Introduction to Database Systems: CS305 Setting Up the Django Web Server

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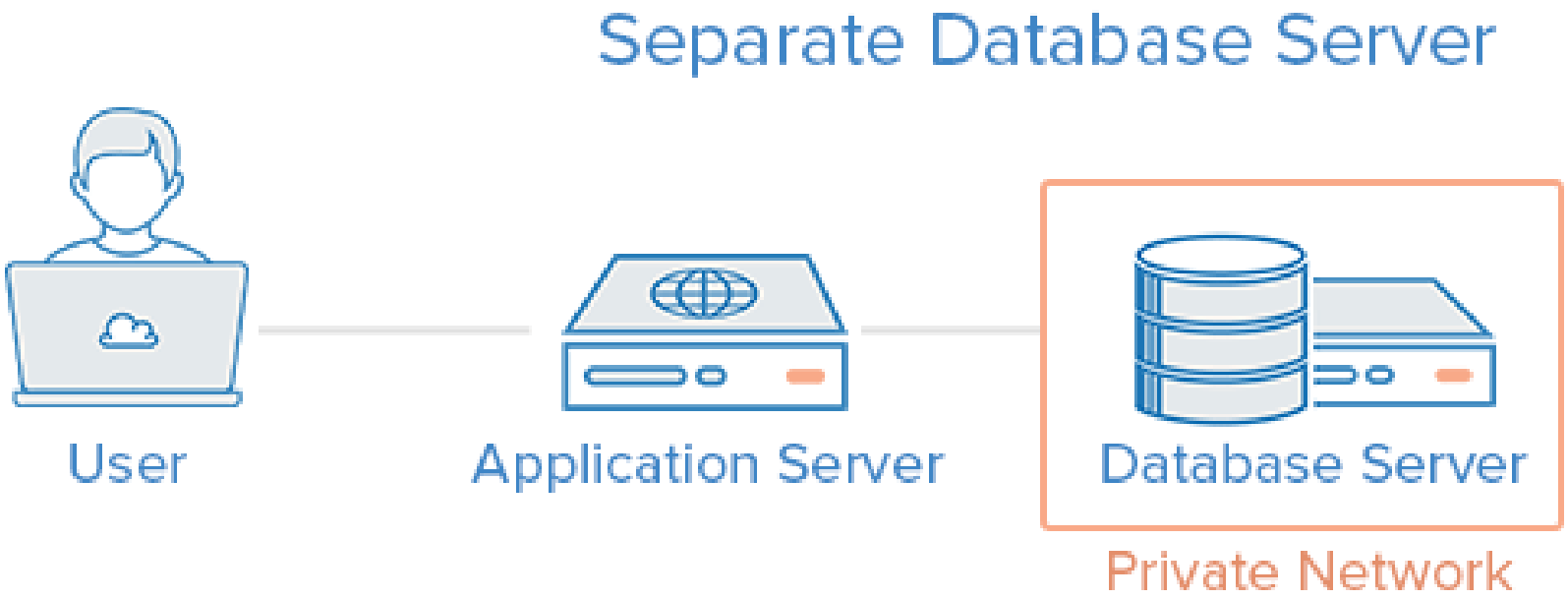
Databases Online

- People use online data
  - Purchasing: `www.amazon.com`
  - Entertainment: `www.netflix.com`
  - Social media: `www.myspace.com`
    - just kidding: `www.facebook.com`
  - Research: `www.uniprot.org`
  - Weather: `www.accuweather.com`
  - And many other forms of information are online!

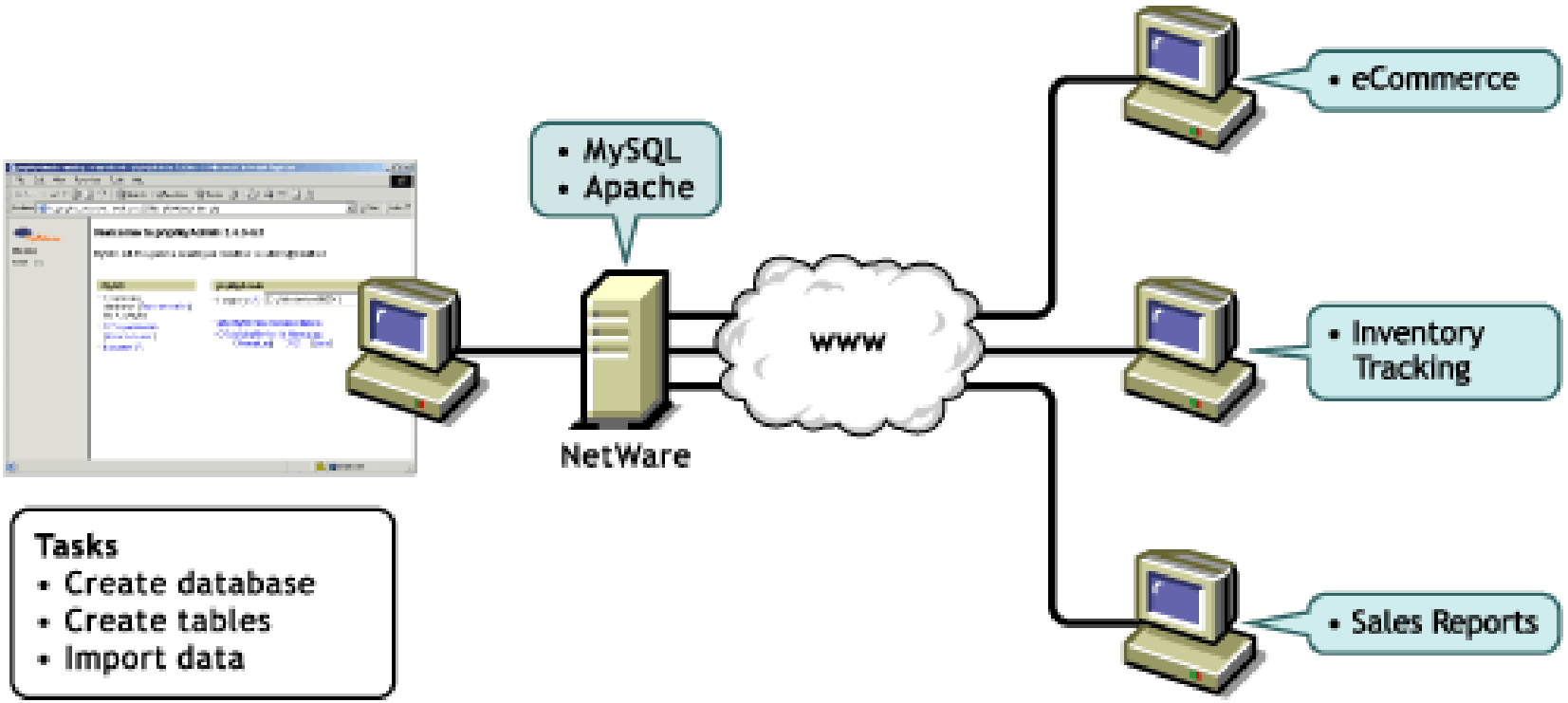
Where is the Database?

Humans indirectly use them



Where is the Database?

Computers use them



Cloud Resources

- Cloud technologies rely on databases

Django

An easy-to-create web site and online database server

- https://www.djangoproject.com/

Django: web server

Easy to build better Web apps more quickly and with less code.

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- Django is a high-level Python Web framework that encourages rapid development and clean, pragmatic design.
- Built by experienced developers, it takes care of much of the hassle of Web development, so you can focus on writing your app without needing to reinvent the wheel.
- It's free and open source.

Django: a sophisticated web server

Easy to build better Web apps more quickly and with less code.

- Designed for rapid development of applications with quick concept to completion.
- Includes dozens of extras:
  - common Web development tasks
  - user authentication
  - content administration
  - site maps
  - RSS feeds
  - DATABASE SUPPORT (more about that later)

Who Uses Django?

- Users
  - Companies, organizations and governments
  - Content management systems
  - Social networks
  - Scientific computing platforms ... *and more!*
  - Specifically...
  - `https:www.google.com/`
  - `https://www.youtube.com/`
  - `https://www.instagram.com/`
  - `https://www.spotify.com/`
  - `https://www.washingtonpost.com/` *and many others!*

Check out:
`https://www.shuup.com/en/blog/25-of-the-most-popular-python-and-django-websites/`

TODO, Today

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- We are going to install a virtual environment, from which to work
- Then install Django and setup an initial-state demo.

Pip: Used to install project software packages

Pip: the Python package installer

- The latest versions of Python (ver 3) come with pip
- To see if pip is already installed on your machine, type `piphelp`
- If pip is not already installed, try upgrading your Python to get a newer version.
- Alternatively, install pip yourself from source: `https://bootstrap.pypa.io/get-pip.py`

Steps to set up a project

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Steps

- Get into a *working* directory.
- Use pip to install virtual environment software to build a working space
- Setup a virtual environment in which to work
- Activate the virtual environment
- Use pip to install Django to build project
- Use Django to build a project
- Run the project

Get into a *working* directory

```
mkdir ~/djangoWorking/
cd ~/djangoWorking/
```

Python Virtual Environments

Another way to set up a virtual environment (called, "myvenv")

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Some versions of Python already have *virtualizing* software already installed

- `python -m venv myvenv`
- or, `python3 -m venv myvenv`

If not ...

If not then you may have to research how to implement a virtual environment on your machine

Steps to Set Up a Virtual Environment

MacOS and Linux Commands

Some commands may require sudo for *superuser*

- Setup: Create an environment `myenv` for use with python3

- `python3 -m venv myvenv`
- Or `python -m venv myvenv`

- Activate the environment

- `source myenv/bin/activate`

- Install the Django software packages. Done once for each `env`.

- `pip install django`
- Or, `pip3 install django`

Steps to Set Up a Virtual Environment

Windows Commands

- Setup: Create an environment `myenv` for use with python3

- `python3 -m venv myvenv`
- Or `python -mvenv myvenv`

- Activate the environment

- `cd myenv/Scripts/`
- Execute: `activate`

- Install the Django software packages. Done once for each `env`.

- `pip install django`
- Or, `pip3 install django`

Setting-up Django

Your terminal should now say, `(myenv)`

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Install Django in your `virtualenv`

```
python -m django --version # check version
#or, python3 -m django --version # check version
```

Create your first Django project!

```
django-admin startproject mysite
```

Use `manage.py` to run the webserver to see your project!

```
cd mysite/
# we are now in: djangoWorking/myenv/mysite
python  manage.py runserver
# or, python3 manage.py runserver
```

Use your browser to check your work

```
http://127.0.0.1:8000/
Control-c to exit
```

The Files of Your Project

Unix OS

```
find . -not -path '*/\.*'
-------------------------
./mysite
./mysite/manage.py
./mysite/mysite
./mysite/mysite/__init__.py
./mysite/mysite/settings.py
./mysite/mysite/urls.py
./mysite/mysite/wsgi.py
```

Notable Files

- `manage.py`: used to run the server
- `settings.py`: configuration file
- `urls.py`: used to connect url addresses to pages
- `wsgi.py`: web server gateway interface utils

The Output From manage.py

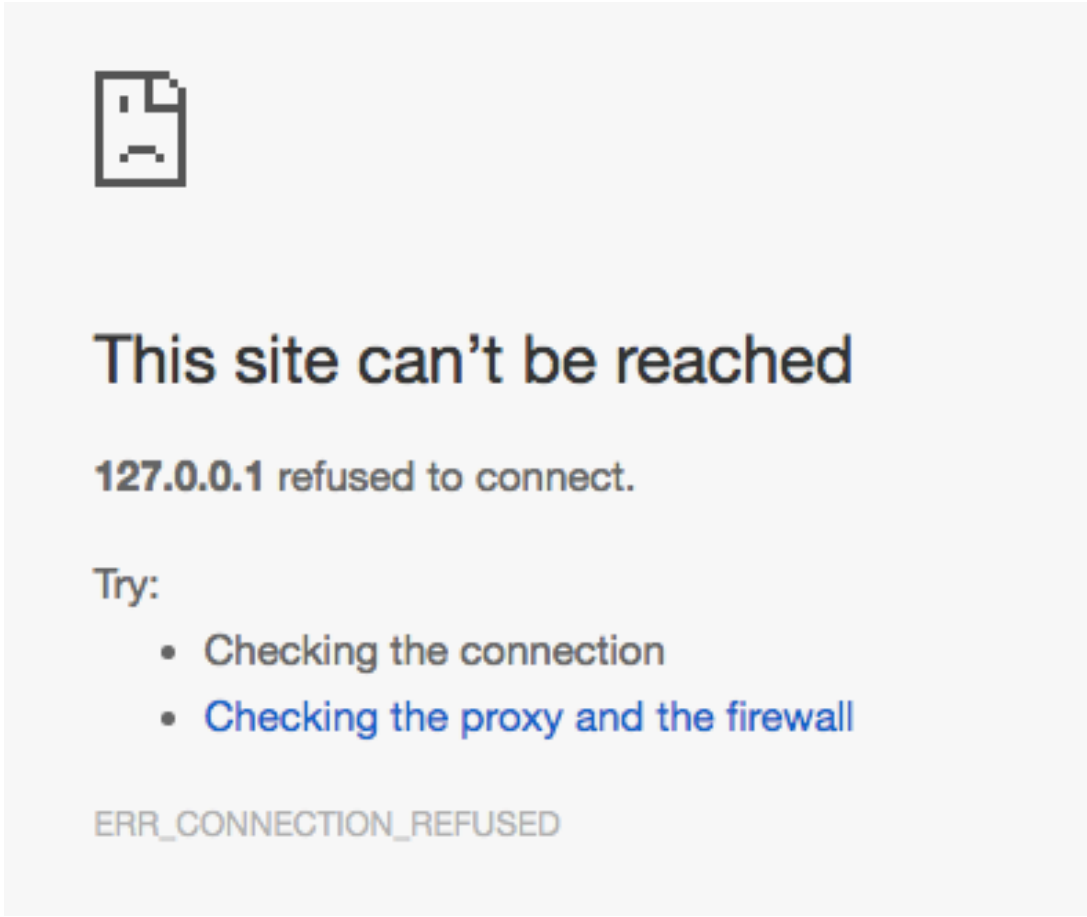
```
Watching for file changes with StatReloader
Performing system checks...

System check identified no issues (0 silenced).

You have 18 unapplied migration(s). Your project
may not work properly until you apply the migrations
for app(s): admin, auth, contenttypes, sessions.
Run 'python manage.py migrate' to apply them.
October 12, 2020 - 06:09:31

Django version 3.1.2, using settings 'mysite.settings'
Starting development server at http://127.0.0.1:8000/
Quit the server with CONTROL-C.
```

Yes! It Worked!

The install worked successfully! Congratulations!

You are seeing this page because DEBUG=True is in your settings file and you have not configured any URLs.

Rats! It Did Not Work!



- See: `https://docs.djangoproject.com/en/3.1/` or
- `https://www.djangoproject.com/start/`

Create a Super User to View Database

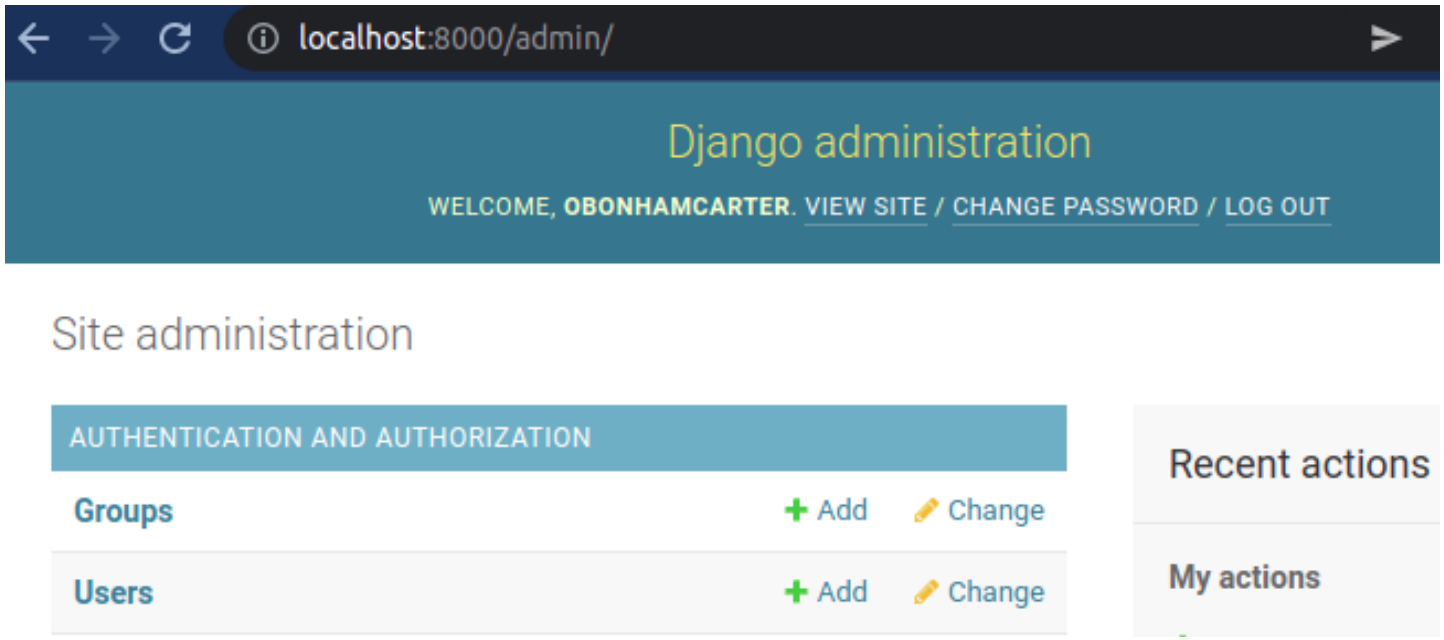
- Need to make a user for the site.

```
python3 manage.py migrate
python3 manage.py createsuperuser
```

- Migrate is to connect a database to the project to hold user (admin) data
- Username (leave blank to use 'user'): admin
- Email address: studentID@allegheny.edu
- Password: *"pass1234"*
- Password (again): *"pass1234"*
- Superuser created successfully.
- Now, look around the admin page, `http://127.0.0.1:8000/admin`

Create a Super User to View Database

- Let's take a look at the "stuff" that Django built to manage the website!
- Visit the Admin controls at `http://localhost:8000/admin/`
- Then visit the File `mysite/db.sqlite3` to check the database.



What could you do with a DB on a website!?!

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