CLAIMS

What is claimed is:

1. A method supporting a distributed resilient network interconnect (DRNI) in a link aggregation group upon communication failure at a network device, wherein the network device and a neighbor network device are included in a first portal of the link aggregation group, wherein the first portal is coupled via links of the link aggregation group with a second portal including of two or more remote network devices, wherein one of the remote network devices is a partner network device of the network device of the link aggregation group, and wherein the network device is communicatively coupled to the neighbor network device via an intra-portal port (IPP) using an intra-portal link (IPL), the method comprising:

   determining (2802) that the network device no longer communicates with the neighbor network device;

   determining (2802) that the network device no longer communicates with the neighbor network device;

   determining (2804) that the partner network device no longer communicates with the partner network device's neighbor network device;

   determining (2806) that the first portal has a higher portal priority than the second portal, wherein each portal is assigned a portal priority;

   determining (2808) that the network device has a lower network device priority than the neighbor network device, wherein each network device is assigned a network device priority; and

   halting (2810) transmitting and receiving frames of the link aggregation group at the network device following the four determinations above.

2. The method of claim 1, wherein the network device no longer communicating with the neighbor network device causes the network device to send a link aggregation control protocol data unit (LACPDU) including a port conversation mask type/length/value (TLV) containing a portal state indicator, referred to as portal system isolated (PSI), wherein the PSI indicates a status of no communication.

3. The method of claim 2, wherein the PSI is a Boolean value, and wherein the Boolean value is set to true when the IPP is determined to be inactive.

4. The method of any of claims 1 to 3, wherein determining that the partner network device is no longer communicating with the partner network device's neighbor network device comprises:

checking a received port conversation mask TLV containing a PSI indicating a status of no communication for the partner network device.

5. The method of any of claims 1 to 3, wherein determining the first portal having the higher portal priority than the second portal comprises:

comparing a value of a first portal system identifier to a value of a second portal system identifier; and

determining that the value of the first portal system identifier is lower than the value of the second portal system identifier.

6. The method of any of claims 1 to 3, wherein determining that the network device has the lower network device priority than the neighbor network device comprises:

comparing a portal system number of the network device to a portal system number of the neighbor network device; and

determining the portal system number of the network device is higher than the portal system number of the neighbor network device.

7. A network device supporting a distributed resilient network interconnect (DRNI) in a link aggregation group upon communication failure, wherein the network device and a neighbor network device are included in a first portal of the link aggregation group, wherein the first portal is coupled via links of the link aggregation group with a second portal including two or more remote network devices, wherein one of the remote network devices is a partner network device of the network device of the link aggregation group, and wherein the network device is communicatively coupled to the neighbor network device via an intra-portal port (IPP) using an intra-portal link (IPL), the network device comprising:

ports (1340) coupled to the physical or aggregation link of the link aggregation group;

a network processor (1300) coupled to the ports, the network processor executing a DRNI function (1313), the DRNI function operative to determine that the network device no longer communicates with the neighbor network device, further operative to determine that the partner network device no longer communicates with the partner network device's neighbor network device,

further operative to determine that the first portal has a higher portal priority than the second portal, wherein each portal is assigned a portal priority, further operative determine that the network device has a lower network device priority than the neighbor network device, wherein each network device is assigned a network device priority, and further operative to cause the ports halting transmitting and receiving frames of the link aggregation group at the network device.

8. The network device of claim 7, wherein the network device no longer communicating with the neighbor network device is to cause the network device to send a link aggregation control protocol data unit (LACPDU) including a port conversation mask type/length/value (TLV) containing a portal state indicator, referred to as portal system isolated (PSI), and wherein the PSI is to indicate a status of no communication.

9. The network device of claim 8, wherein the PSI is a Boolean value, and wherein the Boolean value is set to true when the IPP is determined to be inactive.

10. The network device of any of claims 7 to 9, wherein the DRNI function is operative to determine that the partner network device no longer communicates with the partner network device's neighbor network device through:
    a check of a received port conversation mask TLV containing a PSI indicating a status of no communication for the partner network device.

11. The network device of any of claims 7 to 9, wherein the DRNI function is operative to determine that the first portal has a higher portal priority than the second portal through
    a comparison of a value of a first portal system identifier to a value of a second portal system identifier; and
    a determination of the value of the first portal system identifier being lower than the value of the second portal system identifier.

12. The network device of any of claims 7 to 9, wherein the DRNI function is operative to determine that the network device has the lower network device priority than the neighbor network device through:
    a comparison of a portal system number of the network device to a portal system number of the neighbor network device; and
    a determination of the portal system number of the network device being higher than portal system number of the neighbor network device.

13. A non-transitory machine-readable storage medium having instructions stored therein, which when executed by a processor, cause the processor to perform operations at a network device to support a distributed resilient network interconnect (DRNI) in a link aggregation group upon communication failure, wherein the network device and a neighbor network device are included in a first portal of the link aggregation group, wherein the first portal is coupled via links of the link aggregation group with a second portal including of two or more remote network devices, wherein one of the remote network devices is a partner network device of the network device of the link aggregation group, and wherein the network device is communicatively coupled to the neighbor network device via an intra-portal port (IPP) using an intra-portal link (IPL), the operations comprising:

determining (2802) that the network device no longer communicates with the neighbor network device;

determining (2804) that the partner network device no longer communicates with the partner network device's neighbor network device;

determining (2806) that the first portal has a higher portal priority than the second portal, wherein each portal is assigned a portal priority;

determining (2808) that the network device has a lower network device priority than the neighbor network device, wherein each network device is assigned a network device priority; and

halting (2810) transmitting and receiving frames of the link aggregation group at the network device.

14. The non-transitory machine-readable storage medium of claim 13, wherein the network device no longer communicating with the neighbor network device causes the network device to send a link aggregation control protocol data unit (LACPDU) including a port conversation mask type/length/value (TLV) containing a portal state indicator, referred to as portal system isolated (PSI), wherein the PSI indicates a status of no communication.

15. The non-transitory machine-readable storage medium of claim 14, wherein the PSI is a Boolean value, and wherein the Boolean value is set to true when the IPP is determined to be inactive.

16. The non-transitory machine-readable storage medium of any of claims 13 to 15, wherein determining that the partner network device is no longer communicating with the partner network device's neighbor network device comprises:

checking a received port conversation mask TLV containing a PSI indicating a status of no communication for the partner network device.

17. The non-transitory machine-readable storage medium of any of claims 13 to 15, wherein determining the first portal having the higher portal priority than the second portal comprises:

comparing a value of a first portal system identifier to a value of a second portal system identifier; and

determining that the value of the first portal system identifier is lower than the value of the second portal system identifier.

18. The non-transitory machine-readable storage medium of any of claims 13 to 15, wherein determining that the network device has the lower network device priority than the neighbor network device comprises:

comparing a portal system number of the network device to a portal system number of the neighbor network device; and

determining the portal system number of the network device is higher than the portal system number of the neighbor network device.

19. A method supporting a distributed resilient network interconnect (DRNI) in a link aggregation group at a network device upon communication failure, wherein the network device and a neighbor network device are included in a first portal of the link aggregation group, wherein the first portal is coupled via links of the link aggregation group with a second portal including two or more remote network devices, wherein one of the remote network devices is a partner network device of the network device of the link aggregation group, and wherein the network device is communicatively coupled to the neighbor network device via an intra-portal port (IPP) using an intra-portal link (IPL), the method comprising:

determining (2702) that the network device receives traffic from the partner network device;

determining (2704) that the network device is coupled to the neighbor network device in the first portal of the link aggregation group;

determining (2706) that an operation key received from the partner network device has been updated;

determining (2708) that the network device no longer communicates with the neighbor network device; and

halting (2710) transmitting and receiving frames of the link aggregation group at the network device upon determining that the first portal has a higher portal priority than the second portal, wherein each portal is assigned a portal priority.

20. The method of claim 19, wherein determining that the operation key received from the partner network device has been updated comprises:

determining that the most significant two bits of a received partner operation key indicate a value of 2 or 3; and

determining that the least significant two bits of an aggregation port's partner operation port priority indicate a value of 2 or 3.

21. The method of claim 19 or 20, wherein determining that the first portal has the higher portal priority comprises:

comparing a value of a first portal system identifier to a value of a second portal system identifier; and

determining that the value of the first portal system identifier is lower than the value of the second portal system identifier.

22. A network device supporting a distributed resilient network interconnect (DRNI) in a link aggregation group upon communication failure, wherein the network device and a neighbor network device are included in a first portal of the link aggregation group, wherein the first portal is coupled via links of the link aggregation group with a second portal including two or more remote network devices, wherein one of the remote network devices is a partner network device of the network device of the link

aggregation group, and wherein the network device is communicatively coupled to the neighbor network device via an intra-portal port (IPP) using an intra-portal link (IPL), the network device comprising:

ports (1340) coupled to the physical or aggregation link of the link aggregation group; and

a network processor (1300) coupled to the ports, the network processor executing a DRNI function (1313), the DRNI function operative to determine that the network device receives traffic from the partner network device, further operative to determine that the network device is coupled to the neighbor network device in the first portal of the link aggregation group, further operative to determine that an operation key received from the partner network device has been updated, further operative to determine that the network device no longer communicates with the neighbor network device, and further operative to cause the ports halting transmitting and

receiving frames of the link aggregation group at the network device upon determining that the first portal has a higher portal priority than the second portal, wherein each portal is assigned a portal priority.

23. The network device of claim 22, wherein the DRNI function is operative to determine that the operation key received from the partner network device has been updated through:
a determination that the most significant two bits of a received partner operation key indicate a value of 2 or 3; and
a determination that the least significant two bits of an aggregation port's partner operation port priority indicate a value of 2 or 3.

24. The network device of claim 22 or 23, wherein the DRNI function is operative to determine that the first portal has the higher portal priority through:
a comparison of a value of a first portal system identifier to a value of a second portal system identifier; and
a determination of the value of the first portal system identifier being lower than the value of the second portal system identifier.

25. A non-transitory machine-readable storage medium having instructions stored therein, which when executed by a processor, cause the processor to perform operations at a network device to support a distributed resilient network interconnect (DRNI) in a link aggregation group upon communication failure, wherein the network device and a neighbor network device are included in a first portal of the link aggregation group, wherein the first portal is coupled via links of the link aggregation group with a second portal including two or more remote network devices, wherein one of the remote network devices is a partner network device of the network device of the link
aggregation group, and wherein the network device is communicatively coupled to the neighbor network device via an intra-portal port (IPP) using an intra-portal link (IPL), the operations comprising:
determining (2702) that the network device receives traffic from the partner network device;
determining (2704) that the network device is coupled to the neighbor network device in the first portal of the link aggregation group;
determining (2706) that an operation key received from the partner network device has been updated;
determining (2708) that the network device no longer communicates with the neighbor network device; and

halting (2710) transmitting and receiving frames of the link aggregation group at the network device upon determining that the first portal has a higher portal priority than the second portal, wherein each portal is assigned a portal priority.

26. The non-transitory machine-readable storage medium of claim 25, wherein determining that the operation key received from the partner network device has been updated comprises:

determining that the most significant two bits of a received partner operation key indicate a value of 2 or 3; and

determining that the least significant two bits of an aggregation port's partner operation port priority indicate a value of 2 or 3.

27. The non-transitory machine-readable storage medium of claim 25 or 26, wherein

determining that the first portal has the higher portal priority comprises:

comparing a value of a first portal system identifier to a value of a second portal system identifier; and

determining that the value of the first portal system identifier is lower than the value of the second portal system identifier.

28. A computer program supporting a distributed resilient network interconnect (DRNI) in a link aggregation group, comprising instructions which, when executed on at least one processor, causes the at least one processor to carry out the method according to any one of claims 1 to 6.

29. A computer program supporting a distributed resilient network interconnect (DRNI) in a link aggregation group, comprising instructions which, when executed on at least one processor, causes the at least one processor to carry out the method according to any one of claims 19 to 21.