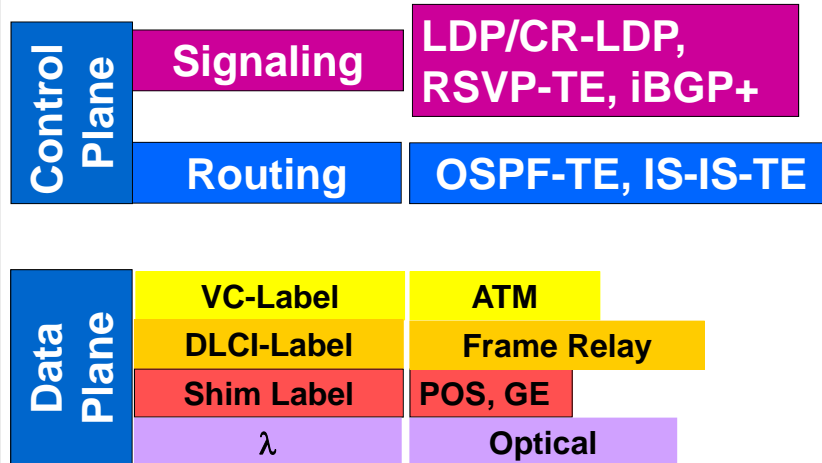
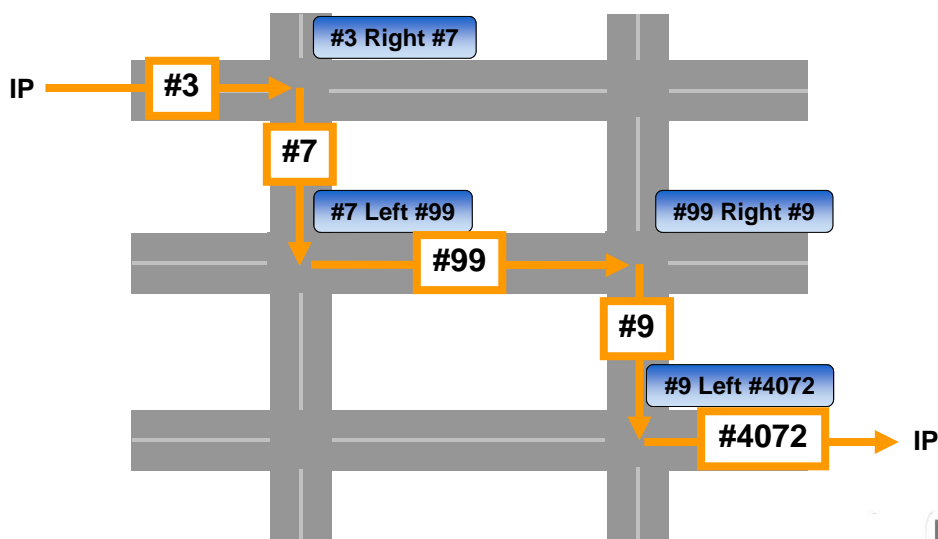


What is Standard MPLS?

Architecture/Framework

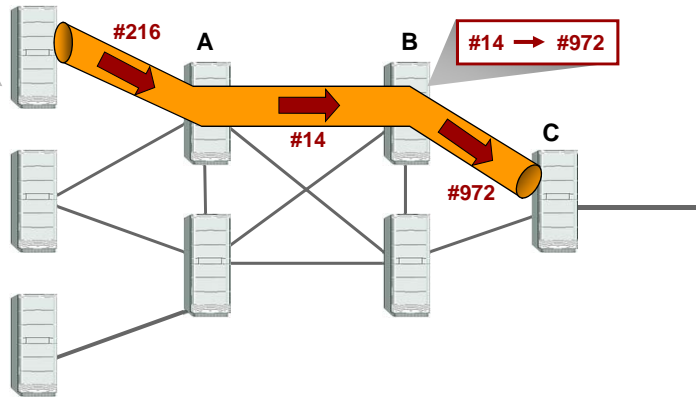


Label Switched Path



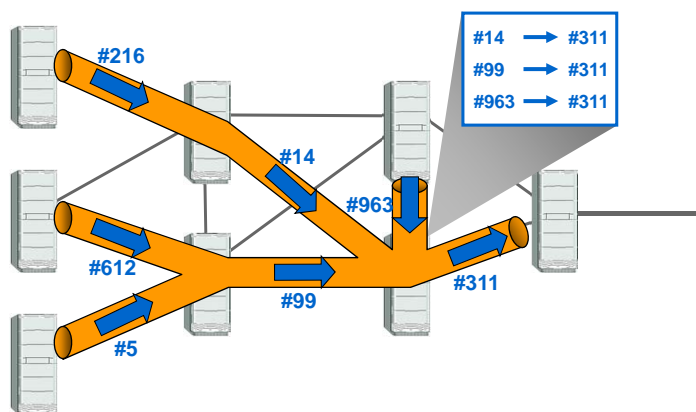
Point-to-point LSP

Route=
{A,B,C}



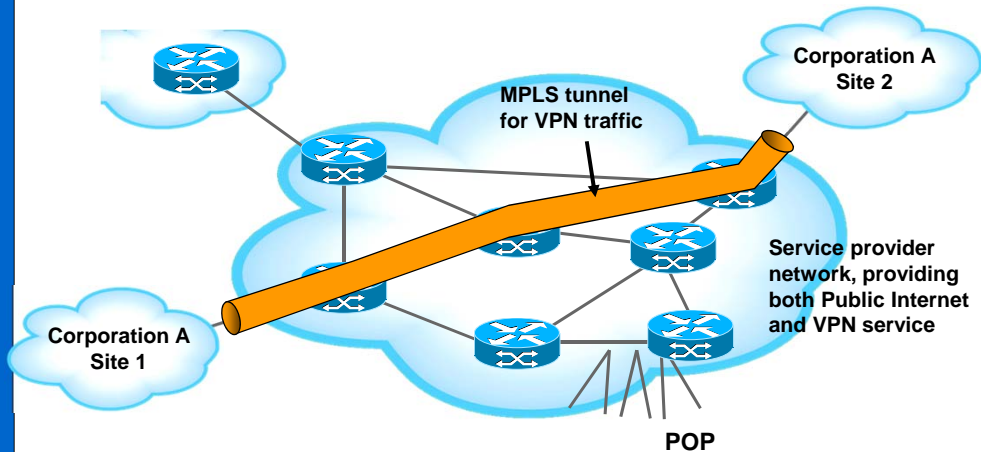
- LSP follows route that source chooses. In other words, the control message to establish the LSP (label request) is *source routed*.

Merging LSP

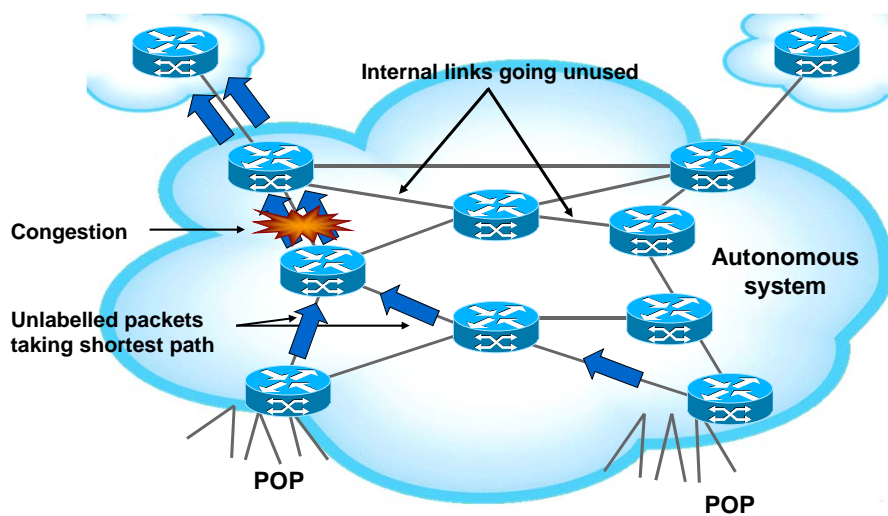


- LSP forms a "sink tree"
- The branches of the LSP always follows the same route as normal IP forwarding; that is, the *shortest path*

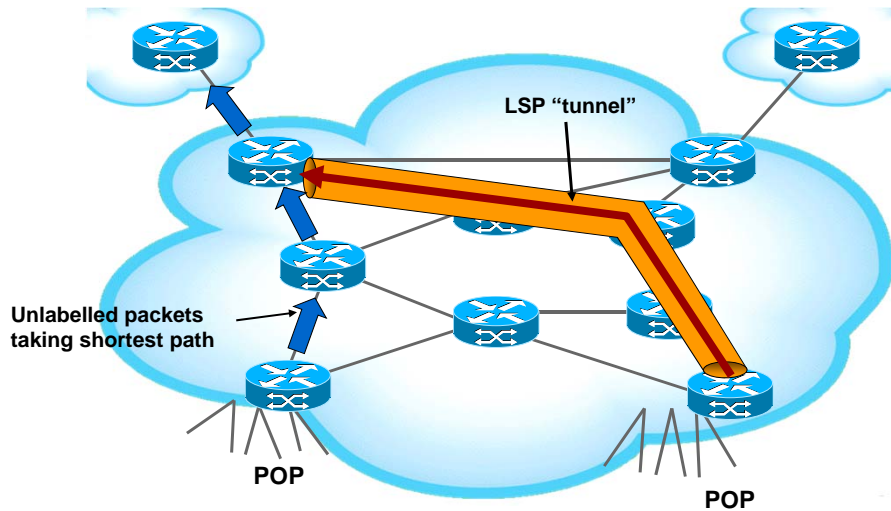
Network-Based Virtual Private Networks using MPLS



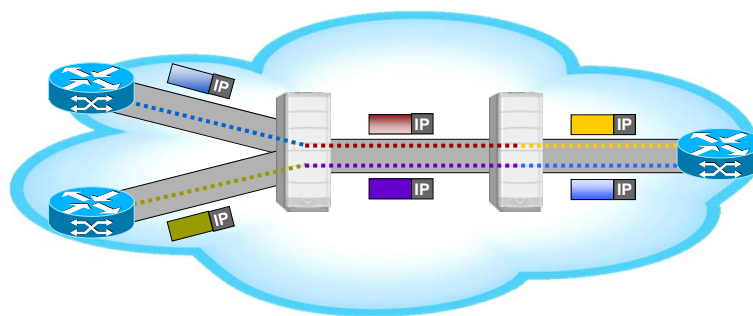
IP Traffic Engineering. Problem Definition



Traffic Engineering using MPLS

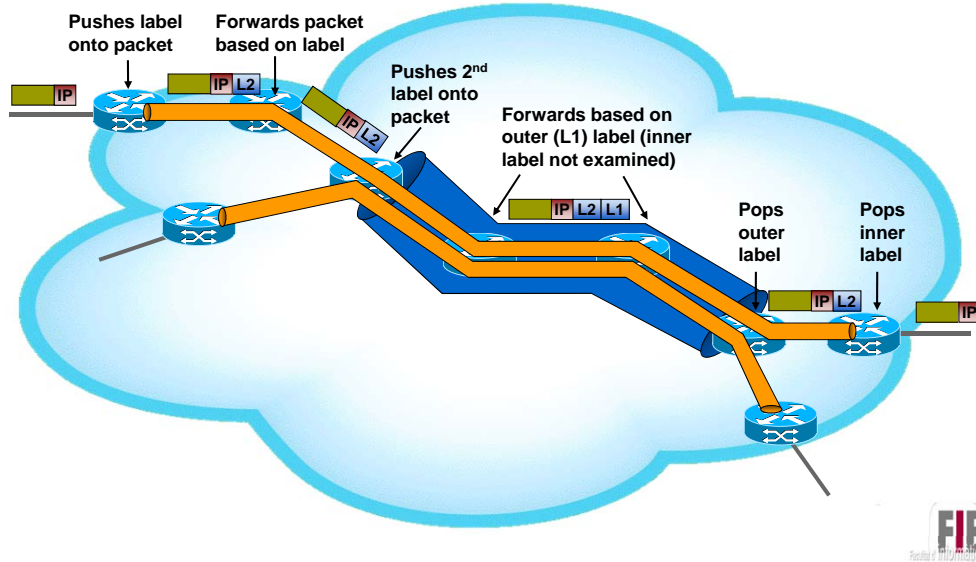


Optical

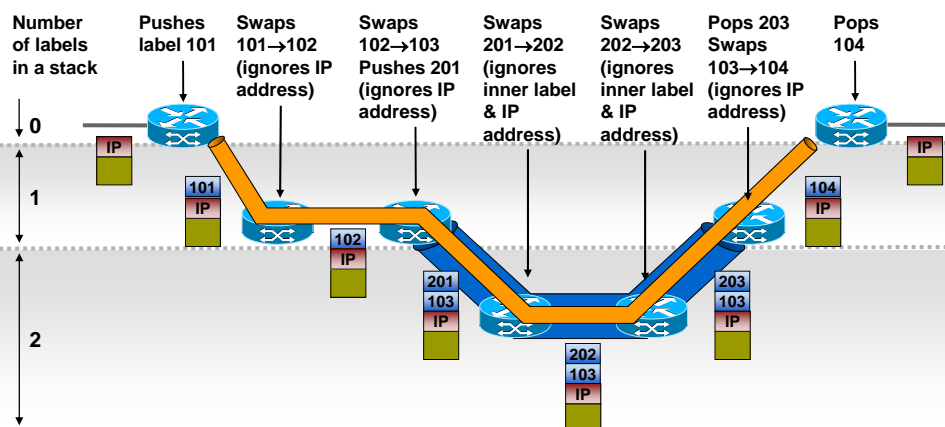


- Label not prepended to packet
- Instead is represented by a fiber number or a wavelength

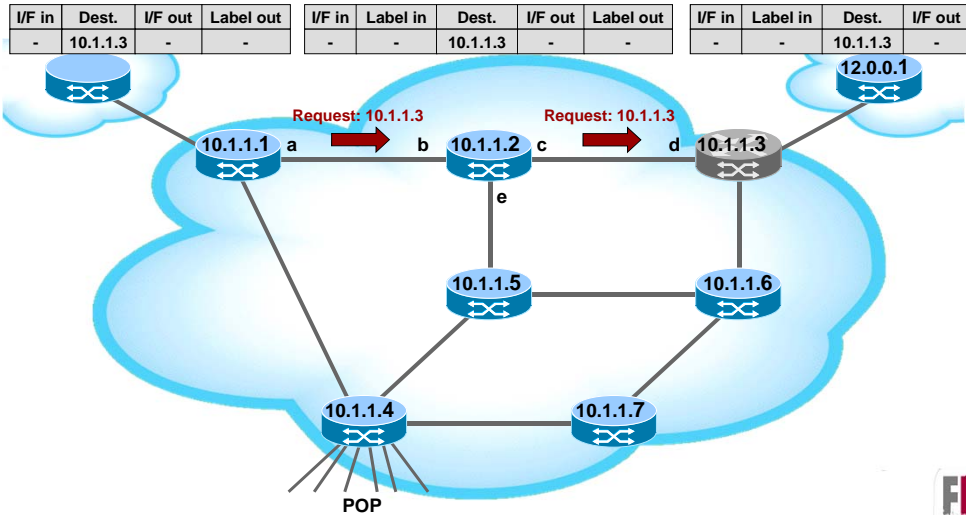
Label Stacking Example



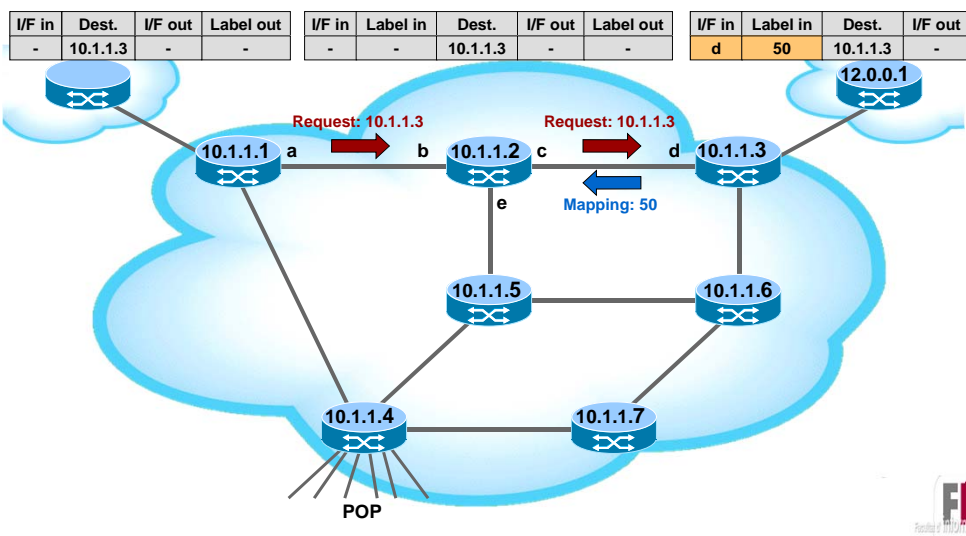
Label Stacking Details



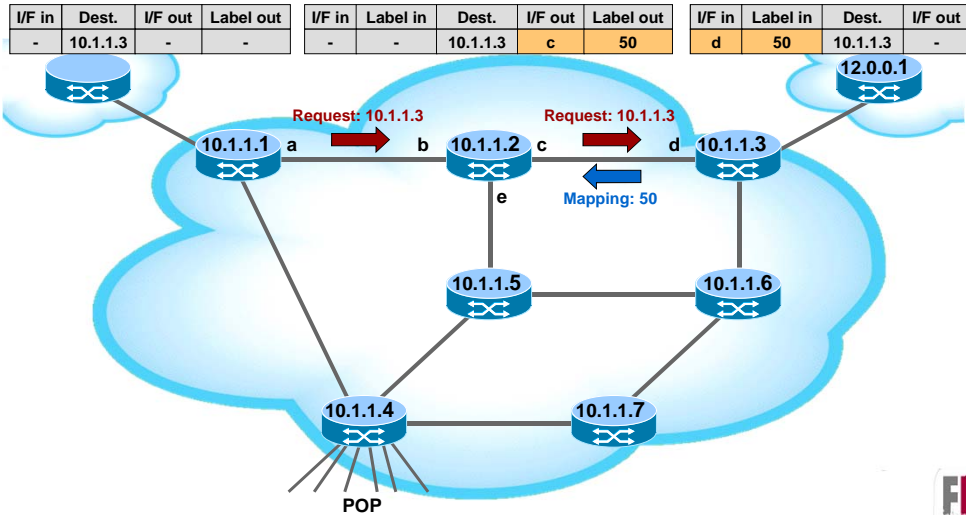
Example establishment LSP with LDP



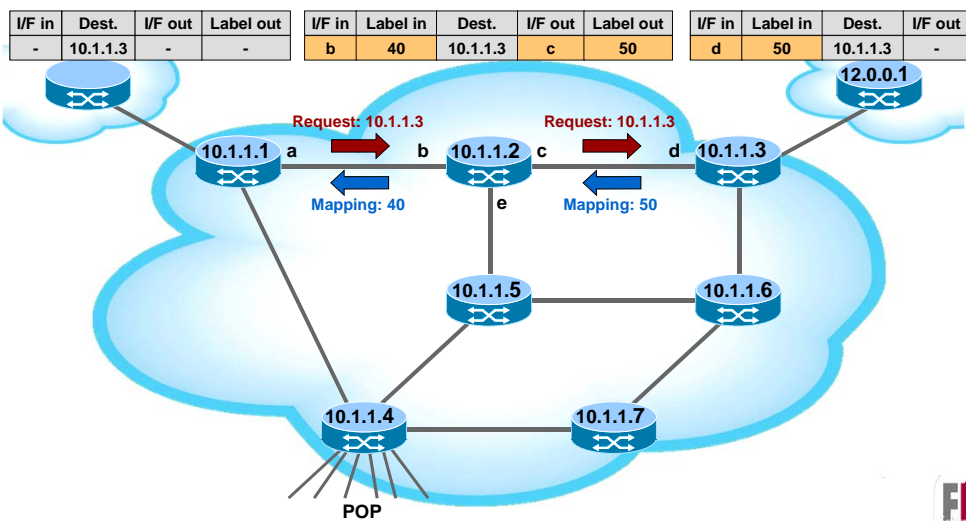
Example establishment LSP with LDP



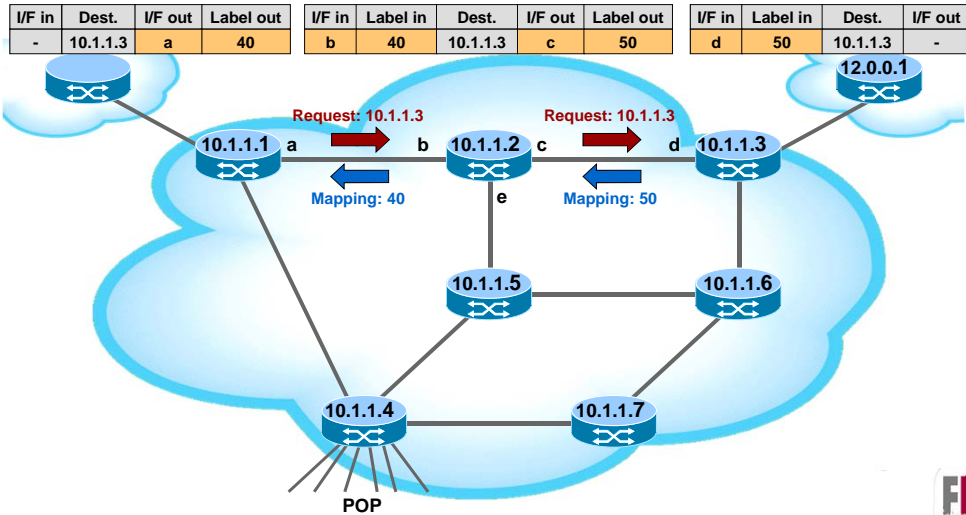
Example establishment LSP with LDP



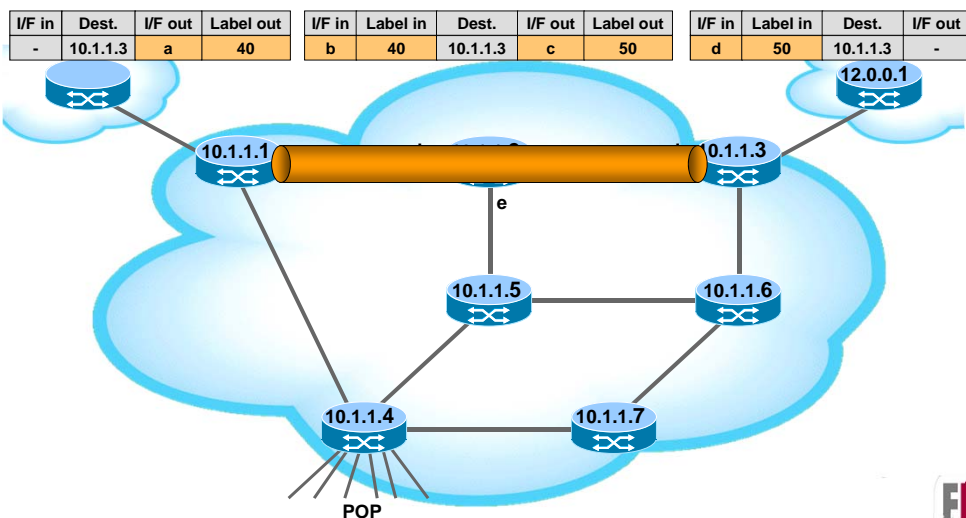
Example establishment LSP with LDP



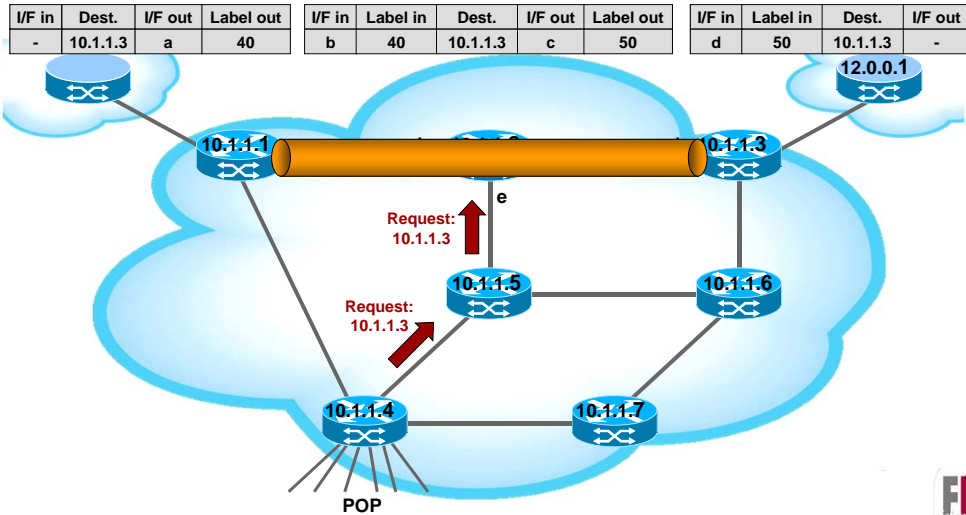
Example establishment LSP with LDP



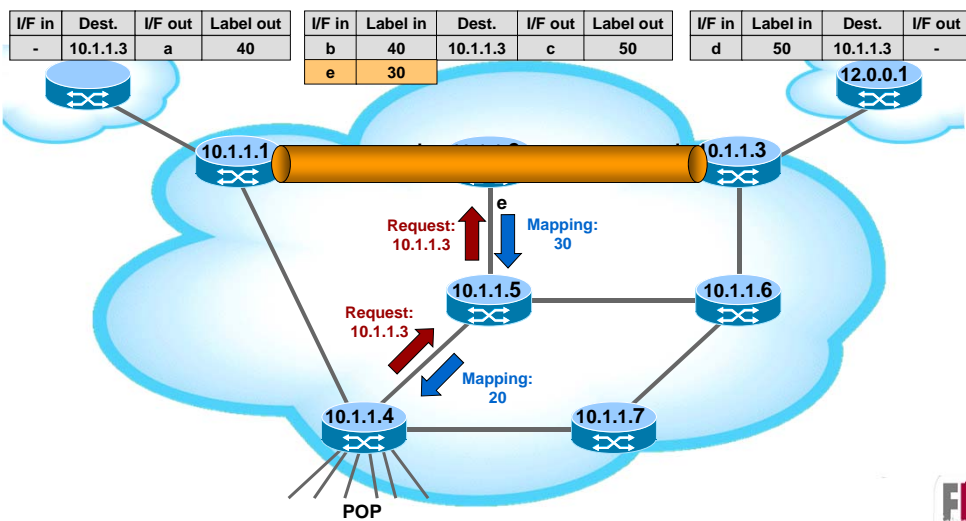
Example establishment LSP with LDP



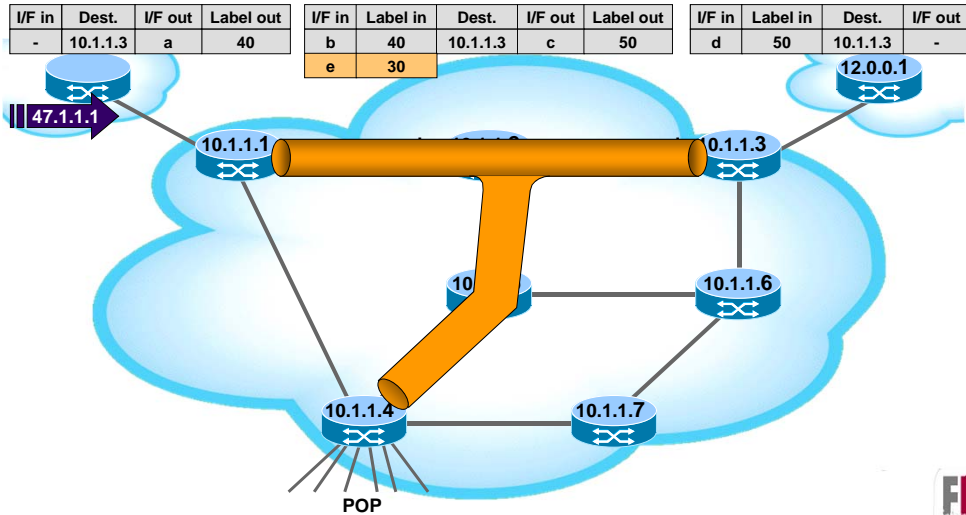
Example establishment LSP with LDP



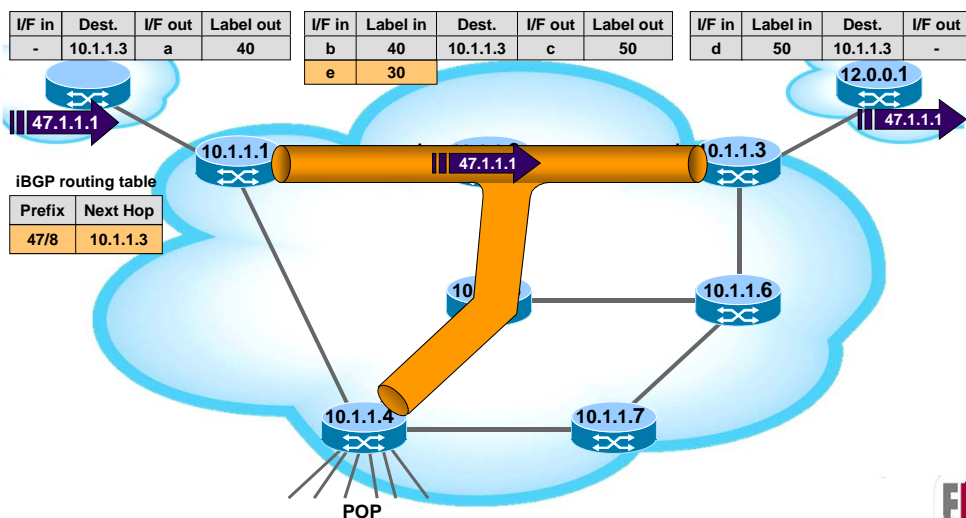
Example establishment LSP with LDP



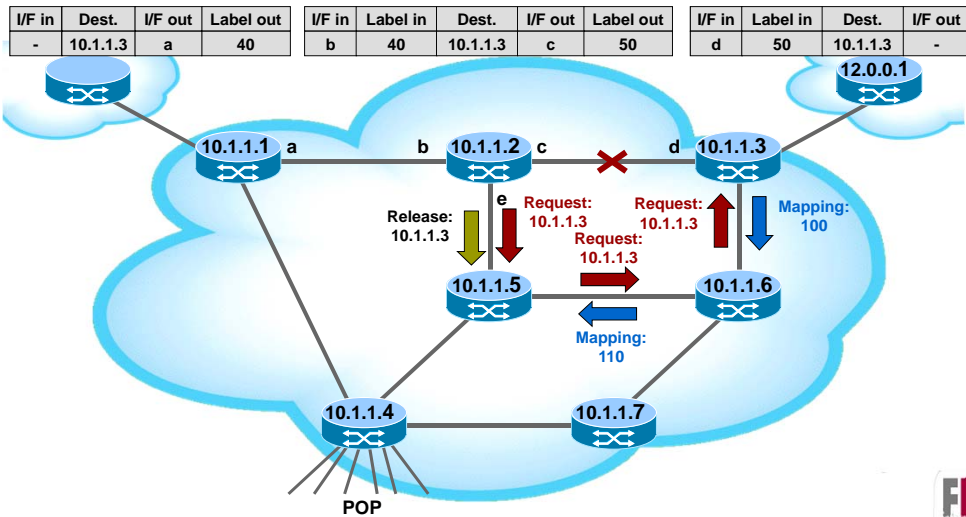
Example establishment LSP with LDP



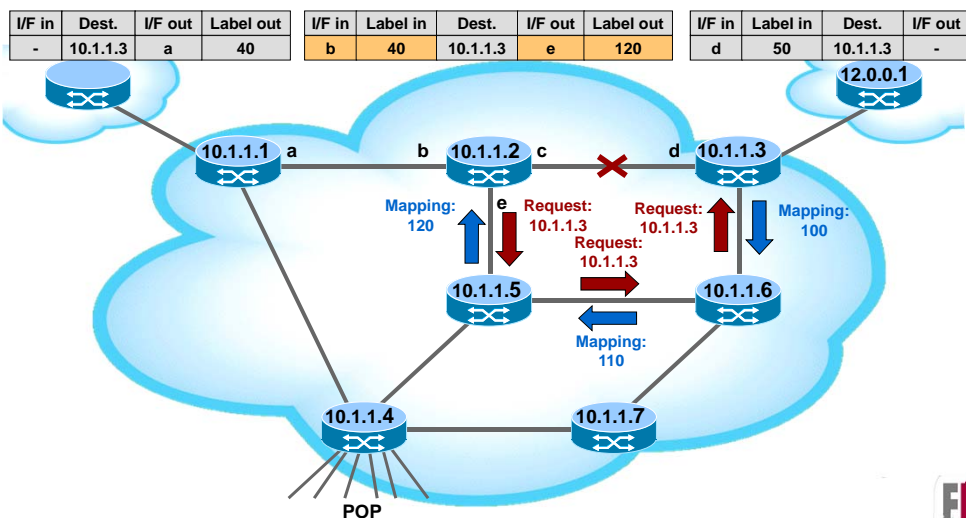
IP travel over LSP



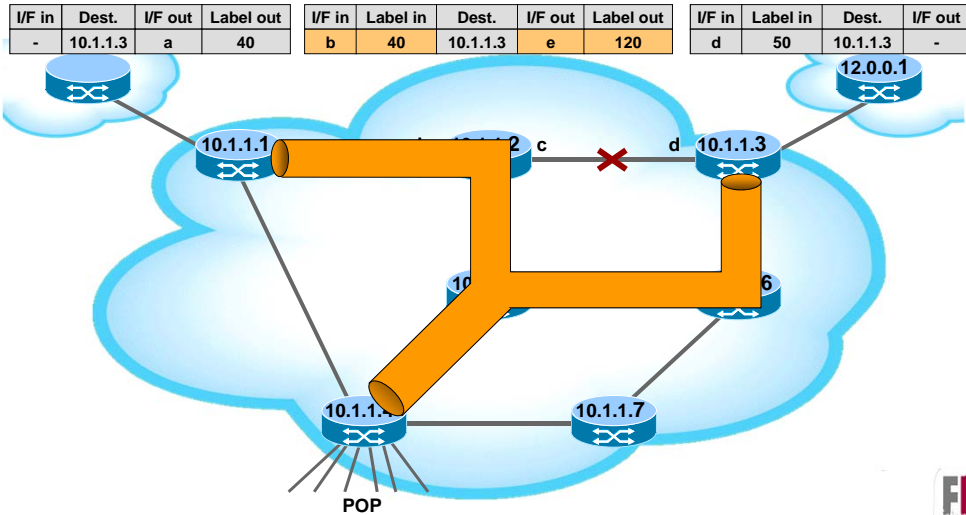
LSP recovery in case of failure



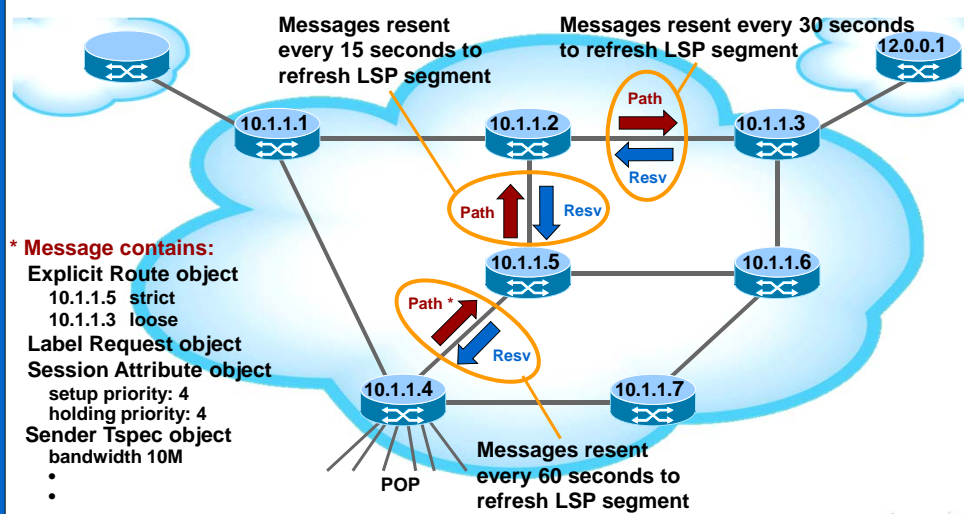
LSP recovery in case of failure



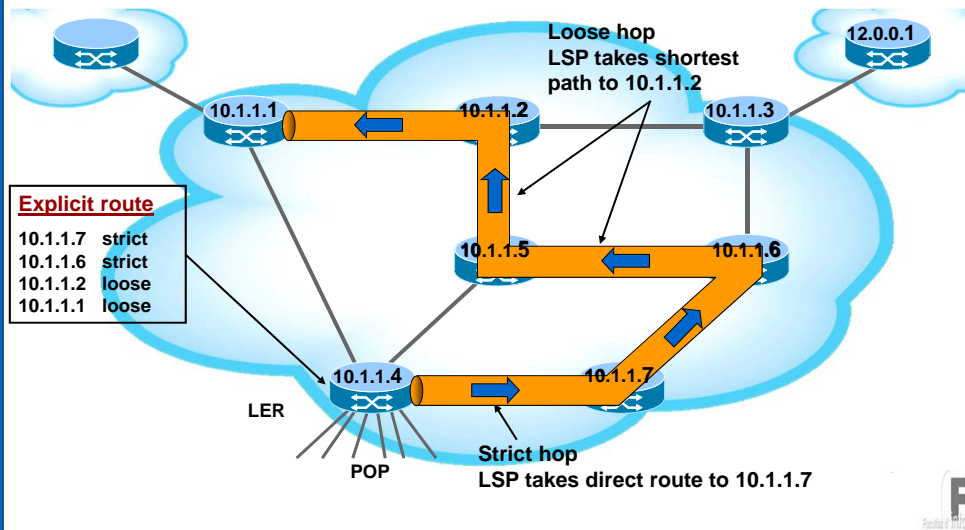
LSP recovery in case of failure



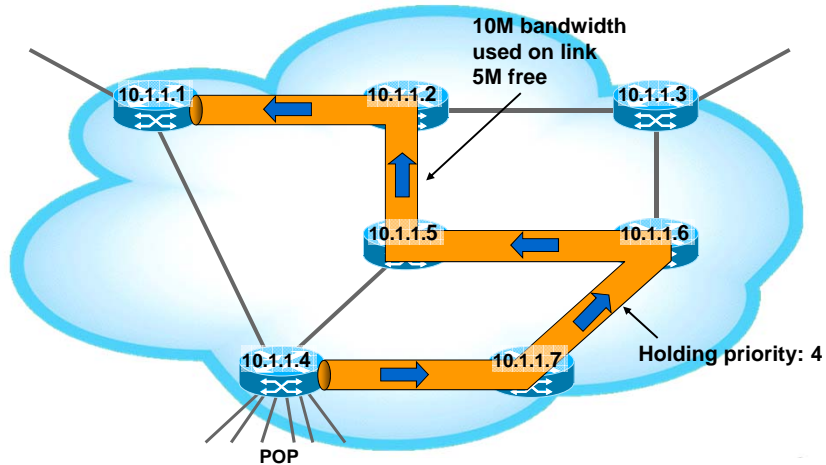
RSVP-TE details: Example



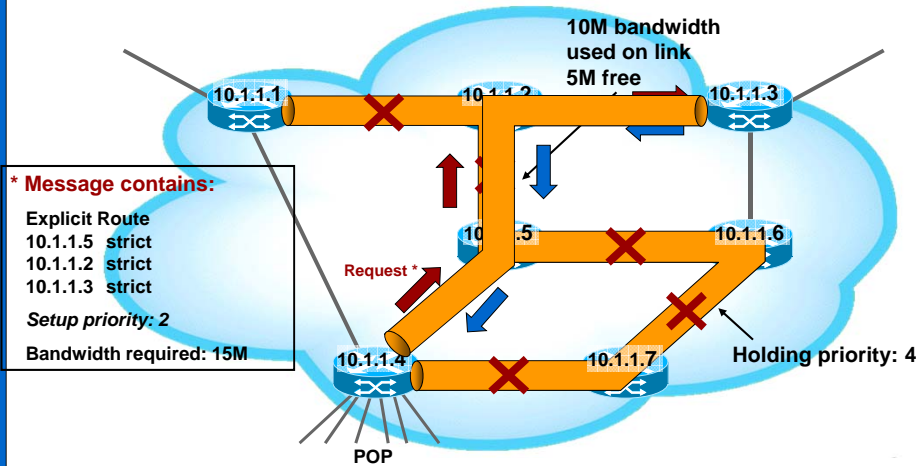
MPLS-TE Explicit Routing.



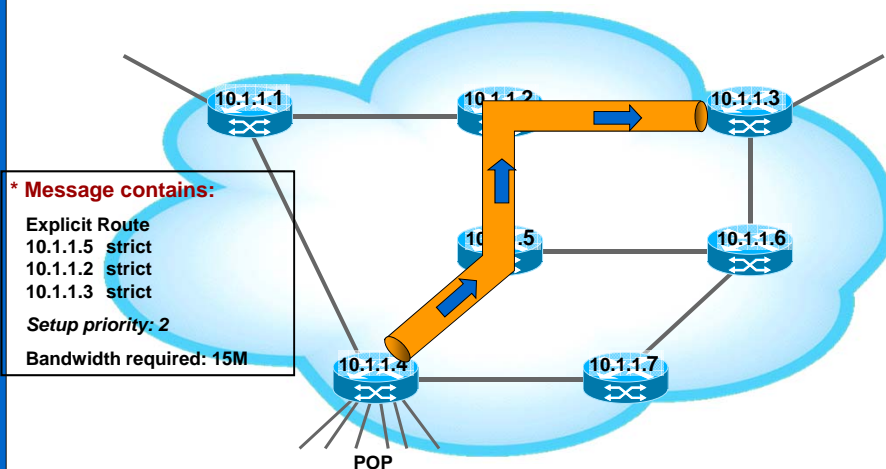
MPLS-TE: LSP preemption



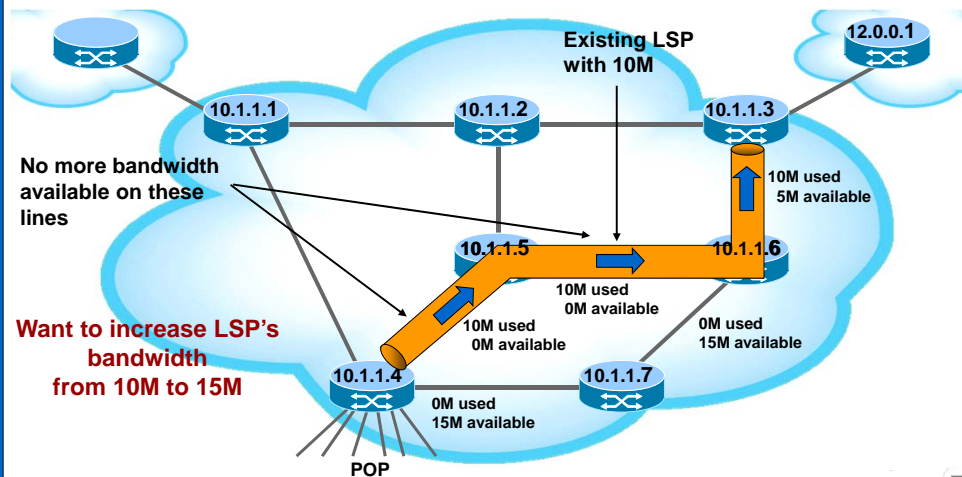
MPLS-TE: LSP preemption



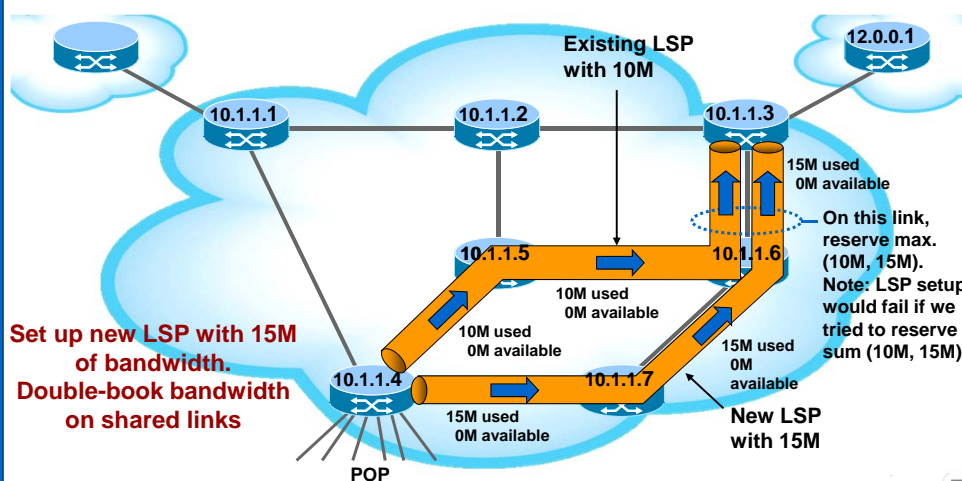
MPLS-TE: LSP preemption



MPLS-TE: LSP modification "make-before-break"



MPLS-TE: LSP modification "make-before-break"



MPLS-TE: LSP modification “make-before-break”

