Ethernet Bandwidth Estimation

Links

https://atc.bmwgroup.net/confluence/display/VISION25/Padi+Bandbreiten

Intro

IDCevo has a 100 MBit/s (SP21) or GBit/s (SP25) link to the vehicle. How do we spend this resource?

Obviously network traffic is bursty, meaning the peak bandwidth usage is always 100% over very short time intervals while the average utilization is much lower.

Jitter will occur in case of bandwidth spikes exceeding the link capacity, some usecases can tolerate this, some cannot.

Note that AVB has precedence over IP traffic, up to a threshold of 75% link bandwidth (according to the standard).

The following table shows some rough data. Not all usecases are active at all times, this is indicated by the 'base load' column.

Figures

usecase	direction	~ avg bandwidth use (MBit/s) SP21	~ avg bandwidth use (MBit/s) SP25	base load	jitter tolerant	comment
AVB audio	in	10	10	yes	no	max 13 channels; peak == avg
AVB audio	out	10	10	yes	no	max 14 channels; peak == avg
AVB video TV	in	5	5	no	no	peaks for I-frames (~1/s)
AVB video Parking	in	40	25	no	no	covers Drive Recorder Playback, mutual exclusion with VideoAR
AVB video AppRecorder	in	-	60	no	no	formerly known as JoyRecorder up to 4 streams with 15 MBit
AVB video IKS	in	-	25	no	no	interior cam
AVB video FCW	in	-	25	no	no	VideoAR
AVB video FCW CV	in	-	65	no	no	semantic segmentation and depth map from CV Make (IPnext) two streams with 32 Mbit each
SOME/IP	in	4	???	yes	partly	SP21 measurement taken from **ABPI-269988** - Getting issue details... STATUS
SOME/IP	out					
NPU	in	-				legacy CAN/LIN etc tunnel
E2B	out	-	5	yes	no	interior light with max no of LEDs (12x100) typical case will be lower
E2B	in	-	1,5	yes	no	interior light with max no of LEDs(12x100) typical case will be lower
backend	in					cdc, dumm
open internet	in					spotify etc

SomeIP behavior

More insights from **ABPI-269988** - Getting issue details... STATUS :

- There were about 3 million SOMEIP messages total in 50 min (3000 sec), so about 1000 msg/s. This might be higher in other cars!

- Average SomeIP packet size comes out at 400 bytes.