ALOHA Load-Balancer - Application Note

Server configuration for layer 4 DSR mode

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Purpose

Server side configuration to be compatible with an **ALOHA Load-Balancer** configured in Layer 4 DSR mode.

DSR (stands for **Direct Server Return**) is also known as **gateway** mode

Complexity

Versions concerned

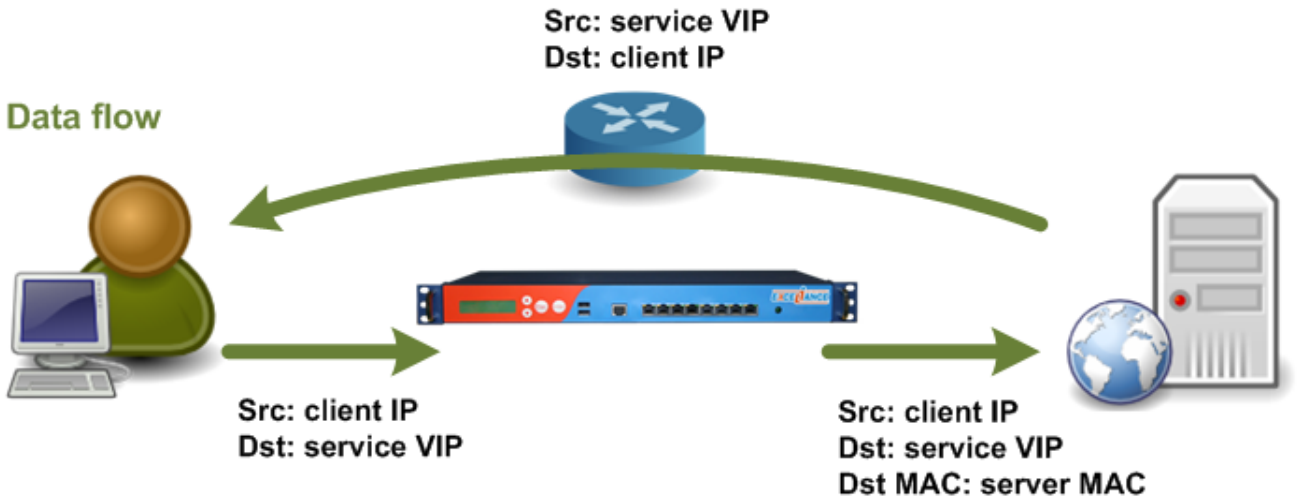
- Aloha 4.2 and above

Changelog

Version	Description
1.1	– HAProxy Tech. theme update – minor changes
1.0	Initial release

Reminder about Gateway or DSR mode

In layer 4 gateway mode, the **ALOHA Load-Balancer** sees only **the traffic going from the client to the server**. The servers answer **directly to the client through its default gateway**.



As shown in the diagram above:

- the client reaches the Virtual IP which is configured on the Load-Balancer
- The **ALOHA Load-Balancer** chooses a server based on its configuration, then **change the destination MAC address** of the frame before forwarding it to the server
- The server gets the packets corresponding to the request
- When the server answers back to the client, it does it directly, bypassing the **ALOHA Load-Balancer**

In order to work in such way, the server must hosts the **Virtual IP** too, but should not **answer to ARP requests with it**.

And this is where you need the current document to know how to configure your servers properly.

Linux configuration

Alias creation on the loopback interface

Create a loopback interface (ie lo:1) with the Virtual IP address and a **netmask value setup to 255.255.255.255 (/32)**.
Don't forget to make it resilient at start up. This configuration depends on the Linux distribution you're using.

System parameters

Setup the two sysctls below:

- arp_ignore must be set to 1
- arp_announce must be set to 2

To apply the changes directly, run the commands below:

```
sysctl -w net.ipv4.conf.all.arp_ignore=1
sysctl -w net.ipv4.conf.all.arp_announce=2
```

In order to makes these changes resilient after reboot, edit your **/etc/sysctls.conf** file then add the two lines below:

```
net.ipv4.conf.all.arp_ignore=1
net.ipv4.conf.all.arp_announce=2
```

To get more information about these sysctls settings, read the chapter **"Further reading"** at the end of this document.

Windows 2003 configuration

Create the loopback interface

- Click on the **Start** menu, then on **Control Panel** and finally on **Add Hardware**
- Click on **Next**
- Select **Yes, I have already connected the hardware**, then click on **Next**
- In the list of installed hardware, select **Add a new hardware device**, then click on **Next**
- Select **Install the hardware that I manually select from a list**, then click on **Next**
- Select **Network adapters**, then click on **Next**
- In the Manufacturer list, select **Microsoft**
- In the Network Adapter list, select **Microsoft Loopback Adapter**
- Click on **Next**
- Click on **Next** again
- Click on **Finish**

Configure the Virtual IP

Now you can configure the Virtual IP address on the **loopback** interface, with a **netmask value setup to 255.255.255.255 (/32)** and without default gateway setting.
You have to set the interface metric to 254, in order to prevent the loopback network adapter from answering ARP requests: When setting up the IP address, click on **Advanced**, uncheck **Automatic metric** then set interface metric to 254.

Windows 2008 configuration

Create a loopback adapter

Go in the Device Manager, then:

- Right-click on **Computer Name**, choose **Add Legacy Hardware**
- Click on **Next**
- Choose **Install the hardware I manually select from a list**
- Click on **Next**
- Choose **Network Adapters**
- Choose **Microsoft** on the left and **Loopback adapter** on the right
- Click on **Next**

It is recommended to rename the loopback you've just created to something more admin friendly. It will ease the job from the next step

Allow traffic on the loopback interface

In the example below, we have a physical interface, called **LAN** and a loopback interface, called **LO**.
Run the command below:

```
netsh interface ipv4 set interface "LAN" weakhostreceive=enabled
netsh interface ipv4 set interface "LO" weakhostreceive=enabled
netsh interface ipv4 set interface "LO" weakhostsend=enabled
```

Firewall settings

Don't forget to configure the firewall on the loopback interface, allowing the traffic it is supposed to receive.

Virtual IP address configuration

Now you can configure the Virtual IP address on the **loopback** interface, with a **netmask value setup to 255.255.255.255 (/32)** and without default gateway setting.

Further reading

Linux sysctls

More information on the required sysctls can be found in the link below, as well as information on many sysctls:
`http://www.kernel.org/doc/Documentation/networking/ip-sysctl.txt`

Microsoft Technet links

- Install a loopback interface on Windows Server 2003:
  `http://support.microsoft.com/kb/842561`
- Install a loopback interface on Windows Server 2008:
  `http://technet.microsoft.com/en-us/library/cc708322.aspx`