

2003. 4

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|       |       |     |
|-------|-------|-----|
| 1 HAL | ..... | 15  |
| 1     | ..... | 6   |
| 2     | ..... | 127 |
| 3     | ..... | 500 |

# 1.

## 1.1.

( )

( )

( )

,

,

.

## 1.2.

~~/~~

, ,

.

~~/~~

.

~~/~~

HAL(Handset Adaptation Layer)

.

~~/~~

(Application Programming Interface,

API)

C

~~/~~

API

.

~~/~~

.

## 1.3.

### 1.3.1.

(Runtime Execution Environment)

,

API

.

### 1.3.2. Clet

C

.

### 1.3.3. Jlet

MSP

### 1.3.4.

. HAL

### 1.3.5.

가

### 1.3.6.

( )

Clet

Jlet

가

(concurrently)

### 1.3.7. ATOC (Ahead-Of-Time Compiler)

(bytecode)

### 1.3.8. MSF(Mobile Standard Foundation)

Mobile

API

### 1.3.9. MSP (Mobile Standard Profile)

MSF

Mobile Device

Profile

### 1.3.10. CLDC (Connection Oriented Device Configuration)

Connected, Limited Device Configuration

Mobile

Configuration . CLDC

Core API



### 1.3.11. MIDP (Mobile Information Device Profile)

CLDC      Mobile Device      Profile      .

### 1.3.12. MIDlet

MIDP      .      MIDP

## 1.4.

     : ~      . (      : ~      . / ~      . / ~      .  
/ ~      . / ~      . )  
      : ~      .

## 1.5.

가

☞ : 96x54

☞ : 4가 256가

☞ :

☞ :

☞ :

### (Non-Volatile)

☞ 가 600KB

☞ CLDC/MIDP 가  
1MB

☞  
400KB

☞ 가 500KB

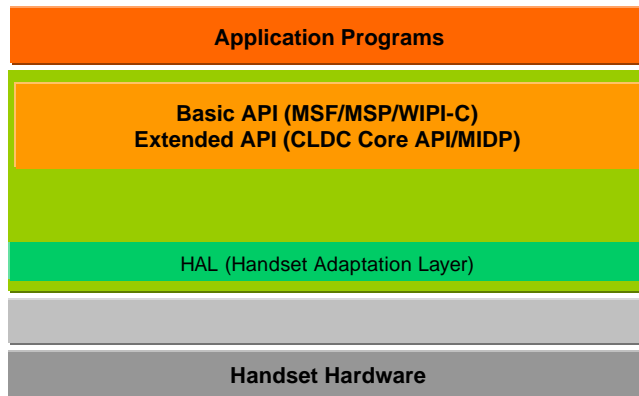
### (Volatile)

☞ 가 HEAP 300KB

☞ 가 20KB

## 2.

1 S/W 1 가 .  
1 Extended API .



1

✍ HAL (Handset Adaptation Layer)

가 , .

✍ API (BASIC API)

가 API . C

API .

### 3.

#### 3.1.

AOTC

#### 3.2.

가 가

#### 3.3.

가 C

API(Basic API)  
, CLDC/MIDP

Extended API

##### 3.3.1. C

API C API C (Semantic)

##### 3.3.2.

API  
, CLDC/MIDP

API  
Extended API

(Semantic)

### 3.4.

가 API

☞ PUBLIC

가 , 가

☞ CP(Content Provider)

CP ,

☞ (System)

#### 3.4.1. API

API API

☞ NO ACCESS : .

☞ READ ONLY : .

☞ WRITE ONLY : .

☞ READ/WRITE : , .

API

#### 3.4.2.

가 ,

☞ (Private Directory)

☞ (Application Shared Directory)

☞ (System Shared Directory)

### 3.5. API 가/

API 가/ . 가/ API  
/ 가 .  
API 가/ 가 7.2  
API .  
가/ API API

### 3.6.

HEAP

☞

☞ (Compaction)

(fragmentation)

☞ 가 (Garbage Collection)

가

☞ (Stack)

(exception)

☞

... , C .

### 3.7.

#### 3.7.1.

☞

☞ /

☞

☞ API 가/

☞

#### 3.7.2.

, 가

### 3.8.

#### 3.8.1.

..

EUC\_KR (Character Set)

### 3.8.2.

C (locale)  
EUC\_KR

### 3.8.3.

EUC\_KR 가 ,  
Private Use(0xE000 -0xF8FFF)  
7.2

## 3.9. CLDC/MIDP

CLDC/MIDP , 2003 12 31  
CLDC/MIDP . CLDC/MIDP  
. CLDC MIDP  
CLDC/MIDP가 3  
, CLDC/MIDP가 3

### 3.9.1. CLDC

CLDC Sun Microsystems CLDC 1.1  
(<http://jcp.org/aboutJava/communityprocess/final/jsr139/index.html>)  
, CLDC  
, CLDC  
Verrification AOTC  
( CLDC 5.2.1.1 Verification  
process Phase 2: In -device verification "In -device "  
AOTC .)  
CLDC "5.2.1 Core System (java.lang) ", "5.2.2 High Level IO  
(java.io) ", "5.2.3 Utilities (java.util) " CLDC Core API

### 3.9.2. MIDP

MIDP Sun Microsystems 2.0  
(<http://jcp.org/aboutJava/communityprocess/final/jsr118/index.html>)



### 3.9.3. Extended API

CLDC/MIDP API Extended API  
Basic API

### 3.9.4. Basic API

Basic API CLDC/MIDP가

## 4. HAL

### 4.1. TYPE DEFINITION

```
typedef unsigned char M_Boolean // unsigned 8bit. TRUE FALSE
CHECK

typedef unsigned int M_Uint32 // unsigned 32 bit type
typedef unsigned short M_Uint16 // unsigned 16bit type
typedef unsigned char M_Uint8 // unsigned 8bit type, unsigned char
type
typedef signed int M_Int32 // signed 32bit type. signed int
type
typedef signed short M_Int16 // signed 16bit type. signed short
typedef signed char M_Int8 // signed 8bit type. signed char
typedef char M_Char // char
typedef unsigned char M_Byte // unsigned 8bit type. unsigned char
type
typedef signed long long M_Int64 // signed 64bit type. signed
long long type
typedef unsigned long long M_Uint64 // unsigned 64bit type. unsigned
long long type
typedef unsigned short M_Ucode // unsigned 16bit. unicode character
typedef signed long M_Sint31 // signed 32bit. signed long type
typedef signed short M_Sint15 // signed 16bit. signed short type
typedef M_Uint32 M_Addr // unsigned 32bit. unsigned int type
```


```
#define NULL    0                //NULL
#define TRUE   1                //TRUE
#define FALSE  0                //FALSE
#define inline __inline        //inline
```

## 4.2. API

API , HAL

. ,  
. HAL API 가

---

 MH\_pltEvent

| MH_KEY_PRESSEVENT<br>MH_KEY_RELEASEEVENT<br>MH_KEY_REPEATEVENT | MH_KeyCode     |
|--|----------------|
| MH_EXIT_EVENT  | NULL           |
| MH_TIMER_EVENT   | NULL           |
| MH_SMS_EVENT   | MH_SMSEvent    |
| MH_ANN_EVENT   | MH_AnnInfo     |
| MH_CALL_EVENT  | MH_CallEvent   |
| MH_NETWORK_EVENT   | MH_NetEvent    |
| MH_SERIAL_EVENT  | MH_SerialEvent |
| MH_MEDIA_EVENT   | MH_MediaEvent  |

1 HAL

MH\_KEY\_PRESSEVENT -

KeyCode

MH\_KeyCode

MH\_KEY\_RELEASEEVENT -

KeyCode

MH\_KeyCode

MH\_KEY\_REPEAT\_EVENT - ,  
 MH\_KEY\_REPEAT\_EVENT  
 가 MH\_KEY\_REPEAT\_EVENT MH\_sysGetInformation  
 () key repeat ,  
 MH\_EXIT\_EVENT - .  
 MH\_TIMER\_EVENT - MH\_timerSet() 가 .  
 MH\_SMS\_EVENT - SMS 가 .  
 MH\_ANN\_EVENT - (Annunciator) 가 .  
 MH\_CALL\_EVENT - 가 .  
 MH\_NETWORK\_EVENT - .  
 MH\_SERIAL\_EVENT - .  
 MH\_MEDIA\_EVENT - .

M\_Boolean MH\_pltEvent(MH\_Event event, void \*param)

[in] event event  
 [in] param event .

TRUE

FALSE - , 가 full .

MH\_EXIT\_EVENT 가 MH\_pltStart()  
 .

## ✎ MH\_pltStart

```

HAL
    , MH_EXIT_EVENT

)
"org.kwis.am.Main"
MH_pltStart(0, "org.kwis.am.Main", 0, 0);
)
"org.kwis.am.Main" /test/appManager.jar
MH_pltStart(0, "org.kwis.am.Main", "/test/appManager.jar", 0);

```

```

M_Int32 MH_pltStart(M_Int32 JavaC, M_Char* programID, M_Char* path, M_Char*
args)

```

```

[in] JavaC      0      Java, 1      C
[in] programID  java    ,              main class
가      . C      ,              ID
[in] path      path    file 가
null
[in] args      (      가
0)

```

## 4.3. System

(Kernel)

(Critical Section)

(lock)

✍

```

MH_pltEvent()
. enum _MH_Event
. enum _MH_Event
가
가
enum MH_SUB_XXX_EVENT
) MH_SERIAL_EVENT
enum _MH_SUB_SERIAL_EVENT{
MH_SERIAL_READ = 0, // READ 가
MH_SERIAL_WRITE, // SERIAL write event
MH_SERIAL_ERROR, // H/W
};

enum _MH_Event {
MH_EXIT_EVENT = 1, //
MH_KEY_PRESSEVENT, // 가
MH_KEY_RELEASEEVENT, // 가
MH_KEY_REPEATEVENT, //
MH_TIMER_EVENT, // 가
MH_SMS_EVENT, // SMS 가
MH_CALL_EVENT, // 가
MH_ANN_EVENT // (Annunciator) 가

```

```

Event
MH_NETWORK_EVENT,
MH_SERIAL_EVENT,
MH_MEDIA_EVENT
};

```

|                     |                    | /                     |
|---------------------|--------------------|-----------------------|
| MH_EXIT_EVENT       |                    |                       |
| MH_KEY_PRESSEVENT   |                    | Key Press             |
| MH_KEY_RELEASEEVENT |                    | Key Release           |
| MH_KEY_REPEATEVENT  |                    | key press             |
| MH_TIMER_EVENT      |                    | MH_timerSet()         |
| MH_SMS_EVENT        | MH_SMS_NEW         | SMS                   |
|                     | MH_SMS_SEND_NOTIFY | MH_smsSend()          |
| MH_CALL_EVENT       | MH_CALL_INCOMING   | 가                     |
|                     | MH_CALL_NOTIFY     | MH_callPlace()        |
| MH_ANN_EVENT        |                    | Annunciator           |
| MH_NETWORK_EVENT    | MH_PPP_OPEN        | MH_netConnect()       |
|                     | MH_PPP_CLOSE       | MH_netClose()         |
|                     | MH_SOCKET_CONNECT  | MH_netSocketConnect() |
|                     | MH_SOCKET_CLOSE    | MH_netSocketClose()   |
|                     | MH_SOCKET_READ     | MH_netSocketRead()    |
|                     | MH_SOCKET_WRITE    | MH_netSocketWrite()   |
| MH_SERIAL_EVENT     | MH_SERIAL_READ     | MH_serialRead()       |



|                |                           |                   |
|----------------|---------------------------|-------------------|
|                | MH_SERIAL_WRITE           | MH_serialWrite()  |
|                | MH_SERIAL_ERROR           | H/W               |
|                | MH_SERIAL_DTR             |                   |
| MH_MEDIA_EVENT | MH_MDAEV__MEDIA<br>_EMPTY | MH_mdaWriteData() |
|                | MH_MDAEV_MEDIA_FULL       | MH_mdaRecord()    |

```

enum _MH_KeyCode{
MH_KEY_0      = '0',
MH_KEY_1      = '1',
MH_KEY_2      = '2',
MH_KEY_3      = '3',
MH_KEY_4      = '4',
MH_KEY_5      = '5',
MH_KEY_6      = '6',
MH_KEY_7      = '7',
MH_KEY_8      = '8',
MH_KEY_9      = '9',
MH_KEY_ASTERISK = '*',
MH_KEY_POUND  = '#',

MH_KEY_UP     = -1,
MH_KEY_DOWN   = -2,
MH_KEY_LEFT   = -3,
MH_KEY_RIGHT  = -4,
MH_KEY_SELECT = -5,
MH_KEY_SOFT1  = -6,
MH_KEY_SOFT2  = -7,
MH_KEY_SOFT3  = -8,
MH_KEY_SEND   = -10,
MH_KEY_END    = -11,
MH_KEY_POWER  = -12,

```

```
MH_KEY_SIDE_UP      = -13,
MH_KEY_SIDE_DOWN    = -14,
MH_KEY_SIDE_SEL     = -15,
MH_KEY_CLEAR        = -16,
MH_KEY_FLIPDOWN     = -17,
MH_KEY_FLIPUP       = -18,
MH_KEY_INVALID      = 0
};
```

```
enum MH_CallState {
MH_CS_IDLE = 0,
MH_CS_CALLING,
MH_CS_CALLED,
MH_CS_CALLREJECTED,
MH_CS_INCOMMING, // , 가 .(?)
MH_CS_OTHERCALL, //
MH_CS_TRANSFERCALL, //
MH_CS_END
}
```

```
enum _MH_Annunciator{
MH_ANN_RSSI, // RSSI
MH_ANN_BATT, //
MH_ANN_NOSERVICE, //
MH_ANN_SILENTMODE, // ,
MH_ANN_ALARM, //
}
typedef _MH_Annunciator MH_Annunciator;
```

```
struct _MH_AnnInfo{
    MH_Annunciator type; //Annunciator info type
    M_Int32 data; //
}
```

```
typedef struct _MH_AnnInfo MH_AnnInfo;
```

✍ MH\_sysGetHeapBlock

```
void MH_sysGetHeapBlock (M_Uint32* start, M_Uint32* size)
```

[out] start     Heap

[out] size     Heap

## ✂ MH\_sysGetInformation

```

        10    string
        가
command   가

```

```

)

```

```

M_Char buf[16];

```

```

MH_sysGetInformation("ESN", buf, sizeof(buf));

```

```

M_Int32 MH_sysGetInformation (M_Char* command, M_Char* buf, M_Int32 bufSize)

```

```

[in]   command   String

```

```

[out]  buf

```

```

[out]  bufSize

```

| command    |                               |
|------------|-------------------------------|
| "ESN"      | ESN                           |
| "NID"      | (Network Identification)      |
| "SID"      | (System Identification)       |
| "BASEID"   | (Base station Identification) |
| "BASELAT"  | (Base station Latitude)       |
| "BASELONG" | (Base station longitude)      |

| “CURRENTCH”    | (Current Channel number)   |  |        |                |              |              |            |              |            |              |            |              |                |             |               |        |            |         |            |         |             |         |           |
|----------------|--|--|--------|----------------|--------------|--------------|------------|--------------|------------|--------------|------------|--------------|----------------|-------------|---------------|--------|------------|---------|------------|---------|-------------|---------|-----------|
| “PHONENUMBER”  |  |  |        |                |              |              |            |              |            |              |            |              |                |             |               |        |            |         |            |         |             |         |           |
| “RSSILEVEL”    | RSSI   |  |        |                |              |              |            |              |            |              |            |              |                |             |               |        |            |         |            |         |             |         |           |
| “BATTERYLEVEL” |  |  |        |                |              |              |            |              |            |              |            |              |                |             |               |        |            |         |            |         |             |         |           |
| “MAXRSSILEVEL” | RSSI   |  |        |                |              |              |            |              |            |              |            |              |                |             |               |        |            |         |            |         |             |         |           |
| “MAXBATTLEVEL” |  |  |        |                |              |              |            |              |            |              |            |              |                |             |               |        |            |         |            |         |             |         |           |
| “MAXSERIALNUM” |  |  |        |                |              |              |            |              |            |              |            |              |                |             |               |        |            |         |            |         |             |         |           |
| “MAXSOCKETNUM” |  |  |        |                |              |              |            |              |            |              |            |              |                |             |               |        |            |         |            |         |             |         |           |
| “MEDIADEVICES” | <p>device ,<br/>                     “,” . device가<br/>                     M_E_NOTSUP .</p> <p>✍</p> <table border="1"> <thead> <tr> <th></th> <th>device</th> </tr> </thead> <tbody> <tr> <td>“Qualcomm_CMX”</td> <td>Qualcomm CMX</td> </tr> <tr> <td>“Yamaha_MA1”</td> <td>Yamaha MA1</td> </tr> <tr> <td>“Yamaha_MA2”</td> <td>Yamaha MA2</td> </tr> <tr> <td>“Yamaha_MA3”</td> <td>Yamaha MA3</td> </tr> <tr> <td>“audio/MIDI”</td> <td>MIDI play<br/>,</td> </tr> <tr> <td>“audio/MP3”</td> <td>MP3 play<br/>,</td> </tr> <tr> <td>“IS96”</td> <td>QCELP - 8K</td> </tr> <tr> <td>“IS96A”</td> <td>QCELP - 8K</td> </tr> <tr> <td>“IS733”</td> <td>QCELP - 13K</td> </tr> <tr> <td>“IS127”</td> <td>EVRC - 8K</td> </tr> </tbody> </table> <p>가 ,</p> |  | device | “Qualcomm_CMX” | Qualcomm CMX | “Yamaha_MA1” | Yamaha MA1 | “Yamaha_MA2” | Yamaha MA2 | “Yamaha_MA3” | Yamaha MA3 | “audio/MIDI” | MIDI play<br>, | “audio/MP3” | MP3 play<br>, | “IS96” | QCELP - 8K | “IS96A” | QCELP - 8K | “IS733” | QCELP - 13K | “IS127” | EVRC - 8K |
|                | device   |  |        |                |              |              |            |              |            |              |            |              |                |             |               |        |            |         |            |         |             |         |           |
| “Qualcomm_CMX” | Qualcomm CMX   |  |        |                |              |              |            |              |            |              |            |              |                |             |               |        |            |         |            |         |             |         |           |
| “Yamaha_MA1”   | Yamaha MA1   |  |        |                |              |              |            |              |            |              |            |              |                |             |               |        |            |         |            |         |             |         |           |
| “Yamaha_MA2”   | Yamaha MA2   |  |        |                |              |              |            |              |            |              |            |              |                |             |               |        |            |         |            |         |             |         |           |
| “Yamaha_MA3”   | Yamaha MA3   |  |        |                |              |              |            |              |            |              |            |              |                |             |               |        |            |         |            |         |             |         |           |
| “audio/MIDI”   | MIDI play<br>,   |  |        |                |              |              |            |              |            |              |            |              |                |             |               |        |            |         |            |         |             |         |           |
| “audio/MP3”    | MP3 play<br>,  |  |        |                |              |              |            |              |            |              |            |              |                |             |               |        |            |         |            |         |             |         |           |
| “IS96”         | QCELP - 8K   |  |        |                |              |              |            |              |            |              |            |              |                |             |               |        |            |         |            |         |             |         |           |
| “IS96A”        | QCELP - 8K   |  |        |                |              |              |            |              |            |              |            |              |                |             |               |        |            |         |            |         |             |         |           |
| “IS733”        | QCELP - 13K  |  |        |                |              |              |            |              |            |              |            |              |                |             |               |        |            |         |            |         |             |         |           |
| “IS127”        | EVRC - 8K  |  |        |                |              |              |            |              |            |              |            |              |                |             |               |        |            |         |            |         |             |         |           |

|                 |   |
|-----------------|---|
|                 | <p>“audio/xxx”</p> <p>MIME</p> <p>) 가 CMX, MA1 EVRC-8K</p> <p>, “Qualcomm_CMX, Yamaha_MA1”</p>      |
| “DNS”           | <p>. IP . )</p> <p>“127.0.0.1”</p>  |
| “TIMEZONE”      | <p>“GMT+ : “, “GMT- : “</p> <p>time zone . ,</p> <p>) “GMT+09:30”, “GMT -12:00”</p>                 |
| “PHONEMODEL”    | <p>ID string</p>  |
| “KEYREPEAT”     | <p>“ : “, ms .</p> <p>M_E_NOTSUP .</p> <p>) “600:250” 600ms</p> <p>MH_KEYREPEAT_EVENT 가 , 250ms</p> |
| “VIBRATORLEVEL” | <p>가 .</p> <p>( 0, 100)</p> <p>) “3” 3</p> <p>“1” 1</p>   |
| “VOLUMELEVEL”   | <p>가 .</p> <p>( 0, 100)</p> <p>) “10” 10</p> <p>“4” 4</p>   |

[out] buf .

string

[in] bufSize buf size

0

M\_E\_INVALID - command

M\_E\_NOTSUP - command

M\_E\_SHORTBUF - 가

## ✎ MH\_sysSetInformation

가 가 . HAL

```
M_Int32 MH_sysSetInformation(M_Char* cmd, M_Char* value)
```

[in] cmd .

[in] value cmd

0

M\_E\_ACCESS - .

M\_E\_INVALID - cmd value .



## ✎ MH\_sysLock

```

                (Critical Section)
                (external context)
MH_sysUnlock
MH_pltEvent()   가
                가 MH_pltEvent()   ISR(interrupt service
routine)        ,   가
                MH_pltEvent()   context
                (Critical Section)   MH_sysLock()
                MH_sysUnlock()   가 MH_pltEvent()
                HAL
MH_sysLock(), MH_sysUnlock   nested
MH_sysLock()   lock   ,   MH_sysUnlock
lock

```

```
void MH_sysLock (void)
```

```
MH_sysUnlock
```

✍ MH\_sysUnlock

MH\_sysLock ..

void MH\_sysUnlock (void)

MH\_sysLock

✍ MH\_sysHallnit

Hal .  
HAL API . HAL  
API 가 API .

void MH\_sysHallnit (void)

✍ MH\_sysHalExit

. HAL

HAL

```
void MH_sysHalExit()
```

✍ MH\_sysWait

Binary semaphore wait .

가 blocking CPU power

. HAL

void MH\_sysWait (void)



---

## ✎ MH\_debugPutChar

HAL API, (console) API

```
void MH_debugPutChar(M_Char ch);
```

[in] ch –





---

## ✎ MH\_callPlace

. 가 . 가  
(MH\_CALLEV\_NOTIFY)가 .

M\_Int32 MH\_callPlace (char \* phonenum)

[in] phonenum

0

M\_E\_ERROR -

✍ MH\_callEnd

MH\_CALLEV\_NOTIFY

void MH\_callEnd (void)

✎ MH\_callAccept

MH\_CALLEV\_INCOMING 가 ,

void MH\_callAccept(void)

MH\_SUB\_CALL\_EVENT

✎ MH\_callReject

. MH\_CALLEV\_INCOMING 가

.

.

void MH\_callReject(void)

## 4.5. HandSet Device



```
//  
typedef enum MH_DevBackLight {  
    MH_LIGHT_ON = 0,        //  
    MH_LIGHT_OFF,          //  
    MH_LIGHT_ALWAYS_ON,    //  
    MH_LIGHT_DEFAULT       //  
} MH_DevBackLight;
```

✎ MH\_devBacklight

가 .  
 MH\_LIGHT\_DEFAULT .  
 system , 가  
 0 LCD  
 1 LCD 가 . 가  
 color color  
 0xYYRRGGBB( (network byte ordering) ) .  
 YY RR (Red), GG (Green), BB (Blue)

M\_Int32 MH\_devBacklight (M\_Int32 id, MH\_DevBackLight on\_off, M\_Int32 color,  
 M\_Int32 timeout)

[ in] id  
 [ in] on\_off  
 [ in] color  
 [ in] timeout , MH\_DEV\_LIGHT\_ON

0

M\_E\_ERROR - 가



✎ MH\_devVibrator

```

Vibrator . on .
    level 0 timeout . level 0
vibrator 가 . level
0-100 . 100 가 가 0
가 . 0-100 가
가 가
가 가 MH_sysGetInformation()
) 가 => 1-100 :
가 , => 1-50 : , 51-100 :
가 , , => 1-33: , 34-66: ,
67-100:
    
```

```

void MH_devVibrator (M_Int32 level, M_Int32 timeout)
    
```

```

[in] level 0 off, 1-100
[in] timeout ,
    
```



✎ MH\_devLedControl



```
void MH_devLedControl (M_Int32 leds, M_Int32 mask)
```

[in] leds LED

[in] mask

✎ MH\_devGetLedCount

LED

M\_Int32 MH\_devGetLedCount (void)

led

## 4.6.

TCP/IP

```

    TCP/IP
    MH_netConnect()
    API
MH_netClose()
    가
    API
    (blocking)
    , API
MH_netClose() MH_netSocketClose() (NonBlocking)
    . MH_netClose() MH_netSocketClose() 가
    가
    API I/O 가 가
    MH_pltEvent()
MH_NETWORK_EVENT MH_NetEvent 가

```

---

```

// 가 2
#define MH_AF_INET 2

//TCP/UDP
typedef enum MH_SOCKET_TYPE{
    MH_SOCKET_STREAM =1, // TCP SOCKET
    MH_SOCKET_DGRAM // UDP SOCKET
} MH_SOCKET_TYPE;

//
typedef enum MH_SUB_NETWORK_EVENT {
    MH_NETEV_NETWORK_OPEN = 0x01, //
    MH_NETEV_NETWORK_CLOSE = 0x02, //
    MH_NETEV_SOCKET_CONNECT = 0x04, // SOCKET
    MH_NETEV_SOCKET_CLOSE = 0x08, // SOCKET

```

```
        MH_NETEV_SOCKET_READ = 0x10,           // SOCKET READ
        MH_NETEV_SOCKET_WRITE = 0x20,         // SOCKET WRITE
    } MH_SUB_NETWORK_EVENT;

//
typedef struct MH_NetEvent{
    M_Int32 fd;                                //
    M_Int32 event;                             //      event, MH_SUB_NETWORK_EVENT
} MH_NetEvent;
```



## ✎ MH\_netClose

(blocking)

MH\_netClose()

API

가

MH\_netClose() 가

M\_Int32 MH\_netClose (void)

0

M\_E\_INPROGRESS -

M\_E\_ERROR -

---

## ✎ MH\_netSocket

. 가 가 .

M\_Int32 MH\_netSocket (M\_Int32 domain, M\_Int32 type)

```
[in] domain                MH_AF_INET
[in] type                  MH_SOCKET_STREAM(TCP      ), MH_SOCKET_DGRAM(UDP
);
```

```
M_E_NOTSUP - domain      type
M_E_NOTCONN-           가 .
M_E_NOSPACE-
M_E_ERROR -
```

## ✍ MH\_netSocketConnect

```
TCP . M_E_WOULDBLOCK
(NonBlocking) , ,
MH_NETEV_SOCKET_CONNECT
```

```
M_Int32 MH_netSocketConnect (M_Int32 fd, M_Int32 addr, M_int16 port)
```

```
[ in] fd
[in] addr IP (network byte ordering)
.
[in] port (network byte ordering)
```

0

```
M_E_INVALID - 가 0
M_E_WODULDBLOCK -
M_E_NOTCONN - 가
M_E_ISCONN - CONNECT
M_E_INPROGRESS -
M_E_ERROR -
```



## ✎ MH\_netSocketRead

TCP . 0 EOF(End Of File) .  
 M\_E\_WOULDBLOCK 가  
 MH\_NETEV\_SOCKET\_READ 가

M\_Int32 MH\_netSocketRead (M\_Int32 fd, M\_Byte \*buf, M\_Int32 len)

[in] fd  
 [out] buf  
 [in] len

M\_E\_WOULDBLOCK - 가  
 M\_E\_NOTCONN- 가  
 M\_E\_ERROR -

## ✎ MH\_netSocketWrite

TCP . M\_E\_WOULDBLOCK  
 MH\_NETEV\_SOCKET\_WRITE 가

M\_Int32 MH\_netSocketWrite (M\_Int32 fd, M\_Byte \*buf, M\_Int32 len)

[in] fd  
 [in] buf  
 [in] len size

M\_E\_WOULDBLOCK -

M\_E\_NOTCONN - 가

M\_E\_ERROR -

---

## ✎ MH\_netSocketBind

local port .

M\_Int32 MH\_netSocketBind (M\_Int32 fd, M\_Int16 port)

[in] fd  
[in] port (network byte ordering)

0

M\_E\_INVALID - 가  
M\_E\_ISCONN - 가  
M\_E\_NOTCONN - 가  
M\_E\_ERROR -

## ✎ MH\_netSocketSendTo

UDP data . M\_E\_WOULDBLOCK  
 MH\_NETEV\_SOCKET\_WRITE 가

```
M_Int32 MH_netSocketSendTo (
    M_Int32 fd,
    M_Byte *buf,
    M_Int32 len,

    M_Int32 addr,
    M_Int16 port,

)
```

[in] fd  
 [in] buf  
 [in] len size  
 [in] addr IP . (network byte  
 ordering)  
 [in] port . (network byte  
 ordering)

M\_E\_WOULDBLOCK -  
 M\_E\_NOTCONN - 가  
 M\_E\_ERROR -



## ✎ MH\_netSocketRcvFrom

UDP . M\_E\_WOULDBLOCK  
 가 .  
 MH\_NETEV\_SOCKET\_READ 가 .

```
M_Int32 MH_netSocketRcvFrom (
    M_Int32 fd,
    M_Byte *buf,
    M_Int32 len,
    M_Int32 *addr,
    M_Int16 *port
)
```

[ in] fd -

[ out] buf -

[ in] len - size

[ out] addr IP . (network byte  
 ordering)

[ out] port . (network byte  
 ordering)

M\_E\_WOULDBLOCK - 가

M\_E\_NOTCONN - 가

M\_E\_ERROR -



---

## ✎ MH\_netSocketClose

(blocking)

```
M_Int32 MH_netSocketClose (M_Int32 fd)
```

[in] fd

0

M\_E\_INPROGRESS -

M\_E\_NOTCONN - 가

M\_E\_ERROR -



✎ MH\_netGetMaxPacketLength

UDP

M\_Int32 MH\_netGetMaxPacketLength (void)

✎ MH\_netSocketAccept

TCP . 가  
MH\_netSocketBind() . 가 M\_E\_WOULDBLOCK  
MH\_NETEV\_SOCKET\_CONNECT .

M\_Int32 MH\_netSocketAccept (M\_Int32 fd)

fd - TCP

M\_E\_WOULDBLOCK -

M\_E\_NOTSUP -

M\_E\_NOTCONN - 가

M\_E\_ERROR -

## 4.7. Serial

```

        MH_sysGetSystemInformation()
        “          가 0,          가 1, ... (
        -1)”          가
        .          가
        MH_pltEvent()
        MH_SERIAL_EVENT   MH_SerialEvent
    ✎
    //
    typedef enum MH_SUB_SERIAL_EVENT{
        MH_SERIALEV_READ = 0,    //
        MH_SERIALEV_WRITE,      //
        MH_SERIALEV_ERROR,      //   H/W
    } MH_SUB_SERIAL_EVENT;

    //
    typedef struct MH_SerialEvent{
        M_Int32 fd;              //
        M_Int32 event;          //   Event, MH_SUB_SERIAL_EVENT
    } MH_SerialEvent;

```

✎ MH\_serialOpen

```

        param
        ::= [
        ::= "=" *(, "=" )
        ::=
        ::=
    
```

| baudrate | 9600, 19200, 38400,<br>57600, 115200 |  | 115200 |
|----------|--------------------------------------|--|--------|
| parity   | even, odd, no                        |  | no     |
| size     |                                      |  | 8      |
| flow     | hardware, software,<br>no            |  | no     |

가 8 ,  
, 115200

”baudrate=115200,parity=no,size=8,flow=hardware”

가

M\_Int32 MH\_serialOpen (M\_Int32 port,M\_byte \*param)

[in] port

[in] param

M\_E\_NOTSUP -

M\_E\_INVALID -

M\_E\_ISCONN - 가

M\_E\_ERROR -

## ✎ MH\_serialWrite

```

M_E_WOULDBLOCK
,
가 , MH_SERIALEV_WRITE
MH_SERIALEV_WRITE
MH_serialWrite()
DTR M_E_NOTCONN

```

```
M_Int32 MH_serialWrite (M_Int32 fd, M_Uint8* buf, M_Int32 len)
```

```

[in] fd
[in] buf
[in] len

```

```

M_E_ERROR -
M_E_WODULDBLOCK -
M_E_NOTCONN - DTR

```

## ✎ MH\_serialRead

```

        M_E_WOULDBLOCK
가 , 가 , MH_SERIAL_READ
가 MH_SERIAL_READ
MH_serialRead()
DTR M_E_NOTCONN

```

```
M_Int32 MH_serialRead (M_Int32 fd, M_Uint8 *buffer, M_Int32 len)
```

```

[in] port
[out] buf
[in] len

```

```

M_E_ERROR - M_E_WOULDBLOCK - 가
M_E_NOTCONN - DTR

```

✎ MH\_serialClose

```
void MH_serialClose (M_Int32 fd)
```

```
[in] fd
```



## 4.8. MEDIA

```

API . /
. , vocoder ,
.

✍

//
typedef enum MH_mdaToneType {

    MH_SND_TONE_0 = 0,           // DTMF for 0 key
    MH_SND_TONE_1,             // DTMF for 1 key
    MH_SND_TONE_2,             // DTMF for 2 key
    MH_SND_TONE_3,             // DTMF for 3 key
    MH_SND_TONE_4,             // DTMF for 4 key
    MH_SND_TONE_5,             // DTMF for 5 key
    MH_SND_TONE_6,             // DTMF for 6 key
    MH_SND_TONE_7,             // DTMF for 7 key
    MH_SND_TONE_8,             // DTMF for 8 key
    MH_SND_TONE_9,             // DTMF for 9 key
    MH_SND_TONE_A,             // DTMF for A key
    MH_SND_TONE_B,             // DTMF for B key
    MH_SND_TONE_C,             // DTMF for C key
    MH_SND_TONE_D,             // DTMF for D key
    MH_SND_TONE_POUND,         // DTMF for # key
    MH_SND_TONE_STAR,          // DTMF for * key
    MH_SND_NOTE_A4,             // 440.0 Hz -Piano Notes-
    MH_SND_NOTE_AS4,           // 466.1 Hz
    MH_SND_NOTE_B4,             // 493.8 Hz
    MH_SND_NOTE_C4,             // 523.2 Hz
    MH_SND_NOTE_CS4,           // 554.3 Hz
    MH_SND_NOTE_D4,             // 587.3 Hz
    MH_SND_NOTE_DS4,           // 622.2 Hz
    MH_SND_NOTE_E4,             // 659.2 Hz
    MH_SND_NOTE_F4,             // 698.5 Hz

```

---

```
MH_SND_NOTE_FS4,           // 739.9 Hz
MH_SND_NOTE_G4,           // 784.0 Hz
MH_SND_NOTE_GS4,         // 830.6 Hz
MH_SND_NOTE_A5,          // 880.0 Hz
MH_SND_NOTE_AS5,         // 932.2 Hz
MH_SND_NOTE_B5,          // 987.7 Hz
MH_SND_NOTE_C5,          // 1046.5 Hz
MH_SND_NOTE_CS5,         // 1108.7 Hz
MH_SND_NOTE_D5,          // 1174.6 Hz
MH_SND_NOTE_DS5,         // 1244.3 Hz
MH_SND_NOTE_E5,          // 1318.5 Hz
MH_SND_NOTE_F5,          // 1397.0 Hz
MH_SND_NOTE_FS5,         // 1479.9 Hz
MH_SND_NOTE_G5,          // 1568.0 Hz
MH_SND_NOTE_GS5,         // 1661.2 Hz
MH_SND_NOTE_A6,          // 1760.0 Hz
MH_SND_NOTE_AS6,         // 1864.7 Hz
MH_SND_NOTE_B6,          // 1975.5 Hz
MH_SND_NOTE_C6,          // 2093.1 Hz
MH_SND_NOTE_CS6,         // 2217.4 Hz
MH_SND_NOTE_D6,          // 2349.3 Hz
MH_SND_NOTE_DS6,         // 2489.1 Hz
MH_SND_NOTE_E6,          // 2637.0 Hz
MH_SND_NOTE_F6,          // 2793.7 Hz
MH_SND_NOTE_FS6,         // 2959.9 Hz
MH_SND_NOTE_G6,          // 3135.9 Hz
MH_SND_NOTE_GS6,         // 3322.4 Hz
MH_SND_NOTE_A7,          // 3520.0 Hz

} MH_mdaToneType;

typedef enum MH_MdaDevInfo {
    MH_MDAINFO_STREAM_PLAY = 0x0001, // STREAM
```

---

```

    MH_MDAINFO_CALL_BY_REFERENCE    = 0x0002, //

    MH_MDAINFO_PAUSE_RESUME        = 0x0004, // pause/resume

    MH_MDAINFO_SEEK                = 0x0008 // seek
    MH_MDAINFO_STREAM_RECORD       = 0x0010, // STREAM

} MH_MdaDevInfo;

//
typedef enum MH_SUB_MEDIA_EVENT {
    MH_MDAEV_MEDIA_EMPTY = 0 // 가
    MH_MDAEV_TONE_EMPTY, // 가
    MH_MDAEV_MEDIA_FULL, // 가 full
    MH_MDAEV_MEDIA_ERROR, // 가
    MH_MDAEV_TONE_ERROR, // 가
} MH_SUB_MEDIA_EVENT;

//
typedef struct MH_MediaEvent{
    M_Int32 event; //MH_SUB_MEDIA_EVENT
    M_Int32 mdaID; /** */
    M_Int32 size; /* MH_MDAEV_MEDIA_EMPTY , MH_MDAEV_TONE_EMPTY
    ,
    MH_MDAEV_MEDIA_FULL ,
    */
} MH_MediaEvent;

```

✎ MH\_mdaTonePlay

```

Tone
    .
    .
    .
    가
    (MH_MDAEV_TONE_EMPTY)
    (MH_MDAEV_TONE_EMPTY)
    가
    ].
    가
MH_MDAEV_TONE_ERROR
mdaID number 0
, (MH_MDAEV_TONE_EMPTY)
MH_MediaEvent
mdaID field 가 0
. pause/resume
, MH_mdaTonePlay
가
, MH_mdaResume
.
pause/resume
MH_mdaTonePlay
,
,
MH_ MH_mdaTonePlay 가
.
0
.

```

M\_Int32 MH\_mdaTonePlay (MH\_mdaToneType tone[], M\_Int32 duration[], M\_Int32 number)

```

[in] tones
[in] duration ( ms)
[in] number

```

```

M_E_INUSE -
M_E_ERROR - 가

```



✎ MH\_mdaFreqTonePlay

```

Tone
    .
    .
    가
    (MH_MDAEV_TONE_EMPTY)
    (MH_MDAEV_TONE_EMPTY)
    가 ]. 가
MH_MDAEV_TONE_ERROR
mdaID number 0 , (MH_MDAEV_TONE_EMPTY)
MH_MediaEvent mdaID field 가 0 . pause/resume
    , MH_mdaTonePlay
    가 , MH_mdaResume
pause/resume MH_mdaFreqTonePlay
    ,
    , MH_MH_mdaFreqTonePlay 가
    0
    .
    
```

```

M_Int32 MH_mdaFreqTonePlay (M_Int32 hiFreq[], M_Int32 lowFreq[], M_Int32
duration[], M_Int32 number)
    
```

```

[in] hiFreq
[in] lowFreq
[in] duration ( ms)
[in] number
    
```

```

M_E_INUSE -
M_E_ERROR - 가
    
```



---

## ✎ MH\_mdaGetDeviceID

```
MH_sysGetInformation() . MH_sysGetInformation command
    "MEDIADVICES" .
    mdaID number 0
mdaID number 0 .
```

```
M_Int32 MH_mdaGetDeviceID(M_Char* devName)
```

```
[ in] devName
```

```
M_E_NOTSUP -
```

```
MH_sysGetInformation
```



✎ MH\_mdaGetDeviceInfo

1. MH\_MDAINFO\_STREAM\_PLAY bit  
 MH\_mdaWriteData( , MH\_mdaTonePlay, MH\_mdaFreqTonePlay) 가 0  
 MH\_MDAINFO\_CALL\_BY\_REFERENCE bit 가
2. MH\_MDAINFO\_CALL\_BY\_REFERENCE bit MH\_mdaWriteData( 가 0 , MH\_mdaTonePlay, MH\_mdaFreqTonePlay) 가 bit가 가
3. MH\_MDAINFO\_PAUSE\_RESUME bit 가 pause/resume
4. MH\_MDAINFO\_SEEK bit 가 seek
5. MH\_MDAINFO\_STREAM\_RECORD bit MH\_mdaCopy

M\_Int32 MH\_mdaGetDeviceInfo(M\_Int32 mdaID, M\_Int32\* rtnInfo)

[in] mdaID  
 [out] rtnInfo MH\_MdaDevInfo bit OR

0

M\_E\_ERROR -

✎ MH\_mdaWriteData

가 (MH\_MDAEV\_MEDIA\_EMPTY)  
 [ (MH\_MDAEV\_MEDIA\_EMPTY) 가 ].  
 MH\_mdaStop()가 가  
 가 ( ) . 가  
 가  
 MH\_MDAEV\_MEDIA\_ERROR . 가  
 , MH\_mdaWriteData가 .

```
M_Int32 MH_mdaWriteData (
M_Int32 mdaID,
void *buf,
M_Int32 size,
)
```

```
[in] mdaID
[in] buf
[in] size
```

```
M_E_INUSE -
M_E_ERROR - 가
M_E_NOTSUP -
```

✎ MH\_mdaPlay

MH\_mdaPlay() 가  
 (background) 가 가  
 (MH\_MDAEV\_MEDIA\_EMPTY)  
 가 MH\_MDAEV\_MEDIA\_ERROR 가  
 가  
 가

M\_Int32 MH\_mdaPlay(M\_Int32 mdaID, M\_Boolean repeat)

[in] mdaID (MH\_mdaGetDeviceID )  
 [in] repeat TRUE :  
 FALSE :

0

M\_E\_INPROGRESS ? 가  
 M\_E\_ERROR -  
 M\_E\_NOTSUP ?

## ✎ MH\_mdaPause

가 (state) MH\_mdaResume 가  
 , pause/resume  
 .

M\_Int32 MH\_mdaPause(M\_Int32 mdamdID)

[in] mdaID

0

M\_E\_NOTSUP - pause/resume

## ✎ MH\_mdaResume

. 가  
, pause/resume .

M\_Int32 MH\_mdaResume(M\_Int32 mdaID)

[ in] mdaID

0

M\_E\_NOTSUP - pause/resume

---

## ✎ MH\_mdaSeek

milli second . pause  
가 , seek

M\_Int32 MH\_mdaSeek(M\_Int32 mdaID, M\_Int32 seekTime)

[in] mdaID  
[in] seekTime (ms), 0  
,

0

M\_E\_NOTSUP - seek

✎ MH\_mdaRecordFreeze

/ MH\_mdaStop() . 가  
MH\_mdaStop() MH\_mdaRecordFreeze() ,  
.

M\_Int32 MH\_mdaRecordFreeze(M\_Int32 mdaID)

[ in] mdaID

가 /  
(0 )

M\_E\_ERROR - / 가



✎ MH\_mdaStop

/ 가 . 가 . 가 .

M\_Int32 MH\_mdaStop (M\_Int32 mdaID)

[in] mdaID

0

✎ MH\_mdaGetVolume

가  
 , 가  
 가 0, 100  
 0 - 100 . 0-100  
 가 가  
 . 가  
 가 MH\_sysGetInformation()  
 ) 가 , => 1-50 : 51-100 :  
 가 , , => 1-33: , 34-66: ,  
 67-100:

M\_Int32 MH\_mdaGetVolume (M\_Int32 mdaID)

[in] mdaID

M\_E\_NOTSUP -

## ✎ MH\_mdaSetVolume

가  
가

0, 100

가

```
void MH_mdaSetVolume (M_Int32 mdaID, M_Int32 value)
```

[ in] mdaID

[ in] value (0-100 )

M\_E\_NOTSUP -

✎

## MH\_mdaControl

(control) 가  
 , HAL 가  
 . 가 ,  
 가 cmd  
 .

```
M_Int32 MH_mdaControl(M_Int32 mdaID, M_Int32 cmd, void* buf1, void* buf2);
```

[in] mdaID  
 [in] cmd (control)  
 [in] buf1 buf1  
 [in] buf2 buf2

0

M\_E\_ERROR- command , command

✎ MH\_mdaRecord

. MH\_mdaRecord() 가  
 (background) sampling  
 . 가 가 full  
 (MH\_MDAEV\_MEDIA\_FULL)  
 . 가 MH\_MDAEV\_MEDIA\_ERROR  
 가 가  
 가 full . 가 full  
 . 가 full  
 , stop .

M\_Int32 MH\_mdaRecord (M\_Int32 mdaID)

[in] mdaID (MH\_mdaGetDeviceID )

0

M\_E\_INPROGRESS - 가

M\_E\_ERROR -

M\_E\_NOTSUP -

---

## ✎ MH\_mdaCopy

, MH\_mdaCopy 가 .

```
M_Int32 MH_mdaCopy(M_Int32 mdaID, void* buf, M_Int32 size)
```

[in] mdaID (MH\_mdaGetDeviceID )

[in] buf 가

[in] size

M\_E\_ERROR -

M\_E\_NOTSUP -

---

## ✎ MH\_mdaSetMuteState

M\_Int32 MH\_mdaSetMuteState(M\_int32 source, M\_Boolean bmute)

source - [in]

MC\_MDA\_VOLTYPE\_TONE, MC\_MDA\_VOLTYPE\_SOUND, MC\_MDA\_VOLTYPE\_RECORDER  
가

bmute - [in]

TRUE :

FALSE :

M\_E\_SUCCESS -

M\_E\_ERROR -

M\_E\_INVALIDSOURCE -

✎ MH\_mdaGetMuteState

M\_Boolean MH\_mdaGetMuteState(M\_int32 source)

source - [in]

MC\_MDA\_VOLTYPE\_TONE, MC\_MDA\_VOLTYPE\_SOUND, MC\_MDA\_VOLTYPE\_RECORDER  
가

TRUE :

FALSE :



## 4.9. TIME

HAL                    1     Timer     가  
                              , HAL     UTC            70   1   1   0   0   0  
                              milli-second                                    .

---

## ✎ MH\_timerSet

가 HAL\_TIMER\_EVENT 가  
MH\_timerSet() ,  
가 .

```
void MH_timerSet (M_Int64 timeout)
```

[in] timeout milli-second , 64bit

✍ MH\_timerClear

```
void MH_timerClear (void)
```

MH\_timerSet

✎ MH\_timerCurrentTime

M\_Int64 MH\_timerCurrentTime (void)

UTC            70   1   1   0   0   0            milli-second

## 4.10. UTILITY

---

## ✎ MH\_utilConvertLocalCodeToUnicode

Space(0x20)

```
M_Int32 MH_utilConvertLocalCodesToUnicode (M_Char *psz, int len, M_Uint16
*puni, int buflen)
```

```
[in] psz      "C"      (      ;      EUC_KR  )
```

```
[in] len
```

```
[out] puni    "Unicode"
```

```
[in] buflen
```

M\_E\_SHORTBUF - puni 가

## ✎ MH\_utilConvertUnicodeToLocalCode

가  
0x20 (Space)

```
M_Int32 MH_utilConvertUnicodeToLocalCode(M_Uint16 *puni, M_Int32 len,
M_Uint8 *plocal, M_Int32 buflen);
```

[in] unicode

[in] puni “Unicode”

[in] len

[out] puni “C” ( ;  
EUC\_KR )

[in] buflen

M\_E\_SHORTBUF - plocal 가

✎ MH\_utilUnConvertLocalCodeToUnicodeChar

```
M_UInt16 MH_utilConvertLocalCodeToUnicodeChar(M_UInt8 *psz, M_Int32 len,  
M_Int32 *pconsumed);
```

[in] psz

[in] len

[out] pconsumed

Unicode



✎ MH\_utilGetLocalCodeSizeInUnicode

```
M_UInt32 MH_utilLocalCodeSizeToUnicodeChar(M_UInt16 *psz, M_Int32 len);
```

[in] psz

[in] len ( :M\_UInt16)

( : )

---

✎ MH\_utilGetUnicodeSizeInLocalCode

M\_Uint16

M\_Uint32 MH\_utilGetUnicodeSizeInLocalCode (M\_Uint8 \*psz, M\_Int32 len);

[in] psz

[in] len

( :M\_Uint16)

## 4.11. FILE

```

File System      .
  API            path      path      .
blocking        .                HAL API      HAL

```




```

#define MH_FILE_OPEN_RDONLY      0x1      // (O_RDONLY)
#define MH_FILE_OPEN_WRONLY      0x2      // (O_WRONLY|O_CREAT)
#define MH_FILE_OPEN_WRTRUNC     0x4      //
(O_WRONLY|O_CREAT|O_TRUNC)
#define MH_FILE_OPEN_RDWR       0x8      // (O_RDWR|O_CREAT|O_BINARY)
#define MH_FILE_SEEK_SET         0
#define MH_FILE_SEEK_CUR         1
#define MH_FILE_SEEK_END         2
#define MH_FILE_IS_DIR           0x01

typedef struct _fileInfo MH_FileInfo {
    M_Int32 attrib                //          bit mask      (
,                                )
    M_Uint32 creationTime        //
    M_Uint32 size                //
};

```

---

  
 MH\_fileAttribute

```
M_Int32 MH_fileAttribute (M_Char* pathname, MH_FileInfo* fi)
```

```
[in]  pathname
```

```
[out] fi
```

```
0
```

```
M_E_BADFILENAME -
```


```
M_E_LONGNAME -
```

```
M_E_ERROR -
```

✎ MH\_fileAvailable

M\_Int32 MH\_fileAvailable (void)

M\_E\_ERROR -

 MH\_fileClose

.

M\_Int32 MH\_fileClose (M\_Int32 fd)

[in] fd

0

M\_E\_ERROR

## ✎ MH\_fileList

```
buf  NULL  ('\0')  NULL
```

```
M_Int32 MH_fileList (M_Char *root, M_Char* buf, M_Int32 bufSize)
```

```
[in]  root
```

```
[out] buf
```

```
[in]  bufSize  buf
```

```
0
```

```
M_E_SHORTBUF - 가
```

```
M_E_BADFILENAME -
```

```
M_E_LONGNAME -
```

```
M_E_ERROR -
```

✎ MH\_fileMkDir

M\_Int32 MH\_fileMkDir (M\_Char \* dirname)

[in] dirname

0

M\_E\_BADFILENAME -

M\_E\_LONGNAME -

M\_E\_NOENT -

가

M\_E\_EXIST -

가

M\_E\_ERROR -



## ✎ MH\_fileOpen

flag 가

| flag                 |   |
|----------------------|---|
| MH_FILE_OPEN_RDONLY  |   |
| MH_FILE_OPEN_WRONLY  |   |
| MH_FILE_OPEN_WRTRUNC | 0 |
| MH_FILE_OPEN_RDWR    | 가 |

M\_Int32 MH\_fileOpen (M\_Char\* pathname, M\_Int32 flag)

[in] pathname

[in] flag

file

M\_E\_NOENT - MH\_FILE\_OPEN\_RDONLY

M\_E\_BADFILENAME -

M\_E\_LONGNAME -

M\_E\_INVALID - open option option parameter

M\_E\_NOSPACE -

M\_E\_ERROR -



---

## ✍ MH\_fileRead

buf .

```
M_Int32 MH_fileRead (M_Int32 fd, M_Char* buf, M_Int32 size)
```

|       |      |                |
|-------|------|----------------|
| [in]  | fd   |                |
| [out] | buf  | buffer pointer |
| [in]  | size | buffer size    |

Size가 0 0 .  
0 EOF .

M\_E\_EOF -

M\_E\_ERROR -

 MH\_fileRemove

M\_Int32 MH\_fileRemove (M\_Char\* pathname)

[in] pathname

0

M\_E\_NOENT -

M\_E\_INUSE -

M\_E\_BADFILENAME -

M\_E\_LONGNAME -

M\_E\_ERROR -

---

  
 MH\_fileRename

```
M_Int32 MH_fileRename (M_Char *oldname, M_Char *newname)
```

```
[in] oldname
```

```
[in] newname
```

```
0
```

```
M_E_BADFILENAME -
```

```
M_E_LONGNAME -
```

```
M_E_NOSPACE -
```

```
M_E_ERROR -
```

```
M_E_NOENT -
```

```
M_E_EXIST
```

```
-
```

```
M_E_INUSE -
```

✎ MH\_fileRmdir

가

M\_Int32 MH\_fileRmdir (M\_Char \* dirname)

[in] dirname

0

M\_E\_BADFILENAME -

M\_E\_LONGNAME -

M\_E\_NOTEMPTY -

가

M\_E\_NOENT - 가

M\_E\_ERROR -



---

  
✎ MH\_fileWrite

fd                    가                    buf 가 가                    size

M\_Int32 MH\_fileWrite (M\_Int32 fd, M\_Char\* buf, M\_Int32 size)

[in]    fd  
[in]    buf  
[in]    size                    write

write

M\_E\_ERROR -

M\_E\_NOSPACE -



✎ MH\_fileTotalSpace

M\_Int32 MH\_fileTotalSpace (void)

M\_E\_ERROR -

## ✎ MH\_fileSetMode

. 가 table fmode

```
M_Int32 MH_fileSetMode(char* pathName, M_Int32 mode)
```

[in] pathName

[in] fmode mode

|                    |   |   |
|--------------------|---|---|
| fmode              |   |   |
| MH_FILEMODE_RDONLY |   | 1 |
| MH_FILEMODE_WRONLY | . | 2 |
| MH_FILEMODE_RDWR   | / | 3 |

M\_E\_SUCCESS -

M\_E\_ERROR -

M\_E\_BADFILENAME -

M\_E\_LONGNAME - 가

M\_E\_INVALID - mode 가

M\_E\_NOENT -

## ✎ MH\_fileGetCounts

가 .

M\_Int32 MH\_fileGetCounts(char\* pathName)

[in] pathName

M\_E\_ACCESS -

M\_E\_ERROR -

M\_E\_BADFILENAME -

M\_E\_LONGNAME - 가

 MH\_fileIsExist

M\_Int32 MH\_fileIsExist(char\* pathName)

[in] pathName

M\_E\_SUCCESS -


M\_E\_ACCESS -

M\_E\_ERROR -

M\_E\_BADFILENAME -

M\_E\_LONGNAME -

M\_E\_NOENT -

 MH\_fileTell

M\_Int32 MH\_fileTell(M\_Int32 fd)

[in] fd

M\_E\_INVALIDFD -

M\_E\_ERROR -

## 4.12. InputMethod

```

InputMethod Automata
    ( ) InputMethod
InputMethod ( ) ( )
    ( ) ( )
InputMethod
    ( ) ,
MH_IMAgetSupportModeCount() MH_IMAgetSupportedModes(),
    MH_IMAgetCurrentMode
MH_IMAgetSupportedModes()
    , ISO 639 , 가
    "/S", "/L" 가
    "EN/S"
    "KO"
    , "N123"
    가 HAL ,

#define MH_IMA_NUM_MODE "N123" //
#define MH_IMA_FLUSH -99 //
    가 MH_IMAhandleInput
    가
    MH_pItEvent


```

✎ MH\_IMAgetSurpportModeCount

\_Int32 MH\_IMAgetSurpportModeCount()

✎ MH\_IMAgetSupportedModes()

. . . , 가 . ISO 639  
 . "EN/S" 가  
 . "KO" .

char\*\* MHAgetSupportedModes()

( )



✎ MH\_IMAsetCurrentMode

MH\_IMAgetSupportedModes()

M\_Int32 MH\_IMAsetCurrentMode (M\_Int32 mode)

가

"1".

"0".

✎ MH\_IMAGetCurrentMode()

MH\_IMAgetSupportedModes()

M\_Int32 MH\_IMAGetCurrentMode()

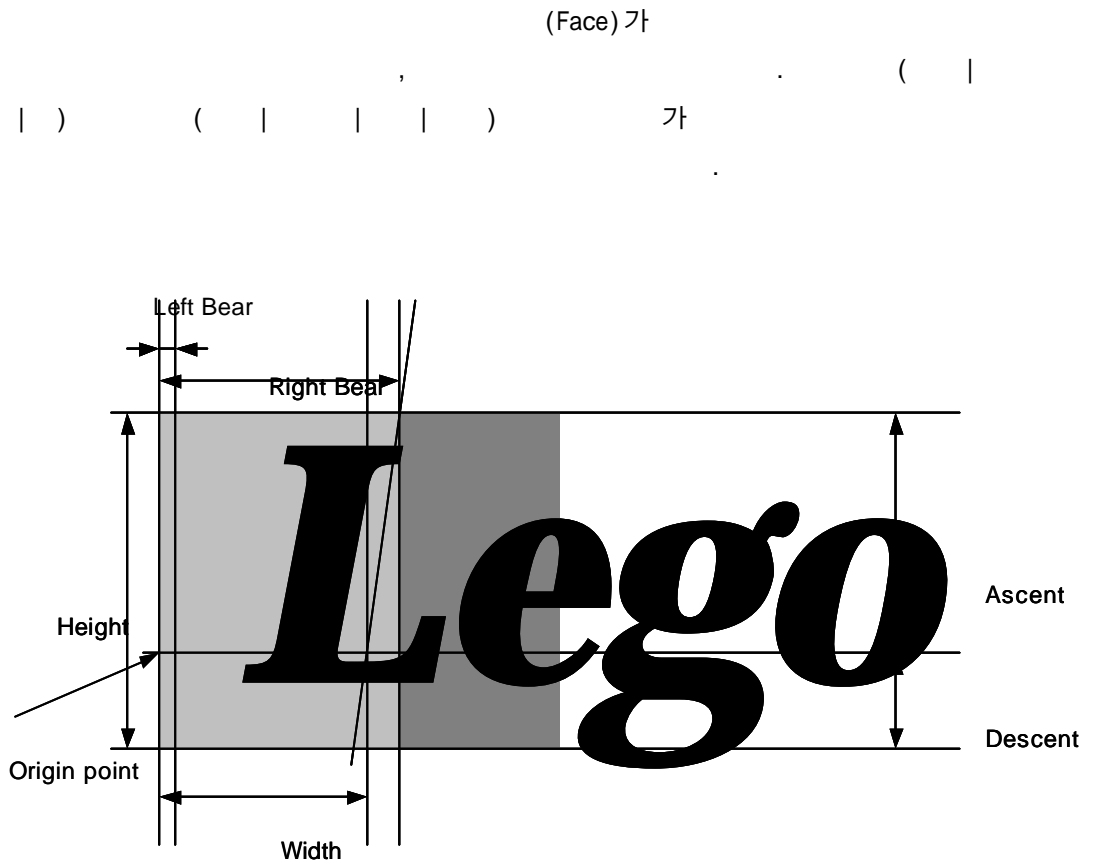
## ✎ MH\_IMAhandleInput

, ( )MH\_IMA\_FLUSH 가

```
M_Int32 MH_IMAhandleInput (
    char key,
    M_Int32 type,
    char *buf1,
    M_Int32 *size1,
    char *buf2,
    M_Int32 *size2
);
```

|            |             |                 |
|------------|-------------|-----------------|
| key [in]   | (MH_KeyCode | , MH_IMA_FLUSH) |
| type [in]  | (MH_Event   | .)              |
| buf1 [out] |             |                 |
| size1 [in] |             |                 |
| buf2 [out] |             |                 |
| size2 [in] |             |                 |

## 4.13. Font



2

(Height)

(Ascent)

(Descent)

(Bear)

(Left Bear) 0

가 . (Right Bear)가 (Width)  
 , (Width)

. (Right Bear)

✍

```
typedef struct _MH_CharGlyphInfo {
    // (bear)
    int lbear;
    // (bear)
    int rbear;
    //
    int width;
    //
    int height;
} MH_CharGlyphInfo;

#define MH_FB_FT_SIZE_SMALL 8
#define MH_FB_FT_SIZE_MEDIUM 0
#define MH_FB_FT_SIZE_LARGE 16

#define MH_FB_FT_FACE_SYSTEM 0
#define MH_FB_FT_FACE_MONOSPACE 32
#define MH_FB_FT_FACE_PROPORTIONAL 64

#define MH_FB_FT_STYLE_PLAIN 0
#define MH_FB_FT_STYLE_BOLD 1
#define MH_FB_FT_STYLE_ITALIC 2
#define MH_FB_FT_STYLE_UNDERLINE 4
```

## ✎ MH\_fnGetFont

```

face    MH_FB_FT_FACE_SYSTEM, MH_FB_FT_FACE_MONOSPACE(
        ), MH_FB_FT_FACE_PROPORTIONAL(
        ),
size    MH_FB_FT_SIZE_SMALL,    MH_FB_FT_SIZE_MEDIUM,
MH_FB_FT_SIZE_LARGE
가 . style    MH_FB_FT_STYLE_ITALIC,
MH_FB_FT_STYLE_BOLD,    MH_FB_FT_STYLE_UNDERLINED    OR
MH_FB_FT_STYLE_PLAIN
가 가

```

“C”

```
M_Int32 MH_fnGetFont (M_Int32 face, M_Int32 size, M_Int32 style)
```

```
[in] face    (MH_FB_FT_FACE_SYSTEM, MH_FB_FT_FACE_MONOSPACE,
MH_FB_FT_FACE_PROPORTIONAL)
```

```
[in] size    (MH_FB_FT_SIZE_SMALL, MH_FB_FT_SIZE_MEDIUM,
MH_FB_FT_SIZE_LARGE)
```

```
[in] style    (MH_FB_FT_STYLE_ITALIC, MH_FB_FT_STYLE_BOLD,
MH_FB_FT_STYLE_UNDERLINED)
```

✎ MH\_fnGetFontHeight

M\_Int32 MH\_fnGetFontHeight (M\_Int32 font)

[in] font

✎ MH\_fnGetFontAscent

(Ascent)

M\_Int32 MH\_fnGetFontAscent (M\_Int32 font)

[in] font

(Ascent)



✎ MH\_fnGetFontDescent

(Descent) .

M\_Int32 MH\_fnGetFontDescent (M\_Int32 font)

[in] font

(Descent)



---

[in] ch ( . 가 )

[in] fgPxl

[in] bgPxl

[out] bpl

. ch 가 NULL

## ✎ MH\_fnGetCharInfo

(Left Bear)                      (Right Bear)

```
M_Int32 MH_fnGetCharInfo(M_Int32 font, M_Uint16 char, MH_CharGlyphInfo *pcg)
```

[in] font

[in] char (                      .                      가                      )

[out] pcg

0

:

M\_E\_ERROR -

가



```
#define MH_FB_SUB_LCD      2
```

✎ MH\_GRP\_DIRECT\_COLOR\_TYPE

```
#define MH_GRP_DIRECT_COLOR_TYPE
```

```
. (1 << 0) .
```

✎ MH\_GRP\_GRAY\_TYPE

```
#define MH_GRP_GRAY_TYPE
```

```
. (1 << 1) .
```



✎ MH\_GRP\_COLOR\_TYPE

```
#define MH_GRP_COLOR_TYPE
```

```
. (1 << 2) .
```

## ✎ MH\_fbGetDisplayInfo

```

screen                . screen      MH_FB_MAIN_LCD
MH_FB_SUB_LCD        가            . MH_FB_MAIN_LCD
LCD                  , MH_FB_SUB_LCD   가      LCD

```

```
void MH_fbGetDisplayInfo (M_Int32 screen, MH_DisplayInfo* displayinfo)
```

```

[in]   screen                : MH_FB_MAIN_LCD, MH_FB_SUB_LCD
      가
[out] displayinfo

```

---

## ✎ MH\_fbFlushLcd

LCD

```
void MH_fbFlushLcd (  
    M_Int32 screen,  
    M_Int32 x,  
    M_Int32 y,  
    M_Int32 w,  
    M_Int32 h  
)
```

screen - : MH\_FB\_MAIN\_LCD, MH\_FB\_SUB\_LCD 가  
x - x  
y - y  
w -  
h -

 MH\_fbMakePixel

0xRRGGBB

M\_Int32 MH\_fbMakePixel (M\_Int32 color)

color - 0xRRGGBB color

✎ MH\_fbGetPixelFromRGB

r, g, b

M\_Int32 MH\_fbGetPixelFromRGB (M\_Int32 r, M\_Int32 g, M\_Int32 b)

r - (0-255)

g - (0-255)

b - (0-255)

---

## ✎ MH\_fbGetRGBFromPixel

```
M_Int32 MH_fbGetRGBFromPixel (M_Int32 pixel, M_Int32 *r, M_Int32 *g,  
M_Int32 *b)
```

pixel –

r - (0-255)

g - (0-255)

b - (0-255)



## 4.15. Virtual Key

```

        가
        가
(mapping)
        ( )
        가 , 가 ,
MH_keyGetVirtualCode MH_keyGetKeyCode 가
        가
“MH_VIRGAME_A” 가 가 가 “7” “1”
“SOFT_2”
int a;
a = MH_keyGetVirtualCode(MH_KEY_7); // a == MH_VIRGAME_A
✎
// UP
#define MH_VIRUP 1
// DOWN
#define MH_VIRDOWN 6
// LEFT
#define MH_VIRLEFT 2
// RIGHT
#define MH_VIRRIGHT 5
// FIRE(SEL)
#define MH_VIRFIRE 8
// GAME1
#define MH_VIRGAME_A 9
// GAME2
#define MH_VIRGAME_B 10
// GAME3
#define MH_VIRGAME_C 11
// GAME4
#define MH_VIRGAME_D 12
// SIDE UP
#define MH_VIRSIDE_UP 96

```



```
// SIDE DOWN
#define      MH_VIRSIDE_DOWN      97
// SIDE SEL
#define      MH_VIRSIDE_SEL      98
// SIDE CLEAR
#define      MH_VIRSIDE_CLEAR    99
```

---

## ✎ MH\_keyGetVirtualCode

(mapping) 가 가

M\_Int32 MH\_keyGetVirtualCode(M\_Int32 keyCode)

keyCode KeyCode . MH\_KeyCode

[in] Virtual Keypad

---

✎ MH\_keyGetKeyCode

가 (mapping) 가

M\_Int32 MH\_keyGetKeyCode(M\_Int32 gameAction)

[in] gameAction Virtual KeyPad

KeyCode . MH\_KeyCode .

## 5. API

### 5.1. C API

Clet API . Clet

✍ handleCletEvent

```
void CletHandleEvent(int type, int param1, int param2)
```

. type 1 가 . param1

param2 type .

| (type)                     |   |                             |
|----------------------------|---|-----------------------------|
| MV_KEY_PRESS_EVENT         | 가 | param1 =<br>.<br>param2 = 0 |
| MV_KEY_REPEAT_EVENT        | 가 | param1 =<br>.<br>param2 = 0 |
| MV_KEY_RELEASE_EVENT       | 가 | param1 =<br>.<br>param2 = 0 |
| MV_CHILD_APP_START_EVENT   |   | param1 =<br><br>param2 = 0  |
| MV_CHILD_APP_DESTROY_EVENT |   | param1 =<br><br>param2 =    |
| MV_USER_EVENT              |   | param1 =<br><br>param2 =    |

## ✍ startClet

```
void startClet(int argc, char *argv[]);
```

. argc 가 , argv  
. argv[0] argv[argc-1] 가 .

## ✍ pauseClet

```
void pauseClet();
```

. 가

## ✍ resumeClet

```
void resumeClet();
```

. 가

## ✍ destroyClet

```
void destroyClet();
```

## ✍ paintClet

```
void paintClet(int x, int y, int w, int h);
```

. x, y, w, h

가 .

### 5.1.1.

API  
 / , / , , ,  
 API .  
 (static) , (dynamic)  
 (compaction) .  
 ,  
 ,  
 MC\_knlAlloc() API , MC\_knlFree()  
 API .  
 (compaction)  
 가 . (ID)  
 (compaction)  
 (compaction)  
 가 , MC\_knlGetFreeMemory() API  
 . API (compaction) API  
 .  
 API API . API  
 (indirect) API . API  
 API .  
 ( ) , DECLARE\_INDIRECTBUF()  
 .DECLARE\_INDIRECTBUF()  
 가 .

```

typedef struct _IndirectBuf {
    INDIRECT_BUF_HEAD;
    char buf[1024]
} IndirectBuf;

char staticBuf[256]; // (static) buffer
char imageBuf[1024];
DECLARE_INDIRECTBUF(IndirectBuf, idBuf);

void startClet() {
    M_Byte* dynamicBuf;
    M_Uint32 mBufID;
    M_Int32 freeMemorySize;
    
```

```

strcpy(staticBuf, "this is testing...\n");
MC_knlPrintk("%s", staticBuf);

mBufID = MC_knlCalloc(256);          // mBufID
dynamicBuf = MC_GETDPTR(mBufID);    //
strcpy(dynamicBuf, "this is testing...\n");
MC_knlPrintk("%s", dynamicBuf);

freeMemorySize = MC_knlGetFreeMemory(); //
    (compaction)

dynamicBuf = MC_GETDPTR(mBufID);     //      (compaction)
//

MC_knlPrintk("%s", dynamicBuf);

MC_knlFree(mBufID);

...

if ( (rID = MC_knlGetResourceID("test.gif", &rSize)) < 0 ) {
    MC_knlPrintk(resource not found\n");
    ...
}

mBufID = MC_knlCalloc(rSize); //
MC_knlGetResource(rID, mBufID, rSize);
dynamicBuf = MC_GETDPTR(mBufID);
memcpy(imageBuf, dynamicBuf, rSize);

...
MC_knlGetResource(rID, &idBuf, rSize); //
DECLARE_INDIRECTBUF()
memcpy(imageBuf, idBuf.buf, rSize);
...
}

```

가 / 가

(access) . event /

가 . 가 ,

(over lay) ..

heap .

가

가

(symbolic)

(symbolic)

가 API

1 가

가 , ESN

API

가 API 가 (caller)

가 .. API

가 API



MC\_PRGTYPE\_JAVAAPP

```
#define MC_PRGTYPE_JAVAAPP
```

```
. 1 .
```

 MC\_PRGTYPE\_CAPP

```
#define MC_PRGTYPE_CAPP
```

```
C . 2 .
```

 MC\_PRGTYPE\_CDLL

```
#define MC_PRGTYPE_CDLL
```

```
C , 3 .
```

✎ MC\_PRGTYPE\_JAVADLL

```
#define MC_PRGTYPE_JAVADLL
```

```
, 4 .
```

✍ MC\_PRGTYPE\_JAVASYDLL

```
#define MC_PRGTYPE_JAVASYDLL
```

```
, 5 .
```

✍ MC\_DIR\_SYS\_READ\_REQ\_MASK

```
#define MC_DIR_SYS_READ_REQ_MASK
```

```
system directory read 가 . 0x01 .
```

✎ MC\_DIR\_SYS\_WRITE\_REQ\_MASK

```
#define MC_DIR_SYS_WRITE_REQ_MASK
```

```
system directory write가 . 0x02 .
```

✎ MC\_DIR\_SHARED\_READ\_REQ\_MASK

```
#define MC_DIR_SHARED_READ_REQ_MASK
```

```
shared directory read 가 . 0x04 .
```



✎ MC\_DIR\_SHARED\_WRITE\_REQ\_MASK

```
#define MC_DIR_SHARED_WRITE_REQ_MASK
```

```
shared directory write가 . 0x08 .
```

✎ MC\_NETWORK\_ACCESS\_REQ\_MASK

```
#define MC_NETWORK_ACCESS_REQ_MASK
```

```
network API 가 . 0x10 .
```

✎ MC\_SERIAL\_ACCESS\_REQ\_MASK

```
#define MC_SERIAL_ACCESS_REQ_MASK
```

```
serial API 가 . 0x20 .
```

---

✎ MC\_SYSTEM1\_ACCESS\_REQ\_MASK

```
#define MC_SYSTEM1_ACCESS_REQ_MASK
```

```
system group1      API      가 (system group1      API      가  
    ) . 0x40          .
```

---

✎ MC\_SYSTEM2\_ACCESS\_REQ\_MASK

```
#define MC_SYSTEM2_ACCESS_REQ_MASK
```

```
system group2      API      가 (system group2      API      가  
    ) . 0x80          .
```

## ✎ MC\_GETDPTR

```
#define MC_GETDPTR(mID)
```

```
MC_knICalloc()
```

```
mID -
```

## ✎ DECLARE\_INDIRECTBUF

```
#define DECLARE_INDIRECTBUF(typeName, var)
```

```
(          ) .
```

```
,
```

```
typedef struct type_name {
```

```
    INDIRECT_BUF_HEAD; //
```

```
    char buf[1024]; // 가
```

```
};
```

```
typeName - 가
```

```
var -
```

kernel overview

## ✍ MCTimer

```
typedef struct _MTimer MCTimer
```

```
MC_knIDefTimer, MC_knISetTimer, MC_knIUnsetTimer
```



---

## ✍ TIMERCB


```
typedef void (*TIMERCB)(MCTimer *tm, void* parm)
```

```
MC_knIDefTimer( . 가 .
```

tm -


parm -

```
MC_knIDefTimer
```

 MC\_knlPrintk

```
int MC_knlPrintk(M_Char* format, ...)
```

|                |        |   |                                      |
|----------------|--------|---|--------------------------------------|
| format string  | stdout | . | “ISO/IEC 9899:1999(E) -- Programming |
| Languages – C” | printf | . |                                      |

 MC\_knlSprintf

```
int MC_knlSprintf(M_Char* buf, M_Char* format, ...)
```

```
format string buf .
```

```
“ISO/IEC 9899:1999(E) -- Programming Languages – C” sprintf .
```

## ✎ MC\_knlGetExecNames

```
M_Int32 MC_knlGetExecNames(M_Char* prgName, M_Char* version, M_Char* vendor,
M_Char* buf, M_Int32 bufSize)
```

```

prgName(          ), version, vendor
.              가 NULL
.              prgName, version, vendor 가      NULL
,              .              null
.
.
.
)"/1/1.jar,3\ 0/2/2.jar,2\ 0"      buf
.

```

```

prgName - [in]
version - [in]
vendor - [in]
buf - [out] null      list
bufSize - [in] buf

```

count

M\_E\_SHORTBUF - buf 가

## ✎ MC\_knlExecute

```
M_Int32 MC_knlExecute(M_Char* execName, M_Int32 parmCnt, ...)
```

```

        java/C/C++
        ,
        (non-blocking)
        MV_CHILD_APP_DESTROY_EVENT
        , event

```

```

C
...
MC_knlExecute("execName", 4, "this parm1", "20", "this parm3", "40");
...

        C/C++
void startClet(int argc, char* args[]) {
    args[0]; // ( )
    args[1]; // "this parm1" 가
    args[2]; // "20" 가
    args[3]; // "this parm3" 가
    args[4]; // "40" 가
}

        Java
public static void main(String[] args) {
    int argsLen = args.length; // 5
    args[0]; // " ( )
    args[1]; // "this parm1" 가
    args[2]; // "20" 가
    args[3]; // "this parm3" 가
    args[4]; // "40" 가
}

```

execName - [in]

, MC\_knlGetExecNames()

parmCnt - [in]

ID

M\_E\_ACCESS - ,  
M\_E\_NOMEMORY - 가  
M\_E\_INVALID - 가



exitCode - [in]



 MC\_knlProgramStop

M\_Int32 MC\_knlProgramStop(M\_Int32 prgID)

prgID - [in]

0

M\_E\_ACCESS -

✎ MC\_knlGetCurProgramID

M\_Int32 MC\_knlGetCurProgramID()

 MC\_knlGetParentProgramID

M\_Int32 MC\_knlGetParentProgramID()

 MC\_knlGeAppManagerID

M\_Int32 MC\_knlGetAppManagerID()

ID .

## ✎ MC\_knlGetProgramInfo

```
M_Int32 MC_knlGetProgramInfo(M_Int32* buf, M_Int32 bufSize)
```

```

, index index
type . buf[2]가 MC_PRGTYPE_JAVADLL prgID가 2
java application DLL .

```

buf - [out]

bufSize - [in]

M\_E\_SHORTBUF - 가

---

## ✎ MC\_knlGetAccessLevel

M\_Int32 MC\_knlGetAccessLevel ()

(bit)

API

(bit)

MC\_DIR\_SYS\_READ\_REQ\_MASK, MC\_DIR\_SYS\_WRITE\_REQ\_MASK,  
 MC\_DIR\_SHARED\_READ\_REQ\_MASK, MC\_DIR\_SHARED\_WRITE\_REQ\_MASK,  
 MC\_NETWORK\_ACCESS\_REQ\_MASK, MC\_SERIAL\_ACCESS\_REQ\_MASK,  
 MC\_SYSTEM1\_ACCESS\_REQ\_MASK, MC\_SYSTEM2\_ACCESS\_REQ\_MASK

( OR )

---

## ✎ MC\_knlGetProgramName

```
M_Int32 MC_knlGetProgramName(M_Char * nameBuf, M_Int32 bufSize)
```

ADF

nameBuf - [out]

bufSize - [in] namebuf size

0

M\_E\_SHORTBUF - 가

---

## ✎ MC\_knlCreateSharedBuf

```
void* MC_knlCreateSharedBuf(const M_Char* name, M_Int32 size)
```

name - [in]

. Null

size - [in]

( )

0 -

가

가

가



---

## ✎ MC\_knlDestroyShareBuf

```
M_Int32 MC_knlDestroySharedBuf(void* buf)
```

```
buf - [in] ( )
```

```
0
```

```
M_E_INVALID -
```

```
가
```

```
M_E_ERROR -
```

---

## ✎ MC\_knlGetSharedBuf

```
void* MC_knlGetSharedBuf(const M_char* name)
```

name

name - [in]

. Null

( )

0 -

가

---

## ✎ MC\_knlGetSharedBufSize

```
M_Int32 MC_knlGetSharedBufSize(void* buf)
```

```
buf - [in] ( ). MC_knlCreateSharedBuf()  
MC_knlGetSharedBuf()
```

-1 - 가

---

✎ MC\_knlResizeSharedBuf

```
void* MC_knlResizeSharedBuf(void* buf, M_Int32 size)
```

.

```
buf - [in]      (      )  
size - [in]
```

가 ( )

0

가

---

## ✎ MC\_knlAlloc

M\_Uint32 MC\_knlAlloc(M\_Int32 size)

MC\_knlFree()

MC\_GETDPTR()

size - [in] (byte )

0

가

---

## ✎ MC\_knlCalloc

```
M_Uint32 MC_knlCalloc(M_Int32 size)
```

```
MC_knlFree()
```

```
MC_GETDPTR()
```

```
size - [in] (byte )
```

```
0
```

```
가
```

✎ MC\_knlFree

```
void MC_knlFree(M_Uint32 mID)
```

```
MC_knlAlloc()
```

```
mID - [in]
```

 MC\_knlGetTotalMemory

```
M_Int32 MC_knlGetTotalMemory()
```

```
total .
```

```
total (byte )
```



 MC\_knlGetFreeMemory

```
M_Int32 MC_knlGetFreeMemory()
```

```
free . free .  
,
```

```
free (byte )
```

## ✎ MC\_knlDefTimer

```
void MC_knlDefTimer(MCTimer* tm, TIMERCB cb)
```

```
가          가
가          MC_knlSetTimer()
가
```

```
MCTimer tm;

void TimerCb(MCTimer* ptm, void* parm) {
    MC_knlPrintk("timer occur %d\n", parm);
    MC_knlSetTimer(ptm, 1000L, (int)param+1);
}

void startClet(int argc, char* argv[]) {
    MC_knlPrintk("start Clet!!!\n");
    MC_knlDefTimer(&tm, TimerCb);
    MC_knlSetTimer(&tm, 1000L, 0x1234);
}
```

tm - [in]

cb - [in]

## ✎ MC\_knlSetTimer

```
M_Int32 MC_knlSetTimer(MCTimer* tm, M_Int64 timeout, void* parm)
```

```

가      MC_knlDefTimer()      가
      가
      ,
      가
      MC_knlUnsetTimer()
      resolution
      가

```

```

tm - [in]
timeout - [in] milliseconde
parm - [in] 가

```

0

M\_E\_EXIST - 가

## ✎ MC\_knlUnsetTimer

```
void MC_knlUnsetTimer(MCTimer* tm)
```

. 가 .

tm - [in]

✎ MC\_knlCurrentTime

M\_Int64 MC\_knlCurrentTime()

.                    millisecond                    .

1970   1   1   0   0   0                    millisecond

## ✎ MC\_knlGetSystemProperty

```
M_Int32 MC_knlGetSystemProperty(M_Char* id, M_Char* rtnBuf, M_Int32 bufSize)
```

```

HAL      API      MH_sysGetInformation()
,
가
.
"ESN", "NID", "SID", "BASELAT", "BASELONG", "CURRENTCH",
"PHONENUMBER", "RSSILEVEL", "BATTERYLEVEL",
"DATASERVICEMODE", "MAXSOCKETNUM", "MAXRSSILEVEL",
"MAXSERIALNUM", "MAXBATTLELEVEL", "MEDIADVICES", "DNS",
"VIBRATORLEVEL " id
.

```

id - [in]

rtnBuf - [out]

bufSize - [in]

0

M\_E\_SHORTBUF : 가

M\_E\_INVALID : 가

 MC\_knlSetSystemProperty

M\_Int32 MC\_knlSetSystemProperty(M\_Char\* id, M\_Char\* buf)

buf HAL API MH\_sysSetInformation() id,  
, 가

id - [in] ID  
buf - [in]

0

M\_E\_INVALID : 가 ,

✎ MC\_knlGetResourceID

```
M_Int32 MC_knlGetResourceID(M_Char* resourceName, M_Int32* size)
```

ID

resourceName - [in]

size - [?]

ID

M\_E\_NOENT : 가



---

## ✎ MC\_knlGetResource

```
M_Int32 MC_knlGetResource(M_Int32 resourceID, void* buf, M_Int32 bufSize)
```

ID

.

resourceID - [in] ID

buf - [in] ( )

bufSize - [in]

0

M\_E\_SHORTBUF : 가

### 5.1.2.

(Off Screen Frame Buffer)

API .

(Byte Per Line) .

MC\_GrpFramebuffer , , ,

/

MC\_grpCreateOffScreenFramebuffer

MC\_grpGetScreenFramebuffer 가 .

MC\_grpDestoryScreenFramebuffer .

가 .

Offset) 가 .

MC\_grpSetContext

API , API

( alpha ) 가 (alpha ), XOR (xor )  
alpha xor 가 , xor

/

BMP, PNG .

```

MC_grpCreatelImage
. MC_grpDrawImage
animated MC_grpDecodeNextImage
. MC_grpDestoryImage
MC_grpEncoDelImage BMP
LCD
LCD
, MC_grpFlushLcd LCD
LCD 가 LCD LCD LCD 가
LCD MC_grpFlushLcd
LCD
가
MC_imGetSurpportModeCount()
ISO 639
가 가 "/S", "/L" 가
"N123"
MC_GrpContext, MC_GrpFrameBuffer

```

## ✎ MC\_GrpPixelOpProc

```
typedef M_Int32 (*MC_GrpPixelOpProc)(M_Int32 srcpxl, M_Int32 orgpxl, M_Int32  
param1)
```

(Operation)

srcpxl    orgpxl    param1

srcpxl - [in]

destpxl - [in]

param1 - [in]

```
int alphaOp(int srcpxl, int orgpxl, int param1){  
    return (srcpxl * (255 - param1) + orgpxl * param1) / 255;  
}
```

---

## ✎ MC\_GrpContext

```
typedef struct _MC_GrpContext MC_GrpContext
```

```
    ,  
    ,  
    ,  
    ,  
    가 .
```

✎ MC\_GRP\_DIRECT\_COLOR\_TYPE

```
#define MC_GRP_DIRECT_COLOR_TYPE
```

```
. (1 << 0) .
```

✎ MC\_GRP\_GRAY\_TYPE

```
#define MC_GRP_GRAY_TYPE
```

```
    . (1 << 1) .
```

✎ MC\_GRP\_COLOR\_TYPE

```
#define MC_GRP_COLOR_TYPE
```

```
    . (1 << 2) .
```



 `_MC_GrpDisplayInfo`

```
struct _MC_GrpDisplayInfo
int m_bpp

int m_depth

int m_width

int m_height

int m_bpl

int m_colortype
    ; MC_GRP_DIRECT_COLOR_TYPE, MC_GRP_GRAY_TYPE, MC_GRP_COLOR_TYPE
int m_redmask

int m_bluemask

int m_greenmask

int m_bpp

int m_depth

int m_width

int m_height

int m_bpl

int m_colortype
```

```
        ; MC_GRP_DIRECT_COLOR_TYPE, MC_GRP_GRAY_TYPE, MC_GRP_COLOR_TYPE  
int m_redmask  
  
int m_bluemask  
  
int m_greenmask
```

✎ MC\_GrpDisplayInfo

```
typedef struct _MC_GrpDisplayInfo MC_GrpDisplayInfo
```

가

✎ \*MC\_GrpFrameBuffer

```
typedef M_Int32 MC_GrpFrameBuffer
```

가 .

✎ MC\_GRP\_GET\_FRAME\_BUFFER\_POINTER

```
#define MC_GRP_GET_FRAME_BUFFER_POINTER(a)
```

a - [in] MC\_GrpFrameBuffer

✎ MC\_GRP\_GET\_FRAME\_BUFFER\_WIDTH

```
#define MC_GRP_GET_FRAME_BUFFER_WIDTH(a)
```

a - [in] MC\_GrpFrameBuffer

✍ MC\_GRP\_GET\_FRAME\_BUFFER\_HEIGHT

```
#define MC_GRP_GET_FRAME_BUFFER_HEIGHT(a)
```

a - [in] MC\_GrpFrameBuffer

✍ MC\_GRP\_GET\_FRAME\_BUFFER\_BPL

```
#define MC_GRP_GET_FRAME_BUFFER_BPL(a)
```

a - [in] MC\_GrpFrameBuffer



✎ MC\_GRP\_GET\_FRAME\_BUFFER\_BPP

```
#define MC_GRP_GET_FRAME_BUFFER_BPP(a)
```

a - [in] MC\_GrpFrameBuffer

✎ MC\_GRP\_CONTEXT\_CLIP\_IDX

```
#define MC_GRP_CONTEXT_CLIP_IDX
```

가

.

,

,

. 0

✎ MC\_GRP\_CONTEXT\_FG\_PIXEL\_IDX

```
#define MC_GRP_CONTEXT_FG_PIXEL_IDX
```

```
. 1 .
```

✎ MC\_GRP\_CONTEXT\_BG\_PIXEL\_IDX

```
#define MC_GRP_CONTEXT_BG_PIXEL_IDX
```

```
. 2 .
```

✎ MC\_GRP\_CONTEXT\_ALPHA\_IDX

```
#define MC_GRP_CONTEXT_ALPHA_IDX
```

```
0 . , 255 . 4
```

✎ MC\_GRP\_CONTEXT\_PIXELOP\_IDX

```
#define MC_GRP_CONTEXT_PIXELOP_IDX
```

```
    (Operation)          . 5          .
```

```
MC_GrpPixelOpFunc
```

✎ MC\_GRP\_CONTEXT\_PIXEL\_PARAM1\_IDX

```
#define MC_GRP_CONTEXT_PIXEL_PARAM1_IDX
```

```
가 가 . 6 .
```

✎ MC\_GRP\_CONTEXT\_FONT\_IDX

```
#define MC_GRP_CONTEXT_FONT_IDX
```

```
MC_getFont . 7 .
```



✎ MC\_GRP\_CONTEXT\_STYLE\_IDX

```
#define MC_GRP_CONTEXT_STYLE_IDX
```

```
MC_GRP_SOLID_STYLE      MC_GRP_DOTTED_STYLE      가      . 8
```

✎ MC\_GRP\_CONTEXT\_XOR\_MODE\_IDX

```
#define MC_GRP_CONTEXT_XOR_MODE_IDX
```

```
    XOR      .          . 1 XOR      ,  
            . 9      .
```

✎ MC\_GRP\_CONTEXT\_OFFSET\_IDX

```
#define MC_GRP_CONTEXT_OFFSET_IDX
```

```
(Offset)
```

```
. 10
```

✎ MC\_GRP\_SOLID\_STYLE

```
#define MC_GRP_SOLID_STYLE
```

```
. MG_FB_SOLID_STYLE .
```

✎ MC\_GRP\_DOTTED\_STYLE

```
#define MC_GRP_DOTTED_STYLE
```

```
MG_FB_DOTTED_STYLE
```

✎ MC\_GRP\_FT\_SIZE\_SMALL

```
#define MC_GRP_FT_SIZE_SMALL
```

```
. 8 .
```

✎ MC\_GRP\_FT\_SIZE\_MEDIUM

```
#define MC_GRP_FT_SIZE_MEDIUM
```

```
. 0 .
```

✎ MC\_GRP\_FT\_SIZE\_LARGE

```
#define MC_GRP_FT_SIZE_LARGE
```

```
. 16 .
```



✎ MC\_GRP\_FT\_FACE\_SYSTEM

```
#define MC_GRP_FT_FACE_SYSTEM
```

```
. 0 .
```

✎ MC\_GRP\_FT\_FACE\_MONOSPACE

```
#define MC_GRP_FT_FACE_MONOSPACE
```

. 32 .

✎ MC\_GRP\_FT\_FACE\_PROPORTIONAL

```
#define MC_GRP_FT_FACE_PROPORTIONAL
```

. 64 .

✎ MC\_GRP\_FT\_STYLE\_PLAIN

```
#define MC_GRP_FT_STYLE_PLAIN
```

```
. 0 .
```

✎ MC\_GRP\_FT\_STYLE\_BOLD

```
#define MC_GRP_FT_STYLE_BOLD
```

```
. 1 .
```

✎ MC\_GRP\_FT\_STYLE\_ITALIC

```
#define MC_GRP_FT_STYLE_ITALIC
```

```
. 2 .
```

~~MC\_GRP\_FT\_STYLE\_UNDERLINE~~

```
#define MC_GRP_FT_STYLE_UNDERLINE
```

```
. 4 .
```

~~MC\_GRP\_IMAGE\_DONE~~

```
#define MC_GRP_IMAGE_DONE
```

```
. 1 .
```



✎ MC\_GRP\_FRAME\_DONE


```
#define MC_GRP_FRAME_DONE
```

가 . 0

✎ MC\_GrpImage

```
typedef void * MC_GrpImage
```

( )가

 MC\_GRP\_IS\_ANIMATED

```
#define MC_GRP_IS_ANIMATED
```

```
. 1 .
```

✎ MC\_GRP\_ANIMATE\_DELAY

```
#define MC_GRP_ANIMATE_DELAY
```

```
. 2 .
```

✎ MC\_GRP\_LOOP\_COUNT

```
#define MC_GRP_LOOP_COUNT
```

```
. 3 .
```

## ✎ MC\_grpGetImageProperty

```
int MC_grpGetImageProperty(MC_GrpImage img, int index)
```

|                      |                 |
|----------------------|-----------------|
| MC_GRP_IS_ANIMATED   | ; 1 , 0         |
| MC_GRP_ANIMATE_DELAY | ;               |
| MC_GRP_LOOP_COUNT    |                 |
| MC_GRP_IMAGE_WIDTH   |                 |
| MC_GRP_IMAGE_HEIGHT  |                 |
| MC_GRP_IMAGE_BPP     | (Bit per Pixel) |

img -

index -

## ✎ MC\_grpGetImageFrameBuffer

```
MC_GrpFrameBuffer MC_grpGetImageFrameBuffer(MC_GrpImage img)
```

img -

---

## ✎ MC\_grpGetScreenFrameBuffer

```
MC_GrpFrameBuffer MC_grpGetScreenFrameBuffer(M_Int32 i)
```

```
    i  
  
    i - [in]      0      LCD      , 1  
                LCD  
  
                ; i      가      NULL
```



## ✎ MC\_grpDestroyOffScreenFrameBuffer

```
void MC_grpDestroyOffScreenFrameBuffer(MC_GrpFrameBuffer fb)
```

fb - [in]

## ✎ MC\_grpCreateOffScreenFrameBuffer

```
MC_GrpFrameBuffer MC_grpCreateOffScreenFrameBuffer(M_Int32 w, M_Int32 h)
```

```

LCD
가
w h 0

```

```
w - [in]
```

```
h - [in]
```

```
; w, h 가 0 가
```

```
NULL
```

---

## ✎ MC\_grpInitContext

```
void MC_grpInitContext(MC_GrpContext* pgc)
```

```
    .  
    , Alpha , XORMode,  
    가 , ,  
    , (0, 0) .
```

pgc - [in] MC\_GrpContext

 MC\_grpSetContext

```
void MC_grpSetContext(MC_GrpContext* pgc, M_Int32 index, void* pv)
```

. index pv 가

| idx                         | pv   |
|-----------------------------|--|
| MC_GRP_CONTEXT_CLIP_IDX     | pv 가<br>x, y 가 ,<br>x, y 가   |
| MC_GRP_CONTEXT_FG_PIXEL_IDX | .  |
| MC_GRP_CONTEXT_BG_PIXEL_IDX | .  |
| MC_GRP_CONTEXT_ALPHA_IDX    | 0<br>255 0 255<br>MC_GRP_CONTEXT_PIXEL_OP_IDX<br>MC_GRP_CONTEXT_PIXEL_PARAM1_IDX 가 |
| MC_GRP_CONTEXT_FONT_IDX     | .  |
| MC_GRP_CONTEXT_STYLE_IDX    | MC_GRP_SOLID_STYLE, MC_GRP_DOTTED_STYLE  |
| MC_GRP_CONTEXT_PIXEL_OP_IDX | .  |
| MC_GRP_CONTEXT_OFFSET_IDX   | . pv   |

|  |                  |
|--|------------------|
|  | 가 . x ,<br>y 가 . |
|--|------------------|

index - [in] ; MC\_GRP\_CONTEXT\_CLIP\_IDX, MC\_GRP\_CONTEXT\_FG\_PIXEL\_IDX,  
MC\_GRP\_CONTEXT\_BG\_PIXEL\_IDX, MC\_GRP\_CONTEXT\_ALPHA\_IDX,  
MC\_GRP\_CONTEXT\_FONT\_IDX, MC\_GRP\_CONTEXT\_STYLE\_IDX,  
MC\_GRP\_CONTEXT\_PIXEL\_OP\_IDX, MC\_GRP\_CONTEXT\_OFFSET\_IDX  
pv - [in]

MC\_GrpContext, MC\_GrpGetContext

---

## ✎ MC\_grpGetContext

```
void MC_grpGetContext(MC_GrpContext* pgc, M_Int32 index, void* pv)
```

. index pv 가  
MC\_grpSetContext .

index - [in] ; MC\_GRP\_CONTEXT\_CLIP\_IDX, MC\_GRP\_CONTEXT\_FG\_PIXEL\_IDX,  
MC\_GRP\_CONTEXT\_BG\_PIXEL\_IDX, MC\_GRP\_CONTEXT\_ALPHA\_IDX,  
MC\_GRP\_CONTEXT\_FONT\_IDX, MC\_GRP\_CONTEXT\_STYLE\_IDX,  
MC\_GRP\_CONTEXT\_PIXELOP\_IDX, MC\_GRP\_CONTEXT\_OFFSET\_IDX  
pv - [out]

MC\_GrpContext, MC\_grpSetContext

---

## ✎ MC\_grpPutPixel

```
void MC_grpPutPixel(MC_GrpFrameBuffer dst, M_Int32 x, M_Int32 y,  
MC_GrpContext* pgc)
```

pgc 가 (Frame Buffer) .  
가 x, y 가  
가

dst - [in]

x - [in] x

y - [in] y

pgc - [in]

## ✎ MC\_grpDrawLine

```
void MC_grpDrawLine(MC_GrpFrameBuffer dst, M_Int32 x1, M_Int32 y1, M_Int32
x2, M_Int32 y2, MC_GrpContext* pgc)
```

(Frame Buffer) .  
pgc 가 가 , /  
(x1, y2), (x2, y2) .  
가  
.

dst - [in]

x1 - [in] x

y1 - [in] y

x2 - [in] x

y2 - [in] y

pgc - [in]



## ✎ MC\_grpDrawRect

```
void MC_grpDrawRect(MC_GrpFrameBuffer dst, M_Int32 x, M_Int32 y, M_Int32 w,
M_Int32 h, MC_GrpContext* pgc)
```

(Frame Buffer)

pgc 가 (x,y) 가 w, h (x+w-1,y+h-1) /

w h가

dst - [in]

x - [in] x

y - [in] y

w - [in]

h - [in]

pgc - [in]

## ✎ MC\_grpFillRect

```
void MC_grpFillRect(MC_GrpFrameBuffer dst, M_Int32 x, M_Int32 y, M_Int32 w,
M_Int32 h, MC_GrpContext* pgc)
```

(Frame Buffer)

pgc 가 (x,y) 부터 (x+w,y+h) 까지  
, (x+w-1, y+h-1) 까지  
w h가 0

dst - [in]

x - [in] x

y - [in] y

w - [in]

h - [in]

pgc - [in]

## ✎ MC\_grpCopyFrameBuffer

```
void MC_grpCopyFrameBuffer( MC_GrpFrameBuffer dst, M_Int32 dx, M_Int32 dy,
M_Int32 w, M_Int32 h, MC_GrpFrameBuffer src, M_Int32 sx, M_Int32 sy,
MC_GrpContext* pgc)
```

(Frame Buffer)

pgc 가 (dx, dy)  
w, h img 가 가 (sx, sy)  
dst src 가 MC\_grpCopyArea  
w h 가 0 src

dst - [in]  
dx - [in] x  
dy - [in] y  
w - [in]  
h - [in]  
src - [in]  
sx - [in] x  
sy - [in] y  
pgc - [in]

MC\_grpCopyArea

## ✎ MC\_grpDrawImage

```
void MC_grpDrawImage( MC_GrpFrameBuffer dst, M_Int32 dx, M_Int32 dy, M_Int32
w, M_Int32 h, MC_GrpImage src, M_Int32 sx, M_Int32 sy, MC_GrpContext* pgc)
```

(Frame Buffer)

pgc 가 (dx, dy)  
w, h img 가 가 (sx, sy)  
가

w h 가 0 src mask plane  
mask 가 1bit plane src 가 DEPTH 가

dst - [in]  
dx - [in] x  
dy - [in] y  
w - [in]  
h - [in]  
src - [in]  
sx - [in] x  
sy - [in] y  
pgc - [in]

---

## ✎ MC\_grpCopyArea

```
void MC_grpCopyArea(MC_GrpFrameBuffer dst, M_Int32 dx, M_Int32 dy, M_Int32 w,  
M_Int32 h, M_Int32 x, M_Int32 y, MC_GrpContext* pgc)
```

dst 가 가 (dx, dy) dst (x, y) w, h

dst - [in]

dx - [in] x

dy - [in] y

w - [in]

h - [in]

x - [in] x

y - [in] y

pgc - [in]

## ✎ MC\_grpDrawArc

```
void MC_grpDrawArc(MC_GrpFrameBuffer dst, M_Int32 x, M_Int32 y, M_Int32 w,
M_Int32 h, M_Int32 s, M_Int32 e, MC_GrpContext* pgc)
```

(Frame Buffer)

pgc 가 (Frame Buffer) 가 , /

s e , 0 가 3 .

(x,y)가 height, width

drawRect 가 (x + width, y + height) 가

가 0 .

dst - [in]

x - [in] x

y - [in] y

w - [in]

h - [in]

s - [in] (0-360 : )

e - [in] (0-360 : )

pgc - [in]

## ✎ MC\_grpFillArc

```
void MC_grpFillArc(MC_GrpFrameBuffer dst, M_Int32 x, M_Int32 y, M_Int32 w,
M_Int32 h, M_Int32 s, M_Int32 e, MC_GrpContext* pgc)
```

(Frame Buffer)

pgc 가 (Frame Buffer) 가 /

s e , 0 가 3

(x,y)가 height, width

fillRect 가 (x + width - 1, y + height - 1) 가

가 0

dst - [in]

x - [in] x

y - [in] y

w - [in]

h - [in]

s - [in] (0-360 : )

e - [in] (0-360 : )

pgc - [in]

## ✎ MC\_grpDrawString

```
void MC_grpDrawString(MC_GrpFrameBuffer dst, M_Int32 x, M_Int32 y, const
M_Char* str, M_Int32 len, MC_GrpContext* pgc)
```

```

                                (Frame Buffer)
pgc 가                                가 /
str                                "C"                                Unicode
drawUnicodeString
len -1                                가 NULL                                , len 0 -1

```

```

pd - [in]
bpl - [in]
x - [in]                                x
y - [in]                                baseline y
str - [in] "C"
len - [in]
pgc - [in]

```



## ✎ MC\_grpDrawUnicodeString

```
void MC_grpDrawUnicodeString(MC_GrpFrameBuffer dst, M_Int32 x, M_Int32 y,
const M_UCode* str, M_Int32 len, MC_GrpContext* pgc)
```

```

                                (Frame Buffer)
pgc 가                                가                                /

str                                "C"                                drawString
                                "C"                                ,

len 0

dst - [in]
x - [in]      x
y - [in]      baseline y
str - [in]
len - [in]
pgc - [in]
```

## ✎ MC\_grpGetRGBPixels

```
void MC_grpGetRGBPixels(MC_GrpFrameBuffer dst, M_Int32 x, M_Int32 y, M_Int32
w, M_Int32 h, M_Uint32* pd, M_Int32 ipl)
```

(Frame Buffer) 가 .  
 .  
 0x00RRGGBB .  
 가 가 ipl .

psrc - [in]  
 sbpl - [in]  
 x - [in] 가 x  
 y - [in] 가 y  
 w - [in] 가  
 h - [in] 가  
 pd - [out]  
 ipl - [in]

## ✎ MC\_grpSetRGBPixels

```
void MC_grpSetRGBPixels(MC_GrpFrameBuffer dst, M_Int32 x, M_Int32 y, M_Int32
w, M_Int32 h, const M_Uint32* psrc, M_Int32 ibpl, MC_GrpContext* pgc)
```

(Frame Buffer) .  
. LCD  
가 .  
0x00RRGGBB .  
가 ibpl w

pd - [in]  
x - [in] 가 x  
y - [in] 가 y  
w - [in] 가  
h - [in] 가  
pd - [in]  
ibpl - [in]  
pgc - [in]

## ✎ MC\_grpFlushLcd

```
void MC_grpFlushLcd(M_Int32 i, MC_GrpFrameBuffer frm, M_Int32 x, M_Int32 y,
M_Int32 w, M_Int32 h)
```

```
          (Frame Buffer) LCD .
          LCD .
          LCD .
          ,
          .
```

```
pd - [in]
i - [in]      (0;      1;      LCD      )
bpl - [in]
x - [in]      x
y - [in]      y
w - [in]
h - [in]
```

## ✎ MC\_grpGetPixelFromRGB

```
M_Int32 MC_grpGetPixelFromRGB(M_Int32 r, M_Int32 g, M_Int32 b)
```

. r, g, b 가 255 가

r - [in] red (0-255)  
g - [in] green (0-255)  
b - [in] blue (0-255)

 MC\_grpGetRGBFromPixel

```
M_Int32 MC_grpGetRGBFromPixel (M_Int32 pixel, M_Int32 *r, M_Int32 *g, M_Int32 *b)
```

pixel - [in] pixel

r - [out] red (0-255)

g - [out] green (0-255)

b - [out] blue (0-255)

pixel

---

## ✎ MC\_grpGetDisplayInfo

```
M_Int32 MC_grpGetDisplayInfo(M_Int32 i, MC_GrpDisplayInfo* pi)
```

.

i - [in] ; 0 .  
pi - [out]

가 1, 0 .

## ✎ MC\_grpRepaint

```
void MC_grpRepaint(M_Int32 lcd, M_Int32 x, M_Int32 y, M_Int32 w, M_Int32 h)
```

```

    paintClet      가      .      ,
    paintClet      , paintClet
    .

i - [in]          0          LCD          , 1
    LCD          .
x - [in]          x
y - [in]          y
w - [in]
h - [in]

```



## ✎ MC\_grpGetFont

```
M_Int32 MC_grpGetFont(M_Int32 face, M_Int32 size, M_Int32 style)
```

가  
face size, style .

face - [in] ; MC\_GRP\_FT\_FACE\_SYSTEM, MC\_GRP\_FT\_FACE\_MONOSPACE,  
MC\_GRP\_FT\_FACE\_PROPORTIONAL

size - [in] ; MC\_GRP\_FT\_SIZE\_LARGE MC\_GRP\_FT\_SIZE\_MEDIUM,  
MC\_GRP\_FT\_SIZE\_SMALL .

style - [in] ; MC\_GRP\_FT\_STYLE\_PLAIN MC\_GRP\_FT\_STYLE\_ITALIC,  
MC\_GRP\_FT\_STYLE\_BOLD, MC\_GRP\_FT\_STYLE\_UNDERLINED OR .

## ✎ MC\_grpGetFontHeight

M\_Int32 MC\_grpGetFontHeight(M\_Int32 font)

가

0

font - [in]

## ✎ MC\_grpGetFontAscent

M\_Int32 MC\_grpGetFontAscent(M\_Int32 font)

(Ascent)

가

0

font - [in]

## ✎ MC\_grpGetFontDescent

M\_Int32 MC\_grpGetFontDescent(M\_Int32 font)

(Descent)  
가 0

font - [in]

---

## ✎ MC\_grpGetStringWidth

```
M_Int32 MC_grpGetStringWidth(M_Int32 font, const M_Uint8* str, M_Int32 len)
```

```
len -1 (NULL 가 )
```

```
font - [in]
```

```
str - [in]
```

```
len [in]
```

---

## ✎ MC\_grpGetUnicodeStringWidth

```
M_Int32 MC_grpGetUnicodeStringWidth(M_Int32 font, const M_UCode* str,  
M_Int32 len)
```

```
len -1 (NULL 가 )
```

font - [in]

str - [in]

len [in]

## ✎ MC\_grpCreateImage

```
M_Int32 MC_grpCreateImage(MC_GrpImage *newImg, M_Uint32 bufID, M_Int32 off,
M_Int32 len)
```

(PNG, GIF, Animated-GIF, BMP ) 가

가 . 가

NULL

buf

MC\_knlCalloc

ID

가

MC\_grpDestroyImage

가

newImg - [out]

;

NULL

bufID - [in]

가

MC\_knlCalloc

ID

off - [in]

len - [in]

MC\_GRP\_IMAGE\_DONE :

가

M\_E\_NOMEMORY :

가

M\_E\_BADFORMAT :

 MC\_grpDestroyImage

```
void MC_grpDestroyImage(MC_GrpImage img)
```

img -



## ✎ MC\_grpDecodeNextImage

M\_Int32 MC\_grpDecodeNextImage(MC\_GrpImage dst)

dst  
dst

가

dst - [out]

MC\_GRP\_FRAME\_DONE : 가

MC\_GRP\_IMAGE\_DONE : 가

가

M\_E\_NOMEMORY : 가

M\_E\_BADFORMAT :



## ✎ MC\_grpPostEvent

```
M_Int32 MC_grpPostEvent(M_Int32 id, M_Int32 type, M_Int32 param1, M_Int32
param2)
```

.  
가 handleCletEvent 가  
. parameter type, param1, param2가 .

id - [in]

type - [in]

param1 - [in] 1

param2 - [in] 2

1, 0

 MC\_grpDrawPolygon

```
void MC_grpDrawPolygon( MC_GrpFrameBuffer dst, M_INT32* xPoints, M_INT32*  
yPoints, M_Int32 nPoints, MC_GrpContext* pgc)
```

dst - [in]

xPoints - [in] x

yPoints - [in] y

nPoints - [in]

pgc - [in]

MC\_grpDrawFillPolygon

 MC\_grpFillPolygon

```
void MC_grpDrawFillPolygon( MC_GrpFrameBuffer dst, M_INT32* xPoints,  
M_INT32* yPoints, M_INT32 nPoints, MC_GrpContext* pgc)
```

dst - [in]

xPoints - [in] x

yPoints - [in] y

nPoints - [in]

Pgc - [in]

MC\_grpDrawPolygon

✎ MC\_imGetSurpportModeCount

M\_Int32 MC\_imGetSurpportModeCount ()

---

## ✎ MC\_imGetSupportedModes

```
M_Char** MC_imGetSupportedModes()
```

ISO 639

```
    , 가  
    "/S", "/L" 가 "EN/S"  
    "KO"
```

```
( )
```

---

## ✎ MC\_imSetCurrentMode

M\_Int32 MC\_imSetCurrentMode (M\_Int32 mode)

MH\_IMAgetSupportedModes()

mode[in]

가

"1".

"0".



✎ MC\_imGetCurrentMode()

M\_Int32 MC\_imGetCurrentMode()

. MH\_IMAgetSupportedModes()

..

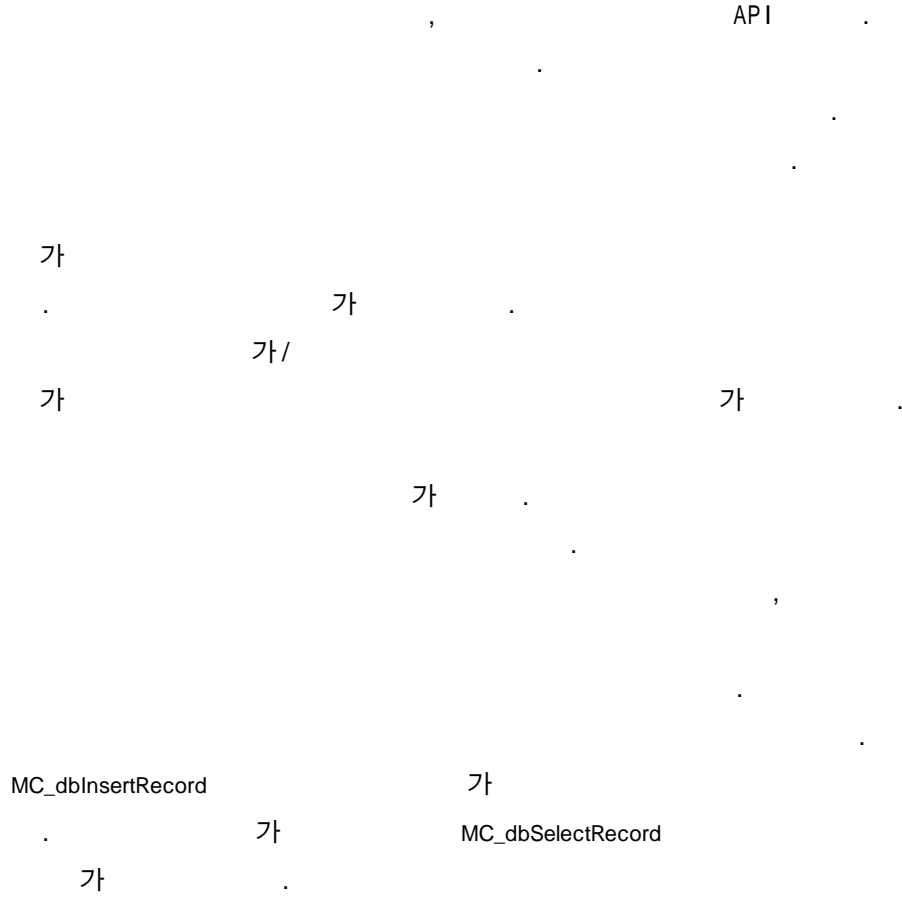
---

✎ MC\_imHandleInput

```
M_Int32 MC_imHandleInput (char key, M_Int32 type, char *buf1, M_Int32
*size1, char *buf2, M_Int32 *size2)
```

```
,
key [in] (MH_KeyCode , MH_IMA_FLUSH)
type [in] (MH_Event .)
buf1 [out]
size1 [in]
buf2 [out]
size2 [in]
```

### 5.1.3.



## ✎ MC\_dbOpenDataBase

가

```
M_Int32 MC_dbOpenDataBase(M_Char* dataBaseName, M_Int32 recordSize,
M_Boolean create, M_Int32 mode)
```

dataBaseName - ,

recordSize - (byte ).

가 recordSize 가

create - 가

mode - , DIR\_PRIVATE\_ACCESS,  
DIR\_SHARED\_ACCESS, DIR\_SYSTEM\_ACCESS 가 가

(0 )

M\_E\_NOENT - create 가 가

M\_E\_INVALID - create 가 recordSize 가 0 ,

dataBaseName NULL , mode 가 가

M\_E\_ERROR -

MC\_dbCloseDataBase

MC\_fsOpen

## ✎ MC\_dbCloseDataBase

M\_Int32 MC\_dbCloseDataBase(M\_Int32 dbId)

dbId -

0

M\_E\_BADFD -

가

M\_E\_ERROR -

MC\_dbOpenDataBase

## ✎ MC\_dbDeleteDataBase

가 가 가 .

```
M_Int32 MC_dbDeleteDataBase(M_Char* dataBaseName, M_Int32 mode)
```

dataBaseName -

mode -

DIR\_PRIVATE\_ACCESS , DIR\_SHARED\_ACCESS, DIR\_SYSTEM\_ACCESS 가 가 ,

0

M\_E\_NOENT - 가

M\_E\_INUSE - 가

M\_E\_INVALID - dataBaseName NULL , mode 가

가

M\_E\_ACCESS -

M\_E\_ERROR -

MC\_dbCloseDataBase

MC\_fsOpen

## ✎ MC\_dbInsertRecord

가 .

가

(garbage)

MC\_dbSelectRecord

(garbage)

M\_Int32 MC\_dbInsertRecord(M\_Int32 dbId, M\_Byte\* buf, M\_Int32 len)

dbId - 가

buf - 가

len -

(0 )

M\_E\_BADFD - 가

M\_E\_DATABIG -

M\_E\_INVALID - len 0 , buf 가 NULL

M\_E\_ERROR -

MC\_dbSelectRecord

MC\_dbUpdateRecord

MC\_dbDeleteRecord

---

## ✎ MC\_dbSelectRecord

MC\_dbGetRecordSize

M\_Int32 MC\_dbSelectRecord(M\_Int32 dbId, M\_Int32 recId, M\_Byte\* buf, M\_Int32 len)

dbId -

recId -

buf -

len -

0

M\_E\_BADFD - 가

M\_E\_BADRECID - 가

M\_E\_INVALID - len 0 , buf 가 NULL

M\_E\_SHORTBUF - 가

M\_E\_ERROR -

MC\_dbInsertRecord

MC\_dbUpdateRecord

MC\_dbDeleteRecord



---

## ✎ MC\_dbUpdateRecord

M\_Int32 MC\_dbUpdateRecord(M\_Int32 dbId, M\_Int32 recId, M\_Byte\* buf, M\_Int32 len)

dbId -

recId -

buf - 가

len -

0

M\_E\_BADFD 가

M\_E\_BADRECID - 가

M\_E\_DATABIG - 가

M\_E\_INVALID - len 0 , buf 가 NULL

M\_E\_ERROR -

MC\_dbInsertRecord

MC\_dbSelectRecord

MC\_dbDeleteRecord

✎ MC\_dbDeleteRecord

M\_Int32 MC\_dbDeleteRecord(M\_Int32 dbId, M\_Int32 recId)

dbId -

recId -

0

M\_E\_BADFD - 가

M\_E\_BADRECID - 가

M\_E\_ERROR -

MC\_dbInsertRecord

MC\_dbSelectRecord

MC\_dbUpdateRecord

---

## ✎ MC\_dbListRecords

```
M_Int32 MC_dbListRecords(M_Int32 dbID, M_Int32* buf, M_Int32 len)
```

dbID -

buf -

len -

M\_E\_BADFD - 가  
M\_E\_INVALID - len 0 , buf 가 NULL  
M\_E\_SHORTBUF - 가  
M\_E\_ERROR -

## MC\_dbSortRecords



buf -

len -

compare - , NULL

byte

filter - , NULL

M\_E\_BADFD - 가

M\_E\_INVALID - len 0 , buf 가 NULL

M\_E\_SHORTBUF - 가

M\_E\_ERROR -

MC\_dbListRecords

---

## ✎ MC\_dbGetAccessMode

```
M_Int32 MC_dbGetAccessMode(M_Char* dataBaseName)
```

dataBaseName -

DIR\_PRIVATE\_ACCESS, DIR\_SHARED\_ACCESS, DIR\_SYSTEM\_ACCESS 가

M\_E\_NOENT - 가

M\_E\_INVALID - dataBaseName NULL

M\_E\_ERROR -

MC\_dbOpenDataBase

MC\_fsOpen

✎ MC\_dbGetNumberOfRecords

M\_Int32 MC\_dbGetNumberOfRecords(M\_Int32 dbId)

dbId -

M\_E\_BADFD - 가  
M\_E\_ERROR -

## ✎ MC\_dbGetRecordSize

M\_Int32 MC\_dbGetRecordSize(M\_Int32 dbId)

dbId -

(byte)

M\_E\_BADFD - 가  
M\_E\_ERROR -

MC\_dbOpenDataBase



## ✎ MC\_dbListDataBases

DIR\_PRIVATE\_ACCESS DIR\_SHARED\_ACCESS,  
DIR\_SYSTEM\_ACCESS 가

NULL(\0) NULL

M\_Int32 MC\_dbListDataBases(M\_Byte\* buf, M\_Int32 len)

buf -

len -

( 가  
)

M\_E\_SHORTBUF - 가  
M\_E\_INVALID - len 0 , buf 가 NULL  
M\_E\_ERROR -

MC\_dbOpenDataBase

MC\_fsOpen

### 5.1.4.

가 가 .  
, , , API  
(separator) "/"  
API  
MC\_fsOpen  
MC\_fsFileAttribute  
MC\_fsRemove  
MC\_fsRename  
MC\_fsMkDir  
MC\_fsRmdir  
MC\_fsList  
가 가 .  
MC\_DIR\_PRIVATE\_ACCESS:  
MC\_DIR\_SHARED\_ACCESS :  
MC\_DIR\_SYSTEM\_ACCESS :  
가 ,  
가  
Read/Write Read  
API blocking , operation

---

✎ MC\_FILE\_OPEN\_RDONLY

```
#define MC_FILE_OPEN_RDONLY
```

```
가 . MH_FILE_OPEN_RDONLY .
```

✎ MC\_FILE\_OPEN\_WRONLY

```
#define MC_FILE_OPEN_WRONLY
```

```
가 . MH_FILE_OPEN_WRONLY .
```

✎ MC\_FILE\_OPEN\_WRTRUNC

```
#define MC_FILE_OPEN_WRTRUNC
```

```
가 0 .  
MH_FILE_OPEN_WRTRUNC .
```

✎ MC\_FILE\_OPEN\_RDWR

```
#define MC_FILE_OPEN_RDWR
```

```
가 . MH_FILE_OPEN_RDWR .
```

✎ MC\_FILE\_IS\_DIR

```
#define MC_FILE_IS_DIR
```

---

```
attribute bit. MH_FILE_IS_DIR .
✎ MC_MAX_FILENAME_LENGTH

#define MC_MAX_FILENAME_LENGTH
    . MH_MAX_FILENAME_LENGTH .
✎ MC_DIR_PRIVATE_ACCESS

#define MC_DIR_PRIVATE_ACCESS
    . 1 .
✎ MC_DIR_SHARED_ACCESS

#define MC_DIR_SHARED_ACCESS
    . 2 .
✎ MC_DIR_SYSTEM_ACCESS

#define MC_DIR_SYSTEM_ACCESS
    . 3 .
✎ MC_FILE_SEEK_SET

#define MC_FILE_SEEK_SET
```

---

. MH\_FILE\_SEEK\_SET

✎ MC\_FILE\_SEEK\_CUR

#define MC\_FILE\_SEEK\_CUR

current position

MH\_FILE\_SEEK\_CUR

✎ MC\_FILE\_SEEK\_END

#define MC\_FILE\_SEEK\_SET

. MH\_FILE\_SEEK\_SET

## ✎ MC\_fsOpen

. aMode 가 .  
30 .

M\_Int32 MC\_fsOpen(M\_Char\* name, M\_Int32 flag, M\_Int32 aMode)

name -

flag - MC\_FILE\_OPEN\_RDONLY 가  
MC\_FILE\_OPEN\_WRONLY 가  
MC\_FILE\_OPEN\_WRTRUNC 가 가 0

MC\_FILE\_OPEN\_RDWR 가 가

aMode - MC\_DIR\_PRIVATE\_ACCESS private  
MC\_DIR\_SHARED\_ACCESS shared  
MC\_DIR\_SYSTEM\_ACCESS system

M\_E\_ERROR -

M\_E\_NOENT - MC\_FILE\_OPEN\_RDONLY

M\_E\_BADFILENAME -

M\_E\_LONGNAME - 가

M\_E\_INVALID - flag 가

M\_E\_NOSPACE -

M\_E\_ACCESS -

:

mkdir aMode

## ✎ MC\_fsRead

```

        . len      byte      buf      .

```

```

M_Int32 MC_fsRead(M_Int32 fd, M_Byte* buf, M_Int32 len)

```

fd -

buf - 가

len - byte

byte

M\_E\_ERROR -

M\_E\_BADFD - 가

M\_E\_EOF -

---

## ✎ MC\_fsWrite

. buf len byte .

```
M_Int32 MC_fsWrite(M_Int32 fd, M_Byte* buf, M_Int32 len)
```

fd -

buf - 가

len - byte

byte

M\_E\_ERROR - fail

M\_E\_BADFD - 가

M\_E\_NOSPACE -



 MC\_fsClose

M\_Int32 MC\_fsClose(M\_Int32 fd)

fd -

0

M\_E\_ERROR -

M\_E\_BADFD - 가

---

## ✎ MC\_fsSeek

M\_Int32 MC\_fsSeek(M\_Int32 fd, M\_Int32 pos, M\_Int32 where)

fd -

pos -

where - MC\_FILE\_SEEK\_SET

MC\_FILE\_SEEK\_CUR           current position

MC\_FILE\_SEEK\_END

M\_E\_ERROR -

M\_E\_BADFD -                 가

M\_E\_INVALID - where 가

M\_E\_BADSEEKPOS -           가

## MC\_fsFileAttribute

가 MC\_FileInfo

```

struct _fileInfo{
    M_Int32    attrib;           //          bit mask
    M_Uint32   creationTime;    //          1970  1  1
    M_Uint32   size;            //
};

```

bit mask

fa->attrib MC\_FILE\_IS\_DIR bit 가 directory

```

program A
MC_FileInfo fi;
...
int rtn = MC_fsFileAttribute("B", &fi, MC_DIR_PRIVATE_ACCESS);
if ( fi.attrib & MC_FILE_IS_DIR ) {
    // direcorty
} else {
}
...

```

M\_Int32 MC\_fsFileAttribute(M\_Char\* name, MH\_FileInfo\* fa, M\_Int32 aMode)

name -

fa - attribute structure

aMode - MC\_DIR\_PRIVATE\_ACCESS private

MC\_DIR\_SHARED\_ACCESS shared

MC\_DIR\_SYSTEM\_ACCESS system

0

M\_E\_ERROR -

M\_E\_BADFILENAME -

M\_E\_LONGNAME - 가

M\_E\_ACCESS -

mkdir aMode

---

## ✎ MC\_fsRemove

M\_Int32 MC\_fsRemove(M\_Char\* name, M\_Int32 aMode)

name -

aMode - MC\_DIR\_PRIVATE\_ACCESS private

MC\_DIR\_SHARED\_ACCESS shared

MC\_DIR\_SYSTEM\_ACCESS system

0

M\_E\_ERROR -

M\_E\_BADFILENAME :

M\_E\_LONGNAME :           가

M\_E\_NOENT:

M\_E\_ACCESS:

mkdir aMode

---

## ✎ MC\_fsRename

```
M_Int32 MC_fsRename(M_Char* oldname, M_Char* newname, M_Int32 aMode)
```

oldname -

newname -

aMode - MC\_DIR\_PRIVATE\_ACCESS private

MC\_DIR\_SHARED\_ACCESS shared

MC\_DIR\_SYSTEM\_ACCESS system

0

M\_E\_ERROR -

M\_E\_BADFILENAME -

M\_E\_LONGNAME - 가

M\_E\_EXIST -

M\_E\_NOSPACE -

M\_E\_ACCESS -

mkdir aMode

## ✎ MC\_fsMkDir

aMode

```
M_Int32 MC_fsMkDir(M_Char* dirName, M_Int32 aMode)
```

dirName -

aMode - MC\_DIR\_PRIVATE\_ACCESS private

MC\_DIR\_SHARED\_ACCESS shared

MC\_DIR\_SYSTEM\_ACCESS system

0

M\_E\_ERROR -

M\_E\_EXIST - 가

M\_E\_NOENT - parent 가

M\_E\_BADFILENAME -

M\_E\_LONGNAME - 가

M\_E\_ACCESS -

## ✎ MC\_fsRmdir

가 . 가

```
M_Int32 MC_fsRmdir(M_Char* dirName, M_Int32 aMode)
```

dirName -

aMode - MC\_DIR\_PRIVATE\_ACCESS private

MC\_DIR\_SHARED\_ACCESS shared

MC\_DIR\_SYSTEM\_ACCESS system

0

M\_E\_ERROR -

M\_E\_NOENT - 가

M\_E\_NOTEMPTY - 가

M\_E\_BADFILENAME -

M\_E\_LONGNAME - 가

M\_E\_ACCESS -

mkdir aMode



---

## ✎ MC\_fsList

```

    null terminator string    buf
    null                      .

```

```

    file1  file2

```

```

file1\0file2\0\0

```

```

M_Int32 MC_fsList(M_Char* name, M_Char* buf, M_Int32 bufSize, M_Int32 aMode)

```

name -

buf - return buf

bufSize - buf

aMode - MC\_DIR\_PRIVATE\_ACCESS private

MC\_DIR\_SHARED\_ACCESS shared

MC\_DIR\_SYSTEM\_ACCESS system

0

M\_E\_ERROR -

M\_E\_BADFILENAME -

M\_E\_LONGNAME - 가

M\_E\_SHORTBUF - buf 가

M\_E\_ACCESS -

mkdir aMode

✎ MC\_fsTotalSpace

M\_Int32 MC\_fsTotalSpace()

(byte)

M\_E\_ERROR -

✎ MC\_fsAvailable

M\_Int32 MC\_fsAvailable()

(byte)

M\_E\_ERROR -

✎ MC\_fsSetMode

가 table fmode  
 가 , 가  
 .

M\_Int32 MC\_fsSetMode(char\* fileName, M\_Int32 fmode, M\_Int32 aMode)

[in] filename

[in] fmode mode

|                    |   |   |
|--------------------|---|---|
| fmode              |   |   |
| MH_FILEMODE_RDONLY |   | 1 |
| MH_FILEMODE_WRONLY | . | 2 |
| MH_FILEMODE_RDWR   | / | 3 |

[in] aMode MC\_DIR\_PRIVATE\_ACCESS private

MC\_DIR\_SHARED\_ACCESS shared

MC\_DIR\_SYSTEM\_ACCESS system

M\_E\_SUCCESS -

M\_E\_ERROR -

M\_E\_BADPATHNAME -

M\_E\_LONGNAME - 가

M\_E\_INVALID - mode 가

M\_E\_ACCESS -

M\_E\_NOENT -



---

## ✎ MC\_fsGetCounts

가 .

```
M_int32 MC_fsGetCounts(char* dirName, M_Int32 aMode)
```

dirName -

aMode - MC\_DIR\_PRIVATE\_ACCESS private

MC\_DIR\_SHARED\_ACCESS shared

MC\_DIR\_SYSTEM\_ACCESS system

M\_E\_ERROR -

M\_E\_BADFILENAME -

M\_E\_LONGNAME - 가

M\_E\_ACCESS -

## ✎ MC\_fsTell

가 .

```
M_int32 MC_fsTell(M_int32 fd)
```

fd -

M\_E\_ERROR -

M\_E\_BADFD - 가

## ✎ MC\_fsIsExist

```
M_Int32 MC_fsIsExist(char* fileName, M_Int32 aMode)
```

[in] fileName

[in] aMode      MC\_DIR\_PRIVATE\_ACCESS private  
                 MC\_DIR\_SHARED\_ACCESS shared  
                 MC\_DIR\_SYSTEM\_ACCESS system

M\_E\_SUCCESS -

M\_E\_ERROR -

M\_E\_BADFILENAME -

M\_E\_LONGNAME -

M\_E\_ACCESS -

M\_E\_NOENT -



## 5.1.5. NETWORK

TCP/IP . , TCP/UDP , HTTP

API .

I/O API (nonblocking) I/O

MC\_netConnect()

API 가 . MC\_netSocketClose()

API 가 M\_E\_NOTCONN ,

. MC\_netConnect()

MC\_netConnect() 가

MC\_netConnect()

TCP UDP . TCP

. TCP UDP

MC\_netSocket() M\_E\_NOSPACE .

MC\_netClose()

API

✎ MC\_AF\_INET

```
#define MC_AF_INET 2
```

가 2 .

✎ MC\_SOCKET\_STREAM

```
#define MC_SOCKET_STREAM 1
```

```
TCP 1
```

✍ MC\_SOCKET\_DGRAM

```
#define MC_SOCKET_DGRAM 2
```

```
UDP 2
```

**✎ NETCONNECTCB**

MC\_netConnect .

```
typedef void (*NETCONNECTCB)(M_Int32 error, void *param)
```

error - : 0, : M\_E\_ERROR

param - MC\_netConnect()

MC\_netConnect

**✍ NETSOCKCONNECTCB**

MC\_netConnect

```
typedef void (*NETSOCKCONNECTCB)(M_Int32 fd, M_Int32 error, void *param)
```

fd –

error – 0 : , : M\_E\_ERROR

param – MC\_netSocketConnect()

MC\_netSocketConnect

 NETSOCKACCEPTCB

MC\_netSocketAccept

```
typedef void (*NETSOCKACCEPTCB)(M_Int32 sd, M_Int32 fd, M_Int32 error, void  
*param)
```

sd -

fd -

error - 0 : , : M\_E\_ERROR

param - MC\_netSocketAccept()

MC\_netSocketAccept

**✍ NETSOCKREADCB**

MC\_netSetReadCB

```
typedef void (*NETSOCKREADCB)(M_Int32 fd, M_Int32 error, void *param)
```

fd –

error – 0 : , : M\_E\_ERROR

param – MC\_netSetReadCB()

MC\_netSetReadCB



**✍ NETSOCKWRITECB**

MC\_netSetWriteCB

```
typedef void (*NETSOCKWRITECB)(M_Int32 fd, M_Int32 error, void *param)
```

fd –

error – : 0, : M\_E\_ERROR

param – MC\_netSetWriteCB()

MC\_netSetWriteCB

---

  
✍ NETHOSTADDRCB

MC\_netGetHostAddr() . . . . . addr -1 IP  
 . . . . . (network byte ordering) .

```
typedef void (*NETHOSTADDRCB)(M_Int32 addr, void *param)
```

addr – IP

param – MC\_netGetHostAddr()

MC\_netGetHostAddr

☞ NETHTTPCB

```

MC_netHttpConnect() . HTTP
가 .
HTTP (parsing)
가 . 가
.
MC_netHttpGetResponseCode(), MC_netHttpGetResponseMessage(),
MC_netHttpGetHeaderField(), MC_netHttpGetLength(),
MC_netHttpGetType(), MC_netHttpGetEncoding().
가 sd
. 가 가 -1
. 가 -1
MC_netSocketConnect() 가 . MC_netHttpClose() 가
가 I/O 가
가 . error 가 M_E_ERROR
가 M_E_ERROR .

```

```

typedef void (*NETHTTPCB)(M_Int32 fd, M_Int32 sd, M_Int32 error, void
*param)

```

```

fd - HTTP
sd -
error - : 0, : M_E_ERROR
param - MC_netHttpConnect()

```

MC\_netHttpConnect

✎ MC\_netConnect

TCP/IP 가 가  
가 0  
M\_E\_INPROGRESS  
M\_E\_ISCONN 가

M\_Int32 MC\_net Connect( NETCONNECTCB cb, void \*param)

cb -

0

M\_E\_INPROGRESS -

M\_E\_ISCONN -

M\_E\_ERROR - 가

✎ MC\_netClose

가

가

,MC\_netHttpOpne()

HTTP

API

가

void MC\_netClose(void)

---

## ✎ MC\_netSocket

TCP      UDP      .      가  
MC\_netConnect()      .

M\_Int32 MC\_netSocket(M\_Int32 domain, M\_Int32 type)

domain -      AF\_INET

type - MC\_SOCKET\_STREAM      MC\_SOCKET\_DGRAM

M\_E\_NOTSUP - domain      type

M\_E\_NOTCONN -

M\_E\_NOSPACE -

M\_E\_ERROR -

✎ MC\_netSocketConnect

TCP .  
 가 IP (addr) (port)  
 (network byte ordering) . 가 NULL  
 M\_E\_INVALID . 가 0  
 가 . 가  
 MC\_netSocketClose() 가 .

M\_Int32 MC\_netSocketConnect(M\_Int32 fd, M\_Int32 addr, M\_Int16 port,  
 NETSOCKCONNECTCB cb, void \*param)

fd -

addr -

port -

cb -

param - 가

0

M\_E\_NOTSUP -

M\_E\_BADFD -

M\_E\_NOTCONN - 가

M\_E\_ISCONN -

M\_E\_INPROGRESS -

M\_E\_INVALID - 가 가 NULL

M\_E\_ERROR -

MC\_netSocketClose

## ✍ MC\_netSocketWrite

TCP

가 M\_E\_WOULDBLOCK

MC\_netSetWriteCB()

M\_E\_WOULDBLOCK

M\_Int32 MC\_netSocketWrite(M\_Int32 fd, M\_Byte\* buf, M\_Int32 len)

fd -

buf -

len -

(0 )

M\_E\_WODULDBLOCK -

M\_E\_BADFD -

M\_E\_NOTCONN -

가

M\_E\_INVALID -

가

MC\_netSocketWriteNETSOCKWRITECB



✍ MC\_netSocketRead

TCP .  
 가 M\_E\_WOULDBLOCK  
 . MC\_netSetReadCB()

M\_E\_WOULDBLOCK .

M\_Int32 MC\_netSocketRead(M\_Int32 fd, M\_Byte\* buf, M\_Int32 len)

fd -

buf -

len -

(0 0)

M\_E\_WOULDBLOCK - 가

M\_E\_NOTCONN - 가

M\_E\_BADFD - 가

M\_E\_INVALID - 가

MC\_netSetReadCB

---

## ✎ MC\_netSocketClose

MC\_netClose()

가

```
M_Int32 MC_netSocketClose(M_Int32 fd)
```

fd -

0

M\_E\_BADFD -

MC\_netClose

---

## ✎ MC\_netSocketBind

```
M_Int32 MC_netSocketBind(M_Int32 fd, M_Uint32 addr, M_Uint16 port)
```

fd -

port - (network byte ordering)

0

M\_E\_INVALID - 가

M\_E\_NOTCONN - 가

M\_E\_BADFD -

✎ MC\_netGetMaxPacketLength

UDP

M\_Int32 MC\_netGetMaxPacketLength(void)

✍ MC\_netSocketSendTo

UDP

MC\_netGetMaxPacketLength() 가  
 가 IP (addr) (port)  
 (network byte ordering) . 가 M\_E\_WOULDBLOCK

MC\_netSetWriteCB()

M\_E\_WOULDBLOCK

M\_Int32 MC\_netSocketSendTo(M\_Int32 fd, M\_Byte\* buf, M\_Int32 len, M\_Uint32  
 addr, M\_Uint16 port)

fd -

buf -

len -

addr - IP . (network byte ordering) .

port - . (network byte ordering) .

(0 )

M\_E\_NOTSUP -

M\_E\_WODULDBLOCK -

M\_E\_BADFD -

M\_E\_NOTCONN - 가

M\_E\_INVALID - 가

MC\_netGetMaxPacketLength

MC\_netSetWriteCB

✎ MC\_netSocketRcvFrom

UDP .  
 IP addr port .  
 IP (network byte ordering)  
 . 가 M\_E\_WOULDBLOCK  
 . MC\_netSetReadCB()

M\_E\_WOULDBLOCK .

M\_Int32 MC\_netSocketRcvFrom(M\_Int32 fd, M\_Byte\* buf, M\_Int32 len, M\_Uint32\*  
 addr, M\_Uint16\* port)

fd -

buf -

len -

addr - IP 가 . (network byte  
 ordering) .

port - 가 . (network byte  
 ordering) .

(0 )

M\_E\_WODULDBLOCK - 가

M\_E\_BADFD -

M\_E\_NOTCONN - 가

M\_E\_INVALID - IP 가  
 가

MC\_netSetReadCB

✎ MC\_netGetHostAddr

IP . 가  
 IP 가 .  
 dnsserver 가 -1 MC\_knlGetSystemProperty () 가  
 IP .

M\_Int32 MC\_netGetHostAddr(M\_Int32 dnsserver, M\_Byte \*hostname, NETHOSTADDRCB  
 cb, void \*param)

dnsserver – IP  
 hostname –  
 cb – IP  
 param – 가

0

M\_E\_INVALID – 가 NULL dnsserver 가  
 0 hostname NULL  
 M\_E\_ERROR –

MC\_knlGetSystemProperty

## ✎ MC\_netSocketAccept

TCP . 가  
 MC\_netSocketBind() . 가 M\_E\_WOULDBLOCK  
 가 .  
 가 M\_E\_WOULDBLOCK .

M\_Int32 MC\_netSocketAccept(M\_Int32 fd, NETSOCKACCEPTCB cb, void \*param)

fd – TCP

cb –

param – 가

M\_E\_INVALID – 가 NULL

M\_E\_WOULDBLOCK –

M\_E\_NOTSUP –

M\_E\_BADFD –

M\_E\_NOTCONN – 가

M\_E\_ERROR -



## ✎ MC\_netSetReadCB

MC\_netSocketRead()    MC\_netSocketRcvFrom()    M\_E\_WOULDBLOCK

가

가 NULL

가

가

M\_Int32 MC\_netSetReadCB(M\_Int32 fd, NETSOCKREADCB cb, void \*param)

fd -

cb -

param - 가

0

M\_E\_NOTCONN - 가

M\_E\_BADF - 가

## ✎ MC\_netSetWriteCB

MC\_netSocketWrite() MC\_netSocketSendTo() 가 M\_E\_WOULDBLOCK

가  
가  
NULL 가  
가

M\_Int32 MC\_netSetWriteCB(M\_Int32 fd, NETSOCKWRITECB cb, void \*param)

fd -

cb -

param - 가

0

M\_E\_NOTCONN - 가

M\_E\_BADF - 가

## ✎ MC\_netHttpOpen

HTTP . HTTP  
 . URL HTTP  
 IP 가 IP  
 IP MC\_knlGetSystemProperty()

MC\_netHttpSetRequestMethod(),  
 MC\_netHttpGetRequestMethod(),  
 MC\_netHttpSetRequestProperty(),  
 MC\_netHttpGetRequestProperty(),  
 MC\_netHttpSetProxy(),  
 MC\_netHttpGetProxy().

M\_Int32 MC\_netHttpOpen(M\_Byte\* url)

url - "http://" URL

HTTP

M\_E\_INVALID - URL

M\_E\_NOSPACE - HTTP

M\_E\_NOTCONN -

M\_E\_ERROR -

MC\_knlGetSystemProperty

MC\_netHttpSetRequestMethod

MC\_netHttpGetRequestMethod

MC\_netHttpSetRequestProperty

MC\_netHttpGetRequestProperty

MC\_netHttpSetProxy

MC\_netHttpGetProxy

## ✎ MC\_netHttpConnect

HTTP . MC\_netHttpOpen() 가  
 HTTP 가 .  
 가 . 가

M\_E\_ERROR .  
 MC\_netHttpSetRequestMethod(),  
 MC\_netHttpGetRequestMethod(),  
 MC\_netHttpSetRequestProperty(),  
 MC\_netHttpGetRequestProperty(),  
 MC\_netHttpSetProxy(),  
 MC\_netHttpGetProxy().

M\_Int32 MC\_netHttpConnect(M\_Int32 fd, NETHTTPCB cb, void \*param)

fd - HTTP

cb -

param - 가

0

M\_E\_BADFD -

M\_E\_NOTCONN - 가

M\_E\_INPROGRESS - HTTP

M\_E\_ERROR -

MC\_netHttpSetRequestMethod

MC\_netHttpGetRequestMethod

MC\_netHttpSetRequestProperty

MC\_netHttpGetRequestProperty

MC\_netHttpSetProxy

MC\_netHttpGetProxy

### ✎ MC\_netHttpSetRequestMethod

HTTP (Request Method) . "GET", "POST",  
 "HEAD" 가 . 가 "POST"  
 . 가 MC\_netHttpConnect() M\_E\_ERROR .

M\_Int32 MC\_netHttpSetRequestMethod(M\_Int32 fd, M\_Byte \*method, M\_Byte \*msg,  
 M\_Int32 msglen)

fd - HTTP

method -

msg - 가 "POST"

msglen -

0

M\_E\_BADFD -

M\_E\_INVALID - POST

M\_E\_ERROR -

MC\_netHttpConnect

## ✎ MC\_netHttpGetMethod

HTTP (Request Method)

MC\_netHttpSetRequestMethod()

"GET" buf

NULL 가 NULL

가 MC\_netHttpConnect() M\_E\_ERROR

M\_Int32 MC\_netHttpGetMethod(M\_Int32 fd, M\_Byte \*buf, M\_Int32 len)

fd - HTTP

buf -

len -

M\_E\_BADFD -

M\_E\_INVALID - 가

M\_E\_ERROR -

MC\_netHttpConnect

---

## ✎ MC\_netHttpSetRequestProperty

HTTP (Request Property) . 가 MC\_netHttpConnect()  
M\_E\_ERROR

```
M_Int32 MC_netHttpSetRequestProperty(M_Int32 fd, M_Byte *key, M_Byte *value)
```

fd - HTTP

key -

value -

0

M\_E\_BADFD -

M\_E\_ERROR -

MC\_netHttpConnect



## ✎ MC\_netHttpRequestProperty

HTTP (Request Property)

가 MC\_netHttpConnect()

M\_E\_ERROR

```
M_Int32 MC_netHttpRequestProperty(M_Int32 fd, M_Byte *key, M_Byte *buf,
M_Int32 len)
```

fd - HTTP

key -

buf -

len -

M\_E\_BADFD -

M\_E\_INVALID - 가

M\_E\_ERROR -

MC\_netHttpConnect

## ✎ MC\_netHttpSetProxy

가 MC\_netHttpConnect()  
 M\_E\_ERROR  
 M\_Int32 MC\_netHttpSetProxy(M\_Int32 fd, M\_Int32 proxyhost, M\_Int16 proxyport)

fd - HTTP  
 proxyhost - IP (network byte  
 ordering)  
 proxyport - (network byte ordering)

0

M\_E\_BADFD -

M\_E\_INVALID - proxyhost 가 0 -1

M\_E\_ERROR -

MC\_netHttpConnect

## ✎ MC\_netHttpGetProxy

MC\_netHttpConnect() M\_E\_ERROR 가

M\_Int32 MC\_netHttpGetProxy(M\_Int32 fd, M\_Int32 \*proxyhost, M\_Int16 \*proxyport)

fd - HTTP

proxyhost - (network byte ordering)

proxyport -

(network byte ordering)

0

M\_E\_BADFD -

M\_E\_INVALID - proxyhost proxyport 가 NULL

M\_E\_ERROR -

MC\_netHttpConnect

---

## ✎ MC\_netHttpGetResponseCode

HTTP

HTTP/1.0 200 OK

HTTP/1.0 404 Not Found

200, 400

가 MC\_netHttpConnect()

가

M\_E\_ERROR

M\_Int32 MC\_netHttpGetResponseCode(M\_Int32 fd)

fd - HTTP

M\_E\_BADFD -

M\_E\_ERROR -

MC\_netHttpConnect

## ✎ MC\_netHttpGetResponseMessage

HTTP

HTTP/1.0 200 OK

HTTP/1.0 404 Not Found

"OK" "Not Found" 가 . 가 MC\_netHttpConnect()

가 M\_E\_ERROR .

M\_Int32 MC\_netHttpGetResponseMessage(M\_Int32 fd, M\_Byte \*buf, M\_Int32 len)

fd - HTTP

buf - 가

len

M\_E\_BADFD -

M\_E\_INVALID - 가

M\_E\_ERROR -

MC\_netHttpConnect

## ✎ MC\_netHttpGetHeaderField

HTTP . 가 MC\_netHttpConnect()  
 가 M\_E\_ERROR .

```
M_Int32 MC_netHttpGetHeaderField(M_Int32 fd, M_Byte *name, M_Byte *buf,
M_Int32 len)
```

fd - HTTP

name -

buf -

len -

M\_E\_BADFD -

M\_E\_INVALID - 가

M\_E\_ERROR -

MC\_netHttpConnect

---

## ✎ MC\_netHttpGetLength

가 MC\_netHttpConnect()  
가 M\_E\_ERROR

M\_Int32 MC\_netHttpGetLength(M\_Int32 fd)

fd - HTTP

M\_E\_BADFD -

M\_E\_ERROR -

MC\_netHttpConnect

## ✎ MC\_netHttpGetType

가 MC\_netHttpConnect()  
 M\_E\_ERROR

```
M_Int32 MC_netHttpGetType(M_Int32 fd, M_Byte *buf, M_Int32 len)
```

fd - HTTP

buf -

len -

M\_E\_BADFD -

M\_E\_INVALID - 가

M\_E\_ERROR -

MC\_netHttpConnect



## ✎ MC\_netHttpGetEncoding

가 MC\_netHttpConnect()  
가 M\_E\_ERROR .

```
M_Int32 MC_netHttpGetEncoding(M_Int32 fd, M_Byte *buf, M_Int32 len)
```

fd - HTTP

buf -

len -

M\_E\_BADFD -

M\_E\_INVALID - 가

M\_E\_ERROR -

MC\_netHttpConnect

---

## ✎ MC\_netHttpClose

HTTP . 가 MC\_netHttpConnect()  
가 .

```
M_Int32 MC_netHttpClose(M_Int32 fd)
```

fd - HTTP

0

M\_E\_BADFD -

### 5.1.6.

Media

```
    , , (CLIP)
    . MC_knlSetSystemProperty()
    "MEDIADEVICES" .
    , ,
    , , 가 .
```

✎ MC\_MDA\_STATUS\_ERROR

```
#define MC_MDA_STATUS_ERROR (-1)
```

```
. -1.
```

✎ MC\_MDA\_STATUS\_END\_OF\_DATA

```
#define MC_MDA_STATUS_END_OF_DATA 1
```

```
( ) - 가 ( )  
1.
```

 MC\_MDA\_STATUS\_START

```
#define MC_MDA_STATUS_STARTED 2
```

```
( ) - ( ) . 2.
```

✎ MC\_MDA\_STATUS\_STOPP

```
#define MC_MDA_STATUS_STOPP 3
```

```
( ) - ( )  
- . 3
```

✎ MC\_MDA\_STATUS\_PAUSE

```
#define MC_MDA_STATUS_PAUSED 4
```

```
( ) - ( )  
- . 4
```



✍ MC\_MDA\_STATUS\_RESUME

```
#define MC_MDA_STATUS_RESUMED 5
```

```
( ) - ( )  
- . 5
```

✎ MC\_MDA\_STATUS\_RECORD

```
#define MC_MDA_STATUS_RECORDED 6
```

```
        - . 6
```

✎ MC\_MDA\_STATUS\_FULL\_OF\_DATA

```
#define MC_MDA_STATUS_FULL_OF_DATA 7
```

- 가 . 7.

✎ MC\_MDA\_VOLSEL\_CUR

```
#define MC_MDA_VOLSEL_CUR 0
```

```
. 0.
```

✎ MC\_MDA\_VOLSEL\_MIN

```
#define MC_MDA_VOLSEL_MIN 1
```

```
. 1.
```

✎ MC\_MDA\_VOLSEL\_MAX

```
#define MC_MDA_VOLSEL_MAX 2
```

. 2.

✍ (\*MEDIACB)

가

```
typedef void (*MEDIACB)(MC_MdaClip* clip, M_Int32 status)
```

clip ?

status ?

## ✎ MC\_mdaClipCreate

```

        CLIP . MC_knlSetSystemProperty()
"MEDIADEVICES" . MIME
    "audio/xxx", "video/xxx" MIME .
file MC_mdaClipPutData() ,
MC_mdaClipPutDataByFile()

Clip .

가 가 .

```

```
MC_MdaClip* MC_mdaClipCreate(M_Char* mType, M_Int32 bufSize, MEDIACB cb)
```

```

mType - [in]
bufSize - [in] (CLIP )
cb - [in]

```

```
MC_MdaClip
```

```
0
```



**✎ MC\_mdaClipFree**

```
M_Int32 MC_mdaClipFree(MC_MdaClip* clip)
```

clip - [in]

0

M\_E\_INUSE :

M\_E\_INVALID: clip NULL

## ✎ MC\_mdaClipGetType

```
M_Int32 MC_mdaClipGetType(MC_MdaClip* clip, M_Byte* buf, M_Int32 bufSize)
```

clip – [in]

buf – [out]

bufSize – [in]

0

M\_E\_SHORTBUF - 가

---

## ✎ MC\_mdaClipPutData

가

, MC\_mdaClipPutData()

가 가 가

```
M_Int32 MC_mdaClipPutData (MC_MdaClip* clip, M_Byte* buf, M_Int32 size)
```

clip – [in]

buf – [in]

size – [in]

## ✎ MC\_mdaClipPutDataByFile

```

        가
        ,
        .
        , MC_mdaClipPutData()
        .
        가   가   가
        .
    
```

```

M_Int32 MC_mdaClipPutData (MC_MdaClip* clip, M_Byte* filename, M_Int32 size,
M_Int32 aMode)
    
```

clip - [in]

filename - [in]

size - [in]

aMode - MC\_DIR\_PRIVATE\_ACCESS private

MC\_DIR\_SHARED\_ACCESS shared

MC\_DIR\_SYSTEM\_ACCESS system

---

## ✎ MC\_mdaClipGetData

, MC\_mdaClipGetData() 가

"MEDIADVICES"

```
M_Int32 MC_mdaClipGetData(MC_MdaClip* clip, M_Byte* buf, M_Int32 size)
```

clip – [in]

buf – [in]

size – [in]

---

✎ MC\_mdaClipAvailableDataSize

가 ( 가 )

```
M_Int32 MC_mdaClipAvailableDataSize(MC_MdaClip* clip)
```

clip - [in]

가

---

## ✎ MC\_mdaClipClearData

가

.

M\_Int32 MC\_mdaClipClearData (MC\_MdaClip\* clip)

clip - [in]

0 -

M\_E\_ERROR -

가

.

## ✎ MC\_mdaClipSetPosition

, M\_E\_NOTSUP 가 .

```
M_Int32 MC_mdaClipSetPosition(MC_MdaClip* clip, M_Int32 ms)
```

clip - [in]

ms - [in] (milli second)

0

M\_E\_NOTSUP ? 가

M\_E\_ERROR -



---

## ✎ MC\_mdaClipGetVolume

가  
0, 100

```
M_Int32 MC_mdaClipGetVolume(MC_MdaClip* clip)
```

clip - [in]

M\_E\_NOTSUP -

---

## ✎ MC\_mdaClipSetVolume

·  
,  
가 · 0, 100  
·

```
void MC_mdaClipSetVolume(MC_MdaClip* clip, M_Int32 level)
```

clip – [in]

level – [in] (0-100 )

M\_E\_NOTSUP –

## ✎ MC\_mdaPlay

가  
 MC\_MDA\_STATUS\_STARTED 가 . 가  
 . 가  
 MC\_MDA\_STATUS\_END\_OF\_DATA 가 .  
 가 ,  
 MC\_mdaClipPutData() .

M\_Int32 MC\_mdaPlay(MC\_MdaClip\* clip, M\_Boolean repeat)

clip - [in]

repeat - [in] 0 , 1

0

M\_E\_INUSE - 가

M\_E\_ERROR -

## ✎ MC\_mdaPause

( / )  
 가  
 MC\_MDA\_STATUS\_PAUSED 가 ,  
 , .

M\_Int32 MC\_mdaPause(MC\_MdaClip\* clip)

clip - [in]

0

M\_E\_NOTSUP - paue

M\_E\_ERROR - ,

---

## ✎ MC\_mdaResume

( / ) .  
가  
MC\_MDA\_STATUS\_RESUMED 가 .  
,

M\_Int32 MC\_mdaResume(MC\_MdaClip\* clip)

clip - [in]

0

M\_E\_NOTSUP - resume

M\_E\_ERROR -

---

## ✎ MC\_mdaStop

( / ) .  
가  
MC\_MDA\_STATUS\_STOPPED 가 .  
,

M\_Int32 MC\_mdaStop(MC\_MdaClip\* clip)

clip - [in]

0

M\_E\_ERROR -

## ✎ MC\_mdaRecord

```

        .
        ,
        가
        MC_MDA_STATUS_RECORDED 가 . 가 ,
        ,
        MC_MDA_STATUS_FULL 가 .
        가
        MC_mdaClipGetData()
        .

M_Int32 MC_mdaRecord(MC_MdaClip* clip)

clip - [in]

0

M_E_INUSE -
M_E_ERROR -

```

✎

## MC\_mdaGetVolume

MC\_mdaClipGetVolume ( ) 0 - 100  
가 0-100  
가 가 가  
MC\_knlGetSystemProperty ( )  
) 가 , => 1-50 : 51-100 :  
가 , , => 1-33: , 34-66: ,  
67-100:  
M\_int32 MC\_mdaGetVolume ( )



---

## ✎ MC\_mdaSetVolume

, Clip API

0 , 100

```
void MC_mdaSetVolume(M_Int32 value)
```

```
value - [in] (0-100 )
```

## ✎ MC\_mdaVibrator

```

Vibrator . on .
    level 0 timeout . level 0 vibrator
가 . level 0-100
    . 100 가 가 0 가
    . 0-100 가
가 . 가
    가 MC_knlGetSystemProperty("VIBRATORLEVEL")
) 가 => 1-100 :
    가 , => 1-50 : , 51-100 :
    가 , , => 1-33: , 34-66: , 67-100:

```

```
void MC_mdaVibrator(M_Int32 level, M_Int32 timeout)
```

```
[in] level 0 off, 1-100
```

```
[in] timeout ,
```

---

## ✎ MC\_mdaSetMuteState

M\_Int32 MC\_mdaSetMuteState(M\_int32 source, M\_Boolean bmute)

source – [in]

|                         |                       |
|-------------------------|-----------------------|
| MC_MDA_VOLTYPE_TONE,    | MC_MDA_VOLTYPE_SOUND, |
| MC_MDA_VOLTYPE_RECORDER | 가                     |

bmute – [in]

TRUE :

FALSE :

M\_E\_SUCCESS –

M\_E\_ERROR –

✎ MC\_mdaGetMuteState

M\_Boolean MC\_mdaGetMuteState(M\_int32 source)

source – [in]

|                         |                       |
|-------------------------|-----------------------|
| MC_MDA_VOLTYPE_TONE,    | MC_MDA_VOLTYPE_SOUND, |
| MC_MDA_VOLTYPE_RECORDER | 가                     |

TRUE :

FALSE :

## 5.1.7. SERIAL

API . 가  
 0, 1, 2.. .  
 MC\_knlGetSystemProperty() “MAXSERIALNUM” .  
 I/O API MC\_srIclose() .  
 I/O 가 I/O M\_E\_WOULDBLOCK  
 I/O 가 HAL  
 가 가 .

---

## ✎ SRLWRITECB

MC\_srISetWriteCB

HAL

가

```
typedef void (*SRLWRITECB)(M_Int32 fd, M_Int32 error, void *param)
```

fd -

error - : 0, : M\_E\_ERROR

param -

MC\_srISetWriteCB

---

## ✎ SRLREADCB

MC\_srISetReadCB

HAL

가

```
typedef void (*SRLREADCB)(M_Int32 fd, M_Int32 error, void *param)
```

fd -

error - : 0, : M\_E\_ERROR

param -

MC\_srISetReadCB





M\_E\_NOTSUP - 가

M\_E\_INVALID -

M\_E\_ISCONN - 가

## ✎ MC\_srlWrite

M\_E\_WOULDBLOCK

MC\_srlSetWriteCB

M\_E\_WOULDBLOCK

```
M_Int32 MC_srlWrite(M_Int32 fd, M_Uint8* buf, M_Int32 size)
```

fd -

buf -

size -

write size

M\_E\_WOULDBLOCK -

M\_E\_BADFD -

M\_E\_INVALID - 가

MC\_srlSetWriteCB

## ✍ MC\_srlRead

가

M\_E\_WOULDBLOCK . MC\_srlSetReadCB

M\_E\_WOULDBLOCK .

M\_Int32 MC\_srlRead(M\_Int32 fd, M\_Uint8\* buf, M\_Int32 size)

fd -

buf -

size -

size

M\_E\_WOULDBLOCK - 가

M\_E\_BADFD - fd

M\_E\_INVALID - 가



## ✎ MC\_srlSetWriteCB

가 param API  
 가 NULL  
 가 가

```
M_Int32 MC_srlSetWriteCB(M_Int32 fd, SRLWRITECB cb, void *param)
```

fd -


cb -

param - 가

0

M\_E\_BADFD -

M\_E\_ERROR -

 MC\_srlClose

M\_Int32 MC\_srlClose(M\_Int32 fd)

fd -

0

M\_E\_BADFD -

## 5.1.8. PHONE

API

MC\_phnCallPlace()

---

  
✎ MC\_phnCallPlace

M\_Int32 MC\_phnCallPlace(M\_Byte\* phonenumber)

phonenumber - ( NULL)

0


M\_E\_ERROR( )



## 5.1.9. MISC

가

HAL

 MC\_BackLight

```
typedef enum _MC_BackLight MC_BackLight {  
    MC_LIGHT_ON = 0        //  
    MC_LIGHT_OFF,         //  
    MC_LIGHT_ALWAYS_ON,   //  
    MC_LIGHT_DEFAULT,     //      가  
} MC_BackLight;
```

## MC\_miscBackLight

가

MC\_LIGHT\_DEFAULT

Backlight 0 LCD  
 1 LCD 가 가  
 color color  
 0xYYRRGGBB( (network byte ordering) )  
 YY RR (Red), GG (Green), BB (Blue)

M\_Int32 MC\_miscBackLight(M\_Int32 id, MC\_BackLight on\_off, M\_Int32 color, M\_Int32 timeout)

id -

on\_off -

color -

timeout - . on\_off 가 MC\_DEV\_LIGHT\_ON

0

M\_E\_ERROR ?

가

## ✎ MC\_miscSetLed

LED on/off . bit가 1 on, 0 off .

)

LED가 4 LSB BIT 4 .

\* 0 bit

\* +-----+

\* | |\*|\*|\*|\*|

\* +-----+

\*

MC\_miscSetLed(0x3) led2 , .

void MC\_miscSetLed(M\_Int32 leds)

leds - 가 1 LED 가 on 0 off

✎ MC\_miscGetLed

LED on/off .

M\_Int32 MC\_miscGetLed()

led on/off bit OR


 MC\_miscGetLedCount

LED

M\_Int32 MC\_miscGetLedCount (void)

led


## **5.1.10. UTILITY**

 **MC\_utilHtonl**

|         |                 |                    |   |
|---------|-----------------|--------------------|---|
| M_Int32 | Host Byte Oding | Network Byte Oding | . |
|---------|-----------------|--------------------|---|


M\_Int32 MC\_utilHtonl(M\_Int32 val)



 **MC\_utilHtons**


M\_Int16                      Host Byte Odering      Network Byte Odering                      .

M\_Int16 MC\_utilHtons(M\_Int16 val)

 **MC\_utilNtohI**

|         |                      |                   |   |
|---------|----------------------|-------------------|---|
| M_Int32 | Network Byte Odering | Host Byte Odering | . |
|---------|----------------------|-------------------|---|

```
M_Int32 MC_utilNtohI(M_Int32 val)
```

 **MC\_utilNtoh**

M\_Int16                      Network Byte Ordering      Host Byte Ordering                      .

M\_Int16 MC\_utilNtoh(M\_Int16 val)

---

  
 MC\_utilInetAddrInt

IP IP .  
IP Network Byte Ordering .

M\_int32 MC\_utilInetAddrInt(M\_Byte\* addr)

-1

-1

---

## ✎ MC\_utilInetAddrStr

IP                    IP                    .  
Network Byte Odering                    .

```
void MC_utilInetAddrStr(M_Int32 ip, M_Byte* addr)
```

ip -                    IP

addr - IP

## 5.1.11.

```

, / ,
, 가 .
/
가
MC_uicGetClass
가
MC_uicCreate
,
MC_uicDestroy .
(0, 0) ,
가
"C"
가
Clet handleCletEvent
MC_uicHandleEvent . MC_uicHandleEvent
,
Clet paintClet MC_uicPaint
.
MC_uicHandleEvent 가 MC_uicSetEventHandler
가
, MC_uicHandleEvent
, MC_uicHandleEvent
MC_uicCallbackProc .

```

---

```

        MC_UicComponent
    ,
    ,
        MC_uicGetTextSize 가
    256 , MC_uicSetTextSize 가
    가
MC_uicInsertText
MC_uicDeleteText
MC_uicGetMaxTextSize
MC_uicSetMaxTextSize
MC_uicGetTextSize
MC_uicGetText

    가
MC_UIC_CHANGE_CALLBACK :
MC_UIC_KEY_CALLBACK : 가

    /
    / MC_UicComponent , /
    , / . MC_uicSetTime
/ , /
    . / ,
    , MC_uicSetTimeMask 가
    가
MC_uicSetTimeMask
MC_uicSetTime
MC_uicGetTime
MC_uicSetTimeLong

    가
MC_UIC_CHANGE_CALLBACK :
```

MC\_UicComponent

가

MC\_uicAddMenuItem  
MC\_uicGetMenuItem  
MC\_uicRemoveMenuItem  
MC\_uicSetActiveMenuItem  
MC\_uicGetActiveMenuItem

가

MC\_UIC\_CHANGE\_CALLBACK :

MC\_UicComponent

가

MC\_uicSetLabel

MC\_UicComponent

가

MC\_uicAddListItem  
MC\_uicGetListItem  
MC\_uicRemoveListItem  
MC\_uicSetActiveListItem  
MC\_uicGetActiveListItem

가

MC\_UIC\_CHANGE\_CALLBACK :



---

가 , .

가 .

MC\_uicDestory  
MC\_uicRepaint  
MC\_uicPaint  
MC\_uicGetClassName  
MC\_uicIsInstance  
MC\_uicHandleEvent  
MC\_uicConfigure  
MC\_uicGetGeometry  
MC\_uicSetEnable  
MC\_uicSetExtData  
MC\_uicGetExtData  
MC\_uicSetCallback  
MC\_uicSetEventHandler  
MC\_uicSetFont  
MC\_uicGetFont

가 .

MC\_UIC\_SELECT\_CALLBACK : 가 "SELECT" 가  
MC\_UIC\_PAINT\_CALLBACK : 가 MC\_UIC\_DESTORY\_CALLBACK :  
가

✎ MC\_UicComponent

```
typedef M_Int32 MC_UicComponent
```

✎ MC\_UicClass

```
typedef M_Int32 MC_UicClass
```

✎ MC\_UicApplicationContext

```
typedef M_Int32 MC_UicApplicationContext
```

 MC\_UicCallbackProc

```
typedef void (*MC_UicCallbackProc)(MC_UicComponent cc, void* serverData,  
M_Int32 clientData)
```

cc -

serverData -

;

clientData -

 MC\_UicEventHandlerProc

```
typedef M_Int32 (*MC_UicEventHandlerProc)(MC_UicComponent cc, M_Int32 type,  
M_Int32 param1, M_Int32 param2)
```

cc -

type -

param1 - 1

param2 - 2

1 , 0

✎ MC\_UIC\_MENU\_COMPONENT

```
#define MC_UIC_MENU_COMPONENT "MenuComponent"
```

```
, "MenuComponent" .
```

✍ MC\_UIC\_DATE\_TIME\_COMPONENT

```
#define MC_UIC_DATE_TIME_COMPONENT    "DateTimeComponent"
```

```
,                                     , "DateTimeComponent" .
```



✎ MC\_UIC\_TEXT\_COMPONENT

```
#define MC_UIC_TEXT_COMPONENT "TextComponent"  
  
                                , "TextComponent" .
```

✎ MC\_UIC\_LABEL\_COMPONENT

```
#define MC_UIC_LABEL_COMPONENT "LabelComponent"
```

```
, "LabelComponent" .
```

✎ MC\_UIC\_LIST\_COMPONENT

```
#define MC_UIC_LIST_COMPONENT "ListComponent"  
  
    , "ListComponent" .
```

✎ MC\_UIC\_DESTROY\_CALLBACK

```
#define MC_UIC_DESTROY_CALLBACK 1
```

가

1

✎ MC\_UIC\_PAINT\_CALLBACK

```
#define MC_UIC_PAINT_CALLBACK 2
```

가 , 2 .

✎ MC\_UIC\_SELECT\_CALLBACK

```
#define MC_UIC_SELECT_CALLBACK      3
```

```
,      3
```

✍ MC\_UIC\_CHANGE\_CALLBACK

```
#define MC_UIC_CHANGE_CALLBACK      4
```

```
,      4
```

```
.
```

✎ MC\_UIC\_KEY\_CALLBACK

```
#define MC_UIC_KEY_CALLBACK 5
```

가 , 5



✎ MC\_GRP\_GRAY\_TYPE

```
#define MC_GRP_GRAY_TYPE(1 << 1)
```

```
.          (1 << 1).
```

✎ MC\_GRP\_COLOR\_TYPE

```
#define MC_GRP_COLOR_TYPE(1 << 2)
```

```
.          (1 << 2).
```

✎ MC\_ALIGN\_LEFT

```
#define MC_ALIGN_LEFT 0
```

```
. 0.
```

✎ MC\_ALIGN\_RIGHT

```
#define MC_ALIGN_RIGHT 1
```

```
. 1.
```

 MC\_ALIGN\_CENTER

```
#define MC_ALIGN_CENTER      2
```

```
.      2.
```

✎ MC\_uicCreateApplicationContext

```
MC_UicApplicationContext MC_uicCreateApplicationContext()
```

---

## ✎ MC\_uicGetClass

```
MC_UicClass MC_uicGetClass(M_Uint8* psz)
```

가 .

가 .

MC\_UIC\_MENU\_COMPONENT, MC\_UIC\_DATE\_TIME\_COMPONENT,  
MC\_UIC\_TEXT\_COMPONENT, MC\_UIC\_LABEL\_COMPONENT, MC\_UIC\_LIST\_COMPONENT 가 .

psz - [in]

(psz)

M\_E\_ERROR

## ✎ MC\_uicCreate

MC\_UicComponent MC\_uicCreate(MC\_UicApplicationContext pac, MC\_UicClass cls)

. MC\_uicCreateApplicationContext  
(Application Context) MC\_uicGetClass 가

pac - [in]


cls - [in]

M\_E\_ERROR :

MC\_UIC\_E\_OUT\_OF\_MEM :

MC\_uicCreateApplicationContext



 MC\_uicDestroy

```
void MC_uicDestroy(MC_UicComponent cc)
```

```
    cc
```

```
cc - [in]
```

## ✎ MC\_uicRepaint

```
void MC_uicRepaint(MC_UicComponent cc, M_Int32 x, M_Int32 y, M_Int32 w,
M_Int32 h)
```

```

        .
        paintClet   가
        .
        w, h가 -1   ,   (x, y)
        가         가
        .

```

cc - [in]

x - [in]                    x     (                    )


y - [in]                    y     (                    )

w - [in]

h - [in]

MC\_grpRepaint

MC\_uicPaint

 MC\_uicPaint

```
void MC_uicPaint(MC_UicComponent cc, MC_GrpContext *pgc)
```

```
    paintClet
```

```
    pgc
```

```
    pgc 가
```

```
cc - [in]
```

```
pgc - [in]
```

---

✎ MC\_uicGetClassName


```
M_Uint8* MC_uicGetClassName(MC_UicComponent cc)
```

cc 가 가

"C"

cc - [in]

NULL

 MC\_uiclsInstance

```
M_Uint32 MC_uiclsInstance(MC_UicComponent cc, M_Uint8* pcls)
```

가

cc - [in]

pcls - [in]

가

1,

0

---

## ✎ MC\_uicHandleEvent

```
M_Int32 MC_uicHandleEvent(MC_UicCompeont cc, M_Int32 type, M_Int32 param1,  
M_Int32 param2)
```

```
0  
가 1  
type param1, param2 handleCletEvent
```

cc - [in]

type - [in]

param1 - [in] 1

param2 - [in] 2

## ✎ MC\_uicConfigure

```
void MC_uicConfigure(MC_UicComponent cc, M_Int32 x, M_Int32 y, M_Int32 w,
M_Int32 h, M_Int32 mask)
```

(x, y)가 가 , w, h  
.mask & MC\_UIC\_POS\_MASK가 0 (x, y) 가  
, mask & MC\_UIC\_SIZE\_MASK가 0 (w, h)  
w h가 0

cc - [in]  
x - [in] x  
y - [in] y  
w - [in]  
h - [in]  
mask - [in] ;  
MC\_UIC\_SIZE\_MASK MC\_UIC\_POS\_MASK OR

---

## ✎ MC\_uicGetGeometry

```
void MC_uicGetGeometry(MC_UicComponent cc, M_Int32* px, M_Int32* py,  
M_Int32* pw, M_Int32* ph)
```

가 .  
px, py 가 가 , pw, ph  
가 NULL , .

cc - [in]

px - [out] x

py - [out] y

pw - [out]

ph - [out]



## ✎ MC\_uicSetEnable

```
void MC_uicSetEnable(MC_UicComponent cc, M_Int32 enable)
```

enable 가 / 가 .  
 enable 가  
 가 (Enable FALSE )

cc - [in]

enable - [in] 1 가 , 0 가

## ✎ MC\_uicSetCallback

```
MC_UicCallbackProc MC_uicSetCallback( MC_UicComponent cc, M_Int32 idx,
MC_UicCallbackProc proc, M_Int32 clientData)
```

```

        가 ,
        .
clientData          가 .      가

MC_UIC_DESTROY_CALLBACK
MC_UIC_PAINT_CALLBACK
MC_UIC_SELECT_CALLBACK
MC_UIC_CHANGE_CALLBACK
MC_UIC_KEY_CALLBACK

cc - [in]
idx - [in]      가          MC_UIC_PAINT_CALLBACK,
MC_UIC_SELECT_CALLBACK
proc - [in]
clientData - [in]

, NULL
```

---

## ✎ MC\_uicSetEventHandler


```
MC_UicEventHandlerProc MC_uicSetEventHandler( MC_UicComponent cc,  
MC_UicEventHandlerProc handler)
```

가 ,

cc - [in]

handler - [in]

NULL


 MC\_uicSetFont

```
M_Int32 MC_uicSetFont(MC_UicComponent cc, M_Int32 fontid)
```

fontid 가


cc - [in]

fontid - [in] MC\_grpGetFont

 MC\_uicGetFont

```
M_Int32 MC_uicGetFont(MC_UicComponent cc)
```

cc - [in]

 MC\_uicSetFgColor

```
void MC_uicSetFgColor(MC_UicComponent cc, M_Int32 nColor);
```

Foreground .

cc - [in]

nColor - (0xRRGGBB)


 **MC\_uicSetBgColor**

```
void MC_uicSetBgColor(MC_UicComponent cc, M_Int32 nColor);
```

Background .

cc - [in]

nColor - (0xRRGGBB)

 MC\_uicSetLabel

```
void MC_uicSetLabel(MC_UicComponent cc, M_Uint8 *psz)
```

가 가

cc - [in]

psz - [in]



✎ MC\_uicGetLabel

```
M_Uint8* MC_uicGetLabel(MC_UicComponent cc)
```

가 가

cc - [in]



## ✎ MC\_uicSetTimeMask

```
M_Int32 MC_uicSetTimeMask(MC_UicComponent cc, M_Int32 mask)
```

```
(mask & MC_UIC_TIME_MASK) 0 , (mask &
MC_UIC_DATE_MASK) 0 가
가 가
```

```
cc - [in]
```

```
mask - [in] , MC_UIC_TIME_MASK MC_UIC_DATE_MASK
OR
```

---

## ✎ MC\_uicSetTime

```
void MC_uicSetTime(MC_UicComponent cc, struct tm* pd)
```

```
pd      가      가  
        C      time.h      tm
```

cc - [in]

pd - [in] . time.h



---

## ✎ MC\_uicGetTime

```
void MC_uicGetTime(MC_UicComponet cc, struct tm* pd)
```

/ .  
 . 가 NULL 가  
 .  
 가 가  
 C time.h tm .

cc - [in]

pd - [out]

---

## ✎ MC\_uicAddMenuItem

```
M_Int32 MC_uicAddMenuItem(MC_Component cc, M_Uint8* psz, MC_GrpImage img)
```

가 .  
가 가 .  
.  
cc - [in]  
psz - [in]  
img - [in]

(0 .)

## ✎ MC\_uicGetMenuItem

```
M_Int32 MC_uicGetMenuItem(MC_Component cc, M_Uint32 idx, M_Uint8* psz,
M_Int32 buflen, MC_GrpImage* img)
```

가 .

가 가 .

cc - [in]

idx - [in] 가

psz - [out]

buflen - [in]

img - [out]

1 0 M\_E\_SHOFTBUF: psz

가



---

✎ MC\_uicRemoveMenuItem

M\_Int32 MC\_uicRemoveMenuItem(MC\_Component cc, M\_Uint32 idx)

idx 가 가

가

가

cc - [in]

idx - [in]

1

0

---

✎ MC\_uicSetActiveMenuItem

```
M_Int32 MC_uicSetActiveMenuItem(MC_Component cc, M_Int32 idx)
```

```
가      가  
idx      ,  
idx -1
```

cc - [in]

idx - [in]

✎ MC\_uicGetActiveMenuItem

M\_Int32 MC\_uicGetActiveMenuItem(MC\_Component cc)

가 가

cc - [in]

-1 : 가

## ✎ MC\_uicInsertText

```
M_Int32 MC_uicInsertText(MC_Component cc, M_Int32 idx, M_Uint8* psz, M_Int32 len)
```

```

    가 .
cc 가 가          idx          psz          len
    . idx 가 0          가          , M_CuicGetMaxTextSize()
    가가          .
    가          psz 가 가
    .
    가          가
    .

```

```
cc - [in]
```

```
idx - [in]
```

```
psz - [in]
```

```
len - [in]
```

```
가
```

```
len
```

---

## ✎ MC\_uicDeleteText

```
void MC_uicDeleteText(MC_Component cc, M_Int32 idx, M_Int32 len)
```

```
cc 가 가 .  
idx 가 len  
.  
len -1 idx 가 .  
idx 가 len 0  
.  
가 가
```

```
cc - [in]  
idx - [in]  
len - [in]
```

✎ MC\_uicGetMaxTextSize

M\_Int32 MC\_uicGetMaxTextSize(MC\_Component cc)

가 가

cc - [in]



✎ MC\_uicGetTextSize

```
M_Int32 MC_uicGetTextSize(MC_Component cc)
```

가 가

cc - [in]



## ✎ MC\_uicGetText

```
M_Int32 MC_uicGetText(MC_Component cc, M_Int32 idx, M_Uint8* pszBuf, M_Int32 len)
```

|     |   |   |  |     |      |        |     |
|-----|---|---|--|-----|------|--------|-----|
| cc  | 가 | 가 |  | idx |      | pszBuf | len |
| idx |   |   |  | ,   | idx가 | 0      | 0   |
|     |   |   |  | ,   | idx가 |        | 0   |
|     |   |   |  | 가   | 가    |        |     |

```
cc - [in]
idx - [in]
psz - [out]
len - [in]
```

---

 MC\_uicAddListItem

```
M_Int32 MC_uicAddListItem(MC_Component cc, M_Uint8* psz, MC_GrpImage img)
```

가 .

가 가

cc - [in]

psz - [in]

img - [in]

(0 .)

## ✎ MC\_uicGetListItem

```
M_Int32 MC_uicGetListItem(MC_Component cc, M_Uint32 idx, M_Uint8* psz,
M_Int32 buflen, MC_GrplImage* img)
```

가 .  
가 가

cc - [in]  
idx - [in] 가  
psz - [out]  
buflen - [in]  
img - [out]

1 0 M\_E\_SHOFTBUF: psz 가

---

✎ MC\_uicRemoveListItem

M\_Int32 MC\_uicRemoveListItem(MC\_Component cc, M\_Uint32 idx)

idx 가 가

가

가

cc - [in]

idx - [in]

1

0

---

## ✎ MC\_uicSetActiveListItem

```
M_Int32 MC_uicSetActiveListItem(MC_Component cc, M_Int32 idx)
```

```
가 가  
idx ,  
idx -1
```

cc - [in]

idx - [in]

✎ MC\_uicGetActiveListItem

M\_Int32 MC\_uicGetActiveListItem(MC\_Component cc)

가 가

cc - [in]

-1 : 가

---

## 5.1.12. C

C

C

ANSI-C

✍

(string.h)

strcpy, strncpy, strcat, strncat, strcmp, strncmp, strchr, strrchr, strspn, strcspn, strpbrk, strstr, strlen, strtok, memcpy, memmove, memcmp, memchr, memset

✍

(stdlib.h)

atof, atoi, atoll, strtod, strtol, strtoul

✍ 가

(stdarg.h)

va\_list, va\_start, va\_arg, va\_end

✍

(time.h)

clock, time, difftime, mktime, localtime, gmtime

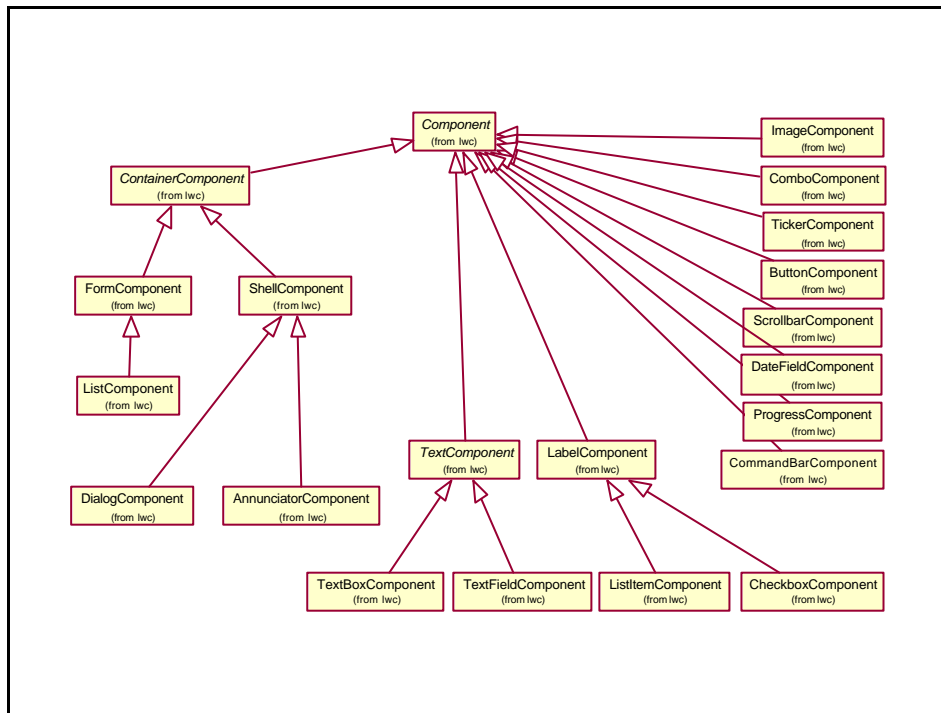
## 5.2. API

java.lang,

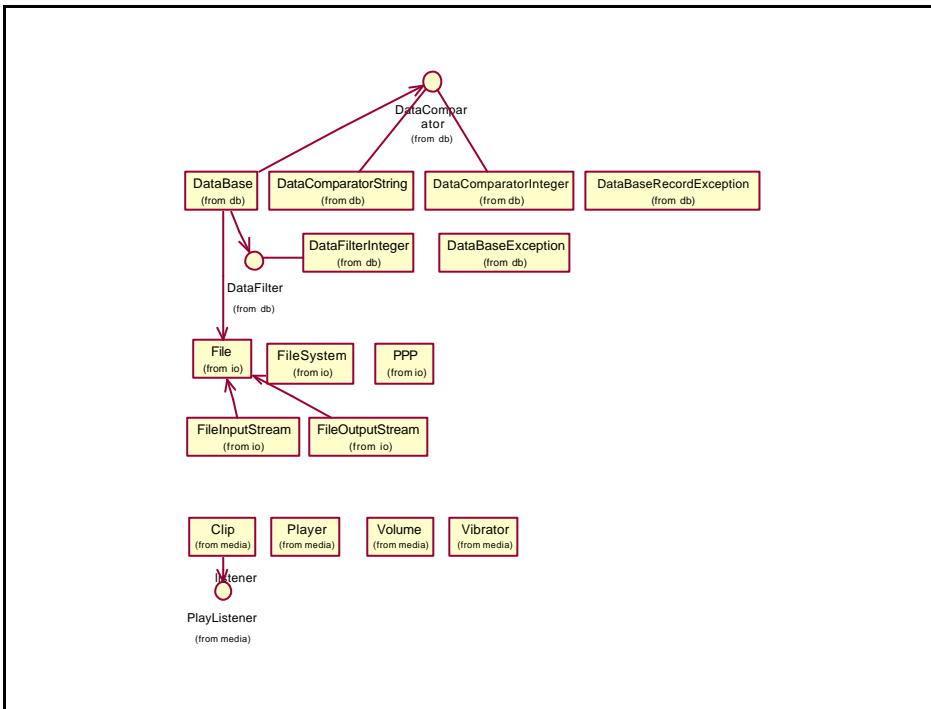
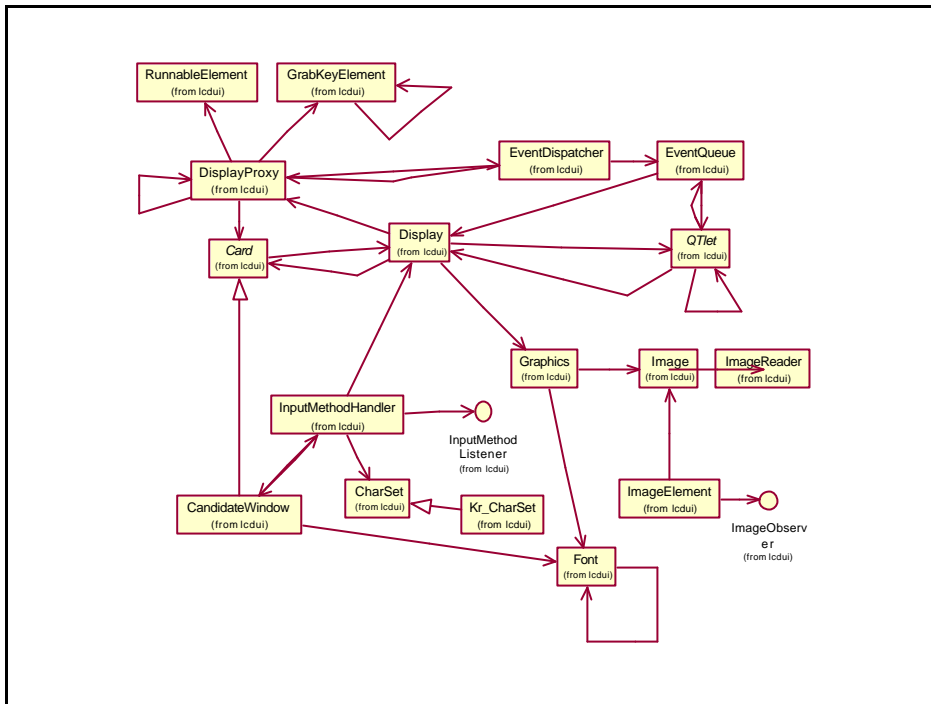
java.io, java.util GNU classpath

CPU

### MSP/MSF API







## 5.2.1. Core System (java.lang)

/ GNU classpath java.lang

| Class or Interface             | Member Variable or Method                        |
|--------------------------------|--|
| ArithmeticException            | ArithmeticException()                            |
|                                | ArithmeticException(java.lang.String)            |
| ArrayIndexOutOfBoundsException | ArrayIndexOutOfBoundsException()                 |
|                                | ArrayIndexOutOfBoundsException(int)              |
|                                | ArrayIndexOutOfBoundsException(java.lang.String) |
| ArrayStoreException            | ArrayStoreException()                            |
|                                | ArrayStoreException(java.lang.String)            |
| Boolean                        | Boolean(boolean)                                 |
|                                | booleanValue()                                   |
|                                | equals(java.lang.Object)                         |
|                                | hashCode()                                       |
|                                | toString()                                       |
| Byte                           | MAX_VALUE  |
|                                | MIN_VALUE  |
|                                | Byte(byte)                                       |
|                                | byteValue()                                      |
|                                | equals(java.lang.Object)                         |
|                                | hashCode()                                       |
|                                | parseByte(java.lang.String)                      |
|                                | parseByte(java.lang.String, int)                 |
|                                | toString()                                       |
| Character                      | MAX_RADIX  |
|                                | MAX_VALUE  |
|                                | MIN_RADIX  |
|                                | MIN_VALUE  |
|                                | Character(char)                                  |
|                                | charValue()                                      |
|                                | digit(char, int)                                 |
|                                | equals(java.lang.Object)                         |

|                        |  |
|------------------------|--|
|                        | hashCode()                               |
|                        | isDigit(char)                            |
|                        | isLowerCase(char)                        |
|                        | isUpperCase(char)                        |
|                        | toLowerCase(char)                        |
|                        | toString()                               |
|                        | toUpperCase(char)                        |
| Class                  | forName(java.lang.String)                |
|                        | getName()                                |
|                        | getResourceAsStream(java.lang.String)    |
|                        | isArray()                                |
|                        | isAssignableFrom(java.lang.Class)        |
|                        | isInstance(java.lang.Object)             |
|                        | isInterface()                            |
|                        | newInstance()                            |
|                        | toString()                               |
| ClassCastException     | ClassCastException()                     |
|                        | ClassCastException(java.lang.String)     |
| ClassNotFoundException | ClassNotFoundException()                 |
|                        | ClassNotFoundException(java.lang.String) |
| Double                 | MAX_VALUE                                |
|                        | MIN_VALUE                                |
|                        | NaN                                      |
|                        | NEGATIVE_INFINITY                        |
|                        | POSITIVE_INFINITY                        |
|                        | Double(double)                           |
|                        | byteValue()                              |
|                        | doubleToLongBits(double)                 |
|                        | doubleValue()                            |
|                        | equals(java.lang.Object)                 |
|                        | floatValue()                             |
|                        | hashCode()                               |
|                        | intValue()                               |
|                        | isInfinite()                             |
|                        | isInfinite(double)                       |

|           |                               |
|-----------|-------------------------------|
|           | isNaN()                       |
|           | isNaN(double)                 |
|           | longBitsToDouble(long)        |
|           | longValue()                   |
|           | parseDouble(java.lang.String) |
|           | shortValue()                  |
|           | toString()                    |
|           | toString(double)              |
|           | valueOf(java.lang.String)     |
| Error     | Error()                       |
|           | Error(java.lang.String)       |
| Exception | Exception()                   |
|           | Exception(java.lang.String)   |
| Float     | MAX_VALUE                     |
|           | MIN_VALUE                     |
|           | NaN                           |
|           | NEGATIVE_INFINITY             |
|           | POSITIVE_INFINITY             |
|           | Float(double)                 |
|           | Float(float)                  |
|           | byteValue()                   |
|           | doubleValue()                 |
|           | equals(java.lang.Object)      |
|           | floatToIntBits(float)         |
|           | floatValue()                  |
|           | hashCode()                    |
|           | intBitsToFloat(int)           |
|           | intValue()                    |
|           | isInfinite()                  |
|           | isInfinite(float)             |
|           | isNaN()                       |
|           | isNaN(float)                  |
|           | longValue()                   |
|           | parseFloat(java.lang.String)  |
|           | shortValue()                  |

|                              |  |
|------------------------------|--|
|                              | toString()                                     |
|                              | toString(float)                                |
|                              | valueOf(java.lang.String)                      |
| IllegalAccessException       | IllegalAccessException()                       |
|                              | IllegalAccessException(java.lang.String)       |
| IllegalArgumentException     | IllegalArgumentException()                     |
|                              | IllegalArgumentException(java.lang.String)     |
| IllegalMonitorStateException | IllegalMonitorStateException()                 |
|                              | IllegalMonitorStateException(java.lang.String) |
| IllegalStateException        | IllegalStateException()                        |
|                              | IllegalStateException(java.lang.String)        |
| IllegalThreadStateException  | IllegalThreadStateException()                  |
|                              | IllegalThreadStateException(java.lang.String)  |
| IndexOutOfBoundsException    | IndexOutOfBoundsException()                    |
|                              | IndexOutOfBoundsException(java.lang.String)    |
| InstantiationException       | InstantiationException()                       |
|                              | InstantiationException(java.lang.String)       |
| Integer                      | MAX_VALUE                                      |
|                              | MIN_VALUE                                      |
|                              | Integer(int)                                   |
|                              | byteValue()                                    |
|                              | doubleValue()                                  |
|                              | equals(java.lang.Object)                       |
|                              | floatValue()                                   |
|                              | hashCode()                                     |
|                              | intValue()                                     |
|                              | longValue()                                    |
|                              | parseInt(java.lang.String)                     |
|                              | parseInt(java.lang.String, int)                |
|                              | shortValue()                                   |
|                              | toBinaryString(int)                            |
|                              | toHexString(int)                               |
|                              | toOctalString(int)                             |
|                              | toString()                                     |
|                              | toString(int)                                  |

|                      |  |
|----------------------|--|
|                      | toString(int, int)                     |
|                      | valueOf(java.lang.String)              |
|                      | valueOf(java.lang.String, int)         |
| InterruptedException | InterruptedException()                 |
|                      | InterruptedException(java.lang.String) |
| Long                 | MAX_VALUE                              |
|                      | MIN_VALUE                              |
|                      | Long(long)                             |
|                      | doubleValue()                          |
|                      | equals(java.lang.Object)               |
|                      | floatValue()                           |
|                      | hashCode()                             |
|                      | longValue()                            |
|                      | parseLong(java.lang.String)            |
|                      | parseLong(java.lang.String, int)       |
|                      | toString()                             |
|                      | toString(long)                         |
|                      | toString(long, int)                    |
| Math                 | E                                      |
|                      | PI                                     |
|                      | abs(double)                            |
|                      | abs(float)                             |
|                      | abs(int)                               |
|                      | abs(long)                              |
|                      | ceil(double)                           |
|                      | floor(double)                          |
|                      | max(double, double)                    |
|                      | max(float, float)                      |
|                      | max(int, int)                          |
|                      | max(long, long)                        |
|                      | min(double, double)                    |
|                      | min(float, float)                      |
|                      | min(int, int)                          |
|                      | min(long, long)                        |
|                      | toDegrees(double)                      |

|                            |  |
|----------------------------|--|
|                            | toRadians(double)                            |
| NegativeArraySizeException | NegativeArraySizeException()                 |
|                            | NegativeArraySizeException(java.lang.String) |
| NullPointerException       | NullPointerException()                       |
|                            | NullPointerException(java.lang.String)       |
| NumberFormatException      | NumberFormatException()                      |
|                            | NumberFormatException(java.lang.String)      |
| Object                     | Object()                                     |
|                            | equals(java.lang.Object)                     |
|                            | getClass()                                   |
|                            | hashCode()                                   |
|                            | notify()                                     |
|                            | notifyAll()                                  |
|                            | toString()                                   |
|                            | wait()                                       |
|                            | wait(long)                                   |
|                            | wait(long, int)                              |
| OutOfMemoryError           | OutOfMemoryError()                           |
|                            | OutOfMemoryError(java.lang.String)           |
| Runnable                   | run()  |
| Runtime                    | exit(int)                                    |
|                            | freeMemory()                                 |
|                            | gc()   |
|                            | getRuntime()                                 |
|                            | totalMemory()                                |
| RuntimeException           | RuntimeException()                           |
|                            | RuntimeException(java.lang.String)           |
| SecurityException          | SecurityException()                          |
|                            | SecurityException(java.lang.String)          |
| Short                      | MAX_VALUE                                    |
|                            | MIN_VALUE                                    |
|                            | Short(short)                                 |
|                            | equals(java.lang.Object)                     |
|                            | hashCode()                                   |
|                            | parseShort(java.lang.String)                 |

|        |   |
|--------|---|
|        | parseShort(java.lang.String, int)                       |
|        | shortValue()  |
|        | toString()  |
| String | String()  |
|        | String(byte[])  |
|        | String(byte[], int, int)                                |
|        | String(byte[], int, int, java.lang.String)              |
|        | String(byte[], java.lang.String)                        |
|        | String(char[])  |
|        | String(char[], int, int)                                |
|        | String(java.lang.String)                                |
|        | String(java.lang.StringBuffer)                          |
|        | charAt(int)   |
|        | compareTo(java.lang.String)                             |
|        | concat(java.lang.String)                                |
|        | endsWith(java.lang.String)                              |
|        | equals(java.lang.Object)                                |
|        | equalsIgnoreCase(java.lang.String)                      |
|        | getBytes()  |
|        | getBytes(java.lang.String)                              |
|        | getChars(int, int, char[], int)                         |
|        | hashCode()  |
|        | indexOf(int)  |
|        | indexOf(int, int)                                       |
|        | indexOf(java.lang.String)                               |
|        | indexOf(java.lang.String, int)                          |
|        | lastIndexOf(int)  |
|        | lastIndexOf(int, int)                                   |
|        | length()  |
|        | regionMatches(boolean, int, java.lang.String, int, int) |
|        | replace(char, char)                                     |
|        | startsWith(java.lang.String)                            |
|        | startsWith(java.lang.String, int)                       |
|        | substring(int)  |
|        | substring(int, int)                                     |



|              |                                 |
|--------------|---------------------------------|
|              | toCharArray()                   |
|              | toLowerCase()                   |
|              | toString()                      |
|              | toUpperCase()                   |
|              | trim()                          |
|              | valueOf(boolean)                |
|              | valueOf(char)                   |
|              | valueOf(char[])                 |
|              | valueOf(char[], int, int)       |
|              | valueOf(double)                 |
|              | valueOf(float)                  |
|              | valueOf(int)                    |
|              | valueOf(long)                   |
|              | valueOf(java.lang.Object)       |
| StringBuffer | StringBuffer()                  |
|              | StringBuffer(int)               |
|              | StringBuffer(java.lang.String)  |
|              | append(boolean)                 |
|              | append(char)                    |
|              | append(char[])                  |
|              | append(char[], int, int)        |
|              | append(double)                  |
|              | append(float)                   |
|              | append(int)                     |
|              | append(long)                    |
|              | append(java.lang.Object)        |
|              | append(java.lang.String)        |
|              | capacity()                      |
|              | charAt(int)                     |
|              | delete(int, int)                |
|              | deleteCharAt(int)               |
|              | ensureCapacity(int)             |
|              | getChars(int, int, char[], int) |
|              | insert(int, boolean)            |
|              | insert(int, char)               |

|                                 |  |
|---------------------------------|--|
|                                 | insert(int, char[ ])   |
|                                 | insert(int, double)  |
|                                 | insert(int, float)   |
|                                 | insert(int, int)   |
|                                 | insert(int, long)  |
|                                 | insert(int, java.lang.Object)                                |
|                                 | insert(int, java.lang.String)                                |
|                                 | length()   |
|                                 | reverse()  |
|                                 | setCharAt(int, char)   |
|                                 | setLength(int)   |
|                                 | toString()   |
| StringIndexOutOfBoundsException | StringIndexOutOfBoundsException()                            |
|                                 | StringIndexOutOfBoundsException(int)                         |
|                                 | StringIndexOutOfBoundsException(java.lang.String)            |
| System                          | err  |
|                                 | out  |
|                                 | arraycopy(java.lang.Object, int, java.lang.Object, int, int) |
|                                 | currentTimeMillis()  |
|                                 | exit(int)  |
|                                 | gc()   |
|                                 | getProperty(java.lang.String)                                |
|                                 | identityHashCode(java.lang.Object)                           |
| Thread                          | MAX_PRIORITY   |
|                                 | MIN_PRIORITY   |
|                                 | NORM_PRIORITY  |
|                                 | Thread()   |
|                                 | Thread(java.lang.Runnable)                                   |
|                                 | activeCount()  |
|                                 | currentThread()  |
|                                 | getPriority()  |
|                                 | isAlive()  |
|                                 | join()   |
|                                 | run()  |
|                                 | setPriority(int)   |

---

|                     |                                       |
|---------------------|---------------------------------------|
|                     | sleep(long)                           |
|                     | start()                               |
|                     | toString()                            |
|                     | yield()                               |
| Throwable           | Throwable()                           |
|                     | Throwable(java.lang.String)           |
|                     | getMessage()                          |
|                     | printStackTrace()                     |
|                     | toString()                            |
| VirtualMachineError | VirtualMachineError()                 |
|                     | VirtualMachineError(java.lang.String) |

## 5.2.2. High Level IO (java.io)

/ GNU classpath java.io

| Class or Interface         | Member Variable or Method              |
|----------------------------|--|
| ByteArrayInputStream       | buf                                    |
|                            | count                                  |
|                            | mark                                   |
|                            | pos                                    |
|                            | ByteArrayInputStream(byte[])           |
|                            | ByteArrayInputStream(byte[], int, int) |
|                            | available()                            |
|                            | close()                                |
|                            | mark(int)                              |
|                            | markSupported()                        |
|                            | read()                                 |
|                            | read(byte[], int, int)                 |
|                            | reset()                                |
|                            | skip(long)                             |
|                            | ByteArrayOutputStream                  |
| count                      |  |
| ByteArrayOutputStream()    |  |
| ByteArrayOutputStream(int) |  |
| reset()                    |  |
| size()                     |  |
| toArray()                  |  |
| toString()                 |  |
| write(byte[], int, int)    |  |
| write(int)                 |  |
| DataInput                  |  |
|                            | readByte()                             |
|                            | readChar()                             |
|                            | readDouble()                           |
|                            | readFloat()                            |

|                 |                                      |
|-----------------|--------------------------------------|
|                 | readFully(byte[])                    |
|                 | readFully(byte[], int, int)          |
|                 | readInt()                            |
|                 | readLong()                           |
|                 | readShort()                          |
|                 | readUnsignedByte()                   |
|                 | readUnsignedShort()                  |
|                 | readUTF()                            |
|                 | skipBytes(int)                       |
| DataInputStream | in                                   |
|                 | DataInputStream(java.io.InputStream) |
|                 | available()                          |
|                 | close()                              |
|                 | mark(int)                            |
|                 | markSupported()                      |
|                 | read()                               |
|                 | read(byte[])                         |
|                 | read(byte[], int, int)               |
|                 | readBoolean()                        |
|                 | readByte()                           |
|                 | readChar()                           |
|                 | readDouble()                         |
|                 | readFloat()                          |
|                 | readFully(byte[])                    |
|                 | readFully(byte[], int, int)          |
|                 | readInt()                            |
|                 | readLong()                           |
|                 | readShort()                          |
|                 | readUnsignedByte()                   |
|                 | readUnsignedShort()                  |
|                 | readUTF()                            |
|                 | readUTF(java.io.DataInput)           |
|                 | reset()                              |
|                 | skip(long)                           |
|                 | skipBytes(int)                       |

|                  |  |
|------------------|--|
| DataOutput       | write(byte[])                          |
|                  | write(byte[], int, int)                |
|                  | write(int)                             |
|                  | writeBoolean(boolean)                  |
|                  | writeByte(int)                         |
|                  | writeChar(int)                         |
|                  | writeChars(java.lang.String)           |
|                  | writeDouble(double)                    |
|                  | writeFloat(float)                      |
|                  | writeInt(int)                          |
|                  | writeLong(long)                        |
|                  | writeShort(int)                        |
|                  | writeUTF(java.lang.String)             |
| DataOutputStream | out                                    |
|                  | written                                |
|                  | DataOutputStream(java.io.OutputStream) |
|                  | close()                                |
|                  | flush()                                |
|                  | write(byte[], int, int)                |
|                  | write(int)                             |
|                  | writeBoolean(boolean)                  |
|                  | writeByte(int)                         |
|                  | writeChar(int)                         |
|                  | writeChars(java.lang.String)           |
|                  | writeDouble(double)                    |
|                  | writeFloat(float)                      |
|                  | writeInt(int)                          |
|                  | writeLong(long)                        |
|                  | writeShort(int)                        |
|                  | writeUTF(java.lang.String)             |
| EOFException     | EOFException()                         |
|                  | EOFException(java.lang.String)         |
| InputStream      | InputStream()                          |
|                  | available()                            |
|                  | close()                                |

|                      |  |
|----------------------|--|
|                      | mark(int)  |
|                      | markSupported()  |
|                      | read()   |
|                      | read(byte[])   |
|                      | read(byte[], int, int)                                     |
|                      | reset()  |
|                      | skip(long)   |
| InputStreamReader    | InputStreamReader(java.io.InputStream)                     |
|                      | InputStreamReader(java.io.InputStream, java.lang.String)   |
|                      | close()  |
|                      | mark(int)  |
|                      | markSupported()  |
|                      | read()   |
|                      | read(char[], int, int)                                     |
|                      | ready()  |
|                      | reset()  |
|                      | skip(long)   |
| InterruptedException | bytesTransferred   |
|                      | InterruptedException()                                     |
|                      | InterruptedException(java.lang.String)                     |
| IOException          | IOException()  |
|                      | IOException(java.lang.String)                              |
| OutputStream         | OutputStream()   |
|                      | close()  |
|                      | flush()  |
|                      | write(byte[])  |
|                      | write(byte[], int, int)                                    |
|                      | write(int)   |
| OutputStreamWriter   | OutputStreamWriter(java.io.OutputStream)                   |
|                      | OutputStreamWriter(java.io.OutputStream, java.lang.String) |
|                      | close()  |
|                      | flush()  |
|                      | write(char)  |
|                      | write(char[], int, int)                                    |
|                      | write(int)   |

|             |                                   |
|-------------|-----------------------------------|
|             | write(java.lang.String, int, int) |
| PrintStream | PrintStream(java.io.OutputStream) |
|             | checkError()                      |
|             | close()                           |
|             | flush()                           |
|             | print(boolean)                    |
|             | print(char)                       |
|             | print(char[ ])                    |
|             | print(int)                        |
|             | print(long)                       |
|             | print(java.lang.Object)           |
|             | print(java.lang.String)           |
|             | println()                         |
|             | println(boolean)                  |
|             | println(char)                     |
|             | println(char[ ])                  |
|             | println(int)                      |
|             | println(long)                     |
|             | println(java.lang.Object)         |
|             | println(java.lang.String)         |
|             | setError()                        |
|             | write(byte[ ], int, int)          |
|             | write(int)                        |
| Reader      | lock                              |
|             | Reader()                          |
|             | Reader(java.lang.Object)          |
|             | close()                           |
|             | mark(int)                         |
|             | markSupported()                   |
|             | read()                            |
|             | read(char[ ])                     |
|             | read(char[ ], int, int)           |
|             | ready()                           |
|             | reset()                           |
|             | skip(long)                        |



---

|                              |  |
|------------------------------|--|
| UnsupportedEncodingException | UnsupportedEncodingException()                 |
|                              | UnsupportedEncodingException(java.lang.String) |
| UTFDataFormatException       | UTFDataFormatException()                       |
|                              | UTFDataFormatException(java.lang.String)       |
| Writer                       | lock   |
|                              | Writer()                                       |
|                              | Writer(java.lang.Object)                       |
|                              | close()  |
|                              | flush()  |
|                              | write(char[])                                  |
|                              | write(char[], int, int)                        |
|                              | write(int)                                     |
|                              | write(java.lang.String)                        |
|                              | write(java.lang.String, int, int)              |

### 5.2.3. Utilities (java.util)

/ GNU classpath java.util

| Class or Interface | Member Variable or Method |
|--------------------|---------------------------|
| Calendar           | AM                        |
|                    | AM_PM                     |
|                    | APRIL                     |
|                    | areFieldsSet              |
|                    | AUGUST                    |
|                    | DATE                      |
|                    | DAY_OF_MONTH              |
|                    | DAY_OF_WEEK               |
|                    | DAY_OF_WEEK_IN_MONTH      |
|                    | DAY_OF_YEAR               |
|                    | DECEMBER                  |
|                    | DST_OFFSET                |
|                    | ERA                       |
|                    | FEBRUARY                  |
|                    | FIELD_COUNT               |
|                    | fields                    |
|                    | FRIDAY                    |
|                    | HOUR                      |
|                    | HOUR_OF_DAY               |
|                    | isSet                     |
|                    | isTimeSet                 |
|                    | JANUARY                   |
|                    | JULY                      |
|                    | JUNE                      |
|                    | MARCH                     |
|                    | MAY                       |
|                    | MILLISECOND               |
|                    | MINUTE                    |
|                    | MONDAY                    |

|  |                                 |
|--|---------------------------------|
|  | MONTH                           |
|  | NOVEMBER                        |
|  | OCTOBER                         |
|  | PM                              |
|  | SATURDAY                        |
|  | SECOND                          |
|  | SEPTEMBER                       |
|  | SUNDAY                          |
|  | THURSDAY                        |
|  | time                            |
|  | TUESDAY                         |
|  | UNDECIMBER                      |
|  | WEDNESDAY                       |
|  | WEEK_OF_MONTH                   |
|  | WEEK_OF_YEAR                    |
|  | YEAR                            |
|  | ZONE_OFFSET                     |
|  | Calendar()                      |
|  | Calendar(java.util.TimeZone)    |
|  | after(java.lang.Object)         |
|  | before(java.lang.Object)        |
|  | complete()                      |
|  | computeFields()                 |
|  | computeTime()                   |
|  | equals(java.lang.Object)        |
|  | get(int)                        |
|  | getFirstDayOfWeek()             |
|  | getGreatestMinimum(int)         |
|  | getInstance()                   |
|  | getInstance(java.util.TimeZone) |
|  | getLeastMaximum(int)            |
|  | getMaximum(int)                 |
|  | getMinimalDaysInFirstWeek()     |
|  | getMinimum(int)                 |
|  | getTime()                       |

|                     |                                       |
|---------------------|---------------------------------------|
|                     | getTimeInMillis()                     |
|                     | getTimeZone()                         |
|                     | initialize()                          |
|                     | internalGet(int)                      |
|                     | isLenient()                           |
|                     | isSet(int)                            |
|                     | set(int, int)                         |
|                     | set(int, int, int)                    |
|                     | setTime(java.util.Date)               |
|                     | setTimeInMillis(long)                 |
|                     | setTimeZone(java.util.TimeZone)       |
| Date                | Date()                                |
|                     | Date(long)                            |
|                     | equals(java.lang.Object)              |
|                     | getTime()                             |
|                     | hashCode()                            |
|                     | setTime(long)                         |
| EmptyStackException | EmptyStackException()                 |
| Enumeration         | hasMoreElements()                     |
|                     | nextElement()                         |
| GregorianCalendar   | AD                                    |
|                     | BC                                    |
|                     | GregorianCalendar()                   |
|                     | GregorianCalendar(int, int, int)      |
|                     | GregorianCalendar(java.util.TimeZone) |
|                     | after(java.lang.Object)               |
|                     | before(java.lang.Object)              |
|                     | computeFields()                       |
|                     | computeTime()                         |
|                     | equals(java.lang.Object)              |
|                     | getGreatestMinimum(int)               |
|                     | getLeastMaximum(int)                  |
|                     | getMaximum(int)                       |
|                     | getMinimum(int)                       |
|                     | hashCode()                            |

|                        |   |
|------------------------|---|
|                        | isLeapYear(int)   |
| Hashtable              | Hashtable()   |
|                        | Hashtable(int)  |
|                        | clear()   |
|                        | contains(java.lang.Object)  |
|                        | containsKey(java.lang.Object)   |
|                        | elements()  |
|                        | get(java.lang.Object)   |
|                        | isEmpty()   |
|                        | keys()  |
|                        | put(java.lang.Object, java.lang.Object)                                       |
|                        | rehash()  |
|                        | remove(java.lang.Object)  |
|                        | size()  |
|                        | toString()  |
| NoSuchElementException | NoSuchElementException()  |
|                        | NoSuchElementException(java.lang.String)                                      |
| Random                 | Random()  |
|                        | Random(long)  |
|                        | next(int)   |
|                        | nextInt()   |
|                        | nextLong()  |
|                        | setSeed(long)   |
| SimpleTimeZone         | SimpleTimeZone(int, java.lang.String)   |
|                        | SimpleTimeZone(int, java.lang.String, int, int, int, int, int, int, int, int) |
|                        | equals(java.lang.Object)  |
|                        | getOffset(int, int, int, int, int, int)                                       |
|                        | getRawOffset()  |
|                        | hashCode()  |
|                        | inDaylightTime(java.util.Date)  |
|                        | setRawOffset(int)   |
|                        | setStartYear(int)   |
|                        | useDaylightTime()   |
| Stack                  | Stack()   |
|                        | empty()   |

|           |  |
|-----------|--|
|           | peek()   |
|           | pop()  |
|           | push(java.lang.Object)   |
|           | search(java.lang.Object)                                       |
| Timer     | Timer()  |
|           | cancel()   |
|           | schedule(java.util.TimerTask, java.util.Date)                  |
|           | schedule(java.util.TimerTask, java.util.Date, long)            |
|           | schedule(java.util.TimerTask, long)                            |
|           | schedule(java.util.TimerTask, long, long)                      |
|           | scheduleAtFixedRate(java.util.TimerTask, java.util.Date, long) |
|           | scheduleAtFixedRate(java.util.TimerTask, long, long)           |
| TimerTask | TimerTask()  |
|           | cancel()   |
|           | run()  |
|           | scheduledExecutionTime()                                       |
| TimeZone  | TimeZone()   |
|           | getAvailableIDs()  |
|           | getAvailableIDs(int)   |
|           | getDefault()   |
|           | getID()  |
|           | getOffset(int, int, int, int, int, int)                        |
|           | getRawOffset()   |
|           | getTimeZone(java.lang.String)                                  |
|           | initialize()   |
|           | setID(java.lang.String)  |
|           | toString()   |
|           | useDaylightTime()  |
| Vector    | capacityIncrement  |
|           | elementCount   |
|           | elementData  |
|           | Vector()   |
|           | Vector(int)  |
|           | Vector(int, int)   |
|           | addElement(java.lang.Object)                                   |

---

|  |  |
|--|--|
|  | capacity()                             |
|  | contains(java.lang.Object)             |
|  | copyInto(java.lang.Object[])           |
|  | elementAt(int)                         |
|  | elements()                             |
|  | ensureCapacity(int)                    |
|  | firstElement()                         |
|  | indexOf(java.lang.Object)              |
|  | indexOf(java.lang.Object, int)         |
|  | insertElementAt(java.lang.Object, int) |
|  | isEmpty()                              |
|  | lastElement()                          |
|  | lastIndexOf(java.lang.Object)          |
|  | lastIndexOf(java.lang.Object, int)     |
|  | removeAllElements()                    |
|  | removeElement(java.lang.Object)        |
|  | removeElementAt(int)                   |
|  | setElementAt(java.lang.Object, int)    |
|  | setSize(int)                           |
|  | size()                                 |
|  | toString()                             |
|  | trimToSize()                           |

## 5.2.4. Low Level IO (org.kwis.msf.io)

### Interface HttpSocket

```
public interface HttpSocket
```

```
HTTP
```

```
✎ HEAD
```

```
public static final java.lang.String HEAD
```

```
HTTP Head . "HEAD" .
```

```
✎ GET
```

```
public static final java.lang.String GET
```

```
HTTP Get . "GET" .
```

```
✎ POST
```

```
public static final java.lang.String POST
```

```
HTTP Post . "POST" .
```

```
✎ TRACE
```

```
public static final java.lang.String TRACE
```

```
HTTP Trace . "TRACE" .
```

```
✎ PUT
```

```
public static final java.lang.String PUT
```

```
HTTP Put . "PUT" .
```

```
✎ DELETE
```

```
public static final java.lang.String DELETE
```

```
HTTP Delete . "DELETE" .
```

```
✎ OPTIONS
```

```
public static final java.lang.String OPTIONS
```



---

```
HTTP Options . "OPTIONS" .
✂ CONNECT

public static final java.lang.String CONNECT
HTTP Connect . "CONNECT" .
✂ HTTP_OK

public static final int HTTP_OK

        OK . 200 .
✂ HTTP_CREATED

public static final int HTTP_CREATED

        CREATED . 201 .
✂ HTTP_ACCEPTED

public static final int HTTP_ACCEPTED

        ACCEPTED . 202 .
✂ HTTP_NON_AUTHORITATIVE

public static final int HTTP_NON_AUTHORITATIVE

        NOT AUTHORITATIVE . 203 .
✂ HTTP_NO_CONTENT

public static final int HTTP_NO_CONTENT

        NO CONTENT . 204 .
✂ HTTP_RESET_CONTENT

public static final int HTTP_RESET_CONTENT

        RESET CONTENT . 205 .
✂ HTTP_PARTIAL_CONTENT

public static final int HTTP_PARTIAL_CONTENT

        PARTIAL CONTENT . 206 .
✂ HTTP_MULTIPLE_CHOICE

public static final int HTTP_MULTIPLE_CHOICE

        MULTIPLE CHOICE . 300 .
✂ HTTP_MOVED_PERMANENTLY
```

---

```
public static final int HTTP_MOVED_PERMANENTLY
    MOVED PERMANENTLY . 301 .
HTTP_MOVED_TEMPORARILY

public static final int HTTP_MOVED_TEMPORARILY
    MOVED TEMPORARILY . 302 .
HTTP_SEE_OTHER

public static final int HTTP_SEE_OTHER
    SEE OTHER . 303 .
HTTP_NOT_MODIFIED

public static final int HTTP_NOT_MODIFIED
    NOT MODIFIED . 304 .
HTTP_USE_PROXY

public static final int HTTP_USE_PROXY
    USE PROXY . 305 .
HTTP_BAD_REQ

public static final int HTTP_BAD_REQ
    BAD REQUEST . 400 .
HTTP_UNAUTHORIZED

public static final int HTTP_UNAUTHORIZED
    UNAUTHORIZED . 401 .
HTTP_PAYMENT_REQUIRED

public static final int HTTP_PAYMENT_REQUIRED
    PAYMENT REQUIRED . 402 .
HTTP_FORBIDDEN

public static final int HTTP_FORBIDDEN
    FORBIDDEN . 403 .
HTTP_NOT_FOUND

public static final int HTTP_NOT_FOUND
    NOT FOUND . 404 .
```

✂ HTTP\_METHOD\_NOT\_ALLOWED

```
public static final int HTTP_METHOD_NOT_ALLOWED
    METHOD NOT ALLOWED . 405 .
```

✂ HTTP\_NOT\_ACCEPTABLE

```
public static final int HTTP_NOT_ACCEPTABLE
    NOT ACCEPTABLE . 406 .
```

✂ HTTP\_PROXY\_AUTHENTICATION\_REQUIRED

```
public static final int HTTP_PROXY_AUTHENTICATION_REQUIRED
    PROXY AUTHENTICATION REQUITRED . 407 .
```

✂ HTTP\_REQ\_TIMEOUT

```
public static final int HTTP_REQ_TIMEOUT
    REQUEST TIMEOUT . 408 .
```

✂ HTTP\_CONFLICT

```
public static final int HTTP_CONFLICT
    CONFLICT . 409 .
```

✂ HTTP\_GONE

```
public static final int HTTP_GONE
    GONE . 410 .
```

✂ HTTP\_LENGTH\_REQUIRED

```
public static final int HTTP_LENGTH_REQUIRED
    LENGTH REQUIRED . 411 .
```

✂ HTTP\_PRECONDITION\_FAILED

```
public static final int HTTP_PRECONDITION_FAILED
    PRECONDITION FAILED . 412 .
```

✂ HTTP\_ENTITY\_TOO\_LARGE

```
public static final int HTTP_ENTITY_TOO_LARGE
    TOO LARGE . 413 .
```

✂ HTTP\_REQ\_TOO\_LONG

```
public static final int HTTP_REQ_TOO_LONG
```

---

```
        REQUEST TOO LONG .      414 .
⌘ HTTP_UNSUPPORTED_TYPE

public static final int HTTP_UNSUPPORTED_TYPE

        UNSUPPORTED TYPE .      415 .
⌘ HTTP_REQ_RANGE

public static final int HTTP_REQ_RANGE

        REQUEST RANGE NOT SATISFIABLE .      416 .
⌘ HTTP_EXPECT_FAIL

public static final int HTTP_EXPECT_FAIL

        EXPECTATION FAILED .      417 .
⌘ HTTP_SERVER_ERR

public static final int HTTP_SERVER_ERR

        INTERNAL SERVER ERROR .      500 .
⌘ HTTP_NOT_IMPL

public static final int HTTP_NOT_IMPL

        NOT IMPLEMENTED .      501 .
⌘ HTTP_BAD_GATEWAY

public static final int HTTP_BAD_GATEWAY

        BAD GATEWAY .      502 .
⌘ HTTP_UNAVAILABLE

public static final int HTTP_UNAVAILABLE


        UNAVAILABLE .      503 .
⌘ HTTP_GATEWAY_TIMEOUT

public static final int HTTP_GATEWAY_TIMEOUT

        GATEWAY TIMEOUT .      504 .
⌘ HTTP_VERSION

public static final int HTTP_VERSION

        VERSION NOT SUPPORTED .      505 .
```



✎ close

```
public void close()  
    throws java.io.IOException
```

HTTP

✎ getInputStream

```
public java.io.InputStream getInputStream()  
    throws java.io.IOException
```

InputStream

Returns:

InputStream

✎ getOutputStream

```
public java.io.OutputStream getOutputStream()  
    throws java.io.IOException
```

OutputStream

Returns:

OutputStream

✎ getURL

```
public java.lang.String getURL()
```

URL

Returns:

URL

✎ getProtocol

```
public java.lang.String getProtocol()
```

URL

Returns:

✎ getHost

public java.lang.String getHost()

URL


Returns:

 getFile

public java.lang.String getFile()

URL

Returns:

 getRef

public java.lang.String getRef()

URL anchor

Returns:

anchor

 getQuery

public java.lang.String getQuery()

URL query

Returns:


query

 getPort

public int getPort()

URL

Returns:

 getRequestMethod

public java.lang.String getRequestMethod()

Returns:

### ✍ setRequestMethod

```
public void setRequestMethod(java.lang.String method)
                           throws java.io.IOException
```

Parameters:

method -

### ✍ getRequestProperty

```
public java.lang.String getRequestProperty(java.lang.String key)
```

key                      request property

Parameters:

key - request header

Returns:

request property

### ✍ setRequestProperty

```
public void setRequestProperty(java.lang.String key,
                               java.lang.String value)
```

request property

Parameters:

key - request header

value - request property

### ✍ getResponseCode

```
public int getResponseCode()
           throws java.io.IOException
```

Returns:

Throws:

java.io.IOException -

✍ `getResponseMessage`

```
public java.lang.String getResponseMessage()  
                        throws java.io.IOException
```

? HTTP/1.0 200 OK

? HTTP/1.0 404 Not Found

"OK" "Not Found"

Returns:

Throws:

java.io.IOException -

✍ `getLength`

```
public long getLength()
```

Returns:

✍ `getType`

```
public java.lang.String getType()
```

Returns:

✍ `getEncoding`

```
public java.lang.String getEncoding()
```

"content-encoding"

Returns:

✍ `getExpiration`



```
public long getExpiration()
```

Returns:

```
1970 1 1 GMT ( )
```

✍ `getDate`

```
public long getDate()
```

Returns:

```
1970 1 1 GMT ( )
```

✍ `getLastModified`

```
public long getLastModified()
```

Returns:

```
1970 1 1 GMT ( )
```

✍ `getHeaderField`

```
public java.lang.String getHeaderField(java.lang.String name)
```

Parameters:

`name` -

Returns:

✍ `setProxy`

```
public void setProxy(java.lang.String host, int port)
                    throws java.io.IOException
```

HTTP

Parameters:

`host` -

`port` -

Throws:

java.io.IOException -

✍ isRelocatable

```
public boolean isRelocatable()
```

가 가

Returns:

가 301, 302, 303 true

✍ relocation

```
public HttpSocket relocation()
```

```
throws java.io.IOException
```

가 가

HTTP

Returns:

HTTP

Throws:

java.io.IOException -

## Class Message

java.lang.Object

|

+- -org.kwis.msf.io.Message

```
public class Message
```

```
extends java.lang.Object
```

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

✎ Message

```
public Message(java.lang.String addr, byte[] data)
```

Parameters:

addr -

data -

✎ Message

```
public Message(java.lang.String addr,
               byte[] data,
               int off,
               int len)
```

Parameters:

addr -

data -

off -

len -

✎ `getData`

```
public byte[] getData()
```

Returns:

✎ `getLength`

```
public int getLength()
```

Returns:

✎ `setLength`

```
public int setLength(int val)
```

|   |                          |                        |
|---|--------------------------|------------------------|
|   | <code>getOffset()</code> | <code>getData()</code> |
| 가 | 가 0                      | -1                     |

Parameters:

val-

Returns:

✎ `getOffset`

```
public int getOffset()
```

Returns:

✎ `setOffset`



Parameters:

date - 가 .

✍ setAddressInt

public void getAddressInt(int addr)

. UDP

IP :

) 111.111.111.111:80

Parameters:

addr -



**Class Network**

java.lang.Object

|

+-org.kwis.msf.io.Network

public class Network

extends java.lang.Object

TCP/IP

API

API

가

TCP/IP

. TCP/IP

URL.find()

 connect

public static int connect()

TCP/IP

Returns:

가 0 ,

1 . -1 .

 disconnect

public static void disconnect()

TCP/IP

가

TCP/IP

I/O

가

### Class SchemeNotFoundException

java.lang.Object

|

+- java.lang.Throwable

|

+- java.lang.Exception

|

+- java.io.IOException

|

+- org.kwis.msf.io.SchemeNotFoundException

```
public class SchemeNotFoundException
extends java.io.IOException
```

Methods inherited from class java.lang.Throwable

fillInStackTrace, getLocalizedMessage, getMessage, printStackTrace,  
printStackTrace, printStackTrace, toString

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, wait, wait, wait

✎ SchemeNotFoundException

```
public SchemeNotFoundException()
```

✎ SchemeNotFoundException

```
public SchemeNotFoundException(java.lang.String s)
```



## Interface Socket

public interface Socket

가

(stream)

java.io.InputStream    java.io.OutputStream

(Message)

가 TCP

가 UDP

✎ `getInputStream`

```
public java.io.InputStream getInputStream()
                               throws java.io.IOException
```

InputStream

Returns:

InputStream

Throws:

java.io.IOException -                    InputStream

✎ `getOutputStream`

```
public java.io.OutputStream getOutputStream()
                               throws java.io.IOException
```

OutputStream

Returns:

OutputStream

Throws:

java.io.IOException -                    OutputStream

✎ `isStream`

```
public boolean isStream()
```

Returns:

true, false

✍ getMessageCount

```
public int getMessageCount()  
    throws java.io.IOException
```

Returns:

-1

Throws:

java.io.IOException - stream

✍ getMessageMaxLength

```
public int getMessageMaxLength()  
    throws java.io.IOException
```

Returns:

Throws:

java.io.IOException -

✍ send

```
public void send(Message m)  
    throws java.io.IOException
```

Parameters:

m - 가

Throws:

java.io.IOException -

✍ recv

```
public void recv(Message msg)
    throws java.io.IOException
```

Parameters:

m –

Returns:

Throws:

java.io.IOException -

✍ close

```
public void close()
    throws java.io.IOException
```

|             |              |                  |                   |
|-------------|--------------|------------------|-------------------|
|             |              | getInputStream() | getOutputStream() |
| InputStream | OutputStream |                  |                   |
|             | InputStream  | OutputStream     | close() 가         |

Throws:

java.io.IOException -

✍ accept

```
public Socket accept()
    throws java.io.IOException
```

Returns:

Throws:

java.io.IOException - I/O 가



|        |                       |   |                            |
|--------|-----------------------|---|----------------------------|
| UDP    | datagram://:< >[/< >] | datagram://:80<br>datagram://:80/r<br>w/3000                  | TCP 가                      |
| serial | comm://< >:< >        | comm://0:baudr<br>ate=115200,parit<br>y=no,size=8,flow<br>=no | HAL<br>API MH_serialOpen() |
| HTTP   | HTTP URL              | http://somehost:<br>80  |                            |

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

✎ URL

public URL()

✎ find

public static Socket find(java.lang.String url)  
throws SchemeNotFoundException

url

Throws:

SchemeNotFoundException -

### 5.2.5. System (org.kwis.msf.core)

#### Class Kernel

java.lang.Object

|

+--org.kwis.msf.core.Kernel

```
public class Kernel
```

```
extends java.lang.Object
```

```
System Kernel
```

```
, , shared library load
```

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

```
✎ PRGTYPE_SYSDLL
```

```
public static final int PRGTYPE_CAPP
```

C

```
✎ PRGTYPE_APPDLL
```

```
public static final int PRGTYPE_CDLL
```

C

```
✎ PRGTYPE_NORMAL
```

```
public static final int PRGTYPE_JAVAAPP
```

Java

```
✎ PRGTYPE_NORMAL
```

```
public static final int PRGTYPE_JAVADLL
```

Java

✎ PRGTYPE\_NORMAL

```
public static final int PRGTYPE_JAVASYSDLL
```

Java

✎ DIR\_SYS\_READ\_REQ

```
public static final int DIR_SYS_READ_REQ_MASK
```

system directory read가

✎ DIR\_SYS\_WRITE\_REQ

```
public static final int DIR_SYS_WRITE_REQ_MASK
```

system directory write가

✎ DIR\_SHARED\_READ\_REQ

```
public static final int DIR_SHARED_READ_REQ_MASK
```

shared directory read가

✎ DIR\_SHARED\_WRITE\_REQ

```
public static final int DIR_SHARED_WRITE_REQ_MASK
```

shared directory write가

✎ NETWORK\_ACCESS\_REQ

```
public static final int NETWORK_ACCESS_REQ_MASK
```

network API 가

✎ SERIAL\_ACCESS\_REQ

```
public static final int SERIAL_ACCESS_REQ_MASK
```

serial API 가

✎ SYSTEM1\_ACCESS\_REQ

```
public static final int SYSTEM1_ACCESS_REQ_MASK
```

system group1 API 가 (system group1 API 가 )

✎ SYSTEM2\_ACCESS\_REQ

```
public static final int SYSTEM2_ACCESS_REQ_MASK
```

system group2 API 가 (system group2 API 가 )

Kernel

public Kernel ()

execute

public static int execute(String execName, String[] args)

(non-blocking)

, MV\_CHILDSTOP\_EVENT

parent

execName - , getExecNames()

args - Main method()

Returns:

ID, error value return

See Also:

getExecNames(String prgName, String version, String vendor)

getPrgID

public static int getPrgID()

ID

Returns:

ID

getAMID

public static int getAMID()

ID

Returns:

ID



## ✎ getParentPrgID

```
public static int getParentPrgID()
```

parent ID .

Returns:

ID

## ✎ getExecNames

```
public static String[] getExecNames(String prgName,
                                     String version,
                                     String vendor)
```

prgName( ), version, vendor

가 NULL

prgName, version, vendor 가

NULL ,

null .

Parameters:

prgName -

version -

vendor -

Returns:

string array

## ✎ getPrgInfo

```
public static int[] getPrgInfo()
```

. int array length

, index index

type . int[2]가 PRGTYPE\_JAVADLL prgID가 2

java application DLL .

Returns:

type integer array

## ✎ stop

```

public static void stop(int prgID)
    . DLL , DLL
APP가
Parameters:
prgID - ID
☞ letThrowExceptionWhenProgramExit

public static int letThrowExceptionWhenProgramExit()
Program thread ProgramExitException exception
    . API library , library
    resource free

Returns:
0 가 ID
☞ getAccessLevel

public static int getAccessLevel()
    access level . return value bit access
    API . bit XXX_REQ define

Returns:
access level
☞ getPrgName

public static java.lang.String getPrgName()
    . ADF file

Returns:

```

## Class ProgramExitException

java.lang.Object

|

+-- java.lang.Throwable

|

+-- java.lang.Exception

|

+-- java.lang.RuntimeException

|

+-- org.kwis.msf.core.ProgramExitException

All Implemented Interfaces:

java.io.Serializable

```
public class ProgramExitException
```

```
extends java.lang.RuntimeException
```

thread

exception

Methods inherited from class java.lang.Throwable

fillInStackTrace, getLocalizedMessage, getMessage, printStackTrace,  
printStackTrace, printStackTrace, toString

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, wait, wait, wait

✎ ProgramExitException


```
public ProgramExitException()
```

ProgramExitException object

✍ ProgramExitException

```
public ProgramExitException(java.lang.String s)
```

message 가 ProgramExitException object



**Class Shared**

```
java.lang.Object
|
+--org.kwis.msf.core.Shared
```


```
public class Shared
extends java.lang.Object

    memory shared . share
buffer 1 가 . shared buffer size create , shared
buffer free .
```

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait



 createBuf

```
public static byte[] createBuf (String name, int size)
    (name) create . byte array create
    . . _create buf buf
```

MIME type

Parameters:

name ?

size - byte array

Returns:

buf , 가 ,  
 null .

✍ getBuf

public static byte[] getBuf (String name)

shared .

Parameters:

name ?

Returns:

, shared buffer가 null

✍ resizeBuf

public static byte[] resizeBuf (byte[] sharedBuf,int size)

. 가  
 가 0 .  
 가 .  
 가 object가 ,  
 object 가 가

Parameters:

sharedBuf - (reference)

size -

Returns:

가

## ✍ destroyBuf

```
public static void destroyBuf(byte[] sharedBuf)
```

가  
destroyBuf() , destroyBuf()가

### Parameters:

sharedBuf - (reference)

## 5.2.6. Database(org.kwis.msp.db)

### Interface DataComparator

All Known Implementing Classes:

DataComparatorInteger, DataComparatorString

```
public interface DataComparator
```

```
    sortRecord(Record r1, Record r2)
    compare(Object o1, Object o2)
```

가

See Also:

[DataFilter](#), [DataComparatorInteger](#)

☞ EQUIVALENT

```
public static final int EQUIVALENT
```

가

☞ FOLLOWS

```
public static final int FOLLOWS
```

가

☞ PRECEDES

```
public static final int PRECEDES
```

가

☞ compare

```
public int compare(byte[] data1,
```



```
byte[] data2)
(      , comparator) .
```

Parameters:

data1 -

data2 -

Returns:

가 DataComparator.EQUIVALENT, data2 data1  
 ( data1 data2 )  
 DataComparator.FOLLOWS, data1 data2가  
 DataComparator.PRECEDES

## Interface DataFilter

All Known Implementing Classes:

DataFilterInteger

```
public interface DataFilter
```

```
    boolean filter(byte[] data);

    void sortRecord(
        DataFilter filter);
```

See Also:

[DataComparator](#), [DataFilterInteger](#)

```
filter
```

```
public boolean filter(byte[] data)
```

Parameters:

data -

Returns:

가 true, false



java.lang.Object

equals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

✎ openDataBase

```
public static DataBase openDataBase(String dataBaseName,
                                   int recordSize,
                                   boolean create)
    throws DataBaseException,
           IllegalArgumentException
    {
        Jlet
        FileSystem.PRIVATE_ACCESS
    }
```

Parameters:

dataBaseName -

recordSize - (byte) 가  
recordSize 가

create - 가

Returns:

Throws:

DataBaseException - create가 false 가  
가

IllegalArgumentException - create가 true , recordSize가 0

✎ openDataBase

```
public static DataBase openDataBase(String dataBaseName,
                                   int recordSize,
                                   boolean create,
                                   int flag)
```

throws DataBaseException,  
IllegalArgumentException

. Jlet , Jlet  
, flag  
.

Parameters:

dataBaseName -

recordSize - (byte ). 가  
recordSize 가

create - 가

flag - , FileSystem.PRIVATE\_ACCESS,  
FileSystem.SHARED\_ACCESS, FileSystem.SYSTEM\_ACCESS 가

Returns:

Throws:

DataBaseException - create가 false 가  
가

IllegalArgumentException - create가 true , recordSize가 0

✎ closeDataBase

```
public void closeDataBase()
    throws DataBaseException
```

Throws:

DataBaseException -

✎ deleteDataBase

```
public static void deleteDataBase(String dataBaseName)
    throws DataBaseException
    Jlet FileSystem.PRIVATE_ACCESS
```

Parameters:

dataBaseName -

Throws:

DataBaseException - 가

✎ deleteDataBase

```
public static void deleteDataBase(String dataBaseName,
                                  int flag)
    throws DataBaseException
```

. Jlet flag 가 가

Parameters:

dataBaseName -

flag - ,

FileSystem.PRIVATE\_ACCESS, FileSystem.SHARED\_ACCESS,

FileSystem.SYSTEM\_ACCESS 가 .

Throws:

DataBaseException - 가

✎ insertRecord

```
public int insertRecord(byte[] data,
                        int offset,
                        int numBytes)
    throws DataBaseRecordException,
           DataBaseException,
           IllegalArgumentException
```

가 .

가

(garbage)

selectRecord

(garbage)

Parameters:

data - 가

offset - 가

numBytes -

Returns:

ID

Throws:

DataBaseRecordException - 가

DataBaseException -

IllegalArgumentException - data                      offset                      numBytes

 insertRecord

```
public int insertRecord(byte[] data)
    throws DataBaseRecordException,
           DataBaseException
```

가 .

.

가

(garbage)

selectRecord

(garbage)

Parameters:

data - 가

Returns:

ID

Throws:

DataBaseRecordException - 가

DataBaseException -

 deleteRecord

```

public void deleteRecord(int recordId)
    throws DataBaseException,
           DataBaseRecordException
    {
        ID
    }

```

Parameters:

recordId - ID

Throws:

DataBaseException -

DataBaseRecordException - ID가

✂ selectRecord

```

public byte[] selectRecord(int recordId)
    throws DataBaseException,
           DataBaseRecordException
    {
        ID
    }

```

Parameters:

recordId - ID

Returns:

ID

Throws:

DataBaseException -

DataBaseRecordException - ID가

✂ selectRecord

```

public void selectRecord(int recordId,
    byte[] buffer,
    int offset)
    throws DataBaseException,
           DataBaseRecordException,
           IllegalArgumentException
    {
        ID
    }

```



가  
getRecordSize

Parameters:

recordId - ID

buffer -

offset -

Throws:

IllegalArgumentException - 가

DataBaseException -

DataBaseRecordException - ID가

✎ updateRecord

```
public void updateRecord(int recordId,
                        byte[] newData,
                        int offset,
                        int numBytes)
    throws DataBaseRecordException,
           DataBaseException,
           IllegalArgumentException
    {
        ID
```

Parameters:

recordId - ID

newData - 가

offset - 가

numBytes -

Throws:

DataBaseException -

DataBaseRecordException - 가  
ID가

IllegalArgumentException -

✍ updateRecord

```
public void updateRecord(int recordId,
                        byte[] newData)
    throws DataBaseException,
           DataBaseRecordException
```

Parameters:

recordId - ID

newData - 가

Throws:

DataBaseException -

DataBaseRecordException - 가  
ID가

✍ sortRecord

```
public int[] sortRecord(DataFilter filter,
                       DataComparator comparator)
    throws DataBaseException
```

[DataComparator](#)

DataComparator comparator가 null  
ID

[DataFilter](#)

filter가 null

filter null comparator  
ID comparator null filter 가  
ID filter comparator null  
ID

([DataFilterInteger](#), [DataComparatorInteger](#).)

ID 가  
ID selectRecord

Parameters:

filter - . null

comparator - . null

Returns:

ID . 가 null

Throws:

DataBaseException -

✎ listDataBases

```
public static String[] listDataBases()
```

Jlet

FileSystem.PRIVATE\_ACCESS

FileSystem.SHARED\_ACCESS, FileSystem.SYSTEM\_ACCESS

가

Returns:

, null

✎ getAccessMode

```
public static int getAccessMode(String dbName)
```

```
throws DataBaseException
```

Parameters:

dbName -

Returns:

FileSystem.PRIVATE\_ACCESS, FileSystem.SHARED\_ACCESS,

FileSystem.SYSTEM\_ACCESS 가

Throws:

DataBaseException - 가 dbName null

✎ getDataBaseName

```
public String getDataBaseName()
```

Returns:

✎ `getDataBaseSize`

```
public int getDataBaseSize()
```

( )

Returns:

✎ `getNumberOfRecords`

```
public int getNumberOfRecords()
```

Returns:

✎ `getRecordSize`

```
public int getRecordSize()
```

(overhead)

Returns:

(byte)

✎ `getSizeAvailable`

```
public int getSizeAvailable()
```

(overhead)가

가

Returns:

(byte )

✎ getLastModified

```
public long getLastModified()
```

가 가

. System.currentTimeMillis()가

Returns:



## Class DataComparatorInteger

```
java.lang.Object
```

```
|
```

```
+- org.kwis.msp.db.DataComparatorInteger
```

All Implemented Interfaces:

DataComparator

```
public class DataComparatorInteger
```

```
extends Object
```

```
implements DataComparator
```

```
sortRecord
```

Fields inherited from interface org.kwis.msp.db.DataComparator

EQUIVALENT, FOLLOWS, PRECEDES

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

 DataComparatorInteger

```
public DataComparatorInteger(int offset)
```

```
sortRecord
```

```
DataComparator
```

```
, DataComparatorInteger
```

```
sortRecord
```

```
4
```

```
(big-endian)
```

```
sortRecord
```

Parameters:

offset - 가

 compare

```
public int compare(byte[] data1,
                  byte[] data2)
```

Description copied from interface: DataComparator

```
( comparator ) .
```

Specified by:

compare in interface DataComparator

Following copied from interface: org.kwis.msp.db.DataComparator

Parameters:

data1 -

data2 -

Returns:

```
가 DataComparator.EQUIVALENT, data2 data1
( data1 data2 )
DataComparator.FOLLOWS, data1 data2가
DataComparator.PRECEDES
```

## Class DataComparatorString

java.lang.Object

|

+- org.kwis.msp.db.DataComparatorString

All Implemented Interfaces:

DataComparator

public class DataComparatorString

extends Object

implements DataComparator


sortRecord

Fields inherited from interface org.kwis.msp.db.DataComparator

EQUIVALENT, FOLLOWS, PRECEDES

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

 DataComparatorString

public DataComparatorString(int offset)

sortRecord

DataComparator

, DataComparatorString

sortRecord

String

sortRecord

Parameters:



offset -

 compare

```
public int compare(byte[] data1,
                  byte[] data2)
```

Description copied from interface: DataComparator

```
(      , comparator) .
```

Specified by:

compare in interface DataComparator

Following copied from interface: org.kwis.msp.db.DataComparator

Parameters:

data1 -

data2 -

Returns:

가 DataComparator.EQUIVALENT, data2 data1  
 ( data1 data2 )  
 DataComparator.FOLLOWS, data1 data2가  
 DataComparator.PRECEDES

## Class DataFilterInteger

java.lang.Object

|

+-org.kwis.msp.db.DataFilterInteger

All Implemented Interfaces:

DataFilter

public class DataFilterInteger

extends Object

implements DataFilter

가 (int) 가 , (min, max )

sortRecord

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

✎ offset

protected int offset

✎ min

protected int min

✎ max

protected int max

### ✎ DataFilterInteger

```
public DataFilterInteger(int offset,
                        int min,
                        int max)
    throws IllegalArgumentException
```

offset (offset)가 (max), (min)가 (big-endian), sortRecord

#### Parameters:

offset -

min - Integer.MIN\_VALUE max

max - Integer.MAX\_VALUE min

#### Throws:

IllegalArgumentException - offset min, max가

### ✎ filter

```
public boolean filter(byte[] data)
```

Description copied from interface: DataFilter

#### Specified by:

filter in interface DataFilter

Following copied from interface: org.kwis.msp.db.DataFilter

Parameters:

data -

Returns:

가 true, false



## Class DataBaseException

```

java.lang.Object
|
+-- java.lang.Throwable
    |
    +-- java.lang.Exception
        |
        +-- org.kwis.msp.db.DataBaseException
  
```

```

public class DataBaseException
extends Exception
  
```

Methods inherited from class java.lang.Throwable

getMessage, printStackTrace, toString

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, wait, wait, wait

✎ DataBaseException

```
public DataBaseException(String message)
```

```
    DataBaseException
```


Parameters:

message -

✎ DataBaseException

```
public DataBaseException()
```

DataBaseException .



## Class DataBaseRecordException

```

java.lang.Object
|
+-- java.lang.Throwable
    |
    +-- java.lang.Exception
        |
        +-- org.kwis.msp.db.DataBaseRecordException
  
```

```

public class DataBaseRecordException
extends Exception
  
```

Methods inherited from class java.lang.Throwable

getMessage, printStackTrace, toString

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, wait, wait, wait

 DataBaseRecordException

```

public DataBaseRecordException(String message)
  
```

```

    DataBaseRecordException
  
```

Parameters:

message -

 DataBaseRecordException

```

public DataBaseRecordException()
  
```

```

    DataBaseRecord
  
```

## 5.2.7. Additional IO(org.kwis.msp.io)

Class File

```
java.lang.Object
|
+--org.kwis.msp.io.File
```

All Implemented Interfaces:

Connection, InputConnection, OutputConnection, StreamConnection

```
public class File
```

```
extends Object
```

```
implements StreamConnection
```

```
/
```

```
Stream
```

```
(separator)
```

```
"/"
```

```
FileSystem
```

```
가
```

```
3가 가
```

```
FileSystem.PRIVATE\_ACCESS,
```

```
FileSystem.SHARED\_ACCESS,
```

```
FileSystem.SYSTEM\_ACCESS
```

```
open(String, int, int)
```

```
open
```

```
stream
```

```
가
```

```
Read Only
```

```
open
```

```
input stream
```

```
output stream
```

```
Write Only
```

```
open
```

```
output stream
```

```
, input stream
```



Read/Write      open      output stream      .

File      low level      가      API가      .

[read\(byte\[\]\)](#)

[read\(byte\[\], int, int\)](#)

[write\(byte\[\]\)](#)

[write\(byte\[\], int, int\)](#)

[write\(int\)](#)

[seek\(int\)](#)

[sizeOf\(\)](#)

API      .

openInputStream(),      openOutputStream(),      openDataInputStream(),  
openDataOutputStream()

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

✎ maxInputStream

protected int maxInputStream

InputStream

✎ maxOutputStream

protected int maxOutputStream

OutputStream

✎ READ\_ONLY

public static final int READ\_ONLY

✎ WRITE

public static final int WRITE

✍ WRITE\_TRUNC

```
public static final int WRITE_TRUNC
                        0
```

✍ READ\_WRITE

```
public static final int READ_WRITE
```

✍ File

```
public File(String filename,
            int mode)
    throws IOException
```

. ("/")  
가 .

READ\_ONLY read only . exception .  
WRITE 가 .  
WRITE\_TRUNC truncation . , 0  
READ\_WRITE read write .  
IllegalArgumentException .

Parameters:

filename -

mode - READ\_ONLY, WRITE, WRITE\_TRUNC, READ\_WRITE

Throws:

IOException -

See Also:

[FileSystem](#)

## ✎ File

```

public File(String filename,
            int mode,
            int flag)
    throws IOException,
           SecurityException
    {
        ("")
        가
    }

READ_ONLY read only exception
WRITE 가
WRITE_TRUNC truncation , 0

READ_WRITE read write
IllegalArgumentExcepion

```

## Parameters:

filename -

mode - READ\_ONLY, WRITE, WRITE\_TRUNC, READ\_WRITE

flag - [FileSystem.PRIVATE\\_ACCESS](#), [FileSystem.SHARED\\_ACCESS](#), [FileSystem.SYSTEM\\_ACCESS](#)

## Throws:

IOException -

SecurityException -

## See Also:

[FileSystem](#)

## ✎ openInputStream

```

public InputStream openInputStream()
    throws IOException

InputStream 가 InputStream DataInputStream

```

Specified by:

openInputStream in interface InputConnection

Returns:

InputStream

Throws:

IOException - InputStream

See Also:

[InputStream](#)

✍ openDataInputStream

```
public DataInputStream openDataInputStream()
                        throws IOException
```

DataInputStream 가 . DataInputStream InputStream

Specified by:

openDataInputStream in interface InputConnection

Returns:

DataInputStream

Throws:

IOException - InputStream

See Also:

[DataInputStream](#)

✍ openOutputStream

```
public OutputStream openOutputStream()
                        throws IOException
```

OutputStream 가 . OutputStream DataOutputStream

Specified by:

openOutputStream in interface OutputConnection

Returns:

## OutputStream

Throws:

IOException -

OutputStream

See Also:

[OutputStream](#)

 openDataOutputStream

```
public DataOutputStream openDataOutputStream()
                                throws IOException
```

DataOutputStream 가 . DataOutputStream  
OutputStream .

Specified by:

openDataOutputStream in interface OutputConnection

Returns:

DataOutputStream


Throws:

IOException -

OutputStream

See Also:

[DataOutputStream](#)

 close

```
public void close()
                throws IOException
```

Exception .

Specified by:

close in interface Connection

Throws:

IOException -

 write

```
public int write(int b)
```

throws IOException

Parameters:

b -

Throws:

IOException - close File write ,

✍ write

```
public int write(byte[] buf)
    throws IOException,
        NullPointerException
```

buf buf . buf가 null  
NullPointerException

Parameters:

buf - 가 byte array

Throws:

IOException - close File write ,

NullPointerException - buf가 null

✍ write

```
public int write(byte[] buf,
    int off,
    int len)
    throws IOException,
        NullPointerException
```

buf off len . buf가 null  
NullPointerException

Parameters:

buf - 가 byte array

off - 가

len -

Throws:

IOException - close File write ,

IOException - buf가 null

✍ read

```
public int read(byte[] buf)
    throws IOException,
        NullPointerException
```

input stream . buf size .  
buf , .  
, read -1 .

Parameters:

buf -

Returns:

EOF -1

Throws:

IOException - close File write ,

NullPointerException - buf가 null

✍ read

```
public int read(byte[] buf,
    int off,
    int len)
    throws IOException,
        NullPointerException
```

input stream len . len  
EOF buf .

Parameters:

buf -

off - buf offset

len - 가 .

Returns:

EOF -1

Throws:

IOException - close File write ,

NullPointerException - buf가 null

seek

```
public void seek(int pos)
    throws IOException
```

Parameters:

pos - , .

Throws:

IOException - handle

가

sizeof

```
public int sizeof()
    throws IOException
```

Returns:

Throws:

IOException - handle

가



## Class FileSystem

java.lang.Object

|

+--org.kwis.msp.io.FileSystem

public final class FileSystem

extends Object

FileSystem / /

가

3가

3가 가

[PRIVATE ACCESS](#)

[SHARED ACCESS](#)

[SYSTEM ACCESS](#)

exists(java.lang.String, int)

isDirectory(java.lang.String, int)

isFile(java.lang.String, int)

list(java.lang.String, int)

mkdir(java.lang.String, int)

rmdir(java.lang.String, int)

remove(java.lang.String, int)

rename(java.lang.String, int)

test

```
if (exists("test", PRIVATE_ACCESS)){
    System.err.println("test exists");
};
```

```
if (exists("test")){
    System.err.println("test exists");
};
```

test

test

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

✎ PRIVATE\_ACCESS

```
public static final int PRIVATE_ACCESS
```

. 1

✎ SHARED\_ACCESS

```
public static final int SHARED_ACCESS
```

(Jlet Descriptor)

, 가

. 2

✎ SYSTEM\_ACCESS

```
public static final int SYSTEM_ACCESS
```

(Jlet

Descriptor)

가

. 3

✎ MAX\_FILENAME\_LENGTH

public static final int MAX\_FILENAME\_LENGTH

filename

가 API

MAX\_FILENAME\_LENGTH

IOException

✎ FileSystem

public FileSystem()

✎ getMaxFilenameLength

public static int getMaxFilenameLength()

Returns:

✎ list

public static Vector list(String dirname)  
throws IOException

dirname null NullPointerException

dirname

MAX\_FILENAME\_LENGTH IOException

Parameters:

dirname -

Returns:

dirname

Throws:

IOException - 가

✍ list

```
public static Vector list(String dirname,
                          int flag)
    throws IOException,
           SecurityException
```

. dirname null

NullPointerException . dirname MAX\_FILENAME\_LENGTH  
IOException .

Parameters:

dirname -

flag -

Returns:

dirname

Throws:

SecurityException - 가 .

IOException - dirname

✍ exists

```
public static boolean exists(String name)
    throws IOException
```

가 .

name null NullPointerException . name  
MAX\_FILENAME\_LENGTH IOException .

Parameters:

name -

Returns:

true, false

✍ exists

```
public static boolean exists(String name,
                              int flag)
```

throws IOException,  
SecurityException

가 . name null  
NullPointerException . name MAX\_FILENAME\_LENGTH  
IOException .

Parameters:

name -

flag -

Returns:

true, false

Throws:

SecurityException -

~~remove~~

public static void remove(String filename)  
throws IOException

. filename null  
NullPointerException . filename MAX\_FILENAME\_LENGTH  
IOException .

Parameters:

filename -

Throws:

IOException -

~~remove~~

public static void remove(String filename,  
int flag)  
throws IOException,  
SecurityException

. filename null NullPointerException .  
exception . filename MAX\_FILENAME\_LENGTH  
IOException .

Parameters:

filename -

flag -

Throws:

SecurityException -

IOException -

✎ mkdir

```
public static void mkdir(String dirname)
    throws IOException
```

. dirname null

NullPointerException

. dirname MAX\_FILENAME\_LENGTH

IOException

Parameters:

dirname -

Throws:

IOException -

가

가

✎ mkdir

```
public static void mkdir(String dirname,
    int flag)
    throws IOException,
    SecurityException
```

. dirname null

NullPointerException

dirname MAX\_FILENAME\_LENGTH

IOException

Parameters:

dirname -

flag -

Throws:

SecurityException -

IOException -

가

가

✍️ `rmdir`

```
public static void rmdir(String dirname)
    throws IOException
```

`dirname` null  
 NullPointerException  
 IOException  
 MAX\_FILENAME\_LENGTH

## Parameters:

`dirname` -

## Throws:

IOException - 가 ,  
 가

✍️ `rmdir`

```
public static void rmdir(String dirname,
    int flag)
    throws IOException,
    SecurityException
```

`dirname` null  
 NullPointerException  
 IOException  
 MAX\_FILENAME\_LENGTH

## Parameters:

`dirname` -

`flag` -

## Throws:

SecurityException -  
 IOException - 가 ,  
 가

✍️ `toCString`

```
public static byte[] toCString(String jStr)
```

Java String C String . Encoding ISO8859( )  
 KSC5601( ) .

## Parameters:

jStr - java String

✍ available

```
public static int available()
```

Returns:

✍ isFile

```
public static boolean isFile(String name)
    throws IOException
```

|                     |      |                      |      |
|---------------------|------|----------------------|------|
| name                | null | NullPointerException | name |
| MAX_FILENAME_LENGTH |      | IOException          |      |

Parameters:

name -

Returns:

|      |       |       |
|------|-------|-------|
| name | true, | false |
|------|-------|-------|

✍ isFile

```
public static boolean isFile(String name,
    int flag)
    throws IOException,
    SecurityException
```

|                      |      |                     |
|----------------------|------|---------------------|
|                      | name | null                |
| NullPointerException | name | MAX_FILENAME_LENGTH |
| IOException          |      |                     |

Parameters:

name -

flag -

Returns:



name true, false

Throws:

SecurityException -

✍ isDirectory

```
public static boolean isDirectory(String name)
    throws IOException
```

NullPointerException . name null  
 IOException . name MAX\_FILENAME\_LENGTH

Parameters:

name -

Returns:

name true, false

✍ isDirectory

```
public static boolean isDirectory(String name,
    int flag)
    throws IOException,
    SecurityException
```

NullPointerException . name null  
 IOException . name MAX\_FILENAME\_LENGTH

Parameters:

name -

flag -

Returns:

name true, false

Throws:

SecurityException -

✍ getCreationTime

```
public static int getCreationTime(String name)
    throws IOException
```

```

        . name null
        NullPointerException . name MAX_FILENAME_LENGTH
        IOException . name -1 return .

```

Parameters:

name -

Returns:

-1 , file

✍ getCreationTime

```
public static int getCreationTime(String name,
    int flag)
    throws IOException,
    SecurityException
```

```

        . name null NullPointerException .
name MAX_FILENAME_LENGTH IOException . name
        -1 return .

```

Parameters:

name -

Returns:

-1 , file

✍ rename

```
public static void rename(String oldName,
    String newName)
    throws IOException
```

```

        가 .
        가 oldName newName null
        NullPointerException . oldName newName
        MAX_FILENAME_LENGTH IOException .

```

Parameters:

oldName -

newName -

Throws:

IOException - 가

✍ rename

```
public static void rename(String oldName,
                          String newName,
                          int flag)
    throws IOException,
           SecurityException
```

가 . 가 . oldName  
 newName null NullPointerException . oldName  
 newName MAX\_FILENAME\_LENGTH IOException .

Parameters:

oldName -

newName -

flag -

Throws:

SecurityException -

IOException - 가

✍ tell

```
public int tell()
    throws IOException
```

Returns:

Throws:

IOException - handle

가

## 5.2.8. Graphics(org.kwis.msp.lcdui)

Interface ImageObserver

```
public interface ImageObserver
```

가

```
    FRAME_END
```

```
    public static final int FRAME_END
```

가

```
    IMAGE_END
```

```
    public static final int IMAGE_END
```

가

```
    NOT_EXIST
```

```
    public static final int NOT_EXIST
```

가

```
    DECODE_ERROR
```

```
    public static final int DECODE_ERROR
```

가

```
    OUT_OF_MEMORY
```

```
    public static final int OUT_OF_MEMORY
```

```
    notify
```


```
    public void notify(Image img,
```

---

```
int status)
    . status . status
    FRAME_END ,
IMAGE_END . 가 status가 NOT_EXIST
DECODE_ERROR OUT_OF_MEMORY .
```

See Also:

[Image.loadImage\(java.lang.String, org.kwis.msp.lcdui.ImageObserver\)](#),  
[Image.play\(org.kwis.msp.lcdui.ImageObserver\)](#)



## Interface InputMethodListener

```
public interface InputMethodListener
```

```
InputMethodHandler - /
```

```
 / - . InputMethodListener
```

```
InputMethodHandler
```

```
InputMethodHandler.setInputMethodListener\(org.kwis.msp.lcdui.InputMethodL  
istener\) . InputMethodHandler InputMethodListener
```

```
notifyTextChanged ,
```

```
.
```

```
✎ notifyTextChanged
```

```
public void notifyTextChanged(char[] chText,  
                             int len,  
                             int pMode)
```

```
InputMethod .
```

Parameters:

chText -

len -

pMode - - Insert(-1) / replace(0) / delete(1)

## Interface JletEventListener

```
public interface JletEventListener
```

```
(Jlet)
```

```
. postEvent
```

```
Listener
```

```
✎ notifyEvent
```

```
public void notifyEvent(int type,
                        int param1,
                        int param2)
```

```
가
```

Parameters:

type -

param1 -

param2 -

See Also:

[Display.addJletEventListener\(org.kwis.msp.lcdui.JletEventListener\)](#)



## Class Card

```
java.lang.Object
```

```
|
```

```
+- -org.kwis.msp.lcdui.Card
```

Direct Known Subclasses:

ProxyCard

```
public abstract class Card
```

```
extends Object
```

```

    .
    가
    가
    (Display)
    .
    가
    . move resize
    .
    repaint
    paint 가
    .
    . keyNotify, pointerNotify,
    가
    Card
    가 true
    Card false
    , true, false
    Card
    가
    ITU-Key '0' '9' '#' '*' 가
    가
    EventQueue.UP, EventQueue.DOWN, EventQueue.LEFT,
    EventQueue.RIGHT, EventQueue.FIRE , EventQueue.SOFT1,
    EventQueue.SOFT2 , 가
    Display.getKeyCode\(int\) 가
    Display.getGameAction\(int\)

```

```

    가 pushCard, popCard
    showNotify 가
    가 x 가
    가 y 가
    
```

|   |
|---|
| Methods inherited from class java.lang.Object                             |
| equals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait |



~~↗~~ x

```

protected int x
card x
    
```

~~↗~~ y

```

protected int y
Card y
    
```

~~↗~~ w

```

protected int w
Card
    
```

~~↗~~ h

```

protected int h
Card
    
```

~~↗~~ bTrans

```

protected boolean bTrans
Card가 , 가
    
```



~~↗~~ Card

```

public Card()
    
```

Display.getDefaultDisplay 가 Display  
 Card  
 public Card(boolean bTrans)  
 BTrans 가  
 Display.getDefaultDisplay 가  
 Display

Parameters:

bTrans –

Card

public Card(Display d)

Parameters:

d - display

Card

public Card(int x,  
 int y,  
 int w,  
 int h)

Display Display Card Display.getDefaultDisplay

Parameters:

x - Card display x

y - Card display y

w - Card

h - Card

Throws:

IllegalArgumentException - w h가 0

## ✍ Card

```
public Card(Display d,
            int x,
            int y,
            int w,
            int h)
```

```
    display . Display
    Card .
```

## Parameters:

d - display.

x - Card display x

y - Card display y

w - Card

h - Card

## Throws:

IllegalArgumentException - w h가 0

## ✍ Card

```
public Card(Display d,
            int x,
            int y,
            int w,
            int h,
            boolean bTrans)
```

```
    display . Display
    Card .
```

## Parameters:

d - display.

x - Card display x

y - Card display y

w - Card

h - Card

bTrans -

Throws:

IllegalArgumentException - w h가 0

 move


```
public void move(int x,
                 int y)
```

· x, y ·

Parameters:

x - Card display x

y - Card display y

 resize

```
public void resize(int w,
                  int h)
```

· w, h 가 0

IllegalArgumentException ·

Parameters:

w -

h -


Throws:

IllegalArgumentException - w h가 0

 getWidth

```
public int getWidth()
```

Returns:

 getHeight

```
public int getHeight()
```

Returns:

✎ getX

```
public int getX()
```

```
    x                .                x
```

Returns:

```
    x
```

✎ getY

```
public int getY()
```

```
    y                .                y
```

Returns:

```
    y
```

✎ showNotify

```
protected void showNotify(boolean bShow)
```

```
    가                ,                가                .
                    bShow    가 true가                ,    가
                    bShow가 false가
```

Parameters:

bShow -

✎ keyNotify

```
protected boolean keyNotify(int type,
                             int key)
```

```
    가                .                가                가
```

```
    param1                , type    KEY_PRESSED
KEY_RELEASED
```

```
    false                가                .                true
```

Parameters:

type - KEY\_PRESSED KEY\_RELEASED, KEY\_TYPED, KEY\_REPEATED

key - keyCode ; [EventQueue](#)

Returns:

true, false

☞ pointerNotify

```
protected boolean pointerNotify(int type,
                                int x,
                                int y)
```

가 ,

type POINT\_PRESSED, POINT\_RELEASED, POINT\_DRAGGED 가 ,

x, y Card

가 false true

ITU ASCII ,

### [Display.getGameAction\(int\)](#)

Parameters:

type - POINT\_PRESSED POINT\_RELEASED, POINT\_DRAGGED

key -

Returns:

Card true, false

☞ paint

```
protected abstract void paint(Graphics g)
```

Card

g Card . translate, setClip

, Card가

Graphics

Parameters:

g - graphics

repaint

```
public void repaint(int x,
                   int y,
                   int w,
                   int h)
{
    . x, y          w,    h
    paint          ,

```

paint 가

paint Graphics

repaint

Card

Parameters:

x - 가 Card x

y - 가 Card y

w -

h -

repaint

```
public void repaint()
```

Card . repaint(0, 0, getWidth(), getHeight())

가

serviceRepaints

```
public void serviceRepaints()
```

repaint , . repaint

paint

isShown

```
public boolean isShown()
```

Card가 . Card가 Display pushCard



Returns:

 `getDisplay`

```
public Display getDisplay()
```

```
    display .
```

Returns:

```
    display
```





## ✎ getDefaultDisplay

```
public static Display getDefaultDisplay()
```

```
    Display . . . . . Display . . . . .
```

Returns:

```
    display
```

Throws:

## ✎ getDisplay

```
public static final Display getDisplay(String str)
```

```
    Display . . . . . null . . . . . Display
    , . . . . . "dual" . . . . . lcd . . . . . Display
    . . . . . Display가 . . . . . null . . . . .
```

Parameters:

```
str - display 가
```

Returns:

```
display
```

Throws:

## ✎ pushCard

```
public final void pushCard(Card c)
```

```
    가 . . . . .
    . . . . .
    가 . . . . .
    c null . . . . .
    가 , . . . . . showNotify . . . . .
    repaint가 , . . . . . paint가 . . . . .
    isShown() true . . . . .
    . . . . . pushCard() . . . . .
```

Parameters:

c -

Throws:

NullPointerException - c가 null

✂ popCard

```
public final Card popCard()
```

```

        ,
        가
        Card
        null
        Jlet
        가
        showNotify()
        isShown()
        false

```

Returns:

✂ removeCard

```
public final boolean removeCard(Card c)
```

```

        ,
        가
        popCard
        c가 null
        false

```

Parameters:

c -

Returns:

✂ removeAllCards

```
public void removeAllCards()
```

```

        Jlet
        Display
        showNotify()가

```

✂ countCard

```
public final int countCard()
```

Display 가 . Jlet Display  
가 .

Returns:

☞ callSerially

```
public final void callSerially(Runnable r)
```

가 Runnable run .  
'Runnable' , 가 .  
가 Runnable run  
. r.run() 가 .  
,

Parameters:

r - runnable

Throws:

NullPointerException - r null

☞ callSerially

```
public final void callSerially(Runnable r,  
                               int timeout)
```

가 Runnable run .  
'Runnable' , 가 .  
thread가 Runnable run  
. r.run() 가 .  
,

r run . timeout 0 0

Parameters:


r - runnable

timeout - Runnable ( )

Throws:

NullPointerException - r null

IllegalArgumentException - timeout

 getDockedCard

```
public Card getDockedCard()
```

 setDockedCard

```
public void setDockedCard(Card cd,
                          int where)
```

가  
가

Parameters:

cd-

where - Graphics.TOP BOTTOM, LEFT, RIGHT 가

 isColor

```
public final boolean isColor()
```

Returns:

 numColors

```
public final int numColors()
```

Returns:

 hasPointerEvents

```
public final boolean hasPointerEvents()
```

가

Returns:

✍ hasPointerMotionEvents

```
public final boolean hasPointerMotionEvents()
```

가

Returns:

✍ hasRepeatEvents

```
public final boolean hasRepeatEvents()
```

가

Returns:

✍ getWidth

```
public final int getWidth()
```

Returns:

✍ getHeight

```
public final int getHeight()
```

Returns:

✍ isDoubleBuffered

```
public boolean isDoubleBuffered()
```

(double buffering)

Graphics

(flush)

Returns:

double buffer

✍ getKeyCode

```

public static int getKeyCode(int gameKey)
{
    switch (gameKey)
    {
        case EventQueue.UP:
        case EventQueue.DOWN:
        case EventQueue.LEFT:
        case EventQueue.RIGHT:
        case EventQueue.FIRE:
        case EventQueue.GAME_A:
        case EventQueue.GAME_B:
        case EventQueue.GAME_C:
        case EventQueue.GAME_D:
            return gameKey;
        default:
            return 0;
    }
}

```

Returns:

See Also:

[EventQueue](#)

 [getKeyName](#)

```

public static String getKeyName(int key)
{
    switch (key)
    {
        case EventQueue.UP:
            return "UP";
        case EventQueue.DOWN:
            return "DOWN";
        default:
            return null;
    }
}

```

Returns:

See Also:

[EventQueue](#)

 [getGameAction](#)

```

public static int getGameAction(int key)
{
    switch (key)
    {
        case ITU-Key '0' - '9', '*', '#':
            return getGameAction(key);
        default:
            return 0;
    }
}

```

Returns:



See Also:

[EventQueue](#)

 `getBitsPerPixel`

```
public int getBitsPerPixel()
                (bit)
```

Returns:

 `flush`

```
public void flush()
```

Graphics

```
serviceRepaints() flush()
isDoubleBuffer 가 true
```

 `addJletEventListener`

```
public void addJletEventListener(JletEventListener qel)
```

```
JletEvent Listener . key, repaint, point
가 Listener
Listener
```

Parameters:

`qel` - Listener

 `removeJletEventListener`

```
public void removeJletEventListener(JletEventListener qel)
```

```
JletEvent Listener
```

Parameters:

`qel` - Listener

 `grabKey`

```
public void grabKey(int key,
                    JletEventListener qel)
```


---

```

        .
        가
        .
        grab                grab                grab
        .
        가                , AccessLevel SYSTEM
        . AccessLevel SYSTEM
        .
    
```

Parameters:

key -

 ungrabKey

```
public void ungrabKey(int key)
```

grabKey

AccessLevel SYSTEM

SYSTEM

. AccessLevel

Parameters:

key - ungrab

Class EventQueue

```
java.lang.Object
|
+--org.kwis.msp.lcdui.EventQueue
```

```
public class EventQueue
extends Object
```

```

        (Jlet)
        EventQueue 가
        가
        가
        가
        EVENT_SIZE가
        가
        , POINTER_EVENT
        가

```

| event[0]      | Event[1]   | event[2]           | event[3] |
|---------------|--|--------------------|----------|
| KEY_EVENT     | KEY_PRESSED  <br>KEY_RELEASED  <br>KEY_REPEATED  <br>KEY_TYPED | (ITU<br>ascii<br>) | 0        |
| POINTER_EVENT | POINTER_PRESSED  <br>POINTER_RELEASED  <br>POINTER_DRAGGED     | x                  | y        |
| TIMER_EVENT   |  |                    |          |

```
Jlet getNextEvent dispatchEvent
```

```
int event[] = new int[EventQueue.EVENT_SIZE];
```

```
while(true){
    eq.getNextEvent(event);
    eq.dispatchEvent(event);
}
```

```

        , ITU-        '0'        '9', '*',
'#'가        ,        가        .
        ,        .
        getGameAction    getkeyCode    가
        가        .        getGameAction
        가        .
getGameAction        getkeyCode    가        .

```

|   |
|---|
| Methods inherited from class java.lang.Object                             |
| equals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait |



EVENT\_SIZE

```
public static final int EVENT_SIZE
```

```
가 . 4 , getNextEvent
```

UP

```
public static final int UP
```

```
UP . 1
```

DOWN

```
public static final int DOWN
```

```
DOWN . 6
```

LEFT

```
public static final int LEFT
```

```
LEFT . 2
```

RIGHT

```
public static final int RIGHT
```

---

```
RIGHT                . 5 .
 FIRE

    public static final int FIRE
FIRE                 . 8 .
 GAME_A

    public static final int GAME_A
GAME_A              . 9 .
 GAME_B

    public static final int GAME_B
GAME_B              . 10 .
 GAME_C

    public static final int GAME_C
GAME_C              . 11 .
 GAME_D

    public static final int GAME_D
GAME_D              . 12 .
 KEY_NUM0

    public static final int KEY_NUM0
ITU-T '0'           . 48('0') .
 KEY_NUM1

    public static final int KEY_NUM1
ITU-T '1'           . 49('1') .
 KEY_NUM2

    public static final int KEY_NUM2
ITU-T '2'           . 50('2') .
 KEY_NUM3

    public static final int KEY_NUM3
ITU-T '3'           . 51('3') .
 KEY_NUM4
```

---

```
public static final int KEY_NUM4
ITU-T '4' . 52('4') .
KEY_NUM5

public static final int KEY_NUM5
ITU-T '5' . 53('5') .
KEY_NUM6

public static final int KEY_NUM6
ITU-T '6' . 54('6') .
KEY_NUM7

public static final int KEY_NUM7
ITU-T '7' . 55('7') .
KEY_NUM8

public static final int KEY_NUM8
ITU-T '8' . 56('8') .
KEY_NUM9

public static final int KEY_NUM9
ITU-T '9' . 57('9') .
KEY_STAR

public static final int KEY_STAR
ITU-T '*' . 42('*') .
KEY_POUND

public static final int KEY_POUND
ITU-T '#' . 35('#') .
SOFT1

public static final int SOFT1
SOFT1 . 90 .
SOFT2

public static final int SOFT2
SOFT2 . 91 .
```

✎ SOFT3

```
public static final int SOFT3
```

```
SOFT3 . 92 .
```

✎ SIDE\_UP

```
public static final int SIDE_UP
```

```
SIDE_UP . 96 .
```

✎ SIDE\_DOWN

```
public static final int SIDE_DOWN
```

```
SIDE_DOWN . 97 .
```

✎ SIDE\_SEL

```
public static final int SIDE_SEL
```

```
SIDE_SEL . 98 .
```

✎ CLEAR

```
public static final int CLEAR
```

```
CLEAR . 99 .
```

✎ KEY\_PRESSED

```
public static final int KEY_PRESSED
```

```
. 1 .
```

✎ KEY\_RELEASED

```
public static final int KEY_RELEASED
```

```
. 2 .
```

✎ KEY\_REPEATED

```
public static final int KEY_REPEATED
```

```
. 3 .
```

✎ KEY\_TYPED

```
public static final int KEY_TYPED
```

```
. 4 .
```

✎ POINT\_PRESSED

```
public static final int POINT_PRESSED
```

---

```

        . 1 .
/ POINT_RELEASED

    public static final int POINT_RELEASED

        . 2 .
/ POINT_DRAGGED

    public static final int POINT_DRAGGED

        . 5 .
/ KEY_EVENT

    public static final int KEY_EVENT

        . 1 .
/ POINTER_EVENT

    public static final int POINTER_EVENT

        . 2 .
/ SMS_EVENT

    public static final int SMS_EVENT
SMS        . 4 .
/ CALL_EVENT

    public static final int CALL_EVENT

    Call Notify        . 7 .
/ ANN_EVENT

    public static final int ANN_EVENT

    indicator Notify        . 8 .

/ REPAINT_EVENT

    public static final int REPAINT_EVENT
/ TIMER_EVENT

    public static final int TIMER_EVENT

        . 42 .
/ CALL_SERIALLY_EVENT

```



---

```

public static final int CALL_SERIALLY_EVENT
    call serially . . . 43 . . .
☒ APP_EVENT

public static final int APP_EVENT
    . 100 . . .
☒ CHILDSTART_EVENT

public static final int CHILDSTART_EVENT
    . 101 . . .
☒ CHILDSTOP_EVENT

public static final int CHILDSTOP_EVENT
    . 102 . . .
☒ ANNUNCIATOR_CHANGE_EVENT

public static final int ANNUNCIATOR_CHANGE_EVENT
    가 . 103 . . .
☒ USER_EVENT

public static final int USER_EVENT
    . 0x5000 . . .
☒ APP_STOP

public static final int APP_STOP
    ; APP_EVENT . 1 . . .
☒ APP_RESUME

public static final int APP_RESUME
    ; APP_EVENT . 2 . . .
☒ APP_DESTROY

public static final int APP_DESTROY
    ; APP_EVENT . 3 . . .
☒ APP_ACTIVE

public static final int APP_ACTIVE
    Active . . . 4 . . .

```

## ✎ getNextEvent

```
public void getNextEvent(int[] event)
```

가 .  
 ,  
 .  
 가 EVENT\_SIZE  
 ArrayIndexOutOfBoundsException .  
 가  
 IllegalStateException .  
 Card keyNotify, paint 가 가

## Parameters:

event - 가 . EVENT\_SIZE .

## Throws:

ArrayIndexOutOfBoundsException - 가 'EVENT\_SIZE'

IllegalStateException - 가

NullPointerException - event가 null

## ✎ postEvent

```
public boolean postEvent(int[] event)
```

가  
 .  
 가 .  
 EVENT\_SIZE .  
 가 false , true

## Parameters:

event -

Returns:

true, false.

Throws:

`ArrayIndexOutOfBoundsException` - 가 `EVENT_SIZE`

`NullPointerException` - event가 null

✍ `postEvent`

```
public static void postEvent(int id,
                             int[] event)
```

. id가 가 가

id가 -1 active parameter가 가

Parameters:

id -

event - event

✍ `dispatchEvent`

```
public void dispatchEvent(int[] event)
```

Parameters:

event -

Throws:

`ArrayIndexOutOfBoundsException` - 가 `EVENT_SIZE`

## Class Font

```
java.lang.Object
|
+--org.kwis.msp.lcdui.Font
```

```
public class Font
```

```
extends Object
```

```

    . getFont
    가 . getFont 가
    .
    getFont 가 Graphics.setFont\(org.kwis.msp.lcdui.Font\)
    .
    getFont , 가
    .
    stringWidth substringWidth
    .
    가 . STYLE_PLAIN
    STYLE_UNDERLINED
    STYLE_BOLD
    STYLE_BOLD | STYLE_UNDERLINED
    STYLE_ITALIC
    STYLE_ITALIC | STYLE_UNDERLINED
    STYLE_BOLD | STYLE_ITALIC
    STYLE_BOLD | STYLE_ITALIC | STYLE_UNDERLINED

```

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

✎ FACE\_MONOSPACE

```
public static int FACE_MONOSPACE
Monospace . 32 . , .
```

✎ FACE\_PROPORTIONAL

```
public static int FACE_PROPORTIONAL
Proportional . 64 . , .
```

✎ FACE\_SYSTEM

```
public static int FACE_SYSTEM
System . 0 . , .
. MONOSPACE PROPORTIONAL .
```

✎ SIZE\_LARGE

```
public static int SIZE_LARGE
. 16 . , .
```

✎ SIZE\_MEDIUM

```
public static int SIZE_MEDIUM
. 0 . , .
```

✎ SIZE\_SMALL

```
public static int SIZE_SMALL
. 8 . , .
```

✎ STYLE\_BOLD

```
public static int STYLE_BOLD
. 1 . , .
```

✎ STYLE\_ITALIC

```
public static int STYLE_ITALIC
. 2 . , .
```

✎ STYLE\_PLAIN

```

public static int STYLE_PLAIN
                                0
✎ STYLE_UNDERLINED
public static int STYLE_UNDERLINED
                                4
✎ style
protected int style
✎ size
protected int size
✎ face
protected int face

```

✎ getFont

```

public static Font getFont(int face,
                           int style,
                           int size)

```

가

가

Parameters:

face - face; FACE\_MONOSPACE, FACE\_PROPORTIONAL, FACE\_SYSTEM

style - ; STYLE\_PLAIN STYLE\_ITALIC, STYLE\_BOLD, STYLE\_UNDERLINED

size - ; SIZE\_LARGE, SIZE\_MEDIUM, SIZE\_SMALL 가

Throws:



---

(base line)

Returns:

baseline

✍ `getDefaultFont`

```
public static Font getDefaultFont()
```

Returns:

✍ `getFace`

```
public int getFace()
```

FACE\_MONOSPACE, FACE\_PROPORTIONAL, FACE\_SYSTEM 가

Returns:

✍ `getHeight`

```
public int getHeight()
```

Returns:

✍ `getSize`

```
public int getSize()
```

Returns:

✍ `getStyle`

```
public int getStyle()
```

STYLE\_BOLD, STYLE\_ITALIC, STYLE\_UNDERLINE, STYLE\_PLAIN OR

Returns:



✎ isBold

```
public boolean isBold()  
    STYLE_BOLD
```

Returns:

```
STYLE_BOLD    true    false
```

✎ isItalic

```
public boolean isItalic()  
    STYLE_ITALIC
```

Returns:

```
STYLE_ITALIC    true    false
```

✎ isPlain

```
public boolean isPlain()  
    STYLE_PLAIN
```

Returns:

```
STYLE_PLAIN    true    false
```

✎ isUnderlined

```
public boolean isUnderlined()  
    STYLE_UNDERLINED
```

Returns:

```
STYLE_UNDERLINED    true    false
```

✎ stringWidth

```
public int stringWidth(String str)  
    . str가
```

Parameters:

str -

Returns:

Throws:

NullPointerException - str null .

✍️ substringWidth

```
public int substringWidth(String str,  
                           int offset,  
                           int len)
```

. str가 offset len

Parameters:

str -

offset -

len -

Returns:

Throws:

StringIndexOutOfBoundsException - offset len

NullPointerException - str null .

## Class Graphics

```
java.lang.Object
```

```
|
```

```
+- -org.kwis.msp.lcdui.Graphics
```

```
public class Graphics
```

```
extends Object
```

```
2
```

```
,
```

```
가
```

```
(0, 0)
```

```
,
```

```
y
```

```
,
```

```
x
```

```
가
```

```
가
```

```
가
```

```
translate
```

```
가
```

```
LEFT, HCENTER, RIGHT
```

```
가
```

```
TOP, BASELINE, BOTTOM
```

```
/
```

```
OR
```

```
BASELINE
```

```
VCENTER
```

```
, OR
```

```
DOTTED SOLID
```

```
drawLine,
```

```
drawArc
```

```
fillRect
```

```
Graphics
```

```
가
```

```
XOR
```

```
setXORMode\(boolean\)
```

```
XOR
```

```
setAlpha\(int\)
```

```

.g.setAlpha(255)
        . XOR      Alpha
        .
        .
        . Graphics 가
        가
    
```

|   |
|---|
| Methods inherited from class java.lang.Object                             |
| equals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait |



~~☒~~ BASELINE

```

public static final int BASELINE
        baseline
    
```

64

~~☒~~ BOTTOM

```

public static final int BOTTOM
    
```

32

~~☒~~ DOTTED

```

public static final int DOTTED
    
```

1

~~☒~~ HCENTER

```

public static final int HCENTER
        가
    
```

1

~~☒~~ LEFT

```

public static final int LEFT
    
```

4

✎ RIGHT

```
public static final int RIGHT
```

8

✎ SOLID

```
public static final int SOLID
```

0

✎ TOP

```
public static final int TOP
```

0

✎ VCENTER

```
public static final int VCENTER
```

가

2



✎ clipRect

```
public void clipRect(int x,
                    int y,
                    int width,
                    int height)
```

(x, y)

, 가 height

width

가

Parameters:

x -

graphics

x

y - graphics y

width -

height -

See Also:

[setClip\(int, int, int, int\)](#)

✍ drawChar

```
public void drawChar(char character,
                    int x,
                    int y,
                    int anchor)
```

가 가

character가

Parameters:

character -

x - x

y - y

anchor - ;

Throws:

IllegalArgumentException - anchor가 가

See Also:

[drawChars\(char\[\], int, int, int, int\)](#)

✍ drawChars

```
public void drawChars(char[] data,
                    int offset,
                    int length,
                    int x,
                    int y,
                    int anchor)
```

data가 가

가 가

Parameters:

data -

offset -

length -

x - x

y - y

anchor - ;

Throws:

ArrayIndexOutOfBoundsException - offset length 가

IllegalArgumentException - anchor

NullPointerException - data null

See Also:

[drawString\(java.lang.String, int, int, int\)](#)

☞ drawImage

```
public void drawImage(Image img,
                      int x,
                      int y,
                      int anchor)
```

img가 가

Parameters:

img -

x - x

y - y

anchor - ;

Throws:

IllegalArgumentException - anchor

NullPointerException - img가 null

See Also:

[Image](#) drawLine

```
public void drawLine(int x1,
                    int y1,
                    int x2,
                    int y2)
```

가

가

## Parameters:

x1 - x

y1 - y

x2 - x

y2 - y

 drawRect

```
public void drawRect(int x,
                    int y,
                    int width,
                    int height)
```

(width + 1)

(height + 1)

가 . width

height가 0

## fillRect

## Parameters:

x - x

y - y

width -

height -

## See Also:

[fillRect\(int, int, int, int\)](#) drawRoundRect



```
public void drawRoundRect(int x,
                          int y,
                          int width,
                          int height,
                          int arcWidth,
                          int arcHeight)
```

가

(width + 1) (height + 1) 가 . width

height가 0

fillRoundRect

. arcWidth가 width / 2 width

/ 2 . arcHeight가 height / 2 height / 2 .

Parameters:

x - x

y - y

width -

height -

arcWidth -

arcHeight -

See Also:

[fillRoundRect\(int, int, int, int, int, int\)](#)

✎ drawString

```
public void drawString(String str,
                       int x,
                       int y,
                       int anchor)
```

가

(space)

가

Parameters:

str -

x - x

y - y  
 anchor - ;

Throws:

IllegalArgumentException - anchor가

NullPointerException - str null

See Also:

[drawChars\(char\[\], int, int, int, int, int\)](#), [drawSubstring\(String, int, int, int, int, int\)](#)

✍ drawSubstring

```
public void drawSubstring(String str,
                          int offset,
                          int len,
                          int x,
                          int y,
                          int anchor)
```

가 (space) 가

Parameters:

str -

offset - '0'

len -

x - x

y - y

anchor - ;

Throws:

IllegalArgumentException - anchor가

NullPointerException - str null

StringIndexOutOfBoundsException - offset len str 가



```
int startAngle,
int arcAngle)
```

startAngle, arcAngle

drawArc

fillRect 가 width height 가  
pie 가 . 가 0

Parameters:

x - x

y - y

width - 가

height - 가

startAngle -

arcAngle -

See Also:

[fillArc\(int, int, int, int, int, int\)](#)

✎ fillRect

```
public void fillRect(int x,
                    int y,
                    int width,
                    int height)
```

width height 가 . width height가

0

Parameters:

x - x


y - y

width -

height -

See Also:

[drawRect\(int, int, int, int\)](#)

 fillRoundRect

```
public void fillRoundRect(int x,
                          int y,
                          int width,
                          int height,
                          int arcWidth,
                          int arcHeight)
    가 .
        width      height      가 .      가 0
        .          .          .          arcWidth
가 width / 2      width / 2      .      arcHeight가 height / 2
        height / 2      .
```

Parameters:

x - x

y - y

width -

height -

arcWidth -

arcHeight -

See Also:

[drawRoundRect\(int, int, int, int, int, int\)](#)

 getBlueComponent

```
public int getBlueComponent()
```

Returns:

0-255

See Also:

[setColor\(int, int, int\)](#)

✍ getClipHeight

```
public int getClipHeight()
```

Returns:

See Also:

[clipRect\(int, int, int, int\)](#), [setClip\(int, int, int, int\)](#)

✍ getClipWidth

```
public int getClipWidth()
```

Returns:

See Also:

[clipRect\(int, int, int, int\)](#), [setClip\(int, int, int, int\)](#)

✍ getClipX

```
public int getClipX()
```

x

Returns:

x

See Also:

[clipRect\(int, int, int, int\)](#), [setClip\(int, int, int, int\)](#)

✍ getClipY

```
public int getClipY()
```

y

Returns:

y

See Also:

[clipRect\(int, int, int, int\)](#), [setClip\(int, int, int, int\)](#)

✍ `getColor`

```
public int getColor()
```

Returns:

0x00RRGGBB 가

See Also:

[setColor\(int, int, int\)](#), [setColor\(int\)](#)

✍ `getFont`

```
public Font getFont()
```

Returns:

See Also:

[Font](#), [setFont\(org.kwis.msp.lcdui.Font\)](#)

✍ `getGrayScale`

```
public int getGrayScale()
```

`setGrayScale`

가

Returns:

0-255

See Also:

[setGrayScale\(int\)](#)

✍ `getGreenComponent`

```
public int getGreenComponent()
```

Returns:

0-255

See Also:

[setColor\(int, int, int\)](#)

✍ getRedComponent

```
public int getRedComponent()
```

Returns:

0 - 255

See Also:

[setColor\(int, int, int\)](#)

✍ getStrokeStyle

```
public int getStrokeStyle()
```

Returns:

LINE\_STYLE\_SOLID LINE\_STYLE\_DOTTED

✍ getTranslateX

```
public int getTranslateX()
```

x

Returns:

x

See Also:

[getTranslateX\(\)](#), [translate\(int, int\)](#)

✍ getTranslateY

```
public int getTranslateY()
```

y

Returns:

y

See Also:

[getTranslateX\(\)](#), [translate\(int, int\)](#)



## ✂️ setClip

```
public void setClip(int x,
                   int y,
                   int width,
                   int height)
```

(x, y) , width  
height가

## Parameters:

x - x

y - y

width -

height -

See Also:

[clipRect\(int, int, int, int\)](#)

## ✂️ setColor

```
public void setColor(int rgb)
```

가  
가 RGB  
0x00RRGGBB 8bit 가

## Parameters:

rgb -

## ✂️ setColor

```
public void setColor(int r,
                    int g,
                    int b)
```

RGB 가  
가 RGB

## Parameters:

r - 0-255

g - 0-255

b - 0-255

Throws:

IllegalArgumentException - r, g, b

✍️ `setFont`

```
public void setFont(Font font)
```

가

가

가 null `setFont(Font.getDefaultFont())`

Parameters:

font -

✍️ `setGrayScale`

```
public void setGrayScale(int val)
```

가

가

가 0-255

Parameters:

val - 0-255

Throws:

IllegalArgumentException -

가

✍️ `setStrokeStyle`

```
public void setStrokeStyle(int style)
```

Parameters:

style - SOLID DOTTED

Throws:

IllegalArgumentException - style

가

## ✍ translate

```
public void translate(int x,
                    int y)
```

## Parameters:

x - x ( )

y - y ( )

## See Also:

[getTranslateX\(\)](#), [getTranslateY\(\)](#)

## ✍ getPixel

```
public int getPixel(int x,
                  int y)
```

가 RGB 가 (x, y)  
가 . 가 0x00RRGGBB 가 .

## Parameters:

x - 가 pixel x

y - 가 pixel y

## Returns:

pixel .

## ✍ setPixel

```
public void setPixel(int x,
                   int y)
```

(x, y)

## Parameters:

x - 가 pixel x

y - 가 pixel y

✍️ `getPixels`

```
public void getPixels(int x,
                    int y,
                    int w,
                    int h,
                    byte[] pixels,
                    int offset,
                    int bpl)
```

가 . Graphics

가 .

, `setPixel` .

Parameters:

x - 가 x

y - 가 y

w - 가

h - 가

pixels -

offset -

bpl - 가

Throws:

`ArrayIndexOutOfBoundsException` - pixels 가.  $(h * bpl + (w * bit$   
per pixel + 7) / 8)

`NullPointerException` - pixels가 null

✍️ `getRGBPixels`

```
public void getRGBPixels(int x,
                        int y,
                        int w,
                        int h,
                        int[] pixels,
```

```
int offset,
int bpl)
```

가 . Graphics  
가 . data

0x00RRGGBB .

Parameters:

x - 가 x

y - 가 y

w - 가

h - 가

pixels -

offset -

bpl - 가

Throws:

ArrayIndexOutOfBoundsException - pixels 가.  $(h * bpl + (w * bit$   
per pixel + 7) / 8)

NullPointerException - pixels가 null

✍ setPixels

```
public void setPixels(int x,
                      int y,
                      int w,
                      int h,
                      byte[] pixels,
                      int offset,
                      int bpl)
```

. Graphic  
. data

, getPixel

Parameters:

x - 가 x

y - 가 y

w - 가

h - 가

pixels -

offset -

bpl - 가

Throws:

ArrayIndexOutOfBoundsException - pixels 가.  $(h * bpl + (w * bit$   
per pixel + 7) / 8)

NullPointerException - pixels가 null

 setRGBPixels

```
public void setRGBPixels(int x,
                        int y,
                        int w,
                        int h,
                        int[] pixels,
                        int offset,
                        int bpl)
```

. Graphic

. data

0x00RRGGBB

integer

Parameters:

x - 가 x

y - 가 y

w - 가

h - 가

pixels -

offset -

bpl - 가

Throws:

`ArrayIndexOutOfBoundsException` - pixels  
per pixel + 7 ) / 8)

가. (h \* bpl + (w \* bit

`NullPointerException` - pixels가 null

✍ `copyArea`

```
public void copyArea(int dx,
                    int dy,
                    int sx,
                    int sy,
                    int w,
                    int h)
```

. Graphics

Parameters:

dx - x

dy - y

sx - x

sy - y

w -

h -

✍ `drawPolygon`

```
public void drawPolygon(int[] x,
                       int[] y)
```

(x, y)

Parameters:

x - x array

y - y array

Throws:

`IllegalArgumentException` - x y 가

NullPointerException - x y가 null

✍ reset

```
public void reset()
```

가

✍ setAlpha

```
public void setAlpha(int alpha)
```

. alpha 0

, 255

255

XOR

Parameters:

alpha -

✍ getAlpha

```
public int getAlpha()
```

alpha 가

Returns:

alpha

✍ setXORMode

```
public void setXORMode(boolean b)
```

XOR . drawLine, drawPolygon XOR

XOR (alpha)

Parameters:

b - true XOR . false

✍ isXORMode

```
public boolean isXORMode()
```

XOR

Returns :

XOR 가 true.

✍ encodeImage



---

```
public byte[] encodeImage(int x,  
                          int y,  
                          int w,  
                          int h)
```

BMP

BMP

Parameters:

x - x

y - y

w -

h -

Returns:

BMP

,

null



```
int imagelength)
```

가

```
imageoffset imagelength
```

data

가

```
IllegalArgumentException
```

가

Parameters:

imagedata - 가

imageoffset -

imagelength -

Returns:

Throws:

IllegalArgumentException - 가

NullPointerException - imagedata가 null

ArrayIndexOutOfBoundsException - imageoffset imagelength가

✍ loadImage

```
public static Image loadImage(String str,
                               ImageObserver io)
```

URL

URL

ImageObserver notify

0 , 가 (ImageObserver.notify가 )

ImageObserver 가

가

Parameters:

str -

io - [ImageObserver](#)

Returns:

;

Throws:

[NullPointerException](#) - str null .

See Also:

[ImageObserver.notify\(org.kwis.msp.lcd.ui.Image, int\)](#)

 [createImage](#)

```
public static Image createImage(Image image)
```

가

가

[getGraphics\(\)](#)

Graphics 가

Animation

[IllegalArgumentException](#)

가

Parameters:

image -

Returns:

Throws:

[IllegalArgumentException](#) - animation 가

[NullPointerException](#) - image가 null .

 [createImage](#)

```
public static Image createImage(int width,
                                int height)
```

가

[getGraphics\(\)](#)

Graphics

가

가 .

Parameters:

width -

height -

Throws:

IllegalArgumentException - width height가 0

✎ createImage

```
public static Image createImage(String name)
    throws IOException
```

가 .

Parameters:

name -

Returns:

Throws:

IllegalArgumentExcepion - 가

NullPointerException - name null .

See Also:

[Class.getResourceAsStream\(java.lang.String\)](#)

✎ getGraphics

```
public Graphics getGraphics()
```

가 . 가 Graphics  
가 null .

Returns:

Graphics

✎ getHeight

```
public int getHeight()
```

Returns:

✎ getWidth

```
public int getWidth()
```

Returns:

✎ isMutable

```
public boolean isMutable()
```

가

Returns:

가

✎ isAnimated

```
public boolean isAnimated()
```

Image가 Animation 가

Returns:

Animation 가

✎ play

```
public void play(ImageObserver ob)
```

가 Animation 가

. Animation ImageObserver animation

ImageObserver notify() . Animation 가

computing , gif

decode . animation


stop

Parameters:

ob - Observer

See Also:

[ImageObserver](#)

 stop

```
public void stop()
```

```

        . Animation Gif
        가 Animation 가
        .
        , 가
        .

```

 stopImage

```
public static void stopImage(ImageObserver io)
```

```

ImageObserver . loadImage play "
" . ImageObserver.notify
        . play
        , stop
        CPU

```

io가 null

Parameters:

io - ImageObserver

## Class InputMethodHandler

java.lang.Object

|

+-org.kwis.msp.lcdui.InputMethodHandler

```
public class InputMethodHandler
```

```
extends Object
```

```
InputMethodHandler
```

```
notifyKeyInput(int keyCode)
```

```
InputMethodListener
```

```
InputMethodListener가
```

```
notifyKeyInput(int) false
```

```
InputMethodListener
```

```
setInputMethodListener(org.kwis.msp.lcdui.InputMethodListener)
```

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

✎ InputMethodHandler

```
public InputMethodHandler(int constraint)
```

```
InputMethodHandler
```

```
TextComponent
```

```
가 가
```

```
IllegalArgumentException -
```

✎ getCurrentModeCode



```
public String getCurrentModeCode()
```

ISO 639  
 가 "/S" "/L" 가  
 "EN" , "EN/S"  
 가

Returns:

☞ notifyKeyInput

```
public final boolean notifyKeyInput(int keyCode,
                                     int type)
```

InputMethodHandler

```
setInputMethodListener(org.kwis.msp.lcd.uit.InputMethodListener)
    InputMethodListener notifyTextChanged
```

Parameters:

keyCode -

Returns:

가 true, false

☞ setInputMethodListener

```
public void
setInputMethodListener(InputMethodListener imListener)
```

InputMethodHandler

InputMethodListener InputMethodListener

notifyTextChanged

InputMethodListener

null InputMethodListener

Parameters:

imListener - InputMethodListener null

☞ changeCurrentModeToNext

```
public void changeCurrentModeToNext()
```

constraint

✍ `getCurrentMode`

```
public int getCurrentMode ()
```

Returns:

✍ `setCurrentMode`

```
public boolean setCurrentMode(int mode)
```

`IllegalArgumentException`

Parameters:

Mode –

✍ `hideSymbolCard`

```
public void hideSymbolCard()
```

`CandidateWindow`

✍ `setSymbolPosition`

```
public void setSymbolPosition(int x,
                              int y,
                              int w,
                              int h)
```

`InputMethodHandler`

가 `IM_SYMBOL`

, `x,y,w,h` '0' , '0'

`IllegalArgumentException`

Parameters:

x - x

y - y

w - width

h - height

Throws:

IllegalArgumentException - w,h '0'



Class Jlet

```
java.lang.Object
|
+--org.kwis.msp.lcdui.Jlet
```

```
public abstract class Jlet
extends Object
MSP
MSP
Thread Card Jlet
Jlet 가 가 . Jlet active 가 ,
pause 가 .
active
Jlet destroyed , Jlet
startApp(), destroyApp() 가 .
pauseApp() resumeApp(),
```



startApp 가 . System.execute  
가 .

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

✎ ACTIVE

public static final int ACTIVE

✎ DESTROYED

public static final int DESTROYED

✎ PAUSED

public static final int PAUSED

✎ Jlet

protected Jlet()

Jlet .

✎ setActiveJlet

public static void setActiveJlet(Jlet ql)

Jlet . Jlet .

✎ getActiveJlet

public static Jlet getActiveJlet()

Jlet . Jlet null .

Returns:

Jlet

✎ getJletFromPID

```
public static Jlet getJletFromPID(int id)
```

id Jlet Jlet ID  
null .

Returns:

ID Jlet  
✎ getCurrentJlet

```
public static Jlet getCurrentJlet()
```

Jlet .

Returns:

Jlet  
✎ getCurrentProgramID

```
public int getCurrentProgramID()
```

Jlet id . id  
가 .

Parameters:

id - Jlet id  
✎ startApp

```
protected abstract void startApp(String[] args)
```

Jlet 가 .  
, .  
. Jlet 가 args .  
args[0] Jlet , args[1] 가 가 .

Parameters:

args - 가 .  
✎ pauseApp

```
protected void pauseApp()
```

( , )

## ✎ resumeApp

```
protected void resumeApp()
```

```
        . pauseApp
        . Jlet
        . pauseApp
        . (
        . )
```

## ✎ destroyApp

```
protected abstract void destroyApp(boolean unconditional)
```

```
throws
```

```
org.kwis.msp.lcdui.JletStateChangeException
```

```
        . unconditional true
        . false
        . JletStateChangeException
        . 가
        . 가
```

Parameters:

unconditional - true 가 , false Jlet  
JletStateChangeException

Throws:

org.kwis.msp.lcdui.JletStateChangeException -  
unconditional true ,

## ✎ notifyDestroyed

```
public final void notifyDestroyed()
```

```
        . Jlet
        . Destroyed 가 , destroyApp
```

Jlet.destroyApp() 가

## ✎ getAppProperty

```
public final String getAppProperty(String key)
```

가 key  
null

Parameters:

key -

Returns:

 `getEventQueue`

```
public final EventQueue getEventQueue()
```

Jlet

Returns:



## 5.2.9. UI Component(org.kwis.msp.lwc)


Interface ActionListener

```
public interface ActionListener
```

```
    void actionPerformed(ActionEvent e);
```

See Also:

ButtonComponent

 action

```
public void actionPerformed(Component cmp,
                           Object o)
```

```
    void actionPerformed(ActionEvent e);
```

Parameters:

cmp - action

o - setActionListener      Object

## Interface ChangeListener

```
public interface ChangeListener
```

```
Selection . 가  
listener .
```

```
changed
```

```
public void changed(Component cmp,  
                    Object o)
```

```
ChangeListener Component CHANGE 가  
. CheckboxComponent ListComponent 가  
Listener changed 가
```

Parameters:

cmp - 가 Component

o - setChangeListener Object( )

See Also:

CheckboxComponent.setChangeListener(org.kwis.msp.lwc.ChangeListener,  
java.lang.Object),

CheckboxGroup.setChangeListener(org.kwis.msp.lwc.ChangeListener,  
java.lang.Object),

ListComponent.setChangeListener(org.kwis.msp.lwc.ChangeListener,  
java.lang.Object),

ListComponent.setChangeListener(org.kwis.msp.lwc.ChangeListener,  
java.lang.Object),

ProgressComponent.setChangeListener(org.kwis.msp.lwc.ChangeListener,  
java.lang.Object)

## Interface CommandListener

```
public interface CommandListener
```

```
    /
```

```
    ✎ FOCUS_CHANGE
```

```
        public static final int FOCUS_CHANGE
```

```
        가
```

```
    ✎ SELECT
```

```
        public static final int SELECT
```

```
    ✎ commandAction
```

```
        public void commandAction(Command c,
                                   int type,
                                   Object obj)
```

```
        가
```

Parameters:

c -

type - SELECT, FOCUS\_CHANGE

## Interface EventListener

```
public interface EventListener
```

```
Component . key,  
show, focus, pointer .
```

```
✍ eventNotify
```

```
public boolean eventNotify(int type,  
                             int arg1,  
                             int arg2,  
                             int arg3,  
                             Object obj)
```

```
Key, Show, Focus, Pointer 가
```

Parameters:

c -

type - (Component.KEY\_NOTIFY,  
Component.SHOW\_NOTIFY,  
Component.POINTER\_NOTIFY)

arg1 - type

arg2 - type

arg3 - type

obj - setEventListner Object

---

**Interface GrabKeyListener**

```
public interface GrabKeyListener
```

```
Key Grab
```

```
✎ grabKeyNotify
```

```
public boolean grabKeyNotify(int type,
                             int chr,
                             Object obj)
```

```
Key, Show, Focus, Pointer 가
```

Parameters:

**c** -

**type** -

(EventQueue.KEY\_RELEASED, EventQueue.KEY\_RELEASED,  
EventQueue.KEY\_REPEATED, EventQueue.KEY\_TYPED)

**chr** -

**obj** - setEventListner            Object

## Class AnnunciatorComponent

java.lang.Object

|

+--org.kwis.msp.lwc.Component

|

+--org.kwis.msp.lwc.ContainerComponent

|

+--org.kwis.msp.lwc.ShellComponent

|

+--org.kwis.msp.lwc.AnnunciatorComponent

```
public class AnnunciatorComponent
```

```
extends ShellComponent
```

Fields inherited from class org.kwis.msp.lwc.ShellComponent

cd, cmpCommand, cmpTitle, cmpWork, RESIZE\_MASK

Fields inherited from class org.kwis.msp.lwc.ContainerComponent

cmpFocus, cmps, insetBottom, insetLeft, insetRight, insetTop, ncomp, offsetX, offsetY, useFrame

Fields inherited from class org.kwis.msp.lwc.Component

bg, evtListener, evtListenerObj, fg, FOCUS\_NOTIFY, h, HAS\_FOCUS\_MASK, INPUT\_MASK, KEY\_NOTIFY, KEY\_PRESSED, KEY\_RELEASED, KEY\_REPEATED, KEY\_TYPED, LAYOUT\_BOTTOM, LAYOUT\_HCENTER, LAYOUT\_LEFT, LAYOUT\_RIGHT, LAYOUT\_TOP, LAYOUT\_VCENTER, mask, parent, POINT\_DRAGGED, POINT\_PRESSED, POINT\_RELEASED, POINTER\_NOTIFY,

POS\_MASK, PREFER\_SIZE\_MASK, prefH, prefW, SHOW\_NOTIFY, SIZE\_MASK, VALID\_MASK, w, x, y

Methods inherited from class org.kwis.msp.lwc.ShellComponent

addComponent, configure, controllInset, getCard, getCommand, getNextTraversalComponent, getPrevTraversalComponent, getTitle, getWorkComponent, getX, getY, grabKey, isShown, keyNotify, processEvent, removeAllComponents, repaint, serviceRepaints, setCommand, setGrabKeyListener, setTitle, setTitle, setWorkComponent, showNotify, ungrabKey

Methods inherited from class org.kwis.msp.lwc.ContainerComponent

getComponent, getIndexOf, getNumberOfComponent, paintFrame, removeComponent, repaint, scrollTo, setComponent, useFrame, validate

Methods inherited from class org.kwis.msp.lwc.Component

calcPreferredSize, canHandleInput, focusNotify, getBackground, getForeground, getHeight, getPreferredHeight, getPreferredHeight, getPreferredWidth, getWidth, getXOnScreen, getYOnScreen, hasFocus, invalidate, isValid, paintContent, pointerNotify, setBackground, setEventListener, setFocus, setForeground, toString

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, wait, wait, wait

✍ AnnunciatorComponent

```
public AnnunciatorComponent(boolean bTrans)
```

```
. bTrans false
```

. true 가

Parameters:

bTrans - 가

✎ addComponent

```
public void addComponent(int idx,
                        Component cmp)
```

Description copied from class: ContainerComponent

가 . cmp가 가 가

AnnunciatorComponent  
IllegalStateException

Overrides:

addComponent in class ShellComponent

Parameters:

index -

cmp -

Throws:

IllegalStateException -

✎ removeComponent

```
public void removeComponent(Component cmp)
```

Description copied from class: ContainerComponent

AnnunciatorComponent  
IllegalStateException

.Overrides:



removeComponent in class ShellComponent

Parameters:

cmp -

Throws:

IllegalStateException -

✎ layout

```
public void layout()
```

Description copied from class: Component

Overrides:

layout in class ShellComponent

✎ show

```
public void show()
```

Description copied from class: ShellComponent

validate

Display

가

Show

가

Show

Overrides:

show in class ShellComponent

✎ hide

```
public void hide()
```

Description copied from class: ShellComponent

AnnunciatorComponent

AnnunciatorComponent가 show hide


IllegalStateException

Overrides:

hide in class ShellComponent

Throws:

IllegalStateException -

 paint

protected void paint(Graphics g)

Overrides:

paint in class ContainerComponent

g 가  
paintContent

Parameters:

g -



## Class ButtonComponent

java.lang.Object

|

+--org.kwis.msp.lwc.Component

|

+--org.kwis.msp.lwc.ButtonComponent

```
public class ButtonComponent
```

```
extends Component
```

```
    . "select" 가
```

```
    ActionListener
```

### Fields inherited from class org.kwis.msp.lwc.Component

bg, evtListener, evtListenerObj, fg, FOCUS\_NOTIFY, h, HAS\_FOCUS\_MASK, INPUT\_MASK, KEY\_NOTIFY, KEY\_PRESSED, KEY\_RELEASED, KEY\_REPEATED, KEY\_TYPED, LAYOUT\_BOTTOM, LAYOUT\_HCENTER, LAYOUT\_LEFT, LAYOUT\_RIGHT, LAYOUT\_TOP, LAYOUT\_VCENTER, mask, parent, POINT\_DRAGGED, POINT\_PRESSED, POINT\_RELEASED, POINTER\_NOTIFY, POS\_MASK, PREFER\_SIZE\_MASK, prefH, prefW, SHOW\_NOTIFY, SIZE\_MASK, VALID\_MASK, w, x, y

### Methods inherited from class org.kwis.msp.lwc.Component

canHandleInput, configure, focusNotify, getBackground, getCard, getForeground, getHeight, getPreferredHeight, getPreferredHeight, getPreferredWidth, getWidth, getX, getXOnScreen, getY, getYOnScreen, hasFocus, invalidate, isShown, isValid, pointerNotify, processEvent, repaint, repaint, serviceRepaints, setBackground, setEventListener, setFocus, setForeground, showNotify, toString, validate

### Methods inherited from class java.lang.Object

---

```
equals, getClass, hashCode, notify, notifyAll, wait, wait, wait
```

```
✎ ButtonComponent
```

```
public ButtonComponent ()
```

```
✎ ButtonComponent
```

```
public ButtonComponent (String str,  
                        Image img)
```

```
Image  
    . img  str  null
```

Parameters:

str -

img -

```
✎ setFont
```

```
public void setFont (Font ft)
```

Parameters:

ft -

```
✎ getFont
```

```
public Font getFont ()
```

Returns:

```
✎ setActionListener
```

```
public void setActionListener (ActionListener l,  
                               Object o)
```

ActionListener  
 ActionListener action  
 ActionListener

Parameters:

1 - ActionListener

0 -

See Also:

ActionListener.action(org.kwis.msp.lwc.Component, java.lang.Object)

✍ keyNotify

```
public boolean keyNotify(int type,
                        int chr)
```

Description copied from class: Component

```
가 , setFocus
가 가 type KEY_PRESSED,
KEY_RELEASED, KEY_REPEATED, KEY_TYPED , chr
```

Overrides:

keyNotify in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

```
type - ; KEY_PRESSED,
KEY_RELEASED, KEY_REPEATED,
KEY_TYPED
```

```
chr - ; '0' - '9' '*', '#'
```

Returns:

```
가 가 , true
false
```

✍ setString

```
public void setString(String str)
```

Parameters:

str -

 getString


```
public String getString()
```

Returns:

 getImage

```
public Image getImage()
```

Returns:

 setImage

```
public void setImage(Image img)
```

Parameters:

img -

 paintContent

```
public void paintContent(Graphics g)
```

Description copied from class: Component

```
validate()
    (
    -1
    ,
```

Overrides:

paintContent in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

g - Graphics.

See Also:

Graphics

✎ layout

protected void layout()

Description copied from class: Component

Overrides:

layout in class Component


✎ calcPreferredSize

protected void calcPreferredSize(int w)

Description copied from class: Component

Overrides:

calcPreferredSize in class Component



## Class CheckboxComponent

```
java.lang.Object
```

```
|
```

```
+- org.kwis.msp.lwc.Component
```

```
|
```

```
+- org.kwis.msp.lwc.LabelComponent
```

```
|
```

```
+- org.kwis.msp.lwc.CheckboxComponent
```

```
public class CheckboxComponent
```

```
extends LabelComponent
```

```
CheckboxComponent 가
```

```
.
```

```
CheckboxGroup
```

```
CheckboxComponent
```

```
, CheckboxGroup
```

```
CheckboxGroup
```

```
CheckboxComponent
```

```
CheckboxGroup
```

```
CheckBox
```

```
, 가
```

```
setState
```

See Also:

[CheckboxGroup](#)

Fields inherited from class org.kwis.msp.lwc.LabelComponent

layout, m\_ft, m\_image, m\_str

Fields inherited from class org.kwis.msp.lwc.Component

bg, evtListener, evtListenerObj, fg, FOCUS\_NOTIFY, h, HAS\_FOCUS\_MASK, INPUT\_MASK, KEY\_NOTIFY, KEY\_PRESSED, KEY\_RELEASED, KEY\_REPEATED, KEY\_TYPED, LAYOUT\_BOTTOM, LAYOUT\_HCENTER, LAYOUT\_LEFT, LAYOUT\_RIGHT, LAYOUT\_TOP, LAYOUT\_VCENTER, mask, parent,



POINT\_DRAGGED, POINT\_PRESSED, POINT\_RELEASED, POINTER\_NOTIFY, POS\_MASK, PREFER\_SIZE\_MASK, prefH, prefW, SHOW\_NOTIFY, SIZE\_MASK, VALID\_MASK, w, x, y

Methods inherited from class org.kwis.msp.lwc.LabelComponent

calcPreferredSize, getFont, getImage, getLabel, invalidate, setFont, setImage, setLabel, setLayout

Methods inherited from class org.kwis.msp.lwc.Component

canHandleInput, configure, focusNotify, getBackground, getCard, getForeground, getHeight, getPreferredHeight, getPreferredHeight, getPreferredWidth, getWidth, getX, getXOnScreen, getY, getYOnScreen, hasFocus, isShown, isValid, layout, pointerNotify, processEvent, repaint, repaint, serviceRepaints, setBackground, setEventListener, setFocus, setForeground, showNotify, toString, validate

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, wait, wait, wait

## ☞ CheckboxComponent

```
public CheckboxComponent(String str,
                          Image img)
    CheckboxComponent . 가 .
CheckboxComponent false가 .
```

Parameters:

str - .

img - .

See Also:

[CheckboxComponent\(String, Image, CheckboxGroup\)](#),  
[CheckboxComponent\(String, Image, boolean\)](#), #CheckboxComponent(String,  
Image, CheckboxGroup, boolean), [CheckboxGroup](#)

✍ CheckboxComponent

```
public CheckboxComponent(String str,
                          Image img,
                          CheckboxGroup cb)

CheckboxComponent .
CheckboxGroup . CheckboxGroup null
Checkbox가 .
```

See Also:

[CheckboxComponent\(String, Image\)](#), [CheckboxComponent\(String, Image, boolean\)](#), #CheckboxComponent(String, Image, CheckboxGroup, boolean),  
[CheckboxGroup](#)

✍ CheckboxComponent

```
public CheckboxComponent(String str,
                          Image img,
                          boolean bSet)

CheckboxComponent .
가 bSet
가 .
```

See Also:

[CheckboxComponent\(String, Image\)](#), [CheckboxComponent\(String, Image, CheckboxGroup\)](#), #CheckboxComponent(String, Image, CheckboxGroup,  
boolean), [setState\(boolean\)](#), [CheckboxGroup](#)

✍ setState

```
public void setState(boolean bState)

CheckboxComponent .
CheckboxGroup . setState
false . CheckboxGroup . CheckboxComponent
```

가 ChangeListener가

See Also:

[getState\(\)](#)

☞ getState

```
public boolean getState()
```

CheckboxComponent

See Also:

[setState\(boolean\)](#)

☞ paintContent

```
public void paintContent(Graphics g)
```

Description copied from class: Component

```
validate
)
-1
```

Overrides:

paintContent in class LabelComponent

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

g - Graphics.

See Also:

[Graphics](#)

☞ keyNotify

```
public boolean keyNotify(int type,
                          int key)
```

Description copied from class: Component

```
가 , setFocus
가 가 . type KEY_PRESSED,
KEY_RELEASED, KEY_REPEATED, KEY_TYPED , chr
```

Overrides:

keyNotify in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

```
type - ; KEY_PRESSED,
KEY_RELEASED, KEY_REPEATED,
KEY_TYPED
```

```
chr - ; '0' - '9' '*', '#' .
```

Returns:

```
가 가 , true .
false .
```

✍ setChangeListener

```
public void setChangeListener(ChangeListener listener,
Object obj)
```

```
CheckboxComponent ChangeListener . CheckboxComponent
가 Listener changed 가
```

Parameters:

listener - Listener

obj - Listener가 Object ( )

See Also:

[CheckboxGroup.setChangeListener\(org.kwis.msp.lwc.ChangeListener, java.lang.Object\)](#)

Class CheckboxGroup

java.lang.Object

|

+- org.kwis.msp.lwc.CheckboxGroup

public class CheckboxGroup

extends Object

CheckboxGroup

CheckboxComponent

|    |               |                       |              |
|----|---------------|-----------------------|--------------|
|    | CheckboxGroup | CheckBoxComponent     | 가            |
| ON | 가             | CheckboxComponent     | ON           |
|    | Checkbox가 ON  | Group                 | Checkbox OFF |
| 가  | .             | CheckboxComponent가 ON | .            |

See Also:

[CheckboxComponent](#)

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait



✎ CheckboxGroup

public CheckboxGroup()

CheckboxGroup

See Also:

[CheckboxComponent](#)



✎ select

public void select(CheckboxComponent cb)

CheckboxGroup

CheckboxComponent

ON

OFF 가 .

Parameters:

cb - select CheckboxComponent.

See Also:

[getSelectedCheckbox\(\)](#)

✎ getSelectedCheckbox

```
public CheckboxComponent getSelectedCheckbox()
```

```
CheckboxGroup          Checkbox          ON          CheckboxComponent
```

Returns:

```
ON          CheckboxComponent
```

See Also:

[select\(org.kwis.msp.lwc.CheckboxComponent\)](#)

✎ setChangeListener

```
public void setChangeListener(ChangeListener listener,
                               Object obj)
```

```
CheckboxGroup    ChangeListener          .    CheckboxGroup
CheckboxComponent    가          Listener    changed    가
```

Parameters:

listener -          Listener

obj - Listener가          Object (          )

See Also:

CheckboxComponent#CheckboxComponent(String, Image, CheckboxGroup, boolean), [CheckboxComponent.CheckboxComponent\(String, Image, CheckboxGroup\)](#), [CheckboxComponent.setChangeListener\(org.kwis.msp.lwc.ChangeListener, java.lang.Object\)](#)

## Class ComboComponent

java.lang.Object

|

+- org.kwis.msp.lwc.Component

|

+- org.kwis.msp.lwc.ComboComponent

```
public class ComboComponent
```

```
extends Component
```

```
ComboComponent
```

```
ComboComponent
```

SELECT

가

```
ComboComponent
```

ChangeListener

ChangeListener

```
changed
```

### Fields inherited from class org.kwis.msp.lwc.Component

bg, evtListener, evtListenerObj, fg, FOCUS\_NOTIFY, h, HAS\_FOCUS\_MASK, INPUT\_MASK, KEY\_NOTIFY, KEY\_PRESSED, KEY\_RELEASED, KEY\_REPEATED, KEY\_TYPED, LAYOUT\_BOTTOM, LAYOUT\_HCENTER, LAYOUT\_LEFT, LAYOUT\_RIGHT, LAYOUT\_TOP, LAYOUT\_VCENTER, mask, parent, POINT\_DRAGGED, POINT\_PRESSED, POINT\_RELEASED, POINTER\_NOTIFY, POS\_MASK, PREFER\_SIZE\_MASK, prefH, prefW, SHOW\_NOTIFY, SIZE\_MASK, VALID\_MASK, w, x, y

### Methods inherited from class org.kwis.msp.lwc.Component

calcPreferredSize, canHandleInput, configure, focusNotify, getBackground, getCard, getForeground, getHeight, getWidth, getX, getXOnScreen, getY, getYOnScreen,

hasFocus, invalidate, isShown, isValid, layout, pointerNotify, processEvent, repaint, repaint, serviceRepaints, setBackground, setEventListener, setFocus, setForeground, showNotify, toString, validate

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, wait, wait, wait

✎ ComboComponent

```
public ComboComponent ()
```

ComboComponent .

✎ append

```
public int append(String str)
```

가 .

Parameters:

str - 가

Returns:

가

Throws:

IllegalArgumentException - str null .

✎ insert

```
public int insert(int index,
                  String str)
```

index

. '0' ListItemComponent 가  
IndexOutOfBoundsException .



Parameters:

index -


Returns:

Throws:

IndexOutOfBoundsException -

See Also:

[ListComponent.insert\(int, java.lang.String, org.kwis.msp.lcdui.Image\)](#)

 set

```
public void set(int index,
                String str)
```

index  
'0' ListItemComponent 가  
IndexOutOfBoundsException

Parameters:

index -

Throws:

IndexOutOfBoundsException -

 delete

```
public void delete(int index)
```

index  
'0'  
ListItemComponent 가  
IndexOutOfBoundsException

Parameters:

index -

Throws:

IndexOutOfBoundsException -

 getString

```
public String getString()
```

Returns:

가  
 ✎ getSize

```
public int getSize()
```

ComboComponent

Returns:

가

✎ getSelectedIndex

```
public int getSelectedIndex()
```

Returns:

가  
 ✎ getPreferredSize

```
public int getPreferredSize()
```

Description copied from class: Component

가  
 ContainerComponent

Overrides:

getPreferredSize in class Component

Following copied from class: org.kwis.msp.lwc.Component

Returns:

✎ getPreferredSize

```
public int getPreferredSize(int w)
```

Description copied from class: Component

가  
 LabelComponent                      TextFieldComponent,  
 TextAreaComponent                      가                      가                      가

가 . 가 가 , 가 .  
 , w가 -1

Overrides:

getPreferredHeight in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

w - 가 .

Returns:

✎ getPreferredWidth

```
public int getPreferredWidth()
```

Description copied from class: Component

. Container  
 가 .

Overrides:

getPreferredWidth in class Component

Following copied from class: org.kwis.msp.lwc.Component

Returns:

✎ paintContent

```
public void paintContent(Graphics g)
```

Description copied from class: Component

. validate , ( . -1 , )

Overrides:

paintContent in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

g - Graphics.

See Also:

[Graphics](#)

✍ keyNotify

```
protected boolean keyNotify(int type,
                             int key)
```

Description copied from class: Component

```
가 , setFocus
가 type KEY_PRESSED,
KEY_RELEASED, KEY_REPEATED, KEY_TYPED , chr
```

Overrides:

keyNotify in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

```
type - KEY_PRESSED,
KEY_RELEASED, KEY_REPEATED,
KEY_TYPED
```

```
chr - ; '0' - '9' '*', '#'
```

Returns:

```
가 , true
false
```

✍ setChangeListener

```
public void setChangeListener(ChangeListener listener,
                               Object obj)
```

ComboComponent

ChangeListener

Parameters:

listener - ChangeListener, null Listener가

obj - Object , null Object Change 가

---

ChangeListener changed 가 .

✍ select

```
public void select(int index)
```


index .

Parameters:

index -

Throws:

IndexOutOfBoundsException -



## Class Command

java.lang.Object

|

+-org.kwis.msp.lwc.Command

```
public class Command
```

```
extends Object
```

가

가

.

가 UI

```
CommandBarComponent
```

20x20pixel

See Also:

[CommandBarComponent](#)

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

✎ Command

```
public Command(String str,
                Object obj)
```

. obj 가 Object 가 null  
getExtObject

Parameters:

str -

obj - Object

✎ Command

```
public Command(String str,
                Image img,
```

Object obj)

가 . Object 가 getExtObject . obj

Parameters:

str -

img -

obj - Object

☞ Command

```
public Command(String str,
                Image img,
                Image imgActive,
                Object obj)
```

. obj 가 Object 가 getExtObject

Parameters:

str -

img -

imgActive -

obj - Object

☞ Command

```
public Command(String str,
                String imgString,
                Object obj)
```

getNormallImage 가 Image.loadImage 가 . obj

가 Object 가 getExtObject

Parameters:

str -

imgString -

obj - Object

✎ Command

```
public Command(String str,
                String imgString1,
                String imgString2,
                Object obj)
```

```
getNormallImage   가   Image.loadImage
                  . imgString1   , imgString2
                               . obj   가   Object
가   getExtObject
```

Parameters :

str -

imgString1 -

imgString2 -

obj - Object

✎ getString

```
public String getString()
```

Returns:

✎ getExtObject

```
public Object getExtObject()
```

Object



Returns:

Object

✍ `getNormalImage`

```
public Image getNormalImage()
```

가 , ,  
가 ,  
Image.loadImage .

Returns:

See Also:

[Image.loadImage\(java.lang.String, org.kwis.msp.lcdui.ImageObserver\)](#)

✍ `getActiveImage`

```
public Image getActiveImage()
```

가 , ,  
가 ,  
Image.loadImage .

Returns:



## Class CommandBarComponent

java.lang.Object

|

+--org.kwis.msp.lwc.Component

|

+--org.kwis.msp.lwc.CommandBarComponent

```
public class CommandBarComponent
```

```
extends Component
```

```
Command
```

```
가
```

```
Active Index -1
```

### Fields inherited from class org.kwis.msp.lwc.Component

bg, evtListener, evtListenerObj, fg, FOCUS\_NOTIFY, h, HAS\_FOCUS\_MASK, INPUT\_MASK, KEY\_NOTIFY, KEY\_PRESSED, KEY\_RELEASED, KEY\_REPEATED, KEY\_TYPED, LAYOUT\_BOTTOM, LAYOUT\_HCENTER, LAYOUT\_LEFT, LAYOUT\_RIGHT, LAYOUT\_TOP, LAYOUT\_VCENTER, mask, parent, POINT\_DRAGGED, POINT\_PRESSED, POINT\_RELEASED, POINTER\_NOTIFY, POS\_MASK, PREFER\_SIZE\_MASK, prefH, prefW, SHOW\_NOTIFY, SIZE\_MASK, VALID\_MASK, w, x, y

### Methods inherited from class org.kwis.msp.lwc.Component

calcPreferredSize, canHandleInput, configure, focusNotify, getBackground, getCard, getForeground, getHeight, getWidth, getX, getXOnScreen, getY, getYOnScreen, hasFocus, invalidate, isShown, isValid, layout, processEvent, repaint, repaint, serviceRepaints, setBackground, setEventListener, setFocus, setForeground, showNotify, toString, validate

### Methods inherited from class java.lang.Object



Overrides:

getPreferredHeight in class Component

Following copied from class: org.kwis.msp.lwc.Component

Returns:

✎ getPreferredWidth

```
public int getPreferredWidth()
```

Description copied from class: Component

가 . Container  
가 .

Overrides:

getPreferredWidth in class Component

Following copied from class: org.kwis.msp.lwc.Component

Returns:

✎ getSize

```
public int getSize()
```

Returns:

Command

✎ addCommand

```
public int addCommand(Command cmd)
```

가 . 가 가 Active Index -1  
. setActiveIndex Command Active .

Parameters:

cmd - 가

Returns:

가 Command Index , -1 .

See Also:

[Command](#), [setActiveIndex\(int\)](#)

✍ removeCommand

```
public void removeCommand(Command cmd)
```

Parameters:

cmd -

See Also:

[Command](#)

✍ removeAll

```
public void removeAll()
```

Parameters:

cmd -

See Also:

[Command](#)

✍ setActiveIndex

```
public void setActiveIndex(int index)
```

Parameters:

index -

✍ getActiveIndex

```
public int getActiveIndex()
```

가

-1

Returns:

✍ getCommand

```
public Command getCommand(int index)
```

가 null

Parameters:

index - 가

Returns:

✎ setCommandListener

```
public void setCommandListener(CommandListener cl,
                                Object obj)
```

Listener 가 가

Parameters:

cl - Listener

obj - commandAction 가 Object

✎ keyNotify

```
protected boolean keyNotify(int type,
                              int chr)
```

Description copied from class: Component

가 , setFocus  
가 type KEY\_PRESSED,  
KEY\_RELEASED, KEY\_REPEATED, KEY\_TYPED , chr

Overrides:

keyNotify in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

type - ; KEY\_PRESSED,  
KEY\_RELEASED, KEY\_REPEATED,  
KEY\_TYPED

chr - ; '0' - '9' '\*', '#'

Returns:

가 가 , true .  
false .

✎ pointerNotify

```
protected boolean pointerNotify(int type,
                                int x,
                                int y)
```

Description copied from class: Component

가

Overrides:

pointerNotify in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

type -

x - 'x'

y - 'y'

Returns:

가 가 , false

✎ paintContent

```
public void paintContent(Graphics g)
```

Description copied from class: Component

. validate , ( . -1 , )

Overrides:

paintContent in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

g - Graphics.

See Also:

[Graphics](#)





## Class Component

java.lang.Object

|

+- -org.kwis.msp.lwc.Component

Direct Known Subclasses:

ButtonComponent, ComboComponent, CommandBarComponent,  
ContainerComponent, DateFieldComponent, ImageComponent, LabelComponent,  
ProgressComponent, ScrollbarComponent, TextComponent, TickerComponent

```
public abstract class Component
```

```
extends Object
```

```
가
```

```
가 ,
```

```
UI
```

```
Component
```

```
가 ,
```

```
( 가 ,
```

```
)
```

```
가 .
```

```
Component
```

```
가
```

```
,
```

```
가
```

```
Component
```

```
ShellComponent가
```

```
,
```

```
ShellComponent 가
```

```
, Component가
```

```
.
```

```
addComponent
```

```
addComponent
```

```
.
```

```
가
```

```
, FormComponent
```

```
LabelComponent
```

```
Component
```

```
가
```

```
가
```

```
가 , invalidate
```

```
, Component가
```

```
, paintContent 가
```

```
validate()
```

```
가
```

```
가
```

```
ContainerComponent
```

```
layout
```

(Label, TextField, TextArea)

가 .  
 가 . UI  
 ShellComponent가 .  
 가 .  
 CanHandleInput 가 true , ContainerComponent  
 setFocus 가 , 가  
 keyNotify 가 . showNotify focusNotify ,  
 pointerNotify 가 ,  
 paintContent 가 .  
 keyNotify pointerNotify , true  
 , 가 . false ,  
 가 .  
 setEventListener Listener  
 Listener가 true  
 가 false  
 .  
 paintContent Graphics  
 .  
 setClip , reset  
 가 .

Component [LAYOUT\\_LEFT](#)  
[LAYOUT\\_RIGHT](#),[LAYOUT\\_HCENTER](#),[LAYOUT\\_TOP](#),  
[LAYOUT\\_BOTTOM](#),[LAYOUT\\_VCENTER](#) .  
 IllegalArgumentException .  
 LAYOUT\_LEFT|LAYOUT\_RIGHT  
 LAYOUT\_TOP|LAYOUT\_BOTTOM

|   |
|---|
| Methods inherited from class java.lang.Object                   |
| equals, getClass, hashCode, notify, notifyAll, wait, wait, wait |

☞ LAYOUT\_LEFT

```
public static final int LAYOUT_LEFT
```

Component

```
. '1'
```

☞ LAYOUT\_RIGHT

```
public static final int LAYOUT_RIGHT
```

Component

```
. '2'
```

☞ LAYOUT\_HCENTER

```
public static final int LAYOUT_HCENTER
```

Component 가

```
. '4'
```

☞ LAYOUT\_TOP

```
public static final int LAYOUT_TOP
```

Component

```
. '8'
```

☞ LAYOUT\_BOTTOM

```
public static final int LAYOUT_BOTTOM
```

Component

```
. '16'
```

☞ LAYOUT\_VCENTER

```
public static final int LAYOUT_VCENTER
```

Component 가

```
. '32'
```

☞ x

```
protected int x
```

Component

```
x
```

☞ y

---

```
protected int y
    Component y
 w
protected int w
 h
protected int h
 parent
protected ContainerComponent parent
 bg
protected int bg
    -1
 fg
protected int fg
 evtListener
protected EventListener evtListener
 evtListenerObj
protected Object evtListenerObj
 prefW
protected int prefW
 prefH
protected int prefH
 POS_MASK
public static final int POS_MASK
```

See Also:

[configure\(int, int, int, int, int\)](#)

✎ SIZE\_MASK

```
public static final int SIZE_MASK
```

See Also:

[configure\(int, int, int, int, int\)](#)

✎ mask

```
protected int mask
```

✎ VALID\_MASK

```
protected static final int VALID_MASK
```

✎ HAS\_FOCUS\_MASK

```
protected static final int HAS_FOCUS_MASK
```

✎ INPUT\_MASK

```
protected static final int INPUT_MASK
```

✎ PREFER\_SIZE\_MASK

```
protected static final int PREFER_SIZE_MASK
```

✎ FOCUS\_NOTIFY

```
public static final int FOCUS_NOTIFY
```

```
가 . 1 .
```

See Also:

[setEventListener\(org.kwis.msp.lwc.EventListener, java.lang.Object\)](#)

✎ SHOW\_NOTIFY

```
public static final int SHOW_NOTIFY
```

```
가 . 2 .
```

See Also:

[setEventListener\(org.kwis.msp.lwc.EventListener, java.lang.Object\)](#)

✎ KEY\_NOTIFY

```
public static final int KEY_NOTIFY
```

```
가 . 3 .
```

See Also:

[setEventListener\(org.kwis.msp.lwc.EventListener, java.lang.Object\)](#)

☞ POINTER\_NOTIFY

```
public static final int POINTER_NOTIFY
```

가

. 4

See Also:

[setEventListener\(org.kwis.msp.lwc.EventListener, java.lang.Object\)](#)

☞ KEY\_PRESSED

```
public static final int KEY_PRESSED
```

가

See Also:

[setEventListener\(org.kwis.msp.lwc.EventListener, java.lang.Object\)](#)

☞ KEY\_RELEASED

```
public static final int KEY_RELEASED
```

가

See Also:

[setEventListener\(org.kwis.msp.lwc.EventListener, java.lang.Object\)](#)

☞ KEY\_REPEATED

```
public static final int KEY_REPEATED
```

가

See Also:

[setEventListener\(org.kwis.msp.lwc.EventListener, java.lang.Object\)](#)

☞ KEY\_TYPED

```
public static final int KEY_TYPED
```

가

See Also:

[setEventListener\(org.kwis.msp.lwc.EventListener, java.lang.Object\)](#)

☞ POINT\_PRESSED

```
public static final int POINT_PRESSED
```

가

See Also:

[setEventListener\(org.kwis.msp.lwc.EventListener, java.lang.Object\)](#)

✎ POINT\_RELEASED

```
public static final int POINT_RELEASED
```

가

See Also:

[setEventListener\(org.kwis.msp.lwc.EventListener, java.lang.Object\)](#)

✎ POINT\_DRAGGED

```
public static final int POINT_DRAGGED
```

가

See Also:

[setEventListener\(org.kwis.msp.lwc.EventListener, java.lang.Object\)](#)

✎ Component

```
protected Component()
```

✎ getWidth

```
public int getWidth()
```

Returns:

✎ getHeight

```
public int getHeight()
```

Returns:

✎ canHandleInput

```
public boolean canHandleInput()
```

```
    가 ( ) true
```

```
ContainerComponent setFocus ( )
    mask
```

Returns:

✎ hasFocus

```
public boolean hasFocus()
```

```
    가 가 가
    , 가 , keyNotify 가 ,
    가
```

Returns:

가

✎ configure

```
public void configure(int x,
                      int y,
                      int w,
                      int h,
                      int mask)
```

```
    . mask
    . mask POS_MASK AND POS_MASK ,
    x, y . mask SIZE_MASK
AND SIZE_MASK , (w, h)
```

```
    repaint , paintContent
    layout 가
```



Parameters:

x - 'x'

y - 'y'

w -

h -

mask - POS\_MASK | SIZE\_MASK가 , POS\_MASK가 x,  
y , SIZE\_MASK가 w, h .

✎ getX

```
public int getX()
```

x . x

Returns:

x

✎ getY

```
public int getY()
```

y . y

Returns:

y

✎ calcPreferredSize

```
protected void calcPreferredSize(int w)
```

✎ getPreferredSize

```
public int getPreferredSize()
```

. ContainerComponent

가 .

Returns:

✎ getPreferredSize



fg -

See Also:

[setBackground\(int bg\)](#),


 `getBackground`

```
public int getBackground()
```

Returns:

See Also:

[setBackground\(int\)](#)

 `getForeground`

```
public int getForeground()
```

Returns:

See Also:

[setForeground\(int\)](#)

 `paintContent`

```
public void paintContent(Graphics g)
```


```
    validate (
    ) -1 ,
```

Parameters:

`g` - `Graphics`.

See Also:

[Graphics](#)

 `isValid`

```
protected boolean isValid()
```

가 가 가

가  
가 false ,  
true .

Returns:

가  
✎ invalidate

public void invalidate()

가 가  
✎ validate

public void validate()

가 paintContent showNotify  
가 가 layout layout  
,

✎ layout

protected void layout()

✎ setFocus

public void setFocus()

가 .

See Also:

[focusNotify\(boolean\)](#)

✎ focusNotify

public void focusNotify(boolean b)

가 가 가  
repaint , .

Parameters:

b - 가 true가 , 가 false

✎ keyNotify

```
protected boolean keyNotify(int type,
                             int chr)
    . 가 , setFocus
    가 type KEY_PRESSED,
KEY_RELEASED, KEY_REPEATED, KEY_TYPED , chr .
```

Parameters:

```
type - ; KEY_PRESSED,
KEY_RELEASED, KEY_REPEATED,
KEY_TYPED
```

```
chr - ; '0' - '9' '*', '#' .
```

Returns:

```
가 가 , true .
false .
```

☞ pointerNotify

```
protected boolean pointerNotify(int type,
                                 int x,
                                 int y)
```

가

Parameters:

```
type -
```

```
x - 'x'
```

```
y - 'y'
```

Returns:

```
가 가 , false
```

☞ showNotify

```
protected void showNotify(boolean bShow)
```

```
. addComponent removeComponent
, (ShellComponent)가 show
```

Parameters:

bShow - 가

☞ repaint

```
public void repaint()
```

가

```
Card repaint, repaint
paintContent
```

☞ isShown

```
public boolean isShown()
```

가

가

```
true, false
```

Returns:

☞ processEvent

```
protected boolean processEvent(int type,
                                int subtype,
                                int param1,
                                int param2)
```

Parameters:

type -

subtype -

param1 - 가

param2 - 가

☞ repaint

```
public void repaint(int x,
                    int y,
                    int w,
                    int h)
```

가

```
, repaint
```

```
Card repaint
paint()
```

Parameters:

x - x

y - y

w -

h -

✎ serviceRepaints

```
public void serviceRepaints()
```

```
    . repaint    paint
```

```
    ,    paint
```

✎ toString

```
public String toString()
```

Object string

Overrides:

toString in class Object

Returns:

✎ getXOnScreen

```
public int getXOnScreen()
```

```
    . Component    X
```

Returns:

X

✎ getYOnScreen

```
public int getYOnScreen()
```

```
    . Component    Y
```

Returns:

Y

✎ getCard

```
public Card getCard()
```

```

        . ShellComponent
        Card 가 .
        . , 가 Card
        . 가 가 null
        .

```

Returns:

Card

See Also:

[Card](#)

 [setEventListener](#)

```
public void setEventListener(EventListener listener,
                             Object obj)
```

```

        Listener . Listener
        Listener가 true , false
        .

```

Parameters:

listener - Listener

obj - Listener

See Also:

[EventListener](#)



## Class ContainerComponent

java.lang.Object

|

+-org.kwis.msp.lwc.Component

|

+-org.kwis.msp.lwc.ContainerComponent

Direct Known Subclasses:

FormComponent, ShellComponent

public abstract class ContainerComponent

extends Component

```

        가
        ,
        , removeComponent
        가
        ,
        가 ShellComponent
show
        layout
        (Inset)
        ,
        가
        setFocus
    
```

See Also:

[ShellComponent](#), [Component](#)

Fields inherited from class org.kwis.msp.lwc.Component

bg, evtListener, evtListenerObj, fg, FOCUS\_NOTIFY, h, HAS\_FOCUS\_MASK, INPUT\_MASK, KEY\_NOTIFY, KEY\_PRESSED, KEY\_RELEASED, KEY\_REPEATED, KEY\_TYPED, LAYOUT\_BOTTOM, LAYOUT\_HCENTER, LAYOUT\_LEFT, LAYOUT\_RIGHT, LAYOUT\_TOP, LAYOUT\_VCENTER, mask, parent, POINT\_DRAGGED, POINT\_PRESSED, POINT\_RELEASED, POINTER\_NOTIFY, POS\_MASK, PREFER\_SIZE\_MASK, prefH, prefW, SHOW\_NOTIFY, SIZE\_MASK, VALID\_MASK, w, x, y

Methods inherited from class org.kwis.msp.lwc.Component

calcPreferredSize, canHandleInput, configure, focusNotify, getBackground, getCard, getForeground, getHeight, getPreferredSize, getPreferredHeight, getPreferredWidth, getWidth, getX, getXOnScreen, getY, getYOnScreen, hasFocus, invalidate, isShown, isValid, layout, paintContent, pointerNotify, serviceRepaints, setBackground, setEventListener, setFocus, setForeground, showNotify, toString

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, wait, wait, wait

✎ cmps

protected Component[] cmps

✎ ncomp

protected int ncomp

✎ cmpFocus

protected Component cmpFocus

가

✎ offsetX

protected int offsetX

✎ offsetY

protected int offsetY

✎ insetTop

protected short insetTop

✎ insetBottom

protected short insetBottom

✎ insetLeft

protected short insetLeft

✎ insetRight

protected short insetRight

✎ useFrame

protected boolean useFrame

✎ ContainerComponent

protected ContainerComponent()

✎ addComponent

```
public void addComponent(int index,
                        Component cmp)
```

가 . cmp가 가 가

cmp가 null NullPointerException . cmp가  
가 IllegalArgumentException .

index '0' 가

IndexOutOfBoundsException .

Parameters:

index -

cmp -

Throws:

IllegalArgumentException - cmp가 가

IndexOutOfBoundsException - index가

NullPointerException - cmp null

✎ addComponent

```
public int addComponent(Component cmp)
```

가 . 가 .

Parameters:

cmp - 가

Throws:

IllegalArgumentException - cmp가 가

NullPointerException - cmp null

✎ setComponent

```
public void setComponent(int index,
                          Component cmp)
```

. cmp가 null NullPointerException . cmp가  
가 IllegalArgumentException .

index '0' 가

IndexOutOfBoundsException .

Parameters:

index -

cmp -

Throws:

IllegalArgumentException - cmp가 가

NullPointerException - cmp가 null

IndexOutOfBoundsException - index가

## ✎ removeComponent

```
public void removeComponent(int index)
```

. index .

index '0' 가

IndexOutOfBoundsException .

Parameters:

index -

Throws:

IndexOutOfBoundsException - index가

## ✎ removeComponent

```
public void removeComponent(Component cmp)
```

. 가

false .

Parameters:

cmp -

## ✎ removeAllComponents

```
public void removeAllComponents()
```

## ✎ getComponent

```
public Component getComponent(int i)
```

stack 가 . 가

null .

Parameters:

i - 가

Returns:

## ✎ getIndexOf

```
public int getIndexOf(Component cmp)
```

stack 가 .

Parameters:

cmp - 가

Returns:

✎ validate

```
public void validate()
```

Description copied from class: Component

```

        가 . paintContent showNotify
        , 가 가 layout . layout
    ,
    .

```

Overrides:

validate in class Component

✎ getNextTraversalComponent

```
protected Component getNextTraversalComponent()
```

```

        가 . 가
        . 가 가 null . 가

```

Returns:

가

✎ getPrevTraversalComponent

```
protected Component getPrevTraversalComponent()
```

```

        가 . 가
        . 가 가 null . 가

```

Returns:

가

✎ keyNotify

```
protected boolean keyNotify(int type,
                             int key)
```

Description copied from class: Component

```

        .      가      , setFocus
        가      가      . type KEY_PRESSED,
KEY_RELEASED, KEY_REPEATED, KEY_TYPED , chr

```

Overrides:

keyNotify in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

```

type -      ;      KEY_PRESSED,
KEY_RELEASED,      KEY_REPEATED,
      KEY_TYPED

```

```

chr -      ; '0' - '9'  '*', '#'

```

Returns:

```

      가      가      , true
      false

```

✍ processEvent

```

protected boolean processEvent (int type,
                                int subtype,
                                int param1,
                                int param2)

```

Description copied from class: Component

Overrides:

processEvent in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

type -

subtype -

param1 - 가

param2 - 가

## ✍ paint

```
protected void paint(Graphics g)
```

```
    g 가  
    paintContent
```

Parameters:

g -

## ✍ scrollTo

```
protected boolean scrollTo(int dx,  
                           int dy)
```

```
    dx, dy가 가 (offset) 가  
    scrollTo
```

Parameters:

dx - x

dy - y

Returns:

```
    true, false
```

## ✍ repaint

```
public void repaint(int x,  
                   int y,  
                   int w,  
                   int h)
```

Description copied from class: Component

```
    가 Card repaint  
    , repaint paint()
```

Overrides:

```
repaint in class Component
```

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

```
x - x
```



y - y

w -

h -

☞ repaint

```
public void repaint()
```

Description copied from class: Component

```
가
Card repaint , repaint
paintContent
```

Overrides:

repaint in class Component

☞ useFrame

```
public void useFrame(boolean useFrame)
```

ContainerComponent . True

```
setInset()
```

False initInset() '0'

☞ controlInset

```
protected void controlInset(boolean flag)
```

ContainerComponent . True

ContainerComponent , False

```
'0'
```

☞ paintFrame

```
protected void paintFrame(Graphics g)
```

useFrame true

Parameters:

g -


☞ getNumberOfComponent

```
public int getNumberOfComponent()
```

Component

Returns:

Component



## Class DateFieldComponent

java.lang.Object

|

+- org.kwis.msp.lwc.Component

|

+- org.kwis.msp.lwc.DateFieldComponent

public class DateFieldComponent

extends Component

DateFieldComponent

DateFieldComponent

[TimeZone](#) [Date](#)

가

getDate, setDate

DateFieldComponent

DateFieldComponent

3가

[MODE\\_TIME](#)

[MODE\\_DATE](#)

[MODE\\_TIME\\_DATE](#)

See Also:

[Date](#), [Calendar](#), [TimeZone](#)

Fields inherited from class org.kwis.msp.lwc.Component

bg, evtListener, evtListenerObj, fg, FOCUS\_NOTIFY, h, HAS\_FOCUS\_MASK, INPUT\_MASK, KEY\_NOTIFY, KEY\_PRESSED, KEY\_RELEASED, KEY\_REPEATED, KEY\_TYPED, LAYOUT\_BOTTOM, LAYOUT\_HCENTER, LAYOUT\_LEFT, LAYOUT\_RIGHT, LAYOUT\_TOP, LAYOUT\_VCENTER, mask, parent, POINT\_DRAGGED, POINT\_PRESSED, POINT\_RELEASED, POINTER\_NOTIFY,

POS\_MASK, PREFER\_SIZE\_MASK, prefH, prefW, SHOW\_NOTIFY, SIZE\_MASK, VALID\_MASK, w, x, y

Methods inherited from class org.kwis.msp.lwc.Component

calcPreferredSize, canHandleInput, configure, focusNotify, getBackground, getCard, getForeground, getHeight, getWidth, getX, getXOnScreen, getY, getYOnScreen, hasFocus, invalidate, isShown, isValid, layout, pointerNotify, processEvent, repaint, repaint, serviceRepaints, setBackground, setEventListener, setFocus, setForeground, toString, validate

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, wait, wait, wait

✎ MODE\_TIME

```
public static final int MODE_TIME
```

DateFieldComponent

MODE\_TIME '0'

✎ MODE\_DATE

```
public static final int MODE_DATE
```

DateFieldComponent

MODE\_DATE '1'

✎ MODE\_TIME\_DATE

```
public static final int MODE_TIME_DATE
```

DateFieldComponent

MODE\_TIME\_DATE '2'

✎ DateFieldComponent

```
public DateFieldComponent(int mode)
```

[TimeZone](#) [Date](#)

DateFieldComponent

가

[MODE\\_TIME](#)

[MODE\\_DATE](#)

[MODE\\_TIME\\_DATE](#)

IllegalArgumentException

Parameters:

mode - DateFieldComponent

Throws:

IllegalArgumentException - 3가

MODE\_TIME, MODE\_DATE, MODE\_DATE -

See Also:

[MODE\\_TIME](#), [MODE\\_DATE](#), [MODE\\_TIME\\_DATE](#), [TimeZone](#), [Date](#)

✎ getDate

```
public Date getDate()
```

DateFieldComponent

가

Date

Date

DateFieldComponent

[Date](#)

1970/1/00:00:00 GMT

milliseconds

가

See Also:

[setDate\(Date dt\)](#), [Date](#)

✎ getMode

```
public int getMode()
```

DateFieldComponent

See Also:

[setMode\(int mode\)](#)

 [getTimeZone](#)

```
public TimeZone getTimeZone()
```

DateFieldComponent

TimeZone

TimeZone

TimeZone, TimeZone.[TimeZone.getDefault\(\)](#)


Returns:

DateFieldComponent

TimeZone

See Also:

[setTimeZone\(TimeZone tz\)](#), [TimeZone](#)

 [showNotify](#)

```
protected void showNotify(boolean bShow)
```

Description copied from class: Component

. addComponent removeComponent  
(ShellComponent)가 show

Overrides:

showNotify in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

bShow - 가

 [setDate](#)

```
public void setDate(Date dt)
```

DateFieldComponent

Date

null

NullPointerException

Date

1970/1/00:00:00 GMT

milliseconds

가

Parameters:



Description copied from class: Component

가  
 . LabelComponent TextFieldComponent,  
 TextAreaComponent 가 가 가  
 가 . 가 가 , 가 가  
 . , w가 -1

Overrides:

getPreferredHeight in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

w - 가 .

Returns:

✎ getPreferredHeight

```
public int getPreferredHeight()
```

Description copied from class: Component

. ContainerComponent  
 가 .

Overrides:

getPreferredHeight in class Component

Following copied from class: org.kwis.msp.lwc.Component

Returns:

✎ getPreferredWidth

```
public int getPreferredWidth()
```

Description copied from class: Component

. Container  
 가 .

Overrides:



getWidth in class Component

Following copied from class: org.kwis.msp.lwc.Component

Returns:

✎ paintContent

```
public void paintContent(Graphics g)
```

Description copied from class: Component

```
        validate
    )
    -1
```

Overrides:

paintContent in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

g - Graphics.

See Also:

[Graphics](#)

✎ keyNotify

```
public boolean keyNotify(int type,
                        int key)
```

Description copied from class: Component

```
        가 , setFocus
    가 . type KEY_PRESSED,
KEY_RELEASED, KEY_REPEATED, KEY_TYPED , chr
```

Overrides:

keyNotify in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

type - KEY\_PRESSED,

KEY\_RELEASED,  
KEY\_TYPED

KEY\_REPEATED,

chr - ; '0' - '9' '\*', '#' .

Returns:

가 가 , true .  
false .

✎ `getValue`

`public String getValue(int mode)`

MODE\_DATE Mon, 10 Dec 2001

MODE\_TIME 03 : 28 ( am )

MODE\_TINE\_DATE Mon, 10 Dec 2001 03 : 28 ( am )

Parameters:

mode - `DateFieldComponent`

Returns:

/ .

Throws:

`IllegalArgumentException` -

## Class DialogComponent

```
java.lang.Object
```

```
|
```

```
+-org.kwis.msp.lwc.Component
```

```
|
```

```
+-org.kwis.msp.lwc.ContainerComponent
```

```
|
```

```
+-org.kwis.msp.lwc.ShellComponent
```

```
|
```

```
+-org.kwis.msp.lwc.DialogComponent
```

```
public class DialogComponent
```

```
extends ShellComponent
```

```
DialogComponent
```

```
DialogComponent
```

```
가
```

```
DialogComponent
```

```
Component
```

```
Component
```

```
가
```

```
ContainerComponent
```

```
가
```

```
DialogComponent
```

```
3가
```

```
TYPE_OK
```

```
TYPE_OK_CANCEL
```

```
TYPE_NONE
```

```
TYPE_NONE
```

```
3
```

```
setTimeout\(int\)
```

```
가
```

```
TYPE_NONE
```

```
TIMEOUT_INFINITE
```

```
timeout
```

```
TYPE_OK
```

```
, TYPE_NONE,TYPE_OK,TYPE_OK_CANCEL
```

```
, IllegalArgumentException
```

Fields inherited from class org.kwis.msp.lwc.ShellComponent

cd, cmpCommand, cmpTitle, cmpWork, RESIZE\_MASK

Fields inherited from class org.kwis.msp.lwc.ContainerComponent

cmpFocus, cmps, insetBottom, insetLeft, insetRight, insetTop, ncomp, offsetX, offsetY, useFrame

Fields inherited from class org.kwis.msp.lwc.Component

bg, evtListener, evtListenerObj, fg, FOCUS\_NOTIFY, h, HAS\_FOCUS\_MASK, INPUT\_MASK, KEY\_NOTIFY, KEY\_PRESSED, KEY\_RELEASED, KEY\_REPEATED, KEY\_TYPED, LAYOUT\_BOTTOM, LAYOUT\_HCENTER, LAYOUT\_LEFT, LAYOUT\_RIGHT, LAYOUT\_TOP, LAYOUT\_VCENTER, mask, parent, POINT\_DRAGGED, POINT\_PRESSED, POINT\_RELEASED, POINTER\_NOTIFY, POS\_MASK, PREFER\_SIZE\_MASK, prefH, prefW, SHOW\_NOTIFY, SIZE\_MASK, VALID\_MASK, w, x, y

Methods inherited from class org.kwis.msp.lwc.ShellComponent

addComponent, addComponent, configure, controllInset, getCard, getCommand, getNextTraversalComponent, getPrevTraversalComponent, getTitle, getWorkComponent, getX, getY, grabKey, hide, isShown, keyNotify, processEvent, removeAllComponents, removeComponent, repaint, serviceRepaints, setCommand, setGrabKeyListener, setTitle, setTitle, setWorkComponent, showNotify, ungrabKey

Methods inherited from class org.kwis.msp.lwc.ContainerComponent

getComponent, getIndexOf, getNumberOfComponent, paint, removeComponent, repaint, scrollTo, setComponent, useFrame, validate

### Methods inherited from class org.kwis.msp.lwc.Component

calcPreferredSize, canHandleInput, focusNotify, getBackground, getForeground, getHeight, getPreferredSize, getPreferredHeight, getPreferredWidth, getWidth, getXOnScreen, getYOnScreen, hasFocus, invalidate, isValid, paintContent, pointerNotify, setBackground, setEventListener, setFocus, setForeground, toString

### Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, wait, wait, wait

### ✎ TYPE\_NONE

```
public static final int TYPE_NONE
```

```
. 3, '0'
```

### ✎ TYPE\_OK

```
public static final int TYPE_OK
```

```
OK . '1'
```

### ✎ TYPE\_OK\_CANCEL

```
public static final int TYPE_OK_CANCEL
```

```
OK ,CANCEL . '2'
```

### ✎ DLG\_TIMEOUT

```
public static final int DLG_TIMEOUT
```

```
doModal TIMEOUT . '10'
```

### ✎ DLG\_OK

```
public static final int DLG_OK
```

```
doModal OK . '11'
```

### ✎ DLG\_CANCEL

```

public static final int DLG_CANCEL
doModal          CANCEL          . '12'

```

✎ OK\_BUTTON

```

public static final int OK_BUTTON
OK          . '20'

```

✎ CANCEL\_BUTTON

```

public static final int CANCEL_BUTTON
CANCEL          . '21'

```

✎ TIMEOUT\_INFINITE

```

public static final int TIMEOUT_INFINITE
timeout          . '-1'

```

✎ actionState

```

protected int actionState
( )

```

-2

DialogComponent [doModal\(\)](#) DialogComponent가



✎ DialogComponent

```

public DialogComponent(int type)

```

가 DialogComponent

DialogComponent DialogComponent 가

```

, TYPE_NONE,TYPE_OK,TYPE_OK_CANCEL
, IllegalArgumentException

```

Parameters :

type -

Throws:

IllegalArgumentException - type TYPE\_NONE, TYPE\_OK, TYPE\_OK\_CANCEL

IllegalArgumentException - cmp가 가

See Also:

[TYPE\\_NONE](#), [TYPE\\_OK](#), [TYPE\\_OK\\_CANCEL](#)

DialogComponent

```
public DialogComponent(Component cmp,
                        String title,
                        int type)
```

DialogComponent

DialogComponent DialogComponent 가

```
, TYPE_NONE,TYPE_OK,TYPE_OK_CANCEL
, IllegalArgumentException
```

null

Parameters:

cmp - null

title - null

type -

Throws:

IllegalArgumentException - type TYPE\_NONE, TYPE\_OK, TYPE\_OK\_CANCEL

IllegalArgumentException - cmp가 가

See Also:

TYPE\_NONE, TYPE\_OK, TYPE\_OK\_CANCEL

✍ DialogComponent

```

public DialogComponent(Component cmp,
                        String ttl,
                        int type,
                        int x,
                        int y,
                        int w,
                        int h)
    DialogComponent
DialogComponent
'0' '0' IllegalArgumentException
, TYPE_NONE,TYPE_OK,TYPE_OK_CANCEL
, IllegalArgumentException
null

```

Parameters:

```

cmp - null
title - null
type - TYPE_NONE,TYPE_OK ,TYPE_OK_CANCEL
x - x
Y - y
w -
h -

```

Throws:

IllegalArgumentException - type TYPE\_NONE, TYPE\_OK, TYPE\_OK\_CANCEL

IllegalArgumentException - x,y '0' w,h '0'

IllegalArgumentException - cmp가 가





[setTimeout\(int\)](#)

Parameters:

tp - DialogComponent

Throws:

IllegalArgumentException -

See Also:

[setTimeout\(int timeout\)](#), [TYPE\\_NONE](#), [TYPE\\_OK](#), [TYPE\\_OK\\_CANCEL](#)

✍️ setTimeout

```
public void setTimeout(int timeout)
```

DialogComponent

[setType\(int\)](#)

milliseconds

TYPE\_NONE

[TIMEOUT\\_INFINITE](#)

TYPE\_OK

timeout

Parameters:

timeout -

See Also:

[getTimeout\(\)](#), [setType\(int type\)](#)

✍️ getTimeout

```
public int getTimeout()
```

milliseconds

Returns:

See Also:

[setTimeout\(int timeout\)](#)

✍️ doModal

```
public int doModal()
```

DialogComponent . 가  
Timeout .

Returns:

- DLG\_OK,DLG\_CANCEL, DLG\_TIMEOUT

✍ show

```
public void show()
```

Description copied from class: ShellComponent

validate

Overrides:

show in class ShellComponent

✍ getActionState

```
public int getActionState()
```

DialogComponent

Returns:

✍ layout

```
public void layout()
```

Description copied from class: Component

Overrides:

layout in class ShellComponent

✍ paintFrame

```
protected void paintFrame(Graphics g)
```

Description copied from class: ContainerComponent

useFrame true

Overrides:

paintFrame in class ContainerComponent

Following copied from class: org.kwis.msp.lwc.ContainerComponent

Parameters:

g -



## Class FormComponent

java.lang.Object

|

+--org.kwis.msp.lwc.Component

|

+--org.kwis.msp.lwc.ContainerComponent

|

+--org.kwis.msp.lwc.FormComponent

Direct Known Subclasses:

ListComponent

```
public class FormComponent
```

```
extends ContainerComponent
```

ContainerComponent

. FormComponent

. UP/DOWN

가

scrollbar가

### Fields inherited from class org.kwis.msp.lwc.ContainerComponent

cmpFocus, cmps, insetBottom, insetLeft, insetRight, insetTop, ncomp, offsetX, offsetY, useFrame

### Fields inherited from class org.kwis.msp.lwc.Component

bg, evtListener, evtListenerObj, fg, FOCUS\_NOTIFY, h, HAS\_FOCUS\_MASK, INPUT\_MASK, KEY\_NOTIFY, KEY\_PRESSED, KEY\_RELEASED, KEY\_REPEATED, KEY\_TYPED, LAYOUT\_BOTTOM, LAYOUT\_HCENTER, LAYOUT\_LEFT, LAYOUT\_RIGHT, LAYOUT\_TOP, LAYOUT\_VCENTER, mask, parent, POINT\_DRAGGED, POINT\_PRESSED, POINT\_RELEASED, POINTER\_NOTIFY,

POS\_MASK, PREFER\_SIZE\_MASK, prefH, prefW, SHOW\_NOTIFY, SIZE\_MASK, VALID\_MASK, w, x, y

Methods inherited from class org.kwis.msp.lwc.ContainerComponent

addComponent, addComponent, controllInset, getComponent, getIndexOf, getNumberOfComponent, paintFrame, processEvent, removeAllComponents, removeComponent, removeComponent, repaint, repaint, setComponent, useFrame, validate

Methods inherited from class org.kwis.msp.lwc.Component

canHandleInput, configure, getBackground, getCard, getForeground, getHeight, getPreferredHeight, getPreferredHeight, getPreferredWidth, getWidth, getX, getXOnScreen, getY, getYOnScreen, hasFocus, invalidate, isShown, isValid, paintContent, pointerNotify, serviceRepaints, setBackground, setEventListener, setFocus, setForeground, showNotify, toString

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, wait, wait, wait

✎ FormComponent

```
public FormComponent ()
```

✎ FormComponent

```
public FormComponent (boolean bVertical)
```

```
. bVertical true
```

```
, false
```

Parameters:

bVertical –



✎ setPacked

```
public void setPacked(boolean b)
```

Parameters:

b - true, false

✎ getPacked

```
public boolean getPacked()
```

Returns:

✎ setGab

```
public void setGab(int gab)
```

Parameters:

gab -

✎ getGab

```
public int getGab()
```

Returns:

✎ focusNotify

```
public void focusNotify(boolean b)
```

Description copied from class: Component

가 가 가

repaint

Overrides:

focusNotify in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

b - 가 true가 , 가 false

☞ keyNotify

```
protected boolean keyNotify(int type,
                             int key)
```

Description copied from class: Component

```
가 , setFocus
가 가 . type KEY_PRESSED,
KEY_RELEASED, KEY_REPEATED, KEY_TYPED , chr
```

Overrides:

keyNotify in class ContainerComponent

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

```
type - ; KEY_PRESSED,
KEY_RELEASED, KEY_REPEATED,
KEY_TYPED
```

```
chr - ; '0' - '9' '*', '#'
```

Returns:

```
가 가 , true
false
```

☞ calcPreferredSize

```
protected void calcPreferredSize(int cw)
```

Description copied from class: Component

Overrides:



calcPreferredSize in class Component

☞ layout

```
public void layout()
```

Description copied from class: Component

Overrides:

layout in class Component

☞ paint

```
public void paint(Graphics g)
```

Overrides:

paint in class ContainerComponent

```
g 가
paintContent
```

Parameters:

g-

☞ getNextTraversalComponent

```
protected Component getNextTraversalComponent()
```

Description copied from class: ContainerComponent

```
가 . 가
.
가 가 null .
가 .
```

Overrides:

getNextTraversalComponent in class ContainerComponent

Following copied from class: org.kwis.msp.lwc.ContainerComponent

Returns:

```
가
```

☞ getPrevTraversalComponent

```
protected Component getPrevTraversalComponent()
```

Description copied from class: ContainerComponent

```
가 . 가
. 가
가 가 null .
```

Overrides:

getPrevTraversalComponent in class ContainerComponent

Following copied from class: org.kwis.msp.lwc.ContainerComponent

Returns:

```
가
✎ scrollTo
```

```
protected boolean scrollTo(int dx,
                             int dy)
```

Description copied from class: ContainerComponent

```
. dx, dy가 가 (offset) 가
. scrollTo .
```

Overrides:

scrollTo in class ContainerComponent

Following copied from class: org.kwis.msp.lwc.ContainerComponent

Parameters:

dx - x

dy - y

Returns:

```
true, false
```

## Class ImageComponent

java.lang.Object

|

+-org.kwis.msp.lwc.Component

|

+-org.kwis.msp.lwc.ImageComponent

```
public class ImageComponent
```

```
extends Component
```

```
ImageComponent
```

```
ImageComponent setLayout\(int\)
```

```
ImageComponent Component.LAYOUT\_LEFT
```

```
Component.LAYOUT\_RIGHT,
```

```
Component.LAYOUT\_HCENTER,Component.LAYOUT\_TOP,
```

```
Component.LAYOUT\_BOTTOM,Component.LAYOUT\_HCENTER
```

```
. ImageComponent
```

```
LAYOUT_LEFT|LAYOUT_TOP
```

See Also:

[Image](#)

### Fields inherited from class org.kwis.msp.lwc.Component


bg, evtListener, evtListenerObj, fg, FOCUS\_NOTIFY, h, HAS\_FOCUS\_MASK, INPUT\_MASK, KEY\_NOTIFY, KEY\_PRESSED, KEY\_RELEASED, KEY\_REPEATED, KEY\_TYPED, LAYOUT\_BOTTOM, LAYOUT\_HCENTER, LAYOUT\_LEFT, LAYOUT\_RIGHT, LAYOUT\_TOP, LAYOUT\_VCENTER, mask, parent, POINT\_DRAGGED, POINT\_PRESSED, POINT\_RELEASED, POINTER\_NOTIFY, POS\_MASK, PREFER\_SIZE\_MASK, prefH, prefW, SHOW\_NOTIFY, SIZE\_MASK, VALID\_MASK, w, x, y

### Methods inherited from class org.kwis.msp.lwc.Component


calcPreferredSize, canHandleInput, configure, focusNotify, getBackground, getCard, getForeground, getHeight, getWidth, getX, getXOnScreen, getY, getYOnScreen, hasFocus, invalidate, isShown, isValid, keyNotify, layout, pointerNotify, processEvent, repaint, repaint, serviceRepaints, setBackground, setEventListener, setFocus, setForeground, toString, validate

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, wait, wait, wait

 imgStr

protected String imgStr

 img

protected Image img

 ImageComponent

public ImageComponent()

ImageComponent . null

 ImageComponent

public ImageComponent(Image img)

ImageComponent . img null .

Parameters:

img - null

 ImageComponent

public ImageComponent(String str)

## ImageComponent

str 가

Parameters:

str - null

✎ setImage

public void setImage(Image img)

ImageComponent

가

repaint가 . img가 null

가

Parameters:

img -

✎ getImage

public Image getImage()

ImageComponent

Returns:

✎ setImage

public void setImage(String str)

ImageComponent

가

null

, IllegalArgumentException

Parameters:

str-

Throws:

IllegalArgumentException -

null

✎ setLayout

public void setLayout(int layout)

[Component.LAYOUT\\_LEFT](#) . ImageComponent  
[Component.LAYOUT\\_LEFT](#) [Component.LAYOUT\\_RIGHT](#),  
[Component.LAYOUT\\_TOP](#),[Component.LAYOUT\\_BOTTOM](#)  
[Component.LAYOUT\\_HCENTER](#),[Component.LAYOUT\\_VCENTER](#) .  
[Component](#)

Parameters:

type - Layout Type .

See Also:

[Component.LAYOUT\\_LEFT](#), [Component.LAYOUT\\_RIGHT](#),  
[Component.LAYOUT\\_HCENTER](#), [Component.LAYOUT\\_TOP](#),  
[Component.LAYOUT\\_BOTTOM](#), [Component.LAYOUT\\_VCENTER](#)

✎ `getPreferredSize`

```
public int getPreferredSize(int w)
```

Description copied from class: Component

가  
LabelComponent TextFieldComponent,  
TextAreaComponent 가 가 가  
가 . 가 가 , 가 .  
. , w가 -1

Overrides:

`getPreferredSize` in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

w - 가 .

Returns:

✎ `getPreferredSize`

```
public int getPreferredSize()
```

Description copied from class: Component

. ContainerComponent

가

Overrides:

getPreferredHeight in class Component

Following copied from class: org.kwis.msp.lwc.Component

Returns:

✎ getPreferredWidth

```
public int getPreferredWidth()
```

Description copied from class: Component

. Container

가

Overrides:

getPreferredWidth in class Component

Following copied from class: org.kwis.msp.lwc.Component

Returns:

✎ paintContent

```
public void paintContent(Graphics g)
```

Description copied from class: Component

```
validate() , (
) -1 ,
```

Overrides:

paintContent in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

g - Graphics.

See Also:

[Graphics](#)

---

  
**showNotify**

```
protected void showNotify(boolean bShow)
```

Description copied from class: Component

```
    . addComponent    removeComponent  
    ,                (ShellComponent)가 show
```

Overrides:

showNotify in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

bShow - 가

**play**

```
public void play()
```

가

**stop**

```
public void stop()
```

가

---



## Class LabelComponent

```
java.lang.Object
```

```
|
```

```
+- org.kwis.msp.lwc.Component
```

```
|
```

```
+- org.kwis.msp.lwc.LabelComponent
```

Direct Known Subclasses:

CheckboxComponent, ListItemComponent

```
public class LabelComponent
```

```
extends Component
```

```
    . LabelComponent setLayout\(int\)
```

```
    . LabelComponent Component
```

```
    . LabelComponent
```

```
LAYOUT_LEFT
```

```
    null
```

Fields inherited from class org.kwis.msp.lwc.Component

```
bg, evtListener, evtListenerObj, fg, FOCUS_NOTIFY, h, HAS_FOCUS_MASK,
INPUT_MASK, KEY_NOTIFY, KEY_PRESSED, KEY_RELEASED, KEY_REPEATED,
KEY_TYPED, LAYOUT_BOTTOM, LAYOUT_HCENTER, LAYOUT_LEFT,
LAYOUT_RIGHT, LAYOUT_TOP, LAYOUT_VCENTER, mask, parent,
POINT_DRAGGED, POINT_PRESSED, POINT_RELEASED, POINTER_NOTIFY,
POS_MASK, PREFER_SIZE_MASK, prefH, prefW, SHOW_NOTIFY, SIZE_MASK,
VALID_MASK, w, x, y
```

Methods inherited from class org.kwis.msp.lwc.Component

```
canHandleInput, configure, focusNotify, getBackground, getCard, getForeground,
getHeight, getPreferredHeight, getPreferredHeight, getPreferredWidth, getWidth,
getX, getXOnScreen, getY, getYOnScreen, hasFocus, isShown, isValid, keyNotify,
layout, pointerNotify, processEvent, repaint, repaint, serviceRepaints,
setBackground, setEventListener, setFocus, setForeground, showNotify, toString,
```

validate

Methods inherited from class java.lang.Object

equals , getClass , hashCode , notify , notifyAll , wait , wait , wait

✂ layout

protected int layout

LabelComoponent . [Component.LAYOUT\\_LEFT](#) .

✂ m\_ft

protected Font m\_ft

✂ m\_str

protected String m\_str

✂ m\_image

protected Image m\_image

✂ LabelComponent

public LabelComponent ()

null

LAYOUT\_LEFT .

✂ LabelComponent

public LabelComponent (String str)

null

null

LAYOUT\_LEFT .

Parameters:

str - 가 null

✎ LabelComponent

```
public LabelComponent(String str,
                       Image img)
```

null, LAYOUT\_LEFT

Parameters:

str - 가 null

img - null

✎ LabelComponent

```
public LabelComponent(String str,
                       String imgString)
```

null,

LAYOUT\_LEFT

Parameters:

str - 가 null

imgString - null

✎ invalidate

```
public void invalidate()
```

Description copied from class: Component

가 가

Overrides:

invalidate in class Component

✎ setLabel

```
public void setLabel(String str)
```

null

Parameters:

str - null

✎ setImage

```
public void setImage(Image img)
```

· null

Parameters:

img - null

✎ getLabel

```
public String getLabel()
```

가 .

Returns:

✎ getImage

```
public Image getImage()
```

가 .

Returns:

✎ setFont

```
public void setFont(Font font)
```

· Font.getDefaultFont() ·

Parameters:

font -

✎ getFont

```
public Font getFont()
```

· Font.getDefaultFont()

Returns:

✍ calcPreferredSize

```
protected void calcPreferredSize(int cw)
```

Description copied from class: Component

Overrides:

calcPreferredSize in class Component

✍ paintContent

```
public void paintContent(Graphics g)
```

Description copied from class: Component

```

        validate
    )
    -1

```

Overrides:

paintContent in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

g - Graphics.

See Also:

[Graphics](#)

✍ setLayout

```
public void setLayout(int layout)
```

. LabelComponent

[Component](#)

IllegalArgumentException

Parameters:

type -

Throws:

IllegalArgumentException -

See Also:

[Component.LAYOUT\\_LEFT](#),

[Component.LAYOUT\\_RIGHT](#),

[Component.LAYOUT\\_HCENTER](#),

[Component.LAYOUT\\_TOP](#),

[Component#LYAOUT\\_VCENTER](#), [Component.LAYOUT\\_BOTTOM](#)

## Class ListComponent

```

java.lang.Object
|
+--org.kwis.msp.lwc.Component
    |
    +--org.kwis.msp.lwc.ContainerComponent
        |
        +--org.kwis.msp.lwc.FormComponent
            |
            +--org.kwis.msp.lwc.ListComponent

```

```
public class ListComponent
```

```
extends FormComponent
```

```
ListComponent FormComponent
```

```
ContainerComponent ListItemComponent 가 ,
```

```
ListItemComponent 3가 . *
```

```
SELECT\_IMPLICIT,
```

```
SELECT\_MULTIPLE, SELECT\_EXCLUSIVE
```

```
SELECT_MULTIPLE,SELECT_EXCLUSIVE 가
```

```
가 ListItemComponent SELECT
```

```
ActionListener
```

```
ChangeListener
```

```
ListComponent 가
```

```
#controlNumberImage(boolean showImage)
```

```
true 가 , false
```

```
가
```

See Also:

[ListItemComponent](#), [ActionListener](#), [ChangeListener](#)

## Fields inherited from class org.kwis.msp.lwc.ContainerComponent

cmpFocus, cmps, insetBottom, insetLeft, insetRight, insetTop, ncomp, offsetX, offsetY, useFrame

## Fields inherited from class org.kwis.msp.lwc.Component

bg, evtListener, evtListenerObj, fg, FOCUS\_NOTIFY, h, HAS\_FOCUS\_MASK, INPUT\_MASK, KEY\_NOTIFY, KEY\_PRESSED, KEY\_RELEASED, KEY\_REPEATED, KEY\_TYPED, LAYOUT\_BOTTOM, LAYOUT\_HCENTER, LAYOUT\_LEFT, LAYOUT\_RIGHT, LAYOUT\_TOP, LAYOUT\_VCENTER, mask, parent, POINT\_DRAGGED, POINT\_PRESSED, POINT\_RELEASED, POINTER\_NOTIFY, POS\_MASK, PREFER\_SIZE\_MASK, prefH, prefW, SHOW\_NOTIFY, SIZE\_MASK, VALID\_MASK, w, x, y

## Methods inherited from class org.kwis.msp.lwc.FormComponent

calcPreferredSize, focusNotify, getGab, getPacked, layout, scrollTo, setGab, setPacked

## Methods inherited from class org.kwis.msp.lwc.ContainerComponent

controlInset, getComponent, getIndexOf, getNumberOfComponent, paintFrame, processEvent, removeAllComponents, removeComponent, removeComponent, repaint, repaint, useFrame, validate

## Methods inherited from class org.kwis.msp.lwc.Component

canHandleInput, configure, getBackground, getCard, getForeground, getHeight, getPreferredSize, getPreferredSize, getPreferredSize, getWidth, getX, getXOnScreen, getY, getYOnScreen, hasFocus, invalidate, isShown, isValid, paintContent, pointerNotify, serviceRepaints, setBackground, setEventListener, setFocus, setForeground, showNotify, toString



Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, wait, wait, wait

✎ SELECT\_IMPLICIT

```
public static final int SELECT_IMPLICIT
```

ListComponent 가

✎ SELECT\_EXCLUSIVE

```
public static final int SELECT_EXCLUSIVE
```

✎ SELECT\_MULTIPLE

```
public static final int SELECT_MULTIPLE
```

✎ ListComponent

```
public ListComponent(int type)
```

가 '0' ListComponent

ListComponent

SELECT\_IMPLICIT ,SELECT\_EXCLUSIVE,SELECT\_MULTIPLE

IllegalArgumentException

Parameters:

type - ListComponent

Throws:

IllegalArgumentException -

See Also:

#ListComponent()

✎ append

```
public int append(String str,
                  Image img)
```

ListComponent

가 .

[ListItemComponent](#)

null .

Parameters:

str - ListItemComponent null

img - ListItemComponent null

Returns:

가 .

✎ addComponent

```
public void addComponent(int index,
                          Component cmp)
```

index 가 .

가 가 [ListItemComponent](#)

IllegalArgumentException . cmp가 null NullPointerException

cmp가 가

IllegalArgumentException .

index '0' ListComponent 가

IndexOutOfBoundsException .

Overrides:

addComponent in class ContainerComponent

Parameters:

index - 가 .

cmp - 가 .

Throws:

IllegalArgumentException - 가 가 [ListItemComponent](#)

IllegalArgumentException - cmp가 가

IndexOutOfBoundsException - index가

NullPointerException - cmp null

See Also:

[addComponent\(Component cmp\)](#), [setComponent\(int index, Component cmp\)](#)

✍ addComponent

```
public int addComponent(Component cmp)
```

가 . 가 .

가 가 [ListItemComponent](#)

IllegalArgumentException . cmp가 null NullPointerException

. cmp가 가

IllegalArgumentException .

Overrides:

addComponent in class ContainerComponent

Parameters:

cmp - 가 .

Returns:

Throws:

IllegalArgumentException - 가 가 [ListItemComponent](#)

IllegalArgumentException - cmp가 가

NullPointerException - cmp null

See Also:

[addComponent\(int index, Component cmp\)](#), [setComponent\(int index, Component cmp\)](#)

## ✍ setComponent

```
public void setComponent(int index,
                        Component cmp)
```

index '0' ListComponent 가

IndexOutOfBoundsException

가 [ListItemComponent](#)

IllegalArgumentException . cmp가 null NullPointerException

cmp가

가

IllegalArgumentException

Overrides:

setComponent in class ContainerComponent

Parameters:

index -

cmp -

Throws:

IllegalArgumentException - 가 [ListItemComponent](#)

IllegalArgumentException - cmp가 가

IndexOutOfBoundsException - index

NullPointerException - cmp null

See Also:

[addComponent\(int index, Component cmp\)](#), [addComponent\(Component cmp\)](#)

## ✍ insert

```
public int insert(int index,
                 String str,
                 Image img)
```

ListItemComponent

가 .  
 '0' ListComponent 가  
 IndexOutOfBoundsException . 가  
[ListItemComponent](#) IllegalArgumentException .  
 cmp가 가 IllegalArgumentException

Parameters:

index - 가 .

srt - 가 .

img - 가 .

Returns:

가 .


Throws:

IndexOutOfBoundsException -

IllegalArgumentException - 가 [ListItemComponent](#)

IllegalArgumentException - cmp가 가

IndexOutOfBoundsException - index가 '0' , 가

 set

```
public void set(int index,
                String str,
                Image img)
```

ListItemComponent  
 null , '0'  
 ListItemComponent 가  
 IndexOutOfBoundsException .

Parameters:

index - .

srt - .

img - 가 .

Throws:

IndexOutOfBoundsException -

✂ getString

```
public String getString(int index)
```

ListItemComponent

'0' ListItemComponent 가

IndexOutOfBoundsException .

Parameters:

index -

Returns:

index

Throws:

IndexOutOfBoundsException -

✂ getImage

```
public Image getImage(int index)
```

ListItemComponent

가 null .

'0' ListItemComponent 가

IndexOutOfBoundsException .

Parameters:

index -

Returns:

index

Throws:

IndexOutOfBoundsException -

✂ getSize

```
public int getSize()
```

ListComponent 가 .

Returns:

ListComponent가 가

☞ isSelected

```
public boolean isSelected(int index)
```

ListComponent가 ListItemComponent가 index가  
- '0' - IndexOutOfBoundsException  
- '1' -

Returns:

true/ false.

Throws:

IndexOutOfBoundsException - index가 - '0' - '1'

☞ getSelectedIndexes

```
public int[] getSelectedIndexes()
```

ListComponent

가 null

Returns:

.. null

☞ getSelectedIndex

```
public int getSelectedIndex()
```

ListComponent

가 '-1'

Returns:

-1

☞ setActionListener

```
public void setActionListener(ActionListener l,  
                               Object o)
```

ListComponent [ActionListener](#) ListComponent가

ListItemComponent [EventQueue.FIRE](#)

ActionListener [ChangeListener.action\(Component cmp, Object o\)](#)

Parameters:

l - ListComponent ActionListener.

o - ListComponent ActionListener .

✎ setChangeListener

```
public void setChangeListener (ChangeListener l,
                               Object o)
```

ListComponent [ChangeListener](#) . ListComponent 가

ListItemComponent 가 ChangeListener

[ChangeListener.changed\(Component cmp, Object o\)](#) .

Parameters:

l - ListComponent ChangeListener.

o - ListComponent ChangeListener .

✎ keyNotify

```
protected boolean keyNotify(int type,
                             int key)
```

Description copied from class: Component

. 가 , setFocus  
가 가 . type KEY\_PRESSED,  
KEY\_RELEASED, KEY\_REPEATED, KEY\_TYPED , chr .

Overrides:

keyNotify in class FormComponent

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

```
type - ; KEY_PRESSED,
KEY_RELEASED, KEY_REPEATED,
KEY_TYPED
```

```
chr - ; '0' - '9' '*', '#'
```

Returns:



가 , true .  
false .

✎ select

```
public void select(int index)
```

index '-1' ,  
IndexOutOfBoundsException .  
'-1' 가 , ListComponent  
SELEC\_EXCLUSIVE .

Parameters:

index - .

Throws:

IndexOutOfBoundsException - index가 (index<-1 ||  
index>( ))

✎ select

```
public void select(ListItemComponent cmpp)
```

ListComponent SELECT\_IMPLICIT, SELECT\_MULTIPLE  
, SELECT\_MULTIPLE  
가 ,

Parameters:

cmpp -  
✎ controlNumber

```
public void controlNumber(boolean showImage)
```

. true 가 (1~9,0  
) , 가 . false  
, Disable . true ,  
가 . false Disable

Parameters:

useImage - true / false

See Also:

[isControlNumber\(\)](#)

✍ isControlNumber

```
public boolean isControlNumber ()
```

Returns:

See Also:

[controlNumber\(boolean\)](#)

✍ paint

```
public void paint (Graphics g)
```

Overrides:

paint in class FormComponent

```
g 가
paintContent
```

Parameters:

g-

✍ getNextTraversalComponent

```
protected Component getNextTraversalComponent ()
```

Description copied from class: ContainerComponent

```
가 . 가
. 가
가 가 null .
```

Overrides:

getNextTraversalComponent in class FormComponent

Following copied from class: org.kwis.msp.lwc.ContainerComponent

Returns:

```
가
```

---

### ✎ getPrevTraversalComponent

protected Component getPrevTraversalComponent()

Description copied from class: ContainerComponent

가 . 가  
가 . 가  
가 가 null .

Overrides:

getPrevTraversalComponent in class FormComponent

Following copied from class: org.kwis.msp.lwc.ContainerComponent

Returns:

가



## Class ListItemComponent

```

java.lang.Object
|
+--org.kwis.msp.lwc.Component
    |
    +--org.kwis.msp.lwc.LabelComponent
        |
        +--org.kwis.msp.lwc.ListItemComponent
  
```

```
public class ListItemComponent
```

```
extends LabelComponent
```

```

ListItemComponent 가 LabelComponent
LabelComponent INPUT_MASK 가
  
```

See Also:

[LabelComponent](#)

### Fields inherited from class org.kwis.msp.lwc.LabelComponent

layout, m\_ft, m\_image, m\_str

### Fields inherited from class org.kwis.msp.lwc.Component

bg, evtListener, evtListenerObj, fg, FOCUS\_NOTIFY, h, HAS\_FOCUS\_MASK, INPUT\_MASK, KEY\_NOTIFY, KEY\_PRESSED, KEY\_RELEASED, KEY\_REPEATED, KEY\_TYPED, LAYOUT\_BOTTOM, LAYOUT\_HCENTER, LAYOUT\_LEFT, LAYOUT\_RIGHT, LAYOUT\_TOP, LAYOUT\_VCENTER, mask, parent, POINT\_DRAGGED, POINT\_PRESSED, POINT\_RELEASED, POINTER\_NOTIFY, POS\_MASK, PREFER\_SIZE\_MASK, prefH, prefW, SHOW\_NOTIFY, SIZE\_MASK, VALID\_MASK, w, x, y

Methods inherited from class org.kwis.msp.lwc.LabelComponent

calcPreferredSize, getFont, getImage, getLabel, paintContent, setFont, setImage, setLabel, setLayout

Methods inherited from class org.kwis.msp.lwc.Component

canHandleInput, configure, focusNotify, getBackground, getCard, getForeground, getHeight, getPreferredSize, getPreferredHeight, getPreferredWidth, getWidth, getX, getXOnScreen, getY, getYOnScreen, hasFocus, invalidate, isShown, isValid, keyNotify, layout, pointerNotify, processEvent, repaint, repaint, serviceRepaints, setBackground, setEventListener, setFocus, setForeground, showNotify, toString, validate

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, wait, wait, wait

✎ ListItemComponent

```
public ListItemComponent(String str)
```

```
    ListItemComponent
```

```
    null
```

```
    null
```

```
    LAYOUT_LEFT
```

Parameters:

str - ListItemComponent가 null

✎ ListItemComponent

```
public ListItemComponent(String str,
                          Image img)
```

ListItemComponent

ListItemComponent

Parameters:

str - ListItem null

img - ListItem null

✎ ListItemComponent

```
public ListItemComponent(String str,
                          String imgString)
```

ListItemComponent

null

LAYOUT\_LEFT

null

Parameters:

str - 가 null

imgString - null

✎ setState

```
public void setState(boolean bState)
```

ListItemComponent

Parameters:

bState - true, false

✎ getState

```
public boolean getState()
```

Returns:

true, false

## Class ProgressComponent

```

java.lang.Object
|
+--org.kwis.msp.lwc.Component
    |
    +--org.kwis.msp.lwc.ProgressComponent
  
```

```
public class ProgressComponent
```

```
extends Component
```

```

Interactive NonInteractive   가   가   . Interactive
                           setStep   가   .
NonInteractive               setValue
    .   step   1   setStep   가   .
ProgressComponent   0   가   .
  
```

### Fields inherited from class org.kwis.msp.lwc.Component

bg, evtListener, evtListenerObj, fg, FOCUS\_NOTIFY, h, HAS\_FOCUS\_MASK, INPUT\_MASK, KEY\_NOTIFY, KEY\_PRESSED, KEY\_RELEASED, KEY\_REPEATED, KEY\_TYPED, LAYOUT\_BOTTOM, LAYOUT\_HCENTER, LAYOUT\_LEFT, LAYOUT\_RIGHT, LAYOUT\_TOP, LAYOUT\_VCENTER, mask, parent, POINT\_DRAGGED, POINT\_PRESSED, POINT\_RELEASED, POINTER\_NOTIFY, POS\_MASK, PREFER\_SIZE\_MASK, prefH, prefW, SHOW\_NOTIFY, SIZE\_MASK, VALID\_MASK, w, x, y

### Methods inherited from class org.kwis.msp.lwc.Component

calcPreferredSize, canHandleInput, configure, focusNotify, getBackground, getCard, getForeground, getHeight, getWidth, getX, getXOnScreen, getY, getYOnScreen, hasFocus, invalidate, isShown, isValid, layout, pointerNotify, processEvent, repaint, repaint, serviceRepaints, setBackground, setEventListener, setFocus, setForeground, showNotify, toString, validate

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, wait, wait, wait

✎ ProgressComponent

```
public ProgressComponent(boolean bInteractive,
                          int max)
```

0

Parameters:

bInteractive - Progress

max -

✎ setStep

```
public void setStep(int step)
```

Interactive

가

, setValue

. step

step

1

Parameters:

nStep - 가

Throws:

IllegalArgumentException - step 0

See Also:

[getStep\(\)](#)

✎ getStep

```
public int getStep()
```

Returns:



가 .

See Also:

#setStep()

✍ setMargin

```
public void setMargin(int top,
                    int bottom)
                    ( )
```

See Also:

#setStep()

✍ setMaxValue

```
public void setMaxValue(int maxValue)
```

Progress .

Parameters:

maxValue -

Throws:

IllegalArgumentException - maxValue 0

✍ setValue

```
public int setValue(int value)
```

```
Progress . setStep step step
          = value - value % step . value 가 0
          0 MAX MAX .
```

Parameters:

value -

Returns:

✍ getValue

```
public int getValue()
```

Returns:

✎ getMaxValue

```
public int getMaxValue()
```

Returns:

✎ getPreferredSize

```
public int getPreferredSize(int w)
```

Description copied from class: Component

가  
 .  
 LabelComponent  
 TextFieldComponent,  
 TextAreaComponent  
 가  
 가 . 가 가 , 가  
 . , w가 -1

Overrides:

getPreferredSize in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

w - 가 .

Returns:

✎ getPreferredSize

```
public int getPreferredSize()
```

Description copied from class: Component

. ContainerComponent  
 가 .

Overrides:

getPreferredHeight in class Component

Following copied from class: org.kwis.msp.lwc.Component

Returns:

✍ getPreferredWidth

```
public int getPreferredWidth()
```

Description copied from class: Component

가 . Container .

Overrides:

getPreferredWidth in class Component

Following copied from class: org.kwis.msp.lwc.Component

Returns:

✍ paintContent

```
public void paintContent(Graphics g)
```

Description copied from class: Component

. validate , ( ) -1 ,

Overrides:

paintContent in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

g - Graphics.

See Also:

[Graphics](#)

✍ keyNotify

```
public boolean keyNotify(int type,
```

```
int key)
```

Description copied from class: Component

```
가 , setFocus
가 . type KEY_PRESSED,
KEY_RELEASED, KEY_REPEATED, KEY_TYPED , chr .
```

Overrides:

keyNotify in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

```
type - ; KEY_PRESSED,
KEY_RELEASED, KEY_REPEATED,
KEY_TYPED
```

```
chr - ; '0' - '9' '*', '#' .
```

Returns:

```
가 가 , true .
false .
```

✎ setChangeListener

```
public void setChangeListener(ChangeListener listener,
Object obj)
```

ProgressComponent [ChangeListener](#) . ProgressComponent  
ChangeListener

[ChangeListener.changed\(Component cmp, Object o\)](#) .

Parameters:

l - ListComponent ChangeListener.

o - ListComponent ChangeListener .

## Class ScrollbarComponent

```

java.lang.Object
|
+--org.kwis.msp.lwc.Component
    |
    +--org.kwis.msp.lwc.ScrollbarComponent
  
```

```
public class ScrollbarComponent
```

```
extends Component
```

```
ScrollbarComponent (direction, chAmount, minimum, maximum, currentValue)
```

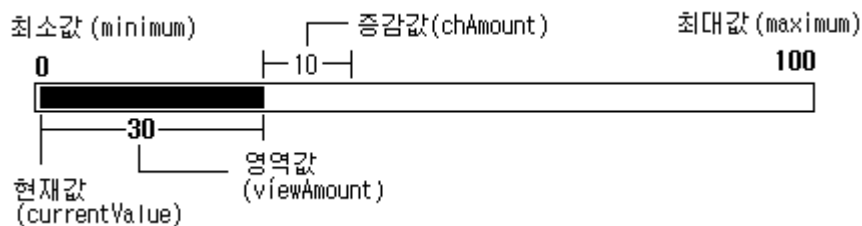
```
ScrollbarComponent (direction, chAmount, minimum, maximum, currentValue)
```

```
ScrollbarComponent (direction, chAmount, minimum, maximum, currentValue)
```

```
ScrollbarComponent (direction, chAmount, minimum, maximum, currentValue)
```

```
ScrollbarComponent (direction, chAmount, minimum, maximum, currentValue)
```

```
ScrollbarComponent (direction, chAmount, minimum, maximum, currentValue)
```

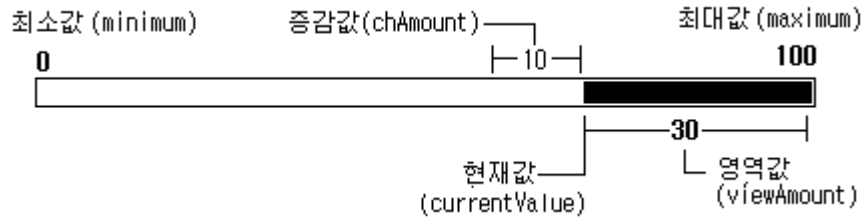


```
ScrollbarComponent
```

```
ScrollbarComponent\(int direction, int currentValue, int viewAmount, int minimum, int maximum, int chAmount\)
```

```

Scrollbar = new ScrollbarComponent(HORIZONTAL, 0, 30, 0,
100, 10);
  
```



|                |   |          |  |
|----------------|---|----------|--|
|                |   |          |  |
| (direction)    | VERTICAL HORIZONTAL<br><br>IllegalArgumentException | VERTICAL | VERTICAL<br>HORIZONTAL   |
| (currentValue) | ScrollbarComponent<br><br>가                         | 0        | (minimum)<=<br><br>(currentValue)<=(<br>(maximum) -<br><br>(viewAmount)) |
| (viewAmount)   | ScrollbarComponent                                  | 1        | 0 <<br>(viewAmount) <=<br>(          (maximum)<br>-<br>(minimum))        |
| (minimum)      | ScrollbarComponent                                  | 0        | (minimum) <<br>(maximum)   |

|                 |                         |    |                                      |
|-----------------|-------------------------|----|--------------------------------------|
| )               |                         |    |                                      |
| (maximum<br>)   | ScrollbarComponent      | 10 | (minimum) <<br>(maximum)             |
| (chAmount<br>t) | ScrollbarComponent<br>가 | 1  | 0 <<br>(chAmount) <=<br>(viewAmount) |

#### Fields inherited from class org.kwis.msp.lwc.Component

bg, evtListener, evtListenerObj, fg, FOCUS\_NOTIFY, h, HAS\_FOCUS\_MASK, INPUT\_MASK, KEY\_NOTIFY, KEY\_PRESSED, KEY\_RELEASED, KEY\_REPEATED, KEY\_TYPED, LAYOUT\_BOTTOM, LAYOUT\_HCENTER, LAYOUT\_LEFT, LAYOUT\_RIGHT, LAYOUT\_TOP, LAYOUT\_VCENTER, mask, parent, POINT\_DRAGGED, POINT\_PRESSED, POINT\_RELEASED, POINTER\_NOTIFY, POS\_MASK, PREFER\_SIZE\_MASK, prefH, prefW, SHOW\_NOTIFY, SIZE\_MASK, VALID\_MASK, w, x, y

#### Methods inherited from class org.kwis.msp.lwc.Component

calcPreferredSize, canHandleInput, configure, getBackground, getCard, getForeground, getHeight, getWidth, getX, getXOnScreen, getY, getYOnScreen, hasFocus, invalidate, isShown, isValid, layout, pointerNotify, processEvent, repaint, repaint, serviceRepaints, setBackground, setEventListener, setFocus, setForeground, showNotify, toString, validate

#### Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, wait, wait, wait

 HORIZONTAL

```
public static final int HORIZONTAL
    = 0;
    public static final int VERTICAL
    = 1;
```

✎ VERTICAL

```
public static final int VERTICAL
    = 2;
```

✎ ScrollbarComponent

```
public ScrollbarComponent()
```

```
public ScrollbarComponent(int direction, ScrollbarComponent
    parent, int minimum, int maximum, int chAmount)
    super('0', '1', '1', '10');
```

See Also:

[ScrollbarComponent\(int direction\)](#), [ScrollbarComponent\(int direction, int
 currentValue, int viewAmount, int minimum, int maximum, int chAmount\)](#)

✎ ScrollbarComponent

```
public ScrollbarComponent(int direction)
```

```
public ScrollbarComponent(int direction, ScrollbarComponent
    parent, int minimum, int maximum, int chAmount)
    super('0', '1', '1', '10');
```

Parameters:

direction -

Throws:

IllegalArgumentException - [HORIZONTAL](#) [VERTICAL](#)

See Also:

[ScrollbarComponent\(\)](#), [ScrollbarComponent\(int direction, int currentValue, int](#)



[viewAmount, int minimum, int maximum, int chAmount\)](#)

✎ ScrollbarComponent

```
public ScrollbarComponent(int direction,
                          int currentValue,
                          int viewAmount,
                          int minimum,
                          int maximum,
                          int chAmount)
```

ScrollbarComponent

[HORIZONTAL](#) [VERTICAL](#)

IllegalArgumentException

ScrollbarComponent

IllegalArgumentException

Parameters:

direction -

currentValue -

viewAmount -

minimum - minimum

maximum - maximum

Throws:

IllegalArgumentException - [HORIZONTAL](#) [VERTICAL](#)

IllegalArgumentException - 가

See Also:

[ScrollbarComponent\(\)](#), [ScrollbarComponent\(int direction\)](#)

✎ getDirection

```
public int getDirection()
```

---

## ScrollbarComponent

VERTICAL

Returns:

See Also:

[setDirection\(int direction\)](#)

✍ setDirection

```
public void setDirection(int direction)
```

[HORIZONTAL](#) [VERTICAL](#)

IllegalArgumentException

Parameters:

direction -

Throws:

IllegalArgumentException -

HORIZONTAL VERTICAL

See Also:

[getDirection\(\)](#)

✍ getCurrentValue

```
public int getCurrentValue()
```

```
(currentValue)
```

Returns:

See Also:

[setCurrentValue\(int newValue\)](#)

✍ setCurrentValue

```
public void setCurrentValue(int newValue)
```

```
(currentValue)
```

Parameters:

newValue -

See Also:

[getCurrentValue\(\)](#)

 [getMinimum](#)

```
public int getMinimum()
```

Returns:

See Also:

[setMinimum\(int newMinimum\)](#)

 [setMinimum](#)

```
public void setMinimum(int newMinimum)
```

[. Minimum](#)

Parameters:

newMinimum - 가

See Also:

[getMinimum\(\)](#)

 [getMaximum](#)

```
public int getMaximum()
```

Returns:

See Also:

[setMaximum\(int newMaximum\)](#)

✍ setMaximum

```
public void setMaximum(int newMaximum)
```

```
    . Maximum
```

Parameters:

newMaximum -

See Also:

[getMaximum\(\)](#)

✍ getViewAmount

```
public int getViewAmount()
```

Returns:

See Also:

[setViewAmount\(int newAmount\)](#)

✍ setViewAmount

```
public void setViewAmount(int newAmount)
```

Parameters:

newAmount -

See Also:

[getViewAmount\(\)](#)

✍ `getChangeAmount`

```
public int getChangeAmount()
```

Returns:

See Also:

[setChangeAmount\(int newChAmount\)](#)

✍ `setChangeAmount`

```
public void setChangeAmount(int newChAmount)
```

Parameters:

`newChAmount` -

See Also:

[getChangeAmount\(\)](#)

✍ `getForegroundColor`

```
public int getForegroundColor()
```

'0x00000000'

Returns:

See Also:

[setForegroundColor\(int\).](#)

✍ `setForegroundColor`

```
public void setForegroundColor(int fg)
```

0x00RRGGBB

'0x00000000'

Parameters:

fg - .

See Also:

[getForegroundColor\(\).](#)

✍ paintContent

```
public void paintContent(Graphics g)
```

Description copied from class: Component

```
        validate
    )
    -1
    ,
```

Overrides:

paintContent in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

g - Graphics.

See Also:

[Graphics](#)

✍ focusNotify

```
public void focusNotify(boolean b)
```

Description copied from class: Component

```
        가 가 가
    repaint
    ,
```

Overrides:

focusNotify in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

b - 가 true가 , 가 false

✍ keyNotify

```
public boolean keyNotify(int type,
```

```
int key)
```

Description copied from class: Component

```

        . 가 , setFocus
        가 가 . type KEY_PRESSED,
KEY_RELEASED, KEY_REPEATED, KEY_TYPED , chr

```

Overrides:

keyNot i fy in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

```

type - ; KEY_PRESSED,
KEY_RELEASED, KEY_REPEATED,
KEY_TYPED

```

```
chr - ; '0' - '9' '*', '#'

```

Returns:

```

        가 가 , true
        false

```

✎ getPreferredHeight

```
public int getPreferredHeight()
```

Description copied from class: Component

```

        . ContainerComponent
        가

```

Overrides:

getPreferredHeight in class Component

Following copied from class: org.kwis.msp.lwc.Component

Returns:

✎ getPreferredHeight

```
public int getPreferredHeight(int w)
```

Description copied from class: Component

가  
 .  
 LabelComponent  
 TextFieldComponent,  
 TextAreaComponent  
 가  
 가  
 가  
 ,  
 가  
 .  
 , w가 -1

Overrides:


getPreferredSize in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

w - 가

Returns:

 getPreferredSize

```
public int getPreferredSize()
```

Description copied from class: Component

. Container  
 가

Overrides:

getPreferredSize in class Component

Following copied from class: org.kwis.msp.lwc.Component

Returns:





## Class ShellComponent

```

java.lang.Object
|
+--org.kwis.msp.lwc.Component
    |
    +--org.kwis.msp.lwc.ContainerComponent
        |
        +--org.kwis.msp.lwc.ShellComponent
  
```

Direct Known Subclasses:

AnnunciatorComponent, DialogComponent

```
public class ShellComponent
```

```
extends ContainerComponent
```

```
Card , 가 . UI
```

```
ShellComponent AddComponent 가
. Icdui Card
```

### Fields inherited from class org.kwis.msp.lwc.ContainerComponent

cmpFocus, cmps, insetBottom, insetLeft, insetRight, insetTop, ncomp, offsetX, offsetY, useFrame

### Fields inherited from class org.kwis.msp.lwc.Component

bg, evtListener, evtListenerObj, fg, FOCUS\_NOTIFY, h, HAS\_FOCUS\_MASK, INPUT\_MASK, KEY\_NOTIFY, KEY\_PRESSED, KEY\_RELEASED, KEY\_REPEATED, KEY\_TYPED, LAYOUT\_BOTTOM, LAYOUT\_HCENTER, LAYOUT\_LEFT, LAYOUT\_RIGHT, LAYOUT\_TOP, LAYOUT\_VCENTER, mask, parent, POINT\_DRAGGED, POINT\_PRESSED, POINT\_RELEASED, POINTER\_NOTIFY, POS\_MASK, PREFER\_SIZE\_MASK, prefH, prefW, SHOW\_NOTIFY, SIZE\_MASK, VALID\_MASK, w, x, y

Methods inherited from class org.kwis.msp.lwc.ContainerComponent


getComponent, getIndexOf, getNumberOfComponent, paint, paintFrame, removeComponent, repaint, scrollTo, setComponent, useFrame, validate

Methods inherited from class org.kwis.msp.lwc.Component

calcPreferredSize, canHandleInput, focusNotify, getBackground, getForeground, getHeight, getPreferredSize, getPreferredHeight, getPreferredWidth, getWidth, getXOnScreen, getYOnScreen, hasFocus, invalidate, isValid, paintContent, pointerNotify, setBackground, setEventListener, setFocus, setForeground, toString

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, wait, wait, wait

 cd

protected Card cd

 cmpTitle

protected Component cmpTitle

 cmpWork

protected Component cmpWork

 cmpCommand

protected Component cmpCommand



✎ ShellComponent

```
public ShellComponent ()
```

Parameters:

✎ ShellComponent

```
public ShellComponent (boolean inflate)
```

```
    . inflate
```

Parameters:

inflate -

✎ ShellComponent

```
public ShellComponent (int x,
                       int y,
                       int w,
                       int h)
```

Parameters:

x -

y -

w -

h -

✎ ShellComponent

```
public ShellComponent (int x,
                       int y,
                       int w,
                       int h,
```

boolean bTrans)

가 bTrans

Parameters:

x –

y –

w –

h –

bTrans –

✎ layout

public void layout()

Description copied from class: Component

Overrides:

layout in class Component

✎ repaint

```
public void repaint(int x,
                   int y,
                   int w,
                   int h)
```

Description copied from class: Component

가  
repaint

Card repaint  
paint()

Overrides:

repaint in class ContainerComponent

Following copied from class: org.kwis.msp.lwc.Component


Parameters:

x - x

y - y


w -

h -

 show

```
public void show()
```

validate

 hide

```
public void hide()
```

 isShown

```
public boolean isShown()
```

Description copied from class: Component


가 . 가  
true, false

Overrides:

isShown in class Component

Following copied from class: org.kwis.msp.lwc.Component

Returns:

 configure

```
public void configure(int x,  
                      int y,  
                      int w,  
                      int h,  
                      int mask)
```

Description copied from class: Component

```

        . mask
        . mask POS_MASK AND POS_MASK ,
        x, y . mask SIZE_MASK
AND SIZE_MASK , (w, h)
        .
        repaint , paintContent
        . layout 가
        .

```

Overrides:

configure in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:


x - 'x'

y - 'y'

w -

h -

mask - POS\_MASK | SIZE\_MASK가 , POS\_MASK가 x,  
y , SIZE\_MASK가 w, h .

 getX

```
public int getX()
```

Description copied from class: Component

```
x . x
```


Overrides:

getX in class Component

Following copied from class: org.kwis.msp.lwc.Component

Returns:

x

 getY

```
public int getY()
```

Description copied from class: Component

```
y . y
```

Overrides:

getY in class Component

Following copied from class: org.kwis.msp.lwc.Component

Returns:

y

☞ showNotify

```
public void showNotify(boolean b)
```

Description copied from class: Component

```
. addComponent removeComponent
, (ShellComponent)가 show
```

Overrides:

showNotify in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

bShow - 가

☞ serviceRepaints

```
public void serviceRepaints()
```

Description copied from class: Component

```
. repaint paint
, paint .
```

Overrides:

serviceRepaints in class Component

☞ addComponent

```
public void addComponent(int index,
```

## Component cmp)

Description copied from class: ContainerComponent

가 . cmp가 가 가  
 .  
 cmp가 null NullPointerException . cmp가  
 가 IllegalArgumentException .  
 index '0' 가  
 IndexOutOfBoundsException .

Overrides:

addComponent in class ContainerComponent

Following copied from class: org.kwis.msp.lwc.ContainerComponent

Parameters:

index -

cmp -

Throws:

IllegalArgumentException - cmp가 가

IndexOutOfBoundsException - index가

NullPointerException - cmp null

✎ addComponent

```
public int addComponent(Component cmp)
```

Description copied from class: ContainerComponent

가 . 가 .

Overrides:

addComponent in class ContainerComponent

Following copied from class: org.kwis.msp.lwc.ContainerComponent

Parameters:

cmp - 가

Throws:



IllegalArgumentException - cmp가 가

NullPointerException - cmp null

✎ processEvent

```
protected boolean processEvent(int type,
                                int subtype,
                                int param1,
                                int param2)
```

Description copied from class: Component

Overrides:

processEvent in class ContainerComponent

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

type -

subtype -

param1 - 가

param2 - 가

✎ setTitle

```
public void setTitle(Component cmp)
```

Parameters:

cmp -

✎ getTitle

```
public Component getTitle()
```

Returns:

✎ getWorkComponent

```
public Component getWorkComponent()
```



true

Parameters:

cmp - 가

bGrab -

✎ getCommand

```
public Component getCommand()
```

Returns:

✎ getNextTraversalComponent

```
protected Component getNextTraversalComponent()
```

Description copied from class: ContainerComponent

|   |   |      |   |
|---|---|------|---|
| 가 | . | 가    |   |
|   | . |      | 가 |
| 가 | 가 | null | . |

Overrides:

getNextTraversalComponent in class ContainerComponent

Following copied from class: org.kwis.msp.lwc.ContainerComponent

Returns:

가

✎ getPrevTraversalComponent

```
protected Component getPrevTraversalComponent()
```

Description copied from class: ContainerComponent

|   |   |      |   |
|---|---|------|---|
| 가 | . | 가    |   |
|   | . |      | 가 |
| 가 | 가 | null | . |

Overrides:

getPrevTraversalComponent in class ContainerComponent

Following copied from class: org.kwis.msp.lwc.ContainerComponent

Returns:

가

✍ setTitle

```
public void setTitle(String str)
```

Parameters:

str -

✍ getCard

```
public Card getCard()
```

Description copied from class: Component

```

        . ShellComponent
        Card 가 . Card
        , 가 가 null
    
```

Overrides:

getCard in class Component

Following copied from class: org.kwis.msp.lwc.Component

Returns:

Card

See Also:

[Card](#)

✍ grabKey

```
public void grabKey(int key)
```

```
(Grab) GrabKeyListener
```

Listener

```
GameKey Display.getKeyCode()
```

Parameters:

key - grab (EventQueue )

See Also:

[setGrabKeyListener\(org.kwis.msp.lwc.GrabKeyListener, java.lang.Object\)](#),  
[ungrabKey\(int\)](#), [GrabKeyListener](#), [Display.getKeyCode\(int\)](#)

✍ ungrabKey

```
public void ungrabKey(int key)
                    (Grab) .
```

Parameters:

gameKey - ungrab (EventQueue )

See Also:

[grabKey\(int\)](#), [setGrabKeyListener\(org.kwis.msp.lwc.GrabKeyListener, java.lang.Object\)](#), [GrabKeyListener](#), [Display.getKeyCode\(int\)](#)

✍ setGrabKeyListener

```
public void setGrabKeyListener(GrabKeyListener listener,
                               Object obj)
```

```
    Listener . grabKey
    Listener . Listener
    Listener가 true , false
```

Parameters:

listener - Listener

obj - Listener

See Also:

[GrabKeyListener](#), [grabKey\(int\)](#), [ungrabKey\(int\)](#)

✍ keyNotify

```
protected boolean keyNotify(int type,
                             int chr)
```

Description copied from class: Component

```
    가 , setFocus
    가 . type KEY_PRESSED,
```

KEY\_RELEASED, KEY\_REPEATED, KEY\_TYPED , chr .

Overrides:

keyNotify in class ContainerComponent

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

type - ; KEY\_PRESSED,  
KEY\_RELEASED, KEY\_REPEATED,  
KEY\_TYPED

chr - ; '0' - '9' '\*', '#' .

Returns:

가 가 , true .  
false .

✍ controlInset

protected void controlInset(boolean flag)

Description copied from class: ContainerComponent

ContainerComponent . True

ContainerComponent , False

'0' .

Overrides:

controlInset in class ContainerComponent

## Class TextBoxComponent

```

java.lang.Object
|
+--org.kwis.msp.lwc.Component
    |
    +--org.kwis.msp.lwc.TextComponent
        |
        +--org.kwis.msp.lwc.TextBoxComponent
  
```

```
public class TextBoxComponent
```

```
extends TextComponent
```

```
TextBoxComponentTextComponent
```

```
가 ContainerComponent
```

```
. TextComoponent
```

```
가
```

```
TextComponent.setMaxLength\(int maxLen\)
```

```
가
```

See Also:

[TextComponent](#), [TextFieldComponent](#)

Fields inherited from class org.kwis.msp.lwc.TextComponent

```
charCount, constChecker, constraint, CONSTRAINT_ANY, CONSTRAINT_NUMBER,
CONSTRAINT_PASSWORD, display, f, imHandler, iMode, isWide, m_cPos, m_td, maxLength,
modeViewer, tShell
```

## Fields inherited from class org.kwis.msp.lwc.Component

bg, evtListener, evtListenerObj, fg, FOCUS\_NOTIFY, h, HAS\_FOCUS\_MASK, INPUT\_MASK, KEY\_NOTIFY, KEY\_PRESSED, KEY\_RELEASED, KEY\_REPEATED, KEY\_TYPED, LAYOUT\_BOTTOM, LAYOUT\_HCENTER, LAYOUT\_LEFT, LAYOUT\_RIGHT, LAYOUT\_TOP, LAYOUT\_VCENTER, mask, parent, POINT\_DRAGGED, POINT\_PRESSED, POINT\_RELEASED, POINTER\_NOTIFY, POS\_MASK, PREFER\_SIZE\_MASK, prefH, prefW, SHOW\_NOTIFY, SIZE\_MASK, VALID\_MASK, w, x, y

## Methods inherited from class org.kwis.msp.lwc.TextComponent

focusNotify, getConstraint, getFont, getMaxLength, getString, setMaxLength, showNotify

## Methods inherited from class org.kwis.msp.lwc.Component

calcPreferredSize, canHandleInput, getBackground, getCard, getForeground, getHeight, getWidth, getX, getXOnScreen, getY, getYOnScreen, hasFocus, invalidate, isShown, isValid, layout, pointerNotify, processEvent, repaint, repaint, serviceRepaints, setBackground, setEventListener, setFocus, setForeground, toString, validate

## Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, wait, wait, wait

## ✍ TextBoxComponent

```
public TextBoxComponent(String data,
                        int constraints)
    TextComponent
    null 가 .
    가 TextComponent.CONSTRAINT\_NUMBER,
```



[TextComponent.CONSTRAINT\\_PASSWORD](#),

[TextComponent.CONSTRAINT\\_ANY](#)

IllegalArgumentException , 가

IllegalArgumentException .

가

[TextComponent.setMaxLength\(int maxLen\)](#)

가

Parameters:

data - null

constraints -

☞ TextBoxComponent

```
public TextBoxComponent(String data,
                        int constraints,
                        int h)
```

TextComponent

, null 가 ,  
가 가

가 [TextComponent.CONSTRAINT\\_NUMBER](#),

[TextComponent.CONSTRAINT\\_PASSWORD](#),

[TextComponent.CONSTRAINT\\_ANY](#)

IllegalArgumentException , 가

IllegalArgumentException .

가

[TextComponent.setMaxLength\(int maxLen\)](#)

가

Parameters:

data - null

constraints -

h -



☞ setString

```
public void setString(String data)
```

Description copied from class: TextComponent

```

        가
        IllegalArgumentException
        가 가 가
        가 null ""(empty String

```

Overrides:

setString in class TextComponent

Following copied from class: org.kwis.msp.lwc.TextComponent

Parameters:


data - null

Throws:

IllegalArgumentException -

See Also:

[TextComponent.getString\(\)](#)

 insert

```
public void insert(char[] data,
                  int offset,
                  int len,
                  int index)
```

Description copied from class: TextComponent

```

        index
        가
        data가 null NullPointerException , index '0'

```

IndexOutOfBoundsException



Parameters:


index - .

len -

Throws:

IndexOutOfBoundsException - len,index '0'

IllegalArgumentException - len

 getPreferredWidth

```
public int getPreferredWidth()
```

Description copied from class: Component

. Container


가 .

Overrides:

getPreferredWidth in class Component

Following copied from class: org.kwis.msp.lwc.Component

Returns:

 getPreferredHeight

```
public int getPreferredHeight(int w)
```

Description copied from class: Component

가

. LabelComponent

TextFieldComponent,

TextAreaComponent

가

가

가

가 . 가 가 , 가

. , w가 -1

Overrides:


getPreferredHeight in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

w - 가

Returns:

 getPreferredSize

```
public int getPreferredSize()
```

Description copied from class: Component

```
        . ContainerComponent
        가
```

Overrides:

getPreferredSize in class Component

Following copied from class: org.kwis.msp.lwc.Component

Returns:

 configure

```
public void configure(int x,
                    int y,
                    int w,
                    int h,
                    int mask)
```

Description copied from class: Component

```
        . mask
        . mask    POS_MASK    AND    POS_MASK ,
        x, y    . mask    SIZE_MASK
AND    SIZE_MASK    ,    (w, h)
        repaint    ,    paintContent
        layout    가
```

Overrides:

configure in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

x - 'x'  
 y - 'y'  
 w -  
 h -  
 mask - POS\_MASK | SIZE\_MASK가 , POS\_MASK가 x,  
 y , SIZE\_MASK가 w, h .  
 keyNotify

```
public boolean keyNotify(int type,
                          int key)
```

Description copied from class: TextComponent

가 , setFocus  
 가 type KEY\_PRESSED,  
 KEY\_RELEASED, KEY\_REPEATED, KEY\_TYPED , chr .  
[EventQueue.SOFT1](#)  
 InputMethodHandler notifykeyInput

[TextFieldComponent](#)

[TextBoxComponent](#)

Overrides:

keyNotify in class TextComponent

Following copied from class: org.kwis.msp.lwc.TextComponent

Parameters:

type - ; KEY\_PRESSED,  
 KEY\_RELEASED, KEY\_REPEATED,  
 KEY\_TYPED  
 key - ; '0' - '9' '\*', '#'

Returns:

가 가 , true .

false .

 setFont

```
public void setFont(Font f)
```

Description copied from class: TextComponent

```
Font.getDefaultFont()
```

Overrides:

setFont in class TextComponent

Following copied from class: org.kwis.msp.lwc.TextComponent

Parameters:

f -

See Also:

[TextComponent.getFont\(\)](#)

 paintContent

```
public void paintContent(Graphics g)
```

Description copied from class: Component

```
validate
(
-1
)
```

Overrides:

paintContent in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

g - Graphics.

See Also:

[Graphics](#)

## Class TextComponent

```

java.lang.Object
|
+--org.kwis.msp.lwc.Component
    |
    +--org.kwis.msp.lwc.TextComponent
  
```

Direct Known Subclasses:

TextBoxComponent, TextFieldComponent

```
public abstract class TextComponent
```

```
extends Component
```

[TextBoxComponent](#)

[TextFieldComponent](#)

TextFieldComponent    TextBoxComponent    [EventQueue.FIRE](#)

가

가

[EventQueue.FIRE](#)

TextComponent    6가

CONSTRAINT\_NUMBER    '-',','

CONSTRAINT\_PASSWORD

!\*

CONSTRAINT\_EMAILADDRESS

CONSTRAINT\_URL    URL

CONSTRAINT\_PHONENUMBER



CONSTRAINT\_ANY

IllegalArgumentException

가 , setMaxLength(int  
maxLen) 가

InputMethodListener ActionListener

TextFieldComponent, TextBoxComponent

See Also:

TextFieldComponent, TextBoxComponent

#### Fields inherited from class org.kwis.msp.lwc.Component

bg, evtListener, evtListenerObj, fg, FOCUS\_NOTIFY, h, HAS\_FOCUS\_MASK, INPUT\_MASK, KEY\_NOTIFY, KEY\_PRESSED, KEY\_RELEASED, KEY\_REPEATED, KEY\_TYPED, LAYOUT\_BOTTOM, LAYOUT\_HCENTER, LAYOUT\_LEFT, LAYOUT\_RIGHT, LAYOUT\_TOP, LAYOUT\_VCENTER, mask, parent, POINT\_DRAGGED, POINT\_PRESSED, POINT\_RELEASED, POINTER\_NOTIFY, POS\_MASK, PREFER\_SIZE\_MASK, prefH, prefW, SHOW\_NOTIFY, SIZE\_MASK, VALID\_MASK, w, x, y

#### Methods inherited from class org.kwis.msp.lwc.Component

calcPreferredSize, canHandleInput, configure, getBackground, getCard, getForeground, getHeight, getPreferredSize, getPreferredSize, getPreferredSize, getWidth, getX, getXOnScreen, getY, getYOnScreen, hasFocus, invalidate, isShown, isValid, layout, paintContent, pointerNotify, processEvent, repaint, repaint, serviceRepaints, setBackground, setEventListener, setFocus, setForeground, toString, validate

#### Methods inherited from class java.lang.Object

```
equals, getClass, hashCode, notify, notifyAll, wait, wait, wait
```

```
☞ CONSTRAINT_NUMBER
```

```
public static final int CONSTRAINT_NUMBER
    가 가 ' ' '-',
CONSTRAINT_NUMBER '1'.
```

```
☞ CONSTRAINT_PASSWORD
```

```
public static final int CONSTRAINT_PASSWORD
    가 가
CONSTRAINT_PASSWORD '2'.
```

```
☞ CONSTRAINT_ANY
```

```
public static final int CONSTRAINT_ANY
    가 가
가
CONSTRAINT_ANY '0'.
```

```
☞ CONSTRAINT_EMAILADDRESS
```

```
public static final int CONSTRAINT_EMAILADDRESS
    가 가
CONSTRAINT_EMAILADDRESS '3'.
```

```
☞ CONSTRAINT_URL
```

```
public static final int CONSTRAINT_URL
    가 가 URL
CONSTRAINT_URL
'4'.
```

```
☞ CONSTRAINT_PHONENUMBER
```

```
public static final int CONSTRAINT_PHONENUMBER
```

가 가

CONSTRAINT\_PHONENUMBER

'5'.

✎ imHandler

protected InputMethodHandler imHandler

✎ m\_cPos

protected int m\_cPos

✎ charCount

protected int charCount

✎ constraint

protected int constraint

✎ m\_td

protected char[] m\_td

✎ iMode

protected int iMode

✎ display

protected Display display

Display

✎ modeViewer

protected org.kwis.msp.lwc.TextComponent.ModeViewer modeViewer

✎ isWide

protected boolean isWide

. true

false

✎ tShell

protected ShellComponent tShell

✎ maxLength

protected int maxLength

가 -1

✎ constChecker

protected org.kwis.msp.lwc.ConstraintChecker constChecker

가

✎ f

protected Font f

TextComponent

Font.getDefaultFont()

[setFont\(org.kwis.msp.lcdui.Font\)](#)

See Also:

[setFont\(Font f\)](#)

✎ setString

public void setString(String data)

가

가

IllegalArgumentException

가

가

가

가 null

""(empty String)

Parameters:

data - null

Throws:

`IllegalArgumentException` -

See Also:

[getString\(\)](#)

 `setMaxLength`

```
public void setMaxLength(int maxLen)
```

```
가 . '-1'
가 가
가 가
가 ,
가
가 가 '0' '-1' IllegalArgumentException
```

Parameters:

`maxLen` - 가

Throws:


`IllegalArgumentException` - '0' '-1'

 `getMaxLength`

```
public int getMaxLength()
```

```
가 가 '-1'
가 .
```

Returns:

가  
 `getString`


```
public String getString()
```

```
. null ""(empty string)
```

Returns:

See Also:

[setString\(String data\)](#)

 insert

```
public void insert(char[] data,
                  int offset,
                  int len,
                  int index)
```

index

가 .

data가 null      NullPointerException      , index '0'

IndexOutOfBoundsException .

가

가

len

IllegalArgumentException .

Parameters:

data - 가

offset - 가 가

len - 가

index - 가


Throws:

NullPointerException - data가 null

IndexOutOfBoundsException - index '0'

IllegalArgumentException - 가 가  
len

IllegalArgumentException -  
가

 delete

```
public void delete(int index,
                  int len)
```

index len

index '0'

IndexOutOfBoundsException

len

IllegalArgumentException

Parameters:

index -

len -

Throws:

IndexOutOfBoundsException - len, index '0'

IllegalArgumentException - len


 `getConstraint`

```
public int getConstraint()
```

[CONSTRAINT\\_ANY](#)

Returns:

constraints

 `focusNotify`


```
public void focusNotify(boolean b)
```

Overrides:

focusNotify in class Component

Parameters:

b - focus 가 true,가 false

 `showNotify`

```
protected void showNotify(boolean bShow)
```

Description copied from class: Component

. addComponent removeComponent  
(ShellComponent)가 show

Overrides:

showNotify in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

bShow - 가

✎ setFont

```
public void setFont(Font f)
```

```
Font.getDefaultFont()
```

Parameters:

f -

See Also:

[getFont\(\)](#)

✎ getFont

```
public Font getFont()
```

Returns:

See Also:

[setFont\(Font f\)](#)

✎ keyNotify

```
public boolean keyNotify(int type,  
int key)
```

```
가 , setFocus
```

```
가 . type KEY_PRESSED,  
KEY_RELEASED, KEY_REPEATED, KEY_TYPED , chr
```



[EventQueue.SOFT1](#)

InputMethodHandler notifykeyInput

[TextFieldComponent](#)

[TextBoxComponent](#)

Overrides:

keyNotify in class Component

Parameters:

type - ; KEY\_PRESSED,  
KEY\_RELEASED, KEY\_REPEATED,  
KEY\_TYPED

key - ; '0' - '9' '\*', '#'

Returns:

가 가 , true  
false

## Class TextFieldComponent

```

java.lang.Object
|
+--org.kwis.msp.lwc.Component
    |
    +--org.kwis.msp.lwc.TextComponent
        |
        +--org.kwis.msp.lwc.TextFieldComponent
  
```

```
public class TextFieldComponent
```

```
extends TextComponent
```

```
TextFieldComponentTextComponent
```

```
. TextComoponent
```

가

[TextComponent.setMaxLength\(int maxLen\)](#)

가

See Also:

[TextComponent](#), [TextBoxComponent](#)

Fields inherited from class org.kwis.msp.lwc.TextComponent

charCount, constChecker, constraint, CONSTRAINT\_ANY, CONSTRAINT\_NUMBER, CONSTRAINT\_PASSWORD, display, f, imHandler, iMode, isWide, m\_cPos, m\_td, maxLength, modeViewer, tShell

Fields inherited from class org.kwis.msp.lwc.Component

bg, evtListener, evtListenerObj, fg, FOCUS\_NOTIFY, h, HAS\_FOCUS\_MASK, INPUT\_MASK, KEY\_NOTIFY, KEY\_PRESSED, KEY\_RELEASED, KEY\_REPEATED, KEY\_TYPED, LAYOUT\_BOTTOM, LAYOUT\_HCENTER, LAYOUT\_LEFT, LAYOUT\_RIGHT, LAYOUT\_TOP, LAYOUT\_VCENTER, mask, parent, POINT\_DRAGGED, POINT\_PRESSED, POINT\_RELEASED, POINTER\_NOTIFY, POS\_MASK, PREFER\_SIZE\_MASK, prefH, prefW, SHOW\_NOTIFY, SIZE\_MASK, VALID\_MASK, w, x, y

Methods inherited from class org.kwis.msp.lwc.TextComponent

focusNotify, getConstraint, getFont, getMaxLength, getString, setFont, setMaxLength, setString, showNotify

Methods inherited from class org.kwis.msp.lwc.Component

calcPreferredSize, canHandleInput, configure, getBackground, getCard, getForeground, getHeight, getWidth, getX, getXOnScreen, getY, getYOnScreen, hasFocus, invalidate, isShown, isValid, layout, pointerNotify, processEvent, repaint, repaint, serviceRepaints, setBackground, setEventListener, setFocus, setForeground, toString, validate

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, wait, wait, wait

 TextFieldComponent

```
public TextFieldComponent(String data,
                          int constraint)
    TextFieldComponent
    .
    null 가
    가 TextComponent.CONSTRAINT\_NUMBER,
```

[TextComponent.CONSTRAINT\\_PASSWORD](#),

[TextComponent.CONSTRAINT\\_ANY](#)

IllegalArgumentException , 가

IllegalArgumentException .

가

[TextComponent.setMaxLength\(int maxLen\)](#)


가

Parameters:

data - null

constraints -



 insert

```
public void insert(char[] data,
                  int offset,
                  int len,
                  int index)
```

Description copied from class: TextComponent

index

가 .

data가 null NullPointerException , index '0'

IndexOutOfBoundsException .

가

가

len

IllegalArgumentException .

Overrides:

insert in class TextComponent

Following copied from class: org.kwis.msp.lwc.TextComponent

Parameters:

data - 가

offset - 가 가

len - 가

index - 가


Throws:

NullPointerException - data가 null

IndexOutOfBoundsException - index '0'

IllegalArgumentException - 가 가  
len

IllegalArgumentException -  
가

 delete

```
public void delete(int index,
                  int len)
```

Description copied from class: TextComponent

index len

index '0'

IndexOutOfBoundsException . len

IllegalArgumentException .

Overrides:

delete in class TextComponent

Following copied from class: org.kwis.msp.lwc.TextComponent

Parameters:

index - .

len -

Throws:

IndexOutOfBoundsException - len,index '0'

IllegalArgumentException - len

✍️ `getPreferredWidth`

```
public int getPreferredWidth()
```

Description copied from class: Component

. Container

가

Overrides:

`getPreferredWidth` in class Component

Following copied from class: org.kwis.msp.lwc.Component

Returns:

✍️ `getPreferredHeight`

```
public int getPreferredHeight()
```

Description copied from class: Component

. ContainerComponent

가

Overrides:

`getPreferredHeight` in class Component

Following copied from class: org.kwis.msp.lwc.Component

Returns:

✍️ `getPreferredHeight`

```
public int getPreferredHeight(int wr)
```

Description copied from class: Component

가

. LabelComponent

. TextFieldComponent,

TextAreaComponent

가

가

가

가 . 가 가

가

. , w가 -1

Overrides:

getPreferredHeight in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

w - 가 .

Returns:

 paintContent

```
public void paintContent(Graphics g)
```

Description copied from class: Component

```
        validate
    )
    -1
    ,
```

Overrides:

paintContent in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

g - Graphics.

See Also:

[Graphics](#)

 keyNotify

```
public boolean keyNotify(int type,
                          int key)
```

Description copied from class: TextComponent

```
        가
    , setFocus
    가
    . type KEY_PRESSED,
KEY_RELEASED, KEY_REPEATED, KEY_TYPED
    , chr
    .
```

[EventQueue.SOFT1](#)

```
InputMethodHandler notifykeyInput
```

[TextFieldComponent](#)[TextBoxComponent](#)

Overrides:

keyNotify in class TextComponent

Following copied from class: org.kwis.msp.lwc.TextComponent

Parameters:

```
type - ; KEY_PRESSED,
KEY_RELEASED, KEY_REPEATED,
KEY_TYPED
```

```
key - ; '0' - '9' '*', '#'
```

Returns:

```
가 가 , true
false
```



## Class TickerComponent

```

java.lang.Object
|
+--org.kwis.msp.lwc.Component
    |
    +--org.kwis.msp.lwc.TickerComponent
  
```

```
public class TickerComponent
```

```
extends Component
```

```
TickerComponent
```

```

TickerComponent
ContainerComponent
    가 , 가 가
  
```

```
setDelay\(int\)
```

```
milleseconds
```

```
DEFAULT\_DELAY
```

```
IllegalArgumentException
```

```
TickerComponent
```

```
setTickerState\(boolean\)
```

```
. true
```

```
, false
```

```
true
```

```
TickerComponent
```

```
ContainerComponent
```

```
IllegalArgumentException
```

Fields inherited from class org.kwis.msp.lwc.Component

```

bg, evtListener, evtListenerObj, fg, FOCUS_NOTIFY, h, HAS_FOCUS_MASK, INPUT_MASK,
KEY_NOTIFY, KEY_PRESSED, KEY_RELEASED, KEY_REPEATED, KEY_TYPED, LAYOUT_BOTTOM,
  
```

LAYOUT\_HCENTER, LAYOUT\_LEFT, LAYOUT\_RIGHT, LAYOUT\_TOP, LAYOUT\_VCENTER, mask, parent, POINT\_DRAGGED, POINT\_PRESSED, POINT\_RELEASED, POINTER\_NOTIFY, POS\_MASK, PREFER\_SIZE\_MASK, prefH, prefW, SHOW\_NOTIFY, SIZE\_MASK, VALID\_MASK, w, x, y

Methods inherited from class org.kwis.msp.lwc.Component

calcPreferredSize, canHandleInput, configure, focusNotify, getBackground, getCard, getForeground, getHeight, getWidth, getX, getXOnScreen, getY, getYOnScreen, hasFocus, invalidate, isShown, isValid, keyNotify, layout, pointerNotify, processEvent, repaint, repaint, serviceRepaints, setBackground, setEventListener, setFocus, setForeground, showNotify, toString, validate

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, wait, wait, wait

DEFAULT\_DELAY

☞ DEFAULT\_DELAY

```
public int DEFAULT_DELAY
```

```
TickerComponent . 500 milliseconds
```

TickerComponent

☞ TickerComponent

```
public TickerComponent(String str,
                        Image img)
```

```
TickerComponent . true
```

```
, 가 .
```

[DEFAULT\\_DELAY](#) .

```
null 가 , null NullPointerException
```

```
null 가 .
```

Parameters:

str - TickerComponent

img - TickerComponent null

Throws:

NullPointerException - 가 null

✎ setString

```
public void setString(String str)
```

TickerComponent . 가

, null . NullPointerException . null

Parameters:

str - TickerComponent

Throws:

NullPointerException - str null

See Also:

[getString\(\)](#), [setImage\(Image img\)](#)

✎ getString

```
public String getString()
```

TickerComponent .

Returns:

string TickerComponent

See Also:

[setString\(String str\)](#)

✎ setImage

```
public void setImage(Image img)
```

TickerComponent . 가

Parameters:

img - TickerComponent

See Also:

[getImage\(\)](#), [setString\(String str\)](#)

✍ getImage

```
public Image getImage()
```

TickerComponent

Returns:

img TickerComponent

See Also:

[setImage\(Image img\)](#)

✍ setDelay

```
public void setDelay(int delay)
```

TickerComponent

[DEFAULT\\_DELAY](#)

가 milliseconds  
IllegalArgumentExcepion

Parameters:

delay - milliseconds

Throws:

IllegalArgumentExcepion - delay

✍ setTickerState

```
public boolean setTickerState(boolean st)
```

TickerComponent

true, false

true

Parameters:

st - true: false:

## ✎ getPreferredHeight

```
public int getPreferredHeight(int w)
```

Description copied from class: Component

가  
 .  
 LabelComponent  
 TextFieldComponent,  
 TextAreaComponent  
 가  
 가  
 가  
 ,  
 가  
 .  
 , w가 -1

Overrides:

getPreferredHeight in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

w - 가

Returns:

## ✎ getPreferredHeight

```
public int getPreferredHeight()
```

Description copied from class: Component

. ContainerComponent  
 가

Overrides:

getPreferredHeight in class Component

Following copied from class: org.kwis.msp.lwc.Component

Returns:

## ✎ getPreferredWidth

```
public int getPreferredWidth()
```

Description copied from class: Component

. Container

가

Overrides:

getPreferredWidth in class Component

Following copied from class: org.kwis.msp.lwc.Component

Returns:

 paintContent

```
public void paintContent(Graphics g)
```

Description copied from class: Component

```
    validate() , (
    ) -1 ,
```

Overrides:

paintContent in class Component

Following copied from class: org.kwis.msp.lwc.Component

Parameters:

g - Graphics.

See Also:

Graphics

## 5.2.10. Handset(org.kwis.msp.handset)

Class HandsetProperty

java.lang.Object

|

+-org.kwis.msp.handset.HandsetProperty

```
public class HandsetProperty
```

```
extends Object
```

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

✎ HandsetProperty

```
public HandsetProperty()
```

✎ getSystemProperty

```
public static String getSystemProperty (String id)
                                throws IllegalArgumentException
```

|                        |    |     |     |
|------------------------|----|-----|-----|
|                        | id | HAL | API |
| MH_sysGetInformation() | ,  |     |     |
| 가                      |    |     |     |

Parameters:

id -

Returns:

Throws:

IllegalArgumentException -

✎ setSystemProperty

```
public static boolean setSystemProperty(String id, String val)
                                throws IllegalArgumentException
```

|  |    |     |     |
|--|----|-----|-----|
|  | id | HAL | API |
|--|----|-----|-----|

MH\_sysSetInfortmaion( ,  
가 .

Parameters:

id -

val - .

Returns:

true -

flase -

IllegalArgumentException -



Class BackLight

```
java.lang.Object
|
+- -org.kwis.msp.handset.BackLight
```

```
public class BackLight
extends Object

LCD
```

|   |
|---|
| Methods inherited from class java.lang.Object                             |
| equals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait |



on

```
public static void on(int id, int color, int duration)
throws IOException
```

```
가
```

|          |             |           |                         |
|----------|-------------|-----------|-------------------------|
| before() | ..          | Backlight | .                       |
| 0        | LCD         | 1         | LCD                     |
|          | 가           |           | 가                       |
| color    | 0xYYRRGGBB( |           | color                   |
| )        | YY          | RR        | (network byte ordering) |
| (Blue)   |             | (Red), GG | (Green), BB             |

Parameters:


id -

color -

duration - 가 (msec ) .

Throws:


IOException -

 off

```
public static void off()  
                throws IOException
```

Throws:


IOException -

 before

```
public static void before()  
                throws IOException
```

Throws:


IOException -

 alwaysOn

```
public static void alwaysOn()  
                throws IOException
```


Throws:

IOException -



**Class Call**`java.lang.Object`

|

`+-org.kwis.msp.handset.Call``public class Call``extends Object`Methods inherited from class `java.lang.Object``equals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait` `Call``public Call()` `accept``public static void accept()  
throws IOException`

Throws:

IOException –

 `reject``public static void reject()  
throws IOException`

Throws:

IOException –

✍ end

```
public static void end()
    throws IOException
```

Throws:

IOException –

✍ place

```
public static void place(String phonenumber)
    throws IOException
```

Parameters:

phonenumber -

Throws:

IOException –

### Class LED

java.lang.Object

|

+- -org.kwis.msp.handset.LED

```
public class LED
```

```
extends Object
```

```
LED(Light Emitting Diodes)
```

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait



✂ LED

```
public LED()
```



✂ getCount

```
public static int getCount()
    throws IOException
```

LED .

Throws:

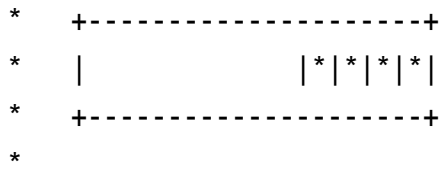
IOException -

✂ set

```
public static void set(int leds)
    throws IOException
```

LED on/off . bit가 1 on, 0 off .  
)

LED가 4 LSB BIT 4 .  
\* 0 bit



set(0x3) led2 , .

Parameters:

leds - 가 1 LED 가 on 0 off .

Throws:

IOException -

✂ get

```
public static int get()
    throws IOException
```

LED on/off

Returns:

led on/off bit OR

Throws:

IOException -

## 5.2.11. Media (org.kwis.msp.media)

Class BaseClip

java.lang.Object

|

+ -org.kwis.msp.media.BaseClip

public abstract class BaseClip

extends java.lang.Object

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

 setBuffer

public boolean setBuffer(byte[] buf, int dataSize)

buf가 BaseClip

BaseClip

BaseClip object

Parameters:

buf -

dataSize -

Returns:

true : , false : 가

✍ putData

public int putData(byte[] buf, int off, int len)

putData(byte[] buf, int off, int len)

가 가

가

Parameters:

buf ?

off ? offset

len ?

Returns:

✍ getData

public int getData(byte[] buf, int off, int len)

buf

, getData(byte[] buf, int off, int len)

가

Parameters:

buf - 가

off -

len -

Returns:

## ✍ clearData

```
public void clearData()
```

가

Parameters:

Returns:

## ✍ availableDataSize

```
public int availableDataSize()
```

가 ( 가 )

Parameters:

Returns:

가

## ✍ playStart

```
protected boolean playStart (boolean repeat)
```

```
Player.play(Clip clip, boolean repeat) repeat  
play가
```

Parameters:

repeat - Player.play() repeat

Returns:

```
true : Player.play() , false : Player.play() 가  
false
```

## ✍ recordStart

```
protected boolean recordStart()
```

```
Player.record(BaseClip clip) record  
record가
```

Parameters:

Returns:

```
true : Player.record() , false : Player.record() 가
```



---

false

✎ playUpdate

public boolean playUpdate(int event, int parm)

PlayListener.playUpdate()

Parameters:

event -

parm - event 가

## Class Clip

java.lang.Object

|

+ - org.kwis.msp.media.BaseClip

+ - org.kwis.msp.media.Clip


```
public class Clip
```

```
extends java.lang.Object
```

Player

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

 Clip

```
public Clip(String type, byte[] buf)
```

가

```
Clip(String type, int bufSize)
```

Parameters:

type -

buf - 가

 Clip

```
public Clip(String type, String resourceName)
```

가

```
Clip(String type, byte[] buf)
```

Parameters:

type -

resourceName - 가

✎ getType

```
public java.lang.String getType()
```

Type

Returns:

Type

✎ setPosition

```
public boolean setPosition(int ms)
```

MediaUnsupportedException

Parameters:

ms - (milli second)

Returns:

true :

false :

✎ getVolume

```
public final int getVolume()
```

가

0

100

Parameters:

Returns:

: (0-100 )

✎ setVolume

```
public final boolean setVolume(int level)
```

---

가 . ,  
100 .

Parameters:

level - (0-100 )

✎ setListener

public void setListener(PlayListener listener)

listener .

Parameters:

listener - listener, null

**Class Player**

java.lang.Object

|

+ - org.kwis.msp.media.Player


```
public class Player
```

```
extends java.lang.Object
```

static

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

 pause

```
public static boolean pause(BaseClip clip)
```

```
( / )
```

```
listener
```

```
PAUSE
```

```
가 가
```

```
가
```

```
,
```

```
,
```

```
pause
```

```
pause
```

```
, MediaUnsupportedException
```


Parameters:

clip -

Returns:

ture :

false :

 stop

```
public static boolean stop(BaseClip clip)
```

```
( / )
```

```
가
```



repeat - false    1    , true

Returns:

ture :

false :

☞ record

public static boolean record(BaseClip clip)

·  
 , MediaUnsupportedException    가  
                          listener    RECORD    가    .  
 ,                           UnavailableException    .  
 ,  
 가                           listener    FULL\_OF\_DATA    가    .  
                          가    ,

Clip.GetData()

Parameters:

clip -

Returns:

ture :

false :



## Interface PlayerListener

```
public interface PlayerListener
```

```
    ✎ ERROR
```

```
public static final int ERROR
```

```
    가 -1 .
```

```
    ✎ END_OF_DATA
```

```
public static final int END_OF_DATA
```

```
    1 .
```

```
    ✎ STARTED
```

```
public static final int START
```

```
    2 .
```

```
    ✎ STOPPED
```

```
public static final int STOP
```

```
    / 3 .
```

```
    ✎ PAUSED
```

```
public static final int PAUSE
```

```
    / 4 .
```

```
    ✎ RESUMED
```

```
public static final int RESUME
```

```
    5 .
```

```
    ✎ RECORDED
```

```
public static final int RECORD
```

```
    6 .
```

```
    ✎ FULL_OF_DATA
```

```
public static final int FULL_OF_DATA
```

```
    가 , 7 .
```





✎ playerUpdate

```
public void playerUpdate(Clip clip, int event, int parm)
```

가 .

Parameters:

Clip ? 가

event -

parm - event 가



## Class UnavailableException

java.lang.Object

|

+-- java.lang.Throwable

|

+-- java.lang.Exception

|

+-- java.lang.RuntimeException

|

+-- org.kwis.msp.media.UnavailableException

```
public class UnavailableException
```

```
extends RuntimeException
```

```
exception .
```

Methods inherited from class java.lang.Throwable

getMessage, printStackTrace, toString

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, wait, wait, wait

✎ UnavailableException

```
public UnavailableException()
```

```
UnavailableException .
```

✎ UnavailableException

```
public UnavailableException(String s)
```

```
UnavailableException .
```

Parameters:

s - UnavailableException .





level - 0 off, 1-100

duration - (milliseconds), 0

**Class Volume**

java.lang.Object

|

+-org.kwis.msp.media.Volume


public class Volume

extends java.lang.Object

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait




 get

public static int get()

HandsetProperty.getSystemProperty("VOLUMELEVEL")  
 ) 가 , => 1-50 : 51-100 :  
 가 , , => 1-33: , 34-66: , 67-100:

Parameters:

Returns:

 set

```
public static void set(int level)
```

```

    * @param level the level of the clip, ranging from 0 (no clip) to 100 (full clip)
    * @param clip the clip to be set
    * @see Clip
    * @since 1.0
    * @api

```

Parameters:

level - (0-100)

-

### Class MediaUnsupportedException

```
java.lang.Object
```

```
|
```

```
+- java.lang.Throwable
```

```
|
```

```
+- java.lang.Exception
```

```
|
```

```
+- org.kwis.msp.media.MediaUnsupportedException
```

```
public class MediaUnsupportedException
```

```
extends Exception
```

```
exception
```

Methods inherited from class java.lang.Throwable

getMessage, printStackTrace, toString

Methods inherited from class java.lang.Object

```
equals, getClass, hashCode, notify, notifyAll, wait, wait, wait
```

```
MediaUnsupportedException
```

```
public MediaUnsupportedException()
```

```
MediaUnsupportedException
```

```
MediaUnsupportedException
```

```
public MediaUnsupportedException(String s)
```

```
MediaUnsupportedException
```

Parameters:

s - IOException

```
VOLTYPE_TONE
```

```
protected static final int VOLTYPE_TONE
```

```
0
```

```
VOLTYPE_SOUND
```

```
protected static final int VOLTYPE_SOUND
```

```
1
```

```
VOLTYPE_RECORDER
```

```
protected static final int VOLTYPE_RECORDER
```

```
2
```

```
setMute
```

```
public static void setMuteState(int source, boolean mute)
```

```
throw IllegalArgumentException
```

```
source
```

```
source  
VOLTYPE_RECORDER
```

```
VOLTYPE_TONE, VOLTYPE_SOUND,  
IllegalArgumentException
```

```
가
```

Parameters:

source ?[in] VOLTYPE\_TONE, VOLTYPE\_SOUND, VOLTYPE\_RECORDER

mute - [in]

TRUE :

FALSE :

Throws:

IllegalArgumentException - source가 VOLTYPE\_TONE, VOLTYPE\_SOUND,  
VOLTYPE\_RECORDER 가

✍ getMute

public static boolean getMuteState(int source)

throws IllegalArgumentException

. source

. source VOLTYPE\_TONE, VOLTYPE\_SOUND,

VOLTYPE\_RECORDER

가

IllegalArgumentException

.

Parameters:

source ?[in] VOLTYPE\_TONE, VOLTYPE\_SOUND, VOLTYPE\_RECORDER

Returns:

TRUE :



## **6.**

1. TIA/EIA/IS -637 Short Message Services for Wideband Spread Spectrum Cellular Systems

# 7.

## 7.1. (EUC\_KR)

KSC5601 (0xA1A0-0xACFF) (0xE1A0-ECFF)

Unicode Character Value = KSC5601 Character Value | 0xE000  
 KSC5601 Character Value = Unicode Character Value & 0xAFFF

|      | character   | . | ( | Code | KSC5601 |
|------|---|---|---|------|---------|
|      | .)  |   |   |      |         |
|      | 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F   |   |   |      |         |
| A1A0 | “ ” ` ˆ ˜ ˘ ˙ ˚ ˛ ˜ ˝ ˞ ˟ ˠ ˡ ˢ ˣ ˤ ˥ ˦ ˧ ˨ ˩ ˪ ˫ ˬ ˭ ˮ ˯ ˰ ˱ ˲ ˳ ˴ ˵ ˶ ˷ ˸ ˹ ˺ ˻ ˼ ˽ ˾ ˿   |   |   |      |         |
| A1B0 | “ ” { } ˆ ˜ ˘ ˙ ˚ ˛ ˜ ˝ ˞ ˟ ˠ ˡ ˢ ˣ ˤ ˥ ˦ ˧ ˨ ˩ ˪ ˫ ˬ ˭ ˮ ˯ ˰ ˱ ˲ ˳ ˴ ˵ ˶ ˷ ˸ ˹ ˺ ˻ ˼ ˽ ˾ ˿   |   |   |      |         |
| A1C0 | ÷ ˆ ˜ ˘ ˙ ˚ ˛ ˜ ˝ ˞ ˟ ˠ ˡ ˢ ˣ ˤ ˥ ˦ ˧ ˨ ˩ ˪ ˫ ˬ ˭ ˮ ˯ ˰ ˱ ˲ ˳ ˴ ˵ ˶ ˷ ˸ ˹ ˺ ˻ ˼ ˽ ˾ ˿   |   |   |      |         |
| A1D0 | §   |   |   |      |         |
| A1E0 | =   |   |   |      |         |
| A1F0 | ¬   |   |   |      |         |
|      | 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F   |   |   |      |         |
| A2A0 | ˆ ˜ ˘ ˙ ˚ ˛ ˜ ˝ ˞ ˟ ˠ ˡ ˢ ˣ ˤ ˥ ˦ ˧ ˨ ˩ ˪ ˫ ˬ ˭ ˮ ˯ ˰ ˱ ˲ ˳ ˴ ˵ ˶ ˷ ˸ ˹ ˺ ˻ ˼ ˽ ˾ ˿   |   |   |      |         |
| A2B0 | ˆ ˜ ˘ ˙ ˚ ˛ ˜ ˝ ˞ ˟ ˠ ˡ ˢ ˣ ˤ ˥ ˦ ˧ ˨ ˩ ˪ ˫ ˬ ˭ ˮ ˯ ˰ ˱ ˲ ˳ ˴ ˵ ˶ ˷ ˸ ˹ ˺ ˻ ˼ ˽ ˾ ˿   |   |   |      |         |
| A2C0 | ˆ ˜ ˘ ˙ ˚ ˛ ˜ ˝ ˞ ˟ ˠ ˡ ˢ ˣ ˤ ˥ ˦ ˧ ˨ ˩ ˪ ˫ ˬ ˭ ˮ ˯ ˰ ˱ ˲ ˳ ˴ ˵ ˶ ˷ ˸ ˹ ˺ ˻ ˼ ˽ ˾ ˿   |   |   |      |         |
| A2D0 | ¶ † ‡   |   |   |      |         |
| A2E0 | Co. ™ am pm © ? ? ? ? ? ? ? ?   |   |   |      |         |
| A2F0 | ? ? ? ? ? ? ? ? ? ? ? ? ? ?   |   |   |      |         |
|      | 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F   |   |   |      |         |
| A3A0 | ! " # \$ % & ' ( ) * + , - . /  |   |   |      |         |
| A3B0 | 0 1 2 3 4 5 6 7 8 9 : ; < = > ?   |   |   |      |         |
| A3C0 | @ A B C D E F G H I J K L M N O   |   |   |      |         |
| A3D0 | P Q R S T U V W X Y Z [ \ ] ^ _   |   |   |      |         |
| A3E0 | ` a b c d e f g h i j k l m n o   |   |   |      |         |
| A3F0 | p q r s t u v w x y z {   } ~   |   |   |      |         |
|      | 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F   |   |   |      |         |
| A4A0 | ㄱ ㅋ ㆁ ㄴ ㄷ ㄹ ㄺ ㄻ ㄼ ㄽ ㄾ ㄿ ㅀ ㅁ ㅂ ㅃ ㅄ ㅅ ㅆ ㅈ ㅉ ㅊ ㅋ ㅌ ㅍ ㅑ ㅒ ㅓ ㅔ ㅕ ㅖ ㅗ ㅘ ㅙ ㅚ ㅛ ㅜ ㅠ ㅡ ㅣ   |   |   |      |         |
| A4B0 | ㅝ ㅞ ㅟ ㅠ ㅡ ㅢ ㅣ ㅤ ㅥ ㅦ ㅧ ㅨ ㅩ ㅪ ㅫ ㅬ ㅭ ㅮ ㅯ ㅰ ㅱ ㅲ ㅳ ㅴ ㅵ ㅶ ㅷ ㅸ ㅹ ㅺ ㅻ ㅼ ㅽ ㅾ ㅿ ㆀ ㆁ ㆂ ㆃ ㆄ ㆅ ㆆ ㆇ ㆈ ㆉ ㆊ ㆋ ㆌ ㆍ ㆎ ㆏ ㆐ ㆑ ㆒ ㆓ ㆔ ㆕ ㆖ ㆗ ㆘ ㆙ ㆚ ㆛ ㆜ ㆝ ㆞ ㆟ ㆠ ㆡ ㆢ ㆣ ㆤ ㆥ ㆦ ㆧ ㆨ ㆩ ㆪ ㆫ ㆬ ㆭ ㆮ ㆯ ㆰ ㆱ ㆲ ㆳ ㆴ ㆵ ㆶ ㆷ ㆸ ㆹ ㆺ ㆻ ㆼ ㆽ ㆾ ㆿ ㆀ ㆁ ㆂ ㆃ ㆄ ㆅ ㆆ ㆇ ㆈ ㆉ ㆊ ㆋ ㆌ ㆍ ㆎ ㆏ ㆐ ㆑ ㆒ ㆓ ㆔ ㆕ ㆖ ㆗ ㆘ ㆙ ㆚ ㆛ ㆜ ㆝ ㆞ ㆟ ㆠ ㆡ ㆢ ㆣ ㆤ ㆥ ㆦ ㆧ ㆨ ㆩ ㆪ ㆫ ㆬ ㆭ ㆮ ㆯ ㆰ ㆱ ㆲ ㆳ ㆴ ㆵ ㆶ ㆷ ㆸ ㆹ ㆺ ㆻ ㆼ ㆽ ㆾ ㆿ |   |   |      |         |
| A4C0 | ㅞ ㅟ ㅠ ㅡ ㅢ ㅣ ㅤ ㅥ ㅦ ㅧ ㅨ ㅩ ㅪ ㅫ ㅬ ㅭ ㅮ ㅯ ㅰ ㅱ ㅲ ㅳ ㅴ ㅵ ㅶ ㅷ ㅸ ㅹ ㅺ ㅻ ㅼ ㅽ ㅾ ㅿ ㆀ ㆁ ㆂ ㆃ ㆄ ㆅ ㆆ ㆇ ㆈ ㆉ ㆊ ㆋ ㆌ ㆍ ㆎ ㆏ ㆐ ㆑ ㆒ ㆓ ㆔ ㆕ ㆖ ㆗ ㆘ ㆙ ㆚ ㆛ ㆜ ㆝ ㆞ ㆟ ㆠ ㆡ ㆢ ㆣ ㆤ ㆥ ㆦ ㆧ ㆨ ㆩ ㆪ ㆫ ㆬ ㆭ ㆮ ㆯ ㆰ ㆱ ㆲ ㆳ ㆴ ㆵ ㆶ ㆷ ㆸ ㆹ ㆺ ㆻ ㆼ ㆽ ㆾ ㆿ   |   |   |      |         |
| A4D0 | ㅞ ㅟ ㅠ ㅡ ㅢ ㅣ ㅤ ㅥ ㅦ ㅧ ㅨ ㅩ ㅪ ㅫ ㅬ ㅭ ㅮ ㅯ ㅰ ㅱ ㅲ ㅳ ㅴ ㅵ ㅶ ㅷ ㅸ ㅹ ㅺ ㅻ ㅼ ㅽ ㅾ ㅿ ㆀ ㆁ ㆂ ㆃ ㆄ ㆅ ㆆ ㆇ ㆈ ㆉ ㆊ ㆋ ㆌ ㆍ ㆎ ㆏ ㆐ ㆑ ㆒ ㆓ ㆔ ㆕ ㆖ ㆗ ㆘ ㆙ ㆚ ㆛ ㆜ ㆝ ㆞ ㆟ ㆠ ㆡ ㆢ ㆣ ㆤ ㆥ ㆦ ㆧ ㆨ ㆩ ㆪ ㆫ ㆬ ㆭ ㆮ ㆯ ㆰ ㆱ ㆲ ㆳ ㆴ ㆵ ㆶ ㆷ ㆸ ㆹ ㆺ ㆻ ㆼ ㆽ ㆾ ㆿ   |   |   |      |         |
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| A4F0 | ㅞ ㅟ ㅠ ㅡ ㅢ ㅣ ㅤ ㅥ ㅦ ㅧ ㅨ ㅩ ㅪ ㅫ ㅬ ㅭ ㅮ ㅯ ㅰ ㅱ ㅲ ㅳ ㅴ ㅵ ㅶ ㅷ ㅸ ㅹ ㅺ ㅻ ㅼ ㅽ ㅾ ㅿ ㆀ ㆁ ㆂ ㆃ ㆄ ㆅ ㆆ ㆇ ㆈ ㆉ ㆊ ㆋ ㆌ ㆍ ㆎ ㆏ ㆐ ㆑ ㆒ ㆓ ㆔ ㆕ ㆖ ㆗ ㆘ ㆙ ㆚ ㆛ ㆜ ㆝ ㆞ ㆟ ㆠ ㆡ ㆢ ㆣ ㆤ ㆥ ㆦ ㆧ ㆨ ㆩ ㆪ ㆫ ㆬ ㆭ ㆮ ㆯ ㆰ ㆱ ㆲ ㆳ ㆴ ㆵ ㆶ ㆷ ㆸ ㆹ ㆺ ㆻ ㆼ ㆽ ㆾ ㆿ   |   |   |      |         |



ABE0 ムメモヤヤユユヨヨラリルレロウワ  
ABF0 ㊦㊧㊨㊩㊪㊫㊬㊭

00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F

ACAO  
ACB0  
ACCO       ? ? ? ? ? ? ? ? ? ? ? ?  
ACD0 ?  
ACE0  
ACF0

## 7.2. API 가/

## API

API 가

### 7.2.1. C API

✍ MC\_knlMExecute

M\_Int32 MC\_knlMExecute(char\* symName, int parmCnt, ...)

가

(partial)

(overlay)

MC\_knlCExecute()

symName - [in]

가

(symbolic)

parmCnt - [in]

ID

M\_E\_ACCESS -

,

M\_E\_NOMEMORY -

가

M\_E\_INVALID -

가

## ✎ MC\_knlLoad

```
M_Int32 MC_knlLoad(char* execName, int parmCnt, ...)
```

```
(non-blocking)
```

```
execName - [in] , MC_knlGetExecNames()
```

```
parmCnt - [in]
```

```
ID
```

```
M_E_ACCESS - ,
M_E_NOMEMORY - 가
M_E_INVALID - 가
```

## ✎ MC\_knIMLoad

```
M_Int32 MC_knIMLoad(char* symName, int parmCnt, ...)
```

(partial)

```
MC_knILoad()
```

symName - [in]                   가                   (symbolic)

parmCnt - [in]

ID

M\_E\_ACCESS -                   ,  
 M\_E\_NOMEMORY -           가  
 M\_E\_INVALID -           가

## 7.2.2. API

✍ mExecute

```
public static int mExecute(java.lang.String symName,
                          java.lang.String[] args)
```

가 . ,  
(partial)  
(overlay)  
execute()

Parameters:

symName - 가 (symbolic)

args - Main method()

Returns:

ID ,

✍ load

```
public static int load(java.lang.String execName,
                      java.lang.String[] args)
```

(non-blocking)

Parameters:

execName - , getExecNames()

args - Main method() parameter

Returns:

load ID ,

See Also:



getExecNames(String prgName, String version, String vendor)

✍ mLoad

```
public static int mLoad(java.lang.String symName,
                        java.lang.String[] args)
```

(partial)

load()

Parameters:

symName - 가 (symbolic)

args - Main method() parameter

Returns:

load

ID ,

## 7.3. SMS API

SMS

### 7.3.1.

가 Teleservice ID

SMS . (Identification, TIA/EIA/IS-637 )

### 7.3.2. Java API

☞ org.kwis.msf.io.URL

SMS URL.find() URL(RFC1738 )

|     | URL            |  |                                  |
|-----|----------------|--|----------------------------------|
| SMS | sms://<<br>< > | >:<br>sms://SHORTME<br>SSAGE:read<br>sms://SHORTME<br>SSAGE:send<br>sms://SHORTME<br>SSAGE:delread | . read:<br>. delread:<br>. send: |

### 7.3.3. C API

SMS API . SMS API

가 가 . SMS

API 가

가 . SMS

MC\_phnSmsOpen()  
가

## ✎ MC\_SmsData

```

typedef MC_SmsData {
    /// SMS Message
    M_Byte index;
    ///
    , 1
    M_Byte class;
    /// ASCII
    .<br>bar
)016-123-4567 ->0161234567
    M_Byte callback[12];
    ///
    data size.
    M_Byte cb_size;
    ///
    M_Byte data[256];
    ///
    M_Byte data_size;
    /**
        year 2byte,etc 1byte.
        <pre>
        2 byte 1 byte 1 byte 1 byte 1 byte 1 byte
        </pre>
    */
    M_Byte timer[7];
} MC_SmsData;

```

SMS 가

## ✍ MC\_SmsCmd

```
typedef enum MC_SmsCmd{  
    MC_SMSCMD_READONLY = 0, //  
    MC_SMSCMD_CHANGEREAD, //  
  
    MC_SMSCMD_DELETE, //  
} MC_SmsCmd;
```

SMS

☞ MC\_phnSmsOpen

```

SMS
SMS del 0 MC_phnSmsRead()

가 가
"SHORTMSG, "BROADCAST",
"VOICEMAIL"

cmd SMS 가 MC_phnSmsRead() 가
" ", " ", " ", "
" 가 가 MC_SMSCMD_READONLY , MC_SMSCMD_CHANGEREAD,
MC_SMSCMD_DELETE " " MC_phnSmsRead()
MC_phnSmsRead() SMS
MC_SmsData class " " 0, " " 1
MC_phnSmsOpen() MC_phnSmsRead()
MC_phnSmsClose() 가 MC_phnSmsOpen()
MC_phSmsRead() 가
    
```

M\_Int32 MC\_phnSmsOpen(M\_Byte\* telIDString, MC\_SmsCmd cmd)

telIDString - ( "SHORTMSG" )  
 cmd - MC\_phnSmsRead()

SMS

- M\_E\_NOTSUP -
- M\_E\_NOENT - 가
- M\_E\_ISCONN - OPEN

MC\_phnSmsRead



---

## ✎ MC\_phnSmsClose

SMS  
가 . MC\_telSmsRead ()

M\_Int32 MC\_phnSmsClose(M\_Int32 fd)

fd - SMS

0

MC\_E\_BADFD( 가 )



## ✎ MC\_phnSmsRead

SMS

M\_Int32 MC\_phnSmsRead(M\_Int32 fd, MC\_SmsData\* buf)

fd - SMS

buf - 가

0 1

M\_E\_BADFD - 가

M\_E\_NOENT - 가

M\_E\_INVALID - 가 가 NULL

MC\_phnSmsOpen

---

## ✎ MC\_phnSmsSend

SMS . telIDString MC\_phnSmsOpen() .  
buf SMS .  
256 .

M\_Int32 MC\_phnSmsSend(M\_Byte\* telIDString, M\_Char\* telnum, M\_Byte\* buf,  
M\_Int32 len)

telIDString -

telnum -

buf -

len -

0

M\_E\_NOTSUP -

M\_E\_INVALID - 가

M\_E\_ERROR -

### 7.3.4. HAL API

```

        SMS
        가
        SMS
        . SMS
        가
        가
        가
        MH_SMSEV_NEW
        MH_pI tEvent()
        SMS
        MH_SMS_EVENT
MH_SMSEvent
/

// SMS
. TIA/EIA/IS - 637

typedef struct MH_SmsData{
    M_Byte index; // SMS
    M_Byte class; /*
        , 1
        */
    M_Byte callback[16]; /* ASCII
        " - "
    */
    M_Byte cb_size; // callback
    M_Byte data[512]; // ,CBS user data + url
    callback + image data = max 512
    M_Byte data_size; //
    M_Byte timer[7]; // 0-99
    /**



|        |        |        |        |        |        |
|--------|--------|--------|--------|--------|--------|
|        |        |        |        |        |        |
| 1 byte | 1 byte | 1 byte | 1 byte | 1 byte | 1 byte |


        */
} MH_SmsData;

// 가 SMS
typedef enum MH_SmsCmd{
    MH_SMSCMD_READONLY = 0, //

```

---

```

        MH_SMSCMD_CHANGEREAD , //

        MH_SMSCMD_DELETE, //
    } MH_SmsCmd;

//SMS
typedef enum MH_SUB_SMS_EVENT {
    MH_SMSEV_NEW = 0,          //          가
    MH_SMSEV_SEND_NOTIFY //          가
} MH_SUB_SMS_EVENT;

//SMS
typedef struct MH_SMSEvent {
    M_Int32 event;           // MH_SUB_SMS_EVENT
    M_Int32 parm1;          //event가 MH_SMSEV_SEND_NOTIFY
                            , -1
                            //event가 MH_SMSEV_NEW

    M_Int32 parm2;//event가 MH_SMSEV_NEW          tele -
Service ID
} MH_SMSEvent;

```

✎ MH\_smsOpen

SMS . telIDString  
 (Teleservice)가  
 가  
 가 .

| String      |  |
|-------------|--|
| “SHORTMSG”  |  |
| “BROADCAST” |  |
| “VOICEMAIL” |  |

cmd SMS 가  
 MH\_smsGetNext() 가 “ ”,  
 “ ”, “ ” 가 가 MH\_SMSCMD\_READONLY ,  
 MH\_SMSCMD\_CHANGEREAD, MH\_SMSCMD\_DELETE . “ ”  
 MH\_smsGetNext() MH\_smsGetNext()  
 SMS MH\_SmsData class “ ” 0,  
 “ ” 1 . MH\_smsOpen() MH\_smsGetNext()  
 MH\_smsClose() 가  
 MH\_smsOpen() MH\_smsGetNext() 가 .

M\_Int32 MH\_smsOpen (M\_Char \* tID, MH\_SmsCmd cmd)

[in] telIDString teleservice ID String  
 [in] cmd

SMS

M\_E\_NOTSUP -

M\_E\_ERROR -

M\_E\_ISCONN -

가

✎ MH\_smsGetAvailable

|                 |   |                 |
|-----------------|---|-----------------|
| SMS             | . | MC_smsGetNext() |
| 1               |   | 가 가             |
| MC_smsGetNext() | 가 | 1               |
| .               |   |                 |

M\_Int32 MH\_smsGetAvailable (M\_Int32 tID)


[in] tID

:

:

M\_E\_ERROR -

MH\_smsGetNext

 MH\_smsClose

SMS

```
void MH_smsClose (M_Int32 tID)
```

[in] tID SMS



## ✎ MH\_smsGetNext

SMS . 가  
M\_E\_NOENT 가 .

```
M_Int32 MH_smsGetNext (
    M_Int32 tID,
    MH_SmsData *buf,
)
```

[in] tID SMS  
[out] buf 가

0

M\_E\_NOENT- 가

M\_E\_ERROR -

## ✍ MH\_smsSend

```

SMS . . . . . HAL . . . . .
      256
MH_smsOpen() . . . . . M_E_WOULDBLOCK
      . . . . .
      . . . . . MH_SMSEV_SEND_NOTIFY
      . . . . .
      . . . . .
      . . . . .
M_Int32 MH_smsSend (M_Char* telIDString, M_Char* telnum, M_Byte* buf,
M_Int32 len)

```

```

[in] telIDString
[in] telnum
[in] buf 256
[in] len

```

```

:
0 :
    M_E_ERROR -
    M_E_NOTSUP -
    M_E_WODULDBLOCK -

```

MH\_smsOpen

✍ MH\_smsGetMaximumLength

SMS

M\_Int32 MH\_smsGetMaximumLength (M\_Char\* telIDString)

[in] telIDString

:

:

M\_E\_NOTSUP -



---

  
 MH\_smsSetStateDirect

```
M_Int32 MH_smsSetStateDirect(M_Char * telIDString,M_Int32 idx,MH_SmsCmd cmd)
```

```
[in] telIDString tele-Service ID String( .)
```

```
[in] idx
```

```
[in] cmd
```

```
:
```

```
0
```

```
:
```

```
M_E_NOTSUP -
```

```
M_E_ERROR -
```

```
,MH_smsOpen
```

```
API
```

## 7.4. Media API

Media

### 7.4.1. C API

✍ MC\_MdaToneType

```
typedef enum MC_MdaToneType {
MC_MDA_TONE_0 = 0      //DTMF for 0 key
MC_MDA_TONE_1 ,      //DTMF for 1 key
MC_MDA_TONE_2 ,      //DTMF for 2 key
MC_MDA_TONE_3 ,      //DTMF for 3 key
MC_MDA_TONE_4 ,      //DTMF for 4 key
MC_MDA_TONE_5 ,      //DTMF for 5 key
MC_MDA_TONE_6 ,      //DTMF for 6 key
MC_MDA_TONE_7 ,      //DTMF for 7 key
MC_MDA_TONE_8 ,      //DTMF for 8 key
MC_MDA_TONE_9 ,      //DTMF for 9 key
MC_MDA_TONE_A ,      //DTMF for A key
MC_MDA_TONE_B ,      //DTMF for B key
MC_MDA_TONE_C ,      //DTMF for C key
MC_MDA_TONE_D ,      //DTMF for D key
MC_MDA_TONE_POUND ,  //DTMF for # key
MC_MDA_TONE_STAR ,   //DTMF for * key
MC_MDA_NOTE_A4 ,     //4400 Hz -Piano Notes-
MC_MDA_NOTE_AS4 ,   //4661 Hz
MC_MDA_NOTE_B4 ,     //4938 Hz
MC_MDA_NOTE_C4 ,     //5232 Hz
MC_MDA_NOTE_CS4 ,    //5543 Hz
MC_MDA_NOTE_D4 ,     //5873 Hz
MC_MDA_NOTE_DS4 ,    //6222 Hz
MC_MDA_NOTE_E4 ,     //6592 Hz
MC_MDA_NOTE_F4 ,     //6985 Hz
```

---

```
MC_MDA_NOTE_FS4 , //7399 Hz
MC_MDA_NOTE_G4 , //7840 Hz
MC_MDA_NOTE_GS4 , //8306 Hz
MC_MDA_NOTE_A5 , //8800 Hz
MC_MDA_NOTE_AS5 , //9322 Hz
MC_MDA_NOTE_B5 , //9877 Hz
MC_MDA_NOTE_C5 , //10465 Hz
MC_MDA_NOTE_CS5 , //11087 Hz
MC_MDA_NOTE_D5 , //11746 Hz
MC_MDA_NOTE_DS5 , //12443 Hz
MC_MDA_NOTE_E5 , //13185 Hz
MC_MDA_NOTE_F5 , //13970 Hz
MC_MDA_NOTE_FS5 , //14799 Hz
MC_MDA_NOTE_G5 , //15680 Hz
MC_MDA_NOTE_GS5 , //16612 Hz
MC_MDA_NOTE_A6 , //17600 Hz
MC_MDA_NOTE_AS6 , //18647 Hz
MC_MDA_NOTE_B6 , //19755 Hz
MC_MDA_NOTE_C6 , //20931 Hz
MC_MDA_NOTE_CS6 , //22174 Hz
MC_MDA_NOTE_D6 , //23493 Hz
MC_MDA_NOTE_DS6 , //24891 Hz
MC_MDA_NOTE_E6 , //26370 Hz
MC_MDA_NOTE_F6 , //27937 Hz
MC_MDA_NOTE_FS6 , //29599 Hz
MC_MDA_NOTE_G6 , //31359 Hz
MC_MDA_NOTE_GS6 , //33224 Hz
MC_MDA_NOTE_A7 , //35200 Hz
} MC_MdaToneType;
```

TONE TYPE

## ✎ MC\_mdaSetWaterMark

MC\_MDA\_STATUS\_END\_OF\_DATA, MC\_MDA\_STATUS\_FULL\_OF\_DATA 가  
 (WaterMark) . 90% ,  
 90% MC\_MDA\_STATUS\_END\_OF\_DATA 가 ,  
 90% MC\_MDA\_STATUS\_FULL\_OF\_DATA 가  
 . 100% .

```
void MC_mdaSetWaterMark(MC_MdaClip* clip, M_Int32 percent)
```

clip – [in]

percent – [in] (0-100)



---

 ✎ MC\_mdaClipPutToneData

```
"audio/TONE"
```

```
, MC_mdaClipPutToneData()
```

```
가 가 가
```

```
M_Int32 MC_mdaClipPutToneData (MC_MdaClip* clip, MC_MdaToneType tone[],
M_Int duration[], M_Int32 number)
```

```
clip - [in]
```

```
tone - [in]
```

```
duration - [in]
```

```
number - [in]
```

## ✎ MC\_mdaClipPutFreqToneData

"audio/FREQTONE"

, MC\_mdaClipPutFreqToneData()

가 가 가

```
M_Int32 MC_mdaClipPutFreqToneData (MC_MdaClip* clip, M_Int32 hiFreq[],
M_Int32 lowFreq[], M_Int32 duration, M_Int32 number)
```

clip – [in]

hiFreq – [in] HZ

lowFreq – [in] HZ

duration – [in]

number – [in]

## 7.4.2. Java API

가 Media (org.kwis.msp.media)

## Class Clip

java.lang.Object

|

+- -org.kwis.msp.media.Clip

```
public class Clip
```

```
extends java.lang.Object
```

Player

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

 SND\_TONE\_0

```
public static final int SND_TONE_0
```

DTMF for 0 key.      0      .

 SND\_TONE\_1

```
public static final int SND_TONE_1
```

DTMF for 1 key.      1      .

 SND\_TONE\_2

```
public static final int SND_TONE_2
```

DTMF for 2 key.      2      .

 SND\_TONE\_3

```
public static final int SND_TONE_3
```

DTMF for 3 key.      3      .

✎ SND\_TONE\_4

```
public static final int SND_TONE_4
```

DTMF for 4 key.      4      .

✎ SND\_TONE\_5

```
public static final int SND_TONE_5
```

DTMF for 5 key.      4      .

✎ SND\_TONE\_6

```
public static final int SND_TONE_6
```

DTMF for 6 key.      6      .

✎ SND\_TONE\_7

```
public static final int SND_TONE_7
```

DTMF for 7 key.      7      .

✎ SND\_TONE\_8

```
public static final int SND_TONE_8
```

DTMF for 8 key.      8      .

✎ SND\_TONE\_9

```
public static final int SND_TONE_9
```

DTMF for 9 key.      9      .

✎ SND\_TONE\_A

```
public static final int SND_TONE_A
```

DTMF for A key.      10      .

✎ SND\_TONE\_B

```
public static final int SND_TONE_B
```

DTMF for B key.      11      .

✎ SND\_TONE\_C

```
public static final int SND_TONE_C
```

DTMF for C key.      12      .

✎ SND\_TONE\_D

```
public static final int SND_TONE_D
```

DTMF for D key.      13      .

✎ SND\_TONE\_POUND

```
public static final int SND_TONE_POUND
```

DTMF for # key.      14      .

✎ SND\_TONE\_STAR

```
public static final int SND_TONE_STAR
```

DTMF for \* key.      15      .

✎ SND\_NOTE\_A4

```
public static final int SND_NOTE_A4
```

440.0 Hz -Piano Notes -.      16      .

✎ SND\_NOTE\_AS4

```
public static final int SND_NOTE_AS4
```

466.1 Hz.      17      .

✎ SND\_NOTE\_B4

```
public static final int SND_NOTE_B4
493.8 Hz .    18    .
```

✎ SND\_NOTE\_C4

```
public static final int SND_NOTE_C4
523.2 Hz.    19    .
```

✎ SND\_NOTE\_CS4

```
public static final int SND_NOTE_CS4
554.3 Hz.    20    .
```

✎ SND\_NOTE\_D4

```
public static final int SND_NOTE_D4
587.3 Hz.    21    .
```

✎ SND\_NOTE\_DS4

```
public static final int SND_NOTE_DS4
622.2 Hz.    22    .
```

✎ SND\_NOTE\_E4

```
public static final int SND_NOTE_E4
659.2 Hz .    23    .
```

✎ SND\_NOTE\_F4

```
public static final int SND_NOTE_F4
698.5 Hz .    24    .
```

✎ SND\_NOTE\_FS4

```
public static final int SND_NOTE_FS4
739.9 Hz .    25    .
```

✎ SND\_NOTE\_G4

```
public static final int SND_NOTE_G4
784.0 Hz .    26    .
```

✎ SND\_NOTE\_GS4

```
public static final int SND_NOTE_GS4
830.6 Hz.    27    .
```

✎ SND\_NOTE\_A5

```
public static final int SND_NOTE_A5
880.0 Hz .    28    .
```

✎ SND\_NOTE\_AS5

```
public static final int SND_NOTE_AS5
932.2 Hz.    29    .
```

✎ SND\_NOTE\_B5

```
public static final int SND_NOTE_B5
987.7 Hz .    30    .
```

✎ SND\_NOTE\_C5

```
public static final int SND_NOTE_C5
1046.5 Hz .    31    .
```

✎ SND\_NOTE\_CS5

```
public static final int SND_NOTE_CS5
1108.7 Hz .    32    .
```

✎ SND\_NOTE\_D5

```
public static final int SND_NOTE_D5
1174.6 Hz .    33    .
```

✎ SND\_NOTE\_DS5

```
public static final int SND_NOTE_DS5
1244.3 Hz .    34    .
```

✎ SND\_NOTE\_E5

```
public static final int SND_NOTE_E5
1318.5 Hz .    35    .
```

✎ SND\_NOTE\_F5

```
public static final int SND_NOTE_F5
1397.0 Hz .    36    .
```

✎ SND\_NOTE\_FS5

```
public static final int SND_NOTE_FS5
1479.9 Hz .    37    .
```

✎ SND\_NOTE\_G5

```
public static final int SND_NOTE_G5
1568.0 Hz .    38    .
```



✎ SND\_NOTE\_GS5

```
public static final int SND_NOTE_GS5
1661.2 Hz .    39    .
```

✎ SND\_NOTE\_A6

```
public static final int SND_NOTE_A6
1760.0 Hz .    40    .
```

✎ SND\_NOTE\_AS6

```
public static final int SND_NOTE_AS6
1864.7 Hz .    41    .
```

✎ SND\_NOTE\_B6

```
public static final int SND_NOTE_B6
1975.5 Hz .    42    .
```

✎ SND\_NOTE\_C6

```
public static final int SND_NOTE_C6
2093.1 Hz .    43    .
```

✎ SND\_NOTE\_CS6

```
public static final int SND_NOTE_CS6
2217.4 Hz .    44    .
```

✎ SND\_NOTE\_D6

```
public static final int SND_NOTE_D6
2349.3 Hz .    45    .
```

✎ SND\_NOTE\_DS6

```
public static final int SND_NOTE_DS6
2489.1 Hz .    46    .
```

✎ SND\_NOTE\_E6

```
public static final int SND_NOTE_E6
2637.0 Hz .    47    .
```

✎ SND\_NOTE\_F6

```
public static final int SND_NOTE_F6
2793.7 Hz .    48    .
```

✎ SND\_NOTE\_FS6

```
public static final int SND_NOTE_FS6
2959.9 Hz .    49    .
```

✎ SND\_NOTE\_G6

```
public static final int SND_NOTE_G6
3135.9 Hz .    50    .
```

✎ SND\_NOTE\_GS6

```
public static final int SND_NOTE_GS6
3322.4 Hz .    51    .
```

✎ SND\_NOTE\_A7

```
public static final int SND_NOTE_A7
3520.0 Hz .    52    .
```



✂ Clip

```
public Clip(String type,
            int bufSize)
    CLIP
    HandsetProperty.getSystemProperty("SOUNDDEVICES", "MEDIADVICES")
        MIME "audio/xxx",
"video/xxx" MIME "audio/TONE" putData(int[]
tone, int[] duration, int off, int len) 가
"audio/FREQTONE" putData(int[] hiFreq, int[] lowFreq, int[] duration,
int off, int len) 가 putData(byte[]
buf, int off, int len) CLIP . CLIP
.
CLIP CLIP listener 가
/ 가
CLIP object IllegalArgumentException
```

Parameters:

type -

bufSize -

1. "audio/TONE" 가 3 putData(int[] tone, int[] duration, int off, int len) int[3] tone, int[3] duration .
2. "audio/FREQTONE" 가 3 putData(int[] hiFreq, int[] lowFreq, int[] duration, int off, int len) int[3] hiFreq, int[3] lowFreq, int[3] duration가 .
3. 가 3 , putData(byte[] buf, int off, int len) byte[3] buf가 .

✂ Clip

```
public Clip(String type)
    . Clip(String type, int bufSize)
,
, 가
setBuffer()
```

Parameters:

type -

✍ Clip

```
public Clip(String type,
             byte[] buf)
```

```
"audio/TONE", "audio/FREQTONE"
    . Clip(String type, int bufSize)
```

Parameters:

type -

buf - 가

✍ Clip

```
public Clip(int[] tone,
             int[] duration)
```

```
"audio/TONE"
    . Clip(String type, int bufSize)
```

Parameters:

tone - 가

duration - 가

✍ Clip

```
public Clip(int[] hiFreq,
             int[] lowFreq,
             int[] duration)
```

```
"audio/FREQTONE"
    . Clip(String type, int bufSize)
```

Parameters:

hiFreq - 가

lowFreq - 가

duration - 가

✍ Clip

```
public Clip(String type,
```

String filename)

가

Clip(String type, byte[] buf)

Parameters:

type -

filename - 가

✎ getType

```
public java.lang.String getType()
```

Type

Returns:

Type

✎ setBuffer

```
public boolean setBuffer(byte[] buf,
                        int dataSize)
```

Parameters:

buf -

dataSize -

Returns:

true : , false : 가

✎ setBuffer

```
public boolean setBuffer(int[] tone,
                        int[] duration,
                        int dataSize)
```

. "audio/TONE"

Parameters:

buf -

dataSize -

Returns:

true : , false : 가

✎ setBuffer

```
public boolean setBuffer(int[] hiFreq,
                        int[] lowFreq,
                        int[] duration,
                        int dataSize)
    . "audio/FREQTONE"
```

Parameters:

buf -

dataSize -

Returns:

true : , false : 가

✎ setWaterMark

```
public void setWaterMark(int percent)
END_OF_DATA, FULL_OF_DATA 가 (WaterMark)
90% , 90%
END_OF_DATA 가 , 90%
FULL_OF_DATA 가 . 100% .
```

Parameters:

percent - (0-100)

✎ putData

```
public int putData(byte[] buf,
                  int off,
                  int len)
```

```
"audio/TONE", "audio/FREQTONE"
```

```
, putData(byte[] buf, int off, int len)
```

```
가 가 가
```


Parameters:

buf -

off - offset

len -

Returns:

 putData

```
public int putData(int[] buf,
                  int off,
                  int len)
```

```
"audio/TONE", "audio/FREQTONE"
```

```
, putData(int[] buf, int off, int len)
```

```
가 가 가
```


Parameters:

buf -

off - offset

len -

Returns:

 putData

```
public int putData(int[] tone,
                  int[] duration,
                  int off,
                  int len)
```

"audio/TONE"

```
, putData(int[] tone, int[] duration, int off, int len)()
```

가 가 가

Parameters:


tone - SND\_TONE\_XXX, SNT\_NOTE\_XXX

duration -

off - offset

len -

Returns:

 putData

```
public int putData(int[] hiFreq,
                  int[] lowFreq,
                  int[] duration,
                  int off,
                  int len)
```

"audio/FREQTONE"

```
, putData(int[] hiFreq, int[] lowFreq, int[] duration, int
off, int len)
가 가 가
```

Parameters:

hiFreq - HZ

lowFreq - HZ

duration -

off - offset

len -

Returns:



✍️ `getData`

```
public int getData(byte[] buf,
                  int off,
                  int len)
```

```
        , getData(byte[] buf, int off, int len)
```

가

"VOCODERDEVICES"

Parameters:

buf - 가

off -

len -

Returns:

✍️ `availableDataSize`

```
public int availableDataSize()
```

```
        가 ( 가 )
```

Returns:

가

✍️ `clearData`

```
public void clearData()
```

가

✍️ `setPosition`

```
public boolean setPosition(int ms)
```

```
        , MediaUnsupportedException
```

Parameters:

ms - (milli second)

Returns:

ture :

false :

✎ `getVolume`

가 0 , 100 .

Parameters:

Returns:

: (0-100 )

✎ `setVolume`

`public final boolean setVolume(int level)`

가 0 ,

100 .

Parameters:

level - (0-100 )

✎ `setListener`

`public void setListener(PlayListener listener)`

listener .

Parameters:

listener - listener, null

✎ `playStart`

`protected void playStart(boolean repeat)`

`Player.play(Clip clip, boolean repeat) repeat`

Parameters:

repeat - `Player.play()` repeat

✎ `playUpdate`

```
public void playUpdate(int event, int parm)
```

```
PlayListener.playUpdate()
```

Parameters:

event -

parm - event 가