



Introduction to Tizen with Architecture Overview	Tizen 简介及架构概述
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<p>Contents</p> <ul style="list-style-type: none">-What is Tizen?-Architecture-Development Environment-Strength-Roadmap & Contributions-Conclusions	<p>目录</p> <ul style="list-style-type: none">- Tizen 是什么?- 架构- 开发环境目录- Tizen- 结论 是什么?架构
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What is Tizen?	Tizen 是什么？
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What is Tizen?

- Open source project hosted by Linux Foundation



- Open source release
- SDK, platform development
- Community support
- Defines TCS and TCT
- Device profiles (Mobile, IVI, TV, etc.)



- TIZEN marketing and events
- Global partner / CP collaboration
- TIZEN Common Store
- TIZEN Device Certification
- TIZEN brand management

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

What is Tizen?	Tizen 是什么？
<ul style="list-style-type: none"> • Open source project hosted by Linux Foundation 	<ul style="list-style-type: none"> • 由 Linux 基金会主办的开源项目
<ul style="list-style-type: none"> • Open source release • SDK, platform development • Community support • Defines TCS and TCT • Device profiles (Mobile, IVI, 	<ul style="list-style-type: none"> • 开源软件发布 • SDK, 平台开发 • 社区支持 • 定义 TCS 和 TCT • 设备外形 (移动、IVI、电视
<p>TIZEN™ Association</p> <ul style="list-style-type: none"> • TIZEN marketing and events • Global partner CP collaboration • TIZEN Common Store • TIZEN Device Certification • TIZEN brand management 	<p>TIZEN™ 联盟</p> <ul style="list-style-type: none"> • TIZEN 营销和活动 • 全球合作伙伴 / CP 协作 • TIZEN Common Store • TIZEN 设备认证 • TIZEN 品牌管理

What is Tizen? (Pronounced “Tie Zen”)

- **Tizen is an open source, standards-based software platform**
 - Smartphones, tablets, netbooks, in-vehicle infotainment devices, TVs, and more.
 - <https://www.tizen.org>
 - Tizen evolution since Apr. 2012
1.0(Web FW), 2.0(+Native FW),
2.1(+Optimization), 2.2(+Enhanced UX), 2.3(+Multi-profile)
- **Tizen provides a robust and flexible environment for application development, based on HTML5**
 - HTML5: the preferred development environment for apps/services for the future
 - Robust capabilities and cross platform flexibility



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infotainment devices, TVs, and more.

- <https://www.tizen.org> development environment for apps/services for the future

- Robust capabilities and cross platform flexibility

Tizen 是什么？（读作“Tie Zen”）

- Tizen 是一种基于标准的开源软件平台
- 智能手机、平板电脑、上网本、车载信息娱乐设备、电视等。
- <https://www.tizen.org>
- Tizen 自 2012 年 4 月 1.0 版本（Web 固件）、2.0 版本（+本地固件）、2.1 版本（+优化）、2.2 版本（+增强的用户体验）、2.3 版本（+多种外形）
- Tizen 可提供一种强大、灵活且基于 HTML5 的应用开发环境。
- HTML5 是一种基于标准的开源软件开发环境
- 能够开发信息娱乐设备的电视等应用
- <https://www.tizen.org>

What is Tizen?

- **Tizen Association**

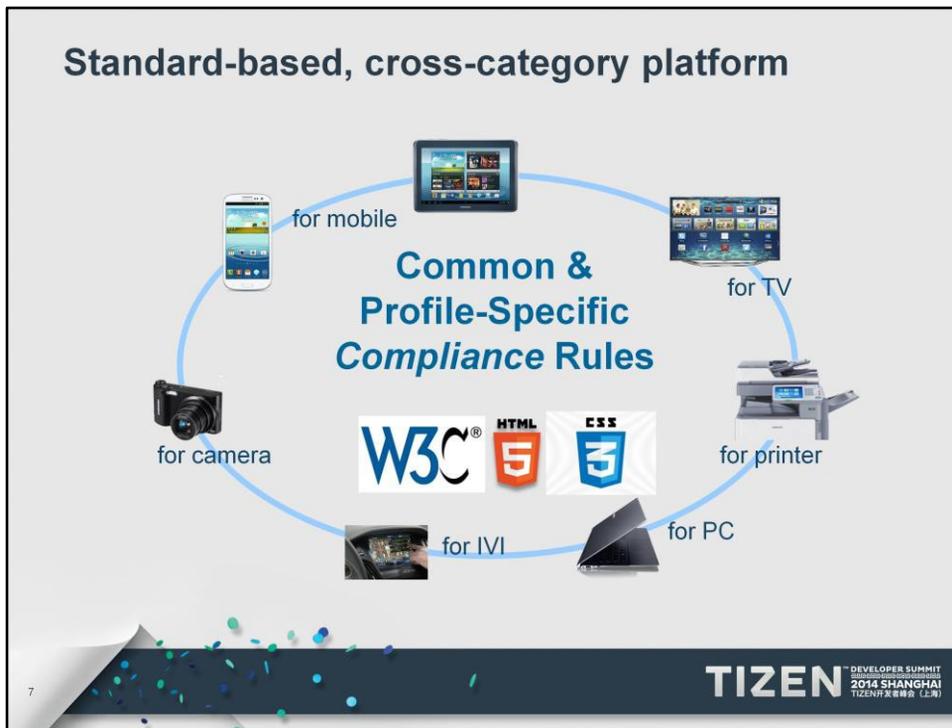
- An industry consortium is comprised of
 - Key service providers
 - Device manufacturers and silicon suppliers
- Guiding the industry role of Tizen includes gathering of
 - Requirements, identification and facilitation of service models
 - Overall industry marketing and education.



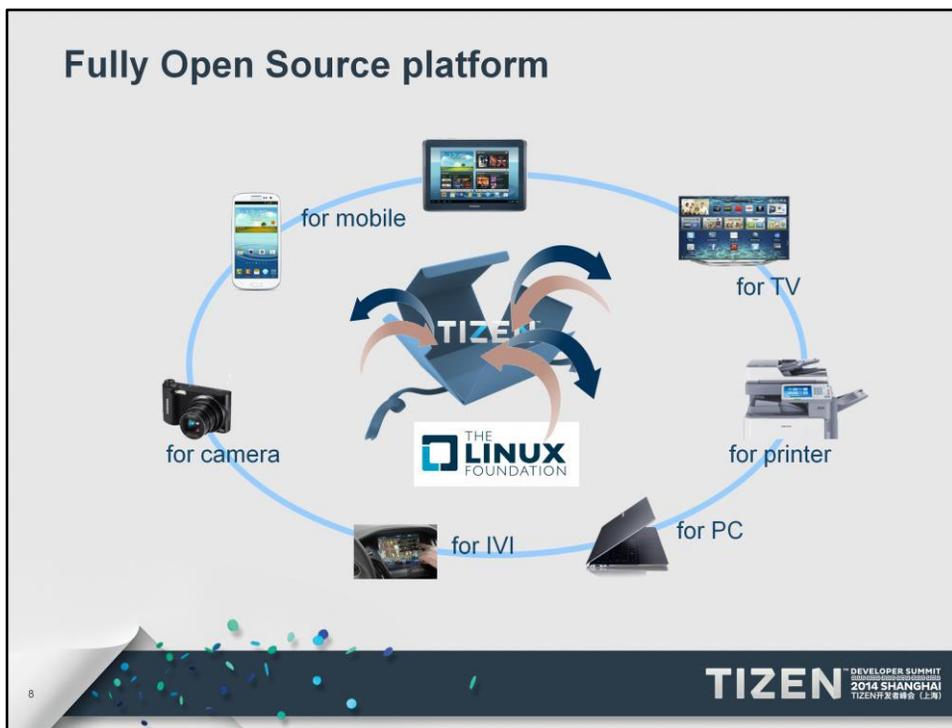
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<p>What is Tizen?</p>	<p>Tizen 是什么？</p>
<ul style="list-style-type: none"> • Tizen <ul style="list-style-type: none"> • comprised of <ul style="list-style-type: none"> • Key service providers • Device manufacturers and silicon suppliers • Guiding the industry role of Tizen includes gathering of <ul style="list-style-type: none"> • Requirements, identification and facilitation of service models • Overall industry marketing and education. 	<ul style="list-style-type: none"> • Tizen 联盟 <ul style="list-style-type: none"> • 一个行业联盟，由以下各方组成 <ul style="list-style-type: none"> • 主要服务提供商 • 设备制造商和芯片供应商 • 指导 Tizen 应该扮演的行业角色，包括收集 <ul style="list-style-type: none"> • 服务模式的要求、认证和便利化建议 • 整体行业的营销和知识普及。
<p>Tizen Association Members</p>	<p>Tizen 联盟成员</p>



Standard-based, cross-category platform	基于标准、跨类别的平台
for mobile	支持移动设备
for TV	支持电视
for printer	支持打印机
for PC	支持 PC
for IVI	支持 IVI
for camera	支持相机
Common & Profile-Specific Compliance Rules	通用和特定外形的合规规则



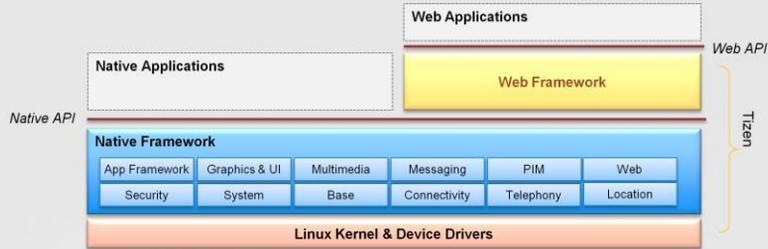
Fully Open Source platform	完全开源平台
for mobile	支持移动设备
for TV	支持电视
for printer	支持打印机
for PC	支持 PC
for IVI	支持 IVI
for camera	支持相机



架构

Tizen Architecture

- **Web API**
 - Web is the primary application development environment for Tizen
- **Native API**
 - Fast, light-weight, scalable native applications can run smoothly on any Tizen mobile phones (from low-end to high-end)



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Tizen Architecture	Tizen 架构
<ul style="list-style-type: none"> • Web API <ul style="list-style-type: none"> • Web is the primary application development environment for Tizen • Native API <ul style="list-style-type: none"> • Fast, light-weight, scalable native applications can run smoothly on any Tizen mobile phones (from low-end to high-end) 	<ul style="list-style-type: none"> • Web API <ul style="list-style-type: none"> • Web 是 Tizen 的主要应用开发环境 • 本地 API <ul style="list-style-type: none"> • 快速、可扩展的轻型本地应用可在任何 Tizen 手机上流畅运行（从低端到高端）
Native Applications Web Applications	本地应用 Web 应用
Native API Web API	本地 API Web API
Web Framework Native Framework	Web 框架 本地框架
Tizen	Tizen
App Framework Security Graphics & UI	应用框架 安全性 显卡和用户界面

Tizen Architecture | Linux Kernel & Device Drivers

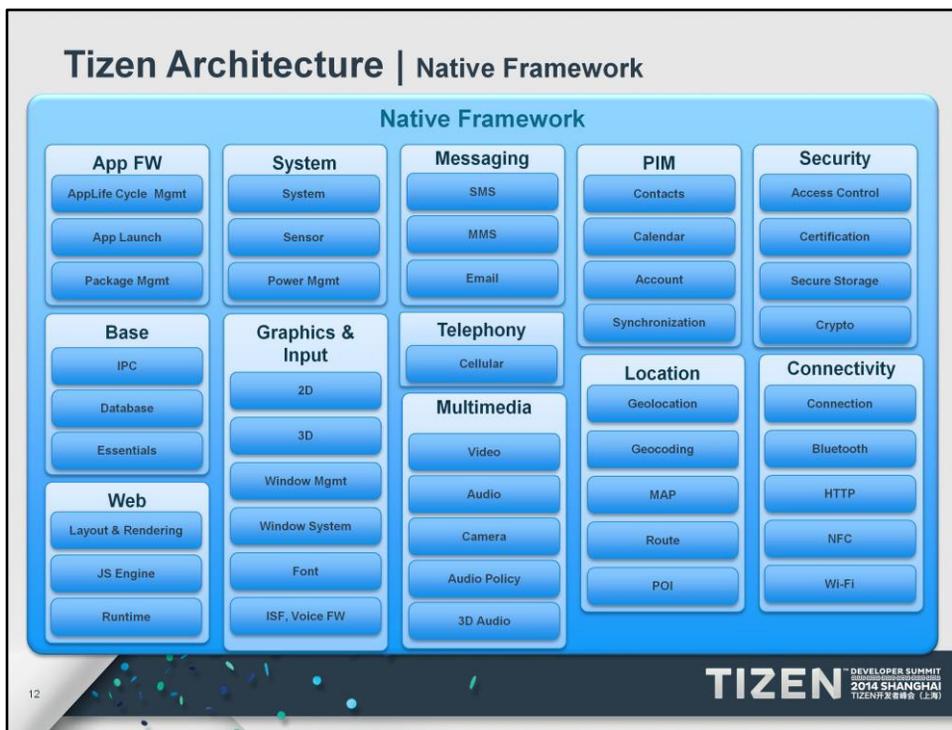
- Linux Kernel
- Device Drivers
- Hardware Adaptation Layer
 - Plug-ins
- OpenGL ES/EGL Graphics Driver
 - DRM based graphics stack



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<p>Tizen Architecture Linux Kernel & Device Drivers</p> <ul style="list-style-type: none"> • Linux Kernel • Device Drivers • Hardware Adaptation Layer Plug-ins • OpenGL ES/EGL Graphics Driver <ul style="list-style-type: none"> – DRM based graphics stack 	<p>Tizen 架构 Linux 内核和设备驱动程序</p> <ul style="list-style-type: none"> • Linux 内核 • 设备驱动程序 • 硬件适配层 <ul style="list-style-type: none"> – 插件 • OpenGL ES/EGL 显卡驱动程序 <ul style="list-style-type: none"> – 基于 DRM 的显卡堆栈 <p>Tizen 架构</p>
<p>Adaptation Layer HAL (HW Adaptation Layer)</p>	<p>适配层 HAL (硬件适配层)</p>
<p>Telephony Plug-ins GStreamer Plug-ins Sensor Plug-ins System Plug-ins OpenGL ES/EGL Graphics Driver Kernel 3.xx SMACK Device Drivers</p>	<p>电话插件 GStreamer 插件 传感器插件 系统插件 OpenGL ES/EGL 显卡驱动程序 3.xx SMACK 设备驱动程序</p>



Tizen 架构 本地框架				
本地框架				
应用固件	系统	消息	PIM	安全性
应用生命周期管理	系统	SMS	联系人	访问控制
应用启动	传感器	MMS	日历	认证
封装管理	电源管理	电子邮件	账户	安全存储
基础 IPC	图形和输入	电话蜂窝	同步位置	加密连接功能
数据库	2D	多媒体	地理定位	连接
基本要素	3D	视频	地理编码	蓝牙
Web	窗口管理	音频	MAP	HTTP
布局和渲染	窗口系统	相机	路由	NFC
JS 引擎	字体	音频策略	POI	Wi-Fi
运行时	ISF、语音固件	3D 音频		

Tizen Architecture | Web FW

- Standard HTML5 + Tizen Device API



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Tizen 架构 | Web 固件

- 标准 HTML5 + Tizen 设备 API

Web 框架

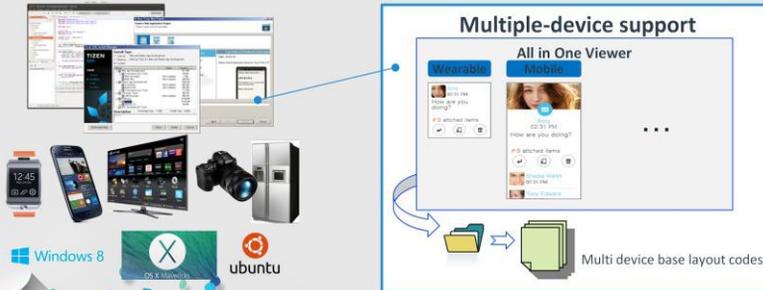
设备 API	W3C		其它
应用	HTML5		Web GL
NFC	CSS3	WebRTC	类型阵列 (Typed Array)
蓝牙	地理定位	Web Worker	全屏 API
媒体内容	触控事件	WebAudio	Metatag
PIM	电池状态	WebSocket	JSON
系统信息	文件	Web 通知	URI 方案
文件系统	应用缓存	Widget	



开发环境
Environment

Development Environment | Multi-devices

- Integrated SDK that supports a wide range device profiles
- Responsive UI for “Easy to make Auto-layouting”
- Working on Multi-OS
 - c.f. Windows 7/8, Mac OSX and ubuntu Linux



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Development Environment <ul style="list-style-type: none"> • supports a wide range device profiles • Responsive UI for “Easy to make Auto-layouting” Working on Multi-OS <ul style="list-style-type: none"> • c.f. Windows 7/8, Mac OSX and ubuntu Linux 	开发环境 多设备 <ul style="list-style-type: none"> • 支持广泛设备外形的集成 SDK • 支持“轻松自动布局”的响应迅捷的用户界面 • 支持多种操作系统 <ul style="list-style-type: none"> • c.f.Windows 7/8、 Mac 和
Multiple-device support	多设备正常
All in One Viewer	一体式查看器
ubuntu	ubuntu
Windows 8	Windows 8
Multi device base layout codes	多设备基础布局代码

Development Environment | All-in-one suite

- Tizen SDK provides various tools and documents integrated with IDE

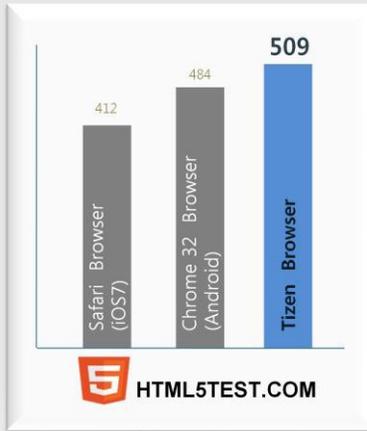
<p>Development Environment All-in-one suite</p> <ul style="list-style-type: none"> • Tizen SDK provides various tools and documents integrated with IDE 	<p>开发环境 一体式套件</p> <ul style="list-style-type: none"> • Tizen SDK 可提供与 IDE 集成的各种工具和文档
<p>WYSIWYG GUI design/editing Project management & easy code editing Static & Dynamic Analysis Live SDK update Test/debugging Build system & Toolchain</p> <ul style="list-style-type: none"> • OBS • Rootstrap management • Cross compiler, packaging • Project compatibility • SDB 	<p>WYSIWYG GUI 设计/编辑 项目管理和简易代码编辑 静态和动态分析 实时 SDK 更新 测试/调试 构建系统和工具链</p> <ul style="list-style-type: none"> • OBS • Rootstrap 管理 • 交叉编译器, 封装 • 项目兼容性 • SDB <p>帮助内容</p>



优势

Open Standards | HTML5 support

- Tizen Browser supports brilliantly HTML5 for embedded devices



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Open Standards HTML5 support	开放标准 HTML5 支持
<ul style="list-style-type: none"> Tizen Browser supports brilliantly HTML5 for embedded devices 	<ul style="list-style-type: none"> Tizen 浏览器完美支持 HTML5 用于嵌入式设备
Safari Browser (iOS7) Chrome 32 Browser (Android) Tizen Browser	Safari 浏览器 (iOS7) Chrome 32 浏览器 (Android) Tizen 浏览器
HTML5TEST.COM	HTML5TEST.COM
Video Streaming	视频流
Location	位置
Multimedia	多媒体
Communication	通信

Open Standards | W3C API support

- **Tizen defines Device APIs according to WebIDL**

- WebIDL is a W3C specification for a format to describe interfaces
 - 1 Numerical constants avoided but string enumerations are used
 - 2 Time consuming methods are defined as asynchronous calls
- Apps using W3C standards can use Tizen's Device API so it can run any device features

TIZEN™



W3C®

- **Ready to open for W3C standards**

- Minimize incompatibility due to proprietary solution

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Open Standards W3C API support	开放标准 W3C API 支持
<ul style="list-style-type: none"> • Tizen defines Device APIs according to WebIDL <ul style="list-style-type: none"> • WebIDL is a W3C <ul style="list-style-type: none"> to describe interfaces 1 Numerical constants avoided but string enumerations are used 2 Time consuming methods are defined as asynchronous calls • Apps using W3C standards can use Tizen's Device API so it can run any device features • Ready to open for W3C standards <ul style="list-style-type: none"> • WebIDL is a W3C 	<ul style="list-style-type: none"> • Tizen 根据 WebIDL 定义设备 API <ul style="list-style-type: none"> • WebIDL 是一种描述界面的 W3C 格式规格 1 避免了常数，但使用了字符串枚举 2 耗时方法被定义为异步调用 • 使用 W3C 标准的应用可使用 Tizen 的设备 API，因此它可运行任何设备特性 • 可以向 W3C 标准开放 • 将专有解决方案的不兼容性降到最低

Performance | 2D/3D Graphics

- 2D Graphics: Cairo H/W Acceleration  
- 3D Graphics: WebGL support



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Performance 2D/3D Graphics <ul style="list-style-type: none"> • 2D Graphics: Cairo H/W Acceleration • 3D Graphics: WebGL support 	性能 2D/3D 图形 <ul style="list-style-type: none"> • 2D 图形: Cairo 硬件加速 • 3D 图形: WebGL 支持
2D Canvas perf. score	2D 画布性能得分
WebGL (Aquarium: fps) *) Stock Browser	WebGL (Aquarium: fps) *) Stock 浏览器
Web Game Applications 2D Game 3D Game	Web Game 应用 2D 游戏 3D 游戏

Performance | Boot Time Optimization

- **Systemd-based Configurable Service and Booting**

- Advanced service & daemon management
 - Execute threaded applications in parallel
 - Easier to optimize booting time.
 - Easier to configure service bring up and management

- **Result: Optimized Booting Time**

- NX300M: 0.5sec
- Phone: 11sec

```

systemd 43 running in system mode. (+PAM -LIBWRAP -AUDIT -SELINUX)
Welcome to Tizen 2.2.0 (Tizen)!
Starting Runtime Directory...
Starting Media Directory...
Starting File System Check on Root Device...
Starting Remount API VFS...
Starting POSIX Message Queue File System...
Starting Load Kernel Modules...
Starting Security File System...
Starting Configuration File System...
Starting FUSE Control File System...
Starting Debug File System...
Starting Anshu Kernel Variables...
Starting Set Up Additional Binary Formats...
Starting Huge Pages File System...
Starting udev Kernel Device Manager...
Starting udev Coldplug all Devices...
Starting Snack filesystem mounting...
Starting Generate environment from /etc/profile.d...
Starting Journal Service...
Starting Journal Service...
Starting udev Kernel Device Manager...
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Starting udev Coldplug all Devices...
    
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<p>Optimization</p>	<p>性能 启动时间优化</p>
<ul style="list-style-type: none"> • Systemd-based Configurable Service and Booting <ul style="list-style-type: none"> Advanced service & daemon management <ul style="list-style-type: none"> - Execute threaded applications in parallel - Easier to optimize booting time. - Easier to configure service bring up and management • Result: Optimized Booting Time <ul style="list-style-type: none"> • NX300M: 0.5sec • Phone: 11 sec 	<ul style="list-style-type: none"> • 基于 Systemd 的可配置服务和启动 <ul style="list-style-type: none"> • 高级服务和后台程序管理 <ul style="list-style-type: none"> - 并行执行线程化应用 - 更容易优化启动时间。 - 更容易配置服务启动和管理 • 成效: 优化的启动速度 <ul style="list-style-type: none"> • NX300M: 0.5 秒 • 手机: 11 秒

High Quality Audio/Video | Rich multimedia support

- Tizen supports High Quality Video Playback based on Plug-in architecture on Gstreamer
 - Plays virtually every media formats without transcoding
 - Supports rich media for Browser and web applications
 - Provides embedded video rendering for various type of graphic surfaces



gstreamer OpenMAX|IL

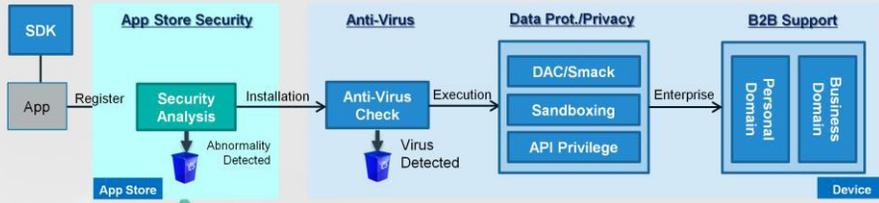
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High Quality Audio/Video Rich multimedia support	优质音频/视频 丰富的多媒体支持
<ul style="list-style-type: none"> • Tizen supports High Quality Video Playback based on Plug-in architecture on Gstreamer <ul style="list-style-type: none"> • Plays virtually every media formats without transcoding • Supports rich media for Browser and web applications • Provides embedded video rendering for various type of graphic surfaces 	<ul style="list-style-type: none"> • Tizen 支持在 Gstreamer 上进行基于插件架构的优质视频播放 <ul style="list-style-type: none"> • 在无需转码的情况下，可播放几乎所有媒体格式 • 支持面向浏览器和 web 应用的富媒体 • 为各种图形曲面提供嵌入式视频渲染
Codecs, Demuxers	编码解码器，Demuxer
Rich Web Media Support	丰富的 Web 媒体支持
Video Rendering on Any Surface	可在任何曲面上进行视频渲染
Video animation effects	视频动画效果

Strong Security | Secure architecture

- **Securing major points in the whole application life cycle**

- App Store Security (Static Analysis)
 - Security Analysis for abnormal application behaviors
- Anti-Virus Framework
 - Anti Virus Check for malicious application filtering
- Data Protection and Privacy
 - Access Control enforcement for managing user data protection & privacy
- B2B Support
 - Domain Separation for Enterprise users



<p>Strong Security Secure architecture</p>	<p>强大的安全性 安全的架构</p>
<ul style="list-style-type: none"> • Securing major points in the whole application life cycle <ul style="list-style-type: none"> • App Store Security (Static Analysis) <ul style="list-style-type: none"> – Security Analysis for abnormal application behaviors • Anti-Virus Framework <ul style="list-style-type: none"> – Anti Virus Check for malicious application filtering • Data Protection and Privacy <ul style="list-style-type: none"> – Access Control • B2B Support <ul style="list-style-type: none"> – Domain Separation for Enterprise users 	<ul style="list-style-type: none"> • 为整个应用生命周期的重要环节提供强大安全保护 <ul style="list-style-type: none"> • 应用商店安全性（静态分析） <ul style="list-style-type: none"> – 异常应用行为的安全分析 • 防病毒框架 <ul style="list-style-type: none"> – 支持恶意应用过滤的防病毒框架 • B2B <ul style="list-style-type: none"> – 环境提供强用户安全域分离

<p>App Store Security Anti-Virus Data Prot./Privacy B2B Support</p>	<p>应用商店安全性 防病毒 数据保护/隐私 B2B 支持</p>
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用户界面可扩展性 | 合理的分辨率扩展

- 通过调整屏幕分辨率和尺寸的比例系数，支持各种分辨率 (WVGA - QXGA)





路线图和贡献
Contributions

Tizen Release Roadmap

Tizen 发布路线图

Tizen 1.0					
2012 年 4 月	2013 年 2 月	2013 年 5 月	2013 年 7 月	2014 年 12 月	2015 年 5 月
以 Web 为中心的 平台	Web/本地框架 framework	混合、web / 本地、Smack 安全性, 和优化的性能 Optimized Perf.	适合商用, 可增强 用户体验 Enhanced UX	+ 可穿戴设备 Profile	64 位支持多用户 Corsswalk Crosswalk

• Tizen 3.0 的重要特性

- 64 位 ARM 支持
- 多用户
- Crosswalk/BLINK
- SMACK - 3 域安全和 Cynara
- 新配置系统 – BUXTON
- KDBUS
- 3D 用户界面和渲染引擎
- 通用连接框架
- Wayland 的一部分, Enlightenment 窗口管理器

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如何工作

- 使用 **GBS** (GIT 构建系统) 构建您的源代码



* 借助 GBS 构建软件包:

<https://source.tizen.org/documentation/developer-guide/getting-started-guide/building-packages-locally-gbs>

- **Tizen SDK**

- 一整套用于开发 Tizen Web 和本地应用的工具

<https://developer.tizen.org/ko/downloads/tizen-sdk/>



如何工作

- 为 Tizen 贡献代码

- 向 Gerrit 提交补丁
- 审查 Gerrit 上的补丁
- 将软件包提交至构建系统



- Review and accept a package on the build server (for release engineer only)

* 为 Tizen 贡献代码

<https://source.tizen.org/ko/documentation/developer-guide/getting-started-guide/contributing-code-tizen/>

- 加入 Tizen 社区

- 对错误进行归档或将其他信息加入现有报告（在 JIRA 内）

- 在社区论坛注册成为义工进行

→ <https://www.tizen.org/community/mailling-lists>

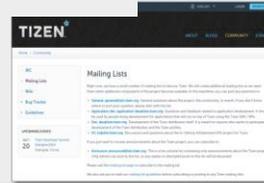
- 实时讨论通过 IRC 举行

→ <https://www.tizen.org/community/irc>

- 为我们的 wiki 文档贡献您的才智

→ <https://www.tizen.org/community/wiki>

→ <https://www.tizen.org/community/wiki>





结论

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- **Tizen** 是开发人员、制造商、服务提供商和用户的乐^士
service providers and users.
- **Tizen**
 - Linux 基金会旗下的完全开源平台
 - 基于标准的跨类别平台
 - 适用于智能设备的出色平台
- **Tizen** 将继续演进，全力支持未来的物联网设备、机器人等全新设备



谢谢!

问答



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



<p>TIZEN™ DEVELOPER SUMMIT 2014 SHANGHAI</p>	<p>TIZEN™ 开发者峰会 2014 上海</p>
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