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Práctica 8. Equilibrado de carga y alta disponibilidad

En esta práctica vamos a configurar un sistema *web* con equilibrado de carga en alta disponibilidad con HAProxy y Keepalived. Utilizaremos varias **máquinas virtuales**.

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- [Configuración del balanceador de carga \(~20 min.\)](#)
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Preparación del entorno (~10 min.)

Usaremos cinco máquinas con los siguientes nombres y direcciones IP:

- lb1 (192.168.1.1): balanceador de carga maestro.
- lb2 (192.168.1.2): balanceador de carga de respaldo.
- webA (192.168.1.3): servidor web A.
- webB (192.168.1.4): servidor web B.
- cliente (192.168.1.5): cliente para acceder a los servidores web.

Una vez importada la imagen `ECO.ova`, en *Configuración → Red*, habilita el *Adaptador de red 2 (eth1)*, que estará conectado a una red interna llamada `intnet`.

Realiza dos clonaciones enlazadas generando nuevas direcciones MAC para todos los adaptadores de red. Establece el nombre de las máquinas a `lb1`, `webA` y `cliente` (más adelante crearemos `lb2` y `webB`). Inicia las máquinas.

Configura `lb1`:

- Instala HAProxy y Keepalived:

```
$ sudo apt-get update
$ sudo apt-get install haproxy keepalived
```
- Añade el siguiente contenido al fichero
`/etc/network/interfaces`:

```
auto eth0 eth1
iface eth1 inet static
    address
    192.168.1.1
    netmask 255.255.255.0
```
- Reinicia la red:

```
$ sudo service networking stop
$ sudo service networking start
```

Configura `webA`:

- Instala Apache y el módulo de PHP:

```
$ sudo apt-get update
$ sudo apt-get install apache2 libapache2-mod-php5
```
- Añade el siguiente contenido al fichero
`/etc/network/interfaces`:

```
auto eth0 eth1
```

```
iface eth1 inet static
    address
        192.168.1.3
    netmask 255.255.255.0
```

- Reinicia la red:

```
$ sudo service networking stop
$ sudo service networking start
```

Configura cliente:

- Instala Apache Bench:

```
$ sudo apt-get update
$ sudo apt-get install apache2-utils
```

- Configura el interfaz de red eth1:

```
$ sudo ip link set dev eth1 up
$ sudo ip address add 192.168.1.5/24 dev eth1
```

Configuración del balanceador de carga (~20 min.)

HAProxy (<http://www.haproxy.org>) ofrece alta disponibilidad, equilibrado de carga y *proxy* para aplicaciones basadas en TCP y HTTP. Puede funcionar como *proxy* de aplicación (*layer 7*, modo HTTP) o de circuito (*layer 4*, modo TCP).

La configuración de HAProxy usa tres fuentes principales de parámetros:

- Los argumentos de la línea de comandos, que siempre tienen precedencia.
- La sección `global`, que establece parámetros a nivel de proceso.
- Las secciones de `proxies`, que pueden ser:
 - `defaults`, que establece parámetros por defecto.
 - `listen`, que define un *proxy* completo (*frontend* y *backend*).
 - `frontend`, que describe un conjunto de `sockets` de escucha que aceptan conexiones cliente.
 - `backend`, que describe un conjunto de servidores a los que el *proxy* se conectará para reenviar las conexiones entrantes.

Configuraremos HAProxy en `lb1`. Añade las siguientes líneas al final del fichero

```
/etc/haproxy/haproxy.cfg
:listen stats
    bind *:8080          # Escucha en el puerto 8080
    stats enable          # Activa las estadísticas
    stats auth user:pass # Establece las
    credenciales

frontend http-in
    mode http             # Establece el modo HTTP
    bind *:80              # Escucha en el puerto 80
    option forwardfor      # Añade cabecera
    X-Forwarded-For default _backend servers # Establece el
    backend

backend servers
    server webA 192.168.1.3:80 check # Define servidores
    y server webB 192.168.1.4:80 check    # comprueba su
    estado
```

Primero se define un *proxy* completo para proporcionar estadísticas de HAProxy, luego se define el *frontend* con el balanceador y finalmente el *backend* con los servidores. Otras opciones permiten establecer la política de equilibrado, gestionar la persistencia mediante *cookies* o realizar comprobaciones de los servidores más completas.

Reinicia HAProxy:

```
$ sudo service haproxy restart
```

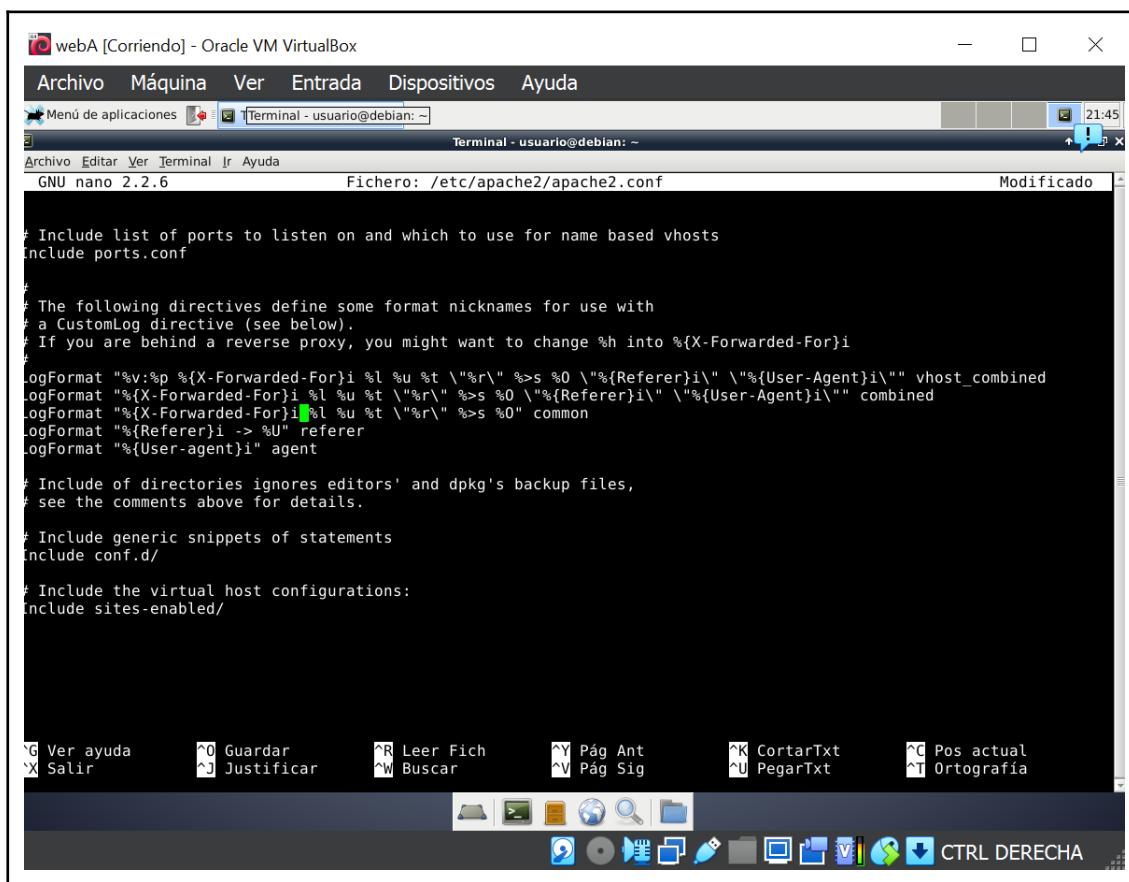
Configuración de los servidores web (~20 min.)

Configuraremos Apache en webA. Crea un fichero /var/www/index.php con el siguiente contenido:

```
<html><body><h1>Web server A</h1>
<?php phpinfo(); ?>
</body></html>
```

La cabecera HTTP X-Forwarded-For contiene la dirección IP del cliente. En el fichero /etc/apache2/apache2.conf, cambia %h por %{X-Forwarded-For}i en las directivas LogFormat para que en los logs aparezca la dirección del cliente en lugar de la dirección del balanceador. Después, reinicia Apache:

```
$ sudo service apache2 restart
```



Desde cliente, accede varias veces a <http://192.168.1.1/index.php> y, después, accede a la página de estadísticas de HAProxy en <http://192.168.1.1:8080/haproxy?stats> (con las credenciales establecidas en la configuración). Comprueba que aparece la dirección del cliente en el fichero /var/log/apache2/access.log de los servidores.

The screenshot shows a desktop environment with a menu bar (Archivo, Máquina, Ver, Entrada, Dispositivos, Ayuda) and a taskbar with icons for phpinfo(), Chromium, and Terminal. The main window displays the PHPinfo page for PHP Version 5.4.45-0+deb7u2. The page contains detailed configuration information for the PHP installation, including system details, build date, server API, and various PHP extensions like mbstring, curl, and gd. At the bottom, it mentions Zend Engine v2.4.0 and provides a link to the Zend Technologies website.

The screenshot shows a modal dialog box titled "Authentication Required". It contains the message: "The server http://192.168.1.1:8080 requires a username and password. The server says: HAProxy Statistics." Below the message are two input fields labeled "User Name:" and "Password:". At the bottom of the dialog are "Cancel" and "Log In" buttons. The background of the dialog is white, and the overall interface is clean and modern.

```
-----  
stats auth user:pass      # Establece las credenciales
```

usuario:user
contraseña:pass

The screenshot shows the HAProxy statistics report interface. At the top, it displays the HAProxy version (1.5.8) and release date (2014/10/31). Below this, the title "Statistics Report for pid 6503" is shown. A section titled "General process information" provides system statistics:

```
pid = 6503 (process #1), listening = 13
upstream weight = 1024000000000
listen stats port 80, backlog = 4034
maxconn = 65536, maxconn N = 2050, maxspawns = 0
maxreq = 1000000, maxrate = 1000, conn-idle = 300s
Running table: LRU, db = 100 N
```

Below this is a legend for status codes:

- active UP
- active, going down
- active, going up
- DOWN, going up
- active or backup DOWN
- active or backup UP
- active or backup UNKNOWN (MAINT)
- active or backup SOFT STOPPED for maintenance

Note: "NO LB"="DRAINED" + UP with bad-balancing disabled.

The interface includes several tabs for monitoring different components:

- stats**: Shows session rates and byte counts for Frontend and Backend.
- http-in**: Shows session rates and byte counts for Frontend.
- services**: Shows service status and connection details for weib0, weib1, and backend.

On the right side, there are "Display options" and "External resources" sections. The "Display options" section includes "Scope" (set to "Global"), "Metrics" (with "Connections" checked), and "Order" (set to "Connections"). The "External resources" section lists "haproxy.131" and "haproxy.132" under "haproxy" and "haproxy.131" under "haproxy manual".

```
Terminal - usuario@debian: ~
Archivo Editar Ver Terminal Ir Ayuda
GNU nano 2.2.6      Fichero: /var/log/apache2/access.log

[ 56 líneas leídas ]
```

Para replicar el servidor web, apaga la máquina `webA` y realiza una clonación enlazada generando nuevas direcciones MAC para todos los adaptadores de red. Establece el nombre de la nueva máquina a `webB`. Arranca las dos máquinas. Modifica la dirección del interfaz `eth1` de `webB` en el fichero `/etc/network/interfaces` y reinicia la red. Cambia también "Web server A" por "Web server B" en el fichero `/var/www/index.php`.

Copia una captura de la página de estadísticas de HAProxy donde aparezcan los dos servidores web activos.

Pruebas de rendimiento (~20 min.)

Desde `cliente`, realiza una prueba de rendimiento usando los dos servidores web a través de `lb1` (<http://192.168.1.1/index.php>). Por ejemplo, lanza 10.000 peticiones con 500 conexiones concurrentes:

```
$ ab -n 10000 -c 500 -r http://192.168.1.1/index.php
```

```
Completed 2000 requests
Completed 3000 requests
Completed 4000 requests
Completed 5000 requests
Completed 6000 requests
Completed 7000 requests
Completed 8000 requests
Completed 9000 requests
Completed 10000 requests
Finished 10000 requests

Server Software:      Apache/2.2.22
Server Hostname:     192.168.1.1
Server Port:          80

Document Path:        /index.php
Document Length:     45853 bytes

Concurrency Level:    500
Time taken for tests: 9.412 seconds
Complete requests:   10000
Failed requests:    1008
(Connect: 0, Receive: 0, Length: 1008, Exceptions: 0)
Write errors:         0
Total transferred:   460428870 bytes
HTML transferred:    458528870 bytes
Requests per second: 1062.53 [#/sec] (mean)
Time per request:   470.576 [ms] (mean)
Time per request:   0.941 [ms] (mean, across all concurrent requests)
Transfer rate:       47775.22 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    3  37.5     0   1001
Processing:    38  352 716.3   188   9379
Waiting:       19  338 716.1   183   9375
Total:        39  354 718.4   189   9389

Percentage of the requests served within a certain time (ms)
  50%   189
  66%   219
  75%   233
  80%   243
  90%   825
  95%  1256
  98%  2474
  99%  3244
100%  9389 (longest request)
usuario@debian:~$
```

Con `webB` apagada

```
Benchmarking 192.168.1.1 (be patient)
Completed 1000 requests
Completed 2000 requests
Completed 3000 requests
Completed 4000 requests
Completed 5000 requests
Completed 6000 requests
Completed 7000 requests
Completed 8000 requests
Completed 9000 requests
Completed 10000 requests
Finished 10000 requests

Server Software:          Apache/2.2.22
Server Hostname:         192.168.1.1
Server Port:              80

Document Path:            /index.php
Document Length:          45853 bytes

Concurrency Level:        500
Time taken for tests:    16.217 seconds
Complete requests:        10000
Failed requests:           1138
    (Connect: 0, Receive: 0, Length: 1138, Exceptions: 0)
Write errors:                0
Total transferred:        454673491 bytes
HTML transferred:          452797241 bytes
Requests per second:      616.62 [#/sec] (mean)
Time per request:          810.869 [ms] (mean)
Time per request:          1.622 [ms] (mean, across all concurrent requests)
Transfer rate:             27379.09 [Kbytes/sec] received

Connection Times (ms)
    min  mean[+/-sd] median   max
Connect:       0    1  4.4     0    27
Processing:    30  552 1915.4    137  16182
Waiting:       0  378 1432.2    122  16182
Total:        57  554 1918.1    137  16199

Percentage of the requests served within a certain time (ms)
 50%    137
 66%    176
 75%    195
 80%    207
 90%    750
 95%   1242
 98%   9503
 99%  12922
100% 16199 (longest request)
usuario@debian:~$ http://192.168.1.3/index.php
```

Sin pasar por balanceador

```
Benchmarking 192.168.1.3 (be patient)
Completed 1000 requests
Completed 2000 requests
Completed 3000 requests
Completed 4000 requests
Completed 5000 requests
Completed 6000 requests
Completed 7000 requests
Completed 8000 requests
Completed 9000 requests
Completed 10000 requests
Finished 10000 requests

Server Software: Apache/2.2.22
Server Hostname: 192.168.1.3
Server Port: 80

Document Path: /index.php
Document Length: 45606 bytes

Concurrency Level: 500
Time taken for tests: 13.042 seconds
Complete requests: 10000
Failed requests: 1410
    (Connect: 0, Receive: 139, Length: 1132, Exceptions: 139)
Write errors: 0
Total transferred: 451593264 bytes
HTML transferred: 449719674 bytes
Requests per second: 766.75 [#/sec] (mean)
Time per request: 652.099 [ms] (mean)
Time per request: 1.304 [ms] (mean, across all concurrent requests)
Transfer rate: 33814.57 [Kbytes/sec] received

Connection Times (ms)
    min  mean[+/-sd] median   max
Connect:      0   57 257.5      0   3004
Processing:   9  466 1876.5    127 13020
Waiting:      0  306 1483.7    110 13019
Total:        25  523 1911.4    129 13036

Percentage of the requests served within a certain time (ms)
 50% 129
 66% 159
 75% 175
 80% 189
 90% 289
 95% 1168
 98% 7340
 99% 12947
100% 13036 (longest request)
usuario@debian:~$
```

El primero es mejor ya que realiza mayor numero de peticiones por tiempo

Con el balanceador y los dos servidores es más productivo, en el momento que apagamos un servidor y queda activado el balanceador se reduce ya que se pierde tiempo pasando por el balanceador y viendo que el servidor esta apagado y al desactivar el balanceador, aumenta con respecto la anterior

Nota: Las peticiones fallidas de tipo Length, debidas a diferencias en el tamaño del contenido con respecto a la primera petición, deben ignorarse, ya que el contenido es dinámico.

Al apagar uno de los servidores web, el balanceador debe redireccionar todas las peticiones al otro servidor. Apaga la máquina `webB` y repite la prueba usando solo el servidor `webA` a través de `lb1`.

Finalmente, repite la prueba de rendimiento usando directamente el servidor `webA` (<http://192.168.1.3/index.php>), es decir, sin pasar por el balanceador.

Copia los resultados y escribe un análisis de los mismos comparando la productividad y el tiempo de respuesta de cada escenario.

Configuración en alta disponibilidad (~20 min.)

Keepalived (<http://www.keepalived.org>) es un software libre para encaminamiento que proporciona equilibrado de carga y alta disponibilidad en encaminadores Linux (layer 3). La alta disponibilidad se consigue mediante el protocolo VRRP (Virtual Router Redundancy Protocol), que proporciona conmutación por error (failover) entre encaminadores. Usaremos Keepalived para que dos平衡adores comparten una dirección IP virtual (también llamada compartida o flotante).

Configuraremos Keepalived en `lb1`, que será el balanceador maestro. Crea el fichero

`/etc/keepalived/keepalived.conf` con el siguiente contenido:

```
vrrp_script chk_haproxy {
    script "killall -0 haproxy" # Comprueba el proceso
    haproxy interval 2          # cada 2 segundos
}

vrrp_instance VRRP1 {
    interface eth1                # Interfaz a monitorizar
    state MASTER                  # Estado
    initial virtual_router_id 51#
    Identificador priority 200   # Prioridad
    virtual_ipaddress {
        192.168.1.10/24           # Dirección IP virtual
    }
    track_script {
        chk_haproxy               # Script de comprobación
    }
}
```

Para replicar el balanceador, apaga la máquina `lb1` y realiza una clonación enlazada generando nuevas direcciones MAC para todos los adaptadores de red. Establece el nombre de la nueva máquina a `lb2`. Arranca las dos máquinas. Modifica la dirección del interfaz `eth1` de `lb2` en el fichero `/etc/network/interfaces` y reinicia la red. `lb2` será el balanceador de respaldo, por tanto, reduce su prioridad a 100 en el fichero

`/etc/keepalived/keepalived.conf`. Finalmente, reinicia Keepalived en `lb1` y `lb2`:

```
$ sudo service keepalived restart
```

The image shows two side-by-side screenshots of a Linux desktop environment. Both screens display a text editor window titled 'keepalived.conf (/etc/keepalived)' with the 'gedit' icon in the title bar. The window contains the same configuration code for Keepalived, which monitors the 'haproxy' process on interface 'eth1'. It defines a VRRP instance 'VRRP1' with priority 51, virtual IP 192.168.1.10, and a track script 'chk_haproxy'.

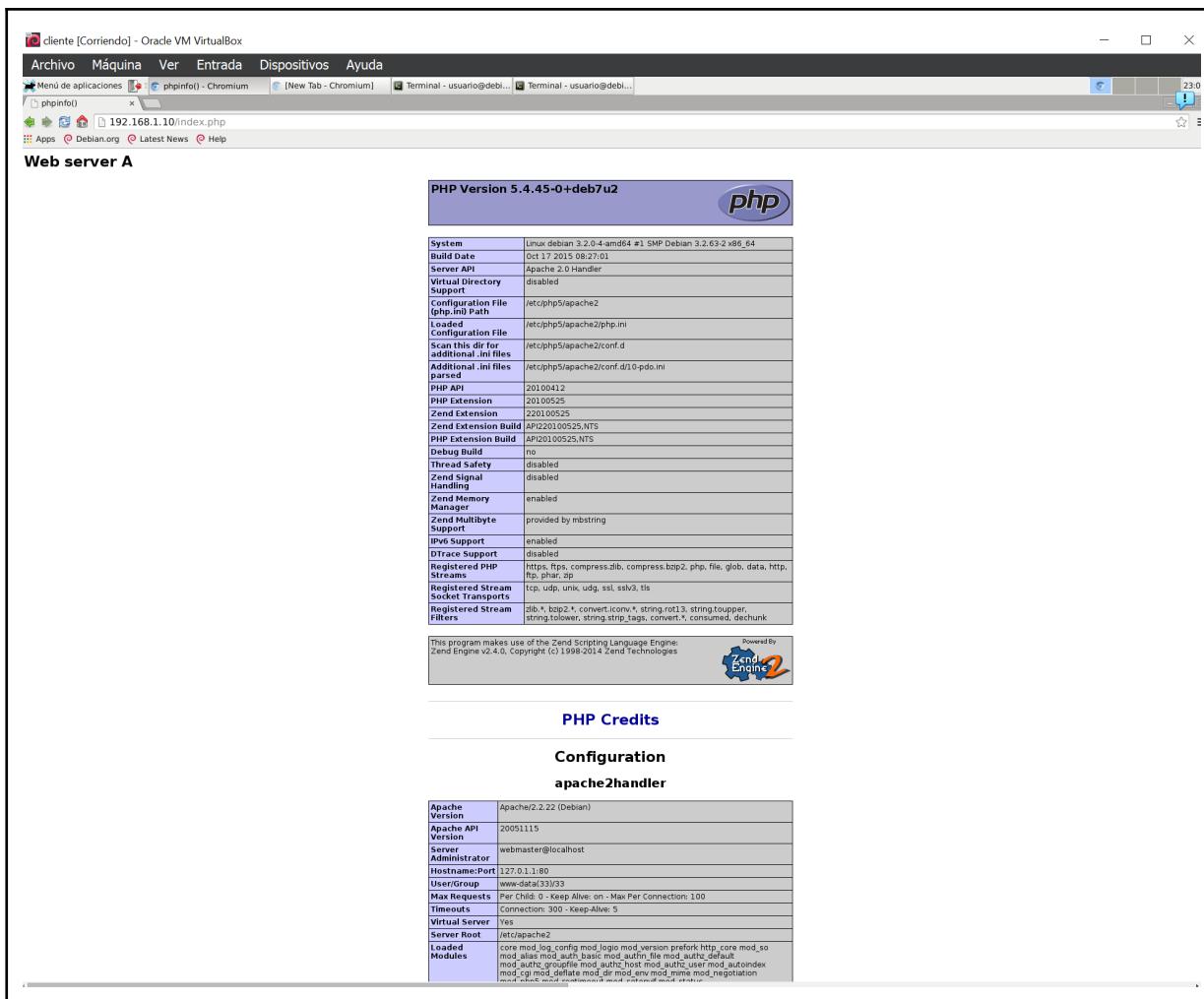
```
#!/usr/bin/python
# vim: tabstop=8 expandtab shiftwidth=4 softtabstop=4
# keepalived.conf
# This file is part of the Keepalived package
# Copyright (C) 2004-2008 - Arnaud Leblond <arnaud.leblond@free.fr>
# Copyright (C) 2008-2010 - David Rosenblatt <david.rosenblatt@free.fr>
# Copyright (C) 2010-2011 - Sébastien RIEU <sebrieu@gmail.com>
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# along with this program.  If not, see <http://www.gnu.org/licenses/>.
```

The top screen (lb1) shows the configuration with a tab width of 8 spaces. The bottom screen (lb2) shows the configuration with a tab width of 17 spaces. The status bar at the bottom of each window indicates the current tab width setting.

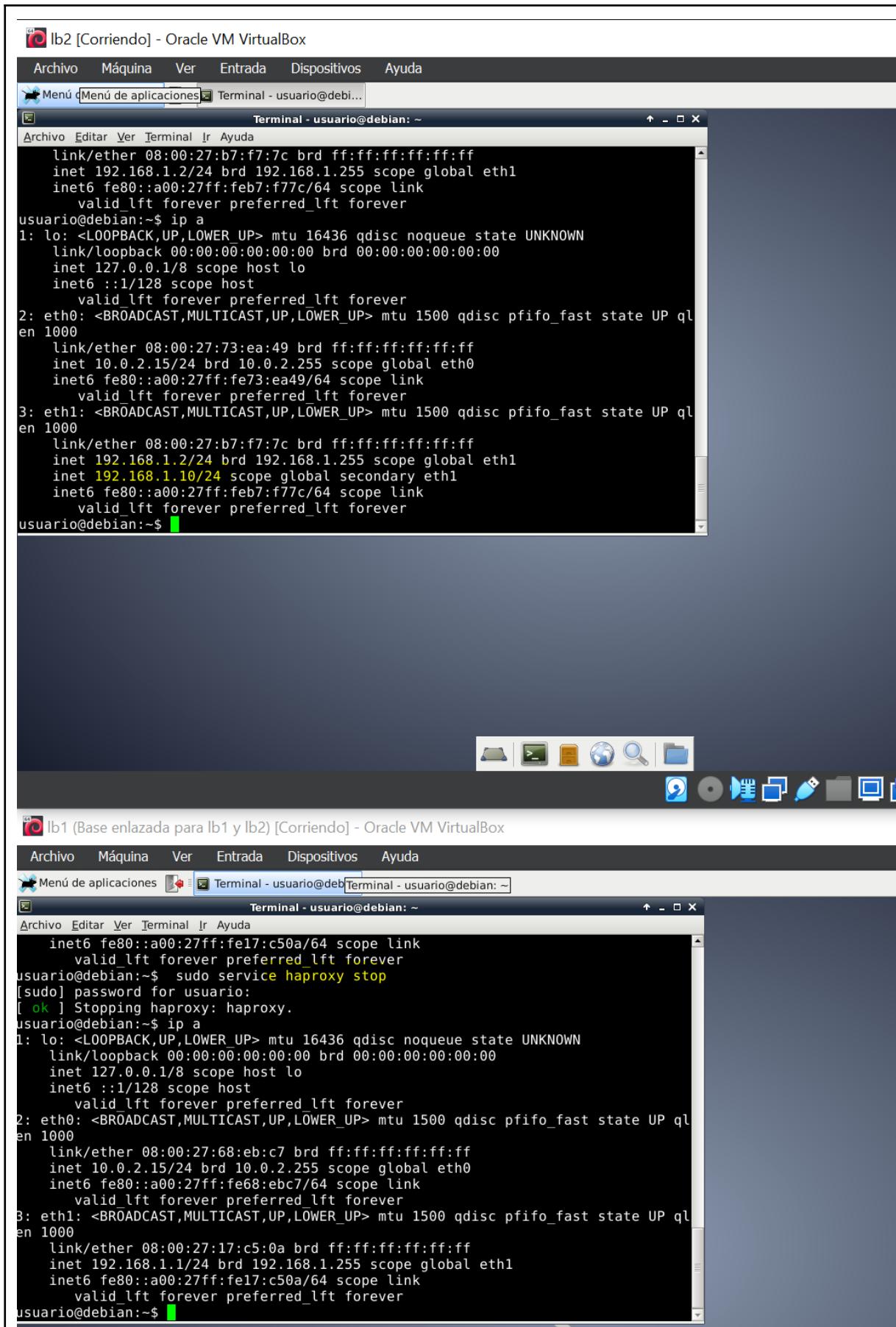
lb1 deberá tener asignada la dirección IP virtual en el interfaz eth1 y, mientras continúe activo, lb2 no debe tenerla. Compruébalo con el siguiente comando en lb1 y lb2:

```
$ ip addr show eth1
```

Desde cliente, accede al servicio usando la IP virtual de los balanceadores (<http://192.168.1.10/index.php>).



Prueba las capacidades de conmutación por error (*failover*) para proporcionar alta disponibilidad parando el servicio HAProxy, apagando el balanceador maestro o desactivando el interfaz red. El balanceador de respaldo debe entonces adquirir la IP virtual. Al iniciar de nuevo el servicio HAProxy, encender el balanceador maestro o activar el interfaz de red, se debe volver a la situación inicial. Los mensajes de cambio de estado de Keepalived (MASTER/FAULT/BACKUP) se pueden ver en los ficheros /var/log/messages y /var/log/syslog.



The image shows two separate Oracle VM VirtualBox windows side-by-side. Both windows have a dark blue title bar with the text "lb2 [Corriendo] - Oracle VM VirtualBox" and "lb1 (Base enlazada para lb1 y lb2) [Corriendo] - Oracle VM VirtualBox". Below the title bar is a menu bar with "Archivo", "Máquina", "Ver", "Entrada", "Dispositivos", and "Ayuda". A "Menú de aplicaciones" icon is also present. The main area of each window is a terminal window titled "Terminal - usuario@debian: ~".

lb2 Terminal Output:

```
inet 192.168.1.2/24 brd 192.168.1.255 scope global eth1
  inet 192.168.1.10/24 scope global secondary eth1
    inet6 fe80::a00:27ff:feb7:f77c/64 scope link
      valid_lft forever preferred_lft forever
usuario@debian:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 16436 qdisc noqueue state UNKNOWN
  link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
  inet 127.0.0.1/8 scope host lo
    inet6 ::1/128 scope host
      valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP qlen 1000
  link/ether 08:00:27:b7:f7:7c brd ff:ff:ff:ff:ff:ff
  inet 192.168.1.2/24 brd 192.168.1.255 scope global eth0
    inet6 fe80::a00:27ff:feb7:f77c/64 scope link
      valid_lft forever preferred_lft forever
3: eth1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP qlen 1000
  link/ether 08:00:27:b7:f7:7c brd ff:ff:ff:ff:ff:ff
  inet 192.168.1.10/24 brd 192.168.1.255 scope global eth1
    inet6 fe80::a00:27ff:feb7:f77c/64 scope link
      valid_lft forever preferred_lft forever
usuario@debian:~$
```

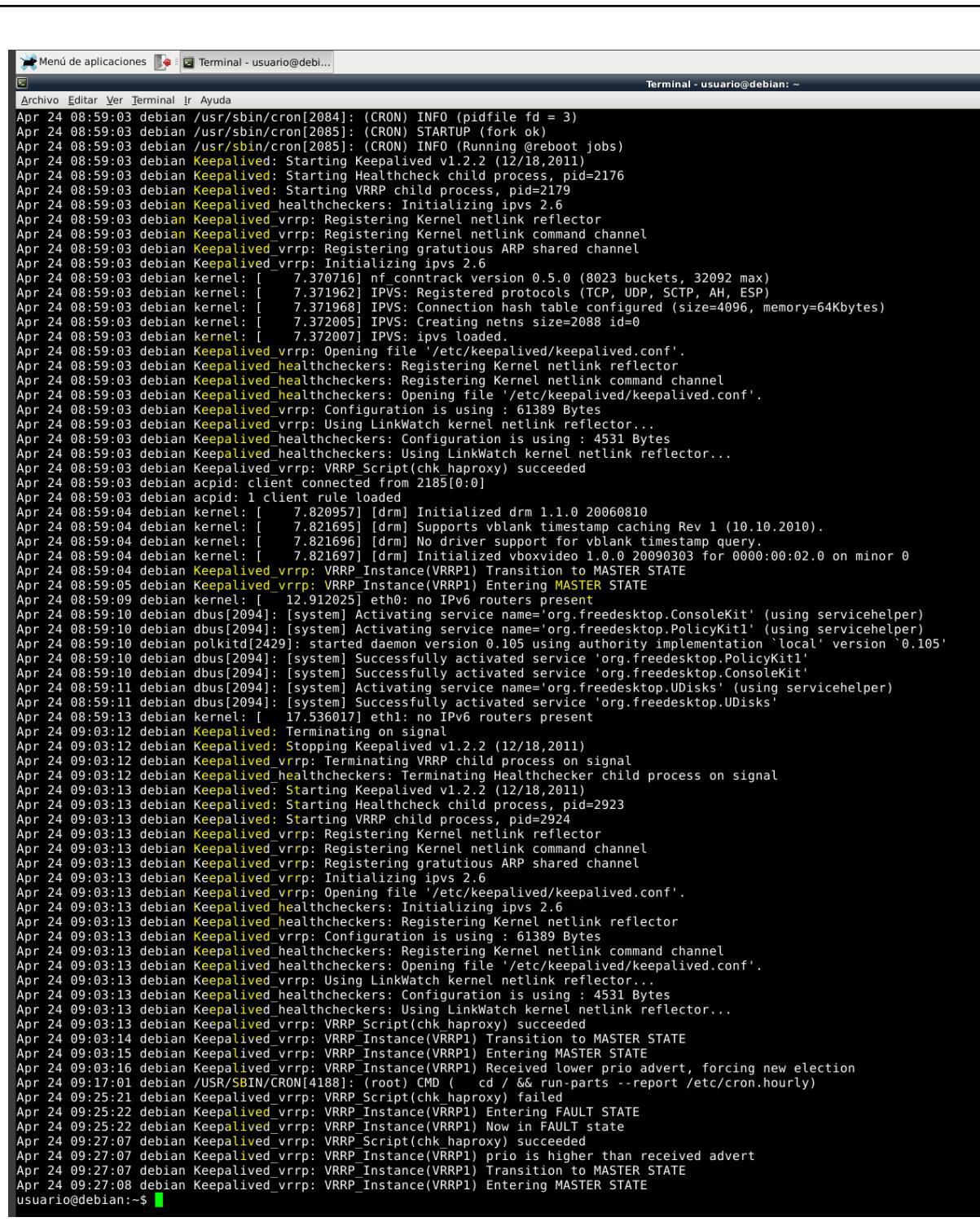
lb1 Terminal Output:

```
usuario@debian:~$ sudo service haproxy start
[ ok ] Starting haproxy: haproxy.
usuario@debian:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 16436 qdisc noqueue state UNKNOWN
  link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
  inet 127.0.0.1/8 scope host lo
    inet6 ::1/128 scope host
      valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP qlen 1000
  link/ether 08:00:27:68:eb:c7 brd ff:ff:ff:ff:ff:ff
  inet 10.0.2.15/24 brd 10.0.2.255 scope global eth0
    inet6 fe80::a00:27ff:fe68:ebc7/64 scope link
      valid_lft forever preferred_lft forever
3: eth1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP qlen 1000
  link/ether 08:00:27:17:c5:0a brd ff:ff:ff:ff:ff:ff
  inet 192.168.1.1/24 brd 192.168.1.255 scope global eth1
    inet6 fe80::a00:27ff:fe17:c50a/64 scope link
      valid_lft forever preferred_lft forever
usuario@debian:~$
```

At the bottom of the image, there is a text box containing the text "var log y sys log de lb1(MASTER)".

The screenshot shows a terminal window titled "Terminal - usuario@debi...". The window contains a log of kernel messages from a Debian system. The messages are primarily in yellow, indicating they are from the "Keepalived_vrrp" module. The log details the configuration and operation of VRRP instances, including transitions between Master and Fault states, and various kernel initialization and healthcheck events. The terminal window has a standard Linux desktop interface at the top and bottom.

```
Menú de aplicaciones Terminal - usuario@debi...
Archivo Editar Ver Terminal Ir Ayuda
Apr 24 08:59:03 debian kernel: [    7.371968] IPVS: Connection hash table config
ured (size=4096, memory=64Kbytes)
Apr 24 08:59:03 debian kernel: [    7.372005] IPVS: Creating netns size=2088 id=
0
Apr 24 08:59:03 debian kernel: [    7.372007] IPVS: ipvs loaded.
Apr 24 08:59:03 debian Keepalived_vrrp: Opening file '/etc/keepalived/keepalived
.conf'.
Apr 24 08:59:03 debian Keepalived_healthcheckers: Registering Kernel netlink ref
lector
Apr 24 08:59:03 debian Keepalived_healthcheckers: Registering Kernel netlink com
mand channel
Apr 24 08:59:03 debian Keepalived_healthcheckers: Opening file '/etc/keepalived/
keepalived.conf'.
Apr 24 08:59:03 debian Keepalived_vrrp: Configuration is using : 61389 Bytes
Apr 24 08:59:03 debian Keepalived_vrrp: Using LinkWatch kernel netlink reflector
...
Apr 24 08:59:03 debian Keepalived_healthcheckers: Configuration is using : 4531
Bytes
Apr 24 08:59:03 debian Keepalived_healthcheckers: Using LinkWatch kernel netlink
reflector...
Apr 24 08:59:03 debian Keepalived_vrrp: VRRP Script(chk_haproxy) succeeded
Apr 24 08:59:04 debian kernel: [    7.820957] [drm] Initialized drm 1.1.0 200608
10
Apr 24 08:59:04 debian kernel: [    7.821695] [drm] Supports vblank timestamp ca
ching Rev 1 (10.10.2010).
Apr 24 08:59:04 debian kernel: [    7.821696] [drm] No driver support for vblank
timestamp query.
Apr 24 08:59:04 debian kernel: [    7.821697] [drm] Initialized vboxvideo 1.0.0
20090303 for 0000:00:02.0 on minor 0
Apr 24 08:59:04 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Transition to MASTE
R STATE
Apr 24 08:59:05 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Entering MASTER STA
TE
Apr 24 09:03:12 debian Keepalived_vrrp: Terminating VRRP child process on signal
Apr 24 09:03:12 debian Keepalived_healthcheckers: Terminating Healthchecker chil
d process on signal
Apr 24 09:03:13 debian Keepalived_vrrp: Registering Kernel netlink reflector
Apr 24 09:03:13 debian Keepalived_vrrp: Registering Kernel netlink command chann
el
Apr 24 09:03:13 debian Keepalived_vrrp: Registering gratuitous ARP shared channe
l
Apr 24 09:03:13 debian Keepalived_vrrp: Opening file '/etc/keepalived/keepalived
.conf'.
Apr 24 09:03:13 debian Keepalived_healthcheckers: Registering Kernel netlink ref
lector
Apr 24 09:03:13 debian Keepalived_vrrp: Configuration is using : 61389 Bytes
Apr 24 09:03:13 debian Keepalived_healthcheckers: Registering Kernel netlink com
mand channel
Apr 24 09:03:13 debian Keepalived_healthcheckers: Opening file '/etc/keepalived/
keepalived.conf'.
Apr 24 09:03:13 debian Keepalived_vrrp: Using LinkWatch kernel netlink reflector
...
Apr 24 09:03:13 debian Keepalived_healthcheckers: Configuration is using : 4531
Bytes
Apr 24 09:03:13 debian Keepalived_healthcheckers: Using LinkWatch kernel netlink
reflector...
Apr 24 09:03:13 debian Keepalived_vrrp: VRRP_Script(chk_haproxy) succeeded
Apr 24 09:03:14 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Transition to MASTE
R STATE
Apr 24 09:03:15 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Entering MASTER STA
TE
Apr 24 09:03:16 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Received lower prio
advertis, forcing new election
Apr 24 09:25:21 debian Keepalived_vrrp: VRRP_Script(chk_haproxy) failed
Apr 24 09:25:22 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Entering FAULT STAT
E
Apr 24 09:25:22 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Now in FAULT state
Apr 24 09:27:07 debian Keepalived_vrrp: VRRP_Script(chk_haproxy) succeeded
Apr 24 09:27:07 debian Keepalived_vrrp: VRRP_Instance(VRRP1) prio is higher than
received advert
Apr 24 09:27:07 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Transition to MASTE
R STATE
Apr 24 09:27:08 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Entering MASTER STA
TE
usuario@debian:~$
```



The screenshot shows a terminal window titled "Terminal - usuario@debian: ~". The window displays a log of events from the Keepalived service. The log starts at 08:59:03 on April 24, 2011, and continues until 09:27:08 on April 24, 2011. The log entries include various system messages such as cron daemon startup, kernel module loading, and Keepalived service transitions between Master and Fault states. It also shows the configuration of IPVS and VRRP scripts.

```
Apr 24 08:59:03 debian /usr/sbin/cron[2084]: (CRON) INFO (pidfile fd = 3)
Apr 24 08:59:03 debian /usr/sbin/cron[2085]: (CRON) STARTUP (fork ok)
Apr 24 08:59:03 debian Keepalived: Starting Keepalived v1.2.2 (12/18,2011)
Apr 24 08:59:03 debian Keepalived: Starting Healthcheck child process, pid=2176
Apr 24 08:59:03 debian Keepalived: Starting VRRP child process, pid=2179
Apr 24 08:59:03 debian Keepalived_healthcheckers: Initializing ipvs 2.6
Apr 24 08:59:03 debian Keepalived_vrrp: Registering Kernel netlink reflector
Apr 24 08:59:03 debian Keepalived_vrrp: Registering Kernel netlink command channel
Apr 24 08:59:03 debian Keepalived_vrrp: Registering gratuitous ARP shared channel
Apr 24 08:59:03 debian Keepalived_vrrp: Initializing ipvs 2.6
Apr 24 08:59:03 debian kernel: [ 7.370716] nf_conntrack version 0.5.0 (8023 buckets, 32092 max)
Apr 24 08:59:03 debian kernel: [ 7.371962] IPv5: Registered protocols (TCP, UDP, SCTP, AH, ESP)
Apr 24 08:59:03 debian kernel: [ 7.371968] IPv5: Connection hash table configured (size=4096, memory=64Kbytes)
Apr 24 08:59:03 debian kernel: [ 7.372005] IPv5: Creating netns size=2088 id=0
Apr 24 08:59:03 debian kernel: [ 7.372007] IPv5: ipvs loaded.
Apr 24 08:59:03 debian Keepalived_vrrp: Opening file '/etc/keepalived/keepalived.conf'.
Apr 24 08:59:03 debian Keepalived_healthcheckers: Registering Kernel netlink reflector
Apr 24 08:59:03 debian Keepalived_healthcheckers: Registering Kernel netlink command channel
Apr 24 08:59:03 debian Keepalived_healthcheckers: Opening file '/etc/keepalived/keepalived.conf'.
Apr 24 08:59:03 debian Keepalived_vrrp: Configuration is using : 61389 Bytes
Apr 24 08:59:03 debian Keepalived_vrrp: Using LinkWatch kernel netlink reflector...
Apr 24 08:59:03 debian Keepalived_healthcheckers: Configuration is using : 4531 Bytes
Apr 24 08:59:03 debian Keepalived_healthcheckers: Using LinkWatch kernel netlink reflector...
Apr 24 08:59:03 debian Keepalived_vrrp: VRRP_Script(chk_haproxy) succeeded
Apr 24 08:59:03 debian apcid: client connected from 2185[0:0]
Apr 24 08:59:03 debian apcid: 1 client rule loaded
Apr 24 08:59:04 debian kernel: [ 7.820957] [drm] Initialized drm 1.1.0 20060810
Apr 24 08:59:04 debian kernel: [ 7.821695] [drm] Supports vblank timestamp caching Rev 1 (10.10.2010).
Apr 24 08:59:04 debian kernel: [ 7.821696] [drm] No driver support for vblank timestamp query.
Apr 24 08:59:04 debian kernel: [ 7.821697] [drm] Initialized vboxvideo 1.0.0 20090303 for 0000:00:02.0 on minor 0
Apr 24 08:59:04 debian Keepalived_vrrp: VRRP Instance(VRRP1) Transition to MASTER STATE
Apr 24 08:59:05 debian Keepalived_vrrp: VRRP Instance(VRRP1) Entering MASTER STATE
Apr 24 08:59:09 debian kernel: [ 12.912025] eth0: no IPv6 routers present
Apr 24 08:59:10 debian dbus[2094]: [system] Activating service name='org.freedesktop.ConsoleKit' (using servicehelper)
Apr 24 08:59:10 debian dbus[2094]: [system] Activating service name='org.freedesktop.PolicyKit1' (using servicehelper)
Apr 24 08:59:10 debian polkitd[2429]: started daemon version 0.105 using authority implementation 'local' version '0.105'
Apr 24 08:59:10 debian dbus[2094]: [system] Successfully activated service 'org.freedesktop.PolicyKit1'
Apr 24 08:59:10 debian dbus[2094]: [system] Successfully activated service 'org.freedesktop.ConsoleKit'
Apr 24 08:59:11 debian dbus[2094]: [system] Activating service name='org.freedesktop.UDisks' (using servicehelper)
Apr 24 08:59:11 debian dbus[2094]: [system] Successfully activated service 'org.freedesktop.UDisks'
Apr 24 08:59:13 debian kernel: [ 17.536017] eth1: no IPv6 routers present
Apr 24 09:03:12 debian Keepalived: Terminating on signal
Apr 24 09:03:12 debian Keepalived: Stopping Keepalived v1.2.2 (12/18,2011)
Apr 24 09:03:12 debian Keepalived_vrrp: Terminating VRRP child process on signal
Apr 24 09:03:12 debian Keepalived_healthcheckers: Terminating Healthchecker child process on signal
Apr 24 09:03:13 debian Keepalived: Starting Keepalived v1.2.2 (12/18,2011)
Apr 24 09:03:13 debian Keepalived: Starting Healthcheck child process, pid=2923
Apr 24 09:03:13 debian Keepalived: Starting VRRP child process, pid=2924
Apr 24 09:03:13 debian Keepalived_vrrp: Registering Kernel netlink reflector
Apr 24 09:03:13 debian Keepalived_vrrp: Registering Kernel netlink command channel
Apr 24 09:03:13 debian Keepalived_vrrp: Registering gratuitous ARP shared channel
Apr 24 09:03:13 debian Keepalived_vrrp: Initializing ipvs 2.6
Apr 24 09:03:13 debian Keepalived_vrrp: Opening file '/etc/keepalived/keepalived.conf'.
Apr 24 09:03:13 debian Keepalived_healthcheckers: Initializing ipvs 2.6
Apr 24 09:03:13 debian Keepalived_healthcheckers: Registering Kernel netlink reflector
Apr 24 09:03:13 debian Keepalived_vrrp: Configuration is using : 61389 Bytes
Apr 24 09:03:13 debian Keepalived_healthcheckers: Registering Kernel netlink command channel
Apr 24 09:03:13 debian Keepalived_healthcheckers: Opening file '/etc/keepalived/keepalived.conf'.
Apr 24 09:03:13 debian Keepalived_vrrp: Using LinkWatch kernel netlink reflector...
Apr 24 09:03:13 debian Keepalived_healthcheckers: Configuration is using : 4531 Bytes
Apr 24 09:03:13 debian Keepalived_healthcheckers: Using LinkWatch kernel netlink reflector...
Apr 24 09:03:13 debian Keepalived_vrrp: VRRP_Script(chk_haproxy) succeeded
Apr 24 09:03:14 debian Keepalived_vrrp: VRRP Instance(VRRP1) Transition to MASTER STATE
Apr 24 09:03:15 debian Keepalived_vrrp: VRRP Instance(VRRP1) Entering MASTER STATE
Apr 24 09:03:16 debian Keepalived_vrrp: VRRP Instance(VRRP1) Received lower prio advert, forcing new election
Apr 24 09:17:01 debian /USR/SBIN/CRON[14188]: (root) CMD ( cd / && run-parts --report /etc/cron.hourly)
Apr 24 09:25:21 debian Keepalived_vrrp: VRRP_Script(chk_haproxy) failed
Apr 24 09:25:22 debian Keepalived_vrrp: VRRP Instance(VRRP1) Entering FAULT STATE
Apr 24 09:25:22 debian Keepalived_vrrp: VRRP Instance(VRRP1) Now in FAULT state
Apr 24 09:27:07 debian Keepalived_vrrp: VRRP Script(chk_haproxy) succeeded
Apr 24 09:27:07 debian Keepalived_vrrp: VRRP_Instance(VRRP1) prio is higher than received advert
Apr 24 09:27:07 debian Keepalived_vrrp: VRRP Instance(VRRP1) Transition to MASTER STATE
Apr 24 09:27:08 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Entering MASTER STATE
usuario@debian:~$
```

lb2 [Corriendo] - Oracle VM VirtualBox

Archivo Máquina Ver Entrada Dispositivos Ayuda

Menú de aplicaciones Terminal - usuario@debian...

Terminal - usuario@debian: ~

```
Archivo Editar Ver Terminal Ir Ayuda
Apr 24 09:03:15 debian Keepalived_healthcheckers: Terminating Healthchecker child process on signal
Apr 24 09:03:16 debian Keepalived_vrrp: Registering Kernel netlink reflector
Apr 24 09:03:16 debian Keepalived_vrrp: Registering Kernel netlink command channel
Apr 24 09:03:16 debian Keepalived_vrrp: Registering gratuitous ARP shared channel
Apr 24 09:03:16 debian Keepalived_vrrp: Opening file '/etc/keepalived/keepalived.conf'.
Apr 24 09:03:16 debian Keepalived_vrrp: Configuration is using : 61389 Bytes
Apr 24 09:03:16 debian Keepalived_vrrp: Using LinkWatch kernel netlink reflector...
Apr 24 09:03:16 debian Keepalived_healthcheckers: Registering Kernel netlink reflector
Apr 24 09:03:16 debian Keepalived_healthcheckers: Registering Kernel netlink command channel
Apr 24 09:03:16 debian Keepalived_healthcheckers: Opening file '/etc/keepalived/keepalived.conf'.
Apr 24 09:03:16 debian Keepalived_healthcheckers: Configuration is using : 4531 Bytes
Apr 24 09:03:16 debian Keepalived_healthcheckers: Using LinkWatch kernel netlink reflector...
Apr 24 09:03:16 debian Keepalived_vrrp: VRRP_Script(chk_haproxy) succeeded
Apr 24 09:03:17 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Transition to MASTER STATE
Apr 24 09:03:17 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Received higher priority advert
Apr 24 09:03:17 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Entering BACKUP STATE
Apr 24 09:25:25 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Transition to MASTER STATE
Apr 24 09:25:26 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Entering MASTER STATE
Apr 24 09:27:08 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Received higher priority advert
Apr 24 09:27:08 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Entering BACKUP STATE
usuario@debian:~$
```

lb1 (Base enlazada para lb1 y lb2) [Corriendo] - Oracle VM VirtualBox

Archivo Máquina Ver Entrada Dispositivos Ayuda

Menú de aplicaciones Terminal - usuario@debian...

Terminal - usuario@debian: ~

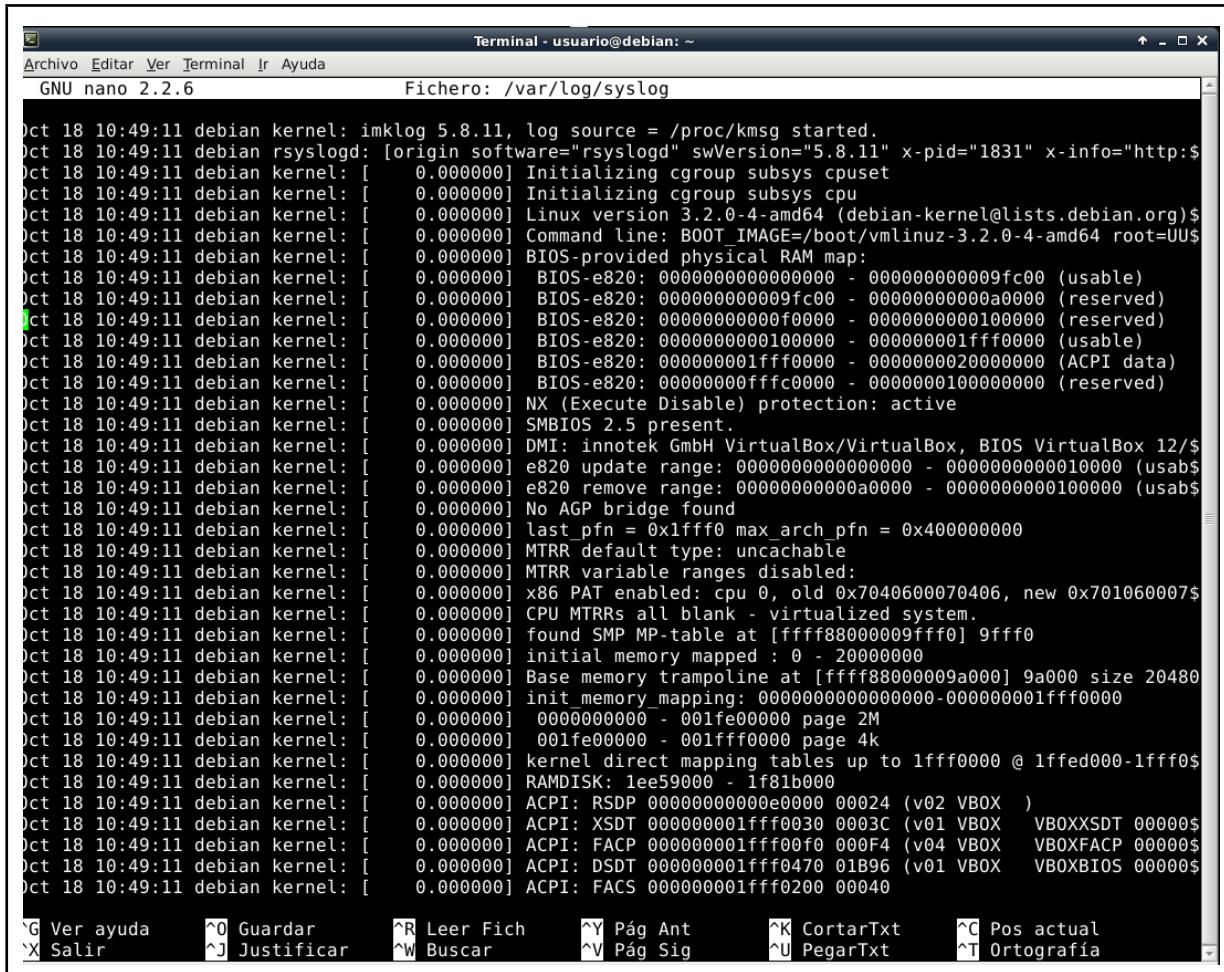
```
Archivo Editar Ver Terminal Ir Ayuda
pr 24 08:59:03 debian kernel: [    6.975868] ADDRCONF(NETDEV UP): eth1: link is not ready
pr 24 08:59:03 debian kernel: [    6.976676] e1000: eth1 NIC Link is Up 1000 Mbps Full Duplex, Flow Control: RX
pr 24 08:59:03 debian kernel: [    6.976965] ADDRCONF(NETDEV_CHANGE): eth1: link becomes ready
pr 24 08:59:03 debian Keepalived_vrrp: Registering Kernel netlink reflector
pr 24 08:59:03 debian Keepalived_vrrp: Registering Kernel netlink command channel
pr 24 08:59:03 debian Keepalived_vrrp: Registering gratuitous ARP shared channel
pr 24 08:59:03 debian kernel: [    7.370716] nf_conntrack version 0.5.0 (8023 buckets, 32092 max)
pr 24 08:59:03 debian kernel: [    7.371962] IPVS: Registered protocols (TCP, UDP, SCTP, AH, ESP)
pr 24 08:59:03 debian kernel: [    7.371968] IPVS: Connection hash table configured (size=4096, memory=64Kbytes)
pr 24 08:59:03 debian kernel: [    7.372005] IPVS: Creating netns size=2088 id=0
pr 24 08:59:03 debian kernel: [    7.372007] IPVS: ipvs loaded.
pr 24 08:59:03 debian Keepalived_vrrp: Opening file '/etc/keepalived/keepalived.conf'.
pr 24 08:59:03 debian Keepalived_healthcheckers: Registering Kernel netlink reflector
pr 24 08:59:03 debian Keepalived_healthcheckers: Registering Kernel netlink command channel
pr 24 08:59:03 debian Keepalived_healthcheckers: Opening file '/etc/keepalived/keepalived.conf'.
pr 24 08:59:03 debian Keepalived_vrrp: Configuration is using : 61389 Bytes
pr 24 08:59:03 debian Keepalived_vrrp: Using LinkWatch kernel netlink reflector...
pr 24 08:59:03 debian Keepalived_healthcheckers: Configuration is using : 4531 Bytes
pr 24 08:59:03 debian Keepalived_healthcheckers: Using LinkWatch kernel netlink reflector...
pr 24 08:59:03 debian Keepalived_vrrp: VRRP_Script(chk_haproxy) succeeded
pr 24 08:59:04 debian kernel: [    7.820957] [drm] Initialized drm 1.1.0 20060810
pr 24 08:59:04 debian kernel: [    7.821695] [drm] Supports vblank timestamp caching Rev 1 (10.10.2010).
pr 24 08:59:04 debian kernel: [    7.821696] [drm] No driver support for vblank timestamp query.
pr 24 08:59:04 debian kernel: [    7.821697] [drm] Initialized vboxvideo 1.0.0 20090303 for 0000:00:02.0 on minor 0
pr 24 08:59:04 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Transition to MASTER STATE
pr 24 08:59:05 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Entering MASTER STATE
pr 24 09:03:12 debian Keepalived_vrrp: Terminating VRRP child process on signal
pr 24 09:03:12 debian Keepalived_healthcheckers: Terminating Healthchecker child process on signal
pr 24 09:03:13 debian Keepalived_vrrp: Registering Kernel netlink reflector
pr 24 09:03:13 debian Keepalived_vrrp: Registering Kernel netlink command channel
pr 24 09:03:13 debian Keepalived_vrrp: Registering gratuitous ARP shared channel
pr 24 09:03:13 debian Keepalived_vrrp: Opening file '/etc/keepalived/keepalived.conf'.
pr 24 09:03:13 debian Keepalived_healthcheckers: Registering Kernel netlink reflector
pr 24 09:03:13 debian Keepalived_vrrp: Configuration is using : 61389 Bytes
pr 24 09:03:13 debian Keepalived_healthcheckers: Registering Kernel netlink command channel
pr 24 09:03:13 debian Keepalived_healthcheckers: Opening file '/etc/keepalived/keepalived.conf'.
pr 24 09:03:13 debian Keepalived_vrrp: Using LinkWatch kernel netlink reflector...
pr 24 09:03:13 debian Keepalived_healthcheckers: Configuration is using : 4531 Bytes
pr 24 09:03:13 debian Keepalived_healthcheckers: Using LinkWatch kernel netlink reflector...
pr 24 09:03:13 debian Keepalived_vrrp: VRRP_Script(chk_haproxy) succeeded
pr 24 09:03:14 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Transition to MASTER STATE
pr 24 09:03:15 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Entering MASTER STATE
pr 24 09:03:16 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Received lower prio advert, forcing new election
pr 24 09:25:21 debian Keepalived_vrrp: VRRP_Script(chk_haproxy) failed
```

```
lb2 [Corriendo] - Oracle VM VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
Menú de aplicaciones Terminal - usuario@debian: ~
Archivo Editar Ver Terminal Ir Ayuda
Apr 24 09:02:21 debian dhclient: DHCPACK from 10.0.2.2
Apr 24 09:02:21 debian dhclient: bound to 10.0.2.15 -- renewal in 35949 seconds.
Apr 24 09:02:21 debian kernel: [ 241.268828] e1000: eth1 NIC Link is Up 1000 Mbps Full Duplex, Flow Control: RX
Apr 24 09:02:21 debian kernel: [ 241.269427] ADDRCONF(NETDEV_UP): eth1: link is not ready
Apr 24 09:02:21 debian kernel: [ 241.269491] ADDRCONF(NETDEV_CHANGE): eth1: link becomes ready
Apr 24 09:02:21 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Entering BACKUP STATE
Apr 24 09:02:29 debian kernel: [ 248.968607] eth0: no IPv6 routers present
Apr 24 09:02:31 debian kernel: [ 251.537639] eth1: no IPv6 routers present
Apr 24 09:03:15 debian Keepalived: Terminating on signal
Apr 24 09:03:15 debian Keepalived: Stopping Keepalived v1.2.2 (12/18,2011)
Apr 24 09:03:15 debian Keepalived_vrrp: Terminating VRRP child process on signal
Apr 24 09:03:16 debian Keepalived_healthcheckers: Terminating Healthchecker child process on signal
Apr 24 09:03:16 debian Keepalived: Starting Keepalived v1.2.2 (12/18,2011)
Apr 24 09:03:16 debian Keepalived: Starting Healthcheck child process, pid=3239
Apr 24 09:03:16 debian Keepalived: Starting VRRP child process, pid=3240
Apr 24 09:03:16 debian Keepalived_vrrp: Registering Kernel netlink reflector
Apr 24 09:03:16 debian Keepalived_vrrp: Registering Kernel netlink command channel
Apr 24 09:03:16 debian Keepalived_vrrp: Registering gratuitous ARP shared channel
Apr 24 09:03:16 debian Keepalived_vrrp: Initializing ipvs 2.6
Apr 24 09:03:16 debian Keepalived_vrrp: Opening file '/etc/keepalived/keepalived.conf'.
Apr 24 09:03:16 debian Keepalived_vrrp: Configuration is using : 61389 Bytes
Apr 24 09:03:16 debian Keepalived_healthcheckers: Initializing ipvs 2.6
Apr 24 09:03:16 debian Keepalived_vrrp: Using LinkWatch kernel netlink reflector...
Apr 24 09:03:16 debian Keepalived_healthcheckers: Registering Kernel netlink reflector
Apr 24 09:03:16 debian Keepalived_healthcheckers: Registering Kernel netlink command channel
Apr 24 09:03:16 debian Keepalived_healthcheckers: Opening file '/etc/keepalived/keepalived.conf'.
Apr 24 09:03:16 debian Keepalived_healthcheckers: Configuration is using : 4531 Bytes
Apr 24 09:03:16 debian Keepalived_healthcheckers: Using LinkWatch kernel netlink reflector...
Apr 24 09:03:16 debian Keepalived_vrrp: VRRP Script(chk haproxy) succeeded
Apr 24 09:03:17 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Transition to MASTER STATE
Apr 24 09:03:17 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Received higher prio advert
Apr 24 09:03:17 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Entering BACKUP STATE
Apr 24 09:17:01 debian /USR/SBIN/CRON[4500]: (root) CMD ( cd / && run-parts --report /etc/cron.hourly)
Apr 24 09:25:25 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Transition to MASTER STATE
Apr 24 09:25:26 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Entering MASTER STATE
Apr 24 09:27:08 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Received higher prio advert
Apr 24 09:27:08 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Entering BACKUP STATE
usuario@debian: ~

lb1 [Base enlazada para lb1 y lb2] [Corriendo] - Oracle VM VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
Menú de aplicaciones Terminal - usuario@debian: ~
Archivo Editar Ver Terminal Ir Ayuda
Apr 24 08:59:03 debian Keepalived_vrrp: VRRP Script(chk haproxy) succeeded
Apr 24 08:59:03 debian acpid: client connected from 2185[0:0]
Apr 24 08:59:03 debian acpid: 1 client rule loaded
Apr 24 08:59:04 debian kernel: [ 7.820957] [drm] Initialized drm 1.1.0 20060810
Apr 24 08:59:04 debian kernel: [ 7.821695] [drm] Supports vblank timestamp caching Rev 1 (10.10.2010).
Apr 24 08:59:04 debian kernel: [ 7.821696] [drm] No driver support for vblank timestamp query.
Apr 24 08:59:04 debian kernel: [ 7.821697] [drm] Initialized vboxvideo 1.0.0 20090303 for 0000:00:02.0 on minor 0
Apr 24 08:59:04 debian Keepalived_vrrp: VRRP Instance(VRRP1) Transition to MASTER STATE
Apr 24 08:59:05 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Entering MASTER STATE
Apr 24 08:59:09 debian kernel: [ 12.912025] eth0: no IPv6 routers present
Apr 24 08:59:10 debian dbus[2094]: [system] Activating service name='org.freedesktop.ConsoleKit' (using servicehelper)
Apr 24 08:59:10 debian dbus[2094]: [system] Activating service name='org.freedesktop.PolicyKit1' (using servicehelper)
Apr 24 08:59:10 debian polkitd[2429]: started daemon version 0.105 using authority implementation 'local' version '0.105'
Apr 24 08:59:10 debian dbus[2094]: [system] Successfully activated service 'org.freedesktop.PolicyKit1'
Apr 24 08:59:10 debian dbus[2094]: [system] Successfully activated service 'org.freedesktop.ConsoleKit'
Apr 24 08:59:11 debian dbus[2094]: [system] Activating service name='org.freedesktop.UDisks' (using servicehelper)
Apr 24 08:59:11 debian dbus[2094]: [system] Successfully activated service 'org.freedesktop.UDisks'
Apr 24 08:59:13 debian kernel: [ 17.536017] eth1: no IPv6 routers present
Apr 24 09:03:12 debian Keepalived: Terminating on signal
Apr 24 09:03:12 debian Keepalived: Stopping Keepalived v1.2.2 (12/18,2011)
Apr 24 09:03:12 debian Keepalived_vrrp: Terminating VRRP child process on signal
Apr 24 09:03:12 debian Keepalived_healthcheckers: Terminating Healthchecker child process on signal
Apr 24 09:03:13 debian Keepalived: Starting Keepalived v1.2.2 (12/18,2011)
Apr 24 09:03:13 debian Keepalived: Starting Healthcheck child process, pid=2923
Apr 24 09:03:13 debian Keepalived: Starting VRRP child process, pid=2924
Apr 24 09:03:13 debian Keepalived_vrrp: Registering Kernel netlink reflector
Apr 24 09:03:13 debian Keepalived_vrrp: Registering Kernel netlink command channel
Apr 24 09:03:13 debian Keepalived_vrrp: Registering gratuitous ARP shared channel
Apr 24 09:03:13 debian Keepalived_vrrp: Initializing ipvs 2.6
Apr 24 09:03:13 debian Keepalived_vrrp: Opening file '/etc/keepalived/keepalived.conf'.
Apr 24 09:03:13 debian Keepalived_healthcheckers: Initializing ipvs 2.6
Apr 24 09:03:13 debian Keepalived_healthcheckers: Registering Kernel netlink reflector
Apr 24 09:03:13 debian Keepalived_healthcheckers: Registering Kernel netlink command channel
Apr 24 09:03:13 debian Keepalived_healthcheckers: Opening file '/etc/keepalived/keepalived.conf'.
Apr 24 09:03:13 debian Keepalived_vrrp: Using LinkWatch kernel netlink reflector...
Apr 24 09:03:13 debian Keepalived_healthcheckers: Configuration is using : 4531 Bytes
Apr 24 09:03:13 debian Keepalived_healthcheckers: Using LinkWatch kernel netlink reflector...
Apr 24 09:03:14 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Transition to MASTER STATE
Apr 24 09:03:16 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Received lower prio advert, forcing new election
Apr 24 09:17:01 debian /USR/SBIN/CRON[4188]: (root) CMD ( cd / && run-parts --report /etc/cron.hourly)
Apr 24 09:25:21 debian Keepalived_vrrp: VRRP Script(chk haproxy) failed
Apr 24 09:25:22 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Entering FAULT STATE
Apr 24 09:25:22 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Now in FAULT state
Apr 24 09:27:07 debian Keepalived_vrrp: VRRP Script(chk haproxy) succeeded
Apr 24 09:27:07 debian Keepalived_vrrp: VRRP_Instance(VRRP1) prio is higher than received advert
Apr 24 09:27:07 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Transition to MASTER STATE
Apr 24 09:27:08 debian Keepalived_vrrp: VRRP_Instance(VRRP1) Entering MASTER STATE
usuario@debian: ~
```

El estado por defecto es FAULT, cuando apago el balanceador maestro lb2 pasa a MASTER STATE y BACKUP STATE.Al volver a activar el balanceador pasa de nuevo a MASTER STATE

AQUÍ CAPTURAS ERRONEAS



The screenshot shows a terminal window titled "Terminal - usuario@debian: ~". The window contains a log of kernel boot messages from "/var/log/syslog". The log starts with "Oct 18 10:49:11 debian kernel: imklog 5.8.11, log source = /proc/kmsg started." and continues through various initialization steps, including cgroup, Linux version, command line, BIOS RAM map, and memory protection settings like NX and SMBIOS. The log ends with ACPI and FACS configuration details. At the bottom of the terminal window, there is a menu bar with "Archivo", "Editar", "Ver", "Terminal", "Ir", and "Ayuda". Below the menu, it says "GNU nano 2.2.6" and "Fichero: /var/log/syslog". At the bottom of the terminal window, there is a status bar with keyboard shortcuts for various functions.

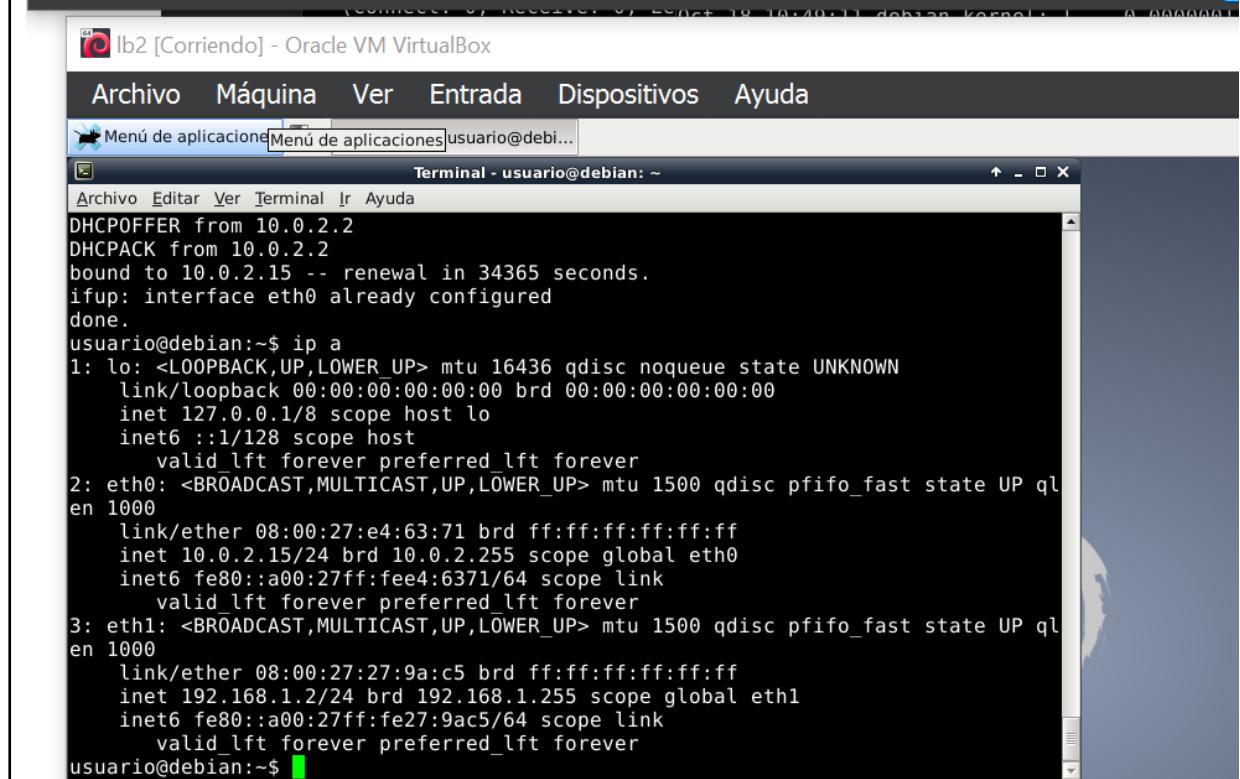
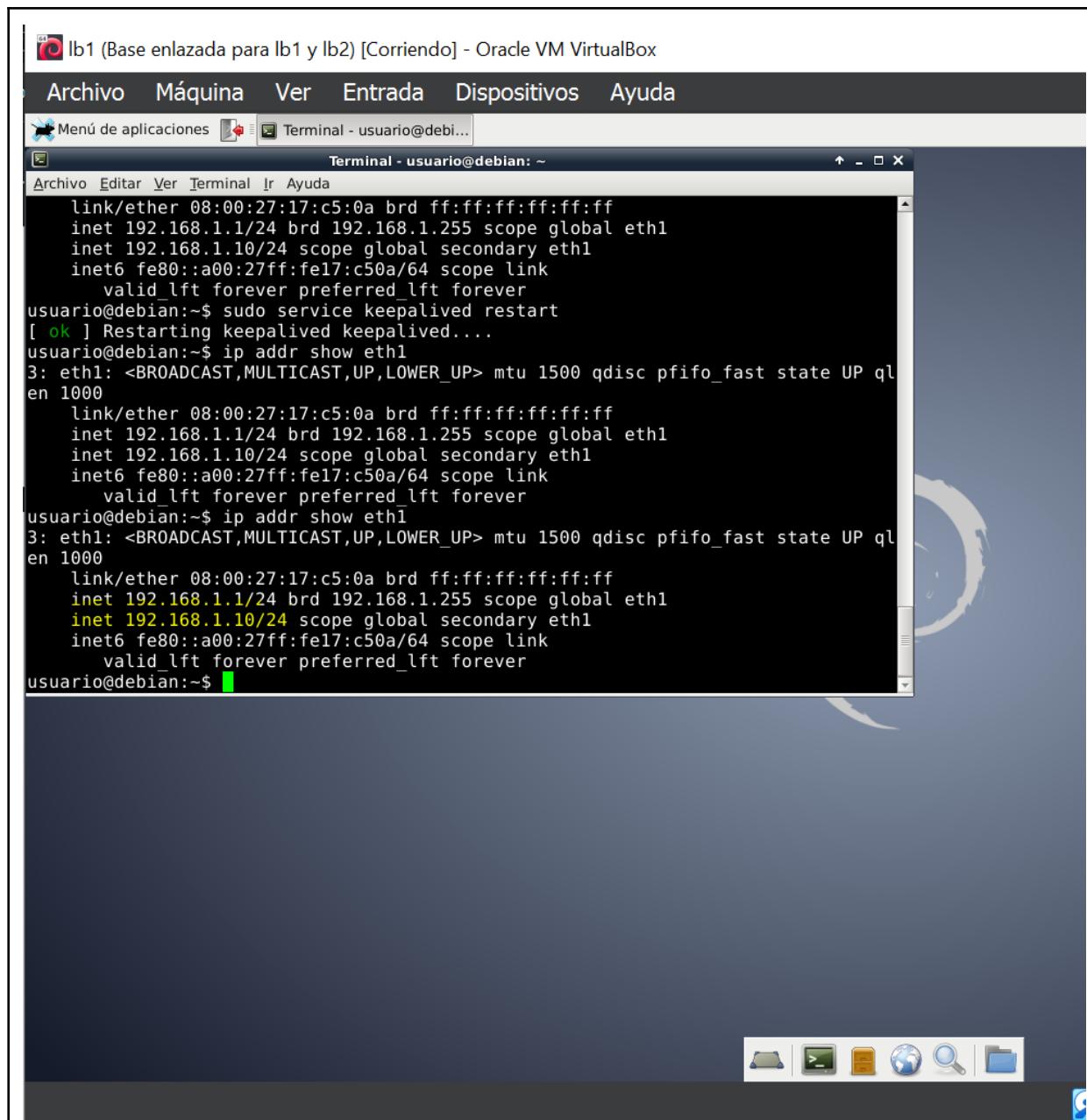
```
Oct 18 10:49:11 debian kernel: imklog 5.8.11, log source = /proc/kmsg started.
Oct 18 10:49:11 debian rsyslogd: [origin software="rsyslogd" swVersion="5.8.11" x-pid="1831" x-info="http:$
Oct 18 10:49:11 debian kernel: [ 0.000000] Initializing cgroup subsys cpuset
Oct 18 10:49:11 debian kernel: [ 0.000000] Initializing cgroup subsys cpu
Oct 18 10:49:11 debian kernel: [ 0.000000] Linux version 3.2.0-4-amd64 (debian-kernel@lists.debian.org)$
Oct 18 10:49:11 debian kernel: [ 0.000000] Command line: BOOT_IMAGE=/boot/vmlinuz-3.2.0-4-amd64 root=UUID
Oct 18 10:49:11 debian kernel: [ 0.000000] BIOS-provided physical RAM map:
Oct 18 10:49:11 debian kernel: [ 0.000000] BIOS-e820: 0000000000000000 - 000000000009fc00 (usable)
Oct 18 10:49:11 debian kernel: [ 0.000000] BIOS-e820: 000000000009fc00 - 00000000000a0000 (reserved)
Oct 18 10:49:11 debian kernel: [ 0.000000] BIOS-e820: 0000000000f00000 - 0000000000100000 (reserved)
Oct 18 10:49:11 debian kernel: [ 0.000000] BIOS-e820: 0000000000100000 - 00000000001ffff0000 (usable)
Oct 18 10:49:11 debian kernel: [ 0.000000] BIOS-e820: 0000000001ffff0000 - 0000000002000000 (ACPI data)
Oct 18 10:49:11 debian kernel: [ 0.000000] BIOS-e820: 00000000fffc0000 - 0000000010000000 (reserved)
Oct 18 10:49:11 debian kernel: [ 0.000000] NX (Execute Disable) protection: active
Oct 18 10:49:11 debian kernel: [ 0.000000] SMBIOS 2.5 present.
Oct 18 10:49:11 debian kernel: [ 0.000000] DMI: innoteck GmbH VirtualBox/VirtualBox, BIOS VirtualBox 12/$
Oct 18 10:49:11 debian kernel: [ 0.000000] e820 update range: 0000000000000000 - 000000000000100000 (usab$)
Oct 18 10:49:11 debian kernel: [ 0.000000] e820 remove range: 0000000000a00000 - 00000000000100000 (usab$)
Oct 18 10:49:11 debian kernel: [ 0.000000] No AGP bridge found
Oct 18 10:49:11 debian kernel: [ 0.000000] last_pfn = 0x1fff0 max_arch_pfn = 0x400000000
Oct 18 10:49:11 debian kernel: [ 0.000000] MTRR default type: uncachable
Oct 18 10:49:11 debian kernel: [ 0.000000] MTRR variable ranges disabled:
Oct 18 10:49:11 debian kernel: [ 0.000000] x86 PAT enabled: cpu 0, old 0x7040600070406, new 0x701060007$0
Oct 18 10:49:11 debian kernel: [ 0.000000] CPU MTRRs all blank - virtualized system.
Oct 18 10:49:11 debian kernel: [ 0.000000] found SMP MP-table at [ffff88000009fff0] 9fff0
Oct 18 10:49:11 debian kernel: [ 0.000000] initial memory mapped : 0 - 20000000
Oct 18 10:49:11 debian kernel: [ 0.000000] Base memory trampoline at [ffff88000009a000] 9a000 size 20480
Oct 18 10:49:11 debian kernel: [ 0.000000] init_memory_mapping: 0000000000000000-000000001ffff0000
Oct 18 10:49:11 debian kernel: [ 0.000000] 0000000000 - 001fe0000 page 2M
Oct 18 10:49:11 debian kernel: [ 0.000000] 001fe00000 - 001fff0000 page 4k
Oct 18 10:49:11 debian kernel: [ 0.000000] kernel direct mapping tables up to 1ffff0000 @ 1ffed000-1ffff0$0
Oct 18 10:49:11 debian kernel: [ 0.000000] RAMDISK: lee59000 - 1f81b000
Oct 18 10:49:11 debian kernel: [ 0.000000] ACPI: RSDP 0000000000e0000 00024 (v02 VBOX )
Oct 18 10:49:11 debian kernel: [ 0.000000] ACPI: XSDT 000000001ffff0030 0003C (v01 VBOX   VBOXXSDT 00000$)
Oct 18 10:49:11 debian kernel: [ 0.000000] ACPI: FACP 000000001ffff00f0 000F4 (v04 VBOX   VBOXFACP 00000$)
Oct 18 10:49:11 debian kernel: [ 0.000000] ACPI: DSDT 000000001ffff0470 01B96 (v01 VBOX   VBOXBIOS 00000$)
Oct 18 10:49:11 debian kernel: [ 0.000000] ACPI: FACS 000000001ffff0200 00040
^G Ver ayuda      ^O Guardar      ^R Leer Fich     ^Y Pág Ant      ^K CortarTxt    ^C Pos actual
^X Salir        ^J Justificar   ^W Buscar       ^V Pág Sig      ^U PegarTxt     ^T Ortografía
```

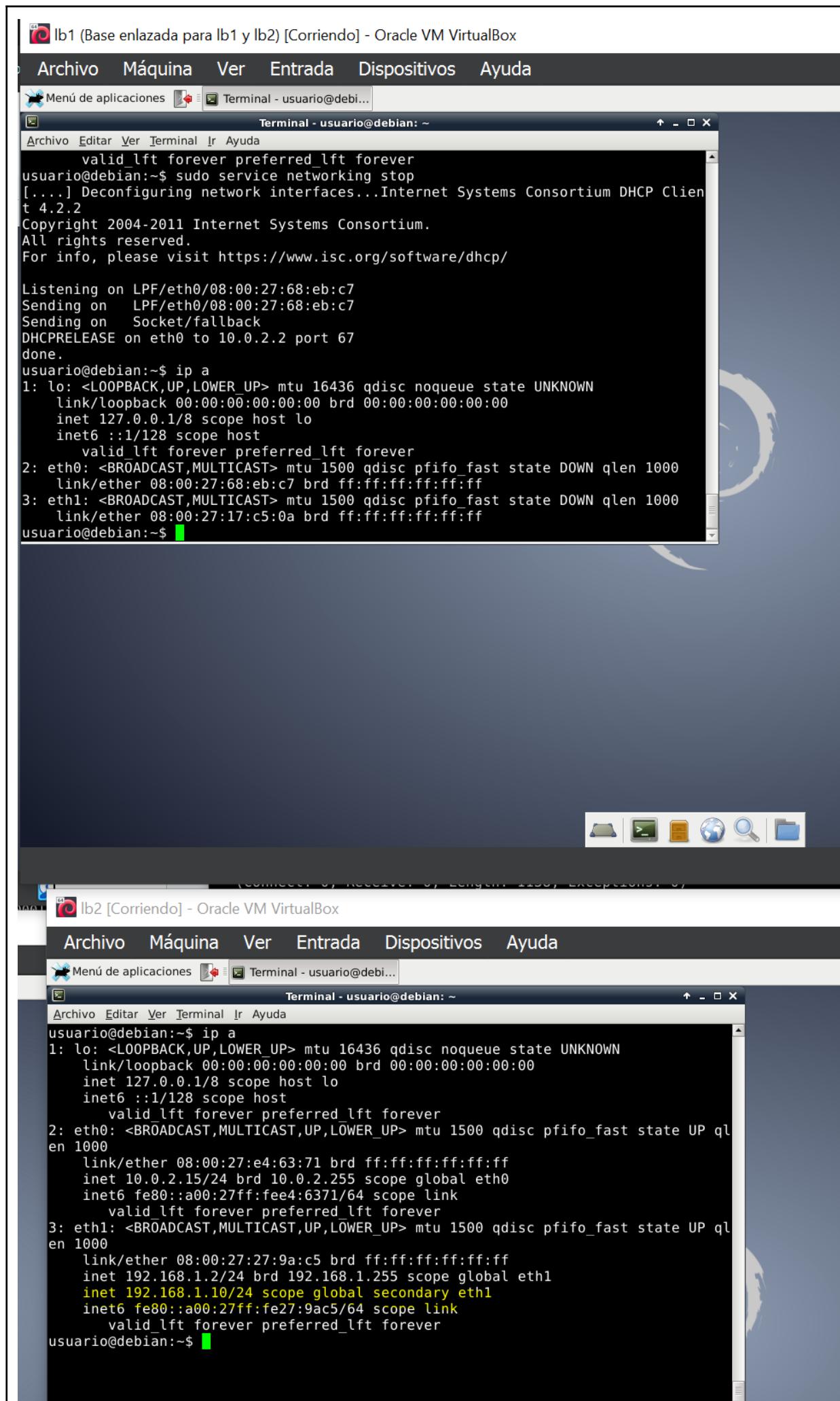
The screenshot shows a terminal window titled "Terminal - usuario@debian: ~". The window displays the contents of the file "/var/log/messages". The log output is a series of kernel messages from October 18, 2011, at 10:49:11. The messages include details about the kernel version (3.2.0-4-amd64), command line parameters (BOOT_IMAGE=/boot/vmlinuz-3.2.0-4-amd64 root=UUID=...), BIOS-provided physical RAM map, memory ranges, and various system initialization steps. The terminal window has a menu bar with "Archivo", "Editar", "Ver", "Terminal", "Ir", and "Ayuda". The bottom of the window shows nano editor key bindings: ^G Ver ayuda, ^O Guardar, ^R Leer Fich, ^Y Pág Ant, ^K CortarTxt, ^C Pos actual, ^X Salir, ^J Justificar, ^W Buscar, ^V Pág Sig, ^U PegarTxt, and ^T Ortografía.

```
Oct 18 10:49:11 debian kernel: imklog 5.8.11, log source = /proc/kmsg started.
Oct 18 10:49:11 debian rsyslogd: [origin software="rsyslogd" swVersion="5.8.11" x-pid="1831" x-info="http:$
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Oct 18 10:49:11 debian kernel: [ 0.000000] Initializing cgroup subsys cpu
Oct 18 10:49:11 debian kernel: [ 0.000000] Linux version 3.2.0-4-amd64 (debian-kernel@lists.debian.org)$
Oct 18 10:49:11 debian kernel: [ 0.000000] Command line: BOOT_IMAGE=/boot/vmlinuz-3.2.0-4-amd64 root=UUID=...
Oct 18 10:49:11 debian kernel: [ 0.000000] BIOS-provided physical RAM map:
Oct 18 10:49:11 debian kernel: [ 0.000000] BIOS-e820: 0000000000000000 - 0000000000009fc00 (usable)
Oct 18 10:49:11 debian kernel: [ 0.000000] BIOS-e820: 0000000000009fc00 - 0000000000a0000 (reserved)
Oct 18 10:49:11 debian kernel: [ 0.000000] BIOS-e820: 000000000000f0000 - 0000000000100000 (reserved)
Oct 18 10:49:11 debian kernel: [ 0.000000] BIOS-e820: 0000000000100000 - 00000000001ffff0000 (usable)
Oct 18 10:49:11 debian kernel: [ 0.000000] BIOS-e820: 0000000001fff0000 - 0000000002000000 (ACPI data)
Oct 18 10:49:11 debian kernel: [ 0.000000] BIOS-e820: 000000000fffc0000 - 0000000010000000 (reserved)
Oct 18 10:49:11 debian kernel: [ 0.000000] NX (Execute Disable) protection: active
Oct 18 10:49:11 debian kernel: [ 0.000000] SMBIOS 2.5 present.
Oct 18 10:49:11 debian kernel: [ 0.000000] No AGP bridge found
Oct 18 10:49:11 debian kernel: [ 0.000000] last_pfn = 0x1ffff0 max_arch_pfn = 0x400000000
Oct 18 10:49:11 debian kernel: [ 0.000000] x86 PAT enabled: cpu 0, old 0x7040600070406, new 0x701060007$...
Oct 18 10:49:11 debian kernel: [ 0.000000] CPU MTRRs all blank - virtualized system.
Oct 18 10:49:11 debian kernel: [ 0.000000] found SMP MP-table at [fffff88000009ff0] 9ffff0
Oct 18 10:49:11 debian kernel: [ 0.000000] init_memory_mapping: 0000000000000000-0000000001fff0000
Oct 18 10:49:11 debian kernel: [ 0.000000] RAMDISK: lee59000 - 1f81b000
Oct 18 10:49:11 debian kernel: [ 0.000000] ACPI: RSDP 0000000000e0000 00024 (v02 VBOX )
Oct 18 10:49:11 debian kernel: [ 0.000000] ACPI: XSDT 0000000001fff0030 0003C (v01 VBOX  VBOXXSDT 00000$...
Oct 18 10:49:11 debian kernel: [ 0.000000] ACPI: FACP 0000000001ffff00f0 000F4 (v04 VBOX  VBOXFACP 00000$...
Oct 18 10:49:11 debian kernel: [ 0.000000] ACPI: DSDT 0000000001ffff0470 01B96 (v01 VBOX  VBOXBIOS 00000$...
Oct 18 10:49:11 debian kernel: [ 0.000000] ACPI: FACS 0000000001ffff0200 00040
Oct 18 10:49:11 debian kernel: [ 0.000000] ACPI: APIC 0000000001ffff0240 00054 (v02 VBOX  VBOXAPIC 00000$...
Oct 18 10:49:11 debian kernel: [ 0.000000] ACPI: SSDT 0000000001ffff02a0 001CC (v01 VBOX  VBOXCPUT 00000$...
Oct 18 10:49:11 debian kernel: [ 0.000000] No NUMA configuration found
Oct 18 10:49:11 debian kernel: [ 0.000000] Faking a node at 0000000000000000-0000000001fff0000
Oct 18 10:49:11 debian kernel: [ 0.000000] Initmem setup node 0 0000000000000000-0000000001ffff0000
Oct 18 10:49:11 debian kernel: [ 0.000000] NODE DATA [0000000001ffe8000 - 0000000001ffecfff]
Oct 18 10:49:11 debian kernel: [ 0.000000] Zone PFN ranges:
Oct 18 10:49:11 debian kernel: [ 0.000000] DMA          0x00000010 -> 0x00001000
Oct 18 10:49:11 debian kernel: [ 0.000000] DMA32         0x0000001000 -> 0x00100000
Oct 18 10:49:11 debian kernel: [ 0.000000] Normal        empty
[ 6540 líneas leídas ]
```

^G Ver ayuda ^O Guardar ^R Leer Fich ^Y Pág Ant ^K CortarTxt ^C Pos actual
^X Salir ^J Justificar ^W Buscar ^V Pág Sig ^U PegarTxt ^T Ortografía

Copia los mensajes de cambio de estado y describe los resultados de las pruebas.





messages

```
[pr 20 21:27:10 debian kernel: [ 0.091031] NET: Registered protocol family 2
[pr 20 21:27:10 debian kernel: [ 0.091173] IP route cache hash table entries: 32768 (order: 6, 262144 bytes)
[pr 20 21:27:10 debian kernel: [ 0.091353] TCP established hash table entries: 131072 (order: 9, 2097152 bytes)
[pr 20 21:27:10 debian kernel: [ 0.091606] TCP bind hash table entries: 65536 (order: 8, 1048576 bytes)
[pr 20 21:27:10 debian kernel: [ 0.091692] TCP: Hash tables configured (established 131072 bind 65536)
[pr 20 21:27:10 debian kernel: [ 0.091694] TCP reno registered
[pr 20 21:27:10 debian kernel: [ 0.091696] UDP hash table entries: 512 (order: 2, 16384 bytes)
[pr 20 21:27:10 debian kernel: [ 0.091698] UDP-Lite hash table entries: 512 (order: 2, 16384 bytes)
[pr 20 21:27:10 debian kernel: [ 0.091724] NET: Registered protocol family 1
[pr 20 21:27:10 debian kernel: [ 0.091728] pci 0000:00:00.0: Limiting direct PCI/PCI transfers
[pr 20 21:27:10 debian kernel: [ 0.092013] pci 0000:00:01.0: Activating ISA DMA hang workarounds
[pr 20 21:27:10 debian kernel: [ 0.092219] Unpacking initramfs...
[pr 20 21:27:10 debian kernel: [ 0.221009] Freeing initrd memory: 10244k freed
[pr 20 21:27:10 debian kernel: [ 0.221848] platform rtc_cmos: registered platform RTC device (no PNP device found)
[pr 20 21:27:10 debian kernel: [ 0.222000] audit: initializing netlink socket (disabled)
[pr 20 21:27:10 debian kernel: [ 0.222006] type=2000 audit(1682018828.220:1): initialized
[pr 20 21:27:10 debian kernel: [ 0.230059] HugeTLB registered 2 MB page size, pre-allocated 0 pages
[pr 20 21:27:10 debian kernel: [ 0.230172] VFS: Disk quotas dquot 6.5.2
[pr 20 21:27:10 debian kernel: [ 0.230182] Dquot-cache hash table entries: 512 (order 0, 4096 bytes)
[pr 20 21:27:10 debian kernel: [ 0.230210] msgmni has been set to 2002
[pr 20 21:27:10 debian kernel: [ 0.230323] alg: No test for stdrng (krng)
[pr 20 21:27:10 debian kernel: [ 0.230331] Block layer SCSI generic (bsg) driver version 0.4 loaded (major 253)
[pr 20 21:27:10 debian kernel: [ 0.230333] io scheduler noop registered
[pr 20 21:27:10 debian kernel: [ 0.230334] io scheduler deadline registered
[pr 20 21:27:10 debian kernel: [ 0.230338] io scheduler cfq registered (default)
[pr 20 21:27:10 debian kernel: [ 0.230373] pci_hotplug: PCI Hot Plug PCI Core version: 0.5
[pr 20 21:27:10 debian kernel: [ 0.230382] pciehp: PCI Express Hot Plug Controller Driver version: 0.4
[pr 20 21:27:10 debian kernel: [ 0.230383] aciphp: ACPI Hot Plug PCI Controller Driver version: 0.5
[pr 20 21:27:10 debian kernel: [ 0.230540] ERST: Table is not found!
[pr 20 21:27:10 debian kernel: [ 0.230541] GHESt: HEST is not enabled!
[pr 20 21:27:10 debian kernel: [ 0.230565] Serial: 8250/16550 driver, 4 ports, IRQ sharing enabled
[pr 20 21:27:10 debian kernel: [ 0.230790] Linux agpgart interface v0.103
```

syslog

```
[Jan 9 14:34:10 debian kernel: [ 3.710506] EXT4-fs (sdal): re-mounted. Opts: errors=remount-ro
[Jan 9 14:34:10 debian kernel: [ 3.776552] loop: module loaded
[Jan 9 14:34:10 debian acpid: starting up with netlink and the input layer
[Jan 9 14:34:10 debian acpid: 1 rule loaded
[Jan 9 14:34:10 debian acpid: waiting for events: event logging is off
[Jan 9 14:34:10 debian /usr/sbin/cron[1947]: (CRON) INFO (pidfile fd = 3)
[Jan 9 14:34:10 debian /usr/sbin/cron[1957]: (CRON) STARTUP (fork ok)
[Jan 9 14:34:10 debian /usr/sbin/cron[1957]: (CRON) INFO (Running @reboot jobs)
[Jan 9 14:34:11 debian acpid: client connected from 2013[0:0]
[Jan 9 14:34:11 debian acpid: 1 client rule loaded
[Jan 9 14:34:11 debian dhclient: Internet Systems Consortium DHCP Client 4.2.2
[Jan 9 14:34:11 debian dhclient: Copyright 2004-2011 Internet Systems Consortium.
[Jan 9 14:34:11 debian dhclient: All rights reserved.
[Jan 9 14:34:11 debian dhclient: For info, please visit https://www.isc.org/software/dhcp
[Jan 9 14:34:11 debian dhclient:
[Jan 9 14:34:11 debian kernel: [ 5.222904] ADDRCONF(NETDEV UP): eth0: link is not ready
[Jan 9 14:34:11 debian kernel: [ 5.223370] e1000: eth0 NIC Link is Up 1000 Mbps Full Duplex, Flow Control: RX
[Jan 9 14:34:11 debian kernel: [ 5.223685] ADDRCONF(NETDEV CHANGE): eth0: link becomes ready
[Jan 9 14:34:11 debian dhclient: Listening on LPF/eth0/08:00:27:e4:85:6e
[Jan 9 14:34:11 debian dhclient: Sending on LPF/eth0/08:00:27:e4:85:6e
[Jan 9 14:34:11 debian dhclient: Sending on Socket/fallback
[Jan 9 14:34:11 debian dhclient: DHCPDISCOVER on eth0 to 255.255.255.255 port 67 interval 4
[Jan 9 14:34:11 debian dhclient: DHCPREQUEST on eth0 to 255.255.255.255 port 67
[Jan 9 14:34:11 debian dhclient: DHCPOffer from 10.0.2.2
[Jan 9 14:34:11 debian dhclient: DHCPACK from 10.0.2.2
[Jan 9 14:34:11 debian dhclient: bound to 10.0.2.15 -- renewal in 39555 seconds.
[Jan 9 14:34:11 debian kernel: [ 5.616420] [drm] Initialized drm 1.1.0 20060810
[Jan 9 14:34:11 debian kernel: [ 5.618744] [drm] Supports vblank timestamp caching Rev 1 (10.10.2010).
[Jan 9 14:34:11 debian kernel: [ 5.618747] [drm] No driver support for vblank timestamp query.
[Jan 9 14:34:11 debian kernel: [ 5.618750] [drm] Initialized vboxvideo 1.0.0 20090303 for 0000:00:02.0 on minor 0
[Jan 9 14:34:16 debian dbus[1939]: [system] Activating service name='org.freedesktop.ConsoleKit' (using servicehelper)
[Jan 9 14:34:16 debian dbus[1939]: [system] Activating service name='org.freedesktop.PolicyKit1' (using servicehelper)
[Jan 9 14:34:16 debian polkitd[2228]: started daemon version 0.105 using authority implementation `local` version `0.105'
[Jan 9 14:34:16 debian dbus[1939]: [system] Successfully activated service 'org.freedesktop.PolicyKit1'
[Jan 9 14:34:16 debian dbus[1939]: [system] Successfully activated service 'org.freedesktop.ConsoleKit'
[Jan 9 14:34:17 debian dbus[1939]: [system] Activating service name='org.freedesktop.UDisks' (using servicehelper)
[Jan 9 14:34:17 debian dbus[1939]: [system] Successfully activated service 'org.freedesktop.UDisks'
[Jan 9 14:34:22 debian kernel: [ 15.982968] eth0: no IPv6 routers present
[Jan 9 14:58:30 debian dbus[1939]: [system] Activating service name='org.freedesktop.UPower' (using servicehelper)
[Jan 9 14:58:30 debian dbus[1939]: [system] Successfully activated service 'org.freedesktop.UPower'
[Jan 9 14:58:35 debian shutdown[2630]: shutting down for system halt
[Jan 9 14:58:35 debian init: Switching to runlevel: 0
[Jan 9 14:58:36 debian acpid: client 2013[0:0] has disconnected
[Jan 9 14:58:36 debian acpid: client connected from 2013[0:0]
[Jan 9 14:58:36 debian acpid: 1 client rule loaded
[Jan 9 14:58:37 debian acpid: exiting
[Apr 20 21:27:10 debian kernel: imklog 5.8.11, log source = /proc/kmsg started.
[Apr 20 21:27:10 debian rsysload: [origin software="rsysload" swVersion="5.8.11" x-pid="1954" x-info="http://www.rsyslog.com"] st
```