The DSpace Course - DSpace Installation

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Downloaded from DSpace Repository, DSpace Institution's institutional repository
Module: DSpace Installation

Module overview:
This module provides information on installation of the DSpace software. Upon completing this module, users will have an understanding of what platforms DSpace can be hosted on, prerequisite software required to install DSpace and how to perform a DSpace installation. The module will conclude with a practical session installing the DSpace software.

Module objectives:
By the end of this module you will:

- Understand the platforms DSpace can be hosted on
- Understand the third party components and tools DSpace requires to run
- Understand how to install DSpace
- Have hands on experience of configuring and installing DSpace

Note
For the practical exercise, please refer to your sheet ‘Local instructions’ for details of the following:

- How to launch a terminal window and a web browser
- What the path to [dspace] and [dspace-src] is
- How to restart Tomcat
Operating Systems

- UNIX like OS
  - Linux
  - HP/UX
  - Sun Solaris
  - MacOS X
- Microsoft Windows
  - Microsoft Server 2003/8
  - Development: Windows XP/VISTA

Operating Systems
UNIX-like OS (Linux, HP/UX etc) : Many distributions of Linux/Unix come with some of the dependencies below pre installed or easily installed via updates, you should consult your particular distributions documentation to determine what is already available.
Third party software, tools and components

- Java JDK 5 or later (standard JDK)
- Apache Maven 2.0.8 or later (Java build tool)
- Apache Ant 1.6.2 or later (Java build tool)
- Relational Database
  - PostgreSQL (7.3 or greater)
  - Oracle 9 or greater
- Servlet Engine
  - Jakarta Tomcat
  - Jetty
  - Cauchio Resin

Third party software, tools and components

Java 5 or later
DSpace now required Java 5 or greater because of usage of new language capabilities introduced in 5 that make coding easier and cleaner.

Apache Maven 2.0.8 or later (Java build tool)
Maven is necessary in the first stage of the build process to assemble the installation package for your DSpace instance. It gives you the flexibility to customize DSpace using the existing Maven projects found in the [DSpace-source]/DSpace/modules directory or by adding in your own Maven project to build the installation package for DSpace, and apply any custom interface "overlay" changes.

Apache Ant 1.6.2 or later (Java build tool)
Apache Ant is still required for the second stage of the build process. It is used once the installation package has been constructed in [DSpace-source]/DSpace/target/DSpace-<version>-build.dir and still uses some of the familiar ant build targets found in the 1.4.x build process.
PostgreSQL 7.3 or greater

It's highly recommended that you try to work with Postgres 8.x or greater, however, 7.3 or greater should still work. Unicode (specifically UTF-8) support must be enabled. This is enabled by default in 8.0+. For 7.x, be sure to compile with the following options to the 'configure' script:

--enable-multibyte --enable-unicode --with-java

Once installed, you need to enable TCP/IP connections (DSpace uses JDBC). For 7.x, edit postgresql.conf (usually in /usr/local/pgsql/data or /var/lib/pgsql/data), and add this line:

tcpip_socket = true

For 8.0+, in postgresql.conf uncomment the line starting:

listen_addresses = 'localhost'

Then tighten up security a bit by editing pg_hba.conf and adding this line:

host  DSpace  DSpace  127.0.0.1  255.255.255.255  md5

Then restart PostgreSQL.

Servlet Engine: (Jakarta Tomcat 4.x, Jetty, Caucho Resin or equivalent).

Note that DSpace will need to run as the same user as Tomcat, so you might want to install and run Tomcat as a user called 'DSpace'.

You need to ensure that Tomcat has a) enough memory to run DSpace and b) uses UTF-8 as its default file encoding for international character support. So ensure in your startup scripts (etc) that the following environment variable is set:

JAVA_OPTS="-Xmx512M -Xms64M -Dfile.encoding=UTF-8"

You also need to alter Tomcat's default configuration to support searching and browsing of multi-byte UTF-8 correctly. You need to add a configuration option to the <Connector> element in [tomcat]/config/server.xml:

<Connector port="8080"
  maxThreads="150" minSpareThreads="25" maxSpareThreads="75"
  enableLookups="false" redirectPort="8443" acceptCount="100"
  connectionTimeout="20000" disableUploadTimeout="true"
  URIEncoding="UTF-8" />
Third party software, tools and components

- Live CD contains all this software pre-installed & configured
- Detailed information on prerequisite software & configuration can be found in the handbooks & in the DSpace installation documentation
  - Website: www.dspace.org
  - [dspace-src]/dspace/docs
DSpace Software Installation

With the advent of a new Apache Maven 2 based build architecture in DSpace 1.5.x, you now have two options in how you may wish to install and manage your local installation of DSpace.

Default Release (DSpace-<version>-release.zip)

- This distribution will be adequate for most cases of running a DSpace instance. It is intended to be the quickest way to get DSpace installed and running while still allowing for customization of the themes and branding of your DSpace instance.
- This method allows you to customize DSpace configurations (in DSpace.cfg) or user interfaces, using basic pre-built interface "overlays".
- It downloads "precompiled" libraries for the core DSpace-api, supporting servlets, taglibraries, aspects and themes for the DSpace-xmlui, DSpace-xmlui and other webservice/applications.
- This approach exposes the parts of the application that the DSpace committers would prefer to see customized. All other modules are downloaded from the 'Maven Central Repository'

We’ll be using the source release in this training
Source Release (DSpace-<version>-src-release.zip)

- This method is recommended for those who wish to develop DSpace further or alter its underlying capabilities to a greater degree.
- It contains "all" DSpace code for the core DSpace-api, supporting servlets, taglibraries, aspects and themes for the DSpace-xmlui, DSpace-xmlui and other webservice/applications.
- Provides all the same capabilities as the normal release.
**Operating Systems**

**Subversion (SVN)**

- DSpace uses Subversion (SVN) to manage its source code, record code changes, and allow multiple developers to work on DSpace without overwriting each other's code.

- Source repository can be viewed at:
  - [http://dspace.svn.sourceforge.net/viewvc/dspace/trunk/dspace](http://dspace.svn.sourceforge.net/viewvc/dspace/trunk/dspace)

- Check out code from SVN:
  - `svn checkout`  
    - [https://dspace.svn.sourceforge.net/svnroot/dspace/trunk/dspace.dspace](https://dspace.svn.sourceforge.net/svnroot/dspace/trunk/dspace.dspace)

- Today we'll be using a pre-downloaded version of the DSpace source as opposed to SVN.

**Subversion**
DSpace Software Installation

- Download the DSpace Source
  - See local instructions sheet for the location of the DSpace Source: referred to as [dspace-src]

- Create the DSpace User
  - useradd -m dspace

- Create a UNICODE dspace database owned by the dspace PostgreSQL user
  - createuser -U postgres -d -A -P dspace15
  - createdb -U dspace15 -E UNICODE dspace15

DSpace Software Installation
DSpace Software Installation

- Edit [dspace-source]/dspace/config/dspace.cfg
  - dspace.dir -- must be set to the [dspace] (installation) directory.
  - dspace.url -- complete URL of this server's DSpace home page.
  - dspace.hostname -- fully-qualified domain name of web server.
  - dspace.name -- "Proper" name of your server, e.g. "My Digital Library".
  - db.url -- URL for connecting to the database
  - db.username -- the database username you entered in the previous step.
  - db.password -- the database password you entered in the previous step.
  - mail.* -- email settings

- Create the directory for the DSpace installation
  - mkdir [dspace]
  - chown dspace [dspace] (Assuming dspace is the UNIX user)
DSpace Software Installation

- Live CD contains all this software pre-installed & configured
- Detailed information on prerequisite software & configuration can be found in the handbooks & in the DSpace installation documentation
  - Website: www.dspace.org
  - [dspace-src]/dspace/docs
DSpace Software Installation

- Link the DSpace web application(s) to the deployment directory of Tomcat
  - `/var/lib/tomcat5.5/webapps/`
  - `sudo ln -s [dspace]/webapps/jspui jspui`
  - `sudo ln -s [dspace]/webapps/xmlui xmlui .....`

- Create an initial administrator account
  - `[dspace]/bin/create-administrator`

- Browse to the base URL of your DSpace web apps
  - JSP User Interface - [http://localhost:8080/jspui](http://localhost:8080/jspui) ...

DSpace Software Installation
**DSpace Software Installation**

1. Create the DSpace user. This needs to be the same user that Tomcat (or Jetty etc) will run as. e.g. as root run:

   ```bash
   useradd -m DSpace
   ```

2. The location of the latest DSpace release can be found on the local instructions sheet.

   For ease of reference, we will refer to the location of the DSpace release as [DSpace-src] in the remainder of these instructions.

   ```bash
   cd [dspace-src]
   ```

3. Database Setup (PostgreSQL)

   Create a DSpace database, owned by the DSpace PostgreSQL user:
   ```bash
   createuser -U postgres -d -A -P DSpace15
   createdb -U DSpace15 -E UNICODE DSpace15
   ```

   Enter a password for the DSpace database. (This isn't the same as the DSpace user's UNIX password.)

4. Edit [DSpace-source]/DSpace/config/DSpace.cfg, in particular you'll need to set these properties:
   ```bash
   • DSpace.dir = /opt/DSpace-install/DSpace
   • DSpace.url = http://localhost:8080/jspui
   • DSpace.hostname = localhost
   • DSpace.name = New Horizons DSpace {or your own DSpace name}
   • db.name = postgres
   • db.url = jdbc:postgresql://localhost:5432/DSpace15
   • db.username = DSpace15
   • db.password = DSpace15
   ```

5. Create the directory for the DSpace installation (i.e. [DSpace]). As root (or a user with appropriate permissions), run:

   ```bash
   mkdir [DSpace]
   chown DSpace [DSpace]
   ```

   (Assuming the DSpace UNIX username.)
6. As the DSpace UNIX user, generate the DSpace installation package in the [DSpace-src]/DSpace/target/DSpace-[version].dir/ directory:

   cd [dspace-src]/DSpace/
   mvn package

7. As the DSpace UNIX user, initialize the DSpace database and install DSpace to [DSpace]:
   cd [DSpace-src]/DSpace/target/DSpace-[version].dir/
   ant fresh_install

8. Set the correct permissions on the DSpace subdirectories. The user which tomcat runs as should have full read and write access to the following directories:

   - assetstore
   - logs
   - search
   - upload

   The tomcat user also needs read access to:

   - config

   If you are using the DSpace Live CD for training purposes, you can use the following commands, however this is NOT suitable for live systems.

   - cd [dspace]
   - chmod -R 777 *

9. Tell your Tomcat/Jetty/Resin installation where to find your DSpace web application(s) by symbolically linking the deployment directory to the tomcat webapps directory.

   Please refer to you local instructions sheet for the path of the Tomcat installation refered to as [tomcat]

   ```
   ln - s [DSpace]/webapps/jspui [tomcat]/webapps/jspui
   ln - s [DSpace]/webapps/oai [tomcat]/webapps/oai
   ln - s [DSpace]/webapps/xmlui [tomcat]/webapps/xmlui
   ```

10. Create an initial administrator account:

    ```
    [DSpace]/bin/create-administrator
    ```

11. Now the moment of truth! Visit the base URL(s) of your server, depending on which DSpace web applications you want to use. You should see the DSpace home page. Congratulations!

    Base URLs of DSpace Web Applications:
    - JSP User Interface - (e.g.) http://localhost:8080/jspui
- XML User Interface (aka. Manakin) - (e.g.) http://localhost:8080/xmlui
- OAI-PMH Interface - (e.g.) http://localhost:8080/oai/request?verb=identify
  (Should return an XML-based response)

Credits
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