



Connecting things together

JTango status

Tango in Java

<https://github.com/tango-controls/JTango>

Context

100% Java implementation of Tango

Based on 2 major 3rd parties:

- Jacorb for CORBA
- JeroMQ for ZMQ to manage Tango events

Shared development between:

- ESRF, Maintainer (Pascal Verdier)
- SOLEIL since 2010, Maintainer of Server API (Gwenaëlle Abeillé)
- HZG DESY since 2013, Major contributor (Igor Khokhriakov)



Reminders of some JTango key features



Key features

Device Server High-level API which is based on Java Annotations

```
protected double[] attr_Attribute_read = new double[1];
protected double attr_Attribute_write;

public void write_attr_hardware(Vector attr_list) throws DevFailed
{
    get_logger().info("In write_attr_hardware for "+attr_list.size()+" attribute(s)");

    for (int i=0 ; i<attr_list.size() ; i++)
    {
        Attribute attr = dev_attr.get_attr_by_index((Integer) attr_list.elementAt(i)).getValue();
        String attr_name = attr.get_name();

        // Switch on attribute name
        //-----
        if (attr_name == "Attribute")
        {
            // Add your own code here
        }
    }
}

public void read_attr_hardware(Vector attr_list) throws DevFailed
{
    get_logger().info("In read_attr_hardware for "+attr_list.size()+" attribute(s)");

    // Switch on attribute name
    //-----
}

public void read_attr(Attribute attr) throws DevFailed
{
    String attr_name = attr.get_name();
    get_logger().info("In read_attr for attribute " + attr_name);

    // Switch on attribute name
    //-----
    if (attr_name == "Attribute")
    {
        // Add your own code here
    }
}
```

+ code of DeviceClass.java

**Before
2010**

```
@Attribute
double attribute = 12;

public double getAttribute() {
    return attribute;
}

public void setAttribute(final double attribute) {
    this.attribute = attribute;
}
```

After

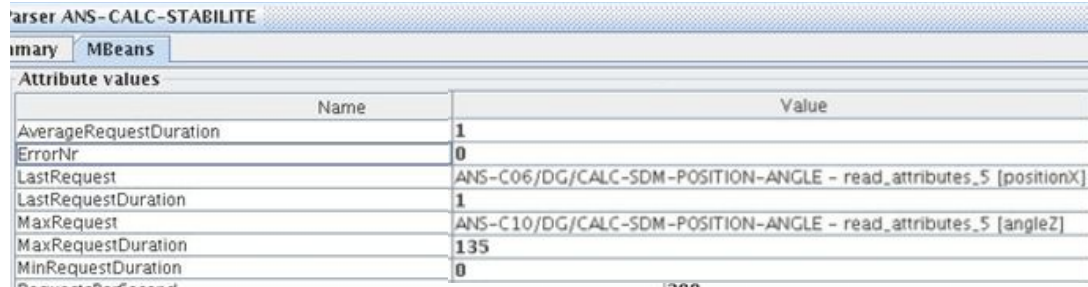


Productivity of
Device development

Key features

JTango uses Java specific features:

- *JMX (Java Monitoring Extension)* to provide performance indicators of Tango Server
- *SLF4J and Logback* 3rd parties, standard de-facto in Java for:
 - fine-tunable device logging
 - Audit Log: logging of the Tango « blackbox » to track all Tango client requests



Parser ANS-CALC-STABILITE

Name	Value
AverageRequestDuration	1
ErrorNr	0
LastRequest	ANS-C06/DG/CALC-SDM-POSITION-ANGLE - read_attributes_5 [positionX]
LastRequestDuration	1
MaxRequest	ANS-C10/DG/CALC-SDM-POSITION-ANGLE - read_attributes_5 [angleZ]
MaxRequestDuration	135
MinRequestDuration	0

```
DEBUG 2019-02-04 10:33:40,563 GA/test/StateComposer.1 - RequestProcessor-3 | read_attributes_5 [lastStateEvent] from CACHE_DEV requested from dev-el6-6.ica.synchrotron-soleil.fr (Java client with main class atkpanel.MainPanel - PID=23718)
DEBUG 2019-02-04 10:33:40,563 GA/test/StateComposer.1 - RequestProcessor-5 | read_attributes_5 [State] from CACHE_DEV requested from dev-el6-6.ica.synchrotron-soleil.fr (Java client with main class atkpanel.MainPanel - PID=23718)
DEBUG 2019-02-04 10:33:40,566 GA/test/StateComposer.1 - RequestProcessor-3 | read_attributes_5 [version] from CACHE_DEV requested from dev-el6-6.ica.synchrotron-soleil.fr (Java client with main class atkpanel.MainPanel - PID=23718)
DEBUG 2019-02-04 10:33:40,566 GA/test/StateComposer.1 - RequestProcessor-3 | read_attributes_5 [Status] from CACHE_DEV requested from dev-el6-6.ica.synchrotron-soleil.fr (Java client with main class atkpanel.MainPanel - PID=23718)
DEBUG 2019-02-04 10:33:41,567 GA/test/StateComposer.1 - RequestProcessor-3 | read_attributes_5 [lastStateEvent] from CACHE_DEV requested from dev-el6-6.ica.synchrotron-soleil.fr (Java client with main class atkpanel.MainPanel - PID=23718)
DEBUG 2019-02-04 10:33:41,568 GA/test/StateComposer.1 - RequestProcessor-5 | read_attributes_5 [State] from CACHE_DEV requested from dev-el6-6.ica.synchrotron-soleil.fr (Java client with main class atkpanel.MainPanel - PID=23718)
DEBUG 2019-02-04 10:33:41,569 GA/test/StateComposer.1 - RequestProcessor-4 | read_attributes_5 [version] from CACHE_DEV requested from dev-el6-6.ica.synchrotron-soleil.fr (Java client with main class atkpanel.MainPanel - PID=23718)
DEBUG 2019-02-04 10:33:41,570 GA/test/StateComposer.1 - RequestProcessor-4 | read_attributes_5 [Status] from CACHE_DEV requested from dev-el6-6.ica.synchrotron-soleil.fr (Java client with main class atkpanel.MainPanel - PID=23718)
```

A complete CI toolchain

- Integrated on the CI GitHub service (Travis-CI)
- ~250 unit and integration tests
- Integration tests (with a Tango DB) based on “tangocs” Docker images
- Code Quality measures with Sonar Cloud
- Binaries deployed in public repositories (Bintray and Maven Central)
- Each Git release tag triggers automatically the build & the deployment



Travis CI

JUnit



sonarcloud 



JFrog Bintray

Mostly
done by
Igor

Last release - Tango 9 LTS - 9.6.0

<https://github.com/tango-controls/JTango/releases/tag/9.6.0>

Last release - Tango 9 LTS

Compatible with Java 8 and onwards:

- Java 7 compilation removed:
 - *As Travis-CI removed the support of openjdk 7*
- Published binaries are produced with Java 8
- CI now done with Java 8 and 11

Special
thanks to
Igor

Last release - Tango 9 LTS

Maintenance & Bug fixes:

- Upgrade to latest Jacorb & JeroMQ versions
- Many fixes on events for server and client APIs

The future



2020-21 Roadmap

- Maintenance on Tango 9 LTS: around 30 open issues
- Focus on quality. Issues highlighted by Sonar
 - Mainly on the client API



2020-21 Roadmap

- As Pascal from ESRF will retire soon
 - And Limited resources are dedicated by SOLEIL
- => Outsourcing of some developments



Future: why maintaining Java as kernel language?

- Mainly ESRF and SOLEIL rely on Java for servers and clients
- All Tango generic clients (Jive, Astor, ATKPanel...) rely on client API
- Java is still a widely used language
 - But Java Swing for GUIs is less and less popular (but still supported)

Java Client Roadmap Update:

<https://www.oracle.com/technetwork/java/javase/javaclientroadmapupdateev2020may-6548840.pdf>

Insights of Java future: <https://dzone.com/articles/java-is-not-dying-yet>, <https://dev.to/stealthmusic/java-is-dead-long-live-java-19bl>



Connecting things together

Thank you Questions?

References:

Jacorb: <https://github.com/JacORB/>,

JeroMQ: <https://github.com/zeromq/jeromq>

JMX: <https://openjdk.java.net/groups/jmx/>

Logging: <http://www.slf4j.org/>, <http://logback.qos.ch/>