Enabling Web Video with DOCSIS

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CREATING &
DISTRIBUTING VIDEO
OVER THE NET

Agenda

- Lots of Bandwidth is coming and how

  The HFC Plant

  DOCSIS 3.0

- Critical technologies to be aware of and why.

  Bonding

  IPv6

  Multicast

HFC Plant Bandwidth Capacity

		Currently	In the Future
HFC Plant Capacity	Frequency Spectrum	129 "TV" channels (54 to 862 MHz)	151 "TV" channels (54 to 1 GHz)
	Space	1000 Homes per Spectrum	64 to 125 Homes per Spectrum (8x-16x)
	Time	40 Mbps per channel (50 Mbps in Europe)	
Small City Capacity	100K HHP	4 Gbps 1 ch * 100K HHP / 1000 * 40 Mbps	4 Tbps (1000x) 125 ch * 100K HHP / 125 * 40 Mbps

HFC = Hybrid Fiber Coax   SG = Service Group
HHP = HouseHold Passed

The HFC Plant is migrating from Broadcast (analog and digital TV) to unicast (DOCSIS, VOD, SDV). Currently it is about 10% unicast.

High Speed Internet Access over Cable

DOCSIS 1.0	DOCSIS 1.1	DOCSIS 2.0	DOCSIS 3.0
• 1997 Spec	• 1999 Spec	• 2001 Spec	• 2006 Spec
• 1998 Product	• 2001 Product	• 2003 Product	• 2008 Product
• 40 Mbps DS	• 40 Mbps DS	• 40 Mbps DS	• 300+ Mbps DS
• 10 Mbps US	• 10 Mbps US	• 30 Mbps US	• 100 Mbps US
• Best Effort Data	• QoS Data		• Bonding
	• VoIP		• IPv6
			• Multicast

DOCSIS: Data over Cable System Interface Specification

Downstream Bandwidth

Currently – **single channel**

- CMs offer 6-10 Mbps within a 40 Mbps downstream channel.

In the Future – **multiple channels with bonding**

- The industry has announced 100 Mbps CMs (3 ch)

- In the lab, we have 300 Mbps CMs working (8 ch)

- We know how to do 1 Gbps CMs. (~24 ch)

What To Watch For

- Now: Early 100 Mbps deployments (3 ch)

- 2009: Full blown 50 to 100 Mbps deployments (4-8 ch)

Upstream Bandwidth

Currently – single channel

- CMs offer 384-768 kbps within a 10 Mbps upstream channel.

In the Future – multiple channels with bonding

- DOCSIS 2.0 permits 30 Mbps upstream channel (1 ch)
- DOCSIS 3.0 permits 120 Mbps upstream channel (4 ch)

What To Watch For

- 2009: 10 to 20 Mbps upstream (4 ch)

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IPv6

Currently – IPv4

- Cable Operators are running out of IPv4 addresses
- Home routers with NAT (Network Address Translation) can impair applications such as video conferencing.

In the Future – IPv6

- Global address space, and lots of it for one price.
- No NAT. Much better transparency for applications.
- MAC OS X and Win XP/Vista already support IPv6

What to Watch For

- 2009: CM Internal address become IPv6
- 2010+: Home network defaults to IPv6

Multicast

Currently

- Multicast is not used much.

In the Future

- Complete Multicast protocol support including Source Specific Multicast (SSM), IGMPv3, IPv6, with full provisioning and quality of service.

What to Watch For

- Greater efficiency due to less server support and more end points.

  Technically, one stream could feed millions of subscribers.

- 2009+: Business opportunities to provide multicast channels from your Video 2.0 site to the Cable Operator

  so that they can provision, manage, and deliver the video stream to the subscriber as a revenue generating service.

  Web Video 2.0 sources become the new content providers.

Summary

- A properly engineered and maintained Cable Plant has plenty of bandwidth to support upcoming Web Video services

- IPv6 and Multicast are key technologies and opportunities which can vastly enhance the Video 2.0 experience.

- All Service Providers (Cable Operators, Telcos) are or will be looking for new content to either differentiate themselves or to just remain competitive.

You guys/gals are that new content.