

How to do an Ersatz client exchange, aka fork a flow.

In OA4MP, you can designate an ersatz (or replacement) client which can take over an existing flow.

P = id of provisioner (starts the flow)

E = id of ersatz client

AT-P, RT-P, IDT-P = access, refresh, ID token for provisioner

AT-E, RT-E, IDT-E = access, refresh, ID token for ersatz client

To start

Begin a standard the flow with P however you do it, getting the tokens AT-P, RT-P, IDT-P.

To fork, you need to use the token endpoint and the token exchange grant (details below).

Normally when you use the token exchange grant you can request a single token type.

This still works but requires 3 exchanges to get all 3 tokens for the fork.

This is a little clunky so OA4MP will return all 3 in the initial fork.

To do the fork

1. You send E's credentials and AT-P
2. You get back AT-E, RT-E, IDT-E
3. Do standard operations with E from this point forward

More details

This next section we give the outline of what goes over the wire. Since tokens can be immense, it is very easy to get confused. These are all in the body of the POST to the server.

It is not helped by the RFC 8693 specification! In that, the token is **always** denoted as "access_token" and you need to look at the returned token type in the response.

Typical token exchange for P to get another IDT-P

REQUEST

(Header contains the credentials for P)

| | |
|---|--------------------------------|
| subject_token_type=urn:ietf:params:oauth:token-type:access_token& | The type of token you send |
| subject_token=AT-P& | The token itself |
| grant_type=urn:ietf:params:oauth:grant-type:token-exchange& | grant type so the server knows |
| | how to handle request |

requested_token_type=urn:ietf:params:oauth:token-type:id_token | The type of token you want back

RESPONSE (JSON always!)

```
{
  "issued_token_type": "urn:ietf:params:oauth:token-type:id_token",
    "token_type": "N_A",
    "access_token": "IDT-P",
    "expires_in": 1800
}
```

| The type of access_token element returned
| the type of an ID token
| An ID token. As per spec this must be done this way
| When (in seconds) the token expires.

Typical exchange to fork

REQUEST

(Header contains the credentials for E!)

subject_token_type=urn:ietf:params:oauth:token-type:access_token&
subject_token=AT-P&
grant_type=urn:ietf:params:oauth:grant-type:token-exchange&
requested_token_type=urn:ietf:params:oauth:token-type:access_token
back

| Token type you send
| The token itself
| grant type
| the type of token you want back

RESPONSE

```
{
  "issued_token_type": "urn:ietf:params:oauth:token-type:access_token",
    "token_type": "Bearer",
    "refresh_token": "RT-E",
    "access_token": "AT-E",
    "id_token": "IDT-E"
}
```

| Type of access_token element returned
| Required type if issued type is access_token
| The refresh token for E
| The access token for E
| The ID token for E

Final notes

- There is that there is no limit on how often you can fork a flow, so every time you present E's credentials and AT-P you will create a fork.
- You may do the fork sending any of AT-P, RT-P or IDT-P as the subject token. Best practices are to use the AT-P.
- You may send along scopes, resources, etc. -- anything that goes in a normal exchange and the resulting tokens will conform to these. This lets P provision for an complex lifecycle and delegate to E only what it is allowed.
- In particular, E may only downscope (i.e., have more restrictive scopes) from P.

Being able to fork repeatedly is very useful for, e.g., having P start a flow with many permissions and forking flows to processes with much more limited scopes etc.