The Resilience for BIER Networks
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draft-xiong-bier-resilience

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Overview

- Discuss the resilience use cases for BIER-specific networks.

- Explore the requirements of BIER resilience.

- Propose solutions for BIER, including the protection mechanisms and detection methods.

Requirements

➢ The listed requirements MUST be supported with any type of transport layer over which BIER layer can be realized.

➢ BIER protection type MAY be defined and configured from a centralized controller or management network including BIER end-to-end protection and link/node protection and related information.

➢ It is required to support the failure detection and notification mechanisms.

➢ It is required to support the fast protection switching for the BIER packets within the limited time.

Use Case 1:End-to-End 1+1 Protection

➢ The multicast traffic MUST be sent across the network through the two disjoint paths and the BFERs need to receive the flows transiting from one of the paths.
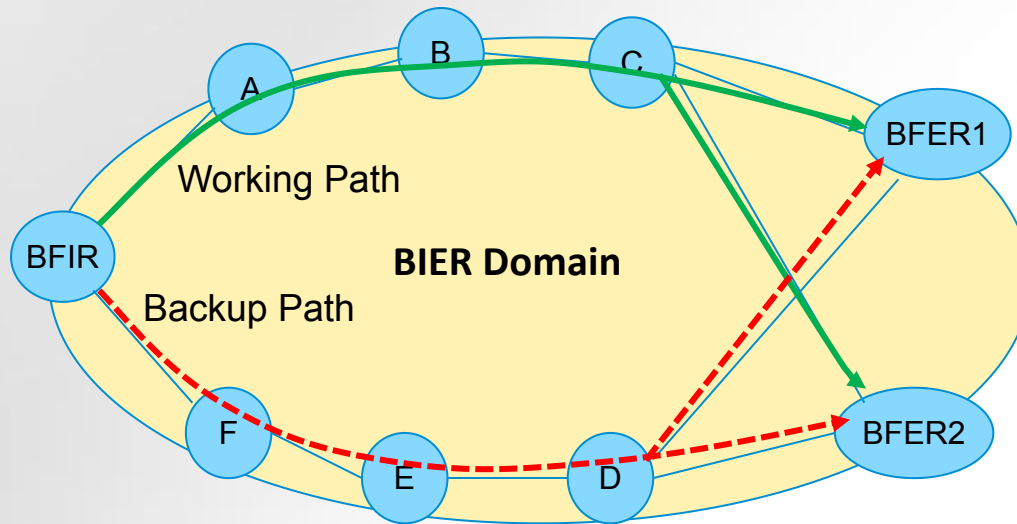
✓ Path-1:BFIR->A->B->C->BFER1/BFER2
✓ Path-2:BFIR->F->E->D->BFER1/BFER2
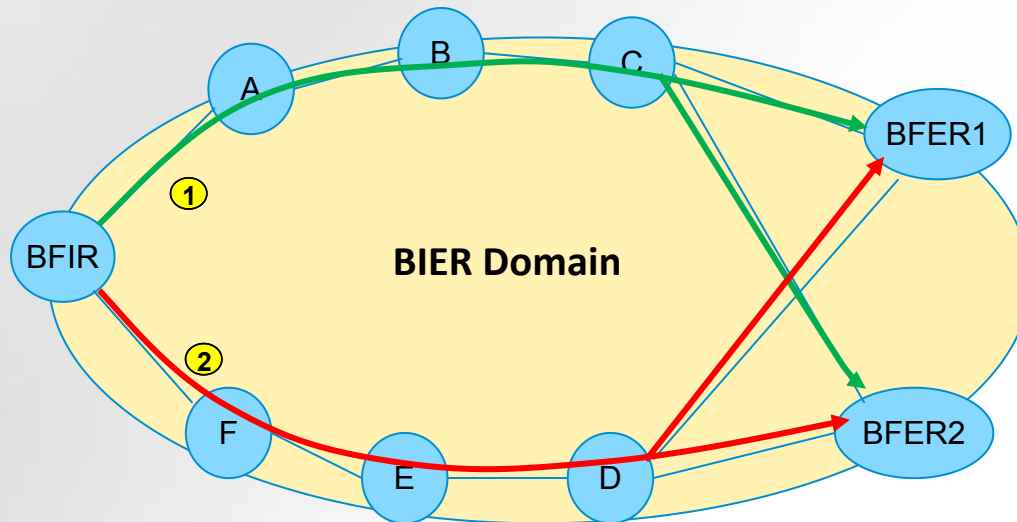
Use Case 2:End-to-End 1:1 Protection

➢ The BFIR will send multicast flows from the working path and switch onto the backup path when failures occur.

   ✓ Working Path:BFIR->A->B->C->BFER1/BFER2
   ✓ Backup Path:BFIR->F->E->D->BFER1/BFER2

Use Case 3:BIER Local Protection

➢ The backup link should be provided and the traffic is switched onto the pre-established backup path to get packets to the downstream node when the BIER link fails.

✓ Protect BIER Link : From BFIR to BFR-A
✓ Backup Link : Pre-established Link from BFIR to BFR-A
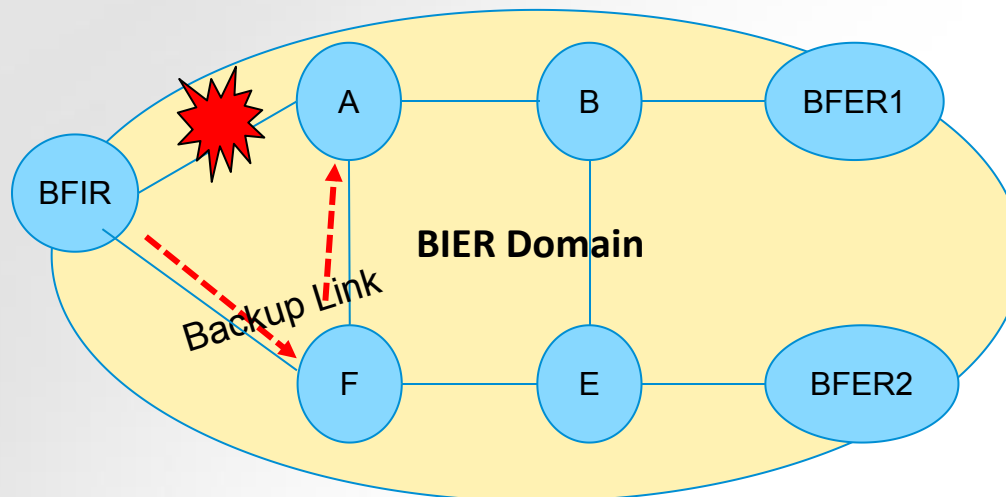
Resilience Solutions for BIER

Use case	Protection Mechnism	Detection Method	Failure Processing
End-to-End 1+1 Protection	Send traffic across two disjiont end-to-end paths	BIER P2MP BFD	Receive the flows transiting from the no-failure path
End-to-End 1:1 Protection	Protect from backup end-to-end path	BIER P2MP Active Tail BFD	Switch onto the backup end-to-end path
BIER Local Protection	Protect from backup BIER link ✓ P2P/P2MP RSVP-TE or SR tunnel ✓ TI-LFA	BIER P2P BFD	Switch onto the backup link

Extension for BIER Resilience

- P2MP BFD MAY be used to verify multipoint connectivity between a BFIR and a set of BFERs. ([I-D.hu-bier-bfd])

- P2MP active tail of BIER-specific extension MAY be proposed based on [I-D.ietf-bfd-multipoint-active-tail].(To be continued)

- P2P BFD MAY be extended for BIER networks to detect the link failure based on [RFC5882].(To be continued)

Next Step

- ➢ Further research directions:
  - ➢ More resilience use cases
  - ➢ BIER P2MP active tail
  - ➢ BIER P2P BFD

- ➢ Comments and discussion

Thanks!