



CHAPTER 1

Broadband Access Center Overview

This chapter gives an overview of Cisco Broadband Access Center, Release 4.0, hereafter referred to as BAC.

This chapter details:

- [Introduction to BAC, page 1-1](#)
- [Technologies and Features, page 1-1](#)

Introduction to BAC

BAC automates the tasks of provisioning and managing customer premises equipment (CPE) in a broadband service-provider network.

With the high-performance capabilities of BAC, you can scale the product to suit networks of virtually any size, even those with millions of devices. It also offers high availability, made possible by the product's distributed architecture and centralized management.

BAC is designed to handle the rapid growth of service providers. It targets broadband service providers (including multiple service operators), internet, and voice service providers who want to deploy IP data, voice, and video on hybrid fiber and coaxial cable networks.

BAC provides such critical features as redundancy and failover. It can be integrated into new or existing environments through a provisioning application programming interface (API) that lets you control how BAC operates. You can use the provisioning API to register devices in BAC, assign device configurations, and configure the entire BAC provisioning system.

The predominant feature of this release is support for provisioning and managing of CPE that is compliant with the DOCSIS 3.0 specification. With IP version 6 (IPv6) being a large subset of DOCSIS 3.0, this release supports DHCPv6 and DNSv6.

Technologies and Features

This section describes the technologies and features that this BAC release supports.

- [Supported Technologies and Standards, page 1-2](#)
- [Supported Devices, page 1-4](#)
- [Features and Benefits, page 1-4](#)

Supported Technologies and Standards

BAC incorporates support for many technologies to provide provisioning services for your network. These technologies include:

- DOCSIS high-speed data
- PacketCable voice service, both Secure and Basic workflows
- Non-secure CableHome provisioning

DOCSIS High-Speed Data

The Data Over Cable Service Interface Specification (DOCSIS) defines functionality in cable modems that are involved in high-speed data distribution over cable television system networks. Using this feature, MSOs can provide a variety of services through an “always-on” Internet connection. These services include broadband Internet connectivity, telephony, real-time interactive gaming, and video conferencing.

This BAC release, besides supporting DOCSIS 1.0, 1.1, and 2.0, provisions and manages CPE that is compliant with DOCSIS 3.0. The DOCSIS 3.0 specification defines the third generation of high-speed data-over-cable systems specification and provides for:

- Provisioning of IPv6 devices
- Expanded addressability of network elements
- Increased channel capacity via channel bonding
- Enhanced network security
- Enhanced multicast capabilities
- New service offerings

PacketCable Voice Services

PacketCable voice technology enables the delivery of advanced, real-time multimedia services over a two-way cable network. PacketCable is built on top of the infrastructure supported by cable modems to enable a wide range of multimedia services such as IP telephony, multimedia conferencing, interactive gaming, and general multimedia applications.

Using PacketCable voice technology, you can provide additional services, such as basic and extended telephony services, in a broadband network. For this purpose, PacketCable is an efficient and cost-effective option.

BAC supports the Secure and Basic variants of PacketCable. PacketCable Basic and PacketCable Secure are much the same, except for reduced security found in the Basic variant.

**Note**

BAC currently supports versions 1.0, 1.1, and 1.5 of the PacketCable specifications.

Euro-PacketCable services are the European equivalent of the North American PacketCable standard. The only significant difference between the two is that Euro-PacketCable uses different MIBs.

CableHome

Non-secure CableHome 1.0 provisioning (hereafter referred to as home networking technology) is built on top of the existing DOCSIS standard and supports a 'plug and play' environment for residential broadband connectivity. This form of home networking technology encompasses a DOCSIS home access device with support for CableHome. This device is known as Portal Services and is considered to be the home's entry point.

Supported Standards

The BAC servers comply with these applicable Requests for Comments (RFCs), protocols, standards, and Internet Engineering Task Force (IETF) drafts.

- IPv6—Complies with RFC 2460 (IPv6 specification), 2461 (Neighbor Discovery protocol), 2462 (Stateless Address Autoconfiguration) 2463 (Internet Control Message Protocol–ICMP), 3513 (Addressing Architecture).
- DHCPv6—Complies with RFC 3315 (DHCPv6 specification), 3633 (IPv6 Prefix Options), 3736 (Stateless DHCP Service for IPv6), 4014 (Remote Authentication Dial-In User Service–RADIUS–Attributes Suboption for the Relay Agent Information Option), 4580 (Relay Agent Subscriber-ID Option), 4649 (Relay Agent Remote-ID Option), and 4704 DHCPv6 Client Fully Qualified Domain Name (FQDN) Option.
- IPv4 and IPv6 Interoperability—Complies with RFC 4038 (Application of IPv6 Transition), and 4472 (Operational Issues and Considerations with IPv6 DNS).
- TFTP and ToD servers—Complies with RFC 868 (Time Protocol) and 2349 (TFTP Block Size Option).

Additionally, BAC complies with these applicable CableLabs and Comcast standards:

- DOCSIS 3.0 Specifications:
 - CM-SP-SECv3.0-I04-070518
 - CM-SP-PHY3.0-I04-070518
 - CM-SP-MULPIv3.0-I04-070518
 - CM-SP-OSSIV3.0-I03-070518
- DOCSIS 2.0 Specification CM-SP-RFI2.0-I12-071206
- DOCSIS L2VPN Specification CM-SP-L2VPN-I06-071206
- PacketCable MTA Device Provisioning Specification PKT-SP-PROV1.5-I03-070412
- CableHome CH-SP-CH1.0-I05-030801
- COMCAST-SP-RNG-200-ProvOSS-I04-070102
- OpenCable specification OC-SP-HOST2.0-CFR-I13-070323

Supported Devices

In this release, BAC supports provisioning and managing of:

- IPv6 devices, which include:
 - Cable modems compliant with DOCSIS 3.0
 - Computers
 - Set-top boxes (STBs)
- Video STBs, specifically the RNG-200 STB, which is based on the evolving OpenCable Application Platform
- Variants of eSAFE (embedded Service/Application Functional Entities) devices, such as mixed-IP mode PacketCable Multimedia Terminal Adapters (MTAs). A mixed-IP mode MTA is an eSAFE device that consists of an IPv6 embedded cable modem and an IPv4 eMTA. This class of devices embeds additional functionality with cable modems, such as packet-telephony, home networking, and video.

BAC provisions the following device types:

- Cable modems and STBs compliant with DOCSIS 1.0, 1.1, and 2.0
- Embedded Multimedia Terminal Adapters (eMTAs) compliant with PacketCable versions 1.x
- Devices compliant with CableHome 1.0
- Computers

Features and Benefits

BAC lets multiple service operators (MSOs) meet the rapidly changing demands for data over cable services. Using BAC, you can realize these benefits:

- Massive scalability. The BAC Regional Distribution Unit can support up to 60 million devices, and a provisioning group can support 2 million devices, of which 500,000 can be Secure PacketCable devices.
- Easy integration with back-end systems, via BAC mechanisms such as:
 - The BAC Java API, which can be used to perform all provisioning and management operations.
 - The BAC publishing extensions, which are useful in writing RDU data into another database.
 - The SNMP agent, which simplifies integration for monitoring BAC.
 - The DPE command-line interface (CLI), which allows you to configure the DPE to suit your requirements via a “services” interface, and which simplifies local configuration when you use the CLI to copy and paste commands.
- Improved management via:
 - Provisioning group properties on the property hierarchy—Enhances the flexibility that the BAC property hierarchy provides by including the properties of a device’s provisioning group.
 - Provisioning group capabilities—Allows you to control the device type support that must be enabled for the provisioning groups in your deployment.

- Increased security via:
 - User-configurable IP addresses and ports to provide multipathing, multi-interface binding, and firewall compatibility.
 - DOCSIS 3.0 for the Extended CMTS MIC Configuration Setting, enabling BAC to use advanced hashing techniques to detect unauthorized modification or corruption of the cable modem configuration file.
 - A password policy to access the RDU from the administrator user interface. The password that you use to log in to the administrator user interface must have at least 8 characters.
 - HTTP over SSL (HTTPS), which provides access to the administrator user interface using a secure SSL connection.
- Enhanced troubleshooting and diagnostics for:
 - Device troubleshooting to provide detailed records of device interactions with BAC servers using the IDs of the devices designated for troubleshooting. Using this feature, you can focus on a single device, identified by its MAC address or its DHCP Unique Identifier (DUID), and use that diagnostic information for further analysis.
 - Server troubleshooting using diagnostics scripts to collect performance statistics—down to a specific type of statistic—for BAC servers. This release also provides many scripts to collect server and system configuration data that may be required for support escalations. You can use additional scripts to bundle the diagnostics data for support.

