Creatio Academy

Testing tools

NUnit

Version 8.0

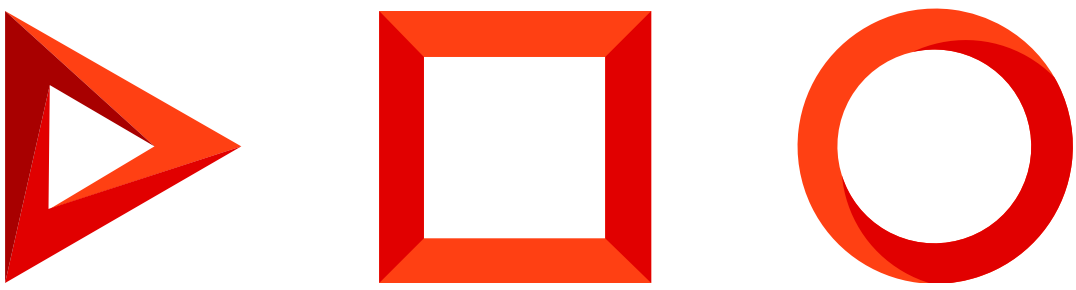


Table of Contents

NUnit

Advanced

Unit testing (module testing) is a software development process that lets you verify the operation capacity of isolated program components. Usually, developers write tests for each non-trivial method of a developed class. This lets you detect **source code regression**: errors in previously tested parts of the program.

One of the unit testing frameworks for .NET apps is NUnit, an open-source unit testing environment. A special **adapter** was developed to integrate NUnit with Visual Studio.

You can install the adapter in the following **ways**:

- as Visual Studio extension
- as NuGet project package that contains the implemented unit tests

Use of the NUnit adapter **as a Visual Studio extension** has the following special features:

- The adapter is available for any test project since the adapter becomes part of the IDE.
- The extension is updated automatically.
- Each team member who works on the test project must install a separate adapter.

Use of the NUnit **as a NuGet package** has the following special features:

- The package is a part of the Visual Studio project and available for all project developers.
- The package must be installed for all unit test projects.

Learn more about working with NUnit in the official NUnit documentation.

To **create unit tests** for custom package class methods or properties:

1. Install NUnit Visual Studio adapter.
2. Turn on the file system development mode.
3. Set up the unit test project.
4. Create tests.
5. Test the methods or properties.

Add test for the custom class

Advanced

Example. Add tests for the custom class implemented in the `UsrNUnitSourceCode` schema of the [*Source code*] type in the `sdkNUnit` custom package.

1. Install NUnit Visual Studio adapter

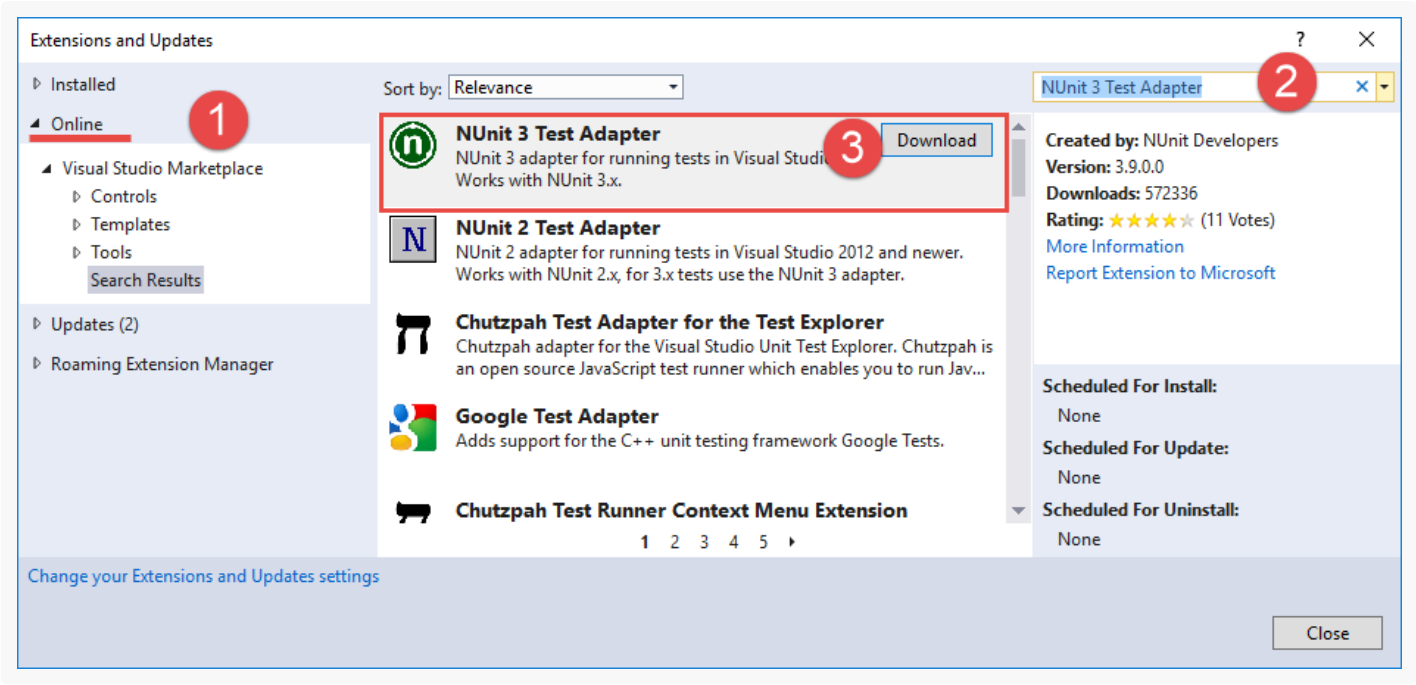
Install NUnit adapter as a Visual Studio extension

Option 1:

1. Download the extension from the Visual Studio Marketplace.
2. Double-click the *.vsix file and run the installation.
3. Select the needed Visual Studio versions during the installation.

Option 2:

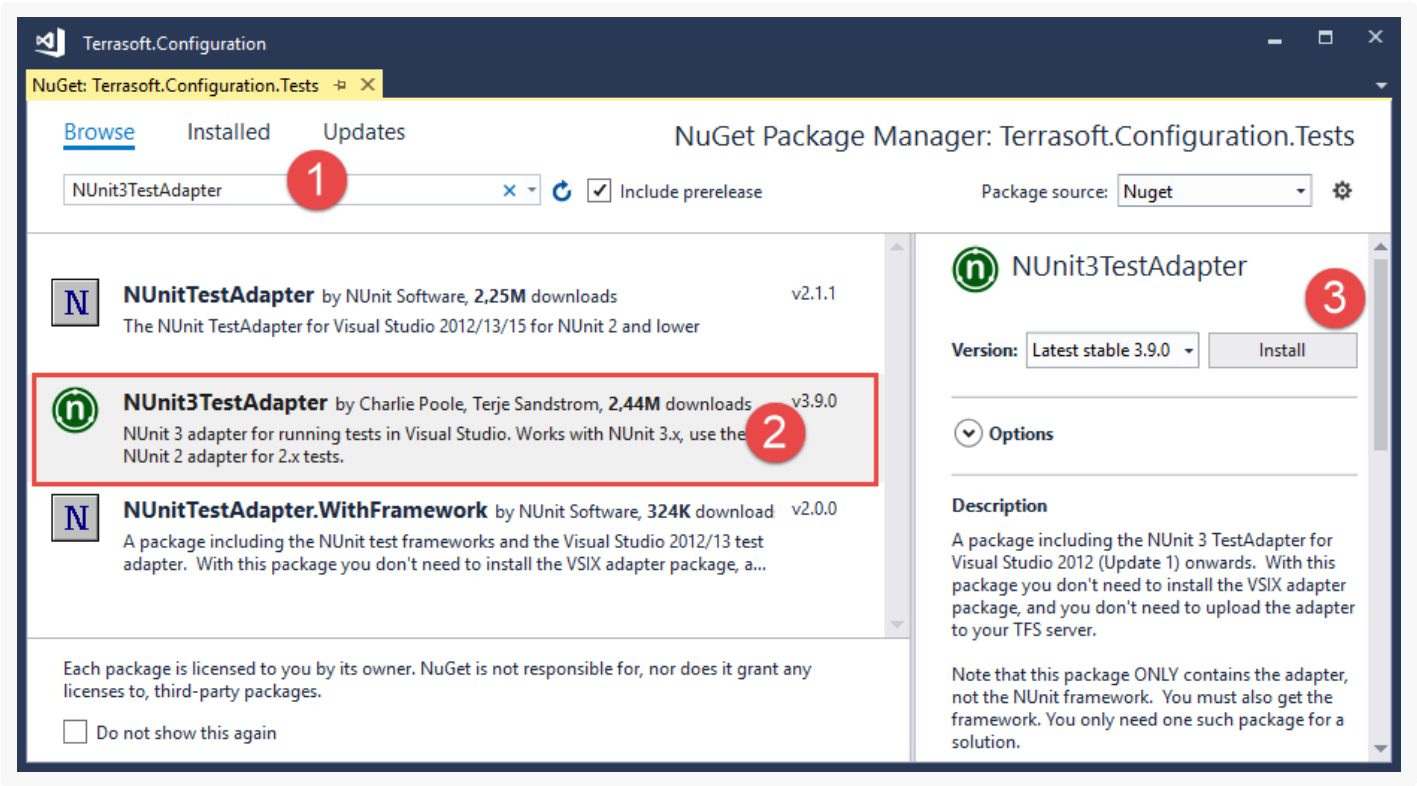
1. Click [*Tools*] → [*Extensions and Updates*] in Visual Studio.
2. Select the [*Online*] filter (1).
3. Enter "`NUnit 3 Test Adapter`" (2) in the search bar.
4. Select the `NUnit 3 Test Adapter` extension (3) in the search results.
5. Click [*Download*] to install the extension.



Install NUnit adapter as a NuGet package

1. Right-click the test project name, for example, `Terrasoft.Configuration.Tests.csproj`, and select the [*Manage NuGet Packages...*] command.
2. Enter "`NUnit3TestAdapter`" (1) in the search bar.
3. Select the `NUnit 3 Test Adapter` package (2) extension in the search results.
4. Click [*Install*] to install the package.

   Learn more about installing the NuGet package in the official Microsoft documentation.



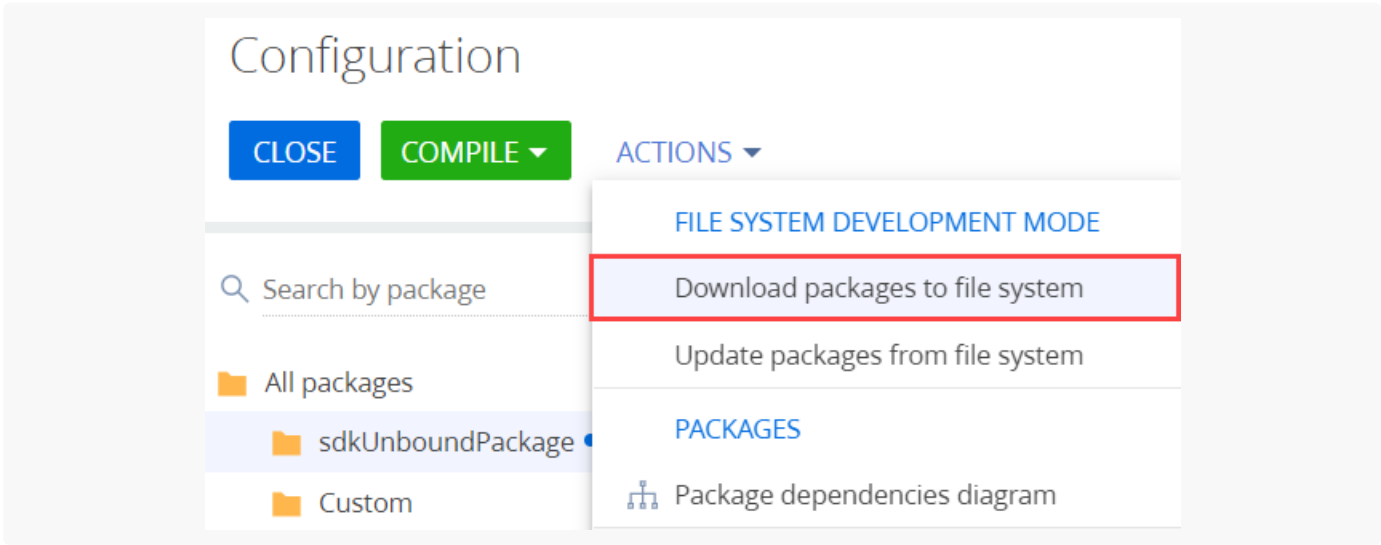
2. Export the package to the file system

You can create unit tests for .NET classes from Creatio packages only in the file system development mode.

This example uses the `sdkNUnit` custom package.

To **download a package** to the file system:

1. Set up Creatio for the file system development mode. To do this, follow instruction in a separate article: External IDEs.
2. Select [*Download packages to file system*] in the [*File system development mode*] group of the action menu.



As a result, the packages will be downloaded along the `..\Terrasoft.WebApp\Terrasoft.Configuration\Pkg` path to the directory whose name matches the package name. The `sdkNUnit` package contains the `UsrNUnitSourceCode` schema of the [*Source code*] type.

The `UsrNUnitSourceCode` class that contains the methods to write tests is implemented in the source code of the `UsrNUnitSourceCode` schema.

`UsrNUnitSourceCode`

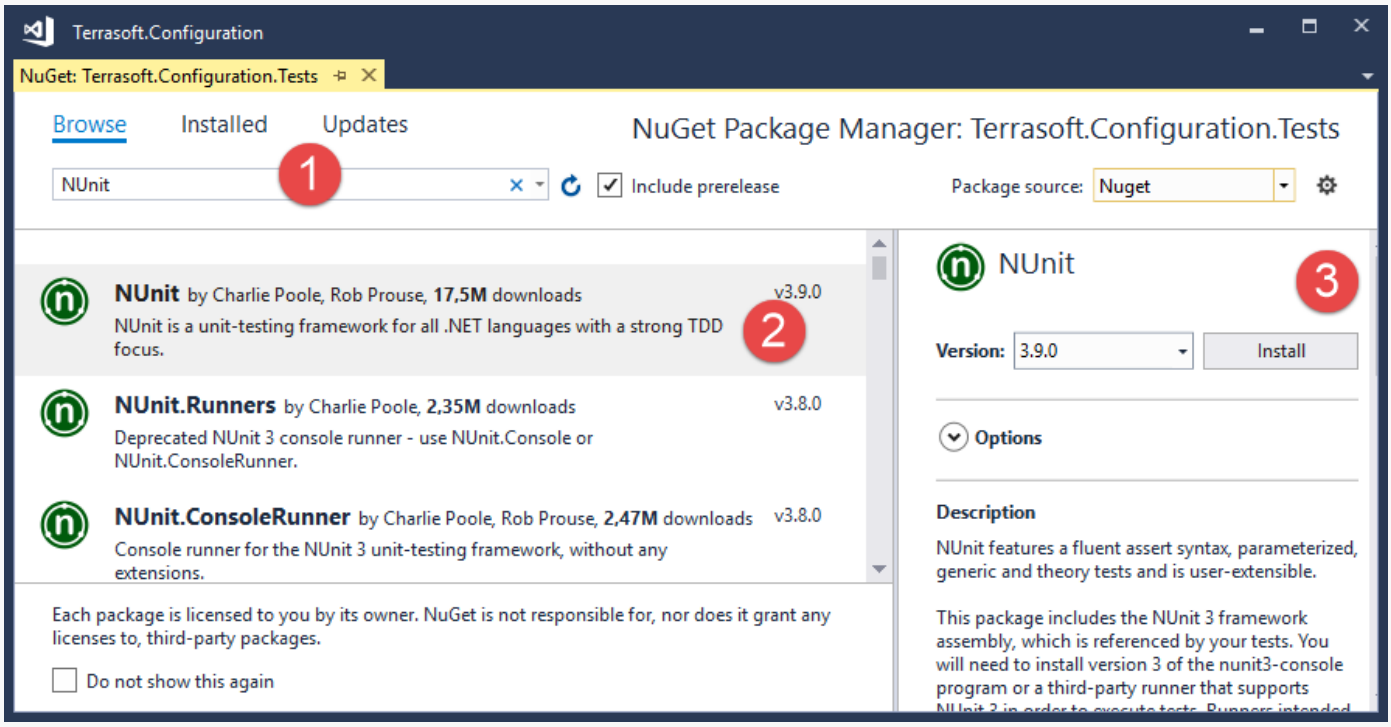
```
namespace Terrasoft.Configuration
{
    public class UsrNUnitSourceCode
    {
        /* String property. */
        public string StringToTest
        {
            get
            {
                return "String to test";
            }
        }
        /* The method that verifies the equality of the two strings. */
        public bool AreStringsEqual(string str1, string str2)
        {
            return str1 == str2;
        }
    }
}
```

3. Set up the unit test project

This example creates unit tests in the `Terrasoft.Configuration.Tests.csproj` pre-configured project that is delivered together with the `Terrasoft.Configuration.sln` solution.

To create tests in the `Terrasoft.Configuration.Tests.csproj` project using the NUnit framework, **add the `NUnit` NuGet package to the project dependencies**. To do this:

1. Right-click the `Terrasoft.Configuration.Tests` project name in the [*Solution Explore*].
2. Select [*Manage NuGet Packages...*].
3. Enter "`NUnit`" (1) in the search bar.
4. Select the `NUnit` package (2) in the search results.
5. Click [*Install*] to install the package.

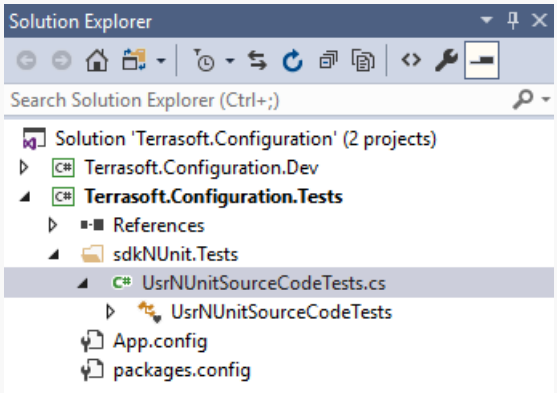


4. Create tests

The **name of the class that contains the tests** must consist of the class name and the "`Tests`" suffix. To **group tests in a project**, it is also convenient to place them in a directory whose name matches the tested package name and has the "`.Tests`" suffix.

To **create tests**:

1. Create a `sdkNUnit.Tests` directory in the `Terrasoft.Configuration.Tests.csproj` project.
2. Create a `UsrNUnitSourceCodeTests` class in the `sdkNUnit.Tests` directory. Visual Studio will save the class source code to the `UsrNUnitSourceCodeTests.cs` file.



3. Add the methods that implement tests to the `UsrNUnitSourceCodeTests` class.

```
UsrNUnitSourceCodeTests
```

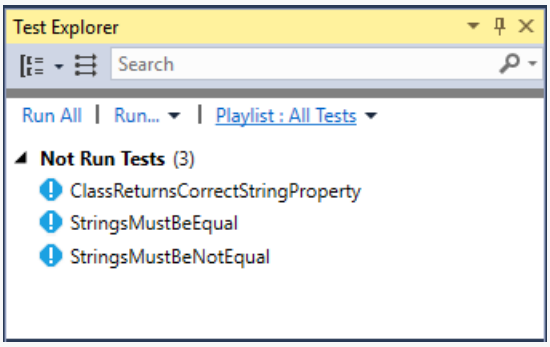
```
using NUnit.Framework;

namespace Terrasoft.Configuration.Tests.sdkNUnitTests
{
    [TestFixture]
    class UsrNUnitSourceCodeTests
    {
        /* The tested class instance. */
        UsrNUnitSourceCode objToTest = new UsrNUnitSourceCode();
        /* The testing string. */
        string str = "String to test";

        [Test]
        public void ClassReturnsCorrectStringProperty()
        {
            /* Test the string property value.
            The value must be populated and match the required value. */
            string res = objToTest.StringToTest;
            Assert.That(res, Is.Not.Null.And.EqualTo(str));
        }

        [Test]
        public void StringsMustBeEqual()
        {
            /* Test the value equality of the two strings. */
            bool res = objToTest.AreStringsEqual(str, "String to test");
            Assert.That(res, Is.True);
        }

        [Test]
        public void StringsMustBeNotEqual()
        {
            /* Test the value inequality of the two strings.
            This test will fail since the values are equal. */
            bool res = objToTest.AreStringsEqual(str, "String to test");
            Assert.That(res, Is.False);
        }
    }
}
```

The `[TestFixture]` attribute indicates that the `UsrNUnitSourceCodeTests` class contains tests. Add the `[Test]` attribute for each method that tests a specific functionality of the class. Learn more about the attributes of NUnit framework in the official NUnit documentation.

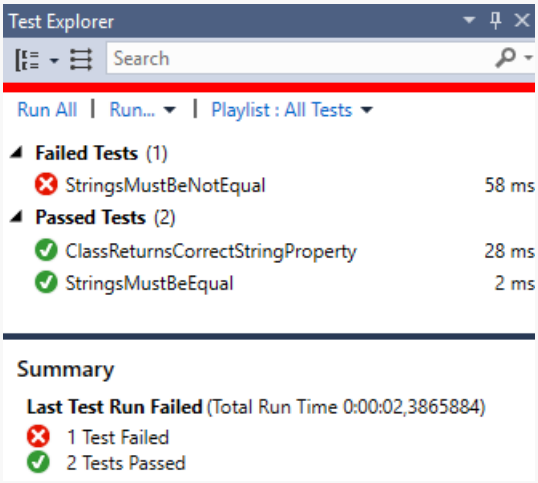
Use the Assert.That() method for testing. The method takes the tested value. Use objects that constrain the tested value as arguments. Learn more about the constraint model in the official NUnit documentation.

5. Test the class

1. Click [*Test*] → [*Windows*] → [*Test Explorer*] in the Visual Studio.



2. Execute the [*Run All*] command to run the tests. Successfully passed tests will be moved to the [*Passed Test*] group, and failed tests will be moved to the [*Failed Test*] group.



Learn more about the [*Test Explorer*] window functionality in the official Visual Studio documentation.