Adding a LANforge Virtual Machine

**Goal**: Add a virtual machine running LANforge to a LAN with a physical LANforge manager.

We review the configuration steps necessary to add a virtual LANforge resource. This was done using VirtualBox 5.2.10 and Fedora 27 Server edition. The guest instances will be configured to export MAC-VLAN ports to run traffic on their physical management port.

1. Create a new guest instance.
   A. When creating the guest, we should use 2 GB of RAM:
B. 20 GB of disk:

C. Omit a floppy drive, use a USB table as pointing device:
D. Allocate two or more cores and PAE/NX:

E. And the usual virtual processor features:
F. We don’t need graphics on these nodes, so use minimum graphics memory:

G. Enable RDP access, that is useful. It might be a good habit to allocate separate RDP ports per host; we’ll use 9134 for the first guest, 9135 for the second.
H. Enable Host I/O caching for your SATA device. Specify the Fedora 27 Server ISO image as the DVD.

I. Disable Audio
J. Configure the network adapter to:

A. Use the LAN bridged adapter br0
B. Use a server adapter driver
C. Enable Promiscuous Mode to allow sniffing

K. Start the installation

Fedora 27

Install Fedora 27
Test this media & install Fedora 27

Troubleshooting

Press Tab for full configuration options on menu items.
L. Under System Automatic partitioning should be adequate for general use.

M. Set the root password to Lanforge. Click Done twice.
N. Add user LANforge:

```
[\root@localhost\]# dnf update -y
[\root@localhost\]# dnf install -y perl
[\root@localhost\]# hostnamectl --static set-hostname atlas-fedora27s01
[\root@localhost\]# shutdown -r now
```

2. Install LANforge on the guest instance. Start by logging in as root:
Fedora 27 (Server Edition)
Kernel 4.16.5-200.fc27.x86_64 on an x86_64 (tty1)

Admin Console: https://192.168.100.225:9090/ or https://[fe80::7e1:eb75:c3e8:962b]:9090/

localhost login: root
Password:

A. Use wget or curl to download lf_kinstall.txt:

   [root@atlas-fedora27s01]## cd /root
   [root@atlas-fedora27s01]## curl -o lf_kinstall.pl http://www.candelatech.com/lf_kinstall.txt
   [root@atlas-fedora27s01]## chmod +x lf_kinstall.pl

B. You don't need to do a bum in, so toggle that off:

   [root@atlas-fedora27s01]## touch /home/lanforge/did_cpuburn

C. Install LANforge:

   [root@atlas-fedora27s01]## ./lf_kinstall.pl --lfver 5.3.7 --kver 4.13.16+ --do_all_ct

D. You can disable the VNC Server and Xrdp services on these guests:

   [root@atlas-fedora27s01]## systemctl stop vncserver@:1.xrdp.service
   [root@atlas-fedora27s01]## systemctl disable vncserver@:1.xrdp.service
   [root@atlas-fedora27s01]## systemctl daemon-reload

E. You will notice that we have about 6GB of disk space left in this VM

   [root@localhost lanforge]## df -h

F. When installation finishes, reboot:

   [root@atlas-fedora27s01]## shutdown -r now
G. On next boot, you will see a LANforge kernel option, it should be automatically selected:

```
Fedora (4.16.5-200.fc27.x86_64) 27 (Server Edition)
Fedora (6-rscusc-12ca91865fa411e835446f5116ebf60b) 27 (Server Edition)
Caneda Technologies 4.13.16+ COM1 115200 B11
Caneda Technologies 4.16.0+ COM1 115200 B11
```

Use the ↑ and ↓ keys to change the selection.
Press ‘e’ to edit the selected item, or ‘c’ for a command prompt.

3. From your LANforge GUI, configure a MAC-VLAN the on default Ethernet port.
   A. In the LANforge GUI, choose the Port Mgr tab, and highlight the new enp0s17 port:

   ![LANforge GUI screenshot](image)

   B. Click the **Create** button
C. create one MAC-VLAN port

A. Select MAC-VLAN
B. Quantity: 1
C. Select DHCP-IPv4
D. Click Apply

D. You will see the new port in the GUI:
In the guest VM, you will also see the new port:

```
[root@localhost]# ip a show
```

```
[root@localhost]# df -h
Filesystem Size Used Avail Use% Mounted on
/dev/ram            99M  87M  12M  91% /
udevmnts            99M  99M  0  100% /dev
tmpfs               12M  0  12M  0% /dev/shm
tmpfs               99M  99M  0  100% /run
loop/mapper/fedora-root  156  0  156  0% /
loopfs              99M  99M  0  100% /sys/fs/cgroup
/dev/sda1           768M 204M  564M  28% /boot
```

```
[root@localhost]# shutdown -r now
```

4. Add a second VM
   A. Shut down the previous VM:

```
[root@atlas-fedora27s01]# shutdown -r now
```
B. Clone the VM

A. Select the Reinitialize MAC addresses choice. These machines will operate simultaneously.

B. Verify the MAC address of the new guest is set.

C. Change the hostname of the second guest:

```bash
[root@localhost]# hostnamectl --static set-hostname atlas-fedora27s02
```

```bash
[root@localhost ~]# hostnamectl --static set-hostname atlas-fedora27s02
```
D. Make sure that the MAC address of the second guest is not listed in the `ifcfg-enp0s17` file.

```
[root@localhost ~]# cd /etc/sysconfig/network-scripts/
[root@localhost network-scripts]# ls
ifcfg-enp0s17  ifdown-ipv6  ifdown-TeamP  ifup-eth  ifup-post  ifup-tunnel
[root@localhost network-scripts]# cd /etc/sysconfig/network-scripts/
[root@localhost network-scripts]# cat ifcfg-enp0s17
TYPE=Ethernet
PROXY_METHOD=none
BROWSER_ONLY=no
BOOTPROTO=dhcp
DEFROUTE=yes
IPV6_FAILURE_FATAL=no
IPV6INIT=yes
IPV6_AUTOCONF=yes
IPV6_DEFROUTE=yes
IPV6_FAILURE_FATAL=no
IPV6_ADDR_GEN_MODE=stable-privacy
BOOTIF=enp0s17
UUID=01539eff-8a66-3a66-b056-473b56c7357e
ONBOOT=yes
AUTOCONNECT_PRIORITY=-999
DEVICE=enp0s17
[root@localhost network-scripts]# _
```

A. Compare the adapter to the file:

```
[root@localhost ]# cd /etc/sysconfig/network-scripts
[root@localhost ]# cat ifcfg-enp0s17
```

B. If it is listed, change it or remove it.

E. LANforge changes the `/etc/udev/rules.d/70-persistent-net.rules` file, edit that file those as to match the value of your mac address.

```
[root@localhost ]# cd /etc/udev/rules.d
[root@localhost ]# ip li show enp0s17
[root@localhost ]# cat 70-persistent-net.rules
```
F. Stop LANforge and change the resource ID for this guest:

```
[root@localhost]# service lanforge stop
[root@localhost]# cd /home/lanforge
[root@localhost]# ./lfconfig
Your command: resource 5
Your command: config
```

```text
connect_mgr [host:port] NONE
gps_dev [device file] 5
max_tx [1-500] 5
max_send_msg_memb [1000-5000000] 320000
max_send_msg_pkts [1-1000] 500
recv_interval [1000-5000000] 380000
all probe timer [50-2000] 50
Other Commands: help, show_all
```

If these values are correct, enter 'config', otherwise change the values by entering the key followed by the new value, for example:

mode manager
Your command: config

```
Interfaces: wif1 enp0s17MO enp0s17MO
Resource Interface assignment:
Resource 5: wif1 enp0s17MO
```

Specified Resource Addresses:

```
Key                Acceptable Values    Value
------------------ --------- -------------
log_level          1-8 (65535)          7
log_dir            /home/lanforge      SEE LIST ABOVE
add_resource_addr [host:port]      SEE LIST ABOVE
rem_resource_addr [host:port]      SEE LIST ABOVE
realm               1-255             26
resource            1-511              5
mgmt_dev            enp0s17MO
mode                resource, manager, both
Other Commands: help, show_all
```

If these values are correct, enter 'config', otherwise change the values by entering the key followed by the new value, for example:

mode manager
Your command: config

G. Reboot the second guest:

```
[root@localhost]# shutdown -r now
```

H. Start up your first guest (resource 4)

I. In your LANforge GUI, you should see your two VMs.

J. Create a MAC-VLAN port for the second guest

5. Create a VOIP connection between the two guests.

A. In the VOIP tab, click Create
B. You configure:

A. Side-A will be resource 3
B. Side-B will be resource 4
C. Click Apply

C. See the newly created connection:

D. In the VOIP/RPT tab, click Start
E. Monitor traffic on the connection with the Modify->View button.