

Qt App Development for Symbian & MeeGo

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From Your Idea to the Store



Your Development Options



Series 40



Symbian



MeeGo / Maemo



Windows Phone



Java

Silverlight

Native (Qt)



XNA



Web

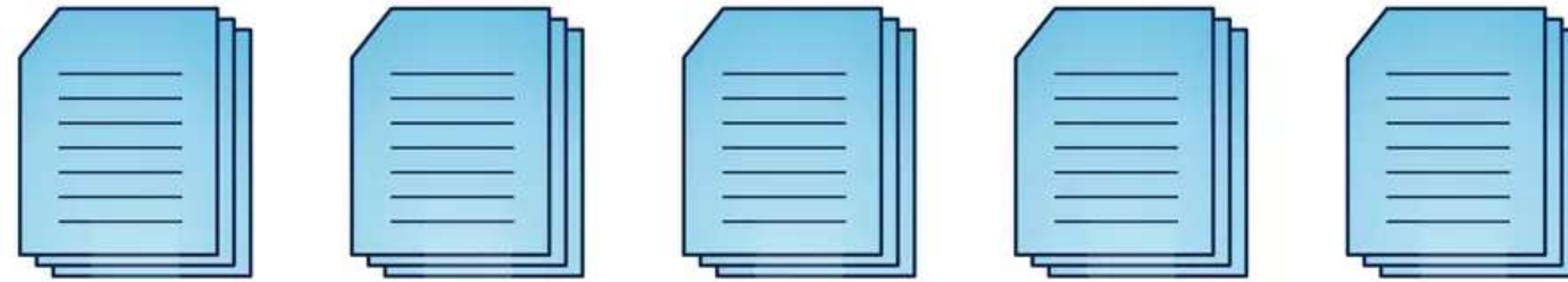
Agenda



What? Why? Where? How? When? Now!

Qt – What?

Multi Platform App Development



Native apps

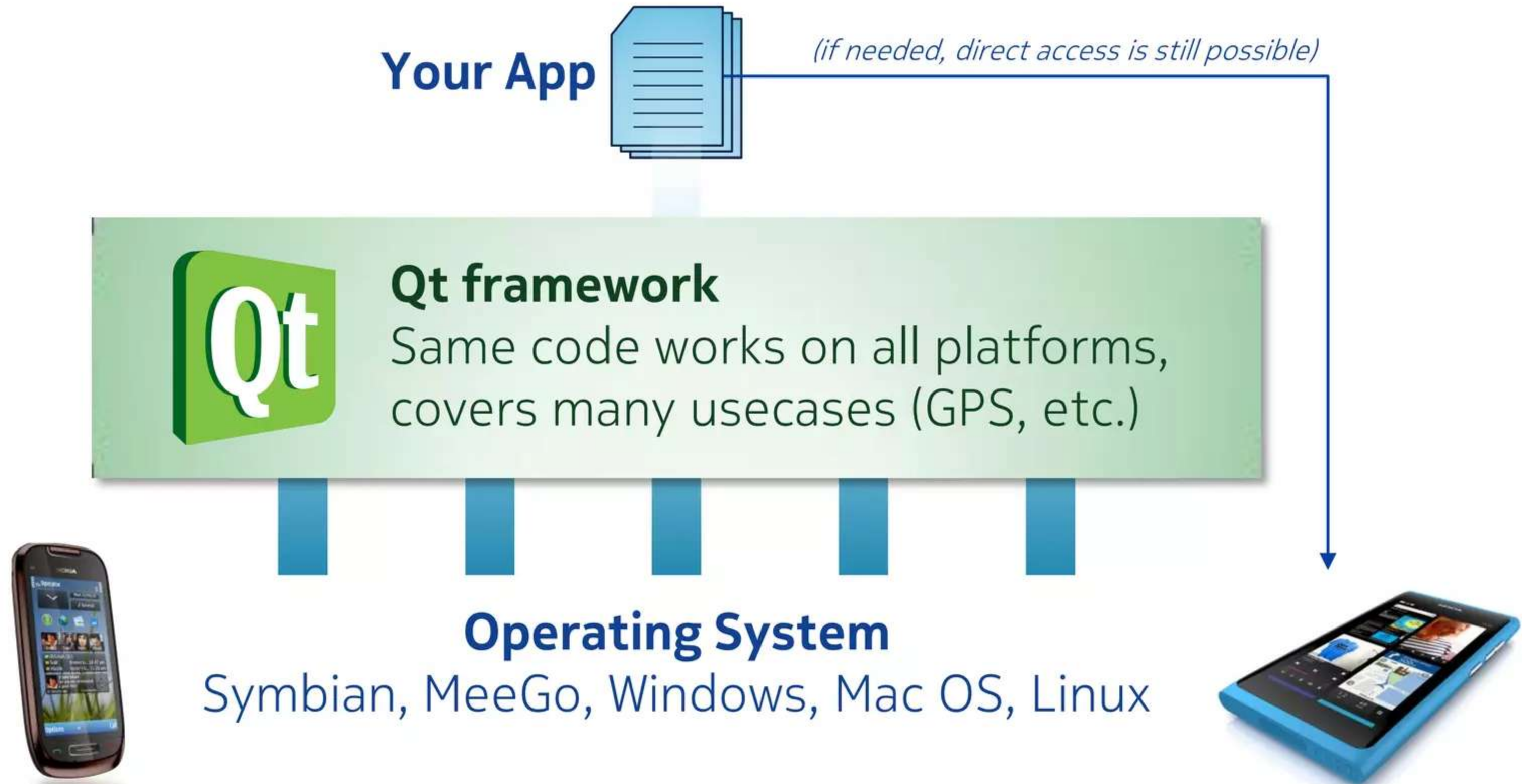
Use operating system and its functions directly
(different code for networking, GPS, etc.)

Operating System

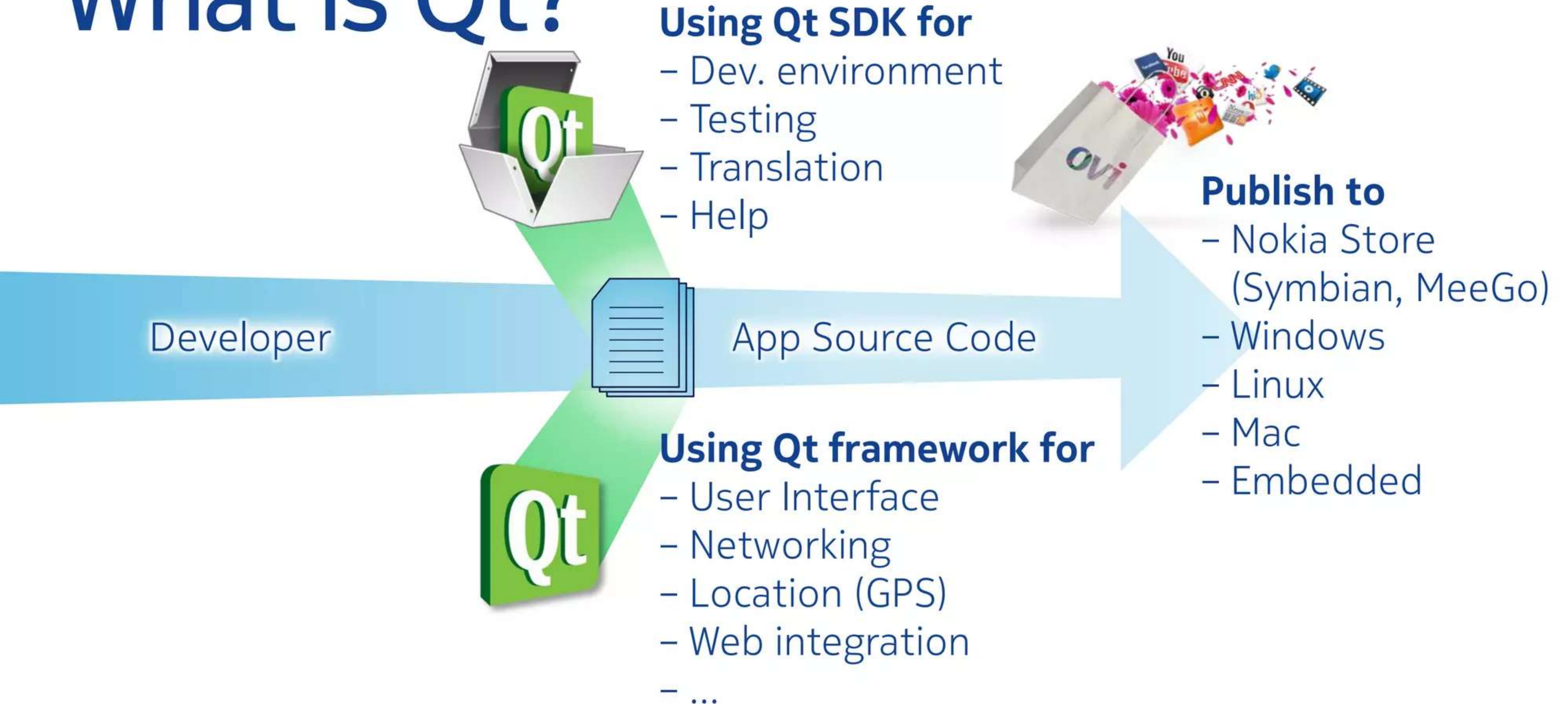
Symbian, MeeGo, Windows, Mac OS, Linux



Multi Platform App Development



What is Qt?



Qt – Why?

Qt – What's Inside?

- **Cross-Platform**

- Same source code for multiple platforms
- Maximum performance – native apps!

- **Generic**

- User Interface
- Declarative UI, animation, gestures, multi-touch, 3D (OpenGL)
- WebKit & JavaScript engine included
- Multimedia (audio, video)
- Networking, XML
- SQL, files, app settings
- Container classes, object communication, threading, unit testing

- **Mobile focus**

- Location, Maps
- Sensors
- Messaging (SMS, email)
- Contacts, Calendar
- Camera
- System information
- Haptics (vibration)

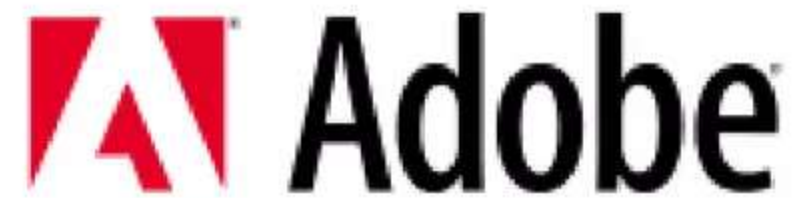
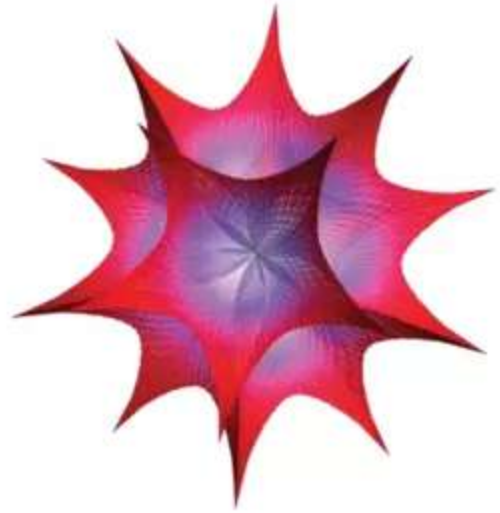
- **Extend**

- Include any 3rd party C++ library / code

23 modules,
~ 800 classes,
~ 9000 functions



Qt: On Your PC already!



... and many, many more!

Qt App Publishing: The Price.

Developer resources & community

NOKIA Developer

Discussion boards,
e-learning videos,
examples



Nokia Publish registration

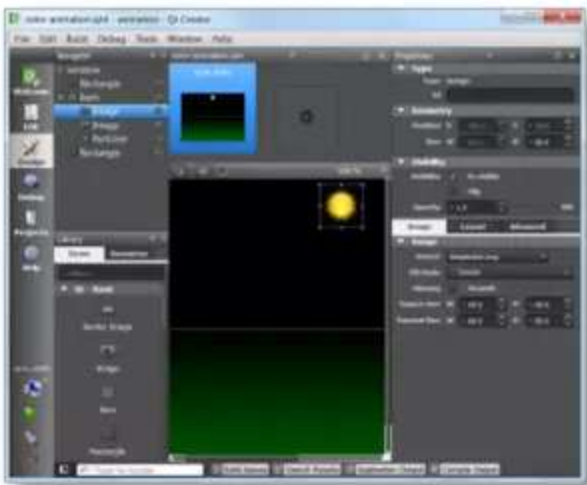
One-time fee of **€1**
Submit an unlimited number of apps



Nokia Store publishing

11 million DL / day
155 million Qt phones
in the market

Complete Qt development environment



SDK, toolchain,
remote device testing,
etc.

Total:

1€

Qt: Free vs. Commercial



Open Source

qt.gitorious.org

Usually the best choice
for mobile apps!



Free (LGPL license)

Qt can be used in commercial,
closed-source apps

Changes to Qt source
must be shared

Tech support available

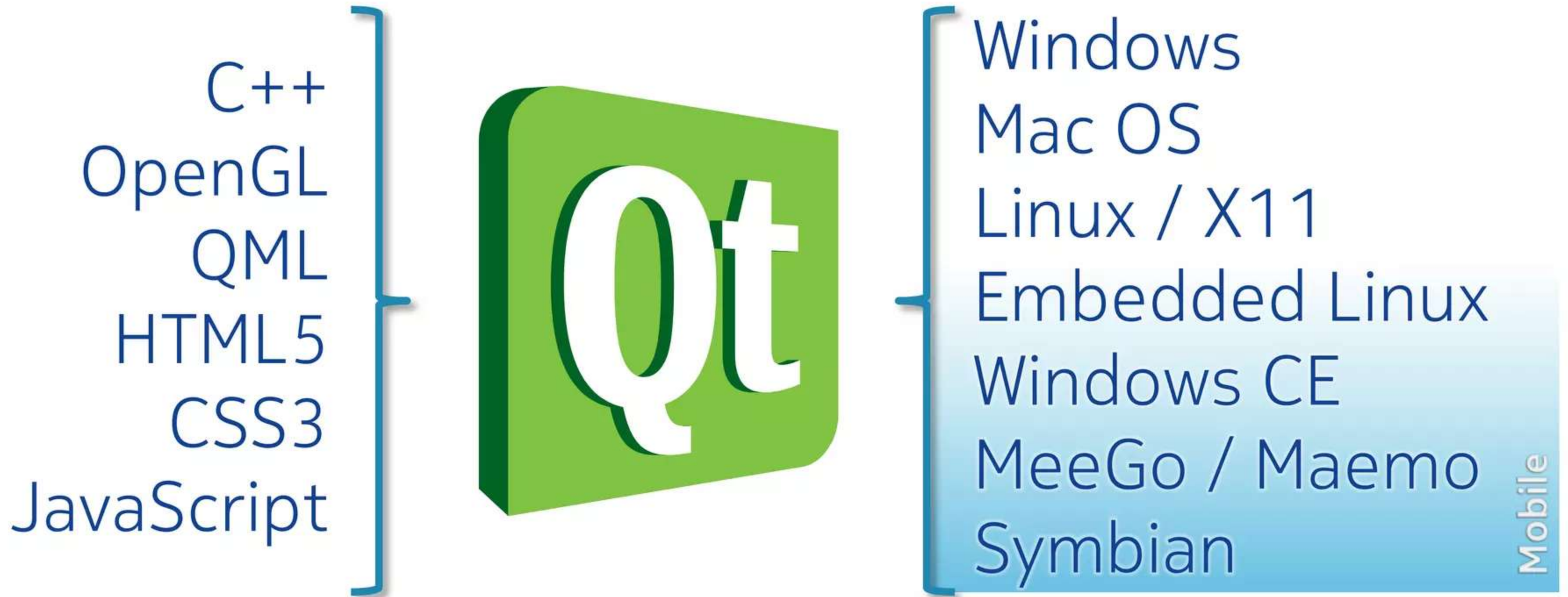
Commercial License

Included support



Qt – Where?

Technologies & Platforms



Symbian & Qt

- Works on S60 3.1+
(E71, E72, 5800, N97, N8, X7, 700, etc.) *
- Look up platform versions:
<http://www.developer.nokia.com/Devices/>

Nokia E71
(S60 3.1, 2008)



Nokia 700
(Symbian Belle, 2011)



Qt Compatibility

Qt Pre-Installed



* Qt can be installed on all compatible devices. Not all devices are enabled for Qt content in the Ovi Store. Current list of Ovi Store device deployment support for Qt apps:
http://www.developer.nokia.com/Distribute/Packaging_and_signing.xhtml

MeeGo™ Harmattan

- Open Source Linux for Mobile Computers
 - Based on Maemo and MobLin
 - Developed by Nokia and Intel
 - Hosted by the Linux Foundation
 - www.meego.com
- Nokia N9
 - MeeGo 1.2 Harmattan



Qt – How?

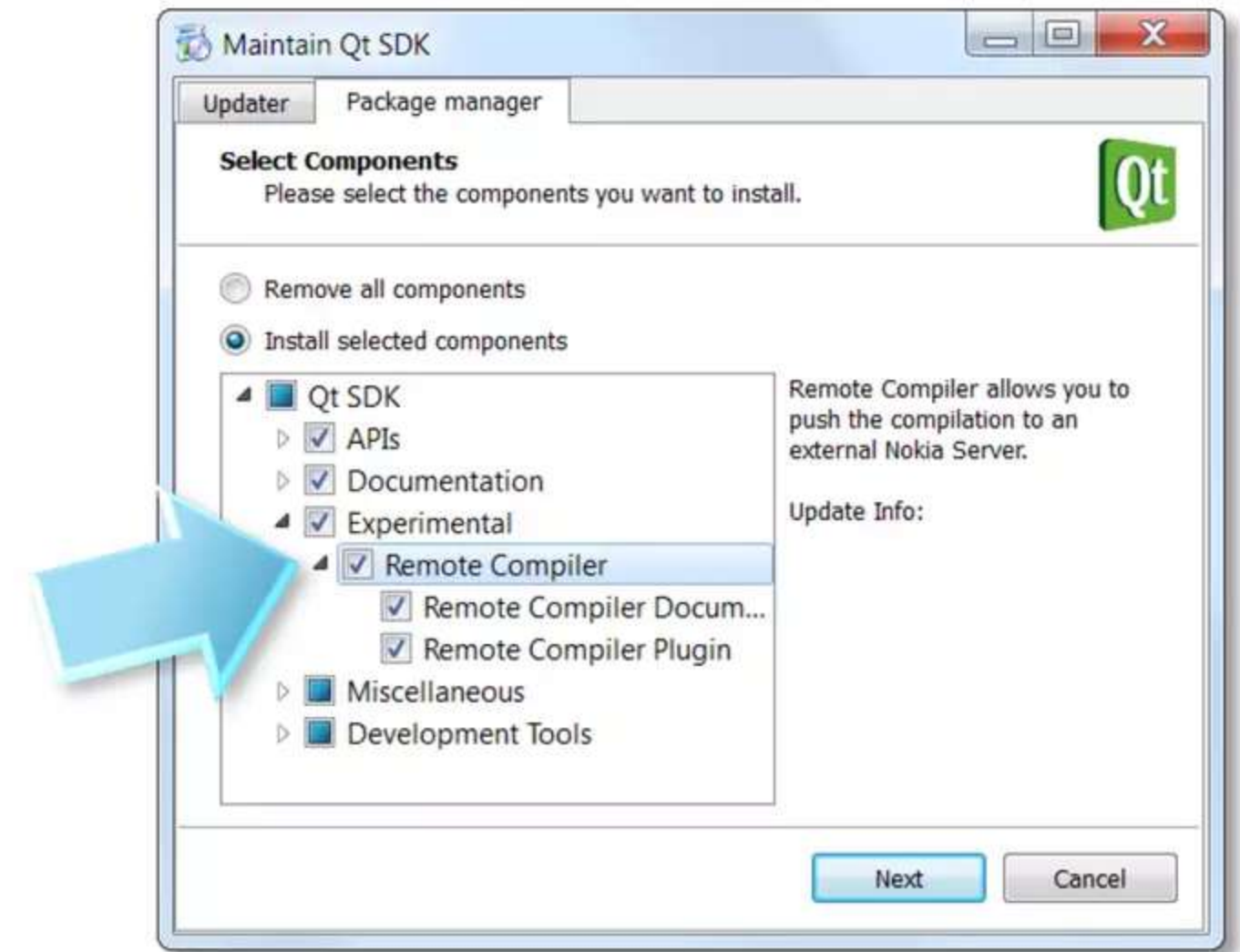
Developer Environment Setup

- One-click installation
 - IDE
 - Tool-chains
 - Documentation
 - Examples
- <http://developer.nokia.com/Qt>



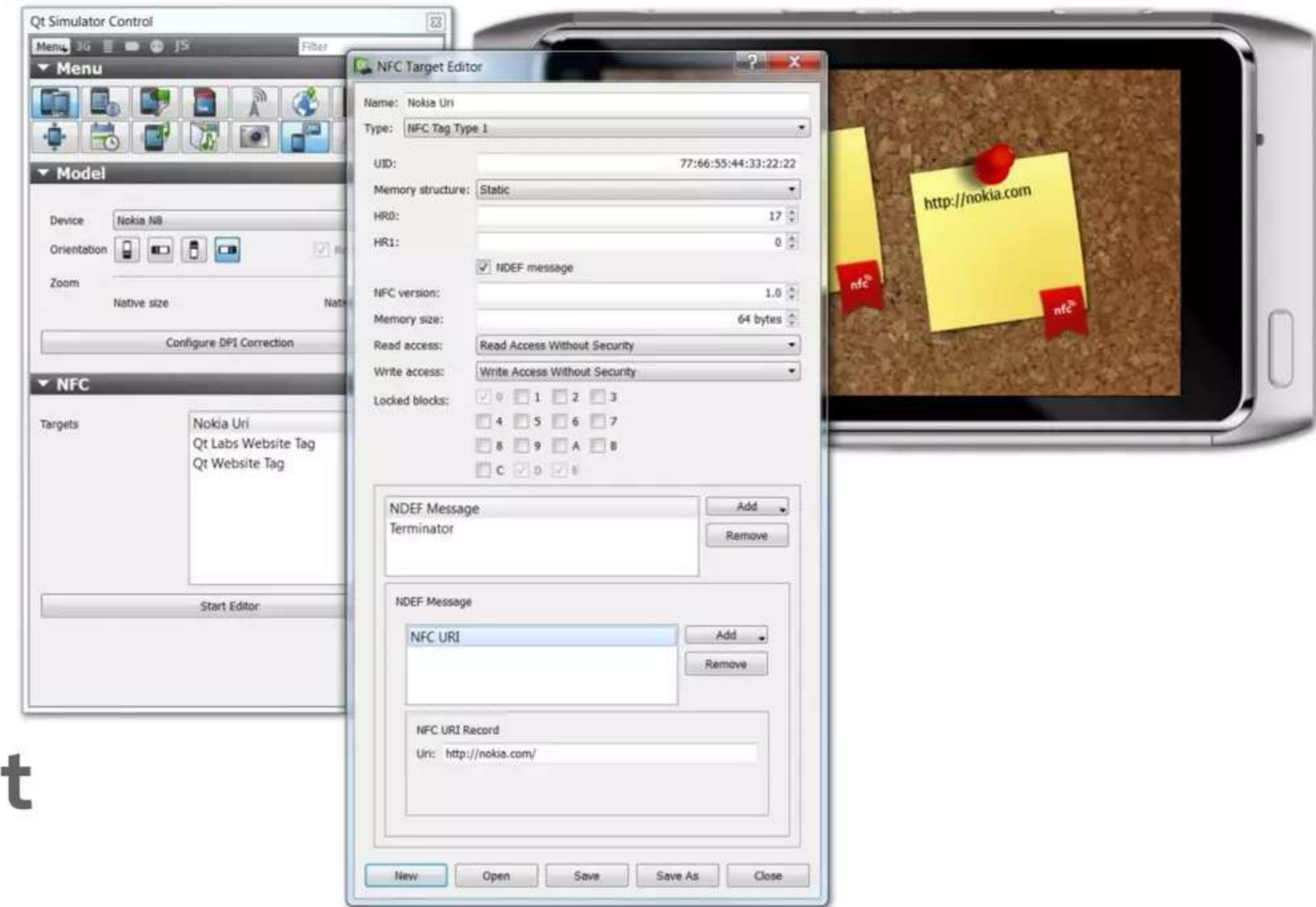
Symbian – Mac / Linux

- Symbian binaries cannot be compiled on Mac or Linux *
 - Legacy Symbian tool chain restriction
- Use Remote Compiler instead
 - Compilation done on Nokia servers in the cloud
 - Compiler log messages displayed in real-time in Qt Creator
 - Binaries delivered back to you
- Enable Remote Compiler during SDK installation or later using the SDK maintenance tool
 - Found under the “Experimental” section

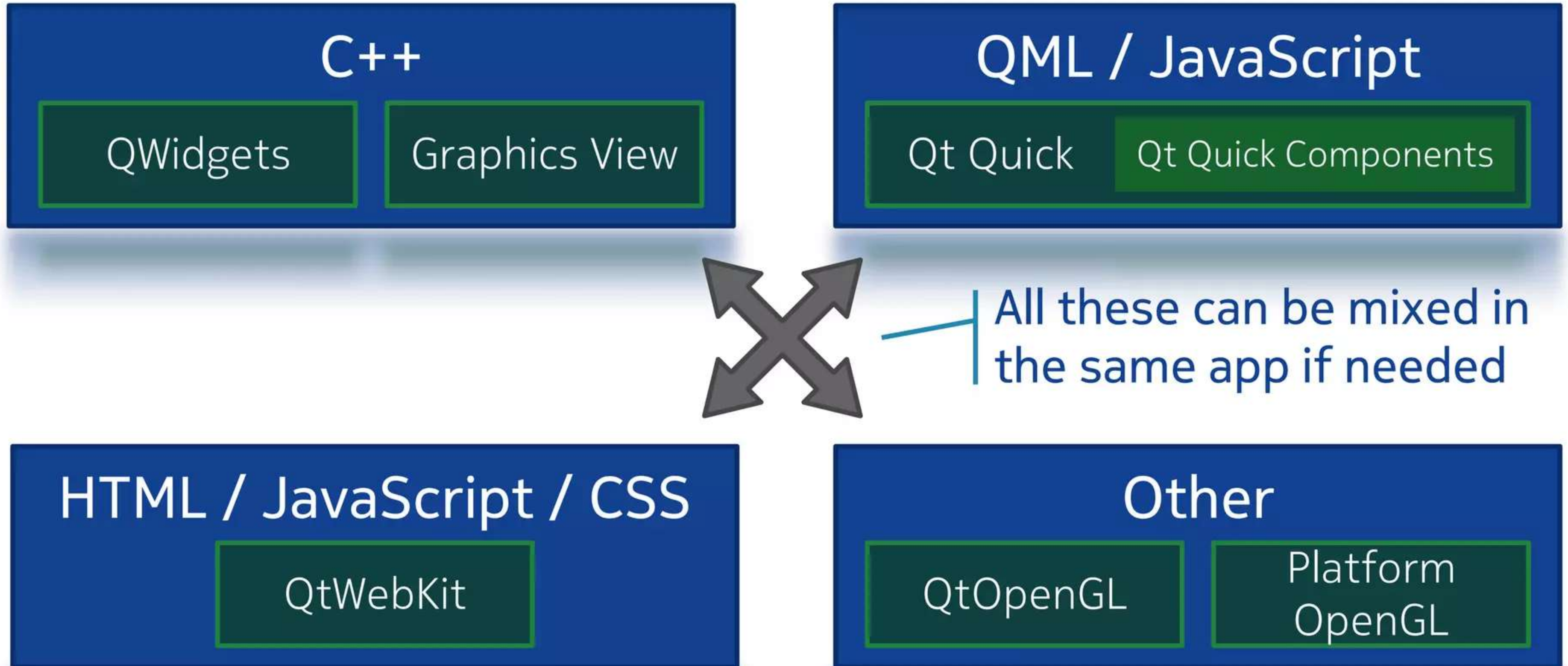


Qt SDK: Simulator

- Efficient Testing
 - Quick
 - **Scripting** (JavaScript)
 - Simulate **phone events**
 - Battery, messages, etc.
 - Simulate **mobile environment**
 - Location, contacts, etc.
 - **Skins**



Start: Application UI

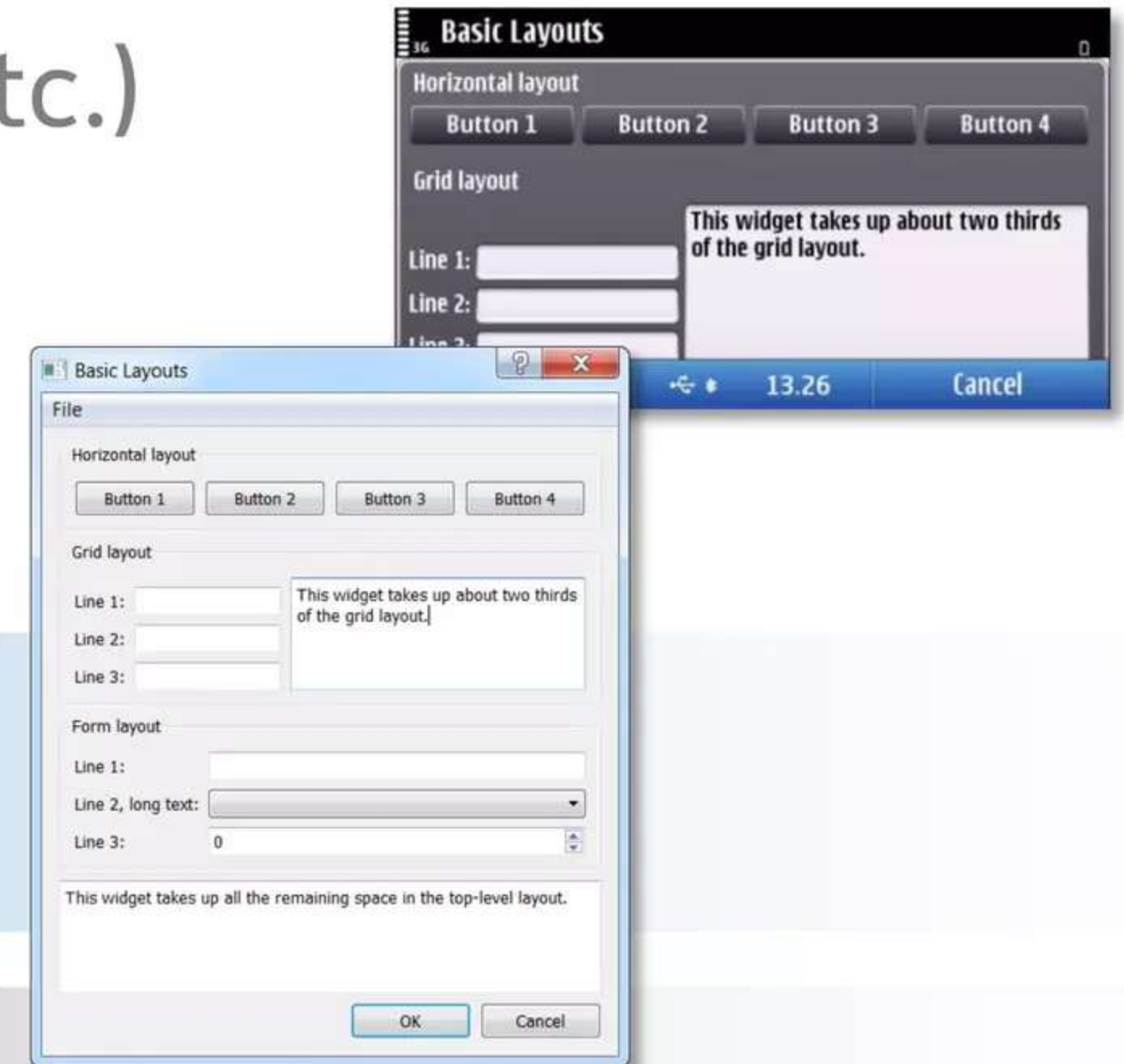


QWidgets

- UI Elements (QLabel, QPushButton, etc.)
 - Use platform UI design
 - Support style sheets
 - Drag & drop UI designer



Great for desktop.



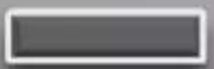
Static layouts make effects difficult.
Small UI, different interaction paradigms.

Graphics View

- Manage 2D scenes with a scene graph
 - Can manage thousands of items with hierarchies
 - Collision detection, affine transformations, drag and drop support
 - Hardware acceleration and integration with QWidget possible



High level
Conceptually nice and flexible



No ready-made common UI components available
Qt 5 development focus on Qt Quick

Qt Quick

- Qt Quick
 - QML language and JavaScript
 - Declarative syntax, animations and states
 - Drag & drop UI designer



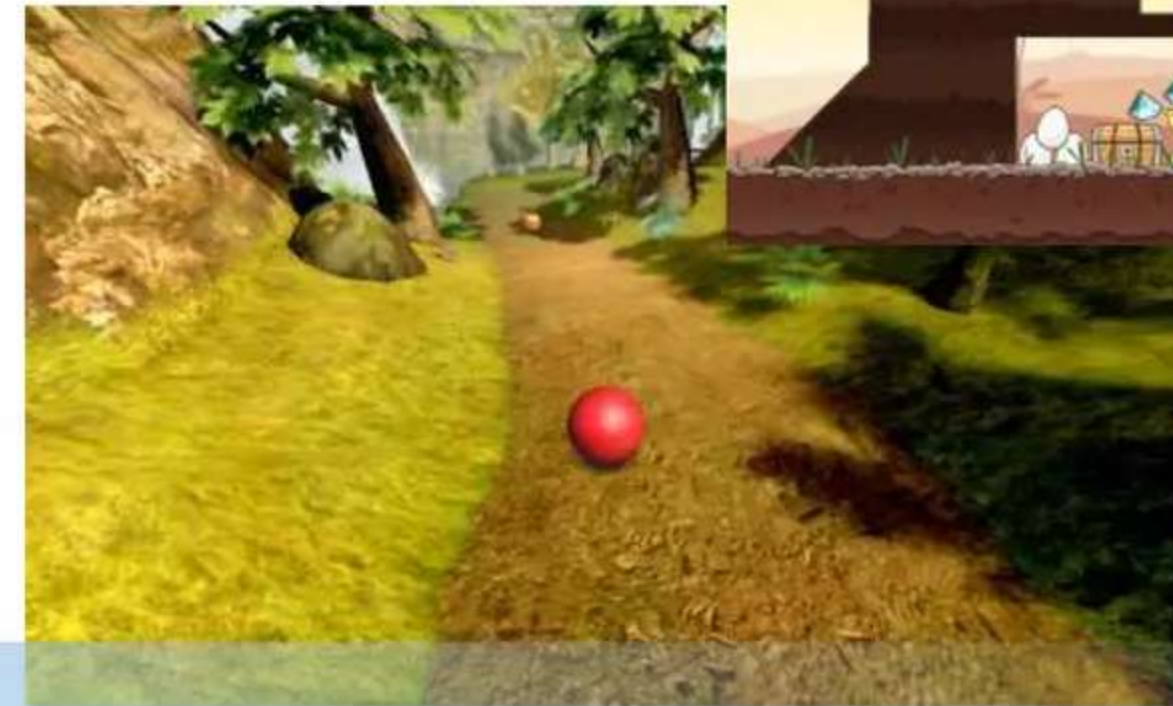
Very easy to make slick, fluid UIs.
Most important for mobile devices!



UI components for desktop still experimental

OpenGL

- Very low level
 - Basic setup provided by Qt



*Angry Birds and Bounce
by Rovio*



Complete control over GL
Good if you have existing codebase & assets, cross-platform



OpenGL is hard work (but there's more Qt coming for that *)

QtWebKit

- Open source browser engine
 - Display HTML(5) and JavaScript
 - Combine Qt QML / C++ and web code if needed to get best of both worlds



Use your existing web skills to create the UI
Reuse web components (online help, etc.)



Complex UIs and interaction probably more difficult
Less performance than native code (but improving)

Recommendations ...

Recommended 
OK 
Not recommended 

	Desktop App	Mobile App	Game
QWidgets			
GraphicsView			
Qt Quick			
OpenGL			
Web			

Platforms and UIs

Supported 

Limited 

Not supported 

	Qt Quick Components	Qt Quick	QWidgets	Direct graphics (OpenGL, GraphicsView)	HTML (5)
Symbian^3 / Anna					
Symbian^1 / S60 5.0					
S60 3.1 / 3.2 (non-touch)					
MeeGo Harmattan					
Maemo 5					
Desktop					

Hello World

Native
Symbian C++

A lot shorter
and easier!

Qt



~ 300 lines of code,
~ 15 files

```
#include <QApplication>
#include <QPushLabel>

int main(int argc, char *argv[])
{
    QApplication app(argc, argv);
    QLabel helloLabel("Hello World");
    helloLabel.setAlignment(Qt::AlignCenter);
    helloLabel.showMaximized();

    return app.exec();
}
```

Qt Quick

Not necessarily shorter, but far
easier to understand



```
import QtQuick 1.0

Rectangle {
    width: 360
    height: 360

    Text {
        anchors.centerIn: parent
        text: "Hello World"
    }
}
```

QML language

User Interfaces with Qt Quick

- Most cross-platform
 - Design and create any custom user interface
 - Same resolution: pixel precise on desktop, Symbian and MeeGo



QML

- Describe UI by tree structure of property bindings
 - **Properties** dynamically evaluated
 - **Communication** through signals & slots
 - **Bindings to C++** code possible
 - **Animate** properties using **states** and transitions

```
import QtQuick 1.0
Rectangle {
    width: 200
    height: 200
    Image {
        source: "QtLogo.png"
        anchors.centerIn: parent
    }
}
```



QML

- Interactivity

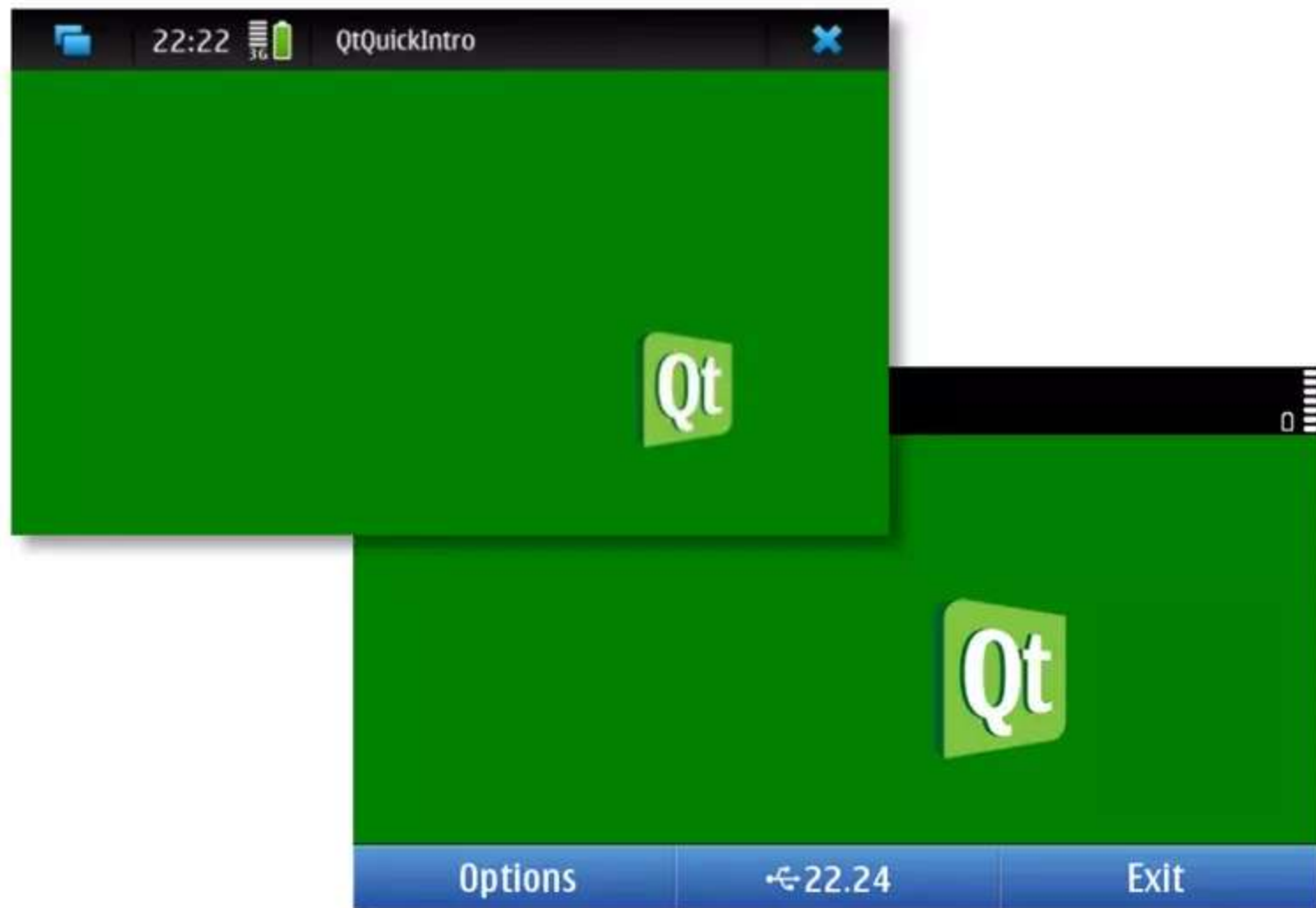
- Interact with mouse / touch
- Execute **JavaScript** in signal handlers

```
import QtQuick 1.0
Rectangle {
    width: 200
    height: 200
    Image {
        source: "QtLogo.png"
        anchors.centerIn: parent
    }
    MouseArea {
        anchors.fill: parent
        onClicked: parent.color = "green"
    }
}
```



QML

- Dynamic property update
 - Move image with mouse



```
import QtQuick 1.0
Rectangle {
    width: 200
    height: 200
    Image {
        source: "QtLogo.png"
        x: myMouse.mouseX
        y: myMouse.mouseY
    }
    MouseArea {
        id: myMouse
        hoverEnabled: true
        anchors.fill: parent
        onClicked: parent.color = "green"
    }
}
```



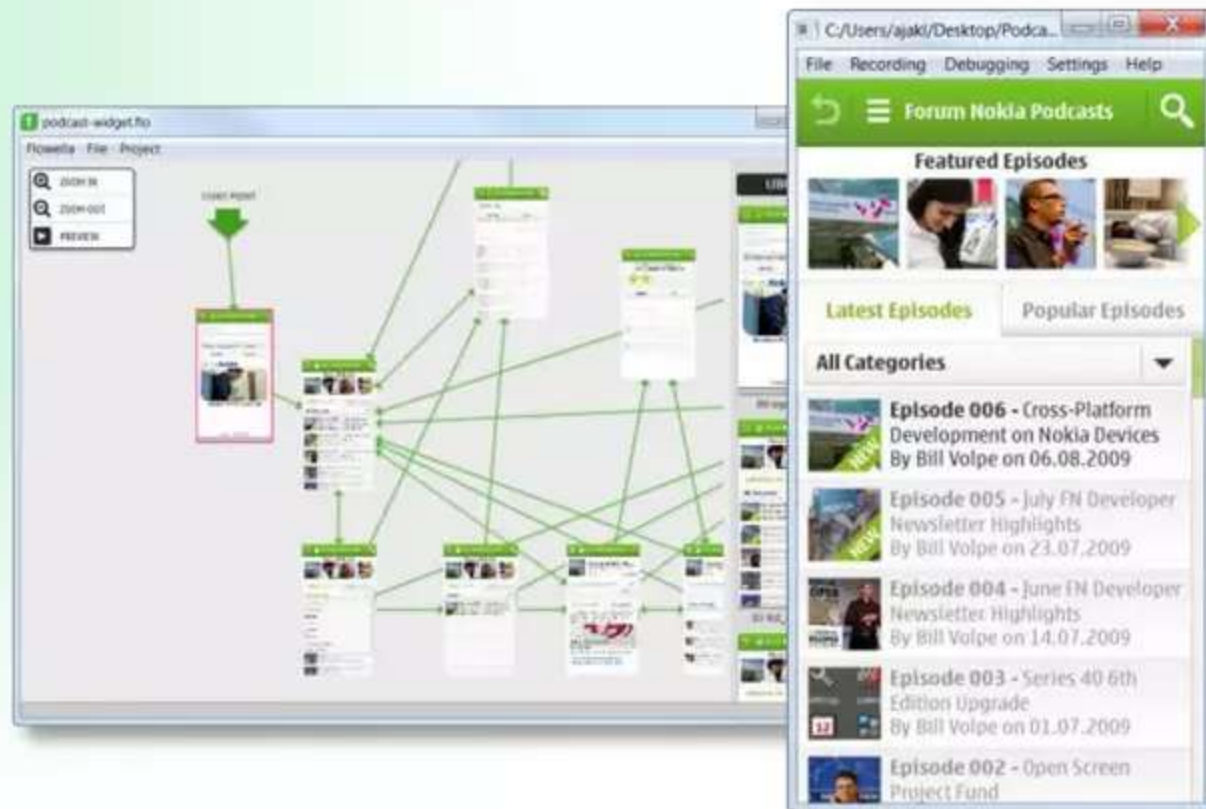
Qt Quick & Qt C++

Quick Prototype

Viewer on PC & mobile:

Testing 100% pure QML directly

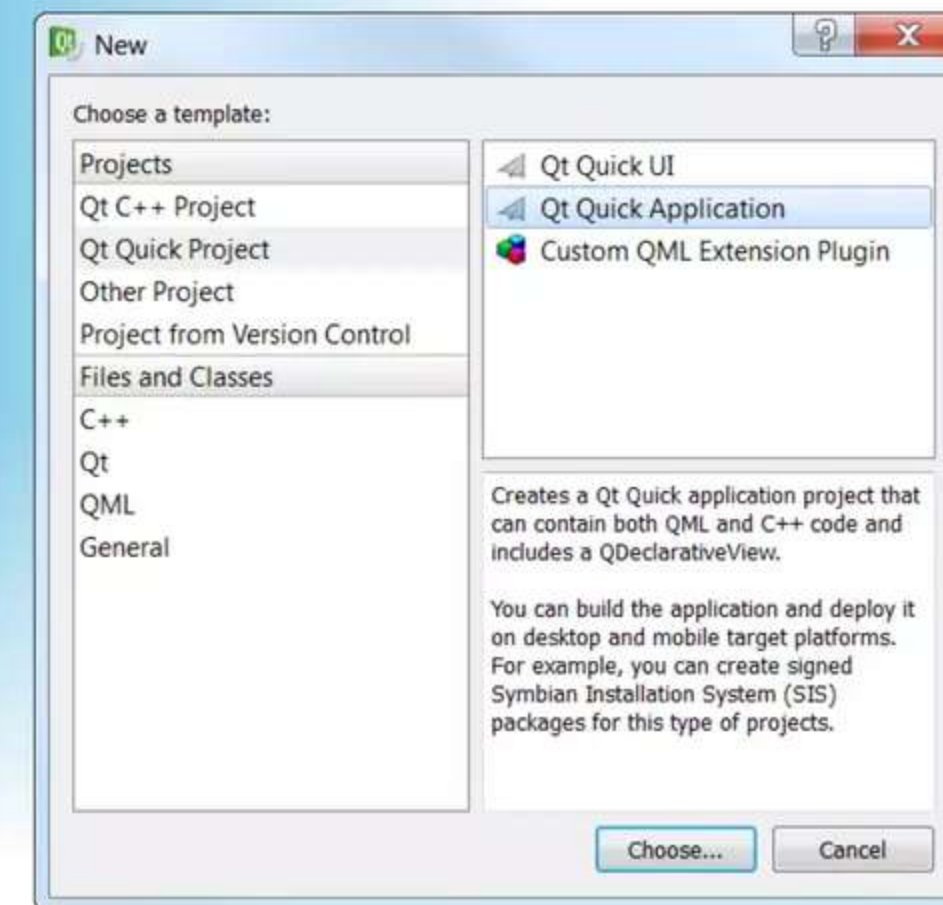
E.g., created by Flowella, Photoshop export



Deployable App

Qt C++ app to load and show QML

Can include C++ for app logic



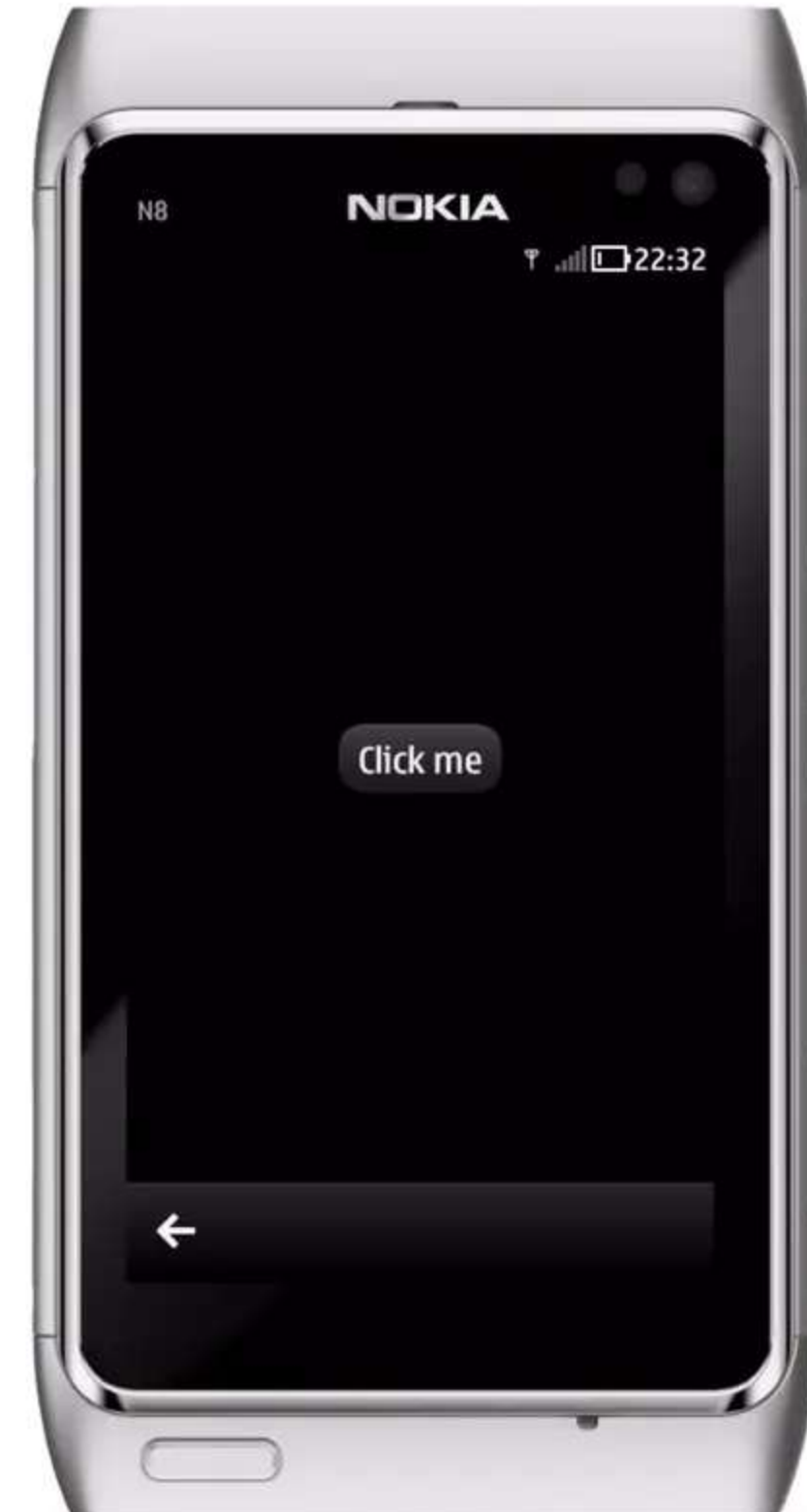
Qt Quick Components

- Simplify building rich UIs with Qt Quick
 - Provides widgets for Qt Quick
 - Title bar, actions, list items, buttons, etc.
 - Styles to integrate with native look & feel
 - MeeGo / Symbian slightly different



Qt Quick Components

```
import QtQuick 1.1
import com.nokia.symbian 1.1
PageStackWindow {
    id: window
    initialPage: mainPage
    showStatusBar: true; showToolBar: true
    Page {
        id: mainPage
        tools: toolBarLayout
        Button {
            anchors.centerIn: parent
            text: "Click me"
        }
    }
    ToolBarLayout {
        id: toolBarLayout
        ToolButton {
            flat: true
            iconSource: "toolbar-back"
            onClicked: window.pageStack.depth <= 1 ? Qt.quit() : window.pageStack.pop()
        }
    }
}
```



Qt Mobility

Mobility 1.0

Bearer Management API
Contacts
Location
Messaging
Multimedia
Publish and Subscribe
Service Framework
Sensors
System Information
Versit

Mobility 1.1

Camera
Document Gallery
Feedback
Landmarks
Maps/Navigation
Organizer
Service Framework – Out of process

Mobility 1.2

Connectivity (Bluetooth, NFC)



Qt – When?

Qt Versions for Symbian



Qt Support in the Nokia Store *

S^3 / Anna / Belle	S60 5th Edition	S60 3rd Edition (Qt 4.6)	MeeGo / Maemo
E7-00	X6-00	E72	N900 (>= PR1.3)
N8-00 / T7-00	C6-00	E71	N9
C7-00 / Astound / Oro	C5-03	E66	
C6-01	N97 (mini)	E63	
E6-00 / 702T	5800 XpressMusic	E52	
X7-00	5530 XpressMusic		
801T	5250		
500	5235		
603	5233		
700	5230		
701	5228		

Symbian: Smart Installer



http://wiki.forum.nokia.com/index.php/Nokia_Smart_Installer_for_Symbian

Note: Symbian Belle ships with Qt in the firmware and not on user memory – new firmware releases update Qt; however, the Smart Installer is still needed for updating (for example) Qt Quick Components.

Qt – Now!

Phones available to you

+ Change your local time: 24 Aug, 16:00 + (all of chosen device filter)

Filter by tag

How our service works: On top of a phone, choose reservation length and a 5/5 Year & data application will be downloaded to your computer. So using the phone.

You can make about 6 hours worth of reservations today.

+ Download dev cert for RDA device (read more about it)

Available now

Symbian Anna

 Nokia C6-01 0044021340334 +358447147476 SW 22.014	 Nokia E6-00 0044021340334 +358447147476 SW 22.014	 Nokia E6-00 0044021340334 +358447147476 SW 22.014	 Nokia E6-00 0044021340334 +358447147476 SW 22.014
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Symbian^3

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S60 5th Edition

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Free Remote Device Access

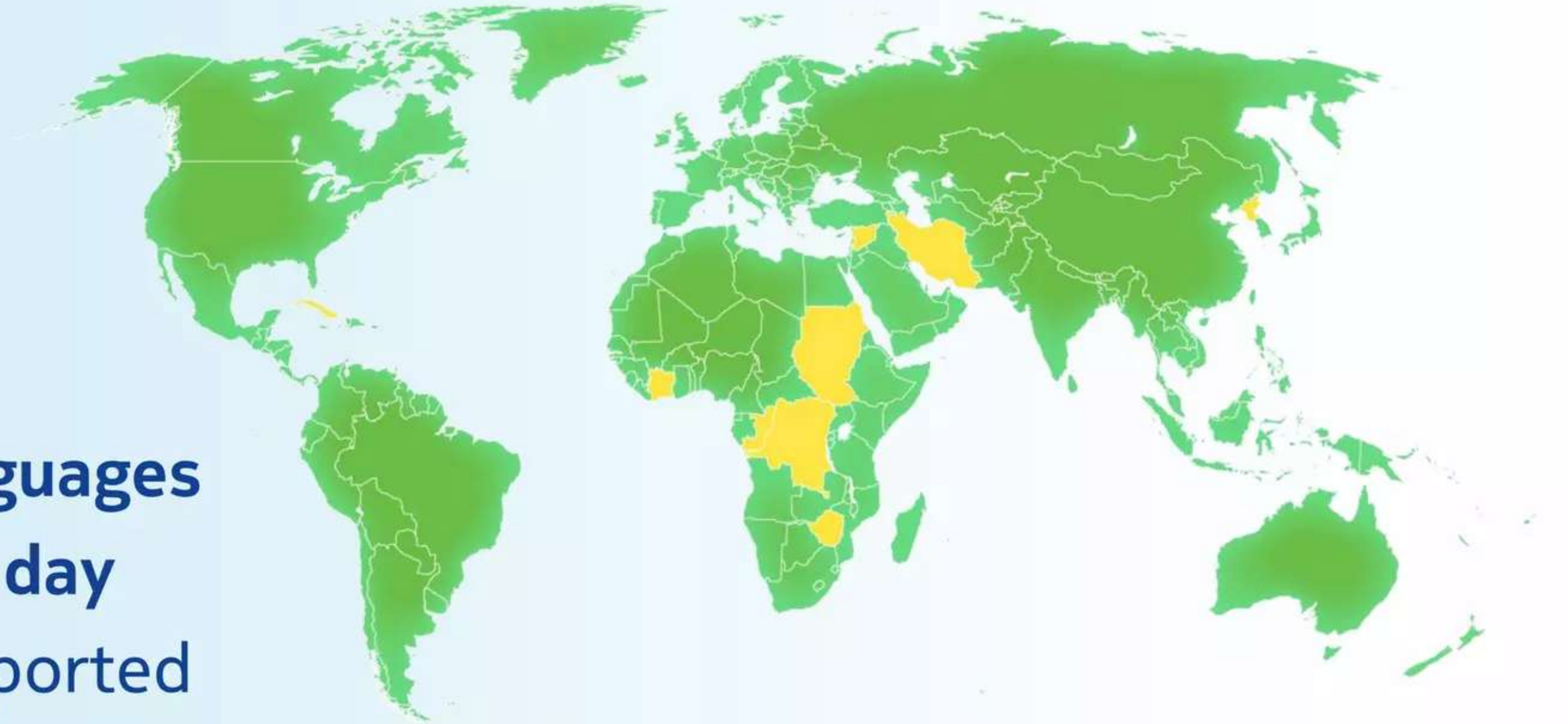


Reserve time on a real device
Full access to install and test your apps
www.developer.nokia.com/rda

Nokia Store



Nokia Store Statistics



190+ countries, 32 languages
11 million downloads / day
154 phone models supported
Operator billing in 46 countries
(credit card: 192 countries)

<http://www.developer.nokia.com/Distribute/Statistics.xhtml>

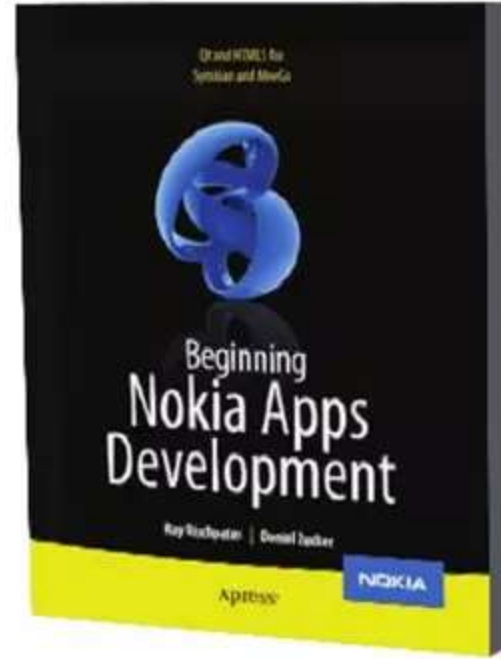
Where to find help?

- Qt SDK
 - Help, examples 
- Discussion boards, wikis
 - Nokia Developer: www.developer.nokia.com/Develop/Qt/
 - Qt Developer Network: developer.qt.nokia.com/
- e-Learning materials
 - www.developer.nokia.com/Develop/Qt/Getting_started/
 - qt.nokia.com/learning
- Community
 - www.qtcentre.org

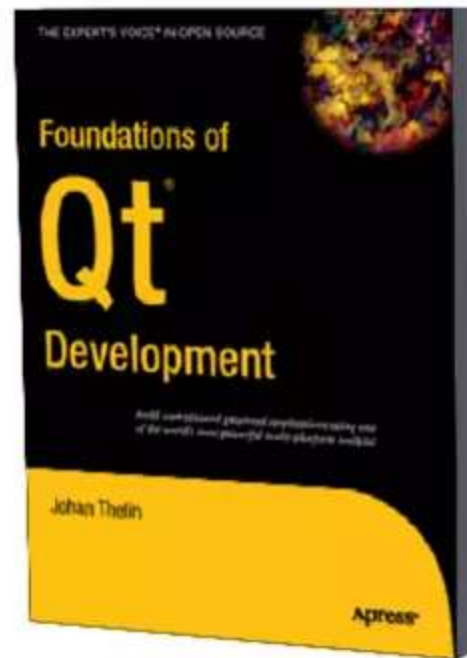


Qt Books

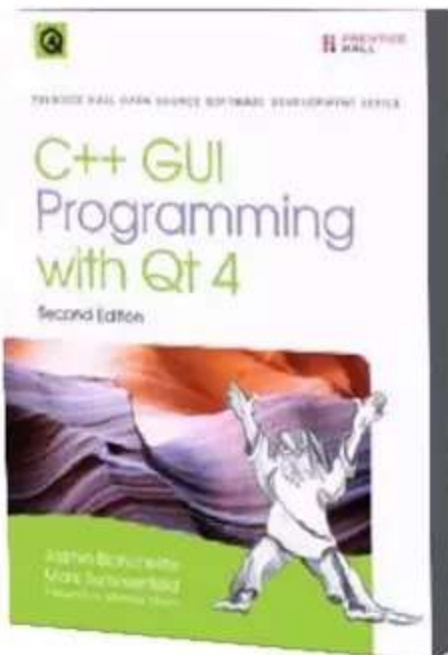
(some recommendations)



Beginning Nokia Apps Development
Ray Rischpater, Daniel Zucker. Apress.
Complete end-to-end story of developing for Symbian and MeeGo with Qt (Quick) and HTML 5.
Status: Qt 4.7, December 2010



Foundations of Qt Development
Johan Thelin. Apress.
More in-depth and technically oriented explanation of Qt – different approach to many other books. Generic Qt, no mobile.
Status: 2007



C++ GUI Programming with Qt 4 (2nd edition)
Jasmin Blanchette, Mark Summerfield. Prentice Hall.
Official book for generic Qt development (no mobile). Good for looking things up or for enhancing your knowledge, average for learning from scratch.
Status: Qt 4.3, 2008

Nokia Certified Qt Developer

- Official accreditation for individual developers
 - Confirms your **development skills** in Qt
 - Become **more attractive** in the job market!
 - **Qt Essentials exam:** 50 multiple choice questions, 60 minutes
 - **Qt Advanced exams:** widgets and C++



Nokia Certified
Qt Developer



Nokia Certified
Qt Specialist

Nokia Developer Champion & Qt Ambassador

- Active community member?
 - Be even more involved, improve your network and get rewarded!
 - **Nokia Developer Champion**
<http://www.developer.nokia.com/Community/Champions/>
 - **Qt Ambassador**
<http://qt.nokia.com/qt-in-use/ambassadors/qtambassador/>

NOKIA Developer
Champion



Universities

- Qt is a good way to teach software development
 - Instant results to motivate attendees
 - Graphical tools make entry easier
 - Flexible system, extensible with own libraries
 - ... and still standard C++!
- University support
 - Free Qt course materials under Creative Commons (PPT and OpenOffice)
<http://qt.nokia.com/learning/education/course-materials>
 - Nokia Developer University support
http://www.developer.nokia.com/Developer_Programs/Nokia_Developer_for_universities/



Your Feedback Counts!

- Not happy with the way something works? Found a bug?
 - Submit your Qt bug report or suggestion to:
<http://bugreports.qt.nokia.com/>
 - Unsure about what to include? The **guide** is here:
<http://developer.qt.nokia.com/wiki/ReportingBugsInQt>
 - Found a bug somewhere **outside** of Qt?
Report it here:
<http://www.developer.nokia.com/Support/>
 - Also go to the above URL to buy a **commercial support ticket** if needed!



Thank You.

Want to learn more?

<http://developer.nokia.com/Qt>

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