



BCM 4.0 System Overview

BCM 4.0 Business Communications Manager

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Chapter 1

Getting started

About this guide

This system overview gives a high-level understanding of the core capabilities and features of the BCM 4.0 upgrade. In addition, it also indicates what capabilities and features are not supported with the BCM 4.0 upgrade.

Audience

This overview is for installers, network administrators, and anyone else who is interested in the BCM 4.0 upgrade.

Acronyms

The following is a list of acronyms used in this guide.

Acronym	Description
OS	Operating System
PVQM	Proactive Voice Quality Monitoring
QoE	Quality of Experience
FR	Frame Relay
PPP	Point-to-Point Protocol (PPP)
MCDN	Meridian Customer Defined Network
TAT	Trunk Anti-Tromboning
TRO	Trunk Route Optimization
SIP	Session Initiated Protocol
NCRI	Network Call Redirection Info
ICCL	ISDN Call Connection Limit
MWI	Message Waiting Indication
SHA1	Secure Hashing Algorithm 1
SFTP	Secure File Transfer Protocol
SNMP	Simple Network Management Protocol
KEM	Key Expansion Module
CDR	Call Detail Records

Acronym	Description
MIB	Management Information Base
CIM	Common Information Model
DMTF	Distributed Management Task Force
NCM	Network Configuration Manager
CCR	Custom Call Routing
VPIM	Voice Profile for Internet Mail
AMIS	Audio Messaging Interchange Specification
ICC	Intelligent Contact Center
CC	Call Center
PSTN	Public Switched Telephone Network
CTI	Computer Telephony Integration
LAN CTE	Local Area Network Computer Telephony Engine
IVR	Interactive Voice Response

Related publications

This section provides a list of additional documents for BCM 4.0. To locate specific information, you can refer to the *Master Index of BCM 4.0 Library*.

BCM 4.0 Unified Messaging Configuration Guide (N0060611)

CallPilot Fax Set Up and Operation Guide (P0606017)

CallPilot Message Networking Set Up and Operation Guide (N0027249)

BCM 4.0 Personal Call Manager User Guide (N0027256 02)

Contact Center Set Up and Operation Guide (N0060620)

BCM 4.0 LAN CTE Configuration Guide (N0060604)

BCM 4.0 Call Detail Recording System Administration Guide (N0060599)

How to get Help

This section explains how to get help for Nortel products and services.

Getting Help from the Nortel Web site

The best way to get technical support for Nortel products is from the Nortel Technical Support Web site:

<http://www.nortel.com/support>

This site provides quick access to software, documentation, bulletins, and tools to address issues with Nortel products. More specifically, the site enables you to:

- download software, documentation, and product bulletins
- search the Technical Support Web site and the Nortel Knowledge Base for answers to technical issues
- sign up for automatic notification of new software and documentation for Nortel equipment
- open and manage technical support cases

Getting Help over the phone from a Nortel Solutions Center

If you don't find the information you require on the Nortel Technical Support Web site, and have a Nortel support contract, you can also get help over the phone from a Nortel Solutions Center.

In North America, call 1-800-4NORTEL (1-800-466-7835).

Outside North America, go to the following Web site to obtain the phone number for your region:

<http://www.nortel.com/callus>

Getting Help from a specialist by using an Express Routing Code

To access some Nortel Technical Solutions Centers, you can use an Express Routing Code (ERC) to quickly route your call to a specialist in your Nortel product or service. To locate the ERC for your product or service, go to:

<http://www.nortel.com/erc>

Getting Help through a Nortel distributor or reseller

If you purchased a service contract for your Nortel product from a distributor or authorized reseller, contact the technical support staff for that distributor or reseller.

Chapter 2

BCM 4.0 system overview

The Nortel Business Communications Manager Release 4.0 (BCM 4.0) brings the benefits introduced with the BCM50 to the BCM200/400 platform. These benefits include a Linux operating system (OS) which enhances product security and an improved operational cost model. The BCM 4.0 release also builds upon previous BCM releases to continue to deliver a global, industry leading enterprise solution for businesses of all types and sizes. These solution enhancements include improvements in IP telephony solutions, applications and new features.

The BCM200/400 OS moves to the Nortel Corporate Linux which provides a more secure environment, direct Nortel control over the operating system for fast issue resolution and BCM portfolio migration to Linux which aligns with BCM50. Software upgrades for the installed base, BCM200/400 and BCM1000, provide investment protection.

The new Element Manager support introduced with BCM50 provides improved system programming and installation time; as well as on-going management tasks. Common operational tasks such as performing backups and applying software updates will be easily handled with the optimized tools included with the Element Manager. As well, support for Startup Profile customizes the system level programming of the BCM200/400 as well as USB port support.

Enhancements to IP telephony include support for a new way of monitoring voice quality (PVQM), new IP sets, SIP interoperability and features, and voice quality improvement for low speed links (voice enabled WAN). These BCM VoIP improvements continue to allow BCM to offer industry leading converged solutions.

Application enhancements include as the introduction of Intelligent Contact Centre, an evolution of Call Centre with more granular agent and skillset selection, simplifying the product offering. The BCM voice mail solution (CallPilot) also receives a series of enhancements there by continuing to evolve this solution and its competitiveness.

BCM 4.0 excels in the areas of security, IP telephony, applications and Ad-Hoc conferencing. Security improvements align with those introduced with BCM50 which provides a major advance in the security paradigm for BCM. These improvements, along with the Linux operating system provide a more secure environment for BCM users.

BCM 4.0 capabilities

BCM 4.0 is the next major software release for the BCM200 and BCM400 systems as well as the installed base of BCM1000 systems. It provides an improved installation and operational cost model and is built upon a Linux operating system, aligning these products with the BCM50 product. The BCM 4.0 release also brings enhanced VoIP and application capabilities as well as the addition of ad-hoc conferencing to the BCM.

Following is a detailed description of each of the incremental capabilities that BCM 4.0 will bring to the BCM200/400 platform as well as to BCM1000 platform through software upgrades.

- | | |
|--|---|
| <p>“Linux upgrade” on page 11</p> <p>“Management upgrade” on page 14</p> <p>“Proactive Voice Quality Monitoring” on page 15</p> <p>“Ad-Hoc Conferencing” on page 15</p> <p>“Meridian Customer-Defined Network Trunk Anti-Tromboning with integrated applications” on page 16</p> <p>“Voice enabled WAN” on page 16</p> <p>“Session-initiated protocol enhancements” on page 17</p> <p>“Security enhancements” on page 17</p> <p>“Terminal and mobility support” on page 20</p> <p>“Global market” on page 21</p> <p>“Intelligent Contact Centre” on page 31</p> <p>“CallPilot/Voicemail enhancements” on page 30</p> | <ul style="list-style-type: none">• Improves security and replaces WinNTE end-of-life• Reduces installation and operations costs associated with BCM with faster and easier programming, remote administration and simplified operations• Provides ability for proactive identification of voice quality of experience (QoE) issues on a per-call basis• Enables troubleshooting of voice quality issues on the LAN• Allows ad-hoc conference users to bring in more participants as required and not be limited to three• Optimizes network resource usage for call scenarios involving applications, such as Auto Attendant and voicemail• Enables customers with low-speed links (PPP, FR) for data / voice to experience improved QoS for voice traffic• Improves link utilization• Enables greater application integration• Enables H.323 users to migrate to SIP• Provides increased security capabilities, addressing a major area of customer concern• Provides ubiquitous capabilities across the BCM portfolio (enhancements introduced with BCM50 R1)• Expands the IP set portfolio to conference rooms• Expands positioning of IP offering to those solutions requiring IP KEM sets• Multilingual voice prompts• second dial tone• 12 digit support• Ability to choose the number of agents and skillsets that a customer or customer site requires• Fills the gap between Basic and Professional CC• Increased number of greeting tables• Expands set-based programming• Mailbox restrictions• Citrix support• Additional languages |
|--|---|

BCM 4.0 capability restrictions

The following items are no longer supported with BCM 4.0 software release:

Companion

- Keycodes will be unavailable with BCM 4.0 and sets will no longer work
- BCM3.7 introduces a new digital mobility solution which will be supported with BCM 4.0
- T7406 cordless phone and 802.11 WLAN IP phones continue to be supported

Matra DECT

- KIRK DECT is the digital mobility solution on BCM and is available with BCM 3.7 and supported with BCM 4.0

Symbol

- This product has not been available for order since May 2004
- Nortel WLAN Handsets 2210 and 2211 have been available since 2004. WLAN Handsets 2212 is now supported.

Miscellaneous Data Features

- PPTP functionality has been removed, although IP Sec will continue to be supported on BCM 4.0
- Though a BCM 3.x system may use the Nortel Optivity Policy Server to push networking policies to the BCM using COPS-PR, this functionality is unavailable in this release. Local policies must be established using the Element Manager.
- Voice Applications: Mailbox/Operator Manager
 - As with BCM50 R1, Mailbox Manager and Operator Manager will be unavailable with BCM 4.0.

Support for USB is being introduced with BCM 4.0 for loading startup profiles and software updates. Please be aware of the following limitations:

- BCM 4.0 adds support for USB port to BCM200/400
- BCM1000 USB continues to be unsupported
- BCM200/400 continues not to support UPS over USB

Linux upgrade

The WinNTE end-of-life drives the migration to a Linux-based operating system using Nortel Corporate Linux. This provides ownership of the operating system, strategic direction, and direct access to the operating system for fast issue resolution and ensuring an effective, long-term support strategy within Nortel.

For customers concerned about potential WinNTE security vulnerability and whose systems are accessible on a WAN or LAN, it is recommended you upgrade to BCM 4.0.

Nortel corporate Linux

The BCM portfolio is now built upon Nortel Corporate Linux, which was developed for the high reliability and secure carrier market. There have been no, significant Linux kernel issues in the two years of exposure for Nortel Corporate Linux on the Compact Call Server product.

The BCM 4.0 software release is an important part of the BCM portfolio evolution in 2006. A major part of this evolution includes a move to a more secure product on a Linux operating system. This portfolio evolution was first introduced with the first release of the BCM50 and continues for the BCM200/400 with the BCM 4.0 release.

BCM 4.0 will support the Linux operating system for the installed base of BCM200, BCM400 and BCM1000 platforms through a software upgrade. All new BCM200/400 shipments will be Linux-based BCM 4.0 as of the General Availability of BCM 4.0 system.

Nortel Linux OS has been tailored for the BCM platforms by restricting and removing OS capabilities that are not required, providing a "hardening" of the OS. This hardening ensures that extraneous capabilities are not potentially available to hackers.

The advantages of BCM built upon Nortel Corporate Linux include an improved security environment, proven reliability, direct developer access to the operating system layer for fast issue resolution and Nortel ownership of the strategic direction providing effective, long term support.

Nortel provides the ability to upgrade a BCM200/400/1000 system to a Linux operating system with BCM 4.0, with the following key attributes:

- Upgrade supported from BCM3.6 or BCM3.7 without hardware changes
- Upgrade target operational time of less than 1.5 hours (BCM3.6 or BCM3.7 upgrade to BCM 4.0)
- Software-only upgrade; does not require hardware upgrade
- Preserves telephony data and voicemail programming data. Preservation is the goal, with maximum preservation of other data
- Automatic transfer of existing system keycode-enabled capabilities through the BCM4.0 upgrade keycode generation
- Clearly defined upgrade steps and back-out points, as in previous BCM releases

BCM 4.0 functionality and capability

BCM 4.0 upgrade will include functionality and capability equivalence or better to BCM3.7 in all major areas, including:

- Telephony capability set (including applications, core telephony, VoIP, terminals, IVR)
- Data functionality equivalence
- Equivalent global country and localization support
- Equivalent mobility and terminal support
- Equivalent data capability set
- Integrated management of voice and data capabilities
- Equivalent scalability to existing BCM3.7 scalability
- Equivalent connectivity and interoperability
- Terminals and mobility equivalency
- Single keycode generated for a release and site capability set

BCM 4.0 dependencies

The eligibility for the upgrade is dependent on these upgrade paths:

Software Release	Hardware Platform	Recommended Upgrade Path
BCM 3.6 BCM 3.7	BCM200 BCM400 BCM1000	BCM 3.6 or BCM 3.7 to BCM 4.0 <ul style="list-style-type: none"> • Software Upgrade preserving customer data
BCM 3.5	BCM200 BCM400 BCM1000	BCM 3.5 to BCM 3.7 to BCM 4.0 <ul style="list-style-type: none"> • Software Upgrade preserving customer data
BCM 3.0	BCM200 BCM400 BCM1000	BCM 3.0 to BCM 3.6 to BCM 4.0 <ul style="list-style-type: none"> • Software Upgrade preserving customer data
BCM 2.5 / FP1	BCM1000	Hard drive replacement (20 GByte) and reprogram customer data <ul style="list-style-type: none"> • Requires 4.0 upgrade keycode
BCM 2.0x	BCM1000	Hard drive replacement (20 GByte) and reprogram customer data <ul style="list-style-type: none"> • Requires 4.0 upgrade keycode + 256Mb RAM



Note: The only supported 20 Gb HD is available through Nortel.

Management upgrade

The new BCM 4.0 management system reduces the cost of selecting, deploying, and maintaining BCM to minimize the cost of ownership and maximize system availability. BCM 4.0 adopts the BCM50 Release 1 management model, which improves ease of use and remote management.

The table below presents common tasks and the advantages of BCM 4.0 over BCM 3.x.

	Tasks	BCM3.x	BCM 4.0 and BCM50 Release 1
Ease of Use	Management Tools	<ul style="list-style-type: none"> Multiple 	<ul style="list-style-type: none"> Element Manager
	Configuration application navigation	<ul style="list-style-type: none"> Up to 8 levels for 1 parameter Hundreds of unique screens Hunt and peck; no parameter correlation 	<ul style="list-style-type: none"> Maximum of 3 clicks to information-rich tabs Complex correlations visible
	Speed of performing common tasks	<ul style="list-style-type: none"> Key click and navigation constraints 	<ul style="list-style-type: none"> Streamlined and task-based, improving speed of tasks
	Remote configuration (dial-up)	<ul style="list-style-type: none"> Slow loading, slow response 	<ul style="list-style-type: none"> Optimized for speed
	Software updates	<ul style="list-style-type: none"> Patch per problem, 2 reboots per patch 	<ul style="list-style-type: none"> Software update packages; 0-1 reboot per package; scheduled loading and activation; USB port loading
Maintenance	Record keeping	<ul style="list-style-type: none"> Lengthy manual template entry, screen shots 	<ul style="list-style-type: none"> Programming Record for configuration print
	Diagnostic and monitoring	<ul style="list-style-type: none"> Basic instrumentation, over 750 disparate alarms 	<ul style="list-style-type: none"> 4 standard MIBs; 50% less alarms with per alarm filtering
Installation	IP assignment	<ul style="list-style-type: none"> Must be configured 	<ul style="list-style-type: none"> DHCP, set-based programming or start-up profile
	Initial programming efficiency	<ul style="list-style-type: none"> Boot–Quickstart Wizard & defaults–45 minutes, 3 reboots 	<ul style="list-style-type: none"> Boot–Start-up Profile from USB memory port and defaults

See [“BCM 4.0 Management” on page 22](#) for management system details, which includes installation, remote management, on-box and device management features, set-based administration, Element Manger, software updates and Network Configuration Manager.

Proactive Voice Quality Monitoring

BCM4.0 introduces Proactive Voice Quality Monitoring (PVQM) on BCM. This capability provides the ability to set call quality thresholds for IP sets and be alerted if these thresholds are violated. This provides for the ability to proactively identify voice quality of experience (QoE) issues on a per call basis. This, in turn, enables troubleshooting of voice quality issues within the network.

PVQM supports calls from an IP set to any other set or trunk, and IP sets support auto notification.

Measured call quality metrics include:

- packet loss
- inter-arrival jitter
- listening R-value
- RTCP round trip delay.

Listener "R" value is a direct measure of the call quality or transmission quality, incorporating the effects of CODEC type, packet loss, discard, burstiness, delay, and other relevant voice quality metrics.

With PVQM, a system wide summary view is maintained of threshold violation alert occurrences. Threshold violations can be sent as alarms and used by the centralized AppManager VoIP performance monitoring product from NetIQ to generate a system wide view of the voice quality of the network and help diagnose voice quality issues. The alarms include extensive call quality information in accordance with IETF RTCP-XR RFC 3611.

PVQM advantages

- Provides ability to monitor quality and integrity of IP-based voice networking
- Significant differentiator in VoIP convergence network sales with its market-leading, proactive, per call focus
- Mitigates customer issues over whether the data network or the BCM is at fault when there are call-quality issues situations
- Consistency in QoE solution across Nortel enterprise call servers facilitates mixed network deployments

Ad-Hoc Conferencing

Currently, the BCM supports three-party conferencing. Ad-Hoc Conferencing extends this capability to support large multi-party conferencing.

Ad-Hoc Conferencing advantages

- User interface model is similar to today's F3 conference.
- There is no impact on the user's feature-button "footprint" (that is, there is no need for additional IC keys or an additional feature key).

- This extends the current three-party conferencing capabilities, allowing users the flexibility to have larger multi-party conferences.
- Support up to 40 simultaneous ad-hoc participants on multiple conferences

Meridian Customer-Defined Network Trunk Anti-Tromboning with integrated applications

The BCM currently uses MCDN signaling to optimize network resource utilization when transferring or forwarding station-to-station calls. This feature adds the ability for applications such as Voicemail and AutoAttendant to leverage these MCDN capabilities to optimize network utilization.

MCDN TAT advantages

- Provides customers with optimal utilization of trunk facilities
- Enables a greater number of feasible networking scenarios for servicing customers

MCDN TAT applications

This feature allows the BCM to determine if calls routed across a network by the integrated AutoAttendant or Voicemail should invoke the TAT or Trunk Route Optimization (TRO) MCDN functionality to optimize the trunking network connection.

Voice enabled WAN

For low-speed Frame Relay and Point-to-Point Protocol (PPP) access to BCM through the WAN interface, effective voice and data communications over this link require fragmentation and compression. Fragmentation techniques allow data frames to be fragmented, meaning that voice packets will not get “stuck” behind large data frames, avoiding the introduction of jitter to voice calls. The use of Header Compression greatly reduces the overhead associated with sending voice packets, allowing more efficient use of the available bandwidth.

This feature enables this support for fragmentation on both FR (FRF.12) and PPP (using MultiLink PPP) and provides RFC2508 on the BCM WAN interface. This capability also adds support for the WAN 520 card.

Voice enabled WAN advantages

- This enables customers with low speed PPP and Frame Relay links to experience improved QoS for voice traffic and better link utilization.
- Many branch offices only require low-speed links for data transmission and tariffing. This capability allows these offices to utilize these links for VoIP as well.
- Enhances the usability of the WAN card on the BCM.

Voice enabled WAN applications

This is typically used for low speed links over Frame Relay and PPP which share Voice over IP and data traffic.

Session-initiated protocol enhancements

BCM supports H.323 and SIP VoIP basic call communication for BCM-to-BCM calls. H.323 also supports the same features that the MCDN (Meridian Customer Defined Network) capability supports. This SIP enhancement adds the following to the BCM SIP capability:

- Support for the MCDN features with SIP
- Expands SIP interoperability to the CS1K and MCS5100

The MCDN features supported include:

- Private Name/Number
- Network Call Redirection Info (NCRI)
- Trunk Anti-Tromboning (TAT)
- ISDN Call Connection Limit (ICCL)
- Message Waiting Indication (MWI)
- Trunk Route Optimization (TRO)

SIP advantages

SIP allows you to begin to transition your entire network to use SIP signaling, which allows greater application integration than can be achieved using H.323.

SIP applications

In enterprise network systems, the SIP feature provides the ability to support private numbering plans, optimize the use of network traffic (TAT/TRO/ICCL), and provides support for centralized voicemail applications (NCRI, MWI) using the SIP messaging protocol. By making these capabilities available using the SIP protocol, you can begin to transition your network to the latest standard.

Security enhancements

The security enhancements with BCM 4.0 are best described in the following sections:

- [“User account access management” on page 17](#)
- [“Secure interface and audit logging” on page 19](#)

User account access management

This feature significantly improves BCM user account access management by enhancing password, session and account authentication and access management enhancements. These improvements bring the BCM in alignment with the security enhancements being introduced with BCM50 and add incremental capabilities.

Password Management and Policy Enhancements:

- Minimize the vulnerability of passwords
 - Password characteristics are now more stringent (length, criteria)
 - Password aging, history and change notification added
 - Forced password change on initial login
 - Password storage hashing with Secure Hashing Algorithm 1 (SHA1)

Session Management Enhancements:

- Minimize the vulnerability of logged-in sessions
 - Idle session time-out

Account Management

- Minimize the vulnerability of UserIDs
 - Automatic disabling of unused accounts
 - Set-based admin requires userID and password

Account UserID Access Privilege Management

- Logged-in userID session/access display

User account access management advantages

These enhancements to user account access management provide a more secure BCM access environment, making it more difficult for a malicious user to gain access to a BCM.

User account access management applications

These enhancements allow owners of BCM to enforce more secure account access controls to the BCM, to ensure secure management of the BCM and thereby increase protection against potential vulnerabilities.

Secure interface and audit logging

This feature enhances interface security by adding more secure access controls. It also adds security audit logs, allowing capture of configuration changes and system activity by UserID, date and time. These improvements bring the BCM in alignment with the security enhancements being introduced with BCM50.

Secure Interface Access and Communications Controls provide:

- Support for Secure Copy (SFTP), providing for SSH encrypted file transfers
- Support for Simple Network Management Protocol (SNMP) v2 & v3, including encryption provided with v3
- BCM owner control of Nortel technical support access
- Use of digital signatures and enhanced tamper detection to ensure trusted sources for software upgrades (patches, software release upgrades)
- Ability to test the system's ability to generate alarms and logs, including system security alarms and logs

Audit Log capabilities:

- Tracks of critical changes to system and login attempts
 - Last successful login identification and interface
 - Last failed login attempt, total failed logins since last successful login
 - Configuration change log, tracking configuration changes to system by UserID
- RADIUS Support
 - Centralized Authentication
 - Radius Client to authenticate and authorize using a centralized Radius server

Secure interface and audit logging advantages

In addition to supporting IPsec tunnels for management, the ability to encrypt SNMP and file transfers provides BCM users with an expanded capability set for secure interface communications.

Audit logging of login attempts provides the BCM user with the ability to track security violation attempts and determine if further action is required.

If a userID security breach is suspected as a result of system configuration changes, the audit logging of configuration changes provides traceability to userIDs and interfaces.

Increased ease of use and reduce user lost productivity by ensuring system availability (protection against DoS attacks). Reduced impacts of potential vulnerabilities, attacks and tampering and reduced Administrative & Support overheads, lower OPEX expenses (RADIUS, User Account, Password, Session by management of Security Policies).

Increase overall Security with effective logging capabilities for Audit Trail logs, Alarm logs, Configuration Change logs.

Secure interface and audit logging applications

A BCM user who requires improved interface access and communications security for alarm, log and file transfers can use these enhancements. As well, a user can audit and identify the critical system changes that were initiated by specific users.

Terminal and mobility support

The BCM 4.0's Terminal and mobility support is equivalent to that of BCM3.7, and it now supports two new IP telephones:

- [“IP Audio Conference Phone 2033” on page 20](#)
- [“IP Key Expansion Module I24” on page 21](#)

IP Audio Conference Phone 2033

The IP Audio Conference Phone 2033 expands the IP portfolio to conference rooms and delivers high-quality audio.



IP Audio Conference Phone 2033

- Familiar Nortel user interface, emulates IP Phone 2001
- Well-known Polycom design, acoustics
- Nortel branded, sold, supported
- Full duplex handsfree with 360° room coverage
- Expandable using extension microphones
- Local AC power option
- Color: Charcoal
- Icons for global market
- Future safe investment (enhancement through firmware download)

IP Audio Conference Phone 2033 applications

- Ideal for conference rooms and executive offices
- Fosters collaboration and idea exchange

IP Key Expansion Module I24

The I24 Key Expansion Module (KEM) expands the IP portfolio to conference rooms, delivers high quality audio and features a large speed dial list.



I24 KEM

- Hardware module to expand line/feature buttons
- Self-label display to customize desktop
- Connects through accessory port on IP Phone 2002 or IP Phone 2004
- Powered by host phone via accessory port
- BCM supports up to 5 KEMs per IP phone
- Maximum 20 sets per system with KEM

I24 KEM applications

- Ideal for Secretary and Health care

IP firmware

IP phones incorporate network management and security enhancements. The firmware can be upgraded with a patch or call sever release providing:

- Enhanced VLAN (configured manually or with DHCP) and PC VLAN (configured manually) tagging
- Enhanced display for local Network Diagnostic Utilities

Global market

BCM 4.0 delivers country and regulatory support equivalent to BCM3.7 and adds additional support for Polish, Irish English, Finnish, Korean, and Turkish Voice prompts.

The following additional capabilities will be available with the BCM4.0 release.

- Addition of second dial tone for PRI/BRI
 - In some markets, it is the responsibility of a PBX to provide a local tone to the originating party (as opposed to the central office)
 - This feature adds the ability to provide the local tone
- Increasing public received digit length from 7 to 12 digits
 - Some markets require > 7 digit public received digits to support dial plans

BCM 4.0 Management

You can quickly install, configure, and administer your BCM. These topics summarize the BCM 4.0 management areas:

- [“Ease of installation” on page 22](#)
- [“Remote management accessibility” on page 23](#)
- [“On-Box and device manageability features” on page 23](#)
- [“Set-Based administration” on page 24](#), for “no-PC” programming of most of the system
- [“Element Manager” on page 25](#), an interface that supports all aspects of BCM 4.0 element management
- [“Software updates” on page 26](#)
- [“Network Configuration Manager” on page 27](#), for multi-element support

Ease of installation

For BCM 4.0 installations that require data networking, IP sets or VoIP trunking, BCM 4.0 can function as a DHCP client to a network DHCP server for automated IP address assignment. BCM 4.0 can also be a DHCP server to provide both IP phone sets and a directly connected Element Manager PC with their IP configuration.

If you use Norstar set-based programming, you can install and program BCM telephony and applications through set-based administration. Also, installers who familiarize themselves with set-based programming use a system connected telephone keypad to program the system without requiring access to a PC.

All configuration programming can be done using the [“Element Manager” on page 25](#).

Startup profile

To accelerate the initial installation programming of system-level parameters, you can use the Startup Profile to quickly bring the BCM 4.0 to a basic operational state, ready to program, without having to use Element Manager or set-based administration.

The Startup Profile is an easy-to-use template you can data-fill using Microsoft Excel. The Startup Profile gives you a quick interface for defining parameters such as:

- system profile including country, telephony template and key voicemail attributes
- system IP parameters
- system-level telephony attributes to automatically create the system DNs
- keycode information through automated application of keycodes
- users and groups

You fill out the template, save it to a USB memory stick, and insert the memory stick into the USB port of the BCM during the initial boot-up of the system. This information is read into BCM 4.0 and applied through a single restart sequence.

The Startup Profile is similar to the Quickstart Profile of the BCM200 and BCM400, but can be data-filled and applied without requiring an IP connection to the unit, or a PC or telephone set. It executes more quickly, and includes a broader scope of system-level parameters.

Remote management accessibility

BCM 4.0 has an integrated analog modem that can accept an incoming modem call on any BCM 4.0 system line. You can configure the BCM 4.0 system to let the modem auto-answer a specific line with configuration options. Remote users can also first initiate a voice call to a person or an auto-attendant, who transfers the call to the modem.

The analog modem also supports callback for management access to the BCM 4.0, which can be used to support auto-dialout on SNMP traps, and automated sending of Call Detail Records (CDR) to a remote CDR collection point.

Although we do not recommend that you use the analog modem for transferring large files, the modem gives you a flexible method of remote access to perform all programming tasks remotely.

BCM 4.0 gives you remote management capability with a high-speed connection. Tasks such as transferring backup files to a remote destination, and transferring software update files, CDR records and log files, can be more efficiently supported than over the analog modem.

On-Box and device manageability features

BCM 4.0 has an SNMPv3 interface that includes support for SNMP v1/v2 for management by legacy SNMP managers. SNMPv3 delivers improved security features for SNMP device access.

BCM 4.0 supports the following versions of SNMP:

- SNMP v1 - the first implementation of SNMP; this version supports protocols such as IP
- SNMP v2C - provides improved efficiency and error handling
- SNMP v3 - provides improvements in security and privacy

Using the Element Manager, you can select which versions of SNMP you want the BCM 4.0 agent to support.

Management Information Bases provide access to the managed objects of a system and specify the format of traps. BCM 4.0 supports these standard Management Information Bases (MIBs) for remote management:

- MIBII RFC 1213 - second version of the Management Information Base for use with network management protocols in a TCP/IP-based internet. It includes System Group, Interfaces Group, and is a baseline RFC implemented by data networking systems.
- Entity MIB RFC 2737 - describes managed objects used for managing multiple logical and physical entities managed by a single SNMP agent.
- System Host MIB RFC 2790 MIB for managing host systems. Defines a set of objects common across many computer system architectures that are useful for the management of host computers, such as memory, CPU, and so on.
- SmallSiteEvent MIB for traps.
- RFC 2261 - SNMP Framework MIB.

BCM 4.0 has adopted the Common Information Model (CIM) standard according to the industry standards organization Distributed Management Task Force (DMTF), which provides a modeled method of managing system programming parameters. BCM 4.0 uses the transport mechanism CIM operations over HTTP using XML, also referred to as CIM-XML. The BCM 4.0 CIM-XML interface provides a consistent way to manage data on the device, whether by the Element Manager, NCM, or third-party network or service management applications.

Log management

BCM 4.0 log management includes, in addition to the component logs that are provided by BCM200 and BCM400 systems, security logs, configuration change logs, alarm logs and system logs.

Set-Based administration

BCM 4.0 gives you the ability to use a telephone interface to program much of the system. Set-Based Administration benefits:

- BCM 4.0 installations that do not have TCP/IP connectivity
- BCM 4.0 installations where the installer does not have access to a computer on-site
- speed of programming
- familiarity with the Norstar interface

With set-based administration, you can manage:

- core telephony
- voicemail services
- IP network settings
- keycode entry
- admin password change
- modem on/off

Multiple languages are supported, consistent with Norstar set-based administration.

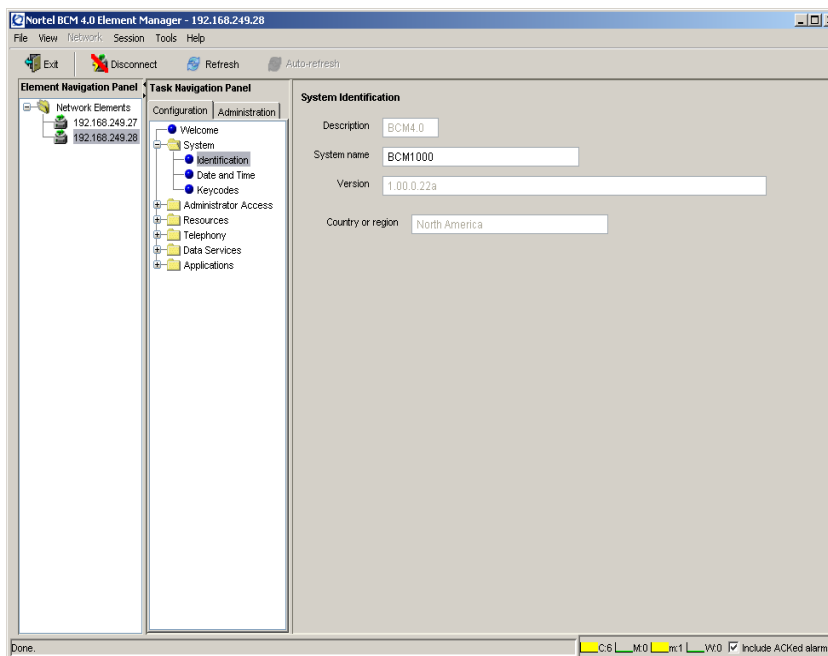
Element Manager

Element Manager gives you access to BCM 4.0 information in a new off-box management architecture. Element Manager has a task-based interface for greater ease of use.

If you have used Business Communications Manager Unified Manager, you will find that performing common BCM 4.0 programming tasks is simpler, faster, and more information-rich on Element Manager, which requires less clicking through the interface to get to tasks. You can get to any programming screen in three mouse-clicks or less.

Programming data is organized in the Element Manager to quickly show all of the associations between data in the form of tables. This eliminates having to look in multiple places to get a system view of the programming.

Figure 1 Element Manager interface



Element Manager runs on a PC, and the information required to draw the screens is contained locally within the client application. The only data transferred between Element Manager and the BCM 4.0 are queries and actual data. Element Manager has familiar Microsoft Office-like capabilities, such as the ability to sort information.

All of the traditional BCM administration tools have been integrated into Element Manager, including managing backups and software updates.

Element Manager has an element navigation panel for organizing a network of elements. You can manage multiple elements at the same time. After you connect to an element, you can perform configuration and administration tasks.

The Element Manager administration interface

Element Manager's Administration management environment includes:

- BCM 4.0 diagnostic and maintenance tools, including BCM Monitor.
- Fault management for viewing BCM 4.0 alarms. You can set which alarms are displayed in the Element Manager alarm browser and which alarms trigger an SNMP trap.
- Log management for off-box transfer of logs, including component logs and administrator logs such as alarm log, security log, configuration change log, and system log.
- Software management tools for software updates (for example, for corrective software) and software upgrades.
- Backup and restore. You can schedule configuration backups or application backups. An application backup includes data generated through the day-to-day use of the on-box applications as well as the configuration data. A scheduled backup provides the ability to routinely perform a backup, which can be kept on the BCM 4.0 hard drive or transferred to an off-box destination such as network folder, FTP server or locally attached USB storage device.

For backup and restore, software management, and log management, a flexible set of source and destinations is supported along with protocols to access them. For example, you can save backups from the BCM 4.0 to either the USB port, the Element Manager client PC (on-demand only), a shared drive available on the network, or a remote FTP server.

Software updates

To ensure that BCM 4.0 will be low-cost to maintain, even in an environment of security and corrective content updates, this is how BCM 4.0 handles software updates:

- Software updates can be downloaded to the BCM 4.0, either on-demand or according to a schedule. This flexible file transfer allows:
 - Loading software updates from your computer, USB memory device, shared folder, or FTP server or SFTP server under Element Manager
 - From FTP server under centralized NCM control for bulk distribution to a network of devices
- Update software is automatically checked against the BCM 4.0 software history and validated before it is transferred. This means only the changes are downloaded, thereby reducing the typical size of software updates.
- You can schedule the application of the software update separately. For example, you can schedule a download for Tuesday night, but the application can be scheduled for Friday at 2 a.m.
- Multiple software update packages can be programmed to be applied at the same time.
- One software update package may include updates for multiple software components. While many software updates will not require a system reboot, some software components require a reboot for the update to take effect. There will be no more than one system reboot if one or more of the software components being updated by the software update package require a reboot.
- Software upgrades are handled in the same way and use the same tool as software updates.

- You can set up the entire software update process for hands-off operation if the software content can either be downloaded remotely, or sent out and installed from the USB port.
- Reliable file transfer

Keycodes

The BCM keycode structure has been redesigned with these capabilities:

- One keycode validates all feature entitlements, which simplifies installation.
- You can apply keycodes in a number of ways:
 - through Element Manager
 - through set-based administration
 - through NCM
 - through a USB memory stick

Network Configuration Manager

Many Business Communications Manager customers already use the optional client-server based management application NCM to manage their multi-site BCM200/400 network. Designed to provide a system-wide perspective for up to 2000 BCM devices, Network Configuration Manager is a centralized database that stores information about every Business Communications Manager device on your network.

NCM for BCM 4.0 includes centralized backup and restore management, common file distribution (for example, system greeting files), parameter configuration, and automated software update distribution. You can manage large BCM 4.0 networks and mixed BCM 4.0/200/400 networks using the NCM.

BCM 4.0 Applications

BCM 4.0 has a wide range of high-value applications. You enable these applications through keycodes, and do not require any additional hardware.

BCM 4.0 gives you 32 voice ports for connecting to various applications. Each port supports one connection to that application. For example, four callers could be leaving voice messages, and two callers could be in the auto attendant while four callers are listening to voice messages. The number of ports can adequately support a fully configured BCM 4.0 system.

BCM 4.0 comes with CallPilot Messaging. Keycoded optional applications are: Intelligent Contact Center, Multimedia Contact Center, LAN CTE, Call Detail Recording, Personal Call Manager and IVR.

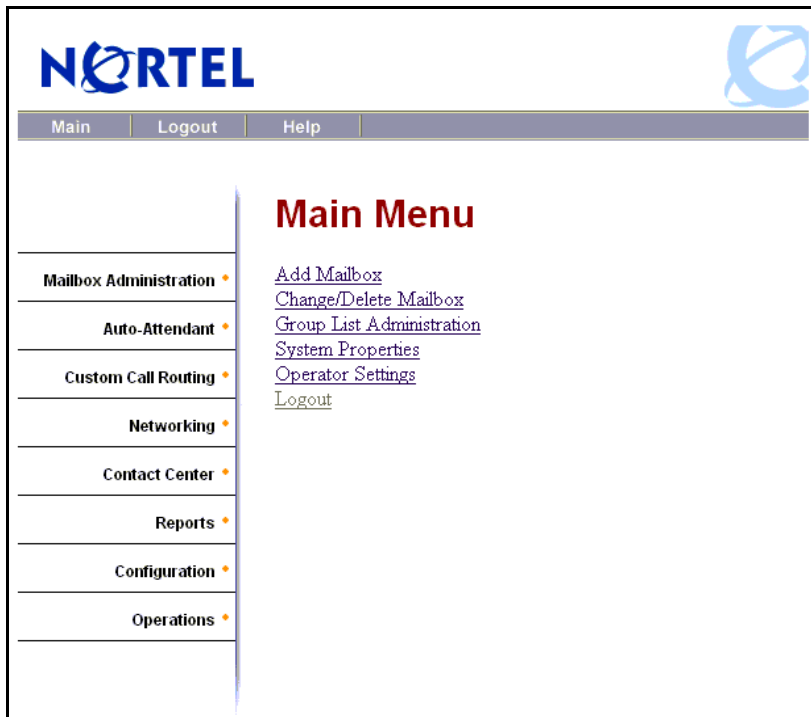
CallPilot Messaging

CallPilot Messaging is a versatile business communications tool that you can use to:

- answer incoming calls
- offer callers a selection of options to route their calls or access information
- provide advanced voicemail, Auto Attendant and call handling capabilities

CallPilot Manager is a web-based application that is accessible through the BCM 4.0 Element Manager. You use CallPilot Manager to set up and administer CallPilot.

Figure 2 CallPilot Manager interface



Features included with CallPilot Messaging

Voicemail

Records messages and stores them in a mailbox for easy retrieval. Business telephones on your system can have their own mailbox and greeting. Information can be distributed quickly to departments and workgroups.

Auto Attendant

The CallPilot answering service that answers your business calls promptly, 24 hours a day, with a Company Greeting, plays a list of options to callers, and performs call routing functions in response to caller selections.

Custom Call Routing (CCR)

Enhances the Auto Attendant menu with customized menus and information messages. With CCR you can determine the menu options and record the voice prompts that guide callers along call paths.

Fax Answering

Fax Answering lets outside callers send faxes to the main site telephone number. Fax Answering is available even if you do not have the Fax option installed on your system. With Fax Answering, a fax call that arrives through the Auto Attendant or CCR transfers to a specified extension.

CallPilot options

CallPilot has options that enhance your office communications. You need a keycode to enable a CallPilot option. Contact your vendor if you want to purchase a software authorization code.

Message Networking

Message Networking links your CallPilot system with other voicemail systems and allows the exchange of voice messages between users at different sites. CallPilot supports Voice Profile for Internet Mail (VPIM) and Audio Messaging Interchange Specification (AMIS) networking.

For more information, see the *CallPilot Message Networking Set Up and Operation Guide*.

Fax

Fax is a CallPilot option that enhances your office communications by providing incoming and outgoing fax capability. With Fax, callers can send and retrieve fax messages as easily as they send and retrieve voice messages. The Fax option includes Fax Messaging, Fax On Demand and Fax Overflow. Fax Answering is available even if you do not have the Fax option installed on your system.

For more information about Fax, refer to the *CallPilot Fax Set Up and Operation Guide*. Fax is not available for CallPilot 100/150.

Unified Messaging

With Unified Messaging, subscribers can use their e-mail application to access voice, fax and text messages from their personal computer. Unified Messaging can be used with several popular e-mail applications:

- Microsoft Outlook 2000, Outlook 2002 (XP), Outlook 2003 including Internet Mail Mode
- Lotus Notes - 5.x and 6.x
- GroupWise - 6.x
- Microsoft Outlook Express - 5.x and 6.x
- Netscape Messenger (Netscape Communicator) - 6.2x
- Netscape Mail - 7.0x
- Qualcomm Eudora Pro - 6.1.2

For more information, see the *BCM 4.0 Unified Messaging Configuration Guide*.

CallPilot/Voicemail enhancements

The BCM 4.0 release builds upon the existing set of Call Pilot / Voicemail capabilities through the introduction of a set of feature enhancements on the BCM CallPilot offering.

These enhancements include the following.

- Significant increases in number of greeting tables, company greetings and Custom Call Routing (CCR) trees

- This provides customers the flexibility to use different Auto Attendant / CCR for different incoming lines.
- F983 Class Of Service Administration
 - Expands set-base admin to include programming of Class of Service
- Prevention of trivial mailbox passwords
 - This security enhancement will prevent "Trivial passwords" (e.g. 1111, 1234, etc.) when enabled.
- Up to 5 alternate DNS per Mailbox with Message Waiting Indicator on 6 sets
 - Previously up to 2 alternative DNS per Mailbox / MWI on 3 sets was supported
- Mailbox assignable feature restrictions
 - Allows the administrator to limit features for selected mailboxes in the system. Great feature for retail and hospitality industries.
- Unified Messaging R2.5 support of Citrix
 - Unified messaging 2.5 will now be supported in a Citrix environment
- Ability to receive VPIM broadcast messages from M1 CallPilot
 - The system can re-broadcast a network message from M1 without additional programming
- Additional Voice Mail Prompt Languages
 - Polish, Irish English, Finnish, Korean, Turkish

Intelligent Contact Centre

BCM4.0 introduces the Intelligent Contact Center (ICC) which is an evolution of the existing Call Center (CC) capability on BCM. ICC will have the same functionality as the current Professional Call Center with the ability to choose exactly the number of agents and skillsets that a customer or customer site requires. This provides the following values with ICC:

- Maximum flexibility in granularity
- Any combination of Agents and Skillsets within boundaries of platform. Eliminates any confusion of features between Basic and Professional. Channel partners and customers do not have to worry about what functionality is contained with what product
 - Intelligent Call Center with Professional Contact Center level of functionality.
- Significantly simplifies product offering
 - Intelligent Call Center, x Skillsets, x Agents, RCC
 - Eliminates Basic, Pro and upgrade between them
- Increases market potential
 - Customers that require more Skillsets than agents

Example: Real Estate - 3 receptionists (3 agents) answering for 20 Real Estate Agents (20 skillsets)

— Big box retail - 3 receptionists (3 agents) answering for 12 Departments (12 skillsets).

Optional components that can be added include:

- x Agents, (keycodes offer granular selection of the number of desired agents)

- x Skillsets, (keycodes offer granular selection of the number of desired skillsets)
- Reporting for ICC
- Multimedia ICC

For more information, see the *Call Center Set Up and Operation Guide*.

Multimedia Contact Center

Using the Multimedia Contact Center application, agents and callers can participate in multimedia calls that include:

- speaking over a Public Switched Telephone Network (PSTN) voice connection
- text chatting
- exchanging and viewing Web pages
- viewing screen captures (sent by an agent to the caller)

Multimedia Contact Center supports two call types:

- Phone-and-browser calls (using PSTN), which integrate a standard voice call with a Contact Center agent and a Multimedia Contact Center browser call session with follow-me browsing, text chat, and screen capture push.
- Browser-only calls have the same browser features of phone-and-browser calls, but no voice call component.

LAN CTE

BCM Computer Telephony Integration (CTI) products provide an interface between your personal computer and your BCM 4.0 system. With these products, you can use telephony applications through the Windows operating system to control your telephone.

One of the software components of BCM CTI is LAN CTE (Local Area Network Computer Telephony Engine). LAN CTE provides an interface between your personal computer, your telephone, and the BCM 4.0 system. With LAN CTE installed on your computer, you can run LAN CTE or TAPI applications to communicate with and control your telephone.

For more information, see the *BCM 4.0 LAN CTE Configuration Guide*.

Call Detail Recording

Call Detail Recording (CDR) is an application that collects call activity. Each time a telephone call is made to or from your company, CDR can record the information about the call. You can use the information CDR collects to create reports about call activity. CDR also provides an interface to third-party applications to allow for call accounting and billing.

For more information, see the *BCM 4.0 Call Detail Recording System Administration Guide*.

Personal Call Manager

Personal Call Manager is a TAPI-based application that provides an easy-to-use interface between your computer and your telephone. You use the telephone to speak with a caller. You can customize your Address Book and your calls. Basic functions that Personal Call Manager performs include making and answering calls, putting calls on hold, transferring calls, and making conference calls.

For more information, see the *BCM 4.0 Personal Call Manager User Guide*.

Interactive Voice Response

IVR is an automated telephony application that prompts callers with a combination of recorded menus and prompts, and real-time data from databases. Users enter digits from their touchtone keypad that direct the Interactive Voice Response application to access databases and play information back to the caller.

IVR is a call-handling system that allows employees to perform their jobs, and agents to make sales, rather than answer frequently asked questions. Interactive Voice Response can distribute calls, make announcements, and give callers access to relevant information from dynamic databases 24 hours a day, 7 days a week.

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