QtWidgets and QtQuick.Controls - A Comparison

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Presented by Kevin Krammer

kevin.krammer@kdab.com

- **The Question**
- Side-by-Side Comparison
- Conclusions

What should I use for a new project:
QtWidgets or **QtQuick.Controls**?

It depends!

- The Question
- **Side-by-Side Comparison**
- Conclusions

Base Line

- Set of standard interface elements
  - e.g. Button, CheckBox, Slider
- Layouting
- Styling
  - Platform Look&Feel
  - Custom
- Application Window
  - Menu Bar, Tool Bar, Status Bar, etc
- Dialogs
  - Standard Dialogs
  - Base for Custom Dialogs

QtWidgets

- System
  - Graphics Buffers
- Qt Version
  - basically any
- Programming Languages
  - For Use
    - C++
    - (QML + JavaScript with QML registered widgets)
  - For Extending
    - C++

QtQuick.Controls

- System
  - OpenGL
- Qt Version
  - > 5.1
- Programming Languages
  - For Use
    - QML + JavaScript
  - For Extending
    - QML + JavaScript (composition)
    - C++ (custom rendering)

QtWidgets

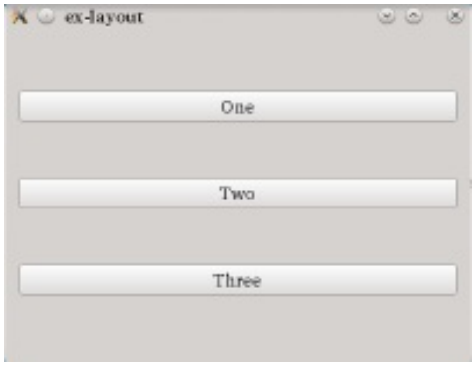
- Horizontal/Vertical Box Layout, Grid Layout, Form Layout
  - Layouts "fill" parent widget
- Widgets provide:
  - Size Hints
  - Size Policies
- Developer can override size hint, set policy

QtQuick.Controls

- RowLayout, ColumnLayout, GridLayout, Anchors (relative positioning)
  - Layouts need to be explicitly sized or anchored
- Controls provide:
  - Implicit Size
- Developer can attach resize hints

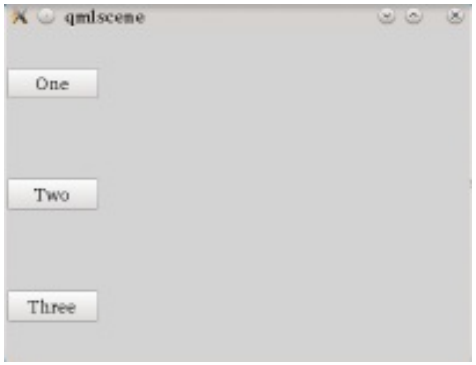
Layouting - Example

QtWidgets




```
1  QVBoxLayout *layout = new QVBoxLayout(this);
2
3  QPushButton *one = new QPushButton("One");
4  layout->addWidget(one);
5
6  QPushButton *two = new QPushButton("Two");
7  layout->addWidget(two);
8
9  QPushButton *three = new QPushButton("Three");
10 layout->addWidget(three);
```

QtQuick.Controls




```
1  ColumnLayout {
2      anchors.fill: parent
3
4      Button { text: "One" }
5      Button { text: "Two" }
6      Button { text: "Three" }
7  }
```

QtWidgets

- Platform Native Styling
- Qt Style Sheets (QSS)
- `QStyle` Plugins

QtQuick.Controls

- Platform Native Styling
- Style Component
  - Replace parts of the control

Styling - Example

QtWidgets


```
QPushButton *button = new QPushButton("Click Me!", window);
button->setStyleSheet("QPushButton {background-color: white}");
```

QtQuick.Controls


```
1  Button {
2      x: 50; y: 50
3      text: "Click Me!"
4
5      style: ButtonStyle {
6          background: Rectangle {
7              color: "white"
8              border.color: "#ABABAB"
9          }
10     }
11 }
```

Application Window

QtWidgets

- `QMainWindow`
  - Menu Bar
  - Status Bar
  - Any number of Tool Bars
    - Adding actions results in Tool Buttons
  - Dock Widgets
  - Central Widget resized with window

QtQuick.Controls

- `ApplicationWindow`
  - Menu Bar
  - Status Bar
  - One Tool Bar
    - Create Tool Buttons, then associate action
  - Content item needs explicit resize handling

QtWidgets

- Standard Dialogs
  - Color, File, Font, MessagBox, Print, Progress, Wizard
- Custom Dialogs
  - Base type `QDialog`
    - Modal and Non-modal
  - `QDialogButtonBox` for platform correct button handling
    - access to individual buttons possible
  - `accept/reject` can be intercepted

QtQuick.Controls

- Standard Dialogs
  - Color, File, Font, Message
- Custom Dialogs
  - Base type `Dialog`
    - Modal and Non-modal
  - standardButtons for platform correct button handling
    - currently not access to buttons
  - All actions close the dialog

QtWidgets

- Qt Designer in QtCreator and stand-alone
  - Code generated by UIC
  - Used by delegation in custom classes
- Testing
  - QtTest for unit testing
  - Squish for UI testing
- Gammaray for runtime inspection
- C++ tools for debugging/analysis of custom code

QtQuick.Controls

- QtQuick Designer in QtCreator
  - Manipulates QML code directly
  - Use by manual editing of the same files
- Testing
  - QtTest for unit testing
  - Squish for UI testing
- Gammaray for runtime inspection
- QtCreator JS debugger/profiler

- The Question
- Side-by-Side Comparison
- **Conclusions**

Conclusions

- Both technologies viable for wide range of projects
- QtQuick.Controls not as complete yet but rapidly evolving
- Knowledge of types easily transferable
- Knowledge of behavior not always applicable