

On the Performance of TCP Spoofing in Satellite Networks

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Overview

- Motive and Goals
- TCP Spoofing
- Simulation Environment
- Results
- Conclusions
- Future Work

Motive and Goals

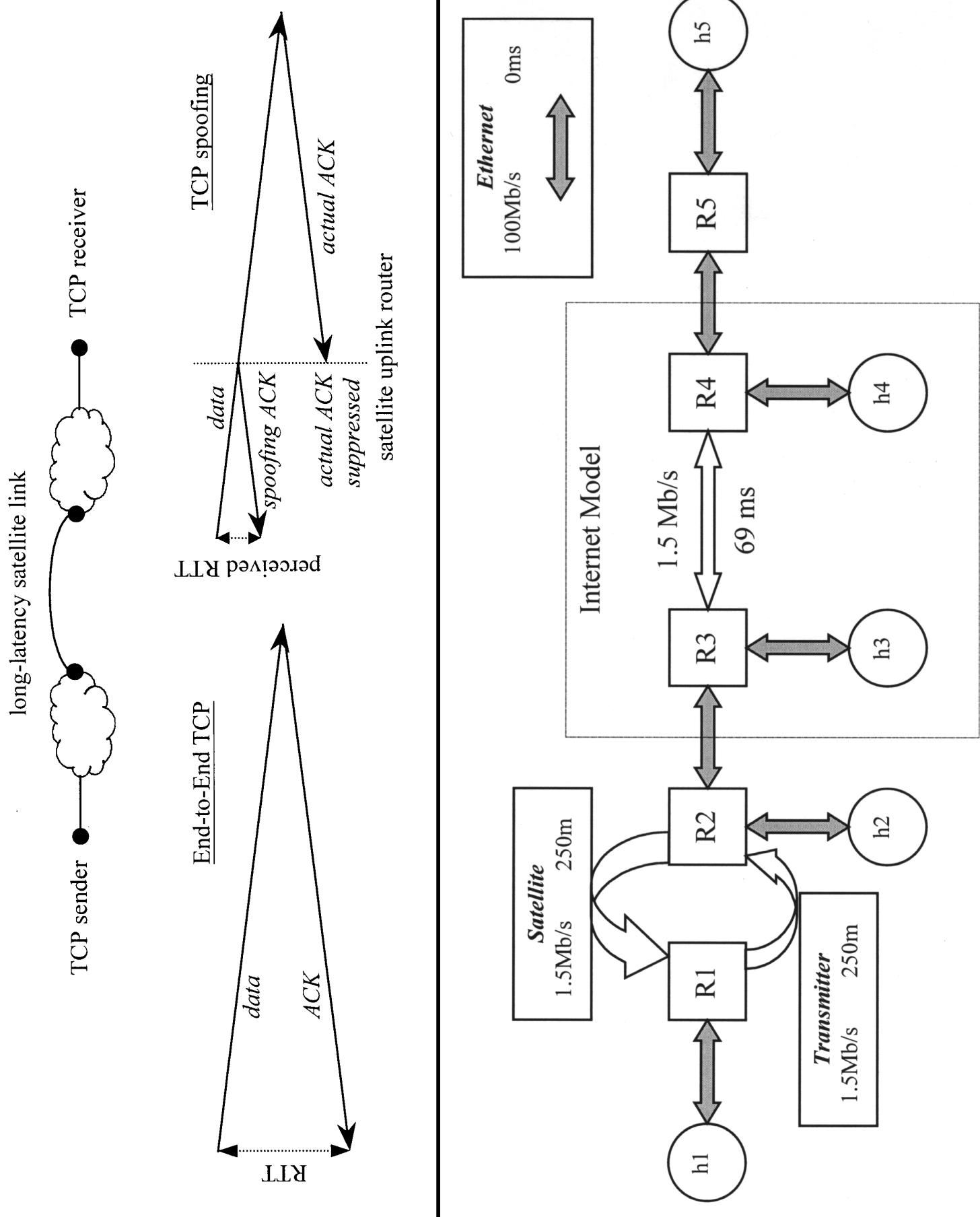
- Answer outstanding questions on the performance of TCP Spoofing
 - Gain for small file transfers
 - Congested conditions
 - Observing performance from multiple vantage points

TCP Spoofing

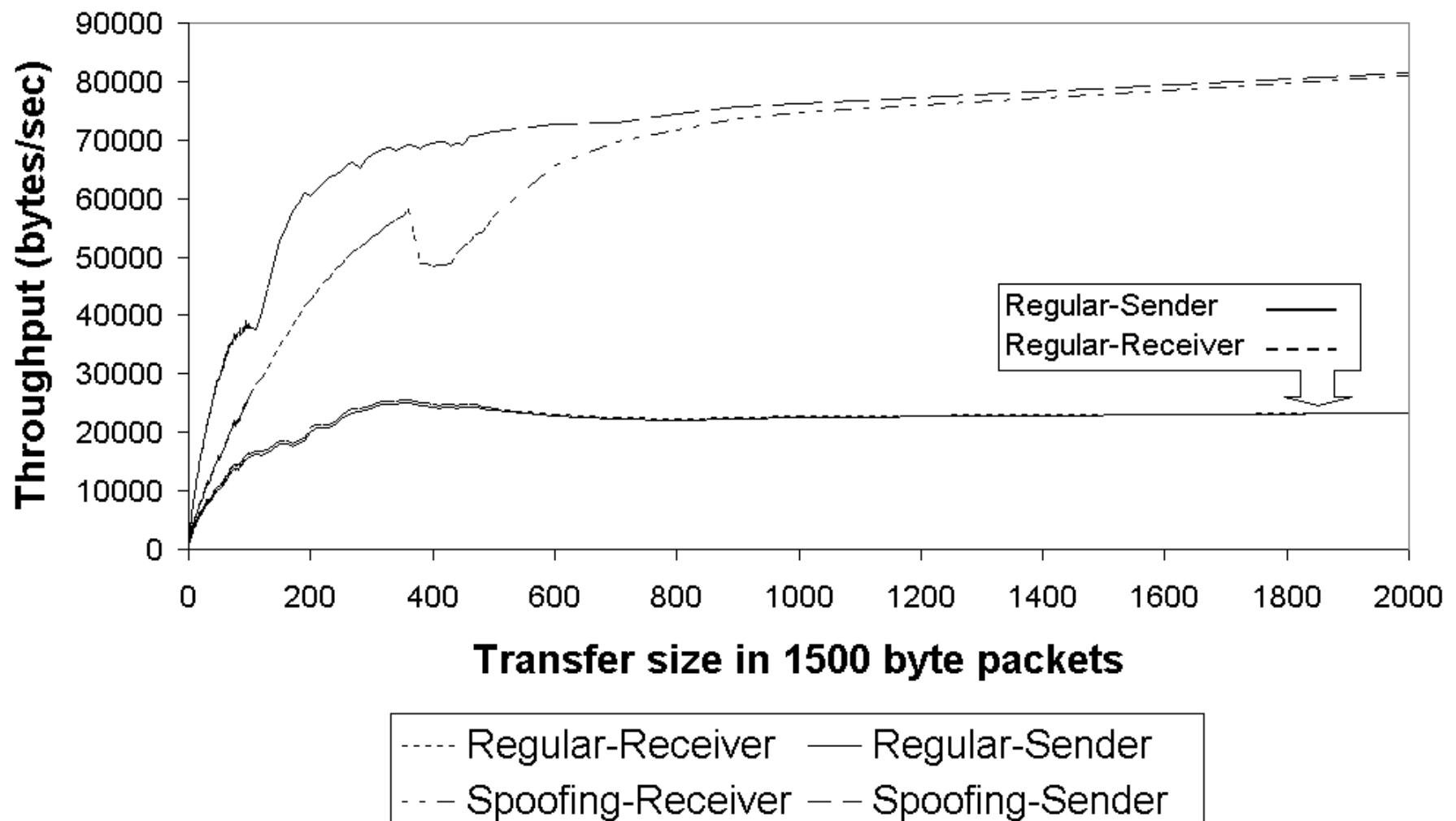
- A performance enhancing proxy which splits a TCP transfer
- Splitting device (spoof) often resides in front of long delay links, such as satellites
- Spoof masquerades as both the sender and receiver

Simulation Environment

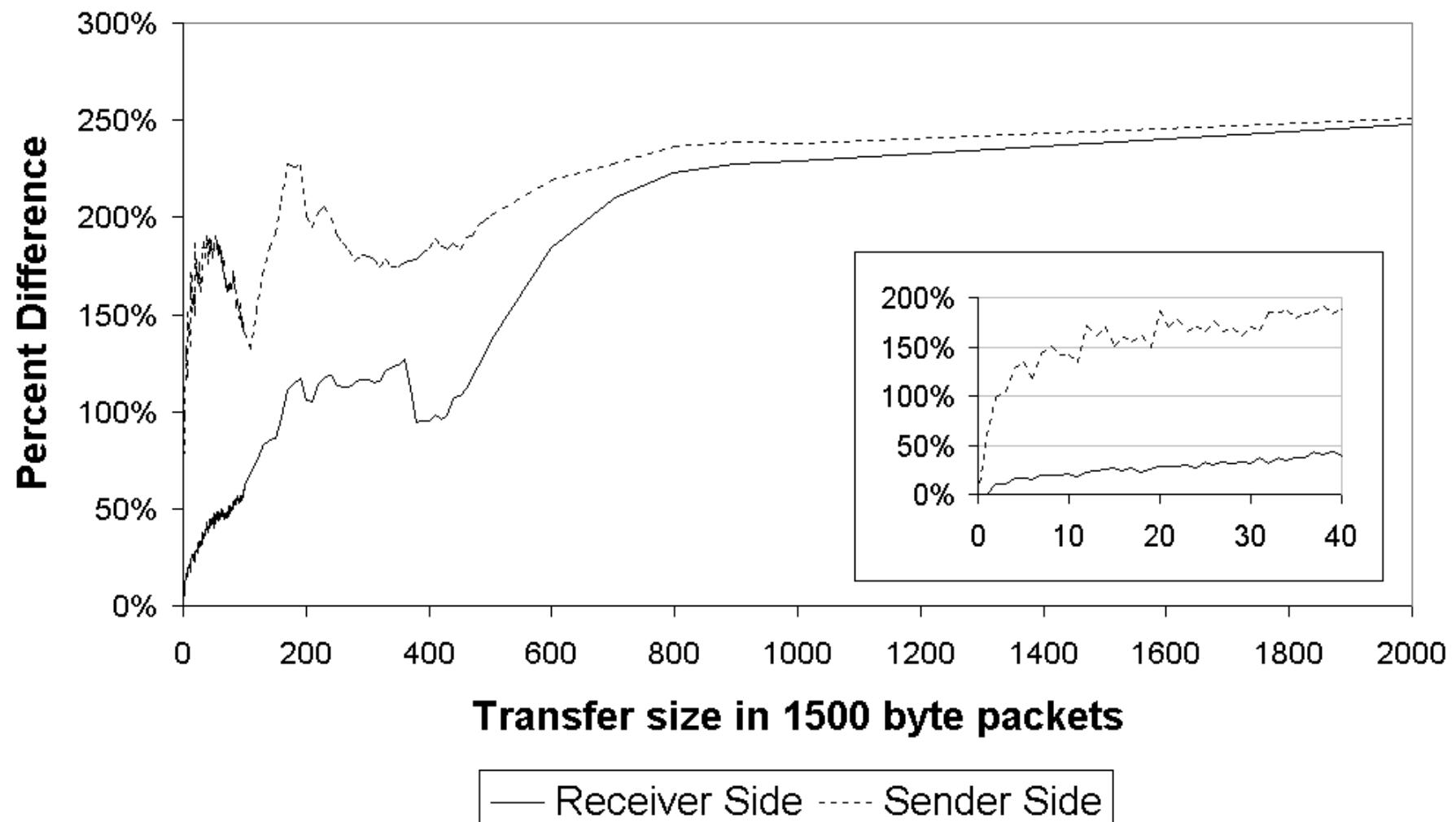
- The Network Simulator (NS)
 - TCP Sack1, Delayed ACKs,
Big Windows, Drop-tail Queuing
- FTP Profile Generator
 - Generates a traffic profile
 - Based on application level behavior, as observed
in prior work (Paxson, 1994)
- Scripts and programs to control analysis and
automation



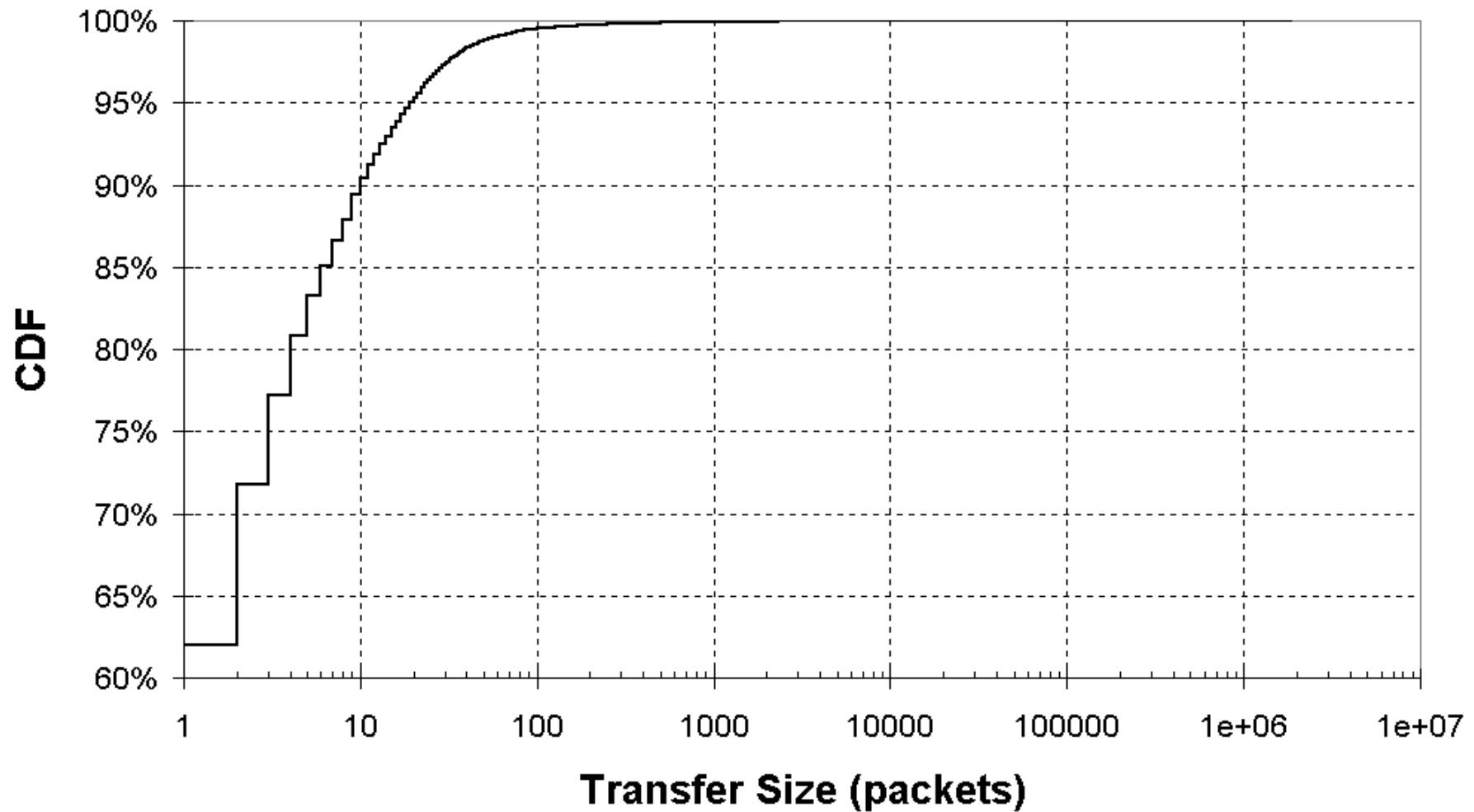
Throughput vs. Transfer Size



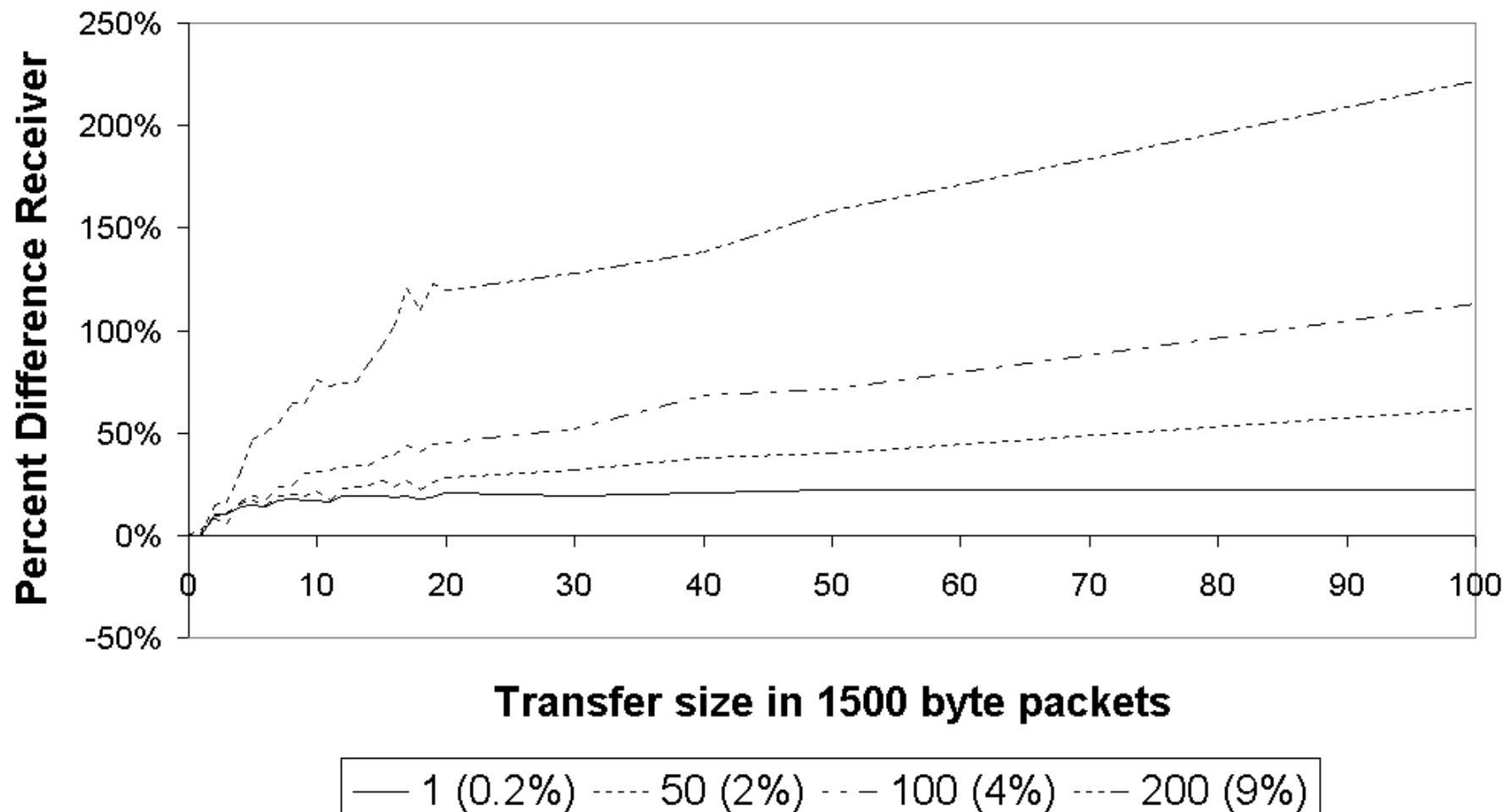
Percent Difference of Throughput



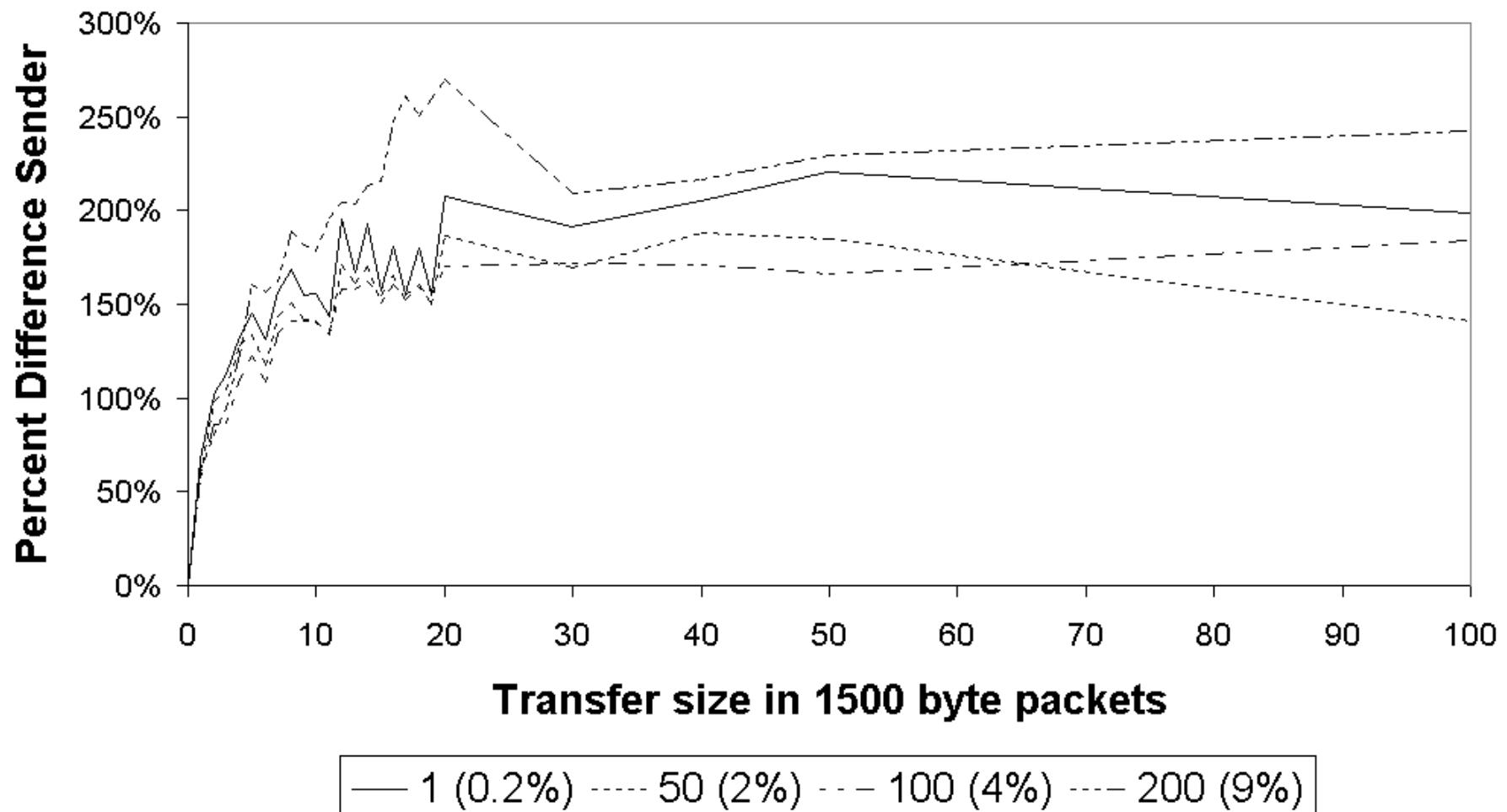
Distribution of Transfer Sizes



Receiver Throughput Difference vs. Congestion Level



Sender Throughput Difference vs. Congestion Level



Conclusions

- Spoofing beneficial for very large transfers across vantage points and congestion levels
- Results show that spoofing has less than a 20 percent benefit for connections transferring 10 packets (14 KB) or less
 - Transfers consisting of 10 packets or less compose 90% of all transfers
- As congestion increases spoofing performs better

Conclusions (cont.)

- Caveat: This work is just a performance study. The robustness and architectural implications of spoofing are not considered. However, such considerations should be considered before development.

Future Work

- Consider spoofing in networks with:
 - Bit errors over satellite
 - Competing traffic on satellite hop
 - Active queue management (RED, BLUE, etc.)
 - Asymmetric satellite channels

Drops vs. Transfer Size

