EPoC Study Group

EPoC RF Media Types

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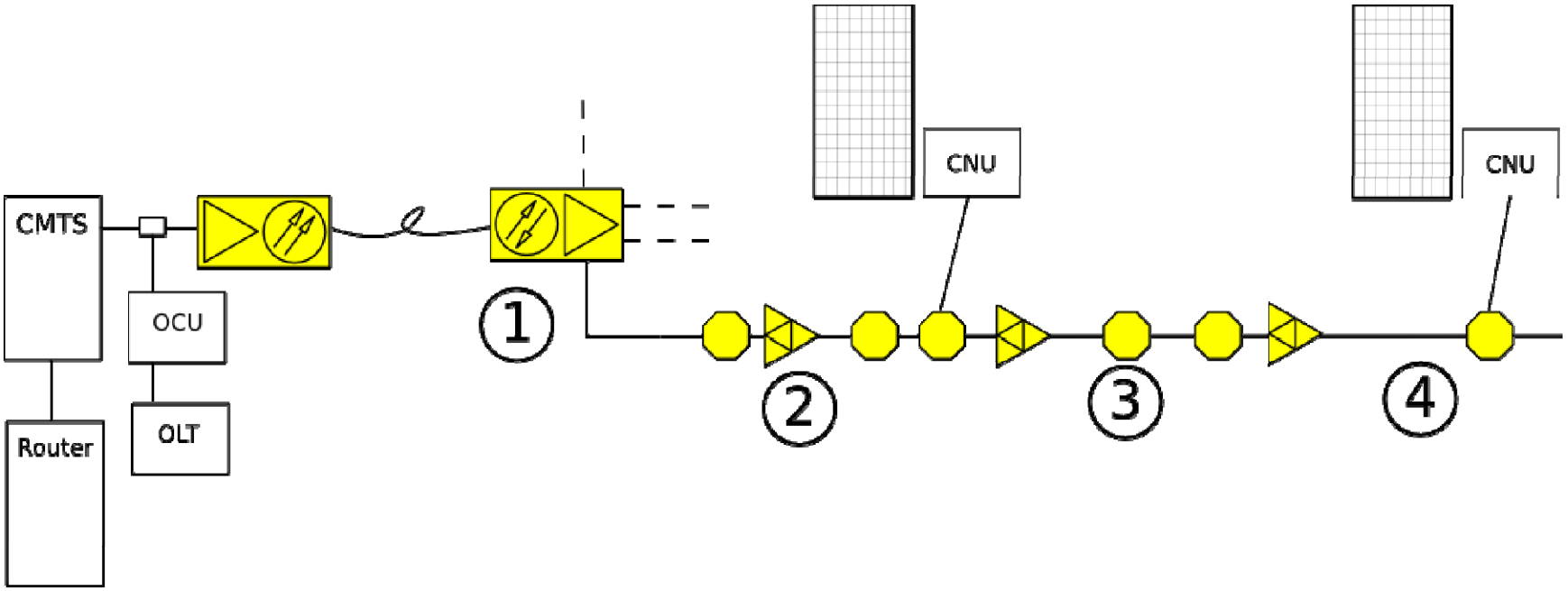
Presentation Objective

- Discuss why support for two media is needed
  - Review EPoC deployment options and operational differences (references to Use Case presentation in ‘mallette_01_0312.pdf’ from Hawaii meeting)
  - Differentiate active and passive coax media types
- Separate presentation from Dave Barr, Steve Shellhammer, Rajeev Jain, and Juan Montojo will discuss the technical differences between the two media types

EPoC Deployment Options

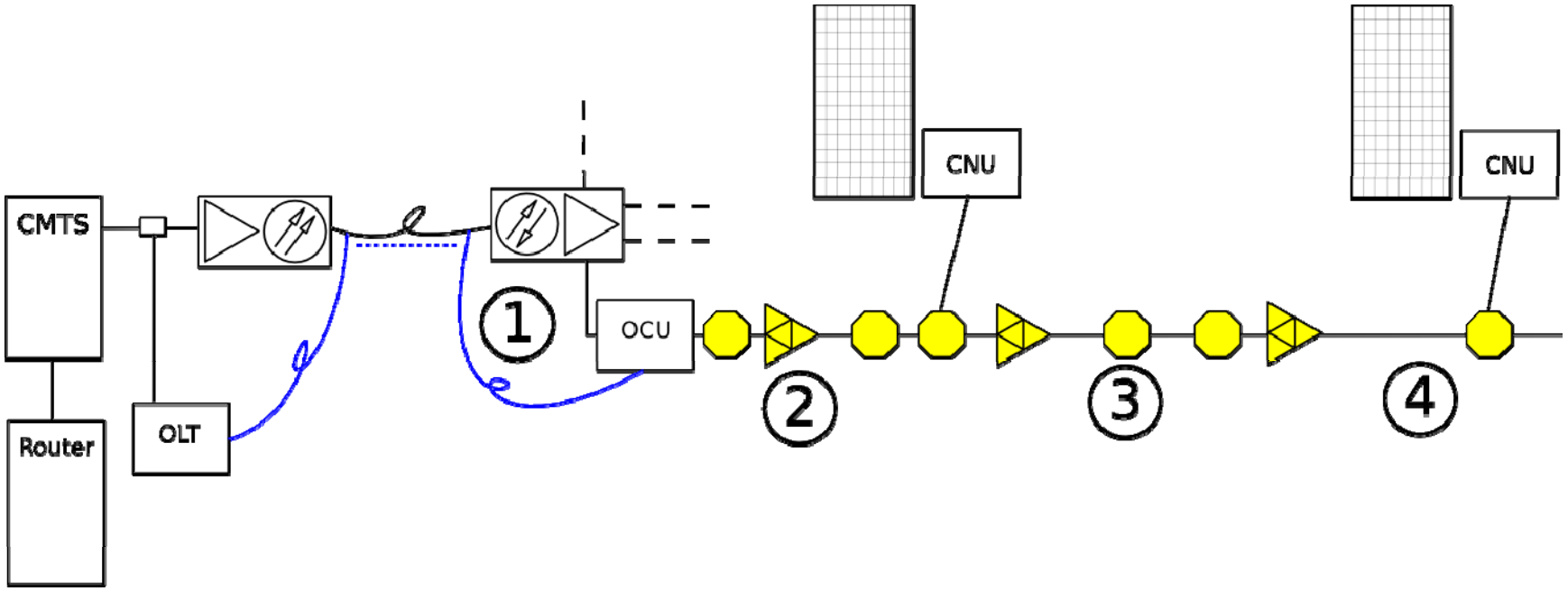
1. OCU located at the headend
   - EPoC signals traverse the entire HFC network (i.e., analog laser/node, amplifiers and line extenders, and taps)
   - Use Case #1 from presentation in Hawaii
2. OCU located at the node
   - EPoC signals traverse the entire coax portion of the HFC network (i.e., amplifiers and taps, but not analog laser)
   - Use Cases #2 and #5 from presentation in Hawaii
3. OCU located at the amplifier
   - EPoC signals traverse only the passive portion of the coax plant (i.e., only taps, not analog laser or amplifiers)
   - Use Cases #3 and #4 from presentation in Hawaii

Option 1. OCU located at the headend



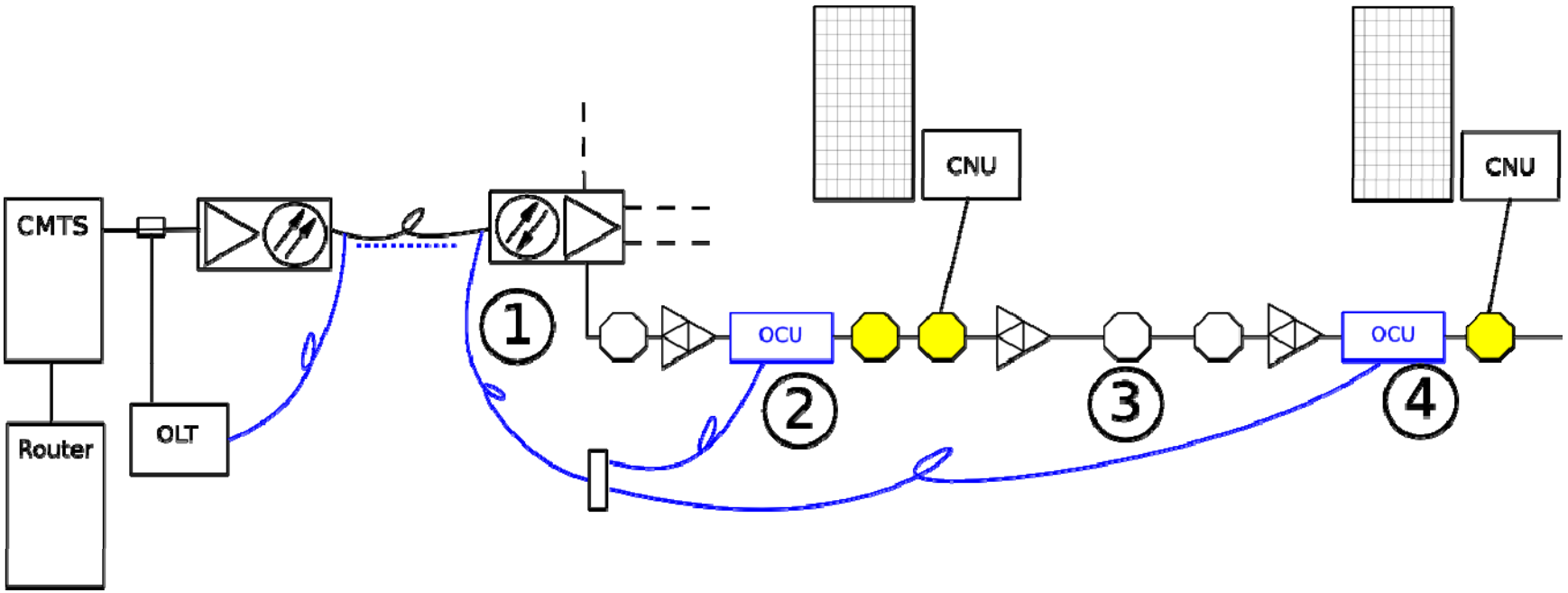
- All active plant components must pass RF signals for EPoC, from the headend optics to the last tap.
- Spectrum available for EPoC limited to what nodes, amplifiers and taps can pass
  - Simplest, but most spectrum in use already or soon will be
  - Freeing or creating spectrum will be complex and costly

Option 2. OCU located at the node



- All active coax plant components must pass RF signals for EPoC, from the node to the last tap (i.e., no headend lasers).
- Spectrum available for EPoC limited to what amplifiers and taps can pass (i.e., spectrum not limited by headend lasers)
  - Same spectrum limitations as Option #1, but more capacity
  - Can use baseband lasers from headend to coax plant

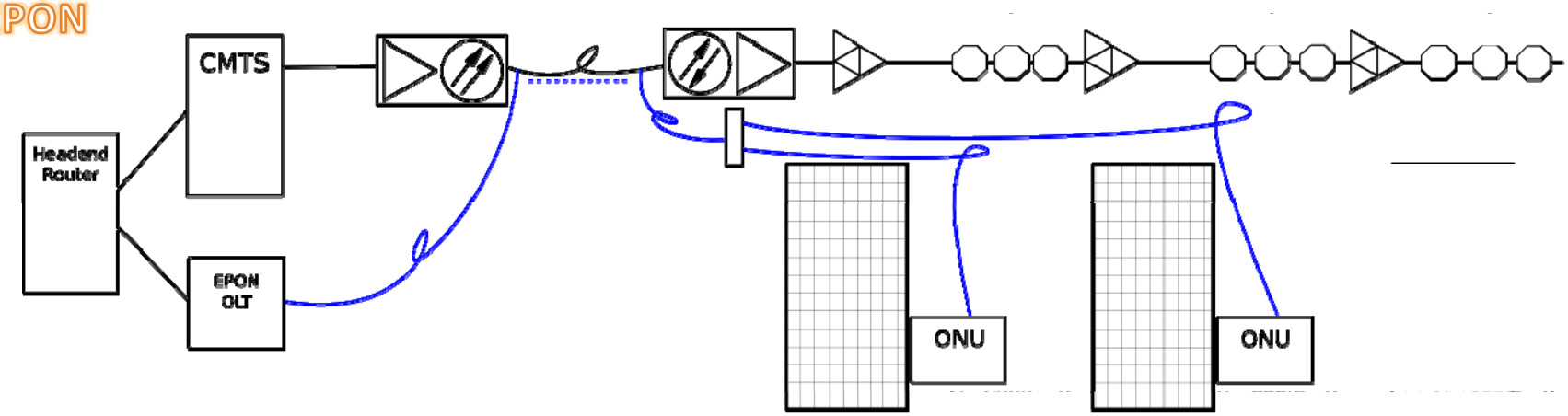
Option 3. OCU located at amplifier



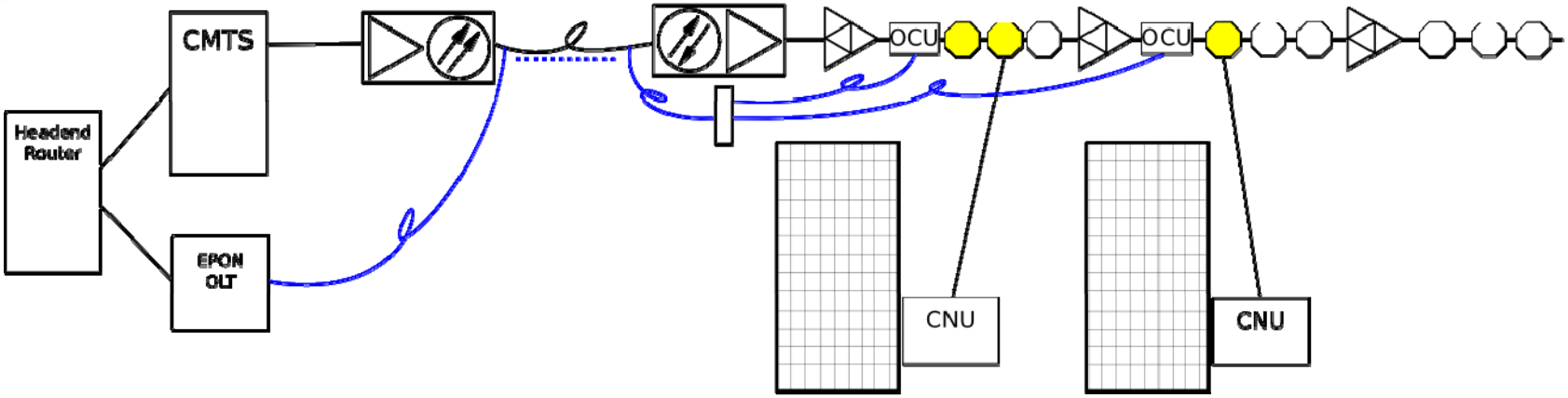
- Only passive coax plant components must pass RF signals for EPoC, from the amp to the tap where customer is located
  - All other portions of the plant remain unchanged
- Significantly more spectrum available for EPoC
  - ~700 MHz in 1 GHz plant and ~1 GHz in 750 MHz plant
  - Does NOT require N+0; Option 3. is an overlay network

Compare EPON to Option 3.

EPON



Option 3.



- Option 3. requires OCU and tap faceplate swaps, but less fiber
- Option 3. should be easier and less expensive to deploy

Two Operating Modes

- Options 1. and 2. are for active HFC plant
  - RF EPoC signals must traverse node and amplifiers
  - Capacity limited to spectrum allocated for US/DS
    - Expansion of US/DS capacity requires physical changes
- Option 3. is for passive coax plant
  - RF EPoC signals only traverse taps
    - RF EPoC signals can be outside operating range of HFC
    - Much more spectrum available: 700 MHz to 1 GHz
  - US and DS capacity
    - Can implement dynamic US:DS allocation

Two Media Types

- Active Media (FDD EPoC System)
  - RF EPoC signals below 750, 860 or 1,000 MHz
    - RF EPoC signals coexist with current services
  - US and DS operating regions are fixed by diplex filter and maximum capacities are pre-allocated
- Passive Media (FDD or TDD EPoC System)
  - RF EPoC signals below or above ~1 GHz
    - Below 1 GHz can use existing taps
    - Practical range up to ~1.7 GHz with passive taps
  - US and DS operating region can be fixed for FDD, but could also be changed on demand or assigned dynamically in TDD system operation

Conclusion

- Support for two media types highly beneficial
  - FDD EPoC system in active plant will be easier to deploy and lower cost, but is limited in spectrum
  - TDD EPoC system in passive overlay will require more fiber and OCUs, but it is more efficient than EPON and it offers significantly more spectrum
- Separate presentation from Dave Barr, Steve Shellhammer, Rajeev Jain, and Juan Montojo will discuss the technical differences between the two media types