# ERICSSON BUSINESSPHONE IP TELEPHONY

Ericsson BusinessPhone IP Telephony solutions are based on the IP Unit (IPU), which is a plug-in board that makes Voice-over-IP (VoIP) an affordable, integrated and – above all – useful tool for small to medium sized enterprises. It enables existing BusinessPhone systems to offer IP-based, as well as traditional telephony.
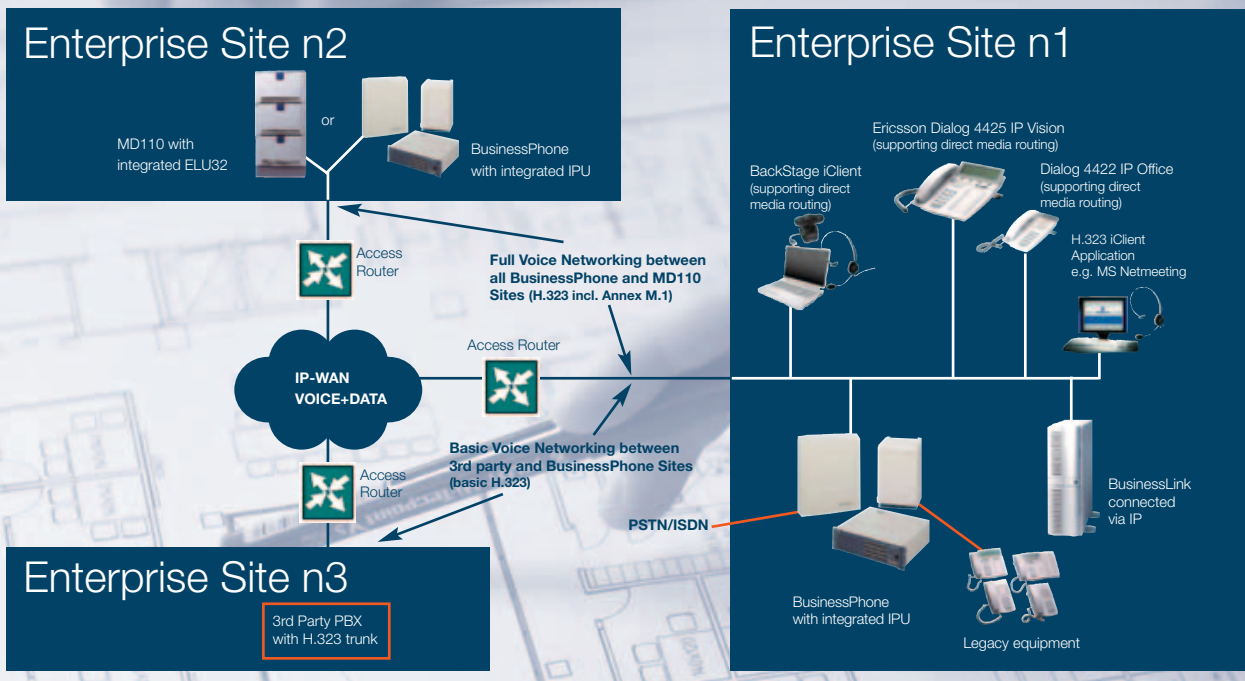
## Overview

BusinessPhone IP Telephony is an integral part of the BusinessPhone system. The immediate benefits are cost-effective connectivity and truly integrated computer-telephony applications over your corporate network.

The BusinessPhone IP Networking solution allows two or more BusinessPhone systems to be networked seamlessly together, or with other PBXs, including the Ericsson MD110. Additionally BusinessPhone offers advanced IP telephony with the Ericsson IP clients, Dialog 4422, Dialog 4425 and BackStage iClient.

With BusinessPhone IP Telephony, it's possible to reuse installed BusinessPhone infrastructure such as cabling, telephones – including analog, digital and DECT cordless models – as well as Computer Telephony (CT) applications.

## Added functionality

With BusinessPhone IP Telephony solutions, all the functionality of the BusinessPhone system is maintained, and enhanced. Fully integrated voice and data communications mean new application possibilities that can enhance operational efficiency and improve customer service. For example, with BusinessPhone systems

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**TAKING YOU FORWARD**

**Enterprise Site n2**

MD110 with integrated ELU32 — or — BusinessPhone with integrated IPU

Access Router

**Full Voice Networking between all BusinessPhone and MD110 Sites (H.323 incl. Annex M.1)**

Access Router

**IP-WAN VOICE+DATA**

**Basic Voice Networking between 3rd party and BusinessPhone Sites (basic H.323)**

Access Router

**Enterprise Site n3**

3rd Party PBX with H.323 trunk

**Enterprise Site n1**

Ericsson Dialog 4425 IP Vision (supporting direct media routing)

BackStage iClient (supporting direct media routing)

Dialog 4422 IP Office (supporting direct media routing)

H.323 iClient Application e.g. MS Netmeeting

BusinessLink connected via IP

PSTN/ISDN

BusinessPhone with integrated IPU

Legacy equipment

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networked over a wide-area IP network, and connected to a BusinessLink CT application server, your staff can share applications as if they were working on their own office network, wherever they are located.

The integration of an H.323 Gatekeeper into the BusinessPhone Communication System allows home and remote workers to be integrated into the organization's workflow. For example, with the BackStage iClient installed on any Multimedia PC, employees can have full access to the BusinessPhone system functionality while they are connected via a Remote Access Service to the organization's data-network. They can access their work files, email and voice-mail, take part in conference calls and use other phone facilities with just a single PC.

Making IP connectivity an integral part of the BusinessPhone solution also opens up some interesting new possibilities in system management. With "Management over IP" it is possible to configure, administrate and maintain the BusinessPhone system from anywhere over an IP connection. The integrated Unified Messaging function is an interesting possibility also enabled by the systems IP Telephony integration.

## Efficiency with quality

IP Telephony has big operational advantages. By using a unified network for voice and data, you only have one set of wiring to consider. And when it comes to adding, moving and removing users, it's just a question of plugging in and unplugging equipment – configuration is simple. This efficiency is not gained at the expense of quality. In the event of a failure in the IP network, or if call quality is insufficient, ongoing Voice-over-IP calls are handed over to an alternative non-IP route. The IPU also supports the "Type of Service" (ToS) field in the IP header to help maintain high quality of service.

## IP Telephony

To integrate IP extensions BusinessPhone uses a Gatekeeper. The implementation is based on the H.323 standard with an additional proprietary enhancement to support the Ericsson IP clients, Dialog 4422 and Dialog 4425, which are fully featured IP telephones, and the BackStage iClient. Functions supported by the IP telephones include Message Waiting Indication and Supervision of any other BusinessPhone extension.

By routing phone calls between IP extensions directly on the corporate IP network, no switching recourses from BusinessPhone are used. Furthermore, speech quality is increased through this direct media routing function by eliminating coding delays.

Application scenarios for usage of IP extensions and clients are manifold, but the main deployment lies in home or remote working as well as in scenarios where support for 'free seated' employees is required. The nature of IP extensions and IP clients dictates that they need to be registered on the system in order to operate appropriately. This is the registration procedure used in free-seating scenarios, where employees can log-on to their personal voice and data account from any desk.

Employees can easily access the company data-network from home or remote locations via secure servers and routers. By logging onto the network's 'voice-server' – BusinessPhone – they will benefit from the same telephony functionality as if they were connected locally. Telephony supports diversion, call-back and even conference calls.

## IP Networking

One of the key benefits of IP Networking is reduced call costs. Internal voice calls can be carried over your private local or wide-area IP network (LAN or WAN). National and international call charges can be reduced dramatically using compression technology which, compared to traditional voice calls, allows a greater number of VoIP calls to be carried over the same facilities.

By installing an appropriate IP voice channel license on the IP-board (IPU) in addition to the traditional voice networking license, it is possible to operate voice networking over IP in the same way as via legacy leased or switched lines. Instead of multiple tielines per node or hop-by-hop routing, the IP connectivity is represented as one route in BusinessPhone. The routing is performed in the corporate IP network, resulting in a point to multi-point connectivity. By this, the dimensioning of the networking routes can be done in a very efficient way. Only the traffic that is generated and terminated in their node needs to be considered in the systems traffic load calculation because there is no longer any need for transit traffic.

BusinessPhone IP Networking is based on the standardized Voice-over-IP (VoIP) protocol H.323. Due to the implementation of Annex M.1 as part of H.323, the protocol mechanisms allow tunneling of QSIG messages

within H.323 call signaling channels. By this, all networking features are supported via IP in the same way as via legacy network connections, even centralized operator functions are supported.

Through adding a proprietary mechanism for tunneling Ericssons networking functions, 'Networking over IP' between Ericssons MD110 and BusinessPhone systems is easily possible while providing full feature transparency between all networked sites, independent of whether MD110 or BusinessPhone systems are installed.

In addition, this solution can be used to transparently couple BusinessPhones and 3rd party PBXes (or Ericsson MD110) through Annex M.1 aware VoIP Gateway equipment over IP backbones. Using H.323 as IP Networking protocol enables integration of small branch offices including local break-out possibilities. This means that any H.323 (at least version 2.0) trunk gateway can be connected in a branch office via the corporate IP network, and can be used as local trunk break-out.

## BusinessPhone IP Gateway

The BusinessPhone IP Gateway solution has the potential to satisfy a multitude of needs for Enterprises due to the wide range of features and the ability to easily customize the system. This package solution comes with a standard BusinessPhone system specialized to focus on the specific Voice-over-IP Gateway function. It enables the customer to implement a common infrastructure in a converged network for both voice and data applications without the need for substantial investment.

The BusinessPhone IP Gateway is based on a standard BusinessPhone 128i system. This allows businesses to expand their voice networks with the addition of PBX functionality in a cost-effective way simply by upgrading the BusinessPhone IP Gateway with the required license and some optional hardware and software such as voice-mail, while maintaining the rest of the system.

Companies using a standard BusinessPhone as a branch node communication system do not need a separate VoIP trunk gateway to connect BusinessPhone to the PBX on the main site as BusinessPhone supports an integrated trunk gateway. Full Feature transparency between the main site and branch offices is easily possible via the corporate data-network. This is done just by adding a BusinessPhone IP Gateway at the main site's PBX and the IP network and on the other side by upgrading the BusinessPhone systems in the branch offices with an integrated IP gateway (IPU).

QSIG networking features are supported via IP in the same manner as via legacy network connections, even centralized operator functions are supported.

## IP Trunking

BusinessPhone IP trunking is enabled through the standard H.323 based implementation on the system's IP board. Known as IP Trunking, this is a method of transmitting Voice-over-IP (VoIP) used by long distance carriers around the globe to transmit voice between Local Access and Transport Areas (LATAs) and between countries. When used in the local loop, it is known as IP Loop Trunking. IP Loop Trunking makes it possible for a carrier to build a single access network that significantly reduces capital and operational costs.

IP Loop Trunking converts voice to IP packets at the customers' premises through BusinessPhone (in the local loop), then aggregates it into the existing carriers' IP backbone. With IP Loop Trunking, Quality of Service is handled simply since the local loop is a closed network, with a known number of subscribers. Voice-over-IP traffic is given the highest priority, and data transmissions receive a lower priority. Once the voice traffic arrives in the carrier's network it can be routed through the IP backbone to a carrier grade Voice-over-IP gateway to hop off at the specified place. IP Loop Trunking makes it impossible for callers to notice any difference between calls made from traditional digital or analog trunks.

## Technical data

**IPU**
- plug-in board with own 48 MHz processor
- removable compact flash disk containing software and firmware
- Ethernet 10/100 BaseT

**Protocols**
- IPv4
- vendor-specific OAM protocols
- BOOTP
- coding of speech packets according to RTP

- DHCP
- TCP, UDP
- FTP (File Transfer Protocol)
- H.323 v4 incl. Annex M.1
- H.225, H.245
- BusinessPhone proprietary IP GateWay (BPIPGW)
- Gatekeeper – Gatekeeper signaling with Location Request procedure

### Voice support

- up to 16 parallel calls per IPU
- voice coder
  - G.711
  - G.723.1
  - G.729ab
- silence suppression with comfort noise insertion
- up to 64ms G.168 echo cancellation
- support of end-to-end DTMF

### Quality of Service

- queuing prioritization, support for Type of Service (ToS)
- DiffServ, Differentiated Services according to RFC2474

### IP extensions

- support of up to 128 IP extensions per IPU via an integrated H.323 Gatekeeper
  - Ericsson IP phone, Dialog 4422 and Dialog 4425
  - BackStage iClient
  - any IP or PC phone conforming to H.323 standard
- direct media routing: end-to-end IP between IP extensions

### IP Networking

- standard based signaling protocol
  - H.323 including Annex M.1 supporting tunneling of QSIG (including proprietary add-ons) between BusinessPhone systems over IP
  - H.323 including proprietary add-on supporting tunneling of QSIG (including proprietary add-ons) between BusinessPhone systems and Ericsson's MD110 systems over IP
- vendor-specific call signaling protocol supporting full voice networking functionality including QSIG between two or more BusinessPhone systems over IP
- Least Cost Routing and Expensive Route Warning
- full support as for any other BusinessPhone route

### Network redundancy

- alternative route selection in the event of LAN access failure or IP congestion during call setup
- hand-over to circuit-switched network in the event of LAN access failure or IP congestion during conversation

### CT and maintenance link

- connection of BusinessLink Server to the BusinessPhone system via IP
- connection of the BusinessPhone Management Suite to the BusinessPhone system via IP
- connection of any traditional application, e.g. Call Center Supervisor, Call Accounting applications to the BusinessPhone system utilizing Vcom, or a software based Com driver running on Windows 98SE, ME, XP, 2000 and 2003
- connection of the Unified Messaging Interface to the BusinessPhone system via IP

### Configuration Options

- flexible utilizing of voice channels, voice channels can be used for
  - IP extensions
  - IP trunks to a central Gatekeeper (operator) conforming to H.323 standard
  - IP trunks for networking purpose
- software and firmware are fully upgradeable from remote locations
- remote configuration and maintenance