ISDN - Integrated Services Digital Network

Synchronous, switched, end-to-end networking - allowing simultaneous transmissions

U interface is a *two-wire* (single pair) interface from the phone switch. It supports full-duplex data transfer over a single pair of wires, therefore only a single device can be connected to a U interface. This device is called an Network Termination 1 (NT-1). The situation is different elsewhere in the world, where the phone company is allowed to supply the NT-1, and thereby the customer is given an S/T interface.

Common US ISDN switch types are **National ISDN-1 (NI-1)**, AT&T **5ESS** and North

DS0 64Kbps	1 channel	
DS1 1.544Mbps	24 channels	**T1**
DS3 44.736Mbps	672 channels	**T3**

ISDN Dual Stack Requirement

	D Channel Usage
Data-Link Layer (2)	**Q.921** (Signaling
Network Layer (3)	**Q.931** (Call Se

PRI (23B+D)

D Channel - sends signaling for setting up calls and dynamically allocating the remaining bearer channels.

ISDN specifie
interfaces
ISDN

Echo cancellation is used to reduce noise, and data encoding schemes (2B1Q in North America, 4B3T in Europe) permit this relatively high data rate over ordinary single-pair local loops.

NT2
Incorporated into Customers ISDN Equipment

(Used to direct traffic)
Handles layers 2 & 3 ISDN protocols

Up to 8 TE1 Devices
(connect to External NT1)

TE1
Terminal Equipme
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T

(D) Data Channel

16Kbps - D Channel LAPD Framing Protocol

Subscriber loop

Telephone company Switch
Central Office

48Kbps
(Framing and Synchronization)

144 Kbps
(64Kb + 64Kb + 16Kb)
2B + 1D Channel

LT *interface*

NT1
Network Terminator

(Boundary between carrier/customer)

(B) Bearer Channels

64Kbps - B1

192 Kbps
(3 DS0)

< 18,000 feet
(repeated up to 50,000 feet)

UTP 2 - wire
pin 4 (Ring)
pin 5 (Tip)
(RJ45 8 wire)

4 - wire
(better
nois

Service Profile Identifier (SPID) - Identifies the ISDN line. Maybe required based on the type of switch. The format is usually a 10-digit phone number, plus a prefix and possibly a suffix.

ISDN Basic Rate Interface
Primary Rate Interface
each at 64 Kbps, an
23B+1D (T1) 1.5
30B+1D (E1)

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