实验 10 路由配置

实验 10-1 配置静态路由和缺省路由

一、实验目标

- 掌握静态路由的配置方法
- 掌握测试静态路由连通性的方法
- 掌握通过配置缺省路由实现本地网络与外部网络间的访问
- 掌握静态备份路由的配置方法

二、实验场景

您是公司的网络管理员。现在公司有一个总部与两个分支机构。其中 R1 为总部路由器，R2、R3 为分支机构，总部与分支机构间通过以太网实现互连，而当前公司网络中没有配置任何路由协议。

由于网络的规模比较小，您可以配置通过静态路由和缺省路由来实现网络互通。IP 编址信息如拓扑图所示。

三、实验拓扑图

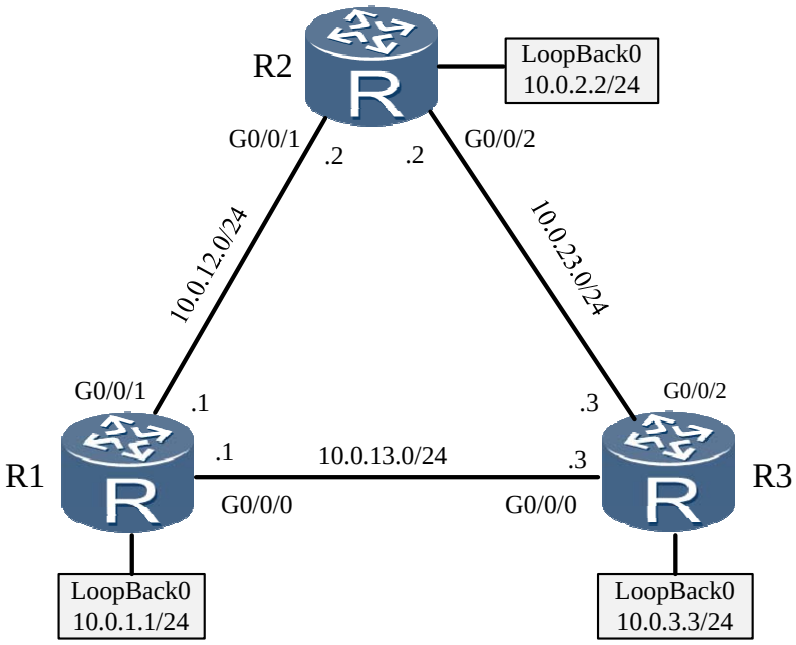

图 10.1 静态路由和缺省路由实验拓扑图

四、实验步骤

任务一 基础配置和 IP 编址

步骤 1 在 R1、R2 和 R3 上配置设备名称和 IP 地址。

```
<Huawei>system-view
Enter system view, return user view with Ctrl+Z.
[Huawei]sysname R1
[R1]interface GigabitEthernet 0/0/0
[R1-GigabitEthernet0/0/0]ip address 10.0.13.1 24
[R1-GigabitEthernet0/0/0]quit
[R1]interface GigabitEthernet 0/0/1
[R1-GigabitEthernet0/0/1]ip address 10.0.12.1 24
[R1-GigabitEthernet0/0/1]quit
[R1]interface LoopBack 0
[R1-LoopBack0]ip address 10.0.1.1 24
```

步骤 2 执行 display current-configuration 命令，检查配置情况。

```
<R1>display ip interface brief
Interface IP Address/Mask Physical Protocol
......output omitted..... GigabitEthernet0/0/0 10.0.13.1/24 up up GigabitEthernet0/0/1 10.0.12.1/24 up up
GigabitEthernet0/0/2 unassigned up down LoopBack0 10.0.1.1/24 up up(s)
......output omitted......

<Huawei>system-view
Enter system view, return user view with Ctrl+Z.
[Huawei]sysname R2
[R2]interface GigabitEthernet 0/0/1
[R2-GigabitEthernet0/0/1]ip address 10.0.12.2 24
[R2-GigabitEthernet0/0/1]quit
[R2]interface GigabitEthernet0/0/2
[R2-GigabitEthernet0/0/2]ip add 10.0.23.2 24
[R2-GigabitEthernet0/0/2]quit
[R2]interface LoopBack0
[R2-LoopBack0]ip address 10.0.2.2 24

<R2>display ip interface brief
Interface IP Address/Mask Physical Protocol
......output omitted......
GigabitEthernet0/0/0 unassigned up down GigabitEthernet0/0/1 10.0.12.2/24 up up
GigabitEthernet0/0/2 10.0.23.2/24 up up LoopBack0 10.0.2.2/24 up up(s)
......output omitted......

<Huawei>system-view
```

```
Enter system view, return user view with Ctrl+Z.
[Huawei]sysname R3
[R3]interface GigabitEthernet 0/0/0
[R3-GigabitEthernet0/0/0]ip address 10.0.13.3 24
[R3-GigabitEthernet0/0/0]quit
[R3]interface GigabitEthernet0/0/2
[R3-GigabitEthernet0/0/2]ip address 10.0.23.3 24
[R3-GigabitEthernet0/0/2]quit
[R3]interface LoopBack 0
[R3-LoopBack0]ip address 10.0.3.3 24

<R3>display ip interface brief
Interface IP Address/Mask Physical Protocol
......output omitted..... GigabitEthernet0/0/0 10.0.13.3/24 up up
GigabitEthernet0/0/1 unassigned up down GigabitEthernet0/0/2 10.0.23.3/24 up up LoopBack0
10.0.3.3/24 up up(s)
......output omitted......
```

步骤 3 执行 ping 命令，检测 R1 与其它设备间的连通性。

```
<R1>ping 10.0.12.2
PING 10.0.12.2: 56 data bytes, press CTRL_C to break
Reply from 10.0.12.2: bytes=56 Sequence=1 ttl=255 time=30 ms
Reply from 10.0.12.2: bytes=56 Sequence=2 ttl=255 time=30 ms
Reply from 10.0.12.2: bytes=56 Sequence=3 ttl=255 time=30 ms
Reply from 10.0.12.2: bytes=56 Sequence=4 ttl=255 time=30 ms
Reply from 10.0.12.2: bytes=56 Sequence=5 ttl=255 time=30 ms
--- 10.0.12.2 ping statistics ---
5 packet(s) transmitted
5 packet(s) received
0.00% packet loss
round-trip min/avg/max = 30/30/30 ms

<R1>ping 10.0.13.3
PING 10.0.13.2: 56 data bytes, press CTRL_C to break
Reply from 10.0.13.3: bytes=56 Sequence=1 ttl=255 time=6 ms
Reply from 10.0.13.3: bytes=56 Sequence=2 ttl=255 time=2 ms
Reply from 10.0.13.3: bytes=56 Sequence=3 ttl=255 time=2 ms
Reply from 10.0.13.3: bytes=56 Sequence=4 ttl=255 time=2 ms
Reply from 10.0.13.3: bytes=56 Sequence=5 ttl=255 time=2 ms
--- 10.0.13.3 ping statistics ---
5 packet(s) transmitted
5 packet(s) received
0.00% packet loss
round-trip min/avg/max = 2/2/6 ms
```

步骤 4 执行 ping 命令，检测 R2 与其它设备间的连通性。

```
<R2>ping 10.0.23.3
PING 10.0.23.3: 56 data bytes, press CTRL_C to break
Reply from 10.0.23.3: bytes=56 Sequence=1 ttl=255 time=31 ms
Reply from 10.0.23.3: bytes=56 Sequence=2 ttl=255 time=31 ms
Reply from 10.0.23.3: bytes=56 Sequence=3 ttl=255 time=41 ms
Reply from 10.0.23.3: bytes=56 Sequence=4 ttl=255 time=31 ms
Reply from 10.0.23.3: bytes=56 Sequence=5 ttl=255 time=41 ms
--- 10.0.23.3 ping statistics ---
5 packet(s) transmitted
5 packet(s) received
0.00% packet loss
round-trip min/avg/max = 31/35/41 ms
```

任务二 测试 R2 到目的网络 10.0.13.0/24、10.0.3.0/24 的连通性

```
<R2>ping 10.0.13.3
PING 10.0.13.3: 56 data bytes, press CTRL_C to break
Request time out
Request time out
Request time out
Request time out
Request time out
--- 10.0.13.3 ping statistics ---
5 packet(s) transmitted
0 packet(s) received
100.00% packet loss

<R2>ping 10.0.3.3
PING 10.0.3.3: 56 data bytes, press CTRL_C to break
Request time out
Request time out
Request time out
Request time out
Request time out
--- 10.0.3.3 ping statistics ---
5 packet(s) transmitted
0 packet(s) received
100.00% packet loss
```

R2 如果要与 10.0.3.0/24 网络通信，需要 R2 上有去往该网段的路由信息，并且 R3 上也需要有到 R2 相应接口所在 IP 网段的路由信息。

上述检测结果表明，R2 不能与 10.0.3.3 和 10.0.13.3 网络通信。

执行 display ip routing-table 命令，查看 R2 上的路由表。可以收现路由表中没有到这两个网段的路由信息。

<R2>display ip routing-table
Route Flags: R - relay, D - download to fib
Routing Tables: Public
Destinations : 13 Routes : 13
Destination/Mask Proto Pre Cost Flags NextHop Interface
10.0.2.0/24 Direct 0 0 D 10.0.2.2 LoopBack0
10.0.2.2/32 Direct 0 0 D 127.0.0.1 LoopBack0
10.0.2.255/32 Direct 0 0 D 127.0.0.1 LoopBack0
10.0.12.0/24 Direct 0 0 D 10.0.12.2 GigabitEthernet0/0/1
10.0.12.2/32 Direct 0 0 D 127.0.0.1 GigabitEthernet0/0/1
10.0.12.255/32 Direct 0 0 D 127.0.0.1 GigabitEthernet0/0/1
10.0.23.0/24 Direct 0 0 D 10.0.23.2 GigabitEthernet0/0/2
10.0.23.2/32 Direct 0 0 D 127.0.0.1 GigabitEthernet0/0/2
10.0.23.255/32 Direct 0 0 D 127.0.0.1 GigabitEthernet0/0/2
127.0.0.0/8 Direct 0 0 D 127.0.0.1 InLoopBack0
127.0.0.1/32 Direct 0 0 D 127.0.0.1 InLoopBack0
127.255.255.255/32 Direct 0 0 D 127.0.0.1 InLoopBack0
255.255.255.255/32 Direct 0 0 D 127.0.0.1 InLoopBack0

任务三 在 R2 上配置静态路由

配置目的地址为 10.0.13.0/24 和 10.0.3.0/24 的静态路由，路由的下一跳配置为 R3 的 G0/0/0 接口 IP 地址 10.0.23.3。默认静态路由优先级为 60，无需额外配置路由优先级信息。

[R2]ip route-static 10.0.13.0 24 10.0.23.3
[R2]ip route-static 10.0.3.0 24 10.0.23.3

注意：在 ip route-static 命令中，24 代表子网掩码长度，也可以写成完整的掩码形式如 255.255.255.0。

<R2>display ip routing-table
Route Flags: R - relay, D - download to fib
Destination/Mask Proto Pre Cost Flags NextHop Interface 10.0.3.0/24 Static 60 0 RD 10.0.23.3 GigabitEthernet0/0/2
10.0.12.0/24 Direct 0 0 D 10.0.12.2 GigabitEthernet0/0/1
10.0.12.2/32 Direct 0 0 D 127.0.0.1 GigabitEthernet0/0/1
10.0.12.255/32 Direct 0 0 D 127.0.0.1 GigabitEthernet0/0/1 10.0.13.0/24 Static 60 0 RD 10.0.23.3 GigabitEthernet0/0/2
10.0.23.0/24 Direct 0 0 D 10.0.23.2 GigabitEthernet0/0/2
10.0.23.2/32 Direct 0 0 D 127.0.0.1 GigabitEthernet0/0/2

任务四 配置备份静态路由

R2 与网络 10.0.13.3 和 10.0.3.3 之间交互的数据通过 R2 与 R3 间的链路传输。如果 R2 和 R3 间的链路发生故障，R2 将不能与网络 10.0.13.3 和 10.0.3.3 通信。

但是根据拓扑图可以看出，当 R2 和 R3 间的链路发生故障时，R2 还可以通过 R1 与 R3 通信。所以可以通过配置一条备份静态路由实现路由的冗余备份。正常情况下，备份静态路由不生效。当 R2 和 R3 间的链路发生故障时，才使用备份静态路由传输数据。

配置备份静态路由时，需要修改备份静态路由的优先级，确保只有主链路故障时才使用备份路由。本任务中，需要将备份静态路由的优先级修改为 80。

```
[R1]ip route-static 10.0.3.0 24 10.0.13.3

[R2]ip route-static 10.0.13.0 255.255.255.0 10.0.12.1 preference 80
[R2]ip route-static 10.0.3.0 24 10.0.12.1 preference 80

[R3]ip route-static 10.0.12.0 24 10.0.13.1
```

任务五 验证静态路由

在 R2 的路由表中，查看当前的静态路由配置。

```
<R2>display ip routing-table
Route Flags: R - relay, D - download to fib
------------------------------------------------------------------------------
Routing Tables: Public
Destinations : 15 Routes : 15
Destination/Mask Proto Pre Cost Flags NextHop Interface
10.0.2.0/24 Direct 0 0 D 10.0.2.2 LoopBack0
10.0.2.2/32 Direct 0 0 D 127.0.0.1 LoopBack0
10.0.2.255/32 Direct 0 0 D 127.0.0.1 LoopBack0 10.0.3.0/24 Static 60 0 RD 10.0.23.3 GigabitEthernet0/0/2
10.0.12.0/24 Direct 0 0 D 10.0.12.2 GigabitEthernet0/0/1
10.0.12.2/32 Direct 0 0 D 127.0.0.1 GigabitEthernet0/0/1
10.0.12.255/32 Direct 0 0 D 127.0.0.1 GigabitEthernet0/0/1 10.0.13.0/24 Static 60 0 RD 10.0.23.3 GigabitEthernet0/0/2
10.0.23.0/24 Direct 0 0 D 10.0.23.2 GigabitEthernet0/0/2
10.0.23.2/32 Direct 0 0 D 127.0.0.1 GigabitEthernet0/0/2
10.0.23.255/32 Direct 0 0 D 127.0.0.1 GigabitEthernet0/0/2
127.0.0.0/8 Direct 0 0 D 127.0.0.1 InLoopBack0
127.0.0.1/32 Direct 0 0 D 127.0.0.1 InLoopBack0
127.255.255.255/32 Direct 0 0 D 127.0.0.1 InLoopBack0
255.255.255.255/32 Direct 0 0 D 127.0.0.1 InLoopBack0
```

路由表中包含两条静态路由。其中，Protocol 字段的值是 Static，表明该路由是静态路由。Preference 字段的值是 60，表明该路由使用的是默认优先级。

在 R2 和 R3 之间链路正常时，R2 与网络 10.0.13.3 和 10.0.3.3 之间交互的数据通过 R2 与 R3 间的链路传输。执行 tracert 命令，可以查看数据的传输路径。

```
<R2>tracert 10.0.13.3
traceroute to 10.0.13.3(10.0.13.3), max hops: 30 ,packet length: 40,
press CTRL_C to break 1 10.0.23.3 40 ms 31 ms 30 ms
```

<R2>tracert 10.0.3.3
traceroute to 10.0.3.3(10.0.3.3), max hops: 30 ,packet length: 40,
press CTRL_C to break 1 10.0.23.3 40 ms 30 ms 30 ms

命令的回显信息证实 R2 将数据直接发送给 R3，未经过其他设备。

任务六 验证备份静态路由

步骤 1 关闭 R2 上的 G0/0/2 接口，模拟 R2 不 R3 间的链路叹生故障，然后查看 IP 路由表的发化。

[R2]intface GigabitEthernet0/0/2
[R2-GigabitEthernet0/0/2]shutdown
[R2-GigabitEthernet0/0/2]quit

注意不关闭接口之前的路由表情况作对比。

<R2>display ip routing-table
Route Flags: R - relay, D - download to fib

Routing Tables: Public
Destinations : 12 Routes : 12
Destination/Mask Proto Pre Cost Flags NextHop Interface
10.0.2.0/24 Direct 0 0 D 10.0.2.2 LoopBack0
10.0.2.2/32 Direct 0 0 D 127.0.0.1 LoopBack0
10.0.2.255/32 Direct 0 0 D 127.0.0.1 LoopBack0 10.0.3.0/24 Static 80 0 D 10.0.12.2 GigabitEthernet0/0/1
10.0.12.0/24 Direct 0 0 D 10.0.12.2 GigabitEthernet0/0/1
10.0.12.2/32 Direct 0 0 D 127.0.0.1 GigabitEthernet0/0/1
10.0.12.255/32 Direct 0 0 D 127.0.0.1 GigabitEthernet0/0/1 10.0.13.0/24 Static 80 0 D 10.0.12.2 GigabitEthernet0/0/1
127.0.0.0/8 Direct 0 0 D 127.0.0.1 InLoopBack0
127.0.0.1/32 Direct 0 0 D 127.0.0.1 InLoopBack0
127.255.255.255/32 Direct 0 0 D 127.0.0.1 InLoopBack0
255.255.255.255/32 Direct 0 0 D 127.0.0.1 InLoopBack0

在 R2 的路由表中，灰色所标记出的两条路由的下一跳和优先级均已发生发化。

步骤 2 检测 R2 到目的地址 10.0.13.3 以及 R3 上的 10.0.3.3 的连通性。

<R2>ping 10.0.3.3
PING 10.0.3.3: 56 data bytes, press CTRL_C to break
Reply from 10.0.3.3: bytes=56 Sequence=1 ttl=255 time=3 ms
Reply from 10.0.3.3: bytes=56 Sequence=2 ttl=255 time=2 ms
Reply from 10.0.3.3: bytes=56 Sequence=3 ttl=255 time=2 ms
Reply from 10.0.3.3: bytes=56 Sequence=4 ttl=255 time=2 ms
Reply from 10.0.3.3: bytes=56 Sequence=5 ttl=255 time=2 ms
--- 10.0.3.3 ping statistics ---

5 packet(s) transmitted
5 packet(s) received
0.00% packet loss
round-trip min/avg/max = 2/2/3 ms

<R2>ping 10.0.13.3
PING 10.0.13.3: 56 data bytes, press CTRL_C to break
Reply from 10.0.13.3: bytes=56 Sequence=1 ttl=255 time=3 ms
Reply from 10.0.13.3: bytes=56 Sequence=2 ttl=255 time=2 ms
Reply from 10.0.13.3: bytes=56 Sequence=3 ttl=255 time=2 ms
Reply from 10.0.13.3: bytes=56 Sequence=4 ttl=255 time=2 ms
Reply from 10.0.13.3: bytes=56 Sequence=5 ttl=255 time=2 ms
--- 10.0.13.3 ping statistics ---
5 packet(s) transmitted
5 packet(s) received
0.00% packet loss
round-trip min/avg/max = 2/2/3 ms

*网络并未因为 **R2** 与 **R3** 之间的链路被关闭而中断。*

步骤 3 执行 tracert 命令，查看数据包的转发路径。

<R2>tracert 10.0.13.3
traceroute to 10.0.13.3(10.0.13.3), max hops: 30 ,packet length: 40,press CTRL_C to break 1 10.0.12.1 40 ms 21 ms 21 ms 2 10.0.13.3 30 ms 21 ms 21 ms

<R2>tracert 10.0.3.3
traceroute to 10.0.3.3(10.0.3.3), max hops: 30 ,packet length: 40,press CTRL_C to break 1 10.0.12.1 40 ms 21 ms 21 ms 2 10.0.13.3 30 ms 21 ms 21 ms

*命令的回显信息表明，**R2** 发送的数据经过 **R1** 抵达 **R3** 设备。*

任务七 配置缺省路由实现网络的互通

步骤 1 打开 R2 上在步骤 6 中关闭的接口。

[R2]intface GigabitEthernet 0/0/2
[R2-GigabitEthernet0/0/2]undo shutdown

步骤 2 验证从 R1 到 10.0.23.3 网络的连通性。

[R1]ping 10.0.23.3
PING 10.0.23.3: 56 data bytes, press CTRL_C to break
Request time out
Request time out
Request time out
Request time out
Request time out
--- 10.0.23.3 ping statistics ---
5 packet(s) transmitted

0 packet(s) received
100.00% packet loss

*因为 **R1** 上没有去往 **10.0.23.0** 网段的路由信息，所以报文无法到达 **R3**。*

步骤 3 显示 R1 的路由表

<R1>display ip routing-table
Route Flags: R - relay, D - download to fib

Routing Tables: Public
Destinations : 14 Routes : 14
Destination/Mask Proto Pre Cost Flags NextHop Interface
10.0.1.0/24 Direct 0 0 D 10.0.1.1 LoopBack0
10.0.1.1/32 Direct 0 0 D 127.0.0.1 LoopBack0
10.0.1.255/32 Direct 0 0 D 127.0.0.1 LoopBack0
10.0.3.0/24 Static 60 0 RD 10.0.13.3 GigabitEthernet0/0/0
10.0.12.0/24 Direct 0 0 D 10.0.12.1 GigabitEthernet0/0/1
10.0.12.1/32 Direct 0 0 D 127.0.0.1 GigabitEthernet0/0/1
10.0.12.255/32 Direct 0 0 D 127.0.0.1 GigabitEthernet0/0/1
10.0.13.0/24 Direct 0 0 D 10.0.13.1 GigabitEthernet0/0/0
10.0.13.1/32 Direct 0 0 D 127.0.0.1 GigabitEthernet0/0/0
10.0.13.255/32 Direct 0 0 D 127.0.0.1 GigabitEthernet0/0/0
127.0.0.0/8 Direct 0 0 D 127.0.0.1 InLoopBack0
127.0.0.1/32 Direct 0 0 D 127.0.0.1 InLoopBack0
127.255.255.255/32 Direct 0 0 D 127.0.0.1 InLoopBack0
255.255.255.255/32 Direct 0 0 D 127.0.0.1 InLoopBack0

可以在 R1 上配置一条下一跳为 10.0.13.3 的缺省路由来实现网络的连通。

[R1]ip route-static 0.0.0.0 0.0.0.0 10.0.13.3

配置完成后，检测 R1 和 10.0.23.3 网络间的连通性。

<R1>ping 10.0.23.3
PING 10.0.23.3: 56 data bytes, press CTRL_C to break
Reply from 10.0.23.3: bytes=56 Sequence=1 ttl=255 time=3 ms
Reply from 10.0.23.3: bytes=56 Sequence=2 ttl=255 time=2 ms
Reply from 10.0.23.3: bytes=56 Sequence=3 ttl=255 time=2 ms
Reply from 10.0.23.3: bytes=56 Sequence=4 ttl=255 time=2 ms
Reply from 10.0.23.3: bytes=56 Sequence=5 ttl=255 time=2 ms
--- 10.0.23.3 ping statistics ---
5 packet(s) transmitted
5 packet(s) received
0.00% packet loss
round-trip min/avg/max = 2/2/3 ms

R1 通过缺省路由实现了与网段 10.0.23.3 间的通信。

任务八 配置备份缺省路由

当 R1 与 R3 间的链路发生故障时，R1 可以使用备份缺省路由通过 R2 实现与 10.0.23.3 和 10.0.3.3 网络间通信。

配置两条备份路由，确保数据来回的双向都有路由。

```
[R1]ip route-static 0.0.0.0 0.0.0.0 10.0.12.2 preference 80

[R3]ip route-static 10.0.12.0 24 10.0.23.2 preference 80
```

任务九 验证备份缺省路由

步骤 1 查看链路正常时 R1 上的路由条目。

```
<R1>display ip routing-table
Route Flags: R - relay, D - download to fib
------------------------------------------------------------------------------
Routing Tables: Public
Destinations : 15 Routes : 15
Destination/Mask Proto Pre Cost Flags NextHop Interface 0.0.0.0/0 Static 60 0 RD 10.0.13.3 GigabitEthernet0/0/0
10.0.1.0/24 Direct 0 0 D 10.0.1.1 LoopBack0
10.0.1.1/32 Direct 0 0 D 127.0.0.1 LoopBack0
10.0.1.255/32 Direct 0 0 D 127.0.0.1 LoopBack0
10.0.3.0/24 Static 60 0 RD 10.0.13.3 GigabitEthernet0/0/0
10.0.12.0/24 Direct 0 0 D 10.0.12.1 GigabitEthernet0/0/1
10.0.12.1/32 Direct 0 0 D 127.0.0.1 GigabitEthernet0/0/1
10.0.12.255/32 Direct 0 0 D 127.0.0.1 GigabitEthernet0/0/1
10.0.13.0/24 Direct 0 0 D 10.0.13.1 GigabitEthernet0/0/0
10.0.13.1/32 Direct 0 0 D 127.0.0.1 GigabitEthernet0/0/0
10.0.13.255/32 Direct 0 0 D 127.0.0.1 GigabitEthernet0/0/0
127.0.0.0/8 Direct 0 0 D 127.0.0.1 InLoopBack0
127.0.0.1/32 Direct 0 0 D 127.0.0.1 InLoopBack0
127.255.255.255/32 Direct 0 0 D 127.0.0.1 InLoopBack0
255.255.255.255/32 Direct 0 0 D 127.0.0.1 InLoopBack0
```

步骤 2 关闭 R1 与 R3 上的 G0/0/0 接口模拟链路故障，然后查看 R1 的路由表。比较关闭接口前后的路由表发化情况。

```
[R1]interface GigabitEthernet0/0/0
[R1-GigabitEthernet0/0/0]shutdown
[R1-GigabitEthernet0/0/0]quit

[R3]interface GigabitEthernet0/0/0
[R3-GigabitEthernet0/0/0]shutdown
[R3-GigabitEthernet0/0/0]quit

<R1>display ip routing-table
```

Route Flags: R - relay, D - download to fib

Routing Tables: Public

Destinations : 11 Routes : 11

Destination/Mask Proto Pre Cost Flags NextHop Interface 0.0.0.0/0 Static 80 0 RD 10.0.12.2 GigabitEthernet0/0/1

10.0.1.0/24 Direct 0 0 D 10.0.1.1 LoopBack0

10.0.1.1/32 Direct 0 0 D 127.0.0.1 LoopBack0

10.0.1.255/32 Direct 0 0 D 127.0.0.1 LoopBack0

10.0.12.0/24 Direct 0 0 D 10.0.12.1 GigabitEthernet0/0/1

10.0.12.1/32 Direct 0 0 D 127.0.0.1 GigabitEthernet0/0/1

10.0.12.255/32 Direct 0 0 D 127.0.0.1 GigabitEthernet0/0/1

127.0.0.0/8 Direct 0 0 D 127.0.0.1 InLoopBack0

127.0.0.1/32 Direct 0 0 D 127.0.0.1 InLoopBack0

127.255.255.255/32 Direct 0 0 D 127.0.0.1 InLoopBack0

255.255.255.255/32 Direct 0 0 D 127.0.0.1 InLoopBack0

*上述路由表中，缺省路由 **0.0.0.0** 的 **Preference** 值为 **80**，表明备用的缺省路由已生效。*

<R1>ping 10.0.23.3

PING 10.0.23.3: 56 data bytes, press CTRL_C to break

Reply from 10.0.23.3: bytes=56 Sequence=1 ttl=254 time=76 ms

Reply from 10.0.23.3: bytes=56 Sequence=2 ttl=254 time=250 ms

Reply from 10.0.23.3: bytes=56 Sequence=3 ttl=254 time=76 ms

Reply from 10.0.23.3: bytes=56 Sequence=4 ttl=254 time=76 ms

Reply from 10.0.23.3: bytes=56 Sequence=5 ttl=254 time=76 ms

--- 10.0.23.3 ping statistics ---

5 packet(s) transmitted

5 packet(s) received

0.00% packet loss

round-trip min/avg/max = 76/110/250 ms

*网络并未因为 **R1** 与 **R3** 之间的链路被关闭而中断。执行 **tracert** 命令，查看数据包的转发路径。*

<R1>tracert 10.0.23.3

traceroute to 10.0.23.3(10.0.23.2), max hops: 30 ,packet length: 40,press CTRL_C to break 1 10.0.12.2 30 ms 26 ms 26 ms 2 10.0.23.3 60 ms 53 ms 56 ms

*结果显示报文通过 **R2**（**10.0.12.2**）到达 **R3**（**10.0.23.3**）。*

任务十 查看配置文件

步骤 1 查看 R1 配置文件

<R1>display current-configuration

……

步骤 2 查看 R2 配置文件

……

步骤 3 查看 R3 配置文件

<R3>display current-configuration

……