Postgresql and its spatial extension PostGIS Quick Installation Guide
started by lufangyi at 7:05 AM 2017/7/18
finished at 7:05 AM 2017/7/19

1. Brief Introductions

As PostGIS Homepage depicted: PostGIS provides spatial objects for the PostgreSQL database, allowing storage and query of information about location and mapping.

So, first, you need install Postgresql. Second, you also need to install and/or build Geos, Proj.4, GDAL, LibXML2 and JSON-C. Third and the last step is to install PostGIS. Here are what I have download, all of which are the newest version till 2017/7/18.

```
-rw-r--r-- 1 root root  14M 7月  18 13:10 gdal-2.2.1.tar.gz
-rw-r--r-- 1 root root 1.8M 7月  18 13:09 geos-3.6.1.tar.bz2
-rw-r--r-- 1 root root 632K 7月  18 13:09 json-c-json-c-0.12.zip
-rw-r--r-- 1 root root 4.6M 7月  18 13:10 libxml2-2.7.2.tar.gz
-rw-r--r-- 1 root root  11M 7月  18 13:12 postgis-2.3.3.tar.gz
-rw-r--r-- 1 root root  25M 7月  18 13:15 postgresql-9.6.3.tar.gz
-rw-r--r-- 1 root root 900K 7月  18 13:12 proj-4.9.3.tar.gz
```

OK, Let's start this time-consulting work.

2. Quick Installation Guides

2.1 postgresql-9.6.3

Make sure you have gcc installed already.

```
-rw-r--r-- 1 root root  20M 7月  18 13:16 gcc-rpm.zip
```

unzip gcc-rpm.zip

sh installGCC.sh

Then, you can start install postgresql.

./configure --prefix=/opt/postgresql-9.6.3

If you encounter such a problem:

```
configure: error: readline library not found
If you have readline already installed, see config.log for details on the
failure.  It is possible the compiler isn't looking in the proper directory.
Use --without-readline to disable readline support.
```

Then, you can first install the two rpm packages below.

rpm -ivh ncurses-devel-5.7-4.20090207.el6.x86_64.rpm

rpm -ivh readline-devel-6.0-4.el6.x86_64.rpm

```
[root@data1 readline]# rpm -ivh ncurses-devel-5.7-4.20090207.el6.x86_64.rpm
warning: ncurses-devel-5.7-4.20090207.el6.x86_64.rpm: Header V3 RSA/SHA1 Signature, key ID c105b9de: NOKEY
Preparing...                ########################################### [100%]
   1:ncurses-devel          ########################################### [100%]
[root@data1 readline]# rpm -ivh readline-devel-6.0-4.el6.x86_64.rpm
warning: readline-devel-6.0-4.el6.x86_64.rpm: Header V3 RSA/SHA1 Signature, key ID c105b9de: NOKEY
Preparing...                ########################################### [100%]
   1:readline-devel         ########################################### [100%]
```

If you encounter such a problem:

```
configure: error: zlib library not found
If you have zlib already installed, see config.log for details on the
failure.  It is possible the compiler isn't looking in the proper directory.
Use --without-zlib to disable zlib support.
```

Then, you still need install the zlib.

rpm -ivh zlib-devel-1.2.3-29.el6.x86_64.rpm

```
[root@data1 zlib]# rpm -ivh zlib-devel-1.2.3-29.el6.x86_64.rpm
warning: zlib-devel-1.2.3-29.el6.x86_64.rpm: Header V3 RSA/SHA1 Signature, key ID c105b9de: NOKEY
Preparing...                ########################################### [100%]
   1:zlib-devel             ########################################### [100%]
```

Finally, you can finish the first step of Postgresql Installation:

./configure --prefix=/opt/postgresql-9.6.3

Then, you can go on to *make.*

make

```
urity -fno-strict-aliasing -fwrapv -O2 -fpic -I../../../src/include
gcc -Wall -Wmissing-prototypes -Wpointer-arith -Wdeclaration-after-s
urity -fno-strict-aliasing -fwrapv -O2 -fpic pg_regress.o pg_regress
ed -Wl,-rpath,'/opt/postgresql-9.6.3/lib',--enable-new-dtags  -lpgc
ss
cp ../../../contrib/spi/refint.so refint.so
cp ../../../contrib/spi/autoinc.so autoinc.so
make[2]: Leaving directory `/home/fly/postgresql-9.6.3/src/test/regr
make -C test/perl all
make[2]: Entering directory `/home/fly/postgresql-9.6.3/src/test/per
make[2]: Nothing to be done for `all'.
make[2]: Leaving directory `/home/fly/postgresql-9.6.3/src/test/perl
make[1]: Leaving directory `/home/fly/postgresql-9.6.3/src'
make -C config all
make[1]: Entering directory `/home/fly/postgresql-9.6.3/config'
make[1]: Nothing to be done for `all'.
make[1]: Leaving directory `/home/fly/postgresql-9.6.3/config'
All of PostgreSQL successfully made. Ready to install.
```

The last thing is just to *make install*, and have a cup of tea, take a break.

make install

```
make[1]: Entering directory `/home/fly/postgresql-9.6.3/co
/bin/mkdir -p '/opt/postgresql-9.6.3/lib/pgxs/config'
/usr/bin/install -c -m 755 ./install-sh '/opt/postgresql-9
/usr/bin/install -c -m 755 ./missing '/opt/postgresql-9.6.
make[1]: Leaving directory `/home/fly/postgresql-9.6.3/con
PostgreSQL installation complete.
```

OK, Let us configure the postgresql, then.

useradd shsi

passwd shsi (Here we set "shsi"as the password.)

su - shsi

vim ~/.bash_profile

```
# .bash_profile

# Get the aliases and functions
if [ -f ~/.bashrc ]; then
        . ~/.bashrc
fi

# User specific environment and startup programs

PATH=$PATH:$HOME/bin

export PGHOME=/opt/pgsql-9.6.3
export PGDATA=/home/shsi/data
export PATH=$PATH:$HOME/bin:$PGHOME/bin
```

initdb --no-locale

```
[shsi@data1 ~]$ initdb
属于此数据库系统的文件宿主为用户 "shsi".
此用户也必须为服务器进程的宿主.
数据库簇将带有 locale zh_CN.UTF-8 初始化.
默认的数据库编码已经相应的设置为 UTF8.
initdb: 无法为语言环境"zh_CN.UTF-8" 找到合适的文本搜索配置
缺省的文本搜索配置将会被设置到"simple"

创建目录 /home/shsi/data ... 成功
正在创建子目录 ... 成功
选择默认最大联接数 (max_connections) ... 100
选择默认共享缓冲区大小 (shared_buffers) ... 32MB
创建配置文件 ... 成功
在 /home/shsi/data/base/1 中创建 template1 数据库 ... 成功
初始化 pg_authid ... 成功
初始化dependencies ... 成功
创建系统视图 ... 成功
正在加载系统对象描述 ... 成功
创建字符集转换 ... 成功
正在创建字典 ... 成功
对内建对象设置权限 ... 成功
创建信息模式 ... 成功
清理数据库 template1 ... 成功
拷贝 template1 到 template0 ... 成功
拷贝 template1 到 template0 ... 成功

警告: 为本地连接启动了 "trust" 认证.
你可以通过编辑 pg_hba.conf 更改或你下
次运行 initdb 时使用 -A 选项.

成功. 您现在可以用下面的命令运行数据库服务器:

    postmaster -D /home/shsi/data
或者
    pg_ctl -D /home/shsi/data -l logfile start
```

```
[shsi@data11 home]$ initdb --no-locale
The files belonging to this database system will be owned by user "shsi".
This user must also own the server process.

The database cluster will be initialized with locale "C".
The default database encoding has accordingly been set to "SQL_ASCII".
The default text search configuration will be set to "english".

Data page checksums are disabled.

creating directory /home/shsi/data ... ok
creating subdirectories ... ok
selecting default max_connections ... 100
selecting default shared_buffers ... 128MB
selecting dynamic shared memory implementation ... posix
creating configuration files ... ok
running bootstrap script ... ok
performing post-bootstrap initialization ... ok
syncing data to disk ... ok

WARNING: enabling "trust" authentication for local connections
You can change this by editing pg_hba.conf or using the option -A, or
--auth-local and --auth-host, the next time you run initdb.

Success. You can now start the database server using:

    pg_ctl -D /home/shsi/data -l logfile start

[shsi@data11 home]$
```

pg_ctl start

```
[shsi@data11 home]$ ps -ef | grep postgres
shsi      149220 146451  0 10:38 pts/0    00:00:00 grep postgres
[shsi@data11 home]$
[shsi@data11 home]$
[shsi@data11 home]$
[shsi@data11 home]$ pg_ctl start
server starting
[shsi@data11 home]$ LOG:  database system was shut down at 2017-07-20 10:36:46 CST
LOG:  MultiXact member wraparound protections are now enabled
LOG:  database system is ready to accept connections
LOG:  autovacuum launcher started

[shsi@data11 home]$ ps -ef | grep postgres
shsi      149223      1  0 10:39 pts/0    00:00:00 /opt/postgresql-9.6.3/bin/postgres
shsi      149225 149223  0 10:39 ?        00:00:00 postgres: checkpointer process
shsi      149226 149223  0 10:39 ?        00:00:00 postgres: writer process
shsi      149227 149223  0 10:39 ?        00:00:00 postgres: wal writer process
shsi      149228 149223  0 10:39 ?        00:00:00 postgres: autovacuum launcher process
shsi      149229 149223  0 10:39 ?        00:00:00 postgres: stats collector process
shsi      149281 146451  0 10:39 pts/0    00:00:00 grep postgres
[shsi@data11 home]$
```

psql -h 127.0.0.1 -d postgres -U shsi

```
[shsi@data1 ~]$ psql -h 127.0.0.1 -d postgres -U shsi
psql (8.4.20)
输入 "help" 来获取帮助信息.

postgres=#
```

pg_ctl stop

```
[shsi@datall home]$ pg_ctl stop
waiting for server to shut down....LOG:  received fast shutdown request
LOG:  aborting any active transactions
LOG:  autovacuum launcher shutting down
LOG:  shutting down
LOG:  database system is shut down
 done
server stopped
[shsi@datall home]$ ps -ef | grep postgres
shsi     149610 146451  0 10:41 pts/0    00:00:00 grep postgres
[shsi@datall home]$
```

If you want to connect the server from your remote server, you need do like this:

vim /home/shsi/data/postgresql.conf

```
[shsi@datal ~]$ vim ~/data/postgresql.conf
```

listen_addresses = '*'

```
# - Connection Settings -

listen_addresses = '*'              # what IP address(es) to listen on;
                                    # comma-separated list of addresses;
                                    # defaults to 'localhost', '*' = all
                                    # (change requires restart)
#port = 5432                        # (change requires restart)
```

vim /home/shsi/data/pg_hba.conf

```
[shsi@datal data]$ vim ~/data/pg_hba.conf
```

Add a line:
host   all   all   0.0.0.0/0   trust

```
# IPv4 local connections:
host    all         all         127.0.0.1/32            trust
host    all         all         0.0.0.0/0           trust
```

OK, restart the postgresql, then test connection from remote client.

Additionally, if you still can not connect the postgresql from remote client. Check your iptables rules. You can "Service iptables stop"or add a rule like this:

```
1.  service iptables start
2.  iptables -I INPUT 7 -p tcp --dport 5432:5438 -j ACCEPT
3.  service iptables save
4.  service iptables restart
```

2.2 libxml2-2.7.2

tar zxvf libxml2-2.7.2.tar.gz

./configure --prefix=/opt/libxml2-2.7.2

```
config.status: creating libxml-2.0-uninstalled.pc
config.status: creating python/setup.py
config.status: creating config.h
config.status: executing depfiles commands
Done configuring
```

make

```
creating gjobread
make[2]: Leaving directory `/home/fly/libxml2-2.7.2/example'
Making all in xstc
make[2]: Entering directory `/home/fly/libxml2-2.7.2/xstc'
make[2]: Nothing to be done for `all'.
make[2]: Leaving directory `/home/fly/libxml2-2.7.2/xstc'
make[1]: Leaving directory `/home/fly/libxml2-2.7.2'
```

make install

```
Making install in xstc
make[1]: Entering directory `/home/fly/libxml2-2.7.2/xstc'
make[2]: Entering directory `/home/fly/libxml2-2.7.2/xstc'
make[2]: Nothing to be done for `install-exec-am'.
make[2]: Nothing to be done for `install-data-am'.
make[2]: Leaving directory `/home/fly/libxml2-2.7.2/xstc'
make[1]: Leaving directory `/home/fly/libxml2-2.7.2/xstc'
```

2.3 proj-4.9.3

tar -zxf proj-4.9.3.tar.gz

./configure --prefix=/opt/proj-4.9.3

```
checking that generated files are newer than configure... done
configure: creating ./config.status
config.status: creating Makefile
config.status: creating cmake/Makefile
config.status: creating src/Makefile
config.status: creating man/Makefile
config.status: creating man/man1/Makefile
config.status: creating man/man3/Makefile
config.status: creating nad/Makefile
config.status: creating jniwrap/Makefile
config.status: creating jniwrap/org/Makefile
config.status: creating jniwrap/org/proj4/Makefile
config.status: creating nad/install
config.status: creating proj.pc
config.status: creating src/proj_config.h
config.status: executing depfiles commands
config.status: executing libtool commands
```

make

```
Making all in cmake
make[1]: Entering directory `/home/fly/proj-4.9.3/cmake'
make[1]: Nothing to be done for `all'.
make[1]: Leaving directory `/home/fly/proj-4.9.3/cmake'
make[1]: Entering directory `/home/fly/proj-4.9.3'
make[1]: Nothing to be done for `all-am'.
make[1]: Leaving directory `/home/fly/proj-4.9.3'
```

make install

```
Making install in cmake
make[1]: Entering directory `/home/fly/proj-4.9.3/cmake'
make[2]: Entering directory `/home/fly/proj-4.9.3/cmake'
make[2]: Nothing to be done for `install-exec-am'.
make[2]: Nothing to be done for `install-data-am'.
make[2]: Leaving directory `/home/fly/proj-4.9.3/cmake'
make[1]: Leaving directory `/home/fly/proj-4.9.3/cmake'
make[1]: Entering directory `/home/fly/proj-4.9.3'
make[2]: Entering directory `/home/fly/proj-4.9.3'
make[2]: Nothing to be done for `install-exec-am'.
 /bin/mkdir -p '/opt/proj-4.9.3/lib/pkgconfig'
 /usr/bin/install -c -m 644 proj.pc '/opt/proj-4.9.3/lib/pkgconfig'
make[2]: Leaving directory `/home/fly/proj-4.9.3'
make[1]: Leaving directory `/home/fly/proj-4.9.3'
```

2.4 json-c-json-c-0.12

unzip json-c-json-c-0.12.zip

./configure --prefix=/opt/json-c-json-c-0.12

```
configure: creating ./config.status
config.status: creating Makefile
config.status: creating json-c.pc
config.status: creating tests/Makefile
config.status: creating json-c-uninstalled.pc
config.status: creating config.h
config.status: creating json_config.h
config.status: executing depfiles commands
config.status: executing libtool commands
```

make

```
Making all in tests
make[2]: Entering directory `/home/fly/json-c-json-c-0.12/tests'
make[2]: Nothing to be done for `all'.
make[2]: Leaving directory `/home/fly/json-c-json-c-0.12/tests'
make[1]: Leaving directory `/home/fly/json-c-json-c-0.12'
```

make install

```
Making install in tests
make[1]: Entering directory `/home/fly/json-c-json-c-0.12/tests'
make[2]: Entering directory `/home/fly/json-c-json-c-0.12/tests'
make[2]: Nothing to be done for `install-exec-am'.
make[2]: Nothing to be done for `install-data-am'.
make[2]: Leaving directory `/home/fly/json-c-json-c-0.12/tests'
make[1]: Leaving directory `/home/fly/json-c-json-c-0.12/tests'
```

2.5 geos-3.6.1

tar -jxvf geos-3.6.1.tar.bz2

./configure --prefix=/opt/geos-3.6.1

```
config.status: creating tests/thread/Makefile
config.status: creating tools/Makefile
config.status: creating tools/geos-config
config.status: creating include/config.h
config.status: creating include/geos/platform.h
config.status: executing depfiles commands
config.status: executing libtool commands
Swig: false
Python bindings: false
Ruby bindings: false
```

make

```
../../../libtool: line 1766: g++: command not found
make[5]: *** [IndexedPointInAreaLocator.lo] 错误 1
make[5]: Leaving directory `/home/fly/geos-3.6.1/src/algorithm/locate'
make[4]: *** [all-recursive] 错误 1
make[4]: Leaving directory `/home/fly/geos-3.6.1/src/algorithm/locate'
make[3]: *** [all-recursive] 错误 1
make[3]: Leaving directory `/home/fly/geos-3.6.1/src/algorithm'
make[2]: *** [all-recursive] 错误 1
make[2]: Leaving directory `/home/fly/geos-3.6.1/src'
make[1]: *** [all-recursive] 错误 1
make[1]: Leaving directory `/home/fly/geos-3.6.1'
make: *** [all] 错误 2
```

If you have such a mistake, you should install gcc-c++

```
[root@data1 gcc_c++]# rpm -ivh gcc-c++-4.4.7-18.el6.x86_64.rpm
warning: gcc-c++-4.4.7-18.el6.x86_64.rpm: Header V3 RSA/SHA1 Signature, key ID c105b9de: NOKEY
Preparing...                ########################################### [100%]
   1:gcc-c++                ########################################### [100%]
```

Then you can success to make.

```
Making all in thread
make[3]: Entering directory `/home/fly/geos-3.6.1/tests/thread'
make[3]: Nothing to be done for `all'.
make[3]: Leaving directory `/home/fly/geos-3.6.1/tests/thread'
make[3]: Entering directory `/home/fly/geos-3.6.1/tests'
make[3]: Nothing to be done for `all-am'.
make[3]: Leaving directory `/home/fly/geos-3.6.1/tests'
make[2]: Leaving directory `/home/fly/geos-3.6.1/tests'
Making all in tools
make[2]: Entering directory `/home/fly/geos-3.6.1/tools'
make[2]: Nothing to be done for `all'.
make[2]: Leaving directory `/home/fly/geos-3.6.1/tools'
make[2]: Entering directory `/home/fly/geos-3.6.1'
make[2]: Nothing to be done for `all-am'.
make[2]: Leaving directory `/home/fly/geos-3.6.1'
make[1]: Leaving directory `/home/fly/geos-3.6.1'
```

make install

```
Making install in tools
make[2]: Entering directory `/home/fly/geos-3.6.1/tools'
make[3]: Entering directory `/home/fly/geos-3.6.1/tools'
 /bin/mkdir -p '/opt/geos-3.6.1/bin'
 /usr/bin/install -c geos-config '/opt/geos-3.6.1/bin'
make[3]: Nothing to be done for `install-data-am'.
make[3]: Leaving directory `/home/fly/geos-3.6.1/tools'
make[2]: Leaving directory `/home/fly/geos-3.6.1/tools'
make[2]: Entering directory `/home/fly/geos-3.6.1'
make[3]: Entering directory `/home/fly/geos-3.6.1'
make[3]: Nothing to be done for `install-exec-am'.
make[3]: Nothing to be done for `install-data-am'.
make[3]: Leaving directory `/home/fly/geos-3.6.1'
make[2]: Leaving directory `/home/fly/geos-3.6.1'
make[1]: Leaving directory `/home/fly/geos-3.6.1'
You have new mail in /var/spool/mail/root
```

2.6 gdal-2.2.1

tar -zxvf gdal-2.2.1.tar.gz

./configure --prefix=/opt/gdal-2.2.1

```
config.status: creating GDALmake.opt
config.status: WARNING:  'GDALmake.opt.in' seems t
config.status: creating port/cpl_config.h
config.status: executing libtool commands

GDAL is now configured for x86_64-pc-linux-gnu

  Installation directory:    /opt/gdal-2.2.1
  C compiler:                gcc -DHAVE_AVX_AT_COM
  C++ compiler:              g++ -DHAVE_AVX_AT_COM
```

make

```
make[1]: Leaving directory `/home/fly/gdal-2.2.1/apps'
rm -f gdal.pc
echo 'CONFIG_VERSION='`cat ./VERSION`'' >> gdal.pc
echo 'CONFIG_INST_PREFIX=/opt/gdal-2.2.1' >> gdal.pc
echo 'CONFIG_INST_LIBS=-L/opt/gdal-2.2.1/lib -lgdal' >> gdal.pc
echo 'CONFIG_INST_CFLAGS=-I/opt/gdal-2.2.1/include' >> gdal.pc
echo 'CONFIG_INST_DATA=/opt/gdal-2.2.1/share/gdal/data' >> gdal.pc
cat gdal.pc.in >> gdal.pc
```

make install

```
Libraries have been installed in:
    /opt/gdal-2.2.1/lib
```

2.7 postgis-2.3.3

Before you start to install postgis, you should run codes below:

cp /opt/geos-3.6.1/lib/libgeos_c.so.1 /opt/postgresql-9.6.3/lib/

cp /opt/proj-4.9.3/lib/libproj.so.12 /opt/postgresql-9.6.3/lib/

cp /opt/json-c-json-c-0.12/lib/libjson-c.so.2 /opt/postgresql-9.6.3/lib/

cp /opt/gdal-2.2.1/lib/libgdal.so.20 /opt/postgresql-9.6.3/lib/

Then, we can start install the PostGIS

tar -zxvf   postgis-2.3.3.tar.gz

./configure   --with-pgconfig=/opt/postgresql-9.6.3/bin/pg_config   --with-geosconfig=/opt/geos-3.6.1/bin/g

eos-config --with-projdir=/opt/proj-4.9.3 --with-jsondir=/opt/json-c-json-c-0.12

--with-gdalconfig=/opt/gdal-2.2.1/bin/gdal-config   --with-xml2config=/opt/libxml2-2.7.2/bin/xml2-config

```
[root@data1 postgis-2.3.3]# ./configure --with-pgconfig=/opt/postgresql-9.6.3/bin/pg_config --with-geosconfig=/opt/geos-3.6.1/bin/g
eos-config --with-projdir=/opt/proj-4.9.3 --with-jsondir=/opt/json-c-json-c-0.12 --with-gdalconfig=/opt/gdal-2.2.1/bin/gdal-config
--with-xml2config=/opt/libxml2-2.7.2/bin/xml2-config
```

```
PostGIS is now configured for x86_64-pc-linux-gnu

-------------- Compiler Info -------------
 C compiler:            gcc -g -O2
 SQL preprocessor:      /usr/bin/cpp -traditional-cpp -w -P

-------------- Dependencies --------------
 GEOS config:           /opt/geos-3.6.1/bin/geos-config
 GEOS version:          3.6.1
 GDAL config:           /opt/gdal-2.2.1/bin/gdal-config
 GDAL version:          2.2.1
 PostgreSQL config:     /opt/postgresql-9.6.3/bin/pg_config
 PostgreSQL version:    PostgreSQL 9.6.3
 PROJ4 version:         49
 Libxml2 config:        /opt/libxml2-2.7.2/bin/xml2-config
 Libxml2 version:       2.7.2
 JSON-C support:        yes
 PCRE support:          no
 PostGIS debug level:   0
 Perl:                  /usr/bin/perl

--------------- Extensions ---------------
 PostGIS Raster:        enabled
 PostGIS Topology:      enabled
 SFCGAL support:        disabled
 Address Standardizer support:        disabled

-------- Documentation Generation --------
 xsltproc:              /usr/bin/xsltproc
 xsl style sheets:
 dblatex:
 convert:
 mathml2.dtd:           http://www.w3.org/Math/DTD/mathml2/mathml2.dtd
```

```
  PostGIS is now configured for x86_64-pc-linux-gnu

  -------------- Compiler Info -------------
  C compiler:            gcc -g -O2
  SQL preprocessor:      /usr/bin/cpp -traditional-cpp -w -P

  -------------- Dependencies --------------
  GEOS config:           /opt/geos-3.6.1/bin/geos-config
  GEOS version:          3.6.1
  GDAL config:           /opt/gdal-2.2.1/bin/gdal-config
  GDAL version:          2.2.1
  PostgreSQL config:     /opt/postgresql-9.6.3/bin/pg_config
  PostgreSQL version:    PostgreSQL 9.6.3
  PROJ4 version:         49
  Libxml2 config:        /opt/libxml2-2.7.2/bin/xml2-config
  Libxml2 version:       2.7.2
  JSON-C support:        yes
  PCRE support:          no
  PostGIS debug level:   0
  Perl:                  /usr/bin/perl

  -------------- Extensions --------------
  PostGIS Raster:        enabled
  PostGIS Topology:      enabled
  SFCGAL support:        disabled
  Address Standardizer support:       disabled

  -------- Documentation Generation --------
  xsltproc:              /usr/bin/xsltproc
  xsl style sheets:
  dblatex:
  convert:
  mathml2.dtd:           http://www.w3.org/Math/DTD/mathml2/mathml2.dtd

[root@data12 postgis-2.3.3]#
```

make

make install

Congratulations!

At the end, create postgis and spartial_ref_sys extension:

```
cd /opt/postgresql-9.6.3/share/contrib/postgis-2.3
psql -h 127.0.0.1 -d shsi -U shsi -f postgis.sql
psql -h 127.0.0.1 -d shsi -U shsi -f spatial_ref_sys.sql
```

check:

```
psql -h 127.0.0.1 -d shsi -U shsi
```

\d

```
shsi=# \d
                List of relations
 Schema |        Name        | Type  | Owner
--------+--------------------+-------+----------
 public | geography_columns  | view  | postgres
 public | geometry_columns   | view  | postgres
 public | spatial_ref_sys    | table | postgres
(3 rows)
```

That's all, thank you for reading this boring file.
You can stop here. Appendices are for further function, while our project is far away from that way and I will have been hahahaha at that time.

3. Appendices:

psql -d abc1 -U postgres -f /opt/pgsql-9.6.3/share/contrib/pgrouting-1.0.3/routing_core.sql
psql -d abc1 -U postgres -f /opt/pgsql-9.6.3/share/contrib/pgrouting-1.0.3/routing_core_wrappers.sql
psql -d abc1 -U postgres -f /opt/pgsql-9.6.3/share/contrib/pgrouting-1.0.3/routing_topology.sql

```
CREATE EXTENSION pgrouting; --添加 pgRouting 函数
CREATE EXTENSION postgis_topology;
CREATE EXTENSION fuzzystrmatch;
CREATE EXTENSION postgis_tiger_geocoder;
CREATE EXTENSION address_standardizer;
```

```
[shsi@data12 ~]$ psql -d shsi2 -U shsi
psql (9.6.3)
Type "help" for help.

shsi2=# \d
No relations found.
shsi2=# CREATE EXTENSION postgis;
CREATE EXTENSION
shsi2=# \d
             List of relations
 Schema |        Name        | Type  | Owner
--------+--------------------+-------+-------
 public | geography_columns  | view  | shsi
 public | geometry_columns   | view  | shsi
 public | raster_columns     | view  | shsi
 public | raster_overviews   | view  | shsi
 public | spatial_ref_sys    | table | shsi
(5 rows)


shsi2=# CREATE EXTENSION postgis_topology;
CREATE EXTENSION
shsi2=# \d
               List of relations
  Schema   |        Name        |   Type   | Owner
----------+--------------------+----------+-------
 public   | geography_columns  | view     | shsi
 public   | geometry_columns   | view     | shsi
 public   | raster_columns     | view     | shsi
 public   | raster_overviews   | view     | shsi
 public   | spatial_ref_sys    | table    | shsi
 topology | layer              | table    | shsi
 topology | topology           | table    | shsi
 topology | topology_id_seq    | sequence | shsi
(8 rows)


shsi2=# CREATE EXTENSION fuzzystrmatch;
CREATE EXTENSION
shsi2=# CREATE EXTENSION postgis_tiger_geocoder;
CREATE EXTENSION
shsi2=#
```

```
 tiger   | pagc_rules                  | table    | shsi
 tiger   | pagc_rules_id_seq           | sequence | shsi
 tiger   | place                       | table    | shsi
 tiger   | place_gid_seq               | sequence | shsi
 tiger   | place_lookup                | table    | shsi
 tiger   | secondary_unit_lookup       | table    | shsi
 tiger   | state                       | table    | shsi
 tiger   | state_gid_seq               | sequence | shsi
 tiger   | state_lookup                | table    | shsi
 tiger   | street_type_lookup          | table    | shsi
 tiger   | tabblock                    | table    | shsi
 tiger   | tabblock_gid_seq            | sequence | shsi
 tiger   | tract                       | table    | shsi
 tiger   | tract_gid_seq               | sequence | shsi
 tiger   | zcta5                       | table    | shsi
 tiger   | zcta5_gid_seq               | sequence | shsi
 tiger   | zip_lookup                  | table    | shsi
 tiger   | zip_lookup_all              | table    | shsi
 tiger   | zip_lookup_base             | table    | shsi
 tiger   | zip_state                   | table    | shsi
 tiger   | zip_state_loc               | table    | shsi
(54 rows)

shsi2=#
```

```
PostgreSQL installation complete.
**********************************************************
=====Success======Director:fly====Company:ZZZJ===HaHaHaHa==
**********************************************************
[root@data12 fly]#
```

Linux 服务器三句 SQL 查询时间测试:

a、返回一个点属于的块(语句执行时间约 40ms)

select   gid   from   (SELECT   ST_Contains(geomA,(ST_GeomFromText('POINT(121.377631
31.289946)',4326))) AS tt,gid FROM (select geom,gid from shsifishnet
13) As foo(geomA))as tb2 where tt=true;

```
sh2=# select gid from (SELECT ST_Contains(geomA,(ST_GeomFromText('POINT(121.377631 31.289946)',4326))) AS tt,gid FROM (select geom,gid from shsifishnet
13) As foo(geomA))as tb2 where tt=true;
  gid
--------
 135944
(1 row)

Time: 39.696 ms
sh2=# select gid from (SELECT ST_Contains(geomA,(ST_GeomFromText('POINT(121.377631 31.289946)',4326))) AS tt,gid FROM (select geom,gid from shsifishnet
13) As foo(geomA))as tb2 where tt=true;
  gid
--------
 135944
(1 row)

Time: 39.753 ms
sh2=# select gid from (SELECT ST_Contains(geomA,(ST_GeomFromText('POINT(121.377631 31.289946)',4326))) AS tt,gid FROM (select geom,gid from shsifishnet
13) As foo(geomA))as tb2 where tt=true;
  gid
--------
 135944
(1 row)

Time: 39.536 ms
```

b、一个块是否包含某个点(语句执行时间约 20ms)

select ST_Contains((select geom from shsifishnet13 where gid=145103),st_geometryfromtext('POINT(121.247236 31.396212)',4326));

```
sh2=# select ST_Contains((select geom from shsifishnet13 where gid=145103),st_geometryfromtext('POINT(121.247236 31.396212)',4326));
 st_contains
-------------
 t
(1 row)

Time: 17.283 ms
sh2=# select ST_Contains((select geom from shsifishnet13 where gid=145103),st_geometryfromtext('POINT(121.247236 31.396212)',4326));
 st_contains
-------------
 t
(1 row)

Time: 20.249 ms
sh2=# select ST_Contains((select geom from shsifishnet13 where gid=145103),st_geometryfromtext('POINT(121.247236 31.396212)',4326));
 st_contains
-------------
 t
(1 row)

Time: 19.884 ms
```

c、两个点之间的距离(语句执行时间约 0.3ms)

SELECT ST_DistanceSphere(ST_GeomFromText('POINT(121.247236 31.396212)',4326),ST_GeomFromText('POINT(121.377631 31.289946)',4326));

```
sh2=# SELECT ST_DistanceSphere(ST_GeomFromText('POINT(121.247236 31.396212)',4326),ST_GeomFromText('POINT(121.377631 31.289946)',4326));
 st_distancesphere
-------------------
    17116.41684054
(1 row)

Time: 0.216 ms
sh2=# SELECT ST_DistanceSphere(ST_GeomFromText('POINT(121.247236 31.396212)',4326),ST_GeomFromText('POINT(121.377631 31.289946)',4326));
 st_distancesphere
-------------------
    17116.41684054
(1 row)

Time: 0.275 ms
sh2=# SELECT ST_DistanceSphere(ST_GeomFromText('POINT(121.247236 31.396212)',4326),ST_GeomFromText('POINT(121.377631 31.289946)',4326));
 st_distancesphere
-------------------
    17116.41684054
(1 row)

Time: 0.284 ms
sh2=# SELECT ST_DistanceSphere(ST_GeomFromText('POINT(121.247236 31.396212)',4326),ST_GeomFromText('POINT(121.377631 31.289946)',4326));
 st_distancesphere
-------------------
    17116.41684054
(1 row)

Time: 0.335 ms
```