

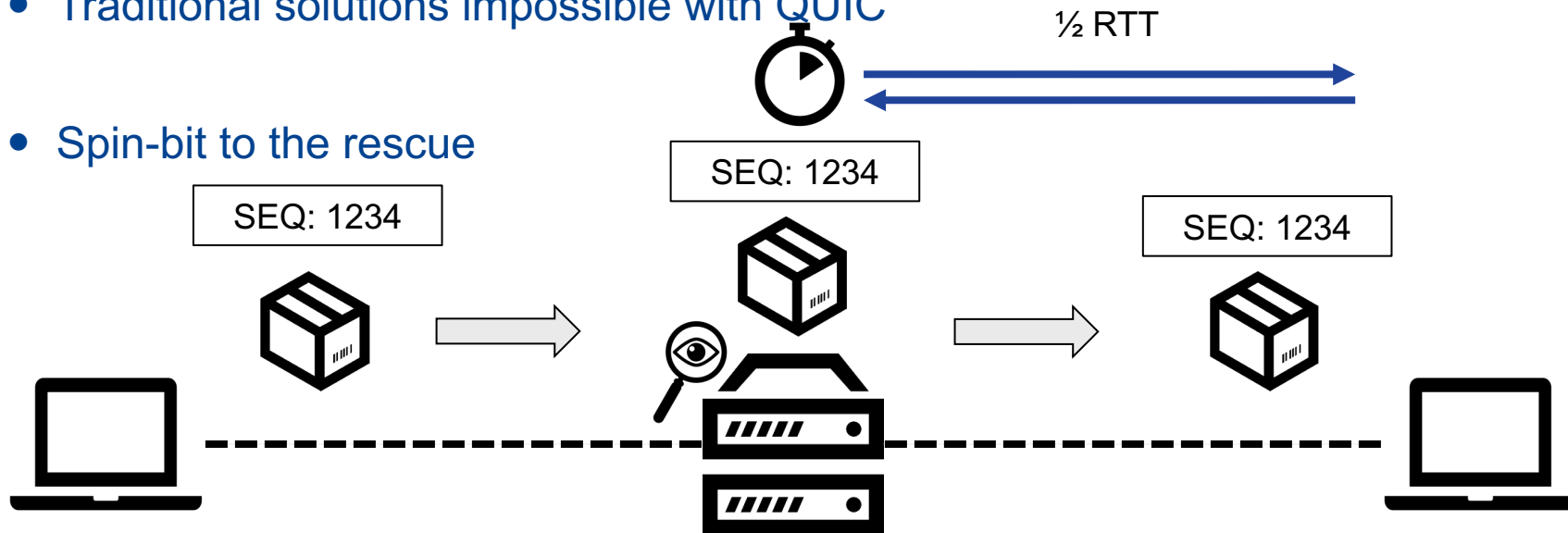
L, Q, R, and T

Which Spin Bit Cousin Is Here to Stay?

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Network Measurements & Encrypted Transports

- Network measurements important since the early Internet
- Traditional solutions impossible with QUIC
- Spin-bit to the rescue



Loss-Focused Explicit Flow Measurements

- IPPM WG discusses four proposals for measuring packet loss

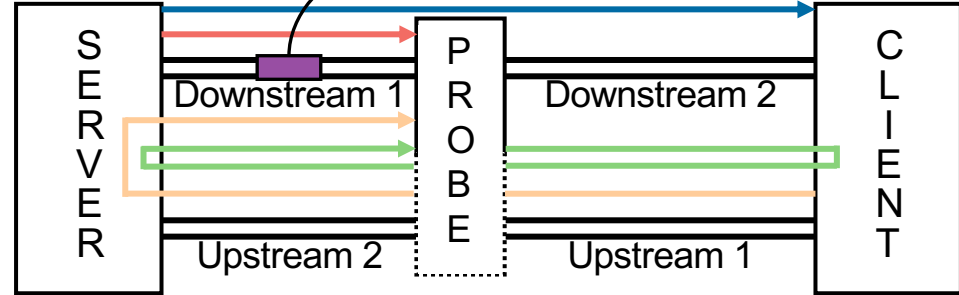
- ▶ L-Bit 

- ▶ R-Bit 

- ▶ Q-Bit 

- ▶ T-Bit 

NetEm/Groundtruth



- Which one to choose?

- ▶ Localization capabilities
- ▶ Measurement accuracy

- Our contribution

- ▶ Mininet-based experimental evaluation (testbed available on GitHub)
- ▶ Investigated Scenarios

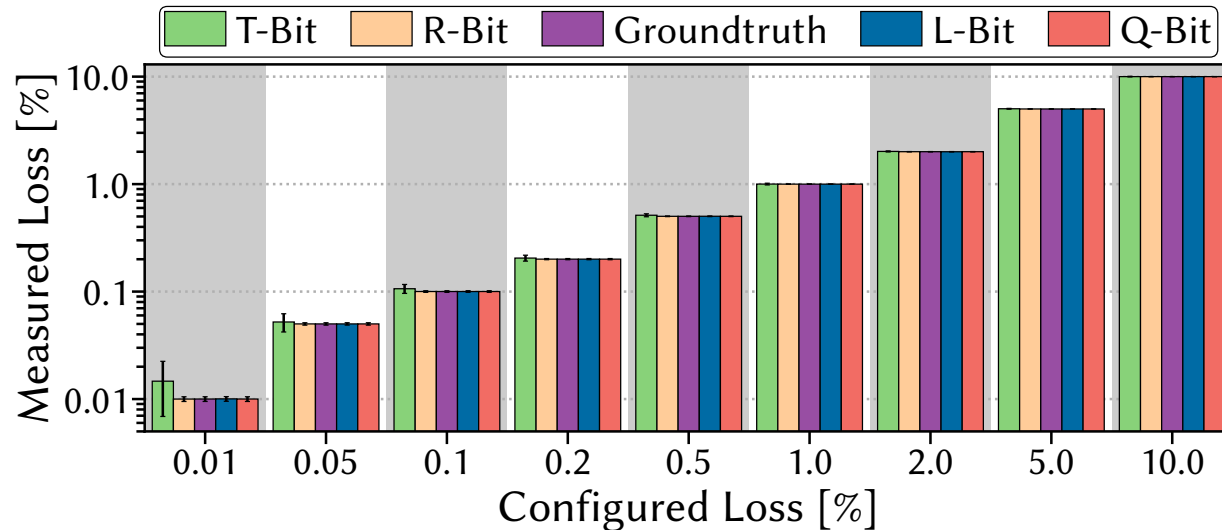
- Random Loss

- Burst Loss

- Different flow sizes

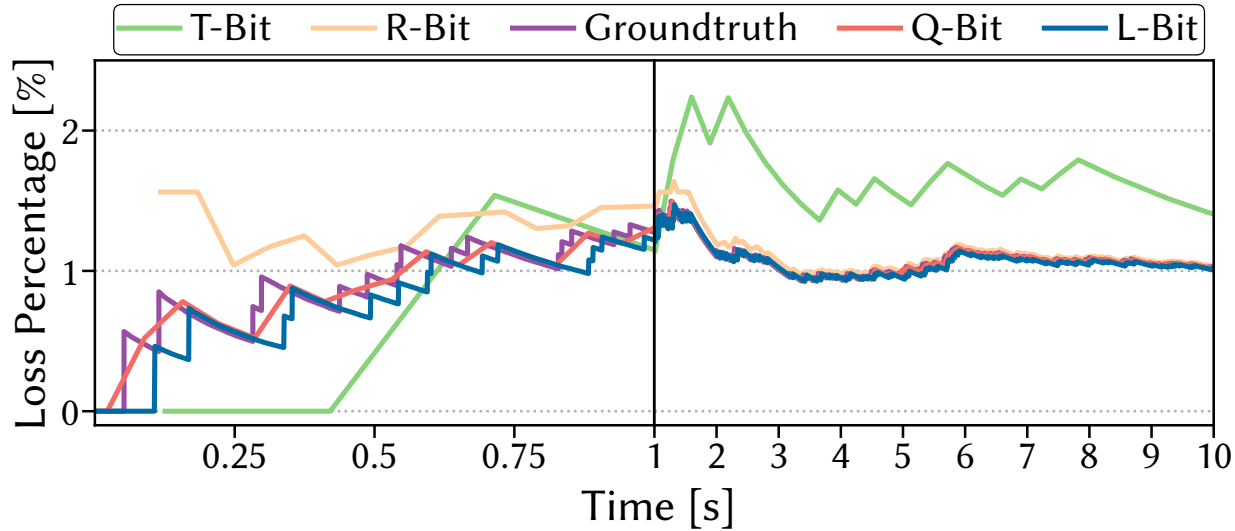
Random Loss

- Symmetric traffic wo. congestion control
- ~1 mio. packets & 30 iterations per setting
- Cumulative loss percentages



Random Loss – A Closer Look at One Example Run

- First 10 seconds of hand-picked run
 - ▶ Configured loss rate: 1%



Which Spin Bit Cousin Is Here to Stay?

- Measurement Accuracy

- ▶ L-Bit has highest accuracy, but requires end-host loss detection
- ▶ Algorithmic intervals of Q/R/T
 - decrease accuracy in times of burst (burst loss scenario)
 - prolong measurement stabilization (flow length scenario)

- Which one to choose?

- ▶ Measurement accuracy seems suitable
- ▶ Path segmentation properties likely the kicker

