Installing a gLite VOMS Server

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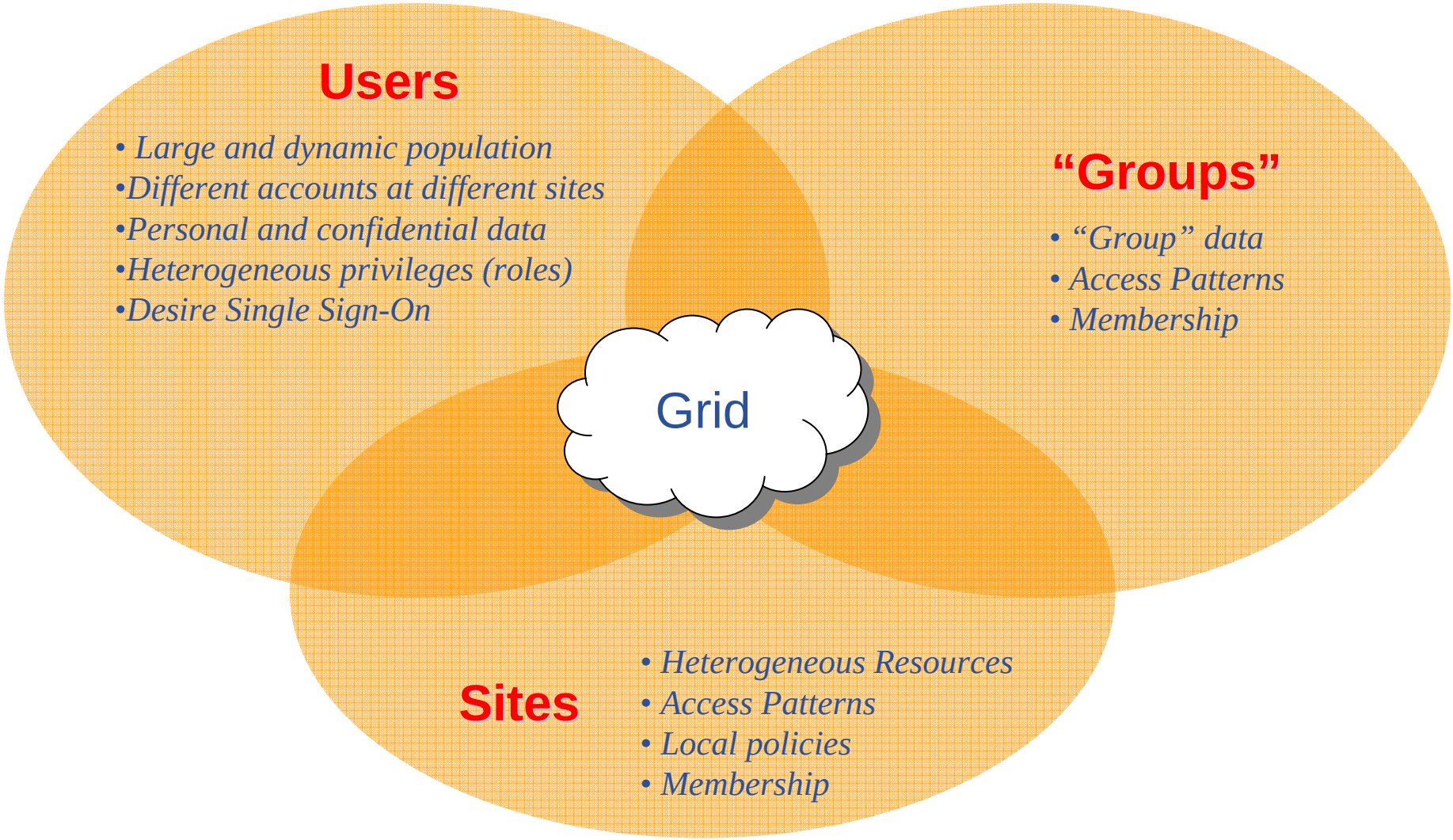
Overview

- Basic concepts on Virtual Organisation
- Introduction to VOMS
  - Features
  - Registration
  - Groups & Roles
- Installing VOMS
  - Reminder of gLite installation
  - Installation via apt
- Configuring VOMS
  - Key aspects
  - Verifying installation
- Registering VOMS admin
- VOMS server web interface
  - Groups
  - Roles
- VOMS admin command line interface

GRID Security: the players



Virtual Organizations and authorization

- **Grid users MUST belong to virtual organizations**
  - What we previously called “groups”
  - Sets of users belonging to a collaboration
  - User must sign the usage guidelines for the VO
  - You will be registered in the VO-LDAP server (wait for notification)
  - List of supported vos:
    - https://lcg-registrar.cern.ch/virtual_organization.html
- **Vos maintain a list of their members on a LDAP Server**
  - The list is downloaded by grid machines to map user certificate subjects to local “pool” accounts

```
...
"/C=CH/O=CERN/OU=GRID/CN=Simone Campana 7461" .dteam
"/C=CH/O=CERN/OU=GRID/CN=Andrea Sciaba 8968" .cms
"/C=CH/O=CERN/OU=GRID/CN=Patricia Mendez Lorenzo-ALICE" .alice
...
```

  - Sites decide which vos to accept

`/etc/grid-security/grid-mapfile`

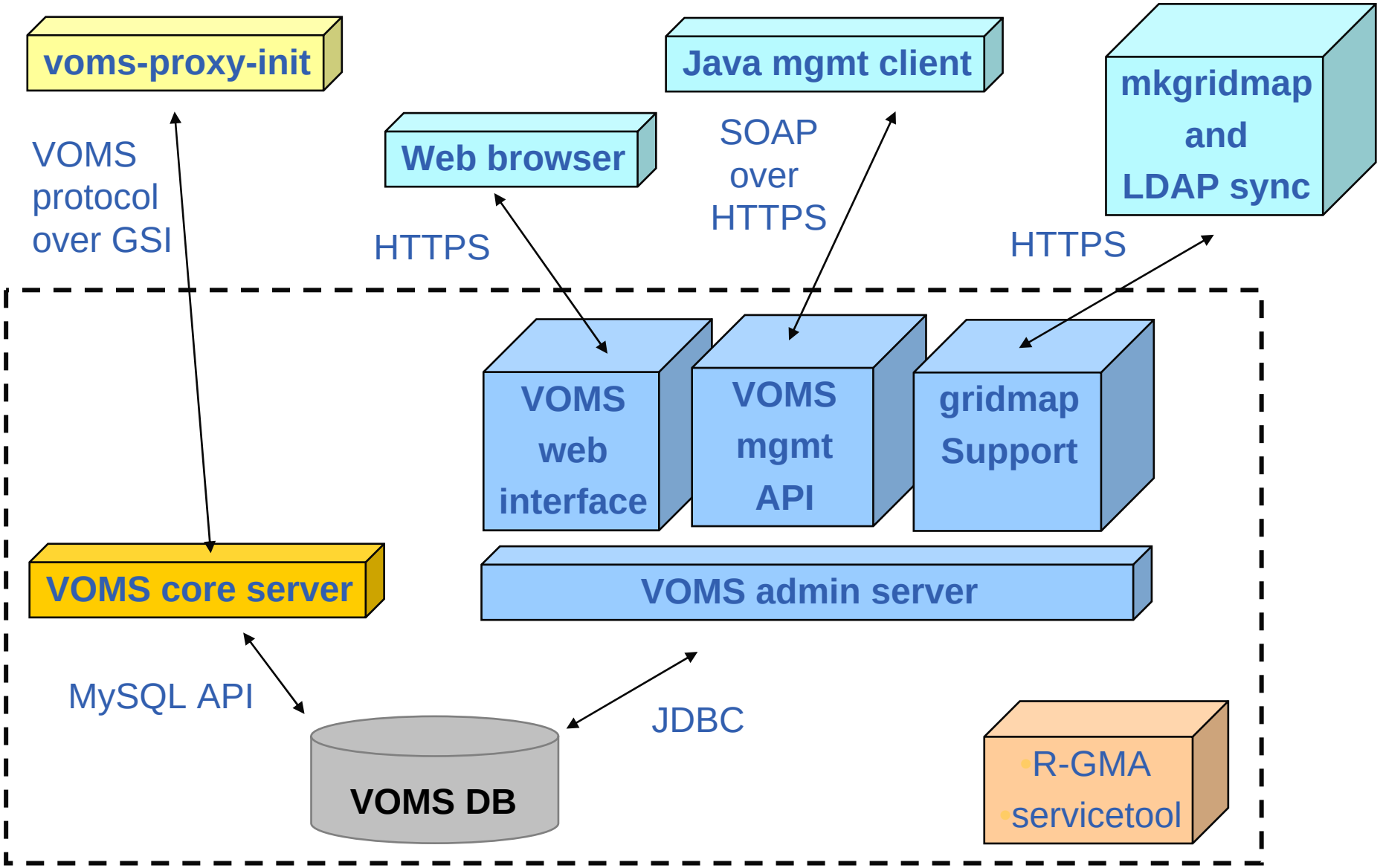
Introduction to VOMS

- Virtual Organization Membership Service (VOMS)
  - Account Database
    - Serving information in a special format (VOMS credentials)
    - Can be administered via command line & via web interface
  - Provides information on the user's relationship with his/her Virtual Organization (VO)
    - VO - Membership
    - Group membership
    - Roles of user

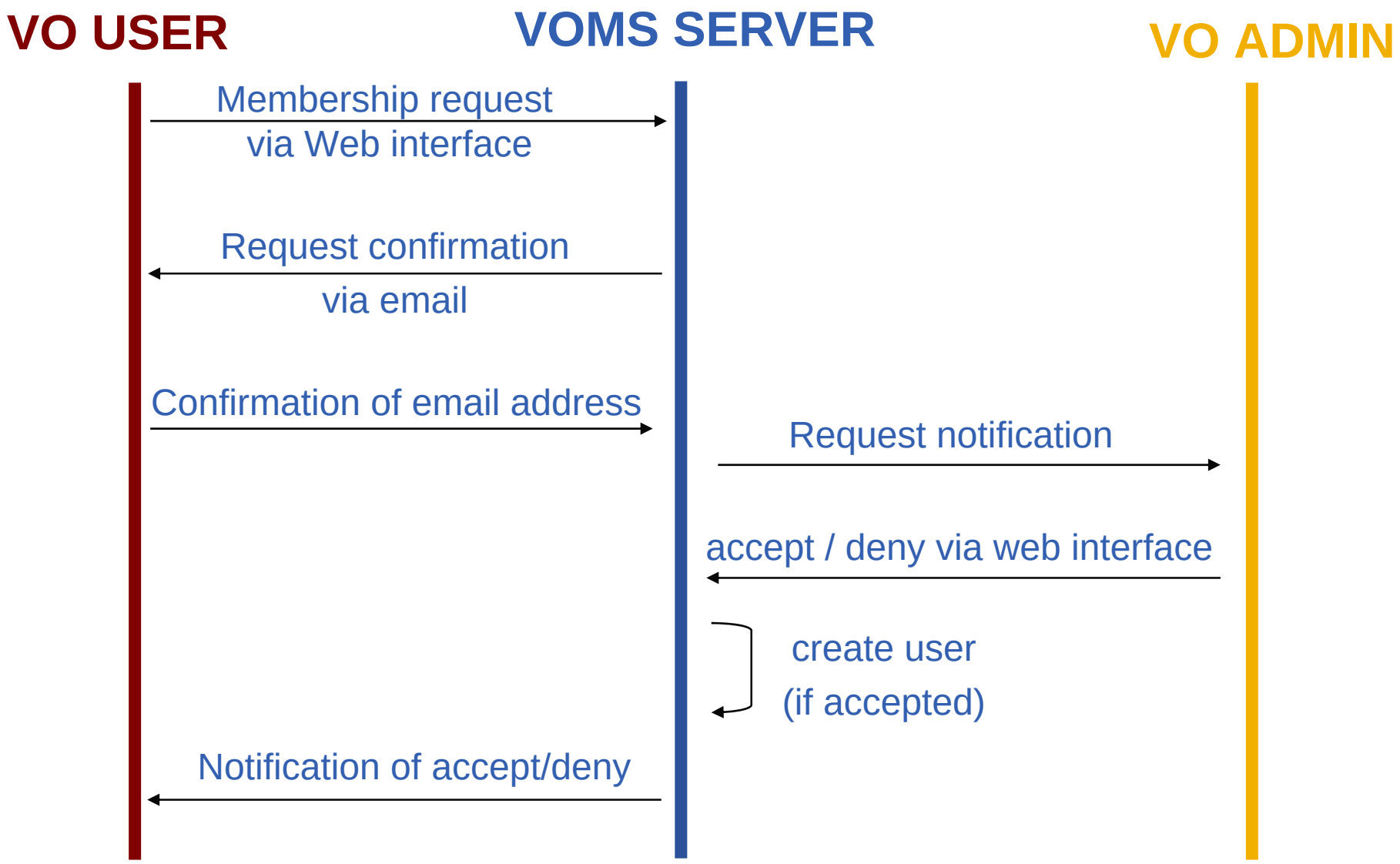
Introduction to VOMS

- **VOMS Features**
  - Single login using (proxy-init) only at the beginning of a session
    - Attaches VOMS certificate to user proxy
  - Expiration time
    - The authorization information is only valid for a limited period of the time as the proxy certificate itself
  - Multiple VO
    - User may log-in into multiple VOs and create an aggregate proxy certificate, which enables him/her to access resources in any one of them
  - Backward compatibility
    - The extra VO related information is in the user's proxy certificate
    - User's proxy certificate can be still used with non VOMS-aware service
  - Security
    - All client-server communications are secured and authenticated.

VOMS architecture



Registration process



Groups

- The number of users of a VO can be very high:
  - E.g. the experiment ATLAS has 2000 member

- Make VO manageable by organizing users in groups:
  Examples:
  - VO BIOMED-FRANCE
    - Group Paris
      - *Sorbonne University*
        - Group Prof. de Gaulle
      - *Central University*
    - Group Lyon
    - Group Marseille
  - VO BIOMED-FRANCE
    - BIOMED-FRANCE/STAFF can write to normal storage
    - BIOMED-FRANCE/STUDENT can only to volatile space

- Groups can have a hierarchical structure

- Group membership is added automatically to your proxy when doing a *voms-proxy-init*

Groups rights

- **Assign rights to certain members of the groups**
  - using Access Control Lists (ACL) like in a file system
    - Allow / Deny
      - create/delete – controls subgroup operations
      - add/remove – controls membership operations
      - setACL/getACL – controls ACL operations
      - setDefault/getDefault – controls default membership operations
      - ALL – special permission for all operations
  - Specifying unit for entry:
    - The local database administrator
    - A specific user (not necessarily a member of this VO)
    - Anyone who has a specific VOMS attribute FQAN
    - Anyone who presents a certificate issued by a known CA (Including host and service certificates)
    - Absolutely anyone, even unauthenticated clients

Roles

- **Roles are specific roles a user has and that distinguishes him from others in his group:**
  - Software manager
  - Administrator
  - Manager

- **Difference between roles and groups:**
  - Roles have no hierarchical structure – there is no sub-role
  - Roles are not used in 'normal operation'
    - They are not added to the proxy by default when running *voms-proxy-init*
    - But they can be added to the proxy for special purposes when running *voms-proxy-init*

- **Example:**
  - User Giorgio has the following membership
    - VO=gildav, Group=tutors, Role=SoftwareManager
  - During normal operation the role is not taken into account, e.g. Giorgio can work as a normal user
  - For special things he can obtain the role "Software Manager"

Installing VOMS Server

gLite general installation – short reminder

- VOMS server can be installed via a gLite deployment package
  - Download: http://glite.web.cern.ch/glite/packages
- Installation via
  - Installer script
  - APT http://glite.web.cern.ch/glite/packages/APT.asp
- Installation will install all dependencies, including
  - other necessary gLite modules
  - external dependencies (e.g. TOMCAT)
- You will need to install non-freely available packages yourself (e.g. Java)

Installing pre-requisites

- Request host certificates for VOMS Server to a CA
  - (i.e) https://gilda.ct.infn.it/CA/mgt/restricted/srvreq.php
- Copy host certificate (hostcert.pem and hostkey.pem) in **/etc/grid-certificates**.
  - *chmod 644 hostcert.pem*
  - *chmod 400 hostkey.pem*

- If planning to use certificates released by unsupported EGEE CA's, be sure that their public key and CRLs (usually distributed with an rpm) are installed.
  - The CRL of the VO GILDA are available from

https://gilda.ct.infn.it/RPMS/ca_GILDA-0.28.1.i386.rpm

Installing VOMS via apt

1. **Verify apt is present:**
   - **rpm -qa | grep apt**
   - **Install apt if necessary:**
     - **rpm -ivh** http://linuxsoft.cern.ch/cern/slc30X/i386/SL/RPMS/apt-0.5.15cnc6-8.SL.cern.i386.rpm
2. **Add gLite apt repository:**
   - Fill up a file (e.g. `glite.list`) under the `/etc/apt/sources.list.d` directory (R 1.4)
   - `rpm http://glitesoft.cern.ch/EGEE/gLite/APT/R1.4/ rhel30 externals Release1.4 updates`
3. **Update apt repository:**
   - `apt-get update`
   - `apt-get upgrade`
4. **Install VOMS server:**
   - `apt-get install glite-voms-server-mysql-config`

Extra packages needed (non freely distributable) :

- **J2SE v 1.4.2_08 JRE:** http://java.sun.com/j2se/1.4.2/download.html

See http://glite.web.cern.ch/glite/packages/APT.asp

gLite configuration – short reminder

- Configuration files
  - XML format
  - templates provided in /opt/glite/etc/config/templates
- Hierarchy of configuration file
  - Global configuration file
  - service specific configuration files
- Parameter groups
  - User parameters ('changeme')
  - Advanced parameters
  - System parameters

Configure the VOMS server

- **Go to configuration directory and copy templates**
  - `cd /opt/glite/etc/config`
  - `cp templates/*.xml .`

- **Customize configuration files by replacing all 'changeme' values with the proper values**

VOMS Server key configuration aspects

- Virtual organization description (one instance per VO)
  - name of the VO (i.e. newVO)
  - VOMS (core) service TCP port number on which the server VO instance will listen
    - must be a valid, unique port number – typically from 15000 upwards
  - e-mail address used to send emails on behalf of the VOMS server

```
<instance name="newVO">
        <parameters>
            <voms.vo.name
           description="Name of the VO associated with this VOMS instance.
           [Example: 'EGEE'] [Type: 'string']"
           value="newVO"/>

           <voms.port.number
          description="Port number listening for request for this VO instance
           [Example: '15001'][Type: 'string']"
          value="1500X"/>
```

VOMS Server key configuration aspects

<voms.admin.notification.e-mail
description="E-mail address that is used to send notification mails
from the VOMS-admin.
[Example: name.surname@domain.org][Type: 'string']"
value="voms-admin@..."/>

<voms.admin.certificate
description="The certificate file (in pem format) of an initial VO administrator.
The VO will be set up so that this user has full VO administration privileges.
Remove parameter or leave parameter empty if you don't want to create an initial VO administartor.
[Example: '/your/path/admincert.pem'] [Type: 'string']"
value="/etc/grid-security/admin-usercert.pe

- **Copy the admin certificate (`admin-usercert.pem`) on `/etc/grid-security/`**

VOMS Server key configuration aspects

- **Servicetool configuration**
  - To publish the existence and status of the VOMS server to the information system (R-GMA)
- **Service discovery configuration**
  - For the rgma client of the machine

Configure MySQL

- **MySQL database configuration**
  - Administrator **password** of used MySQL database (it has to be set **before** configuration)
  - `/usr/bin/mysqladmin --u root password '<your passwd>'`
  - `/usr/bin/mysqladmin --u root -h '<voms-server>' password '<your passwd>'`

Before start...

- `-A RH-Firewall-1-INPUT -m state --state NEW -m tcp -p tcp --dport 8443 -j ACCEPT`
- `-A RH-Firewall-1-INPUT -m state --state NEW -m tcp -p tcp --dport 1500X -j ACCEPT`
- **service iptables restart**

Start the VOMS server

- **Go to the scripts directory and execute the VOMS Server configuration script**
  - `cd /opt/glite/etc/config/scripts`
  - `./glite-voms-server-config.py --configure`
- **Start the VOMS server**
  - `./glite-voms-server-config.py --start`

Register VOMS administrator

The first VOMS administrator has to be added manually using the command line tools:

- Copy your public grid certificate to your VOMS server
- Run voms-admin command to add yourself as admin

```
$GLITE_LOCATION/bin/voms-admin --vo <VO name>
                create-user <certificate.pem>
                assign-role <VO name> VO-Admin
                <certificate.pem>
```

Verify installation

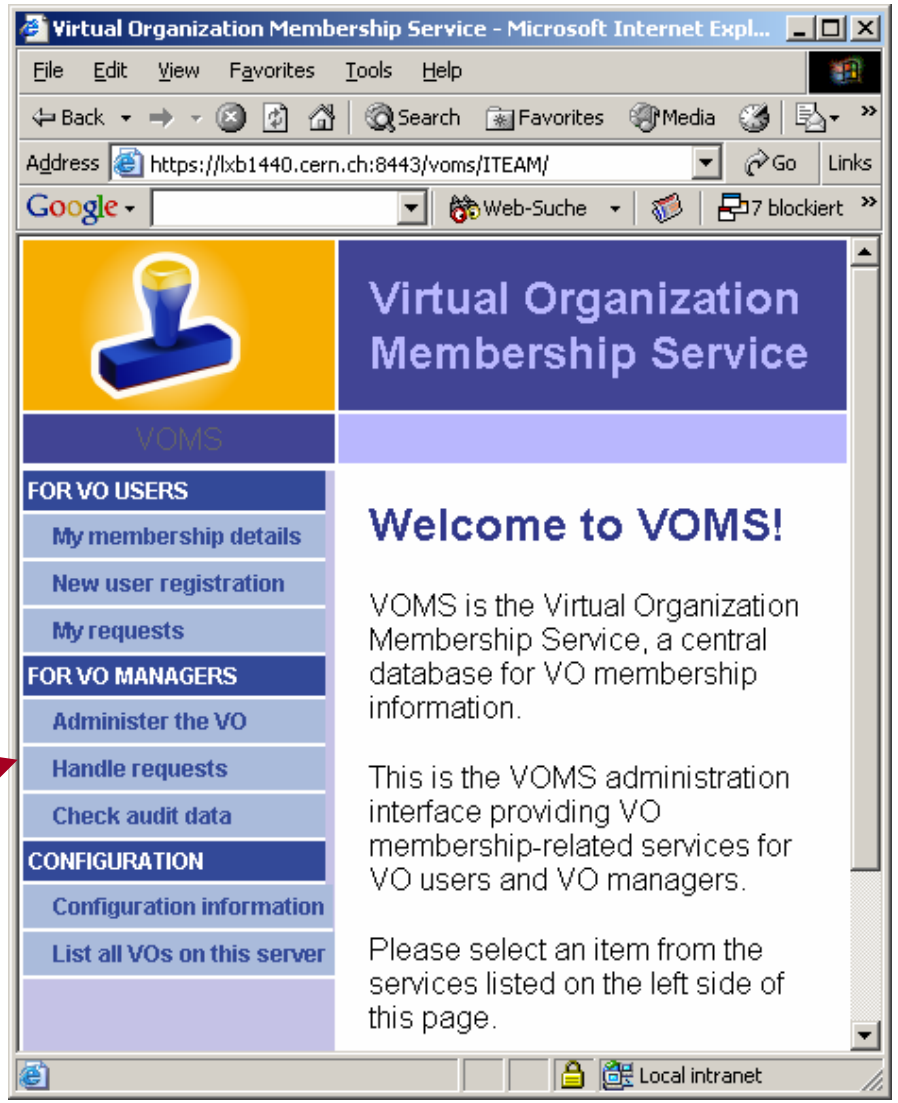
- **Using gLite configuration script**
  - `cd /opt/glite/etc/config/scripts`
  - `./glite-voms-server-config.py --status`
- **Connect to the VOMS server via browser**

(requires personal certificate loaded on browser)

  - https://<hostname>:8443/voms/<your-vo-name>
- **Check if VOMS server is shown up in R-GMA**
  - **https://<rgma-server-machine>:8443/R-GMA**

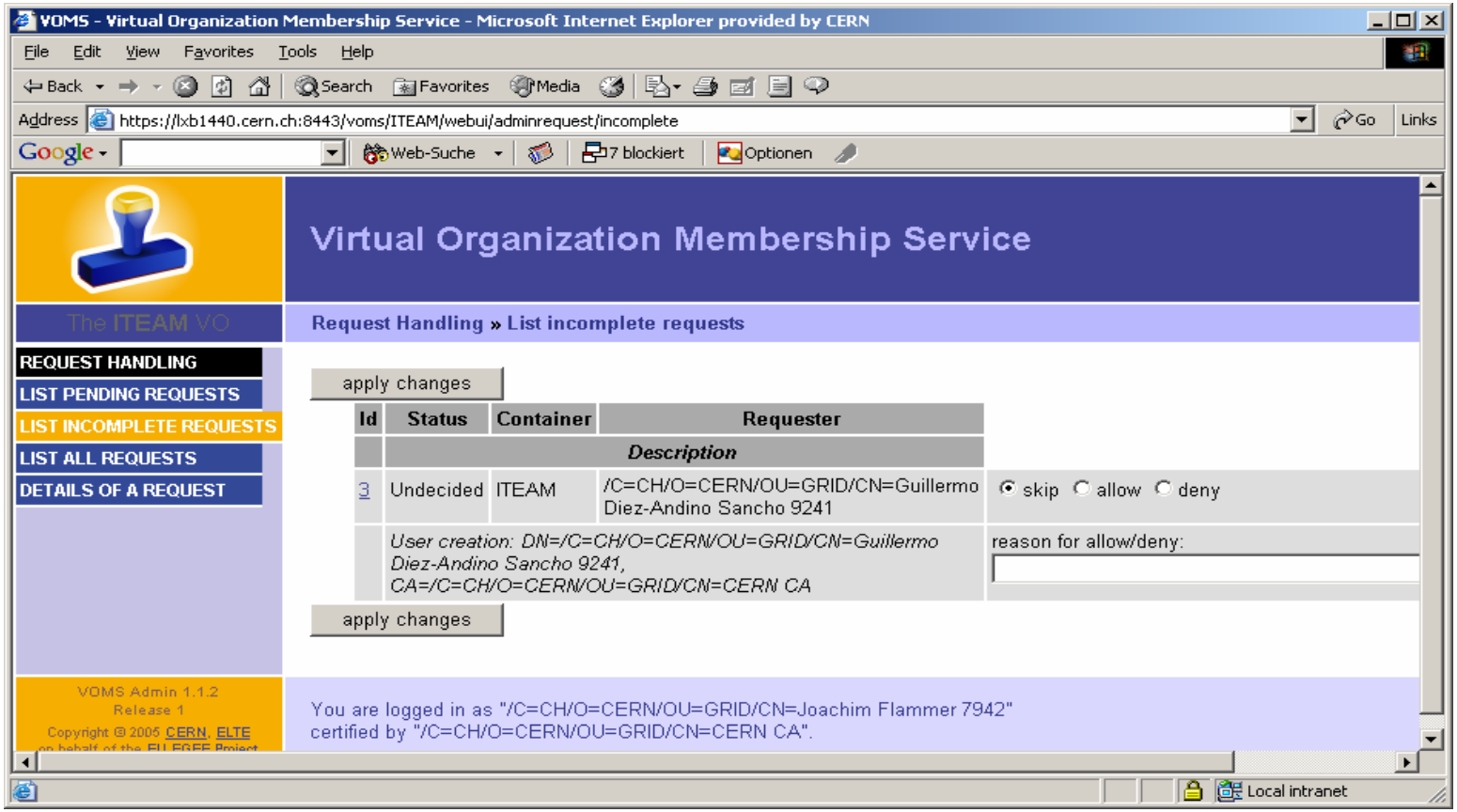
VOMS Web interface

- VO user can
  - Query membership details
  - Register himself in the VO
    - You will need a valid certificate
  - Track his requests
- VO manager can
  - Handle request from users
  - Administer the VO



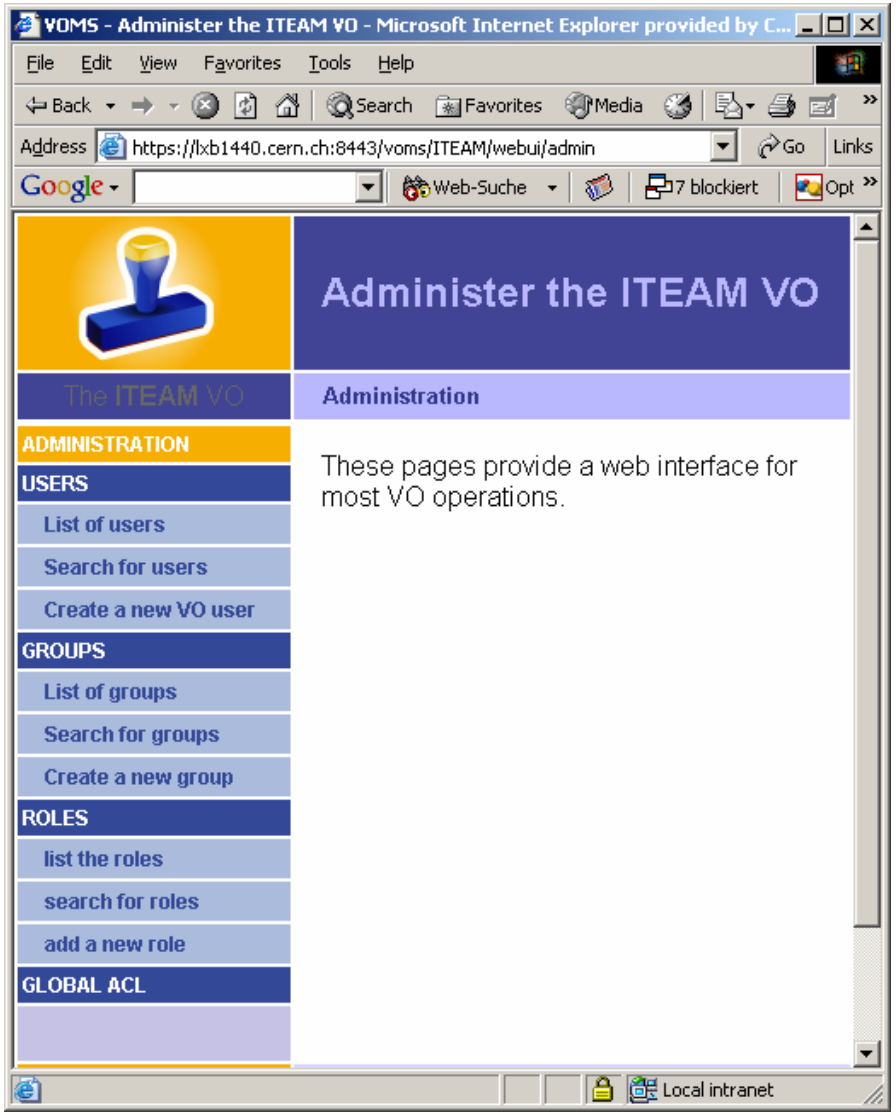
VO Managers - Handling requests

- VO manager will be informed of new requests via mail
  - Query requests
  - Accept / Deny requests



VO Managers - Administer a VO

- The administrator interface allows you to
  - Manage users
    - List users
    - Search for users
    - Create users
  - Manage groups
    - List groups
    - Search for groups
    - Create groups
  - Manage roles
    - List roles
    - Search for roles
    - Create roles



Command line interface

- **General commands**

  voms-admin [OPTIONS] --vo=NAME [-h HOST] [-p PORT] COMMAND PARAM
  voms-admin [OPTIONS] --url=URL COMMAND PARAM

  COMMAND:

  - get-vo-name
  - list-users — list all users of VO
  - create-user <CERTIFICATE.PEM>
  - delete-user USER
  - list-cas — list certificate auth. accepted by VO
  - list-roles
  - ….

  See VOMS admin user guide for entire list and details

Questions…