



Roadmap (past, present + future) Community (who are we?) Examples of use cases Why choose TANGO ?



Roadmap





Roadmap





History

TANGO - an object oriented control system based on CORBA

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Abstract

This paper presen system based on C the ESRF. All con

as methods or attributes of contain network objects (scr vants). Control actions are executed by invoking methods on objects. Objects are served by device servers. TANGO device servers can be written in C++ or Java. Device servers can run on Linux, Windows/NT, Solaris, or HP-UX. TANGO is fully compatible with the ONC RPC based TACO [1] control systems. In this paper the TANGO idl definition, device pattern, database, naming service, event service and scripting languages are presented. The present status of TANGO and how it will be deployed in a TACO control system will be reviewed. .g. naming, events, trading. Language mappings are defined from IDL to the main programming languages e.g. C++, Java, C, COBOL, Smalltalk. For an excellent reference on CORBA with C++ refer to [2].

Which ORB to use ? At the ESRF we have tested various free and commercial ORB's. The commercial ORB's are very expensive in general and not all of them respect the CORBA norm. A number of free ORB's exist but they do not all offer full CORBA compliancy plus support for C++, Java and multi-threading. After trying out different products we chose Orbacus from OOC [5] as ORB. It is





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Who are we?







Goal : actively encourage the TANGO community to work together and participate and contribute source code, documentation and ideas

Tools: web site, mailing list, forum, annual meetings, workshops, technology transfer agencies, industrial partners, EU projects, etc.



Community Site

http://tango-controls.org

TΔNGQ



About us Downloads Resources Community Partners

s Contact



Connecting things together

What is **TANGO Controls ?**

A free open source device-oriented controls toolkit for controlling any kind of hardware or software and building **SCADA** systems...

Why to choose **TANGO Controls**?

Because it is easy to use, flexible, and highly scalable. It provides a complete set of features for controlling equipment and lot of services for managing systems.

How to use TANGO Controls ?

Just download it and install it. Then reuse or write a device server, deploy and marvel at how it works!

READ MORE

READ MORE

READ MORE



Executive Board

Committer: ALBA, ELETTRA, ELI-ALPS, ESRF, (Core) SOLEIL

Contributor: ANKA, DESY, ELI-BL, FRMII, MAX-lab, SOLARIS, U. SZEGED, INAF-OATS

Community

Users: Free to use Open Source under LGPL3

http://sourceforge.net/projects/tango-cs/ http://sourceforge.net/projects/tango-ds/



Pros

- Simple Design
- Performance
- Highly scalable
- Multiple-languages
 - Common tools
 - Name service
 - Databases
- Multicast
 - →• Support

- Rich GUI toolkits
 - Documentation
 - Code generator
 - Access control
 - Community
- Coherency
- Evolution
 - Backwards compatible
 - Virtual box





"The value of a well-designed object is when it has such a rich set of affordances that the people who use it can do things with it that the designer never imagined."

Donald Norman





Control System Design

Device = States + Attributes + Commands

Servers = Device Classes + Devices

Control System = Database + Servers







TANGO is based on a Peer-2-Peer design. This allows it to scale with the number of hosts, servers, clients, and network. Similar to other P2P networks like Internet.







TANGO_HOST=host1,host2

TANGO_HOST=host3



TANG Scalability Statistics

| Institute | Domain | Hosts | Device Servers | Devices | Control Points | Attributes |
|-----------|------------------|-------|-------------------|---------|-------------------|------------|
| ESRF | accelerator | 148 | 1729 | 12768 | 386776 | 134840 |
| Soleil | accelerator | 191 | 4005 | 12978 | 409199 | |
| Alba | accelerator | 143 | 1368 | 5653 | 246736 | 113452 |
| ELETTRA | fermi | 73 | 1248 | 4792 | 195624 | 65598 |
| MAX4 | linac | 4 | 156 | 1038 | 27502 | 10969 |
| | | | | | | |
| ESRF | beamlines * | | | | | |
| Soleil | beamlines * | | | | | |
| Alba | beamlines * | 8 | 50 | 500 | 13987 | |
| ELETTRA | accelerator | 19 | 298 | 1357 | 39516 | 12199 |
| ELETTRA | fermi beam | 25 | 424 | 1410 | 56828 | 17892 |
| ELETTRA | beamlines * | 5 | 75 | 198 | 7227 | 1725 |
| PETRA3 | beamlines sum | 81 | 912 | 11572 | 463821 | 196188 |
| ANKA | beamlines sum | 26 | 146 | | 23999 | 6254 |



Mobile TANGO

•Javascript

•REST api

•Mobile api (Cordova)





Cons

- Device class sharing
- Advanced training
- CORBA is not mainstream
- Web interface
- HDB time res
- Device failover
- Load balancing



Planned

Replace with

zeromq

REST api

HDB++ with MySQL/Cassandra







MARS : VERAS Synchrotron : ESRF Wind Tunnel : ONERA Astronomy : NADIR



MARS VERAS





TANGA MARS VERAS







TANG点 ESRF Managing Metadata



TANGA ESRF Metadata Manager FSM





ONERA Wind Tunnel

Technologies clés :

- TANGO : bus de communication (CORBA / ZMQ)
- Eclipse RCP / Qt : IHM des postes de conduite, de définition et de suivi d'essai
- PostgreSQL / HDF5 : stockage des données de définition et des résultats d'essai



NADIR Data Archive



ΤΔΝG Why Choose TANGO ...?





Because ...

You need one solution which can adapt to a wide variety of use cases i.e. you need to solve a variety of problems*

Devices are a good fit for you You think like a software engineer Your system design is evolutionary TANGO has most of the features you need

You need a mature high performance solution which is proven, low risk + supported

*Oganizations which design systems ... are constrained to produce designs which are copies of the communication structures of these organizations - **M. Conway**





The SKA LMC problem is heterogeneous and TANGO is a good fit

You will gain a lot from a **common protocol** and **control system** for the LMC for modeling, implementing, monitoring, archiving, maintenance