

IP Static Routes



Foreword

The implementation of routes within the IP routing table of a router can be defined manually using static routes or through the use of dynamic routing protocols. The manual configuration of routes enables direct control over the routing table, however may result in route failure should a router's next-hop fail. The configuration of static routes however is often used to compliment dynamic routing protocols to provide alternative routes in the event dynamically discovered routes fail to provide a valid next-hop. Knowledge of the various applications of static routes and configuration is necessary for effective network administration.

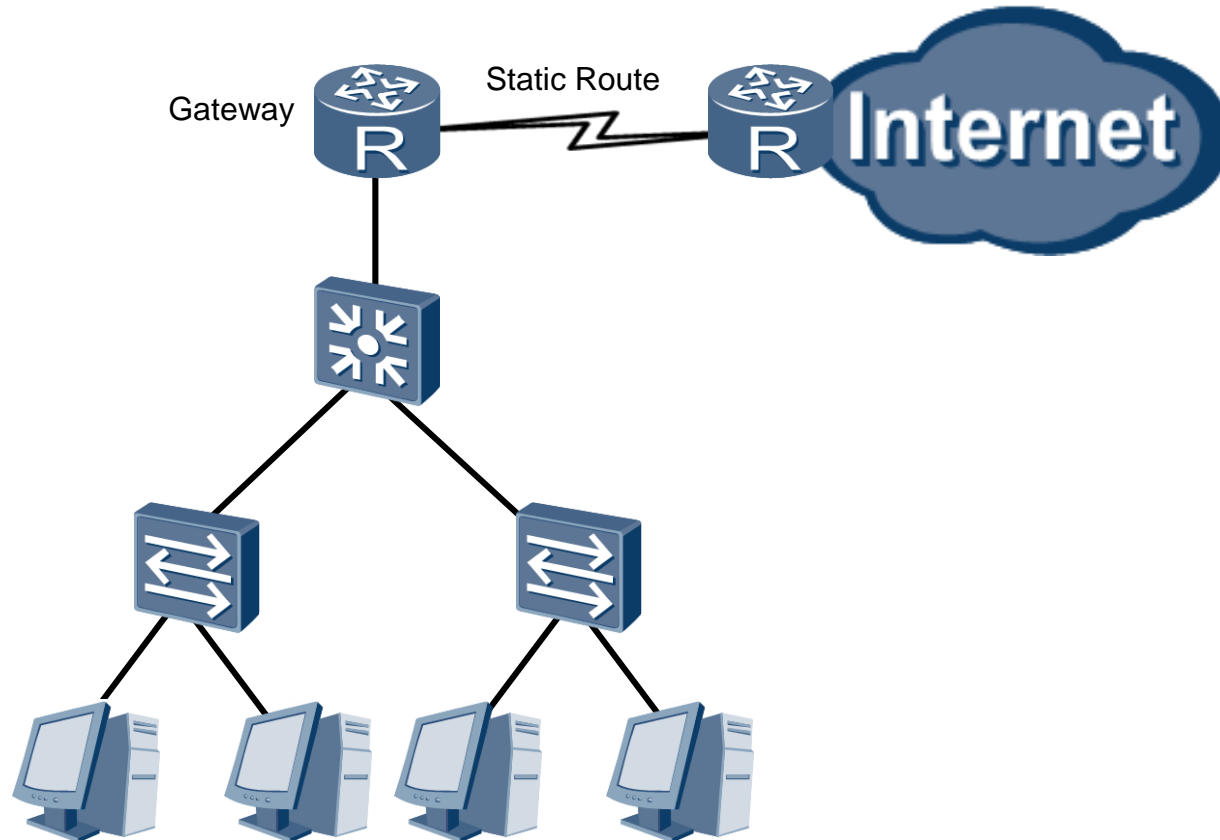


Objectives

Upon completion of this section, trainees will be able to:

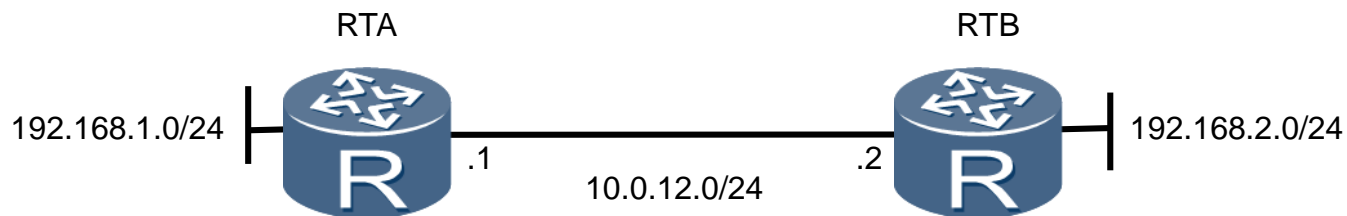
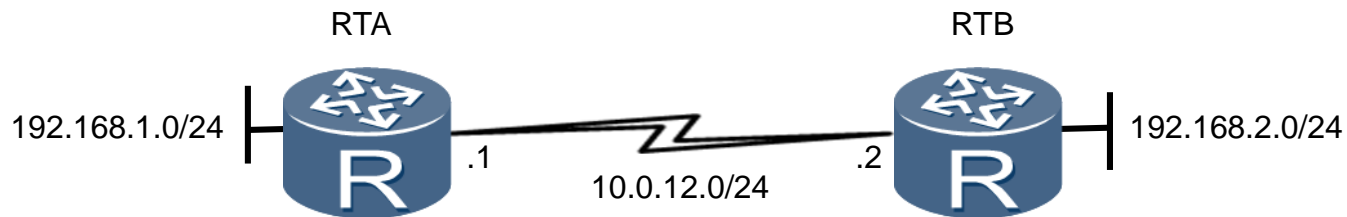
- Explain the different applications for static routes.
- Successfully configure static routes in the IP routing table.

Application for Static Route



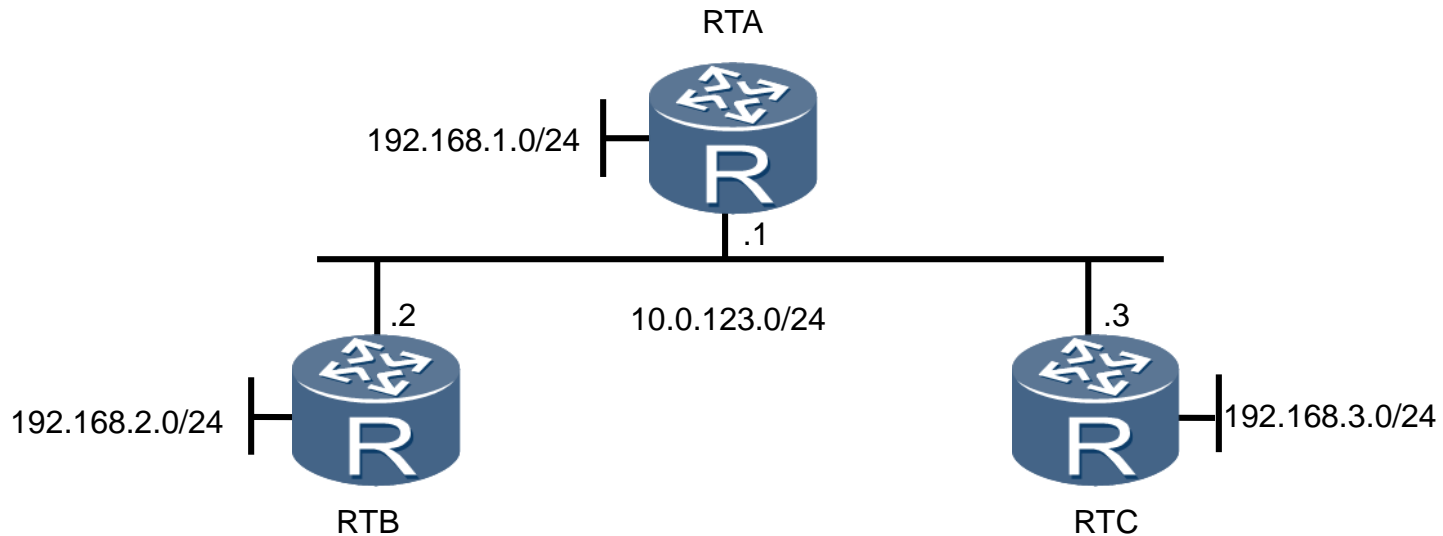
- Static routes define a means of path selection to other networks.

Static Route Behavior



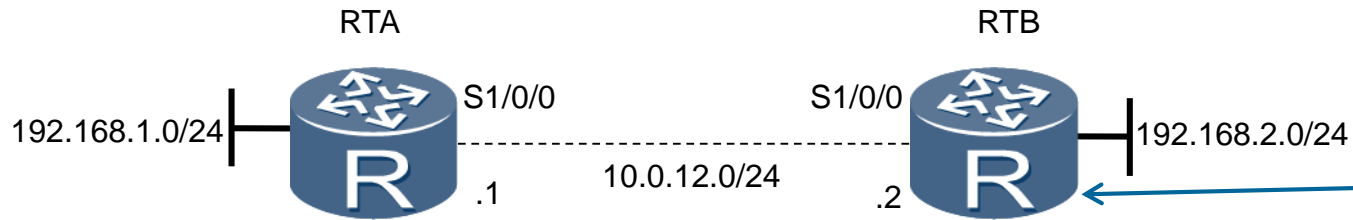
- The forwarding of packets based on a serial interface requires that the outbound interface be defined.

Static Route Behavior



- The forwarding of packets over broadcast networks such as Ethernet, requires that the next-hop be defined.

Configuring a Static Route



```
[RTB]ip route-static 192.168.1.0 255.255.255.0 10.0.12.1
```

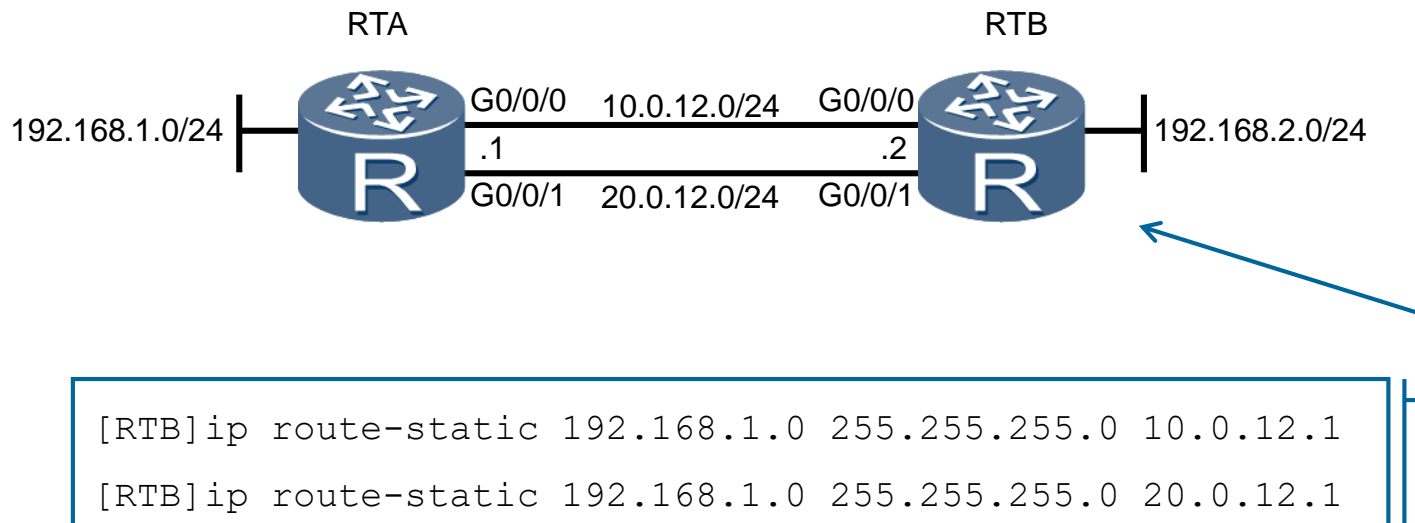
```
[RTB]ip route-static 192.168.1.0 255.255.255.0 Serial 1/0/0
```

```
[RTB]ip route-static 192.168.1.0 24 Serial 1/0/0
```

ip route-static ip-address { mask | mask-length } interface-type interface-number [nexthop-address]

- A static route can be configured based on one of three variations.

Static Route Load Balancing



- Static routes support load balancing to the same destination where the cost of routes are equal.

Verifying Static Route Load Balancing

```
[RTB]display ip routing-table
```

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

```
-----
```

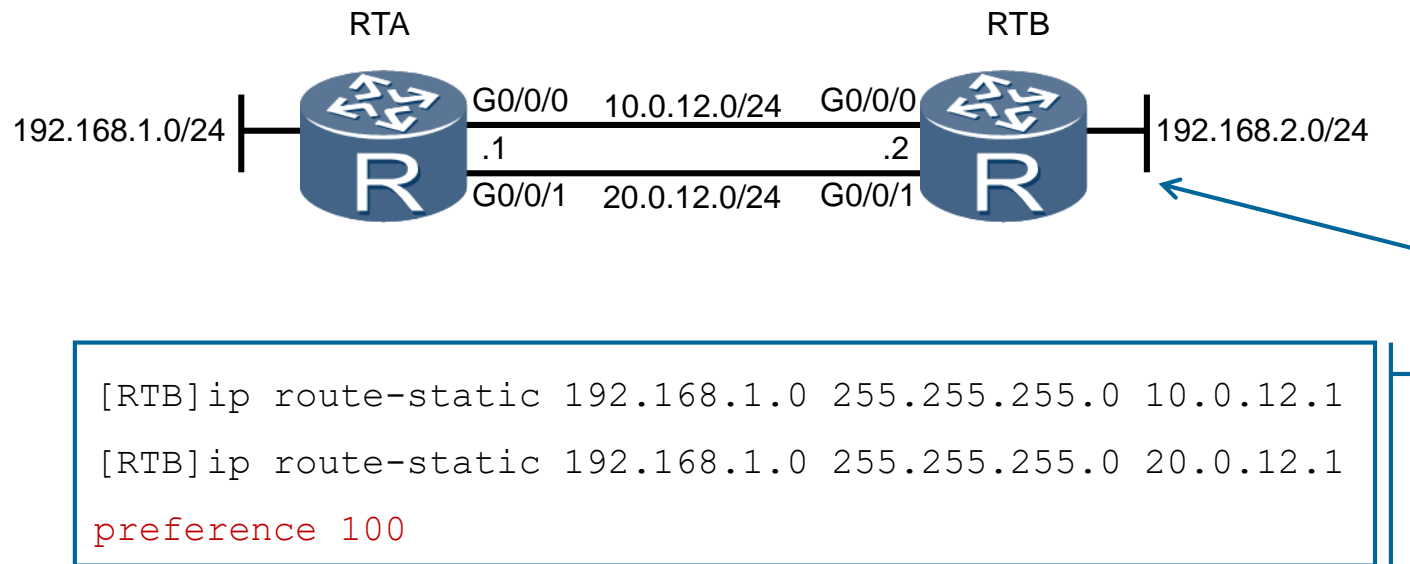
```
Routing Tables: Public  Destinations : 13          Routes : 14
```

```
Destination/Mask  Proto Pre Cost Flags NextHop Interface
```

```
.....
```

```
192.168.1.0/24    Static 60  0   RD 10.0.12.1 GigabitEthernet 0/0/0
                  Static 60  0   RD 20.0.12.1 GigabitEthernet 0/0/1
```

Floating Static Routes



- Floating static routes provide an alternative route in the event that the primary static route fails.

Floating Static Route Check

```
[RTB]display ip routing-table
Route Flags: R - relay, D - download to fib
-----
Routing Tables: Public  Destinations : 13          Routes : 14
Destination/Mask Proto Pre Cost Flags NextHop      Interface
.....
192.168.1.0/24  Static  60    0  RD  10.0.12.1 GigabitEthernet0/0/0
```

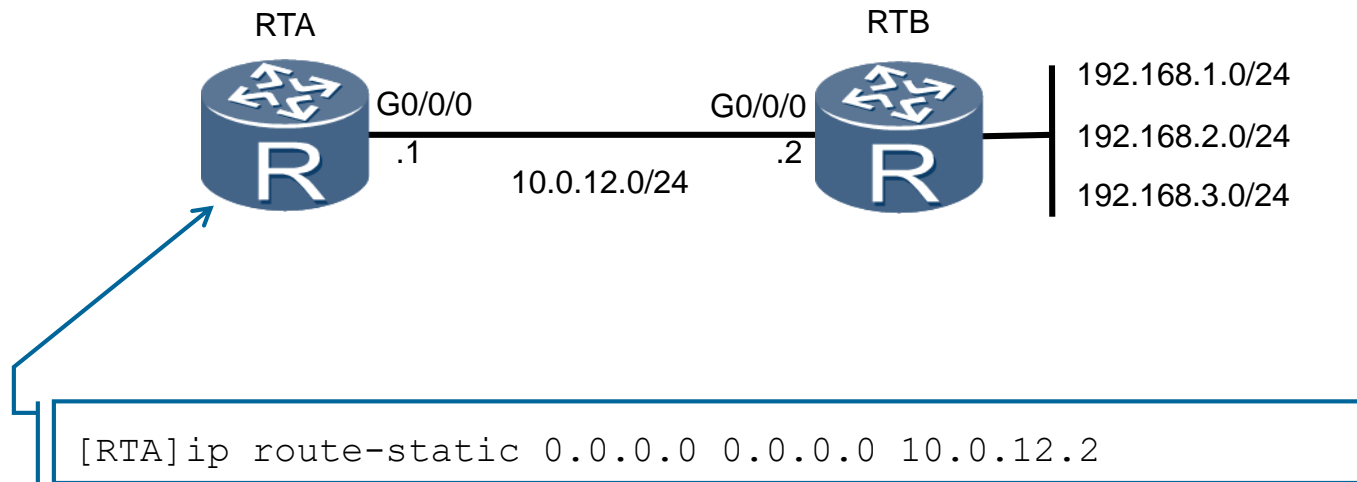
- Prior to the failure of the primary route, only the primary static route will be present within the routing table.

Floating Static Route Check

```
[RTB]interface GigabitEthernet 0/0/0
[RTB-GigabitEthernet 0/0/0]shutdown
[RTB]display ip routing-table
Route Flags: R - relay, D - download to fib
-----
Routing Tables: Public  Destinations : 13          Routes : 14
Destination/Mask Proto Pre Cost Flags NextHop Interface
.....
192.168.1.0/24 Static 100 0 RD 20.0.12.1 GigabitEthernet 0/0/1
```

- In disabling the primary route, the floating static route is then added to the routing table.

Default Static Routes



- Default routes provide a form of last resort route in the event that no other longest match is found within the routing table.

Default Static Route Check

```
[RTA]display ip routing-table
```

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

```
-----
```

```
Routing Tables: Public  Destinations : 13          Routes : 14
```

```
Destination/Mask Proto Pre Cost Flags NextHop Interface
```

```
.....
```

```
0.0.0.0/0          Static 60    0   RD    10.0.12.2 GigabitEthernet0/0/0
```



Summary

- What should be altered to enable a static route to become a floating static route?
- Which network address should be defined to allow a default static route to be implemented in the routing table?



Thank you

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