Enterprise Branch Node
(19-inch rack version)

Enterprise Branch Node
(wall-mounted version)

Aastra Enterprise Branch Node

The Enterprise Branch Node (EBN) is part of Aastra´s branch office solutions for medium to large enterprises based on the MX-ONE™ Telephony System or MD110 Convergence Communication System. These platforms offer a full range of voice, data and mobility solutions to meet the needs of enterprises today and tomorrow.

The EBN provides remote site survivability and local public network (PSTN) access when using the MX-ONE™ or MD110 IP telephony solution and deploying remote IP terminals in branch offices.

Feature Description

The EBN is a self-contained system that offers local gatekeeper and gateway functionality for branch offices using an MX-ONE™/ MD110 IP telephony solution. It offers a backup solution for branch offices with 8 to 100 IP terminal users. The EBN connects directly to the branch office LAN via a standard 10/100 Base-T Ethernet interface, as well as to the local public network (PSTN) via digital or analog trunk interfaces. Combined with the integrated IP networking feature of the MX-ONE™ and MD110 systems, the EBN enables the local PSTN connection with peer-to-peer direct media capability between the IP terminal and the EBN, thus saving use of WAN bandwidth when making local public calls. All corporate users connected to the MX-ONE™/ MD110 network—and not just branch office users—can be given the opportunity to place or receive calls via the local PSTN connection, a so-called remote hop-off connection.

If the branch office expands, EBNs can be networked to provide survivability for up to several hundred users. The EBN may also serve as a local gateway for emergency calls, so that 112/911 calls are automatically routed to the nearest emergency response center. This setup allows presentation of a local telephone number for an emergency response center, enabling immediate location identification.

AASTRA

In a branch office, the EBN may be used for:

- Remote site survivability, providing a backup solution for remote Aastra Dialog 4000/5000 IP telephones and IP soft-phones
- Local inbound or outbound public (PSTN) access for IP terminals in the branch office
- Local connection for emergency calls combined with the integrated IP networking feature of the MX-ONE™ or MD110, the EBN enables local PSTN connection with peer-to-peer direct media capability
- Local connection of fax, analog and Dialog 42XX terminals
- Remote hop-off connection, enabling toll bypass for any corporate user in the MX-ONE™ or MD110 network

The EBN is supplied in the form of pre-configured packages, optimized for different branch office sizes:

- EBN 10 - From 8 – 15 remote users, the EBN is delivered with 2 x 2B+D BRI (ISDN) and configured for 4 concurrent active gateway channels
- EBN 25 - From 16 – 45 remote users, the EBN is delivered with 2 x 2B+D BRI (ISDN), 8 x analog trunks and configured for 8 or 16 concurrent active gateway channels
- EBN 50 - From 45 – 100 remote users, the EBN is delivered with an E1 30B+D PRI (ISDN) and configured for 32 concurrent active gateway channels

All the EBN packages are based on the same base chassis, so even if a customer starts with an EBN10, by simply adding boards and licenses, it can be easily upgraded to have the same capacity as an EBN25 or EBN50.

All of these packages can come in the form of a wallmounted unit or a rack unit to fit the space requirements of any site, while maintaining the same level of functionality.

The EBN is set up and managed using TLG—a Windows-based application. Management of remote sites can be performed from one centralized management workstation.

Scenario Descriptions

1. Normal Mode:

In normal operation mode, branch office users equipped with Aastra Dialog 4000/5000 IP terminals or an Aastra soft-phone client are registered as a main site MX-ONE™/MD110 IP extension over the IP WAN network. As MX-ONE™/MD110 users, they have access to the same features and services as IP extension users at the main site. In this case, the EBN is used primarily for PSTN connection and provides the following applications as standard features:

a) Local public (PSTN) Connection

Offers branch office users the opportunity to make local public calls at local tariffs. It also allows clients/customers to reach the branch office at local tariffs and by dialing the local area code. Call logging is carried out centrally by the MX-ONE™ or MD110 using IP networking. As an example, contact center agents may be located in the branch offices and incoming traffic would be routed to the appropriate CTI group in the central MX-ONE™ or MD110 for handling by Solidus eCare™ and then switched locally to the designated agent. This level of integration allows one centralized Solidus eCare™ system to handle many branch office contact center agent groups, thus simplifying management of the overall solution.

b) Local Break-Out for Emergency Calls

This feature allows IP phone users in a branch office to dial the emergency number and have the call routed directly via the EBN's PSTN trunks to the nearest emergency response center. Routing of these calls can be handed at the MX-ONE™ or MD110 level or locally by the EBN depending in the IP phone configuration. This feature is even available if the IP phone is logged off and someone dials the emergency number.

c) Remote Hop-Off (Toll Bypass)

This feature not only benefits branch office users, but may also be used by any corporate user of an MX-ONE™ or MD110 network to route long-distance or international calls over the IP network, and break out or hop off the network via the branch office PSTN connection, thus bypassing toll charges.

d) Fax, Analog and DTS Phones over IP

The EBN comes equipped with 4 analog and 4 DTS lines to allow connection of analog phones and/or fax machines, as well as DTS phones at branch offices. By adding extension cards, up to 36 local terminals may be directly connected to the EBN. Additionally, if analog phones or fax machines must be connected using the LAN infrastructure, then a 2-port gateway—the Aastra Digital Residential Gateway (DRG22)—provides a costefficient solution. The DRG22s are connected via a LAN to the EBN as IP extensions. Therefore, analog fax machines and phones may be connected (via the analog board or the DRG22 gateway) as local extensions of the EBN. In this case, communication with the main site may be carried out over the IP network or out over the PSTN network.

In an MX-ONE™ environment, the DRGs are registered either to the MX-ONE™ directly or to the EBN with IP networking, if local survivability is required.

2. Isolated Mode (Remote Site Survivability)

If for any reason, data connectivity to the corporate main site is lost or taken down for maintenance, the users in a branch office would normally be cut off from the MX-ONE™ or MD110 services, thus losing phone connectivity. However, with an EBN installed, the IP terminals will sense this automatically and re-register with the EBN, it being the back-up device. In this mode of operation, the EBN will offer users access to the corporate site via the public network (PSTN), in the same way as if they were connected over the IP WAN network. Users do not even have to change their dialing behavior, as the EBN takes care of number conversion. Users simply dial the same extension numbers as when in normal mode. When calling locally, users may also utilize the telephony services supported by the EBN system (inquiry, transfer, conferencing, pick-up, TCD, ACD, hunt groups, ring groups, etc.).

Some main site services, such as access to voice mail, will still be available (accessible via the PSTN). The system at the main site will ensure that calls arriving via the main site PSTN connection and intended for a branch office extension are routed automatically over the PSTN to the branch office EBN.

Once the connection to the corporate IP WAN network is re-established, the Aastra IP terminals will detect this and automatically switch back to the MD110 IP extension at the main site. This will not happen during a call. Switching back to the MX-ONE™ or MD110 is performed as soon as the terminal is unused, when switching can be performed without interrupting service to users. Being a seamless operation, users will not notice the change-over between the isolated mode and normal mode.

Benefits

1. Normal Mode:

The Enterprise Branch Node (EBN) offers a unique remote site survivability solution for customers deploying IP telephony in branch offices. The Aastra Dialog 4000/5000 IP telephones and soft-clients are designed to detect the loss of an IP WAN connection with a main site system and automatically register with the EBN as a backup device. All calls to a main office and visa versa are routed,over the PSTN network automatically. When the IP WAN connection is restored, the Aastra IP terminals will automatically detect this and switch back to the main site system as the primary point of connection. The users will be unaware of this and will, in most cases, not even know they are in back-up mode. Through the local public (PSTN) network connection, the EBN enables longdistance traffic from other parts of the MX-ONE™/MD110 network to be routed over the IP network, thus providing toll bypass, nationally or internationally.

EBN advantages are:

- Cost-effective remote site survivability for branch offices using IP terminals connected to main site MX-ONE™ or MD110
- Seamless operation when switching between isolated mode and normal mode allowing users to work uninterrupted
- Enables local public (PSTN) connection at branch offices and long-distance toll bypass for other users in a corporate network
- Offers local connections for emergency calls adding a enhanced level of security for branch office users
- Offers Fax over IP (FoIP) and analog phone over IP for branch offices
- Offers local support for analog and DTS terminals

Technical Specifications

Line Interfaces: Network Side

Analog

- 4-port analog trunk/CO board (modular RJ-11), CE TBR-21

Digital

- BRI digital trunk board (100 ohm balanced HE- 14/RJ-45) 196 Kbps, 2B+D, CE TBR-4, ITU-T recommendations G.703 / G.704 / G.730
- E1 digital trunk board (75 ohm unbalanced BNC, 120 ohm balanced RJ-45) – 2.048 Mbps, 30B+D, CE TBR-3, ITU-T recommendations G.703 / G.704 / G.732
- T1 digital trunk board (75 ohm unbalanced BNC, 120 ohm balanced RJ-45) – 1,544 Mbps, 23B+D, ITU-T recommendations G.703 / G.704 / G.732

IP Packet Based

- Virtual IP trunk support for networking with the MD110, as well as interconnecting with third-party gatekeepers, gateways and to click-to-dial IP terminals
- SIP trunking support towards SIP service providers

Line Interfaces: User Side

Analog

- 4-port analog extension board for analog telephones and faxes

IP Virtual Packet Based

- SIP and H.323 IP extension support for Aastra Dialog 4000/5000 IP telephones, the Personal Assistant – PC, and the DRG, as well as third-party SIP/ H.323 compliant terminals (e.g. Wifi terminals).

Protocols

Network Signaling Protocols and Standards Supported

- Loop Start DTMF and V23/FSK CLID
- Basic rate ISDN (network and user interface), E-DSS1
- E1 / ISDN PRI (network and user interface), E-DSS1
- T1 / ISDN PRI (network and user interfaces)

Network Interface Protocols (LAN)

- IP (UDP, TCP, RTP, RTCP, etc.)
- WAP (used for enhanced IP telephone signaling with Dialog 44XX IP terminals)
- Telnet
- TFTP
- FTP
- HTTP

Provides Layer 2 and Layer 3 Support for Quality of Service (QoS):

- Layer3: RFC791 Internet Protocol Type of Service (ToS) and RFC2474 Differentiated Services Field (DS Field)

IP telephony Protocols

- SIP V2 for SIP extension and SIP trunk support (Requires CIP board)
- H.323v4, H.225, H.245v4
- G.711, G.723.1, G.729ab coding support
- T.38 fax and G711 transparent fax
- G.168 echo cancellation
- Adaptive Voice Activity Detection (VAD) for silence suppression
- Adaptive Comfort Noise Generation (CNG)

Hardware Specifications

Connections

- 10/100 Base-T Ethernet network connection (HE-14/ RJ-45) with LED indicators
- Serial communication ports (DB-9) for basic setup

Dimensions (W x D x H in inches and cm)

Wall-Mounted Unit

- 15. in x 14.40 in x 5.5 in
- 38 cm x 36.6 cm x 14.1 cm

19–inch Rack-Mounted Unit

- 19 in x 17" in x 5.5 in
- 48 cm x 43 cm x 14.1 cm

Weight

Wall-mounted unit – 5.5 kg (12.1 lbs)
Rack-mounted unit – 9 kg (19.9 lbs)

Power

- Input 100 – 240 V AC (+/- 10 %)
- Frequency 50 – 60 Hz (+/- 10 %)
- Maximum power consumption 80 VA

Operating Requirements

- Operating temperature 5° – 49° C (41° – 120° F)
- Storiage temperature 0° – 70° C (32° – 158° F)
- Humidity 10 – 90 % (non-condensing)

Regulatory Approvals

Product Safety

- CE (EN60950) and ETL listing
- UL standard 1950 and CSA standard C22.2 #950
- IEC 950 (CB scheme test report)

Emissions

- CE CISPR22 / EN55022 Class B and FCC part 15 class B
- ICES-003 class B

Immunit

- EN55024

Network Attachment

- E1 digital trunk CARD: TBR 12 and 13, ACA TS016 2048 Kbps, G.703/G.704, ISDN PRI E1: TBR4, TS038 and ISDN2
- ISDN BRI: TBR3, TS003, TE-1

Call Detail Recording:

- Internal DB enabling storage of up to 8,000 CDRs
- Information recorded includes: originating number, destination number, date, start time, duration of a call, type of call, cost, unit cost, etc.
- CDRs are extracted from the DB and stored as a plain text format (ASCII) file
- Transfer/export of CDRs from the EBN to an external accounting software application is accomplished via TFTP (Trivial File Transfer Protocol)

Compatibility:

For optimal performance, it is recommended that the EBN is updated to Version 10.0 or higher

MD110

- BC12.1 Service Pack 10 or later is recommended. When using the native IP networking capability in BC12, peer-topeer direct media between IP terminals and the EBN is supported.

MX-ONE™

- MX-ONE™ Telephony Switch. Peer-to-peer direct media between IP terminals and the EBN is supported.
- MX-ONE™ Telephony Server 3.1 minimum. Peer-to-peer direct media between IP terminals and the EBN is supported.
- Transfer/export of CDRs from the EBN to an external accounting software application is accomplished via TFTP (Trivial File Transfer Protocol)

Terminals supporting remote site survivability:

- Aastra Dialog 44XX and 5000 series IP phones
- Aastra Dialog 42XX series DTS phones
- Aastra Dialog 41XX series analog phones
- DRG for analog extension and Fax over IP support
- Most third-party H.323V4 or SIP compliant wired and wireless LAN terminals

System Capacity per EBN Unit Running Version10.0 or later Software

Maximum Software Capacity

• Up to 236 extensions (IP and legacy combined)

• Up to128 trunks (IP, analog and digital combined)

Maximum Hardware Capacity

EBN basic configuration with the CPJ8 board:

- 2 BRI ports
- 4 analog extension ports
- 4 digital Dialog 4000 ports
- 1 Ethernet 10/100 Base T port

The CPJ8 board provides 8 slots for expansion boards. Available boards for capacity expansion:

- 2 BRI ports with CTS2 board (max. 7 boards)
- 4 analog extension ports with CZI3 board (max. 7 boards)
- 4 digital Dialog 4000 ports (max. 7 boards)
- 1 PRI port with CAP2 board (max. 4 board with V10 SP1)
- 4 analog trunk lines with CTA board (max. 7 boards)
- 1 Ethernet 10/100 Base T port offering 32 VoIP channels per CIP2 board

The possible maximum configurations can be determined by plugging the above boards into the 8 available slots. Each slot accepts the type of boards above according to the following table:

CTS2	CTS2	CTS2	CTS2	CTS2	CTS2	CTS2	CAP2
CZI3	CZI3	CZI3	CZI3	CZI3	CZI3	CZI3	
CD3	CD3	CD3	CD3	CD3	CD3	CD3	
CTA	CTA	CTA CAP2(*)	CTA	CTA CAP2(*)	CTA	CTA CAP2(*)	CIP2
	CIP2		CIP2		CIP2		
P 1	P 2	P 3	P 4	P 5	P 6	P 7	P 8

Maximum capacities are as follows (actual capacity is configuration-dependant):

- 32 digital DIALOG 4000 interfaces
- 32 analog extension interfaces
- 16 ISDN S0 buses interfaces
- 16 ISDN T0 basic rate access ports
- 1 ISDN T1/ T2 primary rate access port (*)
- 28 analog trunk line ports
- 128 mobile extensions
- 4 x CIP2 board

(*) Support for 4 x PRI(CAP2) in the same chassis planned Q1 - 2009

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