

# Embracing Convergence (2): Protecting Local Government Authority and Revenues in an IP World

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# Definitions

- Television – Literally, “seeing at a distance”, beyond the range of the human eye
  - Most definitions would add “by use of an electronic or other transmission system”
  - There are many forms of television
- Video – Visual communication in a recordable, transportable form
  - There are many video formats

# Definitions

- Internet Protocol (IP) – a Network/Interface layer protocol that specifies how to format packets for transmission
  - IP is a transport-independent protocol that works over a wide variety of networks
  - It is widely used because of its highly beneficial attributes – connectionless, fault tolerant, routable, etc.

# Internet Protocol Television (IPTV) and Video

- Video and audio signals are transformed into data packets using Internet Protocol
  - Quality of Service (QoS) is a must for real-time video
- IP Video can utilize different amounts of bandwidth depending upon resolution
  - Higher resolution = higher bandwidth
  - e.g., HDTV takes more bandwidth than low resolution video conferencing

# Internet Protocol Television (IPTV) and Video

- IPTV/Video *does not* have to traverse the Internet
  - In fact, a great amount of IPTV/Video is carried on closed networks and transmission systems, like cable systems
    - Verizon's FIOS, for example, uses IP Video for Video on Demand

# Internet Protocol Television (IPTV) and Video

- IPTV/Video *can be* used where bandwidth is constrained, to maximize service deployment within limited bandwidth, because it can be housed within a server array and only delivered when it is accessed by any given recipient(s) (subscribers)
  - This is how AT&T's U-verse system is able to deliver cable service video over its last mile copper network that has limited bandwidth capabilities

# QAM and IP

- Quadrature Amplitude Modulation (QAM) is the primary form of video delivery over cable systems today
  - It provides compressed digital video over analog
  - Most cable systems are still based on an underlying RF platform

# QAM and IP

- There is an ever increasing melding of QAM and IP on the cable service platform
  - FIOS, for example, uses QIP (QAM/ Internet Protocol) set top units
    - This is forecast to increase as today's set top units are replaced
    - There is however a large legacy investment in QAM-only boxes that will need to be fully depreciated before the industry moves further into IP delivery

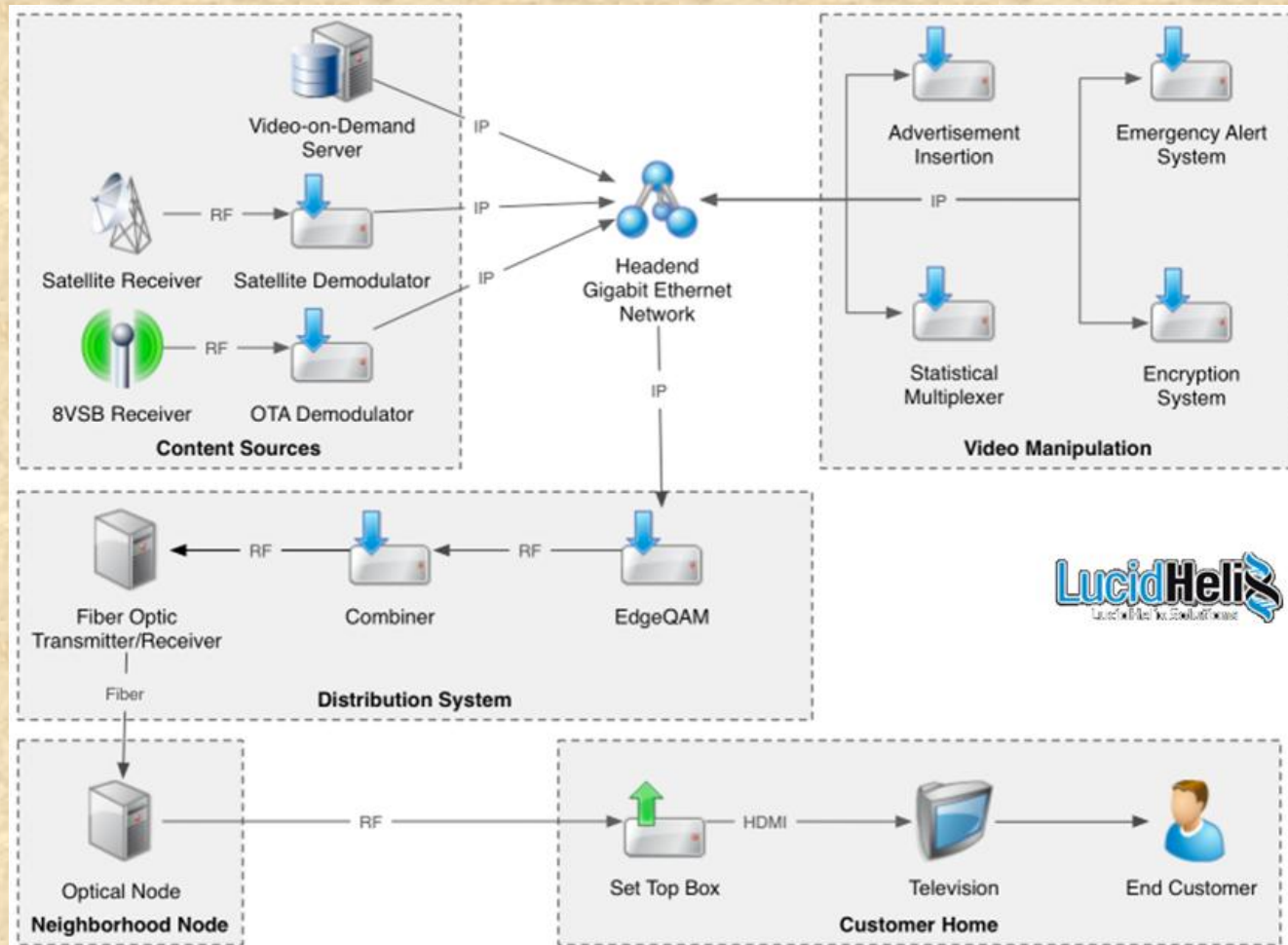
# QAM and IP

- The industry is also gaining benefits from the implementation of switched digital video (SDV), which is an access-driven method for selecting QAM (or other) signals only when needed, and thus maximizing bandwidth
- Less utilized services are not broadcast; instead they are transmitted to specific areas when requested by customers' set-tops

# Other Cable System/Service Uses of IPTV/Video

- Transportation of video between headends and between headends and hubs
  - This occurs on both a regional and national basis
  - Verizon, for example, utilizes IP from its national superheadends (SHE) to its various regional headends, hubs and serving offices

# Example of IPTV Flow in a CATV System



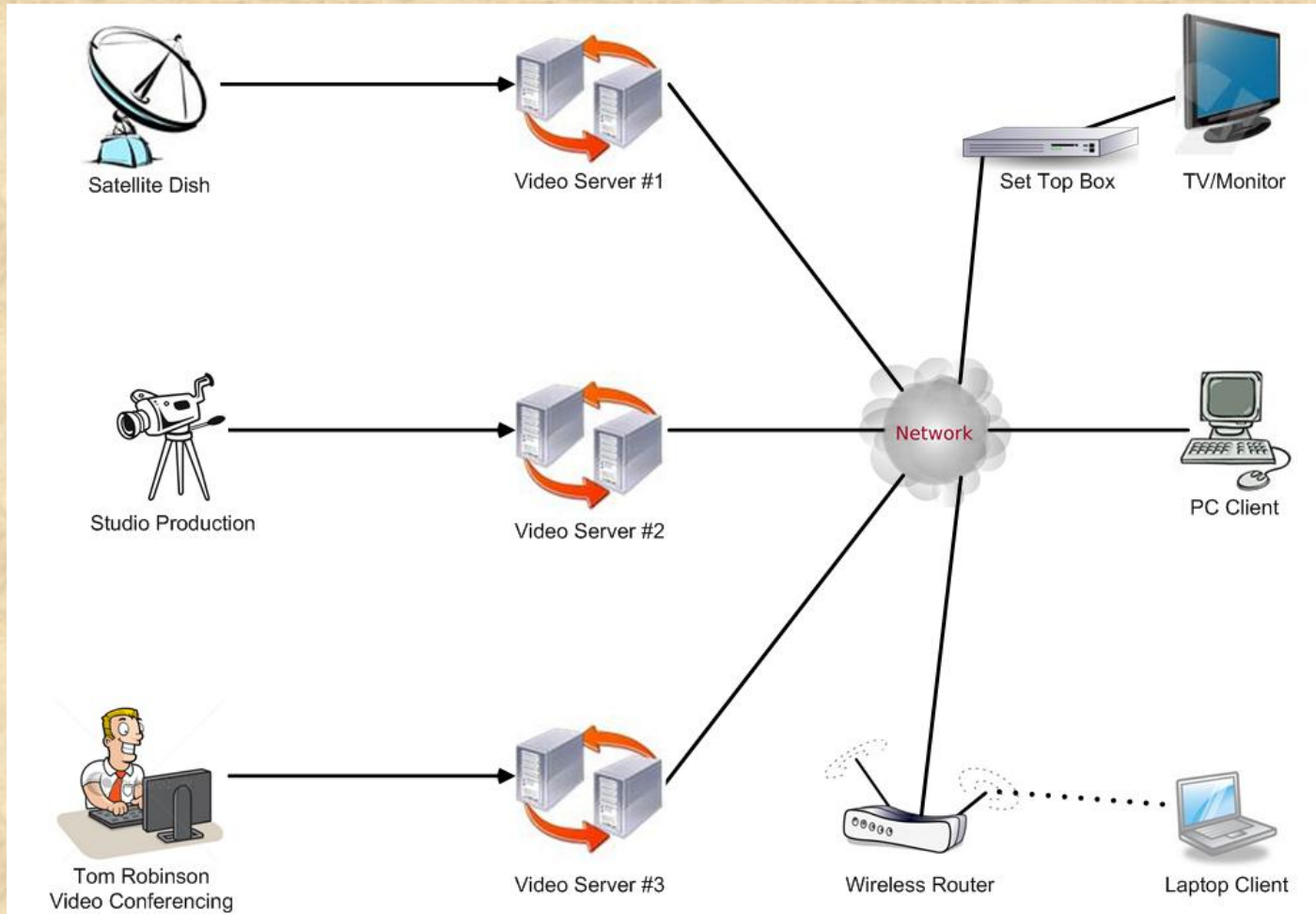
# Other Cable System/Service Uses of IPTV/Video

- IP, although not necessarily IPTV or video, is significantly involved in the development of interactive television (iTV) on the cable platform as the access and delivery mechanism for the information transported to and from subscribers
  - Certainly an issue for discussion is whether the interactive component of an iTV video channel, which is initially being designed for commercial, revenue generating applications, is a form of cable service and therefore the revenues from iTV services are subject to franchise fees

# Internet TV/Video

- IPTV delivered through a broadband (high-speed internet) connection to the end user is Internet TV or Internet video
- It utilizes the same protocol as IPTV delivered over a closed transmission system
- Can be low resolution, such as some types of webcam video conferencing
- Can be high resolution (such as Netflix on-line movie distribution)

# Example of an IPTV System



# Closing Thoughts

- “Video is video is video” and “If it looks like a duck...”
- There is a large legacy investment in QAM-based digital and other non-IP digital technologies that will need to be fully depreciated before all things become IP
- On the one hand, the cable industry says: “Cable service is a strong, lasting commodity which has a bright future”

# Closing Thoughts

- On the other hand, the cable industry says: “The video content delivery marketplace is changing quickly and we are adapting to an inevitable all IP delivery world”
- Which is correct?
  - Both?

Thank You!