
高通多媒体技术期刊 20160113



Qualcomm Technologies, Inc.

Confidential and Proprietary – Qualcomm Technologies, Inc.

机密和专有信息——高通技术股份有限公司



Confidential and Proprietary – Qualcomm Technologies, Inc.

Confidential and Proprietary – Qualcomm Technologies, Inc.

NO PUBLIC DISCLOSURE PERMITTED: Please report postings of this document on public servers or web sites to: DocCtrlAgent@qualcomm.com. **禁止公开：**如在公共服务器或网站上发现本文档，请报告至：DocCtrlAgent@qualcomm.com.

Restricted Distribution: Not to be distributed to anyone who is not an employee of either Qualcomm or its affiliated without the express approval of Qualcomm's Configuration Management. **限制分发：**未经高通配置管理部门的明示批准，不得发布给任何非高通或高通附属及关联公司员工的人。 Not to be used, copied, reproduced, or modified in whole or in part, nor its contents revealed in any manner to others without the express written permission of Qualcomm Technologies, Inc. 未经高通技术股份有限公司明示的书面允许，不得使用、复印、复制、或修改全部或部分文档，不得以任何形式向他人透露其内容。

The user of this documentation acknowledges and agrees that any Chinese text and/or translation herein shall be for reference purposes only and that in the event of any conflict between the English text and/or version and the Chinese text and/or version, the English text and/or version shall be controlling. 本文档的用户知悉并同意中文文本和/或翻译仅供参考之目的，如英文文本和/或版本和中文文本和/或版本之间存在冲突，以英文文本和/或版本为准。 This document contains confidential and proprietary information and must be shredded when discarded. 未经高通明示的书面允许，不得使用、复印、复制全部或部分文档，不得以任何形式向他人透露其内容。本文档含有高通机密和专有信息，丢弃时必须粉碎销毁。 Qualcomm reserves the right to make changes to the product(s) or information contained herein without notice. No liability is assumed for any damages arising directly or indirectly by their use or application. The information provided in this document is provided on an "as is" basis. 高通保留未经通知即修改本档中提及的产品或信息的权利。本公司对使用或应用本文档所产生的直接或间接损失概不负责。本文档中的信息为基于现状所提供，使用风险由用户自行承担。

Qualcomm is a trademark of QUALCOMM Incorporated, registered in the United States and other countries. All QUALCOMM Incorporated trademarks are used with permission. Other product and brand names may be trademarks or registered trademarks of their respective owners. Qualcomm是高通公司在美国及其它国家注册的商标。所有高通公司的商标皆获得使用许可。其它产品和品牌名称可能为其各自所有者的商标或注册商标。

This technical data may be subject to U.S. and international export, re-export, or transfer ("export") laws. Diversion contrary to U.S. and international law is strictly prohibited. 本文档及所含技术资料可能受美国和国际出口、再出口或转移出口法律的 限制。严禁违反或偏离美国和国际的相关法律。

Qualcomm Technologies, Inc. 5775 Morehouse Drive San Diego, CA 92121 U.S.A.
高通技术股份有限公司，美国加利福尼亚州圣地亚哥市莫豪斯路 5775 号，邮编 92121

Revision History

Revision	Date	Description
A	Jan. 2016	Initial release

Note: There is no Rev. I, O, Q, S, X, or Z per Mil. standards.

内容

- Display
 - Rotate 180 Overview for Panel Inverse Mounted
 - 180 Rotation on 8996
 - 180 Rotation on 8952/8956/8976
 - 180 Rotation Onwards Platform
- Browser
 - M42 fix list/update on 12/2015



Display

Rotate 180 Overview for Panel Inverse Mounted

- Why rotate 180 degree:
 - 通常我们要求客户按照正常的扫描方式来安装显示屏，然而因为客户的一些特殊需求，需要Panel Inverse Mounted，且panel不支持旋转倒置时，需要使用平台侧来旋转。
- How rotate 180 degree:
 - 在平台侧，推荐客户使用Android framework solution进行旋转倒置，具体如下：
 - adb shell setprop persist.panel.inversemounted true
 - adb shell stop
 - adb shell start
 - adb shell getprop persist.panel.inversemounted // 去查看此property 是否真正生效
- 代码：
 - 在/frameworks/native/services/surfaceflinger/DisplayDevice.cpp
- 注意：
 - 对于旋转90或者270，没有商业化，因为Android system 很多flags 决定app的旋转方向，即很难覆盖所有use-case。

Rotate 180 Overview for Panel Inverse Mounted – cont1

- 对于180 旋转倒置，举例几个典型如下：
 - Home screen pan
 - Video playback
 - Camera preview

180 Rotation on 8996 – Home screen pan

■ Home screen pan --- without 180 rotation

```
h/w composer state:
h/w composer present and enabled
Hardware Composer state (version 01050000):
mDebugForceFakeVSync=0
Display[0] configurations (* current):
 * 0: 1600x2560, xdpi=489.638000, ydpi=488.902008, refresh=16666666
numHwLayers=5, flags=00000000
```

type	handle	hint	flag	tr	blnd	format	source crop (l,t,r,b)	frame	name
HWC	7f8b052c00	0002	0000	00	0100	RGBx_8888	0.0, 72.0, 1600.0, 2416.0	0, 72, 1600, 2416	com.android.systemui.ImageWallpaper
HWC	7f8ab5ff00	0002	0000	00	0105	RGBA_8888	0.0, 72.0, 1600.0, 2416.0	0, 72, 1600, 2416	com.android.launcher/com.android.launcher2.Launcher
HWC	7f87af8f60	0002	0000	00	0105	RGBA_8888	0.0, 0.0, 1600.0, 72.0	0, 0, 1600, 72	StatusBar
HWC	7f8ab5f9c0	0002	0000	00	0105	RGBA_8888	0.0, 0.0, 1600.0, 144.0	0, 2416, 1600, 2560	NavigationBar
FB TARGET	7f88468fe0	0000	0000	00	0105	RGBA_8888	0.0, 0.0, 1600.0, 2560.0	0, 0, 1600, 2560	HWC_FRAMEBUFFER_TARGET

```
----- Snapdragon Display Manager -----
device type: 0
state: 1, vsync on: 0, max. mixer stages: 7
num configs: 1, active config index: 0
res:1600 x 2560, dpi:489.64 x 488.90, fps:60, vsync period: 16666666
```

■ mCurrentTransform is 0 (0表示没有任何旋转)

```
+ Layer 0x7f87a47c00 (com.android.launcher/com.android.launcher2.Launcher)
Region transparentRegion (this=0x7f87a47e08, count=1)
 [ 0, 0, 0, 0]
Region visibleRegion (this=0x7f87a47c10, count=1)
 [ 0, 72, 1600, 2416]
Region surfaceDamageRegion (this=0x7f87a47c88, count=1)
 [ 0, 0, 1600, 2416]
  layerStack= 0, z= 21015, pos=(0,0), size=(1600,2416), crop=( 0, 72,1600,2416), isOpaque=0, invalidate=0, alpha=0xff, flags=0x00000000,
  client=0x7f87b6cd60
  format= 1, activeBuffer=[1600x2416:1600, 1], queued-frames=1, mRefreshPending=0
    mTexName=17 mCurrentTexture=1
    mCurrentCrop=[0,0,0,0] mCurrentTransform=0
    mAbandoned=0
    -BufferQueue mMaxAcquiredBufferCount=1, mDequeueBufferCannotBlock=0, default-size=[1600x2416], default-format=1, transform-hint=00, FIFC
}

[00:0x7f8ab7ce00] state=QUEUED , 0x7f8ab5f4e0 [1600x2416:1600, 1]
>[01:0x7f8ab7c400] state=ACQUIRED, 0x7f8ab5ff00 [1600x2416:1600, 1]
[02:0x7f8ab7c600] state=FREE , 0x7f8ab5f5a0 [1600x2416:1600, 1]
```


180 Rotation on 8996 – Home screen pan

- Home screen pan --- with 180 rotation
 - mCurrentTransform 为3，表示有180旋转
 - HAL_TRANSFORM_ROT_180 = 0x03

```
+ Layer 0x7f97049000 (com.android.launcher/com.android.launcher2.Launcher)
Region transparentRegion (this=0x7f97049208, count=1)
[ 0, 0, 0, 0]
Region visibleRegion (this=0x7f97049010, count=1)
[ 0, 72, 1600, 2416]
Region surfaceDamageRegion (this=0x7f97049088, count=1)
[ 0, 0, 1600, 2416]
layerStack= 0, z= 21005, pos=(0,0), size=(1600,2416), crop=( 0, 72,1600,2416), isOpaque=0, invalidate=0, alpha=0xff, flags=0x00000000, tr=
client=0x7f97009960
format= 1, activeBuffer=[1600x2416:1600, 1], queued-frames=0, mRefreshPending=0
mTexName=10 mCurrentTexture=1
mCurrentCrop=[0,0,0,0] mCurrentTransform=0x3
mAbandoned=0
-BufferQueue mMaxAcquiredBufferCount=1, mDequeueBufferCannotBlock=0, default-size=[1600x2416], default-format=1, transform-hint=03, FIFO(0)=
[00:0x7f911ce100] state=FREE, 0x7f9701f360 [1600x2416:1600, 1]
>[01:0x7f911ce200] state=ACQUIRED, 0x7f9701f2a0 [1600x2416:1600, 1]
[02:0x7f911ce300] state=FREE, 0x7f9701f3c0 [1600x2416:1600, 1]
```

h/w composer state:

h/w composer present and enabled

Hardware Composer state (version 01050000):

mDebugForceFakeVSync=0

Display[0] configurations (* current):

* 0: 1600x2560, xdpi=489.638000, ydpi=488.902008, refresh=18867924

numHwLayers=5, flags=00000000

type	handle	hint	flag	tx	blnd	format	source crop (l,t,r,b)	frame	name
HWC	7f9701f9c0	0002	0000	00	0100	RGBx_8888	0.0, 144.0, 1600.0, 2488.0	0, 144, 1600, 2488	com.android.systemui.ImageWallpaper
HWC	7f9701f2a0	0002	0000	00	0105	RGBA_8888	0.0, 0.0, 1600.0, 2344.0	0, 144, 1600, 2488	com.android.launcher/com.android.launcher2.Launcher
HWC	7f9701f1e0	0002	0000	00	0105	RGBA_8888	0.0, 0.0, 1600.0, 72.0	0, 2488, 1600, 2560	StatusBar
HWC	7f9701f240	0002	0000	00	0105	RGBA_8888	0.0, 0.0, 1600.0, 144.0	0, 0, 1600, 144	NavigationBar
FB TARGET	7f943af260	0000	0000	00	0105	RGBA_8888	0.0, 0.0, 1600.0, 2560.0	0, 0, 1600, 2560	HWC_FRAMEBUFFER_TARGET

----- Snapdragon Display Manager -----

device type: 0

state: 1, vsync on: 1, max. mixer stages: 7

num configs: 1, active config index: 0

res:1600 x 2560, dpi:489.64 x 488.90, fps:60, vsync period: 16666666

180 Rotation on 8996 – Video playback

- Video playback --- with 180 rotation
 - 从dump SurfaceFlinger信息，可以看出，在播放视频时，有两层layer
 - 第一个layer为SurfaceView, 即Video layer, 此时在 SDE (Snapdragon Display Engine) Pipe 中进行旋转，故tr=03.
 - 第二个layer为Gallery layer，在绘制时进行旋转，请看后一页。

```
h/w composer state:
h/w composer present and enabled
Hardware Composer state (version 01050000):
mDebugForceFakeVSync=0
Display[0] configurations (* current):
 * 0: 1600x2560, xdpi=489.638000, ydpi=488.902008, refresh=18867924
numHwLayers=3, flags=00000000
```

type	handle	hint	flag	tr	blnd	format	source crop (l,t,r,b)	frame	name
HWC	7f9701f5a0	0002	0000	03	0100	? 7fa30c06	0.0, 0.0, 362.0, 272.0	0, 679, 1600, 1881	SurfaceView
HWC	7f9701f120	0002	0000	00	0105	RGBA_8888	0.0, 0.0, 1600.0, 2560.0	0, 0, 1600, 2560	com.android.gallery3d/com.android.gallery3d.app
FB TARGET	7f94967d20	0000	0000	00	0105	RGBA_8888	0.0, 0.0, 1600.0, 2560.0	0, 0, 1600, 2560	HWC_FRAMEBUFFER_TARGET

```
----- Snapdragon Display Manager -----
device type: 0
state: 1, vsync on: 1, max. mixer stages: 7
num configs: 1, active config index: 0
res:1600 x 2560, dpi:489.64 x 488.90, fps:60, vsync period: 16666666
ROI(L T R B) : LEFT(0 0 1600 2560), RIGHT(0 0 0 0)
```

Idx	Comp Type	Split	WB	Pipe	W x H	Format	Src Rect (L T R B)	Dst Rect (L T R B)	Z	Flags	Deci (HxV)
0	SDE	Comp-L	-	0x001	384 x 288	Y_CBCR_420_VENUS_UBWC	182 0 362 272	0 679 796 1881	0	0x00000002	0 x 0
		Comp-R	-	0x002	384 x 288	Y_CBCR_420_VENUS_UBWC	0 0 182 272	796 679 1600 1881	0	0x00000002	0 x 0
1	SDE	Comp-L	-	0x040	1600 x 2560	RGBA_8888_UBWC	0 0 800 2560	0 0 800 2560	1	0x00000000	0 x 0
		Comp-R	-	0x080	1600 x 2560	RGBA_8888_UBWC	800 0 1600 2560	800 0 1600 2560	1	0x00000000	0 x 0

180 Rotation on 8996 – Video playback

- 对于SurfaceView，APP层没有旋转，即mCurrentTransform 为0

```
+ Layer 0x7f93f6fc00 (SurfaceView)
Region transparentRegion (this=0x7f93f6fe08, count=1)
[ 0, 0, 0, 0]
Region visibleRegion (this=0x7f93f6fc10, count=1)
[ 0, 679, 1600, 1881]
Region surfaceDamageRegion (this=0x7f93f6fc88, count=1)
[ 0, 0, -1, -1]
layerStack= 0, z= 21045, pos=(0,679), size=( 362, 272), crop=( 0, 0, 362, 272), isOpaque=1, invalidate=0, alpha=0xff, flags=0:
client=0x7f9700a7c0
format= 4, activeBuffer=[ 362x 272: 384,7FA30C06], queued-frames=0, mRefreshPending=0
mTexName=37 mCurrentTexture=0
mCurrentCrop=[0,0,362,272] mCurrentTransform=0
mAbandoned=0
-BufferQueue mMaxAcquiredBufferCount=1, mDequeueBufferCannotBlock=0, default-size=[362x272], default-format=4, transform-hint=03,
>[00:0x7f911ceb00] state=ACQUIRED, 0x7f9701f5a0 [ 362x 272: 384,7FA30C06]
[01:0x7f97005b00] state=DEQUEUED, 0x7f9701f960 [ 362x 272: 384,7FA30C06]
```

- 对于Gallery layer，APP层有180旋转，即mCurrentTransform 为3

```
+ Layer 0x7f93f71800 (com.android.gallery3d/com.android.gallery3d.app.MovieActivity)
Region transparentRegion (this=0x7f93f71a08, count=1)
[ 0, 679, 1600, 1881]
Region visibleRegion (this=0x7f93f71810, count=1)
[ 0, 0, 1600, 2560]
Region surfaceDamageRegion (this=0x7f93f71888, count=1)
[ 0, 0, 0, 0]
layerStack= 0, z= 21050, pos=(0,0), size=(1600,2560), crop=( 0, 0,1600,2560), isOpaque=0, invalidate=0, alpha=0xff, flags=0x000
client=0x7f9700a7c0
format= 1, activeBuffer=[1600x2560:1600, 1], queued-frames=0, mRefreshPending=0
mTexName=36 mCurrentTexture=2
mCurrentCrop=[0,0,0,0] mCurrentTransform=0x3
mAbandoned=0
-BufferQueue mMaxAcquiredBufferCount=1, mDequeueBufferCannotBlock=0, default-size=[1600x2560], default-format=1, transform-hint=03
[00:0x7f92fbf700] state=FREE, 0x7f943b0400 [1600x2560:1600, 1]
[01:0x7f911ce000] state=FREE, 0x7f9701f3c0 [1600x2560:1600, 1]
>[02:0x7f911ce300] state=ACQUIRED, 0x7f9701f120 [1600x2560:1600, 1]
```

180 Rotation on 8996 – Camera preview

- Camera preview --- with 180 rotation
- 从dump SurfaceFlinger信息中可以看出，tr=7 (4+ 3).
 - HAL_TRANSFORM_ROT_90 = 0x04
 - HAL_TRANSFORM_ROT_180 = 0x03

```
h/w composer state:
```

```
h/w composer present and enabled
```

```
Hardware Composer state (version 01050000):
```

```
mDebugForceFakeVSync=0
```

```
Display[0] configurations (* current):
```

```
* 0: 1600x2560, xdpi=489.638000, ydpi=488.902008, refresh=18867924
```

```
numHwLayers=4, flags=00000000
```

type	handle	hint	flag	tr	blnd	format	source crop (l,t,r,b)	frame	name
HWC	7f9701fa80	0002	0000	07	0100	? 7fa30c06	207.9, 0.0, 1935.9, 1080.0	0, 0, 1600, 2560	SurfaceView
HWC	7f9701f720	0002	0000	00	0105	RGBA_8888	0.0, 0.0, 1600.0, 2416.0	0, 144, 1600, 2560	org.codeaurora.snapcam/com.android.camera
HWC	7f9701f180	0002	0000	00	0105	RGBA_8888	0.0, 0.0, 1600.0, 144.0	0, 0, 1600, 144	NavigationBar
FB TARGET	7f943af260	0000	0000	00	0105	RGBA_8888	0.0, 0.0, 1600.0, 2560.0	0, 0, 1600, 2560	HWC_FRAMEBUFFER_TARGET

```
----- Snapdragon Display Manager -----
```

```
device type: 0
```

```
state: 1, vsync on: 1, max. mixer stages: 7
```

```
num configs: 1, active config index: 0
```

```
res:1600 x 2560, dpi:489.64 x 488.90, fps:60, vsync period: 16666666
```

```
ROI(L T R B) : LEFT(0 0 1600 2560), RIGHT(0 0 0 0)
```

Idx	Comp Type	Split	WB	Pipe	W x H	Format	Src Rect (L T R B)	Dst Rect (L T R B)	Z	Flags	Deci (HxV)
0	SDE	Rot-L	0	0x000	2048 x 1088	Y_CBCR_420_VENUS_UBWC	208 0 1936 1080	0 0 1080 1728	-	-	-
		Comp-L	-	0x001	1080 x 1728	Y_CBCR_420_VENUS_UBWC	0 0 540 1728	0 0 800 2560	0	0x00000002	0 x 0
		Comp-R	-	0x002	1080 x 1728	Y_CBCR_420_VENUS_UBWC	540 0 1080 1728	800 0 1600 2560	0	0x00000002	0 x 0
1	SDE	Comp-L	-	0x010	1600 x 2416	RGBA_8888_UBWC	0 0 800 2416	0 144 800 2560	1	0x00000000	0 x 0
		Comp-R	-	0x080	1600 x 2416	RGBA_8888_UBWC	800 0 1600 2416	800 144 1600 2560	1	0x00000000	0 x 0
2	SDE	Comp-L	-	0x008	1600 x 144	RGBA_8888_UBWC	0 0 800 144	0 0 800 144	2	0x00000000	0 x 0
		Comp-R	-	0x020	1600 x 144	RGBA_8888_UBWC	800 0 1600 144	800 0 1600 144	2	0x00000000	0 x 0

180 Rotation on 8996 – Camera preview

- 对于SurfaceView layer来说
- mCurrentTransform 为4，layer 本身需要90度旋转，另外 180 旋转 使用 SDE Pipe，即180旋转 为3，最终结合旋转结果为 7。

```
+ Layer 0x7f93f6e000 (SurfaceView)
  Region transparentRegion (this=0x7f93f6e208, count=1)
    [ 0, 0, 0, 0]
  Region visibleRegion (this=0x7f93f6e010, count=1)
    [ 0, -308, 1600, 2726]
  Region surfaceDamageRegion (this=0x7f93f6e088, count=1)
    [ 0, 0, -1, -1]
    layerStack= 0, z= 21025, pos=(0,-308), size=(1600,3034), crop=( 0, 0,1600,3034), isOpaque=1, invalidate=0, alpha=0xff, flags=0x(
    client=0x7f970091e0
    format= 4, activeBuffer=[2048x1088:2048,7FA30C06], queued-frames=1, mRefreshPending=0
      mTexName=31 mCurrentTexture=3
      mCurrentCrop=[0,0,2048,1080] mCurrentTransform=0x4
      mAbandoned=0
      -BufferQueue mMaxAcquiredBufferCount=1, mDequeueBufferCannotBlock=0, default-size=[1600x3034], default-format=4, transform-hint=03,
    }

    [00:0x7f94308d00] state=DEQUEUED, 0x7f943afc20 [2048x1088:2048,7FA30C06]
    [01:0x7f92fbf800] state=DEQUEUED, 0x7f9701f660 [2048x1088:2048,7FA30C06]
    [02:0x7f92fbf000] state=DEQUEUED, 0x7f943af0e0 [2048x1088:2048,7FA30C06]
    >[03:0x7f911cea00] state=ACQUIRED, 0x7f9701fa80 [2048x1088:2048,7FA30C06]
    [04:0x7f92fbf700] state=QUEUED , 0x7f9701f900 [2048x1088:2048,7FA30C06]
```

180 Rotation on 8952/8956/8976

- 8952,8956,8976 同样支持Panel Inverse mounted.
- 举例，对于Video playback, SurfaceView layer 使用MDP driver旋转倒置，而其他的UI layer的倒置由GPU在rendering 阶段完成。

```
+ Layer 0x55a9c9a000 (SurfaceView)
  Region transparentRegion (this=0x55a9c9a1f0, count=1)
    [ 0, 0, 0, 0]
  Region visibleRegion (this=0x55a9c9a010, count=1)
    [ 0, 656, 1080, 1263]
    layerStack= 0, z= 21050, pos=(0,656), size=(1280, 720), crop=( 0, 0,1280, 720), isOpaque=1, invalidate=0, alpha=0xff, blur=0xf:
    client=0x55a9c3f160
    format= 4, activeBuffer=[1280x 720:1280,7FA30C04], queued-frames=1, mRefreshPending=0
    mTexName=108 mCurrentTexture=2
    mCurrentCrop=[0,0,1280,720] mCurrentTransform=0
    mAbandoned=0
    -BufferQueue mMaxAcquiredBufferCount=1, mDequeueBufferCannotBlock=0, default-size=[1280x720], default-format=4, transform-hint=03,
  }

  [00:0x55a9c627e0] state=DEQUEUED, 0x55a9c8fc10 [1280x 720:1280,7FA30C04]
  [01:0x55a99cceb0] state=DEQUEUED, 0x55a9c8f900 [1280x 720:1280,7FA30C04]
  >[02:0x55a9cb25e0] state=ACQUIRED, 0x55a9ca2570 [1280x 720:1280,7FA30C04]
  [03:0x55a9c3f160] state=DEQUEUED, 0x55a9c3f160 [1280x 720:1280,7FA30C04]
```

h/w composer state:

h/w composer present and enabled

Hardware Composer state (version 01040000):

mDebugForceFakeVSync=0

Display[0] configurations (* current):

* 0: 1080x1920, xdpi=160.421005, ydpi=159.895004, secure=1 refresh=16666667

numHwLayers=3, flags=00000000

type	handle	hint	flag	tx	blnd	format	source	crop(l,t,r,b)	frame	dirtyRect	name
HWC	55a9ca2570	0002	0000	03	0100	? 7fa30c04	0.0,	0.0, 1280.0, 720.0	0, 657, 1080, 1264	[0, 0, 1280, 720]	SurfaceView
HWC	55a9ca2380	0002	0000	00	0105	RGBA_8888	0.0,	0.0, 1080.0, 1920.0	0, 0, 1080, 1920	[0, 0, 1080, 1920]	com.google.android.apps.plus/
FB TARGET	55a9c5c320	0000	0000	00	0105	RGBA_8888	0.0,	0.0, 1080.0, 1920.0	0, 0, 1080, 1920	[0, 0, 0, 0]	HWC_FRAMEBUFFER_TARGET

Qualcomm HWC state:

MDPVersion=500

DisplayPanel=9

DynRefreshRate=60

180 Rotation onwards platform

- SDM will be using on 8937, 8953, so the panel inverse mounted is supported on 8937, 8953 as well.
- 使用的方法仍然为：
 - `persist.panel.inversemounted`



Browser

M42 fix list/update on 12/2015

Fix	patches	stability	rendering	ui
force close when reset to default	https://www.codeaurora.org/cgit/quic/chrome4sdp/external/android/packages/apps/browser/commit/?h=m42&id=4509c84a9d1ecee29c670dd1342e58dca85e3db9	Y		
force close when sliding up/right after uploading file	https://www.codeaurora.org/cgit/quic/chrome4sdp/chromium/src/commit/?h=m42&id=4452e661b8f56a2d0a9b69198e015fac4ce52305	Y		
show blank page when adding new incognito tab	https://www.codeaurora.org/cgit/quic/chrome4sdp/external/android/packages/apps/browser/commit/?h=m42&id=e3085fcdd4e99e5202111c89aebf36c7b1be78d		Y	
incognitos content may get missing and not reload	https://www.codeaurora.org/cgit/quic/chrome4sdp/chromium/src/commit/?h=m42&id=5fecf7d43460055584bf28a8109f339040f38e18		Y	
Pages show blank content when selecting all bookmarks in bookmark folder to open in new tabs	https://www.codeaurora.org/cgit/quic/chrome4sdp/external/android/packages/apps/browser/commit/?h=m42&id=35a94147249f2b7b517770ea50e90e317913f062		Y	
force close when using night mode	https://www.codeaurora.org/cgit/quic/chrome4sdp/chromium/src/commit/?h=m42&id=fafa3a1aa057f12bc64a551506b7df95922df655	Y		
Browser crashes when using Guest user mode	https://www.codeaurora.org/cgit/quic/chrome4sdp/chromium/src/commit/?h=m42&id=8ad83961409ba52222b49580eca3ac8cdf1ae92	Y		
Fix UI behavior on saved pages	https://www.codeaurora.org/cgit/quic/chrome4sdp/external/android/packages/apps/browser/commit/?h=m42&id=0024f5449fe04ad904fdae5efdf4c51d12e3f42e			Y
Fix tab interface doesn't show completely in landscape mode	https://www.codeaurora.org/cgit/quic/chrome4sdp/external/android/packages/apps/browser/commit/?h=m42&id=abbe487a1ebd1a10fe3de356f8fa04882359f5df			Y

M42 fix list/update on 12/2015

Fix	patches	stability	rendering	ui
force close When adding two tabs at the same time	https://www.codeaurora.org/cgit/quic/chrome4sdp/chromium/src/commit/?h=m42&id=7228d6c7bc2256eed32b42e6822477d7ebf13a64 https://www.codeaurora.org/cgit/quic/chrome4sdp/external/android/packages/apps/browser/commit/?h=m42&id=47666f000ae26677688b903575e76132b594028a	Y		
Fix function of "Request desktop site" is invalid	https://www.codeaurora.org/cgit/quic/chrome4sdp/chromium/src/commit/?h=m42&id=dba02f56c1e05020fb6a2875272258f545bbee1c		Y	
force close when rotating phone continuously in Open source licenses interface	https://www.codeaurora.org/cgit/quic/chrome4sdp/external/android/packages/apps/browser/commit/?h=m42&id=0da374f1373b530389bc4aafff84ca88ab6c2e59	Y		
It's hard to slide screen in Open source licenses interface in landscape mode	https://www.codeaurora.org/cgit/quic/chrome4sdp/external/android/packages/apps/browser/commit/?h=m42&id=eb7b0efae1fe3bc20d545aad242760250031f0e1		Y	
Fix issue of losing tab state	https://www.codeaurora.org/cgit/quic/chrome4sdp/external/android/packages/apps/browser/commit/?h=m42&id=e3085fcdd4e99e5202111c89aeabf36c7b1be78d	Y		
Fix tel: protocol to handle special character	https://www.codeaurora.org/cgit/quic/chrome4sdp/external/android/packages/apps/browser/commit/?h=m42&id=ad74a17d8dd2569d54a7160b5edcd69e13e20f34			Y
Fix flash of comboview	https://www.codeaurora.org/cgit/quic/chrome4sdp/external/android/packages/apps/browser/commit/?h=m42&id=fc4e3f9d9476b07402c745391f3822fd06eedf87			Y
Browser may force close when dragging the Text scaling bar	https://www.codeaurora.org/cgit/quic/chrome4sdp/chromium/src/commit/?h=m42&id=8737c283b87e2a11974c223d629174fb27f351a5	Y		
Fixe bitmap capture's purge all API	https://www.codeaurora.org/cgit/quic/chrome4sdp/chromium/src/commit/?h=m42&id=1ffb698db663e7294e04bb06946ebd07d00d2cd5		Y	

M42 fix list/update on 12/2015

Fix	Patches	stability	rendering	ui
Fix fragment lifecycle in legal credit screen	https://www.codeaurora.org/cgit/quic/chrome4sdp/external/android/packages/apps/browser/commit/?h=m42&id=0da374f1373b530389bc4aaff84ca88ab6c2e59			Y
Fix crashes when modifying Bookmarks	https://www.codeaurora.org/cgit/quic/chrome4sdp/chromium/src/commit/?h=m42&id=ccaebab01f9208e4dd91fa5a9188186842251f72	Y		

- Besides the fixes, M42 also updates some parts to improve the stability in our latest tip.
 1. Update android SDK21 to android SDK23
 2. Update skia library to fix some crashes caused by out of memory
- So we strongly recommend you to sync your m42 codebase to our 1/2016 tip.

Questions?

<https://support.cdmatech.com>

