A Light for Science

European Synchrotron Radiation Facility

Tango Collaboration News

- What is Tango
- The New Collaboration Organization
- On-going Projects
- The Near Future

What is Tango?

What is Tango?

- An object oriented software bus on top of CORBA
    - Communication types: Synchronous, asynchronous, grouped asynchronous and event driven
    - Servers and clients can be written in C++, Python and Java
- The Tango tool chain : Software from the hardware interface to the GUI

Module	Description
Core Libraries	Client/Server communication libraries for C++, Python and Java
Device Classes	About 300 hardware interface classes are available to download
GUI Frameworks	Available for C++ and Python using QT, for Java using Swing and a web interface written in PHP
Client Bindings	LabView, Matlab and IgorPro
Tools	Pogo – Code generator for device classes in C++, Python and Java Jive – Configuration and testing tool Astor – Administration and survey of the Control system
Archiving	Archiving and snapshot system with GUIs and web interface. Usable with Oracle and MySQL
Sardana	Framework for experiment control : Interface standardization, configuration, sequencing, command line interface

Collaboration Organization

- Common Tango web site : http://www.tango-controls.org
- A mailing list for all questions and propositions to the community
- Regular collaboration meetings twice a year
- A coordinator in every partner institute
  - Should streamline all technical and organizational requests
    - But not responsible for the development
- For every new partner a memorandum of understanding needs to be signed by all collaboration partners

Reorganization why?

- New institutes are requesting to join the collaboration
  - Max-lab (Sweden) and FRM-II (Germany)
  - We need a light admission process
- Tango gets used in other places
  - LMJ (France) – Beam diagnostics
  - Industrial companies, due to outsourcing requests
  - More feature requests
- Increasing number of software development projects
  - Clear responsibilities!
  - What will be part of the Tango system?
  - How to decide on a development strategy?
  - How to organize collaboration meetings?

The New Organization

- A collaboration management structure with three levels:

1. **The Executive Committee:**
   - One member from each partner institute
   - Takes decisions on development priorities and strategies
   - Decides on the official list of maintained packages for the Tango system
   - Meets at least after the collaboration meetings

The New Organization

- A collaboration management structure with three levels:
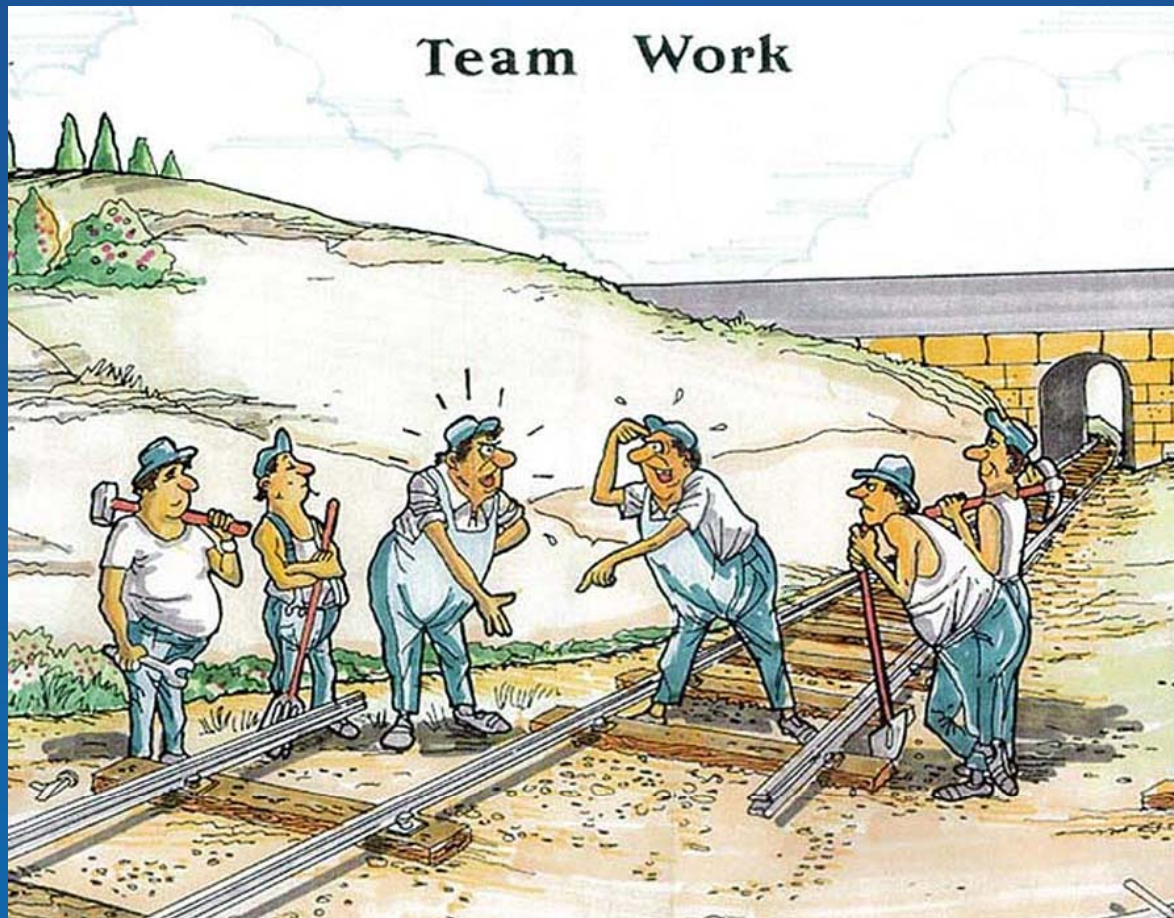
2. **The Collaboration Coordinator**
    - The link between executive committee, project leaders and the community
    - Maintains a global project plan
    - Organizes and coordinates the executive committee meetings
    - Reports back to the community

The New Organization

- A collaboration management structure with three levels:

The New Organization

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3. **The Project Leaders**
    - Responsible for a package which is part of the Tango system
    - Maintains the project plan
    - Responsible for releases and quality of the package
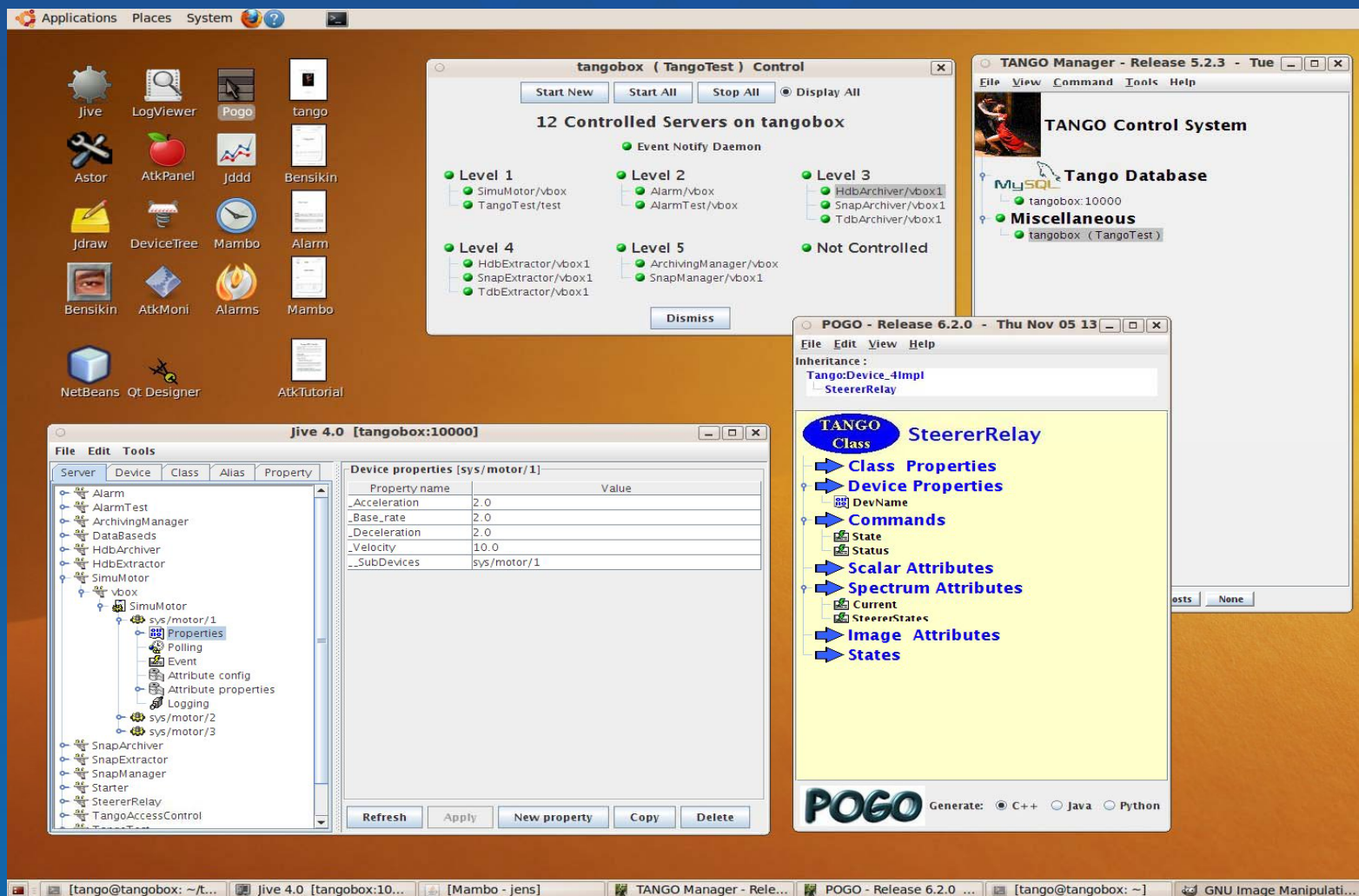   - Contact person for all questions and feature requests

Team Work
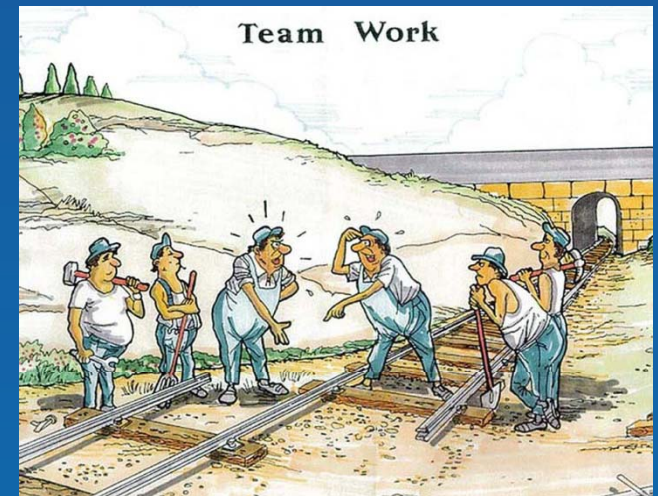
The New Organization

- Regular collaboration meetings once a year
  - Specialized meetings on development projects to be organized by the project leader
- Admission of a new partner
  - Needs to sign the Tango memorandum of understanding
  - Needs to be accepted by the executive committee
- Need for an official Tango decision?
  - Send request to the collaboration coordinator
  - Will be voted during the next executive committee meeting
  - The decision will be published to the community

On-going Projects

- **Library for Image Acquisition (LIMA)**
  - Unified control of 2D detectors
  - Separate hardware specific code from the common features
    - Standard acquisition parameters, file saving, image processing

- **Binary Packages**
  - Available for Ubuntu (Debian) Linux and Windows
  - Under evaluation for other Linux distributions

- **The Tango Box**
  - A virtual Linux machine with most of the Tango packages installed and configured for easy testing
  - Runs with VMware Player

On-going Projects

On-going Projects

- Pogo the Code Generator
  - Generates the Tango class skeletons for C++, Python and Java
    - Was implemented using hand written parsing techniques
  - Rewritten using Xtext and Xpand from the Eclipse modeling project

  - A clean definition of the class model with translation templates for the different languages
  - Support of inheritance in Tango classes
    - Only an abstract interface definition was possible before
  - The C++ version is available
  - Templates for Python and Java will follow

The Near Future

- Replacement tests of the Tango event system
  - Today: CORBA event service (omniNotify)
  - Data Distribution Service (OpenSplice)
    - Multicasting protocol
  - ØMQ Messaging Library
    - Uni- and multicast transmission
    - Unicasting used for tests, reliability problems for multicasting

Sub	1 int (32bits)			1 KByte			1MByte		
	Tango	DDS	ØMQ	Tango	DDS	ØMQ	Tango	DDS	ØMQ
1	770	12500	45000	650	1850	2400	10.7	8	10.7
2	770	10500	27000	460	1800	1200	5	8	5
5	400	7900	14000	200	1800	500	2.1	8	2.0
10	220	6500	7300	100	1700	230	0.9	8	0.9

Events per second between P4, 2.5GHz – Core 2 Duo, 2.6GHz, Ubuntu 9.04 on a 100Mbit nework

The Near Future

	DDS	**ØMQ**
Advantages	CORBA ORB/DDS cohabitation, QoS, Multicast performance	No extra processes, Unicast performance, Can switch from uni- to multicasting
Drawbacks	Three processes + shared memory per host, No dynamic data partitioning possible, SIGKILL forbidden,	Multicasting not 100% reliable, Young product, More integration code to write

- ØMG:
    - Offers a lightweight solution
    - Does not force a complex multicasting set-up
    - Collaboration work needed to make the multicasting protocol reliable

Conclusion

- The new collaboration organization should allow us to dance the Tango close together
- Hopefully the decided choreography is respected by all dancers
- But, despite the effort of dancing the Tango close together, we need to be open to other communities
  - Bridges are available to EPICS and TINE
  - Integration of Tango in JDDD from DOOCS
    - Panel builder and runtime engine
  - Development of a data analysis workbench with DIAMOND
  - A common data model API with ANSTO
    - File access abstraction to handle scientific data

On-going Projects