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THE LOGGER SERVICE

Functionality Description and Installation Manual

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Contents

| | | |
|----------|--|----------|
| 1 | Introduction | 3 |
| 2 | Logger Service | 3 |
| 3 | Interface | 4 |
| 4 | Logger Client | 5 |
| 5 | Installation | 6 |
| 5.1 | Install server | 6 |
| 5.2 | Configure MySQL | 6 |
| 5.3 | Configure server and service | 6 |
| 5.4 | Run server | 6 |

1 Introduction

The Logger Service is one of services implemented in HTTP(S,G) and SOAP Framework [1] and run in *httpsd* server. It provides simple frontend to underlying MySQL database to store and retrieve an information about jobs processed by ARC middleware [2].

Corresponding client is provided as part of ARC installed on cluster's frontend.

2 Logger Service

The Logger service is configured through configuration file of HTTPS/G server. It supports following service-specific commands.

- *acl_read [group [group [...]]]*
- *acl_write [group [group [...]]]*
- *acl_query [group [group [...]]]*

If client belongs to one of groups listed in *acl_read* command it is allowed to retrieve information about job records. Those clients are still restricted to an information about jobs which they are owners of. And those listed in *acl_write* can add new records. Usually those groups match against host credentials of a clusters' frontends. Groups in *acl_query* are allowed to retrieve information about *all* jobs.

Other supported commands are:

- *sqlcontact [user [password]]*
- *sqlcontactsource path*

They provide username and password used to access MySQL database. *sqlcontactsource* points to file which contains username and password in first line. It is better to use *sqlcontactsource* and make it readable only for user who starts the server.

The Logger accepts and stores in database following information:

| <i>Name</i> | <i>Type</i> | <i>Description</i> |
|-------------|---------------|---|
| start | date and time | Time when job was started being processed |
| end | date and time | Time when job finished being processed |
| cluster | string | Subject of cluster's PKI certificate |
| user | string | Subject of job owner's certificate |
| id | string | Identifier of the job |
| name | string | Name of the job given by owner |
| failure | string | Reason of job's failure |
| lrms | string | LRMS which was used to execute job |
| queue | string | Queue name in LRMS |
| rsl | string | Job's description as sent to cluster |
| ui | string | Hostname/ip of user's machine |
| usedcpu | number | Amount of CPU seconds used by job (not provided yes) |
| usedmem | number | Amount of memory bytes used by job (not provided yes) |

3 Interface

Logger service supports two SOAP methods for adding and retrieving records. It accepts information about processed jobs encoded in *UsageRecord* XML record as part of SOAP operation *add*. Corresponding WSDL is available in Appendix B.

Usage record currently consists of following elements

- ngjobid* identifier of a job as used in ARC tools
- usersn* subject of user's certificate
- cluster* subject of cluster's certificate
- description* description of a job as passed to computing resource
- projectname*
- jobname* name of a job specified by user
- clienthost* hostname or/and certificate from which user submitted a job
- requestedcpulimit* amount of CPU time requested in job's description (minutes)
- requestedmemory* amount of memory requested in job's description
- requesteddisk* amount of disk space requested in job's description
- submissiontime* time when job reached computing resource
- localuser* name/id of a user used to execute job on computing resource
- queue* name of a queue on computing resource where applicable

lrms type of batch system used at computing resource (aka LRMS)

localjobid id of a job in LRMS

lrmssubmission time job was passed to LRMS

lrmsendtime time LRMS finished processing job

nodename host names of computers which were executing job

nodecount number of computers which were executing job

exitcode numerical code returned by job's main executable

failurestring textual description of failure which happened during processing of a job (if any)

usedcputime CPU time consumed by job during executing

usedmemory maximal amount of memory used by job while executing

usedwalltime time it took for job to finish executing

useddisk amount of disk space taken by job while executing

status current state of job - kept for compatibility with GGF [3] Usage Record

endtime time computing resource finished processing job

downloadtime time it took to gather all input files requested for job

uploadtime time it took to distribute all output files produced by job

4 Logger Client

Logger service can be communicated using utility *arclogger* installed into `${NORDUGRID_LOCATION}/libexec` by default. It allows to add new records into database and to retrieve information. First functionality is used by a grid-manager to pass information about processed jobs.

```
arclogger [-h] [-d level] [-u url] {control_dir ...|-q [-x] [-e element,element,...] [-o offset] [-s]
```

Here possible options are

-h show reminder,

-d set debug output to *level*,

-u URL of central logging server (mandatory if *-q* is given),

-q retrieve information, otherwise - report job to database,

-x print obtained information in XML,

-o from which record to start,

-s how many records to show,

-e specify which elements are desired in output.
Possible values are: *start,end,cluster,user,id,name,failure,lrms,queue,rsl,ui,usedcpu,usedmem*.

query is SQL conditional expression used to select jobs' records.

5 Installation

5.1 Install server

Just follow any of installation instructions available at <http://www.nordugrid.org/papers.html> to build (optionally) and install server part of NorduGrid ARC. If You choose 0.5 branch You will not need to do anything special. In case of 0.4 branch You will have to recompile ARC with `-enable-experimental` option of configure.

5.2 Configure MySQL

Logger service uses MySQL database. So it is essential to configure database properly. Currently You will either need file `grid-manager/https/logger/create.sql` or use content of Appendix A. It is important that You look into that file and modify first 3 lines (especially password). You can keep them as is, but at least make sure they fit Your intentions.

You have to feed that file to MySQL server. Preferably using `mysql` utility. This can look like `cat create.sql | mysql -p -u root .` ut You should check manual of `mysql` and configuration of the server before You type that.

If everything works MySQL server should have new database called `nglogger` and new user also called `nglogger` allowed to do everything inside that database. If You modified `create.sql` names can be different. Inside that database ther should be table called `jobs`. Do not change this name. There will also be table `files`, but it is not used yet.

That's it. You have database configured.

5.3 Configure server and service

Follow instruction in [1] to configure server. Do not forget to read [4] and add '=' if You use central configuration file. Then follow instructions in section 2 to configure logger service. Make sure `sqlcontact/sqlcontactsources` contain right information.

5.4 Run server

Follow instruction in [1] to start server. Look into log file for line which looks like "Added service logger at /some/path". If You do not see it try to look through file for anything suspicious.

Appendix A

```
CREATE DATABASE IF NOT EXISTS nglogger;
USE nglogger;
CREATE TABLE IF NOT EXISTS jobs (
  num INT UNSIGNED AUTO_INCREMENT,
  start DATETIME NULL DEFAULT NULL,
  end DATETIME NULL DEFAULT NULL,
  cluster VARCHAR(255) NOT NULL DEFAULT "",
  user VARCHAR(255) NOT NULL DEFAULT "",
  id VARCHAR(32) NOT NULL DEFAULT "",
  name VARCHAR(255) NULL DEFAULT NULL,
  failure VARCHAR(255) NULL DEFAULT NULL,
  lrms VARCHAR(32) NULL DEFAULT NULL,
```

```

queue VARCHAR(32) NULL DEFAULT NULL,
rsl TEXT NULL DEFAULT NULL,
ui VARCHAR(255) NULL DEFAULT NULL,
usedcpu INT NULL DEFAULT NULL,
usedmem INT NULL DEFAULT NULL,
KEY num(num)
);

```

Appendix B

```

<definitions targetNamespace="http://www.nordugrid.org/ws/schemas/ARCLoggerV2"
  xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:SOAP-ENC="http://schemas.xmlsoap.org/soap/encoding/"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:n12="http://www.nordugrid.org/ws/schemas/ARCLoggerV2"
  xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
  xmlns:wSDL="http://schemas.xmlsoap.org/wsdl/"
  xmlns="http://schemas.xmlsoap.org/wsdl/">
<wsdl:types>
<schema targetNamespace="http://www.nordugrid.org/ws/schemas/ARCLoggerV2"
  xmlns="http://www.w3.org/2001/XMLSchema">
  <import namespace="http://schemas.xmlsoap.org/soap/encoding/" />
  <simpleType name="ResultCode">
    <restriction base="xsd:string">
      <enumeration value="NoError" />
      <enumeration value="UndefinedError" />
    </restriction>
  </simpleType>
  <complexType name="Result">
    <sequence>
      <element name="Code" type="n12:ResultCode" />
      <element name="Description" type="xsd:string" minOccurs="0" maxOccurs="1" nillable="true" />
    </sequence>
  </complexType>
  <complexType name="UsageRecord">
    <sequence>
      <element name="ngjobid" type="xsd:string" />
      <element name="usersn" type="xsd:string" />
      <element name="cluster" type="xsd:string" minOccurs="0" maxOccurs="1" nillable="true" />
      <element name="description" type="xsd:string" minOccurs="0" maxOccurs="1" nillable="true" />
      <element name="projectname" type="xsd:string" minOccurs="0" maxOccurs="1" nillable="true" />
      <element name="jobname" type="xsd:string" minOccurs="0" maxOccurs="1" nillable="true" />
      <element name="clienthost" type="xsd:string" minOccurs="0" maxOccurs="1" nillable="true" />
      <element name="requestedcputime" type="xsd:int" minOccurs="0" maxOccurs="1" nillable="true" />
      <element name="requestedmemory" type="xsd:int" minOccurs="0" maxOccurs="1" nillable="true" />
      <element name="requesteddisk" type="xsd:int" minOccurs="0" maxOccurs="1" nillable="true" />
      <element name="submissiontime" type="xsd:dateTime" minOccurs="0" maxOccurs="1" nillable="true" />
      <element name="localuser" type="xsd:string" minOccurs="0" maxOccurs="1" nillable="true" />
      <element name="queue" type="xsd:string" minOccurs="0" maxOccurs="1" nillable="true" />

```

```

<element name="lrms" type="xsd:string" minOccurs="0" maxOccurs="1" nillable="true"/>
<element name="localjobid" type="xsd:string" minOccurs="0" maxOccurs="1" nillable="true"/>
<element name="lrmssubmissiontime" type="xsd:dateTime" minOccurs="0" maxOccurs="1" nillable="true"/>
<element name="lrmsendtime" type="xsd:dateTime" minOccurs="0" maxOccurs="1" nillable="true"/>
<element name="nodename" type="xsd:string" minOccurs="0" maxOccurs="1" nillable="true"/>
<element name="nodecount" type="xsd:int" minOccurs="0" maxOccurs="1" nillable="true"/>
<element name="exitcode" type="xsd:int" minOccurs="0" maxOccurs="1" nillable="true"/>
<element name="failurestring" type="xsd:string" minOccurs="0" maxOccurs="1" nillable="true"/>
<element name="usedcputime" type="xsd:int" minOccurs="0" maxOccurs="1" nillable="true"/>
<element name="usedmemory" type="xsd:int" minOccurs="0" maxOccurs="1" nillable="true"/>
<element name="usedwalltime" type="xsd:int" minOccurs="0" maxOccurs="1" nillable="true"/>
<element name="useddisk" type="xsd:int" minOccurs="0" maxOccurs="1" nillable="true"/>
<element name="status" type="xsd:string" minOccurs="0" maxOccurs="1" nillable="true"/>
<element name="endtime" type="xsd:dateTime" minOccurs="0" maxOccurs="1" nillable="true"/>
<element name="downloadtime" type="xsd:dateTime" minOccurs="0" maxOccurs="1" nillable="true"/>
<element name="uploadtime" type="xsd:dateTime" minOccurs="0" maxOccurs="1" nillable="true"/>
<any namespace="##other" minOccurs="0" maxOccurs="unbounded"/>
</sequence>
</complexType>

<complexType name="addRequest">
  <sequence>
    <element name="job" type="nl2:UsageRecord" minOccurs="1" maxOccurs="unbounded"/>
  </sequence>
</complexType>
<complexType name="addResponse">
  <sequence>
    <element name="result" type="nl2:Result"/>
  </sequence>
</complexType>
<complexType name="getRequest">
  <sequence>
    <element name="query" type="xsd:string" minOccurs="0" maxOccurs="1" nillable="true"/>
    <element name="offset" type="xsd:unsignedInt" minOccurs="1" maxOccurs="1"/>
    <element name="size" type="xsd:unsignedInt" minOccurs="1" maxOccurs="1"/>
  </sequence>
</complexType>
<complexType name="getResponse">
  <sequence>
    <element name="result" type="nl2:Result"/>
    <element name="job" type="nl2:UsageRecord" minOccurs="0" maxOccurs="unbounded"/>
  </sequence>
</complexType>

<element name="add" type="nl2:addRequest"/>
<element name="addResponse" type="nl2:addResponse"/>
<element name="get" type="nl2:getRequest"/>
<element name="getResponse" type="nl2:getResponse"/>
</schema>
</wsdl:types>
<wsdl:message name="addRequest">

```

```

    <wsdl:part name="addRequest" element="n12:add"/>
</wsdl:message>
<wsdl:message name="addResponse">
    <wsdl:part name="addResponse" element="n12:addResponse"/>
</wsdl:message>
<wsdl:message name="getRequest">
    <wsdl:part name="getRequest" element="n12:get"/>
</wsdl:message>
<wsdl:message name="getResponse">
    <wsdl:part name="getResponse" element="n12:getResponse"/>
</wsdl:message>
<wsdl:portType name="ARCLoggerV2PortType">
    <wsdl:operation name="add">
        <wsdl:documentation>Add new information into database</wsdl:documentation>
        <wsdl:input name="addRequest" message="n12:addRequest"/>
        <wsdl:output name="addResponse" message="n12:addResponse"/>
    </wsdl:operation>
    <wsdl:operation name="get">
        <wsdl:documentation>Query information in database</wsdl:documentation>
        <wsdl:input name="getRequest" message="n12:getRequest"/>
        <wsdl:output name="getResponse" message="n12:getResponse"/>
    </wsdl:operation>
</wsdl:portType>
<wsdl:binding name="ARCLoggerV2" type="n12:ARCLoggerV2PortType">
    <soap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/>
    <wsdl:operation name="add">
        <soap:operation soapAction=""/>
        <wsdl:input name="addRequest">
            <soap:body use="literal"/>
        </wsdl:input>
        <wsdl:output name="addResponse">
            <soap:body use="literal"/>
        </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="get">
        <soap:operation soapAction=""/>
        <wsdl:input name="getRequest">
            <soap:body use="literal"/>
        </wsdl:input>
        <wsdl:output name="getResponse">
            <wsdl:output name="getResponse">
                <soap:body use="literal"/>
            </wsdl:output>
        </wsdl:output>
    </wsdl:operation>
</wsdl:binding>
<wsdl:service name="ARCLoggerV2">
    <wsdl:documentation>Database to keep and search information about jobs executed at NG-enabled GRID sites</wsdl:documentation>
    <wsdl:port name="ARCLoggerV2" binding="n12:ARCLoggerV2">
        <soap:address location="http://localhost:80"/>
    </wsdl:port>
</wsdl:service>

```

</definitions>

References

- [1] A. Konstantinov, *The HTTP(s,g) And SOAP Framework*, The NorduGrid Collaboration, NORDUGRID-TECH-9. [Online]. Available: http://www.nordugrid.org/documents/HTTP_SOAP.pdf
- [2] “The NorduGrid Collaboration,” Web site. [Online]. Available: <http://www.nordugrid.org>
- [3] “Global Grid Forum,” Web site. [Online]. Available: <http://www.ggf.org/>
- [4] A. Konstantinov, *Configuration and Authorisation of ARC (NorduGrid) Services*, The NorduGrid Collaboration, NORDUGRID-TECH-6. [Online]. Available: http://www.nordugrid.org/documents/Config_Auth.pdf

References

- [1] HTTP(S,G) and SOAP Server/Framework.
- [2] NorduGrid middleware, the Advanced Resource Connector. <http://www.nordugrid.org/middleware/>
- [3] The Globus Alliance. <http://www.globus.org>
- [4] The Global Grid Forum. <http://www.ggf.org>
- [5] Configuration and Authorisation of ARC (NorduGrid) Services.