

# Integration of Java and C++ Federations in M&S HLA Simulations

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## Abstract

High Level Architecture (HLA) constitutes a modern approach to distributed simulation of complex systems.

In our paper, we discuss extending existing platform CERTI, an open-source Run-Time Infrastructure, with binding to previously unsupported Java language.

In addition, we investigate ways of simplifying the process of adding a support for new languages by using automated code generation.

We test the extension by modifying the OpenRADAR to use the Flight Gear simulator data while utilizing the Virtual Air middleware.

## jCERTI

To utilize the CERTI framework in the simulation components one needs to use LibRTI – a library facilitating conversion of standardized HLA service calls into CERTI calls.

Implementing it in a new language is a non-trivial task and it takes a fair amount of effort. We implemented version of LibRTI nicknamed jCERTI which supports Java language.

It is very important to support multiple languages as it gives freedom to developers of simulation components. Because every language has some advantages and disadvantages and the final choice must consider them with the purpose of the component in the scope.

jCERTI was integrated into official repositories and will be included in next CERTI release.



Visit CERTI homepage at <http://www.cert.fr/CERTI/> for CERTI related information

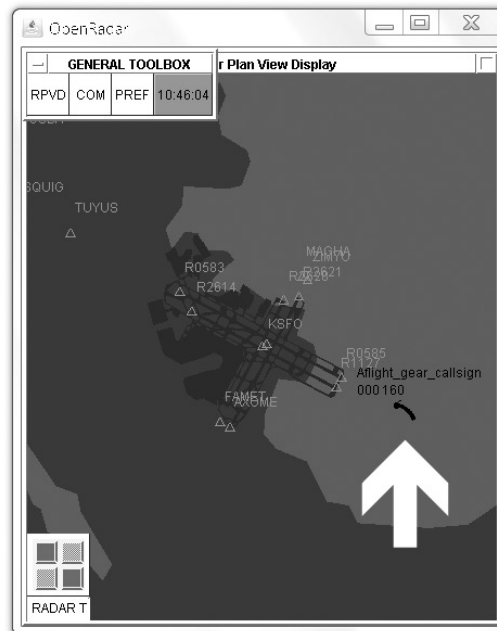


Figure: Virtual radar screen visualising Flight Gear plane position in realtime

## Generator

We use a generator written in Python to generate portions of the code responsible for communication of jCERTI with CERTI infrastructure.

Main advantages of this approach are easy maintenance of the system and proper distribution of bugfixes.

## OpenRADAR

In addition to standard testing methods we created a demo simulation by modifying OpenRADAR to fetch the data from Flight Gear simulator supported by Virtual Air middleware and push them to its visualization pipeline.