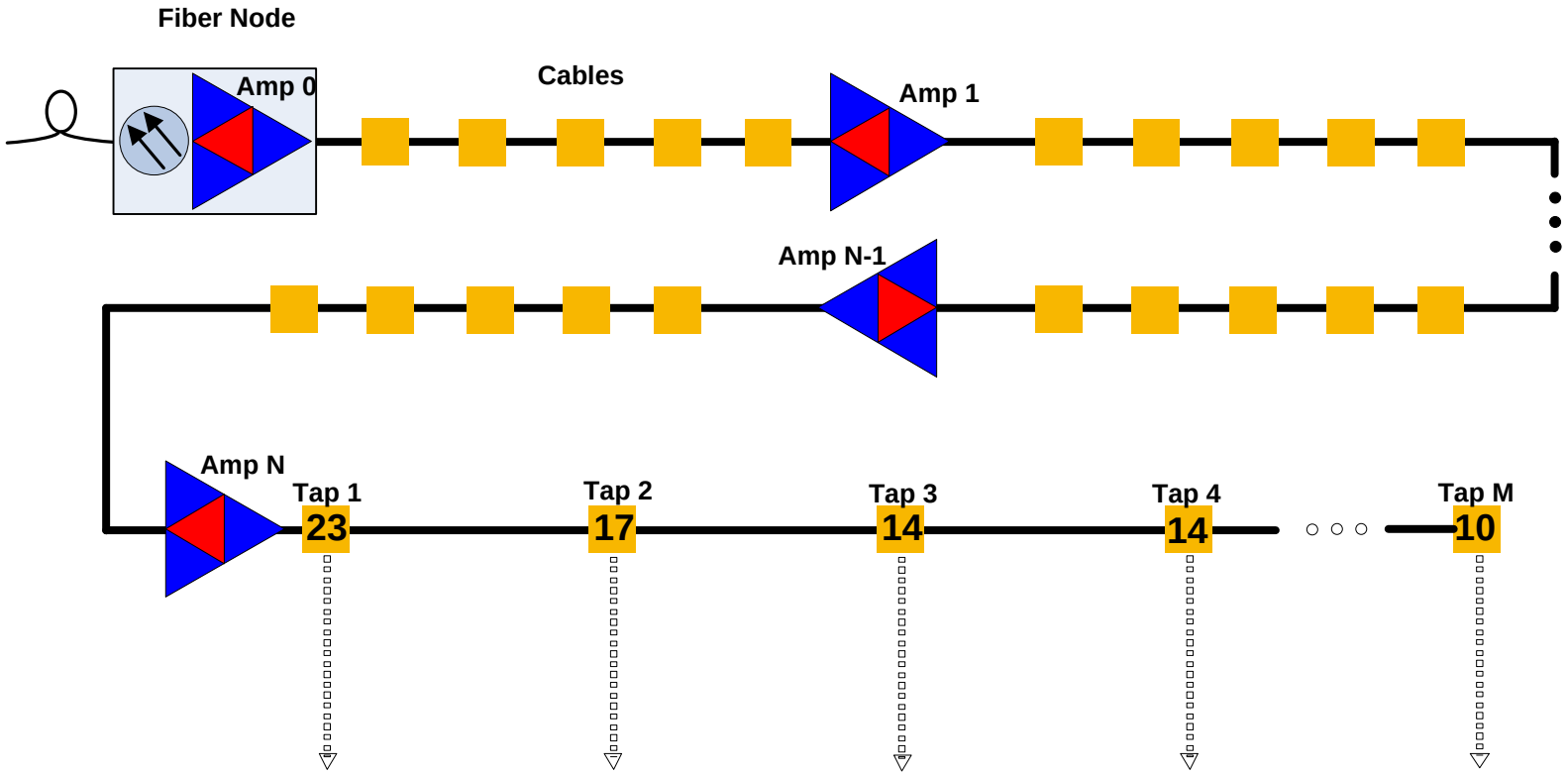
EPoC FEC

Rich Prodan, Broadcom
Christian Pietsch, Qualcomm

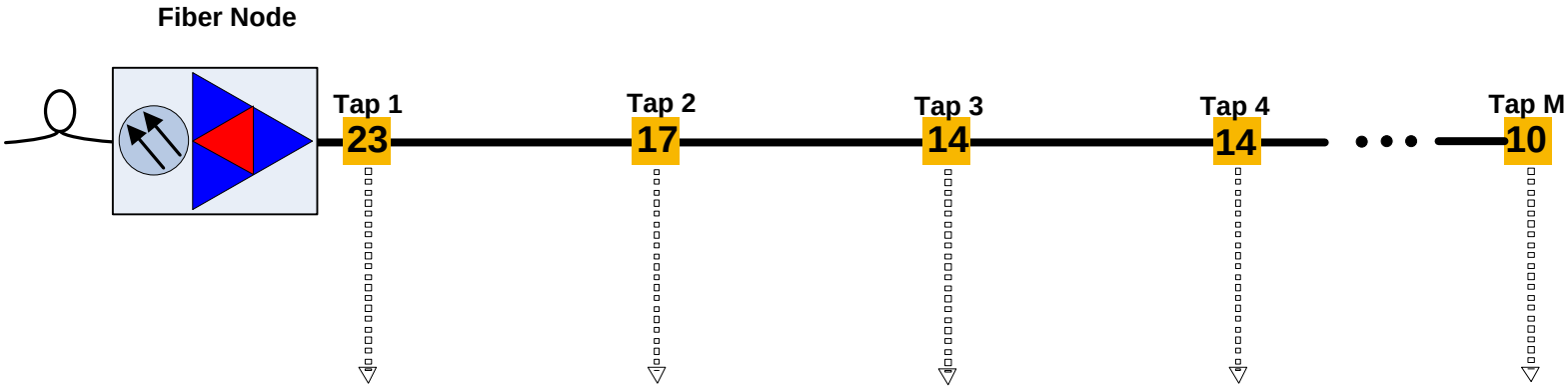
Active Coax Plant

- Node plus N amplifiers
- Typically more CNU's per node



Passive Coax Plant

- Node plus zero amplifiers
- Typically fewer CNU's per node



Low Frequency Band

- Noise in the low frequency region above 5 MHz
  - significant wideband impulsive noise with significant amplitude from motors (arcing) and electronic switching from dimmers (silicon controlled rectifiers that “bounce”)
- Requires the use of robust, lower rate codes to overcome higher thermal noise and transient interference with significant amplitude when compared to the power limited upstream transmissions (i.e. low SNR)
- For active plant
  - Upstream amplifiers add noise in a cascade with combining of multiple branches yielding higher thermal noise levels in the upstream than the downstream
  - more severe linear distortion (signal variation vs. frequency) from impedance mismatches of more cascaded passive components
  - thermal noise due to the combining of many upstream amplifiers into a single reception point.

High Frequency Band

- High frequency region operates from 50-100 or so MHz up to 750 (mostly), 860 (sometimes), or 1000 MHz (rarely) today
  - above the band of predominant electrical interference in the low frequency band
- This band is predominantly thermal noise limited at lower levels (especially passive) with additional lower amplitude intermodulation components from legacy analog and digital services sharing the downstream band (especially active)
- For active architectures
  - downstream amplifiers add noise in a cascade without combining multiple branches like upstream amplifiers yielding lower thermal noise levels in the downstream than the upstream
  - more severe linear distortion (signal variation vs. frequency) from impedance mismatches of more cascaded passive components compared to passive architectures

Codes Parameters and Deployment Scenarios

CODES	Rate	Length
A	$R_A = 8/9$	16200
B	$R_B = 8/9$	16200
C	$R_C = 0.848$	5940
D	$R_D = 3/4$	1120
E	$R_E = 9/10$	14400
F	$R_F = 9/10$	10800
G	$R_G = 13/15$	5400
H	$R_H = 3/4$	960

DEPLOYMENT	Passive plant	Active plant
US, low band	F, G, H	B, C, D
DS, low band	E, (F), G, H	---
US, high band	E, (F), G, H	---
DS, high band	E, (F), G, H	A

Thank You