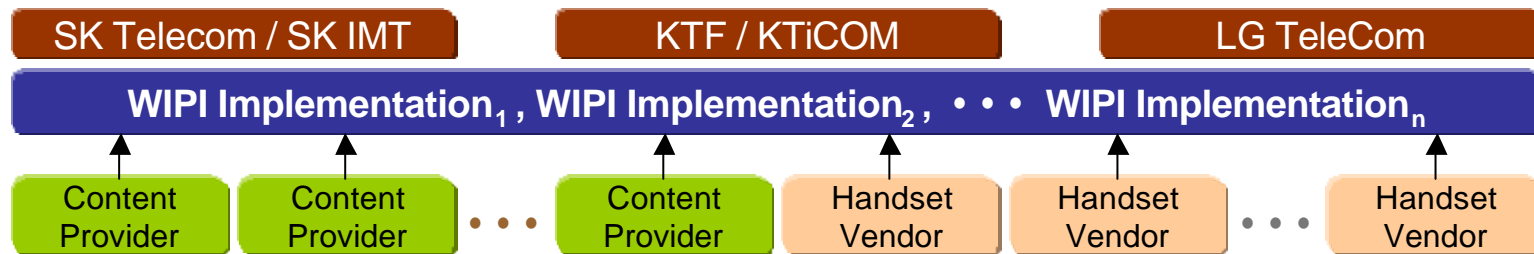
○ KWISF

, Content ,

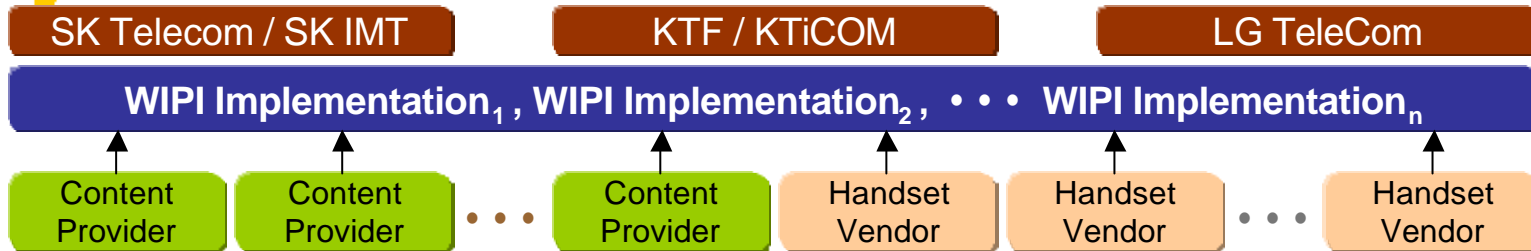
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ETRI

2001.7 ~ 2001.5







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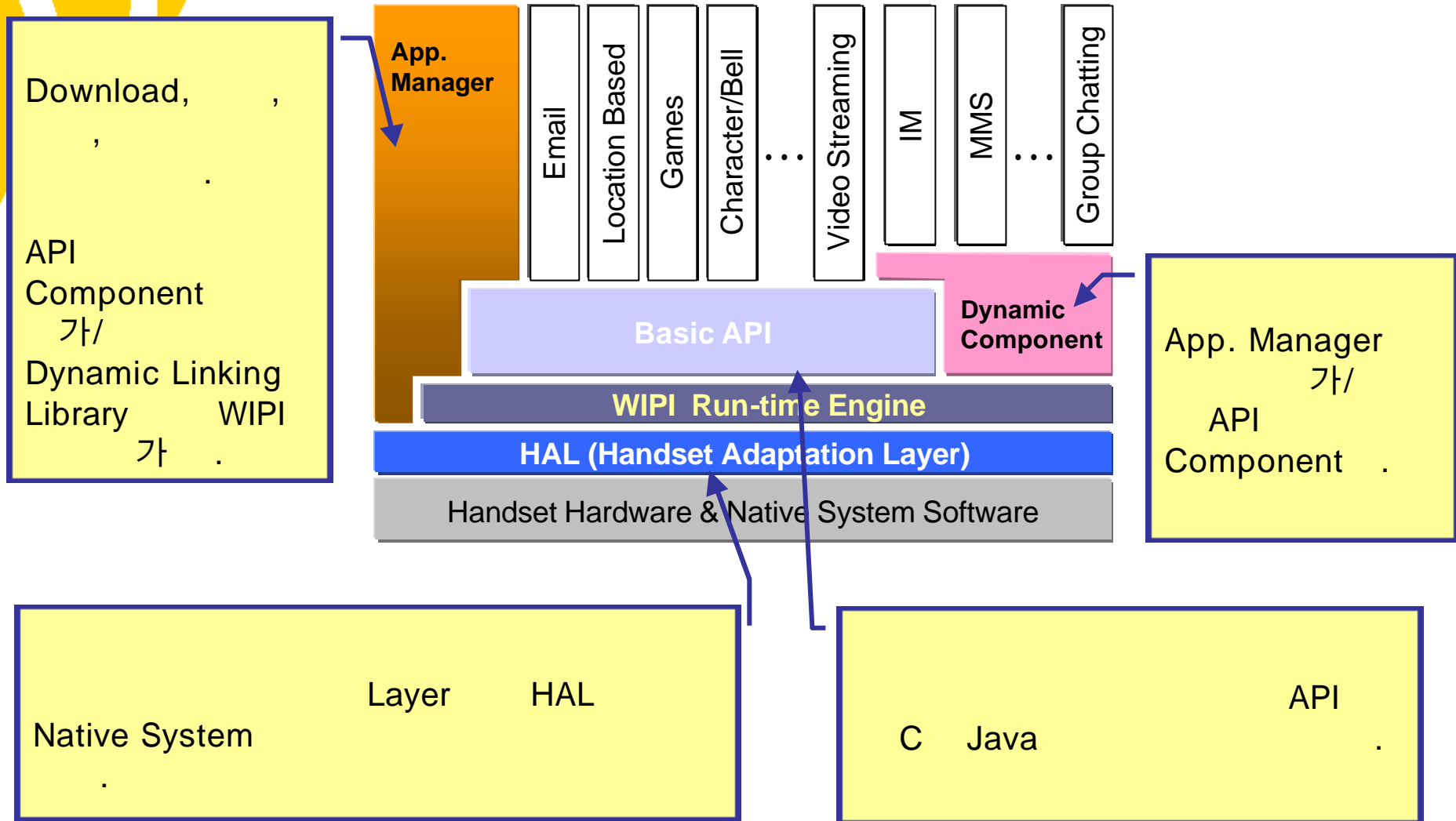
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가



**WIPI**

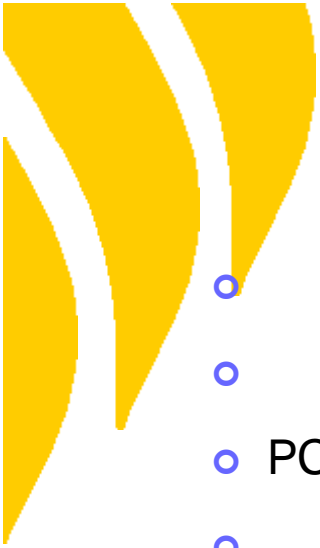
# WIPI



# WIPI

- 
- Content
- WAP J2ME 3GPP  
가
- OS Air Interface
- Content API set
- ,





- : C/C++, Java™
- Content가 binary code
- PC
- API
  - 3 API
  - 3 Data
- - (Compaction) Garbage Collection
  - 
  -
- 
- : Unicode, locale

\* Java™ Sun Microsystems



- API component

- Download

API component(DLL) 가/

- Download  
DLL

DLL

,

# API Overview

## *HAL*

System  
Call  
Device  
Network  
Serial  
SMS  
Sound  
Time  
Utility  
File  
Vocoder  
Input Method  
Font  
Frame Buffer  
Virtual Key

## *C API*

Kernel  
Graphic  
Database  
File System  
Network  
Media Manager  
Serial  
Phone  
Misc.  
Utility  
UI Components  
Standard C  
Library

## *Java API*

Core System  
High Level IO  
Utilities  
Low Level IO  
System  
Database  
Graphics  
UI Components  
Handset  
Media

# H/W

	: 96x54 : 4가 256가
	: , : :
(Non-Volatile)	API : 600KB : 400KB : 500KB
(Volatile)	가 HEAP : 300KB API 가 : 20KB



# HAL API

[1/4]

API	<ul style="list-style-type: none"><li>■ API</li><li>■ HAL ,</li><li>■ . HAL</li><li>■ API가 가</li></ul>
	<ul style="list-style-type: none"><li>■ API</li><li>■ (Critical Section) API</li><li>■ API</li></ul>

# HAL API [2/4]

<b>CALL</b>	<ul style="list-style-type: none"> <li>■ API</li> <li>■ 가</li> </ul>
<b>Handset Device</b>	<ul style="list-style-type: none"> <li>■ LED, , API</li> </ul>
	<ul style="list-style-type: none"> <li>■ PPP API</li> <li>■ UDP, TCP API</li> </ul>
	<ul style="list-style-type: none"> <li>■ API</li> </ul>

# HAL API

[3/4]

SMS	■ SMS 가 , API
	■ Sound , API
TIME	■ 가 API
Utility	■ API
	■ API

# HAL API

[4/4]

<b>Vocoder</b>	■ Vocoder API
<b>Input Method</b>	■ API
	■ , API
<b>Frame Buffer</b>	■ LCD , API
<b>Virtual Key</b>	■ 가 API

# Basic API-C

[1/3]

	<ul style="list-style-type: none"> <li>■ / API</li> <li>■</li> <li>■ API 가</li> </ul>
	<ul style="list-style-type: none"> <li>■ (Off Screen Frame Buffer) API</li> <li>■ (BMP, PNG, GIF, AGIF) / API</li> <li>■ API</li> </ul>

# Basic API-C

[2/2]

	■ , API
	■ API
	■ PPP , TCP/UDP API ■ HTTP API
	■ Media API

# Basic API-C

[3/3]

	■ API
Phone	■ CALL SMS API
Misc	■ LED, API
UI	■ , / , , , API

# Basic API-

[1/3]

<b>Core System</b> ( <b>java.lang</b> )	■ J2SE    java.lang
<b>High Level IO</b> ( <b>java.io</b> )	■ J2SE    java.io
<b>Utilities</b> ( <b>java.util</b> )	■ J2SE    java.util
<b>Low Level IO</b> ( <b>org.kwis.msf.io</b> )	■ J2SE    java.net
<b>System</b> ( <b>org.kwis.msf.core</b> )	■  API



# Basic API-

[2/3]

<b>Additional IO</b> (org.kwis.msp.io)	<ul style="list-style-type: none"><li>■ J2SE file API</li><li>■ PPP API</li></ul>
<b>Graphics</b> (org.kwis.msp.lcdui)	<ul style="list-style-type: none"><li>■ (Off Screen Frame Buffer) API</li><li>■ (BMP, PNG, GIF, AGIF) API</li><li>■ / API</li></ul>

# Basic API-

[3/3]

<b>Database</b> (org.kwis.msp.db)	■ , API
<b>UI Component</b> (org.kwis.msp.lwc)	■ Graphics API
<b>Handset</b> (org.kwis.msp.handset)	■ , , Call API
<b>Media</b> (org.kwis.msp.media)	■ Media API



3

- System Level –

- CP (Content Provider) Level –

CP

- Public Level –  
가

- API - 3

API

- Data - 3

Data

- Private Directory -  
Data

- Application Shared Directory -  
Data

- System Shared Directory -  
Data



- Java

- 

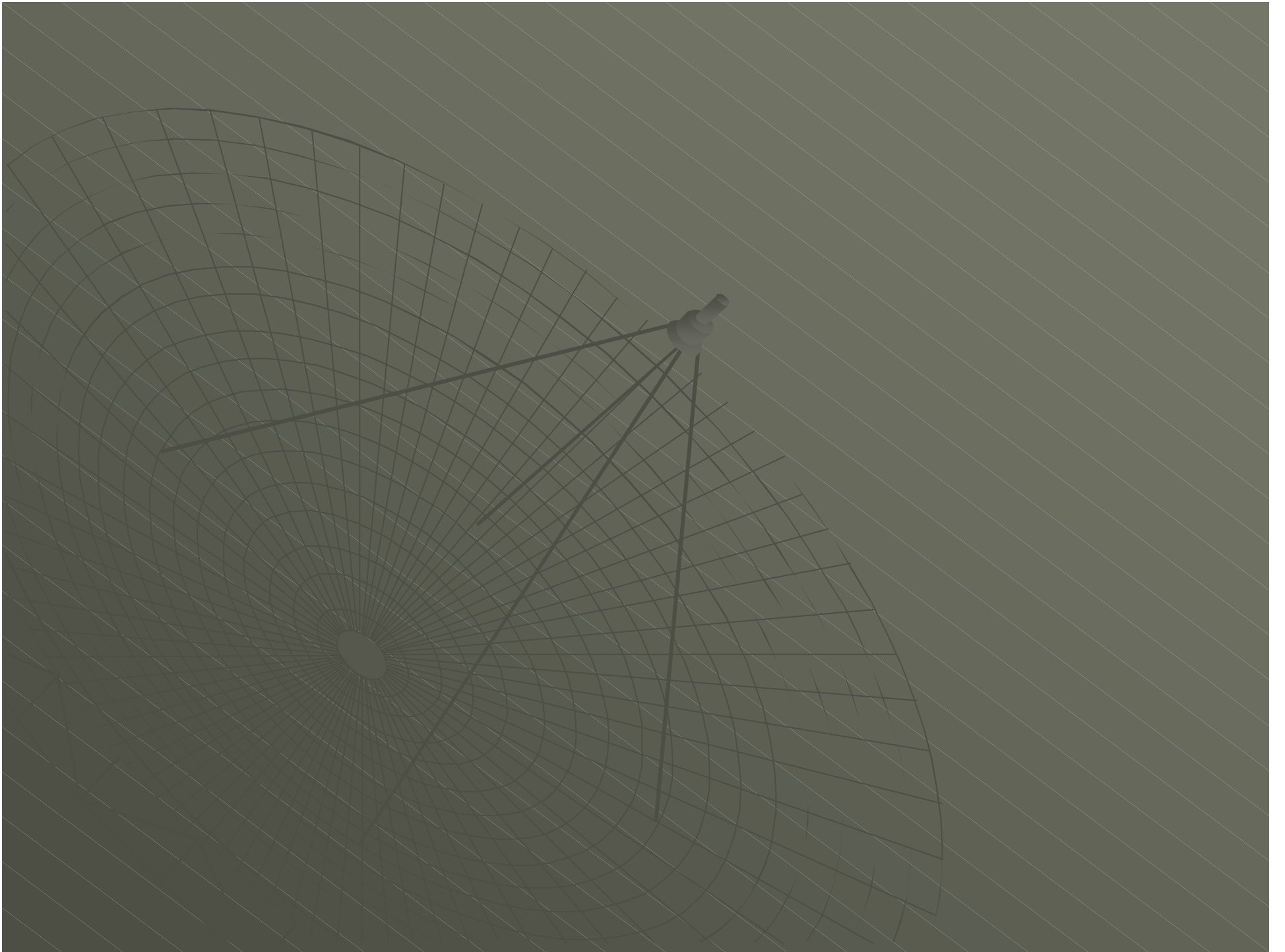
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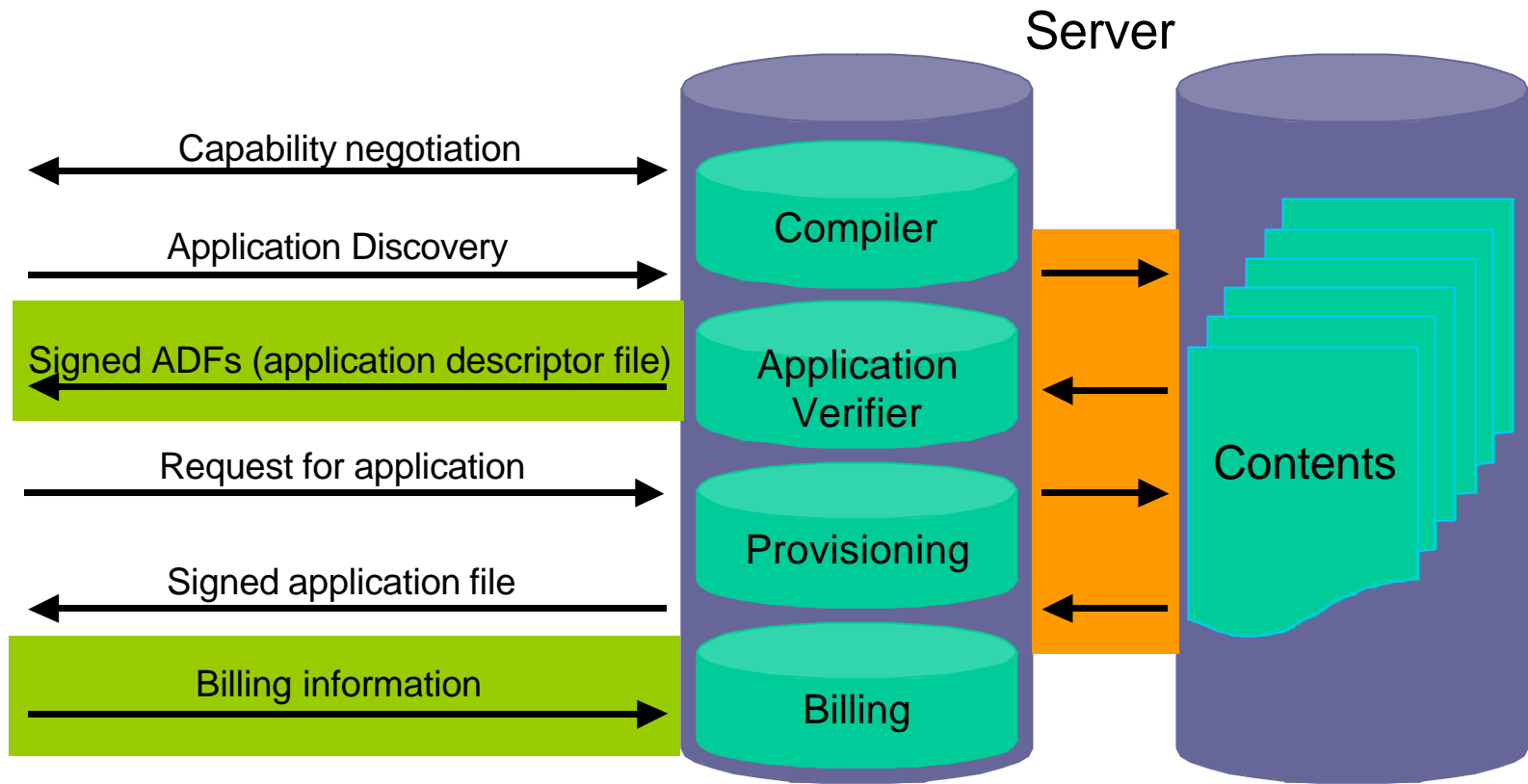
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Descriptor File

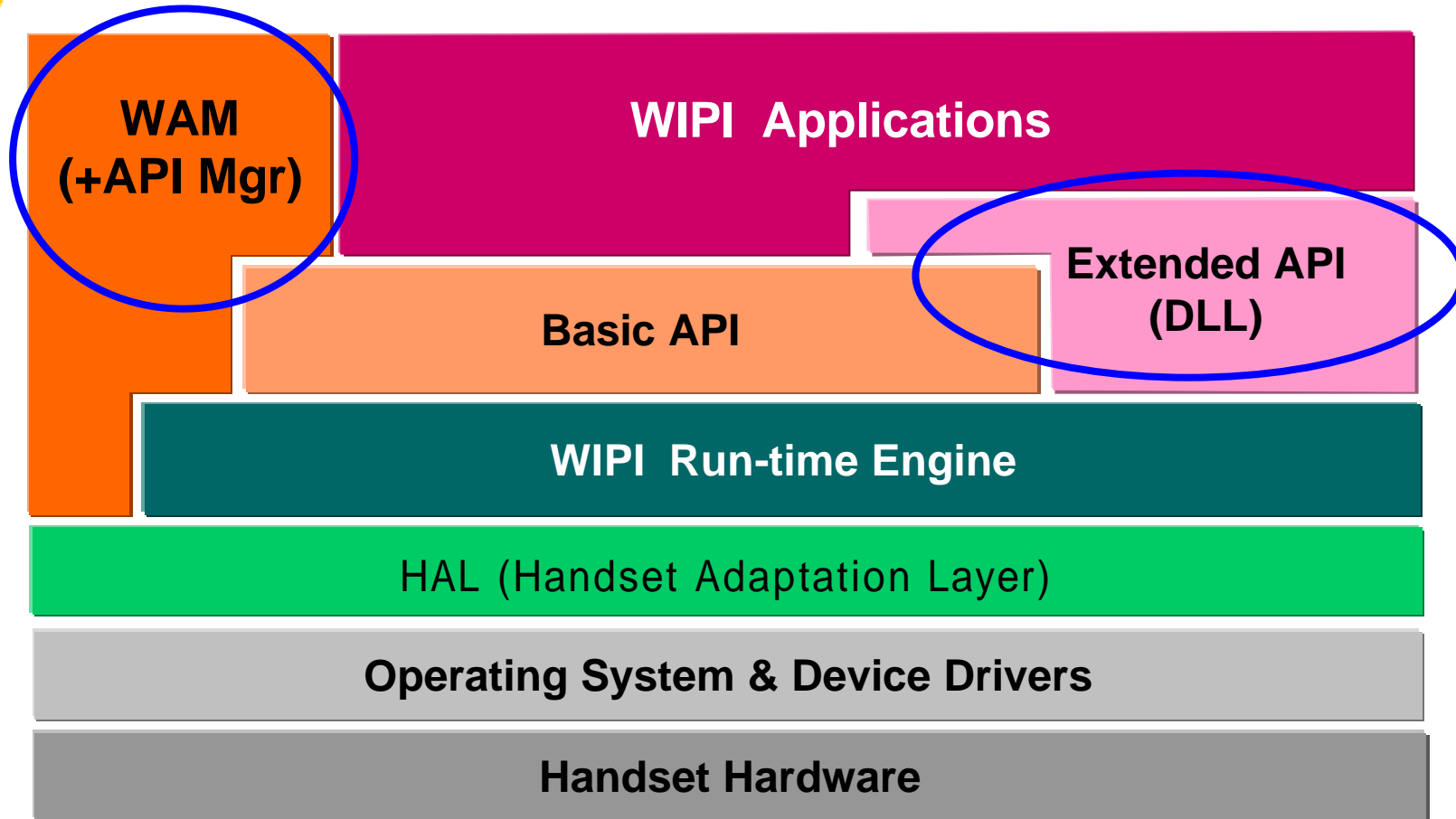
TTA가

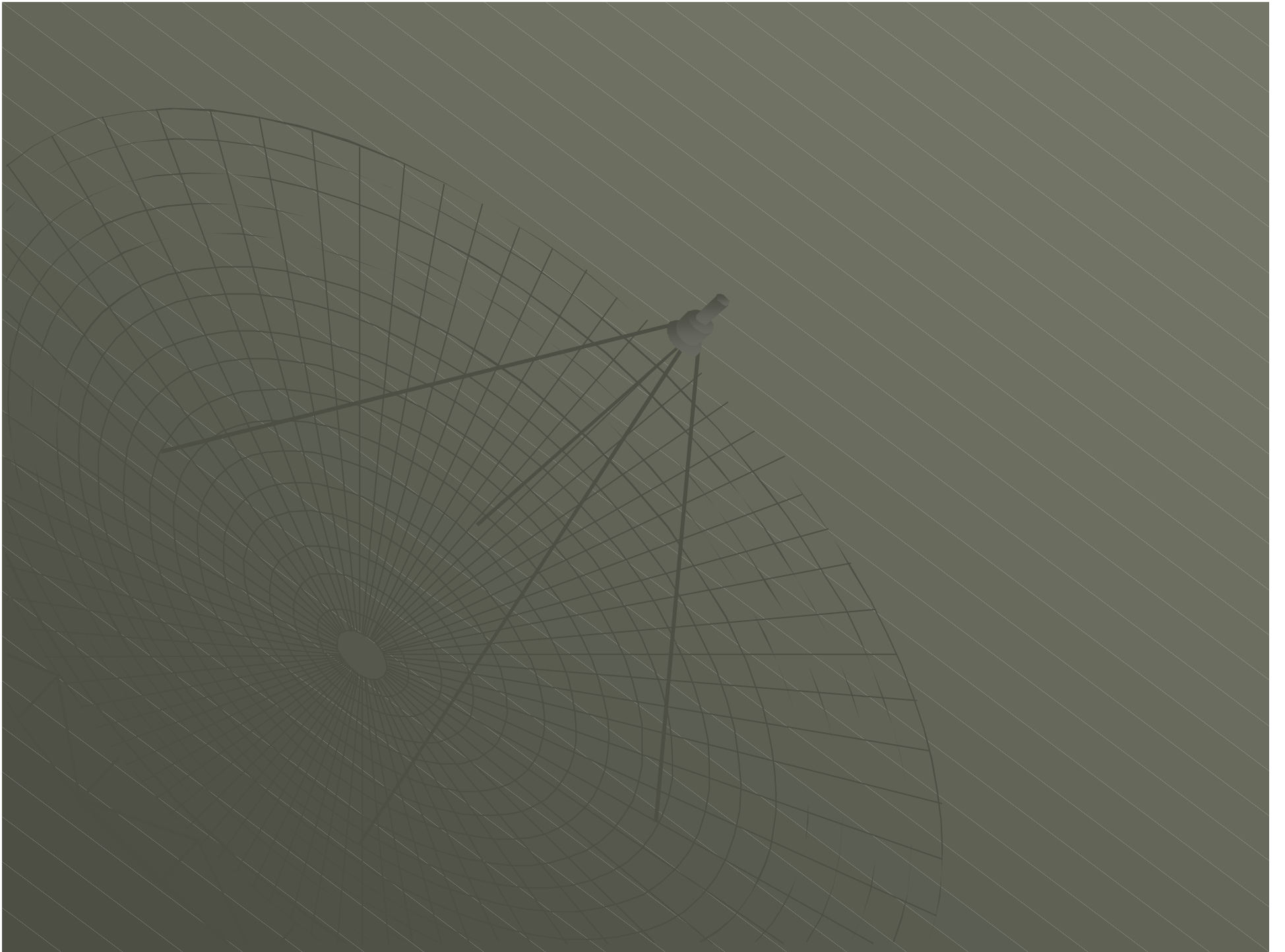


# Service



# WIPI









API

, , , , ,  
가 / API ( )

API

(Java™ )

(locale) (C/C++)

\*\* Java Sun Microsystems





- C/C++    Java

- Java

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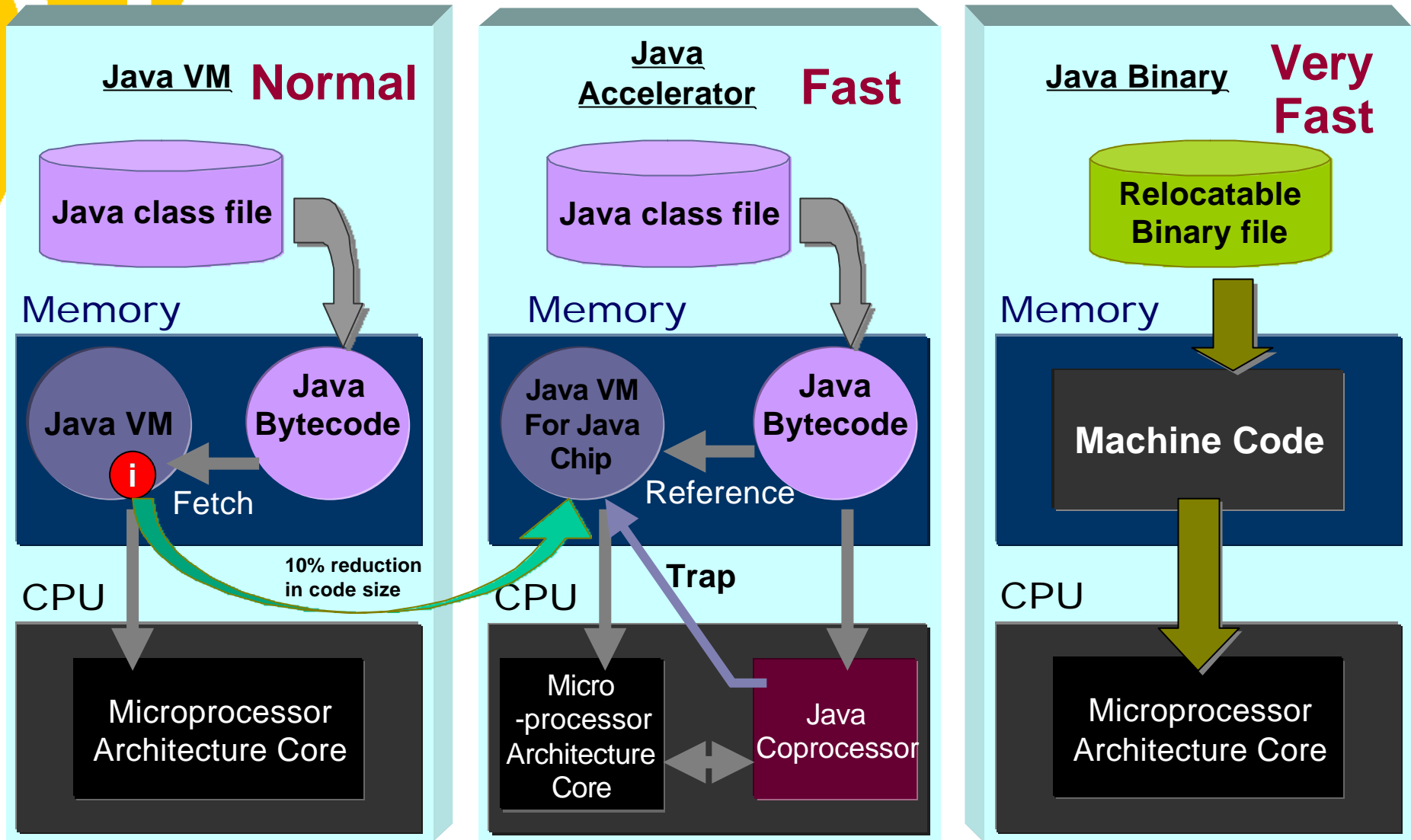
- API    가/

- 

- (Memory Compaction)
- (Garbage Collection)

-

# Java

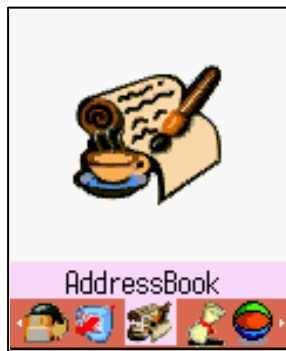




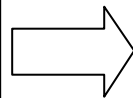
AddressBook  
email address

SendMail

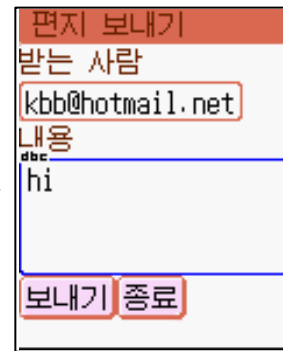
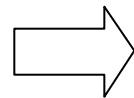
AddressBook



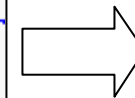
WAM\*  
AddressBook



AddressBook



SendMail



SendMail

AddressBook  
e-mail

AddressBook

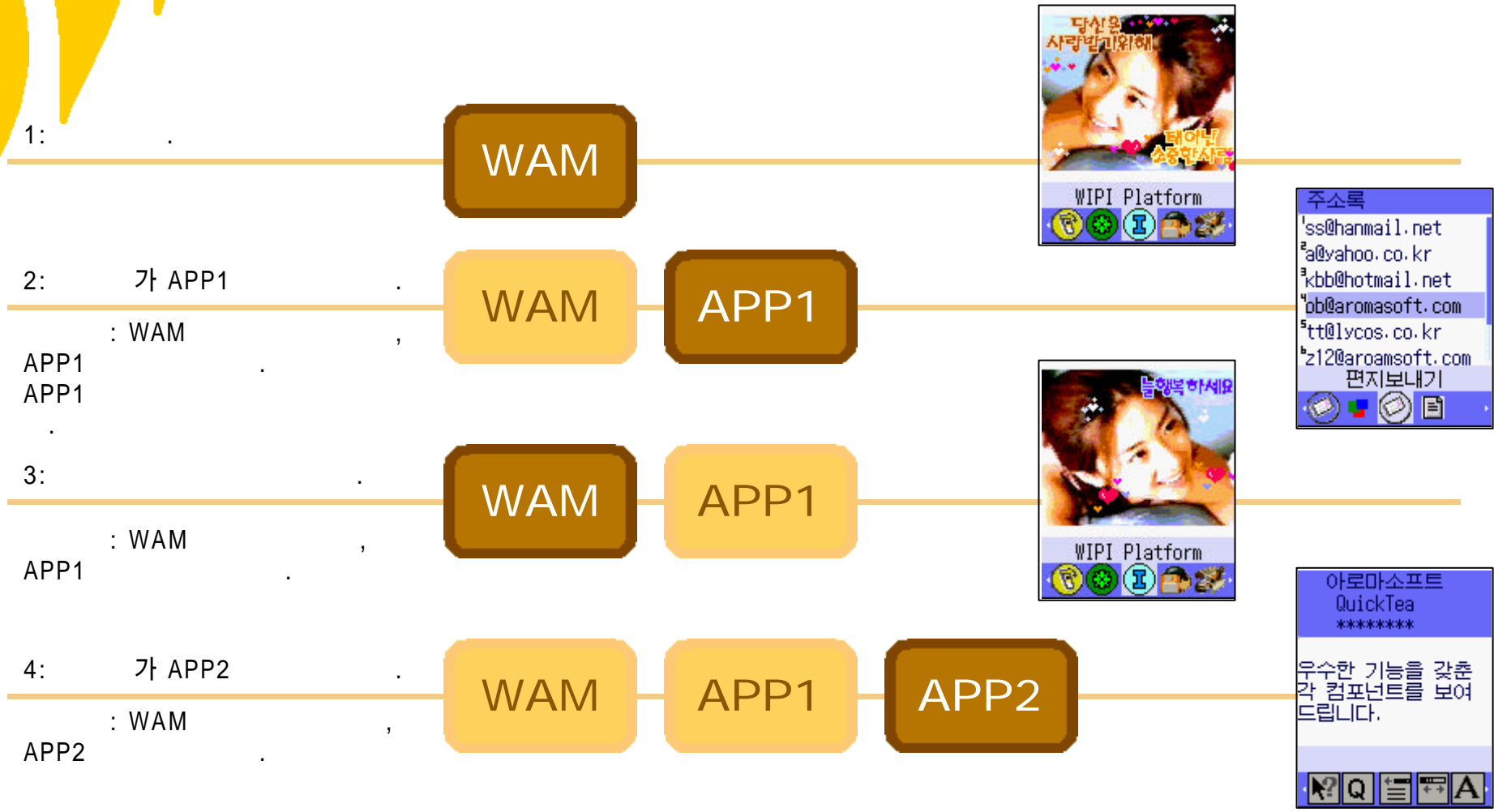
e-mail  
가

가

\*) WAM :



AromaSoft



\*) WAM : WIPI Application Manager



C/C++ Java

Basic API

C/C++

API

C

```
#include "MCAApp.h"

unsigned char *bpl;
int clip[] = {0, 0, 120, 160};

void handleCletEvent(int type,int parm1,int parm2)
{
    if(type == MH_KEY_PRESSEVENT){
        stage = (stage + 1) % 5;
        MC_grpInitContext(&cxt);
        MC_grpFillRect(bpl, 0, 0, width, height, &cxt);
        MC_grpFlushLcd(0, bpl, 0, 0, width, height);
    }
}
```

Java

```
import org.kwismsp.lcdui.*;

abstract public class Canvas extends Card
{
    public boolean keyNotify(int type, int key)
    {
        Display dis = Display.getDefaultDisplay();
        dis.removeCard(this);
        return true;
    }
}
```

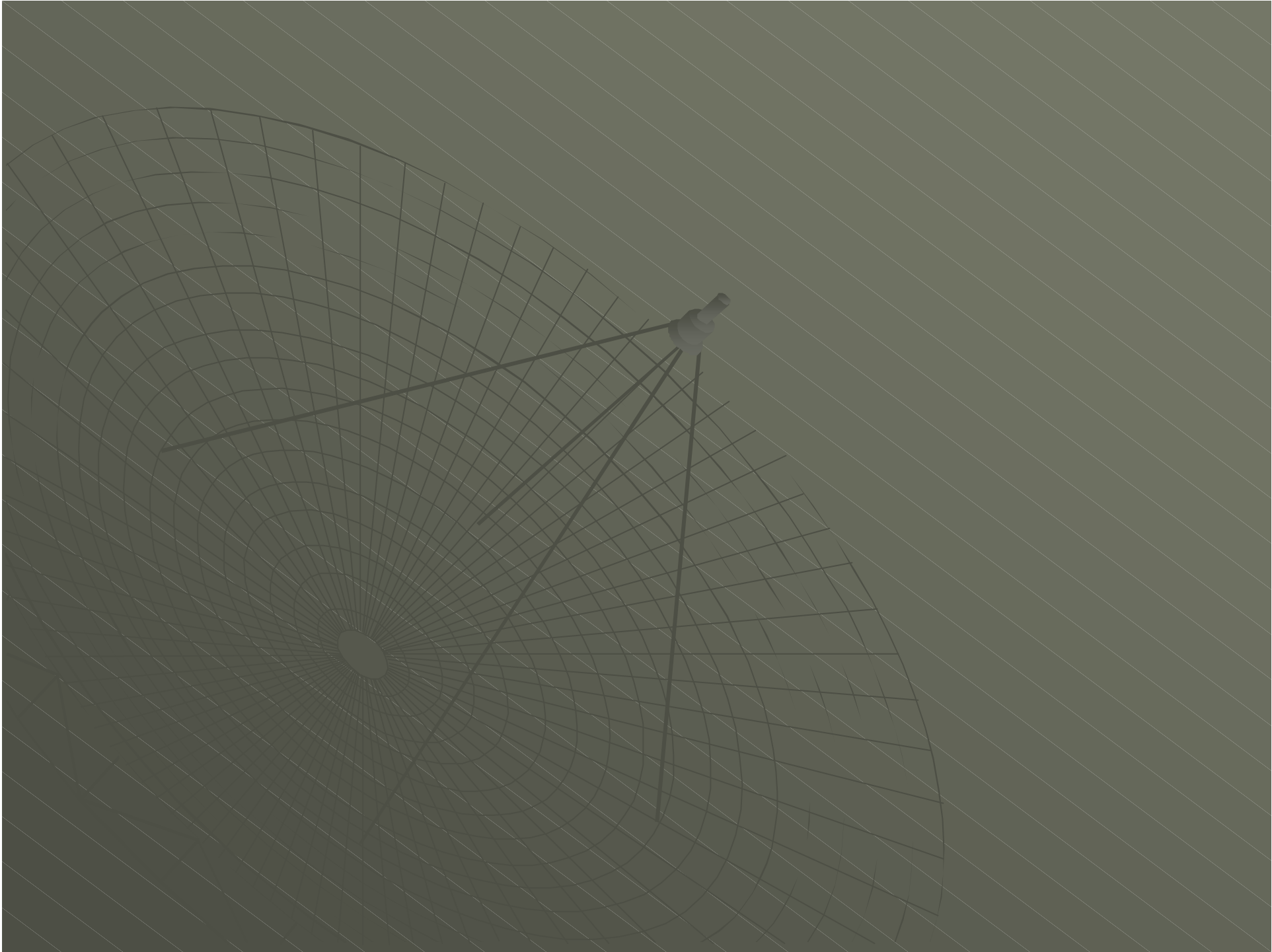


# API

API 3

API

	System1	System2	TAPI	Network	Serial
	ESN, DM,  API	MIN, (OFF-LINE, ...)	, SMS SMS	TCP/IP, UDP, HTTP  Access API	,







■ Compiler ( )

■ GNU gcc Compiler CP

■ ARM Compiler gcc chip core

■ Gcc ARM Compiler 가

■ API 가/ ( )

■ API 가/ API(DLL) 가

■ DLL 가

■ UI 가

■ ( )

■ 가

■ Serial Cable OTA simulation

■ C

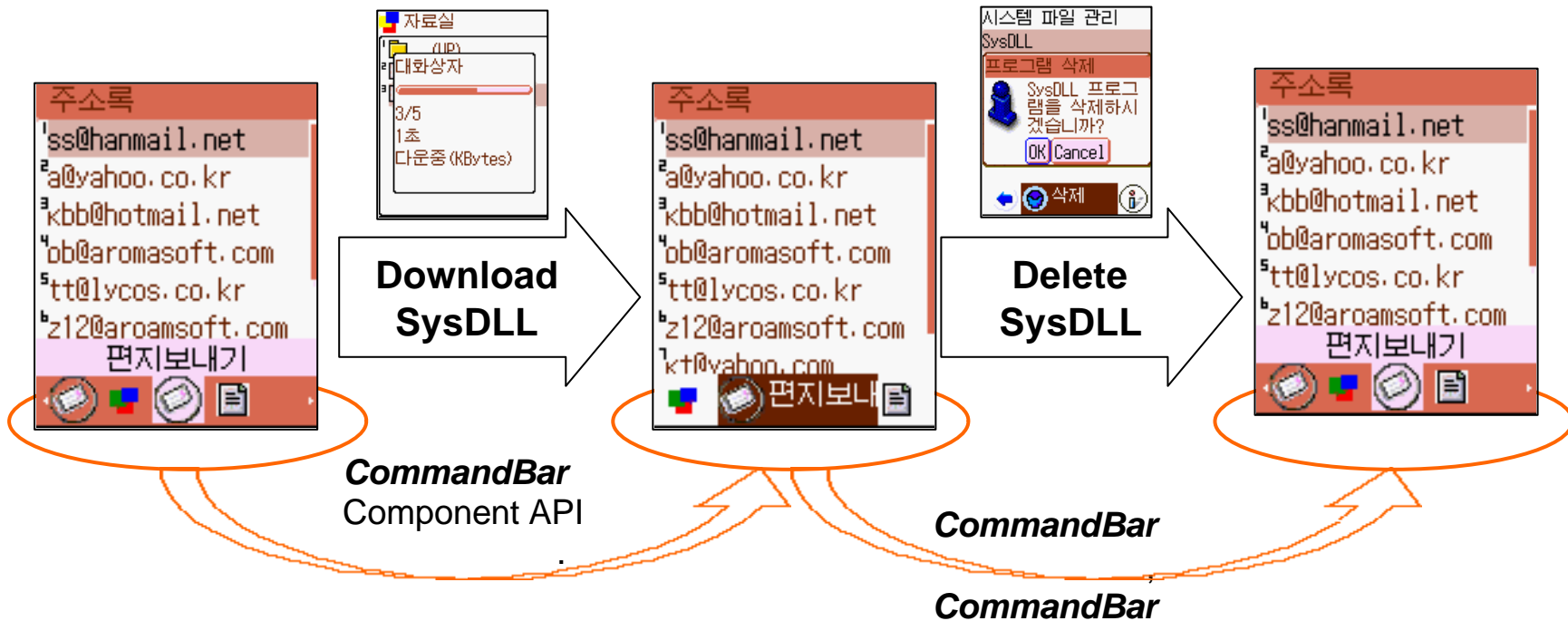
# API

# 가 /

(DLL)

API(DLL)가

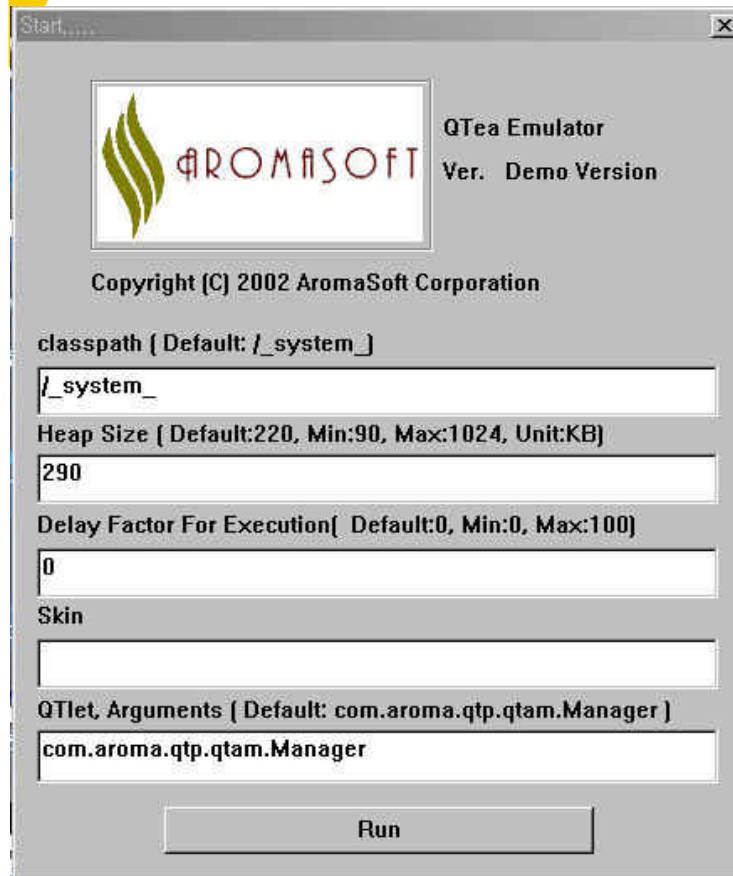
API가



# WIPI

# (Emulator) [1/2]

## Powerful Emulator



Heap  
Free Memory  
Compaction GC가  
memory  
가 .



**WIPI**

# Demonstration ...

