



Developing Embedded Devices with Qt

The Qt Company

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Writing Software for Application
Processors can be Overwhelming

Desktop and Mobile platforms are less overwhelming

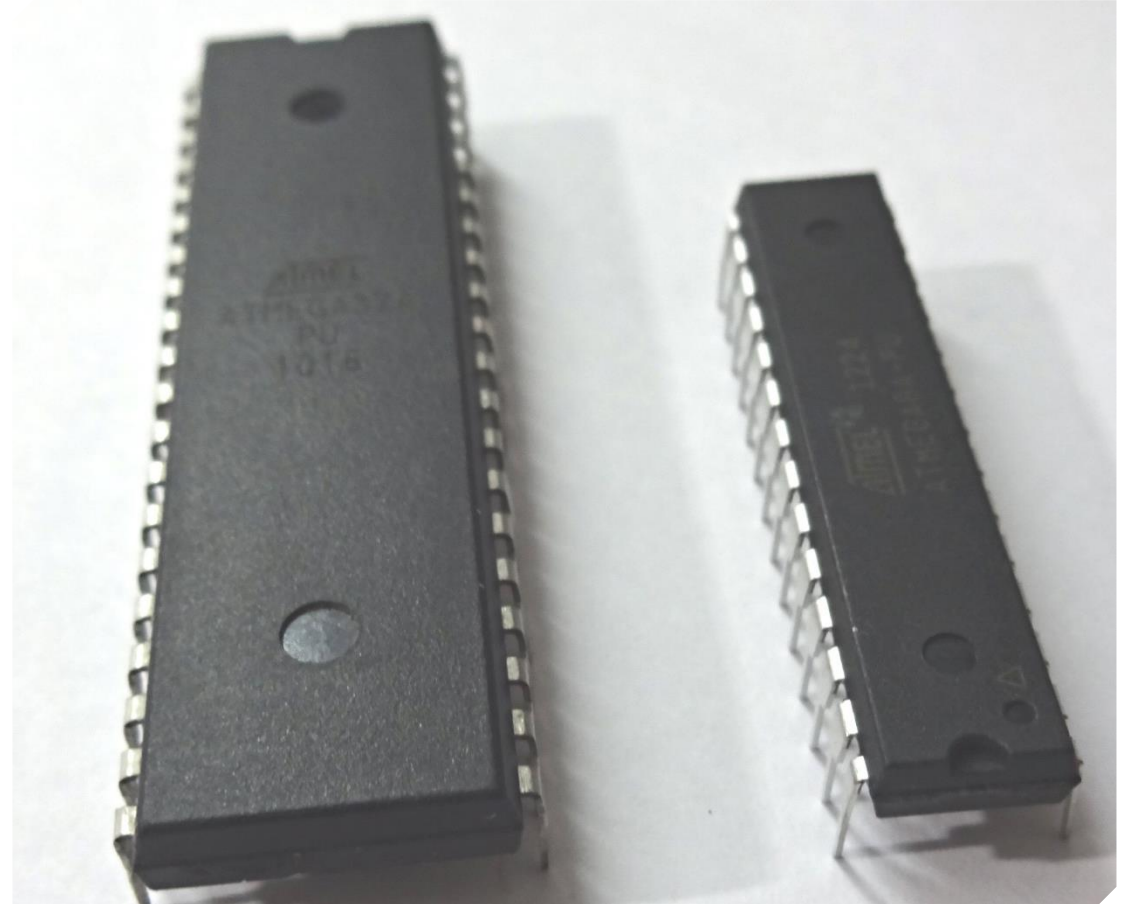
- › Many of the hard decisions are already made:
 - › Operating System
 - › Native API's
 - › Available Toolchains
 - › IDE and Tooling



Microcontrollers put you in Control

(but not more than you can handle)

- › Bare metal programming
- › You choose the OS
- › You build the OS
- › You could write the OS!
- › You can write or at least see every line of code that runs on the device.





Application Processors

- › The control of a Microcontroller
- › The features of a Desktop
- › More features, more problems

Pick an Operating System / Kernel

- › Linux
- › Android
- › QNX
- › Integrity
- › VxWorks
- › *BSD

Decide what will be in your Stack

- › Want graphics?
 - › You need a graphics tool kit like Cairo
- › Want to render scalable text?
 - › You need Freetype
- › What about non-trivial text layouts?
 - › You need harfbuzz
- › Do you want to play sounds?
 - › You need ALSA
- › What if I'm not on linux?
 - › You need other things than above!

Decide on a Toolchain

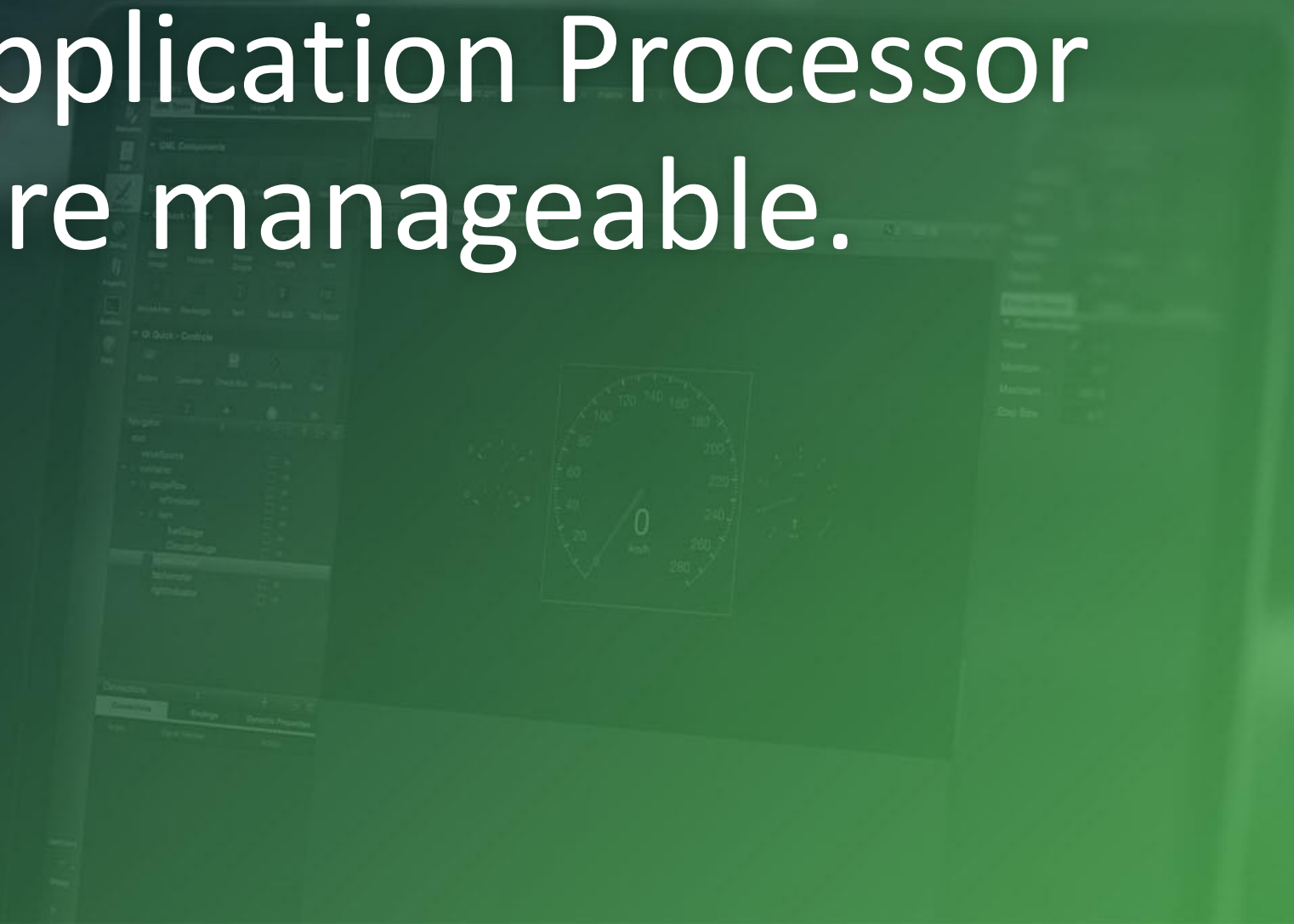
- › Needs to be able to build not just your kernel and your Application, but also everything else on your system.
- › Can I cross compile from Windows?
- › Good support for debugging and profiling

Platform Complexity

- › Unlikely to manage every line of code
 - › Lots of Shared Libraries that will make up stack
 - › Operating Systems are feature rich
- › Impractical to write every line of code
 - › Won't get the most value out of hardware
 - › Not all hardware will have open specs
 - › GPU
 - › Wireless devices

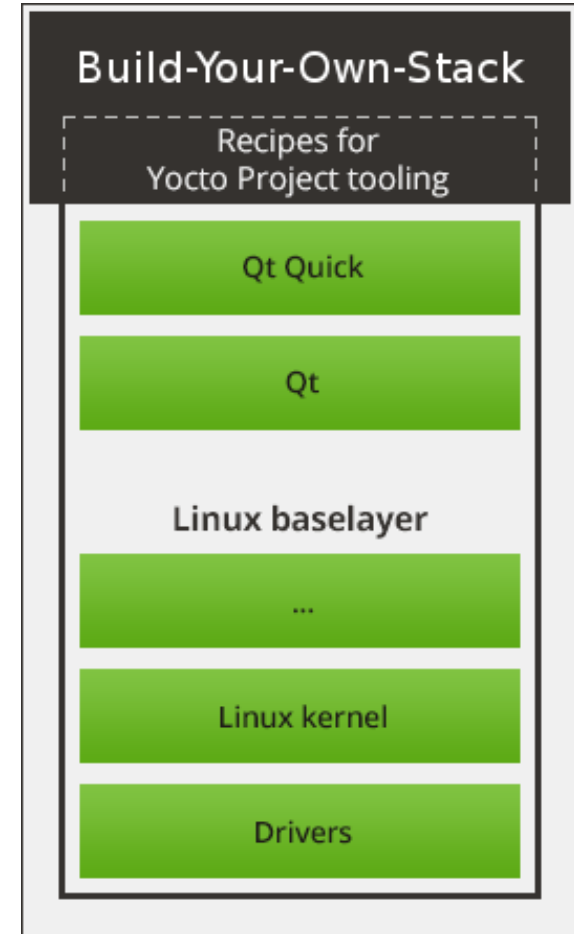


Qt makes Application Processor
projects more manageable.



The Qt Framework is Middleware

- › No matter what OS you pick, the Qt APIs will be the same
- › Qt becomes the “native” platform
 - › How do I show text
 - › How do I request data from a database
 - › How do I read from a Bluetooth sensor
 - › How do I play an alarm
 - › The answer is there is a Qt API for that!





Qt Tooling is your SDK





Qt Creator





Qt provides APIs to make application development cycles shorter.



Qt UI Offering – Choose the Best of All Worlds



Qt Quick

C++ on the back, declarative UI design (QML) in the front for beautiful, modern touch-based User Experiences.



Qt Widgets

Customizable C++ UI controls for traditional desktop look-and-feel. Also good for more static embedded UIs for more limited devices / operating systems.



Web / Hybrid

Use HTML5 for dynamic web documents, Qt Quick for native interaction.

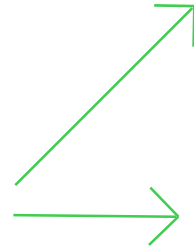
Rapid Workflow with Qt Quick



Designer



Developer



Declarative UI Design

Stunningly Fluent Modern User Interfaces, written with QML.
Ideal for rapid UI prototyping.

Imperative Logic

Power of Cross-Platform Native Qt/C++



Core

Processes, Threads,
IPC, Containers,
I/O, Strings,
Etc.

Network

HTTP
FTP
SSL

Sql

SQL
&
Oracle
Databases

XML

Bluetooth

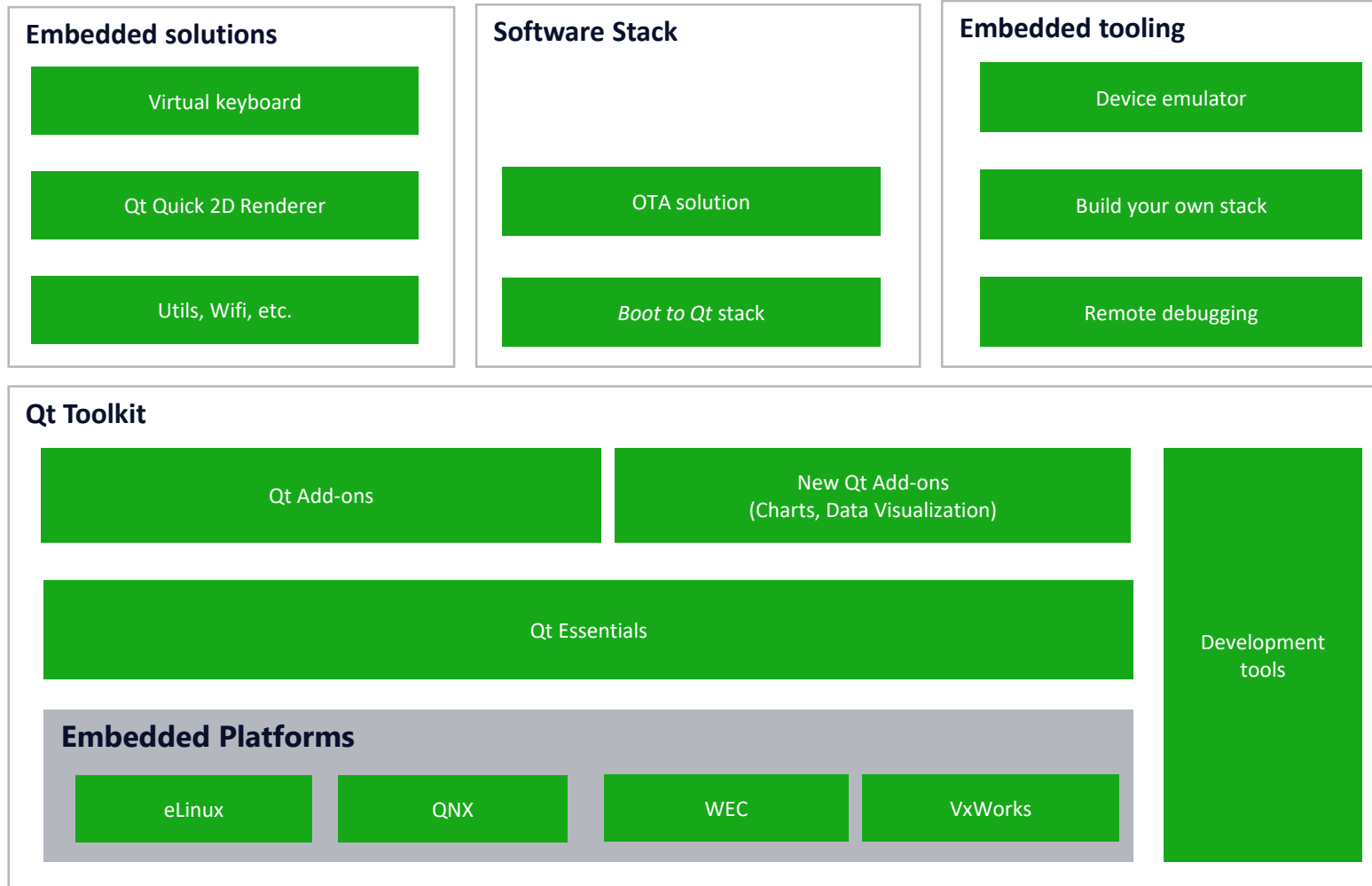
Positioning

NFC

Serial Port

+ Direct Hardware Access

Qt for Device Creation Developer Offering



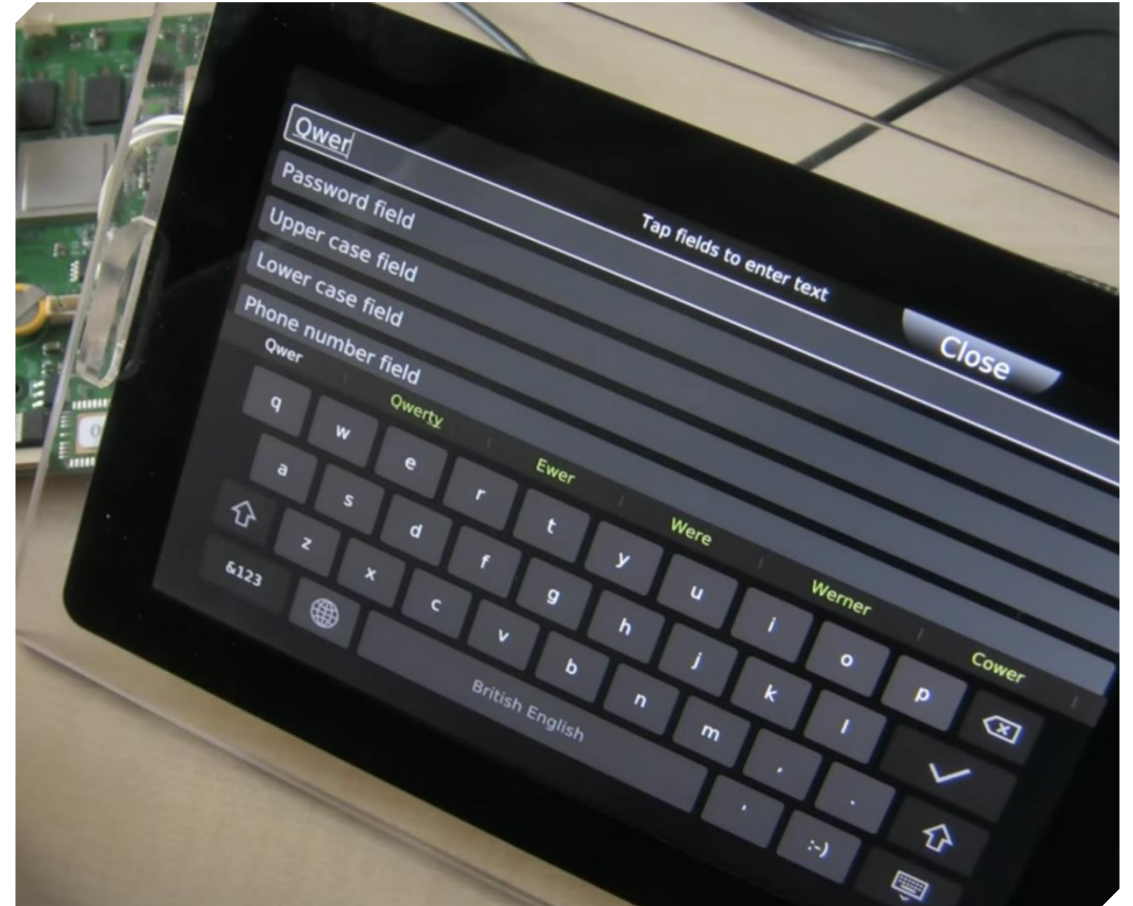


Boot to Qt Software Stack

- › Immediate Embedded Prototyping
- › Kick-start to Embedded Projects
- › Full Customization through the Yocto Project tooling

Qt Virtual Keyboard

- › Full onscreen keyboard solution
- › Customized styling
- › Handwriting Support
- › Asian input methods



Qt Framework Overview

Add-Ons

Canvas 3D	Charts	Qt Quick 2D renderer	Data Visualization	Purchasing
Active Qt	Graphical Effects	NFC	Location	Qt 3D
X11, Windows, Mac Extras	Print Support	Sensors	Concurrent	WebEngine
Android Extras	Image Formats	Positioning	Serial Port	WebSockets
XML & XML Patterns	SVG	Bluetooth	D-Bus	WebChannel

Essentials

		Multimedia Widgets	Quick Dialogs	Quick Controls
GUI	Widgets	Multimedia	Quick Layouts	Quick
Core	Network	SQL	Test	QML

Desktop & mobile platforms

Windows	Mac	Linux Desktop	Android	iOS	WinRT
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Development Tools

Qt Creator Cross-platform IDE	CPU usage analyzer
Qt Designer GUI Designer	QML Profiler
Qt Linguist l18N Toolset	Clang static analyzer
Qt Assistant Documentation Tool	Qt Quick Compiler
moc, uic, rcc Build Tools	Qt Visual Studio Add-In
qmake Cross-platform Build Tool	Autotest integration

How can you integrate Qt into your Project?

- › Source Code

- › Linux

 - › Yocto Project

 - › Buildroot

 - › Timesys

- › Android

- › QNX

- › VxWorks

- › Integrity



Thank you!

Check out our website at qt.io for more info

Twitter: @nezticle