Ohmage Installation and Administration Manual for Ubuntu 11.10

Version 2.9-2

February 23, 2012

Feedback, bugs, comments, suggestions, etc, about the Ubuntu installation packages or this document are welcome and can go to jeroen.ooms@stat.ucla.edu. Communication about the Ohmage software itself is easiets through github: https://github.com/cens/ohmageServer.

About

The following instructions will deploy a server with:

- Ubuntu 11.10
- Ohmage 2.9
- OpenCPU beta2

The 11.10 version of Ubuntu ships with the following software versions of third party Ohmage dependencies:

- Linux kernel 3.0.0
- OpenJDK 6b23
- OpenJDK 7b147 (not in use for now)
- MySQL 5.1.58
- Apache 2.2.20 (includes mod-proxy-ajp and mod-ssl)
- Tomcat 7.0.21

Please note that at this point, Ubuntu is not officially supported by the Ohmage development team.

1 Installation

This section will show how to install Ohmage on Ubuntu 11.10. At this point there are no official Ubuntu builds of Ohmage. The `ohmage-server`, `ohmage-viz` and `ohmage-standalone` installation packages are kindly provided by the `OpenCPU` project.

1.1 Installing Ubuntu

The current build of Ohmage requires an Ubuntu 11.10 system. It can run on any version of Ubuntu, e.g. Ubuntu Desktop, Ubuntu Server, Kubuntu, Edubuntu, etc. If you are already have an installed system, you can skip this section.

The preferred way of running Ohmage is on a clean Ubuntu Server edition. A copy of the Ubuntu Server installation disc can be obtained from the Ubuntu download page:

http://www.ubuntu.com/download/server/download

If you would like to run Ohmage on an Amazon EC2 server, the best way is to use one of the official AMI's as provided by the ubuntu team:

http://cloud-images.ubuntu.com/releases/11.10/release/

Another possibility is to install a Ohmage on a virtual Ubuntu server inside another OS. For example, the free VMware Player is available for Windows and Linux, and on OSX one can use parallels to run an Ubuntu server. This way you can install Ubuntu and Ohmage safely on top of an existing system.

1.2 Getting the system up-to-date

Before begin installation of Ohmage, make sure you are running Ubuntu 11.10 (Oneiric) by entering:

```
cat /etc/*release
```

If it turns out the system is running an older version of Ubuntu, upgrade the OS to 11.10 first. If the system is indeed 11.10, continue by updating the software packages to the latest versions:

```
sudo apt-get update
sudo apt-get upgrade
```

Once the system is up to date, you can begin installing Ohmage.

1.3 Ohmage Installation

Start by adding the `ohmage-2.9` package respository to our system:

```
sudo apt-get install python-software-properties
sudo add-apt-repository ppa:opencpu/ohmage-2.9
```

The system will ask for confirmation on importing the public key. After the repository has been added to the system, update the package list:

```
sudo apt-get update
```

Once this has succeeded ohmage can be installed. You have two options. To install only the ohmage server and frontend, run:

```
sudo apt-get install ohmage-server
```

If you want to install both ohmage and the optional vizualization server you can install

```
sudo apt-get install ohmage-standalone
```

Ohmage has many dependencies, and installation might take a while on a vanilla server. During installation of MySQL (a dependency), the system might ask for a password for the mysql root user. Make sure to enter a strong password and write it down somewhere. You will not need it anymore during the insallation though.

If the installation finished without any problems, it will display the ip address of the host at the very end, which you can can open in your browser and use to test the server.

1.4 Uninstall Ohmage

If you want to remove Ohmage from a system you can use:

```
sudo apt-get remove ohmage-*
sudo apt-get autoremove
```

Note that this will delete the `andwellness` database from MySQL so all data will be lost.

2 Administration

The default install of Ohmage actually installs 3 sites:

- Ohmage Server: http://example.com/app/config/read
- Ohmage Front-end: http://example.com/ohmage
- OpenCPU: http://example.com/R (only available with ohmage-standalone)

The standard user is `ohmage.admin` with password `ohmage.passwd`. You will be prompted to change this password on first login. By default, both http and https are enabled. However, the https is served by a self-signed a.k.a. *snakeoil* SSL certificate, so the browser will give a warning about insecure encryption.

2.1 Tomcat

Ubuntu 11.10 ships with Tomat7. The Tomcat server only hosts the AJP1.3 prototcol on port 8009. Actual incoming HTTP and HTTPS are handled by Apache2 and proxied to Tomcat. To manage the Tomcat server do:

```
sudo service tomcat7 {start | stop | restart}
```

This command calls the `/etc/init.d/tomcat7` script which should usually not be edited. Some global variables can be modified in `/etc/default/tomcat7`. Tomcat configuration files, for example `server.xml` are located at

```
/etc/tomcat7/
```

The tomcat7 log files `aw.log` and `catalina.out` are located at

```
/var/log/tomcat7/
```

The `webapps` directory, hosting the `.war` files is located at

```
/var/lib/tomcat7/webapps/
```

For backward-compatibility reasons `/opt/aw/as/webapps` has a symbolic link to the webapps directory.

2.2 Apache2

Incoming requests on port 80 (HTTP) and port 443 (HTTPS) are handled by the Apache2 webserver. The `mod_proxy_ajp` module is used to proxy requests to Tomcat server. To manage Apache2 use:

```
sudo service apache2 {start | stop | restart}
```

This command calls the `/etc/init.d/apache2` script which should usually not be edited. The main configuration file for apache2 is located at

```
/etc/apache2/httpd.conf
```

However by convention this file should rarely be edited. Custom configurations are located at:

```
/etc/apache2/mods-available/
/etc/apache2/sites-available/
```

These custom configurations can be activated and de-activated as follows:

```
sudo a2enmod proxy_ajp
sudo a2dismod proxy_ajp
sudo a2ensite ohmage
sudo a2dissite ohmage
```

These commands create or remove symoblic inside links to available configuration files inside the following directories:

```
/etc/apache2/mods-enabled/
/etc/apache2/sites-enabled/
```

All files in these directories are automatically included by the main `httpd.conf` file. The `ohmage` and `OpenCPU` sites are defined in the following files:

```
/etc/apache2/sites-available/ohmage
/etc/apache2/sites-available/opencpu
```

The Apache2 log files `access.log` and `error.log` are located at

```
/var/log/apache2/
```

2.3 MySQL

The MySQL server can be managed through:

```
sudo service mysql {start|stop|restart}
```

This command calls the `/etc/init.d/mysql` script which should usually not be edited. Some global settings can be modified in `/etc/mysql/debian-start` and `/etc/mysql/my.cnf`. In general, it should not be required to manually enter mysql for using Ohmage. But if for some reason you want to, you can connect to the mysql server using:

```
mysql -u andwellness -p
```

The password is `&!sickly` and all ohmage data is stored in database `andwellness`.

2.4 OpenCPU (part of ohmage-standalone)

OpenCPU is used by the Ohmage-frontend to offer visualizations for data exploration. If you do not plan on using data vizualization, or use an external vizualization server, opencpu can be disabled:

```
sudo a2dissite opencpu
```

To change the vizualization server used by Ohmage, connect to MySQL and issue the following command:

```
use andwellness;
update preference set p_value = "http://viz.example.com/R/call/Mobilize/"
where p_key = "visualization_server_address";
```

Where the server url is replaced by the appropriate viz server. To restore it to the default value, run:

```
use andwellness;
update preference set p_value = "http://127.0.0.1/R/call/Mobilize/" where
p_key = "visualization_server_address";
```

2.5 SSL certificate

By default, Apache2 uses self signed a.k.a. snakeoil certificates. This is convenient for development servers, but in a production setting these should be replaced by SSL certificates signed by an official Certificate Authority.

The https configurations and locations of the certificates are defined in

```
/etc/apache2/sites-available/default-ssl
```

This file also contains detailed comments with configuration instructions.

2.6 Other Ohmage files

Photos and Documents uploaded by users are stored in

```
/opt/aw/userdata/images/
/opt/aw/userdata/documents/
```

Other than this, the `/opt/aw/` directory contains some scripts and files mostly for legacy reasons that you probably won't need.

3 Clients

Currently there are 3 clients for the Ohmage server system. These are:

- The Ohmage Android App.
- The Ohmage FrontEnd.
- The Ohmage R package.

Below a brief description of these clients.

3.1 The Ohmage Android App

The Ohmage Android 'app' is the application on the mobile phone that can be used to fill out surveys and upload survey-responses to the server. As it currently stands, the server-url is hardcoded in the app and therefore the app has to be built from source. Figure 1 shows a screenshot of the phone app running on an Android 2.2 device.

Figure 1: A screenshot of the Android app.

The source code and instructions on how to build the app are publicly available on:

https://github.com/cens/ohmagePhone

3.2 The Ohmage FrontEnd

The Ohmage FrontEnd is an administrative web application to be used on a regular browser by both users and administrators of Ohmage. The application is automatically installed when installing the server using instructions above and available through: http://example.com/ohmage. Source code and development of the FrontEnd is publicly available on github at https://github.com/cens/ohmageFrontEnd. Figure 2 shows a screenshot of the FrontEnd homepage after logging in.

The FrontEnd is a convenient client to review, share and explore data, add/remove users, classes, campaigns, perform administrative tasks, etc. The frontend can be build with some custom skinning options. The screenshot shows a build of Ohmage with the default theme.

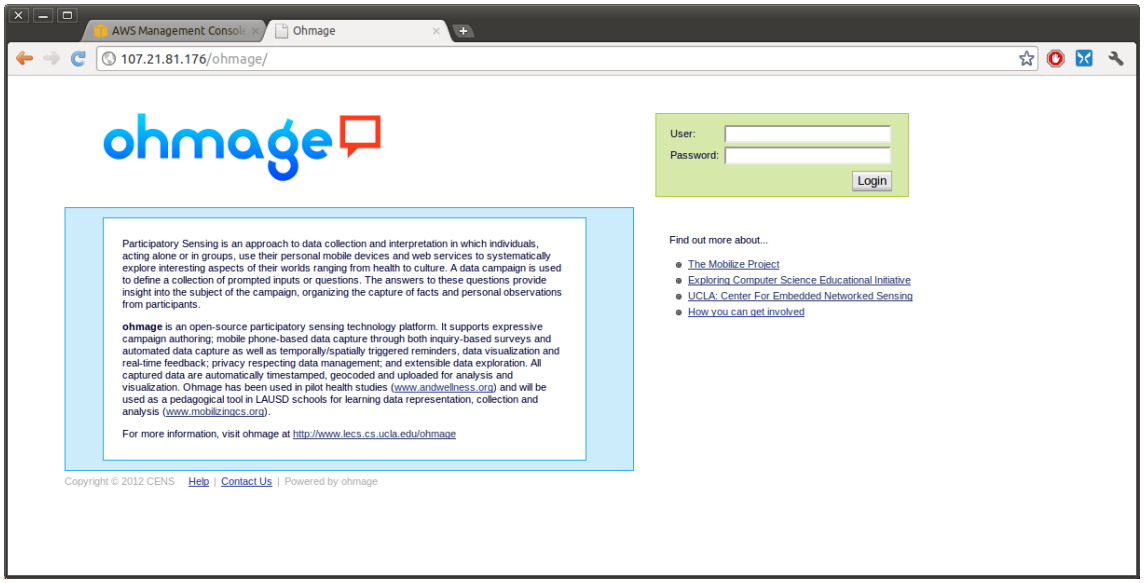

Figure 2: A screenshot of the FrontEnd homepage.

3.3 The Ohmage `R` package

The Ohmage R package is an Ohmage client for R. It depends on other R packages like RCurl, XML and RJSONIO to do it's work. The package is mostly a convenient way to grab data from Ohmage and turn it into a data frame in R. Package and documentation are available from CRAN: http://cran.r-project.org/web/packages/Ohmage. Below a code snippet to illustrate the functionality of the package.

```
library(Ohmage);
oh.login("ohmage.admin", "mypassword", "https://myserver.com/app");
campaigns <- oh.campaign.read();
mydata <- oh.survey_response.read("urn:campaign:myschool:food");
```