Testing App on Emulator

This section includes the following documents for testing application on emulator.

Running and Debugging on Emulator from LG IDE

This document describes how to run and debug the application on LG Smart TV Emulator from LG IDE.

Using LG Smart TV Emulator 2013

This document introduces how LG Smart TV Emulator 2013 works. This section covers the overview and user interface of the emulator, and how to use it.

Using LG Smart TV Emulator 2012

This document introduces how LG Smart TV Emulator 2012 works. This section covers the overview and user interface of the emulator, and how to use it.

Using LG Smart TV Emulator 2011

This document introduces how LG Smart TV Emulator 2011 works. This section covers the overview and user interface of the emulator, and how to use it.

List of Supported Codecs and Containers

This document provides the table specifies all the supported codecs and containers by emulator and real TV in more detail.

Using Resource Monitor

This document explains how to use LG Resource Monitor for monitoring the resource usage status of emulator.

Troubleshooting

This section describes solutions for LG Smart TV Emulator.

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Running and Debugging on Emulator from LG IDE

This section describes how to run and debug the application on LG Smart TV Emulator.

Debugging on LG Smart TV Emulator 2013

1. In IDE, click **[Run Emulator > Debug Configuration]** menu or toolbar icon ![icon]. Then, the Debug Configuration window will be opened.

2. Select Target, Start Page, and HTTP Web Server Port Number. Then, click **[Apply]**.

Note

- If you change the server port number, LG IDE will be restarted. As '8787' is preoccupied, do not use it.
- The IP address of the local server, your current PC, is displayed in the 'Real TV' field.

---
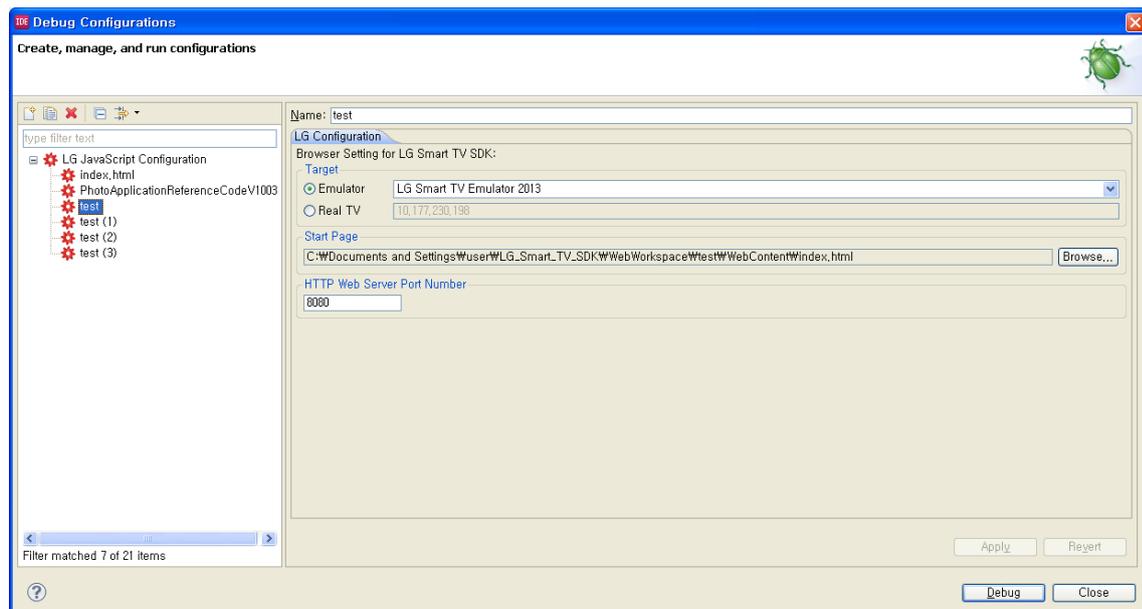
3. Click **[Debug]**. Then, LG IDE starts to begin the [Remote Debug] mode. Or, click **[Close]** to begin by **[Run Emulator > Debug]** menu later.

4. Then, the following popup appears.

5. Finally, [Remote Debug] mode is opened and developer can debug the application on LG Smart TV Emulator 2013 using 'Web Inspector'.

Note

If you change the mode from remote debug perspective to other perspective, the web inspector is automatically closed. To open the closed web inspector again, you should run the debugger by clicking **[Run Emulator > Debug Configuration]** menu or toolbar icon 　.

For details to change the mode, refer to "Changing the Perspective" from Developing > Using SDK > Utilities.

Refer to the following URL to learn about 'Web Inspector': **https://developers.google.com/chrome-developer-tools/docs/overview**
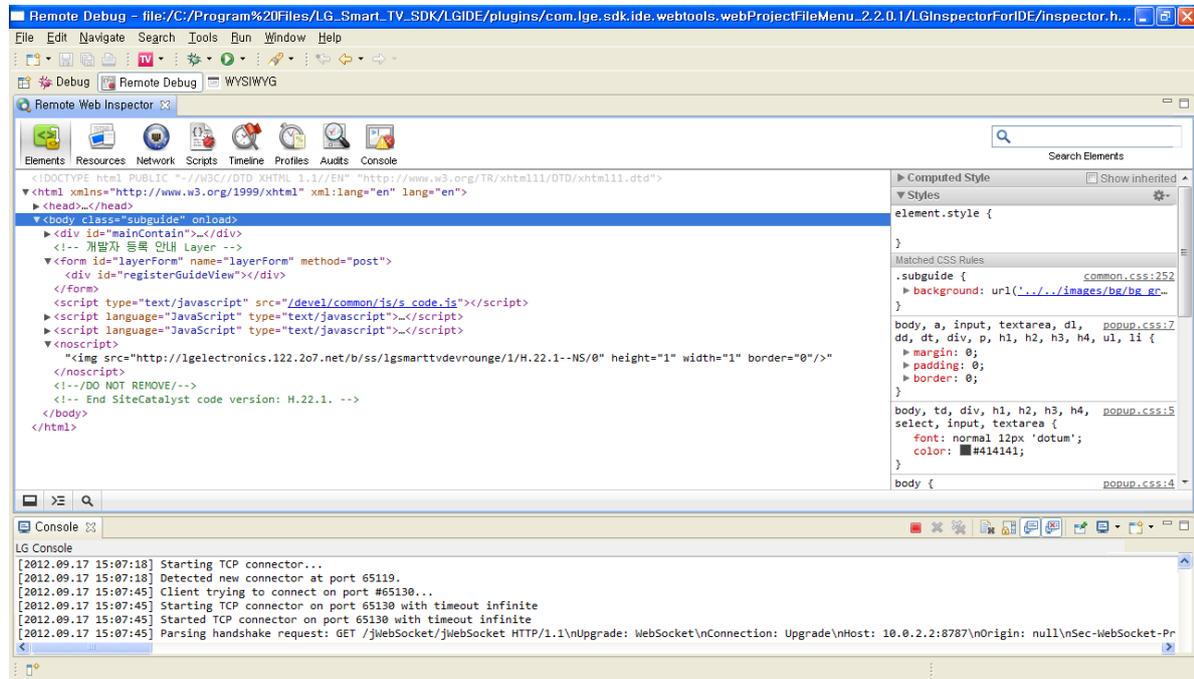
Note

The Safari browser should be installed on your PC to use Web Inspector in LG IDE.

Debugging on LG Smart TV Emulator 2012

1. In IDE, click **[Run Emulator > Debug Configuration]** menu or toolbar icon 　. Then, the Debug Configuration window will be opened.

2. Select Target, Start Page, and HTTP Web Server Port Number. Then, click **[Apply]**.

Note

- If you change the server port number, LG IDE will be restarted. As '8787' is preoccupied, do not use it.
- The IP address of the local server, your current PC, is displayed in the 'Real TV' field.
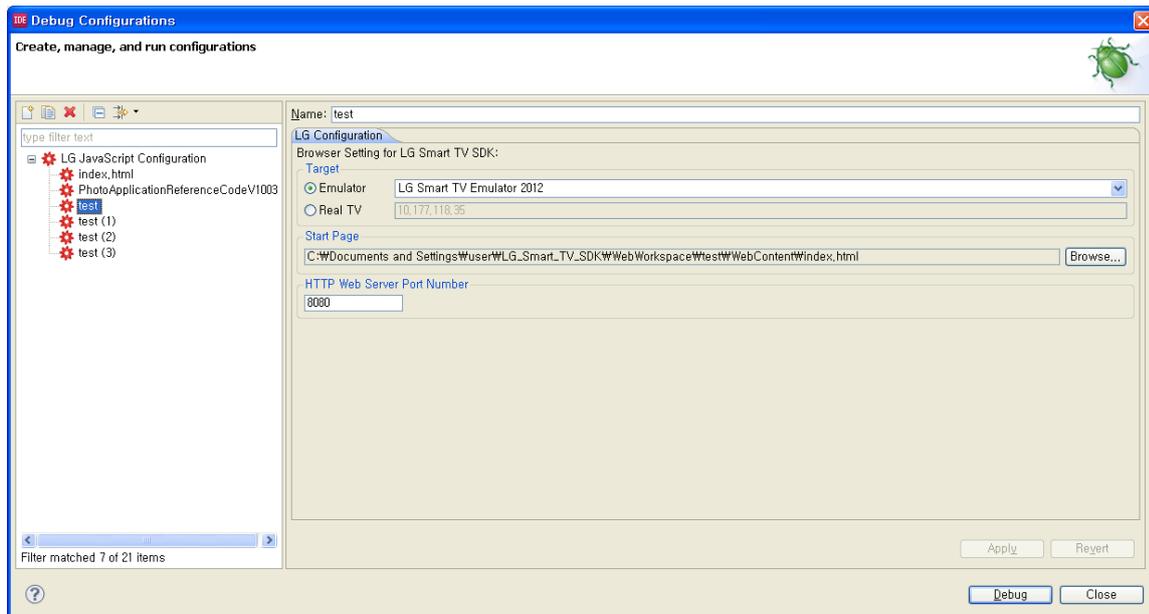
3. Click **[Debug]**. Then, LG IDE starts to begin the [Remote Debug] mode. Or, click **[Close]** to begin by **[Run Emulator > Debug]** menu later.

4. Then, the following popup appears.

5. Finally, [Remote Debug] mode is opened and developer can debug the application on LG Smart TV Emulator 2012 using 'Web Inspector'.

Note

If you change the mode from remote debug perspective to other perspective, the web inspector is automatically closed. To open the closed web inspector again, you should run the debugger by clicking **[Run Emulator > Debug Configuration]** menu or toolbar icon .
For details to change the mode, refer to 'Changing the Perspective' from Developing > Using SDK > Utilities.

Refer to the following URL to learn about 'Web Inspector': **https://developers.google.com/chrome-developer-tools/docs/overview**
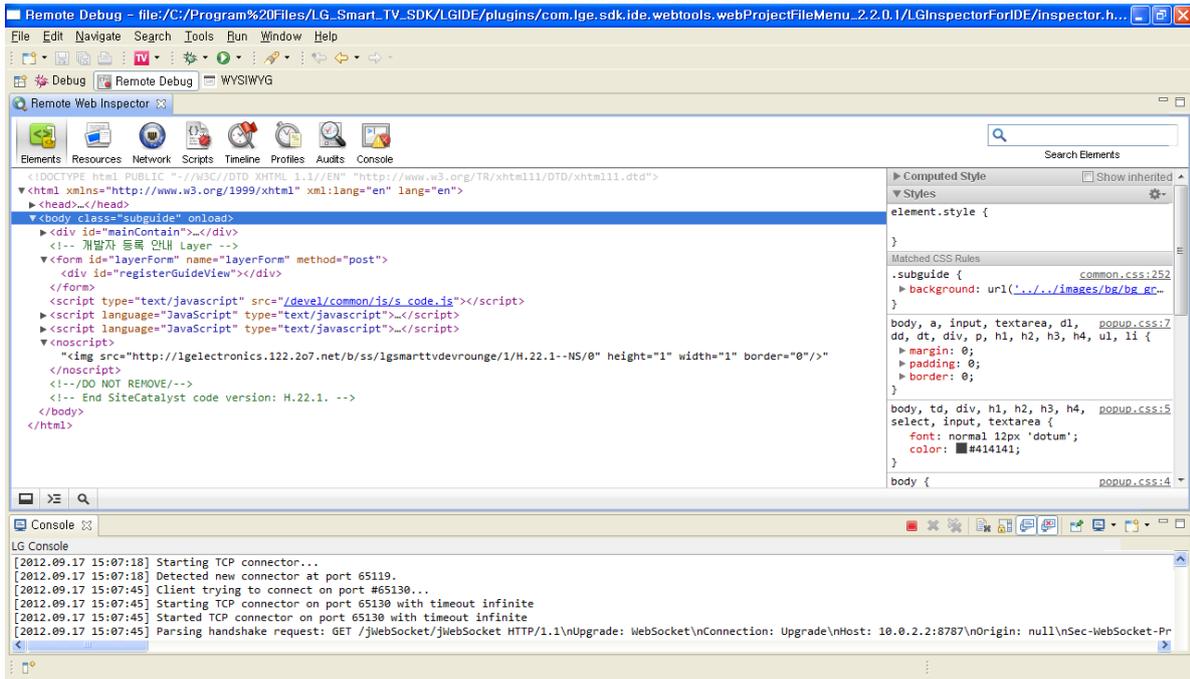
Note

The Safari browser should have been installed to your PC to use Web Inspector in LG IDE.

Debugging on LG Smart TV Emulator 2011

1. In IDE, click **[Run Emulator > Debug Configuration]** menu or toolbar icon 🐞. Then, the Debug Configuration window will be opened.

2. Select Target, Start Page, and HTTP Web Server Port Number. Then, click **[Apply]**.

Note

- If you change the server port number, LG IDE will be restarted. As '8787' is preoccupied, do not use it.
- The IP address of the local server, your current PC, is displayed in the 'Real TV' field.
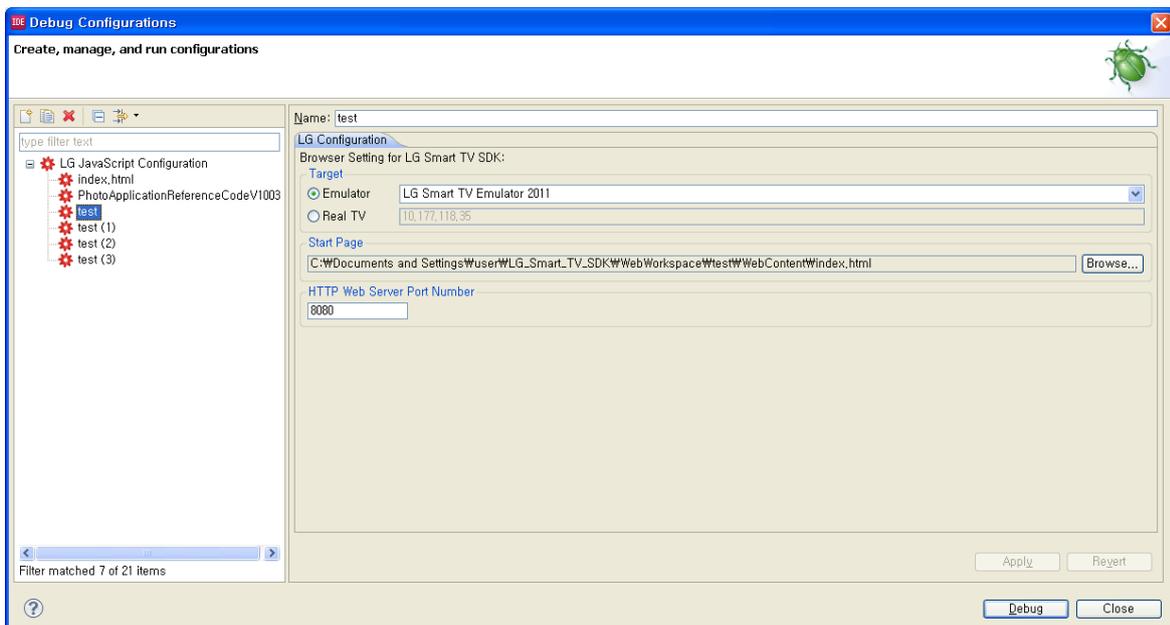
3. Click **[Debug]**. Then, LG IDE starts to begin the [Local Debug] mode. Or, click **[Close]** to begin by **[Run Emulator > Debug]** menu later.

4. Then, the following popup appears.
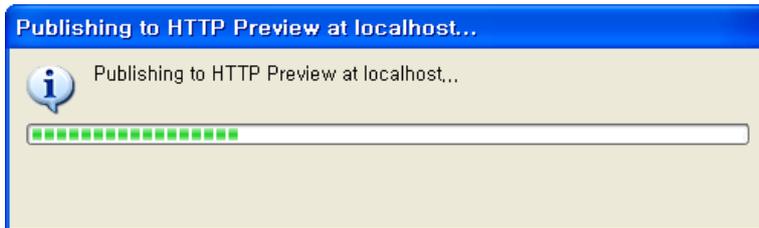
5. Finally, [Local Debug] mode is opened and developer can debug the application on LG Smart TV Emulator 2011.

Inserting the Debugging Code in the Application

1. Open the JavaScript file in LG IDE.

2. Write your console log message in .js file for debugging.
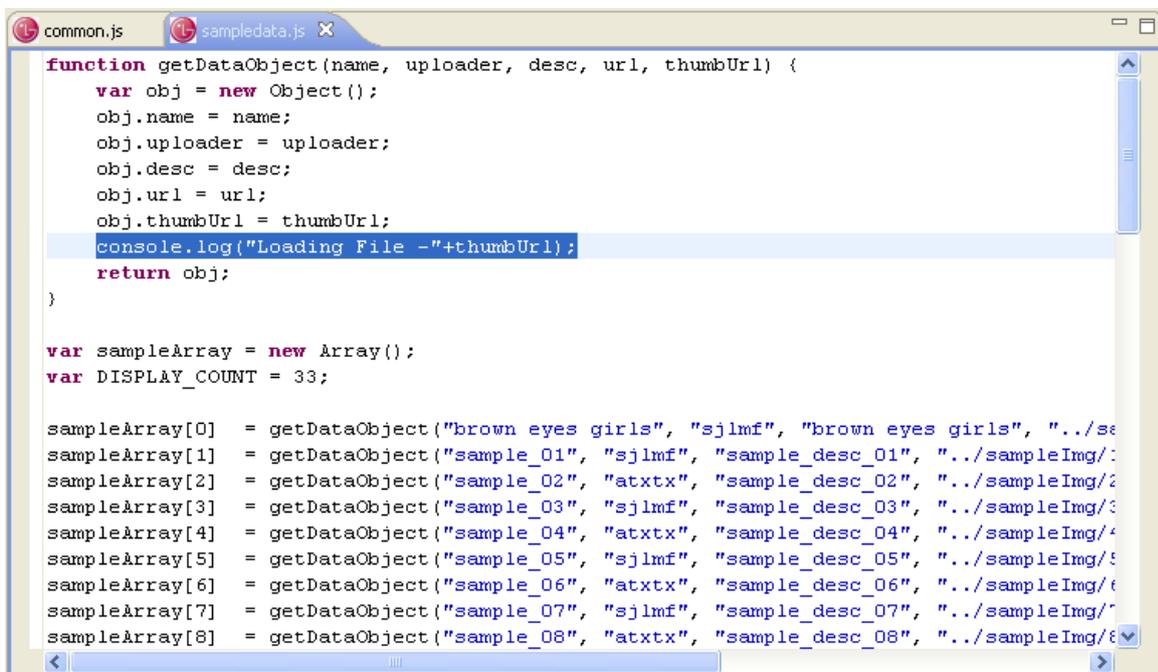
3. Toggle the breakpoint in .js file where you want to debug.
To toggle breakpoints in JavaScript file, click **[Toggle Breakpoint]** from the right-click menu on the left grey vertical line where you want to insert a breakpoint.
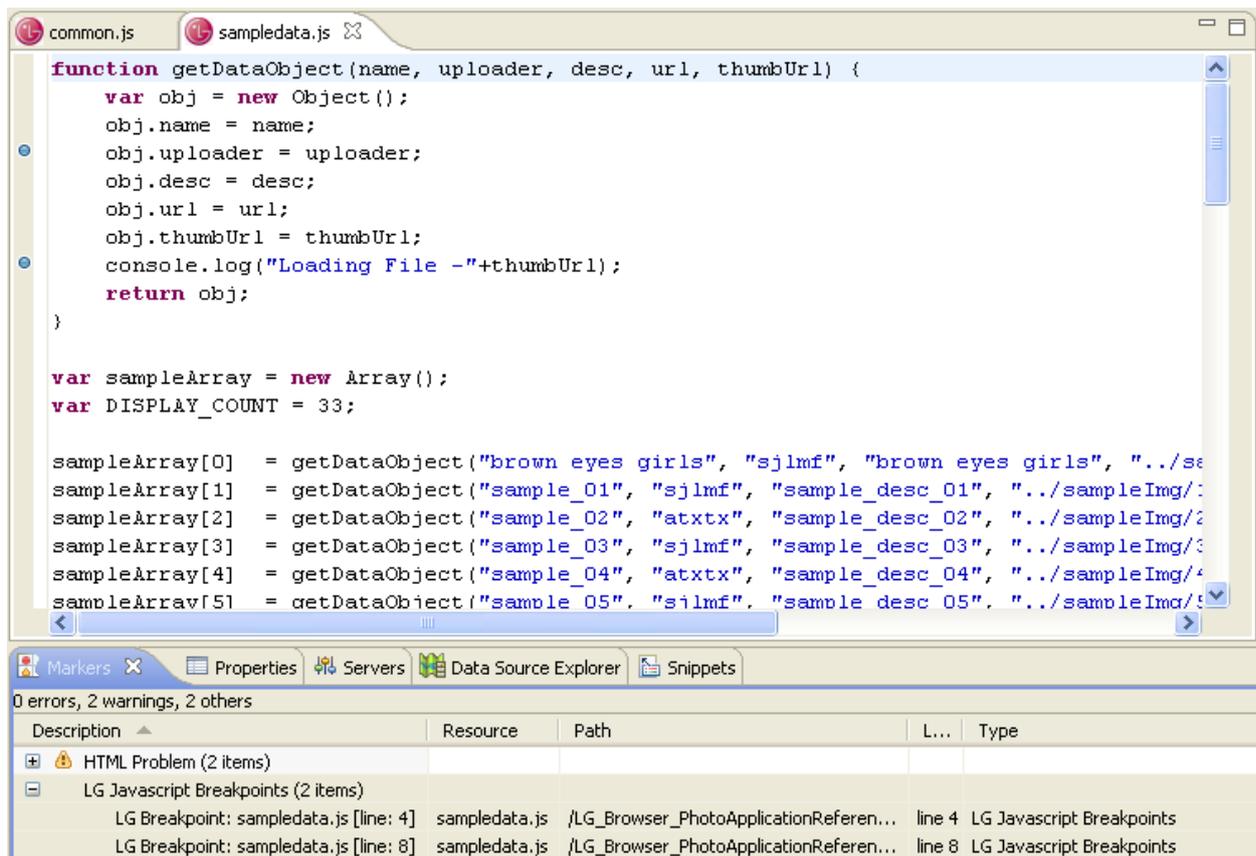
Local Debug Perspective

In [Local Debug] mode, Local Debug Perspective has views as below.

• Breakpoint View
• Variable View
• Log View
• Project Files View
• Debug Scripts
• JavaScript Expression View
• Debug Scripts View

If a view is not shown in the screen, go to **[Windows > Show View]** and select the view to use.

[Table] Local perspective views

Category	Description
Breakpoint View	It keeps track of all breakpoints presented in JavaScript file. You can skip, enable, and disable the breakpoints by selecting the check box.
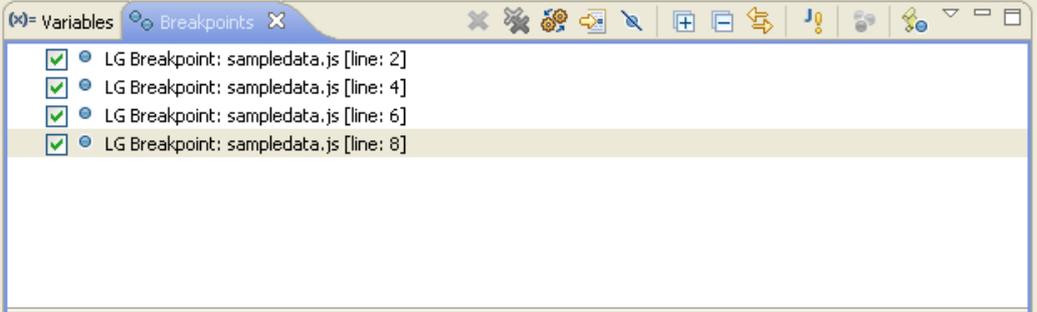
Category	Description
Variable View	It displays all variables presented in JavaScript file.
Log View	It displays the log content. You can remove and export log message to selected location. When you save the log message for the first time, you will be asked to select a location where to store the log file. Afterwards, when you use this option, it will be directly stored in the previously selected location. To save the log message to a file, click ⬈ (Export Log) button.
Project Files View	It displays all the web application files for debugging.
Debug View	It keeps track of all thread running with debug server. We can use resume, suspend, and stop methods to take control of these threads.
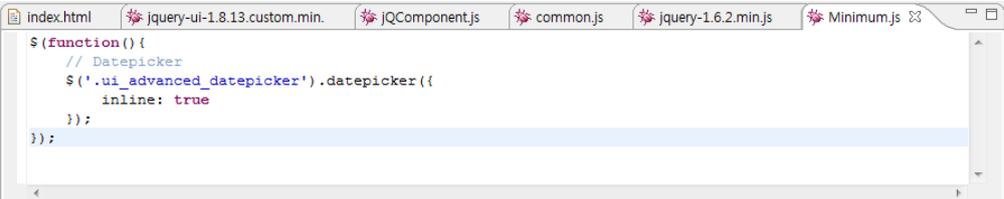
11
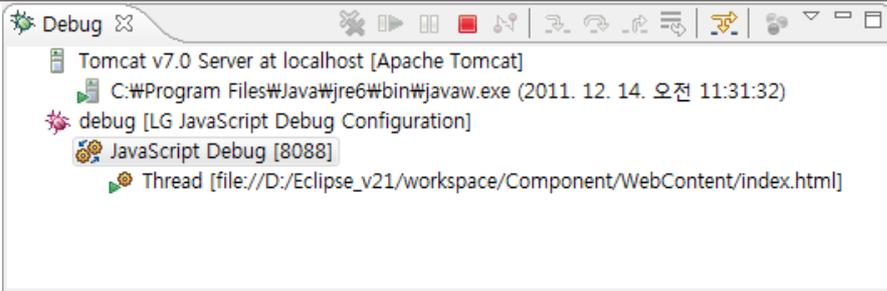
Category	Description
	This view is used for changing variable values and give some JavaScript expressions during debugging. You can add and remove watch expressions.
JavaScript Expression View	
	This expression is changing the text field value of variable val1 to 15. Therefore, output in LG Emulator will come with this updated value.
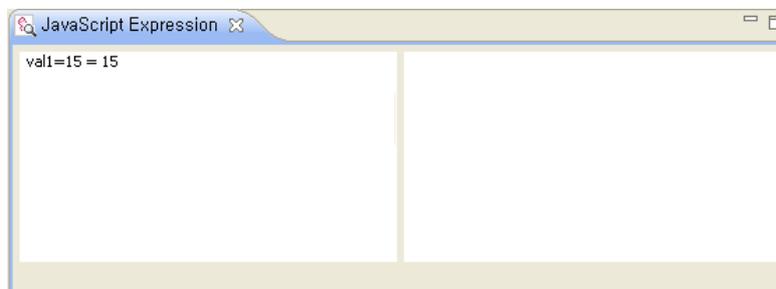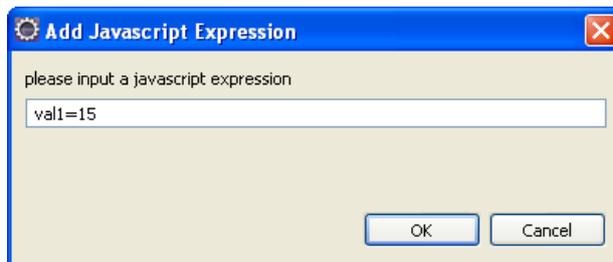
Category	Description

This view shows the file list (html, javascript) for debugging. If you double-click on a list item, the file is opened on the source editor.

Category	Description
Debug Scripts View	
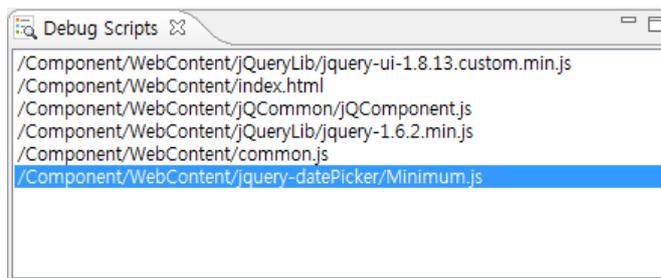
Running on LG Smart TV Emulator

1. In IDE, click **[Run Emulator > Run Configuration]** menu or toolbar icon . Then, the Run Configuration window will be opened.

2. Select Target, Start Page, and HTTP Web Server Port Number. Then, click   **[Apply]**.

Note

- If you change the server port number, LG IDE will be restarted. As '8787' is preoccupied, do not use it.
- The IP address of the local server, your current PC, is displayed in the 'Real TV' field.
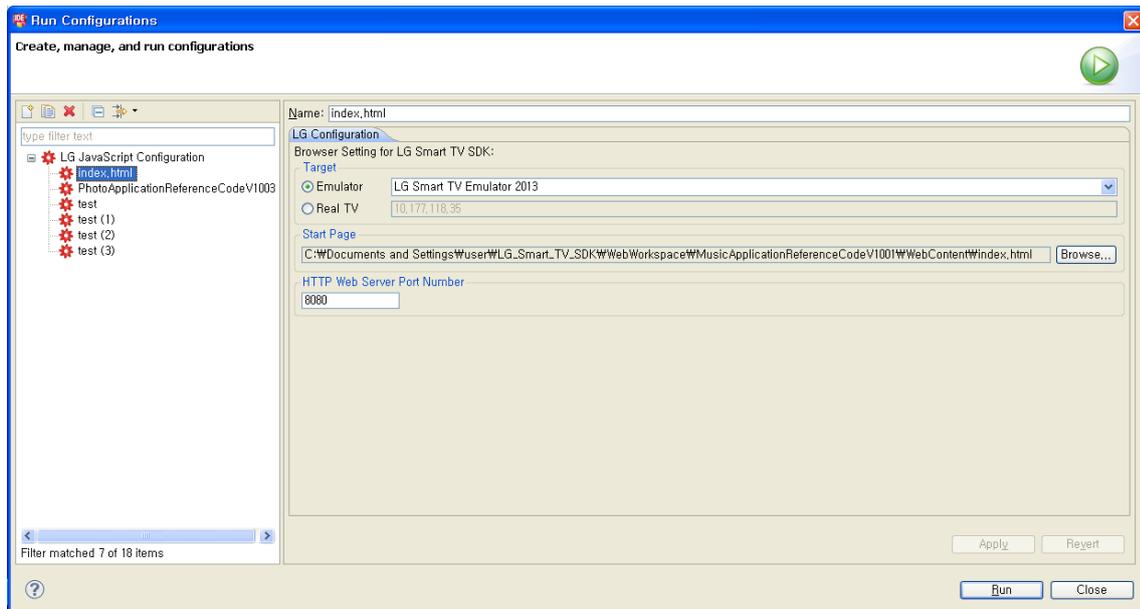
3. If you click **[Run]**, the project starts to run on the target. You can also run the project by clicking on **[Run Emulator > Run]** menu later.

4. Then, 'the following popup appears.

4. Finally, the application is launched on the emulator.

Caution

If the application is not launched on the emulator properly, check if the port '8080' is preoccupied in external server. If so, change the default port in **[Run Emulator > Run Configuration]** menu or release the port of the external server.

If LG Smart TV SDK V2.2 or higher version is installed on your PC, you should not use the eclipse plugin provided by SDK V2.1. In this case, the error may occur during running the emulator. Therefore, use the LG IDE provided by SDK V2.2 or higher version.

Using LG Smart TV Emulator 2013

This section introduces how LG Smart TV Emulator 2013 works. This section covers the overview and user interface (UI) of the emulator, and how to use it.

- **Overview of the LG Smart TV Emulator 2013**
- **Getting Started**
- **Main Functions of Emulator 2013**

Overview of the LG Smart TV Emulator 2013

LG Smart TV Emulator 2013 is a tool that provides developers with the same environment as the target DTV on their PC. Content developers can test DTV Web-based contents on their PC using this emulator. The emulator emulates the actual hardware, library, and graphics of DTV, which are compatible with the PC environment. Content developers can minimize the development period using this emulator without the target DTV.

LG Smart TV Emulator 2013 has the following features:

- Playing Web content for TV with LG Browser emulation
- IR Remote emulation

LG Smart TV SDK provides following features:
- LG Smart TV Emulator 2011: Emulator for LG Smart TV released in 2011
- LG Smart TV Emulator 2012: Emulator for LG Smart TV released in 2012
- LG Smart TV Emulator 2013: Emulator for LG Smart TV released in 2013 (This emulator is based on Ubuntu 10.04)

Caution

LG Smart TV Emulator 2013 has some differences from the LG Browser on the target DTV. Developers should keep in mind these differences when they test applications on the emulator. For detailed information, see Section **Differences from the TV**.

Specifications and Differences from the TV are listed in the following sections.
- **Specifications**
- **Differences from the TV**

Specifications

LG Smart TV Emulator 2013 uses the same Browser engine as the one in the target DTV.
For the LG Browser engine specifications, refer to the "Web Engine" in **Developing > Developing Web App > App Development Guide > Specifications** section in this Library.

Differences from the TV

LG Smart TV Emulator 2013 has some differences from LG Browser on the target DTV. Developers should keep in mind these differences when they test applications on the emulator.
The table below lists LG Smart TV features that work differently on the emulator and on DTV.

[Table] Differences between Emulator and DTV Target

Feature	LG Smart TV Emulator 2013	DTV 2013
Performance	Depending on the PC where the emulator is running.	Depending on the target DTV
Resource size	Depending on the memory of the PC. Note that the memory of the PC is much greater than the one on the target DTV board.	Depending on the memory of the target DTV
Image decoder	prebuilt libjpeg7-win32	patched JPEGsrc.v6b
DRM	Not supported	WM DRM-PD Version 10 is not supported. PlayReady and WideVine DRM are

Feature	LG Smart TV Emulator 2013	DTV 2013
		supported.
Magic Remote	Supported limitedly - Acceleration sensor is not supported.	Supported
Media player	Refer to the **List of Supported Codecs and Containers**.	
Flash	Not supported	Supported
HTML5	Supported	Supported
PLEX	Not supported	Supported
TP Streaming	Not supported	Supported
USB Emulation	Not supported	Supported
DTV General	Not supported	Supported
EMF	Not supported	Supported
DLNA	Not supported	Supported
DVR Ready	Not supported	Supported
3DTV	Not supported	Supported
C Native	Not supported	Supported
LG Apps	Not supported	Supported
My Apps	Not supported	Supported
SDP Client	Not supported	Supported

Note

Between the DTV and emulator, there may be performance difference depending on CPU speed and video memory of the PC that developers use (e.g. graphic rendering speed and quality, video streaming speed).

Getting Started

This chapter covers the user interface of LG Smart TV Emulator 2013 and how to navigate in the emulator. Also, menu descriptions on emulator are provided.

This section includes the following sections.
• **Starting and Exiting the Emulator**
• **User Interface of the Emulator**
• **Navigation in Emulator**
• **Menu Description**

Starting and Exiting the Emulator

Select **[Start** > **Program** > **LG Smart TV SDK > LG Smart TV Emulator 2013]** to launch the emulator after installing it. Then, the virtual machine will launch the emulator. When the emulator starts running, the TV and IR Remote emulator run by default.

Caution

Be sure that VirtualBox should be installed on your PC first before installing LG Smart TV SDK in order to operate LG Smart TV Emulator 2013 normally.

[Figure] Emulator Execution

To exit the emulator, press the [power icon] button on IR Remote emulator or select **[Exit]** in the emulator menu. Then, the following pop-up window appears. Press the **[Yes]** button to exit the emulator.
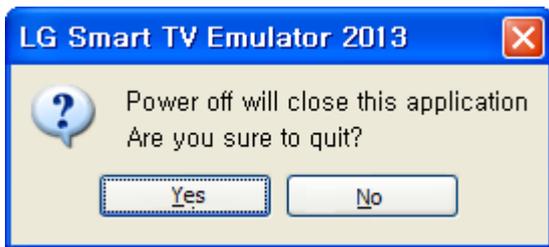
Note

You can also exit the emulator by pressing the [X] button on the top right.

User Interface of the Emulator

LG Smart TV Emulator 2013 basically consists of the main window and IR Remote emulator. All of navigation of emulator is done by the remote control and PC mouse. (see Section **Navigation in Emulator**)

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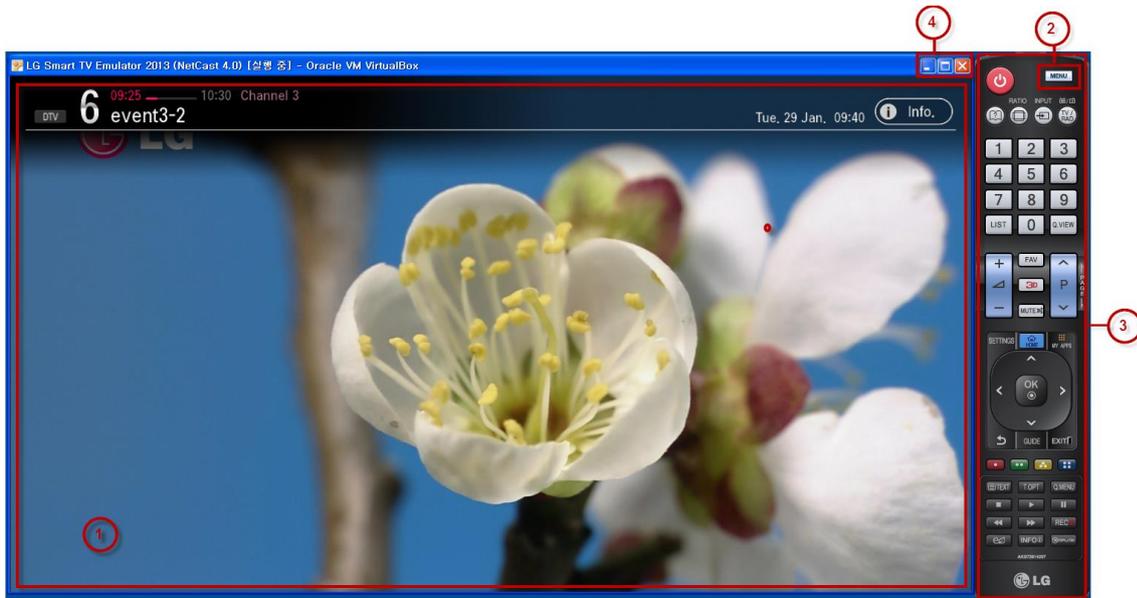
[Figure] User Interface of LG Smart TV Emulator 2013

The following describes each part of the emulator.

① Main window
The main window that displays the operation of the emulator. The emulator has the same resolution as the TV screen. You can resize the main window.

② Emulator menu
Click the MENU button on the top right of the IR Remote to open the emulator menu. (see **Emulator Menu**)

③ IR Remote emulator
Emulates the TV IR Remote. (see **IR Remote Menu**)

④ Minimize and Exit
Press the and button to minimize and maximize the emulator window; press the button to exit the emulator.

Navigation in Emulator

In order to navigate, LG Smart TV Emulator 2013 uses a remote control as you do with the target DTV, but it does not support a keyboard. Users of the TV-based web contents may not have mouse and keyboard. Therefore, you might need to estimate usability of the content without mouse or keyboard – with IR Remote emulator.

When you want to emulate navigation using the Magic Remote, you need to use your PC mouse. Move the cursor using your mouse on the emulator screen.

Note

To learn about IR Remote menu, see **IR Remote Menu**.

Menu Description

This chapter describes the functions of the emulator menu and remote control menu provided by LG Smart TV Emulator 2013.

Emulator Menu

To display the emulator menu, click MENU on the top right of the emulator remote control. Run the basic functions of the emulator and set the options using this menu.

[Figure] Emulator Menu of LG Smart TV Emulator 2013

The following table describes on the emulator menu in LG Smart TV Emulator 2013.

[Table] Emulator Menu Description

Menu	Description
Proxy Configuration	If you use a proxy, enter the proxy server address and port number. See **Proxy Configuration**.
Run Browser	Enters the URL address to access in the browser. See **Browser Emulation**.
Terminate Running App	Kills the currently running application.
Show Log	Runs LG Resource Monitor Tool. See **Show Log**.
Overscan Area On	In Blu-ray Player, overscan area of the screen should be considered. This area must be blank in your application. See **Overscan Area**.
Add Browser Font	Installs an additional browser font. See **Add Browser Font**.
Take Screenshot	Takes a screenshot of the main window. See **Take Screenshot**.
Test Media File	Opens a media file at main window. See **Test Media File**.
Send Voice Input	Sends a word instead of the voice for the voice test. See **Send Voice Input**.
About	Version of the LG Smart TV Emulator
Exit	Exits the emulator.

IR Remote Menu

To emulate the TV IR Remote and its functions, LG Smart TV Emulator 2013 provides the IR Remote emulator. The IR Remote emulator is displayed in a separate window, and you can drag it to the desired position on your desktop.

Note

If you cannot see the remote control when using LG Smart TV Emulator 2013, click on the tray icon or the emulator tab on launch bar to launch it.

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[Figure] IR Remote of LG Smart TV Emulator 2013

The following table describes the buttons on the remote control.

[Table] IR Remote Menu

Button	Description	Disabled/Enabled
①	[POWER]: Turns the emulator off.	Enabled
②	• [RATIO]: Selects your desired Aspect Ratio of picture. • [INPUT]: External input mode rotates in regular sequence. • [TV/RAD]: Selects Radio, TV and DTV channel.	Disabled, [TV/RAD] button is enabled
③	• [0~9]: Selects channel numbers. • [LIST]: Displays the channel table. Also, sets the TV mode and the desired favorite channels list. • [Q.VIEW]: Displays a list of the most recently viewed channels.	Enabled, [Q.VIEW] button is disabled
④	• [FAV]: Changes the channel alternating the registered favorite channels. • [3D]: Converts into the 3D mode. • [MUTE]: Switches the sound on/off. • [VOL +,−]: Adjusts the volume.	Enabled

Button	Description	Disabled/Enabled
	• [PAGE +,−]: Changes the channel.	
⑤	• [SETTINGS]: Opens the settings options. • [Home]: Enters into the Home Dashboard page. • [MY APPS]: Enters into the My Apps page.	Disabled [SETTINGS] button is enabled
⑥	Navigation keys for the menu. Press [OK] to choose the menu. • [BACK]: Returns to the previous menu or exit from current menu. • [GUIDE]:Shows the channel schedule. • [EXIT]: Returns to the previous menu or exit from current menu.	Enabled
⑦	[RED,GREEN,YELLOW,BLUE]: If necessary, DTV content explains the color icons for a specific feature.	Enabled
⑧	• [TEXT], [T.OPT]: These buttons are used for teletext. • [Q.MENU]: Opens the list of Quick Menu options.	Disabled
⑨	• [STOP]: Stops DivX. • [PLAY]: Plays DivX. • [PAUSE]: Pauses DivX. • [REWIND]: Rewinds DivX. • [FASTFORWARD]: FastForwards DivX. • [REC]: Records DivX. • [ENERGY SAVING]: Sets the energy saving mode. • [INFO]: Channel Information. • [ⓈIMPLELINK]: Links to the TV, DISC, VCR1, HDD Recorder and Speaker.	Disabled, [INFO] button is enabled
⑩	MENU : Emulator Menu Button	Enabled

Note

[Menu] button is enabled after finishing Emulator booting.

Main Functions of Emulator 2013

This chapter introduces the main functions of the emulator such as Browser emulation. It also describes on how to use basic DTV emulation functions.

Main Function of Emulator 2013 are as follows:
• **Proxy Configuration**
• **Browser Emulation**
• **Show Log**
• **Overscan Area**
• **Add Browser Font**
• **Take Screenshot**
• **Test Media File**
• **Send Voice Input**

Proxy Configuration

LG Emulator supports proxy configuration.

1. Press **[Proxy Configuration]** in the emulator menu after starting the emulator.

2. If you use a proxy, enter the proxy server address and port number.
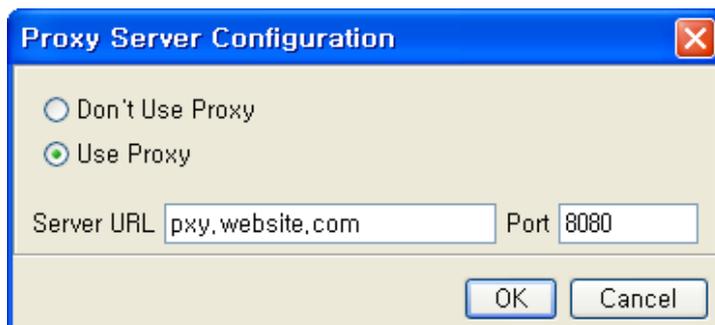
If you do not use proxy, select [Don't Use Proxy].

3. Click **[OK]** button to save the configuration.

Browser Emulation

LG Browser is a web browser for digital TV sets. LG Smart TV Emulator 2013 can open URLs and local URLs on PC for testing web content. Since the emulator uses the same source code as the LG Browser running on the DTV, it reproduces its behaviour quite accurately. Because of the differences between PC and TV platforms, the emulator has differences from the TV. (See **Differences from the TV**)

- Opening URLs: Testing a server-based URL
- Opening Local URLs: Testing a local URL

Opening URL

Follow the next steps to open a URL.

1. Press **[Run Browser]** in the emulator menu. The following window appears in which you can enter a URL. Enter the URL and click **[GO]** to open the URL. To delete the URL from history, select URL and click the **[Delete From History]**.

2. Enter the URL address you want to access and press the **[GO]** button. For example, enter **http://www.lg.com**.

3. Then, you can view the website of the URL in the emulator's browser as shown below.

Note

To delete the URL from history, select URL and click the **[Delete From History]**.

Opening Local URL

LG Smart TV Emulator 2013 supports local URL. This function is not supported on the LG Browser running on the

DTV. Developers can test the developed application stored in their PC.

1. Press **[Run Browser]** in the emulator menu. The following window appears in which you can enter a URL.

A. If you have created a project and started the web server in LG IDE, you can run the web application in localhost. Enter ***http://localhost:<port number>/<project name>/<html file name>*** or ***http://127.0.0.1:<port number>/<project name>/<html file name>*** in the window. The <port number> is the value set in Run Configuration window of LG IDE.

This is the example: http://localhost:8080/myproject/index.html

B. If you did not start the web server on your PC, put your application files under ***C:\Documents and Settings\user\LG_Smart_TV_SDK\FlashWorkspace.*** Then, enter ***file:///C:\Documents and Settings\user\LG_Smart_TV_SDK\FlashWorkspace\<html file name>*** in the window.

2. Press **[GO]** to open the web application stored on your PC.

3. Then, you can view the page of the local URL in the emulator's browser.

Note

The user folder for LG Smart TV SDK is different from each user environment.

Show Log

You can run the Resource Monitor by the show log menu. For more information about resource monitor, refer to **Using LG Resource Monitor**.

Overscan Area

In Blu-ray Player, overscan area of the screen should be considered. This area must be blank in your application.

Press **[Overscan Area On]** in the emulator menu.
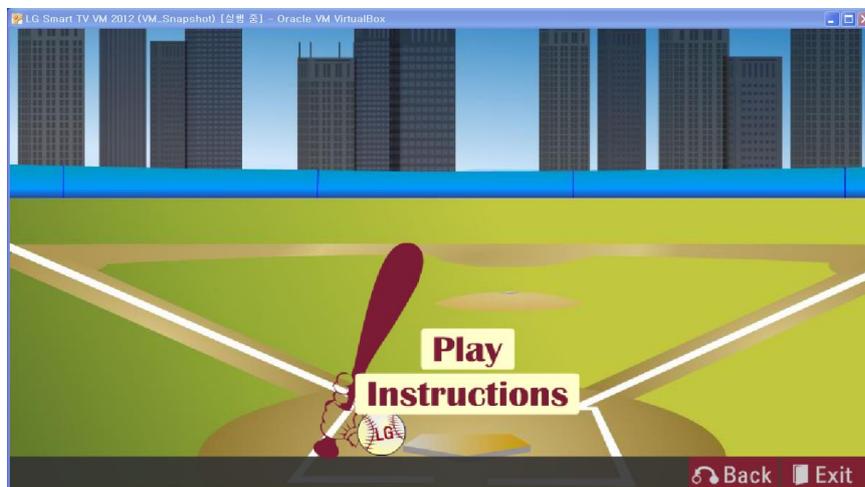
Then, the following window appears. You can check the overscan area.
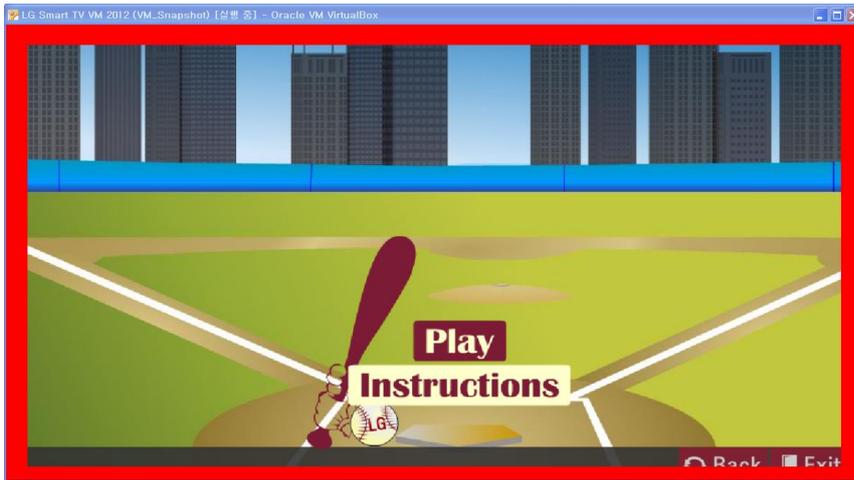
For more information, refer to the "**LG Smart TV and Media Product UI Guideline**" in **[DISCOVER > Legacy Platform (NetCast) > Technical Notes]** in this website.

Add Browser Font

In LG Smart TV Emulator 2013, you can add a new font to the emulator.
If you are a CP (partner) member, you can test the font on the emulator before packaging your application for real TV.

1. Press **[Add Browser Font]** in the emulator menu. Then, the following window appears. Select the font file to install.

2. Press the **[install]** button after entering the file path of the font file stored on your PC.

3. Then, you can use the installed font in emulator.

Caution

When you restart the emulator, previous applied font cannot use anymore on the emulator.

Take Screenshot

In LG Smart TV Emulator 2013, you can save a image of current screen into the user specified folder.

1. Press **[Take Screenshot]** in the emulator menu. Then, the following window appears. The file name is created automatically. You can change file name before pressing the take button.

2. Press the **[Take]** button.

3. Then, you can get image files under *C:\Documents and Settings\user\LG_Smart_TV_SDK\ScreenShot.*

Note

The user folder for LG Smart TV SDK is different from each user environment.

Test Media File

You can test media files whether it is playable on the LG Smart TV.

1. Press **[Test Media File]** in the emulator menu. Then, the following window appears. Select the media file to play.

2. Press the **[Run]** button after entering the file path of the media file stored on your PC.

3. Then, the emulator plays the selected media file as following.

Send Voice Input

Send Voice Input is also available at LG Smart TV Emulator, just like a same style in Magic Remote.

1. Press **[voice input]** button in the application. Then, the following window appears in emulator.

2. Press **[Send Voice Input]** in the emulator menu.

3. Press **[Send]** button after entering word in the Voice textbox.

Note

To delete a word from history, select the word and click the **[Delete From History]**.

---

4. The emulator sends inputted word to the application according to input mode.

Dictation Mode
Dictation Mode sends inputted word from send voice input to the application directly without the similar list.

Keyword Mode
Keyword Mode shows the similar list to choose similar word as inputted word from send voice input. When user select a word, emulator sends that to the application.

Note

The Similar List shows a maximum of three similar word.

Using LG Smart TV Emulator 2012

This section introduces how LG Smart TV Emulator 2012 works. This section covers the overview and user interface (UI) of the emulator, and how to use it.

- **Overview of the LG Smart TV Emulator 2012**
- **Getting Started**
- **Main Functions of Emulator 2012**

Overview of the LG Smart TV Emulator 2012

LG Smart TV Emulator 2012 is a tool that provides developers with the same environment as the target DTV on their PC. Content developers can test DTV Web-based and Flash contents on their PC using this emulator. The emulator emulates the actual hardware, library, and graphics of DTV, which are compatible with the PC environment. Content developers can minimize the development period using this emulator without the target DTV.

LG Smart TV Emulator 2012 has the following features:

- Playing Web content for TV with LG Browser emulation
- Playing Flash content for TV with LG Flash emulation
- Playing Flash content for TV with LG AIR emulation
- IR Remote emulation

LG Smart TV SDK provides following features:
- LG Smart TV Emulator 2011: Emulator for LG Smart TV released in 2011
- LG Smart TV Emulator 2012: Emulator for LG Smart TV released in 2012 (This emulator is based on Ubuntu 10.04)
- LG Smart TV Emulator 2013: Emulator for LG Smart TV released in 2013

Caution

LG Smart TV Emulator 2012 has some differences from the LG Browser and Flash player on the target DTV. Developers should keep in mind these differences when they test applications on the emulator. For detailed information, see Section **Differences from the TV**.

Specifications and Differences from the TV are listed in the following sections.
- **Specifications**
- **Differences from the TV**

Specifications

LG Smart TV Emulator 2012 uses the same Browser and Flash engine as the one in the target DTV.
For the LG Browser engine specifications, refer to the "Web Engine" in **Developing > Developing Web App > App Development Guide > Specifications** section in this Library.

The table below shows the LG Flash player specifications.

[Table] LG Flash Player Specifications

Type	Item	LG Smart TV Emulator 2012
SWF	Version	Flash Player 10.1, AIR 3.0
	ActionScript	AS 3.0
Graphics	Resolution	1280 x 720
	Type of images loadable during runtime	PNG , JPEG
Sound	Format	MP3, AAC, PCM (Event sound only)
	Sample rate	16 kHz, 32 kHz, 44.1 kHz
Flash Video	SW Codec	On2 , Sorenson - Low quality video (because of SW Codec limitation)
	HW Codec	H.264 (with AAC audio only)

Type	Item	LG Smart TV Emulator 2012
	- Recommended video resolution	Up to FHD (1080 p)
	- Recommended audio sample rate	44.1 kHz
Streaming Protocol		Not Supported
Security		NetCast 3.0 does not support RTMP-e and FlashAccess3.0.

Differences from the TV

LG Smart TV Emulator 2012 has some differences from LG Browser and Flash player on the target DTV. Developers should keep in mind these differences when they test applications on the emulator.
The table below lists LG Smart TV features that work differently on the emulator and on DTV.

[Table] Differences between Emulator and DTV Target

Feature	LG Smart TV Emulator 2012	DTV 2012
Performance	Depending on the PC where the emulator is running.	Depending on the target DTV
Resource size	Depending on the memory of the PC. Note that the memory of the PC is much greater than the one on the target DTV board.	Depending on the memory of the target DTV
Image decoder	prebuilt libjpeg7-win32	patched JPEGsrc. v6b
DRM	Not supported	WM DRM-PD Version 10, Playeady and WideVine DRM are supported. Adobe Access 3.0 DRM is supported only in NetCast 3.0
Magic Remote	Supported limitedly - Acceleration sensor is not supported.	Supported
Media player	Refer to the **List of Supported Codecs and Containers**.	
Flash	Supported	Supported
HTML5	Supported	Supported
PLEX	Supported	Supported
TP Streaming	Not supported	Supported
USB Emulation	Not supported	Supported
DTV General	Not supported	Supported
EMF	Not supported	Supported
DLNA	Not supported	Supported
DVR Ready	Not supported	Supported
3DTV	Not supported	Supported
C Native	Not supported	Supported
LG Apps	Not supported	Supported
My Apps	Not supported	Supported
SDP Client	Not supported	Supported

Note

Between the DTV and emulator, there may be performance difference depending on CPU speed and video memory of the PC that developers use (e.g. graphic rendering speed and quality, video streaming speed).

Getting Started

This chapter covers the user interface of LG Smart TV Emulator 2012 and how to navigate in the emulator. Also, menu descriptions on emulator are provided.

This section includes the following sections.

Starting and Exiting the Emulator

Select **[Start** > **Program** > **LG Smart TV SDK > LG Smart TV Emulator 2012]** to launch the emulator after installing it. Then, the virtual machine will launch the emulator. When the emulator starts running, the TV and IR Remote emulator run by default.

Caution

Be sure that VirtualBox should be installed on your PC first before installing LG Smart TV SDK in order to operate LG Smart TV Emulator 2012 normally.

[Figure] Emulator Execution

To exit the emulator, press the button on IR Remote emulator or select **[Exit]** in the emulator menu. Then, the following pop-up window appears. Press the **[Yes]** button to exit the emulator.
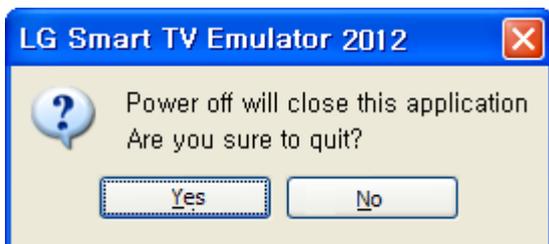
Note

You can also exit the emulator by pressing the button on the top right

---

User Interface of the Emulator

LG Smart TV Emulator 2012 basically consists of the main window and IR Remote emulator. All of navigation of emulator is done by the remote control and PC mouse. (see Section **Navigation in Emulator**)
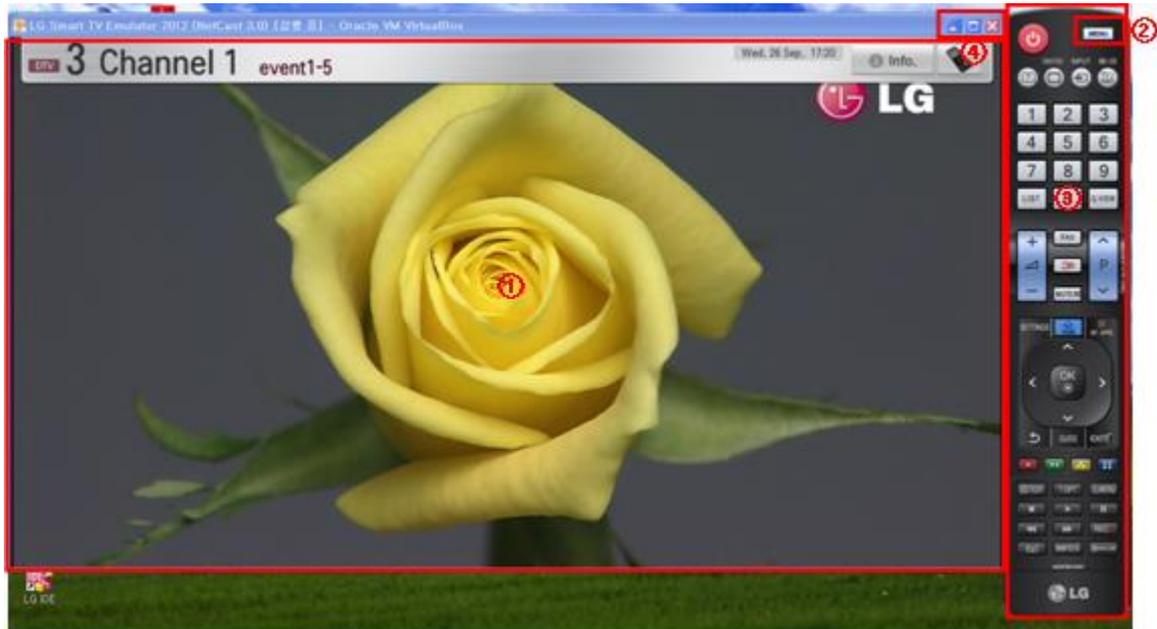
[Figure] User Interface of LG Smart TV Emulator 2012

The following describes each part of the emulator.

① Main window
The main window that displays the operation of the emulator. The emulator has the same resolution as the TV screen. You can resize the main window.

② Emulator menu
Click the ⬚MENU button on the top right of the IR Remote to open the emulator menu. (see **Emulator Menu**.)

③ IR Remote emulator
Emulates the TV IR Remote. (see **IR Remote Menu**)

④ Minimize and Exit
Press the ⬚ and ⬚ button to minimize and maximize the emulator window; press the ⬚ button to exit the emulator.

Navigation in Emulator

In order to navigate, LG Smart TV Emulator 2012 uses a remote control as you do with the target DTV, but it does not support a keyboard. Users of the TV-based web and Flash contents may not have mouse and keyboard. Therefore, you might need to estimate usability of the content without mouse or keyboard – with IR Remote emulator.

When you want to emulate navigation using the Magic Remote, you need to use your PC mouse. Move the cursor using your mouse on the emulator screen.

Note

To learn about IR Remote menu, see **IR Remote Menu**.

Menu Description

This chapter describes the functions of the emulator menu and remote control menu provided by LG Smart TV Emulator 2012.

Emulator Menu

To display the emulator menu, click [MENU] on the top right of the emulator remote control. Run the basic functions of the emulator and set the options using this menu.

[Figure] Emulator Menu of LG Smart TV Emulator 2012

The following table describes on the emulator menu in LG Smart TV Emulator 2012.

[Table] Emulator Menu Description

Menu	Description
Proxy Configuration	If you use a proxy, enter the proxy server address and port number. See **Proxy Configuration**.
Run Flash / AIR	Opens a flash file (.SWF) to be played in the Flash player. Or, opens a AIR directory to be played in the AIR player. See **Flash Player Emulation**. See **AIR Player Emulation**.
Run Browser	Enters the URL address to access in the browser. See **Browser Emulation**.
Terminate Running App	Kills the currently running application.
Show Log	Runs LG Resource Monitor Tool. See **Show Log**.
Overscan Area On	In Blu-ray Player, overscan area of the screen should be considered. This area must be blank in your application. See **Overscan Area**.
Add Browser Font	Installs an additional browser font. See **Add Browser Font**.
Take Screenshot	Takes a screenshot of the main window. See **Take Screenshot**.
Test Media File	Opens a media file at main window. See **Test Media File**.
Send Voice Input	Sends a word instead of the voice for the voice test. See **Send Voice Input**.
About	Version of LG Smart TV Emulator
Exit	Exits the emulator.

IR Remote Menu

To emulate the TV IR Remote and its functions, LG Smart TV Emulator 2012 provides the IR Remote emulator. The IR Remote emulator is displayed in a separate window, and you can drag it to the desired position on your desktop.

Note

If you cannot see the remote control when using LG Smart TV Emulator 2012, click on the tray icon or the emulator tab on launch bar to launch it.

[Figure] IR Remote of LG Smart TV Emulator 2012

The following table describes the buttons on the remote control.

[Table] IR Remote Menu

Button	Description	Disabled/Enabled
①	[POWER]: Turns the emulator off.	Enabled
②	• [RATIO]: Selects your desired Aspect Ratio of picture. • [INPUT]: External input mode rotates in regular sequence. • [TV/RAD]: Selects Radio, TV and DTV channel.	Disabled, [TV/RAD] button is enabled
③	• [0~9]: Selects channel numbers. • [LIST]: Displays the channel table. • [Q.VIEW]: Displays a list of the most recently viewed channels.	Enabled, [Q.VIEW] button is disabled
④	• [FAV]: Sets the desired favorite channels list. • [3D]: Converts into the 3D mode. • [MUTE]: Switches the sound on/off.	Enabled.

Button	Description	Disabled/Enabled
	• [VOL +,−]: Adjusts the volume. • [PAGE +,−]: Changes the channel.	
⑤	• [SETTINGS]: Opens the settings options. • [Home]: Enters into the Home Dashboard page. • [MY APPS]: Enters into the My Apps page.	Disabled [SETTINGS] button is enabled
⑥	Navigation keys for the menu. Press [OK] to choose the menu. • [BACK]: Returns to the previous menu or exit from current menu. • [GUIDE]:Shows channel schedule. • [EXIT]: Returns to the previous menu or exit from current menu.	Enabled
⑦	[RED,GREEN,YELLOW,BLUE]: If necessary, DTV content explains the color icons for a specific feature.	Enabled
⑧	• [TEXT], [T.OPT]: These buttons are used for teletext. • [Q.MENU]: Opens the list of Quick Menu options.	Disabled
⑨	• [STOP]: Stops DivX. • [PLAY]: Plays DivX. • [PAUSE]: Pauses DivX. • [REWIND]: Rewinds DivX. • [FASTFORWARD]: FastForwards DivX. • [REC]: Records DivX. • [ENERGY SAVING]: Sets the energy saving mode. • [INFO]: Channel Information. • [ⓈIMPLELINK]: Links to the TV, DISC, VCR1, HDD Recorder and Speaker.	Disabled, [INFO] button is enabled
⑩	MENU : Emulator Menu Button	Enabled

Note

[Menu] button is enabled after finishing Emulator booting.

Main Functions of Emulator 2012

This chapter introduces the main functions of the emulator such as Browser and Flash player emulation. It also describes on how to use basic DTV emulation functions.

Main Functions of Emulator 2012 are as follows :
• **Proxy Configuration**
• **Browser Emulation**
• **Flash Player Emulation**
• **AIR Player Emulation**
• **Show Log**
• **Overscan Area**
• **Add Browser Font**
• **Take Screenshot**
• **Test Media File**
• **Send Voice Input**

Proxy Configuration

LG Emulator supports proxy configuration.

1. Press **[Proxy Configuration]** in the emulator menu after starting the emulator.

2. If you use a proxy, enter the proxy server address and port number.
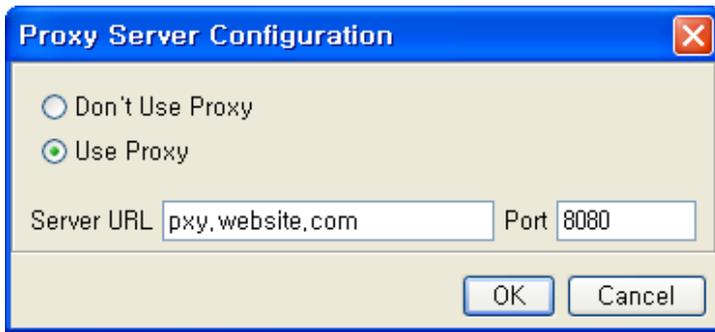
If you do not use proxy, select [Don't use proxy].

3. Click **[OK]** button to save the configuration.

Browser Emulation

LG Browser is a web browser for digital TV sets. LG Smart TV Emulator 2012 can open URLs and local URLs on PC for testing web content. Since the emulator uses the same source code as the LG Browser running on the DTV, it reproduces its behaviour quite accurately. Because of the differences between PC and TV platforms, the emulator has differences from the TV. (See **Differences from the TV**.)

- Opening URLs: Testing a server-based URL
- Opening Local URLs: Testing a local URL

Opening URL

Follow the next steps to open a URL.

1. Press **[Run Browser**] in the emulator menu. The following window appears in which you can enter a URL. Enter the URL and click **[GO]** to open the URL. To delete the URL from history, select URL and click the **[Delete From History]**.

2. Enter the URL address you want to access and press the **[GO]** button. For example, enter ***http://www.lg.com***.

3. Then, you can view the website of the URL in the emulator's browser as shown below.

Opening Local URL

LG Smart TV Emulator 2012 supports local URL. This function is not supported on the LG Browser running on the DTV. Developers can test the developed application stored in their PC.

1. Press **[Run Browser]** in the emulator menu. The following window appears in which you can enter a URL.

A. If you have created a project and started the web server in LG IDE, you can run the web application in localhost. Enter ***http://localhost:<port number>/<project name>/<html file name>*** or ***http://127.0.0.1:<port number>/<project name>/<html file name>*** in the window. The <port number> is the value set in Run Configuration window of LG IDE.

This is the example: http://localhost:8080/myproject/index.html

B. If you did not start the web server on your PC, put your application files under ***C:\Documents and Settings\user\LG_Smart_TV_SDK\FlashWorkspace.*** Then, enter ***file:///C:\Documents and Settings\user\LG_Smart_TV_SDK\FlashWorkspace\<html file name>*** in the window.

2. Press **[GO]** to open the web application stored on your PC.

3. Then, you can view the page of the local URL in the emulator's browser.

Note

The user folder for LG Smart TV SDK is different from each user environment.

Flash Player Emulation

With the emulator, you can open and execute a Flash file to test it on your PC first. Because of the differences between PC and TV platforms, the emulator has Differences from the TV. (See **Differences from the TV**.)

Running Flash Files

In LG Smart TV Emulator 2012 the SWF file should be placed under the following directory so that the virtual machine can find the local file to open on the emulator.

SWF File path in WinXP (default) : C:\Documents and Settings\user\LG_Smart_TV_SDK\FlashWorkspace
SWF File path in Win7 : C:\Users\user\LG_Smart_TV_SDK\FlashWorkspace

1. In LG Smart TV Emulator 2012, press **[Run Flash/AIR]** in the emulator menu.

Then, the following window appears, in which you can select a Flash file (.SWF).
To use default background color with white when executing application, click on the check button.
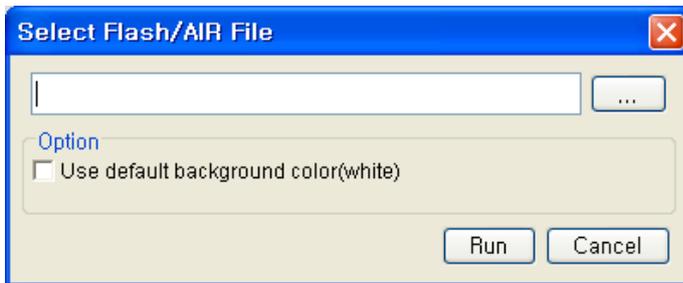
If you do not find the SWF file from the correct directory, the following popup message will appear.
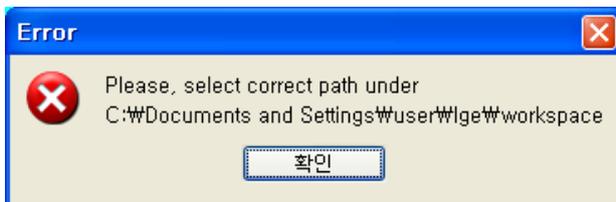
Note

You can change the workspace directory of your project in Adobe Flash CS. Then, LG Smart TV Emulator 2012 will find the local file from the changed directory. Be sure that you must create a shared folder for the workspace directory so that the virtual machine can access the file.

2. Press the **[Run]** button after entering the file path of the Flash file stored on your PC.

3. Then, you can view the opened file in the emulator's Flash player as shown below.

Note

The user folder for LG Smart TV SDK is different from each user environment.

AIR Player Emulation

LG Smart TV Emulator 2012 can play AIR content. The emulator reads and executes the "META-INF\AIR\application.xml" file, therefore, the directory of the META-INF folder should be set. Differences may exist between real TV and the emulator.

Using the **"Step-2. Build and Run Over Emulator"** command from LG IDE plug-in menu in Adobe Flash Professional CS, you can execute the AIR application (developed with ActionScript 3.0) on emulator.

With the emulator, you can open and execute an AIR file to test it on your PC first.

1. Press **[Run Flash/AIR]** in the emulator menu. Then, the following window appears, in which you can select a directory. Select the .air file to test. To use default background color when executing application, click on the check button.
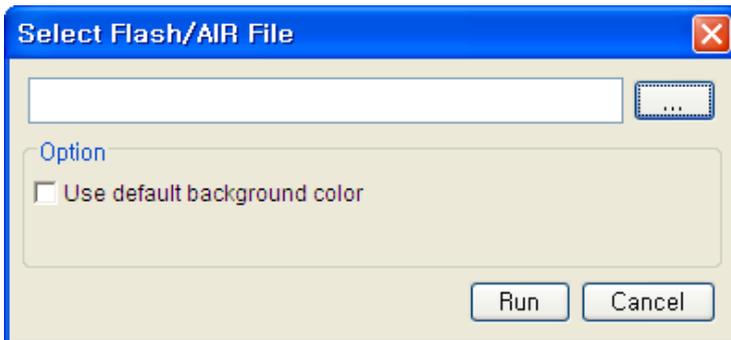
2. Press the **[RUN]** button after entering the file path of the AIR file stored on your PC.

3. Then, you can view the opened file in the emulator's AIR as shown below

Show Log

You can run the Resource Monitor by the show log menu. For more information about resource monitor, refer to **Using LG Resource Monitor**.

Overscan Area

In Blu-ray Player, overscan area of the screen should be considered. This area must be blank in your application.

Press **[Overscan Area On]** in the emulator menu.
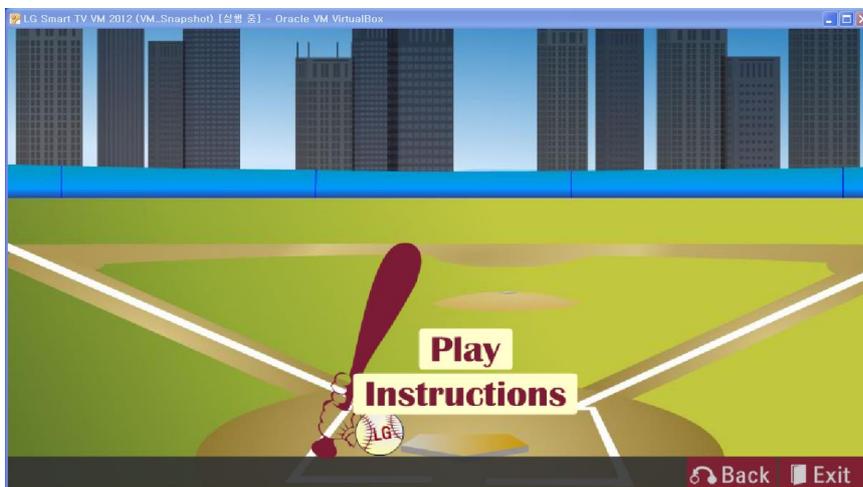
Then, the following window appears. You can check the overscan area.
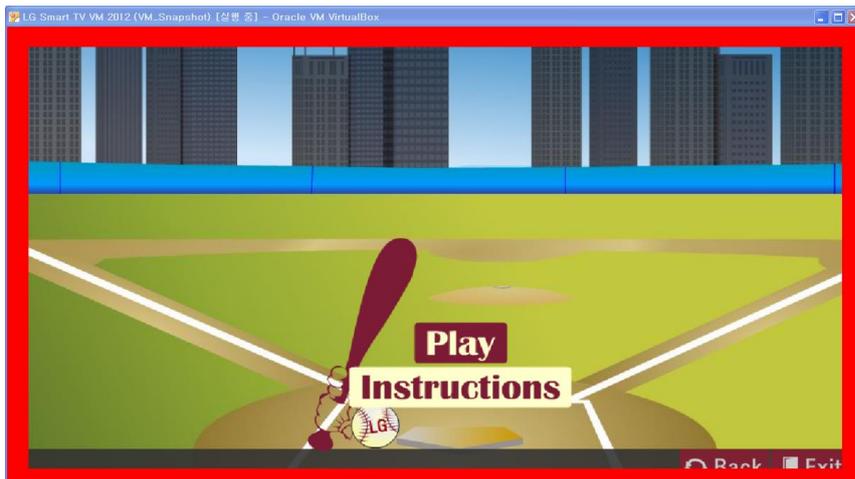
For more information, refer to the "**LG Smart TV and Media Product UI Guideline**" in **[DISCOVER > Legacy Platform (NetCast) > Technical Notes]** in this website.

Add Browser Font

In LG Smart TV Emulator 2012, you can add a new font to the emulator.
If you are a CP (partner) member, you can test the font on the emulator before packaging your application for real TV.

1. Press **[Add Browser Font]** in the emulator menu. Then, the following window appears. Select the font file to install.

2. Press the **[install]** button after entering the file path of the font file stored on your PC.

3. Then, you can use the installed font in emulator

Caution

When you restart the emulator, previous applied font cannot use anymore on the emulator.

Take Screenshot

In LG Smart TV Emulator 2012, you can save a image of current screen into the user specified folder.

1. Press **[Take Screenshot]** in the emulator menu. Then, the following window appears. The file name is created automatically. You can change file name before pressing the take button.

2. Press the **[Take]** button.

3. Then, you can get image files under *C:\Documents and Settings\user\LG_Smart_TV_SDK\ScreenShot.*

Note

The user folder for LG Smart TV SDK is different from each user environment.

Test Media File

You can test media files whether it is playable on the LG Smart TV.

1. Press **[Test Media File]** in the emulator menu. Then, the following window appears. Select the media file to play.

2. Press the **[Run]** button after entering the file path of the media file stored on your PC.

3. Then, the emulator plays the selected media file as following.

Caution

Before testing media file, you must put the media file under *C:\Documents and Settings\user\LG_Smart_TV_SDK\FlashWorkspace*.

Send Voice Input

Send Voice Input is also available at LG Smart TV Emulator, just like a same style in Magic Remote

1. Press **[voice input]** button in the application. Then, the following window appears in emulator.

Note

Voice Input button is only available when developers have implemented it in the application.

2. Press **[Send Voice Input]** in the emulator menu.
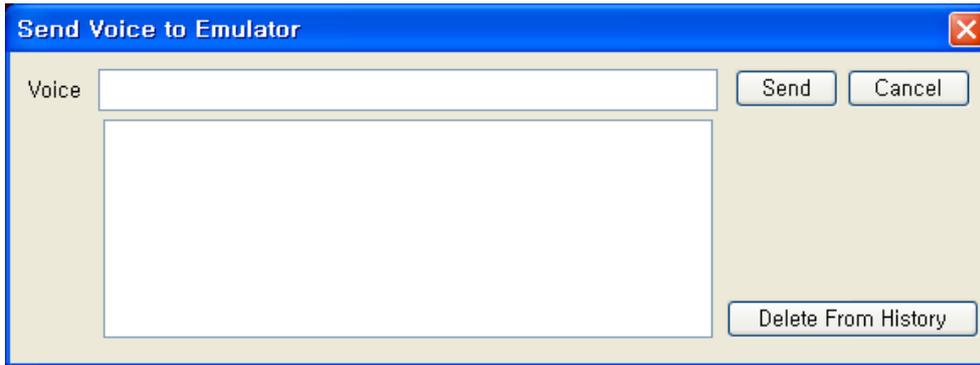
3. Press **[Send]** button after entering word in the Voice textbox.

Note

To delete a word from history, select the word and click the **[Delete From History]**.

---

4. The emulator sends inputted word to the application according to Input Mode.

Dictation Mode
Dictation Mode sends inputted word from send voice input to the application directly without the similar list.

Keyword Mode
Keyword Mode shows the similar list to choose similar word as inputted word from send voice input. When user select a word, emulator sends that to the application.

Note

The Similar List shows a maximum of 3 similar word.

Using LG Smart TV Emulator 2011

This section introduces how LG Smart TV Emulator 2011 works. This section covers the overview and user interface (UI) of the emulator, and how to use it.

- **Overview of LG Smart TV Emulator 2011**
- **Getting Started**
- **Main Functions of Emulator 2011**

Overview of LG Smart TV Emulator 2011

LG Smart TV Emulator 2011 is a tool that provides developers with the same environment as the target DTV on their PC. Content developers can test DTV Web-based and Flash contents on their PC using this emulator. The emulator emulates the actual hardware, library, and graphics of DTV, which are compatible with the PC environment. Content developers can minimize the development period using this emulator without the target DTV.

LG Smart TV Emulator 2011 has the following features:

- Playing Web content for TV with LG Browser emulation
- Playing Flash content for TV with LG Flash emulation
- IR Remote emulation

LG Smart TV SDK provides following features:
- LG Smart TV Emulator 2011: Emulator for LG Smart TV released in 2011
- LG Smart TV Emulator 2012: Emulator for LG Smart TV released in 2012
- LG Smart TV Emulator 2013: Emulator for LG Smart TV released in 2013

Caution

LG Smart TV Emulator 2011 has some differences from the LG Browser and Flash player on the target DTV. Developers should keep in mind these differences when they test applications on the emulator. For detailed information, see **Differences from the TV**.

Specifications and Differences from the TV are listed in the following sections.
- **Specifications**
- **Differences from the TV**

Specifications

LG Smart TV Emulator 2011 uses the same Browser and Flash engine as the one in the target DTV.
For the LG Browser engine specifications, refer to the "Web Engine" in **Developing > Developing Web App > App Development Guide > Specifications** section in this Library.

The table below shows the LG Flash player specifications.

[Table] LG Flash Player Specifications

Type	Item	LG Smart TV Emulator 2011
SWF	Version	Flash Player 9 or lower (NetCast 2.0 does not support Flash Player 10)
	ActionScript	AS 2.0
Graphics	Resolution	1280 x 720
	Type of images loadable during runtime	PNG , JPEG
Sound	Format	MP3, AAC, PCM (Event sound only) (NetCast 2.0 does not support AAC)
	Sample rate	16 kHz, 32 kHz, 44.1 kHz
Flash Video	SW Codec	On2 , Sorenson - Low quality video
	HW Codec	H.264 (with AAC audio only)
	- Recommended video resolution	Up to FHD (1080 p)

Type	Item	LG Smart TV Emulator 2011
	- Recommended audio sample rate	44.1 kHz
Streaming Protocol		HTTP(s) RTMP/RTMP-e
Security		RTMP-e, FlashAccess3.0 (NetCast 2.0 does not support FlashAccess3.0)

Differences from the TV

LG Smart TV Emulator 2011 has some differences from LG Browser and Flash player on the TV. Developers should keep in mind these differences when they test applications on the emulator.
The table below lists LG Smart TV features that work differently on the emulator and on TV.

[Table] Differences between Emulator and TV

Feature	LG Smart TV Emulator 2011	DTV 2011
Performance	Depending on the PC where the emulator is running.	Depending on the target DTV
Resource size	Depending on the memory of the PC. Note that the memory of the PC is much greater than the one on the target DTV board.	Depending on the memory of the target DTV
Image decoder	prebuilt libjpeg7-win32	patched JPEGsrc. v6b
DRM	Not supported	WM DRM-PD Version 10 and WideVine DRM are supported. PlayReady DRM is not supported.
Magic Remote	Supported limitedly - Acceleration sensor is not supported.	Supported
Media player	Refer to the **List of Supported Codecs and Containers**.	
Flash	Supported	Supported
HTML5	Partly Supported	Supported
PLEX	Supported	Supported
TP Streaming	Supported	Supported
USB Emulation	Supported	Supported
DTV General	Supported	Supported
EMF	Supported	Supported
DLNA	Not supported	Supported
DVR Ready	Not supported	Supported
3DTV	Not supported	Supported
C Native	Not supported	Supported
LG Apps	Not supported	Supported
My Apps	Not supported	Supported
SDP Client	Not supported	Supported

Note

Between the DTV and emulator, there may be performance difference depending on CPU speed and video memory of the PC that developers use (e.g., .graphic rendering speed and quality, video streaming speed).

Getting Started

This chapter covers the user interface of LG Smart TV Emulator 2011 and how to navigate in the emulator. Also,

menu descriptions on emulator are provided.

This section includes the following sections.
• **Starting and Exiting the Emulator**
• **User Interface of the Emulator**
• **Navigation in the Emulator**
• **Menu Description**

Starting and Exiting the Emulator

Select **[Start** > **Program** > **LG Smart TV SDK > LG Smart TV Emulator 2011]** to launch the emulator after installing it.

When the emulator starts running, the TV and IR Remote emulator run by default. Press the **[POWER]** button in the remote control to launch the emulator.

To exit the emulator, press the [x] button on the top right or select **[Exit]** in the emulator menu. Then, the following pop-up window appears.
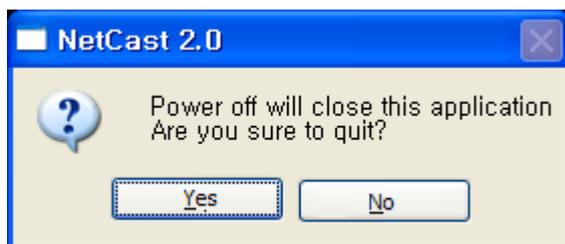
Press the **[Yes]** button to exit the emulator.

User Interface of the Emulator

LG Smart TV Emulator 2011 basically consists of the main window and IR Remote emulator. All of navigation of emulator is done by the remote control and PC mouse. (see **Navigation in Emulator**)
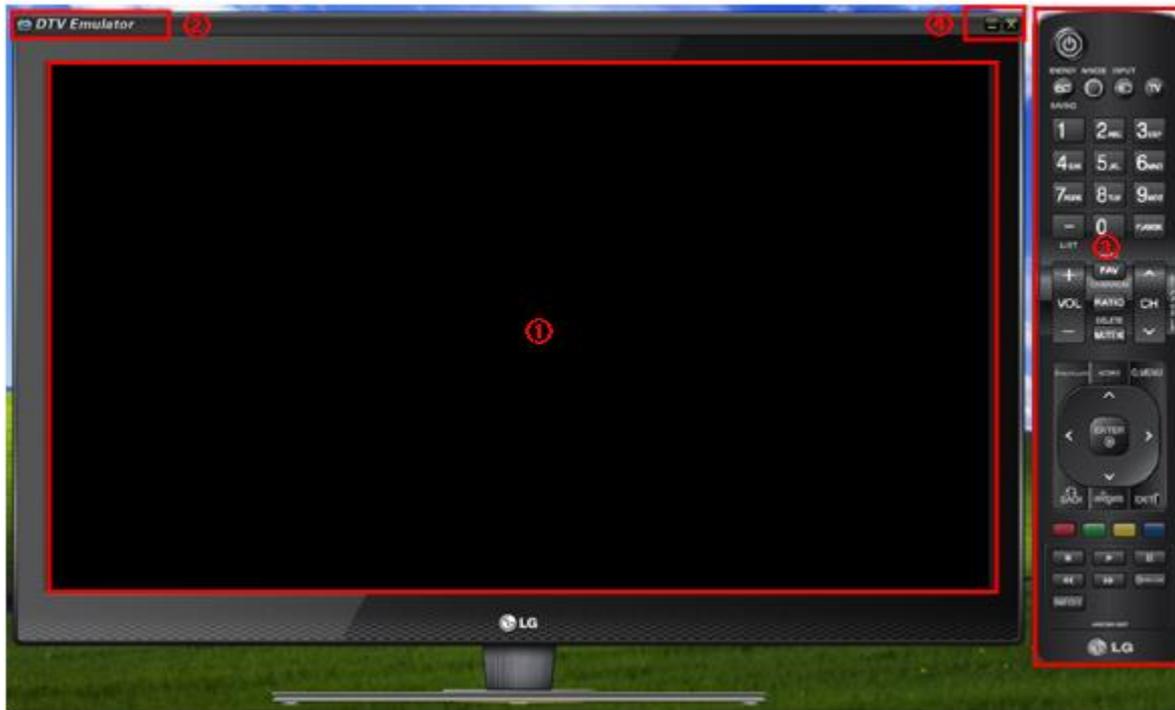
[Figure] User Interface of LG Smart TV Emulator 2011

The following describes each part of the emulator.

① Main window
The main window that displays the operation of the emulator. The emulator has the same resolution as the TV screen.
You can zoom in/out the size of the main window in the emulator menu.

② Emulator menu
Click the title to open the emulator menu. (see **Emulator Menu**.)

③ IR Remote emulator
Emulates the TV IR Remote. (see **IR Remote Menu**)

④ Minimize and Exit
Press the [ ] button to minimize the emulator window; press the [X] button to exit the emulator.

Navigation in the Emulator

In order to navigate, LG Smart TV Emulator 2011 uses a remote control as you do with the target DTV, but it does not
support a keyboard. Users of the TV-based web and Flash contents may not have mouse and keyboard. Therefore,
you might need to estimate usability of the content without mouse or keyboard – with IR Remote emulator.

When you want to emulate navigation using the Magic Remote, you need to use your PC mouse. Move the cursor
using your mouse on the emulator screen.

Note

To learn about IR Remote menu, see **IR Remote Menu**.

Menu Description

This chapter describes the functions of the emulator menu and remote control menu provided by LG Smart TV
Emulator 2011.

Emulator Menu

To display the emulator menu, click the top left of the emulator main window. Run the basic functions of the emulator and set the options using this menu.

Click "DTV Emulator" on the top left of the emulator main window to display the following emulator menu.
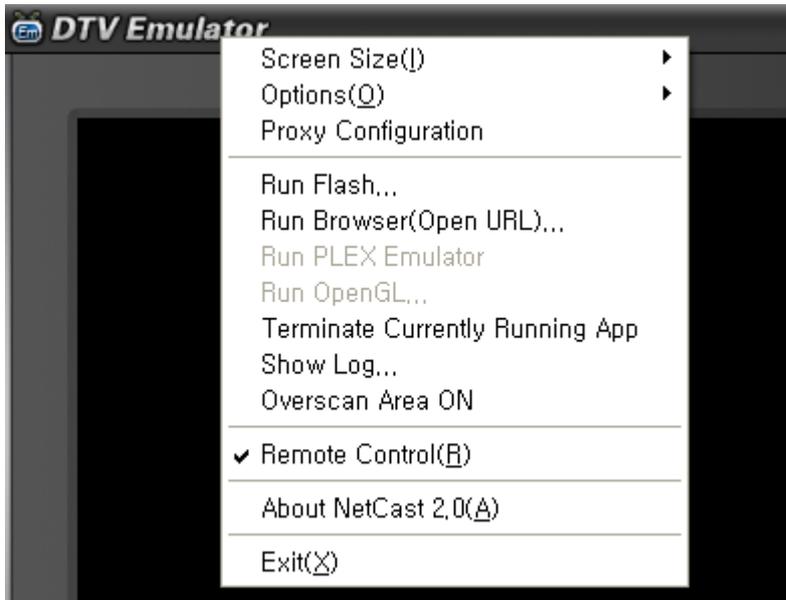
[Figure] Emulator Menu of LG Smart TV Emulator 2011

The following table describes the hierarchy of the emulator menu in LG Smart TV Emulator 2011.

[Table] Emulator Menu Description (LG Smart TV Emulator 2011)

Menu		Description
Screen Size	50%	Shrinks the emulator window.
	75%	The default size of the emulator window.
	100%	Expands the emulator window. (1366 x 768)
	Full Screen	Opens the emulator window in full screen mode.
Options	TP Data	Runs the Transport Stream file. See **TS Emulation**.
	External Device	Emulates external device function regarding to the USB. See **USB Emulation**.
Proxy Configuration		If you use a proxy, enter the proxy server address and port number. See **Proxy Configuration**.
Run Flash…		Opens a flash file (.SWF) to be played in the Flash player. See **Flash Player Emulation**.
Run Browser(Open URL)…		Enters the URL address to access in the browser. See **Browser Emulation**.
Terminate Currently Running App		Kills the currently running application.
Show Log		Shows log message of Browser or Flash application. See Section **Log**.
Overscan Area ON		In Blu-ray Player, overscan area of the screen should be considered. This area must be blank in your application. See **Overscan Area**.
Remote Control		Run or hide the IR Remote emulator. See **IR Remote Menu**.
About NetCast 2.0		Version of LG Smart TV Emulator
Exit		Exits the emulator.

IR Remote Menu

To emulate the TV IR Remote and its functions, LG Smart TV Emulator 2011 provides the IR Remote emulator. The IR Remote emulator is displayed in a separate window, and you can drag it to the desired position on your desktop.

[Figure] IR Remote of LG Smart TV Emulator 2011

The following table describes the buttons on the remote control.

[Table] IR Remote Menu   (LG Smart TV Emulator 2011

Button	Description	Disabled/Enabled
①	[POWER]: Turns the emulator on/off.	Enabled
②	• [ENERGY SAVING]: Sets the energy saving mode. • [AV MODE]: Toggles between preset Video and Audio modes. • [INPUT]: Rotates through inputs. Also turns the TV on from standby. • [TV]: Returns to the last TV channel.	Enabled

Button	Description	Disabled/Enabled
③	• [0~9]: Selects channel numbers. • [−] : Shows the program list. • [FLASHHBK]: Returns to the previous channel.	Enabled
④	• [FAV]: Sets the desired favorite channels list. • [RATIO]: Selects your desired Aspect Ratio of picture. • [MUTE]: Switches the sound on/off. • [VOL +,−]: Adjusts the volume. • [CH +,−]: Changes the channel.	Enabled
⑤	• [Premium]: Shows the premium contents. • [HOME]: Enters into the Home menu. • [Q.MENU]: Opens the list of Quick Menu options.	[Premium] button is disabled. The others are enabled.
⑥	Navigation keys for the menu. Press [ENTER] to choose the menu.	Enabled
⑦	• [BACK]: Returns to the previous menu or exit from current menu. • [Widget]: The function depends on regions. • [EXIT]: Returns to the previous menu or exit from current menu.	[Widget] button is disabled. The others are enabled.
⑧	[RED,GREEN,YELLOW,BLUE]: If necessary, DTV content explains the color icons for a specific feature.	Enabled
⑨	• [STOP]: Stops DivX. • [PLAY]: Plays DivX. • [PAUSE]: Pauses DivX. • [REWIND]: Rewinds DivX. • [FASTFORWARD]: FastForwards DivX. • [ⓈIMPLELINK]: Links to the TV, DISC, VCR1, HDD Recorder and Speaker. • [INFO]: Channel Information.	[STOP], [PLAY], [PAUSE], and [INFO] Buttons are enabled. The others are disabled.

Main Functions of Emulator 2011

This chapter introduces the main functions of the emulator such as Browser and Flash player emulation. It also describes on how to use basic DTV emulation functions.

Main Functions of Emulator 2013 are as follows:
• **Proxy Configuration**
• **Browser Emulation**
• **Flash Player Emulation**
• **Overscan Area**
• **TS Emulation**
• **USB Emulation**
• **Log**

Proxy Configuration

LG Emulator supports proxy configuration.

Caution

You should set up your proxy server before turning the emulator on. If you change proxy configuration at runtime, the emulator needs to be rebooted.

---

1. Press [Proxy Configuration] in the emulator menu after starting the emulator.

2. If you use a proxy, enter the proxy server address and port number.
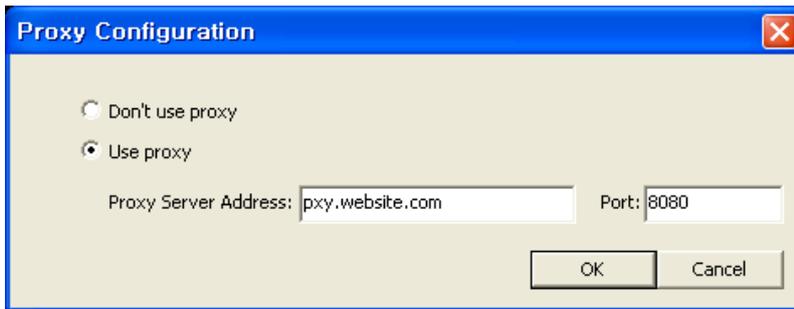
If you do not use proxy, select [Don't use proxy].

3. After completing the proxy configuration, press the [POWER] button in the remote control to turn the emulator on.

Browser Emulation

LG Browser is a web browser for digital TV sets. LG Smart TV Emulator 2011 can open URLs and local URLs on PC for testing web content. Since the emulator uses the same source code as the LG Browser running on the DTV, it reproduces its behaviour quite accurately. Because of the differences between PC and TV platforms, the emulator has differences from the TV. (See **Differences from the TV**.)

• Opening URLs: Testing a server-based URL
• Opening Local URLs: Testing a local URL

Opening URL

Perform the following steps to open a URL.

1. Press **[Run Browser(Open URL)…]** in the emulator menu.

The following window appears in which you can enter a URL. Enter the URL and click **[GO]** to open the URL.
To delete the URL from history, select URL and click the **[Delete From History]**.

2. Enter the URL address you want to access and press the **[GO]** button. For example, enter *http://www.lg.com*.

3. Then, you can view the website of the URL in the emulator's browser as shown below.
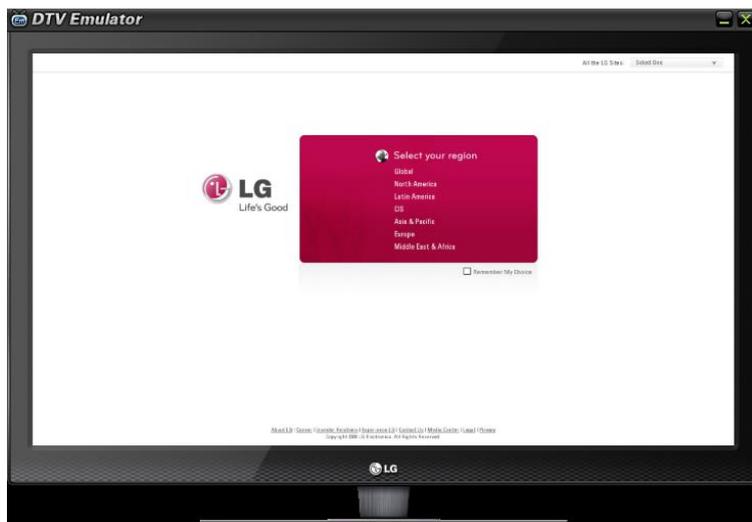
4. Once you have opened a URL, you cannot enter another URL. You need to exit first by pressing **[EXIT]** in the IR Remote emulator and reenter the URL to open another one.

Opening Local URL

LG Smart TV Emulator 2011 supports local URL. The absolute path relates to the executable file of the installed emulator. This function is not supported on the LG Browser running on the real TV. Content developers can test the developed content stored in their PC.

1. Press **[Run Browser(Open URL)…]** in the emulator menu. Then, the window appears, in which you can enter local URL or select a file path from history list. If the absolute path is C:\html\a.html, for example, then you must enter the ***file:///c:/html/a.html***. Or, select local URL from the history list.

2. Press the **[GO]** button to open the browser file stored on your PC. The URLs that you entered will be added in the history. To delete the URL, select URL and click the **[Delete From History]** button.

3. Then, you can view the page of the local URL in the emulator's browser.

4. Once you have opened a local URL, you cannot enter another URL. You need to exit first by pressing **[EXIT]** in the IR Remote emulator and reenter the URL to open another one.

Flash Player Emulation

With the emulator, you can open and execute a Flash file to test it on your PC first. Because of the differences between PC and TV platforms, the emulator has Differences from the TV. (See **Differences from the TV**.)

Note

Refer to **Specifications** for LG Flash Player specifications and **"Flash Content Design Guide for HDTV"** in the **[DISCOVER > Legacy Platform (NetCast) > Technical Notes]** at LG Developer website for Flash content design guidelines.

Running Flash Files

1. In LG Smart TV Emulator 2011, press **[Run Flash…]** in the emulator menu.

Then, the following window appears, in which you can select a Flash file (.SWF).
If you select the [Fit To Flash Dimension] check box and set the resolution of the flash file, the flash file is opened in full screen mode.
If you do not select the [Fit To Flash Dimension] check box, the default resolution of full screen mode is 1280x720.
For example, if the resolution of the flash file is 960x540 and you do not select the [Fit To Flash Dimension] check box, the flash file is opened in top-left corner of the full screen and the size is smaller than the full screen.

SDK V1.3.0 (and above) does not have a backward compatibility with SDK V1.2.0 and lower versions.
[SWF developed by LG Smart TV SDK 1.3.0 and above] check box should be selected in order to run the flash file developed by SDK V1.3.0 and above versions.
By default, check box is selected.
On the contrary to this, the check box should not be selected to run the flash file developed by SDK V1.2.0 and lower
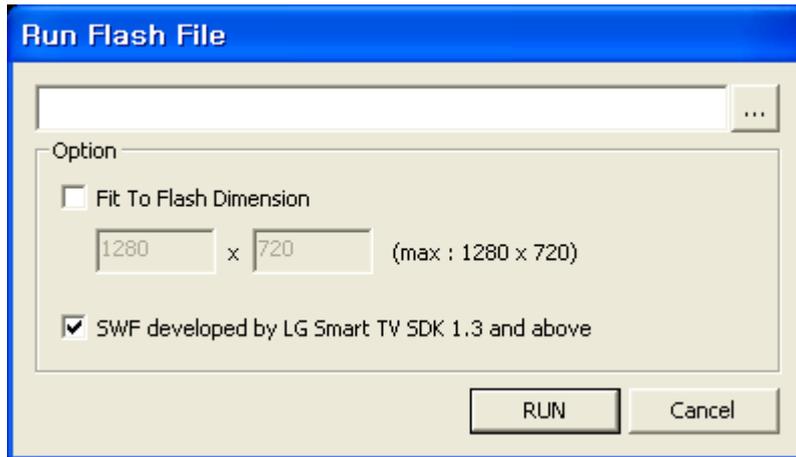
versions.

2. Press the **[RUN]** button after entering the file path of the Flash file stored on your PC.

3. Then, you can view the opened file in the emulator's Flash player as shown below.

Overscan Area

In Blu-ray Player, overscan area of the screen should be considered.
This area must be blank in your application.

Press **[Overscan Area ON]** in the emulator menu.

Then, the following window appears. You can check the overscan area.

For more information, refer to the "UI Guidelines" in **Developing > Designing** section in this Library.

TS Emulation

LG Smart TV Emulator 2011 can emulate DTV basic functions regarding broadcasting.

Note

TS file is MPEG transport stream which is a standard format for transmission and storage of audio, video and data, and is used in broadcast system such as DVB and ATSC. In order to get a TS File, you can save broadcast stream using TV   tuner Card or can download a sample TS file using the internet.
Currently, LG Smart TV Emulator 2011 supports only DVB TS file not ATSC.

Running the TS File

With the emulator, user can add and delete a TS file in LG Emulator for Smart TV. If TS file is added, a physical channel for broadcasting is added automatically.
To add a TS file, follow below steps:

1. Select **[Options > TP Data]** in the emulator menu. Then, the following window appears.
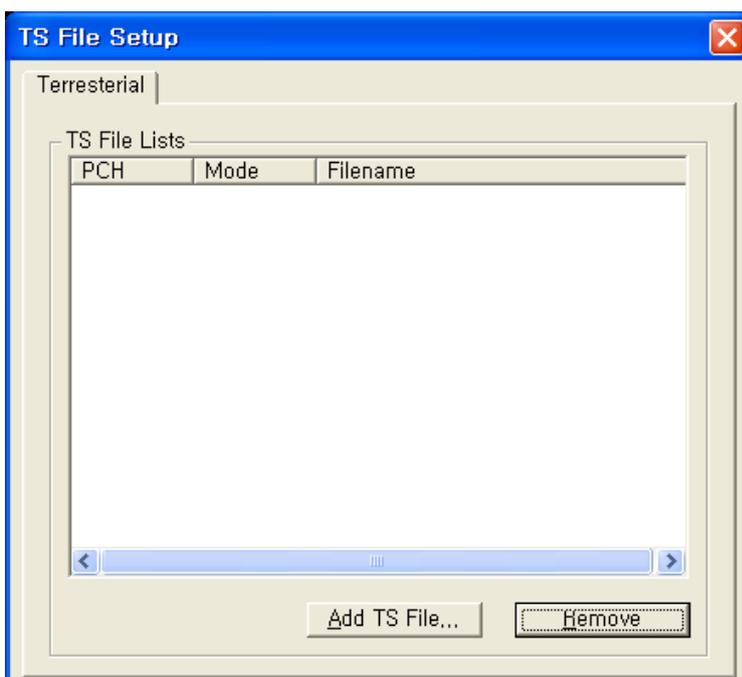
• **[Add TS File…]**: Adds a TS File.
• **[Remove]**: Removes a TS file.

2. Click **[Add TS File…]** button. Then, the following window appears.
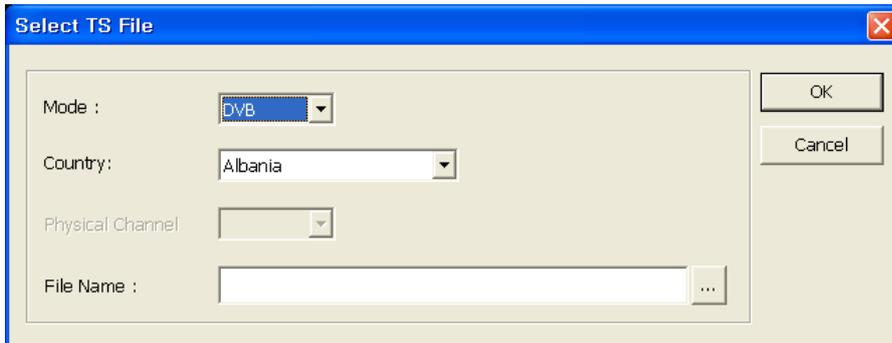
Select TS file that you want to play ([File Name] field (browse for file)). Then, select [Mode] (currently, only DVB is supported) and [Country] that should be same as setting in DTV (DTV Menu > OPTION > Country).

Press **[OK]** button.

3. Press **[Home]** button on the IR Remote emulator.

Then, you can see the Home board as follows (**only in LG Smart TV Emulator 2011**).
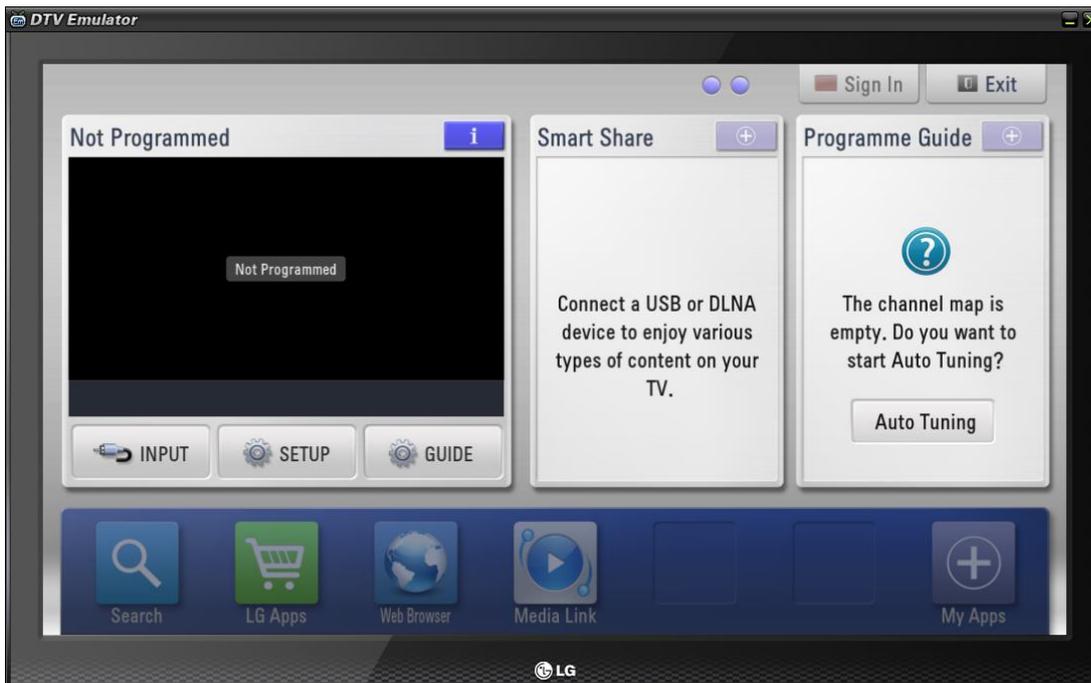
4. Select **[SETUP]** on the Home board. Then, the Setup menu window appears.
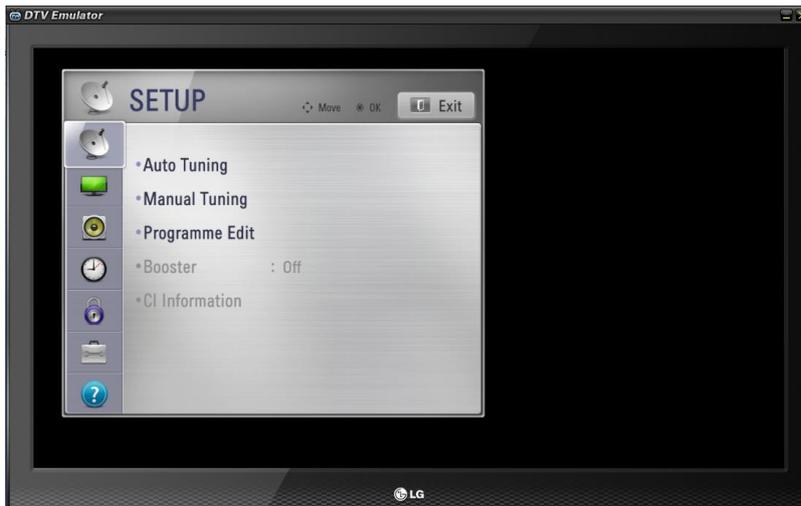
5. Select **[Auto Tuning]** to tune the channel.
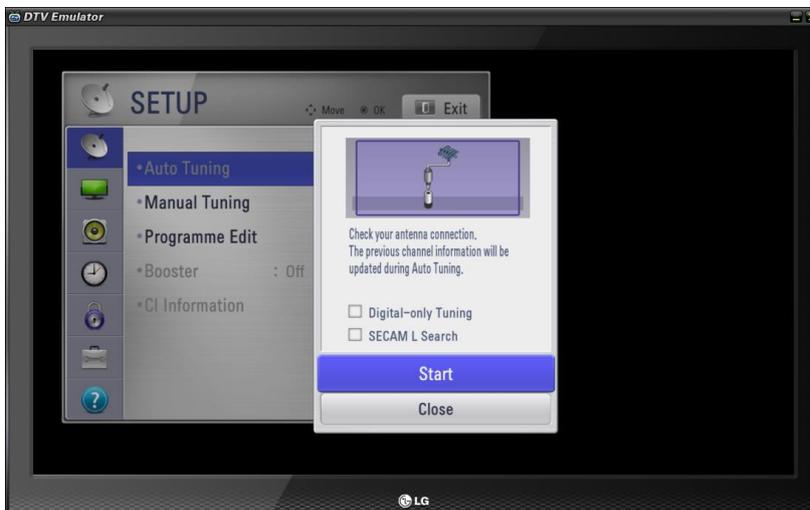
6. If channel tunning is completed, the emulator will play TS.
You can change the channel using remote control.

USB Emulation

LG Smart TV Emulator 2011 can emulate USB feature. It detects and plays media files from the specified directory.
Only USB drive needs not necessarily be specified.
Any system directory can be specified.

Connecting the USB Device

With the emulator, you can point the directory which contains media file such as video, audio, image files. If you configure a directory, the emulator treats the path as a USB external storage path. To configure a USB Emulation path, perform the following steps:

1. Select **[Options > External Device]** in the emulator menu. Then the following window appears.
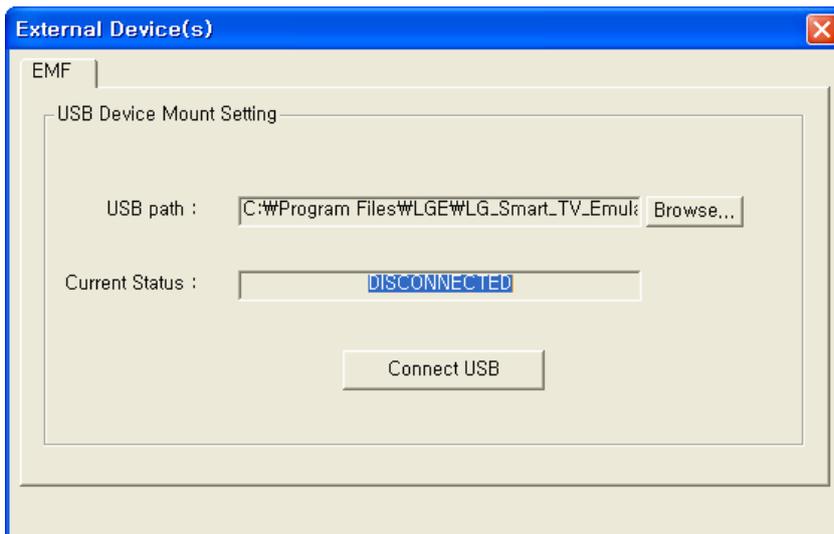
• **[Browse…]**: Sets a specific directory which contains media files.
• **[Connect USB]**: Occurs USB connection event virtually in the emulator.

2. Click **[Connect USB]** button.
Then, the following window appears. Press Movie, Photo, or Music icon according to the media type that is contained in the directory.

3. Then, the following window appears. You can play media file.
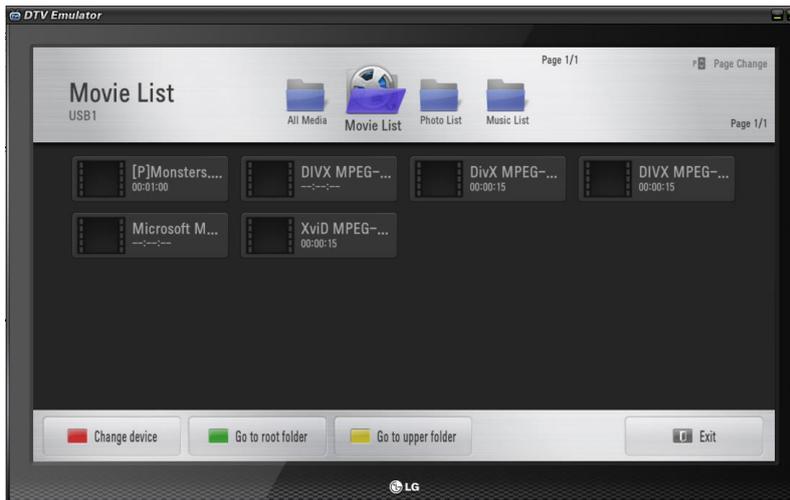
Log

LG Smart TV Emulator 2011 can show log message of Browser or Flash application.

Note

In flash, TRACE can be used to print log message. In web contents, console.log can be used to print log message.

---

1. Select **[Show Log…]** in the emulator menu. Then the following window appears.

2. Log message is shown when an application is running.
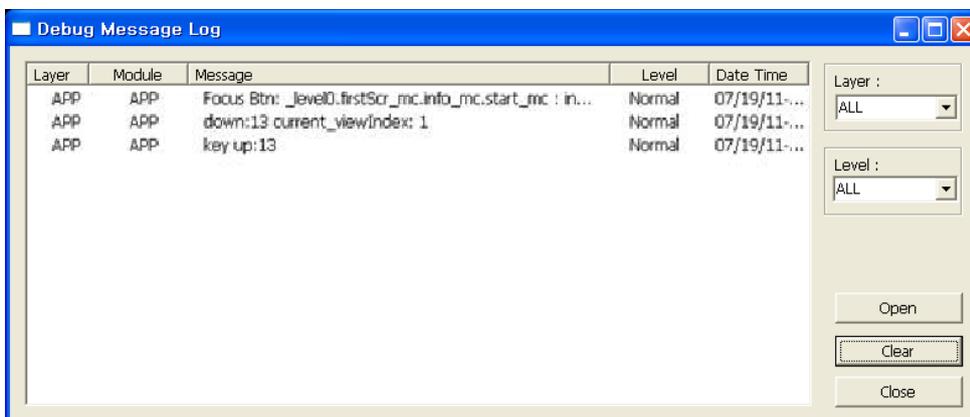
• **[Open]**: Reads the log message from the log file which has *.log extension.
• **[Clear]**: Clears the current log message on the window.
• **[Close]**: Closes the window.

List of Supported Codecs and Containers

The following table specifies all the supported codecs and containers by emulator and real TV in more detail.

Common File Extensions	Media Container	A/V	Codec	FourCC	DTV Target Supported?	Emulator Supported?	Target Description	Profile/Level Support	Emulator Description
.asf .wmv .wma	ASF	Video	VC-1 Advanced Profile	WVC1	**YES**	**YES**	Only streams compliant to SMPTE 421M VC-1 standard are supported.	Advanced Profile @ Level 3 (e.g. 720p60, 1080i60, 1080p30)	
				WMVA	**YES (Read Description)**	**YES**	Only streams compliant to SMPTE 421M VC-1 standard are supported. Some WMVA streams were developed before the VC-1 specification was finalized. These non-compliant streams are considered deprecated by the industry and are not supported.	Advanced Profile @ Level 3 (e.g. 720p60, 1080i60, 1080p30)	
			VC-1 Simple and Main Profiles	WMV3	**YES**	**YES**	Only streams compliant to SMPTE 421M VC-1 standard are supported.	Simple Profile @ Medium Level (e.g. CIF, QVGA) Main Profile @ High Level (e.g. 1080p30)	
			Other video Codecs like MPEG-1/2/4		**NO**	**NO**	ASF is a MS container format. Anything other than MS Codecs should not be found within an ASF file. Non MS Codecs within ASF are not supported.		
		Audio	WMA Standard	0x0161	**YES**	**YES**			
			WMA 9 Professional	0x0162	**YES**	**NO**			.wma format not Supported on emulator.
			WMA Lossless		**NO**	**NO**			
			Other audio Codecs like AC-3, AAC, MP3, MPEG Audio Layer		**NO**	**NO**	ASF is a MS container format. Anything other than MS Codecs should not be found within an ASF file. Non MS Codecs within ASF are not supported.		

Common File Extensions	Media Container	A/V	Codec	FourCC	DTV Target Supported?	Emulator Supported?	Target Description	Profile/Level Support	Emulator Description
			I/II						
.divx .avi	AVI /DivX Media Format	Video	Divx3.11	DIV 3 DIV 4	**YES**	**YES**	Please note that a FourCC value of DIV4 is not a DivX 4 stream, but in fact, a DivX 3.11 stream. DivX 4 streams have a FourCC value of DIVX.		
			Divx4 Divx5 Divx6	div x DIV X DIV 5 DIV 6 DX 50	**YES**	**YES**	MPEG-4 ASP support does not include global motion compensation or quarterpel motion estimation. Streams using this syntax are not supported.	Advanced Simple Profile. The resolution supported is chip dependent with earlier chips supporting up to SD resolutions (480i) and newer chips supporting up to HD (720p/1080i).	
			XViD	XVI D	**YES**	**YES**	MPEG-4 ASP support does not include global motion compensation or quarterpel motion estimation. Streams using this syntax are not supported.	Advanced Simple Profile. The resolution supported is chip dependent with earlier chips supporting up to SD resolutions (480i) and newer chips supporting up to HD (720p/1080i)	
			Other video Codecs like MPEG -1/2		**NO**	**NO**			
			H.264 / AVC	vss h VS SH AV C avc AV C1 avc 1 h26 4 H2 64	**NOT OFFICIAL LY SUPP ORTE D (Read Descr iption)**	**NO**	AVC within AVI files is not officially supported. It is well known in the industry that there are technical issues which make AVC is ill-suited for AVI encapsulation. This creates problems for compliance and interoperability. That is why it is known and recommended for AVC content to be put into other file	Main Profile @ Level 4.1 High Profile @ Level 4.1 (e.g. 720p60, 1080i60, 1080p30)	

Common File Extensions	Media Container	A/V	Codec	FourCC	DTV Target Supported?	Emulator Supported?	Target Description	Profile/Level Support	Emulator Description
							containers such MP4 and MKV. There is Code to attempt to handle AVC within AVI files but some streams will work and others will not.		
		Audio	MPEG-1 Layer I, II	0x0050	**YES**	**YES**			
			MPEG-1 Layer III (MP3)	0x0055	**YES**	**YES**			
			AC-3	0x2000	**YES**	**YES**			
			WMA Standard	0x0161	**YES**	**YES**			
			WMA 9 Professional	0x0162	**YES**	**NO**			
			Other audio Codecs like AAC, DTS, PCM		**NO**	**NO**			
.mkv	MKV	Video	H.264 / AVC	V_MPEG4/ISO/AVC	**YES**	**YES**	Most of the MKV content available is encoded by the open source x264 Codec, the default configuration labels streams as Level 5.0 (e.g. highest level), the video decoder only supports up to Level 4.1 and does it is best to decode Level 5.0 streams	Main Profile @ Level 4.1 High Profile @ Level 4.1 (e.g. 720p60, 1080i60, 1080p30)	.Mkv format is not supported in emulator.
			Other video Codecs like MPEG-1/2/4		**NO**	**NO**	Need sample streams to test		
		Audio	AAC	A_AAC	**YES**	**YES**		AAC-LC and AAC-HE	
			AC-3	A_AC3	**YES**	**YES**			
			MPEG-1 Layer III (MP3)	A_MPEG/L3	**YES**	**YES**			
			MPEG	A_	**YES**	**YES**			

Common File Extensions	Media Container	A/V	Codec	FourCC	DTV Target Supported?	Emulator Supported?	Target Description	Profile/Level Support	Emulator Description
			-1 Layer I, II	MPEG /L1 A_ MPEG /L2					
.ts .trp .tp .m2ts	MPEG-2 TS (Transport Stream), standard 188 byte TS and time-stamped 192 byte TS	Video	H.264 / AVC		**YES**	**YES**		Main Profile @ Level 4.1 High Profile @ Level 4.1 (e.g. 720p60, 1080i60, 1080p30)	.ts, .trp, .tp and .m2ts formats are not supported on emulator.
			MPEG-2		**YES**	**YES**		Main Profile @ High Level (e.g. 720p60, 1080i60)	
			VC-1		**YES**	**NO**	Only streams compliant to SMPTE 421M VC-1 standard are supported. Encapsulation must abide by SMPTE RP227 specification.	Simple Profile @ Medium Level (e.g. CIF, QVGA) Main Profile @ High Level (e.g. 1080p30) Advanced Profile @ Level 3 (e.g. 720p60, 1080i60, 1080p30)	
		Audio	MPEG-1 Layer I, II		**YES**	**YES**			
			MPEG-1 Layer III (MP3)		**YES**	**YES**			
			AC-3		**YES**	**NO**			
			DDP (Enhanced AC-3)		**YES**	**NO**			
			AAC		**YES**	**YES**		AAC-LC and AAC-HE	

Common File Extensions	Media Container	A/V	Codec	FourCC	DTV Target Supported?	Emulator Supported?	Target Description	Profile/Level Support	Emulator Description
.vob	MPEG-2 PS (Program Stream), VOB, SVCD	Video	MPEG-1		**YES**	**NO**			.vob is not supported in emulator.
			MPEG-2		**YES**	**YES**		Main Profile @ High Level (e.g. 720p60, 1080i60)	
		Audio	AC-3		**YES**	**NO**			
			MPEG-1 Layer I, II		**YES**	**YES**			
			DVD-LPCM		**YES**	**NO**			
.mpg .dat	MPEG-1 Systems, VCD	Video	MPEG-1		**YES**	**YES**			.mpg, .dat are not supported in emulator.
		Audio	MPEG-1 Layer I, II		**YES**	**YES**			
.mpg .mpe .mpeg	Unknown						Note that these file extensions do not uniquely specify whether the contents are TS, PS or ES. These files are supported only if the decoder is configured properly for TS, PS or ES. The decoder needs to know this information and will not determine it on its own. See other rows for support information.		
.mp4 .m4a .m4v	MP4	Video	H.264 / AVC	avc1	**YES**	**YES**		Main Profile @ Level 4.1 High Profile @ Level 4.1 (e.g. 720p60, 1080i60, 1080p30)	
			MPEG-4 Part 2	mp4v	**YES**	**YES**	MPEG-4 ASP support does not include global motion compensation or quarterpel motion estimation. Streams using this syntax are not supported. Motion compensation	Advanced Simple Profile The resolution supported is chip dependent with earlier chips supporting up to SD	

Common File Extensions	Media Container	A/V	Codec	FourCC	DTV Target Supported?	Emulator Supported?	Target Description	Profile/Level Support	Emulator Description
							describes a picture in terms of the transformation of a reference picture to the current picture. The reference picture may be previous in time or even from the future. When images can be accurately synthesized from previously transmitted/stored images, the compression efficiency can be improved. Quarter Pixel Motion Search Precision (QPEL): Basically most MPEG-4 Codecs by default detect motion between two frames down to half a pixel (HalfPel). Now with QuarterPel you can detect motion that is only a quarter of a pixel per frame, effectively doubling precision! practically this means that you will get a much sharper image with QPEL. Global Motion Compensation (GMC): GMC detects if there is an amount of motion big parts of the frame have in common. If that's the case GMC kicks in, using a single motion vector for all similar parts of the frame instead of multiple ones. Practically this helps saving bits when panning, zoom or rotation occurs (depending on how good the GMC implementation is/offered warp points), bits which than can be used somewhere else, for example where they bring more	resolutions (480i) and newer chips supporting up to HD (720p/1080i)	

Common File Extensions	Media Container	A/V	Codec	Four CC	DTV Target Supported?	Emulator Supported?	Target Description	Profile/Level Support	Emulator Description
							sharpness.		
			H.263	s263	**YES**	**NO**	Profile 0, Level 70. No Annex supported		
			Other video Codecs like MPEG-1/2, VC-1		**NO**	**NO**	No standard specifying header. No sample files.		
		Audio	AAC	mp4a	**YES**	**YES**		AAC-LC and AAC-HE	
			Other audio Codecs like AC3, DTS, MP3		**NO**	**NO**	No standard specifying header. No sample files.		
.mov	QT	Audio/Video			**NO**	**NO**	Most QuickTime streams appear to be MPEG-4 Part 12. Please see MP4 section of list supported audio/video Codecs.		.mov format is not supported in emulator.
.f4v .f4a .flv	Flash formats	Audio/Video			**YES**	**YES**	Please see MP4 section of list supported audio/video Codecs Support limited to LPCM		Flash engine supports flash playback such as as .f4v, .f4a and .flv. These formats are not supported using open API. (e.g., playClipFile)
.wav	WAV	Audio	LPCM	0x0001	**NO**	**NO**			.wav format is not supported in emulator.
.mp3	MP3	Audio	MPEG-1 Layer III		**YES**	**YES**			

Using LG Resource Monitor

LG Resource Monitor is a tool that displays the resource usage status of the connected device. Currently, only emulator on local PC can be monitored using LG Resource Monitor. Real target monitoring will be supported in the future.

Click **[LG Smart TV SDK > LG SDK Tools > LG Resource Monitor]** from the Start menu. LG Resource Monitor tool consists of three areas. Each area will be described in the following sections.
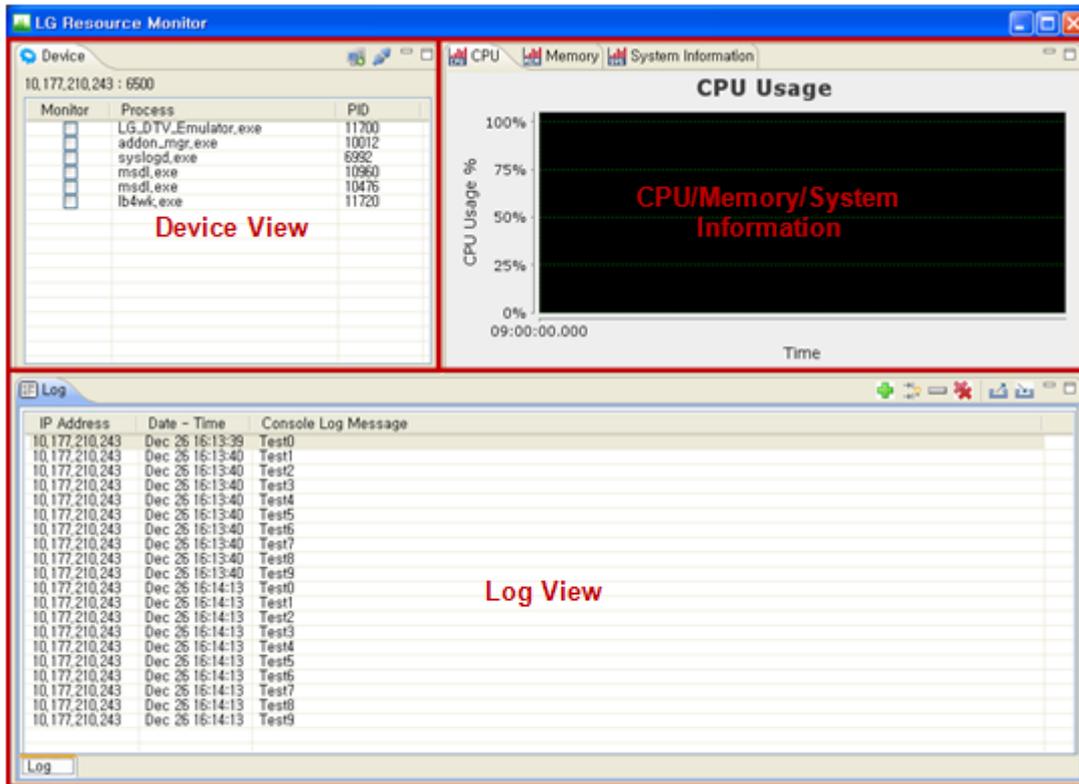
- **Device View**
- **CPU / Memory / System Information**
- **Log View**

Device View

In Device view, you can connect (add) device and select processes to monitor.

- ⊞ : Connect (add) a device to monitor.

- 🔌 : Disconnect the device. (Disabled when no device is connected.)

1. Press ⊞ , then, the following window appears. The IP and Port value for emulator are set default. To monitor the emulator on local PC, click **[Add]**.
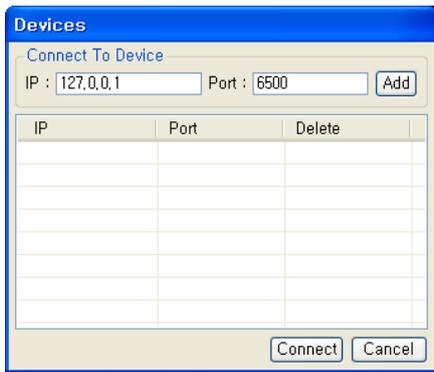
2. Select the device to connect and click **[Connect]**. To delete the device from this list, press 🗑 icon.
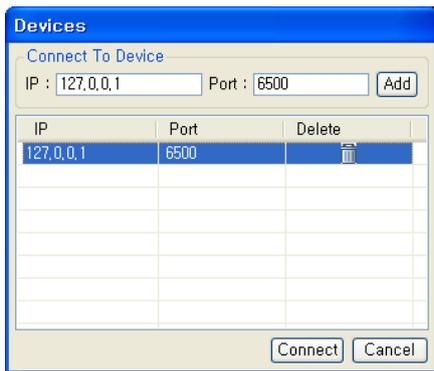
3. Process list of the connected device is shown. Check on the process to monitor. (Multiple selection is available.)
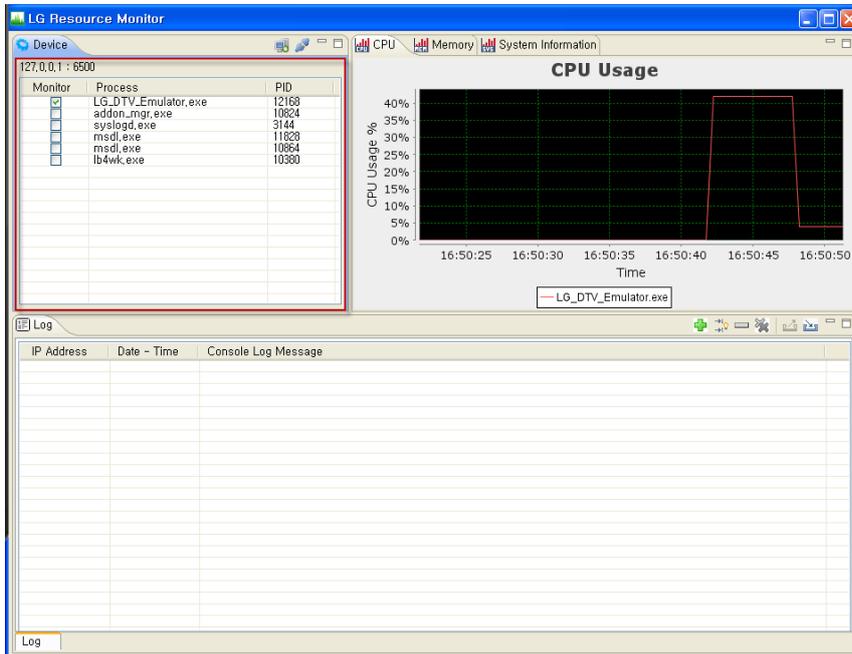
CPU / Memory / System Information

CPU View shows the CPU usage of the checked process. If you checked multiple processes, the chart will show the CPU usage information for each process.
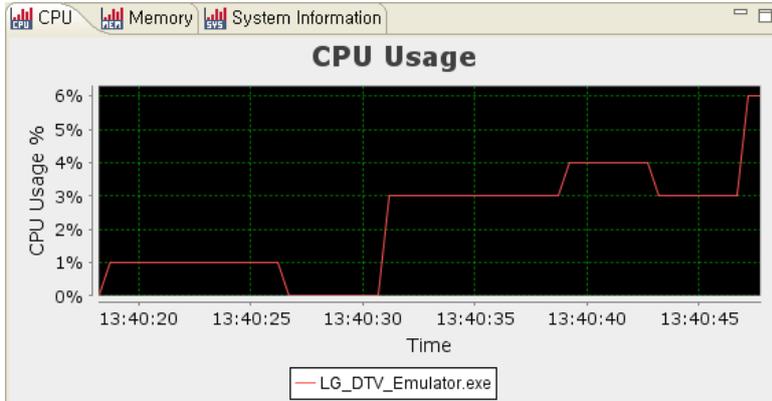
Memory View shows the memory usage of the checked process. If you checked multiple processes, the chart will show the memory usage information for each process.
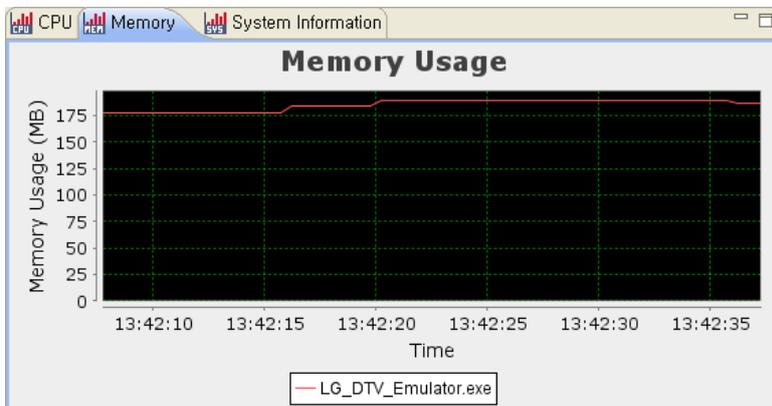
System Information displays the system information of the connected device.
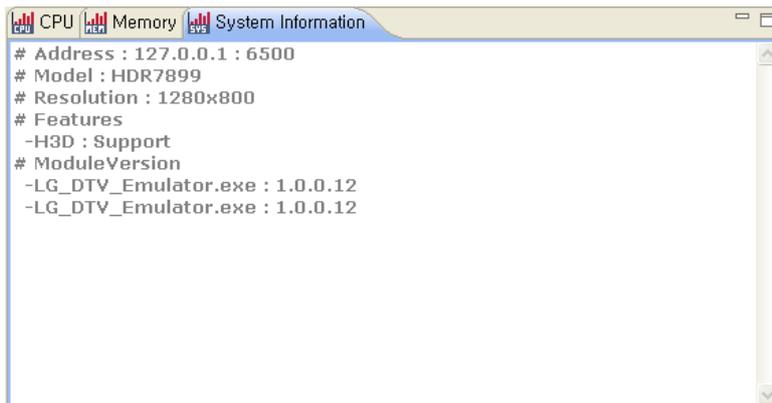
Log View

Displays receiving log messages from the connected device on the "Log" tab. "Log" tab is default log viewer and it cannot be edited or closed. You can add a log filter that will display filtered messages in the new log tab.
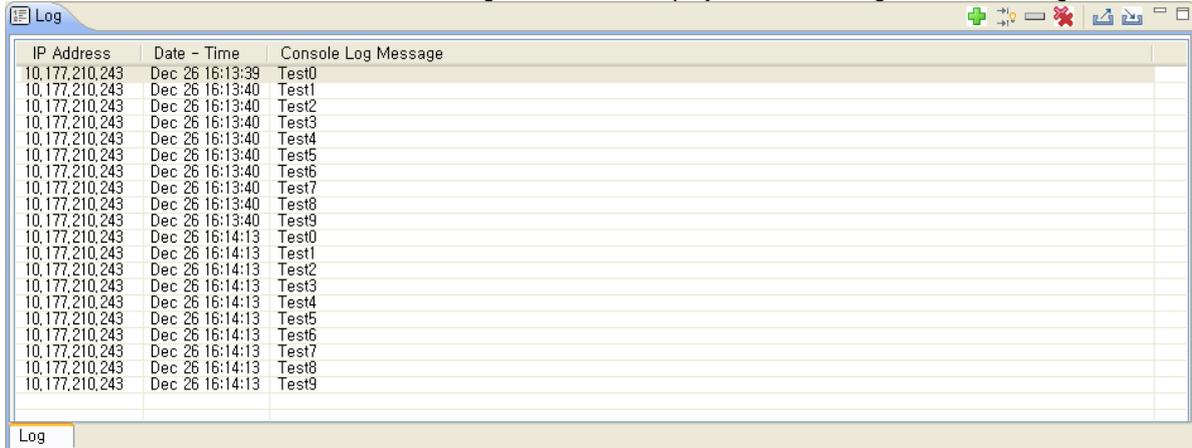
- ![icon]: Add Filter
- ![icon]: Edit Filter (Disabled if "Log" or "Import Log" tab is selected.)
- ![icon]: Close Log (Disabled if "Log" tab is selected.)
- ![icon]: Clear Log
- ![icon]: Export Log
- ![icon]: Import Log

Click ![icon] to add a log filter. If user adds a log filter, a new log tab named <Filter Name> is added next to the "Log" view. Log messages filtered by new log filter are displayed on this tab.

Set filter name and text, and click **[OK]**.

- Filter Name: A filter name that will be shown on the log tab.
- Filter Text: Text to filter from log messages. (e.g. Enter '1' to see log messages including '1' only)

New filter and filtered messages are shown as below.
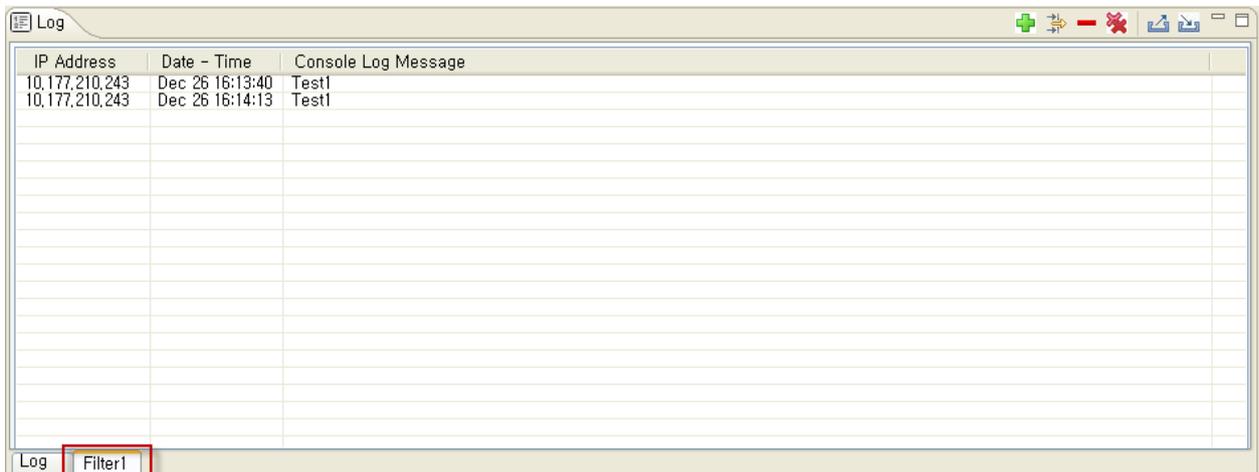
Troubleshooting

Q1) Emulator storage is displayed in an unreadable state on Virtual Box.

A1) Install the SDK again after uninstalling the SDK. If the problem cannot be solved after re-installing the SDK, follow the next steps.

1. Uninstall the SDK.
2. Execute Oracle VM VirtualBox Manager from Start menu > Oracle VM VirtualBox.
3. An Unreadable state is displayed in Storage section as red box below.
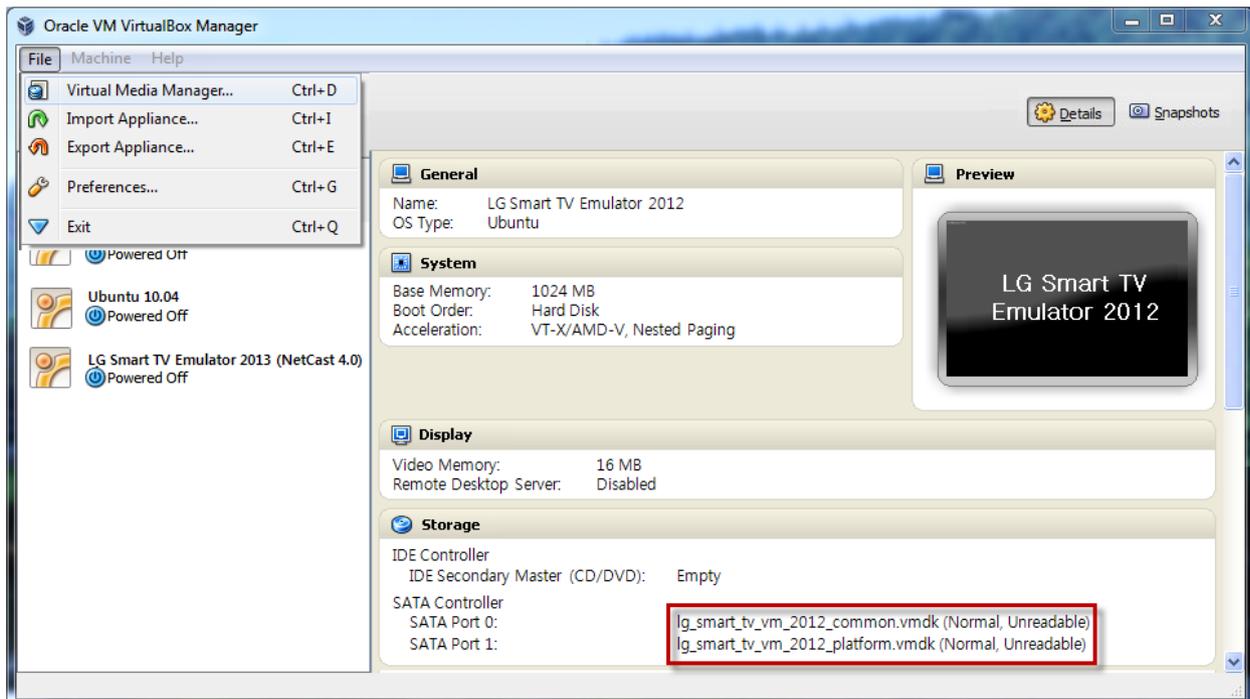
4. Click [File > Virtual Media Manager] menu.

5. In Virtual Media Manager window, release "lg_smart_tv_vm_2012_common.vmdk" and "lg_smart_tv_vm_2012_platform.vmdk" manually, then remove them on the list.

Note

Before releasing "lg_smart_tv_vm_2012_common.vmdk" and "lg_smart_tv_vm_2012_platform.vmdk", the LG Smart TV Emulator must be powered off.
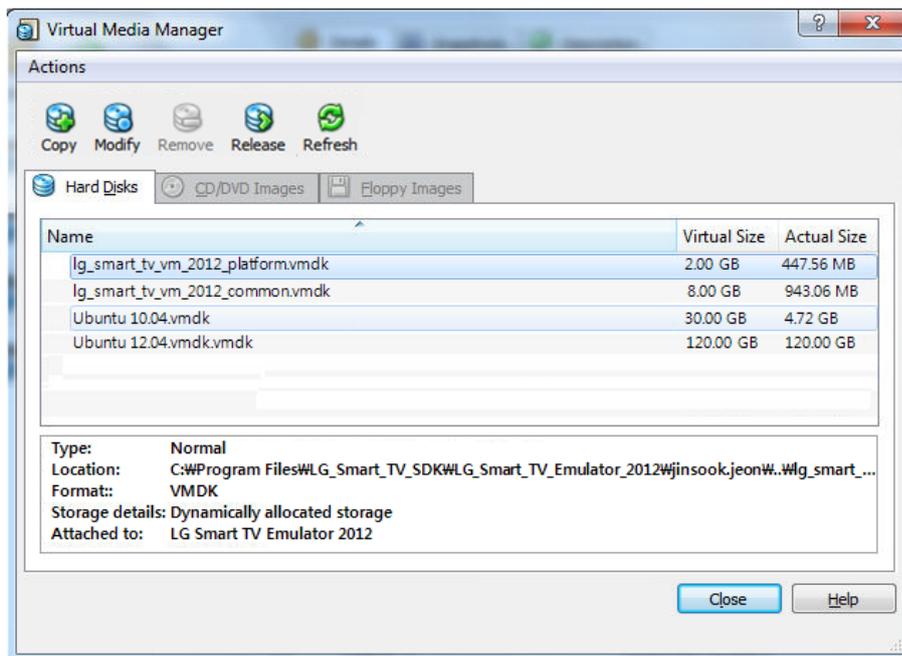
5. Install the LG Smart TV SDK again.

Q2) When executing the emulator, application is automatically terminated or loses its mouse pointer!!

A2) Delete snapshot manually on the list by pressing <Ctrl>+<Shift>+D and execute the emulator again.