
Glencoe
SOFTWARE

Glencoe Software, OMERO and OMERO Plus

OMERO Development and Priorities Meeting 2023

Monday, 19th June 2023

- Erin Diel -

Head of Product

- Chris Allan -

VP Software Engineering

- Sebastien Besson -

Software Engineer

@glencoesoftware

Outline

- Who is Glencoe Software?
- Work to date
- Roadmap, Priorities and Proposals for Collaboration

Company Background

Founded in 2005 – Celebrating 18 Years of success!

- Based in Dundee, UK and Seattle, WA, USA
- Exclusive Commercial Partner of Open Microscopy Environment (OME)

Our Team

18 Glencoe Software staff; more than 30 OME contributors

Expertise

60+ years of experience in life sciences, imaging, publishing and engineering

Established Worldwide

Customer base in pharma, academia, research and publishing

OME ⟷ Glencoe SOFTWARE

Open Source Synergy

A Powerful, Exclusive Partnership

COMMERCIAL LICENSES

Exclusive provider of robust commercial licenses for OMERO Plus and Bio-Formats

CUSTOMIZATION

Warrantied and indemnified software solutions not available in the open source environment

SERVICE & SUPPORT

Commercial and community development synergy as your support resource

Key Products

OMERO Plus

World-leading bioimage data management system.
Heart of all Glencoe Solutions. Enterprise database with secure, controlled, cross-platform data access.

BIO-FORMATS

The world's most used, best known, bioimaging file format translation tool.
Bundled with OMERO Plus.

PathViewer

Digital Pathology viewing and annotation tools. Works in a web browser, securely connects to OMERO Plus from anywhere.

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Image Centric

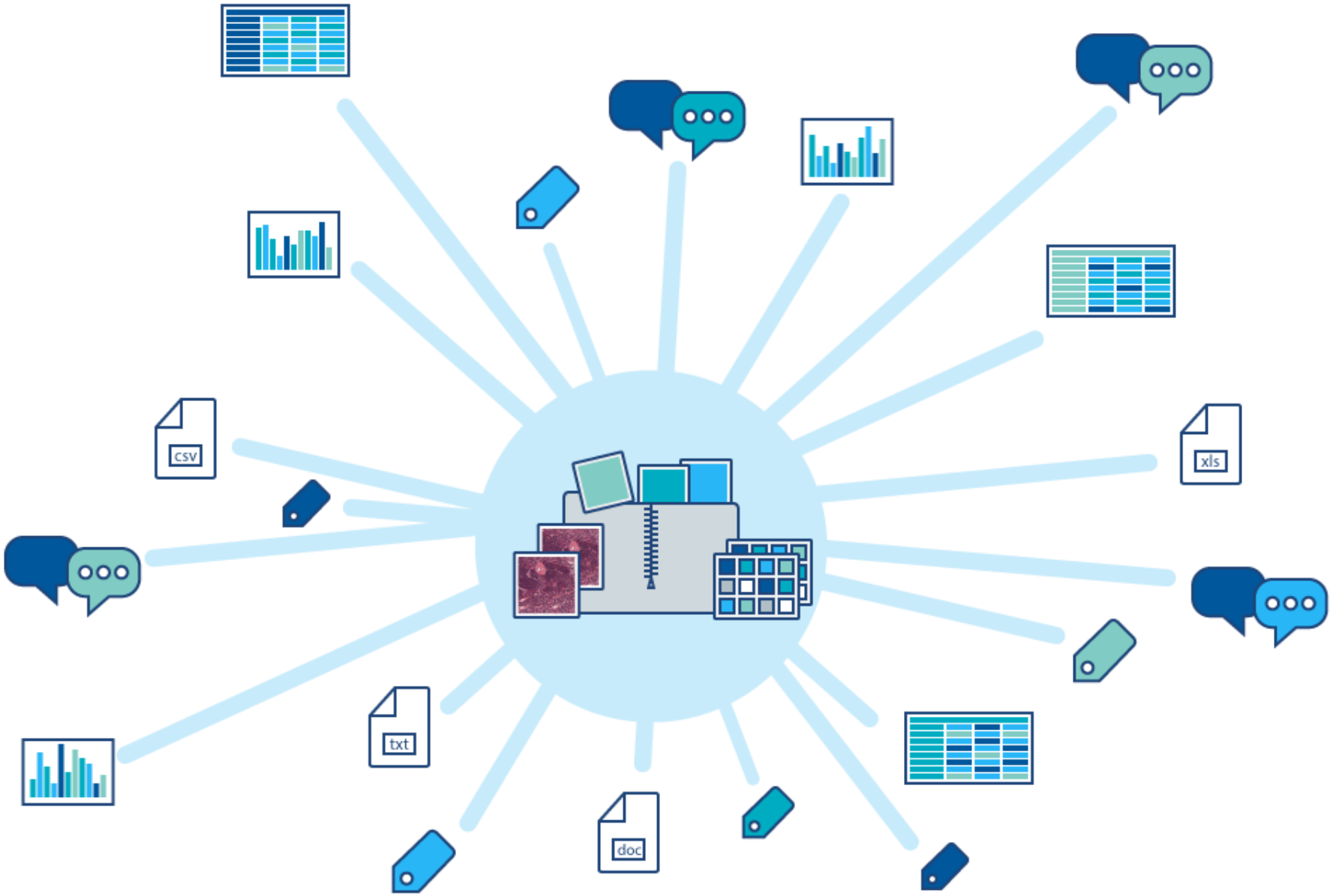


Image Centric:
High Content Screening

Data Scientists

Analytics
Graphs
Quantifications
Tables
Visualization
AI

Researchers

Phenotype
Protocol
Protein
Morphology

Image Analysts

Protocol
QC
Visualization
Segmentation
Quantification
Classification

Business Analyst

Validation
Review
Performance

Image Centric: Digital Pathology

Data Scientists

- Analytics
- Graphs
- Quantifications
- Tables
- Visualization
- AI

Pathologists

- Specimen
- Protocol
- Report
- Clinical
- Patient

Researchers

- Biomarker
- Toxicity
- Multiplexed
- Protocol
- Trial
- Staining

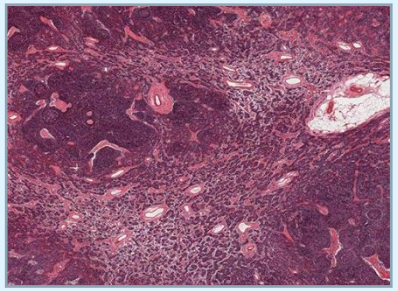


Image Analysts

- Quantification
- QC
- Specimen
- Classification
- Segmentation

Work to date

What we said last year

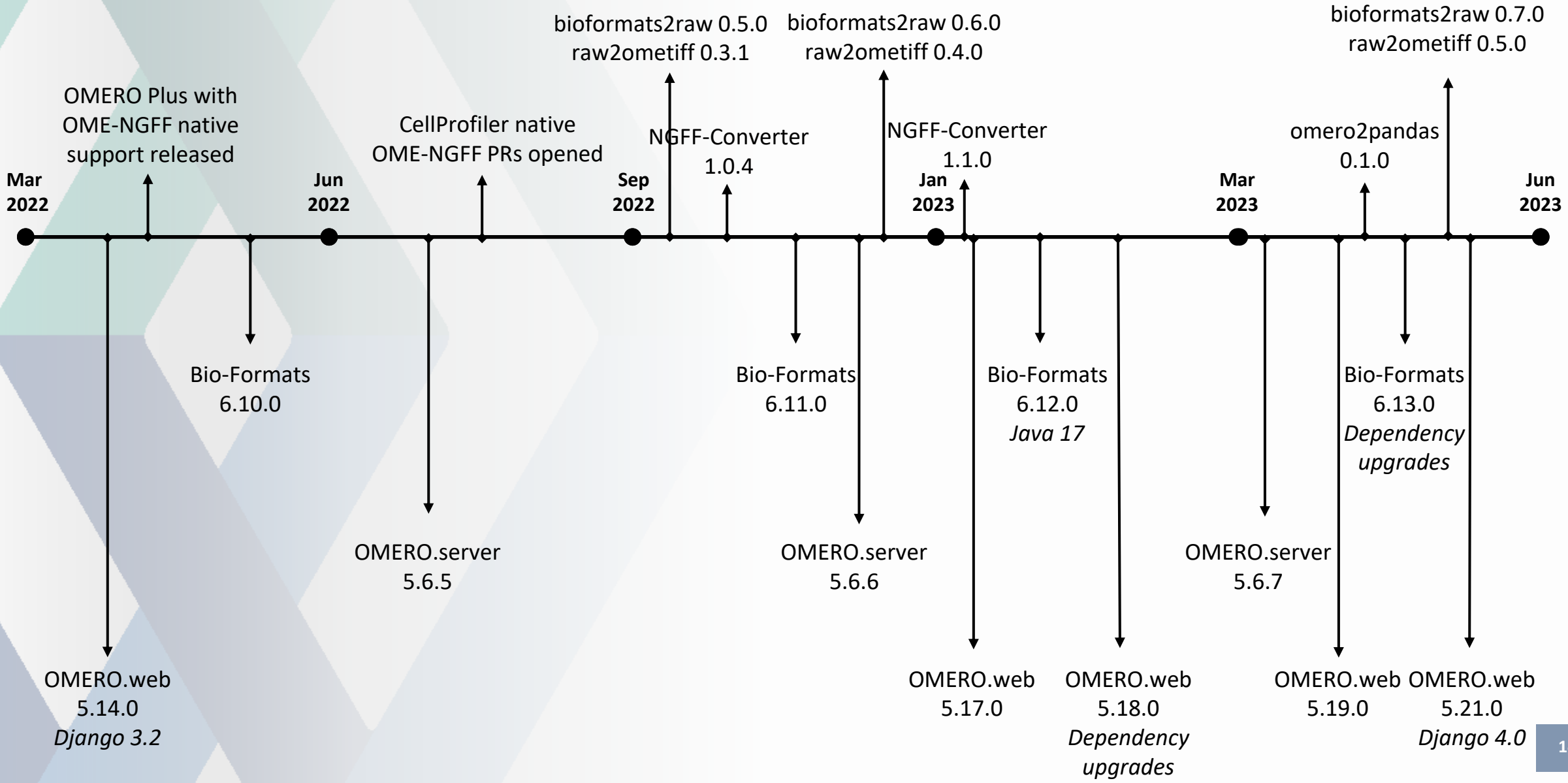
- Take a more active role in Bio-Formats and OMERO core development
- Expand support for OME-NGFF more widely
- Continue speaking engagements and posters on OME technology

https://www.openmicroscopy.org/events/ome-community-meeting-2022/

OMERO Plus technology

	Core	Extensions
Open-source	OME & OMERO Data Model Bio-Formats OMERO.server OMERO.web	OMERO micro-services OMERO plugins (omero2pandas) OME-NGFF integration
Proprietary		SSO integration Pathviewer Segmentation connectors

Timeline


Mar 2022
Jun 2022
Sep 2022
Jan 2023
Mar 2023
Jun 2023
OMERO Plus with OME-NGFF native support released
CellProfiler native OME-NGFF PRs opened
bioformats2raw 0.5.0
raw2ometiff 0.3.1
NGFF-Converter 1.0.4
bioformats2raw 0.6.0
raw2ometiff 0.4.0
NGFF-Converter 1.1.0
omero2pandas 0.1.0
bioformats2raw 0.7.0
raw2ometiff 0.5.0
Bio-Formats 6.10.0
Bio-Formats 6.11.0
Bio-Formats 6.12.0 Java 17
Bio-Formats 6.13.0 Dependency upgrades
OMERO.server 5.6.5
OMERO.server 5.6.6
OMERO.server 5.6.7
OMERO.web 5.14.0 Django 3.2
OMERO.web 5.17.0
OMERO.web 5.18.0 Dependency upgrades
OMERO.web 5.19.0
OMERO.web 5.21.0 Django 4.0

What we said last year – did we deliver?

Take a more active role in Bio-Formats and OMERO core development

- Significant contributions across several releases of Bio-Formats, OMERO.server and OMERO.web
- Active engagement into the Bio-Formats & OMERO.web roadmap and release lifecycle
- Review and update of core dependencies

Expand support for OME-NGFF more widely

- Several releases of converter utilities (bioformats2raw/raw2ometiff) and graphical user interface (NGFF-Converter)
- NGFF metadata requirements informed by OMERO Plus integration

- **Community speaking engagements and posters**
  - ABRF 2022 (Chris MacLeod)
  - PathLake Showcase (Chris Allan)
  - SBI2 (David Stirling, Mina Gheiratmand)
  - CBIAS 2022 (David Stirling, Erin Diel)
  - ABRF 2023 (Chris MacLeod , Erin Diel)
  - Bio-IT World 2023 (Chris McLeod, Marc Bruce, Erin Diel)
  - JupyterCon 2023 (David Stirling, Sebastien Besson, Emil Rozbicki)

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Roadmap, Priorities and Proposals for Collaboration

Collaboration

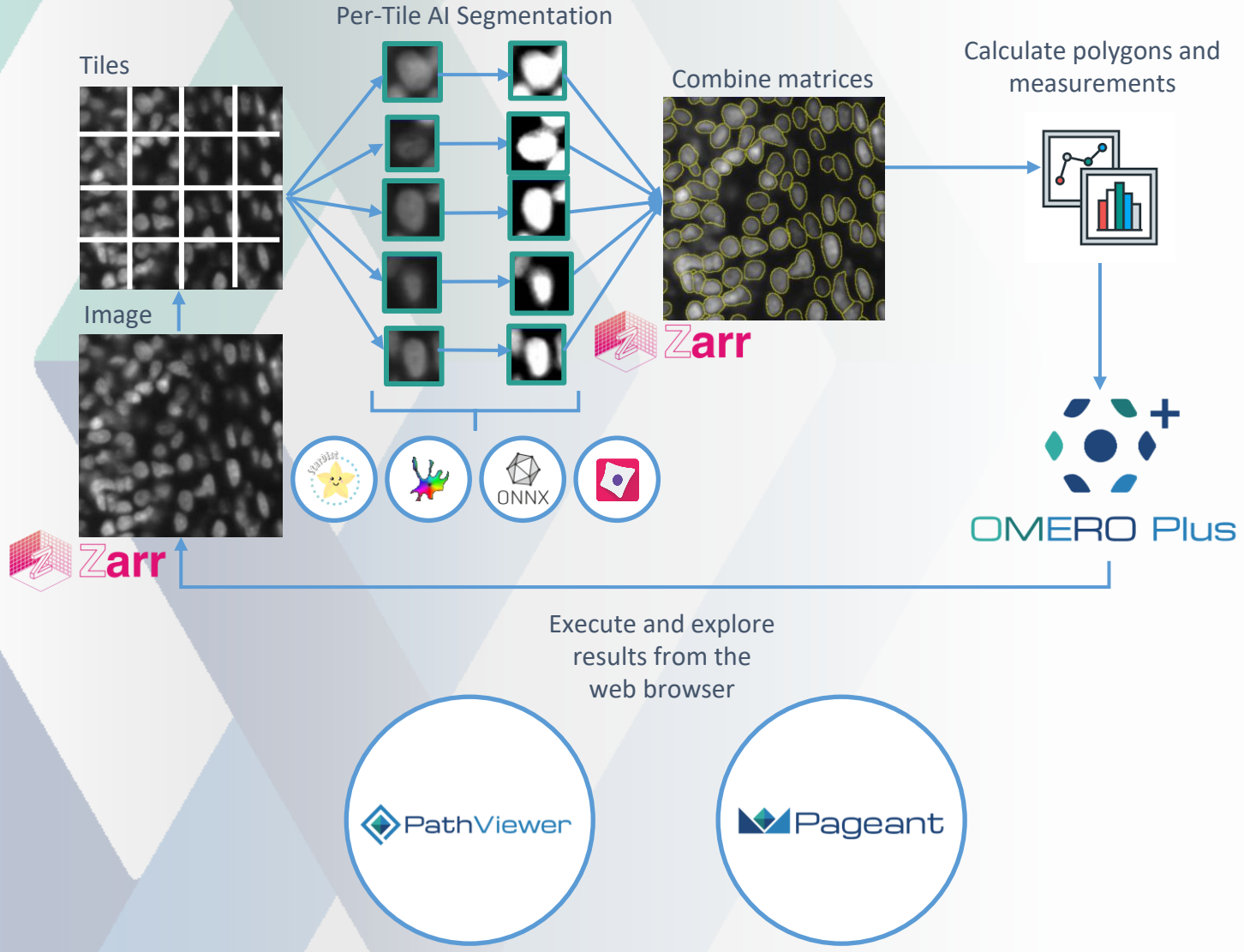
- Engagement in regular subgroup meetings by Glencoe Software staff has been very productive:
  - Bio-Formats
  - OMERO.web
  - OME-NGFF/Zarr
- Glencoe Software could lead a subgroup on OMERO.server
  - Need engagement from 1-2 partners: PR testing, feedback and prioritization
  - Glencoe Software willing to provide testing infrastructure

Priorities – OMERO core

- Maintain OMERO core:
  - Bug fixes
  - Address security vulnerabilities
  - Dependency upgrades
  - OS-compatibility testing

OMERO Plus Domain-Tailored Solutions

Digital Pathology and High Content Screening

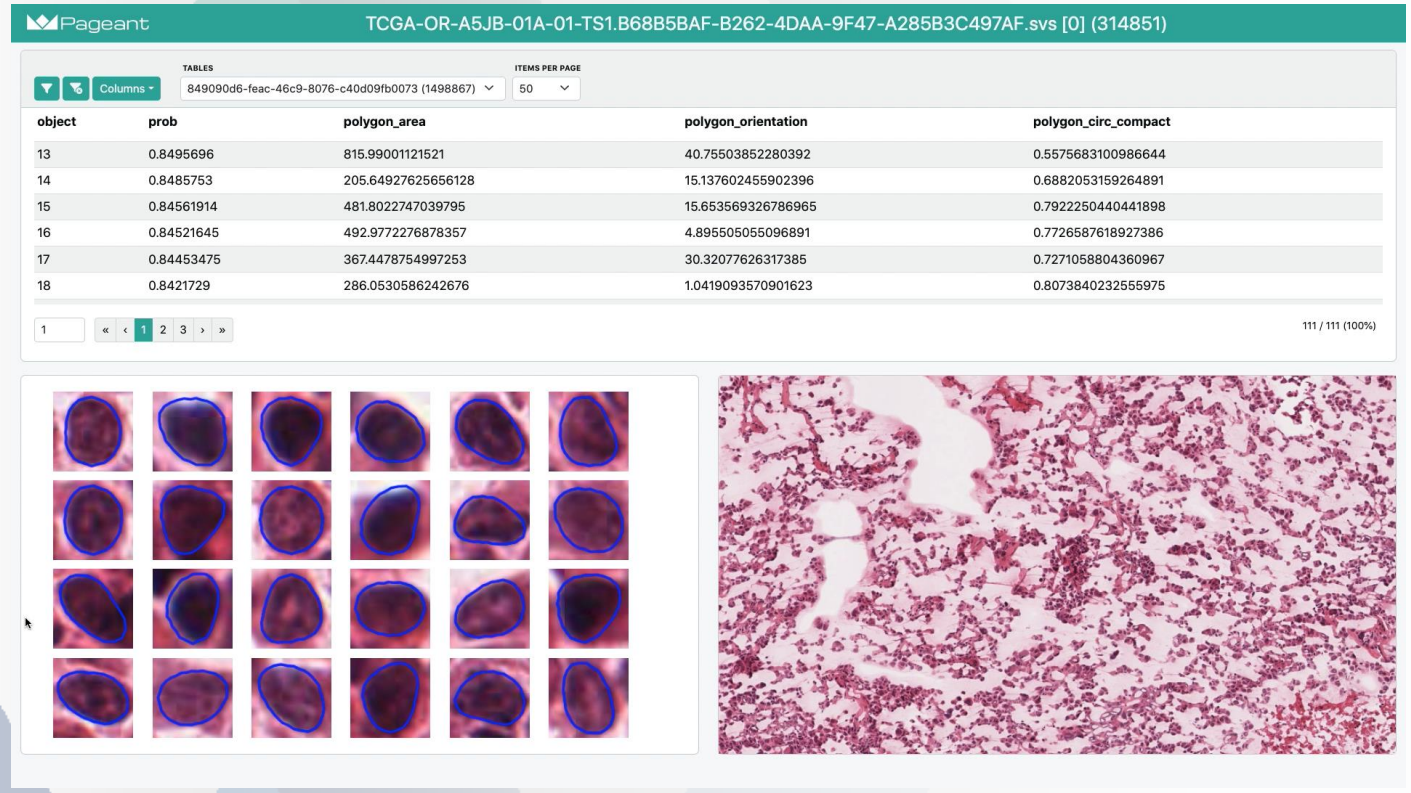


Required technology:

- **OME-NGFF**: cloud-native file format used for improved scalability in image I/O and label image for analysis output overlays
- **OMERO.tables:** for object measurements, with support for spatial indexing

- **OMERO-Segmentation Connector**: Cellpose, StarDist and ONNX models for AI-driven image segmentation; morphometric, spatial, intensity and population metrics for each object
- **PathViewer**: Image visualization and object-level data mining within the tissue context
- **Pageant**: object-level data mining in object-centered view

OMERO Plus Domain-Tailored Solutions
Digital Pathology and High Content Screening



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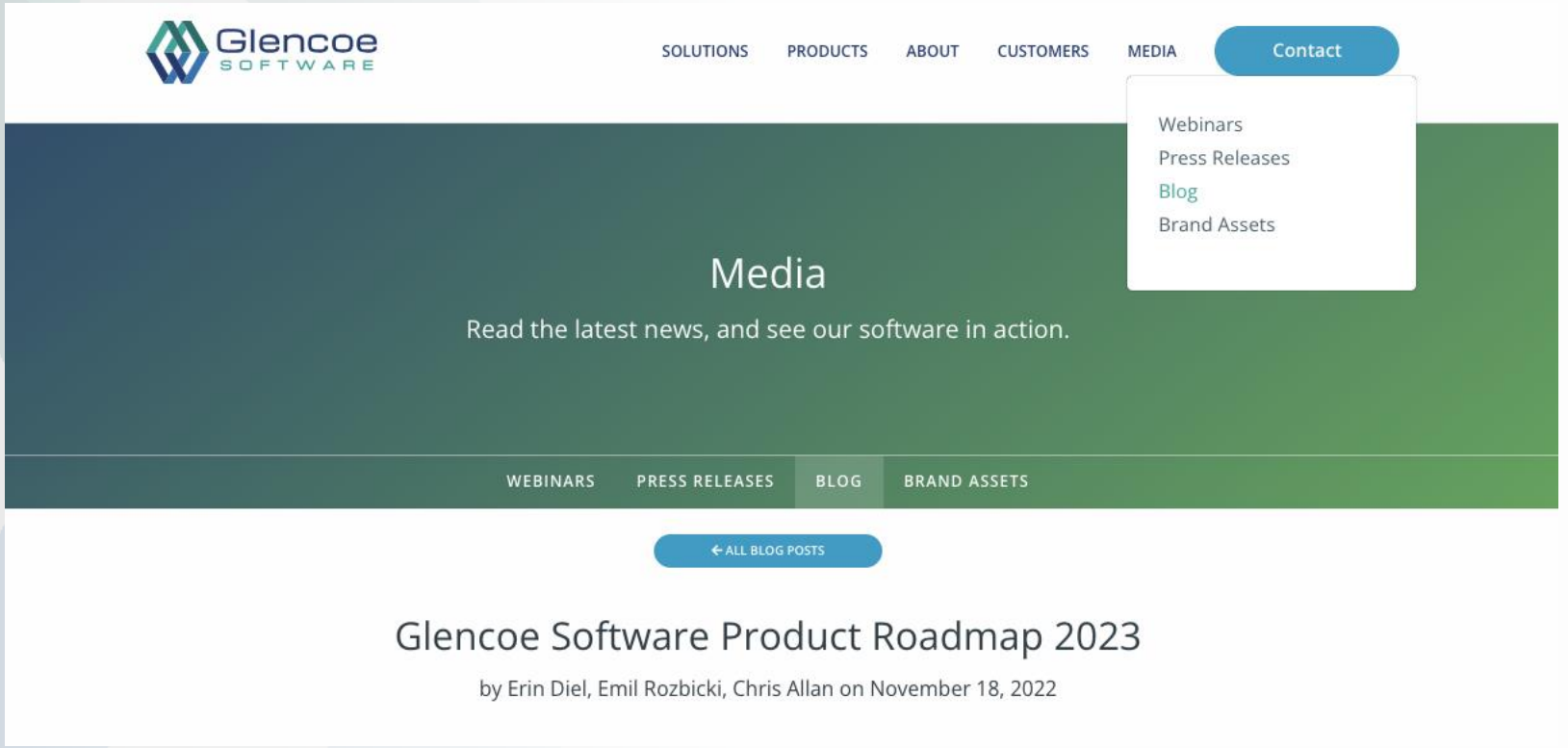
Priorities – NGFF

- Maintain reference implementation for OME-NGFF (bioformats2raw and its GUI wrapper NGFF-Converter)
- Reconcile when possible differences in NGFF image data model between OMERO and OMERO Plus

Priorities – OMERO.tables

- Explore viability of current OMERO.tables implementation for modern data volumes:
  - Cell and nuclear segmentation
  - Transcriptomics



https://www.glencoesoftware.com/blog/2022/11/18/Glencoe-Software-Roadmap-2023.html