

SCTE CABLE-TEC
EXPO'13
OCTOBER 21-24 / ATLANTA, GA

PIONEERING IPTV IN CABLE NETWORKS

John Horrobin

Marketing Manager

Cisco Systems

Tweet about today's session on Twitter  **#scteExpo**

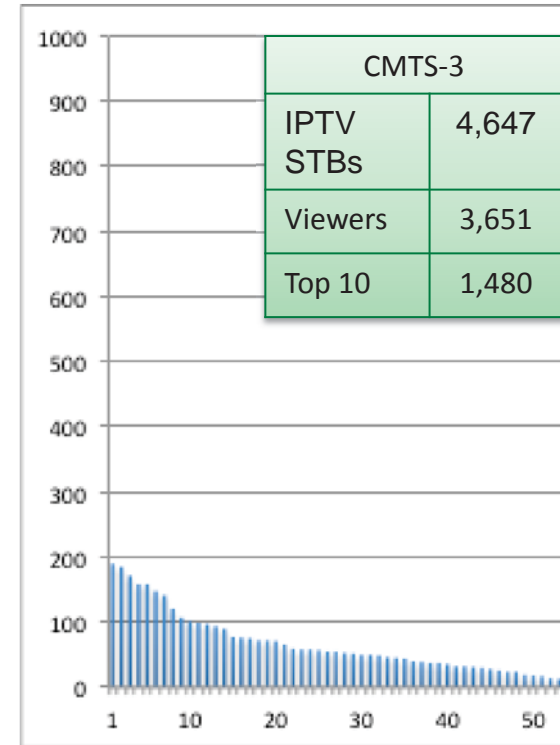
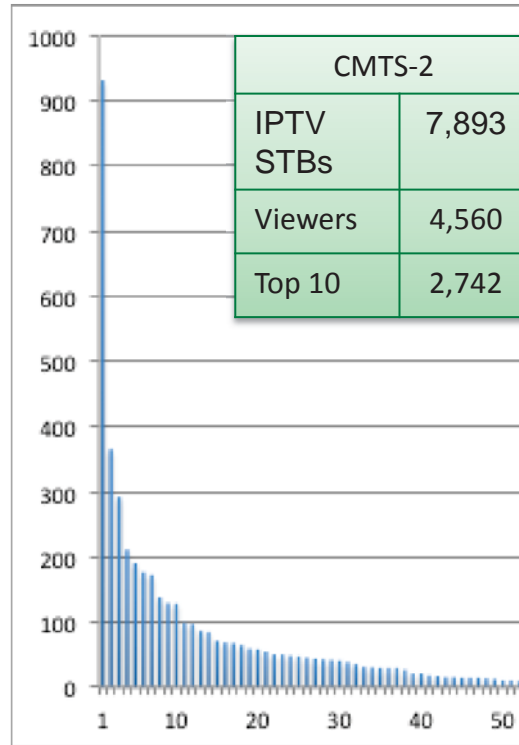
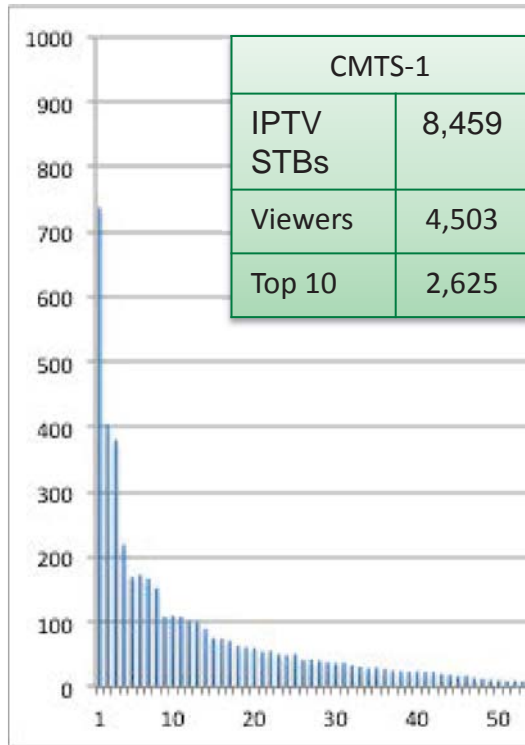
expo.scte.org

Objectives

- ▶ Analyze Linear IPTV viewership data collected from 3 Cisco CMTS's in commercial deployment
- ▶ Compare resource requirements of Linear IPTV delivery options
 - Unicast, Switched, Broadcast, Broadcast+Switched
- ▶ Illustrate benefits of QAM replication and advanced gateways in IPTV deployments



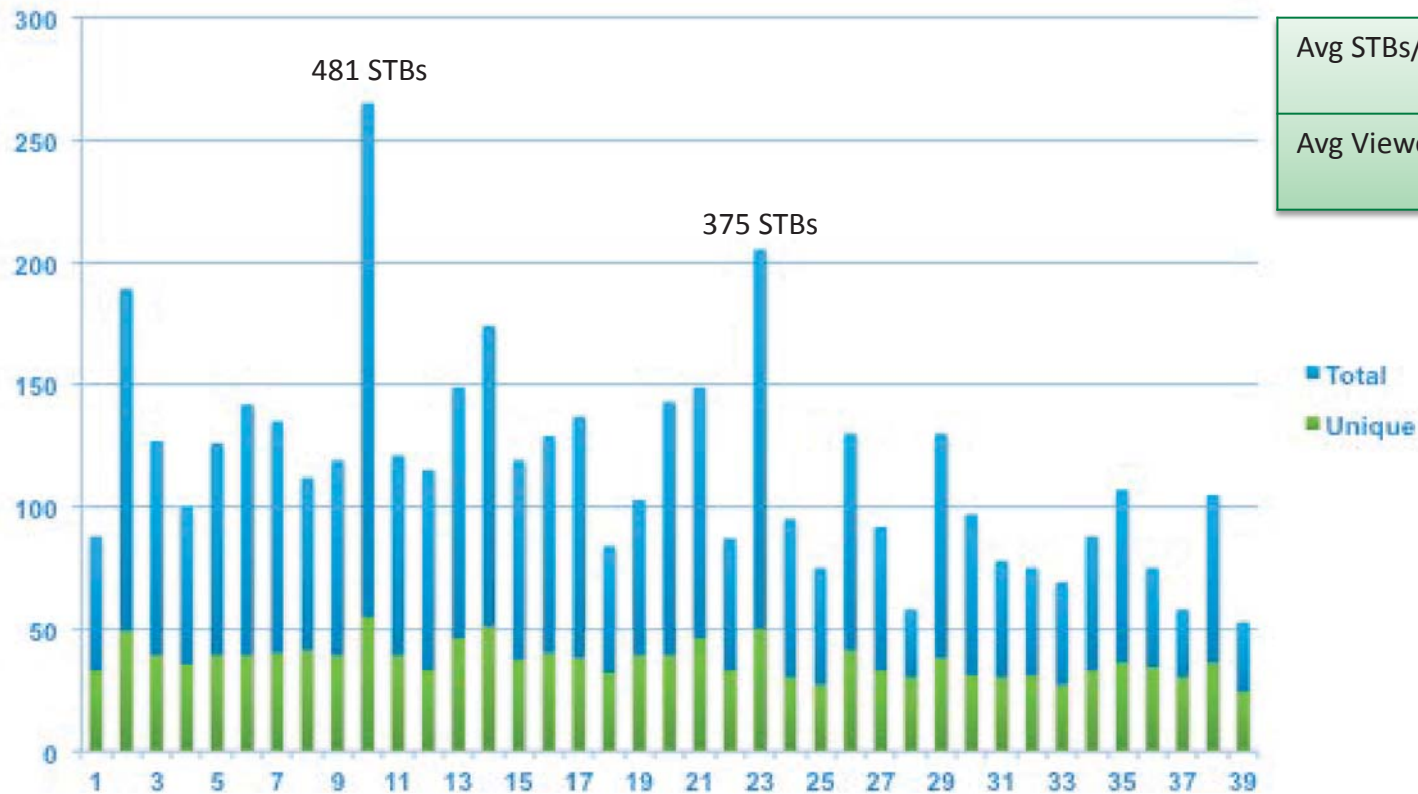
Viewership by TV Channel Rank



- ▶ More than 50% of IPTV STBs were viewing Linear TV at sample time
- ▶ Extremely high concurrency during prime time (CMTS-1, CMTS-2)
- ▶ Viewership more distributed outside prime time (CMTS-3)



Viewership by SG: CMTS-1

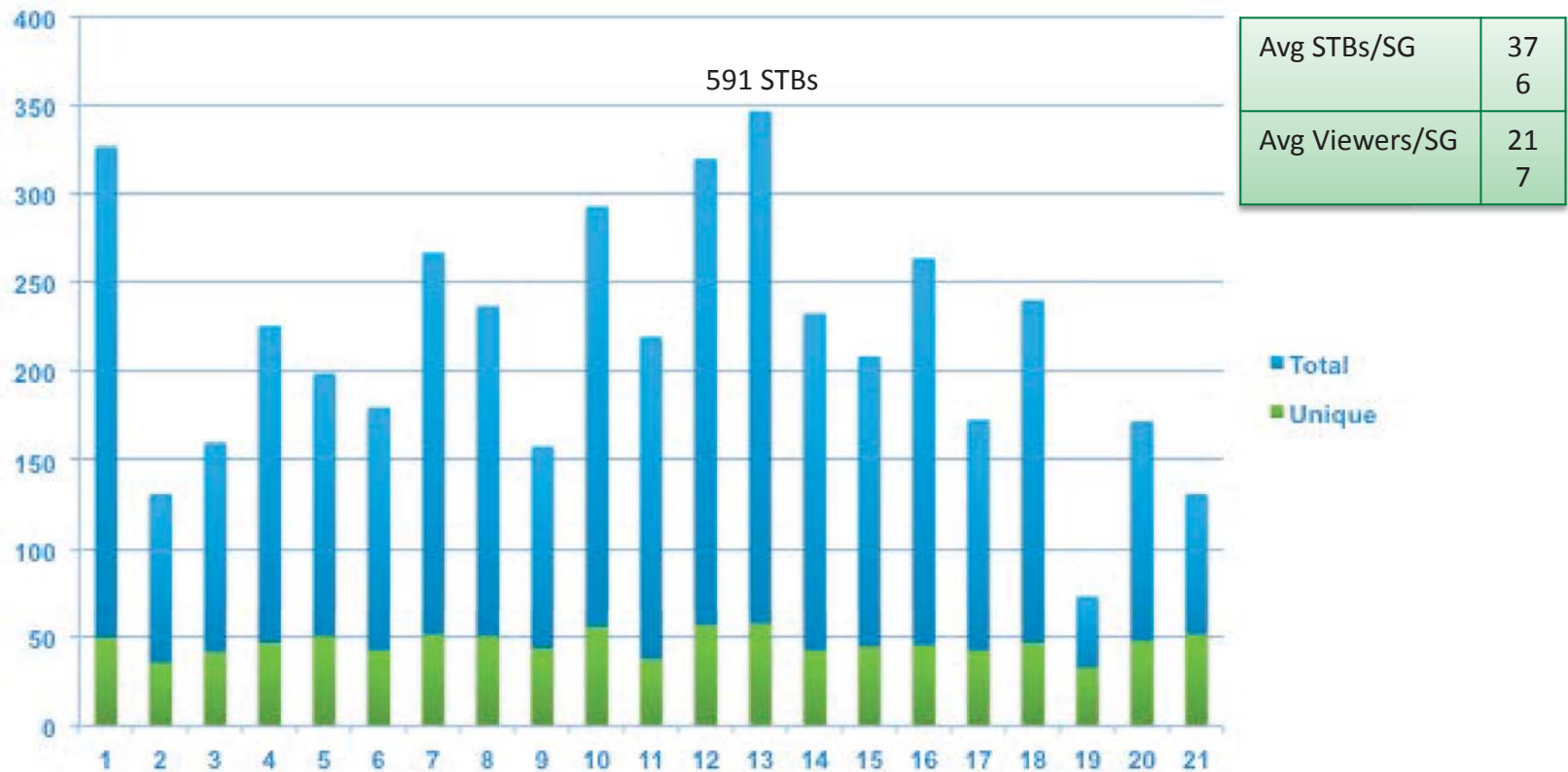


Avg STBs/SG	21 7
Avg Viewers/SG	11 6

- ▶ Total = number of Linear TV viewers per SG at sample time
- ▶ Unique = number of TV channels being viewed per SG at sample time
- ▶ Average of 37 TV channels being viewed per SG at sample time



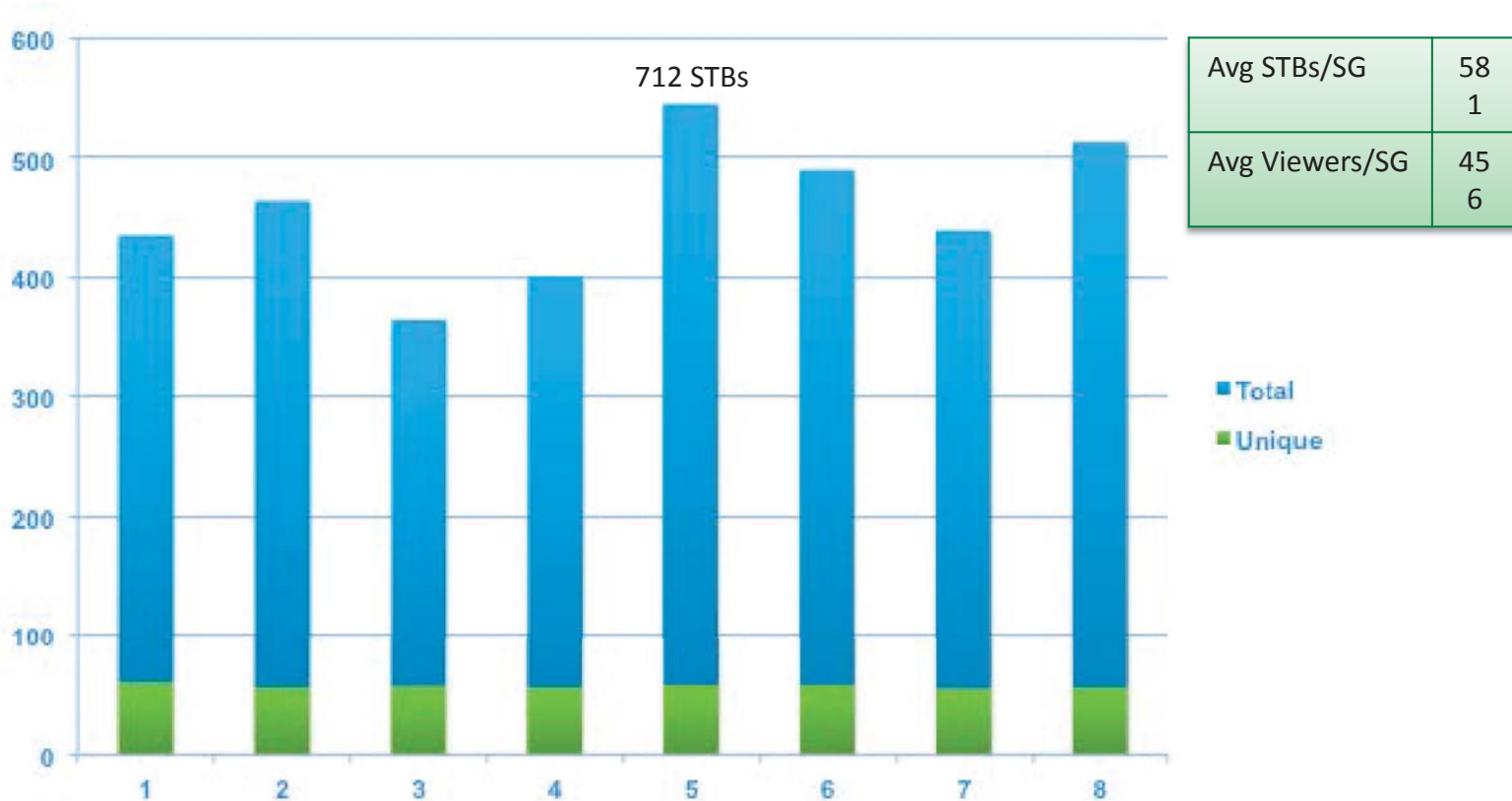
Viewership by SG: CMTS-2



- ▶ Total = number of Linear TV viewers per SG at sample time
- ▶ Unique = number of TV channels being viewed per SG at sample time
- ▶ Average of 46 TV channels being viewed per SG at sample time



Viewership by SG: CMTS-3

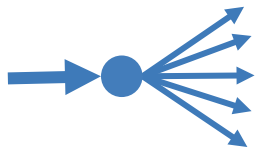


- ▶ Total = number of Linear TV viewers per SG at sample time
- ▶ Unique = number of TV channels being viewed per SG at sample time
- ▶ Average of 57 TV channels being viewed per SG at sample time



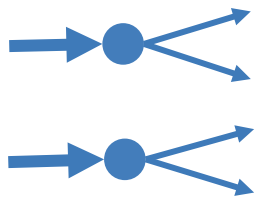
IPTV Delivery Options

Broadcast



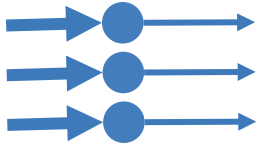
- ▶ Linear TV delivered to all subs all the time
 - ▶ Lowest CMTS cost for delivering Linear TV
 - ▶ Most suitable for large number of subs and popular programming
-

Switched



- ▶ Linear TV delivered only to active viewers
 - ▶ Most efficient use of HFC spectrum for delivering Linear TV
 - ▶ Network sizing based on viewership statistics
-

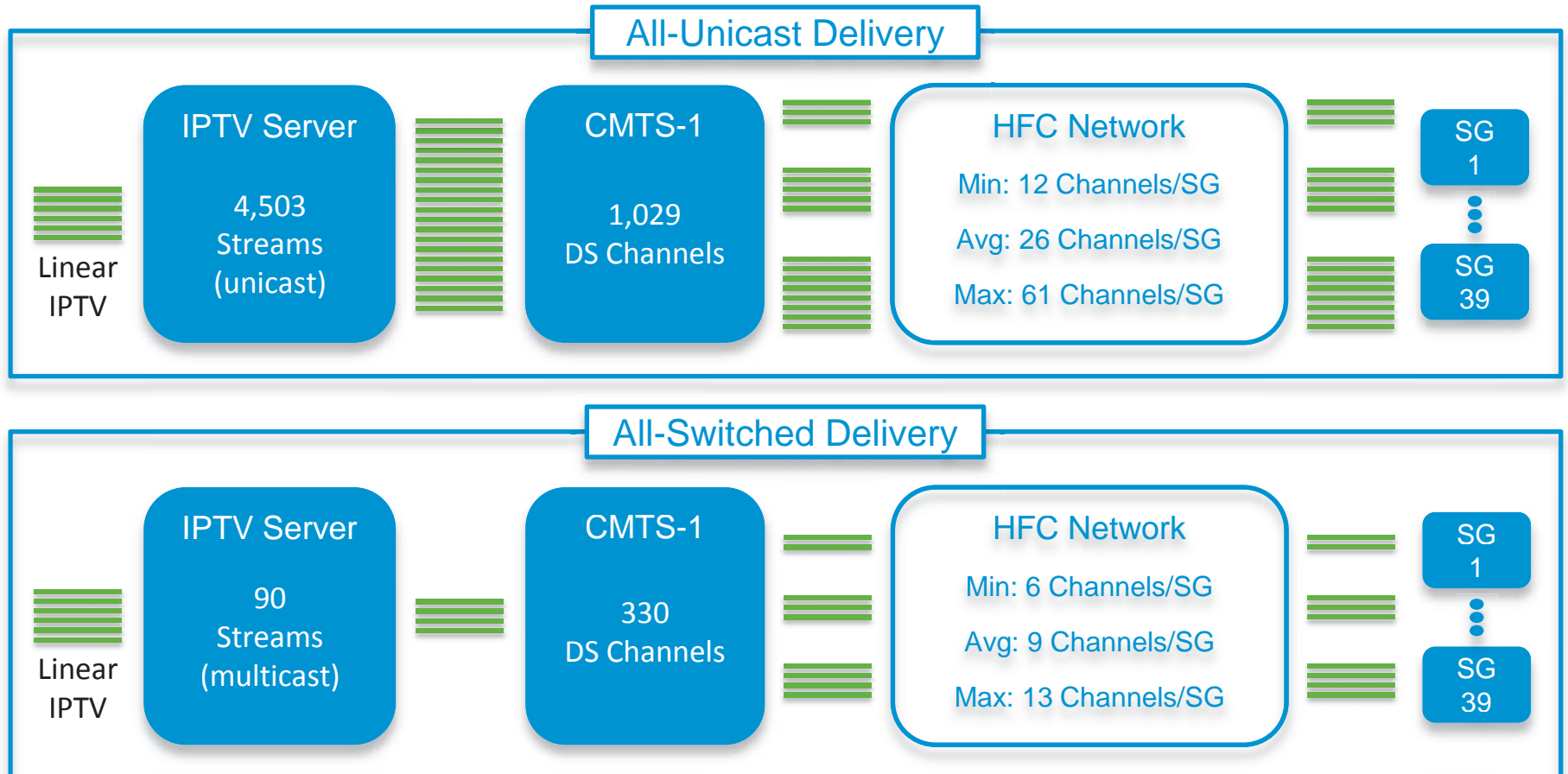
Unicast



- ▶ Personalized Linear TV and VoD delivered to each sub
- ▶ Highest CMTS cost and HFC spectrum for delivering Linear TV
- ▶ Alleviates multicast requirements in IPTV system

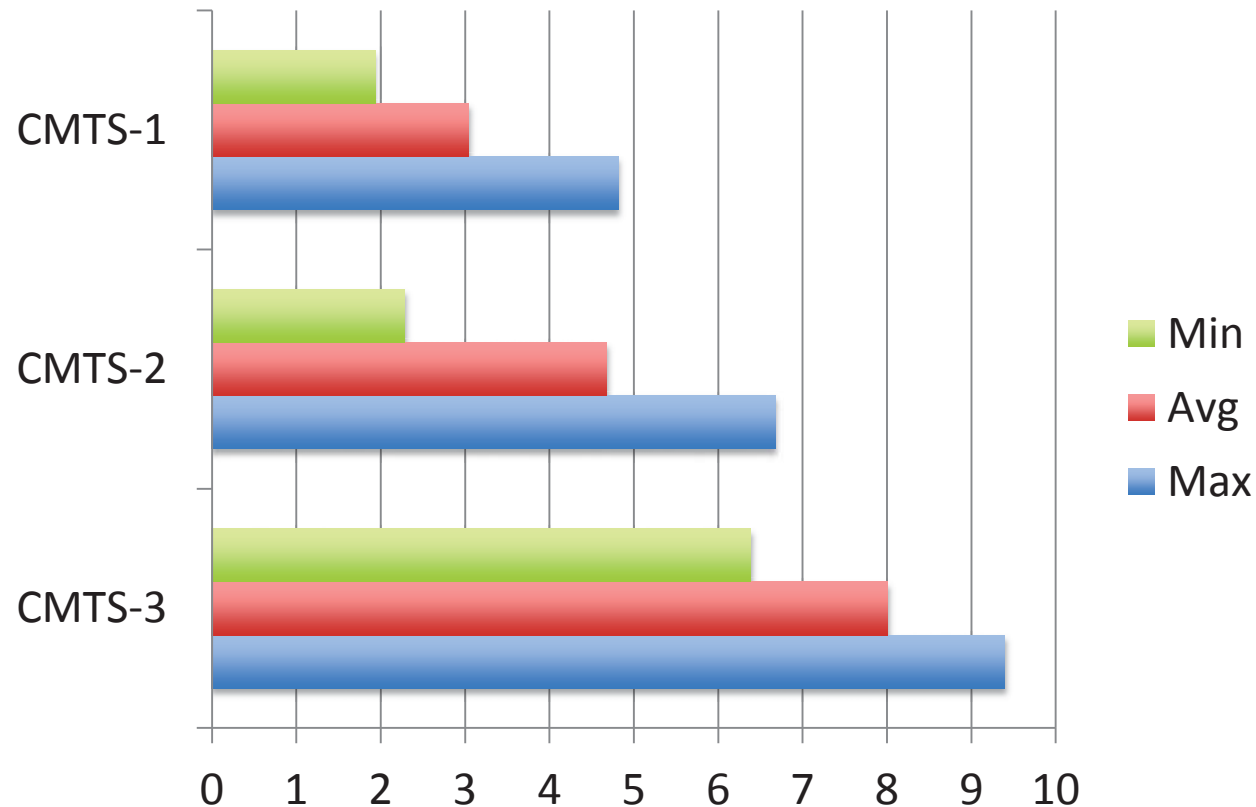


Unicast vs Switched Delivery



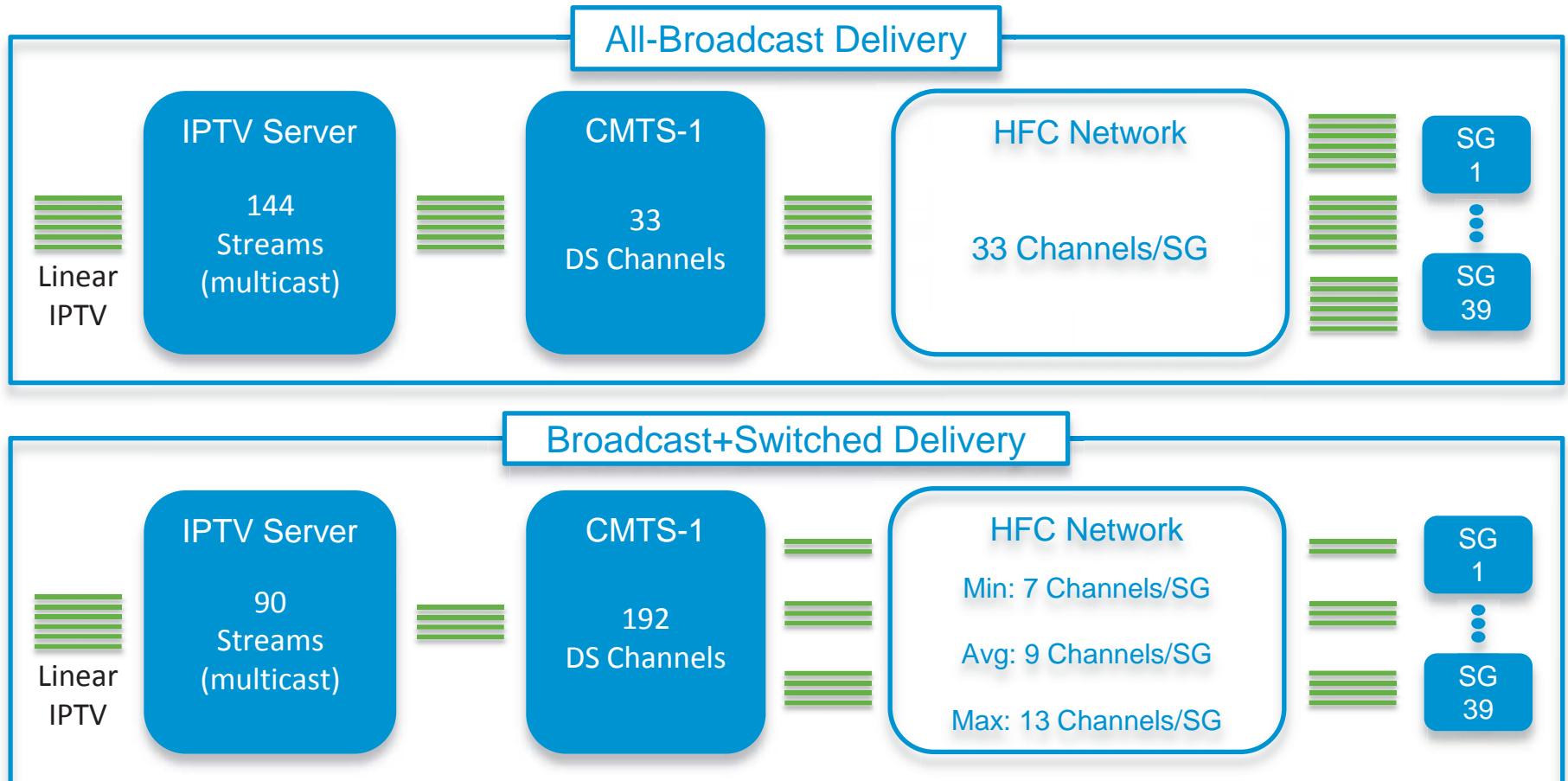
- ▶ Unicast delivery would consume 50X more IPTV Server and IP network capacity, and 3X more CMTS DS channels, compared to switched delivery
- ▶ Assumptions: IPTV encode rate = 8 Mbps; DS channel = 35 Mbps

Multicast Gain



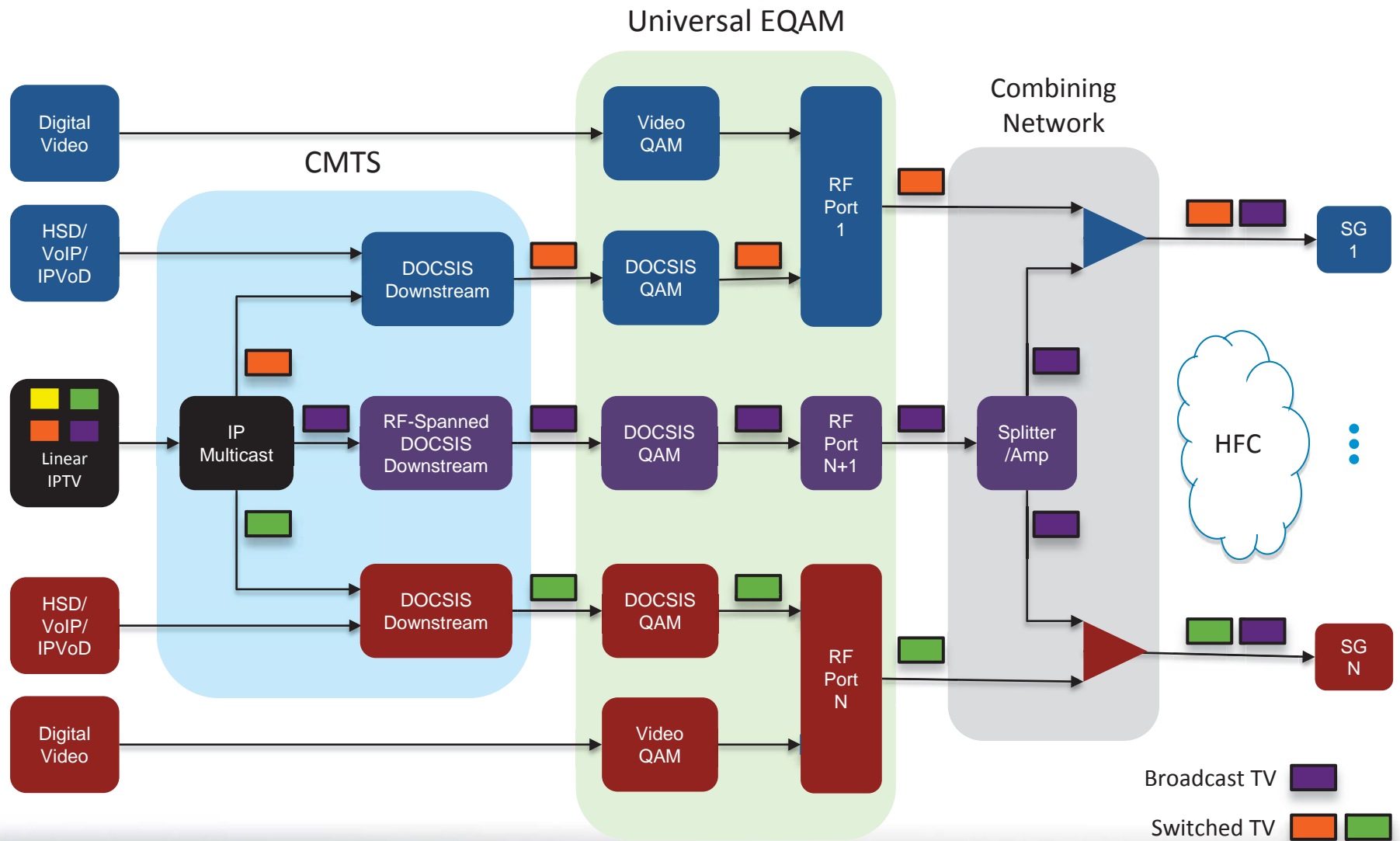
- ▶ Multicast Gain = average number of viewers per Linear TV channel
- ▶ Larger SGs generally achieve higher multicast gain
- ▶ Unicast delivery would consume from 2X to 9X the capacity of multicast

Broadcast vs Bcast+Switched Delivery

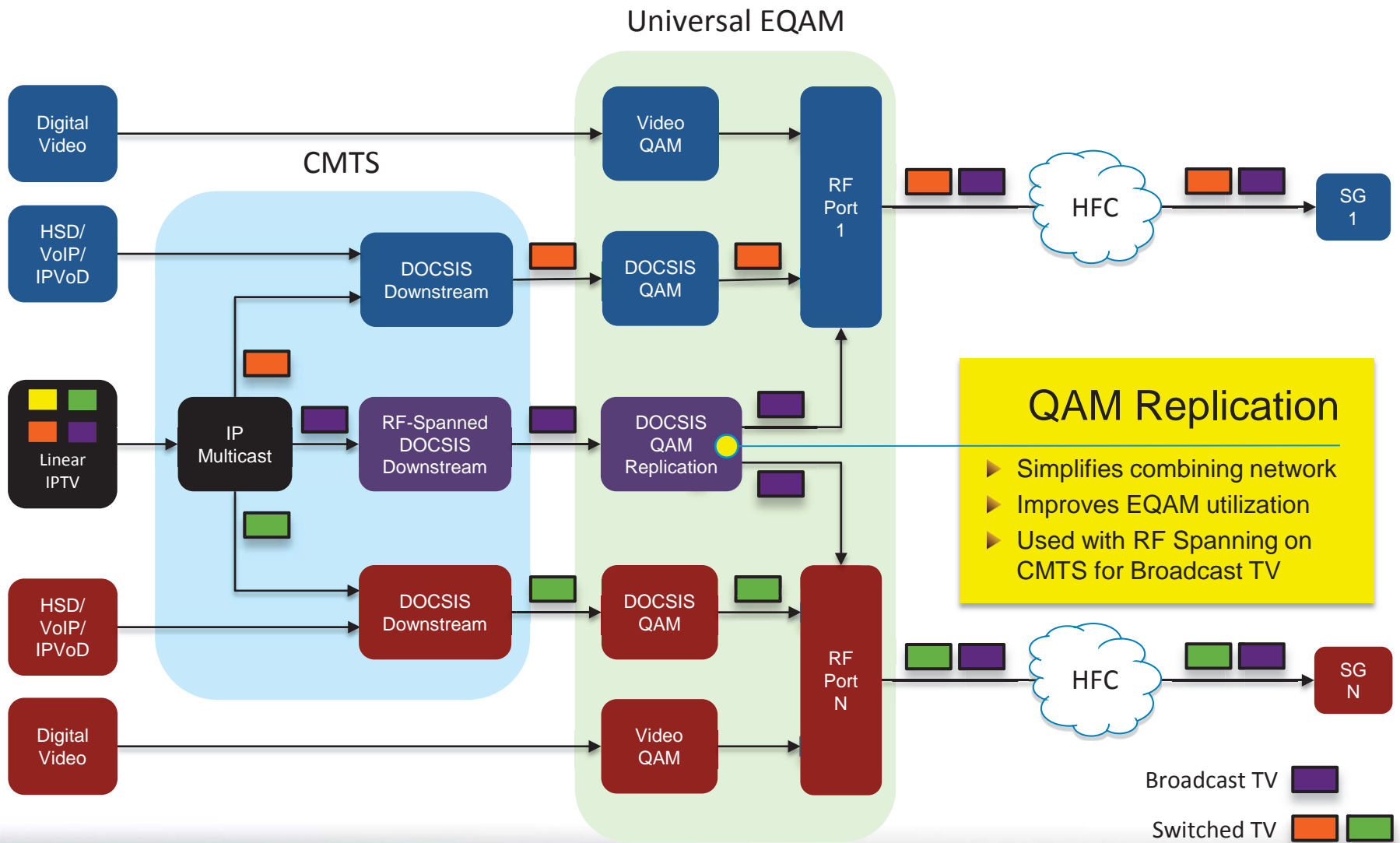


- ▶ Broadcast delivery achieves lowest CMTS cost if spectrum is available
- ▶ Broadcast+Switched delivery balances CMTS cost and spectral efficiency
- ▶ Assumptions: IPTV encode rate = 8 Mbps; DS channel = 35 Mbps

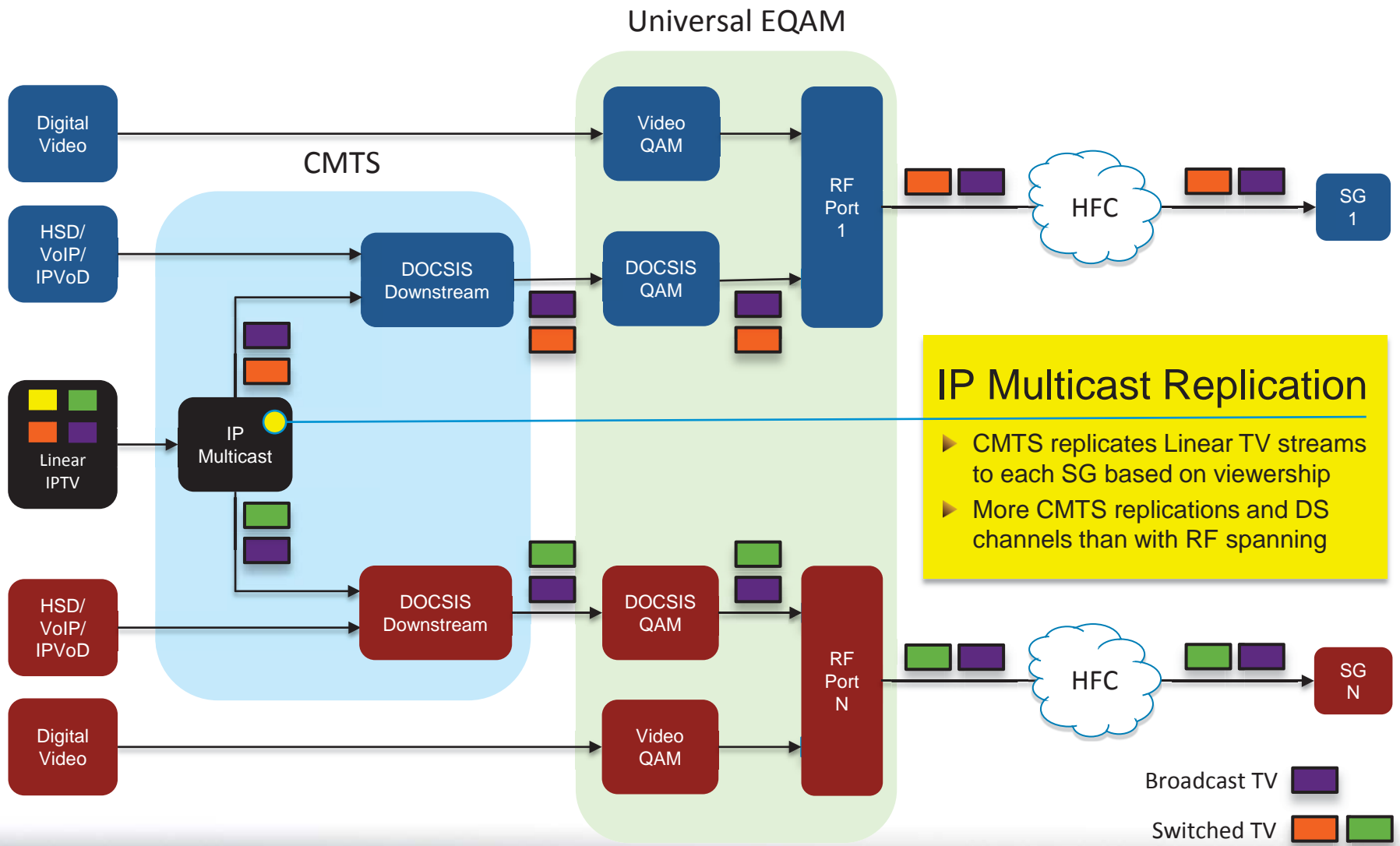
Broadcast+Switched Architecture



Bcast+Switched with QAM Replication



All-Switched Architecture



IP Multicast Replication

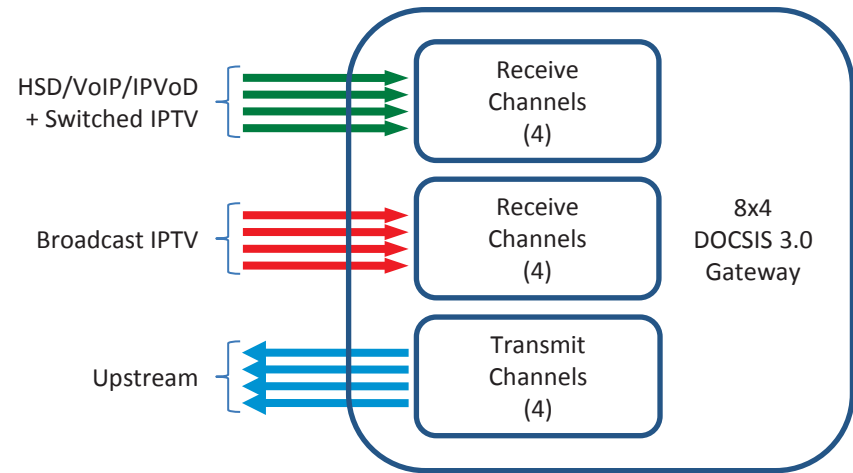
- ▶ CMTS replicates Linear TV streams to each SG based on viewership
- ▶ More CMTS replications and DS channels than with RF spanning



DOCSIS 3.0 Gateway Solutions

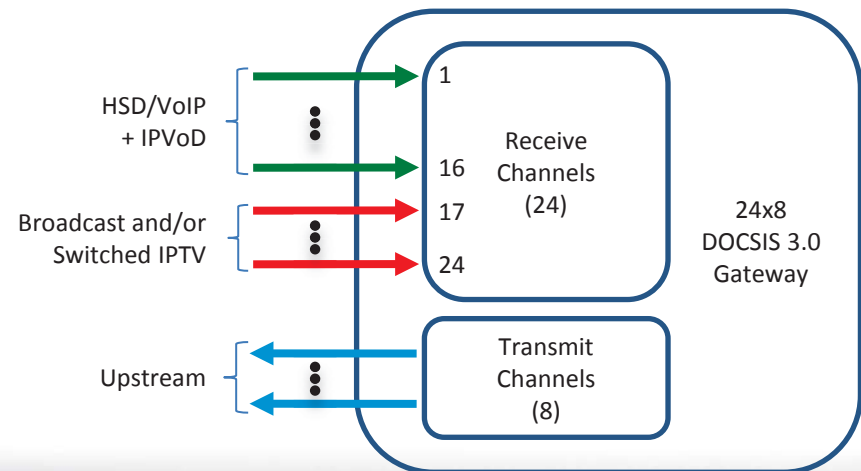
Early IPTV deployments utilized dual-tuner
8x4 DOCSIS 3.0 Gateways

- Example configuration:
 - 4 Rx channels for HSD/VoIP and Switched IPTV (long-tail content)
 - 4 Rx channels for Broadcast IPTV (short-tail content)
- Dual-tuner design restricts Rx allocation



Advanced DOCSIS 3.0 Gateways provide
more options for operators

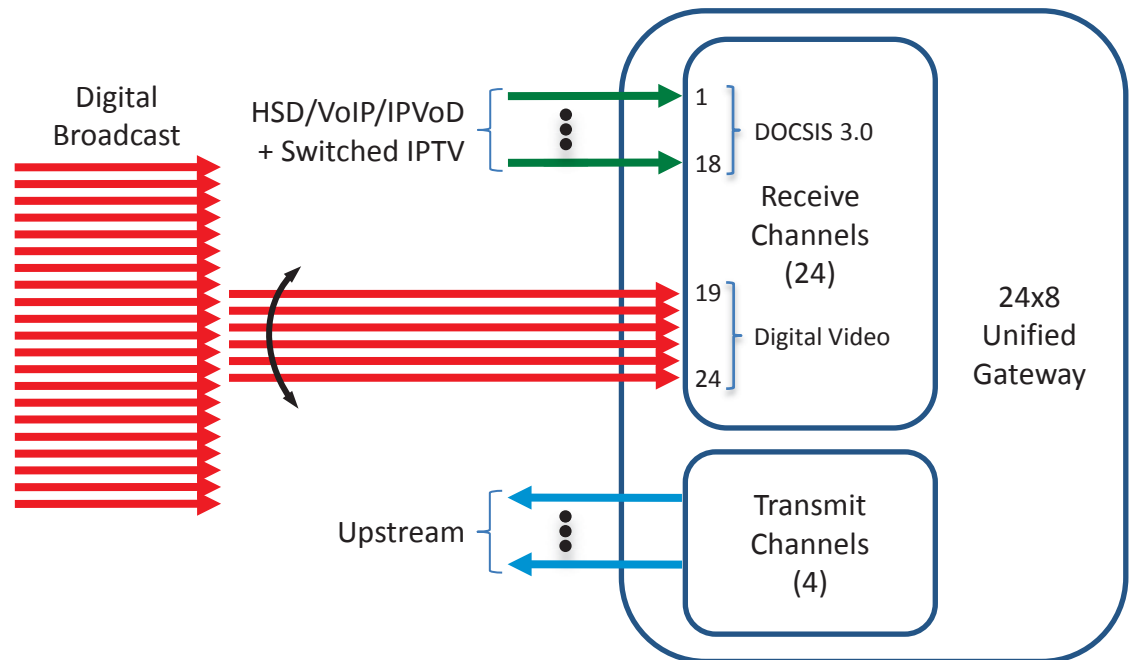
- Example configuration:
 - 16 Rx channels for HSD, VoIP and IPVoD
 - 8 Rx channels for Linear IPTV
- Full-spectrum tuner enables flexible allocation of Rx channels



Unified Gateway

Unified Gateway adds support for Digital Video services

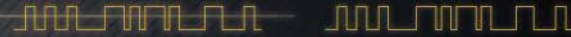
- ▶ Example configuration:
 - 18 Rx for IP services
 - 6 Rx for Digital Broadcast
- ▶ Full-spectrum tuner for flexible allocation of Rx channels
- ▶ Deliver existing Digital Broadcast services to IP devices
- ▶ Offer extended lineup via Switched IPTV
- ▶ Gracefully migrate to all-IP



Conclusions

- ▶ Early IPTV deployments in cable networks demonstrate popularity of Linear TV services
- ▶ Significant multicast gains achieved
 - Up to 9X in largest service groups
- ▶ Broadcast+Switched architecture delivers both CMTS cost savings and spectral efficiency
 - QAM replication simplifies Broadcast TV solution
- ▶ Advanced DOCSIS 3.0 and Unified Gateways open new possibilities for operators





SCTE CABLE-TEC
EXPO'13
OCTOBER 21-24 / ATLANTA, GA

John Horrobin

Marketing Manager

Cable Access Business Unit, Cisco Systems

jhorrobin@cisco.com



Tweet about today's session on Twitter  [#scteExpo](https://twitter.com/scteExpo)

expo.scte.org