Preserving Media Provenance Metadata with C2PA

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Introducing IPTC
(International Press and Telecommunications Council)

IPTC Voting Members include:

IPTC Liaison Partners include:

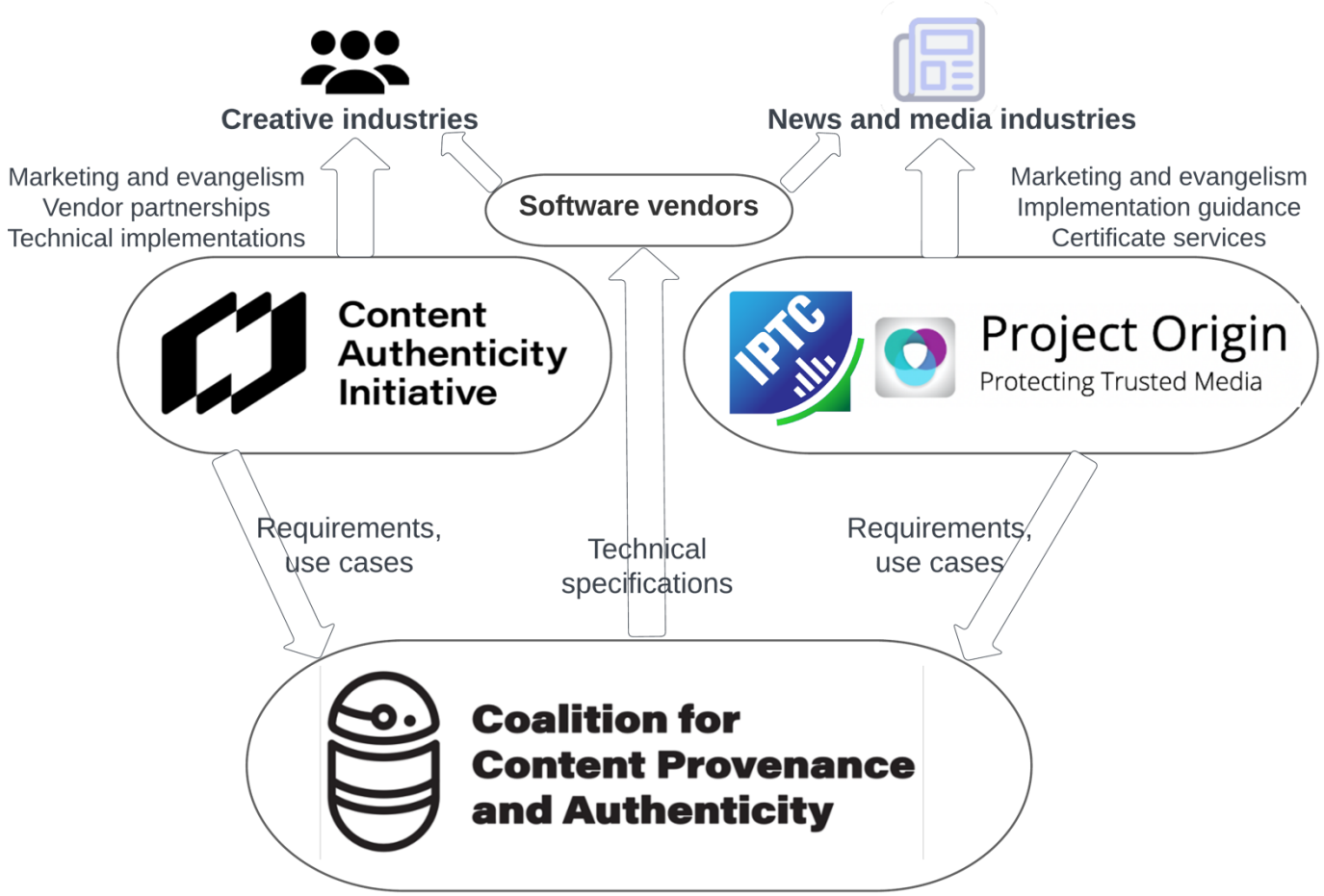
- IPTC (https://iptc.org/) is the global standards body of the news media, providing the technical foundation for the news ecosystem
- An open, non-partisan organisation dedicated to promoting interoperable standards and best practices in the news and media industries
- Founded in 1965 in the UK, IPTC is a non-profit organisation funded by member subscriptions
- Members join as voting members, affiliate members, or individuals

First, some acronyms and background

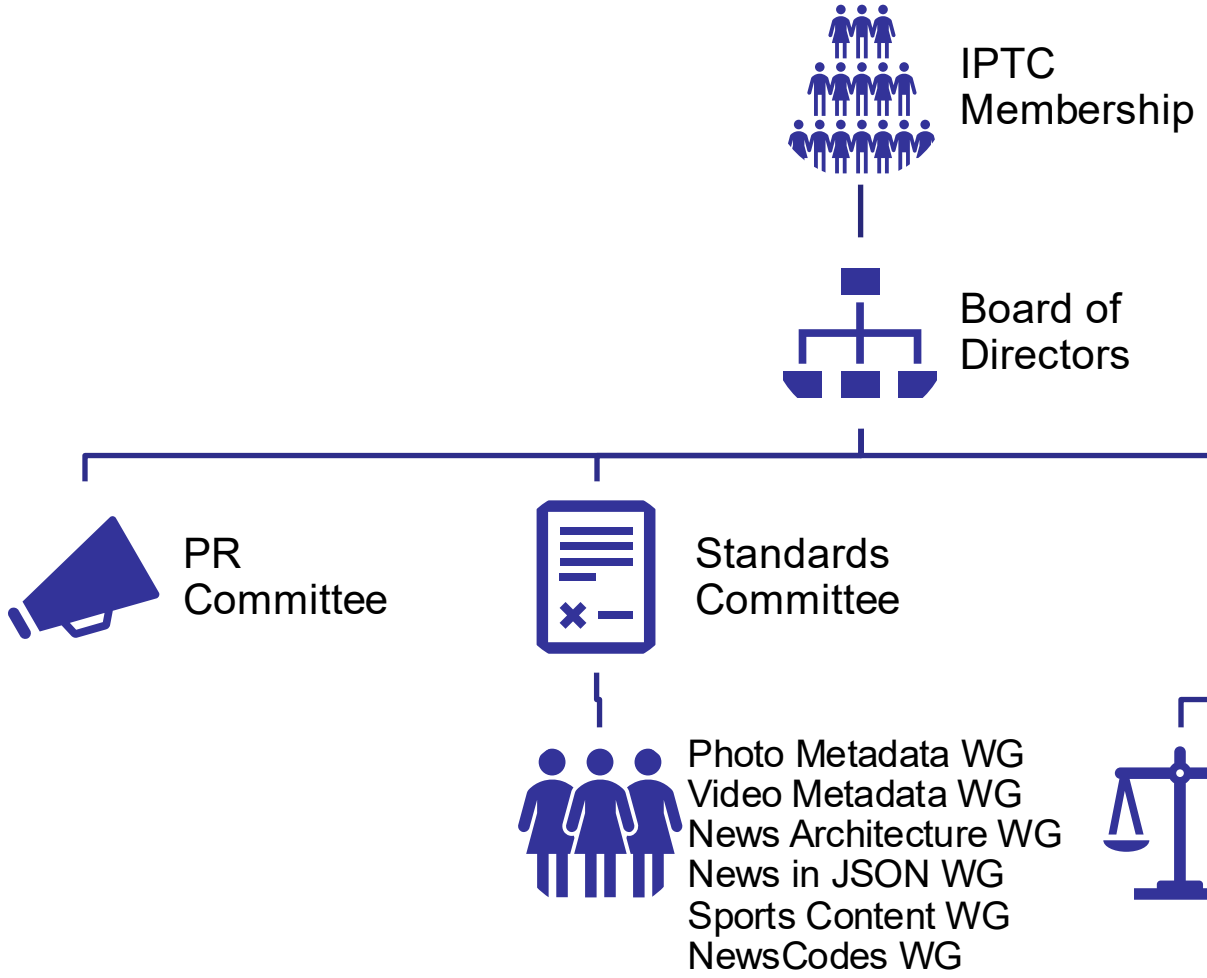
- **CAI - Content Authenticity Initiative**: https://contentauthenticity.org/
  - Founded and led by Adobe (2019)
- **Project Origin**: https://www.originproject.info/
  - Founded by: BBC, CBC/Radio-Canada, The New York Times, and Microsoft (2019)
- **C2PA – Coalition for Content Provenance and Authenticity**: https://c2pa.org/
  - Unifies the efforts of the **Content Authenticity Initiative** and **Project Origin** to provide technical foundation for trust in media (v 1.0 - 2021)
- **CAWG - Creator Assertions Working Group**: https://cawg.io/
  - Builds on the work of the C2PA by defining additional assertions that allow content creators to express individual and organizational intent about their content
  - Now (March 2025) a working group within DIF – the Decentralised Identity Foundation

C2PA, CAI, Project Origin, IPTC: How does it all fit together?

- Project Origin + CAI joined together to create C2PA – Coalition for Content Provenance and Authenticity
- Project Origin was simply a collaboration agreement between a small number of companies: it had no structure to scale
- So the IPTC “adopted” Project Origin
- The work now continues as the IPTC Media Provenance Committee
- “Project Origin” and “Origin” branding remain



IPTC Media Provenance Committee



- Committee Chair: Bruce MacCormack, CBC / Radio Canada
- Governance WG lead: Charlie Halford, BBC
- Best Practices WG lead: Helge O. Svela, Media Cluster Norway
- Advocacy WG lead: Judy Parnall, BBC

Proving what's real is easier than detecting what's fake

- Overall, the approach is to digitally sign content
- These embedded, secure credentials are called "assertions"
- Signed assertions become "claims" embedded in the C2PA "manifest"
- If the media has been modified, the digital "hash" no longer matches, and this will be highlighted to users
- The aim is for this technology to be built into websites, browsers and online platforms

Source: BBC mockup

Creator Assertions Working Group (CAWG) and Identity Assertions

- C2PA alone now covers **only hardware and software** provenance, not creators, producers and publishers**
- Because all means of identifying individuals and organisations were removed from C2PA, the spin-off group Creator Assertions Working Group (CAWG) was initiated to incubate the parts removed from the spec.
- Two significant CAWG projects are:
  - The **cawg.metadata** assertion for generic metadata properties (any metadata that can be expressed in JSON-LD, including IPTC, EXIF, schema.org and more)
  - The **cawg.identity** assertion allows named actors to sign some or all assertions in a C2PA manifest

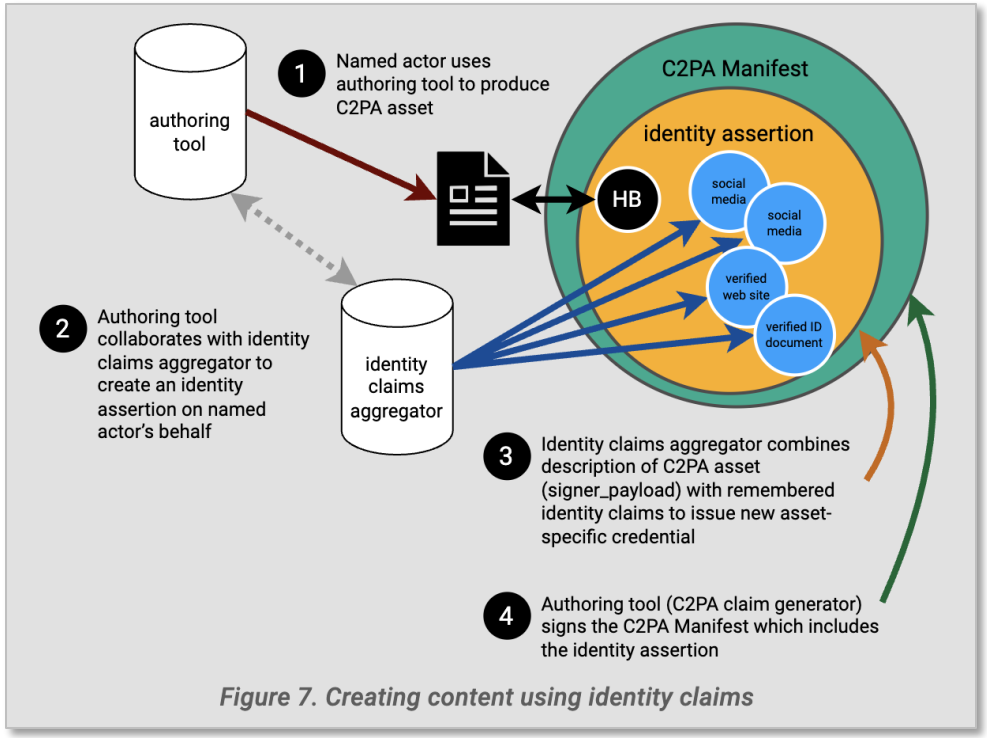


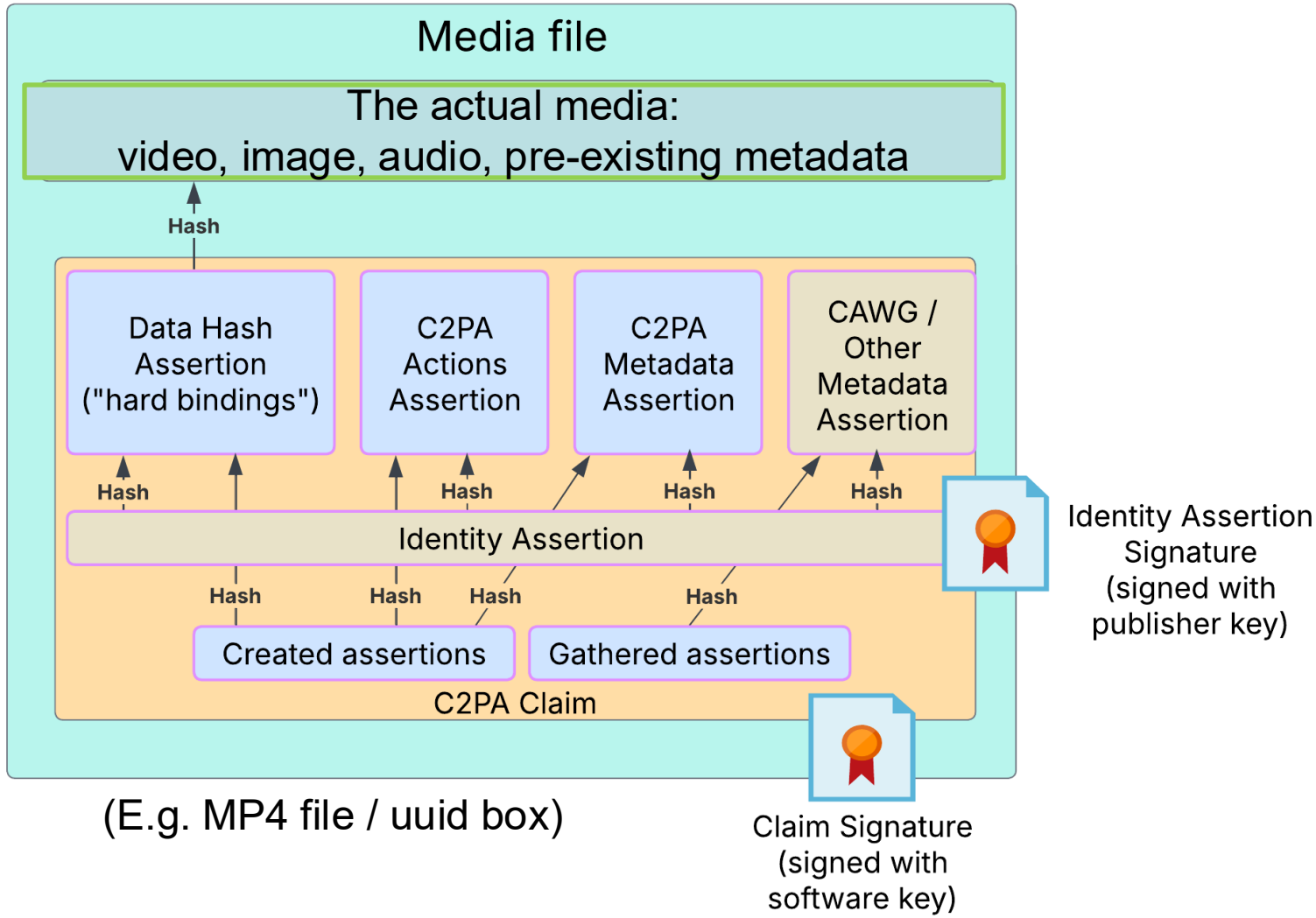
Figure 7. Creating content using identity claims

** C2PA v 2.0 section 5.2.2 (Jan 2024): *"This version represents a significant departure from previous versions. It reduces the use of the term "actor", which no longer represents humans and organisations. In addition to validator-configured trust lists, it also introduces a new default trust list, the "C2PA Trust List", which is intended to cover certificates issued to hardware and software"*

Overall C2PA-ready media file

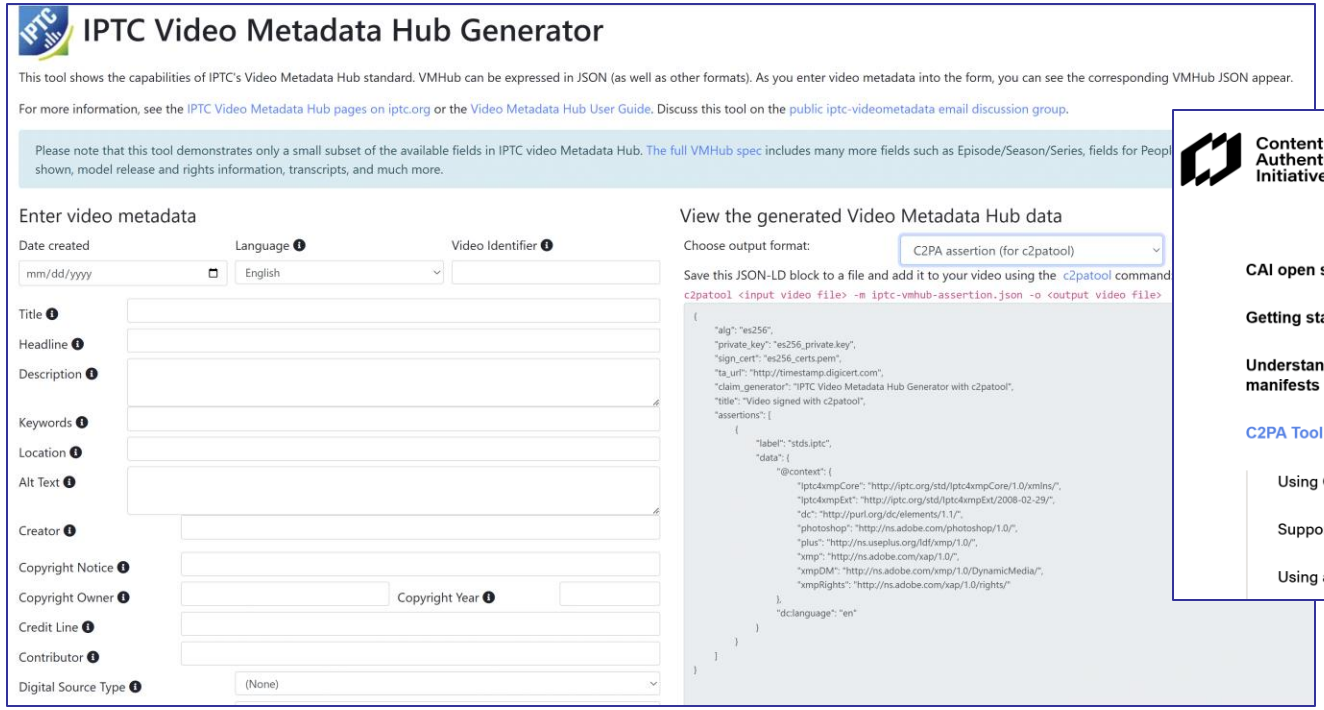
The C2PA manifest:

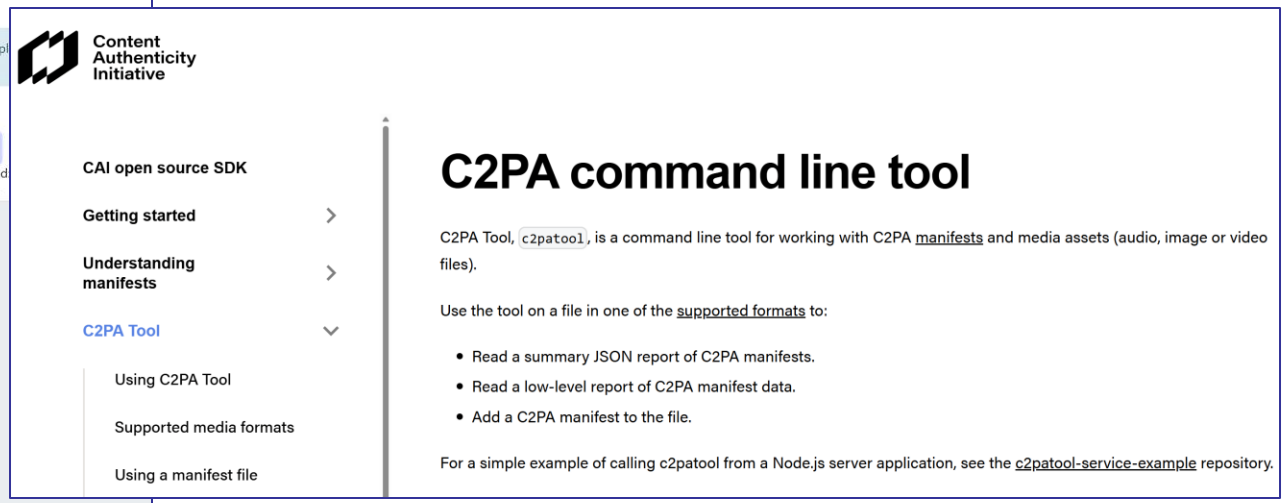
- C2PA claim signature(s) from hardware and software
  - E.g. Sony camera, Final Cut Pro)
- Identity assertion signature(s) from publisher (cawg.identity)
  - E.g. New York Times
- Any other metadata (cawg.metadata)
  - E.g. EIDR ID, title, description, rights info)



Creating C2PA assertions

- Open tools for creating C2PA and embedding assertions:
  - https://www.iptc.org/std/videometadatahub/generator/
  - https://opensource.contentauthenticity.org/docs/c2patool/





The C2PA ecosystem is still evolving

- C2PA Claims are validated using an independent "**Trust List**"
  - Currently, a "CAI Temporary Known Trust List", but this will cease working this year (many current demos use this, but will time out shortly)
  - The v.2.0 –compliant **C2PA Trust List** (hardware and software) will launch "**during 2025**"
  - C2PA v.2.1 spec provides for "additional trust list" anchors
  - IPTC Origin Verified News Publishers List is an "additional trust list" compliant with the C2PA 2.1 spec. More info here: https://iptc.org/verified-news-publishers-list/
  - Discussing extending to wider entertainment community, ideally collaborating with EIDR

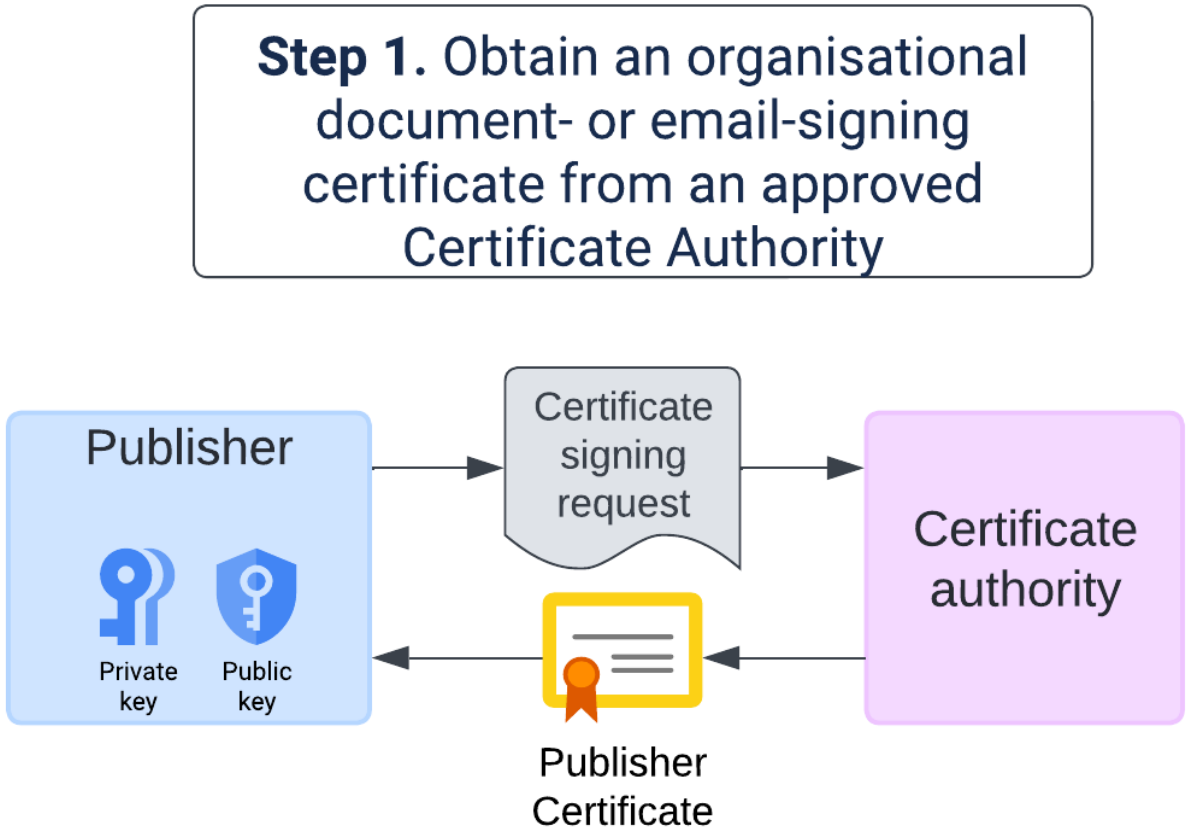
- There are a handful of **validators**, largely open source:
  - https://contentcredentials.org/verify (from CAI)
  - https://originverify.iptc.org/ (from IPTC / Origin)
  - Also several integration tools (e.g. Wordpress plug-in)

IPTC Origin Verified News Publisher List

- We created an IPTC-hosted “Trust List” of “Verified News Publisher” certificates
  - We verify that organisations are genuine news publishers before putting certificates on the list
- We help news organisations to obtain certificates and learn how to sign their content
- We have created a set of certificate and signing tools and have launched a validator at https://originverify.iptc.org/
- One of the main tasks of the Committee is to work out how this will scale to a large number of media publishers
- Current VNP trust list (+10 in process):

How does a publisher join the Verified News Publishers Trust List?

- The current process is in the early stages and limited to news publishers



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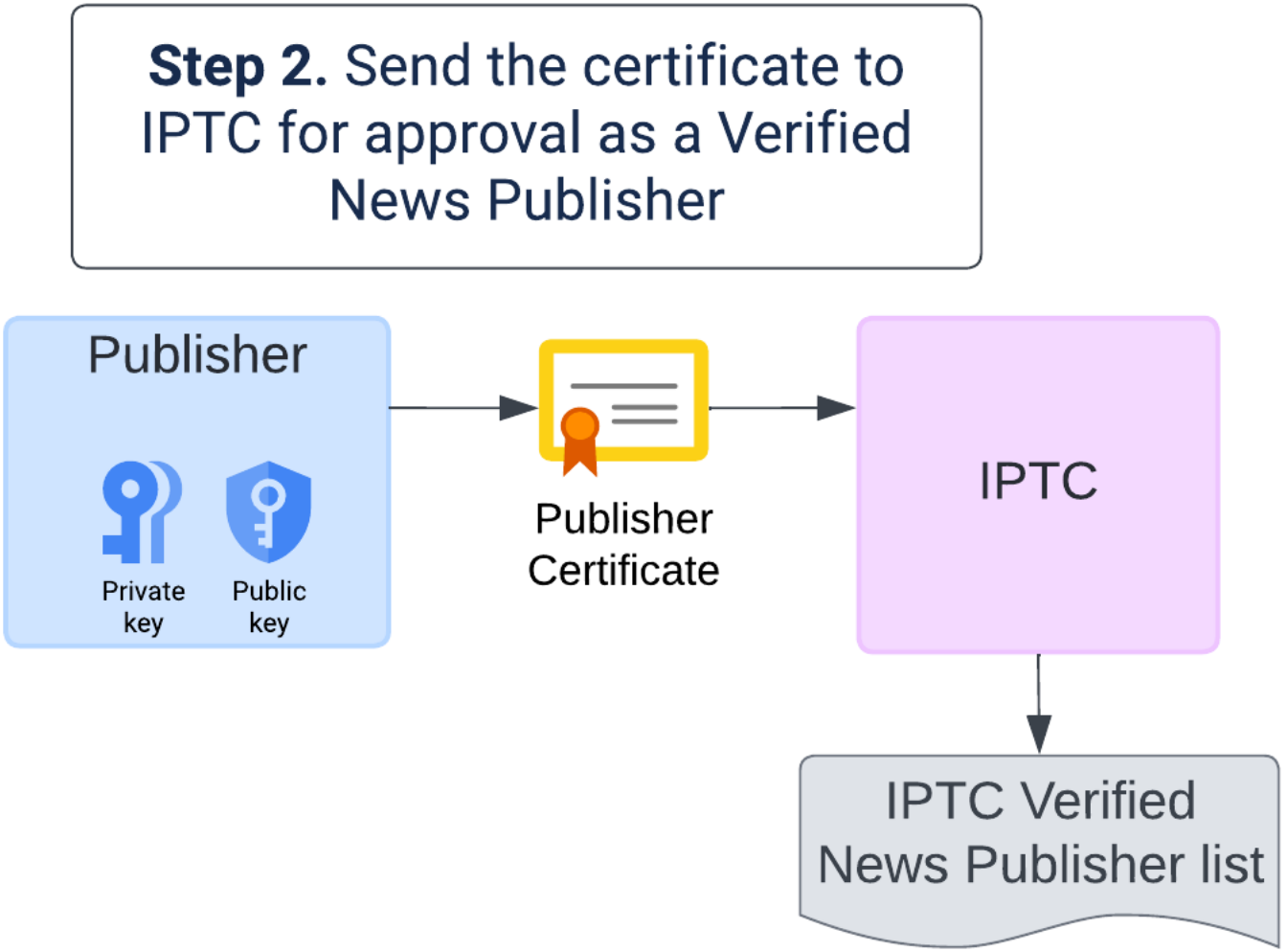

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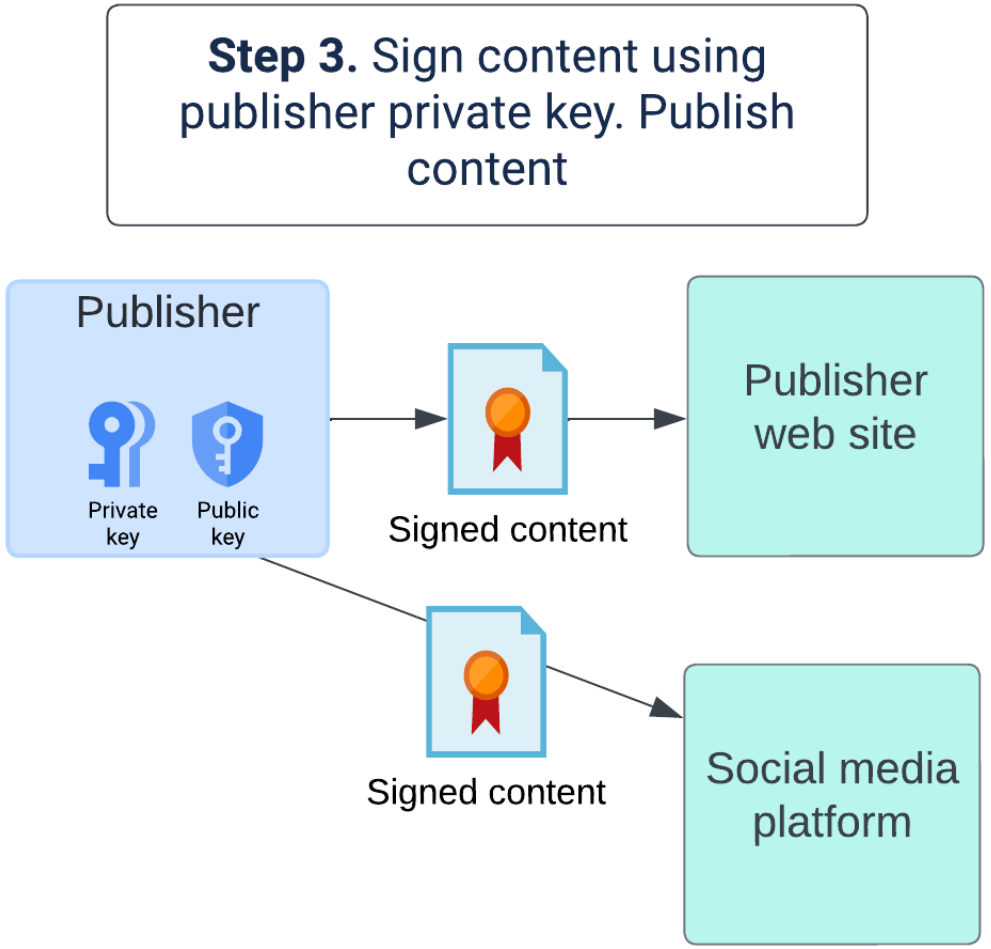

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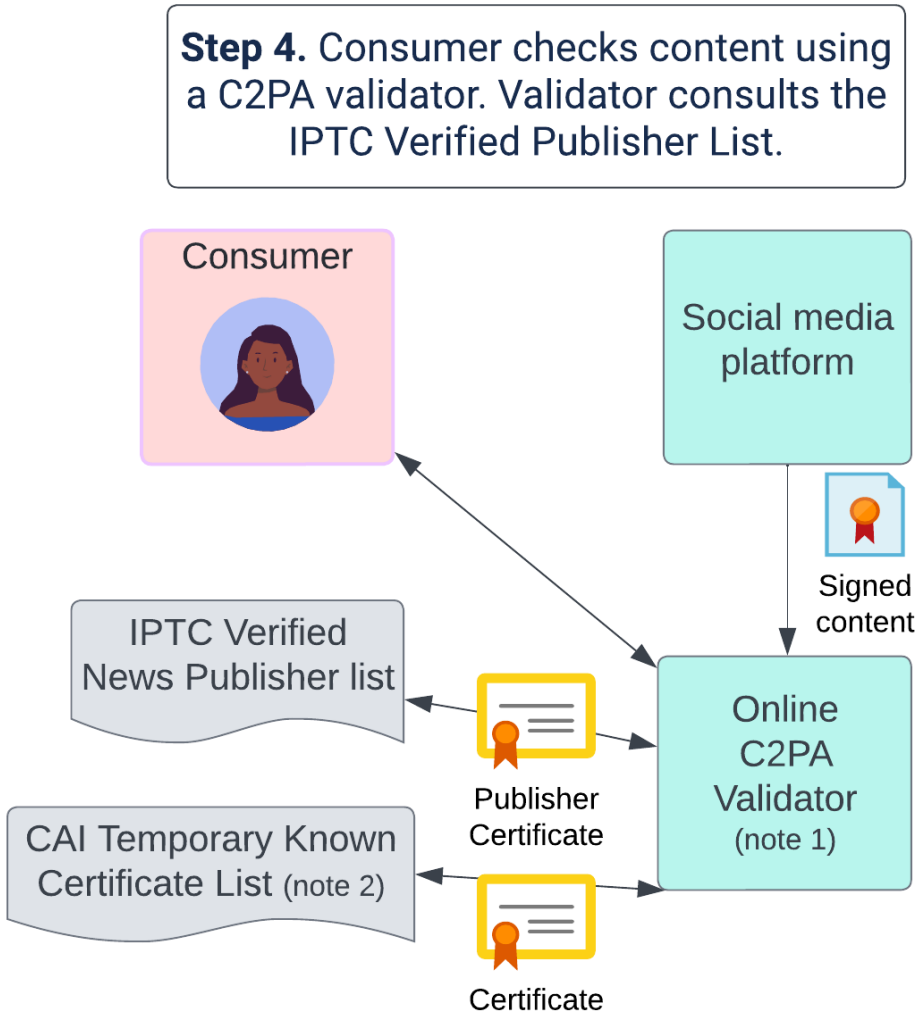
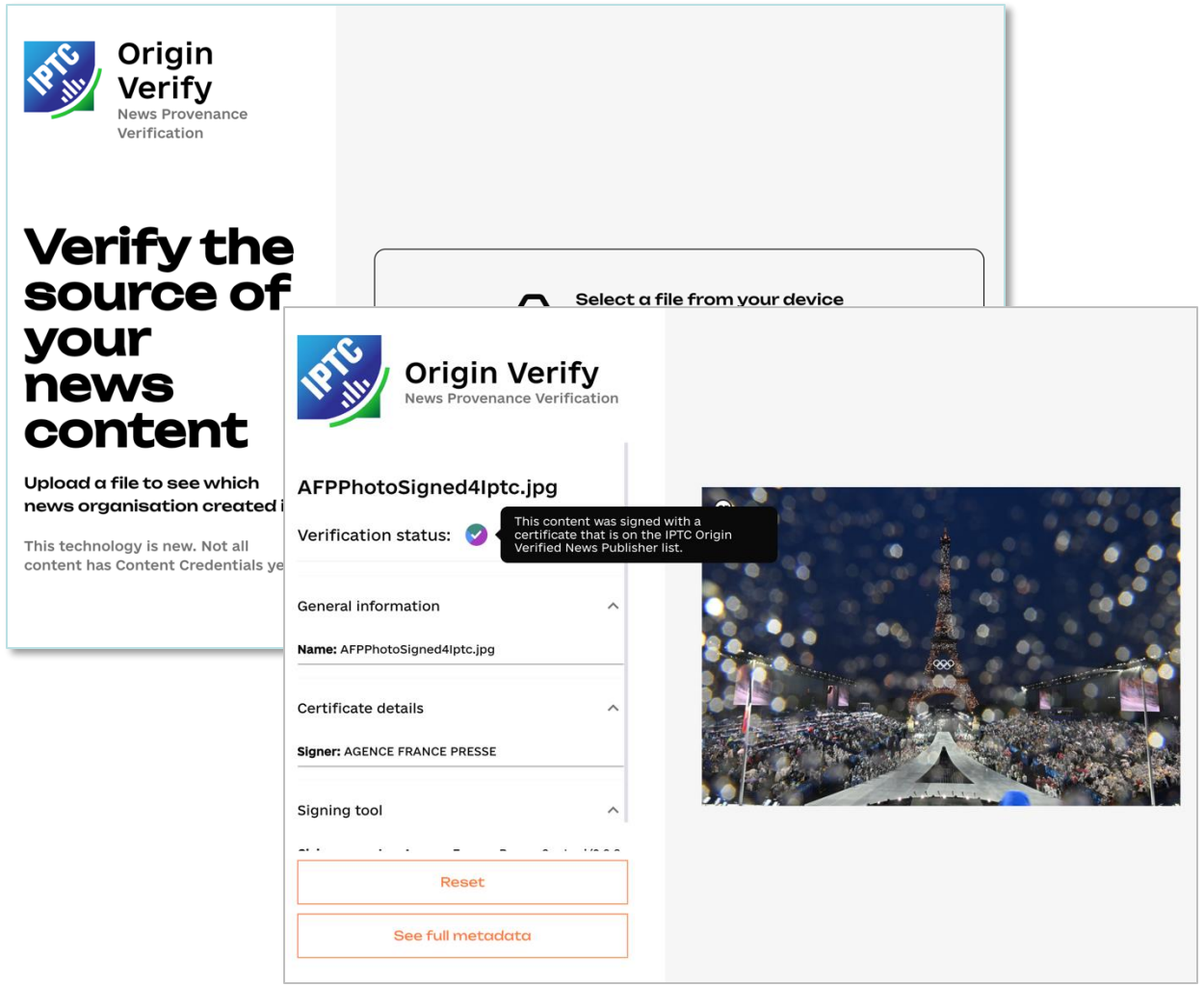


Notes

1. Not all C2PA validators currently support the IPTC list. The IPTC validator at originverify.iptc.org supports both the CAI and IPTC lists.
2. The CAI Temporary Known Certificate List will soon be replaced by the C2PA Trust List, certifying software and hardware that has passed a compliance audit.

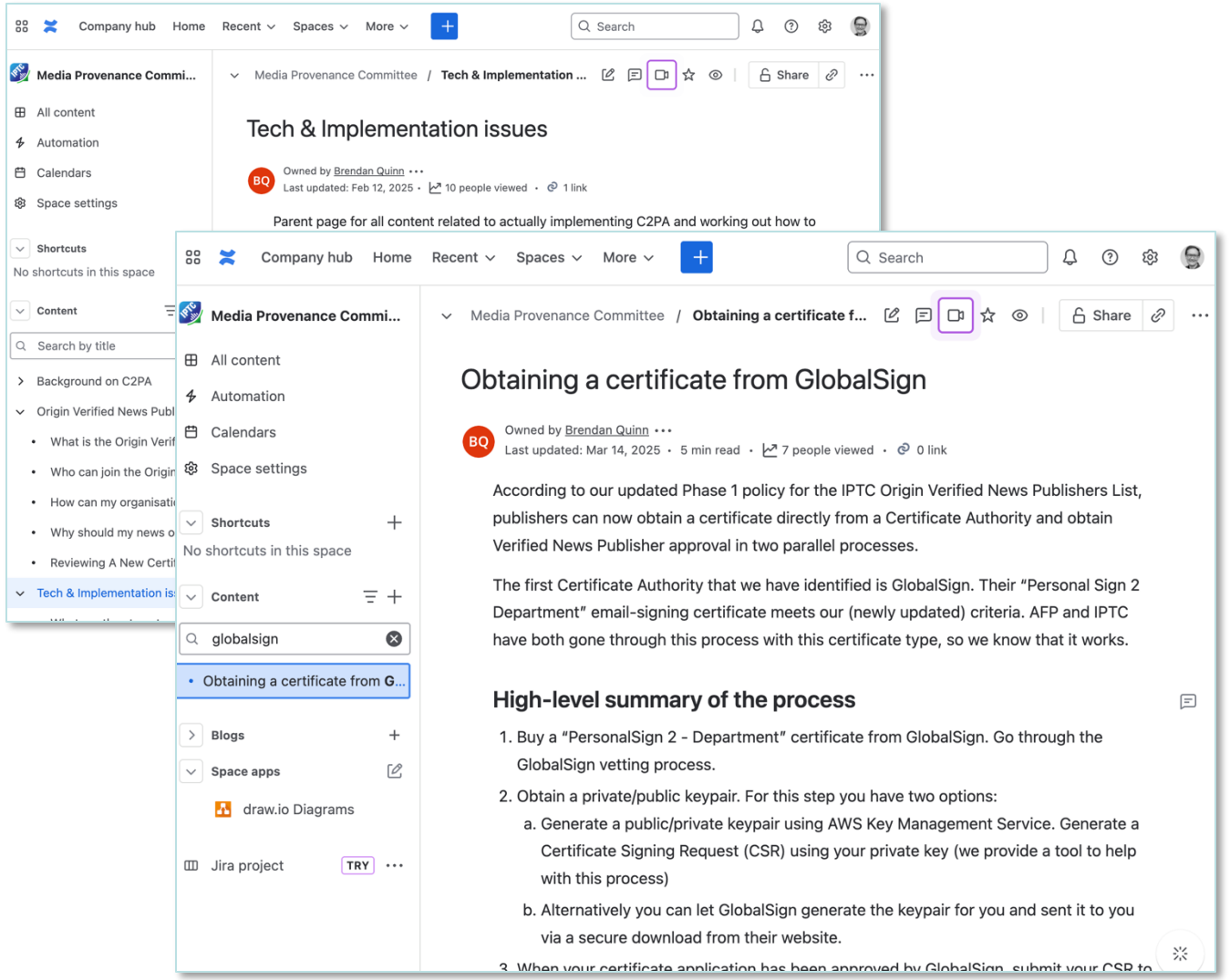
Tools and services to support publishers: Origin Verify Validator

- We have created our own validator, **originverify.iptc.org**
- Shows whether content has been tampered since being signed
- Shows the owner of the certificate used to sign the content
- Shows some basic metadata: publisher, publish time, caption, alt text
- Works with images and video files



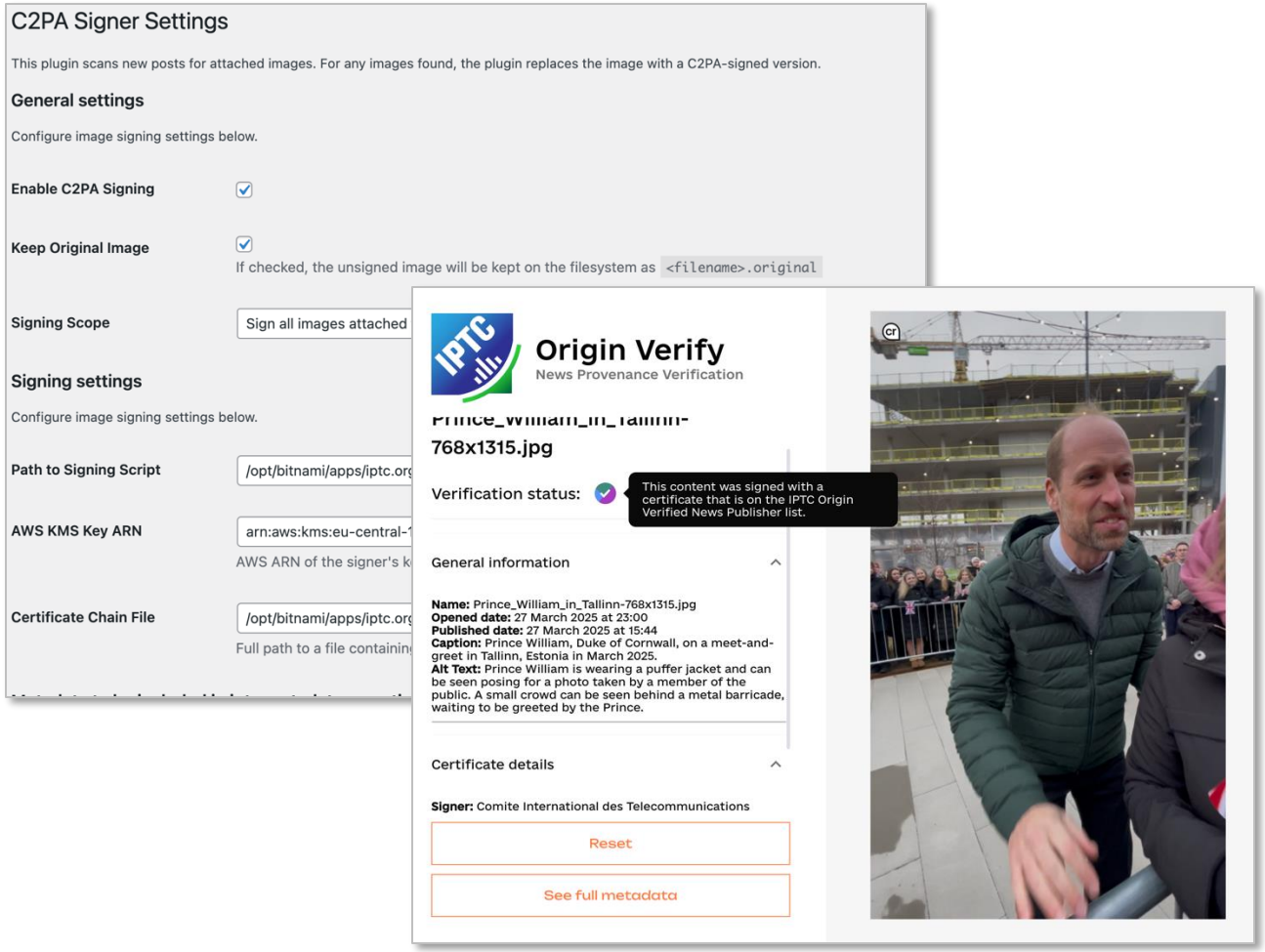
Tools and services to support publishers: IPTC Media Provenance wiki

- We have created an internal wiki for IPTC members
- Includes a step-by-step guide helping publishers to obtain certificates and add them to the Verified News Publishers list
- Includes guides on tech and tools, but also info on workflows and help to explain benefits of C2PA to newsrooms



Tools and services to support publishers: Wordpress plugin

- We have created a Wordpress plugin that uses our signing tools to automatically sign every image published on every news post
- It also extracts caption, alt text and publish date from the Wordpress metadata and adds them to the assertions inside the signed manifest
  - Can be configured by options in the plugin settings
- We are now using this on iptc.org
  - We might be the first publisher to routinely sign all content that we publish!



What are the next steps?

- Be patient! Media provenance using C2PA is worth supporting, and broad adoption will become feasible over the next 6-18 months
- Many, many organizations and individuals are working on this through the initiatives discussed – there is substantial support
  - Most welcome new members, including IPTC!
- Begin planning for adoption now

Thank you!

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For more information on Media Provenance at IPTC: https://iptc.org/media-provenance/