

OVERVIEW

There were a lot of requests from customers about possible ways to integrate C++ ODA SDKs into their non-C++ solutions, especially to .NET and Java projects.

ODA is a huge library and it is impossible to rewrite it for several other languages. The solution was to make wrappers for C++ API for some most common target languages.

The only possible solution was to make wrappers for each target language. This allows customers to use ODA SDKs in their non-C++ solutions with minimal efforts.

Wrapper is a thin layer in target language which marshals calls to C++ libraries and backwards. Currently we use SWIG to generate wrappers for ODA libraries.

SWIG -is an open-source software tool used to connect computer programs or libraries written in C or C++ with languages such as Python, C#, Java and others.

C++ SDK is very big and has a lot of changes in each release. An automated tool like SWIG allows us to wrap a lot of C++ API fast and allows us to keep our wrappers in up to date state.

The generated interface is identical to C++ API (as you can see from the examples). Which means a user can use C++ documentation for other languages as well.

Wrappers ODA API is totally identical to C++ API with respect to language constructions.

The wrappers project allows ODA member to simplify their product development:

- Easy and quick use of ODA SDK in their solutions; they don't need to implement proxy layers for target languages
- ODA keeps wrappers in up-to-date state with C++ API
- Identical API allows using all experience and code samples from C++ to solve the problems

Currently, using SWIG, ODA provides API for managed languages like C# and VB.NET, Java, and Python. Oda API consists of many separate SDKs and they are compiled for many platforms. Wrappers API and platform coverage is different for different target languages.

■ C# target language

C# have the most coverage, all main ODA modules have API wrapped for C#. C# wrappers are available in 3 configurations: For .NET Framework, .NET5 and .NET6. In terms of platforms, .NET Framework configuration is available for Windows and .NET5/.NET6 wrappers are cross platform and available for Windows, Linux and MacOS. In general .NET6 technology also allows writing software for mobile platforms: Android and iOS. Currently we don't have such a build type for our wrappers but it is planned for development.

■ Java target language

Currently we have only main SDKs wrapped for Java: Kernel, Drawings and Dgn (part of drawings). Java version ≥ 8 compatible. Most of the requests were related to C# and ODA team is focused mainly on C# now, but we have plans to extend Java wrappers for at least IFC SDK.

Java wrappers are available for Windows, Linux, Mac and Android platforms.

■ Python target language

Python wrappers were added recently. Wrappers are available for python versions: 2.x and 3.x At the moment we have python wrappers for Windows; Linux wrappers development is in progress. MacOS wrappers are planned for the future.

WHAT'S NEW 2022

Most of the improvements on the project are internal and their goal is to make sure that customers get up to date API each release.

Besides this, we implement wrappers for new C++ SDKs and fix bugs.

- .NET 5 support was added for .NET/C# wrappers
- .NET 6 support was added for .NET/C# wrappers
- WinUI 3 example was added for C# wrappers
- Wrapped BimRv and BimNv SDKs
- Wrapped different new classes which were added to C++ API: OdTvCameraAnimation, OdPdf3DStreamExtractorModule etc
- Upgraded exception mechanism: now C# exception contains useful information about C++ exception which was thrown
- Fixed and extended Java examples related to rendering