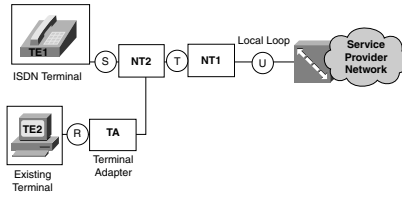
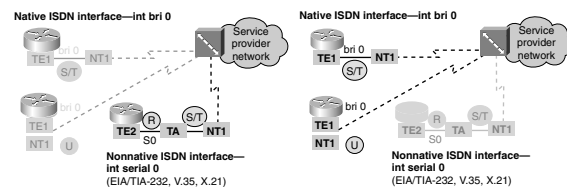


### ISDN Device Types and Reference Points

- **TE1 (terminal endpoint 1)**—Devices have a native ISDN interface.
- **NT2 (network termination 2)**—Aggregates and switches all ISDN lines at the customer service site using a customer switching device.
- **NT1 (network termination 1)**—Converts BRI signals into a form used by the ISDN digital line. An NT1 terminates the local loop.
- **TE2 (terminal endpoint 2)**—A device that requires a TA.
- **TA (terminal adapter)**—Converts EIA/TIA-232, V.35, and other signals into BRI signals.
- **R**—The connection point between a non-ISDN-compatible device and a terminal adapter.
- **S**—The connection point into the customer switching device (NT2). Enables calls between customer equipment.
- **T**—The outbound connection from the NT2 to the ISDN network. This reference point is electrically identical to the S interface.
- **U**—The connection point between NT1 and the ISDN network.



### Determining the Router ISDN Interface



Cisco routers might not have a native ISDN terminal, and those with terminals might not have the same reference point. To avoid

damaging equipment, you need to evaluate each router carefully.

Connectors labeled BRI have a native ISDN interface built in. (Your router is a TE1.) A router might also have a built-in NT1 (BRI U interface). If your router interface is labeled BRI, you must use an external TA device.

**Warning:** Never connect a router with a U interface to an NT1. It will most likely ruin the interface!

### ISDN Switch Types

Service providers use several different types of switches for their ISDN services. Before connecting a router to an ISDN service, you must be aware of the switch types used at the central office. You must specify this information during router configuration to allow ISDN service.

### Service Provider Identifiers

*Service Provider Identifiers* (SPIDs) can be assigned by your service provider to identify your switch at the central office. Your switch must be identified before a connection can be made (during call setup).

The syntax for configuring a SPID on your switch is as follows:

```
isdn [spid1 | spid2] spid-number [ldn]
```

[spid1 | spid2] specifies SPID as either the first or second B channel, *spid-number* is the number assigned by the ISDN service provider, and *ldn* is an optional local dial number.

### ISDN BRI Concepts Summary

- ISDN standards define a digital architecture for integrated voice/data capability using the public switched telephone network. ISDN provides multiple user-traffic feeds, fast call setup, and fast data transfer rates.
- ISDN protocols include the E-series protocol for the telephone network and ISDN; the I-series protocol for ISDN concepts, aspects, and interfaces; and the Q-series protocol for switching and signaling.
- ISDN BRI has 2 64 kbps B channels and 1 16 kbps D channel.
- ISDN PRI has 23 B channels and 1 D channel.
- Reference points define connection points between functions.
- SPIDs are required before you can access the ISDN network.