



# 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



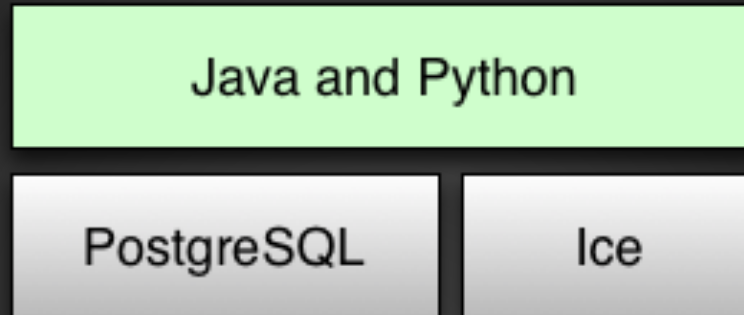
# The Documentation

## 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

```
omero-> \q
omero@omero-vm:~$ psql -U omero
psql (8.4.8)
Type "help" for help.

omero=> \l

      Name      | Owner  | Encoding
-----+-----+-----
omero          | omero  | UTF8
```

```
omero@omero-vm:~$ 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...)

```
omero@omero-vm:~$ icegridadmin -v
3.3.1
```

```
omero@omero-vm:~$ 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 `pgsql`

↪ configuring PostgreSQL

Create tables using `bin\omero db script` output

↪ as DB OMERO user in `pgsql`

↪ `PL/pgsql` language is already created in DB if PostgreSQL ( $\geq 9.0$ )

↪ `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
- ↪ 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 (?)

