TCM-TF Reference Model

Tunneling Compressed Multiplexed Traffic Flows (TCM-TF)
draft-saldana-tsvwg-tcmtf-05

Intended status:

Best Current Practice

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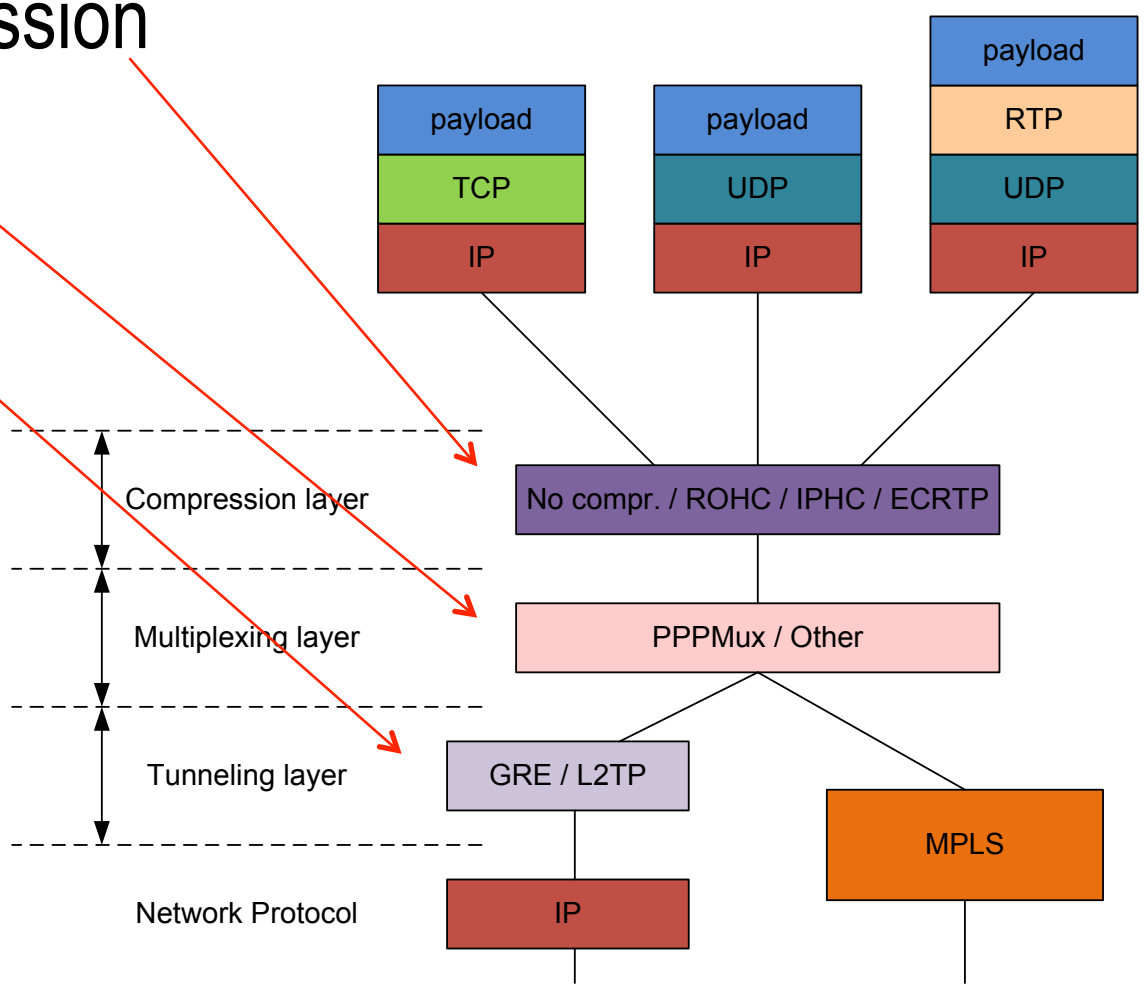
TCM-TF Protocol stack

Three layers:

1. header **C**ompression
2. **M**ultiplexing
3. **T**unneling



TCM-TF Protocol stack

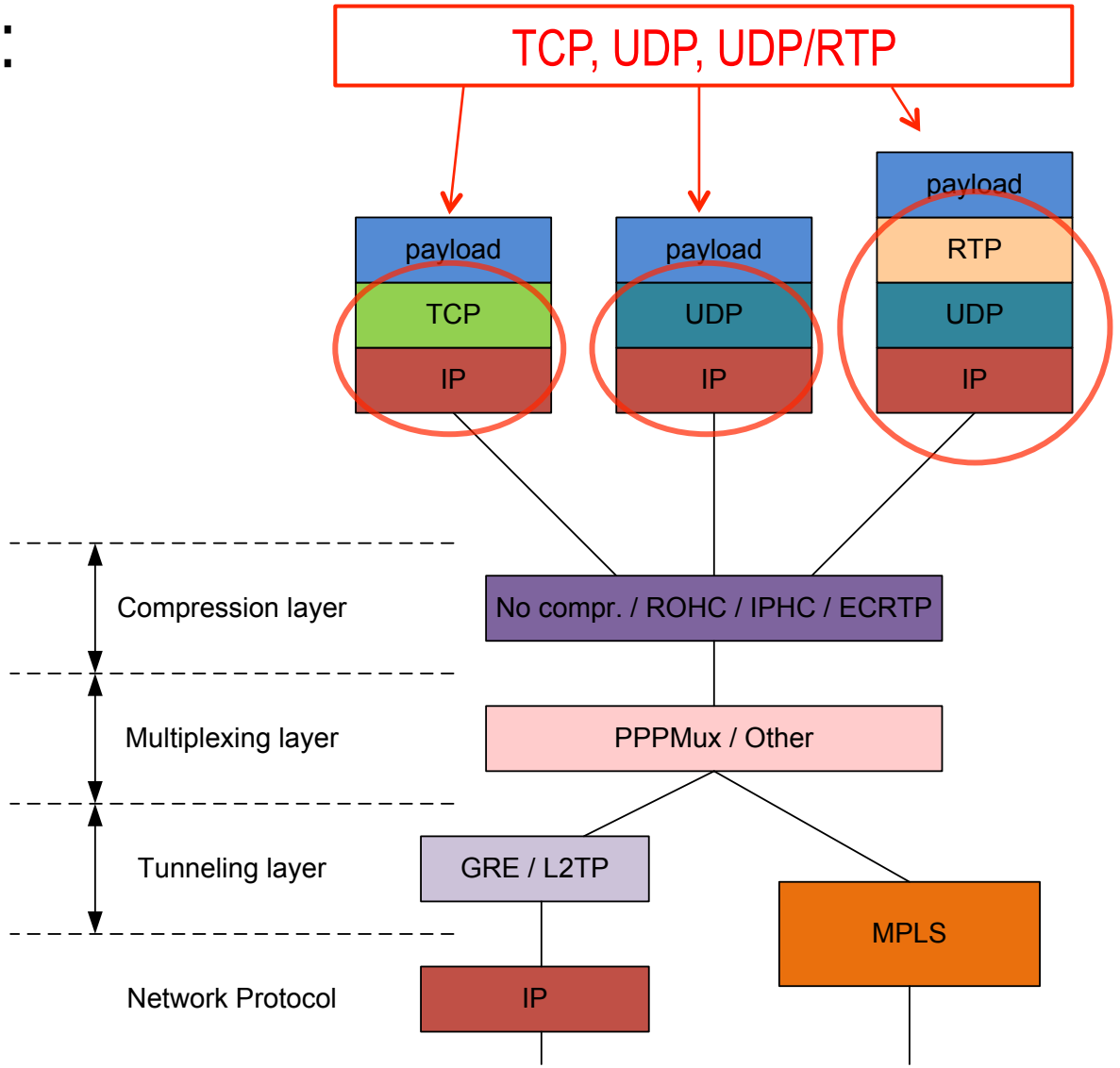
Different **Protocols**:

TCP/IP

UDP/IP

RTP/UDP/IP

ESP/IP

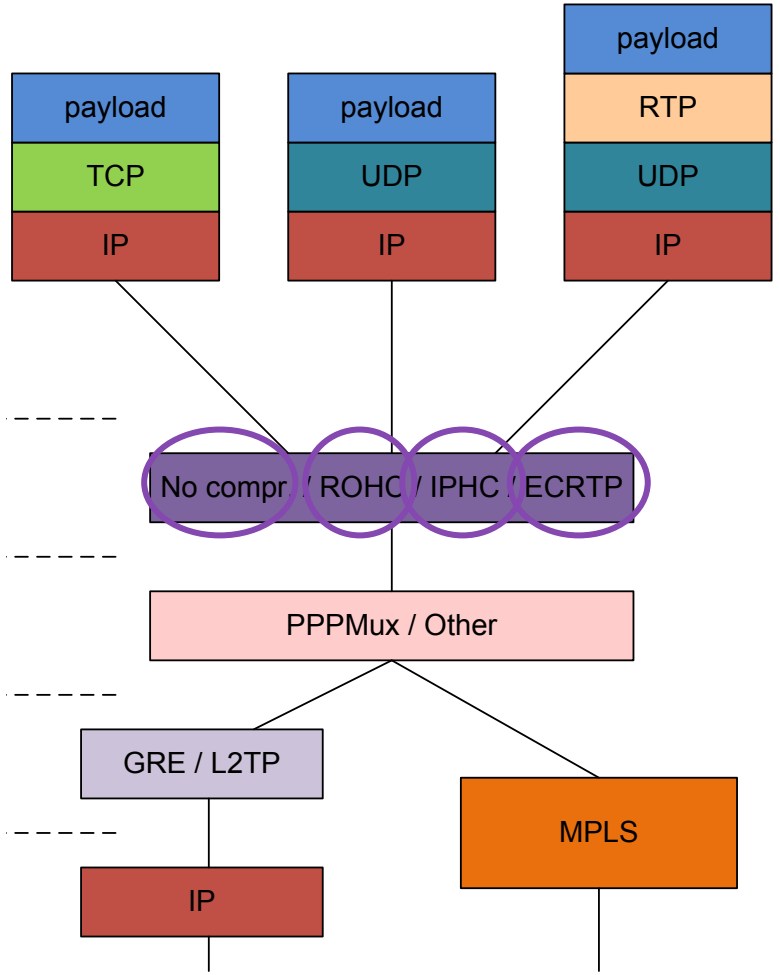


TCM-TF Protocol stack

Different **header compression algorithms**:

The most adequate one can be selected according to:

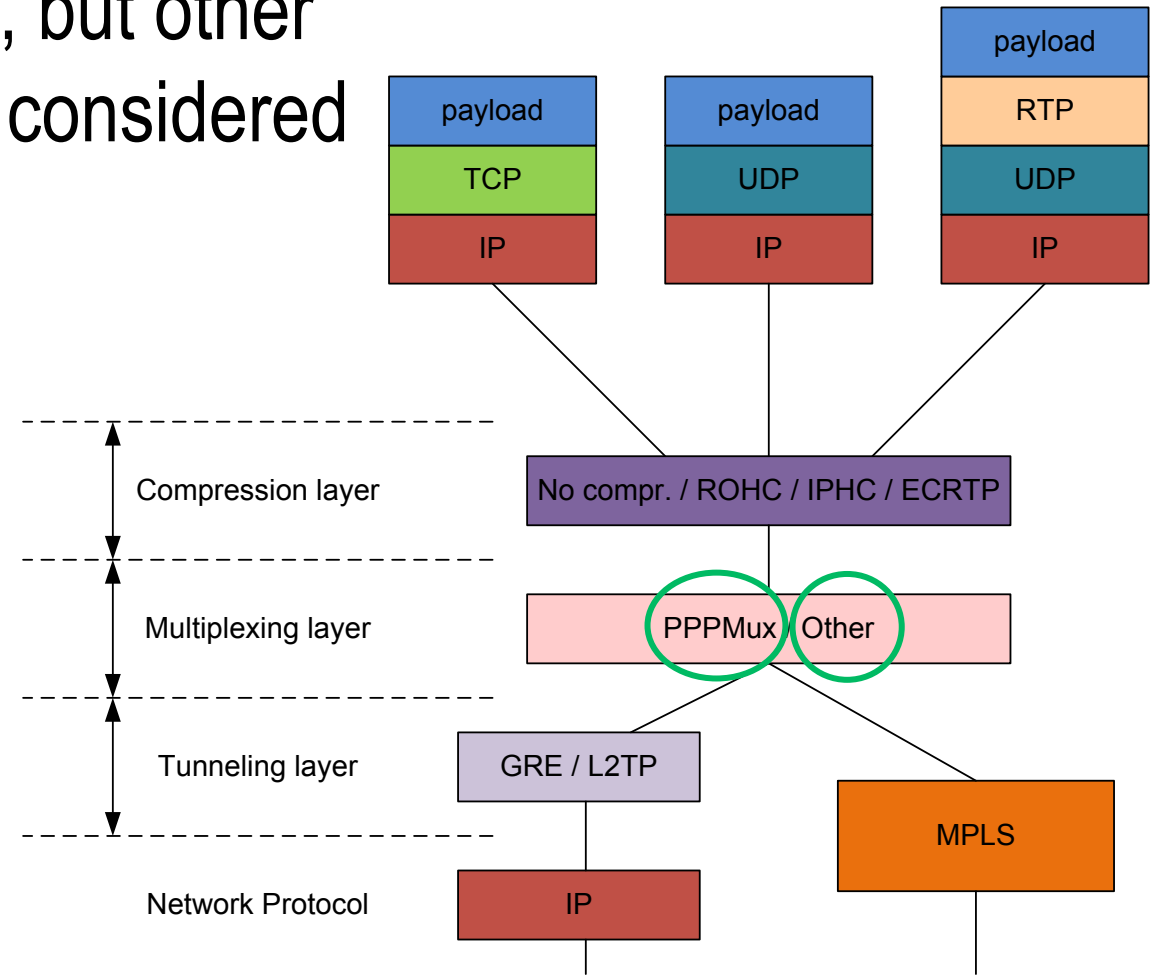
- kind of traffic
- scenario (loss, delay)
- processing capacity, etc.



TCM-TF Protocol stack

Different **mux algorithms**.

Currently: PPPMux, but other ones could also be considered

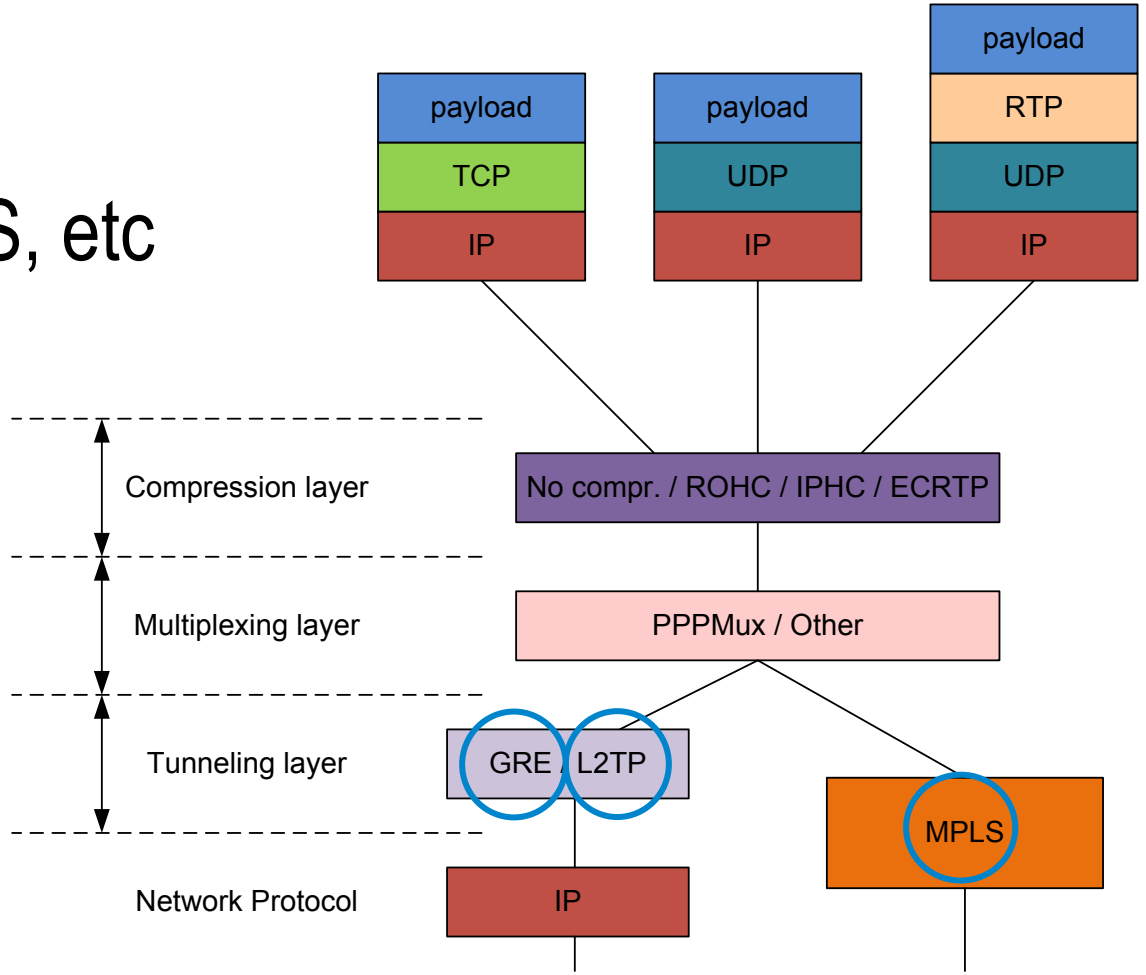


TCM-TF Protocol stack

Different **tunneling algorithms**.

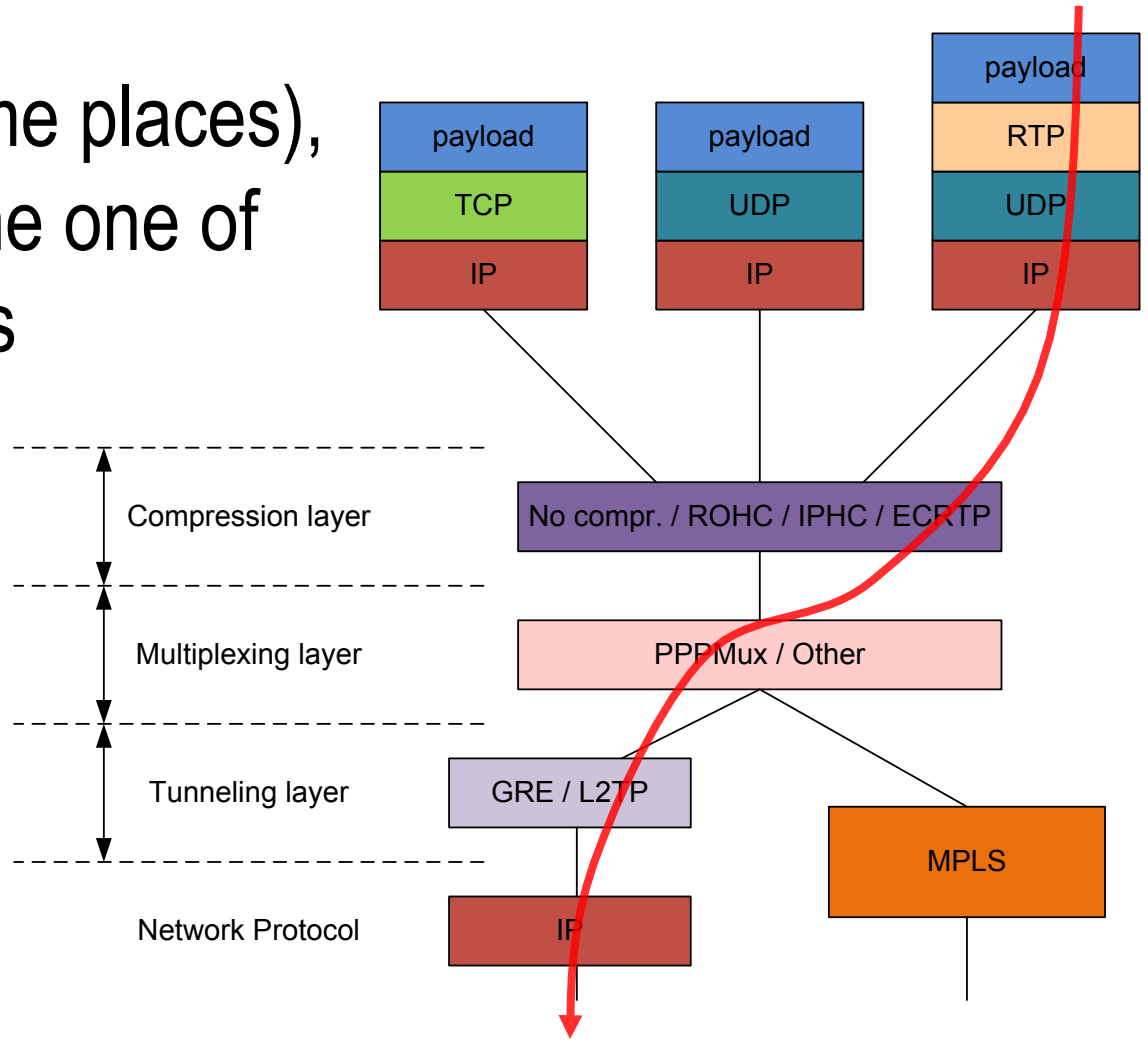
Currently: L2TPv3

Others: GRE, MPLS, etc



TCM-TF Protocol stack

Backwards compatibility with TCRTP (RFC4170, implemented in some places), which would become one of the TCM-TF options



TMC-TF optimized packet examples

Five IPv4/UDP/RTP VoIP packets with two samples of 10 bytes
η=100/300=33%

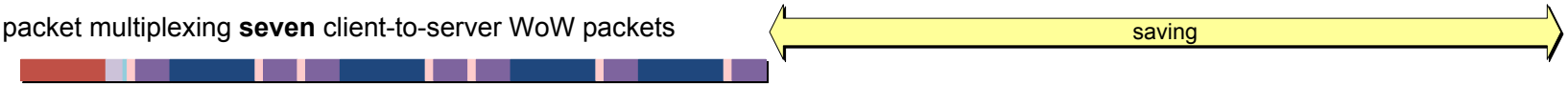
One IPv4 TCMTF Packet multiplexing **five** two sample packets
η=100/161=62%

Four IPv6/UDP/RTP VoIP packets with two samples of 10 bytes
η=80/240=33%

One IPv6 TCMTF Packet multiplexing **four** two sample packets
η=80/161=49%

Seven IPv4/TCP client-to-server packets of World of Warcraft. E[P]=20bytes
η=80/360=22%

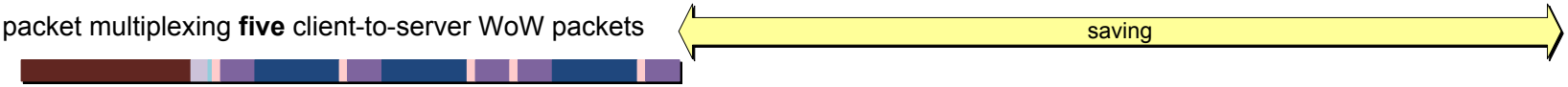
One IPv4/TCMTF packet multiplexing **seven** client-to-server WoW packets
η=80/175=45%



TCP ACKs without payload

Five IPv6/TCP client-to-server packets of World of Warcraft. E[P]=20bytes
η=60/360=16%

One IPv6/TCMTF packet multiplexing **five** client-to-server WoW packets
η=60/187=32%

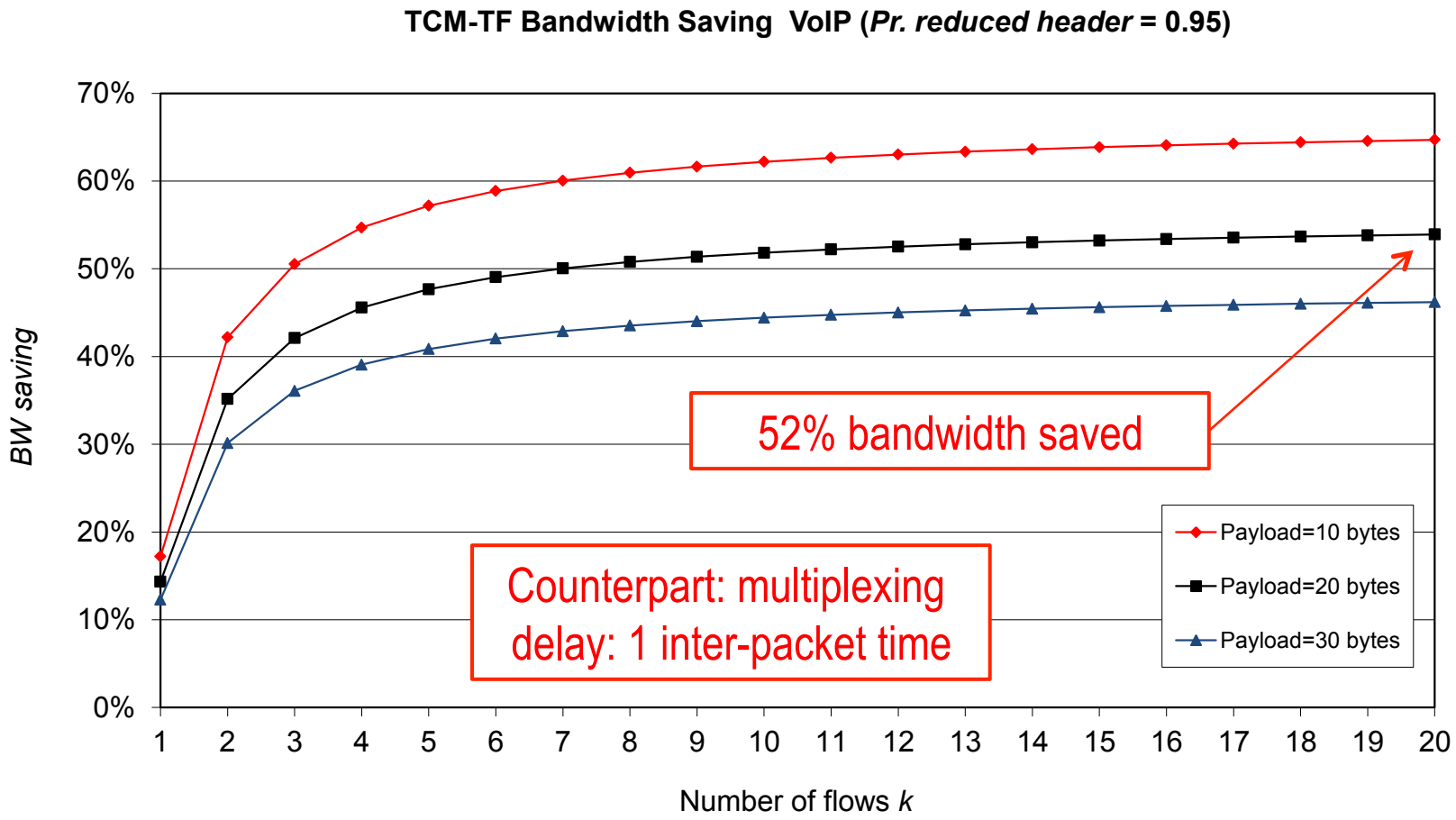


TMC-TF savings

Some remarks

- We can reduce bandwidth and pps
- Bandwidth savings are higher for IPv6
- Interesting for:
  - **Flexibility** (traffic surges at **certain moments** or **places**)
  - **Permanent** optimization: satellite, access links in developing countries
- Tradeoff: we have to add a small delay. So we need to establish some limits, depending on the service, the network status, etc.

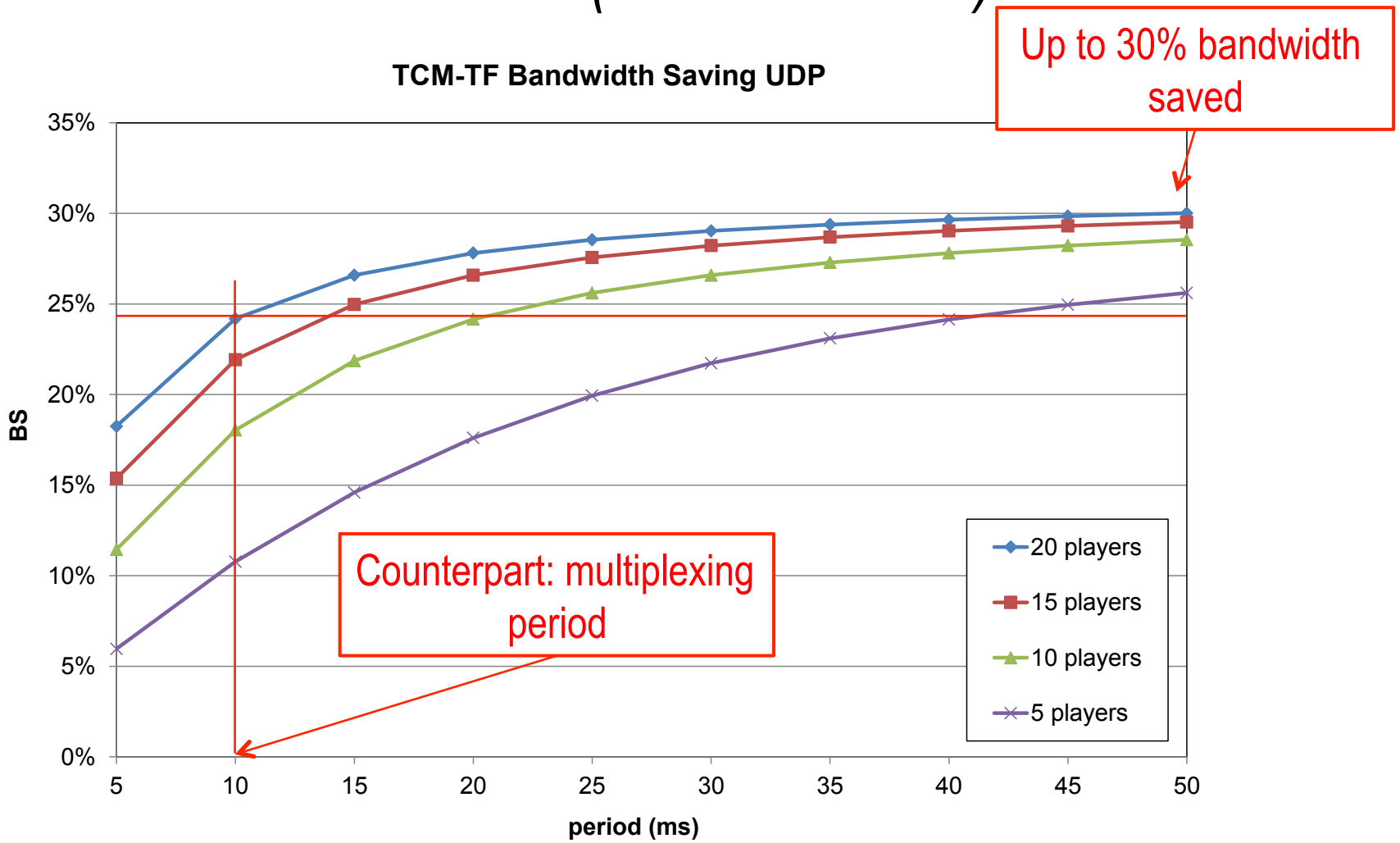
TMC-TF savings for VoIP



"Evaluating the Influence of Multiplexing Schemes and Buffer Implementation on Perceived VoIP Conversation Quality," Computer Networks (Elsevier). http://dx.doi.org/10.1016/j.comnet.2012.02.004

TMC-TF savings for UDP

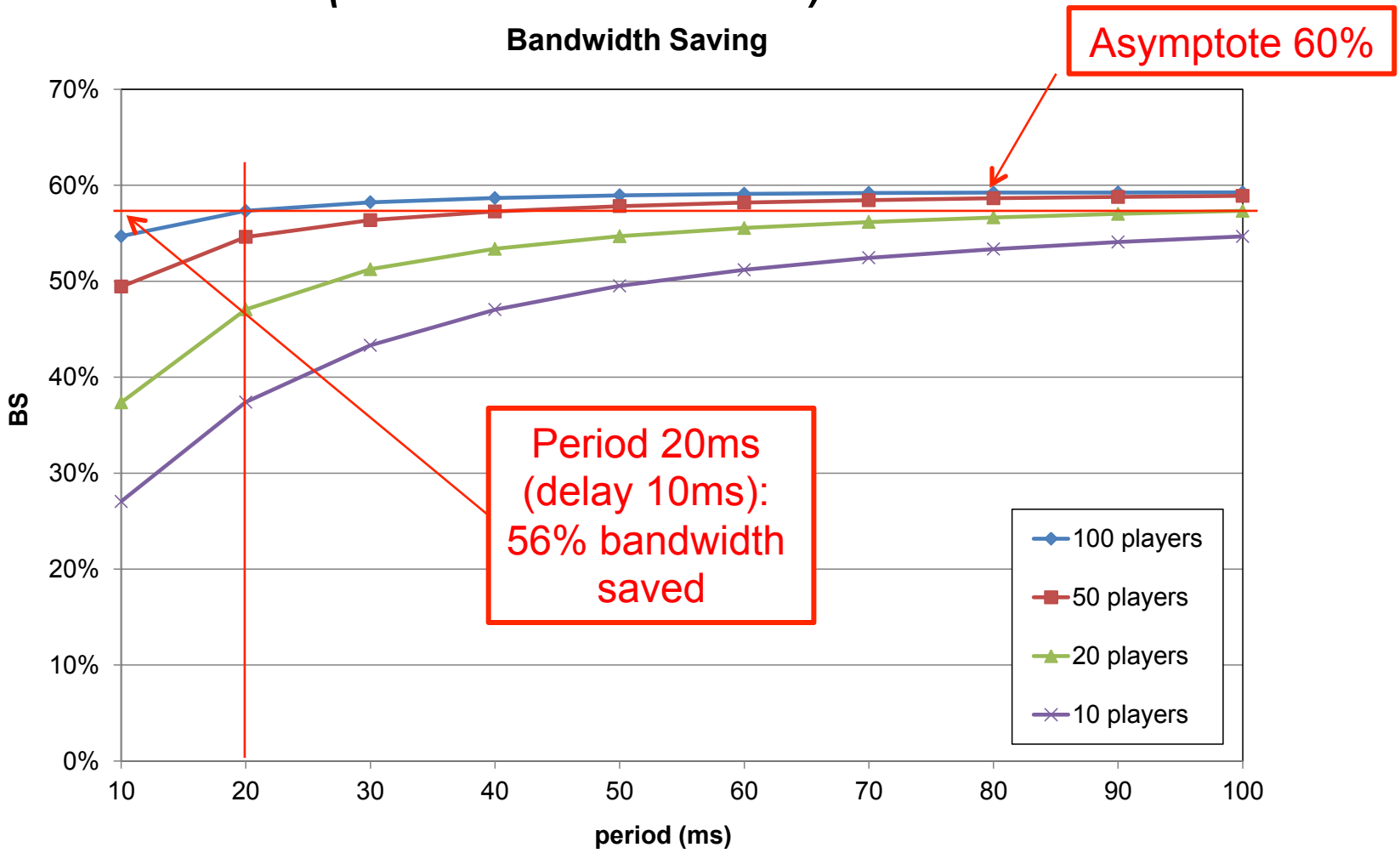
UDP First Person Shooter *(Counter Strike)*



First Person Shooters: Can a Smarter Network Save Bandwidth without Annoying the Players?," IEEE Communications Magazine, vol. 49, no.11, pp. 190-198, November 2011

TMC-TF savings for TCP

TCP MMORPG *(World of Warcraft)*



"Traffic Optimization for TCP-based Massive Multiplayer Online Games," Proc. International Symposium on Performance Evaluation of Computer and Telecommunication Systems SPECTS 2012, July 8-11, 2012, Genoa, Italy.

TMC-TF pps reductions