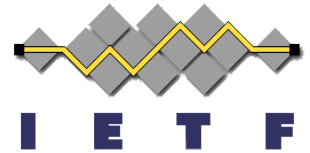


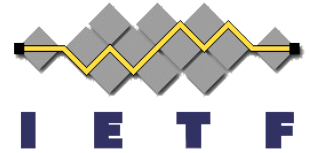
Egress TLV for Nil FEC

draft-rathi-mpls-egress-tlv-for-nil-fec

IETF 109

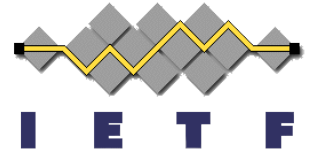
Deepti N Rathi, Juniper Networks
Shraddha Hegde, Juniper Networks
Kapil Arora, Juniper Networks





Agenda

- Spring-TE and NIL FEC
- EGRESS TLV
- Traceroute example
- Next steps

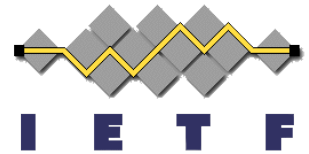


Spring-TE

- Spring-TE paths are built by stacking labels using node-sids, adj-sids and anycast sids
- Requirement Spring-TE OAM
 - Controller created label-stack
 - Routers in the network are not upgraded to support FEC validation for Spring-TE path

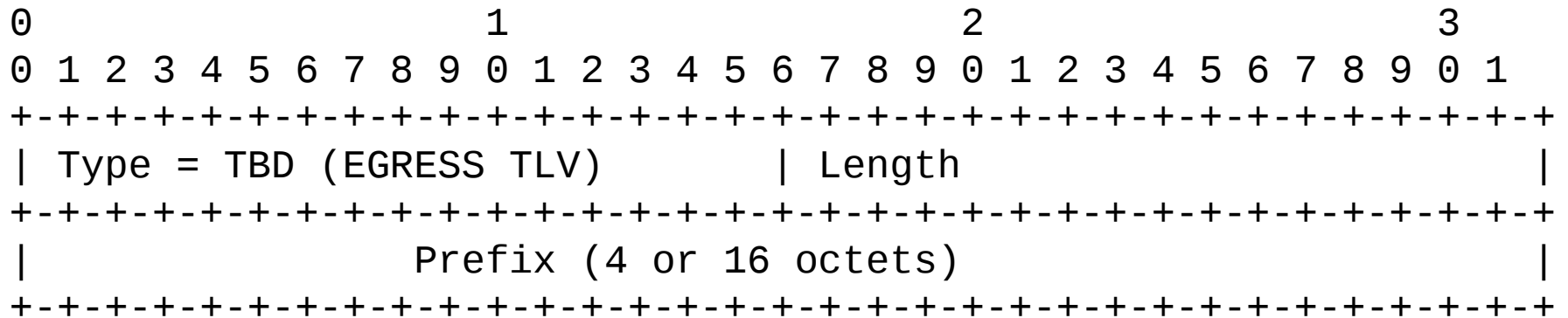
NIL FEC

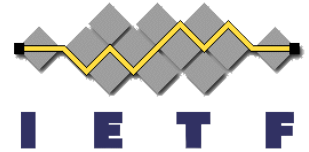
- NIL FEC defined in RFC 8029
 - Intelligent application can be built for verification
 - Verification of the backup paths before using it as primary
- Problems with NIL FEC
 - False positive
 - No egress validation



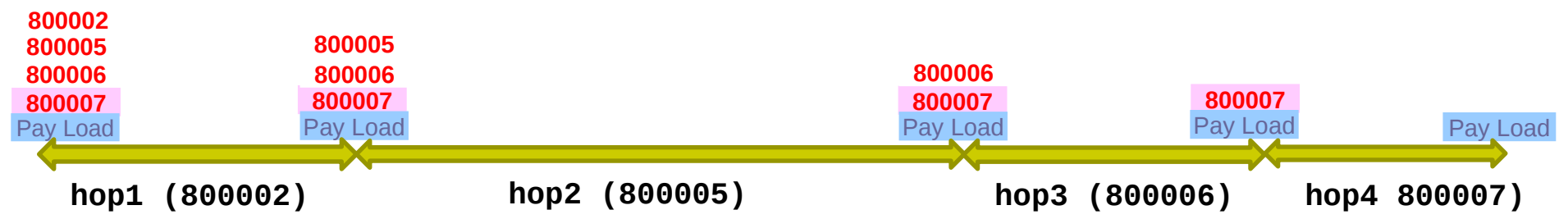
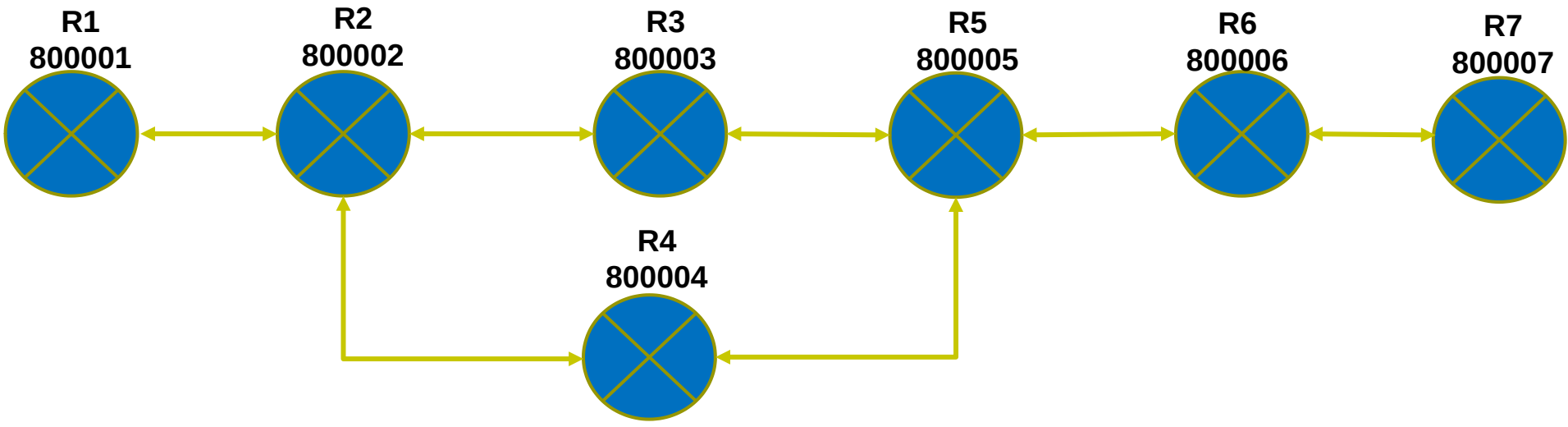
EGRESS TLV

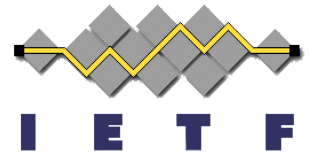
- The Egress object is a TLV that MAY be included in an MPLS Echo Request message. Its an optional TLV and should appear before FEC-stack TLV in the MPLS Echo Request packet.
- The format is as specified below:





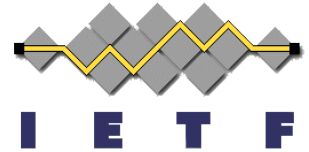
SPRING-TE Topology



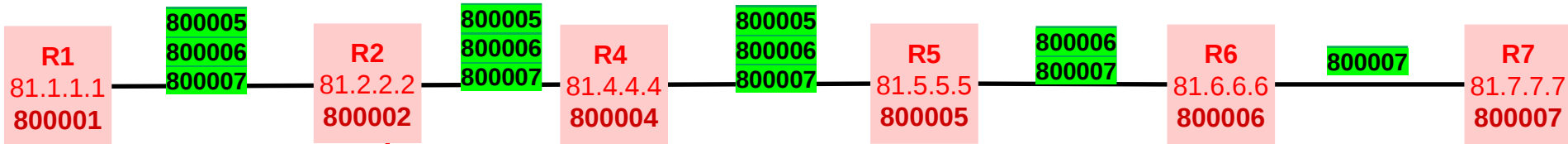


Traceroute Example

- Trace route for Spring-TE path
R1--R2--R4--R5--R6--R7



Traceroute cont.



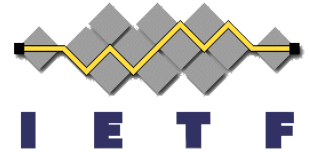
MPLS Echo Request: Probe 1

Egress address TLV : 81.7.7.7	800005 TTL = 1
Nil FEC subTLV : 0000 0000	800006 TTL = 0
Downstream Detailed Mapping TLV	800007 TTL = 0

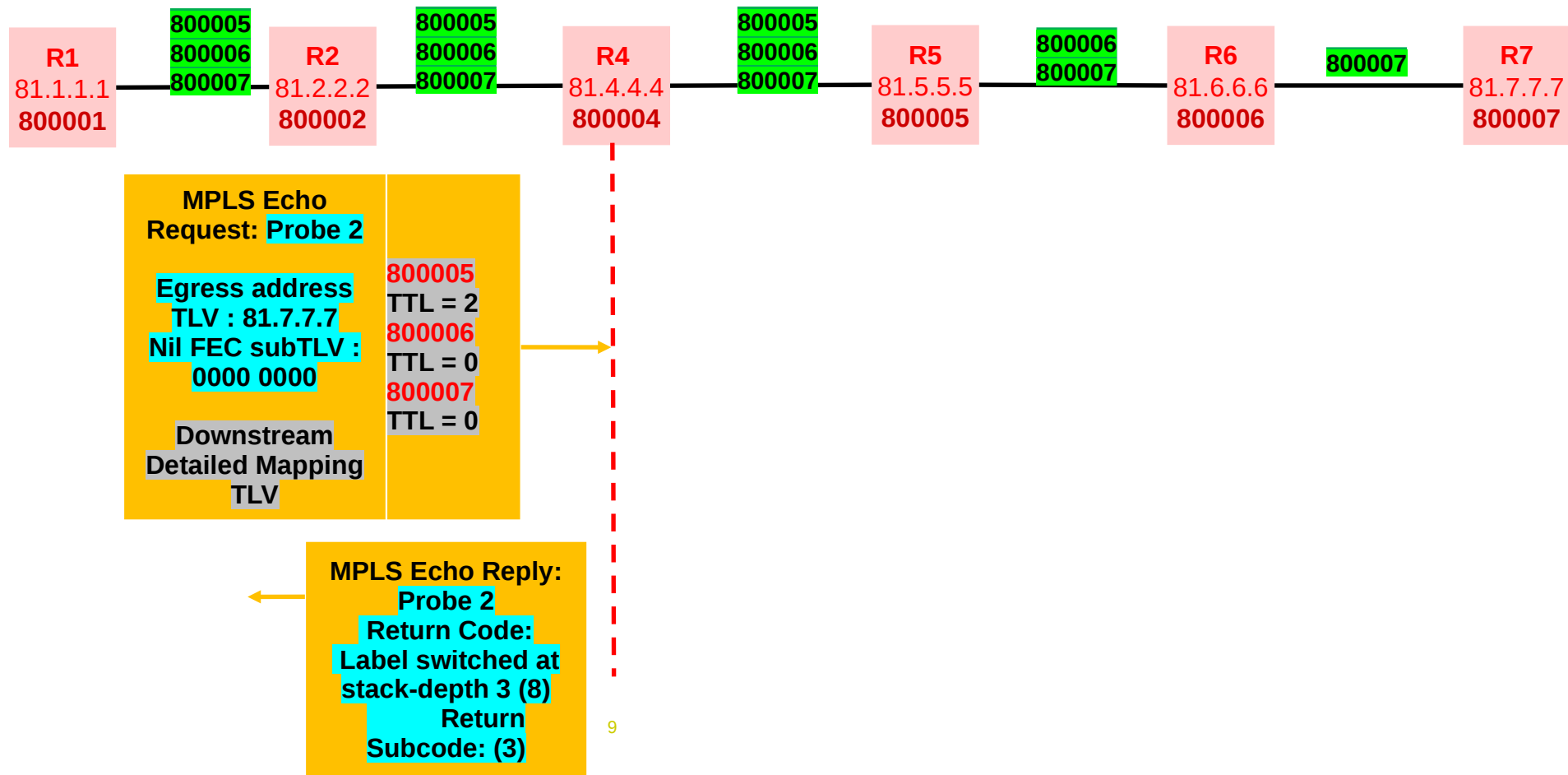
MPLS Echo Reply: Probe 1

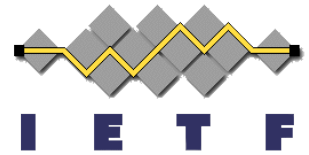
Return Code:
Label switched at stack-depth 3 (8)

Return Subcode: (3)

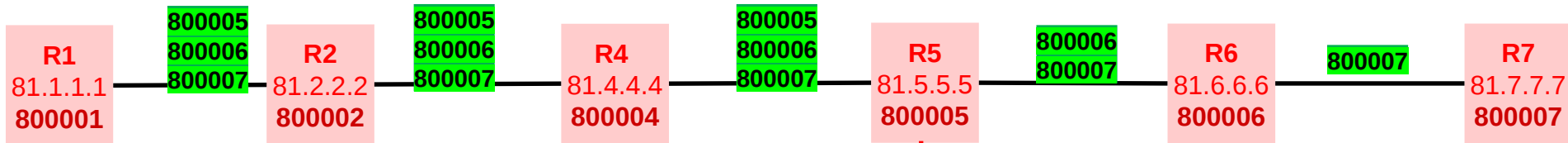


Traceroute cont.





Traceroute cont.



MPLS Echo Request: Probe 3

Egress address TLV : 81.7.7.7

Nil FEC subTLV : 0000 0000

Downstream Detailed Mapping TLV

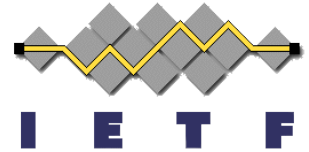
800005	TTL = 255
800006	TTL = 1
800007	TTL = 0

MPLS Echo Reply: Probe 3

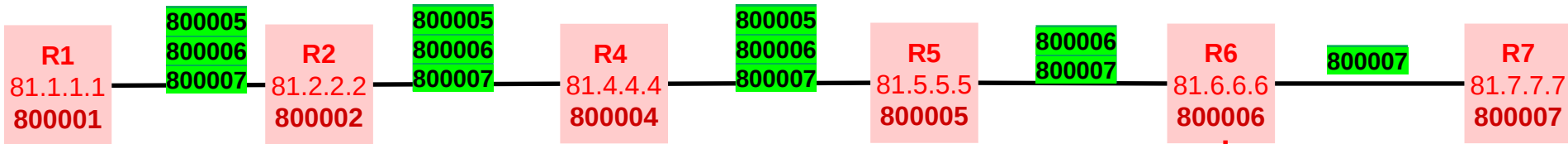
Return Code: Label switched at stack-depth 2 (8)

Return Subcode: (2)

10



Traceroute cont.



MPLS Echo Request: Probe 4

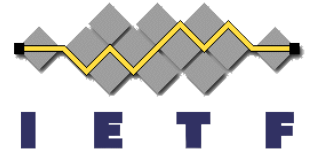
Egress address TLV : 81.7.7.7
Nil FEC subTLV : 0000 0000

Downstream Detailed Mapping TLV

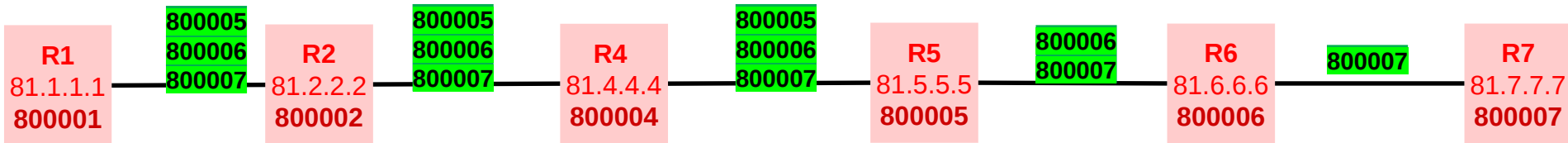
800005	TTL = 255
800006	TTL = 255
800007	TTL = 1

MPLS Echo Reply: Probe 4

Return Code: Label switched at stack-depth 1 (8)
Return Subcode: (1)



Traceroute cont.



MPLS Echo Request: Probe 5

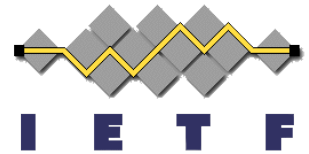
Egress address TLV : 81.7.7.7
Nil FEC subTLV : 0000 0000

Downstream Detailed Mapping TLV

800005	TTL = 255
800006	TTL = 255
800007	TTL = 2

MPLS Echo Reply: Probe 5

Return Code: Replied router is an egress for the FEC at stack depth 1 (3)
Return Subcode: (1)



Next Steps

- Request review and comments
- WG adoption?



Thank you