UNLEASH THE POWER OF LIMITLESS CONNECTIVITY
Operational Transformation

It’s 9:00 AM And Your Fiber Is Still Dark

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Comcast
Our Fiber Optic Footprint Is Growing - Fast

- Distribute Access Architectures (DAA)
- Individual fiber nodes are getting smaller and placed deeper into field
- Connections between primary (PHE) and secondary (SHE) headends
- Connections between SHE and outside plant (OSP) MUX
- Connections between OSP MUX and fiber nodes
- Fiber to the premise products
The Next Generation of Monitoring

Tools Overview

• Headend Rack Mount CPM
  • OTDR (Optical Time Domain Reflectometer)
  • OSA (Optical Spectrum Analyzer)
• Handheld OTDR, OSA, OCC
• Web Application
• Cloud Integration
Rack Mounted Continuous Monitoring

- 48 Fiber Connections
- Continuous monitoring of all ports
- Live View (Web App)
- Tunable OTDR & OSA
- Cloud Storage
  - All scans on all ports stored
  - Troubleshooting and proactive maintenance
  - AI/ Machine Learning
Mobile App Paired To Meter

- OTDR, OSA, and OCC
- WiFi
- iOS Mobile App (connect via WiFi)
- SSO Login
- Cloud Integration
  - Enrich the mobile app experience
  - Store user scans for collaboration & future access
Headend, Field, & Enterprise - Speaking the same language
Fiber Cut – Web View

OTDR and OSA Overlay

- Each CPM cycles through 48 fibers
- OSA monitors the individual wavelengths for light
- OTDR detects the short fiber length, and other physical abnormalities
- Web Application provides visualization of those abnormalities
Legacy Support

External Inline Optical Test Points

- Many legacy environments missing usable test ports
- Splitter inline between ISP & OSP MUX
- Samples 0.5dBm of light to send to the CPM
Cloud Storage – Handheld Scans

Visualize Historical Scans

- Views by user, account, job ID, or location
- Calendar selection shows days with scans available
- Scan listing shows scan times and locations
Initial Configuration & Ongoing Config Updates

- Each CPM device monitors 2,352 wavelengths
- 1 device is a multi hour manual configuration effort
- We import data from existing fiber configuration sheets used in field
- Simple clone option to copy configuration from one device to another for RMA
- Baseline configuration to set expected state to measure against
OTDR Fine Tuning

OTDR – Flexible Config

Headend & Handheld

Pulse Width:
- 50ns

Measure Time:
- 3 seconds

IOR:
- 1.4684

Step Size:
- 10m

Span Length:
- 50km

[Buttons: Reset to Defaults, Get Scan]
DVR Playback

- Play back historical scans in a movie like experience with play, pause, fast forward
- Highlight events in playback bar
- Selection area for day and time windows
Historical Averages

### Historical Average View

- Select day and time windows like the DVR
- Instead of playing each frame, show min, max, average lines for all data selected
Fiber Cut Location Example

- Overlay design maps with fiber assets mapped
- Show location of fiber cut
Summary

- DAA is driving large increases in our fiber networks
- Next generation monitoring is taking technologies typically used in long haul networks, and bringing them to local networks
- Combining continuous monitoring tools with real time troubleshooting tools
- Integration with our cloud unlocks unlimited opportunities for integration
Thank You!

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