

The Resilience for BIER Networks

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Quan Xiong(ZTE)
Fangwei Hu(ZTE)
Gregory Mirsky(ZTE)



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.

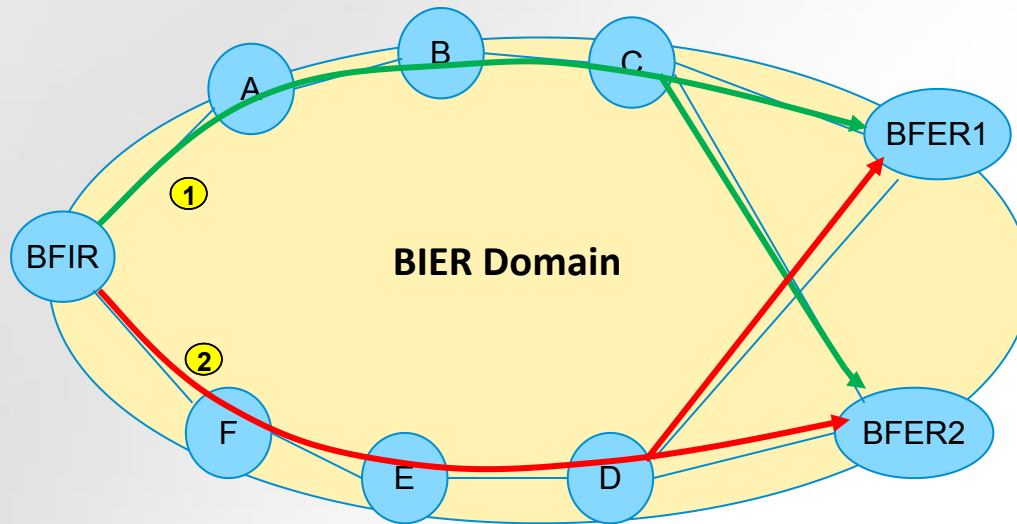
Requirements

- 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.

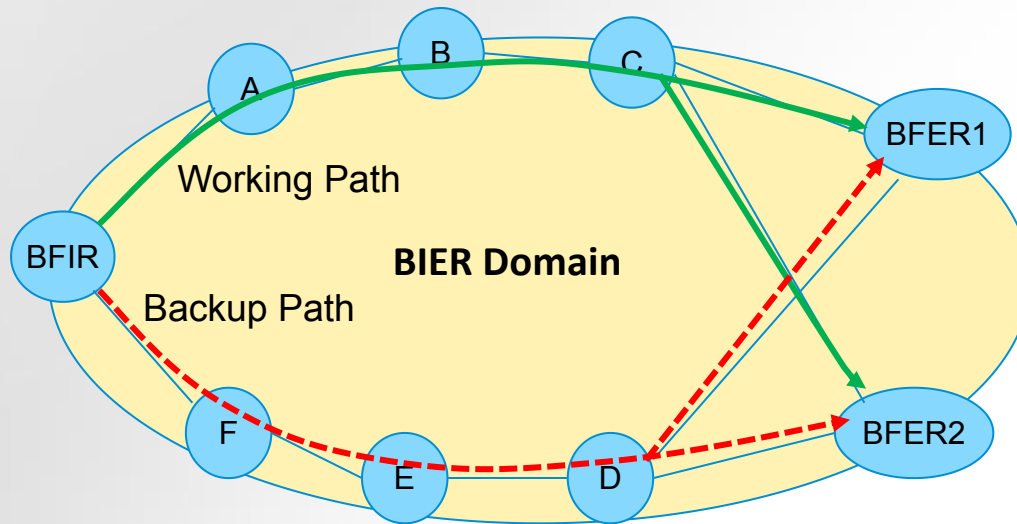
- ✓ Path-1: BFIR->A->B->C->BFER1/BFER2
- ✓ Path-2: BFIR->F->E->D->BFER1/BFER2



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.

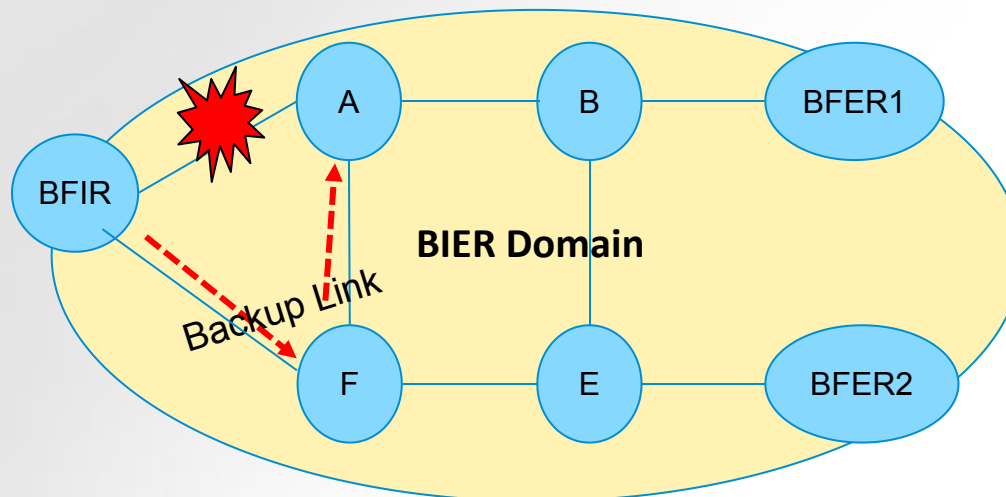
- ✓ Working Path:BFIR->A->B->C->BFER1/BFER2
- ✓ Backup Path:BFIR->F->E->D->BFER1/BFER2



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 Mechanism	Detection Method	Failure Processing
End-to-End 1+1 Protection	Send traffic across two disjoint 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

Next Step

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

- Comments and discussion

Thanks!