

Introduction

The VFX Reference Platform is a set of tool and library versions to be used as a common target platform for building software for the VFX industry. Its purpose is to minimise incompatibilities between different software packages, ease the support burden for Linux-based pipelines and encourage further adoption of Linux by software vendors. The Reference Platform is updated annually by a group of software vendors in collaboration with the Visual Effects Society Technology Committee (<https://www.visualeffectssociety.com/ves-committees?jump-9>).

Current Status

The Calendar Year 2019 (CY2019) Reference Platform is the target for all major software releases in 2019.

12th September 2018 - CY2019 Final now published with OpenVDB updated to 6.x and ACES to 1.1 to reflect recent or imminent major releases of these important industry packages.

22nd July 2018 - CY2019 Draft updated - OpenEXR upped to 2.3.x.

22nd July 2018 - CY2019 Draft updated - minimum version of Python is now 2.7.9 to ensure support of PIP via PyPI.

20th May 2018 - CY2019 Draft published. The move to Python 3 has been pushed to CY2020 due to the need to focus on upgrading to the latest Qt Long Term Support release. Software vendors are requested to provide a Python 3 tech preview release in 2019 to help studios with testing during migration efforts. We are currently soliciting feedback on this Draft so please either send to feedback@vfxplatform.com (<mailto:feedback@vfxplatform.com>) or share on [vfx-platform-discuss](https://groups.google.com/forum/#!forum/vfx-platform-discuss) (<https://groups.google.com/forum/#!forum/vfx-platform-discuss>).

26th November 2017 - CY2018 has had a late change to the compiler version which is now gcc 6.3.1. This successfully resolves issues that were discovered with gcc 5.3.1.

28th August 2017 - Added a note for gcc 5 and updated the Qt note to include a link to the qtdeclarative modifications.

3rd August 2017 - The CY2018 Platform was ratified as Final at the annual SIGGRAPH VFX Reference Platform Birds of a Feather with no further planned changes.

2nd July 2017 - Minor updates to CY2018 Draft for Qt and ACES.

29th April 2017 - CY2018 Draft published with significant upgrades to gcc and glibc. This also comes with notice of our intention to move to Python 3 for CY2019 in advance of Python 2 support ending in 2020. We are currently soliciting feedback on this Draft so please either send to feedback@vfxplatform.com (<mailto:feedback@vfxplatform.com>) or share on [vfx-platform-discuss](https://groups.google.com/forum/#!forum/vfx-platform-discuss) (<https://groups.google.com/forum/#!forum/vfx-platform-discuss>). We expect to publish CY2018 Final around SIGGRAPH in July.

1st August 2016 - CY2017 Final now published with OpenSubdiv and OpenVDB being updated in addition to Boost, Ptex, Alembic and TBB as result of feedback to the Draft.

28th June 2016 - The VFX Reference Platform Qt modifications to the Qt 5.6.1 release are now available from these forks of qtbase (<https://github.com/autodesk-forks/qtbase/tree/adsk-contrib/vfx/5.6.1>) and qtx11extras (<https://github.com/autodesk-forks/qtx11extras/tree/adsk-contrib/vfx/5.6.1>).

20th June 2016 - CY2017 Draft published for comment from the community. The theme for CY2017 is to minimize code changes in the year following the transition to Qt 5.

27th October 2015 - A late change has been proposed to CY2016 to move from Qt 5.5.x to Qt 5.6.x due to that version now being targetted as a Long Term Support release. Please see here (<http://bit.ly/CY2016Qt5>) for further details.

Reference Platform

Each annual reference platform is designated by the calendar year in which major product releases should be targeting that particular reference.

All versions should be considered exact required versions, except for those components where **↓↑** indicates that:

- for systems (or software) providing the library at runtime, versions should be considered *minimum version required*.
- otherwise, for software building software against the library, versions should be considered *highest version allowed*

	CY2019	CY2018	CY2017	CY2016	CY2015	CY2014
gcc ↓↑	6.3.1 (see notes)	6.3.1 (see notes)	4.8.2 with bugfix or 4.8.3	4.8.2 with bugfix or 4.8.3	4.8.2	4.1.2
glibc ↓↑	2.17	2.17	2.12	2.12	2.12	
Python (built with ucs4)	2.7.9 - 2.7.latest 3.6.x (tech preview release) Python 3 upgrade in CY2020	2.7.5 - 2.7.latest	2.7.5 - 2.7.latest	2.7.5 - 2.7.latest	2.7.x	2.7.3

Qt	5.12.x	5.6.1 - 5.6.latest (modified)	5.6.1 (modified)	5.6.1 (modified)	4.8.x	4.8.5
PyQt	5.12	5.6	5.6	5.6		
Qt for Python (PySide)	5.12 branch	2.0.x	2.0.x	2.0	1.2.x	1.2
NumPy	1.14.x	1.12.1	1.9.2	1.9.2		

OpenEXR	CY2019	CY2018	CY2017	CY2016	CY2015	CY2014
Ptex	2.1.33	2.1.28	2.1.28	2.0.42		
OpenSubdiv	3.3.x	3.3.x	3.1.x	3.0.x	2.5.x	2.3.3
OpenVDB	6.x	5.x	4.x	3.x	3.0.x	
Alembic	1.7.x	1.7.x	1.6.x	1.5.8	1.5.x	1.5.x
FBX	2019.x	2018.x	latest	latest	latest	2015
OpenColorIO	1.1.0	1.0.9	1.0.9	1.0.9	1.0.9	1.0.7
ACES	1.1	1.0.3 - 1.0.latest	1.0.x	1.0		
Boost	1.66	1.61	1.61	1.55	1.55	1.53
Intel TBB ↓↑	2018	2017 Update 6	4.4	4.3	4.2	4.1
Intel MKL	2018	2017 Update 2	11.3	11.3		
C++ API/SDK	C++14	C++14	C++11	C++11		

Note - Python 3

The move to Python 3 has been delayed from CY2019 to CY2020 for the following reasons:

- There is no supported combination of Qt 5.6, Python 3 and PySide 2 so Qt first needs to be upgraded.
- Upgrading both Qt and Python in the same year is too large a commitment for software vendors and large studios.

Python 3 in CY2020 is a firm commitment at this point, it will be a required upgrade as Python 2 will no longer be supported beyond 2020. Software vendors are strongly encouraged to provide a tech preview release in 2019 to help studios with testing during their Python migration efforts.

Note - gcc 6

UPDATED November 26th 2017 - CY2018 changed from gcc 5 to gcc 6 due to integration issues discovered with the older version.

Redhat/CentOS systems can obtain gcc 6.3.1 by installing Redhat DTS 6.1 (https://access.redhat.com/documentation/en-us/red_hat_developer_toolset/6/html/6.1_release_notes/index). To install Red Hat Developer Toolset 6.1 on CentOS 7:

```
sudo yum -y install centos-release-scl
sudo yum -y install devtoolset-6
```

If you are looking for gcc 6.3.1 source code then a copy can be found in the CentOS Vault (<http://vault.centos.org/7.5.1804/sclo/Source/rh/devtoolset-6/>).

Since gcc 5.1, libstdc++ introduced a new library ABI (https://gcc.gnu.org/onlinedocs/libstdc++/manual/using_dual_abi.html) that includes new implementations of `std::string` and `std::list`. In order to maintain backwards compatibility the old implementations are still supported in parallel with the new ones. The choice of implementation is made using the `_GLIBCXX_USE_CXX11_ABI` macro, and the VFX Reference Platform is still using the older option so the compiler setting should be `_GLIBCXX_USE_CXX11_ABI=0`. The Platform will move to the newer implementations in a future year once the major Linux distributions have made the transition. RHEL/CentOS 7 and Redhat DTS still use the original implementations by default.

Note - gcc 4

The vanilla gcc 4.8.2 has a serious bug (https://gcc.gnu.org/bugzilla/show_bug.cgi?id=58800) that was fixed in 4.8.3 and some Linux distribution vendors actually ship a patched version as 4.8.2. The reason the Platform gave 4.8.2 as an option for CY2016 is that this gcc version is what ships with Redhat Developer Toolset 2.1 (<http://developerblog.redhat.com/2014/03/12/rh-dts2-1-ga/>) that some software vendors were committed to using through 2016.

The following are the known distributions that ship with a fixed 4.8.2:- Redhat DTS 2.1, RHEL/CentOS 6.

Note - Qt modifications

The major change for CY2016 was a move to Qt 5 which required a port of PySide and modifications to vanilla Qt. In November 2015 CY2016 version of Qt was upped from 5.5.x to 5.6.x with agreement from the community that it was preferable to align with a Long Term Support release. In May 2016 it was updated again to 5.6.1 to incorporate some critical bug fixes.

These modifications are required to avoid the introduction of functional UI regressions impacting DCC tools and consist only of backported bug fixes and critical changes that have not yet been accepted into the mainline Qt distribution. The need for these modifications is not new, currently some software vendors ship their own differently modified Qt so CY2016 represented a significant step forward with the goal of all software vendors sharing an identically modified Qt. We are working with the Qt Company to eliminate the need for these modifications entirely in a future release, potentially as soon as CY2019.

These Qt 5.6 modifications are available on Github from these forks of qtbase (<https://github.com/autodesk-forks/qtbase/tree/adsk-contrib/vfx/5.6.1>), qtx11extras (<https://github.com/autodesk-forks/qtx11extras/tree/adsk-contrib/vfx/5.6.1>) and qtdeclarative (<https://github.com/autodesk-forks/qtdeclarative/tree/adsk-contrib/vfx/5.6.1>). These modifications to Qt 5.6.1 (http://download.qt.io/official_releases/qt/5.6/5.6.1/) should be used by anyone who wishes to build Qt applications against the Platforms from CY2016 through to CY2018.

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