Differences Between PyQt4 and PyQt5

PyQt5 is not compatibile with PyQt4 (although experience shows that the effort in porting applications from PyQt4 to PyQt5 is not great). This section describes the main differences between the two.

Supported Python Versions

Versions of Python earlier than v2.6 are not supported.

Deprecated Features

PyQt5 does not support any parts of the Qt API that are marked as [deprecated](http://pyqt.sourceforge.net/Docs/PyQt5/pyqt4_differences.html) or obsolete in Qt v5.0. However it is possible that some of these have been included accidentaly. These are considered bugs and will be removed if found.

Multiple APIs

PyQt4 supports a number of different API versions (QString, [**QVariant**](http://pyqt.sourceforge.net/Docs/PyQt5/api/QtCore/qvariant.html#PyQt5-QtCore-QVariant) etc.). With the exception of [**QVariant**](http://pyqt.sourceforge.net/Docs/PyQt5/api/QtCore/qvariant.html#PyQt5-QtCore-QVariant), PyQt5 only implements v2 of those APIs for all versions of Python. The changed support for[**QVariant**](http://pyqt.sourceforge.net/Docs/PyQt5/api/QtCore/qvariant.html#PyQt5-QtCore-QVariant), including the removal of QPyNullVariant, is described in [Support for QVariant](http://pyqt.sourceforge.net/Docs/PyQt5/pyqt_qvariant.html#ref-qvariant).

Old-style Signals and Slots

PyQt4’s old-style signals and slots are not supported. Therefore the following are not implemented in PyQt5:

* QObject.connect()
* QObject.emit()
* SIGNAL()
* SLOT()

All methods that had arguments that are usually the [results](http://pyqt.sourceforge.net/Docs/PyQt5/pyqt4_differences.html) of calls to SIGNAL() or SLOT() are no longer supported. There will always be an equivalent that takes a bound signal or callable respectively.

In addition the following methods have differences:

* **disconnect()** takes no arguments and disconnects all connections to the [**QObject**](http://pyqt.sourceforge.net/Docs/PyQt5/api/QtCore/qobject.html#PyQt5-QtCore-QObject) instance.

New-style Signals and Slots

Qt implements signals with an optional argument as two separate signals, one with the argument and one without it. PyQt4 exposed both of these allowing you to connect to each of them. However, when emitting the signal, you had to use the signal appropriate to the number of arguments being emitted.

PyQt5 exposes only the signal where all arguments are specified. However it allows any optional arguments to be omitted when emitting the signal.

Unlike PyQt4, PyQt5 supports the definition of properties, signals and slots in classes not sub-classed from [**QObject**](http://pyqt.sourceforge.net/Docs/PyQt5/api/QtCore/qobject.html#PyQt5-QtCore-QObject) (i.e. in mixins).

QtDeclarative, QtScript and QtScriptTools Modules

PyQt4’s QtDeclarative, QtScript and QtScriptTools modules are not supported. These have been replaced by PyQt5’s [**QtQml**](http://pyqt.sourceforge.net/Docs/PyQt5/QtQml.html#PyQt5-QtQml) and [**QtQuick**](http://pyqt.sourceforge.net/Docs/PyQt5/QtQuick.html#PyQt5-QtQuick) modules. Unlike PyQt4, PyQt5 supports the creation of Python objects from QML.

QtGui Module

PyQt4’s QtGui module has been split into PyQt5’s [**QtGui**](http://pyqt.sourceforge.net/Docs/PyQt5/QtGui.html#PyQt5-QtGui), [**QtPrintSupport**](http://pyqt.sourceforge.net/Docs/PyQt5/QtPrintSupport.html#PyQt5-QtPrintSupport) and [**QtWidgets**](http://pyqt.sourceforge.net/Docs/PyQt5/QtWidgets.html#PyQt5-QtWidgets) modules.

QtOpenGL Module

Only the [**QGLContext**](http://pyqt.sourceforge.net/Docs/PyQt5/api/QtOpenGL/qglcontext.html#PyQt5-QtOpenGL-QGLContext), [**QGLFormat**](http://pyqt.sourceforge.net/Docs/PyQt5/api/QtOpenGL/qglformat.html#PyQt5-QtOpenGL-QGLFormat) and [**QGLWidget**](http://pyqt.sourceforge.net/Docs/PyQt5/api/QtOpenGL/qglwidget.html#PyQt5-QtOpenGL-QGLWidget) classes are supported by PyQt5.

QtWebKit Module

PyQt4’s QtWebKit module has been split into PyQt5’s [**QtWebKit**](http://pyqt.sourceforge.net/Docs/PyQt5/QtWebKit.html#PyQt5-QtWebKit) and [**QtWebKitWidgets**](http://pyqt.sourceforge.net/Docs/PyQt5/QtWebKitWidgets.html#PyQt5-QtWebKitWidgets) modules.

pyqtconfig Module

PyQt4’s pyqtconfig module is not supported. The section [The PyQt5 Extension API](http://pyqt.sourceforge.net/Docs/PyQt5/extension_api.html#ref-build-system) describes the support that PyQt5 provides to third-party [packages](http://pyqt.sourceforge.net/Docs/PyQt5/pyqt4_differences.html) (e.g. [QScintilla](https://www.riverbankcomputing.com/software/qscintilla/)) that want to build on top of PyQt5.

dbus.mainloop.qt Module

PyQt4’s dbus.mainloop.qt module is called **dbus.mainloop.pyqt5** in PyQt5. This allows them to be installed side by side. Their functionality is identical.

QDataStream

The **readUInt8()**, **readInt8()**, **writeUInt8()** and **writeInt8()** methods all interpret the values being read and written as numeric values. In PyQt4 they are interpreted as single character strings.

QFileDialog

The getOpenFileNameAndFilter(), getOpenFileNamesAndFilter() and getSaveFileNameAndFilter() methods of PyQt4’s QFileDialog have now been renamed **getOpenFileName()**, **getOpenFileNames()** and**getSaveFileName()** respectively in PyQt5. PyQt4’s implementations of getOpenFileName(), getOpenFileNames() and getSaveFileName() are not supported in PyQt5.

QGraphicsItemAnimation

Support for the deprecated QGraphicsItemAnimation class has been removed. If porting an existing PyQt4 application then consider first updating it to use [**QPropertyAnimation**](http://pyqt.sourceforge.net/Docs/PyQt5/api/QtCore/qpropertyanimation.html#PyQt5-QtCore-QPropertyAnimation) instead.

QMatrix

Support for the deprecated QMatrix class has been removed. If porting an existing PyQt4 application then consider first updating it to use [**QTransform**](http://pyqt.sourceforge.net/Docs/PyQt5/api/QtGui/qtransform.html#PyQt5-QtGui-QTransform) instead.

QPyTextObject

PyQt4 implements the QPyTextObject as a workaround for the inability to define a Python class that is sub-classed from more than one Qt class. PyQt5 does support the ability to define a Python class that is sub-classed from more than one Qt class so long as all but one of the Qt classes are interfaces, i.e. they have been declared in C++ as such using Q\_DECLARE\_INTERFACE. Therefore QPyTextObject is not implemented in PyQt5.

QSet

In PyQt4, QSet was implemented as a list in Python v2 and a set in Python v3. In PyQt5 QSet is always implemented as a set.

pyuic5

**pyuic5** does not support the --pyqt3-wrapper flag of pyuic4.

pyrcc5

**pyrcc5** does not support the -py2 and -py3 flags of pyrcc4. The [output](http://pyqt.sourceforge.net/Docs/PyQt5/pyqt4_differences.html) of **pyrcc5** is compatible with all versions of Python starting with Python v2.6.

Cooperative Multi-inheritance

Unlike PyQt4, PyQt5 classes implement cooperative multi-inheritance. In other words PyQt5 classes always do the equivalent of the following Python v3 code in their \_\_init\_\_ methods (where kwds is a dictionary of unused keyword arguments):

super().\_\_init\_\_(\*\*kwds)

This means that those unused keyword arguments are passed to the \_\_init\_\_ methods of any mixin classes. Those mixin classes must cooperate, i.e. they must make a similar call if they have their own \_\_init\_\_ implementations.

When using multiple inheritance in PyQt4 it is common to call the \_\_init\_\_ methods of the super-classes explicitly, for example:

**class** **MyQObject**(QObject, MyMixin):

**def** \_\_init\_\_(self, parent, mixin\_arg):

QObject.\_\_init\_\_(self, parent)

MyMixin.\_\_init\_\_(self, mixin\_arg)

*# Other initialisation...*

In PyQt5 the above would cause MyMixin.\_\_init\_\_ to be called twice. Instead it should be implemented as follows:

**class** **MyQObject**(QObject, MyMixin):

**def** \_\_init\_\_(self, \*\*kwds):

super().\_\_init\_\_(\*\*kwds)

*# Other initialisation...*

Note that if there is no other initialisation to do then the \_\_init\_\_ method isn’t actually needed.

The mixin class should be implemented as follows:

**class** **MyMixin**:

**def** \_\_init\_\_(self, mixin\_arg, \*\*kwds):

super().\_\_init\_\_(\*\*kwds)

*# Other initialisation...*

If a class only inherits from a single class then it can still call the super-class’s \_\_init\_\_ method explicitly (although it is recommended to use super()).

See [Support for Cooperative Multi-inheritance](http://pyqt.sourceforge.net/Docs/PyQt5/multiinheritance.html#ref-cooperative-multiinheritance).

Releasing the GIL

The GIL is only released when it is known to be needed. PyQt4 always released the GIL when calling Qt.

Object Destruction on Exit

When the Python [interpreter](http://pyqt.sourceforge.net/Docs/PyQt5/pyqt4_differences.html) exits PyQt4 (by default) calls the C++ destructor of all wrapped instances that it owns. This happens in a random order and can therefore cause the interpreter to crash. This behavior can be disabled by calling the **sip.setdestroyonexit()** function. PyQt5 always calls **sip.setdestroyonexit()** automatically.

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