

# Oracle SBC Labs

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# 1. - Oracle SBC - Basic Peer to Peer LAB

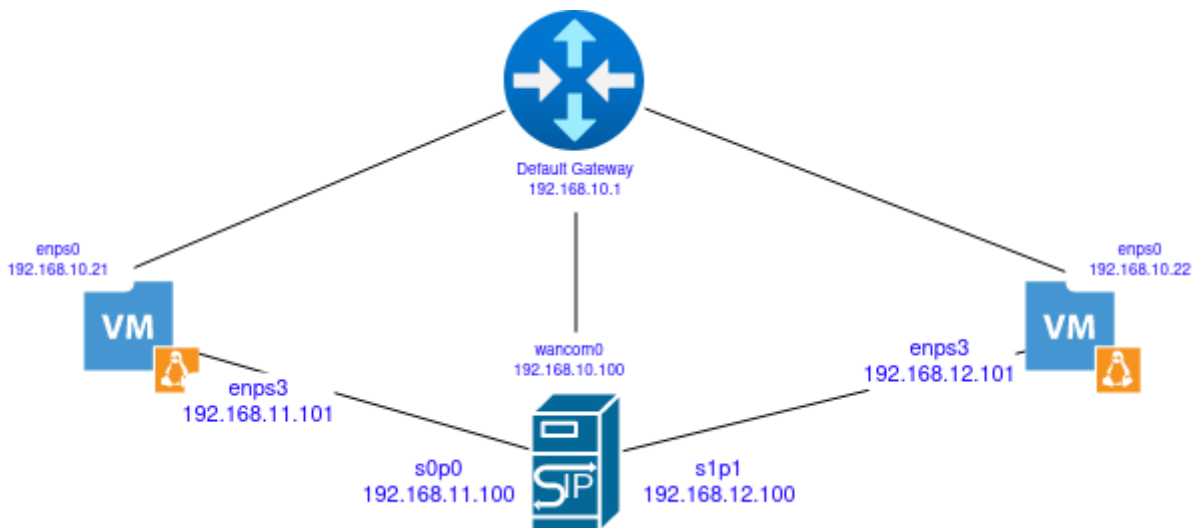
# 0.- Oracle SBC Peer to peer lab Introduction

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
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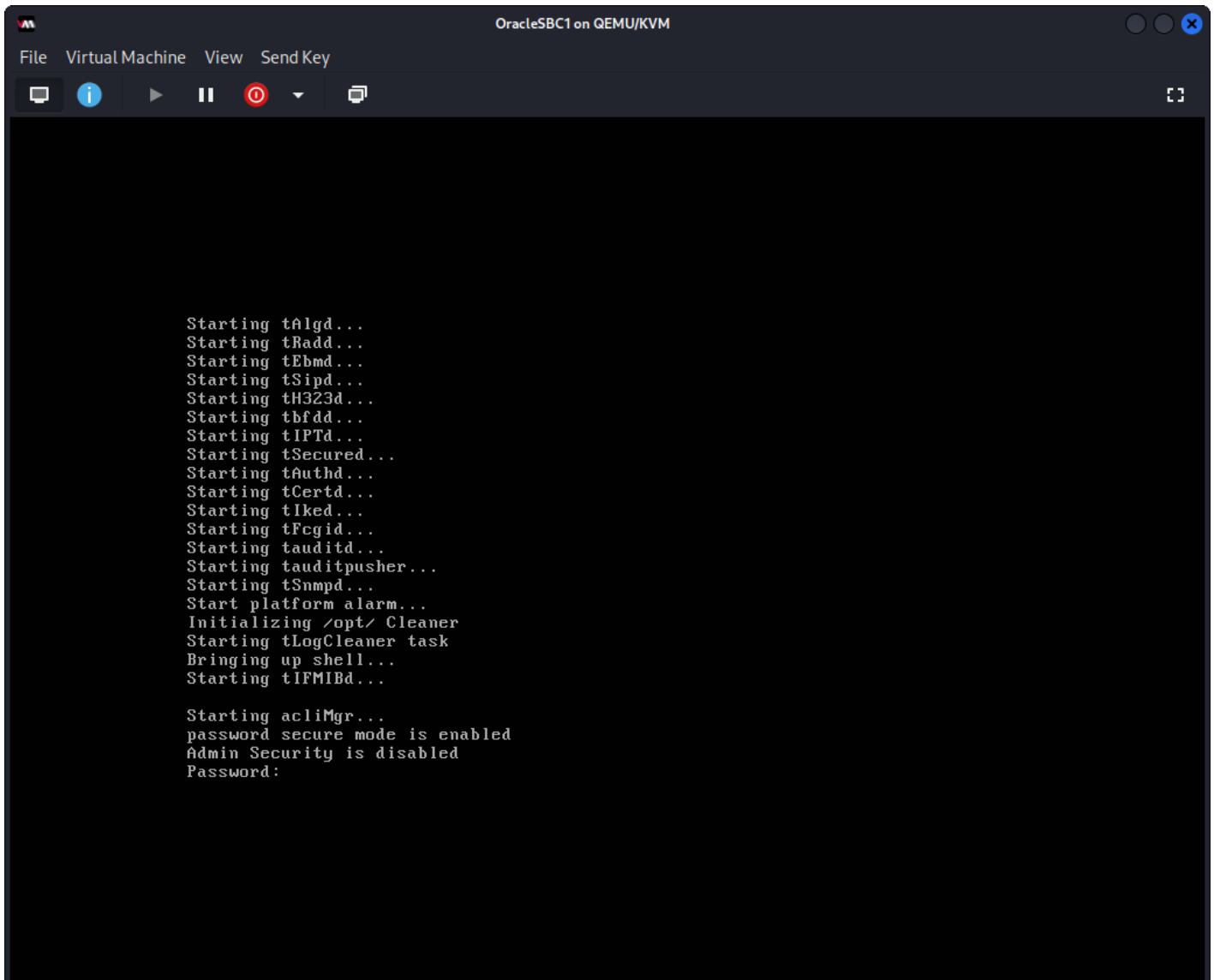
OracleSBC	wancom0	192.168.10.100	192.168.10.1	SBC Management
OracleSBC	s0p0	192.168.11.100	192.168.11.1	SBC Internal
OracleSBC	s1p1	192.168.12.100	192.168.12.1	SBC External
VM1	enp1s0	192.168.10.21	192.168.10.1	VM1 Management
VM1	enp3s0	192.168.11.101	192.168.11.1	VM1 Internal
VM1	enp1s0	192.168.10.22	192.168.10.1	VM1 Management
VM1	enp3s0	192.168.12.101	192.168.12.1	VM2 External

1. - Oracle SBC - Basic Peer to Peer LAB

# 1. - Oracle SBC Initial configuration

Initial password acme

you will need to setup a new password



```
OracleSBC1 on QEMU/KVM
File Virtual Machine View Send Key
Starting tAlgd...
Starting tRadd...
Starting tEbd...
Starting tSipd...
Starting tH323d...
Starting tbfdd...
Starting tIPTd...
Starting tSecured...
Starting tAuthd...
Starting tCertd...
Starting tiked...
Starting tFcgid...
Starting tauditd...
Starting tauditpusher...
Starting tSnmpd...
Start platform alarm...
Initializing /opt/ Cleaner
Starting tLogCleaner task
Bringing up shell...
Starting tIFMIBd...

Starting aclMgr...
password secure mode is enabled
Admin Security is disabled
Password:
```

en password is packet

```
OracleSBC1 on QEMU/KVM
File Virtual Machine View Send Key
[Icons: info, play, pause, stop, dropdown, copy]

- No Valid License Present! (aid: 327702, tid: 2895)
- Product not initialized; Please use 'setup product' (aid: 327725, tid: 2895)
>

Notifications:
- No Valid License Present! (aid: 327702, tid: 2895)
- Product not initialized; Please use 'setup product' (aid: 327725, tid: 2895)
>

Notifications:
- No Valid License Present! (aid: 327702, tid: 2895)
- Product not initialized; Please use 'setup product' (aid: 327725, tid: 2895)
> en
Password:
%
% Only alphabetic (upper or lower case), numeric and punctuation
% characters are allowed in the password.
% Password must be 8 - 64 characters,
% and have 3 of the 4 following character classes :
%   - lower case alpha
%   - upper case alpha
%   - numerals
%   - punctuation
%
Enter New Password:
```

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

```
OracleSBC1 on QEMU/KVM
File Virtual Machine View Send Key
# setup entitlements
<ENTER> no further known parameters

# setup product

-----
WARNING:
Alteration of product alone or in conjunction with entitlement
changes will not be complete until system reboot

Last Modified 2023-03-23 18:21:38
-----
1 : Product          : Enterprise Session Border Controller

Enter 1 to modify, d' to display, 's' to save, 'q' to exit. [s]: 1

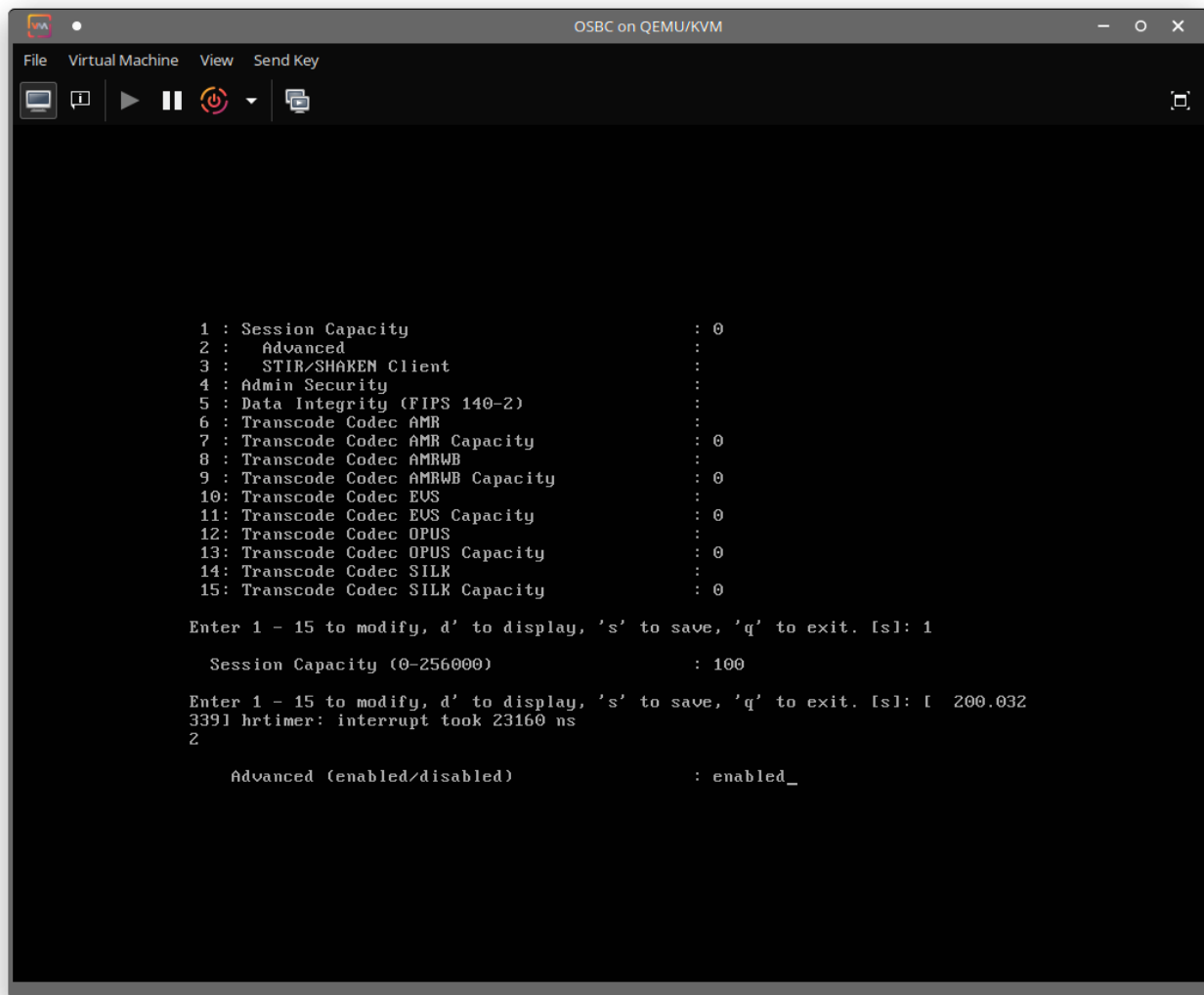
Product
1 - Session Border Controller
2 - Session Router - Session Stateful
3 - Session Router - Transaction Stateful
4 - Subscriber-Aware Load Balancer
5 - Enterprise Session Border Controller
6 - Peering Session Border Controller
Enter choice      :
```

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

```
OracleSBC1 on QEMU/KVM
File Virtual Machine View Send Key
#
#
# setup entitlements
-----
Entitlements for Enterprise Session Border Controller
Last Modified: Never
-----
 1 : Session Capacity           : 0
 2 :   Advanced                 :
 3 :   STIR/SHAKEN Client       :
 4 : Admin Security             :
 5 : Data Integrity (FIPS 140-2) :
 6 : Transcode Codec AMR        :
 7 : Transcode Codec AMR Capacity : 0
 8 : Transcode Codec AMRWB      :
 9 : Transcode Codec AMRWB Capacity : 0
10 : Transcode Codec EVS        :
11 : Transcode Codec EVS Capacity : 0
12 : Transcode Codec OPUS       :
13 : Transcode Codec OPUS Capacity : 0
14 : Transcode Codec SILK       :
15 : Transcode Codec SILK Capacity : 0

Enter 1 - 15 to modify, d' to display, 's' to save, 'q' to exit. [s]:
```

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-ip	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
dnssalg-server-failover   disabled
syslog-on-call-reject     disabled
xcode-fax-max-rate        14400

```

## Interface-mapping show

```

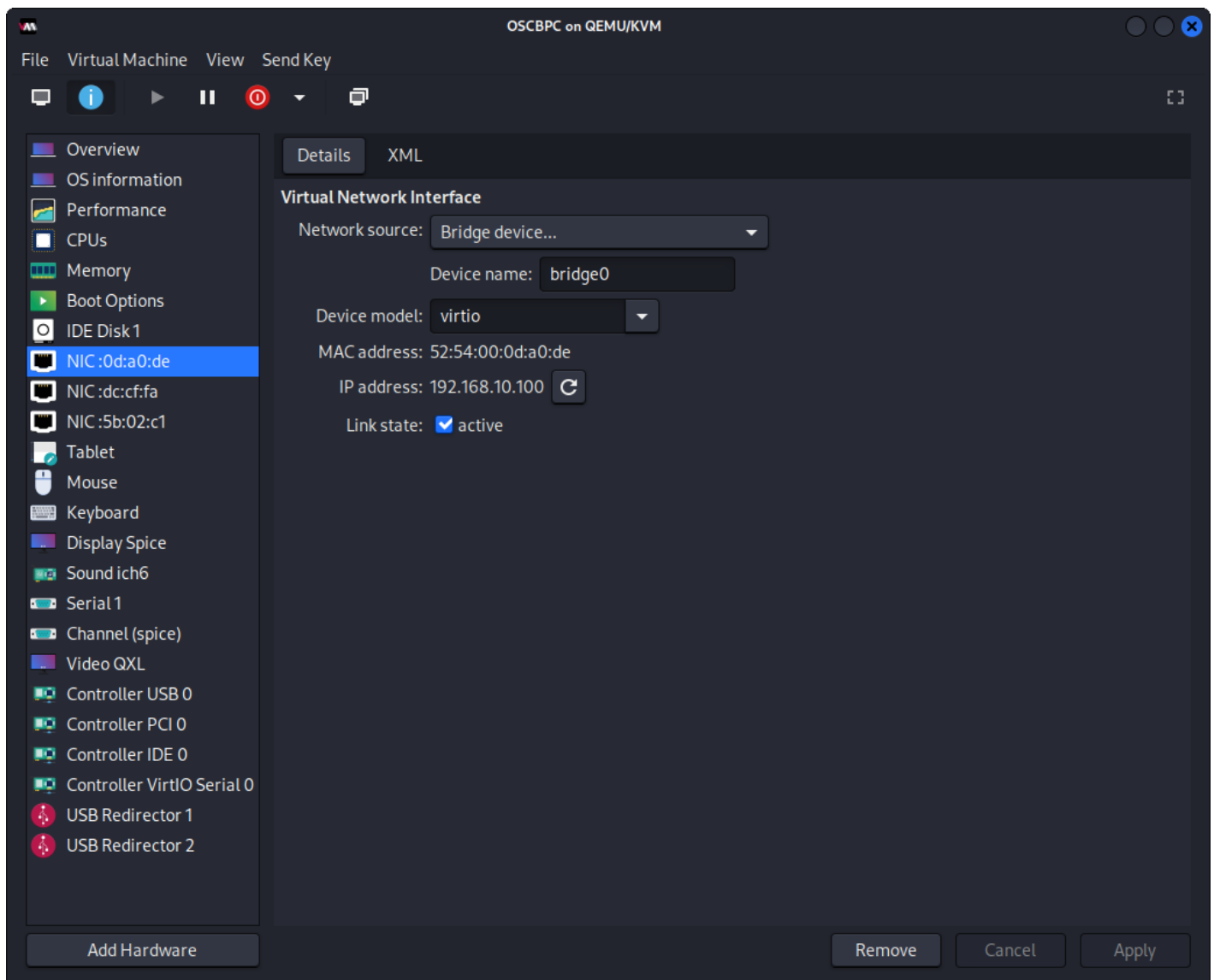
# interface-mapping show
Interface Mapping Info
-----
Eth-IF  MAC-Addr      Label
wancom0 52:54:00:0D:A0:DE #generic
wancom1 52:54:00:DC:CF:FA #generic
s0p0    52:54:00:5B:02:C1   #generic

```

```
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
```

1. - Oracle SBC - Basic Peer to Peer LAB

## 2. - Oracle SBC - Virtual Machines for testing

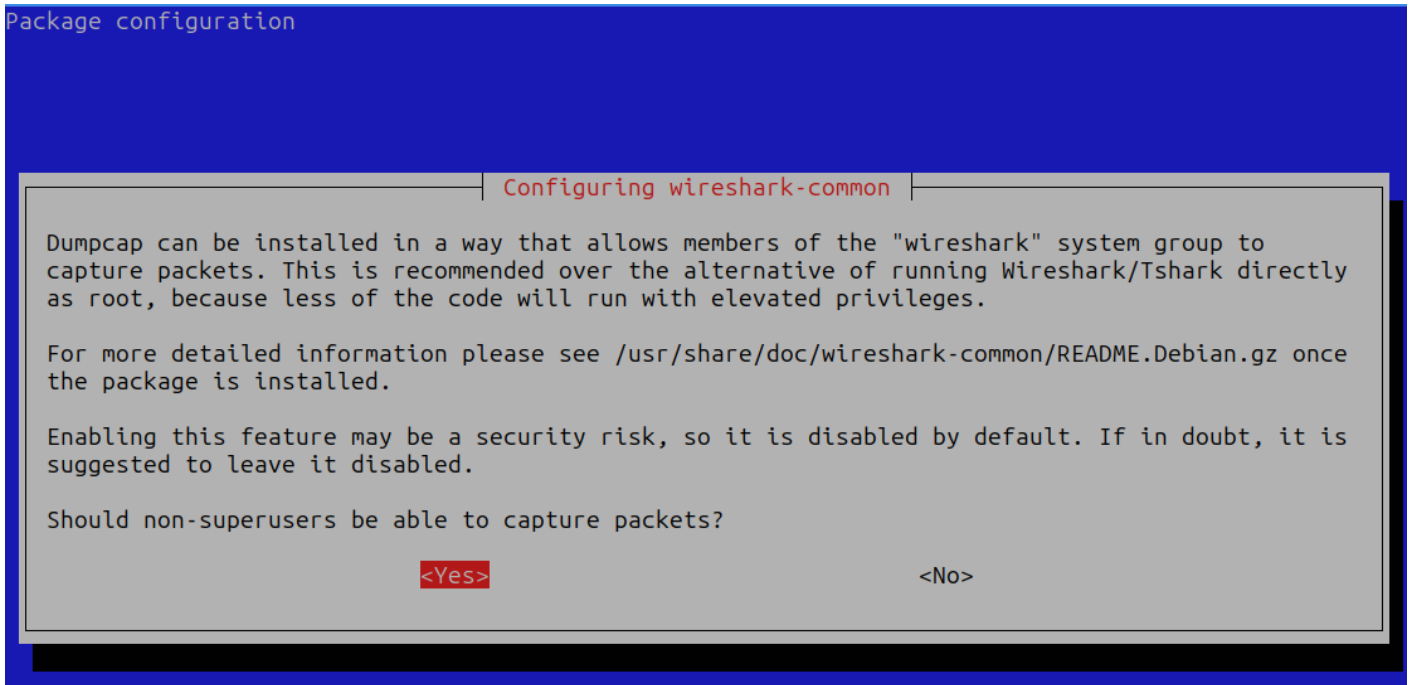
We need to deploy 2 virtual machines in order to test communication between phones via Oracle SBC

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
```

# Oracle SBC With Asterisk