ABSTRACT

Develop a Link Layer Forward Error correction capable of replacing dropped or corrupted IP packets in a data stream without retransmission.

OVERVIEW

While the data rate of internet connections is important, there are other factors that can significantly impact user experience. Long latencies, congestion and links with poor connectivity can also degrade performance. Whenever a packet is dropped or corrupted, the network, depending on the protocol, will either deliver less than the original data, or will recognize that packets are missing and request a retransmission. In the latter case, while the data eventually gets there, it can take a significantly long time and create a poor user experience. In the former case, the user may observe artifacts in audio or video streams which can only be partially concealed by the applications.

Link Layer FEC (Forward Error Correction) can be used to address this case. With the addition of some redundancy, missing or dropped packets can be replaced in route without any retransmission. This is a software project.

EXPERIENCE

- Students should be familiar with basic networking protocols.
- The FEC code will be supplied, both for encoding and decoding.
- Students will learn about FEC, UDP, and programming at the socket level.
- While C++ is preferred, we are open to using a different language.

EQUIPMENT

While it is anticipated that no equipment will need to be purchased, AHA will provide computing and test equipment as needed, as well as any software that needs to be purchased.