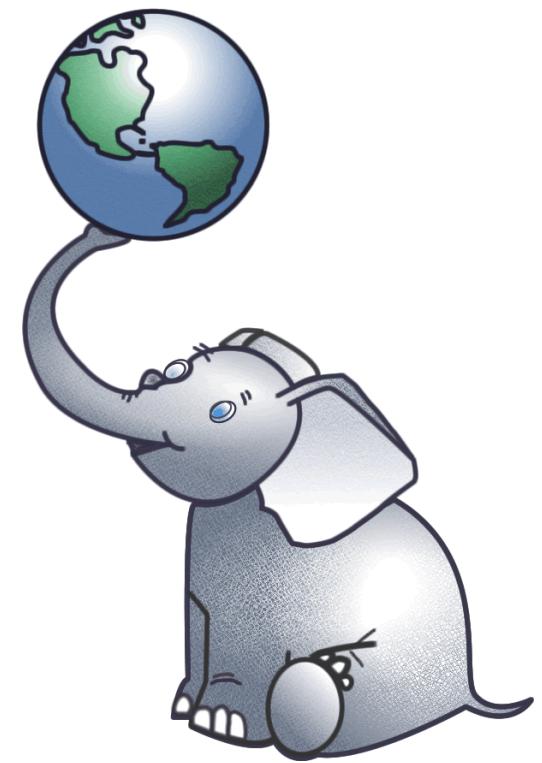


PostGIS

Lubia Vinhas



Bancos de Dados

Convencionais

Tipos

string, float, date

Índices

b-tree, hash

Funções

strlen(string), pow(float, float),
now()

Geográficos

Tipos Espaciais

geometry, geography

Índices Espaciais

r-tree, quad-tree, kd-tree

Funções Espaciais

ST_Length(geometry),
ST_X(geometry)

PostgreSQL

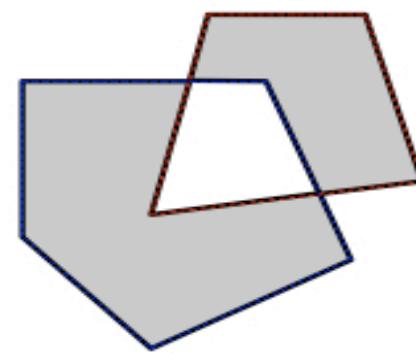
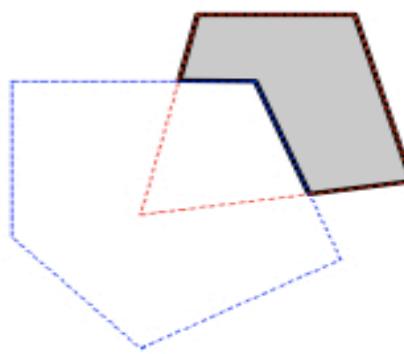
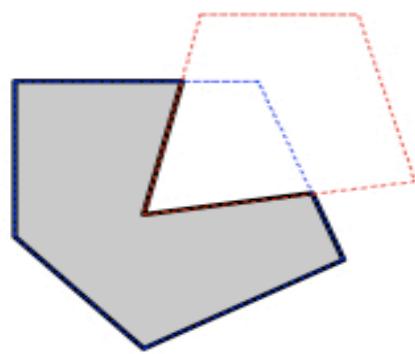
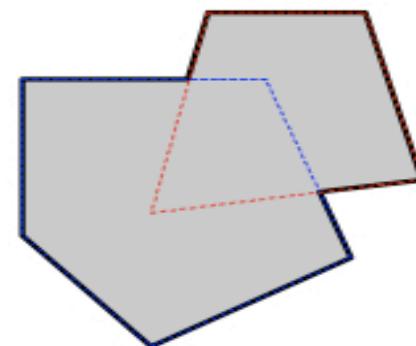
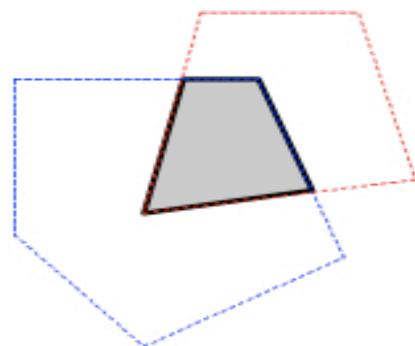
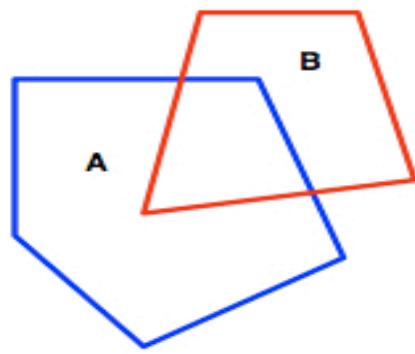


PostGIS

Certificado em relação ao OGC SFSQL – Simple Features for SQL



Exemplos de funções definidas pela SFSQL



História do PostGIS



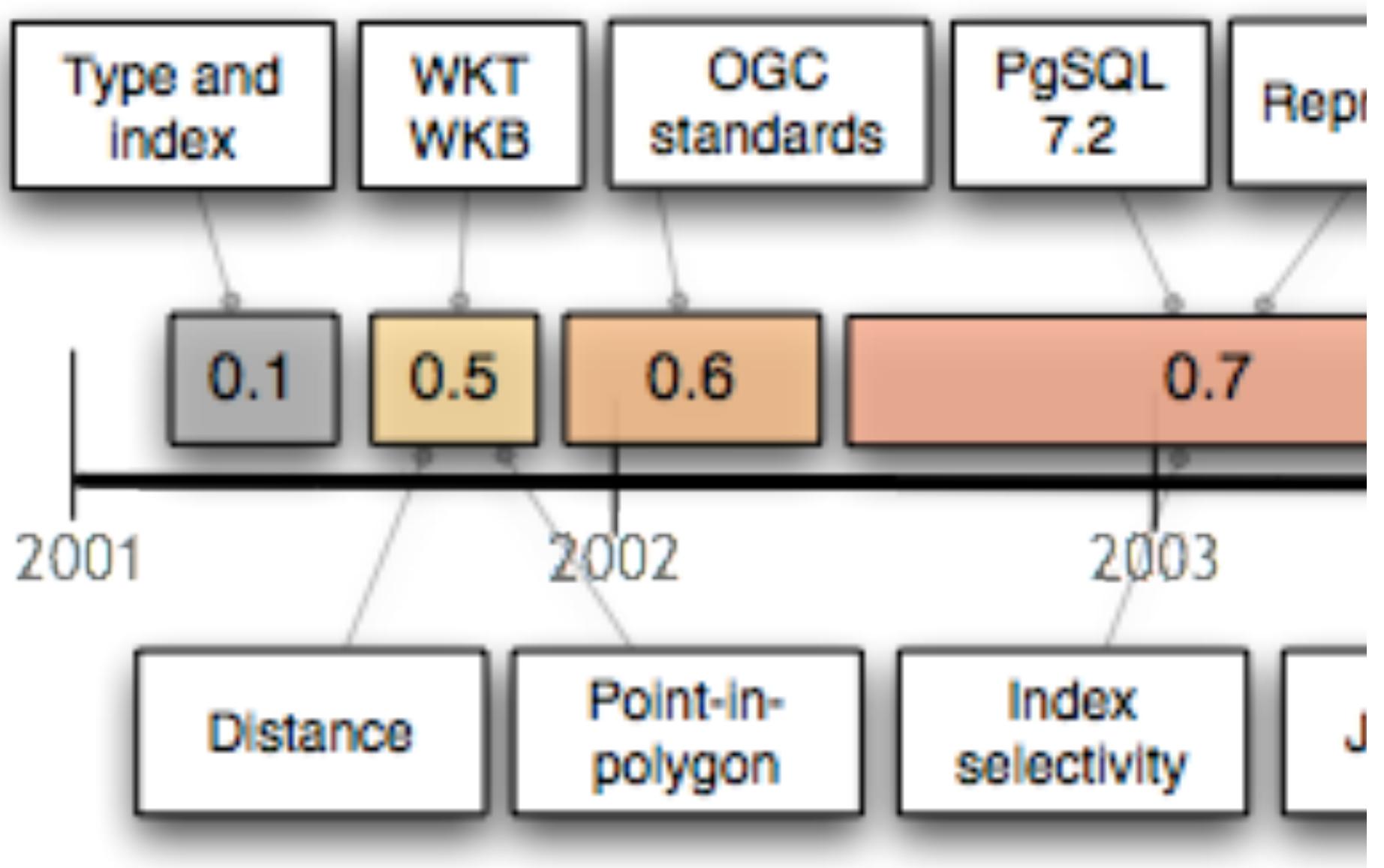
Desenvolvido pela Refractions Research, com o apoio de várias companhias.

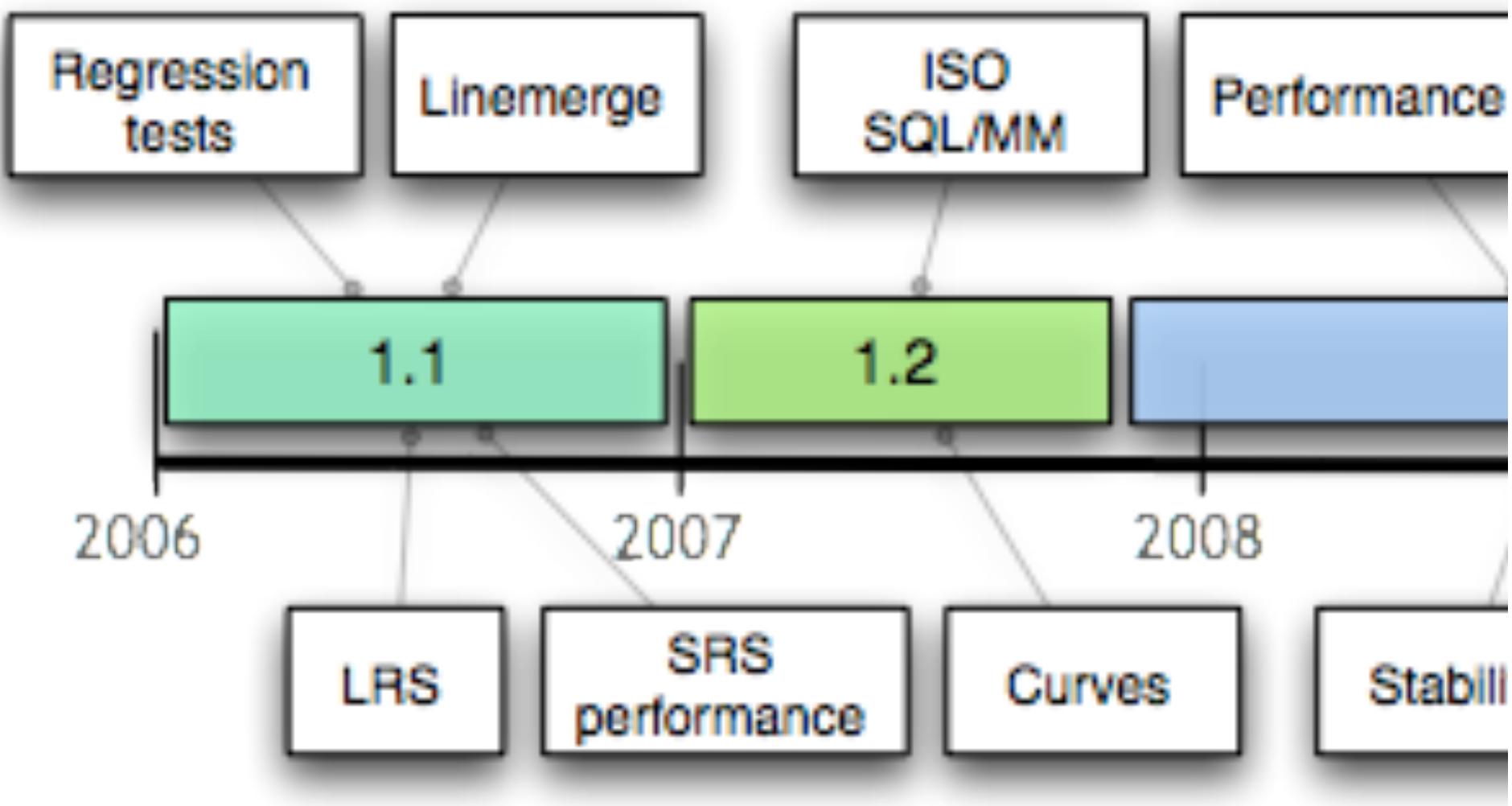
Licença GNU General Public License

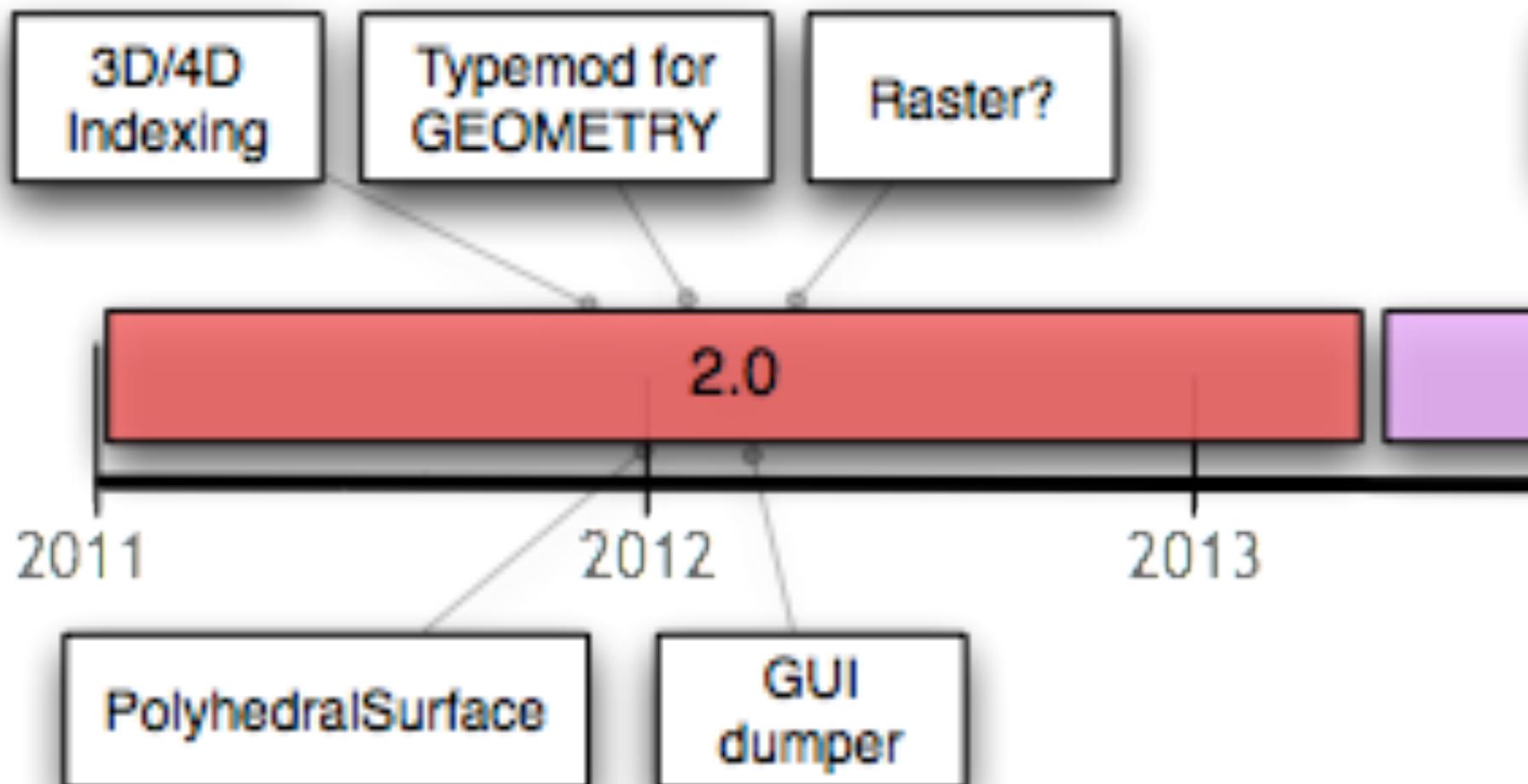
Slides foram adaptados da apresentação “The State of PostGIS”, do Paul Ramsey no FOSS4G - 2010

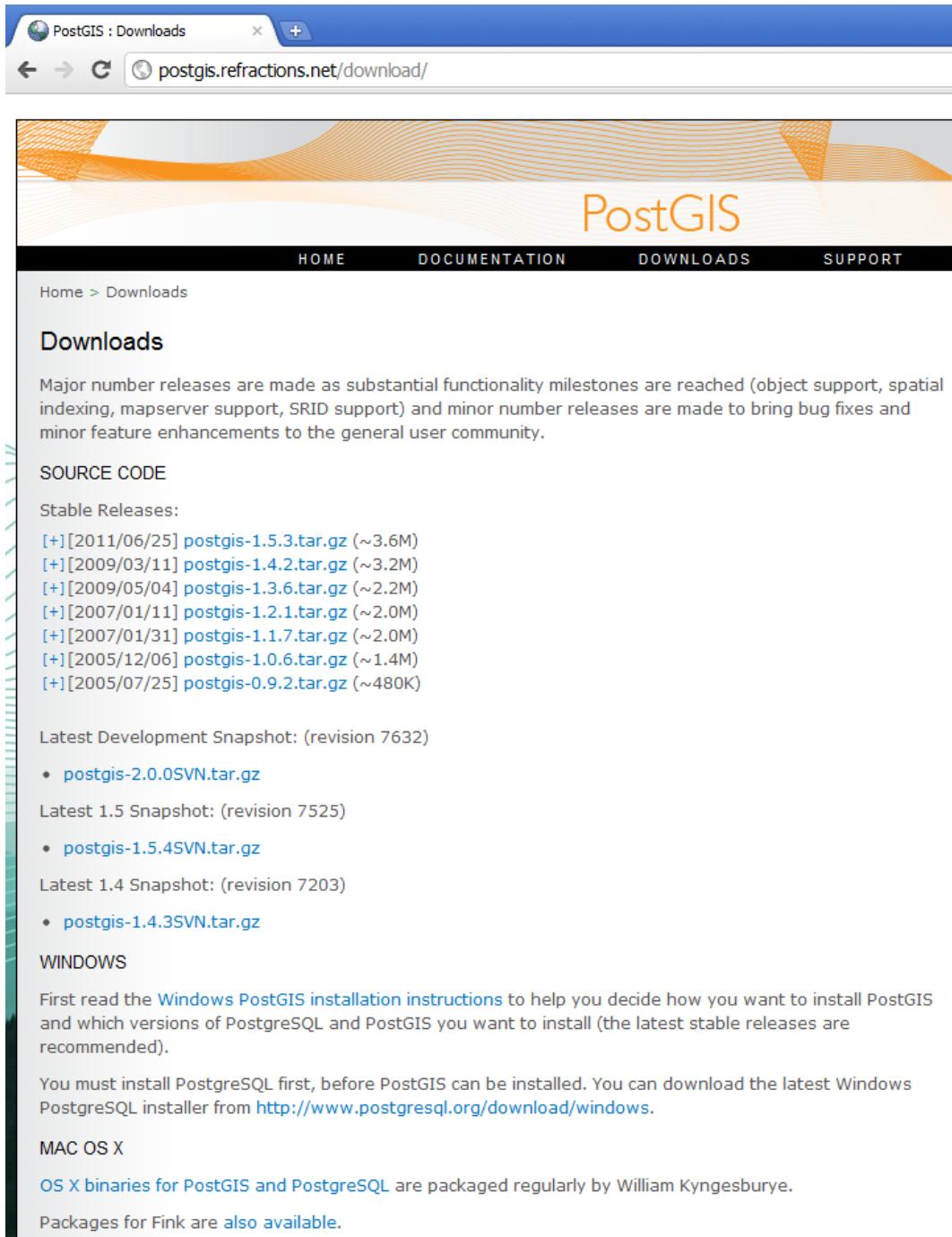
Escalabilidade

“Enterprise”	1 Dual-Core	2 Quad-Core
Oracle	\$40,000	\$160,000
IBM DB2	\$36,400	\$145,600
MS SQL Server	\$25,000	\$50,000
IBM Informix	\$50,000	\$200,000
PostGIS	\$0	\$0









The screenshot shows a web browser window with the title "PostGIS : Downloads". The URL in the address bar is "postgis.refractions.net/download/". The page has a header with the PostGIS logo and navigation links for HOME, DOCUMENTATION, DOWNLOADS (which is the active tab), and SUPPORT. Below the header, there's a breadcrumb trail "Home > Downloads" and a section titled "Downloads". A text block explains that major releases are milestones for functionality like object support and spatial indexing, while minor releases fix bugs and add minor features. There are sections for "SOURCE CODE" (listing stable releases from 2005 to 2011), "Latest Development Snapshot" (revision 7632), "Latest 1.5 Snapshot" (revision 7525), and "Latest 1.4 Snapshot" (revision 7203). The "WINDOWS" section advises reading installation instructions and installing PostgreSQL first. The "MAC OS X" section mentions William Kyngesbury's packages. The footer links to the main PostGIS site.

PostGIS

HOME DOCUMENTATION DOWNLOADS SUPPORT

Home > Downloads

Downloads

Major number releases are made as substantial functionality milestones are reached (object support, spatial indexing, mapserver support, SRID support) and minor number releases are made to bring bug fixes and minor feature enhancements to the general user community.

SOURCE CODE

Stable Releases:

- [+] [2011/06/25] [postgis-1.5.3.tar.gz](#) (~3.6M)
- [+] [2009/03/11] [postgis-1.4.2.tar.gz](#) (~3.2M)
- [+] [2009/05/04] [postgis-1.3.6.tar.gz](#) (~2.2M)
- [+] [2007/01/11] [postgis-1.2.1.tar.gz](#) (~2.0M)
- [+] [2007/01/31] [postgis-1.1.7.tar.gz](#) (~2.0M)
- [+] [2005/12/06] [postgis-1.0.6.tar.gz](#) (~1.4M)
- [+] [2005/07/25] [postgis-0.9.2.tar.gz](#) (~480K)

Latest Development Snapshot: (revision 7632)

- [postgis-2.0.0SVN.tar.gz](#)

Latest 1.5 Snapshot: (revision 7525)

- [postgis-1.5.4SVN.tar.gz](#)

Latest 1.4 Snapshot: (revision 7203)

- [postgis-1.4.3SVN.tar.gz](#)

WINDOWS

First read the [Windows PostGIS installation instructions](#) to help you decide how you want to install PostGIS and which versions of PostgreSQL and PostGIS you want to install (the latest stable releases are recommended).

You must install PostgreSQL first, before PostGIS can be installed. You can download the latest Windows PostgreSQL installer from <http://www.postgresql.org/download/windows>.

MAC OS X

[OS X binaries for PostGIS and PostgreSQL](#) are packaged regularly by William Kyngesbury.

Packages for Fink are [also available](#).

Download e Instalação

Tipos de Dados Espaciais

POINT(1 1)

MULTIPOINT(1 1, 3 4, -1 3)

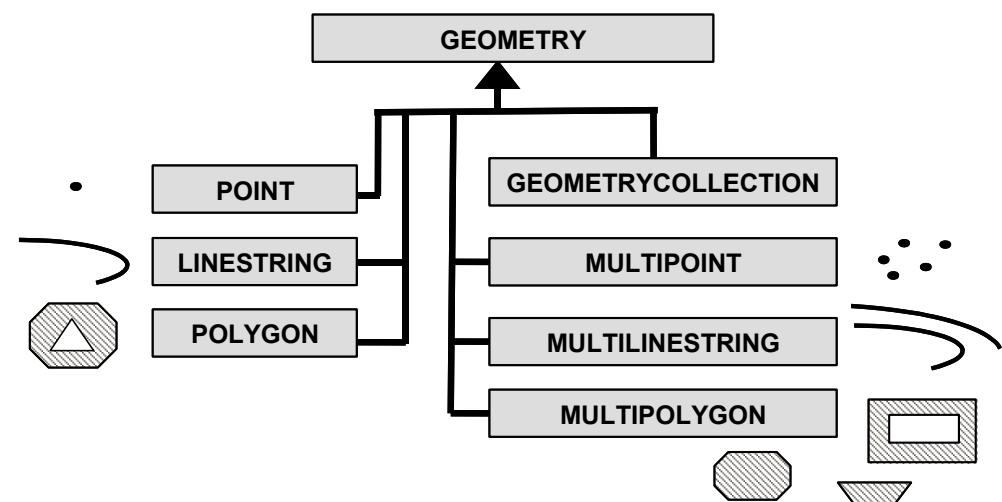
LINESTRING(1 1, 2 2, 3 4)

POLYGON((0 0, 0 1, 1 1, 1 0, 0 0))

MULTIPOLYGON((0 0, 0 1, 1 1, 1 0, 0 0), (5 5, 5 6, 6 6, 6 5, 5 5))

MULTILINESTRING((1 1, 2 2, 3 4),(2 2, 3 3, 4 5))

GEOMETRYCOLLECTION(POINT(2 2 0), LINESTRING((4 4 0, 9 9 0)))



PostGIS – Consultas Espaciais

Operadores Topológicos:

equals(geometry, geometry)

disjoint(geometry, geometry)

intersects(geometry, geometry)

touches(geometry, geometry)

crosses(geometry, geometry)

within(geometry, geometry)

overlaps(geometry, geometry)

contains(geometry, geometry)

PostGIS – Consultas Espaciais

Operadores Conjunto:

`intersection(geometry, geometry):geometry`

`geomUnion(geometry, geometry):geometry`

`symdifference(geometry, geometry):geometry`

`difference(geometry, geometry):geometry`

Operadores Métricos:

`distance(geometry,geometry):double`

`area(geometry):double`

A tabela spatial_ref_sys

EPSG European Petroleum Survey Group: fornece uma base de dados de códigos para representação de Sistemas de Referência Espacial

PROJ4 biblioteca OS para fazer conversão de coordenadas entre dois sistemas

	srid integer	proj4text character varying(2048)
1	32718	+proj=utm +zone=18 +south +ellps=WGS84 +datum=WGS84 +units=m +no_defs
2	32719	+proj=utm +zone=19 +south +ellps=WGS84 +datum=WGS84 +units=m +no_defs
3	32720	+proj=utm +zone=20 +south +ellps=WGS84 +datum=WGS84 +units=m +no_defs
4	32721	+proj=utm +zone=21 +south +ellps=WGS84 +datum=WGS84 +units=m +no_defs
5	32722	+proj=utm +zone=22 +south +ellps=WGS84 +datum=WGS84 +units=m +no_defs
6	32723	+proj=utm +zone=23 +south +ellps=WGS84 +datum=WGS84 +units=m +no_defs
7	32724	+proj=utm +zone=24 +south +ellps=WGS84 +datum=WGS84 +units=m +no_defs
8	32725	+proj=utm +zone=25 +south +ellps=WGS84 +datum=WGS84 +units=m +no_defs
9	32726	+proj=utm +zone=26 +south +ellps=WGS84 +datum=WGS84 +units=m +no_defs

A tabela geometry_columns

Serve como um diretório de quais as tabelas possuem colunas com tipos geométricos:

```
create table points ( pt geometry, name varchar );
insert into points values ( 'POINT(0 0)', 'Origin' );
insert into points values ( 'POINT(5 0)', 'X Axis' );
insert into points values ( 'POINT(0 5)', 'Y Axis' );
insert into geometry_columns values ("', 'public', 'points', 'pt',
1,2022,'POINT');
```

Consultas:

```
select name, ST_AsText(pt), ST_Distance(pt, 'POINT(5 5)') from points;
```

Consultas

Importar o arquivo Distritos.shp, SRID = 29193 usando a ferramenta do pgAdmin

1) Relacionamentos Espaciais

```
select * from distritos  
where ST_within(  
    GeometryFromText('POINT(326748 7384065)',29193),  
    the_geom);
```

2) Processamentos

```
select deno, ST_AREA(the_geom) from distritos  
where deno = 'SANTO AMARO';
```

Consultas

3) Acessadores

```
select name, ST_AsText(pt) from points where name='Origin';  
select ST_Envelope(the_geom) from distritos where where deno = 'SANTO  
AMARO';
```

Importar o arquivo RodoviasSP, SRID = 29193 usando a ferramenta do pgAdmin

Consultas

Qual o total (em kms) das rodovias?

```
SELECT Sum(ST_Length(the_geom))/1000 AS km_rods  
FROM rodoviassp;
```

Qual o maior distrito?

```
SELECT deno,  
       ST_Area(the_geom)/10000 AS hectares  
  FROM distritos  
 ORDER BY hectares DESC  
 LIMIT 1;
```

Outras consultas

```
SELECT ST_AsText(the_geom)
FROM metro
WHERE deno LIKE 'LIBERDADE';
```

```
SELECT Sum(pop_elada) AS populacaofav
FROM distritos
WHERE
    ST_DWithin(
        the_geom,
        ST_GeomFromText('POINT(333074.178121 7394109.227359)',29193),
        2000
    );
```