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DRNI – An Application perspective

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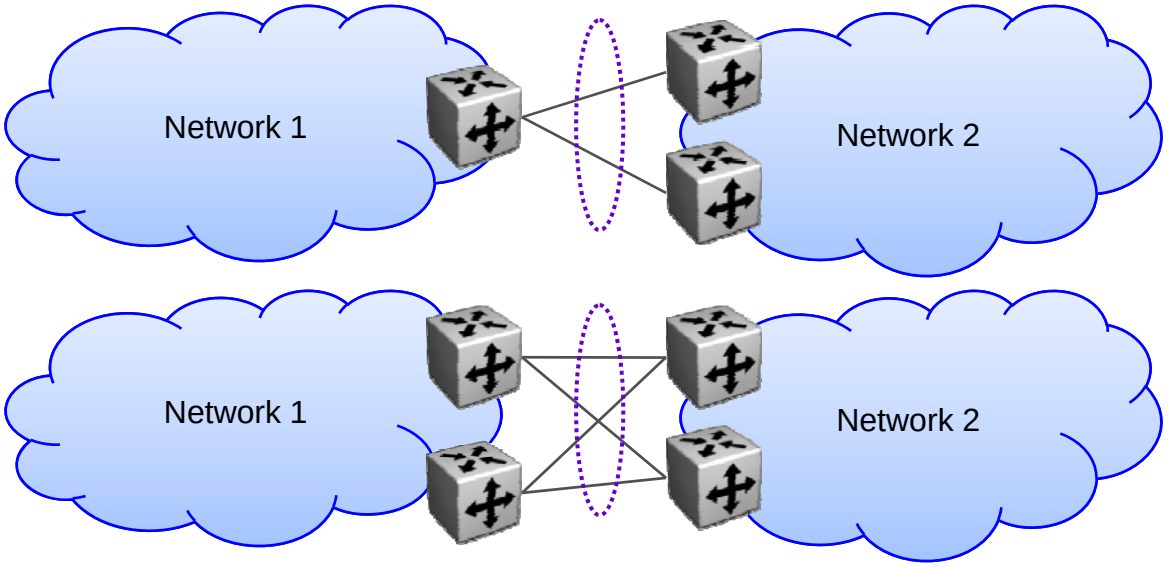
DRNI as an ENNI between 2 N/Ws (1)

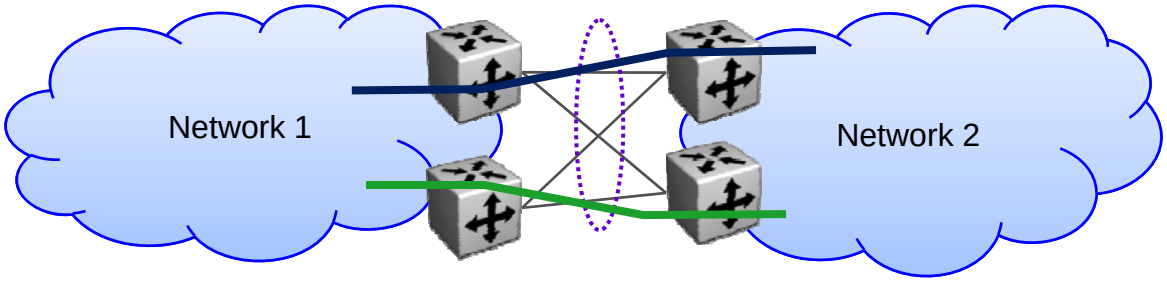
- DRNI as an ENNI into a single network
  - Provides Node and Link level redundancy into a Network
  - Requires load-balancing of services on the DRNI
  - The DRNI could be connected to different vendor nodes → Requires interoperability between different vendors
  - Requires hair-pinning of services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



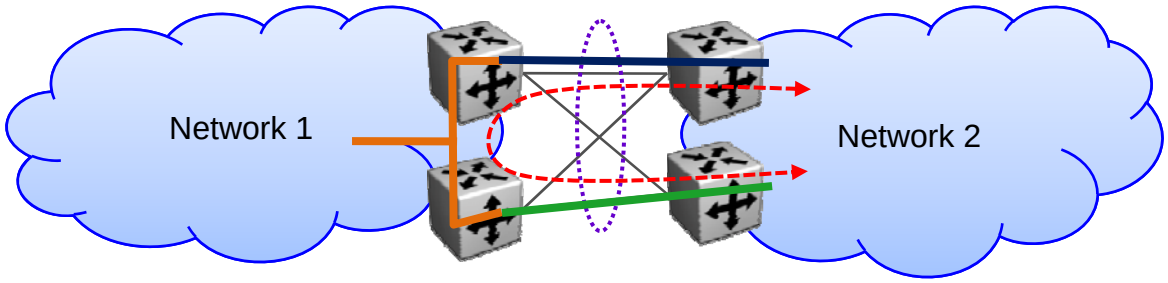
Example configuration 1 (needs to be backward compatible)

Example configuration 2

DRNI as an ENNI between 2 N/Ws (2)
Service Perspective



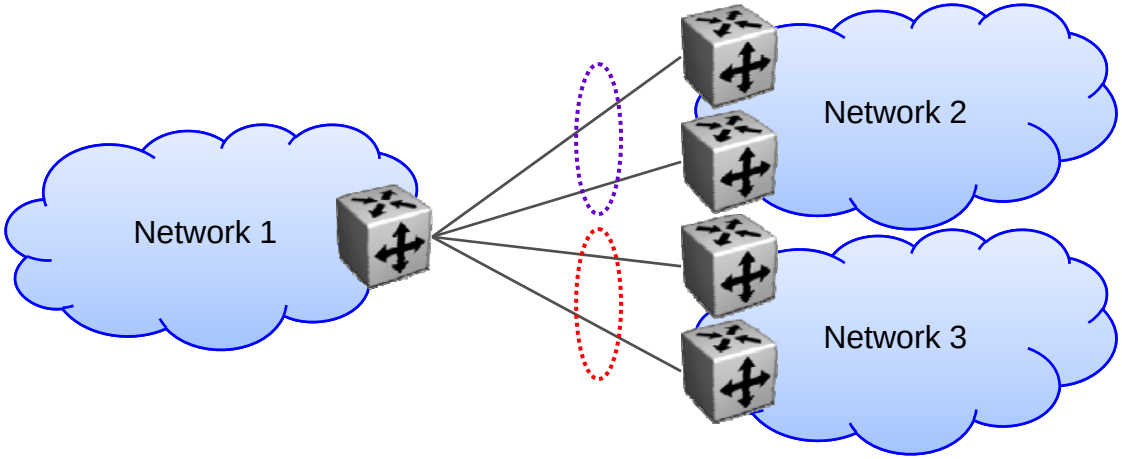
Load-balancing



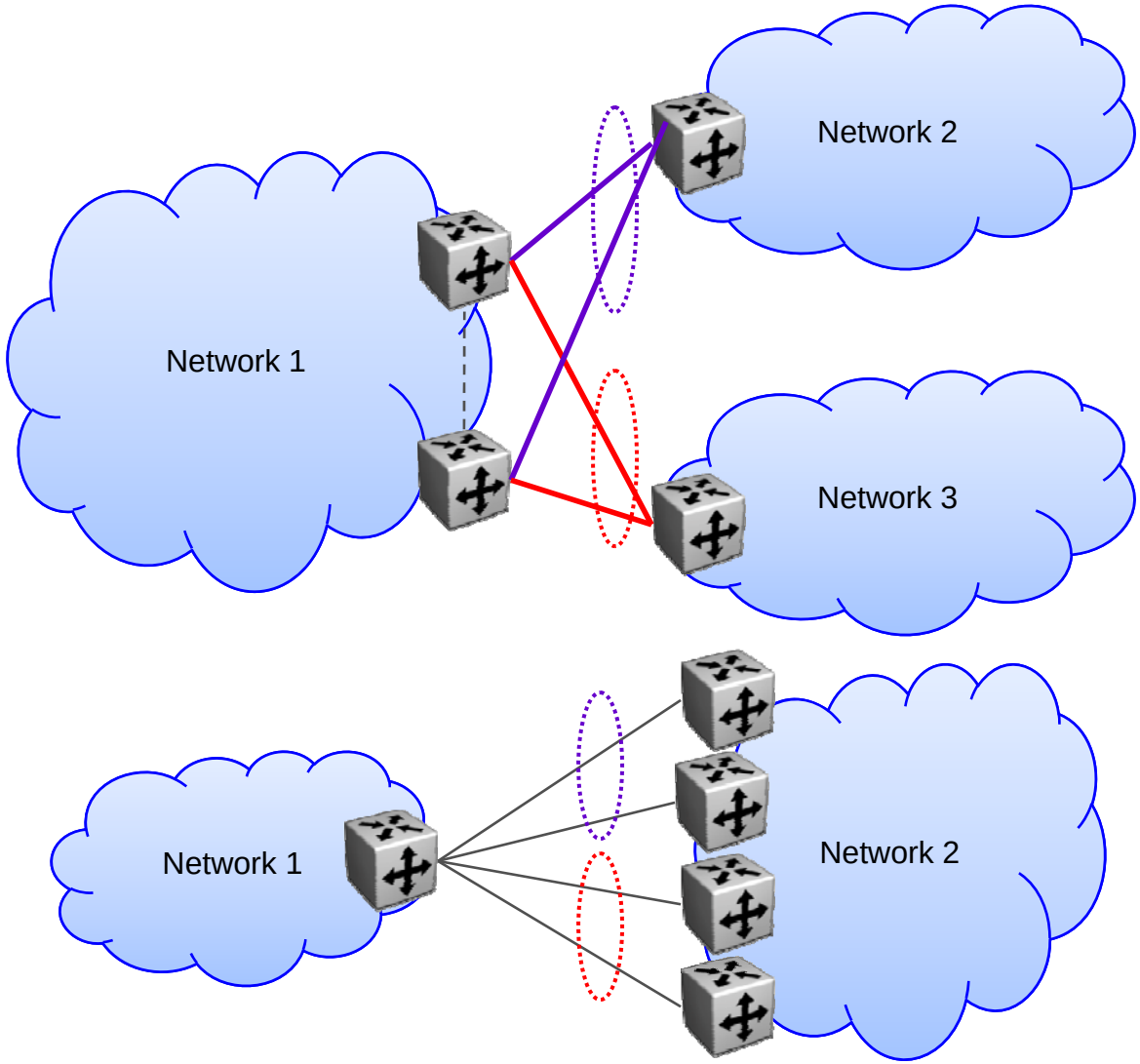
Hair-pinning

Multiple DRNIs (1)

- Multiple DRNIs on the same DRNI portal node
  - A relatively common case is where an network is connected to two or more different carriers – over two or more different DRNIs.
  - The use cases could be:
    - Customer Network is connected into two different Carriers. One Carrier serves as a back-up to another Carrier. For eg. In figure below, N/W 3 serves as a backup to N/W 2
    - In the same scenario, some services are mapped to one carrier and other services are mapped to a different carrier
    - Etc.



Multiple DRNIs (2)



DRNI as an ENNI between 3 or more N/Ws (1)

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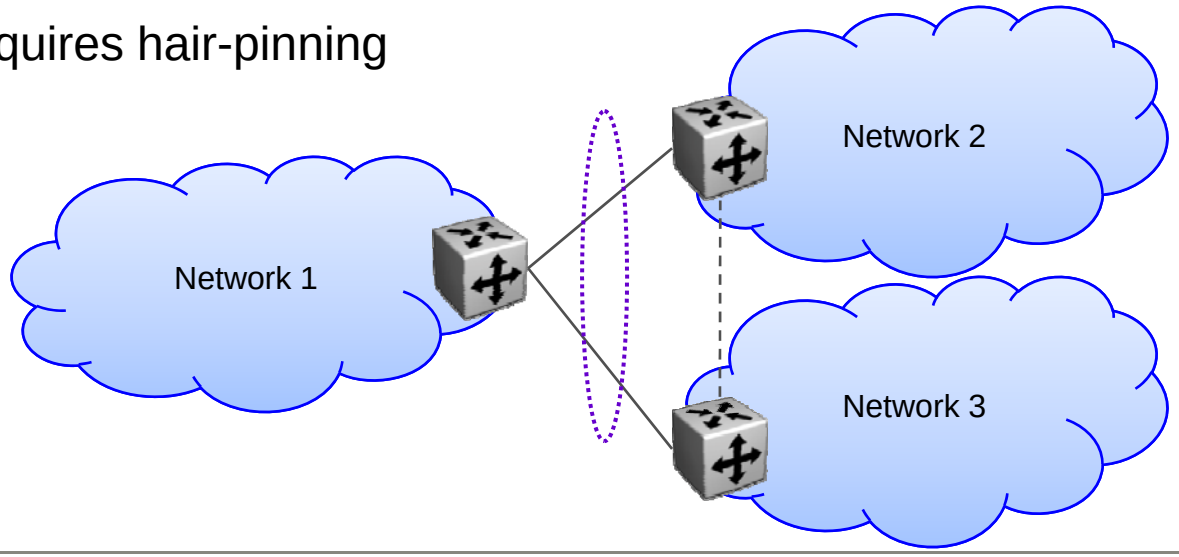
In-scope OR Out-of-scope?

- DRNI as an ENNI into <u>different</u> Networks
  - Another way to implement the application in the 'Multiple DRNI slides' maybe by supporting the <u>same DRNI</u> into different Networks
  - Different links within a DRNI connected to Networks
  - Provides link and node level redundancy
  - Requires load-balancing of services on the DRNI
    - mapping of services to a specific Network is required for the purposes of accounting and billing
  - Requires hair-pinning



Example configuration 1

DRNI as an ENNI into 3 or more N/Ws (2)

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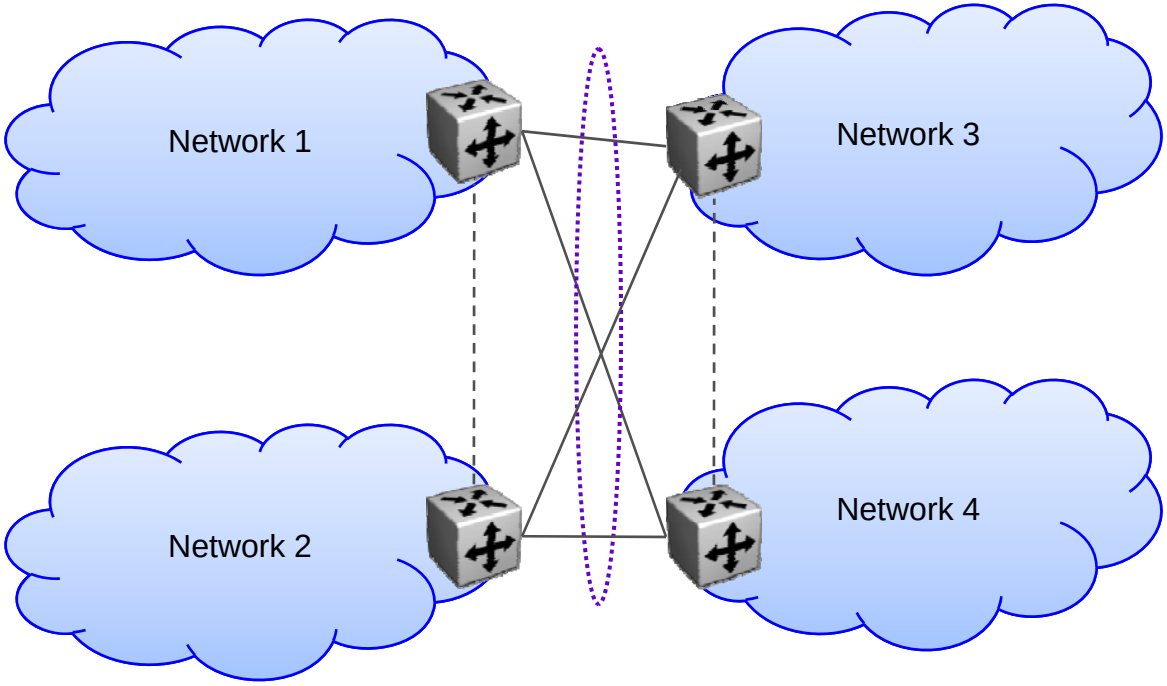
In-scope
OR
Out-of-scope?



Example configuration 2

DRNI as an ENNI between 3 or more N/Ws (3)
Service Perspective

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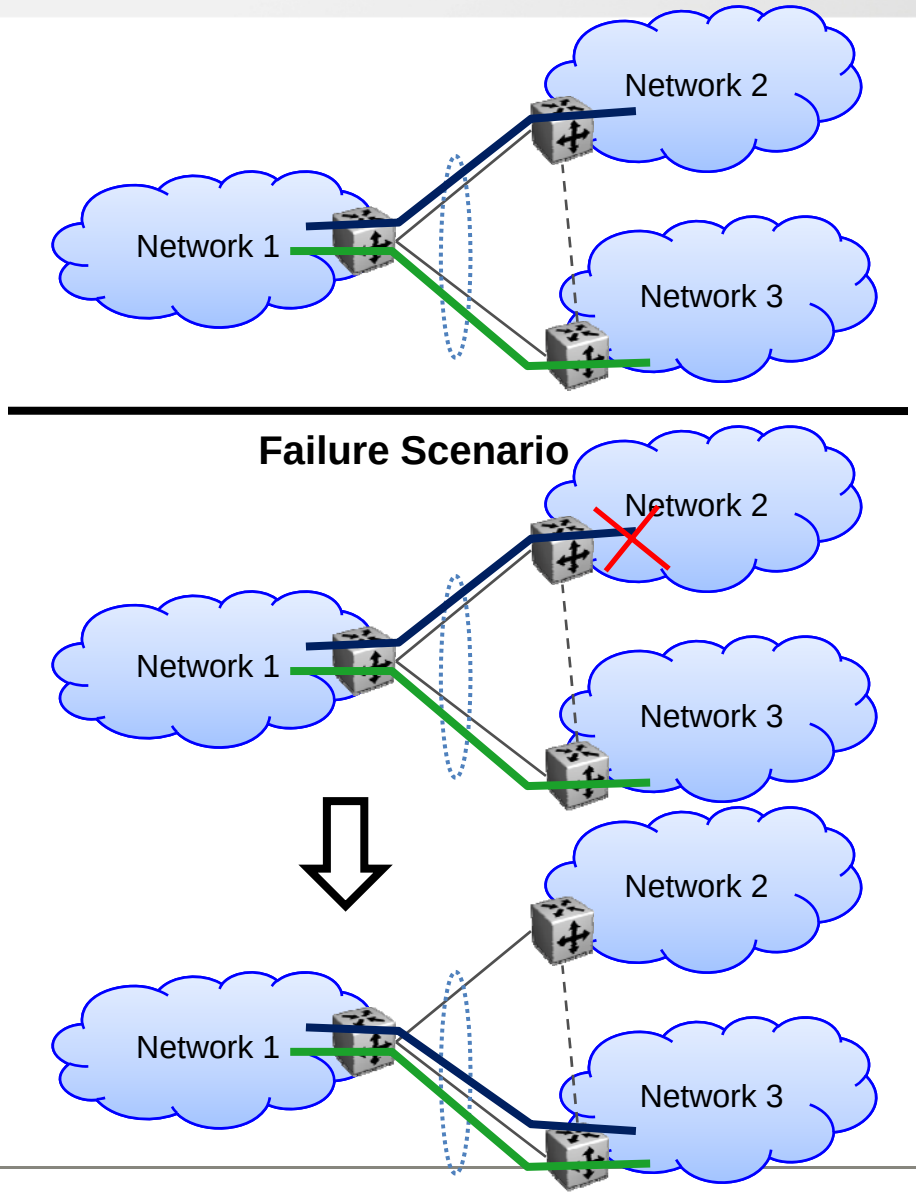
In-scope
OR
Out-of-scope?



Load-balancing

- How services are Load-balanced between Networks should be driven entirely by static configuration.
- This is because a single service will likely be forwarded only by one Network at any given time. It is unlikely that a completely independent load-balancing scheme would be employed.
- This is because there will be agreements between the 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 N/W 2 fails to forward the Blue Service, N/W 3 takes over. However, this will have to be driven via configuration in Network 1

DRNI as an ENNI between 3 or more N/Ws (4) Service Perspective

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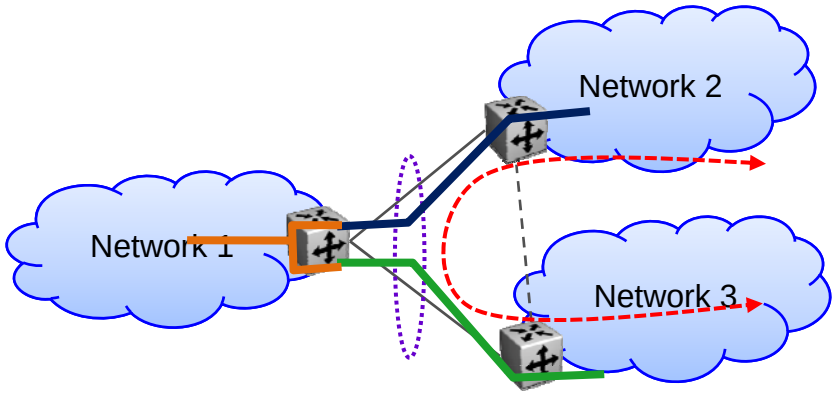
In-scope
OR
Out-of-scope?



Hair-pinning

- Hair-pinning will be required as shown in the example here
- For example Network1 buys one service each from Network1 and Network 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.

DRNI within the same N/W

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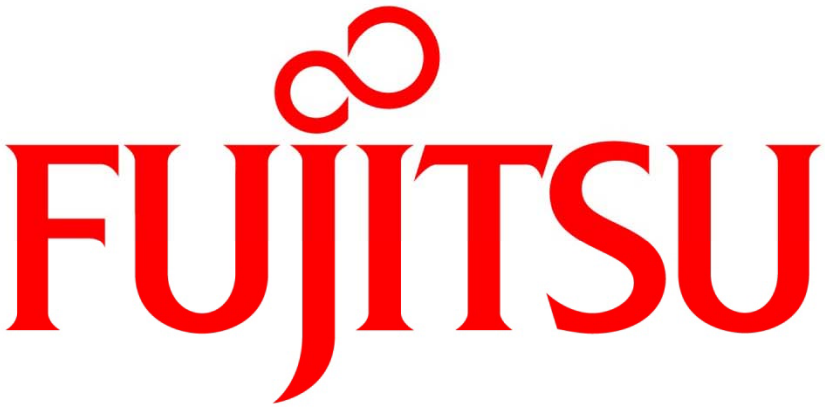
- DRNI within the same Network
  - DRNI deep within a network adds the requirement to distribute/virtualize the Higher layer technology running in the network – For instance virtualize Bridging OR virtualize OSPF etc.
  - Trying to understand what is the practical use of a DRNI within the same Network??
    - 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 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 could be viewed as an ENNI connecting the two domains.



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