

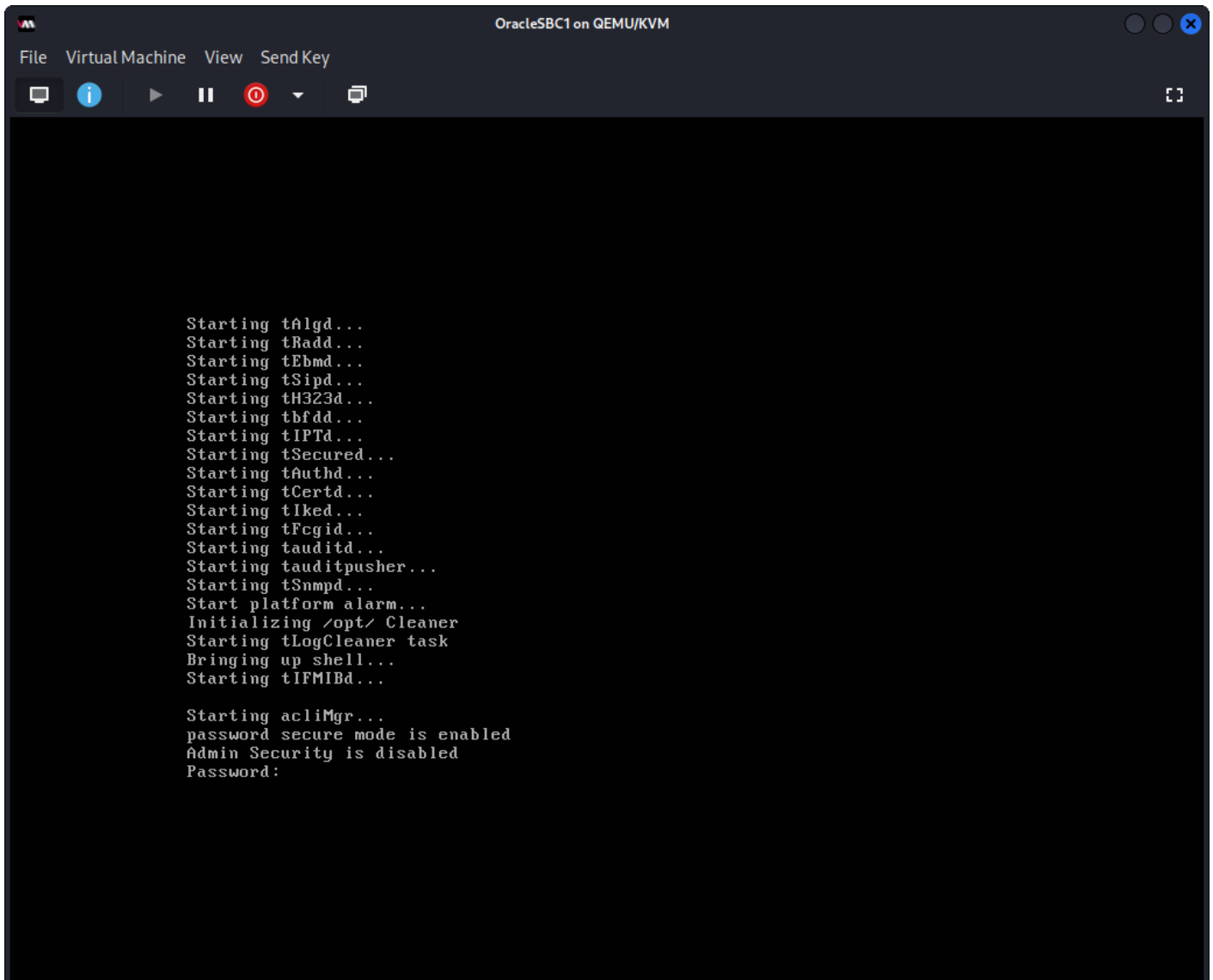
SBC HomeLAB

- 1. - SBC Initial configuration
- 2. - SBC physical and network interfaces
- 3. - SBC Realms
- 4. - SBC SIP Interfaces
- 5. - SBC Steering pool
- 6. - SBC Local Policies

1. - SBC Initial configuration

Initial password acme

you will need to setup a new password



```
Starting tAlgd...
Starting tRadd...
Starting tEbdm...
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 acIMgr...
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: VM, Info, Play, Pause, Stop, Refresh]

- 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

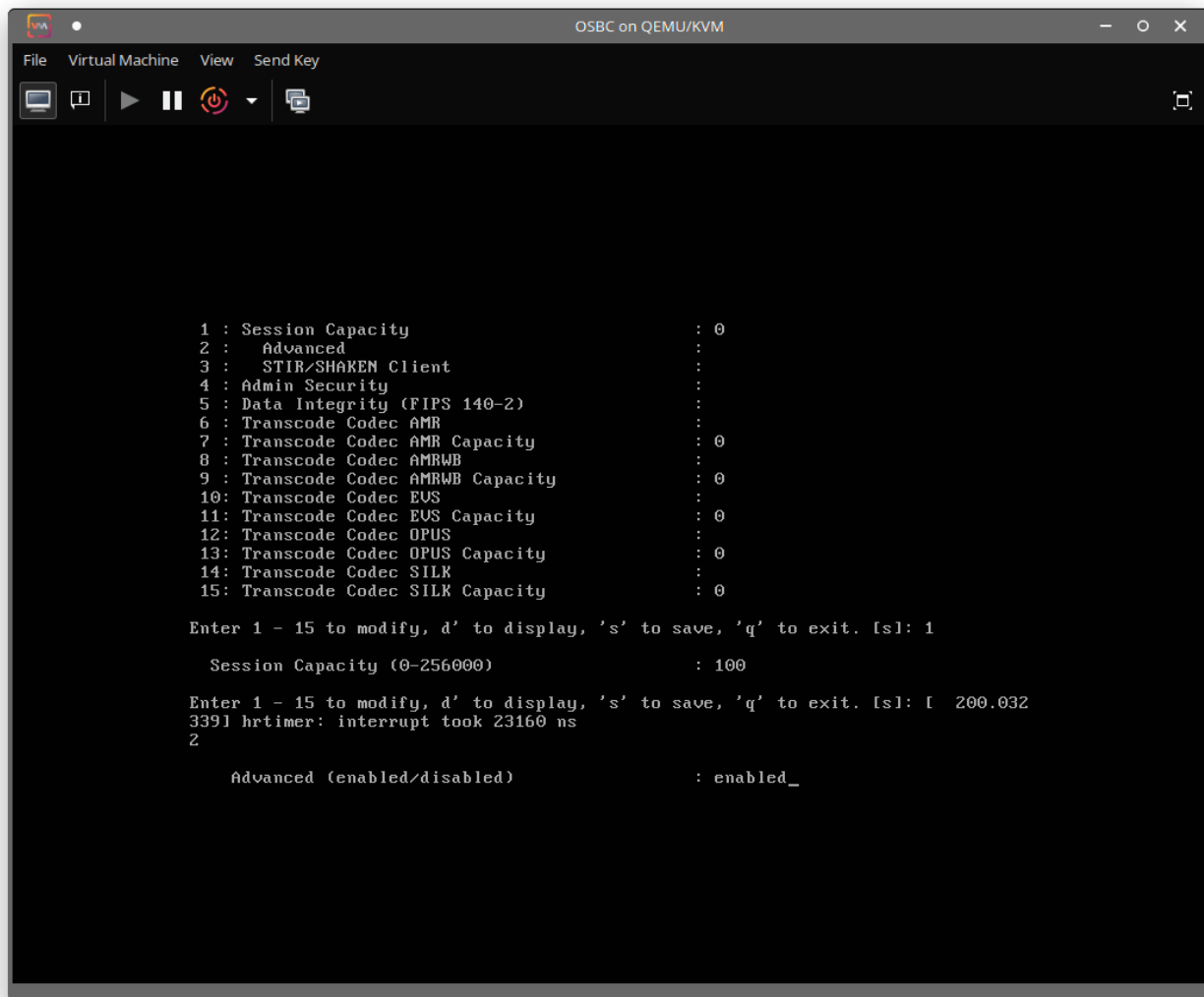
Product
1 - Session Border Controller
2 - Session Router - Session Stateful
3 - Session Router - Transaction Stateful
4 - Subscriber-Aware Load Balancer
5 - Enterprise Session Border Controller
6 - Peering Session Border Controller
Enter choice      :
```

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
mpps-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
dnalg-server-failover	disabled
syslog-on-call-reject	disabled
xcode-fax-max-rate	14400

Interface-mapping show

```
# interface-mapping show
```

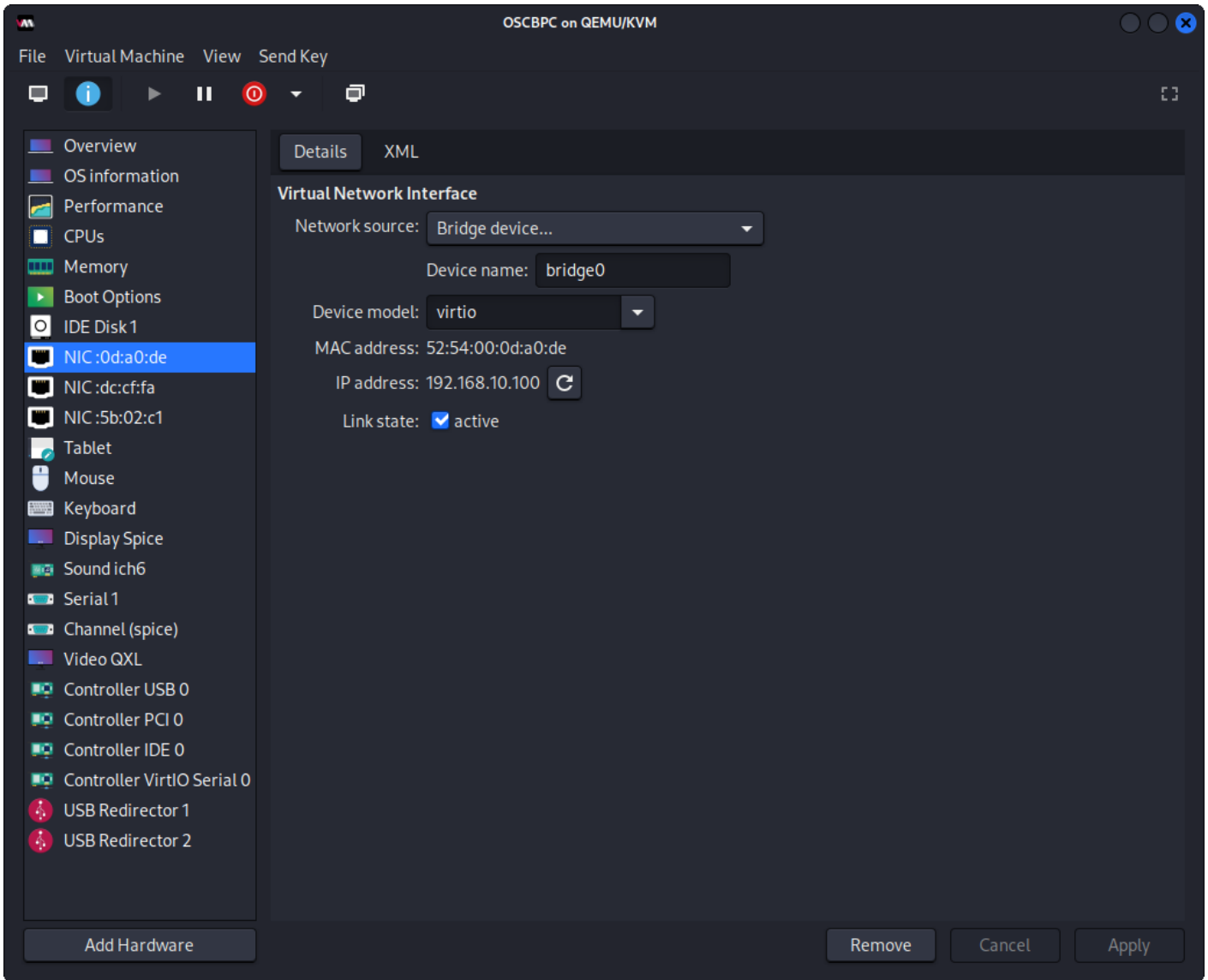
```
Interface Mapping Info
```

```
-----
```

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

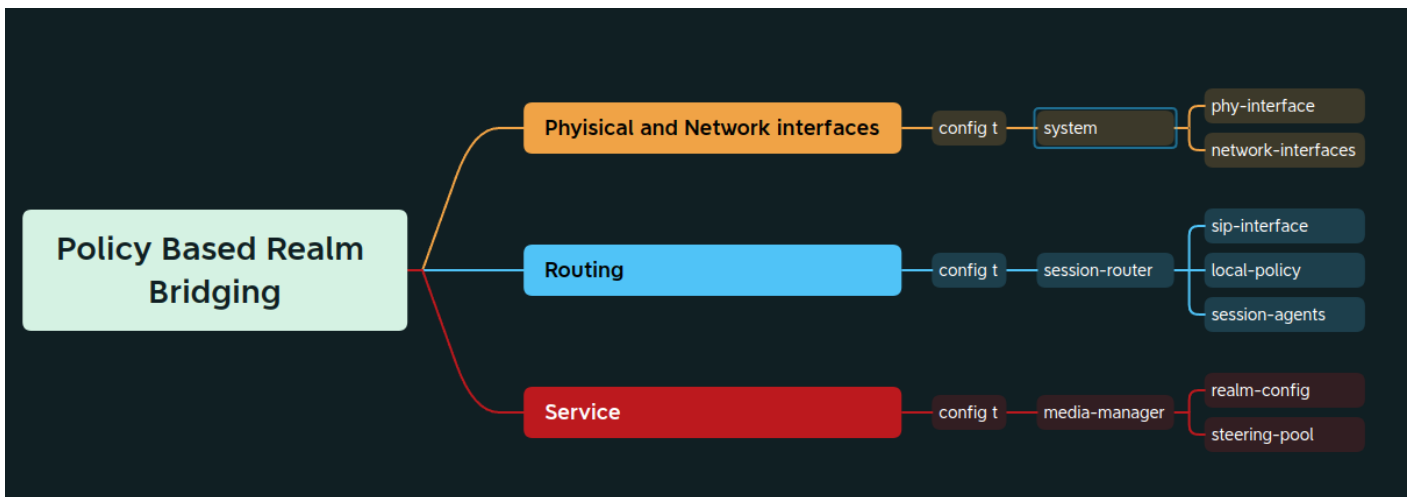
44 bytes from 192.168.10.1: icmp_seq=2 ttl=64 time=0.158 ms

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. - SBC physical and network interfaces



Oracle SBCs have dedicated interfaces to be used for signaling and media, those interfaces are defined as sXpX when listing the interfaces. As defined in the first entry two interfaces will be created and configured dedicating one for internal (s0p0) communication and the other for external (s1p1) communication.

The first step is set up a physical interface: s1p1 (slot 1 port 1)

```
PCOSBC# config t
PCOSBC(configure)# system phy-interface
PCOSBC(phy-interface)# name Internal
PCOSBC(phy-interface)# operation-type Media
PCOSBC(phy-interface)# port 1
PCOSBC(phy-interface)# slot 1
PCOSBC(phy-interface)#
PCOSBC(phy-interface)# done
```

```

phy-interface
  name Internal
  operation-type Media
  port 1
  slot 1
  virtual-mac
  admin-state enabled
  auto-negotiation enabled
  duplex-mode FULL
  speed 100
  wancom-health-score 50
  overload-protection disabled

```

With the physical interface created an IP address can be assigned to the physical interface, the link between the physical and the network interface is using the same name, in this case Internal.

```

PCOSBC(system)#
PCOSBC(system)# network-interface
PCOSBC(network-interface)#
PCOSBC(network-interface)# name Internal
PCOSBC(network-interface)# ip-address 192.168.10.101
PCOSBC(network-interface)# netmask 255.255.255.0
PCOSBC(network-interface)# gateway 192.168.10.1
PCOSBC(network-interface)# add-hip-ip 192.168.10.101
PCOSBC(network-interface)# add-icmp-ip 192.168.10.101
PCOSBC(network-interface)#
PCOSBC(network-interface)# done
network-interface
  name Internal
  sub-port-id 0
  description
  hostname
  ip-address 192.168.10.101
  pri-utility-addr
  sec-utility-addr
  netmask 255.255.255.0
  gateway 192.168.10.1
  sec-gateway
  gw-heartbeat
  state disabled

```

```

    heartbeat                0
    retry-count              0
    retry-timeout            1
    health-score             0
bfd-config
    state                    disabled
    health-score             0
    options
dns-ip-primary
dns-ip-backup1
dns-ip-backup2
dns-domain
dns-timeout                 11
dns-max-ttl                 86400
signaling-mtu               0
hip-ip-list                 192.168.10.101
icmp-address                 192.168.10.101
snmp-address
ssh-address

```

Now lets set up the physical interface s0p0, it will be named as External.

```

PCOSBC(network-interface)#
PCOSBC(network-interface)# exit
PCOSBC(system)# phy-interface
PCOSBC(phy-interface)# name External
PCOSBC(phy-interface)# operation-type Media
PCOSBC(phy-interface)# port 0
PCOSBC(phy-interface)# slot 0
PCOSBC(phy-interface)#
PCOSBC(phy-interface)# done
phy-interface
    name                External
    operation-type      Media
    port                0
    slot                0

```

```
virtual-mac
admin-state          enabled
auto-negotiation    enabled
duplex-mode         FULL
speed               100
wancom-health-score 50
overload-protection disabled
```

and now the network-interface for external

```
PCOSBC(phy-interface)# exit
PCOSBC(system)# network-interface
PCOSBC(network-interface)# name External
PCOSBC(network-interface)# ip-address 192.168.10.201
PCOSBC(network-interface)# netmask 255.255.255.0
PCOSBC(network-interface)# gateway 192.168.10.1
PCOSBC(network-interface)# add-hip-ip 192.168.10.1
PCOSBC(network-interface)# add-icmp-ip 192.168.10.1
PCOSBC(network-interface)#
PCOSBC(network-interface)# done
network-interface
  name          External
  sub-port-id   0
  description
  hostname
  ip-address    192.168.10.201
  pri-utility-addr
  sec-utility-addr
  netmask       255.255.255.0
  gateway       192.168.10.1
  sec-gateway
  gw-heartbeat
    state       disabled
    heartbeat    0
    retry-count  0
    retry-timeout 1
    health-score 0
bfd-config
```

```
state                disabled
health-score         0
options
dns-ip-primary
dns-ip-backup1
dns-ip-backup2
dns-domain
dns-timeout          11
dns-max-ttl          86400
signaling-mtu        0
hip-ip-list          192.168.10.1
icmp-address          192.168.10.1
snmp-address
ssh-address
```

With all IP addresses assigned, connectivity can be verified with **show arp** (this command lets you know the status connectivity to the default gateways)

In this configuration we're using 1 gateway only.

```
PCOSBC# 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)
```

3. - SBC Realms

Session Border Controllers are network devices that secures voice over IP (VoIP) infrastructure while providing interworking between incompatible signaling messages and media flows from end device or application servers.

An important element in Oracle SBCs is realm which are defined as a logical way to identify domain, network, collection of networks.

Let's forget the management interfaces running in the lab devices for now, the concept of realm would be applied as the following image associating the SBCs interfaces to the realms and any external device sending traffic to the IPs associated.



Now let's go back to the CLI and configure the realms as shown in the image above, it's important to mention that identifier can have any name, in my case I used the same names used in physical interfaces and network interfaces, but the key is associate the correct network interface name created in the previous entry.

```
PCOSBC# config t
PCOSBC(configure)# media-manager
PCOSBC(media-manager)# realm-config
PCOSBC(realm-config)# identifier External
PCOSBC(realm-config)#
PCOSBC(realm-config)# network-interfaces External
PCOSBC(realm-config)#
PCOSBC(realm-config)# done
realm-config
```

realm-config extended

realm-config

identifier	External
description	
addr-prefix	0.0.0.0
network-interfaces	External:0
media-realm-list	
mm-in-realm	disabled
mm-in-network	enabled
mm-same-ip	enabled
mm-in-system	enabled
bw-cac-non-mm	disabled
msm-release	disabled
qos-enable	disabled
max-bandwidth	0
fallback-bandwidth	0
max-priority-bandwidth	0
max-latency	0
max-jitter	0
max-packet-loss	0
observ-window-size	0
parent-realm	
dns-realm	
media-policy	
nsep-media-policy	
rtcp-mux	disabled
ice-profile	
teams-fqdn	
teams-fqdn-in-uri	disabled
sdp-inactive-only	disabled
dtls-srtp-profile	
class-profile	
in-translationid	
out-translationid	
in-manipulationid	
out-manipulationid	
average-rate-limit	0
access-control-trust-level	none
invalid-signal-threshold	0
maximum-signal-threshold	0
untrusted-signal-threshold	0
nat-trust-threshold	0
max-endpoints-per-nat	0
nat-invalid-message-threshold	0
wait-time-for-invalid-register	0

deny-period	30
session-max-life-limit	0
cac-failure-threshold	0
untrust-cac-failure-threshold	0
ext-policy-svr	
diam-e2-address-realm	
subscription-id-type	END_USER_NONE
symmetric-latching	disabled
pai-strip	disabled
trunk-context	
device-id	
early-media-allow	
enforcement-profile	
additional-prefixes	
restricted-latching	none
restriction-mask	32
user-cac-mode	none
user-cac-bandwidth	0
user-cac-sessions	0
icmp-detect-multiplier	0
icmp-advertisement-interval	0
icmp-target-ip	
monthly-minutes	0
options	
spl-options	
accounting-enable	enabled
net-management-control	disabled
delay-media-update	disabled
refer-call-transfer	disabled
hold-refer-reinvite	disabled
refer-notify-provisional	none
dyn-refer-term	disabled
codec-policy	
codec-manip-in-realm	disabled
codec-manip-in-network	enabled
rtcp-policy	
constraint-name	
session-recording-server	
session-recording-required	disabled
manipulation-string	
manipulation-pattern	
stun-enable	disabled
stun-server-ip	0.0.0.0
stun-server-port	3478

```

stun-changed-ip          0.0.0.0
stun-changed-port       3479
sip-profile
flow-time-limit         -1
initial-guard-timer     -1
subsq-guard-timer       -1
tcp-flow-time-limit     -1
tcp-initial-guard-timer -1
tcp-subsq-guard-timer   -1
sip-isup-profile
match-media-profiles
qos-constraint
block-rtcp              disabled
hide-egress-media-update disabled
tcp-media-profile
monitoring-filters
node-functionality
default-location-string
alt-family-realm
pref-addr-type          none
sm-icsi-match-for-invite
sm-icsi-match-for-message
merge-early-dialogs    disabled
user-site
srvcc-trfo
feature-trfo

```

```

PCOSBC(media-manager)# realm-config
PCOSBC(realm-config)# identifier Internal
PCOSBC(realm-config)# network-interfaces Internal
PCOSBC(realm-config)#
PCOSBC(realm-config)# done

```

real-config extended

```

realm-config
  identifier          Internal
  description
  addr-prefix        0.0.0.0
  network-interfaces Internal:0

```

media-realm-list	
mm-in-realm	disabled
mm-in-network	enabled
mm-same-ip	enabled
mm-in-system	enabled
bw-cac-non-mm	disabled
msm-release	disabled
qos-enable	disabled
max-bandwidth	0
fallback-bandwidth	0
max-priority-bandwidth	0
max-latency	0
max-jitter	0
max-packet-loss	0
observ-window-size	0
parent-realm	
dns-realm	
media-policy	
nsep-media-policy	
rtcp-mux	disabled
ice-profile	
teams-fqdn	
teams-fqdn-in-uri	disabled
sdp-inactive-only	disabled
dtls-srtp-profile	
class-profile	
in-translationid	
out-translationid	
in-manipulationid	
out-manipulationid	
average-rate-limit	0
access-control-trust-level	none
invalid-signal-threshold	0
maximum-signal-threshold	0
untrusted-signal-threshold	0
nat-trust-threshold	0
max-endpoints-per-nat	0
nat-invalid-message-threshold	0
wait-time-for-invalid-register	0
deny-period	30
session-max-life-limit	0
cac-failure-threshold	0
untrust-cac-failure-threshold	0
ext-policy-svr	

diam-e2-address-realm	
subscription-id-type	END_USER_NONE
symmetric-latching	disabled
pai-strip	disabled
trunk-context	
device-id	
early-media-allow	
enforcement-profile	
additional-prefixes	
restricted-latching	none
restriction-mask	32
user-cac-mode	none
user-cac-bandwidth	0
user-cac-sessions	0
icmp-detect-multiplier	0
icmp-advertisement-interval	0
icmp-target-ip	
monthly-minutes	0
options	
spl-options	
accounting-enable	enabled
net-management-control	disabled
delay-media-update	disabled
refer-call-transfer	disabled
hold-refer-reinvite	disabled
refer-notify-provisional	none
dyn-refer-term	disabled
codec-policy	
codec-manip-in-realm	disabled
codec-manip-in-network	enabled
rtcp-policy	
constraint-name	
session-recording-server	
session-recording-required	disabled
manipulation-string	
manipulation-pattern	
stun-enable	disabled
stun-server-ip	0.0.0.0
stun-server-port	3478
stun-changed-ip	0.0.0.0
stun-changed-port	3479
sip-profile	
flow-time-limit	-1
initial-guard-timer	-1

subsq-guard-timer	-1	
tcp-flow-time-limit	-1	
tcp-initial-guard-timer	-1	
tcp-subsq-guard-timer	-1	
sip-isup-profile		
match-media-profiles		
qos-constraint		
block-rtcp	disabled	
hide-egress-media-update		disabled
tcp-media-profile		
monitoring-filters		
node-functionality		
default-location-string		
alt-family-realm		
pref-addr-type	none	
sm-icsi-match-for-invite		
sm-icsi-match-for-message		
merge-early-dialogs		disabled
user-site		
srvcc-trfo		
feature-trfo		

At this point any device communicating with IP 192.168.10.101 will be associated with the Internal realm and any traffic to/from 192.168.10.201 associated with the External realm.

4. - SBC SIP Interfaces

It's now time to create a SIP service associating the IP in network interfaces with realms configured previously.

On the CLI lets first create the External SIP interface:

```
PCOSBC# config t
PCOSBC(configure)# session-router
PCOSBC(session-router)# sip-interface
PCOSBC(sip-interface)# realm-id External
PCOSBC(sip-interface)# sip-ports
PCOSBC(sip-port)# address 192.168.10.201
PCOSBC(sip-port)# port 5060
PCOSBC(sip-port)# transport-protocol udp
PCOSBC(sip-port)# allow-anonymous all
PCOSBC(sip-port)#
PCOSBC(sip-port)# done
sip-port
  address          192.168.10.201
  port             5060
  transport-protocol  UDP
  allow-anonymous  all
  multi-home-addr
  ims-aka-profile
```

Remember to issue the done command when completing the sip-port element and exit to jump to the sip-interface branch and issue the done command.

Setup SIP Interface for Internal

```
PCOSBC(configure)# session-router
PCOSBC(session-router)# sip-interface
PCOSBC(sip-interface)# realm-id Internal
PCOSBC(sip-interface)# sip-ports
PCOSBC(sip-port)# address 192.168.2.101
```

```
PCOSBC(sip-port)# transport-protocol UDP
PCOSBC(sip-port)#
PCOSBC(sip-port)# allow-anonymous all
PCOSBC(sip-port)# done
sip-port
  address          192.168.2.101
  port             5060
  transport-protocol  UDP
  allow-anonymous  all
  multi-home-addr
  ims-aka-profile
```

```
PCOSBC(sip-port)# exit
PCOSBC(sip-interface)# done
```

```
sip-interface
  state            enabled
  realm-id         Internal
  description
  sip-port
    address        192.168.2.101
    port           5060
    transport-protocol  UDP
    allow-anonymous  all
    multi-home-addr
    ims-aka-profile
```

An easy way to confirm the association of the IP address with the correct realm is issuing the command: `show virtual` need to save active config to display the information

```
PCOSBC# show virtual
intf phy-name vlan ip-addr    realm  type
0/0 External 0  192.168.10.201 External sip-port
1/1 Internal 0  192.168.10.101 Internal sip-port
```


5. - SBC Steering pool

With the current configuration Oracle SBC is now able to process signaling but there are two problems, first there are no resources to manage audio and there is no routing in place to process the session correctly.

Let's fix the problem about the resources adding steering pools associated with the Internal and External realms.

Adding steering pools resources must be associated with the number of sessions to be supported and needs to be consider ports for video and RTCP. For this lab environment we will add only 101 ports.

```
PCOSBC# config t
PCOSBC(configure)# media-manager
PCOSBC(media-manager)# steering-pool
PCOSBC(steering-pool)# ip-address 192.168.10.201
PCOSBC(steering-pool)# start-port 20000
PCOSBC(steering-pool)# end-port 20100
PCOSBC(steering-pool)# realm-id External
PCOSBC(steering-pool)# done
steering-pool
  ip-address          192.168.10.201
  start-port         20000
  end-port           20100
  realm-id           External
  network-interface
  last-modified-by   admin@192.168.10.10
  last-modified-date 2023-03-30 05:53:07
```

```
PCOSBC(media-manager)# steering-pool
PCOSBC(steering-pool)# ip-address 192.168.10.101
PCOSBC(steering-pool)# start-port 30000
PCOSBC(steering-pool)# end-port 30100
PCOSBC(steering-pool)# reallm
```

```

PCOSBC(steering-pool)# realm-id Internal
PCOSBC(steering-pool)# done
steering-pool
  ip-address          192.168.10.101
  start-port         30000
  end-port           30100
  realm-id           Internal
  network-interface
  last-modified-by   admin@192.168.10.10
  last-modified-date 2023-03-30 05:53:47

```

an easy way to verify the number of ports assigned ot realms is issuing the command show mbcd realm

```

PCOSBC# show mbcd realms
05:55:51-47
      --- Steering Ports --- ----- Bandwidth Usage -----
Realm      Used  Free  No Ports  Flows Ingrss Egress  IngrssPriority EgressPriority  Total  Insuf BW
External   0  101    0    0   OK   OK    OK    OK    0K    0
Internal   0  101    0    0   OK   OK    OK    OK    0K    0

```

This command can be used in real time to verify if ports are enough to support current sessions.

6. - SBC Local Policies

The last step for this basic lab environment is to create routing to connect the External and Internal realms.

In Oracle SBCs this kind of configuration is called Policy Realm Based Realm Bridging.

To configure this routing, we need to create 2 local policies, indicating the source realm and destination realm, let's go to the CLI: