SCTE ISBE CABLE-TEC EXPO '16

SEPTEMBER 26-29 PHILADELPHIA

What Home LAN Dreams May Come

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Comcast

SCTE Society of Cable Telecommunications Engineers

ISBE International Society of Broadband Experts

#CableTecExpo

Essential Knowledge for Cable Professionals™

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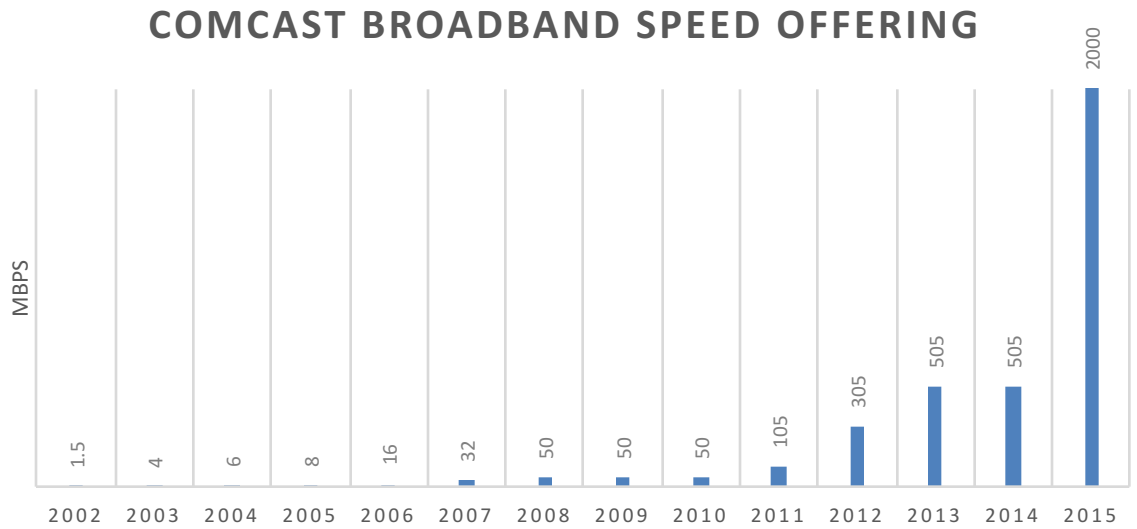
WAN Links Are Outpacing LAN Links

- **Apple released gigabit Ethernet on Power Mac G4s in 2004**
- **Only recently with 802.3bz will LAN Ethernet get a speed boost**



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6 Eras of LAN CPE Architecture

1. **Analog delivery** – No CPE
2. **Digital QAM Video** – Independent CPE
3. **MDVR** – Centralized DVR
4. **Hybrid-IP** – MoCA/Wi-Fi only clients
5. **Multicast** – DVR STB not required
6. **BYO CPE** – Streaming direct to TVs or retail devices

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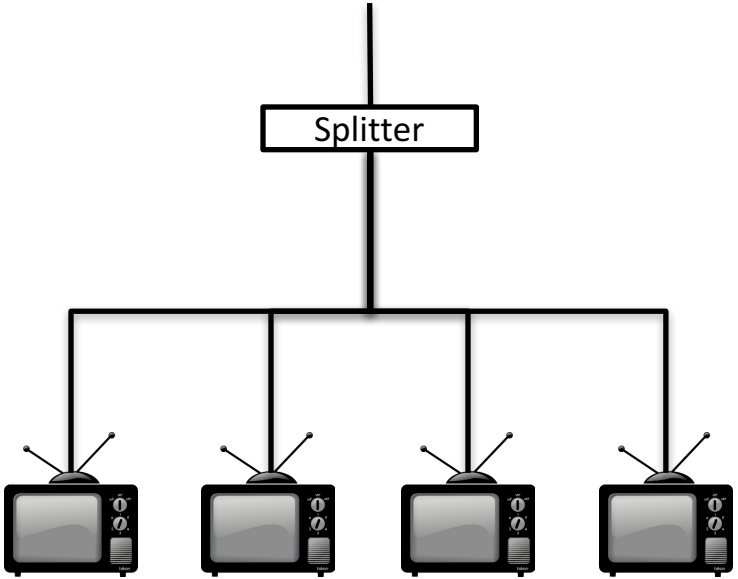
Analog Era



- **Triggered by**: poor OTA reception, and a desire for more channels

- STBs are often not required
- Extremely limited features
- High fidelity/quality access network
- No high speed internet

DVR Client Requirements:

Not available

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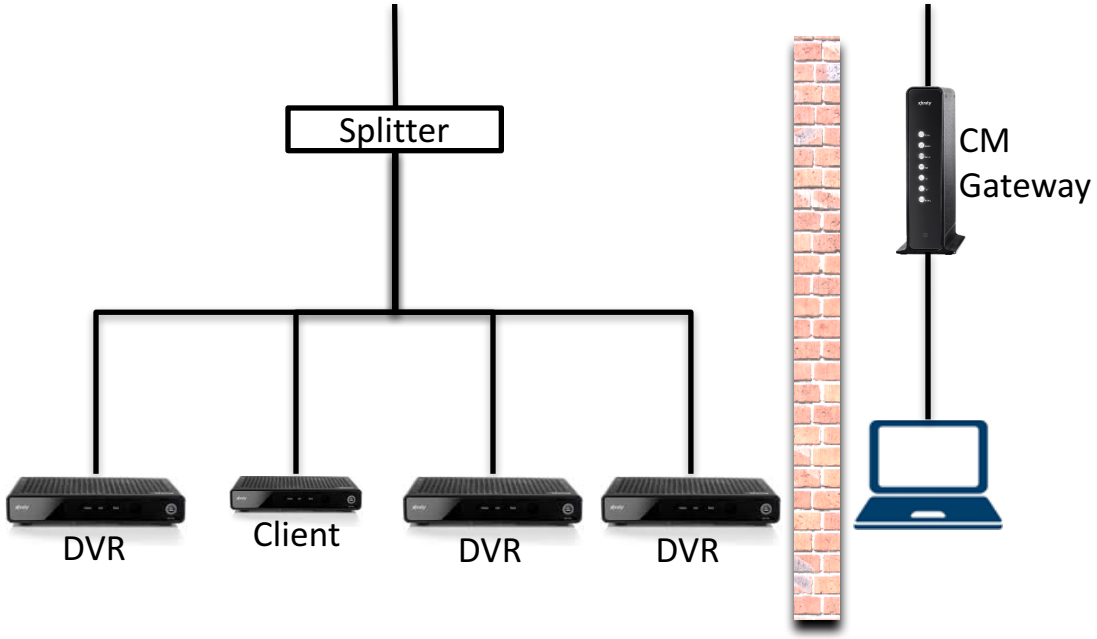
Digital QAM Video Era



- **Triggered by**: MPEG2 codec, and QAM distribution

- STBs have no communication to any other device in the home
- Customers make individual STB decisions per TV
- Enables DOCSIS

DVR Client Requirements:

HDD, Cable Card, QAM Tuner, DOCSIS Tuner

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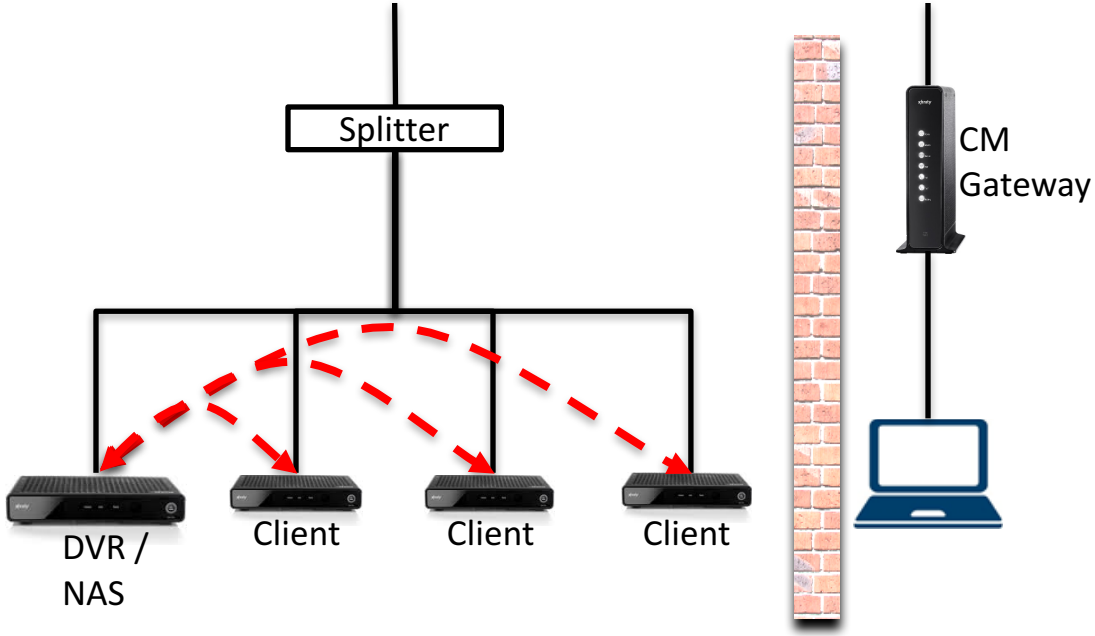
MDVR Era



- **Triggered by**: MoCA

- Allowed for one centralized DVR in the home
- Lowered the cost of client STBs
- STBs mainly communicated to other STBs, and not COAM devices
- A NAS architecture was possible

DVR Client Requirements:

~~HDD~~, Cable Card, QAM Tuner, DOCSIS Tuner

Central DVR

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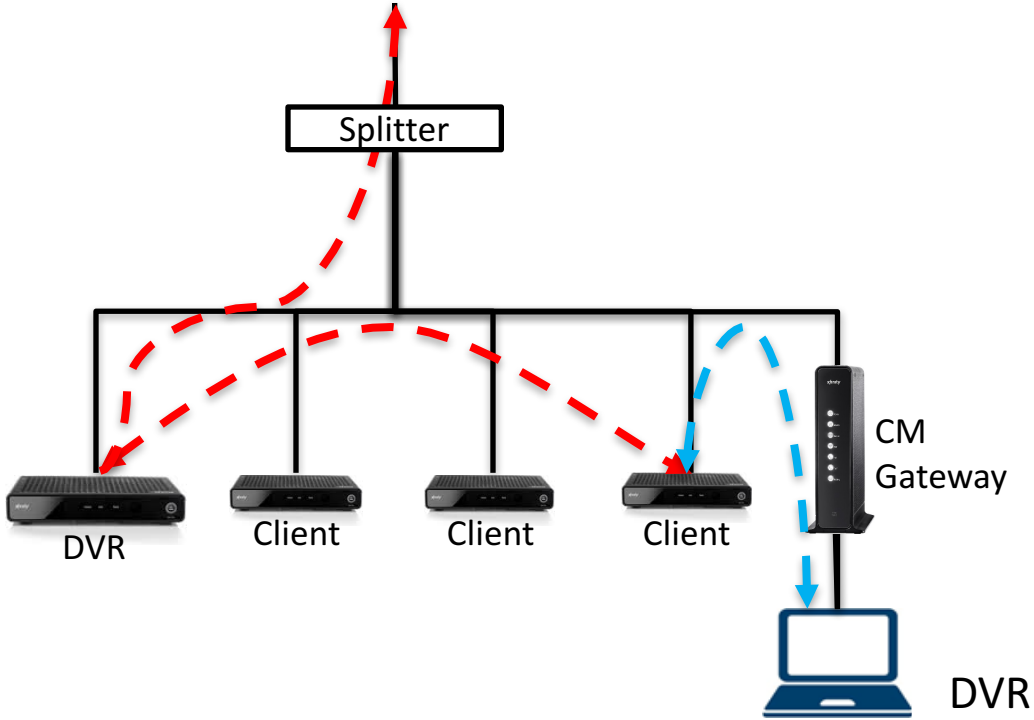
Hybrid-IP Era



- **Triggered by**: Cable card regulation relaxation, and CDVR MPEG4 file based encoding

- All client STB connectivity is via MoCA to a DVR STB
- Allowed reduced cost client STBs
- MPEG4 CDVR allowed COAM file based playback
- First STB to COAM communication for vidipath and IP control

DVR Client Requirements:

~~HDD~~, ~~Cable Card~~, ~~QAM Tuner~~, ~~DOCSIS Tuner~~

Central DVR, TSB

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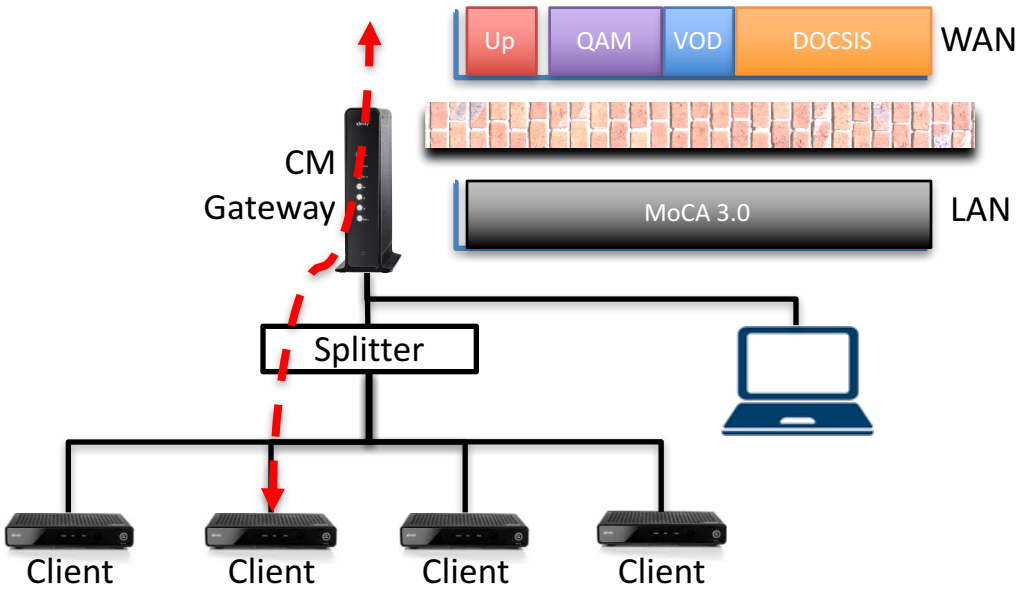
Multicast Era



- **Triggered by**: advances in back office encoding and packaging

- DVR STB is no longer required
- Separate WAN and LAN networks allow increased capacity and ease fiber deployments
- Multiple levels of in-home caching
- D3.1 is key to support IP and QAM channel lineups on plant simultaneously

DVR Client Requirements:

~~HDD~~, ~~Cable Card~~, ~~QAM Tuner~~, ~~DOCSIS Tuner~~

~~Central DVR~~, TSB, GW DVR cache

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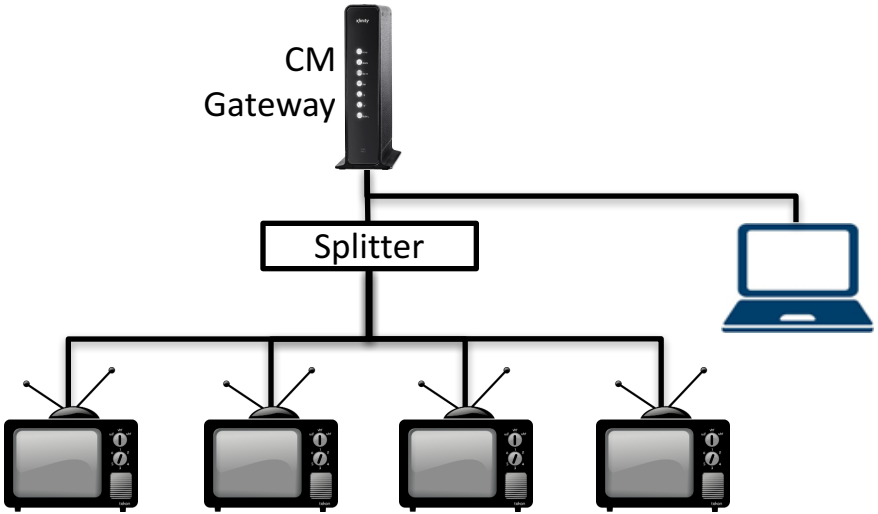
BYO CPE Era



- **Triggered by**: continued STB cost reduction, and market expansion

- MSO provided STBs would not be required
- Integrated streaming on mid-high end TVs
- Full circle from the analog era of no STB

DVR Client Requirements:

~~HDD~~, ~~Cable Card~~, ~~QAM Tuner~~, ~~DOCSIS Tuner~~

~~Central DVR~~, ~~TSB~~, GW DVR cache

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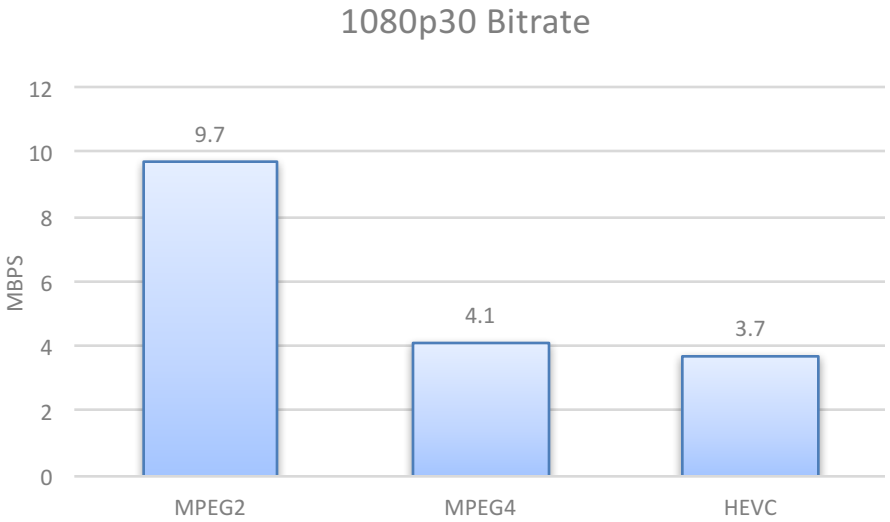
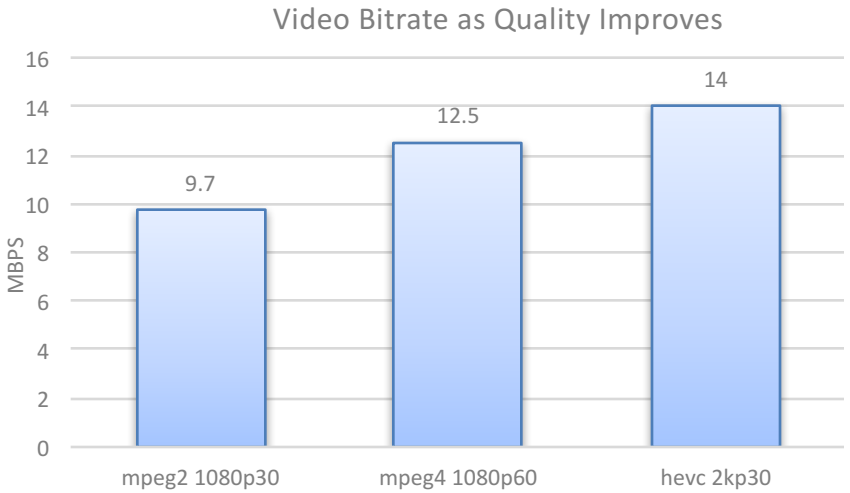
Wi-Fi Video Distribution

- **Video bitrate remains largely flat, considering the advancements in resolution, color depth, and framerate**





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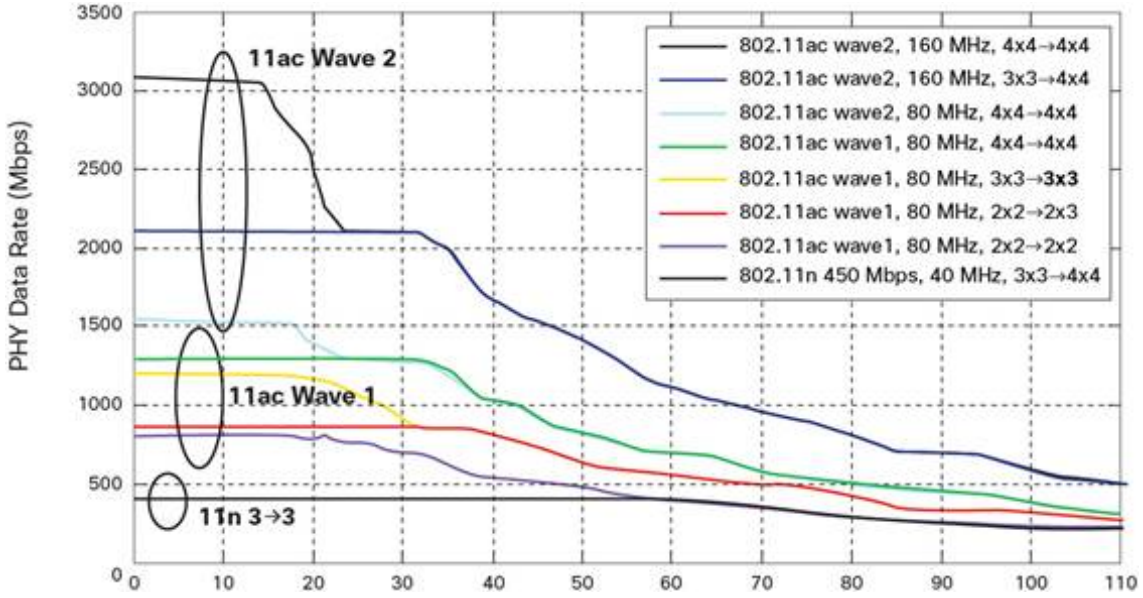
Wi-Fi Protocol Advancements

- **Little is gained at extended ranges, most throughput advantages are within the first 30-40 feet**



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