

# JUnit 5 Release Notes

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Version 5.4.0-SNAPSHOT

# Table of Contents

5.4.0 .....	1
JUnit Platform .....	1
JUnit Jupiter .....	3
JUnit Vintage .....	5
5.4.0-RC2 .....	5
JUnit Platform .....	5
JUnit Jupiter .....	5
JUnit Vintage .....	6
5.3.2 .....	6
JUnit Platform .....	6
JUnit Jupiter .....	6
JUnit Vintage .....	7
5.3.1 .....	7
JUnit Platform .....	7
JUnit Jupiter .....	7
JUnit Vintage .....	8
5.3.0 .....	8

This document contains the *change log* for all JUnit 5 releases since 5.3 GA.

Please refer to the [User Guide](#) for comprehensive reference documentation for programmers writing tests, extension authors, and engine authors as well as build tool and IDE vendors.

## 5.4.0

**Date of Release:** February 6, 2019

### Scope:

- New `junit-jupiter` dependency-aggregating artifact for simplified dependency management in build tools
- XML report generating listener
- Test Kit for testing engines and extensions
- `null` and `empty` argument sources for `@ParameterizedTest` methods
- `@TempDir` support for temporary directories
- Custom display name generator API
- Support for ordering test methods
- Support for ordering extensions registered via `@RegisterExtension`
- `TestWatcher` extension API
- API for accessing outer test instances in `ExtensionContext`
- JUnit 4 `@Ignore` migration support
- Improved diagnostics and error reporting
- Improved documentation and user experience in the User Guide
- Discontinuation of the `junit-platform-surefire-provider`
- Various minor improvements and bug fixes

For a complete list of all *closed* issues and pull requests for this release, consult the [5.4 M1](#), [5.4 RC1](#), [5.4 RC2](#), and [5.4 GA](#) milestone pages in the JUnit repository on GitHub.

## JUnit Platform

### Bug Fixes

- The `junit-platform-suite-api` artifact no longer has an unnecessary direct dependency on `junit-platform-commons`.
- Containers and tests that interrupt the current thread no longer cause surprising failures in subsequent tests that interact with the reused thread.
  - This applies specifically to containers and tests executed via a `HierarchicalTestExecutorService`—for example, a `@Test` method in JUnit Jupiter—that

interrupt the current thread—for example, via `Thread.currentThread().interrupt()`—but fail to clear the *interrupted status* flag for the current thread.

- The `TestTask` implementation used internally by `HierarchicalTestExecutorService` implementations now automatically clears the *interrupted status* for the current thread after the execution of each container and test and logs a message at `DEBUG` level (`FINE` in `java.util.logging`) if the *interrupted status* is not cleared properly by user code.

## Deprecations and Breaking Changes

- The JUnit Platform Maven Surefire Provider (`junit-platform-surefire-provider`) has been discontinued and is no longer released as part of JUnit 5. Please use [Maven Surefire's native support](#) for running tests on the JUnit Platform instead (requires Maven Surefire 2.22.0 or higher).
- `TestPlan.add(TestIdentifier)` has always been considered *internal* and is now *deprecated*. While calls from third-party code will continue to work for the time being, IDEs and build tools should remove any such code as soon as possible.

## New Features and Improvements

- New `junit-platform-reporting` artifact containing a `LegacyXmlReportGeneratingListener` that generates XML reports using a format which is compatible with the de facto standard for JUnit 4 based test reports that was made popular by the Ant build system.
  - See [JUnit Platform Reporting](#) in the User Guide for details.
- New `junit-platform-testkit` artifact containing a *Test Kit* API for testing the execution of a `TestEngine` running on the JUnit Platform.
  - See [JUnit Platform Test Kit](#) in the User Guide for details.
- The root cause and suppressed exceptions are now included in the stack trace printed by the `ConsoleLauncher`.
- The `ConsoleLauncher` now sanitizes user-provided display names before printing them to the console.
  - Common whitespace characters such as `\t`, `\n`, `\x0B`, `\f`, and `\r` are replaced by a standard space character, and all other ISO control characters are emitted as a single dot (`.`).
- New `ModifierSupport` class providing an API for extension and test engine authors to inspect modifiers of classes and members.
  - See the [User Guide](#) for details.
- `AnnotationSupport` provides new methods for finding annotated fields and their values.
  - Consult the Javadoc for the various `findAnnotatedFields()` and `findAnnotatedFieldValues()` methods in [AnnotationSupport](#) for details.
- `ReflectionSupport` provides new methods for finding fields and reading a field's value.
  - Consult the Javadoc for the `findFields()` and `tryToReadFieldValue()` methods in [ReflectionSupport](#) for details.
- Exceptions reported due to failed reflective operations such as loading a class, reading a field's

value, or looking up a method by name now include the original exception as their cause to make it easier to debug underlying issues.

- The `Launcher` API now provides an `execute(TestPlan, TestExecutionListener...)` method that allows one to execute a previously discovered `TestPlan`.
- `@RunWith(JUnitPlatform.class)` no longer executes test discovery twice.
- Implementations of `HierarchicalTestEngine` may now add behavior that wraps around the invocation of `Node.before()`, `Node.execute()`, and `Node.after()` using the new `Node.around()` hook.

## JUnit Jupiter

### Bug Fixes

- `@RegisterExtension` fields that are `null` when evaluated are no longer silently ignored. Instead, the corresponding test class or test method now fails with an informative exception.
- `@ParameterizedTest` once again supports `MessageFormat` patterns for individual parameters — for example, `{0,number,#.##}`.
- `@ResourceLock` can now be declared on test template methods such as `@RepeatedTest` and `@ParameterizedTest` methods. If `@ResourceLock` is used, the invocations will run in the same thread, even if parallel execution is enabled.
- The `@Execution` and `@ResourceLock` annotations used to configure parallel test execution are now inherited within test class hierarchies (via `@Inherited` semantics).

### Deprecations and Breaking Changes

- The default mode for parallel test execution has been changed from `CONCURRENT` to `SAME_THREAD` to allow for gradual opt-in by using the `@Execution` annotation on individual test classes or methods. You can invert this behavior by changing the default execution mode via the new `junit.jupiter.execution.parallel.mode.default` configuration parameter. Please refer to the [User Guide](#) for details.

### New Features and Improvements

- New `org.junit.jupiter:junit-jupiter` artifact that simplifies dependency management for JUnit Jupiter in build tools such as Gradle and Maven.
  - Specifically, this artifact aggregates all dependencies that are required to use JUnit Jupiter along with optional dependencies that extend the core Jupiter APIs.
  - It contains compile-time dependencies on `junit-jupiter-api` and `junit-jupiter-params` and a runtime dependency on `junit-jupiter-engine`.
- `Assertions.assertEquals()` variants that compare floating point numbers using a delta now support a *delta* of zero.
- New `Assertions.assertEquals()` variants that accept mixed boxed and unboxed primitive values, allowing statements such as `assertEquals(42, Integer.valueOf("42"))` to compile.
- New `Assertions.assertNotEquals()` variants that accept the following primitive data types: `char`,

`byte`, `short`, `int`, `long`, `float`, and `double`. Mixed boxed and unboxed primitive values are also supported.

- Exceptions thrown in `Assertions.assertAll()` are now additionally tracked as *suppressed exceptions* in the resulting `MultipleFailuresError`. Consequently, the stack traces for such exceptions are now visible as *Suppressed* at the end of the stack trace for the invocation of `assertAll()`.
- JUnit 4's `AssumptionViolatedException` is now supported in JUnit Jupiter for aborting a test mid-flight due to a failed assumption — for example, via JUnit 4's `org.junit.Assume` utility class.
- JUnit 4's `@Ignore` annotation is now supported for disabling test classes and test methods via the `junit-jupiter-migrationsupport` module.
  - See the [User Guide](#) for details.
- New `@TempDir` extension (formerly part of JUnit Pioneer) that allows one to write tests that require a temporary directory in a `java.nio.file.FileSystem`.
  - See the [User Guide](#) for details.
- In addition to returning streams, `@TestFactory`-annotated methods may now return a single `DynamicNode` — for example, a `DynamicTest` or a `DynamicContainer`.
- New `@NullSource`, `@EmptySource`, and `@NullAndEmptySource` argument sources that provide `null` and `empty` arguments to `@ParameterizedTest` methods.
  - See [Null and Empty Sources](#) in the User Guide for details.
- Implicit conversion from hexadecimal and octal string representations to integral types in `@ParameterizedTest` arguments — for example, conversion from `"0xff"` to `255`.
- New `JRE.JAVA_12` enum constant for use with `@EnabledOnJre` and `@DisabledOnJre`.
- New `LOCALE` and `TIME_ZONE` constants in `org.junit.jupiter.api.parallel.Resources` for use with `@ResourceLock` to synchronize test execution regarding the default `Locale` and default `TimeZone`, respectively.
- New `MethodOrderer` API for ordering the sequence of tests with built-in support for *alphanumeric*, `@Order` annotation based, and *random* ordering of test methods.
  - See [Test Execution Order](#) in the User Guide for details.
- New `DisplayNameGenerator` interface and `@DisplayNameGeneration` annotation that allow declarative configuration of a pre-defined or custom display name generator.
  - See [Display Name Generators](#) in the User Guide for details.
- New `TestWatcher` extension API that allows extensions to process test results by defining result-based callbacks invoked after test execution.
  - See [Test Result Processing](#) in the User Guide for details.
- Extensions registered *programmatically* via `@RegisterExtension` may now be registered in an explicit order via the `@Order` annotation.
  - See [Extension Registration Order](#) in the User Guide for details.
- New `ExtensionContext` methods to access all test instances, including enclosing ones for `@Nested` tests: `getTestInstances()` and `getRequiredTestInstances()`.

# JUnit Vintage

## Bug Fixes

- The `VintageTestEngine` now uses the fully qualified class name as the *legacy reporting name* for Vintage test classes instead of the simple class name which caused problems in test reports based on legacy reporting names — for example, reports generated by Maven Surefire.

## Deprecations and Breaking Changes

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## New Features and Improvements

- The `VintageTestEngine` now validates that the version of `junit:junit` on the classpath is supported (i.e., is equal to or greater than 4.12).

# 5.4.0-RC2

**Date of Release:** January 31, 2019

**Scope:** Simplification of the `@TempDir` support, as well as minor improvements and bug fixes since 5.4.0-RC1.

For a complete list of all *closed* issues and pull requests for this release, consult the [5.4.0-RC2](#) milestone page in the JUnit repository on GitHub.

# JUnit Platform

No changes

# JUnit Jupiter

## Bug Fixes

- A change to the `TempDirectory` extension in 5.4.0-RC1 made it impossible for test classes to have any parameters declared in their constructor if the `TempDirectory` extension was registered. This regression has been fixed.

## Deprecations and Breaking Changes

- The implementation of the `TempDirectory` extension is now internal to the `JupiterTestEngine`.
  - Declarations of `@ExtendWith(TempDirectory.class)` will now result in a compiler error; however, explicit registration is no longer necessary since the `TempDirectory` extension is now registered automatically.
  - The `ParentDirProvider` and `TempDirContext` APIs and corresponding factory methods in the

`TempDirectory` extension have been removed without replacement. `@TempDir` can therefore no longer be configured with a custom file system or custom parent directory.

- See the [User Guide](#) for details.

## New Features and Improvements

- `@TempDir` can now be used without the need to explicitly register the `TempDirectory` (which is now an internal implementation).
  - See the [User Guide](#) for examples.

## JUnit Vintage

No changes

### 5.3.2

**Date of Release:** November 25, 2018

**Scope:** Bug fixes since 5.3.1

For a complete list of all *closed* issues and pull requests for this release, consult the [5.3.2](#) milestone page in the JUnit repository on GitHub.

## JUnit Platform

### Bug Fixes

- When configured with `--details verbose`, the `ConsoleLauncher` no longer throws a `MissingFormatArgumentException` if a test method display name contains `String` format specifiers such as `%c`.

## JUnit Jupiter

### Bug Fixes

- `Assertions.assertAll()` is now thread-safe — for example, it can now be used with a *parallel Stream*.
- The `OS.SOLARIS` enum constant used with `@EnabledOnOs` and `@DisabledOnOs` is now also detected as the current operating system if the `os.name` JVM system property contains `"SunOs"`.
- `Assertions.assertLinesMatch()` no longer throws a `NullPointerException` after evaluating a fast-forward match if there are more expected lines after the fast-forward match than remain in the actual results. This bug only manifested itself if the expected list size was equal to or greater than the actual list size.
- Multidimensional arrays may now be supplied to `@ParameterizedTest` methods from factory methods configured via `@MethodSource`.



- For example, a factory method with the signature `static Stream<int[][]> factory()` can be used as the `@MethodSource` for a `@ParameterizedTest` with the signature `void test(int[][])`.
- Threads created for running tests in parallel now use the same thread context class loader (TCCL) that was set when creating the underlying executor service. This resolves `ClassNotFoundException` issues that only occur in parallel execution mode when a custom TCCL is in place.
- When executing tests in parallel, lifecycle methods and callbacks called after a `@TestFactory` method are now always executed after the dynamic tests returned by the method.
- Exceptions thrown during initialization of static `@RegisterExtension` fields now cause the test class to fail instead of being silently swallowed.

## JUnit Vintage

No changes

### 5.3.1

**Date of Release:** September 11, 2018

**Scope:** Bug fixes since 5.3.0

For a complete list of all *closed* issues and pull requests for this release, consult the [5.3.1](#) milestone page in the JUnit repository on GitHub.

## JUnit Platform

### Bug Fixes

- An `OutOfMemoryError` regression introduced in JUnit 5.3.0 has been fixed.
  - Specifically, the `NodeTestTask` used by implementations of `HierarchicalTestEngine` (such as the Jupiter and Vintage test engines) no longer retains references to contextual state after a node has completed execution. This allows state such as instances of test classes to be properly garbage collected by the JVM.
  - Previously, a `NodeTestTask` instance was created for each `TestDescriptor` before starting execution. Now they are created on the fly and can be garbage collected by the JVM after the enclosing container has finished.
- The [OpenTest4J](#) dependency has been updated to 1.1.1 to fix a serialization incompatibility between 1.0.0 and 1.1.0 that caused failure messages to be discarded when used from Gradle and potentially other tools and IDEs.

## JUnit Jupiter

## Bug Fixes

- Invocations of `assertThrows()` that are passed a method reference for an overloaded method with a `void` return type once again compile.
  - For example, given an instance of `java.lang.Object` stored in a variable named `object`, `assertThrows(Exception.class, object::wait)` compiled against JUnit 5.2.0, failed to compile against JUnit 5.3.0, but now compiles against JUnit 5.3.1.

## Breaking Changes

- In order to revert the aforementioned breaking change, variants of `assertThrows()` introduced in JUnit 5.3.0 that accept `ThrowingSupplier` arguments have been removed.

## JUnit Vintage

No changes

## 5.3.0

**Date of Release:** September 3, 2018

**Scope:** Parallel test execution, output capture for `System.out` and `System.err`, new `TestInstanceFactory` extension API, custom test sources for dynamic tests, promotion of the dynamic test API from *experimental* to *maintained* status, discontinuation of the `junit-platform-gradle-plugin`, deprecation of the `junit-platform-surefire-provider`, as well as various minor improvements and bug fixes.

For complete details consult the [5.3.0 Release Notes](#) online.