



Developer Days 2012

Why you should be excited about Qt 5

Thiago Macieira, Qt Core Maintainer
Software Architect, Intel OTC
Berlin, Nov 13-14, 2012
Santa Clara, Dec 6-7, 2012



ANDROID FOR INTEL ARCHITECTURE INTEL LINUX WIRELESS
TIZEN OPENSTACK POWERTOP YOCTO CONNMAN XEN GUPNP KVM POKY LINUX KE
INTEL LINUX GRAPHICS SYNCEVOLUTION SIMPLE FIRMWARE INTERFACE (SFI) ENTERPRISE SECURITY IN

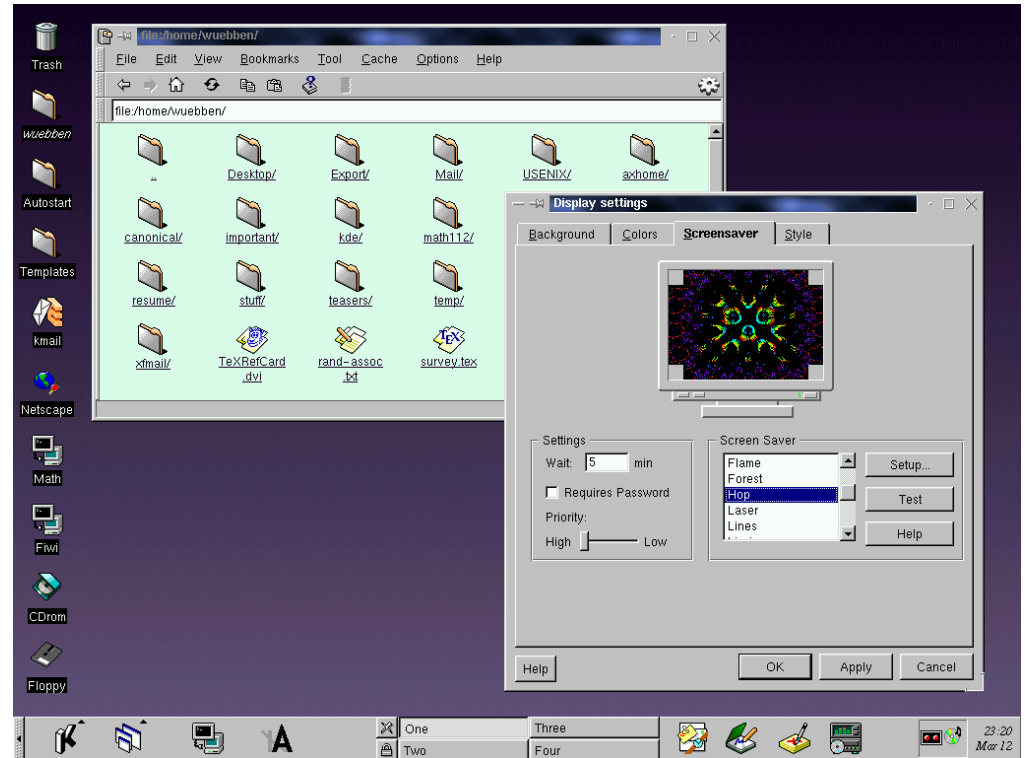
Who am I?

- **Open Source developer for 15 years**
- **Software Architect at Intel's Open Source Technology Center (OTC) since last year**
 - Living in Portland, Oregon
- **Maintainer of two modules in the Qt Project**
 - QtCore and QtDBus
- **MBA and double degree in Engineering**
- **Previously, led the “Qt Open Governance” project**
 - Ended with the creation of the Qt Project



We've come a long way

- 1999-06-25: Qt 2.0
- 2001-10-15: Qt 3.0
- 2005-06-27: Qt 4.0



Habemus Betam 2

- Released today
- Get it while it's fresh!
 - In your hotel, so you don't kill the connection for everyone
 - Or the USB sticks

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





Goals

- **Works for everyone (desktop, embedded, mobile)**
- **New features**
- **State-of-the-art UIs**
- **Increased modularity**
- **Reduced footprint**
- **Compatible with Qt 4.x**



What is new in Qt 5.0?



- **Qt Quick 2**



- **New graphics stack**



- **New modular structure**



- **All platforms based on QPA**



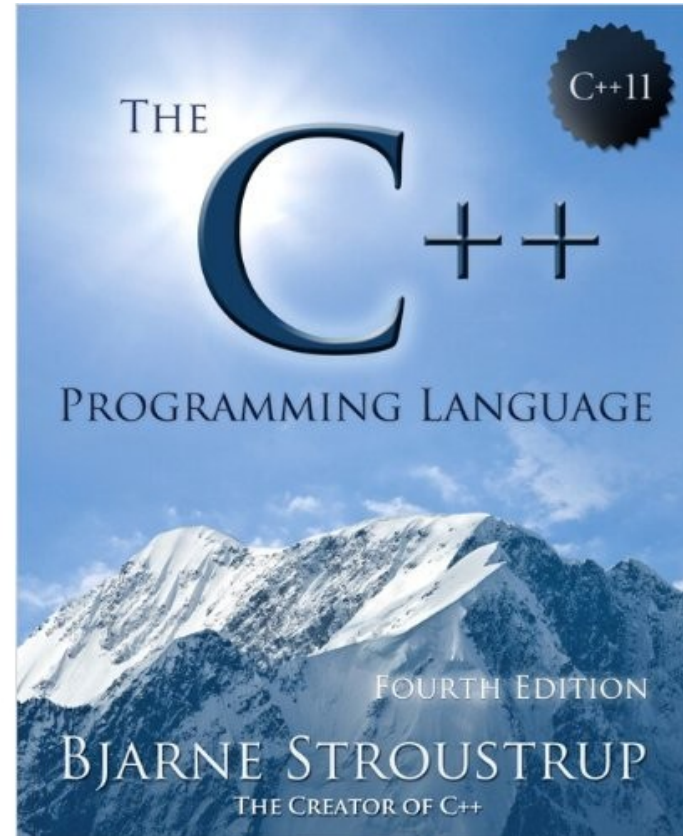
New features

- Performance improvements
- OpenGL w/ ANGLE support
- Wayland support
- JSON support
- Mimetype support
- QStandardPaths
- XCB instead of Xlib
- QRegularExpression based on PCRE
- QDnsLookup
- New Signal/Slot connection mechanism
- C++11 support
- WebKit2 architecture in QtWebKit
- V8 as JS engine
- ...



New features: C++11 support

- Certain new functionality only in C++11
 - Inline UTF-16 support for QString
 - New signal / slot syntax
 - Performance
- Qt continues to support C++98 (for now)



New features: new signal/slot connection syntax

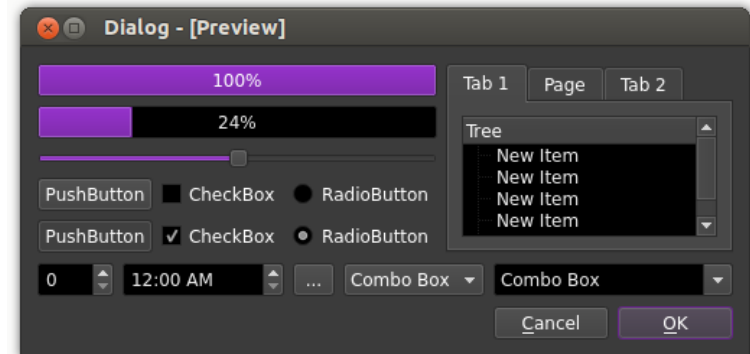
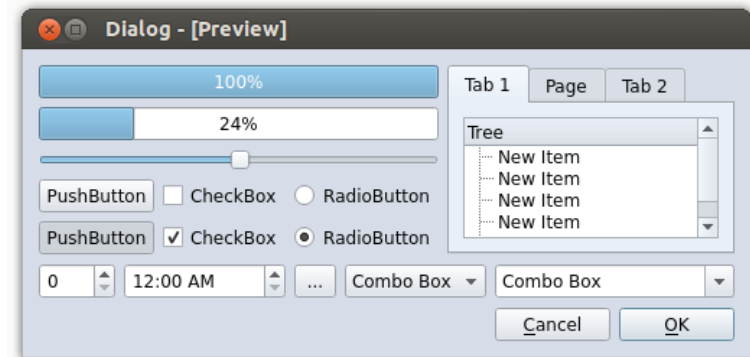
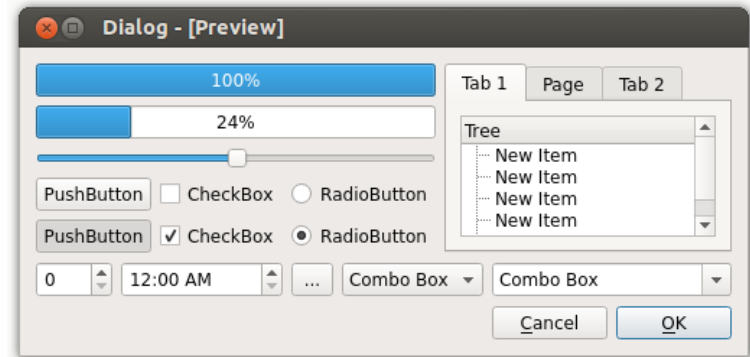
- Compile-time checking of:
 - Existence of the signal and the slot
 - Argument compatibility
- Works best with C++11
- Advantages:
 - Proper namespace and typedef support
 - Automatic type promotion & demotion
 - long → int
 - const char * → QByteArray or QString

```
QObject::connect(s, &SenderObject::signal1, r1, &ReceiverObject::slot1);  
QObject::connect(s, &SenderObject::signal1, [=]() { s->dumpObjectInfo(); });
```



UIs: new style for desktops

- New modern style, called Fusion
- Replaces previous styles
 - Motif, Plastique, Cleanlooks
 - Still available in a separate module



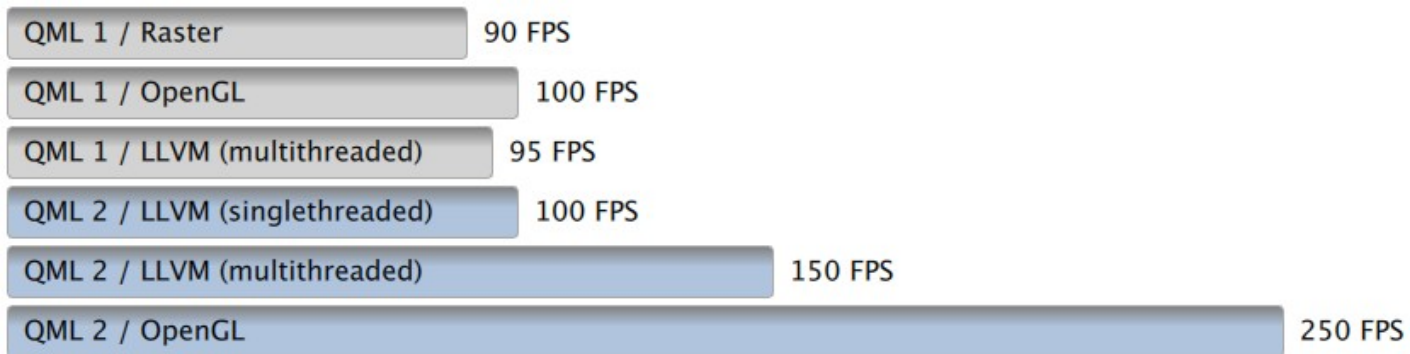
UIs: QML in the spotlight

- QML is our bet in “the next step in GUI programming”
- Easier interaction with designers
- Easier to modify, update, maintain
- Implementations:
 - Qt Quick 1
 - Qt Quick 2
 - Cascades
 - Desktop Components

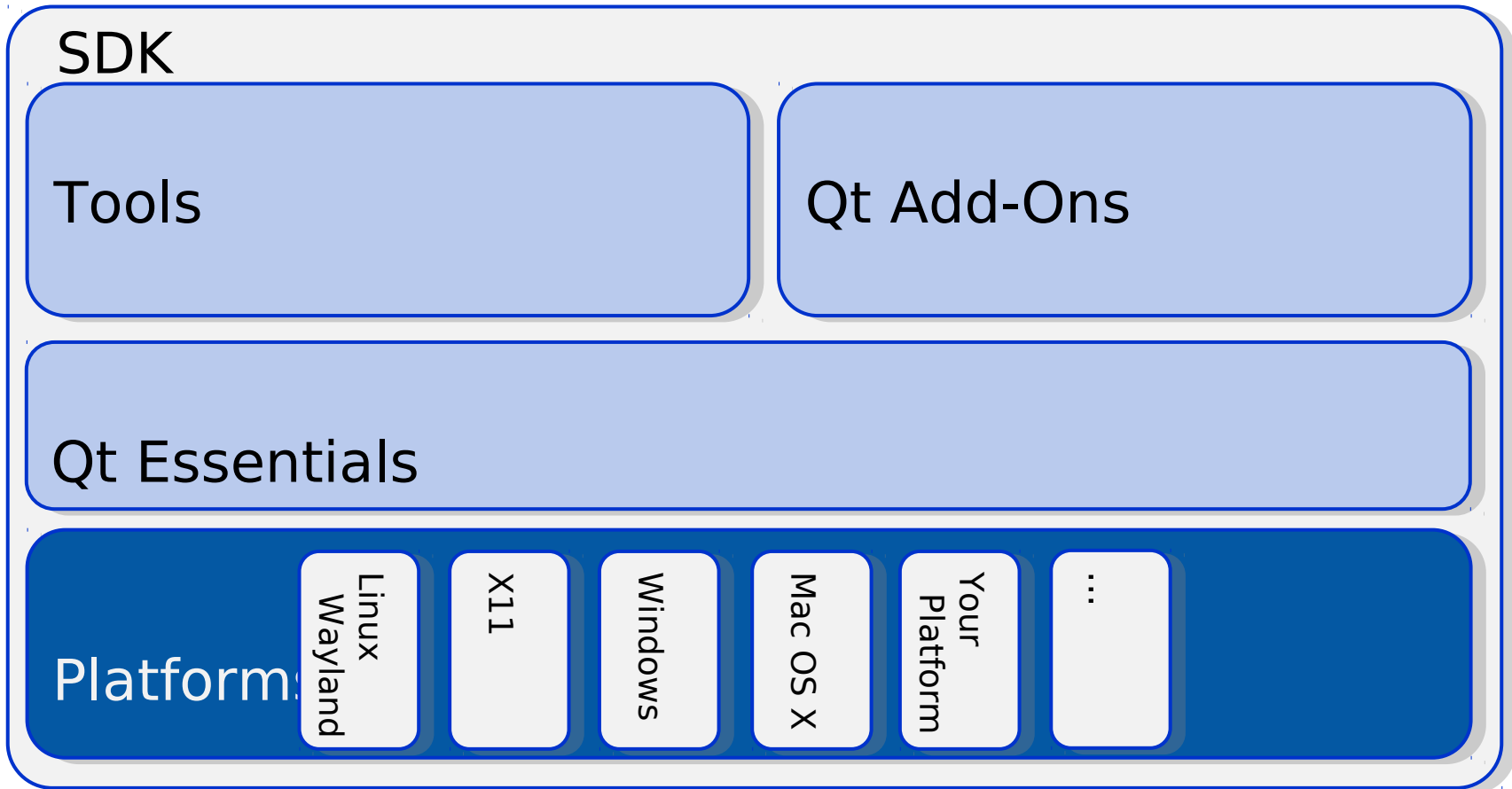


UIs: Qt Quick 2 and OpenGL (ES)

- Qt 5 supports two rendering paradigms
 - Software rasteriser/QPainter: used by QWidgets
 - OpenGL (ES): used by Qt Quick 2
- QPainter
 - Optimised for many years
- Qt Quick 2 is built and optimized for OpenGL
 - Even SW rasterisation can give great performance



Modularity: Structure of Qt 5



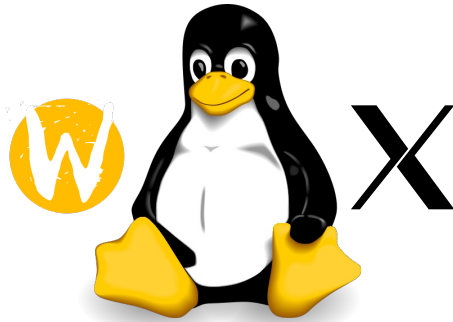
Modularity: Qt 5 Platforms

Reference platforms

- Linux* (X11 and Wayland)
- Mac OS X*
- Windows*

Other supported platforms

- QNX, DirectFB
- Android, iOS being worked on



Modularity: Tiers

Tier 1

- Tested all the time, especially at release time
- Team behind it is committed to supporting it

Tier 2

- Tested at release, but not all fixes in
- May raise in the future

Tier 3

- Code is present, but support level is unknown



Modularity: Qt Essentials

Always available:

- Qt Core
- Qt Network
- Qt Gui
- Qt Widgets (for desktops only)
- Qt WebKit
- Qt Multimedia
- Qt Sql
- Qt Quick 1 and 2



Modularity: Add-on modules

For specific contexts

- Qt Widgets (desktop)
- Qt Quick components
- Qt Svg
- Qt Xml
- Qt XmlPatterns
- Qt Script, Qt Script Tools
- Qt Concurrent
- Qt Print Support
- Qt Help
- Qt UiTools
- Qt Designer
- Qt ActiveQt (Windows)
- Qt WebKit (WebKit1)
- Qt Multimedia Widgets
- Qt Feedback
- Qt 3D
- Qt Compositor
- Qt Wayland
- Qt Graphical Effects
- Qt Json Db
- Qt Mime Type
- Qt Organizer
- Qt Contacts
- Qt Versit

And more being added...



Modularity: why addons?

- Simpler to maintain for us
 - Different release schedules
 - Quicker to QA and test
- Simpler for new projects to be added



Footprint: Lean and mean QtGui

- Widget classes moved to a separate module (QtWidgets)
- QtGui concentrates on basic tasks
 - Window management (QWindow) & windowing system integration
 - Raster painting (QPainter, QImage)
 - OpenGL / OpenGL ES support



Footprint: Widgets in Qt 5

- In “Done” state of development
 - Will fix important bugs
 - Community is not adding new features or improving performance
- Currently recommended for desktop GUI
- Does not require OpenGL or JS engine



Compatibility: Migrating from Qt 4 to Qt 5

- Compatible with Qt 4 with very few exceptions
- Qt Widgets are supported in Qt 5
- Doesn't require migration to Qt Quick
- Doesn't require OpenGL
- Doesn't require JavaScript



Compatibility: Embedded support

EGLFS

- Uses EGL
- Full screen applications
- Single process only

DirectFB

- Blitting acceleration
- Input handling
- OpenGL support possible

Wayland

- Designed for HW acceleration
- Wayland 1.0
- Qt Compositor API
- Integrates with other Wayland clients and servers



Done under the Qt Project



The Qt Project
celebrated
1 year on October 22

<http://qt-project.org>



Current state

We're in Beta!



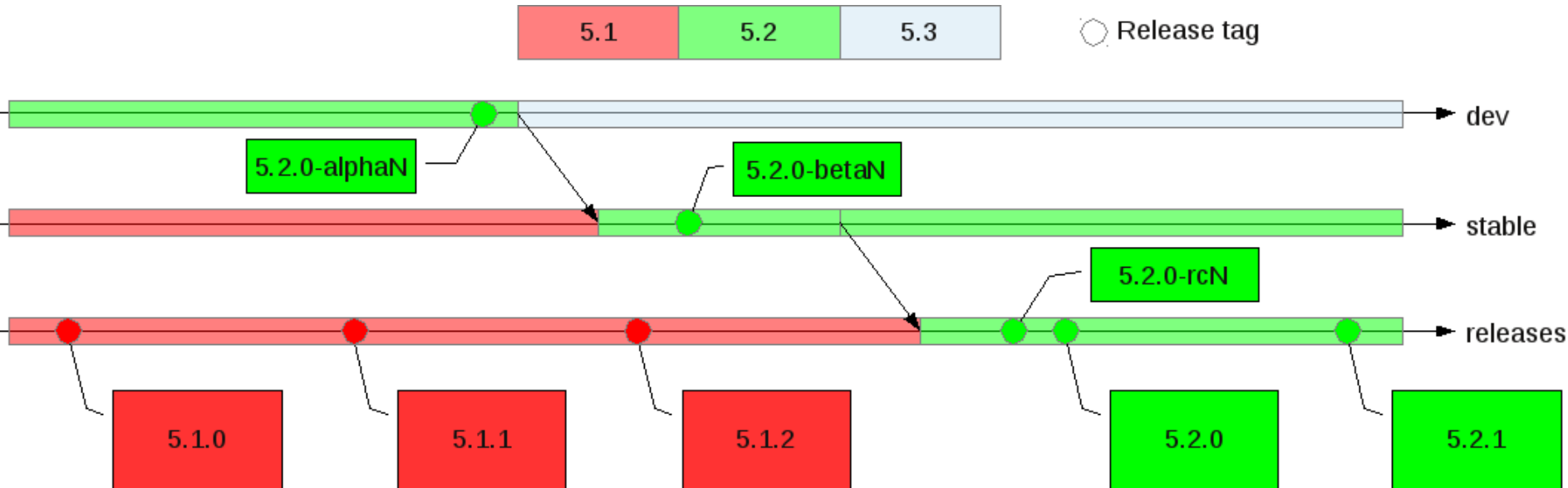
- Feature freeze: March 2012
- Alpha: April 4 2012
- Beta 1: August 30 2012
- Beta 2: **today**
- Final: by the end of the year



After 5.0: Releases

Hybrid time / quality based release schedule

- 2 feature releases per year



After 5.0: Embedded systems

Recover time lost

- Cooperate with vendors and embedded Linux distributions
 - Ready for your use
 - Yocto Project, Open Embedded, etc.
- Investigate Android on embedded
- Tooling support
 - Cross-compiling, remote debugging, deployment, etc.
 - Integrated into Qt Creator



After 5.0: More platforms

- Definite support for Blackberry and QNX
 - RIM contributing directly to the Qt Project
- Investigating support for
 - Android
 - IOS
 - Windows 8 / RT



After 5.0: Others

- Full Desktop support in Qt Quick
- Integrated Software OpenGL renderer
- Continue to evolve the WebKit2 based Qt WebKit
- More processor architectures for JavaScript
- Improvement on the V4 engine
- Your ideas?



Questions?

Thiago Macieira

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Links:

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

Mailing lists: <http://lists.qt-project.org>

IRC: #qt and #qt-labs on Freenode



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