dpi's switches improve packet throughput using section-packing methods for DSM-CC sections. Under normal conditions not fully filled transport stream packets are padded with dummy bytes and send across the system.

Section packing enables the system to fill free space until the transport stream packets are fully loaded or a timeout occurs, before transport stream packets are sent. Section packing is done at PID level. dpi's switches can provide section packing independent of the number of active PIDs, which is unique worldwide. Section packing is important if there are many small packets in the system (for instance many TCP acknowledgements in IP unicast environments).

Figure 15 shows an example of two transport streams, which both contain the same amount of user data. One is section packed (PID 0x86) and one is passed without section packing (PID 0x82). The IP packet payload size is 58 bytes (UDP header plus 50 bytes of data).

Under normal conditions one packet (DSM-CC + IP + UDP + payload, 16 + 20 + 8 + 50), would be send using one transport stream packet (header + pointer byte + payload, 4 + 1 + 183) wasting 89 bytes per IP packet transmission. dpi's switches can pack data up to100 MBPS at no performance degradation.

The unpacked stream needs almost twice as much capacity in the outgoing transport stream compared to the section packed stream.

dpi's implementation of section packing is hardware independent and patented. The layered driver model allows to implement this method on top of different hardware structures. Keeping full standard compliance (ISO/IEC 13818), it runs in DVB systems as well as in ATSC systems without any restrictions.
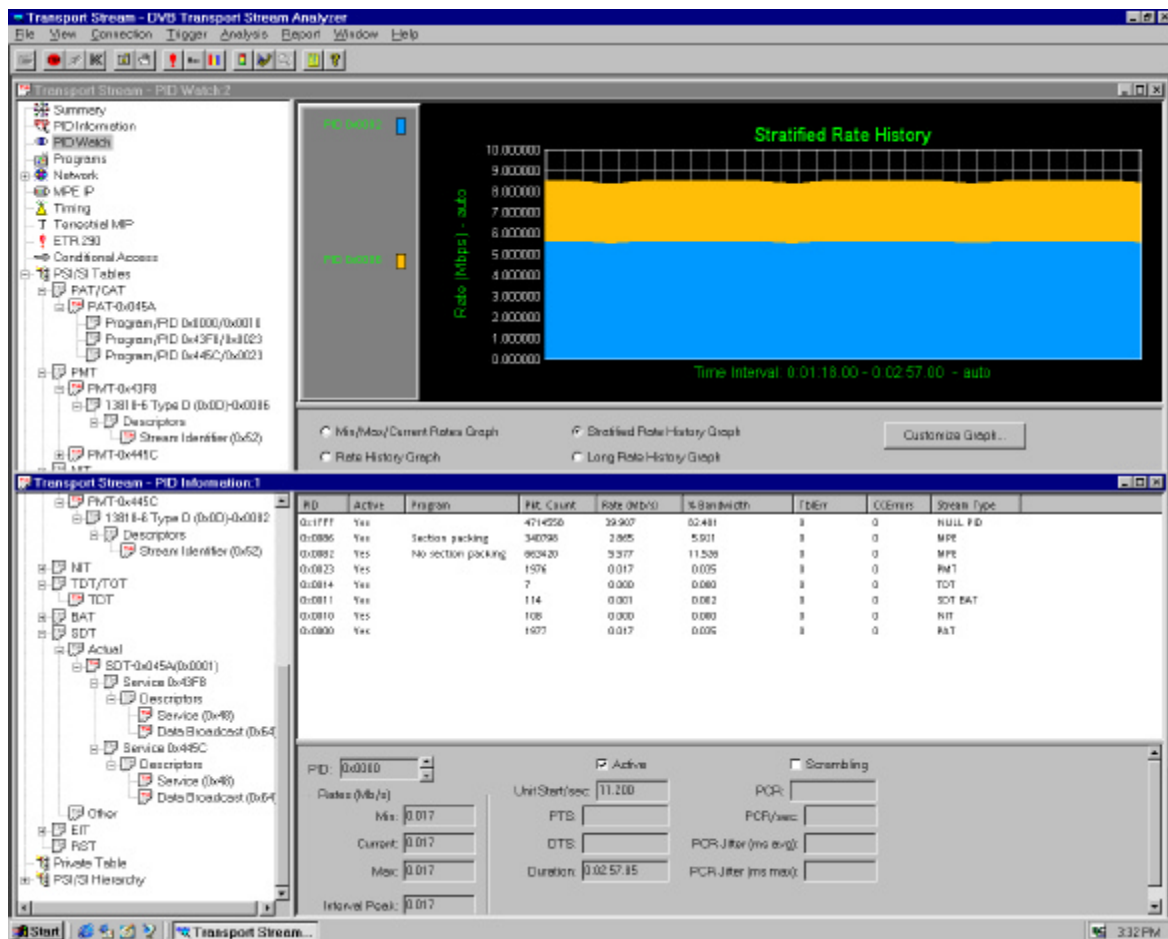
Figure 1. Section packing performance

Section packing looses efficiency, if packets are switched via many different PIDs as each individual PID channel keeps track of its own sections. dpi's extensive system integration experience helps clients to find the appropriate number of PIDs in their system depending on their requirements and traffic models.