Exercise 0: Testing the installation

1. Test Apache: `http://localhost`

   If it is working you should see the OSGEO LiveDVD Welcome page.

2. Place phpinfo.php into `/usr/local/geomoose/htdocs/php`.

   This script simply calls `phpinfo()` which allows us to verify that Apache is processing PHP files correctly. Also, check this page to make sure that the sqlite3 module is installed. It is required by some of the services to keep track of features.

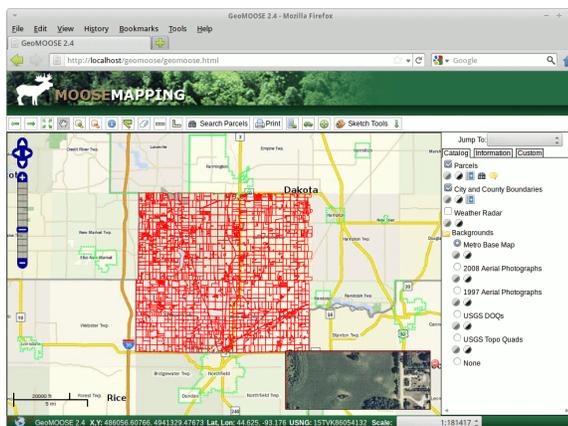   phpinfo.php:

   ```php
   <?php
   phpinfo();
   ?>
   ```

3. Test PHP: `http://localhost/geomoose/php/phpinfo.php`

   You should see a result similar to:

4. Test GeoMOOSE: `http://localhost/geomoose/geomoose.html`

   You should see GeoMOOSE load and display the initial map.

Exercise 1: Exploring the interface

Basic Tools

Note the tools in the toolbar above the map. If you hover over the tool you will see the tool's name. Try the various tools. There are two types of tools in GeoMOOSE. Some tools like "pan" and "zoom" stay active after they are selected. Other tools such as "Print" perform an immediate action and whatever tool was selected before remains active.

Other Tools/Services

Tools are also separated by if they are implemented in the client in JavaScript, or if they are implemented by querying the server. The tools that query the server are known as services.

Catalog

This is where the layers reside. Notice there are also tools available under each layer that apply to that particular layer.

Final Notes

All of the tools, services, and layers are configured in the Mapbook. We will explore the Mapbook later.

Exercise 2: Creating a new GeoMOOSE instance

So far we have been working with the demonstration install on the LiveDVD. For the purposes of the workshop, we will make a new installation so we can make changes without disturbing the demo. To do this, first copy the existing demo install to a new folder. Then, configure the new folder to update the paths stored in the configuration files. Finally, create a symlink so Apache can see the files in the htdocs directory.
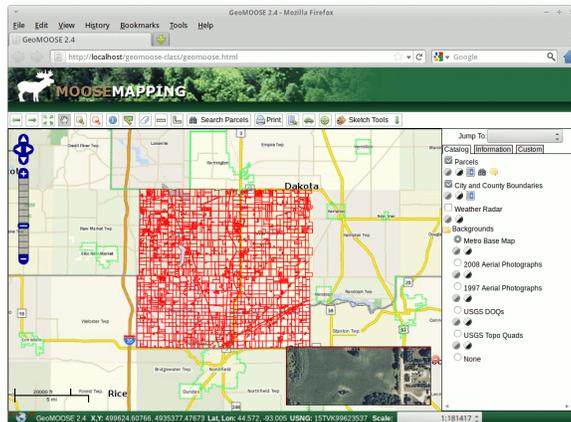
```
user@osgeo-live:/usr/local$ sudo cp -r geomoose geomoose-class
user@osgeo-live:/usr/local$ sudo chown -R user geomoose-class
user@osgeo-live:/usr/local$ cd geomoose-class
user@osgeo-live:/usr/local/geomoose-class$ ./configure --with-url-path=/geomoose-class \
                                    --with-temp-directory=/tmp/ \
                                    --with-mapfile-root=/usr/local/geomoose-class/maps/
configure: creating ./config.status
config.status: creating Makefile
config.status: creating ms4w/Apache/htdocs/geomoose2.pkg.html
config.status: creating conf/mapbook.xml
config.status: creating conf/mapbook_webmercator.xml
config.status: creating conf/settings.ini
```

```
config.status: creating geomoose2_httpd.conf
config.status: creating maps/temp_directory.map
user@osgeo-live:/usr/local/geomoose-class$ sudo ln -s /usr/local/geomoose-class/htdocs \
                                                        /var/www/geomoose-class

user@osgeo-live:/usr/local/geomoose-class$
```
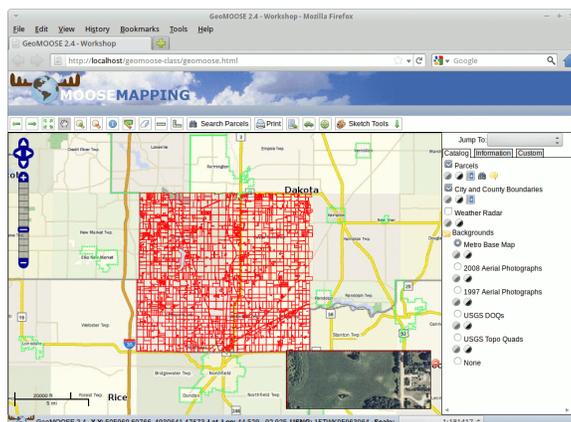
You should now be able to view the "new" interface at `http://localhost/geomoose-class/geomoose.html`.

Exercise 3: Customizing the interface

In this exercise we will customize the new interface. We will start by changing the title and skin. This is done in the `geomoose.html` file.

1. Open the `geomoose.html` file in the `htdocs` folder of the new geomoose-class instance in a text editor.

2. Navigate to the `<title>GeoMOOSE 2.4</title>` line and change it to read `<title>GeoMOOSE 2.4 - Workshop</title>`.

3. Now navigate to around line 45 where the skins are defined. Comment out the green skin and uncomment the blue skin. If you are familiar with CSS, take a look at the skin's CSS file.

4. Reload the geomoose-class page in the browser to see the changes

Exercise 4: Customizing the map

In this exercise we will customize the map display. To work with the layers we will be adding later, we need to change the project from EPSG:26915 (UTM 15) to EPSG:900913 (Web Mercator). We will also need to change the extents of the map to be the world, and allow the user to zoom out farther.

Changing the projection: The projection needs to be changed in two places. First in the `settings.ini` file in the `conf` directory. This file controls the PHP services. Open the settings.ini file in a text editor and change the line that reads `projection=EPSG:26915` to read `projection=EPSG:900913` and save the file.

Next, open the `mapbook.xml` file in a text editor. Find the line that sets the projection. Change the projection from `EPSG:26915` to `EPSG:900913`. It should look like

```
<param name="projection">EPSG:900913</param>
```

when you are done.

Changing the extents: Continuing in the mapbook, find the lines that configure the `max_extent` and `initial_extent`. Change both extents to `-20037508.34,-20037508.34,20037508.34,20037508.34`. It should look like

```
<param name="max_extent">-20037508.34,-20037508.34,20037508.34,20037508.34</param>
<param name="initial_extent">-20037508.34,-20037508.34,20037508.34,20037508.34</param>
```
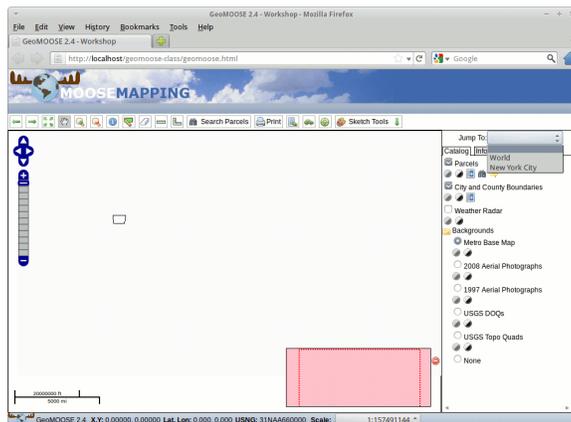
when you are done.

Changing the Jump To list: Continuing in the mapbook, find the lines that define the Jump To list. Change it to include entries for the world and New York City.

```
<param name="zoomto['Jump To:']"><![CDATA[
{
'World' : [-20037508.34,-20037508.34,20037508.34,20037508.34],
'New York City' : [-8242894,4965204,-8227290,4994963]
}
```

Adding to the available scales: Find the scales configuration parameter and change it to read

Wrap up: Look at the other parameters available in the `<configuration/>` section of the mapbook.

Test it: Reload the geomoose-class page.

Exercise 5: Adding a WMS layer

There are to parts to adding a layer to GeoMOOSE. First a `<map-source/>` must be defined to tell GeoMOOSE how to access the data. Then a `<layer/>` entry must be added to the catalog. This is split because the layer can be included in the catalog multiple times.
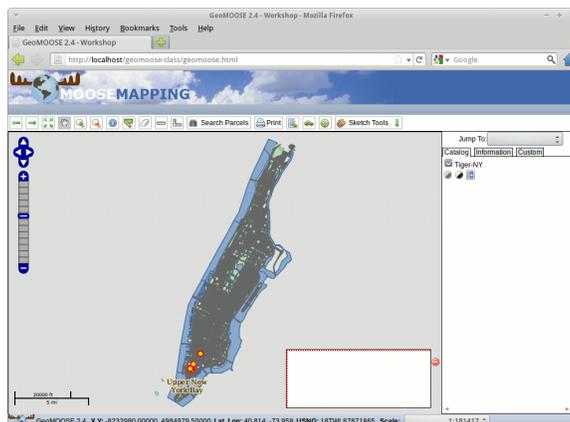
Adding the map-source: Under the definition for the highlight layer add the following to define the new map-source.

```
<map-source name="geoserver" type="wms">
<url>http://localhost:8082/geoserver/ows?</url>
<layer name="tiger-ny"/>
<param name="TRANSPARENT" value="true"/>
</map-source>
```

Adding the layer: Locate the `<catalog/>` section. Add the following to add the layer to the catalog.

```
<layer title="Tiger-NY" src="geoserver/tiger-ny" status="on"/>
```

Test it: Reload the geomoose-class page.

Exercise 6: Adding a MapServer Layer

Adding a MapServer layer is similar to adding a WMS layer. This has been the traditional way to add a layer to GeoMOOSE and still is more flexible than the WMS route. The main advantages with the MapServer route right now are that it gives you more control over the presentation (even if you are just laundering a WMS layer) and the standard services currently work better with MapServer layers. We are working on improving the WMS functionality for GeoMOOSE 2.6.

This exercise will add the countries layer from the Natural Earth dataset that is included on the LiveDVD. We will need to create a Mapfile to tell MapServer how to render the layer. Then we will add that layer to the catalog. Finally, we will intentionally break the layer to demonstrate how to troubleshoot typical problems.

Creating the Mapfile : We will reuse some of the architecture from the demo layers.

1. Under `/usr/local/geomoose-class/maps` create a directory called `natural_earth` and in `natural_earth` create a directory called `countries`.
2. Copy the MapServer Mapfile (`natural_earth.map`) into the `countries` directory. If you are familiar with MapServer, this is just a standard Mapfile. If you are not familiar with MapServer, this is just a text file.

Adding the layer to the Mapbook: This is similar to adding the WMS layer.

1. Open the mapbook in a text editor (`/usr/local/geomoose-class/conf/mapbook.xml`)
2. Add the natural-earth map-service above the `geoserver` service. Note: the order of the map-services controls the default draw order of the layers.

```
<map-source name="natural_earth" type="mapserver" queryable="true">
<file>./workshop/natural_earth/natural_earth.map</file>
<layer name="countries"/>
<param name="TRANSPARENT" value="true"/>
</map-source>
```

Figure 1: natural_earth.map

```
MAP
NAME 'natural_earth'
SIZE 800 650
STATUS ON
EXTENT -20037508.34 -20037508.34 20037508.34 20037508.34
        UNITS METERS

INCLUDE "../../geomoose_globals.map"

WEB
METADATA
'ows_title' 'Countries'
'ows_srs' 'EPSG:26915 EPSG:4326 EPSG:900913'
END
END

PROJECTION
'init=epsg:900913'
END

LEGEND
        STATUS ON
      LABEL
TYPE TRUETYPE
FONT vera_sans
SIZE 8
COLOR 0 0 0
      END
END

LAYER
    NAME 'countries'
    DATA '/home/user/data/natural_earth/10m_admin_0_countries'
    STATUS ON
    TYPE LINE
    MINSCALE 1000
    SYMBOLSCALE 200000
    PROJECTION
 "init=epsg:4326"
    END
    LABELITEM 'NAME'
      CLASS
 NAME "Country Boundary"
 STYLE
   SYMBOL 'circle'
   SIZE 3
   MINSIZE 3
   MAXSIZE 5
   COLOR 210 210 210
END
 STYLE
   SIZE 1
   MINSIZE 1
   MAXSIZE 3
   # WIDTH 1
   COLOR 50 50 50
END
        LABEL
 TYPE TRUETYPE
 FONT vera_sans-bold
 FORCE TRUE
 MINSIZE 8
 SIZE 10
 MAXSIZE 12
 COLOR 0 0 0
 OUTLINECOLOR 232 232 232
 BUFFER 4
        END
        END
END
END ## end Map
```
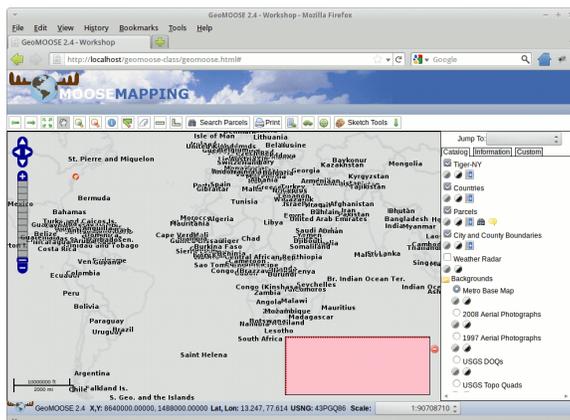
3. Add the layer to the catalog... maybe under the Tiger-NY layer, but really anywhere you want.

```
<layer title="Countries" src="natural_earth/countries" status="on"/>
```


Breaking it:

Break the Mapfile: Edit the `natural_earth.map` file and introduce an error somewhere. For example change `LAYER` to `LLAYER`. Reload the layer in the interface and see what it does. Look in Firebug and look for the link to the natural earth layer. Open that link in a new tab to see the error message from MapServer.

Break the Mapbook:

1. Introduce an error into the mapbook. Change `<?xml version="1.0"?>` into `<?xxml version="1.0"?>`. Reload the interface and see what it does.

2. Restore the mapbook and reload the interface to make sure it works again.

3. Introduce a different error the mapbook. Change the name for the `natural_earth` map-source so it doesn't match the path for that layer in the catalog. I.E. change

   ```
   <map-source name="natural_earth" type="mapserver" queryable="true">
   ```

   to

   ```
   <map-source name="natural_earth_" type="mapserver" queryable="true">
   ```

4. Reload the interface and see what it does.

Exercise 7: Custom Extensions

See http://www.geomoose.org/developer/extensions.html.

Exercise 8: Custom Services

See http://www.geomoose.org/developer/services.html.