NNI protection LACP alternative

Zehavit Alon

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NNI protection using LACP

- In the last few virtual meetings a proposal for protecting NNI using LACP with enhancements was introduced.
 - The idea and the LACP functionality over external links were described in: <u>http://www.ieee802.org/1/files/public/docs2010/new-nfinn-light-nni-0710-v01.pdf</u>
 - Options for internal links functionality and network functionality to support the protection mechanism was described in: <u>http://www.ieee802.org/1/files/public/docs2010/new-enni-nbragg-Light-ENNI-0810-v01.ppt</u>
- Additional requirements are described in the following slides.



 All elements participating in the mechanism must be standardized, including the protocol running over the internal links (between border nodes in a single portal) as it is unreasonable to mandate that a portal will consist of border nodes from a single vendor



 In the proposed mechanism, the means by which the border nodes communicate and overcome failures are not defined as it is assumed that all border nodes in a specific network are from a single vendor

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 The mechanism must maintain an agnostic approach regarding the network technology running in each of the interconnected networks and the protection mechanism deployed by each of the interconnected networks



- The proposed mechanism depends on the network capability to refrain from sending flooded, broadcast and multicast packets directly to more than one border node (packets from Ax are sent directly to either A1 or A2).
 - Can be achieved by MSTP/SPB regions, but what about PBB-TE? VPLS?



• The mechanism must provide a standard mean to guarantee that traffic will be received only once by a network



- In the proposed mechanism it is assumed that each network sends a packet only once. This
 functionality is not standardized and not guaranteed. If one network sends packets more
 than once (from more than one border node), the attached network will receive the same
 packet more than once.
- In the case where the connectivity between the border nodes is lost, packets may be sent to the attached network by more than one border node until the brain dead situation is identified and handled.
- A node should distinguish between different scenarios when receiving a packet over the internal link in order to know whether to send the packets and over which link

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- Packets that were conveyed by Ax to A1 and then by A1 to A2 and to the IZ
- A2 should not convey the packets received over link 1-2 to the IZ since they were already conveyed by A1, nor to Ax as it is the source of the packets





- Packets that were conveyed by Ax to A1 and then by A1 to A2 only as there is no connectivity to the nodes on the attached network.
- A2 should convey the packets received over link 1-2 to the IZ since they were not conveyed by A1, but should not convey packets received over link 1-2 to Ax as it was already conveyed to Ax by A1.





- Packets that were received by A1 from the IZ and should be sent directly to Ax.
- A2 should not convey the packets received over link 1-2 to Ax as it was already conveyed by A1, and should not convey packets received over link 1-2 to the IZ as it is the source of the packets.





- Packets that were received by A1 from the IZ and should be sent to only to A2
- A2 should convey packets received over link 1-2 to Ax as A1 did not convey it, but it should not convey packets received over link 1-2 to the IZ as it is the source of the packets.





NNI protection using LACP Requirement 3 – Summary

A1 receives packets and sends them over link 1-2 to A2.

- A2 receives packets over link 1-2 and should be able to identify:
- 1. Where A1 received the packets from,
- 2. Whether A1 sent them to their destination or not

Packets received by A1	A2→Ax	A2→IZ
from IZ and sent to Ax	no	no
from IZ and NOT sent to Ax	yes	no
From Ax and sent to IZ	no	no
from Ax and NOT sent to IZ	no	yes



• The mechanism must function without internal links.



- Internal links are mainly used for data transfer when the service gateway can be preserved.
- The service gateway preservation is not mandatory as there are cases when such preservation is unachievable (node failure)
- Overcoming brain dead situations by shutting down a node will interfere with other traffic the border node handles, which is not influenced by the brain dead situation.

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Thank You

zehavit.alon@nsn.com



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