

Open GIS Consortium, Inc.

OpenGIS Test Protocol:
Coordinate Transformation Services
For COM

OpenGIS Project Document 01-043

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1 Preface

1.1 Submitting Companies

The following company is pleased to submit this test protocol as a companion to the “OpenGIS Implementation Specification: Coordinate Transformation Services” (OpenGIS Project Document Number 01-009):

Computer Aided Development Corporation (Cadcorp) Ltd.

1.2 Submission Contact Point

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2 Overview

This document specifies a standard protocol for testing candidate OpenGIS Coordinate Transformation Services for COM implementations.

There is a single test program that checks that all of the mandatory features have been implemented, and can be called, but that does not check that the returned values are valid.

In addition, an optional set of sample coordinate transformations is provided for testing. See [Optional Transformation Test](#) for more details.

3 Architecture

The test script is written in Microsoft Visual Basic Version 6. VB6 was chosen as the test script language because it has good compatibility with COM, and is widely available.

The test script is completely implementation independent, with the user being prompted for COM object names each time the test is used. The COM object names required are those of the 'factory' interfaces in the CS and CT packages. These factory interfaces are then used to create all other objects.

There are several groups of tests, and these fall into three categories, as follows.

3.1 Mandatory Interface Tests

These tests check that objects created by the factories implement the mandatory interfaces.

3.2 Mandatory Method Tests

These tests check that the interface implementations support all mandatory methods. As stated above, the results of these calls are not checked for validity.

3.3 Optional Transformation Test

This tests the candidate implementation against a sample set of known coordinate transformations, based on the test cases in a Defense Mapping Agency (now NIMA) Technical Report "Supplement to Department of Defense [sic] World Geodetic System 1984 Technical Report", Parts I "Methods, Techniques and Data used in WGS84 Development" (DMA TR 8350.2-A), and II "Parameters, Formulas, and Graphics for the Practical Application of WGS 84" (DMA TR 8350.2-B). See http://www.nima.mil/GandG/tr8350_2.html for more details.

The samples are all contained in a script file called "CT_TestScript.txt". This file is an implementation- and DCP-independent recipe for creating and testing coordinate transformations. The test program reads the script, and interprets the recipe, converting the command keywords to actions. The keywords used in the script file are as follows (arguments in square brackets [] are optional, all others are mandatory):

- `set SYMBOL=TEXT`
 - Where 'SYMBOL' appears later in the script, 'TEXT' will be inserted instead.
- `cs_source=CS_WKT`
 - Create the 'source' CS from the given Well-Known-Text.
- `cs_target=CS_WKT`
 - Create the 'target' CS from the given Well-Known-Text.
- `test_tolerance=(tol0[,tol1,tol2,tol3,tol4,tol5,tol6,tol7])`
 - Set the tolerance for subsequent ordinate comparisons.

- `test_tolerance=tol0`
 - Set the tolerance for subsequent ordinate comparisons.
- `pt_source=(ord0[,ord1,ord2,ord3,ord4,ord5,ord6,ord7])`
 - Set the source ordinates for the test.
- `pt_target=(ord0[,ord1,ord2,ord3,ord4,ord5,ord6,ord7])`
 - Set the target ordinates for the test.

The script first sets up some commonly used symbols, then runs through several known reference positions. A single test involves setting `cs_source`, `cs_target`, `test_tolerance`, `pt_source` and `pt_target`. When the `pt_target` is set, the test program checks that the result of the forward (from `pt_source` to `pt_target`) transformation between `cs_source` and `cs_target` is within the `test_tolerance`.

4 Test Protocol

Follow these steps in order:

1. Install the candidate implementation
2. Run the supplied CTest.exe Visual Basic executable
3. Enter the implementation-specific object class names in the first dialog
4. Choose the tests that you want to perform (some tests are mandatory, and some are optional)
5. Review the results when the tests have finished.