



# The Qt Crystal Ball

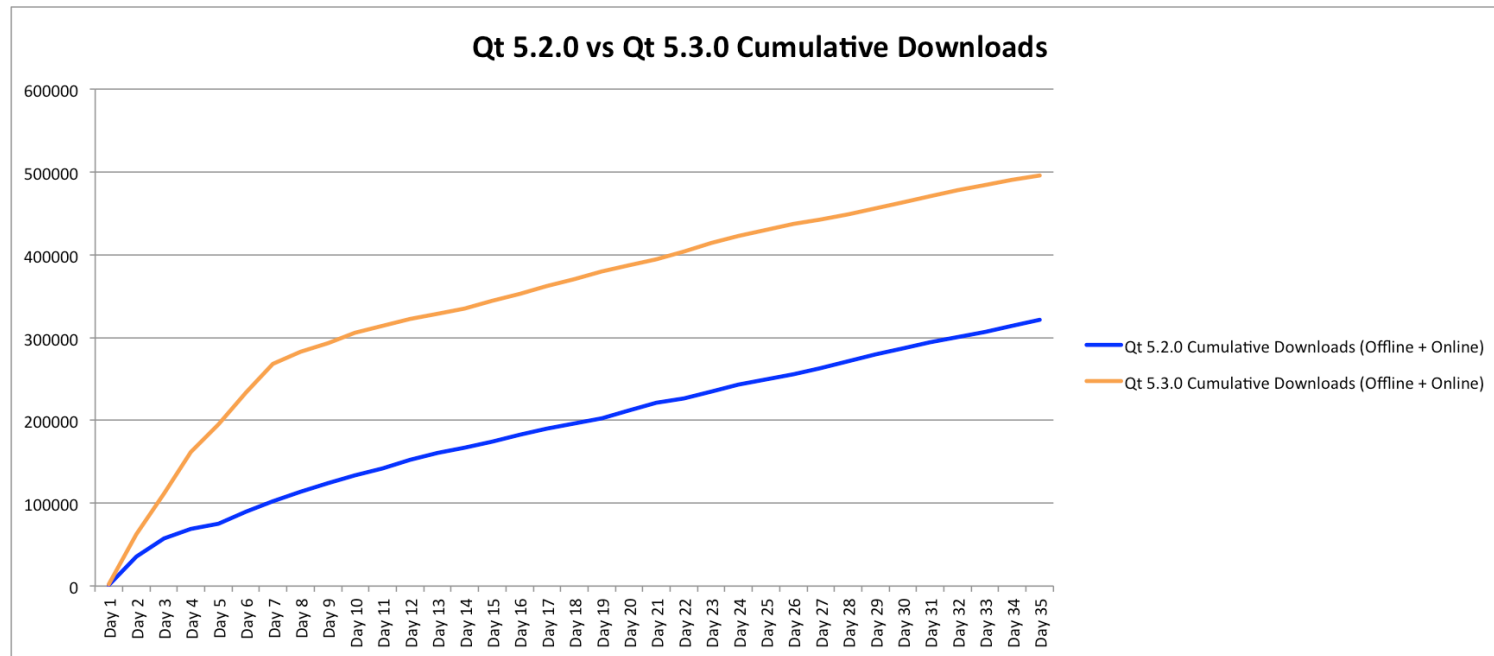
Insider's View into Qt's Expansion & Technical Advancement Plans

**Lars Knoll**

Qt Chief Maintainer  
CTO, The Qt Company

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# Growing more and more popular

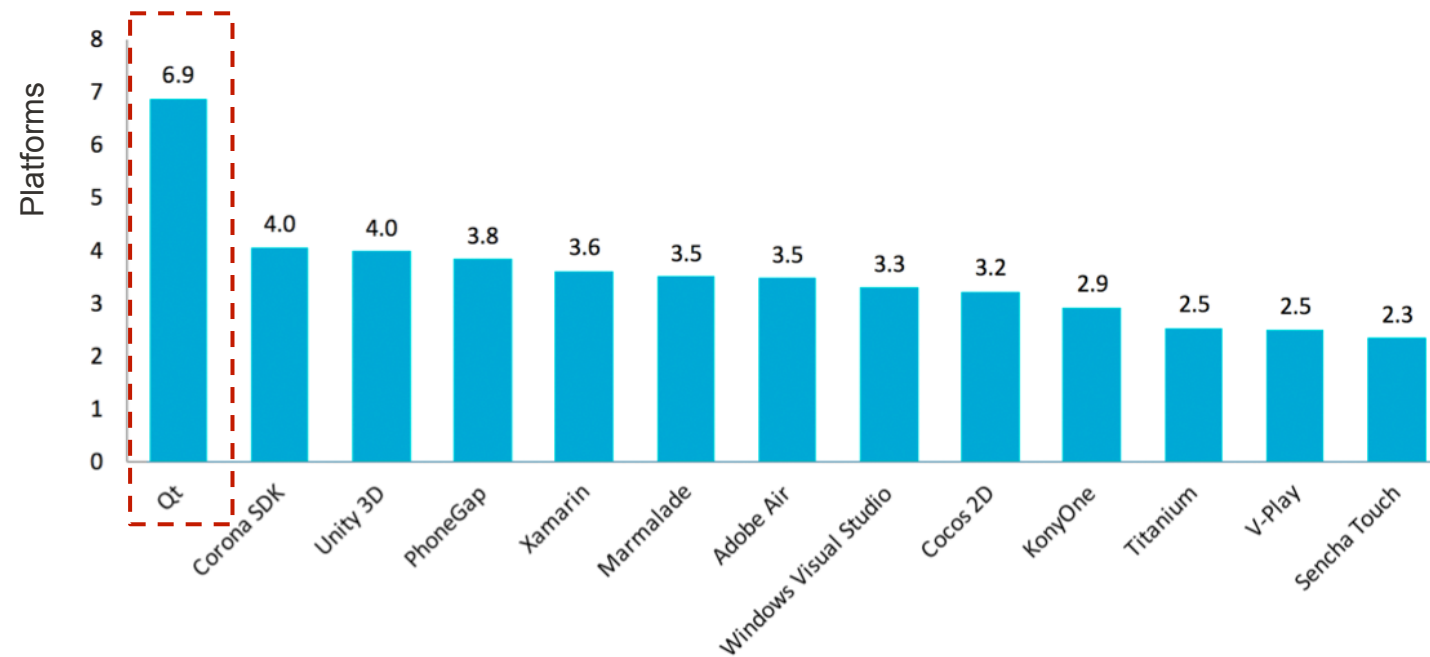


## 2.7 Million downloads of Qt since the release of Qt 5.2

Average number of platforms for which users publish their apps developed with a cross platform tool



“Qt is the leader of cross-platform app development”



Source: Research2guidance, CPT Benchmarking 2014

## Top 10 App quality



Rank	Tool	Much lower/ lower	Same	Much higher/ higher	Can't tell	# Ratings
→ 1	Qt	-6%	35%	56%	3%	342
2	Windows Visual Studio	-8%	32%	51%	9%	201
3	Cocos 2D	-14%	29%	50%	6%	171
4	Unity	-17%	27%	48%	9%	312
5	Windows Azure	-8%	32%	47%	12%	99
6	Adobe Air	-23%	30%	45%	2%	255
7	Marmalade	-20%	36%	39%	5%	297
8	V-Play	-1%	49%	39%	11%	138
9	jQuery Mobile	-34%	22%	37%	7%	128
10	Sencha Touch	-35%	27%	33%	4%	147
<b>Benchmark (Average all tools)</b>		<b>-16%</b>	<b>40%</b>	<b>41%</b>	<b>3%</b>	

Source: Research2guidance, CPT Benchmarking 2014

# Top 10 Cross Platform Tools by time savings



Rank	Tool	50%+ slower	10-50% slower	Same	10-50% faster	50%+ faster	Can't tell	# Ratings
→ 1	V-Play	0%	0%	0%	31%	69%	0%	62
2	Unity	0%	0%	5%	25%	62%	8%	106
→ 3	Qt	0%	-1%	2%	34%	56%	8%	122
4	Corona SDK	-2%	-5%	3%	39%	50%	2%	106
5	Xamarin	-2%	-1%	10%	43%	37%	8%	105
6	Cocos 2D	0%	-5%	7%	40%	28%	20%	60
7	Windows Visual Studio	0%	0%	14%	49%	26%	11%	73
8	Adobe Air	-5%	-3%	7%	54%	25%	6%	87
9	KonyOne	0%	0%	11%	67%	22%	0%	55
10	PhoneGap	-3%	-6%	8%	57%	22%	5%	102
<b>Benchmark (Average all tools)</b>		<b>-1%</b>	<b>-1%</b>	<b>7%</b>	<b>48%</b>	<b>36%</b>	<b>7%</b>	

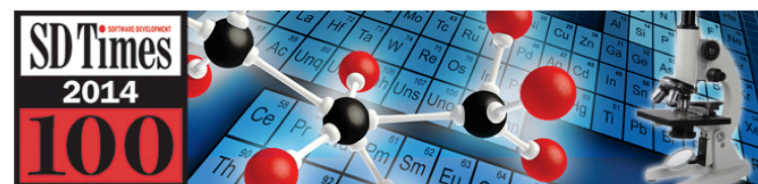
Source: Research2guidance, CPT Benchmarking 2014



## On the Radar (IT): Digia

Qt, the cross-platform development environment for mobile, enterprise desktop, and embedded applications

## The 2014 SD Times 100: 'Best in Show' in Software Development



APIS, LIBRARIES & FRAMEWORKS

# Unifying our Ecosystem

One Product



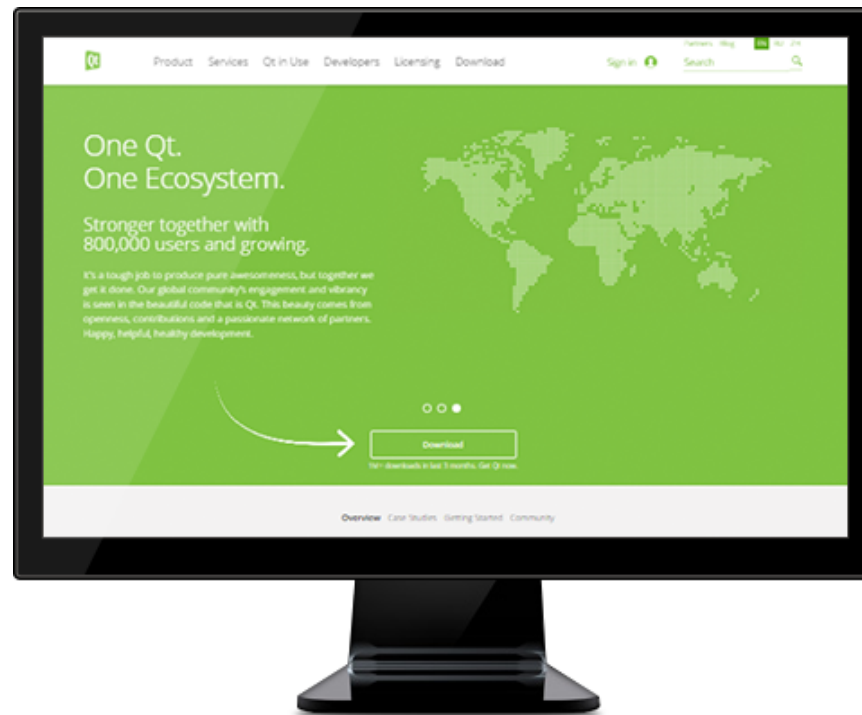


## One Set of Packages



Qt provides different licensing and pricing models to fit all needs.

One Website: [www.qt.io](http://www.qt.io)







## Qt 4.8.x support

Maintenance and commercial support will continue for one more year

# Indie Mobile

20€ / \$25



Windows RT



Android



iOS

Promotion: 11% discount on any online subscription



**Indie Mobile** – Get commercial licensing rights for Android, iOS and WinRT deployment

Buy Qt:

[qt.io/download](http://qt.io/download)

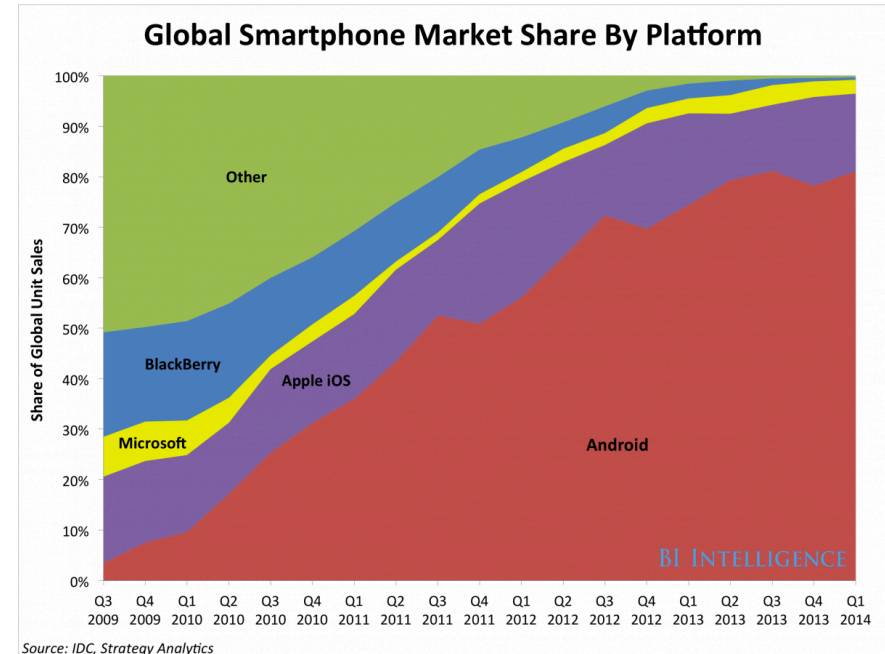
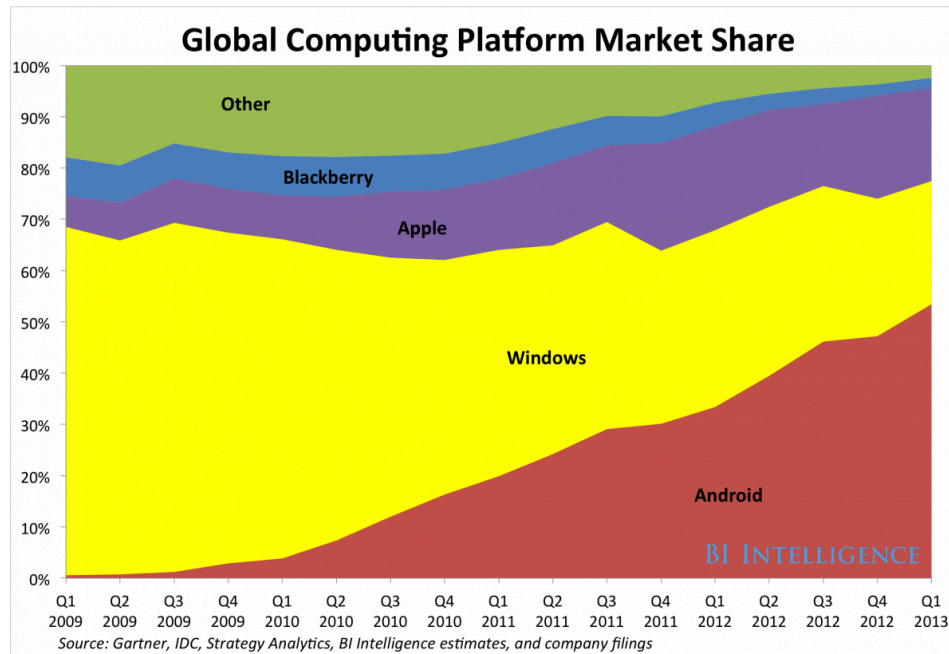
**Professional** – Get the full Qt experience with commercial licensing for development and deployment on all desktop and mobile platforms

Promo code:

**DD14BEROS**

# Trends in computing & Qt long term vision

# Platform diversity







## Multi screen

- Access functionality from different devices
  - Laptop, Phones & Tablets
  - TV
  - Car IVI
  - Wearables (e.g. Watch)
  - Virtual and augmented reality
  - Specialized Device
  - ...



will continue to support all  
relevant platforms

## Qt will continue to support all relevant platforms



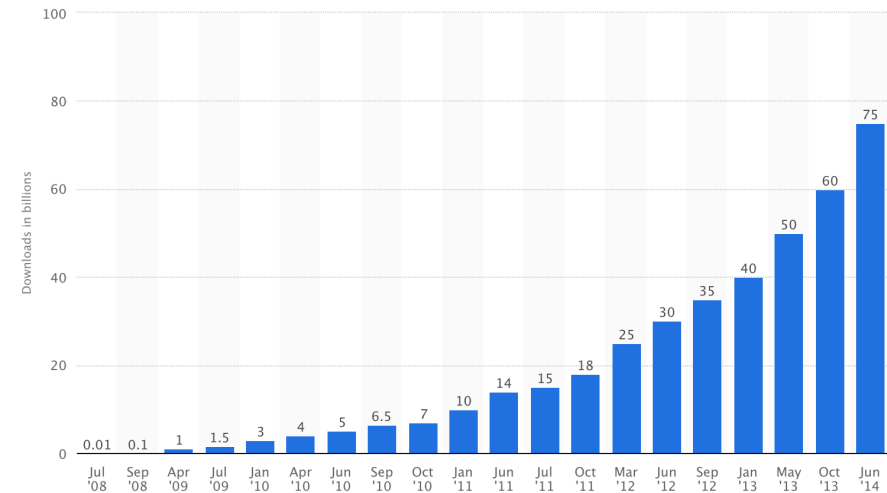
- Support new compilers
- Support new OS versions
- Support new OSes
- C++14
- **Bug fixing**

# Application Stores



- Hard requirement on mobile
- Apple and Microsoft pushing them for Desktop as well
- Windows 10 and WinRT are all about the Windows Store

## Downloads from Apple App Store



© Statista 2014



Time to market  
more and more critical



helps cover more parts of the  
application lifecycle

# Application lifecycle



- Design
- **Development**
- Packaging
- Deployment
- Customer Feedback
- Maintenance

## Embedded is growing



\*Worldwide market expected to grow at a projected compound annual growth rate (CAGR) of 5.4% over the next five years

**2014**  $\approx$  \$152.4 billion

**2019**  $\approx$  \$198.5 billion

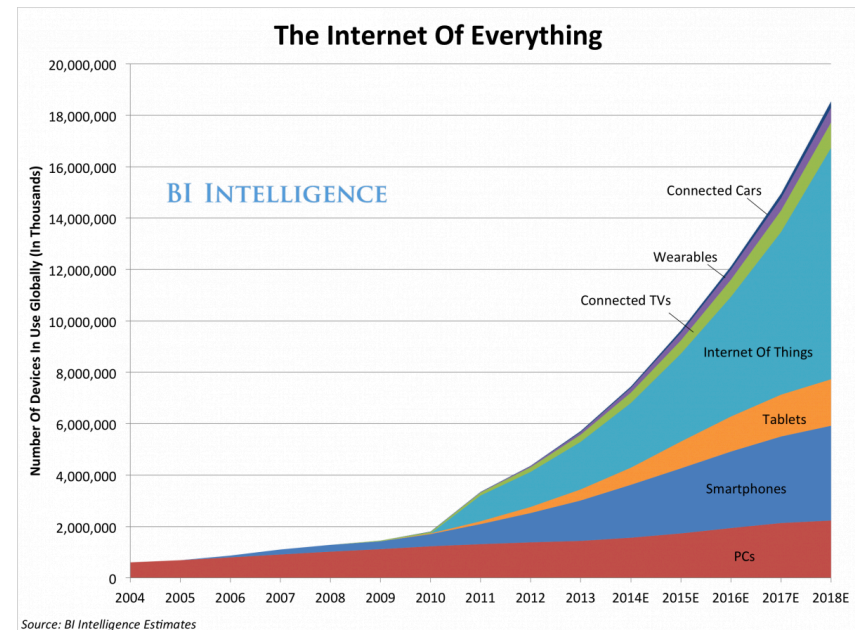
*\*Source: BCC Research 2014*



# Connected Devices



- More and more devices get touch screens
- Need a simple to configure, flexible stack
- Machine to Machine (M2M)
  - Common data protocols
  - Discovery
- Issues
  - Data processing and analytics
  - Security, access control
  - Software updates
  - Data control and sharing





makes device creation  
faster and easier



helps connect  
applications and devices

## Device Creation



- **Improve productivity with professional tooling**
- **Improve our Linux offering**
  - Provide a more complete stack
  - Easy to configure and tune
  - Fast boot times
  - Work on lower end hardware
    - Work on devices with very **low energy profile**
    - Devices without OpenGL
- **Remote displays**
  - Stream a UI to a different device
  - Connect to device through a browser



## Data storage and processing

- Exponential growth of the amount of data gathered/received
  - Data collection happens at different places
- Stored in different, disconnected clouds
  - How to connect with different clouds
  - Combine data from different sources
- Processing the data
  - Analytics
  - Visualization
  - How to use it in a meaningful way



## Data and system security

- Where to store data
  - Cloud
  - Decentralized
- How to keep the users or companies data safe
  - Encrypted connections
  - Encrypted data
  - How and with whom do I share data
- Authentication and access control
- Avoid single points of failure
- Maintain and deploy security updates



will help manage your data  
and keep it safe

# What's cooking?



# Qt for Desktop



- High-DPI support on all platforms
  - QT\_DEVICE\_PIXEL\_RATIO
  - Transparent support for 5.5
- Support for OS X 10.10 'Yosemite'
- Support for Windows Store Apps
- Support for Windows 10
- Dynamic GL switching on Windows
  - Native OpenGL
  - ANGLE
  - Software rasterization
- Continue fixing the “long tail” of minor issues.
  - Smaller bugs
  - Look and feel issues on OS X



## Qt on Windows Runtime (Windows Store Apps)



- Integrated into Qt Creator
- Compliant with Windows Store
- New Modules
  - Geopositioning
  - Qt Quick Enterprise Controls
  - Engin.io
  - Qt Quick Compiler
  - Multimedia
- Qt 5.5 and later
  - Bluetooth, BT LE, ...
  - In-app purchasing

### Supports

- Windows 8.1 and newer
- Windows Phone 8.1 and newer
- Windows 10 mostly working



**Fully supported with Qt 5.4**

# Qt for Android



- **Deployment**
  - Optimize package sizes
    - Support for QML import scanner
  - Improve start-up time
    - Pre-generated assets cache
- **Native Look and Feel**
  - Android style for Qt Quick Controls
- **Bearer management improvements**
- **Native input handling**
  - Marking and selecting text
- **Gradle build system support**
- **Supports Android 'L' since Qt 5.3**



## Qt for iOS



- Supports iOS 8
- XCode 6 Support
- Make applications behave and look more native
  - Pop-up menus
    - some in Qt 5.4
    - more in Qt 5.5
  - Native dialogs
    - Qt 5.5
- Native input handling
  - Marking and selecting text
  - VKB integration



# Graphics



- OpenGL
  - Adopt native OpenGL contexts
  - Improved support for OpenGL ES 3.0/3.1
  - QOpenGLWidget / QOpenGLWindow
- Software drawing
  - QRasterWindow
- Qt Quick
  - QQuickWidget (5.3)
  - QQuickRenderControl
  - Canvas 3D (Tech preview for Qt 5.4)
  - 2 new styles for Enterprise Controls

## Qt OpenGL module

### **deprecated with Qt 5.4**

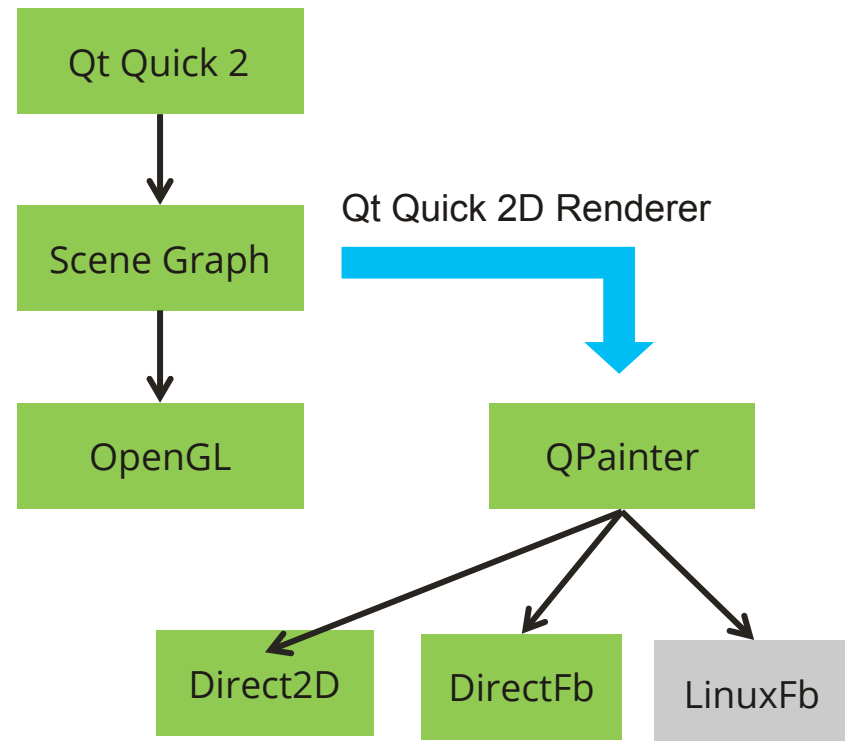
(Qt Gui provides all required functionality)

## Qt Quick 2D renderer



- Renders Qt Quick without OpenGL
- Can render fully in Software
- Makes use of 2D Hardware acceleration
  - DirectFB (Linux)
  - Direct 2D (Windows)
  - Others possible

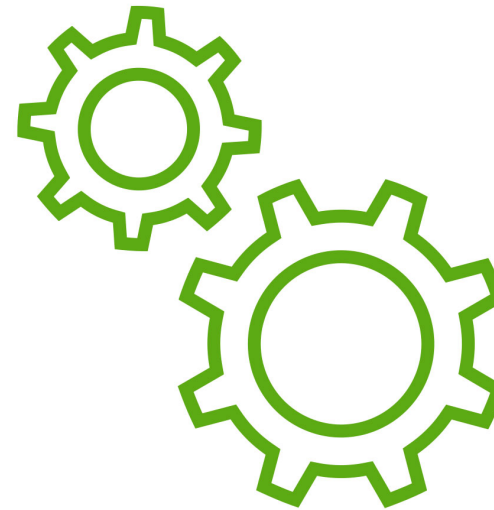
**New commercial add-on for Qt 5.4**



# Qt Quick Engine & Qt Quick Compiler



- Typed array support (Qt 5.5)
- C++ JS integration bridge (Qt 5.5)
  - Provide a replacement API for Qt Script
  - Improve QML/JS  $\leftrightarrow$  C++ integration
- New garbage collector (Qt 5.5)
  - Better performance
  - Kicks in more optimally
- Qt Quick Compiler (enterprise)
  - Cmake integration
  - Bug-fixes
  - 2.0 release for 5.4
- Bugfixing and other improvements



## Bluetooth and Bluetooth LE



- APIs for Bluetooth and Bluetooth LE in Qt 5.4
- Support for
  - Linux
  - Embedded Linux
  - Android
  - Can use BlueZ 4 or BlueZ 5
- Further platforms (WinRT, iOS,...) planned for future Qt versions
- Support for Bluetooth LE (Low Energy)
  - Included as a Tech preview in Qt 5.4



# Qt WebEngine

Next generation web integration for Qt

## Goals



- APIs for embedding web contents
- Simple to create a fully functional browser
- Deeply integrated with the Qt graphics stack
- Easy to use
- Cross platform

## Based on Chromium

- Full support for Qt Widgets and Qt Quick
- Great performance
- Full compliance with latest Web standards



Qt Quick API

Qt Widgets API

Qt WebEngine

Chromium

## Some numbers

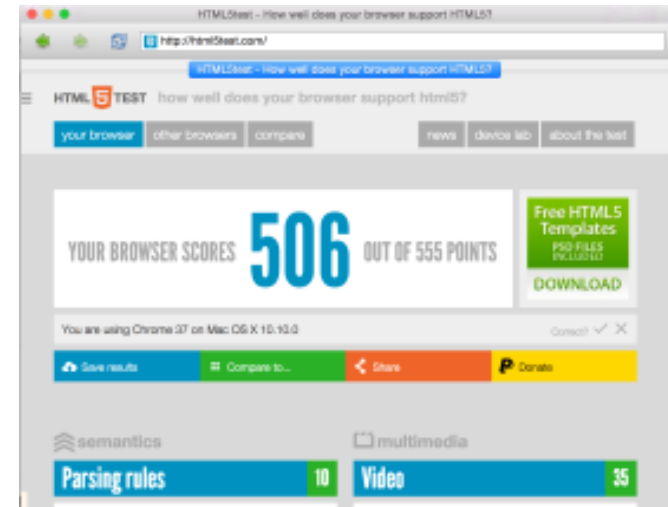


### HTML5Test.com (on Mac OS X)

- Qt WebEngine 506 points
- Google Chrome 512 points
- Safari 7.1 405 points

### SunSpider

- Qt WebEngine: 139.0ms +/- 1.7%
- Google Chrome: 135.9ms +/- 1.4%



# Features



- Full QWidget integration
- Combine seamlessly with Qt Quick
  - Tight integration with Qt Scene Graph
  - Best in class performance
  - Combine with graphical effects
    - Apply any shader effect to WebEngineView
- Interface with native code through Qt WebChannel
- Web features through Chromium
- Standards compliant

# Platforms



- Desktop Linux
- Mac OS X
- Windows Vista and above
  - requires MSVC 2013 (Express) and ANGLE
- Embedded Linux

Available under



LGPLv3

or

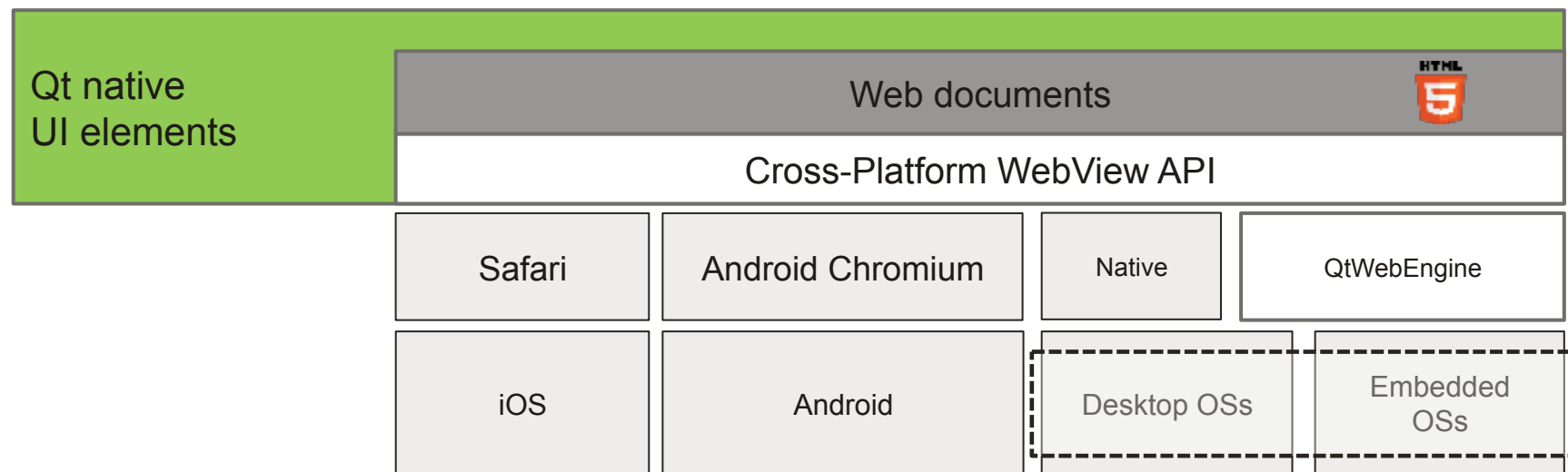
Commercial licensing

(Chromium parts licensed under LGPLv2.1)

# WebView



Lightweight component for embedding web content



Technology preview with Qt 5.4 (Android & iOS)



# Qt WebChannel



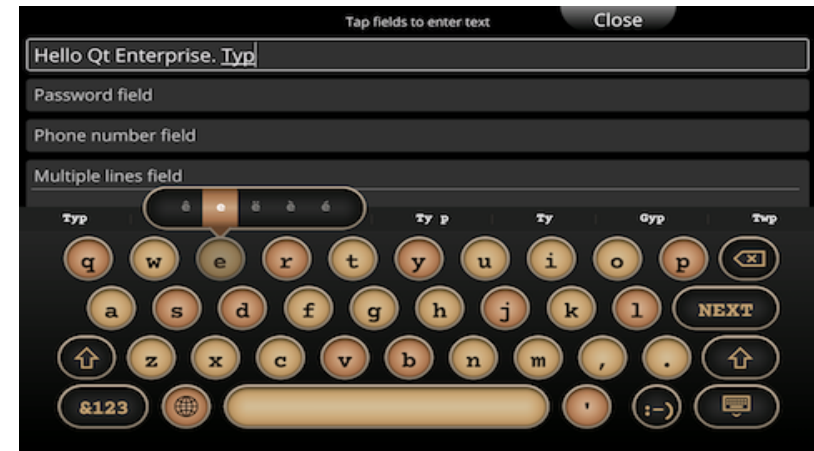
## Easy interaction between Qt and HTML/JavaScript

- Works with
  - Qt WebEngine
  - Qt WebView
  - Qt WebKit
  - Any browser supporting Web Sockets
- Exposes objects from Qt to HTML5
  - Replacement for the QObject bridge in Qt WebKit

# Qt Virtual Keyboard



- Keyboard layouts supported
  - Western keyboard layouts
  - Russian
  - Pinyin (Chinese input)
  - Farsi
  - Hindi
  - Japanese and Korean upcoming
- 2 way and 5-way navigation support
- Change theme at run-time
- Windows support





## Other items

- **QStorageInfo**
  - Provide info about mounted storage volumes and drives
- **Data Visualization**
  - Volume Rendering & Performance improvements
- **Official support for Wayland**
- **Qt Location**
  - Work ongoing
  - Goal: Technology preview this year
- **Qt 3D**
  - Most of the new architecture in place

## Qt for device creation

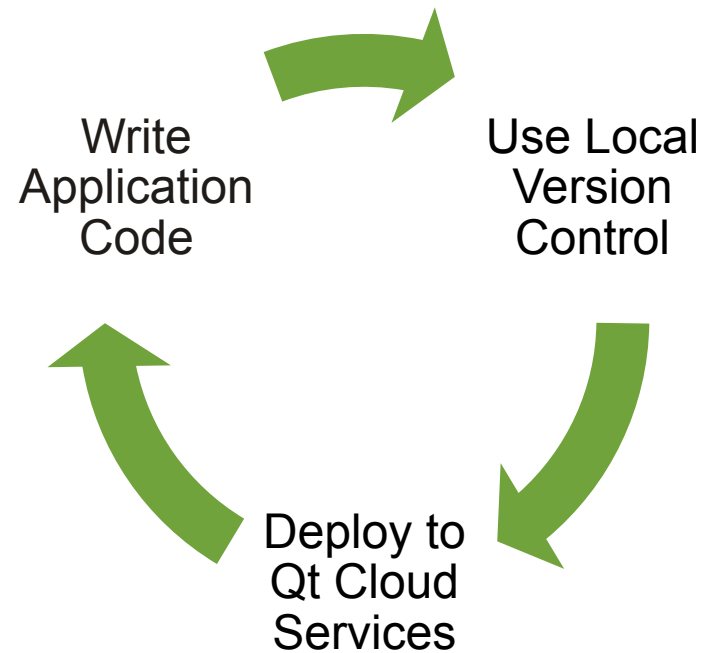


- Qt 5.4 libraries, updated reference stacks and add-on components (December 2014)
- Qt Quick 2D Renderer plugin for devices without OpenGL
- Integration of Wayland for multi-process support
- New meta-Qt layer for building your own stack in Yocto
- New utility library for controlling audio, display, network etc
- Qt Creator wizard for flashing device images
- Performance optimizations, improvements and bug fixes



# Managed Application Runtime

## How does it work?



# Scalable



## Your Application

- Configure
- Deploy
- Scale with your business



GIT Push API

Native Add-Ons



Environment Variables

Application Instances



Load Balancer



# Qt Creator and Tooling



# Qt Creator 3.3



## Qt Quick Designer

- Clean split of user interface design and application logic
- Support for Tabview Control
- Extended Anchoring options

## QML Profiler

- JavaScript Heap Profiler (Commercial)
- Improved Scenegraph Profiler (Commercial)
- Annotations on profile view
- Static code analyzer support using clang

Create your own wizard using simple scripting

Drag around edited documents between views

## New Quick-fixes

- Switch between Stack & Heap allocation
- Convert “old-style” connect call to “new-style”

Improved High-Dpi support

## Schedule



16. September	Qt 5.3.2 released
Within 2 weeks	Qt 5.4 beta
Beginning of November	Qt 5.4 Release Candidate
End of November	Qt 5.4 Final
December	Qt Creator 3.3
December	Qt for device creation
Q1 2015	Qt 4.8.7
April 2015	Qt 5.5 & Qt Creator 3.4

Qt Champions



# Champions

<http://qt-project.org/champion>



# Thank you!

[www.qt.io](http://www.qt.io)