



**Hewlett Packard  
Enterprise**

# **SDN Exercise 1**

Development VM



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# SDN Exercise 1 - Outline

- Create your development vm
- Check setup and capture some packets
- Save to and email results.


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# Virtualization platform

- If you have a virtualization platform you can skip these steps.
- The next steps will teach you how to download and install VMware player as virtualization platform
- You will need a pc that provides virtualization support (almost all modern pc's do)
- These steps assume you have a pc running windows 7,8,8.1 or 10
- Any other - please either refer to google or contact me.

# Virtualization platform

- Go to vmware player download page
- <http://www.vmware.com/products/player/playerpro-evaluation.html>



VMware Workstation Player builds on the industry leading foundation of Workstation Pro, and delivers a streamlined user interface for creating and running operating systems and applications in a virtual machine.

The free version is available for non-commercial, personal and home use. We also encourage students and non-profit organizations to benefit from this offering.

Commercial organizations require paid licenses to use Workstation Player.

Need a more advanced virtualization solution? Check out [Workstation Pro for Windows](#) or [Workstation Pro for Linux](#)

VMware Workstation 12.5 Player for Windows 64-bit

✔ Download Now »

VMware Workstation 12.5 Player for Linux 64-bit

✔ Download Now »

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# Virtualization platform

- Download vmware player for windows, and install
- Installation is a simple click next/agree/continue process.
- After installation you might need to restart your computer.
- If you never used a virtualization platform on you PC, you'll need to enable virtualization support in BIOS.
- Google your PCs make and model with the keywords “VT-x enable”
- You'll get step through manual like this for my HP elitebook:
- [https://www.youtube.com/watch?v=0nDD2\\_i79Qg](https://www.youtube.com/watch?v=0nDD2_i79Qg)
- Save and reboot – open vmware player to create a new vm

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# CentOS 7

- In our workshop, development and testing will run on the CentOS 7 Linux distribution.
- To create our development vm we'll need to first download an installation image

# CentOS 7

- Go to CentOS download page
- <https://www.centos.org/download/>



The screenshot shows the top navigation bar of the CentOS website with the logo and links for 'GET CENTOS', 'ABOUT', 'COMMUNITY', 'DOCUMENTATION', and 'HELP'. The main heading is 'Download CentOS'. Below it, a paragraph explains that users are invited to be part of the community as contributors. At the bottom, three orange buttons offer 'DVD ISO', 'Everything ISO', and 'Minimal ISO' download options.

**CentOS** GET CENTOS ABOUT ▾ COMMUNITY ▾ DOCUMENTATION ▾ HELP

## Download CentOS

As you download and use CentOS Linux, the CentOS Project invites you to *be a part of the community as a contributor*. There are many ways to contribute to the project, from documentation, QA, and testing to coding changes for *SIGs*, providing mirroring or hosting, and helping other users.

**DVD ISO** **Everything ISO** **Minimal ISO**

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# CentOS 7

- Download minimal installation iso for centos 7.2
- The iso should be about 603MB
- You should have mirrors based in Israel an those should have the best download speed



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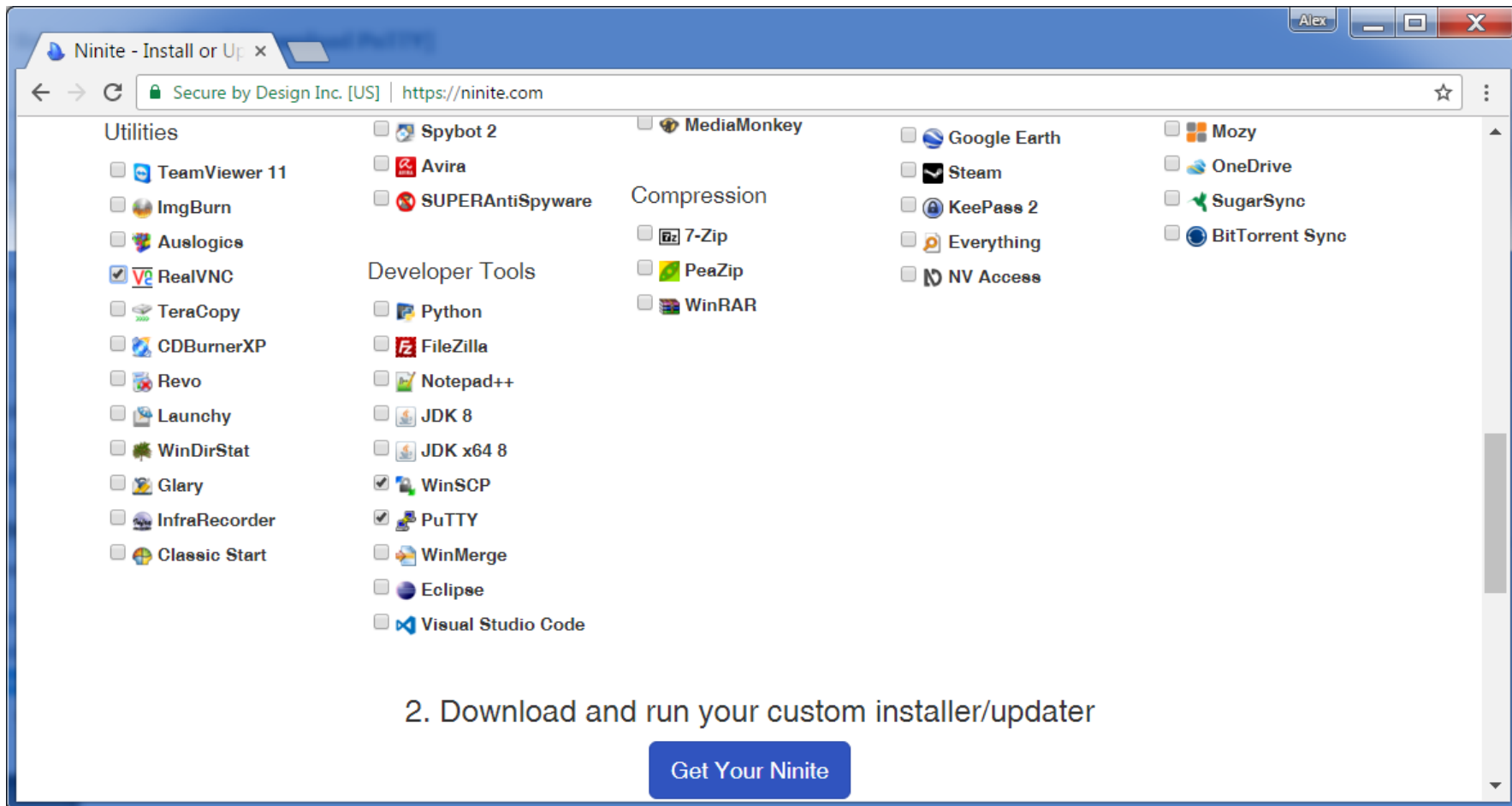
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# Common Tools

- To interact with your new devel vm you'll need the following tools
- PuTTY – ssh client for windows
- WinScp – Free SFTP, SCP and FTP client for Windows (transfer files)
- RealVnc Viewer – VNC client to watch, control, and interact with the VM.

# Common Tools

- Go to ninite download page
- <https://ninite.com/>



2. Download and run your custom installer/updater

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# Common Tools

- Select the above mentioned tools
- Click “Get your ninite” button
- Wait for download and execute the downloaded file.
- Wait until silent install is finished.

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# Boot a new vm

- Create a new vm in your virtualization platform.
- Minimum requirements for a development vm are
  - 2 vCPU
  - 4GB RAM (4096MB)
  - 20GB Disk space
- Recommended vm params
  - 4 vCPU
  - 8GB RAM (8192MB)
  - 80GB Disk space
- A single network card configured to NAT outside for internet is fine.

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# Boot a new vm

- [https://kb.vmware.com/selfservice/microsites/search.do?language=en\\_US&cmd=displayKC&externalId=2013483](https://kb.vmware.com/selfservice/microsites/search.do?language=en_US&cmd=displayKC&externalId=2013483)
- <https://linhost.info/2009/09/how-to-mount-an-iso-on-vmware-player/>
- Attach the CentOS 7.2 minimal installation iso as a CD to the vm
- Boot the vm and start installation
- In the installation:
  - Enable Ethernet port
  - Change local time zone to Jerusalem
  - Automatically partition disk – then delete home partition and extend root partition
  - Start installation
  - Set root password
  - Wait for the installation to complete and reboot

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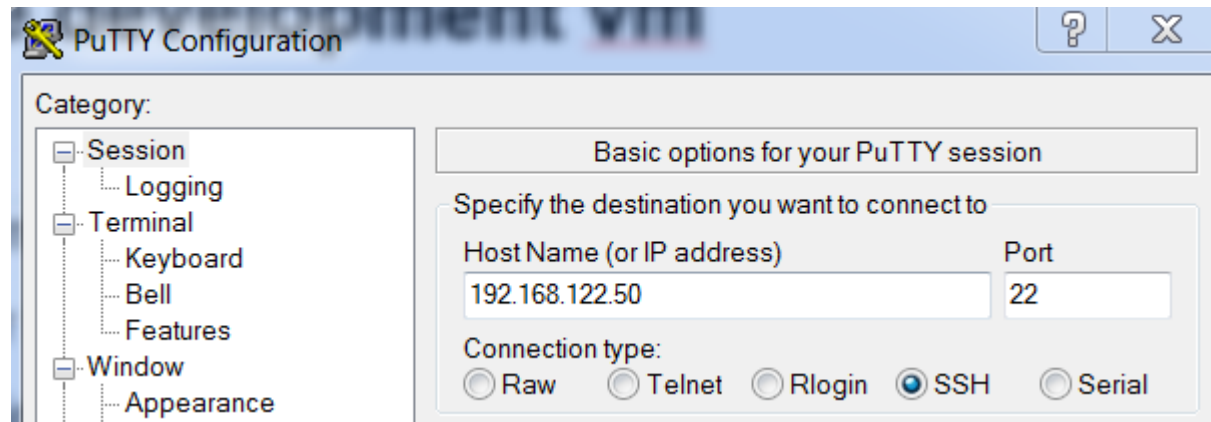
# Spin up the development vm

- When you have a working minimal CentOS 7.2 vm – you can login to it with the root/password you created
- Then run the following command:
- ip addr
- You should see an ip address (probably look like 192.168.X.X)

```
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP qlen 1000
    link/ether 00:1a:4a:c6:e6:09 brd ff:ff:ff:ff:ff:ff
    inet 192.168.122.50/30 brd 192.168.122.51 scope global eth0
        valid_lft forever preferred_lft forever
    inet6 fe80::21a:4aff:fec6:e609/64 scope link
        valid_lft forever preferred_lft forever
```

# Spin up the development vm

- You will have 2 interfaces
- One is the lo (for local) which will have 127.0.0.1/8 the local loop back address
- And the other might be eth0 or called another name – this is your network card
- In my example I have 192.168.122.50
- Find your address and use putty to connect to it with your user root/password.





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# Spin up the development vm

- You are in!
- Follow the steps described in the example in this link
- <https://github.com/alexfeigin/devel>
- If you want to use a silent install (recommended)
- You can keep the defaults
- Just mind the username (first name + first letter of lastname is encouraged. i.e alexf)
- Mind your password
- Keep in mind that vnc password is what you will use to log on to your graphical user interface and it must be 6 letters or longer
- It's encouraged you use your real full name as the gituser
- And a real email for gitemail

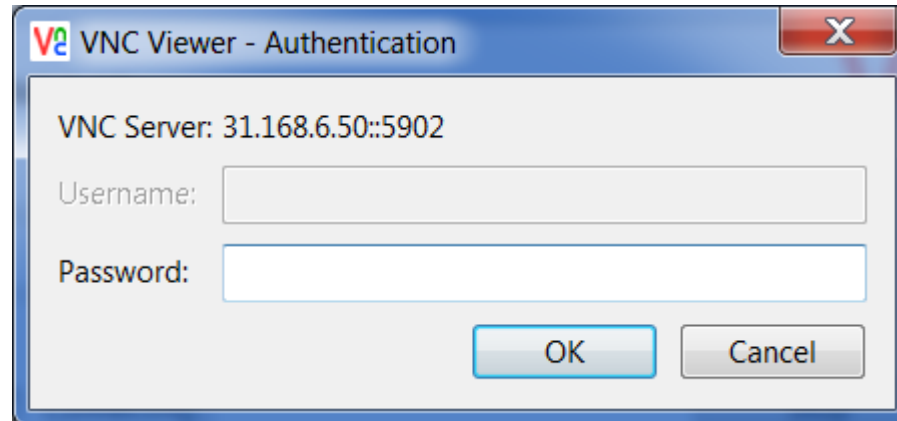
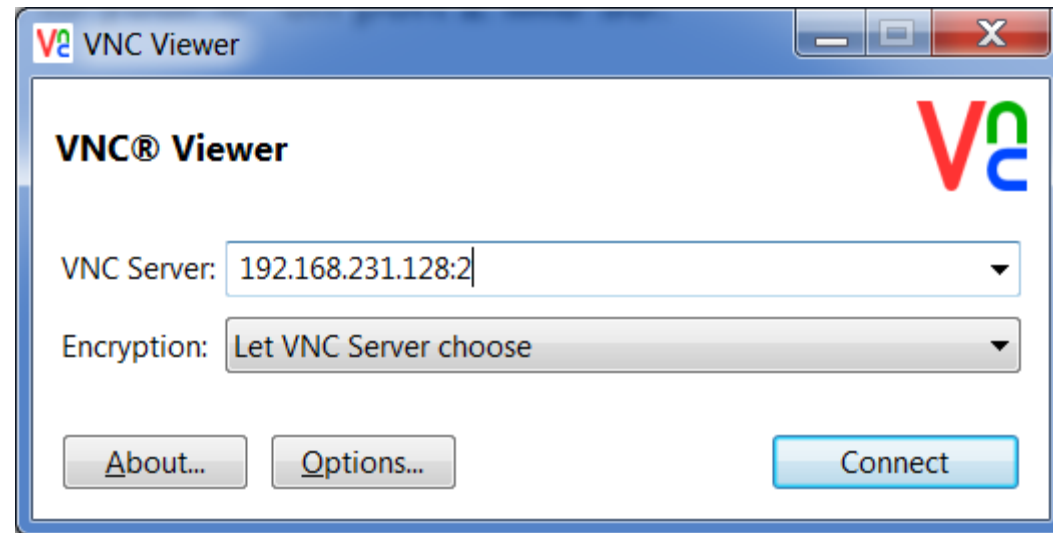
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# Congratulations

- You are now the proud new owner of a devel machine.
- You get a fully working machine that's the same as the one I use at work – so you're half way to being a professional
- With great power..
- I need you to do one thing this will show me that your devel machine is alive

# Test your new superpower

- Open RealVNC Viewer to your IP on port 2 like so:
- Use your vnc password



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# Test your new superpower

- Open a terminal
  - `sudo -i #login as root`
  - `mn --topo single,2`
  - `h1 ping h2`
- Open another terminal
  - `sudo tcpdump -neevvi h1-eth0 -c 4 -w - > yourname.pcap`
  - `wireshark yourname.pcap`
  - Take a look at the wireshark – you’ve just captured some packets – be proud
  - Use `winscp` to copy the pcap file out and mail it to me – so we can both rejoice in your success
- You can kill the mininet ping and exit mininet
- You can poweroff the devel machine – you did great.



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Thank you