



将 Tizen 移植到流行参考手机

Pengcheng Zou
Thundersoft 高级副总裁



顶级项目

Tizen 开放移植

最流行参考设计上最开放且最强大的移动操作系统



TIZEN v2.2



QRD 8916

- * 1.2Ghz Quad Core
- * 5" FWVGA
- * 1G Memory, 8G Flash
- * LTE
- * Dual SIM Dual Active



10 款免费的 Tizen QRD 设备，只需提出问题或做出贡献

提出问题

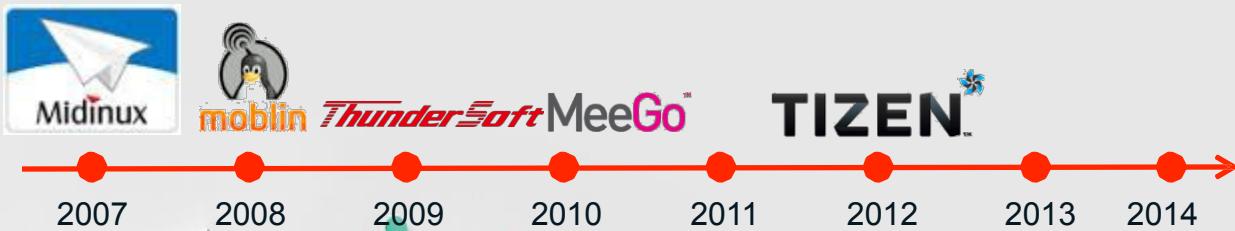


为顶级项目贡献
才智



历史概览

- 2005: Maemo (诺基亚)
- 2006: Midinux (RedFlag)
- 2007: Moblin (英特尔)
- 2008: 领先移动操作系统提供商 Thundersoft 创立
- 2010: MeeGo (诺基亚、英特尔、其他主要的硬件和软件公司)
- 2010: Bada (三星: 旨在减少对 Android 的依赖)
- 2011: 诺基亚放弃了 MeeGo (重点发展 Windows Phone)
- 2011: 英特尔和其他支持者相继放弃了 MeeGo
- 2011: LiMo 4 (LiMo 基金会 - 三星参与了 EFL 项目合作
(Carsten Haitzler = Rasterman))
- 2011: 英特尔加入 LiMo, 后者被更名为 Tizen
- 2012: LiMo 基金会更名为 Tizen 联盟
- 2012: 三星计划将 Bada 和 Tizen 进行合并



MID Midinux 团队在 1997 年北京 IDF 上

QRD 是什么？

“高通参考设计 (QRD) 整合了技术创新、优化设计、硬件/软件生态系统、工厂/开发工具等，能够为设备厂商提供交钥匙解决方案，帮助他们在更广泛的市场更经济高效、更快速地发布产品。”

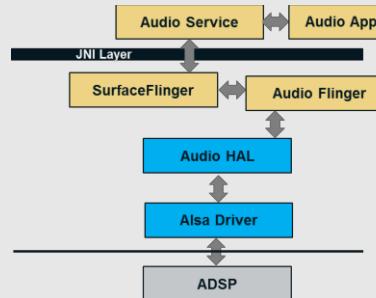
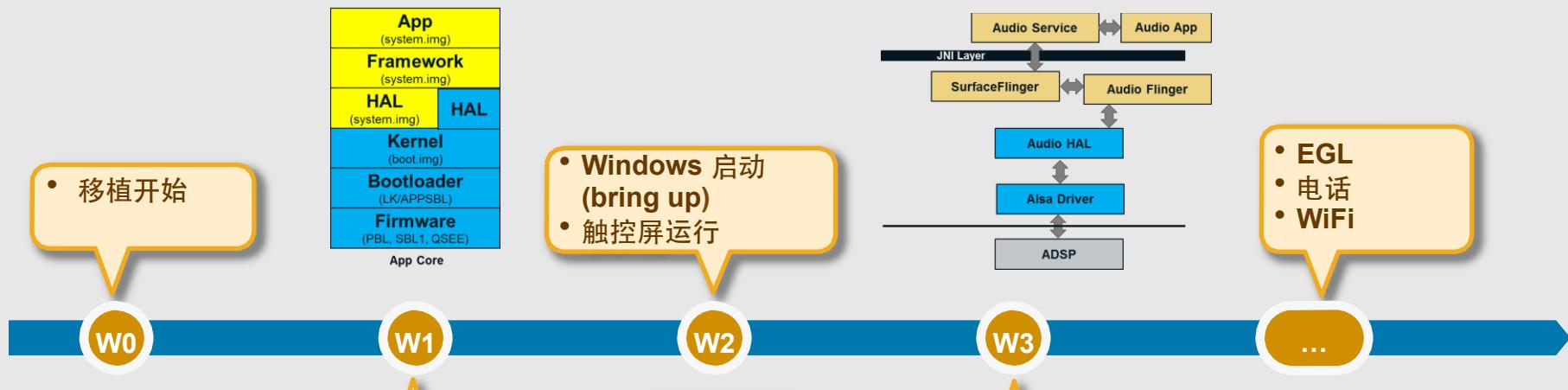


Tizen 为何会配置在 QRD 上？

- 支持畅快编辑程序
- 我们已将 Ubuntu 和 FirefoxOS 移植到 QRD 上
- 最流行的交钥匙解决方案上最开放且最强大的操作系统
- OEM/OEM、运营商等相关方可获得更多选择



移植路线图



- EGL
- 电话
- WiFi

Sales Hotline:

Service Time:
9:00AM-6:00PM (GMT+08:00)

Tel: +86-10-62014800 ext 801

24-hour hotline:

+86-15910509237

Email:

ord-sales@thundersoft.com for sales issuestechnical-support@thundersoft.com for post-sales service

Qualcomm Reference Design

Qualcomm Reference Design (QRD), is designed as a series of reference design engineering prototype for smart phone . QRD is designed to streamline the rapid market introduction of Android™ smart phones at lower development costs — drawing on the technical innovation and product quality. QRD offers you tools to help bring your product to market faster — including testing and acceptance readiness for leading regional and operator requirements, a comprehensive ecosystem of third-party providers, and easy customization options that allow you to save engineering costs and focus your development efforts on differentiation. QRD positions you to compete more effectively.

QRD 7x27A & QRD 8x25 & QRD 8x25Q & QRD 8x30 Tablet & QRD8930 Smartphone, are sold by ThunderSoft which is the sole exclusive sale agency in China, can be ordered and purchased directly online.



**QRD8916 DSDS: C + G
2-4-2 Half-Board**

Key Features • MSM8916 1.2Ghz Quad Core • Dual SIM / Dual Active...



QRD8930 TD-LTE(SGLTE&CSFB)

Attributes Dimensions: 8.9mm CS: July '13 High Level Specifications
MSM8930, WTR1605L, WCD9304, WCN3660A, PM8038, QSC1215...



QRD8x12 DSDS: TDS SS (option for T+G)

高级规格

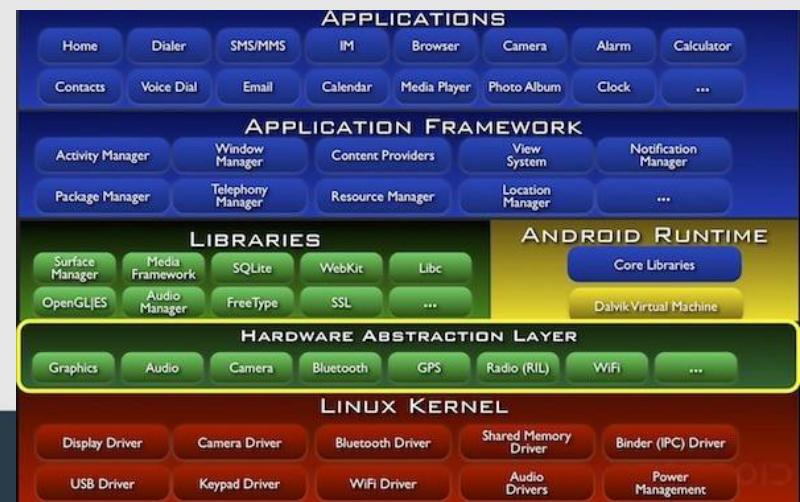
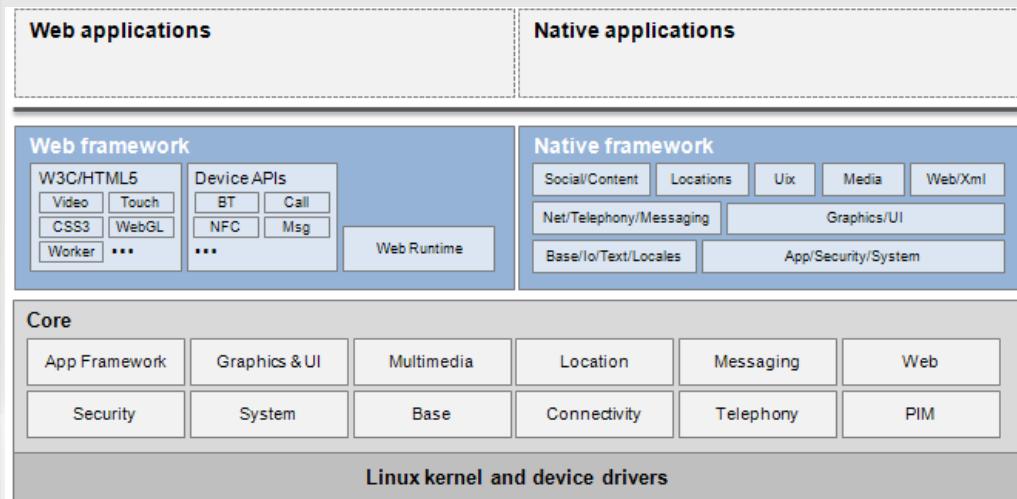
- MSM8916 1.2Ghz 四核 支持双 SIM / 双活动 (Dual Active)
- CT 的衍生配置 (需最少的努力) 图形处理器: Adreno 306 (400 MHz)
- 快速充电 1.0
- USB 主机模式支持 NFC
- 语言翻译 (12-15 种语言)
- 支持 1080p 编码@ 30fps

- MSM8916、WTR1605L、PM8916、WCN3620、QCA1990
- RF360 - QFE2320、QFE2340、QFE2101
- 天线调谐器 – QFE1520/QFE1550 Android 4.4 KitKat 配置
- CT 4 模式: 1xSRLTE, DSDS C + G 5.0 英寸 FWVGA 多点触控 LCD 摄像头: 5MP + 2MP LED flash
- 8GB eMMC, 8Gb LPDDR3 (eMCP) [533 MHz]
- MicroSD (最高支持 64GB) 3.5 毫米立体声耳机插孔连接功能 –
- WiFi 802.11 b/g/n/BT/FM (WCN3620)
- NFC (QCA 1990)
- GPS: AGPS/GLONASS/BEIDOU 传感器
- 光/近距离/Accel 快速充电 1.0 – SMB1360 USB2.0 (microUSB)。USB OTG
- 2-4-2 Half-board PCB, 具有 3.0 密耳轨迹 (mil trace)

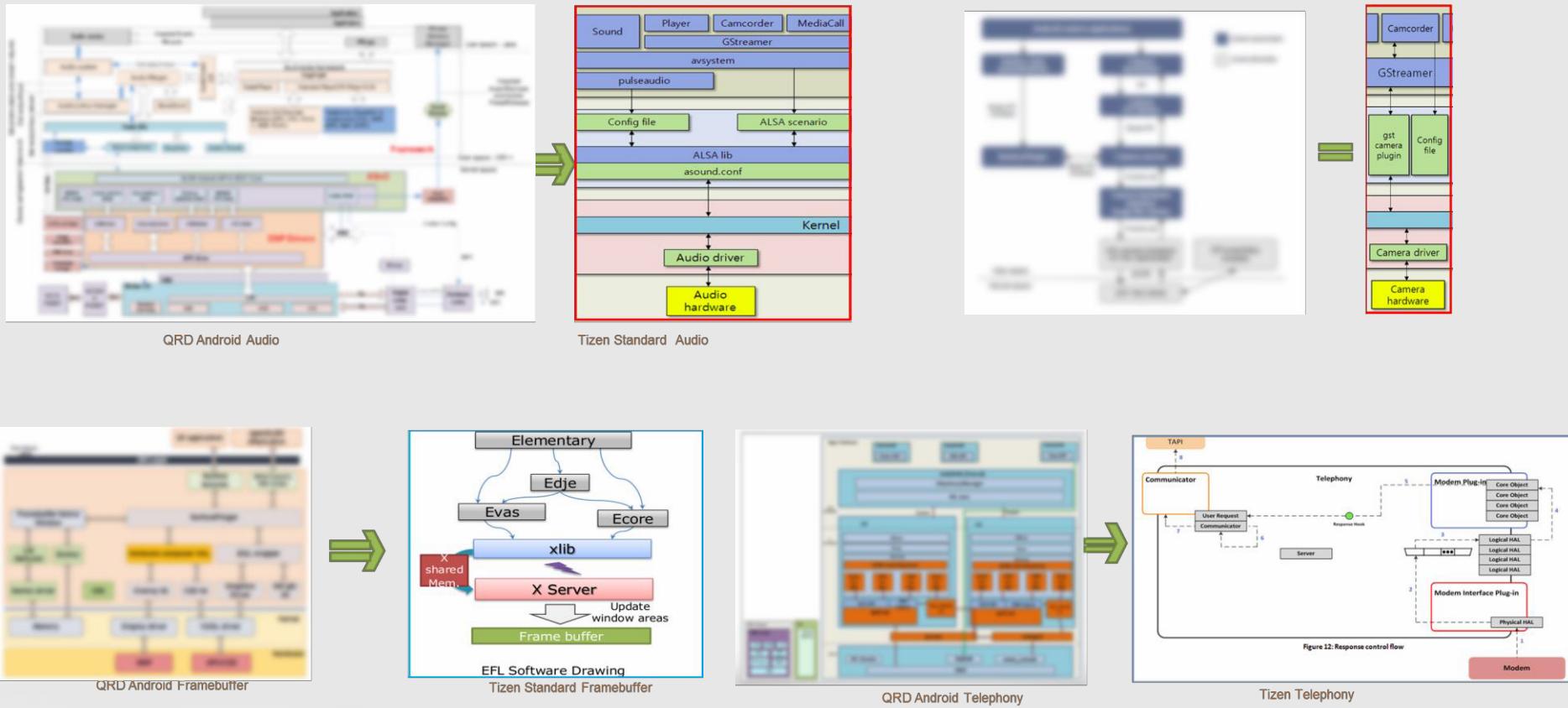


架构：Tizen 与 Android

组件	Tizen	Android
工具链	variant arm-linux-gcc	variant arm-linux-gcc
构建系统	GBS	Google Android Make System
内核	标准的 Linux 内核	修改的 Linux 内核
驱动程序	标准驱动程序	标准驱动程序
HAL	tizen hal based input dev	android hal based input dev
Init	SystemD	Init
C Lib	glibC	Bionic
音频	Alsa	TinyAlsa
摄像头	V4I2	QC V4I2
多媒体系统	Gstreamer	Stagefright
窗口系统	X-Window/Wayland	SurfaceFlinger
应用框架	AUL/Web 运行时	Java
应用运行时	本地/Web 运行时	Dalvik
Wifi	wpa_supplicant	WCNSS
BT	BlueZ	BlueDroid/BlueZ
图形	EFL/OpenGLES	Skia/OpenGLES
安全性	类似的沙盒模型	需要许可

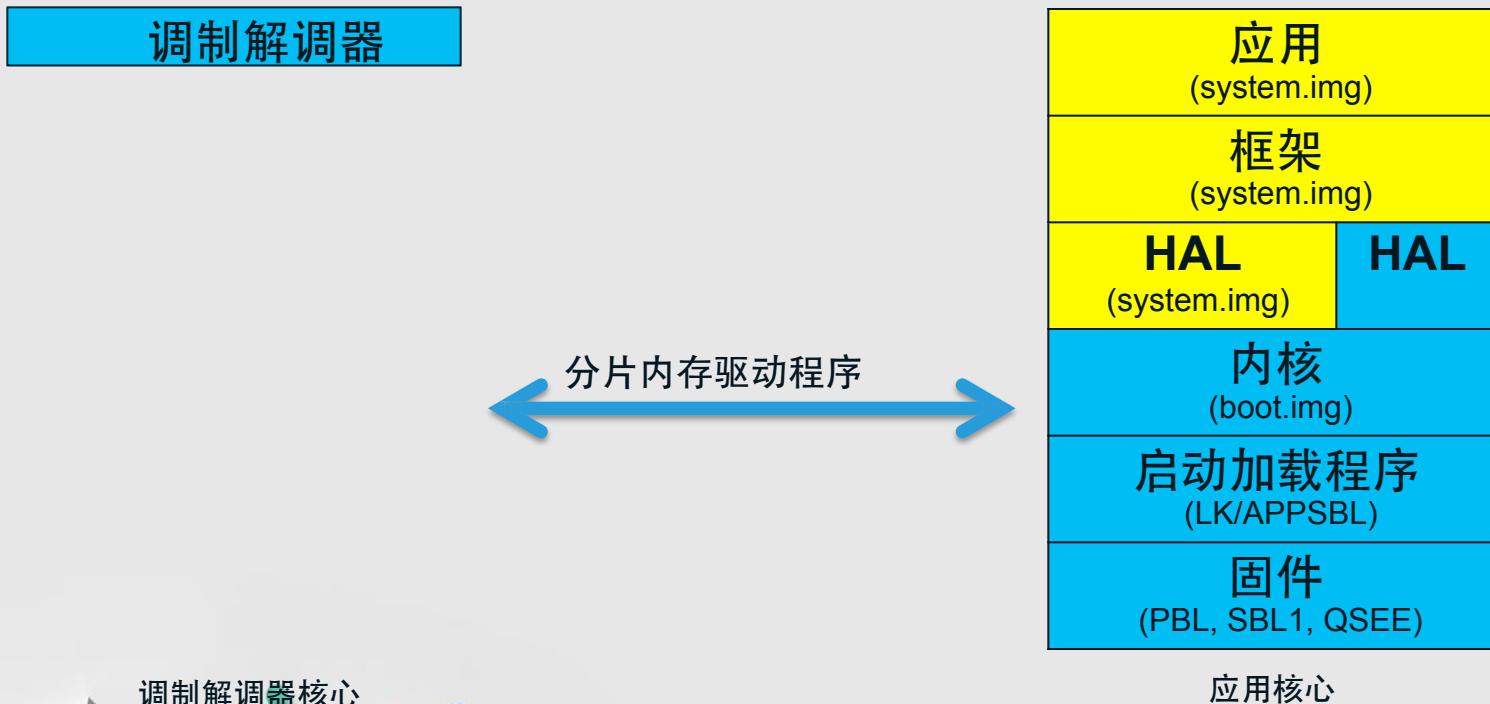


架构：Tizen 与 Qualcomm Android



移植策略

- 选项 1：使用 **kexec** 对设备进行多重启动
- 选项 2：先启动 **Android**，再 **chroot** 至 **Tizen**
- 选项 3：完全系统擦除和安装



构建软件包

- GBS – Git 构建系统

Linux

- 设置构建环境
- 安装依赖软件包 (**Dependent Package**)
- 尽享依赖的乐趣



Android

- 跨构建环境
- Makefile 规则
- 自动依赖创建
- 软件包构建 + 映像构建



依赖校正

pkgmgr-info.spec | 1... × +

192.168.33.81/tizen2/#/c/27/1/packaging/pkgmgr-info.spec

访问最多 ▾ Getting Started

All My Differences Projects Groups Plugins Documentation

Side-by-Side Unified Commit Message Preferences Patch Sets Files

Wu Hua <wuhua0721@thundersoft.com> | Settings | Sign Out

status:merged

Reviewed & next →

packaging/pkgmgr-info.spec

Up to change

patch Set Base 1 ↗ patch Set 1 ↗

pkcmgr-info.c ↗

```
1 Name: pkgmgr-info
2 Summary: Packager Manager infomation api for package
3 Version: 0.0.144
4 Release: 1
5 Group: Application Framework/Package Management
6 License: Apache-2.0
7 Source0: %(name)-%(version).tar.gz
8 BuildRequires: cmake
9 BuildRequires: pkgconfig(dlog)
10 BuildRequires: pkgconfig(vconf)
11 BuildRequires: pkgconfig(sqlite3)
12 BuildRequires: pkgconfig(db-util)
13 BuildRequires: pkgconfig(libxml-2.0)
14 BuildRequires: pkgconfig(dbus-1)
15 BuildRequires: pkgconfig(dbus-glib-1)
16 BuildRequires: pkgconfig(deviced)
17
18 %description
19 Packager Manager infomation api for packaging
20
21 %package devel
22 Summary: Packager Manager infomation api (devel)
23 Group: Development/Libraries
24 Requires: %(name) = %(version)-%(release)
25 %description devel
26 Packager Manager infomation api (devel)
27
28 %package parser
29 Summary: Library for manifest parser
30 Group: Application Framework/Package Management
31 Requires: %(name) = %(version)-%(release)
32
33 %description parser
34 Library for manifest parser
35
36 %package parser-devel
37 Summary: Dev package for libpkgmgr-parser
38 Group: Development/Libraries
39 Requires: %(name) = %(version)-%(release)
```

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Library for manifest parser

%package parser-devel
Summary: Dev package for libpkgmgr-parser
Group: Development/Libraries
Requires: %(name) = %(version)-%(release)
```

安装文件校正

```
diff --git a/osp-web.spec b/osp-web.spec
--- a/osp-web.spec
+++ b/osp-web.spec
@@ -97,10 +97,10 @@ else
 OXFLAGS="-O2 -g -pipe -Wall -fno-exceptions -Wformat -Wformat-security -Wl,-as-needed -fmessage-le
 ngt=0 -march=armv7 -mtune=cortex-a8 -mlittle-endian -mfpu=neon -mfloat-abi=softfp -D_SOFTFP_=m
 thumb -Wa,-mimplicit-it=thumb -funwind-tables -D_OSP_DEBUG_-D_SECURE_LOG-D_OSP_ARMEL_"
 cmake . -DCMAKE_INSTALL_PREFIX=%{_prefix} -DFULLVER=%{version} -DMAJORVER=$(MAJORVER)
+endif
@@ -101,10 +101,10 @@ endif
 # Call make instruction with smp support
 make %?obs:-j%jobs
@@ -104,10 +104,10 @@ install
 rm -rf %{buildroot}
 mkdir -p %{buildroot}/usr/share/license
 cat %{_builddir}/%{name}-%{version}/LICENSE.APv2.0 >> %{buildroot}/usr/share/license/%{name}
@@ -109,10 +109,10 @@ make_install
@@ -112,10 +112,10 @@ post -p /sbin/ldconfig
@@ -114,10 +114,10 @@ postun -p /sbin/ldconfig
@@ -116,10 +116,10 @@ files
 %manifest osp-web.manifest
 /usr/share/license/%{name}
 %{_libdir}/osp/libosp-web.so*
@@ -120,10 +120,10 @@ _libdir}/osp/browser-plugin/*.so
@@ -122,10 +122,10 @@ files devel
 %{_includedir}/osp/*.h
@@ -124,10 +124,10 @@ _libdir}/pkconfig/osp-web.pc
@@ -126,10 +126,10 @@ files internal-devel
 %{_includedir}/osp/web/controls/*.h
@@ -127,10 +127,10 @@ files debug
 %{_libdir}/osp/debug/*.so.*
@@ -131,10 +131,10 @@ _libdir}/osp/browser-plugin/debug/*.so
@@ -97,10 +97,10 @@ else
 OXFLAGS="-O2 -g -pipe -Wall -fno-exceptions -Wformat -Wformat-security -Wl,-as-needed -fmessage-le
 ngt=0 -march=armv7 -mtune=cortex-a8 -mlittle-endian -mfpu=neon -mfloat-abi=softfp -D_SOFTFP_=m
 thumb -Wa,-mimplicit-it=thumb -funwind-tables -D_OSP_DEBUG_-D_SECURE_LOG-D_OSP_ARMEL_"
 cmake . -DCMAKE_INSTALL_PREFIX=%{_prefix} -DFULLVER=%{version} -DMAJORVER=$(MAJORVER)
+endif
@@ -101,10 +101,10 @@ endif
 # Call make instruction with smp support
 make %?obs:-j%jobs
@@ -104,10 +104,10 @@ install
 rm -rf %{buildroot}
 mkdir -p %{buildroot}/usr/share/license
 cat %{_builddir}/%{name}-%{version}/LICENSE.APv2.0 >> %{buildroot}/usr/share/license/%{name}
@@ -109,10 +109,10 @@ make_install
@@ -112,10 +112,10 @@ post -p /sbin/ldconfig
@@ -114,10 +114,10 @@ postun -p /sbin/ldconfig
@@ -116,10 +116,10 @@ files
 %manifest osp-web.manifest
 /usr/share/license/%{name}
 %{_libdir}/osp/libosp-web.so*
@@ -120,10 +120,10 @@ _libdir}/osp/browser-plugin/*.so
@@ -122,10 +122,10 @@ files devel
 %{_includedir}/osp/*.h
@@ -124,10 +124,10 @@ _libdir}/pkconfig/osp-web.pc
@@ -126,10 +126,10 @@ files internal-devel
 %{_includedir}/osp/web/controls/*.h
@@ -127,10 +127,10 @@ files debug
 %{_libdir}/osp/debug/*.so.*
@@ -131,10 +131,10 @@ _libdir}/osp/browser-plugin/debug/*.so
@@ -132,10 +132,10 @@ lib/debug/*
@@ -133,10 +133,10 @@ src/debug/*
@@ -134,10 +134,10 @@ lib/debug/.*
```

[Commit Message](#) [Up to change](#)

Press '?' to view keyboard shortcuts
Powered by [Gerrit Code Review](#) (2.5.2) | [Report Bug](#)

路径校正

CMakeLists.txt | 192... x +

192.168.33.81/tizen2/#/c/25/1/privacy-popup/CMakeLists.txt

访问最多 ▾ Getting Started

Patch Set Base 1 Patch Set 1

```
▶ 1 INCLUDE(FindPkgConfig)
2 pkg_check_modules(privacy-popup_pkgs
3 REQUIRED
4 ecore-x
5 ui-gadget-1
6 dlog
7 appcore-efl
8 privacy-manager-client
9 pkgmgr-info
10 )
11 SET(this_target tizenprv00.privacy-popup)
12 SET(manifest_target privacy-popup.xml)
13
14 SET(SRCS
15 src/privacy-popup.c
16 )
17
18 INCLUDE_DIRECTORIES(${privacy-popup_pkgs_INCLUDE_DIRS})
19 INCLUDE_DIRECTORIES(.inc)
20
21
22 FIND_PROGRAM(UNAME NAMES uname)
23 EXEC_PROGRAM("${UNAME}" ARGS "-m" OUTPUT_VARIABLE "ARCH")
24
25 IF("${ARCH}" STREQUAL "arm")
26 ADD_DEFINITIONS(-DTARGET)
27 MESSAGE("add -DTARGET")
28 ENDIF("${ARCH}" STREQUAL "arm")
29
30 MESSAGE("CMAKE_INSTALL_PREFIX: ${CMAKE_INSTALL_PREFIX}")
31
32 ADD_EXECUTABLE(${this_target} ${SRCS})
33
34 ADD_DEPENDENCIES(${this_target} privacy-manager-client)
35 TARGET_LINK_LIBRARIES(${this_target} ${privacy-popup_pkgs_LDFLAGS} ${privacy-popup_pkgs_LIBRARIES})
36
37 INSTALL(TARGETS
38 ${this_target}
39 DESTINATION
40 /usr/bin/
41 )
42 INSTALL(FILES ${CMAKE_SOURCE_DIR}/packaging/${manifest_target} DESTINATION /usr/share/packages)
```

Patch Set 1

```
INCLUDE(FindPkgConfig)
pkg_check_modules(privacy-popup_pkgs
REQUIRED
ecore-x
ui-gadget-1
dlog
appcore-efl
privacy-manager-client
pkgmgr-info
)
SET(this_target tizenprv00.privacy-popup)
SET(manifest_target privacy-popup.xml)

SET(SRCS
src/privacy-popup.c
)

INCLUDE_DIRECTORIES(${privacy-popup_pkgs_INCLUDE_DIRS})
INCLUDE_DIRECTORIES(.inc)

FIND_PROGRAM(UNAME NAMES uname)
EXEC_PROGRAM("${UNAME}" ARGS "-m" OUTPUT_VARIABLE "ARCH")

IF("${ARCH}" STREQUAL "arm")
ADD_DEFINITIONS(-DTARGET)
MESSAGE("add -DTARGET")
ENDIF("${ARCH}" STREQUAL "arm")

MESSAGE("CMAKE_INSTALL_PREFIX: ${CMAKE_INSTALL_PREFIX}")

ADD_EXECUTABLE(${this_target} ${SRCS})

ADD_DEPENDENCIES(${this_target} privacy-manager-client)
TARGET_LINK_LIBRARIES(${this_target} ${privacy-popup_pkgs_LDFLAGS} ${privacy-popup_pkgs_LIBRARIES})

INSTALL(TARGETS
${this_target}
DESTINATION
/usr/bin/
)
INSTALL(FILES ${CMAKE_SOURCE_DIR}/packaging/${manifest_target} DESTINATION /usr/share/packages)
```

Commit Message

Up to change

Press '?' to view keyboard shortcuts
Powered by Gerrit Code Review (2.5.2) | Report Bug

GBS 适用于 Good .gbs.conf

- 多线程构建?
- 需排除什么软件包?

```
[general]
tmpdir=/var/tmp/
profile = profile.tizen2.2
work_dir=.

[repo.tizen2.2_arm]
url=${work_dir}/pre-built/toolchain-arm/

[repo.tizen2.2_x86]
url=${work_dir}/pre-built/toolchain-x86/

[profile.tizen2.2]
repos=repo.tizen2.2_arm, repo.tizen2.2_x86
buildconf=${work_dir}/scm/meta/build-config/build.conf

#exclude_packages=gcc,cmake,libva,python-magic,nss

exclude_packages=bash,bzip2-libs,c-ares,cmake,coreutils,diffutils,eglibc,elfutils-libelf,elfutils-libs,elfutils_fdupes,file,findutils,gawk,gmp,gz
ip,libacl,libattr,libcap,libcurl,libfile,libgcc,liblua,libstdc++,make,mpc,mpfr,ncurses-libs,nodejs,nspr,nss-softokn-freebl,nss,openssl,patch,popt
,rpm-build,rpm-libs,rpm,sed,sqlite,tar,xz-libs,zlib,binutils,gcc

exclude_packages=gcc,cmake,libva,python-magic,nss
```

映像构建

- **MIC msm8916_32.ks**
- **make_ext4fs**
 - # sudo make_ext4fs -s -l 1140000000 platform.simg /media/xxx/platform

```
# -*-mic2-options-*- -f loop --pack-to=@NAME@.tar.gz -*-mic2-options-*-
#
# Do not Edit!Generated by:
# kickstarter.py
#
lang en_US.UTF-8 keyboard us
timezone --utc America/Los_Angeles
# ROOT fs partition
part / --size=3000 --ondisk mmcblk0p --fstype=ext4 --label=platform
# DATA partition
part /opt/ --size=3000 --ondisk mmcblk0p --fstype=ext4 --label=data
# UMS partition
part /opt/usr/ --size=3000 --ondisk mmcblk0p --fstype=ext4 --label=ums
...
repo --name=Tizen-main --baseurl=http://download.tizen.org/releases/2.2/tizen-2.2/repos/tizen-main/armv7l/packages/ --save --ssl_verify=no --priority=99 repo --name=Tizen-base --baseurl=http://download.tizen.org/releases/2.2/tizen-2.2/repos/tizen-base/armv7l/packages/ --save --ssl_verify=no --priority=99 repo --name=local --baseurl=file:///home/wuhua/GBS-ROOT/local/repos/tizen2.2/armv7l --priority=1
...
```

Msm8916_32.ks

```
--- a/ext4_utils/make_ext4fs.c
+++ b/ext4_utils/make_ext4fs.c
@@ -164,6 +164,8 @@ static u32 build_directory_structure(const char
*full_path, const char *dir_path
dentries[i].size = stat.st_size;
dentries[i].mode = stat.st_mode &
(S_ISUID|S_ISGID|S_ISVTX|S_IRWXU|S_IRWXG|S_IRWXO);
dentries[i].mtime = stat.st_mtime;
+
dentries[i].uid = stat.st_uid;
+
dentries[i].gid = stat.st_gid; uint64_t capabilities;
if (fs_config_func != NULL) {
#ifndef ANDROID
@@ -242,7 +244,9 @@ static u32 build_directory_structure(const char
*full_path, const char *dir_path
inode = make_directory(dir_inode, entries, dentries, dirs);

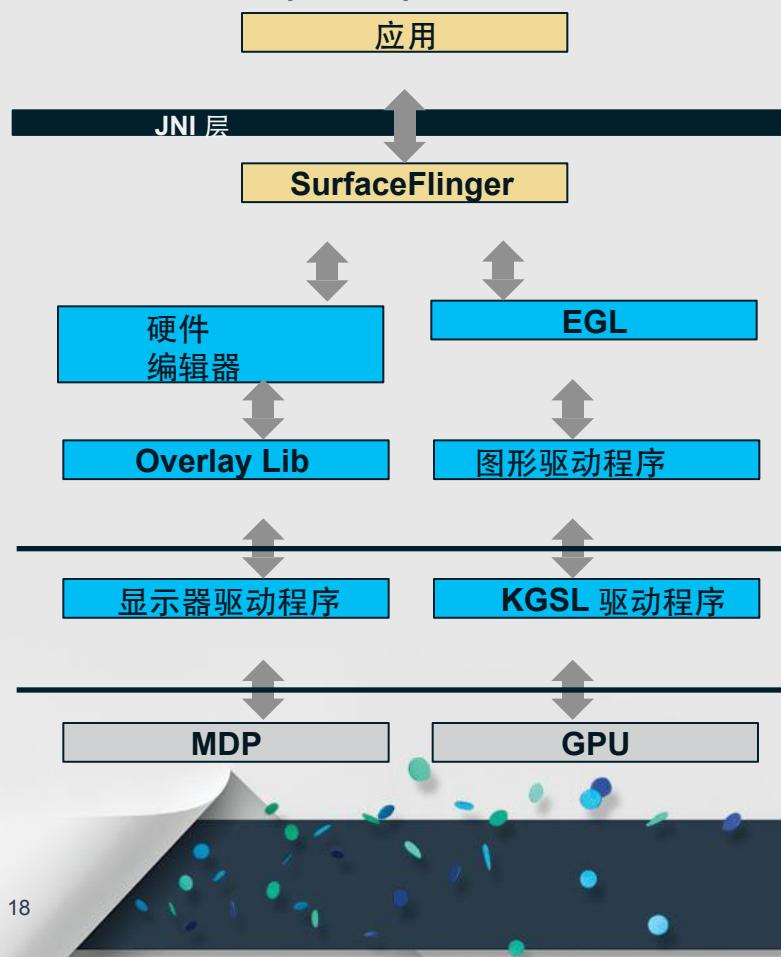
for (i = 0; i < entries; i++) {
if (dentries[i].file_type == EXT4_FT_REG_FILE) { if ((dentries[i].file_type ==
EXT4_FT_REG_FILE) ||
(dentries[i].file_type == EXT4_FT_CHRDEV) || (dentries[i].file_type ==
EXT4_FT_BLKDEV)) {
entry_inode = make_file(dentries[i].full_path,
dentries[i].size);
} else if (dentries[i].file_type == EXT4_FT_DIR) {
char *subdir_full_path = NULL;
```

make_ext4fs

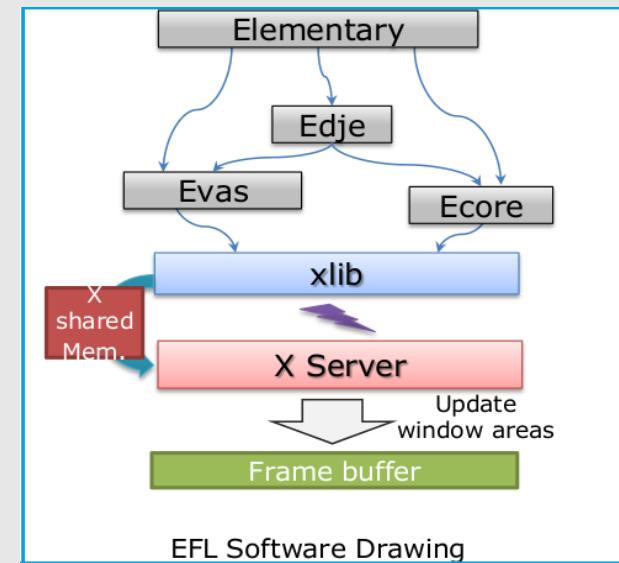
TIZEN™ DEVELOPER SUMMIT
2014 SHANGHAI
TIZEN开发者峰会（上海）

显示器

- QRD 仅支持叠加和 OpenGL/ES
- 帧缓冲区启用以支持 Xwindows
- aRGB (Tizen) 与 RGBa (高通)



```
if (mdss_fb_alloc_fbmem(mfd)) {  
    if (mdss_fb_alloc_fb_ion_memory(mfd))  
        pr_warn("unable to allocate fb memory in fb register\n");  
}
```



触控板

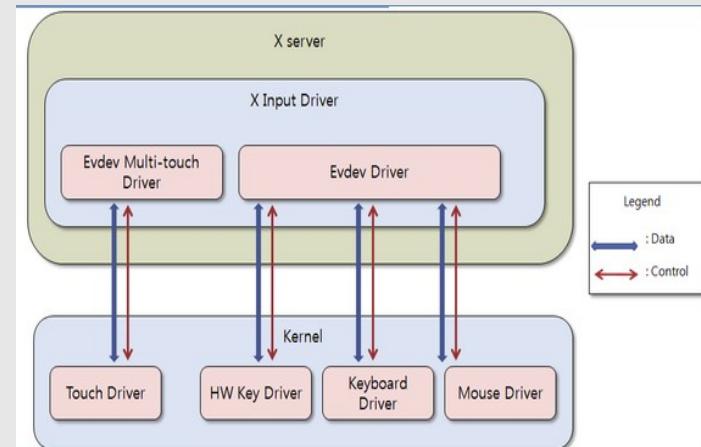
- 高通：触控事件和虚拟键事件使用相同的界面 (`/dev/eventX`)
- Tizen：触控事件和虚拟键事件使用不同的界面发送



```
#ifdef FT5X06_VIRTUAL_KEY
    input_key_dev = input_allocate_device();
    if (!input_key_dev) {
        dev_err(&client->dev, "failed to allocate input key device\n");
        return -ENOMEM;
    }

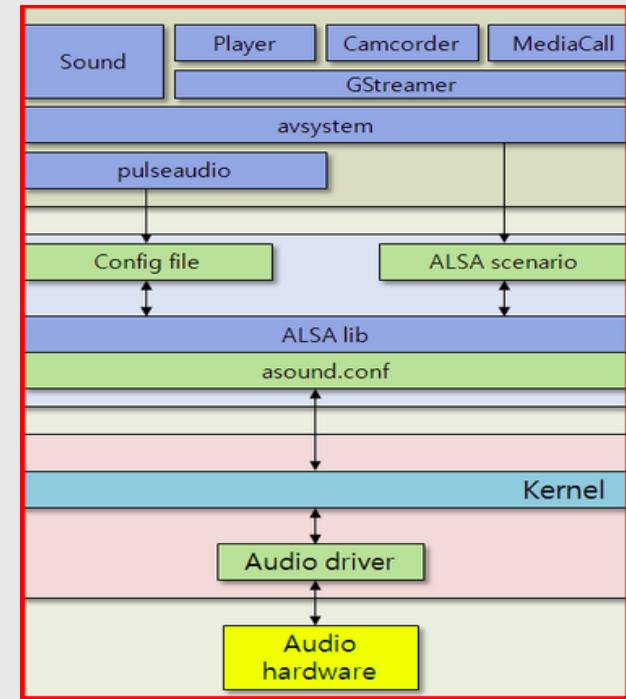
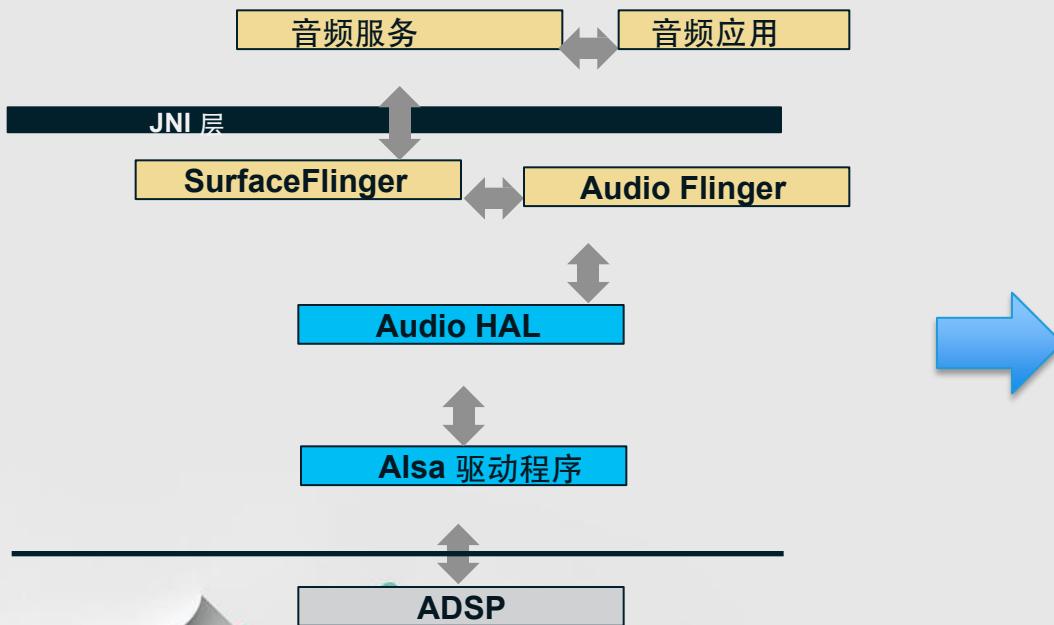
    input_key_dev->name = "ft5x06_ts_kbd";
    input_key_dev->id.bustype = BUS_I2C;
    input_key_dev->dev.parent = &client->dev;
```

```
#ifdef FT5X06_VIRTUAL_KEY
    if (status == FT_TOUCH_DOWN || status == FT_TOUCH_CONTACT) {
        if ((x == 0x78) && (y == 0x384) && (menudown == 0)) {
            menudown = 1;
            input_report_key(input_key_dev, KEY_PHONE, 1);
            update_key_input=true;
        }
        if ((x == 0xF0) && (y == 0x384) && (homedown == 0)) {
            homedown = 1;
            input_report_key(input_key_dev, KEY_MENU, 1);
            update_key_input=true;
        }
    }
```



音频

- 音频和调制解调器
 - 在 8916 中，需启用调制解调器以支持音频功能(DSP)
 - 需要启动 ueventd 以创建设备节点（如 /dev/smd0 Run rmt_storage）,
 - 初始化调制解调器
- TinyAlsa 与 ALSA



在 Tizen 上运行 Android 服务

- 链接程序和加载程序不同
- 运行 Android “初始化”和 systemD
- 引入必要的服务
- 在 Tizen 中使用 Android lib

- <https://github.com/libhybris>

	Tizen	Android
加载程序	Ld-linux.so	链接程序
动态 Lib 搜索路径	/user/lib/osp /usr/lib /lib	/vendor/lib /system/lib
典型的动态 Lib	# ldd bash /usr/lib/libc-assert.so /lib/libdl.so.2 /lib/libgcc_s.so.1 /lib/libc.so.6 /lib/ld-linux.so.3 /lib/libunwind.so.8 \\	# ldd rild liblog.so libcutils.so libril.so libdl.so libc.so libstdc ++.so libm.so

```
static soinfo* solist = &libdl_info;
static soinfo* sonext = &libdl_info;
static soinfo* somain; /* main process, always the one after libdl_info */

static const char* const gSoPaths[] = { "/vendor/lib",
"/system/lib",
NULL
};

static char gLdPathsBuffer[LDPATH_BUFSIZE]; static const char*
gLdPaths[LDPATH_MAX + 1];
static soinfo* solist = &libdl_info;
static soinfo* sonext = &libdl_info;
static soinfo* somain; /* main process, always the one after libdl_info */
```

linker.cpp

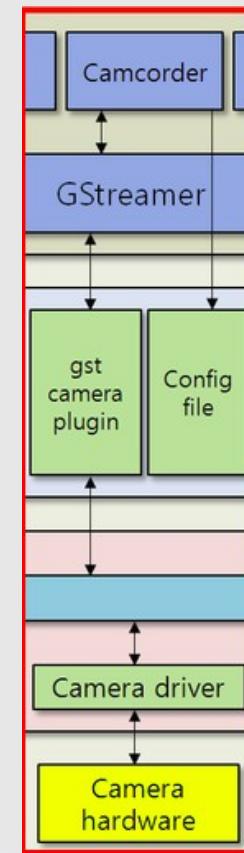
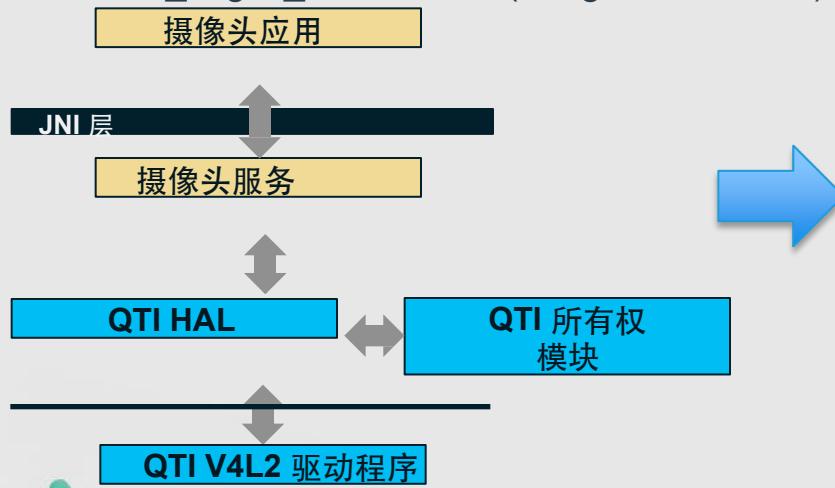
```
EGLBoolean eglInitialize(EGLDisplay dpy, EGLint *major, EGLint *minor)
{
EGL_DLSYM(&_eglInitialize, "eglInitialize");
return (*_eglInitialize)(dpy, major, minor);
}

void *android_dlopen(const char *filename, int flag)
{
soinfo *ret;

pthread_mutex_lock(&dl_lock); ret = find_library(filename); if (unlikely(ret ==
EGLBoolean eglInitialize(EGLDisplay dpy, EGLint *major, EGLint *minor)
{
EGL_DLSYM(&_eglInitialize, "eglInitialize");
dlopen("eglInitialize", dpy); refcount++;
}
pthread_mutex_unlock(&dl_lock); return ret;
void *android_dlopen(const char *filename, int flag)
```

摄像头

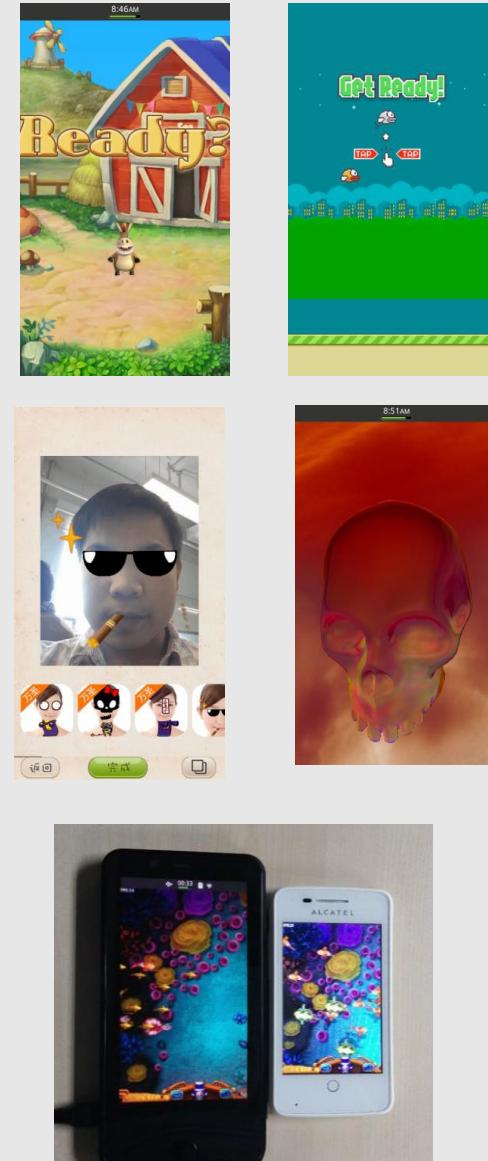
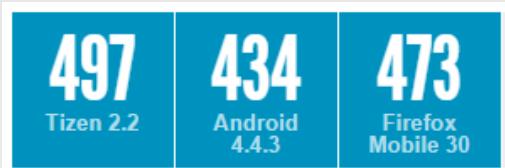
- QTI V4L2 与标准 V4L2
- 用户空间内的摄像头驱动程序
 - m-qcamera-daemon
 - Liboemcamera.so
 - libmmcamera2_stats_modules.so (3A lib)
 - libmmcamera2_sensor_modules.so (sensor related lib)
 - libmmcamera2_pproc_modules.so (Post-processing lib)
 - libmmcamera2_imlib_modules.so (Images related lib)



Web 应用移植

- Tizen web 应用与 FirefoxOS 应用
 - Web API, 设备 API, 封装, Syntax 等

	Tizen	FirefoxOS
Web 引擎	webkit2	gecko
Javascript 引擎	JavaScript 核心	Spider monkey
Web 渲染	Cairo	Skia
应用声明	config.xml (xml 格式)	manifest.webapp (json 格式)
“const”支持	否	是
蓝牙 API	非标准	非标准
环境光 传感器 API	非标准 (通过 传感器管理器)	W3C
WebFM	否	是
警报器	非标准 (警报器管理器)	W3C
简单的推送 API	不支持	不支持



后续步骤

- 发布源代码
- EGL
- 电话
- WiFi
- 面向摄像头的 Gstreamer 插件
- 传感器

资源

- 从 Tizen 到 Android
 - http://events.linuxfoundation.org/sites/events/files/als13_dupuis_tizen.pdf
- Tizen 移植指南
 - https://wiki.tizen.org/wiki/Porting_Guide
- 将 Tizen 移植到全志 A10 上
 - <https://github.com/leon-anavi/tizen-sunxi>
- Linux 配置在 Snapdragon 上
 - <https://www.codeaurora.org/projects/all-active-projects/qr-linux>
 - <http://releases.linaro.org/latest/ubuntu/ifc6410>

问答

ThunderSoft

- www.thundersoft.com
- store.thundersoft.com
- zoupc@thundersoft.com



	设备 API 支持 (共 56)	不支持	支持		HTML 得分
Tizen	56	18	38	0.678571429	497
Firefox	56	26	30	0.535714286	473