

# GIS goes 3D : an OpenSource stack

**Oslandia Team**

**FOSS4G 2014 - Portland**

# E-PLU Project



**Direccte**  
**ÎLE-DE-FRANCE**

Direction régionale des entreprises,  
de la concurrence, de la consommation,  
du travail et de l'emploi

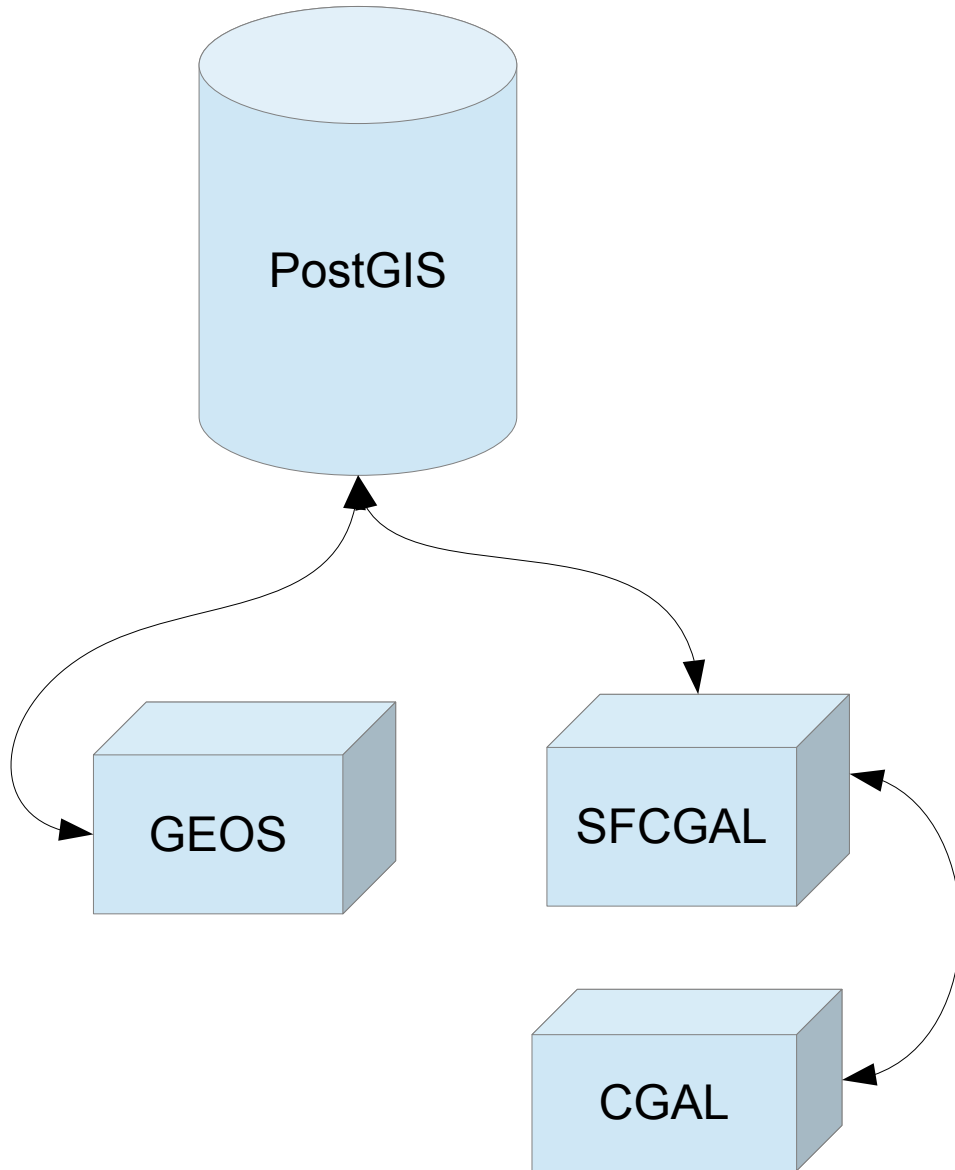




2010

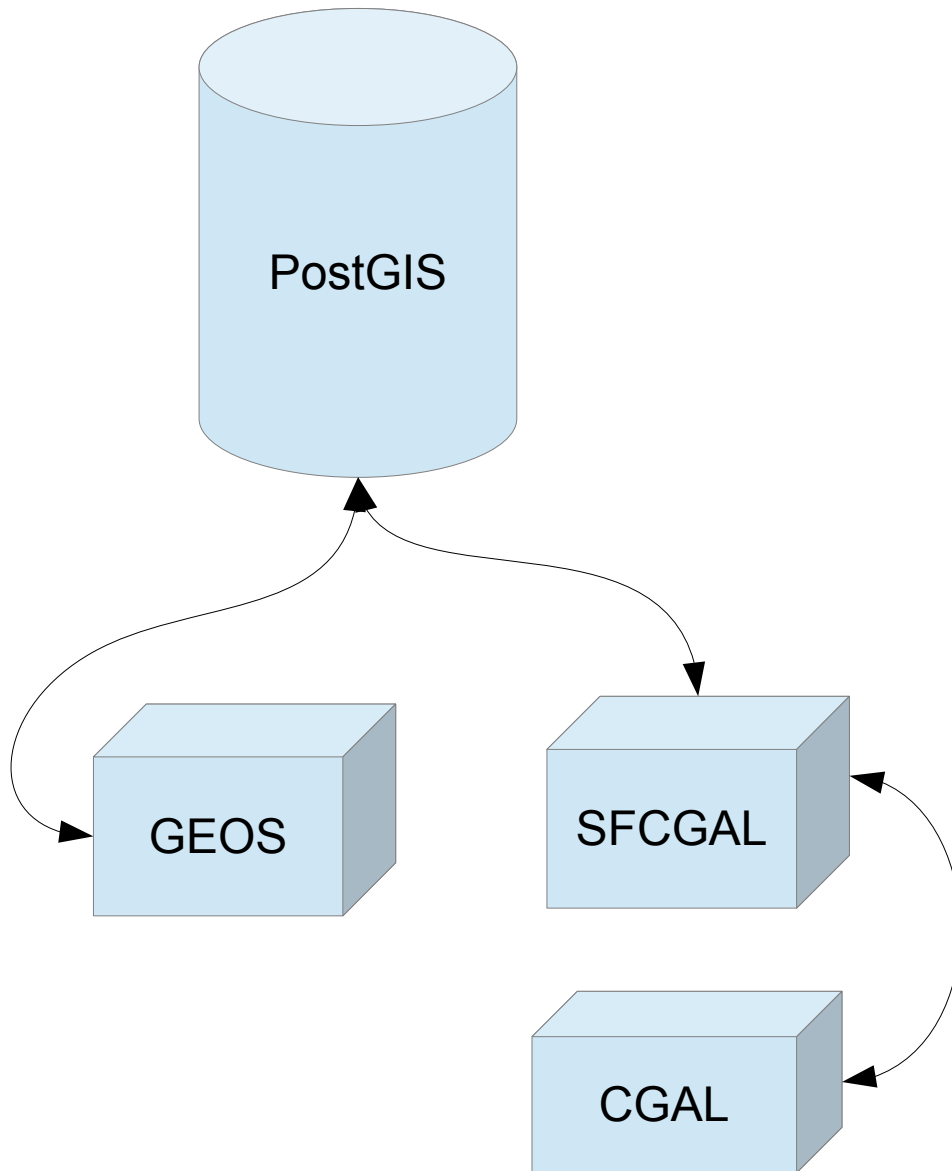
2014

2015





CGAL



ST\_3DIntersection

ST\_Tessellate

ST\_3DArea

ST\_Extrude

ST\_ForceLHR

ST\_Orientation

ST\_MinkowskiSum

ST\_StraightSkeleton



SFCGAL functions

ST\_3DIntersection

ST\_Tessellate

ST\_3DArea

ST\_Extrude

ST\_ForceLHR

ST\_Orientation

ST\_MinkowskiSum

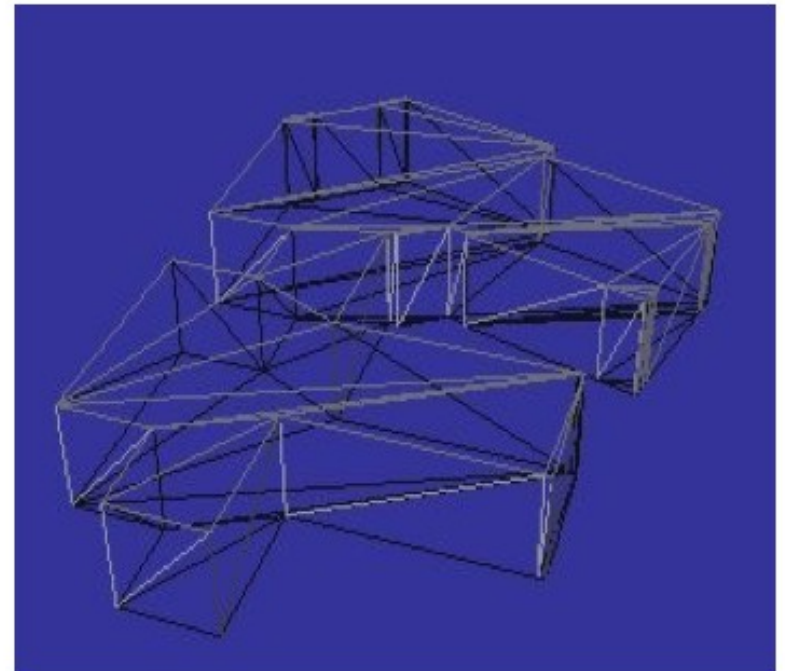
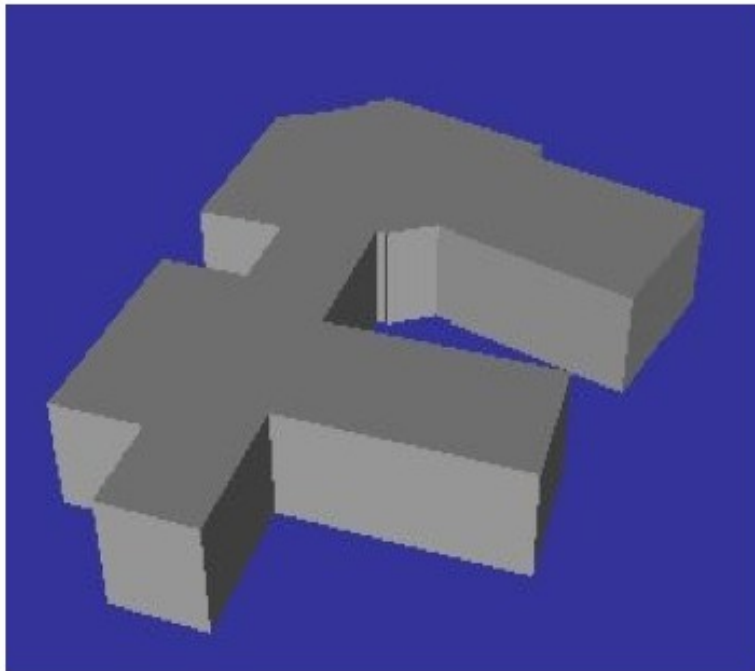
ST\_StraightSkeleton



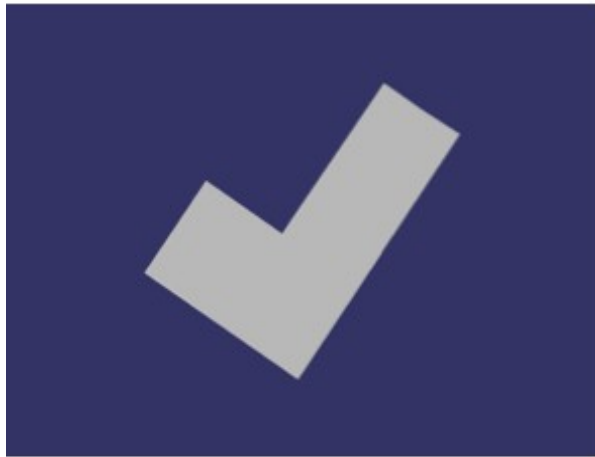
SFCGAL functions



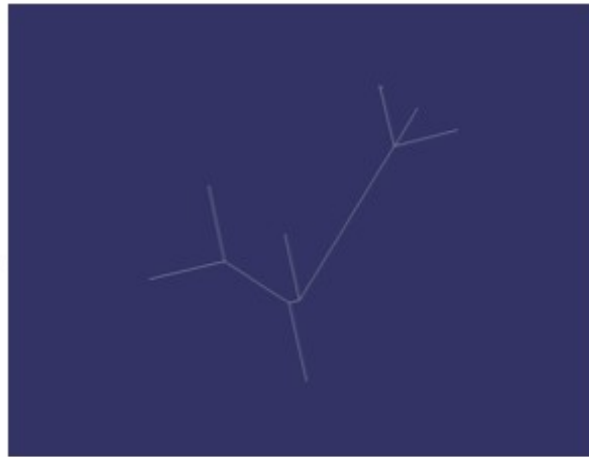
# ST\_Tessellate



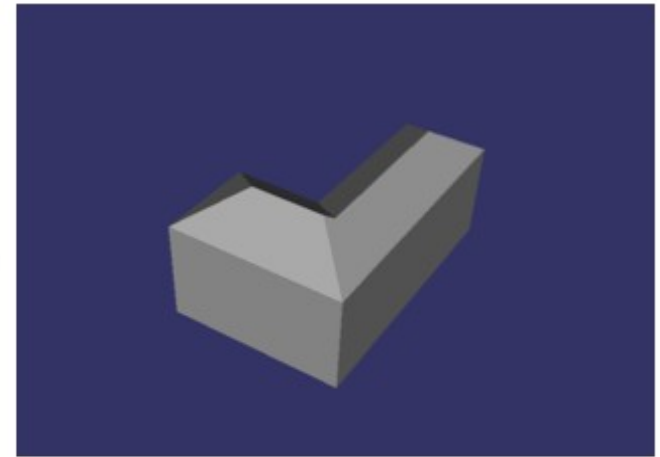
# ST\_StraightSkeleton



2D Building  
Footprint



Straight Skeleton



Extrusion  
& roof computation

ST\_Intersects

ST\_3DIntersects

ST\_Intersection

ST\_Area

ST\_Distance

ST\_3DDistance



Both GEOS & SFCGAL

```
SET postgis.backend = 'geos' ;
```

```
SET postgis.backend = 'sfcgal' ;
```

Regress tests PostGIS for GEOS

OK

GardenTest PostGIS

OK

3D Invalid geometry proof

OK

Wide user community

not yet

SFCGAL performances similar to GEOS ones for 2D  
(but with SFCGAL we gain arbitrary precision)

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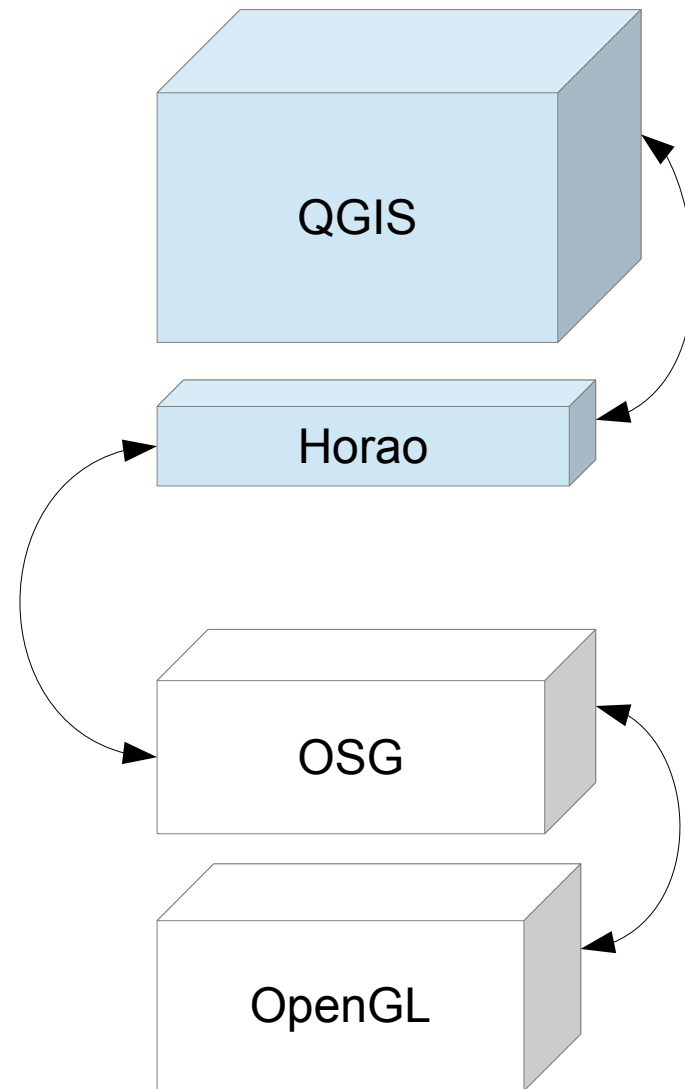
**But some 3D computation could take time.**

ISO 19107:2013

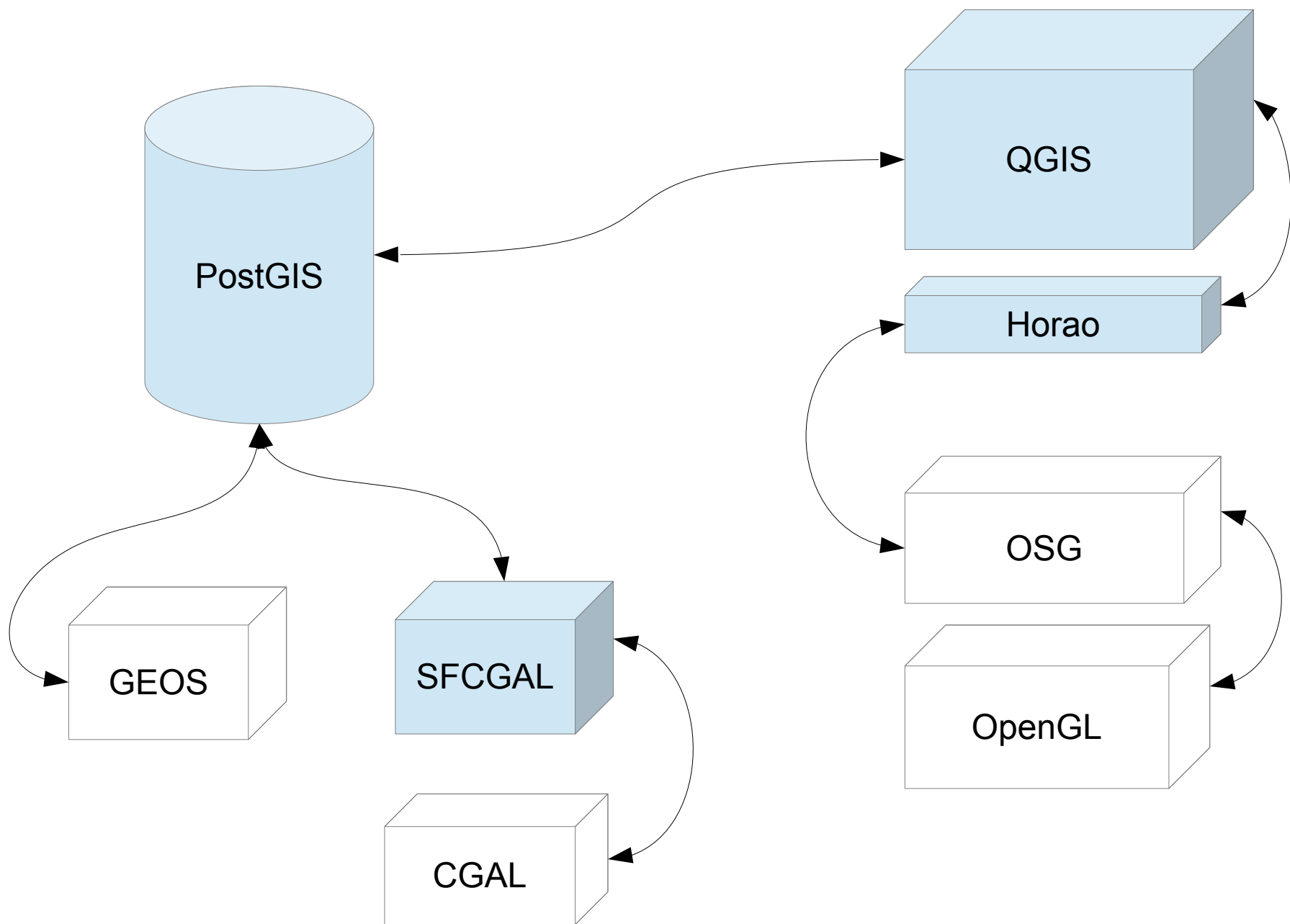
ISO 19125:2013

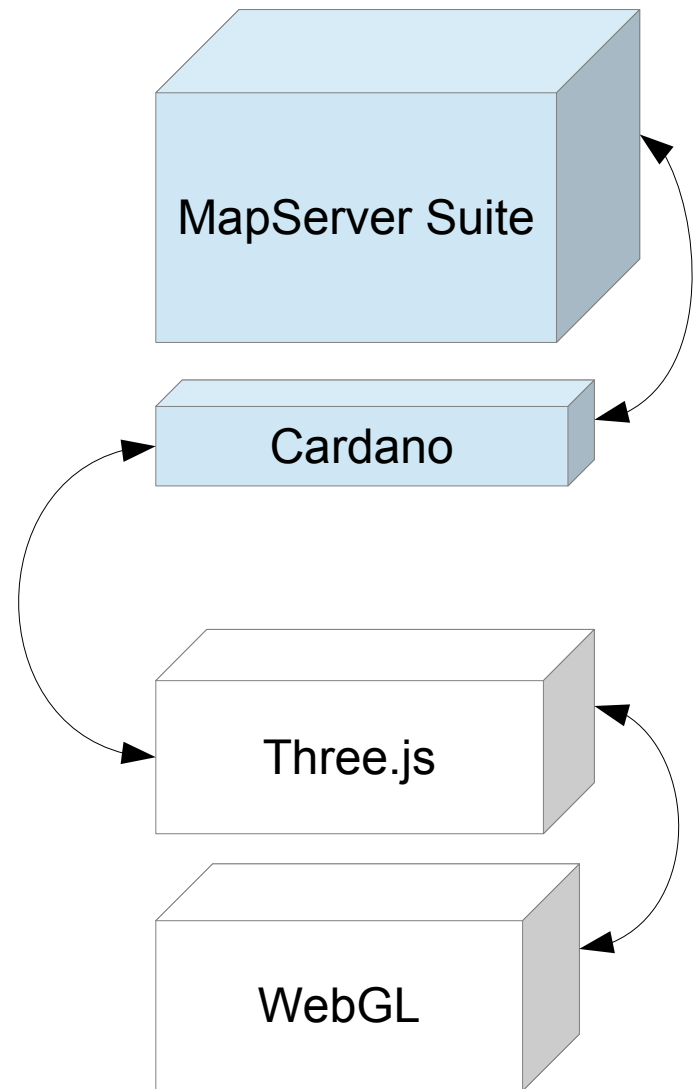


ὁράω



<https://vimeo.com/74869530>





```
CREATE TYPE texture AS (url text,uv float[][]);
```

3DCityDB-Importer-Exporter  
to import Texture metadata in PostGIS

HTTP as static texture server

Gerolamo Cardano

OGC WS Client (Features & DEM)

Client Side Triangulation

Basic Symbology Handling

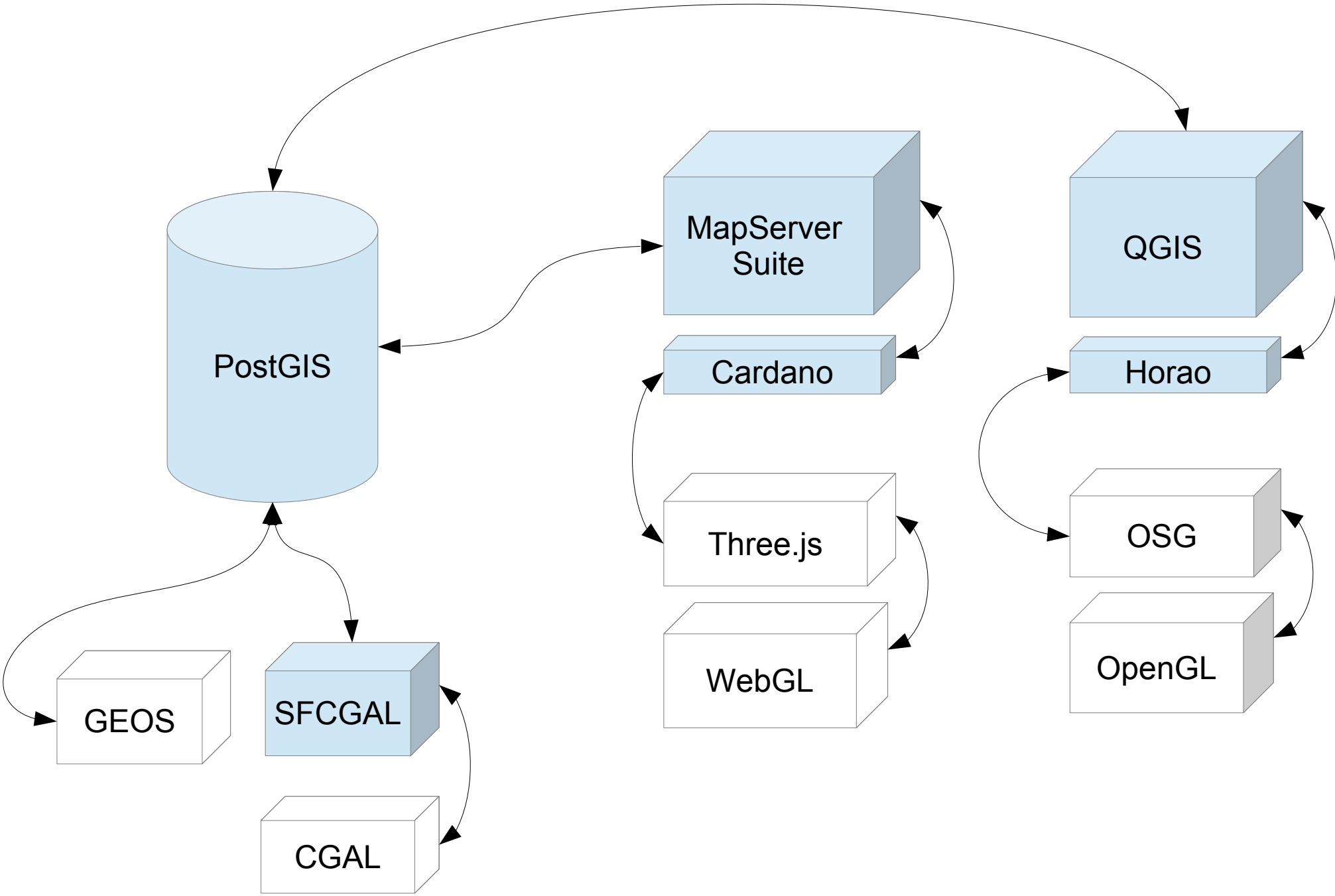
Level Of Details

Texture

HTML UI



<http://vimeo.com/105323534>



[www.sfcgal.org](http://www.sfcgal.org)

[www.horao.net](http://www.horao.net)

[www.cardano.org](http://www.cardano.org)

[www.postgis.org](http://www.postgis.org)

[www.qgis.org](http://www.qgis.org)

[www.mapserver.org](http://www.mapserver.org)



2010

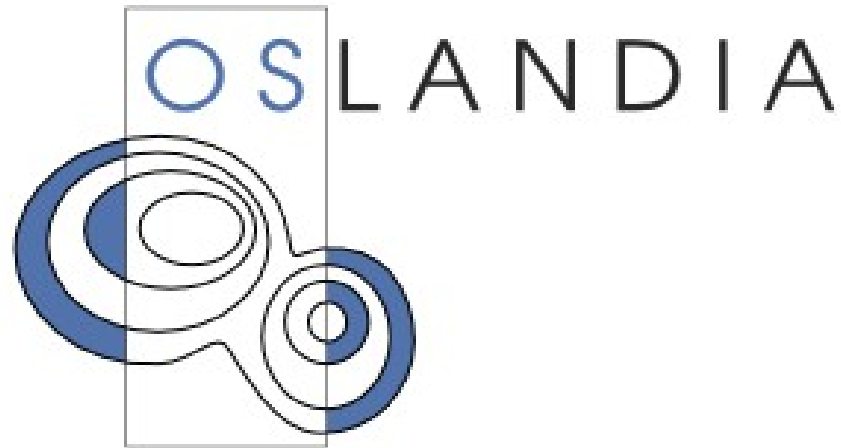
2014

2015

Vector Tile Cache Server

9DIM Full 3D Topology Functions

PostgreSQL Serialization Performance



**[www.oslandia.com](http://www.oslandia.com)**

<https://github.com/Oslandia/presentations>

<https://github.com/Oslandia/Workshops>