What is TAP

The aim of the *Thredds Admin Portal* **(TAP)** project lies in the idea of solving the huge problem existing in the *Unidata Thredds* application with the management of users, roles and dataset access. The Thredds user authentication is delegated to Tomcat Basic which gets users and roles from a given Realm. In order to authorize users, Thredds checks whether the dataset is restricted and if so, gets the user roles to make a decision. **TAP** manages the datasource mentioned to control user access to protected datasets.

Environment setup

TAP and *Thredds* get users and roles from a database created specifically to model all the entities and processes involved. The main idea is to include easily a database instance to work with. Derby network allow users to access db instances even from outside when they are running and most people are familiar with it. To accomplish this step you need two components:

- Derby 10.10.1.1 library
- Derby database
- Apache Tomcat 7.0.59
- jre 1.7.0_75

Attached is a preconfigured environment which includes a lib folder (appz) , the Apache Tomcat 7.0.59 with thredds and TAP deployed and the jre 1.7.0_75

If you want to build it by yourself, we suggest to follow these steps:

1. Create a deployment folder (eg. deployment_test)
1. Create an appz folder in deployment_test to place libraries.
1. Extract *Derby 10.10.1.1* library in /deployment_test/appz
1. Extract *Tomcat 7.0.59* or paste the customized *Tomcat* provided.
1. Place the Derby DB folder (derbydb) in $CATALINA_HOME/content/data

Derby setup

To start *Derby* successfully add a socket permission in *JAVA 7* by including in *$JRE_HOME/lib/security/java.policy* the following line:

```
permission java.net.SocketPermission "HOST:DERBY_PORT", "listen,resolve";
```

Start derby

```
$JRE_HOME/bin/java -jar $PATH_TO_DERBY_LIB/db-derby-10.10.1.1-bin/lib/derbyrun.jar server start -p DERBY_PORT -h 0.0.0.0 &
```

Tomcat setup

Although attached is a customized tomcat ready to run, you can use another and configure it following these steps

Expose our datasource in Tomcat

Tomcat gets users and roles from conf/tomcat-users.xml by default. We are going to change this in order to get users and roles from a given database. First of all, include both derbyclient.jar and derbynet.jar in $CATALINA_HOME/lib. After doing that, we need to add a new resource called ?jdbc/admin? in *GlobalNamingResurces?*:

```
          <Resource name="jdbc/adminDB" auth="Container" type="javax.sql.DataSource"
               factory="org.apache.tomcat.dbcp.dbcp.BasicDataSourceFactory"
               validationQuery="SELECT count(*) FROM users" maxActive="20" maxIdle="10" username="admin" password="adm!n"
               driverClassName="org.apache.derby.jdbc.ClientDriver"
               url="jdbc:derby://YOUR_HOST:YOUR_PORT/../content/data/derbydb" readOnly="false"/>
```

Set the realm

A Realm is a ?database? of usernames and passwords that identify valid users of a web application (or set of web applications), plus an enumeration of the list of roles associated with each valid user. The servlet container will be connected to the database and it also be aware of the username and the corresponding roles. Define this realm inside <Engine> in your server.xml:

```
<Realm className="org.apache.catalina.realm.DataSourceRealm" digest="MD5" debug="0" dataSourceName="jdbc/adminDB"
   userTable="USERS" userNameCol="USERNAME" userCredCol="PASSWORD" userRoleTable="V_USERS_ROLES" roleNameCol="ROLENAME"/>
```

Expose the datasource as JNDI resource

TAP gets the datasource from the JNDI resource "jdbc/adminDB". Add to $CATALINA_HOME/conf/context.xml the following line:

```
<ResourceLink global="jdbc/adminDB" name="jdbc/adminDB" type="javax.sql.DataSource"/>
```

Start Tomcat

We strongly recomend you before run Tomcat, set JAVA_OPTS="-Xms256m -Xmx4096m -XX:+DisableExplicitGC -Dcom.sun.management.jmxremote -XX:PermSize=256m -XX:MaxPermSize=512m -XX:-UseGCOverheadLimit"

Initial TAP setup

Before deploying TAP you need to configure some files in order to adapt it for your needs.

WEB_INF/classes/global_variables.properties

```
recaptcha.verificationurl = http://www.google.com/recaptcha/api/verify
recaptcha.privatekey = YOUR_RECAPTCHA_PRIVKEY
recaptcha.publickey = YOUR_RECAPTCHA_PUBKEY

tap.baseurl = http://localhost:8080/tap
tap.managers.email = manager1@yourhost.com, manager2@yourhost.com #They will receive emails if people join groups
tap.email.noreply = no-reply@yourhost.com
```

You need to create a recaptcha ?https://www.google.com/recaptcha/admin#list and set both private and public keys in the previous file. You also need to set your base url like localhost:8080/tap or yourhost/tap, the managers emails which allow people to keep in touch of the group events (when user wants to join a group, etc)

WEB-INF/classes/mail.properties

```
mail.port = port_number
mail.host = email_host
```

You can change the email templates optionally in WEB-INF/classes/templates

You can change the messages optionally in WEB-INF/classes/locale/messages.properties

Thredds and TAP deployment

The last part of this tutorial is manage to start both applications successfully. Move both thredds.war and tap.war to $CATALINA_HOME/webapps. Start the Tomcat instance and the Derby network instance. If Thredds is not able to start due to a directory error, please create a folder called ?thredds? in $CATALINA_HOME/content to solve that issue.

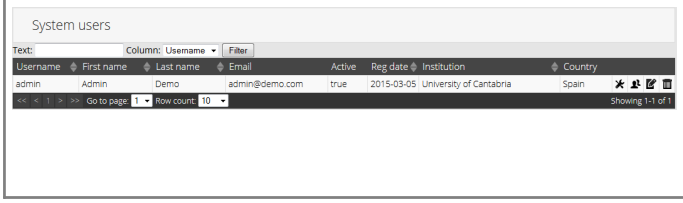
First steps in TAP

When the initial setup is finished TAP is ready to register users, send confirmation emails, let people join groups, etc. With your preconfigured TAP there is a Derby db with demo data. If you have deployed successfully both Thredds and TAP and they are running, go to ?http://yourhost/tap and log in with the following credentials:

```
username: admin
password: adm!n
```

You will find new admin options in the main menu. From there you can control users, roles, groups, dataset policies and send messages to your users or a set of them.

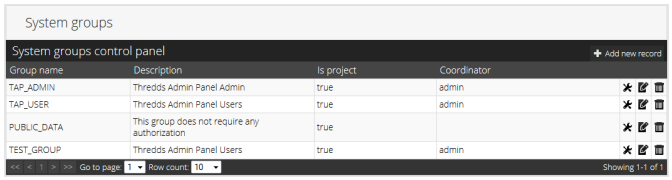
System users



Operations:

1. **User roles:** Add or remove user roles directly.
2. **User groups:** Add or remove user groups direcly (Some requires user acceptance)
3. **Edit record:** Edit user details.
4. **Delete record:** Remove a user from the app and the relations with roles and groups.

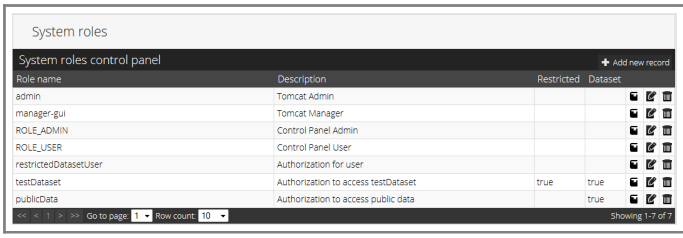
System groups



Operations:

1. **Group roles:** Add or remove roles from the group.
2. **Edit record:** Edit group details.
3. **Delete record:** Remove a group from the app and the relations with roles and users.

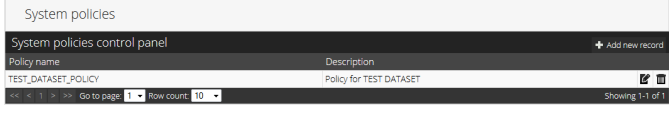
System roles



Operations:

1. **Policy assignment:** Add or remove policies from the role/dataset.
2. **Edit record:** Edit role details.
3. **Delete record:** Remove a role from the app and the relations with groups and users.

System policies

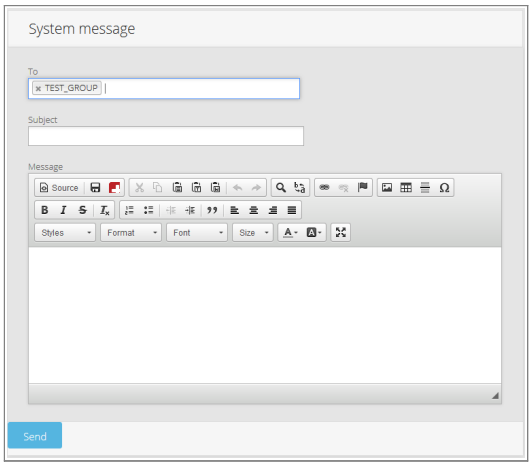


Operations:

1. **Edit record:** Edit policy details.
2. **Delete record:** Remove a policy from the app and the relations with roles.

System messages

You can send messages to your users filtering by groups, newsletter, admins, etc.



The messages you send are customized. You don't need to include Hi, Dear nothing or goodbye. The template is the following:

```
Dear admin,

{YOUR MESSAGE}

Best regards,

TAP Manager
```

Thredds restricted dataset

Thredds allows users to restrict dataset access in two different ways:

- URL restriction using Tomcat: difficult to maintain. You need to restrict every dataset by URL and set the role in the web.xml
- Dataset restriction using TDS Catalog: most commonly used by adding an attribute on a dataset or datasetScan element in the TDS catalog. Eg, restrictAccess=?roleName?

If you set the mentioned attribute in a Dataset, users need two roles to access it: restrictedDatasetUser and roleName. That means, every user who wants to access to a restricted dataset needs the restrictedDatasetUser role by default and also the role of the dataset. Here is where TAP does the job for you.

Restrict dataset access

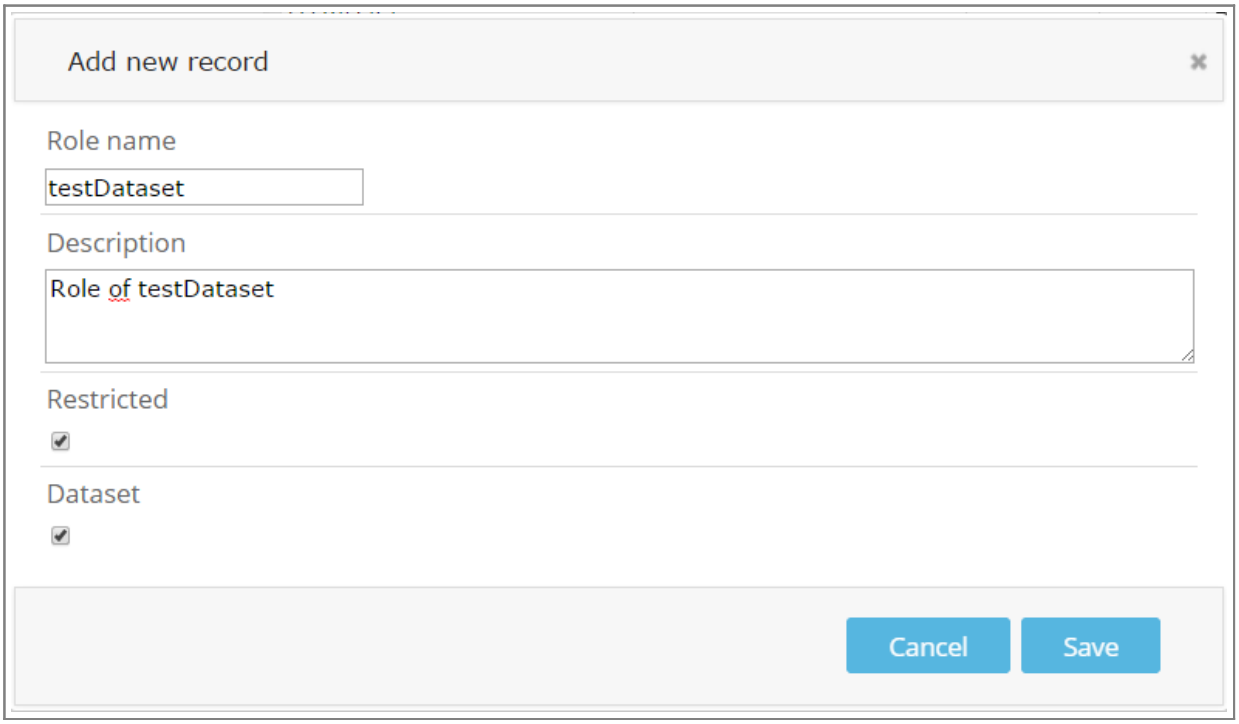
As we mentioned, TAP manages users, roles, groups, policies and their relationships. It is a common scenario to have a dataset with policies that prevent you of doing an illegal use of the data. In the given example you will find the default Thredds catalog example. The first step is to protect the dataset:

```
<dataset name="Test Single Dataset" ID="testDataset"
         serviceName="dap"  urlPath="test/testData.nc" dataType="Grid" restrictAccess="testDataset"/>
```

When a user tries to access this dataset, the Thredds authorizer expects to find the roles "testDataset" and "restrictedDatasetUser" in the user's granted authorities.

Allow access to a restricted dataset from TAP

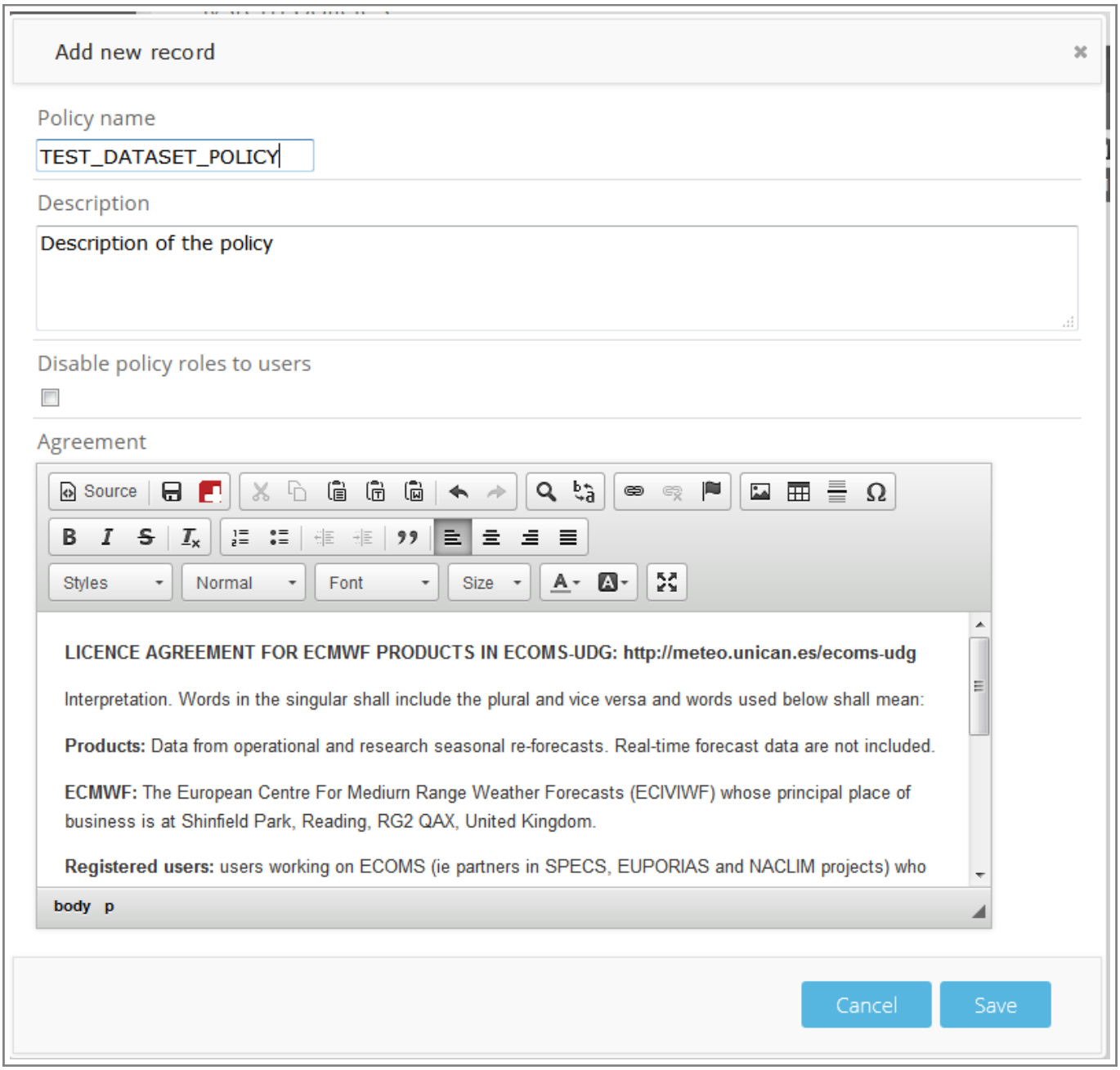
To allow access to the previous dataset, create the role in /tap/admin/roles "Add new record":



Fill the form:

- Name: testDataset
- Description: a description of the dataset
- Restricted: True if you want to moderate its access. Users will wait until a confirmation from an Admin or manager
- Dataset: True in this case. If you want to create an internal role in TAP set to false.

Create a policy in /tap/admin/policies "Add new record" :

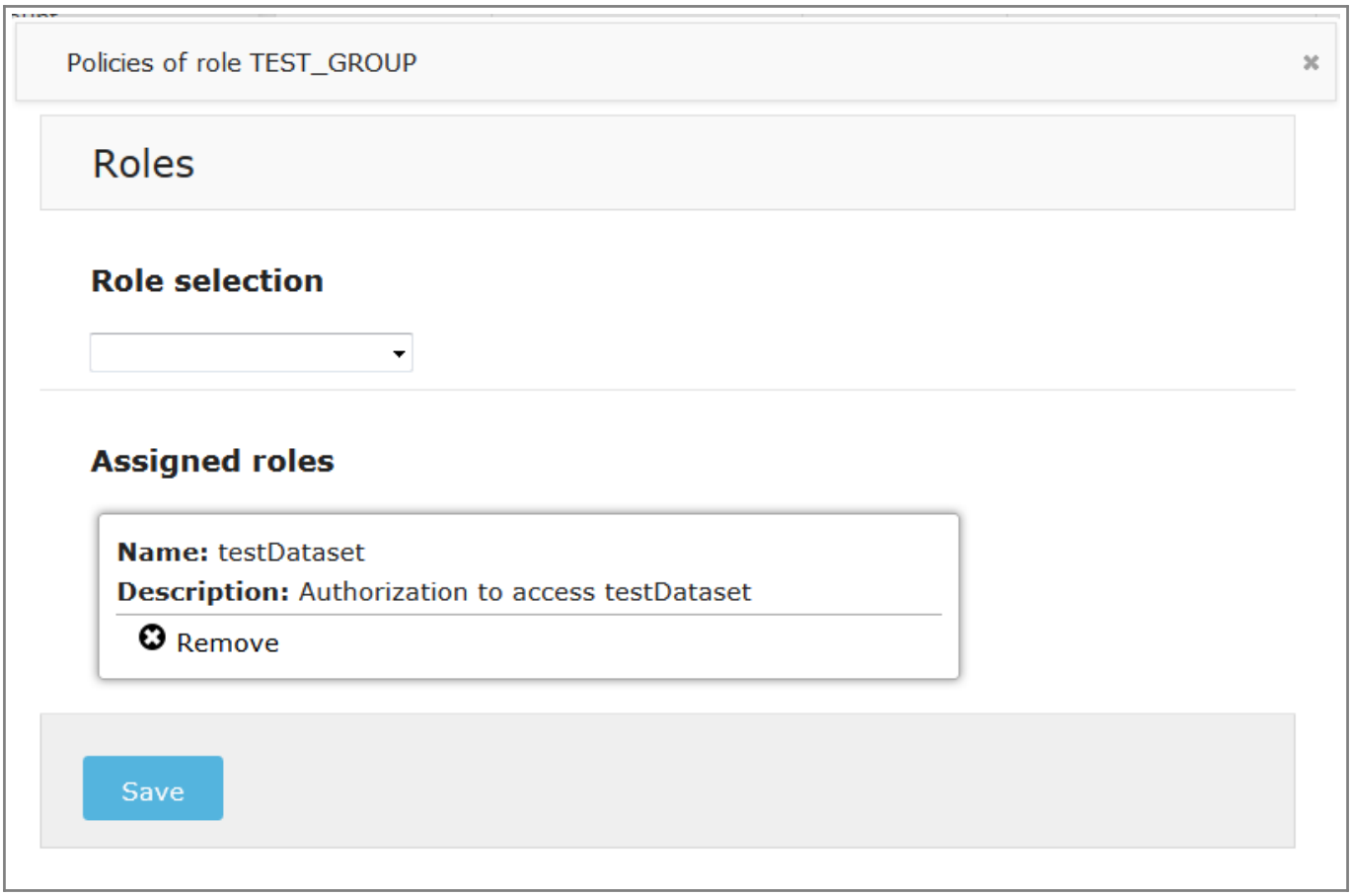


Fill the form

- Name: TEST_DATASET_POLICY
- Description: Description of the policy
- Disable policy: ignore this in the creation. If you edit the policy and you want users accept again the agreement, set to true.
- Agreement: You can paste html directly by clicking in the source button.

Create a Group in /tap/admin/groups "Add new record":

After creating the Policy, asociate it with the dataset (role) testDataset:



Fill the form

- Name: TEST_GROUP
- Description: Description of the group
- Is project: If the group represents a project like EUPORIAS, VALUE, CORDEX...
- Coordinator: If you want to delegate the user acceptance. TAP will send an email to the coordinator containing two links: accept or reject the user group request.

After creating the group, it is necessary to asociate the dataset(role) testDataset to the group: