Is DOCSIS 3.0 Really Here?

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So you're an MSO with a DOCSIS network and want to know when you can start moving to DOCSIS 3.0 to gain all the new bells and whistles to include bandwidth, IPv6, & advanced security. DOCSIS 3.0 has the ability to give you over 100+Mbps to the customer, new security features, and support for IPv6 so you can save the internet's IP resources. A rather important question remains, are there any vendors already selling DOCSIS 3.0 networks and devices? The answer is not the quick "yes" a vendor's PowerPoint presentation may lead you to believe.

The most profound issue with DOCSIS 3.0 revolves around the modems themselves. There are no true DOCSIS 3.0 modems on the market at this time. All of the vendors have a 3.0(D)ownsteam only modems. This just gives you the downstream channel bonding, but does not have the upstream channel bonding IPv6, or the security features that makes DOCSIS 3.0 so enticing. The other issue that arises is "do the modems they're selling today, have the ability to be upgraded to full DOCSIS 3.0"? Well in a short the answer is "no" they will not. The reason for this lack of upgrade ability is the Broadcom chipset supporting the 256-bit AES encryption and the additional upstream tuners are not available today. This chipset is needed to implement the security functions required in the DOCSIS 3.0 specification. At this point the chips are not 100% ready or at least not in mass production. So no matter how bad you want to get your network to DOCSIS 3.0 you are faced with the lack of true DOCSIS 3.0 modems. If you do decide on using Pre-DOCSIS 3.0 downstream only modems you need to make sure the modems you buy are not proprietary and bound to a specific brand of CMTS. If that is the case you would be in a predicament if you ever choose to switch CMTS vendors. Not only would this cause a headache for your customers, but it would create an unnecessary capital investment as you would have to forklift all the proprietary modems and replace them with newer 100% DOCSIS 3.0 modems.

With these new DOCSIS 3.0 modems slated to cost multiple hundreds of dollars each, this would be an unwelcome PO in your accounting department. So choose your modem carefully and make sure they can be upgraded or you may be regretting your decision to arrive early at the DOCSIS 3.0 party. Another large obstacle will be the price of the modem. Currently you can buy DOCSIS 2.0 modems in bulk for roughly $40.00USD.

These newer DOCSIS 3.0 modems are rumored to initially cost anywhere from $100-$250 each. With a DOCSIS 3.0 modem costing that much it is prohibitively expensive to put one in every home. It's very likely that these modems won't make it to the residential customer anytime soon. The DOCSIS model is built around standards so nothing is going to stop a power user from going to their local WalMart or BestBuy and paying $250.00USD for a new DOCSIS 3.0 modem. On the other hand, not many users have that kind of money to spend on a modem and there is little justification for stores to even carry them. Why as a consumer would you pay hundreds of dollars more for a modem when the old modem works and is basically free in comparison.

So the question is, how do you transition from your current DOCSIS 1.x/DOCSIS 2.0 network to a full 3.0 network? I don't see the move to DOCSIS 3.0 happening nearly as fast as the industry is buzzing and it will most likely start with business customer first. These business customers have a more attractive ROI and can justify the capital being spent on them. Once the efficiency of manufacturing gets in place these modems will cost less, but the raw cost of multiple tuners and brand new chips will always make them more expensive than a DOCSIS 2.0 modem. The true cost breakthroughs will come when the raw materials come down in cost. Single chips that can replace multiple tuners, more chips being produced thus further lowering the initial cost to the manufacturer. This is years away but once it happens the cost per modem will drop, also an MSO's ability to negotiate pricing and buy in bulk will further expedite this process.

I think once the modems are around $60.00 wholesale you will see the MSO's stocking up on them and installing them in residential "power user" homes. The cable industry is in a period of growth with many new technologies providing never before seen opportunities. If they want to party it's going to cost them billions to get to the next level, but when they do get there the customer experience will be amazing. Hopefully we will catch up with many of the Asian MSO's and be able to make a 100+Mbps just a simple mouse click away.

The 3 Major Players

DOCSIS 3.0

Pros:

- IPv6
- Bandwidth (Downstream 100mbps+ & Upstream 50+mbps)
- 256 bit AES encryption
- SNMP v3
- Channel Bonding (Upstream & Downstream)
- IPDR
- Support IGMPv3
- Multicast QoS
- Improved ability to monitor DOCSIS devices

Cons:

- Availability
- Complexity
- Cost
- Number of vendors
- Having to replace parts of network
- RF bandwidth needed
- RF plant conditions to support higher QAMs
- 2-4 DS carriers have to be adjacent to each other
- Only one of the bonded channels has the MAC/scheduling info inside it
- VoIP Protection currently only on one downstream (not in the edge QAM)

References:
Many vendor presentations (Cisco, Motorola, Bigband, Arris)
Cablelabs listed public specs (www.cablelabs.com)
Google (www.google.com)

Published:
Slimjim100 Blog (http://slimjim100.com/Is%20DOCSIS%203.0%20here%20now.pdf)
Network World (http://www.networkworld.com/community/taxonomy/term/9076)