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# **Hoverfly Java Documentation**

*Release 0.9.3*

**SpectoLabs**

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# Contents

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<b>1</b>	<b>Quickstart</b>	<b>3</b>
1.1	Maven . . . . .	3
1.2	Gradle . . . . .	3
1.3	Code example . . . . .	3
1.4	Contents . . . . .	4





**Hoverfly** is a lightweight service virtualisation tool which allows you to stub / simulate HTTP(S) services. It is a proxy written in [Go](#) which responds to HTTP(S) requests with stored responses, pretending to be it's real counterpart.

It enables you to get around common testing problems caused by external dependencies, such as non-deterministic data, flakiness, not yet implemented API's, licensing fees, slow tests and more.

**Hoverfly Java** is a native language binding which gives you an expressive API for managing Hoverfly in Java. It gives you a Hoverfly class which abstracts away the binary and API calls, a *DSL* for creating simulations, and a junit integration for using it within JUnit tests.

Hoverfly Java is developed and maintained by [SpectoLabs](#).



### Maven

If using Maven, add the following dependency to your pom:

```
<dependency>
  <groupId>io.specto</groupId>
  <artifactId>hoverfly-java</artifactId>
  <version>0.9.3</version>
  <scope>test</scope>
</dependency>
```

### Gradle

Or with Gradle add the dependency to your \*.gradle file:

```
testCompile ``io.specto:hoverfly-java:0.9.3``
```

### Code example

The simplest way to get started is with the JUnit rule. Behind the scenes the JVM proxy settings will be configured to use the managed Hoverfly process, so you can just make requests as normal, only this time Hoverfly will respond instead of the real service (assuming your HTTP client respects JVM proxy settings):

```
public class HoverflyExample {

    @ClassRule
    public static HoverflyRule hoverflyRule = HoverflyRule.inSimulationMode(dsl(
        service("www.my-test.com")
            .get("/api/bookings/1")
    ))
}
```

```
        .willReturn(success("{\"bookingId\":\"1\"}", "application/json"))
    });

    @Test
    public void shouldBeAbleToGetABookingUsingHoverfly() {
        // When
        final ResponseEntity<String> getBookingResponse = restTemplate.getForEntity(
↪ "http://www.my-test.com/api/bookings/1", String.class);

        // Then
        assertThat(getBookingResponse.getStatusCode()).isEqualTo(OK);
        assertThatJSON(getBookingResponse.getBody()).isEqualTo("{\"bookingId\":\"1\"}
↪");
    }

    // Continues...
```

## Contents

### Quickstart

#### Maven

If using Maven, add the following dependency to your pom:

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  <groupId>io.specto</groupId>
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  <version>0.9.3</version>
  <scope>test</scope>
</dependency>
```

#### Gradle

Or with Gradle add the dependency to your \*.gradle file:

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#### Code example

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```
public class HoverflyExample {

    @ClassRule
    public static HoverflyRule hoverflyRule = HoverflyRule.inSimulationMode(dsl(
        service("www.my-test.com")
```



```

        .get("/api/bookings/1")
        .willReturn(success("{\"bookingId\":\"1\"}", "application/json"))
    });

    @Test
    public void shouldBeAbleToGetABookingUsingHoverfly() {
        // When
        final ResponseEntity<String> getBookingResponse = restTemplate.getForEntity(
        ↪ "http://www.my-test.com/api/bookings/1", String.class);

        // Then
        assertThat(getBookingResponse.getStatusCode()).isEqualTo(OK);
        assertThatJSON(getBookingResponse.getBody()).isEqualTo("{\"bookingId\":\"1\"}
        ↪");
    }

    // Continues...

```

## Core functionality

This section describes the core functionality of Hoverfly Java.

### Simulating

The core of this library is the `Hoverfly` class, which abstracts away and orchestrates a `Hoverfly` instance. A flow might be as follows:

```

try (Hoverfly hoverfly = new Hoverfly(configs(), SIMULATE)) {

    hoverfly.start();
    hoverfly.importSimulation(classpath("simulation.json"));

    // do some requests here
}

```

When running `Hoverfly` standalone you can clean up the simulation and journal logs by calling `reset` method.

### Spying

In `Spy` mode, `Hoverfly` calls the real service if a request is not matched, otherwise, it simulates.

This mode allows you to spy on some of the endpoints of the services your test depends on, while letting other traffic to pass through.

```

try (Hoverfly hoverfly = new Hoverfly(configs(), SPY)) {

    hoverfly.start();
    hoverfly.importSimulation(classpath("simulation.json"));

    // do some requests here
}

```

### Capturing

The previous examples have only used Hoverfly in simulate mode. You can also run it in capture mode, meaning that requests will be made to the real service as normal, only they will be intercepted and recorded by Hoverfly. This can be a simple way of breaking a test's dependency on an external service; wait until you have a green test, then switch back into simulate mode using the simulation data recorded during capture mode.

```
try(Hoverfly hoverfly = new Hoverfly(configs(), CAPTURE)) {  
  
    hoverfly.start();  
  
    // do some requests here  
  
    hoverfly.exportSimulation(Paths.get("some-path/simulation.json"));  
}
```

### Simulation source

There are a few different potential sources for Simulations:

```
SimulationSource.classpath("simulation.json"); //classpath  
SimulationSource.defaultPath("simulation.json"); //default hoverfly resource path  
↳which is src/test/resources/hoverfly  
SimulationSource.url("http://www.my-service.com/simulation.json"); // URL  
SimulationSource.url(new URL("http://www.my-service.com/simulation.json")); // URL  
SimulationSource.file(Paths.get("src", "simulation.json")); // File  
SimulationSource.dsl(service("www.foo.com").get("/bar").willReturn(success())); //↳  
↳Object  
SimulationSource.simulation(new Simulation()); // Object  
SimulationSource.empty(); // None
```

### DSL

Hoverfly Java has a DSL which allows you to build request matcher to response mappings in Java instead of importing them as JSON.

The DSL is fluent and hierarchical, allowing you to define multiple service endpoints as follows:

```
SimulationSource.dsl(  
    service("www.my-test.com")  
  
        .post("/api/bookings").body("{\"flightId\": \"1\"}")  
        .willReturn(created("http://localhost/api/bookings/1"))  
  
        .get("/api/bookings/1")  
        .willReturn(success("{\"bookingId\": \"1\"}", "application/json")),  
  
    service("www.anotherService.com")  
  
        .put("/api/bookings/1").body(json(new Booking("foo", "bar")))  
        .willReturn(success())  
  
        .delete("/api/bookings/1")  
        .willReturn(noContent())  
)
```

The entry point for the DSL is `HoverflyDSL.service`. After calling this you can provide a method and path, followed by optional request components. You can then use `willReturn` to state which response you want when there is a match, which takes `ResponseBuilder` object that you can instantiate directly, or via the helper class `ResponseCreators`.

You can also simulate fixed network delay using DSL.

Global delays can be set for all requests or for a particular HTTP method:

```
SimulationSource.dsl(
  service("www.slow-service.com")
    .andDelay(3, TimeUnit.SECONDS).forAll(),

  service("www.other-slow-service.com")
    .andDelay(3, TimeUnit.SECONDS).forMethod("POST")
)
```

Per-request delay can be set as follows:

```
SimulationSource.dsl(
  service("www.not-so-slow-service.com")
    .get("/api/bookings")
    .willReturn(success().withDelay(1, TimeUnit.SECONDS))
)
)
```

## Request/response body conversion

There is currently an `HttpBodyConverter` interface which can be used to marshal Java objects into strings, and also set a content type header automatically.

It can be used for both request and response body, and supports JSON and XML data format out-of-the-box.

```
// For request body matcher
.body(equalsToJson(json(myObject))) // with default objectMapper
.body(equalsToJson(json(myObject, myObjectMapper))) // with custom objectMapper

// For response body
.body(xml(myObject))
.body(xml(myObject, myObjectMapper))
```

There is an implementation which lets you write inline JSON body efficiently with single quotes.

```
.body(jsonWithSingleQuotes("{\"bookingId':'1'}"))
.body(jsonWithSingleQuotes("{\"merchantName':'Jame\\'s'}")) // escape single quote in
↳ your data if necessary
```

## Request field matchers

Hoverfly-Java abstracts away some of the complexity of building the [request field matchers supported by Hoverfly](#).

By default, the DSL request builder assumes exact matching when you pass in a string.

You can also pass in a matcher created by the `HoverflyMatchers` factory class. The supported types of matchers are limited to `exactMatch`, `globMatch`, and `regexMatch` (not yet implemented) for URL, path and query.

The `body` method supports all the above plus JSON/XML equality matching, and `JSONPath/XPath` matching.

Here are some examples:

```
SimulationSource.dsl(  
    service(matches("www.*-test.com")) // Matches url with wildcard  
        .get(startsWith("/api/bookings/")) // Matches request path that starts_  
↳with /api/bookings/  
        .queryParams("page", any()) // Matches page query with any value  
        .willReturn(success(json(booking)))  
  
        .put("/api/bookings/1")  
        .body(equalsToJson(json(booking))) // Matches body which equals to a_  
↳JSON Object  
        .willReturn(success())  
  
        .post("/api/bookings")  
        .body(matchesJsonPath("$.flightId")) // Matches body with a JSON path_  
↳expression  
        .willReturn(created("http://localhost/api/bookings/1"))  
  
        .put("/api/bookings/1")  
        .body(equalsToXml(xml(booking))) // Matches body which equals to a XML_  
↳object  
        .willReturn(success())  
  
        // XPath Matcher  
        .post("/api/bookings")  
        .body(matchesXPath("/flightId")) // Matches body with a xpath_  
↳expression  
        .willReturn(created("http://localhost/api/bookings/1"))  
)
```

HoverflyMatchers also provides the following matching methods:

```
HoverflyMatchers.contains("foo")  
HoverflyMatchers.endsWith("foo")
```

Fuzzy matching is possible for request method, query and body with these simple built-in DSL methods:

```
SimulationSource.dsl(  
    service("www.booking-is-down.com")  
        .anyMethod(any())  
        .anyQueryParams()  
        .anyBody()  
        .willReturn(serverError().body("booking is down"))  
)
```

Headers are not used for matching unless they are specified. If you need to set a header to match on, use the header method:

```
SimulationSource.dsl(  
    service("www.my-test.com")  
        .post("/api/bookings")  
        .body("{\"flightId\": \"1\"}")  
        .header("Content-Type", "application/json") // Count as a match when_  
↳request contains this Content-Type header  
        .willReturn(created("http://localhost/api/bookings/1"))  
}
```

When you supply a simulation source to the `HoverflyRule`, you can enable the `printSimulationData` option to help debugging. This will print the simulation JSON data used by Hoverfly to `stdout`:

```
@ClassRule
public static HoverflyRule hoverflyRule = HoverflyRule.
    ↪inSimulationMode(simulationSource)
        .printSimulationData();
```

## Response Templating

If you need to build a response dynamically based on the request data, you can do so using templating:

```
hoverfly.importSimulation(dsl(
    service("www.my-test.com")

        // Using path in template
        .get("/api/bookings/1")
        .willReturn(success().body(jsonWithSingleQuotes(
            ↪"{'id':{{ Request.Path.[2] }},'origin':'London','destination':
            ↪'Singapore','_links':{'self':{'href':'http://localhost/api/bookings/{{ Request.Path.
            ↪[2] }}'}"
            )))

        // Using query Param in template
        .get("/api/bookings")
        .queryParams("destination", "London")
        .queryParams("page", any())
        .willReturn(success().body(jsonWithSingleQuotes(
            ↪"{'id':'1','destination':{{ Request.QueryParam.destination }},'_'
            ↪links':{'self':{'href':'http://localhost/api/bookings?page={{ Request.QueryParam.
            ↪page }}'}"
            ))));
```

The first example sets the `id` in response body based on the last path segment in the request using `{{ Request.Path.[2] }}`. The second example sets some response body data based on the request param using `{{ Request.QueryParam.destination }}` and `{{ Request.QueryParam.page }}`.

For more details, please check out the [Hoverfly documentation](#).

## Verification

This feature lets you verify that specific requests have been made to external service endpoints. You can verify the number of repeating requests or different requests performed in certain order.

The `verify` method from `HoverflyRule` accepts the same `RequestMatcherBuilder` DSL that you use for creating the simulations.

It also accepts a `VerificationCriteria` lambda function which is extensible. Here are some examples:

```
// Verify exactly one request
hoverfly.verify(
    service(matches("*.flight.*"))
        .get("/api/bookings")
        .anyQueryParams());

// Verify exactly two requests
hoverfly.verify(
```

```
service("api.flight.com")
    .put("/api/bookings/1")
    .anyBody()
    .header("Authorization", "Bearer some-token"), times(2));
```

There are some useful `VerificationCriteria` static factory methods provided out-of-the-box. This will be familiar if you are a [Mockito](#) user.

```
times(1)
atLeastOnce(),
atLeast(2),
atMost(2),
never()
```

If you want to verify all the stubbed requests were made at least once, you can use `verifyAll`:

```
hoverfly.verifyAll();
```

You can also verify that an external service has never been called:

```
hoverfly.verifyZeroRequestTo(service(matches("api.flight.*")));
```

You can call `verify` as many times as you want, but requests are not verified in order by default. Support for verification in order will be added in a future release.

### Resetting state

Verification is backed by a journal which logs all the requests made to Hoverfly. If multiple tests are sharing the same Hoverfly instance, for example when you are using `HoverflyRule` with `@ClassRule`, verification from one test might interfere with the requests triggered by another test.

In this case, you can reset the journal before each test to ensure a clean state for verifications:

```
@Before
public void setUp() throws Exception {
    hoverfly.resetJournal();
}
```

### Configuration

Hoverfly takes a config object, which contains sensible defaults if not configured. Ports will be randomised to unused ones, which is useful on something like a CI server if you want to avoid port clashes. You can also set fixed port:

```
configs().proxyPort(8080)
```

You can configure Hoverfly to process requests to certain destinations / hostnames

```
configs().destination("www.test.com") // only process requests to www.test.com
configs().destination("api") // matches destination that contains api, eg. api.test.
↳ com
```

You can configure Hoverfly to proxy localhost requests. This is useful if the target server you are trying to simulate is running on localhost.

```
configs().proxyLocalHost()
```

You can configure Hoverfly to capture request headers which is turned off by default:

```
configs().captureHeaders("Accept", "Authorization")
configs().captureAllHeaders()
```

You can configure Hoverfly to run as a web server on default port 8500:

```
configs().asWebServer()
```

You can configure Hoverfly to skip TLS verification. This option allows Hoverfly to perform “insecure” SSL connections to target server that uses invalid certificate (eg. self-signed certificate):

```
configs().disableTlsVerification()
```

If you are developing behind a cooperate proxy, you can configure Hoverfly to use an upstream proxy:

```
configs().upstreamProxy(new InetSocketAddress("127.0.0.1", 8900))
```

## Middleware

You can configure Hoverfly to use a local middleware (for more details, please check out [Hoverfly Middleware](#)):

```
configs().localMiddleware("python", "middleware/modify_response.py")
```

You should provide the absolute or relative path of the binary, in this case, `python` for running the python middleware. The second input is the middleware script file in the classpath (eg. `test/resources` folder)

## SSL

When requests pass through Hoverfly, it needs to decrypt them in order for it to persist them to a database, or to perform matching. So you end up with SSL between Hoverfly and the external service, and then SSL again between your client and Hoverfly. To get this to work, Hoverfly comes with it’s own self-signed certificate which has to be trusted by your client. To avoid the pain of configuring your keystore, Hoverfly’s certificate is trusted automatically when you instantiate it.

Alternatively, you can override the default SSL certificate by providing your own certificate and key files via the `HoverflyConfig` object, for example:

```
configs()
    .sslCertificatePath("ssl/ca.crt")
    .sslKeyPath("ssl/ca.key");
```

The input to these config options should be the file path relative to the classpath. Any PEM encoded certificate and key files are supported.

If the default SSL certificate is overridden, `hoverfly-java` will not automatically set it trusted, and it is the users’ responsibility to configure SSL context for their HTTPS client.

### Using externally managed instance

It is possible to configure Hoverfly to use an existing API simulation managed externally. This could be a private Hoverfly cluster for sharing API simulations across teams, or a publicly available API sandbox powered by Hoverfly.

You can enable this feature easily with the configs fluent builder. The default settings point to localhost on default admin port 8888 and proxy port 8500.

```
configs().remote()
```

You can point it to other host and ports

```
configs()
  .remote()
  .host("10.0.0.1")
  .adminPort(8080)
  .proxyPort(8081)
```

Depends on the set up of the remote Hoverfly instance, it may require additional security configurations.

You can provide a custom CA certificate for the proxy.

```
configs()
  .remote()
  .proxyCaCert("ca.pem") // the name of the file relative to classpath
```

You can configure Hoverfly to use an HTTPS admin endpoint.

```
configs()
  .remote()
  .withHttpsAdminEndpoint()
```

You can provide the token for the custom Hoverfly authorization header, this will be used for both proxy and admin endpoint authentication without the need for username and password.

```
configs()
  .remote()
  .withAuthHeader() // this will get auth token from an environment variable named
  ↪ 'HOVERFLY_AUTH_TOKEN'

configs()
  .remote()
  .withAuthHeader("some.token") // pass in token directly
```

### Admin API client

Consuming Hoverfly Admin API is easy with *HoverflyClient*. It allows you to control an external Hoverfly instance, such as changing mode, setting simulation data, etc.

You can create a default client that points to localhost:8888

```
HoverflyClient.createDefault();
```

You can customize the hostname and port. If the external Hoverfly requires authentication, you can provide an auth token from environment variable.



```
HoverflyClient.custom()
    .host("remote.host")
    .port(12345)
    .withAuthToken() // this will try to get the auth token from an
↪environment variable named 'HOVERFLY_AUTH_TOKEN'
    .build();
```

## JUnit 4

An easier way to orchestrate Hoverfly is via the JUnit Rule. This is because it will create destroy the process for you automatically, doing any cleanup work and auto-importing / exporting if required.

### Simulate

```
@ClassRule
public static HoverflyRule hoverflyRule = HoverflyRule.inSimulationMode(classpath(
↪"simulation.json"));
```

### Capture

```
@ClassRule
public static HoverflyRule hoverflyRule = HoverflyRule.inCaptureMode("simulation.json
↪");
```

File is relative to `src/test/resources/hoverfly`.

### Multi-Capture

```
@ClassRule
public static HoverflyRule hoverflyRule = HoverflyRule.inCaptureMode();

public void someTest() {
    hoverflyRule.capture("firstScenario.json");

    // test
}

public void someTest() {
    hoverflyRule.capture("someOtherScenario.json");

    // test
}
```

File is relative to `src/test/resources/hoverfly`.

### Capture or Simulate

You can create a Hoverfly Rule that is started in capture mode if the simulation file does not exist and in simulate mode if the file does exist. File is relative to `src/test/resources/hoverfly`.

```
@ClassRule
public static HoverflyRule hoverflyRule = HoverflyRule.inCaptureOrSimulationMode(
    ↪ "simulation.json");
```

### Use @ClassRule

It is recommended to start Hoverfly once and share it across multiple tests by using a `@ClassRule` rather than `@Rule`. This means you don't have the overhead of starting one process per test, and also guarantees that all your system properties are set correctly before executing any of your test code.

One caveat is that if you need to have a clean state for verification, you will need to manually reset the journal before each test:

```
@Before
public void setUp() throws Exception {
    hoverflyRule.resetJournal();
}
```

However this is not required if you are calling `hoverflyRule.simulate` in each test to load a new set of simulations, as the journal reset is triggered automatically in this case.

## JUnit 5

Hoverfly JUnit 5 extension takes advantage of the new *Extension* API to give finer control of Hoverfly throughout JUnit 5 tests life cycles. This section will show you how to get started with this new feature, and how to configure hoverfly via annotations in the JUnit 5 tests.

### Quick Start

If your project is already using JUnit 5, simply import the *hoverfly-java-junit5* library.

For Maven, add the following dependency to your pom:

```
<dependency>
  <groupId>io.specto</groupId>
  <artifactId>hoverfly-java-junit5</artifactId>
  <version>0.9.3</version>
  <scope>test</scope>
</dependency>
```

Or with Gradle add the dependency to your *\*.gradle* file:

```
testCompile ``io.specto:hoverfly-java-junit5:0.9.3``
```

If you haven't yet use JUnit 5, here is an example of Gradle configuration to get you up and running with Hoverfly and JUnit 5 in your project.

```
buildscript {
    dependencies {
        classpath ``org.junit.platform:junit-platform-gradle-plugin:1.0.1``
    }
}

repositories {
```

```

        mavenCentral()
    }
}

apply plugin: ``org.junit.platform.gradle.plugin``

dependencies {
    testCompile ``io.specto:hoverfly-java-junit5:0.9.3``

    testRuntime(``org.junit.platform:junit-platform-launcher:1.0.1``)
    testRuntime(``org.junit.jupiter:junit-jupiter-engine:5.0.1``)
    testRuntime(``org.junit.vintage:junit-vintage-engine:4.12.1``)
}

```

## Hoverfly Extension

Enabling Hoverfly is as easy as registering the `HoverflyExtension` in your test class:

```

@ExtendWith(HoverflyExtension.class)
class MyTests {
    // ...
}

```

Declaring `HoverflyExtension` at the top of the class will start Hoverfly in simulation mode with default configurations, and stop it after all the tests are done.

You can add Hoverfly as an argument to constructor or methods which will be dynamically resolved by JUnit 5 runtime. It gives you the ability to configure hoverfly in a per-test basis, and use Hoverfly API to simulate using *DSL* or perform *Verification*.

```

@Test
void shouldDoSomethingWith(Hoverfly hoverfly) {
    // ...
}

```

As you can see, injecting `Hoverfly` into your test gives you a lot of flexibility, and `HoverflyExtension` takes care of resetting `Hoverfly` before each test to prevent interference.

## Configurations

You can override Hoverfly configuration via the `@HoverflyCore` annotation, for example to change the ports of Hoverfly:

```

@HoverflyCore(mode = HoverflyMode.CAPTURE, config = @HoverflyConfig(adminPort = 9000,
↳ proxyPort = 9001))
@ExtendWith(HoverflyExtension.class)
class CustomHoverflyTests {
    // ...
}

```

All the existing Hoverfly *Configuration* options are available via the `@HoverflyConfig` interface.

## Simulate

With `@HoverflySimulate` annotation, you can declare a global simulation source that applies to all the tests in a test class. If one test loads a different simulation, `HoverflyExtension` is able to import the global source declared in `@HoverflySimulate` before the next test run.

```
package com.x.y.z;

@HoverflySimulate(source = @HoverflySimulate.Source(value = "test-service-https.json",
↳ type = HoverflySimulate.SourceType.CLASSPATH))
@ExtendWith(HoverflyExtension.class)
class SimulationTests {
    // ...
}
```

The current supported source type is `CLASSPATH`, `FILE`, and `DEFAULT_PATH` (which is `src/test/resources/hoverfly)`

If no source is provided, it will try to locate a file called with fully qualified name of test class, replacing dots (.) and dollar signs (\$) to underlines (\_) in the Hoverfly default path. In this example, the file path that will be looked for is `src/test/resources/hoverfly/com_x_y_z_SimulationTests.json`

## Capture

You can declare `@HoverflyCapture` to run Hoverfly in capture mode (see *Capturing*). You can customize the path and the filename for exporting the simulations.

```
@HoverflyCapture(path = "build/resources/test/hoverfly",
    filename = "captured-simulation.json",
    config = @HoverflyConfig(captureAllHeaders = true, proxyLocalHost = true))
@ExtendWith(HoverflyExtension.class)
class CaptureTests {
    // ...
}
```

If `path` and `filename` are not provided, the simulation will be exported to a file with fully-qualified name of the test class in the default Hoverfly path.

## Capture or simulate

You can set `HoverflyExtension` to switch between simulate and capture mode automatically. If a source is not found, it will capture, otherwise, simulate. This is previously known as `inCaptureOrSimulateMode` in JUnit 4 `HoverflyRule` (see *Capture or Simulate*).

This feature can be enabled easily by setting `enableAutoCapture` to `true` in `@HoverflySimulate`:

```
@HoverflySimulate(source = @Source(value = "build/resources/test/hoverfly/missing-
↳ simulation.json", type = SourceType.FILE),
    enableAutoCapture = true)
@ExtendWith(HoverflyExtension.class)
class CaptureIfFileNotPresent {
    // ...
}
```

## Nested tests

If your test class contains several groups of tests that require different Hoverfly configurations, you can do so by registering `HoverflyExtension` with nested tests:

```
@Nested
@HoverflySimulate
@ExtendWith(HoverflyExtension.class)
class MyNestedTestsOne {
    // ...
}

@Nested
@HoverflyCapture
@ExtendWith(HoverflyExtension.class)
class MyNestedTestsTwo {
    // ...
}
```

## Miscellaneous

### Apache HttpClient

This doesn't respect JVM system properties for things such as the proxy and truststore settings. Therefore when you build one you would need to:

```
HttpClient httpClient = HttpClients.createSystem();
// or
HttpClient httpClient = HttpClientBuilder.create().useSystemProperties().build();
```

Or on older versions you may need to:

```
HttpClient httpClient = new SystemDefaultHttpClient();
```

In addition, Hoverfly should be initialized before Apache HttpClient to ensure that the relevant JVM system properties are set before they are used by Apache library to configure the HttpClient.

There are several options to achieve this:

- Use `@ClassRule` and it guarantees that `HoverflyRule` is executed at the very start and end of the test case
- If using `@Rule` is inevitable, you should initialize the `HttpClient` inside your `@Before` `setUp` method which will be executed after `@Rule`
- As a last resort, you may want to manually configured Apache HttpClient to use custom proxy or SSL context, please check out [HttpClient examples](#)

### OkHttpClient

If you are using `OkHttpClient` to make HTTPS requests, you will need to configure it to use the custom `SSLContext` and `TrustManager` that supports Hoverfly CA cert:

```
SslConfigurer sslConfigurer = hoverflyRule.getSslConfigurer();
OkHttpClient okHttpClient = new OkHttpClient.Builder()
```

```
.sslSocketFactory(sslConfigurer.getSslContext().getSocketFactory(),  
↳sslConfigurer.getTrustManager())  
.build();
```

### Legacy Schema Migration

If you have recorded data in the legacy schema generated before hoverfly-junit v0.1.9, you will need to run the following commands using [Hoverfly](#) to migrate to the new schema:

```
$ hoverctl start  
$ hoverctl delete simulations  
$ hoverctl import --v1 path-to-my-json/file.json  
$ hoverctl export path-to-my-json/file.json  
$ hoverctl stop
```

### V1 to V2 Schema Migration

Starting from Hoverfly-java v0.5.0, the simulation schema is upgraded to v2 which supports matchers. Although it is backward compatible with v1, upgrading to v2 is recommended:

```
$ hoverctl start  
$ hoverctl delete simulations  
$ hoverctl import path-to-my-json/file.json  
$ hoverctl export path-to-my-json/file.json  
$ hoverctl stop
```

### Using Snapshot Version

To use snapshot version, you should include the OSS snapshot repository in your build file.

If using Maven, add the following repository to your pom:

```
<repositories>  
  <repository>  
    <id>oss-snapshots</id>  
    <name>OSS Snapshots</name>  
    <url>https://oss.sonatype.org/content/repositories/snapshots</url>  
    <snapshots>  
      <enabled>true</enabled>  
    </snapshots>  
  </repository>  
</repositories>
```

Or with Gradle add the repository to your build.gradle file:

```
repositories {  
  maven {  
    url 'https://oss.sonatype.org/content/repositories/snapshots'  
  }  
}
```