Installing OMERO.server on Linux

http://tinyurl.com/omero-linux

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Agenda

The Documentation
Prerequisites (installation and verification)
Filesystem layout
DB scaffolding
Server configuration (web deployment)
Live demo of VDI VM - available on USB sticks
The Documentation

Walkthrough and help available

- server installation documentation
- hardware requirements
- community resources
- feedback welcome
Prerequisites

Installation time ~10 minutes

Environment variables

- JAVA_HOME, JRE_HOME, ICE_HOME, POSTGRES_HOME
- PYTHONPATH, DYLD_LIBRARY_PATH, LD_LIBRARY_PATH, PATH

Safe to use installation defaults

- may want to 'harden' for production
Prerequisites - verification

Set PATH and PYTHONPATH first

```
omeno@omerovm:~$ python
Python 2.6.6 (r266:84292, Dec 27 2010, 00:02:40) [GCC 4.4.5] on linux2
Type "help", "copyright", "credits" or "license" for more information.
>>>
import tables
>>> tables.test()
(output...)
omeno@omerovm:~$ icegridadmin -v
3.3.1
```

```
omeno@omerovm:~$ java -version
java version "1.6.0_26"
Java(TM) SE Runtime Environment (build 1.6.0_26-b03)
Java HotSpot(TM) Client VM (build 20.1-b02, mixed mode, sharing)
```
Filesystem layout

Default use case - /OMERO

- server binaries in ~/OMERO.server
- repository in /OMERO
- binary repository explained

OMERO writes to user's home directory

- i.e. ~/omero
- can be changed by env var OMERO_TEMPDIR

Unzip server code, run diagnostics

~ /OMERO.server/bin/omero admin diagnostics
DB scaffolding

Do not use db_user and db_password!
- usernames and passwords explained

Create DB user, set a password
- as DB owner in psql
- configuring PostgreSQL

Create tables using bin\omero db script output
- as DB OMERO user in psql
- PL/pgsql language is already created in DB if Postgres (≥9.0)
- COMMIT as final output line means success
Server configuration

Use `bin/omero config set`, minimally configure

- `omero.db.name`
- `omero.db.user`
- `omero.db.pass`

- `etc/omero.properties` for defaults set and other options

If needed, set up LDAP authentication

- `setting up LDAP auth`

`bin/omero admin start` should succeed

- and your mem/CPU usage should go up
- `omero admin diagnostics... icegridnode`
Server configuration
(web deployment)

Make sure you have Nginx / Apache installed

- OMERO.web requires mod_fastcgi (NOT fcgi!)
- (CentOS/Redhat: rpmforge)
- http://nginx.org

```
bin/omero config set
  omero.web.application_server
```

```
bin/omero web config nginx
  copy to e.g. /etc/nginx.conf
  nginx -c /etc/nginx.conf
  n.b. above not production nginx deployment
```

Finally `bin/omero web start`
Server configuration

Minimal settings to be up and running

C:\OMERO.server>bin\omero config get
omero.db.name=omero
omero.db.pass=omero
omero.db.user=omero
omero.web.application_server=fastcgi-tcp

http://localhost/omero
Live demo - vdi on USB sticks
Thank you
Server heap memory

Server has 512 MiB set by default

- see etc\grid\templates.xml

General rule for memory allocation

- depends on your largest image size
- 2 copies of that image present in RAM
- 2 GB medium, 3 GB in other cases
- JCB DataViewer uses 4/8 GB RAM
Filesystem I/O latency

NFS increases the latency

Lock management

→ distributed locking over NFS is subject to many variables

Considerations

→ NFS vs. CIFS
→ NAS embedded locking management
→ "mount lost" recovery scenario
→ mount health monitoring
Security

Overview

Out of the box

- encryption of all passwords between client and server via SSL
- full encryption of all data when requested via SSL
- limited visible TCP ports to ease firewalling
- escaping and bind variable use in all SQL interactions performed via Hibernate
Data backup/restore

DB and binary repository go together!
- do not back up only one or the other
- walkthrough

PostgreSQL
- `pg_dump` and `pg_restore` are helpful
Deployment Hardening

Separating Disk Access

- OS filesystem
- Binary Repository
- OMERO TEMPDIR
- Postgres DB
- Postgres Log (?)