OPENBACH, OPEN METROLOGY TESTING FRAMEWORK

General context presentation

May, 30st 2017

Satellite Mobile Innovation Laboratory & Engineering

WELCOME IN « OPENBACH » DAY

Goals :

- Present OpenBACH technical objectives and details
- Exchange with satcom network and access community on the need and have feedbacks.

CNES contacts :

SMILE Projet :

Christelle Boustie

PAR TEAM

Emmanuel Dubois, N. Kuhn, J-B Dupé, P. Gélard.

Developer :

Viveris Technologies : David Pradas.

OPENBACH AGENDA

9h15 – 10h15	**General context presentation** **General technical presentation**
10h15 - 10h30	**Pause**
10h30 - 11h30	**Detailed technical presentation with examples**
~ 11h30 – 12h00	**Questions and answers**

A buffet will be available after the presentations for discussion.

CONTEXT : RESEARCH & ENGINEERING
TOOL OBJECTIVES

➢Goals

Need of tools to maintain and improve skills on satcom protocols engineering

Study validation, performance evaluation, protocol adaptation to satellite constraints

Develop and validate new satcom mechanisms and new architectures (star, mesh, …)

Test and validate services and applications in a real time environment

➢Usage

R&T studies, PhD postdoc

Telecom projects : CNES, European Commission, ESA, …

Internal studies

Education

⇒ OpenSAND has been developed for core satcom emulation

For simulation, tools are integrated with end to end capabilities : NS2/NS3.
Not the same scope and usage.

CONTEXT : WHY OPENBACH ?

- Around OpenSAND, lack of a benchmark for consistency in the configuration and the metrology in many projects : CNES R&T, internal projects, industrials prospects,…

- There is a need for a consistent benchmark tool, otherwise it is :
  - Difficult to reproduce tests between studies, partners, …
  - Difficult to analyze and compare results
  - Difficult to maintain tools outside OpenSAND
  - Difficult to reproduce tests on real satellite platform (CESARS CNES platform for instance)

Many aspects are common to several studies : need to generalize the benchmark.

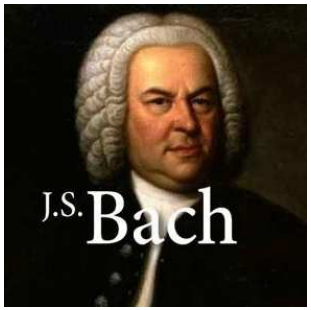
OpenBACH Project

Open Benchmark Automation tools for Communication and Hypervision

OPENBACH NAME

- **OPEN** : Like OpenSAND, will to make it open source and public.

- **BACH** : « Benchmark Automation tools for Communication and Hypervision ». The « orchestrator » !



GENERAL OBJECTIVES

- Integrate existing metrology tools.
- Provide a **modular** integration (as plugins) for each new tool.
- Allow the implementation for different types of networks (terrestrial / satellite) technologies and equipment, with minimal adaptation.
- But independent of the network or network emulation means
- Allow various types of application / transport stream
- Based, wherever possible, to a maximum of **open-source** components.
- Easily scalable to allow the addition of architectures, services, components and / or measured elementary functions.

HISTORY OF THE PROJECT

- **2013** : SMILE project propose to fund transport performance tool for studies.
- **2013** : First requirements and specifications study with **Viveris Technologies, TeSA, Thales Alenia Space**
- **2015/2016** : Tool development with **Viveris Technologies, Thales Alenia Space, Objectif Libre.**
- **January 2017** : End of first beta version
- **March 2017** : Opening of OpenBACH beta version.
- **2017** : Development of new features and use in different contexts
- **2018** : Objective of first stable version 1.0.0.

OPENBACH USE CASES

- R&T Studies :
  - Currently with Terrestrial/Satellite Sharing R&T based on MP-TCP (see example)
  - MMT
  - But all future studies where the tools can be useful
- PhD
- Internal use
- BDTM (Banc de Test Mobile) Mobile testing vehicle : test of mobile antenna, ACU, modem in real time and postprocessing with speed, position and altitude of the vehicle.

OPENSAND EXPLOITATION EXPERIENCE

The goals achieved with OpenSAND were :

- Used in many satcom projects thanks to the open source distribution.
- Some contributions, mainly bugs and user experience
- Opening has helped the quality and clarity of design, documentation
- Constant Evolutions
- Maintenance

With this success, same orientation is **foreseen** for OpenBACH with open source virtuous loop.

OPENSAND AND OPENBACH PHILOSOPHY

- The objective is to optimize and rationalize more the research and development in satellite access and networks domain, avoiding duplication of efforts and therefore facilitate programs of new satellite solutions.

- Trust between partners is possible as free licence guarantee each one freedom and **independence**. The tool can be used freely.

- The goal is to promote the sharing of modifications in a win-win strategy (difficulties to maintain some modifications alone), rather than keep multiple different platforms.

- This goal is possible in satellite networks context in satellite communications because of the little community and thus an importance of cooperation. Satellite networks are also a ‘’niche’’ compared with terrestrial networks.

CALL FOR PARTICIPATION

As OpenSAND, OpenBACH is an open tool which lives on participation and feedbacks.

The lead of the project can be opened with :

- Man power
- Funding

We are interested of feedbacks on your interest and possible participation:

- Just use it ?
- Develop in it ?
- Be part of a technical steering committee ?
- Be part in strategical orientation of the tool ?

ACKNOWLEDGEMENTS

Thanks to :

- **Viveris Technologies :** David Pradas, Adrien Thibaud, Mathias Ettinger, Aurélien Delrieu, Mickael Bitard, Julien Bernard, Didier Barvaux, Julien Couraudon
- **Thales Alenia Space :** Fabrice Arnal, Cédric Baudoin, Renaud Sallantin
- **Objectif Libre :** Guillaume Espanel and all the team
- **TeSA :** Riadh Dhaou, Emmanuel Chaput, Julien Fasson
- **ISAE :** Victor Ramiro for project audit.
- **CNES teams : particularly in DSO/NT and many others (ACM for logo…)**

CONCLUSION

- OpenBACH is open in beta version since March 2017
  - Ease of use and configuration, modular and versatile
  - Even in beta version, first tests show an efficient tool to test, validate and analyze in a satellite context
  - Go to : http://www.openbach.org for more information

- Main technical points in progress :
  - Technical Jobs
  - Network integration/configuration
  - Postprocessing
  - System configuration
  - Multi-user benchmark
  - HMI evolution

- **Partnerships are welcome ! Don’t hesitate to contact us if interested.**