



# Creator Assertions Working Group

APAC welcome and  
recap of CAWG's first year

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## Topics for today

Who's who

C2PA data model overview

CAWG and the identity assertion



# Who's who?



**Content  
Authenticity  
Initiative**



**Coalition for  
Content  
Provenance  
and Authenticity**



**Creator  
Assertions  
Working Group**



## Who's who?



**Content  
Authenticity  
Initiative**

**Outreach · Advocacy · Open Source**

*\* also name of Adobe's team*



**Coalition for  
Content  
Provenance  
and Authenticity**

**Technical Standards: What / How**



**Creator  
Assertions  
Working Group**

**Technical Standards: Who**



## Who's who?



**Content  
Authenticity  
Initiative**

[contentauthenticity.org](https://contentauthenticity.org)



**Coalition for  
Content  
Provenance  
and Authenticity**

[c2pa.org](https://c2pa.org)



**Creator  
Assertions  
Working Group**

[creator-assertions.github.io](https://creator-assertions.github.io)



# 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

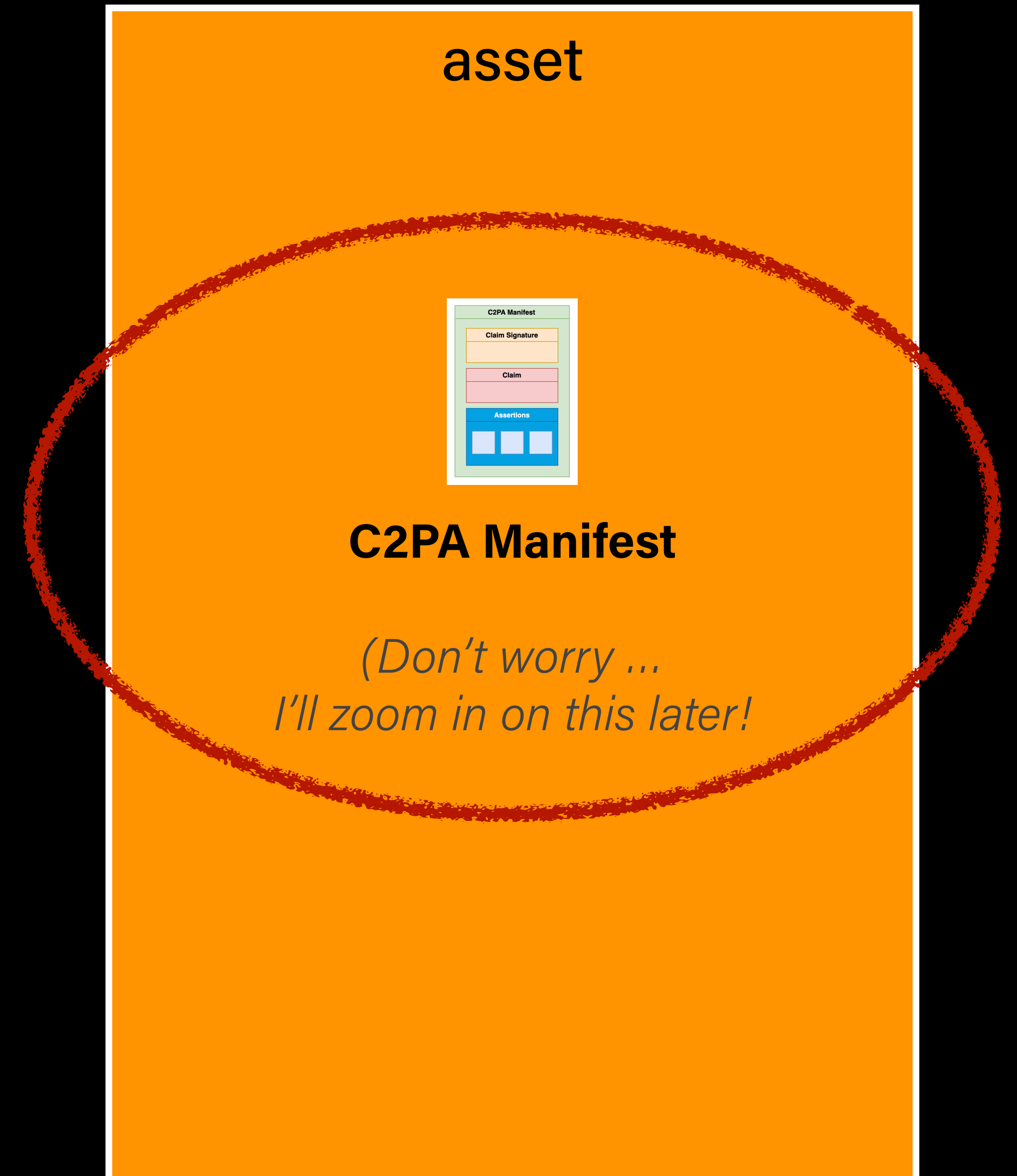


# C2PA data model

## Overview

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

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







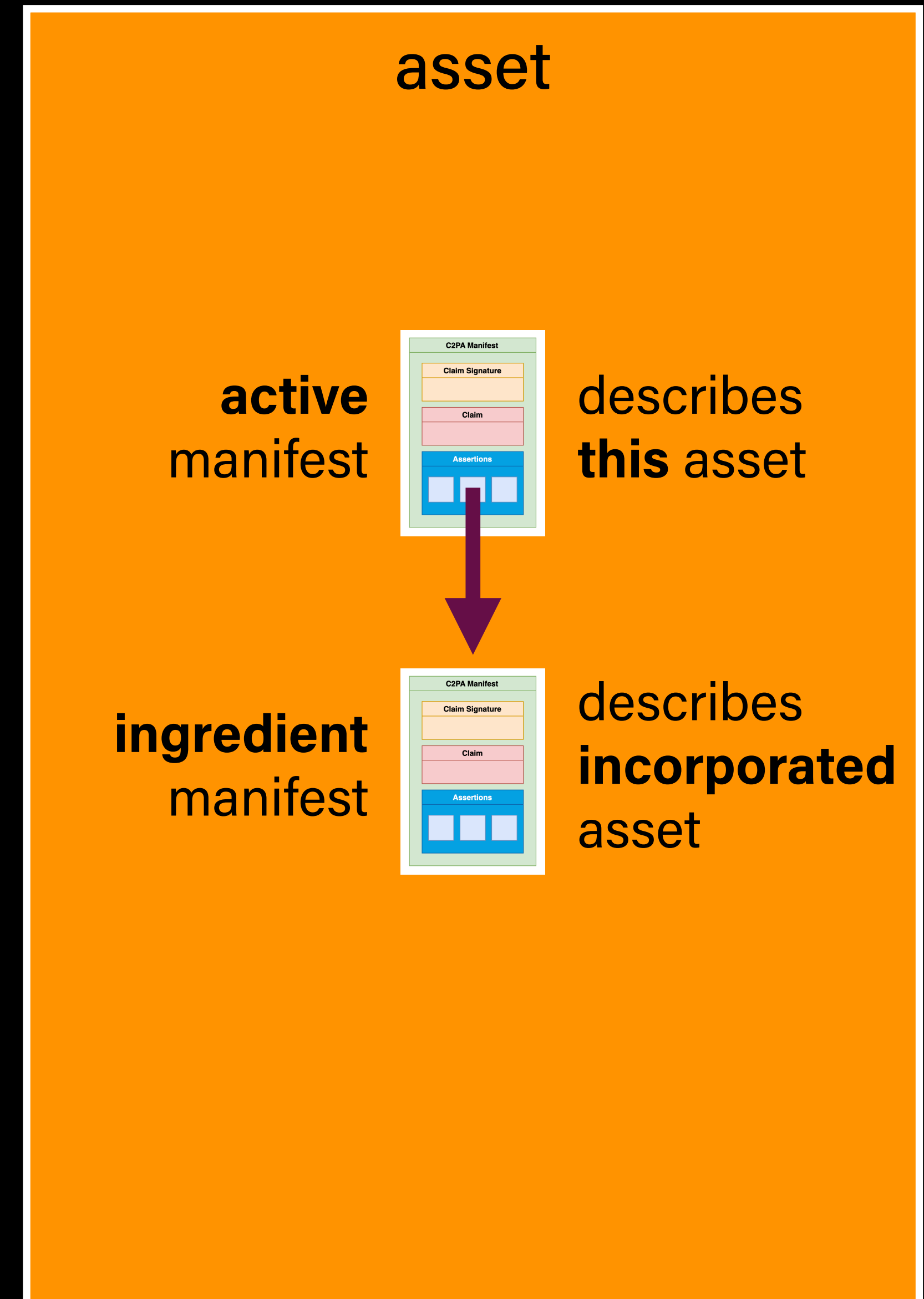
# C2PA data model

## Overview

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

It is described by a **C2PA Manifest**. Each asset in C2PA has an *active manifest* which describes the current asset.

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





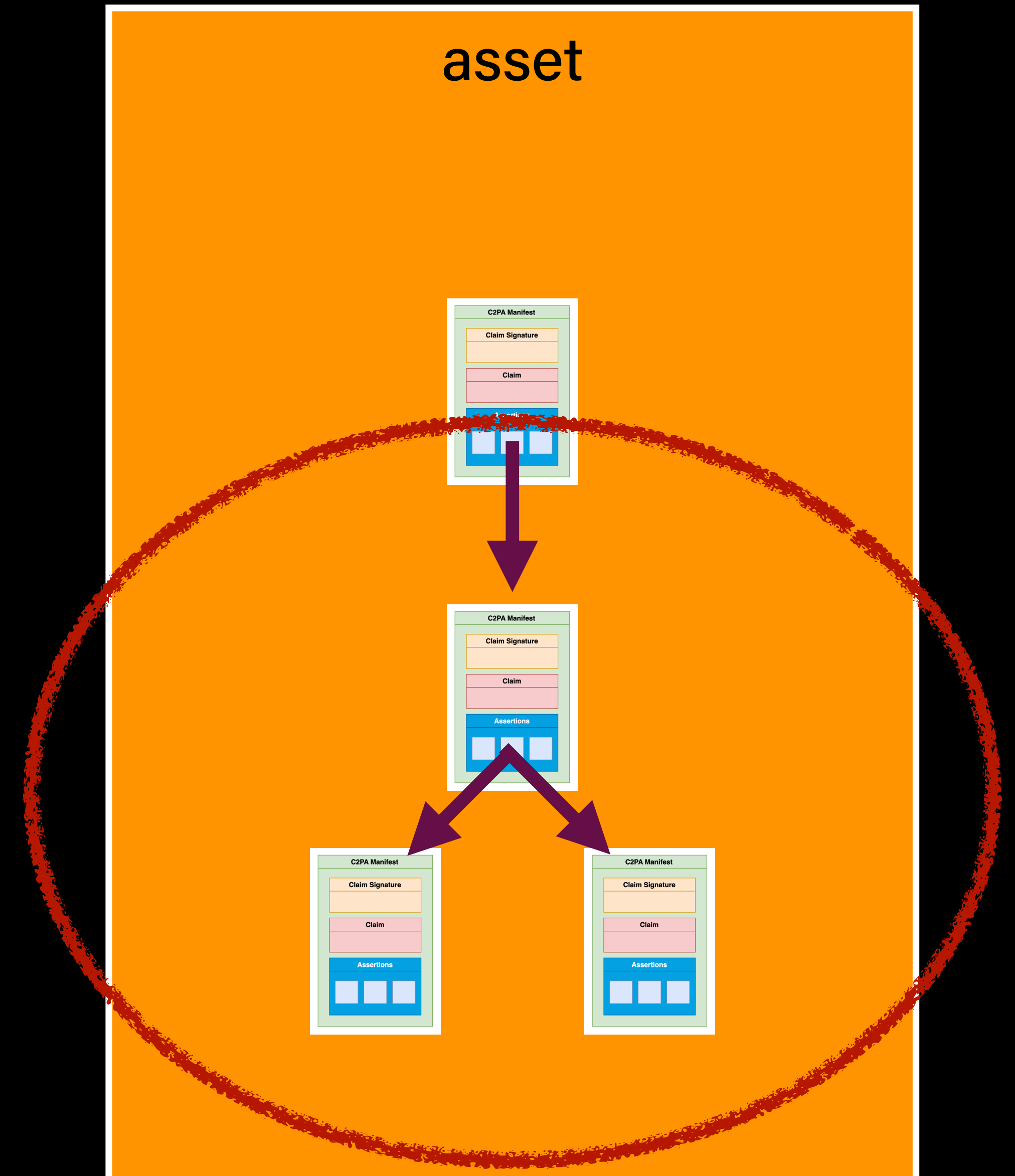
# C2PA data model

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# C2PA data model

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It is described by a **C2PA Manifest**. Each asset in C2PA has an *active manifest* which describes the current asset.

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

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



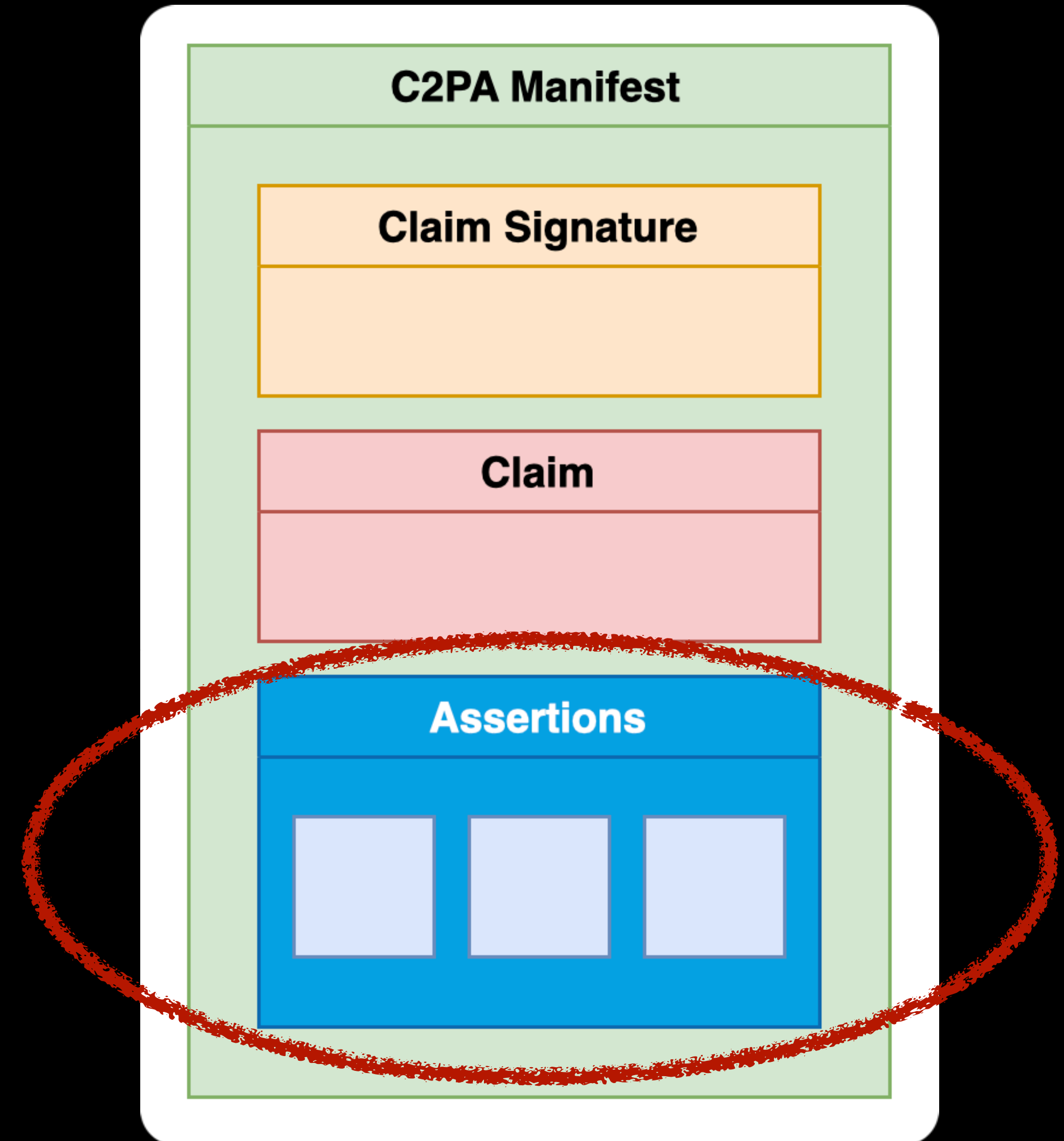


# C2PA data model

## 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



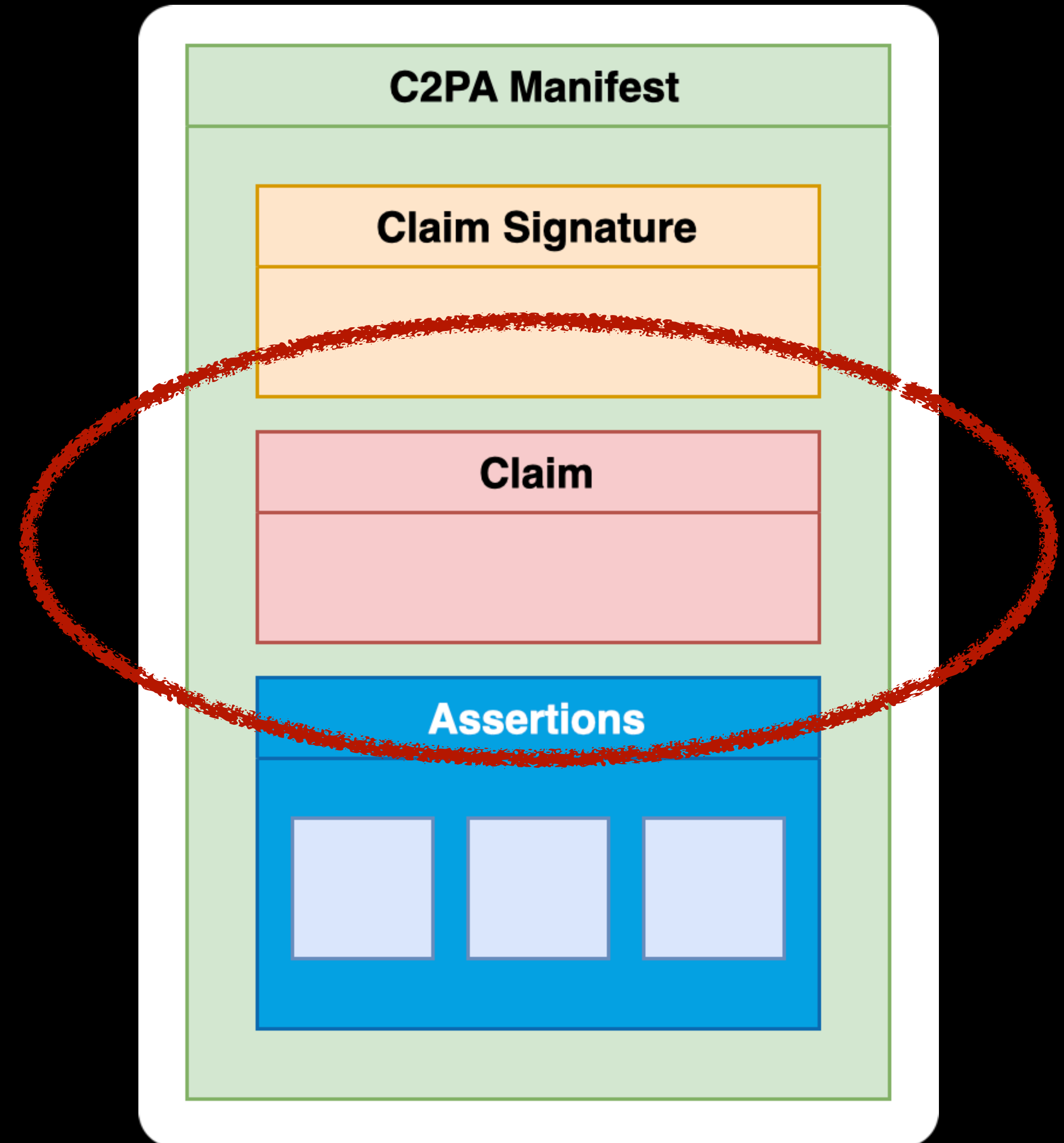


# C2PA data model

## 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





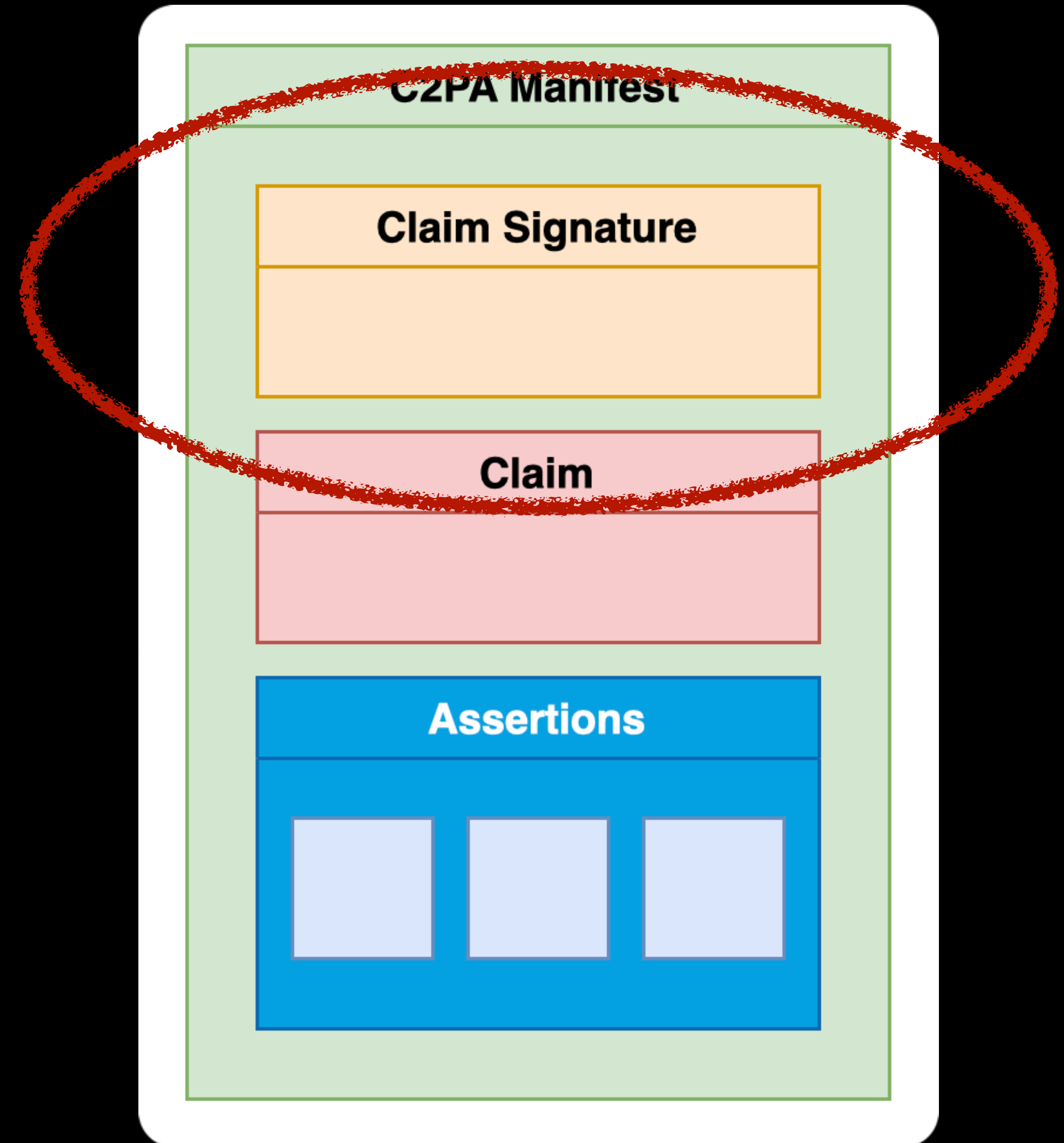


# C2PA data model

## 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.

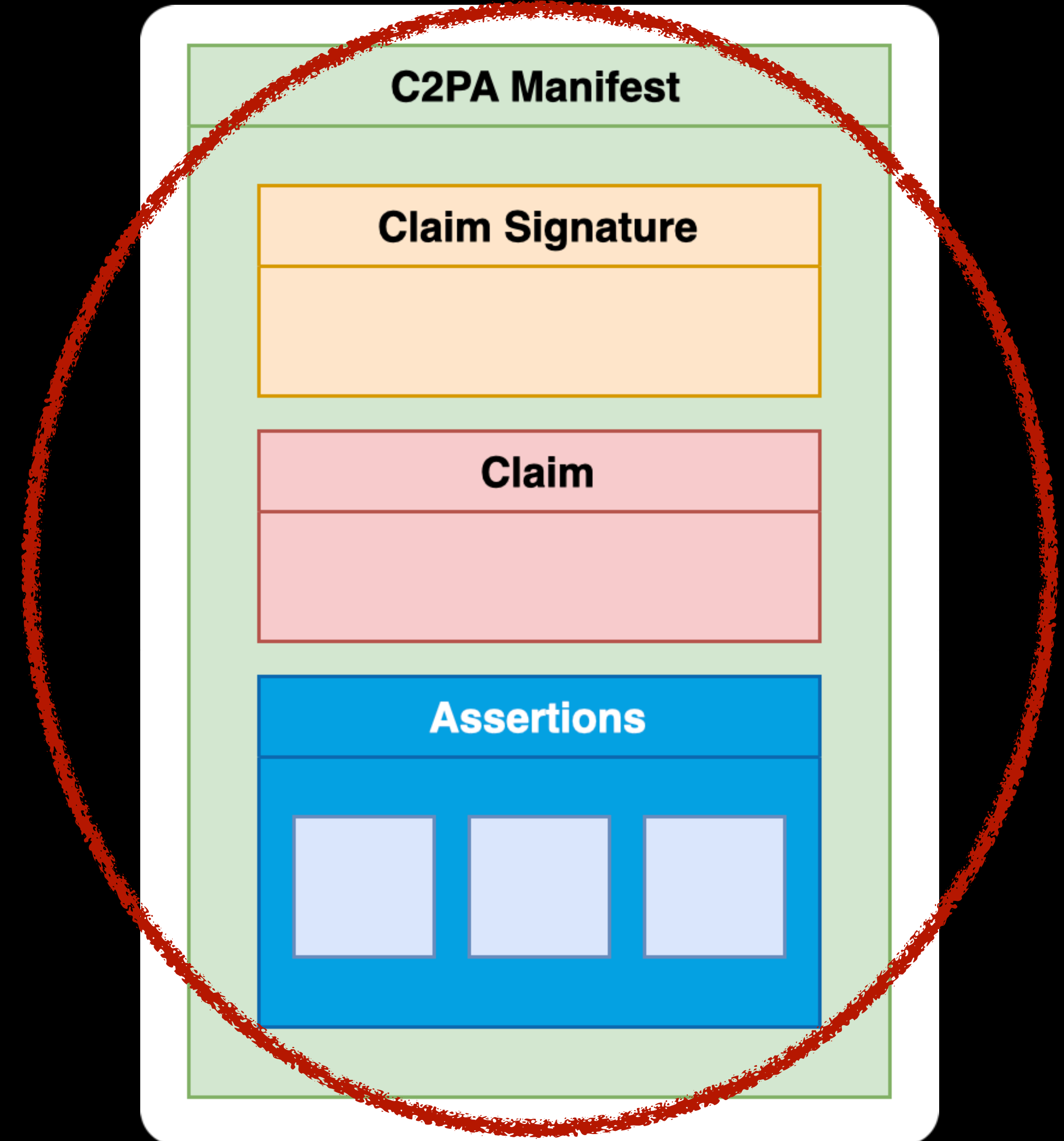




# C2PA data model

## C2PA Manifest

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





# C2PA data model

## Sample user experience

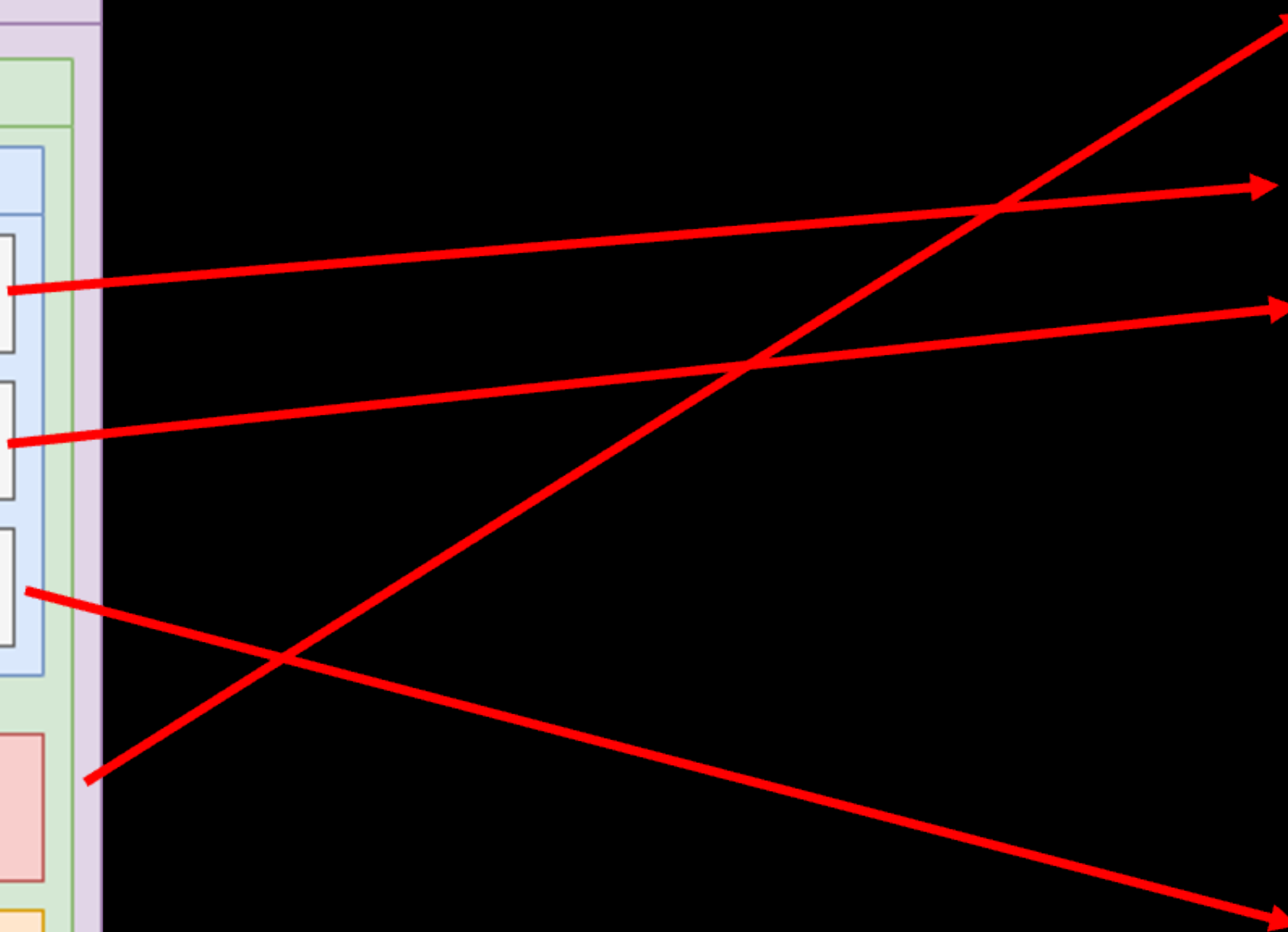
### Content Credentials



See [contentcredentials.org/verify](https://contentcredentials.org/verify) for a production version.

The screenshot shows a user interface for content verification. It includes the following elements:

- ES EditSuite** logo and name
- Timestamp: September 8, 2021 at 10:34 AM
- PRODUCED BY** John Smith
- EDITS AND ACTIVITY** section with three items:
  - Color adjustments: Changed tone, saturation, etc.
  - Combined assets: Composited 2 or more assets
  - Size and position adjustments: Changed size, orientation, direction, or position
- ASSETS** section with two asset thumbnails
- View more** button





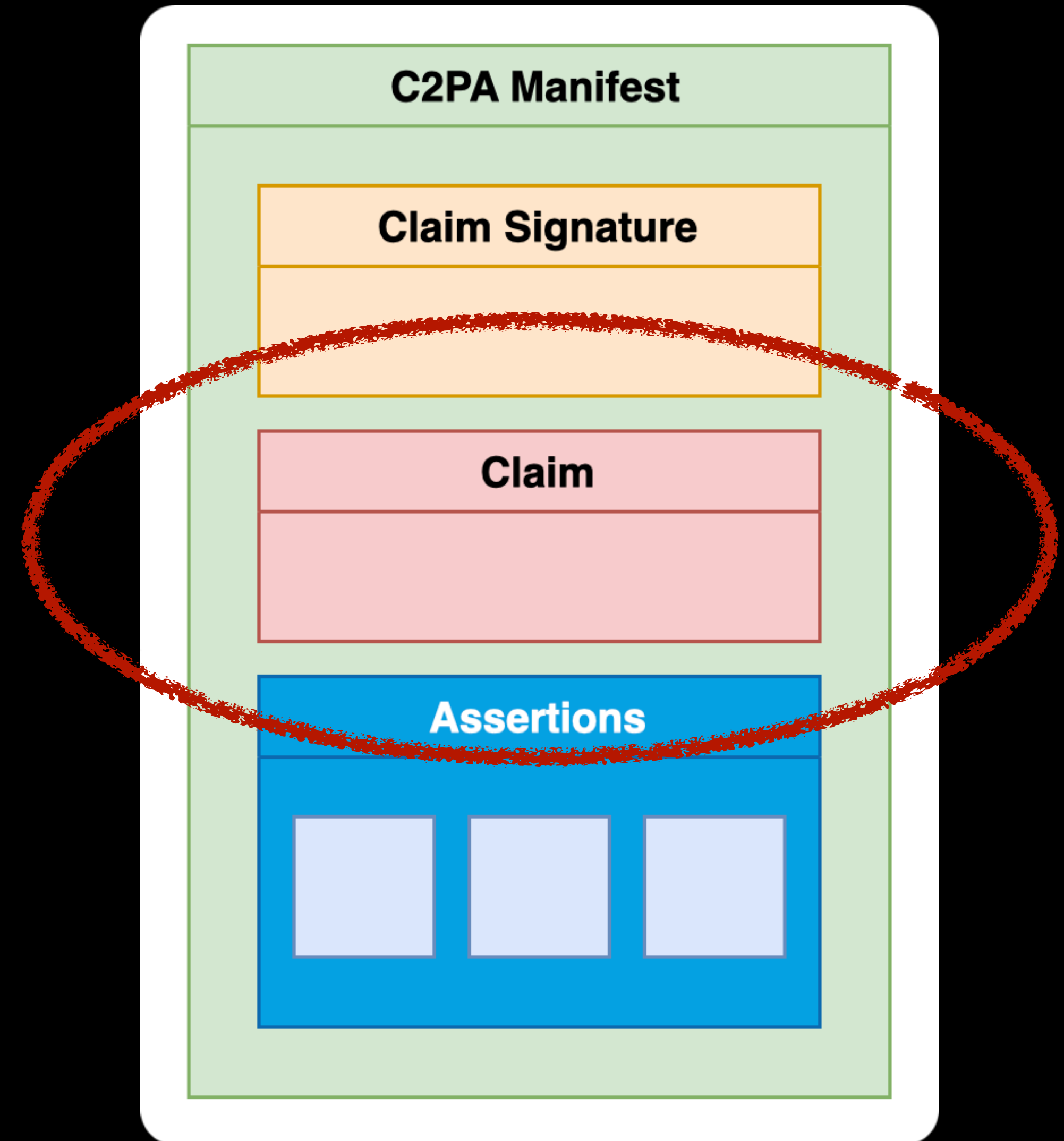


# C2PA 2.0 transition

## Claim data structure

Claim version 2 introduces this distinction:

- **Created assertions** ► assertions described in the C2PA technical specification and **do not require human input**. Claim generator can directly attest to the content.
- **Gathered assertions** ► assertions not described in the C2PA technical specification. Information in these assertions **may come from a source other than the claim generator**.





## Introducing CAWG

CAWG (Creator Assertions Working Group)

was created in early 2024 to create technical standards to house metadata that was no longer part of C2PA 2.0 technical standard.



## What does CAWG do?

Four assertion standards, building on C2PA technical spec:

- **Endorsement** ▶ Forward permission for CDN-style renditions on C2PA assets
- **Identity** ▶ Binding digital identity credentials to C2PA assets
- **Metadata** ▶ Associate user-generated metadata with C2PA assets
- **Training and Data Mining** ▶ Express permissions regarding AI training and data mining usage



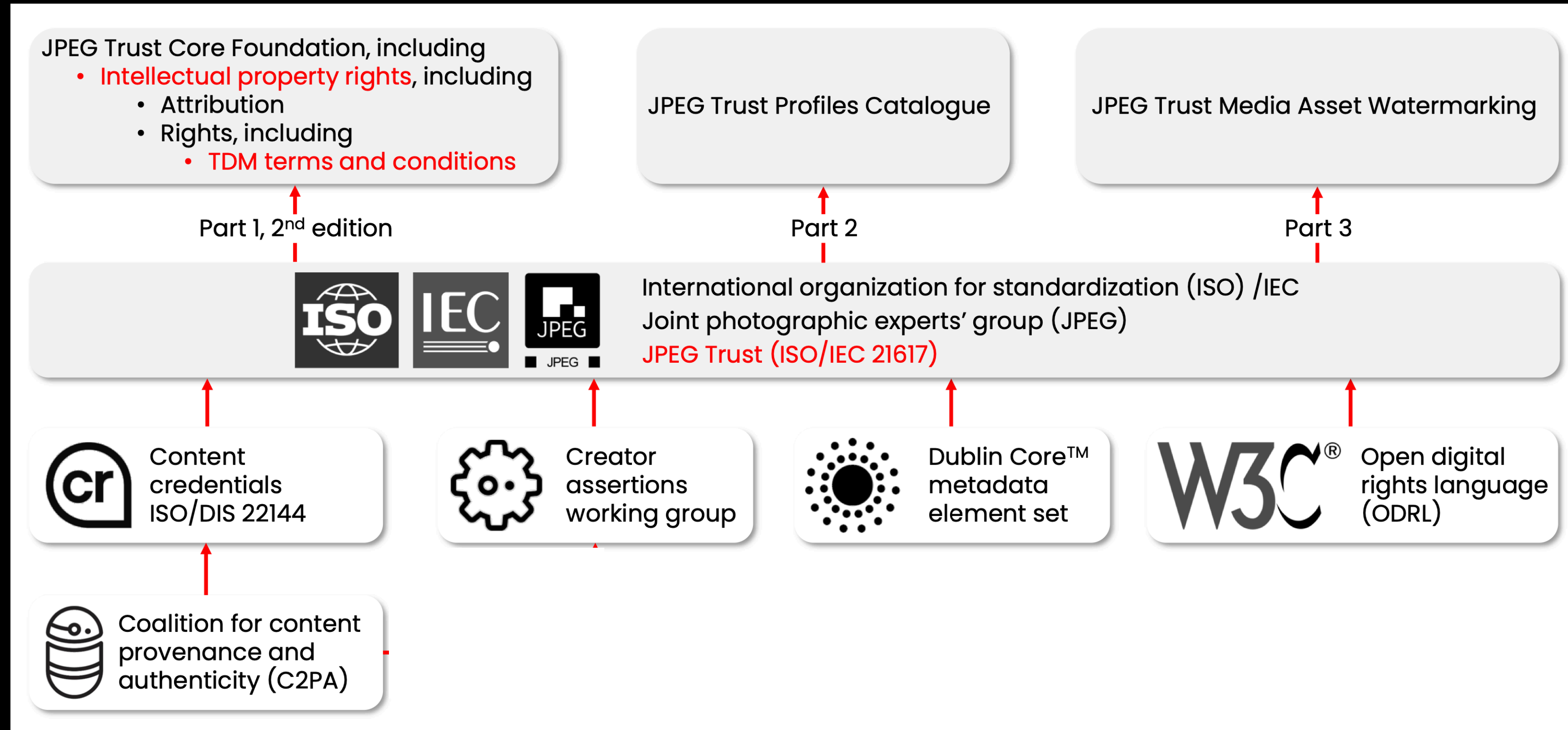
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# Rights and remuneration (ISO / JPEG Trust)



See 21 January 2025 CAWG meeting



# Identity assertion

is a framework

The actor\* described by ... *`${credential}`*

using a credential issued by ... *`${issuer}`*

produced the content described by ... *`${signer_payload}`*

---

Signed by ... *`${credential_holder}`*

\*actor can be human, non-human, or organization of humans

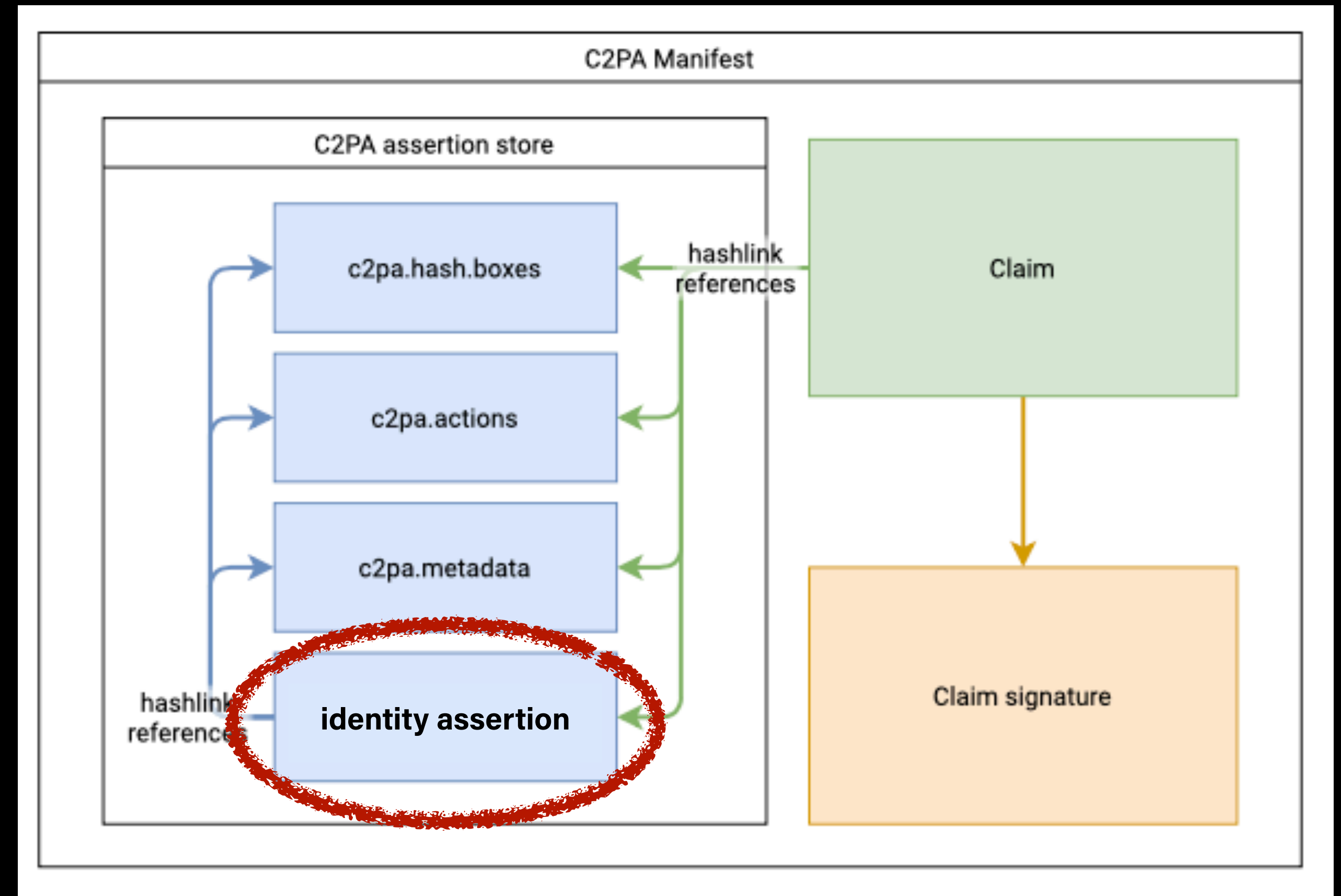


# Identity assertion

## 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 ...





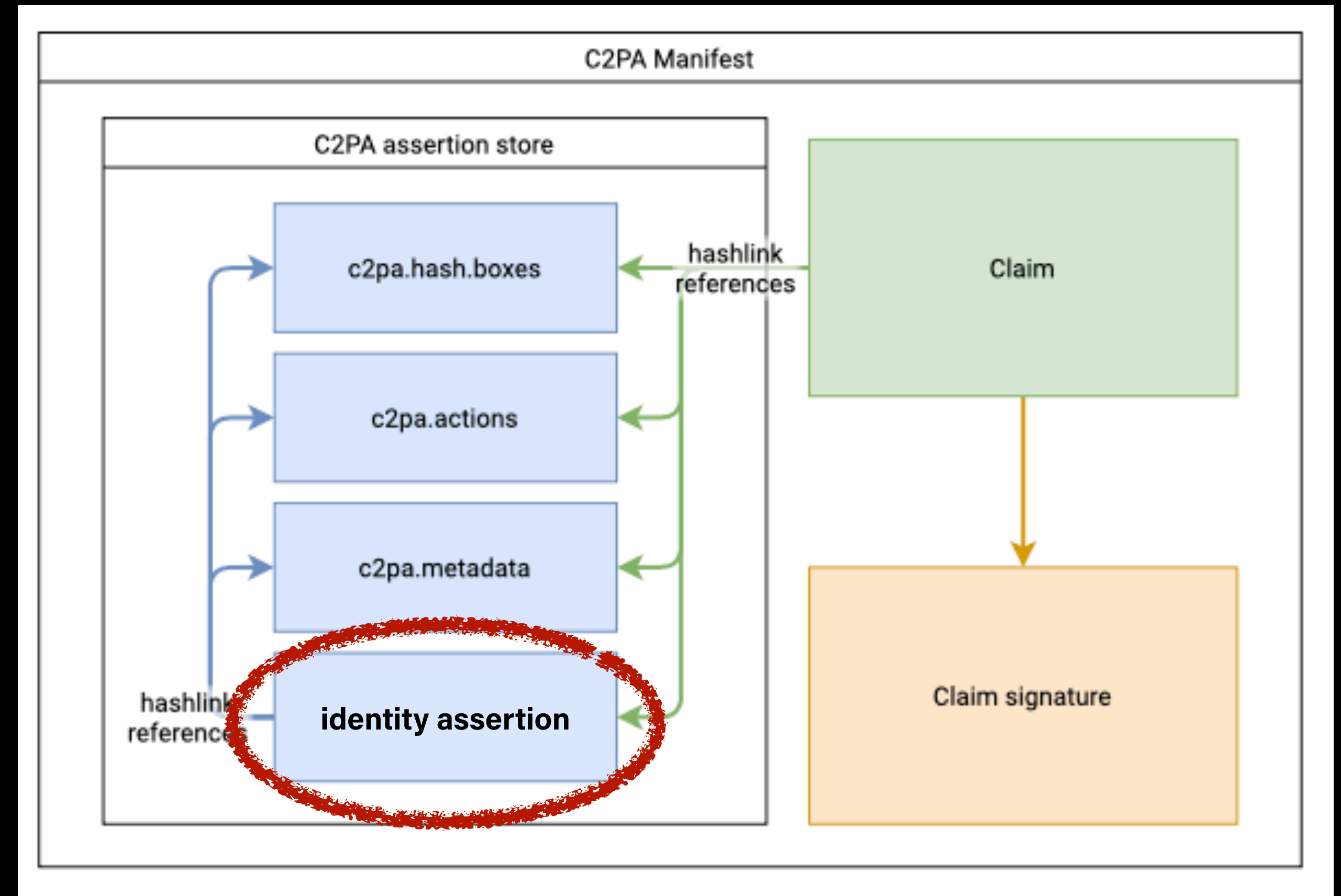


# Identity assertion

## 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

## CBOR-DIAG example

```
{
  "signer_payload": {
    "sig_type": "cawg.x509.cose",
    "referenced_assertions": [
      { "url": "self#jumbf=c2pa/urn:uuid:F9168C5E-CEB2-4faa-B6BF-329BF39FA1E4/c2pa.assertions/c2",
        "hash": b64'U9Gyz05tmpftkoEYP6XYNsMnUbnS/KcktAg2vv7n1n8=' },
      { "url": "self#jumbf=c2pa/urn:uuid:F9168C5E-CEB2-4faa-B6BF-329BF39FA1E4/c2pa.assertions/c2",
        "hash": b64'G5hfJwYeWTlf1x0hmfC09xDAK52aKQ+YbKNhRZeq92c=' },
      { "url": "self#jumbf=c2pa/urn:uuid:F9168C5E-CEB2-4faa-B6BF-329BF39FA1E4/c2pa.assertions/c2",
        "hash": b64'Yzag4o5j04xPyfANVtw7ET1bFSWZNfeM78qbSi8Abkk=' }
    ],
    "role": ["cawg.creator"], // optional
  },
  "signature": b64'....', // signature over signer_payload
  "pad1": b64'....', // zero-filled pad buffer
  "pad2": b64'....' // zero-filled pad buffer
}
```



# Identity assertion

## CBOR-DIAG example

```
{
  "signer_payload": {
    "sig_type": "cawg.x509.cose",
    "referenced_assertions": [
      { "url": "self#jumbf=c2pa/urn:uuid:F9168C5E-CEB2-4faa-B6BF-329BF39FA1E4/c2pa.assertions/c2",
        "hash": b64'U9Gyz05tmpftkoEYP6XYNsMnUbn5/...' },
      { "url": "self#jumbf=c2pa/urn:uuid:F9168C5E-CEB2-4faa-B6BF-329BF39FA1E4/c2pa.assertions/c2",
        "hash": b64'G5hfJwYeWTlf1x0hmfC09xDAK52ak0+YbkNhP7eg92c=...' },
      { "url": "self#jumbf=c2pa/urn:uuid:F9168C5E-CEB2-4faa-B6BF-329BF39FA1E4/c2pa.assertions/c2",
        "hash": b64'Yzag4o5j04xPyfANVtw7ETlbFSW7NfeM78qbSi8Abkk=...' }
    ],
    "role": ["cawg.creator"], // optional
  },
  "signature": b64'....', // signature over signer_payload
  "pad1": b64'....', // zero-filled pad buffer
  "pad2": b64'....' // zero-filled pad buffer
}
```

**referenced\_assertions MUST:**

▶ Also appear in the C2PA Manifest (either in created\_assertions or gathered\_assertions)

▶ Include the same hard-binding assertion used in the C2PA Manifest



# Identity assertion in the C2PA data model

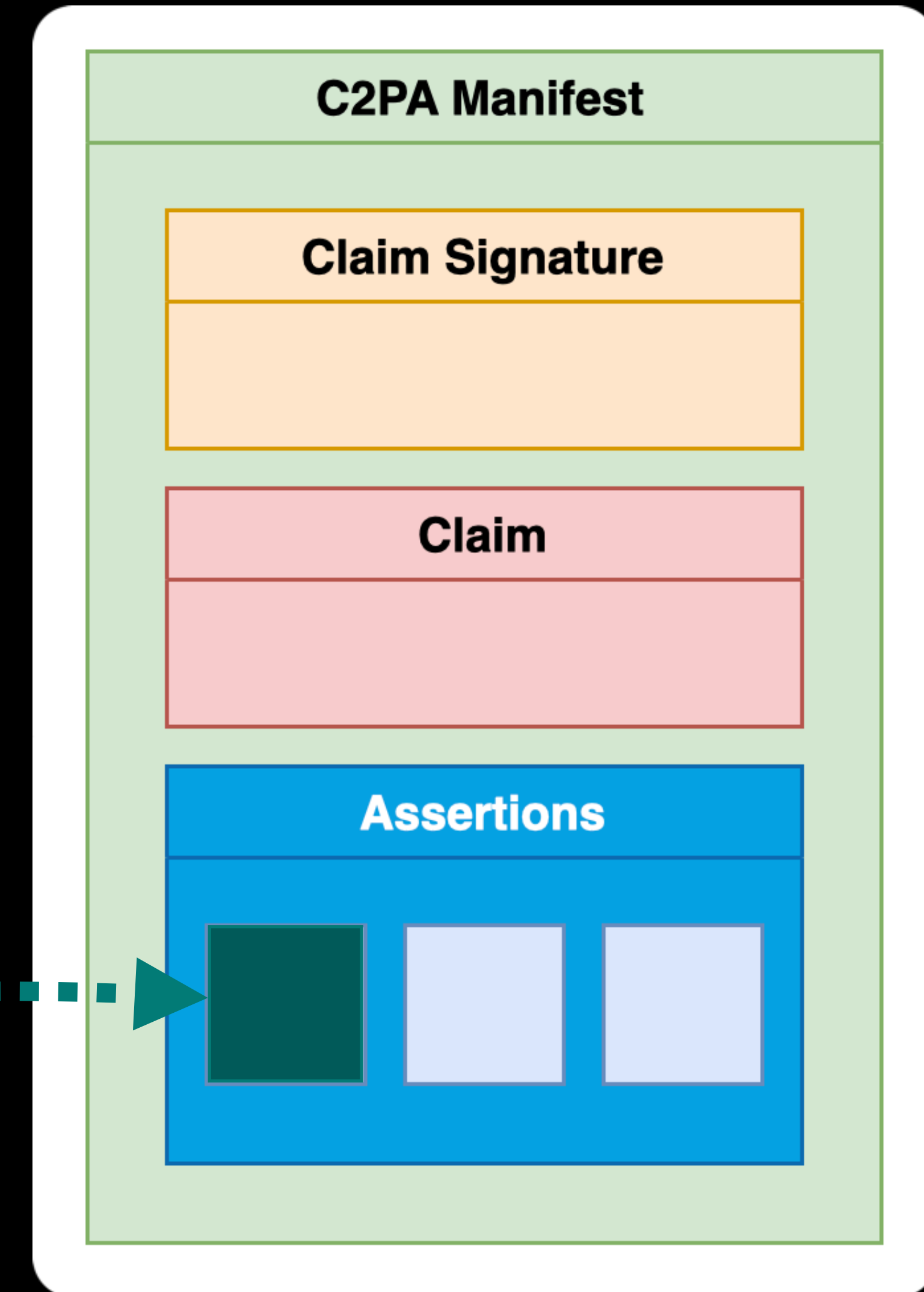
A **CAWG identity assertion** is a CBOR data structure (assertion) that can be part of a C2PA Manifest.

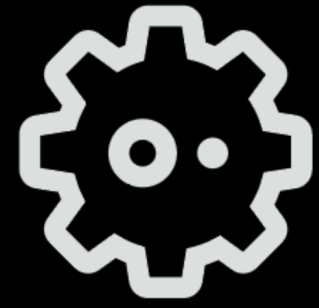
A **CAWG identity assertion** is typically meant to indicate subject's **authorization or active participation** in production of the asset.

```
The actor* described by ... #{credential}  
using a credential issued by ... #{issuer}  
produced the content described by ... #{signer_payload}  


---

Signed by ... #{credential holder}
```





## Identity assertion

How do content creators want to be identified in ~~2024~~  
2025?



# **Identity assertion**

Who we've talked to (so far)

**Institutional news media**

**Individual creative professionals**

**Institutional brands**



# Identity assertion

Institutional news media

The actor described by ... X.509 certificate

using a credential issued by ... certificate authority

produced the content described by ... `${signer_payload}`

---

Signed by ... certificate holder



## W3C VC walkthrough

- Actor holds VC
- Actor is linked to VP that references assertions
- `signature` is the VP

**NOPE!**



## W3C VC walkthrough

- Actor holds VC
- Actor is asked to issue a new VC that references assertions
- `signature` is the new VC

**ALSO NO!**





## W3C VC walkthrough (version 3 - current)

`signature` is a new VC  
that describes the **asset**  
and its creator



# Identity assertion

Individual content creators

- Instagram
- Twitter
- Other social media
- Web site
- Identity document (mDL or physical drivers license, etc.)

**Problem:** These credentials can generally be *observed* or *gathered* temporarily, but they generally don't have autonomous signing capability.



## Identity assertion

Individual content creators

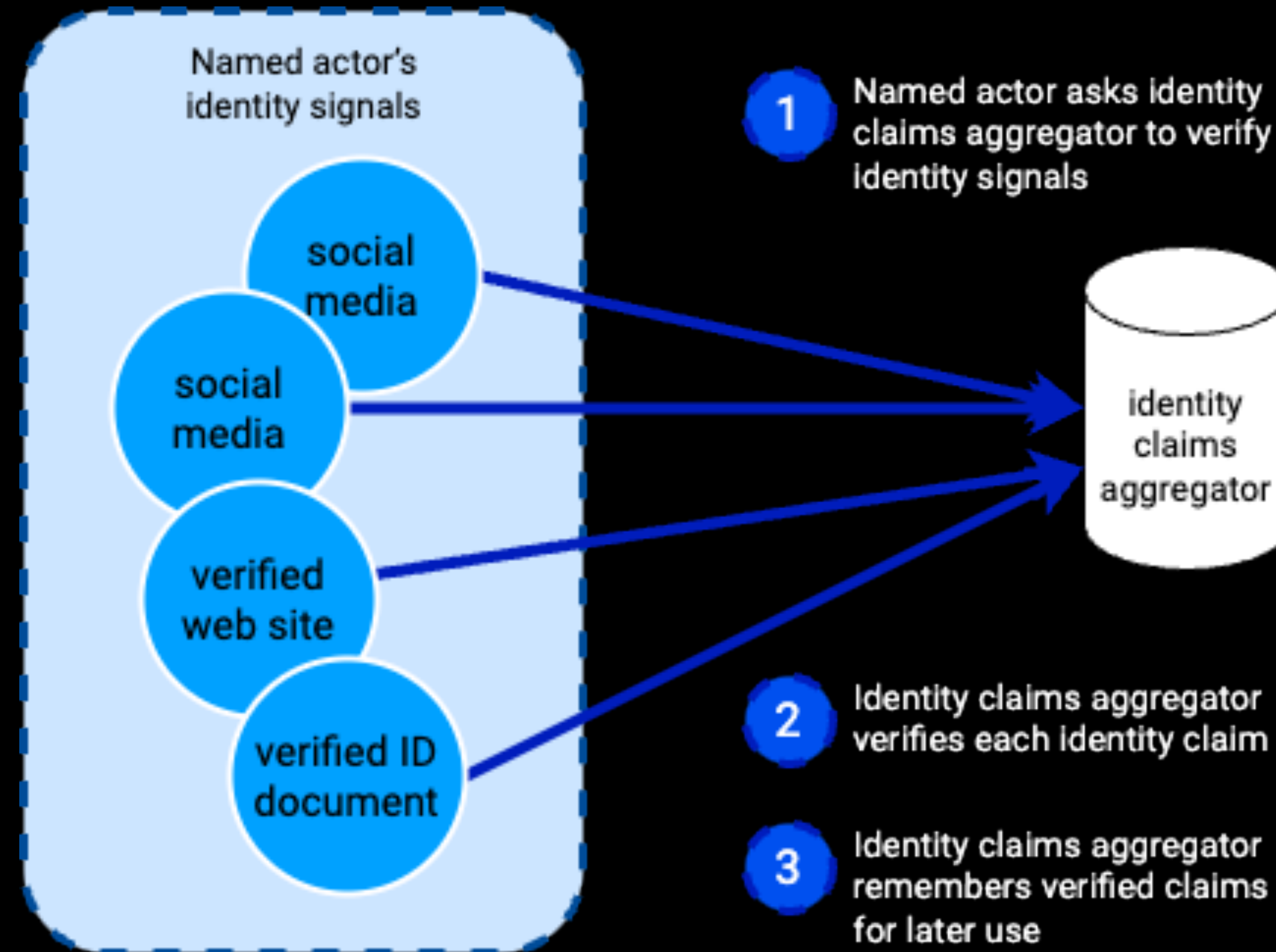
- Instagram
- Twitter
- Other social media
- Web site
- Identity document (mDL or physical drivers license, etc.)

**Solution:** Describe how a platform vendor can *aggregate* these identity signals and attest to them on behalf of their customer.



# Identity assertion

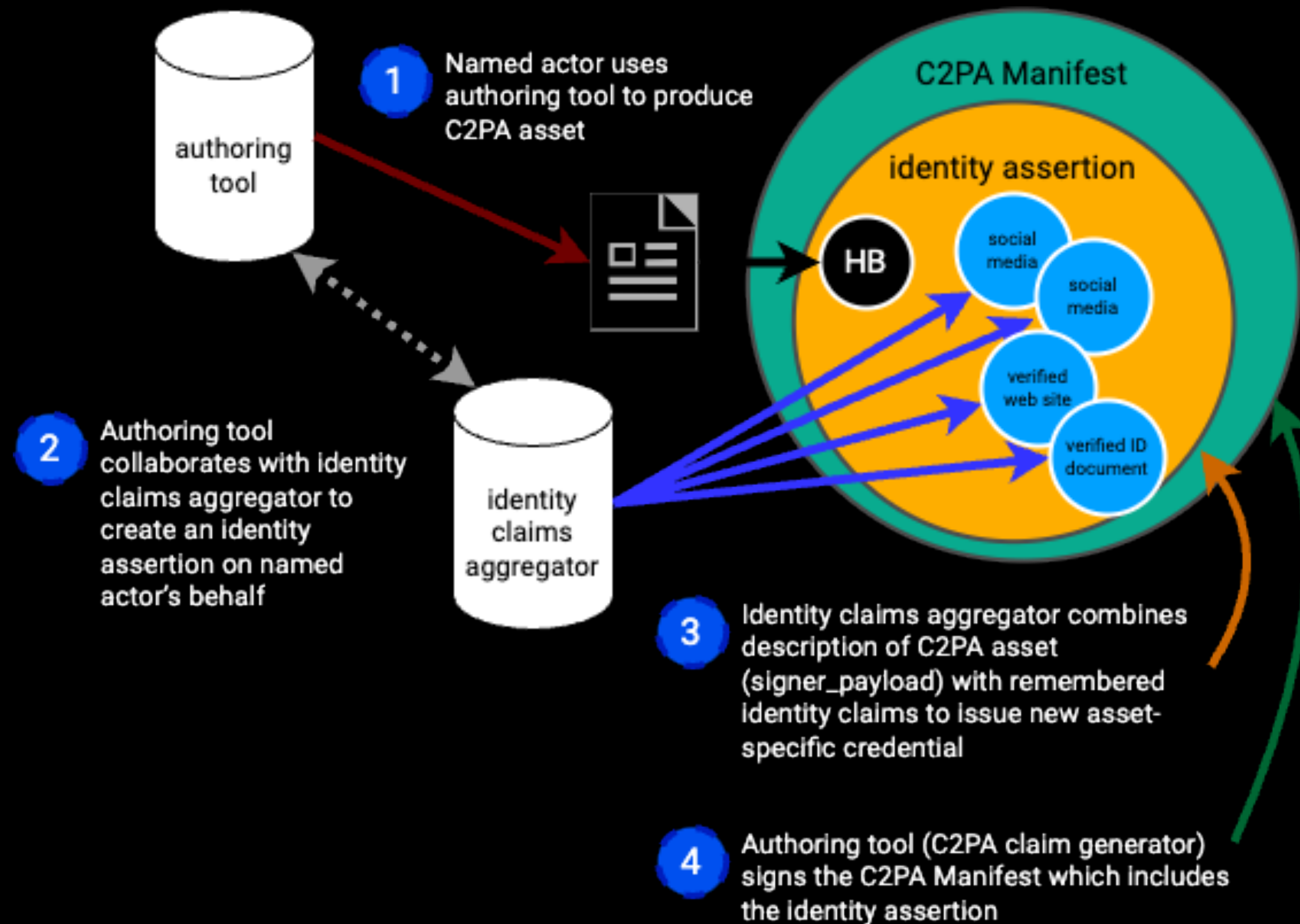
Verifying identity attestations





# Identity assertion

Creating content





# Identity assertion

Individual content creators

The actor described by ... VC with aggregated ID signals  
using a credential issued by ... identity claims aggregator  
produced the content described by ... `{signer_payload}`

---

Signed by ... identity claims aggregator



# Identity claims aggregation VC walkthrough

```
{
  "@context": [
    "https://www.w3.org/ns/credentials/v2", // VCDM v1 also accepted
    "https://cawg.io/identity/1.1/ica/context/"
  ],
  "type": [
    "VerifiableCredential",
    "IdentityClaimsAggregationCredential"
  ],
  ...
}
```





# Identity claims aggregation VC walkthrough

```
{  
  ...,  
  "issuer": {  
    id: "did:example:2g55q912ec3476eba2l9812ecbfe",  
    name: "Adobe Photoshop 2024"  
  },  
  ...  
}
```





# Identity claims aggregation VC walkthrough

```
{
  ...,
  "credentialSubject": {
    "id": "did:example:ebfeb1f712ebc6f1c276e12ec21",
    "c2paAsset": {
      "referenced_assertions": [
        {
          "url": ".../c2pa.hash.data",
          "hash": "U9Gyz05t..."
        },
        { "url": "...", "hash": "..." },
        { "url": "...", "hash": "..." }
      ],
      "sig_type": "cawg.identity_claims_aggregation"
    }
  },
  "proof": ...,
  ...
}
```



## **Connect the dots**

Who's next?

My challenge to you:

Introduce me to content creators who have access to autonomous signing credentials and know how to use them.



# Identity assertion

Who's next?

The actor described by ... ???

using a credential issued by ... ???

produced the content described by ... `${signer_payload}`

---

Signed by ... content creator for themselves, ideally