



# TANGO integration in MORPHO-SATIS project



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## 1. AKKA GROUP introduction



AKKA TECHNOLOGIES  
CORPORATE  
PRESENTATION

▼ PASSION FOR TECHNOLOGIES

MBtech aeroconseil

**A WORLDWIDE  
MULTI-  
SPECIALIST**

2015 revenue



**12,220**

talented Individuals



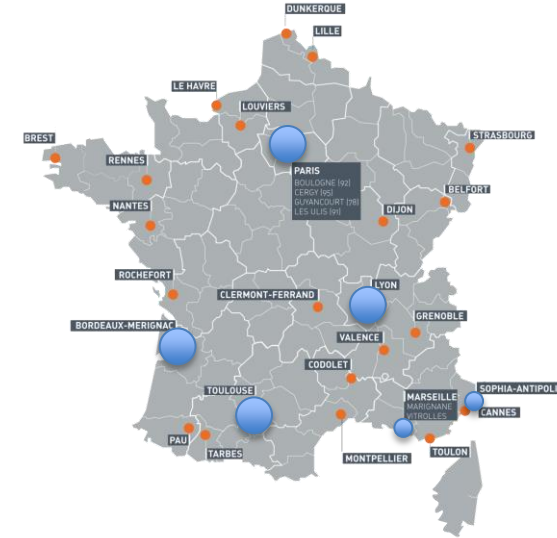
**A PRESENCE IN**

Europe, Asia & America

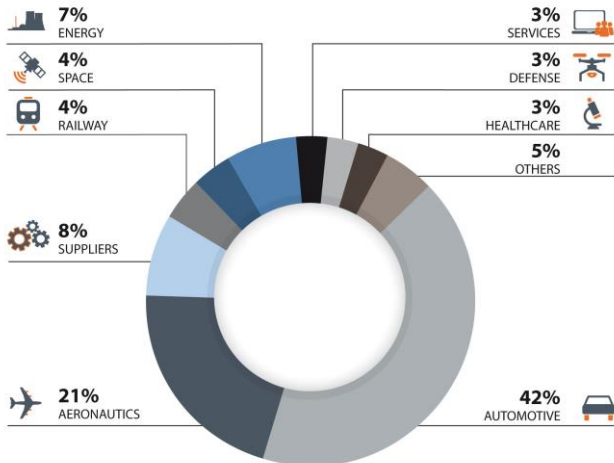


**7 VALUE-ADDED EXPERTISES**

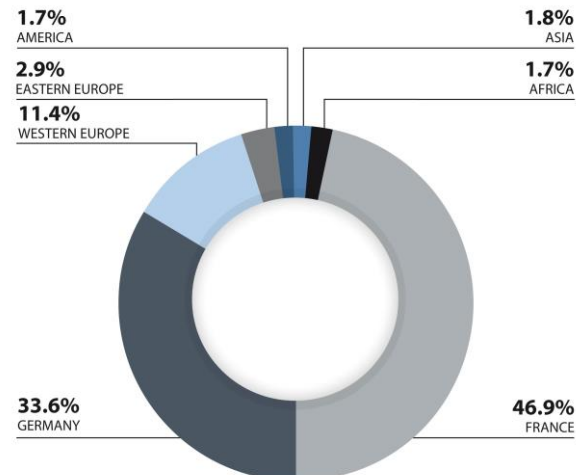
for a global offer



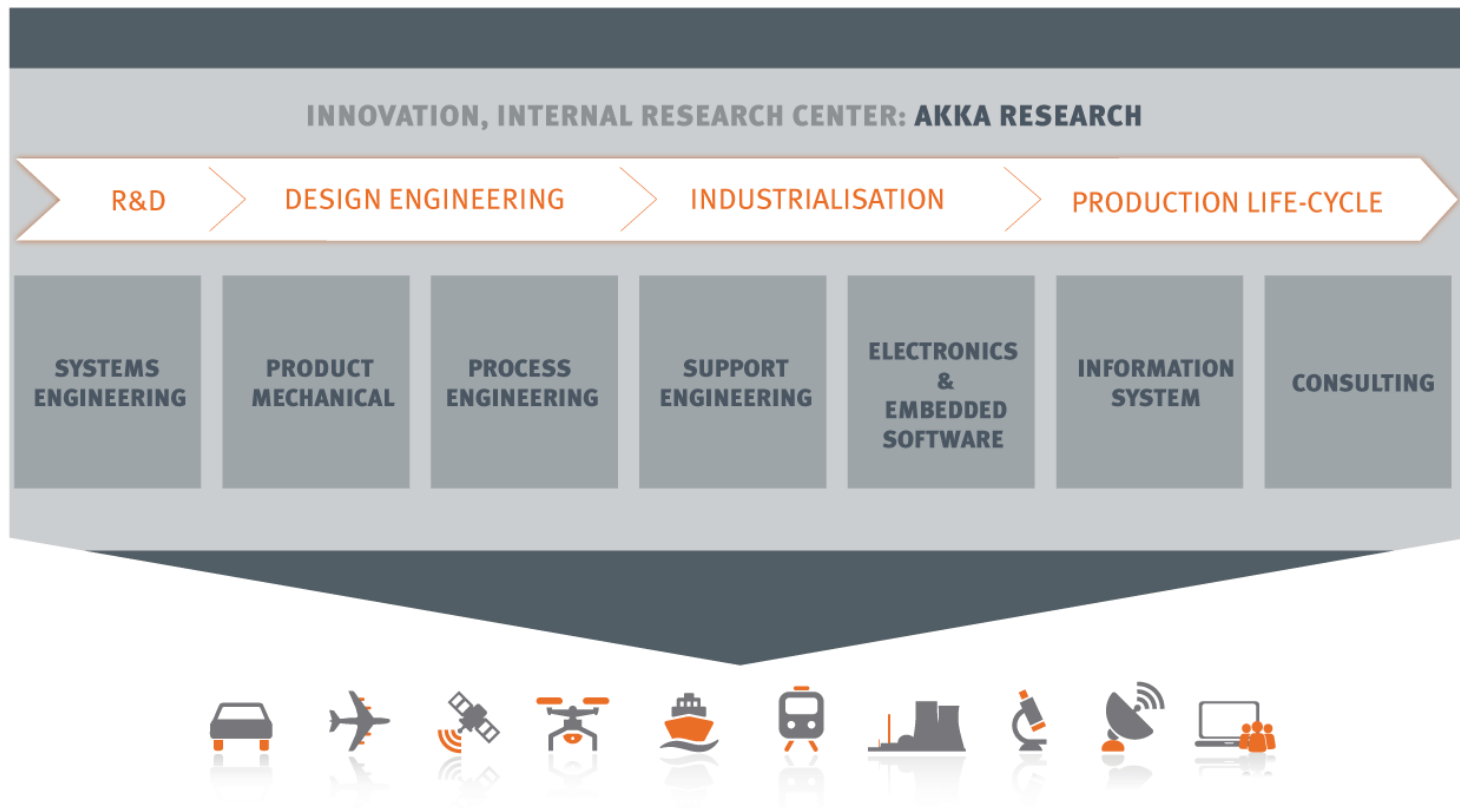
**REVENUE BY BUSINESS SEGMENT**



**REVENUE BY BUSINESS UNIT**



# ADDED VALUE FOR A GLOBAL OFFER



# 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





## 2. AKKA industrial project :

**TANGO integration in MORPHO-SATIS ONERA project**

### SATIS PROJECT:

Systeme 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.



### CONTEXT

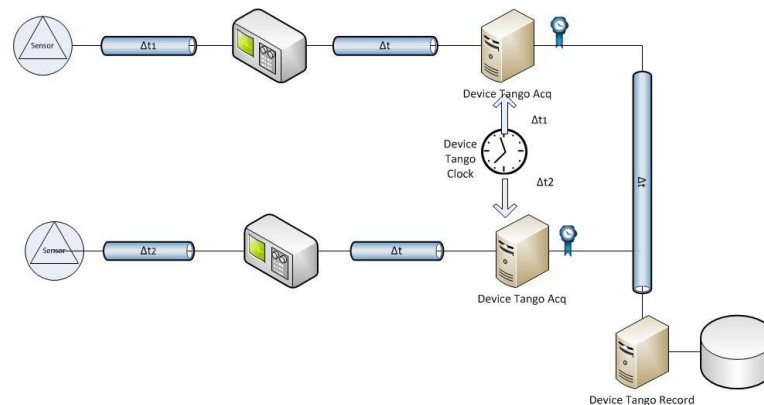
- Numerous equipment's in the acquisition chain
- High capacities of simultaneous data diffusion and storage,
- High frequency expected,
- Crucial synchronisation of signal acquisition,



### SATIS SYSTEM SYNCHRONISATION CAPACITIES

AKKA has designed :

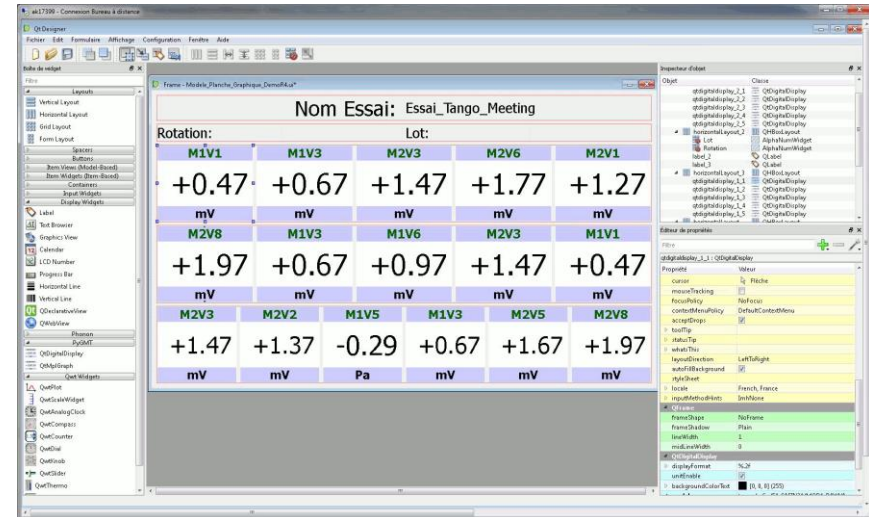
- Dynamic system acquisition up to 50 KHz (and more),
- Systems' synchronisation by software at 1 millisecond,
- Exploitation of SATIS format: specific SATIS format based on TANGO. Image
- Storage in HDF5 format



## 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



## 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.

PostgreSQL

BUILT ON  
eclipse

## Real Time computation by interpreters and users' devices

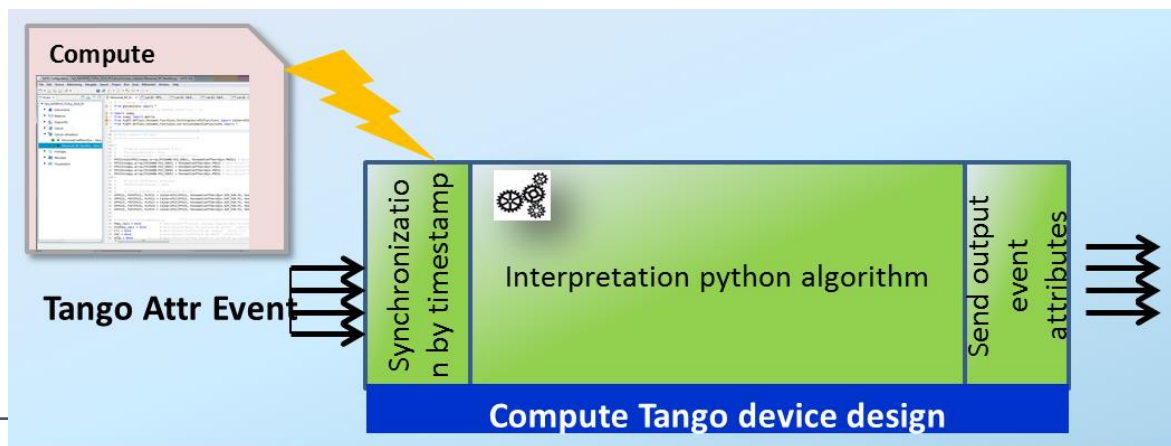
### CONTEXT

- 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)



## 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

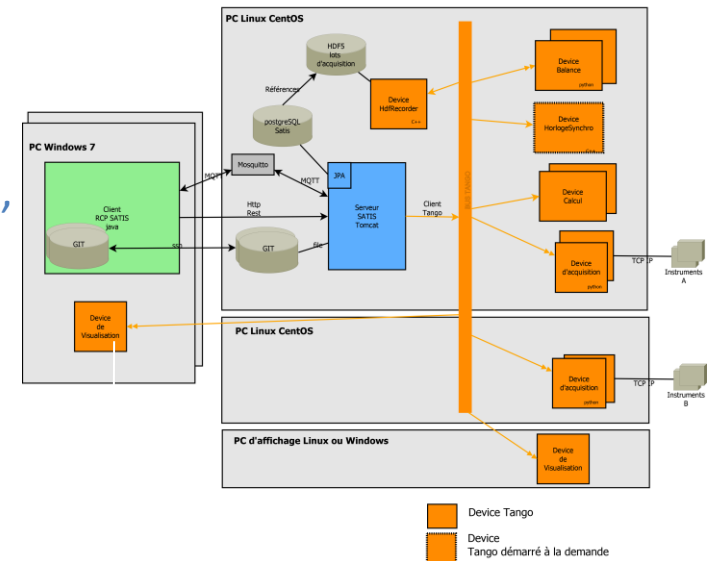
To provide:

- 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

Architecture logicielle de Satis



## Industrial success project through AGILE method

### AGILE CONTEXT

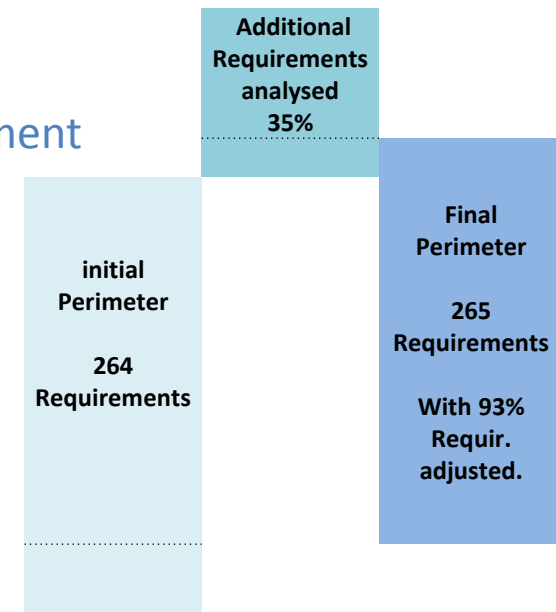
- Product Owner from ONERA + AKKA Agile coach & Scrum Master
- Acceptance Test Driven Development combined with Requirement Management / Change management
- Fixed price contract with the ONERA.

### 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.



Project perimeter evolution through Agile Method

## AKKA Proposition for Technical evolutions...

### 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**

