GammaRay

Taking a deeper look into your application

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The Qt, OpenGL and C++ experts

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Runtime introspection for Qt applications

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How do I use it?

- Similar to a debugger
  - Launch application with GammaRay
  - Attach at runtime
- GUI, QtCreator plugin or command line interface available
- Works locally and remotely
- Requires no instrumentation or modifications of the application
- Needs a probe DLL matching the used Qt version exactly

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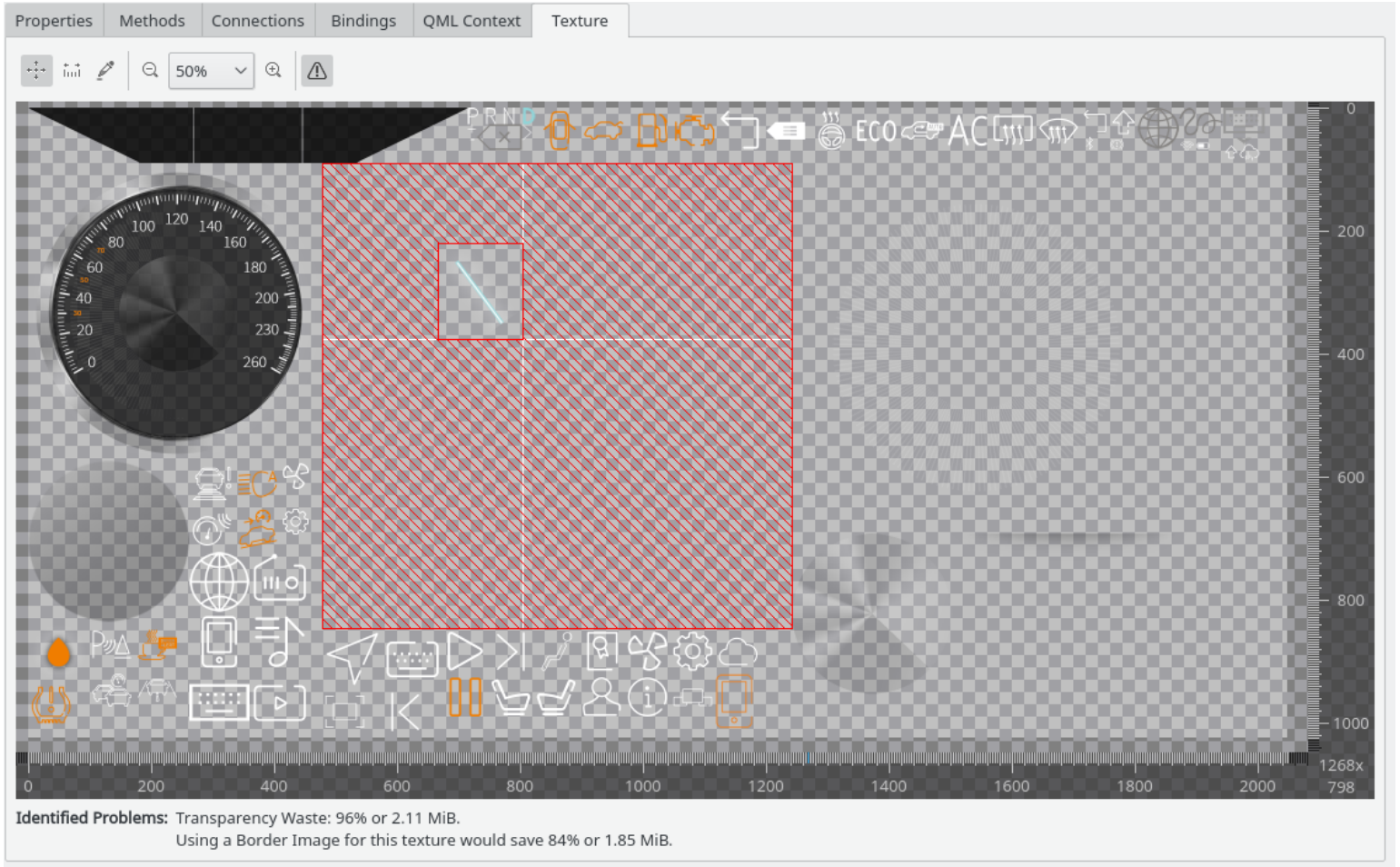
What can I do with it?

Qt Quick Textures

- Problems
  - High texture memory consumption
  - Sub-optimal render performance
- Investigation
  - Are texture atlases uses properly?
  - Is there unnecessary texture data?
- Counter-Measures
  - Tweak texture atlas parameters: QSG_ATLAS_[HEIGHT|WIDTH]
  - Use BorderImage for repeating content
  - Don’t use transparent textures to simplify layouting

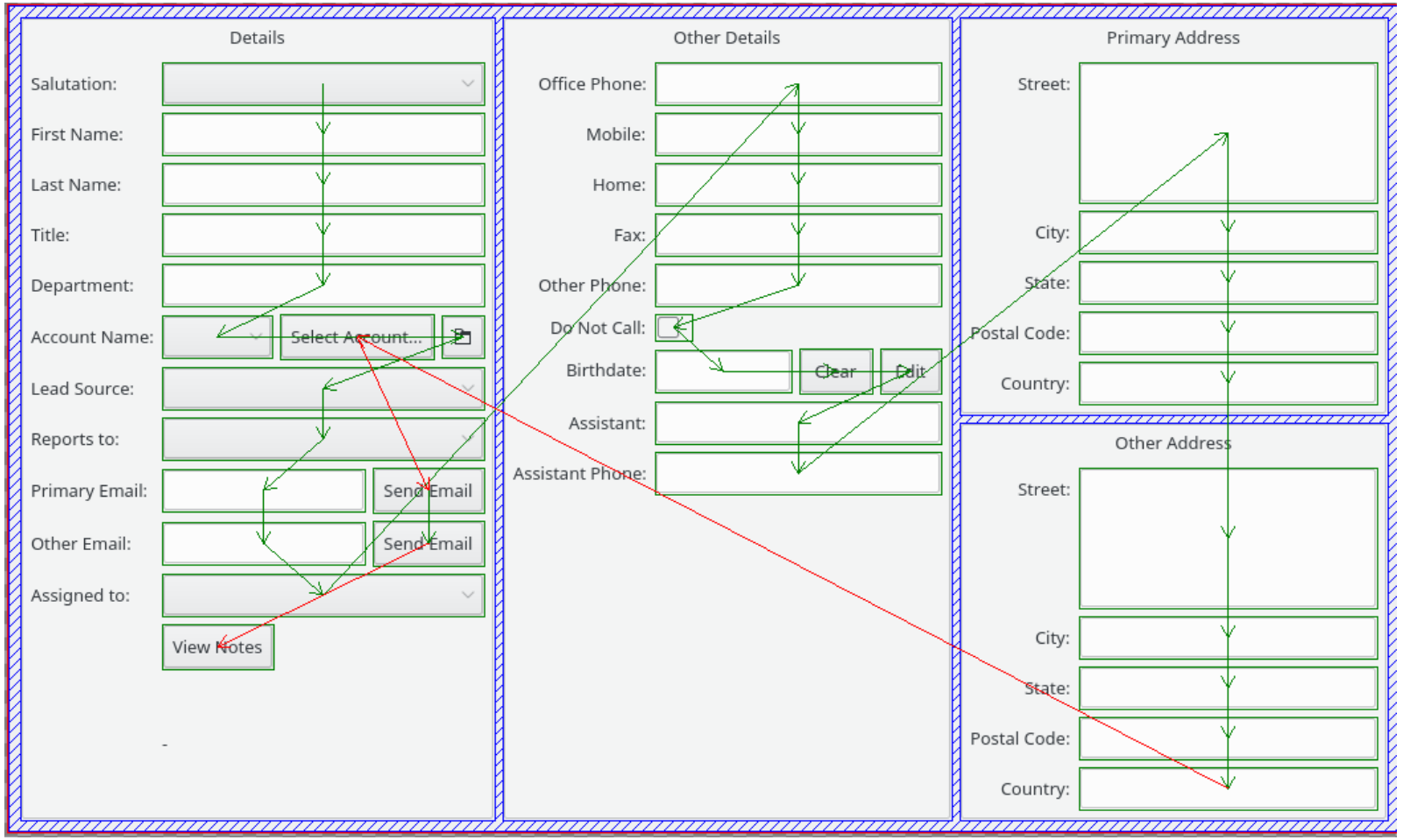
Qt Quick Textures



Qt Widget Tab Focus Chains

- Problem
  - Tab order in large dialogs is wrong/confusing/incomplete
  - Manual testing of this is tedious
- Investigation
  - GammaRay has tab order visualization
  - “Crossing” transitions are highlighted
  - Inspection of various focus properties for problematic widgets

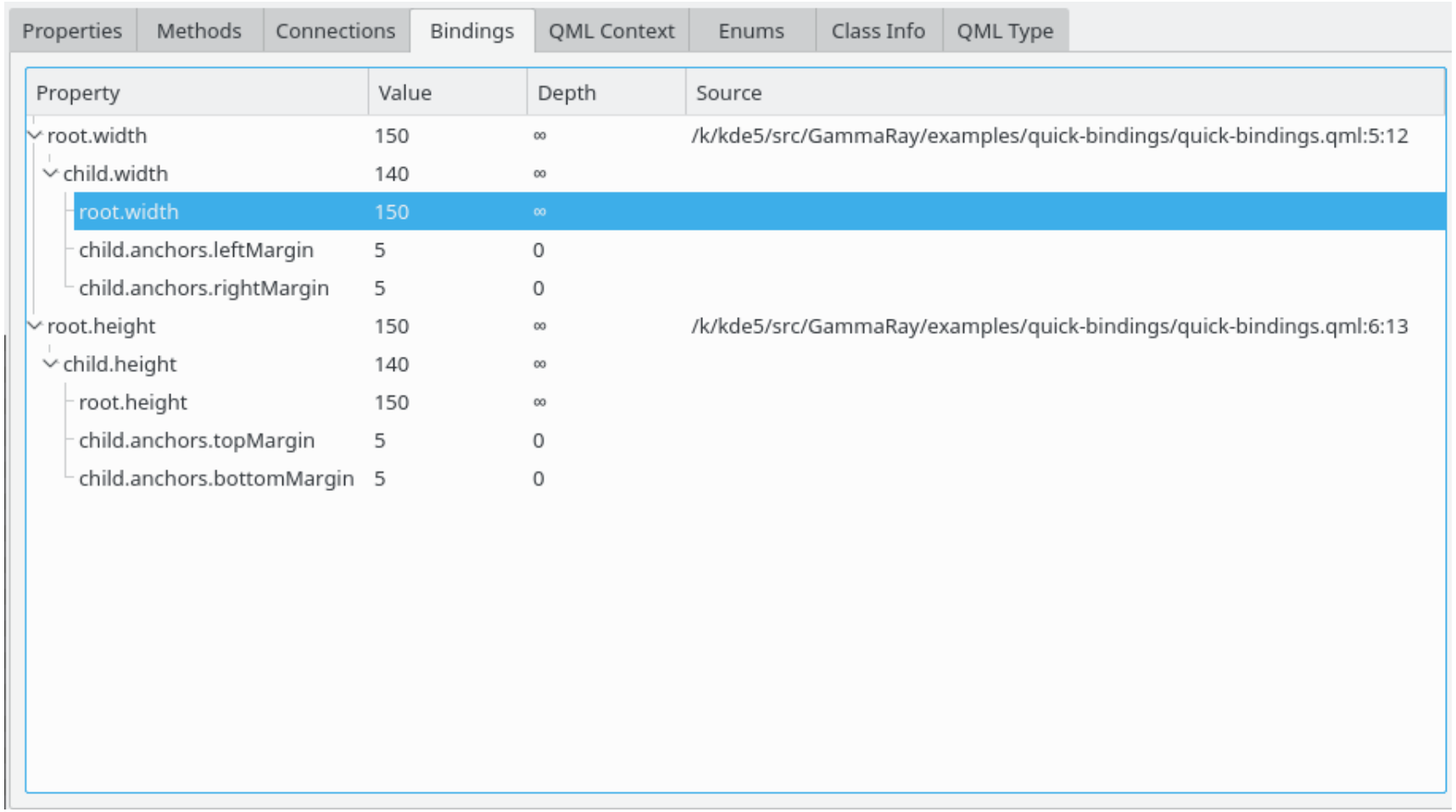
Qt Widget Tab Focus Chains



QML Binding Loops

- Problem
  - Indirect circular dependencies in QML bindings
  - Implicit dependencies inside Qt Quick layouting code
  - Runtime warning only shows source of detected loop, but not the dependencies
  - Manual access to that requires digging deep into Qt internals
- Investigation
  - GammaRay provides access to full dependency tree
  - Source navigation gets you quickly to the right place to fix things

QML Binding Loops



Out-of-control Timers

- Problem
  - Backtrace only indicates activity caused by a timer, but not which one or where it was started from
- Investigation
  - List active timers
  - Allow to navigate to source of timer creation
  - Verify hypothesis by modifying timer properties at runtime

Out-of-control Timers

Object Name	State	Total Wakeups	Wakeups/Sec	Time/Wakeup [uSecs]	Max Wakeup Time [uSecs]	Timer ID
QTimer[this=0x158f790]	Repeating (0 ms)	28988	1319.3	349.5	734	3
MyUpdateTimer[this=0x1499770]	Repeating (0 ms)	27070	1319.3	N/A	N/A	5
QDefaultAnimationDriver[this=0x1649...	Repeating (16 ms)	14	21.6	N/A	N/A	6
QDefaultAnimationDriver[this=0x1649...	Repeating (16 ms)	14	4.1	N/A	N/A	2
QDefaultAnimationDriver[this=0x1649...	Repeating (16 ms)	17	2.8	N/A	N/A	5
QDefaultAnimationDriver[this=0x1649...	Repeating (16 ms)	8	1.6	N/A	N/A	8
QTimer[this=0x1214f30]	Inactive (20 ms)	5	0.4	20.7	202	-1
QTimer[this=0x7f3ff0005d30]	Inactive (20 ms)	5	0.4	10.7	44	-1
QPMCache[this=0x7f400030c740]	Repeating (30000 ms)	1	0	N/A	N/A	4

How can I get it?

How do I get GammaRay?

- https://www.kdab.com/gammaray
- Dual license: GPL + commercial
- Included in Qt Automotive Suite

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Questions?