Selenium Waits – Complete Guide with Examples

In Selenium, waits are used to handle synchronization issues between the test script and the web application. Selenium provides three main types of waits.

1. Implicit Wait

Implicit wait tells WebDriver to wait for a specified amount of time before throwing NoSuchElementException.

```
driver.manage().timeouts().implicitlyWait(Duration.ofSeconds(10));
```

2. Explicit Wait

Explicit wait is used to wait for a specific condition to occur before proceeding.

```
WebDriverWait wait = new WebDriverWait(driver, Duration.ofSeconds(10));
wait.until(ExpectedConditions.visibilityOfElementLocated(By.id("username")));
```

3. Fluent Wait

Fluent wait defines maximum wait time, polling frequency, and exception handling.

```
Wait wait = new FluentWait<>(driver) .withTimeout(Duration.ofSeconds(30))
.pollingEvery(Duration.ofSeconds(5)) .ignoring(NoSuchElementException.class);
```

Comparison of Waits

1. Implicit Wait: Applies globally to all elements
2. Explicit Wait: Applies to a specific element/condition
3. Fluent Wait: Advanced form of explicit wait with polling control

Best Practice: Avoid mixing implicit and explicit waits. Prefer explicit waits for stable and reliable automation scripts.