
"Sometimes
It's alright
To be …
LAZY
EVRY

Managing Personal Test Databases with Tools like …

Oracle VirtualBox & Vagrant

… & SALT

… & FlywayDB

By Lasse Jenssen

"Sometimes it's alright to be LAZY"

EVRY


The best system administrators and developers I know are downright …
LAZY

Safe Harbor Statement

As most of the Tech15 attendees the author of the following presentation, was out enjoying a beer or two last night. Every single word and print will truly be presented with the best intentions for the audience.
Regardless of this, there is no guarantee that there won't be any errors or mistakes in the following content.

Agenda:

- Introduction to Vagrant (& Virtualbox)
- How to get going?
- My small Oracle Vagrant Framework
- How to do ...
  - testing with snapshots & rollback
  - clean up your schema
  - create new databases
  - drop old databases
- Example: SALT to create Vagrant Box
- Example: Build schema w/flywayDB

Use-Cases:

- Administering your **personal** test databases
- Providing an production like platform for you **developer** (on developers local laptop)
- Provide a testing platform to be integrated with **Jenkins** for automated testing
- Easy way to deploy test/development databases to your VMware environment (No provider for Oracle VM yet)

EVRY

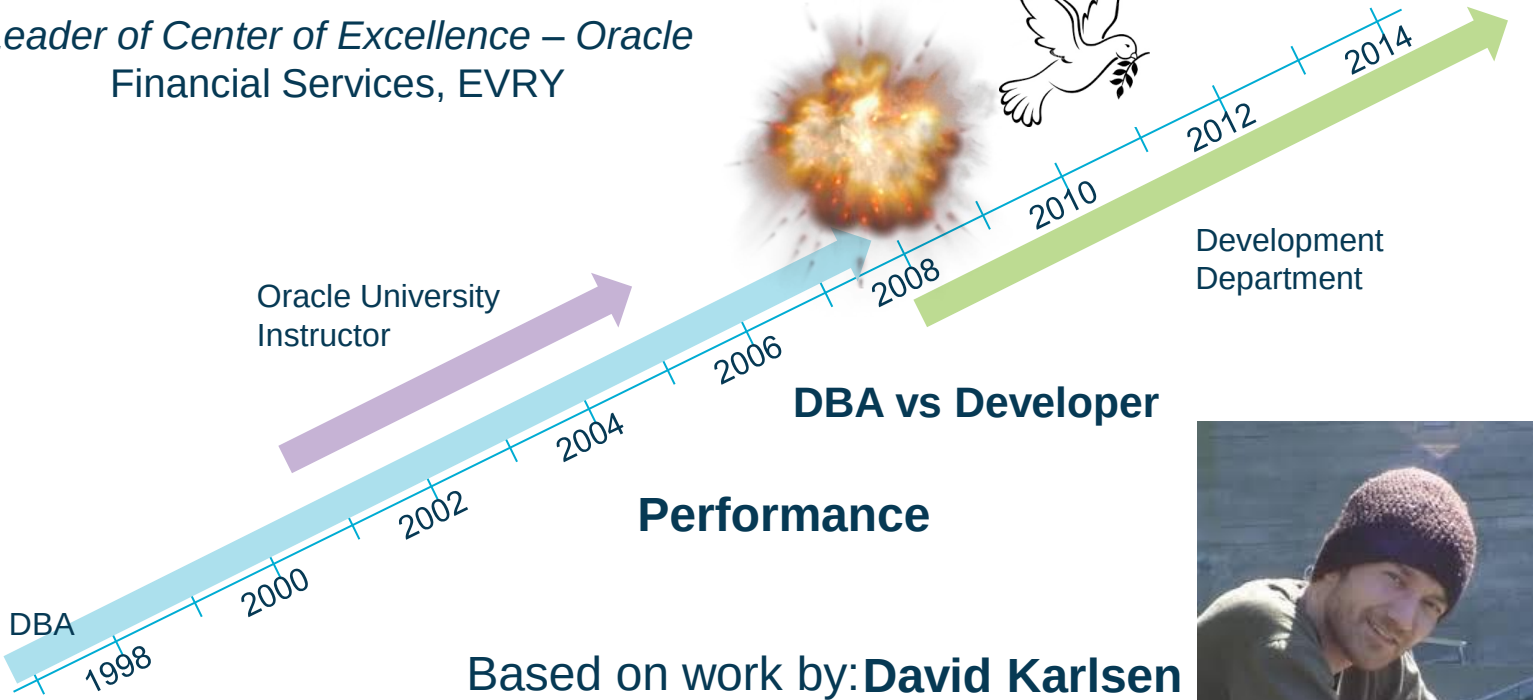
https://github.com/lasjen/OracleVagrantFramework

Oracle End-to-end Metrics

Lasse Jenssen

Leader of Center of Excellence – Oracle

Financial Services, EVRY



DBA vs Developer

Performance

Based on work by: **David Karlsen**

Leader of Center of Excellence – Java

EVRY

Oracle VirtualBox

a hypervisor for x86 computers

freely available

Open Source Software under the terms of the
GNU General Public License (GPL) version 2

runs on Windows, Linux, Macintosh, and Solaris hosts

a large number of guest operating systems

including but not limited to
Windows (NT 4.0, 2000, XP, Server 2003, Vista, Windows 7, Windows 8),
DOS/Windows 3.x, Linux (2.4, 2.6 and 3.x), Solaris and OpenSolaris, OS/2, and OpenBSD.

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File Machine Help

New Settings Show Discard Details Snapshots

- WinCorp8 — Running
- oracle — Powered Off
- OEL65-ORA11G-P... — Aborted
- OEL65-ORA11G-P... — Aborted
- OEL66-DOCKER-D... — Powered Off
- OEL65-ORA11G-P... — Aborted
- OEL65-ORA12C-P... — Powered Off

General

Name:	WinCorp8
Operating System:	Windows 8.1 (64-bit)

System

Base Memory:	6068 MB
Processors:	4
Boot Order:	Hard Disk
Acceleration:	VT-x/AMD-V, Nested Paging

Preview

Display

Video Memory:	128 MB
Acceleration:	2D Video
Remote Desktop Server:	Disabled
Video Capture:	Disabled

Storage

Controller: IDE
IDE Secondary Master: [CD/DVD] Empty
Controller: SATA
SATA Port 0: WinCorp8-disk2.vmdk (Normal, 100,00 GB)

Audio

Host Driver: PulseAudio

Vagrant

It’s magic!

… running on Windows, Linux & Macintosh hosts

… working on the shoulder of giants
(like VirtualBox, VMware, Amazone WS, Google CE or any other provider)

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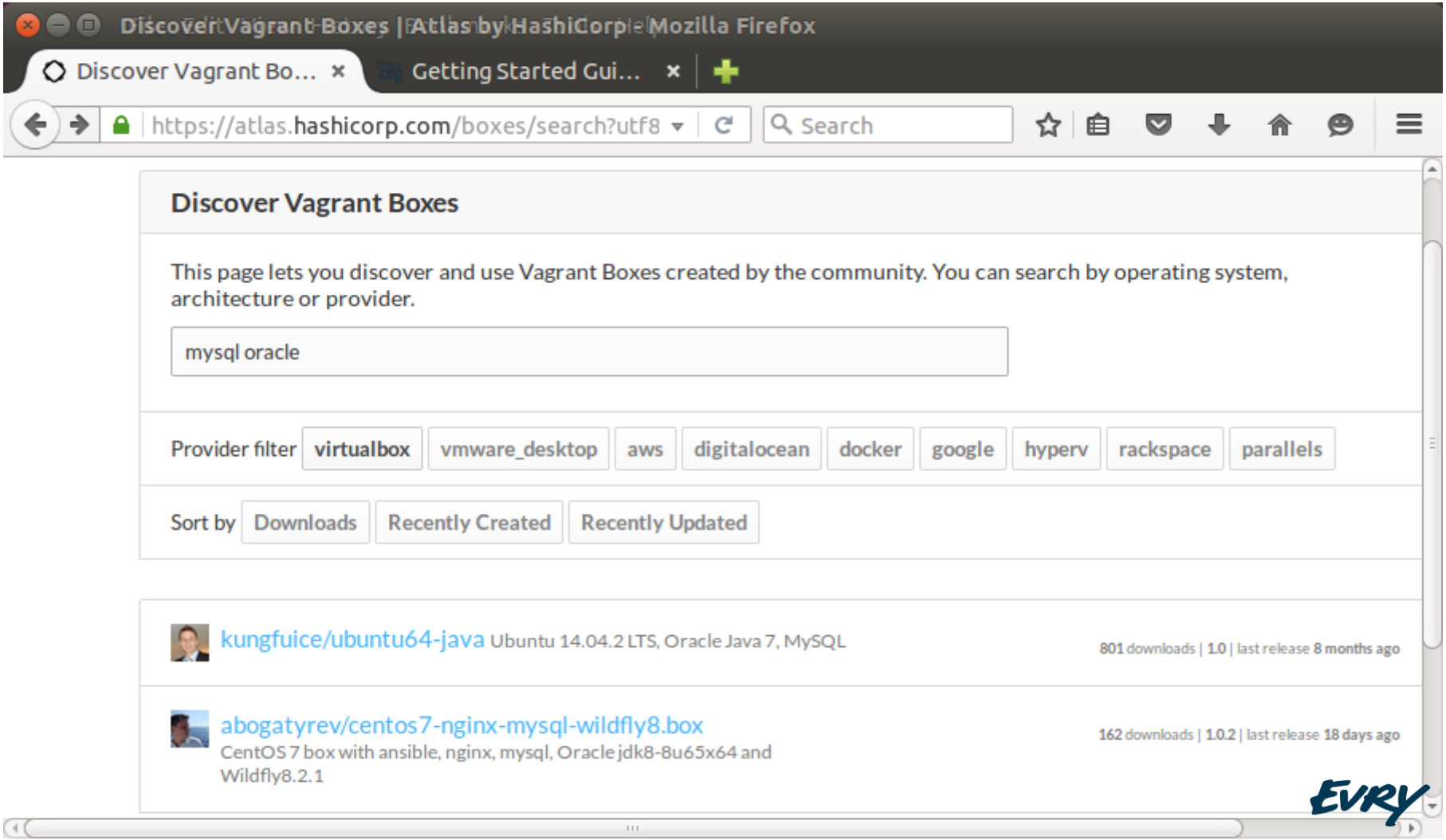
Discover Vagrant Boxes | Atlas by HashiCorp - Mozilla Firefox
Discover Vagrant Bo...
Getting Started Gui...
https://atlas.hashicorp.com/boxes/search?utf8
Search
Discover Vagrant Boxes
This page lets you discover and use Vagrant Boxes created by the community. You can search by operating system, architecture or provider.
mysql oracle
Provider filter
virtualbox
vmware_desktop
aws
digitalocean
docker
google
hyperv
rackspace
parallels
Sort by
Downloads
Recently Created
Recently Updated
kungfuice/ubuntu64-java Ubuntu 14.04.2 LTS, Oracle Java 7, MySQL
801 downloads | 1.0 | last release 8 months ago
abogatyrev/centos7-nginx-mysql-wildfly8.box
CentOS 7 box with ansible, nginx, mysql, Oracle jdk8-8u65x64 and Wildfly8.2.1
162 downloads | 1.0.2 | last release 18 days ago

```
$ mkdir ubuntu64_java
$ cd ubuntu64_java/
$ vagrant init kungfuice/ubuntu64-java
A `Vagrantfile` has been placed in this directory. You are now
ready to `vagrant up` your first virtual environment! …

$ vagrant up
Bringing machine 'default' up with 'virtualbox' provider...
==> default: Importing base box 'kungfuice/ubuntu64-java'...
==> default: Matching MAC address for NAT networking...
==> default: Checking if box 'kungfuice/ubuntu64-java' is up to date...
==> default: Setting the name of the VM:
ubuntu64_java_default_1448663249906_18214
==> default: Fixed port collision for 22 => 2222. Now on port 2200.
==> default: Clearing any previously set network interfaces...
==> default: Preparing network interfaces based on configuration...
    default: Adapter 1: nat
==> default: Forwarding ports...
    default: 22 => 2200 (adapter 1)
==> default: Booting VM...
==> default: Waiting for machine to boot. This may take a few minutes..
…
```

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```
$ vagrant ssh
Welcome to Ubuntu 14.04.2 LTS (GNU/Linux 3.16.0-30-generic x86_64)

  System information as of Fri Nov 27 17:29:54 EST 2015

  System load:  0.47              Processes:           106
  Usage of /:   5.6% of 35.07GB   Users logged in:     0
  Memory usage: 3%                IP address for eth0: 10.0.2.15
  Swap usage:   0%

Last login: Tue Mar  3 17:29:37 2015
vagrant@vagrant:~$ hostname
vagrant
vagrant@vagrant:~$ exit
logout
Connection to 127.0.0.1 closed.
$ hostname
ws-coe-ek2046
$ ssh vagrant@localhost -p2220
Welcome to Ubuntu 14.04.2 LTS (GNU/Linux 3.16.0-30-generic x86_64)
…
```

What have I done to get this far?

Configured BIOS for Virtualization

Installed Oracle VirtualBox

Installed Vagrant

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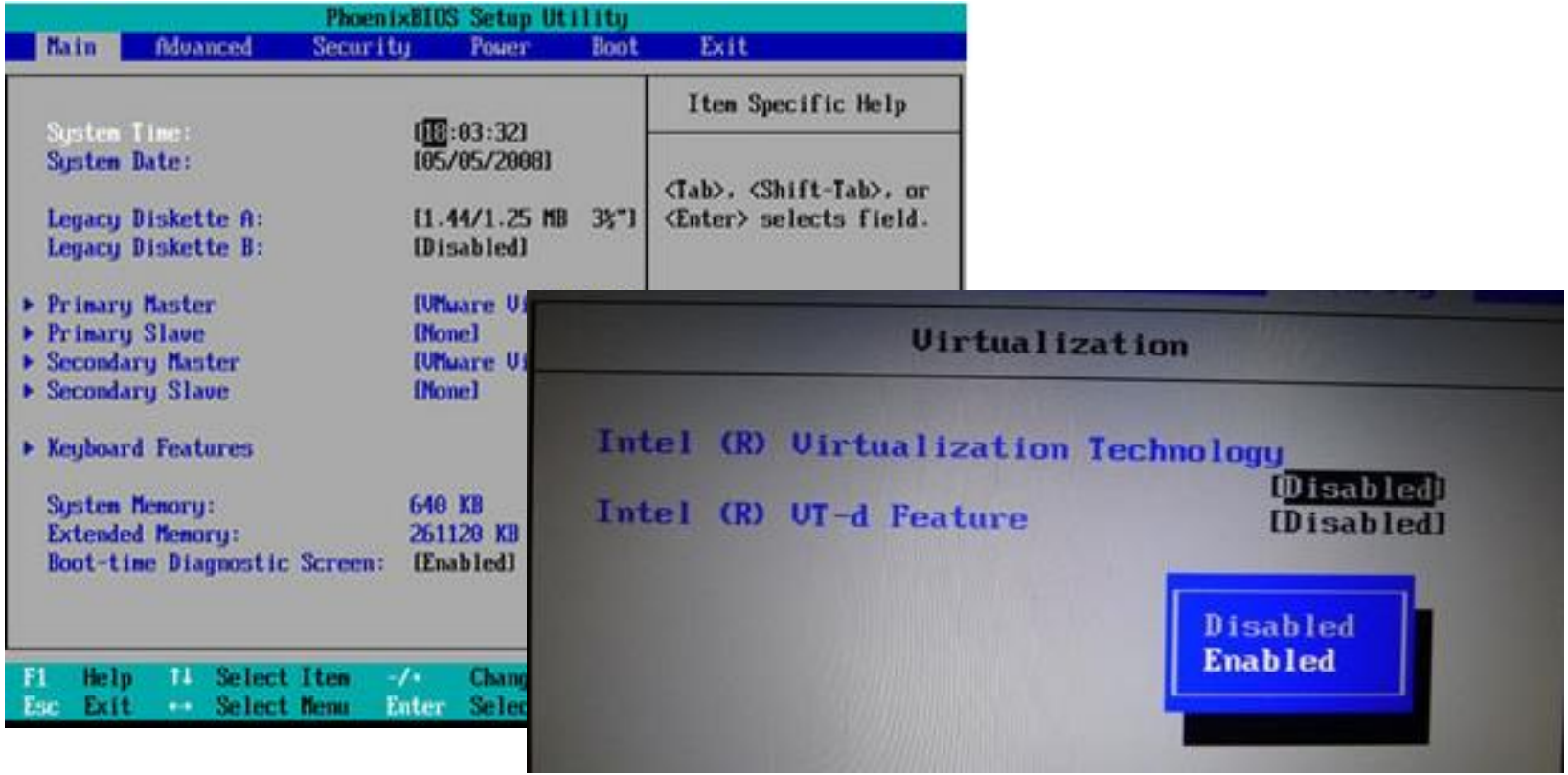
PhoenixBIOS Setup Utility
Main
Advanced
Security
Power
Boot
Exit
Item Specific Help
System Time:
System Date:
Legacy Diskette A:
Legacy Diskette B:
Primary Master
Primary Slave
Secondary Master
Secondary Slave
Keyboard Features
System Memory:
Extended Memory:
Boot-time Diagnostic Screen:
640 KB
261120 KB
Enabled
<Tab>, <Shift-Tab>, or <Enter> selects field.
F1 Help
Esc Exit
Select Item
Select Menu
Enter
Virtualization
Intel (R) Virtualization Technology
Intel (R) VT-d Feature
Disabled
Disabled
Disabled
Enabled

Lasse

www.oracle.com/technetwork/server-storage/virtualbox/downloads/index.html

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Oracle VM VirtualBox

The latest release is version 5.0.6.

On this page you can download:

- Oracle VM VirtualBox
- Oracle VM VirtualBox Extension Pack
- Oracle VM VirtualBox Source Code
- Oracle VM VirtualBox Pre-built Appliances

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DOWNLOAD

Latest

Old Versions

DOWNLOAD VAGRANT

Below are all available downloads for the latest version of Vagrant (1.7.4). Please download the proper package for your operating system and architecture. You can find SHA256 checksums for packages here, and you can find the version changelog here.

MAC OS X

Universal (32 and 64-bit)

WINDOWS

Universal (32 and 64-bit)

LINUX (DEB)

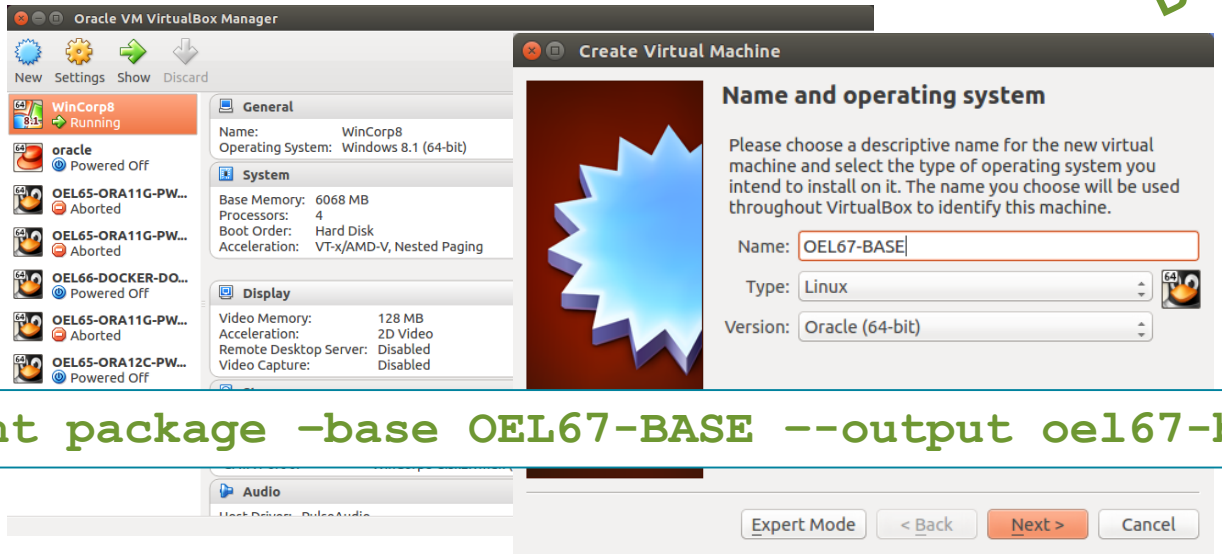
32-bit | 64-bit

LINUX (RPM)

32-bit | 64-bit

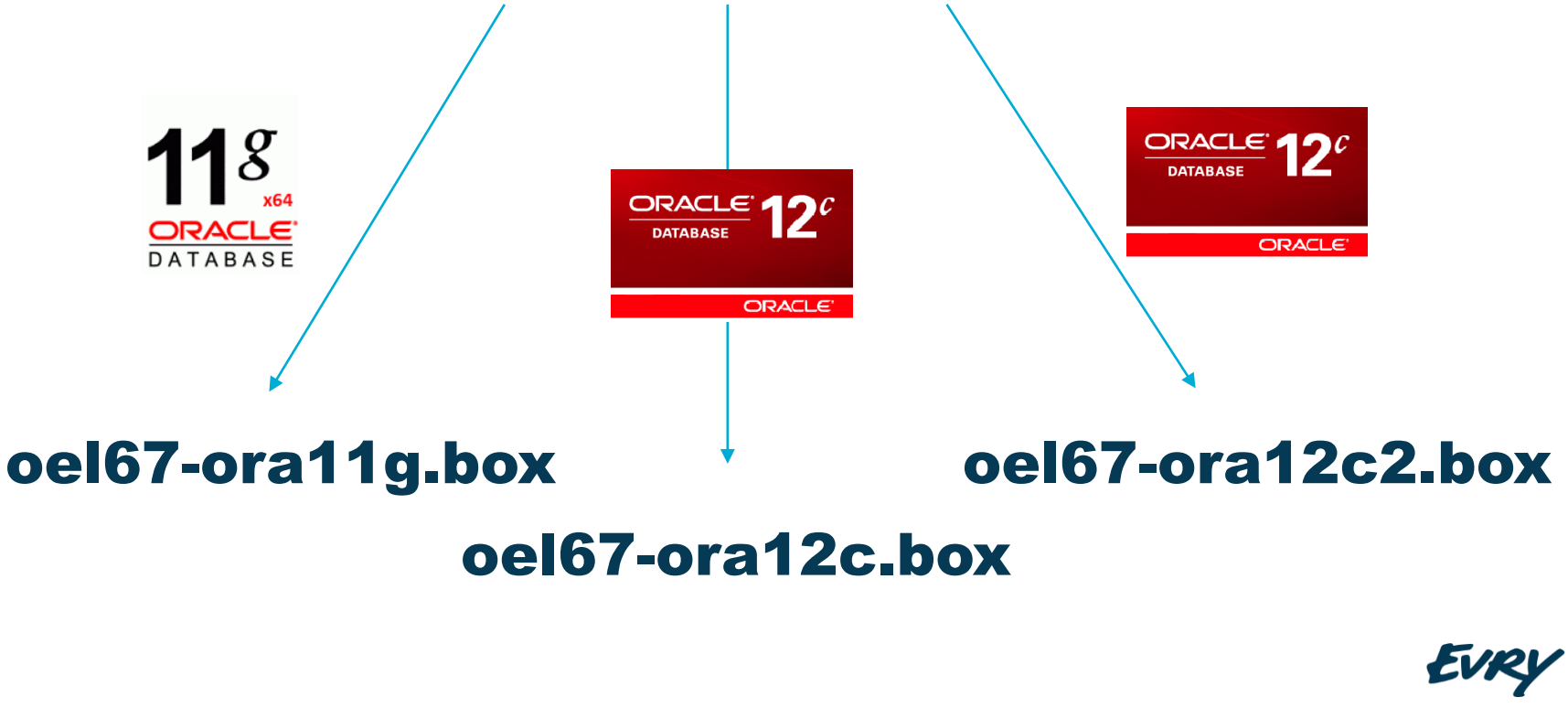
But we need to build our own boxes

package VM into




```
> Vagrant package -base OEL67-BASE --output oel67-base.box
```

EVRY


oel67-base.box
11g x64 ORACLE DATABASE
ORACLE 12c DATABASE ORACLE
ORACLE 12c DATABASE ORACLE
oel67-ora11g.box
oel67-ora12c2.box
oel67-ora12c.box

Hold on!

That is a lot of ...

WORK.

What happened to LAZY???

EVRY

Lasse

www.oracle.com/technetwork/server-storage/virtualbox/downloads/index.html

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- StorageTek Tape Storage

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- Oracle VM VirtualBox Pre-built Appliances

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	▪ Oracle Enterprise Pack for Eclipse	
Database App Development VM	▪ Oracle Linux 7 ▪ Oracle Database 12c Release 1 Enterprise Edition (12.1.0.2 with In-Memory Option) ▪ Oracle XML DB ▪ Oracle SQL Developer ▪ Oracle SQL Developer Data Modeler ▪ Oracle Application Express ▪ Hands-On-Labs (accessed via the Toolbar Menu in Firefox)	Downloads and Instructions
Oracle VM 3.2.4 Manager & Server VMs	▪ Oracle Linux 5 update 9 with the Unbreakable Enterprise Kernel (2.6.39) ▪ Oracle VM Manager 3.2.4	Download and Instructions

I got a box. with Oracle

What now?

EVRY

```
$ vagrant package -base OEL67-ORA12 --output /tmp/oel67-ora12.box

$ vagrant box list
OEL65-ORA11              (virtualbox, 0)
kungfuice/ubuntu64-java (virtualbox, 1.0)

$ vagrant box add OEL67-ORA12C /tmp/oel67-ora12c.box

$ vagrant box list
OEL65-ORA11              (virtualbox, 0)
OEL67-ORA12              (virtualbox, 0)
kungfuice/ubuntu64-java (virtualbox, 1.0)

-- Note! Remove old boxes not in use
$ vagrant box remove kungfuice/ubuntu64-java
```

the Vagrantfile

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My personal “Oracle Vagrant Framework”

```
$ cd 31_orcl/
$ tree
.
├── files
│   ├── DBdumps
│   ├── import_data.sh
│   ├── provision.sh
│   ├── setup
│   │   └── common
│   │       ├── create_directories_OS.sh
│   │       ├── create_dev_users.sql
│   │       ├── drop_dev_users.sql
│   │       ├── dev_users_env.sql
│   │       ├── partition_enable.sql
│   │       ├── profiles.sql
│   │       └── setup_db.sql
│   └── work
└── Vagrantfile

5 directories, 11 files
$
```

This structure is a “definition” of my “potential“ database machine

The Vagrantfile being the starting point

EVRY

```
$ cat Vagrantfile
# -*- mode: ruby -*-
# vi: set ft=ruby :

Vagrant.configure("2") do |config|
  # If several PWH virtal machines, separate by different APPENDIX
  $V_HOSTNAME_APPENIX="31"
  $V_BOX_LINK="oel67_ora12.box"
  $V_ORA_VERSION="12"
  $V_OS_VERSION="67"
  $V_DB_NAME="ORCL"
  $V_USER_NAME="LJ"

  # ------------------------------------------------------------------
  # WARNING! DO NOT EDIT BELOW THIS LINE!
  # ------------------------------------------------------------------
  $V_PRIVATE_IP="10.0.2.1"+$V_HOSTNAME_APPENIX
  $V_SSH_PORT="22"+$V_HOSTNAME_APPENIX
  $V_TNS_PORT="15"+$V_HOSTNAME_APPENIX
  $V_BOX_NAME="OEL"+$V_OS_VERSION+"-ORA"+$V_ORA_VERSION
  $V_BOX_URL="file:/data/vagrant_boxes/"
  $V_HOST_NAME=$V_BOX_NAME+"-"+$V_DB_NAME+"-"+$V_HOSTNAME_APPENIX
```

It's just a name reference

Let's me set different
IP addressees and port numbers

```
config.vm.box=$V_BOX_NAME        #The name of the registered box
config.vm.box_url=$V_BOX_URL     #If not in local repo
config.vm.hostname=$V_HOST_NAME  #The name shown in Virtualbox (unique)

if Vagrant.has_plugin?("vagrant-proxyconf")
  config.proxy.http     = "http://proxy.edb.com:8080/"
  config.proxy.https    = "http://proxy.edb.com:8080/"
  config.proxy.no_proxy = "localhost,127.0.0.1,.evry.com,.edb.com"
end

if Vagrant.has_plugin?("vagrant-vbplugin")
  config.vbguest.auto_update = true                -- VboxGuestAddition
end

config.vm.synced_folder "./", "/vagrant", id: "vagrant-root",
  owner: "vagrant",
  group: "dba",
  mount_options: ["dmode=775,fmode=664"]

config.vm.synced_folder "/data/ora_sql", "/ora_sql"
  owner: "oracle",
  group: "dba",
  mount_options: ["dmode=755,fmode=664"]
```

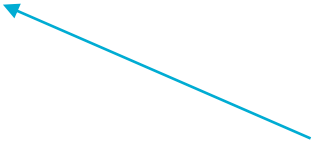
```
  # Forward Oracle SQLNET and SSH port
  config.vm.network :forwarded_port, guest: 1521, host: $V_TNS_PORT
  config.vm.network :forwarded_port, id: 'ssh', guest: 22, host: $V_SSH_PORT

  # Define privat network if to connect between VMs
  #config.vm.network "private_network", ip: $V_PRIVATE_IP

  config.vm.provider :virtualbox do |vb|          # Provider specific config
    #vb.gui = true
    vb.cpus = 2
    vb.name = config.vm.hostname
    # Use VBoxManage to customize the VM
    vb.customize ["modifyvm", :id,
                  "--memory", "2048",
                  # Enable DNS behind NAT
                  "--natdnshostresolver1", "on"]
  end

  # Provision part, this set up the vagrant box with a oracle test user
  config.vm.provision "shell", path: "files/provision.sh", args: $V_ORA_VERSION
end
```

READY to GO!

```
$ vagrant plugin install vagrant-proxyconf
Installing the 'vagrant-proxyconf' plugin. This can take a few minutes...
Installed the plugin 'vagrant-proxyconf (1.5.2)'!
$ vagrant plugin install vagrant-vbguest
Installing the 'vagrant-vbguest' plugin. This can take a few minutes...
Installed the plugin 'vagrant-vbguest (0.11.0)'!
```

```
$ cd 31_orcl
$ vagrant up
Bringing machine 'default' up with 'virtualbox' provider...
==> default: Importing base box 'OEL67-ORA12'...
==> default: Matching MAC address for NAT networking...
==> default: Setting the name of the VM: OEL67-ORA12-ORCL-31
==> default: Clearing any previously set network interfaces...
==> default: Preparing network interfaces based on configuration...
    default: Adapter 1: nat
==> default: Forwarding ports...
    default: 1521 => 1531 (adapter 1)
    default: 22 => 2231 (adapter 1)
==> default: Running 'pre-boot' VM customizations...
==> default: Booting VM...
==> default: Waiting for machine to boot. This may take a few minutes...
    default: SSH address: 127.0.0.1:2231
    default: SSH username: vagrant
    default: SSH auth method: password
    default: Warning: Connection timeout. Retrying...
    default: Warning: Connection timeout. Retrying...
    default: Warning: Connection timeout. Retrying...
```

```
    default: Inserting generated public key within guest...
    default: Removing insecure key from the guest if it's present...
    default: Key inserted! Disconnecting and reconnecting using new SSH key…
==> default: Machine booted and ready!
==> default: Configuring proxy environment variables...
==> default: Configuring proxy for Yum...
GuestAdditions 5.0.10 running --- OK.
==> default: Checking for guest additions in VM...
==> default: Mounting shared folders...
    default: /vagrant => /data/vagrant_test/31_orcl
    default: /ora_sql => /data/ora_sql
==> default: Running provisioner: shell...
    default: Running: /tmp/vagrant-shell20151205-16447-1mzckys.sh
```



This is the **provision.sh** script

the provision.sh

```
# Define APP_USER from in-parameter
V_ORA_VER=${1}

cd /vagrant/files/setup/common/
echo "Creating OS directories..."
sh create_directories_OS.sh

#sleep 30
echo "Creating common objects and users in DB..."
sudo -u oracle -i <<EOF
cd /vagrant/files/setup/common
sqlplus /nolog @setup_db.sql $V_ORA_VER
EOF

echo "Importing data"
if [ -f /vagrant/files/DBdumps/dpump_data.dmp.gz ]; then
   sudo -u oracle -i sh /vagrant/files/data_import.sh
fi

echo "Provisioning finished! "
```

```
sudo mkdir -p /u01/app/oracle/oradata/orcl

sudo chown -R oracle:oinstall /u01
```

```
connect / as sysdba
@@drop_dev_users.sql &1
@@create_dev_users.sql &1
exit
```

```
==> default: Running provisioner: shell...
    default: Running: /tmp/vagrant-shell20151205-16447-1mzckys.sh
==> default: Creating OS directories...
==> default: Creating common objects and users in DB...
==> default: SQL*Plus: Release 12.1.0.2.0 Prod… on Sat Dec 5 21:28:15 2015
==> default: Copyright (c) 1982, 2014, Oracle.  All rights reserved.
==> default: Connected.
==> default: * ------------------------------------------------------  *
==> default: * Script: drop_dev_users.sql is running (please wait …)
==> default: * ------------------------------------------------------ *
==> default: *** ENVIRONMENT SETTINGS:  ***
==> default: Data Owner             : LJDATA
==> default: Application User       : LJ
==> default: Support User           : LJSUPP
==> default: Oracle Version         : 12
==> default: Grant Package          : USER_GRANT
==> default: Read-Only Role         : LJ_RO
==> default: Read-Write Role        : LJ_RW
==> default: Atomikos Enabled       : TRUE
==> default: Tablespace Directory   : /u01/app/oracle/oradata/orcl
==> default: Plugable Name          : ORCL
```

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```
==> default: ***      Dropping USERS (waiting)                    ***
==> default: User LJDATA does not exist.
==> default: User LJSUPP does not exist.
==> default: User LJ does not exist.
==> default: ***      Dropping ROLES                              ***
==> default: Role LJ_RO does not exist.
==> default: Role LJ_RW does not exist.
==> default: ***      Dropping Tablespaces (waiting)              ***
==> default: Tablespace LJ_DATA does not exist.
==> default: Tablespace LJ_IDX does not exist.
==> default: Tablespace LJ_LOB does not exist.
==> default: ***         Dropping Triggers                        ***
==> default: Triggers dropped with users.
```

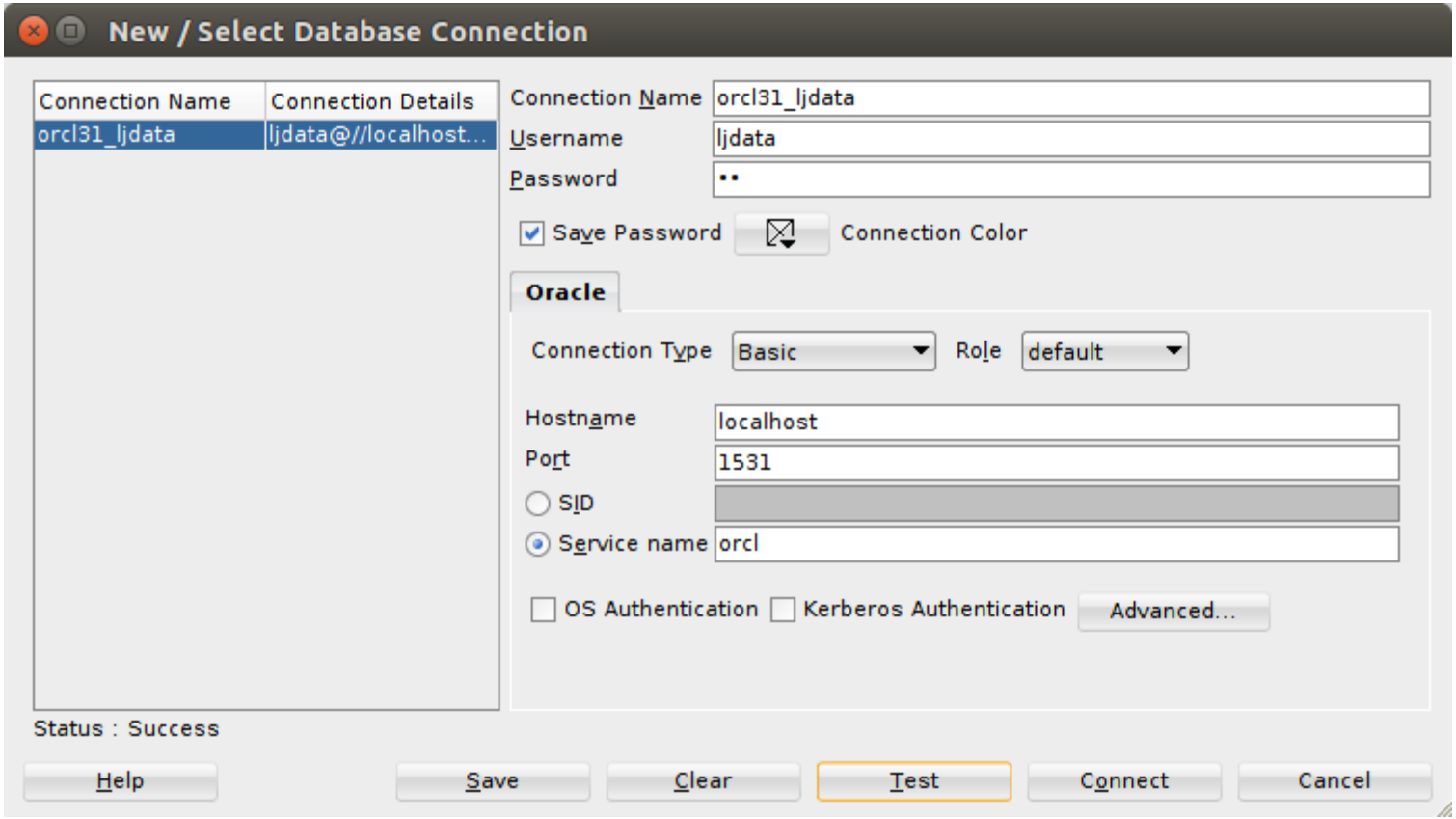
```
==> default: * ------------------------------------------------------------ *
==> default: * Script: create_dev_users.sql is running (please wait …)
==> default: * ------------------------------------------------------------ *
==> default: Successfully set container(PDB) to ORCL
==> default: *** ENVIRONMENT SETTINGS:                    ***
==> default: Data Owner           : LJDATA
==> default: Application User     : LJ
==> default: Support User         : LJSUPP
...
==> default: ***         Creating TABLESPACES ... (waiting)       ***
==> default: Creating tablespace LJ_DATA succeeded.
==> default: Creating tablespace LJ_IDX succeeded.
==> default: Creating tablespace LJ_LOB succeeded.
==> default: ***         Creating ROLES and give GRANTS           ***
==> default: Creating role LJ_RO succeeded.
==> default: Creating role LJ_RW succeeded.
==> default: Granting SELECT on sys.dba_pending_transactions to LJ_RW succ ..
==> default: Granting SELECT on sys.pending_trans$ to LJ_RW succeeded
==> default: Granting SELECT on sys.dba_2pc_pending to LJ_RW succeeded
==> default: Granting EXECUTE on sys.dbms_xa to LJ_RW succeeded
```

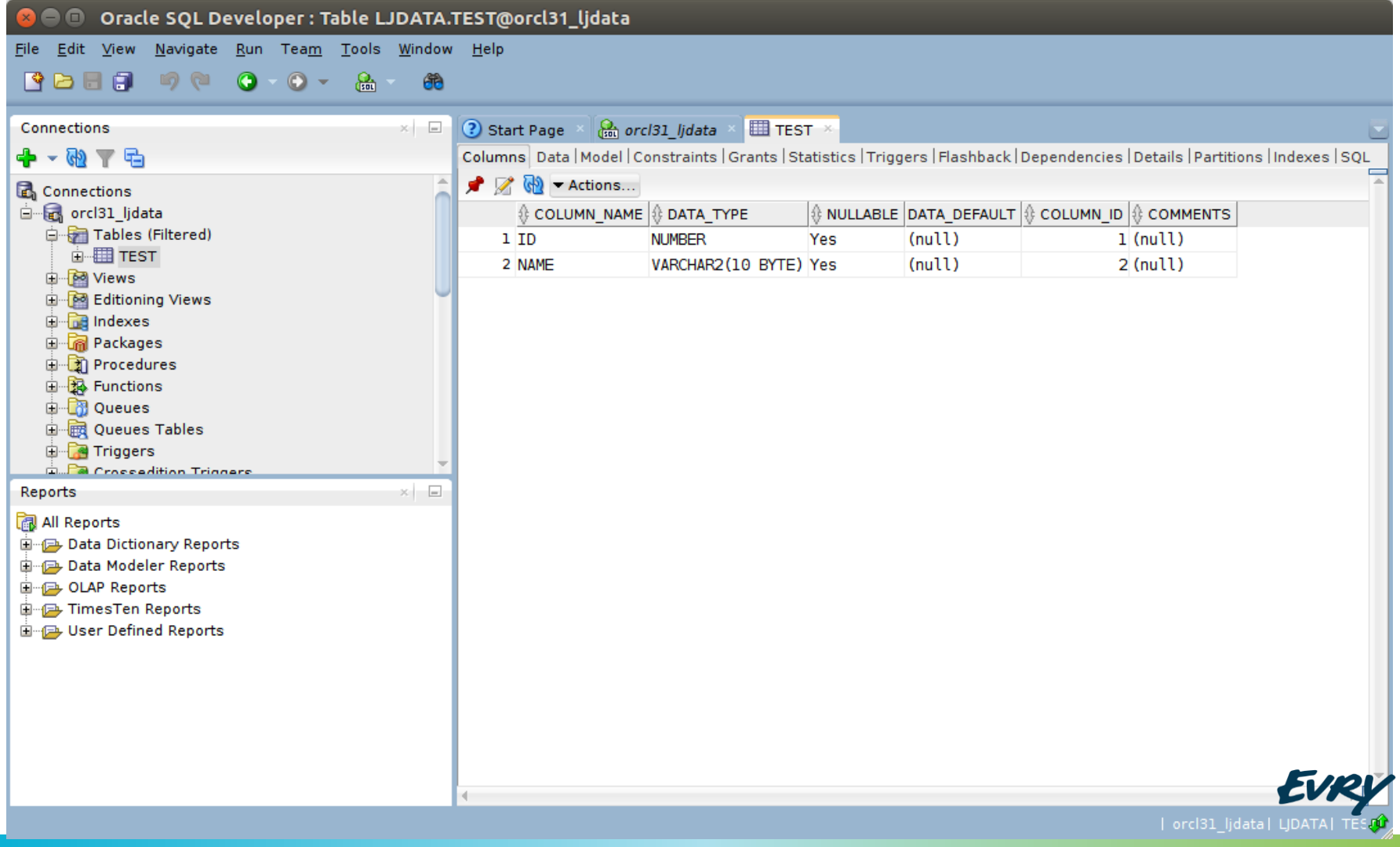
EVRY

```
==> default: ***        Creating users ... (waiting)                ***
==> default: User LJ created successfully.
==> default: User LJ granted CREATE SESSION successfully
==> default: User LJDATA created successfully.
==> default: User LJDATA granted CREATE SESSION successfully
==> default: User LJDATA granted owner rights successfully.
==> default: User LJSUPP created successfully.
==> default: User LJSUPP granted CREATE SESSION successfully
==> default: User LJ granted LJ_RW successfully.
==> default: User LJSUPP granted LJ_RO successfully.
==> default: ***        Creating triggers ...                       ***
==> default: Trigger TRG_LJ created successfully.
==> default: Trigger TRG_LJSUPP created successfully.
==> default: ***        Creating GRANT package ...                  ***
==> default: Package USER_GRANT created successfully.
==> default: Package body USER_GRANT created successfully.
==> default: Synonym for USER_GRANT created successfully.
==> default: Disconnected from Oracle 12c EE Release 12.1.0.2.0 - 64bit …
==> default: With the Partitioning, OLAP, Adv. Analytics and RAT options
==> default: Importing data
==> default: Provision finished!
```

EVRY

```
$ vagrant ssh
Last login: Sat Dec  5 22:01:24 2015 from 10.0.2.2
------------------------------------------------------------------
  Oracle Enterprise Linux 6.7                    built 2015-11-23
------------------------------------------------------------------
[vagrant@OEL67-ORA12-ORCL-32 ~]$ sudo su - oracle
[oracle@OEL67-ORA12-ORCL-32 ~]$ sqlplus ljdata/lj@orcl

SQL*Plus: Release 12.1.0.2.0 Production on Sat Dec 5 22:30:43 2015
Connected to:
Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production
…

SQL> create table test (id number, name varchar2(10));
Table created.

SQL> insert into test values (1,'LASSE');
1 row created.

SQL> commit;
Commit complete.
```


New / Select Database Connection
Connection Name
Connection Details
orcl31_ljdata
ljdata@//localhost...
Connection Name
orcl31_ljdata
Username
ljdata
Password
Save Password
Connection Color
Oracle
Connection Type
Basic
Role
default
Hostname
localhost
Port
1531
SID
Service name
orcl
OS Authentication
Kerberos Authentication
Advanced...
Status : Success
Help
Save
Clear
Test
Connect
Cancel


Oracle SQL Developer : Table LJDATA.TEST@orcl31_ljdata
File Edit View Navigate Run Team Tools Window Help
Connections
Connections
orcl31_ljdata
Tables (Filtered)
TEST
Views
Editioning Views
Indexes
Packages
Procedures
Functions
Queues
Queues Tables
Triggers
Crossedition Triggers
Reports
All Reports
Data Dictionary Reports
Data Modeler Reports
OLAP Reports
TimesTen Reports
User Defined Reports
Start Page
orcl31_ljdata
TEST
Columns Data Model Constraints Grants Statistics Triggers Flashback Dependencies Details Partitions Indexes SQL
Actions...
COLUMN_NAME DATA_TYPE NULLABLE DATA_DEFAULT COLUMN_ID COMMENTS
1 ID NUMBER Yes (null) 1 (null)
2 NAME VARCHAR2(10 BYTE) Yes (null) 2 (null)
orcl31_ljdata | LJDATA | TEST

If I want to Test ...

```
$ vagrant plugin install sahara
Installing the 'sahara' plugin. This can take a few minutes...
Installed the plugin 'sahara (0.0.17)'!
$ vagrant sandbox on
[default] Starting sandbox mode...
0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...100%
$ vagrant ssh
[vagrant@OEL67-ORA12C-ORCL-31 ~]$ sudo su - oracle
[oracle@OEL67-ORA12C-ORCL-31 ~]$ sqlplus ljdata/lj@orcl
SQL*Plus: Release 12.1.0.2.0 Production on Sun Dec 6 09:16:04 2015
…
SQL> delete from test;
1 row deleted.
SQL> commit;
Commit complete.

SQL> exit
[oracle@OEL67-ORA12C-ORCL-31 ~]$ exit
[vagrant@OEL67-ORA12C-ORCL-31 ~]$ exit
Connection to 127.0.0.1 closed.
$
```

```
$ vagrant sandbox rollback
[default] Rolling back the virtual machine...
0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...100%
0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...100%

$ vagrant ssh
[vagrant@OEL67-ORA12C-ORCL-31 ~]$ sudo su - oracle
[oracle@OEL67-ORA12C-ORCL-31 ~]$ sqlplus ljdata/lj@orcl

SQL> select * from test;

         ID NAME
---------- ----------
          1 LASSE

SQL>
```

```
$ vagrant sandbox commit                                    # Save snapshot
[default] Committing the virtual machine...
0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...100%
0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...100%

$ vagrant sandbox off                                       # delete snapshots
[default] Stopping sandbox mode...
0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...100%
```

If I want to Empty DB ...

```
$ vagrant provision
==> default: Configuring proxy environment variables...
==> default: Configuring proxy for Yum...
==> default: Running provisioner: shell...
    default: Running: /tmp/vagrant-shell20151206-25974-1ju0emf.sh
==> default: Creating OS directories...
==> default: Creating common objects and users in DB...
==> default: SQL*Plus: Release 12.1.0.2.0 on Sat Dec 5 21:28:15 2015
==> default: Copyright (c) 1982, 2014, Oracle.  All rights reserved.
==> default: Connected.
==> default: * ------------------------------------------------------  *
==> default: * Script: drop_dev_users.sql is running (please wait …)
==> default: * ------------------------------------------------------ *
…
==> default: * ------------------------------------------------------ *
==> default: * Script: create_dev_users.sql is running (please wait …)
==> default: * ------------------------------------------------------ *
…
==> default: Disconnected from Oracle DB 12c EE Release 12.1.0.2.0 - 64bit ..
==> default: With the Partitioning, OLAP, Advanced Analytics and RAT options
==> default: Importing data
==> default: Provision finished!
```

EVRY

If I want a New Server

```
$ cp -R 31_orcl 32_orcl
$ cd 32_orcl
$ vi Vagrantfile
$ cat Vagrantfile
# -*- mode: ruby -*-
# vi: set ft=ruby :

Vagrant.configure("2") do |config|
  # If several virtal machines, separate by different APPENDIX
  $V_HOSTNAME_APPENIX="32"
  $V_BOX_LINK="oel67_ora12c.box"
  $V_ORA_VERSION="12"
  $V_OS_VERSION="67"
  $V_DB_NAME="ORCL"
  $V_USER_NAME="LJ"
…

$ rm -rf .vagrant/
$ vagrant up
```

If I want a Clean up ...

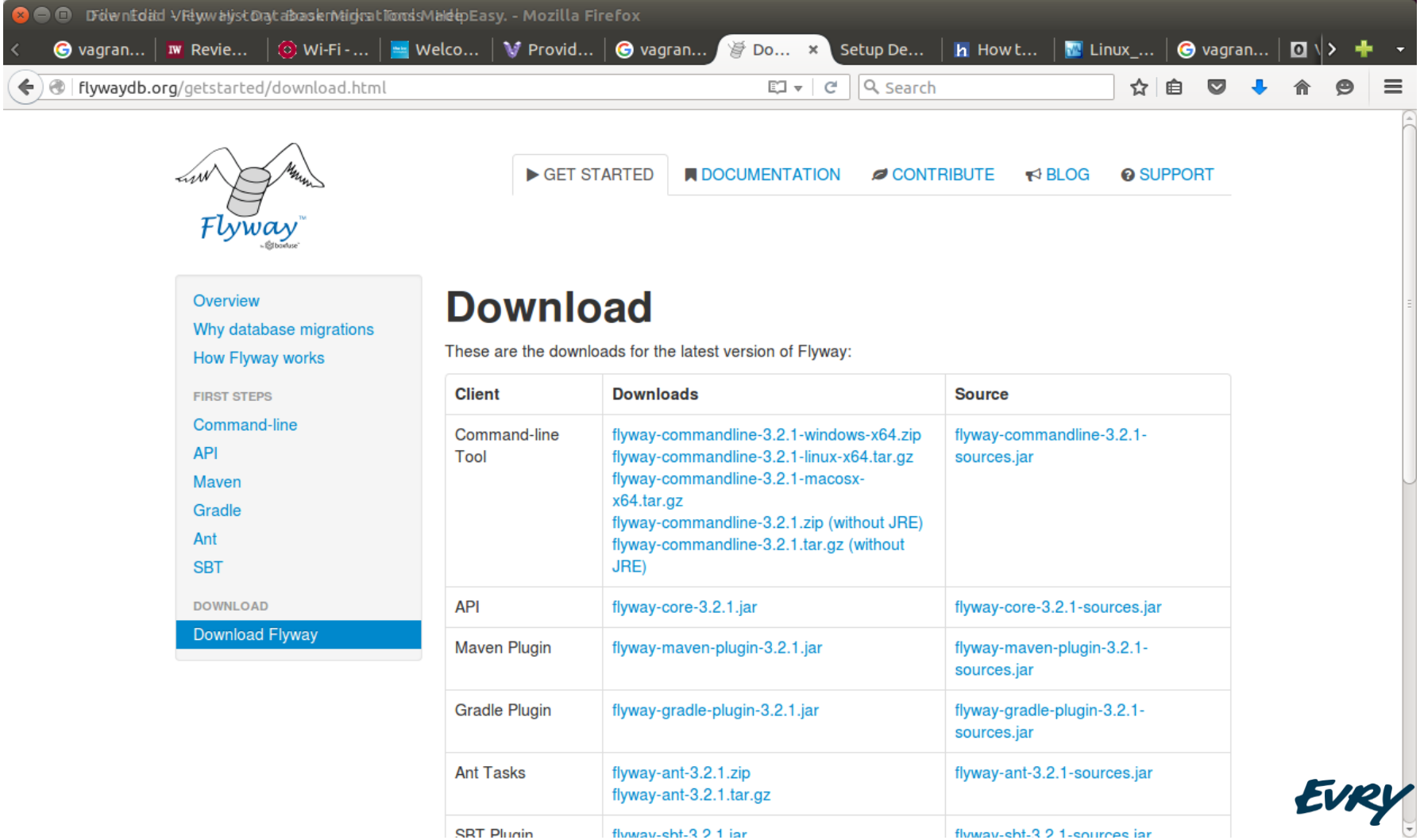
```
$ cd 32_orcl
$ vagrant destroy
    default: Are you sure you want to destroy the 'default' VM? [y/N] y
==> default: Forcing shutdown of VM...
==> default: Destroying VM and associated drives...
==> default: Running cleanup tasks for 'shell' provisioner...
$ cd ..
$ rm -rf 32_orcl
```

or Jenkins

If your developer wants to
run SQLs from his source (git) to

Build DATA schema

EVRY


Download | Flyway by Boxfuse - Database Migrations Made Easy. - Mozilla Firefox
vagran...
Revie...
Wi-Fi - ...
Welco...
Provid...
vagran...
Do...
Setup De...
How t...
Linux_...
vagran...
flywaydb.org/getstarted/download.html
Search
Flyway
GET STARTED
DOCUMENTATION
CONTRIBUTE
BLOG
SUPPORT
Overview
Why database migrations
How Flyway works
FIRST STEPS
Command-line
API
Maven
Gradle
Ant
SBT
DOWNLOAD
Download Flyway
Download
These are the downloads for the latest version of Flyway:
Client
Downloads
Source
Command-line Tool
flyway-commandline-3.2.1-windows-x64.zip
flyway-commandline-3.2.1-linux-x64.tar.gz
flyway-commandline-3.2.1-macosx-x64.tar.gz
flyway-commandline-3.2.1.zip (without JRE)
flyway-commandline-3.2.1.tar.gz (without JRE)
flyway-commandline-3.2.1-sources.jar
API
flyway-core-3.2.1.jar
flyway-core-3.2.1-sources.jar
Maven Plugin
flyway-maven-plugin-3.2.1.jar
flyway-maven-plugin-3.2.1-sources.jar
Gradle Plugin
flyway-gradle-plugin-3.2.1.jar
flyway-gradle-plugin-3.2.1-sources.jar
Ant Tasks
flyway-ant-3.2.1.zip
flyway-ant-3.2.1.tar.gz
flyway-ant-3.2.1-sources.jar
SBT Plugin
flyway-sbt-3.2.1.jar
flyway-sbt-3.2.1-sources.jar

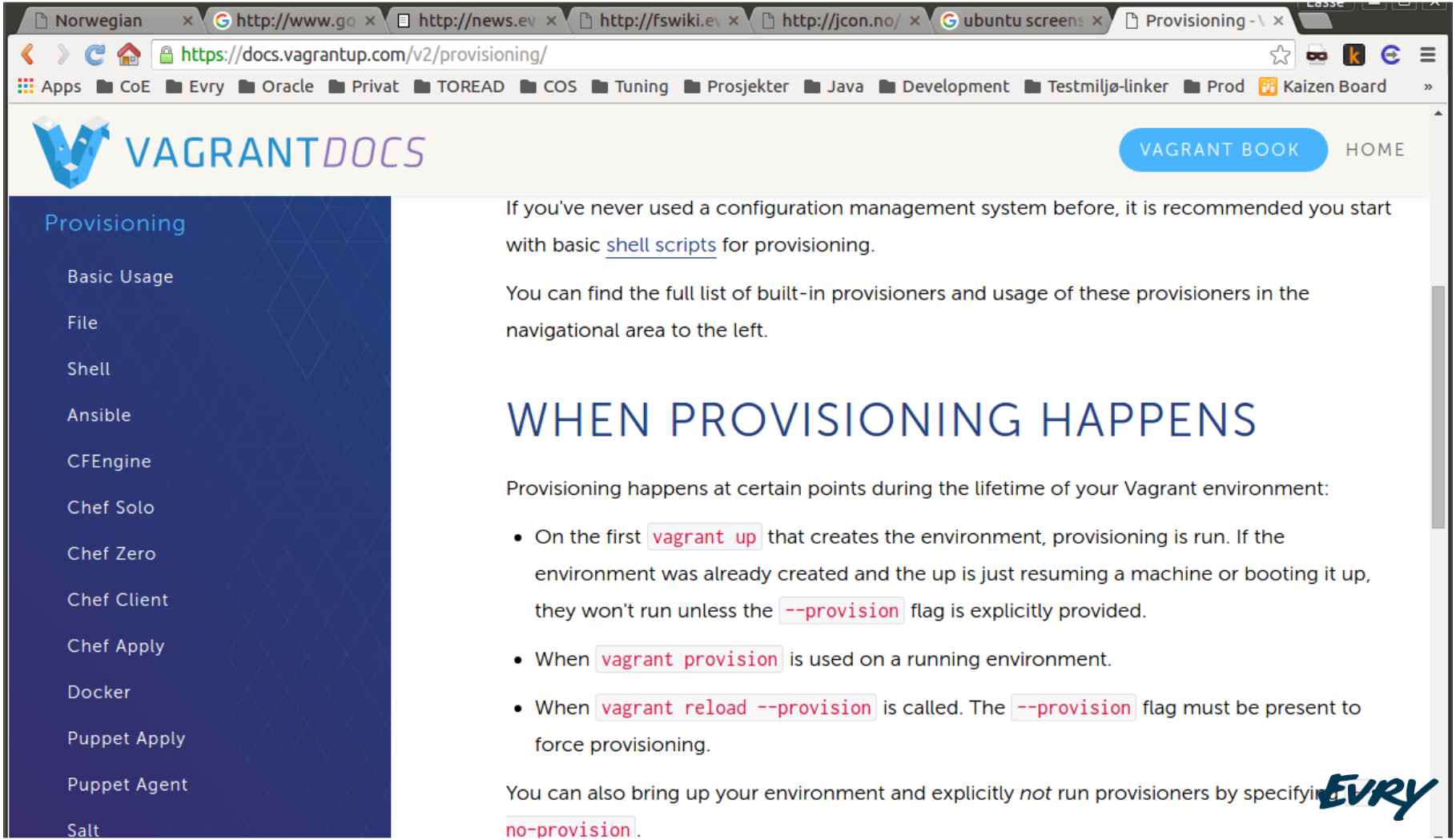
```
#Configure FlywayDB:
$ vi /data/flyway-3.2.1/conf/flyway.conf
flyway.url=jdbc:oracle:thin:@//localhost:1521/orcl
flyway.user=ljdata
flyway.password=lj
flyway.locations=filesystem:/ora_sql/flyway/

#Add this to Vagrantfile
config.vm.synced_folder "/data/apps/flyway-3.2.1", "/flyway",
    owner: "vagrant", group: "dba", mount_options: ["dmode=775,fmode=775"]

#Copy Oracle driver to the drivers folder (standing inside my guest os)
$ cd /flyway/drivers
$ cp /u01/app/oracle/product/12.1.0/dbhome_1/jdbc/lib/ojdbc6.jar .
```

```
#Copy your scripts to your flyway directory
$ ls -l /data/ora_sql/flyway/
-rw-rw-r-- 1 ek2046 ek2046  77 des.   8 15:15 V1_1__Create_person_table.sql
-rw-rw-r-- 1 ek2046 ek2046 156 des.   8 15:15 V2__Add_people.sql

#Add to provision.sh
echo "Migrating schema if flyway script is available ..."
if [ "$(ls -A /ora_sql/flyway)" ]; then
  sudo -u oracle -i sh /flyway/flyway migrate -baselineOnMigrate=true
else
  echo "Flyway: No scripts available"
fi

# Ready to GO
$ vagrant provision
```

```
$ vagrant provision
…
==> default: Connected.
==> default: * ------------------------------------------------------------  *
==> default: * Script: drop_dev_users.sql is running (please wait …)
==> default: * ------------------------------------------------------------ *
==> default: * ------------------------------------------------------------ *
==> default: * Script: create_dev_users.sql is running (please wait …)
==> default: * ------------------------------------------------------------ *
==> default: Migrating schema if flyway script is available ...
==> default: Flyway 3.2.1 by Boxfuse
==> default: Database: jdbc:oracle:thin:@//localhost:1521/orcl (Oracle 12.1)
==> default: Validated 2 migrations (execution time 00:00.107s)
==> default: Creating Metadata table: "LJDATA"."schema_version"
==> default: Schema baselined with version: 1
==> default: Current version of schema "LJDATA": 1
==> default: Migrating schema "LJDATA" to version 1.1 - Create person table
==> default: Migrating schema "LJDATA" to version 2 - Add people
==> default: Successfully applied 2 migrations to schema "LJDATA" (execution
time 00:00.051s).
==> default: Provision finished!
```

EVRY

Back to Creating Boxes


Norwegian
http://www.go
http://news.ev
http://fswiki.e
http://jcon.no/
ubuntu screens
Provisioning -
https://docs.vagrantup.com/v2/provisioning/
Apps
CoE
Evry
Oracle
Privat
TOREAD
COS
Tuning
Prosjekter
Java
Development
Testmiljø-linker
Prod
Kaizen Board
VAGRANTDOCS
VAGRANT BOOK
HOME
Provisioning
Basic Usage
File
Shell
Ansible
CFEngine
Chef Solo
Chef Zero
Chef Client
Chef Apply
Docker
Puppet Apply
Puppet Agent
Salt
If you've never used a configuration management system before, it is recommended you start with basic shell scripts for provisioning.
You can find the full list of built-in provisioners and usage of these provisioners in the navigational area to the left.
WHEN PROVISIONING HAPPENS
Provisioning happens at certain points during the lifetime of your Vagrant environment:
On the first vagrant up that creates the environment, provisioning is run. If the environment was already created and the up is just resuming a machine or booting it up, they won't run unless the --provision flag is explicitly provided.
When vagrant provision is used on a running environment.
When vagrant reload --provision is called. The --provision flag must be present to force provisioning.
You can also bring up your environment and explicitly not run provisioners by specifying
no-provision.
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Salt Open

a configuration management system,
capable of maintaining remote nodes in defined states

a distributed remote execution system used to
execute commands and query data on remote nodes

Master *Minion*

freely available

Open Source Software under the terms of the
GNU General Public License (GPL) version 2

Tested and packaged to run on
CentOS, Debian, RHEL, Ubuntu, Windows

EVRY

```
$ tree
.
├── Makefile
├── minion
├── srv
│   ├── pillar
│   │   ├── oracle12c
│   │   │   └── init.sls
│   │   └── top.sls
│   └── salt
│       ├── oracle12c
│       │   ├── <some files>
│       │   ├── <some files>
│       │   ├── <some files>
…
│       │   ├── init.sls
│       │   ├── map.jinja
│       └── top.sls
├── uploadboxtoshare.sh
└── Vagrantfile

$ make export
```

```
clean:  vagrant destroy -f
        rm -f *box

setup:  clean
        set vagrant --version
        VBoxManage --version
        VBoxManage setproperty machinefolder
                              $(VBOX_USER_HOME)/machinefolder
        VBoxManage setproperty hwvirtexclusive off
        vagrant plugin install vagrant-proxyconf
        vagrant plugin install vagrant-vbguest
        vagrant plugin install vagrant-reload

build:  setup
        vagrant up

export: build
        vagrant halt
        vagrant package --output $(EXPORT_BOX_FILE)
        vagrant destroy -f

upload: export
        ./uploadboxtoshare.sh $(EXPORT_BOX_FILE)

all:    upload
```

EVRY

```
$ tree
.
├── Makefile
├── minion
├── srv
│   ├── pillar
│   │   ├── oracle12c
│   │   │   └── init.sls
│   │   └── top.sls
│   └── salt
│       ├── oracle12c
│       │   ├── <some files>
│       │   ├── <some files>
│       │   ├── <some files>
…
│       │   ├── init.sls
│       │   ├── map.jinja
│       └── top.sls
├── uploadboxtoshare.sh
└── Vagrantfile
```

We use a pre buildt Oracle Linux Box:

```
vagrant.configure("2") do |config|
    config.vm.box = "boxcutter/ol67"
    config.vm.synced_folder "srv", "/srv/"
    config.vm.synced_folder ".", "/vagrant"
```

Then we install Salt inside our box with Vagrant:

```
config.vm.provision :salt do |salt|
    salt.verbose = true
end

#...issues/5973
config.vm.provision :shell, :inline =>  _
"sudo cp /vagrant/minion /etc/salt/minion && _
 sudo service salt-minion restart && _
 salt-call state.highstate"

#then reload so we can...
config.vm.provision :reload
```

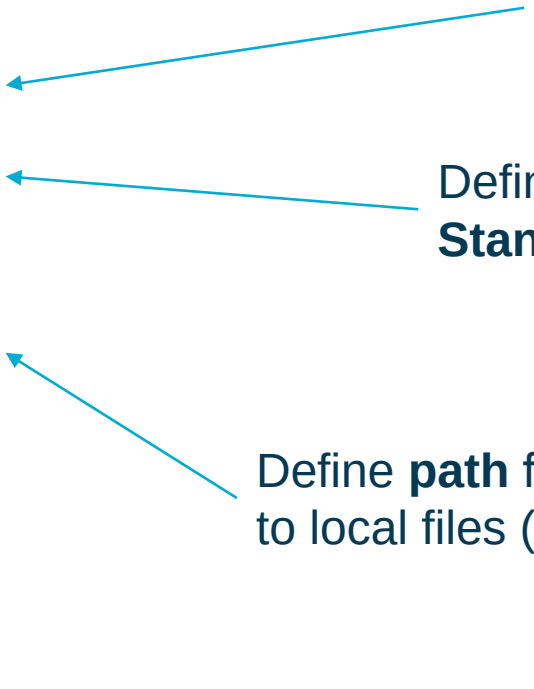
/etc/salt/minion

```
state_top: top.sls

file_client: local

file_roots:
 base:
   - /srv/salt

pillar_roots:
 base:
   - /srv/pillar
```



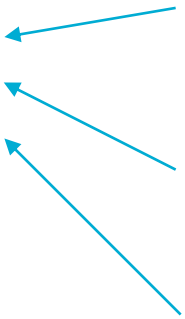
(default) starting point

Defines that we are using **Standalone minion**

Define **path** for the “**base**” environment to local files (not using master)

/srv/salt/top.sls

```
base:
  '*':
    - oracle12c
```



Apply SLS files from the directory root for the 'base' environment

For all minions with a minion_id that match '*'

Apply the state in file named **'oracle12c.sls'**

"Environments are directory hierarchies which contain a top files and a set of state files.

Environments can be used in many ways, however there is no requirement that they be used at all. In fact, the most common way to deploy Salt is with a single environment, called ***base****."*

EVRY

```
$ tree
.
├── Makefile
├── minion
├── srv
│   ├── pillar
│   │   ├── oracle12c
│   │   │   └── init.sls
│   │   └── top.sls
│   └── salt
│       ├── oracle12c
│       │   ├── <some files>
│       │   ├── <some files>
│       │   ├── <some files>
…
│       │   ├── init.sls
│       │   ├── map.jinja
│       └── top.sls
├── uploadboxtoshare.sh
└── Vagrantfile
```

Starting SALT provisioning:

```
salt-call state.highstate
```

The top.sls -> oracle12c

SALT find the default file: **init.sls**

```
$ cat srv/salt/oracle12c/init.sls
{% from "oracle12c/map.jinja" import extractdir, ora_app, ora_prod with
context %}

{% set ora_d = extractdir ~ '/ora' %}

unzip:
  pkg.installed

# Limiting Maximum Number of Processes Available for the Oracle User
/etc/security/limits.d/90-nproc.conf:
  file.managed:
    - source: salt://oracle12c/etc/security/limits.d/90-nproc.conf

/etc/fstab:
  file.managed:
    - source: salt://oracle12c/etc/fstab
```

/tmp/install_files

/u01/app/oracle

/u01/app/oracle/product/12.1.0

```
wget -O /tmp/p17694377_121020_Linux-x86-64_1of8.zip
http://fsfiles.evry.com/vagrant_boxes/sw/oracle_source/p17694377_121020_Linux
-x86-64_1of8.zip:
  cmd.run
```

Hack to work around issue with “**archive.extracted**”

```
wget -O /tmp/p17694377_121020_Linux-x86-64_2of8.zip
http://fsfiles.evry.com/vagrant_boxes/sw/oracle_source/p17694377_121020_Linux
-x86-64_2of8.zip:
  cmd.run

mkdir -p {{ora_d}} && unzip /tmp/p17694377_121020_Linux-x86-64_1of8.zip -d
{{ora_d}} && unzip /tmp/p17694377_121020_Linux-x86-64_2of8.zip -d {{ora_d}}
&& rm /tmp/p17694377_121020_Linux-x86-64_1of8.zip
/tmp/p17694377_121020_Linux-x86-64_2of8.zip:
  cmd.run

#https://github.com/saltstack/salt/issues/23822:
chmod -R a+x {{extractdir}}:
  cmd.run
```

EVRY

```
oracle-rdbms-server-12cR1-preinstall:
  pkg.installed

{% for file in [ '12c_oracle_EE.rsp','12c_cfgrsp.properties' ] %}
{{extractdir}}/{{file}}:
  file.managed:
    - source: salt://oracle12c/{{file}}
{% endfor %}

{{ora_app}}:
  file.directory:
    - user: oracle
    - group: oinstall
    - mode: 775
    - makedirs: True

#need to -ignorePrereq since numprocesses are not yet read by this shell:
{{ora_d}}/database/runInstaller -silent -ignorePrereq -waitforcompletion -
ignoreSysPrereqs -responseFile {{extractdir}}/12c_oracle_EE.rsp:
  cmd.run:
    - user: oracle
```

Python Code

EVRY

```
/u01/app/oraInventory/orainstRoot.sh:
  cmd.run

{{ora_prod}}/dbhome_1/root.sh:
  cmd.run

{{ora_prod}}/dbhome_1/cfgtoollogs/configToolAllCommands
RESPONSE_FILE={{extractdir}}/12c_cfgrsp.properties:
  cmd.run:
    - user: oracle

/tmp/12c_pdb_autostart.sh:                                  # trigger
  file.managed:
    - source: salt://oracle12c/12c_pdb_autostart.sh
    - mode: 0755
    - user: oracle
    - group: oinstall
  cmd.run:
    - user: oracle
```

```
/etc/init.d/dbora:
  file.managed:
    - source: salt://oracle12c/etc/init.d/dbora
    - user: root
    - group: root
    - mode: 755

chkconfig --add dbora:                          # Run dbora when restarting
  cmd.run

/home/oracle/.profile:                          # Set Oracle Environment
  file.managed:
    - source: salt://oracle12c/home/oracle/.profile
    - user: oracle
    - group: oinstall

/home/oracle/.bash_profile:
  file.managed:
    - source: salt://oracle12c/home/oracle/.profile
    - user: oracle
    - group: oinstall
```

EVRY

```
/home/oracle/scripts:
  file.recurse:
    - source: salt://oracle12c/home/oracle/scripts
    - user: oracle
    - file_mode: 0755

#start database so we can run sqlplus on it afterwords:
/etc/init.d/dbora start:
  cmd.run

{% for script in [ 'noexpirepw', 'create_dev_users', 'alteruser' ] %}
/tmp/{{script}}.sql:
  file.managed:
    - source: salt://oracle12c/{{script}}.sql

{{ora_prod}}/dbhome_1/bin/sqlplus "/ as sysdba" @/tmp/{{script}}.sql >
/tmp/{{script}}.log:
  cmd.run:
    - user: oracle
{% endfor %}
```

```
/tmp/shrink_tablespaces_part1.sql:                    # Resize TEMP and UNDO
  file.managed:
    - source: salt://oracle12c/shrink_tablespaces_part1.sql

/tmp/shrink_tablespaces_part2.sql:
  file.managed:
    - source: salt://oracle12c/shrink_tablespaces_part2.sql

# Network Config
{{ora_prod}}/dbhome_1/network/admin/listener.ora
  file.managed:
    - source:
salt://oracle12c/u01/app/oracle/product/12.1.0/dbhome_1/network/admin/listene
r.ora

{{ora_prod}}/dbhome_1/network/admin/tnsnames.ora
  file.managed:
    - source:
salt://oracle12c/u01/app/oracle/product/12.1.0/dbhome_1/network/admin/tnsname
s.ora
```

```
{{ora_prod}}/dbhome_1/bin/sqlplus / as sysdba
@/tmp/shrink_tablespaces_part1.sql > /tmp/shrink_tablespaces.log:
  cmd.run:
    - user: oracle

restartDB_ts:
  cmd.run:
    - user: oracle
    - name: /home/oracle/scripts/shutdown.sh &&
/home/oracle/scripts/startup.sh

{{ora_prod}}/dbhome_1/bin/sqlplus / as sysdba
@/tmp/shrink_tablespaces_part2.sql >> /tmp/shrink_tablespaces.log:
  cmd.run:
    - user: oracle

#cleanup
{{extractdir}}:
  file.absent
```

Just push the button

```
$ make export
```

… and Vagrant & Salt makes the box for you!

EVRY

Any Questions

www.jcon.no/oracle

#lasjen

EVRY

Thanks!

www.jcon.no/oracle

#lasjen

EVRY

We bring information to life