

Usage of QML Tools

Coding, Debugging & Performance

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iOS



QML



Overview of existing tools



Get feedback and feature requests

Coding

QML/JS Editor
Qt Quick Designer



Debugging

C++/QML Debugging
Inspector
Console

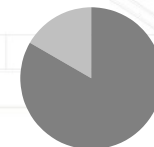


Profiling

QML Profiler



Q&A



How many of you use Qt Creator for Qt Quick application development ?



Qt Creator

Command Line

Coding

QML/JS Editor
Qt Quick Designer

Debugging

C++/QML Debugger
Inspector
Console

Console APIs

Profiling

QML Profiler

QML Profiler*



1) Qt Creator 2.6.0

2) Qt Quick 1 – Qt 4.8.x and Qt 5.0.0
and Qt Quick 2 – Qt 5.0.0

(Deviations are indicated with ✖)


```
do {  
    var pill = getPill()  
} while (pill.color === Qt.color("blue"))
```


It understands the QML code model

Code faster

- Code navigation
- Auto-completion
- Qt Quick toolbars

Reduce errors

- Syntax check

Maintain code

- Code refactor

Easy to read

- Semantic Highlight

```
function loadPuzzle() {  
    if (gameCanvas.mode != "")  
        Logic.cleanUp();  
    Logic.startNewGame(gameCanvas, "puzzle", "levels/level"+acc+".qml")  
}  
function nextPuzzle() {  
    acc = (acc + 1) % 10;  
    loadPuzzle();  
    if (a == 1)  
        acc = 10  
    this is Surely an Error  
}  
Timer {  
    id: gameOverTimer  
    interval: 1500  
    running : gameCanvas.gameOver && gameCanvas.mode == "puzzle" //mode  
    repeat : false  
    onTriggered: {  
        Logic.cleanUp();  
        nextPuzzle();  
    }  
}  
Image {  
    source: "content/images/background.png"  
    anchors.fill: parent  
}  
GameArea {  
    id: gameCanvas  
    z: 1  
    width: parent.width
```

Expected token `;`

Qt Quick toolbar

320x480

Code faster

Minimize manual coding
UI component library
Visual feedback

Quick Prototype

Easy to use

Lets you create apps
even if you are not a
coder.



UI Component Library



Currently supports Qt Quick 1. Support for Qt Quick 2 is ongoing.



Client Server architecture



Device running Qt Quick application

TCP/IP



Developer Machine

1) A TCP server is started that listens to connections on a specified port.

3) Server advertises available services.

2) A TCP client connects to specified port.

4) Service clients connect to respective services.
(Only one client per service is accepted.
All clients share the same port.)



An open port presents a security risk.
Ensure that the port is properly
protected by a firewall.

1) Enable TCP Server✱

Compile with qmake argument

CONFIG+=declarative_debug for Qt Quick 1 apps or

CONFIG+=qml_debug for Qt Quick 2 apps.

2) Specify Port

- Pass -qmljsdebugger=port:xxxx as a command line argument.
- [,host:<ip address>] optional arg specifies the IP address
- [,block] optional arg blocks the GUI thread until a profiling client is connected to the TCP server.

3) Attach a Profiling Client

Connect a profiling client to the TCP server at known address and port.

Debugging: C++/QML Debugger

(1/2)

Qt DeveloperDays
2012

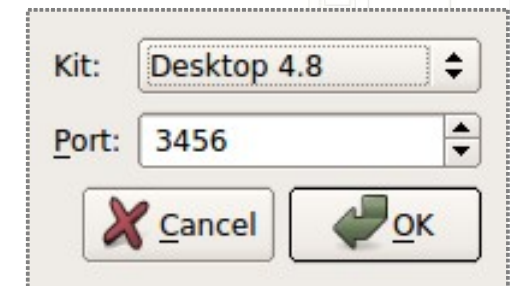
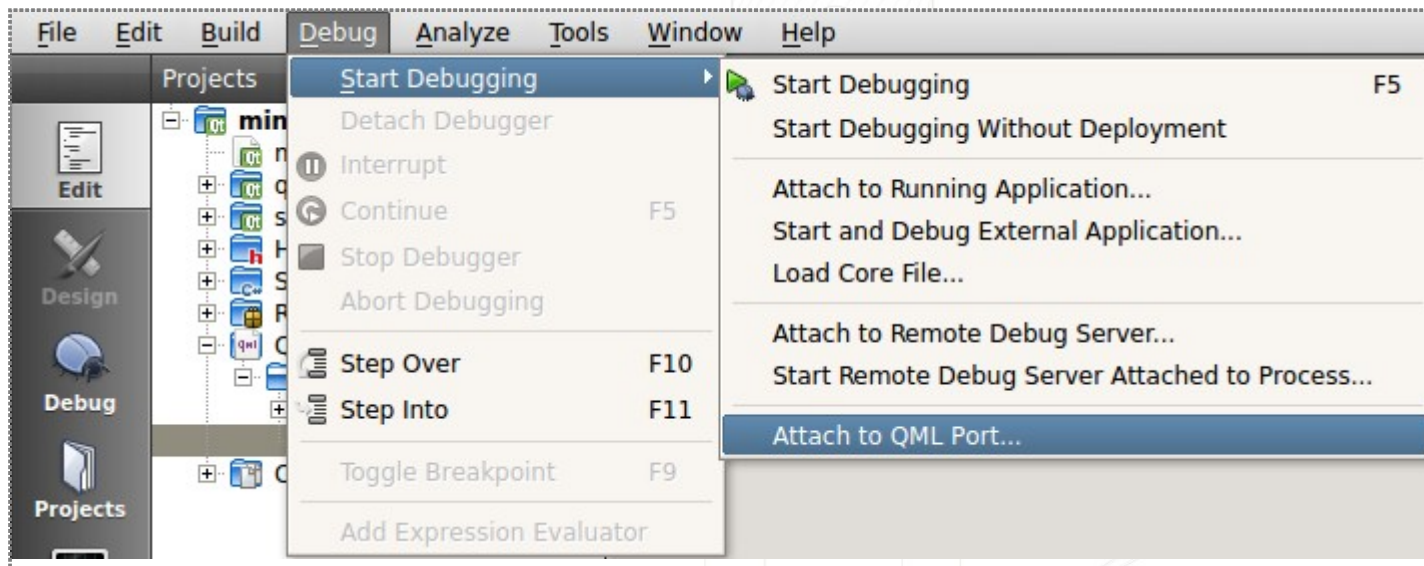
Press the Debug Button



Debugging: C++/QML Debugger

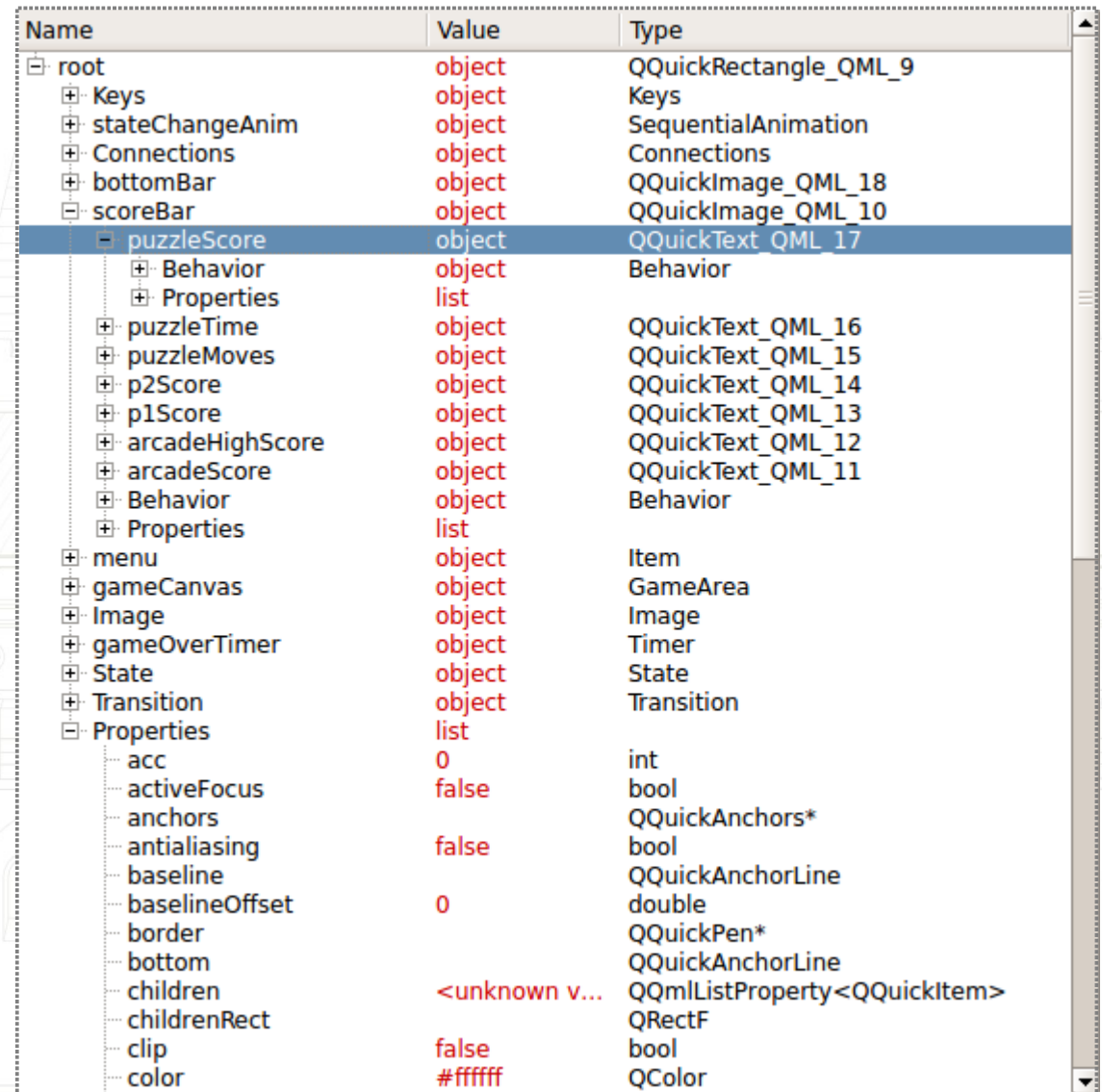
(2/2)

To debug a running application that has QML debugging enabled, specify the port and the corresponding kit.



Inspect the QML object tree when debugger is not on a debug break.

Modify properties of QML elements.



Name	Value	Type
root	object	QQuickRectangle_QML_9
Keys	object	Keys
stateChangeAnim	object	SequentialAnimation
Connections	object	Connections
bottomBar	object	QQuickImage_QML_18
scoreBar	object	QQuickImage_QML_10
puzzleScore	object	QQuickText_QML_17
Behavior	object	Behavior
Properties	list	
puzzleTime	object	QQuickText_QML_16
puzzleMoves	object	QQuickText_QML_15
p2Score	object	QQuickText_QML_14
p1Score	object	QQuickText_QML_13
arcadeHighScore	object	QQuickText_QML_12
arcadeScore	object	QQuickText_QML_11
Behavior	object	Behavior
Properties	list	
menu	object	Item
gameCanvas	object	GameArea
Image	object	Image
gameOverTimer	object	Timer
State	object	State
Transition	object	Transition
Properties	list	
acc	0	int
activeFocus	false	bool
anchors		QQuickAnchors*
antialiasing	false	bool
baseline		QQuickAnchorLine
baselineOffset	0	double
border		QQuickPen*
bottom		QQuickAnchorLine
children	<unknown v...	QqmlListProperty<QQuickItem>
childrenRect		QRectF
clip	false	bool
color	#ffffff	QColor



(Debugger Toolbar)

Qt Quick tools

 'Application on top' tool tries to ensure the debuggee is always the top level window.

 'Select' tool selects UI elements in the view. It can be used to identify a particular element and view its properties.*

 'Zoom' tool provides zoom in and zoom out functionality.*

* For Qt Quick 2 applications, Select tool also provides zoom functionality. The Zoom tool is hence disabled.

Console APIs*

~ Firebug console APIs

Logging (`console.log()`, `console.warn()`, etc.)

Profiling (`console.time()`, `console.timeEnd()`, etc.)

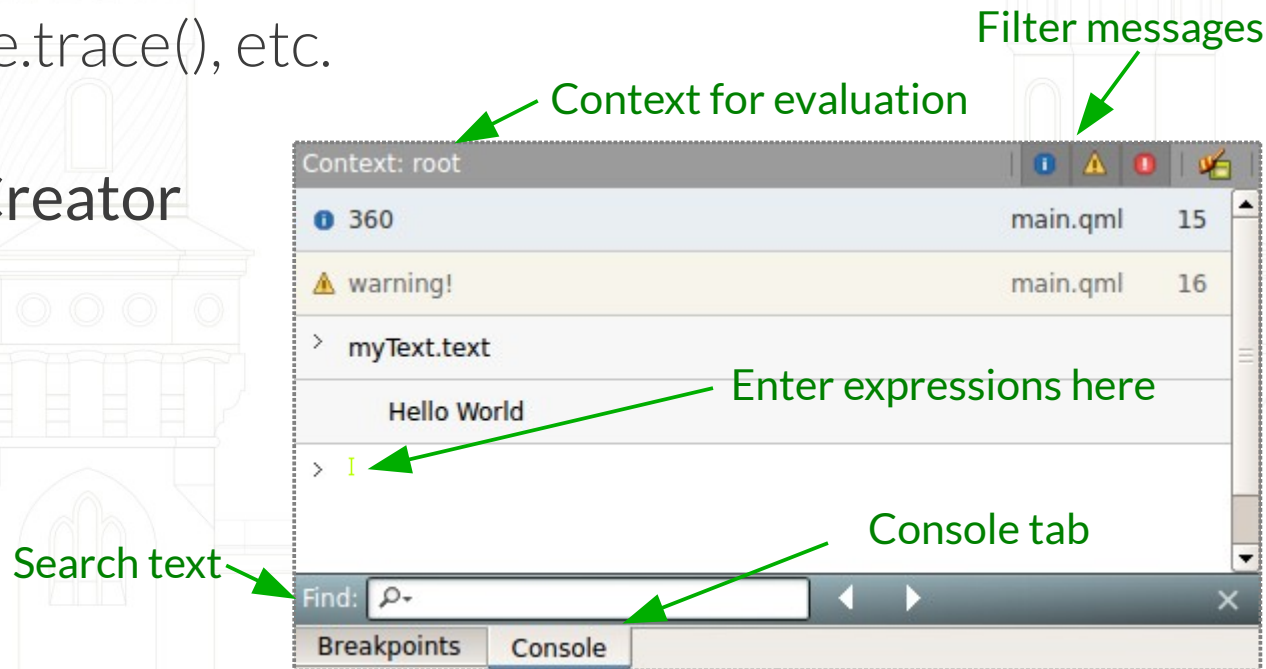
`console.assert()`, `console.trace()`, etc.

Interactive console in Qt Creator

Evaluate expressions

Filter messages

Find functionality



* For Qt Quick 1 applications, a subset of console APIs is available.

Modify register values of locals.

Modify property values of QML objects.

Watch expressions.

Evaluate JavaScript expressions.

Break on JavaScript exceptions.*

Select, zoom UI elements in the application view.





Re-uses Debugging Client Server architecture



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3) Attach a Profiling Client

Connect a profiling client to the TCP server at known address and port.

Press the QML Profiler Start Button

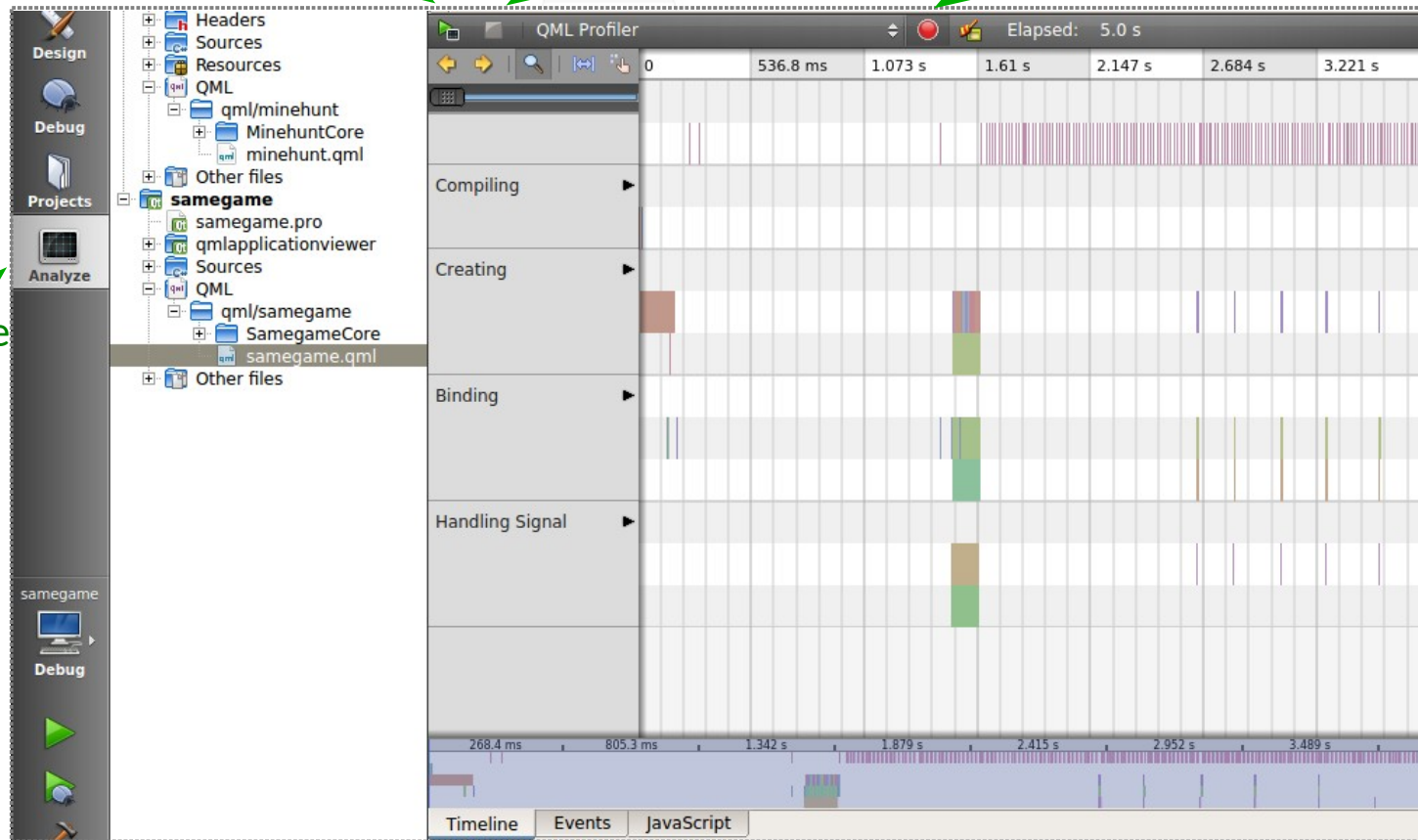


Start

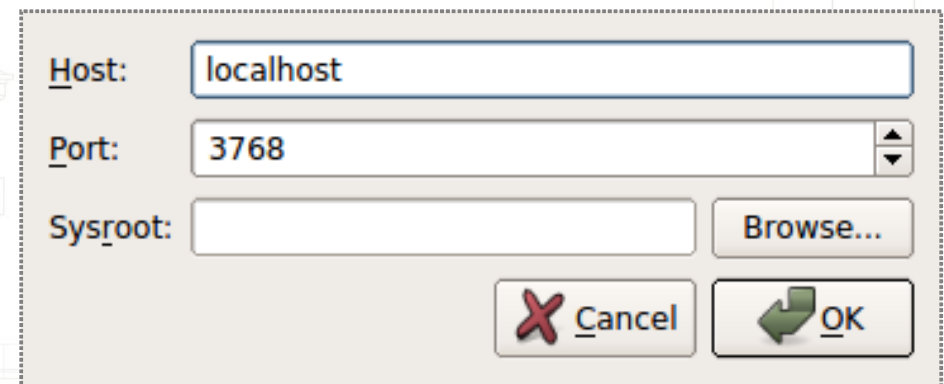
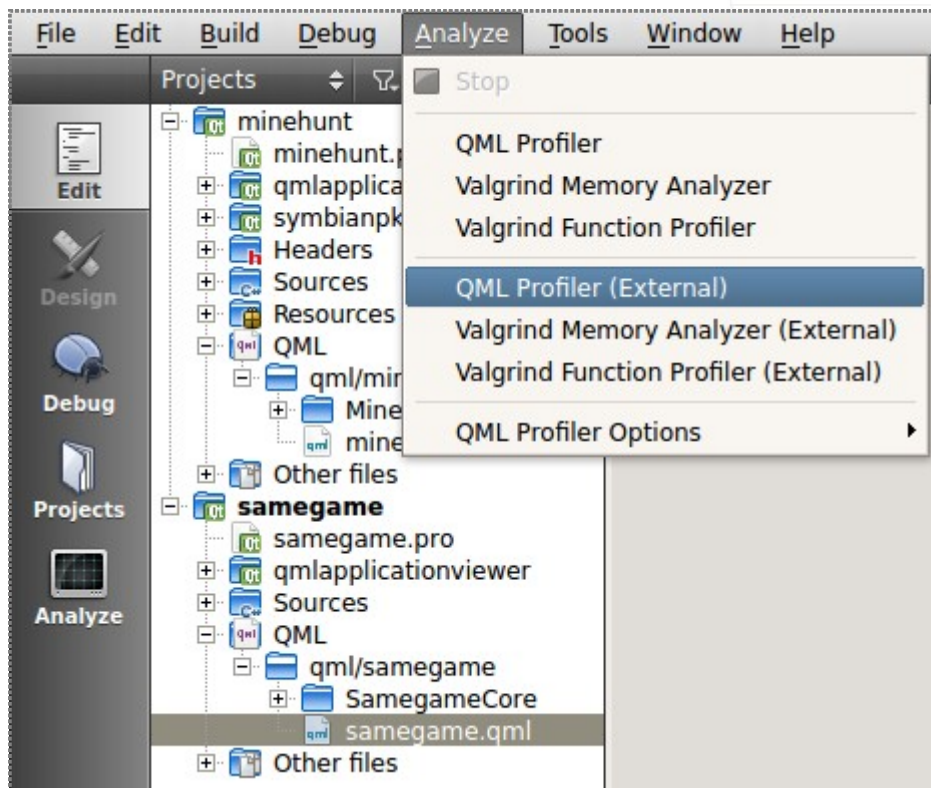
Stop

Toggle Recording

Analyze Mode



To profile a running application that has QML debugging enabled, specify the host and port.



To start an application with the profiler,

```
qmlprofiler [options] [program] [program args]
```

To profile a running application that has QML debugging enabled,

```
qmlprofiler [options] -attach [hostname]
```

Options

- -fromStart to record as soon as the QML engine is started.
- -p [-port] <number> specifies the TCP/IP port to use.

Commands

- r [record] to toggle recording.
- q [quit] to quit.

Profile data is saved in XML format.



Overview of events on a timeline.

Zoom in or out in Timeline view.

Step through events in either chronological or reverse chronological order.

Detailed view of events in tabular form.

Filter events within a time period.

View callers and callees of functions.

Profile JavaScript code.*

Debug Code!

Find binding loops in your code.

Optimize Code.

Find binding evaluations during animations and state changes.



Qt Creator

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Profiling

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QML Profiler*



Documentation

<http://doc.qt.digia.com/qtcreator/index.html>

THANK YOU

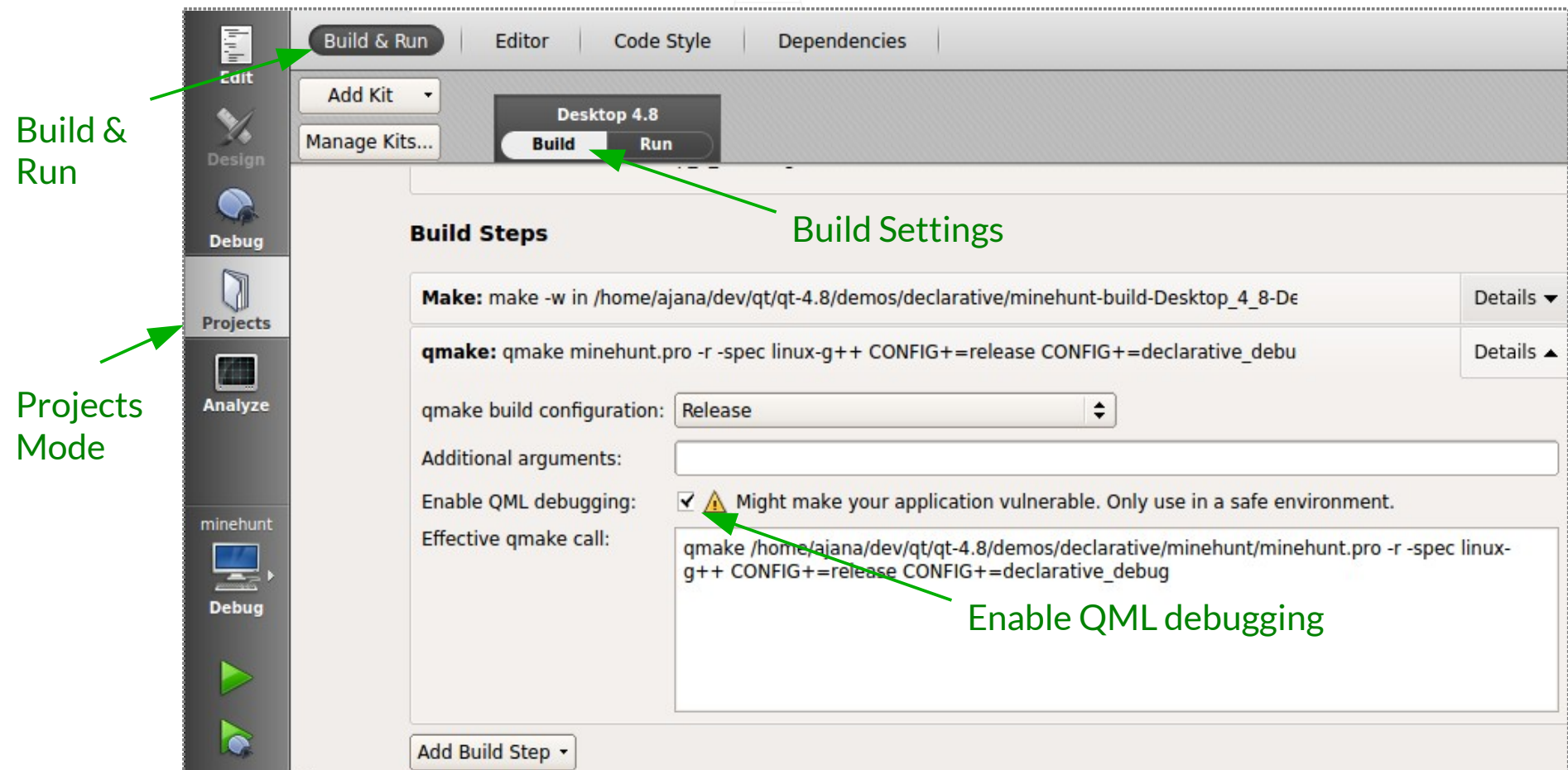
Contact

Qt mailing lists

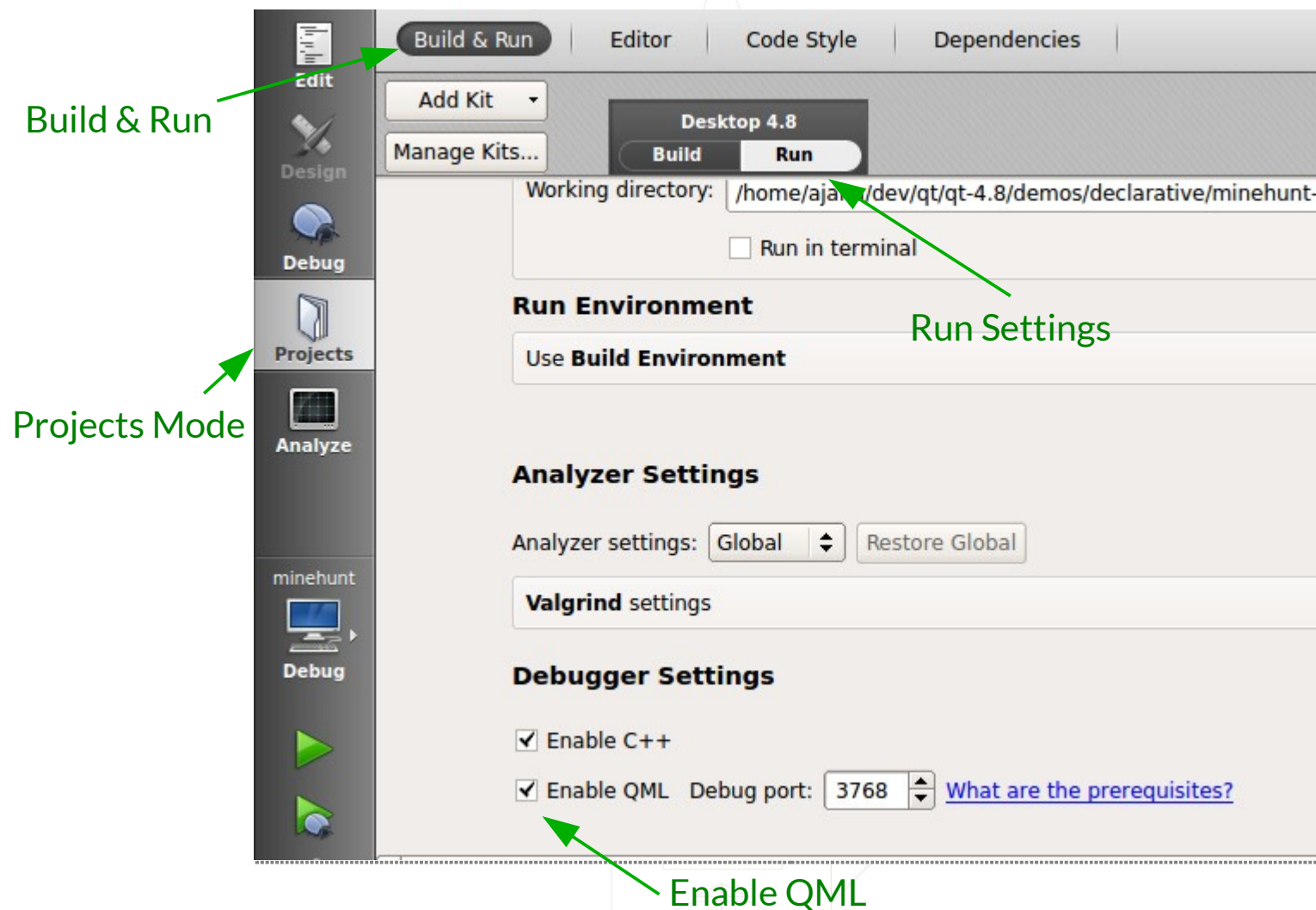
Aurindam Jana – aurindam.jana@digia.com

Troubleshooting: Debugger / Profiler

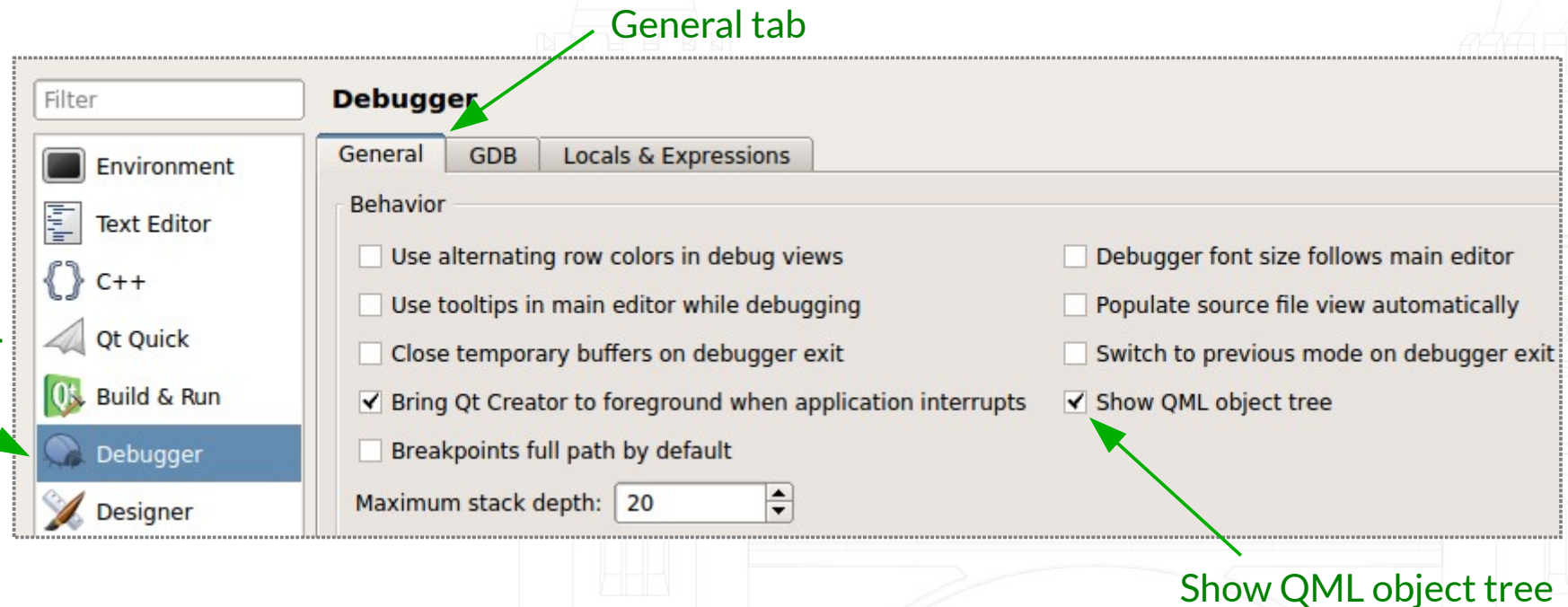
Ensure 'Enable QML Debugging' is checked in Build Settings. The default is checked.



Ensure 'Enable QML' is checked in Run Settings.



To enable Inspector view, ensure 'Show QML object tree' is checked in Debugger Options. The default is checked.



<http://qt-projects.org> – Qt and Qt Creator icons
http://en.wikipedia.org/wiki/FC_Barcelona – FC Barcelona icon
<http://www.apple.com> – iOS icon
<http://www.clker.com> – Berlin skyline
<http://svengraph.deviantart.com> – Tools icon
<http://www.damieng.com> - Tablet icon
<http://www.fasticon.com> - Display off icon
<http://www.cosmicwise.com> – Swat fly image
<http://turbomilk.com> - Black asterisk icon
<http://www.saveyourinnertortoise.com> - Tortoise with rocket image