

# A High Level Perspective on EPoC Requirements

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# Agenda

- Market/Urgency
- Spectrum
- Bit Rates
- Node+N
- Architecture

# Market/Urgency

- Not 10 years – more like 2 years
- Business Applications today
  - opportunistic where DOCSIS and fiber not feasible

# Spectral Placement

- Problems we face
  - Existing unmovable services in the current reverse and in the “mid band”
  - Quantity of coaxial elements is makes wholesale replacement prohibitively expensive
    - 100’s of thousands of miles of coaxial cable
    - 10’s of thousands of HFC fiber nodes
    - Over 1.5 million RF Amplifiers
    - Over 10 million passives (taps)
    - 10’s of millions of coax connectors
- Spectral Placement is Undecided
  - Design for this uncertainty – Wide spectral occupancy, especially where the plant works today
  - Possibly different placement market to market
- Must be able to move around as the coax network evolves
- Be Flexible

# Coexistence

- We have tons of services
  - Voice
  - Video
  - Data
- EPOC MUST be nice to existing spectral users

# Spectrum Management

- Exclusion requirements
  - Manually Exclude reception of subcarriers located at frequencies of known ingress interferers
  - Manually Disable transmission of (or relative power levels of) subcarriers located at frequencies of known interferers
  - Manually Mute transmission of subcarriers (or blocks of) effectively suppressing noise contribution to adjacent signals

# Spectral Channel Width

- We use all of our spectrum (PERIOD).
  - If asked how much is available,
  - We ask how much is required
  - Cost/Benefit analysis ensues
- We need YOU to contribute your proposals for technical feasibility

# Bit Rates

- Speed/Capacity
  - greater than DOCSIS/QAM256 at the same spectral width
- Rate conversion
  - Abstract the upstream connection
  - Be creative!!!



# Transmission Adaptation

- Highly desirable to automatically adjust bit loading of individual subcarriers in both upstream and downstream
  - Adapting to interferers with known transmission characteristics
- Alternates?
  - Feasibility proposals greatly appreciated

# Node+N (ugh!)

- Node + N is not a term to be used in specifications
- Specify a set of worst-case and best-case End of Line characteristics
  - Tilt
  - Attenuation
  - Group/Phase Delay
  - etc.

# Architecture

- Ethernet is simple, not complex. Keep it that way
- Reuse Existing EPON deployments
  - Tie to existing OLT platforms to allow flexibility in the deployment
- No analog optics in the EPoC path