



**Content
Authenticity
Initiative**

Eric Scouten · Identity Standards Architect · Adobe



Content Authenticity 101

Content Authenticity: Who? What? Why?

C2PA data model overview

CAWG identity assertion overview

Tomorrow: Working session on identity assertion



Why content provenance?





Why content provenance?

The
New York
Times

Making Deepfakes Gets Cheaper and Easier Thanks to A.I.

Forbes

The Battle Against Fake News Enters The Age Of Deepfakes

CNN BUSINESS

Puffer coat Pope. Musk on a date with GM CEO. Fake AI ‘news’ images are fooling social media users

The
Guardian

Elections in UK and US at risk from AI-driven disinformation, say experts

TIME

From Scams to Music, AI Voice Cloning Is on the Rise

cbc
NEWS

With rise of AI-generated images, distinguishing real from fake is about to get a lot harder



Why content provenance?

We can't uninvent this.

What we *can* do is ...

provide a mechanism for well-intentioned
content creators to stand apart from misinformation.



Our goals

Allow **content creators** to make tamper-evident, digitally-signed statements about what they've created.

Allow **content consumers** to evaluate those statements and use them to make trust decisions.

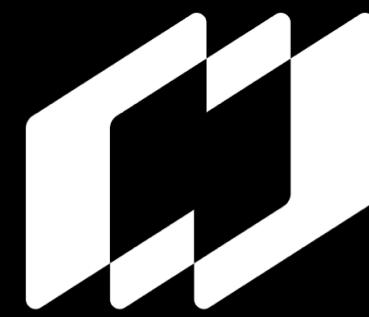


Our non-goals

Content Authenticity is **not**:

- fact-checking
- fake image detection
- politically opinionated

Demo: How it works in Photoshop



Who's who?



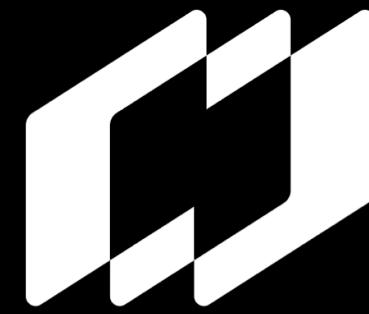
**Content
Authenticity
Initiative**



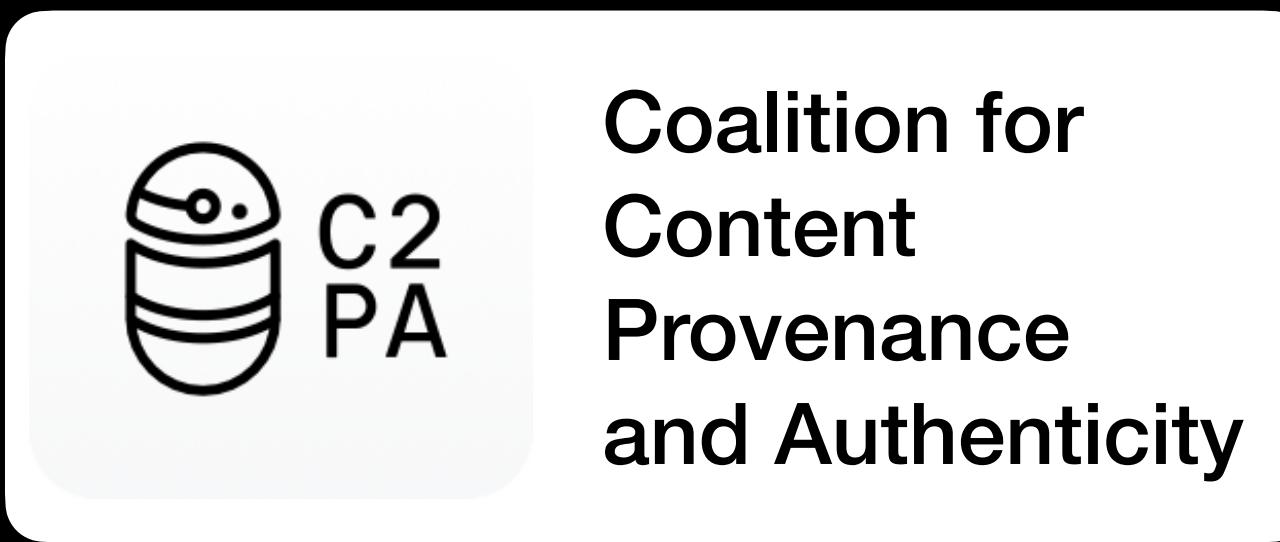
**Coalition for
Content
Provenance
and Authenticity**



**Creator
Assertions
Working Group**



Who's who?

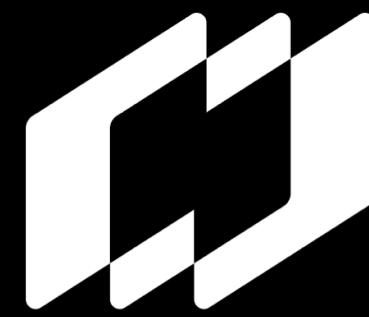


Outreach · Advocacy · Open Source

** also name of Adobe's team*

Technical Standards: **What / How**

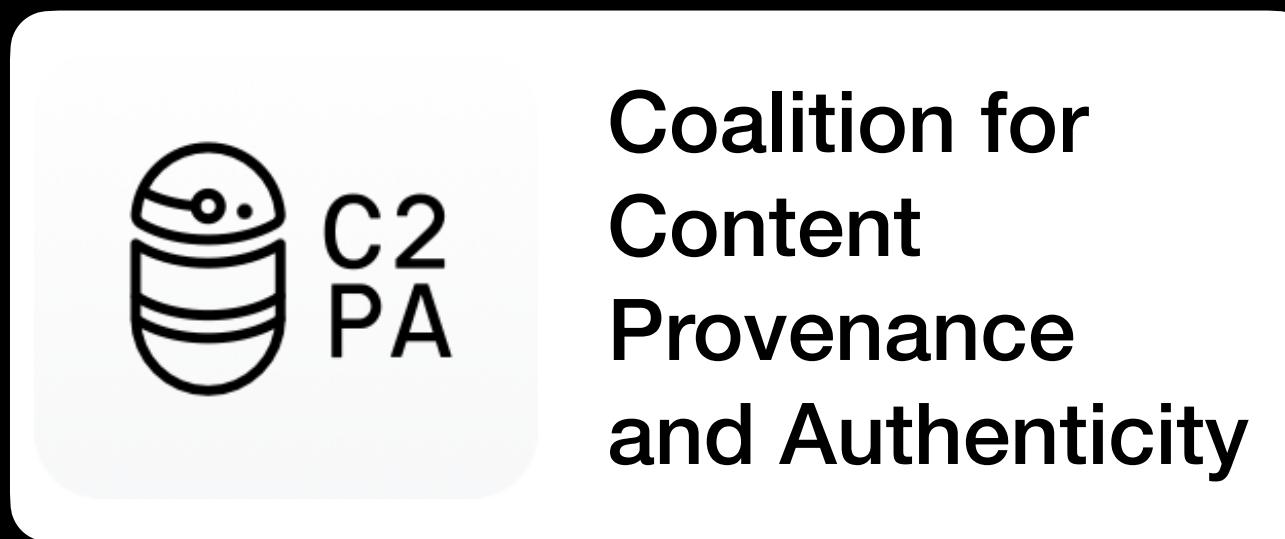
Technical Standards: **Who**



Who's who?



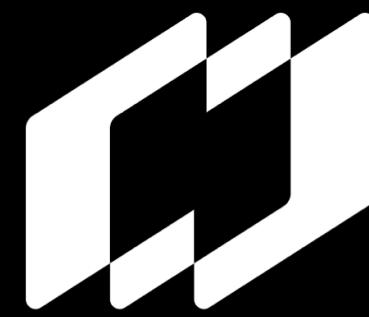
contentauthenticity.org



c2pa.org



creator-assertions.github.io



Who's in?

~2500 members, including ...

CBC  Radio-Canada

EFE:

dpa ...

GANNETT

gettyimages®

THE
GLOBE
AND
MAIL*

The New York Times

THE WALL STREET JOURNAL.

The Washington Post

infobae

shutterstock



REUTERS

epaimages

 stern

EL TIEMPO

BBC

axel springer_

AP

AFP

 NATIONAL
GEOGRAPHIC
SOCIETY

npr

dentsu


PUBLICIS
GROUPE

OmnicomGroup

 truepic

arm

camera  bits

Canon

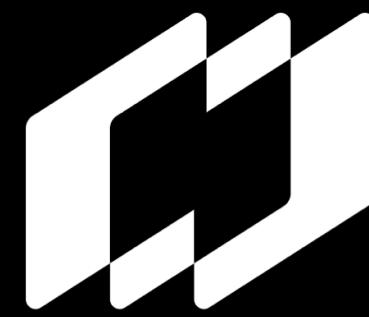
 Microsoft

Qualcomm

 Nikon

 Leica

 Adobe



Who's in?

Major camera manufacturers



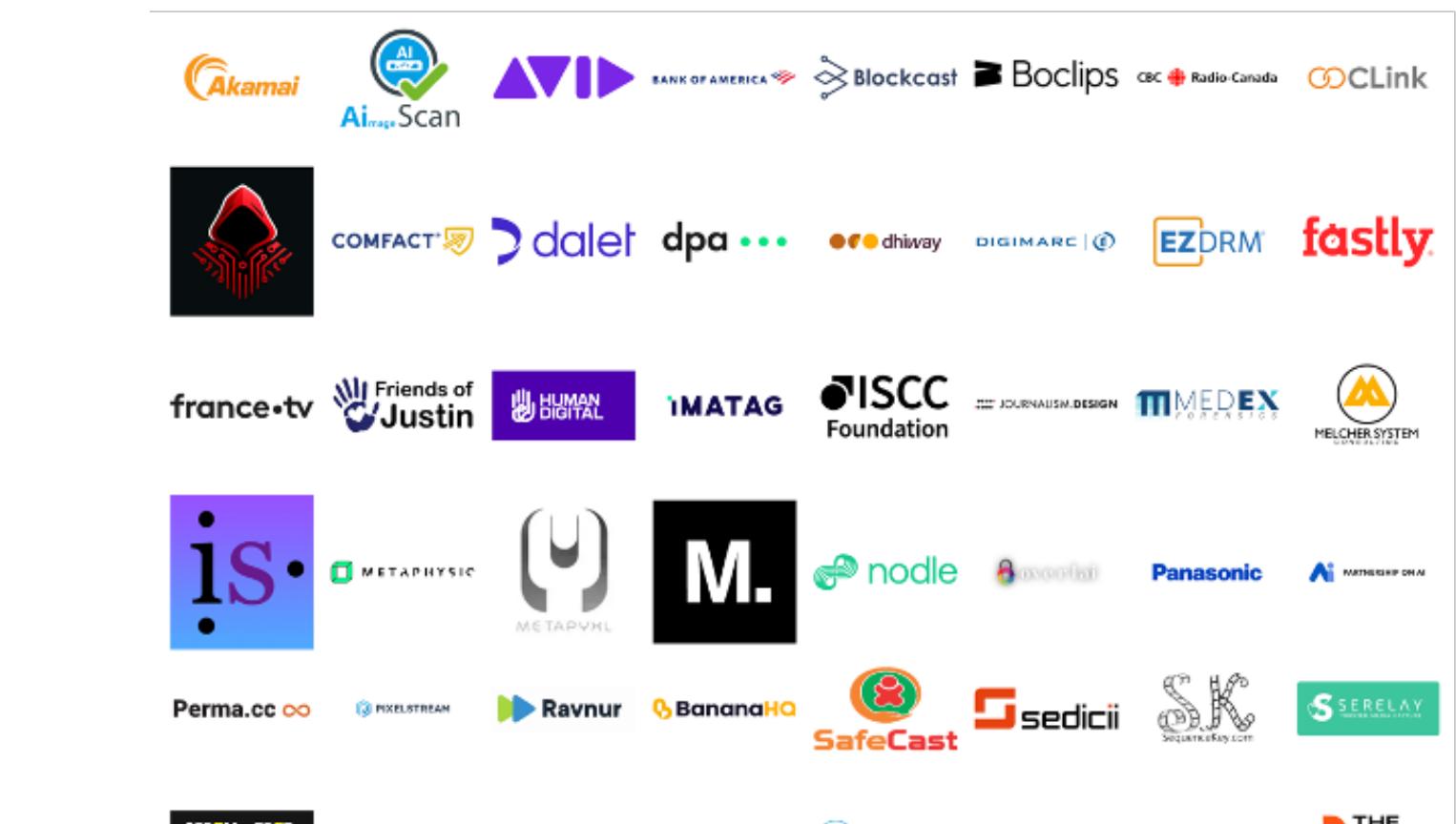
SONY





Who's in?

~100 members, including ...





C2PA data model



C2PA data model

Overview

An **asset** is any piece of digital media that we wish to describe.

asset

Currently supported asset types include:

photo

video

audio

documents

fonts

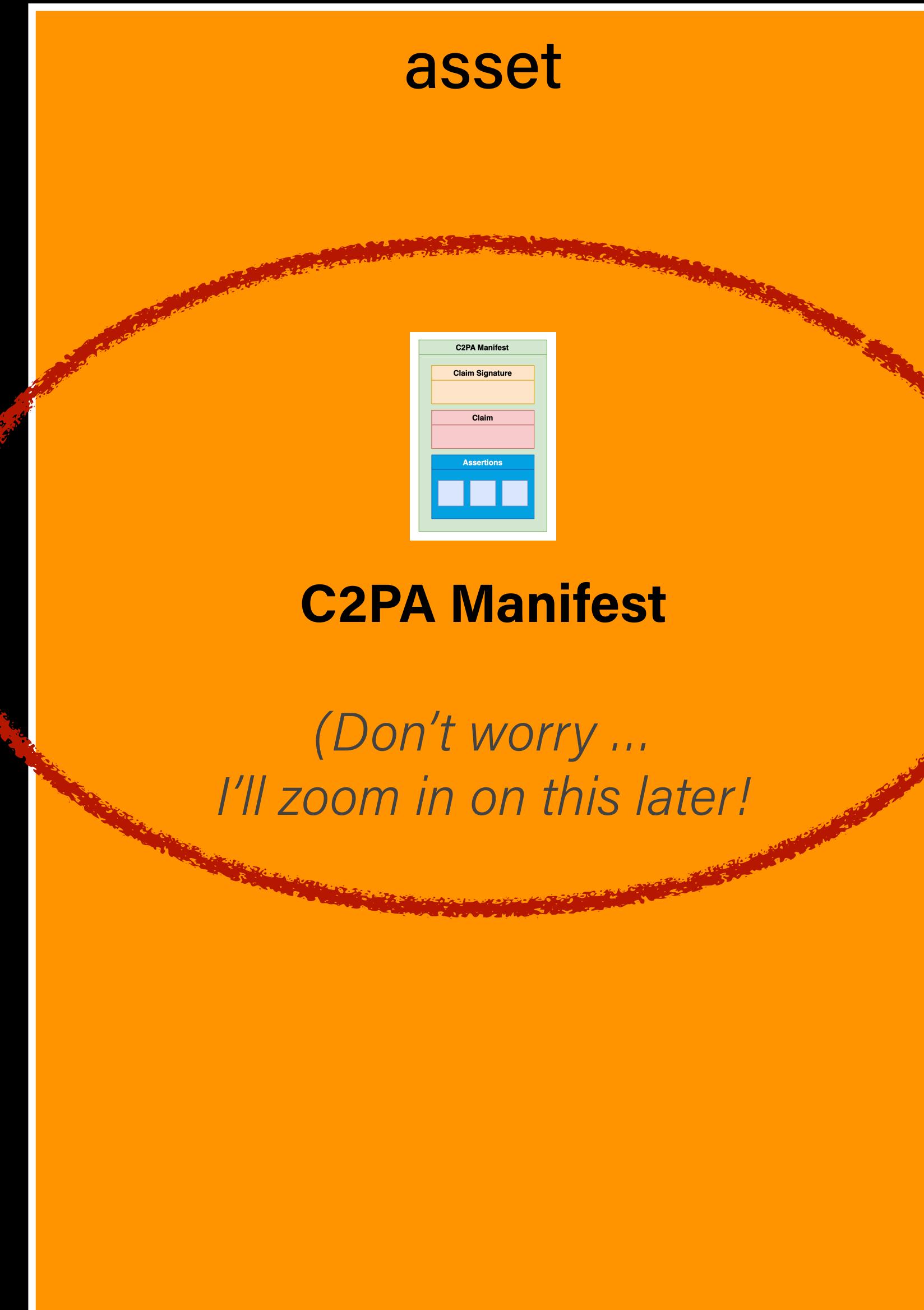


C2PA data model

Overview

An **asset** is any piece of digital media that we wish to describe.

It is described by a **C2PA Manifest**.





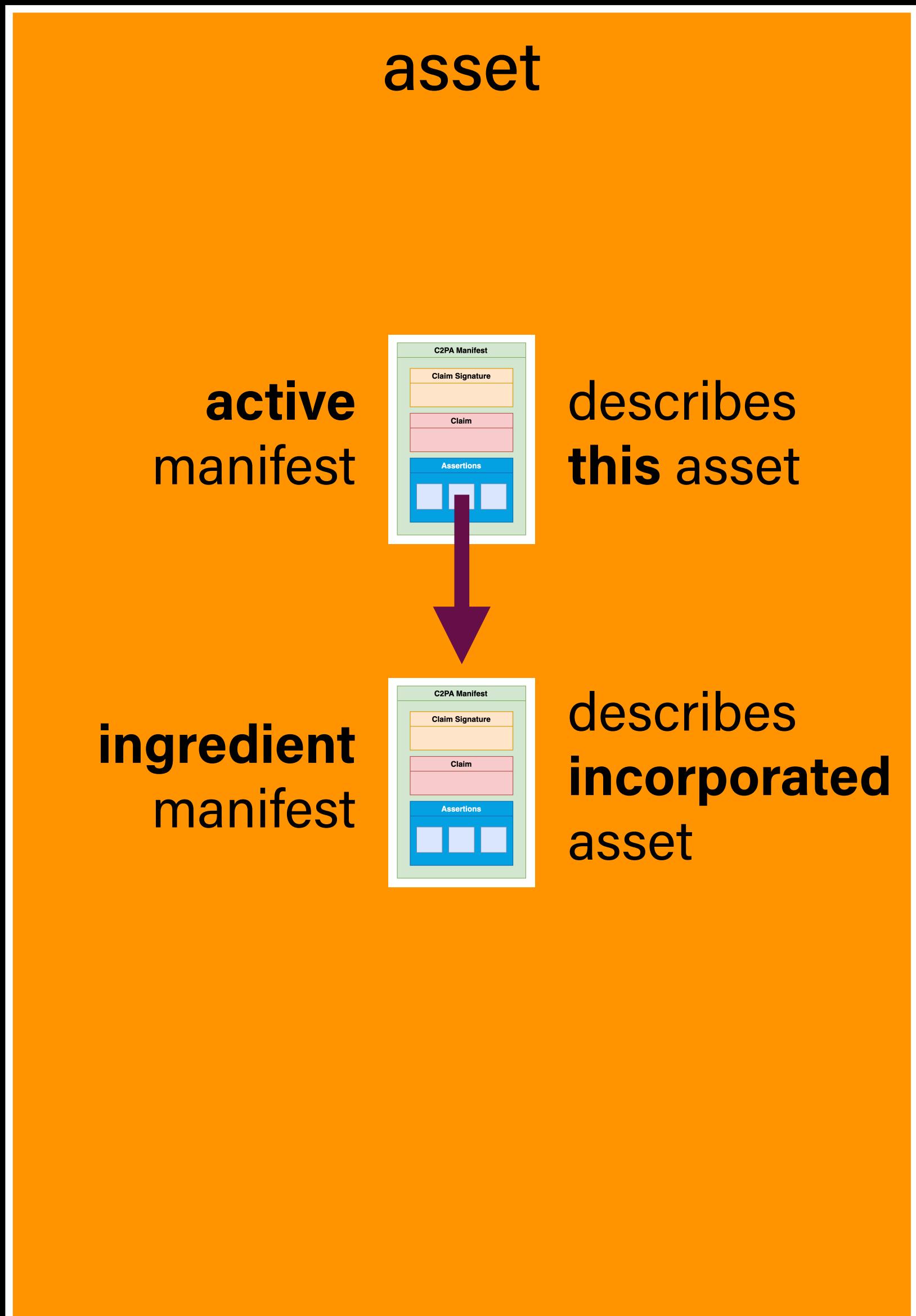
C2PA data model

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An **asset** is any piece of digital media that we wish to describe.

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That C2PA Manifest may refer to *ingredient manifests* when earlier content is incorporated.





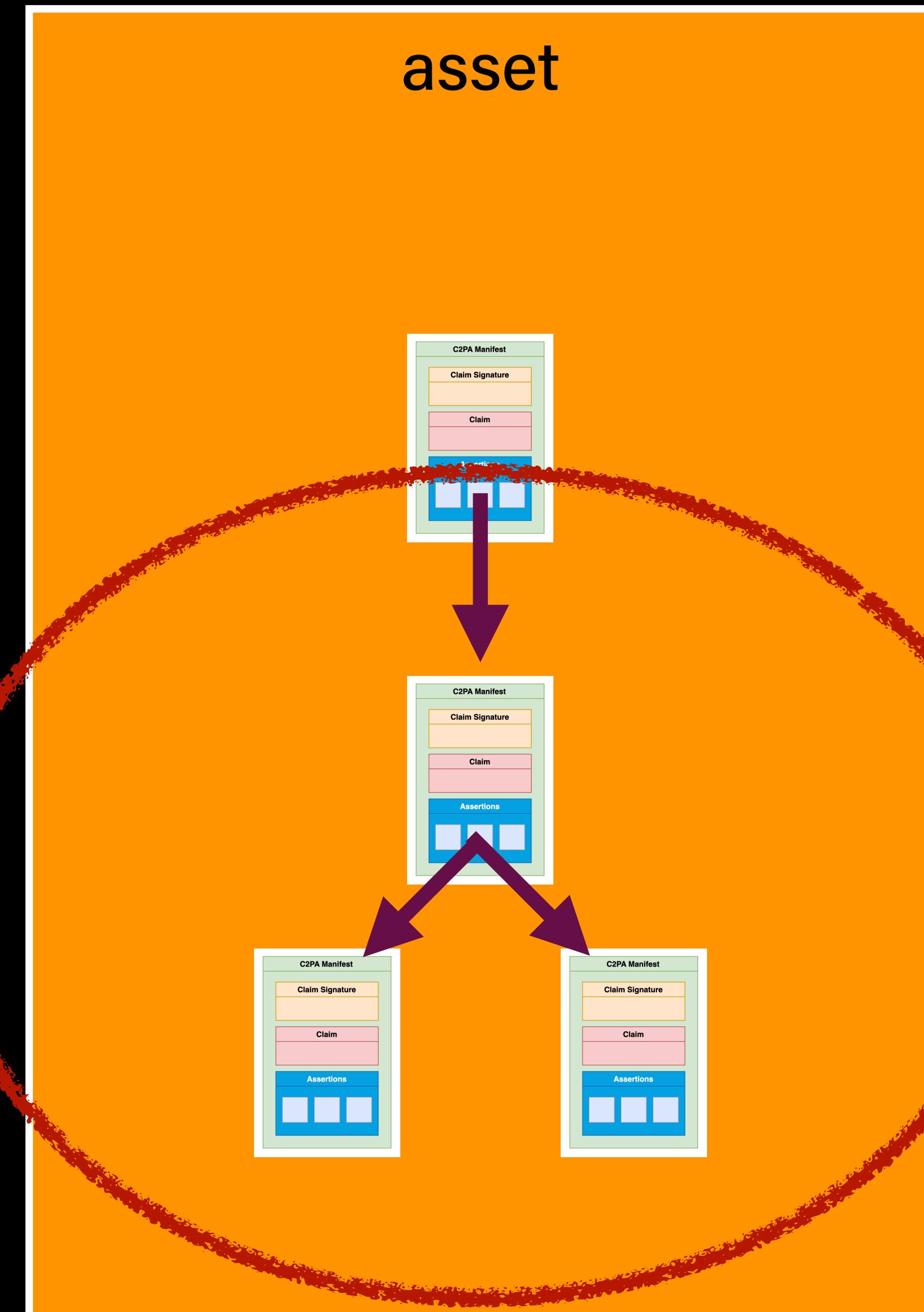
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C2PA data model

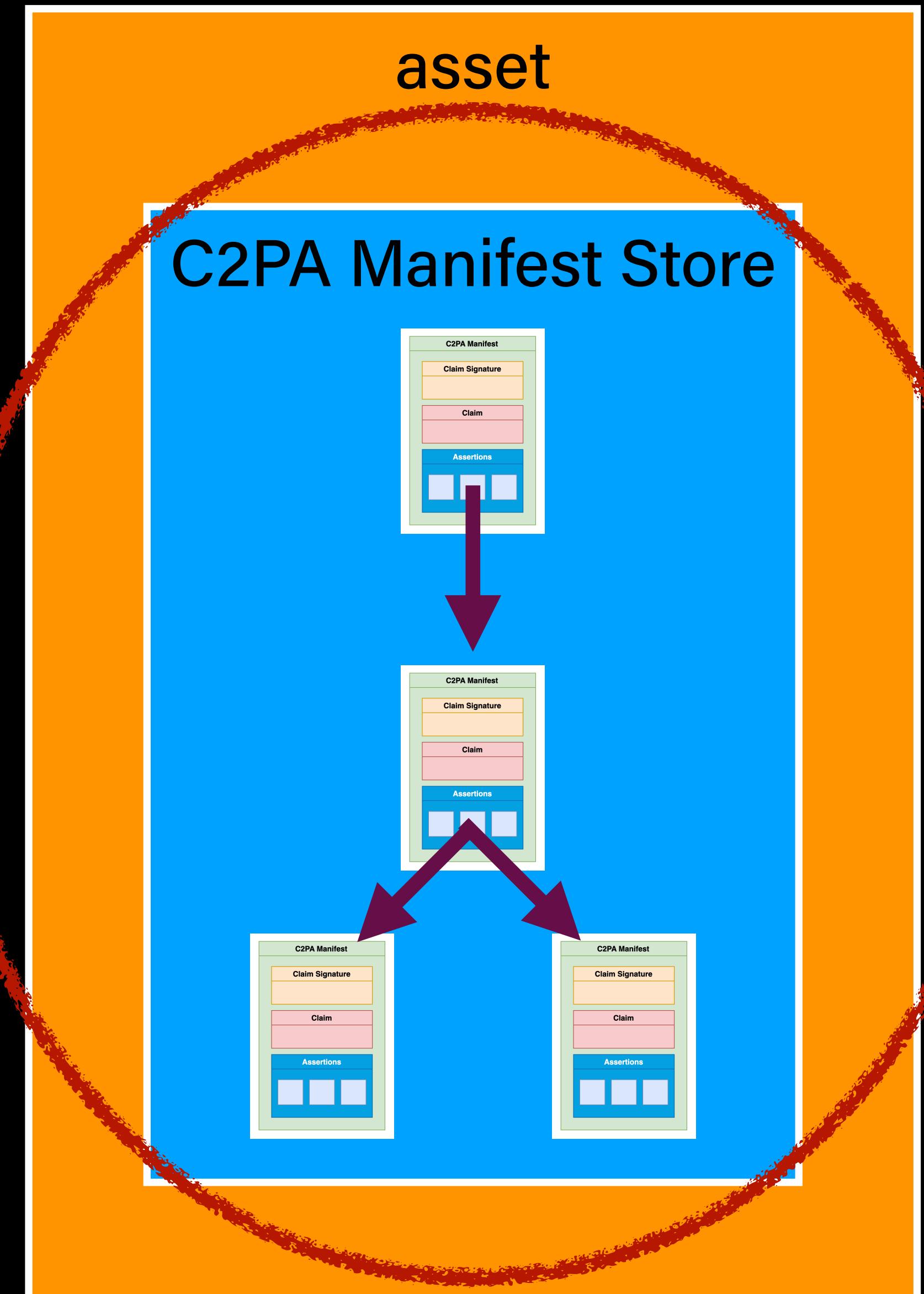
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The collection of C2PA Manifests is referred to as a **C2PA Manifest Store**.



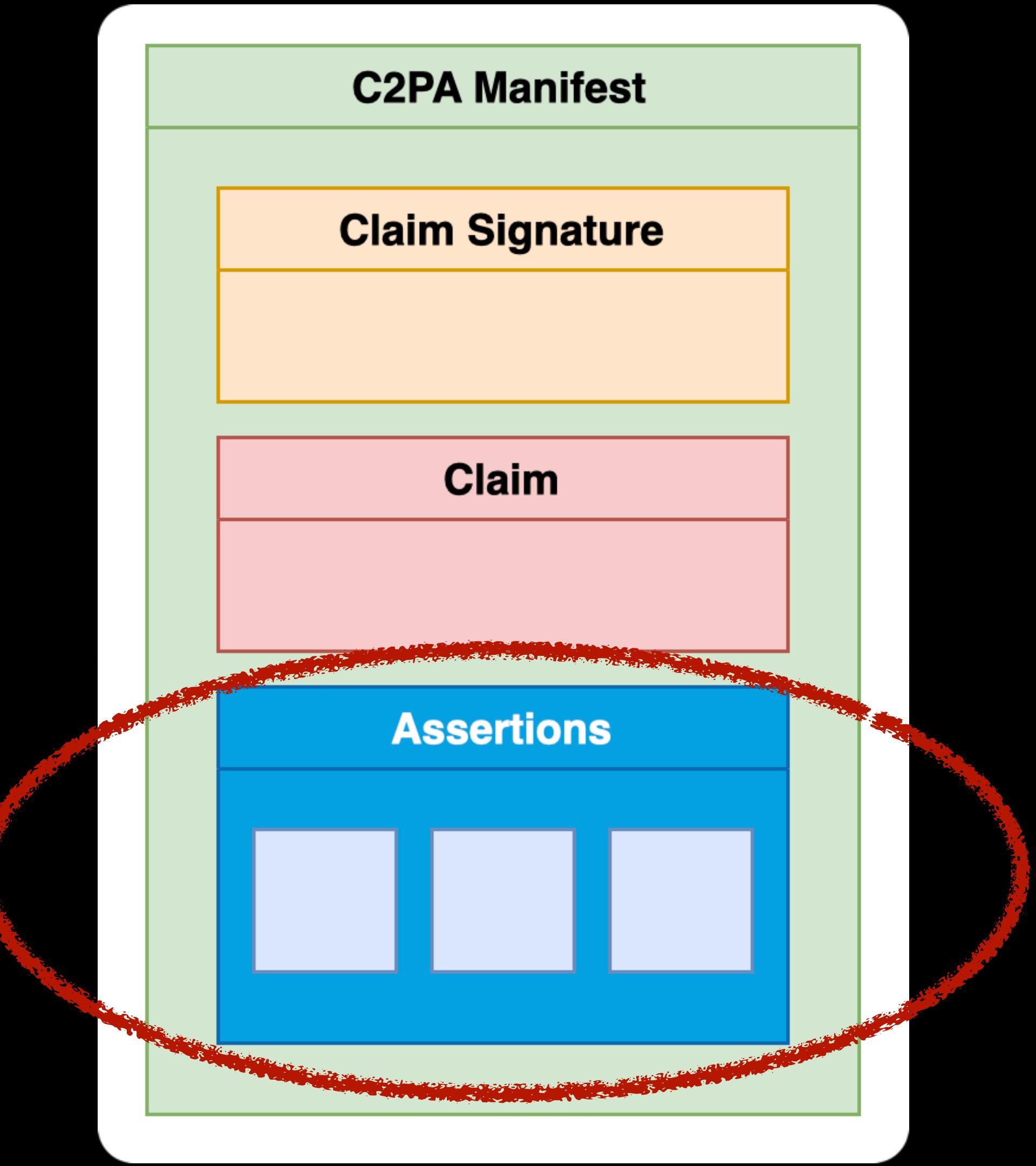


C2PA data model

Assertions

Assertions are opt-in statements that cover areas such as:

- hard binding to asset's binary content (*required - provides tamper evidence*)
- capture device details
- edit actions
- thumbnail of the content
- other content (ingredients) that were incorporated into this content





C2PA data model

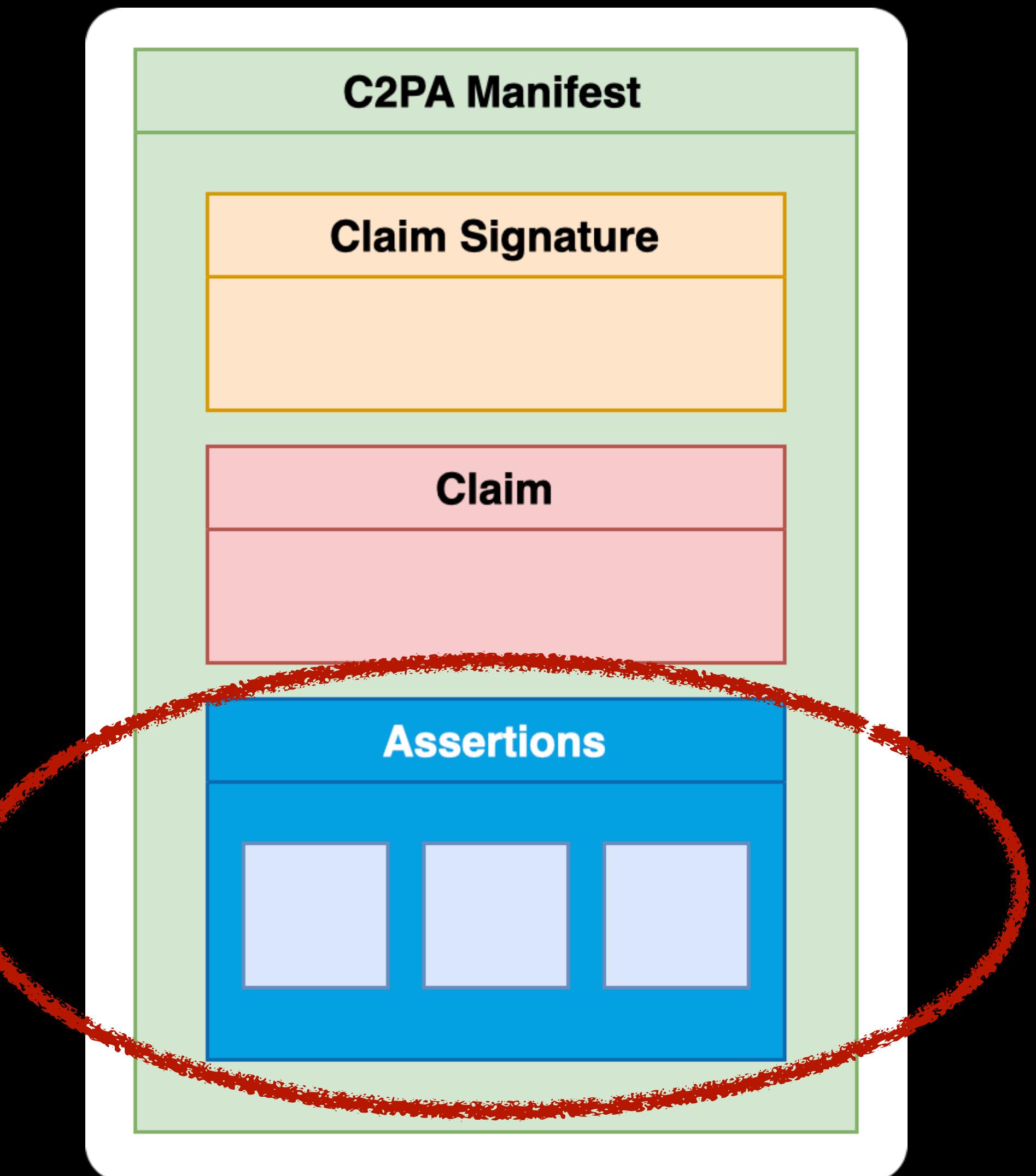
Assertions, part 2

Assertions can be **redacted** (overwritten by zeros) by future manifest producers.

Assertions are typically serialized in CBOR.

Assertions defined by C2PA *only* describe machine-attestable content.
(New in C2PA 2.0.)

Assertions are labeled and can be defined by other organizations.



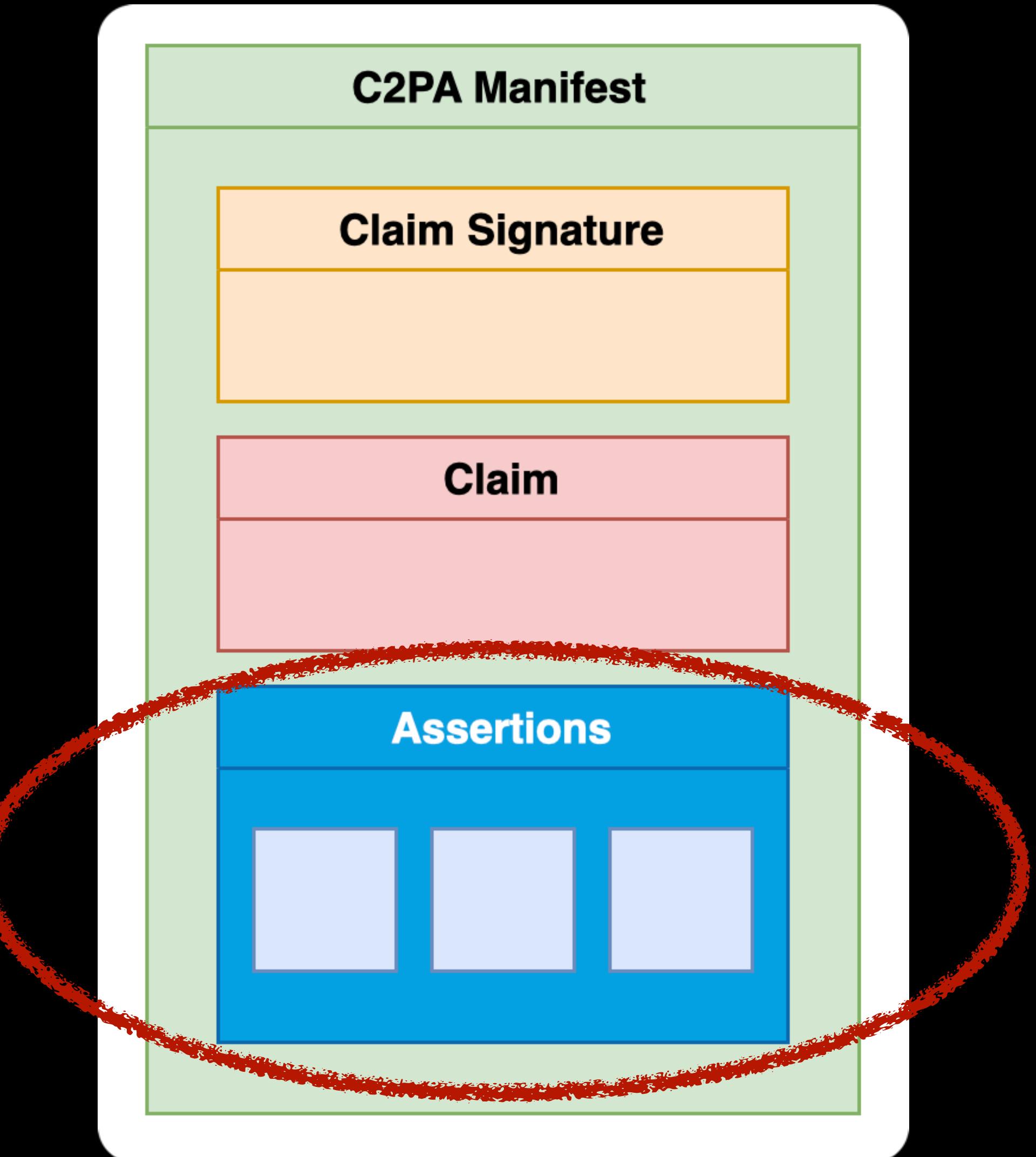


C2PA data model

Assertions, part 3

Some examples of non-C2PA assertions:

- identity of the content creator(s) (*see later CAWG discussion*)
- training and data mining intent



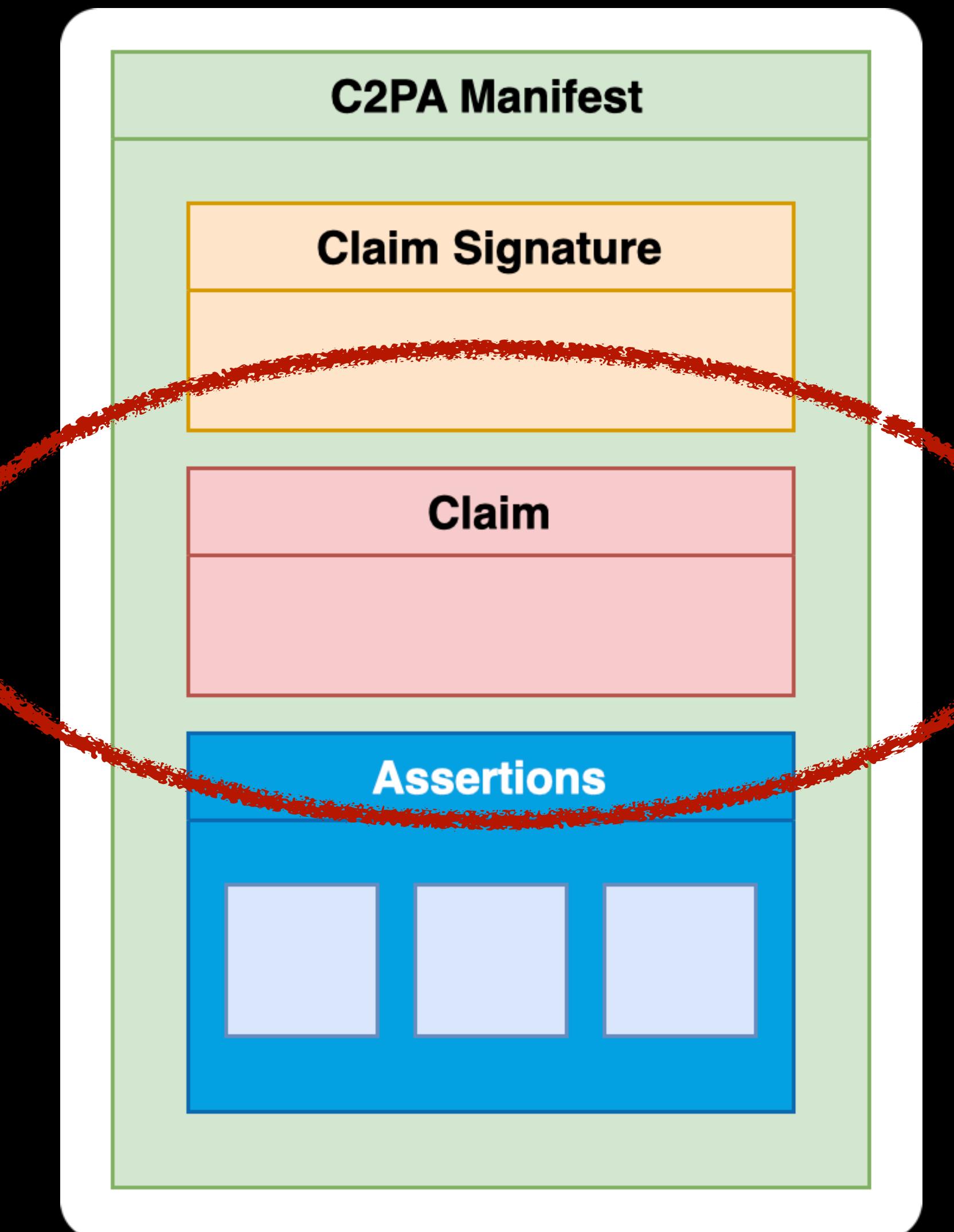


C2PA data model

Claim

Every C2PA Manifest has exactly one **claim**, which contains:

- a list of its assertions (via hashed JUMBF URI)
- information about who created the claim (typically tool vendor)
- assertions from ingredients that were redacted



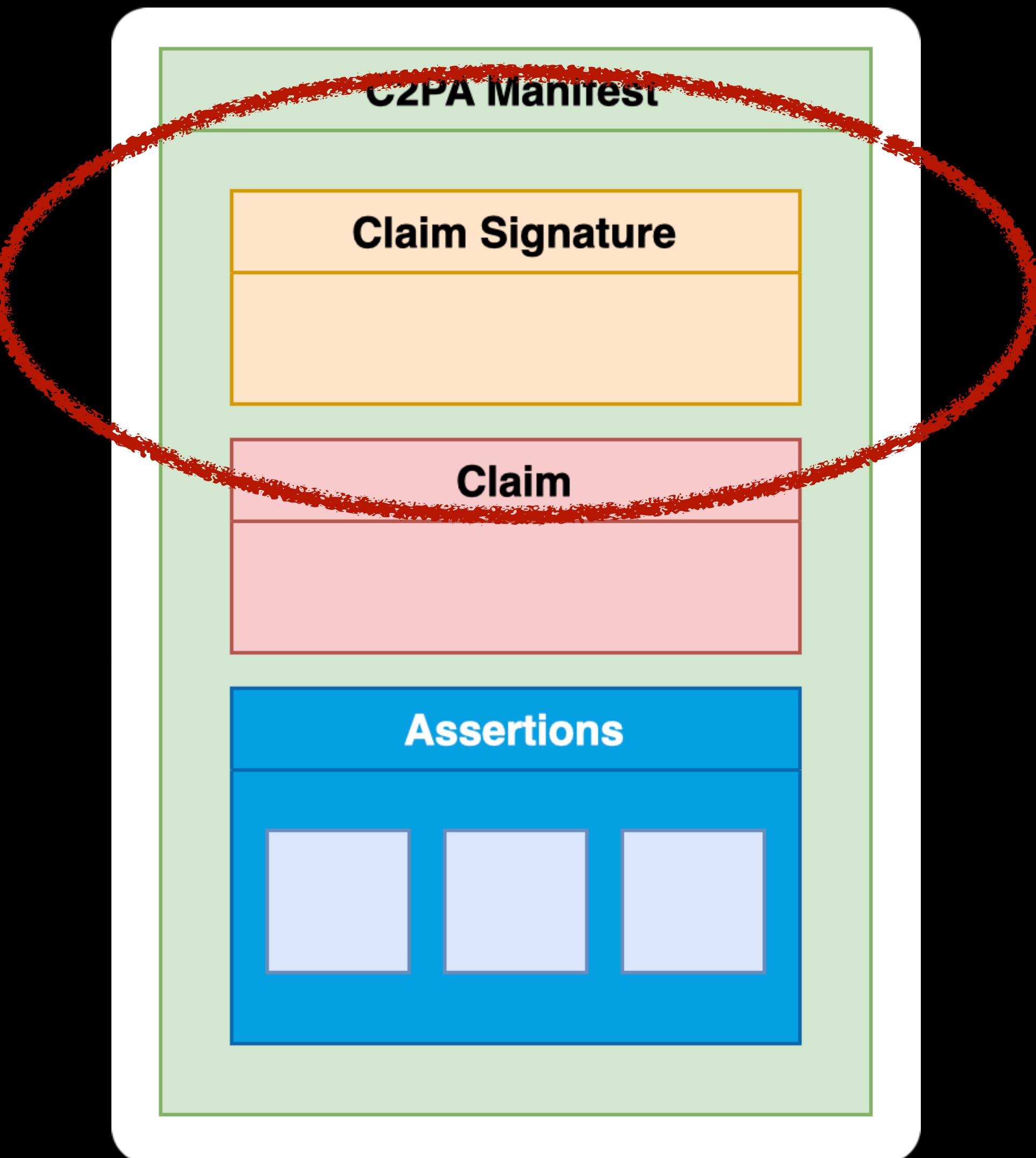


C2PA data model

Claim signature

A **claim signature** is a COSE signature that binds the claim data structure to an X.509 certificate holder.

The X.509 certificate typically identifies the *implementation* of C2PA (hardware or software), **not** the content author.

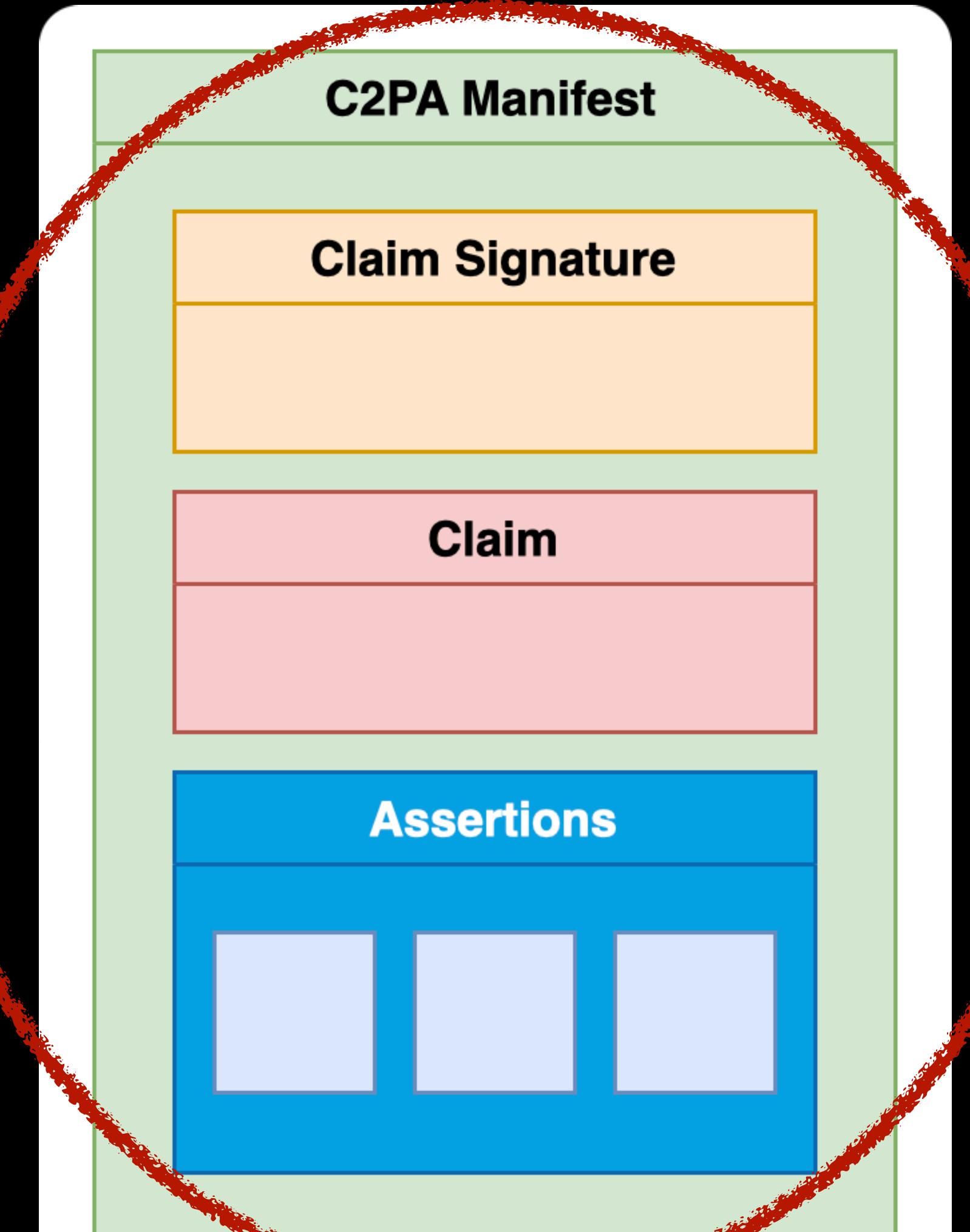




C2PA data model

C2PA Manifest

A **C2PA Manifest** is a JUMBF data structure which contains the claim signature, claim, and assertions.





C2PA data model

Sample user experience

See
contentcredentials.org/verify
for a production version.

Content Credentials



A screenshot of a Content Credential card:

EditSuite [ES] September 8, 2021 at 10:34 AM

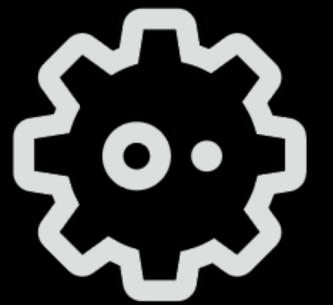
PRODUCED BY
John Smith

EDITS AND ACTIVITY

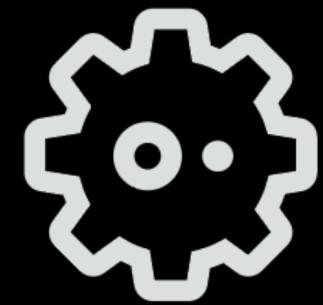
- Color adjustments
Changed tone, saturation, etc.
- Combined assets
Composed 2 or more assets
- Size and position adjustments
Changed size, orientation, direction, or position

ASSETS

[View more](#)

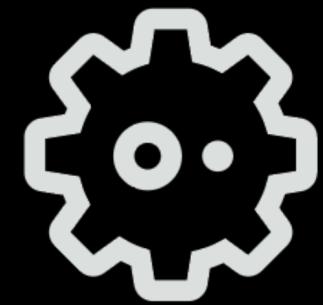


CAWG identity assertion



Identity assertion: Why?

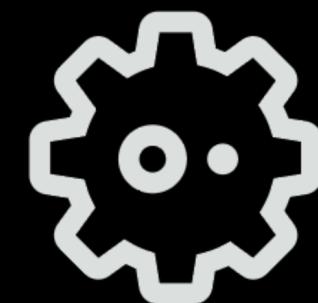
- **Ensure that identity is securely bound to content.**
- The CreativeWork assertion in the C2PA 1.x specification did not provide this assurance and was deprecated for that reason.
- Provide new home for identity given new C2PA 2.0 core spec focus on machine-attestable content.



Identity assertion: Why?

“This specification aims to allow an actor to document their relationship to a C2PA asset produced by them or on their behalf independently from the C2PA claim generator, and to allow consumers of a C2PA asset to independently verify that the received asset was in fact produced by the named actor and has not been tampered with.”

- Identity assertion specification “Design goals” section

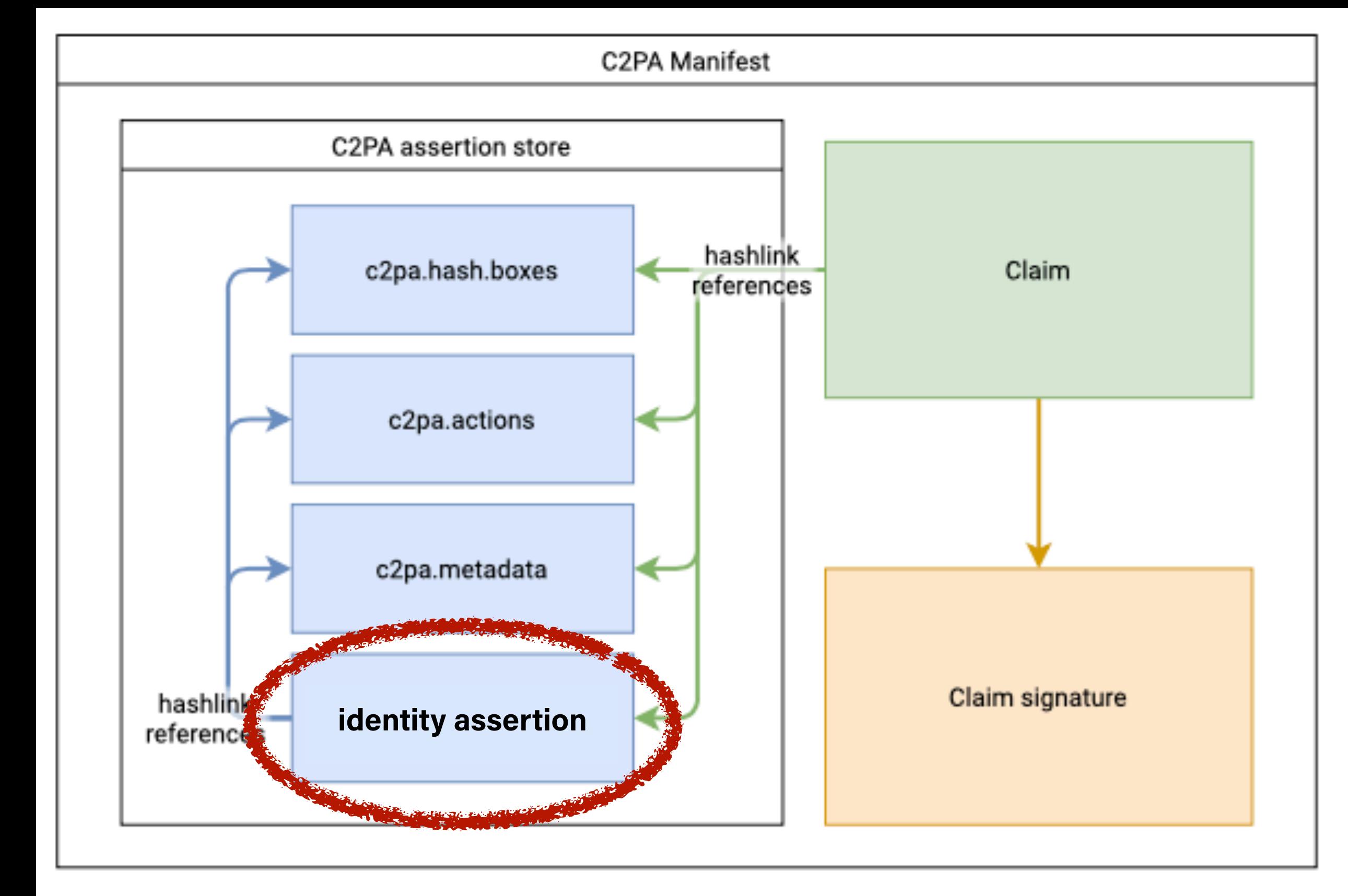


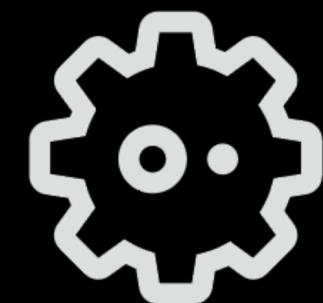
Identity assertion

Overview

Identity assertion allows a credential holder to sign a data structure we call signer_payload, which contains:

- Tamper-evident references to one or more other assertions in the same C2PA Manifest (including hard-binding assertion)
- Role of credential subject with regard to the content
- Other items TBD ...



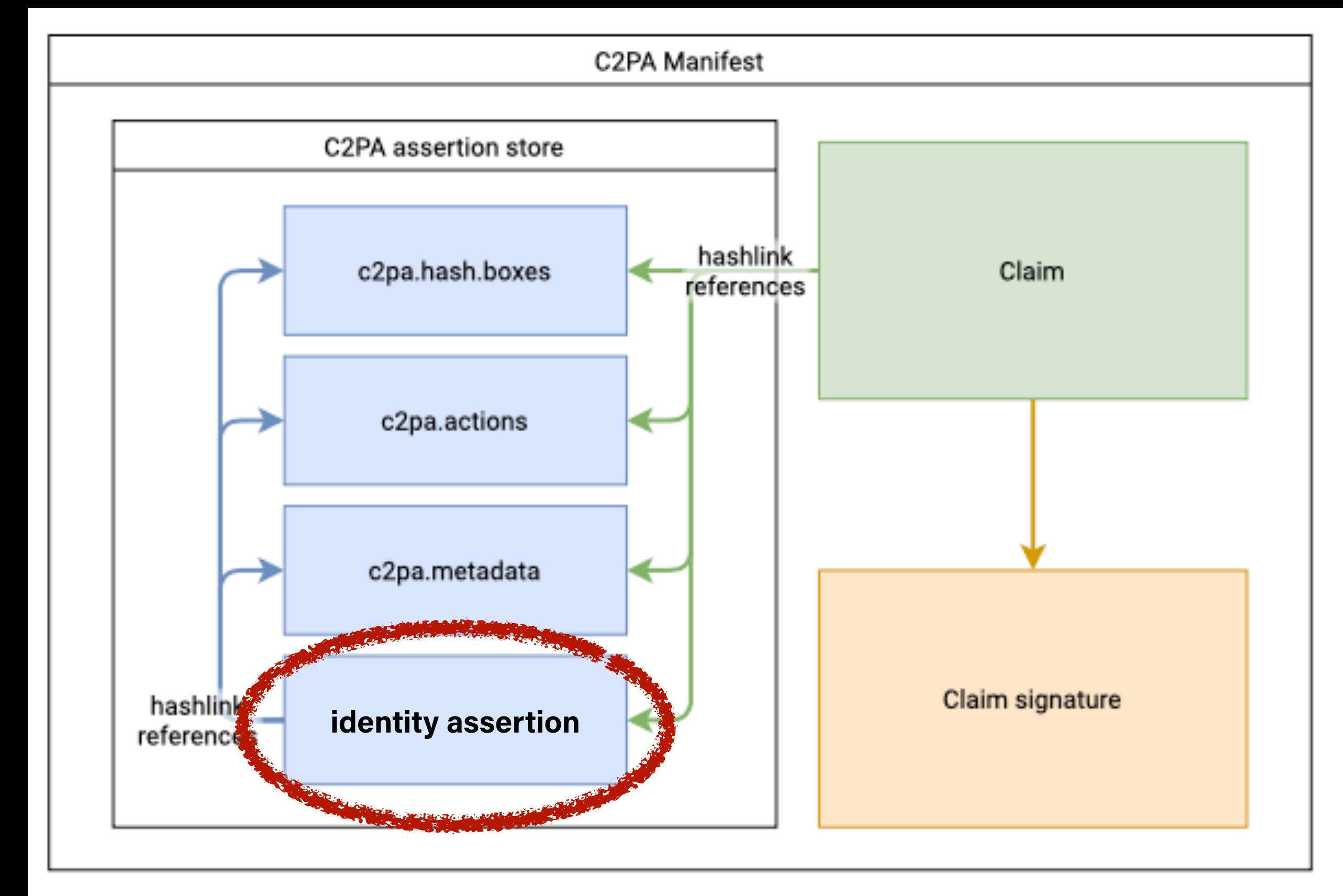


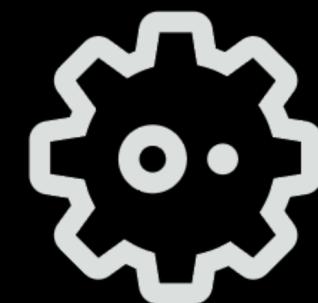
Identity assertion

Overview

New and separate trust signal over and above the C2PA claim generator signal.

Typically meant to indicate **subject's authorization or active participation** in production of the asset.



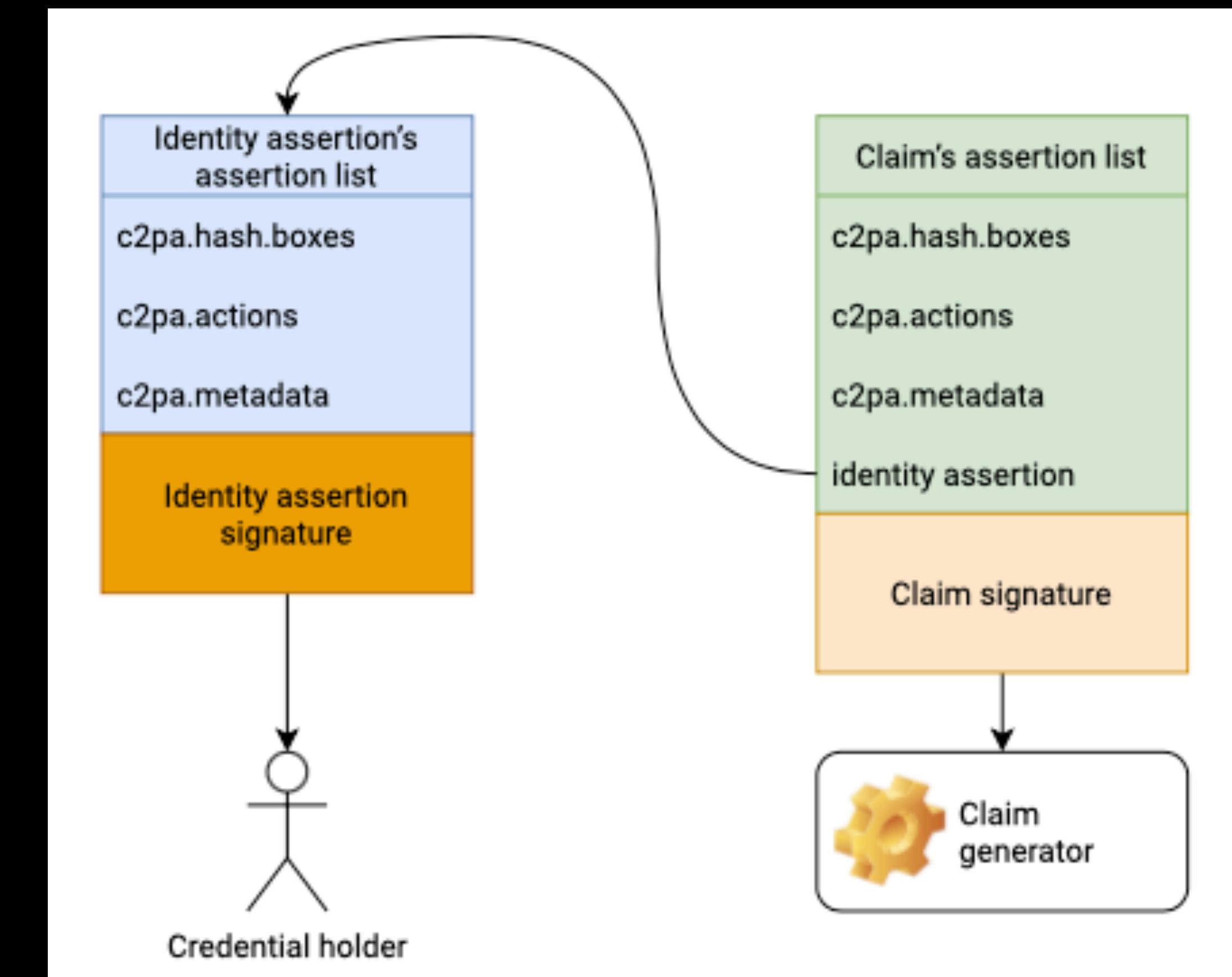


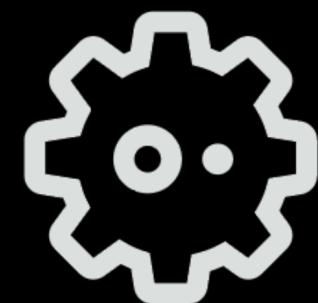
Identity assertion

Overview

Credential and signature can be:

- X.509 certificate ➤ COSE signature
- W3C verifiable credential ➤ another VC
- *Extensible ... others may be added by CAWG in future or by others i*



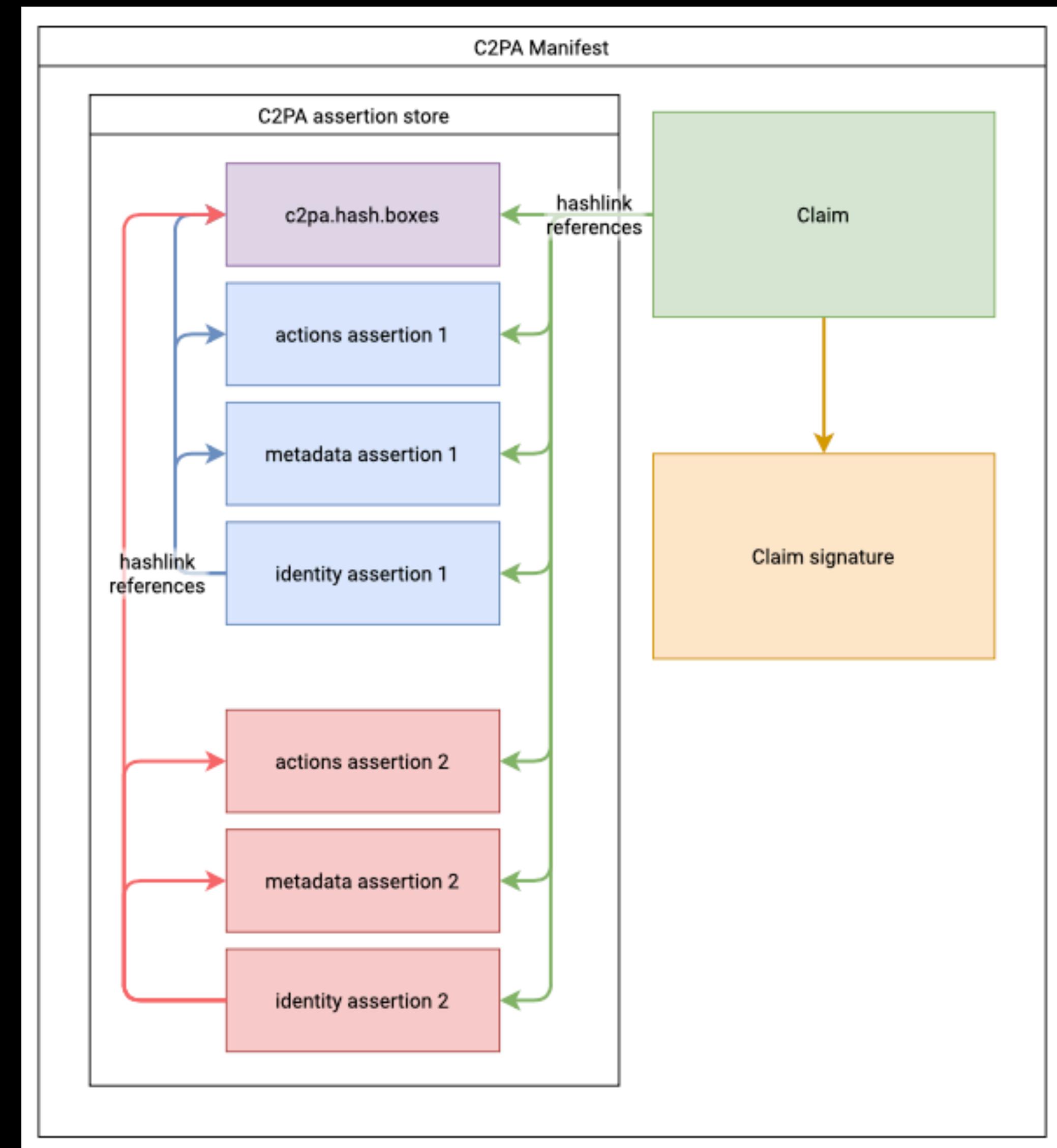


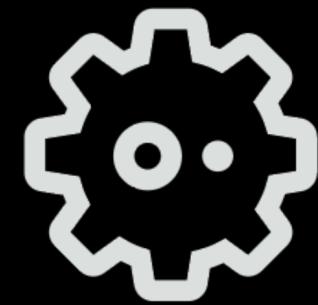
Identity assertion Overview

Identity assertion is **optional**.

Identity assertion may be **repeated any number of times** for multiple content producers (for example, interactive multi-author app).

Identity assertion can be **redacted** if needed for privacy/safety reasons.

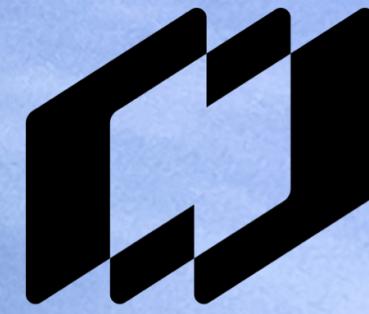




Identity assertion

Help us build it!

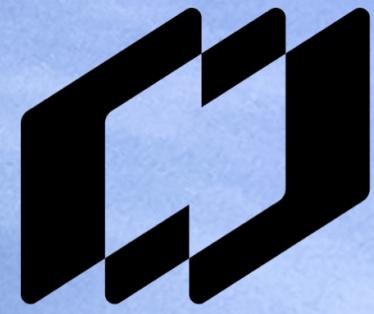
- <https://creator-assertions.github.io>
- Weekly meetings:
 - Typically on Mondays at 0830 Pacific / 1130 Eastern / 1530 UTC
 - Contact me for invitation
 - Working session **tomorrow (pithy title to be determined)**



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Questions and discussion

contentauthenticity.org

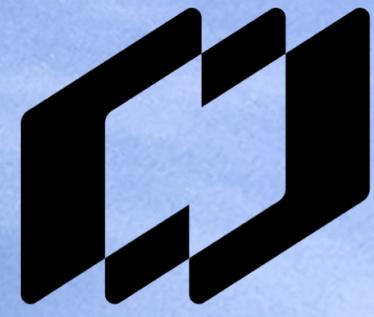


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Thank you!

contentauthenticity.org

Stansbury Island, Utah, 2022
Eric Scouten



Content
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Thank you!

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Stansbury Island, Utah, 2022
Eric Scouten
(yes, really!)