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# DUCXunit: Unit Tesing Environment for Fabasoft DUCXdev

Automated testing of software is a must in today's software industry. In particular, testing of the smallest pieces of code, called unit testing, is critical. DUCXunit is providing unit test support for Fabasoft DUCXdev, which is a development platform for content enabled vertical applications (CEVAs).

The Fabasoft DUCXdev applications are written using domain specific languages. DUCXunit is not just a unit testing framework, but it consist of domain-specific language for unit testing, the editor for this language and an Eclipse plug-in.

Unit Testing

Compilers

Web Services

Domain Specific Languages

JUnit

## Introduction

DUCXunit is a framework that adds unit test support to the Fabasoft DUCXdev platform. This solution belongs to the category of xUnit frameworks along with JUnit, TestNG, NUnit, etc.

The design of DUCXunit is influenced by all these existing unit testing frameworks and has most of their characteristics. However it is unique and different, because of DUCXdev platform characteristics.

Firstly, in the Fabasoft DUCXdev platform, for every aspect of software development there is a different domain-specific language (DSL). Unit testing is a new aspect for the DUCXdev platform. Therefore it is normal to add one more DSL for writing unit tests.

Secondly, DUCXdev is a service oriented platform, which means that the evaluation of the code is performed remotely by a web service. Therefore, unit test evaluation should also be implemented as a web service.

All these characteristics make DUCXunit a unique framework, but at the same time it conforms to xUnit standards.

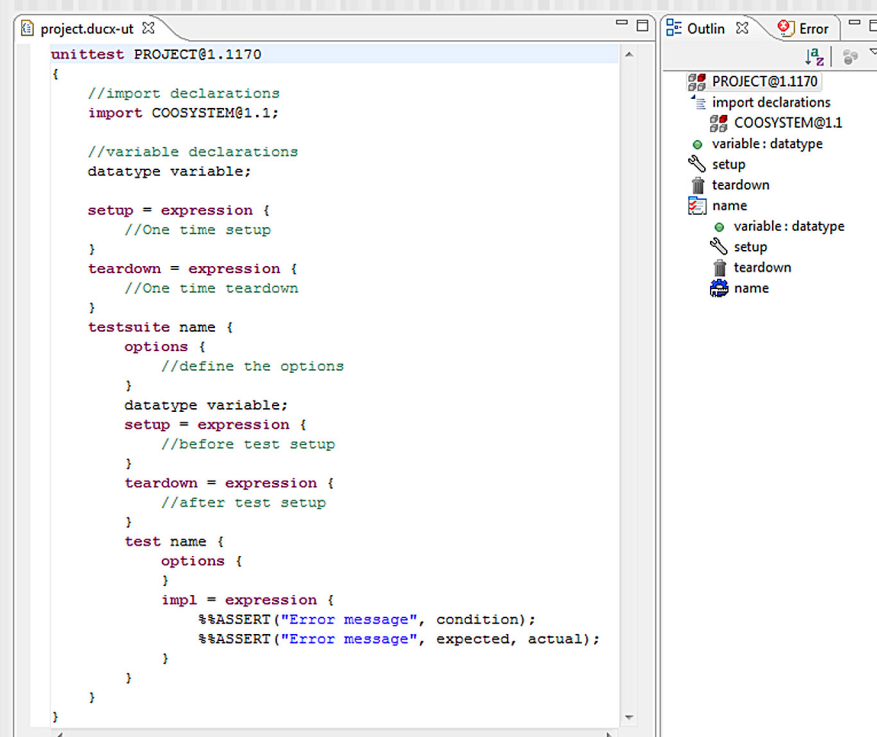
## Unit Testing Language

The new domain-specific language (DSL) used for unit testing of Fabasoft DUCXdev had to meet two requirements: to conform to xUnit – the standard for unit testing – and to be similar to the other DUCXdev languages. The DUCX Unit Test Language is a hybrid of the two.

The language was described with a formal grammar, written in ANTLR v3 (ANother Tool for Language Recognition). ANTLR transforms the grammar to a compiler written in Java. The compiler recognizes the language, detects and recovers errors, and transforms the unit tests into Java objects which will be later used by the unit test runner.

## Eclipse Plug-in

DUCXunit is integrated into Eclipse. It can be installed as a plug-in. The tests written with DUCXunit can be easily executed from the development environment with a single click. The results of the tests can be exported in XML format which is JUnit compatible. This allows you to display the test results in the well known JUnit view within the Eclipse environment. The DUCXunit Eclipse feature also consists of a unit test editor.



## Unit Test Editor

Like all DUCXdev languages, there exists a source code editor for the DUCX Unit Test Language. The editor is integrated with Eclipse, and is implemented using the Xtext framework.

The Xtext framework takes as input a grammar, and it transforms it to a source code editor in Eclipse. The source code editor offers incremental syntax checking, syntax highlighting, outline view, autocompletion and semantic checks. These features were customized to fit the needs of DUCXunit.

The source code editor also recognizes the expression language of DUCXdev, making it possible to implement use cases and other constructs using the source code editor.

