



Universitat de Girona
Servei de Sistemes d'Informació
Geogràfica i Teledetecció

Cosas que puedes hacer con PostGIS que quizás no sepas



XAVIER TORRET
Socio Director BGEO



Geotech/Spatial Data Science, 14 y 15 de junio de 2023 | Girona



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“POSTGIS CAMBIÓ MI VIDA”

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NUESTRA EMPRESA

Somos una empresa multicultural con sede en Barcelona con más de 15 años. Nos apasiona ayudar a las empresas de agua a mejorar sus procesos y resiliencia mediante el uso de soluciones de alta relación calidad-precio.

Nuestra visión es agua y saneamiento para todos, y nuestra misión es ser una empresa mundial impulsada por el conocimiento de los servicios públicos de agua.



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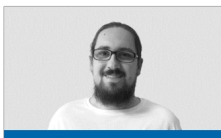
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Geotech/Spatial Data Science, 14 y 15 de junio de 2023 | Girona





- 1) LA GÉNESIS DE LOS OBJETOS Y EL SEGUNDO PRINCIPIO DE LA TERMODINÁMICA**
- 2) ¿DISEÑO Y PROGRAMACIÓN ORIENTADO A OBJETOS?**
- 3) ¿PUEDEN SER LAS VISTAS EDITABLES?**
- 4) EL MUNDO REAL Y EL MUNDO VIRTUAL**
- 5) EL GOBIERNO EN LA SOMBRA: CONTROLANDO DESDE BACKEND**
- 6) LOS SIETE GRANDES RETOS SUPERADOS**



LA GÉNESIS DE LOS OBJETOS Y EL SEGUNDO PRINCIPIO DE LA TERMODINÁMICA

```
> cat_arc
> cat_arc_shape
> cat_brand
> cat_brand_model
> cat_builder
> cat_connec
> cat_dscenario
> cat_element
> cat_feature
> cat_feature_arc
> cat_feature_connec
> cat_feature_node
> cat_manager
> cat_mat_arc
> cat_mat_element
> cat_mat_node
> cat_mat_roughness
> cat_node
> cat_owner
> cat_pavement
> cat_soil
> cat_users
> cat_work
> cat_workspace
```

```
> temp_anlgraph
> temp_arc
> temp_csv
> temp_data
> temp_demand
> temp_go2epa
> temp_mincut
> temp_node
> temp_table
```

```
> config_csv
> config_file
> config_form_fields
> config_form_list
> config_form_tableview
> config_form_tabs
> config_fprocess
> config_function
> config_graph_checkvalve
> config_graph_inlet
> config_graph_valve
> config_info_layer
> config_info_layer_x_type
> config_param_system
> config_param_user
> config_report
> config_table
> config_toolbox
> config_typevalue
> config_user_x_expl
> config_user_x_sector
> config_visit_class
> config_visit_class_x_feature
> config_visit_class_x_parameter
> config_visit_parameter
> config_visit_parameter_action
```

```
> sys_addfields
> sys_feature_cat
> sys_feature_epa_type
> sys_feature_type
> sys_foreignkey
> sys_fprocess
> sys_function
> sys_image
> sys_message
> sys_param_user
> sys_role
> sys_style
> sys_table
> sys_typevalue
> sys_version
```

```
> selector_audit
> selector_date
> selector_expl
> selector_hydrometer
> selector_inp_dscenario
> selector_inp_result
> selector_mincut_result
> selector_plan_psector
> selector_plan_result
> selector_psector
> selector_rpt_compare
> selector_rpt_compare_tstep
> selector_rpt_main
> selector_rpt_main_tstep
> selector_sector
> selector_state
> selector_workcat
```



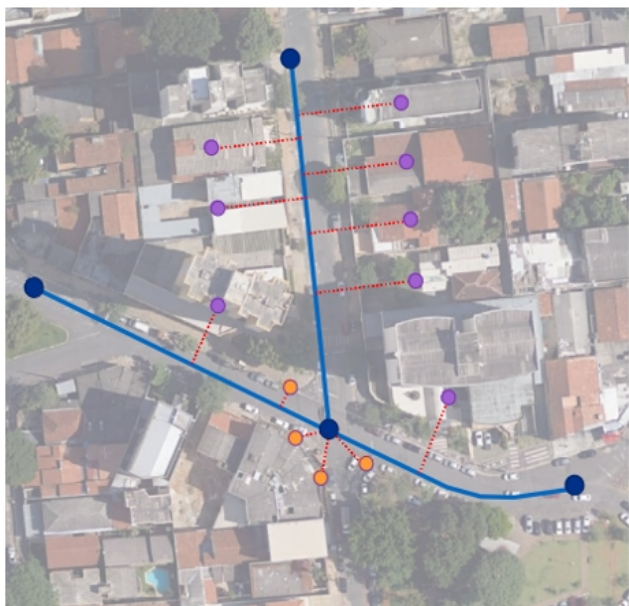
LA GÉNESIS DE LOS OBJETOS Y EL SEGUNDO PRINCIPIO DE LA TERMODINÁMICA

```
> gw_fct_admin_check_data(json)
> gw_fct_admin_manage_addfields(json)
> gw_fct_admin_manage_backup(json)
> gw_fct_admin_manage_child_config(json)
> gw_fct_admin_manage_child_views(json)
> gw_fct_admin_manage_child_views_view(json)
> gw_fct_admin_manage_ct(json)
> gw_fct_admin_manage_fields(json)
> gw_fct_admin_manage_migra(json)
> gw_fct_admin_manage_roles(json)
> gw_fct_admin_manage_schema(json)
> gw_fct_admin_manage_triggers(text, text)
> gw_fct_admin_manage_views(json)
> gw_fct_admin_manage_visit(json)
> gw_fct_admin_manage_visit_view(json)
> gw_fct_admin_rename_fixviews(json)
> gw_fct_admin_reset_sequences()
> gw_fct_admin_role_permissions()
> gw_fct_admin_role_resetuserprofile(json)
> gw_fct_admin_role_upsetuser(json)
> gw_fct_admin_schema_clone(json)
> gw_fct_admin_schema_i18n(json)
> gw_fct_admin_schema_lastprocess(json)
> gw_fct_admin_schema_utils_fk()
> gw_fct_admin_test_ci()
> gw_fct_anl_arc_duplicated(json)
> gw_fct_anl_arc_length(json)
> gw_fct_anl_arc_no_startend_node(json)
> gw_fct_anl_arc_same_startend(json)
> gw_fct_anl_connec_duplicated(json)
> gw_fct_anl_node_duplicated(json)
> gw_fct_anl_node_orphan(json)
> gw_fct_anl_node_proximity(json)
> gw_fct_anl_node_tcandidate(json)
> gw_fct_anl_node_topological_consistency(json)
> gw_fct_arc_repair(json)
> gw_fct_audit_log_feature(text)
> gw_fct_audit_schema_check(varchar)
> gw_fct_audit_schema_repair(varchar)
```

```
> gw_trg_arc_noderotation_update()
> gw_trg_arc_orphannode_delete()
> gw_trg_arc_vnodelink_update()
> gw_trg_audit_log_feature()
> gw_trg_calculate_period()
> gw_trg_cat_dscenario()
> gw_trg_cat_feature()
> gw_trg_cat_manager()
> gw_trg_config_control()
> gw_trg_connec_proximity()
> gw_trg_connect_update()
> gw_trg_doc()
> gw_trg_edit_address()
> gw_trg_edit_anl_hydrant()
> gw_trg_edit_arc()
> gw_trg_edit_cad_aux()
> gw_trg_edit_cat_dscenario()
> gw_trg_edit_cat_feature()
> gw_trg_edit_cat_node()
> gw_trg_edit_config_addfields()
> gw_trg_edit_config_sysfields()
> gw_trg_edit_connect()
> gw_trg_edit_dimensions()
> gw_trg_edit_dma()
> gw_trg_edit_dqa()
> gw_trg_edit_element()
> gw_trg_edit_element_pol()
> gw_trg_edit_exploitation()
> gw_trg_edit_field_node()
> gw_trg_edit_foreignkey()
> gw_trg_edit_inp_arc()
> gw_trg_edit_inp_connec()
> gw_trg_edit_inp_controls()
> gw_trg_edit_inp_curve()
> gw_trg_edit_inp_dscenario()
> gw_trg_edit_inp_dscenario_demand()
> gw_trg_edit_inp_node()
> gw_trg_edit_inp_pattern()
> gw_trg_edit_inp_rules()
> gw_trg_edit_link()
```




DISEÑO Y PROGRAMACIÓN ORIENTADO A OBJETOS



- Node
- Arc
- Connec
- Gully
- Link

NODE

```
ABC node_id (varchar(16))
ABC code (varchar(30))
123 elevation (numeric(12, 4))
123 depth (numeric(12, 4))
ABC nodecat_id (varchar(30))
ABC epa_type (varchar(16))
123 sector_id (int4)
ABC arc_id (varchar(16))
ABC parent_id (varchar(16))
123 state (int2)
```

```
123 district_id (int4)
ABC adate (text)
ABC adescript (text)
123 accessibility (int2)
ABC workcat_id_plan (varchar(255))
ABC asset_id (varchar(50))
```

ARC

```
ABC arc_id (varchar(16))
ABC code (varchar(30))
ABC node_1 (varchar(16))
ABC node_2 (varchar(16))
ABC arccat_id (varchar(30))
ABC epa_type (varchar(16))
123 sector_id (int4)
123 state (int2)
```

```
123 staticpressure (numeric(12, 3))
123 district_id (int4)
123 depth (numeric(12, 3))
ABC adate (text)
ABC adescript (text)
ABC workcat_id_plan (varchar(255))
ABC asset_id (varchar(50))
ABC pavcat_id (varchar(30))
```



DISEÑO Y PROGRAMACIÓN ORIENTADO A OBJETOS

gw_trg_topocontrol_arc (before insert or update of the _geom, state on arc)

```
-- working without statetopocontrol
SELECT node.* INTO nodeRecord1 FROM node
JOIN cat_node ON cat_node.id=node.nodecat_id
JOIN cat_feature_node ON cat_feature_node.id = node.type_id
WHERE ST_DWithin(ST_startpoint(NEW.the_geom), node.the_geom, v_arc_searchnodes) ORDER BY
(case when isarcoid is true then 1 else 2 end),
ST_Distance(node.the_geom, ST_startpoint(NEW.the_geom)) limit 1;

SELECT node.* INTO nodeRecord2 FROM node
JOIN cat_node ON cat_node.id=node.nodecat_id
JOIN cat_feature_node ON cat_feature_node.id = node.type_id
WHERE ST_DWithin(ST_endpoint(NEW.the_geom), node.the_geom, v_arc_searchnodes) ORDER BY
(case when isarcoid is true then 1 else 2 end),
ST_Distance(node.the_geom, ST_endpoint(NEW.the_geom)) limit 1;
```

gw_trg_topocontrol_node (after insert or update of the _geom, state on node)

```
-- check existing statetopocontrol
SELECT * INTO node_rec FROM node WHERE ST_DWithin(NEW.the_geom, node.the_geom, v_node_proximity) AND node.node_id != NEW.node_id AND node.state=1
IF node_rec.node_id IS NOT NULL THEN

    IF v_dsql_error IS NOT TRUE THEN
        EXECUTE 'SELECT gw_fct_getmessage($client){"device":4, "infoType":1, "lang":"ES"}, {"feature":{},'
        "data":{"message":"1097", "function":"1334", "debug_msg":"' || NEW.node_id || '"});';
    ELSE

        SELECT concat('ERROR-',id,',',error_message,',',hint_message) INTO v_message FROM sys_message WHERE id = 1097;
        INSERT INTO audit_log_data (fid, feature_id, log_message) VALUES (106, NEW.node_id, v_message);
    END IF;
END IF;
```



¿PUEDEN SER LAS VISTAS EDITABLES?

cat_feature

id	system_id	feature_type	shortcut_key	parent_layer	child_layer	descript	link_path	code_autofill	active	config
PR_BREAK_VALVE	VALVE	NODE	NULL	v_edit_node	ve_node_pr_break_valve	Pressure break valve	NULL	true	true	NULL
PR_SUSTA_VALVE	VALVE	NODE	NULL	v_edit_node	ve_node_pr_susta_valve	Pressure sustainer valve	NULL	true	true	NULL
CONTROL_REGISTER	REGISTER	NODE	NULL	v_edit_node	ve_node_control_register	Control register	NULL	true	true	NULL
FL_CONTR_VALVE	VALVE	NODE	NULL	v_edit_node	ve_node_fl_contr_valve	Flow control valve	NULL	true	false	NULL
GEN_PURP_VALVE	VALVE	NODE	NULL	v_edit_node	ve_node_gen_purp_valve	General purpose valve	NULL	true	false	NULL
THROTTLE_VALVE	VALVE	NODE	NULL	v_edit_node	ve_node_throttle_valve	Throttle-valve	NULL	true	false	NULL
ADAPTATION	JUNCTION	NODE	NULL	v_edit_node	ve_node_adaptation	Adaptation junction	NULL	true	false	NULL
BYPASS_REGISTER	REGISTER	NODE	NULL	v_edit_node	ve_node_bypass_register	Bypass-register	NULL	true	false	NULL
VALVE_REGISTER	REGISTER	NODE	NULL	v_edit_node	ve_node_valve_register	Valve register	NULL	true	false	NULL

sys_addfields

id	param_name	cat_feature_id	is_mandatory	datatype_id	orderby	active	iseditable
2	outfallvalve_param_1	OUTFALL_VALVE	falso	text	1	true	verdadero
4	outfallvalve_param_2	OUTFALL_VALVE	falso	boolean	2	true	verdadero
6	shtvalve_param_1	SHUTOFF_VALVE	falso	text	1	true	verdadero



¿PUEDEN SER LAS VISTAS EDITABLES?

ve_node_*

```
FROM ws_sample.ve_node
JOIN ws_sample.man_meter ON man_meter.node_id::text = ve_node.node_id::text
LEFT JOIN ( SELECT ct.feature_id,
ct.pressmeter_param_1,
ct.pressmeter_param_2
FROM crosstab('SELECT feature_id, parameter_id, value_param
FROM ws_sample.man_addfields_value LEFT JOIN ws_sample.sys_addfields ON sys_addfields.id=parameter_id
JOIN ws_sample.v_state_node ON node_id = feature_id
WHERE value_param IS NOT NULL AND cat_feature_id='PRESSURE_METER' OR cat_feature_id is null ORDER BY 1,2)::text,
VALUES (('24'),('26'))::text) ct(feature_id character varying, pressmeter_param_1 text, pressmeter_param_2 date)) a
ON a.feature_id::text = ve_node.node_id::text
WHERE ve_node.node_type::text = 'PRESSURE_METER'::text;
```

gw_trg_edit_node

```
-- man addfields update
IF v_customfeature IS NOT NULL THEN
FOR v_addfields IN SELECT * FROM sys_addfields
WHERE (cat_feature_id = v_customfeature OR cat_feature_id is null) AND active IS TRUE AND iseditable IS TRUE

EXECUTE 'SELECT $1.* || v_addfields.param_name||''''
USING NEW
INTO v_new_value_param;

EXECUTE 'SELECT $1.* || v_addfields.param_name||''''
USING OLD
INTO v_old_value_param;

IF v_new_value_param IS NOT NULL THEN

EXECUTE 'INSERT INTO man_addfields_value(feature_id, parameter_id, value_param) VALUES ($1, $2, $3)
ON CONFLICT (feature_id, parameter_id)
DO UPDATE SET value_param=$3 WHERE man_addfields_value.feature_id=$1 AND man_addfields_value.parameter_id=$2'
USING NEW.node_id , v_addfields.id, v_new_value_param;

ELSIF v_new_value_param IS NULL AND v_old_value_param IS NOT NULL THEN

EXECUTE 'DELETE FROM man_addfields_value WHERE feature_id=$1 AND parameter_id=$2'
USING NEW.node_id , v_addfields.id;

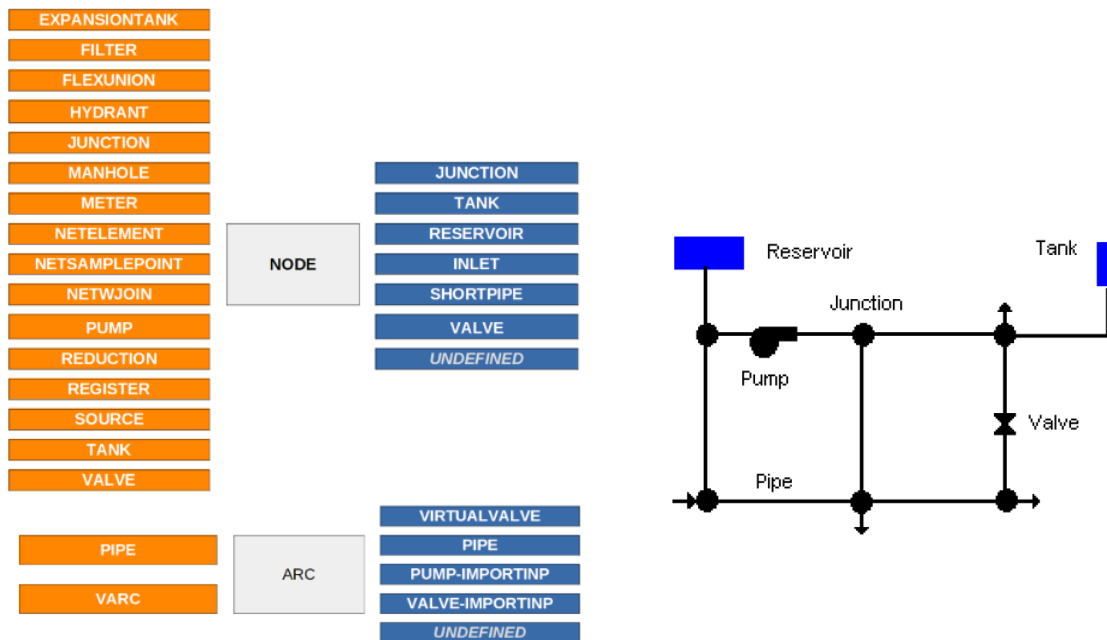
END IF;

END LOOP;
END IF;
```



EL MUNDO REAL Y EL MUNDO VIRTUAL

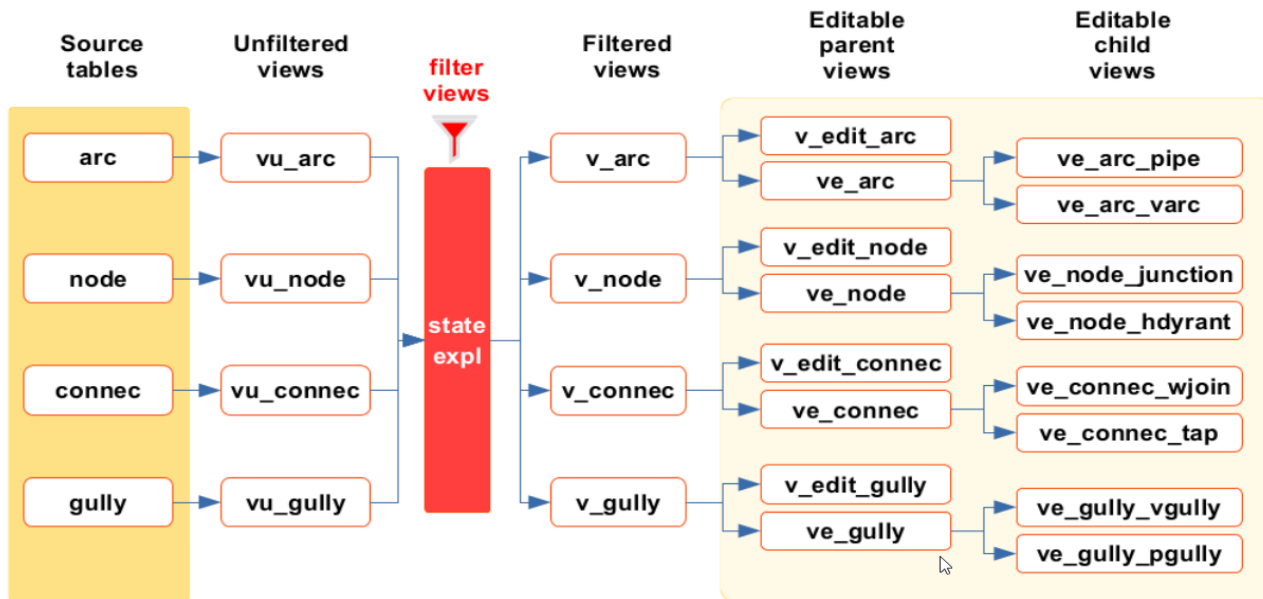
https://github.com/Giswater/giswater_dbmodel/wiki/EPANET-dual-dbmodel





EL GOBIERNO EN LA SOMBRA: CONTROLANDO DESDE BACKEND

https://github.com/Giswater/giswater_dbmodel/wiki/feature-views-strategy





EL GOBIERNO EN LA SOMBRA: CONTROLANDO DESDE BACKEND

https://github.com/Giswater/giswater_dbmodel/wiki/feature-views-strategy

- > selector_audit
- > selector_date
- > selector_expl
- > selector_hydrometer
- > selector_inp_dscenario
- > selector_inp_result
- > selector_mincut_result
- > selector_plan_psector
- > selector_plan_result
- > selector_psector
- > selector_rpt_compare
- > selector_rpt_compare_tstep
- > selector_rpt_main
- > selector_rpt_main_tstep
- > selector_sector
- > selector_state
- > selector_workcat

v_state_arc

```
SELECT arc.arc_id
FROM ws_sample.selector_state,
ws_sample.selector_expl,
ws_sample.arc
WHERE arc.state = selector_state.state_id AND arc.expl_id = selector_expl.expl_id
AND selector_expl.cur_user = "current_user"()::text
AND selector_state.cur_user = "current_user"()::text
```

v_state_node

```
SELECT node.node_id
FROM ws_sample.selector_state,
ws_sample.selector_expl,
ws_sample.node
WHERE node.state = selector_state.state_id AND node.expl_id = selector_expl.expl_id
AND selector_expl.cur_user = "current_user"()::text
AND selector_state.cur_user = "current_user"()::text
```

v_state_connec

```
SELECT connec.connec_id,
connec.arc_id,
1 AS flag
FROM ws_sample.selector_state,
ws_sample.selector_expl,
ws_sample.connec
WHERE connec.state = selector_state.state_id AND connec.expl_id = selector_expl.expl_id
AND selector_expl.cur_user = "current_user"()::text
AND selector_state.cur_user = "current_user"()::text
```



EL GOBIERNO EN LA SOMBRA: CONTROLANDO DESDE BACKEND

https://github.com/Giswater/giswater_dbmodel/wiki/Qgis-backend-built-forms

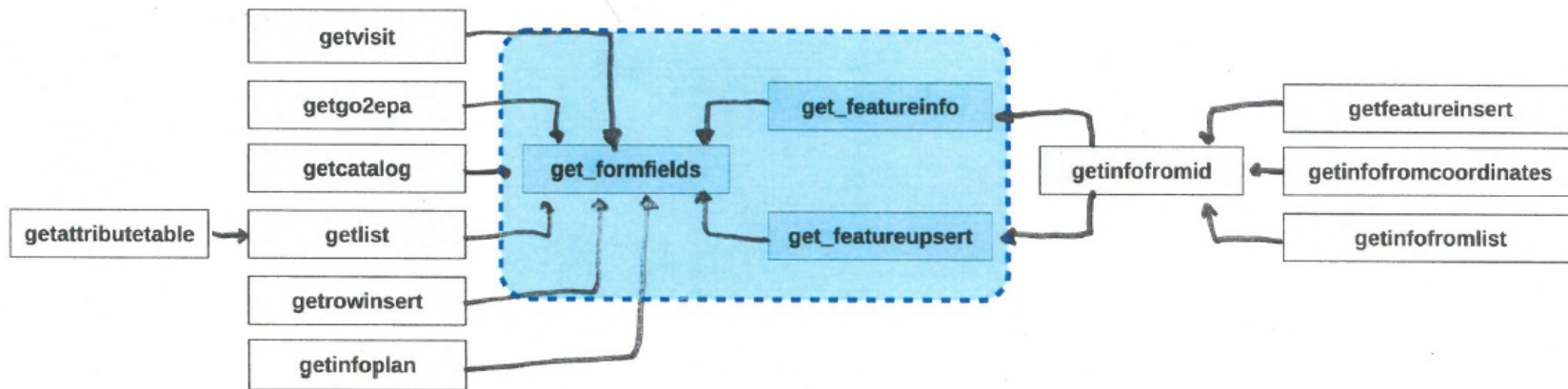
The screenshot shows the 'PIPE - 2054' form in QGIS. The form is divided into several sections: 'Main data' and 'Additional data'. The 'Main data' section contains fields for 'Node_1' (1065), 'Node_2' (1036), 'Node_type_1' (T), 'Node_type_2' (T), 'Elevation1' (57.9172), 'Elevation2' (55.1050), 'Depth1' (0.0000), 'Depth2' (0.0000), 'Code' (2054), 'Solcat_id' (soil), 'Cat_matcat_id' (FC), 'Function_type' (St. Function), 'Cat_pnom' (10), 'Category_type' (St. Category), 'Cat_dnom' (160), 'Fluid_type' (St. Fluid), 'Gis_length' (56.06), 'Location_type' (St. Location), 'Work_id' (work1), 'Pavcat_id' (Asphalt), 'Bulldate' (05/12/2017), 'Label_y' (), 'Label_x' (), 'Label_rotation' (), 'Owner' (owner1), 'Verified' (TO REVIEW), 'Work id end' (Only when state is obsolete), 'Presszone' (Undefined), 'Enddate' (NULL), 'Dqa' (dqa1-1d), 'Minsector_id' (Exploitation), 'exp1_01' (), 'Staticpressure1' (0.000), 'Workcat_id_plan' (), 'Staticpressure2' (0.000), 'Asset id' (). The 'Additional data' section contains 'Sector' (sector1-1d), 'Dma' (dma1-1d), 'State' (OPERATIVE), and 'State_type' (OPERATIVE). There are 'Accept' and 'Cancel' buttons at the bottom.

The screenshot shows the 'JUNCTION - 1006' form in QGIS. The form is divided into several sections: 'Main data' and 'Additional data'. The 'Main data' section contains fields for 'Code' (1006), 'Arc_id' (), 'Optional: Arc_id of related arc' (), 'Elevation' (53.6136), 'Solcat_id' (soil), 'Depth' (0.0000), 'Function_type' (St. Function), 'Cat_matcat_id' (N/1), 'Category_type' (St. Category), 'Cat_pnom' (16), 'Fluid_type' (St. Fluid), 'Cat_dnom' (160), 'Location_type' (St. Location), 'Work_id' (work1), 'Catalog label' (), 'Bulldate' (06/12/2017), 'Label_y' (), 'Label_x' (), 'Label_rotation' (), 'Owner' (owner1), 'Rotation' (), 'Work_id_end' (Only when state is obsolete), 'Enddate' (NULL), 'Verified' (TO REVIEW), 'Staticpressure' (0.000), 'Presszone' (pzone1-1d), 'Minsector_id' (), 'Dqa' (dqa1-1d), 'Hemisphere' (), 'Exploitation' (exp1_01), 'Parent_id' (Optional: Node_id of the parent node), 'Workcat_id_plan' (), 'Asset id' (). The 'Additional data' section contains 'Sector' (sector1-1d), 'Dma' (dma1-1d), 'State' (OPERATIVE), and 'State_type' (OPERATIVE). There are 'Accept' and 'Cancel' buttons at the bottom.



EL GOBIERNO EN LA SOMBRA: CONTROLANDO DESDE BACKEND

https://github.com/Giswater/giswater_dbmodel/wiki/Qgis-backend-built-forms





EL GOBIERNO EN LA SOMBRA: CONTROLANDO DESDE BACKEND

https://github.com/Giswater/giswater_dbmodel/wiki/Qgis-backend-built-forms

gw_fct_getformfields (varchar, varchar, varchar, varchar, varchar, varchar, varchar, varchar, varchar, int4, json)

```
v_querystring = concat('SELECT array_agg(row_to_json(a)) FROM (  
  WITH typevalue AS (SELECT * FROM config_typevalue)  
  
  SELECT ',v_label,', columnname, columnname as column_id, concat(',quote_literal(p_tabname)',',',columnname) AS widgetname, widgettype,  
  widgetfunction,', v_device,' hidden, datatype, tooltip, placeholder, iseditable, row_number()over(ORDER BY layoutname, layoutorder) AS orderby,  
  layoutname, layoutorder, dv_parent_id AS "parentId", isparent, ismandatory, linkedobject, dv_querytext AS "queryText", dv_querytext_filterc AS "queryTextFilter", isautoupdate,  
  dv_orderby_id AS "orderById", dv_isnullvalue AS "isNullValue", stylesheet, widgetcontrols, web_layoutorder  
  FROM config_form_fields  
  LEFT JOIN config_typevalue a ON a.id = widgetfunction::json->'functionName' AND a.typevalue = 'widgetfunction_typevalue'  
  LEFT JOIN config_typevalue b ON b.id = widgettype AND b.typevalue = 'widgettype_typevalue'  
  
  WHERE formname = 'quote_nullable(p_formname)' AND formtype = 'quote_nullable(p_formtype)' AND v_clause = 'v_filter_widgets' ORDER BY orderby) a');  
  
v_debug_vars := json_build_object('v_label', v_label, 'p_tabname', p_tabname, 'v_device', v_device, 'p_formname', p_formname, 'p_formtype', p_formtype, 'v_clause', v_clause);  
v_debug_sql := json_build_object('querystring', v_querystring, 'vars', v_debug_vars, 'funcname', 'gw_fct_getformfields', 'flag', 10);  
SELECT gw_fct_debugsql(v_debug_sql) INTO v_msgerr;  
EXECUTE v_querystring INTO fields_array;
```

config_form_fields

	formname	formtype	tabname	columnname	layoutname	layoutorder	datatype	widgettype	label	tooltip	placeholder	isman	isparent	ise	isautoupdat	isfilter	dv_querytext
1	v_plan_result_arc	form_feature	main	y1	[NULL]	[NULL]	double	text	y1	[NULL]	[NULL]	[]	[]	[]	[]	[NULL]	[NULL]
2	v_plan_result_arc	form_feature	main	area	[NULL]	[NULL]	double	text	area	[NULL]	[NULL]	[]	[]	[]	[]	[NULL]	[NULL]
3	price_compost	form_feature	main	id	[NULL]	[NULL]	string	text	id	[NULL]	[NULL]	[]	[]	[v]	[]	[NULL]	[NULL]
4	v_plan_result_arc	form_feature	main	z1	[NULL]	[NULL]	double	text	z1	[NULL]	[NULL]	[]	[]	[]	[]	[NULL]	[NULL]
5	v_ext_streetaxis	form_feature	main	descript	lyt_data_3	13	text	text	descript	[NULL]	[NULL]	[]	[]	[v]	[]	[NULL]	[NULL]



EL GOBIERNO EN LA SOMBRA: CONTROLANDO DESDE BACKEND

https://github.com/Giswater/giswater_dbmodel/wiki/Use-existing-PLpgSQL-function

Are you planning to develop new applications interacting with Giswater database?

Here you can find functions we have used in our database model ready to work with you. Functions json/json ready to build-up a Web Service and interact with your new development. More info:

- [Actions](#)
- [Admin](#)
- [Data quality](#)
- [Feature accesor](#)
- [Feature editor](#)
- [File I/O](#)
- [Graph analysis](#)
- [Topology analysis](#)



EL GOBIERNO EN LA SOMBRA: CONTROLANDO DESDE BACKEND

https://github.com/Giswater/giswater_dbmodel/wiki/Use-existing-PLpgSQL-function

List of Action functions

- gw_fct_getcatalog
- gw_fct_getchilds
- gw_fct_getcolumnsfromid
- gw_fct_getconfig
- gw_fct_getdimensioning
- gw_fct_getlist
- gw_fct_getmincut
- gw_fct_getpermissions
- gw_fct_getprint
- gw_fct_getprofilevalues
- gw_fct_getsearch
- gw_fct_getselectors
- gw_fct_gettoolbox
- gw_fct_getunexpected
- gw_fct_getvisit
- gw_fct_psector_duplicate
- gw_fct_setcheckproject
- gw_fct_setconfig
- gw_fct_setdelete

List of Admin functions

- gw_fct_admin_manage_addfields
- gw_fct_admin_manage_backup
- gw_fct_admin_manage_child_views
- gw_fct_admin_manage_ct
- gw_fct_admin_manage_fields
- gw_fct_admin_manage_visit
- gw_fct_admin_role_resetuserprofile
- gw_fct_admin_role_upsertuser
- gw_fct_admin_schema_clone

List of Graph analysis functions

- gw_fct_graphanalytics_downstream
- gw_fct_graphanalytics_flowtrace
- gw_fct_graphanalytics_lrs
- gw_fct_graphanalytics_mapzones
- gw_fct_graphanalytics_mincutzones
- gw_fct_graphanalytics_minsector
- gw_fct_graphanalytics_upstream

List of Data quality functions

- gw_fct_grafanalytics_check_data
- gw_fct_om_check_data
- gw_fct_pg2epa_check_data
- gw_fct_pg2epa_check_network
- gw_fct_pg2epa_check_options
- gw_fct_pg2epa_check_result
- gw_fct_plan_check_data

List of Feature accessor functions

- gw_fct_getcheckdelete
- gw_fct_getfeatureinsert
- gw_fct_getfeaturerelation
- gw_fct_getinfocrosssection
- gw_fct_getinfofromcoordinates
- gw_fct_getinfofromid
- gw_fct_getinfofromlist
- gw_fct_getinfofromplan
- gw_fct_getlayersfromcoordinates

List of Topology analysis functions

- gw_fct_anl_arc_intersection
- gw_fct_anl_arc_inverted
- gw_fct_anl_arc_no_startend_node
- gw_fct_anl_arc_same_startend
- gw_fct_anl_connec_duplicated
- gw_fct_anl_node_duplicated
- gw_fct_anl_node_exit_upper_intro
- gw_fct_anl_node_flowregulator
- gw_fct_anl_node_orphan
- gw_fct_anl_node_proximity
- gw_fct_anl_node_sink
- gw_fct_anl_node_topological_consistency



EL GOBIERNO EN LA SOMBRA: CONTROLANDO DESDE BACKEND

https://github.com/Giswater/giswater_dbmodel/wiki/PLpgSQL-function-input-parameters

```
{
  "client": {
    "device": 4, --> Device type: 1-mobile, 2-tablet, 3-web, 4-desktop
    "infoType": 1, --> Info type: 1-full, 2-reduced
    "lang": "es_ES", --> Language of client
    "epsg": 25831, --> Srid of map
    "cur_user": "test_user", --> Name of current user
  },
  "form": {
    "formName": "upsert_catalog_arc", --> Name of the form
    "tabName": "data", --> Name of the tab
    "editable": "TRUE", --> Force editability of form
    "formTabs": { "active": true, "fields": {} } --> Tabs of form
  },
  "feature": {
    "featureType": "arc", "feature_type": "ARC", "type": "ARC", --> Feature type. Need to be harmonized
    "tableName": "ve_arc_pipe", --> Name of the table related to feature
    "idName": "arc_id", --> Name of the column wich acts as primary key on related table
    "id": "2001", --> Id of element
    "catFeature": "PUMP" --> Catalog of element
  }
}
```

https://github.com/Giswater/giswater_dbmodel/wiki/PLpgSQL-function-output-parameters

```
{
  "status": "Accepted", --> Status of the response: Accepted, Failed
  "message": { --> Message of response
    "level": 1, --> Criticity of message: 0-OK, 1-WARNING, 2-ERROR
    "text": "Hello world"}, --> Text of message
  "version": "3.5.024" --> Backend version
}
```



LOS SIETE GRANDES APRENDIZAJES

- 1) EL ORDEN DE LAS COSAS
- 2) VISTAS EDITABLES CON TRIGGER DINÁMICO
- 3) ESTRATEGIA DE CONTROL EN BACKEND (SELECTORES, DIÁLOGOS, API)
- 4) PERFORMANCE (INDICES, SQL vs PL-SQL, TABLAS TEMPORALES, TABLESPACES)
- 5) ESTRATEGIAS DE DEBUG EN PL-PGSQL
- 6) POSTGRES FORWARD COMPATIBILITY
- 7) NO HAY MANERA DE USAR UN BUEN ADMINISTRADOR DE CÓDIGO LIBRE



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BIG THANK YOU TO POSTGIS!

Geotech/Spatial Data Science, 14 y 15 de junio de 2023 | Girona



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