

K H R O N O STM
G R O U P

COLLADATM

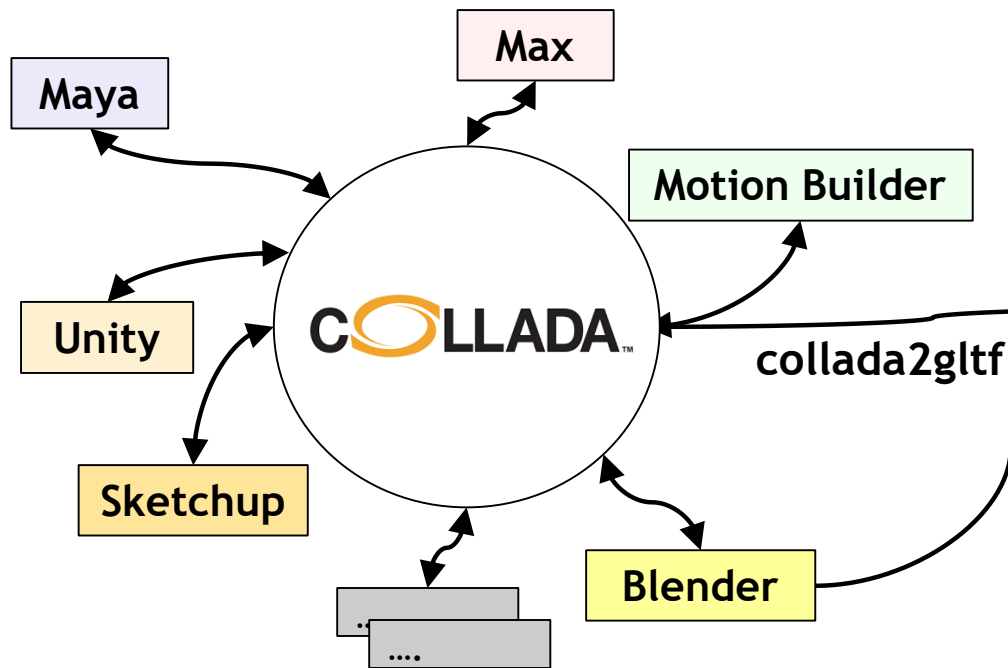
SIGGRAPH 2017

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Mark Barnes

COLLADA and glTF

COLLADA

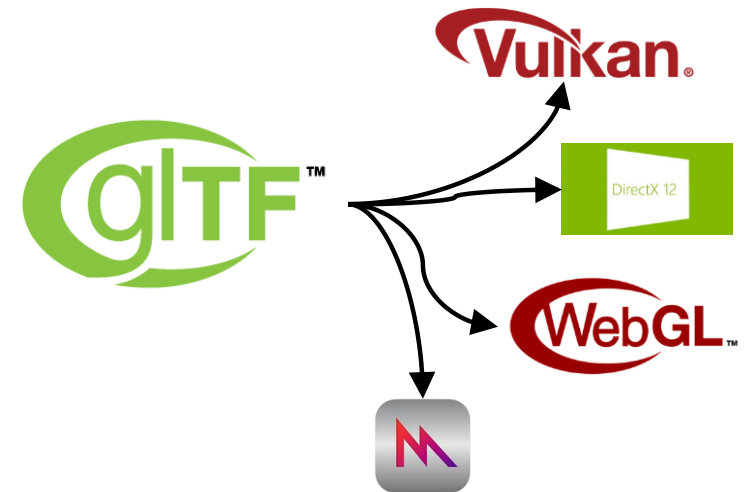
Two way 3D asset **INTERCHANGE**
ISO Standard Lossless Archival
Flexible specialization and toolchains



COLLADA enables the flow of assets through sophisticated toolchains

GLTF

Efficient runtime 3D asset **TRANSMISSION**
Compact File Size
Easy to unpack and use on all platforms



glTF delivers assets to run-time applications

COLLADA Status - Stable

- **1.4.1 was released SIGGRAPH 2006 - 11 years ago (1.0 was 2004)**
 - Most implementations are 1.4.1 - stable
 - 1.5 release 2008
 - ISO/PAS 17506:2012 certified, used mainly for CAx and complex kinematics
- **COLLADA derived formats**
 - OpenRAVE robot interchange format
http://openrave.org/docs/0.8.2/collada_robot_extensions/
 - AutomationML car industry provides interchange format
<https://www.automationml.org/o.red.c/home.html>
- **1.4.1 extensions**
 - Definitions
https://www.khronos.org/collada/wiki/Category:COLLADA_extensions
 - Implementations, maintenance, bug fixes
<https://github.com/KhronosGroup/OpenCOLLADA>

More Details

<https://github.com/KhronosGroup/OpenCOLLADA>

OpenCOLLADA library (SAX) for macOS, Windows, Linux
ColladaMax, ColladaMaya

Blender, Collada2Gltf ...

uses OpenCOLLADA

<https://github.com/fl4re/COLLADAMobu>

MotionBuilder using old FCollada library

Useful in game production, updated last april

Maya, Max also have native implementation with FBX library

Unity

Native editor import via FBX library

Editor exporter in store

<https://www.assetstore.unity3d.com/en/#!/content/40946>

run-time importer in store

Import/Export libraries

OpenCollada

ColladaDOM (<https://sourceforge.net/projects/collada-dom/>)

lightweight variant <https://github.com/rdiankov/collada-dom/>

Assimp (<http://assimp.sourceforge.net>)

FBX (<https://www.autodesk.com/products/fbx/overview>)

AssetKit (<https://github.com/recp/assetkit>)

Status: In Progress:

3D importer/exporter library based on COLLADA 1.5 spec written in C99, it will full support COLLADA 1.4, 1.5+ and glTF,

And many others

Motion Builder Exporter

- Useful in production
 - Create skeleton / skin in Maya
 - Exports one .dae per skin. Export skeleton data with all models
 - Skeleton data small, used as a 'key' to the model. Checked by engine importer
 - Export various animations for skeleton, with Motion Builder
 - Run-time loads several daes, and take what it needs to allow multiple skins, multiple animations
 - Taking advantage of COLLADA's URI-based external reference mechanism

DAEValidator

- **New Test App for OpenCOLLADA**

- <https://github.com/KhronosGroup/OpenCOLLADA/tree/master/DAEValidator>

- Verify your .dae documents

- Supports 1.4, 1.5, and PhysX extensions

- Runs unit tests for OpenCOLLADA

Options:

- **Validate** against COLLADA schema or custom schema extensions

- **Check URI** verifies that external documents exist and # fragments resolve to elements

- **Check Unique ID** verifies ID attribute constraints

- **Check Unique SID** verifies Scoped ID attribute constraints

New COLLADA Extensions

- Animation Extensions
- Physics Extensions

- Following COLLADA Extension process
 - HOW-TO (https://www.khronos.org/collada/wiki/How_to_create_a_COLLADA_Extension)
 - Design extension schema
 - Advertise extension at Khronos (https://www.khronos.org/collada/wiki/Portal:Extensions_directory)
 - Publishing extension schema to khronos.org
- Implementing in OpenCOLLADA
- Adding test cases in OpenCOLLADA DAEValidator

COLLADAMaya Extensions

- Animation events

Example

```
<animation_clip id="clip2" start="0" end="4.7666667">
  <instance_animation url="#clip2_c_torso_a_ue"/>
  <instance_animation url="#clip2_c_torso_b_ue"/>
  <instance_animation url="#clip2_c_torso_c_ue"/>
  <extra>
    <technique profile="OpenCOLLADAMaya">
      <event>
        <timestamps id="clip2-marker-input-array" count="4">0 1 2.26 3.56 </timestamps>
        <markers id="clip2-marker-name-array" count="4">Foot_L Foot_R Foot_L Hand_L </markers>
      </event>
    </technique>
  </extra>
</animation_clip>
```

COLLADAMaya Extensions

- NVIDIA PhysX

- <https://www.khronos.org/blog/opencollada-maya-exporter-now-with-nvidia-physx-support>

- Adds most of the NVIDIA PhysX engine parameters

- Created XML Schema for extension validation

- Implemented in OpenCOLLADA

Extended COLLADA elements:

- <physics_material> Friction and restitution combine modes have been added to physics material

- <rigid_body> Actor flags, rigid body flags, linear and angular damping and many other parameters have been added

- <rigid_constraint> All parameters to fully describe a PxD6Joint in PhysX SDK have been added

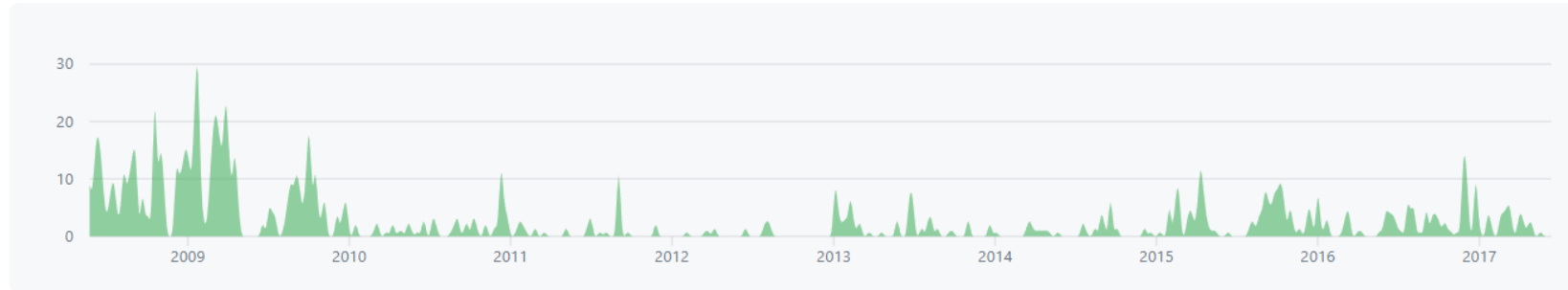
- <shape> Extension adds filters data, contact/rest offsets, PxShape flags...

OpenCOLLADA Activity

Jun 29, 2008 – Jul 19, 2017


Contributions: Commits ▾

Contributions to master, excluding merge commits



- Released SIGGRAPH 2008. quite active till 2010 (Intel). Active again since 2015 (mostly Starbreeze but more and more external contributions)
- ~75 merged PRs since last SIGGRAPH

Fl4reBot and Jenkins


 Fl4reBot commented on Jun 13 Member + 😊 ✎ ✕

SUCCESS: exercise-opencollada-pull-request build #110

- COLLADA-MAX-PC-PULL-REQUEST build #414 with result SUCCESS. Artifacts: [Max 2011](#) [Max 2012](#) [Max 2013](#) [Max 2014](#) [Max 2015](#) [Max 2016](#) [Max 2017](#)
- COLLADA-MAYA-PC-PULL-REQUEST build #407 with result SUCCESS. Artifacts: [Maya 2011](#) [Maya 2012](#) [Maya 2013](#) [Maya 2014](#) [Maya 2015](#) [Maya 2016](#) [Maya 2017](#)
- Maya-2015_2017-mac-pull-request build #398 with result SUCCESS. Artifacts: [Maya 2015](#) [Maya 2016](#) [Maya 2017](#)
- openCOLLADA-mac-pull-request build #408 with result SUCCESS. Artifacts: [OpenCOLLADA Mac](#)
- openCOLLADA-pc-pull-request build #403 with result SUCCESS. Artifacts: [OpenCOLLADA Win](#)
- openCOLLADA-ubuntu-pull-request build #297 with result SUCCESS. Artifacts: [OpenCOLLADA Ubuntu](#)

Pull Requests:



- PR #534: *Consistent use of std::abs* [OpenCOLLADA](#)

 RemiArnaud commented on Jun 13 Member + 😊 ✎ ✕

thank you for the contribution

  RemiArnaud merged commit `3e25759` into `KhronosGroup:master` on Jun 13 View details Revert

1 check passed

  elfprince13 deleted the `elfprince13:absfixes` branch on Jun 13

Automated Tests

<https://github.com/fl4re/openCOLLADAtests>

openCOLLADAtests

Validation tests for OpenCOLLADA plugins.

Python test framework which allows you to validate OpenCOLLADA plugins for Maya, 3DSMax, MotionBuilder...

Requirements

Python 2.7 Applications to test (Maya, 3DSMax...) COLLADA plugin built in Release DAEValidator built in Release

Setup

By default, test framework supposes OpenCOLLADA and openCOLLADAtests projects are located in the same directory and that applications (Maya, 3DSMax...) are installed to their default location (usually in C:\Program Files\Autodesk on Windows).

If default paths are not used you can tell where things are located by setting environment variables:

OPENCOLLADA_PATH path to OpenCOLLADA project folder *MAYA_PATHVVVV_X64* path to Maya installation where VVVV is Maya version (2015, 2017...) *ADSK_3DSMAX_x64_VVVV* path 3DSMax installation where VVVV is 3DSMax version (2017...)

COLLADA plugins must be built in Release prior to running tests. They are automatically installed before running tests. You don't have to install them manually.

DAEValidator tool must be built in Release prior to running tests.

Running tests

To run tests, go to openCOLLADAtests folder and run the following command:

```
python launch.py
```

Options:

New - Binary Packages in GitHub Release Tab

The screenshot shows the GitHub interface for the repository 'KhronosGroup / OpenCOLLADA'. At the top, there are navigation links for 'Code', 'Issues 39', 'Pull requests 0', 'Projects 0', 'Wiki', 'Settings', and 'Insights'. On the right, there are buttons for 'Unwatch', 'Star 333', and 'Fork 178'. Below the navigation, there are tabs for 'Releases' and 'Tags', and a 'Draft a new release' button. The main content area displays the latest release, 'v1.6.57', which was released 2 days ago by 'Fl4reBot'. The release description lists various binary packages for different platforms and versions, including COLLADA-MAX-PC, COLLADA-MAYA-PC, COLLADA-MAYA-MAC, and OpenCOLLADA-Win/Mac/Ubuntu. Below the description, there is a 'Downloads' section with links for 'Source code (zip)' and 'Source code (tar.gz)'. An 'Edit' button is visible in the top right corner of the release details.

- <https://opencollada.fl4re.com> is no more! Archived binaries are now at <https://www.dropbox.com/sh/dzjyp1x8x5odt4d/AADX0hSFq34NyS5Ab5ssHDoCa?dl=0>

Thanks!

Questions?

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