

ISS-1: Spatial Data Warehouse for Administrators

<ol style="list-style-type: none"> 1. Introduction <ol style="list-style-type: none"> 1.1. Users & Roles 1.2. Security Model 1.3. Software Familiarisation 2. Administrator Actions <ol style="list-style-type: none"> 2.1. Set up Studio 2.2. Create an Admin user 2.3. Create a Standard user 2.4. Grant/Remove Roles for users 2.5. Create a Schema 2.6. Create a User table 2.7. Move a User Table into a Corporate schema 2.8. Import External data 2.9. Drop a Table 2.10. Changing the default MapInfo styling 2.11. Change MapInfo Styling for a Table 2.12. Create a User View 2.13. Move a Staging Schema View to a Corporate Schema 2.14. Create a View in a Corporate schema 2.15. Load a Non-spatial table into the SDW 	<p style="text-align: center;">An Astun Technology iShare Training Module</p> <table border="1" style="width: 100%;"> <tr> <td>Code</td> <td>ISS-1</td> </tr> <tr> <td>Title</td> <td>Spatial Data Warehouse for Administrators</td> </tr> <tr> <td>Description</td> <td>Setting up and managing a Spatial Data Warehouse.</td> </tr> <tr> <td>Required Software</td> <td>iShare 5.4.x Spatial Data Warehouse</td> </tr> <tr> <td>Target Audience</td> <td>iShare Administrators</td> </tr> <tr> <td>Pre-requisites</td> <td>iShare for Administrators</td> </tr> <tr> <td>Duration</td> <td>.5 day</td> </tr> <tr> <td>Version</td> <td>1.0</td> </tr> <tr> <td>Updated</td> <td>12 Nov 2015</td> </tr> <tr> <td>Updated by</td> <td>Kim Stimpson</td> </tr> <tr> <td>Status</td> <td>Complete</td> </tr> </table>	Code	ISS-1	Title	Spatial Data Warehouse for Administrators	Description	Setting up and managing a Spatial Data Warehouse.	Required Software	iShare 5.4.x Spatial Data Warehouse	Target Audience	iShare Administrators	Pre-requisites	iShare for Administrators	Duration	.5 day	Version	1.0	Updated	12 Nov 2015	Updated by	Kim Stimpson	Status	Complete
Code	ISS-1																						
Title	Spatial Data Warehouse for Administrators																						
Description	Setting up and managing a Spatial Data Warehouse.																						
Required Software	iShare 5.4.x Spatial Data Warehouse																						
Target Audience	iShare Administrators																						
Pre-requisites	iShare for Administrators																						
Duration	.5 day																						
Version	1.0																						
Updated	12 Nov 2015																						
Updated by	Kim Stimpson																						
Status	Complete																						

1. Introduction

Astun's Spatial Data Warehouse (SDW) is built upon PostgreSQL/PostGIS with a custom security model designed for our typical clients. A typical installation will have Astun staff deploying a SDW to a client's server. They'll also probably migrate some data from an existing spatial database and then provide training on SDW maintenance duties. The purpose of this document is to provide material covering those maintenance duties.

1.1. Users & Roles

The GIS staff will act as the administrator of the SDW; they will be assigned a role called 'admin'.

All staff members will assigned a role called 'staff'.

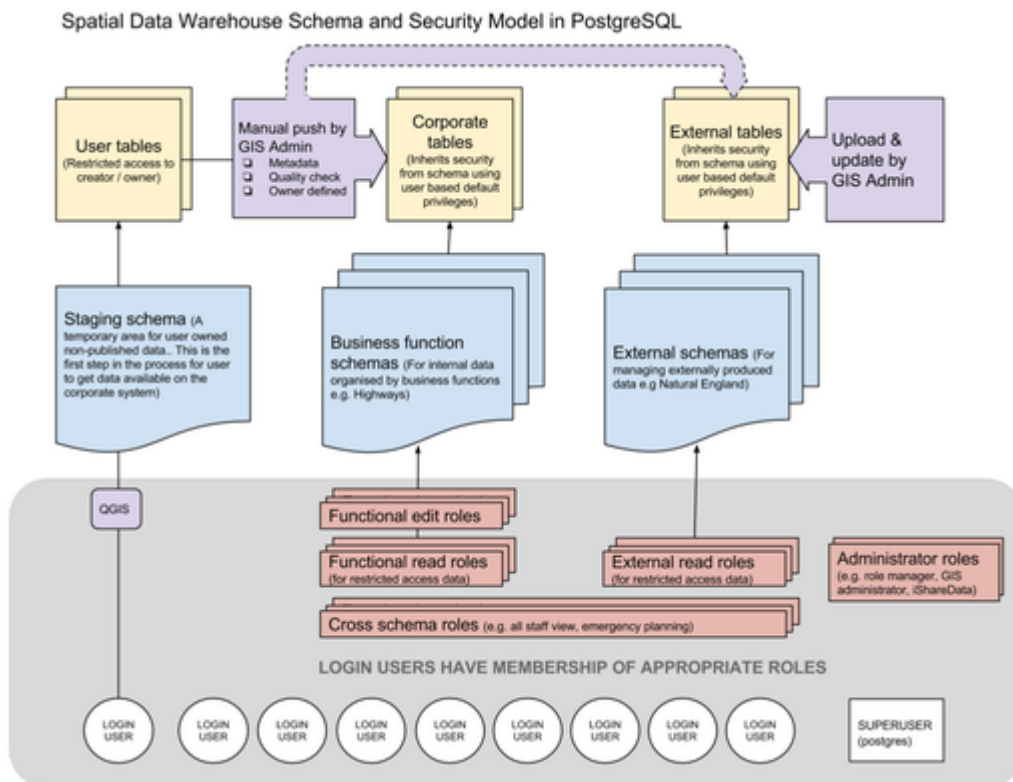
Staff members can create data in the schema called 'staging'. Consider it a scribble-pad area. By default users can only see their own data in this area. Once data is ready for corporate consumption SDW admin

staff will move data tables from 'staging' to another schema. Schemas can be set up for projects or departments.

Schemas are the key to the security model. All tables and views within a schema are owned by the schema_owner role. Editing rights to tables are owned by the schema_editor role and read access is controlled by the schema_viewer role. If the schema has been created with corporate access (think public) in mind then read access is also controlled by the staff role.

1.2. Security Model

Below is a schematic representing the SDW security model. Note that the security model does not permit users to create data in the public schema. It is possible for a superuser to migrate data to the public schema, although it is not recommended.



1.3. Software Familiarisation

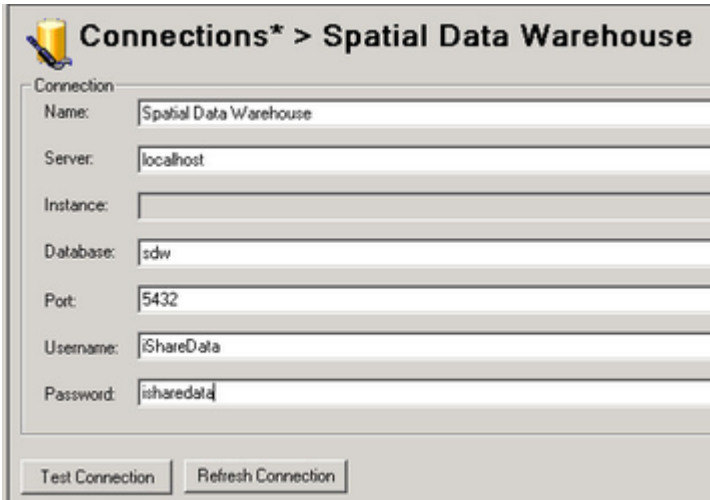
It is important that the admin staff members are familiar with Astun's iShare Studio and pgAdmin3 - the client interface for PostgreSQL databases. They should be able to create Workflow Connections and Workflow Tasks in Studio.

2. Administrator Actions

2.1. Set up Studio

Studio will be used for most of the tasks associated with the SDW. Within Studio you need to create a Workflow Connection that points to the SDW.

- Open Studio
- Expand the Workflow node and right click on Connections and select New Connection.
- Create a Workflow Postgres Connection to the SDW.




For most cases the following details will be suitable for a connection but if in doubt check with Astun Support:

- Enter a Name for your Connection; Server: localhost, Database: sdw Port: 5432 username: iShareData password: isharedata.
- Click Test Connection. You should see a Connection OK dialog. Click OK.
- Click Save to save your new connection details.

Note: If the GIS team decide that they wish to track who runs which task then it will be necessary to create individual Workflow Connections. Use the iShareData account to create admin users and then create Workflow Connections for each admin user. The iShareData connection to the SDW should then be removed. Be aware that Studio will store passwords for Workflow Connections but passwords can be removed from a connection before saving.

2.2. Create an Admin user

- Open Studio
 - Expand the Jobs node, right click on Unassigned tasks and select New Task.
 - Create a Workflow Stored Procedure Task and give it a Name e.g. Create admin user
 - Select the Spatial Data Warehouse Connection, Click on the Astun radio button and select the Function at `_sdw_new_admin`.
 - Select the **username** parameter and enter the name of the user you wish to create by typing in the **Edit parameter 'username'** box. **Note that the task will fail if you call the user "admin" as this is the name of an existing group role.**
 - Repeat for the **password** parameter e.g.

 **Unassigned tasks > Create admin user**

Name:

Connection details


SDW Function: Work

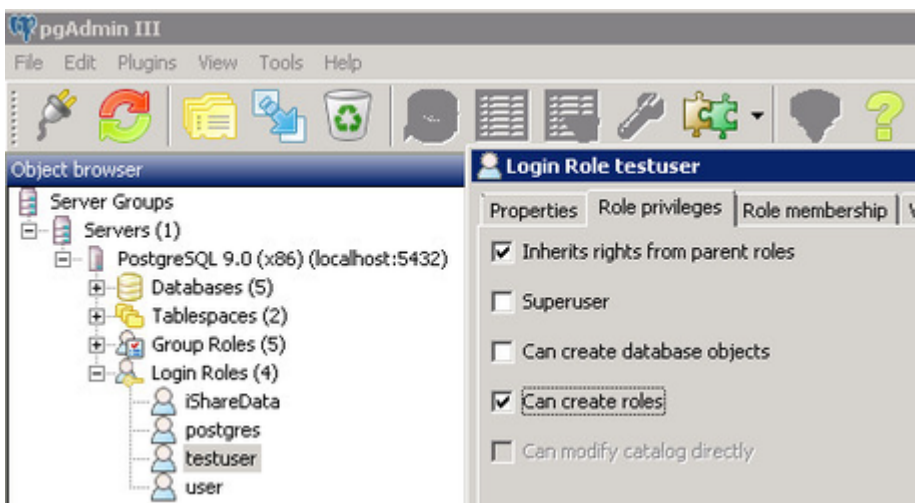
Parameters

No	Name	Type	Value	Description
1.	username	text	testadmin	
2.	password	text	testpassword	

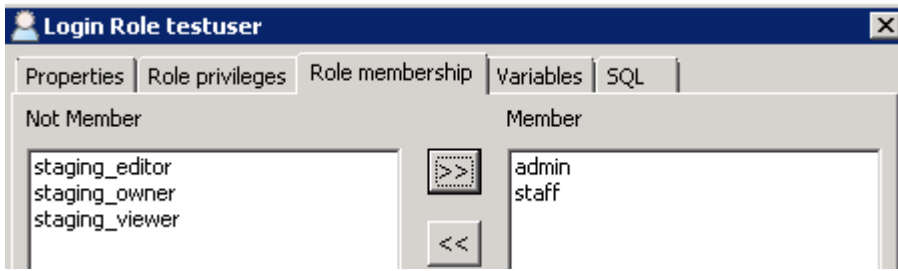
Edit parameter 'username':




- Click the Run button  to run the task. You should see the dialog SPTask 'Create admin user' created successfully. Click OK.
- Click Save to save your new task details.
- Open pgAdmin III
 - Expand the Server details for the SDW server and login using a superuser or administrator account.
 - Expand the Login Roles to show the entries.
 - Right-click on the user you have just created and select Properties.
 - Verify that the box "Can create roles" is checked.



- Now select the Role membership tab.
- Verify that the role "admin" is in the Member box.

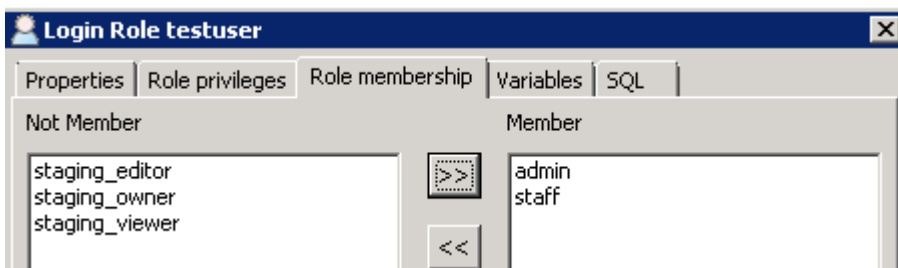


2.3. Create a Standard user

- Open Studio
 - Create a new workflow task called "Create new user"
 - Select the Spatial Data Warehouse Connection, Click on the Astun radio button and select the Function at `_sdw_new_user`.
 - Enter the user and password parameters with the name and password for the user you wish to create.
- Click the Run button  to run the task. You should see the dialog SPTask 'Create new user' created successfully. Click OK.

2.4. Grant/Remove Roles for users

- Run pgAdmin III
 - Expand the Server details for the SDW server and login using a superuser or administrator account.
 - Expand the Login Roles to show the entries.
 - Right-click on the user you have just created and select Properties.
 - Select the Role membership tab.
 - Select the relevant role in the Not Member box and click >> to add to the Member box. For restricted read-only access a user requires the restricted schema **viewer** role. For read/write access a user requires the restricted schema **editor** role.

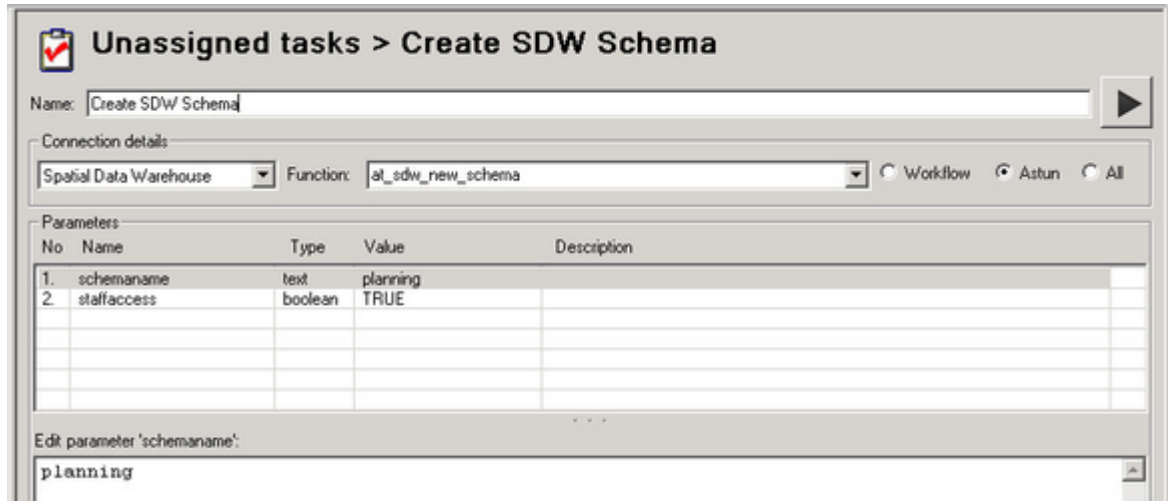


- Click OK.

2.5. Create a Schema

- Open Studio

- Expand the Jobs node, right click on Unassigned tasks and select New Task.
- Create a Workflow Stored Procedure Task and give it a Name e.g. Create SDW Schema
- Select the Spatial Data Warehouse Connection, Click on the Astun radio button and select the Function at_sdw_new_schema.
- Select the **schemaname** parameter and enter the name of your schema in the **Edit parameter box**. Then select the **staffaccess** parameter and enter **TRUE**.



Unassigned tasks > Create SDW Schema

Name:


Connection details:

Spatial Data Warehouse Function: Workflow Astun All

Parameters:

No	Name	Type	Value	Description
1.	schemaname	text	planning	
2.	staffaccess	boolean	TRUE	

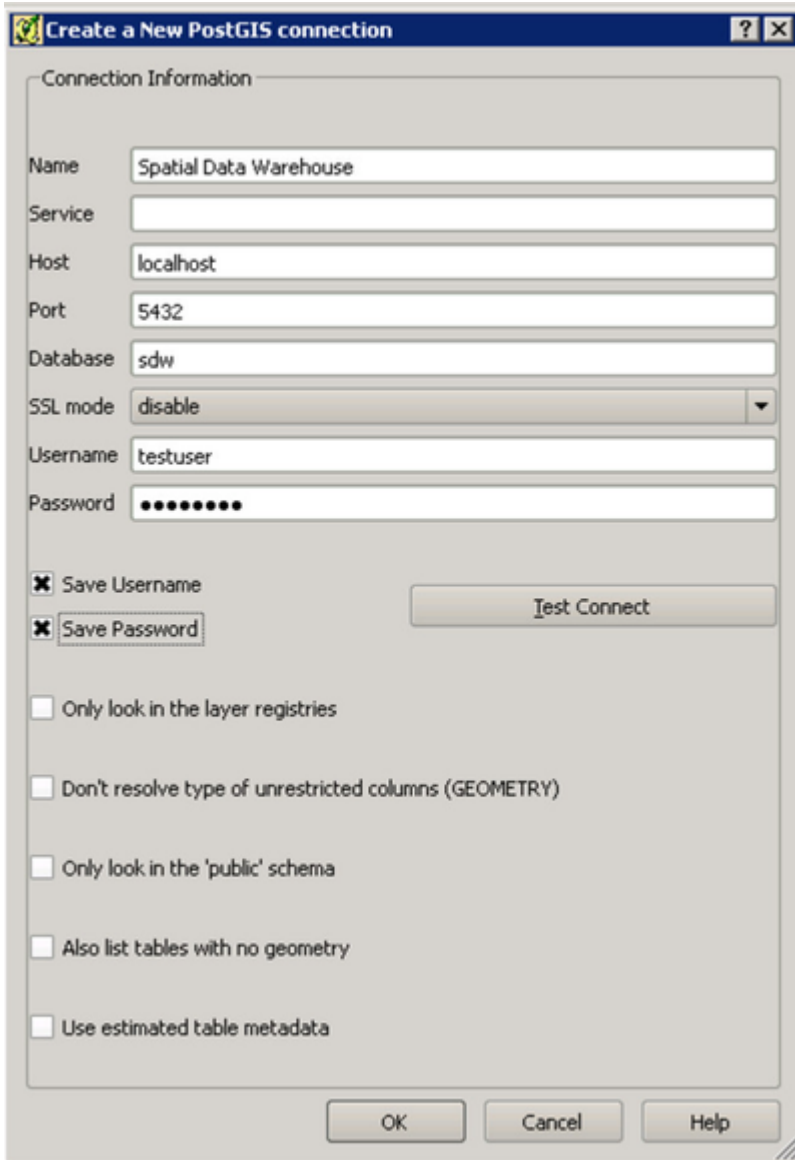
Edit parameter 'schemaname':

- Note: Change "TRUE" to "FALSE" for a private schema.
- Click the Run button  to run the task. You should see the dialog SPTask 'Create SDW Schema' created successfully. Click OK.
- Click Save to save your new task details.

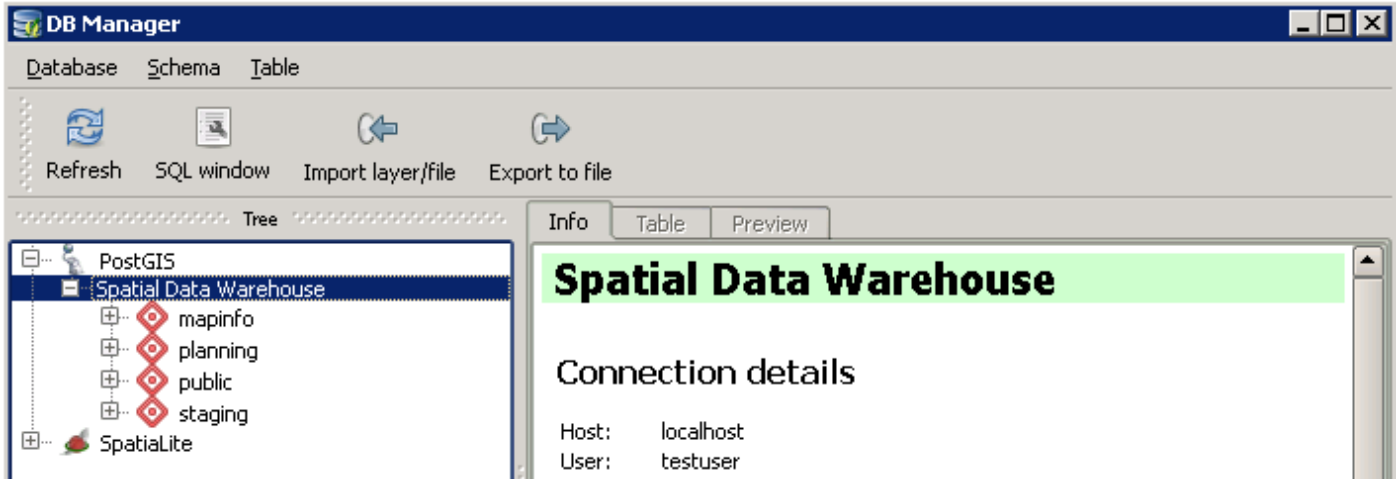
2.6. Create a User table

Note: Users will only be able to create their own tables in the 'staging' schema.

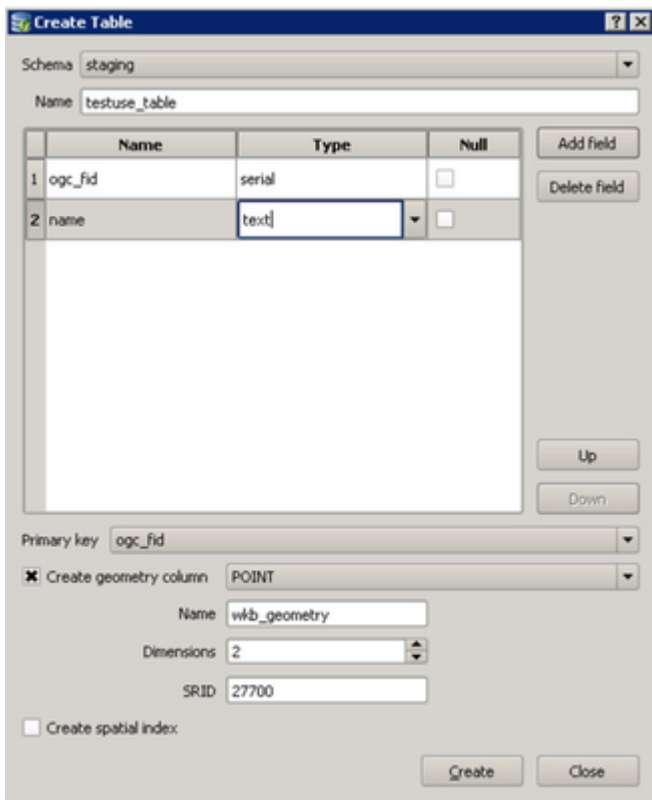
- Open QGIS
 - Select Add PostGIS Layers... from the Layer menu.
 - Click the New button under Connections to create a connection to your SDW.



- Enter the details for your SDW and the admin user that you created previously. See above screenshot for details.
- Click Test Connect to make sure you have entered your details correctly and then click OK.
- Click Close to close the Add PostGIS Table(s) dialog.
- Now select the DB Manager > DB Manager from the Database menu.
- Expand the PostGIS node to display the Spatial Data Warehouse connection we have just created.
- Expand the node for your SDW and you will see any existing schemas e.g.



- Select the staging schema from the tree and then go to the Table menu and select Create Table.



- The first field needs to have a Name of **ogc_fid** and be Type **serial**. Then you may click Add field to add any other fields that you require.
- Select ogc_fid as the Primary key, check the Create geometry column box, select the geometry type from the list; enter the Name as **wkb_geometry** with an SRID of **27700** and **2** dimensions.
- Click Create. You should see an "everything went fine" dialog - click OK. Click Close.

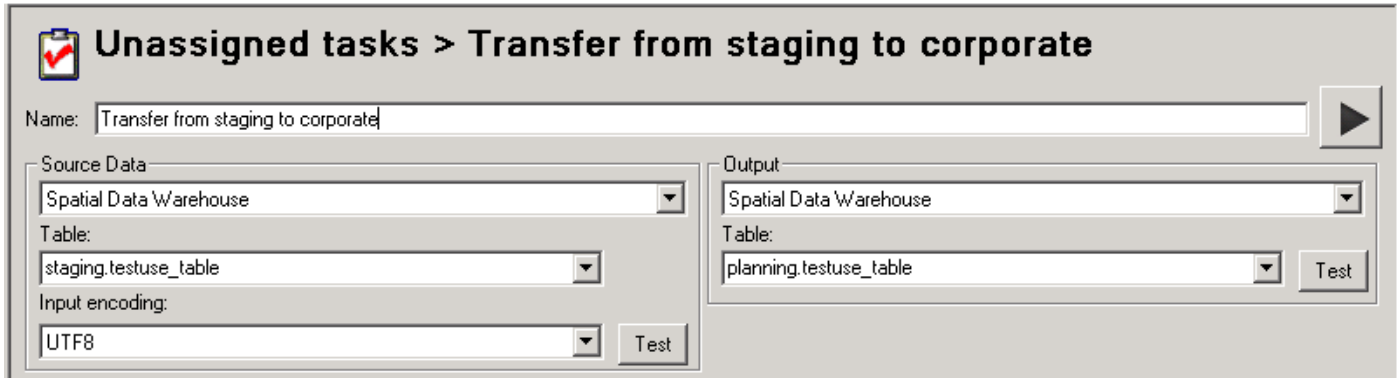
2.7. Move a User Table into a Corporate schema

GIS Admin users will be able to transfer tables from the 'staging' schema to a 'corporate' schema.

- Open Studio - First we need to create a task to transfer the table from the staging schema into the

corporate schema [in this case planning].

- Expand the Jobs node, right click on Unassigned tasks and select New Task.
- Create a Workflow Spatial Data Transformation Task and give it a Name e.g. Transfer from staging to corporate.



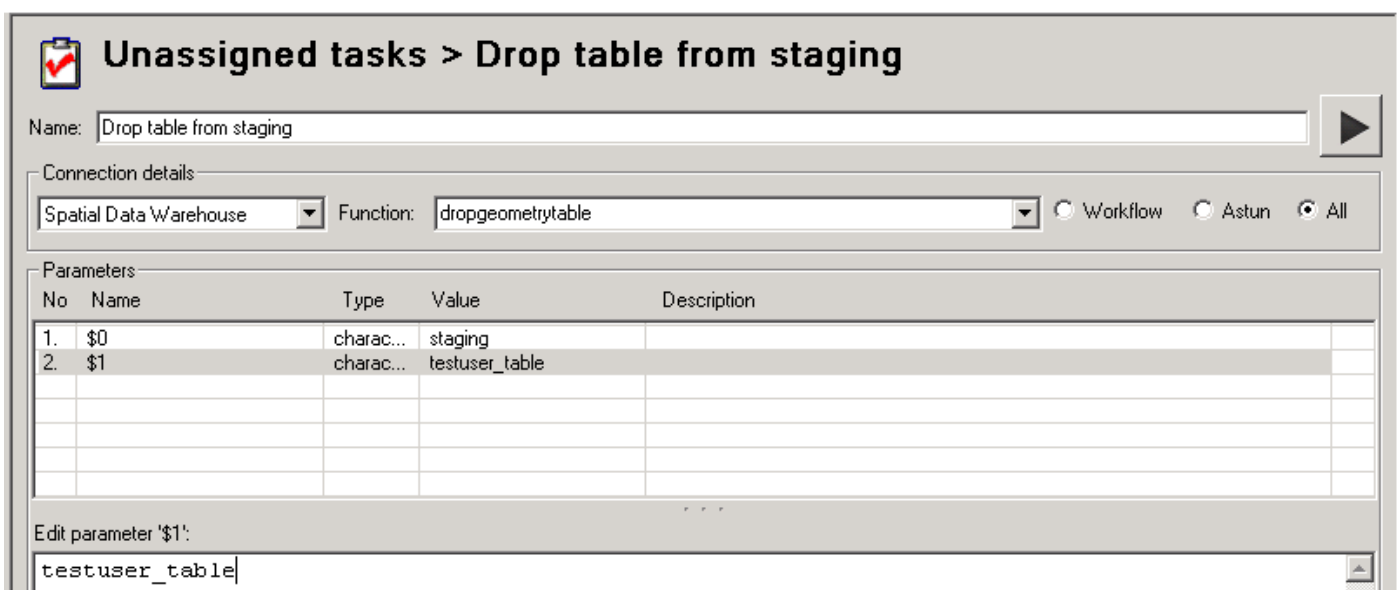
Unassigned tasks > Transfer from staging to corporate

Name:

Source Data:
 Table:
 Input encoding:

Output:
 Table:

- Select your Spatial Data Warehouse as both your Source Data and Output.
 - Pick the Source Table that you wish to transfer, in this case staging.testuse_table and manually enter the name of the Output Table that you wish to upload to, in the format schema.table, in this case, planning.testuse_table.
 - Run the task. Click OK.
 - Check the contents of the new table in pgAdmin III.
- Now we need to create a task to drop the table from the staging schema.
- Right click on Unassigned tasks and select New Task.
 - Create a Workflow Stored Procedure Task and give it a Name e.g. Drop table from staging
 - Select the Spatial Data Warehouse Connection, Click on the All radio button and select the Function dropgeometrytable - note that there are several functions with this name, ensure that you choose the version that takes exactly two parameters, normally the second in the list (it should look like the image below).
 - Select the first parameter and enter **staging** (schema name) in the **Edit parameter** box. Then select the second parameter and enter the name of the **table** you wish to drop e.g.



Unassigned tasks > Drop table from staging

Name:

Connection details: Function: Workflow Astun All

No	Name	Type	Value	Description
1.	\$0	charac...	staging	
2.	\$1	charac...	testuser_table	

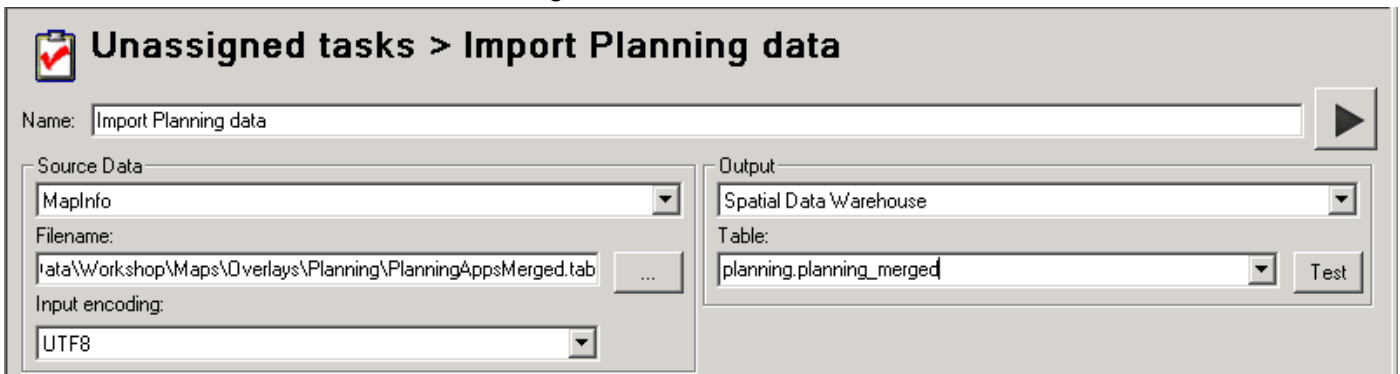
Edit parameter '\$1':

- Run the task. Click OK.
- Note that it is not sufficient to simply delete/drop a Geometry table using pgAdmin3. The approach described above not only drops the table but also clears the reference to it from the public.geometry_columns table.

2.8. Import External data

GIS Admin will be able to import tables into corporate schemas directly.

- Open Studio
 - Expand the Jobs node, right click on Unassigned tasks and select New Task.
 - Create a Workflow Spatial Data Transformation Task and give it a Name e.g. Import Planning data.
 - Select the Source Data from either a file (e.g. MapInfo, ShapeFile) or a pre-defined Workflow Connection.
 - Specify the Output as your Spatial Data Warehouse and enter the Table as schema_name.table_name e.g.



Unassigned tasks > Import Planning data

Name: ▶

Source Data: ▼

Filename: ...

Input encoding: ▼

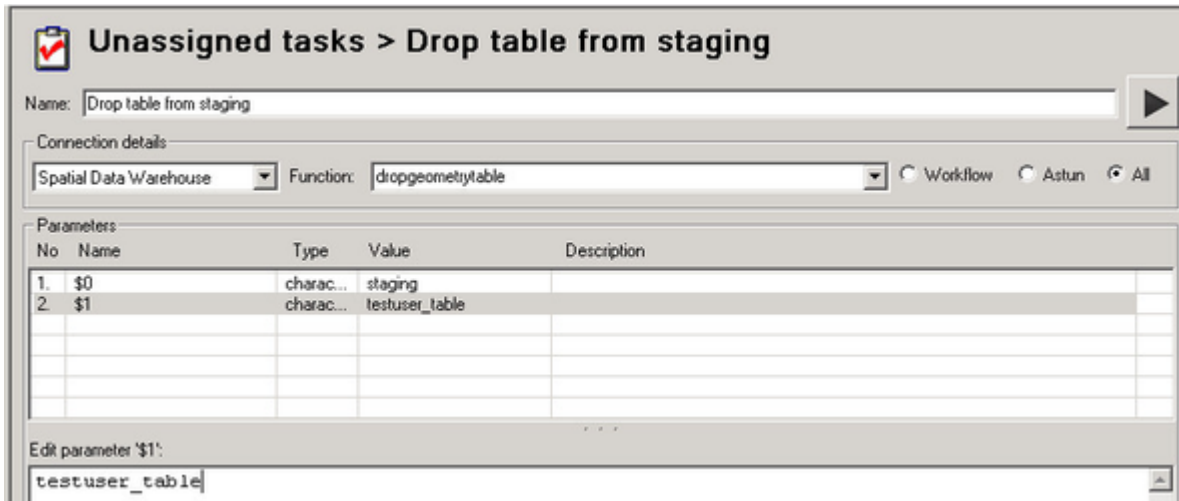
Output: ▼

Table: ▼ Test

- Run the task.

2.9. Drop a Table

- Open Studio
 - Right click on Unassigned tasks and select New Task.
 - Create a Workflow Stored Procedure Task and give it a Name e.g. Drop table
 - Select the Spatial Data Warehouse Connection, Click on the All radio button and select the Function DropGeometryTable.
 - Select the first parameter and enter **staging** (schema name) in the **Edit parameter** box. Then select the second parameter and enter the name of the **table** you wish to drop e.g.

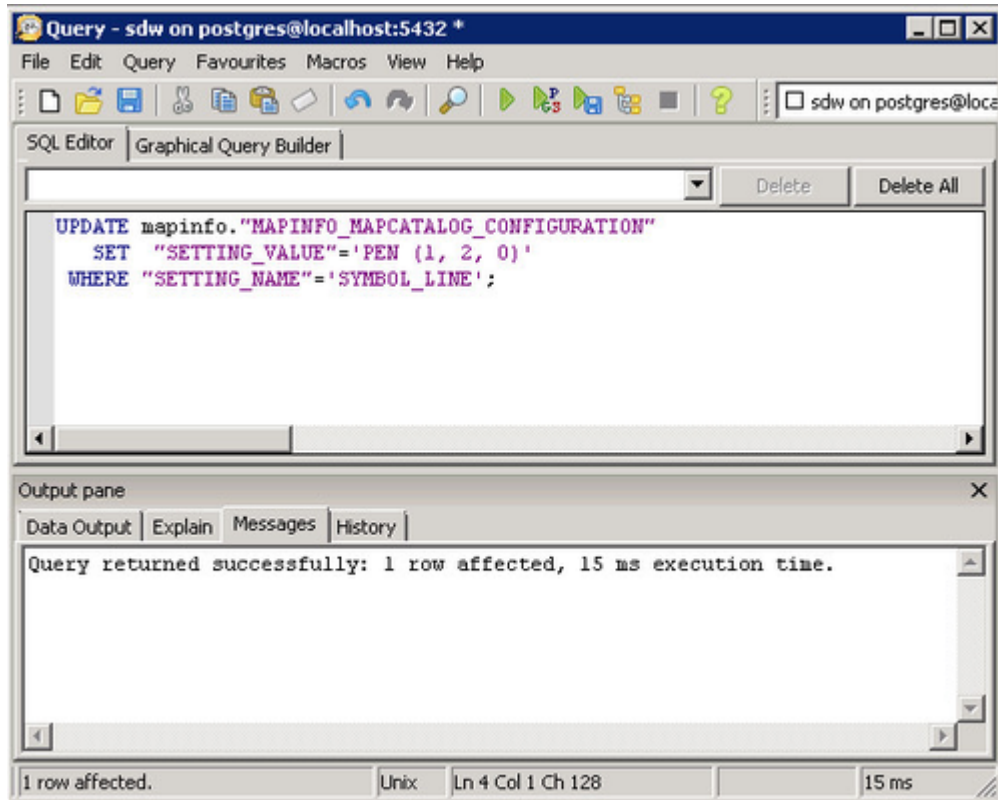


- Run the task. Click OK.

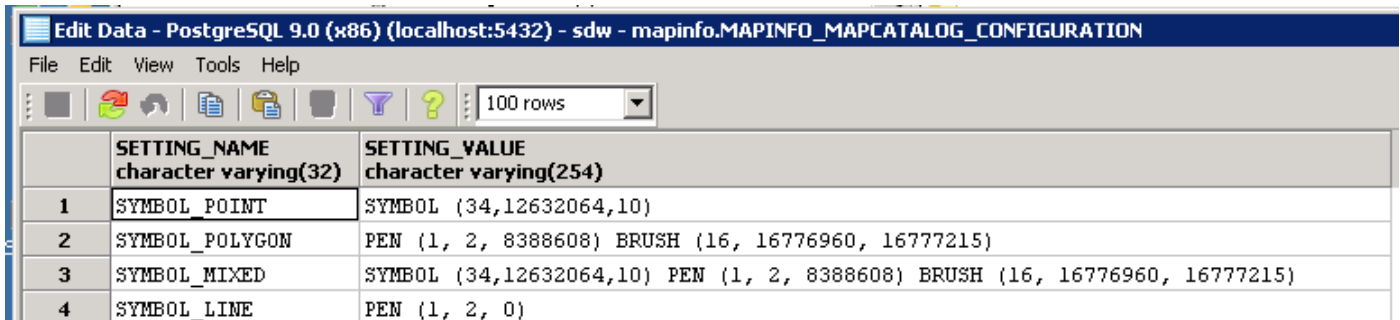
2.10. Changing the default MapInfo styling

Styling for MapInfo is set in the mapinfo.mapinfo_mapcatalog table. If styling doesn't exist when a table is created then the styling rules stored in the mapinfo.mapinfo_mapcatalog_configuration table will be used instead. Please refer to MapInfo documentation for information on the correct values for the styles you require. Note: Any changes to the default MapInfo styling will only be applied to new tables created using Studio and pre-existing tables will have been created with the original defaults.

- Open pgAdmin III and connect to PostgreSQL as a user with admin role.
 - Expand the node for your SDW, expand the Schemas entry, expand the mapinfo schema, expand the Tables.
 - Right click on the MAPINFO_MAPCATALOG_CONFIGURATION and select Scripts > UPDATE Script to open the SQL Editor.
 - Now change the script to update the entry you require e.g.



The above screenshot shows an example of an update to the SYMBOL_LINE entry. The following screenshot details the entries that may be overridden.



	SETTING_NAME character varying(32)	SETTING_VALUE character varying(254)
1	SYMBOL_POINT	SYMBOL (34,12632064,10)
2	SYMBOL_POLYGON	PEN (1, 2, 8388608) BRUSH (16, 16776960, 16777215)
3	SYMBOL_MIXED	SYMBOL (34,12632064,10) PEN (1, 2, 8388608) BRUSH (16, 16776960, 16777215)
4	SYMBOL_LINE	PEN (1, 2, 0)

2.11. Change MapInfo Styling for a Table

Please refer to MapInfo documentation for information on the correct values for the styles you require.

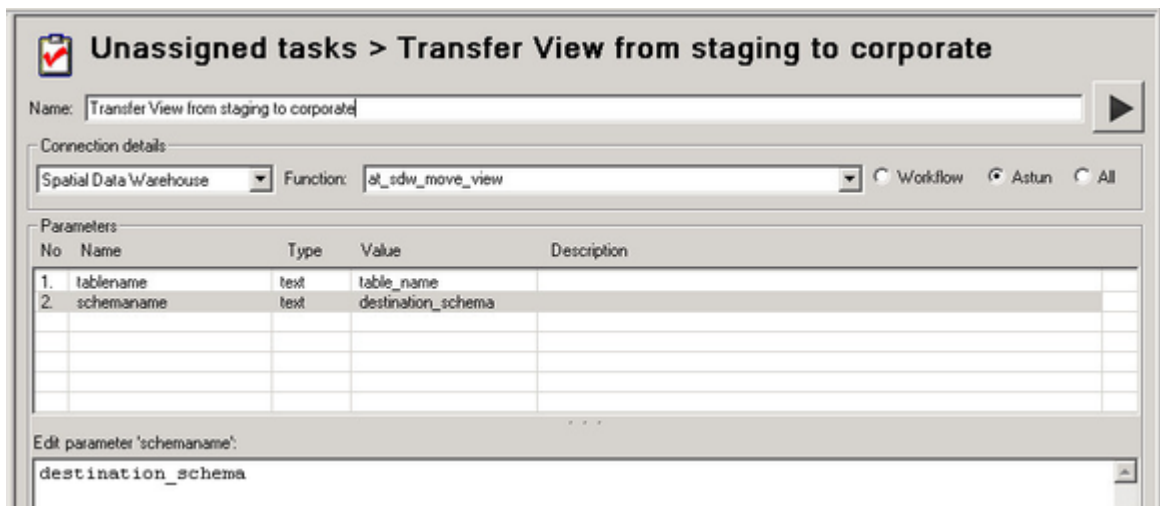
- Open pgAdmin III and connect to PostgreSQL as a user with admin role.
 - Expand the node for your SDW, expand the Schemas entry, expand the mapinfo schema, expand the Tables.
 - Right click on the MAPINFO_MAPCATALOG and select Scripts > UPDATE Script to open the SQL Editor.
 - Now change the script to update the entry you require making sure that you only select the table and schema that you wish to update e.g. WHERE TABLENAME='testuse_table' and OWNERNAME='planning'.

2.12. Create a User View

A user can create a view in staging just like a table. They can do this through pgAdmin III, psql or through the DB manager interface of QGIS.

2.13. Move a Staging Schema View to a Corporate Schema

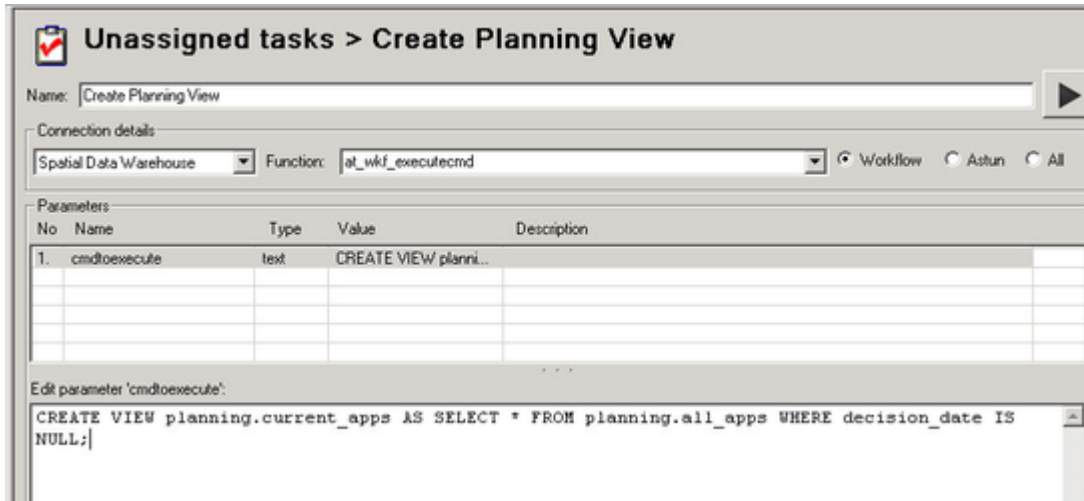
- Open Studio
 - Expand the Jobs node, right click on Unassigned tasks and select New Task.
 - Right click on Unassigned tasks and select New Task.
 - Create a Workflow Stored Procedure Task and give it a Name e.g. Transfer View from staging to corporate
 - Select the Spatial Data Warehouse Connection, Click on the Astun radio button and select the Function at `_sdw_move_view`.
 - Select the **tablename** parameter and enter the name of the *view* you wish to move in the **Edit parameter** box. Now select the **schemaname** parameter and enter the name of the destination *schema* you wish to transfer to e.g.



- Run the task. Click **OK**
- Check in pgAdmin III to see if the View has been created.

2.14. Create a View in a Corporate schema

- Open Studio
 - Create a Workflow Stored Procedure Task and give it a Name e.g. Create Planning View
 - Select the Spatial Data Warehouse Connection, Click on the Workflow radio button and select the Function at `_wkf_executecmd`.
 - Select the **cmdtoexecute** parameter and enter the CREATE VIEW statement into the **Edit parameter 'cmdtoexecute'** box e.g.



Unassigned tasks > Create Planning View

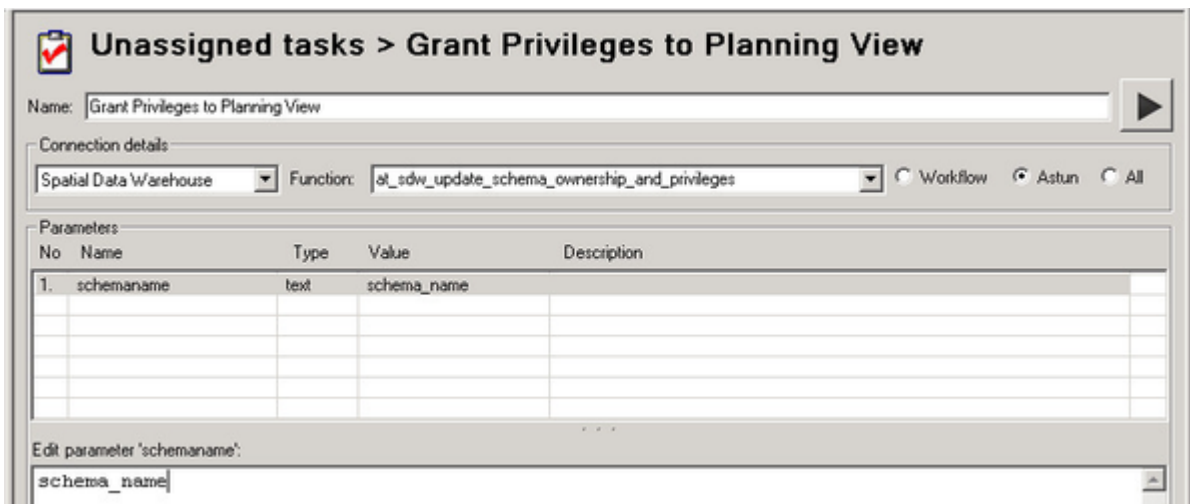
Name:

Connection details:
 Spatial Data Warehouse | Function: at_wkf_executecmd | Workflow Astun All

No	Name	Type	Value	Description
1.	cmdtoexecute	text	CREATE VIEW/ planni...	

Edit parameter 'cmdtoexecute':
 CREATE VIEW planning.current_apps AS SELECT * FROM planning.all_apps WHERE decision_date IS NULL;

- Run the task. Click **OK**
- Now we need to grant privileges to this view.
 - Create a Workflow Stored Procedure Task and give it a Name e.g. Grant Privileges to Planning View
 - Select the Spatial Data Warehouse Connection, Click on the Astun radio button and select the Function at_sdw_update_schema_ownership_and_privileges.
 - Select the **schemaname** parameter and enter the name of the schema where you created the view into the **Edit parameter 'schemaname'** box e.g.



Unassigned tasks > Grant Privileges to Planning View

Name:

Connection details:
 Spatial Data Warehouse | Function: at_sdw_update_schema_ownership_and_privileges | Workflow Astun All

No	Name	Type	Value	Description
1.	schemaname	text	schema_name	

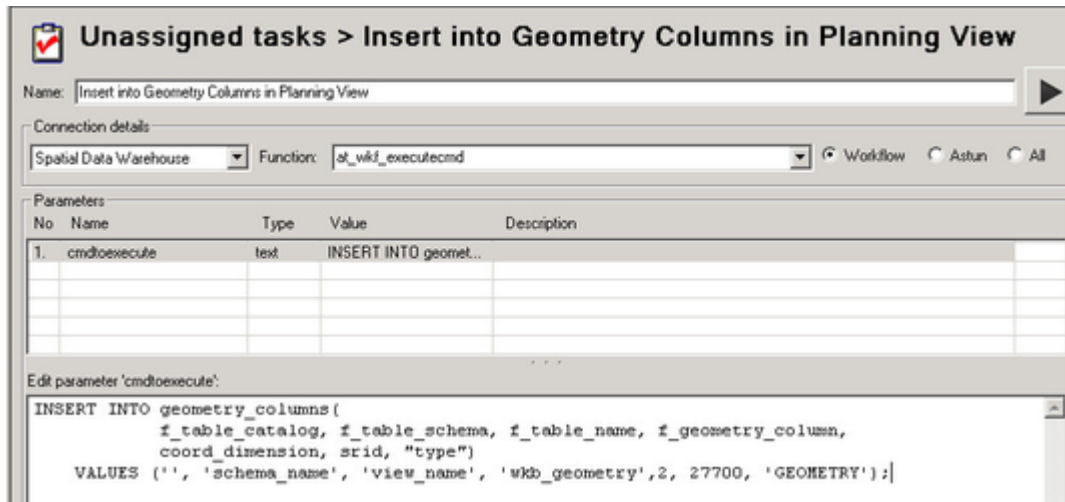
Edit parameter 'schemaname':
 schema_name

- Run the task. Click **OK**
- In PostGIS 1.5 a row will also need to be inserted into the **geometry_columns** table via an INSERT statement before GIS clients such as **QGIS** and **MapInfo** will be able to see the view.
 - Create a Workflow **Stored Procedure** Task and give it a *Name* e.g. **Insert into Geometry Columns in Planning View**
 - Select the **Spatial Data Warehouse Connection**, Click on the **Workflow** radio button and select the *Function* at_wkf_executecmd.
 - Select the **cmdtoexecute** parameter and enter the following INSERT statement into the **Edit parameter 'cmdtoexecute'** box e.g.

Example INSERT Statement

```
INSERT INTO geometry_columns(
    f_table_catalog, f_table_schema, f_table_name, f_geometry_column,
    coord_dimension, srid, "type")
VALUES ('', 'schema_name', 'view_name', 'wkb_geometry', 2, 27700, 'GEOMETRY');
```

Replace '**schema_name**' with the name of the schema where you created the view and '**view_name**' with the name of the view. The "**type**" could also be POINT, LINESTRING, POLYGON, MULTIPOINT, MULTILINESTRING, MULTIPOLYGON, GEOMETRYCOLLECTION.



- Run the task. Click **OK**

2.15. Load a Non-spatial table into the SDW

Non-spatial tables may be required from DataShare Connections or Spatial Data Transformation workflow tasks. A DataShare connection will always create the data in the public schema either of the local iShareData database or the SDW. A Data Share Connection in Studio will create a connection to numerous different sources. Syncing a Data Share Connection will migrate the data to a public table of the same name in the public schema of the local iShareData database. PostgreSQL commands are then used to move the table to the SDW database.

- Open Studio
- Create a Workflow Spatial Data Transformation, and name it something like "Import Planning CSV"
- Set the source data to the type Comma-Delimited Text File
- Import a CSV from the following folder:
 - D:\iShareData\Astun\Source Data\csv\surreyplanning>alerts\
- Set the output to the SDW database
- Set the tablename, in the form **schema.tablename** where the schema should be one the studio user has admin rights to, eg staging
- Check the "Force Geometry" box and choose **NONE** from the dropdown list

Unassigned tasks > Import CSV

Name: Import CSV

Source Data: Comma-Delimited Text File

Filename: D:\ShareData\Astun\Source Data\csv\Asureyplanning\Alerts\planning_2015_06_26_2025.csv

Input encoding: UTF8

Output: SDW

Table: staging_planning_nonspatial

Options:

Projection as British National Grid Force Geometry: NONE

WHERE statement

Action:

Overwrite layer Append to layer Skip Failures

Expert mode:

Show expert mode

Additional parameters:

- Run task.

There are two functions for transferring non-spatial data to the correct schema. Choose **at_sdw_move_nonspatial_table** if you wish to delete the source table from the original schema, or **at_sdw_copy_nonspatial_table** if you wish to keep the source data in the original schema.

- Open Studio
- Create a Workflow Stored Procedure Task
- Select the procedure **at_sdw_move_nonspatial_table** and set the following parameters:
 - **schemasource**- the source schema for the table you created in the above task
 - **schemadestination** - the schema you would like to move the table to
 - **tablename**- the name of the table (this will be the same in both the source and destination schemas)

Unassigned tasks > Move non-spatial

Name: Move\ non-spatial

Connection details:

SDW Function: at_sdw_move_nonspatial_table

Parameters:

No	Name	Type	Value	Description
1.	schemasource	text	staging	
2.	schemadestination	text	grounds	
3.	tablename	text	planning_nonspatial	

Edit parameter 'tablename':

planning_nonspatial

- Run the task.
- Open pgadmin3 and verify that the table has been moved from the staging schema to the schema of your choice, and that the roles and privileges are correctly set.