Ingress Replication BUM flag in VXLAN

draft-rabsaj-bess-evpn-vxlan-ir-bum-00

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IETF124, November 2025
Montreal

Introduction

Ingress Replication BUM flag in VXLAN

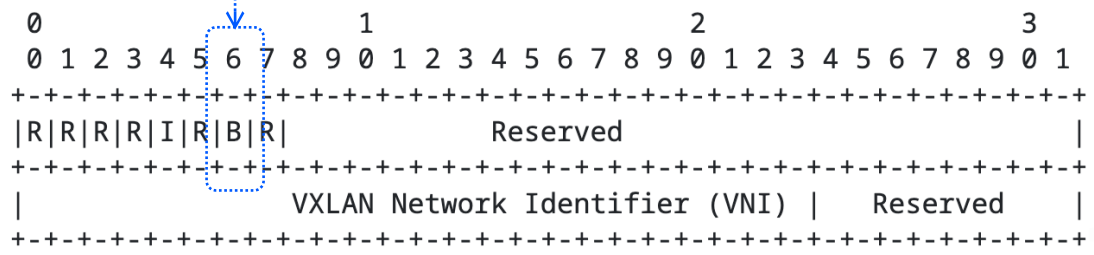
- The **Problem**
  - Ingress replication + unknown-unicast flooding without a distinct label can cause duplicate delivery
  - Happens when ingress PE hasn’t yet learned the destination MAC, but egress PEs have
  - Conditions: all-active MH, unknown-unicast flooding, ingress replication, MAC not yet learned by ingress PE
- The **Solution** (per RFC 8365, section 8.3.3)
  - Use VXLAN-GPE encapsulation with B-bit to mark ingress-replicated BUM frames
- **Why didn’t** RFC8365 defined the B-bit in **VXLAN** (RFC7348)?
  - It was an independent submission, not an IETF sponsored document
  - draft-ietf-nvo3-rfc7348bis makes VXLAN an IETF technology and creates the "VXLAN Flags” registry (IANA)
- **Goals** of this document
  - **Request allocation** of the B-bit (“Ingress Replication BUM” flag) in the VXLAN Flags registry
  - **Extend its use** beyond the original RFC 8365 scenario

The Ingress Replication BUM flag in VXLAN

Allocation and Procedures

Ingress Replication BUM flag

- **Bit 6** - same position as in VXLAN-GPE, to facilitate implementation alignment

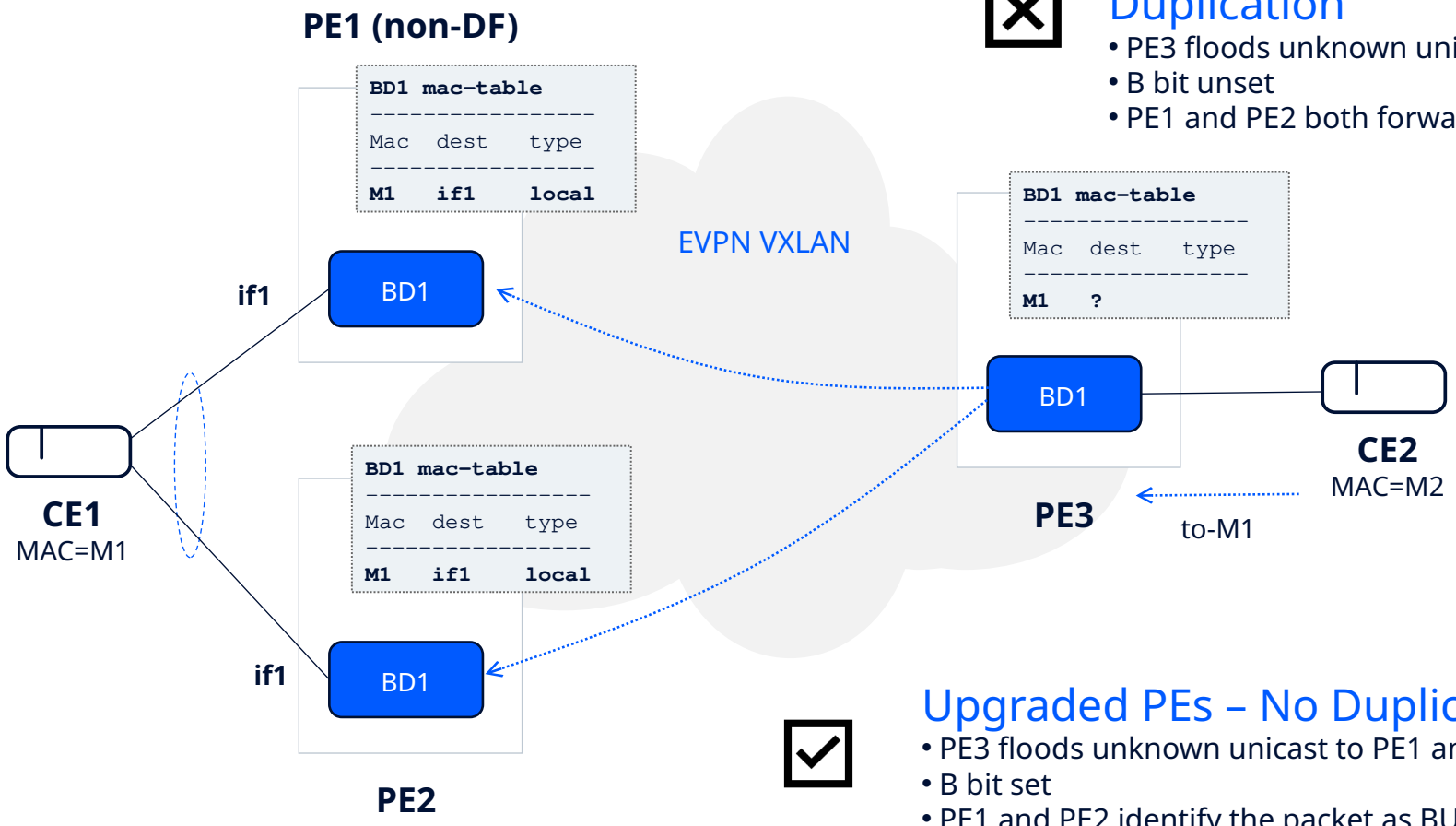


Procedures

- **Ingress PEs MUST set B** in broadcast, multicast, or unknown unicast encapsulated packets
  - Applies to Ingress Replication and
  - Assisted Replication (RFC9574)
- **Egress PEs MUST treat** any received packet with B=1 as **BUM traffic**, regardless of the destination MAC
- **Egress PEs MUST treat** any received packet with B=0 as **known unicast** traffic, regardless of the destination MAC

Application Scenarios

Scenario 1 - Avoid transient packet duplication in all-active MH (RFC8365)



Non upgraded PEs – Packet Duplication

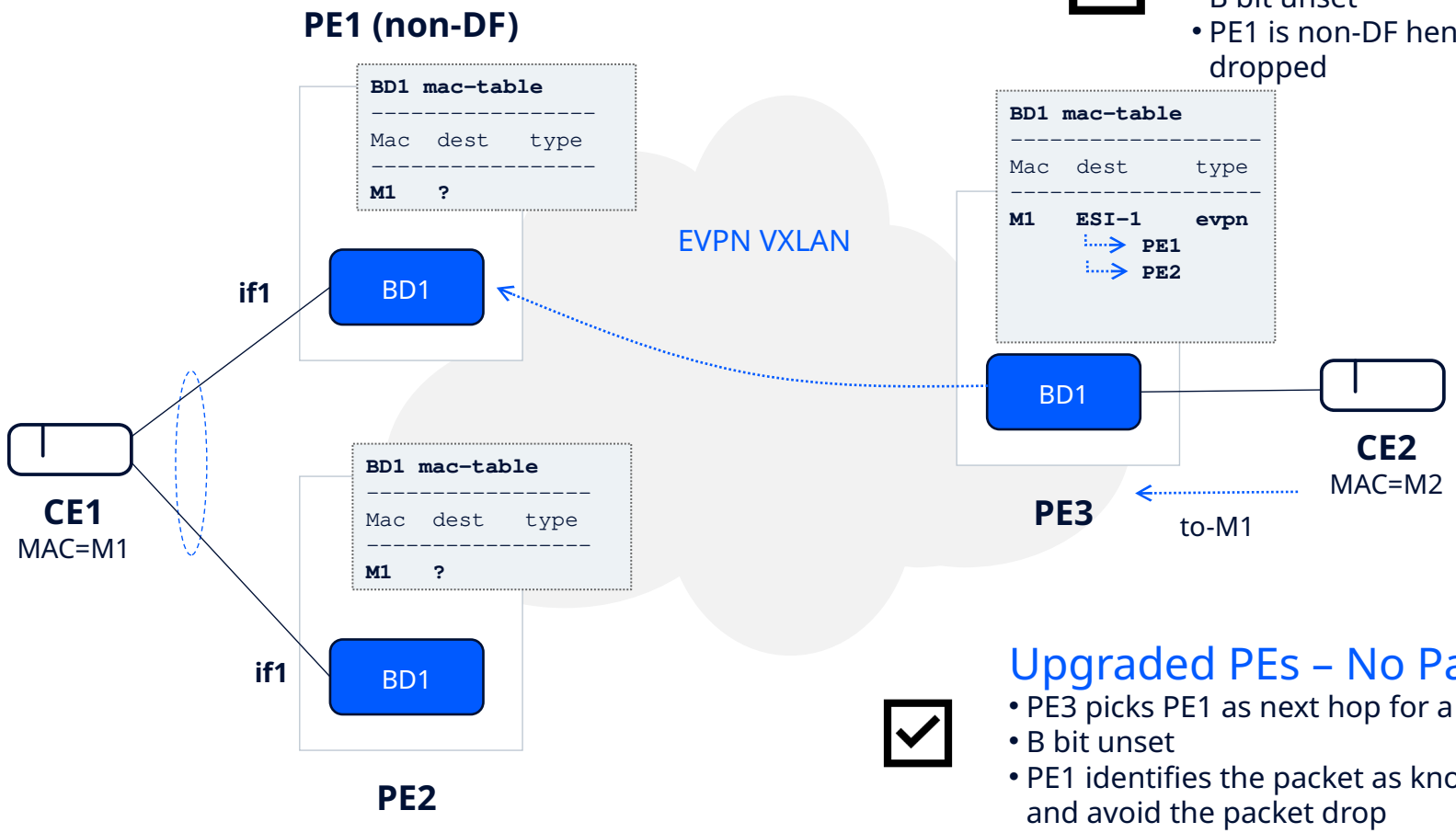
- PE3 floods unknown unicast to PE1 and PE2
- B bit unset
- PE1 and PE2 both forward to CE1

Upgraded PEs – No Duplication

- PE3 floods unknown unicast to PE1 and PE2
- B bit set
- PE1 and PE2 identify the packet as BUM and only the DF (PE1) forwards to CE1

Application Scenarios

Scenario 2 - Avoid transient packet drop in all-active MH (not in RFC8365)



Non upgraded PEs – Packet Drop

- PE3 picks PE1 as next hop for a flow to ESI-1
- B bit unset
- PE1 is non-DF hence BUM to CE1 is blocked and packets dropped

Upgraded PEs – No Packet Drop

- PE3 picks PE1 as next hop for a flow to ESI-1
- B bit unset
- PE1 identifies the packet as known unicast, hence it can safely forward to CE1 and avoid the packet drop

What is next?

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Other use-cases might benefit of the B-bit indication

Authors request **feedback** from the Working Group

Thank you