Heterogeneous Replications with

Octopus

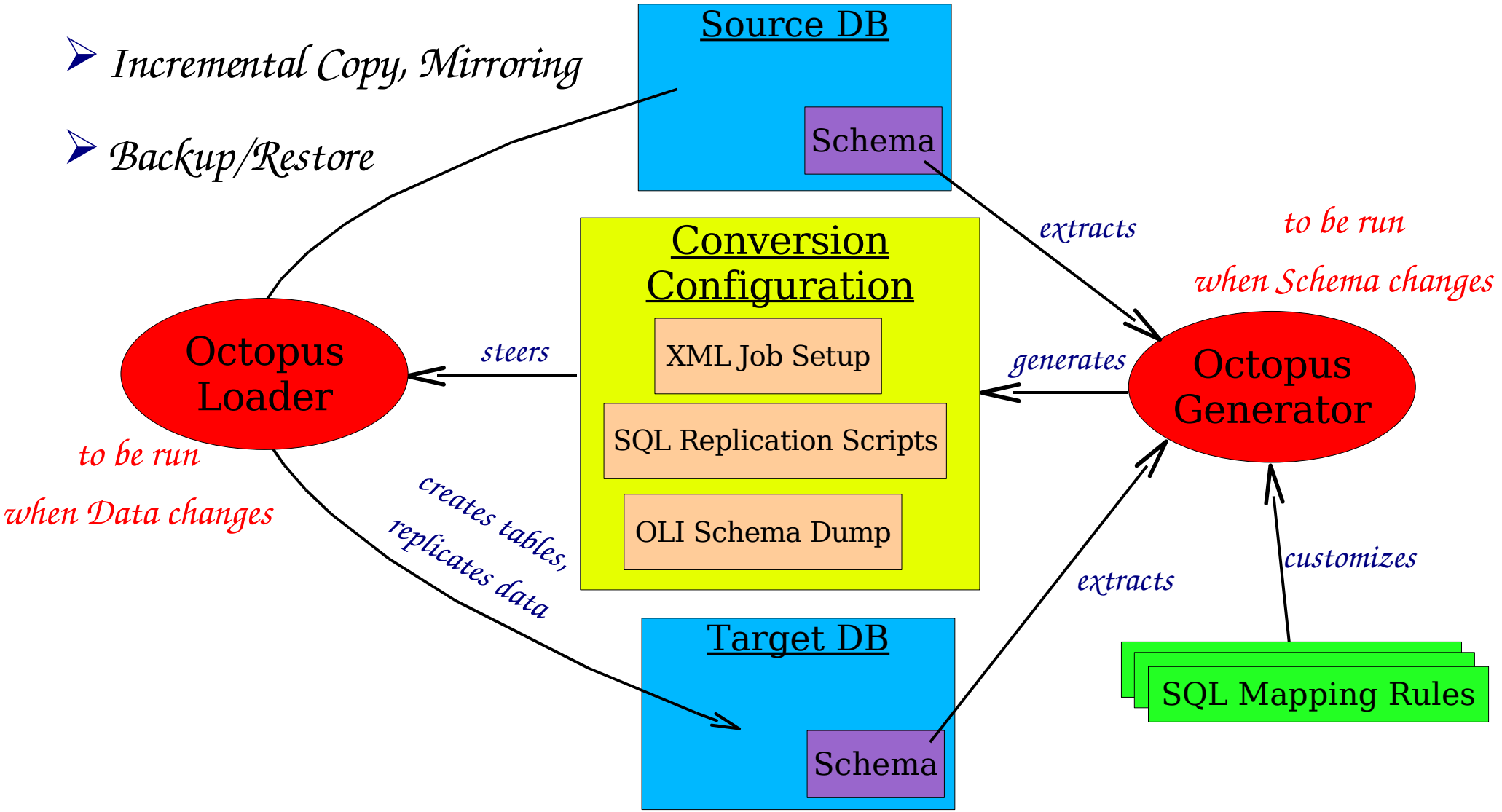
- Architecture
- Configuration
- Use in Atlas

Octopus

- Octopus is a Java-based Extraction, Transformation, and Loading tool. It may connect to any JDBC data sources and perform transformations defined in an XML file.
- Octopus supports MSSQL, Oracle, DB2, QED, JDBC-ODBC, Excel, Access, MySQL, PostgreSQL, McKoi, Hypersonic, Informix, Paradox, Sybase, CSV-files, XML-files, CSV-files, MS-SQL, XML and i18n. Other databases can be easily included.
- Sequoia uses Octopus.
- Atlas uses Octopus. Complete "Rome" Tag database has been replicated between CERN and BNL; all combinations of Oracle-MySQL have been tried.

Octopus Architecture

- Modes:
  - Full Copy
  - Incremental Copy, Mirroring
  - Backup/Restore



Octopus Atlas Setup

- Ant build.xml file
- Run description build.properties file
- Customised mapping map.properties file (designed to satisfy special Atlas requirements)

```
Src.Db=@sundb07.cern.ch:1521:pdb01-1
Src.User=atlasdd
Src.Passwd=bla
Src.Schema=ATLASDD

Dest.Db=atlasdbdev.cern.ch:3306/CollectionTest
Dest.User=CollTester
Dest.Passwd=bla

Log.Mode=full

Tables=ALIN_DATA;ALIN_DATA2TAG
```

```
octopus.mysql.varchar2(4000).type=varchar
octopus.mysql.varchar2(4000).length=255

octopus.mysql.float(126).type=double

octopus.mysql.float(63).type=float

octopus.mysql.number(1).type=tinyint
octopus.mysql.number(1).length=1

octopus.mysql.number(10).type=integer
octopus.mysql.number(10).length=10
```

```
# Clean everything
ant clean

# Generate replication scripts
ant generate

# Perform the replication
ant load

# Recompile Atlas customizations
ant patch

# Get help
ant -projecthelp
```

Octopus Configuration

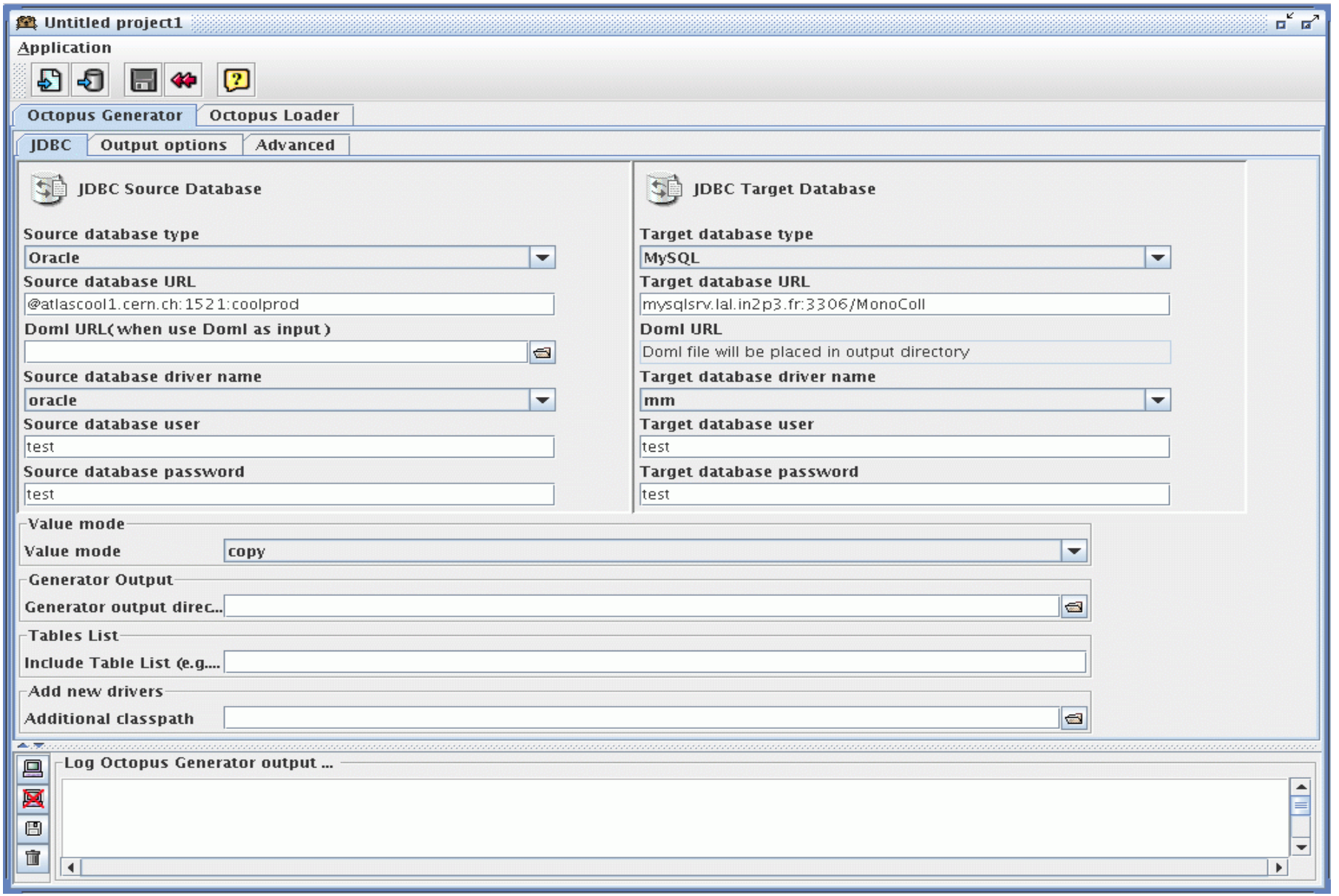
```
<LoaderGeneratorTask
        sourceType="Oracle"
        sourceDriverName="oracle"
        sourceDataBase="${Src.Db}"
        sourceUser="${Src.User}"
        sourcePassword="${Src.Passwd}"
        targetType="MySQL"
        targetDriverName="mm"
        targetDataBase="${Dest.Db}"
        targetUser="${Dest.User}"
        targetPassword="${Dest.Passwd}"
        valueMode="copy"
        generatorOutput="../run"
        domlUrl=""
        generateDoml="true"
        packageName="org.webdocwf.util.loader"
        generateDropTableStmt="true"
        generateDropIntegrityStmt="false"
        generateCreateTableStmt="true"
        generateCreatePKStmt="true"
        generateCreateFKStmt="true"
        generateCreateIndexStmt="true"
        generateXml="true"
        fullMode="true"
        logMode="${Log.Mode}"
        schema="${Src.Schema}"
        includeTableList="${Tables}"
        logDirName="../run"
        octopusHome="${Octopus.Home}"/>
```

```
<LoaderTask
        mode="${Log.Mode}"
        logDir="../run"
        restartIndicator="false"
        onErrorContinue="true"
        loadJob="../run/LoaderJob.olj"/>
```

- *Overall customization: build.xml*
- *Detailed customization via generated files:*
  - *XML Job Setup*
  - *SQL Replication Scripts*

Customization is simple as long as it can be expressed via generic XML description and SQL commands. More advanced filters can be written as plugins.

Octopus GUI



Available as a WebStart: http://octopus.enhydra.org/JavaWebStart/octopus.jnlp

Octopus Enhancements in Atlas

- *Support for SQLite: LCG doesn't provide JDBC driver for SQLite, out-of-box Octopus doesn't support SQLite. => SQLite JDBC Driver has been written and included in Octopus.*
- *Support for non-standard SQL types mapping: Databases based on LCG tools are often incorrect and/or inconsistent. => Octopus can be forced to accept incorrect/inconsistent mapping.*
- *Support for database configurations not supported in out-of-box Octopus: Octopus doesn't understand Oracle Schema, Synonyms,... => All needed configurations have been added.*
- *Bug-fixes: included in the Octopus distribution.*

Octopus Use in Atlas

- Geometry DB: replicated databases in Atlas distribution
  - Oracle -> MySQL
  - Oracle -> SQLite
- Tag DB: all Rome tags replicated from CERN to BNL
  - Oracle -> MySQL
  - MySQL -> Oracle
  - MySQL -> MySQL

Documentation

- Octopus is provided by ObjectWeb Open Source Middleware Consortium, released under GPL, they has active user base and responsive developers. They are probably the only (so the best) such OpenSource Tool.
- Octopus works well with other ObjectWeb Tools, like Sequoia, JOnAS Application Server, Speedo JDO, etc.
- Documentation:
  - Octopus Home: http://octopus.objectweb.org
  - Octopus Atlas Wiki: https://uimon.cern.ch/twiki/bin/view/Atlas/DatabaseReplication