
802.3bz Use Cases

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Background

Next Generation Enterprise Access BASE-T PHY Objectives

- Support full duplex operation only
 - Preserve the 802.3 / Ethernet frame format utilizing the 802.3 MAC
 - Preserve minimum and maximum Frame Size of current 802.3 standard
 - Support Auto-Negotiation (Clause 28)
 - Support optional Energy Efficient Ethernet (Clause 78)
 - Support local area networks using point-to-point links over structured cabling topologies
 - Do not preclude meeting FCC and CISPR EMC requirements
 - Support PoE (Clause 33)
 - including amendments made by 802.3bt “DTE Power via MDI over 4-Pair Task Force”
 - Support MAC data rates of 2.5 Gb/s and 5 Gb/s
 - Support a BER better than or equal to 10^{-12} at the MAC/PLS service interface (or the frame loss ratio equivalent)
 - Select copper media from ISO/IEC 11801:2002, with any appropriate augmentation to be developed through work of 802.3 in conjunction with ISO/IEC JTC 1/SC 25/WG3 and TIA TR42
- Define a 2.5 Gb/s PHY for operation over
 - Up to at least 100m on four-pair Class D (Cat5e) balanced copper cabling on defined use cases and deployment configurations
 - Define a 5 Gb/s PHY for operation over
 - Up to at least 100m on four-pair Class E (Cat6) balanced copper cabling on defined use cases and deployment configurations
 - Up to 100m on four-pair Class D (Cat5e) balanced copper cabling on defined use cases and deployment configurations

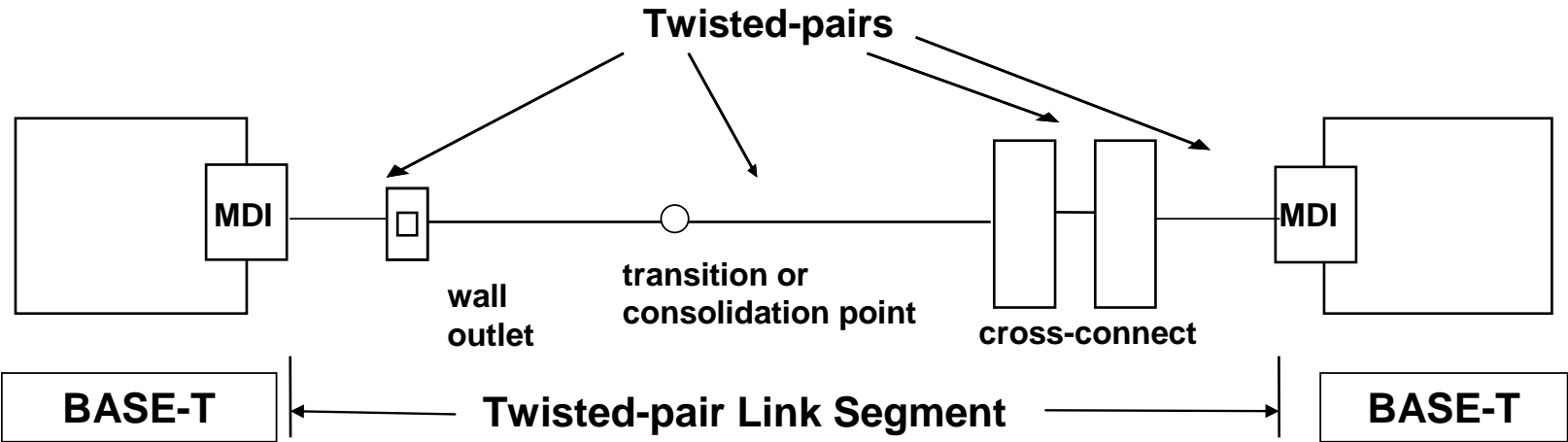
Background

- **Use cases defined to develop deployment configurations and characterize noise environment.**
- **Deployment configurations needed to develop link segment characteristics (ALSNR).**

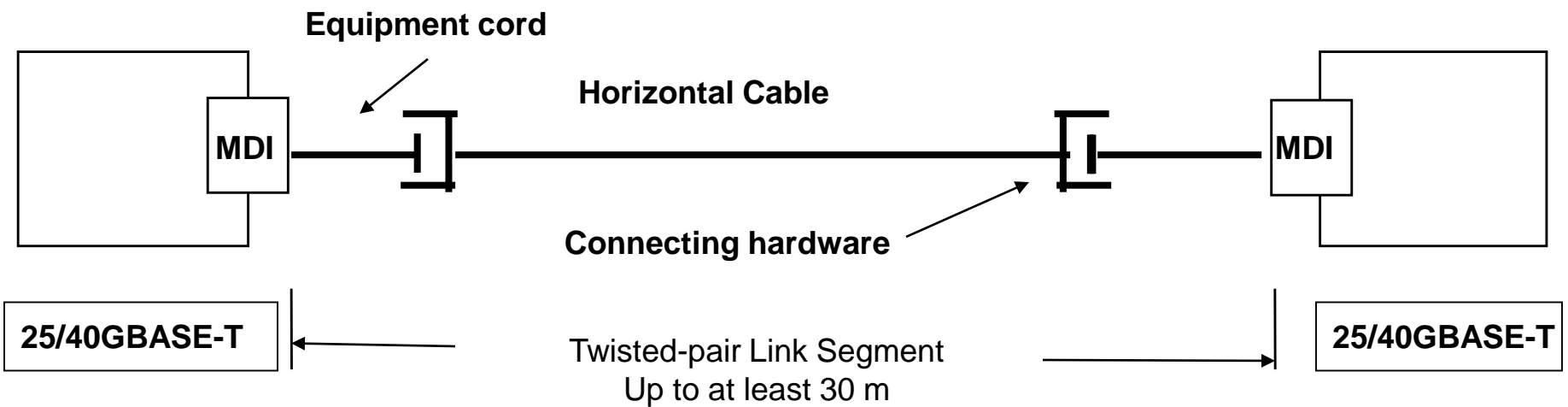
Deployment configurations

- Define a 2.5 Gb/s PHY for operation over
 - Up to at least 100m on four-pair Class D (Cat5e) balanced copper cabling on defined use cases and deployment configurations¹
 - Define a 5 Gb/s PHY for operation over
 - Up to at least 100m on Class E (Cat6) balanced copper cabling on defined (2) use cases and deployment configurations
 - Up to 100m on Class D (Cat5e) balanced copper cabling on defined use cases and deployment configurations
- 1) Use cases and deployment configurations for 2.5 Gb/s PHY for operation over
 - Up to at least 100m on four-pair Class D (Cat5e) balanced copper cabling
 - 2) Use cases and deployment configurations for a 5 Gb/s PHY for operation over
 - Up to at least 100m on Class E (Cat6) balanced copper cabling
 - 3) Use cases and deployment configurations for a 5 Gb/s PHY for operation over
 - Up to 100m on Class D (Cat5e) balanced copper cabling
- Use case based deployment configurations not required for PHYs demonstrating operation over “worse case” cabling configurations.

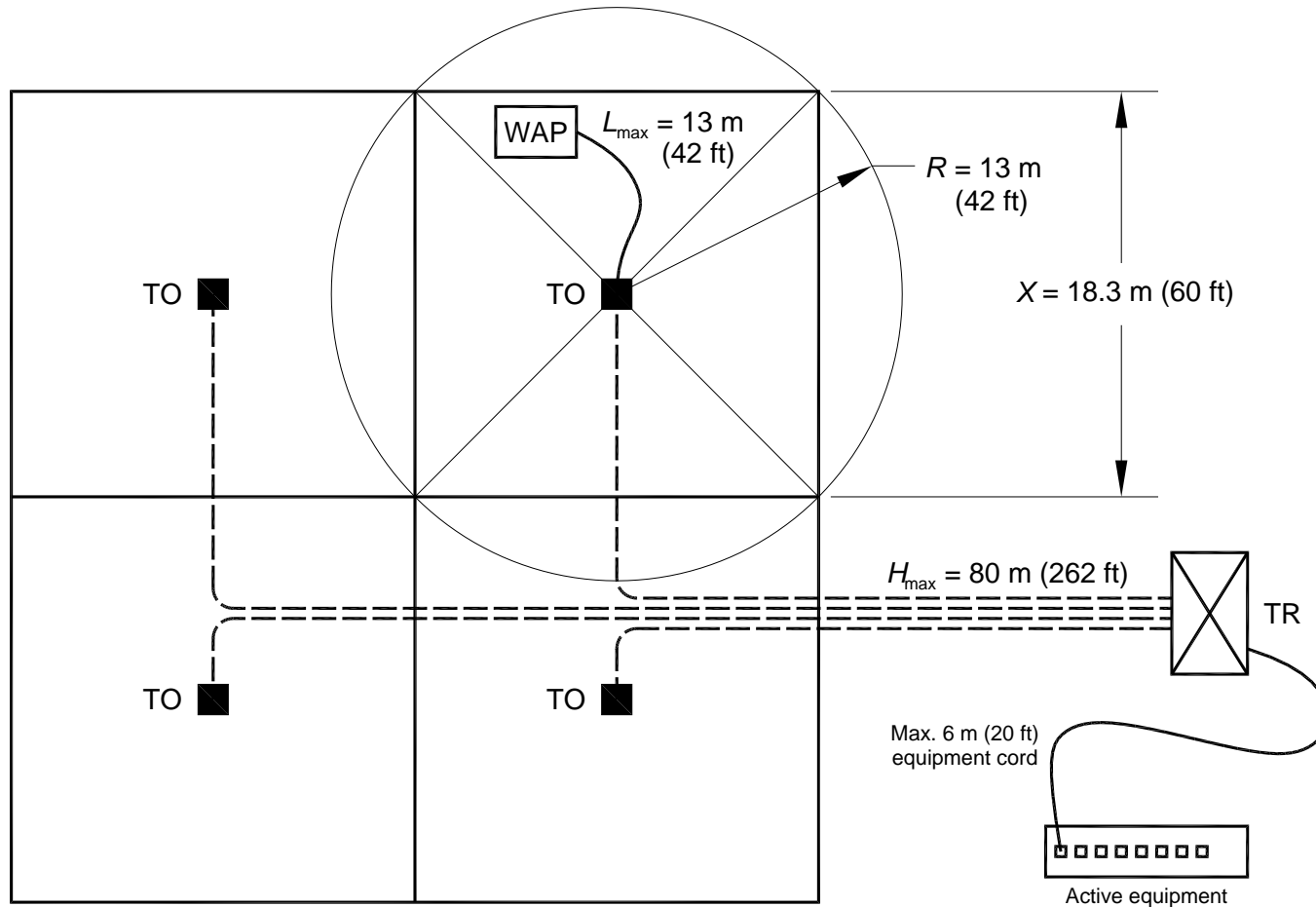
IEEE 802.3 Twisted-Pair Link Segment



10BASE-T/100BASE-T/1000BASE-T/10GBASE-T



TIA/TSB-162-A – Cabling Guidelines WAPs



WAP cell

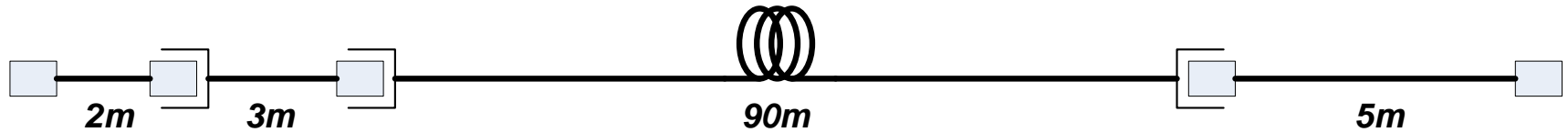
Tests Performed @ Dell Austin

- Cat5e – 2 and 3 connector topologies – 6x1 bundled cable
 - All combinations of line rates – Intel Test Suite
 - Cabling tests (internals, ANEXT, AFEXT)
- Cat6 – 2 and 3 connector topologies – 6x1 bundled cable
 - All combinations of line rates – Intel Test Suite
 - Cabling tests (internals, ANEXT, AFEXT)
- Contributors
 - Jon Lewis – Dell (sponsored)
 - Pete Cibula – Intel (to provide update with more details)
 - Paul Wachtel – Panduit
 - Mike Klempa – UNH-IOL

Test Summary

3-Connector

2.5G/2.5G – Intel Tests Sweeps

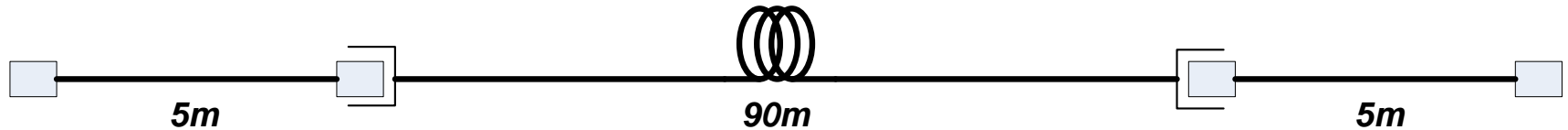


bundled cable tie wraps every 8"

Near End

Far End

2-Connector



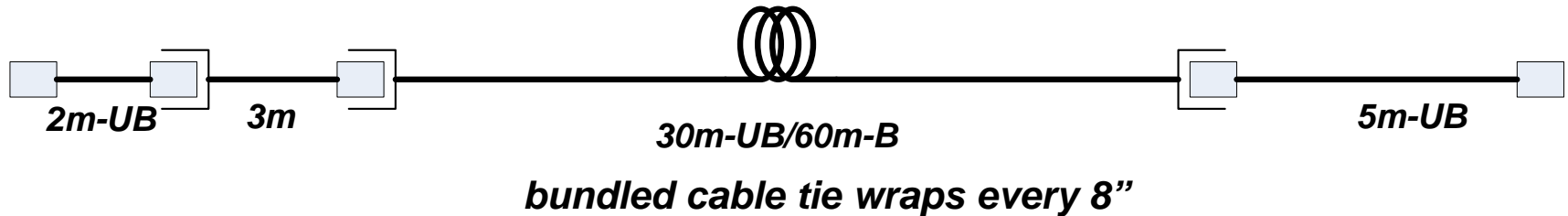
bundled cable tie wraps every 8"

tie wraps 

Test Summary

3-Connector

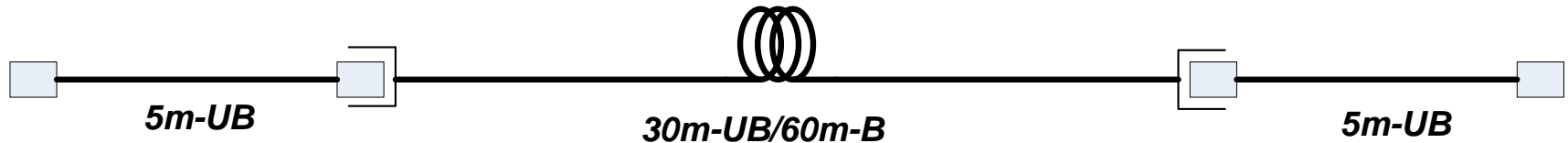
5G/5G – Intel Test Sweeps



Near End

Far End

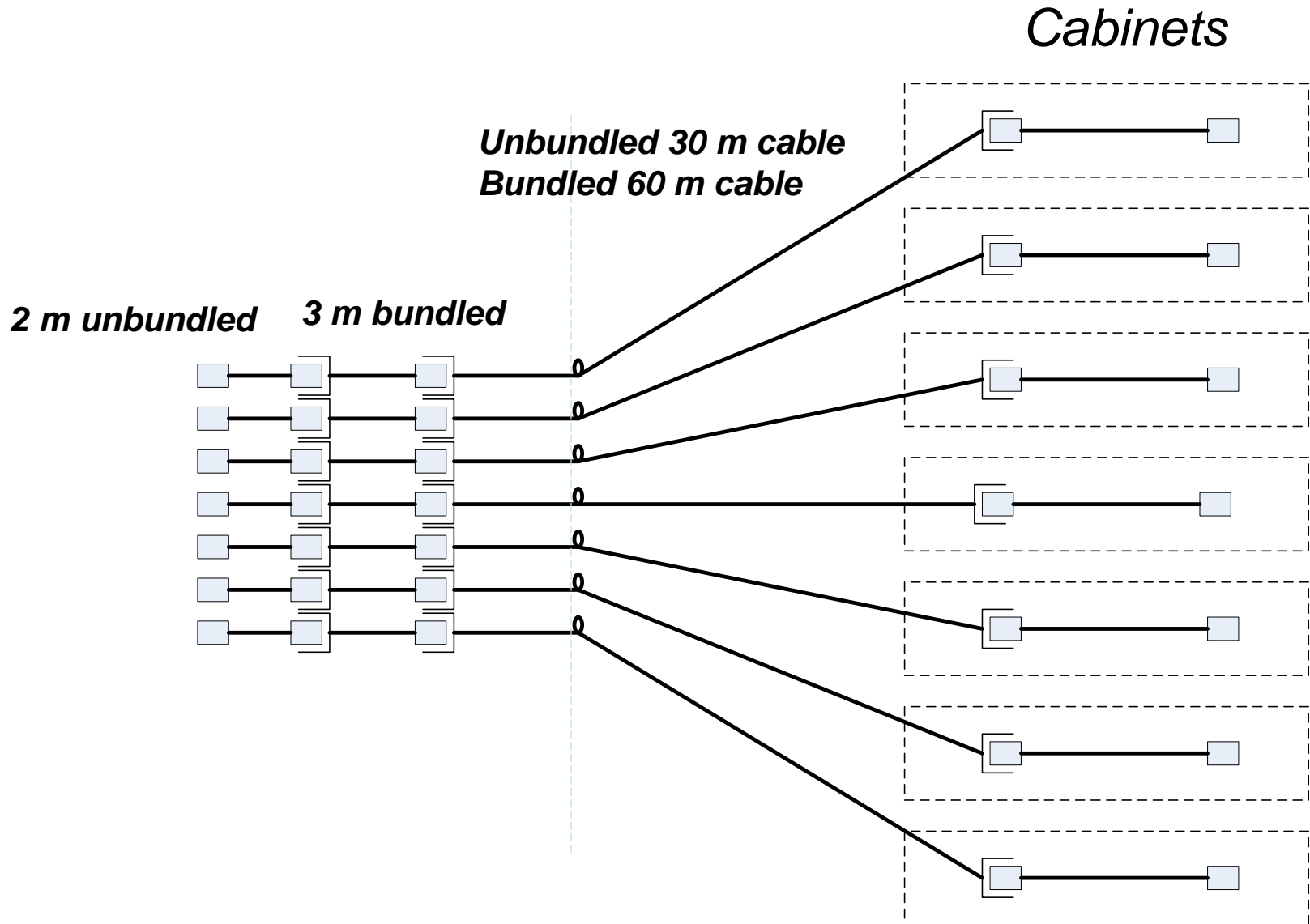
2-Connector



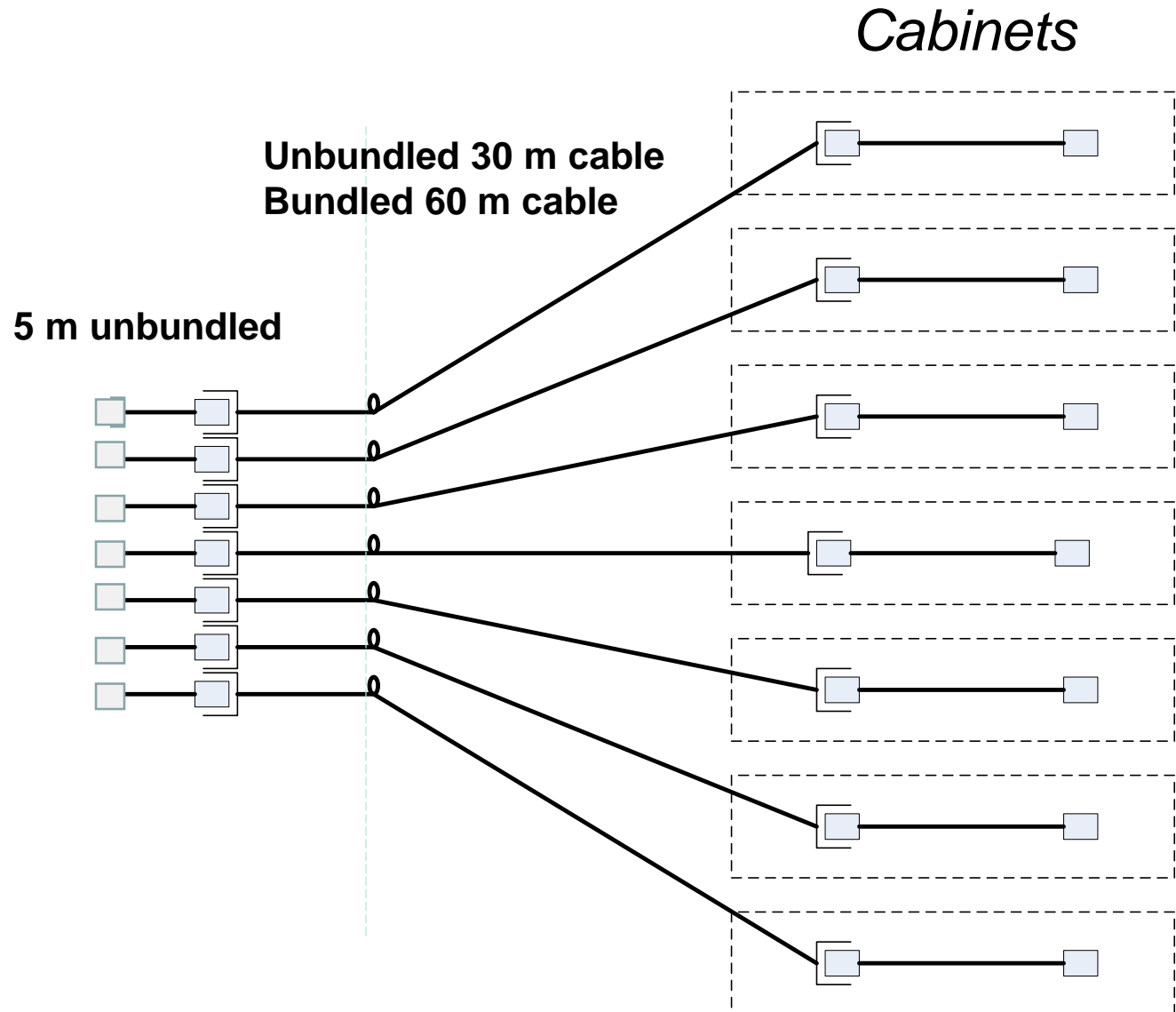
bundled cable tie wraps every 8"

*UB = unbundled
B = bundled*

Use Cases Supported



Use Cases Supported



Getting to a Target SNR

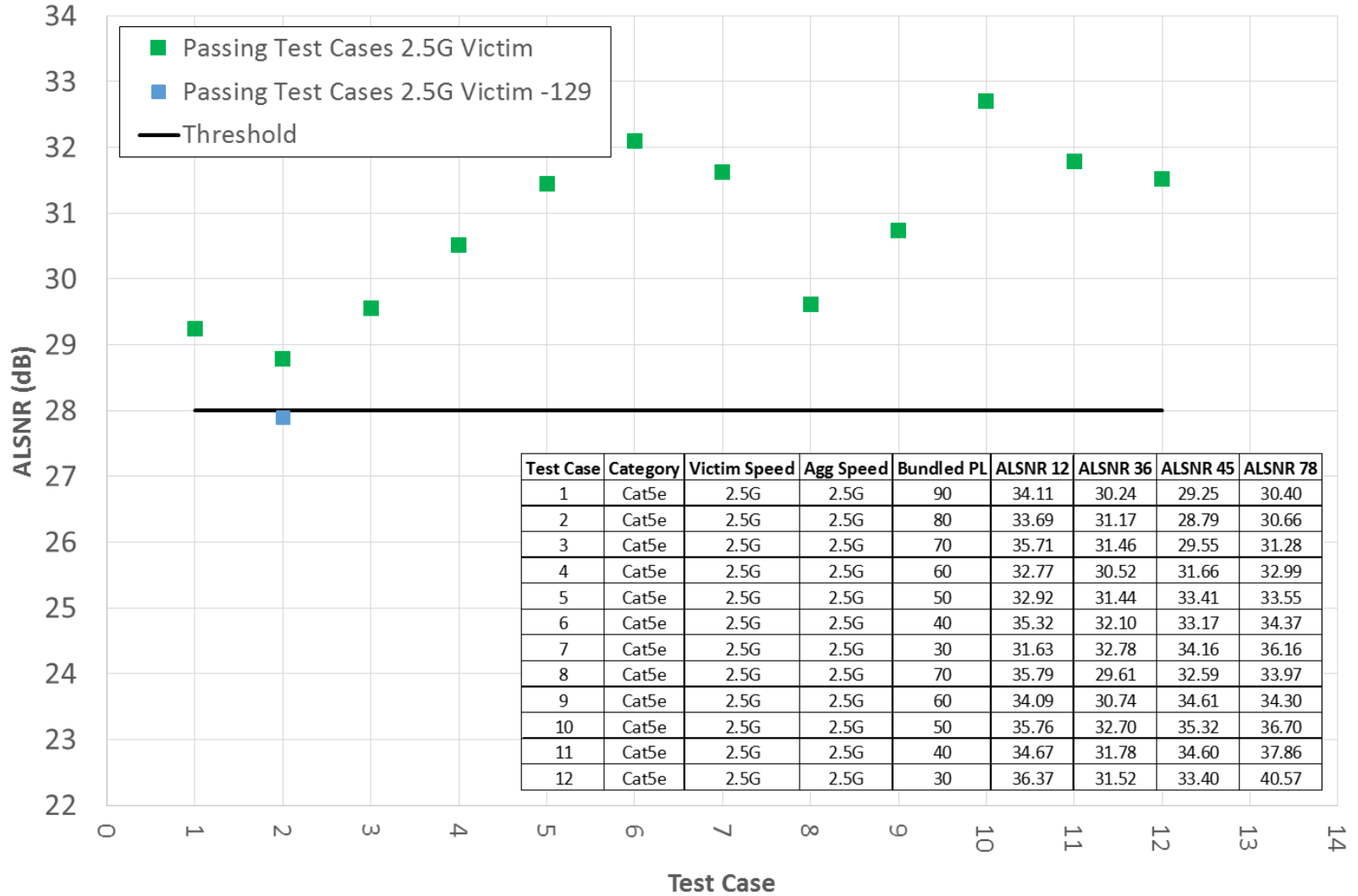
- Don't worry about anything below the decimal point!
- Start at 24 dB (10G rounded off)
- Add 6 dB implementation margin
- Add up to 2 dB for PBO uncertainty

- Result: Target SNR between 30 and 32 dB
 - Reasonable?

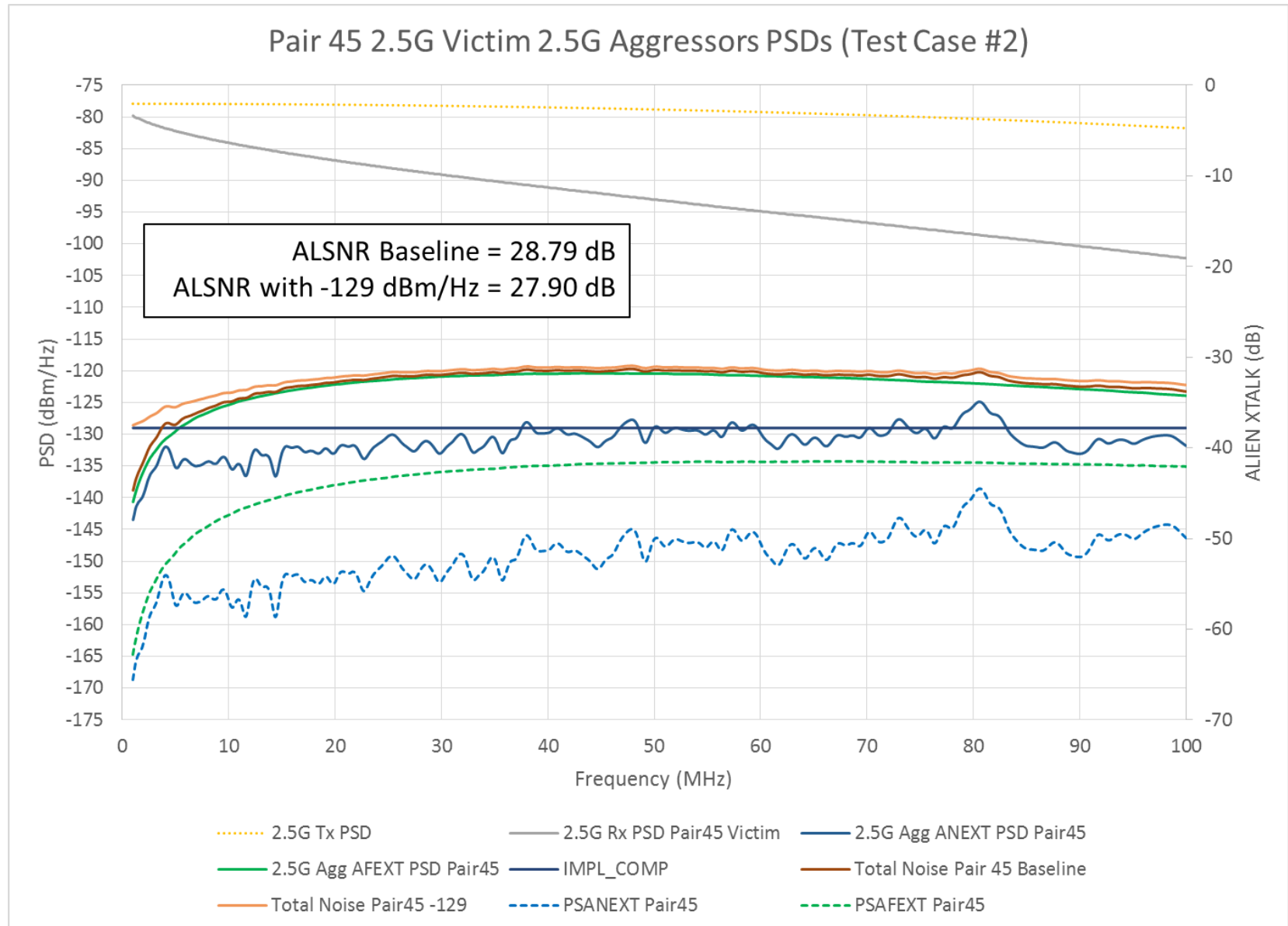
zimmerman_3bzah_01a_0815.pdf

ALSNR – 2.5G disturbed/ 2.5G disturbing

2.5G(Victim) / 2.5G(Agg) Min ALSNR (Cat5e 3 Connector Channel)



ALSNR – 2.5G disturbed/ 2.5G disturbing



ALSNR – 5G disturbed/ 5G disturbing

5G(Victim) / 5G(Agg) Min ALSNR (Cat5e 2 Connector Channel)



ALSNR – 5G disturbed/ 5G disturbing

