WIMSE SERVICE TO SERVICE PROTOCOL

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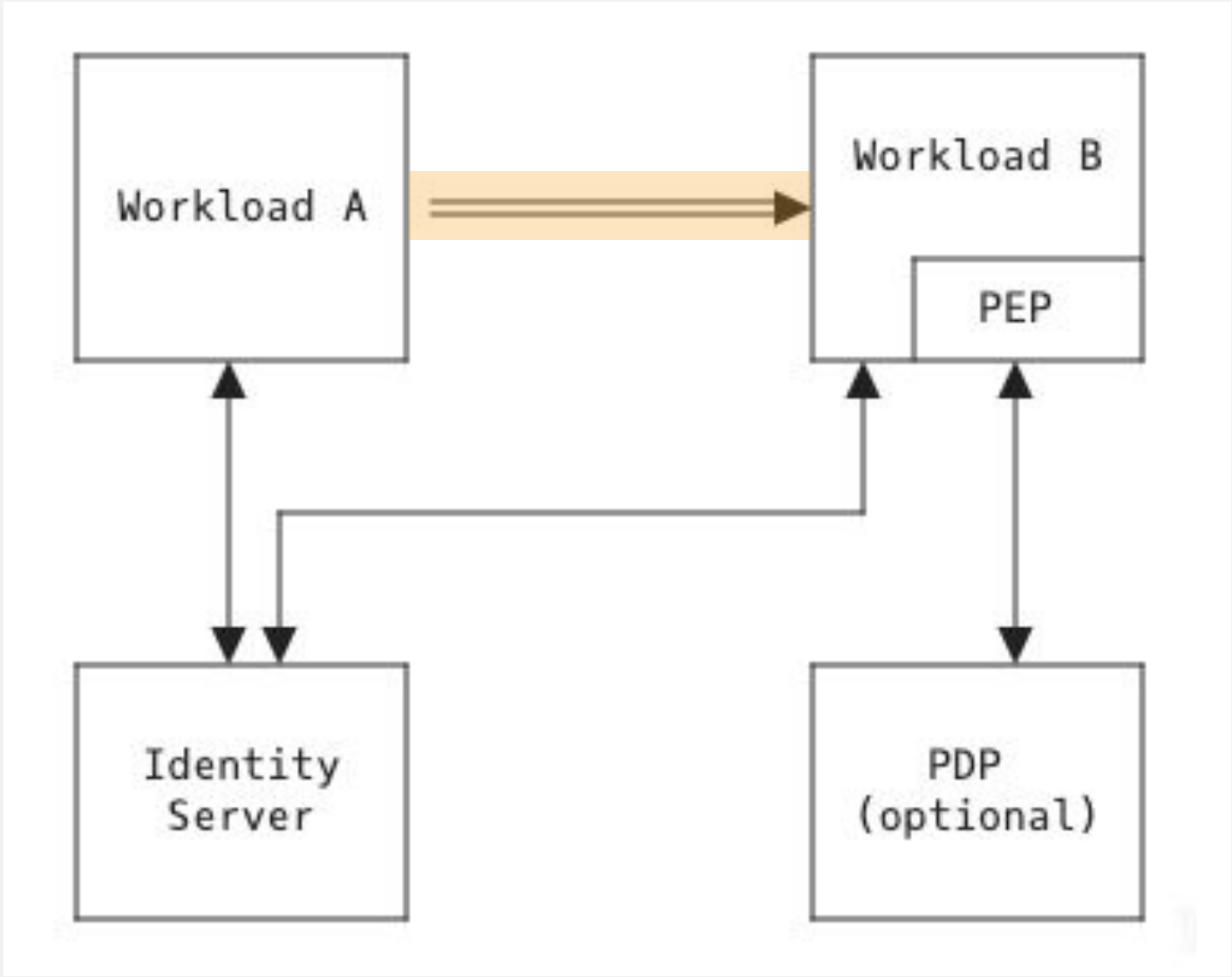
draft-sheffer-wimse-s2s-protocol-00

https://datatracker.ietf.org/doc/draft-sheffer-wimse-s2s-protocol/

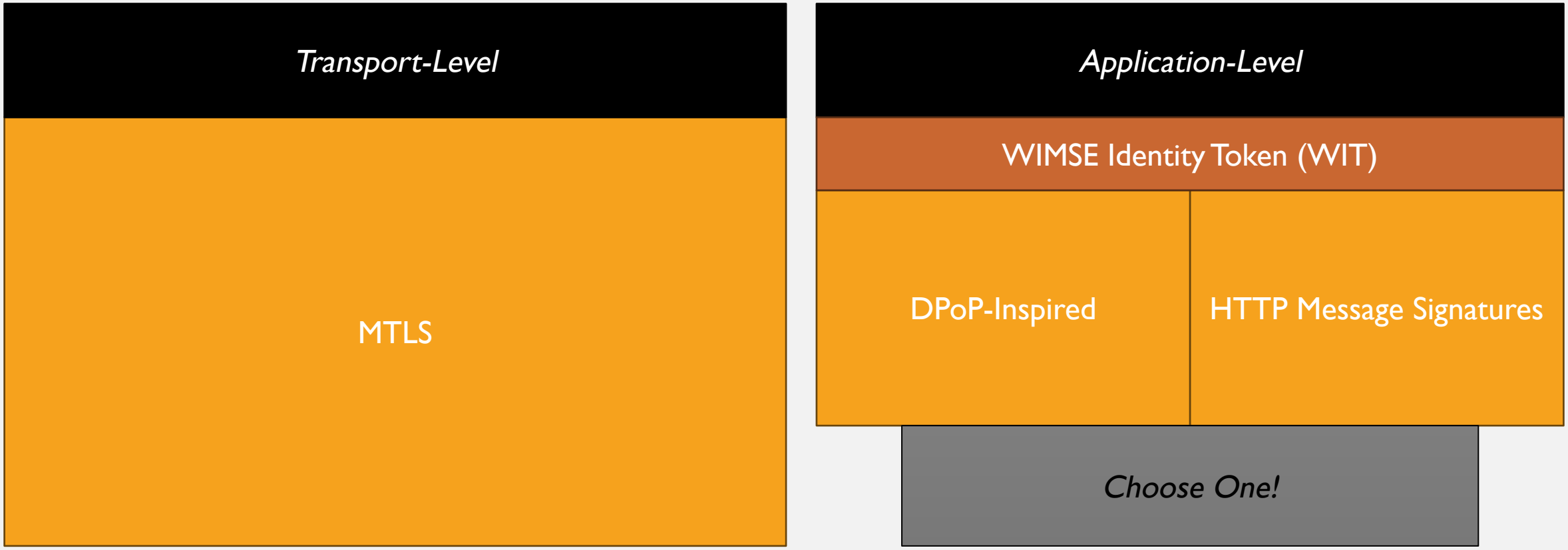
WHERE WE ARE IN THE WIMSE ARCHITECTURE



WHERE WE ARE **NOT** THE WIMSE ARCHITECTURE

- Conveying the call chain or stack or full context of invocation via a directed hopefully acyclic graph
- Cross domain
  - JWT Profile for OAuth [...] Authorization Grants (RFC7523)
  - OAuth Identity and Authorization Chaining Across Domains (draft-ietf-oauth-identity-chaining)
  - Whatever some huge providers insist on calling OpenID Connect
  - Whatever WIMSE might be doing with Token Exchange
- Conveying **anything** about the external authentication/authorization context of the call (but allow for checking the integrity thereof)
  - Transaction Tokens (draft-ietf-oauth-transaction-tokens)
  - OAuth bearer token (original or exchanged) or BYO token thing
- Distributing or provisioning anything to these workloads

OPTIONS


Transport-Level
MTLS
Application-Level
WIMSE Identity Token (WIT)
DPoP-Inspired
HTTP Message Signatures
Choose One!

WIMSE IDENTITY

~~Universal~~ Uniform Resource Identifiers

⇒ Architecture draft, architecture slides

WIMSE IDENTITY TOKEN (WIT)

```
{
    "alg": "ES256",
    "typ": "wimse-id+jwt",
    "kid": "July 4"
}
.
{
    "iss": "wimse://example.com/trusted-central-authority",
    "sub": "wimse://example.com/specific-workload",
    "exp": 1717612470,
    "jti": "x-_1CTL2cca3CSE4cwb__",
    "cnf": {
        "jwk": {
            "kty": "OKP",
            "crv": "Ed25519",
            "x": "_amRC3YrYbHhH1RtYrL8cS…"
        }
    }
}
.
[Signature]
```

- iss, sub, exp, jti and cnf claims are **required**.
- HTTP-Header "Workload-Identity-Token". Not a Bearer token!
- Key binding via RFC 7800. (Self-contained via JWK in the confirmation claim)
- No audience
- Differs from JWT-SVID: added iss and cnf claims, removed aud claim

DPOP-INSPIRED OPTION: WIMSE PROOF TOKEN (WPT)

```
{
    "alg": "EdDSA",
    "typ": "wimse-proof+jwt"
}
.
{
  "iss": "wimse://example.com/specific-workload",
  "aud": "https://service.example.com/path",
  "exp": 1717612820,
  "jti": "__bwc4ESC3acc2LTC1-_x",
  "ath": "CL4wjfpRmNf-bdYI...GwKYE10wUwzC0jI",
  "tth": "l8_Ffsx-34tV3hRI...lpBhF42UQUfWVAW"
}
.
[Signature]
```

- Signature corresponds to key in ‘cnf’ of Workload Identity Token.
- optional ‘ath’, ‘tth’ and ‘oth’ hashes bind access-, transaction- and “other” token.
- HTTP-Header “Workload-Proof-Token”

MESSAGE SIGNATURES

```
GET /gimme-ice-cream?flavor=vanilla HTTP/1.1
Host: example.com
Signature: wimse=:…dkqa2WfCQ==:
Signature-Input: wimse=("@method" "@request-target"
"workload-identity-token");created=1718291357;
expires=1718291657;nonce="abcd1111";
tag="wimse-service-to-service"
Workload-Identity-Token: aGVhZGVyCg.VGh…Lgo.c2l…JlCg
```

- The draft defines which headers must be signed
- Easy to extend for different context headers
- Optionally: sign the response

THE TLS IS MUTUAL

- Similar to the SPIFFE X.509 approach
- Open issues
  - Handling hostname validation
  - Trust domain mapping

Discussion

NEXT STEPS

- Ready for WG adoption?

DPoP-inspired vs Message Signatures · Issue #52 · yaronf/wimse-s2s (github.com)

- Which mechanism does the working group prefer? Should we focus on one or on both?

Authorization header and error responses · Issue #15 · yaronf/wimse-s2s (github.com)

- 401 HTTP response code requires WWW-Authenticate header.
  WWW-Authenticate: <type> realm=<realm>
- Is 401 the correct choice?
- New type for WWW-Authenticate required?

DPOP-ish Option

Limiting Proof of Possession Scope · Issue #50 · yaronf/wimse-s2s (github.com)

- Which aspects should the proof of possession cover? Opinionated list of headers? Body?
- Should it be a choice of the deployment?

DPOP-ish Option

[Freshness of Workload Proof Tokens · Issue #43 · yaronf/wimse-s2s (github.com)]

- Currently proof of possession is one-shot, no request-response pattern (e.g. to exchange a nonce).
- Now, “Freshness” is only determined by claims.

DPOP-ish Option

might want to also include the hash of the WIT in the proof · Issue #24 · yaronf/wimse-s2s (github.com)

- Should a hash of the Workload Identity Token be present in the proof?
- Now:
  - public key WIT <=> Signature of proof token
  - WIT “sub” == Proof “iss”