# Secure Web Development

## Authentication & Authorization

## ESILV

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# Authentication & Authorization

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- More: 2FA, OAuth2...

# Definitions

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## Authentication & Authorization

- “**Authentication** is the act of proving an assertion, such as the identity of a computer system user” (Wikipedia)

- “**Authorization** [...] is the function of specifying access rights/privileges to resources” (Wikipedia)

# Authentication

# Authentication

## How to prove the identity of a user ?

User proves their identity by:

- **Password authentication:** proving their knowledge of a secret password
- **Token authentication:** giving a token signed by a trusted authentication system
- **Biometric authentication:** showing unique biometric characteristic
- **Certificate-based authentication:** using a digital certificate delivered by a trusted certificate authority
- **MFA/Multi-Factor authentication:** using multiple authentication method above

# Authentication
## Risks and mitigations

- **Password authentication:**
  - Stealing: Hard to mitigate, user’s responsibility to use unique passwords. Never store plain-text password. Avoid needing to transfer the password (only once when possible)
  - Brute-force: Rate-limiting API requests. No mitigation possible on stolen database data
  - Rainbow-table attacks (pre-bruteforced password list): Use salt when hashing passwords
- **Token authentication:**
  - Stealing: Use short-lived token with refresh token
  - Token-key leak: Change key ASAP

# Authorization

# Authorization

## How to define authorizations of a user ?

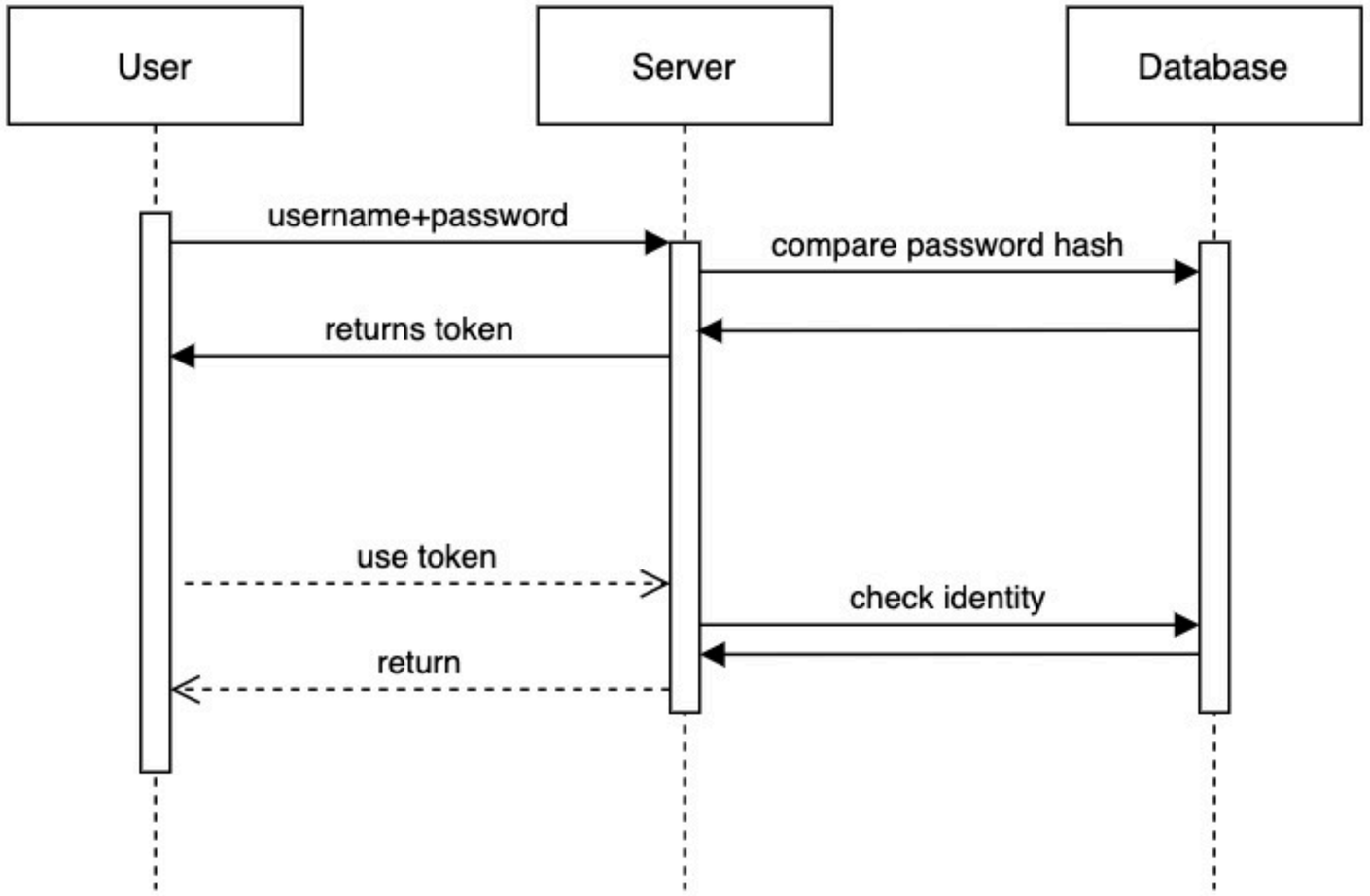
Allow user access to ressources based on:

- **Role-based access control (RBAC):** user’s group (admin, moderator etc...)
- **Policy-based access control (PBAC):** user privileges on resources policies (each resource have a policy, users can have multiple policies enabled)

# Implementation

# Implementation

## Authentication Flow



# Implementation

## Password Auth Using Passport Middleware

Login URL


Authentication
(Passport Middleware)

JWT Generation

# Implementation

## Token (JWT) Auth Using Passport Middleware

Resource URL


Authentication
(Passport Middleware)

# Implementation

## Token (JWT) Auth + RBAC

# Implementation

## Token (JWT) Auth + PBAC