Token and Identity Chaining Between Protected Resources Using OAuth Token Exchange

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Background

- Published OAuth and OIDC profiles to enable “identity bridging” and federated authentication
  - Identity of user and client are bridged to access a resource
- Published Token and Identity Chaining Profiles (drafts)
  - Single and multi-ICAM environment use cases
  - Update removes some options, presents a new solution

Token and Identity Chaining in a Multi-ICAM Environment

- Problem:
  - In a multi-ICAM ecosystem, an OAuth client makes a request to a protected resource PR1 in its organization, but PR1 needs to access a second PR2 in a different organization to answer the client's request
- Solution:
  - PR1, acting as an OAuth client, uses the IETF OAuth Token Exchange protocol to exchange received access token with its AS1 for a new access token that it can use to access PR2
- Goals for this week:
  - Get feedback on Token Chaining Profiles
  - Get feedback on newly defined claim (`chained_id`)

Relevant Token Chaining Profile Requirements

- The new access token received by PR1 from token exchange
  - Has PR1 as the "`client_id`"
  - Is sender-constrained to PR1's PKI certificate using "`cnf`" claim

  For verification by PR2

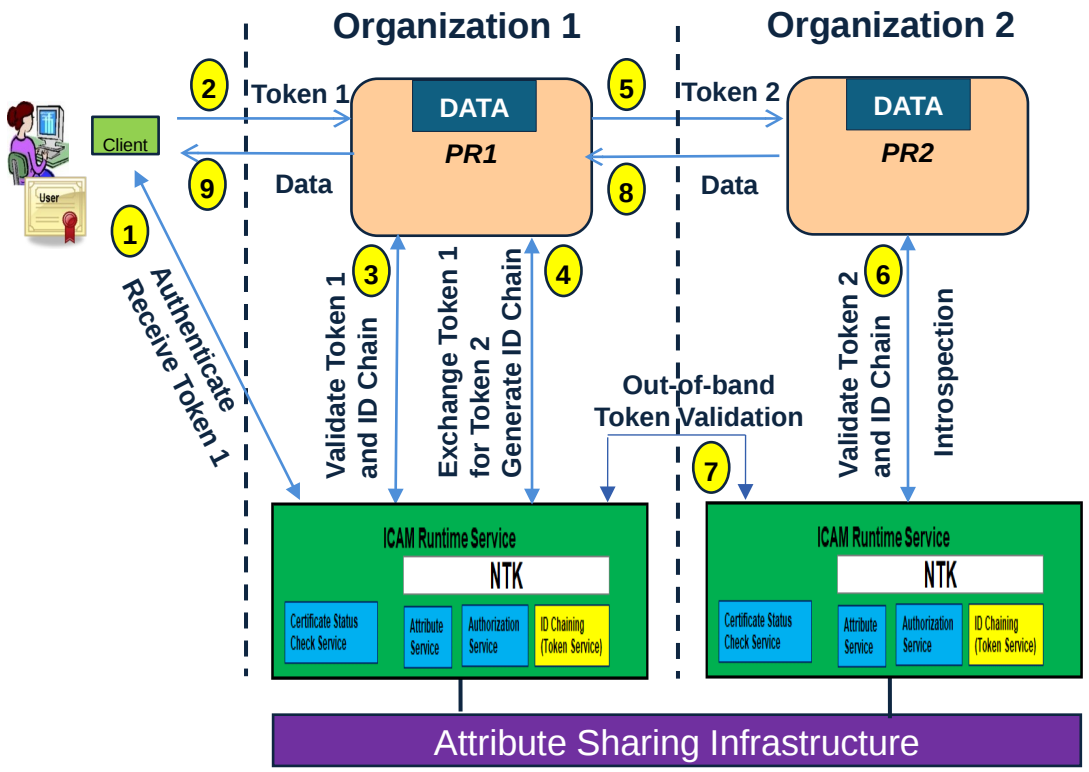
  - Contains an "`act`" claim with:
  - "`sub`" claim identifying PR1
  - "`iss`" claim identifying the AS generating the token
  - All "`act`" claims from previous tokens to show entire history of token holders back to the original client

  PR2 may use for authorization decisions

Multiple ICAM Ecosystem – Option 1
AS1 Generates the New Token

Summary:

- PR1 performs token exchange with AS1
  - AS1 generates the new token
- PR1 presents the token to PR2
- PR2 presents token to AS2
- AS2 validates the token with AS1 out-of-band using the attribute sharing infrastructure
- PR2 returns the requested data to PR1



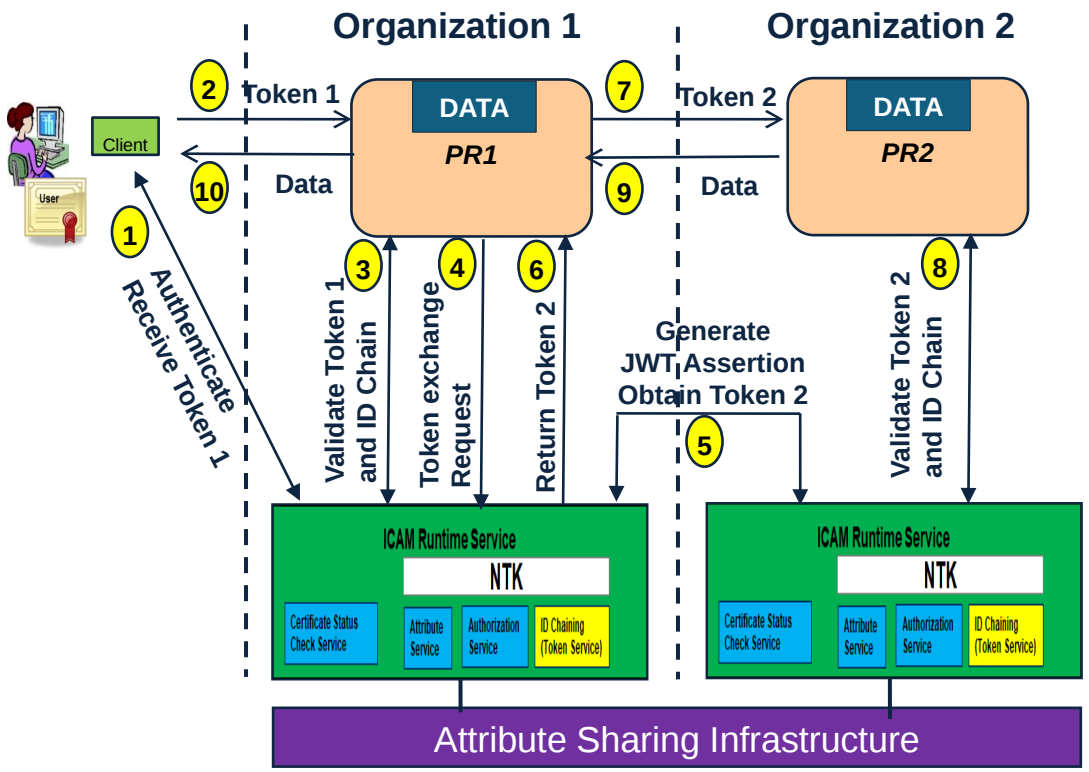
Multiple ICAM Ecosystem – Option 2
AS2 Generates the New Token

Summary:

- PR1 performs token exchange with AS1
  - AS1 generates a JWT assertion that it uses to obtain the access token from AS2
- AS2 generates the token and returns it to AS1, who returns it to PR1 to complete the token exchange request

Problem:

- We need PR1 "`client_id`" and "`cnf`" fields in the token for PR2 to verify
- So AS1 needs to pass these two bits of information to AS2 in its request to AS2 for the token



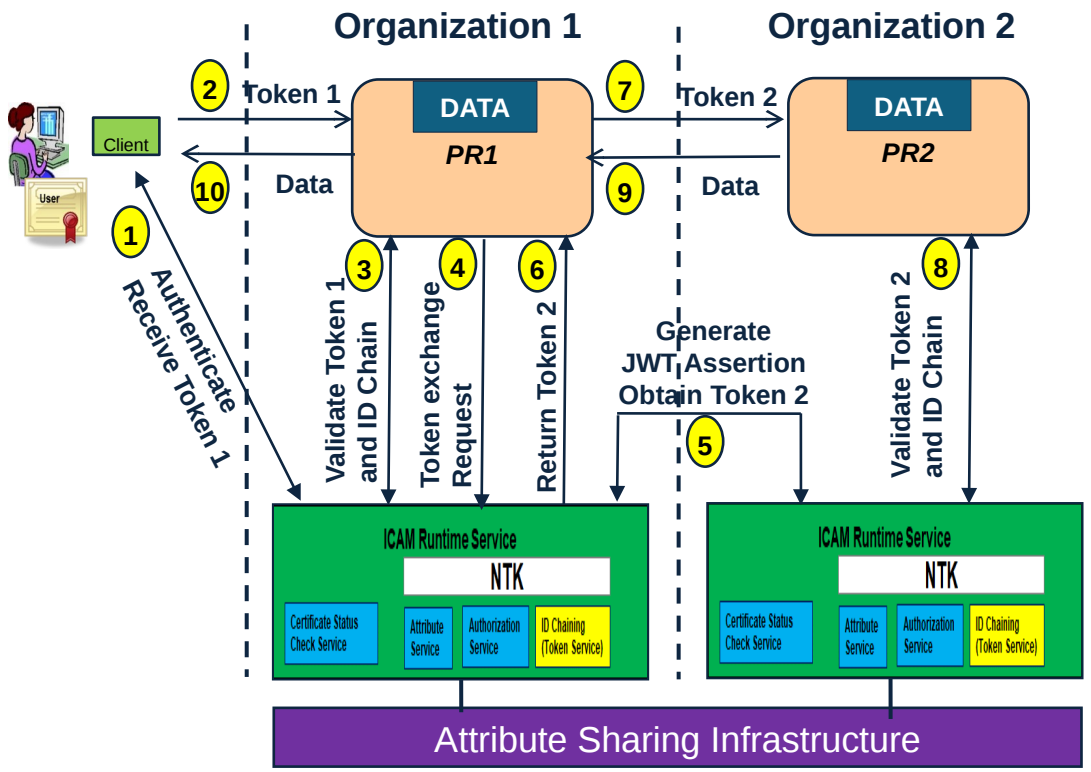
Multiple ICAM Ecosystem – Option 2 AS2 Generates the New Token

Solution:

- Define a new private use OAuth claim

```
chained_id {
    "client_id": "PR1"
    "cnf": [Hash of PR1 PKI certificate]
}
```

- AS1 includes "`chained_id`" in its token request to AS2
- AS2 populates new token with "`iss`", "`exp`", "`sub`", "`aud`" according to specs **and/but**
  - "`client_id`" and "`cnf`" claims are populated with the values of PR1 obtained in the "`chained_id`" claim



What’s Next

- Implementations
  - Ping Federate complete
    - Custom processing at AS1
  - Keycloak next
- Thoughts on new claim?
- Are these profiles generally useful?