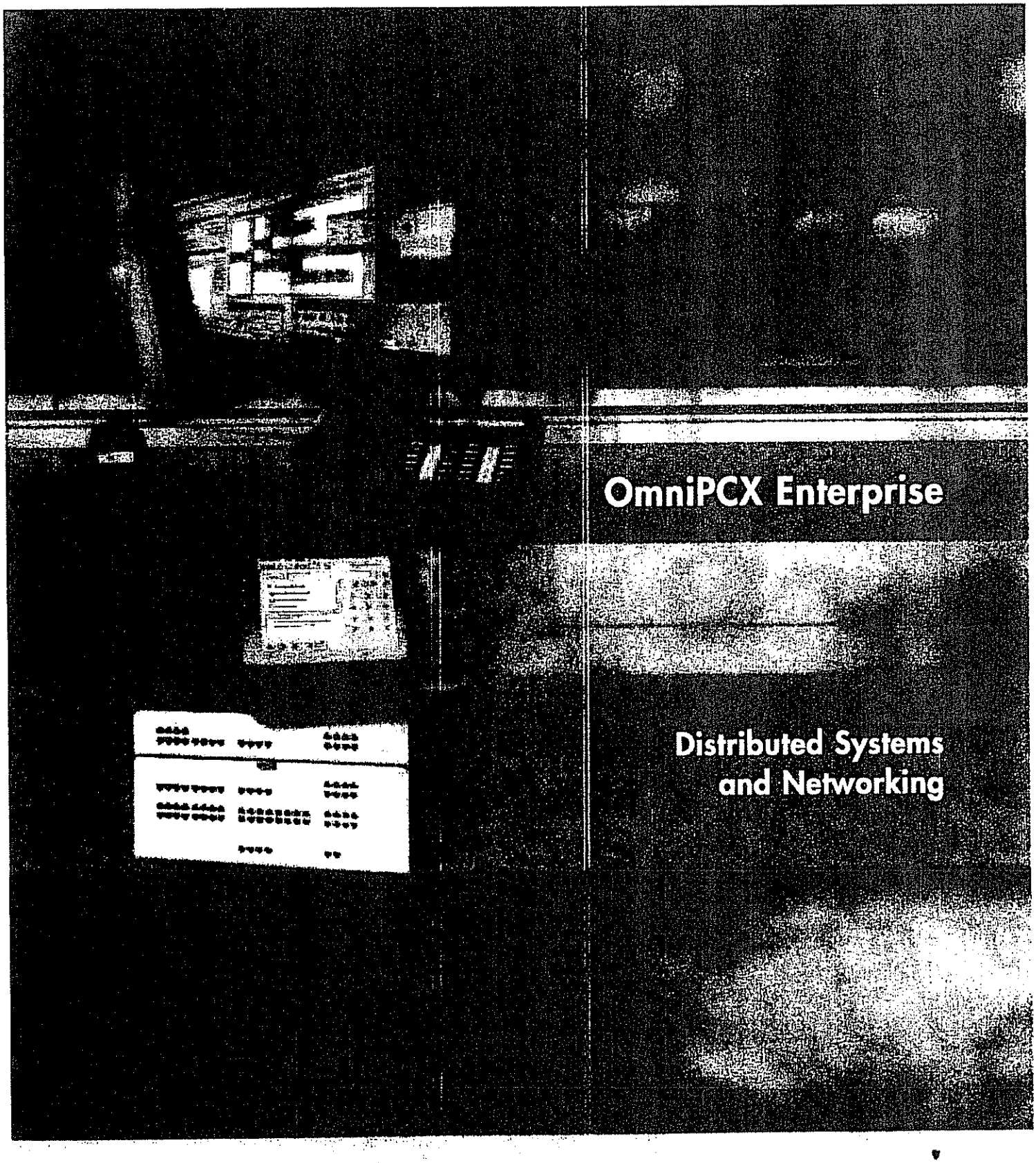
EXHIBIT 4

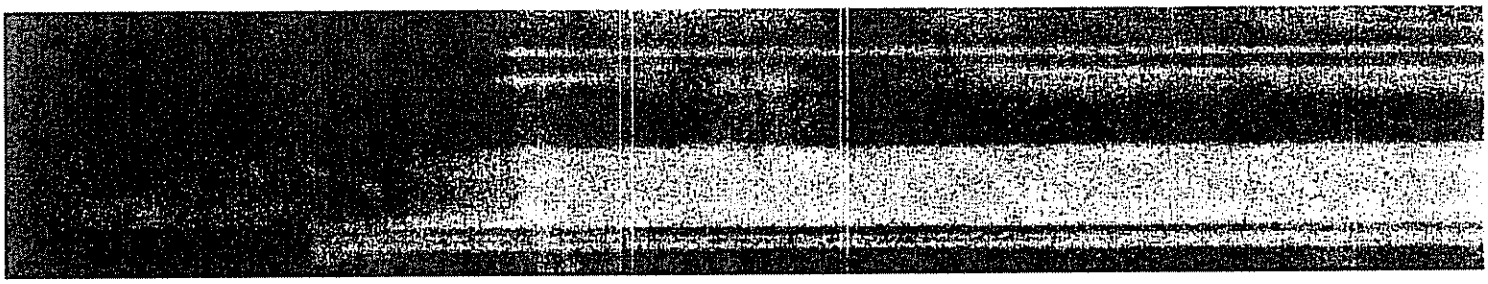


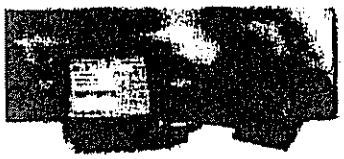
OmniPCX Enterprise

Distributed Systems and Networking

ARCHITECTS OF AN INTERNET WORLD

ALCATEL





The Alcatel OmniPCX Enterprise is a voice communication system that was designed from the beginning to act as an enterprise network node. The model for the PBX came from the telephone central office while the model for the OmniPCX Enterprise comes from the Internet. Alcatel has built networking software so powerful that a network of 100 nodes delivers the same features as a single system, keeping the distributed architecture completely transparent to the user.

Alcatel's software and hardware is so powerful that voice can be sent across a private IP network in a compressed, low-cost form. And across frame relay. And across ATM. And across the public ISDN / PSTN networks. Alcatel delivers radically new end-user power, and radically new integration of voice and data applications, across any combination of wide area networks

A powerful distributed architecture

The Alcatel OmniPCX Enterprise hardware components can be distributed throughout company premises and in remote locations via any communication infrastructure such as public telephone networks, digital leased lines or IP data networks. This corresponds to a single virtual system that is completely transparent

A powerful distributed system

In the distributed configuration, the various Alcatel OmniPCX Enterprise communication servers communicate using the Alcatel Business Communication (ABC) Protocol. This protocol works with all topologies and transport infrastructures and is based on four modules offering the following services:

ABC-F: Telephone features

ABC-F provides complete telephone feature transparency. Almost every feature available in a single system is available across an entire network of Alcatel OmniPCX Enterprise

ABC-A: Applications

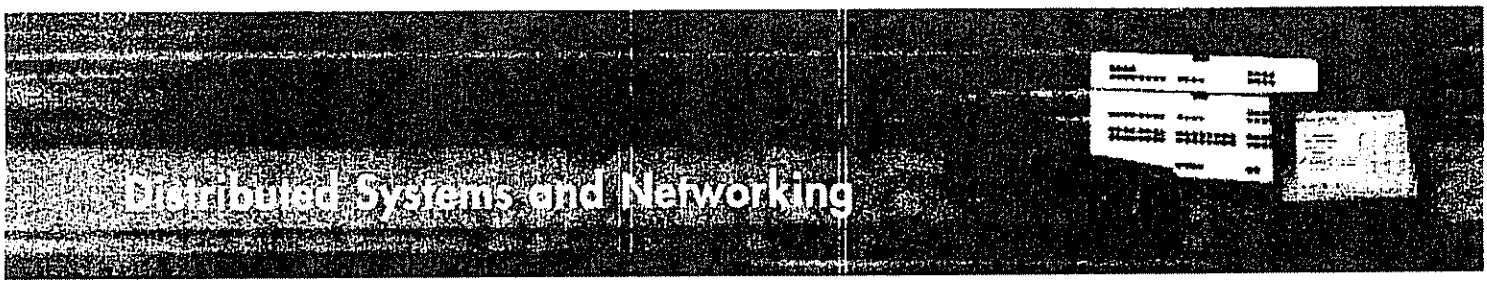
ABC-A offers enhanced network-wide applications, as both centralized and distributed solutions

ABC-R: Routing

The core of the built-in routing protocol, ABC-R is based on a unique adaptive routing mechanism that optimizes the size of network links and improves overall security. This protocol was designed to reduce costs through the use of least-cost routing, automatic route selection, forced on-net, break-in, break-out, and link optimization on transfer. And, ABC-R delivers a high degree of network resilience.

ABC-M: Management

ABC-M guarantees database consistency among all Alcatel OmniPCXEnterprise. It uses broadcasting and audit mechanisms to inform the whole network about configuration changes. It also safeguards the system with centralized alarms



Packet voice network

Fueled by the quick evolution of enabling technologies such as packet voice, it is now possible to deliver innovative services at reduced costs through a unified network. This unification leads to more network choices: voice over IP, voice over frame relay, voice over ATM networks, and even packet voice over traditional circuit networks.

Voice virtual private network (VPN)

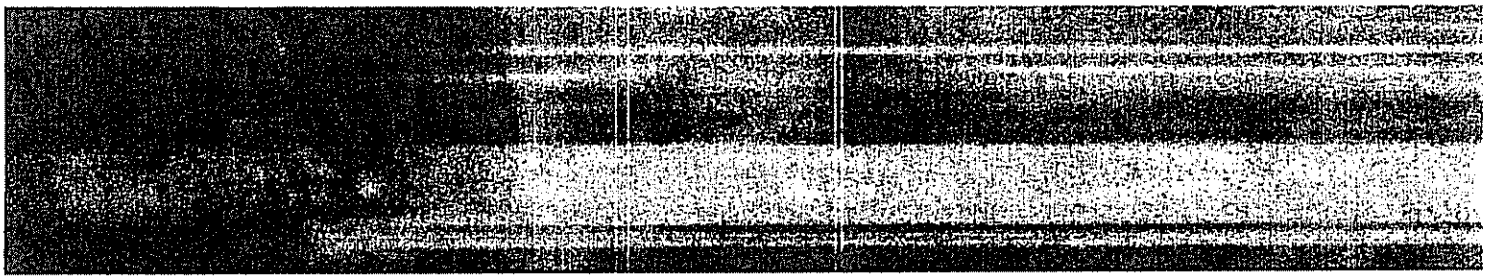
New carrier tariff policies create opportunities for networks using public operators' switched infrastructures. Alcatel's virtual private network solutions optimize both cost and performance with the use of packet voice and compression technologies. Alcatel's advanced networking technologies also integrate easily with existing ISDN / PSTN carrier services.

Heterogeneous network

Alcatel's ABC protocol is a superset of QSIG that increases the quality and performance of the Alcatel OmniPCX Enterprise in an all-Alcatel network, and is completely compatible with other vendors existing systems in multi-vendor environments. The QSIG protocol can also be used to connect new applications to legacy PBXs; for example, mobile user groups, single-number dialing, call centers, etc. It is also an important tool for migrating from older legacy PBXs to the capabilities of the converged Alcatel OmniPCX Enterprise. The Alcatel OmniPCX Enterprise also fully supports the legacy DPNSS protocol

Network concept

The Alcatel OmniPCX Enterprise offers attractive and versatile options that reduce communication expenses while maintaining a consistent service level throughout the organization.





Distributed systems

To address the needs of the very large organization, including very small locations, Alcatel provides substantial network capacity:

- 100 systems in a homogeneous network
- 255 systems in a supra-network
- 50,000 users in a homogeneous network
- Over 1 million users in a supra-network
- 60,000 phone book entries

Distributed Media Gateways

In the Alcatel OmniPCX Enterprise distributed architecture, various cabinets and chassis, called media gateways, provide for all traditional voice end-point connections (i e , analog, digital, wireless and soft phones, and PSTN / trunk interfaces), system resources (e g , conference and tone generation/ detection circuits), auxiliary devices and also provide local switching for voice end-points and resources within the media gateway

Distributed media gateway over fiber optics

- Multi-mode and single mode fiber optic interface options
- Full feature transparency
- Local switching for local communications
- On-site cellular hand-over and roaming between media gateways
- Up to four 8 Mbps connections between the remote media gateways and the communication server

Distributed media gateway over copper cabling

- Category 5 UTP copper cable
- Full feature transparency
- Local switching for local communications
- On-site cellular hand-over and roaming between media gateways
- Up to four 8 Mbps connections between the remote media gateways and the communication server

Distributed media gateway over digital leased line

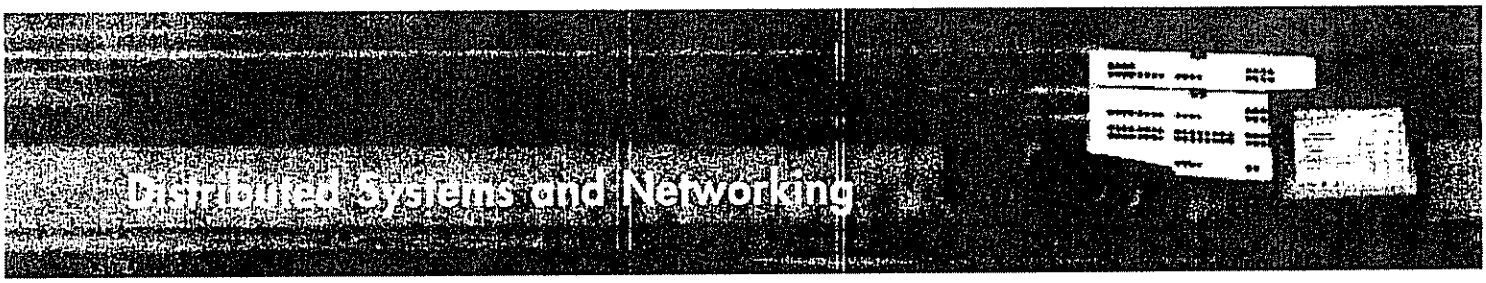
- 64 Kbps serial digital link or frame relay
- Six / eight voice channels plus ABC network signaling supported
- Full ABC networking features
- Local switching for local communications
- "On-site" PWT cellular roaming
- Overflow over ISDN / PSTN with ABC services in case of link saturation or failure

Distributed media gateway over TCP-IP data networks

- TCP / IP network
- 120 voice channels
- Local switching for local communications
- Full feature transparency

IP domains for IP media gateways and IP phones

- Call limitation between domains
- Different compression algorithms intra-domain and inter-domains
- Mixed legacy / IP domains
- Local media service: voice prompts, music on hold, conferencing



Packet voice network

Traditional voice networks are based on digital leased lines, including T1 and fractional T1. These are still useful, and are an important component of current networks

However, organizations can now deploy new networking configurations using the packet voice technology built into the Alcatel OmniPCX Enterprise. These include the digital public switched telephone network using ISDN/PSTN signaling; public and private IP networks; frame relay networks; and ATM networks.

Packet voice network over ISDN

Traditional voice uses 64 Kbps for a single voice call. With the Alcatel OmniPCX Enterprise compression engine integrated in LIO (link optimizer) boards, a single ISDN/PSTN 64 Kbps channel can support up to eight voice calls simultaneously.

- LIO B (serial data) provides one serial data interface per board, X.24 / V.11 or V.36 native frame relay. Each LIO B board can support up to four frame relay directions and has eight integrated voice compression channels.
- LIO X (auxiliary compression module) provides eight additional voice compression channels

Characteristics:

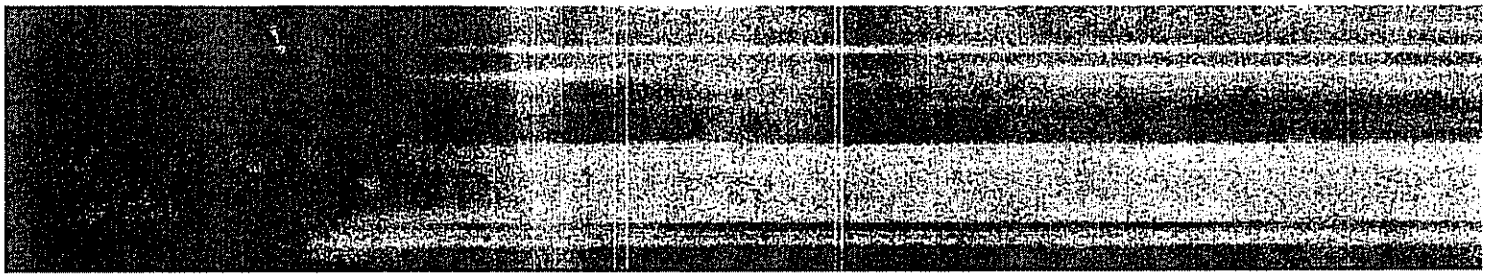
- Automatic fax detection
- Using G.729A compression algorithm, compression rate is 8 Kbps
- Using G.723.1 compression algorithm, compression rate is 6.4 Kbps
- DTMF Q.23 codes interpreted, coded and regenerated
- End-to-end compression / decompression
- G3 fax up to 4.8 Kbps
- Integrated echo cancellation
- Lost frame interpolation
- Mutual aid between compression resources
- Silence suppression and regeneration (VAD)
- Voice frame fragmentation (reducing delay)
- G.711 voice coding: 64 Kbps

Packet voice network over IP

The Alcatel OmniPCX Enterprise provides a powerful communication capability across any IP network, and more. By sending the full ABC networking protocol across an IP network, almost every feature that works in a single OmniPCX Enterprise also works across a network. So, you do more than reduce transmission costs. You create a single transparent network of almost any size across any distance

Characteristics:

- Allocation of the compression algorithm
- Static
- Per bundle between Alcatel OmniPCX Enterprise
- Automatic fax detection
- Call rerouting for new calls
- If there's an IP network failure
- QoS problems (call by call)
- Using G.729A compression algorithm, compression rate is 8 Kbps
- Using G.723.1 compression algorithm, compression rate is 6.4 Kbps
- DTMF Q23 codes interpreted, coded, and regenerated
- Dynamic jitter buffer
- Echo cancellation
- End to end compression / decompression
- Ethernet connectivity
- G3 Fax up to 4.8 Kbps
- Inter-node transit





- LIO E/INT-IP/MCV boards (one LAN interface per board)
- Lost frame interpolation
- Management fully integrated with management platforms
- Multiple VoIP bundles
- Silence suppression and regeneration (VAD)
- Up to 60 voice channels per board
- Up to 1,500 channels per node
- G.711 voice coding: 64 Kbps

Packet voice network over frame relay

Frame relay is a central element of many enterprise networks. It's efficient and cost-effective, and provides more deterministic performance than the Internet. The Alcatel OmniPCX Enterprise provides optimized support for voice across frame relay networks. The OmniPCX sends voice across private and public frame relay networks. This is particularly useful for interconnecting sites with small to medium traffic loads.

- LIO B (serial data) provides one serial data interface per board, supporting X.24 / V.11 or V.36
- Interface speed: 64 - 128 Kbps

Characteristics:

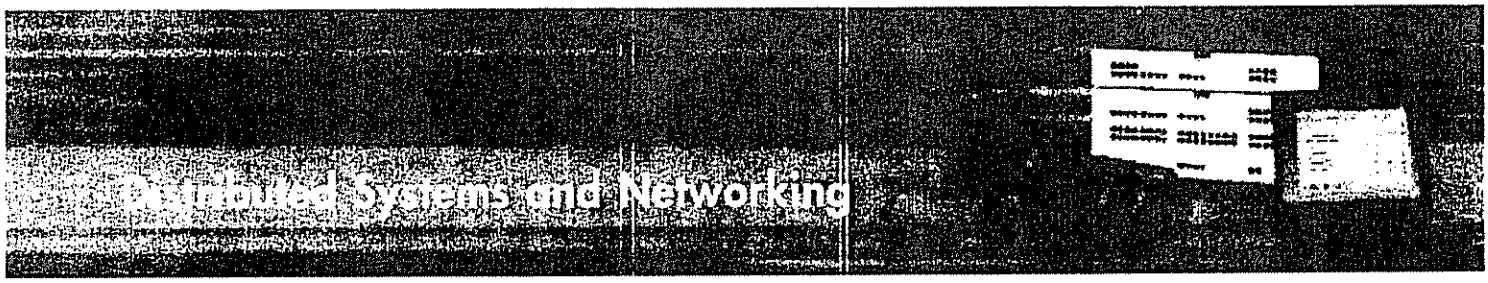
- Automatic fax detection
- Using G.729A compression algorithm, compression rate is 8 Kbps
- Using G.723.1 compression algorithm, compression rate is 6.4 Kbps
- Data frame fragmentation (reducing delay)
- DTMF Q23 codes interpreted, coded, and regenerated
- Each LIO B board supports up to four bundles of compressed channels; each bundle can go to a separate destination
- End to end compression / decompression
- G3 Fax up to 4.8 Kbps
- Integrated echo cancellation
- Lost frame interpolation
- Mutual help between compression resources
- Silence suppression and regeneration (VAD)
- Six voice channels per PVC
- G.711 voice coding: 64 Kbps

Voice over ATM

Today, many campus networks use ATM as a backbone technology with many carriers providing ATM as an interface to a high-speed wide area network. The OmniPCX Enterprise supports native ATM connectivity, providing seamless integration of voice and ABC services over ATM networks.

Characteristics:

- ATM interface: 155 Mbps
- ATM adaptation layer 1
- VToA Permanent Virtual Circuits: AAL1 CBR (constant bit rate)
- The ATM interface uses circuit emulation mode (CES1) unstructured
- The SDH transmit unit implements an ATM user network interface compliant with the ATM Forum UNI 3.1 and the ITU-TI 432



Virtual Private Network

Networking small sites with low or medium voice traffic does not always justify dedicated leased lines. As a result of technical evolution of their infrastructure, carriers now offer an increasing number of switched network options at increasingly attractive costs. The Alcatel OmniPCX Enterprise supports versatile virtual solutions with real advantages.

ABC-VPN

Alcatel's ABC-VPNs are used as a complete solution, or as a way to handle peak overloads from leased line and other network alternatives. Leased lines can be sized based on the average – rather than peak – traffic loads. When the leased lines become saturated, additional calls are transparently routed across the public switched network, using integrated compression if desired. This reduces costs and increases network availability.

Another alternative is a full VPN architecture, which requires only one permanent connection, which can be low speed, for signaling. All voice traffic is handled by public switched digital connections, using integrated compression, if desired. It is:

- Compliant with QSIG and ISDN / PSTN networks
- Integrated compression over QSIG and ISDN /PSTN networks

The OmniPCX Enterprise uses a disassociated signaling concept. This means that calls can be routed over one path (for example, the PSTN) while inter-OmniPCX Enterprise signaling is sent over another path:

- Analog link via modem
- Digital serial link
- Ethernet TCP/IP networks
- ISDN/QSIG B channel
- Leased line D-channel
- PLL X 25 in ISDN D-channel. (Country dependent)

ABC on demand

This solution makes it possible to build a powerful private voice network over a public switched network without any permanent connection. It combines an integrated voice compression engine with signaling on demand.

When required, one B channel connection is set up between two nodes and functions as a virtual leased line, transporting the network signals and the compressed voice. Up to eight calls are carried in a single B channel. The virtual leased line is released when the call ends.

Analog ABC

Analog ABC uses analog leased lines for voice traffic. Analog ABC is cost-effective for international networks and countries with attractive tariffs for analog links. In addition, existing legacy networks based on analog lines can be optimized with full ABC feature transparency; the disassociated signaling is transported via:

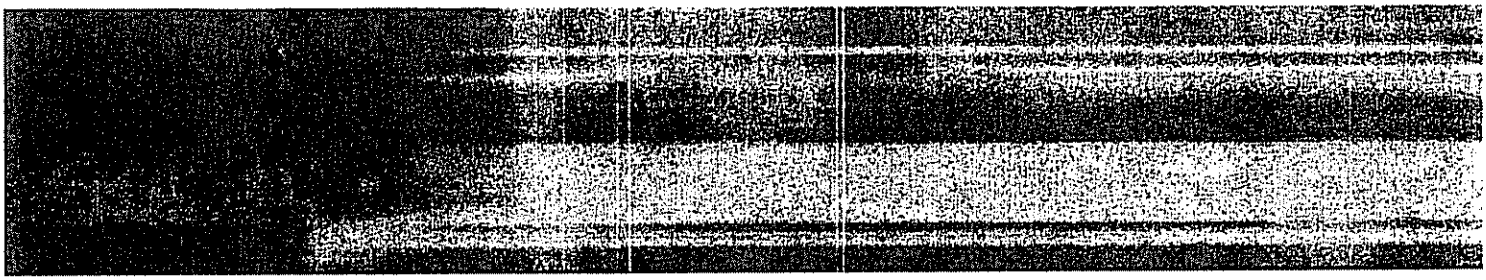
- Analog link via modem
- Ethernet TCP/IP networks

ISVPN (ISDN based VPN)

This service uses a D-channel service of public networks called user-to-user signaling (UUS1). ISVPN is a networking solution with implementation of all basic networking features. ISVPN services:

- Basic call
- Call back request
- Call forwarding
- Centralized attendant
- Enquiry call
- Homogeneous-numbering plan (based on virtual DID)
- Intrusion
- Name and number identification
- Overflow
- Path optimization
- Transfer on no reply and conversation.

All networking solutions – using networks based on digital leased lines, analog leased lines, IP, frame relay, ATM, ABC-VPN, or VPN on demand – inter-work perfectly and provide a consistent and unique level of service.





Features and Spicifications

ABC-F: Telephone features

- 3 party conference
- 29 party conference
- Alcatel Hospitality / Healthcare Link (AHL)
- Auto assignment for guests / patients
- Automatic call-back on busy private link
- Basic call
- Broker call
- Call back on busy links
- Call back on free or busy extensions
- Call by name
- Call deflection
- Call offer
- Call park
- Call waiting indication
- Camp on
- Conditional forwarding (forwarding on no reply, forwarding on busy)
- Conference
- Data communication
- DISA
- Distinctive ringing based on hierarchies
- Do not disturb
- Entity routing for multi company/ department configuration
- Hold
- Individual call pick-up
- Inquiry call
- Intercom call
- Intrusion
- ISDN supplementary services
- Number and name identification
- Reading of personal charging pulse meters
- Retransmission of last number dialed
- Substitution
- Text mini-messaging
- Transfer
- Transparency in decade and Q 23 dialing
- Unconditional forwarding

ABC-F: Distributed GroupWare Features

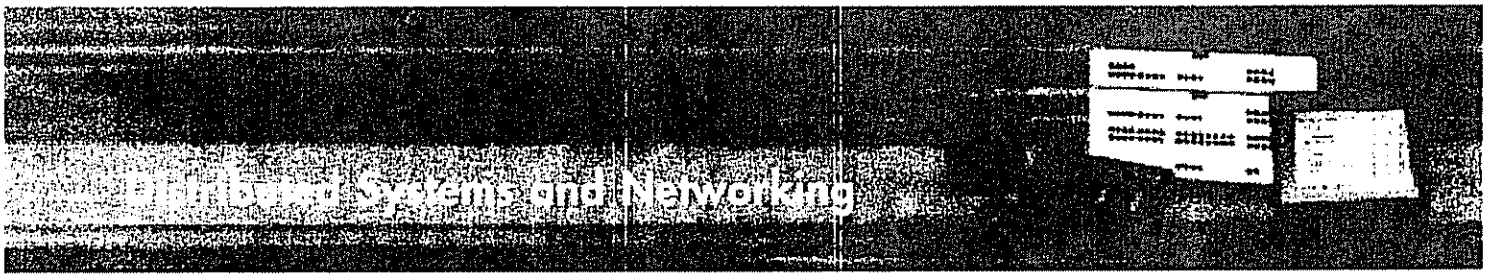
- Associate in network
- Conditional forwarding to associate
- Hunting group of subscriber
- Immediate forwarding to associate
- Manager / assistant filtering team
- Object supervision: free, partially busy, totally busy, ringing
- Supervision of trunk, bundle, subscriber

ABC-F: Mobility features

- On-site mobility in network: roaming, user rights and accounting allocated to home node number
- Paging services in networks
- Remote forwarding
- Substitution
- Ubiquity services

ABC-A: Networking applications

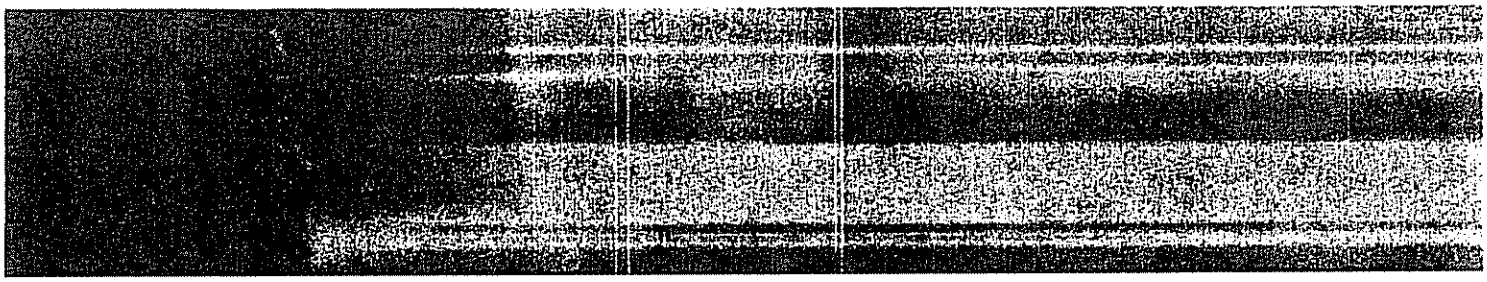
- Attendant services
- 3–party conference
- 29–party conference
- Broker call
- Bundle reservation
- Call by name
- Call distribution for decentralized and centralized attendants
- Call distribution in attendant groups parallel, cyclic, longest idle state
- Call offer
- Centralized ACD supervisor in network with real time supervision

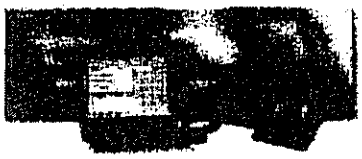


- Centralized or shared messaging system distributed in network
- Chained call
- Class of service identification
- Class of traffic indication on line keys (local call, external call, overflow)
- Do not disturb override
- Dynamic access to user communication resources (PWT, voicemail, text mail, etc.)
- Entity or installation status management (day, night, fwd1, fwd2)
- Hold
- Inquiry call
- Intrusion
- Large busy lamp field supervision
- Message waiting in networks
- Multi-tenant services
- Mutual aid between ACD groups in different nodes with look ahead call routing
- Number and name identification
- Overflow of unanswered external calls
- Reading of personal charging pulse meters
- Retransmission of last number dialed
- Routing and services for multi-company multi-department services
- Station reservation
- Status management (day / night / forwarding) for entity and attendant groups
- Text advertising message on busy user display
- Text mini-messaging
- Traffic overflow for attendant group or attendants based on caller waiting time
- Traffic overflow with look-ahead routing
- Transfer with or without presentation
- Transparency in decade and Q 23 dialing
- Trunk allotting with or without barring
- Trunk reservation
- User, abbreviated numbers, and entities management
- Voicemail management ntegrated in subscriber management. ACD

ABC-R: Routing mechanism

- Adaptive routing
- Automatic Route Selection (ARS)
  - 1,000 route lists
  - 20,000 destinations
  - 100 weekly tables
  - Access to alternative routes based on caller rights
  - ARS server centralized or distributed
  - ARS time dependent: day of the week, hour, and minute of the day
  - Cost limit barring per user / installation status
  - Dialing command tables with add/delete digits for number
  - Direct or indirect multi-carrier access
  - Five daily tables per weekly table
  - Five routes per direction
  - Information (voice prompt) to callers if cheapest route is not available
  - Information (voice prompt) to caller if he/she needs permission to use a more expensive route
  - One to thirty analyzed digits translation
  - Up to thirty numbers in dialing command table
- Break-in
- Break-out
- Break-in via secured DISA
- Forced on net
- Homogeneous numbering plan
- IP domains
- Multiple call barring translators
- Multiple DID translators
- Multi public translators
- Multi-tenant ARS
- Overflow if leased line failure or saturation





according to user rights

- Private network dialing plan (eight digit)
- Private to public overflow (according to user rights)

ABC-M: Management features

These management functions are integrated in the ABC networking protocol to facilitate and secure the administration of a system. Connection to the Alcatel OmniPCX Enterprise is provided by an Ethernet 10BaseT connection using state-of-the-art protocol stacks on top of TCP/IP.

- Audit service
- Broadcast functionality
- Centralized alarms
- Centralized or distributed management from external applications
- Communication tickets with VPN and LCR tags
- Management from attendant
- Remote maintenance access
- Remote software downloading
- SNMP traps
- VT 100 local management

Heterogeneous networking

The Alcatel OmniPCX Enterprise supports network signaling based on QSIG, a standard ITU protocol. This allows users to build networks with non-Alcatel systems. It also eases the transition from traditional PBXs (most of which support at least some QSIG functions) to the new PCX architecture. Advanced capabilities such as IP phones, network-wide mobility, ACD, PC-based telephony, and others, can work across an entire network – even a network that still contains some legacy PBXs – because of the transparent signaling supported by QSIG. It includes three QSIG functions:

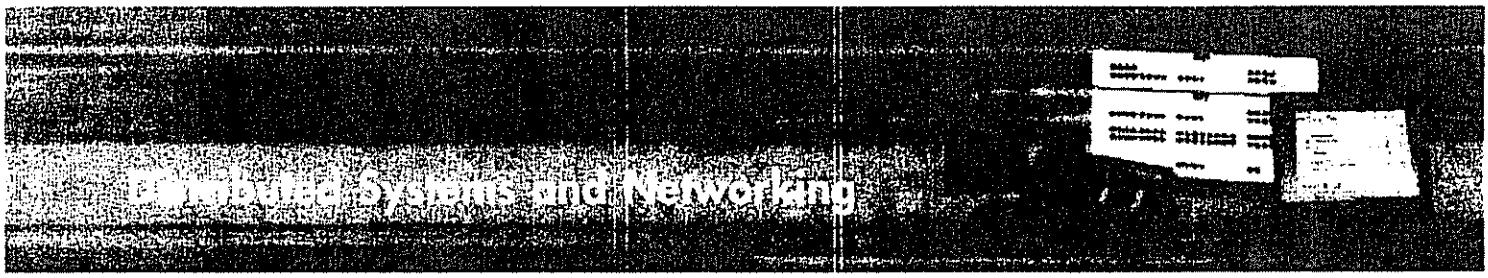
QSIG - Basic call

This allows multi-vendor networks to be built, using basic telephony features:

- Calling line identification
- Connecting line identification
- Data calls bearer
- Malicious call identification
- Sub-address

QSIG - Generic function protocol

This part of the QSIG standard makes it possible to combine voice systems from multiple manufacturers in a single network, and yet still have full support for the advanced features offered by each supplier between that supplier's systems. This is important for working across new carrier services that support QSIG GF



QSIG - Supplementary services

Alcatel always remains up to date with the latest QSIG upgrades and commits itself to testing these features with other major suppliers. Supplementary services available on the Alcatel OmniPCX Enterprise (more available with ongoing standardization) include:

- Advice of charge
- Call completion on no reply
- Call completion to busy subscriber
- Call forwarding - busy
- Call forwarding on no reply
- Call forwarding - unconditional
- Calling/connected line identification restriction
- Calling/connected name identification restriction
- Calling line identification presentation
- Calling name identification presentation
- Call transfer
- Call offer
- Connected line identification presentation
- Connected name identification presentation
- Generic functional procedures
- Message waiting indication
- Path replacement

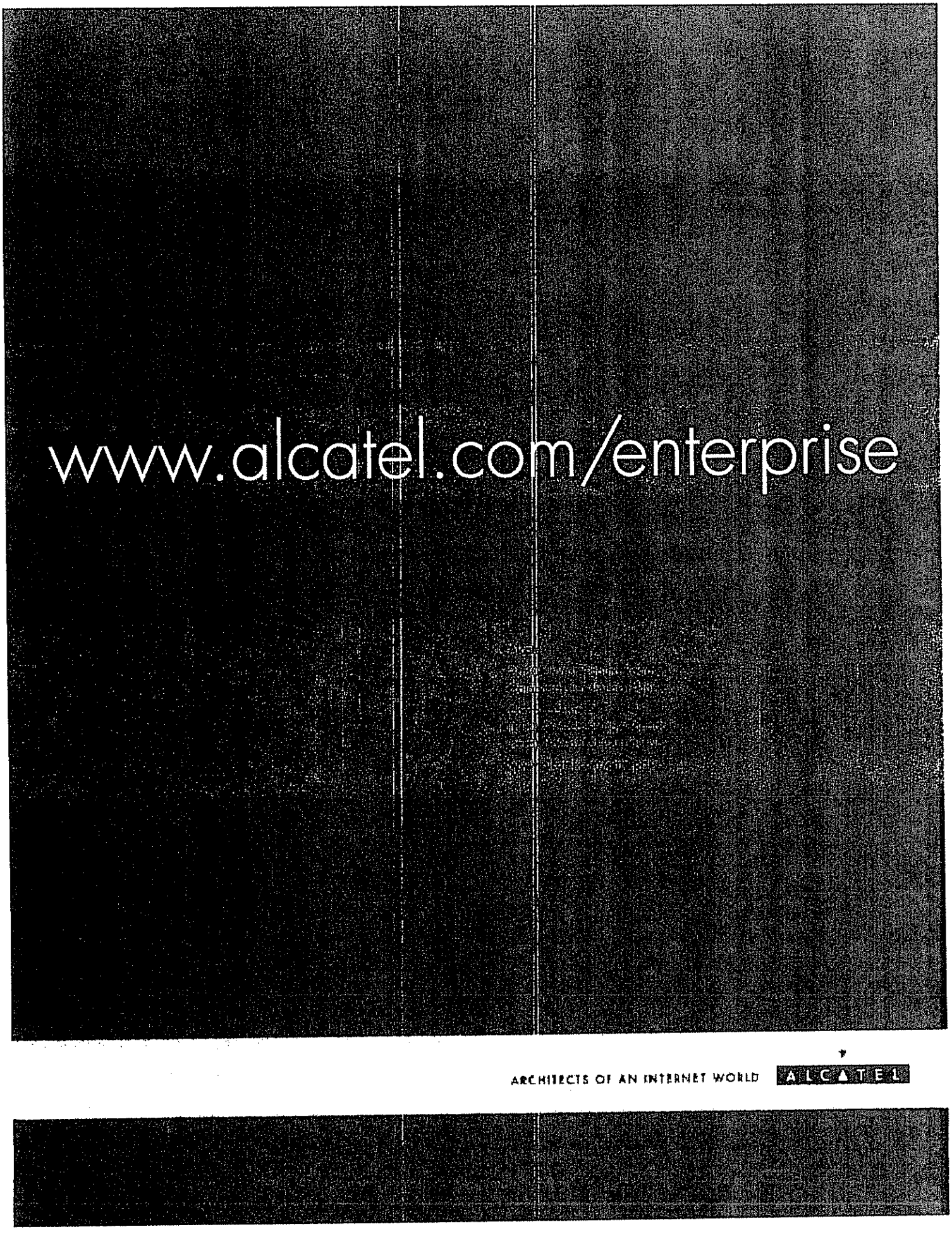
DPNSS

The OmniPCX Enterprise also supports the legacy protocol DPNSS, which inter-works with the ABC protocol.

The services supported are the following:

- Call back when free (call completion on busy phone) (9)
- Call forwarding (11)
- Call offer (14)
- Call waiting (17)
- Centralized night service (25)
- Conference (13)
- Do not disturb (32)
- Hold (12)
- Inquiry call (13)
- Intrusion (10)
- Loop avoidance (37)
- Route optimization (19)
- Service independent string (16) Name
- Transfer (13)
- Voice and data call (6 and 7)

OmniPCX Enterprise packet voice networking offers optimized bandwidth through an integrated compression engine across all network types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