CHAPTER 13

Configuring Link Aggregation

This chapter describes configuring link aggregation and includes the following sections:

- About Link Aggregation, page 13-1
- Configuration Overview, page 13-2
- Configuring Link Aggregation, page 13-3
- Managing Link Aggregation Groups, page 13-4

About Link Aggregation

Link aggregation, also called trunking, is an optional feature available on the Ethernet gateway and is used with Layer 2 Bridging. Link aggregation allows multiple ports to merge logically in a single link. Because the full bandwidth of each physical link is available, bandwidth is not wasted by inefficient routing of traffic. As a result, the entire cluster is utilized more efficiently. Link aggregation offers higher aggregate bandwidth to traffic-heavy servers and reroute capability in case of a single port or cable failure.

Supported Features

Link aggregation supports the following features:

- Standard 802.3ad link aggregation is supported
- Static link aggregation group configuration
- One link aggregation group can be assigned to one bridge-group or to multiple bridge-groups
- Six link aggregation groups are supported for each Ethernet gateway
- VLAN tagging with different VLAN ID is supported
- Seven different frame distribution types are supported
- Each link aggregation group can carry up to 32 VLANs

Load Distribution Types

When configuring link aggregation on a switch that is link aggregation aware, you must select a type of distribution for the switch by using the distribution-type command. (See Table 13-1.)
A link aggregation Ethernet switch is required to use link aggregation on the gateway. It is not required that the distribution type be the same on the Ethernet switch and on the Ethernet gateway, but we recommend that you achieve the same load distribution in both directions.

**Table 13-1  Load Distribution Types**

<table>
<thead>
<tr>
<th>Distribution Type</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>dst-ip</td>
<td>Load distribution is based on the destination IP address. Packets to the same destination are sent on the same port, but packets to different destinations are sent on different ports in the channel.</td>
</tr>
<tr>
<td>dst-mac</td>
<td>IB hosts do not have a MAC address, so load distribution is based on the LID address of the IB node and MAC address of the Ethernet node. Packets to the same destination are sent on the same port, but packets to different destinations are sent on different ports in the channel.</td>
</tr>
<tr>
<td>src-dst-ip</td>
<td>The distribution function is based on a combination of source and destination IP/MAC addresses.</td>
</tr>
<tr>
<td>src-dst-mac</td>
<td>IB hosts do not have a MAC address, so load distribution is based on a combination of the LID address of the IB node and the MAC address of the Ethernet node.</td>
</tr>
<tr>
<td>src-ip</td>
<td>Load distribution is based on the source IP address. Packets to the same destination are sent on the same port, but packets to different destinations are sent on different ports in the channel.</td>
</tr>
<tr>
<td>src-mac</td>
<td>IB hosts do not have a MAC address, so load distribution is based on the source-LID address of the incoming packet. Packets from different hosts use different ports in the channel, but packets from the same host use the same port in the channel.</td>
</tr>
<tr>
<td>round robin</td>
<td>Round Robin is a load balancing algorithm that distributes load in a circular fashion, thereby creating an evenly distributed load. When using redundancy groups and load balancing, selecting the Round Robin distribution can increase performance in many cases. Even with a topology that contains as few as one Ethernet host, the performance benefits from using this distribution type.</td>
</tr>
</tbody>
</table>

**Configuration Overview**

This section describes how to create trunk groups to configure link aggregation between two or more ports on a single gateway, and it includes the following sections:

- Creating a Link Aggregation Interface, page 13-3
- Setting the Distribution Type, page 13-4
- Setting the Distribution on Your Ethernet Switch, page 13-4
- Assigning Ports to the Link Aggregation Group, page 13-4
- Disabling a Link Aggregation Group, page 13-5
- Deleting a Link Aggregation Group, page 13-5
Chapter 13 Configuring Link Aggregation

Configuring Link Aggregation

This section describes how to configure link aggregation and includes the following topics:

- Creating a Link Aggregation Interface, page 13-3
- Setting the Distribution Type, page 13-4
- Setting the Distribution on Your Ethernet Switch, page 13-4
- Assigning Ports to the Link Aggregation Group, page 13-4

The number of link aggregation groups that you can create is limited by the number of gateways that you have.

Creating a Link Aggregation Interface

To create link aggregation interface, perform the following steps:

**Note**

Using link aggregation is not required, but we recommend that you use it for maximum performance.

**Step 1** Specify the trunk interface, and assign a number to the trunk group.

The trunk group ID can be any number between 1 - 256.

```
SFS-3504 # config
SFS-3504 (config)# interface trunk 1
SFS-3504 (config-if-trunk)#
```

**Step 2** Enable the trunk group:

```
SFS-3504 (config-if-trunk)# enable
```
Step 3  (Optional) Assign a name to the trunk group:

```
SFS-3504 (config-if-trunk)# name eth-grp-1
SFS-3504 (config-if-trunk)#
```

### Setting the Distribution Type

If you are using link aggregation, you must set the type of distribution for the trunk group. The default distribution is src-dst-mac. Select a type of distribution that is appropriate for the gateway and your Ethernet switch. For more information, see the “Load Distribution Types” section on page 13-1.

```
SFS-3504 (config-if-trunk)# distribution-type src-mac
SFS-3504 (config-if-trunk)#
```

### Setting the Distribution on Your Ethernet Switch

To set the distribution on your Ethernet switch, perform the following steps:

- **Step 1** Verify that your Ethernet switch that connects to the gateway supports link aggregation.
- **Step 2** Configure the distribution of the corresponding ports on your Ethernet switch. For best performance, use the same distribution-type as you have set for the link aggregation group.

### Assigning Ports to the Link Aggregation Group

To assign ports to the link aggregation group, perform the following steps:

**Note** If you are using link aggregation, you must specify the ports that belong to a particular trunk group.

- **Step 1** Specify the interface and the ports that belong to the first trunk:
  
  ```
  SFS-3504 (config)# interface ethernet 1/1-1/6
  ```

- **Step 2** Enter the trunk group ID or the name of the new trunk:
  
  ```
  SFS-3504 (config-if-ether-1/1-1/6)# trunk-group 1
  ```

- **Step 3** Return to global configuration mode:
  
  ```
  SFS-3504 (config-if-ether-1/1-1/6)# exit
  ```

### Managing Link Aggregation Groups

This section describes how to manage link aggregation groups and includes the following topics:
Disabling a Link Aggregation Group

To disable a link aggregation group without removing it from the configuration, perform the following steps:

**Note**
The link aggregation group can be reenabled later if required.

**Step 1** Start a CLI session.
**Step 2** Enter privileged EXEC mode:

```
SFS-3504 > enable
SFS-3504 
```

**Step 3** Enter global configuration mode:

```
SFS-3504 # configure
SFS-3504 (config)#
```

**Step 4** Specify the trunk interface and the number of the trunk group:

```
SFS-3504 (config)# interface trunk 1
SFS-3504 (config-if-trunk)#
```

**Step 5** Disable the trunk group:

```
SFS-3504 (config-if-trunk)# disable
SFS-3504 (config-if-trunk)#
```

Deleting a Link Aggregation Group

To delete or destroy a link aggregation group, perform the following steps:

**Step 1** Start a CLI session, unless you have already done so.
**Step 2** Enter privileged EXEC mode:

```
SFS-3504 > enable
SFS-3504 
```

**Step 3** Enter global configuration mode:

```
SFS-3504 # configure
SFS-3504 (config)#
```

**Step 4** Specify the trunk interface and the number of the trunk group:

```
SFS-3504 (config)# interface trunk 1
SFS-3504 (config-if-trunk)#
```

**Step 5** Disable the trunk group:

```
SFS-3504 (config)#
```
SFS-3504 (config)# no trunk 1

The trunk group is deleted.

**Step 6** Exit to privileged EXEC mode with the **Ctrl-Z** command:

SFS-3504 (config-if-trunk)# ^Z
SFS-3504 #