

2003. 4

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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

1.3.4.

. HAL

1.3.5.

가

1.3.6.

()

Clet

Jlet

(concurrently)

가

1.4.

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

1.5.

가

☞ : 96x54

☞ : 4가 256가

☞ :

☞ :

☞ :

(Non-Volatile)

☞ 가 600KB

☞
400KB

☞ 가 500KB

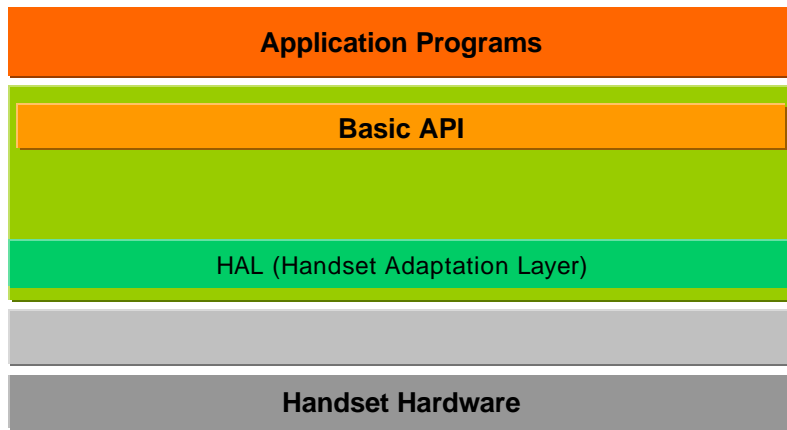
(Volatile)

☞ 가 HEAP 300KB

☞ 가 20KB

2.

S/W 1 가 .



1

✍ HAL (Handset Adaptation Layer)

가 , .

✍ API (BASIC API)

가 API . C

API .

3.

3.1.

3.2.

가 가

3.3.

가 C API(Basic API)

3.3.1. C

API C API C (Semantic)

3.3.2.

API 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
API 가/ API 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

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 MH_KEY_RELEASEEVENT 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_KEYREPEAT_EVENT
 가 MH_KEYREPEAT_EVENT MH_sysGet Information
 () 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

)
    가
    , Main class
"org.kwis.am.Main"
MH_pltStart(0, "org.kwis.am.Main", 0, 0);
)
    가
    , Main class
"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
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 _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 , device가 “,” . device가 M_E_NOTSUP .</p> <p>✍</p> <table border="1"> <tr> <td></td> <td>device</td> </tr> <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 ,</td> </tr> <tr> <td>“audio/MP3”</td> <td>MP3 play ,</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> </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 ,	“audio/MP3”	MP3 play ,	“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 ,																						
“audio/MP3”	MP3 play ,																						
“IS96”	QCELP - 8K																						
“IS96A”	QCELP - 8K																						
“IS733”	QCELP - 13K																						
“IS127”	EVRC - 8K																						

	<p> MIME) 가 CMX, MA1 EVRC-8K , ☞ “Qualcomm_CMX, Yamaha_MA1” </p>
“DNS”	<p> . IP .) “127.0.0.1” </p>
“TIMEZONE”	<p> “GMT+ : “, “GMT- : “ time zone . ,) “GMT+09:30”, “GMT -12:00” </p>
“PHONEMODEL”	<p>ID string</p>
“KEYREPEAT”	<p> “ : ”, ms . M_E_NOTSUP .) “600:250” 600ms MH_KEYREPEAT_EVENT 가 , 250ms </p>
“VIBRATORLEVEL”	<p> 가 . (0, 100)) “3” 3 “1” 1 </p>
“VOLUMELEVEL”	<p> 가 . (0, 100)) “10” 10 “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_pIltEvent() 가
        가 MH_pIltEvent() ISR(interrupt service
routine) , 가
        MH_pIltEvent() context
        (Critical Section) MH_sysLock()
        MH_sysUnlock() 가 MH_pIltEvent()
        HAL
MH_sysLock(), MH_sysUnlock nested
MH_sysLock() lock , MH_sysUnlock
lock

```

void MH_sysLock (void)

MH_sysUnl ock

✍ MH_sysUnlock

MH_sysLock ..

void MH_sysUnlock (void)

MH_sysLock

✍ MH_sysHallInit

Hal .
HAL API . HAL
API 가 API .

void MH_sysHallInit (void)

✍ MH_sysHalExit

. HAL

HAL

void MH_sysHalExit()

✍ MH_sysWait

Binary semaphore wait .

. HAL

가 blocking CPU power

void MH_sysWait (void)

✍ MH_sysSignal

Binary semaphore signal .

가 MH_sysWait() blocking .

MH_pItEvent() . MH_sysSignal() ISR

void MH_sysSignal (void)

✍ MH_debugPutChar

HAL API, (console) API

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

[in] ch -

4.4. CALL

```


,
MH_CALL_EVENT   MH_CallEvent
가
MH_pltEvent()

//
typedef enum MH_SUB_CALL_EVENT {
    MH_CALLEV_INCOMING = 0,      // 가
    MH_CALLEV_NOTIFY          // MH_callPlace() /
} MH_SUB_CALL_EVENT;

//
typedef struct MH_CallEvent{
    M_Int32 event;              // Event, enum _MH_SUB_CALL_EVENT

    M_Int32 rtnCode;          /**0 : MH_callPlace()가
                             , -1 : MH_callPlace()가 */
} MH_CallEvent;

```

 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
virbrator 가 . level
0-100 . 100 가 가 0
가 . 0-100 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_pI tEvent ()
        가
MH_NETWORK_EVENT
        MH_NetEvent

```



```

//
        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_netConnect

(NonBlocking) M_E_WOULDBLOCK
 가
 가 MH_NETEV_NETWORK_OPEN
 가 MH_NETEV_NETWORK_CLOSE

M_Int32 MH_netConnect (void)

0

M_E_WOULDBLOCK - 가 가

M_E_INPROGRESS -

M_E_ISCONN - 가

M_E_ERROR -

✎ 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_WODULDBLOCK -

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_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, 57600, 115200		115200
parity	even, odd, no		no
size			8
flow	hardware, software, 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_SERIALWRITE
MH_SERIALWRITE
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_WOULDBLOCK -
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
    (MH_MDAEV_TONE_EMPTY)
    (MH_MDAEV_TONE_EMPTY)
    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(가 0, MH_mdaTonePlay, MH_mdaFreqTonePlay)
 MH_MDAINFO_CALL_BY_REFERENCE bit가
2. MH_MDAINFO_CALL_BY_REFERENCE bit MH_mdaWriteData(가 0, MH_mdaTonePlay, MH_mdaFreqTonePlay)가 bit가가
3. MH_MDAINFO_PAUSE_RESUME bit가 pause/resume
4. MH_MDAINFO_SEEK bit가 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_SOUND_EMPTY)
        [ (MH_MDAEV_SOUND_EMPTY)
        가 ].
MH_mdaStop()가 가
가 . 가
가
가 MH_MDAEV_SOUND_ERROR
. pause/resume ,
MH_mdaWriteData 가 ,
MH_mdaResume . pause/resume
MH_mdaWriteData ,
MH_mdaWriteData 가

```

```

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

```

```

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

```

M_E_ERROR - 가
M_E_NOTSUP -

MH_mdaPause

가 . MH_mdaResume 가
(state)
가 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_mdaStop

/ 가
가 가 . 가
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 . . . 0, 100 .
가 ,
가 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_Char* cmd, M_Byte* buf1, M_Byte*
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 MH_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_Unicode *puni, M_Int32 len,
M_Unicode *plocal, M_Int32 buflen);
```

[in] unicode


[in] puni “Unicode”

[in] len

[out] puni “C” (“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 -

M_E_EXIST -

M_E_ERROR -

가

가

✎ 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_fileSeek

pos pos ,
3 가

M_Int32 MH_fileSeek (M_Int32 fd, M_Int32 pos, M_Int32 where)

[in] fd
[in] pos , / 가
[in] where MH_FILE_SEEK_SET, MH_FILE_SEEK_CUR, MH_FILE_SEEK_END

M_E_INVALID - MH_FILE_SEEK_SET, MH_FILE_SEEK_CUR, MH_FILE_SEEK_END
M_E_BADSEEKPOS - 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_pltEvent

```

 MH_IMAgetSurpportModeCount


_Int32 MH_IMAgetSurpportModeCount()

✎ MH_IMAgetSupportedModes()

. . . , 가 . ISO 639
"EN/S" 가
"KO"

char** MH_IMAgetSupportedModes()

()

 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 .)

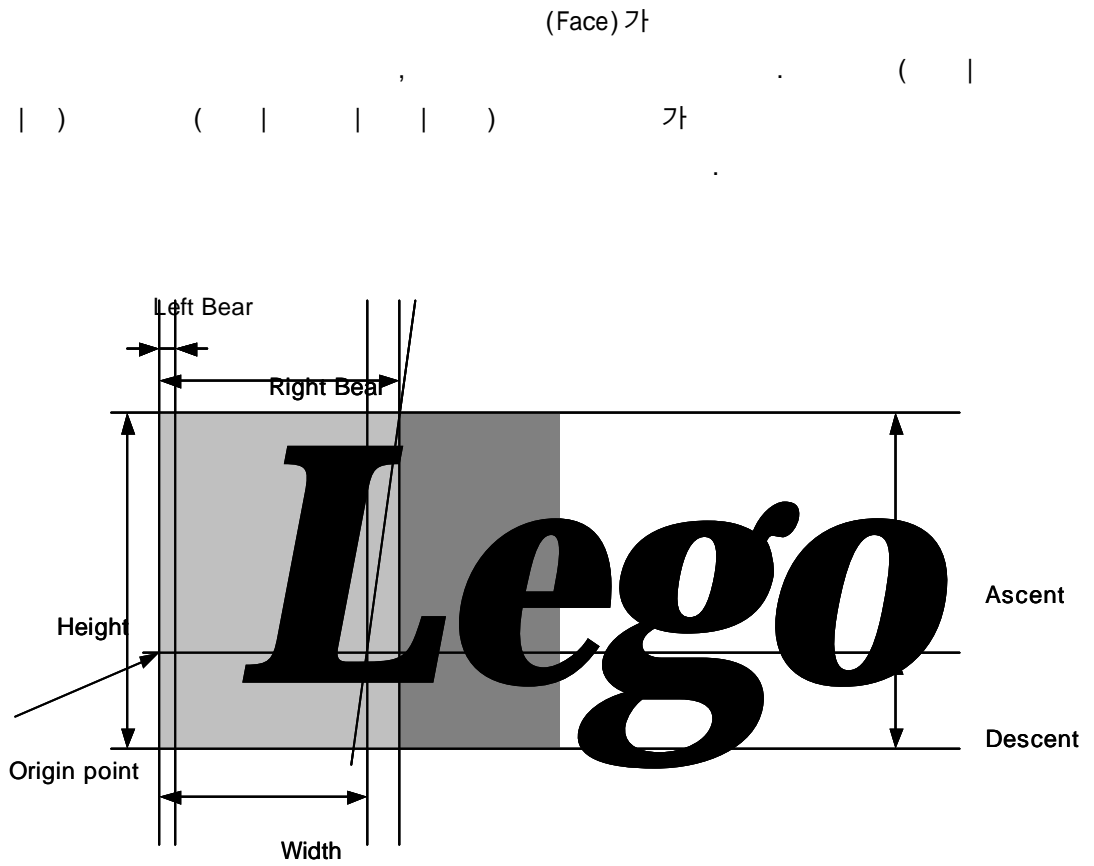
buf1 [out]

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) .

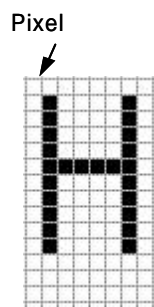
M_Int32 MH_fnGetFontDescent (M_Int32 font)

[in] font

(Descent)

✎ MH_fnGetCharGlyph

LCD 가 LCD
 가 (0,
 0) (1, 0), (2, 0), ... (0, 1), (1, 1) ...



LCD가 16bit

```
M_UInt8 *pbuf = MH_fnGetCharGlyph(fontid, 'H', blackPixel, whitePixel, &bpl);
M_UInt16 *ppxls = (M_UInt16 *)pbuf;
가 , , ppxls[0] whitePixel ppxls[bpl*1]
whitePixel, ppxls[bpl * 1 + 1] blackPixel
```

```
const M_UInt8 *MH_fnGetCharGlyph(
    const M_Int32 fontid,
    const M_UInt16 ch,
    const M_UInt32 fgPxl,
    const M_UInt32 bgPxl,
    M_Int32 *pbpl,
)
```

[in] fontid

[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

4.14. Frame Buffer

```

LCD
,
LCD
, Double Buffering
. MG_fbGetScreenBuffer()
,
.
MG_fbFlushLcd()
LCD
.

```

✍

```

typedef struct _MH_DisplayInfo MH_DisplayInfo {
//
M_Int32 bpp;
//
24bit
bpp
32 가
, depth
24 가
. 2
depth
M_Int32 depth;
//
;
M_Int32 width;
//
;
M_Int32 height;
//
; PADDING
M_Int32 bpl;
// LCD 가 GrayScale
TRUE COLOR
M_Int32 colortype;
// TRUE
red
mask
M_Int32 redmask;
// TRUE
blue
mask
M_Int32 bluemask;
// TRUE
green
mask
M_Int32 greenmask;
};

```

```
#define MH_FB_MAIN_LCD      1
#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 –

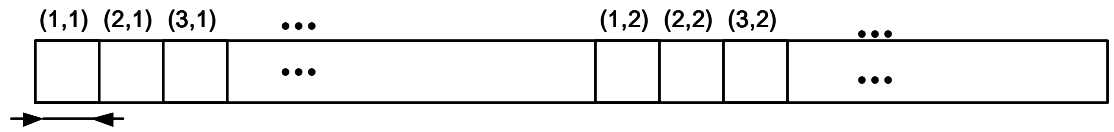
r - (0-255)

g - (0-255)

b - (0-255)

✎ MH_fbGetScreenBuffer

LCD 가 LCD
 LCD
 -(bits per pixel * width + padding) / 8 * height - ,
 가
 Dual LCD LCD LCD depth()가
 가 , LCD 가 가
 가 LCD , MG_fbFlushLcd
 (가) LCD
 LCD
 가



Pixel (LCD가 16bit 2byte가 , 8bit 1byte가)

M_Uint8* MH_fbGetScreenBuffer (M_Int32 lcd_num)

lcd_num - [in] (0; 1; LCD)

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 = . param2 = 0
MV_KEY_REPEAT_EVENT	가	param1 = . param2 = 0
MV_KEY_RELEASE_EVENT	가	param1 = . param2 = 0
MV_CHILD_APP_START_EVENT		param1 = . param2 = 0
MV_CHILD_APP_DESTROY_EVENT		param1 = . param2 =
MV_USER_EVENT		param1 =

		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

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_knICall loc()
```

```
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_knlDefTimer, MC_knlSetTimer, MC_knlUnsetTimer
```

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_knlSprintk

```
int MC_knlSprintk(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, vendor가 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 argLen = 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

✎ MC_knlExit

```
void MC_knlExit(M_Int32 exitCode)
```

```

    return ,
    MC_knlExit()
    MV_CHILD_APP_DESTROY_EVENT(exitCode
    A 가 B B 가 exitCode 27

```

```

program A

void handleCletEvent(int type, int parm1, int parm2)

switch(type) {
case MV_CHILD_APP_DESTROY_EVENT :
    knlPrintk("exit code %d\n", parm1); // 27
    break;

case XXX :
    ...
    execute("B", ...);
    ...
    break;

}

...
}

program B

void handleCletEvent(int type, int parm1, int parm2) {

    ...
    if ( xxx ) {
        MC_knlExit(27);
        return
    }

}

```

exitCode - [in]

 MC_knIProgramStop

M_Int32 MC_knIProgramStop(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()


0

MC_GETDPTR()

size - [in] (byte)

0

가

 MC_kniFree

```
void MC_kniFree(M_Uint32 mID)
```

```
MC_kniCalloc()
```

```
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)
```

. API HAL

```
"ESN", "NID", "SID", "BASELAT", "BASELONG", "CURRENTCH",
"PHONENUMBER", "RSSILEVEL", "BATTERYLEVEL",
"DATASERVICEMODE", "MAXSOCKETNUM", "MAXRSSILEVEL",
"MAXSERIALNUM", "MAXBATTLEVEL", "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)
```

. API HAL

가 .

"ESN", "NID", "SID", "BASELAT", "BASELONG", "CURRENTCH",
 "PHONENUMBER", "RSSILEVEL", "BATTERYLEVEL",
 "DATASERVICEMODE", "MAXSOCKETNUM", "MAXRSSILEVEL",
 "MAXSERIALNUM", "MAXBATTLELEVEL", "MEDIADEVICES", "DNS"
 id .

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)
 . , xor
 alpha xor 가 .

/

BMP, PNG .

```

MC_grpCreatelImage
. MC_grpDrawImage .
animated MC_grpDecodeNextImage
. MC_grpDestoryImage .
MC_grpEncodelImage BMP
.
LCD
.
LCD
, MC_grpFlushLcd LCD
.
LCD 가 가 LCD LCD 가
. LCD MC_grpFlushLcd
LCD . ( .) MC_grpFlushLcd
가
,
가 , 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_Grplmage

```
typedef void * MC_Grplmage
```

```
    . ( )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_Grplmage 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 x, y 가 가 , x, y 가
MC_GRP_CONTEXT_FG_PIXEL_IDX	.
MC_GRP_CONTEXT_BG_PIXEL_IDX	.
MC_GRP_CONTEXT_ALPHA_IDX	0 255 0 255 MC_GRP_CONTEXT_PIXEL_OP_IDX 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 , 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_PIXELOP_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_PIXEL_OP_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)
```

pgc 가 (Frame Buffer) 가 , /
(x,y) 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 w, h 가 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 , /

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_knlAlloc

ID

가

MC_grpDestroyImage 가

newImg - [out]

;

NULL

bufID - [in]

가

MC_knlAlloc

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 - [out]

- MC_GRP_FRAME_DONE : 가
- MC_GRP_IMAGE_DONE : 가 ,
- 가
- M_E_NOMEMORY : 가
- M_E_BADFORMAT :

✎ MC_grpEncodeImage

```
M_Int16 MC_grpEncodeImage(MC_GrpFrameBuffer src, M_Int32 x, M_Int32 y,
M_Int32 w, M_Int32 h, M_Int32* len)
```

		BMP	
	len		MC_kniCalloc
ID	.		
src - [in]			
x	- [in]	x	
y	- [in]	y	
w	- [in]		
h	- [in]		
len	- [out]		
ID,		NULL	

✎ 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()
```

```
        .           ,           가           .           ISO 639  
        "/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 .)

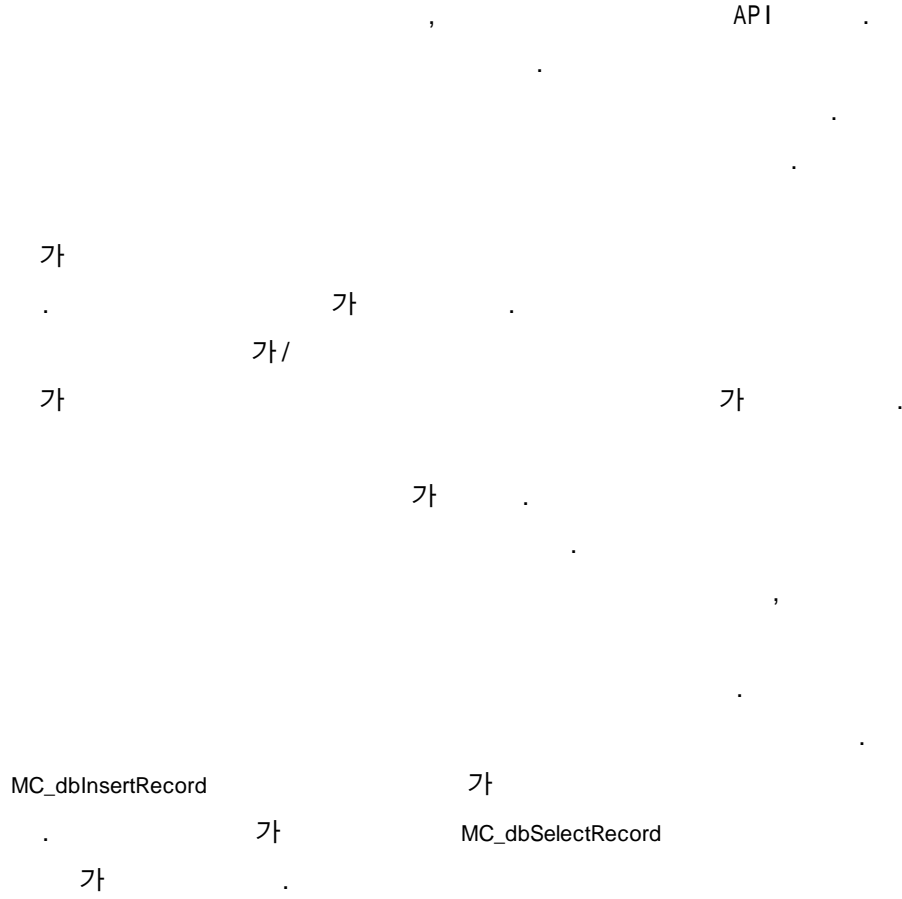
buf1 [out]

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

MC_dbSortRecords

가	가 2	가 4
0	0x33 0x22	
1	0x11 0x22	
2	0x22 0xff	
3	0x11 0xff	

*
 1, 3, 2, 0
 compare
 filter NULL 가 4()가 (compare
 compare
 . compare 가
 가 0 , 0 ,
 filter 가 0 .
 filter 가 0 .

```
M_Int32 MC_dbSortRecords(M_Int32 dbID, M_Int32* buf, M_Int32 len, M_Int32
(*compare)(const void *, const void *), M_Int32 (*filer)(const void *))
```

dbld -
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 - where가

M_E_BADSEEKPOS - 가

✎ MC_fsFileAttribute

가 MC_FileInfo

```

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

```

bit mask

fa->attrib MC_FILE_IS_DIR bit가 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
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] fiileName

[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

☞ NETHHTTPCB

```

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

```

typedef void (*NETHHTTPCB)(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_WOULDBLOCK -

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_knIGetSystemProperty () 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_knIGetSystemProperty

✎ 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
 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_netHttpGetRequestMethod

```

HTTP (Request Method)
MC_netHttpSetRequestMethod()
"GET" buf
NULL 가 NULL
가 MC_netHttpConnect() M_E_ERROR

```

```
M_Int32 MC_netHttpGetRequestMethod(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_netHttpRequestConnect()

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_netHttpRequestConnect

✎ 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_netHttpGetType() 가 MC_netHttpGetType() 가
 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_netHttpGetType

✎ MC_netHttpGetEncoding

가 MC_netHttpGetEncoding() 가 MC_netHttpConnect() 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 .
        MC_mdaClipPutData() ,
file 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 ,
가
MC_MDA_STATUS_FULL 가 . 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
. 0-100
가 가
. 가 가
MC_knlGetSystemProperty( ) 가 , => 1-50 : 51-100 :
가 , , => 1-33: , 34-66: ,
67-100:

M_int32 MC_mdaGetVolume()
```

✎ MC_mdaSetVolume

MC_mdaSetVolume(M_Int32 value, Clip API)

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

✎ MC_srlOpen

```

        param
        0
        := [
        := " " *(, " ")
        :=
        :=
    
```

baudrate	9600, 19200, 38400, 57600, 115200		115200
parity	even, odd, no		no
Size			8
Flow	hardware, software, no		no

가 , 8 ,
, 115200

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

M_Int32 MC_srlOpen(M_Int32 port, M_Byte* param)

port - (0 ~ (- 1));
param -

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

M_E_WOULDBLOCK . MC_srlSetReadCB 가

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 -

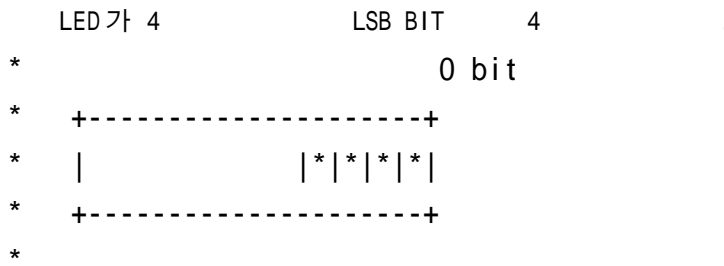
timeout - . on_off 가 MC_DEV_LIGHT_ON

0

M_E_ERROR ? 가

 MC_miscSetLed


LED on/off . bit가 1 on, 0 off .
)



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 Odering Network Byte Odering .

M_Int32 MC_utilHtonl(M_Int32 val)

 MC_utilHtons


M_Int16 Host Byte Oding Network Byte Oding .

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_utilNtohs

M_Int16 Network Byte Oding Host Byte Oding .

M_Int16 MC_utilNtohs(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)
```

				가	1
		0			
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_uicSetlabelAlignment

M_Int32 MC_uicSetlabelAlignment(MC_UicComponent cc, M_Int32 align)

MC_ALIGN_LEFT, MC_ALIGN_RIGHT, MC_ALIGN_CENTER

,
가 ,
가

cc - [in]

align - [in]

MC_ALIGN_LEFT, MC_ALIGN_RIGHT,

MC_ALIGN_CENTER

✎ 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)
```


	가	가		.
pd	C	time.h	tm	.

cc - [in]

pd - [in] . time.h

✎ MC_uicSetTimeLong

```
void MC_uicSetTimeLong(MC_UicComponent cc, time_t time)
```

time_t
time

가

C

time.h

time()

.

cc - [in]

time - [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_GrplImage* img)
```

가 .

가 가 .

cc - [in]

idx - [in] 가

psz - [out]

buflen - [in]

img - [out]

1 0 M_E_SOFTBUF: 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_uicSetMaxTextSize

```
M_Int32 MC_uicSetMaxTextSize(MC_Component cc, M_Int32 max)
```

```
    .
    .
    가          가
    .          .
    256
    .
    max
    .
    max
    .
    cc - [in]
    max - [in] ( )
    .
    ; 가 M_E_NOMEMORY 가
```

✎ 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_Grplmage* 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)
```

```

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    .
        .
            .
                .
                    .
                        .
                            .
                                .
                                    .
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                                            .
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                                                                                                                                                            .
                                                                                                                                                                .
                                                                                                    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

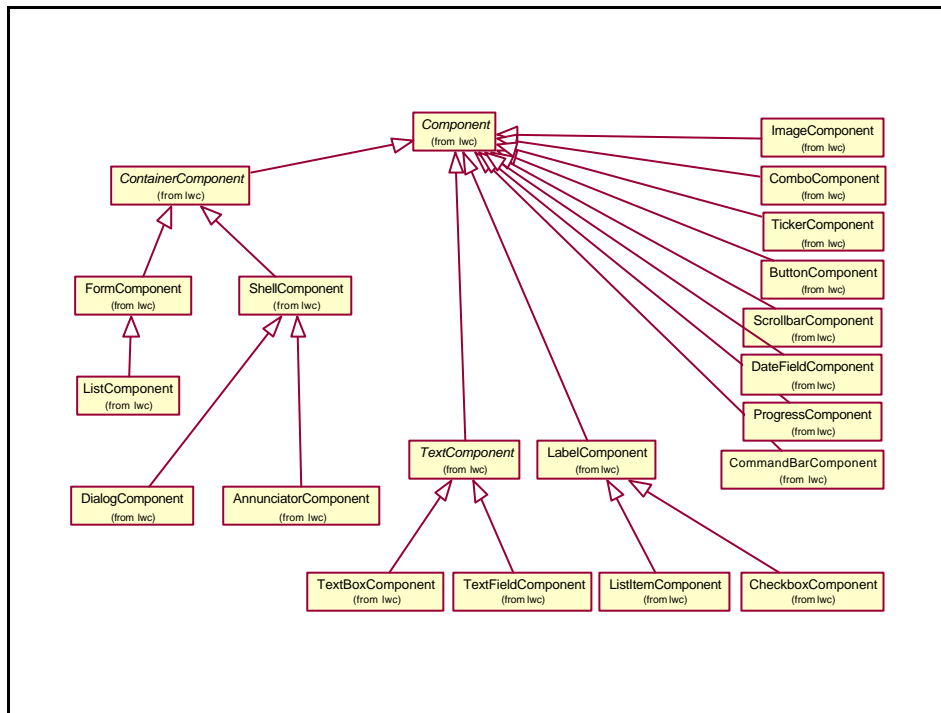
5.2. API

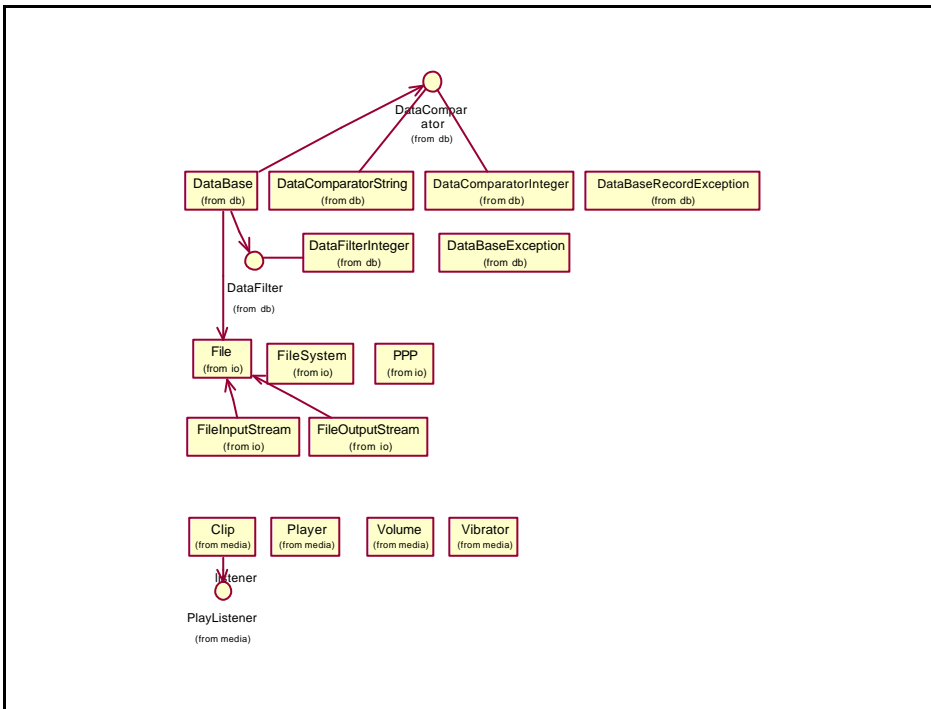
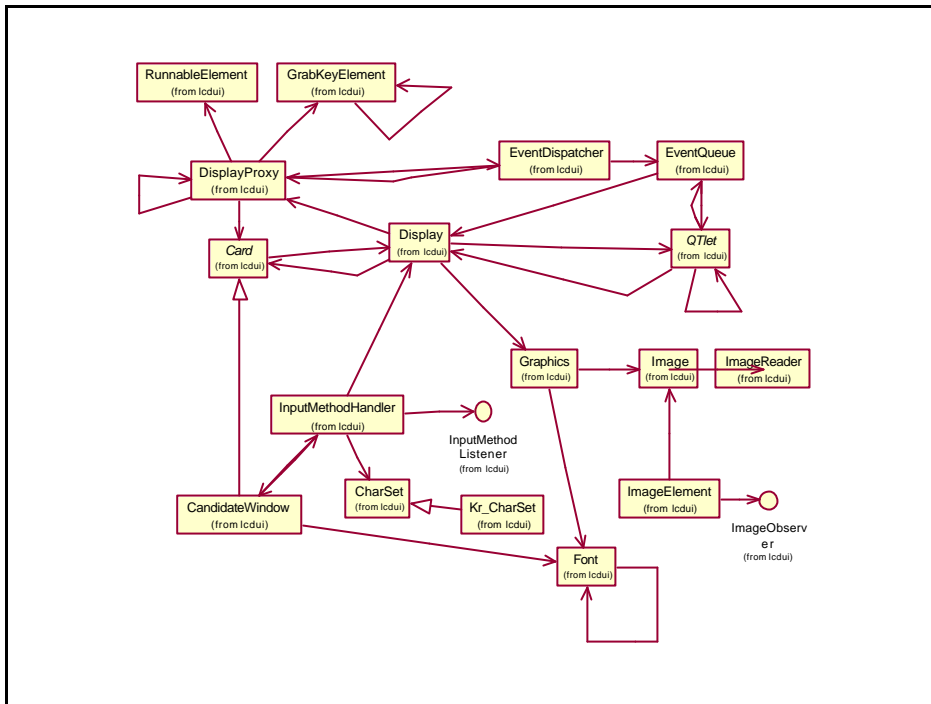
java.lang,

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	buf
	count
	ByteArrayOutputStream()
	ByteArrayOutputStream(int)
	reset()
	size()
	toArray()
	toString()
	write(byte[], int, int)
	write(int)
DataInput	readBoolean()
	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)
InterruptedIOException	bytesTransferred
	InterruptedIOException()
	InterruptedIOException(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`

```
public int setOffset(int val)
```

`getData()` 가
`getData()` 가

`getLength()`

0

-1

Parameters:

val-

Returns:

 `getAddress`

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

Returns:

 `getAddressInt`

```
public int getAddressInt()
```

Returns:

✍ getDate

```
public java.util.Date getDate()
```

```
가 .
```

Returns:

```
: 가 .
```

```
: null .
```

✍ setDate

```
public void getDate(java.util.Date date)
```

```
가 .
```

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



Class URL

java.lang.Object

|

+-org.kwis.msf.io.URL

public class URL

extends java.lang.Object

```

URL.find(      URL(RFC1738      )      . URL
      (scheme)
      (stream)      URL
      TCP      URL(socket://      )
      (Socket)
    
```

	URL		
TCP	socket://<IP >:< >[/< >/< >] serversocket://:< > [/< >/< >]	socket://111.11 1.111.111:80 socket://111.11 1.111.111:80/rw /3000	<pre> . :r(), w(), rw(가) . : . 0 . . . "rw", "0 ". (serversocket ://) . . </pre>

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

 Shared

```
public Shared()
```

 createBuf

```
public static byte[] createBuf(int size)
```

```

        create . byte array 1 create . create
    buf buf .
        MIME type

```

Parameters:

size - byte array

Returns:

buf, 가 null .

getBuf

```
public static byte[] getBuf()
```

shared .

Returns:

, shared buffer가 null

resizeBuf

```
public static byte[] resizeBuf(int size)
```

. 가

가 0 .

가 .

가 object가 ,

object 가 가

Parameters:

size -

Returns:

가

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
```

```
    . sortRecord
```

```
    가
```

```
    DataFilter
```

```
    가
```

See Also:

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

 filter

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

Parameters:

data -

Returns:

```
가
```

```
true,
```

```
false
```

Class DataBase

java.lang.Object

|

+ - org.kwis.msp.db.DataBase

public class DataBase

extends Object

Jlet

()

Jlet

()

ID 0 가 ID Integer ID
 1 가 . 가 ID
 ID .
 가/ 가
 가 . MSP 가
 (compaction)

Jlet

가

Jlet

Jlet

Jlet

Jlet

Jlet

()

DataFilter

DataComparator

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,
IllegalArgumentOutOfRangeException

가 .

.

가

(garbage)

selectRecord

(garbage)

Parameters:

data - 가

offset - 가

numBytes -

Returns:

ID

Throws:

DataBaseRecordException - 가

DataBaseException -

IllegalArgumentOutOfRangeException - 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
    {
        .
        .
        .
    }
```


Parameters:

recordId - ID

Throws:

DataBaseException -

DataBaseRecordException - ID가

 selectRecord

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

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
```

ID

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()
```

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:

 `getNumberORecords`

`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) (big-endian) , sortRecord 가

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

IllegalArgumentException

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 `URLConnection`

Returns:

InputStream

Throws:

IOException - InputStream

See Also:

[InputStream](#)

 `openDataInputStream`

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

DataInputStream 가 . DataInputStream InputStream

Specified by:

`openDataInputStream` in interface `URLConnection`

Returns:

DataInputStream


Throws:

IOException -

InputStream

See Also:

[DataInputStream](#)

 `openOutputStream`

```
public OutputStream openOutputStream()
                        throws IOException
```

OutputStream 가 . OutputStream DataOutputStream

Specified by:

openOutputStream in interface OutputConnect ion

Returns:

OutputStream

Throws:

IOException -

OutputStream

See Also:

[OutputStream](#)

 `openDataOutputStream`

```
public DataOutputStream openDataOutputStream()
                        throws IOException
```

DataOutputStream 가 . DataOutputStream

OutputStream .

Specified by:

openDataOutputSt ream in interface OutputConnect ion

Returns:

DataOutputStream


Throws:

IOException -

OutputStream

See Also:

[DataOutputStream](#)

 close

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

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
, 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
```

Descriptor)

가

(Jlet

. 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 . dirname MAX_FILENAME_LENGTH
IOException .
```

Parameters:

dirname -

Throws:

IOException - 가 ,
가

✍ rmdir

```

public static void rmdir(String dirname,
                          int flag)
    throws IOException,
           SecurityException
    {
        if (dirname == null)
            throw new NullPointerException();
        if (flag > MAX_FILENAME_LENGTH)
            throw new IOException();
    }

```

Parameters:

dirname -

flag -

Throws:

SecurityException -

IOException - 가 ,
가

toCString

```

public static byte[] toCString(String jStr)
    {
        return toCString(jStr, 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
```

```

        . name null
NullPointerException . name MAX_FILENAME_LENGTH
IOException
Parameters:
name -
Returns:
name true, false

```

isDirectory

```

public static boolean isDirectory(String name,
                                  int flag)
    throws IOException,
           SecurityException

```

```

        . name null      NullPointerException . name
MAX_FILENAME_LENGTH    IOException
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\(java.lang.String, org.kwis.msp.lcd.ImgObserver\)](#),
[Image.play\(org.kwis.msp.lcd.ImgObserver\)](#)

Interface InputMethodListener

```
public interface InputMethodListener
```

```
InputMethodHandler - /
```

```
 / - . InputMethodListener
```

```
InputMethodHandler
```

```
InputMethodHandler.setInputMethodListener\(org.kwis.msp.lcd.ui.InputMethodL  
istener\) . 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.getGameAction\(int\)
        가
        Display.getKeyCode\(int\)

```


가 pushCard, popCard ,
 showNotify 가 .
 , 가 y 가 ,
 가 x 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 , 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.getDefaultDisplay
Display Card .
```

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
Card

Display

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
```

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 ,

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
```



Class Display

```
java.lang.Object
|
+--org.kwis.msp.lcdui.Display
```

```
public class Display
```

```
extends Object
```

```

    LCD가
    Display Card , pushCard
    Display Card Card paint
    (LCD) Display Display 가
        LCD가 Jlet
        Display
        가
        Card Card Card
        Card가
        Card Card
    Card Card
    Card
    InputMethodHandler
    가
    LCD Display ( , )
    가

```

See Also:

[Card](#)

Methods inherited from class java.lang.Object
equals, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait



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
가
        .
        Jlet
        Display

```

Returns:

✍ callSerially

```
public final void callSerially(Runnable r)
```

```

가
        Runnable
        run
        'Runnable'
        ,
        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'
        thread가
        .
        .
        r.run()
        Runnable
        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)
```

gameKey EventQueue.UP,
EventQueue.DOWN, EventQueue.LEFT, EventQueue.RIGHT, EventQueue.FIRE,
EventQueue.GAME_A, EventQueue.GAME_B, EventQueue.GAME_C,
EventQueue.GAME_D, 가 ,

가 0

Returns:

See Also:

[EventQueue](#)

 getKeyName

```
public static String getKeyName(int key)
```

[EventQueue](#)

가 null
"UP", "DOWN"

Returns:

See Also:

[EventQueue](#)

 getGameAction

```
public static int getGameAction(int key)
```

ITU-Key '0' - '9', '*', '#"

getGameAction

[EventQueue](#)

가 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)

```

        .
        .
        .
        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
    , Jlet 가
    가
    가 EVENT_SIZE가
    가
    , POINTER_EVENT
    가

```

event[0]	Event[1]	event[2]	event[3]
KEY_EVENT	KEY_PRESSED KEY_RELEASED KEY_REPEATED KEY_TYPED	(ITU ascii)	0
POINTER_EVENT	POINTER_PRESSED POINTER_RELEASED 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 .
```

 RSSI_EVENT

```
public static final int RSSI_EVENT
RSSI LEVEL . 5 .
```

 BATT_EVENT

```
public static final int BATT_EVENT
LEVEL . 6 .
```

 CALL_EVENT

```
public static final int CALL_EVENT
Call Notify . 7 .
```

 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

IllegalThreadStateException .

Card keyNotify, paint

가

가

Parameters:

event - 가 . EVENT_SIZE .

Throws:

ArrayIndexOutOfBoundsException - 가 'EVENT_SIZE'

IllegalThreadStateException - 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

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:

IllegalArgumentException - face, style, size 가

charsWidth

```
public int charsWidth(char[] ch,
                      int offset,
                      int length)
```

가
ch가 가 offset length
가

Parameters:

ch -

offset -

length -

Returns:

Throws:

`ArrayIndexOutOfBoundsException` - offset length 가

`NullPointerException` - ch가 null

 `charWidth`

```
public int charWidth(char ch)
```

. ch가

' '(0x20)

' '가

Parameters:

ch -

Returns:

 `getBaselinePosition`

```
public int getBaselinePosition()
```

(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)
```

. `str`가 `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
```

```
,
```

```
가
```

```
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 length가

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)
```

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
fillRoundRect
width
height가 0
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

See Also:

[drawString\(String, int, int, int\)](#)

✍ drawArc

```
public void drawArc(int x,
                   int y,
                   int width,
                   int height,
```



```
int startAngle,
int arcAngle)
```

```
startAngle      arcAngle      0 가 x      가
      Y      가      , 3      .
      ,
      (x, y)      width , height가      가
      , drawRect      가 width + 1      height + 1
가      .      가 0
```

Parameters:

x - - x

y - - y

width - 가

height - 가

startAngle -

arcAngle -

See Also:

[fillArc\(int, int, int, int, int, int\)](#)

fillArc

```
public void fillArc(int x,
int y,
int width,
int height,
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\(int, int, int, int\)](#)

 `getWidth`

```
public int getWidth()
```

Returns:

See Also:

[clipRect\(int, int, int, int\)](#), [setClip\(int, int, int, int\)](#)

 `getX`

```
public int getX()
```

x

Returns:

x

See Also:

[clipRect\(int, int, int, int\)](#), [setClip\(int, int, int, int\)](#)

 `getY`

```
public int getY()
```

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\(org.kwis.msp.lcd.ui.Font\)](#)

 getGrayScale

```
public int getGrayScale()
```

setGrayScale

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:

`SOLID` `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
 0x00RRGGBB . 8bit RGB ,

Parameters:

rgb -

setColor

```
public void setColor(int r,
                    int g,
                    int b)
```

가 RGB . 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 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 (x, y) 위치의 픽셀의 RGB 값을 0x00RRGGBB 형태로 반환한다.

Parameters:

x - 픽셀의 x 좌표

y - 픽셀의 y 좌표

Returns:

픽셀의 RGB 값

✍ `setPixel`

```
public void setPixel(int x,
                    int y)
```

(x, y)

Parameters:

x - 픽셀의 x 좌표

y - 픽셀의 y 좌표

✍ `getPixels`

```
public void getPixels(int x,
                     int y,
                     int w,
                     int h,
                     byte[] pixels,
                     int offset,
                     int bpl)
```

가
가 . Graphics

, setPixel

Parameters:

x - 가 x

y - 가 y

w - 가

h - 가

pixels -

offset -

bpl - 가

Throws:

ArrayIndexOutOfBoundsException - pixels 가. $(h * bpl + (w * bit \text{ per pixel} + 7) / 8)$

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. $(h * bpl + (w * bit \text{ per pixel} + 7) / 8)$

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 가. $(h * bpl + (w * bit \text{ per pixel} + 7) / 8)$

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

Class Image

```
java.lang.Object
|
+--org.kwis.msp.lcdui.Image
```

```
public class Image
```

```
extends Object
```

```

        .           gif png 가
        ,
        .           getGraphics 가 .
        가 가 가 가
        ,
        가 .
        가 , mask
        mask , mask
        가 .
        gif(animated), png, bmp(RLE ) .
    
```

Methods inherited from class java.lang.Object

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

Image

protected Image()

createImage

```
public static Image createImage(byte[] imagedata,
                                int imageoffset,
                                int imagelength)
```

data
imageoffset
imagelength
가
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 - 가 animation

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:

IllegalArgumentException - 가

NullPointerException - name null .

See Also:

[Class.getResourceAsStream\(java.lang.String\)](#)


 `getGraphics`

```
public Graphics getGraphics()
```

가
가
null
Graphics

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)
```

```

        . Animation 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.lcdiui.InputMethodHandler

```
public class InputMethodHandler
```

```
extends Object
```

```
InputMethodHandler
```

```
notifyKeyInput(int keyCode)
```

```
InputMethodListener
```

```
InputMethodListener가
```

```
notifyKeyInput(int) false
```

```
InputMethodListener
```

```
setInputMethodListener(org.kwis.msp.lcdiui.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()
```

가 ISO 639
 "/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

notifyTextChanged

InputMethodListener

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:

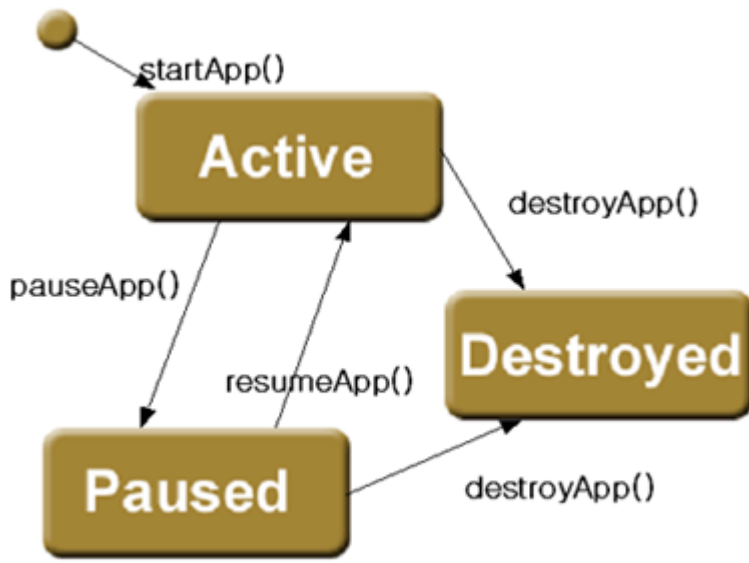
IllegalArgumentException - w,h '0'



Class Jlet

```
java.lang.Object
|
+--org.kwis.msp.lcdui.Jlet
```

```
public abstract class Jlet
extends Object
MSP
MSP
MSP
Thread Card Jlet
Jlet 가 가 . Jlet active 가 ,
pause 가 .
active
Jlet destroyed , Jlet
pauseApp() resumeApp(),
startApp(), destroyApp() 가 .
```



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
        ,
        . 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)

. key
가 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)
```

```
    action .
```

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 . o
ActionListener action . ActionListener
ActionListener .
```

Parameters:

`l` - ActionListener

`o` -

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 . 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, getPreferredSize, getPreferredSize, getPreferredSize, 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` 가
`CheckboxGroup` . `CheckboxGroup` null
`Checkbox`가 .

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` . `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 . 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\(int, java.lang.String, org.kwis.msp.lcd.ui.Image\)](#)

 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:

String, null

 getSize

```
public int getSize()
```

ComboComponent

Returns:


가

 getSelectedIndex

```
public int getSelectedIndex()
```

Returns:

int, -1

 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 , 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
    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)
```


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
    . obj          가          Object          가          getExtObject
```

Parameters:

str -

obj - Object

 Command

```
public Command(String str,
                Image img,
                Object obj)
```

가 . 가 . obj
 Object 가 getExtObject

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   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

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

✎ CommandBarComponent

```
public CommandBarComponent ()
```

✎ getPreferredSize

```
public int getPreferredSize (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


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:

 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 , invalidate
```

```
, 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

,

가

mask

Returns:


 hasFocus

```
public boolean hasFocus()
```

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

```
public int getPreferredSize(int w)
```

가

. LabelComponent

TextFieldComponent,

TextAreaComponent

가

가

가

가 . 가 가

,

가


.

. , w가 -1

Parameters:

w - 가

Returns:

 `getWidth()`

```
public int getWidth()
```

`Container`

가

Returns:

 `setBackground()`

```
public void setBackground(int bg)
```

-1

`0x00RRGGBB`

Parameters:

bg -

See Also:

[getBackground\(\)](#)

 `setForeground()`


```
public void setForeground(int fg)
```

Parameters:

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      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, 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, getPreferredSize, 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

```

        . paintContent showNotify
        , 가 가 layout . layout
        ,
        .
    
```

Overrides:

validate in class Component

 getNextTraversalComponent

```
protected Component getNextTraversalComponent()
```

```

        가 . 가
        . 가
        가 가 null .
    
```

Returns:

가

 getPrevTraversalComponent

```
protected Component getPrevTraversalComponent()
```

```

        가 . 가
        . 가
        가 가 null .
    
```

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.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:

dt - DateFieldComponent Date

Throws:

NullPointerException - Date가 null

See Also:

[getDate\(\)](#), [Date](#)

setMode

```
public void setMode(int mode)
```

DateFieldComponent . 가 MODE_TIME,
 MODE_DATE, MODE_TIME_DATE ,
 IllegalArgumentException .

Parameters:

mode - DateFieldComponent

Throws:

IllegalArgumentException -

See Also:

[getMode\(\)](#), [MODE_TIME](#), [MODE_DATE](#), [MODE_TIME_DATE](#)

setTimeZone

```
public void setTimeZone(TimeZone tz)
DateFieldComponent    TimeZone    .    TimeZone
    TimeZone    , TimeZone.TimeZone.getDefault\(\)
```

Parameters:


tz - DateFieldComponent TimeZone

Throws:

NullPointerException - TimeZone null

See Also:

[getTimeZone\(\)](#), [TimeZone](#)

 [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:

 [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](#)

 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
```

 getStringValue

```
public String getStringValue(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
```

```
가
```

```
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

See Also:

[TYPE_NONE](#), [TYPE_OK](#), [TYPE_OK_CANCEL](#)

 `setButtonString`

```
public void setButtonString(int buttonType,
                             String buttonStr)
```

DialogComponent TYPE_NONE

[OK_BUTTON](#)

[CANCEL_BUTTON](#)

IllegalArgumentException

TYPE_NONE

Parameters:

buttonType - . OK_BUTTON CANCEL_BUTTON .

buttonStr -

Throws:

IllegalArgumentException - .

See Also:

[OK_BUTTON](#), [CANCEL_BUTTON](#)

 setType

public void setType(int type)

DialogComponent .

. TYPE_NONE 3 ,

[TIMEOUT_INFINITE](#) .

, , TYPE_NONE,TYPE_OK,TYPE_OK_CANCEL

, IllegalArgumentException .

TYPE_OK TYPE_OK_CANCEL

[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 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 , 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 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

✎ 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:


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](#)

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

LabelComponent . [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
    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
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 .

str - 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 -

str -

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)
```

ListComponent 가 ListItemComponent - '0' ' index가

-1' - IndexOutOfBoundsException

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](#) . ListComponent 가

ListItemComponent [EventQueue.FIRE](#)

ActionListener [ActionListener.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 . 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 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
, 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 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 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 LabelComponent
  
```

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, getPreferredSize, getPreferredSize, 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 가 , 가 가
 . , w가 -1

Overrides:


getPreferredSize 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](#)

 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)
```

```
ProgressComponent ChangeListener . ProgressComponent  
ChangeListener  
ChangeListener.changed\(Component cmp, Object o\) .
```

Parameters:

l - ListComponent ChangeListener.

o - ListComponent ChangeListener .



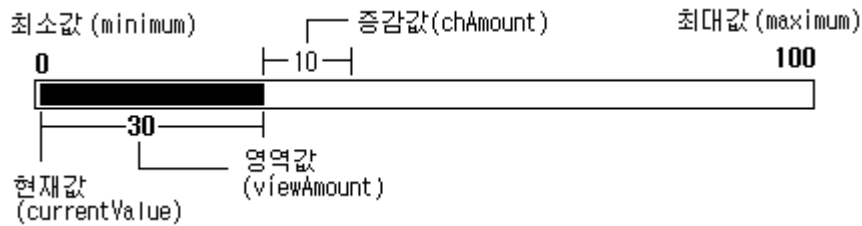
Class ScrollbarComponent

```

java.lang.Object
|
+--org.kwis.msp.lwc.Component
    |
    +--org.kwis.msp.lwc.ScrollbarComponent
    
```

```

public class ScrollbarComponent
extends Component
ScrollbarComponent( direction, 가
.
ScrollbarComponent HORIZONTAL VERTICAL
가 setDirection\(int direction\)
, HORIZONTAL VERTICAL
IllegalArgumentException
.
setCurrentValue
    
```

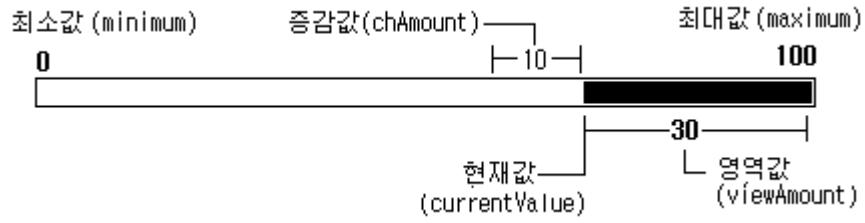


```

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 IllegalArgumentException	VERTICAL	VERTICAL HORIZONTAL
(currentValue)	ScrollbarComponent 가	0	(minimum) <= (currentValue) <= (maximum) - (viewAmount)
(viewAmount)	ScrollbarComponent	1	0 < (viewAmount) <= (maximum) - (minimum)
(minimum)	ScrollbarComponent	0	(minimum) < (maximum)

)			
(maximum)	ScrollbarComponent	10	(minimum) < (maximum)
(chAmount t)	ScrollbarComponent 가	1	0 < (chAmount) <= (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
    = 1;
```

✍ VERTICAL

```
public static final int VERTICAL
    = 2;
```

✍ ScrollbarComponent

```
public ScrollbarComponent (
    int direction, ScrollbarComponent
    parent, int value, int minimum, int maximum,
    int chAmount) {
    super (0, 1, 1);
}
```

See Also:

[ScrollbarComponent\(int direction\)](#), [ScrollbarComponent\(int direction, int currentValue, int viewAmount, int minimum, int maximum, int chAmount\)](#)

✍ ScrollbarComponent

```
public ScrollbarComponent (int direction)
    throws IllegalArgumentException {
    super (HORIZONTAL, VERTICAL,
        0, 1, 1);
}
```

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 . 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 .

 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 . 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:



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	Card repaint
, 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()
```

Component

Returns:

add Work

 `setWorkComponent`

```
public void setWorkComponent(Component cmp)
```

Component

Parameters:

cmp - Work

 `removeAllComponents`

```
public void removeAllComponents()
```

Description copied from class: ContainerComponent

Overrides:

removeAllComponents in class ContainerComponent

 `removeComponent`

```
public void removeComponent(Component cmp)
```

Description copied from class: ContainerComponent

```
        .                가  
        false            .
```

Overrides:

removeComponent in class ContainerComponent

Following copied from class: org.kwis.msp.lwc.ContainerComponent

Parameters:

cmp -

 `setCommand`

```
public void setCommand(Component cmp,  
                        boolean bGrab)
```

keyNotify() 가 . bGrab
true .

Parameters:

cmp - 가

bGrab -

 getCommand

public Component getCommand()

Returns:

 getNextTraversalComponent

protected Component getNextTraversalComponent()

Description copied from class: ContainerComponent

가 . 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 .

✍ 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 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 .

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
IllegalArgumentExceptio .

```

Overrides:

delete in class TextComponent

Following copied from class: org.kwis.msp.lwc.TextComponent

Parameters:

index - .

len -

Throws:

IndexOutOfBoundsException - len,index '0'

IllegalArgumentExceptio - 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
        .
        , 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:

 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 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  
)
```

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, getPreferredHeight, getPreferredWidth, 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'


```

        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 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

가 . index

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)
```


 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\(int\)
        milliseconds
        DEFAULT\_DELAY
        IllegalArgumentException
    TickerComponent
        setTickerState\(boolean\)
            , 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

```
public int DEFAULT_DELAY
```

```
TickerComponent . 500 milliseconds
```

 TickerComponent

```
public TickerComponent(String str,
                        Image img)
```

```
TickerComponent . true
, 가 .
```

DEFAULT_DELAY

가 null 이거나, null 이거나 NullPointerException
 가 null 이거나.

Parameters:

str - TickerComponent

img - TickerComponent null

Throws:

NullPointerException - 가 null



 **setString**

```
public void setString(String str)
```

TickerComponent 가
 null 이거나
 , null 이거나 NullPointerException

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

, '-' . '-' IllegalArgumentException

Parameters:

`delay` - .milliseconds

Throws:

IllegalArgumentException - 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 . 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
```

Parameters:

`id` -

Returns:

Throws:

`IllegalArgumentException` -

✍ `setSystemProperty`

```
public static boolean setSystemProperty(String id, String val)
                                throws IllegalArgumentException
```

Parameters:

`id` -

`val` -

Returns:

`true` -

`false` -

`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
color 0xYYRRGGBB( (network byte ordering)
) YY RR (Red), GG (Green), BB
(Blue)
```

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 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

Clip

```
public Clip(String type,  
            byte[] buf)
```

가

```
Clip(String type, int bufSize)
```

Parameters:

type -

buf - 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

 **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:

✍ 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 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

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(Clip clip)
```

```
( / )
```

```
listener
```

```
PAUSE
```

```
가 가
```

```
가
```

```
,
```

```
pause
```

```
pause
```

```
, MediaUnsupportedException
```


Parameters:

clip -

Returns:

true :

false :

 stop

```
public static boolean stop(Clip clip)
```

```
( / ) 가  
listener STOP 가 .
```

Parameters:

clip -

Returns:

true :

false :

 resume

```
public static boolean resume(Clip clip)
```

```
( / ) 가  
listener RESUME 가 .  
resume  
resume ,
```

MediaUnsupportedException .


Parameters:

clip -

Returns:

true :

false :

 play

```
public static boolean play(Clip clip,  
                           boolean repeat)
```

```
가  
listener START 가 .  
UnavailableException .  
가  
listener END_OF_DATA 가 .
```

가 , Clip.putData()

.

Parameters:

clip -

repeat - false 1 , true

Returns:

ture :

false :

record

public static boolean record(Clip 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 .



Class Vibrator

java.lang.Object

|


+-org.kwis.msp.media.Vibrator

public class Vibrator

extends java.lang.Object

Methods inherited from class java.lang.Object

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

 on

```
public static void on(int level,
                    int duration)
```

```

        가                가                .                가
                                duration
                                .
        .                level    0                timeout                . level
0 vibrator가                level
0-100                . 100                가                가                0 가
                . 0-100                가
                가                .                가
                가
HandsetProperty.getSystemProperty("VIBRATORLEVEL")
)                가                => 1-100 :
                가 ,                => 1-50 :                , 51-100 :
                가 , ,                => 1-33:                , 34-66:                , 67-100:
```

Parameters:

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()

· , Clip.getVolume()
· ,
· 0 - 100 가 · 0-100 가
· 가 가

HandsetProperty.getSystemProperty("VOLUMELEVEL") .
) 가 , => 1 -50 : 51 -100 :
 가 , , => 1-33: , 34 -66: , 67 -100:

Parameters:

Returns:

 set

public static void set(int level)

0 , 100 . , Clip 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_TONE, VOLTYPE_SOUND,
VOLTYPE_RECORDER 가 IllegalArgumentException
```

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)
    throw 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

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_knIMExecute

```
M_Int32 MC_knIMExecute(char* symName, int parmCnt, ...)
```

가

(partial)

(overlay)

MC_knICExecute()

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://< < >	>: sms://SHORTME SSAGE:read sms://SHORTME SSAGE:send sms://SHORTME SSAGE:delread	. read: . delread: . 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
    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
        . SMS
        SMS
        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 (Teleservice)가
telIDString
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]

✍ Clip

```
public Clip(int[] hiFreq,
            int[] lowFreq,
            int[] duration)
```

```
"audio/FREQTONE" 가
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