



## OpenMAX-IL interface implementation tested with MSC Tracer.

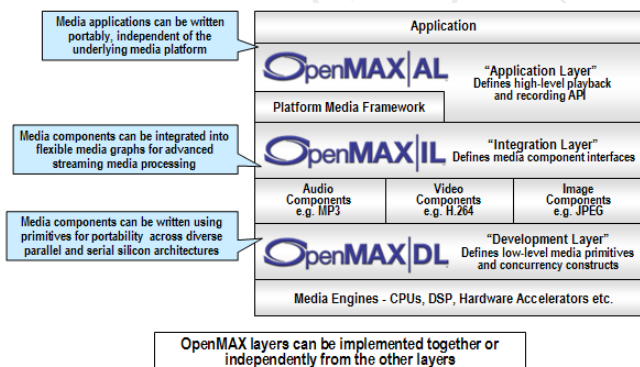
This is a short note on MSC Tracer utilization within one of the ST-Ericsson's projects. The goal of this project was to develop a software layer running on an ARM core using the OpenMAX IL standardized media component interface. This project has been developed in Sophia-Antipolis by two audio software engineers: Sebastian Mulewski and Alain Di Piazza.

### The company

ST-Ericsson is a leading company specialized in audio, video and telecom solutions for the mobile communication market. Created as result of the conglomeration between STMicroelectronics and Ericsson, its mission is to provide 2G and 3G mobile platforms and multimedia designs to the market.

### The OpenMAX standard

The OpenMAX IL (Integration Layer) API defines a standardized media component interface to enable developers and platform providers to integrate and communicate with multimedia codecs implemented in hardware or software.

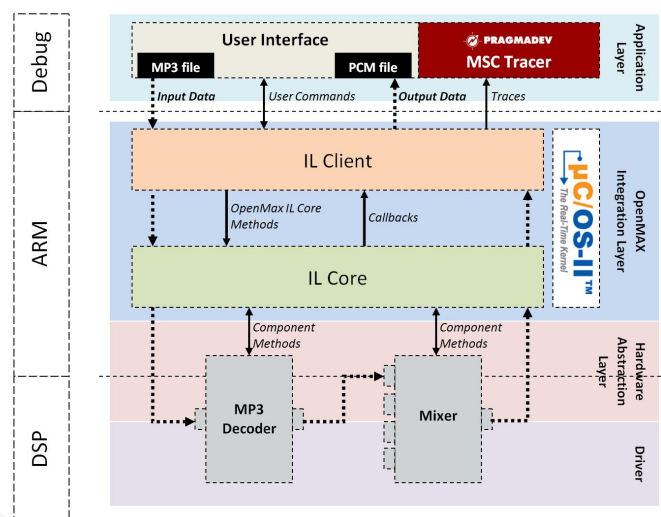


The OpenMAX IL API strives to give media components portability across an array of platforms. Each module is encapsulated in a component interface. OpenMAX defines three main types of entities:

- **IL Client** : This module represents the application which uses the OpenMAX services.
- **IL Core** : This module is used to dynamically load and unload the different components.
- **The components**: The components can be sources, codecs filters, mixers or any other data operators.

### Audio use case

The example below shows a simple use case, which consist in an audio playback processing chain. An MP3 file is decoded and sent to a mixer to be eventually mixed with other audio sources.



On our implementation, the different components (MP3 decoder, Mixer, Etc..) are running on an ARM core, but the processing in itself is entirely performed by a dedicated DSP.

### The project

The Hardware Abstraction Layer (HAL) developed for this project is using the standardized OpenMAX-IL interface. It controls and abstracts the main audio features running on the audio DSP subsystem. The interaction between the different components has been validated and tested with PragmaDev MSC Tracer tool in ST-Ericsson's facility located in Sophia Antipolis.

### The needs

On this project, it was very important to visualize the communication between the ARM processor and the DSP as well as the communication between the different OpenMAX components.

We started looking for a tool that could provide graphical representation of all tasks, messages and objects implemented in the OpenMAX IL layer. MSC Tracer tool was selected because it can represent traces on a diagram and it is very easy to use.

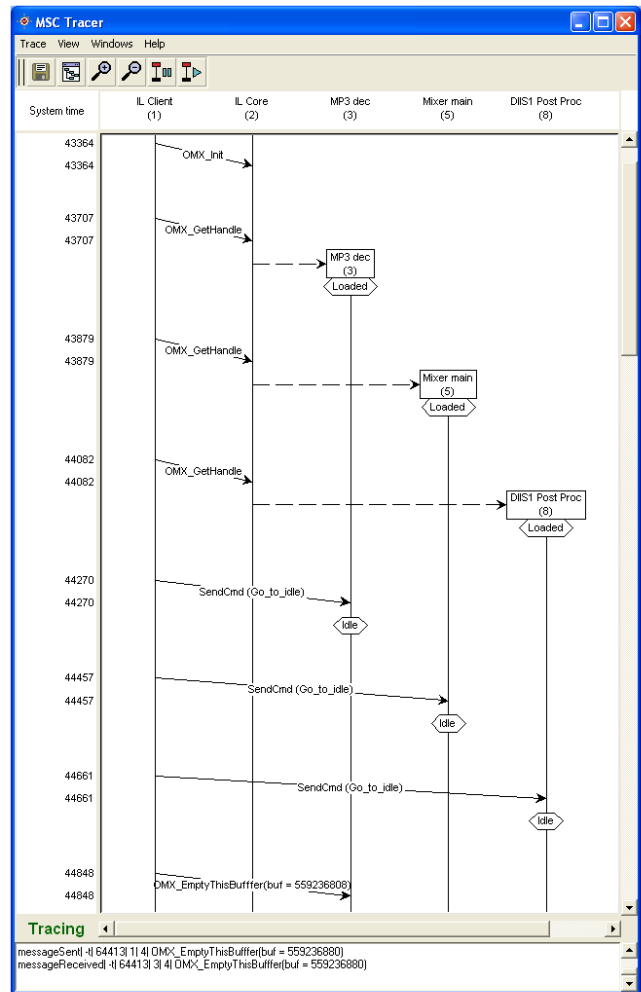
## The solution

MSC Tracer allows showing data exchange between entities and can reconstruct any scenario in an easy manner. The diagram is easy to read and based on international standards. MSC Tracer uses socket-based communication to retrieve data from the source; therefore it can be installed on every station in the network.

In addition, the tool allows editing the diagrams: zoom in, zoom out, pause tracing etc. It is also possible to save traces in order to further retrieve them even if the source is not connected. MSC Tracer displays time between the events which is very useful when checking the correct behavior of the firmware.

Generally speaking the utilization of the tool turned out to be indispensable in the project. The idea of generating diagrams from the traces allows saving time and getting a better understanding of the global architecture. Below

is shown an example of a scenario ran on ARM where basic OpenMAX methods are traced.



## PragmaDev

We have very good relationships with PragmaDev that acted like a partner. If requested, they can adapt the tool for your specific needs.

## Future work

MSC Tracer has been a very suitable solution to test and demonstrate our software. Its user-friendly interface lets save your time and brings you to work more efficiently. We strongly recommend MSC Tracer to all that are looking for a tool to visualize the interaction between modules or components like in our OpenMAX projects.