



Qt 6 Port and some notes on the Future of Linux Desktop

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Motivation

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Extremely Large Telescope (ELT) Development Environment Changes

- CentOS 7 (2016-2021): Qt5, PySide2
- CentOS 8 (2022): Qt5, PySide2
- Looking forward: Qt's PySide2 only supports Python <=3.11
- **Fedora Linux 38 (2024): Qt5/PySide2, Qt6/PySide6**
- Fedora Linux 40 (2025): Qt5, Qt6/PySide6
- Alma Linux 10 (2026): Qt5, Qt6/PySide6

https://wiki.qt.io/Qt_for_Python#Python_compatibility_matrix

Python compatibility matrix

	2.7	3.5	3.6	3.7	3.8	3.9	3.10	3.11	3.12	3.13
5.15.0	o	o	o	o	o	x	x	x	x	x
5.15.1-7	o	o	o	o	o	o	x	x	x	x
5.15.8	o	o	o	o	o	o	o	x	x	x
5.15.9-10	x	o	o	o	o	o	o	x	x	x
5.15.11-15	x	x	o	o	o	o	o	o	x	x
6.0.x	x	x	o	o	o	o	x	x	x	x
6.1.x	x	x	o	o	o	o	x	x	x	x
6.2.x	x	x	o	o	o	o	o	x	x	x
6.3.x	x	x	o	o	o	o	o	x	x	x
6.4.x	x	x	x	o	o	o	o	o	x	x
6.5.x	x	x	x	o	o	o	o	o	x	x
6.6.x	x	x	x	x	o	o	o	o	o	x
6.7.x	x	x	x	x	x	o	o	o	o	x
6.8.x	x	x	x	x	x	o	o	o	o	o



Motivation

Selection of a fast upstream integration distribution was intentional.

Development requirements demanded we adopted fast while we could.

- Fedora 38, 40, then stabilize into Alma Linux when EL matches Fedora.
- Fixes in Qt and shiboken.
- Cpp new standards (format, spans, mdspan).
- Python 3.12+ (asyncio performance)
- Newer version of libraries (fastdds, asyncio, pybind11)



What is new?



Qt6 – What is New?

Taurus

MR for Taurus that added Qt6 support was published 08/2024.

Jul2025 release included Qt6 support.

Qt

QtCore, QtGui, QtWidgets, the main modules used did not received much changes.

QtQuick and QtQML are the ones mainly affected in Qt6. Development in Qt changes a lot these modules.

Newer versions of python were adopted by PySide6 and PyQt6.

Qt dropped support older versions of python with PySide6 and Python 3.12.



Qt6, What is New in C++

QVector is now a typedef of QList.

QList has been reimplemented to have all interfaces.

QProcess::start behaviour changed.

QtOpenGL module and classes restructured. As describe in the reference, no changes, but it would be import/include statements and dependency changes in modules.

QtSvg module have been separated into two: QtSvg and QtSvgWidgets.

QtGui: QPixmap: Implicit construction of a QPixmap from a QPixmap is no longer supported

QtGui: Affected by the QtOpenGL module restructure.

QAction: Moved from QtWidgets to QtGui.

<https://doc.qt.io/qt-6/portingguide.html>



Qt6, What is New in Python

PySide changed its mayor numeration to match the Qt version.

qApp is deprecated in favor of `QApplication.instance()`

Enums: **PyQt6 supports only fully qualified names for enumeration:**

`Qt.AlignHCenter` → `Qt.AlignmentFlag.AlignHCenter`

Support for previous notation is added in `taurus.external.qt`

exec is no longer a reserved word by the language. `TaurusApplication.exec()` is now possible.

Signal overload in PySide6 (lists no longer accepted)

```
my_signal = Signal([int], [int, str])
```

```
my_signal = Signal((int,), (int, str))
```

<https://doc.qt.io/qt-6/portingguide.html>



Other considerations



Graphical Acceleration

Most of QtWidgets do not use graphical acceleration.

Changing to Qt6 will not “require” use of graphical acceleration. Ssh/vnc/rdp/nomachine will continue working, except:

- QtOpenGL of course does, but so does QtWebEngine if available (due to Chromium).
- QML and Quick were designed and programmed considering Graphical Acceleration.

Early Qt6 versions (<6.6) apps failed due to this.

Qt 6.6+: When no proper graphical accelerator is found and it is needed (For example using Qt3D), MESA LLVMpipe is automatically used. It is a low-level software rasterizer.

<https://doc.qt.io/qt-6/portingguide.html>



Wayland

RedHat EL10 and Alma Linux 10 drops X11 server... not even packages are available.

Forced to adopt Wayland in a hard manner.

Ancillary tools (xauth, xvfb) and Xwayland are still available.

You can still execute X11 applications (thanks to xwayland)

For remote execution the use of waypipe is recommended

```
ssh -X eltdev@eltdev01 taurus form
```

```
waypipe ssh -X eltdev@eltdev01 taurus form
```

Waypipe needs to be installed in client and server. Available in all linux distros, and in windows via WSL.

<https://www.redhat.com/en/blog/rhel-10-plans-wayland-and-xorg-server>



Future

- Python (3.13+) with no Global Interpreter Lock (GIL). Still no support from PyQt6 nor PySide6.
- Try replacing `taurus.external.qt` for `qtpy`.
- HighDPI: Higher resolutions but same display area.

When drawing, switch to Float family of classes and functions: `QPoint` -> `QPointF`

- OpenGL is being phased out in favor of Vulkan.
- Quick/QML, data binding/property binding
- Qt3D* modules recently deprecated in favor of QtQuick3D (notice license differences)
- QPainter prototype with QRhi graphical acceleration was shown in Qt Day 2025.



Thank you!

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