



Enabling Grids for E-science

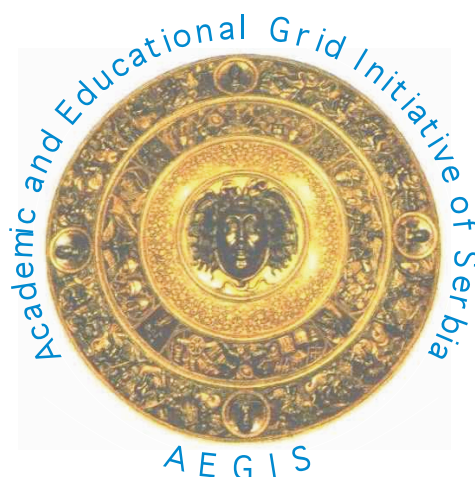
AMGA tutorial

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SEE-GRID-SCI
SEE-GRID eInfrastructure for regional eScience



Information Society



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www.eu-egee.org

- **Arda Metadata Catalogue Project**

- Data about data
- Simple generic structure
- Advantages
 - Part of GRID
 - GRID security (VOMS access)
 - Concealing variety of databases

- **Client-server approach**
 - AMGA server
 - AMGA clients
 - C++ binaries : mdclient, mdcli (standard part of UI)
 - Java applications
 - API way
 - *c++, java, python, perl, php*
 - Web frontend: AMGA WI
- **mdclient**
 - Configuration file needed

- **.mdclient.config example**

Host = grid16.rcub.bg.ac.yu

Port = 8822

User settings

Login = NULL

PermissionMask = rwx

GroupMask = rwx

Home = /

Security options

UseSSL = require # options: require, try, no

AuthenticateWithCertificate = 1 # Use certificate to authenticate

UseGridProxy = 1

IgnoreCertificateNameMismatch = 1

If server certificates are verified, CA certificates need to be loaded:

TrustedCertDir = /etc/grid-security/certificates

- Proxy creation

```
$ voms-proxy-init --voms seegrid
```

- Connecting to AMGA server

```
$ mdclient
```

```
Connecting to grid16.rcub.bg.ac.yu:8822...
```

```
ARDA Metadata Server 1.3.0
```

```
Query>
```

- **Structure**

- Based on file-system scheme

- directories (collections) – abstraction of standard database tables
 - entry – file in file-system , but also a row in table
 - attribute – can be observed as a column of table in standard database
 - Directories have different attributes and so the entries that reside in those directories
 - Subdirectories exist
 - Users and groups
 - Unix like access rights to directories and entries - rwx

- **Help**

Query> help

>> help [topic]

>> Displays help on a command or a topic.

**>> Valid topics are: help metadata metadata-optional
directory replication constraints entry group acl index
schema sequence user view site replicas ticket capabilities
commands**

Query> help user

- **Some standard commands**

- dir
- pwd
- cd
- createdir
- rmdir
- chown
- chmod
- link
- ls
- stat

- **Attribute handling**

- Every attribute added to some directory is defined by couple:

attribute name – attribute type

AMGA	PostgreSQL	MySQL	Oracle	SQLite	Python
int	integer	int	number(38)	int	int
float	double precision	double precision	float	float	float
varchar(n)	character varying(n)	character varying(n)	varchar2(n)	varchar(n)	string
timestamp	timestamp w/o TZ	datetime	timestamp(6)	unsupported	time(unsupported)
text	text	text	long	text	string
numeric(p,s)	numeric(p,s)	numeric(p,s)	numeric(p,s)	numeric(p,s)	float

- **Example**

```
Query> cd /grid/seegrid/
```

```
Query> createdir movies
```

```
Query> cd movies
```

- **Attribute adding**

```
addattr [path] <attribute_name> <type_name>
```

```
Query> addattr . MovieTitle varchar(128)
```

```
Query> addattr . Runtime int
```

```
Query> addattr . Type text
```

- **Attribute listing**

```
Query> listattr /grid/seegrid/movies/  
>> MovieTitle  
>> varchar(128)  
>> Runtime  
>> int  
>> Type  
>> text
```

- **Attribute removing**

```
Query> removeattr <dir> <attribute >
```

- **Adding entries to directory and setting attribute values**

```
Query> addentry hair.mov MovieTitle 'Hair'
```

```
Query> setattr hair.mov Runtime 121
```

```
Query> setattr hair.mov Runtime 121 Type 'musical'
```

```
Query> addentry vertigo.mov MovieTitle 'Vertigo'
```

```
Query> setattr vertigo.mov Runtime 128 Type 'thriller'
```

- **Data reviewing and query creation**

- getattr : getattr <pattern> <attribute1><attribute2> ...
- selectattr : selectattr <attr>... <condition>
- find : find <pattern> 'query'

Query> getattr * MovieTitle Runtime Type

>> hair.mov

>> Hair

>> 121

>> musical

>> vertigo.mov

>> Vertigo

>> 128

>> thriller

```
Query> selectattr .:MovieTitle .:Runtime .:Type '.:Runtime >
125'
```

```
>> Vertigo
```

```
>> 128
```

```
>> thriller
```

```
Query> selectattr .:MovieTitle 'like(.:FILE,"%r.mov%")'
```

```
>> Hair
```

```
Query> find *.mov 'Runtime < 123'
```

```
>> hair.mov
```

- **Attribute updating**

Query> updateattr * Runtime Runtime+10 'Runtime>123'

Query> getattr * Runtime

>> hair.mov

>> 121

>> vertigo.mov

>> 138

- **Complex queries can be created**

- Using different functions in query conditions
- Using of table joins

- **Access right control**

- ACL (access control list)
- User
- Group

- **Examples**

```
Query> whoami  
>> seegrid
```

```
Query> grp_member  
>> seegrid:nova_grupa  
>> seegrid:users
```



```
Query> acl_show /grid/seegrid/movies/
```

```
>> seegrid rwx
```

```
>> root:seegrid-user rwx
```

```
>> seegrid:nova_grupa rw
```

```
>> seegrid:users rwx
```

```
>> system:anyuser rx
```

```
Query> acl_add /grid/seegrid/movies/ nova_grupa rwx
```

```
Query> acl_remove /grid/seegrid/movies/ nova_grupa
```

- **Advanced features**
 - Replication
 - Index creation
 - Table constraints
 - Sequence creation
 - Managing user capabilities

- **Application**
 - LFC interaction
 - Efficient team coordination
 - Grid jobs implementation
 - ...

Useful links

- http://wiki.egee-see.org/index.php/AMGA_Metadata_Catalogue_Tutorial
- <http://project-arda-dev.web.cern.ch/project-arda-dev/metadata/index.html>
- <https://grid.ct.infn.it/twiki/bin/view/GILDA/AMGAHandsOn>

The end