

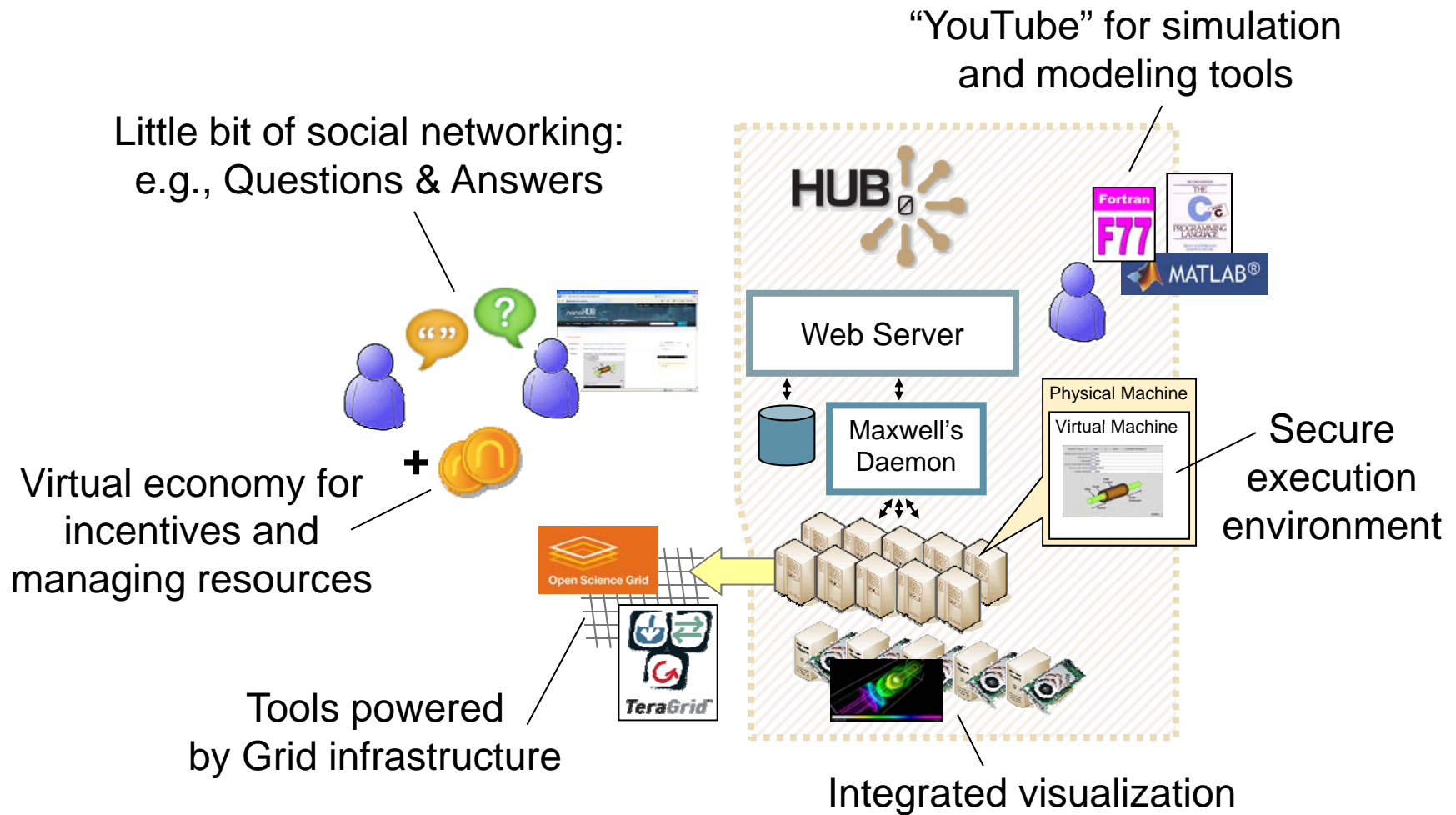
HUBzero™

Cyberinfrastructure for Digital Scholarship,
Dissemination, Collaboration, and Outreach

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A Platform for Scientific Collaboration



Hubs 'R Us



- Feb 2007: 1 hub
- Feb 2008: 5 hubs
- Feb 2009: 8 hubs
- Feb 2010: 21 hubs

Each hub has its own funding stream

Outside institutions:
EPA, SUNY, Rice

I want to do it all by myself!



Installing the HUBzero Software Stack (setting up the basic website)

This won't work....



This will...

- Debian GNU/Linux 5.0
- 64-bit Intel compatible CPUs
(32-bit support forthcoming)
- A HUB-in-a-box can be squeezed into a 64-bit x86 virtual machine with about 4 Gigabytes of disk and 768 Megabytes of RAM.
- A typical starter production hub uses a dedicated machine with dual Quad Core Intel Xeon processors, 16-24 Gigabytes of RAM, and 1 Terabyte of mirrored disk (e.g., Dell R610)



Personnel Roles



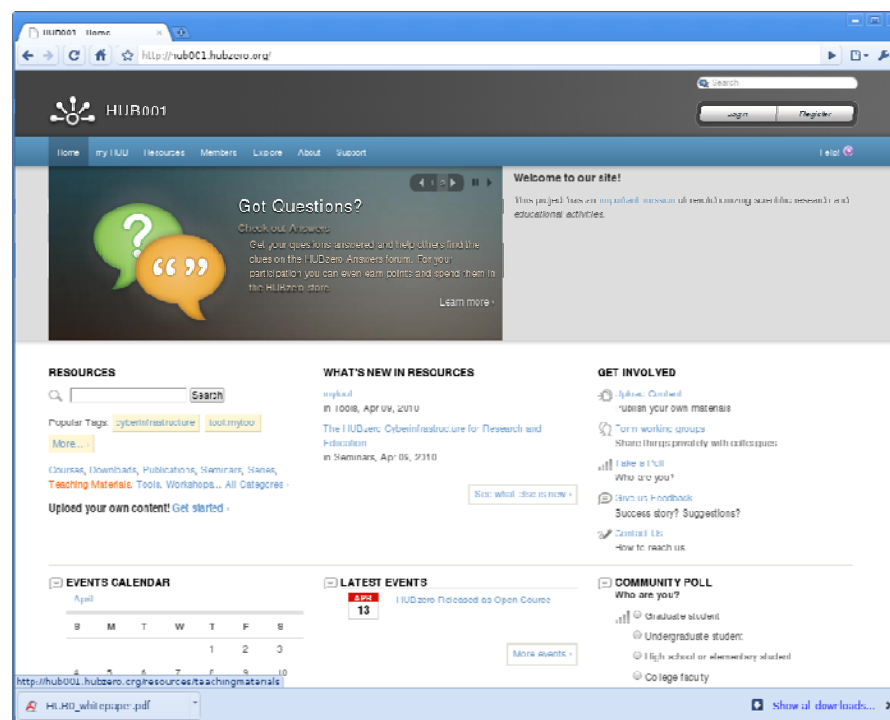
- Systems Administration
- Web Development
- Application/Tool Development
- Content Management
- Application/Tool Deployment
- Hub Management

Installation



Documentation for the installation process can be found at
<http://hubzero.org/documentation/0.9.0/installation>

HUBzero Content Management System



The Base Operating System...

The goal is to work with an off-the-shelf Debian GNU/Linux 5.0 installation. We aren't there yet...



A separate /export filesystem containing subdirectories www, opt, home and apps is required to isolate filesystem quotas used by the HUBzero middleware.

We also assume that it is running on a system dedicated to HUBzero. There can be no user accounts (above id 900), or groups (above id 900) and it must run an OpenVZ kernel.

OpenLDAP

HUBzero uses “first class” users and groups. This means every registered user on the site and every group has a corresponding Linux account. This is currently handled by mirroring account data into an OpenLDAP instance that Linux can then use PAM and NSS modules to access.

A custom HUBzero LDAP schema is currently used, later this year we will just be using the default schema that ships with Debian.



HUBzero uses a MySQL database as its primary data store. This pretty much works straight out of the box but could be customized for security and performance considerations as required by your site.

Our 'hubzero-mysql' package makes a slight change to the default Debian mysql maintenance account, giving it permissions to grant permissions to other accounts. The lack of these permissions appears to be a bug.



Apache 2

HUBzero makes extensive use of the Apache 2 web server. Our “hubzero-apache2” module enables several modules that we use and provides basic “hub” and “hub-ssl” site definitions which get installed into `/etc/apache2/sites-available`.



The HUBzero Content Management System (CMS) is written in PHP. Nothing special really needs to be done, although we typically disable displaying errors and enable logging errors. You may also need to increase the file and post limits if you expect users to upload very large files. You may also find that you need to increase the memory limits.

These settings can all be modified in `/etc/php5/apache2/php.ini`



Mail configuration is really site dependent. Basically HUBzero expects outgoing mail to work. Our documentation goes over the simplest configuration of the exim4 mailer to achieve this.



Content Management System

The HUBzero Content Management System (CMS) is the most visible part of HUBzero. It is based on the Joomla! CMS at its core, but adds dozens of extensions and enhancements.

The remainder of this presentation will discuss basic installation of the HUBzero CMS and go over where some important configuration details are.



CMS Preparation

- ✓ Edit /etc/hubzero.conf
- ✓ Copy files from master copy to document root
- ✓ Create hub and hub_metrics database
- ✓ Change document root in apache configuration

Restart the apache service and navigate to your site in a browser to begin the modified Joomla! Installation process

Language Selection

Joomla! Installation
1.5.15

Steps

- 1 : Language
- 2 : Pre-installation Check
- 3 : License
- 4 : Database
- 5 : LDAP Configuration
- 6 : FTP Configuration
- 7 : Configuration
- 8 : Finish

Choose Language

Next

Select Language

Please select the language to use during the Joomla! installation steps:

- ar-DZ - Arabic - Algeria
- be-BY - Беларуская-бе-BY
- bg-BG - Bulgarian (Български)
- bn-BD - Bengali (Bangladesh)
- ca-ES - Catalan
- cs-CZ - Český (Czech)
- da-DK - Danish (DK)
- de-DE - Deutsch (DE-CH-AT)
- el-GR - Greek
- en-G3 - English (United Kingdom)
- en-US - English (US)
- eo-XX - Esperanto
- es-ES - Spanish (Español internacional)
- et-EE - Estonian - et
- fa-IR - Persian (فارسی)
- fi-FI - Finnish (Suomi)
- fr-FR - French (Fr)
- gl-ES - Galician
- gu-IN - ગુજરાતી (Gujarati)
- hr-HR - Croatian (HR)

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Pre-installation Check

Joomla! Installation
1.5.15

Steps

- 1 : Language
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- 8 : Finish

Pre-installation Check

[Check Again](#) [Previous](#) [Next](#)

Pre-installation check for Joomla! 1.5.15 Stable [Wojmami Ama Mamni] 05-November-2009 04:00 GMT:

If any of these items are not supported (marked as **No**), your system does not meet the minimum requirements for installation. Please take appropriate actions to correct the errors. Failure to do so could lead to your Joomla! installation not functioning properly.

PHP Version >= 4.3.10	Yes
- Zlib Compression Support	Yes
- XML Support	Yes
- MySQL Support	Yes
MB Language is Default	Yes
MB String Overload Off	Yes
configuration.php Writable	Yes

Recommended Settings:

These are the recommended settings for PHP in order to ensure full compatibility with Joomla!. Joomla! will still operate even if your settings do not match.

Directive	Recommended	Actual
Safe Mode:	Off	Off
Display Errors:	Off	Off
File Uploads:	On	On
Magic Quotes Runtime:	Off	Off
Register Globals:	Off	Off
Output Buffering:	Off	Off
Session Auto Start:	Off	Off

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Joomla! Installation
1.5.15

Steps

- 1: Language
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License

Previous
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GNU General Public License:

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Database Configuration

Joomla! Installation
1.5.15

Steps

- 1: Language
- 2: Pre-installation Check
- 3: License
- 4: Database
- 5: LDAP Configuration
- 6: FTP Configuration
- 7: Configuration
- 8: Finish

Database Configuration

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Next →

Connection Settings:

Setting up Joomla! to run on your server involves four easy steps.

The first step is database configuration. Choose your preferred settings:

Basic Settings

Select the type of database from the drop down list. This will generally be **MySQL**.

Enter the hostname of the database server Joomla! will be installed on. This may not necessarily be the same as your Web server so check with your hosting provider if you are not sure.

Enter the MySQL username, password and database name you wish to use with Joomla!. These must already exist for the database you are going to use.

Advanced Settings

Select how to handle existing tables from a previous installation.

Enter a table prefix to be used for this Joomla! installation.

Basic Settings

Database Type
mysql *This is probably **MySQL**.*

Host Name
localhost *This is usually **localhost** or a host name provided by the hosting provider.*

Username
myhub *This can be the default MySQL username **root**, a username provided by your hosting provider, or one that you created in setting up your database server.*

Password
..... *Using a password for the MySQL account is mandatory for site security. This is the same password used to access your database. This may be predefined by your hosting provider.*

Database Name
myhub *Some hosting providers allow only a specific database name per account. If this is the case with your setup, use the table prefix option in the Advanced Settings section below to differentiate more than one Joomla! site.*

Advanced Settings

Delete existing tables *Any existing backup tables from previous Joomla! installations will be replaced.*

Backup Old Tables

Table Prefix
jos_ *Do not use the prefix 'bak_'. This is used for backup tables.*

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LDAP Configuration

Joomla!™ Installation
1.5.15

Steps

- 1: Language
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- 7: Configuration
- 8: Finish

LDAP Configuration

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Connection Settings:

HUBzero requires an OpenLDAP server with the HUBzero schema extensions. Please enter the configuration information for this server here.

Basic Settings

Enter the hostname or URI of your OpenLDAP server and optionally enter a secondary hostname or URI if you have a backup OpenLDAP server which should be tried if the primary fails.

Note: You must enter a port number if you don't specify a full URI and if you specify a full URI the port field will be ignore.

Enter the other fields as appropriate

Basic Settings

OpenLDAP Primary Host URI *This is usually **ldap://localhost***

OpenLDAP Secondary Host URI *optional*

Base DN *tipLDAPBaseUser*

Search DN *tipLDAPSearchUser*

Search DN Password *tipLDAPSearchPW*

Manager DN *tipLDAPManagerUser*

Manager DN Password *tipLDAPManagerPW*

Enable TLS Negotiation

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FTP Configuration

Joomla! Installation
1.5.15

Steps

- 1: Language
- 2: Pre-installation Check
- 3: License
- 4: Database
- 5: LDAP Configuration
- 6: FTP Configuration
- 7: Configuration
- 8: Finish

FTP Configuration

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FTP Configuration:

Due to file system permission restrictions on Linux and other Unix systems (and PHP Safe Mode restrictions), an FTP layer is used to handle file system manipulation and enable Joomla! installers.

Enter an FTP username and password with access to the Joomla! root directory. This will be the FTP account that handles all file system operations when Joomla! requires FTP access to complete a task.

For security reasons and if the option is available, it is best to create a separate FTP user account with access to the Joomla! installation only and not the entire Web server.

Note: If you are installing on a Windows Operating System, the FTP layer is **not** required.

Basic Settings

Yes Enable FTP file system layer
 No

FTP User:

FTP Password:

FTP Root Path:

▶ **Advanced Settings**

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Main Configuration

Joomla! Installation
1.5.15

Steps

- 1: Language
- 2: Pre-installation Check
- 3: License
- 4: Database
- 5: LDAP Configuration
- 6: FTP Configuration
- 7: Configuration
- 8: Finish

Main Configuration

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Site Name:
Enter the name of your Joomla! site.

Site Name

Confirm the Admin E-mail and Password.
Enter your e-mail address. This will be the e-mail address of the Web site Super Administrator. Enter a new password and then confirm it in the appropriate fields. Along with the username **admin**, this will be the password that you will use to login to the Administrator Control Panel at the end of the installation.
If you are migrating, you can ignore this section. Your current settings will be automatically migrated.

Your E-mail

Admin Password

Confirm Admin Password

Load sample data, restore or migrate backed-up content

Important! It is strongly recommended that new Joomla! users install the default sample data. To do this, select the option *and* click on the button *before* moving to the next stage.
Before leaving the installation, you can populate the site database with data. There are three ways to do this:

- 1. Default sample data** can be inserted. To do this, select the first option and click the Install Sample Data button.
- 2a. A Joomla! 1.5.x compatible SQL script file** can be uploaded from a local host and executed on the site. This could be for installing localised sample data or restoring a Joomla! 1.5.x backup. The script should have the correct table prefixes, be in UTF-8 encoding and comply with the Joomla! 1.5.x database schema.
- 2b. Migrate content from previous versions of Joomla!** Selecting the Load Migration Script option enables support for the migration of older Joomla! 1.0.x version database dumps to a new Joomla! 1.5.x site. The required conversions are performed on-the-fly and the migration script file can be created on the older site by using the `com_migration` component. For further information about the component and the migration procedure, please see the [Joomla! 1.5 Migration Guide](#).

You can upload uncompressed SQL script files, zip-packed script files and gz-packed script files. Packed files may contain only one SQL script file. If your file is too big to handle or causing memory and time limit errors, upload the uncompressed file into the `installation/sql/migration/` folder. Rename it `migration.sql` and then tick the "I have already uploaded..." option.

- 3. Clean Installation:** If you wish to perform a clean installation, enter the site name, admin e-mail and choose a password. Then proceed to the final step by clicking *Next*.

Install sample data Installing sample data is strongly recommended for beginners. This will install sample content that is included in the Joomla! installation package.

or

Sample HUBzero data installed successf

Load Migration Script The migration script needs to be created on the old site by the `com_migration` tool to conform. Enter the table prefix of the old site and enter the encoding used in old site (`_ISO` setting in language file or as seen in browser info/encoding/source). Joomla! 1.5 migration SQL scripts need to be Joomla! 1.5.x compatible and should have the appropriate table prefix.

Maximum Upload Size: Your server's maximum file upload size is 2.0MB.

Old Table Prefix:

Old Site Encoding:

Migration Script: No file chosen

I have already uploaded the migration script to the server (e.g. via FTP/SCP)

This script is a Joomla! 1.0 migration script.

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Joomla! Installation
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Finish

[Site](#)
[Admin](#)

Congratulations! Joomla! is now installed.

Click the Site button to view your Joomla! Web site or the Admin button to take you to your administrator login.

On the Joomla! Help Site, you will find an easy, step-by-step guide to installing your own language pack in Joomla! You will find a list of links to available language packs.

Click the button on the right to open the Help Site in a new window.

PLEASE REMEMBER TO COMPLETELY REMOVE THE INSTALLATION DIRECTORY.

You will not be able to proceed beyond this point until the installation directory has been removed. This is a security feature of Joomla!.

Administration Login Details

Username: admin

Joomla! in your own language?

Visit the Joomla! Help Site for more information and downloads.

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HUB001

Login
Register

Home
my HUB
Resources
Members
Explore
About
Support
Help!

Got Questions?

Check out Answers

Get your questions answered and help others find the clues on the HUBzero Answers forum. For your participation you can even earn points and spend them in the HUBzero store.

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EVENTS CALENDAR

April

S	M	T	W	T	F	S
				1	2	3

LATEST EVENTS

APR 13 [HUBzero Released as Open Source](#)

[More events >](#)

COMMUNITY POLL

- Who are you?**
- Graduate student
 - Undergraduate student
 - High school or elementary student

Are we there yet?



You might be done.... if all you wanted was a web site. If that's all you want then you might just want to use Joomla! Or other similar content management system rather than deal with something that is quite a bit quirkier.

But let's assume you are here for the HUB Apps (Tools). There is a long way to go get that support up and running. We will cover most of it in the next section, but there are a few small pieces that fit in between that we will quickly cover here.

SUBVERSION®

Subversion is an open source version control system. HUBzero uses it as part of its HUB App development platform via the “contribtool” component. HUB App developers get access to a Subversion repository to use for the application development. We use the subversion revision number to identify the application/tool version.

WebDAV

WebDAV stands for “Web-based Distributed Authoring and Versioning”. It is a set of extensions to the HTTP protocol which allows users to collaboratively edit and manage files on remote web servers. HUBzero uses this mechanism as way of allow users to directly access the files in their HUB home directories from their desktop. There are WebDAV clients available for all common desktop operating system.



Usermap

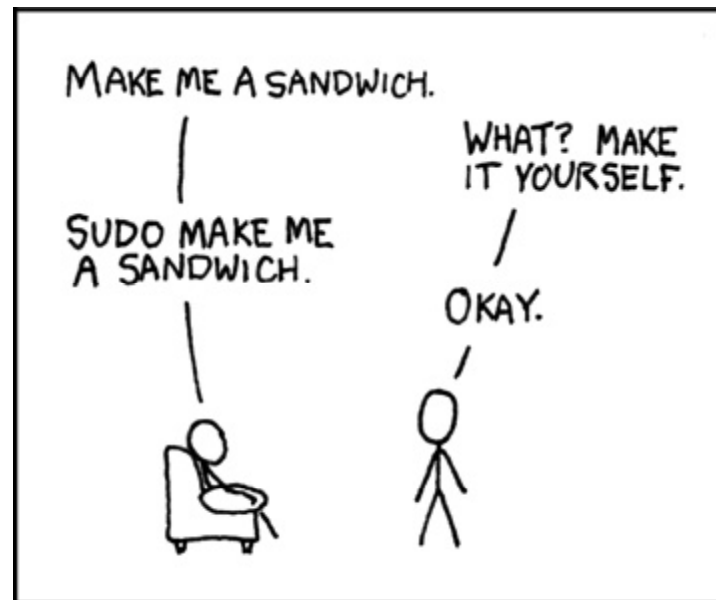
- In order for WebDAV apache module to serve files to a client, it must have permission to access the files. Since we want to use WebDAV to serve files in a user's home directory we have to use a filesystem that can map a user's home directory into a permission space suitable for the Apache WebDAV module to access.
- USERMAP serves this purpose, it is used to mount a user's home directory inside the /webdav directory with ownership and group permissions assigned to WebDAV process owner (www-data). Usermap is implemented as a simple FUSE based filesystem.



Trac is an enhanced wiki and issue tracking system for software development projects (<http://trac.edgewall.org>).

- A Trac project is created for every HUBzero Application development project created by the CONTRIBUTOR component of the HUBzero CMS.
- Trac projects are stored in `/opt/trac/tools/<project>` and apache Routes URLs from `/tools/<project>/<trac-function>` to Trac. Trac does not currently have a Single Sign On relationship with the main HUBzero CMS (you have to login separately), but they do share the same authentication tables.

ADDREPO is an external script used to create HUBzero Application development projects. It is run as part of the contribtool component of the website. It has to run various commands as the 'apps' user which requires modifying the "sudo" configuration file /etc/sudoers.



Hands-on

If we have time we will try a hand-on session. See your hand-outs. We have some partially installed VM instances that you can try to finish configuring.



Installing the HUBzero Software Stack (setting up the middleware)