edg-voms-admin

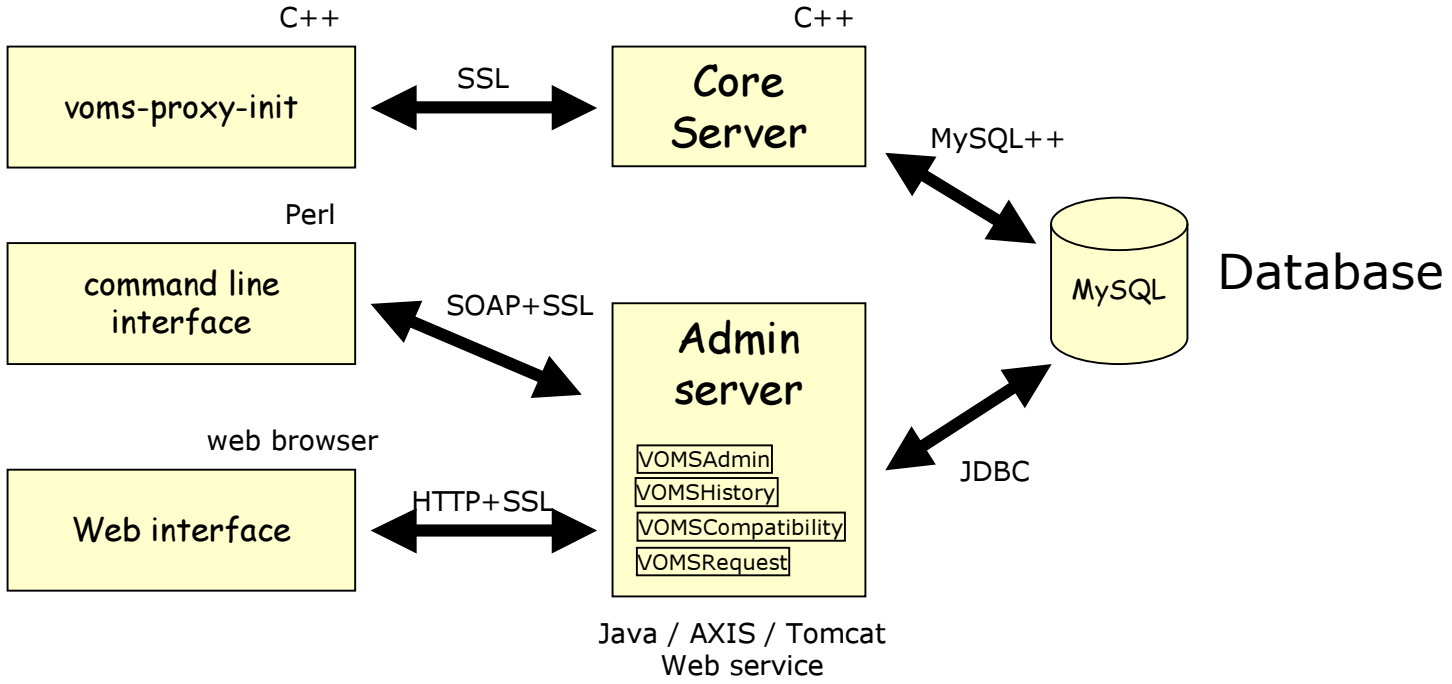
European DataGrid Project

Security Coordination Group

http://cern.ch/hep-project-grid-scg

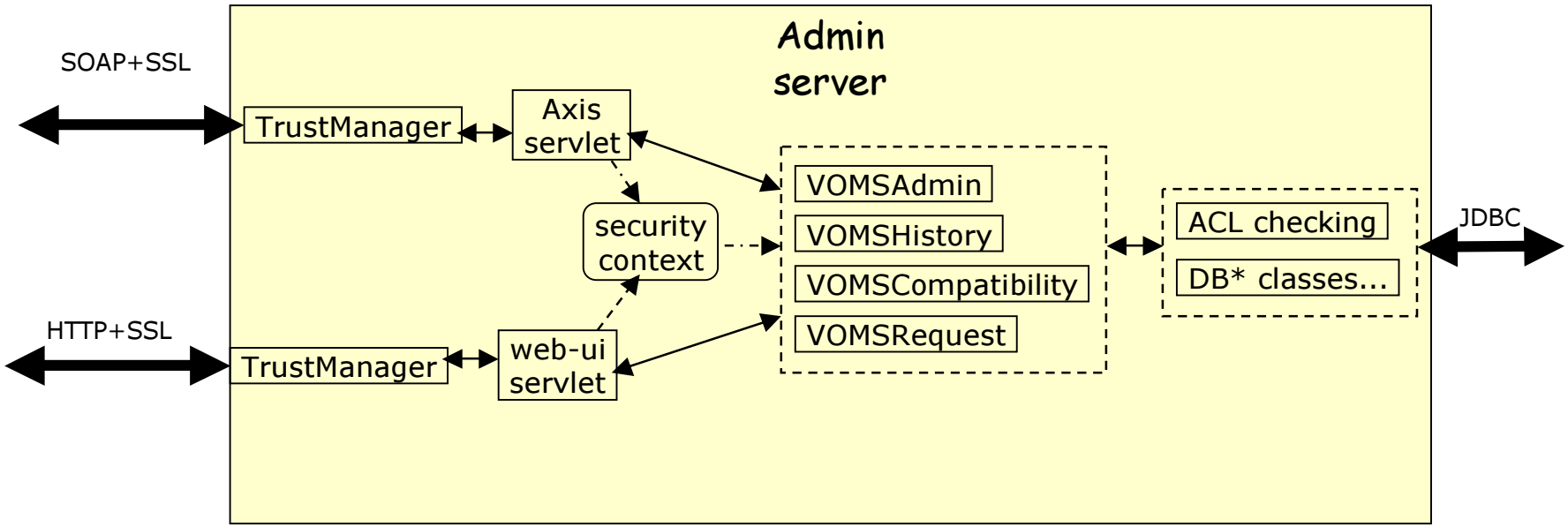
VOMS architecture

- MySQL database – with history and audit records
- core query service and client in C++
- Java Web Service based administration interface
  - Perl client (batch processing)
  - Web browser client (generic administrative tasks)
- replication is planned, but not implemented yet



VOMS internals

- SOAP and HTTP access are sharing the implementation of the business logic
- authentication: Trust Manager (edg-java-security)
- authorization: ACL checking logic inside the implementation



Proxy in Perl client

```
package EDG::HTTPS;
sub setEnv {
    # euid is not 0: this is a user with user cert or proxy
    if($>) {
      $proxy = $ENV{X509_USER_PROXY} || "/tmp/x509up_u" . $>;
       splitProxy();
       $ENV{HTTPS_CERT_FILE} = $proxy. '.proxy';
       $ENV{HTTPS_KEY_FILE} = $proxy. '.key';
       $ENV{HTTPS_CA_FILE} = $proxy . '.user';
       if($@) {                          # fallback solution: the real user certificate
          $ENV{HTTPS_CERT_FILE} = $ENV{X509_USER_CERT} ||
          $ENV{HOME}.'/.globus/usercert.pem';
          $ENV{HTTPS_KEY_FILE}  = $ENV{X509_USER_KEY} || $ENV{HOME}.'/.globus/userkey.pem';
       }
    }
    # euid is 0: this is a daemon, so we use the hostcert/key
    else {
        $ENV{HTTPS_CERT_FILE} = $ENV{X509_USER_CERT} ||  '/etc/grid-security/hostcert.pem';
        $ENV{HTTPS_KEY_FILE}  = $ENV{X509_USER_KEY} ||  '/etc/grid-security/hostkey.pem';
    }
    $ENV{HTTPS_VERSION} = 3;
    $ENV{HTTPS_CA_DIR} = $ENV{X509_CERTDIR} ||  '/etc/grid-security/certificates';
}
```

SecurityContext

```
package org.edg.security.voms.service;
public class InitSecurityContext extends BasicHandler {
    public static void initSC (ServletRequest req) {
        SecurityContext sc = new SecurityContext();
        SecurityContext.setCurrentContext(sc);

        sc.setClientCertChain((X509Certificate[]) req.getAttribute("javax.servlet.request.X509Certificate"));

       // We use the old DN format in the database.
        if (sc.getClientName () != null)
            sc.setClientName (new DNConvert (sc.getClientName ()).removeProxySuffix (DNConvert.X500));
        if (sc.getIssuerName () != null)
            sc.setIssuerName (new DNConvert (sc.getIssuerName ()).reformat (DNConvert.X500));
    }
}
```

VOMSAdmin.getUser()

```
package org.edg.security.voms.service.admin;
public final class VOMSAdminSoapBindingImpl implements VOMSAdmin {
    synchronized public User getUser (String username, String userca)  throws RemoteException {
        try {
            QueryWrapper c = QueryWrapper.get ();
            try {
                DBGroup vo = DBGroup.getVOGroup (c);
                vo.checkPermission (c, Operation.LIST);
                User result = DBUser.getInstance (c, username, DBCA.getInstance (c, userca)).getAsUser (c);
                log.info ("Returned detailed information about user \"" + result.getDN () + "\"");
                return result;
            }
            finally {
                c.release ();
            }
        }
    }
}
```

DBGroup.checkPermission()

```
package org.edg.security.voms.database;
final public class DBGroup implements DBContainer {
    public void checkPermission (Connection c, Operation o) {
        getACL (c).checkPermission (c, o);
    }
    public DBACL getACL (Connection c) {
        return DBACL.getInstance (c, aclId, this);
    }
}
```

```
CREATE TABLE groups (    -- Holds all groups in a VO.
  gid bigint unsigned NOT NULL,  -- Internal entity identifier.
  dn varchar(255) NOT NULL,  -- Fully Qualified Group Name
  parent bigint unsigned NOT NULL,  -- Parent group.
  -- Applied ACL (entries are in 'or' relation).
  aclid bigint unsigned NOT NULL,
  -- Default ACL for a group/role created under this group.
  defaultAclid bigint unsigned NOT NULL,
)
```

```
CREATE TABLE acl (   -- Access Control List for containers
  aid bigint unsigned NOT NULL,  -- ACL identifier (common id for all entries in one list)
  adminid bigint NOT NULL,-- Administrator's identifier
  operation smallint NOT NULL,-- Operation on the container
  allow tinyint NOT NULL, -- 0 means deny, 1 means allow
)
CREATE TABLE admins (  -- List of the administrator users
  adminid bigint NOT NULL,    -- Administrator's identifier
  dn varchar(250) NOT NULL,   -- the DN of the administrator
  ca smallint unsigned NOT NULL,  -- Issuer certificate authority
)
```

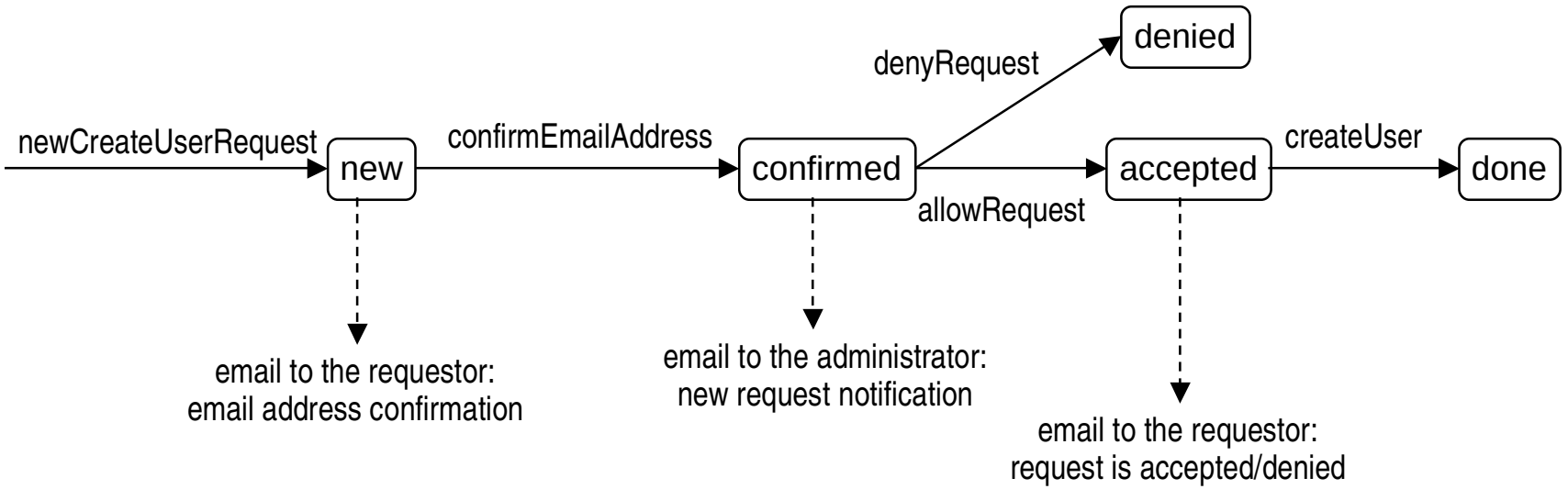
Access Control Lists

container.checkPermission (operation)

- An ACL is a set of *subject-operation-allow* triplets bound to a container
  - The *subject* is (an attribute of) the client requesting the operation
  - If the *allow* flag is true the access is granted (positive match), if false access is denied (negative match)
- *Subject* is matched against all known attributes of the client
  - Client's DN+CA (direct match)
  - Authorization Manager attributes
  - VOMS attributes in the local database
  - VOMS attributes embedded in the client's proxy cert
- Access is granted iff there is a positive match *and* there is no negative match

Request handling (plans)

- VOMSRequest interface for request processing *outside* the core VOMS database tables:
  - new user in the VO
  - member in an existing group
  - ... and for the rest upon request ☺
- planned: extensible Producer/Consumer pattern as an implementation to satisfy complex use cases (e.g. US-CMS VOX project, multiple admins)



Installation

- Install RPMs: edg-voms-admin, edg-voms-admin-interface, edg-voms-admin-config (, edg-voms-admin-client)
- edg-voms-admin-configure install –-vo=fred –dbapwd=...
- $EDG_LOCATION/etc/init.d/edg-voms-admin start
- edg-voms-admin-local fred --add-admin
- edg-voms-admin-local fred --add-host
- CLI:
  edg-voms-admin –url=https://localhost:8443/edg-voms-admin-fred list-users
- web: https://localhost:8443/edg-voms-admin-fred/Admin

VOMS migration