

# PON ONU Requirements in Broadband Networks

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# 10/10 EPON ONU Design

- 802.3ca objectives require coexistence with 10/10 EPON
- 10/10 GEPON ONU's are designed with a restricted operating temp range due to internal and external temp limits
  - Typical operating temp spec is -5C to 40C
  - Meet external case surface temp safety limits
  - Avoid or minimize the use of internal fans (Noise reduction)
  - Stay within component maximum temp limits
- Many ONU designs are built as multi-service gateway devices
  - WiFi, voice modem, MoCA, etc.
  - Requires ONU to be centrally located in the home for best coverage
  - Additional function SOC's add to internal temp rise

# 10G EPON Fiber Gateway



- Compact ONU size and shape to meet aesthetic and ergonomic design requirements

## Wireless

- Simultaneous 802.11n (3x3 with MIMO) + 802.11ac (3x3 with MIMO)
- Radio output power: 30 dBm maximum
- 20/40/80 MHz channels
- Wi-Fi encryption: WEP-64/128, WPA-PSK, WPA2-PSK (TKIP/AES)
- WPS PIN: 8 digits randomly generated - not part of the MAC address
- QoS: WMM/WMM U-APSD

## Interfaces

- LED indicators: Power, PON, Wi-Fi 2.4 GHz, Wi-Fi 5 GHz, Phone1, Phone2, MoCA, WPS
- WPS Push-button
- Two FXS RJ-11 telephone ports
- Four 10/100/1000 Mbps (1000BASE-T) Ethernet ports with activity link LEDs
- One SC/UPC fiber uplink port
- One USB 2.0 port
- Battery backup UPS connector with alarm monitoring
- Reset button (recessed)
- AC power adapter input

## Hardware

- One RF F-type female port (MoCA Interface)
- MoCA 2.0 Channel Bonding for 800 Mbps Networking
- On board Flash memory
- On board RAM
- 10G EPON fiber interface for OLT connectivity
- DPoE for DOCSIS provisioning system integration

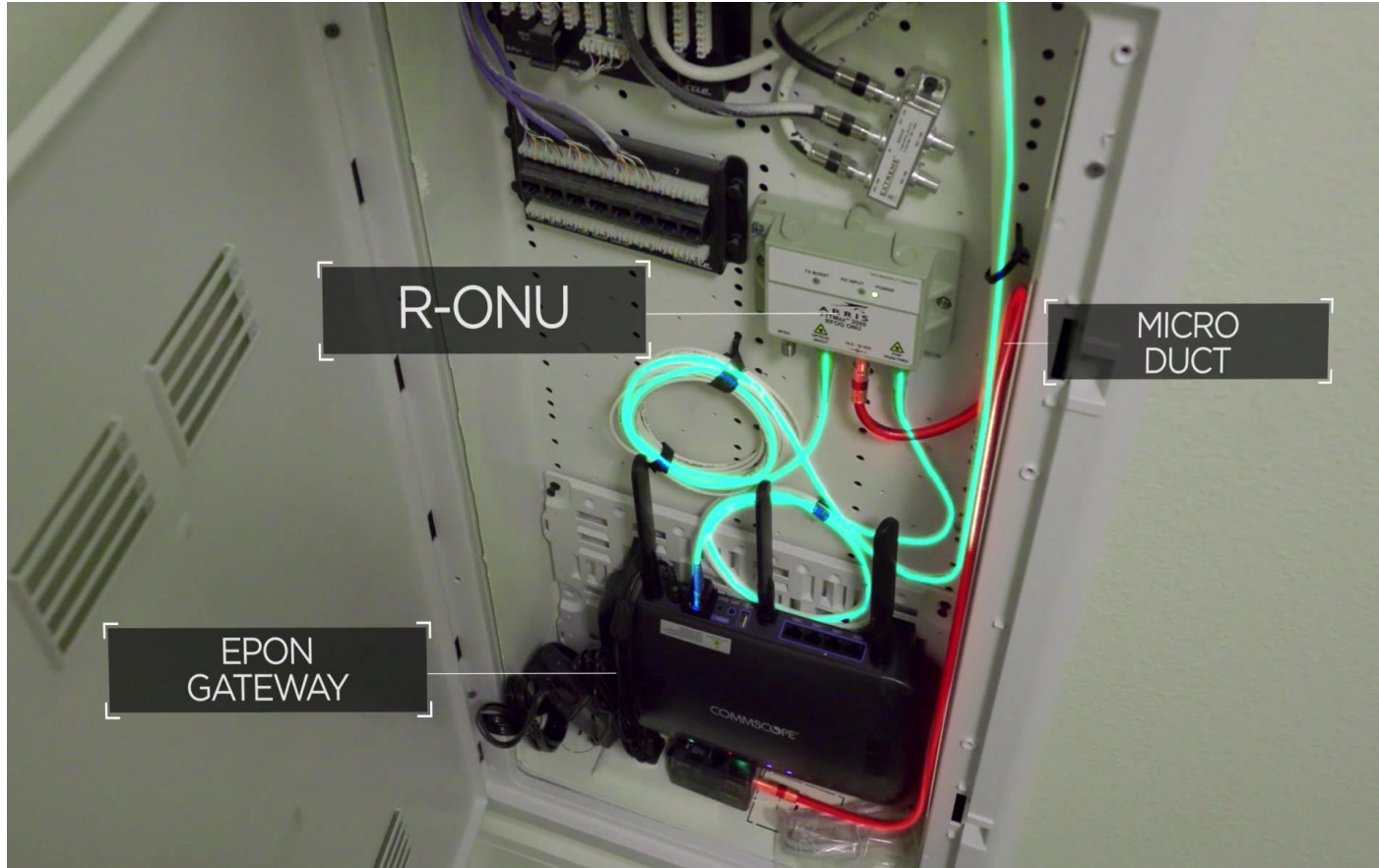
# Typical MDU Media Panel Location



Laundry/Utility  
Room – Location  
of CPE

- Actual PON MDU application
- Media panel has limited space and ventilation

# Media Panel Installation

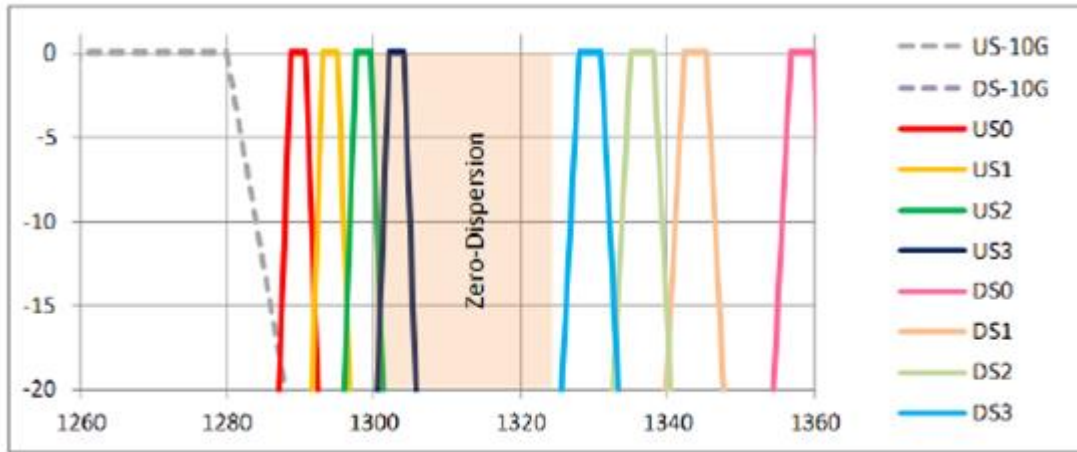


- Actual MDU application
- Panel box contains all RF, electrical, and fiber connections

# NG-EPON Wavelength Allocation Considerations

- Plan A channels were selected to fit between the existing 10G US allocation and the zero dispersion region of smf fiber
- The 10G US allocation (1270 nm +/- 10 nm) allows for the expected wavelength variation of an un-cooled laser in an uncontrolled environment (side of home deployment)
- Existing applications and future trends for 10G and higher PON ONU's require that these devices are located within the subscriber home or MDU unit.
- The expected ONU operating temp range is reduced for these in-home environments and may allow NG-EPON channels to be located closer to or within the filter skirt of the current 10G US spectrum

# Wavelength Plan Proposal to Address Ch Width



- Plan A concern is the narrow channel width due to adjacent spectrum
- 10G laser wavelength excursions are reduced due to restricted operating temp applications and use of laser thermoelectric cooler
- Reducing the guard band between 10G US and the lowest 25G US channel would potentially allow wider channel allocations



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