Upper Frequency for Link Segments

Martin Rossbach , Nexans

Supporters

Valerie Maquire (Siemon)

German Feyh (Broadcom)

Dieter Schicketanz (Consulter)
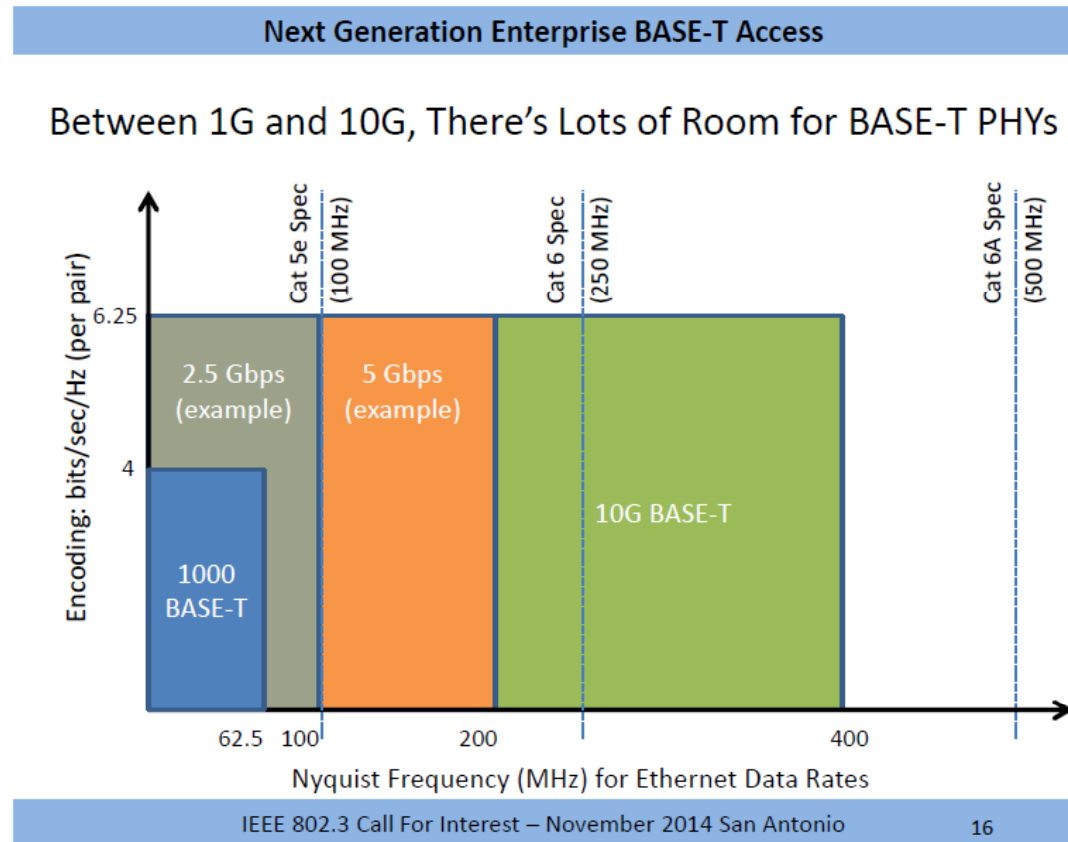
Victor Renteria (Stewart Connector)

Yvan Engels (Leoni)

Dave Hess (Cord Data)

Yakov Belopolsky (Stewart Connector)

Concept of MultiG : Re-Use of 10G Chips at different Clock Rates

- 10G Technology now used for all 4 applications defined by 802.3bq & 802.3bz

- Upper Frequency Requirements should be similar

How much headroom above Nyquist Frequency is required ?

- Current Drafts of 802.3bq and 802.3bz are not consistant: a range of 0 % up to 25% can be found
  - Link Segment 802.3bq requires 25% headroom (2 GHz for 1.6GHz)
  - Liason letter about 2.5/5G to ISO requested 0% headroom
  - Scaling Factors used are not applied in same way :
    - bz used Scaling for PMA only
    - bq uses Scaling for PMA and Link Segment

Overview

	2,5G	5G	25G	40G
Scaling Factor 126.1 .1 / 113.1.1	0,5	1	0,625	1
Modulation rate in Megasysmbols/s (126.1.3/113.1.3)	200	400	2000	3200
PMA in Megasysmbols/s (126.1.3.2/113.1.3.2)	400 xS over 4xTP 100m	400 xS over 4xTP 100m	3200*S over 4xTP 30m	3200*S over 4xTP 30m
Link Segment in MHz (126.7.1)	100 MHz	250 MHz	2000*S	2000*S
Link Segment Upper Freq (126.7.2)	100 MHz (IL, RL, ACRF)	250 MHz	2000*S	2000*S
Scaling used in Salz SNR (126.7.3)	IL +PSD = 200MHz x S Noise = 200 x S	IL +PSD = 200MHz x S Noise = 200 x S		

Is there a difference of assessing installed base and recommending new cabling ?

- If yes, this needs clarification/confirmation as 2 TR of assessing installed cabling are under way in ISO which need guidance
  - ISO 11801-9904 : 100MHz or 125MHz for 2.5G over Cat5e
  - ISO11801-9905 : 1000MHz or 1250MHz for 25G over Cat ?

Double Headroom ?

— A hard requirement needs frequency expansion, a soft requirement or „Nice to have" maybe does not

- Take into account that cabling designers also appreciate headroom and apply some „room"
  - If standards spec a cable of 2 GHz, you likely will see 2.2 G cable or better in the field

—There is a risk of double counting

Conclusion

- 25% headroom rule required now 400 MHz: In the past, this was used for 5 cabling classes
  - Class A to E: 100kHz/1MHz/16MHz /100MHz /250MHz

- Recommendation:
  - Specify what is really required
  - Use consistant approach in 802.3bq and 802.3bz
  - Keep 100MHz for 2.5G , 1 GHz for 25GBase-T as installed base is available
  - Keep 2 GHz Spec for 40G (including some headroom for maybe another app to come)