Aastra BusinessPhone Networking

The Aastra BusinessPhone Networking solution enables the BusinessPhone Communication System to become part of your integrated digital corporate voice and data networks. There are different Networking licenses, designed to cover a wide range of corporate networking scenarios, allowing Aastra BusinessPhone systems to interact with other Aastra BusinessPhone and MX-ONE systems, as well as with PBXs from other manufacturers. Switched dial-up and leased ISDN lines can be used to connect BusinessPhone systems, and an integrated IP gateway also allows full networking between BusinessPhone sites using corporate IP networks.

Overview

BusinessPhone Networking provides a way of turning the standalone BusinessPhone Communication System into a fully integrated, networked PBX able to interact with other PBX systems, both from Aastra and from other manufacturers. In effect, BusinessPhone Networking can link your Communication System together so that they behave like one unified voice and data communication network, providing service transparency, cost efficiency and adaptability to your organization's needs.

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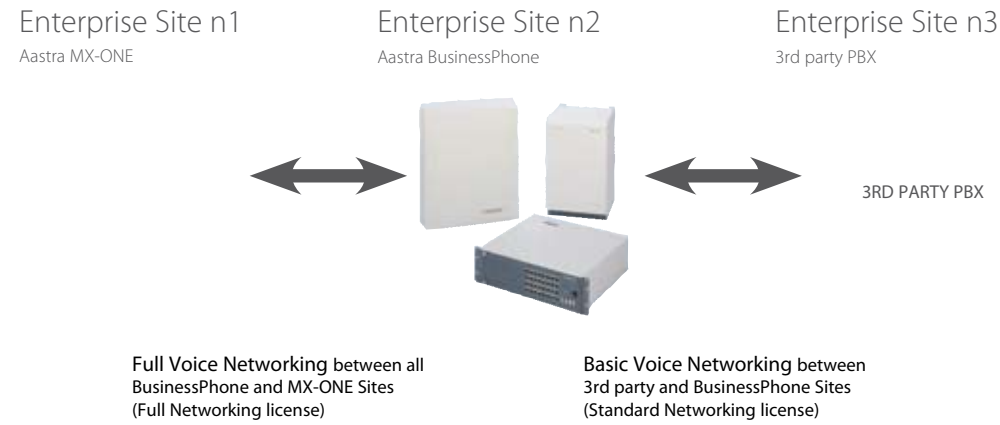


Full Voice Networking between all BusinessPhone and MX-ONE Sites (Full Networking license)

Basic Voice Networking between 3rd party and BusinessPhone Sites (Standard Networking license)

BusinessPhone Networking provides interconnection in a variety of corporate network configurations, and is available with different functional licenses.

The QSIG Network license provides basic connectivity with a common corporate numbering plan and supplementary services between BusinessPhone system and other vendors' PBXs over leased lines with QSIG signaling. Support for the ECMA/ETSI standard QSIG interface and services ensures the interaction with any compliant systems in multi-vendor networks.

The Full Networking license additionally includes a range of proprietary services and applications available between BusinessPhone and Aastra MX-ONE communication systems.

The BusinessPhone and MX-ONE systems may be linked together over leased lines with QSIG, over switched dial-up lines with DSS1 (Digital Signaling System No.1) signaling, over corporate IP networks, or using a mixture of these connection methods. The use of dialup ISDN lines allows the creation of Virtual Private Networks (VPNs), offering full transparency of services and a common corporate numbering plan.

Network configuration options

The BusinessPhone Networking solution is flexible enough to match a wide variety of configuration and capacity requirements. In combination with the Aastra MX-ONE system, it is possible to create networks with nodes ranging from ten to 20,000 extensions, offering uniform access to the same services and applications.

There are three typical corporate network configurations with BusinessPhone Networking.

Networking with only BusinessPhone nodes can be used for smaller corporate networks, either with a central headquarters and branch offices, or where several offices need to be interconnected, but no office plays the role of headquarters, a configuration that accounts for around one third of all networks. This BusinessPhone networking solution provides a common corporate numbering plan and full transparency of standard and proprietary services such as Call Back and Diversion.

Networking with BusinessPhone and MX-ONE is suitable for larger corporate networks, with the MX-ONE system typically located at the headquarters, acting as the main node with a gateway to the public ISDN. The BusinessPhone system(s) would typically serve branch offices, and may also be directly interconnected and have their own access to the public ISDN for overflow or backup purposes.

With the Full Networking license, both of these BusinessPhone Networking solutions can use Euro-ISDN with DSS1 for VPN functionality over switched lines and private ISDN with QSIG over leased lines, using the common Aastra protocol and services, transported by the User-User Signaling Service 1, 2 and 3 (UUS 1, 2, 3).

Multi-vendor corporate networks can be created using the QSIG Networking license, which integrates BusinessPhone with other vendors' telephone systems that use QSIG standard signaling. Moreover, the Full networking license can still be used to provide the full range of services and applications between BusinessPhone systems in such a multivendor network.

System features

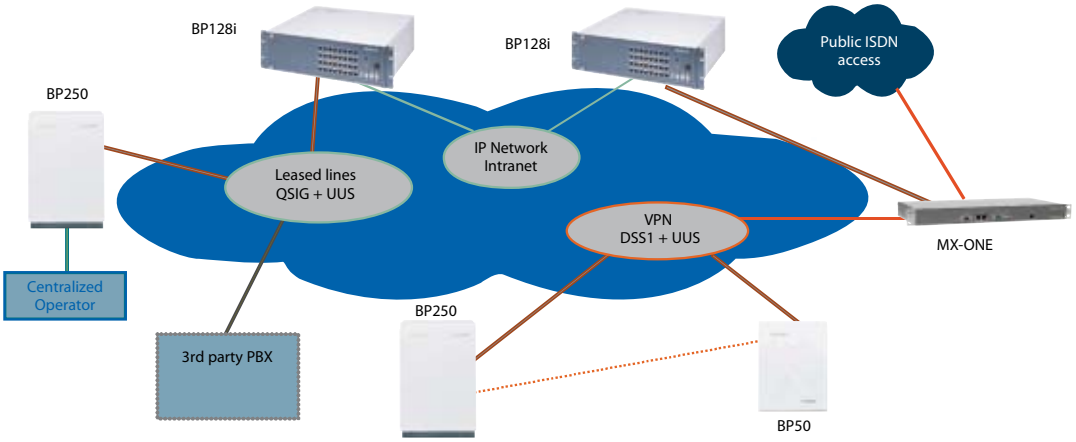
BusinessPhone Networking is enabled by installing an appropriate Networking license per system.

This provides access to networking functions for an unlimited number of BusinessPhone users. The features provided differ according to whether the QSIG or Full Networking license is used.

Basic Networking capability

The Basic Networking features of both, BusinessPhone QSIG and Full Networking includes:

- Common corporate numbering plan – allows a common and uniform numbering plan to be used for all users in the private network. It combines coordinated and location code-based numbering schemes, allowing numbers with up to eight digits: up to four to identify the node, and up to four to identify the extension. Up to 1,000 corporate network nodes may be defined.
- Private network routing – ensures that the best possible route for private network traffic is always selected, to minimize costs and make maximum use of private network resources. A first choice and three alternative routes are possible. The alternatives can be ISDN, analog or IP. The IP unit (IPU) handles the handover to a circuit-switched network in the event of poor VoIP quality or interrupted LAN access.
- Basic (2B+D) and Primary Rate (30B+D) interfaces – can be configured to provide both the Q-reference point, for QSIG leased line connections, and the T-reference point, for switched public ISDN connections with DSS1. The same hardware is used for both interface and connection types.



QSIG networking capability

The QSIG Networking license (green license) allows BusinessPhone to interact with multi-vendor corporate networks containing other ECMA/ETSI QSIG-compliant PBXs over leased lines or corporate IP networks. Features supported include:

- Basic Call– the basic call set-up protocol, with Transit Counter to limit the number of hops between corporate network nodes to avoid looping, and Party Category to ensure appropriate handling of the corporate network calls according to the type of party involved. The Generic Functional Protocol is implemented to support the standard QSIG supplementary services
- Calling/Connected Line Identification Presentation and Restriction (CLIP/COLP, CLIR) – allows the number of the calling/ connected party to be presented, or to be restricted from being presented, on the called/calling party's telephone display.
- Calling/Connected Name Identification Presentation/ Restriction (CNIP/CONP, CNIR) – allows the calling/ connected party's name to be presented, or to be restricted from being presented, on the called/calling party's telephone display. The line and name identification services are coupled, so that when a calling/connected number is displayed, the calling/ connected user's name is also displayed, if available. Similarly, the name and number are both restricted if either has been restricted.
- Advice of Charge (AOC) — if the public network provides Advice of Charge information for calls, this information is presented on the corporate network telephone displays.

Full Networking capability

The Full Networking license (orange or red license pack) provides interaction between BusinessPhone systems, or between BusinessPhone systems and the MX-ONE system, over leased or switched lines or corporate IP network, based on the common protocol and services, carried by UUS 1, 2, 3. In addition to the functionality of the QSIG Networking license, a wide range of further services is supported.

- The CN (Corporate Network) Route Optimization service gives the possibility to reduce the usage of routes (trunks) in different network call scenarios, i.e. the speech path is optimized through the private network between the participating users. This service works in legacy networks with multiple BusinessPhone's or BusinessPhone's mixed with MX-ONE's, as well as in pure BusinessPhone IP Networking scenarios.
- Basic Call – similar to the QSIG Basic Call functionality, including Transit Counter and Party Category, with the addition of the proprietary Traveling Class Mark. This enables or restricts a user's access to certain routing possibilities in the corporate network. In addition, corporate network extension features include:
- Call Back on Busy (or on No Reply) – allows the corporate network calling party to be automatically called back when the called corporate network extension becomes free (or active) again
- Call Diversion (Direct, on Busy, and on No Reply), Follow Me and Diversion Bypass – these features allow a corporate network user to set up different types of call diversion, and to bypass call diversion by dialing a special code
- Calling/Connected Line Identification Presentation/ Restriction – equivalent to the QSIG standard CLIP/COLP and CLIR functions
- Calling/Connected Name Identification Presentation/Restriction – equivalent to the QSIG standard CNIP/CONP and CNIR functions
- Call Transfer – allows ongoing calls to be transferred in the corporate network
- Camp on Busy – notifies a busy corporate network extension that a call is waiting
- External Message Waiting – indicates a message waiting for a BusinessPhone user where the voice message system is located in the MX-ONE system
- Expensive Route Warning – sounds a special tone if a user sets up an alternative route. The user can decide whether to proceed or not
- Intrusion – allows an extension user to intrude into a corporate network call if the called extension is busy
- Network Account Code – allows call charging information to be associated with different users/ accounts in the private network

The Full Networking capability also supports Centralized Operator functionality in "active mode", where the operator is located in the BusinessPhone system, or "passive mode", where the operator is located in an MX-ONE or any other BusinessPhone system in the network. Centralized Operator features include all those listed above, except call back on no reply, and also include the following extra features:

- Call to Operator, Rerouting to Operator and Extending
- Intrusion and Forced Release – these features allow the central operator to intrude into a user's call and to release the unwanted party
- Night Service Notification – allows BusinessPhone to handle the notification from the headquarters (MX-ONE) system that it is passing into night service mode, and consequently (according to the BusinessPhone programming) to reroute incoming calls for BusinessPhone users to an alternative night answering position, other than the headquarters system

IP Networking options

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 tie-lines per node or hop-by-hop routing, the IP connectivity is represented as one route in the BusinessPhone. The routing is performed in the corporate IP network, resulting in a point to multipoint 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 own node needs to be considered in the systems traffic load calculation, as there is no longer any need for transit traffic.

The Networking over IP function in Aastra BusinessPhone as well as in Aastra's MX-ONE is built on the standardized Voice-over-IP (VoIP) protocol H.323 which enables basic IP telephony functionality. On top of that Aastra put a proprietary mechanism to tunnel all available networking functions over corporate IP networks. By that, full feature transparency between a main site equipped with an Aastra MX-ONE systems and branch offices where BusinessPhone systems are installed is easily possible via the corporate data network, meaning all networking features (incl. proprietary add-ons) are supported via IP in the same way as via legacy network connections, even centralized operator functions are supported.

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. Therefore, this solution can be used to transparently couple BusinessPhone systems and 3rd party PBXs (or Aastra MX-ONE) through Annex M.1 aware VoIP Gateway equipment over IP backbones.

Networking between a main site equipped with any 3rd party PBX and branch offices where BusinessPhone systems are installed, is possible via the corporate data network just by adding a Business-Phone IP Gateway solution at the main site as an interface with the IP network, and upgrading the BusinessPhone systems in the branch offices with an integrated IP gateway (IPU).

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.

Network Call Accounting

BusinessPhone Networking supports centralized call accounting in the corporate network using certified BusinessPhone call accounting products. This allows efficient monitoring and charging of all calls in the corporate network and may be used to generate consolidated call accounting and billing reports. Each BusinessPhone node is equipped with a buffer for storing call records, which are periodically collected by the centralized call accounting software.

Networking Operation & Maintenance

The BusinessPhone Management Suite can handle BusinessPhone networking functionality:

- System-level programming of corporate network traffic handling routines
- Definition of Class of Service
- Definition of corporate network numbering plan and routing parameters
- Trunk- and route-level programming of the signaling system and network interface
- Use of UUS services
- Setting parameters for QSIG and proprietary supplementary
- Configuration of IP Networking options

Technical data

System requirements

- BP250, BP50 or BP128i

Hardware requirements

- CPU-D4 or CPU-D5 boards, appropriate license
- ISDN connection: BTU-B and/or MFU and/or BTU-D boards with capability for Q-and T-interface configuration
- IP connection: IPU board

Interfaces

- ISDN: Basic Access (2B+D) and Primary Rate Access (30B+D)
- IP: Ethernet 10/100BaseT

Numbering plan

- Coordinated, location code-based and mixed numbering schemes

Network functionality

- Originating, transit and terminating

Network topology

- Point-to-point
- Star, with either BusinessPhone or MX-ONE as main node
- Meshed

QSIG standards

- GFP (within the scope of the supported supplementary service listed below): ETS 300 239/ISO 11582

Supplementary services:

- CLIP, COLP, CLIR: ETS 300 173/ISO 14136
- CNIP, CONP, CNIR: ETS 300 238/ISO 13864, 13868
- AOC: ECMA 211/212

Protocol compliance

- Layer 1: ETS 300 011/ETS 300 012
- Layer 2: ETS 300 170
- Layer 3: ETS 300 172

License options

The basic License supports full networking for two network interfaces, whether via switched, leased, or IP lines. According to the BusinessPhone licensing concept, the following Networking licenses are available:

- Green Pack: QSIG Networking license for unlimited corporate network interfaces
- Orange Pack: Full Networking license for systems with up to 32 corporate network interfaces
- Red Pack: Full Networking license for unlimited corporate network interfaces
- Plus Pack: Update to Red Pack from Green or Orange Pack (Full Networking license for unlimited corporate network interfaces)

IP telephony options

- Up to 60 IP Networking channels, in steps of 4
- Full feature transparency between BusinessPhone systems using BP IP Gateway protocol, or Standard based H.323 incl. Annex M.1
- Full feature transparency between BusinessPhone and MX-ONE TSW and MX-ONE TS from V3 onwards using standard based H.323 with proprietary add-on.
- Support of basic calls between BusinessPhone systems and other 3rd party PBX via standard H.323 connections

Subject to alterations without notice. Produced in Sweden on Eco-labeled paper XGS ComPrint

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EN/LZT 102 3656 RE

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