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DRNI – An Application perspective

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DRNI as an ENNI into a single Carrier N/W (1)

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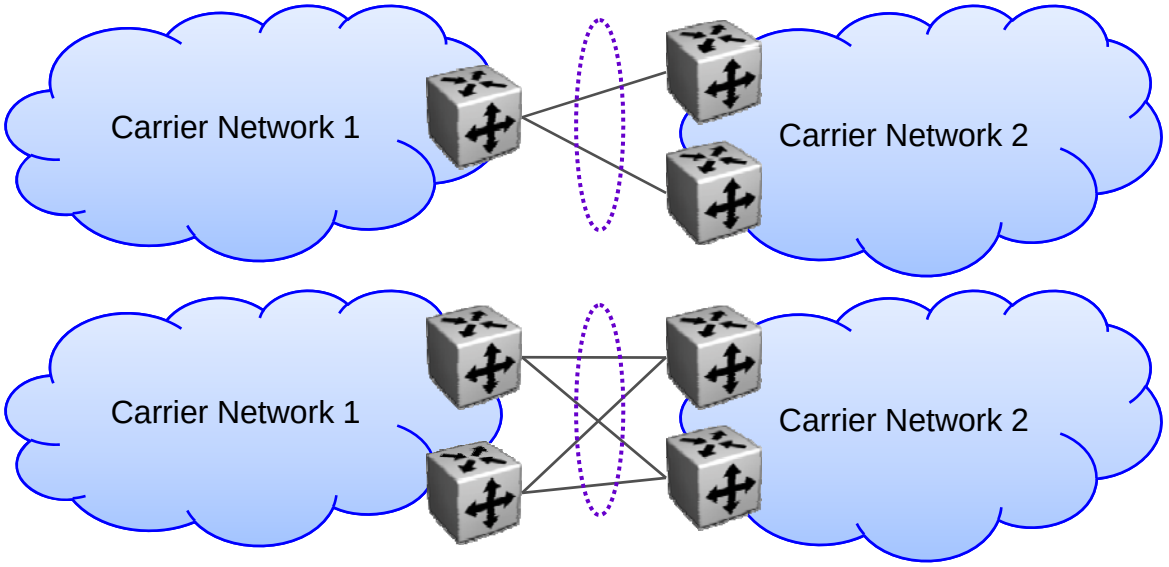
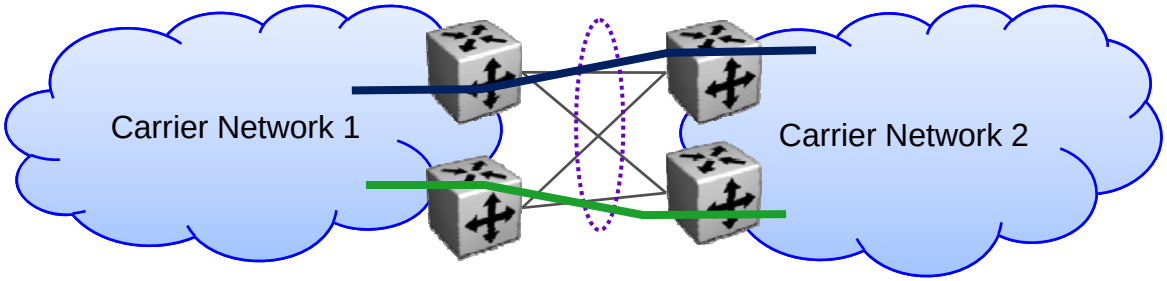
- DRNI as an ENNI into a single Carrier network
  - Provides Node and Link level redundancy into a Carrier Network
  - Requires load-balancing of services on the DRNI
  - The DRNI could be connected to different vendor nodes → Requires interoperability between different vendors
  - Requires hair-pinning of services
  - Required backward compatibility



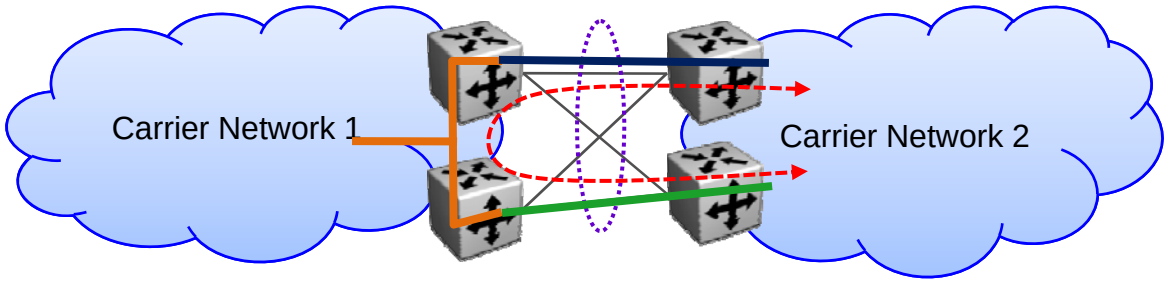
Example configuration 1 (needs to be backward compatible)

Example configuration 2

DRNI as an ENNI into a single Carrier N/W (2) Service Perspective



Load-balancing



Hair-pinning

DRNI as an ENNI into different Carrier N/Ws (1)

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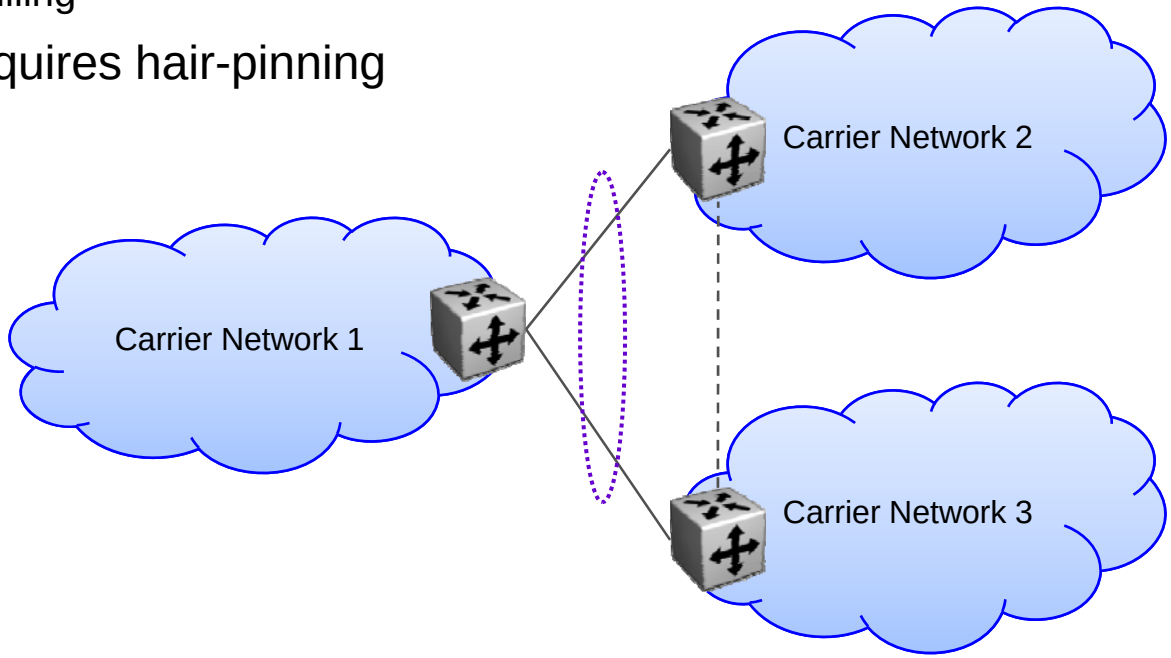
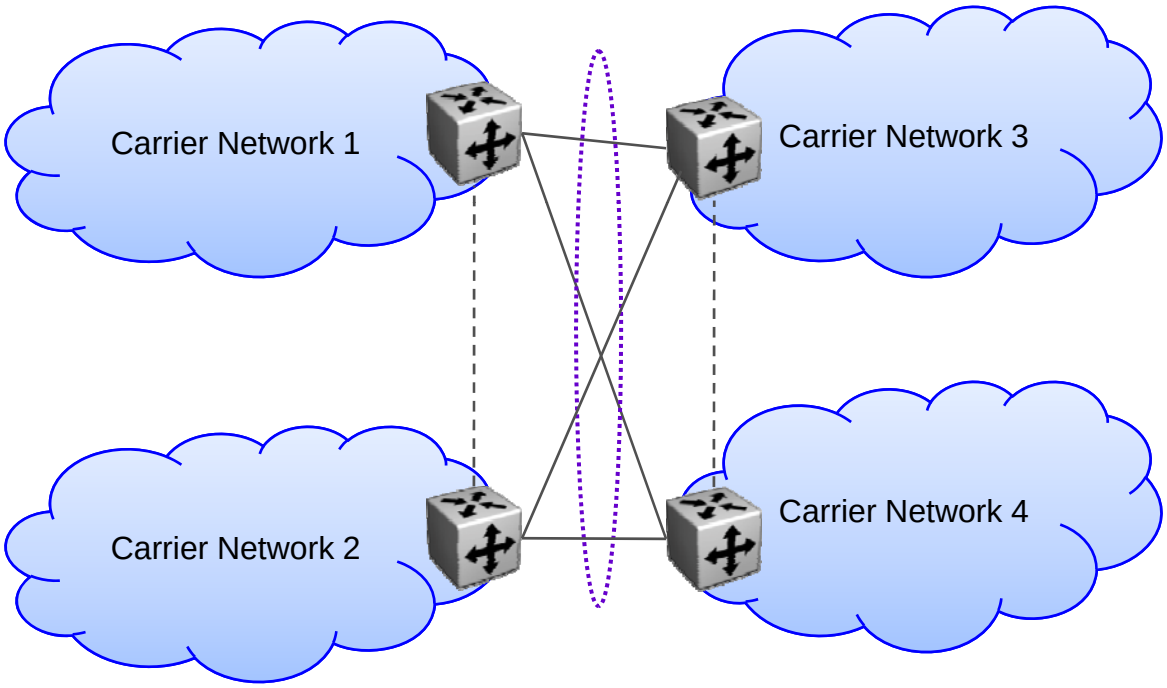
- DRNI as an ENNI into different Carrier Networks
  - Different links within a DRNI connected to different Carriers
  - Provides link and node level redundancy
  - Requires load-balancing of services on the DRNI
    - mapping of services to a specific carrier is required for the purposes of accounting and billing
  - Requires hair-pinning



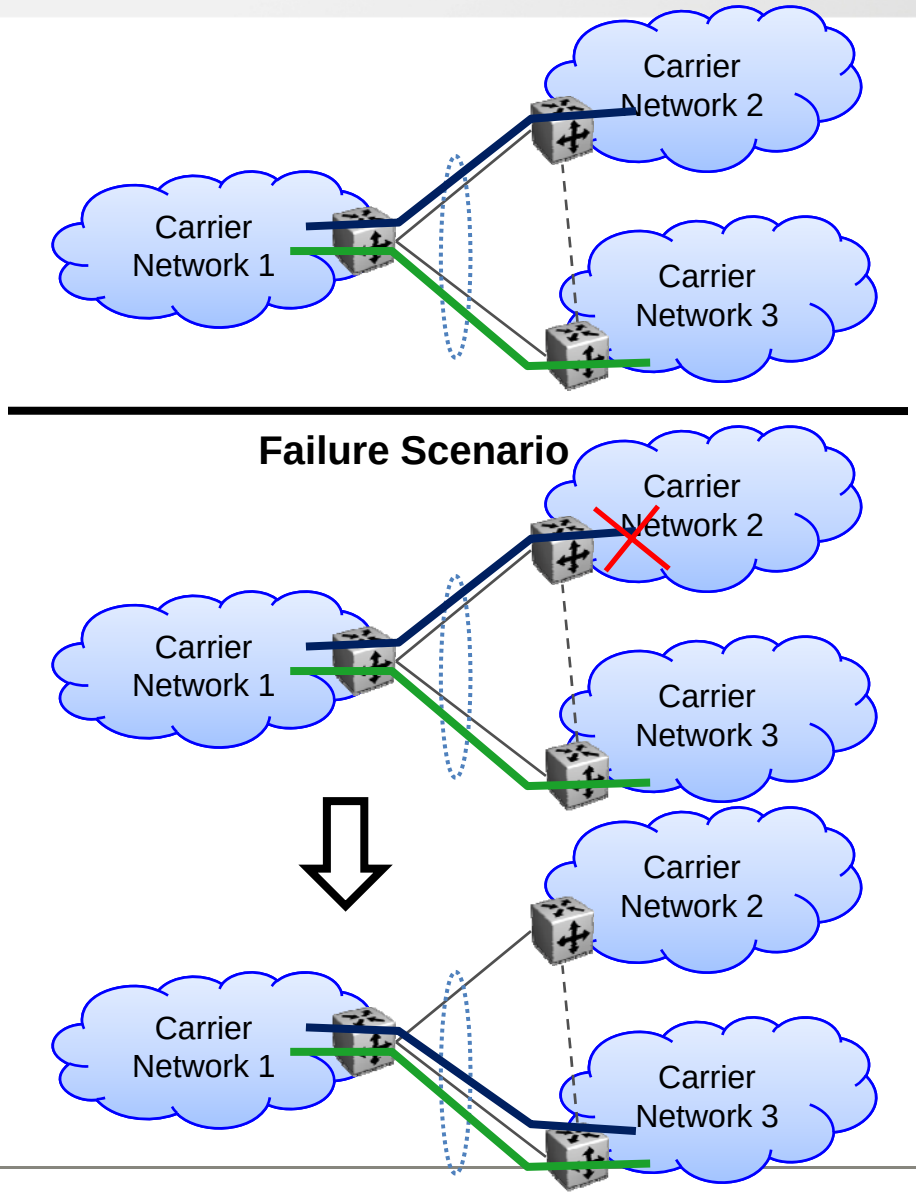
Example configuration 1

DRNI as an ENNI into different Carrier N/Ws (2)



Example configuration 2

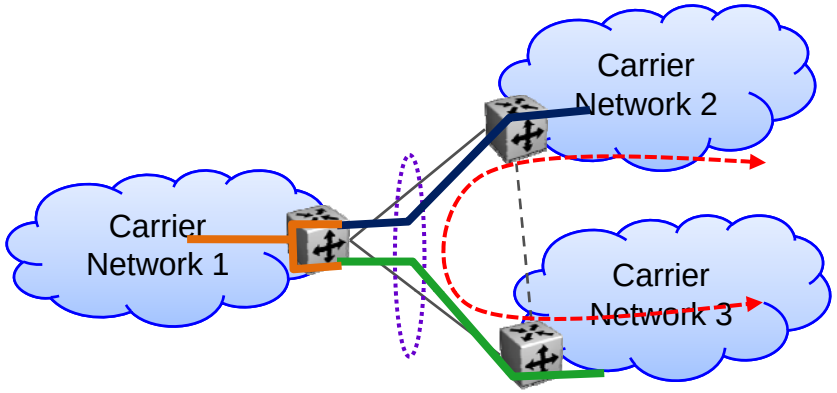
DRNI as an ENNI into different Carrier N/Ws (3) Service Perspective



Load-balancing

- How services are Load-balanced between Carriers should be driven entirely by static configuration.
- This is because a single service will likely be forwarded only by one Carrier Network at any given time. It is unlikely that a completely independent load-balancing scheme would be employed.
- This will be because there will be agreements between the Carrier/peering networks on their peering relationship(s)
- However, there could be an agreement that if a service fails in one carrier then the other Carrier takes over and forwards that service
- For instance, if Carrier N/W 2 fails to forward the Blue Service, Carrier N/W 3 takes over. However, this will have to be driven via configuration in Carrier Network 1

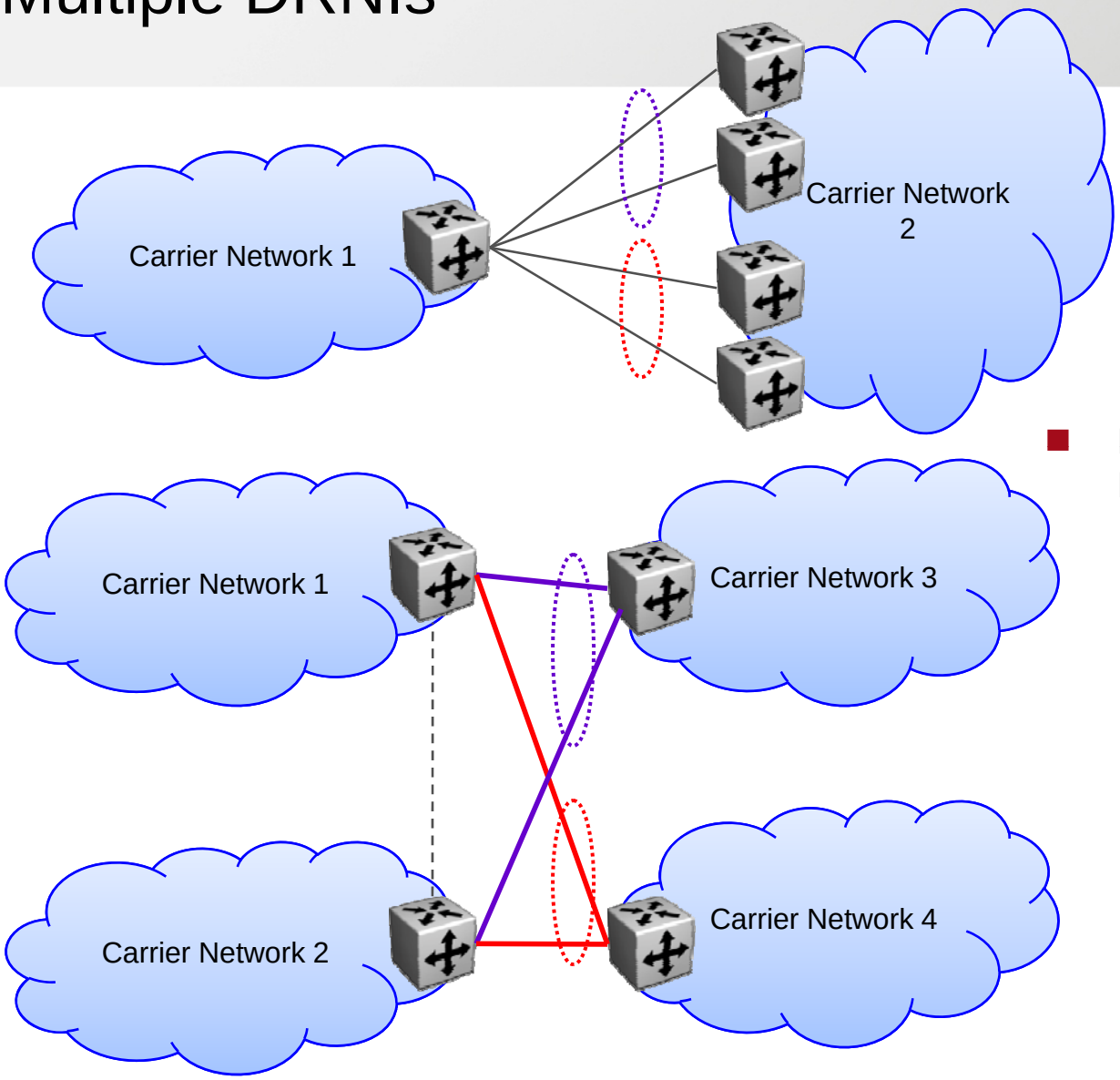
DRNI as an ENNI into different Carrier N/Ws (4) Service Perspective



Hair-pinning

- Hair-pinning will be required as shown in the example here
- For example Carrier1 buys one service each from Carrier 1 and Carrier 2 and hair-pinning is required on the services
- The only reason to refer to it as hair-pinning is that the service is send back to the logical port it was received on - the DRNI. The link may not be sent on the same physical port. In fact, in this scenario the link will NOT be sent back on the same physical port. So calling it hair-pinning maybe somewhat of a misnomer.

Multiple DRNIs



- Multiple DRNIs on the same DRNI portal node
  - Does multiple DRNIs on the same DRNI portal add any new requirements? Probably not!?

DRNI within the same Carrier N/W

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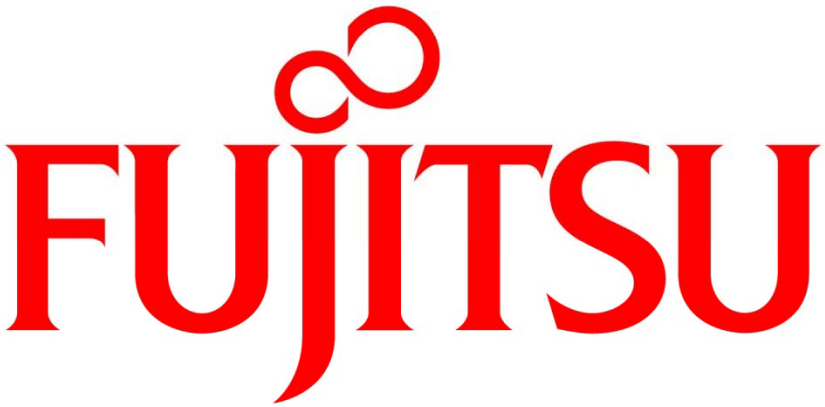
- DRNI within the same Carrier Network
  - DRNI deep within a carrier network adds the requirement to distribute/virtualize the Higher layer technology running in the network – For instance virtualize Bridging OR virtualize OSPF etc.
  - Trying to understand what is the practical use of a DRNI within the same Carrier Network??
    - For instance, what is the use for having DRNI deep within a Bridged network
  - There are other means of providing Node and Link level redundancy within a Carrier network (Bridging, Link state protocols (OSPF etc.), P2P protocols (MPLS LSPs, G.8031 SNCs etc.) and associated protection mechanisms etc.
  - For connecting two different administrative domains (that may or may not run the same technologies: for instance bridging in both or bridging in one and P2P in the other), the DRNI is for all practical purposes an ENNI connecting the two domains.



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