- Support for compression of Ethernet, VXLAN, EoMPLS, MPLS, PPPoE and PPP headers
- Support for compression of GRE and GTP-U headers
- Support for compression of IPv4, IPv6, TCP, UDP and RTP headers
- Easily extended with additional header support, e.g., L2TP
- Robustness against packet loss, both in the network and over the compressed link
- Robustness against jitter and packet reordering in the network
- Resilience against jitter and packet reordering over the compressed link
- Feedback fast recovery
- Easy to use API
- CPU and memory efficient implementation suitable for all types of devices
- Highly portable ISO/IEC 9899:1999 (C99) code with no operating system dependencies
- Platform and endianness (byte-order) independent
- Support for compiler link time optimization

Background

The current header compression schemes IPHC (RFC 2507: IP Header Compression), CRTP (RFC 2508: Compressed RTP) and ROHC (RFC 3095 and RFC 5225: Robust Header Compression) compress single headers or one of protocol header chains in IP packets. These schemes are very efficient in compressing these header chains and ROHC is particularly compression efficient as well as robust against bit errors and packet losses.

Figure 1: Examples of single layer protocol header chains in an IP packet

There are many situations where multiple IP header chains are present in an IP packet, e.g., in 3GPP LTE backhaul, relay base stations and many such variants on satellite networks or microwave networks. The existing header compression schemes must be applied twice to compress two protocol layers and they are not able to compress headers such as Ethernet, GTP-U, L2TP, PPP etc. Some of these links are high bandwidth high packet rate links and others are typical home broadband connections being used for cellular small cell connectivity.
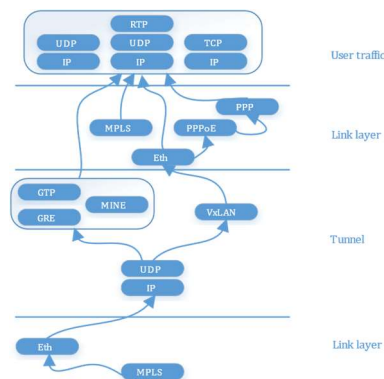

Figure 2: Examples of multiple layer protocol header chains in an IP packet

Solution: Effnet BHC™

Effnet has developed a new header compression scheme, Effnet BHC™, to be able to compress both one layer of IP header chains like all the existing header compression schemes and also compress multiple layers of IP header chains, including headers which are not supported by existing header compression schemes. Our long experience with header compression and ROHC has enabled us to develop Effnet BHC™ with the following three key properties.

Compression and System Efficiency

Effnet BHC™ is 2-3 times more system efficient than ROHC (requires far fewer CPU cycles) and is still capable of delivering a compression efficiency comparable with ROHC. Most importantly, it is a flexible and modular scheme that can be easily extended to add support for many other header types and tuned to achieve a desired balance of compression and system efficiency on the target link based on its bandwidth and packet rate.
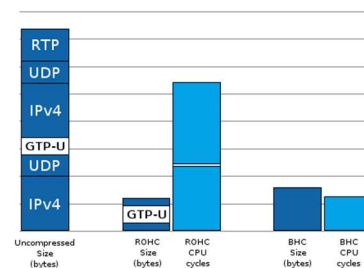

Figure 3: ROHC and Effnet BHC™ comparison

Robustness

Effnet BHC™ is robust against and packet loss. It has advanced header field encoding mechanisms coupled with feedback and error recovery to keep the compressor and decompressor in synchronization. It can efficiently handle reordering of packets on the link.

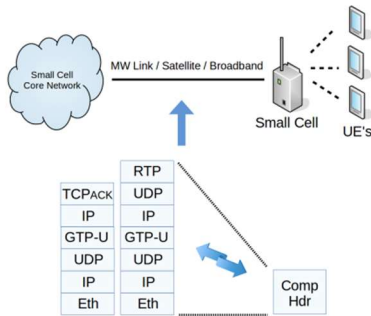## Effnet BHC™ Applications

Effnet BHC™ on LTE backhaul links

Figure 4: Effnet BHC™ application on a backhaul link
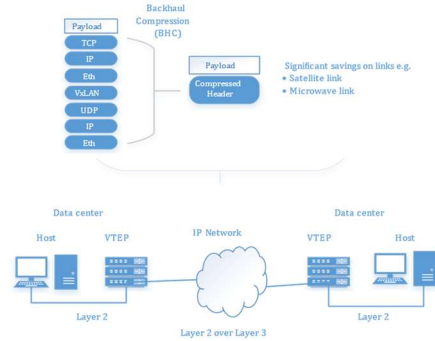
Effnet BHC™ on LTE relay links

Figure 5: Effnet BHC™ application on an LTE relay link

Effnet BHC™ on satellite links

Figure 6: Effnet BHC™ application on a satellite link

Effnet BHC™ on datacenter tunnels

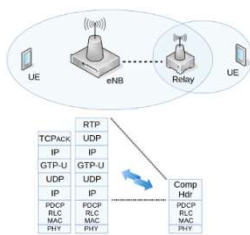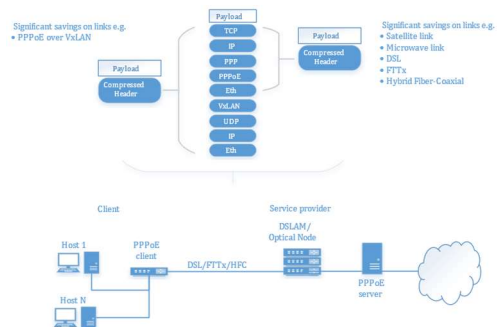Figure 7: Effnet BHC™ application on datacenters connecting tunnel

Effnet BHC™ on last mile access and in core networks

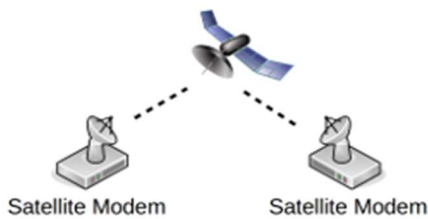Figure 8: Effnet BHC™ application on DSL/FTTx/HFC last mile access
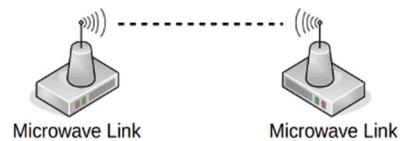
Effnet BHC™ on microwave links

Figure 9: Effnet BHC™ application on a microwave link

Platforms

Effnet BHC™ has been tested on ARM, PowerPC, MIPS and x86 platforms, and its portable design makes it straightforward to port to other platforms as well.

Support

Effnet products are offered with a full range of support services, including problem reporting, bug fixes, updates, training, consulting and integration services. Sample application code is provided which demonstrates the use of the API and helps to speed-up the integration process.

For more information and references about header compression and Effnet BHC™, see our library of white papers and data sheets at www.effnet.com