Pi in the Sky
(Scripts for Web Interface)

Whitney Nelson
Hampton University
SiParcs
Mentors: Dr. Richard Loft and Raghu Raj Prasanna Kumar
Objective

- Use a Weather Pi to upload data
- Store data using cloud storage
- Query and display data onto an interface
Overview of Raspberry Pi

- Raspberry Pi 2 Model B ($35)
- Single board computer running at 900 MHz
- Linux based operating system

Features:
- HDMI Port
- Ethernet Port
- Quad USB ports
- Micro USB
- GPIO Pins

Image of Raspberry Pi with various ports labeled.
Personal Objective

• View data that has been uploaded from the sensors
• Allow client to interact with the server
• Display data in tables and graphs
• Handle any missing values in case of error in the sensors
Sensors

Built in Sensors e.g. Temperature and Pressure

Python scripts read data from Weather Pi

Weather Pi connects to Raspberry Pi through GPIO pins
Cloud

- Owncloud 7.0.1- self hosted share server
- Remotely stores data that were uploaded from the sensors
- Information can be accessed by any Raspberry Pi within storage cluster
My Role in the Project

Wind Speed  
Humidity  
Pressure  
Temperature  
Altitude

Altitude Plot

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Pressure</th>
<th>Altitude</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>81454</td>
<td>1804</td>
<td>20150723</td>
<td>1250</td>
</tr>
<tr>
<td>23</td>
<td>81448</td>
<td>1804</td>
<td>20150723</td>
<td>1251</td>
</tr>
<tr>
<td>23</td>
<td>81446</td>
<td>1804</td>
<td>20150723</td>
<td>1252</td>
</tr>
<tr>
<td>23</td>
<td>81450</td>
<td>1804</td>
<td>20150723</td>
<td>1253</td>
</tr>
<tr>
<td>23</td>
<td>81454</td>
<td>1804</td>
<td>20150723</td>
<td>1254</td>
</tr>
<tr>
<td>23</td>
<td>81451</td>
<td>1804</td>
<td>20150723</td>
<td>1255</td>
</tr>
<tr>
<td>23</td>
<td>81447</td>
<td>1804</td>
<td>20150723</td>
<td>1256</td>
</tr>
<tr>
<td>23</td>
<td>81448</td>
<td>1804</td>
<td>20150723</td>
<td>1257</td>
</tr>
<tr>
<td>23</td>
<td>81450</td>
<td>1804</td>
<td>20150723</td>
<td>1258</td>
</tr>
</tbody>
</table>
- Send data from cloud to the database
- Organize data into tables
- Index through the data to be extracted from database to display onto a webpage

Client makes request

Server request database for information
### Why PHP and HTML?

<table>
<thead>
<tr>
<th>Hypertext Markup Language (HTML5)</th>
<th>Hypertext Preprocessor (PHP5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Works on client side</td>
<td>• Works on server side</td>
</tr>
<tr>
<td>• Language that describes and displays browsers</td>
<td>• Intelligent programming language</td>
</tr>
<tr>
<td>• Users sends HTML code</td>
<td>• PHP processes HTML code</td>
</tr>
</tbody>
</table>
User makes web page request

- Temperature
- Pressure
- Altitude
- HTUtemp
- Humidity

Select a Date: 

Enter a time between ___ and ___

Submit
1. Connect to the database

```php
$db = mysql_connect("IP Address", "username", "password");

if (!$_db)
{
    die("Connection unsuccessful" . mysql_error());
}

$mydb = mysql_select_db("Weather", $db);

if (!$_mydb)
{
    die("Unsuccessful");
}

$result = mysql_query("SELECT * FROM Table name", $db);
```
2. Query the database

```php
$query = "SELECT ";
echo "<table>";
echo "<tr>";

$list = array();

if(!empty($_POST['checklist']))
{
    foreach($_POST['checklist'] as $check)
    {
        array_push($list, $check);
        echo "<th>".$check."</th>";
    }
}

,index = 0;
while (!empty($list))
{
    $query .= $list[$index]. ", ";
    unset($list[$index]);
    $index++;
}

$query .= " Date,Time FROM TableName"
$query .= " WHERE Date='".$date." AND Time BETWEEN ".$timel.' AND "$time2";";
```
3. Display data in tables

```php
$temp = mysql_query($query);
while ($row = mysql_fetch_array($temp))
{
    echo "<tr>";
    echo "<td>".$row[0]."</td>";
    echo "<td>".$row[1]."</td>";
    echo "<td>".$row[2]."</td>";
    echo "<td>".$row[3]."</td>";
    echo "<td>".$row[4]."</td>";
    echo "<td>".$row[5]."</td>";
    echo "</tr>";
}
```
Web Interface

Altitude Plot

- Altitude vs Time
Updating graphics and error handling

- JpGraph: tool for graphing data
- Display graphs for current time and date
- Queries that were made for tables can also be used for graphs
- Missing values in database are replaced with nearest value
Image Credits

- http://www.wpclipart.com/computer/PCs/more_computers/computer_thin_client.png
- http://imgsdown.1mobile.com/group3/M00/0C/AB/S34UR1S8jTWAYQ29AABfnKh2CHs607.png
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QUESTIONS???