Module: IIOT NETWORK FALLBACK SIMULATION

Main functionalities

This module provides the simulation environment d3vs1m in order to simulate the network behaviour, specified with the IIoT Network Device Positioning, and a selected cyber-attack scenario. It takes properties of the mobile radio devices as input and simulates the network behaviour and the energy consumption of battery-powered devices. Depending on the simulation setup, the user gets the adapted network behaviour with an applied fallback strategy to block or mitigate the simulated cyber-attack.

Technical specifications

Processor – 1 GHz

RAM -512 MB

Disk space (Minimum)

32-bit – 4.5 GB

64-bit – 4.5 GB

Inputs and outputs

Inputs:

JSON configuration files

OBJ files (Wavefront) as 3D environment

Outputs:

JSON files with meta information

CSV files as simulation data report

HTTP+JSON on web service

Formats and standards

The simulation modules are developed completely in C# and based on the .NET Standard 2.0. This can be seen as the contract to multiple target environments that can execute the application logic. The provided runtime may be installed on Windows, Linux, Mac or even mobile or industrial computers. The modules can be used on every system where one of the following runtime versions is installed:

.NET Core Runtime or .NET Core Software Development Kit (SDK), version 3.1 with long term support (LTS) is recommended.

.NET Framework 4.8 Runtime or Development Pack

.NET 5 Runtime or SDK

The application uses different file formats and APIs summarized in the following list:

REST-full API: the interface of the web service provides HTTP+JSON endpoints

JSON files as input and output configuration

CSV files as simulation data report

Owner (organization)

Fraunhofer Institute for Machine Tools and Forming Technology (IWU), https://www.iwu.fraunhofer.de/

Documents

Online repository of the source code, licenses, API and user documentation: https://github.com/adriansinger87/d3vs1m

Trainings

To learn more about the solution, click on the link below to access the training on the Moodle platform

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