



Data Plane for Resilient Network Interconnect

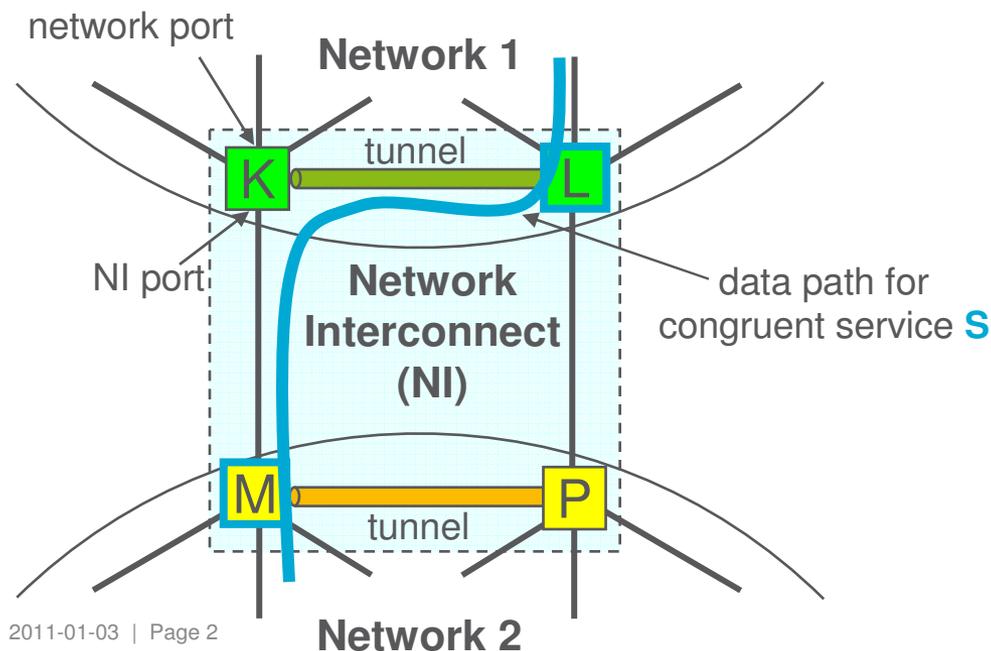
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Introduction

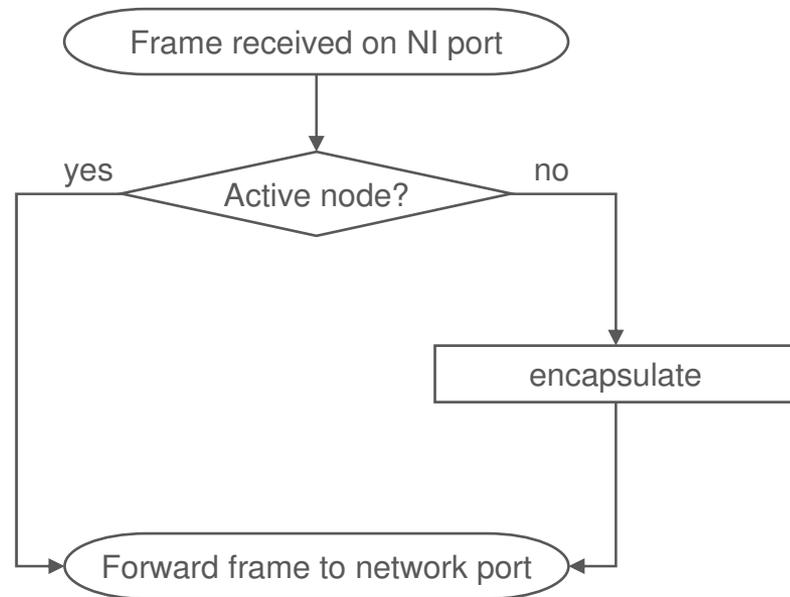
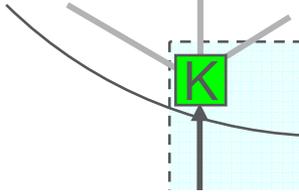
- › Data paths do not depend on the applied control protocol
- › How to implement the data paths within the 802.1 architecture?
- › Let's cover the most complex case
 - Overlay tunnel within the network (single tunnel between a node-pair)
 - Support both congruent and non-congruent forwarding



Forwarding within an NI bridge

1) frame received on NI port

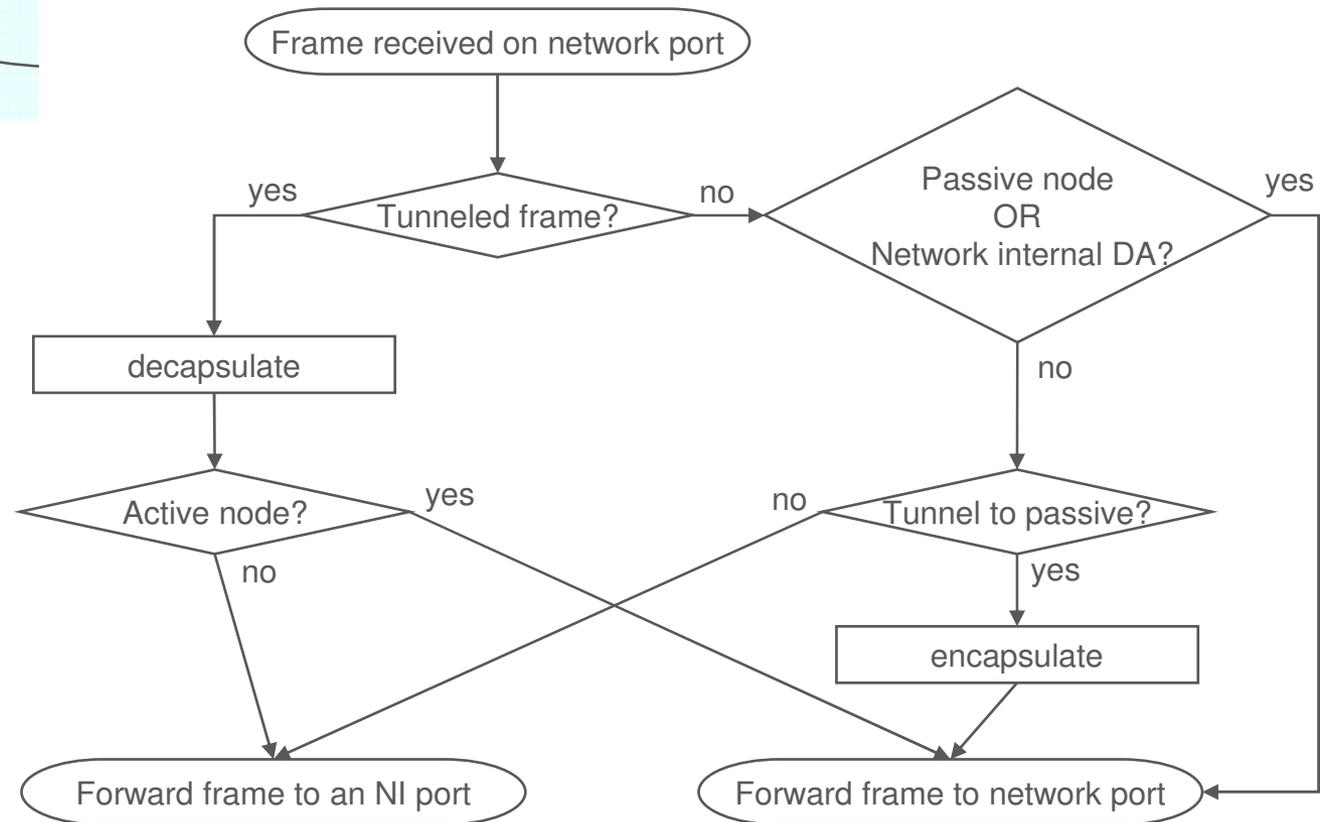
> For example



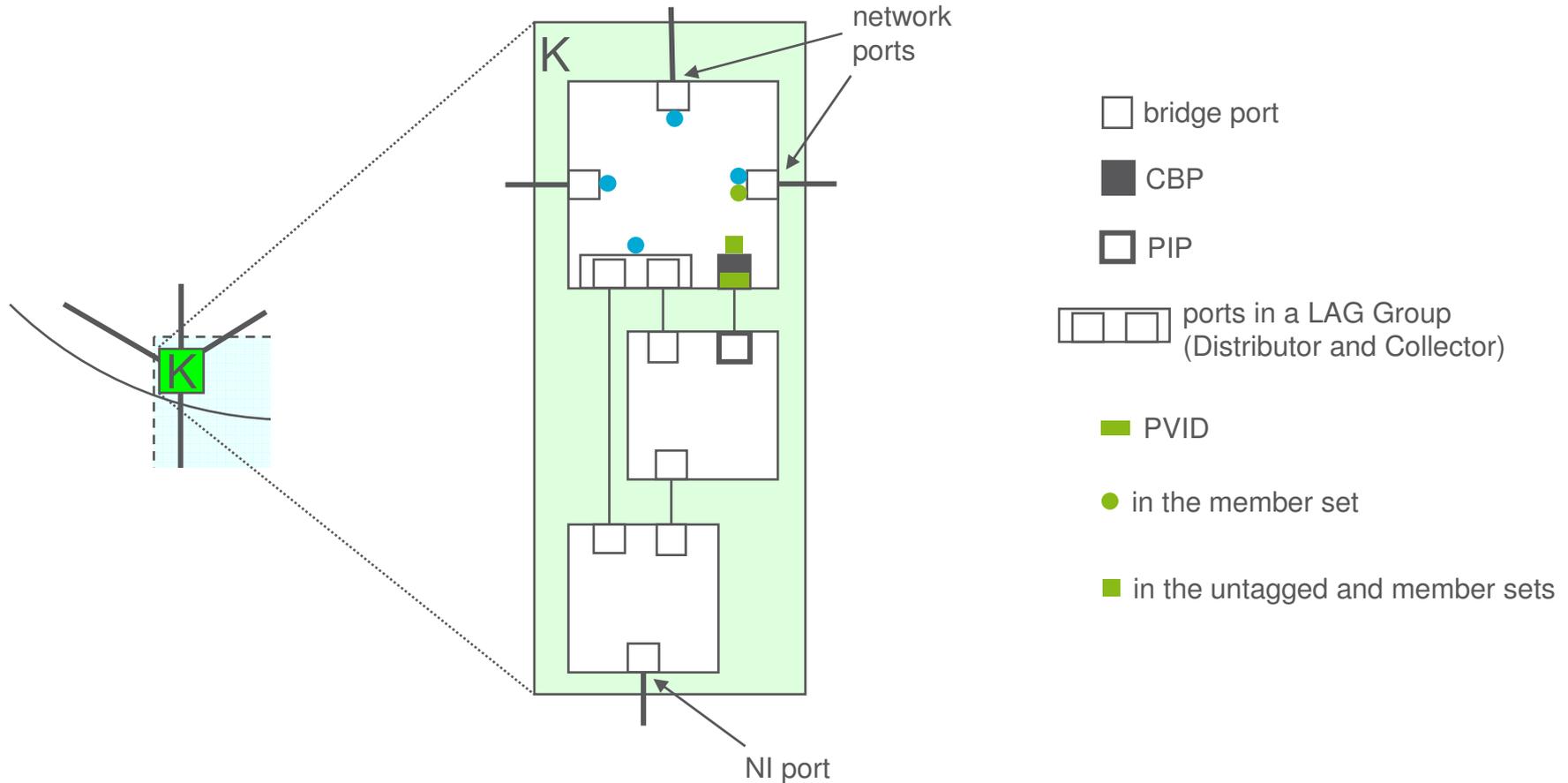
Forwarding within an NI bridge

2) frame received on network port

> For example



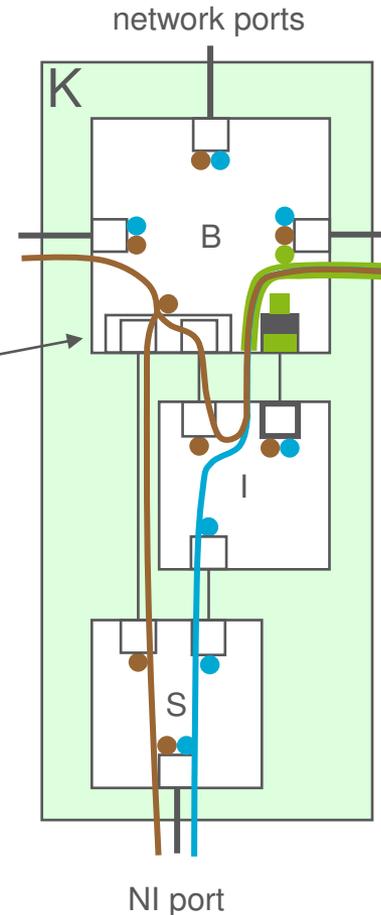
Notations for bridge component model



- › Operation of frame forwarding can also be described by the bridge component model
- › Bridge component model is suitable to illustrate what needs to be implemented in the data plane

Edge Bridge using LAG features and PBB encapsulation

- › The Network is a PBN
- › S-tagged NI
- › LAG Distributor of the Active Gateway decides whether the Service VID is tunneled
- › Single ingress to the relay from NI supports MAC learning for non-congruent services too
- › Overlay tunnel between NI nodes is implemented by 802.1ah encapsulation
 - green B-VID is the tunnel B-VID
- › NI node K is the Active Gateway for the brown S-VID
- › NI node K is Passive for the blue S-VID
- › Note that Gateway (re)-selection is just setting the VID member sets in the S-Components



Functionality of the component

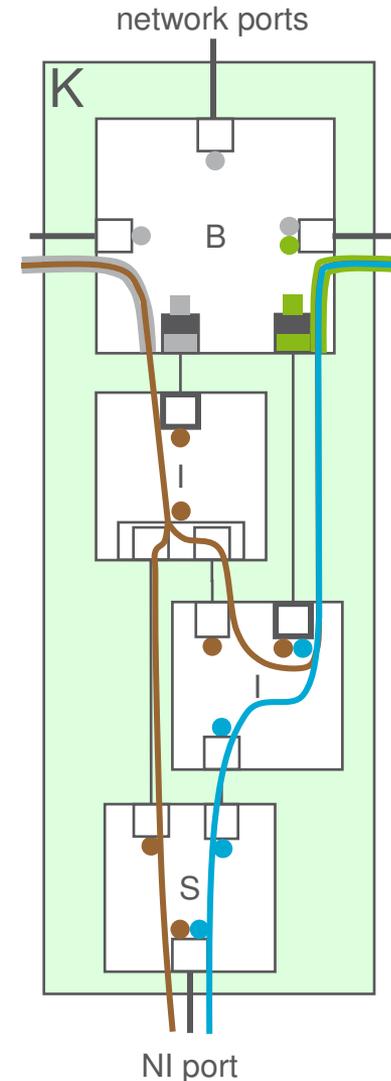
Active / Passive for frames received on network port

MAC relay

Active / Passive for frames received on NI port

Alternatively, Backbone Edge Bridge using LAG features

- › The Network is a PBBN
- › S-tagged NI
- › LAG Distributor of the Active Gateway decides whether the Service VID is tunneled
- › A B-VID is used as overlay tunnel
 - green B-VID is the tunnel B-VID
- › NI node K is the Active Gateway for the brown S-VID
- › NI node K is Passive for the blue S-VID



Functionality of the component

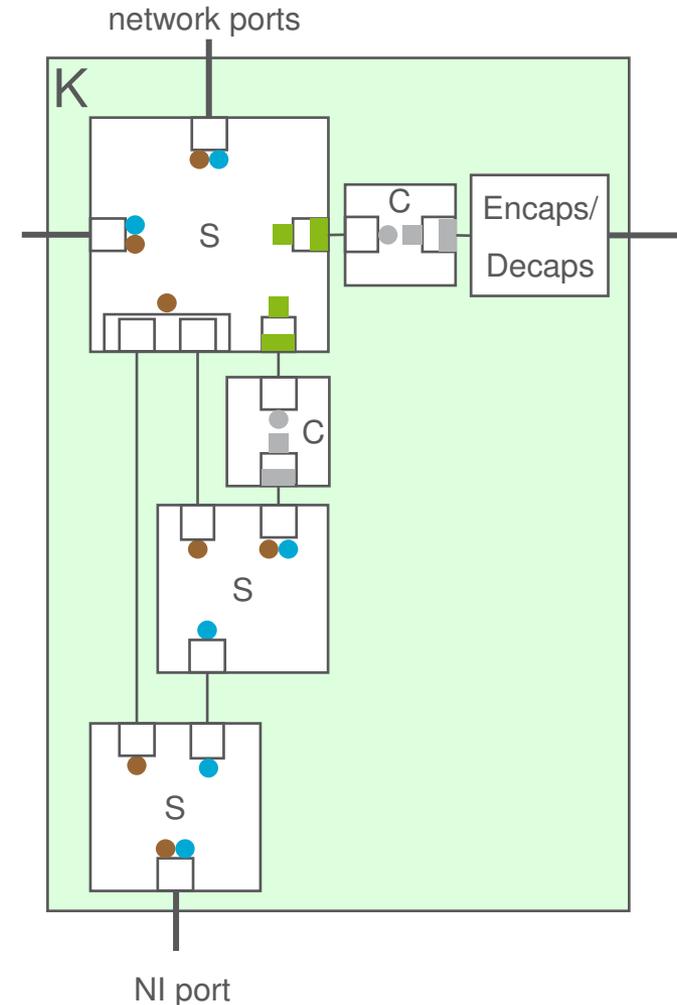
Active / Passive for frames received on network port

MAC relay

Active / Passive for frames received on NI port

Edge Bridge using LAG features and generic tunneling

- › The Network is a PBN
- › S-tagged NI
- › LAG Distributor of the Active Gateway decides whether the Service VID is tunneled
- › Generic Overlay tunnel between NI nodes
 - Green S-VID and grey C-VID are NI node internal VIDs only applied in the bridge component model description
- › NI node K is the Active Gateway for the brown S-VID
- › NI node K is Passive for the blue S-VID



Summary

- › The model presented here is proposed to be used as the data plane for the Resilient Network Interconnect
- › Both congruent and non-congruent data paths can be supported by the same components
- › Overlay tunneling can also be supported
 - Direct physical link between NI nodes is also covered
 - Tunneling support provides connectivity between NI nodes as long as the Network is not split
- › The Gateway Selection functionality of the control protocol only has to adjust VID member set for a couple of ports