COMMSCOPE®

# The Evolving CMTS Chassis: Low Latency DOCSIS® and the E6000® Converged Edge Router

Interest in Low Latency DOCSIS is on the rise. In the past, network latency was largely an issue for the online gaming community, where lag times caused by latency could impact response times for gamers and put them at a disadvantage when playing online against other gamers. Today, however, gaming is just one of many online activities in which latency can negatively impact the user experience. As consumers begin adopting latency sensitive services such as video conferencing, augmented and/or virtual reality, and voice services, they'll expect flawless performance when they use them.

Latency, however, can be a source of frustration to these consumers due to delays incurred in the network; these delays are caused by the time it takes information packets to go from the sender (the end user) to the receiver (the network CMTS) and back again. Latency isn't a bandwidth issue, though; delays aren't the result of a network's capacity or lack thereof. Rather, latency is a messaging (or "pinging") issue, so adding bandwidth to a network won't address latency problems. Interactive applications, such as those mentioned above, simply require faster packet communication times between the subscriber's location and the headend to operate smoothly. Compounding the problem is that during peak traffic times, latency can spike dramatically, which can further compromise packet communication in the network; while typical latency in a DOCSIS 3.1 network is ~10–20 milliseconds (ms), latency under peak network traffic can spike as high as 100 ms or more. These spikes, in turn, can create an even more unstable user experience, beset by lag, video buffering, and jitter.

Networks configured for Low Latency DOCSIS, on the other hand, can always maintain a consistent latency of under~10 ms for targeted applications, no matter how heavy the network traffic. Enabling Low Latency DOCSIS enables applications that require stringent low latency to assure Quality of Service (QoS), even when there is substantial network load and head-of-line bloacking due to other network traffic. For example, gaming applications, which transmit packets on demand and expect a rapid response from the gaming servers are assigned to a low latency queue with appropriate traffic classification. Other applications, such as file downloads or transfers, which don't have to transmit and receive packets quickly to function properly and don't typically cause latency problems, are assigned to a different queue that uses "classic" methods of communication between the end user and the headend.

MSOs can deploy Low Latency DOCSIS by upgrading DOCSIS 3.1 modems and gateways and their CMTS with software that supports low latency provisioning and tools. CommScope currently offers software Release 14 for its E6000 Converged Edge Router (CER) for MSOs who want to upgrade their networks to support Low Latency DOCSIS. Building off software Release 12 and Release 13's expanded latency support, software Release 14 supports several new Low Latency DOCSIS functions that provide enhanced network responsiveness for interactive services, including:

- Expanded support for downstream Low Latency DOCSIS service flows with AQM coupling, enabling fairer service splits between Classic and Low Latency queues

- Improved support for Low Latency DOCSIS classifiers, fully managed from the E6000 CER, which simplifyies the ability to add new classifiers as needed
- Support for multiple low latency Aggregate Service Flow (ASF) provisioning scenarios: SF-SCN ASF Expansion; ASF-AQP-ASF Expansion; and ASF-EXPLICIT

While bandwidth doesn't directly impact Low Latency DOCSIS deployments, MSOs should note that software Release 14 also supports D3.1*Enhanced* (D3.1*E*) operation in DOCSIS 3.1 mid-split and high-split networks. MSOs who operate at these bandsplits can leverage Release 14's support for D3.1*E* technology, which greatly expands downstream bandwidth to the subscriber by using next-generation DOCSIS 3.1+ and 4.0 CPE devices and bonding more OFDM channel blocks together than was possible with previous generation DOCSIS 3.1 CPE devices. When operating in conjunction with these CPE devices, an E6000 CER with Release 14 can support up to five OFDM downstream channels instead of the two OFDM channels available in standard DOCSIS 3.1 networks. With a simple upgrade to Release 14, MSOs can easily and economically deploy an unbeatable combination of enhanced performance (via Low Latency DOCSIS) and capacity (via D3.1*E*) without costly equipment upgrades or invasive network rebuilds.

E6000 software Release 14 demonstrates CommScope's ongoing commitment to help MSOs get the most out of their current network assets. By enhancing the performance and capacity of E6000 CERs, MSOs can extend the lives of their current deployments for the foreseeable future. Doing so supports the monetization of these assets while maintaining a competitive value proposition with consumers and getting the best return on investment from any field upgrades they deploy. CommScope will continue to enhance and expand E6000 CER features in future releases to keep pace with cutting-edge network technologies like Low Latency DOCSIS and D3.1E and improve the return on investment MSOs can realize from these upgrades.

CommScope pushes the boundaries of communications technology with game-changing ideas and ground-breaking discoveries that spark profound human achievement. We collaborate with our customers and partners to design, create and build the world's most advanced networks. It is our passion and commitment to identify the next opportunity and realize a better tomorrow. Discover more at commscope.com

COMMSCOPE®

commscope.com

Visit our website or contact your local CommScope representative for more information.

© 2025 CommScope, LLC All rights reserved.

CommScope and the CommScope logo are trademarks of CommScope and/or its affiliates in the U.S. and other countries. For additional trademark information see https://www.commscope.com/trademarks. DOCSIS is a trademark of Cable Television Laboratories, Inc. All product names, trademarks and registered trademarks are property of their respective owners.

ANS-MKTG-ART-003-25(06/25)_RevB