



# Balance network loads to optimize user traffic (cluster administrators only)

## ONTAP System Manager

NetApp

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# Balance network loads to optimize user traffic (cluster administrators only)

## Overview

You can configure your cluster to serve client requests from appropriately loaded LIFs. This results in a more balanced utilization of LIFs and ports, which in turn allows for better performance of the cluster.

## What DNS load balancing is

DNS load balancing helps in selecting an appropriately loaded data LIF and balancing user network traffic across all available ports (physical, interface groups, and VLANs).

With DNS load balancing, LIFs are associated with the load balancing zone of an SVM. A site-wide DNS server is configured to forward all DNS requests and return the least-loaded LIF based on the network traffic and the availability of the port resources (CPU usage, throughput, open connections, and so on). DNS load balancing provides the following benefits:

- New client connections balanced across available resources.
- No manual intervention required for deciding which LIFs to use when mounting a particular SVM.
- DNS load balancing supports NFSv3, NFSv4, NFSv4.1, CIFS, SMB 2.0, SMB 2.1, and SMB 3.0.

## How DNS load balancing works

Clients mount an SVM by specifying an IP address (associated with a LIF) or a host name (associated with multiple IP addresses). By default, LIFs are selected by the site-wide DNS server in a round-robin manner, which balances the workload across all LIFs.

Round-robin load balancing can result in overloading some LIFs, so you have the option of using a DNS load balancing zone that handles the host-name resolution in an SVM. Using a DNS load balancing zone, ensures better balance of the new client connections across available resources, leading to improved performance of the cluster.

A DNS load balancing zone is a DNS server inside the cluster that dynamically evaluates the load on all LIFs and returns an appropriately loaded LIF. In a load balancing zone, DNS assigns a weight (metric), based on the load, to each LIF.

Every LIF is assigned a weight based on its port load and CPU utilization of its home node. LIFs that are on less-loaded ports have a higher probability of being returned in a DNS query. Weights can also be manually assigned.

## Create a DNS load balancing zone

You can create a DNS load balancing zone to facilitate the dynamic selection of a LIF based on the load, that is, the number of clients mounted on a LIF. You can create a load balancing zone while creating a data LIF.

### Before you begin

The DNS forwarder on the site-wide DNS server must be configured to forward all requests for the load balancing zone to the configured LIFs.

The Knowledgebase article *How to set up DNS load balancing in Cluster-Mode* on the NetApp Support Site contains more information about configuring DNS load balancing using conditional forwarding.

### About this task

- Any data LIF can respond to DNS queries for a DNS load balancing zone name.
- A DNS load balancing zone must have a unique name in the cluster, and the zone name must meet the following requirements:
  - It should not exceed 256 characters.
  - It should include at least one period.
  - The first and the last character should not be a period or any other special character.
  - It cannot include any spaces between characters.
  - Each label in the DNS name should not exceed 63 characters.

A label is the text appearing before or after the period. For example, the DNS zone named `storage.company.com` has three labels.

### Step

Use the `network interface create` command with the `dns-zone` option to create a DNS load balancing zone.

If the load balancing zone already exists, the LIF is added to it. For more information about the command, see the man pages.

The following example demonstrates how to create a DNS load balancing zone named `storage.company.com` while creating the LIF `lif1`:

```
network interface create -vserver vs0 -lif lif1 -home-node node1
-home-port e0c -address 192.0.2.129 -netmask 255.255.255.128 -dns-zone
```

## Add or remove a LIF from a load balancing zone

You can add or remove a LIF from the DNS load balancing zone of a storage virtual machine (SVM). You can also remove all the LIFs simultaneously from a load balancing zone.

### Before you begin

- All the LIFs in a load balancing zone should belong to the same SVM.
- A LIF can be a part of only one DNS load balancing zone.
- Failover groups for each subnet must have been set up, if the LIFs belong to different subnets.

### About this task

A LIF that is in the administrative down status is temporarily removed from the DNS load balancing zone. When the LIF returns to the administrative up status, the LIF is automatically added to the DNS load balancing zone.

### Step

Add a LIF to or remove a LIF from a load balancing zone:

If you want to...	Enter...
Add a LIF	<pre>network interface modify -vserver vs0 -lif lif1 -dns-zone zone_name</pre> <p>Example:</p> <pre>network interface modify -vserver vs1 -lif data1 -dns-zone cifs.company.com</pre>
Remove a single LIF	<pre>network interface modify -vserver vs0 -lif lif1 -dns-zone none</pre> <p>Example:</p> <pre>network interface modify -vserver vs1 -lif data1 -dns-zone none</pre>
Remove all LIFs	<pre>network interface modify -vserver vs0 -lif * -dns-zone none</pre> <p>Example:</p> <pre>network interface modify -vserver vs0 -lif * -dns-zone none</pre> <p>You can remove an SVM from a load balancing zone by removing all the LIFs in the SVM from that zone.</p>

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