Analysis of Active-Active connection solutions

draft-hao-trill-analysis-active-active-01

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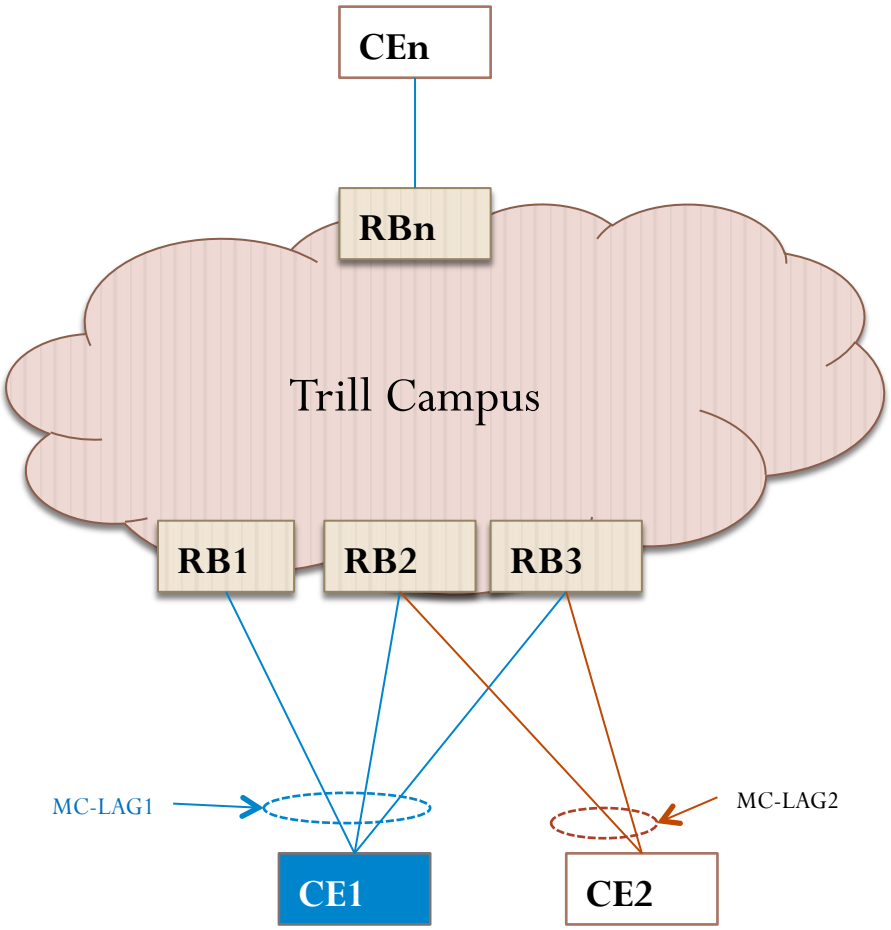
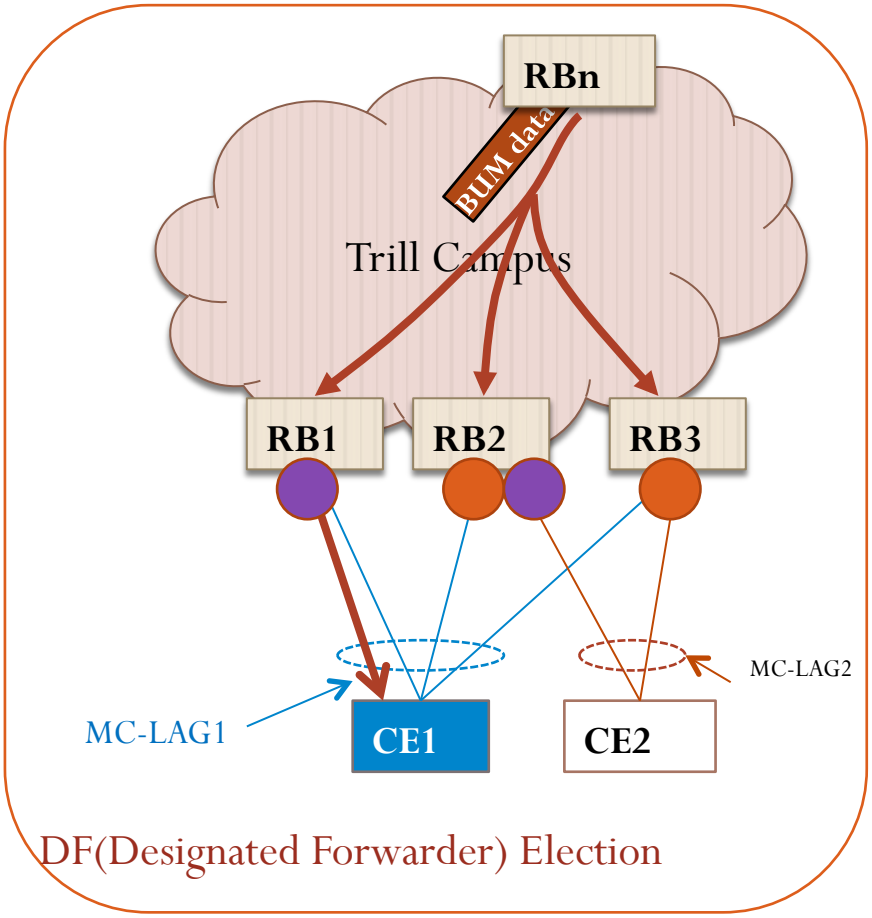
Introduction



Problem	Solution	Pros/ Cons
Frame duplications	1,2…	?
Loop	1,2…	?
Address flip-flop	1,2…	?
Unsynchronized information among member RBridges	1,2…	?

Solution For Problem 1: Frame Duplication



DF: Allow to egress multicast traffic from TRILL campus to local access side.
Non DF: Block egress multicast traffic from TRILL campus to local access side.

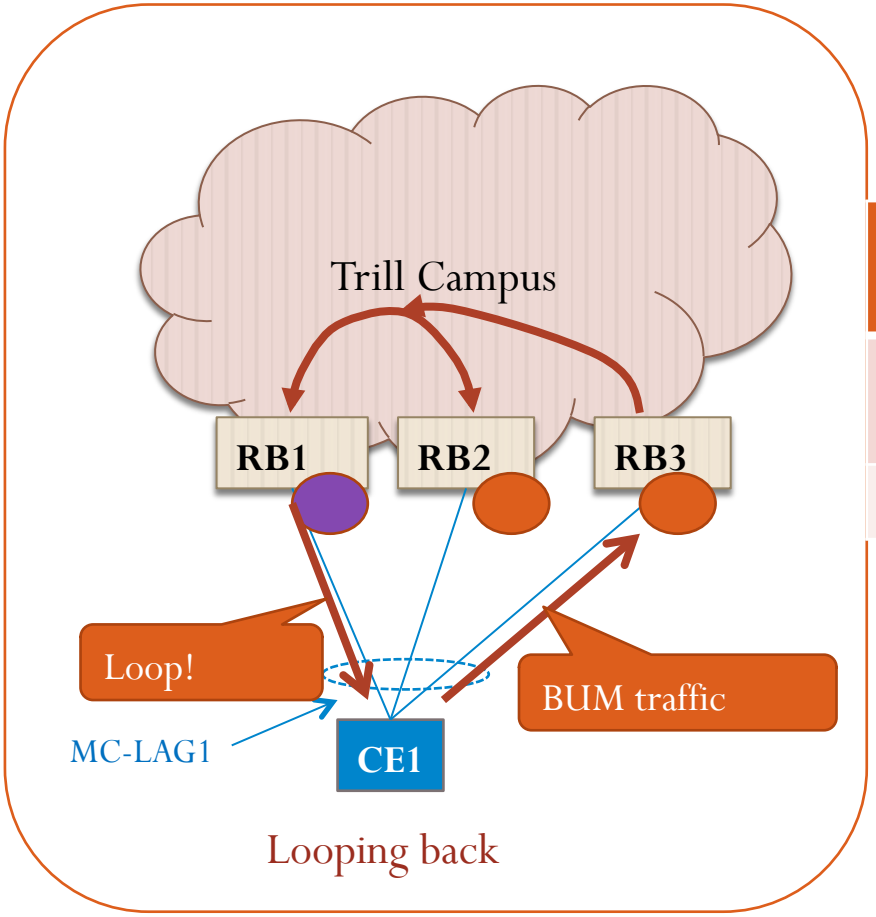
Only one port is elected as a DF per MC-LAG per VLAN to avoid frame duplication from remote RBn.

Solution For Problem 1: Frame Duplication

Traffic type	Direction	DF	Non-DF
Unicast	Ingress	Forward	Forward
Unicast	Egress	Forward	Forward
Multicast	Ingress	Forward	Forward
Multicast	**Egress**	**Forward**	**Block**

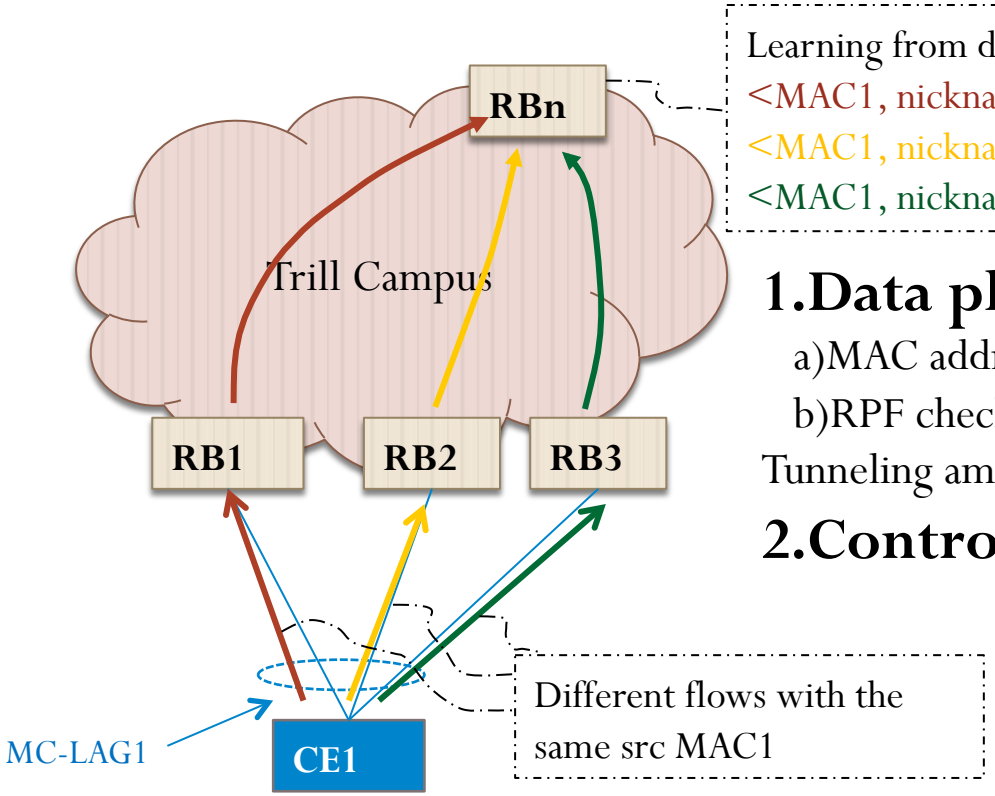
DF election mechanism has no any impact on ingress direction unicast and multicast traffic , also it has no impact on egress direction unicast traffic. It only affects egress forwarding of multicast traffic. [draft-hao-trill-dup-avoidance- active-active-00] has more details about DF election and TRILL protocol extension.

Solution For Problem 2: Loop



Solution	Independent Allocation	Consistent Allocation
Nickname consumption	High	Normal
Scalability	Low	High

Solution For Problem 3: Address Flip-Flop



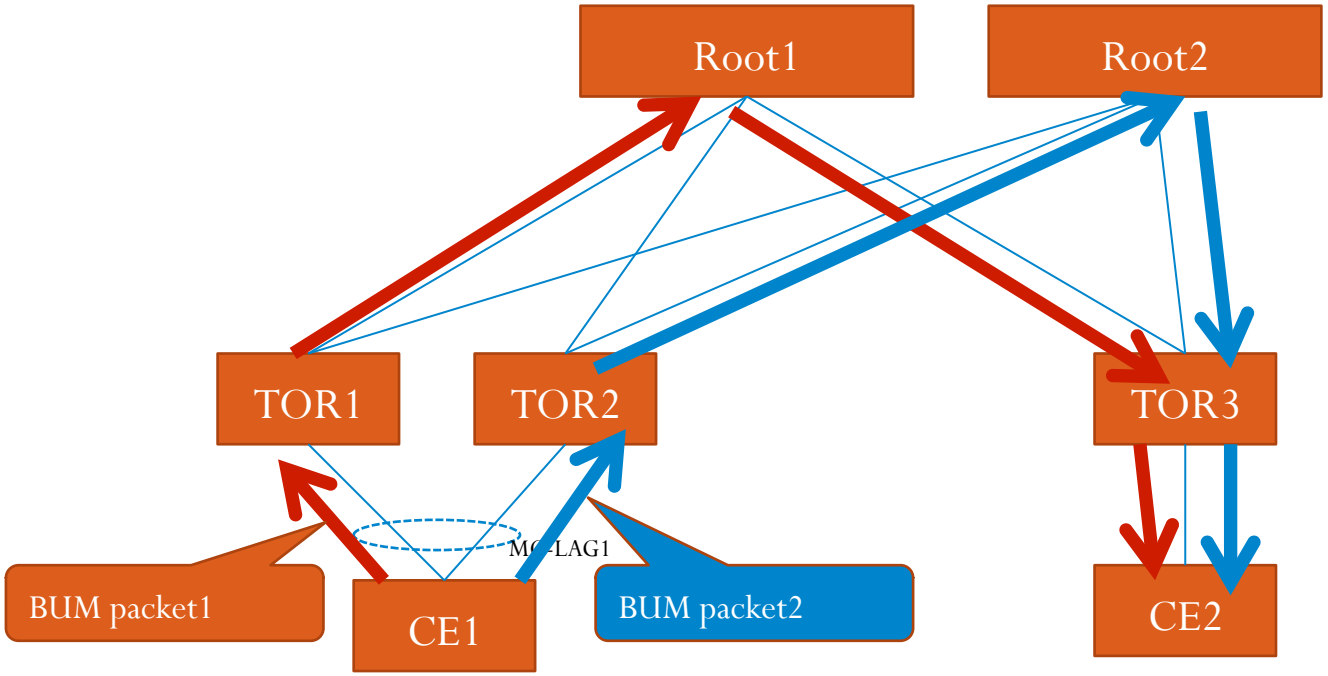
1.Data plane learning mode

a)MAC address flip-flop: pseudo-nickname

b)RPF check Failure :CMT, Centralized replication, Tunneling among edge RBs

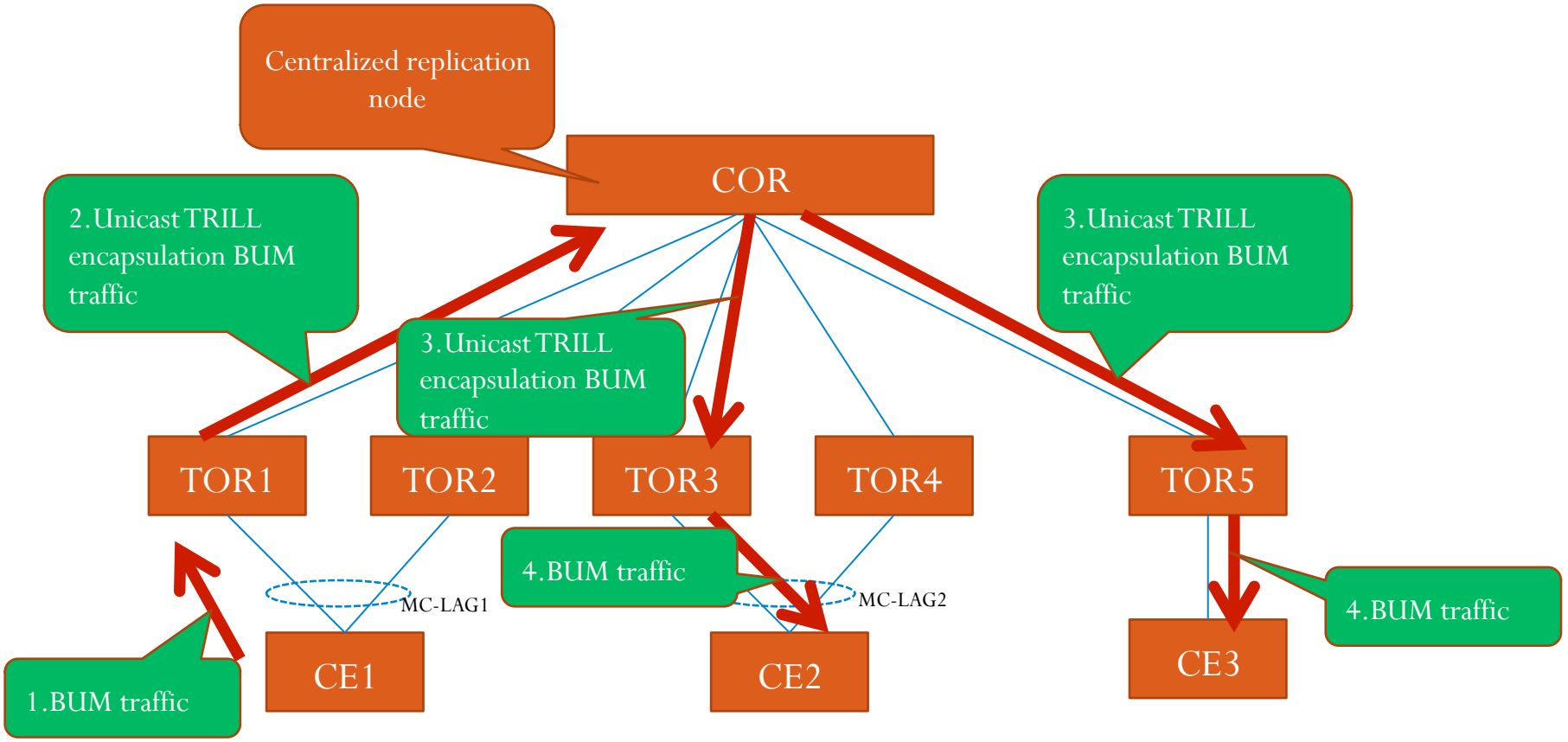
2.Control plane learning mode

CMT(Coordinated Multicast Tree)



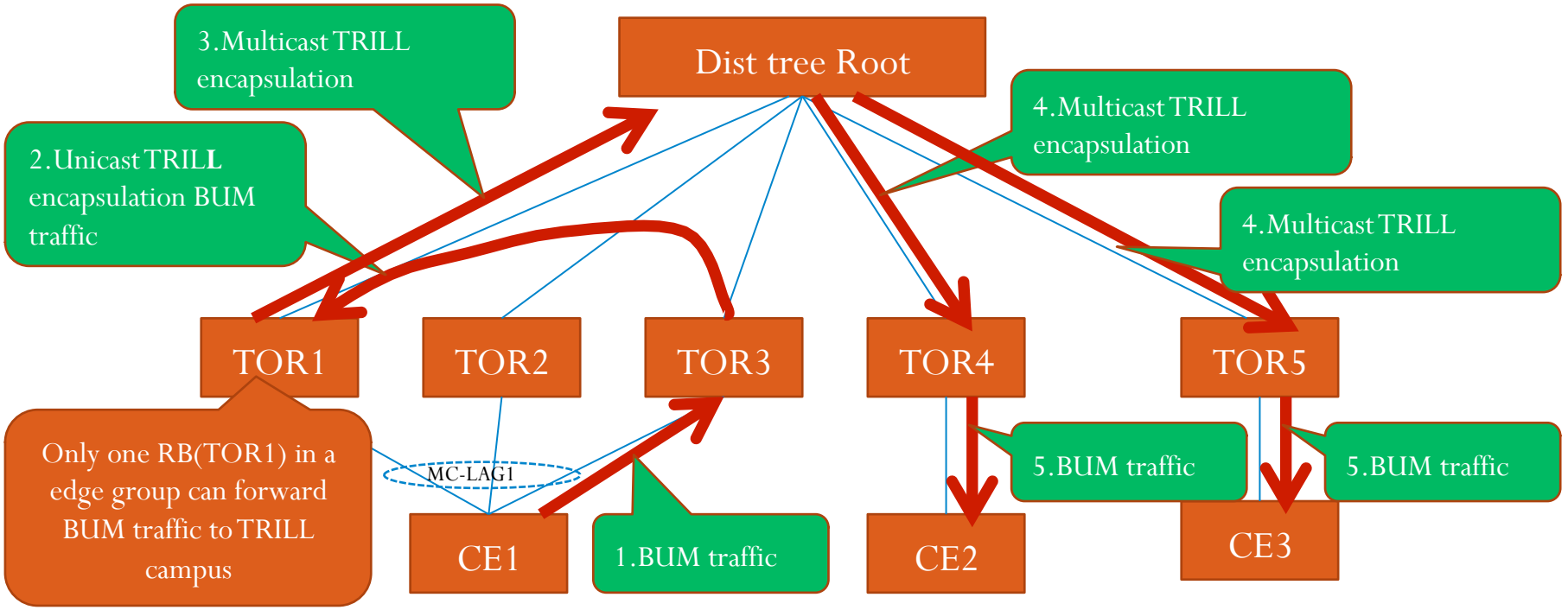
In this solution, it's required to establish multiple distribution trees in a TRILL campus, i.e. if a CE is active-active accessed to 4 edge RBridges, at least 4 distribution trees are required. No hardware upgrade is needed for RBridges in the TRILL campus, only software upgrade is needed.

Centralized replication



[draft-hao- trill-centralized-replication-00] has more details.

Tunneling among edge RBs



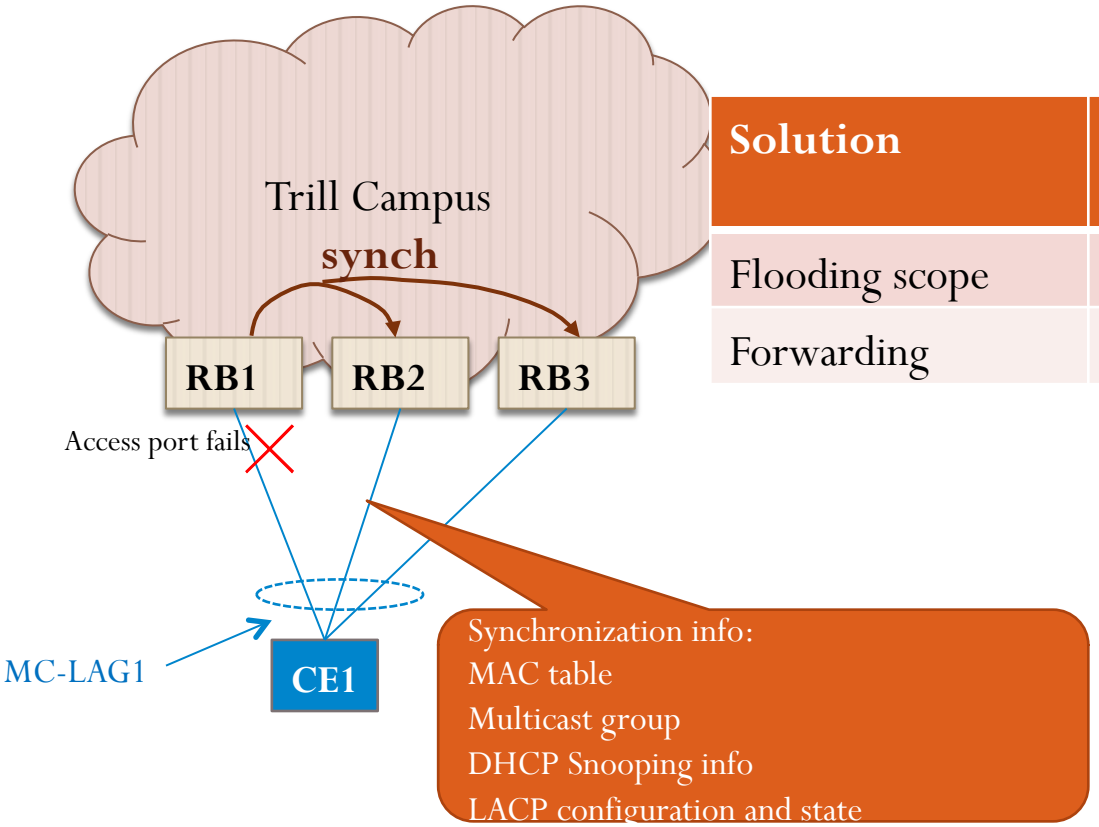
Solution For Problem 3: Address Flip-Flop

Solution	CMT	Centralized replication	Tunneling among edge RBs
Scalability	Medium	High	High
Network bandwidth consumption	Low	High	High
Software upgrade	All RBs	root and edge nodes	root and edge nodes
Hardware upgrade	No	root and edge nodes	root and edge nodes

Data Plane Learning Mode

Control plane learning mode : Remote Rbriges learn end station's MAC association with different ingress RB nicknames and generate multiple MAC forwarding entries in ECMP mode. This method requires hardware and software changes.

Solution For Problem 5: Info inconsistency



Solution	RBridge channel based	TRILL LSP extension
Flooding scope	Edge group	Campus wide
Forwarding	Data plane	Control plane

Solution Summary

Problem	Solution			
Frame duplication	DF election			
Loop	Data plane MAC learning			Control plane MAC learning
	CMT	Centralized replication	Tunneling among edge RBs	
Address flip-flop	Independant allocation		Consistent allocation	
Unsynchronized information	RBridge channel based		LSP extension	

Summary and next step

- Solicit comments. Take this draft as the base for active-active connection completed solution?