Cable Operator Deploys World's First Commercial DOCSIS® 3.0 Implementation

Motorola's DOCSIS 3.0-Qualified CMTS and DOCSIS 3.0-Certified SURFboard® Cable Modem Solution Enables Asian Cable Operator to Provide Standards-Based 160 Mbps Ultra-Broadband Services.

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By being an early innovator in deploying DOCSIS 3.0 and channel bonding, this cable operator has strengthened its broadband leadership nationwide. It has increased its revenues and market share, and has successfully positioned its premium high-speed services against competitive threats from VDSL and FTTP providers. This MSO has protected its existing investment in DOCSIS 1.x and 2.0 network assets, and supports all DOCSIS-based customer premises equipment over a common HFC network.

One of the largest multiple system operators (MSOs) in the Asia-Pacific region has aggressively implemented DOCSIS 3.0 to offer new services, increase market share, and successfully compete with incumbent telecom carriers. This leading cable operator—which asked to be un-named in this article—has implemented a national deployment of DOCSIS 3.0 and is leveraging Motorola's standards-based channel bonding solutions to deliver ultra-broadband experiences to their premium customers.

This MSO provides cable television, high-speed Internet access, telephony, and mobile services to customers nationwide, and its digital television service is a mixture of about 100 HD and SD channels. It selected Motorola's DOCSIS 3.0-qualified BSR 64000 Cable Modem Termination System (CMTS) and DOCSIS 3.0-certified SURFboard cable modems to deliver up to 160 Mbps downstream throughput and 10 Mbps upstream throughput to residential and commercial ultra-broadband service customers.

This deployment allows the MSO to efficiently deliver accelerated personal media experiences in a highly competitive broadband market. It reaffirms Motorola's global video and high-speed data leadership position and Motorola's ability to deliver broadband everywhere using DOCSIS 3.0 solutions.

What is DOCSIS 3.0?

DOCSIS 3.0 allows cable operators to take advantage of the extra capacity enabled by the initiative's channel-bonding technology in order to offer ultra-broadband services. With Motorola's solution, operators can protect their investments in existing assets while leveraging existing CMTS/edge router platforms. Motorola's ultra-broadband solution allows cable operators to implement DOCSIS 3.0 by relying on Motorola products and professional services expertise to enable them to increase revenues, reduce churn, and gain/retain high-value subscribers by offering them innovative differentiating ultra-broadband services.

DOCSIS 3.0 outlines specifications for IP transport over hybrid fiber coax (HFC) access networks to enable cable operators to deliver new ultra-high-speed data, voice, and video services, which, in turn allows them to create closer bonds with their subscribers. These specifications also provide a clearer migration path to the delivery of IPTV and provide better support for managing IP addresses. In fact, DOCSIS 3.0 is a very large set of specifications, which potentially makes it a daunting task for vendors to implement DOCSIS 3.0 compatibility. From the headend to the home or business, Motorola provides the end-to-end products that allow cable operators to swiftly deploy new ultra-broadband services that leverage DOCSIS 3.0.

Motorola offers standards-based DOCSIS 3.0-based solutions and has significantly contributed to the development of these standards. Further, Motorola supports the delivery of ultra-broadband services that leverage DOCSIS 3.0 channel bonding. Cable operators can deploy the DOCSIS 3.0-qualified BSR 64000 CMTS/edge routers and DOCSIS 3.0-certified Motorola SURFboard cable and digital voice modems to take advantage of the DOCSIS 3.0 specifications today, while continuing to leverage their legacy DOCSIS customer premises equipment (CPE). DOCSIS 3.0 is key to the future of home networking because it allows cable operators to dramatically increase the capacity available to subscribers so they can create innovative bundles of services that increase revenues and market share.

Bonding Four Physical Channels Into a Single Logical Channel

The market demand for increasing Internet access speeds was a driving force behind the development of the DOCSIS 3.0 standards. Cable operators worldwide are wrestling with finding the most optimal means to deploy tiered, high-speed ultra-broadband services, which are necessary for maintaining a competitive edge in a landscape that is seeing an accelerating amount of fiber-deep deployments.

Channel bonding creates major opportunities for cable operators to gain a competitive advantage by delivering higher-speed services. The path to ultra-broadband services greater than 50 Mbps can be started today by deploying standards-based, DOCSIS 3.0 channel bonding. Cable operators can leverage channel bonding to deliver ultra-broadband services that discourage existing subscribers from migrating to competing service providers. Channel bonding is a standards-based solution that enables cable operators to compete more effectively with other carriers, who are increasingly providing ultra-broadband services via FTTP or copper-based VDSL technologies.

DOCSIS 3.0 channel bonding provides a standardized approach to bonding multiple physical channels into a single, virtual, high-bandwidth channel. This is achieved by combining multiple RF channels to create a single virtual channel, and it allows cable operators to provide ultra-broadband services to both commercial and residential subscribers. Before DOCSIS 3.0, a single cable modem could access only a single channel, therefore the maximum bandwidth that any single cable modem could achieve was the peak capacity of that channel. Cable operators can now leverage industry standards to provide cable modems with access to multiple channels to increase peak bandwidth capacity.

Channel bonding solutions from Motorola allow cable operators to deliver increased bandwidth to a given cable modem by transmitting DOCSIS frames across multiple RF channels in parallel. This enables increased throughput between a cable modem and a CMTS by sending packets on multiple streams at the same time. To gain a competitive edge, cable operators can bond up to four physical channels to offer ultra-broadband services today. By deploying the BSR 64000 in the headend or distribution hub and Motorola SURFboard DOCSIS 3.0 cable and digital voice modems at the locations of residential or commercial subscribers, operators worldwide can deploy channel-bonding solutions today to deliver ultra-broadband services.

The Need for Ultra-Broadband Services

In the Asia-Pac country served by the cable operator featured in this article, there is a strong interest in ultra-broadband data services that deliver over 50 Mbps downstream capacity to support advanced multimedia services, such as network-based multi-player gaming, high-quality video conferencing and peer-to-peer networking. Video streaming and downloading are among the drivers for DOCSIS 3.0 deployments, and ABI Research estimates that consumers worldwide will view 70 billion videos via the Internet annually by 2012.

"Motorola's deep knowledge of cable networks and DOCSIS channel-bonding technology and its leadership position in the video and high-speed data markets are key reasons why we deployed a DOCSIS 3.0-based solution from Motorola," said a senior engineering manager for the MSO. "Motorola's DOCSIS 3.0 solution provides a true next-generation broadband foundation and is allowing us to substantially grow our broadband service portfolio while protecting existing investments in currently deployed DOCSIS solutions."

"Cable operators worldwide are seeking new ways to bring their customers innovative and value-added services which are geared towards Web 2.0," said Alan Lefkof, Corporate Vice President and General Manager, Broadband Home Gateways and Software Group, Home & Networks Mobility, Motorola. "We are honored to be involved with this leading cable operator and their first commercial deployment of up to 160 Mbps DOCSIS 3.0 channel bonded broadband services. Using Motorola's proven channel-bonding solution, this cable operator is able to provide customers incredible personal media experiences."

This Motorola customer migrated to DOCSIS 3.0 primarily in response to competitive threats from carriers offering ultra-broadband services over VDSL or in fiber to the premises (FTTP) implementations to deliver over 100 Mbps. "The broadband market in our country is highly competitive, and subscribers greatly value high-speed throughput," explained the senior engineering manager for the MSO. "We migrated to DOCSIS 3.0 so we could gain a competitive advantage over carriers by offering 160 Mbps services using channel bonding. Market dynamics drove us to move quickly. We could not wait any longer, and we worked closely with Motorola to develop a cost-effective migration path that would allow us to quickly increase revenues and market share."

Aggressive Pricing Drives Market Share Growth

This Motorola customer is using the Motorola solution to power its high-end data service, capping shared downstream speeds at 160 Mbps via the bonding of four 6 MHz channels. This premium service is available to customers living in single dwelling units, individual homes, and smaller apartment buildings.

About the SB6120 SURFboard eXtreme Cable Modem

Motorola's easy-to-use SB6120 SURFboard eXtreme Cable Modem unlocks the potential of offering innovative high-bandwidth data and multimedia services to customers. Utilizing the power of DOCSIS 3.0, the SB6120 enables channel bonding of up to four downstream channels and four upstream channels—which allows an operator to offer their customers advanced multimedia services with data rates of well over 100 Mbps in each direction.

About the BSR 64000

The DOCSIS 3.0-qualified BSR 64000 is a high-density, fully redundant (CMTS)/ intelligent edge router that enables broadband operators to rapidly introduce differentiated data, voice and multimedia services for both corporate and residential subscribers. It also offers the robust routing, flexibility and scalability required to support emerging revenue-generating services, such as high-speed ultra-broadband services, voice-over-IP (VoIP) and Virtual Private Networks (VPNs).

At the rough equivalent of about $65 USD or €46 per month, this premium service costs slightly more than this cable operator's single-channel, 30 Mbps downstream offering. "Based on our marketing experience, we initially estimated that less than 15% of new subscribers would pay a premium price for higher-speed service," said the Motorola customer. "But market acceptance of our ultra-broadband services exceeded our expectations." This cable operator is now benefitting from a take rate of approximately 25%, as subscribers opt for the premium service, and the premium service already has over 30,000 subscribers. "That figure is 10% more than we expected," he said.

This cable operator is already planning to deploy additional services over its ultra-broadband network. "Motorola continues to add new features to the BSR 64000, allowing us to add new services to our subscribers," said the senior engineering manager. "By relying on a standards-based DOCSIS 3.0 solution, we are able to safely and swiftly deploy channel bonding, and Motorola offers the breadth of products and services that allow us to continue to add value to our subscribers."

An Efficient and Economical Migration to DOCSIS 3.0

Channel bonding allowed this MSO to bundle four times the bandwidth of conventional services to achieve downstream speeds of up to 160 Mbps. This cable operator began by implementing a Motorola pre-DOCSIS 3.0 channel bonding implementation in several markets in 2006 and 2007. The service was initially launched regionally, and was then gradually deployed nationwide.

Motorola initially offered a solution before the DOCSIS 3.0 specifications were finalized. This MSO deployed Motorola's BSR 64000 CMTS/edge router in their headends and Motorola SURFboard cable modems at the customer premises. Since the initial trials, the BSR 64000 has received CableLabs Bronze qualification for DOCSIS 3.0, and the SB6120 SURFboard eXtreme cable modem received CableLabs DOCSIS 3.0 certification.

Since 2008, this MSO has been gradually implementing 160 Mbps Internet access service. This service is the world's first commercial Internet service complying with the DOCSIS 3.0 standard. It utilizes the cable operator's existing HFC network, catering mainly to single-dwelling units and smaller

Adding Value Through Whole-Home Service Assurance

Cable operators implementing DOCSIS 3.0 solutions can extend the value of their ultra-broadband service offerings by offering IP-based device management services that allow MSOs to ensure the success of broadband services throughout the connected home.

The Motorola Netopia® Broadband Server (NBBS) remote device management software platform, a key component of Motorola's Whole-Home Service Assurance solutions suite, allows cable operators to grow broadband service revenues and improve customer care while reducing operational and support costs. Through automated / centralized service provisioning and comprehensive device management, NBBS simplifies the increasingly complex digital home by managing a myriad of IP-based consumer premise equipment, including cable modems, VoIP phones, wireless base stations, and set-top terminals. In fact, over 20 service providers worldwide are already adding value to their broadband offerings by leveraging the NBBS to manage over 15 million CPE devices.

"In the highly-competitive market for broadband subscribers, O2 Germany is the first to deliver a zero-touch installation experience to customers in our market," said Peter Hlawna, Manager of User Equipment Engineering for O2 Germany. "This feature of NBBS virtually eliminates costly truck rolls. With NBBS in place we see the additional benefits of simplicity. After initial deployment, O2 can control the CPE, a domain that was previously impossible to manage remotely. Now we have the benefit of knowing exactly which equipment is out there, and if there is a problem we can quickly identify and test it. NBBS allows us to manage the firmware in the CPE. Among other things, we can ensure the appropriate version has been deployed. This dramatically streamlines operations and reduces costs."

To expedite time-to-market, Motorola also provides value-added professional-service expertise to help cable operators manage the end-to-end delivery of their voice, video and high-speed data services to the connected home across different networks and devices. Motorola's NBBS solution provides the link between services and devices so MSOs' can rapidly deploy new and sophisticated subscriber equipment that enables operators to remotely access, configure and troubleshoot CPE devices in the home. It can even activate new devices and help cable operators manage the customer's home network.

multi-dwelling units. "When considering the combined benefits of speed, enhanced security, and a competitive usage fee, it is clear that our 160 Mbps service is more attractive and competitive than FTTH," he said.

"It is important that we let our customers and prospects know that we are offering enough capacity to support very high-speed network services," he added. "We began working with Motorola before the BSR 64000 was certified so we could understand how to best deploy DOCSIS 3.0 nationwide, and when the BSR 64000 received Bronze qualification we upgraded the software and offered standards-based DOCSIS 3.0 services."

This MSO now provides subscribers access to enhanced Internet services while maintaining uninterrupted support of existing operations and interoperability with currently deployed DOCSIS 1.x and 2.0 cable modems. The BSR 64000 supports DOCSIS 3.0 as well as legacy cable modems, allowing MSOs to implement a cost-effective migration path to DOCSIS 3.0 while protecting investments in deployed cable modems. Motorola's DOCSIS 3.0 CMTS channel-bonding solution is designed to help operators remain competitive and increase market share while establishing long-term subscriber relationships. Channel-bonding technology provides cable operators with an economic option to deliver ultra-broadband throughput to residential subscribers without the need for a HFC plant upgrade.

With the option to deploy fully-redundant bandwidth, Motorola's DOCSIS 3.0 channel-bonding solution provides a foundation for true commercial service capabilities and supports substantial growth of subscribers with support from IPv6 which incorporates improved address space, enhanced Quality of Service (QoS) capabilities, and increased data security over current-generation technology.

Gaining a Competitive Advantage

By being an early innovator in deploying DOCSIS 3.0 and channel bonding, this cable operator has strengthened its broadband leadership nationwide. It has increased its revenues and market share, and has successfully positioned its premium high-speed services against competitive threats from VDSL and FTTP providers. This MSO has protected its existing investment in DOCSIS 1.x and 2.0 network assets, and supports all DOCSIS-based customer premises equipment over a common HFC network. Approximately 25% of new subscribers opt for the premium high-speed services, allowing this Motorola customer to realize higher margins on data services.

"Motorola offers a standards-based, DOCSIS 3.0 solution that has allowed us to efficiently implement channel bonding, and we now offer our 160 Mbps downstream services nationwide while continuing to support legacy cable modems over the same infrastructure," said a senior engineering manager for this Motorola customer. "We work closely with Motorola to optimize our service, improve operational efficiency, and enhance service assurance while scaling our access networks."

For More Information

To find out more about deploying DOCSIS 3.0, contact your Motorola account representative or visit www.motorola.com/ultrabroadbandsolutions.

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