# Identity Chaining

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# Collaborators

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- **George Fletcher**, Executive Distinguished Engineer – Identity Architect, CapitalOne
- **Hannes Tschofenig**, Chair OAuth WG @ IETF
- **Joe Jubinski**, Chief Architect for Cloud Integration & Interop
- **Kelley W Burgin**, Cybersecurity Engineer, The MITRE Corporation
- **Michael Jenkins**, Secure Protocol Standards Lead, NSA-CCSS
- **Pieter Kasselman**, Identity Standards Architect, Microsoft
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# Goal

Enable services within the **same trust boundary** and **across trust boundaries** to securely and interoperably convey **identity**, **authentication**, **call chain**, and **call context information** in communication between **independent** services for authorization and audit purposes.

# Motivation

- Securing authorization and identity information in micro-service communication
- Defense against microservice attacks
  - Prevent the access of arbitrary data to/from other microservices.
- Needs open-standard to work across multiple cloud platforms and hybrid deployments.

# Identity and AuthZ Information

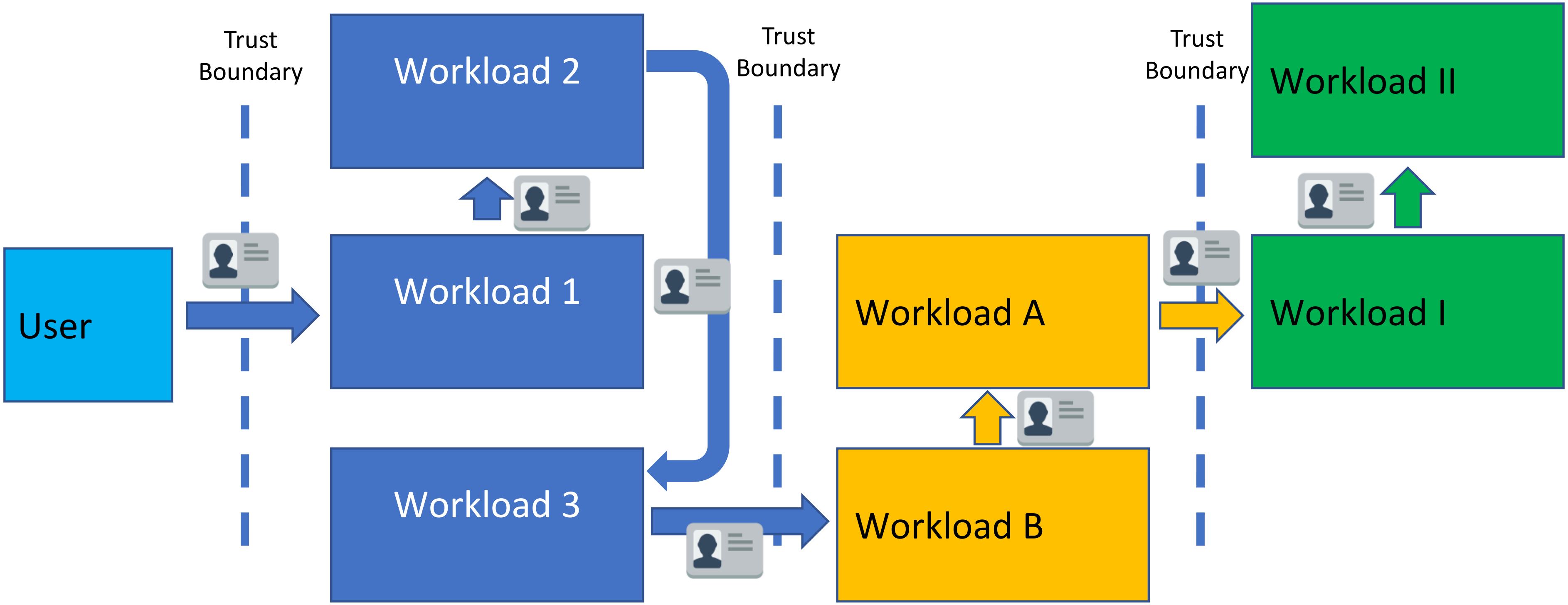
- Preserve Identity of the initiating principal
- Service identity of the calling service
- Service identities of participants in the call chain
- Authorization scope defined by the caller
- Authorization scope defined previously called services in the call chain
- Argument context defined by the initiating principal
- Argument context defined anywhere in the call chain

# Background

- Prior Work
  - Netflix blog - Edge Authentication, protobuf “Passport” token HMAC signatures
  - Athenz - Verizon supported open-source for “AuthNZ”; Centralized and decentralized authz
- Related presentations
  - George Fletcher at Identiverse 2020 - short-lived Transaction Tokens, JWT based
  - Dr. Kelley W. Burgin at IETF 114 - OAuth token chaining
  - Atul Tulshibagwale- Fine Grained Transactional Authorization
  - Rifaat Shekh-Yusef - JWT Embedded Token

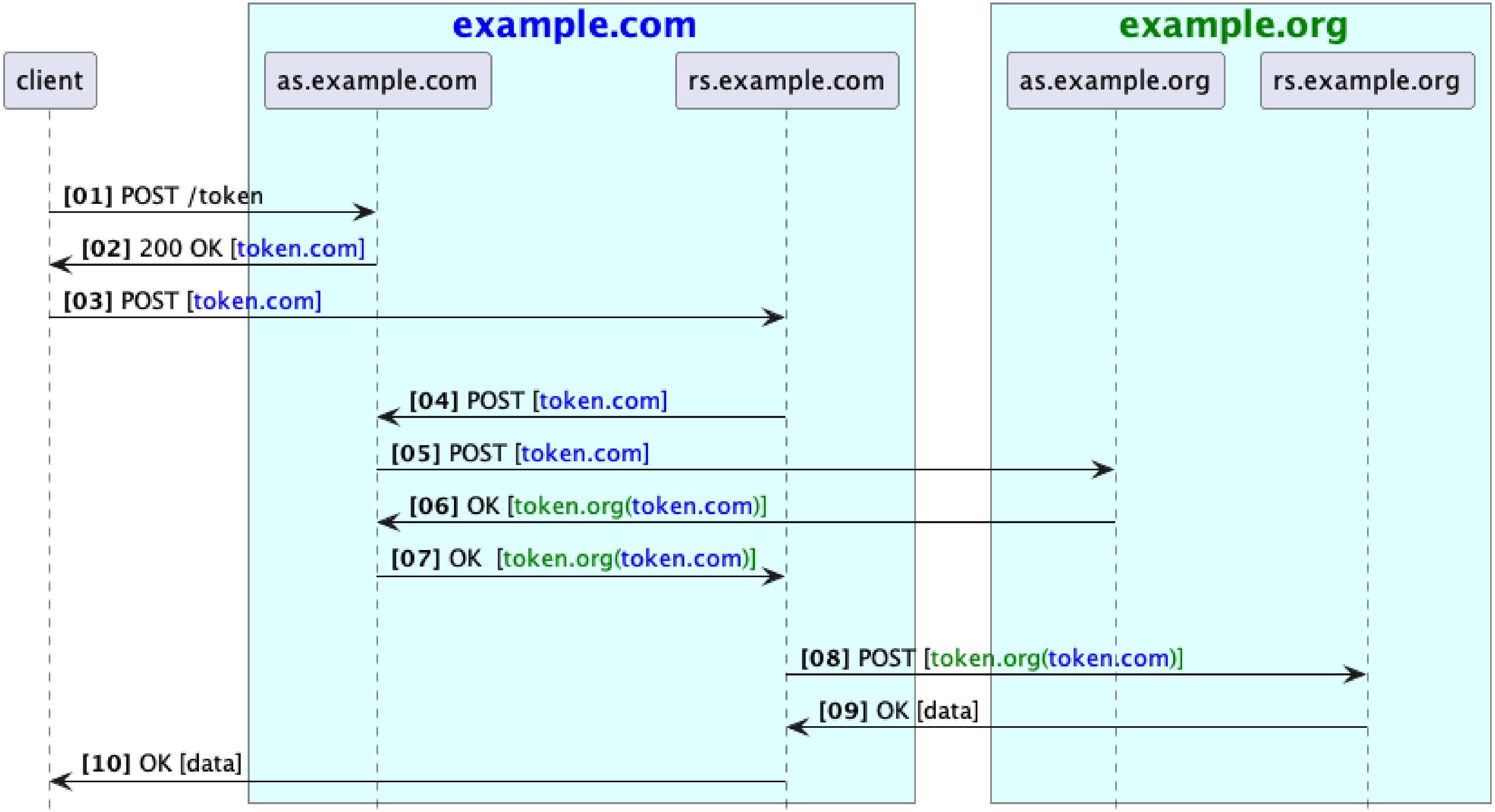
# Use Cases

- API Security Use Case
- Preserve User Context across Trust Domains
- Report Building in a Federated Environment



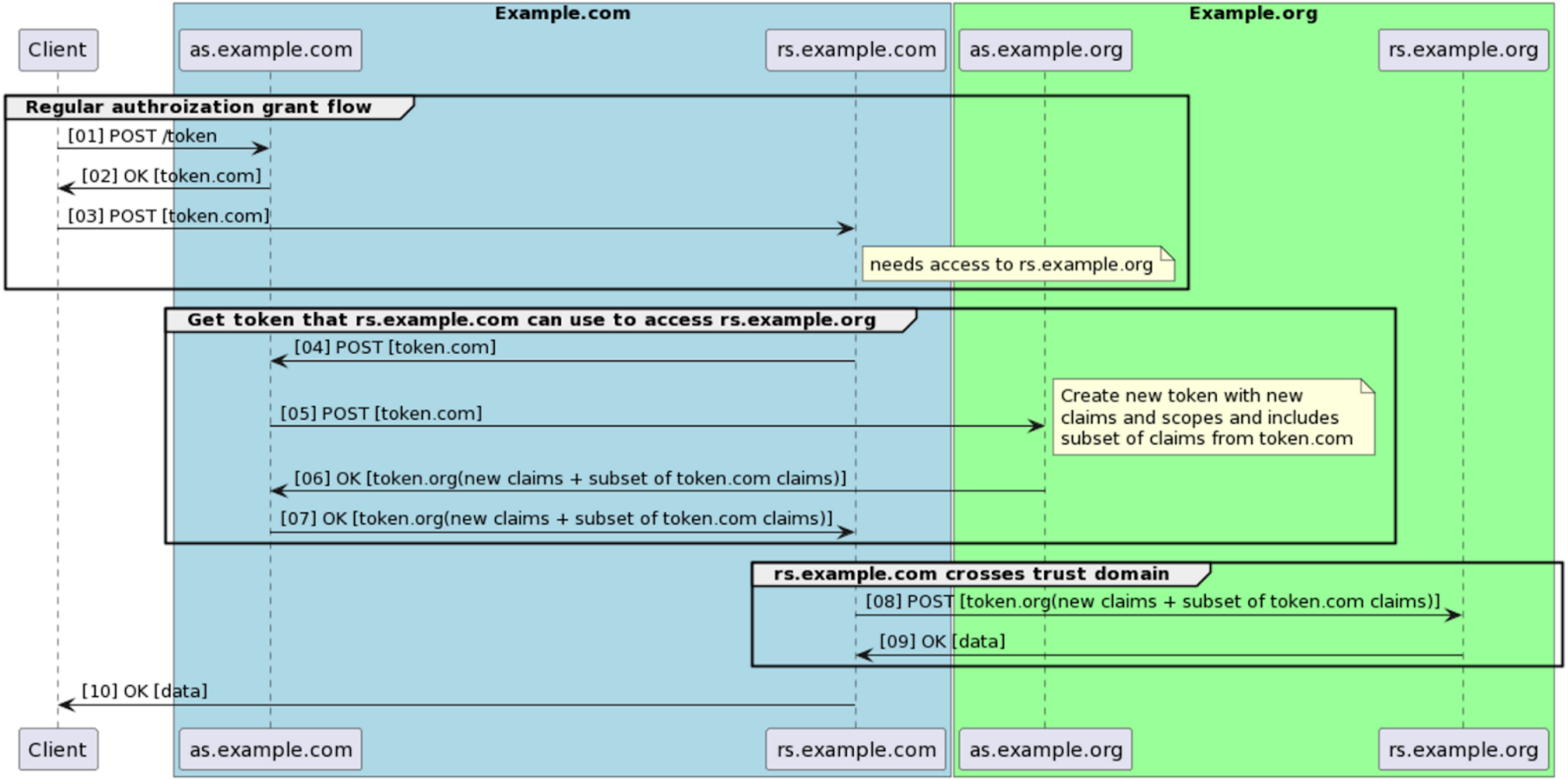
# Different Subjects with Embedded Tokens (1 of 3)

Wrap the token inside another token when crossing trust boundaries.



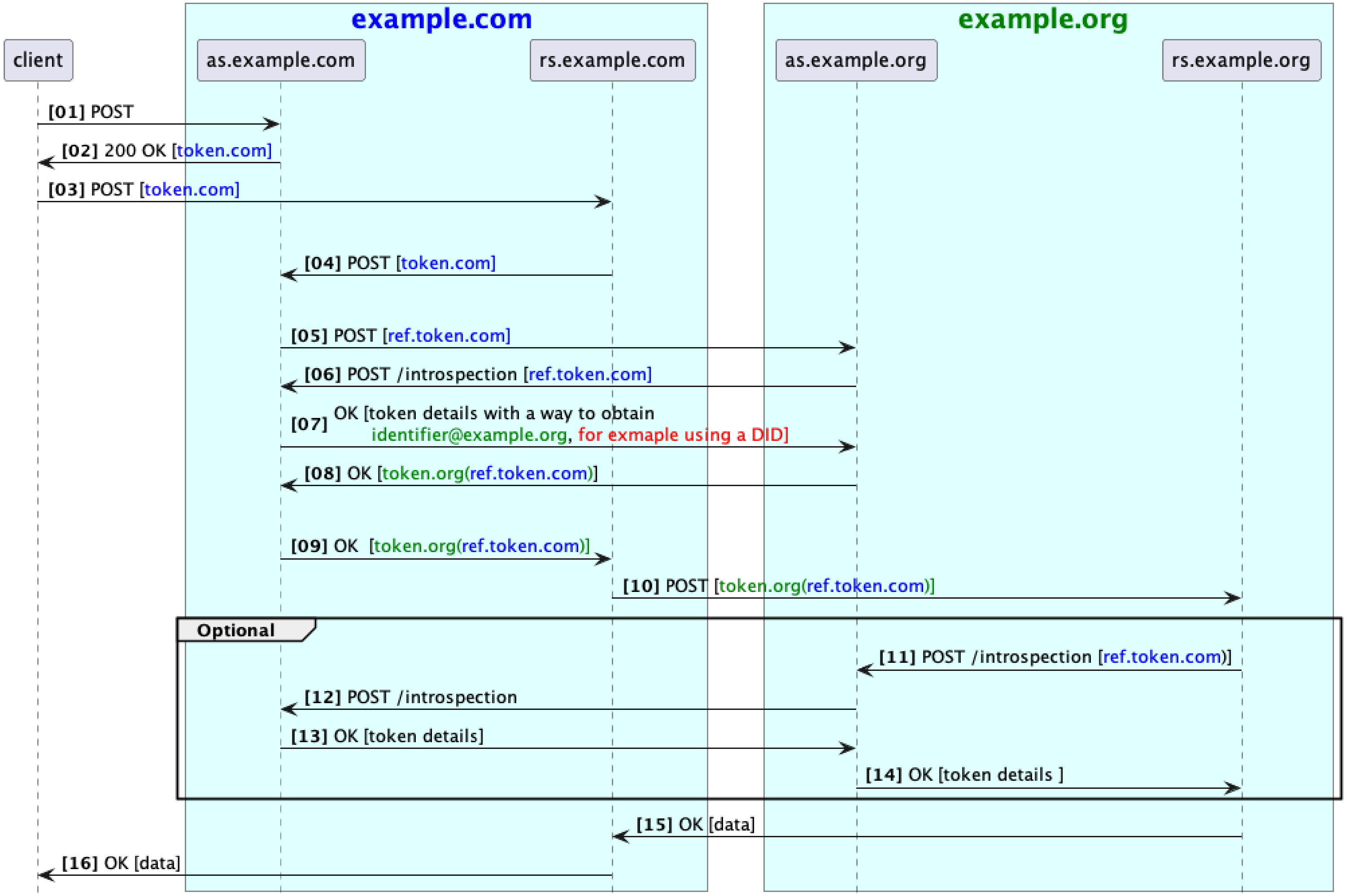
# Different Subjects with Embedded Claims (2 of 3)

Transcribe a subset of claims when crossing trust boundaries.


Example.com
Example.org
Client
as.example.com
rs.example.com
as.example.org
rs.example.org
Regular authroization grant flow
[01] POST /token
[02] OK [token.com]
[03] POST [token.com]
needs access to rs.example.org
Get token that rs.example.com can use to access rs.example.org
[04] POST [token.com]
[05] POST [token.com]
Create new token with new claims and scopes and includes subset of claims from token.com
[06] OK [token.org(new claims + subset of token.com claims)]
[07] OK [token.org(new claims + subset of token.com claims)]
rs.example.com crosses trust domain
[08] POST [token.org(new claims + subset of token.com claims)]
[09] OK [data]
[10] OK [data]
Client
as.example.com
rs.example.com
as.example.org
rs.example.org

# One Subject with Different Identifiers 3 of 3

Allow different identifiers to be used in different domains.



example.com

example.org

client

as.example.com

rs.example.com

as.example.org

rs.example.org

[01] POST

[02] 200 OK [token.com]

[03] POST [token.com]

[04] POST [token.com]

[05] POST [ref.token.com]

[06] POST /introspection [ref.token.com]

[07] OK [token details with a way to obtain identifier@example.org, for exmaple using a DID]

[08] OK [token.org(ref.token.com)]

[09] OK [token.org(ref.token.com)]

[10] POST [token.org(ref.token.com)]

Optional

[11] POST /introspection [ref.token.com)]

[12] POST /introspection

[13] OK [token details]

[14] OK [token details ]

[15] OK [data]

[16] OK [data]

# Questions?