Metro HFC Network Proposal

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History

- Albert Einstein laid the foundation for the laser and optical amplifier in 1917.
- Laser was made by Theodore H. Maiman in 1960, in California.
- Charles Kao forecasted less than 20dB/Km optical fiber in 1966.
- Robert Maurer etc. (Corning Inc.) made low loss single-mode fibers in 1970.
- Ortel Corporation released the CATV RF semiconductor laser in 1990.
- HFC network was popular in USA (1991), China (1992) and worldwide.
Optical Node Coverage

Fiber Deep
- Fiber to the Home: Each receiver serving one subscriber
- Fiber to the Building: Each Node serving 125 subscribers
- Fiber to the Curb: Each Node serving 500 subscribers
- Fiber Installed: Each Node serving more than 2000 subscribers

RF Performance

Reliability

- The line extender followed each optical node reduced to Zero along with fiber deep. GWR1000L-2 node has two RF ports (44dBmV each), each port serves less than 60 subscribers.
- Fiber Deep needs cost-effective and more reliable network structure.
Key Points

• 1550nm technology applied in the trunk ring and hub dense fiber distribution, no O-E and E-O conversion in the hub.
• High power optical amplifier drives the entire network.
• Interactive services inserts at hub via optical overlay.
• 1550nm Tx and optical amplifier SNMP managed.
• Each optical node serves less than 150 subscribers.
Ring Trunk and Hub Star Distribution Network

Main Ring
Backup Ring

1550nm Optical Tx
EDFA2 23dBm
2x1 Optical Switch
EDFA1 23dBm

To all optical nodes next to Headend

Headend
Hub 1
Hub 2
Hub 3
Hub N
Hub 4
Hub 5

Splitter
Optical Splitter
Main Ring
Backup Ring

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At each hub, the local VOD IPQAM signal and CMTS signal are inserted into the broadcasting RF signal from Headend via DWDM 1550nm overlay transmitter, where each DWDM optical transmitter covers about 4~8 optical nodes.
The Network in Future

- FTTP/FTTH
- 1550nm RF working with GEPON/GPON high speed Ethernet data offering triple-play on the single SM fiber to each home.
- More bandwidth meeting any demand on voice, data and video.
Greatway Products in FTTH or FTTB triple-play application
Mission: 30 Analog TV channels and 100 Digital TV channels along with Ethernet and VoIP

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Key Products

• External Modulation TX GWT3500D (2x7dBm outputs)
• Leading 35dBm optical amplifier GWA3530, capability of driving nearly 2000 units optical nodes
• Direct Modulation DWDM TX GWT3500
• 1x24 or 1x32 optical splitters
• GWR1000L FTTB Optical Node
• GFH1000 FTTH Optical Receiver
Thank you...