



Move logical interfaces (LIFs)

OnCommand Unified Manager 9.5

NetApp

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Move logical interfaces (LIFs)

Moving logical interfaces (LIFs) to a less busy port can help improve load balancing, assist with maintenance operations and performance tuning, and reduce indirect access.

Indirect access can reduce system efficiency. It occurs when a volume workload is using different nodes for network processing and data processing. To reduce indirect access, you can rearrange LIFs, which involves moving LIFs to use the same node for network processing and data processing. You can configure load balancing to have ONTAP automatically move busy LIFs to a different port or you can move a LIF manually.

Benefits	
<ul style="list-style-type: none">• Improve load balancing.• Reduce indirect access.	
Considerations	
	When moving a LIF connected to CIFS shares, clients accessing the CIFS shares are disconnected. Any read or write requests to the CIFS shares are disrupted.

You use the ONTAP commands to configure load balancing. For more information, see the ONTAP networking documentation.

You use OnCommand System Manager and the ONTAP CLI commands to move LIFs manually.

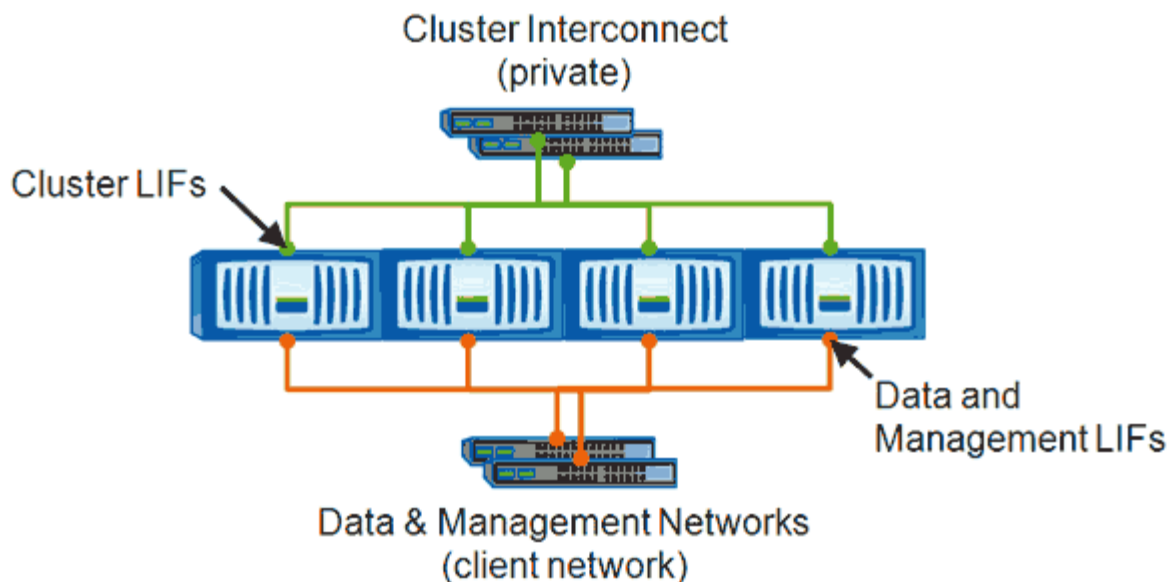
Moving LIFs manually

storage virtual machines (SVMs) contain data volumes and one or more logical interfaces (LIFs) through which the SVM provides data to the clients. You can move data LIFs from one physical port to another within the same SVM. You might want to do this to improve load balancing or assist with maintenance operations and performance tuning.

About this task

The following types of LIFs exist:

- Data LIFs: Associated with a SVM and used for communicating with clients.
- Cluster Management LIFs: Used for managing nodes, SVMs, and the cluster itself.
- Cluster LIFs: Used for intracluster traffic.
- Intercluster LIFs: Used for communication between clusters.
- Intracluster LIFs: Used for communication between HA pairs.
- SVM Management LIFs: Data LIFs associated with a SVM and used for managing that SVM.



Note: Networks are redundant

This workflow describes how to move data LIFs. This applies to NAS (NFS and CIFS) LIFs, but not to SAN (FC and iSCSI) LIFs.



When moving a LIF connected to CIFS shares, clients accessing the CIFS shares will be disconnected. Any read or write requests to the CIFS shares will be disrupted.



For information about how to move other types of LIFs, including details about moving LIFS connected CIFS shares, see the ONTAP networking documentation.

You can perform the following basic actions related to data LIFs:

- Display all the data LIFs.
- Identify the busiest LIFs.
- Identify the best node to accept a busy LIF.
- Modify the home port or node for a LIF to change its preferred location in the cluster.

You should move a LIF rather than migrate a LIF for a more lasting change. To return to the original home port, you should revert the LIF.

- Migrate a data LIF to another port for a temporary change that might be used if the home port or node has a problem or is undergoing scheduled maintenance.
- Revert a data LIF to its home port.

What LIFs are

A LIF (logical interface) is an IP address or WWPN with associated characteristics, such as a role, a home port, a home node, a list of ports to fail over to, and a firewall policy. You can configure LIFs on ports over which the cluster sends and receives communications over the network.

LIFs can be hosted on the following ports:

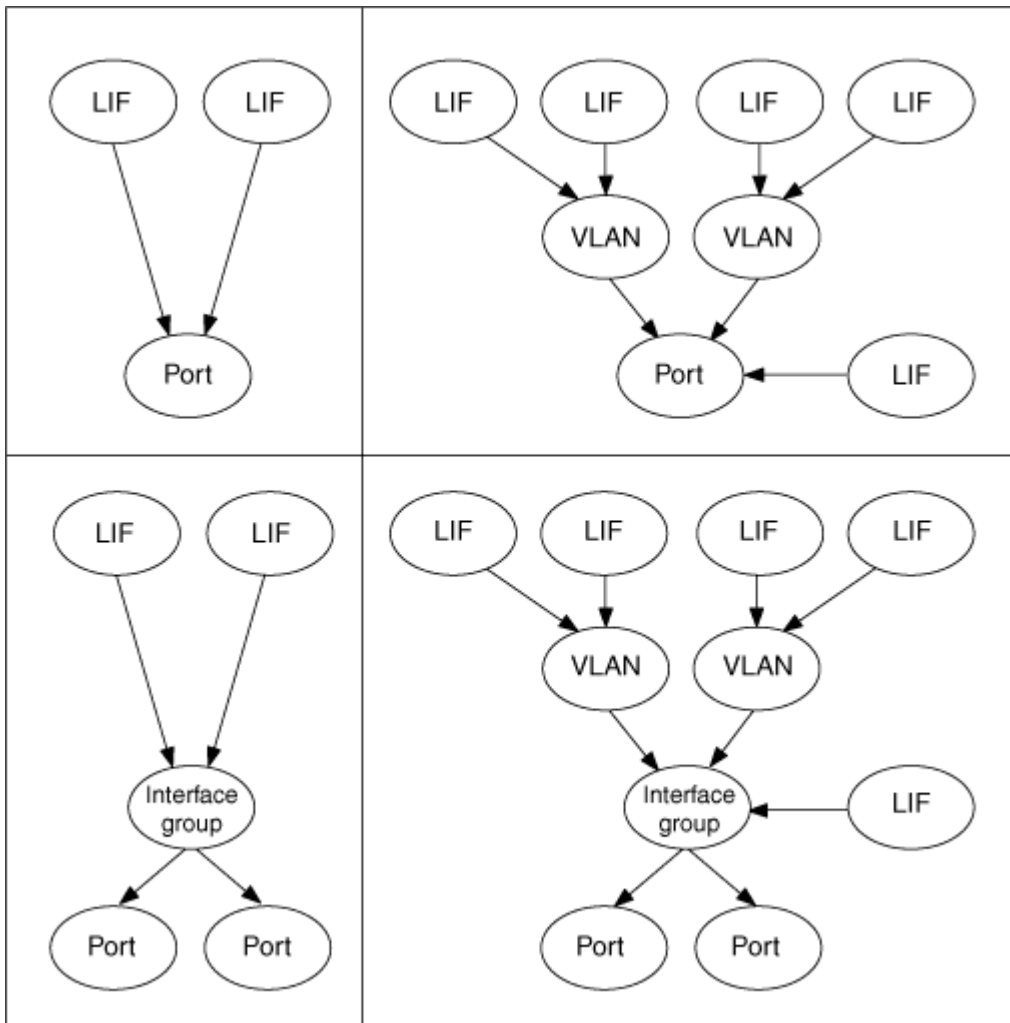
- Physical ports that are not part of interface groups
- Interface groups
- VLANs
- Physical ports or interface groups that host VLANs
- Virtual IP (VIP) ports

Starting with ONTAP 9.5, VIP LIFs are supported and are hosted on VIP ports.

While configuring SAN protocols such as FC on a LIF, it will be associated with a WWPN.

[ONTAP 9 SAN Administration Guide](#)

The following figure illustrates the port hierarchy in an ONTAP system:



Displaying all LIFs in a SVM using the CLI

You can display information about all LIFs in a SVM. You might want to display all LIFs before you determine which LIFs might be busy and should be moved.

About this task

The operational status of a LIF is determined by whether it has been configured on a particular port and is capable of serving data. When a SVM is stopped, the associated Data LIFs and SVM Management LIFs can no longer serve data. The operational status of these LIFs changes to down.

Steps

1. To display information about all LIFs in a SVM, enter the following command: `network interface show -vserver vs1`

The command displays the following information:

- Node or SVM associated with the LIF
- LIF name
- Administrative and operational status
- IP address
- Netmask
- Node and port on which the LIF is configured

A home server can be either a node or a SVM.

If data for a field is not available (for instance, the operational duplex and speed for an inactive port), the field is listed as undef.



You can get all available information by specifying the `-instance` parameter.

The following example displays general information about all LIFs in a SVM:

```
vs1::> network interface show -vserver vs1
```

	Logical	Status	Network	Current	
Current Is					
Vserver	Interface	Admin/Oper	Address/Mask	Node	Port
Home					
vs1					
	lif1	up/up	192.0.2.253/24	node-01	e0b
false					
	d2	up/up	192.0.2.252/21	node-01	e0d
true					
	data3	up/up	192.0.2.251/20	node-02	e0c
true					

Identifying LIFs with the most connections using the CLI

You might want to migrate a data LIF if it exhibits a heavy load or throughput. To decide whether to migrate a LIF, you can display the load on LIFs, number of connections on the port, throughput, and CPU cycles on the node.

Steps

- 1. Access the CLI as a cluster administrator.
- 2. Set the privilege level to advanced by entering the following command: `set -privilege advanced`

For details about using the CLI in advanced mode, see the *System Administration Reference*.

- 3. To find the weight of each LIF, enter the following command: `network interface lif-weights show`

A busy LIF is one that has the lowest weight.

- 4. To find the active connections on a node, enter the following command: `network connections active show-clients`

Note the highest client count by node.

```
cluster1::> network connections active show-clients
Node      Client IP Address      Count
-----
node1     192.0.2.253            12
          192.0.2.252            9
          192.0.2.251            12

node2     192.0.2.250            12
          192.0.2.252            9
          192.0.2.253            9

node3     customer.example.com    2
          customer.example.net    2
          customer.example.org 2
```

- 5. To find the active connections by LIF on a node and SVM, enter the following command: `network connections active show-lifs`

Note the highest client count per LIF.

```
cluster1::> network connections active show-lifs
```

Node	Vserver Name	Interface Name	Count
node1	vs1	clus1	30
node2	vs2	clus1	30
node3	vs3	lif1	2
	vs4	clus1	30

6. Check the LIFs that are sharing the same home port and home node to identify the LIFs with the most connections.
7. To choose the best data port, enter the following: `statistics show -object port`

The statistics command provides throughput and bandwidth information for Ethernet ports. Each row provides a separate counter of unique information. Value is the value for the type of object since the counter was last cleared (since ONTAP was last started).

```
cluster1::> statistics show -object port
```

```
Object: port
```

```
Instance: e0a
```

```
Start-time: 10/11/2013 13:51:41
```

```
End-time: 10/11/2013 13:51:41
```

```
Node: node1
```

Counter	Value
recv-data	0B
recv-packets	0
recv-mcasts	0
recv-errors	0
recv-dropped	0
sent-data	0B
sent-packets	0
sent-mcasts	0
sent-errors	0
collisions	0

Identifying the best node for a busy LIF using the CLI

You can display information about all the ports in a cluster. You can view information such

as the network port role (cluster, data, or node-management), link status, maximum transmission unit (MTU), speed setting and operational status, and the port's interface group, if applicable.

Steps

- 1. To display port information, enter the following command: `network port show`

The following example displays information about network ports that have a data role and are up in the cluster:

```
cluster1::> network port show -role data -link up
```

Node	Port	Role	Link	MTU	Auto-Negot Admin/Oper	Duplex Admin/Oper	Speed (Mbps) Admin/Oper
node1							
	e0M	data	up	1500	true/true	full/full	auto/100
	e0b	data	up	1500	true/true	full/full	auto/1000
node2							
	e0b	data	up	1500	true/true	full/full	auto/1000

- 2. Check for destination ports that are in the same network as the source home port and home node.

For example, the destination home port and home node should be on the same VLAN where applicable.

- 3. To identify the least busy port, choose a data port that has the least number of connections.

Identifying the best node for a busy LIF using OnCommand System Manager

You can display information about all the ports in a cluster. You can view information such as the network port role (cluster, data, or node-management), link status, maximum transmission unit (MTU), speed setting and operational status, and the port's interface group, if applicable.

Steps

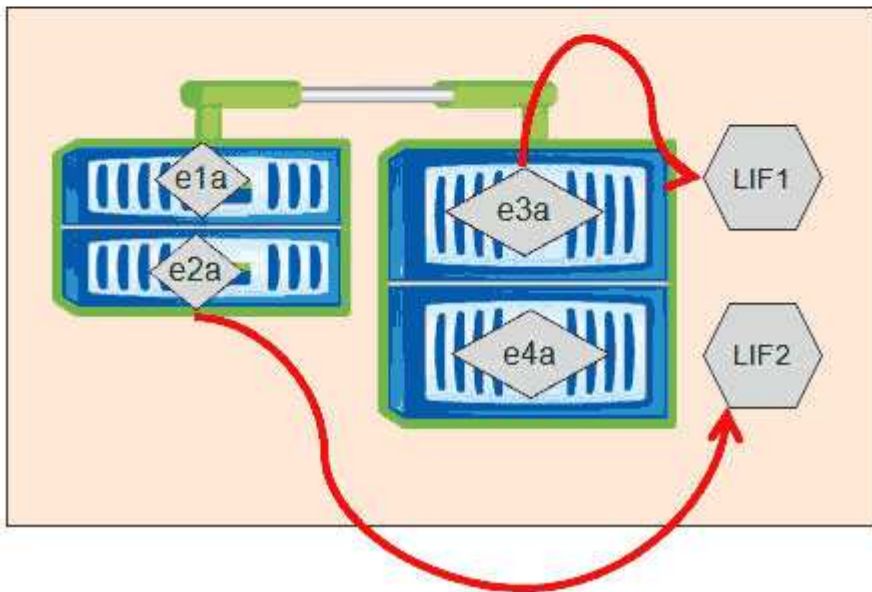
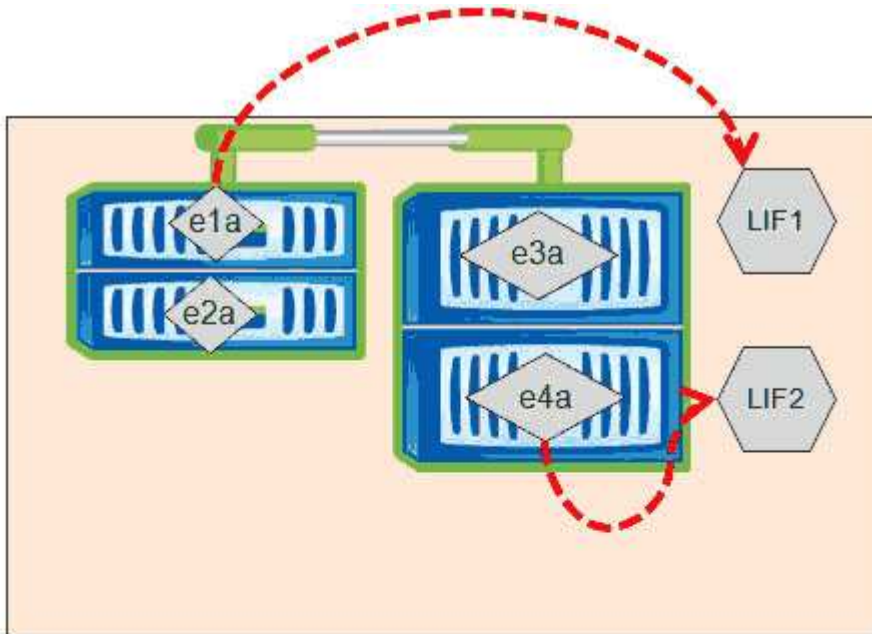
- 1. Open OnCommand System Manager.
- 2. From the **Home** tab, double-click the storage system.
- 3. In the navigation pane, expand the **Nodes** hierarchy.
- 4. To find the active connections on a node, in the navigation pane, select the icon for a node.
- 5. Click the name link of a node and then click **Configuration > Ports/Adapters**.
- 6. Note the highest client count by node.

Changing home port and nodes for a LIF using OnCommand System Manager

You can change the preferred location of a LIF by modifying its home port and home node. This is a more lasting configuration than migrating a LIF, which is typically used to temporarily relocate a LIF to a different node during scheduled maintenance.

About this task

The following image shows the original LIF home port and node and the home port and node after the change. The original LIF1 home port was changed from e1a to e3a and LIF2 was changed from e4a to e2a.



Steps

1. Open OnCommand System Manager.
2. From the **Home** tab, double-click the storage system.
3. In the navigation pane, expand the **SVMs** hierarchy.
4. In the navigation pane, select the SVMs and click **Configuration > Network Interfaces**.
5. Select the LIF and click **Edit**.
6. In the **Edit Interface** dialog box, enter the home port and network address of the target port.

Edit Interface - lif1

Role: data

Status: Enabled

Protocol Access: cifs

Home Port: nucleus-04:e0a

Network address: 199.99.999.99

Netmask: 255.255.255.0

Gateway (Optional): 199.99.999.99



In ONTAP 8.2.1, the Home Port field is disabled.

7. Click **Save and Close**.

Reverting a LIF to its home port using OnCommand System Manager

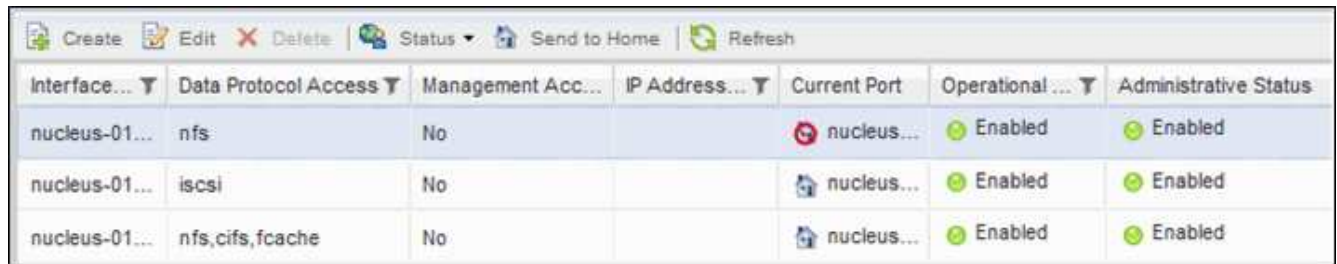
You can revert a LIF from its current port to its home port after it fails over or is migrated to a different port either manually or automatically. You can do this using OnCommand System Manager.




About this task

When creating a LIF, the administrator specifies a home port and home node to use as the preferred location of the LIF. If the home node is unavailable or the home port experiences a physical link outage, the LIF is automatically migrated to a new location. The new location is reported, in OnCommand System Manager for example, as the current port for the LIF. Unless the automatic revert option is enabled, the LIF will remain at this new location until it is reverted.

Steps

1. Open OnCommand System Manager.
2. From the **Home** tab, double-click the storage system.
3. In the navigation pane, expand the **Storage Virtual Machines** hierarchy.
4. In the navigation pane, select the SVM and click **Configuration > Network Interfaces**.
5. Look for data LIFs that display a house icon with a red cross mark, in the **Current Port** column, as in the following image.



Interface...	Data Protocol Access	Management Acc...	IP Address...	Current Port	Operational...	Administrative Status
nucleus-01...	nfs	No		 nucleus...	Enabled	Enabled
nucleus-01...	iscsi	No		 nucleus...	Enabled	Enabled
nucleus-01...	nfs,cifs,fcache	No		 nucleus...	Enabled	Enabled

6. Select the LIF and click **Send to Home**.

This option is enabled only when the selected interface is hosted on a non-home port and when the home port is available.

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