

# **C2PA and Identity**

**Technical overview for Trust Over IP Foundation**

**Eric Scouten · 21 February 2024**

**CAI vs C2PA**

**Overview of C2PA data model**

**What's new in C2PA 2.0?**

**Identity "2.0" assertion**

Questions: At end, please



**Content  
Authenticity  
Initiative**

“We are a **community** of media and tech companies, NGOs, academics, and others working to promote adoption of an open industry standard for content authenticity and provenance.”

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



“C2PA addresses the prevalence of misleading information online through the development of **technical standards** for certifying the source and history (or provenance) of media content.”

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

# 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

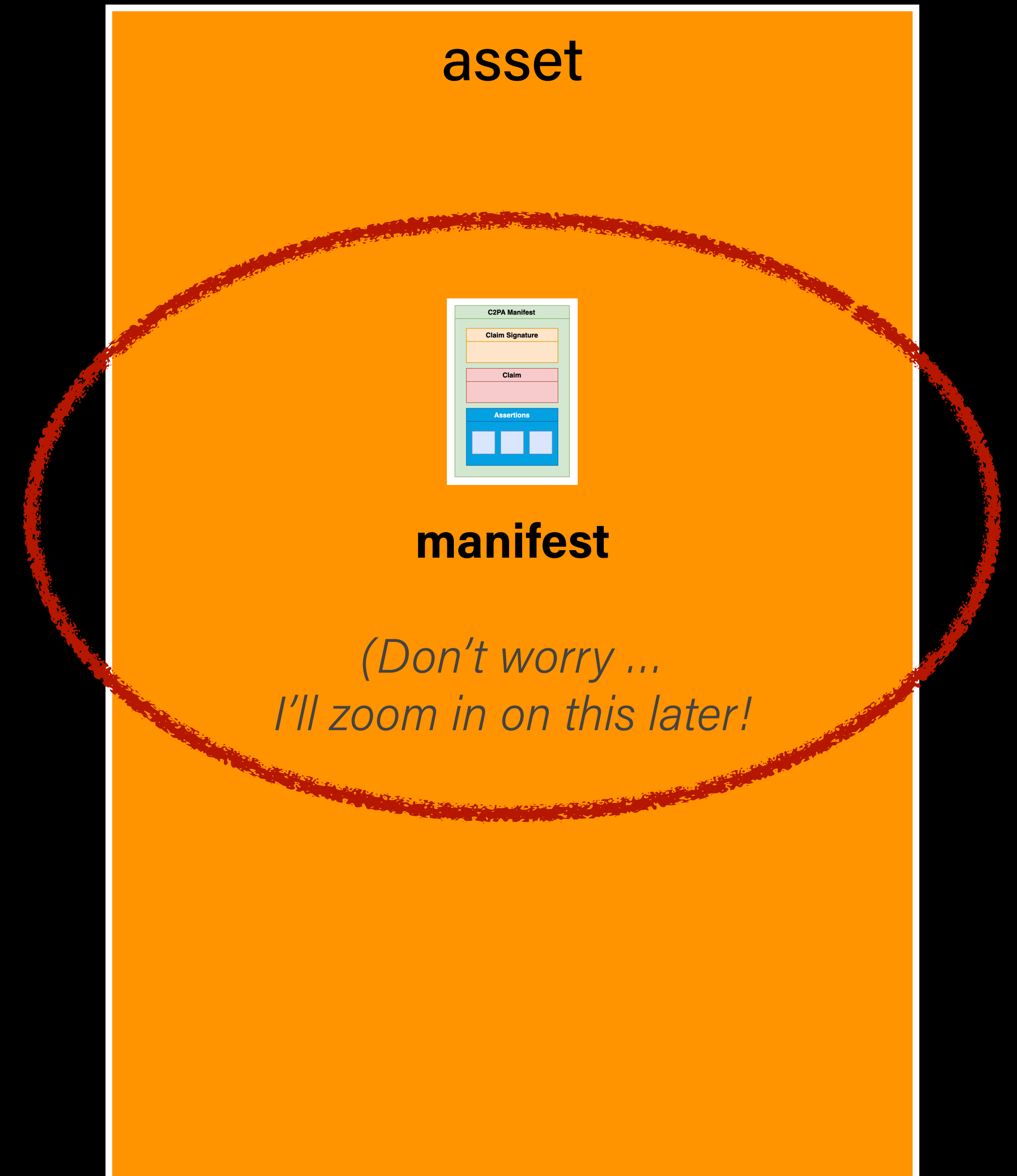
fonts

# C2PA data model

## Overview

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

It is described by a **manifest**.



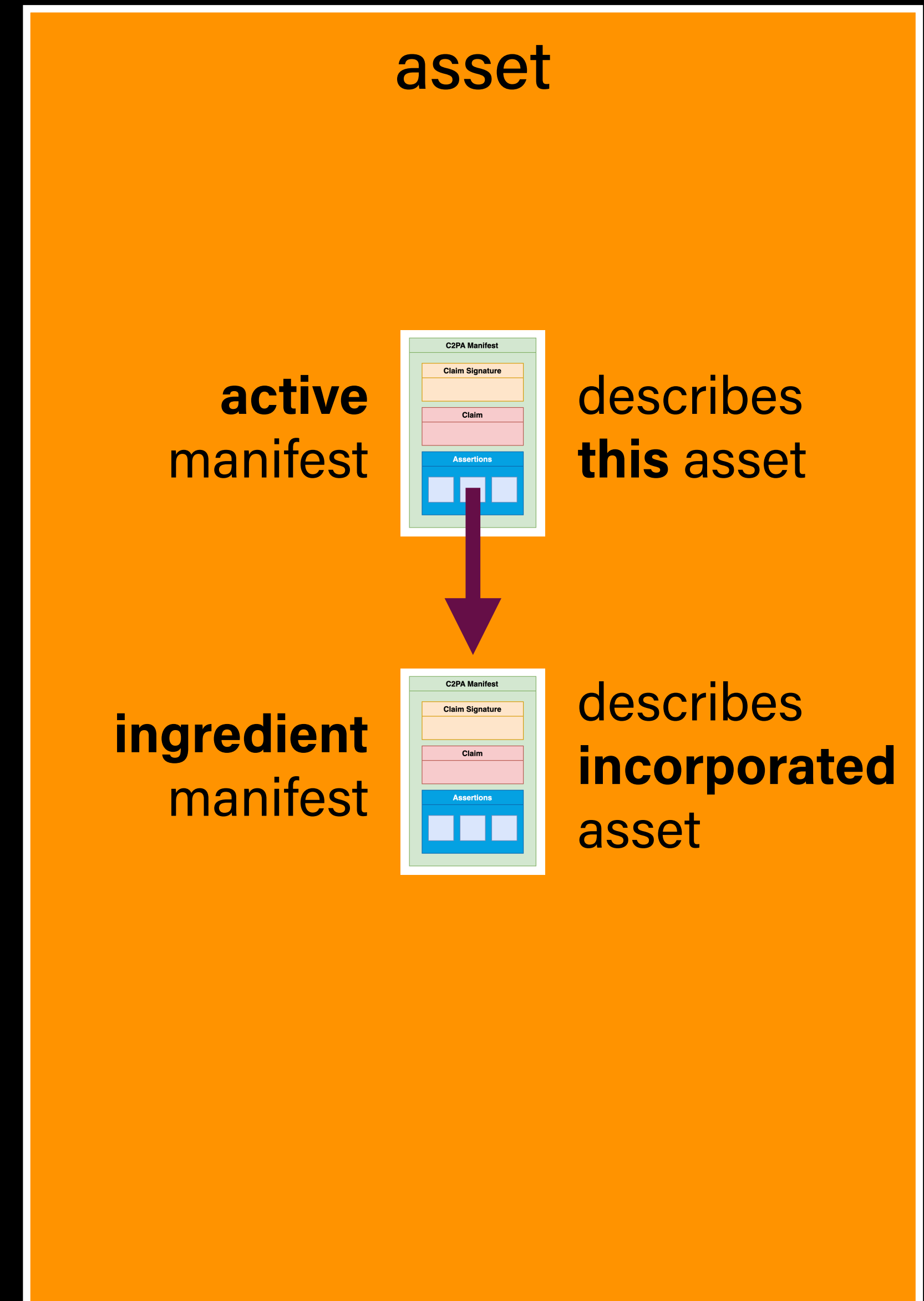
# C2PA data model

## Overview

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

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

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





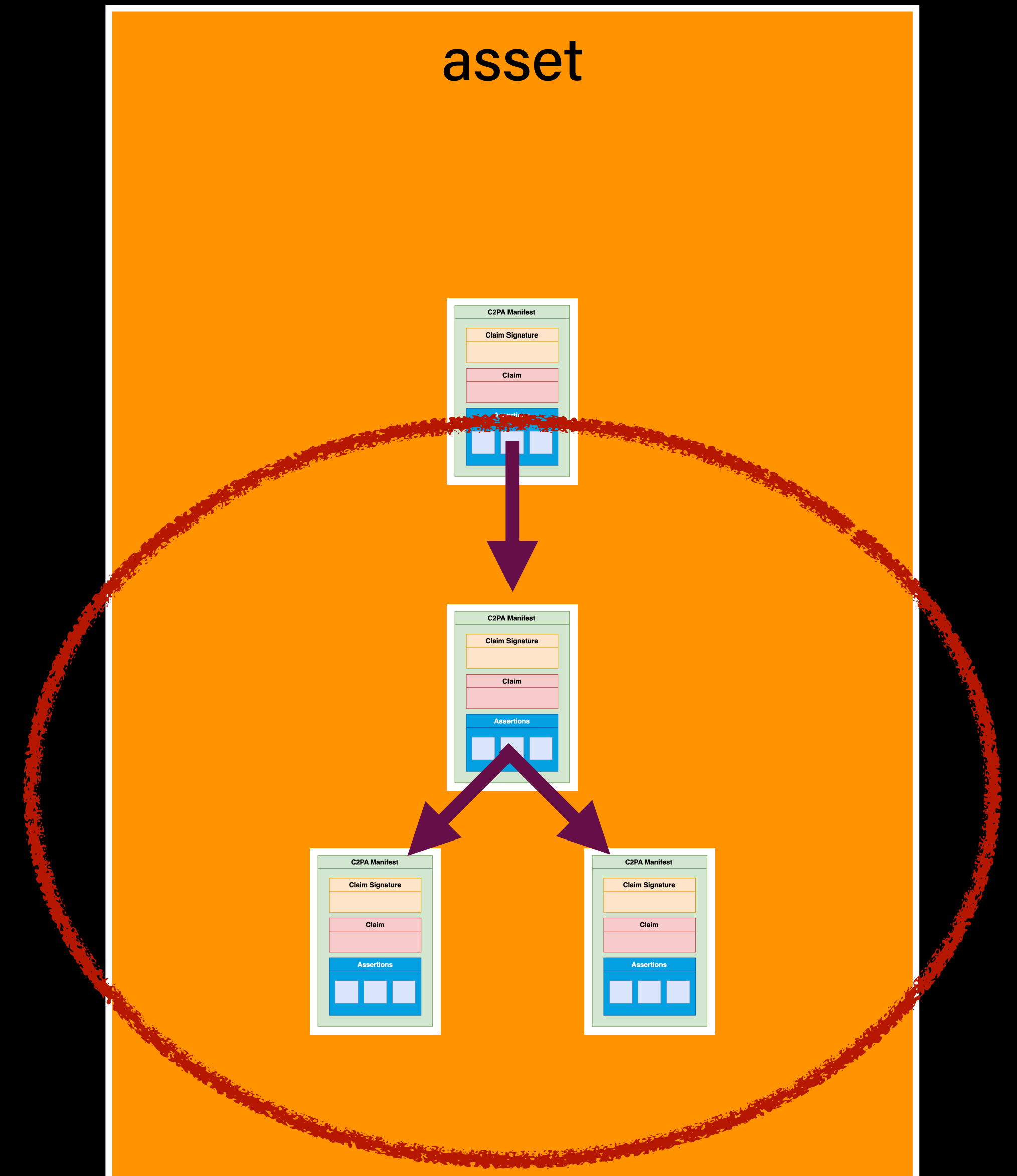
# C2PA data model

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# C2PA data model

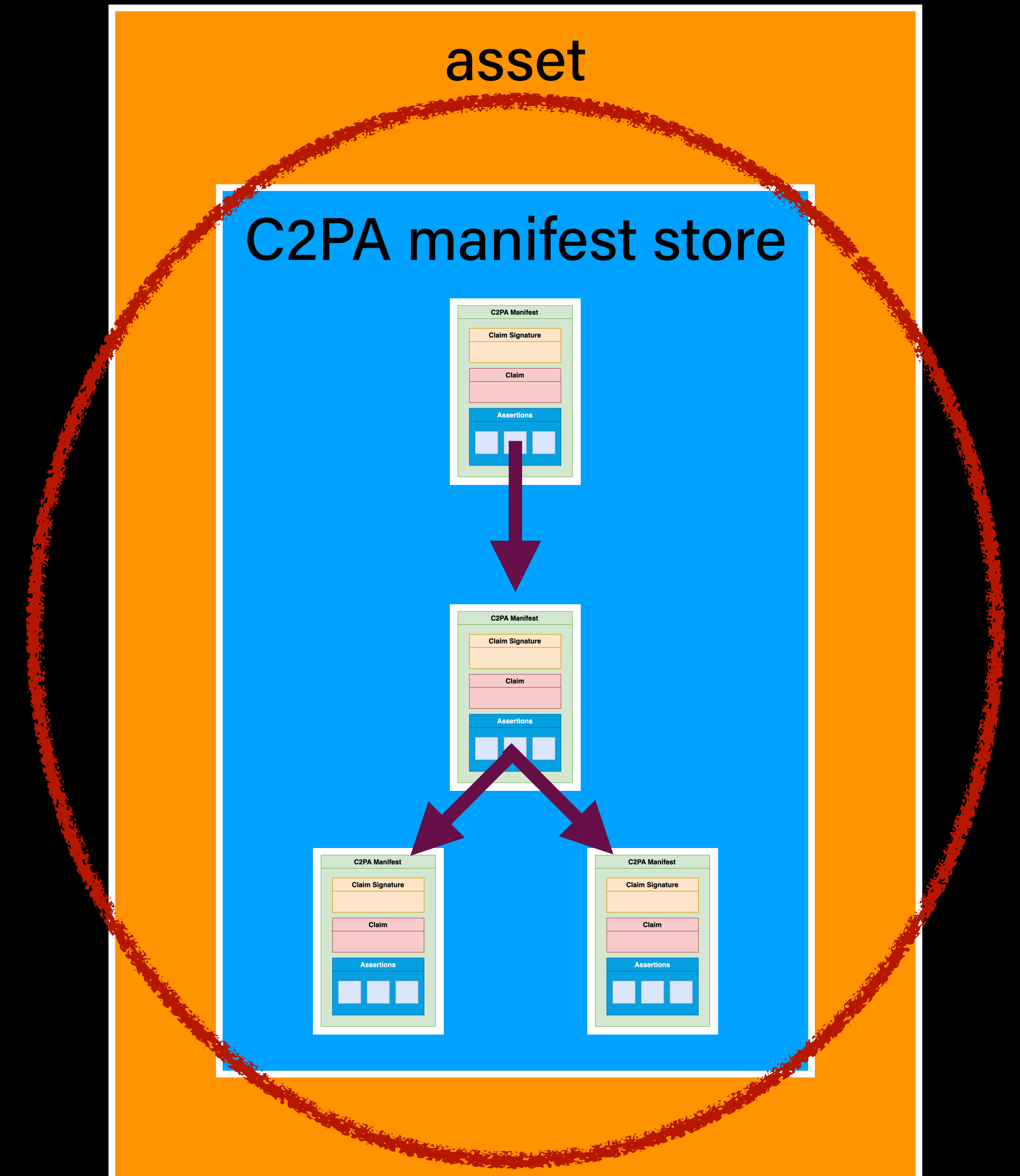
## Overview

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

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

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

The collection of manifests is referred to as a **manifest store**.

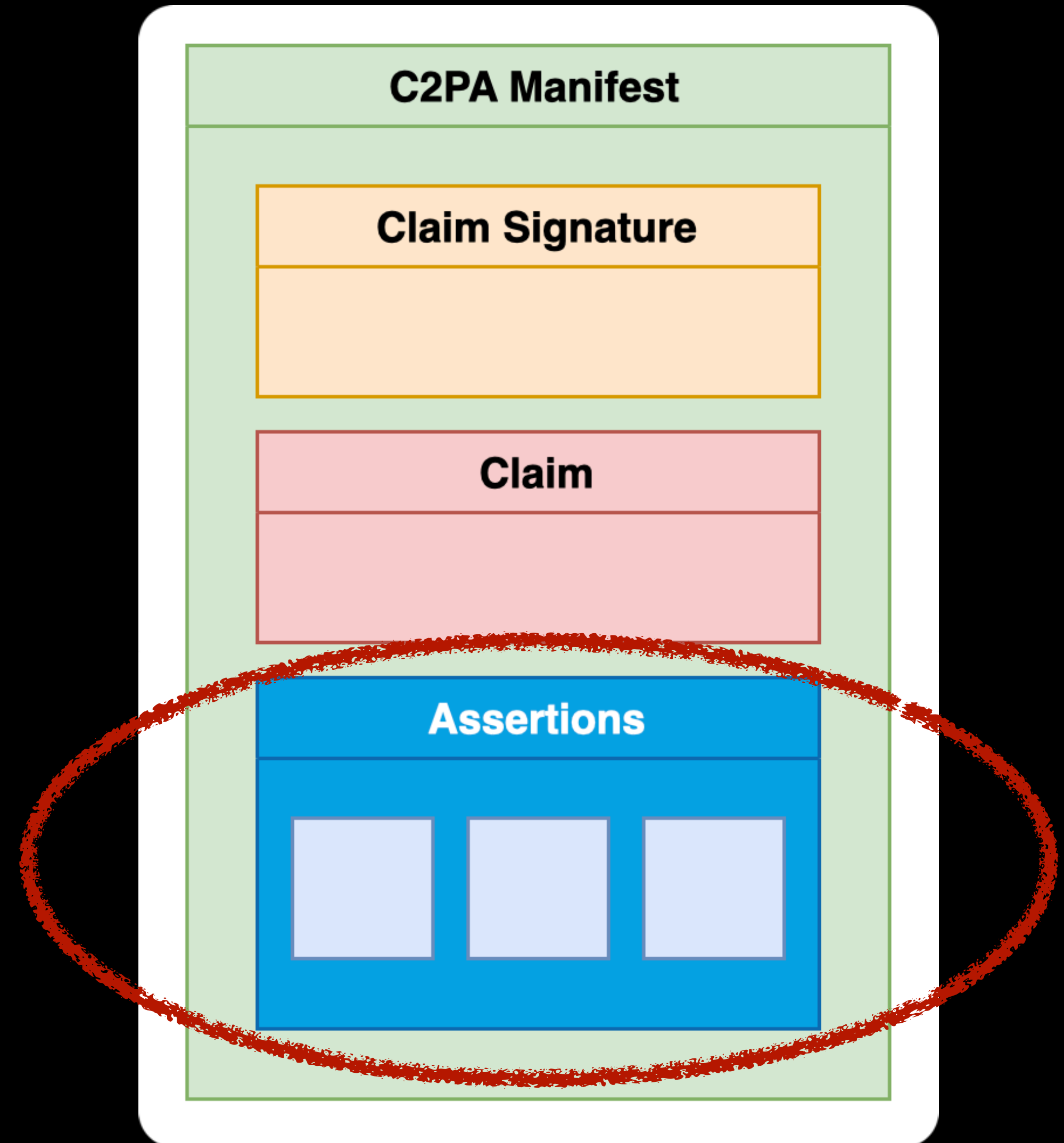


# C2PA data model

## 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
- identity of the content creator(s) (*see later discussion*)
- edit actions
- thumbnail of the content
- other content (ingredients) that were incorporated into this content

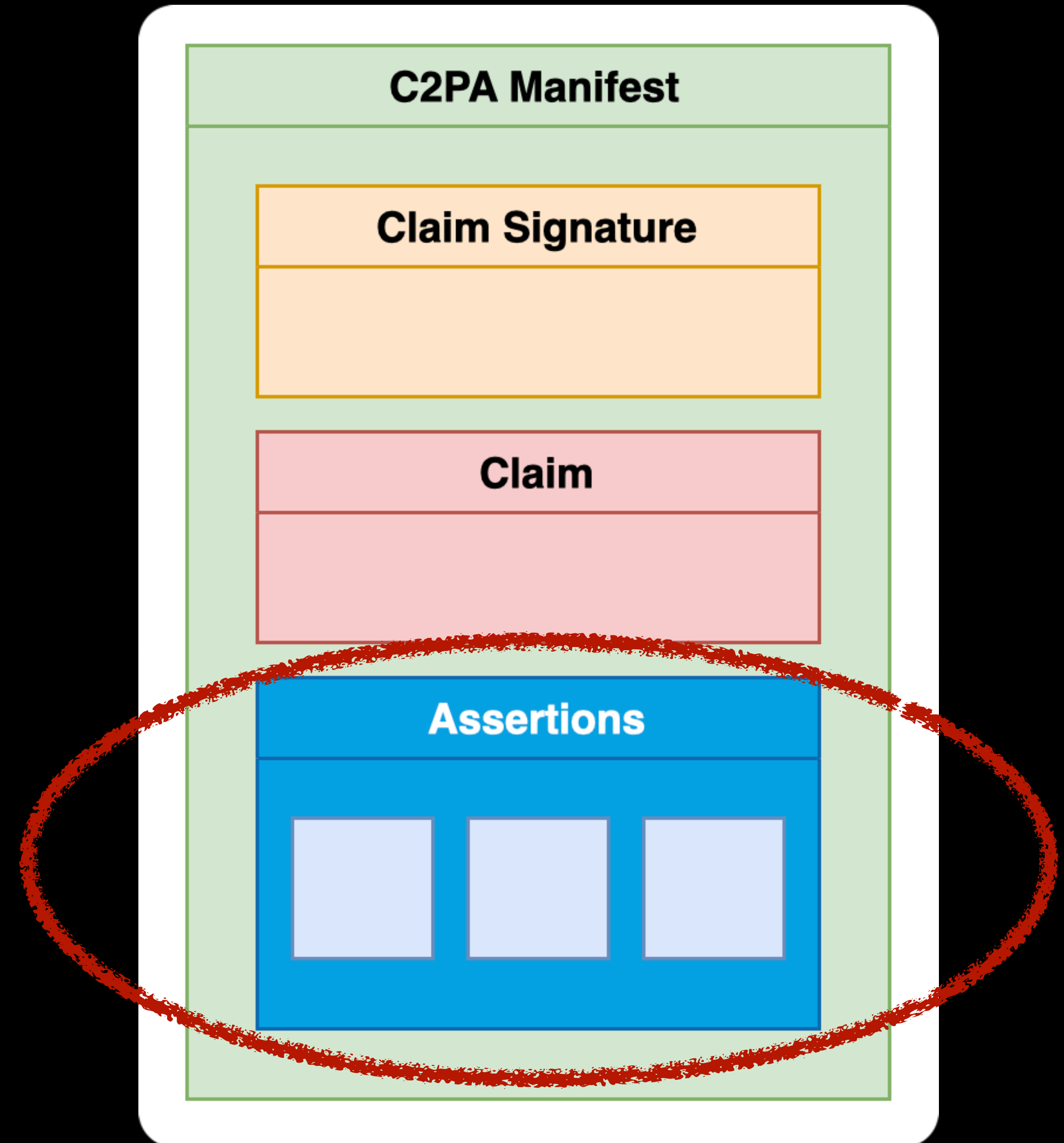


# C2PA data model

## Assertions, part 2

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

Assertions are typically serialized in CBOR.

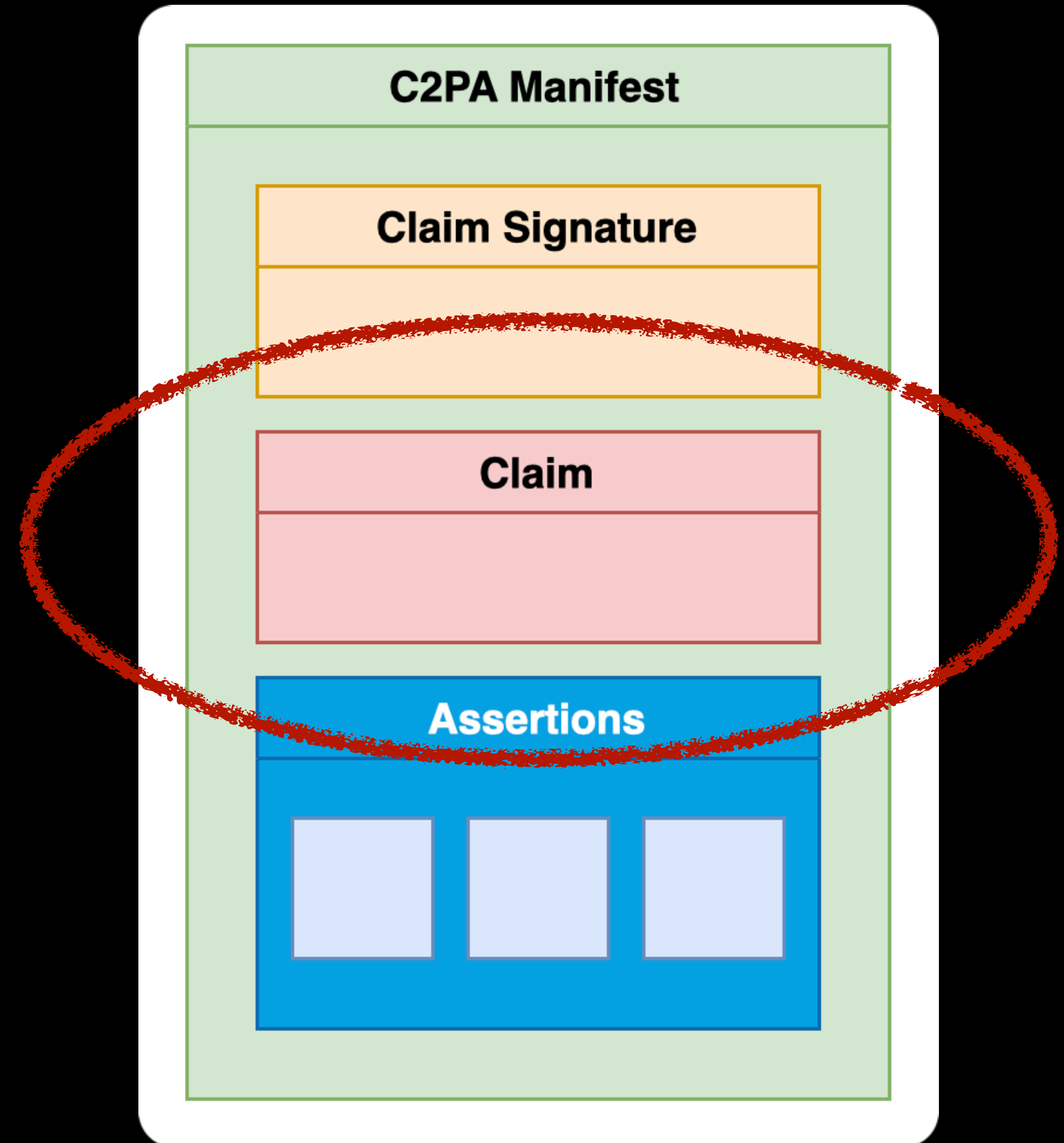


# C2PA data model

## Claim

Every manifest has exactly one **claim**, which contains:

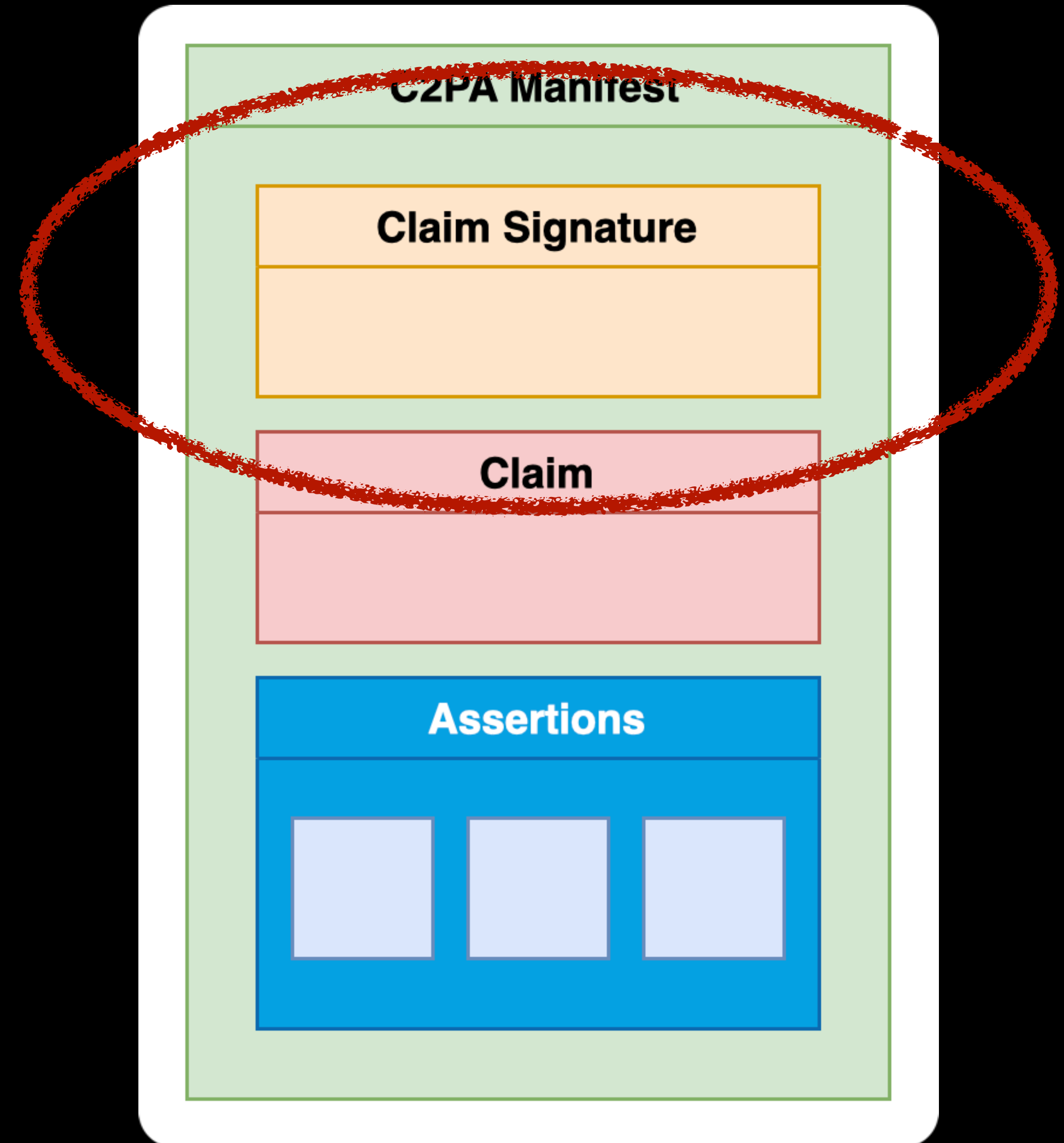
- a list of its assertions (via hashed JUMBF URI)
- information about who created the claim (typically tool vendor)
- assertions from ingredients that were redacted



# C2PA data model

## Claim signature

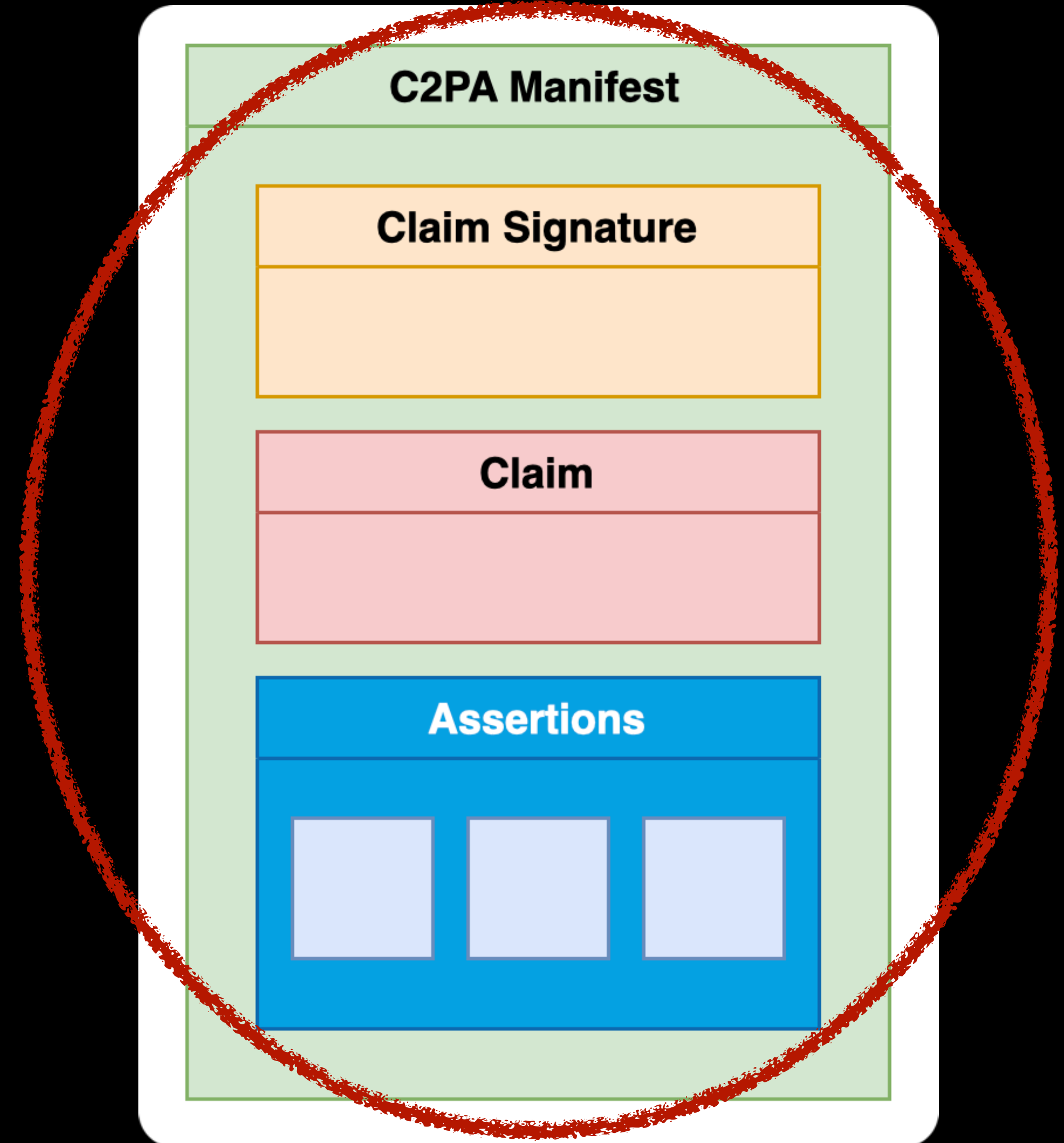
A **claim signature** is a COSE signature that binds the claim data structure to an X.509 certificate holder.



# C2PA data model

## Manifest

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





# C2PA 2.0

Released January 2024



# C2PA 2.0

## Narrowing scope

**C2PA 1.4 spec is a 217 page PDF. How to make it smaller?**

- C2PA 2.0 now only describes metadata that is **machine-attestable** and relies on extensibility (custom assertion types) to permit human-generated statements to be made.
- Strong guidance (but not requirement) that manifest signature should be issued by the tool implementation (hardware or software), not the individual or organisation content producer.
- Several assertion types were **deleted** from C2PA 2.0. These will be taken up outside of C2PA – see next section.

# C2PA 2.0

## New concepts – manifests

A well-formed manifest is:

- Structurally valid
- Has a valid signature (may or may not be on trust list)
- Unmodified since signature was issued

A trusted manifest is *also*:

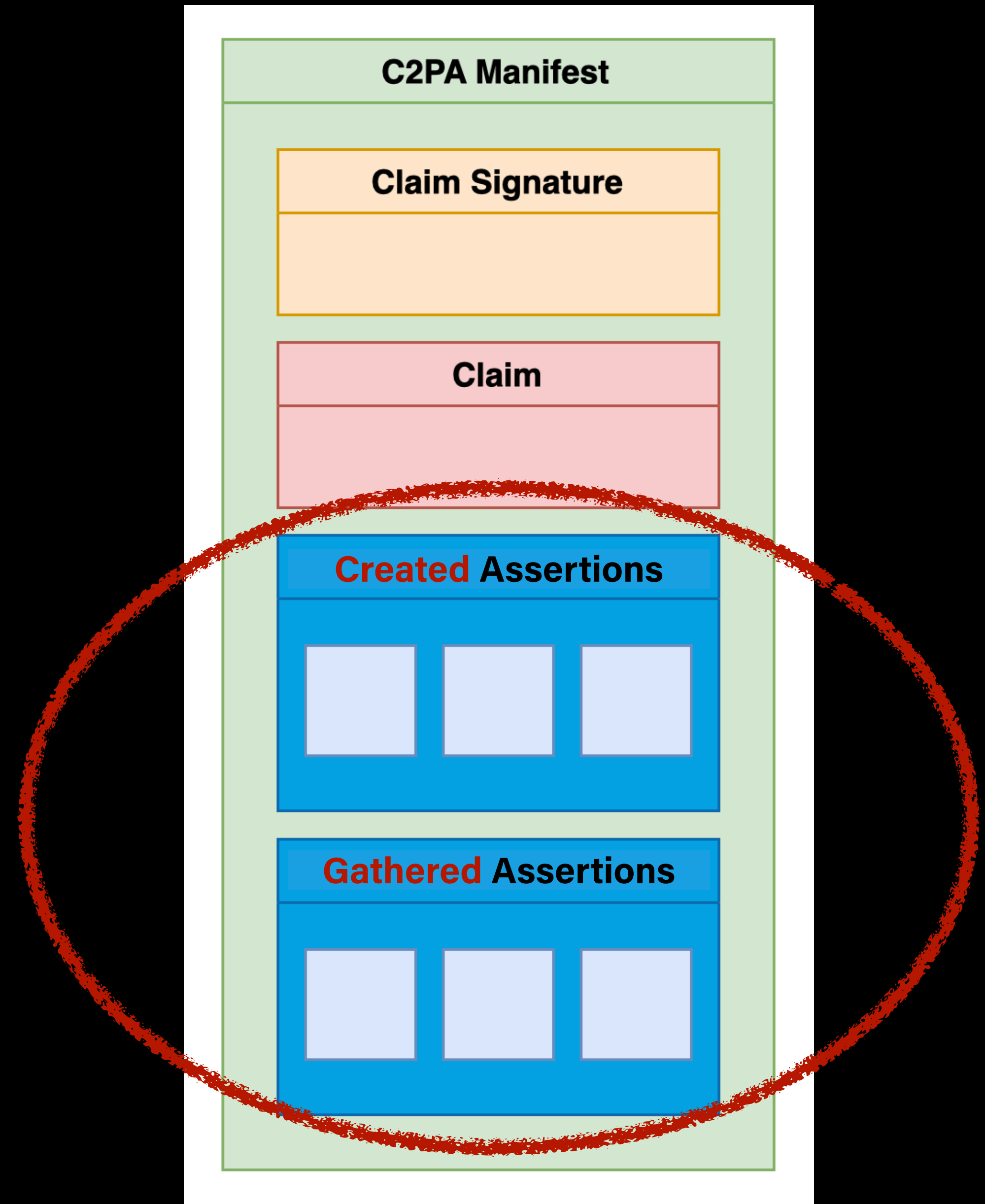
- Signed by a certificate holder that is on verifier's trust list
- Trust list should include a **C2PA trust list** (*not yet implemented*)

# C2PA 2.0

## New concepts - claim

A version 2 claim now distinguishes between:

- **Created assertions**, which are directly created by the claim generator (i.e. machine-attestable)
- **Gathered assertions**, which are provided by some other part of the workflow (i.e. human-provided content)



# Identity “2.0” assertion

Current work in progress

# Identity “2.0” 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 “2.0” assertion

## What?

“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 “2.0” assertion

## What?

“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.”

**actor**: A human or non-human (hardware or software) that is participating in the C2PA ecosystem.

For purposes of identity 2.0 spec, this typically means an individual or organization that is creating content.

# Identity “2.0” assertion

## What?

“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.”

**C2PA asset**: Defined in identity 2.0 spec as any asset containing a C2PA manifest.



# Identity “2.0” assertion

## What?

“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.”

The identity 2.0 spec defines a new trust signal for content creators (“actors”) that is independent from and in addition to the signature defined in the C2PA 2.0 spec for claim generators.

# Identity “2.0” assertion

## What?

“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.”

Similar to the signature mechanism for claim generators in the core C2PA spec, the identity 2.0 spec encourages independent verification of relevant credentials.

# Identity “2.0” assertion

## What?

“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.”

The identity 2.0 spec encourages the use of credentials that include attestation from independent sources (employers, professional organizations, KYC/KYB vendors, etc.).

# Identity “2.0” assertion

## What?

“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.**”

The identity 2.0 spec requires a reference to the same tamper-evident, hard-binding assertion as the C2PA claim that includes it, thus ensuring that the named actor has given their consent to be identified with this specific content and ensuring that the signature will be invalidated if the content is modified after their signature was issued.

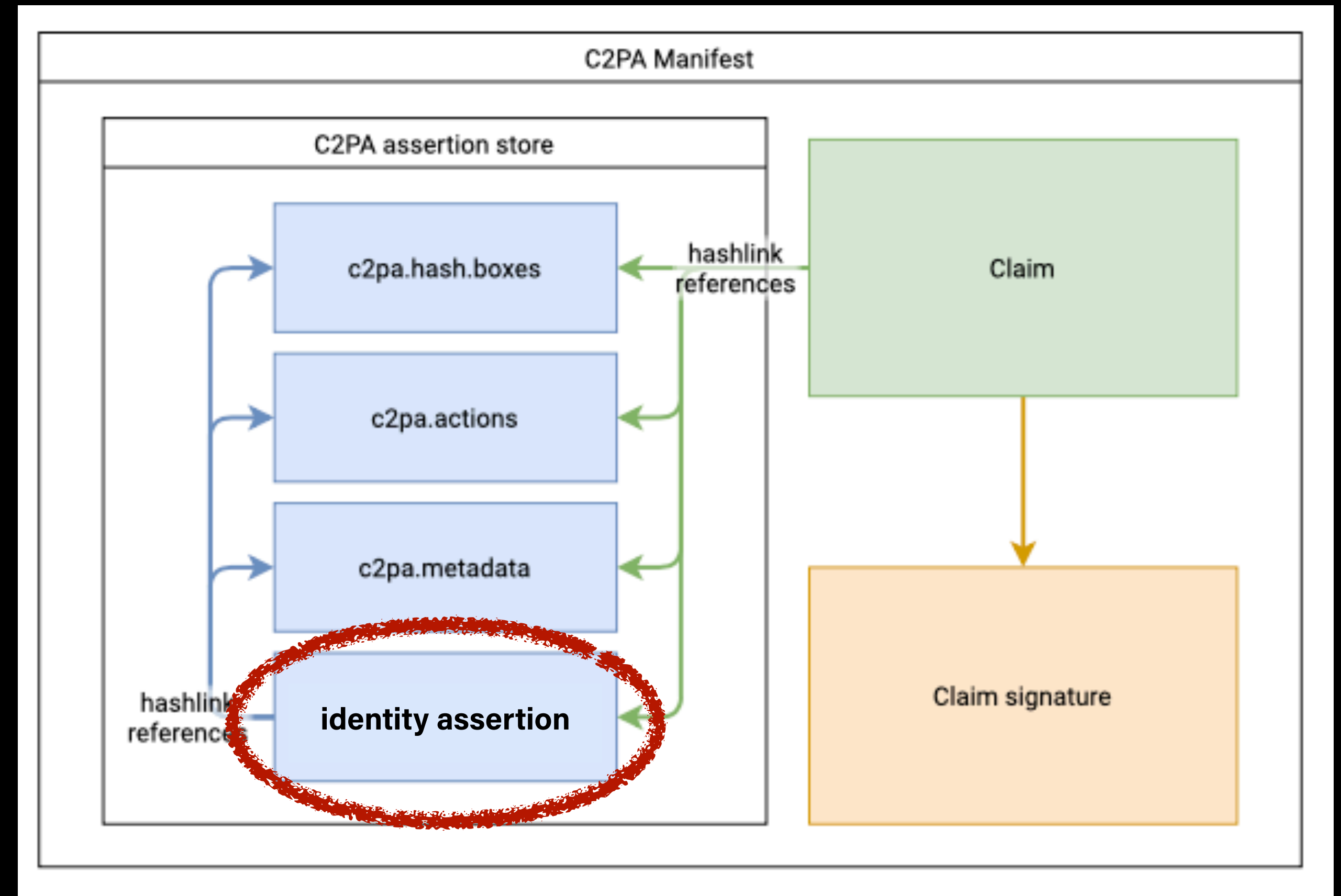
# Identity “2.0” assertion

## Technical overview

Identity assertion allows one credential subject to sign a **list of assertions.**

Meant to imply **subject’s authorization or active participation** in production of the asset.

**Additional trust signal** over and above the C2PA claim generator signal.

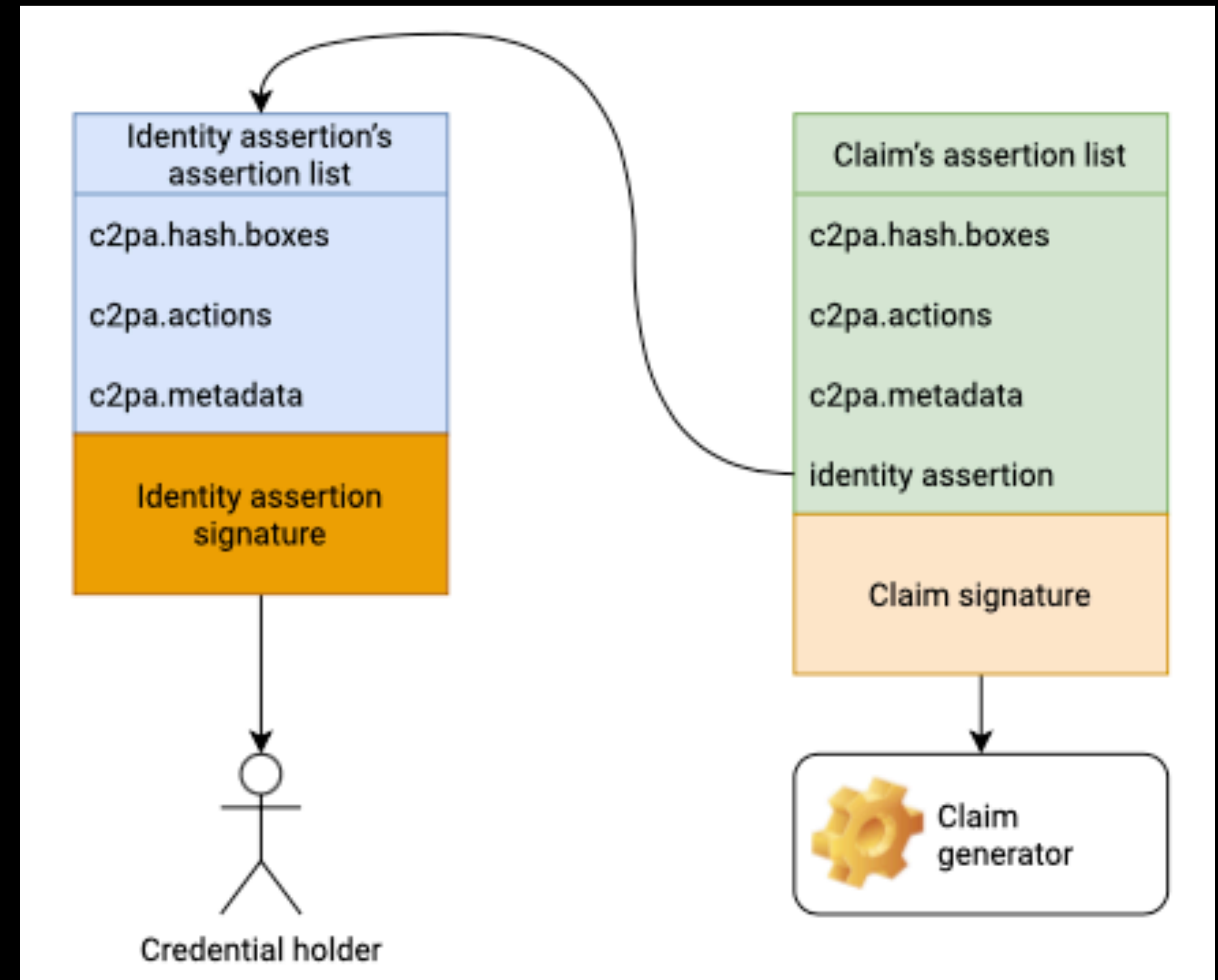


# Identity “2.0” assertion

## Technical overview

Credential and signature can be:

- X.509 certificate ➤ COSE signature
- W3C verifiable credential ➤ another VC  
(*maybe VP?*)





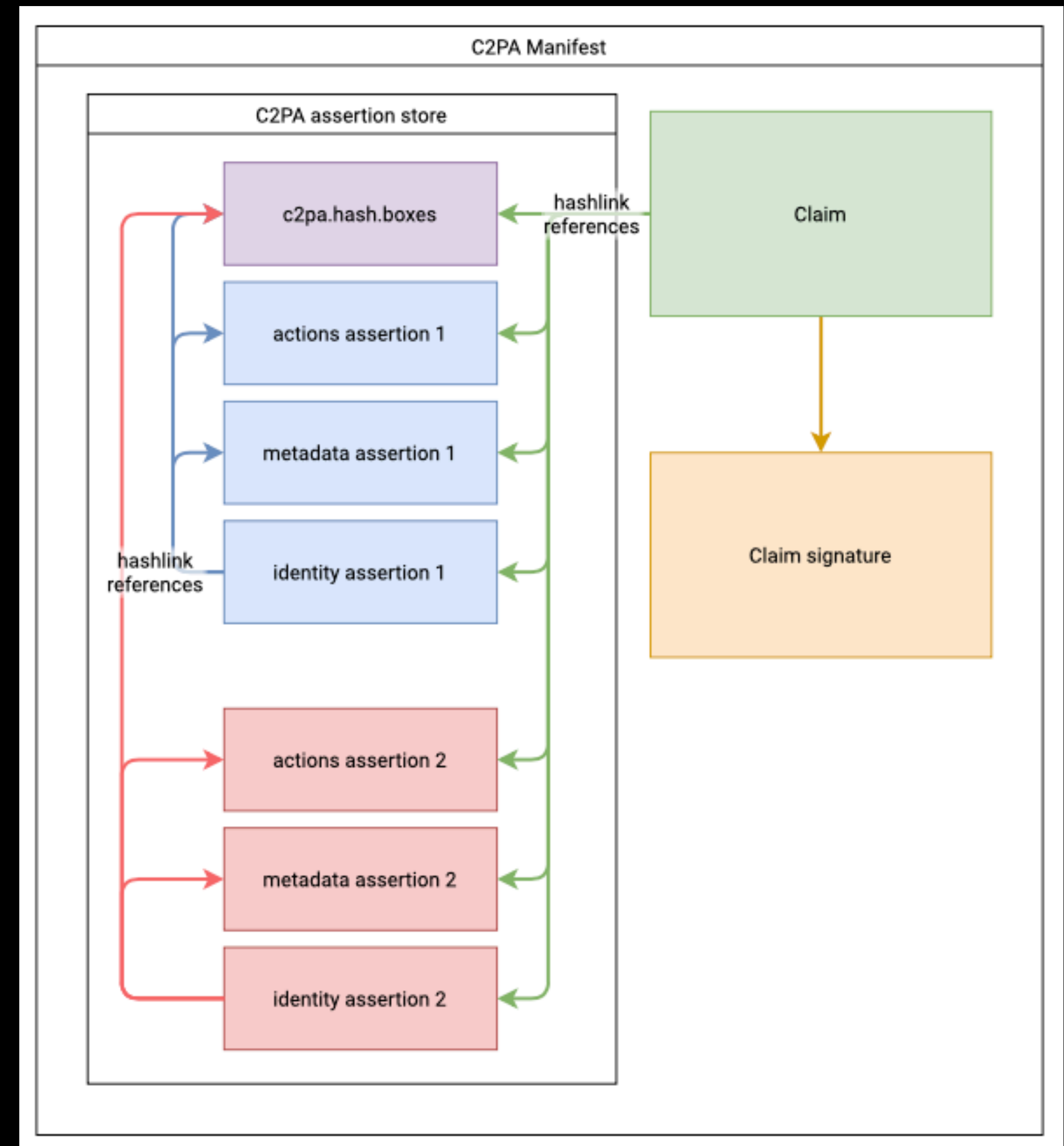
# Identity “2.0” assertion

## Technical 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 “2.0” assertion

Who’s building this? Me 😊 and ...

- Discussions at **Internet Identity Workshop** last year (I’ll be back this April!)
- Became my full-time job in November 2023, private drafts circulated since then
  - Several ToIP members have provided feedback – **thank you!**
- Previewed at **CAI Summit** in December 2023
- Going public ...



# Identity “2.0” assertion

## Introducing the Creator Assertions Working Group

- <https://creator-assertions.github.io>
- Governed under **Community Specification License** process
- Will also take up the following assertions deleted from C2PA 2.0
  - Training and data mining
  - Endorsements
  - Metadata

# Identity “2.0” assertion

Please join and guide this implementation!

- <https://creator-assertions.github.io>
- Weekly meetings
  - Typically on Mondays at 0830 Pacific / 1130 Eastern / 1630 UTC  
*(will change to 1530 UTC with US Daylight Savings time in March)*
  - Contact me for invitation

Questions and discussion ...