1. - Oracle SBC - Basic Peer to Peer LAB

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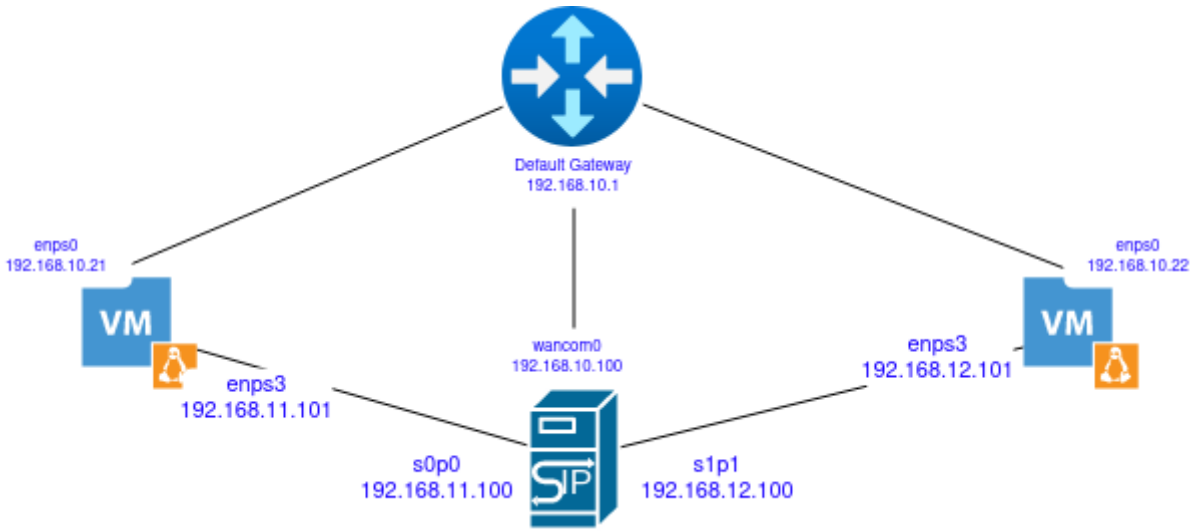
0.- Oracle SBC Peer to peer lab Introduction

The objective of this first series of entries is to setup an environment to be able to perform testing on a Oracle Session Border Controller.

SIP traffic will be generated using Linphone application on 2 remote hosts using Oracle SBC.

Name	Network
Management (Home Network)	192.168.10.0/24
External	192.168.11.0/24
Internal	192.168.12.0/24

Diagram representing our LAB



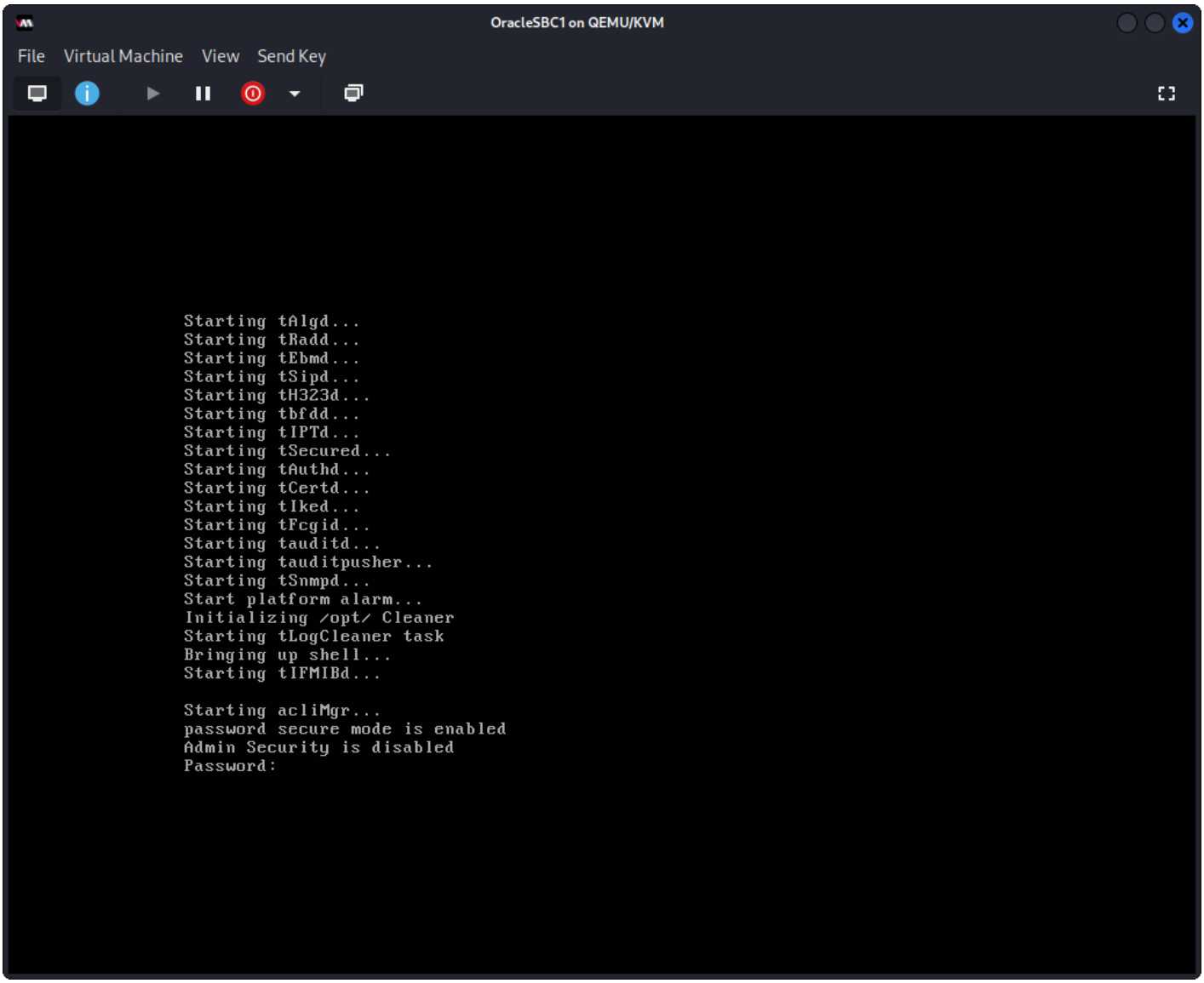
Device	Interface	IP	Gateway	Description
OracleSBC	wancom0	192.168.10.100	192.168.10.1	SBC Management

OracleSBC	s0p0	192.168.11.100	192.168.11.1	SBC Internal
OracleSBC	s1p1	192.168.12.100	192.168.12.1	SBC External
VM1	enp1s0	192.168.10.21	192.168.10.1	VM1 Management
VM1	enp3s0	192.168.11.101	192.168.11.1	VM1 Internal
VM1	enp1s0	192.168.10.22	192.168.10.1	VM1 Management
VM1	enp3s0	192.168.12.101	192.168.12.1	VM2 External

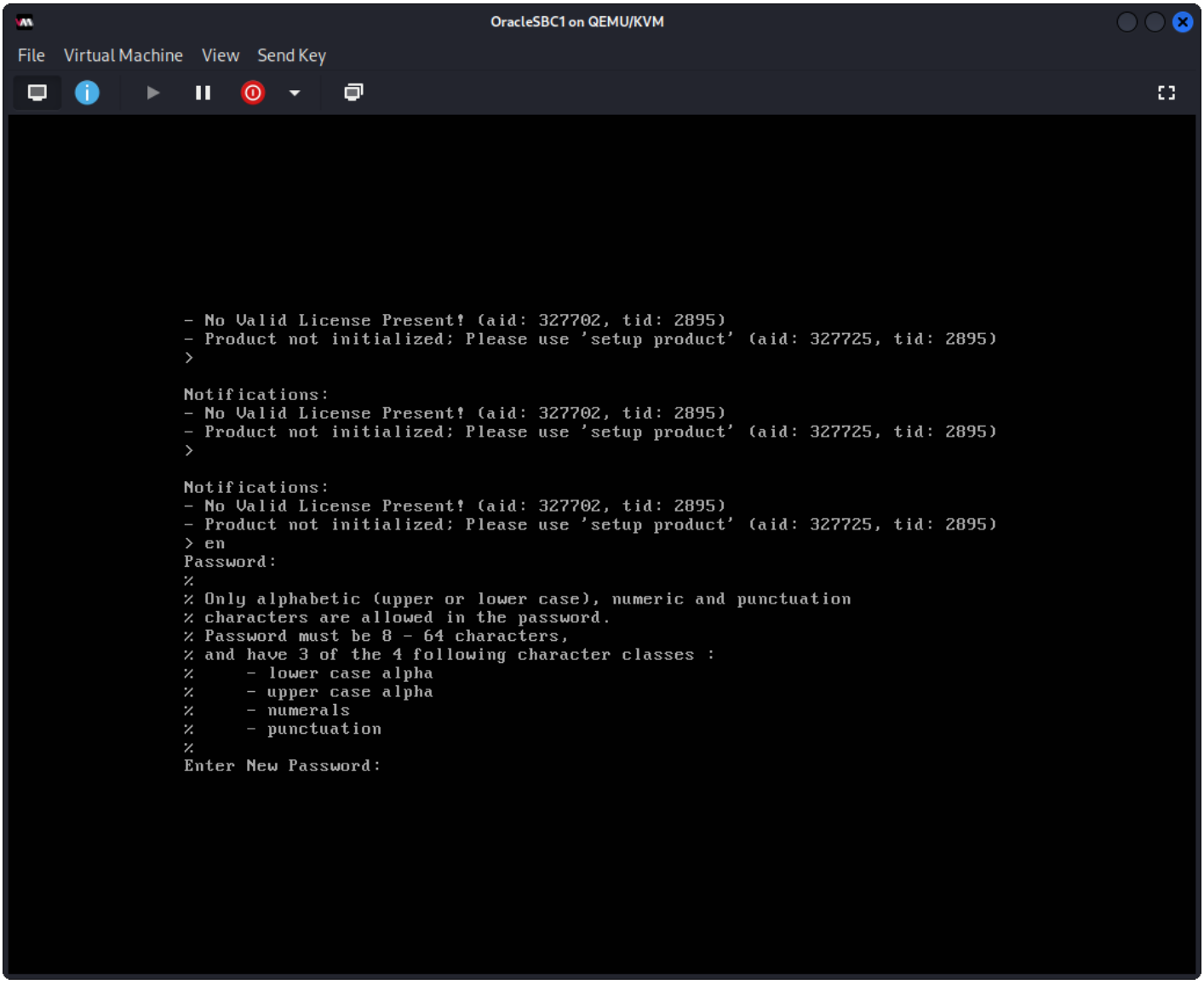
1. - Oracle SBC Initial configuration

Initial password acme

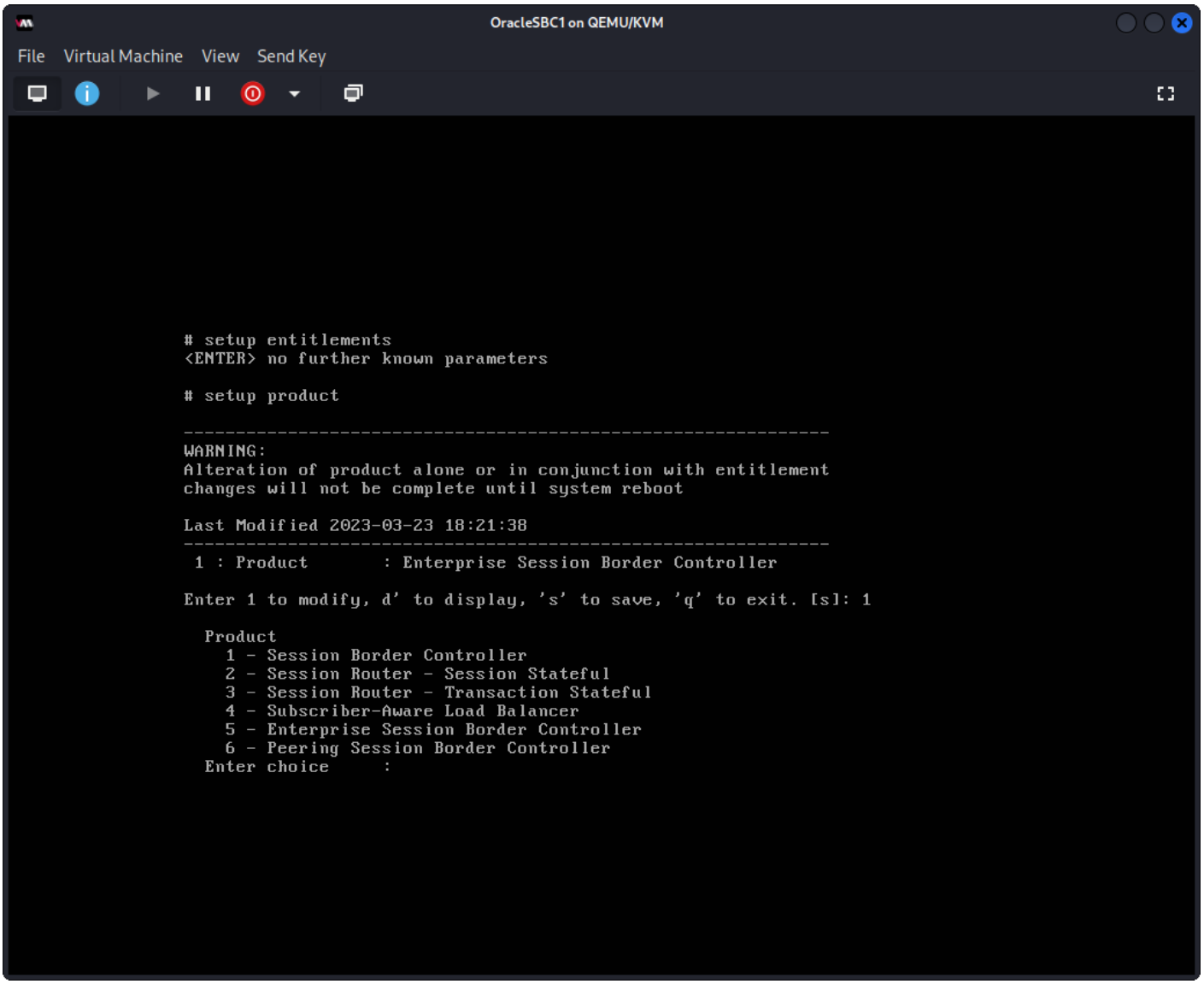
you will need to setup a new password



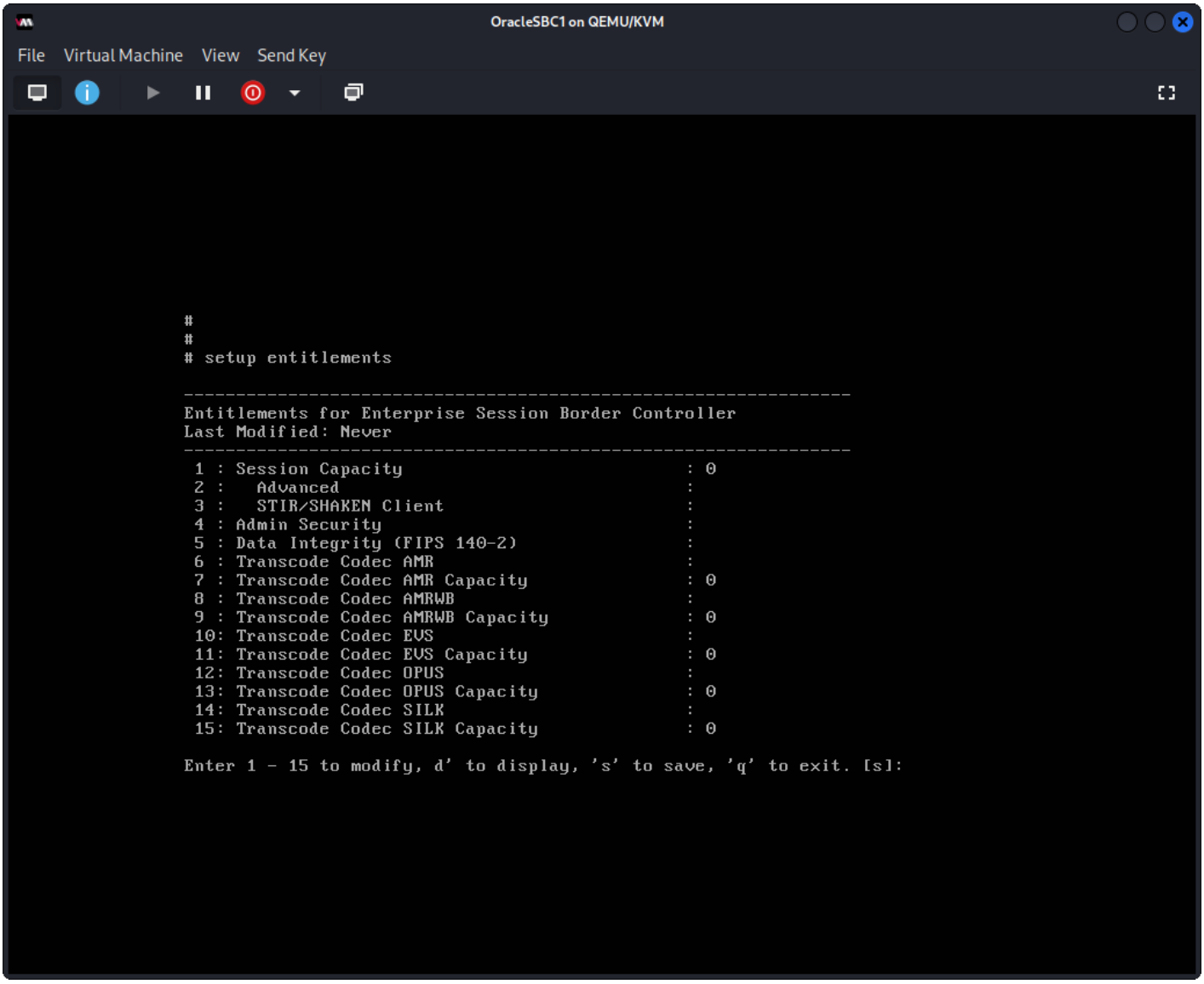
en password is packet



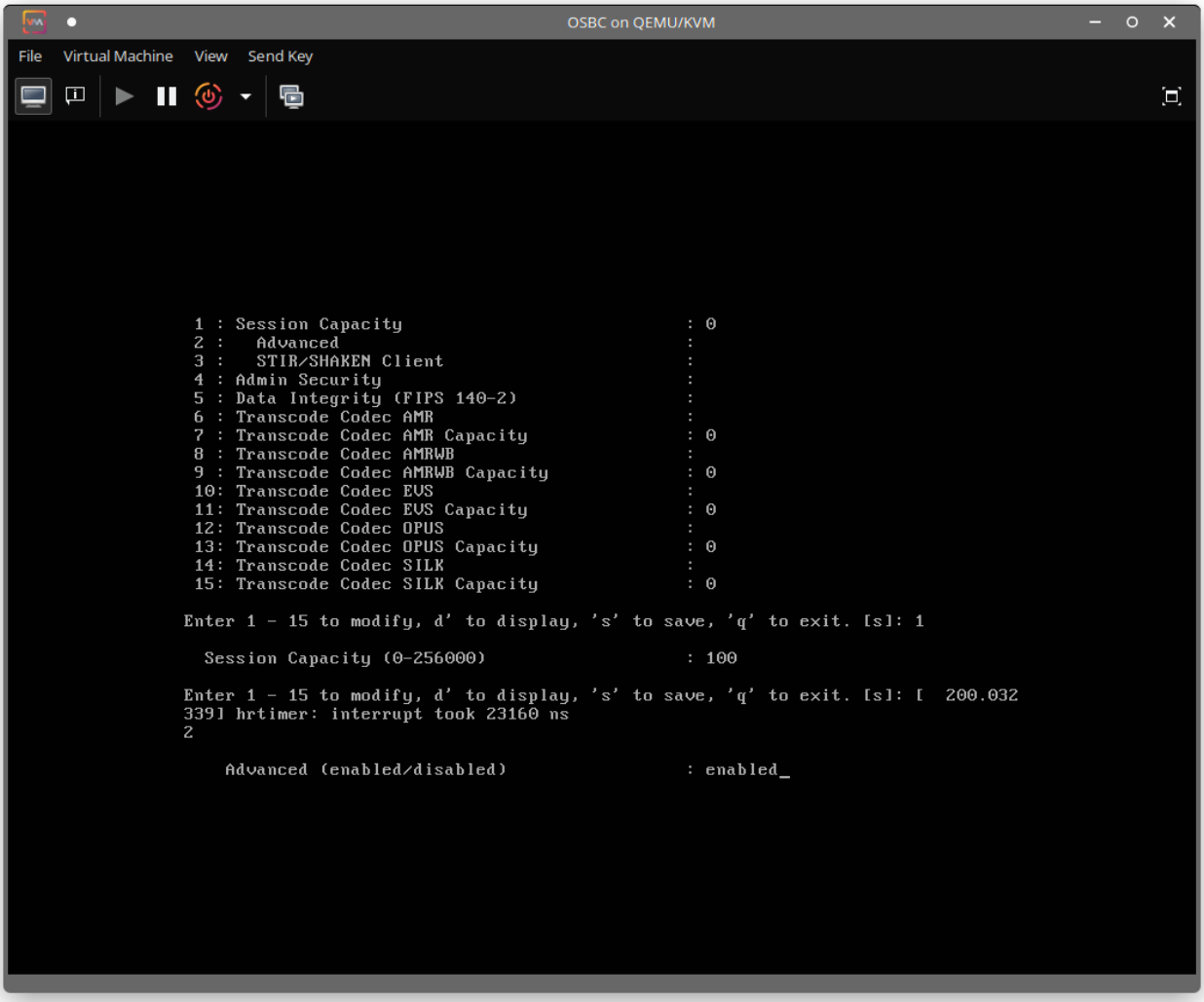
enter setup product, press 1 to modify then 5 for sbc enterprise then s to save



enter command setup entitlements then 1 for session capacity enter 100 then save



Select 2 to enable advance licenses then press s to save config



go to config t and setup bootparam

IP address to ssh remotely for management

```
(configure)# bootparam

'.' = clear field;  '-' = go to previous field;  q = quit

Boot File           : /boot/bzImage
IP Address          : 192.168.10.100
VLAN                :
Netmask             : 255.255.255.0
Gateway             : 192.168.10.1
IPv6 Address        :
IPv6 Gateway        :
Host IP             :
```

```
FTP username            :
FTP password            :
Flags                   :
Target Name             : PCOSBC
Console Device          : VGA
Console Baudrate        : 115200
Other                   :

NOTE: These changed parameters will not go into effect until reboot.
Also, be aware that some boot parameters may also be changed through
PHY and Network Interface Configurations.
```

After rebooting, SBC must show LabOSBC in the prompt name and must reply in the network.

configure options

```
(configure)# session-router
(session-router)# sip-config
(sip-config)# options +max
(sip-config)# options +max-udp-length=0
(sip-config)# options +reinvite-trying=yes
(sip-config)# options +sag-target-uri=ip
(sip-config)# enum-sag-match enabled
(sip-config)# extra-method-stats enable
(sip-config)#
(sip-config)# done
sip-config
```

Options explained

These are some configuration options for SIP (Session Initiation Protocol) on an Oracle SBC:

1. `options +max`: This command sets the maximum number of simultaneous sessions that the SBC can handle. The value can be any integer between 1 and 50000.
2. `options +max-udp-length=0`: This command sets the maximum UDP packet size to 0, which effectively disables UDP transport for SIP signaling. This can be useful for troubleshooting or for environments where UDP traffic is not allowed.
3. `options +reinvite-trying=yes`: This command enables the SBC to send 100 Trying responses to re-INVITE requests from the far-end UA (user agent). This is useful when the far-end UA sends re-INVITE requests without waiting for an answer to the previous

request.

4. `options +sag-target-uri=ip`: This command sets the target URI for the SAG (Session Agent) to the IP address of the SBC. This is useful when the SAG and SBC are on different networks and the SAG needs to know the IP address of the SBC.
5. `enum-sag-match enabled`: This command enables the ENUM (Electronic Numbering) feature on the SBC. ENUM is a protocol that maps telephone numbers to IP addresses, allowing SIP calls to be routed more efficiently.
6. `extra-method-stats enable`: This command enables additional SIP method statistics to be collected by the SBC. This can provide more detailed information on SIP traffic patterns and help with troubleshooting.

Toggle to display options

Options

```
state                          enabled
      operation-mode                 dialog
      dialog-transparency             enabled
      home-realm-id
      egress-realm-id
      auto-realm-id
      nat-mode                     None
      registrar-domain
      registrar-host
      registrar-port               0
      register-service-route          always
      init-timer                   500
      max-timer                    4000
      trans-expire                 32
      initial-inv-trans-expire        0
      invite-expire                180
      session-max-life-limit          0
      inactive-dynamic-conn           32
      enforcement-profile
      pac-method
      pac-interval                 10
      pac-strategy                 PropDist
      pac-load-weight                 1
      pac-session-weight              1
      pac-route-weight                1
      pac-callid-lifetime             600
      pac-user-lifetime               3600
      red-sip-port                 1988
```

```
red-max-trans                    10000
red-sync-start-time              5000
red-sync-comp-time               1000
options                          max-udp-length=0
                                 reinvite-trying=yes
                                 sag-target-uri=ip
spl-options
add-reason-header                disabled
sip-message-len                  4096
enum-sag-match                   enabled
extra-method-stats               enabled
extra-enum-stats                 disabled
mps-volte                        disabled
rph-feature                      disabled
nsep-user-sessions-rate          0
nsep-sa-sessions-rate            0
registration-cache-limit         0
register-use-to-for-lp           disabled
refer-src-routing                disabled
add-ucid-header                  disabled
proxy-sub-events
allow-pani-for-trusted-only      inherit
atcf-stn-sr
atcf-psi-dn
atcf-route-to-sccas              disabled
eatf-stn-sr
pass-gruu-contact                disabled
sag-lookup-on-redirect           disabled
set-disconnect-time-on-bye       disabled
refer-reinvite-no-sdp            disabled
msrp-delayed-bye-timer           15
transcoding-realm
transcoding-agents
create-dynamic-sa                disabled
node-functionality               P-CSCF
match-sip-instance               disabled
sa-routes-stats                  disabled
sa-routes-traps                  disabled
rx-sip-reason-mapping            disabled
add-ue-location-in-pani          inherit
hold-emergency-calls-for-loc-info  0
retry-after-upon-offline         0
reg-reject-response-upon-offline  503
hold-invite-calls-for-loc-info   0
cache-loc-info-expire            32
```

```
        msg-hold-for-loc-info                   0
        npli-upon-register                      inherit
        start-hold-timer-event                  AAR
        hist-to-div-for-cause-380               inherit
        anonymize-history-for-untrusted         disabled
        asymm-preconditions-evs-swb-support     disabled
        sms-report-timeout                      32
        user-agent
```

config continue

```
(sip-config)# exit
(session-router)# exit
(configure)# media-manager
(media-manager)# media-manager
(media-manager-config)# select
(media-manager-config)# options active-arp
(media-manager-config)#
(media-manager-config)# done
```

Media Manager options

```
media-manager
        state                           enabled
        latching                        enabled
        flow-time-limit                 86400
        initial-guard-timer             300
        subsq-guard-timer               300
        tcp-flow-time-limit             86400
        tcp-initial-guard-timer         300
        tcp-subsq-guard-timer           300
        tcp-number-of-ports-per-flow    2
        hnt-rtcp                        disabled
        algd-log-level                  NOTICE
        mbcd-log-level                  NOTICE
        options                         active-arp
        red-flow-port                   1985
        red-mgcp-port                   1986
        red-max-trans                   10000
        red-sync-start-time             5000
```

```
        red-sync-comp-time                  1000
        media-policing                      enabled
        max-arp-rate                        10
        max-signaling-packets               0
        max-untrusted-signaling             100
        min-untrusted-signaling             30
        dos-guard-window                    5
        untrusted-minor-threshold           0
        untrusted-major-threshold           0
        untrusted-critical-threshold        0
        trusted-minor-threshold             0
        trusted-major-threshold             0
        trusted-critical-threshold          0
        arp-minor-threshold                 0
        arp-major-threshold                 0
        arp-critical-threshold              0
        tolerance-window                    30
        untrusted-drop-threshold            0
        trusted-drop-threshold              0
        acl-monitor-window                  30
        trap-on-demote-to-deny              disabled
        trap-on-demote-to-untrusted         disabled
        syslog-on-demote-to-deny            disabled
        syslog-on-demote-to-untrusted       disabled
        rtcp-rate-limit                     0
        anonymous-sdp                       disabled
        rfc2833-timestamp                   disabled
        reactive-transcoding                disabled
        default-2833-duration               100
        rfc2833-end-pkts-only-for-non-sig   enabled
        translate-non-rfc2833-event         disabled
        media-supervision-traps             disabled
        dnsalg-server-failover              disabled
        syslog-on-call-reject               disabled
        xcode-fax-max-rate                  14400
```

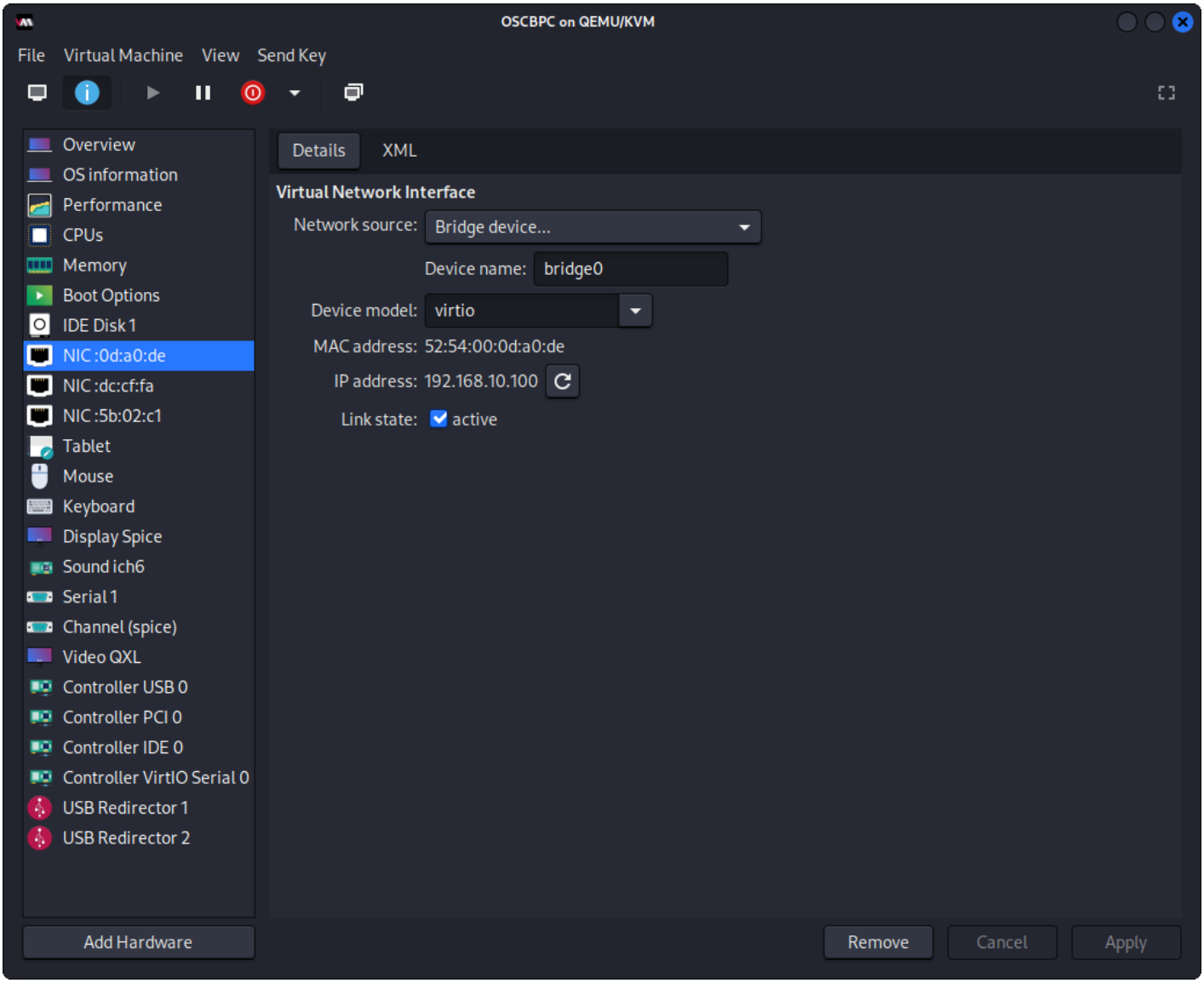
Interface-mapping show

```
# interface-mapping show
Interface Mapping Info
------------------------------------------
Eth-IF  MAC-Addr            Label
```

```
wancom0 52:54:00:0D:A0:DE       #generic
wancom1 52:54:00:DC:CF:FA       #generic
s0p0    52:54:00:5B:02:C1       #generic
wancom2 FF:FF:FF:FF:FF:FF       #dummy
spare   FF:FF:FF:FF:FF:FF       #dummy
s1p0    FF:FF:FF:FF:FF:FF       #dummy
s0p1    FF:FF:FF:FF:FF:FF       #dummy
s1p1    FF:FF:FF:FF:FF:FF       #dummy
s0p2    FF:FF:FF:FF:FF:FF       #dummy
s1p2    FF:FF:FF:FF:FF:FF       #dummy
s0p3    FF:FF:FF:FF:FF:FF       #dummy
s1p3    FF:FF:FF:FF:FF:FF       #dummy
```

In case of an incorrect interface mapping between the VM settings with the interfaces in the Oracle SBC use the following command to swap the MAC addresses. Important note, any swap change requires a reboot of the virtual Oracle SBC.

> Below screenshot its using linux KVM Virtual Machine Manager




```
# interface-mapping show
Interface Mapping Info
-----------------------------------------
Eth-IF  MAC-Addr              Label
wancom0 52:54:00:0D:A0:DE     #generic
wancom1 52:54:00:DC:CF:FA     #generic
s0p0    52:54:00:5B:02:C1     #generic
wancom2 FF:FF:FF:FF:FF:FF     #dummy
spare   FF:FF:FF:FF:FF:FF     #dummy
s1p0    FF:FF:FF:FF:FF:FF     #dummy
s0p1    FF:FF:FF:FF:FF:FF     #dummy
s1p1    FF:FF:FF:FF:FF:FF     #dummy
s0p2    FF:FF:FF:FF:FF:FF     #dummy
s1p2    FF:FF:FF:FF:FF:FF     #dummy
```

```
s0p3    FF:FF:FF:FF:FF:FF       #dummy
s1p3    FF:FF:FF:FF:FF:FF       #dummy

# interface-mapping swap
Error: Missing label text!
# interface-mapping swap wancom0 wancom1
Interface Mapping Info after swapping
-------------------------------------------
Eth-IF  MAC-Addr                Label
wancom0 52:54:00:DC:CF:FA       #generic
wancom1 52:54:00:0D:A0:DE       #generic
s0p0    52:54:00:5B:02:C1       #generic
wancom2 FF:FF:FF:FF:FF:FF       #dummy
spare   FF:FF:FF:FF:FF:FF       #dummy
s1p0    FF:FF:FF:FF:FF:FF       #dummy
s0p1    FF:FF:FF:FF:FF:FF       #dummy
s1p1    FF:FF:FF:FF:FF:FF       #dummy
s0p2    FF:FF:FF:FF:FF:FF       #dummy
s1p2    FF:FF:FF:FF:FF:FF       #dummy
s0p3    FF:FF:FF:FF:FF:FF       #dummy
s1p3    FF:FF:FF:FF:FF:FF       #dummy


Changes could affect service, and Requires Reboot to become effective.

Continue [y/n]?:
```

show arp and ping gateway

```
# show arp
IP address       HW type     Flags       HW address            Mask     Device
192.168.10.1     0x1         0x2         7c:2b:e1:13:be:3d     *        wancom0
192.168.10.10    0x1         0x2         f0:2f:74:20:1a:17     *        wancom0

            Total L2 Entries = 0
            ----------------------
No Gateway Entries (0)
# ping 192.168.10.1
PING 192.168.10.1 from wancom0:1
```

```
44 bytes from 192.168.10.1: icmp_seq=1 ttl=64 time=0.183 ms
44 bytes from 192.168.10.1: icmp_seq=2 ttl=64 time=0.158 ms
44 bytes from 192.168.10.1: icmp_seq=3 ttl=64 time=0.211 ms
44 bytes from 192.168.10.1: icmp_seq=4 ttl=64 time=0.209 ms

4 packets transmitted, 4 received, 0% packet loss
```

2. - Oracle SBC - Virtual Machines for testing

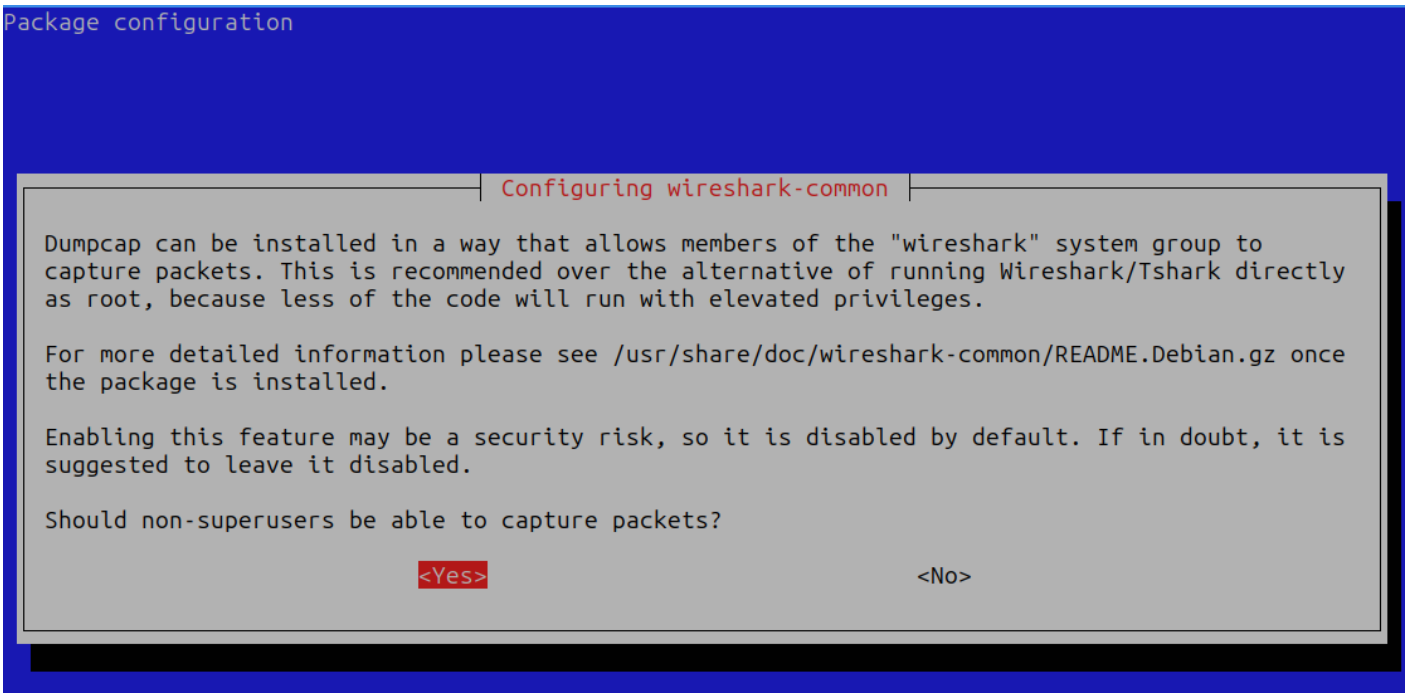
We need to deploy 2 virtual machines in order to test communication between phones via Oracle SBC

we will not go over the deployment, feel free to choose any distribution, for this lab we are using Lubuntu. (feel free to use windows if needed) visit https://www.linphone.org/ to download.

first we need to update our distro and install necessary tools

sudo apt-get update

sudo apt-get install wireshark (make sure you allow non-superusers to capture packets)



next we will add linphone repository and install linphone

sudo add-apt-repository ppa:linphone/release

sudo apt-get update

sudo apt-get install linphone -y

Last step is to manually assign IP address to our interfaces, example below is for VLAN 1 we are using

enp1s0 - 192.168.10.21

enp3s0 - 192.168.11.101

```
csr@vm1:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    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: enp1s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 52:54:00:1b:aa:1f brd ff:ff:ff:ff:ff:ff
    inet 192.168.10.21/24 brd 192.168.10.255 scope global noprefixroute enp1s0
       valid_lft forever preferred_lft forever
    inet6 fe80::9fdc:3b2e:a4a9:29af/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
3: enp2s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 52:54:00:c7:c9:c5 brd ff:ff:ff:ff:ff:ff
    inet 192.168.10.30/24 brd 192.168.10.255 scope global dynamic noprefixroute enp2s0
       valid_lft 6425sec preferred_lft 6425sec
    inet6 fe80::a096:1c9d:9db0:f414/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
4: enp3s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 52:54:00:0e:0c:17 brd ff:ff:ff:ff:ff:ff
    inet 192.168.11.101/24 brd 192.168.11.255 scope global noprefixroute enp3s0
       valid_lft forever preferred_lft forever
    inet6 fe80::d0ef:196b:c26b:f50d/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
```

ping all gateways to validate connectivity.

```
csr@vm1:~$ ping 192.168.10.1
PING 192.168.10.1 (192.168.10.1) 56(84) bytes of data.
```

```
64 bytes from 192.168.10.1: icmp_seq=1 ttl=64 time=0.249 ms
64 bytes from 192.168.10.1: icmp_seq=2 ttl=64 time=0.203 ms
^C
--- 192.168.10.1 ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1004ms
rtt min/avg/max/mdev = 0.203/0.226/0.249/0.023 ms
csr@vm1:~$ ping 192.168.11.1
PING 192.168.11.1 (192.168.11.1) 56(84) bytes of data.
64 bytes from 192.168.11.1: icmp_seq=1 ttl=64 time=0.436 ms
64 bytes from 192.168.11.1: icmp_seq=2 ttl=64 time=0.244 ms
^C
--- 192.168.11.1 ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1021ms
rtt min/avg/max/mdev = 0.244/0.340/0.436/0.096 ms
csr@vm1:~$ ping 192.168.12.1
PING 192.168.12.1 (192.168.12.1) 56(84) bytes of data.
64 bytes from 192.168.12.1: icmp_seq=1 ttl=64 time=0.271 ms
64 bytes from 192.168.12.1: icmp_seq=2 ttl=64 time=0.268 ms
^C
--- 192.168.12.1 ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1023ms
rtt min/avg/max/mdev = 0.268/0.269/0.271/0.001 ms
```