



What are Conditional Annotations?

Conditional annotations in Spring (`@Conditional`) allow you to register a bean or load a configuration **only if a specific condition is met**. This helps in making the application dynamic and flexible without changing the code.

Most common ones are:

- `@ConditionalOnProperty`: Loads a bean if a property exists in `application.yml`.
- `@ConditionalOnClass`: Loads a bean only if a specific class is on the classpath.
- `@ConditionalOnMissingBean`: Loads a bean only if the user hasn't defined their own version of it (basis of Spring Boot Auto-configuration).
- `@ConditionalOnExpression`: Loads a bean based on a SpEL expression.

Use Case in My Application

"I used `@ConditionalOnProperty` to switch between **Real** and **Mock** implementations of a Payment Gateway service based on the environment.

Scenario:

In **Production**, we use the real Stripe API.

In **QA/Dev**, we don't want to hit the real Stripe API (to save costs and avoid noise), so we use a mock implementation.

Implementation:

1. Interface:

```
public interface PaymentService {  
    void processPayment();  
}
```

2. Real Implementation (Production):

```
@Service  
@ConditionalOnProperty(name = "payment.provider", havingValue = "stripe")  
public class StripePaymentService implements PaymentService {  
    public void processPayment() { /* Calls real Stripe API */ }  
}
```

3. Mock Implementation (Dev/QA):

```
@Service
@ConditionalOnProperty(name = "payment.provider", havingValue = "mock", matchIfMissing = true)
public class MockPaymentService implements PaymentService {
    public void processPayment() { /* Logs "Payment Success" */ }
}
```

4. Configuration (application-dev.yml):

```
payment.provider: mock
```

Benefit:

We deploy the exact same jar to all environments. We just change the config property, and Spring automatically wires the correct implementation. This is cleaner than using `if-else` logic inside the business code."

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1. <https://ppl-ai-file-upload.s3.amazonaws.com/web/direct-files/attachments/images/81815274/429036f4-3bc3-4a7a-8c6f-90246e73b9b9/image.jpg>
2. <https://ppl-ai-file-upload.s3.amazonaws.com/web/direct-files/attachments/images/81815274/24f18c0a-b56e-4862-a619-e2959036a5c2/image.jpg>
3. <https://ppl-ai-file-upload.s3.amazonaws.com/web/direct-files/attachments/images/81815274/97e9ed86-ed11-4035-a18b-1eb05c1bab4e/image.jpg>
4. <https://ppl-ai-file-upload.s3.amazonaws.com/web/direct-files/attachments/images/81815274/87f62423-96f2-4071-9802-8f6699e0ecd8/image.jpg>