TANGO – can ZMQ replace CORBA?

or

MAKING THINGS SIMPLER
Ensō

this is it
It takes 3 to TANGO!
Simple Peer-to-Peer
Managing complexity simply
Talk has two parts

1. New ZMQ event system
2. Replacing CORBA completely
What is wrong with CORBA?

NOTHING!

for TANGO

A LOT!

for new projects
What is ZMQ?

- Sockets on steroids
- Concurrency framework
- Asynchronous I/O high performance on multicores

Library
A protocol

http://hintjens.com/

Pieter Hintjens
TANGO events based on Notification Service
TANGO ZMQ events
Remove
Broker

omniNotify = dead project
TANGO ZMQ Events

- C++ and Java
- Few 1000 lines
- 18 months
- In 24/7 mode
  TANGO ≥ 8.1
- ZMQ ≥ 3.2
Why ZMQ?

"What else?"
Why ZMQ?

- Adds support for multi-casting
Why TANGO can replace CORBA?

TANGO was designed so that CORBA could be replaced.
TANGO uses in CORBA

1. IDL
2. IOR
3. DII
4. Corbaloc
5. Collocation
6. Interceptors
7. CDR serialisation
8. Binary performance
9. Multi-language bindings
10. OmniORB + JacORB threading
11. Synchronous calling mechanism
TANGO implements:

1. Naming
2. Versioning
3. Persistence
4. Security
5. Startup
6. Logging
7. Polling
8. Caching
9. Rich Data types
10. Connection management
Replacing CORBA

1. IDL – TANGO has only ONE interface (Device)!
2. IOR – replace with <protocol>:<host><port><FQDN>
3. DII – replace with ROUTER-ROUTER socket pattern
4. Corbaloc – same as for IOR
5. Collocation – replace with <inproc>
6. CDR serialisation – replace with open source library
7. Binary performance – built-in with ZMQ
8. Multi-language bindings – built-in with ZMQ
9. OmniORB + JacORB threading – use ZMQ concurrency
10. Synchronous calling mechanism – use ROUTER
Device Servers based on ZMQ
Key to adoption = Compatibility

*Forwards and Backwards Compatibility*

Old site

Client

Device Server

Protocol A (CORBA)

Protocol B (ZMQ)

Upgraded site

Client

Device Server

New site

Client

Device Server
What do we gain with ZMQ?

(1) simplicity  (2) performance

(3) support for new protocols e.g. encryption, streaming, web, multi-casting, batching

(4) portability for mobile and embedded platforms,

(5) larger more active user community

longer life time for TANGO due to more modern protocol
TANGO Protocol

Devices on embedded platforms without Linux could publish the TANGO protocol (TANGOP) using a protocol stack like *picotcp*
What do we lose with ZMQ?

Some Services Serialisation = more code to write
Conclusion

- TANGO has successfully replaced the CORBA Notification service with a ZMQ event based system.
- The performance increase can be up to 2 orders of magnitude.
- Study of replacing CORBA completely in TANGO while maintaining backwards compatibility shows there are no show stoppers.
- There are a number of advantages replacing CORBA completely with ZMQ not least of which are simplicity and ensuring TANGO stays modern.
Next steps

- Implement prototype
- Present it to the community
- Community decides to adopt TANGO 2.0
- Implementation and testing in C++, Python and Java will take ≈ 24 person months