Chapter 9

Configuring Uni-Directional Link Detection (UDLD)

Uni-directional Link Detection (UDLD) monitors a link between two HP devices and brings the ports on both ends of the link down if the link goes down at any point between the two devices. This feature is useful for links that are individual ports and for trunk links. Figure 9.1 shows an example.

**Figure 9.1  UDLD example**

Without link keepalive, the Routing Switch ports remain enabled. Traffic continues to be load balanced to the ports connected to the failed link.

When link keepalive is enabled, the feature brings down the ports connected to the failed link.

![Diagram of UDLD example](image)

Normally, an HP device load balances traffic across the ports in a trunk group. In this example, each HP device load balances traffic across two ports. Without the UDLD feature, a link failure on a link that is not directly attached to one of the HP devices is undetected by the HP devices. As a result, the HP devices continue to send traffic on the ports connected to the failed link.

When UDLD is enabled on the trunk ports on each HP device, the devices detect the failed link, disable the ports connected to the failed link, and use the remaining ports in the trunk group to forward the traffic.

Ports enabled for UDLD exchange proprietary health-check packets once every second (the keepalive interval). If a port does not receive a health-check packet from the port at the other end of the link within the keepalive interval, the port waits for two more intervals. If the port still does not receive a health-check packet after waiting for three intervals, the port concludes that the link has failed and takes the port down.

**Configuration Considerations**

- The feature is supported only on Ethernet ports.
• To configure UDLD on a trunk group, you must configure the feature on each port of the group individually. Configuring UDLD on a trunk group's primary port enables the feature on that port only.
• Dynamic trunking is not supported. If you want to configure a trunk group that contains ports on which UDLD is enabled, you must remove the UDLD configuration from the ports. After you create the trunk group, you can re-add the UDLD configuration.

Configuring UDLD

To enable UDLD on a port, enter a command such as the following at the global CONFIG level of the CLI:

ProCurveRS(config)# link-keepalive ethernet 1/1

Syntax: [no] link-keepalive ethernet <portnum> [ethernet <portnum>]

To enable the feature on a trunk group, enter commands such as the following:

ProCurveRS(config)# link-keepalive ethernet 1/1 ethernet 1/2
ProCurveRS(config)# link-keepalive ethernet 1/3 ethernet 1/4

These commands enable UDLD on ports 1/1 – 1/4. You can specify up to two ports on the same command line.

Changing the Keepalive Interval

By default, ports enabled for UDLD send a link health-check packet once every 500 ms. You can change the interval to a value from 1 – 60, where 1 is 100 ms, 2 is 200 ms, and so on. To change the interval, enter a command such as the following:

ProCurveRS(config)# link-keepalive interval 3

Syntax: [no] link-keepalive interval <num>

The <num> parameter specifies how often the ports send a UDLD packet. You can specify from 1 – 60, in 100 ms increments. The default is 5 (500 ms).

Changing the Keepalive Retries

By default, a port waits one second to receive a health-check reply packet from the port at the other end of the link. If the port does not receive a reply, the port tries four more times by sending up to four more health-check packets. If the port still does not receive a reply after the maximum number of retries, the port goes down.

You can change the maximum number of keepalive attempts to a value from 3 – 10. To change the maximum number of attempts, enter a command such as the following:

ProCurveRS(config)# link-keepalive retries 4

Syntax: [no] link-keepalive retries <num>

The <num> parameter specifies the maximum number of times the port will try the health check. You can specify a value from 3 – 10. The default is 5.

UDLD for Tagged Ports

The default implementation of UDLD sends the packets untagged, even across tagged ports. If the untagged UDLD packet is received by a third-party switch, that switch may reject the packet. As a result, UDLD may be limited only to HP devices, since UDLD may not function on third-party switches.

Beginning with Enterprise software release 07.6.06, you can configure ports to send out UDLD control packets that are tagged with a specific VLAN ID as tagged UDLD control packets. The enhancement also allows third party switches to receive the control packets that are tagged with the specified VLAN.

To allow ports to receive and send UDLD control packets tagged with a specific VLAN ID, enter commands such as the following:

ProCurveRS(config)# link-keepalive ethernet 1/10 vlan 22
This command enables UDLD on port 1/18 and allows UDLD control packets tagged with VLAN 22 to be received and sent on port 1/18.

**Syntax:** [no] link-keepalive ethernet <portnum> [vlan <vlan-ID>]

Enter the slot number (if applicable) and the port number of the Ethernet port.
Enter the ID of the VLAN that the UDLD control packets can contain to be received and sent on the port. If a VLAN ID is not specified, then UDLD control packets are sent out of the port as untagged packets.

**NOTE:** You must configure the same VLANs that will be used for UDLD on all devices across the network; otherwise, the UDLD link cannot be maintained.

### Displaying UDLD Information

#### Displaying Information for All Ports

To display UDLD information for all ports, enter the following command:

```
ProCurveRS(config)# show link-keepalive
```

Total link-keepalive enabled ports: 4
Keepalive Retries: 3  Keepalive Interval: 1 Sec.

<table>
<thead>
<tr>
<th>Port</th>
<th>Physical Link</th>
<th>Logical Link</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/1</td>
<td>up</td>
<td>up</td>
<td>FORWARDING</td>
</tr>
<tr>
<td>4/2</td>
<td>up</td>
<td>up</td>
<td>FORWARDING</td>
</tr>
<tr>
<td>4/3</td>
<td>down</td>
<td>down</td>
<td>DISABLED</td>
</tr>
<tr>
<td>4/4</td>
<td>up</td>
<td>down</td>
<td>DISABLED</td>
</tr>
</tbody>
</table>

**Syntax:** show link-keepalive [ethernet <portnum>]

<table>
<thead>
<tr>
<th>This Field...</th>
<th>Displays...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total link-keepalive enabled ports</td>
<td>The total number of ports on which UDLD is enabled.</td>
</tr>
<tr>
<td>Keepalive Retries</td>
<td>The number of times a port will attempt the health check before concluding that the link is down.</td>
</tr>
<tr>
<td>Keepalive Interval</td>
<td>The number of seconds between health check packets.</td>
</tr>
<tr>
<td>Port</td>
<td>The port number.</td>
</tr>
<tr>
<td>Physical Link</td>
<td>The state of the physical link. This is the link between the HP port and the directly connected device.</td>
</tr>
<tr>
<td>Logical Link</td>
<td>The state of the logical link. This is the state of the link between this HP port and the HP port on the other end of the link.</td>
</tr>
<tr>
<td>State</td>
<td>The traffic state of the port.</td>
</tr>
</tbody>
</table>

Table 9.1: CLI Display of UDLD Information
If a port is disabled by UDLD, the change also is indicated in the output of the `show interfaces brief` command. Here is an example:

```
ProCurveRS(config)# show interface brief
```

```
<table>
<thead>
<tr>
<th>Port</th>
<th>Link State</th>
<th>Dupl</th>
<th>Speed</th>
<th>Trunk</th>
<th>Tag</th>
<th>Priori</th>
<th>MAC</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1</td>
<td>Up</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>00e0.52a9.bb00</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>Down</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>00e0.52a9.bb01</td>
<td></td>
</tr>
<tr>
<td>1/3</td>
<td>Down</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>00e0.52a9.bb02</td>
<td></td>
</tr>
<tr>
<td>1/4</td>
<td>Down</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>00e0.52a9.bb03</td>
<td></td>
</tr>
</tbody>
</table>
```

If the port was already down before you enabled UDLD for the port, the port's state is listed as None.

**Syntax**: show interface brief

Beginning with Enterprise software release 07.6.06, the `show link-keepalive` command shows the following:

```
ProCurveRS(config)# show link-keepalive ethernet
```

```
Current State : down  Remote MAC Addr : 0000.0000.0000
Local Port     : 1/1    Remote Port : n/a
Local System ID: e0eb8e00 Remote System ID : 00000000
Packets sent   : 0      Packets received : 0
Transitions    : 0      Link-vlan : 100
Port blocking  : No     BM disabled : Yes
```

The Link-vlan entry shows the ID of the tagged VLAN in the UDLD packet.

**Syntax**: show link-keepalive ethernet

### Displaying Information for a Single Port

To display detailed UDLD information for a specific port, enter a command such as the following:

```
ProCurveRS(config)# show link-keepalive ethernet 4/1
```

```
Current State : up     Remote MAC Addr : 00e0.52d2.5100
Local Port    : 4/1    Remote Port : 2/1
Local System ID: e0927400 Remote System ID : e0d25100
Packets sent  : 254    Packets received : 255
Transitions   : 1
Port blocking : No     BM disabled : No
```

<table>
<thead>
<tr>
<th>Table 9.2: CLI Display of Detailed UDLD Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>This Field...</strong></td>
</tr>
<tr>
<td>Current State</td>
</tr>
<tr>
<td>Remote MAC Addr</td>
</tr>
</tbody>
</table>
Table 9.2: CLI Display of Detailed UDLD Information (Continued)

<table>
<thead>
<tr>
<th>This Field...</th>
<th>Displays...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Port</td>
<td>The port number on this HP device.</td>
</tr>
<tr>
<td>Remote Port</td>
<td>The port number on the HP device at the remote end of the link.</td>
</tr>
<tr>
<td>Local System ID</td>
<td>A unique value that identifies this HP device. The ID can be used by HP technical support for troubleshooting.</td>
</tr>
<tr>
<td>Remote System ID</td>
<td>A unique value that identifies the HP device at the remote end of the link.</td>
</tr>
<tr>
<td>Packets sent</td>
<td>The number of UDLD health-check packets sent on this port.</td>
</tr>
<tr>
<td>Packets received</td>
<td>The number of UDLD health-check packets received on this port.</td>
</tr>
<tr>
<td>Transitions</td>
<td>The number of times the logical link state has changed between up and down.</td>
</tr>
<tr>
<td>Port blocking</td>
<td>Information used by HP technical support for troubleshooting.</td>
</tr>
<tr>
<td>BM disabled</td>
<td>Information used by HP technical support for troubleshooting.</td>
</tr>
</tbody>
</table>

The show interface ethernet <portnum> command also displays the UDLD state for an individual port. In addition, the line protocol state listed in the first line will say “down” if UDLD has brought the port down. Here is an example:

ProCurveRS(config)# show interface ethernet 1/1
FastEthernet1/1 is down, line protocol is down, link keepalive is enabled
Hardware is FastEthernet, address is 00e0.52a9.bbca (bia 00e0.52a9.bbca)
Configured speed auto, actual unknown, configured duplex fdx, actual unknown
Member of L2 VLAN ID 1, port is untagged, port state is DISABLED
STP configured to ON, priority is level10, flow control enabled
mirror disabled, monitor disabled
Not member of any active trunks
Not member of any configured trunks
No port name
300 second input rate: 0 bits/sec, 0 packets/sec, 0.00% utilization
300 second output rate: 0 bits/sec, 0 packets/sec, 0.00% utilization
0 packets input, 0 bytes, 0 no buffer
Received 0 broadcasts, 0 multicasts, 0 unicasts
0 input errors, 0 CRC, 0 frame, 0 ignored
0 runts, 0 giants, DMA received 0 packets
19 packets output, 1216 bytes, 0 underruns
Transmitted 0 broadcasts, 0 multicasts, 0 unicasts
0 output errors, 0 collisions, DMA transmitted 19 packets

In this example, the port has been brought down by UDLD. Notice that in addition to the information in the first line, the port state on the fourth line of the display is listed as DISABLED.

Clearing UDLD Statistics

To clear UDLD statistics, enter the following command:

ProCurveRS# clear link-keepalive statistics

*Syntax:* clear link-keepalive statistics
This command clears the Packets sent, Packets received, and Transitions counters in the `show link keepalive ethernet <portnum>` display.