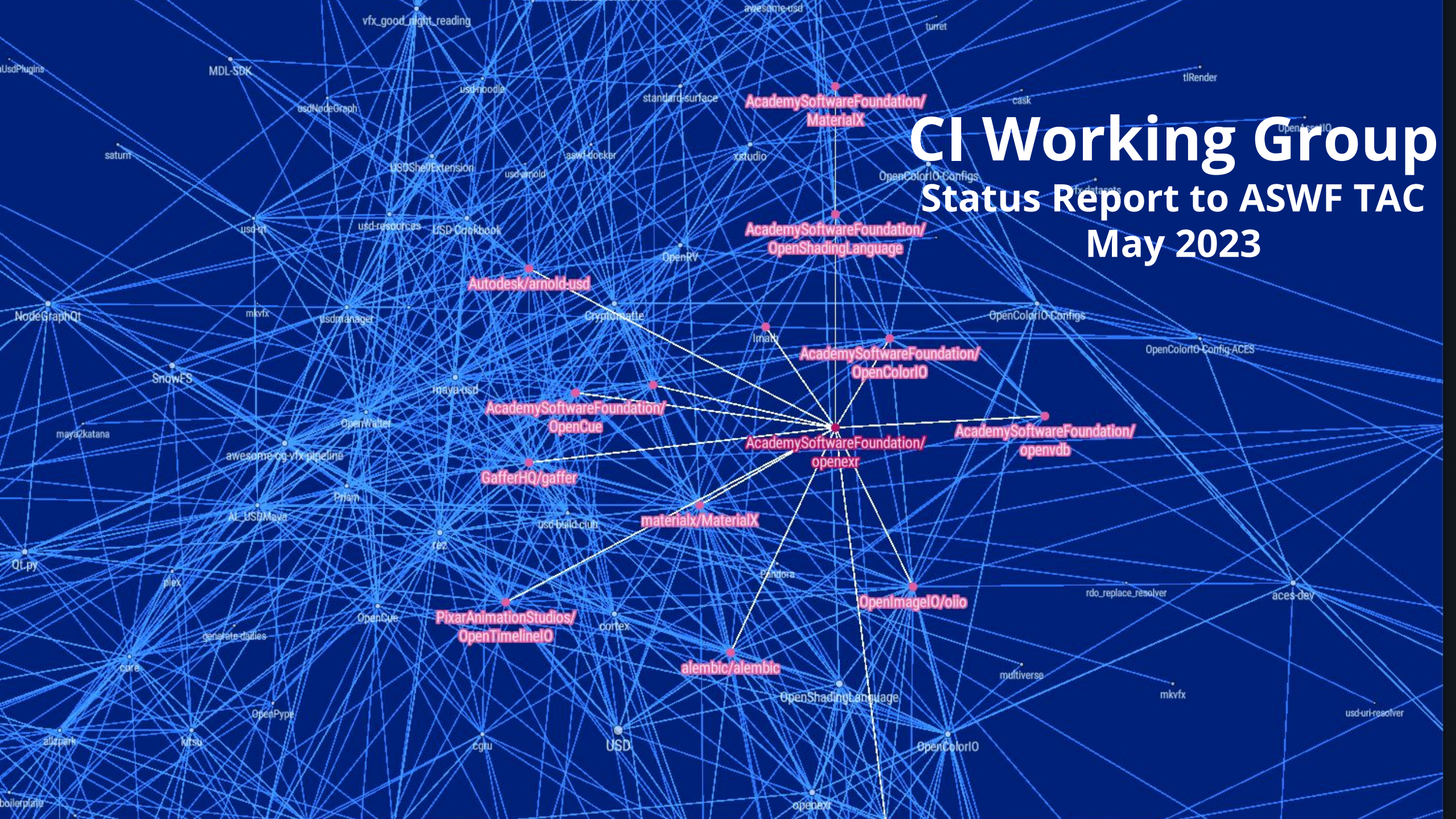


# CI Working Group Status Report to ASWF TAC May 2023



# Continuous Integration WG Mission Statement

The ASWF Continuous Integration (CI) Working Group is tasked to investigate and deliver tools, procedures and services used by ASWF projects in their development process, including:

- Revision control
- Build toolchains
- CI build environments
- Testing
- Packaging and distribution

## Continuous Integration WG Mission Statement (cont)

- Provide a forum for the exchange of ideas between individuals interested in all aspects of the tooling and processes involved in software development, building and distribution
- Nothing we do is prescriptive, projects are free to adopt or not, and are encouraged to share infrastructure with other ASWF projects.

## Administrativia


- One meeting a month, off cadence from TAC (next is May 24th at 13:00 Pacific Time)
- On average 8 attendees over last 12 months, lots of repeat visits
- Meeting minutes in repo:  
<https://github.com/AcademySoftwareFoundation/wg-ci/tree/main/meetings>
- Slack Channel: #wg-ci 245 members, reasonable traffic volume, enough to help fill meeting agenda, a good place to share an interest in tooling

# Where to Get Help with Infrastructure

- #wg-ci for general discussion
- Linux Foundation Release Engineering Helpdesk:  
<https://jira.linuxfoundation.org/plugins/servlet/desk>
- GitHub Permissions
- Secrets Management
- External Integrations
- ...

**Status Update**  
Parts of our service are experiencing issues. [View StatusPage](#)


Project Support Services > Request PyPI organization on behalf of AcademySoftwareFoundation

 **Request PyPI organization on behalf of AcademySoftwareFoundation** (IT-24425)


Comment on this request...

ACTIVITY

Your request status changed to: **Waiting for Customer** 25/Apr/23 7:56 AM **LATEST**

 **Andrew Grimberg** 25/Apr/23 7:56 AM  
I applied for the "alias" of aswf with the long description of "Academy Software Foundation" which is what the registration form seemed to be indicating to me was the best way given the examples in the form.

Your request status changed to: **Waiting for Support** 24/Apr/23 2:12 PM

 **Jean-Francois Panisset** 24/Apr/23 2:12 PM  
Did you apply for "AcademySoftwareFoundation" or "aswf"?

# Limitations of GitHub-hosted Free Runners

- Time limits, concurrent jobs limits
- Minimal hardware (2 cores, 7 GB, 14GB disk)
- x86 only, no ARM / M1 options
- No GPU acceleration (OCIO test suite)
- Projects need more CPU/memory (OpenVDB) and longer build times (clang, Qt full builds)
- "Self" hosting is possible, but tricky to do reliably
  - Don't want expensive runaway cloud instance
  - Watch out for abuse ("expensive" build events)
- AWS CodeBuild
  - On demand access to larger instances, Linux GPU
  - Per minute pricing
  - OCIO GPU test suite



# ASWF Enterprise GitHub Organization

- Higher limits on free GHA minutes, concurrent jobs
- Larger, for pay runners:
  - \$1,500/month pre-authorized
  - Used by OpenVDB, aswf-docker for builds that wouldn't complete
  - Informally managed
- Early access to GPU runners
  - Windows and Linux
  - Used by OSL (I think?)
  - Not yet charged
- No ETA yet for Apple Silicon

Size (vcpu)	Memory (RAM)	Storage (SSD)
4 cores	16 GB	150 GB
8 cores	32 GB	300 GB
16 cores	64 GB	600 GB
32 cores	128 GB	1200 GB
64 cores	256 GB	2040 GB

# Testing

- CTest for C++ projects, pytest for Python (examples)
  - 80% code coverage requirement for CII Silver
- Linting / Static Analysis
  - CII badge requirement
  - clang-tidy (OpenEXR, OSL)
  - pytest --pylint
  - SonarCloud (org-level secret)
- Dynamic Analysis / Fuzzing
  - Google OSS-Fuzz for OpenEXR
  - Valgrind
- Limitations of GitHub-hosted runners
- How will we test GUI apps? (ORI, MaterialX, OpenCue...)







LLVM




pytest



# Sample ASFW Projects on SonarCloud


sonarcloud   ?   Log in

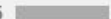
Academy Software Foundation  https://www.aswf.io/ Key: academysoftwarefoundation


Projects Quality Profiles Rules Quality Gates

**Filters**

**Quality Gate**


Passed 1 

Failed 5 


**Reliability** (  Bugs )


A 0 |


B 0 |


C 2 

D 0 |

E 4 

**Security** (  Vulnerabilities )


A 5 

B 1 


C 0 |

D 0 |

E 0 |


**Security Review** (  Security Hotspots )


A ≥ 80%


Perspective: Overall Status Sort by: Name   9 projects


**aswf-docker** Failed


Last analysis: June 5, 2022 at 5:00 PM


2 C  
 Bugs

0 A  
 Vulnerabilities

0.0% E  
 Hotspots Reviewed

48 A  
 Code Smells

 29.6%  
Coverage

 1.5%  
Duplications


6k S  
Python


**aswf-sample-project**


Project is not analyzed yet.


**Imath** Passed


Last analysis: August 6, 2022 at 5:44 PM


109 E  
 Bugs

0 A  
 Vulnerabilities

0.0% E  
 Hotspots Reviewed

7k B  
 Code Smells

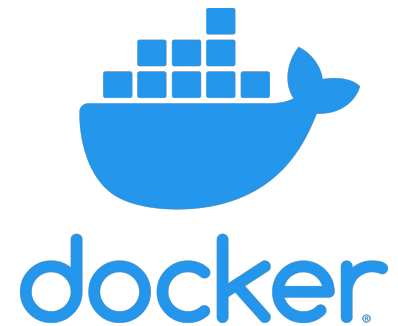
 75.3%  
Coverage

 5.7%  
Duplications

61k M  
C, C++, ...

# Packaging and Distribution

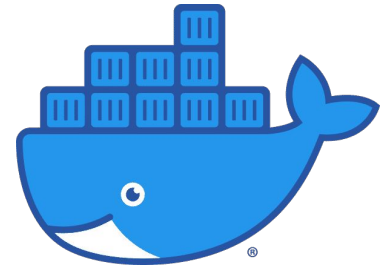
- Python and PyPI
  - OpenTimelineIO builds Python wheels as part of CI
  - Organization level support from PyPI announced, we are signed up for "AcademySoftwareFoundation" and "aswf"
  - Expertise to be shared in #wg-ci
- Paid Docker Hub account for Docker containers
  - No throttling on downloads of aswf-docker containers
  - Available to all projects (GitHub org level secrets)
- JFrog Artifactory
  - <https://linuxfoundation.jfrog.io/artifactory/aswf-conan/>
  - Conan packages from aswf-docker, supports other formats
  - Eventually package binaries (app installers - ORI)



## The aswf-docker Project

<https://github.com/AcademySoftwareFoundation/aswf-docker>

- Created by Aloys Baillet
- Yearly implementation of the VFX Reference Platform
- Hierarchy of layered containers:
  - aswf/ci-base has tools and most prerequisites
  - aswf/ci-openexr is used to build OpenEXR
  - aswf/ci-vfxall has everything pre-built
- Used by most ASWF projects to build in a controlled environment with all required dependencies
- VFX2022 based on CentOS 7.9, leverages RedHat Developer Toolset for newer tools
- Clang also included



## The aswf-docker Project (cont.)

- Includes CUDA, OpenGL
  - Can be used to run GPU accelerated test suites
  - Can be used to run entire applications
- Can be used to build "difficult to build" open source projects on CentOS 7 by providing updated dependencies and tools
- Pushed to paid for, unthrottled account:
  - <https://hub.docker.com/u/aswf>
  - but 4+ GB vfx-all container can still take a while to pull...
- 600K pulls from Docker Hub across versions!

## The aswf-docker project: work in progress

- Support for Conan package manager
  - Create Conan packages from build results
  - Push to JFrog Artifactory repository
  - More granularity for clients consuming packages
  - More applicable to Windows and macOS
  - `aswf-docker/packages/conan/recipes/`
- VFX Platform 2023 support
  - New set of ASWF and non-ASWF components for CY2023
  - Move from CentOS 7.9 base to Rocky Linux 8.x
  - Based on NVIDIA cuda containers (cudagl no longer maintained)
  - Very close...
  - Should make future base distro changes "simpler"



# The aswf-docker project: what's next

- Support for new ASWF projects: ORI, OIIO, OpenFX...
- More components repackaged as Conan packages
- Contribution from Foundry: set of Conan recipes they are using internally to package open source components, will make available soon.
- VFX 2024: transition to EL 9?
  - Not explicitly required by VFX 2024
  - EL8 AND EL9? Maybe worth a poll
  - QT6.5
- Windows container support
  - Containers have limitations on Windows, but should be possible to build equivalent set of containers
- macOS support (easier with Conan)



# Documentation

- ASWF Confluence instance, available to all projects and WGs that want a Wiki
- Paid ReadTheDocs instance (gets rid of small ad / supports the project)
  - Starting to be used by OpenRV
  - Projects already using RTD can keep using their own instance

## OpenSSF (Open Source Security Foundation) Badging Requirements Discussion

- Significant effort to discuss and analyze requirements in context of our projects
- Aim to produce recommendations / additional information around requirements
- Some of it is being fed back to OpenSSF project
- Work needed to extract from several months of meetings notes into a usable form
- CI WG happy to help projects that have questions about OpenSSF requirements for project graduation



# Thank you!

- Don't hesitate to ask if your project needs infrastructure you don't currently have, CI WG may be able to help, or another project may have already solved the problem
- If your project has an interesting piece of infrastructure, CI WG wants to hear about it, maybe it can be generalized / benefit others