Using Databases in the Web of Things Environment

Modified from Dinda's *Using Databases in the Web of Things Environment*

During this class, you will have accounts on the tlab, the Wilkinson lab, and on two of the resources in the Web Of Things (WOT) environment: Murphy and the Parkinson cluster. Murphy has been configured to support EECS 339 with relational databases, while Parkinson has been configured to support distributed databases.

Tlab? Wilkinson Lab? WOT? Murphy?

The Tlab ("Teaching Lab"), Tech F252, consists of workstation machines (tlab-01 and up) with very large monitors that you can use locally or remotely, and a server machine (tlab-login). This is the lab in the Tech building that is adjacent to the bridge to the Ford building.

The Wilkinson lab ("Wilk Lab"), Tech M338, consists of a range of workstation machines with very large monitors that you can use locally or remotely. Wilkinson also has huge amounts of project space and seating space to work collaboratively on a project.

The Web Of Things is a group of specialized servers, mobile phones, tablets, and sensor network nodes that are intended to support education in pervasive computing, sensing, and actuation. When not in use for a course, some of the mobile hardware is available to be checked out by students. The Web Of Things is supported by a Murphy Society grant.

For the class, you will be able to log into **murphy.wot.eecs.northwestern.edu.** Murphy is a Dell R410 with dual Xeon hexacore processors (24 hardware threads total), 128 GB of RAM, and 6 TB of RAID 5 storage. It's running the current release of Red Hat Enterprise Linux. The relational database engines that are installed include Oracle 11g Enterprise (the primary database we will use in the class), MySQL, and Postgres. Apache is installed and configured to serve individual user www directories, including CGI, and using suexec. Perl, Python, and PHP are installed and configured to support access to the Oracle and MySQL databases from CGI scripts.

Logging in

You can log into murphy from anywhere using an ssh client. The username and password are the same as you would use for the Wilkinson Lab or Tlab.

We assume in the class that you are using the "bash" shell, or a shell compatible with it. If not, you can contact systems support about changing your login shell, or you can run "bash" from your login shell to invoke bash.

What's in your home directory on Murphy?

Your home directory is the same as on the TLab or Wilkinson Lab machines – it's your shared home directory. If it does not already exist, you will want to create a subdirectory:

```
mkdir ~/www
chmod 711 ~/www
```

The contents of this directory (~/www) and all of its subdirectories will be served by apache as http://murphy-wot.eecs.northwestern.edu/~NID123 (where NID123 is your own netID). The directory is also CGI-enabled in Apache's configuration files. This means that any file you place in there with a .cgi, .pl, .py, or .php extension that is executable will be run by Apache when it is requested, instead of being simply sent verbatim to the web browser making the request. Apache has been configured with suexec, which means that your scripts will run as you.

Using MySQL on Murphy

MySQL is relatively straightforward to access on Murphy. For the class, we have established two databases, cs339data and cs339play, as well as a shared class account. The shared class account has read permissions on cs339data and both read and write permissions on cs339play. We will not create individual student accounts for MySQL automatically, but if you need one, please contact us.

To access mysql using the shared class account, run

```
mysql –u mhealth –p
```

After you type the password (which we will give you separately), you will see something like this:

```
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 29
Server version: 5.1.61 Source distribution

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Type 'help;' or '\h' for help. Type '\c' to clear the current
input statement.

mysql>
```

At the mysql prompt, you can now type sql commands. You'll need to first select a database:

```
mysql> use mhealthplay;
```

Then you can manipulate it:

```
mysql> create table students (id int, lastname varchar(32));
```