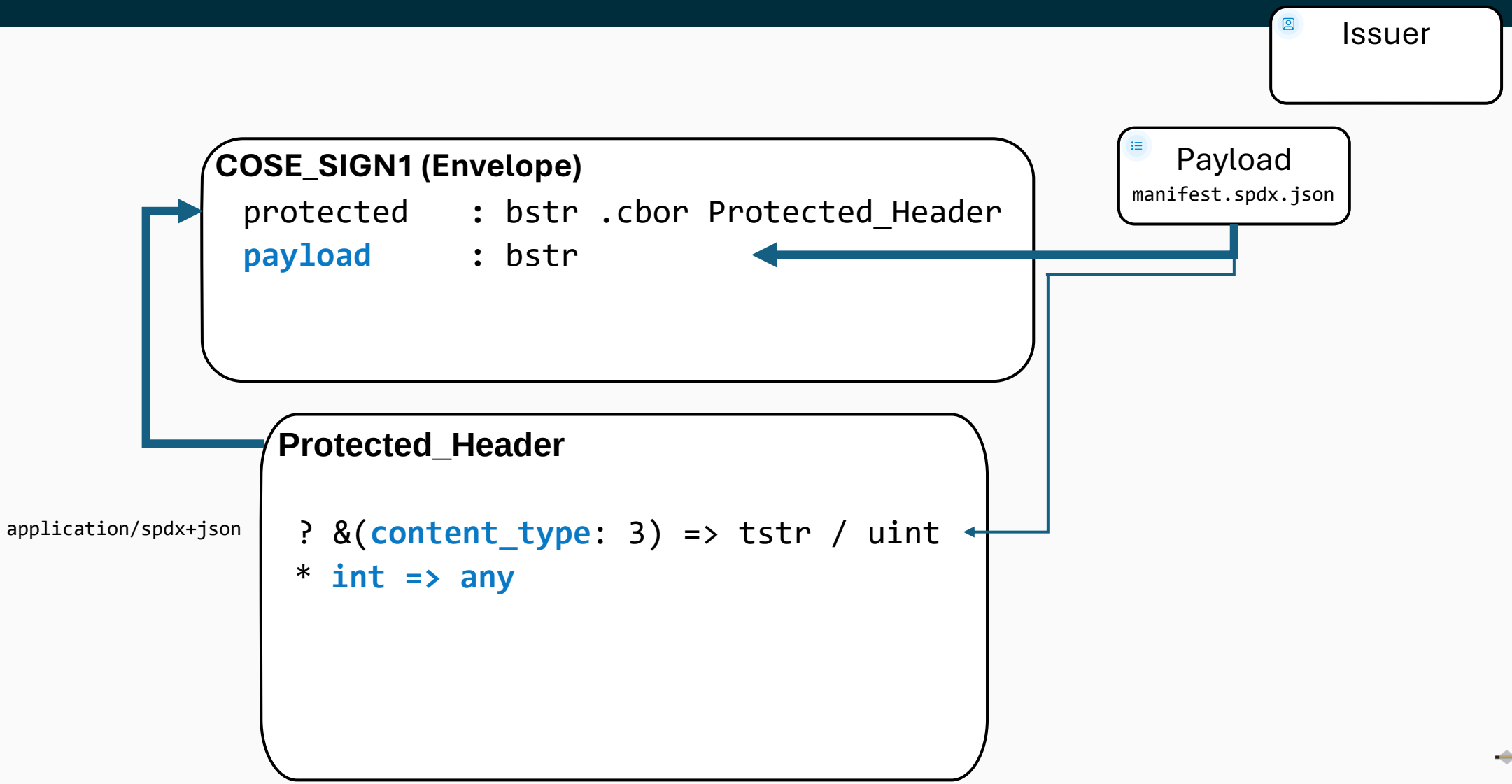
COSE Hash Envelope

draft-steele-cose-hash-envelope

Reference: https://datatracker.ietf.org/doc/draft-steele-cose-hash-envelope/

Current State - Attached

To Be Signed Bytes



Signed Bytes

Issuer

Statement

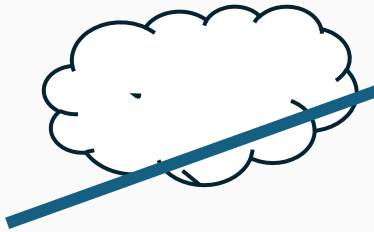
COSE_SIGN1 (Envelope)

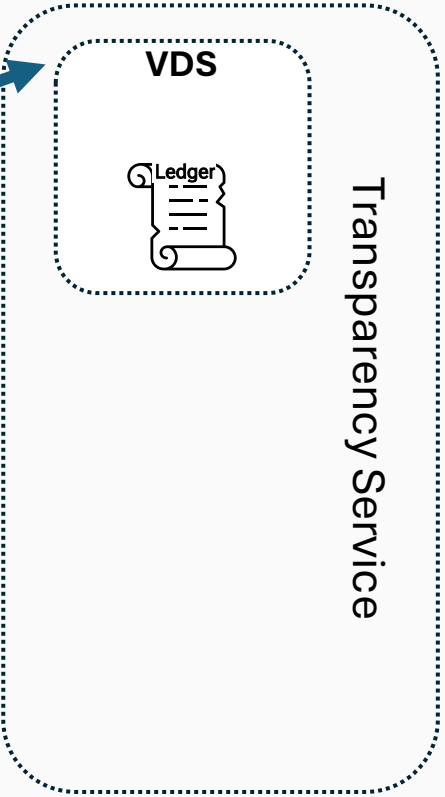
```
protected   : bstr .cbor Protected_Header
payload     : bstr
signature   : bstr
```

Registering on a Verifiable Data Structure (VDS)

COSE_SIGN1 (Envelope)

```
protected   : bstr .cbor Protected_Header
payload     : bstr
signature   : bstr
unprotected : Unprotected_Header
```

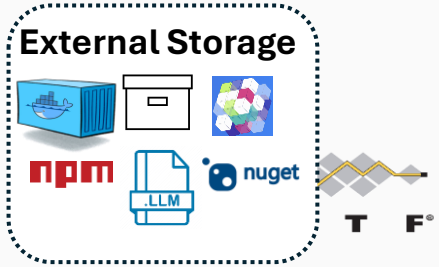




How large is the COSE_Sign1 Envelope?

Protected Header	~1k
Unprotected Header	0
Signature	~1k

2k

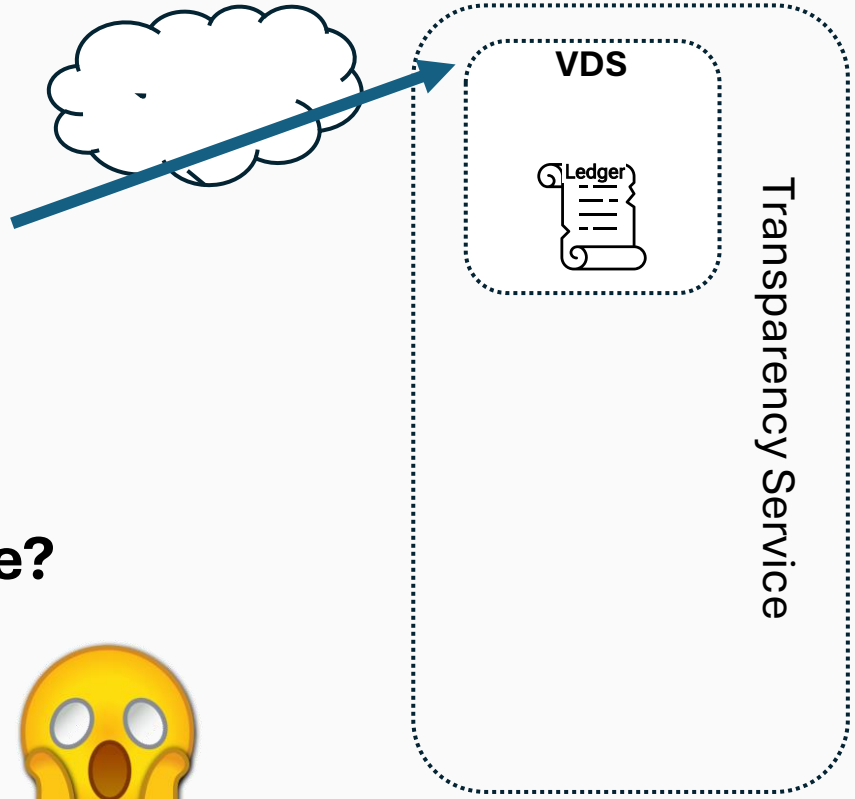


- Is ***size*** the constraint?
- Is the ***payload*** already stored somewhere else?
- Do we need to continually pass the payload for signature checking?

Registering on a Verifiable Data Structure (VDS)

COSE_SIGN1 (Envelope)

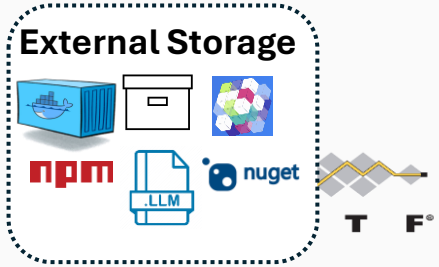
```
protected   : bstr .cbor Protected_Header
payload     : bstr
signature   : bstr
unprotected : Unprotected_Header
```



How large is the COSE_Sign1 Envelope?

Protected Header	~1k
Unprotected Header	0
Signature	~1k
Payload	1k-50gb

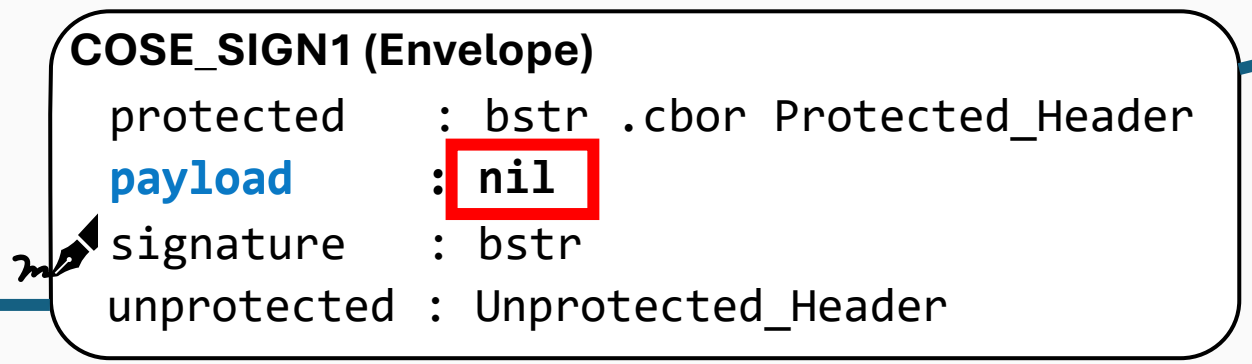
~50.002gb

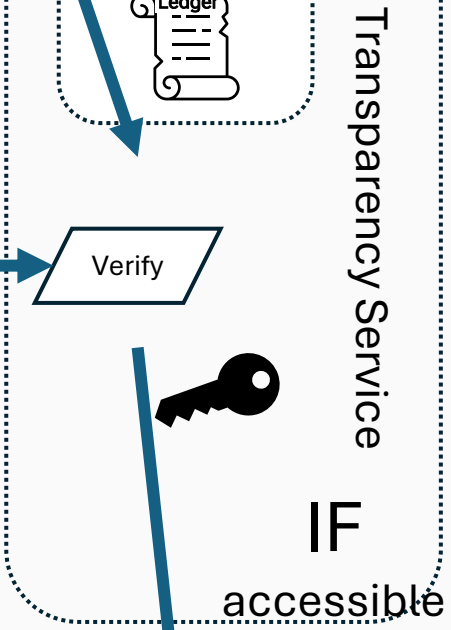


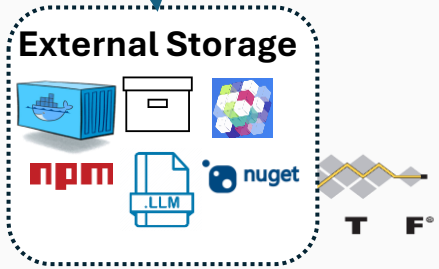
- Is ***size*** the constraint?
- Is the ***payload*** already stored somewhere else?
- Do we need to continually pass the payload for signature checking?

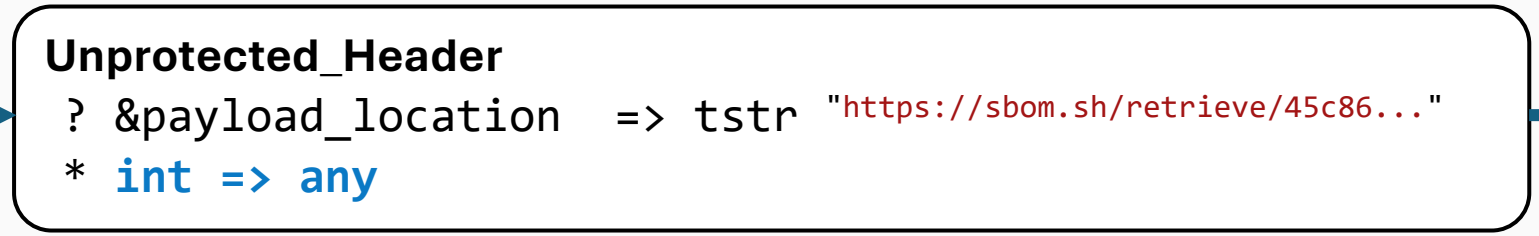
COSE Detached Payloads

Detached Payloads

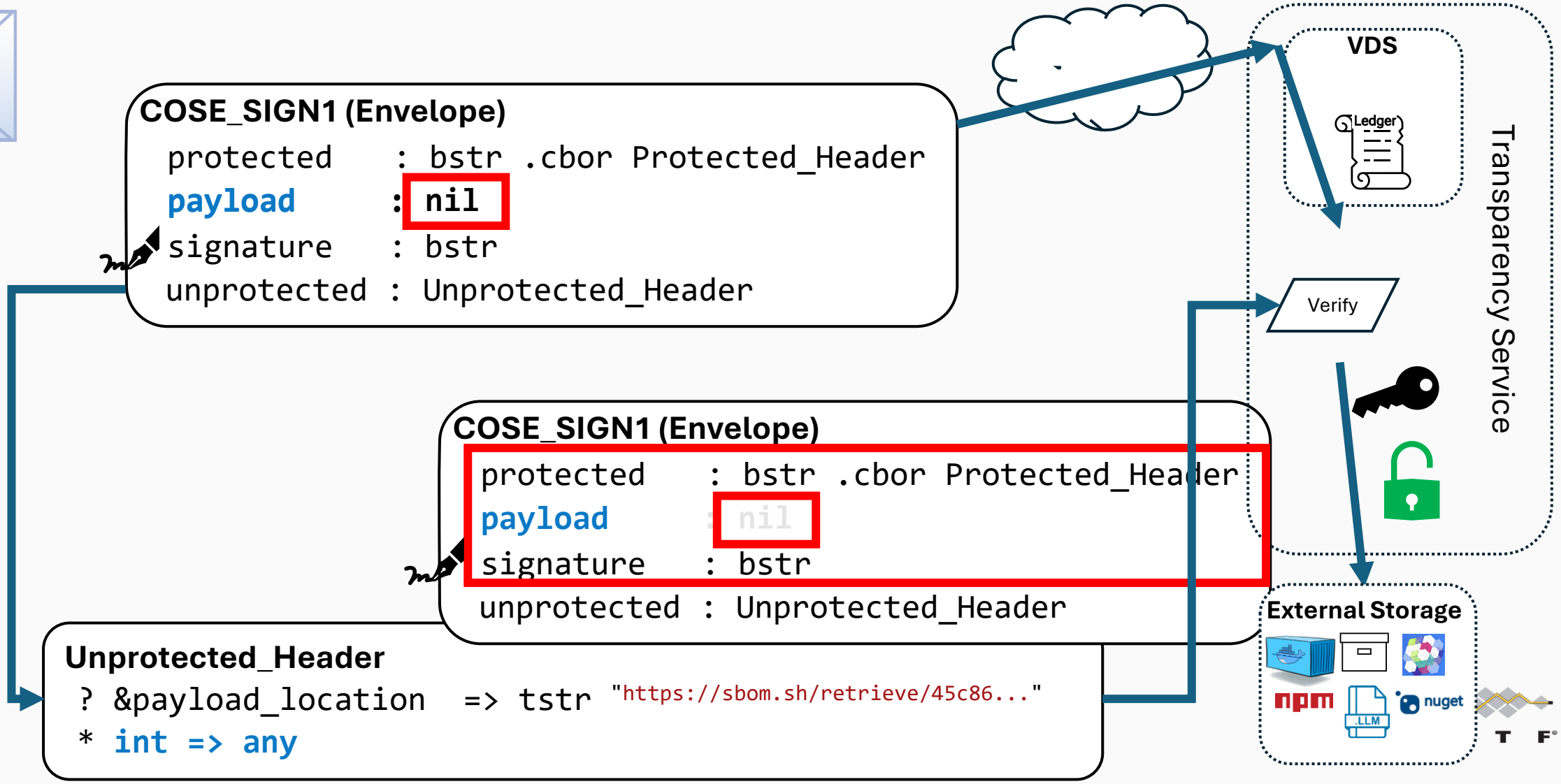




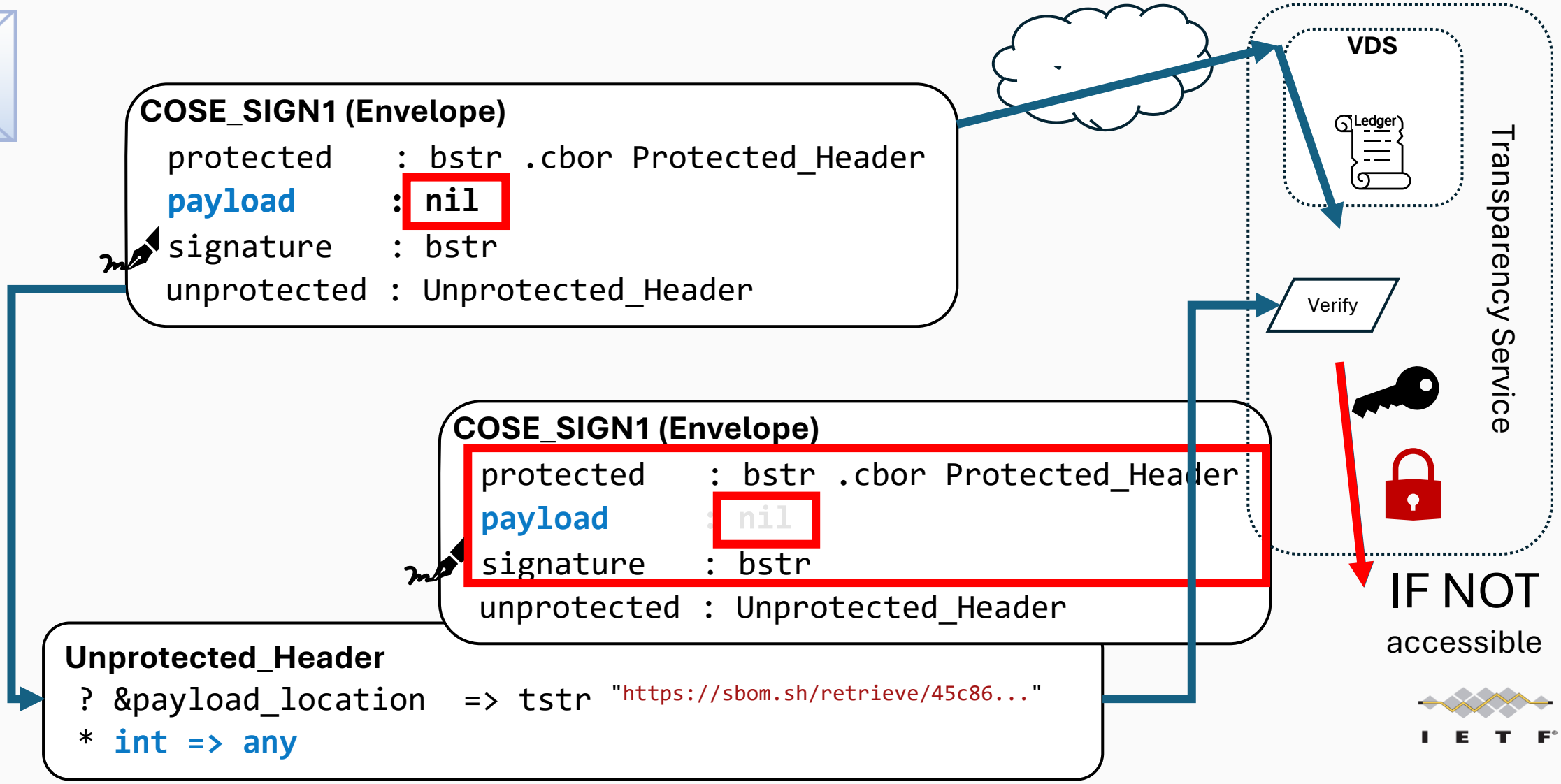




Detached Payloads



Detached Payloads



Content of a Payload

Inline content (binary)

Small File *Define Small*

Large file *Define Large*

Collections of files
large and/or small
Likely packaged in another file (zip/tar) or referenced by a manifest

File by Reference: URI to the location: docker image, npm package, vcon, youtube video

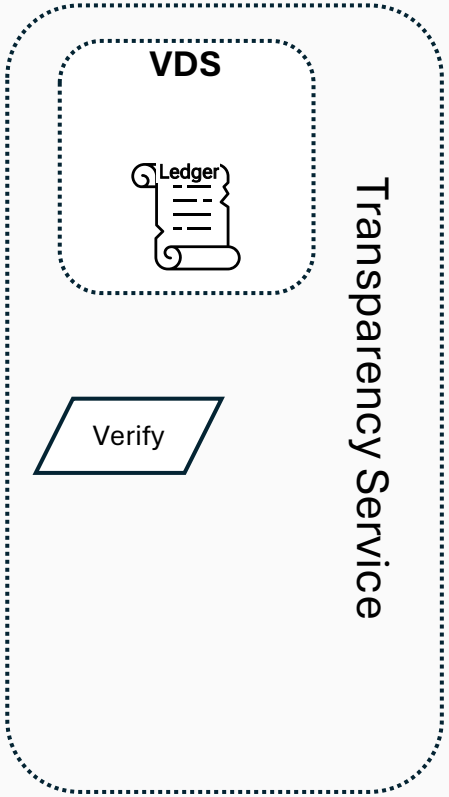
Manifest: Collections of files, each referenced by a unique id (eg: docker image, npm package, vcon, youtube video)

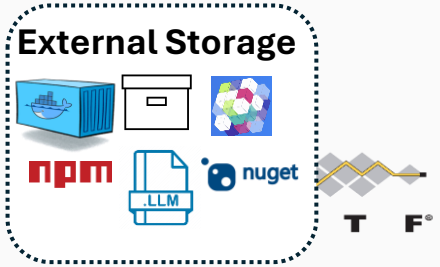
COSE_SIGN1 (Envelope)

```
protected   : bstr .cbor Protected_Header
payload     : bstr / nil
signature   : bstr
unprotected : Unprotected_Header
```

Persistence

Where is the Payload persisted?





HASH Envelope

Options Considered, → Proposal

Content of a Payload

Inline content (binary)

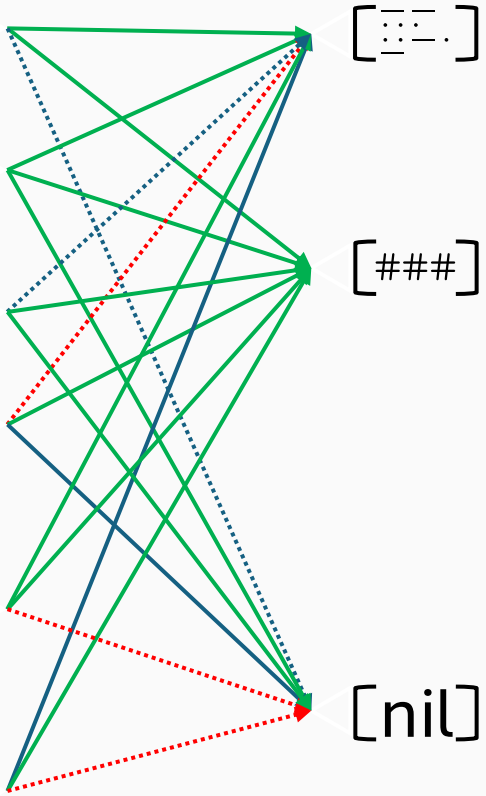
Small File

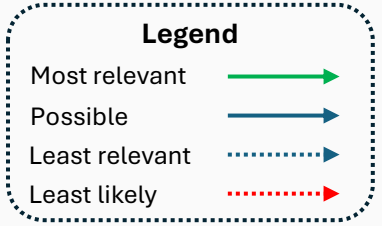
Large file

Collections of files
large and/or small
Likely packaged in another file (zip/tar) or referenced by a manifest

File by Reference: URI to the location: docker image, npm package, vcon, youtube video

Manifest: Collections of files, each referenced by a unique id (eg: docker image, npm package, vcon, youtube video)





Payload Encasing

How is the Payload represented within COSE_SIGN1

[...]

Inline:

payload: <statement>
content-type: Type of the payload (application/json, application/bin,)

[###]

Hash:

type: application/hashed+cose
payload: Hash of the content, minimizing the COSE Envelope Size
payload pre-image
content-type: Type of the hashed content (application/spdx+json)
detached-hash-algorithym: sha-256 | *SHA3-512*
payload-location: added to resolve a possible location for the payload

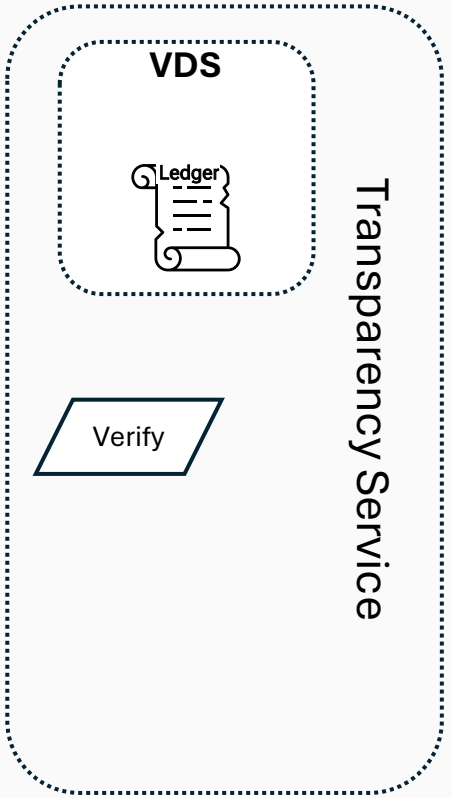
[nil]

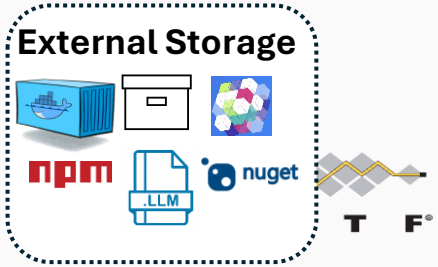
Detached Payload:

payload: nil
content-type: the type of the detached content (application/json, application/bin,)
payload-location: added to resolve a possible location for the payload

Persistence

Where is the Payload persisted?





Content of a Payload

Inline content (simple values)

Small File

Large file

Collections of files
large and/or small
Likely packaged in another file (zip/tar) or referenced by a manifest

File by Reference: URI to the location: docker image, npm package, vcon, youtube video

Manifest: Collections of files, each referenced by a unique id (eg: docker image, npm package, vcon, youtube video)

Payload Encasing

How is the Payment represented within COSE_SIGN1

[###]

Hash:

type: application/hashed+cose

payload: Hash of the content, minimizing the COSE Envelope Size

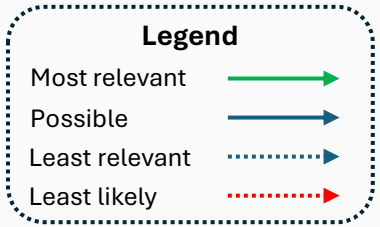
payload pre-image

content-type: Type of the hashed content (application/spdx+json)

detached-hash-algorithym: sha-256

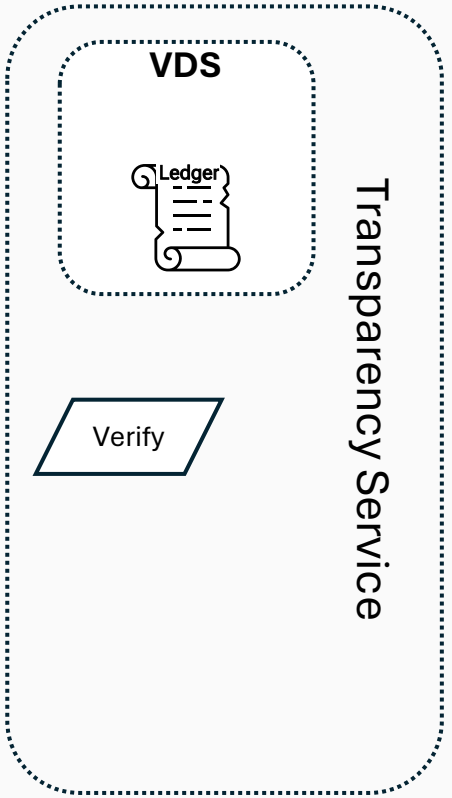
payload-location: added to resolve a possible location for the payload

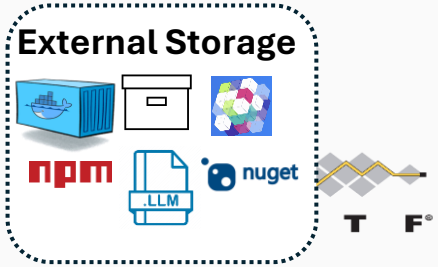
- Never wonder what size constraint will fail
- Builds upon existing storage services



Persistence

Where is the Payload persisted?





HASH Envelope Protected Header

```
{                                          / Protected                          /
      1: -7,                               / Algorithm (ECDSA)                  /
     16: application/hashed+cose,          / Type (RFC 9596)                    /
  TBD_1: -16,                              / Payload Hash Algorithm (SHA256)    /
  TBD_2: application/spdx+json,            / Payload Pre-Image Content Type     /
  TBD_3: https://blob.example/24f...9c9,   / Payload Location                   /
}
```

Fetching a resource can be negotiated by the content type (TBD_2)
Example: SPDX supports json, yaml, xml, …

Reference Validations & Implementations

- SCITT GitHub Actions
  - github.com/**datatrails**/scitt-action
  - github.com/**digicert**/scitt-action
- vCon
  - github.com/**vcon**-dev/vcon-server

Next Steps

- Please review the draft
- Is there enough interest for WG Adoption

- https://datatracker.ietf.org/doc/draft-steele-cose-hash-envelope/