

# Thundersoft HTML5 Experience

# Agenda

- ❖ An Introduction to Thundersoft
- ❖ HTML5 OS Experience
  - ▶ Firefox OS
  - ▶ Ubuntu
  - ▶ Tizen
- ❖ HTML5 TV OS
- ❖ HTML5 Apps
- ❖ HTML5 Tools

# Thundersoft

Provide leading hardware design, mobile OS technology to reduce Development Cost and Shorten Time-to-Market.

- ▶ Founded in March 2008
- ▶ 1600+ experienced Hardware/Software engineers
- ▶ Provide Hardware + Software One-stop Solution
- ▶ Target for Smart Connected Devices
- ▶ Solid partnership with Global Companies

# HTML5 Experience Overview

HTML5 OS Support



Firefox OS, Ubuntu, Tizen

Full Service Coverage



BSP, Framework, Application, Tools

Key Customers



TCL, 21vianet, Mozilla, DoCoMo

Close Partnership



Mozilla, ARM, Canonical, Qualcomm, Spreadtrum, Linaro, etc.

Mature Technology

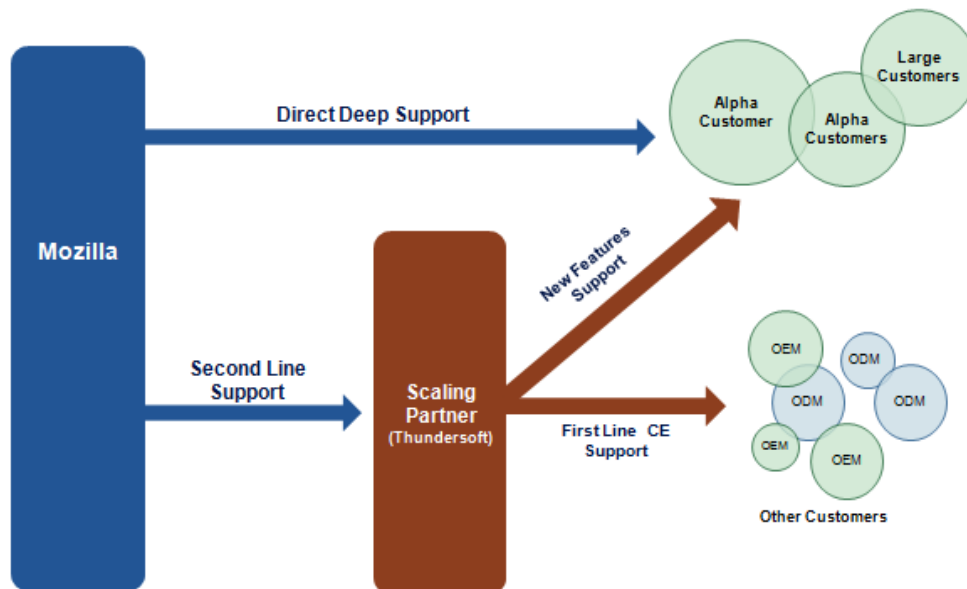


Optimization, App/Tool Development, Multi-media, Multi-screen, FOTA, MDM, Camera, Multi-win, etc.

# Firefox OS Works

# Relationship with Mozilla

- ❖ Joint R&D in system optimization & core feature development
- ❖ The sole FirefoxOS scaling partner in China
- ❖ Joint FirefoxOS reference phone development
- ❖ Mutual partners like ARM, Qualcomm, Spreadtrum, etc.



# Thundersoft Works on Firefox OS

- ❖ Firefox OS application development
  - ▶ Web application (HTML5/CSS/JavaScript)
  - ▶ Carrier application
- ❖ Key framework feature enabling
  - ▶ Streaming, DLNA, FOTA, Multi-window, etc.
- ❖ BSP/Driver development
- ❖ Firefox OS optimization
  - ▶ Performance tuning
  - ▶ Power consumption optimization
  - ▶ Customization
  - ▶ Troubleshooting



## Firefox OS

# TV Dongle - Overview

- ❖ Project Multimedia content to the TV via PC or tablet
- ❖ Support both local and remote video
- ❖ Provide SDK for both sender side and receiver side
- ❖ Based on Firefox OS 1.3, main feature includes:
  - ▶ Video cast (DLNA & AirPlay)
  - ▶ Support 1080P mp4、webm and other formats
  - ▶ Support multiple video streaming format(rtsp/hls/hpd)
  - ▶ MDM/FOTA
  - ▶ Support local media server
  - ▶ Support mouse
  - ▶ WIFI connection config
  - ▶ Multiple online game
  - ▶ Multiple window

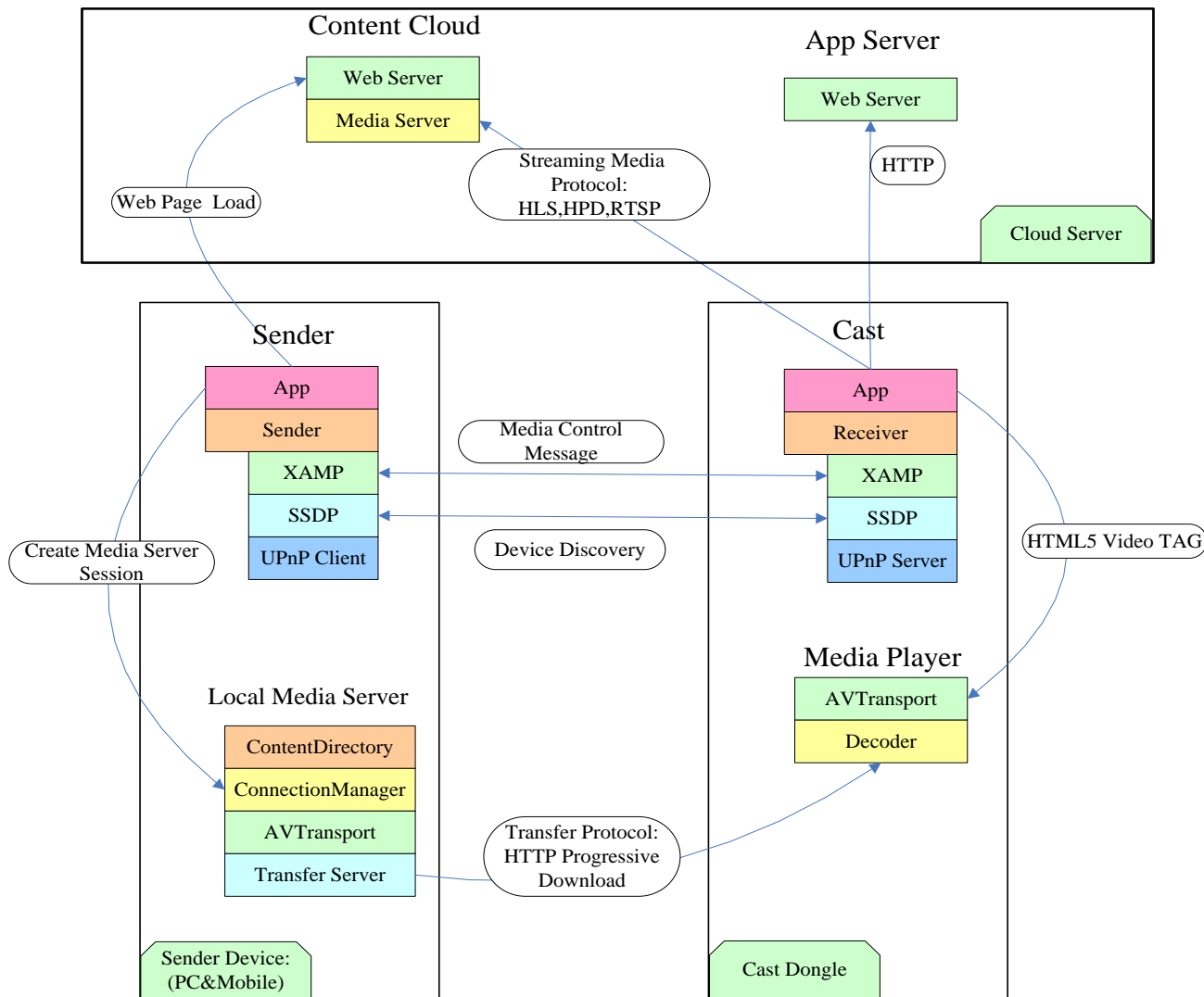




# TV Dongle - Spec

Item	Description
Dimension	110(L)*40(W)*11(H)
Chipsets	RK3066 Dual-A9 1.2G (MXS)
Display Interface	HDMI 1.4 (720P/1080P)
Memory	1G Byte DDR3
Storage	4G eMMC
Bluetooth	N/A
WiFi	802.11 b/g/n
Power	Micro USB
OS	Firefox 1.2/1.3
Accessory	HDMI Extension Cable/USB Cable/5V Adaptor
Power	Max 2.5W, Average <1.8W
Thermal	Ta=25 Tchip max 75C degree Tcase max 50C degree

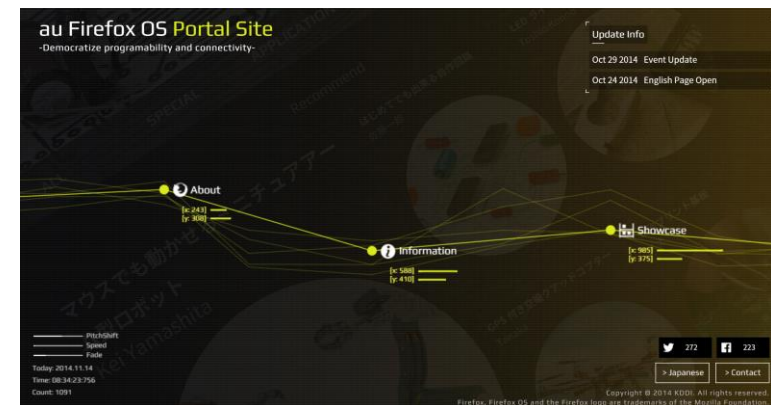
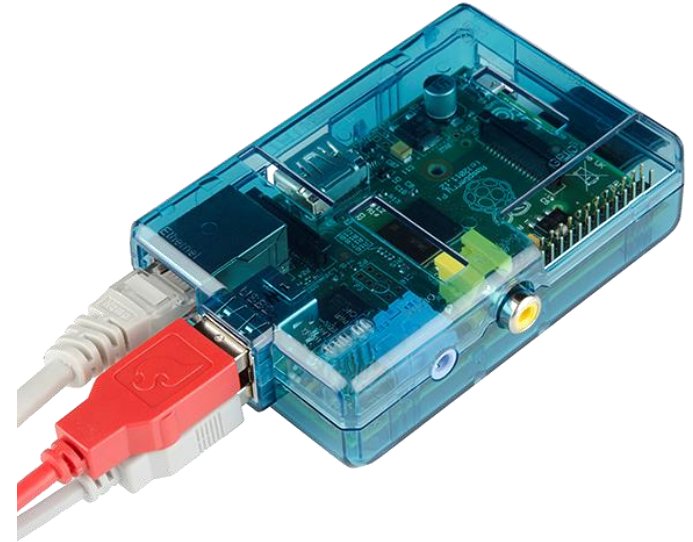
# TV Dongle - Architecture



- ❖ Cloud server
  - ▶ Media server
  - ▶ App server
- ❖ Sender
  - ▶ XAMP and SSDP protocol
- ❖ Cast
  - ▶ rtsp/hls/hpd media protocol
  - ▶ SSDP connect protocol

# KDDI au Firefox OS Dongle

Item	Description
Dimension	TBD
Chipsets	RK3066 Dual-A9 1.2G
Display Interface	HDMI 1.4 (720P/1080P)
Memory	1G Byte DDR3
Storage	8G eMMC/SD Card ?
Bluetooth	4.0
WiFi	802.11 b/g/n
Power	5V 2A through Micro USB
OS	Firefox 1.3/1.4
Interface	USB Host *1, USB Device, HDMI, GPIO, SPI
Accessory	HDMI Extension Cable/USB Cable/5V Adaptor

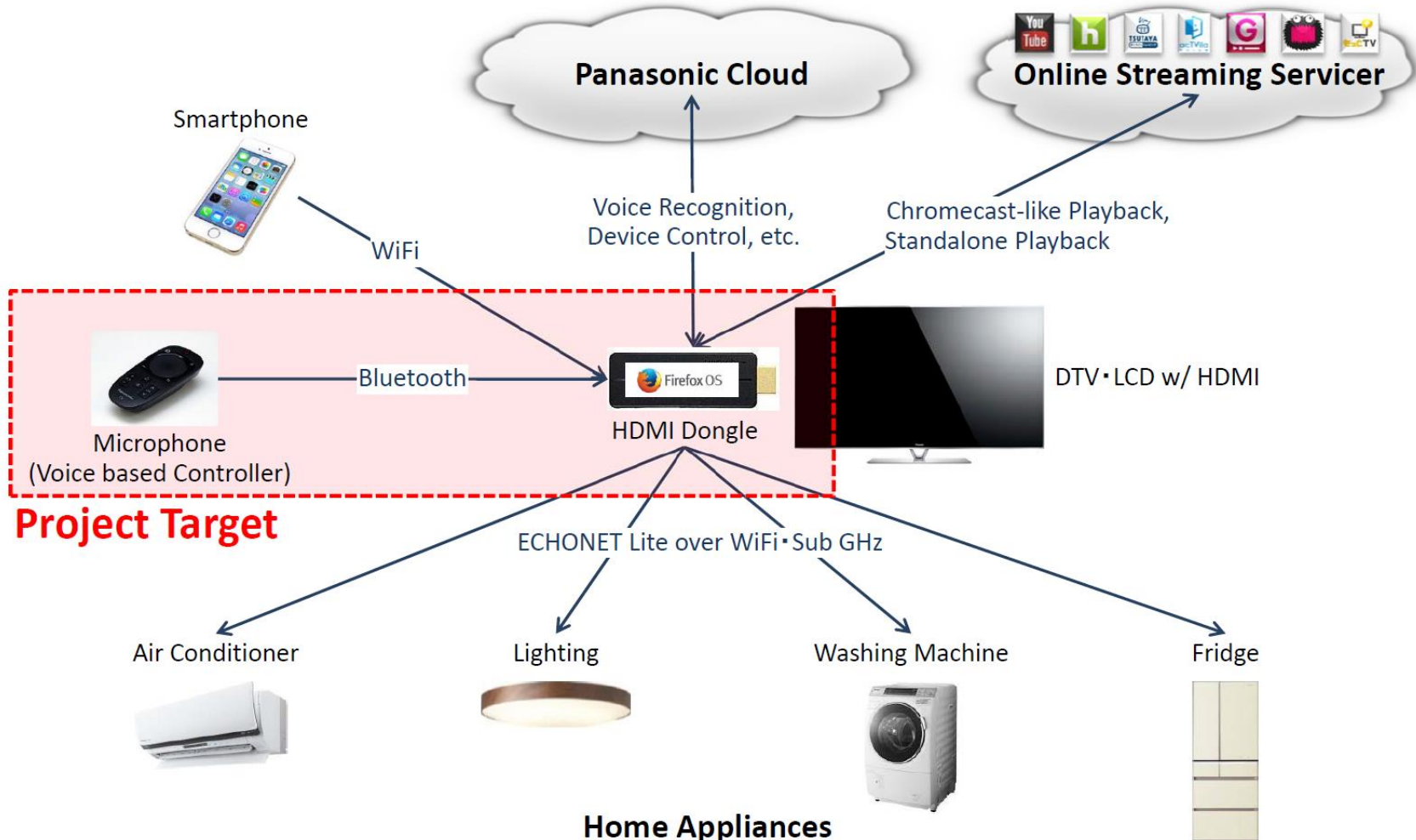


# Flexible & Scalable Interface

Item	Scalability
Input	USB Mouse & Key board
Audio	USB Audio (need to specifiy)
Display	HDMI Monitor
Storage	8G + External TF card
Camera	USB VGA/1.3M
NFC	PN532
ZigBee	USB Adptor
Power/Battery	5V through USB

# Panasonic FFOS TV Dongle

Firefox OS TV dongle for streaming services and voice based home appliance control



Home Appliances

# Firefox OS Phone Overview

## ❖ Firefox OS Flame reference phone

- ▶ 4.5" screen (FWVGA 854 × 480 pixels)
- ▶ Qualcomm MSM8210 Snapdragon, 1.2GHZ Dual core processor
- ▶ Dual SIM
- ▶ 5MP rear camera
- ▶ 2MP front-facing camera
- ▶ 256MB -1GB RAM (adjustable by developers), 8GB Internal storage
- ▶ 3G, WiFi: 802.11 b/g/n, Bluetooth, Micro USB aGPS, NFC
- ▶ 1800 mAh battery



## ❖ One Touch Fire for Telefonica using Qualcomm 8x10

- ▶ 3.5" 320 x 480 pixel HVGA TFT display
- ▶ dual-core processor running at 1.2GHz
- ▶ 512MB of RAM
- ▶ 4GB of internal storage, microSD card slot for expansion
- ▶ VGA rear camera
- ▶ 1300mAh battery
- ▶ HSPA+ connectivity





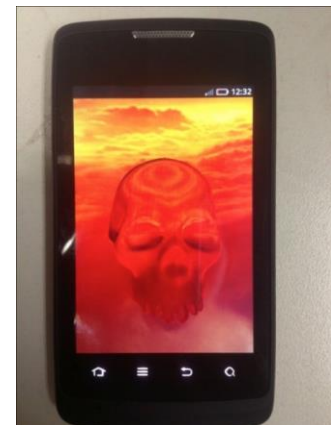
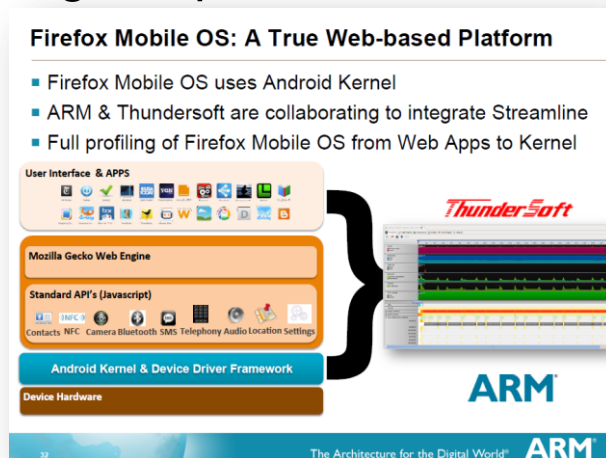
# Works on TCL Firefox OS Phones

- ❖ 2D/3D performance optimization
- ❖ Whole system troubleshooting
- ❖ BSP enabling
- ❖ Driver porting and development
  - ▶ Camera, GPS, DSDA, NFC, and Compass, etc.
- ❖ Application development



# Firefox OS Optimization Overview

- ❖ Joint Optimization Project with ARM and Mozilla Foundation
- ❖ Goal of the Joint Firefox OS Optimization Project
  - ▶ System optimization for FirefoxOS
  - ▶ Qualcomm and Spreadtrum
- ❖ Profiling
  - ▶ Using OProfile, DS-5 to identify some hotspots
- ❖ Benchmarking
  - ▶ CPU/Graphics/Memory/HTML5/JS
- ❖ Tuning & Optimization



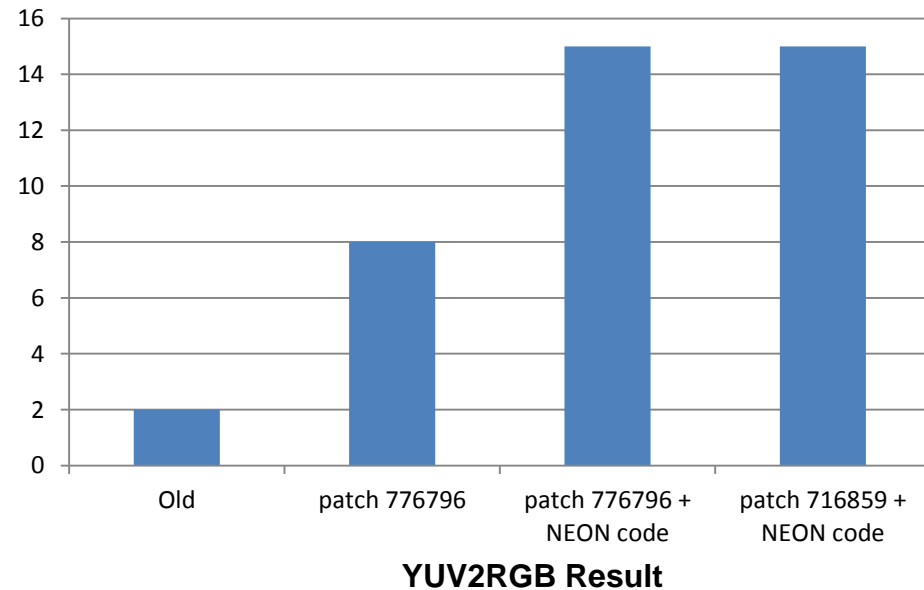
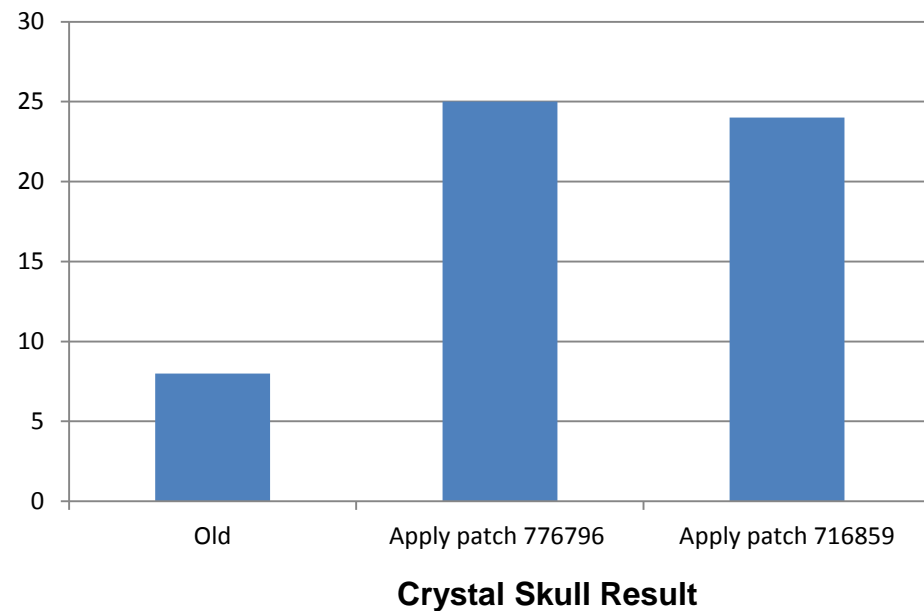


# Optimization Methods

- ❖ Memory access reduction
- ❖ Apply NEON instructions
- ❖ use the linaro's toolchain to compile the B2G system
- ❖ apply the Linaro's NEON patches to the B2G libraries.
- ❖ Provided many suggestions for the gecko engine
  - ▶ Image decoding
  - ▶ DNS tuning
  - ▶ HTTP/IP optimization
  - ▶ Efficient image caching & tile rendering
  - ▶ Optimize threading for multi-core
- ❖ 3D
  - ▶ WebGL optimization
  - ▶ integrated into FirefoxOS
- ❖ 2D
  - ▶ enable OpenGL backends
  - ▶ Cairo + pixman => Skia

# Optimization Result

- ❖ "Crystal Skull" benchmark's frame rate to 3x (from 8FPS to 25FPS)
- ❖ YUV2RGB performance enhanced by 7x



# Ubuntu OS

# Ubuntu Touch on QRD

- ❖ Working with Canonical directly
- ❖ Enabling Ubuntu Phone on Qualcomm QRD (Reference Design Work)
- ❖ Porting, Optimize Ubuntu Phone on QRD
- ❖ Validation using Qualcomm standard



# Tizen

# Tizen Experience Overview

## 1<sup>st</sup> Tizen conference

- May 2012, San Francisco
- Invited by Intel as the key ISV partner
- Demo UCam and UPhoto apps on Tizen.
- Post-processing photo filter effects
- Photo editing function Contrast / Brightness / Saturation adjustment, Crop, flip and rotate.



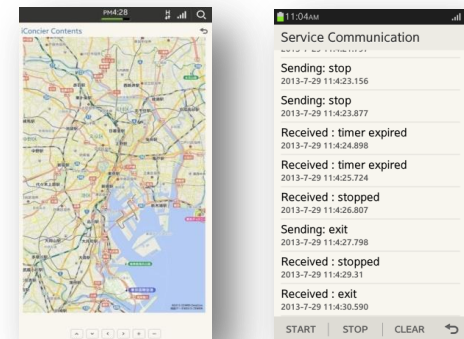
## Tizen Development

- HTML5 GUI Builder (RIP)
- for Tizen
- Fill more Tizen widgets
- Attribute editing for the widget
- Drag and drop the widgets to the simulated device
- Create Package for the interface



## DoCoMo Tizen Phone

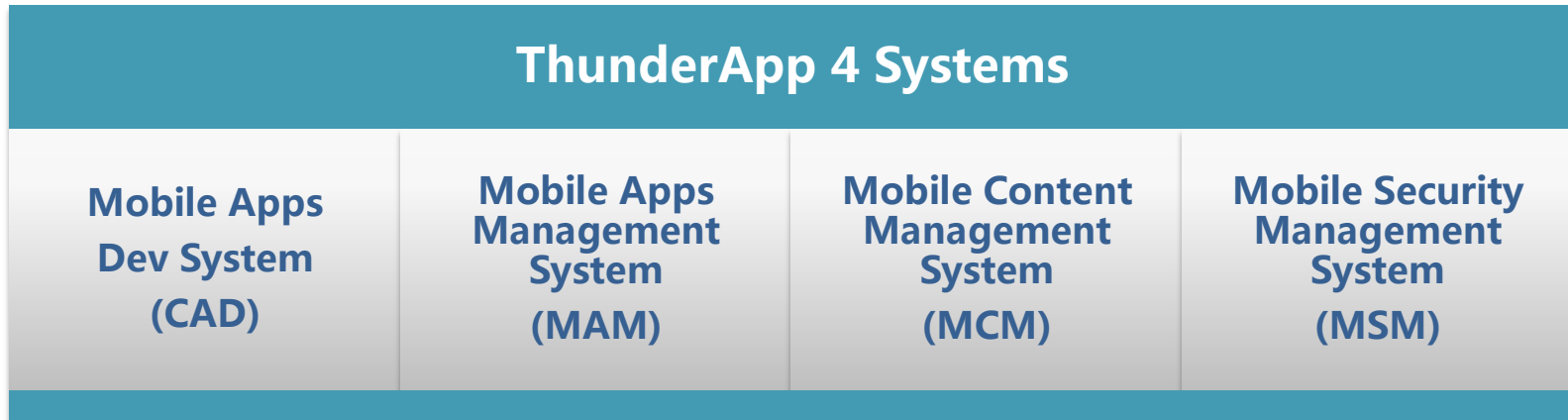
- 2013, NTT DoCoMo
- Porting Android app for DoCoMo Tizen phone
- Work Scope
- Inter-process communication / Mapping / URI Scheme registration / WebGL map rendering / Geo-location / Application Control / Message Port Communication



iConcier Map      Message Port Comm

# HTML5 Apps

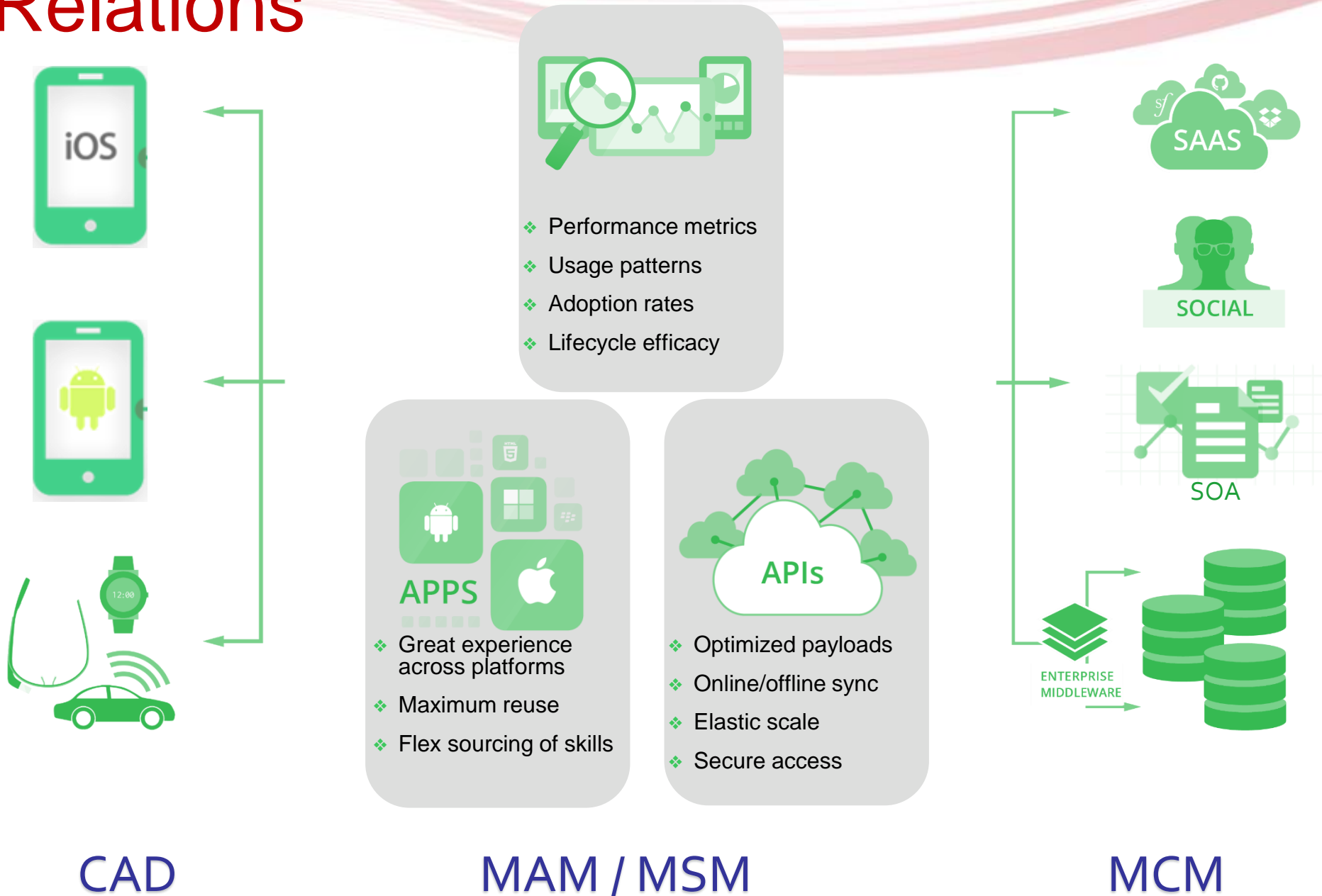
# ThunderApp Mobile App Platform



- ❖ **ThunderApp CAD (SDK)** – a comprehensive app development environment
- ❖ **ThunderApp MAM** – a private enterprise application management system including an enterprise app store and analytics dashboard
- ❖ **ThunderApp MCM** – a powerful integration system to connect enterprise back-end services under a variety of security mechanisms
- ❖ **ThunderApp MSM** – ensure the security while providing services to client



# Relations

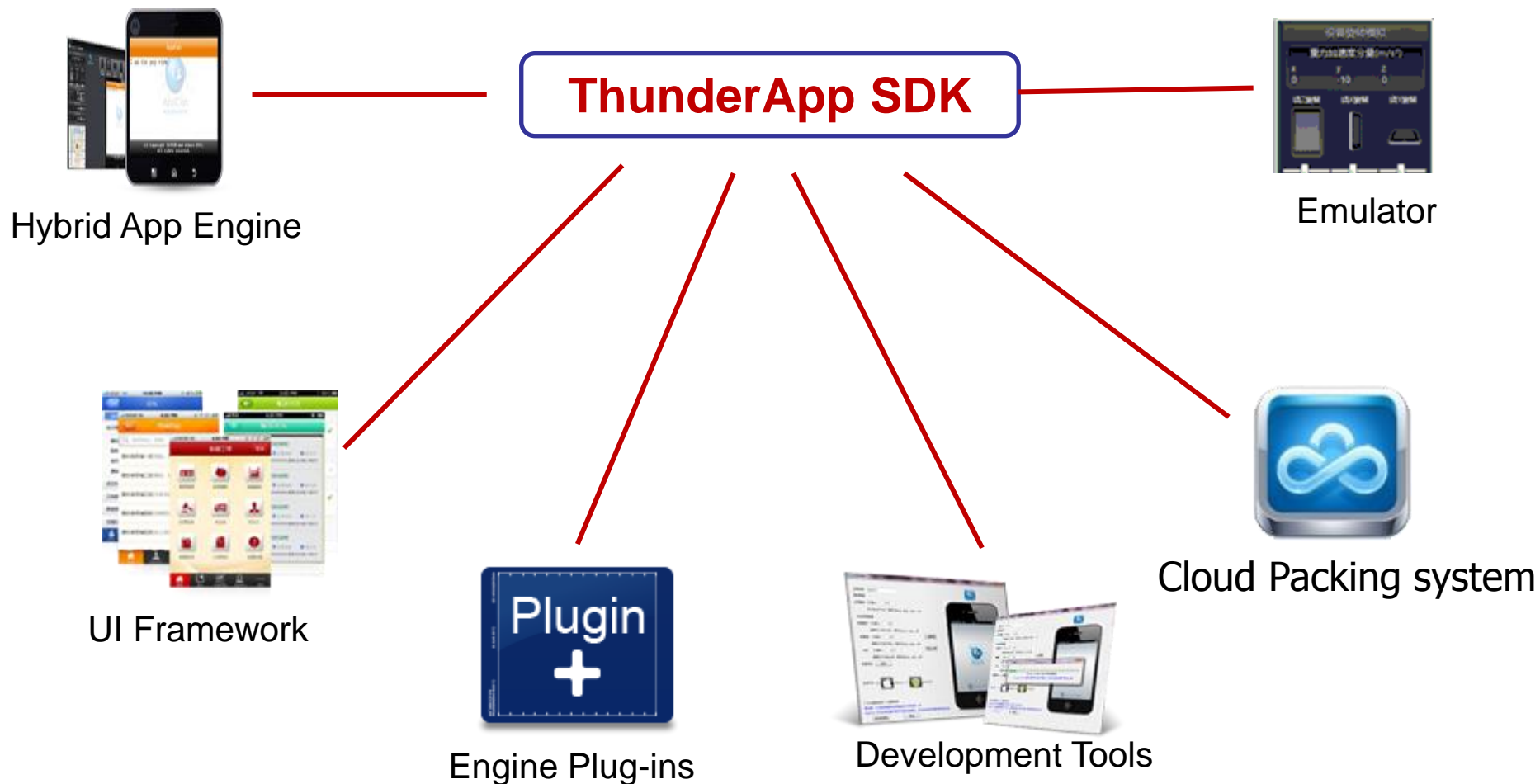


CAD

MAM / MSM

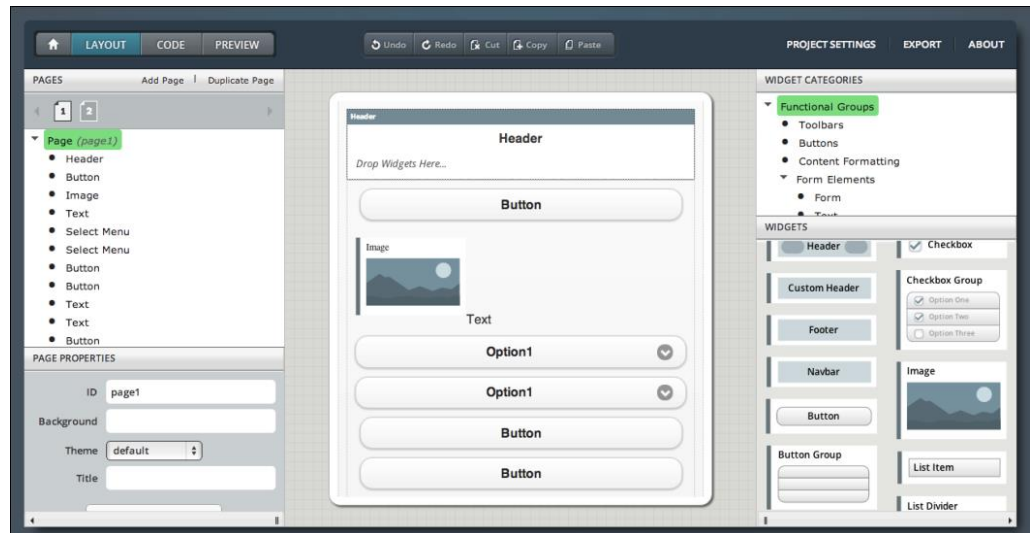
MCM

# ThunderApp SDK



# HTML5 GUI Builder (RIB)

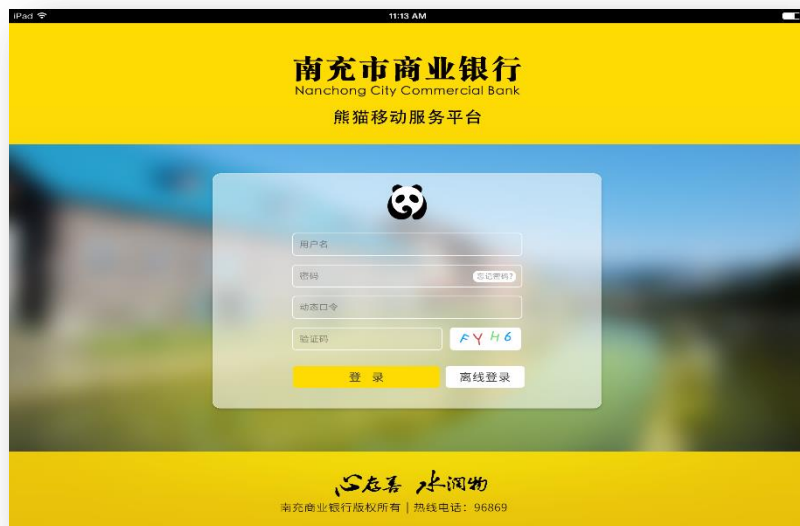
- ❖ Fully HTML5 based GUI editor for jQuery Mobile or Tizen.
- ❖ No server required
- ❖ Based on jQuery UI enhanced framework.
- ❖ Attribute editing for the widgets.
- ❖ Drag and drop the widgets to the simulated device.
- ❖ Create package for the interface.
- ❖ Local Storage/Drag & Drop/File system API.



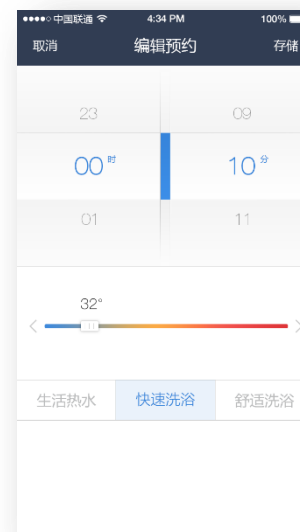
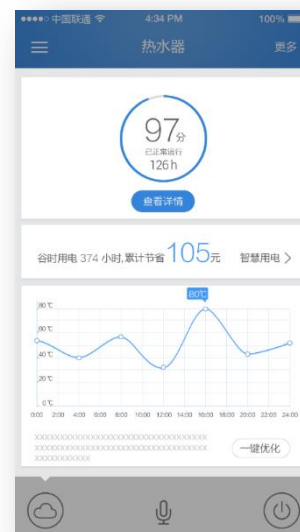




南充市商业银行  
Nanchong City Commercial Bank



# Haier





# Hybrid Lockscreen/Launcher

- ❖ Better way to show Ads & access apps;
- ❖ Easy to upgrade
- ❖ Flexible presentation
- ❖ HTML5-based page on home/lock
- ❖ Composing using UI builder in HTML5
- ❖ Ubiquitous access



Launcher with UPanel Embedded

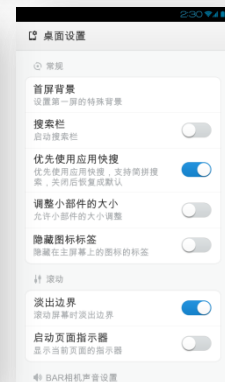
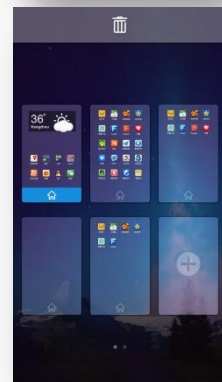
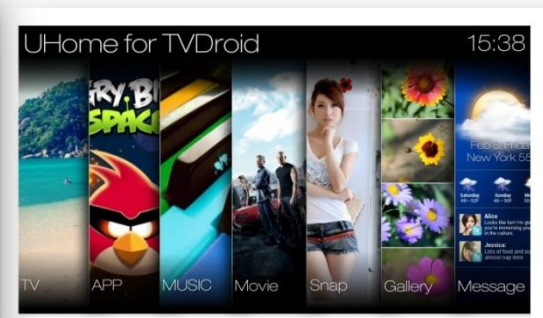


UPanel in Launcher



# Uhome – HTML5 Launcher

- ❖ Bar UI
- ❖ Tablet and TV variant
- ❖ Light-weight App
- ❖ All-in-1 App
- ❖ Integrated App Search





# HTML5 TV OS

# HTML5 is Very Important for TV

## ❖ Benefits

- ▶ Open Standard
- ▶ Open Source
- ▶ Rich Developer Resource
- ▶ Cross Platform

## ❖ All Are Interested

- ▶ iServices
- ▶ Operators
- ▶ Chip Vendors
- ▶ Government

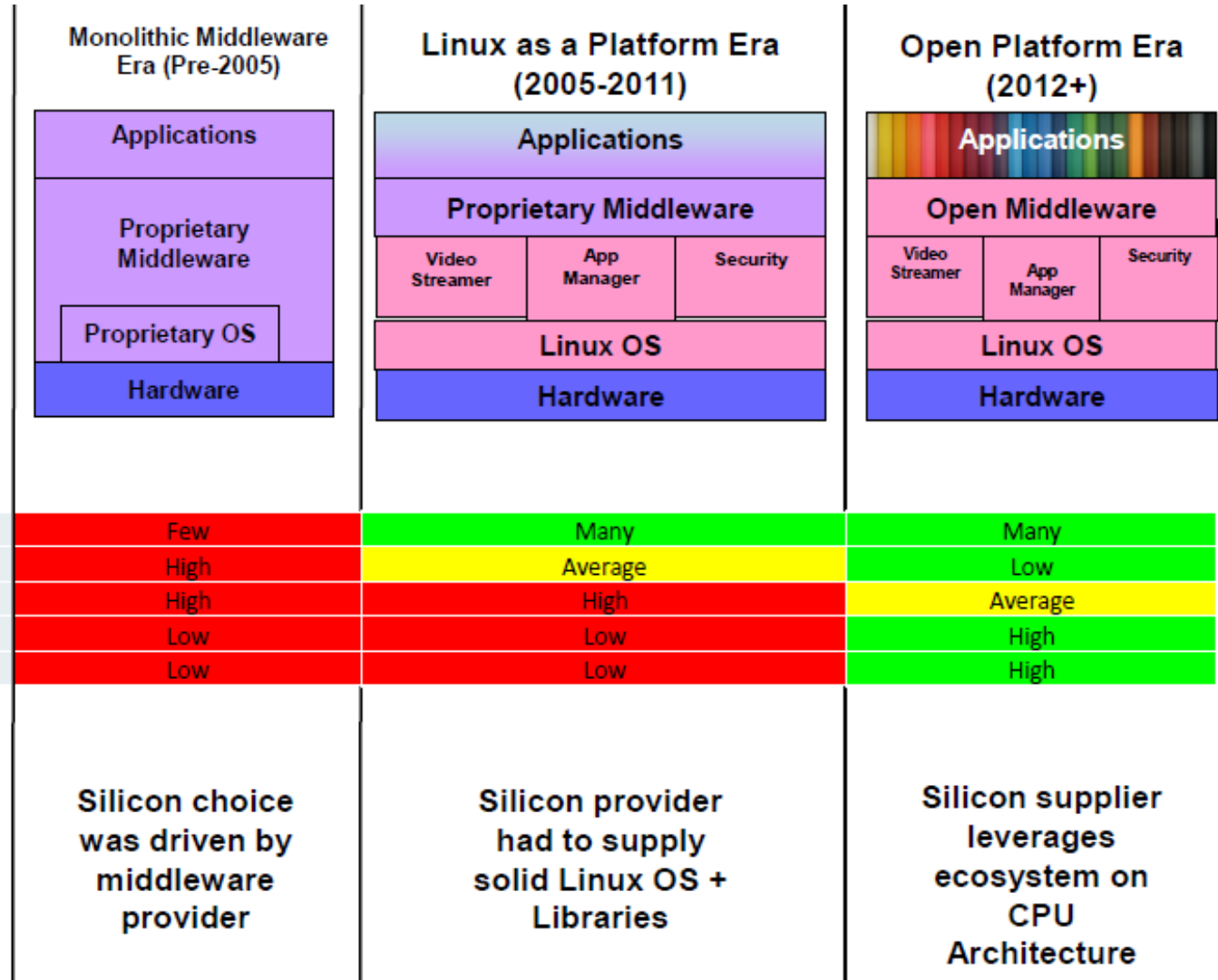
## ❖ Some Gaps

- ▶ Performance
- ▶ Feature Set
- ▶ API
- ▶ Platform Support

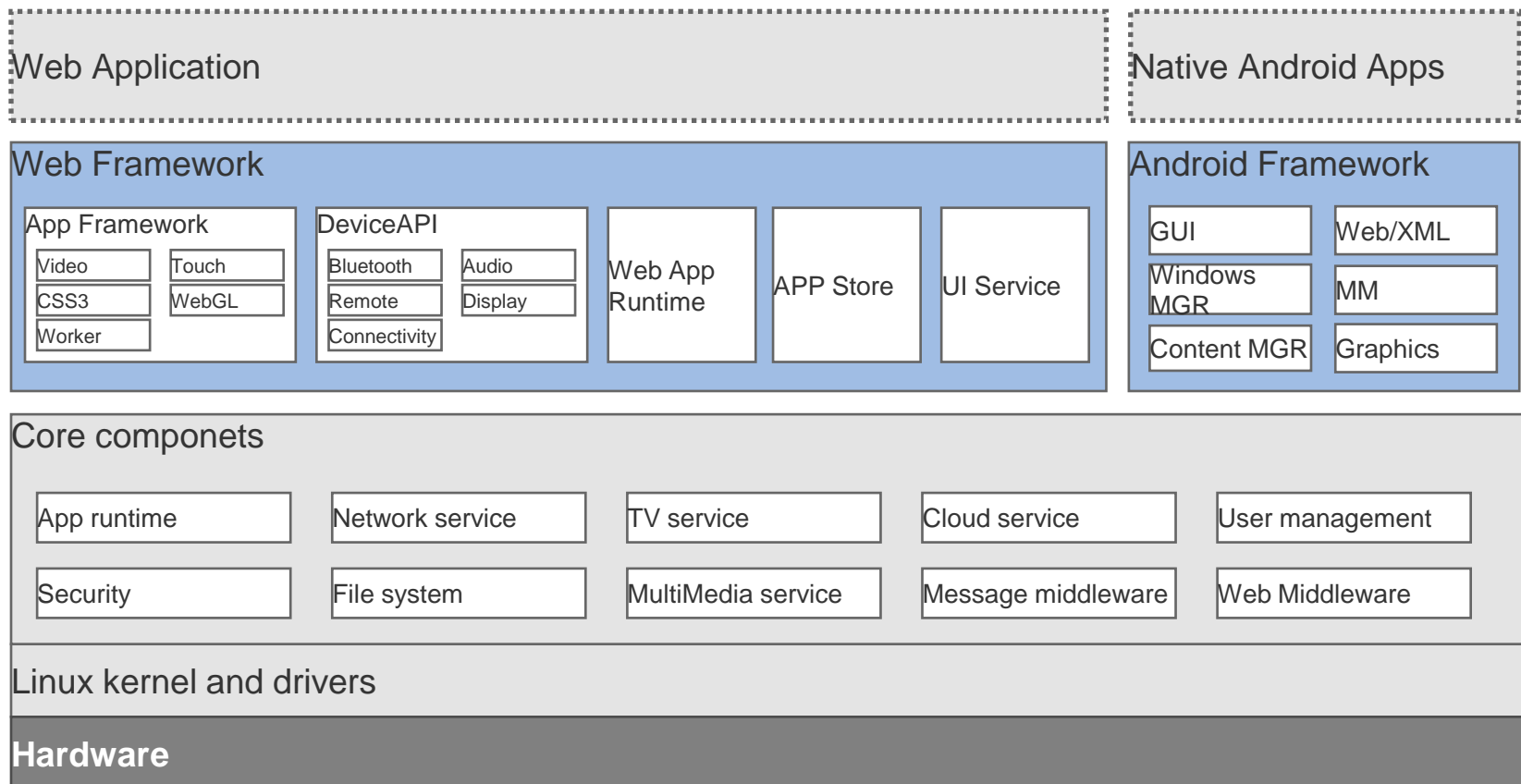
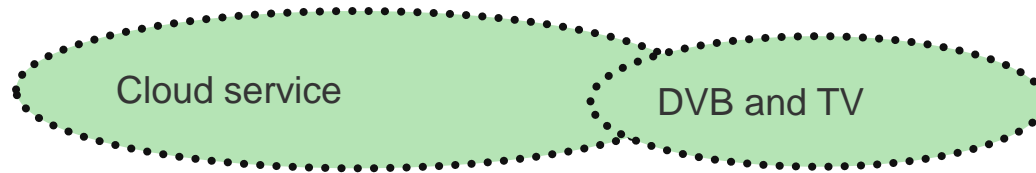
## ❖ Work Together

- ▶ Chip Vendors: ARM, Rockchip, Allwinner, Qualcomm, Spreadtrum, etc.
- ▶ OS Vendors: Mozilla, Ubuntu, Thundersoft,
- ▶ TV manufacturing & content provider
- ▶ Government Sectors

# Trend



# Overall Architecture



# Thanks

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