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UMKC Center for Health Insights

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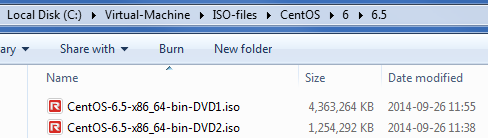
# Overview

These notes show how to create a new CentOS VMWare virtual machine from an ISO file, and customize the machine for use in developing Django/TastyPie applications.

# Download ISO File with DVD Image

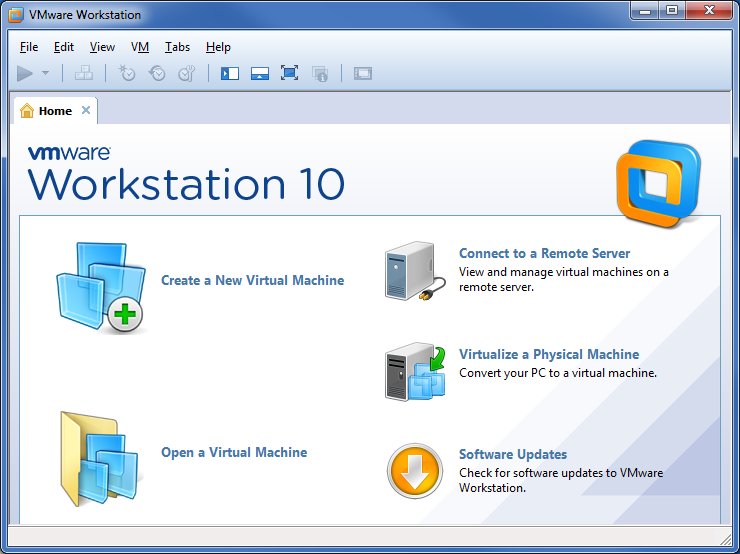
Download CentOS 6.5 ISO files from Argonne National Laboratory Public Software Mirror: <http://mirror.anl.gov/>

<http://mirror.anl.gov/pub/centos/6.5/isos/x86_64/>



# VMware Installation: CentOS65 Virtual Machine

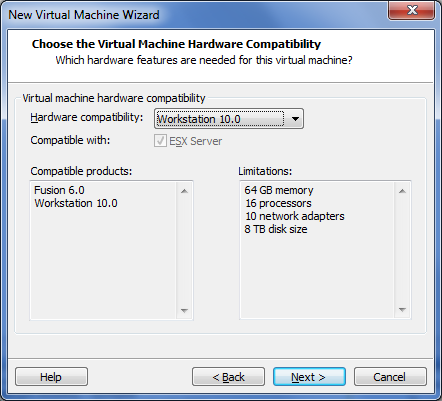
Start VMware



File | New Virtual Machine

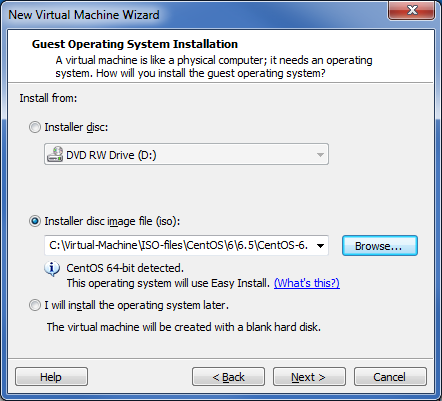


Next



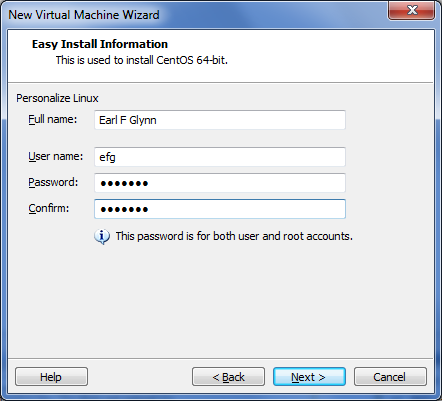
Next

## ISO file for DVD



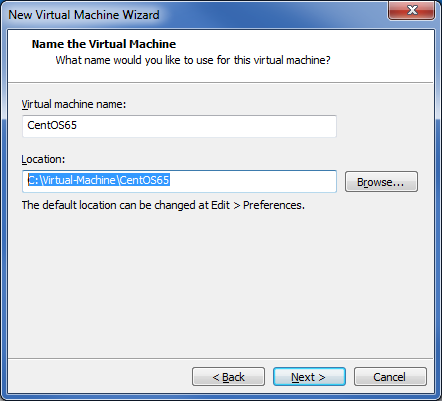
C:\Virtual-Machine\ISO-files\CentOS\6\6.5\CentOS-6.5-x86\_64-bin-DVD1.iso  
Next

## Default User



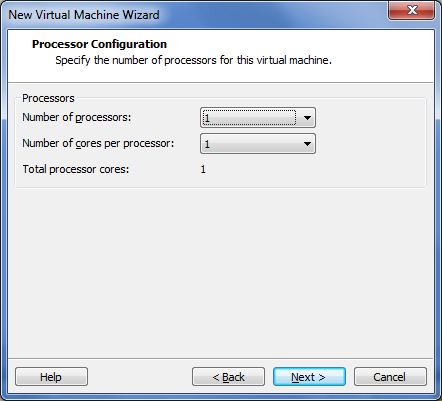
Next

## Machine Name

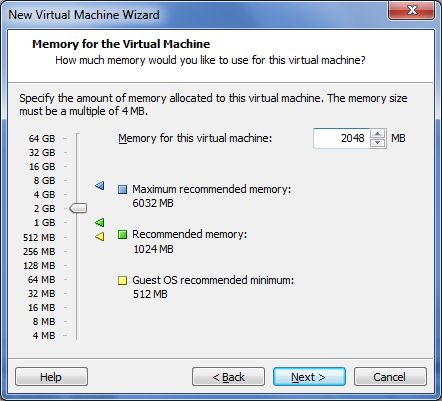


Override defaults: CentOS65, C:\Virtual-Machine\CentOS65, Next

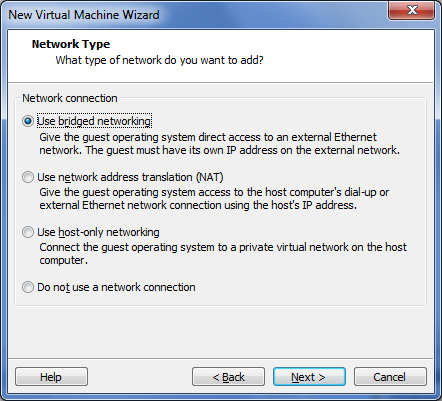
## Base Configuration



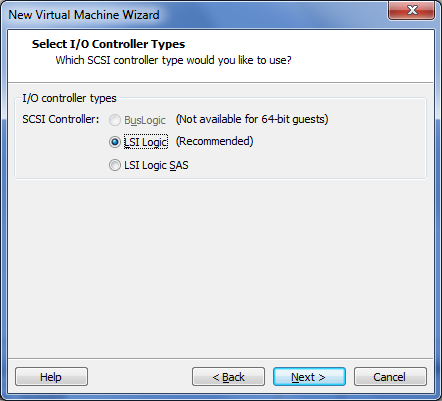
Next



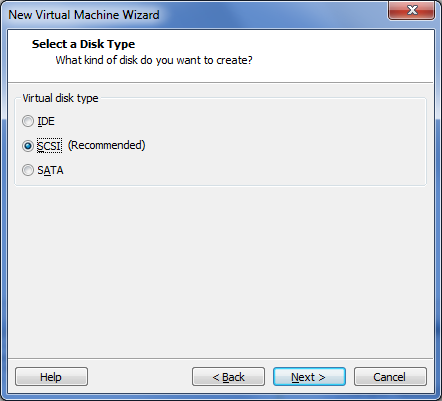
2048, Next



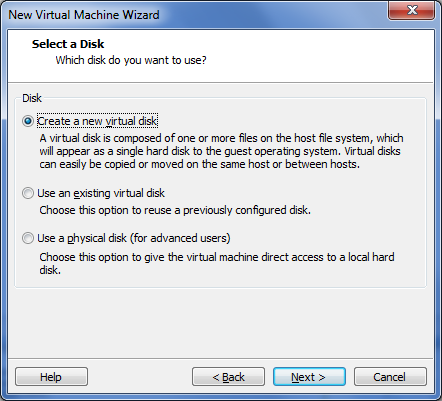
Use bridged networking, Next



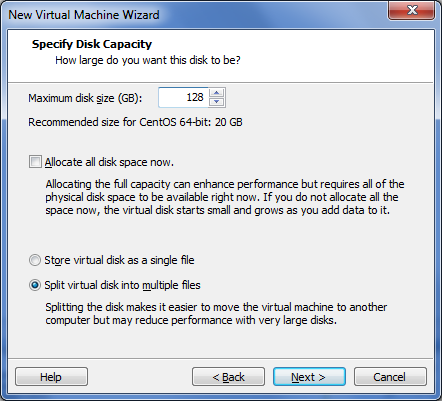
Next



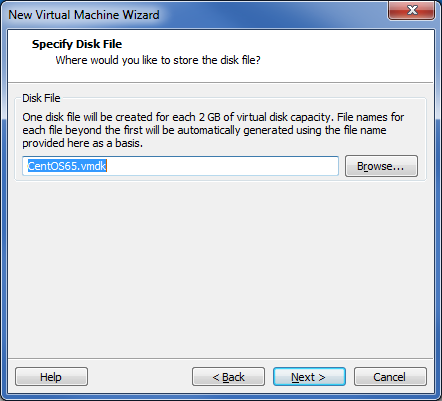
Next



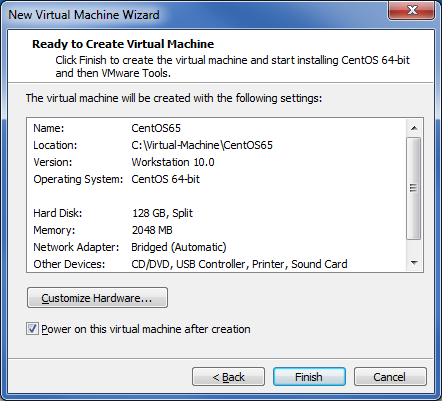
Next



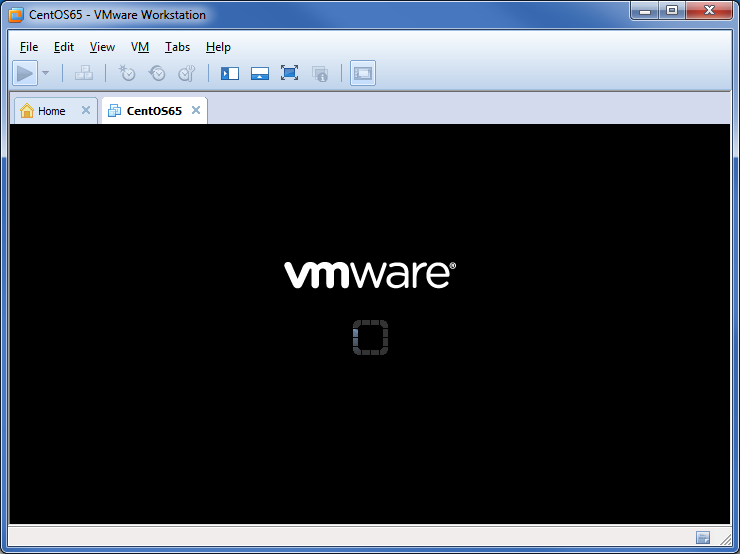
128, Next



Next

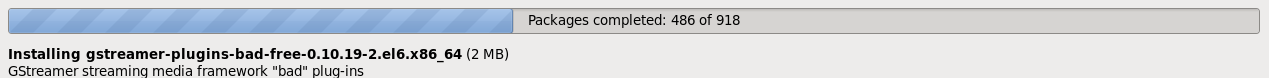


Finish

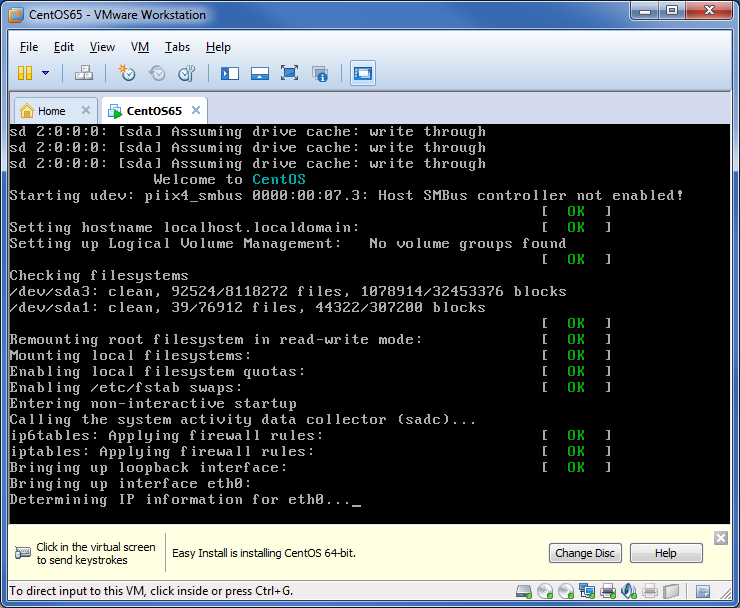


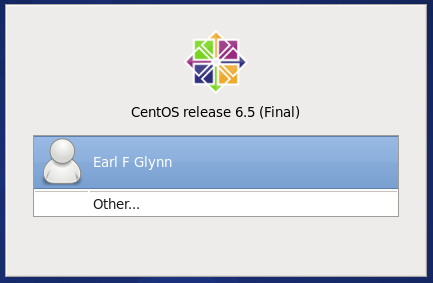


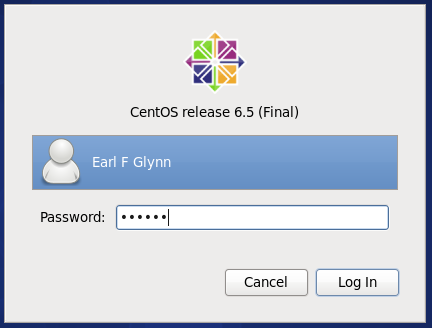
. . .



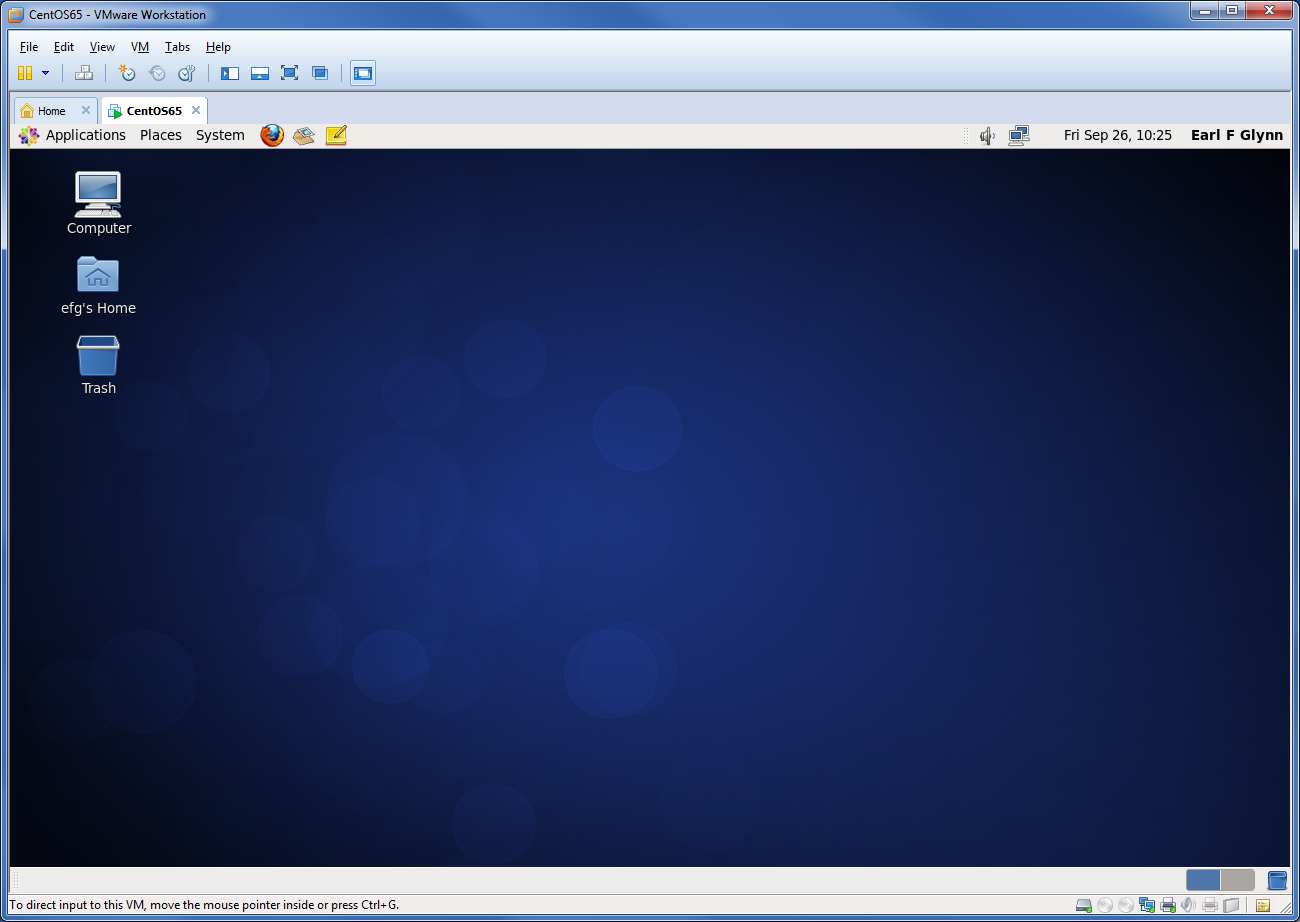
## First Bootup







Log In



# CentOS Customization

## System Update

Applications | System Tools | Terminal



su root

yum update

. . .

Transaction Summary

================================================================================

Install 5 Package(s)

Upgrade 363 Package(s)

Total download size: 312 M

Is this ok [y/N]: y

. . .

(368/368): yum-utils-1.1.30-30.el6.noarch.rpm | 110 kB 00:00

--------------------------------------------------------------------------------

Total 1.7 MB/s | 312 MB 03:05

warning: rpmts\_HdrFromFdno: Header V3 RSA/SHA1 Signature, key ID c105b9de: NOKEY

Retrieving key from file:///etc/pki/rpm-gpg/RPM-GPG-KEY-CentOS-6

Importing GPG key 0xC105B9DE:

Userid : CentOS-6 Key (CentOS 6 Official Signing Key) <centos-6-key@centos.org>

Package: centos-release-6-5.el6.centos.11.1.x86\_64 (@anaconda-CentOS-201311272149.x86\_64/6.5)

From : /etc/pki/rpm-gpg/RPM-GPG-KEY-CentOS-6

Is this ok [y/N]: y

. . .

yum-utils.noarch 0:1.1.30-30.el6

Replaced:

firefox.x86\_64 0:17.0.10-1.el6.centos

Complete!

[root@localhost efg]#

*Shutdown and Restart, and repeat* yum update *until there's nothing to update*

**[root@localhost efg]#** yum update

. . .

No Packages marked for Update

## Add users to sudoers

**Add efg and root to sudoers**

<http://wpguru.co.uk/2014/06/centos-sudoers/>

**[efg@localhost ~]$** su root

**[root@localhost efg]#**

echo "efg ALL=(ALL) NOPASSWD: ALL" >> /etc/sudoers

## Add Additional CentOS Repositories

**Add EPEL Repo**

**Install RHEL (Red Hat Enterprise Linux) Extra Packages Repo**

**[efg@localhost ~]$** yum repolist

Loaded plugins: fastestmirror, refresh-packagekit, security

Loading mirror speeds from cached hostfile

\* base: mirror.steadfast.net

\* extras: mirror.steadfast.net

\* updates: mirror.steadfast.net

repo id repo name status

base CentOS-6 - Base 6,518

extras CentOS-6 - Extras 36

updates CentOS-6 - Updates 530

repolist: 7,084

[efg@localhost ~]$ mkdir Software

[efg@localhost ~]$ cd Software

[efg@localhost Software]$

wget http://mirror-fpt-telecom.fpt.net/fedora/epel/6/i386/epel-release-6-8.noarch.rpm

--2014-12-22 09:21:39-- http://mirror-fpt-telecom.fpt.net/fedora/epel/6/i386/epel-release-6-8.noarch.rpm

Resolving mirror-fpt-telecom.fpt.net... 118.69.250.132

Connecting to mirror-fpt-telecom.fpt.net|118.69.250.132|:80... connected.

HTTP request sent, awaiting response... 200 OK

Length: 14540 (14K) [application/x-redhat-package-manager]

Saving to: “epel-release-6-8.noarch.rpm”

100%[======================================>] 14,540 60.1K/s in 0.2s

2014-12-22 09:21:40 (60.1 KB/s) - “epel-release-6-8.noarch.rpm” saved [14540/14540]

**[efg@localhost Software]$** sudo rpm -ivh epel-release-6-8.noarch.rpm

warning: epel-release-6-8.noarch.rpm: Header V3 RSA/SHA256 Signature, key ID 0608b895: NOKEY

Preparing... ########################################### [100%]

1:epel-release ########################################### [100%]

**[efg@localhost Software]$** yum repolist

Loaded plugins: fastestmirror, refresh-packagekit, security

Loading mirror speeds from cached hostfile

epel/metalink | 13 kB 00:00

\* base: mirror.steadfast.net

\* epel: mirror.unl.edu

\* extras: mirror.steadfast.net

\* updates: mirror.steadfast.net

epel | 4.4 kB 00:00

http://mirror.unl.edu/epel/6/x86\_64/repodata/repomd.xml: [Errno -1] repomd.xml does not match metalink for epel

Trying other mirror.

epel | 4.4 kB 00:00

epel/primary\_db | 6.3 MB 00:00

repo id repo name status

base CentOS-6 - Base 6,518

epel Extra Packages for Enterprise Linux 6 - x86\_64 11,110

extras CentOS-6 - Extras 36

updates CentOS-6 - Updates 530

repolist: 18,194

## Additional packages to install/configure

### yum info

*yum and package info:*<http://www.cyberciti.biz/faq/rhel-centos-fedora-linux-yum-command-howto/>   
<http://mirror.centos.org/centos/6/os/x86_64/Packages/>

View/Verify valid grouplist names, especially those needed in the next section:

**[efg@localhost ~]$** yum grouplist

### GroupInstall: "Development Tools" and "Additional Development"

**[efg@localhost ~]$** sudo yum groupinstall "Development Tools"

. . .

================================================================================

Install 43 Package(s)

Total download size: 55 M

Installed size: 180 M

Is this ok [y/N]: y

. . .

Complete!

For **xorg-x11-proto-devel** and **java openjdk**

**[efg@localhost ~]$** sudo yum groupinstall "Additional Development"

. . .

================================================================================

Install 160 Package(s)

Total download size: 142 M

Installed size: 475 M

Is this ok [y/N]: y

. . .

Complete!

apxs (Apache eXtenSion tool) is needed to re-compile mod\_wsgi (Python/Apache interface)  
<http://httpd.apache.org/docs/2.2/programs/apxs.html>

Apache development tools are needed to rebuild mod\_wsgi: httpd-devel

**[efg@localhost ~]$** sudo yum install httpd-devel

================================================================================

Install 5 Package(s)

Total download size: 1.6 M

Installed size: 7.1 M

Is this ok [y/N]: y

. . .

Complete!

Verify all of these were installed:

**[efg@localhost ~]$** sudo yum install gcc gcc-c++ make openssl-devel

Nothing to do

**[efg@localhost ~]$** sudo yum install libxml2 libxml2-devel libxslt libxslt-devel

Nothing to do

### Math Libraries

A variety of math/stat packages (e.g., R, Python numpy/scipy) can use or require optimized math libraries.

**[efg@localhost ~]$** sudo yum install atlas blas lapack lapack-devel blas-devel

================================================================================

Install 5 Package(s)

Total download size: 12 M

Installed size: 36 M

Is this ok [y/N]: y

**[efg@localhost ~]$** sudo yum install libsvm

...

Complete!

### FileZilla

**Install and configure filezilla**

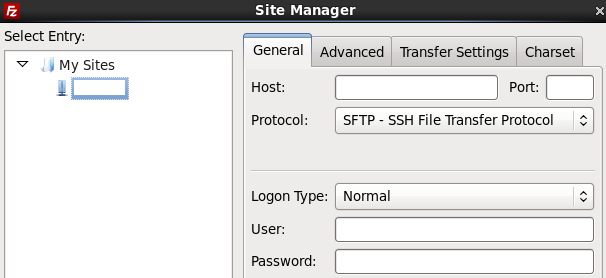
**[efg@localhost ~]$** sudo yum install filezilla

. . .

Complete!

**[efg@localhost ~]$** filezilla &

Configure: File | Site Manager | New Site . . .



### Tree

**Install tree**

<http://mama.indstate.edu/users/ice/tree/>

**[efg@localhost ~]$** sudo yum install tree

Short test:

**[efg@localhost ~]$** tree Software

Software

└── epel-release-6-8.noarch.rpm

### unix2dos and dos2unix

Use these commands to correct line endings when exchanging ASCII files between Linux and Windows.

**[efg@localhost ~]$** sudo yum install unix2dos dos2unix

### Configure Firefox

Add JSONView add-on to Firefox to view JSON in more readable format with APIs

**[efg@localhost ~]$** firefox &







JSONView



Install



## Desktop

### Configure Launchers

Applications | Accessories | right click on gedit Text Editor | Add this launcher to panel



Applications | System Tools | right click on File Browser | Add this launcher to panel



Applications | System Tools | right click on System Monitor | Add this launcher to panel



Applications | System Tools | right click on Terminal | Add this launcher to panel



Applications | Internet | Firefox Web Browser | Add this launcher to panel



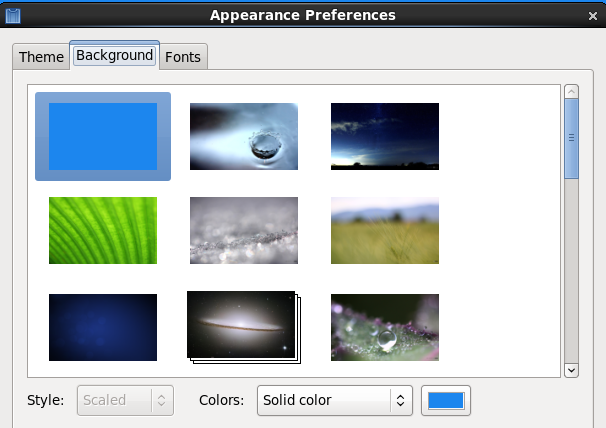
Applications | Internet | Filezilla | Add this launcher to panel

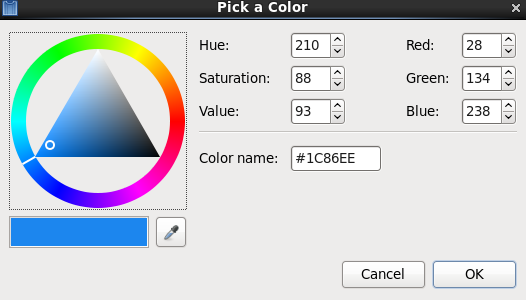




### Configure Background

Right click on desktop | Change Desktop Background







### Modify .bashrc

[efg@localhost ~]$ cd

[efg@localhost ~]$ gedit .bashrc

My idiosyncrasies. The prompt shows "who", "which machine", "which directory" and a time stamp.

*copy and paste*

# .bashrc

# Source global definitions

if [ -f /etc/bashrc ]; then

. /etc/bashrc

fi

# User specific aliases and functions

alias filemanager='nautilus --no-desktop --browser /home/efg'

alias systemmonitor=gnome-system-monitor

alias xterm=gnome-terminal

alias ll='ls -AlF --color=auto'

case $TERM in

xterm\*)

PROMPT\_COMMAND='echo -ne "\033]0;${USER} ${HOSTNAME}\007"'

;;

\*)

;;

esac

BLUETEXT="\[\e[34;1m\]"

RESETTEXT="\[\e[0m\]"

PS1="\n$BLUETEXT[\! \u \h \$(date '+%Y-%m-%d %T') \$( pwd )]$RESETTEXT\n"

### Display Preferences

System | Preferences | Display



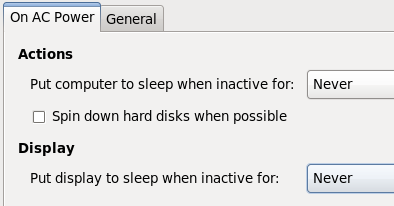
or



(or higher if possible on other monitors)

### Power Management

System | Preferences | Power Management



"Never" on both

### Time Zone

System | Administration | Date & Time | <root password> | Time Zone

### Screen Saver

System | Preferences |Screen Saver



Uncheck "Activate"

The **CentOS65** virtual machine at this point was saved as **CentOS65-Raw**.

# Virtual Environments

Use virtual environments to support multiple versions of Python simultaneously.

## virtualenvwrapper and virtualenv: TestEnv

[45 efg localhost 2014-12-22 12:05:39 /home/efg]

sudo yum install python-pip

[46 efg localhost 2014-12-22 12:07:10 /home/efg]

sudo pip install virtualenv

[47 efg localhost 2014-12-22 12:07:21 /home/efg]

sudo pip install virtualenvwrapper

Let use /opt to hold the virtual Python environments.

[48 efg localhost 2014-12-22 12:09:06 /home/efg]

cd /opt

[49 efg localhost 2014-12-22 12:10:28 /opt]

sudo mkdir virtualenv

[50 efg localhost 2014-12-22 12:10:47 /opt]

sudo chown efg virtualenv

[51 efg localhost 2014-12-22 12:10:58 /opt]

source `which virtualenvwrapper.sh`

[52 efg localhost 2014-12-22 12:12:45 /opt]

export WORKON\_HOME=/opt/virtualenv

Let's call our first test environment TestEnv

[53 efg localhost 2014-12-22 12:13:31 /opt]

mkvirtualenv TestEnv

New python executable in TestEnv/bin/python

Installing setuptools, pip...done.

(TestEnv)

[54 efg localhost 2014-12-22 12:15:21 /opt]

python --version

Python 2.6.6

Add setup to .bashrc:

(TestEnv)

[57 efg localhost 2014-12-22 12:18:28 /home/efg]

tail -4 .bashrc

# virtualenvwrapper

export WORKON\_HOME=/opt/virtualenv

source `which virtualenvwrapper.sh`

This enables command "workon" to display possible environments from any terminal window, and then enable a new environment.

(TestEnv)

**[60 efg localhost 2014-12-22 12:21:16 /home/efg]**

workon

TestEnv

(TestEnv)

**[61 efg localhost 2014-12-22 12:21:17 /home/efg]**

workon TestEnv

(TestEnv)

## Python278 environment

<http://stackoverflow.com/questions/1534210/use-different-python-version-with-virtualenv>

**Latest Python 2.7 version for work environment**

<https://www.digitalocean.com/community/tutorials/how-to-set-up-python-2-7-6-and-3-3-3-on-centos-6-4>

If necessary: sudo yum update

sudo yum groupinstall -y development

sudo yum install -y zlib-devel openssl-devel sqlite-devel bzip2-devel

### Establish directory

Let's put all python compiled versions in subdirectories here:

**/opt/python**

specifically:

**/opt/python/python278  
/opt/python/python342**

Let's create a **/opt/python/bin** directory that will have links to the individual python executables, like python27 and python 33. More on this later.

For now:

(TestEnv)

**[66 efg localhost 2014-12-22 12:34:40 /opt]**

deactivate

**[70 efg localhost 2014-12-22 12:36:29 /opt]**

sudo mkdir -p python/python278

**[71 efg localhost 2014-12-22 12:36:52 /opt]**

sudo chown -R efg python

### Compile from source

Let's compile Python version 2.7.8 (in future check for later 2.X version) into the directory /opt/python/python278:

**[74 efg localhost 2014-12-22 12:38:28 /home/efg/Software]**

wget http://www.python.org/ftp/python/2.7.8/Python-2.7.8.tar.xz

**[75 efg localhost 2014-12-22 12:38:50 /home/efg/Software]**

xz -d Python-2.7.8.tar.xz

**[77 efg localhost 2014-12-22 12:41:50 /home/efg/Software]**

tar -xvf Python-2.7.8.tar

**[79 efg localhost 2014-12-22 12:43:49 /home/efg/Software]**

cd Python-2.7.8

Need --enable-shared to later compile **mod\_wsgi** for Django interface to Apache:  
<https://groups.google.com/forum/#!topic/modwsgi/Ev4iULHB3ms>

**[80 efg localhost 2014-12-22 12:43:51 /home/efg/Software/Python-2.7.8]**

./configure --enable-shared --prefix=/opt/python/python278

. . .

creating Makefile

**[81 efg localhost 2014-12-22 12:46:34 /home/efg/Software/Python-2.7.8]**

make

Python build finished, but the necessary bits to build these modules were not found:

\_tkinter bsddb185 dl

imageop sunaudiodev

To find the necessary bits, look in setup.py in detect\_modules() for the module's name.

**[82 efg localhost 2014-12-22 12:49:33 /home/efg/Software/Python-2.7.8]**

make altinstall

Be sure to use **altinstall** above to not change the system version of Python.

### Some additional maintenance

**[88 efg localhost 2014-12-22 13:08:44 /opt/python/python278/lib]**

cd /usr/lib64

(wd now: /usr/lib64)

**[89 efg localhost 2014-12-22 13:09:41 /usr/lib64]**

su root

Password:

**[9 root localhost 2014-12-22 13:09:48 /usr/lib64]**

cp /opt/python/python278/lib/libpython2.7.so.1.0 .

ln -s libpython2.7.so.1.0 libpython2.7.so

**[12 root localhost 2014-12-22 13:13:35 /usr/lib64]**

ll libpython\*

lrwxrwxrwx. 1 root root 19 Dec 22 09:38 libpython2.6.so -> libpython2.6.so.1.0

-r-xr-xr-x. 1 root root 1672576 Jan 22 2014 libpython2.6.so.1.0

lrwxrwxrwx. 1 root root 19 Dec 22 13:13 libpython2.7.so -> libpython2.7.so.1.0

-r-xr-xr-x. 1 root root 6060584 Dec 22 13:12 libpython2.7.so.1.0

For now, it's unclear if the SELinux context difference is important:

**[19 root localhost 2014-12-22 13:22:34 /usr/lib64]**

ls -Z libpython\*

lrwxrwxrwx. root root system\_u:object\_r:lib\_t:s0 libpython2.6.so -> libpython2.6.so.1.0

-r-xr-xr-x. root root system\_u:object\_r:lib\_t:s0 libpython2.6.so.1.0

lrwxrwxrwx. root root unconfined\_u:object\_r:lib\_t:s0 libpython2.7.so -> libpython2.7.so.1.0

-r-xr-xr-x. root root unconfined\_u:object\_r:lib\_t:s0 libpython2.7.so.1.0

### Verify executable built correctly

**[92 efg localhost 2014-12-22 13:25:09 /opt]**

/opt/python/python278/bin/python2.7 --version

Python 2.7.8

Until libpython2.7.so was moved to /user/lib64, this message was observed:

/opt/python/python278/bin/python2.7 --version

/opt/python/python278/bin/python2.7: error while loading shared libraries: libpython2.7.so.1.0: cannot open shared object file: No such file or directory

### Create new virtual environment

**[95 efg localhost 2014-12-22 13:33:08 /opt/virtualenv]**

virtualenv --python=/opt/python/python278/bin/python2.7 Python278

Running virtualenv with interpreter /opt/python/python278/bin/python2.7

New python executable in Python278/bin/python2.7

Also creating executable in Python278/bin/python

Installing setuptools, pip...done.

**[96 efg localhost 2014-12-22 13:33:30 /opt/virtualenv]**

workon

Python278

TestEnv

**[97 efg localhost 2014-12-22 13:34:29 /opt/virtualenv]**

workon Python278

(Python278)

**[98 efg localhost 2014-12-22 13:34:39 /opt/virtualenv]**

python --version

Python 2.7.8

### Build mod\_wsgi to be compatible with Python version 2.7

How do I compile mod\_wgsi for Python 2.7  
<https://www.fir3net.com/Programming/Python/how-do-i-compile-modwgsi-for-python-27.html>

<http://code.google.com/p/modwsgi/wiki/InstallationIssues>

How to set LD\_LIBRARY\_PATH on VPS red-hat linux to be visible by apache  
<http://serverfault.com/questions/424997/how-to-set-ld-library-path-on-vps-red-hat-linux-to-be-visible-by-apache>

<https://github.com/GrahamDumpleton/mod_wsgi>

<http://code.google.com/p/modwsgi/wiki/ChangesInVersion0305>

(Python278)

**[49 efg localhost 2014-12-22 13:53:09 /home/efg/Software]**

mkdir wsgi

(Python278)

**[50 efg localhost 2014-12-22 13:53:18 /home/efg/Software]**

cd wsgi

(Python278)

**[51 efg localhost 2014-12-22 13:53:21 /home/efg/Software/wsgi]**

wget https://github.com/GrahamDumpleton/mod\_wsgi/archive/3.5.tar.gz

--2014-12-22 13:55:09-- https://github.com/GrahamDumpleton/mod\_wsgi/archive/3.5.tar.gz

Resolving github.com... 192.30.252.129

Connecting to github.com|192.30.252.129|:443... connected.

HTTP request sent, awaiting response... 302 Found

Location: https://codeload.github.com/GrahamDumpleton/mod\_wsgi/tar.gz/3.5 [following]

--2014-12-22 13:55:10-- https://codeload.github.com/GrahamDumpleton/mod\_wsgi/tar.gz/3.5

Resolving codeload.github.com... 192.30.252.145

Connecting to codeload.github.com|192.30.252.145|:443... connected.

HTTP request sent, awaiting response... 200 OK

Length: 135875 (133K) [application/x-gzip]

Saving to: “3.5.tar.gz”

100%[======================================>] 135,875 797K/s in 0.2s

2014-12-22 13:55:10 (797 KB/s) - “3.5.tar.gz” saved [135875/135875]

(Python278)

**[52 efg localhost 2014-12-22 13:55:10 /home/efg/Software/wsgi]**

tar xvf 3.5.tar.gz

(Python278)

**[53 efg localhost 2014-12-22 13:57:14 /home/efg/Software/wsgi]**

cd mod\_wsgi-3.5

(Python278)

**[54 efg localhost 2014-12-22 13:57:37 /home/efg/Software/wsgi/mod\_wsgi-3.5]**

export LD\_LIBRARY\_PATH=/opt/python/python278/lib

(Python278)

**[55 efg localhost 2014-12-22 13:58:32 /home/efg/Software/wsgi/mod\_wsgi-3.5]**

./configure --with-python=/opt/python/python278/bin/python2.7 --prefix=/opt/python/python278

. . .

config.status: creating Makefile

(Python278)

**[56 efg localhost 2014-12-22 14:00:30 /home/efg/Software/wsgi/mod\_wsgi-3.5]**

make

The result is in the .libs directory:

(Python278)

**[57 efg localhost 2014-12-22 14:01:39 /home/efg/Software/wsgi/mod\_wsgi-3.5]**

cd .libs

(Python278)

**[59 efg localhost 2014-12-22 14:03:40 /home/efg/Software/wsgi/mod\_wsgi-3.5/.libs]**

ll

total 1644

-rw-rw-r--. 1 efg efg 621454 Dec 22 14:01 mod\_wsgi.a

lrwxrwxrwx. 1 efg efg 14 Dec 22 14:01 mod\_wsgi.la -> ../mod\_wsgi.la

-rw-rw-r--. 1 efg efg 1039 Dec 22 14:01 mod\_wsgi.lai

-rw-rw-r--. 1 efg efg 621248 Dec 22 14:01 mod\_wsgi.o

-rwxrwxr-x. 1 efg efg 430722 Dec 22 14:01 mod\_wsgi.so\*

Verify shared object built with dependency on libpython2.7:

(Python278)

**[60 efg localhost 2014-12-22 14:03:41 /home/efg/Software/wsgi/mod\_wsgi-3.5/.libs]**

ldd mod\_wsgi.so

linux-vdso.so.1 => (0x00007fff981ff000)

libpython2.7.so.1.0 => /opt/python/python278/lib/libpython2.7.so.1.0 (0x00007fe3e6310000)

libpthread.so.0 => /lib64/libpthread.so.0 (0x00007fe3e60de000)

libdl.so.2 => /lib64/libdl.so.2 (0x00007fe3e5eda000)

libutil.so.1 => /lib64/libutil.so.1 (0x00007fe3e5cd7000)

libm.so.6 => /lib64/libm.so.6 (0x00007fe3e5a52000)

libc.so.6 => /lib64/libc.so.6 (0x00007fe3e56be000)

/lib64/ld-linux-x86-64.so.2 (0x00000036f1000000)

**mod\_wsgi.so** is linked to libpython2.7.so.1.0, as required.

From the README

***If you have multiple versions of Python installed and you are not using that which is the default, you may have to organise that the PATH inherited by the Apache application when run will result in Apache finding the alternate version.*** *Alternatively, the WSGIPythonHome directive should be used to specify the exact location of the Python installation corresponding to the version of Python compiled against.*

**mod\_wsgi.so** needs to be in the Apache module folder, usually **/usr/lib64/httpd/modules**.

(Python278)

**[61 efg localhost 2014-12-22 14:10:11 /home/efg/Software/wsgi/mod\_wsgi-3.5/.libs]**

sudo cp mod\_wsgi.so /usr/lib64/httpd/modules/.

(Python278)

**[480 efg localhost 2014-12-23 16:26:45 /home/efg/Software/wsgi/mod\_wsgi-3.5/.libs]**

ll /usr/lib64/httpd/modules/\* | tail -3

-rwxr-xr-x. 1 root root 10416 Oct 16 09:49 /usr/lib64/httpd/modules/mod\_version.so\*

-rwxr-xr-x. 1 root root 10424 Oct 16 09:49 /usr/lib64/httpd/modules/mod\_vhost\_alias.so\*

-rwxr-xr-x. 1 root root 430722 Dec 23 16:26 /usr/lib64/httpd/modules/mod\_wsgi.so\*

Leave Python278 environment

(Python278)

**[64 efg localhost 2014-12-22 14:17:54 /opt/python/python278/lib]**

deactivate

## Python 342 environment

Some new software packages are released that are dependent on Python 3 instead of Python 2. Let's create a work environment for the latest version of Python 3.

Let's compile Python version 3.4.2 (in future check for later 3.X version):

**[69 efg localhost 2014-12-22 14:26:11 /opt]**

mkdir -p python/python342

**[70 efg localhost 2014-12-22 14:27:16 /opt]**

cd ~/Software

**[71 efg localhost 2014-12-22 14:27:53 /home/efg/Software]**

wget <http://www.python.org/ftp/python/3.4.2/Python-3.4.2.tar.xz>

**[72 efg localhost 2014-12-22 14:28:10 /home/efg/Software]**

xz -d Python-3.4.2.tar.xz

**[73 efg localhost 2014-12-22 14:29:45 /home/efg/Software]**

tar -xvf Python-3.4.2.tar

**[74 efg localhost 2014-12-22 14:30:29 /home/efg/Software]**

cd Python-3.4.2

**[75 efg localhost 2014-12-22 14:30:43 /home/efg/Software/Python-3.4.2]**

./configure --prefix=/opt/python/python342

. . .

creating Makefile

**[76 efg localhost 2014-12-22 14:32:00 /home/efg/Software/Python-3.4.2]**

make

**[77 efg localhost 2014-12-22 14:34:53 /home/efg/Software/Python-3.4.2]**

make altinstall

Be sure to use **altinstall** above to not change the system version of Python.

Verify executable built correctly

**[78 efg localhost 2014-12-22 14:52:20 /home/efg/Software/Python-3.4.2]**

/opt/python/python342/bin/python3.4 --version

Python 3.4.2

Create new virtual environment.

**[85 efg localhost 2014-12-22 15:02:49 /opt/virtualenv]**

virtualenv --python=/opt/python/python342/bin/python3.4 Python342

Running virtualenv with interpreter /opt/python/python342/bin/python3.4

Using base prefix '/opt/python/python342'

New python executable in Python342/bin/python3.4

Also creating executable in Python342/bin/python

Installing setuptools, pip...done.

**[86 efg localhost 2014-12-22 15:03:12 /opt/virtualenv]**

workon

Python278

Python342

TestEnv

**[87 efg localhost 2014-12-22 15:03:29 /opt/virtualenv]**

workon Python342

(Python342)

**[88 efg localhost 2014-12-22 15:03:58 /opt/virtualenv]**

python --version

Python 3.4.2

Might consider modifying path, but not now:

export PATH="/opt/python/bin:$PATH"

## Computational Environment

Install the following into both virtual Python 2.7 and 3.4 virtual environments described above.

### Libraries

sudo yum install atlas blas lapack lapack-devel blas-devel

Use **workon Python278** or **workon Python342** to enable the desired environment, e.g.:

**[210 efg localhost 2014-12-23 09:57:08 /home/efg]**

workon Python278

(Python278)

### numpy/scipy/matplotlib

This section assumes the math libraries **atlas, blas, lapack, lapack-devel**, and **blas-devel** have been installed.

pip install numpy

pip install scipy

pip install sympy

pip install matplotlib

pip install ipython (requires Python 2.7 or 3.3 or higher)

### Other Python packages

pip install pandas

pip install nose

pip install argparse

pip install Pillow # maintained version of PIL (Python Imaging Library)

pip install scikit-learn # Machine learning <http://scikit-learn.org/stable/install.html>

### Find location of Python site-packages directory

(DjangoEnv)

**[677 efg chidata 2015-01-09 12:04:01 /opt/django/umkcchiapi/umkcchiapi]**

python

Python 2.7.8 (default, Dec 22 2014, 12:48:35)

[GCC 4.4.7 20120313 (Red Hat 4.4.7-11)] on linux2

Type "help", "copyright", "credits" or "license" for more information.

>>> from distutils.sysconfig import get\_python\_lib

>>> print(get\_python\_lib())

/opt/virtualenv/DjangoEnv/lib/python2.7/site-packages

>>> import sys

>>> import pprint

>>> pprint.pprint(sys.path)

['',

'/opt/virtualenv/DjangoEnv/lib/python27.zip',

'/opt/virtualenv/DjangoEnv/lib/python2.7',

'/opt/virtualenv/DjangoEnv/lib/python2.7/plat-linux2',

'/opt/virtualenv/DjangoEnv/lib/python2.7/lib-tk',

'/opt/virtualenv/DjangoEnv/lib/python2.7/lib-old',

'/opt/virtualenv/DjangoEnv/lib/python2.7/lib-dynload',

'/opt/python/python278/lib/python2.7',

'/opt/python/python278/lib/python2.7/plat-linux2',

'/opt/python/python278/lib/python2.7/lib-tk',

'/opt/virtualenv/DjangoEnv/lib/python2.7/site-packages']

The **CentOS65** virtual machine at this point was saved as **CentOS65-Base**.

# Django and TastyPie: CentOS65-API Virtual Machine

Django Versions: [**https://docs.djangoproject.com/en/dev/releases/**](https://docs.djangoproject.com/en/dev/releases/)

Django 1.7 release notes, Sept. 2, 2014: **Django 1.7 requires Python 2.7 or above**

## Setup DjangoEnv environment

A new virtual environment, **DjangoEnv**, based on the **Python278** environment was created for work with Django/TastyPie.

**[241 efg localhost 2014-12-23 11:12:22 /home/efg]**

cd /opt/virtualenv

**[242 efg localhost 2014-12-23 11:12:29 /opt/virtualenv]**

virtualenv --python=/opt/python/python278/bin/python2.7 DjangoEnv

Running virtualenv with interpreter /opt/python/python278/bin/python2.7

New python executable in DjangoEnv/bin/python2.7

Also creating executable in DjangoEnv/bin/python

Installing setuptools, pip...done.

**[243 efg localhost 2014-12-23 11:13:22 /opt/virtualenv]**

workon DjangoEnv

NOTE:

MySQL should be installed before django.

(DjangoEnv)

**[244 efg localhost 2014-12-23 11:14:19 /opt/virtualenv]**

pip install django

Collecting django

Downloading Django-1.7.1-py2.py3-none-any.whl (7.4MB)

100% |################################| 7.4MB 727kB/s

Installing collected packages: django

Successfully installed django-1.7.1

(DjangoEnv)

**[247 efg localhost 2014-12-23 11:15:35 /opt/virtualenv]**

pip install django-tastypie

Collecting django-tastypie

Downloading django\_tastypie-0.12.1-py2.py3-none-any.whl (75kB)

100% |################################| 77kB 2.6MB/s

Collecting python-dateutil!=2.0,>=1.5 (from django-tastypie)

Downloading python\_dateutil-2.3-py2.py3-none-any.whl (173kB)

100% |################################| 176kB 7.2MB/s

Collecting python-mimeparse>=0.1.4 (from django-tastypie)

Downloading python-mimeparse-0.1.4.tar.gz

Collecting six (from python-dateutil!=2.0,>=1.5->django-tastypie)

Downloading six-1.8.0-py2.py3-none-any.whl

Installing collected packages: six, python-mimeparse, python-dateutil, django-tastypie

Running setup.py install for python-mimeparse

Successfully installed django-tastypie-0.12.1 python-dateutil-2.3 python-mimeparse-0.1.4 six-1.8.0

(DjangoEnv)

**[248 efg localhost 2014-12-23 11:17:34 /opt/virtualenv]**

pip install defusedxml

Collecting defusedxml

Downloading defusedxml-0.4.1.tar.gz (48kB)

100% |################################| 49kB 1.3MB/s

Installing collected packages: defusedxml

Running setup.py install for defusedxml

Successfully installed defusedxml-0.4.1

(DjangoEnv)

**[251 efg localhost 2014-12-23 11:29:09 /opt/virtualenv]**

sudo yum install ~~libxslt-devel~~ libxslt-python

. . .

~~Package libxslt-devel-1.1.26-2.el6\_3.1.x86\_64 already installed and latest version~~

. . .

=======================================================================================

Install 1 Package(s)

Total download size: 139 k

Installed size: 321 k

Is this ok [y/N]: y

Install 1 Package(s)

Total download size: 139 k

Installed size: 321 k

Is this ok [y/N]: y

Downloading Packages:

libxslt-python-1.1.26-2.el6\_3.1.x86\_64.rpm | 139 kB 00:00

Running rpm\_check\_debug

Running Transaction Test

Transaction Test Succeeded

Running Transaction

Installing : libxslt-python-1.1.26-2.el6\_3.1.x86\_64 1/1

Verifying : libxslt-python-1.1.26-2.el6\_3.1.x86\_64 1/1

Installed:

libxslt-python.x86\_64 0:1.1.26-2.el6\_3.1

Complete!

Where is **libxslt-python** installed and which version of Python is it dependent on?

(DjangoEnv)

**[238 efg localhost 2014-12-23 11:52:06 /usr/lib64]**

ll libxslt\*

-rw-r--r--. 1 root root 400916 Sep 13 2012 libxslt.a

lrwxrwxrwx. 1 root root 17 Dec 22 11:36 libxslt.so -> libxslt.so.1.1.26\*

lrwxrwxrwx. 1 root root 17 Dec 22 04:32 libxslt.so.1 -> libxslt.so.1.1.26\*

-rwxr-xr-x. 1 root root 250640 Sep 13 2012 libxslt.so.1.1.26\*

(DjangoEnv)

**[252 efg localhost 2014-12-23 11:33:25 /opt/virtualenv]**

pip install lxml

. . .

Successfully installed lxml-3.4.1

(DjangoEnv)

**[253 efg localhost 2014-12-23 11:52:10 /opt/virtualenv]**

sudo yum install libyaml libyaml-devel

. . .

Installed:

libyaml.x86\_64 0:0.1.3-1.4.el6

libyaml-devel.x86\_64 0:0.1.3-1.4.el6

Complete!

(DjangoEnv)

**[254 efg localhost 2014-12-23 11:56:38 /opt/virtualenv]**

pip install pyyaml

. . .

Successfully installed pyyaml-3.11

(DjangoEnv)

**[255 efg localhost 2014-12-23 11:57:43 /opt/virtualenv]**

pip freeze > DjangoEnv-requirements.txt

(DjangoEnv)

**[256 efg localhost 2014-12-23 12:03:13 /opt/virtualenv]**

cat DjangoEnv-requirements.txt

defusedxml==0.4.1

Django==1.7.1

django-tastypie==0.12.1

lxml==3.4.1

python-dateutil==2.3

python-mimeparse==0.1.4

PyYAML==3.11

six==1.8.0

re-create later with: pip install –r DjangoEnv-requirements.txt

## Create "Empty" Django Project

Enter *workon* to see list of selectable environments.

workon

DjangoEnv

Python278

Python342

TestEnv

In Django working directory, **/home/efg/django**, activate the DjangoEnv environment:

**[334 efg localhost 2014-12-23 13:49:19 /home/efg/django]**

workon DjangoEnv

(DjangoEnv)

Or:

cd /opt/virtualenv

source DjangoEnv/bin/activate

Create "empty" Django project:

(DjangoEnv)

**[366 efg localhost 2014-12-23 14:26:11 /home/efg/django]**

django-admin startproject empty

**[367 efg localhost 2014-12-23 14:26:19 /home/efg/django]**

tree empty

empty

├── empty

│   ├── \_\_init\_\_.py

│   ├── settings.py

│   ├── urls.py

│   └── wsgi.py

└── manage.py

## Create empty API app

(DjangoEnv)

**[368 efg localhost 2014-12-23 14:29:12 /home/efg/django]**

cd empty

May need to setup execute flag on manage.py if not set

(DjangoEnv)

**[379 efg localhost 2014-12-23 14:43:11 /home/efg/django/empty]**

chmod +x manage.py

**[381 efg localhost 2014-12-23 14:44:44 /home/efg/django/empty]**

./manage.py startapp apiapp

(DjangoEnv)

**[382 efg localhost 2014-12-23 14:45:36 /home/efg/django/empty]**

cd ..

(DjangoEnv)

**[383 efg localhost 2014-12-23 14:46:01 /home/efg/django]**

tree empty

empty

├── apiapp

│   ├── admin.py

│   ├── \_\_init\_\_.py

│   ├── migrations

│   │   └── \_\_init\_\_.py

│   ├── models.py

│   ├── tests.py

│   └── views.py

├── empty

│   ├── \_\_init\_\_.py

│   ├── \_\_init\_\_.pyc

│   ├── settings.py

│   ├── settings.pyc

│   ├── urls.py

│   └── wsgi.py

└── manage.py

3 directories, 13 files

(DjangoEnv)

### Modify settings.py

Add apiapp to settings.py:

(DjangoEnv)

**[386 efg localhost 2014-12-23 14:47:58 /home/efg/django/empty/empty]**

gedit settings.py

# Application definition

INSTALLED\_APPS = (

'django.contrib.admin',

'django.contrib.auth',

'django.contrib.contenttypes',

'django.contrib.sessions',

'django.contrib.messages',

'django.contrib.staticfiles',

'apiapp',

)

### Synchronize database: syncdb

(DjangoEnv)

**[389 efg localhost 2014-12-23 14:49:15 /home/efg/django/empty]**

./manage.py syncdb

Operations to perform:

Apply all migrations: admin, contenttypes, auth, sessions

Running migrations:

Applying contenttypes.0001\_initial... OK

Applying auth.0001\_initial... OK

Applying admin.0001\_initial... OK

Applying sessions.0001\_initial... OK

You have installed Django's auth system, and don't have any superusers defined.

Would you like to create one now? (yes/no): yes

Username (leave blank to use 'efg'):

Email address: xxxxxx@umkc.edu

Password: xxxxx

Password (again): xxxxx

Superuser created successfully.

If new or additional superuser needs to be setup later:

./manage.py createsuperuser --username=efg

Email address: xxxxxx@umkc.edu

Password: xxxxx

Password (again): xxxxx

Superuser created successfully.

### Migrate Database

(DjangoEnv)

**[391 efg localhost 2014-12-23 14:53:01 /home/efg/django/empty]**

./manage.py migrate

Operations to perform:

Apply all migrations: admin, contenttypes, auth, sessions

Running migrations:

No migrations to apply.

### Run development server

(DjangoEnv)

**[392 efg localhost 2014-12-23 14:53:08 /home/efg/django/empty]**

./manage.py runserver

Performing system checks...

System check identified no issues (0 silenced).

December 23, 2014 - 20:54:41

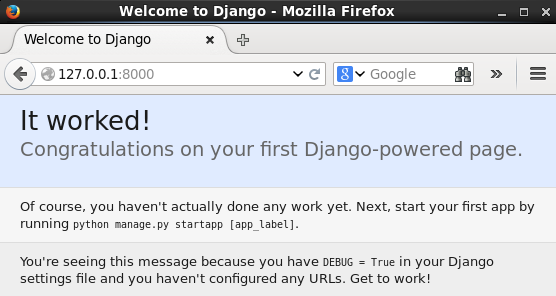
Django version 1.7.1, using settings 'empty.settings'

Starting development server at http://127.0.0.1:8000/

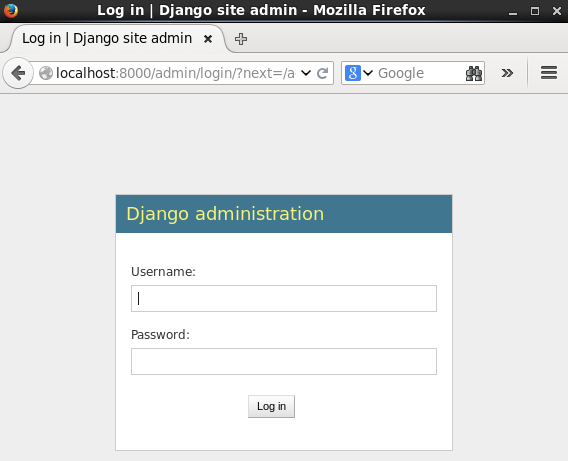
Quit the server with CONTROL-C.

No API has been defined, yet but the base page and Admin app can still be displayed in browser:

http://127.0.0.1:8000/



http://127.0.0.1:8000/admin/



### Delete database data

<http://stackoverflow.com/questions/7598024/django-flush-vs-sqlclear-syncdb>

(DjangoEnv)

**[1033 efg localhost 2014-12-16 12:04:06 /home/efg/django/empty]**

./manage.py flush

You have requested a flush of the database.

This will IRREVERSIBLY DESTROY all data currently in the '/home/efg/django/empty/db.sqlite3' database,

and return each table to an empty state.

Are you sure you want to do this?

Type 'yes' to continue, or 'no' to cancel: yes

Installed 0 object(s) from 0 fixture(s)

### Deactivate DjangoEnv environment

(DjangoEnv)

**[394 efg localhost 2014-12-23 14:58:31 /home/efg/django/empty]**

deactivate

# MySQL

NOTE:

MySQL should be installed before django in virtual environment.

Let's switch from Django's SQLITE development database (/opt/django/umkcchiapi/apitest-db.sqlite3) to a production MySQL server. To do this, let's install MySQL (or use a remote server), setup a django MySQL account, and then let Django create the MySQL tables. Later we can populate the data tables for the API lookups.

## Installation

See and follow notes: **C:\GitHub\configuration\Packages\MySQL-Installation-CentOS.docx**

These instructions include creation of *root* and *earl* MySQL users.

### Virtual environment complications

Installation in virtual environment

(DjangoEnv)

**[675 efg chidata 2015-01-09 14:06:42 /home/efg]**

pip install --upgrade pip

You are using pip version 6.0.2, however version 6.0.6 is available.

You should consider upgrading via the 'pip install --upgrade pip' command.

(DjangoEnv)

**[676 efg chidata 2015-01-09 14:06:49 /home/efg]**

pip uninstall django

(DjangoEnv)

**[677 efg chidata 2015-01-09 14:07:29 /home/efg]**

pip install mysql-python

Collecting mysql-python

Downloading MySQL-python-1.2.5.zip (108kB)

100% |################################| 110kB 2.7MB/s

Installing collected packages: mysql-python

Running setup.py install for mysql-python

building '\_mysql' extension

gcc -pthread -fno-strict-aliasing -g -O2 -DNDEBUG -g -fwrapv -O3 -Wall -Wstrict-prototypes -fPIC -Dversion\_info=(1,2,5,'final',1) -D\_\_version\_\_=1.2.5 -I/usr/include/mysql -I/opt/python/python278/include/python2.7 -c \_mysql.c -o build/temp.linux-x86\_64-2.7/\_mysql.o -g -pipe -Wp,-D\_FORTIFY\_SOURCE=2 -fexceptions -fstack-protector --param=ssp-buffer-size=4 -m64 -fPIC -g -fabi-version=2 -fno-omit-frame-pointer -fno-strict-aliasing -DMY\_PTHREAD\_FASTMUTEX=1

In file included from /usr/include/mysql/my\_config.h:27,

from \_mysql.c:44:

/usr/include/mysql/my\_config\_x86\_64.h:442:1: warning: "HAVE\_WCSCOLL" redefined

In file included from /opt/python/python278/include/python2.7/Python.h:8,

from \_mysql.c:29:

/opt/python/python278/include/python2.7/pyconfig.h:911:1: warning: this is the location of the previous definition

gcc -pthread -shared build/temp.linux-x86\_64-2.7/\_mysql.o -L/usr/lib64/mysql -L/opt/python/python278/lib -lmysqlclient -lpthread -lm -lrt -ldl -lpython2.7 -o build/lib.linux-x86\_64-2.7/\_mysql.so

Successfully installed mysql-python-1.2.5

(DjangoEnv)

**[678 efg chidata 2015-01-09 14:10:02 /home/efg]**

pip install django

Collecting django

Downloading Django-1.7.2-py2.py3-none-any.whl (7.4MB)

100% |################################| 7.4MB 724kB/s

Installing collected packages: django

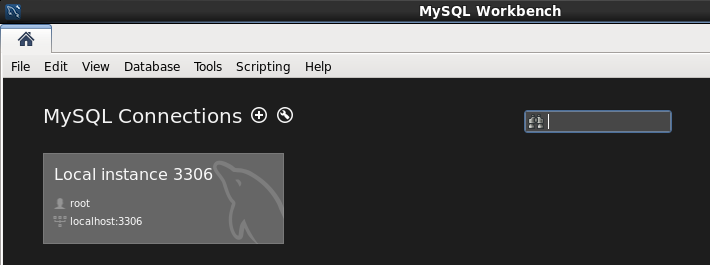
Successfully installed django-1.7.2

## Add django MySQL user

Start MySQL Workbench.



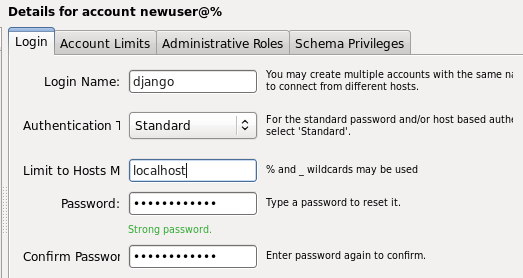




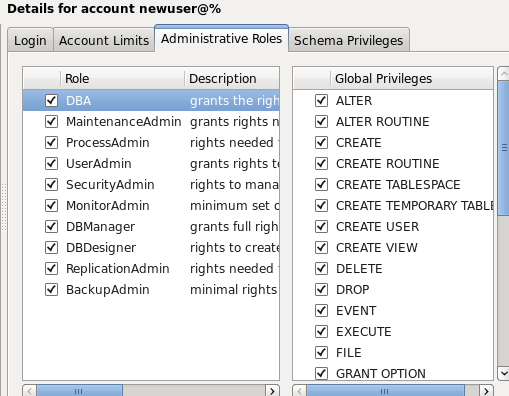
Select **Local instance**

Add *django* user ID to MySQL: **Server | Users and Privileges**

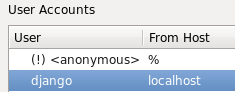




django | password







## Create Empty CHI Database

In query window in MySQL Workbench:

**create database CHI**; <ctrl><enter>



## Look at SQLite transition to MySQL

The file **/opt/django/umkcchiapi/apiapp/models.py** defines the tables needed for the APIs. This file contains the definitions for **SocioEcon** and **FoodDesert** classes.

Change DATABASES definition in file **/opt/django/umkcchiapi/umkcchiapi/settings.py**.

Original definition for local SQLITE: database:

DATABASES = {

'default': {

'ENGINE': 'django.db.backends.sqlite3',

'NAME': os.path.join(BASE\_DIR, 'apitest-db.sqlite3'),

}

}

### Local MySQL Database

New definition for local MySQL database

DATABASES = {

'default': {

'ENGINE' : 'django.db.backends.mysql',

'NAME' : 'CHI',

'USER' : 'django',

'PASSWORD': 'Tasty#3#Pie7',

'HOST' : 'localhost',

'PORT' : '3306',

}

}

### Remote MySQL Database

[complete for chidata server]

### Verify connectivity

(DjangoEnv)

**[677 efg chidata 2015-01-09 12:04:01 /opt/django/umkcchiapi/umkcchiapi]**

python

Python 2.7.8 (default, Dec 22 2014, 12:48:35)

[GCC 4.4.7 20120313 (Red Hat 4.4.7-11)] on linux2

Type "help", "copyright", "credits" or "license" for more information.

>>> from distutils.sysconfig import get\_python\_lib

>>> print(get\_python\_lib())

/opt/virtualenv/DjangoEnv/lib/python2.7/site-packages

>>> quit

(DjangoEnv)

**[680 efg chidata 2015-01-09 13:18:04 /opt/virtualenv/DjangoEnv/lib/python2.7/site-packages/django/db/backends]**

ll

total 292

. . .

drwxrwxr-x. 2 efg efg 4096 Dec 23 11:15 mysql/

. . .

drwxrwxr-x. 2 efg efg 4096 Dec 23 11:15 sqlite3/

. . .

## Tell Django to create MySQL tables

Python classes are defined in **/opt/django/umkcchiapi/apiapp/models.py**

### Table apiapp\_SocioEcon

If desired, delete the database and create again::

**[932 efg chidata 2015-01-13 15:16:29 /opt/django/umkcchiapi]**

workon DjangoEnv

(DjangoEnv)

**[933 efg chidata 2015-01-13 15:16:34 /opt/django/umkcchiapi]**

./manage.py flush

You have requested a flush of the database.

This will IRREVERSIBLY DESTROY all data currently in the 'CHI' database,

and return each table to an empty state.

Are you sure you want to do this?

Type 'yes' to continue, or 'no' to cancel: yes

Installed 0 object(s) from 0 fixture(s)

class SocioEcon(models.Model):

state = models.CharField(max\_length=2, help\_text="State postal abbreviation")

zcta5 = models.CharField(max\_length=5, primary\_key=True, help\_text="5-digit ZIP Code Tabulation Area")

ZIPname = models.CharField(max\_length=40, help\_text="Name assigned to ZIP, associated with ZCTA")

County = models.CharField(max\_length=34, help\_text="County in which ZCTA all or mostly contained")

County2 = models.CharField(max\_length=30, blank=True, help\_text="Secondary county for ZCTA (mostly blank)")

MedianAge = models.DecimalField(max\_digits=3, decimal\_places=1, blank=True, null=True, help\_text="Median age [years]")

pctUnder18 = models.DecimalField(max\_digits=4, decimal\_places=1, blank=True, null=True, help\_text="% under age 18")

pctOver65 = models.DecimalField(max\_digits=4, decimal\_places=1, blank=True, null=True, help\_text="% 65 years and over")

pctWhite1 = models.DecimalField(max\_digits=4, decimal\_places=1, blank=True, null=True, help\_text="% White alone")

pctBlack1 = models.DecimalField(max\_digits=4, decimal\_places=1, blank=True, null=True, help\_text="% Black or African American")

pctAsian1 = models.DecimalField(max\_digits=4, decimal\_places=1, blank=True, null=True, help\_text="% Asian")

pctHispanicPop = models.DecimalField(max\_digits=4, decimal\_places=1, blank=True, null=True, help\_text="% Hispanic or Latino for any race")

MedianHHInc = models.DecimalField(max\_digits=6, decimal\_places=0, blank=True, null=True, help\_text="Median household income [$]")

MedianFamInc = models.DecimalField(max\_digits=6, decimal\_places=0, blank=True, null=True, help\_text="Median family income [$]")

PovUniverse = models.DecimalField(max\_digits=5, decimal\_places=0, blank=True, null=True, help\_text="Persons for whom poverty status is determined")

pctpoor = models.DecimalField(max\_digits=4, decimal\_places=1, blank=True, null=True, help\_text="% persons below poverty")

pctInCollege = models.DecimalField(max\_digits=4, decimal\_places=1, blank=True, null=True, help\_text="% in college or graduate school")

pctBachelorsormore = models.DecimalField(max\_digits=4, decimal\_places=1, blank=True, null=True, help\_text="% bachelor degree or higher")

pctForeignBorn = models.DecimalField(max\_digits=4, decimal\_places=1, blank=True, null=True, help\_text="% foreign born")

pctRenterOcc = models.DecimalField(max\_digits=4, decimal\_places=1, blank=True, null=True, help\_text="% renter-occupied units")

MedianHValue = models.DecimalField(max\_digits=7, decimal\_places=0, blank=True, null=True, help\_text="Median home value [$]")

MedianGrossRent = models.DecimalField(max\_digits=4, decimal\_places=0, blank=True, null=True, help\_text="Median gross rent [$]")

### Table apiapp\_FoodDeserts

class FoodDesert(models.Model):

CensusTract = models.CharField(max\_length=11, primary\_key=True, help\_text="Census Tract")

State = models.CharField(max\_length= 2, help\_text="State")

County = models.CharField(max\_length=21, help\_text="County")

LILATracts\_1And10 = models.IntegerField(help\_text="Low income and low access measured at 1 and 10 miles")

LILATracts\_halfAnd10 = models.IntegerField(help\_text="Low income and low access measured at 1/2 and 10 miles")

LILATracts\_1And20 = models.IntegerField(help\_text="Low income and low access measured at 1 and 20 miles")

LILATracts\_Vehicle = models.IntegerField(help\_text="Low income and low access using vehicle access")

Urban = models.IntegerField(help\_text="Urban tract")

Rural = models.IntegerField(help\_text="Rural tract")

LA1and10 = models.IntegerField(help\_text="Low access tract at 1 mile for urban areas or 10 miles for rural areas")

LAhalfand10 = models.IntegerField(help\_text="Low access tract at 1/2 mile for urban areas or 10 miles for rural areas")

LA1and20 = models.IntegerField(help\_text="Low access tract at 1 mile for urban areas or 20 miles for rural areas")

LATracts\_half = models.IntegerField(help\_text="Low access tract at 1/2 mile")

LATracts1 = models.IntegerField(help\_text="Low access tract at 1 mile")

LATracts10 = models.IntegerField(help\_text="Low access tract at 10 miles")

LATracts20 = models.IntegerField(help\_text="Low access tract at 20 miles")

HUNVFlag = models.IntegerField(help\_text="Vehicle access, tract with low rate")

GroupQuartersFlag = models.IntegerField(help\_text="Group quarters, tract with high share")

OHU2010 = models.IntegerField(help\_text="Housing units, total")

NUMGQTRS = models.IntegerField(null=True, blank=True, help\_text="Group quarters, tract population residing in, number")

PCTGQTRS = models.FloatField(null=True, blank=True, help\_text="Group quarters, tract population residing in, shar")

LowIncomeTracts = models.IntegerField(help\_text="Low income tract")

POP2010 = models.IntegerField(help\_text="Population, tract total")

UATYP10 = models.CharField(max\_length= 1, help\_text="Census urban area")

lapophalf = models.FloatField(help\_text="Low access, people at 1/2 mile, number")

lalowihalf = models.FloatField(help\_text="Low access, low-income people at 1/2 mile, number")

lakidshalf = models.FloatField(help\_text="Low access, children age 0-17 at 1/2 mile, number")

laseniorshalf = models.FloatField(help\_text="Low access, seniors age 65+ at 1/2 mile, number")

lahunvhalf = models.FloatField(help\_text="Vehicle access, housing units without and low access at 1/2 mile, number")

lapop1 = models.FloatField(help\_text="Low access, people at 1 mile, number")

lalowi1 = models.FloatField(help\_text="Low access, low-income people at 1 mile, number")

lakids1 = models.FloatField(help\_text="Low access, children age 0-17 at 1 mile, number")

laseniors1 = models.FloatField(help\_text="Low access, seniors age 65+ at 1 mile, number")

lahunv1 = models.FloatField(help\_text="Vehicle access, housing units without and low access at 1 mile, number")

lapop10 = models.FloatField(help\_text="Low access, people at 10 miles, number")

lalowi10 = models.FloatField(help\_text="Low access, low-income people at 10 miles, number")

lakids10 = models.FloatField(help\_text="Low access, children age 0-17 at 10 miles, number")

laseniors10 = models.FloatField(help\_text="Low access, seniors age 65+ at 10 miles, number")

lahunv10 = models.FloatField(help\_text="Vehicle access, housing units without and low access at 10 miles, number")

lapop20 = models.FloatField(help\_text="Low access, people at 20 miles, number")

lalowi20 = models.FloatField(help\_text="Low access, low-income people at 20 miles, number")

lakids20 = models.FloatField(help\_text="Low access, children age 0-17 at 20 miles, number")

laseniors20 = models.FloatField(help\_text="Low access, seniors age 65+ at 20 miles, number")

lahunv20 = models.FloatField(help\_text="Vehicle access, housing units without and low access at 20 miles, number")

### syncdb

**[688 efg chidata 2015-01-09 14:21:19 /opt/django/umkcchiapi]**

**./manage.py syncdb**

Operations to perform:

Synchronize unmigrated apps: apiapp

Apply all migrations: admin, contenttypes, tastypie, auth, sessions

Synchronizing apps without migrations:

Creating tables...

Creating table apiapp\_socioecon

Creating table apiapp\_fooddesert

Installing custom SQL...

Installing indexes...

Running migrations:

Applying contenttypes.0001\_initial... OK

Applying auth.0001\_initial... OK

Applying admin.0001\_initial... OK

Applying sessions.0001\_initial... OK

Applying tastypie.0001\_initial... OK

You have installed Django's auth system, and don't have any superusers defined.

Would you like to create one now? (yes/no): **yes**

Username (leave blank to use 'efg'):

Email address: glynne@umkc.edu

Password:

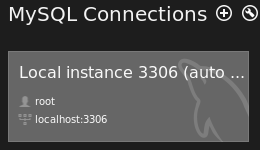
Password (again):

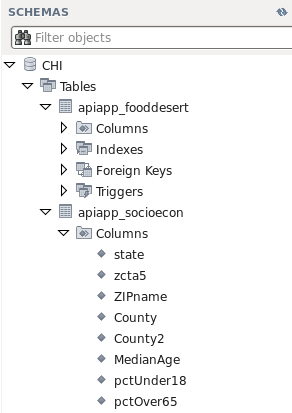
Superuser created successfully.

## Inspect MySQL Tables Created by Django









## Load MySQL Data Tables

### Local MySQL Database

If necessary, start the MySQL server:

http://www.niteshluharuka.com/2013/02/how-to-start-stop-mysql-server-on-centos-server/

**[884 efg chidata 2015-01-12 14:55:29 /home/efg]**

sudo /etc/init.d/mysqld start

Starting mysqld: [ OK ]

**SocioEconomic**

**[927 efg chidata 2015-01-12 15:51:03 /home/efg/2015/MySQL/SocioEconomic/Create-Load-Local]**

ll

total 5236

-rwxrwxr-x. 1 efg efg 171 Jan 12 14:41 SocioEconomic-Create.bash\*

-rw-rw-r--. 1 efg efg 922 Jan 12 15:43 SocioEconomic-Create.sql

-rwxrwxr-x. 1 efg efg 96 Jan 12 14:27 SocioEconomic-Load.bash\*

-rw-rw-r--. 1 efg efg 605 Jan 12 15:44 SocioEconomic-Load.sql

-rw-rw-r--. 1 efg efg 526 Jan 12 15:48 SocioEconomic-Load.txt

-rw-rw-r--. 1 efg efg 5340858 Jan 12 15:09 SocioEconomic-US.csv

The Create scripts are not usually needed since Django creates the table, so let's focus only on the Load scripts here.

**[929 efg chidata 2015-01-12 15:52:57 /home/efg/2015/MySQL/SocioEconomic/Create-Load-Local]**

cat \*Load.bash

#!/bin/bash

set -x

date

mysql -u earl -v < SocioEconomic-Load.sql > SocioEconomic-Load.txt

date

**[931 efg chidata 2015-01-12 15:53:46 /home/efg/2015/MySQL/SocioEconomic/Create-Load-Local]**

cat \*Load.sql

# ZCTA data from C:\Data\US-Government\Census-Bureau\Missouri-Census-Data-Center

use CHI;

LOAD DATA LOCAL INFILE '/home/efg/2015/MySQL/SocioEconomic/Create-Load-Local/SocioEconomic-US.csv'

INTO TABLE apiapp\_socioecon

FIELDS TERMINATED BY ',' OPTIONALLY ENCLOSED BY '"'

LINES TERMINATED BY '\n'

IGNORE 1 LINES # ignore headers

(state, zcta5, ZIPName, County, County2, MedianAge,

pctUnder18, pctOver65, pctWhite1, pctBlack1, pctAsian1, pctHispanicPop,

MedianHHInc, MedianFamInc, PovUniverse,

pctpoor, pctInCollege, pctBachelorsormore, pctForeignBorn, pctRenterOcc,

MedianHValue, MedianGrossRent)

The file to be loaded has 32,622 records.

**[932 efg chidata 2015-01-12 15:53:50 /home/efg/2015/MySQL/SocioEconomic/Create-Load-Local]**

wc -l \*US\*

32622 SocioEconomic-US.csv

**[924 efg chidata 2015-01-12 15:48:47 /home/efg/2015/MySQL/SocioEconomic/Create-Load-Local]**

./SocioEconomic-Load.bash

+ date

Mon Jan 12 15:48:49 CST 2015

+ mysql -u earl -v

+ date

Mon Jan 12 15:48:49 CST 2015

**[1008 efg chidata 2015-01-13 16:11:43 /home/efg/2015/MySQL/SocioEconomic/Create-Load-Local]**

cat \*.txt

--------------

LOAD DATA LOCAL INFILE '/home/efg/2015/MySQL/SocioEconomic/Create-Load-Local/SocioEconomic-US.csv'

INTO TABLE apiapp\_socioecon

FIELDS TERMINATED BY ',' OPTIONALLY ENCLOSED BY '"'

LINES TERMINATED BY '\n'

IGNORE 1 LINES

(state, zcta5, ZIPName, County, County2, MedianAge,

pctUnder18, pctOver65, pctWhite1, pctBlack1, pctAsian1, pctHispanicPop,

MedianHHInc, MedianFamInc, PovUniverse,

pctpoor, pctInCollege, pctBachelorsormore, pctForeignBorn, pctRenterOcc,

MedianHValue, MedianGrossRent)

--------------

Query OK, 32621 rows affected, 8059 warnings (0.52 sec)

Records: 32621 Deleted: 0 Skipped: 0 Warnings: 8059

--------------

SHOW WARNINGS

--------------

+---------+------+---------------------------------------------------------------------+

| Level | Code | Message |

+---------+------+---------------------------------------------------------------------+

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianHHInc' at row 3 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianFamInc' at row 3 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianHValue' at row 3 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 3 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 17 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 25 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianHHInc' at row 36 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianFamInc' at row 36 |

| Warning | 1366 | Incorrect decimal value: '' for column 'pctpoor' at row 36 |

| Warning | 1366 | Incorrect decimal value: '' for column 'pctRenterOcc' at row 36 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianHValue' at row 36 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 36 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianHHInc' at row 53 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianFamInc' at row 53 |

| Warning | 1366 | Incorrect decimal value: '' for column 'pctpoor' at row 53 |

| Warning | 1366 | Incorrect decimal value: '' for column 'pctRenterOcc' at row 53 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianHValue' at row 53 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 53 |

| Warning | 1366 | Incorrect decimal value: '' for column 'pctInCollege' at row 61 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianHValue' at row 61 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 61 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 79 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 89 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 90 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 91 |

| Warning | 1366 | Incorrect decimal value: '' for column 'pctInCollege' at row 101 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 111 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 119 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 121 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 140 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 142 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 152 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 174 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianHValue' at row 190 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianHValue' at row 221 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 225 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianHHInc' at row 287 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianFamInc' at row 287 |

| Warning | 1366 | Incorrect decimal value: '' for column 'pctInCollege' at row 287 |

| Warning | 1366 | Incorrect decimal value: '' for column 'pctRenterOcc' at row 287 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianHValue' at row 287 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 287 |

| Warning | 1366 | Incorrect decimal value: '' for column 'pctInCollege' at row 314 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 314 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 325 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianHValue' at row 369 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianHHInc' at row 399 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianFamInc' at row 399 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianHValue' at row 399 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 399 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianHHInc' at row 403 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianFamInc' at row 403 |

| Warning | 1366 | Incorrect decimal value: '' for column 'pctpoor' at row 403 |

| Warning | 1366 | Incorrect decimal value: '' for column 'pctRenterOcc' at row 403 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianHValue' at row 403 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 403 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianHValue' at row 417 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 417 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 447 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 456 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 462 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 467 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianGrossRent' at row 470 |

| Warning | 1366 | Incorrect decimal value: '' for column 'MedianAge' at row 472 |

+---------+------+---------------------------------------------------------------------+

64 rows in set (0.00 sec)

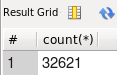
Bye

The above warnings were caused by missing values in the data.

Using MySQL Workbench, verify the table has the correct number of records:

USE CHI; <ctrl><enter>

select count(\*) from apiapp\_socioecon; <ctrl><enter>



**FoodDesert**

**[926 efg chidata 2015-01-13 16:14:41 /home/efg/2015/MySQL/FoodDeserts/Create-Load-Local]**

cat \*Load.bash

#!/bin/bash

# Create script not normally needed, since table is created by Django.

set -x

date

mysql -u earl -v -v -v < FoodDeserts-Load.sql > FoodDeserts-Load.txt

date

**[927 efg chidata 2015-01-13 16:15:59 /home/efg/2015/MySQL/FoodDeserts/Create-Load-Local]**

cat \*Load.sql

# MySQL script for loading USDA Food Access data

# http://www.ers.usda.gov/data-products/food-access-research-atlas/download-the-data.aspx

# Download script: 0-USDA-Food-Access-Data-Download.R

# Preprocessing script: 1-USDA-Food-Access-FirstLook.R

# (also extracts data from Excel and writes CSV file used here

# C:/Data/US-Government/USDA-Food/Data/Food-Access-Research-Atlas-Current.csv)

# UMKC Center for Health Insights

# Earl F Glynn, 2015-01-12

USE CHI;

LOAD DATA LOCAL INFILE '/home/efg/2015/MySQL/FoodDeserts/Create-Load-Local/Food-Access-Research-Atlas-Current.csv'

INTO TABLE apiapp\_fooddesert

FIELDS TERMINATED BY ',' OPTIONALLY ENCLOSED BY '"'

LINES TERMINATED BY '\n'

IGNORE 1 LINES # ignore headers

# For now do not read the "share" variables since they could be recomputed

(CensusTract,State,County,LILATracts\_1And10,LILATracts\_halfAnd10,

LILATracts\_1And20,LILATracts\_Vehicle,Urban,Rural,LA1and10,LAhalfand10,

LA1and20,LATracts\_half,LATracts1,LATracts10,LATracts20,HUNVFlag,

GroupQuartersFlag,OHU2010,@NA\_NUMGQTRS,@NA\_PCTGQTRS,LowIncomeTracts,

POP2010,UATYP10,lapophalf,@lapophalfshare,lalowihalf,@lalowihalfshare,

lakidshalf,@lakidshalfshare,laseniorshalf,@laseniorshalfshare,lahunvhalf,

@lahunvhalfshare,lapop1,@lapop1share,lalowi1,@lalowi1share,lakids1,

@lakids1share,laseniors1,@laseniors1share,lahunv1,@lahunv1share,lapop10,

@lapop10share,lalowi10,@lalowi10share,lakids10,@lakids10share,laseniors10,

@laseniors10share,lahunv10,@lahunv10share,lapop20,@lapop20share,lalowi20,

@lalowi20share,lakids20,@lakids20share,laseniors20,@laseniors20share,

lahunv20,@lahunv20share)

SET

# Special processing for 'NA's created via R's extraction of Excel values.

NUMGQTRS = IF(@NA\_NUMGQTRS = 'NA', NULL, CONVERT(@NA\_NUMGQTRS, UNSIGNED) ),

# Unclear why MySQL requires DECIMAL here instead of DOUBLE

PCTGQTRS = IF(@NA\_PCTGQTRS = 'NA', NULL, CONVERT(@NA\_PCTGQTRS, DECIMAL(10,8)) );

SHOW WARNINGS;

**[929 efg chidata 2015-01-13 16:17:19 /home/efg/2015/MySQL/FoodDeserts/Create-Load-Local]**

./FoodDeserts-Load.bash

+ date

Tue Jan 13 16:17:31 CST 2015

+ mysql -u earl -v -v -v

+ date

Tue Jan 13 16:17:34 CST 2015

**[938 efg chidata 2015-01-13 16:26:28 /home/efg/2015/MySQL/FoodDeserts/Create-Load-Local]**

cat \*Load.txt

--------------

LOAD DATA LOCAL INFILE '/home/efg/2015/MySQL/FoodDeserts/Create-Load-Local/Food-Access-Research-Atlas-Current.csv'

INTO TABLE apiapp\_fooddesert

FIELDS TERMINATED BY ',' OPTIONALLY ENCLOSED BY '"'

LINES TERMINATED BY '\n'

IGNORE 1 LINES

(CensusTract,State,County,LILATracts\_1And10,LILATracts\_halfAnd10,

LILATracts\_1And20,LILATracts\_Vehicle,Urban,Rural,LA1and10,LAhalfand10,

LA1and20,LATracts\_half,LATracts1,LATracts10,LATracts20,HUNVFlag,

GroupQuartersFlag,OHU2010,@NA\_NUMGQTRS,@NA\_PCTGQTRS,LowIncomeTracts,

POP2010,UATYP10,lapophalf,@lapophalfshare,lalowihalf,@lalowihalfshare,

lakidshalf,@lakidshalfshare,laseniorshalf,@laseniorshalfshare,lahunvhalf,

@lahunvhalfshare,lapop1,@lapop1share,lalowi1,@lalowi1share,lakids1,

@lakids1share,laseniors1,@laseniors1share,lahunv1,@lahunv1share,lapop10,

@lapop10share,lalowi10,@lalowi10share,lakids10,@lakids10share,laseniors10,

@laseniors10share,lahunv10,@lahunv10share,lapop20,@lapop20share,lalowi20,

@lalowi20share,lakids20,@lakids20share,laseniors20,@laseniors20share,

lahunv20,@lahunv20share)

SET

NUMGQTRS = IF(@NA\_NUMGQTRS = 'NA', NULL, CONVERT(@NA\_NUMGQTRS, UNSIGNED) ),

PCTGQTRS = IF(@NA\_PCTGQTRS = 'NA', NULL, CONVERT(@NA\_PCTGQTRS, DECIMAL(10,8)) )

--------------

Query OK, 72864 rows affected (1.93 sec)

Records: 72864 Deleted: 0 Skipped: 0 Warnings: 0

--------------

SHOW WARNINGS

--------------

Empty set (0.00 sec)

Bye

Verify load in MySQL:

select count(\*) from apiapp\_fooddesert;



### Remote MySQL Database

# Apache 2 Server

In the test environment Django apps are developed in the directory /home/efg/django and served with a development web server.

To approximate a production machine, Apache and WSGI must be configured (see next section).

Start/restart Apache server if necessary after killing the development server. Kill Apache server to return to development server.

**[393 efg localhost 2014-12-23 14:57:25 /home/efg/django/empty]**

sudo service httpd start

Starting httpd: httpd: Could not reliably determine the server's fully qualified domain name, using localhost.localdomain for ServerName

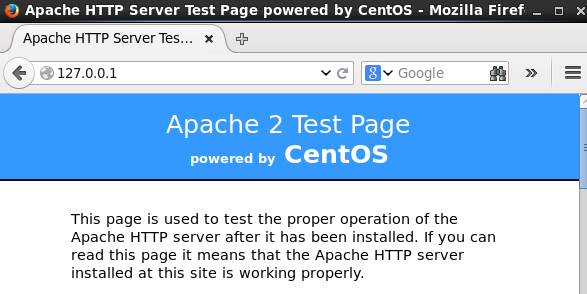
[ OK ]

Test in browser:

<http://localhost>

or

<http://127.0.0.1>



A local domain name, e.g., chidata, can be used, if desired, as long as VMware IP number is stable:

**[395 efg localhost 2014-12-23 14:59:19 /home/efg/django/empty]**

ifconfig | head -2

eth0 Link encap:Ethernet HWaddr 00:0C:29:B0:36:52

inet addr:134.193.160.182 Bcast:134.193.167.255 Mask:255.255.248.0

Add to /etc/hosts and restart server:

**[398 efg localhost 2014-12-23 15:04:06 /home/efg]**

cat /etc/hosts

127.0.0.1 localhost localhost.localdomain localhost4 localhost4.localdomain4

::1 localhost localhost.localdomain localhost6 localhost6.localdomain6

134.193.160.182 chidata

**[399 efg localhost 2014-12-23 15:04:10 /home/efg]**

sudo service httpd restart

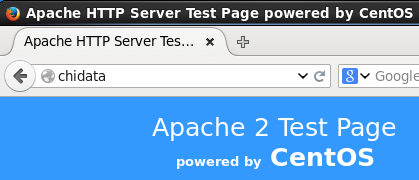
Stopping httpd: [ OK ]

Starting httpd: httpd: Could not reliably determine the server's fully qualified domain name, using localhost.localdomain for ServerName

[ OK ]

chidata is now redirected locally:

<http://chidata/>



## Apache log files

Consult the Apache log files whenever there are problems:

**/var/log/httpd/error\_log**

# WSGI (Web Server Gateway Interface)

Deploying Django with Apache and **mod\_wsgi** is the recommended way to get Django into production.

Installation Instructions  
<http://code.google.com/p/modwsgi/wiki/InstallationInstructions>

WSGI "Hello World" example  
<http://code.google.com/p/modwsgi/wiki/QuickConfigurationGuide>

Integration with Django  
<http://code.google.com/p/modwsgi/wiki/IntegrationWithDjango>

An improved WSGI script for use with Django  
<http://blog.dscpl.com.au/2010/03/improved-wsgi-script-for-use-with.html>

To approximate the production server, let's first copy the *umkcchiapi* Django application to the **/opt/django** directory using FTP from another machine.

NOTE: FTP does not maintain execute flags, so some may need to be reset.

**[442 efg localhost 2014-12-23 15:31:07 /opt/django/umkcchiapi]**

chmod +x index.wsgi

**[443 efg localhost 2014-12-23 15:31:23 /opt/django/umkcchiapi]**

chmod +x manage.py

**[444 efg localhost 2014-12-23 15:31:31 /opt/django/umkcchiapi]**

chmod +x wsgi.py

**[443 efg localhost 2014-12-23 15:23:27 /opt/django]**

tree umkcchiapi

umkcchiapi

├── apiapp

│   ├── admin.py

│   ├── \_\_init\_\_.py

│   ├── models.py

│   ├── tests.py

│   └── views.py

├── apitest-db.sqlite3

├── index.wsgi

├── manage.py

├── runserver

│   ├── admin.py

│   ├── \_\_init\_\_.py

│   ├── models.py

│   ├── tests.py

│   └── views.py

├── umkcchiapi

│   ├── api.py

│   ├── \_\_init\_\_.py

│   ├── settings.py

│   ├── urls.py

│   └── wsgi.py

└── wsgi.py

If running, kill the Apache server.

**[458 efg localhost 2014-12-23 15:56:37 /opt/django]**

sudo service httpd stop

Stopping httpd: [ OK ]

**[459 efg localhost 2014-12-23 15:56:46 /opt/django]**

cd umkcchiapi

**[460 efg localhost 2014-12-23 15:56:51 /opt/django/umkcchiapi]**

workon DjangoEnv

(DjangoEnv)

**[461 efg localhost 2014-12-23 15:56:58 /opt/django/umkcchiapi]**

./manage.py runserver

Performing system checks...

System check identified no issues (0 silenced).

December 23, 2014 - 15:57:07

Django version 1.7.1, using settings 'umkcchiapi.settings'

Starting development server at http://127.0.0.1:8000/

Quit the server with CONTROL-C.

See development server tests in **/opt/django/umkcchiapi/DemoNotes.txt**, including ….

<http://127.0.0.1:8000/admin/>

<http://localhost:8000/api/fooddesert/v1/29095004300/?format=json>

<http://localhost:8000/api/socioecon/v1/64108/?format=json>

If the above URLs produce appropriate output, the development server still works with the copied app.

**[465 efg localhost 2014-12-23 16:09:43 /home/efg]**

deactivate

**Kill development server** and close any associated browser windows.

## Check mod\_wsgi compatibility

This check should not be necessary if mod\_wsgi was re-compiled above to match the version of Python being used.

<https://docs.djangoproject.com/en/1.4/howto/deployment/wsgi/modwsgi/>

<https://www.linode.com/docs/websites/frameworks/django-apache-and-modwsgi-on-centos-5/>

The **mod\_wsgi** installed via yum may not be compatible with the version of Python being used.

<http://blog.stannard.net.au/2010/12/11/installing-django-with-apache-and-mod_wsgi-on-ubuntu-10-04/>

The version of python in the output should match the actual version of python you have installed.

**[486 efg localhost 2014-12-23 16:30:03 /home/efg]**

sudo find / -name mod\_wsgi.so -print

/home/efg/Software/wsgi/mod\_wsgi-3.5/.libs/mod\_wsgi.so

/usr/lib64/httpd/modules/mod\_wsgi.so

The first mod\_wsgi.so is from the original build location. The second is the one Apache needs.

Use *ldd* command to verify that **mod\_wsgi.so** is using a shared Python library:

**[487 efg localhost 2014-12-23 16:30:07 /home/efg]**

ldd /usr/lib64/httpd/modules/mod\_wsgi.so

linux-vdso.so.1 => (0x00007fffcbdff000)

libpython2.7.so.1.0 => /usr/lib64/libpython2.7.so.1.0 (0x00007faadf2f4000)

libpthread.so.0 => /lib64/libpthread.so.0 (0x00007faadf0d7000)

libdl.so.2 => /lib64/libdl.so.2 (0x00007faadeed2000)

libutil.so.1 => /lib64/libutil.so.1 (0x00007faadeccf000)

libm.so.6 => /lib64/libm.so.6 (0x00007faadea4b000)

libc.so.6 => /lib64/libc.so.6 (0x00007faade6b6000)

/lib64/ld-linux-x86-64.so.2 (0x00000036f1000000)

**[467 efg localhost 2014-12-23 16:16:38 /home/efg]**

ldd /opt/python/python278/lib/mod\_wsgi.so

linux-vdso.so.1 => (0x00007fff979ff000)

libpython2.7.so.1.0 => /usr/lib64/libpython2.7.so.1.0 (0x00007f47d8628000)

libpthread.so.0 => /lib64/libpthread.so.0 (0x00007f47d840b000)

libdl.so.2 => /lib64/libdl.so.2 (0x00007f47d8206000)

libutil.so.1 => /lib64/libutil.so.1 (0x00007f47d8003000)

libm.so.6 => /lib64/libm.so.6 (0x00007f47d7d7f000)

libc.so.6 => /lib64/libc.so.6 (0x00007f47d79ea000)

/lib64/ld-linux-x86-64.so.2 (0x00000036f1000000)

Verify the .so (shared object library) is in the expected directory:

**[468 efg localhost 2014-12-23 16:16:56 /home/efg]**

ll /usr/lib64/libpython2.7\*

lrwxrwxrwx. 1 root root 19 Dec 22 15:13 /usr/lib64/libpython2.7.so -> libpython2.7.so.1.0\*

-r-xr-xr-x. 1 root root 6060584 Dec 22 15:12 /usr/lib64/libpython2.7.so.1.0\*

## Create index.wsgi

This file tells Django where the virtual environment **DjangoEnv** is:

**[491 efg localhost 2014-12-23 16:37:44 /opt/django/umkcchiapi]**

cat index.wsgi

import os

import sys

import site

# Add the site-packages of the chosen virtualenv to work with

site.addsitedir('/opt/virtualenv/DjangoEnv/lib/python2.7/site-packages')

# Add the app's directory to the PYTHONPATH

path = '/opt/django/umkcchiapi'

if path not in sys.path:

sys.path.append(path)

path = '/opt/django/umkcchiapi/umkcchiapi'

if path not in sys.path:

sys.path.append(path)

os.environ['DJANGO\_SETTINGS\_MODULE'] = 'umkcchiapi.settings'

# activate your virtual env

activate\_env='/opt/virtualenv/DjangoEnv/bin/activate\_this.py'

execfile(activate\_env, dict(\_\_file\_\_=activate\_env))

import django.core.handler.wsgi

application = django.core.handlers.wsgi.WSGIHandler()

## Edit Apache configuration file

### Location of Apache configuration file

**[495 efg localhost 2014-12-23 16:41:24 /opt/django]**

httpd -V | grep HTTPD\_ROOT

-D HTTPD\_ROOT="/etc/httpd"

**[496 efg localhost 2014-12-23 16:41:29 /opt/django]**

httpd -V | grep SERVER\_CONFIG\_FILE

-D SERVER\_CONFIG\_FILE="conf/httpd.conf"

So we want to look at file /etc/httpd/conf/httpd.conf.

### Create static and images directories

**[501 efg localhost 2014-12-23 16:44:09 /opt/django]**

sudo mkdir /var/www/html/static

**[502 efg localhost 2014-12-23 16:44:21 /opt/django]**

sudo mkdir /var/www/html/images

**Fix Django admin CSS (may be a better way)**

<http://stackoverflow.com/questions/16986384/cant-get-django-admin-to-find-static-files-css-img-js-on-apache>

**[504 efg localhost 2014-12-23 16:45:46 /var/www/html/static]**

sudo cp -R /opt/virtualenv/DjangoEnv/lib/python2.7/site-packages/django/contrib/admin/static/admin/ .

**[505 efg localhost 2014-12-23 16:46:01 /var/www/html/static]**

cd admin

**[506 efg localhost 2014-12-23 16:46:09 /var/www/html/static/admin]**

ll

total 12

drwxr-xr-x. 2 root root 4096 Dec 23 16:46 css/

drwxr-xr-x. 3 root root 4096 Dec 23 16:46 img/

drwxr-xr-x. 3 root root 4096 Dec 23 16:46 js/

### Modify httpd.conf

<https://docs.djangoproject.com/en/dev/howto/deployment/wsgi/modwsgi/>   
<http://www.davidcraddock.net/2009/03/30/virutalhosts-on-centos/>   
<http://code.google.com/p/modwsgi/wiki/ConfigurationGuidelines>

A **LoadModule** statement does NOT need to be added to **httpd.conf** since it exists in the **wsgi.conf** file:

**[514 efg localhost 2014-12-23 16:50:32 /etc/httpd/conf.d]**

cat wsgi.conf

LoadModule wsgi\_module modules/mod\_wsgi.so

Apache modules like **mod\_wsgi.so** are all in **/usr/lib64/httpd/modules**.

Add to the bottom of **/etc/httpd/conf/httpd.conf**:

For the development virtual machine:

ServerName chidata:80

. . .

<VirtualHost \*:80>

ServerName **chidata**

DocumentRoot /var/www/html

WSGIScriptAlias / **/opt/django/umkcchiapi**/wsgi.py

<Directory **/opt/django/umkcchiapi**>

<Files index.wsgi>

Order allow,deny

Allow from all

</Files>

</Directory>

<Directory **/var/www/html/static**>

Order deny,allow

Allow from all

</Directory>

<Directory **/var/www/html/images**>

Order deny,allow

Allow from all

</Directory>

# Static directory needed for CSS for Admin interface

Alias /static/ **/var/www/html/**static/

Alias /images/ **/var/www/html/**images/

</VirtualHost>

WSGIPassAuthorization On

Slight changes are needed in this file on the production server.

## Modify .bashrc

Most sources say to put these modification in **.bash\_profile** but they just do not work from there on the CentOS boxes I use. The modifications seem to work from **.bashrc**:

<http://thecodeship.com/deployment/deploy-django-apache-virtualenv-and-mod_wsgi/>

**[520 efg localhost 2014-12-23 16:55:13 /home/efg]**

tail -5 .bashrc

# virtualenvwrapper

# http://thecodeship.com/deployment/deploy-django-apache-virtualenv-and-mod\_wsgi/

export WORKON\_HOME=/opt/virtualenv

source `which virtualenvwrapper.sh`

## Start Apache server

**[521 efg localhost 2014-12-23 16:56:23 /home/efg]**

sudo service httpd start

Starting httpd: [ OK ]

View Django pages via Apache

<http://chidata/> or

<http://localhost/>



# Quick Tests

If necessary restart local MySQL server:

**[1001 efg chidata 2015-01-13 16:48:42 /home/efg]**

sudo /etc/init.d/mysqld start

Starting mysqld: [ OK ]

If necessary when working with Apache server:

**[1003 efg chidata 2015-01-13 16:55:58 /home/efg]**

sudo service httpd start

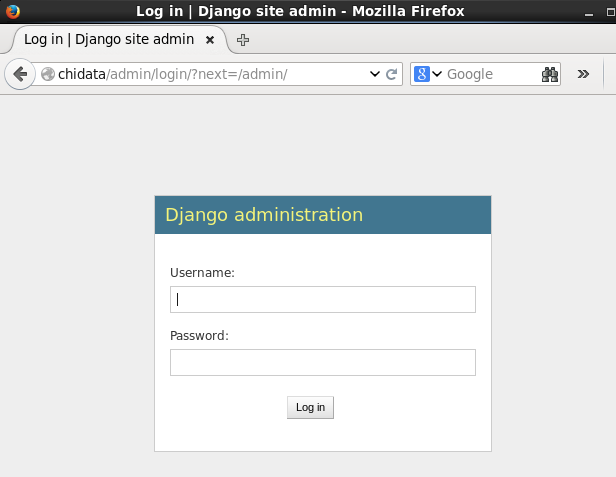
Starting httpd: [ OK ]

## Django admin

Browse to … (Use only localhost with Apache)

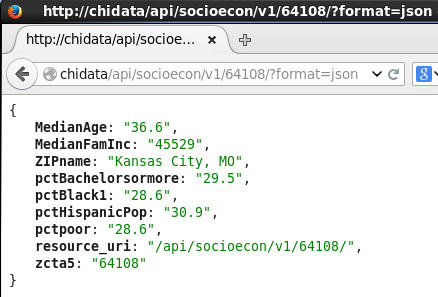
<http://localhost/admin>

<http://localhost/admin/login/?next=/admin/>



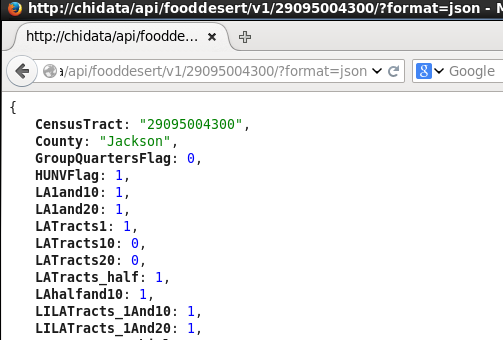
## SocioEcon API

<http://localhost/api/socioecon/v1/64108/?format=json>



## Food Desert API

<http://chidata/api/fooddesert/v1/29095004300/?format=json>



## Troubleshooting SQLite Development Database

Development Database location: **/opt/django/umkcchiapi/apitest-db.sqlite3**

### sqLite3 Command Line

**[668 efg chidata 2015-01-08 15:27:46 /opt/django/umkcchiapi]**

sqlite3 apitest-db.sqlite3

SQLite version 3.6.20

Enter ".help" for instructions

Enter SQL statements terminated with a ";"

sqlite> .databases

seq name file

--- --------------- ----------------------------------------------------------

0 main /opt/django/umkcchiapi/apitest-db.sqlite3

sqlite> .schema

CREATE TABLE "apiapp\_fooddesert" (

"CensusTract" varchar(11) NOT NULL PRIMARY KEY,

"State" varchar(2) NOT NULL,

"County" varchar(21) NOT NULL,

"LILATracts\_1And10" integer NOT NULL,

"LILATracts\_halfAnd10" integer NOT NULL,

"LILATracts\_1And20" integer NOT NULL,

"LILATracts\_Vehicle" integer NOT NULL,

"Urban" integer NOT NULL,

"Rural" integer NOT NULL,

"LA1and10" integer NOT NULL,

"LAhalfand10" integer NOT NULL,

"LA1and20" integer NOT NULL,

"LATracts\_half" integer NOT NULL,

"LATracts1" integer NOT NULL,

"LATracts10" integer NOT NULL,

"LATracts20" integer NOT NULL,

"HUNVFlag" integer NOT NULL,

"GroupQuartersFlag" integer NOT NULL,

"OHU2010" integer NOT NULL,

"NUMGQTRS" integer NOT NULL,

"PCTGQTRS" real NOT NULL,

"LowIncomeTracts" integer NOT NULL,

"POP2010" integer NOT NULL,

"UATYP10" varchar(1) NOT NULL,

"lapophalf" real NOT NULL,

"lalowihalf" real NOT NULL,

"lakidshalf" real NOT NULL,

"laseniorshalf" real NOT NULL,

"lahunvhalf" real NOT NULL,

"lapop1" real NOT NULL,

"lakids1" real NOT NULL,

"laseniors1" real NOT NULL,

"lahunv1" real NOT NULL,

"lapop10" real NOT NULL,

"lalowi10" real NOT NULL,

"lakids10" real NOT NULL,

"laseniors10" real NOT NULL,

"lahunv10" real NOT NULL,

"lapop20" real NOT NULL,

"lalowi20" real NOT NULL,

"lakids20" real NOT NULL,

"laseniors20" real NOT NULL,

"lahunv20" real NOT NULL

);

CREATE TABLE "apiapp\_socioecon" (

"state" varchar(2) NOT NULL,

"zcta5" varchar(5) NOT NULL PRIMARY KEY,

"ZIPname" varchar(40) NOT NULL,

"County" varchar(34) NOT NULL,

"County2" varchar(30) NOT NULL,

"MedianAge" decimal,

"pctUnder18" decimal,

"pctOver65" decimal,

"pctWhite1" decimal,

"pctBlack1" decimal,

"pctAsian1" decimal,

"pctHispanicPop" decimal,

"MedianHHInc" decimal,

"MedianFamInc" decimal,

"PovUniverse" decimal,

"pctpoor" decimal,

"pctInCollege" decimal,

"pctBachelorsormore" decimal,

"pctForeignBorn" decimal,

"pctRenterOcc" decimal,

"MedianHValue" decimal,

"MedianGrossRent" decimal

);

CREATE TABLE "auth\_group" ("id" integer NOT NULL PRIMARY KEY AUTOINCREMENT, "name" varchar(80) NOT NULL UNIQUE);

CREATE TABLE "auth\_group\_permissions" ("id" integer NOT NULL PRIMARY KEY AUTOINCREMENT, "group\_id" integer NOT NULL REFERENCES "auth\_group" ("id"), "permission\_id" integer NOT NULL REFERENCES "auth\_permission" ("id"), UNIQUE ("group\_id", "permission\_id"));

CREATE TABLE "auth\_permission" ("id" integer NOT NULL PRIMARY KEY AUTOINCREMENT, "name" varchar(50) NOT NULL, "content\_type\_id" integer NOT NULL REFERENCES "django\_content\_type" ("id"), "codename" varchar(100) NOT NULL, UNIQUE ("content\_type\_id", "codename"));

CREATE TABLE "auth\_user" ("id" integer NOT NULL PRIMARY KEY AUTOINCREMENT, "password" varchar(128) NOT NULL, "last\_login" datetime NOT NULL, "is\_superuser" bool NOT NULL, "username" varchar(30) NOT NULL UNIQUE, "first\_name" varchar(30) NOT NULL, "last\_name" varchar(30) NOT NULL, "email" varchar(75) NOT NULL, "is\_staff" bool NOT NULL, "is\_active" bool NOT NULL, "date\_joined" datetime NOT NULL);

CREATE TABLE "auth\_user\_groups" ("id" integer NOT NULL PRIMARY KEY AUTOINCREMENT, "user\_id" integer NOT NULL REFERENCES "auth\_user" ("id"), "group\_id" integer NOT NULL REFERENCES "auth\_group" ("id"), UNIQUE ("user\_id", "group\_id"));

CREATE TABLE "auth\_user\_user\_permissions" ("id" integer NOT NULL PRIMARY KEY AUTOINCREMENT, "user\_id" integer NOT NULL REFERENCES "auth\_user" ("id"), "permission\_id" integer NOT NULL REFERENCES "auth\_permission" ("id"), UNIQUE ("user\_id", "permission\_id"));

CREATE TABLE "django\_admin\_log" ("id" integer NOT NULL PRIMARY KEY AUTOINCREMENT, "action\_time" datetime NOT NULL, "object\_id" text NULL, "object\_repr" varchar(200) NOT NULL, "action\_flag" smallint unsigned NOT NULL, "change\_message" text NOT NULL, "content\_type\_id" integer NULL REFERENCES "django\_content\_type" ("id"), "user\_id" integer NOT NULL REFERENCES "auth\_user" ("id"));

CREATE TABLE "django\_content\_type" ("id" integer NOT NULL PRIMARY KEY AUTOINCREMENT, "name" varchar(100) NOT NULL, "app\_label" varchar(100) NOT NULL, "model" varchar(100) NOT NULL, UNIQUE ("app\_label", "model"));

CREATE TABLE "django\_migrations" ("id" integer NOT NULL PRIMARY KEY AUTOINCREMENT, "app" varchar(255) NOT NULL, "name" varchar(255) NOT NULL, "applied" datetime NOT NULL);

CREATE TABLE "django\_session" ("session\_key" varchar(40) NOT NULL PRIMARY KEY, "session\_data" text NOT NULL, "expire\_date" datetime NOT NULL);

CREATE TABLE "tastypie\_apiaccess" ("id" integer NOT NULL PRIMARY KEY AUTOINCREMENT, "identifier" varchar(255) NOT NULL, "url" varchar(255) NOT NULL, "request\_method" varchar(10) NOT NULL, "accessed" integer unsigned NOT NULL);

CREATE TABLE "tastypie\_apikey" ("id" integer NOT NULL PRIMARY KEY AUTOINCREMENT, "key" varchar(128) NOT NULL, "created" datetime NOT NULL, "user\_id" integer NOT NULL UNIQUE REFERENCES "auth\_user" ("id"));

CREATE INDEX auth\_group\_permissions\_0e939a4f ON "auth\_group\_permissions" ("group\_id");

CREATE INDEX auth\_group\_permissions\_8373b171 ON "auth\_group\_permissions" ("permission\_id");

CREATE INDEX auth\_permission\_417f1b1c ON "auth\_permission" ("content\_type\_id");

CREATE INDEX auth\_user\_groups\_0e939a4f ON "auth\_user\_groups" ("group\_id");

CREATE INDEX auth\_user\_groups\_e8701ad4 ON "auth\_user\_groups" ("user\_id");

CREATE INDEX auth\_user\_user\_permissions\_8373b171 ON "auth\_user\_user\_permissions" ("permission\_id");

CREATE INDEX auth\_user\_user\_permissions\_e8701ad4 ON "auth\_user\_user\_permissions" ("user\_id");

CREATE INDEX django\_admin\_log\_417f1b1c ON "django\_admin\_log" ("content\_type\_id");

CREATE INDEX django\_admin\_log\_e8701ad4 ON "django\_admin\_log" ("user\_id");

CREATE INDEX django\_session\_de54fa62 ON "django\_session" ("expire\_date");

CREATE INDEX tastypie\_apikey\_3c6e0b8a ON "tastypie\_apikey" ("key");

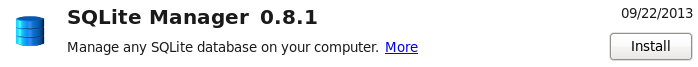
sqlite> .exit

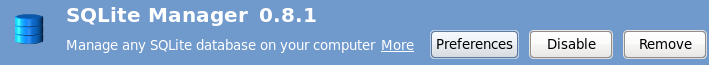
### SQLite Manager

On CentOS6 virtual machine

Firefox Add-on

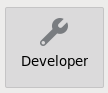
<https://addons.mozilla.org/en-US/firefox/addon/sqlite-manager/>







Right click on



Customize



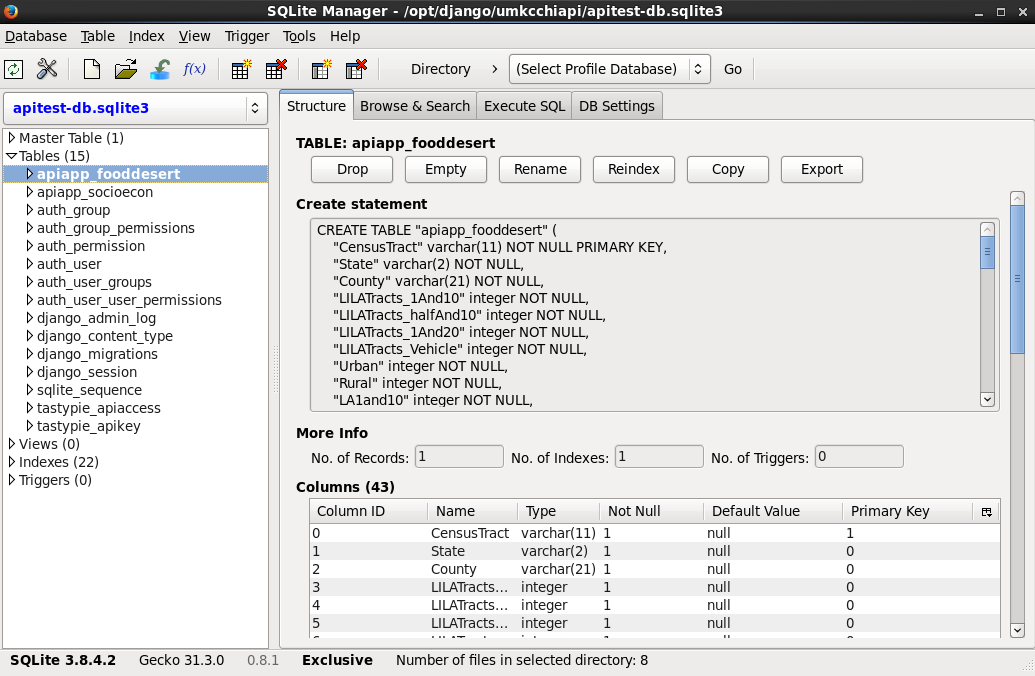
Right click: Add to Toobar

Start from Toolbar





Browse to **/opt/django/umkcchiapi/apitest-db.sqlite3**



## Troubleshooting MySQL Production Database

### Python

import MySQLdb

db = MySQLdb.connect(host="KC-ISIA-MySQL1", user="chidatauser", passwd="9s7Z3kRzAxp95oJHwII4", db="chidata")

cursor = db.cursor()

cursor.execute("SELECT VERSION()")

data = cursor.fetchone()

print "Database version: %s" % data

db.close()

quit()

**Database version: 5.6.18-enterprise-commercial-advanced-log**

import MySQLdb

db = MySQLdb.connect(host="KC-ISIA-MySQL1", user="chidatauser", passwd="9s7Z3kRzAxp95oJHwII4", db="chidata")

cursor = db.cursor()

cursor.execute("select zcta5, ZIPName from apiapp\_socioecon where zcta5='64014'")

data = cursor.fetchone()

print "Info: %s %s" % data

db.close()

quit()

# Problems / Fixes

## No module named MySQLdb

(DjangoEnv)

**[687 efg chidata 2015-01-09 13:24:53 /opt/django/umkcchiapi]**

./manage.py syncdb

. . .

File "/opt/virtualenv/DjangoEnv/lib/python2.7/site-packages/django/db/backends/mysql/base.py", line 17, in <module>

raise ImproperlyConfigured("Error loading MySQLdb module: %s" % e)

django.core.exceptions.ImproperlyConfigured: Error loading MySQLdb module: No module named MySQLdb

**Solution:**

<http://stackoverflow.com/questions/3243073/django-unable-to-find-mysqldb-python-module>

## Failed to map segment from shared object

[Fri Jan 16 10:34:57 2015] [error] [client ::1] **ImproperlyConfigured**: Error loading MySQLdb module: /opt/virtualenv/DjangoEnv/lib/python2.7/site-packages/\_mysql.so: failed to map segment from shared object: Permission denied

## No module named django.core.management

**Problem**

**[446 efg localhost 2014-12-23 15:31:41 /opt/django/umkcchiapi]**

./manage.py runserver

Traceback (most recent call last):

File "./manage.py", line 8, in <module>

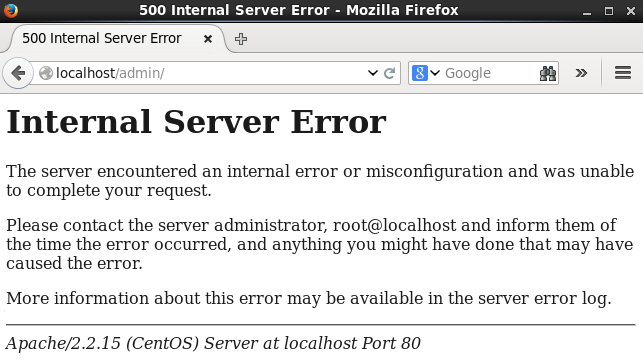
from django.core.management import execute\_from\_command\_line

**ImportError: No module named django.core.management**

**Solution: Activate virtual environment DjangoEnv**

## Internal Server Error (500)

Almost any Django/TastyPie problem can cause this error.



### Target WSGI cannot be loaded as Python module

<http://stackoverflow.com/questions/6454564/target-wsgi-script-cannot-be-loaded-as-python-module>

Tue Jan 13 17:00:05 2015] [error] [client ::1] mod\_wsgi (pid=4228): Target WSGI script '/opt/django/umkcchiapi/wsgi.py' cannot be loaded as Python module.

Fix1:

**[1003 efg chidata 2015-01-16 09:38:18 /opt/django/umkcchiapi]**

chmod +x wsgi.py

**Make root the owner of Django directory**

**[1004 efg chidata 2015-01-16 09:58:11 /opt/django/umkcchiapi]**

ll

total 104

drwxrwxr-x. 2 efg efg 4096 Jan 13 16:26 apiapp/

-rw-rw-r--. 1 efg efg 51200 Dec 23 15:23 apitest-db.sqlite3

-rw-rw-r--. 1 efg efg 26929 Dec 23 15:23 DemoNotes.txt

-rwxrwxr-x. 1 efg efg 682 Dec 23 15:23 index.wsgi\*

-rwxrwxr-x. 1 efg efg 253 Dec 23 15:23 manage.py\*

drwxrwxr-x. 2 efg efg 4096 Dec 23 15:23 runserver/

drwxrwxr-x. 2 efg efg 4096 Jan 9 13:25 umkcchiapi/

-rwxrwxr-x. 1 efg efg 844 Dec 23 15:23 wsgi.py\*

[1008 efg chidata 2015-01-16 10:30:06 /opt/django]

sudo chown -R root umkcchiapi

sudo chgrp –R root umkcchiapi

Fix2: SELinux conlict

<http://beginlinux.com/server_training/web-server/976-apache-and-selinux>

### SELinux fix: Shared Libraries

**Problem:**

In **/var/log/httpd/error\_log:**

[Mon Dec 29 09:38:23 2014] [error] [client ::1] ImportError: /opt/python/python278/lib/python2.7/lib-dynload/**operator.so**: failed to map segment from shared object: Permission denied

[Mon Dec 29 09:38:23 2014] [error] [client ::1] mod\_wsgi (pid=2851): Target WSGI script '/opt/django/umkcchiapi/**wsgi.py**' cannot be loaded as Python module.

[Mon Dec 29 09:38:23 2014] [error] [client ::1] mod\_wsgi (pid=2851): Exception occurred processing WSGI script '/opt/django/umkcchiapi/wsgi.py'.

<http://stackoverflow.com/questions/20919771/centos-6-4-failed-to-map-segment-from-shared-object-permission-denied>

**Solution:**

**[1063 efg chidata 2015-01-16 13:10:18 /opt/virtualenv/DjangoEnv/lib/python2.7/site-packages]**

ll -Z \*.so

-rwxrwxr-x. efg efg unconfined\_u:object\_r:usr\_t:s0 \_mysql.so\*

-rwxrwxr-x. efg efg unconfined\_u:object\_r:usr\_t:s0 \_yaml.so\*

**[1064 efg chidata 2015-01-16 13:10:42 /opt/virtualenv/DjangoEnv/lib/python2.7/site-packages]**

chcon -t shlib\_t \*.so

**[1065 efg chidata 2015-01-16 13:11:18 /opt/virtualenv/DjangoEnv/lib/python2.7/site-packages]**

ll -Z \*.so

-rwxrwxr-x. efg efg unconfined\_u:object\_r:lib\_t:s0 \_mysql.so\*

-rwxrwxr-x. efg efg unconfined\_u:object\_r:lib\_t:s0 \_yaml.so\*

**[550 efg chidata 2014-12-29 10:08:23 /opt/python/python278/lib/python2.7/lib-dynload]**

ls -Z operator.so

-rwxr-xr-x. efg efg unconfined\_u:object\_r:usr\_t:s0 operator.so

**[551 efg chidata 2014-12-29 10:09:51 /opt/python/python278/lib/python2.7/lib-dynload]**

sudo chcon -R -h -t httpd\_sys\_script\_exec\_t /opt/python/python278/lib/python2.7/lib-dynload/\*.so

**[552 efg chidata 2014-12-29 10:12:53 /opt/python/python278/lib/python2.7/lib-dynload]**

ls -Z operator.so

-rwxr-xr-x. efg efg unconfined\_u:object\_r:httpd\_sys\_script\_exec\_t:s0 operator.so

### Python modules

[Fri Jan 16 11:25:42 2015] [error] [client ::1] mod\_wsgi (pid=5357): Target WSGI script '/opt/django/umkcchiapi/wsgi.py' cannot be loaded as Python module.

**[1068 efg chidata 2015-01-16 13:17:42 /opt/django/umkcchiapi]**

ls -Z wsgi.py

-rwxrwxr-x. root root unconfined\_u:object\_r:httpd\_sys\_content\_t:s0 wsgi.py

**[1069 efg chidata 2015-01-16 13:17:52 /opt/django/umkcchiapi]**

sudo chcon -h -t httpd\_sys\_script\_exec\_t wsgi.py

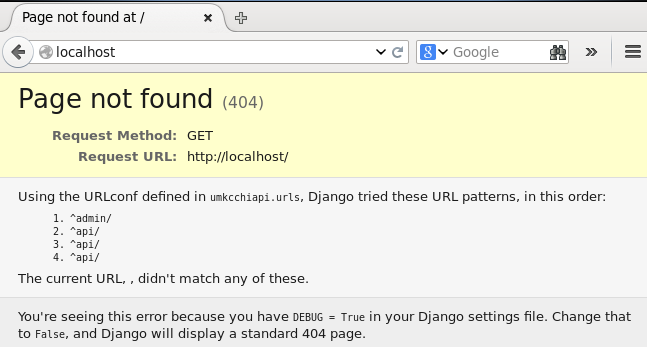
**[1070 efg chidata 2015-01-16 13:19:43 /opt/django/umkcchiapi]**

ls -Z wsgi.py

-rwxrwxr-x. root root unconfined\_u:object\_r:httpd\_sys\_script\_exec\_t:s0 wsgi.py

## Page not found (404)

**Problem**



**Solution**: This is not an error (for now). By design there is no API base page, but only API interface URLs.

## populate() isn't reentrant

[Fri Jan 16 10:57:09 2015] [error] [client ::1] RuntimeError: populate() isn't reentrant

Restart apache server. To troubleshoot, relax SELinux setting: sudo setenforce 0

## SELinux

Great SELINUX resources:

<http://rcorredorj.tumblr.com/post/61012813841/deploying-django-1-5-3-application-in-apache-via>

<http://beginlinux.com/server_training/web-server/976-apache-and-selinux>  
Great explanation of Apache and SELinux

Red Hat SELinux policy for mod\_wsgi  
<http://blog.endpoint.com/2010/02/selinux-httpd-modwsgi-26-rhel-centos-5.html>

<http://docs.fedoraproject.org/en-US/Fedora/13/html/SELinux_FAQ/index.html>

setenforce 0

setenforce 1

sestatus

sudo chown -R root python

sudo chgrp -R root python

<http://stackoverflow.com/questions/19576167/403-error-on-apache-server-with-django-application>

SELinux has its own system of granting access. Your process ever has to be granted to access files on filesystem depending on SELinux context. There are some default politics and contexts defined in SELinux those are usefull for default cases of your installation. Just web files are expected to be in '/var/www'. You can mostly check the current context of files or processes using switch '-Z'

The Apache HTTPD server is allowed to access files with SELinux type **httpd\_sys\_content\_**t but it is NOT allowed to access files with SELinux type var\_t.

### http\_sys\_content

[1018 efg chidata 2014-12-17 11:55:08 /opt/django]

ls -Z umkcchiapi

drwxr-xr-x. efg root unconfined\_u:object\_r:usr\_t:s0 apiapp

-rw-r--r--. efg root unconfined\_u:object\_r:usr\_t:s0 apitest-db.sqlite3

-rw-r--r--. efg root unconfined\_u:object\_r:usr\_t:s0 DemoNotes.txt

-rwxr-xr-x. efg root unconfined\_u:object\_r:usr\_t:s0 index.wsgi

-rw-r--r--. efg efg unconfined\_u:object\_r:usr\_t:s0 index.wsgi~

-rwxr-xr-x. efg root unconfined\_u:object\_r:usr\_t:s0 manage.py

drwxr-xr-x. efg root unconfined\_u:object\_r:usr\_t:s0 runserver

drwxr-xr-x. efg root unconfined\_u:object\_r:usr\_t:s0 umkcchiapi

<http://stackoverflow.com/questions/19576167/403-error-on-apache-server-with-django-application>

**[1020 efg chidata 2014-12-17 12:05:04 /opt/django]**

chcon -R -t httpd\_sys\_content\_t /opt/django/umkcchiapi

**[1021 efg chidata 2014-12-17 12:05:41 /opt/django]**

ls -Z /opt/django/umkcchiapi

drwxr-xr-x. efg root unconfined\_u:object\_r:httpd\_sys\_content\_t:s0 apiapp

-rw-r--r--. efg root unconfined\_u:object\_r:httpd\_sys\_content\_t:s0 apitest-db.sqlite3

-rw-r--r--. efg root unconfined\_u:object\_r:httpd\_sys\_content\_t:s0 DemoNotes.txt

-rwxr-xr-x. efg root unconfined\_u:object\_r:httpd\_sys\_content\_t:s0 index.wsgi

-rwxr-xr-x. efg root unconfined\_u:object\_r:httpd\_sys\_content\_t:s0 manage.py

drwxr-xr-x. efg root unconfined\_u:object\_r:httpd\_sys\_content\_t:s0 runserver

drwxr-xr-x. efg root unconfined\_u:object\_r:httpd\_sys\_content\_t:s0 umkcchiapi

### http\_sys\_script\_exec\_t

**[1073 efg chidata 2015-01-16 13:25:22 /opt/virtualenv/DjangoEnv/lib/python2.7/site-packages/MySQLdb]**

ll -Z

-rw-rw-r--. efg efg unconfined\_u:object\_r:usr\_t:s0 connections.py

-rw-rw-r--. efg efg unconfined\_u:object\_r:usr\_t:s0 connections.pyc

drwxrwxr-x. efg efg unconfined\_u:object\_r:usr\_t:s0 constants/

-rw-rw-r--. efg efg unconfined\_u:object\_r:usr\_t:s0 converters.py

-rw-rw-r--. efg efg unconfined\_u:object\_r:usr\_t:s0 converters.pyc

-rw-rw-r--. efg efg unconfined\_u:object\_r:usr\_t:s0 cursors.py

-rw-rw-r--. efg efg unconfined\_u:object\_r:usr\_t:s0 cursors.pyc

-rw-rw-r--. efg efg unconfined\_u:object\_r:usr\_t:s0 \_\_init\_\_.py

-rw-rw-r--. efg efg unconfined\_u:object\_r:usr\_t:s0 \_\_init\_\_.pyc

-rw-rw-r--. efg efg unconfined\_u:object\_r:usr\_t:s0 release.py

-rw-rw-r--. efg efg unconfined\_u:object\_r:usr\_t:s0 release.pyc

-rw-rw-r--. efg efg unconfined\_u:object\_r:usr\_t:s0 times.py

-rw-rw-r--. efg efg unconfined\_u:object\_r:usr\_t:s0 times.pyc

**[1074 efg chidata 2015-01-16 13:25:30 /opt/virtualenv/DjangoEnv/lib/python2.7/site-packages/MySQLdb]**

sudo chcon -h -t httpd\_sys\_script\_exec\_t \*.py

[1075 efg chidata 2015-01-16 13:26:18 /opt/virtualenv/DjangoEnv/lib/python2.7/site-packages/MySQLdb]

sudo chcon -h -t httpd\_sys\_script\_exec\_t \*.pyc

[1076 efg chidata 2015-01-16 13:26:21 /opt/virtualenv/DjangoEnv/lib/python2.7/site-packages/MySQLdb]

ll -Z

-rw-rw-r--. efg efg unconfined\_u:object\_r:httpd\_sys\_script\_exec\_t:s0 connections.py

-rw-rw-r--. efg efg unconfined\_u:object\_r:httpd\_sys\_script\_exec\_t:s0 connections.pyc

drwxrwxr-x. efg efg unconfined\_u:object\_r:usr\_t:s0 constants/

-rw-rw-r--. efg efg unconfined\_u:object\_r:httpd\_sys\_script\_exec\_t:s0 converters.py

-rw-rw-r--. efg efg unconfined\_u:object\_r:httpd\_sys\_script\_exec\_t:s0 converters.pyc

-rw-rw-r--. efg efg unconfined\_u:object\_r:httpd\_sys\_script\_exec\_t:s0 cursors.py

-rw-rw-r--. efg efg unconfined\_u:object\_r:httpd\_sys\_script\_exec\_t:s0 cursors.pyc

-rw-rw-r--. efg efg unconfined\_u:object\_r:httpd\_sys\_script\_exec\_t:s0 \_\_init\_\_.py

-rw-rw-r--. efg efg unconfined\_u:object\_r:httpd\_sys\_script\_exec\_t:s0 \_\_init\_\_.pyc

-rw-rw-r--. efg efg unconfined\_u:object\_r:httpd\_sys\_script\_exec\_t:s0 release.py

-rw-rw-r--. efg efg unconfined\_u:object\_r:httpd\_sys\_script\_exec\_t:s0 release.pyc

-rw-rw-r--. efg efg unconfined\_u:object\_r:httpd\_sys\_script\_exec\_t:s0 times.py

-rw-rw-r--. efg efg unconfined\_u:object\_r:httpd\_sys\_script\_exec\_t:s0 times.pyc

### httpd\_can\_network\_connect\_db

Problem: OperationalError: (2003, "Can't connect to MySQL server on 'localhost' (49)")

Solution to <http://stackoverflow.com/questions/1792918/weird-mysql-python-mod-wsgi-cant-connect-to-mysql-server-on-localhost-49-pr>

**[1007 efg chidata 2015-01-16 14:10:27 /home/efg]**

sudo setsebool -P httpd\_can\_network\_connect\_db on

<http://rcorredorj.tumblr.com/post/61012813841/deploying-django-1-5-3-application-in-apache-via>

[Deploying Django 1.5.3 application in Apache via mod\_wsgi, on a Fedora 18 and using virtualenv and DB MySQL](http://rcorredorj.tumblr.com/post/61012813841/deploying-django-1-5-3-application-in-apache-via)

This post is in English (finally!) and I would like to describe all what I have suffered configuring everything since ZERO. The only thing installed on my machine was the Fedora 18 with the graphical environment (GNOME). I hope I won’t loose any detail in order to be the most reproducible as possible. Let’s go to the configuration stuff !!

**1- Install and configure ‘Web Server’ and MySQL Database**

Using yum I installed the following packages:

$ sudo yum groupinstall “Web Server”  
$ sudo yum install make automake gcc gcc-c++ kernel-devel  
$ sudo yum install mysql-server mysql-devel

Enable services to be launched at system start-up and run them

$ sudo chkconfig httpd on  
$ sudo chkconfig mysqld on  
$ sudo service httpd start  
$ sudo service mysqld start

Verify that everything is working

$ sudo service httpd status$ sudo service mysqld status$ mysql —user root —execute “select version()”Configure database root password and basic stuff. Leave the test database in order to make tests with django.

$ sudo mysql\_secure\_installation

I wanted to put my applications in the $HOME/public\_html of an user so I changed the config of the server to use the web user directories. For that:

$ getsebool -a | grep httpd  
$ sudo setsebool -P httpd\_enable\_homedirs on# Read and make the modifications in the file /etc/httpd/conf.d/userdir.conf and restart the web server  
$ sudo service httpd restart

Create public\_html folder and assign permissions

$ mkdir ~/public\_html  
$ chmod 711 ~username  
$ chmod 755 ~/public\_html

**2- Install and configure Python, virtualenv, and Django**

Normally, global things with yum and easy\_install and local ones with pip

$ sudo yum install python  
$ sudo yum install python-setuptools python-devel  
$ sudo easy\_install pip  
$ sudo pip install virtualenv

Defining a virtualenv

$ mkdir ~/public\_html/testAppDjango  
$ cd ~/public\_html/testAppDjango  
$ virtualenv env —no-site-packages  
$ source env/bin/activate  
$ pip install django -U  
$ django-admin.py startproject testproject  
$ cd testproject  
$ python manage.py runserver 8000

By now it should run. Stop the server and continue

**3- Configuring connection to MySQL and the mod\_wsgi**

$ pip install MySQL-python$ sudo yum install mod\_wsgi$ python manage.py startapp testapp

# Modify the settings.py as follows:

- In DATABASES > ‘ENGINE’ : ‘django.db.backends.mysql’, ‘NAME’ : ‘test’, ‘USER’ : ‘root’, ‘PASSWORD’ : ‘password’, ‘HOST’ ; ‘localhost’, ‘PORT’ : ”  
  
- Activate admin in installed\_apps (make the same change in the urls.py file).  
  
The ones who knows a little bit of Django, knows what I’m talking about. Now, use your editor to create the following file. The most important one.

$ gedit /etc/httd/conf.d/testApp.conf

Insert the following text:

WSGIPythonPath /home/username/public\_html/testAppDjango/testproject:/home/username/public\_html/testAppDjango/env/lib/python2.7/site-packages  
  
<VirtualHost \*:80>  
  
    WSGIScriptAlias / /home/username/public\_html/testAppDjango/testproject/testproject/wsgi.py  
    Alias /static/ /home/username/public\_html/testAppDjango/testproject/testproject/static/  
    Alias /media/ /home/username/public\_html/testAppDjango/testproject/testproject/media/  
  
    <Directory /home/username/public\_html/testAppDjango/testproject>  
    <Files wsgi.py>  
        Order deny,allow  
        Allow from all  
    </Files>  
    </Directory>  
  
    <Directory /home/username/public\_html/testAppDjango/testproject/testproject/static/>  
        Order deny,allow  
        Allow from all  
    </Directory>  
  
    <Directory /home/username/public\_html/testAppDjango/testproject/testproject/media/>  
        Order deny,allow  
        Allow from all  
    </Directory>  
</VirtualHost>

Synchronize the database and see what happens in the browser http://localhost

$ python manage.py syncdb

**NOW IT SHOULD WORK BUT …. A 500 HTTP ERROR APPEARED IN THE BROWSER :(. Look in the Apache error log:**

$ sudo less /etc/httpd/logs/error\_log

In my server logs appeared the following #$f..ck@ error:

**Error Loading MySQLdb module: /home/username/public\_html/testAppDjango/env/lib/python2.7/site-packages/\_mysql.so: failed to map segment from shared object: Permission denied**

After a deep search on Google and some hopeless guides that told difficult things to recompile libraries and all that stuff I found that this problem is related to a security system included in Fedora the SELinux. Some people have deactivated it and their apps work, but my production server can’t be modified in that way so [other guy](http://www.haidongji.com/2011/04/03/selinux-and-failed-to-map-segment-from-shared-object-error)'s guide  and a little troubleshot in a website gave me some useful commands:

$ cd /home/username/public\_html/testAppDjango/env/lib/python2.7/site-packages/$ ll -Z# The \_mysql.so file shoud appear as a lib\_t not a httpd\_user\_content.  
# With the following it tells that is a shared lib:  
$ chcon -t shlib\_t \*.so

**NOW FOR ME IT WORKED!!**

Next, do some important things to display the website correctly and to maintain it:

$ cd ~/public\_html/testAppDjango/$ pip freeze > requirements.txt$ cd testproject/testproject$ mkdir static$ mkdir media$ cp ../../env/lib/python2.7/site-packages/django/contrib/admin/static/admin/\* .

Just if you want to verify, my only dependencies in requirements file are:  
Django==1.5.3  
MySQL-python==1.2.4  
wsgiref==0.1.2  
  
Hope this will be useful. RaC!