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VIRTUALIZATION GUIDE

1. INTRODUCTION

1.1. Purpose

The purpose of this guide is to provide a practical step-by-step doable from top to bottom guide for setting up a full development environment for Windows and Linux relying heavily on virtualization

1.2. Target Setup

The target setup of this guide is a physical Windows machine operating a fully configurable network of virtual machines (guests) which all will have access both internall to one another and to the Internet via the network connections of the host machine.
The Guests will have also read and write access to a shared dir on the host, which will be visible as mounted share to the guests.

1.3. Master storage

The master storage of this document is the followign mark-down file in GitHub:
https://github.com/YordanGeorgiev/you-guides/doc/md
You could download the pdf ver

1.4. Version control

Each version of this document is identifiable via the git commit hash - should you find an error / want to suggest a change in the content of the document - clone this github repository and create a merge request ... Emails / IM's might just as well be ignored / noted but left without further action ...

2. CLONE THE REPO

2.1. Clone this GitHub repo as follows

Clone this GitHub repo as follows:

```
cd ~
git clone git://github.com/YordanGeorgiev/ysg-guides .
```

3. INSTALLATIONS AND CONFIGURATIONS

3.1. Install Windows OS on the host

If you just bought the machine, congratulation. Plug it to the wall , put it on and follow the instructions on the screen. Do not quickly press next , next , but always use the customizable options and plan a bit before configuring (for example the keyboard layout is trully something you should feel confortable with ...)

3.2. Create initial dir structure

Now this is important. The reason for creating initial dir structure are as follows:
- once estalished naming conventions and logic within the structure you would NEVER have to loose any important file or dir again. Period.

```
mkdir -p C:\var\<<org>>\hosts\%COMPUTERNAME%\
```

3.3. Install Chrome, Firefox and Opera for Windows

Install Chrome, Firefox and Opera for Windows or any other browsers. The principle is to have at least 3 so that you could compare the different rendering of the html pages by swithing to a different browser.

3.4. Configure networking , connect to Internet

Configure networking , connect to Internet.

3.5. Install WIN GNU binaries

Google download Windows GNU binaries. Download and install the following MUST-HAVE binaries: grep , less

3.6. Install Strawberry Perl on Windows

Google download Strawberry Perl for Windows. Install for your platform (32-bit or 64-bit)

3.7. Configure the WIN PATH env var

This step will enable to quickly run one-liners with the VBoxManage.exe to quickly change virtualization settings.
Open the advanced system properties on Windows add the VBobxManage.exe directory into your PATH environmental variable.
Add the path of the cygwin installer as well as it could be used from both the cygwin shell and the cmd.exe.

```
:: WinLogo + R , type:
sysdm.cpl
```

3.8. Install cygwin on Windows host

You will use cygwin only as the terminal for your virtual machines with a very limited amount of packages.

3.9. Install cygwin packages

Install the following cygwin packages

```
for /f "tokens=*" %i in ('echo bash binutils bzip2 cygwin gcc-core gcc-g++ gcc-java gzip m4 make unzip zip') do setup-x86_64.exe -n -q -s http://cygwin.mirror.constant.com -P %i
```

3.10. Install Windows utility applications

For each step in this sub-section you could install a different application than the suggested one, however skipping the advise to install a type of application will make you work more difficult ...

3.11. Install proper text editors

Notepad is not a proper text editor - install TextPad, NotePad++, Atom or whatever else LIGHT text editor for quickly editing text and configuration files

3.12. Install a password manager application

Install a Password Manager application - in this setup we use PasswordSafe:
https://pwsafe.org/

3.13. Install Oracle Virtual Box

Google the download oracle virtual box, which at the moment will provide you with the download page @:
https://www.virtualbox.org/wiki/Downloads
Since the target setup is to have the VB running on the Widows hosts you would choose the download the package for the Windows hosts.

3.14. Install Oracle Virtual Box Extension Pack

Google the download oracle virtual box extension pack, which at the moment will provide you with the download page @:
https://www.virtualbox.org/wiki/Downloads
You have to double click the file and it will open with the VirtualBox UI.

3.15. Enable fully read,write access to a shared folder on the host from the guest

This is the most error prone section, as your mealeage will vary.
This step will enable you to access a certain root dir on your Windows host machine from the Linux guest terminal.
In this example the name of the share from the OVB perspective will be vshare (which is the default) , the full dir path to the Windows OS (the host OS) will be "C:\var\" and the full file path to access it from the guest vm will be "/vagrant", and finally the name of the user to enable the full rea/write access will be "you".

```
# how-to add a shared folder on the host
VBoxManage sharedfolder add "host-name" -name "vshare" -hostpath "C:\var" -automount
```

3.15.1. Install the Guest Additions prerequisites

Install the Guest Additions prerequisites by issuing the following command:

```
sudo apt-get install -y build-essential make gcc  linux-headers-$(uname -r) linux-headers-generic make linux-source  linux-generic linux-signed-generic
```

3.15.2. Install the Guest Additions

Do not use the .iso file to download and the installer from there - it will simply not work

```
sudo apt-get install virtualbox-guest-dkms
```

3.15.3. Change your for the share dir to be automounted on vm boot

Change your for the share dir to be automounted on vm boot by addding the folowing lines to the end of your fstab file

```
#/media/sf_vshare /vagrant bind defaults,bind 0 0
/media/sf_vshare /vagrant vboxsf bind,uid=10001,rw,umask=0000 0 0

# eof file: /etc/fstab
```

3.15.4. add yourself to the vboxsf group

You need to add yourself to the vboxsf group in order to be able to edit as non-root from your vm the files on your host machine.

```
# run the fooll
sudo mount -a

sudo usermod -G vboxsf -a you
```

3.15.5. reboot and verify

Reboot the vm and login via ssh to verify the file sharing.

```
# ssh to the vm
ssh you@host-name

# check as yourself that you have
find /vagrant
```

4. MAINTENANCE AND OPERATIONS

This section contains maintenance and operational activities around the virtualization.

4.1. Start and stop vms

4.1.1. Start a virtual machine

To start a virtual machine perform the following command from the Start , Run dialog box.

```
vm-start host-name
```

4.1.2. Stop a virtual machine

To stop a virtual machine perform the following command from the Start , Run dialog box.

```
vm-stop host-name
```

4.2. VMs backup and restore

4.2.1. Backup a single vm

To backup a single vm issue the following command:

```
# list first you vms
VBoxManage list vms

# select the host-name vm
VBoxManage export host-name -o host-name.ova
```

4.2.2. Backup the current state of the virtual machines

If you performed the installations and configurations as described above you will be able to backup any or all of your guests by simply backing up the vms folder.

```
# in bash how-to export all myy Virtual box vms in Windows in the current dir
```

```
while read -r vms ; do echo VBoxManage export "$vms" -o "$vms".ova ; done < <(VBoxManage list vms|cut -d'"' -f2)
```

4.2.3. Restore a backup of vm

Copy the backed-up folder into your Windows hosts vms folder.
Open OVB. Machine add , navigate to the just copied <<machine-name>>.ova.

4.2.4. How-to attach an iso drive as a DVD on the

To attach the storage would mean in the physical world to buy a DVD drive and physically attach it to the hardware of your box.
Issue the following 2 commands:

```
# add the ide
VBoxManage.exe storagectl "host-name" --name IDE --add ide

# attach the DVD drive with the following command
VBoxManage.exe storageattach "host-name" --storagectl IDE --port 0 --device 0 --type dvddrive --medium "C:\var\pckgs\oracle\virtual-box\VBoxGuestAdditions_5.1.2.iso"
```