

111. Why is security more complex in microservices?

Multiple services mean more entry points, network exposure, and distributed security policies that increase vulnerability.

112. What is authentication vs authorization?

Authentication verifies identity (who are you?). Authorization determines access (what can you access?).

113. What are common authentication methods in microservices?

- Basic Auth (deprecated)
- OAuth2
- JWT (JSON Web Token)
- OpenID Connect

114. What is JWT (JSON Web Token)?

A compact, signed token used to securely transmit user identity and claims. Structure: Header.Payload.Signature

115. How does JWT authentication work in microservices?

1. Auth server issues JWT
2. Client sends it in Authorization header
3. Microservices validate and use it to authorize requests

116. What are the pros of using JWTs?

- Stateless
- Scalable
- Carries useful info like roles and expiry

117. What are the cons of using JWTs?

- Cannot revoke easily
- Large payload
- Needs HTTPS for safety

118. How do you validate JWT tokens?

Verify signature, check expiration (exp), issuer (iss), and audience (aud) claims.

119. What is OAuth2?

A framework for delegated access, allowing apps to access user data without sharing credentials.

120. OAuth2 Grant Types

- Authorization Code
- Client Credentials
- Password Grant (deprecated)
- Implicit Grant (deprecated)

121. What is OpenID Connect (OIDC)?

An identity layer on top of OAuth2 for authentication, providing ID tokens and user profile info.

122. What is API Gateway's role in security?

Enforces auth, validates tokens, applies rate limiting, logging, and protects internal services.

123. What is mutual TLS (mTLS)?

Both client and server authenticate each other using certificates for secure communication.

124. How do you implement service-to-service authentication?

- mTLS
- JWT-based headers
- API keys (less secure)

125. What are some tools used for securing microservices?

- Spring Security
- Keycloak
- OAuth2 Proxy
- Istio Auth
- Okta/Auth0