# openPASS / World_OSI

08.08.2018 | Setup guide

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# 1 Introduction

The World_OSI provides an implementation of the WorldInterface using Open Simulation Interface (OSI) as a “backend storage”. OSI already provides data structures for representing various objects in traffic simulation environments. As these objects are specified rather sensor centric, the OSI source currently needs some additions to satisfy the needs of the World_OSI module (see https://github.com/OpenSimulationInterface/open-simulation-interface/pull/244).

To allow unit-testing of the implementation, an additional layer has been introduced on top of OSI, whose classes represent the objects needed in the simulator’s world using Google protobuffers. Another benefit of this layer is keeping the area of contact to the data backend small, to allow easy adaption if OSI switches from protobuf to another storage technology (open discussion).

The current use of protobuf provides easy serialization and deserialization of all stored data out-of-the-box.

# 2 Prerequisites

Before being able to compile and run the World_OSI module, make sure to have all dependencies installed. You can follow the guide for setting up the openPASS environment located in `Documentation/openPASS_Setup_StepByStep.pdf` which is located in the openPASS source repository. Please note to check out the intech branch, where the OSI changes will be located for now. For the OSI world demonstration an additional project file OpenPASS_OSI_UseCase has been added.

# 3 Dependencies

The World_OSI module introduces an additional third-party dependency on the OSI library, and as a consequence on Google protobuffers.

## 3.1 Protobuf

If not already installed on the system, the protobuf library and headers have to be installed prior to being able to compile OSI. Source is located here: https://github.com/google/protobuf, installation instructions can be found in `src/README.md`

### 3.2 Open Simulation Interface

The OSI project is hosted on Github. Please check out the source of the mentioned pull request and compile OSI using the following commands executed from the source directory (adjust paths to your needs).

```
cmake . \
    -DCMAKE_INSTALL_PREFIX=~/repos/ThirdParty \
    -DCMAKE_BUILD_TYPE=Release \
    -DProtobuf_INCLUDE_DIR=~/repos/ThirdParty/include \
    -DProtobuf_PROTOC_EXECUTABLE=~/repos/ThirdParty/bin/protoc \
    -DProtobuf_LIBRARIES=~/repos/ThirdParty/lib

make
make install
```

The OSI class documentation is part of the source code and can be found as a compiled version here:
https://opensimulationinterface.github.io/open-simulation-interface/index.html

## 4 Simulation

The proposed demo scenario can be simulated using the configuration files from `OpenPass_Source_Code/openPASS_Resource/OpenPass_OSI_UseCase`.