Recovery Documentation

Project network

Version 0.9.1

1 Introduction

This document describes the steps needed to create project network.

The latest version of this document is available at https://github.com/deadbok/project_network

Project web page https://deadbok.github.io/project_network/

When nothing else is mentioned commands are executed as root

This is a test/teaching setup, there are some configuration details in here that should NEVER be allowed in a production environment. - Root logins from remote machines, instead create an unprivileged user for remote access. - Leaving unused interface configurations in the routers, they could be exploided and should be removed.

2 Overview

This are the overall steps in recreating the system from scratch. - Software sources - Create virtual machines and install OSs if needed - Define the interfaces on each machine and link them together - Configure internal router - Configure internal server for DHCP - Configure the external router - Configure the external server for HTTP services - Configure internal machine for local DNS resolution

3 Software sources:

These are the links to the external resources that has been downloaded to get things working:

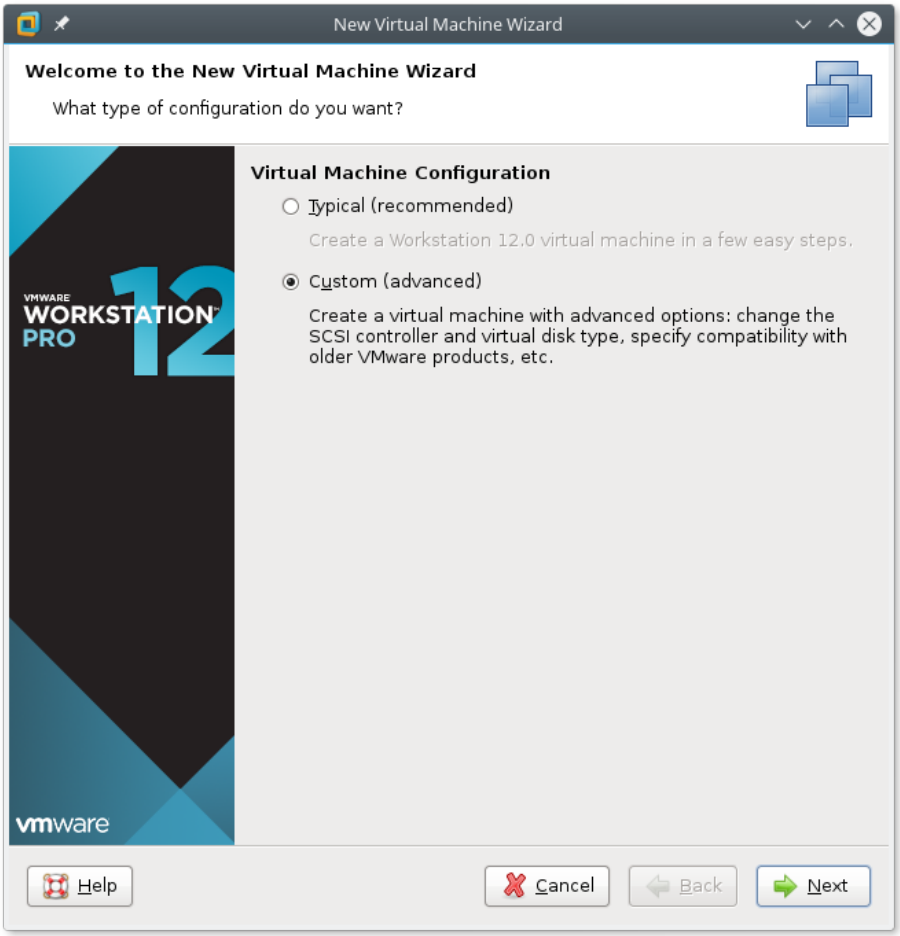
- MWare Workstation 12 Pro
- JunOS SRX VMWare virtual machine OVF
- JunOS SRX VMWare virtual machine VMDK
- Debian net installer ISO
- Kali Linix 64-bit ISO

4 Creating the Virtual Machines and install their OSs

When creating the virtual machines do not bother with the network configuration at this time.

4.1 CLIENT-USRLAN (Kali client)

The Kali client is a Live CD and is run directly from the ISO image, with no persistent storage. When setting up this machine in VMWare, create a custom machine (as shown in Illustration 1) with no emulated hard drive.

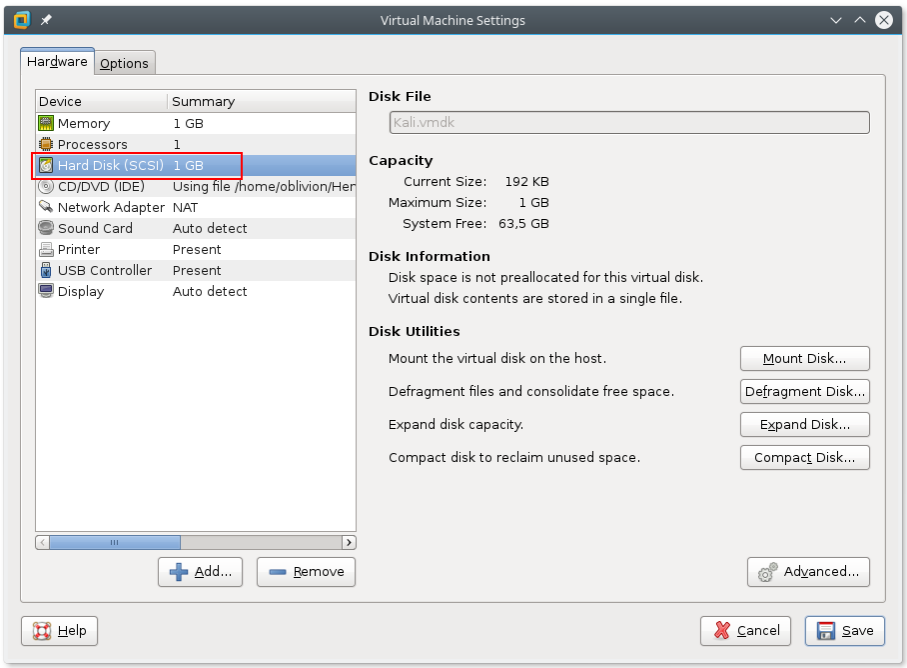


> Illustration 1: Creating a custom virtual machine

Add the ISO image to the virtual machine in the screen after that, and on the next screen select the OS as shown in Illustration 2.

> Illustration 2: OS selection for the Kali Client

On the following screen enter the name CLIENT-USRLAN. Set the amount of memory to no less than 1024MB or Kali will complain. VMWare insísts on creating a virtual hard drive, but since Kali is running from a live image, you are free to delete this virtual drive when the machine is created (see Illustration 3)



> Illustration 3: You can delete the Hard Disk image since Kali is booted from the ISO image.

4.2 SERVER-SRVLAN-DNS & SERVER-DMZ-WEB (Debian netinst)

To create the virtual machines for the Debian server, just click through the guided VM creation, in VMWare. There are only three changes, remember to select the debian-8.6.0-amd64-netinst.iso, for the installation media, set the correct machine name, and decrease the virtual hard drive to 2GB, to not waste space. When installing the Debian GNU/Linux remember to have a working Internet connection in the VM, because the netinst image fetches most of the Debian packages from the Internet. When the Debian installation asks for the hostname, use the name from the naming convention. Set the domain to “localnet”.

4.3 ROUTER-EXT & ROUTER-INT (JunOS SRX VM)

The downloaded files has a VMWare “.ovf” file that you can open from the VMWare file menu. Rename the machine “ROUTER-EXT”. Create a full clone of the “ROUTER-EXT” machine and name that one “ROUTER-INT”. The JunOS operating system is all ready installed on the image, so for these machines there are no OS installation step.

5 Configuring the virtual machines

5.1 General setup of the Debian servers

To login to the server to install the configuration files an SSH connection to the virtual machine has to be established. To do this follow these steps:

5.1.1 Setup SSH for root logins over the network

Login as root and edit `/etc/ssh/sshd_config`, find the following line:

```
PermitRootLogin without-password
```

and change it to:

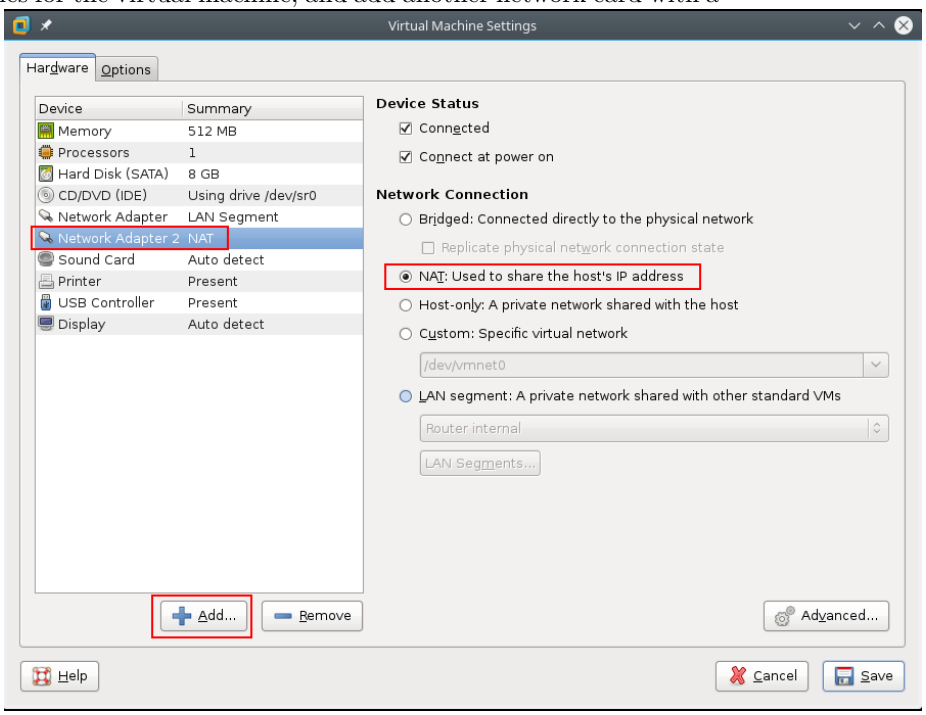
```
PermitRootLogin yes
```

Save the file and then restart SSH service:

```
service ssh restart
```

5.1.2 Add another network card to the virtual machine

Open the properties for the virtual machine, and add another network card with a NAT connection.



> Adding a network card using Host-only to allow connecting from the host.

After these steps simply get an address for the new interface on the server vm. There is no need to make any more changes to configuration files since this is a temporary management connection. To get an IP address for eth1 (assuming this is the name of the new network device) in the server vm run the following as root:

```
dhclient eth1
```

When the command finishes run ip addr, to learn the address assigned by DHCP:

```
ip addr
```

The output looks like this:

```
root@server:~# dhclient eth1
root@server:~# ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default
    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 group default qlen 100
0
    link/ether 00:0c:29:63:42:41 brd ff:ff:ff:ff:ff:ff
    inet 192.168.1.2/24 brd 192.168.1.255 scope global eth0
       valid_lft forever preferred_lft forever
    inet6 fe80::20c:29ff:fe63:4241/64 scope link
       valid_lft forever preferred_lft forever
3: eth1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 100
0
    link/ether 00:0c:29:63:42:4b brd ff:ff:ff:ff:ff:ff
    inet 172.16.189.128/24 brd 172.16.189.255 scope global eth1
       valid_lft forever preferred_lft forever
    inet6 fe80::20c:29ff:fe63:424b/64 scope link
       valid_lft forever preferred_lft forever
```

To ssh from the host to the vm server use the following command (with the actual IP address of the server):

```
ssh root@172.16.189.128
```

```
oblivion@martin:~$ ssh root@172.16.189.128
root@172.16.189.128's password:

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Sun Nov 20 12:53:44 2016 from 172.16.189.1
root@server:~#
```

Figure 1: SSH - Debian

5.2 General SSH setup of the routers

As with the server, and ssh connection is needed to copy the configuration to the routers. To have a Host-only connection refer to section “Add another network card to the virtual machine“.

5.2.1 Configuring the router for SSH

To set up the router for SSH access the following configuration has to be set for the Host-only interface:

```
#Enter the cli
cli

#Enter edit mode
edit

# Set the root password
set system root-authentication plain-text-password
New Password: type password here
Retype new password: retype password here

# Set the interface to DHCP
set interfaces ge-0/0/3 unit 0 family inet dhcp

# Delete the interface from the untrusted zone.
delete security zones security-zone untrust interfaces \
ge-0/0/3.0

# Put the interface in the trusted zone and allow all services
set security zones security-zone trust interfaces \
ge-0/0/3.0 host-inbound-traffic system-services all

# Allow all protocols
set security zones security-zone trust  \
interfaces ge-0/0/3.0 host-inbound-traffic protocols  all

# Commit the changes
commit
```

5.3 CLIENT-USRLAN (Kali client)

The client boots of the ISO image and does not need any configuration.

5.4 ROUTER-INT

To copy the configuration file onto the router when configured for SSH access do like this:

```
scp router-int.conf root@172.16.189.133:~/.
```

Then on the router login and load the configuration:

```
# Enter the cli
cli

# Enter edit mode
edit

# Load the configuration that has just been copied to the
# router.
load override router-int.conf

# Commit the new configuration
commit
```

5.5 ROUTER-EXT

To copy the configuration file onto the router when configured for SSH access do like this:

```
scp router-ext.conf root@172.16.189.133:~/.
```

Then on the router login and load the configuration:

```
# Enter the cli
cli

# Enter edit mode
edit

# Load the configuration that has just been copied to the
# router.
load override router-ext.conf

# Commit the new configuration
commit
```

5.6 SERVER-SRVLAN-DNS

- Copy the configuration files into the server

- Install dnsmasq
- Enable the dnsmasq service

Install dnsmasq on the virtual machine:

```
# Install dnsmasq
apt-get install dnsmasq

# Enable dnsmasq at boot
update-rc.d dnsmasq enable

# Start the service now
service dnsmasq start
```

Copy the configuration files from the host to the virtual machine:

```
scp -r server-srvlan-dns/* root@192.168.206.132:/.
```

5.7 SERVER-DMZ-WEB

- Install apache
- Enable the apache service

Install dnsmasq on the virtual machine:

```
# Install dnsmasq
apt-get install apache2

# Enable dnsmasq at boot
update-rc.d apache2 enable

# Start the service now
service apache2 start
```

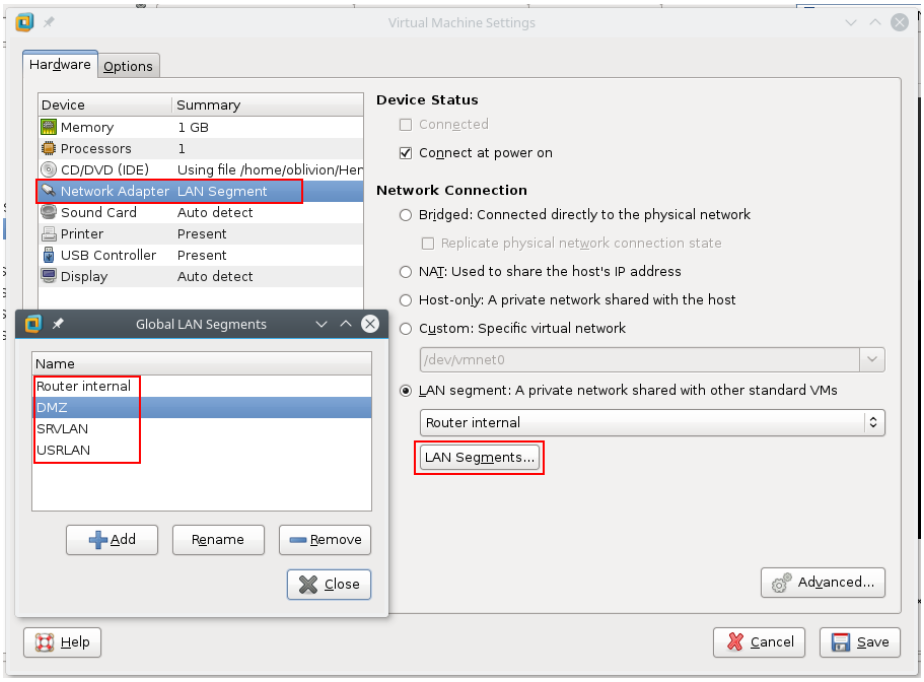
Copy the default HTML page to the server.

```
scp -r server-dmz-web/* root@192.168.206.130:/.
```

5.8 Network setup

This configuration uses the WMWare LAN segment feature. The LAN segments created in the first virtual machine area available to the rest as well.

Open the settings for the virtual machine and navigate to the LAN segment settings as shown in Illustration 4.



> Illustration 4: Creating the LAN segments

Set the interfaces of the virtual machines according to Table 1:

Machine name	Interface 1	Interface 2	Interface 3	Interface 4
CLIENT-USRLAN	USRLAN	*nc*	*nc*	*nc*
ROUTER-INT	USRLAN	SRVLAN	Router internal	*nc*
ROUTER-EXT	Router internal	DMZ	*nc*	*nc*
SERVER-SRVLAN-DNS	SRVLAN	*nc*	*nc*	*nc*
SERVER-DMZ-WEB	DMZ	*nc*	*nc*	*nc*

nc: not connected.

Table 1: Virtual machine interface connections.