Bidirectional Forwarding Detection (BFD) on Link Aggregation Group (LAG) Interfaces

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Overview

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The Importance of Link Failure Detection

02

Bidirectional Forwarding Detection (BFD)

03

Link Aggregate Group (LAG) and Link Aggregation Control Protocol (LACP)

04

Challenges & Conclusion

Networks

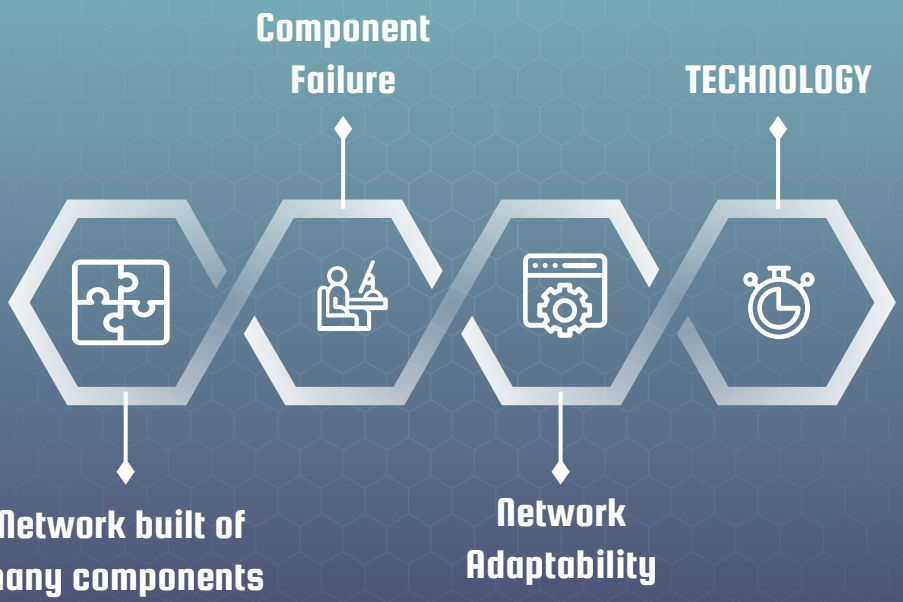
Computer Networks are all around us

Increase in network traffic each year

Networks are complex and have many open standard and exclusive protocols

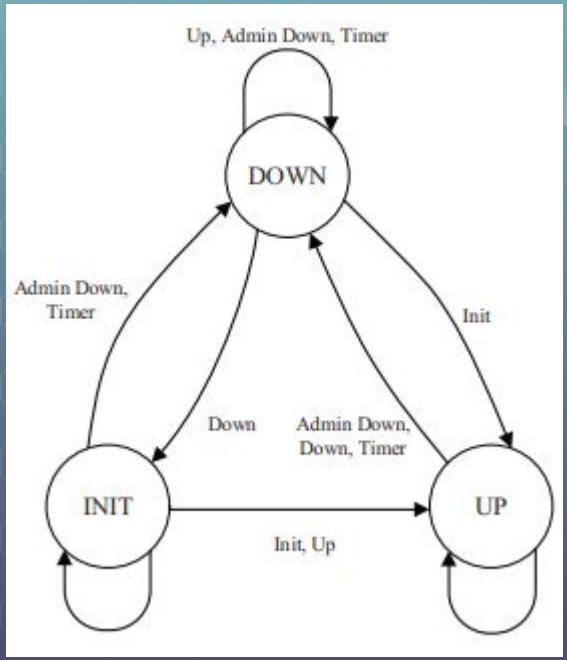
Network adaptability to change can dictate its reliability

Link Failure Detection



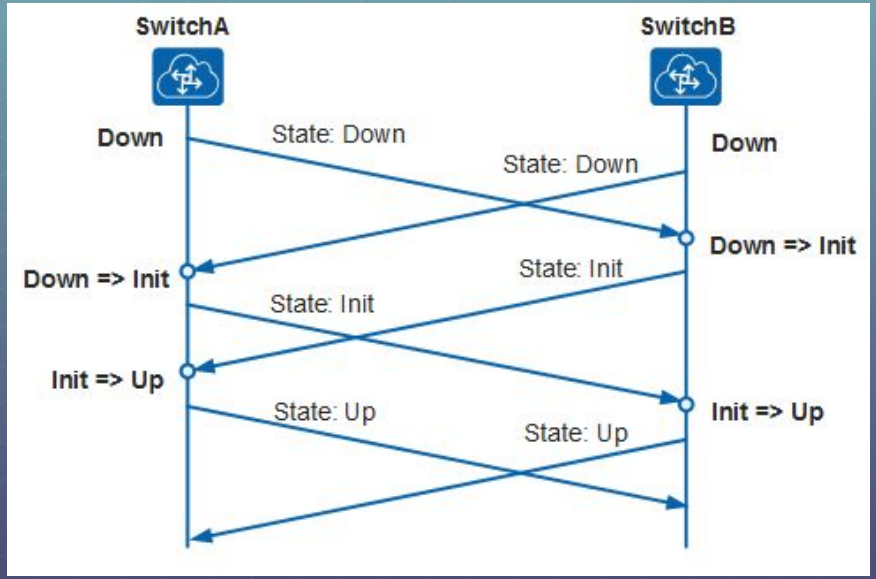
Bidirectional Forwarding Detection (BFD)

- Provides fast failure detection mechanism
- Simple state machine
- Protocol-inde pendent.
- Works with other protocols

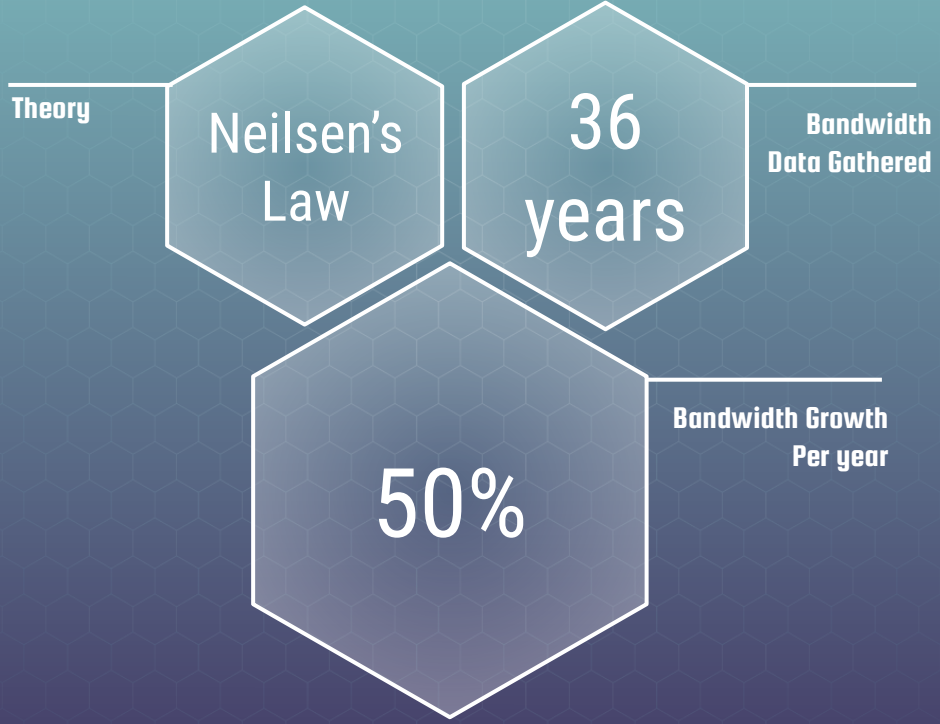


BFD

Session establishment example

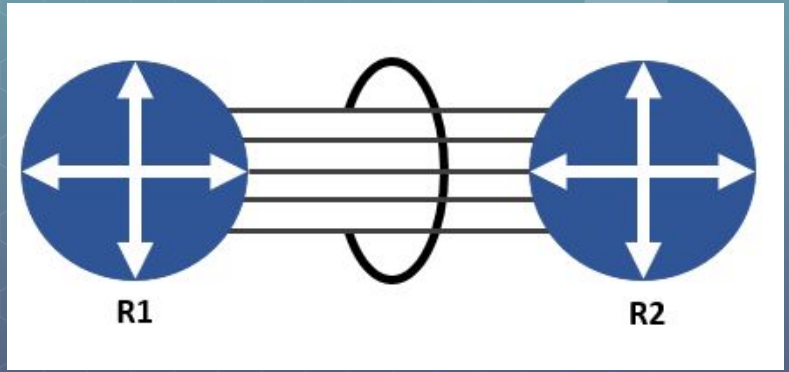


Increase in Bandwidth



Link Aggregate Group (LAG)

- Bundle multiple physical links
- Higher Bandwidth
- Single logical link



Link Aggregation Control Protocol (LACP)

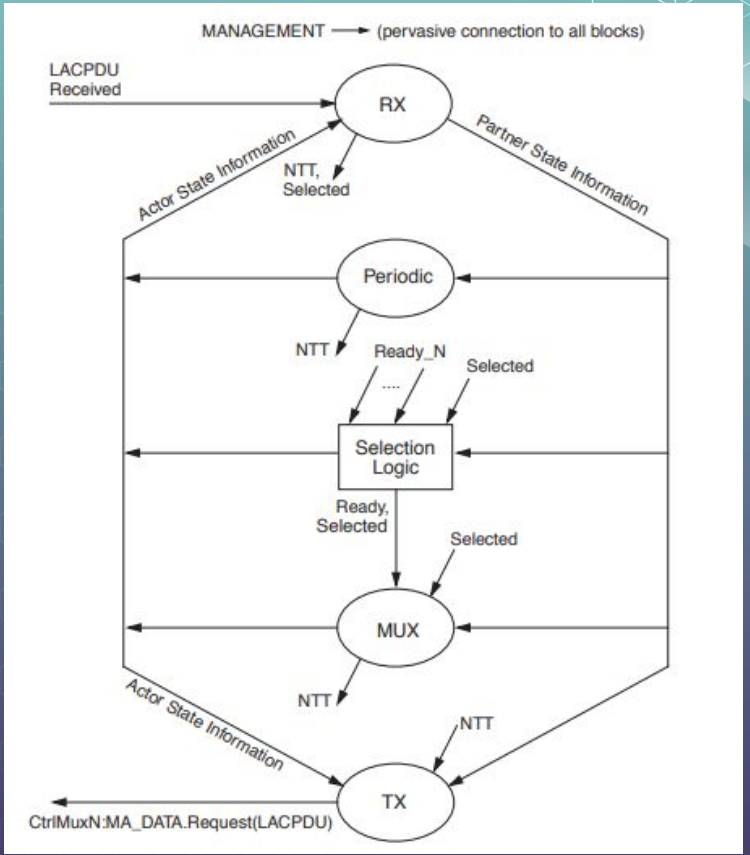
Discover and configure capabilities

Enables failure detection

Multiple state machines co-operate

Complex protocol

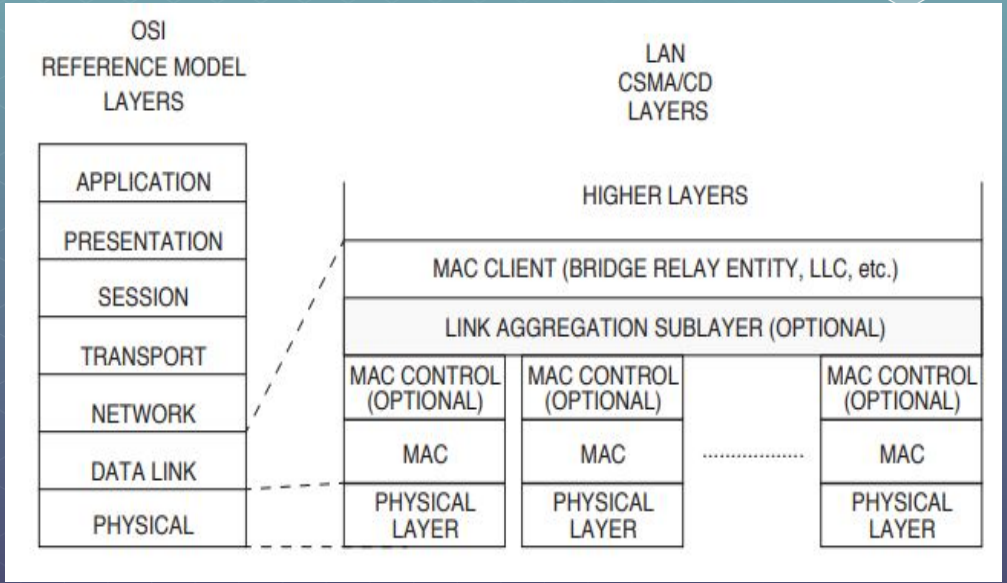
Failure detection is slower due to complexity



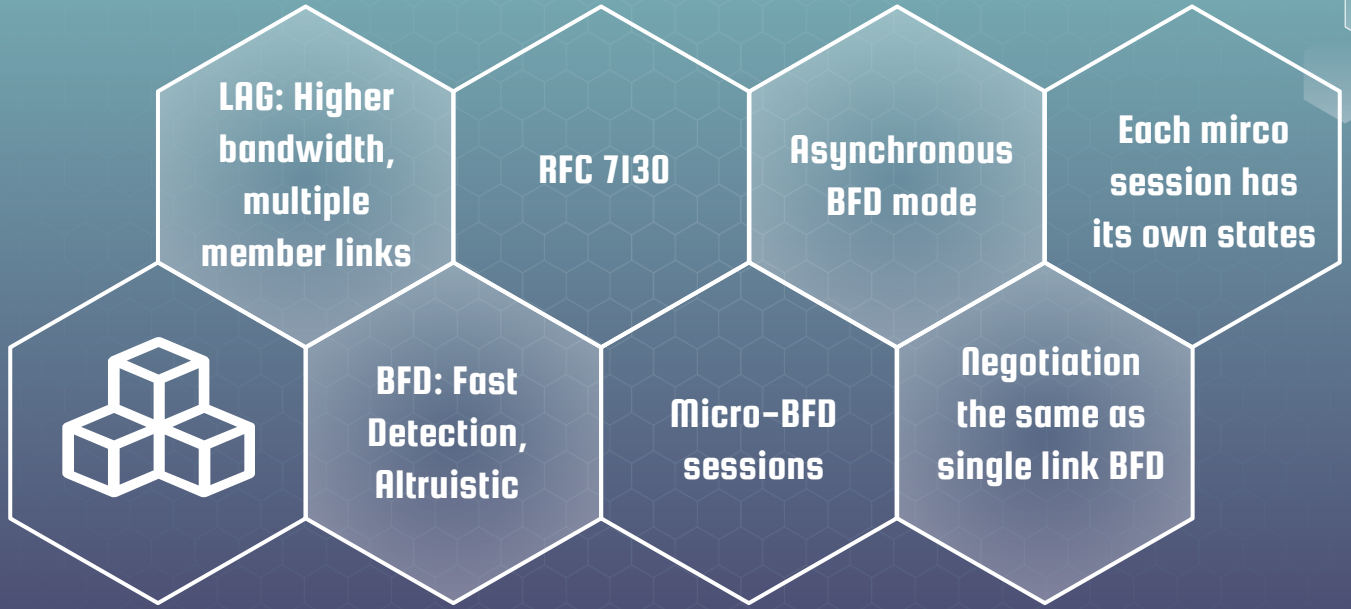
LACP

Link layer protocol

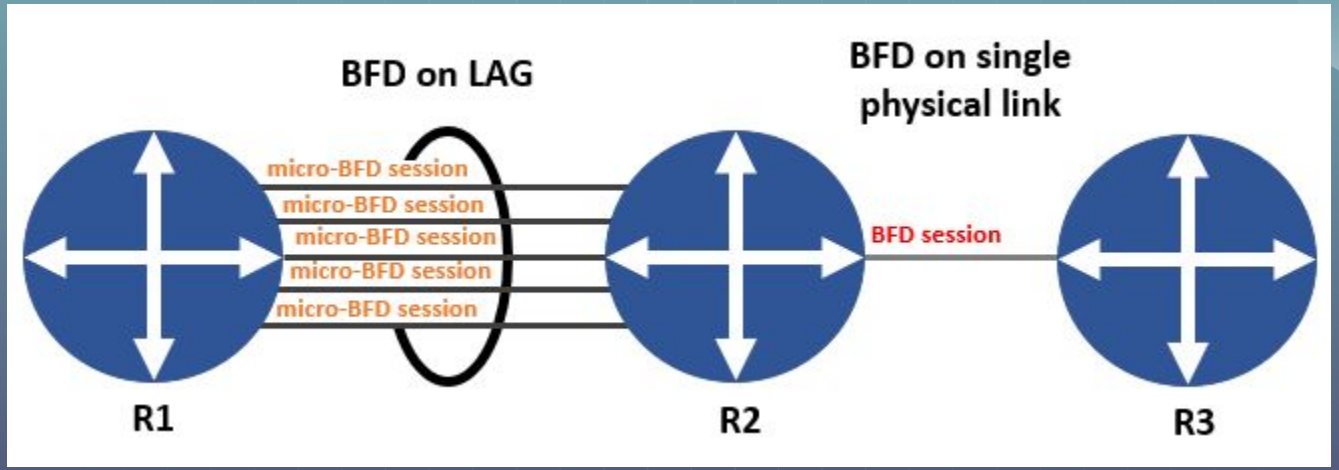
Can only detect failures in link layer



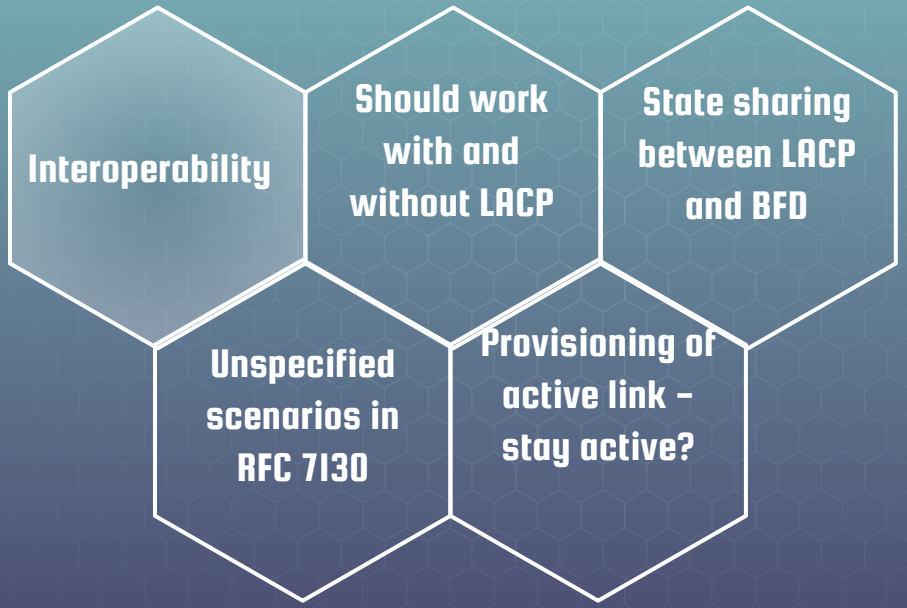
BFD on LAG


LAG: Higher bandwidth, multiple member links
RFC 7130
Asynchronous BFD mode
Each mirco session has its own states
BFD: Fast Detection, Altruistic
Micro-BFD sessions
Negotiation the same as single link BFD

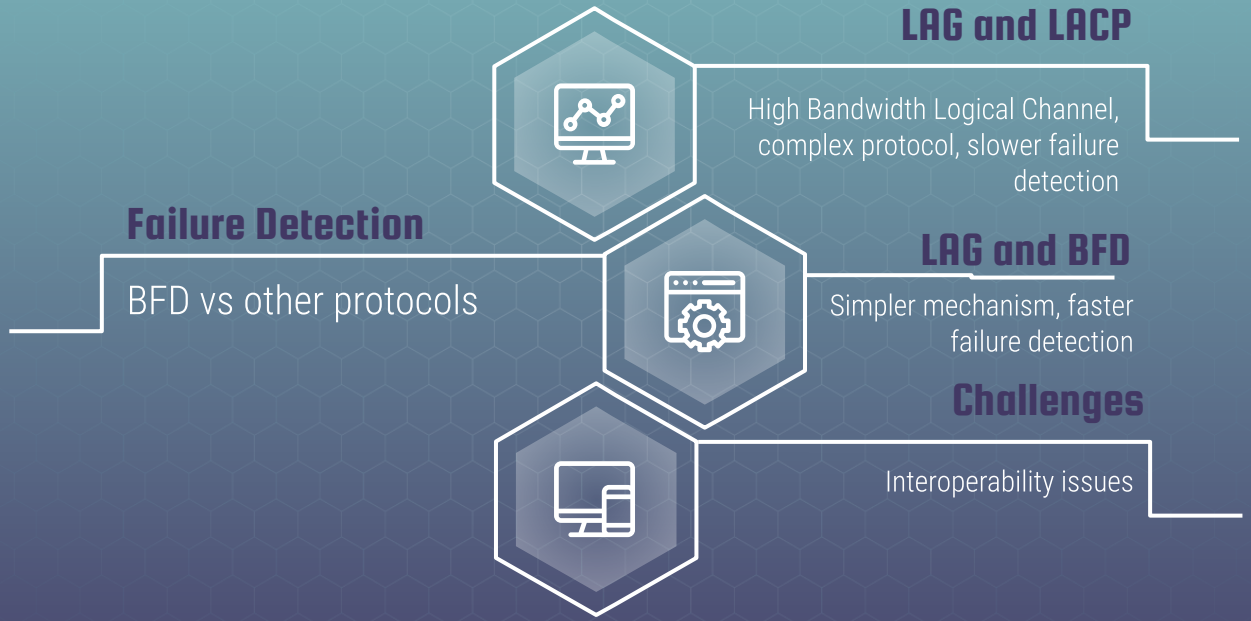
BFD on LAG


BFD on LAG
BFD on single physical link
micro-BFD session
micro-BFD session
micro-BFD session
micro-BFD session
micro-BFD session
BFD session
R1
R2
R3

Challenges


Interoperability
Should work with and without LACP
State sharing between LACP and BFD
Unspecified scenarios in RFC 7130
Provisioning of active link – stay active?

Conclusion


LAG and LACP
High Bandwidth Logical Channel, complex protocol, slower failure detection
Failure Detection
BFD vs other protocols
LAG and BFD
Simpler mechanism, faster failure detection
Challenges
Interoperability issues

References

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[9] IEEE Std 802.3ad-2000 Amendment to Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications— Aggregation of Multiple Link Segments.

The End