Speed, Cable type and Reach for ISAAC

Rev 02a

IEEE 802.3

ISAAC Study Group

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Introduction

- This presentation relates to three key items for ISAAC

  - Data Rates
  - Cable reach
  - Media type

- These 3 items go together. Selecting reach without stating speed or type is not prudent.
  - For example, what if the speed is 50G? Does 15 meters go with that?

- Being specific with these items will help move the project forward faster

- Being vague with these items will broaden the scope and make it harder to reach consensus and establish distinct identity

Cable Types and Reach
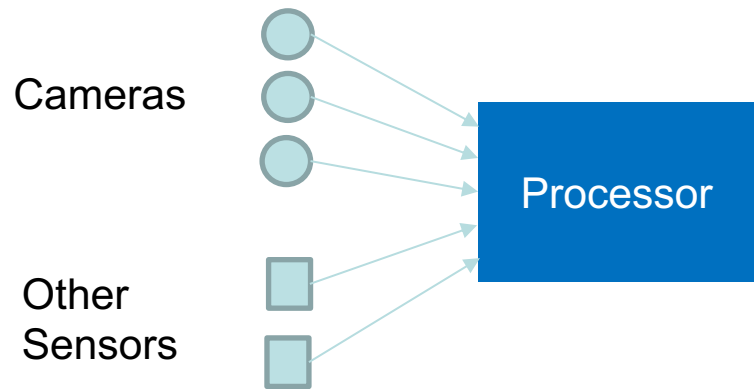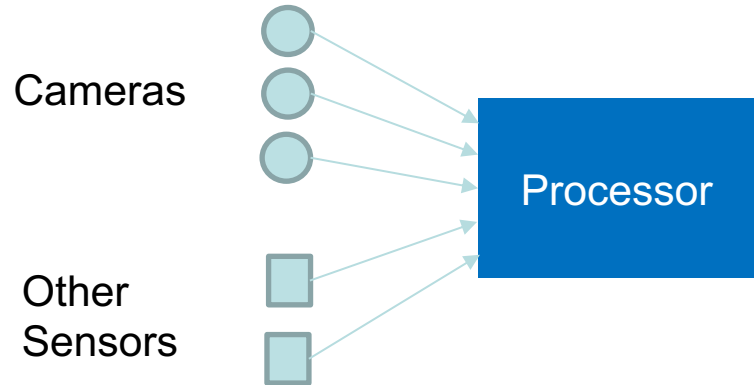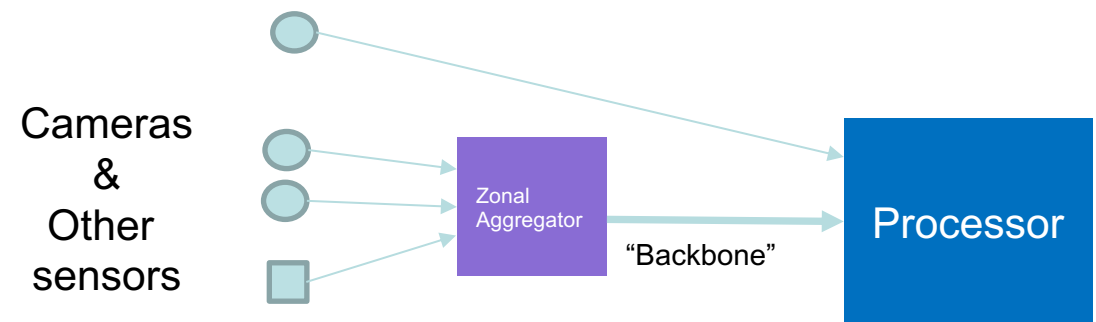

Without Aggregation
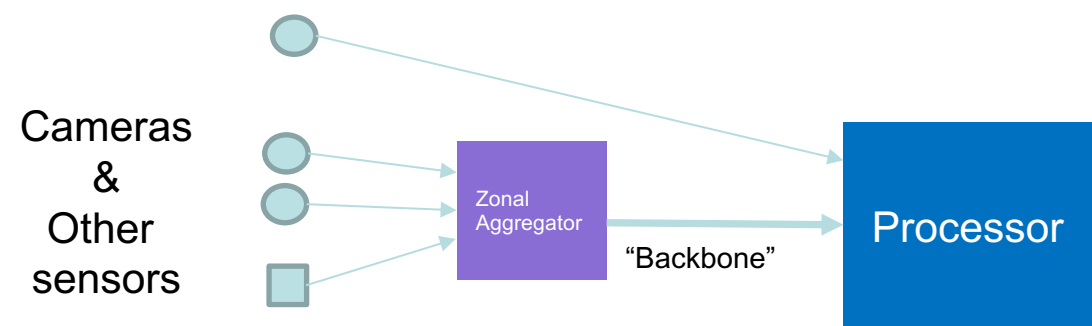
With Aggregation

- 802.3ch, ASA and IEEE A-PHY support 15 meters of cable reach

- 15 meters is a well-established number in the industry for cameras

- Cameras predominantly use COAX cabling

- Camera to Zonal Agg will predominantly use COAX cabling

- Zonal Agg to Processor likely to use STP cabling

- 802.3cy specifies 11 meters of STP cabling

- ASA and IEEE A-PHY specify 10 meters of STP

Data Rates

Without Aggregation

8MP camera is a relatively high resolution for automotive
  Realistic Max Data rate ~ 8 x 30 FPS x 16 bpp x 1.2 = 4.6G

17MP camera is extremely rare
  Realistic Max Data rate ~ 17 x 30 FPS x 16 bpp x 1.2 = 9.8G

Some 24bpp cases and some radars may need higher BW

10G appears sufficient to cover *most* "end node" applications!

With Aggregation

- Backbone links may need data rates beyond 10G

- 25G may be a good rate to cover these applications

- 802.3cy already exists for this application

- **Is 802.3cy not sufficient?**

COAX and STP IL
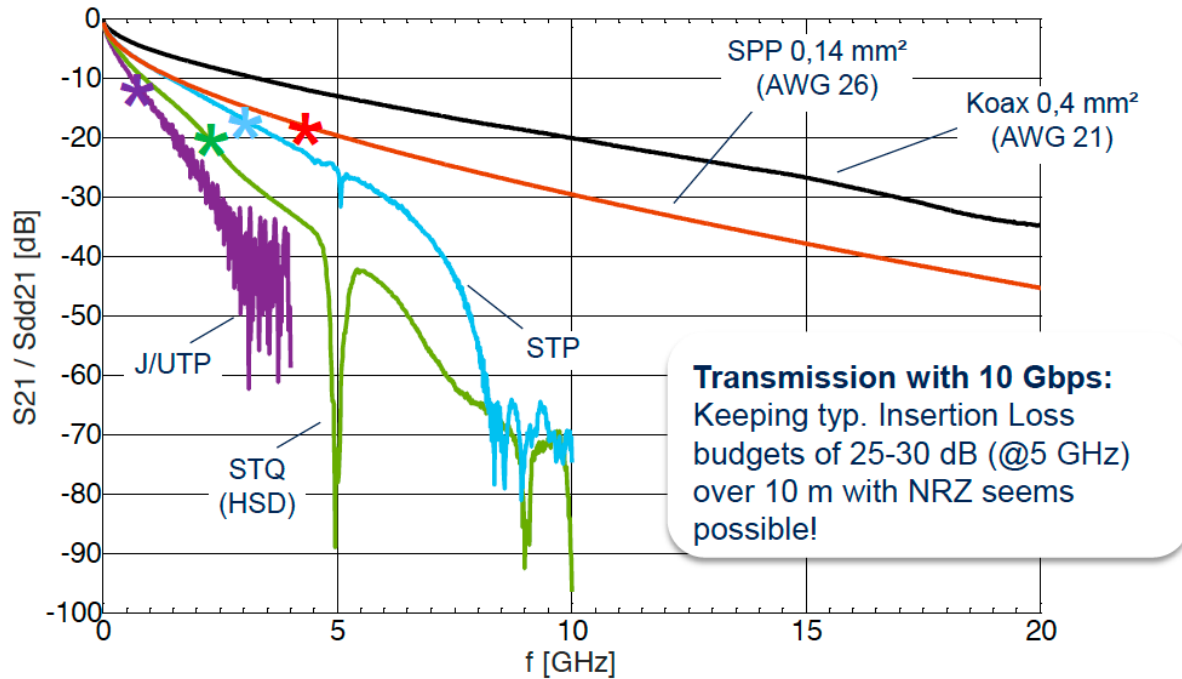
- Example of Automotive cable measurements

- Coax length is not the same as STP length for a given IL

Source:
https://www.ieee802.org/3/ch/public/jul17/mueller_channel
_options_01a_0717.pdf

Summary

- **Data Rates** for **end nodes** (recall that CFI was very focused on camera end nodes)
  - 10G, 5G and 2.5G adequately cover most of the end node applications. Some may be higher.
    - 10G for 17MP cameras
    - 5G for 8MP cameras
    - 2.5G for 3MP cameras

  If a new 25G PHY, that differs from 802.3cy, is desirable for **aggregation**, recommend doing a new CFI to study the need

- **Cable Types**
  - COAX is mandatory for cameras
  - STP would be used for a subset of end nodes. Lower volume compared to COAX.

- **Cable reach**
  - 15 meters of COAX is necessary to be competitive
  - 10 meters of STP will cover additional applications without imposing undue burden on PHY design

Thank You!