Programming and Running Poky Linux from SD Card on Freescale SABRE i.MX 6 Series Development Board

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Date: 9/4/2015 10:11 AM

Revision History

Date [MM/DD/YYYY]	Author [First and Last Name]	Revision [Letter]	Reason [Brief Description]
08/04/2015	Kris Zawada	А	Initial Release

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Purpose

The overall purpose of this HOW-TO Guide is to program an SD card with a valid image of embedded Linux and boot Freescale SABRE i.MX 6 Series development board with this image.

Requirements

- "Root" privileges on the host machine.
- Ability to access the Freescle website.
- Class 4 or Class 10 8 GB SD Card.
- Ubuntu Linux host machine, but another other Linux distribution will do.

Instructions

- 1. Download Linux SD Card Image
 - a. From a Linux host machine (in this case Ubuntu 12.04.3 LTS) click on 'Firefox Web Browser' from the launcher to open it.



b. In the address bar enter the address:

<u>http://www.freescale.com/webapp/sps/site/prod_summary.jsp?code=RDIMX6SABREPL</u> AT.

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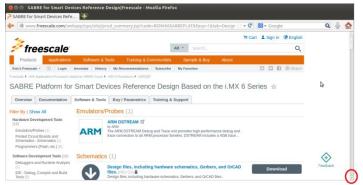
c. Click on the "Go to the address in the Location Bar" button indicated by the green play icon.

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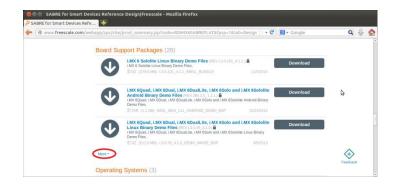
d. Click on the "Software & Tools" link on the main page.

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tures	multimedia performance capabilities of i.MX 6 series applications process	sors based on ARM® Cortex [™] -A9 technology.	
ported Devices Ip Start Your Design	The SABRE platform for smart devices provides a foundation for enabling		
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	Broad operating system support includes Android™, Linux® and Window	s® Embedded (via third-party).	
	₩ Buy		
	RDIMX6SABREPLAT: Product Block Diagram		
	SABRE Platform for Smart Devices Based on the LMX 6 Series		
			Feedback

e. Scroll down until "Board Support Packages".



f. Click on the "More" link to expand the "Board Support Packages" link.



g. Scroll down until "L3.14.28_1.0.0_iMX6QDLS_BUNDLE" is shown.

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h. Click on "Download" to being downloading the file.



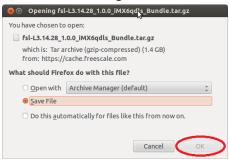
i. Click on "Sign in" to proceed. NOTE: The login information will auto fill if previously setup.



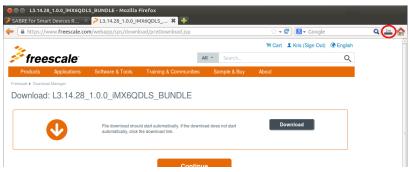
j. Click on "I Accept".

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k. Click on "OK" to begin to save the file to disk.



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q. Right click on "fsl-L3.14.28_1.0.0_iMX6qdls_Bundle.tar.gz" and select "Extract Here".

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r. Wait until archive is extracted.

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s. Once the archive is extracted click on the arrow next to the directory to expand it.

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t. Right-click on "L3.14.28_1.0.0_ga_images_MX6.tar.gz" and select "Extract Here".

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u. Wait until archive is extracted.



v. Once archive is extracted verify that a directory named "L3.14.28_1.0.0_ga_images_MX6" exists.

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		Name	Size	Туре	Date Modified
	_	Fsl-L3.14.28_1.0.0_iMX6qdls_Bundle	3 items		Mon 03 Aug 2015 01:18:08 PM C
Mome		L3.14.28_1.0.0_ga_images_MX6	44 items		Tue 24 Mar 2015 02:38:53 AM CE
		fsl-yocto-3.14.28-1.0.0.tar.gz	9.2 MB	Tar archive (gzip-compressed)	Fri 10 Apr 2015 11:42:36 AM CD
Desktop		L3.14.28_1.0.0_ga_images_MX6.tar.gz	1.6 GB	Tar archive (gzip-compressed)	Fri 27 Mar 2015 05:13:39 PM CD
Documents Downloads	-	fsl-L3.14.28_1.0.0_iMX6qdls_Bundle.tar.gz	1.6 GB	Tar archive (gzip-compressed)	Tue 28 Jul 2015 04:56:06 PM CD1
Music Pictures Videos Videos Fitures Trash Network Browse Network					

w. Proceed to next step.

2. Program Linux image to SD Card

a. Plug an SD card into the host computer.



b. Select "Dash Home" from the application launcher.



c. Enter the word Terminal from in the search box.

- Commands
 Commands</
- d. Select the "Terminal" icon.

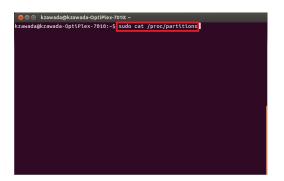


e. Wait until the terminal opens.



f. Execute the command "cat /proc/partitions" to view the mounted partitions on the host.

<u>Terminal Syntax:</u>			
kzawada@kzawada-OptiPlex-7010:~\$	sudo	cat	/proc/partitions



g. Find the partitions associated with the SD card. In this case there are two mounts associated with the SD card. *NOTE: If the SD card is removed physically, these partions will not be shown when the command above is executed. This is a good way to determine where it is being mounted.*

Terminal Syntax:

kzawada@kzawada-OptiPlex-7010:~\$ sudo cat /proc/partitions major minor #blocks name

8	0	156250000	sda
8	1	147873792	sda1
8	2	1	sda2
8	5	8373248	sda5
11	0	1048575	sr0
8	16	7782400	sdb
8	17	7774208	sdb1

kzawada@kzawada-OptiPlex-7010:~\$

		a-OptiPlex blocks na	-7010:~\$ sudo cat /proc/partitions
ајог м	unor #	DLOCKS Ha	me
		156250000	sda
8		147873792	sda1
			sda2
		8373248	
11		1048575	sr0
	16	7782400	sdb
8	17	7782400 7774208 a-OptiPlex	sdb1
8	17	7774208	sdb1
8	17	7774208	sdb1
8	17	7774208	sdb1
8	17	7774208	sdb1
8	17	7774208	sdb1
8	17	7774208	sdb1
8	17	7774208	sdb1
8	17	7774208	sdb1

h. Unmount the first partition by executing the command below.

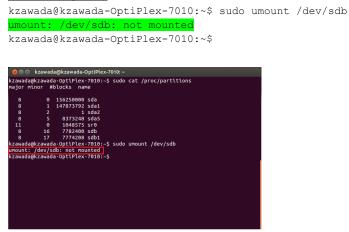
Terminal Syntax:

kzawada@kzawada-OptiPlex-7010:~\$ sudo umount /dev/sdb

			-7010:~\$ sudo cat /proc/partitions
јог	minor #	blocks na	me
8	θ	156250000	sda
8		147873792	sda1
			sda2
		8373248	sda5
11	0	1048575	sr0
	16	7782400	sdb
8	17	7774208	cdb1
awac			-7010:-\$ sudo umount /dev/sdb
awad			
awad			
awad			

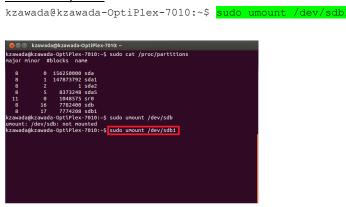
i. Notice that this first partition is not mounted, which is fine.

Terminal Syntax:



j. Unmount the second partition by executing the command below.

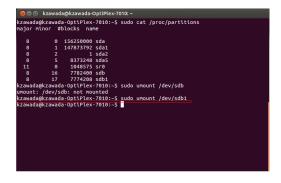
Terminal Syntax:



k. Notice that the second partition was unmounted successfully.

Terminal Syntax:

```
kzawada@kzawada-OptiPlex-7010:~$ sudo umount /dev/sdb1
kzawada@kzawada-OptiPlex-7010:~$
```



I. Next enter the command below to program the SD card with the downloaded image.

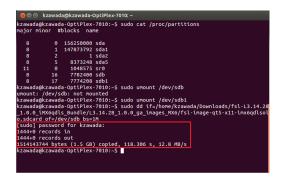
Terminal Syntax:



m. Wait until the program finishes writing to the SD card.

Terminal Syntax:

```
kzawada@kzawada-OptiPlex-7010:~$ sudo dd if=/home/kzawada/Downloads/fsl-
L3.14.28_1.0.0_iMX6qdls_Bundle/L3.14.28_1.0.0_ga_images_MX6/fsl-image-qt5-x11-
imx6qdlsolo.sdcard of=/dev/sdb bs=1M
[sudo] password for kzawada:
1444+0 records in
1444+0 records out
1514143744 bytes (1.5 GB) copied, 118.306 s, 12.8 MB/s
kzawada@kzawada-OptiPlex-7010:~$
```



n. Remove the SD card from the host SD card slot.



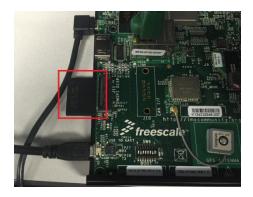
o. Next, proceed to boot from Linux image on SD card.

3. Boot Linux Image from SD Card

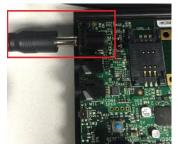
a. Obtain a Freescale SABRE i.MX6 Series development board and ensure the keyboard, mouse, and debug connection are made.



b. Plug in the SD Card into the provided slot.



c. Plug in the power cable.



d. Press the reset button to cause the board to start booting from the SD card slot.



e. Wait until boot progresses through the "freescale" screen.



f. Wait until boot progresses through the "Linux penguin" screen.



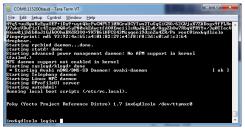
g. Wait until boot progresses through the "yocoto project" screen.



h. Once a Linux desktop is shown the image has booted.



i. The debug terminal will indicate the boot progress as well. The login screen will indicate that the board has booted.



j. Proceed to the next step to verify which verson of Linux is loaded.

4. Verify Linux Image Version

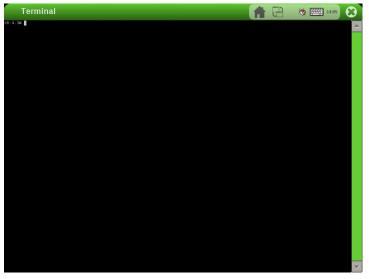
a. From the main GUI screen click on the arrow to view the next set of icons/shortcuts.

Desktop					(§
• iMX Player i.MX Player	Music Pla Play your fav	Applic QT3D Bas QT3D Basket	QT3D Nes QT3D Nesting	QT3D Sol QT3D Solar	1210
QT5 Ever QT5 Everyw	QT5 Hello QT5 Hello W	QT5 Hello QT5 HelloG	QT5 Leds QT5 Ledscr	QT5 Leds QT5 Ledscr	
Qt5 NMa Qt5 NMapper	Qt5 QUIt Qt5 QUItBatt	Q t5 QUITB QI5 QUIBatt	Qt5 Smart Qt5 Smart H	Video Video Player	X11VNC S Share this d

b. Select the "Terminal" application.



c. Wait until the terminal application opens.



d. Extecute the command below to determine the distribution of Linux.

Terminal Syntax: sh-4.3# cat /etc/issue Poky (Yocto Project Reference Distro) 1.7 \n \l

sh-4.3#



e. Execute the command below to determine the Linux kernel version.

<u>Terminal Syntax:</u>

```
sh-4.3# cat /proc/version
Linux version 3.14.28-1.0.0_ga+g91cf351 (jenkins@scmbl1) (gcc version 4.9.1 (GCC)
) #1 SMP PREEMPT Fri Mar 20 21:49:03 CST 2015
sh-4.3#
Terminal
Sh-4.3# cat /etc/issue
poky (vocto Project Reference Distro) 1.7 \n \l
sh-4.3# cat /proc/version
Linux version 3.14.28-1.0.0.ga+g91cf351 (jenkins@scmbl1) (gcc version 4.9.1 (GCC) ) #1 SMP PREEMPT Fri Mar 20 21:49:03 CST 2015
```

f. Execute the command below to get the processor information.

```
Terminal Syntax:
sh-4.3# cat /proc/cpuinfo
           : 0
processor
            : ARMv7 Processor rev 10 (v71)
model name
Features : swp half thumb fastmult vfp edsp neon vfpv3 tls vfpd32
CPU implementer
                  : 0x41
CPU architecture: 7
CPU variant : 0x2
CPU part : 0xc09
CPU revision : 10
           : 1
processor
model name : ARMv7 Processor rev 10 (v71)
Features : swp half thumb fastmult vfp edsp neon vfpv3 tls vfpd32
CPU implementer
                   : 0x41
CPU architecture: 7
CPU variant : 0x2
CPU part : 0xc09
CPU revision : 10
processor
           : 2
model name : ARMv7 Processor rev 10 (v71)
Features : swp half thumb fastmult vfp edsp neon vfpv3 tls vfpd32
                  : 0x41
CPU implementer
CPU architecture: 7
CPU variant : 0x2
         : 0xc09
CPU part
CPU revision : 10
```

```
processor
             : 3
model name : ARMv7 Processor rev 10 (v71)
Features : swp half thumb fastmult vfp edsp neon vfpv3 tls vfpd32
CPU implementer
                     : 0x41
CPU architecture: 7
CPU variant : 0x2
CPU part : 0xc09
CPU revision : 10
Hardware
             : Freescale i.MX6 Quad/DualLite (Device Tree)
Revision
             : 0000
Serial
              : 00000000000000000
Poky (Yocto Project Reference Distro) 1.7 \n \l
Linux version 3.14.28-1.0.0 ga+g91cf351 (jenkins@scmbl1) (gcc version 4.9.1 (GCC)
) #1 SMP PREEMPT Fri Mar 20 21:49:03 CST 2015
processor
             : 0
model name : ARMv7 Processor rev 10 (v71)
Features : swp half thumb fastmult vfp edsp neon vfpv3 tls vfpd32
CPU implementer
                      : 0x41
CPU architecture: 7
CPU variant : 0x2
CPU part
               : 0xc09
CPU revision : 10
processor
              : 1
model name : ARMv7 Processor rev 10 (v71)
Features : swp half thumb fastmult vfp edsp neon vfpv3 tls vfpd32
CPU implementer
                     : 0x41
CPU architecture: 7
CPU variant : 0x2
             : 0xc09
CPU part
CPU revision : 10
              : 2
processor
model name : ARMv7 Processor rev 10 (v71)
Features : swp half thumb fastmult vfp edsp neon vfpv3 tls vfpd32
CPU implementer
                   : 0x41
CPU architecture: 7
CPU variant : 0x2
CPU part : 0xc09
CPU revision : 10
processor
             : 3
model name : ARMv7 Processor rev 10 (v71)
Features : swp half thumb fastmult vfp edsp neon vfpv3 tls vfpd32
CPU implementer : 0x41
CPU architecture: 7
CPU variant : 0x2
CPU part : 0xc09
CPU revision : 10
Hardware : Freescale i.MX6 Quad/DualLite (Device Tree)
Revision
              : 0000
              : 0000000000000000
sh-4.3#
```

h-4.3# cat /etc/			
oky (Yocto Proje	ect Reference Distro) 1.7 \n \l		
h-4.3# <u>cat /proc</u> rocessor : odel name : eatures : PU implementer : PU architecture: PU variant : PU part :	4.28-10.0.0_ga+g91cf351 (jenkins@scmbl1) (gcc version 4.9 /o ARWY Processor rev 10 (v71) sup half thumb fastmult vfp edsp neon vfpv3 tls vfpd32 0×41	1 (GCC)) #1 SHP PREEMPT Fri Har 2	0 21:49:03 CST 2015
odel name : eatures : PU implementer : PU architecture: PU variant : PU part :			
odel name eatures PU implementer PU architecture: PU variant PU part			
odel name : eatures : PU implementer : PU architecture: PU variant : PU part :			
evision :	: Freescale i.HX6 Quad/DualLite (Device Tree) : 0000 : 000000000000000		

g. Exit the terminal by typing in the command "exit".

Terminal Syntax: sh-4.3# exit

Terminal		S	$\mathbf{\Theta}$
sh-4.3# cat /etc/issue Poky (Yocto Project Reference Distro) 1.7 ∖n ∖l			
sh-4.3# cat /proc/version Linux version 3.14.28-1.0.0_ga+g91cf351 (jenkins@scmbl1) (gcc version 4.9.1 (GCC)) #1 SNP PREEN sh-4.3# cat /proc/cpuinfo processor :0 model name : ARNY7 Processor rev 10 (v71) meatures :: sup half thumb fastmult vfp edsp neon vfpv3 tis vfpd32 cFU implementer : 0x41 CFU architecture: 7 cFU variant : 0x2 cFU part :: 0x60 cFU part :: 0x60 cFU revision :: 10	PT Frl Mar 20 21:49:0	3 CST 2015	
processor : 1 model name : ARMY7 Processor rev 10 (v71) Features : swp half thumb fastmult vfp edsp neon vfpv3 tls vfpd32 CFU implementer : 0x41 cFU architecture: 7 CFU variant : 0x2 CFU part : 0x200 CFU revision : 10			
processor : 2 model name : ARNV7 Processor rev 10 (v71) Features : swp half thumb fastmult vfp edsp neon vfpv3 tls vfpd32 CFU inplementer : 0x41 CFU architecture: 7 CFU variant : 0x2 CFU revision : 00			
processor : 3 model name : ARNY Processor rev 10 (v71) Features : Swp half thumb fastmult vfp edsp neon vfpv3 tls vfpd32 CFU inplementer : 0x41 cFU architecture: 7 CFU variant : 0x2 CFU part : 0x209 CFU revision : 10			
Hardware : Freescale i.HXS Quad/DualLite (Device Tree) Revision : 0000 Serial : 000000000000000 sh-4.3# [EXIT]			
			-

h. At this point the Linux is running from the SD card and is ready for further testing.

Tips & Warnings

• To connect a keyboard and mouse use a 'Micro B male to a USB A female OTG' connector. Ensure the keyboard has a USB hub built in so the mouse can be daisy chained through the keyboard.



• To take a screenshot of the display use the commands below. This was discovered on the i.MX Community forums at the following link: https://community.freescale.com/message/547830.

Terminal Syntax: root@imx6qsabresd:~# export DISPLAY=:0 root@imx6qsabresd:~# screenshot abc.pnd - - X COM6:115200baud - Tera Term VT Edit Setup Control Window Help File abresd:~# ₩# pwd esd:~# esd:~# esd:~# esd:~# sed:~# sed:~# sed:~# root <u>File Edit Go B</u>ookmarks <u>V</u>iew Tool<u>s H</u>elp 🔹 🏠 📄 /home/root 4 -Places -..... abc.png Applications Trash Can mmcblk2p1 mmcblk3p1

• Either Ubuntu 12.04 LTS or Ubuntu 14.04 LTS will work great as a host machine.

Programming and Running Poky Linux from SD Card on Freescale SABRE i.MX 6 Series Development Board

• To logins use the user name 'root' and password is blank.

Related

- The Freescale SABRE i.MX 6 Series: http://www.freescale.com/webapp/sps/site/prod_summary.jsp?code=RDIMX6SABREPLAT.
- Discussion on programing SD card is located here: https://community.freescale.com/message/547307.