



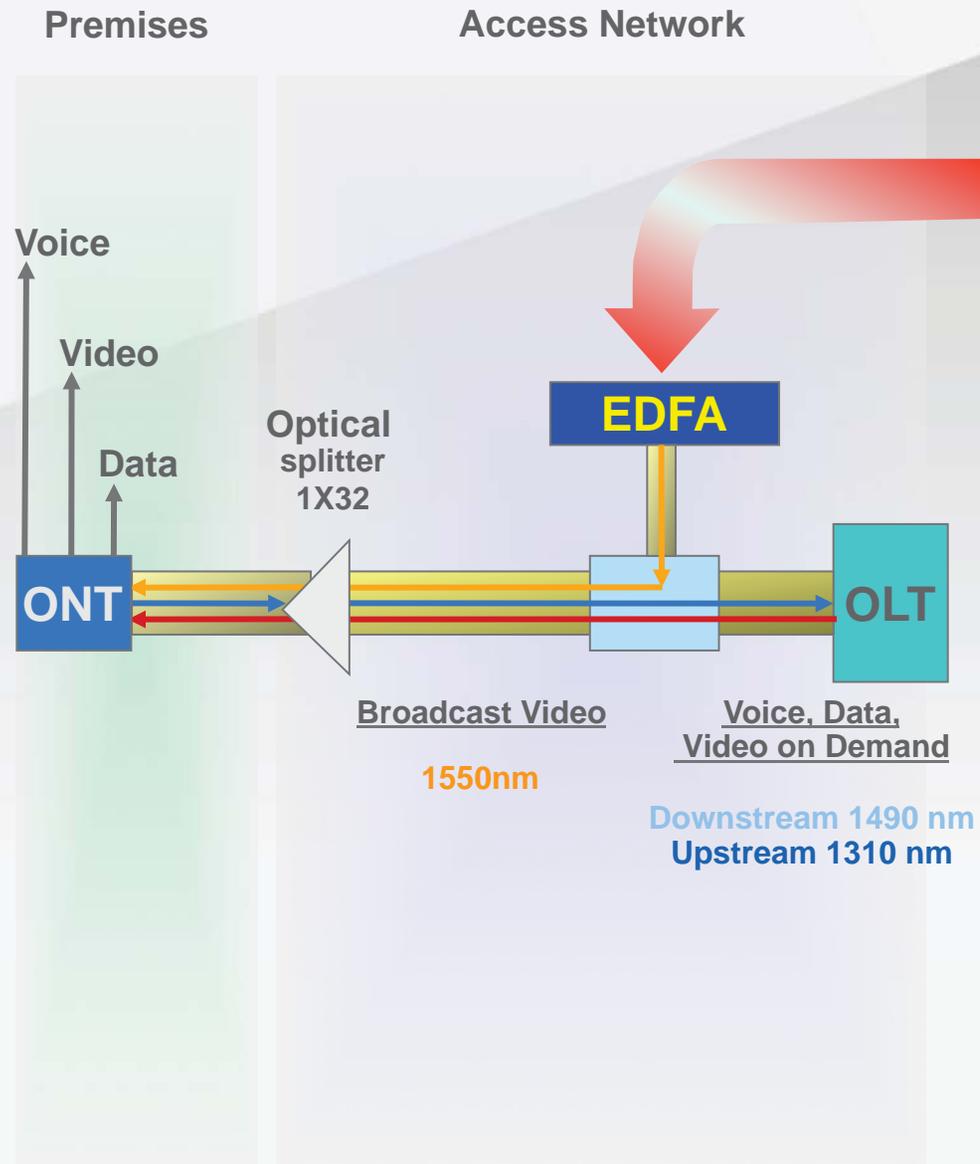
FiOS-TV, Overview

An Overview of the FiOS-TV service Architecture

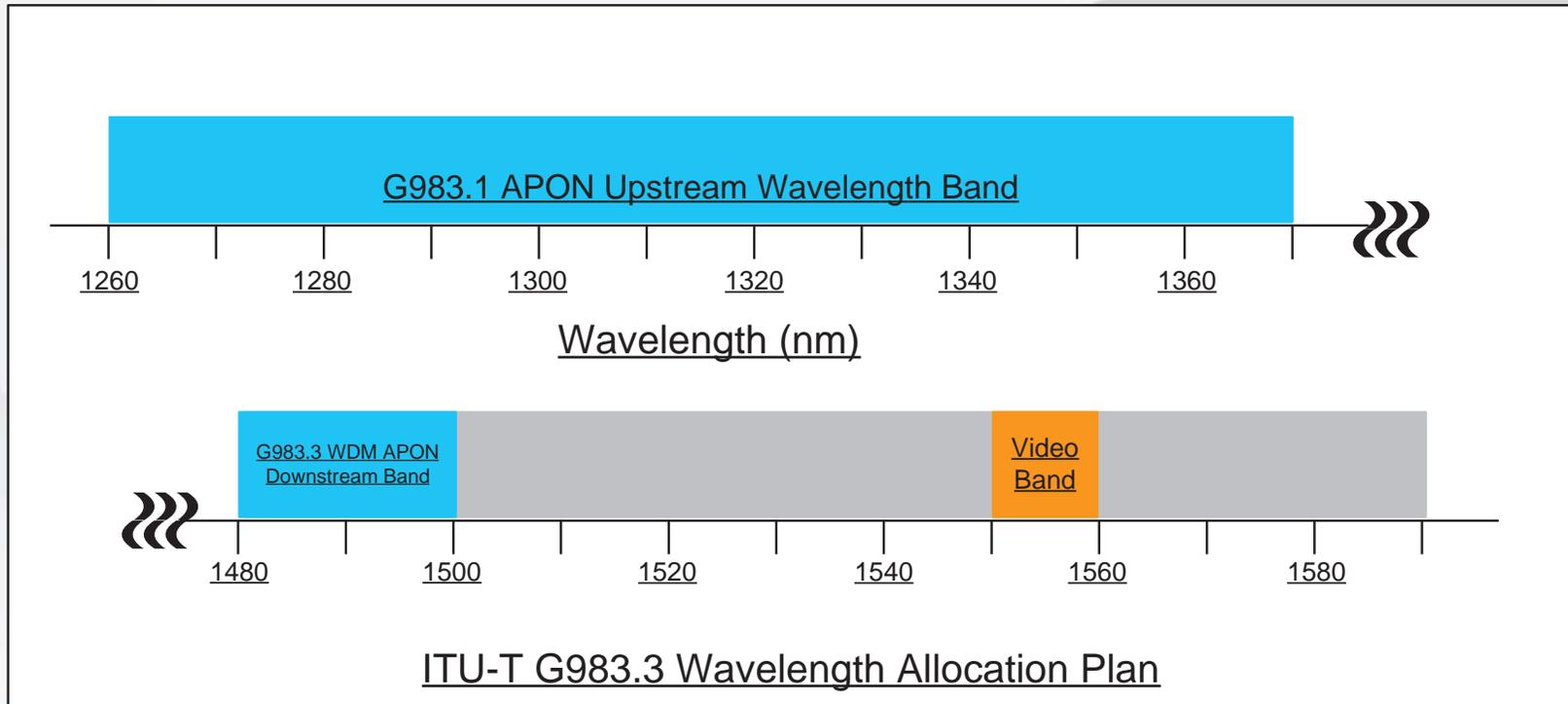
Presented by: Dan O'Callahan, Verizon

The QAM/IP Hybrid Approach to Video

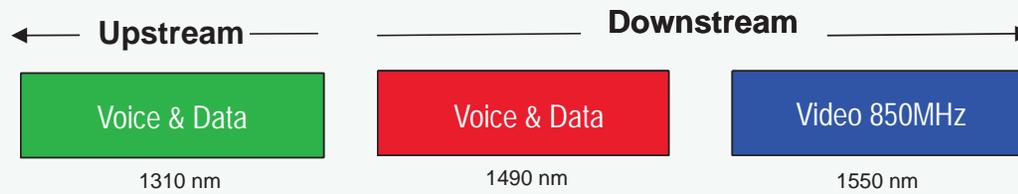
- Uses “overlay” wavelength (1550nm) for broadcast video
- VOD over IP using data/voice wavelengths (1490nm & 1310nm)
- Full support for both cable style RF video as well as emerging IPTV video
 - Moving VOD to IP frees up spectrum for more HDTV growth and is more scalable as demand increases
- POTS via ATM AAL1&2
- Data (& VoD) via ATM AAL5



ITU G.98x PON Optical Spectrum



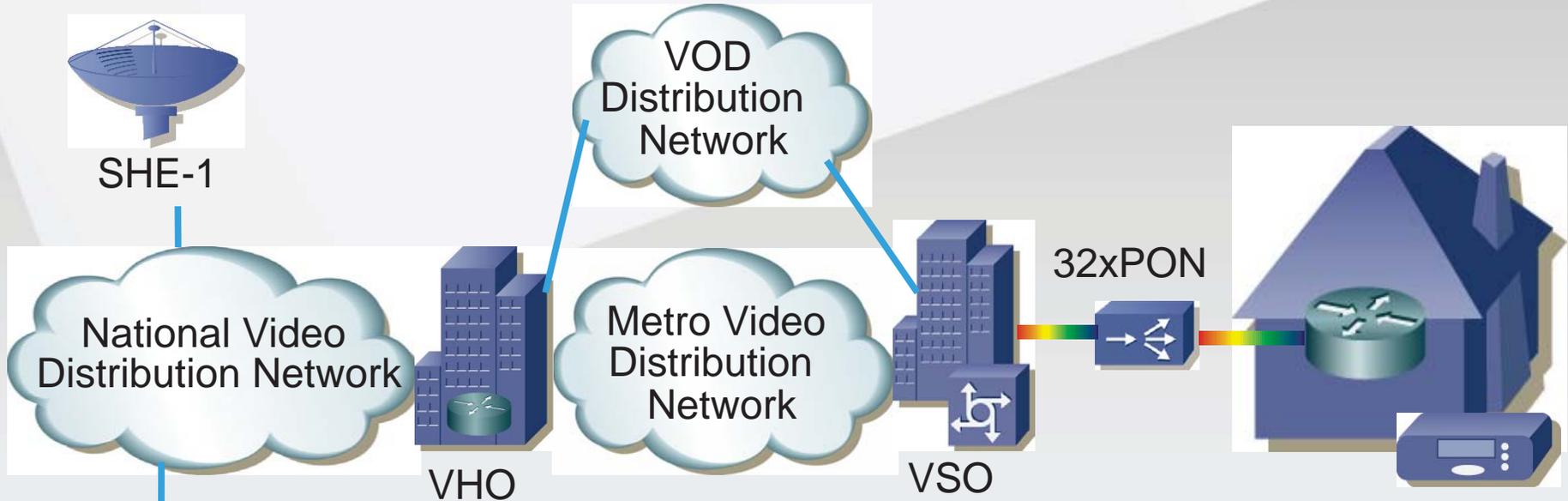
Bandwidths & Services



The Video Networks (current)

- LHN – Long Haul Network
- MHN – Medium Haul Network
 - Super Trunks (Now deprecated)
 - Edge Modulation
- PON – Passive Optical Network B or G, The access Network
- VOD Network
- VCDN * - Video Content Distribution Network
- VDCN * – Video Data Communication Network

Video Architecture 100k ft Level



Current PON Protocols

VHO Out

VSO Out

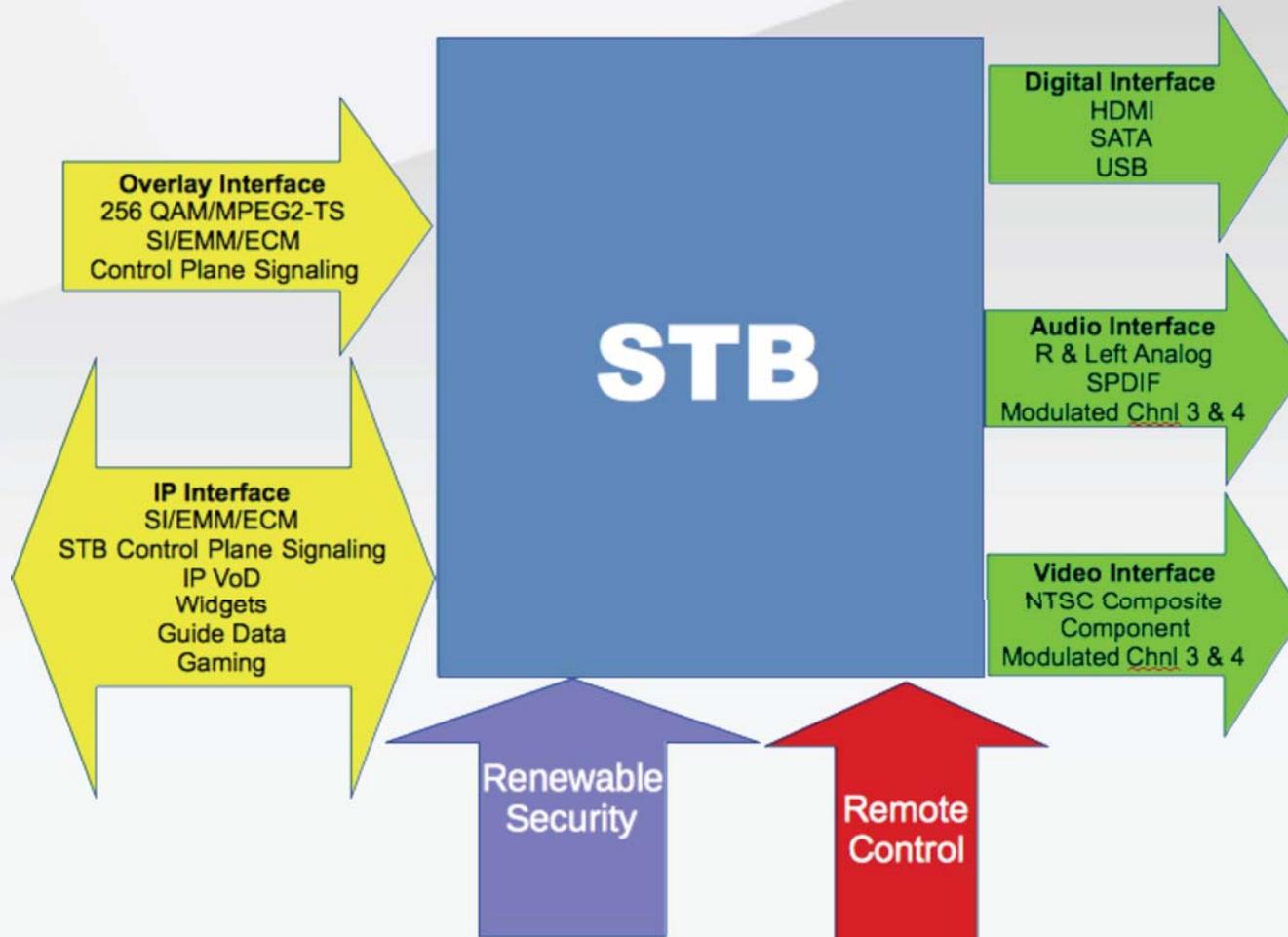
MPEG-MPTS
UDP
IP
Ethernet
GFP SONET
DWDM

BCAST	VOD
MPEG-MPTS	MPEG-SPTS
UDP	UDP
IP	IP
Ethernet	Ethernet
GFP SONET	GFP SONET
DWDM	DWDM

BCAST	VOD
MPEG-MPTS	MPEG-SPTS
UDP	UDP
IP	IP
Ethernet	Ethernet
256-QAM	ATM AAL5
PON	PON

BCAST	VOD
MPEG-MPTS	MPEG-SPTS
256-QAM	UDP
	IP
	MoCa
	Ethernet
PON	

Dual-Network Hybrid STB Architecture





CAS Security

- FiOS deploys both Mediacypher and PowerKey in all markets via a Simulcrypt compliant architecture
- All channels scrambled using DVB/CSA cipher
- Fully supports CableCard interface
 - Different CableCards for Mediacypher and PowerKey
- Headend Complies With Simulcrypt standard
 - Mediacypher has the sole CWG function
 - FiOS operates two OOB channels
 - SCTE-55-1 for Mediacypher
 - SCTE-55-2 for PowerKey
 - Both Mediacypher and PowerKey are accessing the same commonly encrypted version of the content. No overhead as is the case in the Cisco Overlay product

Multi-Screen Video



Many channels and VoD content available through alternate IP channels

- Smart Phones, Tablets, Smart-TVs, Gaming Platforms

Non-FiOS access networks use DRM rather than CAS for security

DRM solutions based on 128 bit AES/CTR mode cipher