Datacom Systems LINKprotect® for SS-1200/2200/4200 Series Aggregation Taps

Definition:

The LINKprotect® feature on SINGLEstream taps allows the endpoint devices of tapped links to quickly identify if link status goes down.

This feature is available to SINGLEstream taps with copper network ports. This feature is not required on fiber taps, since they are completely passive and the endpoints do not negotiate with the SINGLEstream.

Note that if LINKprotect® is enabled and the network ports are not connected, the SINGLEstream will make clicking sounds. The clicking sounds are part of the default configuration of the LINKprotect® feature, when one or both network ports don't have link.
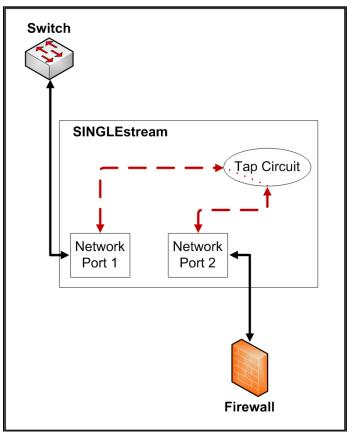

Figure 1 - Default SINGLEstream Traffic Flow

Normal SINGLEstream operation:

The Taps use an ASIC for tapping the data, and to create copies of the data for tools. When the tap is powered and connected on both network ports, traffic flows between the ports while passing through the ASIC.
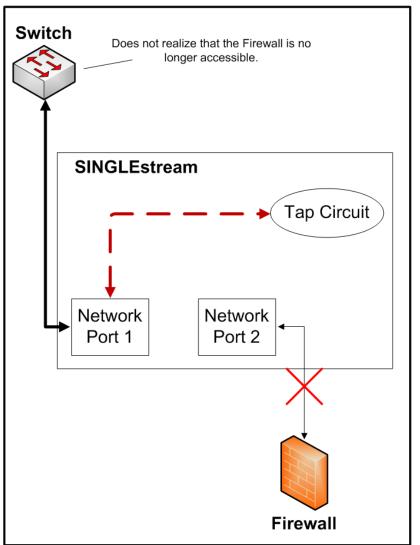

Figure 2 - LINKprotect® Not Enabled

LINKprotect® example:

If link state is lost between the SINGLEstream and the Firewall, network traffic between the Switch and Firewall will be interrupted.

On a tap **without** LINKprotect® enabled, the Switch would be unaware that the link has gone down. This is because the Switch is still linked to the SINGLEstream.
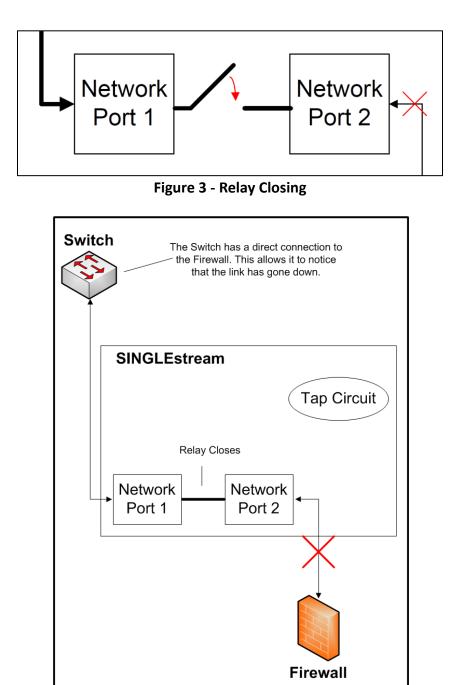
Figure 3 - Relay Closing

Figure 4 - After the Relay Closes

On a tap **with** LINKprotect® enabled, the SINGLEstream will notice that the link has been broken on the Firewall's side. After a user-configured period of time, a set of relays within the network port pair will close. This makes the SINGLEstream temporarily behave like a piece of copper wire, and will allow each endpoint to directly connect to each other. Since the endpoints will now be directly connected, the Switch now sees that the link to the Firewall has gone down.

What happens after the relays close?

LINKprotect® has two separate modes of configuration: Manual mode and Auto mode. The mode selected dictates the behaviour of the network port pair after the relays have been closed.
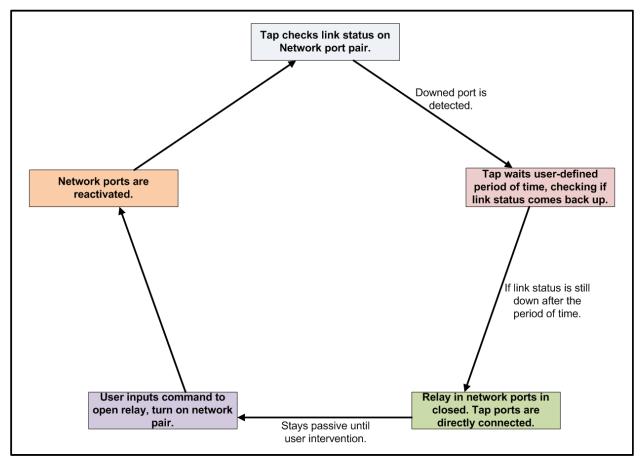

Figure 5 – Manual Reconnect Mode Flow Diagram

Manual mode: When the relays close as a result of LINKprotect® activating, the relay will stay closed until the user initiates a command to the SINGLEstream to reactivate the network ports. Once a failover occurs in this mode, the monitoring tools connected to the SINGLEstream will not receive traffic until there is intervention by the user. The SINGLEstream will not try and resurrect the link in this mode, which is often preferable on some redundant/HA systems in place on the network devices connected to the SINGLEstream. See page 6 for an example on recovering the ports once they fail over.
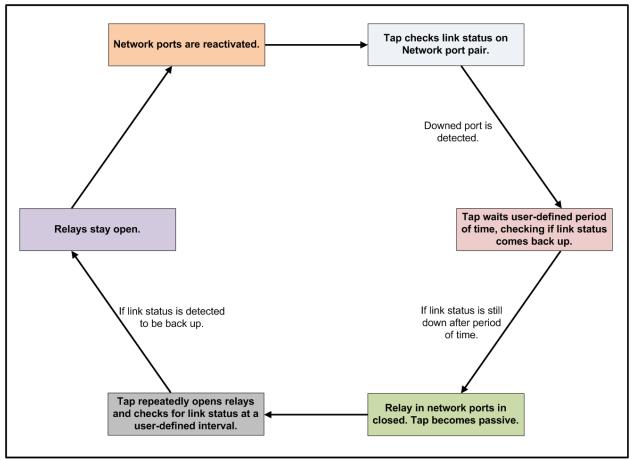
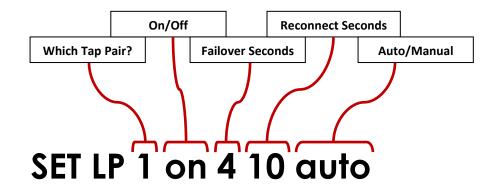**Figure 6 – Auto Reconnect Mode Flow Diagram**

Auto mode:

When the relays close as a result of LINKprotect® activating, the Tap will wait a user-programmed period of time before attempting to reactivate the network ports. Once a failover occurs in this mode, the monitoring tools connected to the SINGLEstream will not receive traffic until link has been re-established on the network ports. This mode allows the SINGLEstream to keep checking to see if link status has been recovered. If it detects that the link has been recovered, it will place the network pair back into normal operation mode and send traffic to the monitoring ports. Both Tap ports may go up/down to check the link status.

LINKprotect® Commands:

Which Tap Pair?	On/Off	Failover Seconds	Reconnect Seconds	Auto/Manual

SET LP 1 on 4 10 auto

Which Tap Pair: This part of the command indicates which Tap pair is being modified. Some SINGLEstream devices have multiple pairs of Taps.

On/Off: This part of the command determines if the tap pair will have LINKprotect® enabled or disabled. If the syntax to this part of the command is set to "off" the command can be entered after this value.

Failover Seconds: This part of the command determines the period of time between one of the network ports going down and the Tap going into failover state.

Reconnect Seconds: This part of the command determines the timer between each attempt for the Tap to reconnect to the endpoints. If the tap is unable to reconnect to the endpoints, the timer starts over. Only available in "Auto" mode.

Auto/Manual: This part of the command determines whether the SINGLEstream attempts to reconnect to the endpoint devices once it has failed over. In "AUTO" mode the tap will refer to the "Reconnect Seconds" to determine when it will try to reconnect. In "MANUAL" mode, the network ports will stay failed over until the user manually inputs the LINKprotect® command again to reactivate it.

Recover the ports (Manual mode only): In order to bring the ports back online following a failover, enter the LINKprotect® command again. This is typically done once the link has been repaired, and monitoring needs to be resumed. See example 3 for the syntax of this command.

Example #1: SET LP 1 on 4 10 AUTO. This command will turn LINKprotect® on for the first network pair. If one of the two network ports goes down for more than 4 seconds, the port pair will go into failover state. Every 10 seconds after the failover, the Tap will try and reconnect to the end devices to see if link is possible.

Example #2: SET LP 1 on 5 10 AUTO. This command will turn LINKprotect® on for the first network pair. If one of the two network ports goes down for more than 5 seconds, the port pair will go into failover state. Every 10 seconds after the failover, the Tap will try and reconnect to the end devices to see if link is possible.

Example #3: SET LP 1 on 4 3600 MANUAL. This command will turn LINKprotect® on for the first network pair. The command can also be used to override the failover on a network pair once the relay has closed. If one of the two network ports goes down for more than 4 seconds, the port pair will go into failover state. The port pair will not reactivate until a LINKprotect® command has been entered to manually override the failover.

Example #4: SET LP 1 off. This command will turn LINKprotect® off for the first network pair.