# Postgresql 9.5 (Jay)

1. sudo apt-get update
2. sudo apt-get install postgresql postgresql-contrib
3. sudo -u postgres createuser --interactive
   * Name: fhir
   * Superuser? Y
4. sudo -u postgres createdb fhir
5. sudo -u postgres psql
   * \password fhir
   * \q
6. sudo -u postgres nano /etc/postgresql/9.5/main/pg\_hba.conf
   * add line “host all all 0.0.0.0/0 md5”
7. sudo –u postgres nano /etc/postgresql/9.5/main/postgresql.conf
   * change “#listen\_addresses = ‘localhost’” to “listen\_addresses = ‘\*’”
8. sudo /etc/init.d/postgresql restart

Steps 6 through 8 allow direct access to the postgres database. By default, postgres installation limits database connections to localhost only.

# PostGIS 2.X install (Peter)

1. sudo apt install postgis
2. sudo su – postgres
3. psql fhir -c “create extension postgis”
4. psql fhir -c “create extension fuzzystrmatch”
5. psql fhir -c “create extension postgis\_tiger\_geocoder”
6. psql fhir -c “create user synth\_ma encrypted password 'synth\_ma123'”
7. --export/import schemas: tiger\_data (ma partitions), tiger\_cb14\_500k, synth\_ma, zip (zip\_to\_zcta)

# Tomcat 8 (Jay)

1. sudo apt-get update
2. sudo apt-get install default-jdk
3. sudo groupadd tomcat
4. sudo useradd -s /bin/false -g tomcat -d /opt/tomcat tomcat
5. curl --proxy http://gatekeeper.mitre.org:80 -O http://mirror.reverse.net/pub/apache/tomcat/tomcat-8/v8.5.3/bin/apache-tomcat-8.5.3.tar.gz
6. sudo mkdir /opt/tomcat
7. sudo tar xzvf apache-tomcat-8.5.3.tar.gz -C /opt/tomcat/ --strip-components=1
8. cd /opt/tomcat/
9. sudo mkdir target
10. sudo mkdir target/lucenefiles
11. sudo chgrp -R tomcat /opt/tomcat
12. sudo chown -R tomcat /opt/tomcat
13. sudo chmod g+rwx conf
14. sudo chmod -R g+r conf
15. sudo nano /etc/systemd/system/tomcat.service

|  |
| --- |
| Contents of tomcat.service file |
| [Unit]  Description=Apache Tomcat Web Application Container  After=network.target  [Service]  Type=forking  Environment=JAVA\_HOME=/usr/lib/jvm/java-1.8.0-openjdk-amd64  Environment=CATALINA\_PID=/opt/tomcat/temp/tomcat.pid  Environment=CATALINA\_HOME=/opt/tomcat  Environment=CATALINA\_BASE=/opt/tomcat  Environment='CATALINA\_OPTS=-Xms512M -Xmx2048M -server -XX:+UseParallelGC'  Environment='JAVA\_OPTS=-Djava.awt.headless=true -Djava.security.egd=file:/dev/./urandom'  ExecStart=/opt/tomcat/bin/startup.sh  ExecStop=/opt/tomcat/bin/shutdown.sh  User=tomcat  Group=tomcat  RestartSec=10  Restart=always  [Install]  WantedBy=multi-user.target |

1. Development/Integration Only
   * sudo nano /opt/tomcat/conf/tomcat-users.xml
   * Add “<user username="fhir" password="fhir" roles="manager-gui" />” within <tomcat-users/>
2. sudo systemctl daemon-reload
3. sudo systemctl enable tomcat
4. sudo systemctl start tomcat
5. systemctl status tomcat.service

# Deploy SyntheticMass fork of HAPI-FHIR (Jay)

1. mvn package
2. mv hapi-fhir-jpaserver-example/target/hapi-fhir-jpaserver-example.war ./fhir.war
3. Copy fhir.war to Ubuntu machine /opt/tomcat/webapps/fhir.war
4. Webapp will autodeploy (if Tomcat is running)
   * Webpage: http://[server]:8080/fhir
   * FHIR REST API: <http://[server]:8080/fhir/baseDstu3>
5. If there are errors in running the war file:
   * sudo less /opt/tomcat/logs/catalina.out

# Move Tomcat 8 to Port 80 (Greg)

NOTE: End up moving tomcat to port 8081 and proxying it via apache web server on port 80

1. Echo $UID to find out my user id
2. sudo apt-get install unzip
3. sudo apt-get install ant
4. vim /opt/tomcat/conf/server.xml
5. Change port from 8080 to 80 and save and exit
6. Restarted tomcat and now it works!
7. See port usage: sudo netstat –peanut
8. see processes for process ids: ps all

# Install htc-api (Greg)

1. pip freeze got error that pip was not installed
2. sudo apt install python-pip
3. pip install virtualenv
4. added the following lines to the end of ~/.bashrc:

$ export no\_proxy='localhost,127.0.0.1,.mitre.org'

$ export NO\_PROXY=$no\_proxy

# Proxy on/off

$ alias proxy-on="export http\_proxy='http://gatekeeper.mitre.org:80'; export https\_proxy='http://gatekeeper.mitre.org:80'; export HTTP\_PROXY=$http\_proxy; export HTTPS\_PROXY=$https\_proxy;"

$ alias proxy-off="unset http\_proxy ; unset https\_proxy ; unset HTTP\_PROXY ; unset HTTPS\_PROXY"

1. source ~/.bashrc
2. pip install virtualenv 🡪 FAILED
   1. apt-get remove python-pip python3-pip
   2. wget <https://bootstrap.pypa.io/get-pip.py> --no-check-certificate
   3. sudo –H python get-pip.py 🡪 FAILED
   4. sudo apt-get install python-pip
   5. sudo –H pip install virtualenv --proxy=gatekeeper.mitre.org:80 (indicated newer pip version available)
   6. ~~pip install --upgrade pip (skipped this the 2~~~~nd~~ ~~time because virtualenv venv was failing)~~
3. ssh-keygen –t rsa
4. more ~/.ssh/id\_rsa.pub
5. copy key
6. went to gitlab.mitre.org and added the public key using copy above
7. git clone [git@gitlab.mitre.org:HTCProject/htc-api.git](mailto:git@gitlab.mitre.org:HTCProject/htc-api.git)
8. cd htc-api/api
9. virtualenv venv 🡪 FAILED (setuptools pkg\_resources pip wheel failed with error code 2)
10. <https://github.com/pypa/pip/issues/1805>
11. Uninstalled pip and virtualenv and re-installed. Did #6 then continued at #13
12. Now get OSError: [Errno 17] File exists
13. Deleted venv directory in htc-api/api
14. virtualenv venv
15. source venv/bin/activate
16. pip install –r requirements.txt –proxy gatekeeper.mitre.org:80
    1. Command “python setup.py egg\_info” failed with error code 1 in /tmp/pip-build-Akzwsl/psycopg2/
    2. Error: You need to install postgresql-server-dev-X.Y for building a server-side extension or libpq-dev for building a client-side application
    3. sudo apt-get install postgresql 🡪 says already installed
    4. sudo apt-get install python-psycopg2
    5. sudo apt-get install libpq-dev
    6. Re-ran pip install –r requirements.txt –proxy gatekeeper.mitre.org:80
17. Hit <http://syntheticmass.mitre.org:8080/htc/api/v1> from firefox and it works fine
18. . test\_rest.sh

# Update htc-api

1. Made pct\_male and pct\_female returned for counties/stats return percentages as decimals between 0 and 1.

# Use local postgres (Greg)

1. Changed htc\_login.txt to point at local postgres
2. Changed mht schema in queries within htc\_api.py to synth\_ma
3. . htc\_kill.sh
4. . htc\_run.sh (make sure virtual environment activated with source command)
5. . test\_rest.sh
6. Error: relation “county\_health.chr” does not exist
   1. Sent e-mail to Peter Sylvester (cc’ed Andre and Jay) about missing table chr.
   2. Peter copied the chr table over from mht to syntheticmass postgres
7. . htc\_kill.sh
8. . htc\_run.sh (make sure virtual environment activated with source command)
9. . test\_rest.sh (all tests pass)

# Mod\_proxy (Greg)

(both fhir and api served through apache on port 80)

1. sudo apt-get install apache2 apache2-doc apache2-utils
2. sudo vim /etc/apache2/apache2.confs
3. sudo service apache2 restart
4. sudo a2dissite 000-default.conf
5. sudo vim /etc/apache2/sites-available/syntheticmass.mitre.org.conf
6. sudo mkdir –p /var/www/syntheticmass.mitre.org/public\_html
7. sudo mkdir /var/www/syntheticmass.mitre.org/logs
8. sudo a2ensite syntheticmass.mitre.org.conf
9. sudo service apache2 restart
10. vim /opt/tomcat/conf/server.xml
11. Change port from 80 to 8081 and save and exit
12. Restarted tomcat
13. sudo a2enmod proxy\_http
14. service apache2 restart
15. Edited the configuration /etc/apache2/sites-available/syntheticmass.mitre.org.conf (red lines above may be replaced by this instead):

<VirtualHost \*:80>

#ServerAdmin webmaster@syntheticmass.mitre.org

ServerName syntheticmass.mitre.org

#ServerAlias www.syntheticmass.mitre.org

#DocumentRoot /var/www/syntheticmass.mitre.org/public\_html

ErrorLog /var/www/syntheticmass.mitre.org/error.log

CustomLog /var/www/syntheticmass.mitre.org/access.log combined

ProxyPass "/api" "http://syntheticmass.mitre.org:8080/htc/api"

ProxyPassReverse "/api" "http://syntheticmass.mitre.org:8080/htc/api"

ProxyPass "/fhir" "http://syntheticmass.mitre.org:8081/fhir"

ProxyPassReverse "/fhir" "http://syntheticmass.mitre.org:8081/fhir"

</VirtualHost>

1. sudo service apache2 restart

NOTE: should switch to using AJP connector on tomcat behind proxy

# Install DIRECT reference implementation (bare metal)

1. sudo apt-get install unzip
2. sudo apt-get install ant
3. export JAVA\_HOME=/usr/lib/jvm/java-8-openjdk-amd64/
4. echo "export JAVA\_HOME=$JAVA\_HOME" | sudo tee -a /etc/environment
5. Wrote, compiled, and ran simple program to check max AES encryption key length:

<https://gist.github.com/jehrhardt/5167854>

Key length is unlimited so no JCE install required for OpenJDK 8

1. cd /opt
2. sudo wget -e use\_proxy=yes -e https\_proxy=http://gatekeeper.mitre.org:80/ --no-check-certificate <https://oss.sonatype.org/content/repositories/releases/org/nhind/direct-project-stock/3.0.1/direct-project-stock-3.0.1.tar.gz>
3. sudo tar xvfz direct-project-stock-3.0.1.tar.gz
4. export DIRECT\_HOME=`pwd`/direct
5. echo "export DIRECT\_HOME=$DIRECT\_HOME" | sudo tee -a /etc/environment