

# 配置示例：使用浮动静态路由和按需拨号路由

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## 简介

本文档的目的在于配置 ISDN 基本速率接口 (BRI)，以便在帧中继电路发生逻辑故障时进行拨号并将流量传输到远程站点。

Enhanced Interior Gateway Routing Protocol (EIGRP) 不在 BRI 上运行。相反，本文档中的示例使用浮动静态路由，以便在通过帧中继电路上的 EIGRP 获知的正常路由丢失时，重定向 BRI 上的数据流。

在所有路由器中，确保启用了 `ip classless`。

## 先决条件

### 要求

本文档没有任何特定的要求。

### 使用的组件

本文档不限于特定的软件和硬件版本。

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您使用的是真实网络，请确保您已经了解所有命令的潜在影响。

### 规则

有关文档规则的详细信息，请参阅 [Cisco 技术提示规则](#)。

## 配置

这些配置是完整配置的片断。

本部分提供有关如何配置本文档所述功能的信息。

**注意：**要查找本文档所用命令的其他信息，请使用[命令查找工具](#)（[仅限注册用户](#)）。

## 网络图

本文档使用以下网络设置：

### 图1 – 网络图

## 配置

本文档使用以下配置：

- 分布层路由器 #1
- 分布层路由器 #2
- 接入层路由器
- 远程站点路由器

路由器 C194u 是两个分布层路由器之一。在本示例中，路由器 C194u 具有到远程站点的 BRI。另一个分布层路由器 C194n，具有到远程站点的配套串行接口。

### 分布层路由器 #1

```
hostname c194u
!
!--- Create a username for the router at the remote
site. username c194s password 7 XXXXXXXX ! ip subnet-
zero isdn switch-type basic-dms100 ! interface Loopback0
ip address 192.168.11.141 255.255.255.252 ! interface
Ethernet0 ip address 163.241.222.93 255.255.255.0 media-
type 10BaseT ! interface BRI0 description to Remote Site
c194s, (this end 08358662 08358664) ip address
192.168.11.138 255.255.255.252 no ip mroute-cache
encapsulation ppp no ip route-cache isdn spid1
0835866201 isdn spid2 0835866401 dialer idle-timeout 600
dialer wait-for-carrier-time 10 dialer map ip
192.168.11.137 name c194s broadcast 8358661 dialer map
ip 192.168.11.137 name c194s broadcast 8358663 dialer
hold-queue 5 dialer load-threshold 128 outbound dialer-
group 1 no fair-queue ppp authentication chap ppp
multilink ! router eigrp 65535 !--- We redistribute the
static routes listed below, so if the Frame Relay !---
network fails, the other routers in this autonomous
system (AS) will !--- begin to see the remote networks
advertised from this router. !--- Normally these routes
are learned through EIGRP across the Frame Relay link.
!--- Make the BRI interfaces passive. An alternative is
to use a dialer-list !--- to identify EIGRP packets as
"uninteresting" packets. redistribute static
passive-interface BRI0
network 192.168.11.0
network 163.241.0.0
```

```

default-metric 64 200 255 1 1500
no auto-summary
eigrp log-neighbor-changes
!
ip classless
!--- Both distribution layer routers have a default
route to their Null !--- interfaces so that they
advertise the 0/0 network to all other routers !--- in
the AS. ip route 0.0.0.0 0.0.0.0 Null0
!--- There must be a static route for each network
behind the C194s !--- router at the remote site. Use the
IP address of the BRI interface !--- of router C194s,
and ensure that the administrative distance is 240. !---
Note: Summarize these routes if your addressing scheme
lends itself !--- to summarization. If the Frame Relay
network fails, this will force !--- packets destined to
the remote site out the BRI interface, and will cause !-
-- it to dial and restore connectivity.

ip route 192.168.11.0 255.255.255.224 192.168.11.137 240
ip route 192.168.11.32 255.255.255.224 192.168.11.137
240
ip route 192.168.11.64 255.255.255.224 192.168.11.137
240
ip route 192.168.11.132 255.255.255.252 192.168.11.137
240
!
access-list 100 deny icmp any any
access-list 100 permit ip any any
dialer-list 1 protocol ip list 100
!
end

```

以下是路由器 C194u 的 **show dialer** 命令输出示例：

### 分布层路由器 #1

```

c194u#show dialer

BRI0 - dialer type = ISDN

Dial String      Successes   Failures   Last called
Last status
8358663          4          1311      01:32:08
failed
8358661          1874       1315      00:02:07
successful
0 incoming call(s) have been screened.

BRI0:1 - dialer type = ISDN
Idle timer (600 secs), Fast idle timer (20 secs)
Wait for carrier (5 secs), Re-enable (15 secs)
Dialer state is physical layer up
Dial reason: ip (s=192.168.11.138, d=192.168.11.137)

```

下一个路由器 C194n，是第二个分布层路由器，原因如下。在本图示中，它是帧链路路由器。它没有任何特殊配置。它只含有重分配到 EIGRP 的默认路由。

### 分布层路由器 #2

```

hostname c194n
!
!
interface Ethernet0
 ip address 163.241.222.98 255.255.255.0
!
interface Serial11
 no ip address
 bandwidth 1544
 no ip mroute-cache
 encapsulation frame-relay
 no fair-queue
!
interface Serial11.301 point-to-point
 ip address 192.168.11.130 255.255.255.252
 bandwidth 32
 frame-relay interface-dlci 301
!
router eigrp 65535
 redistribute static
 network 192.168.11.0
 network 163.241.0.0
 default-metric 64 200 255 1 1500
 no auto-summary
 eigrp log-neighbor-changes
!
ip classless
ip route 0.0.0.0 0.0.0.0 Null0
!

```

下一个路由器 C194s 是远程站点路由器，即接入层路由器。它通过分布层路由器将远程网络连接到骨干网。

### 接入层路由器

```

!
hostname c194s
!
!--- Create a username for the distribution layer
router. username c194u password 7 XXXXXXXXXX ! isdn
switch-type basic-dms100 ! interface Loopback0 ip
address 192.168.11.133 255.255.255.252 ! interface
Ethernet0 ip address 192.168.11.2 255.255.255.224 !
interface Serial0 no ip address bandwidth 64
encapsulation frame-relay ! interface Serial0.300 point-
to-point ip address 192.168.11.129 255.255.255.252
bandwidth 32 frame-relay interface-dlci 300 ! interface
BRI0 description to Hub Site c194u, (this end 08358661
08358663) ip address 192.168.11.137 255.255.255.252 no
ip mroute-cache encapsulation ppp no ip route-cache isdn
spid1 0835866101 isdn spid2 0835866301 dialer idle-
timeout 600 dialer wait-for-carrier-time 10 dialer map
ip 192.168.11.138 name c194u broadcast 8358662 dialer
map ip 192.168.11.138 name c194u broadcast 8358664
dialer hold-queue 5 dialer load-threshold 128 dialer-
group 1 no fair-queue ppp multilink ppp authentication
chap ! router eigrp 65535 !--- Redistribute the static
route, so any routers which you could have attached !---
to the Ethernet network 192.168.11.0/27 will see this
router as their way !--- out to the remainder of the
network. However, do not allow this default !--- route
back into your distribution layer routers. Use a

```

```

distribute list !--- to block the advertisement.
redistribute static
  passive-interface BRI0
  network 192.168.11.0
  default-metric 64 200 255 1 1500
  distribute-list 2 out Serial0.300
  no auto-summary
  eigrp log-neighbor-changes
!
ip classless
!--- Use the IP address of the BRI interface of the
distribution layer router to !--- Add a default route.
When the frame network goes down, this will !--- push
your traffic out the BRI interface, and cause it to dial
and !--- restore connectivity. ip route 0.0.0.0 0.0.0.0
192.168.11.138 240
!
access-list 1 permit any
!
access-list 2 deny 0.0.0.0
access-list 2 permit any
!
dialer-list 1 protocol ip list 1
!
end
!

```

下一个路由器代表远程站点网络。除了参加接入层路由器的IGP动态路由协议、EIGRP，并无任何特殊需求。

### 远程站点路由器

```

!
hostname c194s
!
!--- Create a username for the distribution layer
router. username c194u password 7 XXXXXXXXXX ! isdn
switch-type basic-dms100 ! interface Loopback0 ip
address 192.168.11.133 255.255.255.252 ! interface
Ethernet0 ip address 192.168.11.2 255.255.255.224 !
interface Serial0 no ip address bandwidth 64
encapsulation frame-relay ! interface Serial0.300 point-
to-point ip address 192.168.11.129 255.255.255.252
bandwidth 32 frame-relay interface-dlci 300 ! interface
BRI0 description to Hub Site c194u, (this end 08358661
08358663) ip address 192.168.11.137 255.255.255.252 no
ip mroute-cache encapsulation ppp no ip route-cache isdn
spid1 0835866101 isdn spid2 0835866301 dialer idle-
timeout 600 dialer wait-for-carrier-time 10 dialer map
ip 192.168.11.138 name c194u broadcast 8358662 dialer
map ip 192.168.11.138 name c194u broadcast 8358664
dialer hold-queue 5 dialer load-threshold 128 dialer-
group 1 no fair-queue ppp multilink ppp authentication
chap ! router eigrp 65535 !--- Redistribute the static
route, so any routers which you could have attached !---
to the Ethernet network 192.168.11.0/27 will see this
router as their way !--- out to the remainder of the
network. However, do not allow this default !--- route
back into your distribution layer routers. Use a
distribute list !--- to block the advertisement.
redistribute static
  passive-interface BRI0

```

```

network 192.168.11.0
default-metric 64 200 255 1 1500
distribute-list 2 out Serial0.300
no auto-summary
eigrp log-neighbor-changes
!
ip classless
!--- Use the IP address of the BRI interface of the
distribution layer router to !--- Add a default route.
When the frame network goes down, this will !--- push
your traffic out the BRI interface, and cause it to dial
and !--- restore connectivity. ip route 0.0.0.0 0.0.0.0
192.168.11.138 240
!
access-list 1 permit any
!
access-list 2 deny 0.0.0.0
access-list 2 permit any
!
dialer-list 1 protocol ip list 1
!
end
!

```

## 验证

本部分所提供的信息可用于确认您的配置是否正常工作。

[命令输出解释程序工具](#) ( [仅限注册用户](#) ) 支持某些 **show** 命令，使用此工具可以查看对 **show** 命令输出的分析。

当帧中继网络发生故障时，请从远程站点的网络尝试 **traceroute**。根据网络图 ( 请参见 [图 1](#) )，目标 IP 地址是中心站点路由器的环回接口。

```

c194ec#trace
Target IP address: 192.168.11.141
Source address: 192.168.11.65
Tracing the route to 192.168.11.141

```

```

 1 192.168.11.2 4 msec 4 msec 4 msec
 2 * * *
 3 * *
    192.168.11.138 24 msec

```

请注意，它如何需要若干数据包，以便启用 BRI 接口。在 BRI 停用且数据包丢失前，再次发出 **traceroute** 命令：

```

c194ec#traceroute 192.168.11.141

Tracing the route to 192.168.11.141

```

```

 1 192.168.11.2 4 msec 4 msec 4 msec
 2 192.168.11.138 20 msec * 20 msec

```

再次启用帧交换。在帧中继网络当前可用的情况下，请不要使用 ISDN：

```

c194ec#traceroute 192.168.11.141

```

Tracing the route to 192.168.11.141

```
 1 192.168.11.2 4 msec 4 msec 4 msec
 2 192.168.11.130 36 msec 36 msec 32 msec
 3 163.241.222.93 36 msec * 32 msec
```

可用帧中继网络的路由表如下所示。请注意如何通过中心站点网络的 EIGRP 来获知单独的路由。还有一个通过 EIGRP 获知的默认路由。

```
c194ec#show ip route
```

```
Gateway of last resort is 192.168.11.2 to network 0.0.0.0

 163.241.0.0 255.255.255.0 is subnetted, 1 subnets
D    163.241.222.0 [90/2221056] via 192.168.11.2, 00:02:09, Ethernet0
 192.168.11.0 is variably subnetted, 7 subnets, 2 masks
C    192.168.11.64 255.255.255.224 is directly connected, Loopback0
C    192.168.11.32 255.255.255.224 is directly connected, Ethernet1
C    192.168.11.0 255.255.255.224 is directly connected, Ethernet0
D    192.168.11.128 255.255.255.252
      [90/2195456] via 192.168.11.2, 00:02:13, Ethernet0
D    192.168.11.132 255.255.255.252
      [90/409600] via 192.168.11.2, 01:23:14, Ethernet0
D    192.168.11.136 255.255.255.252
      [90/40537600] via 192.168.11.2, 01:23:14, Ethernet0
D    192.168.11.140 255.255.255.252
      [90/2349056] via 192.168.11.2, 00:02:10, Ethernet0
D*EX 0.0.0.0 0.0.0.0 [170/40614400] via 192.168.11.2, 00:02:10, Ethernet
```

当帧中继网络发生故障时的路由表如下所示。仍然会有一个默认路由，但在中心站点网络的一些单个路由丢失。但是由于启用了 **ip classless**，并且您拥有默认路由，您仍然可以访问网络中的任何地方。

```
c194ec#show ip route
```

```
Gateway of last resort is 192.168.11.2 to network 0.0.0.0

 192.168.11.0 is variably subnetted, 5 subnets, 2 masks
C    192.168.11.64 255.255.255.224 is directly connected, Loopback0
C    192.168.11.32 255.255.255.224 is directly connected, Ethernet1
C    192.168.11.0 255.255.255.224 is directly connected, Ethernet0
D    192.168.11.132 255.255.255.252
      [90/409600] via 192.168.11.2, 01:25:27, Ethernet0
D    192.168.11.136 255.255.255.252
      [90/40537600] via 192.168.11.2, 01:25:27, Ethernet0
D*EX 0.0.0.0 0.0.0.0 [170/40076800] via 192.168.11.2, 00:00:15, Ethernet
```

## 故障排除

目前没有针对此配置的故障排除信息。

## 相关信息

- [技术支持 - Cisco Systems](#)