

**TANGO**



**Industrialisation**

***Promoting the use of  
TANGO in and by  
Industry***

# Gravit and TANGO



*Speeding up  
technology transfers*

- **Gravit is a technology transfer accelerator organisation based in Grenoble financed by France and Europe**
- **Gravit has financed the TANGO project for 50 000 euros over one year (2013)**



Andy Götz

Project consultant : **Alexandre Delorme**



Jean-Michel Chaize

***Goals : demonstrate TANGO to industry, help industry to adopt, prepare TANGO Foundation, TANGO to be a de facto industrial standard***

# Gravit and TANGO



*Speeding up  
technology transfers*

- **Project made up of 3 work packages :**
  - Specify industrial demonstrator
  - Build industrial demonstrator
  - Prepare TANGO Foundation

# Budget

	ESRF	Gravit	Autres	Total
WP1	9100			9100
WP2	21000	40000		61000
WP3	38000	10000	25000	73000
Total				143100

WP1 = write a specification for the demonstrator


WP2 = implement the industrial demonstrator

WP3 = prepare a study on TANGO Foundation


# Industrial Demonstrator

**TANGO on the web**

**WP1 – TANGO leaflet writing**




**WP2 – TANGO packaging enhancement**




**TANGO demonstration**

**WP3 – TANGO Demonstration**




**TANGO new features**

**WP4 – TANGO OPC-UA client development**



**WP5 – TANGO high speed acquisition on open hardware**



# TANGO is Open Source

Are you ready for the Open Source Revolution ?

OSI Affiliates, June 18, 2012



**98 % of Enterprises use Open Source**

**OSS = key to Software Development**



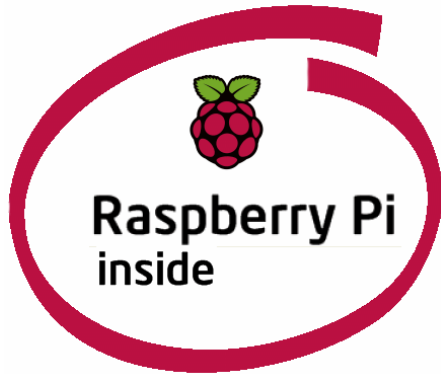
*DESIGNED and USED to*

« Remote control anything and everything »<sup>tm</sup>



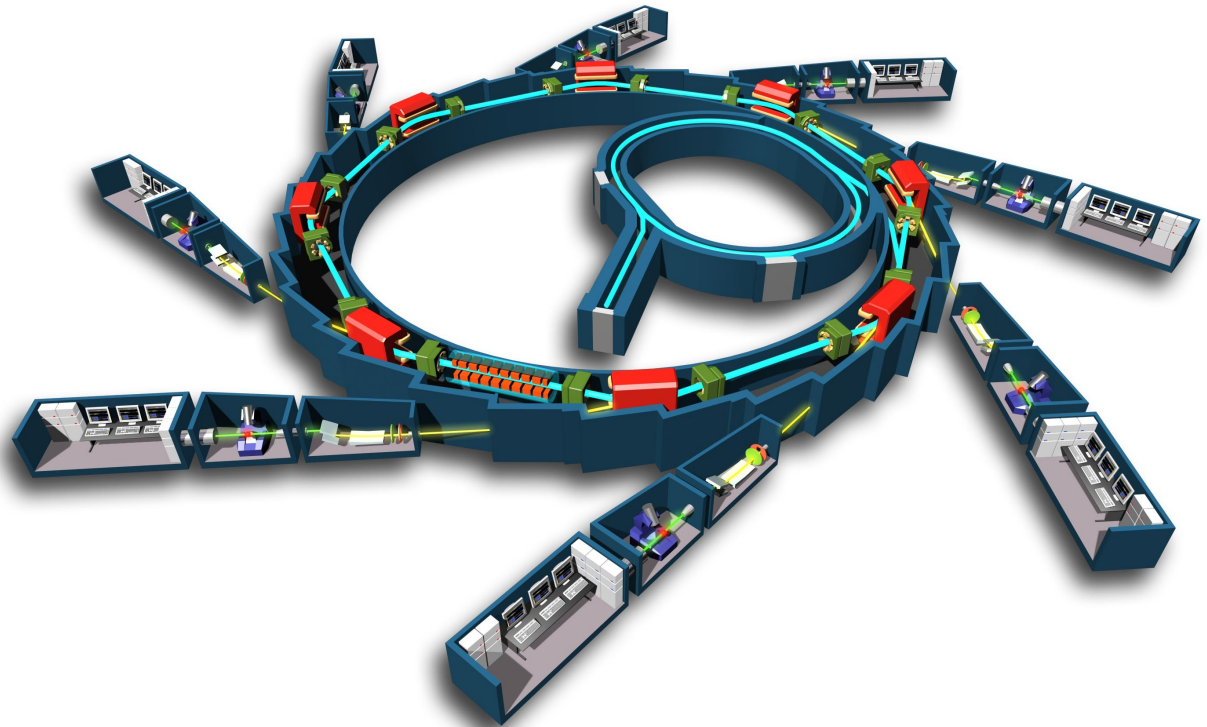
# is HIGHLY scalable !

## From one device running on a ...





... to 20 000 devices running an  
accelerator



# TANGO – Research Institutes

## Large Installations

- **ESRF**
- **SOLEIL** *Large > 1000 devices*
- **ELETTRA** *100 > Small > 0 device*
- **ALBA**
- **CEA/LIONS**
- **DESY**

## Small Installations

- **LMJ**
- **FRMII**
- **MAXLAB**
- **HZB**
- **DLS**
- **SLS**
- ...

# TANGO – Industrial Users

- **Nexeya**
- **Cosylab**
- **ATOS**
- **Hytec**
- **Theosis**
- **Aerotech**
- **Oxford Instruments**
- **Photonics Science**
- **Your Favourite Companies ...**

# TANGO – Industrial use cases

- **Provide TANGO support for industrial hardware**
- **Provide Services for TANGO e.g. Training**
- **Be a TANGO System Integrator**

# TANGO – System Integrator

- **TANGO System Integrator markets**
  - Research Institutes
  - Internal projects use
  - SCADA market

# TANGO – Industrial hardware support

- **Provide a TANGO Device Server for your hardware**
- **Embed TANGO in your equipment**
- **Provide TANGO device server source code to run externally**
- **Advantage :**
  - Sales argument for TANGO community
  - Provide remote control of your device
  - Profit from TANGO framework
- **Examples : Aerotech, Hytec, Photonics, Oxford Instruments, ...**

# TANGO - Embedded devices





# TANGO – Hundreds of Device Classes

Open Source on Sourceforge and local forges :

Tango Device Server User's Guide

www.esrf.eu/computing/cs/tango/tango\_doc/ds\_doc/index.html

ESRF, elettra, SOLEIL SYNCHROTRON, ALBA, TANGO Device Servers, DESY, MAX-lab, Forschungszentrum für Materialwissenschaften

**WARNING: These classes have been developed for a specific usage and are not guaranteed for all platforms.**

### 21 Acquisition Classes hosted by tango-ds

Class Name	Lang	Repos	Description
<a href="#">CCDPVCAM</a>	C++	SVN	<a href="#">Server for handling the Quad-Ro X-ray Camera from Princenton Instruments</a>
<a href="#">Ccd1394</a>	C++	CVS	<a href="#">A generic device server for interfacing all FireWire cameras under Linux. It uses the dc1394 library for accessing the cameras.</a>
<a href="#">DataCollector</a>	C++	SVN	<a href="#">Collects data for further display or storage. Base on events.</a>
<a href="#">ImagePro</a>	C++	CVS	<a href="#">A device class to control the ImagePro image acquisition and analysis program via a device server. ImagePro is a sophisticated program for image analysis which has drivers for a num...</a>
<a href="#">Ketek_4k</a>	C++	SVN	<a href="#">This class handles the KETEK_4K MCA, USB device</a>
<a href="#">LCXCamera</a>	C++	SVN	<a href="#">Class for controlling the LCX Camera from Roper Scientific.</a>
<a href="#">LCXCameraCtrl</a>	C++	SVN	<a href="#">Class for connecting via socket to the perl server for the LCX Camera.</a>
<a href="#">MCA8715</a>	C++	SVN	<a href="#">Class for the histograming module for the 8715/8710 ADCs of Canberra.</a>
<a href="#">MCADxpXmap</a>	C++	CVS	<a href="#">This Device Server controls the MCA DXP-XMAP from XIA (cPCD). It uses the XIA handel library. The ini file is loaded into the xMAP. 1 spectrum attribute is created dyna...</a>
<a href="#">Mar345</a>	C++	CVS	<a href="#">The Mar345 device is used to control the MAR345 Image Plate Scanner Detector. it uses the scan345 daemon to run. it write commands into a dedicated file, which is processed by the ...</a>

Search

Alphabetical List

# TANGO – Future technical developments

- **Support for mobile platforms – tablets, smartphones**
- **Debian packaging of Tango 8**
- **Events in Java device servers**
- **High speed archiving of terabytes**
- **Even faster transport protocols**
- **Improved Python binding**

**No limit to ideas for improvements ...**

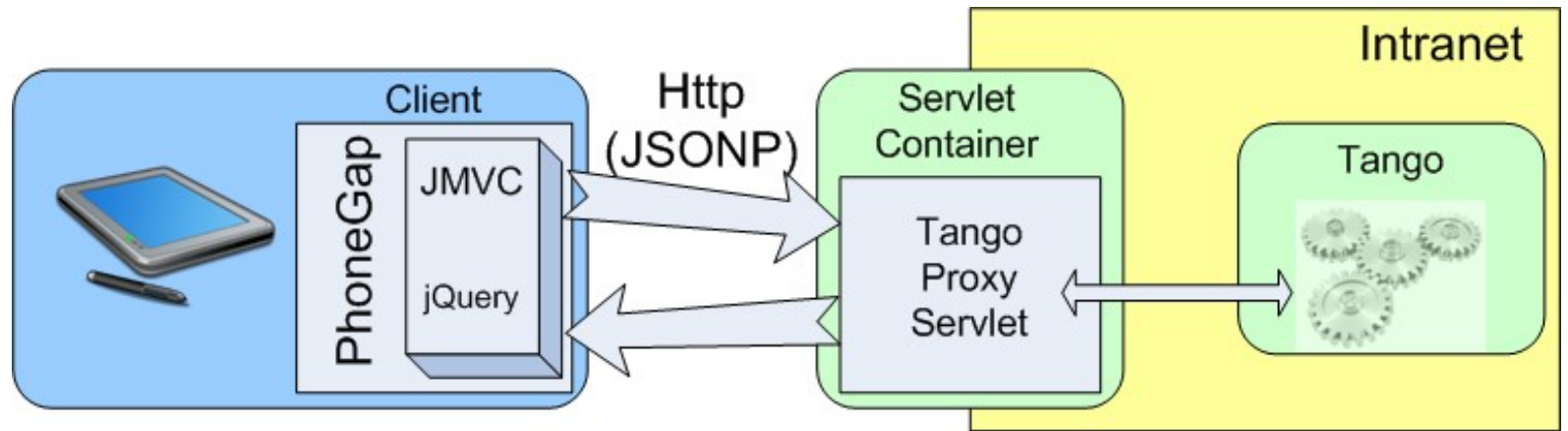
# Gravit's secret plan for TANGO ;-)

**Linux, Firefox et  
Android** examples of  
successful Open Source  
projects



**Make TANGO the Android of SCADA !**

# TANGO on mobile platforms



# TANGO provides

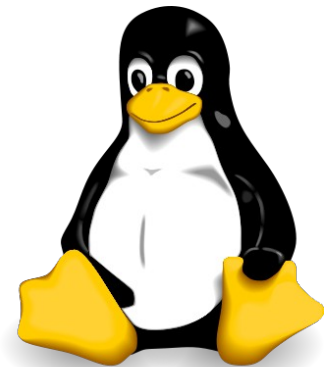
- A **mature** product developed over **12 years**
- **Kernel** developers between **3 and 5** engineers
- More than **70 Device class developers !!!**
- **User interfaces** in **Java, Python** and **C++**
- **Full support** for all 3 languages (**client+server**)
- **Bindings** for most commonly used tools e.g. Matlab, Labview, Igor, Octave, ...
- Interfaced to many **PLC's** via **Modbus**
- **Integrates** other **SCADAs** like **EPICS, Panorama, ...**

# What is missing from TANGO ?

- More industrial partners
- Trained people
- Larger community
- More system integrators
- TANGO enabled hardware
- Industrial standard quality + support
- Industrial systems based on TANGO

# Long term goal – TANGO Foundation

- **Goal – official entity to manage TANGO officially**
- **Legal representative of TANGO community**
- **Protect logo, licence etc.**
- **Develop and release official versions**
- **Collect and manage funds to promote TANGO**
- **Examples**
  - *Apache Foundation*
  - *Eclipse.org*
  - *Linux.org*





# TANGO - Differences with industrial SCADA

## Positive

- Open Source
- Free to try and distribute
- Multi-language and multi-platform
- Scalable from 1 device to 100000 devices
- SUPER-SCADA to integrate (m)any SCADA(s)

## Negative

- Packaging not as polished
- Duplicate solutions
- Lack of standardisation
- Hardware needs to be procured separately

# Trade shows planned :

- **Embedded Days – 28 May 2013 @ Orly Airport**



- **ICALEPCS 2013**

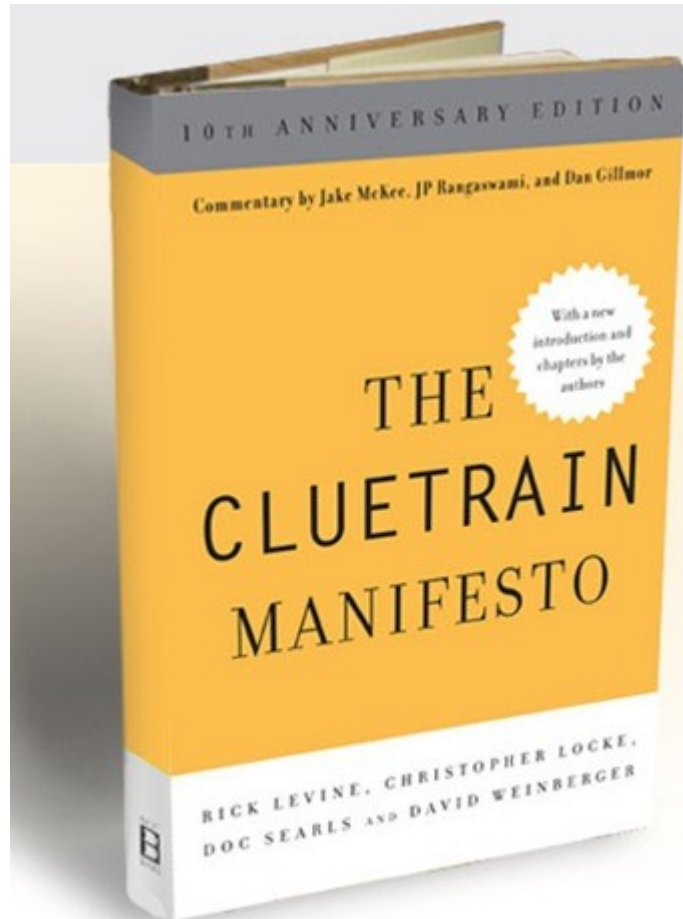
6-11 October 2013

San Francisco



- **Your suggestions welcome ...**

# ***The end of business (+ software) as usual***



***These 15. Dans quelques années à peine, l'actuelle voix homogène des affaires - le son des rapports de mission et des brochures - semblera aussi forcée et artificielle que le langage du 18ème siècle à la cour de France.***

# TANGO Open Source Business Model

- **GOAL** : make TANGO the OPEN SOURCE solution for industrial control systems
- **HOW** : create a COMMUNITY of INDUSTRIAL PARTNERS
- **MARKET** : RESEARCH INFRASTRUCTURES 400 M€/yr, INDUSTRIAL CONTROL 12 B€/yr
- **BENEFITS** : create JOBS in INDUSTRY, give EU INDUSTRY a competitive ADVANTAGE, INVENT new solutions for control e.g. SECURE protocol

**TANG** 

a COMET in the SCADA sky ?

Check the sky tonight for Pan-STARRS comet !!!

science © NASA

