Tango

from the

Control System Integrator's Perspective

Igor Dolinsek, Cosylab

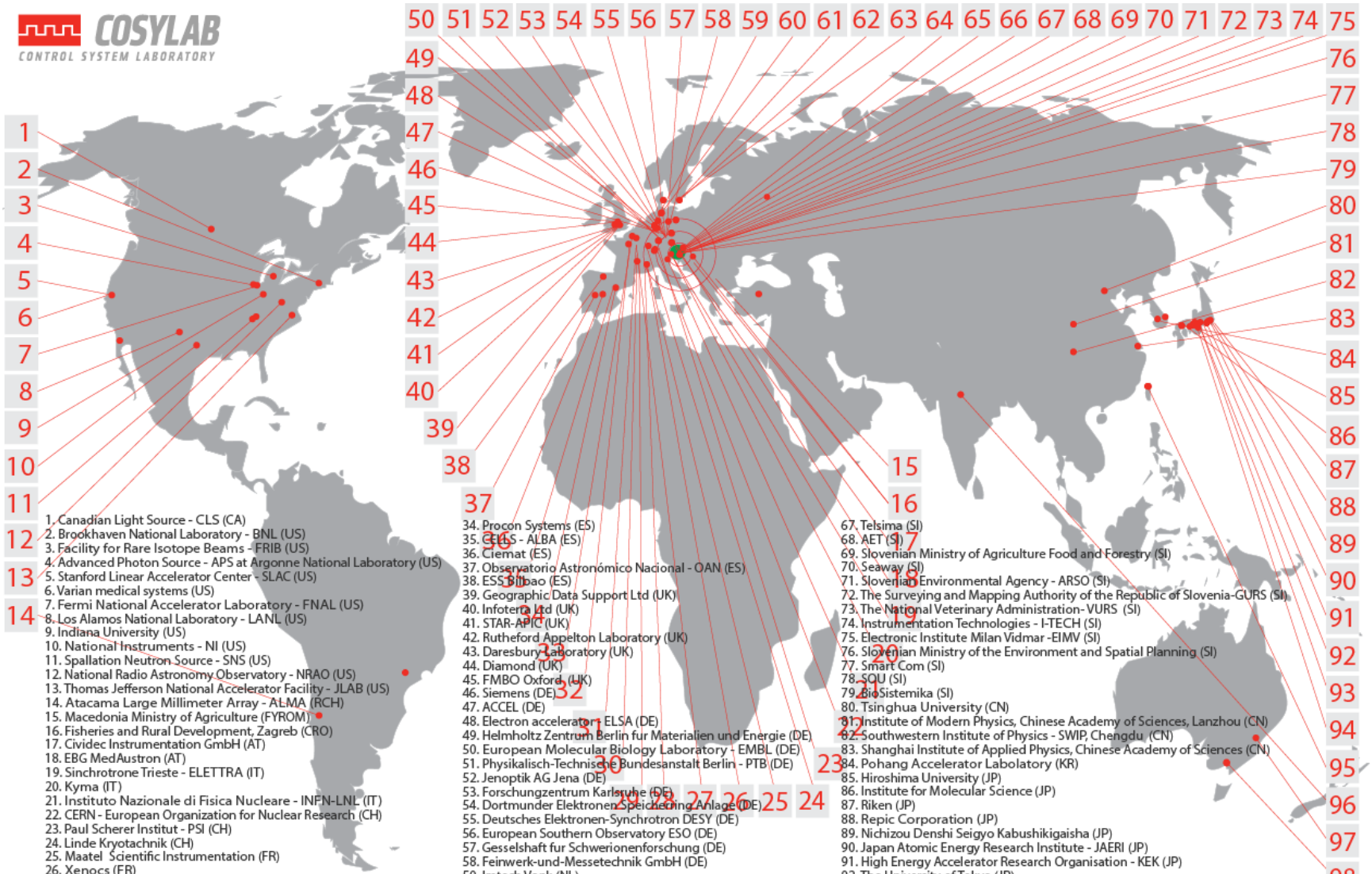
TANGO MEETING 2015
@SOLARIS

The Company Cosylab

- Leading integrator of control systems for particle accelerators and large physics facilities
- We provide control systems integration services and develop products where specific domain knowledge is required
- Our projects span from the single device or subsystem integration to the construction of the complete control systems for accelerators
- In 15 years of continued growth we have built one of the largest controls groups in the world – without having our own machine
- Our integrators assist controls teams from the labs and from industry in covering their peak loads during initial control system construction phase, during machine upgrades or even in maintenance and support phase.

Customers all around the World

COSYLAB
CONTROL SYSTEM LABORATORY



1. Canadian Light Source - CLS (CA)
2. Brookhaven National Laboratory - BNL (US)
3. Facility for Rare Isotope Beams - FRIB (US)
4. Advanced Photon Source - APS at Argonne National Laboratory (US)
5. Stanford Linear Accelerator Center - SLAC (US)
6. Varian medical systems (US)
7. Fermi National Accelerator Laboratory - FNAL (US)
8. Los Alamos National Laboratory - LANL (US)
9. Indiana University (US)
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12. National Radio Astronomy Observatory - NRAO (US)
13. Thomas Jefferson National Accelerator Facility - JLAB (US)
14. Atacama Large Millimeter Array - ALMA (RCH)
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17. Cividec Instrumentation GmbH (AT)
18. EBG MedAustron (AT)
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29. European Synchrotron Radiation Facility - ESRF (FR)
30. bioMérieux (FR)
31. Synchrotron Soleil (FR)
32. Atos Origin (FR)
33. Ion Beam Applications - IBA (B)

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35. CELLS - ALBA (ES)
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38. ESS Bilbao (ES)
39. Geographic Data Support Ltd (UK)
40. Infoterra Ltd (UK)
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56. European Southern Observatory ESO (DE)
57. Gesselshaft fur Schwerionenforschung (DE)
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59. Imtech Vonk (NL)
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63. MAX-lab, Lund University (SE)
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66. ISKRATEL (SI)

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85. Hiroshima University (JP)
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87. Riken (JP)
88. Repic Corporation (JP)
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90. Japan Atomic Energy Research Institute - JAERI (JP)
91. High Energy Accelerator Research Organisation - KEK (JP)
92. The University of Tokyo (JP)
93. Hitachi Zosen (JP)
94. Japan Synchrotron Radiation Research Institute - JASRI (JP)
95. NSRRC -National Synchrotron Radiation Research Center (TW)
96. Raja Ramanna Centre of Advanced Technology - RRCAT (IN)
97. Australian national nuclear research and development organisation - ANSTO (AU)
98. Australian Synchrotron - AS (AU)

Our clients

Cosylab References

Platforms knowhow

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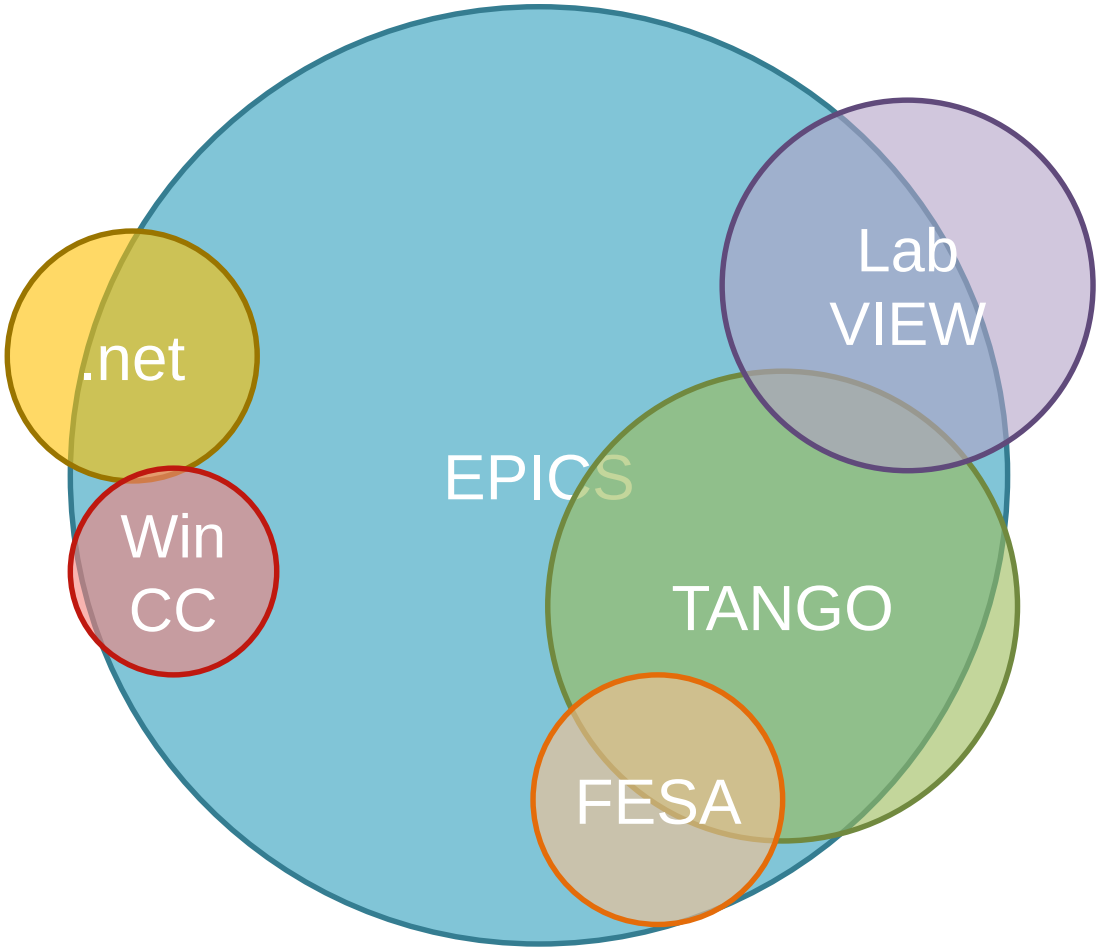

Tango projects

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- 2006: MAATEL: TANGO/EPICS: Asyn driver for Tango
- 2007: EMBL Hamburg: Tango ←→ Tine translators
- 2008: ESRF: Feasibility Study of Integrating TANGO to the Control System Studio
- 2008: Interface for XENOCS Camera
- 2009: DESY: CSS Tango DAL layer implementation
- 2009: ELETTRA: microIOC BCM product integration
- 2010: MAXLAB: Beamline Control System Design documentation and prototype
- 2010: SOLEIL: Hexapod integration

Tango projects (cont)

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- 2011: MAXLAB: Framework agreement
- 2012: MAXLAB: Elliptically Polarizing Undulator Control system
- 2013: ESRF: instruction manual and tutorial video for TangoBox V3, the virtual machine with out-of-the box running Tango
- 2013: ESRF: TANGO2EPICS gateway
- 2013: AKKA: Migration of a legacy control system for ONERA windtunnels to a Tango based system
- 2014-2015: SOLARIS accelerator and storage ring Control System CS
- 2014-2015: SOLARIS UARPES and PEEM beamline Control System

Solaris case (1)

- New machine: synchrotron with 2 beamlines
- Challenges:
  - short build/install/commission timeframe,
  - Very limited budget
  - small internal Solaris controls team
    - Jan 2014: Initial Solaris controls team with two Tango developers (including head of controls ☺) and one PLC developer
    - March 2015 (→ September 2015): Deadline for project completion
- Solution:
  - Contract external control system integration service provider
    - January 2014: Tender published
    - March 2014: contract with Cosylab signed
    - June 2015: all contracted CS deliverables must be ready
  - Gradually ramp up Solaris controls team in the meantime

Solaris case (2)

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- Tango 8.1.2c + patches, HDB, TDB, SNAP, pyAlarm
- Device support: tango device servers (C++, Python)
  - Minimal adaptations of sw from Tango community (30%)
  - Larger adaptations of sw from Tango community (30%)
  - New development (40%)
- Control Room software
  - (Control Program + custom GUIs) (Python)
  - Adaptation of GUIs from Maxlab (Python) and LiberaBPM from ESRF (Java)
- CS configuration tool, Jenkins build setup
- Commissioning support scripts:
  - Adaptation of Maxlab scripts for linac + new development
  - adaptation of Soleil MML scripts for storage ring
- Sardana for beamlines:
  - Taurus: 3.3.0 (July 2014 release), Sardana: 1.4.0 (July 2014 release)

Working with Tango

- **First impression**: TANGO Virtual Machine, new logo and portal: significant improvement in initial perception for novice users
- **Overall impression**: Platform has significantly stabilized since Cosylab started working with Tango
- **Observations**:
  - Library of device classes accelerator-biased and not as useful as it sounds on the web page
  - Often poorly documented: pogo-based html documentation format is fine but too limiting, encourages sparse documentation practice
  - Code serves very specific use cases and specific device models which are usually not described.
  - Device servers often provide only partial integration of the underlying device
  - Code often does not follow the Tango guidelines document: poor error handling, incorrect threading, states usage etc.
  - Effort needed for the adaptation of the code from the community can be quickly underestimated

THANK YOU!

Igor Dolinsek
COSYLAB
Web: www.cosylab.com

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