# Cisco BTS 10200 Softswitch

Telecommunications innovators recognize the opportunities made possible by migrating from time-division multiplexing (TDM)-switched voice telephony to packet-based networks. The Cisco® BTS 10200 Softswitch meets the high-quality and reliable packet voice requirements of a softswitch network, providing call-control intelligence for establishing, maintaining, routing, and terminating voice calls. It serves as an interface to enhanced, converged voice-and-data services and application platforms such as voicemail and unified messaging.

Taking advantage of the power and flexibility of packet-based networks while operating with traditional circuit-switched infrastructures, the Cisco BTS 10200 Softswitch empowers service providers and carriers to gracefully transition to packet-based technology. Implementing the Cisco BTS 10200 Softswitch helps ensure rapid service deployment, carrier-grade reliability, service flexibility, scalability to millions of subscribers, and cost savings through operational efficiencies and investment optimization.

The Cisco BTS 10200 Softswitch incorporates a comprehensive feature set, including call control for local voice services that previously required the implementation of large, complex telephone switches. Compared to traditional switching systems, the Cisco BTS 10200 Softswitch gives service providers and their subscribers significant savings in equipment and transmission costs, space, and the required time to deploy services. The Cisco BTS 10200 is a class-independent softswitch, supporting applications for local and transit services and Signaling System 7 (SS7) Primary Rate Interface (PRI) and TDM offload. Multiple country-specific SS7 variants and access types (cable, T1/E1, DSL and others) are supported.

The Cisco BTS 10200 Softswitch offers tremendous flexibility to service providers that want to deploy local services. It serves as the ideal platform for:

- Cable operators
- Startup local services carriers
- Resellers moving to facilities-based services
- Facilities-based competitive local exchange carriers (CLECs)
- Fixed-wireless carriers

The Cisco BTS 10200 Softswitch provides service providers the following advantages:

- One network, one transport protocol, and multiple services (voice, video, and data)
- Increased revenue, profits, and customer loyalty by delivering additional services over an existing infrastructure
- Fast deployment of advanced services such as voice messaging and video services
- Proven, industry-leading network components for reliable, scalable, carrier-class packet networks
- Structured architecture for flexible, high-performance network services

- Pure packet-based network infrastructure, reducing the operating costs required to run multiple networks

## Solutions Enabled by the Cisco BTS 10200 Softswitch

The foundation for several voice solutions from Cisco, the Cisco BTS 10200 Softswitch is deployed globally by broadband providers that are offering services such as residential primary and secondary line over broadband, and converged voice and data services to business clients. The Cisco BTS 10200 allows service providers to deliver multiple services over a common broadband access network, expanding their market potential. Cisco helps service providers deliver packet-based local telephony services to their end customers over the same access network that simultaneously delivers data and video services. Cisco BTS 10200 solutions are supported over several broadband access networks, including cable, DSL, Metro Ethernet, and T1/E1 (refer to Figure 1).

**Figure 1.** Cisco Network Configuration for Voice over Broadband Services
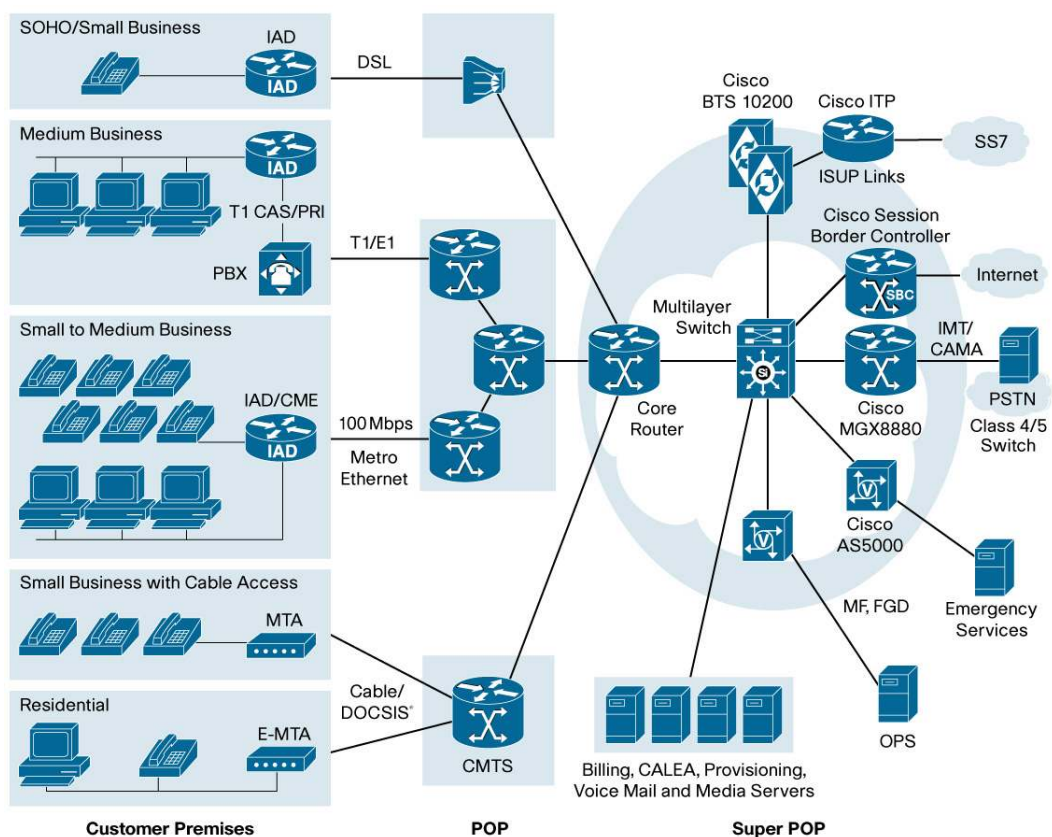


The standards-based Cisco BTS 10200 Softswitch helps enable new, innovative, and differentiated services for a bundled broadband services offering. Services can be quickly deployed without requiring time-consuming and costly upgrades to each transport element – the Cisco BTS 10200 Softswitch separates the call-control and service applications from the transport network. In addition to telecommunications services, service providers can offer a wider range of other business and residential services, including multiservice VPNs, Web hosting, and Internet access. These content-rich services not only improve overall customer satisfaction and enhance customer loyalty, but also result in increased average revenue per user (ARPU).

Bundling gives the service provider more account control and allows subscribers to benefit from a single, comprehensive invoice for all their telecommunications needs. A bundled data and voice service offering delivered over a single, integrated multiservice packet network translates into lower total cost of network ownership, increased revenue per customer, access to new markets, reduced customer turnover, and deepened relationships with existing subscribers.

The Cisco BTS 10200 is integrated with proven network components, structured network architectures, and tight integration and testing of network elements to deliver innovative and profitable solutions.

### Cisco Cable Voice and Multimedia Communications Solution

The Cisco Cable Voice and Multimedia Communications Solution delivers packet voice and data services designed to meet CableLabs® PacketCable™ requirements. The PacketCable initiative has defined specifications for solutions to deliver advanced, real-time multimedia services over a two-way cable network for North American cable operators. PacketCable standards are also being adapted for European markets.

Cisco has supported and remains actively involved with both CableLabs and the PacketCable initiative. The Cisco BTS 10200 Softswitch was one of the first products to receive PacketCable 1.0 qualification in CableLabs Certification Wave 25, April 11, 2003. The Cisco BTS 10200 Softswitch and the Cisco uBR10012 Universal Broadband Router now join the Cisco uBR7246VXR Universal Broadband Router, PacketCable 1.0 qualified at CableLabs, in Certification Wave 24, as an elite group of products to have passed the rigorous tests. The Cisco MGX® 8880 Media Gateway has also achieved PacketCable qualification.

The Cisco Cable Voice and Multimedia Communications Solution reflects this ongoing commitment and provides a multiservice voice-over-cable solution – available today – that meets the needs of cable operators looking to increase their revenue by offering additional services.

### Broadband Local Integrated Services

Cisco solutions for broadband local integrated services help service providers deliver data, voice, and video over a variety of access networks to small and medium-sized businesses (SMBs). Using existing access lines, the solution helps service providers offer a bundle of packet-based services, including local and long-distance voice services and high-speed data. By providing multiple services over a common infrastructure, a carrier can increase its revenue and profits, while offering SMB customers a better telecommunications value. This solution is especially well suited for serving SMB customers over traditional T1/E1 access infrastructure. Additionally, in a metropolitan area where Metro Ethernet fiber-optic networks are generally available, the solution delivers always-on 10-/100-Mbps Ethernet connections to each user, supporting data (Internet, LAN interconnect, and VPNs), voice (basic and supplementary), and video (conferencing, on-demand, and broadcast) services. The solution has also been implemented over additional broadband access networks, including DSL, cable, and fixed wireless. Since 2001, Cisco BTS 10200-based solutions for SMBs have been successfully deployed worldwide over a variety of access methods.

### Cisco BTS 10200 Softswitch Architecture and Components

The Cisco BTS 10200 Softswitch helps enable IP connections to the public switched telephone network (PSTN) using SS7, H.323, Media Gateway Control Protocol (MGCP), and Session Initiation Protocol (SIP) standards. The system integrates call-control and services software on an open UNIX platform. All Cisco BTS 10200 Softswitch equipment and paths are fully redundant with

an architecture that eliminates single-point failures and is designed for 99.999-percent reliability. The Cisco BTS 10200 Softswitch delivers the call-throughput capabilities required for even very large subscriber bases.

Three elements comprise the Cisco BTS 10200 Softswitch:

- The call agent component serves as a call management system and media gateway controller. In the latest release 5.0, the BTS 10200 supports the physical separation of the call management server (CMS) and media gateway controller (MGC) functions. Each Cisco BTS 10200 Softswitch system incorporates multiple call agents to handle capacity and redundancy requirements.

- The element management system (EMS) serves as a mediation device between a network management system (NMS) and one or more call agents. The EMS facilitates the provisioning, administration, reporting, and billing features of the Cisco BTS 10200 Softswitch. Cisco Extensible Provisioning and Operations Manager (EPOM) is a Web-based GUI in the Cisco BTS 10200 EMS that saves operator time and simplifies Cisco BTS 10200 provisioning through the use of wizards. Cisco EPOM facilitates other repetitive tasks (adding subscribers, for example) by eliminating redundant steps and duplication of effort. Cisco EPOM optimizes user productivity by providing online access to EMS documentation, allowing traversal of different configuration items, views into the status of the provisioned media gateways, and user group administration security. The Cisco Self-Service Phone Administration (Cisco SPA) is an add-on product to the Cisco BTS 10200 Softswitch that allows phones to be organized into accounts and managed by nonservice personnel. This setup reduces service provider costs while enhancing the user's product experience. When the service provider has installed Cisco SPA and configured it by using the Cisco SPA operation and configuration tool, all that remains is creating accounts for users to manage their own phones. The Cisco SPA GUI interface is designed to be self-explanatory, and specific user tasks are accomplished by navigating the windows and consulting the help files that are included.

- The feature server provides an open protocol and flexible framework for the introduction of new and innovative features into the network, allowing service providers to take advantage of multivendor products. It provides various basic telephone service and Centrex, tandem, and Advanced Intelligent Network (AIN) services to the calls controlled by the call agents. It also processes features such as call forwarding and call waiting.

**Cisco BTS 10200 Enhancements for Operator Network Efficiency**

Cable voice providers are searching for ways to define new network architectures that provide operationally viable and cost-effective alternatives for both CMS deployment and PSTN interconnect to deliver voice services to their subscribers. In release 5.0, the Cisco BTS 102000 supports Inter-CMS Routing, enabling the solution to function as a standalone CMS or standalone MGC, with SIP-based call routing in between. A SIP route proxy, such as the Cisco Network Route Director (NRD) or other third-party proxy, helps scale and support a regional deployment model in which multiple CMSs are used for large geographies. When the Cisco BTS 10200 Softswitch cannot associate a called number with a provisioned subscriber in its own subscriber database, it hands off the call to the SIP route proxy for network routing to the appropriate softswitch in another region, or to a Cisco BTS 10200 acting as an MGC if the call is destined for the PSTN. Inter-CMS routing provides IP-to-IP peering, enabling the cable operator to avoid unnecessary time-division multiplexing (TDM) conversions and PSTN termination costs

by keeping more calls "on net" and avoids unnecessary interconnections to the PSTN. The hierarchical architecture of the inter-CMS routing capability provides a viable means of scaling, helps simplify a cable operator's next-generation services network, and increases its profitability, efficiency, and level of control over call routing within its VoIP networks.

Another enhancement enabled by the capability to physically separate the CMS and MGC functionality of the BTS 10200 is support for CMS Clustering. Cable operators are able to scale the CMS and MGC independently and can cluster Cisco BTS 10200 CMSs at the headend or regional data center to add voice services capacity as needed as the number of subscribers grow. Furthermore, operators can more efficiently consolidate Cisco BTS 10200 MGCs and media gateways at PSTN peering points to be shared by all CMSs, while also aggregating larger volumes of call minutes for better PSTN interconnect rates.

**Differentiated Voice Application Services Using SIP Triggers**
Cable operators are looking for ways to differentiate their voice services from the telecom providers. An excellent option, which also furthers the network migration toward the IP Multimedia Subsystem (IMS) standard, is to offer SIP-based application services. Cisco BTS 10200 release 5.0 supports a SIP Triggers feature that uses the IMS Service Control (ISC) standard interface to enable the softswitch to interoperate with third-party application servers so that cable operators can provide customers with enhanced features and services. Many application developers are now building innovative SIP applications, enabling cable operators to quickly deploy new and differentiated voice services that integrate with the cable voice infrastructure. Examples of these applications include caller ID on TV, click-to-dial, hunt groups, custom ringback tones, voice dialing, and so on.

**Built-In Redundancy Helps Ensure Efficient Call Management and High Availability**
The Cisco BTS 10200 Softswitch supports real-time maintenance and provisioning plus automated interfaces for service integration. It requires no product customization to interoperate with public and multivendor infrastructures. By taking advantage of open protocols in both directions – up to the feature server and down to the transport server – the Cisco BTS 10200 Softswitch is well suited to multivendor infrastructures.

The Cisco BTS 10200 Softswitch provides detailed reporting information for billing and quality-of-service (QoS) requirements. Thorough call detail records (CDRs) are generated for every call. Each CDR includes QoS metrics such as jitter and average packet latency. Traffic data is collected at regular intervals during the day and the collected data is kept for two days for ensured protection. Users can choose from either the Cisco EPOM GUI or the command-line interface (CLI) – both provide intuitive system setup and administrative capabilities.

**Evolving to Next-Generation Multimedia Communications Services**
Cisco has developed the Cisco IP Next-Generation Network (IP NGN) architecture to address the broad sweeping transformation of a service provider's network and business. The Cisco IP NGN architecture is focused around three primary areas of convergence to provide rich, personalized, value-add multimedia services: an application layer that interfaces with the customer, a secure network layer that creates and delivers the services, and in between, a service control layer that orchestrates the delivery, operations, features, and billing of the service itself. Within the Cisco IP NGN architecture, Cisco has developed the Service Exchange Framework (SEF), a set of enabling technologies that allow service providers to deliver today's voice, video, and data services more efficiently while accommodating the delivery of new rich

multimedia services. The SEF provides enhanced subscriber and application awareness in the network, allowing network operators to capture and analyze granular details about their subscribers, what services they are using and how they are using them, and how valuable and finite network resources are being allocated to support this usage.

The Cisco Service Exchange Framework enables service providers to generate revenue by offering their subscribers ubiquitous access over any network to a complete array of real-time, multimedia business and consumer services, such as "triple play," push-to-talk, presence-based services, video telephony, and fixed and mobile convergence. Service providers can allow subscribers to easily personalize and select their own multimedia services, while retaining control of billing and usage options.

### Converged Voice and Data Network Advantages

The Cisco BTS 10200 Softswitch allows carriers to introduce converged communications services while cutting costs, through the implementation of a single platform that efficiently supports many nonsegregated types of traffic. The switch combines an innovative architecture, an open platform and interfaces, and the ability to operate in a multivendor network. Some important platform features and benefits are outlined in Tables 1, 2, and 3.

**Table 1.**     Cisco BTS 10200 Softswitch – Highlighted Features and Benefits

| Select Features | Benefit |
|---|---|
| Comprehensive Industry-Standard Protocol Support | Seamless integration with the PSTN and multivendor voice and data networks; enables implementation of best-of-breed network components |
| Carrier-Grade Reliability with Network Building Systems (NEBS) Compliance and Redundant Platform Components | Telephony-grade quality with the flexibility of packet-switched technology |
| PacketCable Qualified | Reduced operating expense from fast integration with other qualified components |
| Interoperable with Numerous Commercial Feature Servers | Fast deployment of advanced services |
| Feature Server Architecture, which Provides an Open Protocol | Rapid development and deployment of lucrative customized services |
| Streamlined Maintenance, Provisioning, and Service Activation | Reduced operational costs |
| Integrated Access Device Support | Reduced subscriber costs with single-line delivery and billing for voice and data services; provides flexible bandwidth allocation to meet varying or peak traffic demands |
| GUI and Command-Line Interface (CLI) | Easy operation with Cisco EPOM GUI wizards, which allow the user to step through provisioning and consolidate or eliminate redundant transactions |
| Comprehensive Reporting Features, Including Billing Records | Sophisticated billing capabilities, including detailed QoS-related parameters in the call usage record, and integration with standard billing systems |
| Network Scalability through Flexible Deployment Options | Economical startup deployments and flexible expansions to support growing subscriber bases and services; reduced infrastructure costs. Inter-CMS Routing through a SIP route proxy to enable CMS and MGC to scale independently. |
| Differentiated Voice Services via SIP Triggers | Support for SIP triggers based on the IMS Service Control (ISC) interface to enable enhanced SIP applications such as Caller ID on TV, Click to Dial, voice dialing, etc. |
| Enhanced Subscriber Service Reliability | Support for multihoming of eMTAs to two networked pairs of Cisco BTS 102000 Softswitches (Buddy Pop) |
| Support of SIP MTAs and Endpoints | Support SIP-based MTA as regular SIP endpoints behind the cable modem with PCMM for QoS |
| Support of PacketCable Multimedia Specification | Support PacketCable Multimedia from an Application Manager point of view, controlling non-NCS endpoints (e.g., IAD, SIP, and MGCP endpoints, etc.) while providing QoS based on PacketCable Multimedia method of interworking with a Policy Server |

| Select Features | Benefit |
|---|---|
| CALEA Support for SIP Endpoint Based on SII | CALEA support on SIP endpoints spans both basic and feature calls for SII (SNMPv3)-capable intercept access point such as Cisco edge routers (for example, Cisco 6509/7600/10000). EM I08 for CALEA has been supported on BTS 10200 since Release 4.4. |

**Table 2.**  Cisco Voice Advantages

| Cisco Voice Network Advantage | Evidence |
|---|---|
| High-Quality, Reliable Packet Voice | • Leader in voice quality as evidenced by industry reports<br>• Existing large, successful networks based on Cisco solutions, including examples of networks that transport more than 1 billion packet-based telephony minutes yearly<br>• Most experience in building and managing packet networks<br>• Support for several QoS techniques |
| Open Standards and Worldwide Interoperability and Compatibility | • Largest, most geographically diverse customer base<br>• Support for multiple protocols and transmission technologies (IP, ATM, and Frame Relay; and H.323, MGCP, and SIP)<br>• A "reference standard" for many interoperability tests such as the Mier report<br>• PSTN interoperability (SS7 connectivity and local signaling variants) |
| Industry Leader with the Broadest Product Offering | • Voice products in every segment<br>• Market-share leader in most categories<br>• Best-of-breed products<br>• Strategic commitment to all markets<br>• End-to-end solutions<br>• Corporate size and financial stability |
| Easy and Rapid Service Creation and Deployment | • Numerous best-in-class applications through extensive partner programs<br>• Open platform<br>• Tools for third-party development<br>• More overall IP service offerings |
| More Tools for Service Provider Success | • Cisco Powered Network program<br>• Cisco Joint Marketing programs<br>• Cisco Customer Advocacy services and support |

**Table 3.**  Technical Features and Specifications

| Technical Features | Specifications |
|---|---|
| Call Model | ITU-CS2 model |
| Numbering Plan | One 10-digit North American Numbering Plan (NANP), support service codes (N11), private numbering plan, and ITU-T E.164 dial plan |
| Provisioning | Cisco EPOM Web-based GUI, Cisco SPA, Secure Shell (SSH) Protocol, Secure FTP (SFTP), SOAP XML |
| Management | Simple Network Management Protocol Version 2 (SNMPv2) agent, Common Object Request Broker Architecture (CORBA), CLI |
| Software and Billing Interface | PacketCable EM, SFTP, FTP, and third -party mediation |

The Cisco BTS 10200 Softswitch allows service providers to offer basic voice services and business group services. Table 4 lists some of the services implemented in the Cisco BTS 10200 Softswitch.

**Table 4.**   Services

| Category | Services |
|---|---|
| **Basic Subscriber Features** | • Call forwarding unconditional<br>• Call forwarding on busy<br>• Call forwarding on no answer<br>• Call forwarding combined<br>• Call waiting<br>• Cancel call waiting<br>• Call waiting deluxe<br>• Three-way calling<br>• Usage-sensitive three-way calling<br>• Three-way calling deluxe<br>• Call block – Reject caller<br>• Call transfer<br>• Customer-originated call trace<br>• Multiple directory numbers (teen service)<br>• Soft dial tone<br>• Calling number delivery<br>• Calling number delivery blocking<br>• Calling name delivery<br>• Calling name delivery blocking<br>• Calling identity delivery and suppression<br>• Calling line identification presentation<br>• Calling line identification restriction<br>• Calling identity delivery on call waiting<br>• Calling identity delivery blocking<br>• Call identity suppression per call |
| **Enhanced Subscriber Features** | • Anonymous call rejection<br>• Automatic callback (repeat dialing)<br>• Automatic recall (call return)<br>• Hotline service<br>• Hotline variable service (warm line)<br>• Do not disturb<br>• Multiline hunt group<br>• Selective call forwarding<br>• Selective call rejection<br>• Selective call acceptance<br>• Remote activation of call forwarding<br>• Remote call forwarding<br>• Speed dial (8 and 30)<br>• Limited call duration service with RADIUS interface to authentication, authorization, and accounting (AAA)<br>• Message waiting indication<br>• No solicitation announcement<br>• Own calling number announcement<br>• Privacy screening with third-party announcement server<br>• Subscriber-controlled services and screening list editing<br>• Voicemail<br>• Voicemail always<br>• Visual message waiting indication<br>• Outgoing call barring |

To support today's multivendor networks, several signaling protocols are implemented in the Cisco BTS 10200 Softswitch (Table 5).

**Table 5.**    Protocol Support

| Protocol | Description | Reference Number | Organization |
|---|---|---|---|
| MTP | SS7 and Message Transfer Part (MTP) | • T1.111/GR-246<br>• Q701 | • ANSI and Telcordia<br>• ITU<br>• ETSI |
| SCCP | SS7 and Signaling Connection Control Part (SCCP) functional description | • T1.111/GR-246<br>• Q.716 | • ANSI and Telcordia<br>• ITU<br>• ETSI |
| TCAP | SS7 and Transaction Capability Application Part (TCAP) or Application of Intelligent Network Application Protocols (INAP) CS1 for UPT Service Set 1 | • T1.111/GR-246<br>• Q.1551 | • ANSI and Telcordia<br>• ITU<br>• ETSI |
| AIN 0.1 | AIN 0.1 SCP application protocol interface generic requirements | TR-NWT-001285 | Telcordia |
| AIN 0.1 SSP | AIN 0.1 Switching Systems Protocol (SSP) generic requirements | TR-NWT-001284 | Telcordia |
| AIN Toll-Free | Switching and signaling generic requirements for toll-free service using AIN | GR-2892 | Telcordia |
| IN/1 Toll-Free | Service switching points; toll-free service | GR-533-CORE | Telcordia |
| TCAP CNAM | Custom local area signaling services (CLASS) feature: Calling Name Delivery (CNAM) generic requirements | GR-1188-CORE | Telcordia |
| LNP | Local number portability (LNP) | T1S1.6 TR2 | ATIS |
| ISUP | SS7, ISDN User Part (ISUP) | • T1.113/GR-246<br>• TU Q761<br>• ITU Q767<br>• ETSI, China, Thailand, Hong Kong, Mexico, Chile, Israel, Australia, Hungary, Colombia, and Argentina | • ANSI and Telcordia<br>• ITU<br>• ETSI |
| ISUP | LSSGRLATA switching systems generic requirements: Switching system generic requirements for call control using ISUP | GR-317 | Telcordia |
| ISUP Feature Group D (FGD) (IXC interconnection) | LSSGR: Switching system generic requirements for interexchange carrier (IXC) interconnection using the integrated services digital user part (ISDNUP) | GR-394 | Telcordia |
| ISDN L3 NI2 | ISDN PRI call-control switching and signaling generic requirements for Class II equipment | TR-NWT-001268, SR-4994 | Telcordia |
| ISUP-PRI Interworking | Switching system requirements supporting ISDN access using ISUP | TR-NWT-000444, T1.609 | Telcordia and ANSI |
| MGCP | Media Gateway Control Protocol (MGCP) versions 1.0 and 0.1 | RFC2705 (Draft-huitema-MGCP-v0r1.txt) | IETF |
| NCS | Network-Based Call Signaling Protocol (NCS) | Pkt-sp-ec-mgcp-i02-991201 | CableLabs |
| SIP | Session Initiation Protocol (SIP) | • RFC 2617<br>• RFC 3261<br>• RFC 3263<br>• RFC 3265<br>• RFC 3311<br>• RFC 3398<br>• RFC 2976 | IETF |
| SIP-T | SIP for Telephony (SIP-T): Context and architectures | RFC 3372 | IETF |

| Protocol | Description | Reference Number | Organization |
|---|---|---|---|
| **Analog DID** | Analog direct inward dialing (DID) | TIA/EIA-464-B, TR-TSY-000524 | ANSI and Telcordia |
| **Bell-I, Bell-II** | Operator services signaling; also applicable for emergency services | TR-NPL-000258, OSSGR FR-271 | Telcordia |
| **CAS** | Channel associated signaling (CAS) (multifrequency/dual-tone multifrequency [DTMF] trunk) | TR-NPL-258, GR-506 | Telcordia |
| **CORBA** | Common Object Request Broker Architecture (CORBA) | Version 2.3 | OMG |
| **SNMP** | Simple Network Management Protocol (SNMP) | Version 2c | IETF |
| **H.323** | Packet-based and multimedia communications system | H.323 versions 2, 3, and 4 | ITU |
| **PacketCable** | PacketCable Audio/Video Codecs Specification | PKT-SP-CODEC-I05-040113 | CableLabs |
| | PacketCable Dynamic Quality-of-Service Specification | PKT-SP-DQOS-I10-040721 | CableLabs |
| | PacketCable Network-Based Call Signaling Protocol Specification | PKT-SP-EC-MGCP-I10-040402 | CableLabs |
| | PacketCable Event Message Specification | PKT-SP-EM-I10-040721 | CableLabs |
| | PacketCable Internet Signaling Transport Protocol (ISTP) Specification | PKT-SP-ISTP-I02-011221 | CableLabs |
| | PacketCable MTA MIB Specification | PKT-SP-MIB-MTA-I09-040402 | CableLabs |
| | PacketCable Multimedia Application Manager Specification | PKT-SP-MM-I02-040930 and PKT-TR-MM-ARCH-V01-030627 | Cable Labs |
| | PacketCable CMSS | PKT-SP-CMSS1.5- | CableLabs |
| | PacketCable CALEA/ES I04 Compliance | PKT-SP-EM-I11-040723 and PKT-SP-ESP-I04-040723 | CableLabs |
| | PacketCable QoS On-Net to On-Net Calls – SIP Update method | PKT-SP-CMSS1.5-I01-050128 | CableLabs |

## Cisco BTS 10200 Hardware Specifications

Table 6 gives specifications of the Cisco BTS 10200 Softswitch.

**Table 6.**     Specifications of Cisco BTS 10200 Softswitch

| Configuration | Number of Boxes | CPU per Box | Memory Per Box | Disks Per Box |
|---|---|---|---|---|
| **Sun Netra 240** | 4 | 2 @ 1280 MHz | 8 GB | 2 x 73 GB |
| **Sun Netra 440** | 4 | 4 @ 1280 MHz | 8 GB | 4 x 73 GB |
| **Sun Netra 1280** | 4 | 4–12 @ 1200 MHz | 8–24 GB | 2 x 73 GB |

## Regulations (Meets or Exceeds Requirements)

### Safety

UL 1950 Third Edition, CCA C22.2 No. 950, TUV EN 60950, CB scheme with nordic deviations
EMKO-TSE (74 SEC) 203, ZH1/618, and GR 1089-CORE

### RFI/EMI

FCC Class A, EN 55022 Class A, EN 61000-3-2, and GR-1089-CORE

### Immunity

EN 50082-1 and GR-1089-CORE

### Certification

NEBS, Bellcore SR-3850 First edition, Level 3 (mission critical), and UL

### Ordering Information

To place an order, visit the Cisco Ordering Home Page.

For more information about Cisco voice solutions, visit http://www.cisco.com/go/sp.

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