Qt in Industrial and Infrastructure Automation

Roadmap and focus on a growing market

Michele Rossi, Product Manager Automation & IIoT

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Agenda

- Why Qt in Automation
- Our mission
- Qt for Automation
- Qt values for automation challenges

Why Qt in Automation

5.5 M Connected Daily

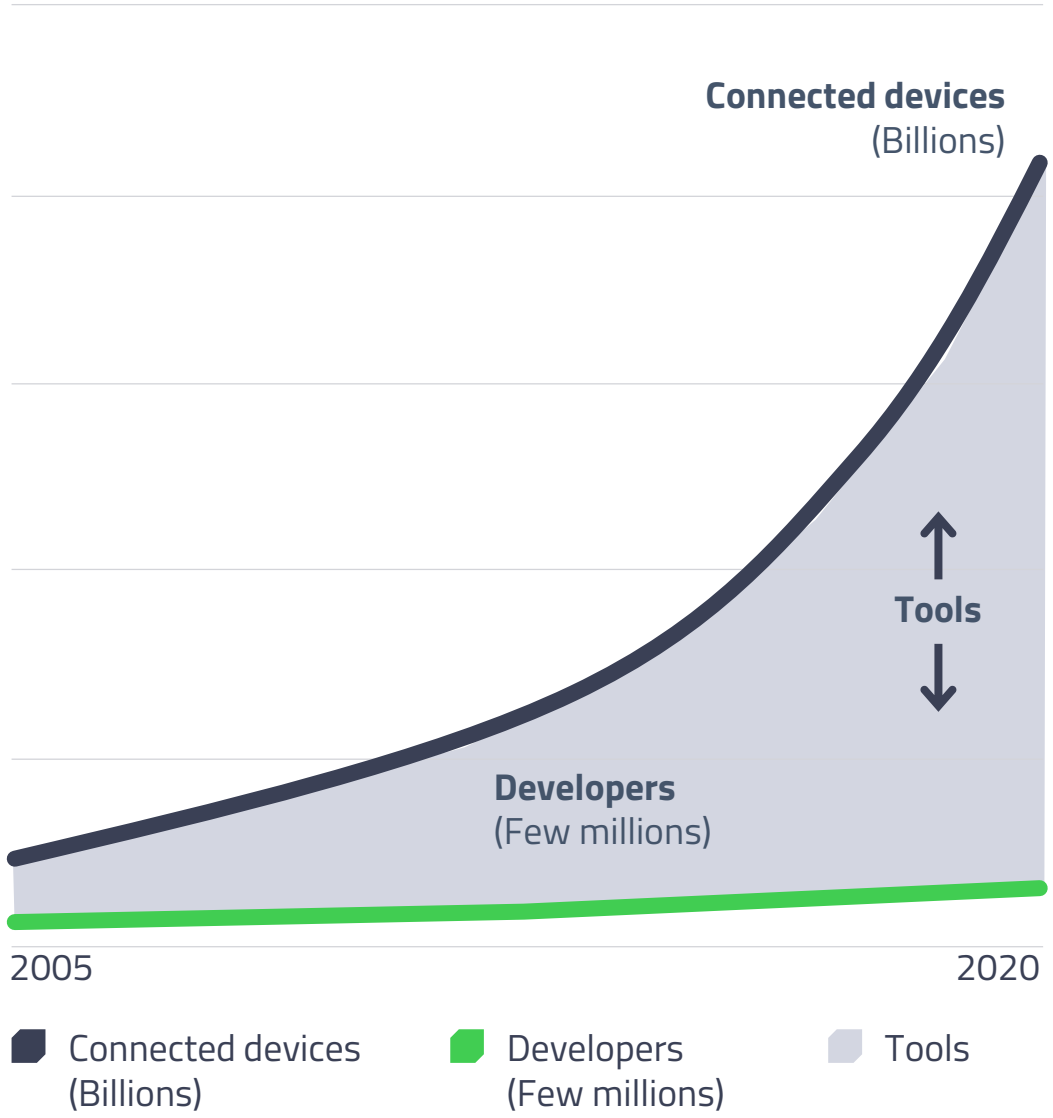
6.4 Billion new things connected in 2017

Driving Factors

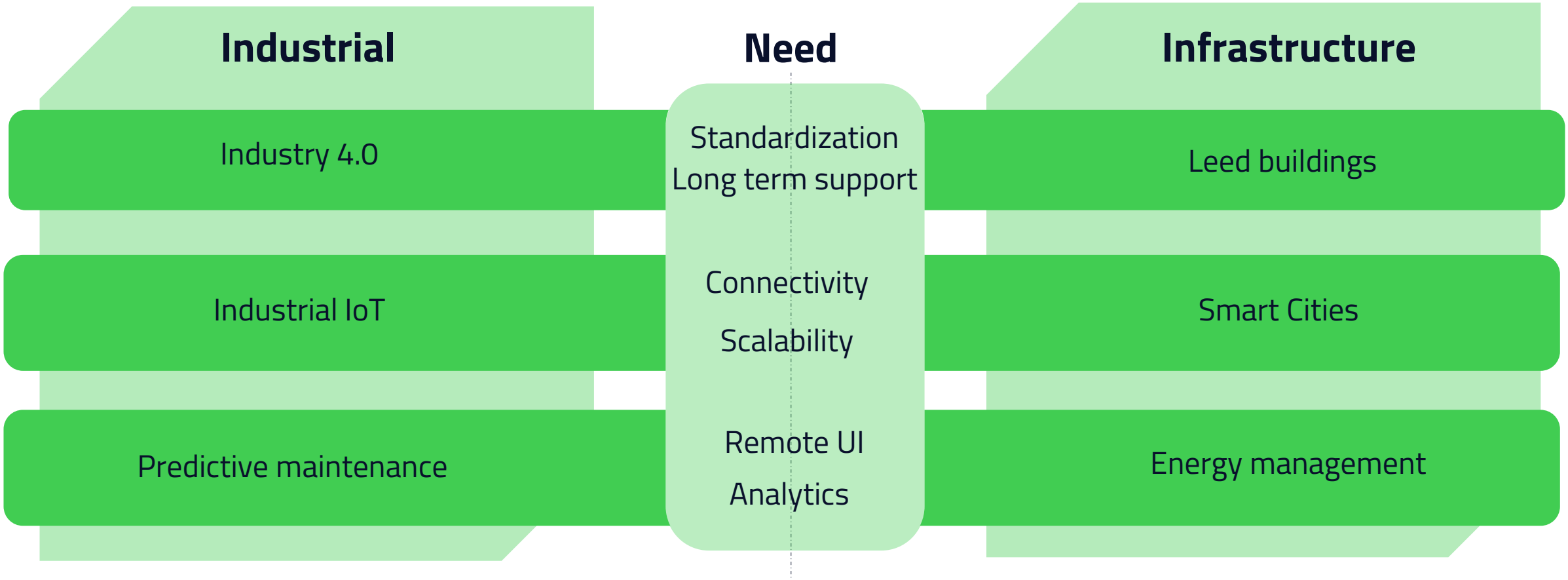
- Evolving Connectivity
- Standardization
- Downscaling of Devices/Sensors

Automation Challenges

- Scalability
- Interoperability
- Long term support
- Future Business Models



Common needs in two different scenario



Concrete challenges in Automation scenario

- Complex Alarm management
- Collections of information via DDS protocol integration
- Crossplatform capabilities running in small and big devices both

Bringing digitalization into Industry 4.0

- Multiple APPs grouped in categories such as Production or Support each with a single concise scope

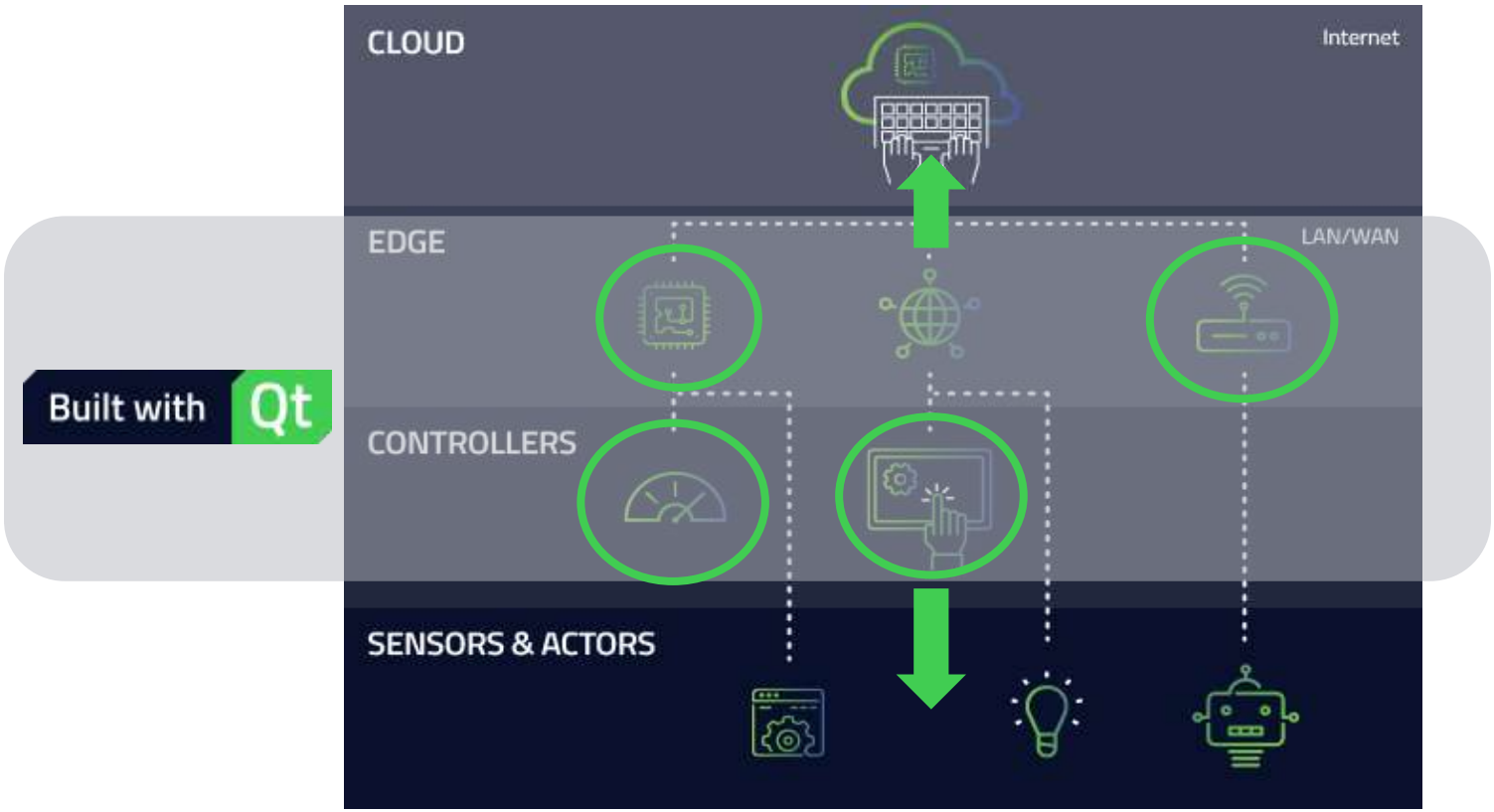
CELOS is horizontally integrated

  - APP JOB MANAGER
  - JOB SCHEDULER
  - JOB ASSISTANT

Connectivity to enterprise resource planning tools

Qt in Industrial & Infrastructure Automation

Solutions at the edge of the internet



- Connectivity
- Tooling
- Remote UI
- Safety and Security
- Advanced UI

Qt in Automation evolving use cases








New scenarios

Built with Qt

Home hub

Industrial gateways

Digital Twins

Predictive maintenance

Augmented Reality

Remote maintenance

Remote Trainings

Automation related release schedule

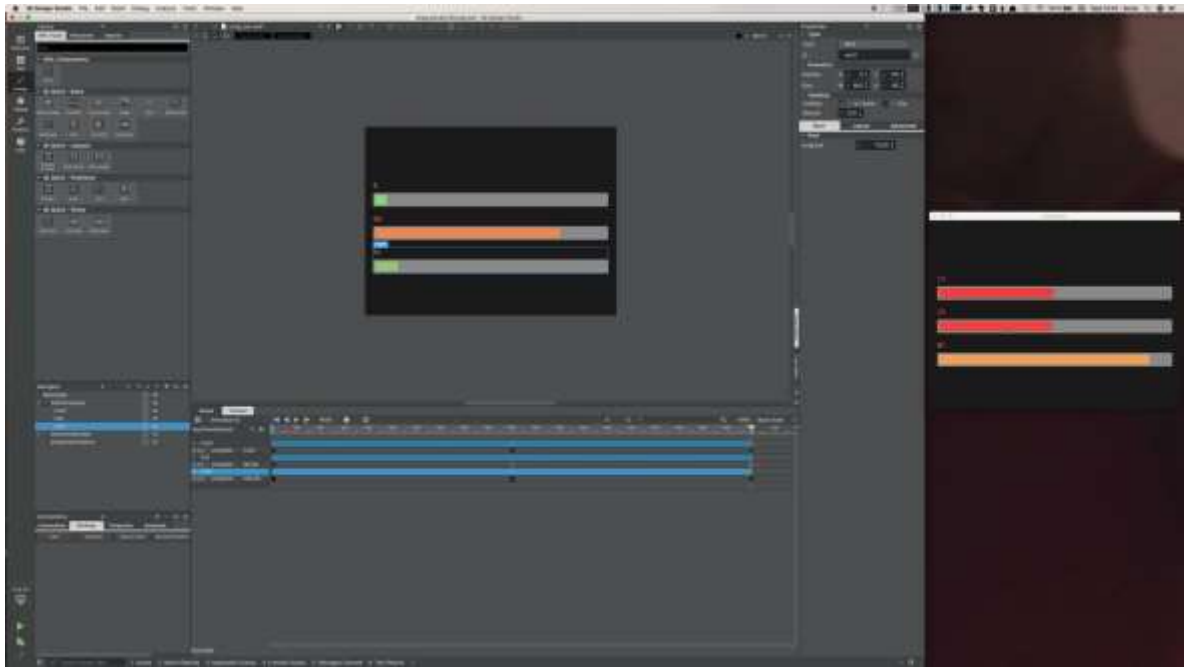
	Add-on Qt for Automation 1.0 (Qt 5.10)	Add-on Qt for Automation 5.11 (Qt 5.11)
Qt SerialBus	✓	✓
Qt VNC	✓	✓
Qt WebGL Streaming	✓ (TP)	✓ (TP)
Qt Webassembly	✗	✓ (TP)
Qt MQTT	✓	✓
Qt KNX	✓ (TP)	✓
Qt OPC UA	✗	✓ (TP)

Qt Tooling

Enhancing your HMI application in automation. Easy, quick, smart.

The connection between designer and developers:

- Qt Creator
- Boot2Qt
- Qt Quick Designer
- Qt 3D Studio
- Qt Charts
- Language management

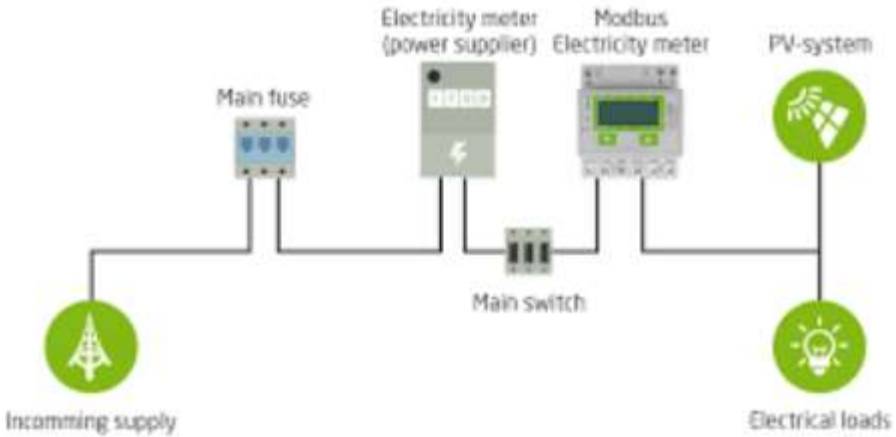


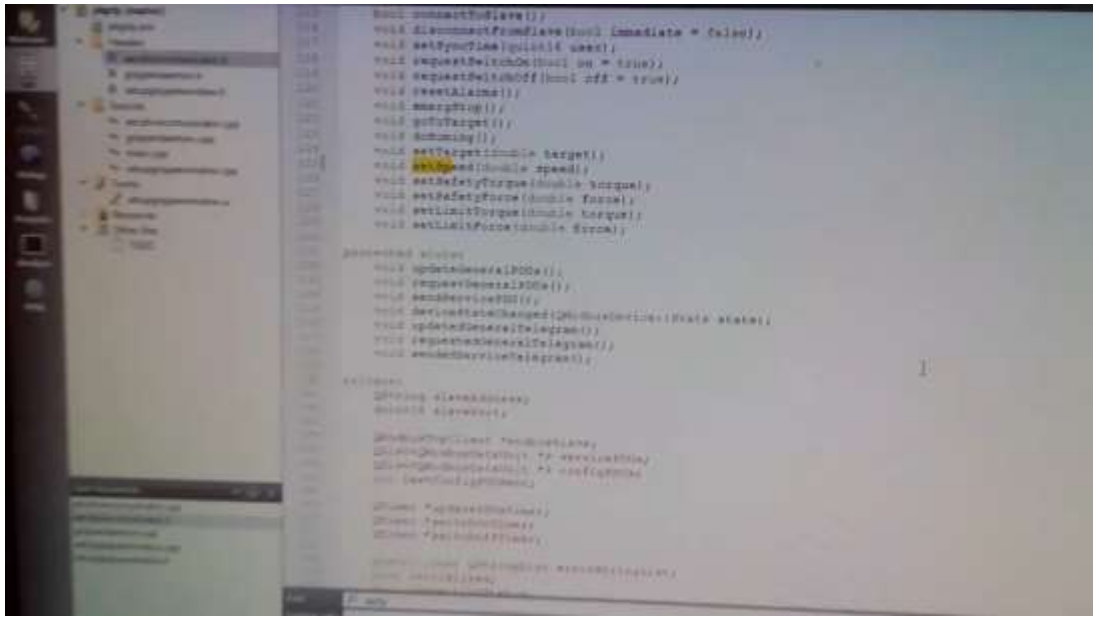
Qt SerialBus

Qt Serial Bus API allow to integrate devices and peripherals using industrial serial buses and protocols.

Control and monitor your industrial peripherals directly from Qt APIs

- CanBus
- ModBus
  - QModbusDevice provides an API for common functionality with client and server.
  - QModbusClient provides an API for direct access to Modbus client.
  - QModbusServer provides an API for direct access to Modbus server.
  - QModbusDataUnit represents a data value.
  - QModbusReply is created by QModbusClient as a handle for write/read operation



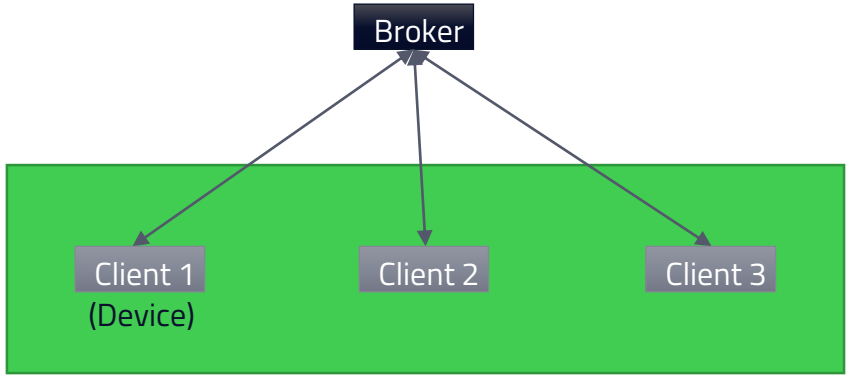


Qt MQTT

Lightweight, Reliable, Secure, QtMQTT simplify the connectivity for Industrial IoT solutions.

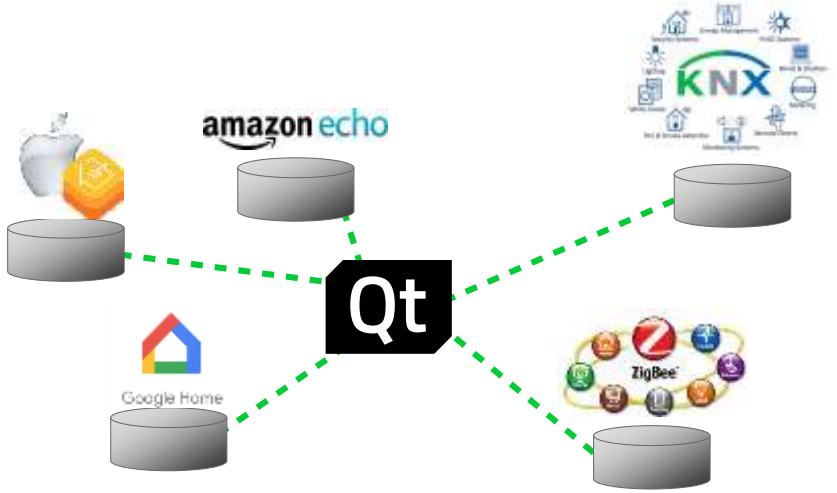
Enable device communication and telemetry applications:

- Protocol level 3.1 and 4 (resp. 3.1.1)
- All QoS levels
- Wildcards
- Authentication
- SSL connections
- Last Will support



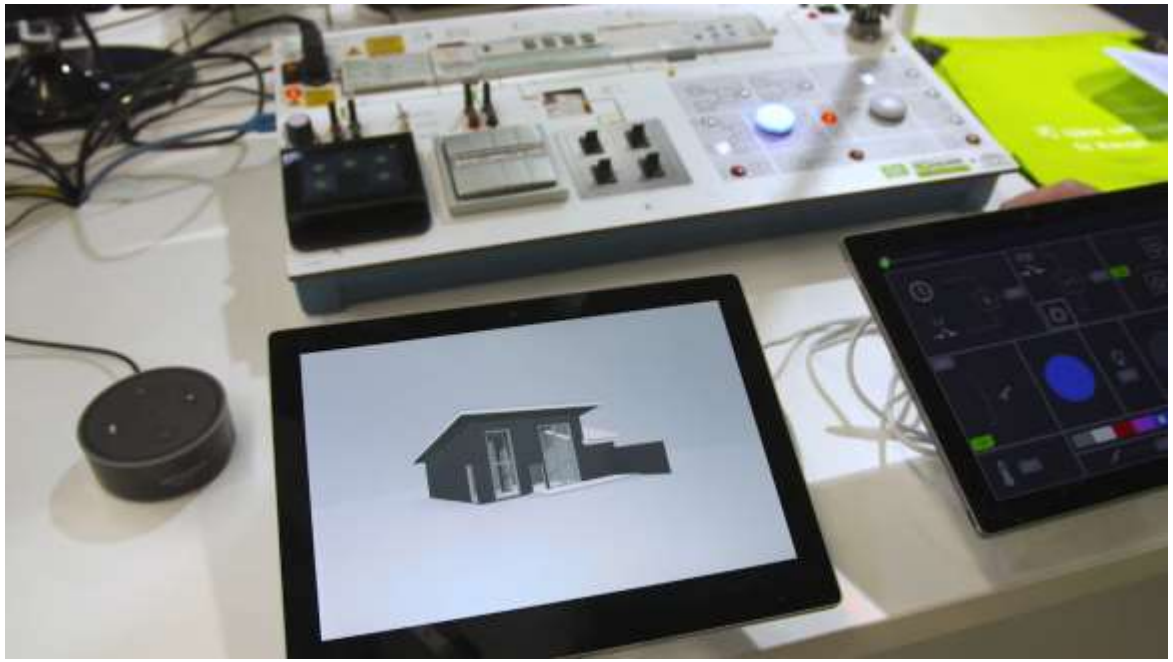
Qt KNX

Building automation made easy with Qt KNX protocol module allow to integrate different players in one framework.



All functionalities to build a client application:

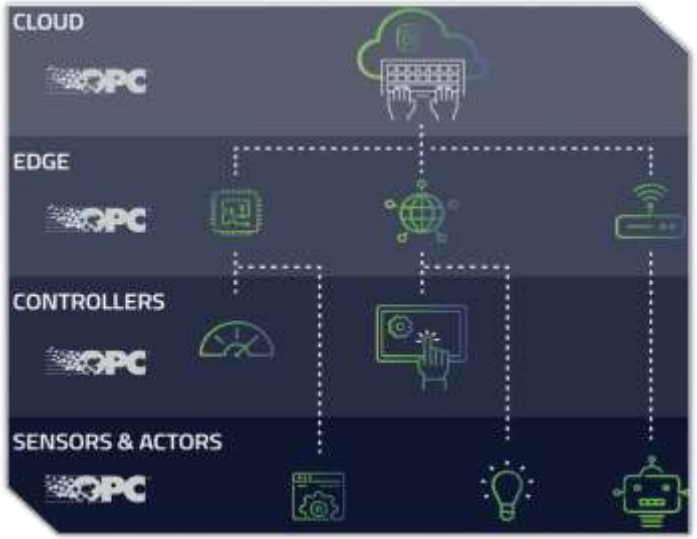
- Discover and connect to KNX NET/IP servers
  - Tunnel
  - Management
- Basic read / write and local management functionalities:
  - Local management: management functionality on NET/IP server



Qt OPC UA

Next generation of Industry 4.0 applications with Qt

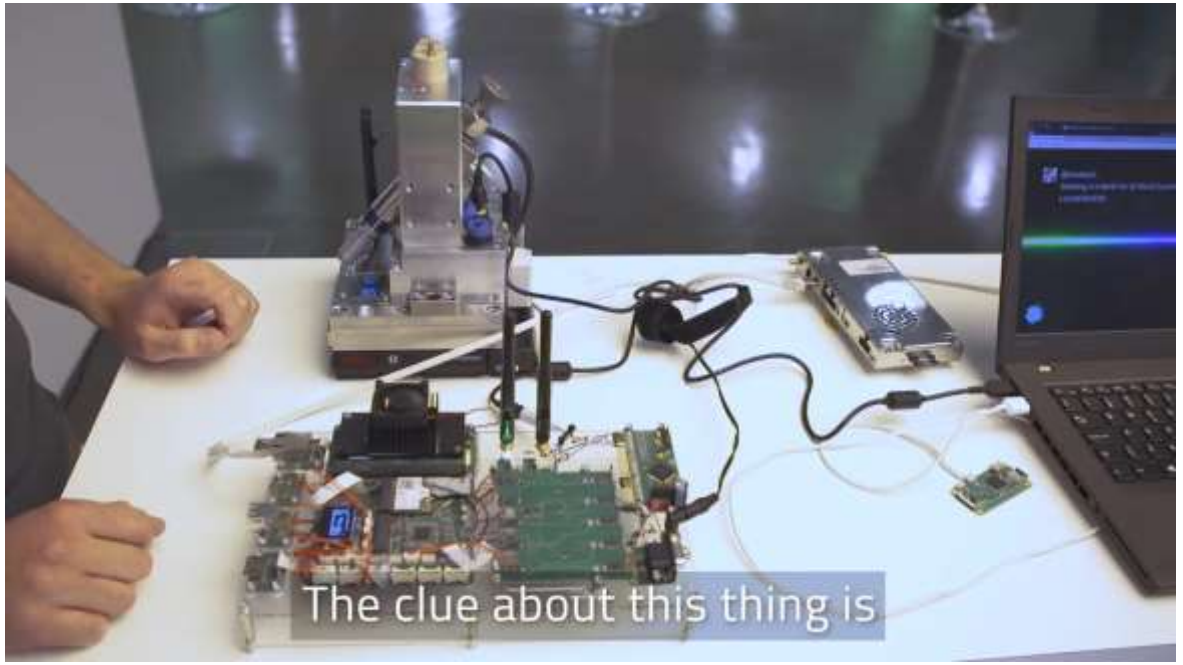
- Supporting Multiple Backends
  - FreeOpcUA
  - Open62541
  - Unified Automation
- Client implementation:
  - Connection management
  - Node querying
  - Data handling (read/write)
  - Method handling
- Next Stop: Events, Secure Channels



Qt WebGL

Predictive maintenance made easy with WebGL remote UI solution

- Use a browser to remotely control an application in any device
  - Streaming of OpenGL commands via compressed WebGL over websockets
  - User input in a return channel
  - Works with common web browsers without additional installations
- Uses Qt webserver deployed on device



Mirroring (PoC)

Proof of concept on top of WebGL video streaming, enabling remote training and remote maintenance use cases in automation

- Using Qt Remote Objects in order to Mirror GUI to an external browser
- Use a browser to remotely control an application in any device
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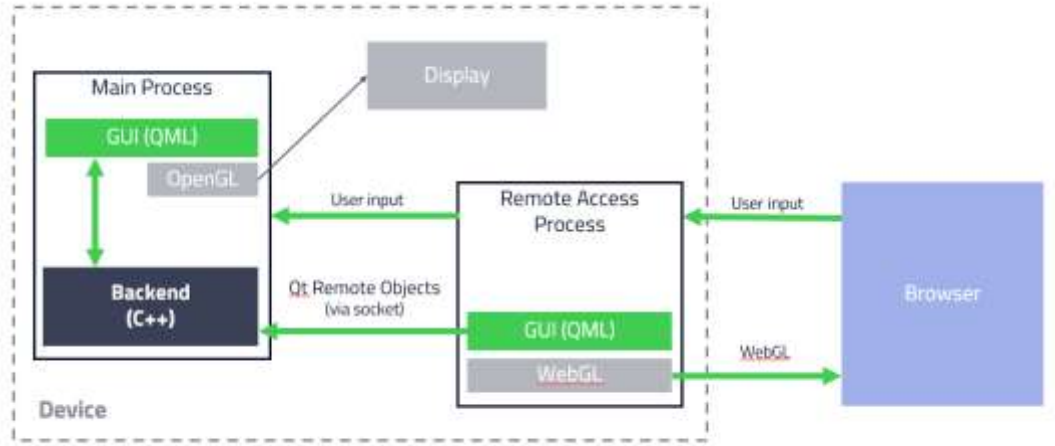
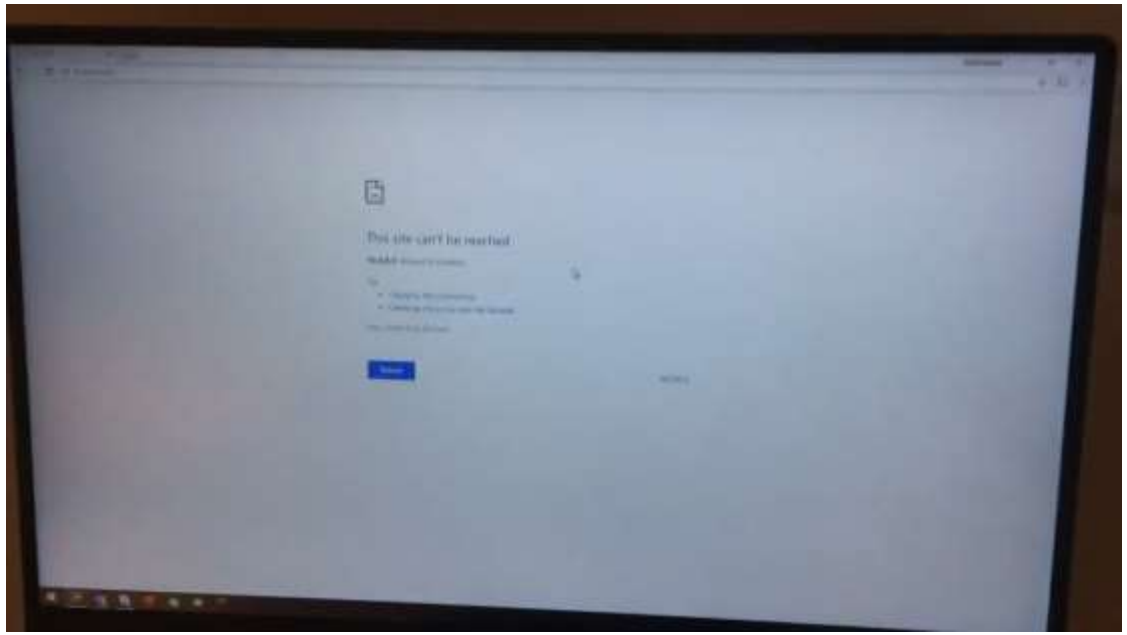




Qt WebAssembly

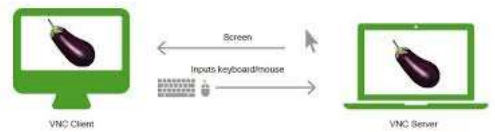
Run Native Qt Applications in a browser enabling 0 installation infrastructure

- Utilize the CPU power by native execution
- Zero installation on all form factors (desktop, mobile)
  - Applicable to mobile all platforms (iOS, Android)
  - Applicable to desktop platforms (MacOS, Win10)
- Decide to have the business logic on server/remote
- Almost no additional testing effort
- Use one reliable and performant tool chain (design & coding) for all scenarios
- Use case example run SCADA system in the cloud

Qt Enable Zero Installation Applications

	VNC Server In Qt 5.9 and later releases	**WebGL Streaming** In Qt 5.10 TP	**WebAssembly** In Qt 5.11 as Technology Preview (TP)
Use-Case	Cloning/Mirroring	Exclusively Streaming	Zero installation Qt application over a browser
Information Sent	Compressed Images	GL Drawing calls	Requests to webserver
Client	Any VNC Client (even Browser)	Browser only	Browser only
Quality	Lossy	Lossless	Lossless
Content Rendering	Server	Client/Browser + Server generating UI (Bigger load on a server side)	Client only (Less load on a server side)
User	Single User	Single User (in Qt 5.10)	Multi-User (e.g. up to 1000 or more clients)
Optimization to	Highly Dynamic Image Based Content	Native Qt Applications (only QtQuick application)	Native Qt Applications (also Widget technology)
Latency	High	High	Low latency
Server backend	VNC server requested	Qt integrated Webserver mandatory	Running on every webserver

Remote control of a dekstop application



Headless device control / monitoring

SCADA / Industrial HMI application

How to get ‘Qt For Automation‘

Commercial License

1. Purchase add-on license on your existing Qt license
2. Contact your Sales contact person for a quotation

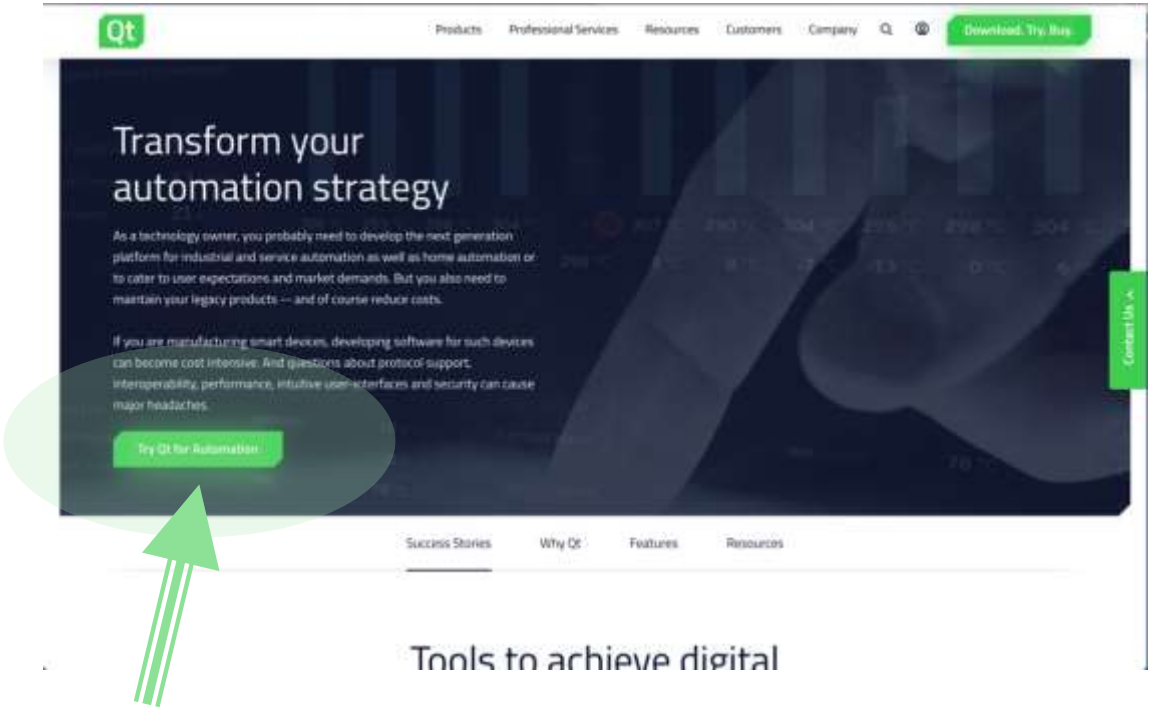
Qt for Automation add-ons

Qt for Device Creation

Qt for Application Development

Evaluation License

1. Ask your Sales contact person
2. Download from https://www.qt.io/qt-in-automation/



Thank You!

Let’s start with questions

michele.rossi@qt.io