



Solution Overview

This chapter provides an overview of the Cisco Cable Wideband Solution, Release 1.0, and contains the following major topics:

- [Solution Description and Scope, page 1-1](#)
- [Solution Key Features, page 1-3](#)
- [Solution Components, page 1-3](#)

In this document, the terms *wideband channel*, *bonded channel*, and *bonding group* have the same meaning: a logical grouping of one or more physical radio frequency (RF) channels over which MPEG-TS packets are carried.

Solution Description and Scope

Cisco IOS Release 12.3(21)BC and 12.3(21a)BC3 support the DOCSIS 3.0 Downstream Channel Bonding feature, which is the key feature of the Cisco Cable Wideband Solution, Release 1.0.

In the Cisco Cable Wideband Solution, Release 1.0, the DOCSIS 3.0 Downstream Channel Bonding feature supports downstream wideband channels consisting of multiple bonded RF channels. The solution provides wideband data services over existing hybrid fiber coax (HFC) networks. With wideband data services, multiple RF channels are aggregated into a single logical wideband channel (bonding group) that delivers higher bandwidth to the wideband cable modem than was previously possible with DOCSIS 2.0 technology. This aggregation of RF channels is referred to as “channel bonding.”

The maximum bandwidth supported depends on the number of RF channels that can be aggregated into a wideband channel. For example:

- The Linksys WCM300-NA wideband cable modem supports downstream throughput of up to approximately 292 Mbps (with a wideband channel consisting of eight RF channels at 6 MHz and 256 QAM).
- The Scientific Atlanta DPC2505 wideband cable modem supports downstream throughput of up to approximately 74 Mbps (with a wideband channel consisting two RF channels at 6 MHz and 256 QAM).

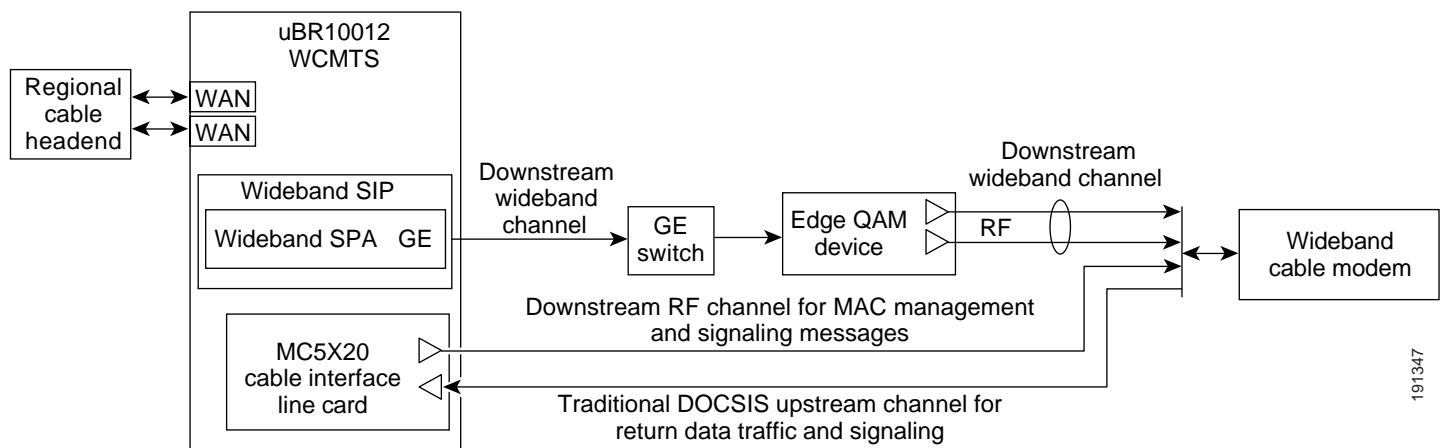
The Cisco Cable Wideband Solution, Release 1.0, can be deployed in parallel with DOCSIS 1.X/2.0 technology. The CMTS supports DOCSIS 1.X/ 2.0 modems on non-wideband ports while wideband cable modems deliver higher-speed throughput on the wideband ports.

Architecture and Scope

Figure 1-1 presents a simplified view of the Cisco Cable Wideband Solution, Release 1.0. In Figure 1-1, two RF channels are bonded into a wideband channel (bonding group). The Cisco Cable Wideband Solution includes these major components:

- Wideband cable modem termination system (WCMTS)—Cisco uBR10012 router
- Cisco Wideband SPA (Shared Port Adapter) and Cisco Wideband SIP (SPA Interface Processor)
- Edge QAM (EQAM) device
- Wideband cable modem (WCM)

Figure 1-1 Cisco Wideband Cable System



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In Scope

The scope of the Cisco Cable Wideband Solution, Release 1.0, comprises fully tested and supported Cisco and Scientific Atlanta components, as well as selected third-party components tested for interoperability by Cisco. The following aspects of the solution are in scope:

- DOCSIS 3.0 Downstream Channel Bonding software
- One or more downstream wideband channels with RF channel bonding
- Wideband CMTS (Cisco uBR10012 router) including cable interface and network uplink line cards
- Cisco Wideband SIP and Cisco Wideband SPA
- Edge QAM device
- Wideband cable modem
- Wideband-related cable modem configuration file parameters
- Cisco IOS command set for wideband-channel configuration, provisioning, and maintenance
- Cisco IOS command set for wideband hardware monitoring, troubleshooting, and debugging
- MIBs for the wideband CMTS, wideband cable modem, and wideband channel and service statistics

Device configuration that is in scope for this document is limited to the Wideband SIP and Wideband SPA. Comprehensive documentation for other CMTS components is provided in the existing Cisco uBR10012 documentation set, which is accessible at www.cisco.com.

For information on edge QAM device installation and software configuration, refer to the vendor's edge QAM device documentation.

Out of Scope

The Cisco Cable Wideband Solution-related information in this document pertains to the components listed in “[In Scope](#)” section above. Not included in the scope of the Cisco Cable Wideband Solution are the hardware and software components that make up the remainder of the cable data network.

For the Cisco Cable Wideband Solution, Release 1.0, cable network management tools and operations support system (OSS) facilities for wideband cable are outside the scope of the solution.

Solution Key Features

The Cisco Cable Wideband Solution, Release 1.0, provides the following key features:

- Pre-DOCSIS 3.0 version of wideband cable that uses packet bonding
- Channel-bonded wideband downstream channels
- Traditional DOCSIS 2.0 upstream channels
- Solution can be deployed in parallel with DOCSIS 1.X/2.0 technology.
- Existing Cisco uBR10012 router (CMTS) can be upgraded to wideband CMTS with add-on components.
- Modular CMTS architecture makes use of external edge QAM devices.
- Cisco uBR10012 router (CMTS) supports up to two Wideband SPAs in a Wideband SIP jacket card.
- Each Cisco Wideband SPA can support up to 24 downstream RF channels.
- Each Cisco Wideband SPA can support up to 12 logical wideband channels (bonding groups).
- Cisco Wideband CMTS and line cards have built-in redundancy and resiliency features.
- Scientific Atlanta and third-party edge QAM devices are tested for interoperability.
- Linksys WCM300-NA, WCM300-EURO (for EuroDOCSIS), and WCM300-JP (for J-DOCSIS) wideband cable modems support the receiving of up to eight RF channels, which can be bonded into wideband channels. One traditional DOCSIS downstream channel is used for MAC management and signalling messages.
- Linksys WCM300-NA, WCM300-EURO, and WCM300-JP wideband cable modems support one primary bonded (wideband) channel for unicast and multicast traffic and up to two secondary bonded channels for multicast traffic.
- Scientific Atlanta DPC2505 and EPC2505 wideband cable modems support one bonded downstream channel consisting of two RF channels, and support one traditional DOCSIS downstream channel for MAC management and signalling messages.

Solution Components

Cisco Cable Wideband Solution, Release 1.0, consists of Cisco, Linksys, and Scientific Atlanta components that are tested, documented, and fully supported by Cisco, Linksys, or Scientific Atlanta. Also, third-party equipment, although not fully supported by Cisco, has been selected and tested for interoperability with the solution components.

Cisco, Linksys, and Scientific Atlanta Equipment

For the Cisco Cable Wideband Solution, Release 1.0, the following Cisco, Linksys, and Scientific Atlanta equipment have been tested in the context of the solution.

- Cisco uBR10012 universal broadband router with PRE2 processor modules and these components:
 - Cisco SPA Interface Processor (SIP) for the 1-Gbps Wideband SPA—referred to in this document as the Cisco Wideband SIP or Wideband SIP
 - Cisco 1-Gbps Wideband Shared Port Adapter (SPA)—referred to in this document as the Cisco Wideband SPA or Wideband SPA
 - Cisco uBR10-MC5X20S/U/H and uBR10-MC5X20U-D cable interface line cards
- Edge QAM device
 - Scientific Atlanta Continuum DVP XDQA24 EQAM device
- Wideband cable modem
 - Linksys WCM300-NA, WCM300-EURO, and WCM300-JP wideband cable modems
 - Scientific Atlanta DPC2505 and EPC2505 wideband cable modems

Third-Party Equipment

For the Cisco Cable Wideband Solution, Release 1.0, [Table 1-1](#) lists the third-party component, vendor, and the basic functionality each component provides.

Table 1-1 *Component Partners and Basic Functionality*

Component and Vendor	Basic Functionality
Harmonic NSG 9116 www.harmonicinc.com	Edge QAM device
Harmonic NSG 9000 www.harmonicinc.com	Edge QAM device
Vecima Networks VistaLynx VL1000 www.vecimanetworks.com	Edge QAM device