

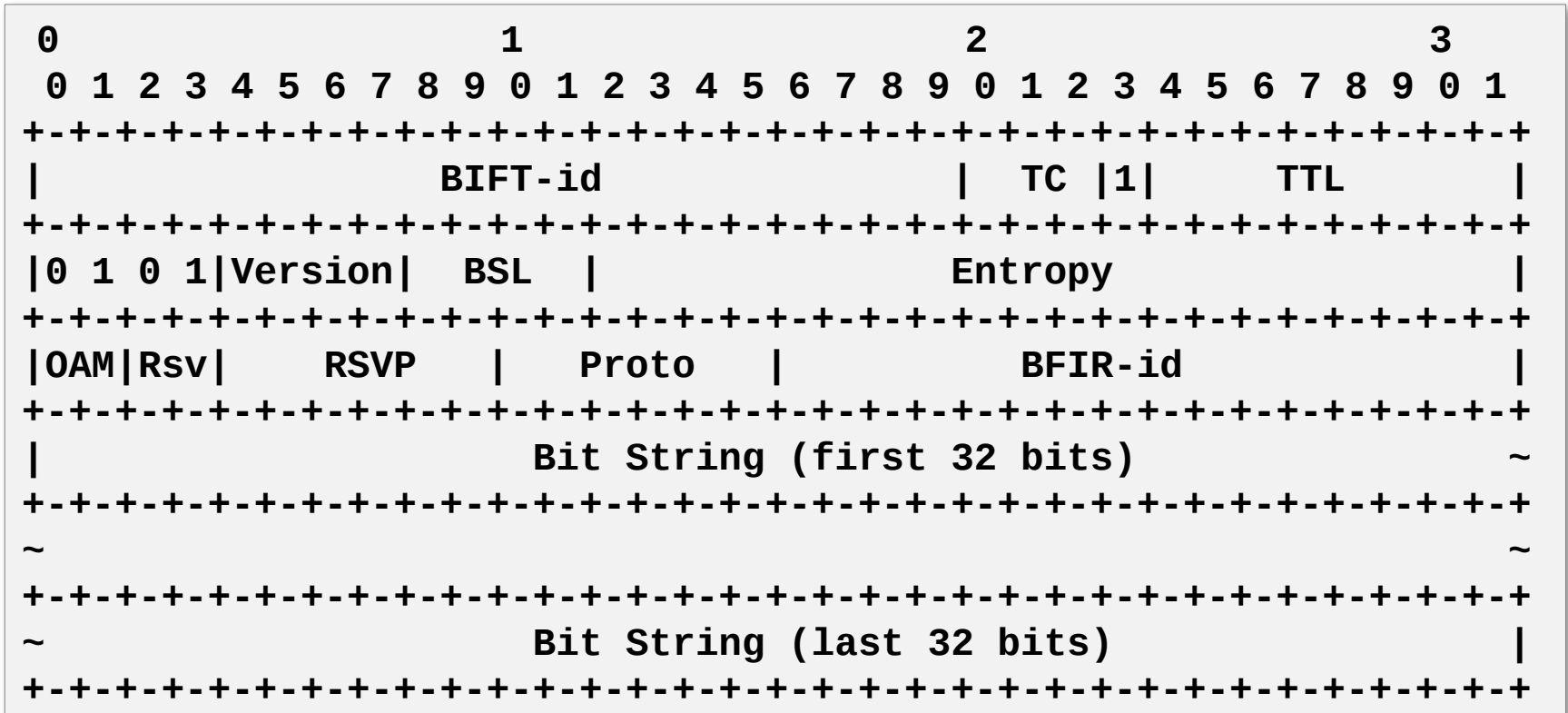
# **PSD MNA with BIER over MPLS**

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# Bit-Indexed Explicit Replication

- Multicast without creating per-flow state in transit BIER nodes.
  - As a result, if PSD MNA follows the BIER header, it will be replicated according to information encoded in the BitString field.
- Techniques used include:
  - The ingress BIER router (BFIR) prepends the payload packet with the BIER header.
  - The BIER header includes a bit string in which each bit represents exactly one egress BIER router (BFER).

# BIER Header



BIFT-id field represents a particular Bit Index Forwarding Table (BIFT). A BIFT corresponds to a particular combination of Sub-domain, Bit String Length, and a Set Identifier. At the same time, the field contains BIER-MPLS label that is locally unique.

# Important Rules of BIER over MPLS

- The first four octets of the BIER encapsulation header are also the last four octets of the MPLS header
- As a result, PHP MUST NOT be applied to a BIER-MPLS label
- When a BFR receives an MPLS packet and the next label to be processed is one of the BFR's BIER-MPLS labels, it will assume that the remainder of the BIER header **immediately follows** the stack
- 6-bit "Next Protocol" field identifies the type of the packet or frame **immediately following** the BIER header
- IANA created "BIER Next Protocol Identifiers" registry:
  - 0 - Reserved
  - 1 - MPLS packet with downstream-assigned label at top of stack
  - 2 - MPLS packet with upstream-assigned label at top of stack
  - 3 - Ethernet frame
  - 4 - IPv4 packet
  - 5 - OAM packet, e.g., BIER ping
  - 6- IPv6 packet
  - 63 - Reserved

# BIER-MPLS and PS MNA

- It appears that PS MNA cannot precede the BIER header
- A PS MNA block may follow the BIER Header

# Some Ideas for PS MNA in BIER

- **Option 1:**
  - Use distinctive BIER Next Protocol Identifier value for PS MNA
  - In PS MNA header, include the Next Protocol field that identifies the type of payload according to IANA's BIER Next Protocol Identifier registry
- **Option 2:**
  - Do not set S in BIER-MPLS LSE
  - Bump up Version in the BIER header
  - Set Proto in the new BIER header to 0



Questions?

Thank you!