

# **400GBASE-LR8 Measurement Data for Reaches >10km**

**IEEE 802.3 Beyond 10km Optical PHYs Study Group**

**San Diego, CA**

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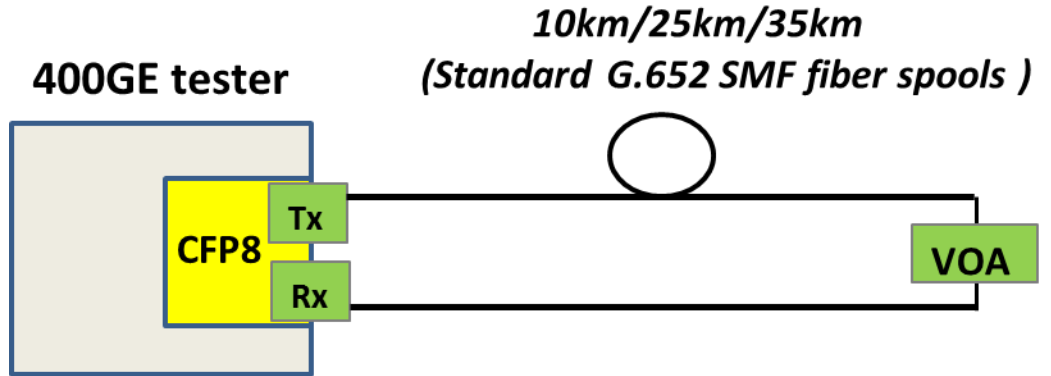
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# Outline

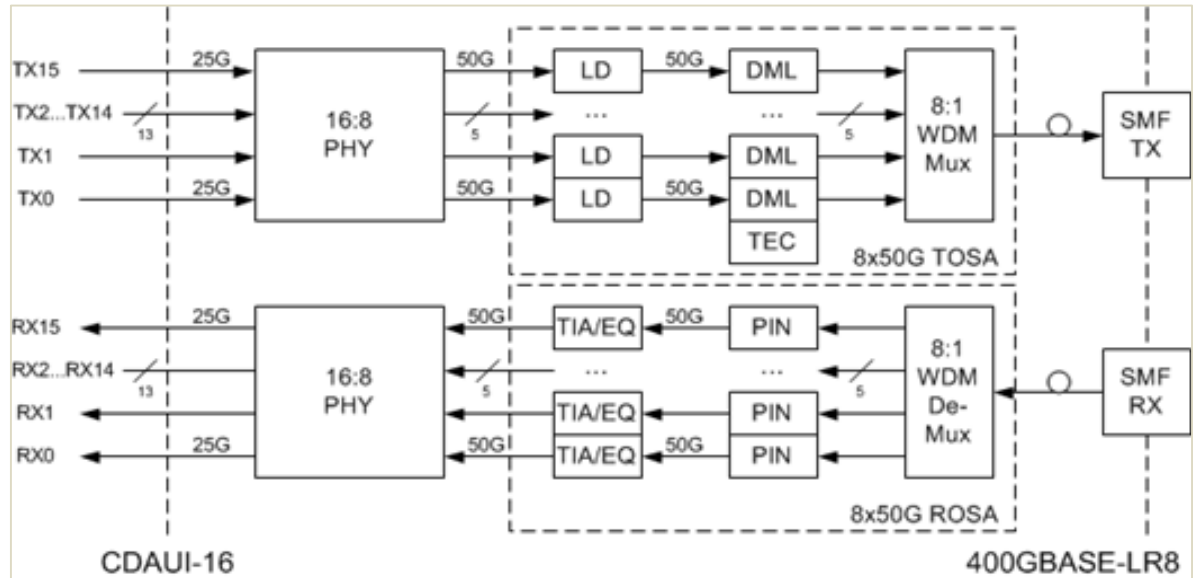
- 400GBASE-LR8 measurement data for reaches >10km is presented in support of technical feasibility of 400GBASE-ER8 standard.
- Experimental Lab Data for reaches up to 35km
- Field Trial Data for reaches up to 27km

# Experimental Laboratory Configuration

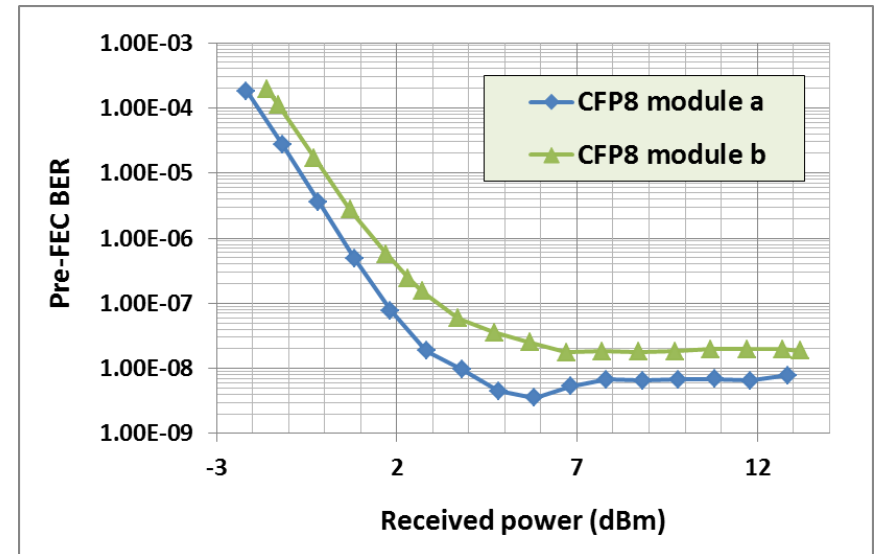
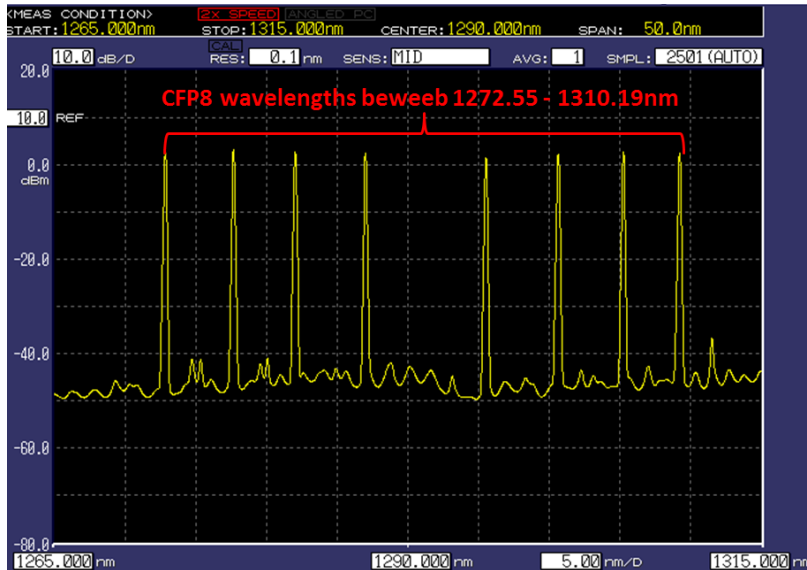
400GBASE-LR8  
signal over G.652  
SMF of different  
lengths



400GE CFP8

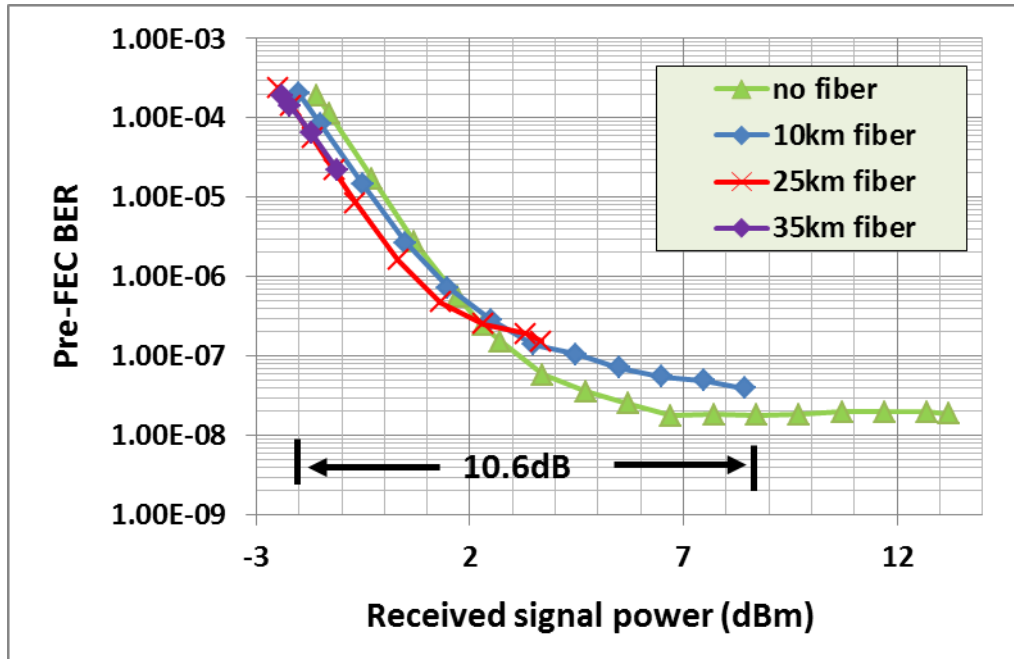


# 400GBASE-LR8 BTB Data



- Two 400GBASE-LR8 modules
- Error free performance achieved for pre-FEC BER as high as  $2 \times 10^{-4}$  for total RX AOP =  $\sim -2$  dBm
- Total loss budget =  $\sim 15$  dB in an ideal loss limited case

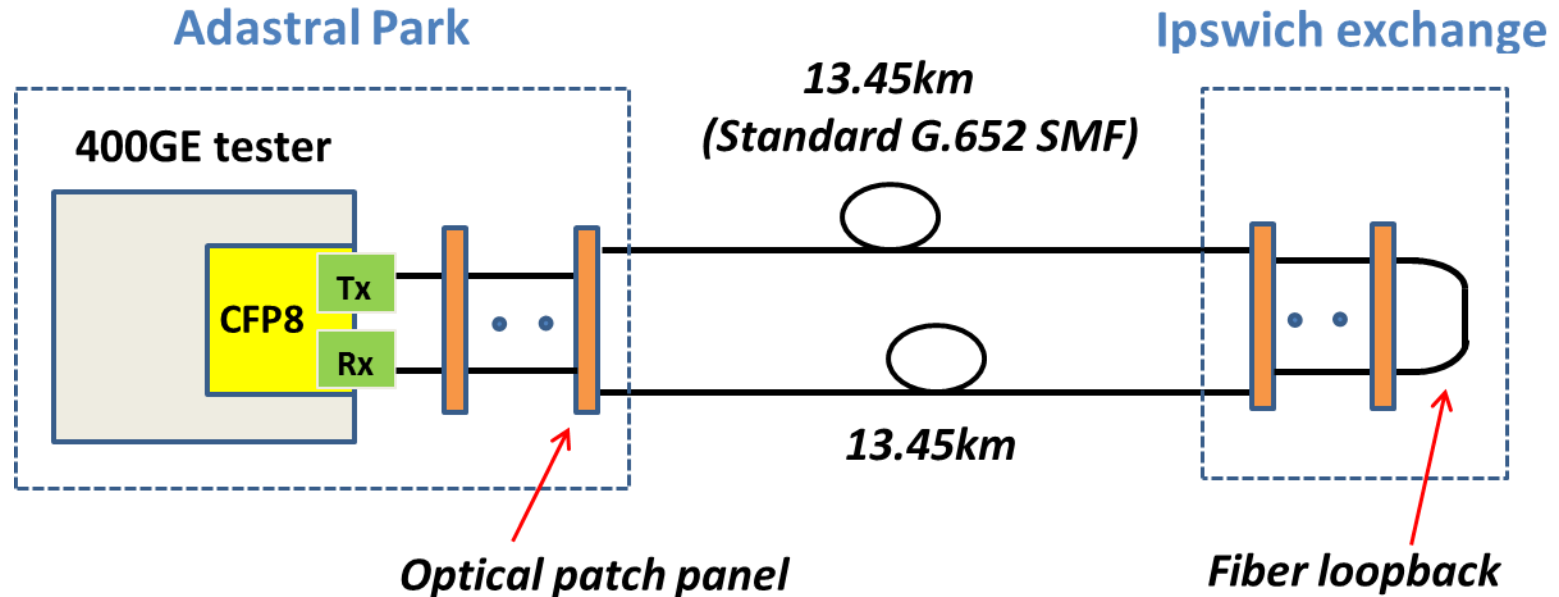
# 400GBASE-LR8 Lab Data for SMF vs. Reach



- Error free performance achieved for different optical fiber distances up to 35km
- Impact of fiber dispersion is small

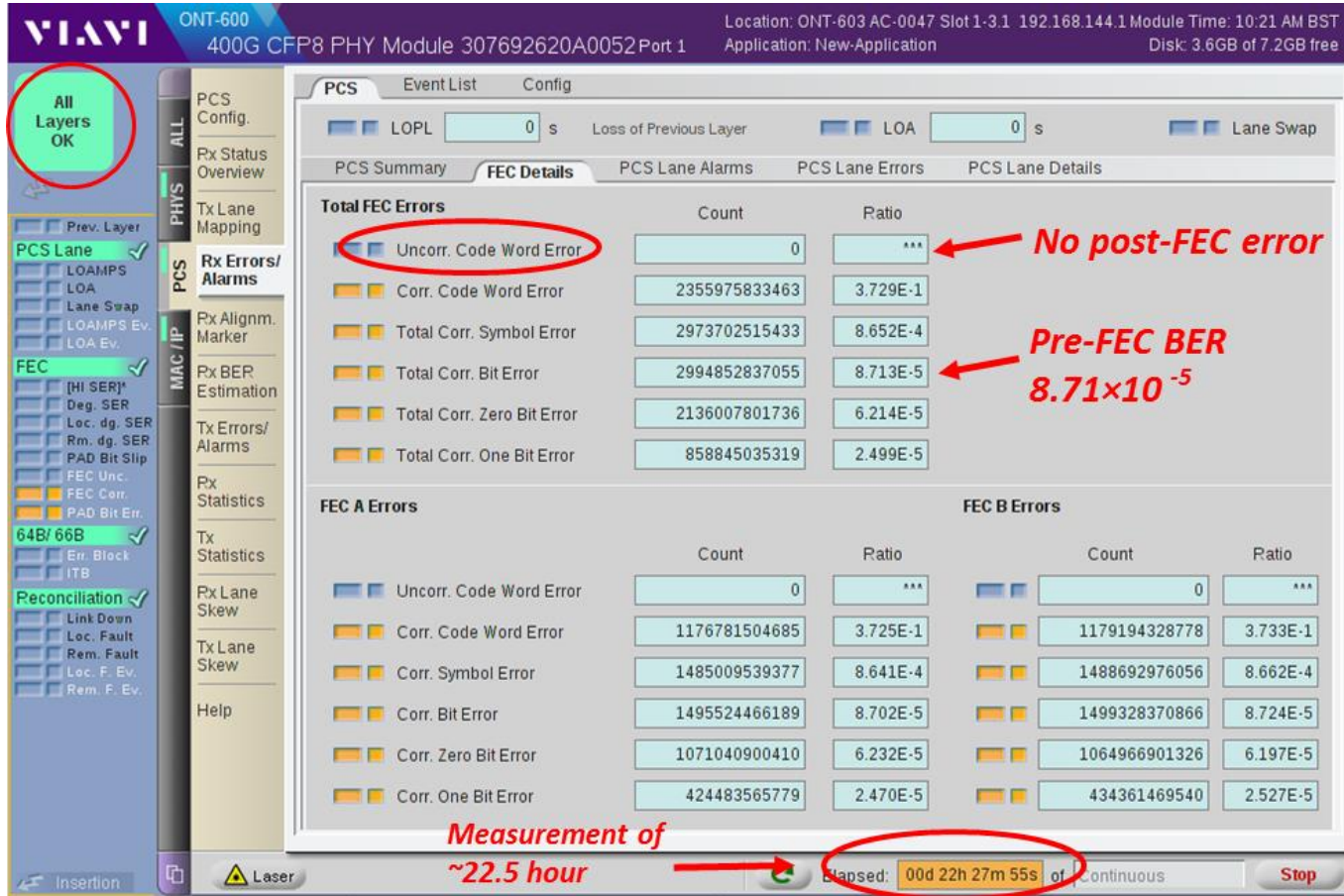
- 10.6dB loss margin for 10km reach
- Longer distances beyond 10km, e.g. 35km with ~1dB margin
- Long term error free 400GE data measured over weekend with different Ethernet frame configs, e.g. fixed 64 byte frame and random frame size between 64 – 1518 bytes (over 35km)

# Field Trial Configuration



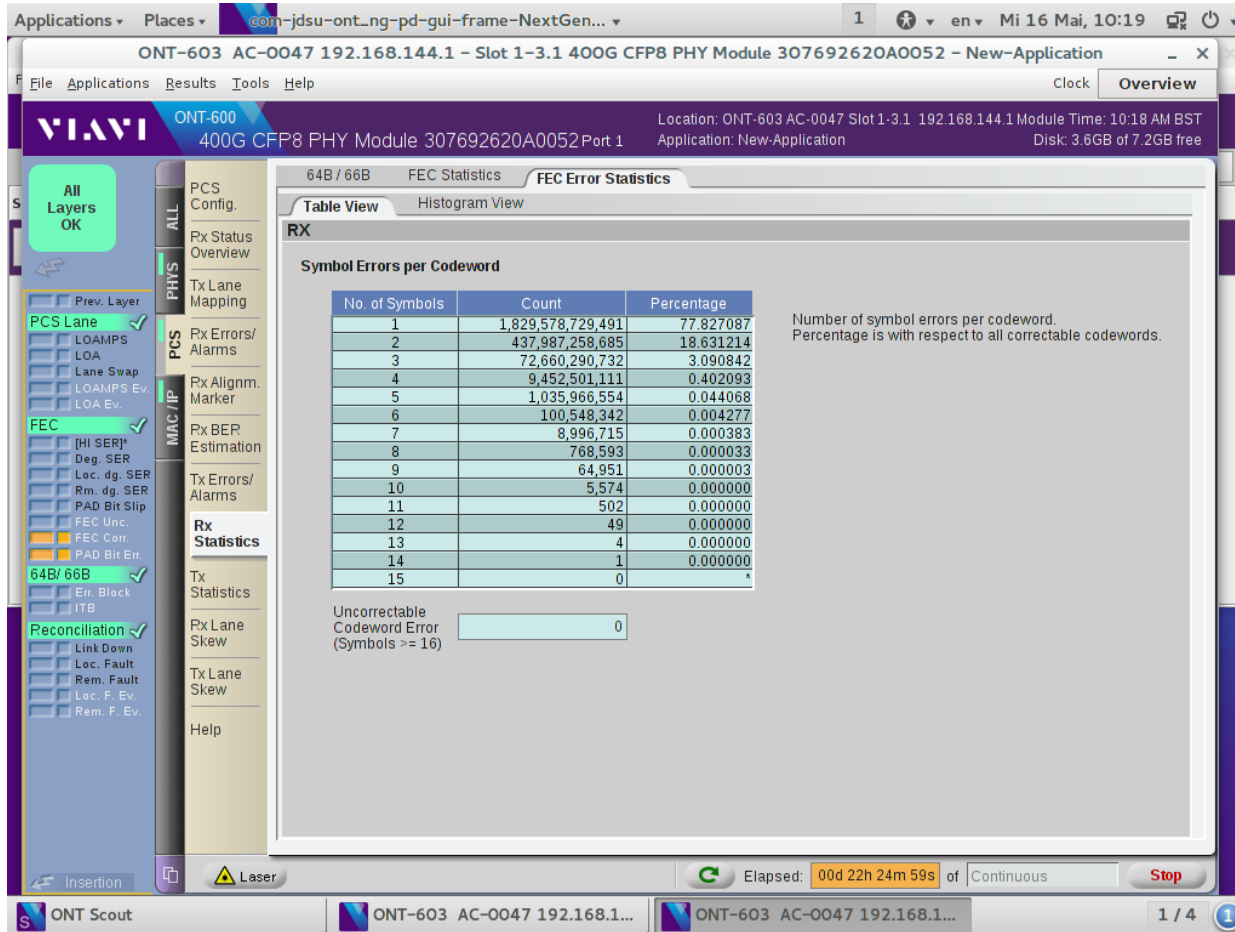
- 400GBASE-LR8 optical signal transmitted over field SMF link from BT Labs at Adastral Park to Ipswich Exchange
- Looped back at Ipswich Exchange for total reach = 27km
- Across several optical patch panels

# 400GBASE-LR8 Field Data for 27km SMF



- Error free performance over 27km and patch panels
- All layers (PHYS, PCS, MAC/IP) error free with full 400Gb/s Ethernet traffic over 22.5 hours

# 400GBASE-LR8 Field Data for 27km SMF



- Number of error symbols in a code word over 22.5 hours
- Max error symbols = 14



# 400GBASE-LR8 Data for Reaches >10km

Thank you