

# Playwright using JavaScript

## Introduction

Just like Selenium, Playwright supports:

- ✓ **Multiple Operating Systems** (Windows, Mac, Linux)
- ✓ **Multiple Languages** (JavaScript, Python, Java, etc.)
- ✓ **Multiple Browsers** (Chrome, Edge, Safari, Firefox)

 **Official Website** – [playwright.dev](https://playwright.dev)

**Playwright is used for testing modern web applications.**

It can also automate **APIs** and **browser-based applications on mobile devices**. However, it **does NOT support mobile native apps**.

## What is a Native App?

A **native app** is an application built for a specific mobile operating system, like:

-  **Android** – Built using Java/Kotlin
-  **iOS** – Built using Swift/Objective-C

For example,

### 1. Purely Native App (Not Browser-Based)

 **Snapchat** – Only works as a native mobile app, no browser-based version.

### 2. Purely Browser-Based Mobile App (No Native Version)

 **Google Search (mobile site: google.com)** – Fully web-based, no need to install an app.

Since **Playwright can only automate browser-based apps**, it can work with **Google Search (mobile site)** but **not with Snapchat**.

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## What Features Does Playwright Support?

### 1. Supports Different Types of Applications

- **Web Apps** – Example: Automating the NBCU login page in a web browser.
- **Mobile Web Apps** – Example: Testing NBCU's website in a mobile browser like Chrome or Safari.
- **API Automation** – Example: Testing NBCU's backend APIs for fetching movie details.

## 2. Supports Multiple Programming Languages

Playwright works with:

- **JavaScript** (Most commonly used)
- **TypeScript**
- **Java**
- **Python**
- **.NET (C#)**

### Why is **JavaScript Mostly Used in Playwright?**

- Playwright is built using **JavaScript**.
- Most web applications are developed using **JavaScript**.
- **JavaScript** makes Playwright tests run faster and integrate easily with web apps.

## 3. Supports Multiple Browsers

Playwright can run tests on:

- **Google Chrome (Chromium-based)**
- **Microsoft Edge**
- **Safari (for Mac/iOS)**
- **Firefox**
- All browsers support **headed mode (with UI)** and **headless mode (without UI, runs faster)**.

### What is **Chromium**?

Chromium is an open-source browser engine. It powers:

- **Google Chrome**
- **Microsoft Edge**
- **Opera**
- **Brave**

## 4. Supports Multiple Operating Systems

Playwright runs on:

- **Windows**
  - **MacOS**
  - **Linux**
  - **CI/CD Environments** (Example: Running Playwright tests in **Jenkins**, **GitHub Actions**, or **Azure DevOps**).
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# Why Prefer Playwright Over Selenium?

## Comparison of Features

### 1. Free and Open Source

- **Selenium** – Yes, Selenium is an open-source automation framework.
  - **Playwright** – Yes, Playwright is also open-source and maintained by Microsoft.
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### 2. Supported Browsers

- **Selenium** – Supports Chrome, Edge, Firefox, Safari, and Opera.
  - **Playwright** – Supports Chromium (Chrome & Edge), Firefox, WebKit (Safari).
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### 3. Programming Language Support

- **Selenium** – Supports Java, Python, C#, JavaScript, Ruby, PHP.
  - **Playwright** – Supports JavaScript, TypeScript, Java, Python, C# (.NET).
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### 4. Supported Operating Systems

- **Selenium** – Supports Windows, MacOS, Linux.
  - **Playwright** – Supports Windows, MacOS, Linux + CI/CD environments.
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### 5. Headless Mode (Runs Without Opening the Browser UI)

- **Selenium** – Yes, using ChromeOptions.

```
ChromeOptions options = new ChromeOptions();
options.addArguments("--headless");
WebDriver driver = new ChromeDriver(options);
```

- **Playwright** – ✓ Yes, using headless mode by default.

```
const { chromium } = require('playwright');
(async () => {
  const browser = await chromium.launch({ headless: true });
  const page = await browser.newPage();
  await page.goto('https://www.peacocktv.com');
  console.log(await page.title());
  await browser.close();
})();
```

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## 6. Cross Browser & Cross OS Testing

- **Selenium** – ✓ Yes, using config.properties & Selenium Grid.

```
browser=chrome
platform=windows
DesiredCapabilities cap = new DesiredCapabilities();
cap.setBrowserName("chrome");
cap.setPlatform(Platform.WINDOWS);
WebDriver driver = new RemoteWebDriver(new
URL("http://localhost:4444"), cap);
```

- **Playwright** – ✓ Yes, using Playwright Test Runner.

```
npx playwright test --project=chromium
npx playwright test --project=firefox
```

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## 7. Parallel Execution

- **Selenium** – ✓ Yes, using TestNG.  
**testng.xml:**

```
<suite name="NBCU Test Suite" parallel="tests" thread-count="2">
  <test name="Login Test">
    <classes>
      <class name="tests.LoginTest"/>
    </classes>
  </test>
  <test name="Search Test">
    <classes>
      <class name="tests.SearchTest"/>
    </classes>
  </test>
</suite>
```

- **Playwright** – Yes, built-in parallel execution.

```
test.describe.parallel('NBCU Tests', () => {
  test('Login Test', async ({ page }) => {
    await page.goto('https://www.peacocktv.com');
    // Perform login test
  });
});
```

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## 8. Auto Waits (Handles Element Waiting Automatically)

- **Selenium** – No, needs **Implicit & Explicit Waits**.

```
// Implicit Wait
driver.manage().timeouts().implicitlyWait(10, TimeUnit.SECONDS);

// Explicit Wait
WebDriverWait wait = new WebDriverWait(driver,
Duration.ofSeconds(10));
WebElement element =
wait.until(ExpectedConditions.elementToBeClickable(By.id("start")));
```

- **Playwright** – Yes, **Auto-Waiting** is built-in.

```
await page.click('#start'); // Automatically waits for the element to
be clickable
```

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## 9. Multi-Tab & Multi-Window Handling

- **Selenium** – Yes, using `switchTo().window()`.

```
Set<String> windows = driver.getWindowHandles();
for (String window : windows) {
  driver.switchTo().window(window);
}
```

- **Playwright** – Yes, using `context.newPage()`.

```
const nextPage = await context.newPage();
await nextPage.goto('https://www.peacocktv.com');
```

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## 10. Real-Time Test Execution

🔴 Only Cypress supports real-time execution.

📌 What is real-time execution?

It means seeing the test run **step-by-step in real-time**, like watching a video. Selenium & Playwright don't have this feature.

❓ Why only Cypress supports real-time execution?

Cypress runs directly in the browser and provides a **real-time dashboard** with automatic reloads.

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## 11. Debugging

- **Selenium** – ✅ Yes, using **DevTools integration**.

```
ChromeOptions options = new ChromeOptions();
options.setExperimentalOption("debuggerAddress", "localhost:9222");
```

- **Playwright** – ✅ Yes, has **built-in debuggers**.

```
await page.pause(); // Opens Playwright Inspector
```

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## 12. API Testing

- **Selenium** – ❌ No, needs **RestAssured** for API testing.

```
Response response =
RestAssured.get("https://api.peacocktv.com/movies");
```

- **Playwright** – ✅ Yes, built-in API testing support.

```
const response = await
request.get('https://api.peacocktv.com/movies');
console.log(await response.json());
```

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## 13. Supported Frameworks

- **Selenium** – Works with **TestNG, JUnit, Cucumber**.
  - **TestNG** – Framework for running parallel tests.
  - **Cucumber** – BDD framework for writing tests in Gherkin.
- **Playwright** – Works with **Jest, Mocha**.
  - **Jest** – Fast JavaScript test framework.
  - **Mocha** – Flexible JS test framework.

- **Common Framework Support** –  Both support integration with **CI/CD tools** like Jenkins & GitHub Actions.
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## Why is Playwright Faster than Selenium?

- ◆ Selenium interacts with browsers through drivers (e.g., ChromeDriver, GeckoDriver).
- ◆ Playwright directly controls browsers via WebSockets, eliminating extra layers.

This direct interaction makes **Playwright tests faster & more stable**.

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