

BIER-TE for Broadcast Link

draft-chen-bier-te-lan-00

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Introduction

➤ Issue: Duplicated Packets in Existing BIER-TE with Broadcast Links

Path A to H, F: {2', 4', 6', 12', 15', 2, 4}

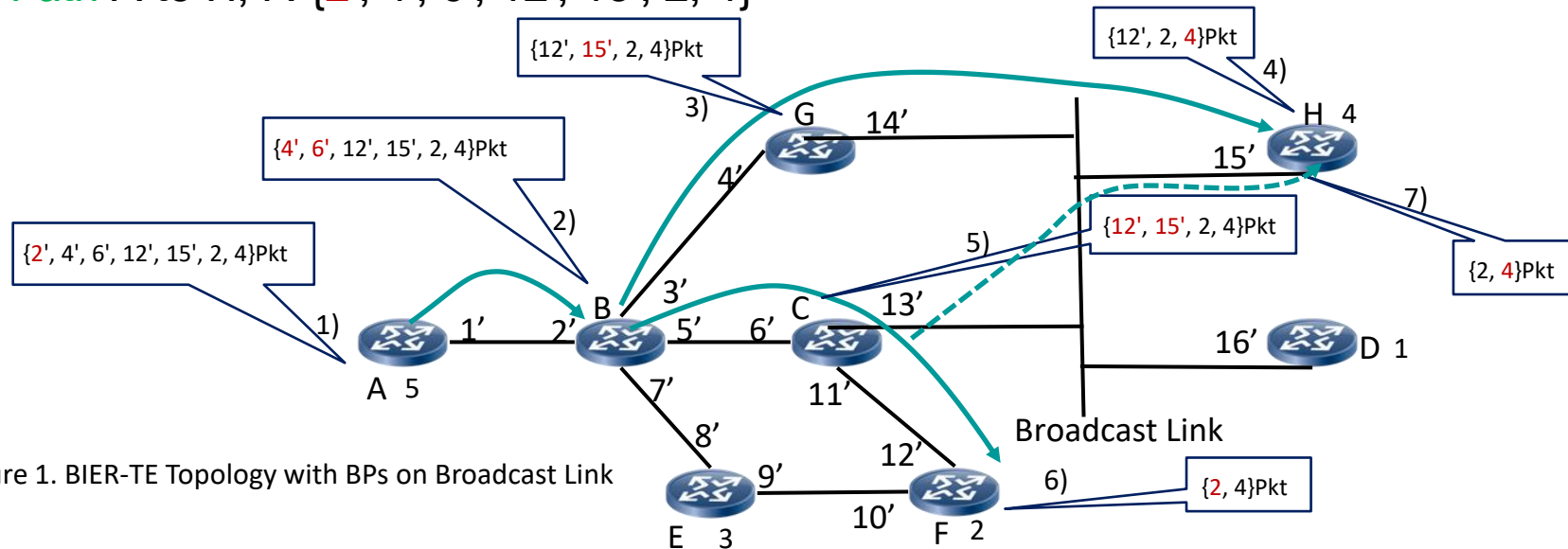
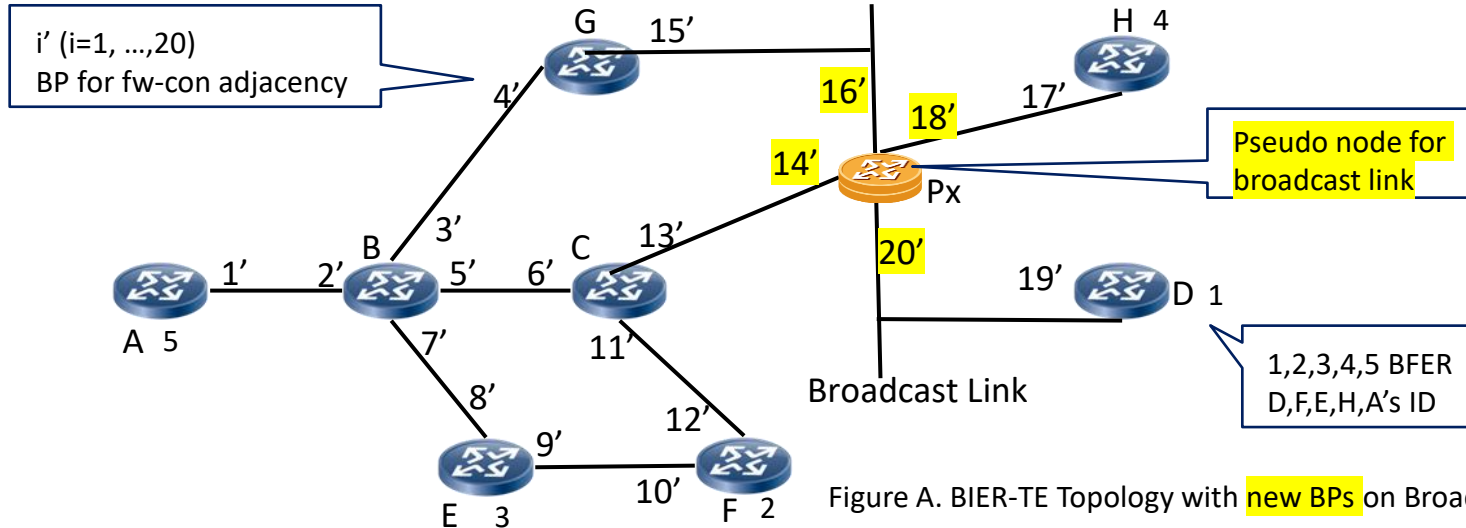


Figure 1. BIER-TE Topology with BPs on Broadcast Link

➤ Improved BIER-TE with Broadcast Links Resolving Issue

New BP Assignments for Broadcast Link

- For a broadcast link connecting X_1, X_2, \dots, X_m , assuming they are connected a pseudo node P_x (e.g., DR in OSPF or DIS in IS-IS).
- For connection between P_x and X_1, X_2, \dots, X_m , two BPs are assigned.
 - One is for **lan-connected** adjacency from X_i ($i=1, 2, \dots, m$) to P_x ,
 - the other is for forward connected adjacency from P_x to X_i .



- For **lan-connected** adjacency from X_i to P_x , X_i acts as P_x (i.e., after X_i “sends” packet to P_x using main BIFT, X_i “sends” the packet to P_x ’s BFR-NBRs using secondary BIFT for P_x)

Improved BIER-TE BIFT on BFR

For a BFR on broadcast link, its improved BIER-TE BIFT comprises:

- main BIFT containing a forwarding entry for lan-connected adjacency to Px.
- secondary BIFT for Px on BFR containing a forwarding entry for each of forward connected adjacencies from Px to BFRs attached to broadcast link except for the adjacency from Px to the BFR.

Adjacency BP (SI:Bitstring)	Action	BFR-NBR (Next Hop)
5'(6:00010000)	fw-connected	B
12'(7:00001000)	fw-connected	F
14'(7:00100000)	lan-connected	Px

Main BIFT on BFR C

Adjacency BP (SI:Bitstring)	Action	BFR-NBR (Next Hop)
15'(7:01000000)	fw-connected	G
17'(8:00000001)	fw-connected	H
19'(8:00000100)	fw-connected	D

Secondary BIFT for Px on BFR C

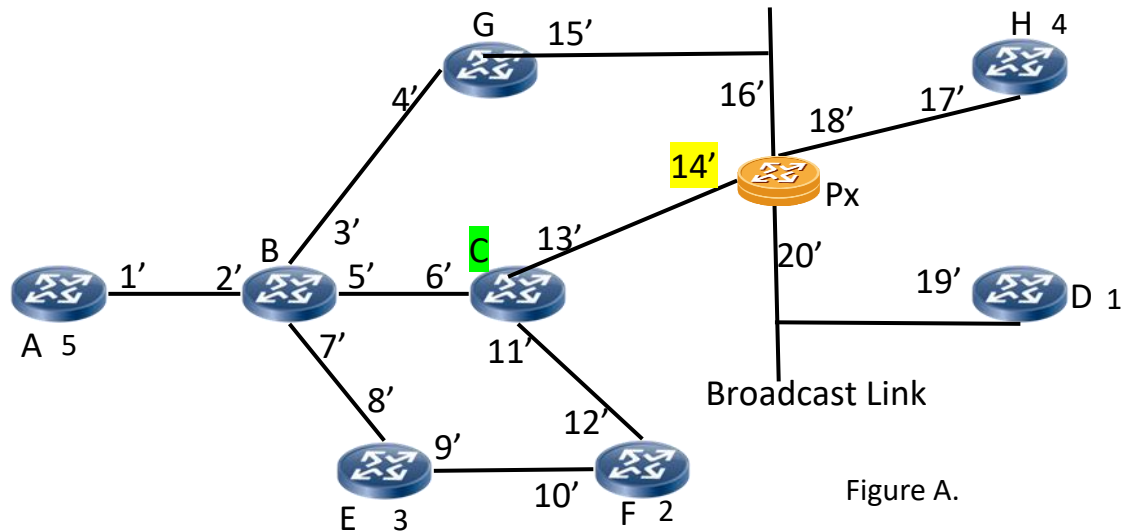


Figure A.

Figure B. Improved BIER-TE BIFT on BFR C

Example Application of Improved BIER-TE

➤ No Duplicated Packets in Improved BIER-TE with Broadcast Links

Path A to H, F: {2', 4', 6', 12', 16', 17', 2, 4}

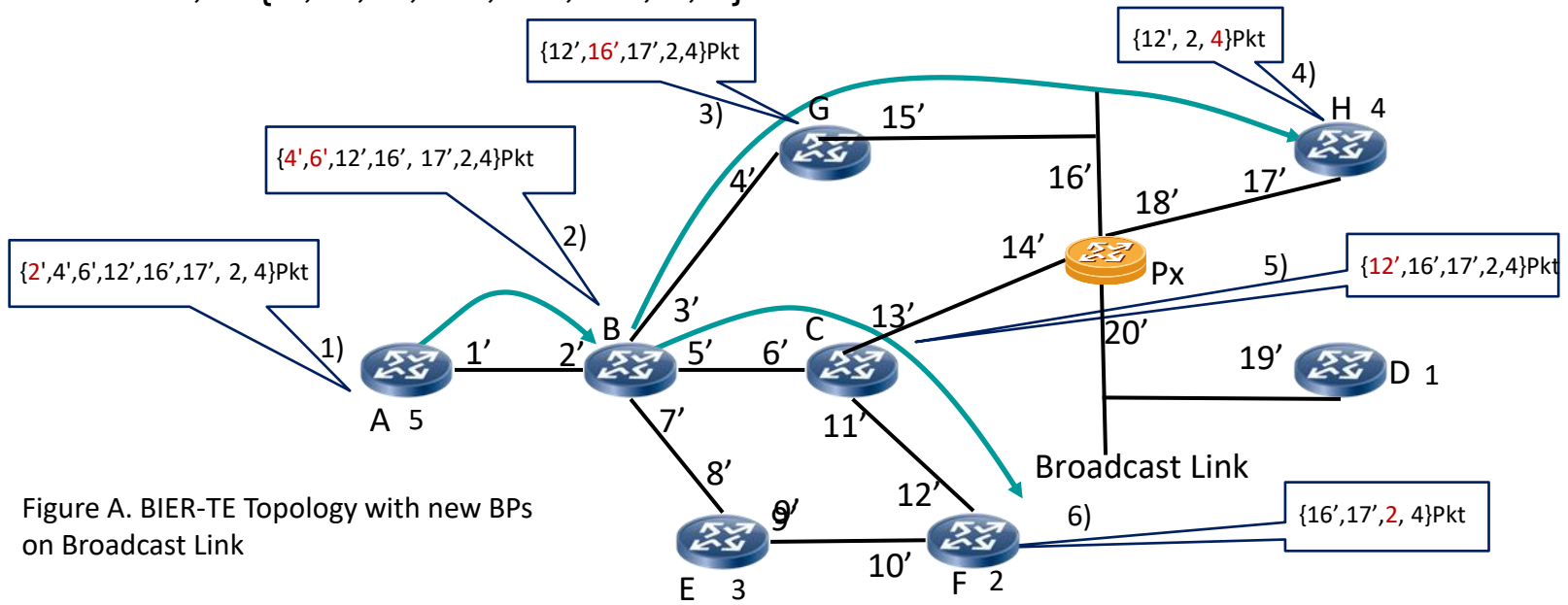


Figure A. BIER-TE Topology with new BPs on Broadcast Link

Next Steps

- Comments

BIER Egress Protection

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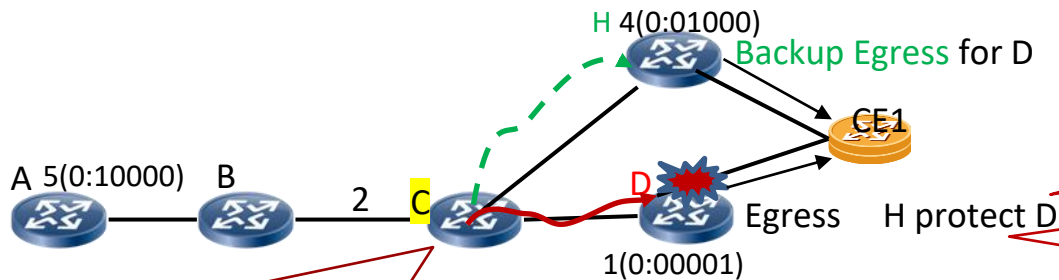
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Overview

➤ BIER egress protection in previous versions

a) H protect D, (assume: D's and H's BIER packet to same CE)



1. Config D's backup H to protect D
a). D's and H's BIER packet to same CE as default

2. IGP distributes the info about D's backup H

3. When detecting D's failure, for packet destined to D, PLR C clears bit for D, sets bit for H, sends packet to H

➤ Extended for a) above and b)

a) H protect D, D's and H's BIER packet to same CE (flag S=1, meaning Same CE)

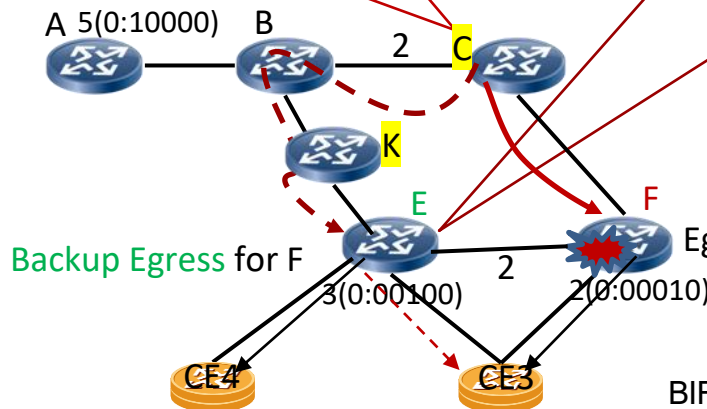
b) E protect F, F's and E's BIER packet to different CEs (S=0, meaning different CEs)

Egress Protection for case b)

1. E protect F with flag S=0 is configured
2. IGP distributes info about E protect F with S=0
 - PLR C extends its BIFT containing backup entry for F considering S
 - E has a mFIB for F and its BIFT including backup entry for F with pointer to mFIB for S=0
3. For packet with F, C sends it to K (TI-LFA to E) when detecting F's failure
4. E, detecting F's failure, acts as Proxy of F, decaps packet with F and uses mFIB for F to send payload to CE3.

3. When PLR C detects F's failure, C sends packet with F to K (TI-LFA to E) since S=0
(When C detects D's failure, for packet with D, clears D, sets H and sends it to H since S=1)

4. when E detects F's failure, E uses forwarding behavior of F and acts as Proxy of F. E decaps packet with F, sends payload using mFIB for F.



1. Config F's backup E to protect F
 - a).
 - b). F's and E's BIER packets to different CES (F's to CE3, E's to CE4)

2. IGP distributes F's backup E with b) (S=0)

BIFT on C

BFR-id	F-BM	NBR	BA	S	BE-BFER	BF-BM	B-NBR
1(00001)	00001	D	0	1	H	01001	H
2(00010)	00110	F	0	0	E	00010	K (TI-LFA)

BIFT on E

BFR-id	F-BM	NBR	BA	S	BE-BFER	BF-BM	B-NBR/P-FIB
1(00001)							
2(00010)	00011	F	0	0	E (00100)	00010	P-FIB-4F

mFIB for F

Next Steps

- Welcome comments

BIER Fast Reroute

draft-chen-bier-frr

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Overview

- Addressed the comments
- Enough unanimous hands up in IETF 111
- Request for adoption call

Thanks