OAuth 2.0 vs OpenID Connect: Authentication vs Authorization

Introduction

Modern web applications often rely on third-party services to manage **user identity** and **access control**. Two widely adopted protocols for these tasks are **OAuth 2.0** and **OpenID Connect (OIDC)**. While they are related, they serve fundamentally different purposes.

This write-up explores the **technical differences** between OAuth 2.0 and OpenID Connect, focusing on how they handle **authorization** and **authentication**, respectively.

What is OpenID Connect?

OpenID Connect (OIDC) is an **authentication layer** built on top of OAuth 2.0.

Primary Use Case

- **Single Sign-On (SSO)** and user identity verification.
- Enables apps to **know who the user is**, i.e., **authentication**.

What it Adds to OAuth 2.0

- Introduces an **ID Token**, a JWT (JSON Web Token) that contains user identity information.
- Defines a standard `/userinfo` endpoint to fetch profile data.
- Adds scopes like:
- `openid` (required to use OIDC)

- `profile`, `email`, etc.

ID Token Example (decoded):

```
{
  "sub": "248289761001",
  "name": "Jane Doe",
  "email": "janedoe@example.com",
  "iss": "https://accounts.google.com",
  "aud": "client-id",
  "exp": 1625070900
}
```

OIDC Flow

- Reuses OAuth 2.0 Authorization Code flow.
- Additionally returns an **ID Token** alongside the Access Token.

Analogy

Imagine logging into a third-party photo editing app using Google:

- **OAuth 2.0** lets the app access your Google Drive photos **after you grant permission**.
- **OpenID Connect** lets the app **log you in using your Google account**, knowing your name and email.

Conclusion

While OAuth 2.0 and OpenID Connect often coexist, they serve **different security goals**:

- Use **OAuth 2.0** for **secure delegated access** to APIs.
- Use **OpenID Connect** when you need to **identify and authenticate users**.

When designing modern web and mobile apps, understanding and correctly implementing both is essential to ensure secure authentication and authorization mechanisms.