WMS WS Interface and WMS-UI Restructuring

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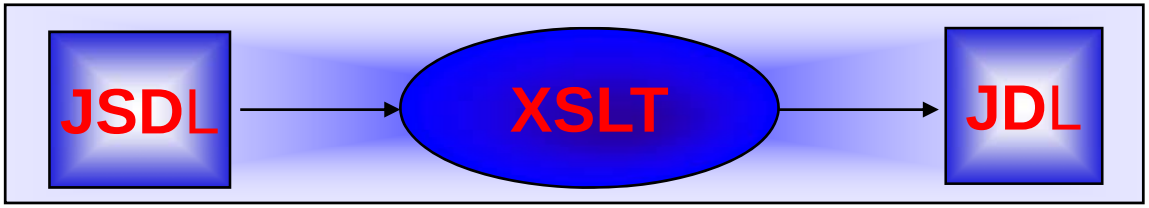
JSDL
Adopted Solution (1/3)

- **How we did: a mapping/conversion**
  - WMS and its UI needs JDL
    - Components implementation is strongly based on the JDL and class-ads libraries: cannot stick to pure XML representation internally (e.g. matchmaking)
    - Backward compatibility
    - JSDL does not support workflow
  - It does make sense to translate JSDL into JDL specifications, and fed the JDL into the gLite infrastructure where required
  - A converter can be '*embedded*' in different services at different levels
    - WMProxy Server
    - WMS User Interface

JSDL
Adopted Solution (2/3)

- **How to map/convert**
  - Using an XSL (eXtensible Stylesheet Language) Transformation
    - High flexibility
    - No service code changes in case of changes and/or evolution of the job description languages specifications: it suffices applying a new stylesheet
    - All conversion logic is handled within the stylesheet
    - eXtensible Stylesheet Language Transformation
      - *XSL based language for transforming XML documents into any other kind of document (generally HTML)*



JSDL2JDL
Adopted Solution (3/3)

- **First approach:**

- **Current:**

Status

- **What has been done**
  - JSDL2JDL stylesheet
    - Almost finalized
  - JSDL resources
    - Defined a small JSDL extension for supporting a few relevant GLUE attributes (e.g. LRMSType, RunTimeEnvironment, …)
  - Prototype of WMProxy WSDL interface accepting JSDL requests
    - Operations submit, register and listmatch supporting JSDL

- **What will be done**
  - Finalize support for JSDL
    - Update the stylesheet with the new GIN Profile
  - Adopt the JSDL normative extensions that seems to fit quite well some JDL job types:
    - JSDL ParameterSweep → JDL Parametric job
    - JSDL ParallelApplication (status?) → JDL MPI job

Delegation 2 (1/2)

- **Changes in Delegation 2:**
  - New proxycache structure:
    - *Directory name inside proxycache built from an hash of the User DN:*
      - E.g. /var/glite/proxycache/%2FC%3DIT%2FO%3DINFN%2FOU%3DPersonal%20Certificate%2FL%3DDATAMAT%20DSAGRD%2FCN%3DLuca%20Petronzio
    - *One subdir per delegation ID used actually containing the proxy:*
      - /var/glite/proxycache/<user DN hash>/<delegation ID>/userproxy.pem
    - *Allows empty delegation ID*
      - The user proxy will be stored directly in the <user DN hash> directory
    - *However the storage of the proxy does not keep any track of the proxy FQAN*
  - New operations introduced:
    - getNewProxyReq: new implementation of getProxy
    - getTerminationTime: returns date and time of proxy expiration
    - renewProxyReq: performs the renew of the proxy
    - Destroy: destroys the user proxy

Delegation 2 (2/2)

- **Delegation 2 migration in WMProxy and WMS-UI:**
  - Experimental version of WMProxy Server successfully running exposing both delegation 1 and delegation 2 operations
  - Tested using WMS WMProxy API and both WMS-UI branch and HEAD versions
  - WMProxy WebService WSDL imports both Gridsite delegation wsdl:
    - *www.gridsite.org-delegation-1.0.0.wsdl*
    - *www.gridsite.org-delegation-2.0.0.wsdl*

- **Integration Workplan still to be decided:**
  - Possible solutions:
    - *Release of WMProxy Server supporting delegation 1 and delegation 2: both UI can delegate on it*
    - *Release of UI supporting delegation 1 and delegation 2: checks WMProxy server version and uses the supported delegation by the server (only if strongly required)*

IPv6 within WMS/WMS-UI

- **IPv6 Compliant Network:**
  - Both WMProxy Server and WMS-UI at the moment are NOT IPv6 compliant
  - It is in our Workplan and currently developing it using BOOST Asio libraries, will be ready by the end of december
  - A few bugs currently open on this argument:
    - https://savannah.cern.ch/bugs/?39890
    - https://savannah.cern.ch/bugs/?41294
    - https://savannah.cern.ch/bugs/?41295
  - External tools have been verified by SA2:
    - https://edms.cern.ch/cedar/plsql/doc.info?document_id=942749&version=1 *(gSOAP – Compliant)*
    - https://edms.cern.ch/cedar/plsql/doc.info?document_id=942683&version=1 *(gridFTP - Compliant)*
    - https://edms.cern.ch/cedar/plsql/doc.info?document_id=930868&version=1 *(general IPv6 compliance of a Server – WMProxy NOT compliant)*
    - https://edms.cern.ch/cedar/plsql/doc.info?document_id=935729&version=1.1 *(BOOST Asio Lib)*

Files Transfers

- **Files transfers:**
  - WMS-UI to WMS:
    - gridFtp:
      - *Achieved using globus-url-copy command*
    - https:
      - *Achieved using Gridsite htcp command:*
        - Htcp is written with the CURL API but gives a more high level approach, reflecting the globus-url-copy mechanism
        - CURL approach deprecated, complexity in the code and bugged
        - Htcp performs host check
        - Provided by the Gridsite commands rpm
  - WMS to WN:
    - gridFtp:
      - *Achieved using globus-url-copy command*
    - https:
      - *Achieved using Gridiste htcp command*
    - SRM, *Storage Resource Management*:
      - *Also considering to provide files transfer support using SRM:*
        - External WebService that would handle files transfer/management
        - Requests received from various experiments
        - Interoperability with other middlewares, like ARC and UNICORE (already uses it)

New WMS-UI

- **New WMS-UI components:**
  - org.glite.wms.client and org.glite.wms-ui.cli-python have been merged
  - org.glite.wms-ui.wrap-python has been redesigned
  - Old structure:
    - Subsystems: WMS: org.glite.wms.client
      WMS-UI: org.glite.wms-ui.wrap-python
      org.glite.wms-ui.cli-python
  - New structure:
    - Subsystems: WMS-UI: org.glite.wms-ui.api-python
      org.glite.wms-ui.commands
    - Where:
      - org.glite.wms-ui.api-python contains the wrapping of the LB API in Python language, redesigned and reimplemented
      - org.glite.wms-ui.commands provides both commands glite-wms-job-* to call WMProxy Server operations and glite-wms-job-status/logging-info commands to query LB Server

WMS-UI messaging

- **The UI command line messages have been cleaned**
- **Evaluating returning error codes**
- **A new output format has been added, JSON now available:**
  - The commands glite-wms-job-submit, glite-wms-job-output and glite-wms-job-cancel have now a new option –json
  - E.g. the submit output format is the following:
    - Normal Job:

```
{
result: success
jobid: https://devel15.cnaf.infn.it:9000/kyCIX2WtH8GtdeHewK4s9A
endpoint: https://devel16.cnaf.infn.it:7443/glite_wms_wmproxy_server
}
```

    - Collection/Parametric/DAG Jobs:

```
{
result: success
parent: https://devel15.cnaf.infn.it:9000/_x81jH7KZr8rDVjpex57zQ
endpoint: https://devel16.cnaf.infn.it:7443/glite_wms_wmproxy_server
children: {
   Node_2: https://devel15.cnaf.infn.it:9000/Q9iGuzzo-JVhrcefA8n9wA
   Node_3: https://devel15.cnaf.infn.it:9000/leTl8p-pr7LIzFuzMeMcKw
   Node_4: https://devel15.cnaf.infn.it:9000/NbqQpwbU9Gr44OycdzjEGA
   Node_0: https://devel15.cnaf.infn.it:9000/c0-q7z0Hv6Bv5gW80LKpxg
   Node_1: https://devel15.cnaf.infn.it:9000/gEyYchaOU7UfKkVzwohfgw
  }
}
```

Bugs Fixes

- **WMProxy Server bugs fixed:**
  - "bug #28696: WMProxy should allow jobListMatch to timeout":
    - *Timeout has been implemented in the comunication between WM and WMProxy to avoid WMProxy left stuck on the jobListMatch call*
  - "bug #39903: Fermilab proxy cannot submit to WMS SL4, they are ok with SL3"
  - "bug #43545: messed up user DN logged by WMProxy":
    - *User DN logged to LB Server was garbage or null for events: Accepted, Enqueued Start/Ok*
  - "bug #36496: WMProxy Server: any-user does not work" and "bug #38739: WMProxy Server: doesn't allow exec if there's only user DN in gacl file":
    - *WMProxy GACL Authorization framework was bugged, reimplemented following original design (that was really not implemented correctly)*
  - "bug #36558: WMProxy Server: should log user id on syslog":
    - *For security purposes now WMProxy logs the user id on syslog (/var/log/messages)*
  - "bug #39641: User proxy mixup for job submissions too close in time":
    - *Wrong proxy linked in the renewd directory if the proxy was unregistered and later on a new one was registered, but related to another job*

WMS-UI Bugs Fixes

- **WMS-UI bugs fixed:**
  - bug #34949: Ctl-C'ed submission gives funny state
  - bug #26989: WMProxy API Java: Heap size reaches OutOfMemoryException
    - *User credential were kept in Java heap memory when not needed, giving soon an OutOfMemoryException calling the operation in a cycle*
  - bug #36757: WMProxy API Python: local proxy in api constructor does not work
    - *API Python constructor was not setting properly the proxy passed in input*
  - bug #38689: WMS UI: glite-wms-job-info should check if the jobid is a node
  - bug #43446: Problem with command glite-wms-job-info
  - bug #41072: Submit command holds after an exception:
    - *UI was peeking an empty endpoint after a blocking exception was raised by the WMProxy*
  - Bugs related to output messages and malformed options have been fixed