

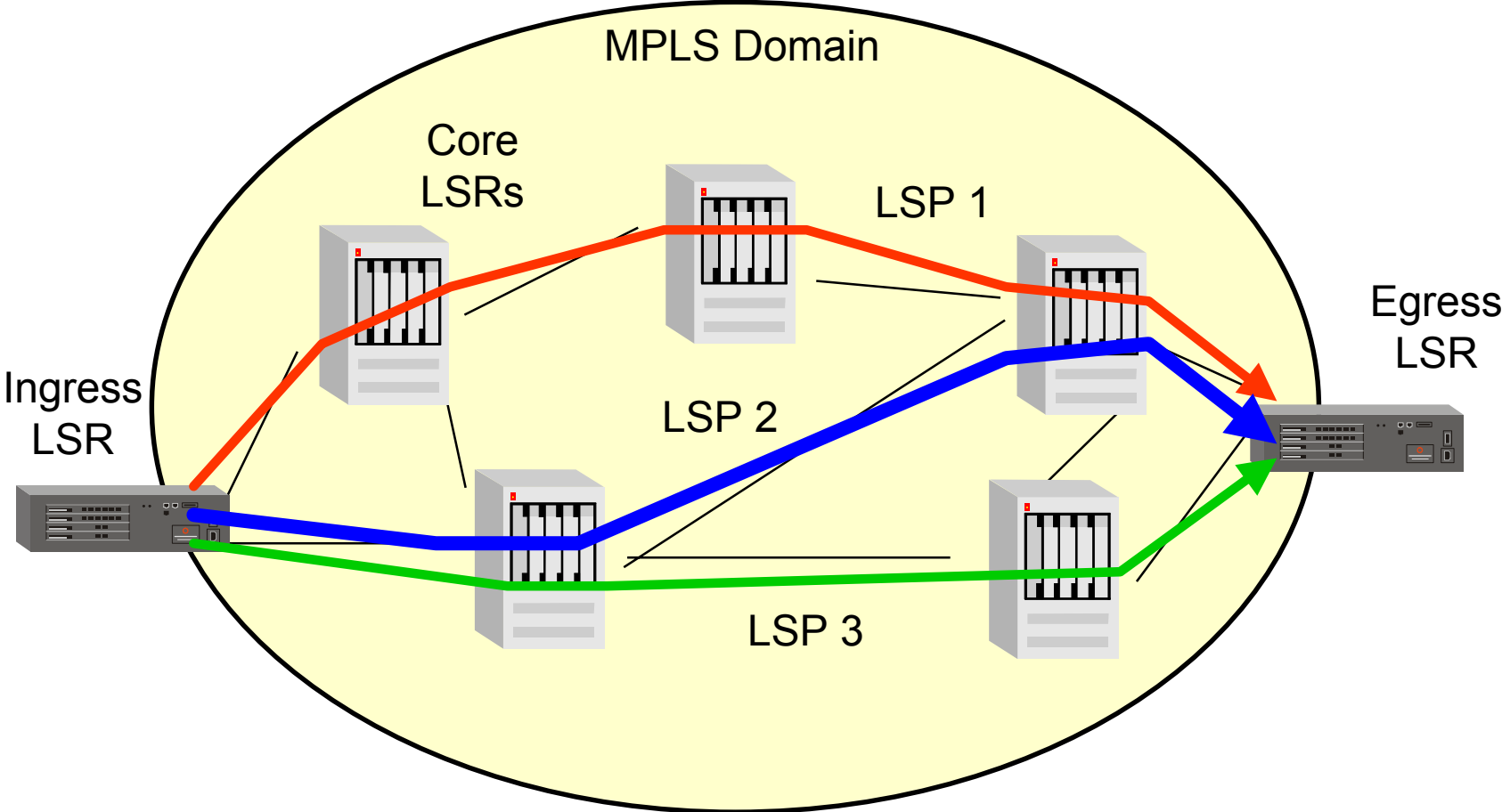
Measurement Protocol for One-Way Performance Metrics

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Motivation

- There is a need to measure path (e.g. LSP) characteristics for many purposes, for example traffic engineering
- One-way measurement is needed since link characteristics are typically asymmetric

Load Balancing among Multiple LSPs



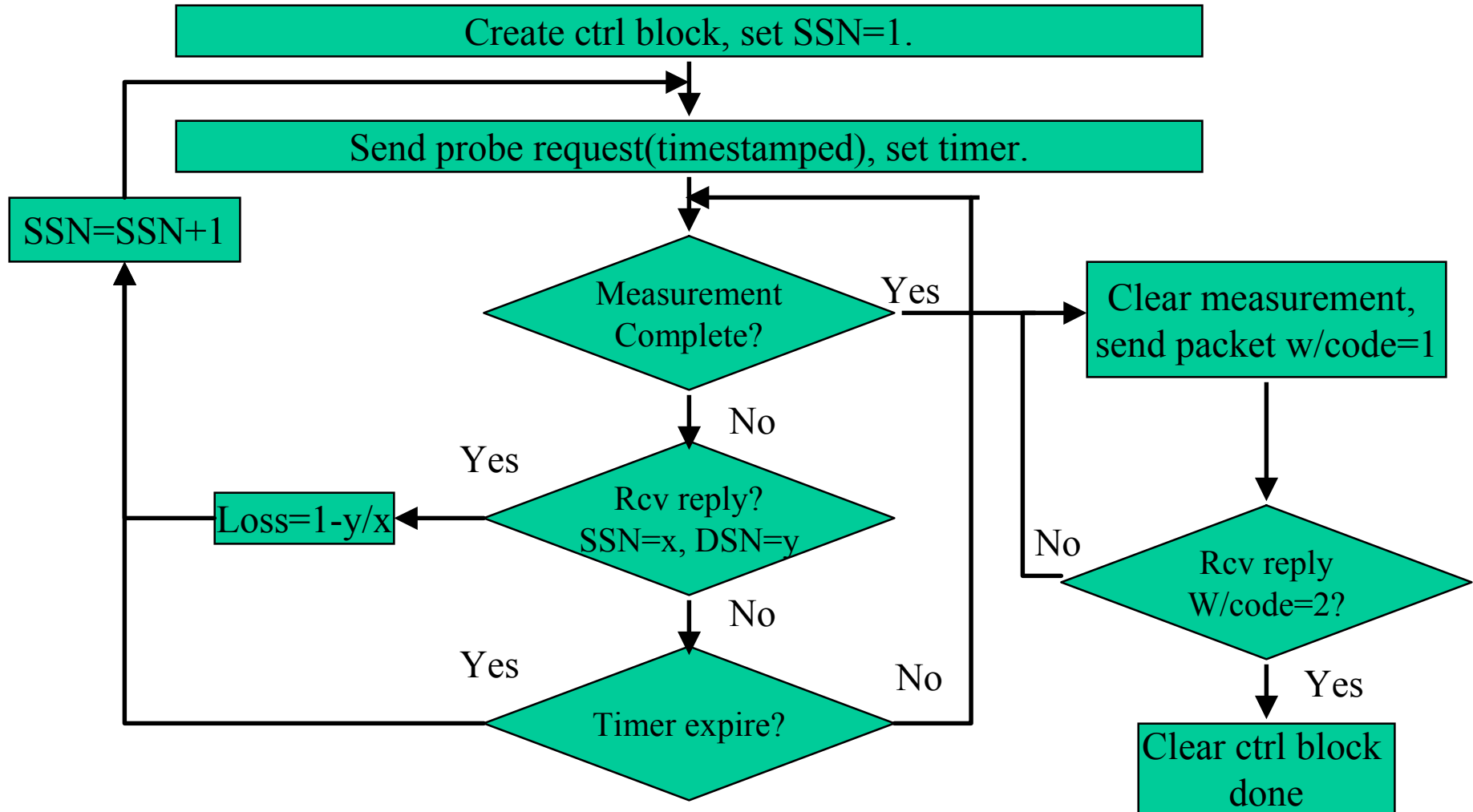
Implementation Approaches

- ▣ ICMP_based implementation

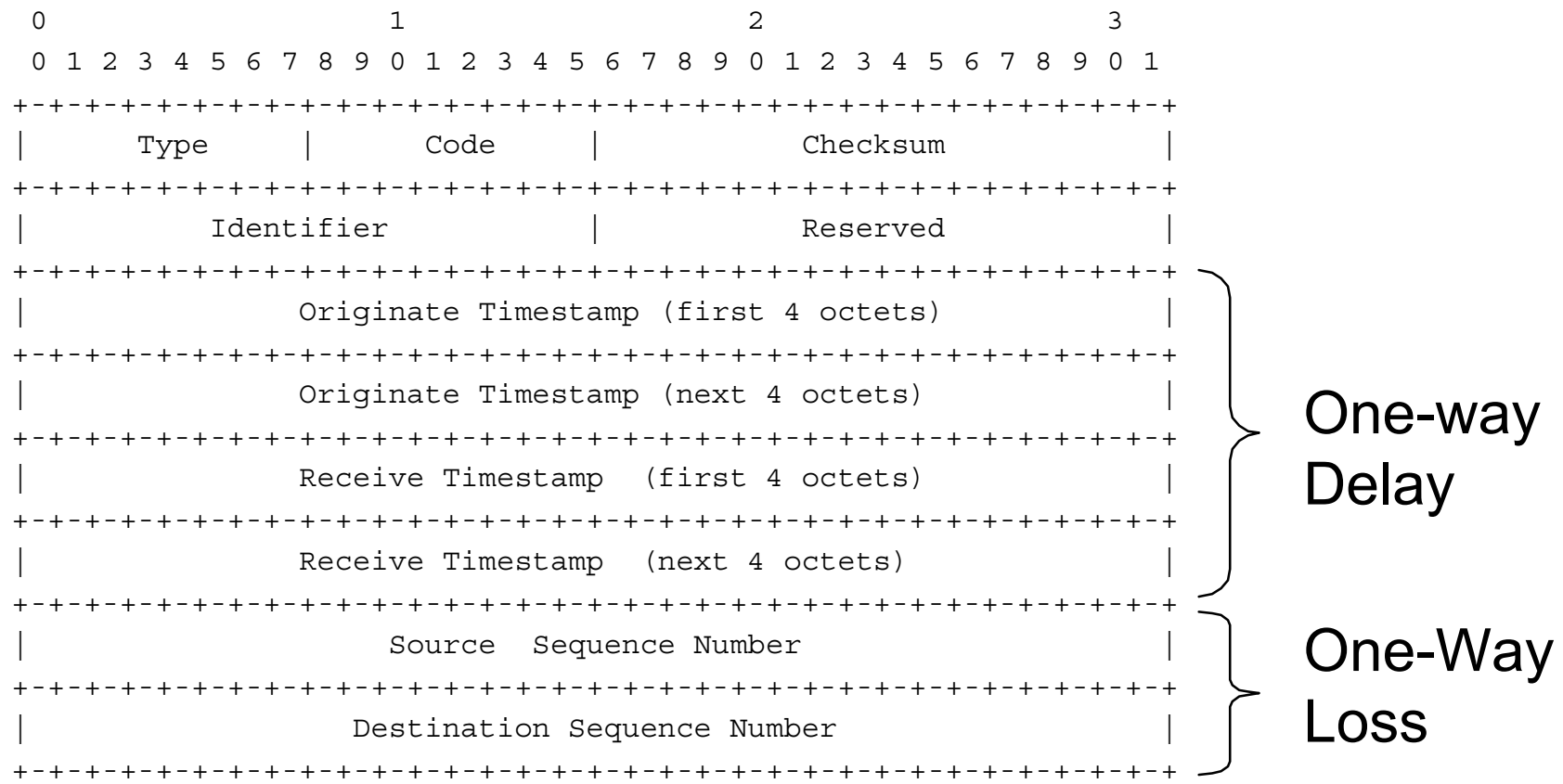
<draft-elwalid-icmp-ext-00.txt>

- ▣ UDP_based implementation

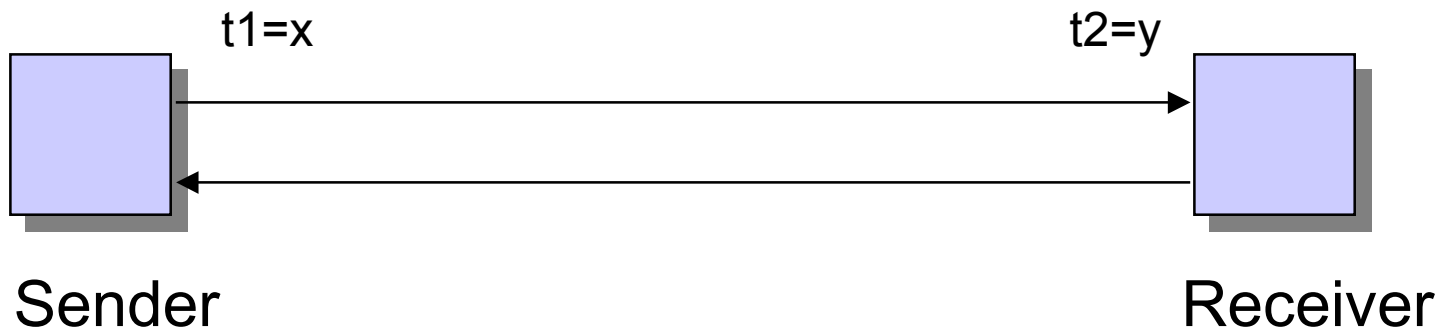
One-Way Loss and Delay Protocol: Sender's Behavior



ICMP Extension: probe request(type 41) & probe reply(type 42)

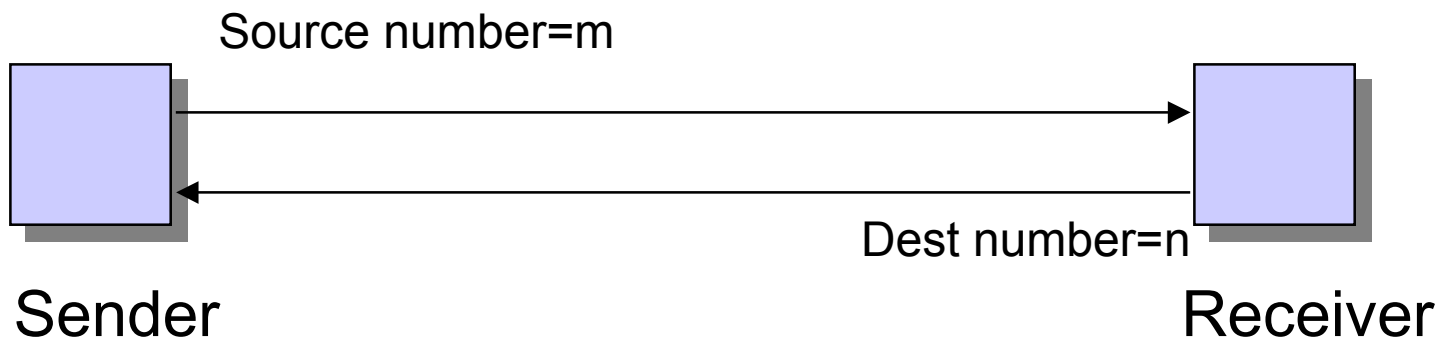


One-Way Delay



$$\text{Relative delay} = x - y$$

One-Way Loss



Received n packets out of m packets

*The measurement is fault-tolerant against losses
in the reverse path*