

Configuring VRRP with CLI

This section provides information to configure VRRP using the command line interface.

Topics in this section include:

- [VRRP Configuration Overview on page 308](#)
- [Basic VRRP Configurations on page 309](#)
- [Common Configuration Tasks on page 313](#)
- [Configuring VRRP Policy Components on page 315](#)
- [VRRP Configuration Management Tasks on page 320](#)
- [Modifying a VRRP Policy on page 320](#)
- [Deleting a VRRP Policy on page 321](#)
- [Modifying Service and Interface VRRP Parameters on page 322](#)
 - [Modifying Non-Owner Parameters on page 322](#)
 - [Modifying Owner Parameters on page 322](#)
 - [Deleting VRRP on an Interface or Service on page 322](#)

VRRP Configuration Overview

Configuring VRRP policies and configuring VRRP instances on interfaces and router interfaces is optional. The basic owner and non-owner VRRP configurations on an IES or router interface must specify the **backup ip-address** parameter.

VRRP helps eliminate the single point of failure in a routed environment by using virtual router IP address shared between two or more routers connecting the common domain. VRRP provides dynamic fail over of the forwarding responsibility if the master becomes unavailable.

The VRRP implementation allows one master per IP subnet. All other VRRP instances in the same domain must be in backup mode.

Preconfiguration Requirements

VRRP policies:

- VRRP policies must be configured before they can be applied to an interface or IES or VPRN VRRP instance. VRRP policies are configured in the **config>vrrp** context.

Configuring VRRP on an IES or VPRN service interface:

- The service customer account must be created prior to configuring an IES or VPRN VRRP instance.
- The interface address must be specified in the both the owner and non-owner IES, VPRN or router interface instances.

Basic VRRP Configurations

Configure VRRP parameters in the following contexts:

- [VRRP Policy on page 309](#)
- [VRRP IES Service Parameters on page 310](#)
- [VRRP Router Interface Parameters on page 312](#)

VRRP Policy

Configuring and applying VRRP policies are optional. There are no default VRRP policies. Each policy must be explicitly defined. A VRRP configuration must include the following:

- Policy ID
- Define at least one of the following priority events:
 - Port down
 - LAG port down
 - Host unreachable
 - Route unknown

The following example displays a sample configuration of a VRRP policy.

```
A:SR2>config>vrrp>policy# info
-----
    delta-in-use-limit 50
    priority-event
      port-down 4/1/2
        hold-set 43200
        priority 100 delta
      exit
      port-down 4/1/3
        priority 200 explicit
      exit
      lag-port-down 1
        number-down 3
        priority 50 explicit
      exit
      host-unreachable 10.10.24.4
        drop-count 25
      exit
      route-unknown 10.10.0.0/32
        priority 50 delta
        protocol bgp
      exit
    exit
-----
```

VRRP IES Service Parameters

VRRP parameters are configured within an IES service with two contexts, owner or non-owner. The status is specified when the VRRP configuration is created. When configured as owner, the virtual router instance owns the backup IP addresses. All other virtual router instances participating in this message domain must have the same **vrid** configured and cannot be configured as owner.

For IPv4, up to 4 virtual routers IDs (vrid) can be configured on an IES service interface. Each virtual router instance can manage up to 16 backup IP addresses. For IPv6, only one virtual router instance can be configured on an IES service interface.

VRRP parameters configured within an IES service must include the following:

- VRID
- Backup IP address(es)

The following example displays a sample configuration of a IES service owner and non-owner VRRP configurations.

```
A:SR2>config>service>ies# info
-----
      interface "tuesday" create
        address 10.10.36.2/24
        sap 7/1/1.2.2 create
        vrrp 19 owner
          backup 10.10.36.2
          authentication-type password
          authentication-key "testabc"
        exit
      exit
      interface "testing" create
        address 10.10.10.16/24
        sap 1/1/55:0 create
        vrrp 12
          backup 10.10.10.15
          policy 1
          authentication-type password
          authentication-key "testabc"
        exit
      exit
      no shutdown
-----
A:SR2>config>service>ies#
```

Configure VRRP for IPv6

The following output shows a VRRP for IPV6 configuration example. The interface must be configured first.

```
*A:nlt7750-3>config>router>router-advert# info
-----
      interface "DSC-101-Application"
        use-virtual-mac
        no shutdown
      exit
...
-----
*A:nlt7750-3>config>router>router-advert#

*A:nlt7750-3>config>service>ies# info
-----
      description "VLAN 921 for DSC-101 Application"
      interface "DSC-101-Application" create
        address 10.152.2.220/28
        vrrp 217
          backup 10.152.2.222
          priority 254
          ping-reply
        exit
      ipv6
        address FD10:D68F:1:221::FFFD/64
        link-local-address FE80::D68F:1:221:FFFD preferred
        vrrp 219
          backup FE80::D68F:1:221:FFFF
          priority 254
          ping-reply
        exit
      exit
      sap ccag-1.a:921 create
        description "cross connect to VPLS 921"
      exit
    exit
    no shutdown
-----
*A:nlt7750-3>config>service>ies#
```

VRRP Router Interface Parameters

VRRP parameters are configured on a router interface with two contexts, owner or non-owner. The status is specified when the VRRP configuration is created. When configured as owner, the virtual router instance owns the backed up IP addresses. All other virtual router instances participating in this message domain must have the same `vrid` configured and cannot be configured as owner.

For IPv4, up to 4 virtual routers IDs (`vrid`) can be configured on a router interface. Each virtual router instance can manage up to 16 backup IP addresses. For IPv6, only one virtual router instance can be configured on a router interface.

VRRP parameters configured on a router interface must include the following:

- VRID
- Backup IP address(es)

The following example displays a sample configuration of a router interface owner and non-owner VRRP configurations.

```
A:SR4>config>router# info
#-----
echo "IP Configuration "
#-----
    interface "system"
        address 10.10.0.4/32
    exit
    interface "test1"
        address 10.10.14.1/24
        secondary 10.10.16.1/24
        secondary 10.10.17.1/24
        secondary 10.10.18.1/24
    exit
    interface "test2"
        address 10.10.10.23/24
        vrrp 1 owner
            backup 10.10.10.23
            authentication-type password
            authentication-key "testabc"
        exit
    exit
#-----
A:SR4>config>router#
```

Common Configuration Tasks

This section provides a brief overview of the tasks that must be performed to configure VRRP and provides the CLI commands.

VRRP parameters are defined under a service interface or a router interface context. An IP address must be assigned to each IP interface. Only one IP address can be associated with an IP interface but several secondary IP addresses also be associated.

Owner and non-owner configurations must include the following parameters:

- All participating routers in a VRRP instance must be configured with the same *vrid*.
- All participating *non-owner* routers can specify up to 16 backup IP addresses (IP addresses the master is representing). The *owner* configuration must include at least one backup IP address.
- For IPv6, all participating routers must be configured with the same link-local backup address (the one configured for the owner instance.)

Other owner and non-owner configurations include the following optional commands:

- `authentication-type`
- `authentication-key`
- `MAC`
- `message-interval`

In addition to the common parameters, the following *non-owner* commands can be configured:

- `master-int-inherit`
- `priority`
- `policy`
- `ping-reply`
- `preempt`
- `telnet-reply`
- `ssh-reply (IPv4 only)`
- `[no] shutdown`

Creating Interface Parameters

If you have multiple subnets configured on an Ethernet interface, you can configure VRRP on each subnet.

The following displays an IP interface configuration example:

```
A:SR1>config>router# info
#-----
echo "IP Configuration "
#-----
      interface "system"
          address 10.10.0.1/32
      exit
      interface "testA"
          address 123.123.123.123/24
      exit
      interface "testB"
          address 10.10.14.1/24
          secondary 10.10.16.1/24
          secondary 10.10.17.1/24
          secondary 10.10.18.1/24
      exit
      router-id 10.10.0.1
#-----
A:SR1>config>router#
```

Configuring VRRP Policy Components

The following displays a VRRP policy configuration example:

```
A:SR1>config>vrrp# info
-----
    policy 1
      delta-in-use-limit 50
      priority-event
      port-down 1/1/2
        hold-set 43200
        priority 100 delta
      exit
      route-unknown 0.0.0.0/0
        protocol isis
      exit
    exit
  exit
-----
A:SR1>config>vrrp#
```

Configuring Service VRRP Parameters

VRRP parameters can be configured on an interface in a service to provide virtual default router support which allows traffic to be routed without relying on a single router in case of failure. VRRP can be configured the following ways:

- [Non-Owner VRRP Example on page 316](#)
- [Owner Service VRRP on page 317](#)

Non-Owner VRRP Example

The following displays a basic non-owner VRRP configuration example:

```
A:SR2>config>service>ies# info
-----
...
        interface "testing" create
            address 10.10.10.16/24
            sap 1/1/55:0 create
            vrrp 12
                backup 10.10.10.15
                policy 1
                authentication-type password
                authentication-key "testabc"
            exit
        exit
    no shutdown
-----
A:SR2>config>service>ies#
```

Owner Service VRRP

The following displays the owner VRRP configuration example:

```
A:SR4>config>router# info
#-----
echo "IP Configuration "
#-----
...
    interface "test2"
        address 10.10.10.23/24
        vrrp 1 owner
            backup 10.10.10.23
            authentication-type password
            authentication-key "testabc"
        exit
    exit
#-----
A:SR4>config>router#
```

Configuring Router Interface VRRP Parameters

VRRP parameters can be configured on an interface in an interface to provide virtual default router support which allows traffic to be routed without relying on a single router in case of failure.

VRRP can be configured the following ways:

- [Router Interface VRRP Non-Owner on page 318](#)
-

Router Interface VRRP Non-Owner

The following displays a non-owner interface VRRP configuration example:

```
A:SR2>config># info
#-----
    interface "if-test"
      address 10.20.30.40/24
      secondary 10.10.50.1/24
      secondary 10.10.60.1/24
      secondary 10.10.70.1/24
      vrrp 1
        backup 10.10.50.2
        backup 10.10.60.2
        backup 10.10.70.2
        backup 10.20.30.41
        ping-reply
        telnet-reply
        authentication-type password
        authentication-key "testabc"
      exit
    exit
#-----
A:SR2>config>#
```

Router Interface VRRP Owner

The following displays router interface owner VRRP configuration example:

```
A:SR2>config>router# info
#-----
    interface "vrrpowner"
        address 10.10.10.23/24
        vrrp 1 owner
            backup 10.10.10.23
            authentication-type password
            authentication-key "testabc"
        exit
    exit
#-----
A:SR2>config>router#
```

VRRP Configuration Management Tasks

This section discusses the following VRRP configuration management tasks:

- [Modifying a VRRP Policy on page 320](#)
 - [Deleting a VRRP Policy on page 321](#)
 - [Modifying Service and Interface VRRP Parameters on page 322](#)
 - [Modifying Non-Owner Parameters on page 322](#)
 - [Modifying Owner Parameters on page 322](#)
 - [Deleting VRRP on an Interface or Service on page 322](#)
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Modifying a VRRP Policy

To access a specific VRRP policy, you must specify the policy ID. To display a list of VRRP policies, use the `show vrrp policy` command.

The following example displays the modified VRRP policy configuration:

```
A:SR2>config>vrrp>policy# info
-----
      delta-in-use-limit 50
      priority-event
        port-down 1/1/2
          hold-set 43200
          priority 100 delta
        exit
      port-down 1/1/3
        priority 200 explicit
      exit
      host-unreachable 10.10.24.4
        drop-count 25
      exit
    exit
-----
A:SR2>config>vrrp>policy#
```

Deleting a VRRP Policy

Policies are only applied to non-owner VRRP instances. A VRRP policy cannot be deleted if it is applied to an interface or to an IES service. Each instance in which the policy is applied must be deleted.

The `Applied` column in the following example displays whether or not the VRRP policies are applied to an entity.

```
A:SR2#
=====
VRRP Policies
=====
Policy      Current      Current      Current      Delta      Applied
Id          Priority & Effect  Explicit    Delta Sum   Limit
-----
1           200 Explicit    200         100         50         Yes
15          254          None         None         1           No
32          100          None         None         1           No
=====
A:SR2#
```

Modifying Service and Interface VRRP Parameters

Modifying Non-Owner Parameters

Once a VRRP instance is created as non-owner, it cannot be modified to the `owner` state. The `vrid` must be deleted and then recreated with the `owner` keyword to invoke IP address ownership.

Modifying Owner Parameters

Once a VRRP instance is created as `owner`, it cannot be modified to the non-owner state. The `vrid` must be deleted and then recreated *without* the `owner` keyword to remove IP address ownership.

Entering the `owner` keyword is optional when entering the `vrid` for modification purposes.

Deleting VRRP on an Interface or Service

The `vrid` does not need to be shutdown to remove the virtual router instance from an interface or service.

Example:

```
config>router#interface
config>router# interface if-test
config>router>if# shutdown
config>router>if# exit
config>router# no interface if-test
config>router#
```

The following example displays the command usage to delete a VRRP instance from an interface or IES service:

Example:

```
config>service#ies 10
config>service>ies# interface "test"
config>service>ies>if# vrrp 1
config>service>ies>if>vrrp# shutdown
config>service>ies>if>vrrp# exit
config>service>ies>if# no vrrp 1
config>service>ies>if# exit all
```