

# WebTestClient

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`WebTestClient` is a thin shell around `WebClient`, using it to perform requests and exposing a dedicated, fluent API for verifying responses. `WebTestClient` binds to a WebFlux application by using a [mock request and response](#), or it can test any web server over an HTTP connection.



Kotlin users: See [this section](#) related to use of the `WebTestClient`.

# Chapter 1. Setup

To create a `WebTestClient` you must choose one of several server setup options. Effectively you're either configuring the WebFlux application to bind to, or using a URL to connect to a running server.

## 1.1. Bind to Controller

The following example shows how to create a server setup to test one `@Controller` at a time:

```
client = WebTestClient.bindToController(new TestController()).build();
```

The preceding example loads the `WebFlux Java configuration` and registers the given controller. The resulting WebFlux application is tested without an HTTP server by using mock request and response objects. There are more methods on the builder to customize the default WebFlux Java configuration.

## 1.2. Bind to Router Function

The following example shows how to set up a server from a `RouterFunction`:

```
RouterFunction<?> route = ...  
client = WebTestClient.bindToRouterFunction(route).build();
```

Internally, the configuration is passed to `RouterFunctions.toWebHandler`. The resulting WebFlux application is tested without an HTTP server by using mock request and response objects.

## 1.3. Bind to `ApplicationContext`

The following example shows how to setup a server from the Spring configuration of your application or some subset of it:

```

@RunWith(SpringRunner.class)
@ContextConfiguration(classes = WebConfig.class) ❶
public class MyTests {

    @Autowired
    private ApplicationContext context; ❷

    private WebTestClient client;

    @Before
    public void setUp() {
        client = WebTestClient.bindToApplicationContext(context).build(); ❸
    }
}

```

❶ Specify the configuration to load

❷ Inject the configuration

❸ Create the `WebTestClient`

Internally, the configuration is passed to `WebHttpHandlerBuilder` to set up the request processing chain. See [WebHandler API](#) for more details. The resulting WebFlux application is tested without an HTTP server by using mock request and response objects.

## 1.4. Bind to Server

The following server setup option lets you connect to a running server:

```

client = WebTestClient.bindToServer().baseUrl("http://localhost:8080").build(
);

```

## 1.5. Client Builder

In addition to the server setup options described earlier, you can also configure client options, including base URL, default headers, client filters, and others. These options are readily available following `bindToServer`. For all others, you need to use `configureClient()` to transition from server to client configuration, as follows:

```
client = WebTestClient.bindToController(new TestController())  
    .configureClient()  
    .baseUrl("/test")  
    .build();
```

## Chapter 2. Writing Tests

`WebTestClient` is a thin shell around `WebClient`. It provides an identical API up to the point of performing a request by using `exchange()`. What follows after `exchange()` is a chained API workflow to verify responses.

Typically, you start by asserting the response status and headers, as follows:

```
client.get().uri("/persons/1")
    .accept(MediaType.APPLICATION_JSON_UTF8)
    .exchange()
    .expectStatus().isOk()
    .expectHeader().contentType(MediaType.APPLICATION_JSON_UTF8)
    // ...
```

Then you specify how to decode and consume the response body:

- `expectBody(Class<T>)`: Decode to single object.
- `expectBodyList(Class<T>)`: Decode and collect objects to `List<T>`.
- `expectBody()`: Decode to `byte[]` for `JSON Content` or an empty body.

Then you can use built-in assertions for the body. The following example shows one way to do so:

```
client.get().uri("/persons")
    .exchange()
    .expectStatus().isOk()
    .expectBodyList(Person.class).hasSize(3).contains(person);
```

You can also go beyond the built-in assertions and create your own, as the following example shows:

```
client.get().uri("/persons/1")
    .exchange()
    .expectStatus().isOk()
    .expectBody(Person.class)
    .consumeWith(result -> {
        // custom assertions (e.g. AssertJ)...
    });
```

You can also exit the workflow and get a result, as follows:

```
EntityExchangeResult<Person> result = client.get().uri("/persons/1")
    .exchange()
    .expectStatus().isOk()
    .expectBody(Person.class)
    .returnResult();
```



When you need to decode to a target type with generics, look for the overloaded methods `that` `accept` `{api-spring-framework}/core/ParameterizedTypeReference.html` `[ParameterizedTypeReference]` instead of `Class<T>`.

## 2.1. No Content

If the response has no content (or you do not care if it does) use `Void.class`, which ensures that resources are released. The following example shows how to do so:

```
client.get().uri("/persons/123")
    .exchange()
    .expectStatus().isNotFound()
    .expectBody(Void.class);
```

Alternatively, if you want to assert there is no response content, you can use code similar to the following:

```
client.post().uri("/persons")
    .body(personMono, Person.class)
    .exchange()
    .expectStatus().isCreated()
    .expectBody().isEmpty();
```

## 2.2. JSON Content

When you use `expectBody()`, the response is consumed as a `byte[]`. This is useful for raw content assertions. For example, you can use `JSONAssert` to verify JSON content, as follows:

```
client.get().uri("/persons/1")
    .exchange()
    .expectStatus().isOk()
    .expectBody()
    .json("{\"name\":\"Jane\"}")
```

You can also use [JSONPath](#) expressions, as follows:

```
client.get().uri("/persons")
    .exchange()
    .expectStatus().isOk()
    .expectBody()
    .jsonPath("$[0].name").isEqualTo("Jane")
    .jsonPath("$[1].name").isEqualTo("Jason");
```

## 2.3. Streaming Responses

To test infinite streams (for example, `"text/event-stream"` or `"application/stream+json"`), you need to exit the chained API (by using `returnResult`), immediately after the response status and header assertions, as the following example shows:

```
FluxExchangeResult<MyEvent> result = client.get().uri("/events")
    .accept(TEXT_EVENT_STREAM)
    .exchange()
    .expectStatus().isOk()
    .returnResult(MyEvent.class);
```

Now you can consume the `Flux<T>`, assert decoded objects as they come, and then cancel at some point when test objectives are met. We recommend using the `StepVerifier` from the `reactor-test` module to do that, as the following example shows:



```
Flux<Event> eventFux = result.getResponseBody();

StepVerifier.create(eventFlux)
    .expectNext(person)
    .expectNextCount(4)
    .consumeNextWith(p -> ...)
    .thenCancel()
    .verify();
```

## 2.4. Request Body

When it comes to building requests, the `WebTestClient` offers an API identical to the `WebClient`, and the implementation is mostly a simple pass-through. See the [WebClient documentation](#) for examples on how to prepare a request with a body, including submitting form data, multipart requests, and more.