

Robust Header Compression

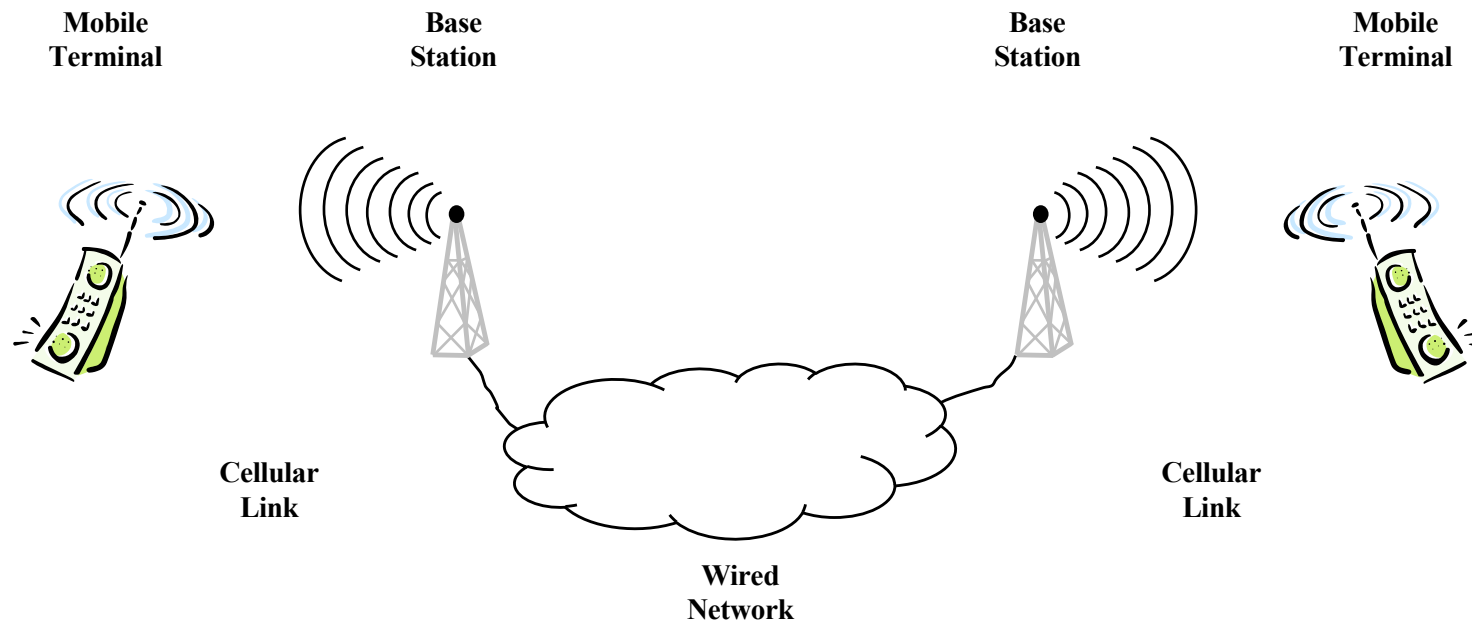
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Robust header compression

- Goal: Making IP-telephony as speech service economically viable compared to traditional circuit switched telephony.

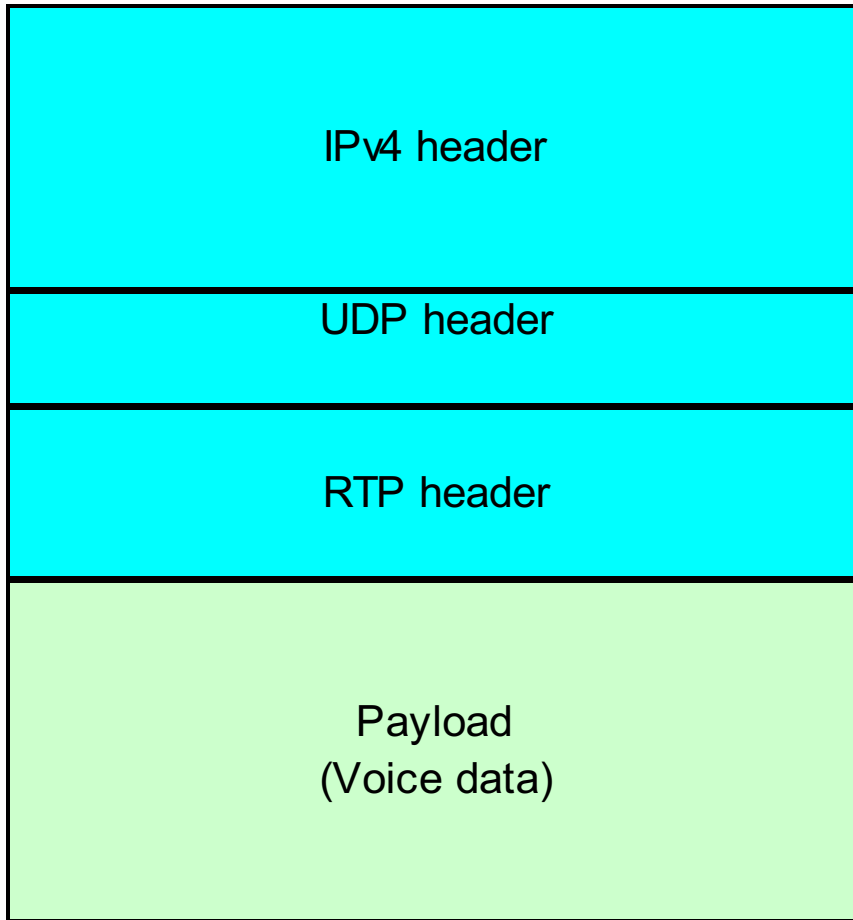


Link properties

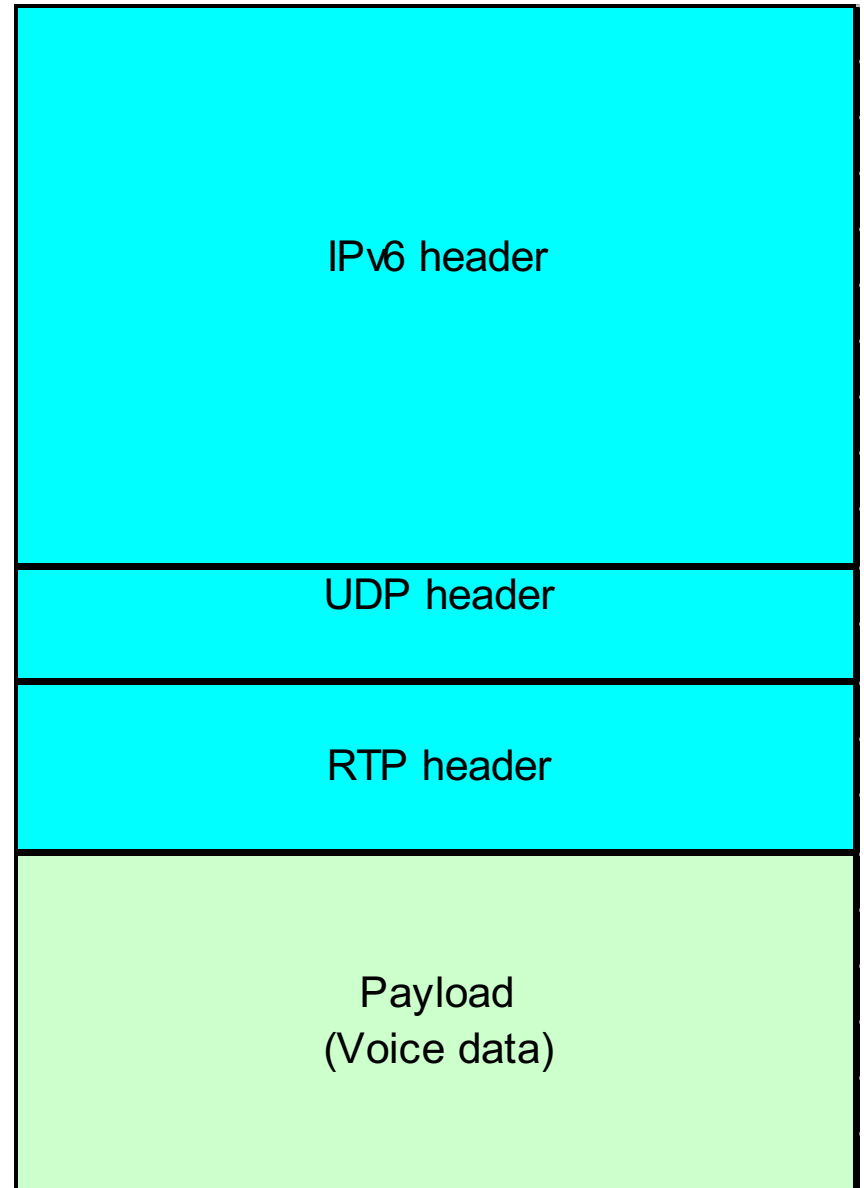
- Wireless cellular networks usually run at a point where there is around 1% frame loss.
 - Raw bit-error rate 10
 - %, after channel coding, etc, $1e-2$ to $1e-6$.
- Voice codecs can cope with such loss and still deliver reasonable service.
- A loss event involves 1-2 packets. For some technologies 3. Longer events *very* rare.
 - True for WCDMA, GSM, CDMA-2000, EDGE.

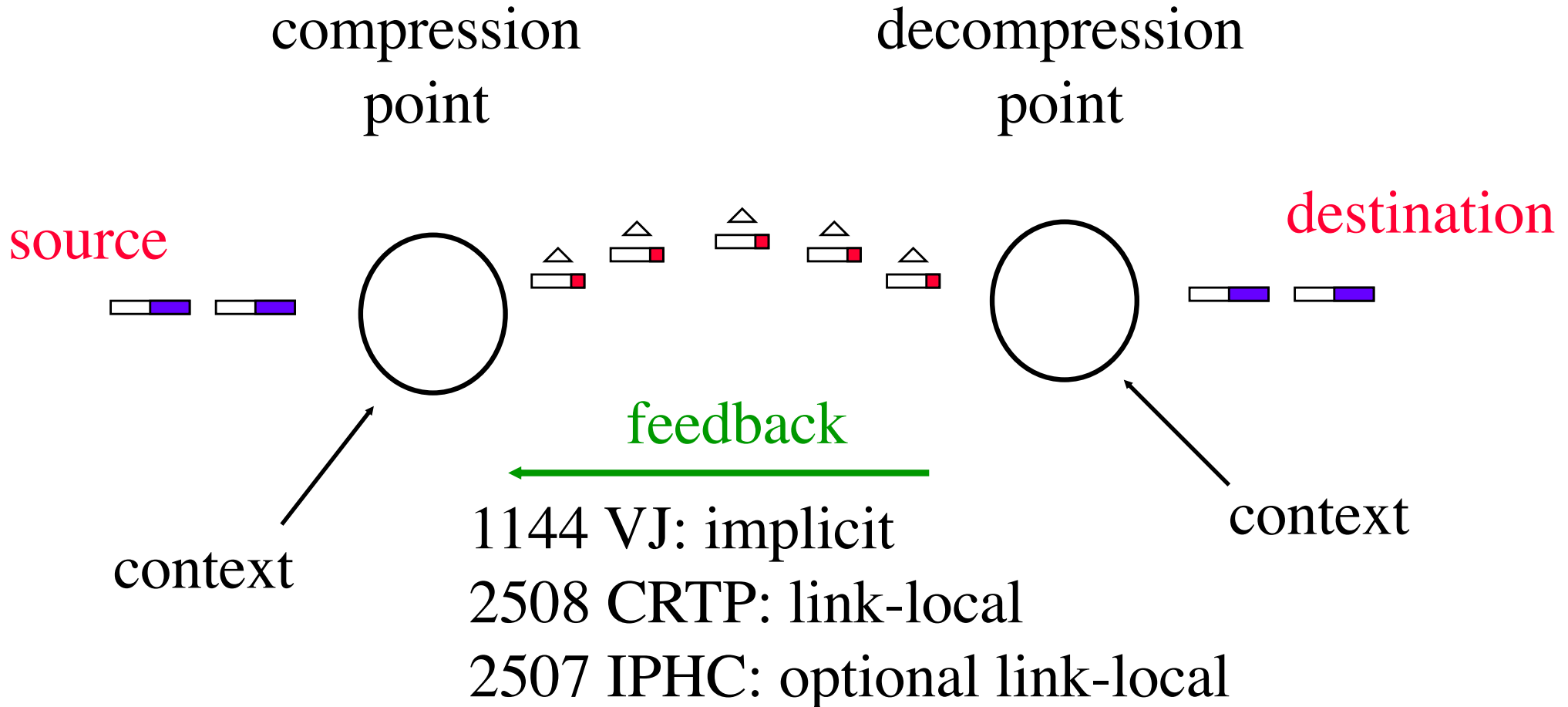
IP voice packet

$$20+8+12+24$$



$$40+8+12+24$$





HC exploits regularities in stream of headers.
 Schemes above suffer under high-loss & irregularities.
 “twice”

Requirements

- Complete transparency
- No production of erroneous headers
- No added packet loss due to header compr.
- IPv6, IPv4, RTP/UDP/IP, TCP/IP
 - Extension headers, TCP options
 - RTP for voice & video
- Compress headers of tunneled packets
- Should be possible to compress over simplex links.

Most loss due to context damage

- Large delay-bandwidth product over link
- Unrepaired context damage implies loss of entire “window” , i.e., 100-200 ms of voice.
- So, avoid context damage or repair without going across link.
 - ROCCO: repair without going across link
 - ACE: delta in compressed header is relative to hdr confirmed to have reached decompressor

Robust header compression

- Avg. header size less than 2 bytes.
 - Minimal header is one byte
 - Both ROCCO and ACE
- Neither add significantly to loss rate.
- No reliance on transport checksums
 - May not be present.
 - Voice codecs might want data even if damaged.
- Entirely possible to do similar things for TCP.

Tunneling & Security

- Encrypted or authentication data cannot be compressed. (AH adds significantly)
- Outer header in an encrypted tunnel can be compressed (IPHC, rfc2507)
- Inner headers could be compressed at tunnel entry point, but currently no defined way to do so for transport headers.
 - Reordering.
 - Work in AVT, but may not perform well enough when RTP stream subject to high loss.

■ **Compression of inner headers**

- for end-to-end encryption.
- for tunnels across “core network”
- Need robustness against reordering & loss & irregularities in packet stream.
- work in AVT, but may not produce robust solution

■ **Compression of signaling packets?**

■ Further information

- rohc @ cdt.luth.se
- draft-degermark-crtp-eval-01.{txt, ps}
- draft-degermark-robhc-requirements-00.txt
- draft-jonsson-robust-hc-03.{txt, ps}
- Rfcs 1144, 2507-2509