TANGO integration in MORPHO-SATIS project

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1. AKKA GROUP introduction
A WORLDWIDE € 1002 MILLION
MULTI-SPECIALIST

2015 revenue

12,220
talented Individuals

A PRESENCE IN
Europe, Asia & America

7 VALUE-ADDED EXPERTISES
for a global offer

REVENUE BY BUSINESS SEGMENT

REVENUE BY BUSINESS UNIT

1.7% AMERICA
1.8% ASIA
2.9% EASTERN EUROPE
1.7% AFRICA
11.4% WESTERN EUROPE
33.6% GERMANY
46.9% FRANCE
ADDED VALUE FOR A GLOBAL OFFER

INNOVATION, INTERNAL RESEARCH CENTER: AKKA RESEARCH

R&D → DESIGN ENGINEERING → INDUSTRIALISATION → PRODUCTION LIFE-CYCLE

SYSTEMS ENGINEERING → PRODUCT MECHANICAL → PROCESS ENGINEERING → SUPPORT ENGINEERING → ELECTRONICS & EMBEDDED SOFTWARE → INFORMATION SYSTEM → CONSULTING
OUR SERVICES, FLEXIBLE AND TAILORED TO YOUR NEEDS

Experts on demand
Reactivity, flexibility
Our experts support you on location through
- A deep understanding of each business sectors
- A strong master of existing and coming technologies
- A concrete ability to create innovation

Engineering
Expertise, know-how
Our team support you on your work-packages and tailored turnkey solutions through our
- Mechanical design centers
- Systems design centers
- Software design centers
- Nearshore/offshore facilities

Consulting
Result & implementation oriented
Our services enable you to sustainably optimize the entire value chain through our entities
- Casciope
- MBtech Consulting

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2. AKKA industrial project:

TANGO integration in MORPHO-SATIS ONERA project
ONERA : SATIS Project

Acquisition and data processing for Wind tunnel system

SATIS PROJECT:

Système d'Acquisition et de Traitement des Informations Souffleries.
a Software and system development and deployment for F1 Wind Tunnel Testing.

PROJECT MAIN FUNCTIONS

- Management of testing
- Supervision of process and test chain
- Measurement and calculation
- Real time monitoring and customer reporting
- Test configurations preparation
- Test results report production
- Storage, archive produced test data

MAIN GOALS

- Performance, Flexibility and Availability

SATIS AKKA solution is based on durable and innovative technologies.
ONERA : SATIS
Acquisition / synchronisation

CONTEXT

- Numerous equipment's in the acquisition chain
- High capacities of simultaneous data diffusion and storage,
- High frequency expected,
- Crucial synchronisation of signal acquisition,

SATIS SYSTEM SYNCHRONISATION CAPACITIES

AKKA has designed:

- Dynamic system acquisition up to 50 KHz (and more),
- Systems’ synchronisation by software at 1 millisecond,
- Exploitation of SATIS format: specific SATIS format based on TANGO. Image
- Storage in HDF5 format
ONERA : SATIS
Real Time numerical and graphic data display

CONTEXT
- Data Display definition by WISIWIG edition
- Real Time visualisation by numerical and graphic display
- Scenes display Storage
- « Offline » visualisation expected

SATIS RT DATA DISPLAY SOLUTION
- SATIS QT Data displays created by AKKA
  - Managed by a TANGO Device
- Scenes build using QtDesigner with Real Time diffusion,
- QtDesigner used to store display under XML files
- Improving exploitation trough optimised « Men Machine Interfaces »
- Integration of NEBULA on SATIS IDE
ONERA : SATIS
Advance tests results storage &
tests’ configurations management

CONTEXT
- To ensure the traceability of the data and the tests’ configuration (Acquisition system, computation formulary, constants, software, ...)
- To allow full test replay

SATIS FOR COMPLETE TEST CONFIGURATION MANAGEMENT
- Guaranty the traceability between the data production means (Configuration, modules’ code) and test data (including measured and generated parameters)
- Based on a cooperation between a PostgreSQL Database and GIT
- Based on GIT plugin integration in Eclipse IDE,
- Providing by TANGO Devices Clusters:
  - For which configurations are managed by SATIS
  - SATIS monitors the devices clusters.
ONERA : SATIS
Real Time computation by interpreters and users’ devices

CONTEXT
- To add "on the fly" new formulary computation
- To proposal complex computation facilities

SATIS RT PROJECT
- Interpreter TANGO Device designed by COSYLAB and integrated by AKKA
  - PYTHON Code interpretation "on the fly"
  - Linked to TANGO Bus parameters, both:
    - Acquisition of TANGO Bus parameters
    - Re-injection of computed parameters on TANGO Bus
  - Integration of PYDEV in SATIS IDE based on Eclipse IDE.
- User’s devices:
  Generic TANGO Devices integrated
  in charge of computation and Tango data manipulation (inputs / outputs)
ONERA : SATIS
Test sequencing via Soleil PASSERELLE sequencer

CONTEXT
- To create test workflow
- Exploit graphic test Sequencer
- Test Monitoring
  - To build a SATIS sequencer
    - To configure and execute test workflows manipulating Devices and TANGO parameters

SATIS PROJECT INTEGRATION
- For sequencing needs, integration of PASSERELLE API Services in SATIS Server
- To design/develop/program sequences, exploitation of the PASSERELLE graphical IDE (Integrated Development Environment, ISencia) as editor
- Development of specific SATIS ACTORS and one DIRECTOR
ONERA : SATIS
A real times collaborative shared platform

OBJECTIVES
To provide:
- a collaborative test means management,
- A shared multi-sites and actors management,
- Tests shared with all the ONERA sites
  - In parallel on same TANGO Bus

SATIS COLLABORATIVE PLATFORM
- SATIS based on standard client /server architecture
  - Pertinent architecture
    - For an operational and efficient system
    - To facilitate implantation of any new test means and interface with SATIS as web interfaces, mobiles...
- SATIS Client based on SATIS IDE build on ECLIPSE IDE and JAVA FX for graphical interface
- SATIS Server: a REST Server based on SPRING BOOT.
- Last JAVA 8 version
- N clients can subscribe to the test workflow via MQTT Bus
ONERA : SATIS
Industrial success project through AGILE method

AGILE CONTEXT
- Product Owner from ONERA + AKKA Agile coach & Scrum Master
- Acceptance Test Driven Development combined with Requirement Management / Change management
- Fixed price contract with the ONERA.

AGILE PROJECT
- 2,5 years project duration (2014-2016) with sprints of 1 month
- 8 releases, one each of 4 sprints
- High Flexibility applied to one big change:
  - On the architecture after more of 1 year of project
  - move from DB to GIT for test configuration management
    - applied and managed in 1 sprint
- Flexibility all along the project (requirement evolution)

RESULTS
- After 10 months, first project tests on operational site closed to real conditions,
- This agile approach enables ONERA to refine its needs and specifications regularly with the AKKA team.
PLATFORM CURRENT STATUS

- Demonstration is done of the capacity of SATIS to manage and monitor Wind Tunnel Testing and data on TANGO architecture,
- Evolution capabilities are offered due to SATIS architecture and technologies,
- Positive feedback from ONERA end-users on SATIS demonstrator.

“Proposing a tool that simplifies tests definition and shorters implementation time.”

EVOLUTIONS PROPOSED BY AKKA

- Go to TANGO V9 or 10.
- Capacity to integrate new generic acquisition devices without code modification
- Mobil Client Integration
- DOCKER integration, to be able to replay tests in the configuration of « old » tests (even for previous software versions and TANGO version).
THANK YOU FOR YOUR ATTENTION