

Virtual machine W4M-Galaxy: Installation guide

Christophe Duperier

August, 6th 2014 – v03

This document describes the installation procedure and the functionalities provided by the W4M-Galaxy virtual machine available at the www.workflow4metabolomics.org site.

The virtual machine is available either:

- as an OVA or OVF file
- as an image of a USB stick containing portable virtualbox and the virtual machine

I. Virtual machine (VM)	3
II. System requirements.....	3
III. Activating the virtualization in the BIOS (Dell example).....	3
IV. Getting the virtual machine	3
V. Installation of the Virtualbox Host-Only Ethernet Adapter driver	3
VI. Starting the virtual machine	4
VII. USB stick virtual machine case	5
VIII. Network configuration with VirtualBox import	5
IX. Network configuration with VMware player import	6
X. Using Galaxy	7
XI. Uploading files on your virtual machine	8

I. Virtual machine (VM)

- Distribution: CentOS 6.5
- Memory: 4 Go (this parameter value can be modified in your virtualization software)
- 2 cores (this parameter value can be modified in your virtualization software)
- Thin provisioned system disk of 60 Go (6 Go space left to the user)
- Thin provisioned data disk of 20 Go (10 Go space left to the user)
- Network interface: DHCP (on the stick, the VM is configured as "host private network")
- Apache web server
- PostgreSQL database server

II. System requirements

- Host machine under Windows 7 (64bits) or Mac Os 10.9 (64bits)
- Virtualization activated in the BIOS (see below)
- Host machine with a minimum of 4 Go RAM memory
- Host machine with a minimum of 20 Go disk space
- You need to have Administrator privileges on the host machine
- In case of the USB stick image, install the virtualbox Host-Only Ethernet Adapter driver (see below)

III. Activating the virtualization in the BIOS (Dell example)

- Access the BIOS setup by pressing F2 while the computer is booting
- Go to 'Processor Settings' or 'performance' (this name can change with the bios version)
- Activate 'Virtualization Technology'

IV. Getting the virtual machine

- In the case of OVA/OVF files, get the OVA file (or the repository containing the OVF) and import it in your virtualization system (virtualBox, Vmware player and Vmware fusion)
- In the case of the USB stick, format a stick (32 Go minimum) to the NTFS file system. Download the compressed file, and unzip it on the USB stick

V. Installation of the Virtualbox Host-Only Ethernet Adapter driver

This step is necessary if you use the virtual machine under a USB stick.

- Plug the USB stick
- Go to the Device Manager
- Go to the Network tab
- Click on 'Action' and then 'Add an older generation device'

- In the window, choose 'Install the selected device'
- In the next screen, select 'Network adapter'
- In the next screen, select 'Provided disk'
- Point to the directory from the USB stick: app64/drivers/network/netadp
- Install the driver

VI. Starting the virtual machine

- Start the virtual machine from you virtualization software
- Two logins are available on the virtual machine: root or galaxy (both with the same password: galaxy).
- Log in as galaxy
- In the case of the USB key, check the configuration with the command line ' ifconfig -a' (eth1 inet addr must be set to 10.0.0.2)
- Start the Galaxy service with the command: service galaxy start; the screen display should be as follows:

```
CentOS release 6.5 (Final)
Kernel 2.6.32-431.el6.x86_64 on an x86_64

metabohub-galaxy login: galaxy
Password:
Last login: Tue Aug  5 16:52:21 on tty1
(galaxy_env)-bash-4.1$ service galaxy start
Starting galaxy...
Handling web1 with log file /galaxy/log/web1.log...
Entering daemon mode
Handling web2 with log file /galaxy/log/web2.log...
Entering daemon mode
Handling manager with log file /galaxy/log/manager.log...
Entering daemon mode
Handling handler0 with log file /galaxy/log/handler0.log...
Entering daemon mode
Handling handler1 with log file /galaxy/log/handler1.log...
Entering daemon mode
Entering daemon mode
...done.
(galaxy_env)-bash-4.1$ _
```

- After a few seconds you can open the Galaxy interface by starting your internet browser and entering the <http://10.0.0.2> address.
- Should you experiencing connection troubles, you can check the log files in the directory: /galaxy/log (file main.log).

VII. USB stick virtual machine case

Please launch the virtualbox application with the Portable-Virtualbox.exe executable.

The USB stick virtual machine has a network configuration with two interfaces: NAT and 'Host-Only'.

In this configuration, your workstation has a virtual network adapter. The IP address of the eth1 interface is configured permanently to 10.0.0.2, in order to always reach the Galaxy server with the same address. This configuration enables the virtual machine to communicate with your workstation (e.g., using http or ssh) but also to have access to the internet.

This configuration is based on the following post : <http://www.diije.fr/installer-serveur-developpement-local-virtualbox-ubuntu-server/>

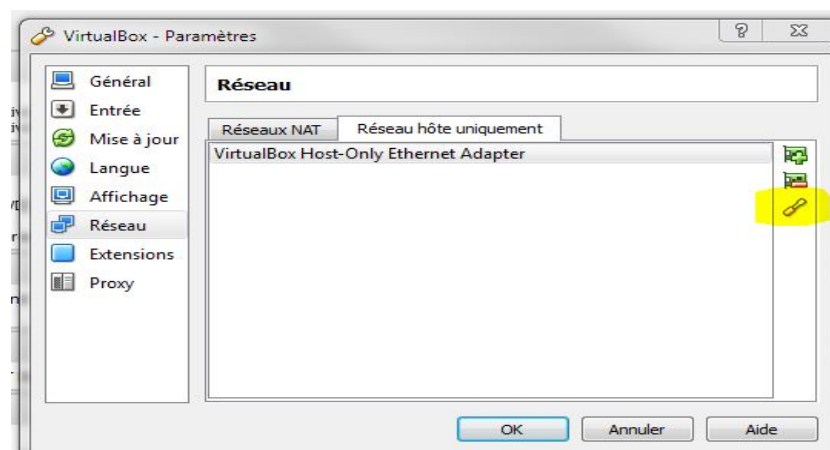
If you wish to modify the network configuration in your virtualbox (special security configuration), contact your system administrator.

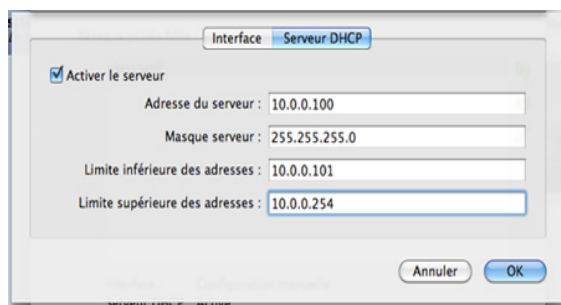
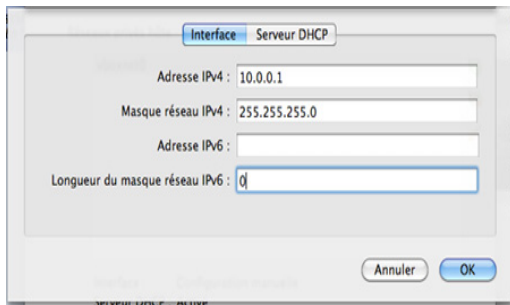
VIII. Network configuration with VirtualBox import

Warning : VirtualBox 3.14 seems to know issues with some antivirus softwares. This configuration is validated with VirtualBox 3.12.

The network preconfiguration is the same for the usb stick virtual machine and for the virtualbox vm. You need to adjust some initial parameters before vm running :

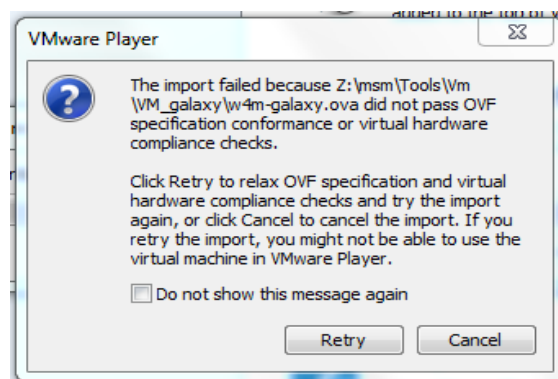
Please, select on main menu of virtualBox, 'Files' then 'Parameters' and go to the 'network' tab. Edit the default host private network of virtualBox (usually, vboxnet0) and fill the 'Interface' and the 'DHCP Server' parts.





IX. Network configuration with VMware player import

Warning : During the import under VMWare, a failed message is possible. Just retry the import step.



When importing the virtual machine into VMware, network interface is renamed (eth0 → eth1).

As **root**, you therefore need to proceed as follows:

Stop the network service:

```
service network stop
```

Edit the 70-persistent-net.rules file:

```
nano /etc/udev/rules.d/70-persistent-net.rules
```

You will find four two-line groups starting with #PCI device xxxxxx:xxxxxx and SUBSYSTEM== »net ». If you go at the end of the « SUBSYSTEM » lines, you will see that one of them refers to eth0 and the other to eth1.

Delete the group of lines corresponding to eth0. Go to the end of the subsystem line of the other group and change eth1 into eth0.

You now need to restart UDEV and the network service:

```
start_udev
```

`service network restart`

Check with the `ifconfig` command that your adapters are now `eth0` with the parameters from the `icfg-eth0` file.

X. Using Galaxy

Start your virtual machine

Open a user session (shell command line) with the **login: galaxy** and the **password: galaxy**

Start Galaxy by typing in the shell command line: **service galaxy start**

Start your web browser to access the Galaxy interface with the following address :

- For VirtualBox : <http://10.0.0.2>
- For VMware Player et VMware fusion : <http://192.168.xxx.xxx> (get the full address with `ifconfig` part `eth0`)

You will see the Galaxy interface started :

The screenshot displays the Galaxy web interface. At the top, the browser window title is "Galaxy / VM FOR TESTS" and the address bar shows "10.0.0.2". The interface features a dark blue header with the text "Galaxy / VM FOR TESTS" and a navigation menu including "Analyze Data", "Workflow", "Shared Data", "Visualization", "Help", and "User". On the left, there is a sidebar with "Tools" and a search box. The main content area shows a workflow diagram with various tool nodes connected by arrows. A central notification box contains the following text: "17-07-2014: New release 1.1 for Workflow4Metabo. Change left panel, update some tools and add other : 2-Extraction : XCMS suite + fillPeaks_report + CAMERA.annotateDiffreport 3-Quality Control : Filters + Determine_batch_correction + ACP ellipsoid 4-Normalisation : Batch_correction 5-Statistical Analysis : Anova + Univariate + Multivariate (PCA, PLS and OPLS) 6-Annotation : HR2 + Kegg Compounds + Chempidder + HMDB + Lipidmaps + M... Update Galaxy interface to version : June 2014 Latest. 13-06-2014: New release 1.0 for Workflow4Metabo. Update all tools to RFMF workshop version : 'Initiation au traitement et a l'analy... Extraction : XCMS suite + fillPeaks_report + CAMERA.annotateDiffreport". On the right, a "History" sidebar shows "Unnamed history" with "307 bytes" and a single entry "1: outfile.mol".

In the top menu of the Galaxy interface, you can click on the 'User' pull-down menu:



to become administrator by using **login: admin-galaxy@yourdomain.fr** and **password: galaxy**.

XI. Uploading files on your virtual machine

You can upload files (e.g., raw mass spectrometry files, preprocessed data and metadata tabulated files, additional R packages, etc.) on your virtual machine from your workstation, by using Winscp (or Cyberduck) and configuring a new connection with:

- Host name: 10.0.02 (portable virtualbox et virtualbox) and 192.168.xxx.XXX (VMware)
- User name: galaxy
- Password: galaxy

Click on "login" and accept the security key.

Raw files have to be moved into the `/galaxy/data/depot` repository in order to be called by the Galaxy preprocessing modules (see the screen capture below)

