

Routing  
Switching  
Tigers  
Forum

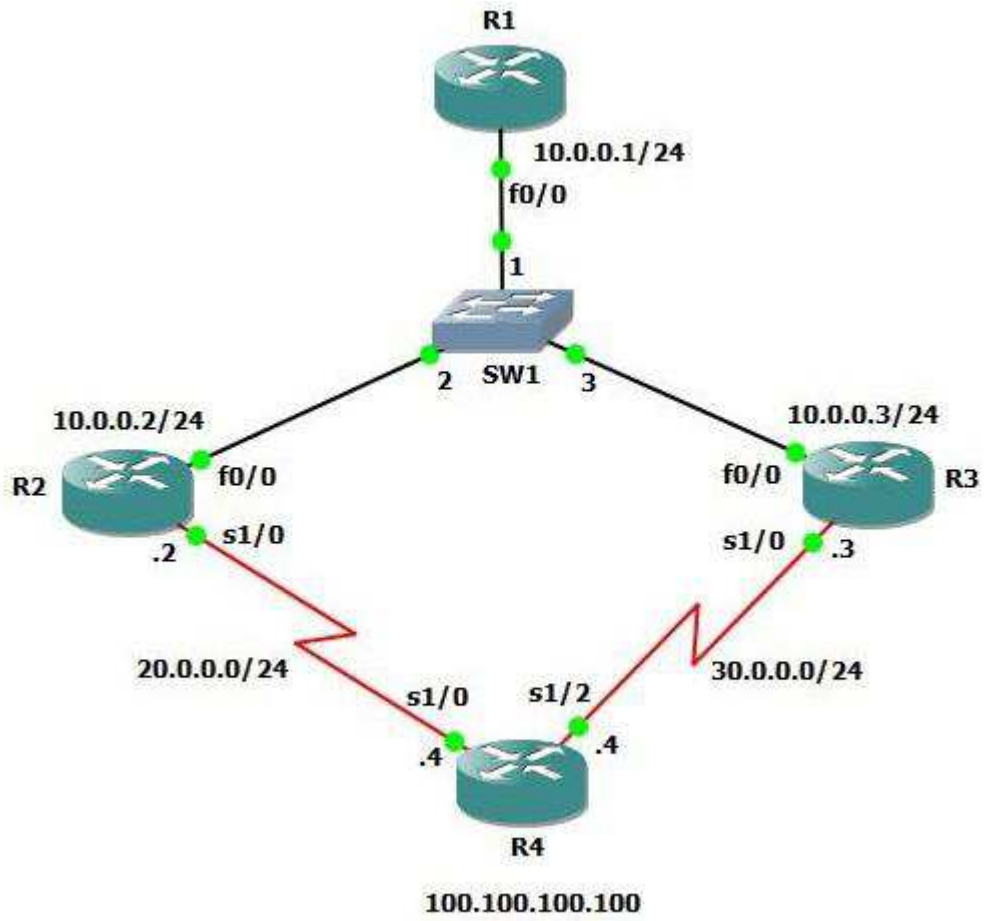


# VRRP



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# VRRP Topology



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# LAB 1: Configure VRRP:

## Task 1: Configure VRRP for IPv4

Step 1 Configure VRRP Basic Configuration

R1:

```
interface f0/0
ip address 10.0.0.1 255.255.255.0
no shutdown
exit

ip route 100.0.0.0 255.0.0.0 10.0.0.5
```

R2:

```
interface f0/0
ip address 10.0.0.2 255.255.255.0
no shutdown
exit

interface serial 1/0
ip address 20.0.0.2 255.255.255.0
no shutdown
exit

ip route 100.0.0.0 255.0.0.0 20.0.0.4
```

```
interface f0/0
vrrp 1 ip 10.0.0.5
vrrp 1 priority 100
vrrp 1 timers advertise 5
exit
```

R3:

```
interface f0/0
ip address 10.0.0.3 255.255.255.0
no shutdown
exit

interface serial 1/0
ip address 30.0.0.3 255.255.255.0
no shutdown
exit
```

```
ip route 100.0.0.0 255.0.0.0 30.0.0.4
```

```
interface f0/0  
vrrp 1 ip 10.0.0.5  
vrrp 1 priority 110  
vrrp 1 timers advertise 5  
exit
```

R4:

```
interface serial 1/0  
ip address 20.0.0.4 255.255.255.0  
no shutdown  
exit
```

```
interface serial 1/2  
ip address 30.0.0.4 255.255.255.0  
no shutdown  
exit  
interface loopback 1  
ip address 100.100.100.100 255.255.255.0  
exit
```

```
ip route 0.0.0.0 0.0.0.0 20.0.0.2  
ip route 0.0.0.0 0.0.0.0 30.0.0.3
```

## Task 2: Verification

### Step 1 Verify Active and Standby State in VRRP

R2:

```
R2(config)#do sh vrrp br  
Interface      Grp Pri Time Own Pre State Master addr  Group addr  
Fa0/0          1 100 15609 Y Backup 10.0.0.3 10.0.0.5
```

R3:

```
R3(config)#do sh vrrp br  
Interface      Grp Pri Time Own Pre State Master addr  Group addr  
Fa0/0          1 110 15570 Y Master 10.0.0.3 10.0.0.5
```

R3:  
R3#sh vrrp int f0/0  
FastEthernet0/0 - Group 1  
State is Master  
Virtual IP address is 10.0.0.5  
Virtual MAC address is 0000.5e00.0101  
Advertisement interval is 5.000 sec  
Preemption enabled  
Priority is 110  
Master Router is 10.0.0.3 (local), priority is 110  
Master Advertisement interval is 5.000 sec  
Master Down interval is 15.570 sec

R2:  
  
R2(config)#do sh vrrp int f0/0  
FastEthernet0/0 - Group 1  
State is Backup  
Virtual IP address is 10.0.0.5  
Virtual MAC address is 0000.5e00.0101  
Advertisement interval is 5.000 sec  
Preemption enabled  
Priority is 100  
Master Router is 10.0.0.3, priority is 110  
Master Advertisement interval is 5.000 sec  
Master Down interval is 15.609 sec (expires in 13.037 sec)

### Task 3: Verify VRRP Automatic Gateway Selection

Step 1 Shutdown the Active router

```
R3:  
interface f0/0  
shutdown
```

Step 2 Verify VRRP Automatic Gateway selection to Router 3 form Backup state to Master state

```
R2:  
*Mar 1 00:47:35.287: %VRRP-6-STATECHANGE: Fa0/0 Grp 1 state Backup -> Master
```

```
R3:  
*Mar 1 00:47:33.199: %VRRP-6-STATECHANGE: Fa0/0 Grp 1 state Master -> Init
```

R3:

```
R3(config)#do sh vrrp int f0/0
FastEthernet0/0 - Group 1
State is Init
Virtual IP address is 10.0.0.5
Virtual MAC address is 0000.5e00.0101
Advertisement interval is 5.000 sec
Preemption enabled
Priority is 110
Master Router is unknown, priority is unknown
Master Advertisement interval is unknown
Master Down interval is unknown
```

R2:

```
R2#sh vrrp int f0/0
FastEthernet0/0 - Group 1
State is Master
Virtual IP address is 10.0.0.5
Virtual MAC address is 0000.5e00.0101
Advertisement interval is 5.000 sec
Preemption enabled
Priority is 100
Master Router is 10.0.0.2 (local), priority is 100
Master Advertisement interval is 5.000 sec
Master Down interval is 15.609 sec
```

R3:

```
Int f0/0
No shut
```

R3:

```
*Mar 1 00:54:43.259: %VRRP-6-STATECHANGE: Fa0/0 Grp 1 state Init -> Backup
```

```
R3(config-if)#ex
```

```
R3(config)#
```

```
R3(config)#
```

```
*Mar 1 00:54:45.231: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
```

```
*Mar 1 00:54:46.231: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
```

```
R3(config)#
```

```
*Mar 1 00:54:58.827: %VRRP-6-STATECHANGE: Fa0/0 Grp 1 state Backup -> Master
```

R2:

```
*Mar 1 00:54:58.983: VRRP: Grp 1 sending Advertisement checksum 70F3
*Mar 1 00:55:00.395: VRRP: Grp 1 Advertisement priority 110, ipaddr 10.0.0.3
*Mar 1 00:55:00.395: VRRP: Grp 1 Event - Advert higher or equal priority
```

R1:

```
R1#ping 100.100.100.0
```

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 100.100.100.0, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 140/184/236 ms

### Step 3 Increase the Priority for current Backup Router

R2:

```
Int f0/0
```

```
Vrrp 1 priority 150
```

### Step 4 Verify VRRP Automatic Gateway selection to Router 2 form Backup to Master state

R2:

```
*Mar 1 02:05:56.167: %VRRP-6-STATECHANGE: Fa0/0 Grp 1 state Backup -> Master
```

R3:

```
Debug vrrp
```

```
*Mar 1 02:05:54.763: %VRRP-6-STATECHANGE: Fa0/0 Grp 1 state Master -> Backup
```

```
*Mar 1 02:07:58.139: VRRP: Grp 1 Advertisement priority 150, ipaddr 10.0.0.2
```

```
*Mar 1 02:07:58.143: VRRP: Grp 1 Event - Advert higher or equal priority
```

```
*Mar 1 02:08:02.823: VRRP: Grp 1 Advertisement priority 150, ipaddr 10.0.0.2
```

```
*Mar 1 02:08:02.827: VRRP: Grp 1 Event - Advert higher or equal priority
```

```
R2(config)#do sh vrrp
```

```
FastEthernet0/0 - Group 1
```

```
State is Master
```

```
Virtual IP address is 10.0.0.5
```

```
Virtual MAC address is 0000.5e00.0101
```

```
Advertisement interval is 5.000 sec
```

```
Preemption enabled
```

```
Priority is 150
```

```
Master Router is 10.0.0.2 (local), priority is 150
```

```
Master Advertisement interval is 5.000 sec
```

Master Down interval is 15.414 sec

```
R3#sh vrrp
FastEthernet0/0 - Group 1
  State is Backup
  Virtual IP address is 10.0.0.5
  Virtual MAC address is 0000.5e00.0101
  Advertisement interval is 5.000 sec
  Preemption enabled
  Priority is 110
  Master Router is 10.0.0.2, priority is 150
  Master Advertisement interval is 5.000 sec
  Master Down interval is 15.570 sec (expires in 15.418 sec)
```

```
R1#ping 100.100.100.100
```

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 100.100.100.100, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 140/168/188 ms

#### Task 4: Verify VRRP Automatic Gateway Selection when Serial link is down

Step 1 Shutdown the serial interface

```
R2:
interface serial 1/0
shutdown
```

```
R2#show vrrp
State is Master
  Virtual IP address is 10.0.0.5
  Virtual MAC address is 0000.5e00.0101
  Advertisement interval is 5.000 sec
  Preemption enabled
  Priority is 150
  Master Router is 10.0.0.2 (local), priority is 150
```



Master Advertisement interval is 5.000 sec  
Master Down interval is 15.414 sec

R3#show vrrp

FastEthernet0/0 - Group 1

State is Backup

Virtual IP address is 10.0.0.5

Virtual MAC address is 0000.5e00.0101

Advertisement interval is 5.000 sec

Preemption enabled

Priority is 110

Master Router is 10.0.0.2, priority is 150

Master Advertisement interval is 5.000 sec

Master Down interval is 15.570 sec (expires in 12.970 sec)

R1:

R1#ping 100.100.100.100

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 100.100.100.100, timeout is 2 seconds:

UUUUU

Success rate is 0 percent (0/5)

Step 2 Configure VRRP Track to track serial interface

R2:

track 5 int s1/0 ip routing

int f0/0

vrrp 1 track 5 decrement 50

exit

interface serial 1/0

shutdown

\*Mar 1 03:26:12.855: %TRACKING-5-STATE: 5 interface Se1/0 ip routing Up->Down

R2(config-if)#ex

\*Mar 1 03:26:14.831: %LINK-5-CHANGED: Interface Serial1/0, changed state to administratively down

```
*Mar 1 03:26:15.831: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0,
changed state to down
R2(config-if)#ex
```

```
R2(config)#
```

```
*Mar 1 03:26:27.387: %VRRP-6-STATECHANGE: Fa0/0 Grp 1 state Master -> Backup
```

Step 5 Verify VRRP Automatic Gateway selection to Router 3 form Standby state to Active state

```
R3:
```

```
R3#show vrrp
```

```
*Mar 1 03:26:25.699: %VRRP-6-STATECHANGE: Fa0/0 Grp 1 state Backup -> Master
```

```
R3#sh vrrp
```

```
FastEthernet0/0 - Group 1
```

```
State is Master
```

```
Virtual IP address is 10.0.0.5
```

```
Virtual MAC address is 0000.5e00.0101
```

```
Advertisement interval is 5.000 sec
```

```
Preemption enabled
```

```
Priority is 110
```

```
Master Router is 10.0.0.3 (local), priority is 110
```

```
Master Advertisement interval is 5.000 sec
```

```
Master Down interval is 15.570 sec
```

```
R2:
```

```
R2#show vrrp
```

```
FastEthernet0/0 - Group 1
```

```
State is Backup
```

```
Virtual IP address is 10.0.0.5
```

```
Virtual MAC address is 0000.5e00.0101
```

```
Advertisement interval is 5.000 sec
```

```
Preemption enabled
```

```
Priority is 100 (cfdg 150)
```

```
Track object 5 state Down decrement 50
```

```
Master Router is 10.0.0.3, priority is 110
```

```
Master Advertisement interval is 5.000 sec
```

```
Master Down interval is 15.414 sec (expires in 14.490 sec)
```

R1:

```
R1#ping 100.100.100.100
```

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 100.100.100.100, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 120/166/196 ms

R2:

```
Int s1/0
```

```
No shut
```

```
*Mar 1 03:36:54.283: %VRRP-6-STATECHANGE: Fa0/0 Grp 1 state Backup -> Master
```

```
R2(config)#do sh vrrp
```

```
FastEthernet0/0 - Group 1
```

```
State is Master
```

```
Virtual IP address is 10.0.0.5
```

```
Virtual MAC address is 0000.5e00.0101
```

```
Advertisement interval is 5.000 sec
```

```
Preemption enabled
```

```
Priority is 150
```

```
Track object 5 state Up decrement 50
```

```
Master Router is 10.0.0.2 (local), priority is 150
```

```
Master Advertisement interval is 5.000 sec
```

```
Master Down interval is 15.414 sec
```

R3:

```
*Mar 1 03:36:52.755: %VRRP-6-STATECHANGE: Fa0/0 Grp 1 state Master -> Backup
```

```
R3(config)#do sh vrrp
```

```
FastEthernet0/0 - Group 1
```

```
State is Backup
```

```
Virtual IP address is 10.0.0.5
```

```
Virtual MAC address is 0000.5e00.0101
```

```
Advertisement interval is 5.000 sec
```

```
Preemption enabled
```

```
Priority is 110
```

```
Master Router is 10.0.0.2, priority is 150
```

```
Master Advertisement interval is 5.000 sec
```

```
Master Down interval is 15.570 sec (expires in 14.162 sec)
```

## Task 5: VRRP Authentication

### Step 1 Configure VRRP Authentication

R2:

```
int f0/0
 vrrp 1 authentication md5 key-string cisco
 ex
```

R3:

```
int f0/0
 vrrp 1 authentication md5 key-string cisco
 ex
```

R2:

```
R2(config)#do sh vrrp
FastEthernet0/0 - Group 1
 State is Master
 Virtual IP address is 10.0.0.5
 Virtual MAC address is 0000.5e00.0101
 Advertisement interval is 5.000 sec
 Preemption enabled
 Priority is 150
  Track object 5 state Up decrement 50
 Authentication MD5, key-string "cisco"
 Master Router is 10.0.0.2 (local), priority is 150
 Master Advertisement interval is 5.000 sec
 Master Down interval is 15.414 sec
```

R3:

```
R3(config)#do sh vrrp
FastEthernet0/0 - Group 1
 State is Backup
 Virtual IP address is 10.0.0.5
 Virtual MAC address is 0000.5e00.0101
 Advertisement interval is 5.000 sec
 Preemption enabled
 Priority is 110
 Authentication MD5, key-string "cisco"
 Master Router is 10.0.0.2, priority is 150
```

Master Advertisement interval is 5.000 sec  
Master Down interval is 15.570 sec (expires in 11.298 sec)

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