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**OAuth2**

**Key Components of OAuth2**

* **Resource Owner**: The end user who owns the data the client application wants to access.
* **Client (Application)**: The application requesting access to the resource. In Spring Boot, this is your application.
* **Authorization Server**: Authenticates the user and issues an access token to the client. Examples include Google's OAuth2 service.
* **Resource Server**: Hosts the protected resources and verifies the access token provided by the client.

**How OAuth2 Works in Spring Boot**

In a Spring Boot application, OAuth2 can be integrated to handle both authentication and authorization. The framework relies on Spring Security, which provides robust mechanisms for securing applications.

Here’s how OAuth2 fits into the Spring Boot architecture:

1. **Client Registration**: You need to register the application with the OAuth2 provider (e.g., Google, GitHub) to obtain a client ID and client secret. These credentials are used to identify the application to the authorization server.
2. **OAuth2 Client Setup in Spring Boot**: In Spring Boot, configure the OAuth2 client settings in the application.properties or application.yml file. This includes specifying the client ID, client secret, authorization server URLs, and scopes of access. The Spring Security OAuth2 client automatically handles the redirection to the authorization server and manages the exchange of authorization codes for access tokens.
3. **Authentication Flow**:
   * When a user tries to access a secured resource, Spring Security intercepts the request and checks if the user is authenticated.
   * If the user is not authenticated, Spring Security redirects them to the OAuth2 provider's login page.
   * After successful authentication, the OAuth2 provider redirects the user back to the application with an authorization code.
   * The Spring Security OAuth2 client exchanges this code for an access token, which is then used to authenticate the user within the application.

* client-id and client-secret are your Google OAuth credentials.
* scope specifies the data you are requesting from Google.
* redirect-uri is where Google will send the user after successful authentication.

@Configuration

@EnableWebSecurity

**public** **class** **SecurityConfig** **extends** WebSecurityConfigurerAdapter {

@Override

**protected** void configure(HttpSecurity http) **throws** Exception {

http

.authorizeRequests()

.antMatchers("/", "/login\*\*").permitAll() *// Allow unauthenticated access to home and login pages*

.anyRequest().authenticated() *// Require authentication for all other requests*

.and()

.oauth2Login() *// Enable OAuth2 login*

.defaultSuccessUrl("/dashboard", **true**); *// Redirect to dashboard after successful login*

}

}

* **antMatchers("/", "/login\*\*").permitAll():** Allows unauthenticated access to the home and login pages. This ensures that users can access these pages without logging in.
* **anyRequest().authenticated():** Requires authentication for all other requests, ensuring that users need to be logged in to access other parts of the application.
* **oauth2Login():** Configures the application to use OAuth2 login.
* **defaultSuccessUrl("/dashboard", true):** Redirects users to the dashboard page after a successful login.

1 How will you do the code review

Spring Boot and Java best practices aim to improve code quality, maintainability, performance, and scalability.

Spring Boot Best Practices:

* **Utilize Spring Boot Starters:**

Leverage the provided starter dependencies to simplify dependency management and configuration.

* **Externalize Configuration:**

Store configuration properties outside the application code (e.g., in application.yml or external configuration servers) for easier environment-specific adjustments.

* **Implement Global Exception Handling:**

Use @ControllerAdvice and @ExceptionHandler to centralize and standardize error responses across the application.

* **Optimize REST API Design:**

Follow RESTful principles for resource naming, HTTP verbs, and status codes. Implement pagination and filtering for large datasets.

* **Secure Applications:**

Apply security measures like Spring Security, secure coding practices, and regular security testing.

* **Thorough Testing:**

Write comprehensive unit, integration, and end-to-end tests to ensure application stability and correctness.

* **Monitor and Manage:**

Use Spring Boot Actuator for health checks, metrics, and application monitoring.

* **Maintain Up-to-Date Dependencies:**

Regularly update Spring Boot and other library versions to benefit from new features, bug fixes, and security patches.

* **Use Lombok:**

Employ Lombok annotations to reduce boilerplate code for getters, setters, constructors, and logging.

* **Leverage Profiles:**

Utilize Spring profiles for environment-specific configurations and bean definitions.

Java Best Practices:

**[Follow Naming Conventions:](https://www.google.com/search?safe=active&rlz=1C1GCTT_enUS1161US1161&cs=0&sca_esv=f2a1013ade9b71de&sxsrf=AE3TifNap0lTGtlmrBZwlTaOyhN3aid6ng%3A1756700801232&q=Follow+Naming+Conventions&sa=X&ved=2ahUKEwi1i6K53LaPAxXtKVkFHcvjESgQxccNegQIOhAD&mstk=AUtExfADo1yALJV2KqwHMreREdv-7muD77nXKgiUVF-HD0tY1MEf12_5WYo_mFDrU3XneL2ycZMHig63R48XYcRljegKnPIw8Q-O4OTs5sjeHRcoo-HcCwXnhz64e2ccFLC06gv-RpYhcng6q7vczSPPdP67asqJeEL9I5703D-NDLpBW0wT9HXTSWvkMcUgrlVFaad6_gPAM-W9GLmIZegi3F0O1Ae8s1fH0384CtUxv7F4MaU0ahh9pGap6q8y358Pj4jdRVBdofHjnJF0d6erq5DZ&csui=3" \t "_blank)**

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Adhere to standard Java naming conventions for classes, methods, variables, and packages for improved readability.

[Use Optional to Avoid NullPointerException:](https://www.google.com/search?safe=active&rlz=1C1GCTT_enUS1161US1161&cs=0&sca_esv=f2a1013ade9b71de&sxsrf=AE3TifNap0lTGtlmrBZwlTaOyhN3aid6ng%3A1756700801232&q=Use+Optional+to+Avoid+NullPointerException&sa=X&ved=2ahUKEwi1i6K53LaPAxXtKVkFHcvjESgQxccNegQIOBAD&mstk=AUtExfADo1yALJV2KqwHMreREdv-7muD77nXKgiUVF-HD0tY1MEf12_5WYo_mFDrU3XneL2ycZMHig63R48XYcRljegKnPIw8Q-O4OTs5sjeHRcoo-HcCwXnhz64e2ccFLC06gv-RpYhcng6q7vczSPPdP67asqJeEL9I5703D-NDLpBW0wT9HXTSWvkMcUgrlVFaad6_gPAM-W9GLmIZegi3F0O1Ae8s1fH0384CtUxv7F4MaU0ahh9pGap6q8y358Pj4jdRVBdofHjnJF0d6erq5DZ&csui=3" \t "_blank)

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Employ Optional for potentially null values to prevent NullPointerException and enhance code clarity.

**[Choose Appropriate Collection Types:](https://www.google.com/search?safe=active&rlz=1C1GCTT_enUS1161US1161&cs=0&sca_esv=f2a1013ade9b71de&sxsrf=AE3TifNap0lTGtlmrBZwlTaOyhN3aid6ng%3A1756700801232&q=Choose+Appropriate+Collection+Types&sa=X&ved=2ahUKEwi1i6K53LaPAxXtKVkFHcvjESgQxccNegQIRRAD&mstk=AUtExfADo1yALJV2KqwHMreREdv-7muD77nXKgiUVF-HD0tY1MEf12_5WYo_mFDrU3XneL2ycZMHig63R48XYcRljegKnPIw8Q-O4OTs5sjeHRcoo-HcCwXnhz64e2ccFLC06gv-RpYhcng6q7vczSPPdP67asqJeEL9I5703D-NDLpBW0wT9HXTSWvkMcUgrlVFaad6_gPAM-W9GLmIZegi3F0O1Ae8s1fH0384CtUxv7F4MaU0ahh9pGap6q8y358Pj4jdRVBdofHjnJF0d6erq5DZ&csui=3" \t "_blank)**

[.](https://www.google.com/search?safe=active&rlz=1C1GCTT_enUS1161US1161&cs=0&sca_esv=f2a1013ade9b71de&sxsrf=AE3TifNap0lTGtlmrBZwlTaOyhN3aid6ng%3A1756700801232&q=Choose+Appropriate+Collection+Types&sa=X&ved=2ahUKEwi1i6K53LaPAxXtKVkFHcvjESgQxccNegQIRRAD&mstk=AUtExfADo1yALJV2KqwHMreREdv-7muD77nXKgiUVF-HD0tY1MEf12_5WYo_mFDrU3XneL2ycZMHig63R48XYcRljegKnPIw8Q-O4OTs5sjeHRcoo-HcCwXnhz64e2ccFLC06gv-RpYhcng6q7vczSPPdP67asqJeEL9I5703D-NDLpBW0wT9HXTSWvkMcUgrlVFaad6_gPAM-W9GLmIZegi3F0O1Ae8s1fH0384CtUxv7F4MaU0ahh9pGap6q8y358Pj4jdRVBdofHjnJF0d6erq5DZ&csui=3" \t "_blank)

Select the most suitable collection (e.g., ArrayList, LinkedList, HashMap, HashSet) based on performance requirements and data characteristics.

[Override equals() and hashCode():](https://www.google.com/search?safe=active&rlz=1C1GCTT_enUS1161US1161&cs=0&sca_esv=f2a1013ade9b71de&sxsrf=AE3TifNap0lTGtlmrBZwlTaOyhN3aid6ng%3A1756700801232&q=Override+equals%28%29+and+hashCode%28%29&sa=X&ved=2ahUKEwi1i6K53LaPAxXtKVkFHcvjESgQxccNegQIQhAD&mstk=AUtExfADo1yALJV2KqwHMreREdv-7muD77nXKgiUVF-HD0tY1MEf12_5WYo_mFDrU3XneL2ycZMHig63R48XYcRljegKnPIw8Q-O4OTs5sjeHRcoo-HcCwXnhz64e2ccFLC06gv-RpYhcng6q7vczSPPdP67asqJeEL9I5703D-NDLpBW0wT9HXTSWvkMcUgrlVFaad6_gPAM-W9GLmIZegi3F0O1Ae8s1fH0384CtUxv7F4MaU0ahh9pGap6q8y358Pj4jdRVBdofHjnJF0d6erq5DZ&csui=3" \t "_blank)

[.](https://www.google.com/search?safe=active&rlz=1C1GCTT_enUS1161US1161&cs=0&sca_esv=f2a1013ade9b71de&sxsrf=AE3TifNap0lTGtlmrBZwlTaOyhN3aid6ng%3A1756700801232&q=Override+equals%28%29+and+hashCode%28%29&sa=X&ved=2ahUKEwi1i6K53LaPAxXtKVkFHcvjESgQxccNegQIQhAD&mstk=AUtExfADo1yALJV2KqwHMreREdv-7muD77nXKgiUVF-HD0tY1MEf12_5WYo_mFDrU3XneL2ycZMHig63R48XYcRljegKnPIw8Q-O4OTs5sjeHRcoo-HcCwXnhz64e2ccFLC06gv-RpYhcng6q7vczSPPdP67asqJeEL9I5703D-NDLpBW0wT9HXTSWvkMcUgrlVFaad6_gPAM-W9GLmIZegi3F0O1Ae8s1fH0384CtUxv7F4MaU0ahh9pGap6q8y358Pj4jdRVBdofHjnJF0d6erq5DZ&csui=3" \t "_blank)

When defining custom classes used in hash-based collections, correctly override both equals() and hashCode().

**[Prefer Interface Types:](https://www.google.com/search?safe=active&rlz=1C1GCTT_enUS1161US1161&cs=0&sca_esv=f2a1013ade9b71de&sxsrf=AE3TifNap0lTGtlmrBZwlTaOyhN3aid6ng%3A1756700801232&q=Prefer+Interface+Types&sa=X&ved=2ahUKEwi1i6K53LaPAxXtKVkFHcvjESgQxccNegQIRBAD&mstk=AUtExfADo1yALJV2KqwHMreREdv-7muD77nXKgiUVF-HD0tY1MEf12_5WYo_mFDrU3XneL2ycZMHig63R48XYcRljegKnPIw8Q-O4OTs5sjeHRcoo-HcCwXnhz64e2ccFLC06gv-RpYhcng6q7vczSPPdP67asqJeEL9I5703D-NDLpBW0wT9HXTSWvkMcUgrlVFaad6_gPAM-W9GLmIZegi3F0O1Ae8s1fH0384CtUxv7F4MaU0ahh9pGap6q8y358Pj4jdRVBdofHjnJF0d6erq5DZ&csui=3" \t "_blank)**

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Program to interfaces rather than concrete implementations for greater flexibility and maintainability.

[Use StringBuilder for String Concatenation:](https://www.google.com/search?safe=active&rlz=1C1GCTT_enUS1161US1161&cs=0&sca_esv=f2a1013ade9b71de&sxsrf=AE3TifNap0lTGtlmrBZwlTaOyhN3aid6ng%3A1756700801232&q=Use+StringBuilder+for+String+Concatenation&sa=X&ved=2ahUKEwi1i6K53LaPAxXtKVkFHcvjESgQxccNegQIPRAD&mstk=AUtExfADo1yALJV2KqwHMreREdv-7muD77nXKgiUVF-HD0tY1MEf12_5WYo_mFDrU3XneL2ycZMHig63R48XYcRljegKnPIw8Q-O4OTs5sjeHRcoo-HcCwXnhz64e2ccFLC06gv-RpYhcng6q7vczSPPdP67asqJeEL9I5703D-NDLpBW0wT9HXTSWvkMcUgrlVFaad6_gPAM-W9GLmIZegi3F0O1Ae8s1fH0384CtUxv7F4MaU0ahh9pGap6q8y358Pj4jdRVBdofHjnJF0d6erq5DZ&csui=3" \t "_blank)

[.](https://www.google.com/search?safe=active&rlz=1C1GCTT_enUS1161US1161&cs=0&sca_esv=f2a1013ade9b71de&sxsrf=AE3TifNap0lTGtlmrBZwlTaOyhN3aid6ng%3A1756700801232&q=Use+StringBuilder+for+String+Concatenation&sa=X&ved=2ahUKEwi1i6K53LaPAxXtKVkFHcvjESgQxccNegQIPRAD&mstk=AUtExfADo1yALJV2KqwHMreREdv-7muD77nXKgiUVF-HD0tY1MEf12_5WYo_mFDrU3XneL2ycZMHig63R48XYcRljegKnPIw8Q-O4OTs5sjeHRcoo-HcCwXnhz64e2ccFLC06gv-RpYhcng6q7vczSPPdP67asqJeEL9I5703D-NDLpBW0wT9HXTSWvkMcUgrlVFaad6_gPAM-W9GLmIZegi3F0O1Ae8s1fH0384CtUxv7F4MaU0ahh9pGap6q8y358Pj4jdRVBdofHjnJF0d6erq5DZ&csui=3" \t "_blank)

Employ StringBuilder for efficient String manipulation, especially in loops.

**[Implement Logging:](https://www.google.com/search?safe=active&rlz=1C1GCTT_enUS1161US1161&cs=0&sca_esv=f2a1013ade9b71de&sxsrf=AE3TifNap0lTGtlmrBZwlTaOyhN3aid6ng%3A1756700801232&q=Implement+Logging&sa=X&ved=2ahUKEwi1i6K53LaPAxXtKVkFHcvjESgQxccNegQIPBAD&mstk=AUtExfADo1yALJV2KqwHMreREdv-7muD77nXKgiUVF-HD0tY1MEf12_5WYo_mFDrU3XneL2ycZMHig63R48XYcRljegKnPIw8Q-O4OTs5sjeHRcoo-HcCwXnhz64e2ccFLC06gv-RpYhcng6q7vczSPPdP67asqJeEL9I5703D-NDLpBW0wT9HXTSWvkMcUgrlVFaad6_gPAM-W9GLmIZegi3F0O1Ae8s1fH0384CtUxv7F4MaU0ahh9pGap6q8y358Pj4jdRVBdofHjnJF0d6erq5DZ&csui=3" \t "_blank)**

[.](https://www.google.com/search?safe=active&rlz=1C1GCTT_enUS1161US1161&cs=0&sca_esv=f2a1013ade9b71de&sxsrf=AE3TifNap0lTGtlmrBZwlTaOyhN3aid6ng%3A1756700801232&q=Implement+Logging&sa=X&ved=2ahUKEwi1i6K53LaPAxXtKVkFHcvjESgQxccNegQIPBAD&mstk=AUtExfADo1yALJV2KqwHMreREdv-7muD77nXKgiUVF-HD0tY1MEf12_5WYo_mFDrU3XneL2ycZMHig63R48XYcRljegKnPIw8Q-O4OTs5sjeHRcoo-HcCwXnhz64e2ccFLC06gv-RpYhcng6q7vczSPPdP67asqJeEL9I5703D-NDLpBW0wT9HXTSWvkMcUgrlVFaad6_gPAM-W9GLmIZegi3F0O1Ae8s1fH0384CtUxv7F4MaU0ahh9pGap6q8y358Pj4jdRVBdofHjnJF0d6erq5DZ&csui=3" \t "_blank)

Use a robust logging framework like SLF4J with Logback for effective debugging and monitoring.

**[Practice Defensive Programming:](https://www.google.com/search?safe=active&rlz=1C1GCTT_enUS1161US1161&cs=0&sca_esv=f2a1013ade9b71de&sxsrf=AE3TifNap0lTGtlmrBZwlTaOyhN3aid6ng%3A1756700801232&q=Practice+Defensive+Programming&sa=X&ved=2ahUKEwi1i6K53LaPAxXtKVkFHcvjESgQxccNegQISBAD&mstk=AUtExfADo1yALJV2KqwHMreREdv-7muD77nXKgiUVF-HD0tY1MEf12_5WYo_mFDrU3XneL2ycZMHig63R48XYcRljegKnPIw8Q-O4OTs5sjeHRcoo-HcCwXnhz64e2ccFLC06gv-RpYhcng6q7vczSPPdP67asqJeEL9I5703D-NDLpBW0wT9HXTSWvkMcUgrlVFaad6_gPAM-W9GLmIZegi3F0O1Ae8s1fH0384CtUxv7F4MaU0ahh9pGap6q8y358Pj4jdRVBdofHjnJF0d6erq5DZ&csui=3" \t "_blank)**

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Validate input data, handle edge cases, and anticipate potential errors.

**[Write Clear and Concise Code:](https://www.google.com/search?safe=active&rlz=1C1GCTT_enUS1161US1161&cs=0&sca_esv=f2a1013ade9b71de&sxsrf=AE3TifNap0lTGtlmrBZwlTaOyhN3aid6ng%3A1756700801232&q=Write+Clear+and+Concise+Code&sa=X&ved=2ahUKEwi1i6K53LaPAxXtKVkFHcvjESgQxccNegQIQRAD&mstk=AUtExfADo1yALJV2KqwHMreREdv-7muD77nXKgiUVF-HD0tY1MEf12_5WYo_mFDrU3XneL2ycZMHig63R48XYcRljegKnPIw8Q-O4OTs5sjeHRcoo-HcCwXnhz64e2ccFLC06gv-RpYhcng6q7vczSPPdP67asqJeEL9I5703D-NDLpBW0wT9HXTSWvkMcUgrlVFaad6_gPAM-W9GLmIZegi3F0O1Ae8s1fH0384CtUxv7F4MaU0ahh9pGap6q8y358Pj4jdRVBdofHjnJF0d6erq5DZ&csui=3" \t "_blank)**

[.](https://www.google.com/search?safe=active&rlz=1C1GCTT_enUS1161US1161&cs=0&sca_esv=f2a1013ade9b71de&sxsrf=AE3TifNap0lTGtlmrBZwlTaOyhN3aid6ng%3A1756700801232&q=Write+Clear+and+Concise+Code&sa=X&ved=2ahUKEwi1i6K53LaPAxXtKVkFHcvjESgQxccNegQIQRAD&mstk=AUtExfADo1yALJV2KqwHMreREdv-7muD77nXKgiUVF-HD0tY1MEf12_5WYo_mFDrU3XneL2ycZMHig63R48XYcRljegKnPIw8Q-O4OTs5sjeHRcoo-HcCwXnhz64e2ccFLC06gv-RpYhcng6q7vczSPPdP67asqJeEL9I5703D-NDLpBW0wT9HXTSWvkMcUgrlVFaad6_gPAM-W9GLmIZegi3F0O1Ae8s1fH0384CtUxv7F4MaU0ahh9pGap6q8y358Pj4jdRVBdofHjnJF0d6erq5DZ&csui=3" \t "_blank)

Strive for code that is easy to understand and maintain, using meaningful names and comments where necessary.

**[Apply Design Patterns:](https://www.google.com/search?safe=active&rlz=1C1GCTT_enUS1161US1161&cs=0&sca_esv=f2a1013ade9b71de&sxsrf=AE3TifNap0lTGtlmrBZwlTaOyhN3aid6ng%3A1756700801232&q=Apply+Design+Patterns&sa=X&ved=2ahUKEwi1i6K53LaPAxXtKVkFHcvjESgQxccNegQIRhAD&mstk=AUtExfADo1yALJV2KqwHMreREdv-7muD77nXKgiUVF-HD0tY1MEf12_5WYo_mFDrU3XneL2ycZMHig63R48XYcRljegKnPIw8Q-O4OTs5sjeHRcoo-HcCwXnhz64e2ccFLC06gv-RpYhcng6q7vczSPPdP67asqJeEL9I5703D-NDLpBW0wT9HXTSWvkMcUgrlVFaad6_gPAM-W9GLmIZegi3F0O1Ae8s1fH0384CtUxv7F4MaU0ahh9pGap6q8y358Pj4jdRVBdofHjnJF0d6erq5DZ&csui=3" \t "_blank)**

[.](https://www.google.com/search?safe=active&rlz=1C1GCTT_enUS1161US1161&cs=0&sca_esv=f2a1013ade9b71de&sxsrf=AE3TifNap0lTGtlmrBZwlTaOyhN3aid6ng%3A1756700801232&q=Apply+Design+Patterns&sa=X&ved=2ahUKEwi1i6K53LaPAxXtKVkFHcvjESgQxccNegQIRhAD&mstk=AUtExfADo1yALJV2KqwHMreREdv-7muD77nXKgiUVF-HD0tY1MEf12_5WYo_mFDrU3XneL2ycZMHig63R48XYcRljegKnPIw8Q-O4OTs5sjeHRcoo-HcCwXnhz64e2ccFLC06gv-RpYhcng6q7vczSPPdP67asqJeEL9I5703D-NDLpBW0wT9HXTSWvkMcUgrlVFaad6_gPAM-W9GLmIZegi3F0O1Ae8s1fH0384CtUxv7F4MaU0ahh9pGap6q8y358Pj4jdRVBdofHjnJF0d6erq5DZ&csui=3" \t "_blank)

Utilize established design patterns to address recurring design problems and improve code structure.

Lambda function

A screenshot of a computer

AI-generated content may be incorrect.

ECS:

A screenshot of a computer

AI-generated content may be incorrect.

What is a container? Containers are executable unit of software in which application code is packaged, along with its libraries and dependencies so it can be run any where whether it is a desktop or traditional IT, or the cloud.

Amazon ECS makes it easy to deploy, manage, and scale Docker containers running applications, services, and batch processes.

DynamoDB:

Dynamo DB is serverless, noSQL database, with consistent single digit millisecond performance, also it automatically scale to support workload, only pay for what you use,

High availability with 0 down time and maintenance. Support ACID transactions and strong consistency, indexing, continuous backups, integration with many AWS services, security is AWS culture,

Great fit for mobile, web, gaming, advertising technology, Internet of Things, and other applications.

**Amazon DynamoDB**

A fast and flexible NoSQL database service for any scale

DynamoDB is a fully managed, key-value, and document database that delivers single-digit-millisecond performance at any scale.

A screenshot of a computer

AI-generated content may be incorrect.

How Redis Caching Works

**[1. Application Request:](https://www.google.com/search?safe=active&sca_esv=8c966bae1d54a914&rlz=1C1GCTT_enUS1161US1161&sxsrf=AE3TifNm9KXL5Ao2qyylGd54bHlbHt_NeQ%3A1756874407132&q=Application+Request&sa=X&ved=2ahUKEwij086X47uPAxUAFVkFHSLwBzUQxccNegUIzQEQAw&mstk=AUtExfCOHYu2KMJ78FBE9XhNBBWhHr1No_o-XEf2s-72tJzAhmuWj40JGUfN1Cd32zL5iM9WrPqkRqWrvZHPHZH9gk16XSvK6WTjS8HnOZCAr-jgiVBCiZUjpkFYZjgHaRhTzh32CdwnfKFLbRqMdWnREsjnp8mVd-JeN82HkD55w0RBls8&csui=3" \t "_blank)**

[.](https://www.google.com/search?safe=active&sca_esv=8c966bae1d54a914&rlz=1C1GCTT_enUS1161US1161&sxsrf=AE3TifNm9KXL5Ao2qyylGd54bHlbHt_NeQ%3A1756874407132&q=Application+Request&sa=X&ved=2ahUKEwij086X47uPAxUAFVkFHSLwBzUQxccNegUIzQEQAw&mstk=AUtExfCOHYu2KMJ78FBE9XhNBBWhHr1No_o-XEf2s-72tJzAhmuWj40JGUfN1Cd32zL5iM9WrPqkRqWrvZHPHZH9gk16XSvK6WTjS8HnOZCAr-jgiVBCiZUjpkFYZjgHaRhTzh32CdwnfKFLbRqMdWnREsjnp8mVd-JeN82HkD55w0RBls8&csui=3" \t "_blank)

An application needs to retrieve data.

**[2. Cache Check:](https://www.google.com/search?safe=active&sca_esv=8c966bae1d54a914&rlz=1C1GCTT_enUS1161US1161&sxsrf=AE3TifNm9KXL5Ao2qyylGd54bHlbHt_NeQ%3A1756874407132&q=Cache+Check&sa=X&ved=2ahUKEwij086X47uPAxUAFVkFHSLwBzUQxccNegUIxQEQAw&mstk=AUtExfCOHYu2KMJ78FBE9XhNBBWhHr1No_o-XEf2s-72tJzAhmuWj40JGUfN1Cd32zL5iM9WrPqkRqWrvZHPHZH9gk16XSvK6WTjS8HnOZCAr-jgiVBCiZUjpkFYZjgHaRhTzh32CdwnfKFLbRqMdWnREsjnp8mVd-JeN82HkD55w0RBls8&csui=3" \t "_blank)**

[.](https://www.google.com/search?safe=active&sca_esv=8c966bae1d54a914&rlz=1C1GCTT_enUS1161US1161&sxsrf=AE3TifNm9KXL5Ao2qyylGd54bHlbHt_NeQ%3A1756874407132&q=Cache+Check&sa=X&ved=2ahUKEwij086X47uPAxUAFVkFHSLwBzUQxccNegUIxQEQAw&mstk=AUtExfCOHYu2KMJ78FBE9XhNBBWhHr1No_o-XEf2s-72tJzAhmuWj40JGUfN1Cd32zL5iM9WrPqkRqWrvZHPHZH9gk16XSvK6WTjS8HnOZCAr-jgiVBCiZUjpkFYZjgHaRhTzh32CdwnfKFLbRqMdWnREsjnp8mVd-JeN82HkD55w0RBls8&csui=3" \t "_blank)

The application first checks the Redis cache to see if the data is available.

**[3. Cache Hit:](https://www.google.com/search?safe=active&sca_esv=8c966bae1d54a914&rlz=1C1GCTT_enUS1161US1161&sxsrf=AE3TifNm9KXL5Ao2qyylGd54bHlbHt_NeQ%3A1756874407132&q=Cache+Hit&sa=X&ved=2ahUKEwij086X47uPAxUAFVkFHSLwBzUQxccNegUI4wEQAw&mstk=AUtExfCOHYu2KMJ78FBE9XhNBBWhHr1No_o-XEf2s-72tJzAhmuWj40JGUfN1Cd32zL5iM9WrPqkRqWrvZHPHZH9gk16XSvK6WTjS8HnOZCAr-jgiVBCiZUjpkFYZjgHaRhTzh32CdwnfKFLbRqMdWnREsjnp8mVd-JeN82HkD55w0RBls8&csui=3" \t "_blank)**

[.](https://www.google.com/search?safe=active&sca_esv=8c966bae1d54a914&rlz=1C1GCTT_enUS1161US1161&sxsrf=AE3TifNm9KXL5Ao2qyylGd54bHlbHt_NeQ%3A1756874407132&q=Cache+Hit&sa=X&ved=2ahUKEwij086X47uPAxUAFVkFHSLwBzUQxccNegUI4wEQAw&mstk=AUtExfCOHYu2KMJ78FBE9XhNBBWhHr1No_o-XEf2s-72tJzAhmuWj40JGUfN1Cd32zL5iM9WrPqkRqWrvZHPHZH9gk16XSvK6WTjS8HnOZCAr-jgiVBCiZUjpkFYZjgHaRhTzh32CdwnfKFLbRqMdWnREsjnp8mVd-JeN82HkD55w0RBls8&csui=3" \t "_blank)

If the data is in the cache (a cache hit), it's returned immediately, leading to fast response times.

**[4. Cache Miss:](https://www.google.com/search?safe=active&sca_esv=8c966bae1d54a914&rlz=1C1GCTT_enUS1161US1161&sxsrf=AE3TifNm9KXL5Ao2qyylGd54bHlbHt_NeQ%3A1756874407132&q=Cache+Miss&sa=X&ved=2ahUKEwij086X47uPAxUAFVkFHSLwBzUQxccNegUI0gEQAw&mstk=AUtExfCOHYu2KMJ78FBE9XhNBBWhHr1No_o-XEf2s-72tJzAhmuWj40JGUfN1Cd32zL5iM9WrPqkRqWrvZHPHZH9gk16XSvK6WTjS8HnOZCAr-jgiVBCiZUjpkFYZjgHaRhTzh32CdwnfKFLbRqMdWnREsjnp8mVd-JeN82HkD55w0RBls8&csui=3" \t "_blank)**

[.](https://www.google.com/search?safe=active&sca_esv=8c966bae1d54a914&rlz=1C1GCTT_enUS1161US1161&sxsrf=AE3TifNm9KXL5Ao2qyylGd54bHlbHt_NeQ%3A1756874407132&q=Cache+Miss&sa=X&ved=2ahUKEwij086X47uPAxUAFVkFHSLwBzUQxccNegUI0gEQAw&mstk=AUtExfCOHYu2KMJ78FBE9XhNBBWhHr1No_o-XEf2s-72tJzAhmuWj40JGUfN1Cd32zL5iM9WrPqkRqWrvZHPHZH9gk16XSvK6WTjS8HnOZCAr-jgiVBCiZUjpkFYZjgHaRhTzh32CdwnfKFLbRqMdWnREsjnp8mVd-JeN82HkD55w0RBls8&csui=3" \t "_blank)

If the data is not in the cache (a cache miss), the application fetches it from the primary database.

**[5. Cache Update:](https://www.google.com/search?safe=active&sca_esv=8c966bae1d54a914&rlz=1C1GCTT_enUS1161US1161&sxsrf=AE3TifNm9KXL5Ao2qyylGd54bHlbHt_NeQ%3A1756874407132&q=Cache+Update&sa=X&ved=2ahUKEwij086X47uPAxUAFVkFHSLwBzUQxccNegUI4AEQAw&mstk=AUtExfCOHYu2KMJ78FBE9XhNBBWhHr1No_o-XEf2s-72tJzAhmuWj40JGUfN1Cd32zL5iM9WrPqkRqWrvZHPHZH9gk16XSvK6WTjS8HnOZCAr-jgiVBCiZUjpkFYZjgHaRhTzh32CdwnfKFLbRqMdWnREsjnp8mVd-JeN82HkD55w0RBls8&csui=3" \t "_blank)**

[.](https://www.google.com/search?safe=active&sca_esv=8c966bae1d54a914&rlz=1C1GCTT_enUS1161US1161&sxsrf=AE3TifNm9KXL5Ao2qyylGd54bHlbHt_NeQ%3A1756874407132&q=Cache+Update&sa=X&ved=2ahUKEwij086X47uPAxUAFVkFHSLwBzUQxccNegUI4AEQAw&mstk=AUtExfCOHYu2KMJ78FBE9XhNBBWhHr1No_o-XEf2s-72tJzAhmuWj40JGUfN1Cd32zL5iM9WrPqkRqWrvZHPHZH9gk16XSvK6WTjS8HnOZCAr-jgiVBCiZUjpkFYZjgHaRhTzh32CdwnfKFLbRqMdWnREsjnp8mVd-JeN82HkD55w0RBls8&csui=3" \t "_blank)

The data is then stored in the Redis cache for future requests and returned to the application.

Key Benefits

* **Performance:** Reduces latency and speeds up applications by serving data from memory.
* **Scalability:** Handles large volumes of traffic and data by distributing cache servers.
* **High Availability:** Provides resilience through features like [Redis Sentinel](https://www.google.com/search?safe=active&sca_esv=8c966bae1d54a914&rlz=1C1GCTT_enUS1161US1161&sxsrf=AE3TifNm9KXL5Ao2qyylGd54bHlbHt_NeQ%3A1756874407132&q=Redis+Sentinel&sa=X&ved=2ahUKEwij086X47uPAxUAFVkFHSLwBzUQxccNegUIyQEQAQ&mstk=AUtExfCOHYu2KMJ78FBE9XhNBBWhHr1No_o-XEf2s-72tJzAhmuWj40JGUfN1Cd32zL5iM9WrPqkRqWrvZHPHZH9gk16XSvK6WTjS8HnOZCAr-jgiVBCiZUjpkFYZjgHaRhTzh32CdwnfKFLbRqMdWnREsjnp8mVd-JeN82HkD55w0RBls8&csui=3) and [replication](https://www.google.com/search?safe=active&sca_esv=8c966bae1d54a914&rlz=1C1GCTT_enUS1161US1161&sxsrf=AE3TifNm9KXL5Ao2qyylGd54bHlbHt_NeQ%3A1756874407132&q=replication&sa=X&ved=2ahUKEwij086X47uPAxUAFVkFHSLwBzUQxccNegUIyQEQAg&mstk=AUtExfCOHYu2KMJ78FBE9XhNBBWhHr1No_o-XEf2s-72tJzAhmuWj40JGUfN1Cd32zL5iM9WrPqkRqWrvZHPHZH9gk16XSvK6WTjS8HnOZCAr-jgiVBCiZUjpkFYZjgHaRhTzh32CdwnfKFLbRqMdWnREsjnp8mVd-JeN82HkD55w0RBls8&csui=3).
* **Cost Efficiency:** Reduces load on primary databases, saving on database resources.

Use Cases

* **Caching frequently accessed content:** For example, storing movie metadata on a streaming platform.
* [**Session caching**](https://www.google.com/search?safe=active&sca_esv=8c966bae1d54a914&rlz=1C1GCTT_enUS1161US1161&sxsrf=AE3TifNm9KXL5Ao2qyylGd54bHlbHt_NeQ%3A1756874407132&q=Session+caching&sa=X&ved=2ahUKEwij086X47uPAxUAFVkFHSLwBzUQxccNegUIrgEQAQ&mstk=AUtExfCOHYu2KMJ78FBE9XhNBBWhHr1No_o-XEf2s-72tJzAhmuWj40JGUfN1Cd32zL5iM9WrPqkRqWrvZHPHZH9gk16XSvK6WTjS8HnOZCAr-jgiVBCiZUjpkFYZjgHaRhTzh32CdwnfKFLbRqMdWnREsjnp8mVd-JeN82HkD55w0RBls8&csui=3)**:** Storing user session data for web applications.
* [**Distributed caching**](https://www.google.com/search?safe=active&sca_esv=8c966bae1d54a914&rlz=1C1GCTT_enUS1161US1161&sxsrf=AE3TifNm9KXL5Ao2qyylGd54bHlbHt_NeQ%3A1756874407132&q=Distributed+caching&sa=X&ved=2ahUKEwij086X47uPAxUAFVkFHSLwBzUQxccNegUIrwEQAQ&mstk=AUtExfCOHYu2KMJ78FBE9XhNBBWhHr1No_o-XEf2s-72tJzAhmuWj40JGUfN1Cd32zL5iM9WrPqkRqWrvZHPHZH9gk16XSvK6WTjS8HnOZCAr-jgiVBCiZUjpkFYZjgHaRhTzh32CdwnfKFLbRqMdWnREsjnp8mVd-JeN82HkD55w0RBls8&csui=3)**:** Distributing data across multiple servers for better performance and availability.

<dependency>  
<groupId>redis.clients</groupId>  
<artifactId>jedis</artifactId>  
<version>4.4.4</version>  
</dependency>

Jedis jedis = new Jedis(hostname, port)

jedis.set(key,value)

package org.geeksforgeeks;

import redis.clients.jedis.Jedis;

public class Main {

public static void main(String[] args) {

Jedis jedis = new Jedis();

jedis.set(&quot;key&quot;, &quot;value&quot;);

}

}

jedis.get(key)

package org.geeksforgeeks;

import redis.clients.jedis.Jedis;

public class Main {

public static void main(String[] args) {

Jedis jedis = new Jedis();

jedis.set(&quot;key&quot;, &quot;value&quot;);

System.out.println(&quot;The value of the key is : &quot; + jedis.get(&quot;key&quot;));

}

}

<https://www.geeksforgeeks.org/system-design/redis-cache-in-java-using-jedis/>

<https://docs.spring.io/spring-data/redis/reference/redis/redis-cache.html>

1. [↑](#footnote-ref-1)