## *Change in VXLAN Module in Open vSwitch for Proof-Of-Concept-*

The default installation of OpenStack HAVANA does not use OVS 2.1 (it uses lower version). The VXLAN module is a separate module in Linux kernel which can be used to create tunnel device as well as to program it at L2 level. This will lead the usage on VXLAN module in OVS in two ways-
1- Statically built with VXLAN source code
2- References to VXLAN primitives.

The increment in network performance for SNAT cases is due to changing Open vSwitch module dependency in Linux kernel in the default OpenStack installation. The POC initially gave network performance equivalent to that of default OpenStack setup for both SNAT / DNAT cases.

Following was the module dependency for Open vSwitch module in Linux Kernel in default OpenStack setup-

```
# lsmod | grep openvswitch
openvswitch 86825 0
libcrc32c 1246 1 openvswitch
```

This dependency of Open vSwitch module on libcrc32c module was explicitly replaced with the default RHEL distribution provided VXLAN module to improve the performance. After changing module dependency-

```
# lsmod | grep openvswitch
openvswitch 48579 0
vxlan 25102 1 openvswitch
```

This change in Open vSwitch module dependency from default libcrc32 module during OpenStack installation to RHEL distribution provided VXLAN module is responsible for better performance for SNAT use cases in POC.

## *Script for changing VXLAN Module-*

```
Node having default OpenStack HAVANA installation-

# depmod

# cd /lib/modules/2.6.32-431.el6.x86_64

[root@rhel65-23 2.6.32-431.el6.x86_64]# cat modules.dep  | grep openvswitch
extra/openvswitch/openvswitch.ko: kernel/lib/libcrc32c.ko

[root@rhel65-23 2.6.32-431.el6.x86_64]# cat modules.dep  | grep vxlan
kernel/drivers/net/vxlan.ko:

[root@rhel65-23 2.6.32-431.el6.x86_64]# lsmod | grep openvswitch
openvswitch            86825  0
libcrc32c               1246  1 openvswitch

[root@rhel65-23 2.6.32-431.el6.x86_64]# lsmod | grep vxlan
vxlan                  25102  0


Node having VXLAN module updated for POC-

[root@rhel65-25 2.6.32-431.el6.x86_64]# cat modules.dep | grep openvswitch
kernel/net/openvswitch/openvswitch.ko: kernel/drivers/net/vxlan.ko

[root@rhel65-25 2.6.32-431.el6.x86_64]# cat modules.dep | grep vxlan
kernel/drivers/net/vxlan.ko:
kernel/net/openvswitch/openvswitch.ko: kernel/drivers/net/vxlan.ko

[root@rhel65-25 2.6.32-431.el6.x86_64]# lsmod | grep openvswitch
openvswitch            48579  0
vxlan                  25102  1 openvswitch

[root@rhel65-25 2.6.32-431.el6.x86_64]# lsmod | grep vxlan
vxlan                  25102  1 openvswitch


As mentioned above,
On the node having default OpenStack HAVANA setup-
# lsmod | grep openvswitch
libcrc32
And, on the node having updated VXLAN module for POC-
```

```
# lsmod | grep openvswitch
vxlan
```

Following steps need to be followed on the node having default OpenStack HAVANA setup for POC-

```
# cd /lib/modules/2.6.32-431.el6.x86_64/extra/openvswitch

[root@rhel65-23 openvswitch]# mv openvswitch.ko openvswitch.ko.new

[root@rhel65-23 openvswitch]# rmmod openvswitch

[root@rhel65-23 openvswitch]# depmod

[root@rhel65-23 openvswitch]# modprobe openvswitch

[root@rhel65-23 openvswitch]# lsmod | grep openvswitch
openvswitch            48579  0
vxlan                  25102  1 openvswitch
```