

# AccessWare and National ISDN

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## 1 Introduction

The TB series of documents are Initia Technical Bulletins for customers and resellers.

The purpose of this document is to summarize the National ISDN features of the AccessSwitch.

### 1.1 Objective

When configuring AccessWare from the NMC menu to work with an AT&T network,<sup>1</sup> one can use the protocol 5E8 for the downstream side, also called the trunk side, of a BRI interface. Similarly, the protocol 5ESS - Downstream can be used for the PRI interface to an AT&T network. These protocols are compatible with the 5E8 generics of Lucent Technologies, which are Lucent's implementation of Bell Core's NI-1 specifications. Since 5E8, Lucent Technologies brought out newer releases 5E9(1), 5E9(2), 5E10, 5E11 and 5E12.

Questions have been raised as to if AccessWare is compatible with new software releases of a 5ESS or Northern Telecom switch and if so, what features of these new releases are, or are not, supported by AccessWare. This document is an attempt to answer this question for the 5ESS switch.

### 1.2 References

- [1] Bellcore Specifications SR-NWT-001937, "National ISDN - 1", Issue 1, February 1991.
- [2] Bellcore Specifications SR-NWT-002120, "National ISDN - 2", Issue 1, May 1992.
- [3] Bellcore Specifications SR-NWT-002457, "National ISDN - 3" Issue 1, December 1993.
- [4] Bellcore Specifications GR-2941-CORE, "Generic Requirements for Automated SPID Selection", Issue 1, October 1996.
- [5] Bellcore Specifications TR-NWT-001203, "Generic Requirements for the Switched DS1/Switched Fractional DS1 service Capability for an ISDN Interface (SWF-DS1/ISDN)", Issue 1, December 1991.

## 2 Summary

The later releases of the 5ESS switch software implement NI-1, NI-2 and NI-3 according to Bell Core's specifications, and are all backwards compatible. In other words, they support all services and features supported by earlier releases up to and including 5E8. Hence, the features that AccessWare supports with its 5E8 protocol on the trunk side of a BRI interface and the 5ESS - Downstream protocol for a PRI interface will continue to work correctly with the later releases of the 5ESS switch software. Furthermore, these new releases also provide some additional features and new

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<sup>1</sup>What was AT&T's 5ESS switch is now called Lucent Technologies' 5ESS @ - 2000 switch.

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services. Some of these new features are supported by AccessWare; however, there are others that are not.

## 3 NI-1, NI-2 and NI-3

Since Lucent Technologies have brought out many newer releases of their switch software to support the evolving National ISDN standards called NI-1, NI-2 and NI-3, it is necessary to understand the features specified by these standards [1] - [3]. Table 1 gives a summary of NI-1, NI-2 and NI-3 features.

NI-1	Standard BRI and PRI interface. However, a user may see differences in the manner in which a feature operates among different vendors' products.
NI-2	Same as NI-1 except that features on different vendors' products operate the same way. In other words, NI-2 provides for standardized operations of some features. For details, see below.
NI-3	Provides a few new features and interconnection between ISDN and PCS. Also, provides access to additional services by means of equipment adjuncts to the network. These services are: frame relay, video and data conferencing (using MCU), modem interworking <sup>2</sup> and X.25 multicasting. <sup>3</sup> For details, see below.

**Table 1** Summary of NI-1, NI-2 and NI-3 features.

Table 2 shows an approximate correspondence between the National ISDN standards and the later releases of the 5ESS switch software.

National ISDN	5ESS Generics
NI-1	5E8
NI-2	5E9, 5E10
NI-3	5E11, 5E12

**Table 2** Correspondence between the National ISDN standards and 5ESS switch software generics.

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<sup>2</sup> This allows an analog data user to interact with an ISDN data user.

<sup>3</sup> Using this feature, a user can send an ISDN X.25 packet to more than one destination.

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## 4 Features Supported by AccessWare

### 4.1 NI-1

Table 3 lists the NI-1 features. The features supported by AccessWare are indicated by Y.

Features	Supported
Standard CPE interface	Y
Single user/interface - up to 3 applications - voice, data and packet data on D channel or two user/interface - each with 3 apps as above. A user may be restricted to a single B channel	Y (but no packet on the D channel)
Supplementary Voice - Call Forwarding Variable, call forwarding interface busy, call forwarding	Y
Redirecting number,	Y
Redirecting reason, courtesy call	N
Automatic call back	N
Additional call offering	Y
Flexible calling - Hold, transfer	Y
Flexible calling - conference, conf. Hold/Retrieve, etc.	N
Calling Number ID	Y
Sub-features of Calling Number ID - Calling Party Number Privacy, Privacy of Redirecting Number and Redirecting Reason	N
Message waiting	N
Supplementary data	N
EKTS - multiple DNs per terminal, multiple appearances, Hold/Retrieve, intercom calling,	Y
Membership in a multi-line hunt group, bridging, abbreviated and delayed ringing, circular hunting, uniform hunting, stop hunt, make busy, analog members in a hunt group	N
Business group dial access features - intercom dialing, abbreviated dialing, dial access to private facilities, code restrictions, DOD, DID	Y
PRI - voice and circuit switched data	Y
Provisioned (i.e. PVC) packet-switched data on a B channel <sup>4</sup>	N

**Table 3** NI-1 Features. Features are marked Y if they are supported and are marked N otherwise.

<sup>4</sup> On-demand packet data on B channel (ODB) or permanent packet D channel (PPD) are not supported in NI-1, nor are they supported in AccessWare.

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## 4.2 NI-2

Table 4 lists the NI-2 features.

Features		Supported
BRI	<b><u>EKTS Features</u></b>	
	Multiple DNs per terminal	Y
	Analog member in an EKTS group	N
	Multiple DN appearances/CACH	Y
	Hold/retrieve	Y
	Bridging	N
	Intercom calling	Y
	Multi-line hunt group	N
	Abbreviated/delayed ringing	N
	Automatic/manual bridged call exclusion	N
	Call Forwarding <sup>5</sup>	Y
	Additional call offering (ACO)	Y
	<b><u>Flexible Calling</u></b>	
	Call transfer	Y
	Conference calling	N
	Consultation hold	N
	Drop last call on conference	N
	<b><u>Calling Number Identification</u></b>	
	Delivery of network-provided calling number	Y
	Privacy of calling number	N
	Delivery of redirecting number	Y
	Privacy of redirecting number	N
	Delivery of redirecting reason	N
	Segregate number delivery on intra-BBG or inter-BBG basis	N
	ISDN display service	N
	On demand B channel packet data	N

**Table 4** NI-2 Features (continues)

<sup>5</sup> Three types call forwarding are supported - call forwarding unconditional, call forwarding busy and call forwarding no reply.

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PRI features <sup>6</sup>	Call-by-call service selection of FX, tie trunks, OUTWATS and INWATS (using NSF IE)	Y
	Delivery of network-provided calling number	Y
	Privacy of calling number	N
	Delivery of redirecting number	Y
	Privacy of redirecting number	N
	Delivery of redirecting reason	N
	Switched DS1/Switched fractional DS1 <sup>7</sup>	Y
	D channel backup	N
	Multi-level Precedence and preemption (MLPP)	N
	Protocol discriminator of 3 for maintenance messages	Y

**Table 4** NI-2 Features (cont).

Notice that **the features that AccessWare supports with the 5E8 protocol on a BRI interface or 5ESS protocol on a PRI interface should continue to work with 5E9 through 5E12.**

## 4.3 NI -3

Table 5 shows the NI-3 features that are supported by AT&T's 5E10 and later releases. It also indicates which of these features AccessWare supports.

BRI features:	Non-initializing terminals <sup>8</sup>	Y
	Music on Hold	N
	ISDN Calling Name Delivery Service	N
	ISDN inspect <sup>9</sup>	N

**Table 5** NI-3 features (continues)

<sup>6</sup> On a PRI interface of an AccessSwitch, a user can select from the NMC either 5ESS or 4ESS protocol. The AccessWare 4ESS protocol is compatible with AT&T's so-called custom PRI interfaces on its 4ESS long-haul switches (AT&T TR 41459). The AccessWare 5ESS protocol is the same as AT&T's National ISDN PRI interfaces. The only difference between the custom PRI and National ISDN PRI is the following: A custom PRI may contain only one DS1 interface, its D channel controlling the B channels on the same interface. A national ISDN PRI may contain up to 20 DS1s where one D channel can control up to 479 B channels using the NFAS. The later releases of 5E support both custom and National ISDN PRIs.

<sup>7</sup> These are H0, H11 and multi-rate calls [6].

<sup>8</sup> In AT&T's 5E8 and 5E9, an NIT is supported only for packet calls - for both on-demand B (ODB) and permanent packet D (PPD). The later releases support both circuit and packet services with a NIT.

<sup>9</sup> It enables the BRI user to query the switch about the feature or capability associated with a particular feature activator or terminal-controlled call appearance.

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PRI Features	Call-by-call service selection for Hotel/Motel	N
	Selective class of call screening (SCOCS)	N
	Call-by-call access to inter-exchange carriers	Y
	Call transport for a customer with multiple locations over dedicated and virtual private networks (VPN)	N
	ISDN Calling Name Delivery Services	N

**Table 5** NI-3 features (cont).

5E12 provides enhancements on top of 5E11. For example, it supports:

On a BRI interface

- PCS
- Call Park
- Auto SPID. After layer 2 is established, a terminal automatically requests initialization using a universal SPID via INFORMATION messages. In response, the switch sends all valid SPIDS to the terminal [4].

On a PRI interface:

- Larger called party number (for CDMA data feature).

AccessWare **does not support** any of these 5E12 enhancements.