

# Basic ISDN Configuration

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## Introduction

This document provides a sample configuration for basic ISDN. It also explains some of the ISDN configuration commands. For more information about the commands, see the Router Products Command Reference.

## Prerequisites

### Requirements

Readers of this document should have basic knowledge of IP routing. For more information, see IP Addressing and Subnetting for New Users.

### Components Used

This document is not restricted to specific software and hardware versions.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

### Conventions

For more information on document conventions, refer to Cisco Technical Tips Conventions.

## Background Information

This document uses a Cisco 3103 (1E/1BRI) in the example. It is configured to route IP over a Dial-on-Demand Routing (DDR) link.

Switch types refer to the ISDN software that runs on the switch, and not the manufacturer or the model.

This document uses static routing, and includes only the relevant and necessary commands. Either of the routers can initiate the connection, and all IP packets are "interesting," which means that the routers can dial, and can reset the DDR idle timer. No routing protocol is configured in this example, because routing updates can keep the link up indefinitely, and incur usage charges. This configuration helps you to connect a home or remote office where IP is the only protocol in use.

## Configure

In this section, you are presented with the information to configure the features described in this document.

**Note:** To find additional information on the commands used in this document, use the Command Lookup Tool (registered customers only) .

## Network Diagram

This document uses this network setup:



## Configurations

This document uses these configurations:

- Remote Router
- Main Router

Remote Router
<pre>hostname branch1 ! username main password secret1 ! isdn switch-type basic-dms100 ! interface Ethernet 0 ip address 131.108.64.190 255.255.255.0 ! interface BRI 0 encapsulation PPP ip address 131.108.157.1 255.255.255.0 isdn spid1 415988488501 9884885 isdn spid2 415988488602 9884886 ppp authentication chap dialer idle-timeout 300 dialer map IP 131.108.157.2 name main 4883 dialer-group 1 ! ip route 131.108.0.0 255.255.0.0 131.108.157.2 ! ip route 0.0.0.0 0.0.0.0 131.108.157.2 ! dialer-list 1 protocol ip permit</pre>

## Main Router

```
hostname main
!
username branch1 password secret1
username branch2 password secret2
!
isdn switch-type basic-dms100
!
interface Ethernet 0
ip address 131.108.38.1 255.255.255.0
!
interface BRI 0
encapsulation PPP
ip address 131.108.157.2 255.255.255.0
isdn spid1 415988488201 9884882
isdn spid2 415988488302 9884883
ppp authentication chap
dialer idle-timeout 300
dialer map IP 131.108.157.1 name branch1 4885
dialer-group 1
!
ip route 131.108.64.0 255.255.255.0 131.108.157.1
!
```

## Key Configuration Parameters

### **hostname** *name*

The hostname of the router is used to identify the router to another router when it sends Challenge Handshake Authentication Protocol (CHAP) messages.

### **username** *name password secret*

The **username** command is required to specify the CHAP secret message to use when challenged by another router. The two routers that need to communicate must share the same password.

### **isdn switch-type** *switch-type* and **isdn spid1** *spid-number [ldn]*, **isdn spid2** *spid-number [ldn]*

This router connects to a Northern Telecom DMS-100 switch. The Service Profile Identifiers (SPIDs) for the station are 415988488501 and 415988488602. These numbers were configured on the switch and will be given to a user by the local service provider. 9884885 and 9884886 are regular phone numbers for the two channels. They are normally called Local Directory Numbers (LDNs).

The **isdn spid1** and **isdn spid2** commands are not required for AT&T 5ESS switch software configured for point-to-point operation, but they are required for National ISDN-1 (NI1) software. Remember, switch types in this document refer to the ISDN software that runs on the switches, not the manufacturer or the model.

These are the only ISDN-specific commands required. The rest of the configuration is really dial-on-demand routing (DDR) configuration, and applies to other kinds of DDR interfaces, such as in-band and asynchronous.

## Define Interesting Traffic

- **dialer-group** *group number*
- **dialer-list** *dialer-group protocol protocol-name {permit | deny}*
- **dialer-list** *dialer-group protocol protocol-name list access-list-number*

These commands are required to define "interesting" packet types. An interesting packet is one that activates the dialing sequence and resets the "idle-timeout" timer. In this example, all IP packets are interesting on one side, and an access list is used on the other side to demonstrate the two forms of the command. On branch1, all IP packets are interesting, but only non-Interior Gateway Routing Protocol (non-IGRP) packets are interesting on the main router.

### **ppp authentication chap**

This command specifies that CHAP authentication must be used on this interface. See the explanation of the **dialer map** command for details.

### **dialer idle-timeout seconds**

This command makes the router disconnect calls that have not had any interesting traffic for the configured time. Only outbound packets reset the idle timer.

### **dialer map protocol name remote-name broadcast speed 56 phone-number**

The **dialer map** is used to distinguish between different remote sites, which can be connected at various times. A map is required for each site, and each protocol used. The remote name is the hostname of the other router. The broadcast flag specifies whether broadcast packets, such as routing updates, are sent for this protocol to this site. In this example, it is turned off.

The speed parameter defaults to 64. Set it to 56 in order to allow the call to complete successfully over networks that are not end-to-end ISDN. The phone number is used when calls are originated or authenticated in networks with calling number delivery. The number can be left out to create a "receive-only" dialer map. The example in this document shows a four-digit interoffice extension number, but a valid phone number of any length will work.

Dialer maps provide the network-layer-to-link-layer mapping required by the router to successfully encapsulate (or send packets out to) an interface. In this example, dialer maps include the phone number to call and the name of the other router. The name is essential to identify calling routers, through the use of CHAP. CHAP also provides some security, but is included in this basic configuration mainly because it allows identification of calling routers. In the general case, CHAP is required for identification of the calling router because calling number delivery is not always possible.

### **ip route network [mask] {address | interface} [distance]**

This command provides the static routing information necessary in order for the packets to be routed to the next hop appropriately. When packets are routed to a DDR interface, Demand is created, which, as the name implies, is an essential part of DDR.

**Note:** This is a simple configuration that you can use for IP traffic that uses static routing between two routers, which perform DDR over an ISDN interface. All unicast IP packets can trigger dialing, and will reset the idle timer. CHAP is used to identify the calling party router, and it is needed in the general case.

## **Verify**

There is currently no verification procedure available for this configuration.

# Troubleshoot

There is currently no specific troubleshooting information available for this configuration.

## Related Information

- **Technical Support – Cisco Systems**
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