

# 1 Track Commands

Command	Function
<a href="#">delay</a>	Configure the delay for notifying the status change of a track object.
<a href="#">dhcp</a>	Create a reliable network service (RNS) test of Dynamic Host Configuration Protocol (DHCP) type.
<a href="#">dns</a>	Create an RNS test of DNS type.
<a href="#">frequency</a>	Configure a test interval.
<a href="#">icmp-echo</a>	Create an RNS test of ICMP echo type.
<a href="#">ip rns</a>	Define a track operation object.
<a href="#">ip rns reaction-configuration</a>	Configure the proactive threshold monitoring and triggering mechanism for a test.
<a href="#">ip rns reaction-trigger</a>	Trigger another test in pending state to activate when the monitoring threshold exceeds the expectation during a test.
<a href="#">ip rns reset</a>	Clear the configurations of all tests.
<a href="#">ip rns restart</a>	Restart a test.
<a href="#">ip rns schedule</a>	Configure the scheduling policy of a test.
<a href="#">ip rns-server udp-echo</a>	Configure the IP RNS server to provide server functions for the test of UDP echo type.
<a href="#">object</a>	Configure a member object for a track list object.
<a href="#">request-data-size</a>	Configure the protocol payload size of a test.
<a href="#">show ip rns-server</a>	Display the configuration information of an RNS server object.
<a href="#">show ip rns configuration</a>	Display the configuration information of a track object.
<a href="#">show ip rns collection-statistics</a>	Display the detailed statistics of a test.
<a href="#">show ip rns operational-state</a>	Display the current status of a test.
<a href="#">show ip rns reaction-configuration</a>	Display the proactive threshold monitoring information of a test.

<a href="#"><u>show ip rns reaction-trigger</u></a>	Display the test trigger information of a test.
<a href="#"><u>show ip rns statistics</u></a>	Display the brief statistics of a track object.
<a href="#"><u>show track</u></a>	Display the statistics of a track object.
<a href="#"><u>tag</u></a>	Configure a tag for an IP test.
<a href="#"><u>tcp-connect</u></a>	Configure a TCP test.
<a href="#"><u>threshold</u></a>	Configure the upper threshold of a test.
<a href="#"><u>timeout</u></a>	Configure the timeout interval of a test.
<a href="#"><u>tos</u></a>	Configure the type of service (TOS) field in the IPv4 packet of a test.
<a href="#"><u>track interface line-protocol</u></a>	Configure a track object, which is used to track the link status of an interface.
<a href="#"><u>track list</u></a>	Configure a track object for tracking the status of a track list.
<a href="#"><u>track rns</u></a>	Configure a track object, which is used to track the test result of a track instance.
<a href="#"><u>track rns-list</u></a>	Configure a track object, which is used to track the test result of an rns-list instance.
<a href="#"><u>udp-echo</u></a>	Configure a test object of UDP echo type.
<a href="#"><u>vrf</u></a>	Configure the VRF of a test.

## 1.1 delay

### Function

Run the **delay** command to configure the delay for notifying the status change of a track object.

Run the **no** form of this command to restore the default configuration.

No delay is set by default for notifying the track object status change from up to down or from down to up.

### Syntax

```
delay { up interval [ down interval ] | down interval [ up interval ] }
```

```
no delay
```

### Parameter Description

**up** *interval*: Specifies the delay for notifying the status change of a track object from down to up, in seconds. The value range is from 0 to 180.

**down** *interval*: Specifies the delay for notifying the status change of a track object from up to down, in seconds. The value range is from 0 to 180.

### Command Modes

Track configuration mode

### Default Level

1

### Usage Guidelines

When the status of a track object frequently changes, the status of the client that uses the track object will frequently change as well.

Run this command to delay the notification of the status change of a track object. For example, if the status of a track object changes from up to down, and the **delay down** command is configured, the down status of the track object is notified 10s later. If the status of the track object changes to up again within this period of time, no notification is sent. Therefore, the status of the track object is always up on the client that uses this track object.

### Examples

The following example configures track object 5 for tracking track instance 10. When the status of the track object changes from down to up, the notification is delayed for 30 seconds.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# track 5 rns 10
Hostname(config-track)# delay up 30
```

### Notifications

When no track object is configured, the following notification will be displayed:

```
set delay error.
```

## Common Errors

N/A

## Platform Description

N/A

## Related Commands

N/A

# 1.2 dhcp

## Function

Run the **dhcp** command to create a reliable network service (RNS) test of Dynamic Host Configuration Protocol (DHCP) type.

No RNS test of DHCP type is created by default.

## Syntax

```
dhcp destination-ipv4-address out-interface interface-type interface-number next-hop next-ipv4-address
```

## Parameter Description

*destination-ipv4-address*: Destination host IP address for testing.

**out-interface** *interface-type interface-number*: Specifies the outbound interface for test packets.

**next-hop** *next-ipv4-address*: Specifies the next hop IP address for test packets.

## Command Modes

IP RNS configuration mode

## Default Level

1

## Usage Guidelines

The RNS test of DHCP type supports the IPv4 network only.

After an RNS test of DHCP type is started, the system sends a DHCP packet to test whether the network of the target host is connected, and whether the destination host has the function of DHCP service. After an RNS test of DHCP type is created, the system enters the IP RNS DHCP mode.

You need to configure the test type, such as Internet Control Message Protocol (ICMP) echo or domain name server (DNS), before configuring its specific parameters. To modify the type of a test instance, delete the instance by running the **no ip rns** command in global configuration mode.

## Examples

The following example creates test instance 1 of DHCP type. The instance requests the DHCP service of 172.30.30.3 through the GigabitEthernet 0/1 interface and the next hop address 172.30.31.1.

```
Hostname> enable
Hostname# configure terminal
```

```

Hostname(config)# ip rns 1
Hostname(config-ip-rns)# dhcp 172.30.30.3 out-interface GigabitEthernet 0/1 next-
hop 172.30.31.1
Hostname(config-ip-rns-dhcp)#

```

### Notifications

When you want to create a test of DHCP type, if the memory allocation fails, the configuration fails and the following notification will be displayed:

```
rns object rns-dhcp create fail
```

### Common Errors

- When a test of DHCP type is created, the DHCP service is not enabled on the server.
- When a test of DHCP type is created, no IP address is configured for the outbound interface of the client.

### Platform Description

N/A

### Related Commands

N/A

## 1.3 dns

### Function

Run the **dns** command to create an RNS test of DNS type.

No RNS test of DNS type is created by default.

### Syntax

```

dns { oob destination-hostname name-server ipv4-address [ source-ipaddr ipv4-address ] via interface-type
interface-number next-hop ipv4-address } | { destination-hostname name-server ipv4-address [ source-
ipaddr ipv4-address ] [

```

```

[ af-direct ] out-interface interface-type interface-number [ next-hop ipv4-address ] ] }

```

```

dns destination-hostname name-server ipv4-address [ source-ipaddr ipv4-address ] [ [ af-direct ] out-
interface interface-type interface-number [ next-hop ipv4-address ] ]

```

### Parameter Description

**oob**: Indicates the test on the MGMT port.

*destination-hostname*: Destination host name. The maximum length is 127 characters, and the excess part is truncated automatically.

**name-server** *ipv4-address*: Indicates the IP address of the DNS server.

**source-ipaddr** *ipv4-address*: Indicates the source IP address.

**out-interface** *interface-type* *interface-number*: Specifies the outbound interface (not the MGMT port) for test packets.

**af-direct**: Indicates that packets are received and sent without passing through the protocol stack in the test.

**via** *interface-type interface-number*: Specifies the MGMT port as the egress interface for the test packets.

**next-hop** *ipv4-address*: Indicates the next hop IP address when the outbound interface is specified.

### Command Modes

IP RNS configuration mode

### Default Level

1

### Usage Guidelines

The RNS test of DNS type supports the IPv4 network only.

After an RNS test of DNS type is started, the system sends a DNS parsing request packet to test whether the device is connected to the target host. After an RNS test of DNS type is created, the system enters the IP RNS DNS mode.

You need to configure the test type, such as Internet Control Message Protocol (ICMP) echo or domain name server (DNS), before configuring its specific parameters. To modify the type of a test instance, delete the instance by running the **no ip rns** command in global configuration mode.

### Examples

The following example creates test instance 1 of DNS type. The DNS server address configured for this instance is 61.154.22.41, and the IP address of the domain name www.abc.com is requested.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip rns 1
Hostname(config-ip-rns)# dns www.abc.com name-server 61.154.22.41
Hostname(config-ip-rns-dns)#
```

### Notifications

When you want to create a test of DNS type, if the memory allocation fails, the configuration fails and the following notification will be displayed:

```
rns object dns create fail
```

### Common Errors

- When you want to create a test of DNS type, the memory allocation fails.
- When you want to create a test of DNS type, the maximum length of the destination host name consists of 127 characters, and the excess part is truncated automatically.

### Platform Description

N/A

### Related Commands

N/A

## 1.4 frequency

### Function

Run the **frequency** command to configure a test interval.

Run the **no** form of this command to remove this configuration.

The default test interval is **60** seconds.

### Syntax

**frequency** *interval*

**no frequency**

### Parameter Description

*interval*: Packet transmission interval, in milliseconds. The value range is from 10 to 604800000. The maximum duration is 1 week.

### Command Modes

IP RNS DNS configuration mode

IP RNS ICMP-Echo configuration mode

IP RNS TCP configuration mode

IP RNS UDP-Echo configuration mode

### Default Level

1

### Usage Guidelines

In the lifetime of a test, the test is conducted periodically. Run the **frequency** command to specify the test interval. The configuration must comply with the following formula to ensure correct test calculation.

$(\text{frequency } interval) > (\text{timeout } interval) \geq (\text{threshold } interval)$

### Examples

The following example configures test instance 1 of ICMP echo type, and sets the test destination IP address of this instance to 192.168.21.1, the test frequency to 30 seconds, the timeout to 8000 milliseconds, and the threshold to 6000 milliseconds.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip rns 1
Hostname(config-ip-rns)# icmp-echo 192.168.21.1
Hostname(config-ip-rns-icmp-echo)# frequency 30000
Hostname(config-ip-rns-icmp-echo)# timeout 8000
Hostname(config-ip-rns-icmp-echo)# threshold 6000
```

### Notifications

When you configure a test repeat interval shorter than the timeout interval, the configuration fails and the following notification will be displayed:

```
Illegal Value: Cannot set Frequency to be less than Timeout
```

### Common Errors

- The configured test repeat interval is shorter than the timeout interval.

### Platform Description

N/A

### Related Commands

N/A

## 1.5 icmp-echo

### Function

Run the **icmp-echo** command to create an RNS test of ICMP echo type.

No RNS test of ICMP echo type is created by default.

### Syntax

```
icmp-echo { oob { destination-ipv4-address | destination-hostname [ name-server ipv4-address ] } [ source-ipaddr ipv4-address ] via interface-type interface-number next-hop ipv4-address } | { { destination-ipv4-address | destination-hostname [ name-server ipv4-address ] } [ source-ipaddr ipv4-address | source-interface interface-type interface-number ] [ [ af-direct ] out-interface interface-type interface-number [ next-hop ipv4-address ] ] }
```

```
icmp-echo { destination-ipv4-address | destination-hostname [ name-server ipv4-address ] } [ source-ipaddr ipv4-address | source-interface interface-type interface-number ] [ [ af-direct ] out-interface interface-type interface-number [ next-hop ipv4-address ] ]
```

### Parameter Description

**oob**: Indicates the test on the MGMT port.

*destination-ipv4-address*: Destination IPv4 address.

*Destination-hostname*: Destination host name. The maximum length is 127 characters, and the excess part is truncated automatically.

**name-server** *ipv4-address*: Specifies the DNS server when the destination host name is configured. By default, the DNS server configured by running the **ip name-server** command is used for address resolution.

**source-ipaddr** *ipv4-address*: Indicates the source IPv4 address.

**source-interface** *interface-type* *interface-number*: Specifies the source interface type and number.

**out-interface** *interface-type* *interface-number*: Specifies the outbound interface (not the MGMT port) for test packets.

**af-direct**: Indicates that packets are received and sent without passing through the protocol stack in the test.

**via** *interface-type* *interface-number*: Specifies the MGMT port as the egress interface for the test packets.

**next-hop** *ipv4-address*: Indicates the next hop IPv4 address when the outbound interface is specified.



## Command Modes

IP RNS configuration mode

## Default Level

1

## Usage Guidelines

After an ICMP echo test is started, the system sends an ICMP echo request packet to test whether the device is connected to the target host. After an ICMP echo test instance is created, the system enters the IP RNS ICMP echo mode. The default protocol payload size of an ICMP echo request packet is **36** bytes. Run the **request-data-size** command to change the packet size. You need to configure the test type, such as Internet Control Message Protocol (ICMP) echo or domain name server (DNS), before configuring its specific parameters. To modify the type of a test instance, delete the instance by running the **no ip rns** command in global configuration mode.

You are not advised to use the **name-server** parameter, but use **ip name-server** to configure a DNS.

## Examples

The following example configures IP test instance 1 of ICMP echo type, and sets the destination IP address of this instance to 10.1.1.1.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip rns 1
Hostname(config-ip-rns)# icmp-echo 10.1.1.1
Hostname(config-ip-rns-icmp-echo)#
```

## Notifications

When you want to create a test of ICMP echo type, if the memory allocation fails, the configuration fails and the following notification will be displayed:

```
rns object icmp-echo create fail.
```

## Common Errors

N/A

## Platform Description

N/A

## Related Commands

No test

# 1.6 ip rns

## Function

Run the **ip rns** command to define a track operation object.

Run the **no** form of this command to remove this configuration.

No track operation object is created by default.

## Syntax

```
ip rns operation-number [ { dns destination-hostname name-server ipv4-address | icmp-echo destination-
ipv4-address | tcp-connect destination-ipv4-address port-number } [ frequency interval ] [ timeout interval ] [
threshold interval ] ]
no ip rns operation-number
```

## Parameter Description

*operation-number*: Track operation number. The value range is from 1 to 500.

**dns destination-hostname name-server ipv4-address**: Briefly configures a DNS test.

*destination-hostname*: Destination host name. The maximum length is 127 characters, and the excess part is truncated automatically.

**name-server ipv4-address**: Indicates the IPv4 address of the DNS server.

**icmp-echo destination-ipv4-address**: Briefly configures an ICMP echo test.

*destination-ipv4-address*: Destination IPv4 address.

**tcp-connect destination-ipv4-address port-number**: Briefly configures a Transmission Control Protocol (TCP) connect test.

*destination-ipv4-address*: Destination IPv4 address.

*port-number*: TCP port to be tested.

**frequency interval**: Indicates the test repeat interval.

**timeout interval**: Configures the timeout interval of an IP test.

**threshold interval**: Configures the upper threshold of an IP test.

## Command Modes

Global configuration mode

## Default Level

1

## Usage Guidelines

Currently, only IPv4-related tests are supported, but IPv6-related tests are not supported. At most 500 tests can be configured, depending on the performance of devices. The test function is only a value-added function. When a large number of tests are configured and consume a lot of system resources, the test function may be temporary disabled to ensure normal operation of core services, such as route forwarding.

Detailed configuration (executing mandatory items of **ip rns operation-number**): Run this command and enter the IP RNS mode. In this mode, you can define various test types. If the test type is not configured, the track object is not created. After configuring a test, you must run the **ip rns operation-number** command to configure its scheduling startup policy; otherwise, the test cannot be conducted.

After configuring the type of a test, you can run the **ip rns** command to enter the configuration mode of the corresponding test type. To modify the type of a test, you must first delete the test by running the **no ip rns** command in global configuration mode.

Brief configuration (executing the subsequent optional test items of **ip rns**): After optional items are executed, it is equivalent that **ip rns operation-number**, **ip rns schedule**, detailed test configuration (such as the ICMP

echo test), **frequency**, **timeout**, and **threshold** are executed according to the logical sequence. Among these commands, the **ip rns schedule** command is executed to start a test by using the *start-time now life forever* parameter. For details about restrictions of other configuration items, see the related description in the detailed configuration.

Similarly, to modify a briefly configured test, you need to first delete this test by running the **no ip rns** command in global configuration mode before re-configuration.

## Examples

The following example defines test instance 1.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip rns 1
Hostname(config-ip-rns)#
```

The following example defines test instance 1 of ICMP echo type, and sets the test destination IP address of this instance to 10.1.1.1, the threshold to 10 seconds, the timeout interval to 20 seconds, and the test frequency to 30 seconds.

```
Hostname(config)# ip rns 1 icmp-echo 10.1.1.1 threshold 10000 timeout 20000
frequency 30000
```

## Notifications

When you define a track operation object, if the operation object ID is already configured and the object is running, you will enter the IP RNS mode and the following notification will be displayed:

```
Entry already running and cannot be modified
(only can delete (no) and start over)
(check to see if the probe has finished exiting)
```

## Common Errors

- When you run the **ip rns** command, if the corresponding test is already configured and is running, you cannot enter the mode corresponding to the test type. To modify the test configuration, you must first delete the scheduling configuration by running the **no ip rns schedule** command.

## Platform Description

N/A

## Related Commands

- [frequency](#)
- [threshold](#)
- [timeout](#)

# 1.7 ip rns reaction-configuration

## Function

Run the **ip rns reaction-configuration** command to configure the proactive threshold monitoring and triggering mechanism for a test.

Run the **no** form of this command to remove this configuration.

The proactive threshold monitoring and triggering mechanism is not configured for the test by default.

### Syntax

```
ip rns reaction-configuration operation-number react { allfail | rtt | timeout } [ action-type track ] [
threshold-type { average [ number-of-measurements ] | consecutive [ occurrences ] | immediate | never |
xofy [ x-value y-value ] } ] [ threshold-value max-threshold min-threshold ]
no ip rns reaction-configuration operation-number [ react monitored-element ]
```

### Parameter Description

*operation-number*: Track operation number. The value range is from 1 to 500.

**react { allfail | rtt | timeout }**: Specifies the monitored test information element (*monitored-element*). **allfail** indicates that monitoring all elements fails, and only correlation with track is supported. **rtt** indicates that the packet round trip time is not within the threshold range. **timeout** indicates timeout in either direction.

**action-type { track | trigger }**: Indicates the action taken after the test is triggered. Only correlation with trigger or track is supported. Correlation with the track action is allowed only when the monitored test information element is **allfail**. This parameter is not configured by default, namely, no action is taken.

**average [ number-of-measurements ]**: Indicates that the test is triggered if the average of number-of-measurements of the monitored element exceeds the threshold. For example, set the value of number-of-measurements to 3, upper threshold to 5000, and lower threshold to 4000. If the values of three consecutive tests are 6000, 6000, and 5000 respectively, their average is  $(6000 + 6000 + 5000)/3 = 5667$ , exceeding the upper threshold 5000. The value range of number-of-measures is from 1 to 16, and the default value is **5**.

**consecutive [ occurrences ]**: Indicates that the action is triggered if the number of consecutive occurrences of the monitored element exceeds the threshold. The value range of occurrences is from 1 to 16. The default value is **5**.

**immediate**: Indicates that the action is triggered immediately after the monitored element exceeds the threshold.

**never**: Indicates that the action is never triggered.

**xofy [ x-value y-value ]**: Indicates that results of X tests exceed the threshold in the last Y tests. The value ranges of both X and Y are from 1 to 16. The default values of X and Y are both **5**.

**threshold-value max-threshold min-threshold**: Indicates the upper and lower thresholds. When the monitored test information element is **rtt**, the thresholds indicate time, in milliseconds, and the value range is from 0 to 60000. For default values, see *Usage Guidelines*. When the monitored test information element is **timeout**, the **threshold-value** parameter does not need to be configured.

### Command Modes

Global configuration mode

### Default Level

1

### Usage Guidelines

You can configure multiple thresholds for one test to monitor different elements. The following table lists the mappings between test types and monitored elements.

**Table 1-1 Mapping Table of Test Types and Monitored Elements**

monitored-element	icmp-echo	dns	tcp-connect	udp-echo
timeout	✓	✓	✓	✓
rtt	✓	✓	✓	✓

The following table lists the default thresholds of each monitored element.

**Table 1-2 Mapping Table of Monitored Elements and Default Thresholds**

monitored element	Upper Threshold	Lower Threshold
timeout	-	-
rtt	5000 ms	0 ms

**Examples**

The following example configures to trigger the action when the monitored element of test instance 1 times out in any direction and the timeout exceeds the threshold range, and supports correlation with trigger only.

```

Hostname> enable
Hostname# configure terminal
Hostname(config)# ip rns reaction-configuration 1 react timeout threshold-type
immediate action-type trigger
    
```

**Notifications**

When you configure the proactive threshold for the test of a track instance, if creation of a react variable memory fails, the configuration will fail and the following notification will be displayed:

```
rns react malloc fail
```

When the configured information type of monitored test element is not supported, the configuration will fail and the following notification will be displayed:

```
rns entry %d detect not support this react_type %s [reacttype name]
```

**Common Errors**

- The configured information type of the monitored test element is not supported.

**Platform Description**

N/A

**Related Commands**

N/A

## 1.8 ip rns reaction-trigger

### Function

Run the **ip rns reaction-trigger** command to trigger another test in pending state to activate when the monitoring threshold exceeds the expectation during a test.

Run the **no** form of this command to remove this configuration.

The trigger mechanism when the monitoring threshold exceeds the expectation is not configured for the test by default.

### Syntax

```
ip rns reaction-trigger source-operation-number target-operation-number
```

```
no ip rns reaction-trigger source-operation-number target-operation-number
```

### Parameter Description

*source-operation-number*: Number of the source operation triggering the action. The value range is from 1 to 500.

*target-operation-number*: Number of the triggered target operation. The value range is from 1 to 500.

### Command Modes

Global configuration mode

### Default Level

1

### Usage Guidelines

The trigger function is generally used in network fault diagnosis scenario. In a common scenario, you do not need to configure the trigger function.

### Examples

The following example triggers to activate track instance 2 in pending state when the monitoring threshold of test instance 1 exceeds the expectation.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip rns reaction-trigger 1 2
```

### Notifications

When you configure a test trigger object, if the memory allocation for the trigger object fails, the configuration will fail and the following notification will be displayed:

```
rns trigger malloc fail
```

### Common Errors

N/A

### Platform Description

N/A

## Related Commands

N/A

## 1.9 ip rns reset

### Function

Run the **ip rns reset** command to clear the configurations of all tests.

### Syntax

```
ip rns reset
```

### Parameter Description

N/A

### Command Modes

Global configuration mode

### Default Level

1

### Usage Guidelines

Run this command to clear all the track configurations. This command is used only in extreme cases, for example, when a lot of track tests are configured but the configurations are found incorrect.

### Examples

The following example clears all the test configurations.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip rns reset
```

### Notifications

The following notification will be displayed when you run **ip rns reset** to clear all the track configurations, and you need to confirm the operation. The default value is **no**.

```
WARNING: rns reset will remove all rns configurations, continue? (y/n) [no]
```

If a track instance is being tested, you will be prompted to confirm the deletion. The default value is **no**.

```
rns 1 schedule is running, confirm to delete?(y/n) [no]
```

### Common Errors

N/A

### Platform Description

N/A

### Related Commands

N/A

## 1.10 ip rns restart

### Function

Run the **ip rns restart** command to restart a test.

### Syntax

```
ip rns restart operation-number
```

### Parameter Description

*operation-number*: Track operation number. The value range is from 1 to 500.

### Command Modes

Global configuration mode

### Default Level

1

### Usage Guidelines

This command restarts an ip rns test for which the scheduling policy is configured and is in pending state of scheduling. This command is invalid for a test for which the scheduling policy is not configured.

### Examples

The following example restarts test instance 1.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip rns restart 1
```

### Notifications

If the specified test is not configured, the test will fail to restart and the following notification will be displayed:

```
rns operate has not define
```

If the specified test is not configured with rns schedule, the test will fail to restart and the following notification will be displayed:

```
% rns 2 schedule is not configured.
```

If the specified test is running, the test will fail to restart and the following notification will be displayed:

```
rns 1 schedule is active state.
```

### Common Errors

- The specified test is not configured.
- The rns schedule configuration is not configured.
- The specified test is running.

### Platform Description

N/A



## Related Commands

N/A

## 1.11 ip rns schedule

### Function

Run the **ip rns schedule** command to configure the scheduling policy of a test.

Run the **no** form of this command to remove this configuration.

No scheduling policy is configured for the test by default.

### Syntax

```
ip rns schedule operation-number [ life { forever | period } ] [ start-time { hh:mm [ :ss ] [ month day | day month ] | pending | now | after hh:mm:ss } ] [ recurring ]
```

```
no ip rns schedule operation-number
```

### Parameter Description

*operation-number*: Track operation number. The value range is from 1 to 500.

**life forever**: Indicates that the life of RNS operation is always valid.

**life period**: Indicates the life period of the ip rns test. That is, after the test starts at the configured start-time, the test stops in the time set for *period*.

*hh:mm* [ *:ss* ]: Accurate operation start time, in a 24-hour system.

*month*: Month in which the operation starts. The default value is the current month. The format is the English abbreviation or full name of January to December.

*day*: Date on which the operation starts. The default value is the current day. The value range is from 1 to 31.

**pending**: Indicates that the start time of the operation is not defined, and the default value is used.

**now**: Indicates that the operation start time is now and the operation will start immediately.

**after** *hh:mm:ss*: Indicates that the operation starts after a delay of *hh:mm:ss*.

**recurring**: Indicates that the operation starts at the same time every day.

### Command Modes

Global configuration mode

### Default Level

1

### Usage Guidelines

If a test of scheduling policy has been configured by running the **ip rns schedule** command and the test has started, the test parameters cannot be modified. To modify the configuration, you need to first run the **no ip rns schedule** command to delete the scheduling configuration.

### Examples

The following example configures to start test instance 1 immediately and makes it permanently valid.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip rns schedule 1 start-time now life forever
```

The following example makes the test unmodifiable after a scheduling policy is configured. The test can be modified after the scheduling policy is deleted.

```
Hostname(config)# ip rns 1
Entry already running and cannot be modified
    (only can delete (no) and start over)
    (check to see if the probe has finished exiting)
Hostname(config)# no ip rns schedule 1
Hostname(config)# ip rns 1
Hostname(config-ip-rns-icmp-echo)# exit
```

### Notifications

When you configure the scheduling policy of a test, if memory allocation fails, configuration of the scheduling policy will fail and the following notification will be displayed:

```
ip rns malloc rns schedule fail
```

When the schedule object is already configured and being tested, the configuration will fail and the following notification will be displayed:

```
Cannot modify schedule. Operation may have started.
```

### Common Errors

- The **ip rns schedule** object is already configured and running.

### Platform Description

N/A

### Related Commands

N/A

## 1.12 ip rns-server udp-echo

### Function

Run the **ip rns-server udp-echo** command to configure the IP RNS server to provide server functions for the test of UDP echo type.

Run the **no** form of this command to remove this configuration.

The server for UDP echo test is not configured by default.

### Syntax

```
ip rns-server udp-echo port-number
```

```
no ip rns-server udp-echo
```

### Parameter Description

**udp-echo:** Configures the server for the UDP echo test.

*port-number*: Number of the port monitored by the UDP service on the RNS server. The value range is from 1025 to 65535.

### Command Modes

Global configuration mode

### Default Level

1

### Usage Guidelines

If the RNS type is UDP echo, the RNS server must be enabled on the peer end to process the test packet.

### Examples

The following example configures the IP RNS server to provide server functions for the UDP echo test, and configures the port for UDP service monitoring as 1025.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip rns-server udp-echo 1025
```

### Notifications

N/A

### Common Errors

N/A

### Platform Description

N/A

### Related Commands

N/A

## 1.13 object

### Function

Run the **object** command to configure a member object for a track list object.

Run the **no** form of this command to delete a track member.

No member object is configured by default.

### Syntax

```
object object-number [ not ]
```

```
no object object-number
```

### Parameter Description

*object-number*: Number of a track object. The value range is from 1 to 700.

## Command Modes

Track configuration mode

## Default Level

1

## Usage Guidelines

Run this command to configure a member object for a track list. The number of track list members that can be configured is restricted by the capacity of track objects only.

If the status of the track object is consistent with that of the member object, only when the member object is in the up status, can the track object be in the up status.

If the status of the track object is contrary to that of the member object, only when the member object is in the down status, can the track object be in the up status.

Configure this command only when the track object is in the track mode of list.

A track object cannot track itself.

Track objects cannot track each other. For example, if Track A tracks Track B, Track B cannot track Track A in reverse. Otherwise, the statuses of Track A and Track B may change frequently.

## Examples

The following example configures track object 4. When the status of track object 1 is up, the status of track object 2 is down, and the status of track object 3 is up, track object 4 is up.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# track 4 list boolean and
Hostname(config-track)# object 1
Hostname(config-track)# object 2 not
Hostname(config-track)# object 3
```

## Notifications

When no track object is configured or the configuration fails, the following notification will be displayed if you configure this **object** command:

```
set object error.
```

If a configured member object is the track object itself, the configuration will fail and you will be prompted that the track object cannot track itself.

```
track can not track itself.
```

If the configured member object has tracked this track object, the configuration will fail and the following notification will be displayed:

```
object xx is already tracking track yy.
```

## Common Errors

N/A

## Platform Description

N/A

## Related Commands

N/A

# 1.14 request-data-size

## Function

Run the **request-data-size** command to configure the protocol payload size of a test.

Run the **no** form of this command to restore the default configuration.

The default protocol payload sizes of both the ICMP echo test and UDP echo test are **36**.

## Syntax

**request-data-size** *bytes*

**no request-data-size**

## Parameter Description

*bytes*: Number of bytes in the payload of the test packet. The minimum/maximum bytes are different for respective tests. The value range of the ICMP echo test and the UDP echo test is from 36 to 1472.

## Command Modes

IP RNS ICMP Echo configuration mode

IP RNS UDP Echo configuration mode

## Default Level

1

## Usage Guidelines

This command is used to stuff some bytes in the test packet so that large packets can be used for the test.

## Examples

The following example configures test instance 1 of ICMP echo type, and sets the test destination address to 10.1.1.1 and the protocol load size to 50.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip rns 1
Hostname(config-ip-rns)# icmp-echo 10.1.1.1
Hostname(config-ip-rns-icmp-echo)# request-data-size 50
```

## Notifications

N/A

## Common Errors

N/A

**Platform Description**

N/A

**Related Commands**

N/A

**1.15 show ip rns-server****Function**

Run the **show ip rns-server** command to display the configuration information of an RNS server object.

**Syntax**

```
show ip rns-sever udp-echo
```

**Parameter Description**

N/A

**Command Modes**

All modes except the user EXEC mode

**Default Level**

1

**Usage Guidelines**

Run this command to display the configuration information of an RNS server object. The configuration information varies with packet types.

**Examples**

The following example displays the configuration information of ip rns-server udp.

```

Hostname> enable
Hostname# show ip rns-server udp-echo
  UDP-Echo-Server: 0.0.0.0:1026
  Receive packets number: 0
  Reflect packets success number: 0
  Reflect packets fail number: 0

```

**Table 1-1 Output Fields of the show ip rns-server udp-echo Command**

Field	Description
UDP-Echo-Server	Server address of the UDP echo test, including the server IP address and port information
Receive packets number	Number of received packets
Reflect packets success number	Number of response packets that are sent successfully

Field	Description
Reflect packets fail number	Number of response packets that cannot be sent

### Notifications

N/A

### Platform Description

N/A

### Related Commands

N/A

## 1.16 show ip rns configuration

### Function

Run the **show ip rns configuration** command to display the configuration information of a track object.

### Syntax

```
show ip rns configuration [ operation-number ]
```

### Parameter Description

*operation-number*: Track operation number. The value range is from 1 to 500. If this parameter is not specified, all the tests are displayed.

### Command Modes

All modes except the user EXEC mode

### Default Level

1

### Usage Guidelines

Run this command to display the configuration information of a test. The configuration information varies with packet types.

### Examples

The following example displays the configuration information of ip rns 1.

```
Hostname> enable
Hostname# show ip rns configuration 1
Entry number: 1
Tag: Hostname555
Type of operation to perform: icmp-echo
Operation timeout (milliseconds): 5000
Operation frequency (milliseconds): 10000
Threshold (milliseconds): 5000
```

```

Recurring (Starting Everyday): FALSE
Life (seconds): 3500
Next Scheduled Start Time:Start Time already passed
Target address/Source address: 2.2.2.3/0.0.0.0
Request size (ARR data portion): 36

```

**Table 1-1** Output Fields of the show ip rns configuration Command

Field	Description
Entry number	Track operation index
Tag	Instance tag
Type of operation to perform	Test type
Operation timeout (milliseconds)	Timeout duration
Operation frequency (milliseconds)	Test repeat interval
Threshold (milliseconds)	Threshold
Recurring (Starting Everyday)	Whether to start repeatedly
Life (seconds)	Time to live
Next Scheduled Start Time	Start time of the next test scheduling
Target address/Source address	Destination/source address
Request size (ARR data portion)	Size of the request packet data

**Notifications**

When the IP track instance is not configured, the following notification will be displayed:

```
rns operate has not define
```

**Platform Description**

N/A

**Related Commands**

N/A

**1.17 show ip rns collection-statistics****Function**

Run the **show ip rns collection-statistics** command to display the detailed statistics of a test.

**Syntax**

```
show ip rns collection-statistics [ operation-number ]
```



## Parameter Description

*operation-number*: Track operation number. The value range is from 1 to 500. If this parameter is not specified, all the RNS operation objects are displayed.

## Command Modes

All modes except the user EXEC mode

## Default Level

1

## Usage Guidelines

Run this command to display the result statistics of a test.

## Examples

The following example displays the result statistics of all the tests (the ICMP echo test type is taken as an example).

```

Hostname> enable
Hostname# show ip rns collection-statistics 1
Entry number: 1
Start Time Index: *2014-03-20 19:53:51
Last receive time Index: *2020-11-08 06:13:42
Number of successful operations: 919
Number of operations over threshold: 0
Number of failed operations due to a Disconnect: 0
Number of failed operations due to a Timeout: 2
Number of failed operations due to a Busy: 0
Number of failed operations due to a No Connection: 0
Number of failed operations due to an Internal Error: 2
Number of failed operations due to a Sequence Error: 0
Number of failed operations due to a Verify Error: 0
Last packet sent sequence: 5

RTT Values:
RTTAvg: 18          RTTMin: 16          RTTMax: 37
NumOfRTT: 919      RTTSum: 16654        RTTSum2: 302786
jitter of operations: 0.000000
Lost packet ratio :0.0000%
```

**Table 1-1** Output Fields of the show ip rns collection-statistics Command

Field	Description
Entry number	Track operation index
Start Time Index	Actual test start time (scheduling start time)
Number of successful operations:	Number of successful tests

Field	Description
Number of operations over threshold:	Number of operations over the configured threshold
Number of failed operations due to a Disconnect:	Number of disconnections
Number of failed operations due to a Timeout:	Number of failed operations due to timeout
Number of failed operations due to a Busy:	Number of failed operations because the peer is busy after a packet is sent to the test destination address
Number of failed operations due to a No Connection:	Number of failed operations due to a connection failure
Number of failed operations due to an Internal Error:	Number of failed operations due to an internal error
Number of failed operations due to a Sequence Error:	Number of failed operations due to a sequence error
Number of failed operations due to a Verify Error:	Number of failed operations due to a verification error
RTT Values	Round trip time (RTT) value
RTTAvg:	RTT average of the test
RTTMin:	RTT minimum value of the test
RTTMax:	RTT maximum value of the test
NumOfRTT:	Number of times of counting RTT
RTTSum:	RTT sum of the test
RTTSum2:	RTT square sum of the test
jitter of operations:	Jitter value during the test
Lost packet ratio	Packet loss rate, with four decimal places reserved

### Notifications

When the IP track instance is not configured, the following notification will be displayed:

```
rns operate has not define
```

### Platform Description

N/A

**Related Commands**

N/A

**1.18 show ip rns operational-state****Function**

Run the **show ip rns operational-state** command to display the current status of a test.

**Syntax**

```
show ip rns operational-state [ operation-number ]
```

**Parameter Description**

*operation-number*: Track operation number. The value range is from 1 to 500. If this parameter is not specified, all the tests are displayed.

**Command Modes**

All modes except the user EXEC mode

**Default Level**

1

**Usage Guidelines**

Run this command to display the current status of a test.

**Examples**

The following example displays the current status information of all the tests.

```

Hostname> enable
Hostname# show ip rns operational-state
Entry number: 1
Modification time: *2014-01-10 10:26:14
Current seconds left in Life: Forever
Operational state of entry: Active
Number of Octets Used by this Entry: 2272
Number of operations attempted: 232
Number of operations skipped: 0
Connection loss occurred: FALSE
Timeout occurred: FALSE
Over thresholds occurred: FALSE
Latest RTT (milliseconds): 4
Latest operation start time: 2014-01-10 10:26:55
Latest operation return code: OK

```

**Table 1-1 Output Fields of the show ip rns operational-state Command**

Field	Description
Entry number	Track operation index

Field	Description
Modification time	Re-counting time of test results (the results are re-counted after one scheduling starts)
Number of Octets Used by this Entry	Total number of packet bytes sent by the instance
Number of operations attempted	Total number of operations attempted
Number of operations skipped	Total number of operations skipped
Current seconds left in Life	Remaining life of the test
Operational state of entry	Current status (Active or Disactive) of the test
Connection loss occurred	Whether disconnection occurred during the test
Timeout occurred	Whether timeout occurred
Over thresholds occurred	Whether the test result exceeds the threshold
Latest RTT (milliseconds)	RTT of the latest test
Latest operation start time	Latest operation start time
Latest operation return code	Latest operation return code

### Notifications

When the IP track instance is not configured, the following notification will be displayed:

```
rns operate has not define
```

### Platform Description

N/A

## 1.19 show ip rns reaction-configuration

### Function

Run the **show ip rns reaction-configuration** command to display the proactive threshold monitoring information of a test.

### Syntax

```
show ip rns reaction-configuration [ operation-number ]
```

### Parameter Description

*operation-number*: Number of an IP RNS operation object. The value range is from 1 to 500. If this parameter is not specified, all the RNS operation objects are displayed.

## Command Modes

All modes except the user EXEC mode

## Default Level

1

## Usage Guidelines

Run this command to display the proactive threshold monitoring information of a test.

## Examples

The following example displays the proactive threshold monitoring information of all the tests.

```

Hostname> enable
Hostname# show ip rns reaction-configuration
Entry number: 1
Reaction: rtt
Threshold Type: Never
Rising (milliseconds): 5000
Falling (milliseconds): 3000
Threshold Count: 5
Threshold Count2: 5
Action Type: trigger
Entry number: 2
Reaction: timeout
Threshold Type: Never
Threshold Count: 5
Threshold Count2: 5
Action Type: trigger

```

**Table 1-1** Output Fields of the show ip rns reaction-configuration Command

Field	Description
Entry number	Track operation index
Reaction	Threshold monitoring object, such as RTT or timeout
Threshold Type	Threshold trigger action type
Rising (milliseconds)	Upper threshold
Falling (milliseconds)	Lower threshold
Threshold Count	x value when threshold-type is xofy or the average number of times when threshold-type is average
Threshold Count2	y value when threshold-type is xofy or the number of consecutive times when threshold-type is consecutive
Action Type	Action type

**Notifications**

When the IP track instance is not configured, the following notification will be displayed:

```
rns operate has not define.
```

**Platform Description**

N/A

**Related Commands**

N/A

**1.20 show ip rns reaction-trigger****Function**

Run the **show ip rns reaction-trigger** command to display the test trigger information of a test.

**Syntax**

```
show ip rns reaction-trigger [ operation-number ]
```

**Parameter Description**

*operation-number*: Number of an IP RNS operation object. The value range is from 1 to 500. If this parameter is not specified, all the RNS operation objects are displayed.

**Command Modes**

All modes except the user EXEC mode

**Default Level**

1

**Usage Guidelines**

Run this command to display the test trigger information of a test.

**Examples**

The following example displays the test trigger information of all the tests.

```
Hostname> enable
Hostname# show ip rns reaction-trigger
Entry number: 1
Target rns index: 2
Status of Entry: active
Operational State: pending
```

**Table 1-1**Output Fields of the show ip rns reaction-trigger Command

Field	Description
Entry number	Track operation index

Field	Description
Target rns index	Triggered track index value
Status of Entry	rns_entry status
Operational State	Current trigger status

## Notifications

When the IP track instance is not configured, the following notification will be displayed:

```
rns operate has not define
```

## Platform Description

N/A

## Related Commands

N/A

# 1.21 show ip rns statistics

## Function

Run the **show ip rns statistics** command to display the brief statistics of a track object.

## Syntax

```
show ip rns statistics [ operation-number ]
```

## Parameter Description

*operation-number*: Number of an IP RNS operation object. The value range is from 1 to 500. If this parameter is not specified, all the RNS operation objects are displayed.

## Command Modes

All modes except the user EXEC mode

## Default Level

1

## Usage Guidelines

Run this command to display the brief statistics of a track object. The statistics vary with packet types.

## Examples

The following example displays the brief statistics of ip rns 1.

```
Hostname> enable
Hostname# show ip rns statistics 1
Entry number: 1
Operation time to live: forever
```

```

Latest RTT: 1
Latest operation start time: 2020-07-31 14:59:07
Latest operation return code: NoConnection/Busy/Timeout
Number of successes: 16
Number of failures: 49
Jitter of rtt time: 2

```

**Table 1-1 Output Fields of the show ip rns statistics Command**

Field	Description
Entry number	RNS index ID
Operation time to live	Remaining life of the current test
Latest RTT	RTT of the latest test
Latest operation start time	Latest operation start time
Latest operation return code	Latest operation return code (such as ok, timeout, and noconnection)
Number of successes	Number of successful tests
Number of failures	Number of failed tests

**Notifications**

When the IP track instance is not configured, the following notification will be displayed:

```
rns operate has not define
```

**Platform Description**

N/A

**Related Commands**

N/A

## 1.22 show track

**Function**

Run the **show track** command to display the statistics of a track object.

**Syntax**

```
show track [ object-number ]
```

**Parameter Description**

*object-number*: Number of a track object. The value range is from 1 to 700. If this parameter is not specified, all the track objects are displayed.

**Command Modes**

All modes except the user EXEC mode



**Default Level**

1

**Usage Guidelines**

Run this command to display the statistics of a track object.

**Examples**

The following example displays the statistics of all the track objects.

```

Hostname> enable
Hostname# show track
Track 1
  Reliable Network Service 1
  The state is Up
    1 change, current state last: 120 secs
  Delay up 30 secs, down 50 secs
Track 2
  Interface GigabitEthernet 0/1
  The state is Down
    3 change, current state last: 300 secs
  Delay up 60 secs, down 60 secs
Track 4
  rns-list 1-2 and
  The state is Down
    3 change, current state last: 5 secs
  Delay up 0 secs, down 0 secs

```

**Table 1-1 Output Fields of the show track Command**

Field	Description
Track x	Number of the track object
Reliable Network Service x	Track RNS object
The state is x	Track object state
x change	Number of state change times of the track object
current state last: x secs	Duration of the current track object state
Delay up x secs, down x secs	Delay attribute of the track object
Interface x x	Track interface information
The state is x, delayed y (c secs remaining)	Indicates that the current track object state is x and changes to y after c seconds.
List boolean and	Indicates that the result of the track object is accessed from the AND operation result of all the members.
Object x	Indicates that the meeting condition of member x is its up state.

Field	Description
Object x not	Indicates that the meeting condition of member x is its down state.

### Notifications

When the specified track object for display is not configured, the following notification will be displayed:

```
Illegal Value: the track object does not exist.
```

### Platform Description

N/A

### Related Commands

N/A

## 1.23 tag

### Function

Run the **tag** command to configure a tag for an IP test.

Run the **no** form of this command to remove this configuration.

No test tag is configured by default.

### Syntax

```
tag tag-name
```

```
no tag
```

### Parameter Description

*tag-name*: Test tag. The value is a string consisting of a maximum of 79 characters.

### Command Modes

IP RNS DNS configuration mode

IP RNS ICMP-Echo configuration mode

IP RNS TCP configuration mode

IP RNS UDP-Echo configuration mode

### Default Level

1

### Usage Guidelines

This command specifies a tag for a test, which is often used to indicate the function of the test. When the tag character length exceeds 79, the excess part is automatically truncated.

## Examples

The following example configures test instance 1 of ICMP echo type, and sets the test destination IP address of this instance to 10.1.1.1 and tag to `telecom_gateway`.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip rns 1
Hostname(config-ip-rns)# icmp-echo 10.1.1.1
Hostname(config-ip-rns-icmp-echo)# tag telecom_gateway
```

## Notifications

N/A

## Common Errors

N/A

## Platform Description

N/A

## Related Commands

N/A

# 1.24 tcp-connect

## Function

Run the **tcp-connect** command to configure a TCP test.

No test of TCP type is configured by default.

## Syntax

```
tcp-connect { destination-ipv4-address | destination-hostname [ name-server ipv4-address ] } port-number [ source-ipaddr ipv4-address ] [ [ af-direct ] out-interface interface-type interface-number next-hop ipv4-address ]
```

## Parameter Description

*destination-ipv4-address*: Destination IPv4 address.

*destination-hostname*: Destination host name. The maximum length is 127 characters, and the excess part is truncated automatically.

**name-server** *ipv4-address*: Indicates the IPv4 address of the DNS server. By default, the DNS server configured by running the **ip name-server** command on the device is used for resolution.

*port-number*: TCP port to be tested. The value range is from 1 to 65535.

**source-ipaddr** *ipv4-address*: Indicates the source IPv4 address.

**af-direct**: Indicates that packets are received and sent without passing through the protocol stack in the test.

**out-interface** *interface-type interface-number*: Specifies the outbound interface type and number for test packets.

**next-hop** *ipv4-address*: Indicates the next hop IPv4 address when the outbound interface is specified.

## Command Modes

IP RNS configuration mode

## Default Level

1

## Usage Guidelines

After a TCP test is started, the system sets up a TCP connection to test whether the device is connected to the target host. After a TCP IP test is created, the system enters the IP RNS TCP mode.

The TCP test is used to test the performance of establishing a connection with a TCP server. When there is no corresponding TCP server at the peer end, you can start the RNS server on the peer device to complete the test.

## Examples

The following example configures test instance 1 of TCP type, and sets the test destination address to www.123.com, DNS server address to 1.1.1.1, and the test TCP port to 999.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip rns 1
Hostname(config)# tcp-connect www.123.com name-server 1.1.1.1 999
```

## Notifications

When you configure a test of TCP type, if the memory allocation fails, the configuration fails and the following notification will be displayed:

```
rns object tcp create fail
```

When you configure a TCP test, if the destination host name exceeds 63 characters, the configuration fails and the following notification will be displayed:

```
rns domain name too long
```

When you configure an incorrect tcp-connect destination host name, the configuration fails and the following notification will be displayed:

```
dns domain name to ip faild
```

## Common Errors

- The configured tcp-connect destination host name is incorrect.

## Platform Description

N/A

## Related Commands

N/A

## 1.25 threshold

### Function

Run the **threshold** command to configure the upper threshold of a test.

Run the **no** form of this command to restore the default configuration.

The default upper threshold of test is **5** seconds.

### Syntax

**threshold** *interval*

**no threshold**

### Parameter Description

*interval*: Upper threshold of a test, in milliseconds. The value range is from 0 to 60000.

### Command Modes

IP RNS DNS configuration mode

IP RNS ICMP-Echo configuration mode

IP RNS TCP configuration mode

IP RNS UDP-Echo configuration mode

### Default Level

1

### Usage Guidelines

The configured threshold must be less than or equal to timeout. For the configuration relationship between timeout, frequency, and threshold, see the usage guidelines for frequency.

### Examples

The following example configures test instance 1 of ICMP echo type, and specifies the test destination address as 10.1.1.1. The upper threshold of test is set to 8000 milliseconds.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip rns 1
Hostname(config-ip-rns)# icmp-echo 10.1.1.1
Hostname(config-ip-rns-icmp-echo)# threshold 8000
```

### Notifications

When the configured threshold is greater than timeout, the following notification will be displayed:

```
Illegal Value: Cannot set Threshold to be greater than Timeout.
```

### Common Errors

N/A

**Platform Description**

N/A

**Related Commands**

N/A

## 1.26 timeout

**Function**

Run the **timeout** command to configure the timeout interval of a test.

Run the **no** form of this command to restore the default configuration.

The default timeout interval of a test is **5** seconds.

**Syntax**

**timeout** *interval*

**no timeout**

**Parameter Description**

*interval*: Timeout interval of the test, in milliseconds. The value range is from 10 to 604800000.

**Command Modes**

IP RNS DNS configuration mode

IP RNS ICMP-Echo configuration mode

IP RNS TCP configuration mode

IP RNS UDP-Echo configuration mode

**Default Level**

1

**Usage Guidelines**

The configured timeout interval must be greater than or equal to the configured threshold. For the configuration relationship between timeout, frequency, and threshold, see the usage guidelines for frequency.

**Examples**

The following example configures test instance 1 of ICMP echo type, specifies the test destination IP address as 10.1.1.1, and sets the timeout interval to 10000 milliseconds.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip rns 1
Hostname(config-ip-rns)# icmp-echo 10.1.1.1
Hostname(config-ip-rns-icmp-echo)# timeout 10000
```

## Notifications

When you configure a timeout interval greater than the frequency value, the configuration fails and the following notification will be displayed:

```
Illegal Value: Cannot set Timeout to be greater than Frequency.
```

When you configure a timeout interval smaller than the threshold value, the configuration fails and the following notification will be displayed:

```
Illegal Value: Cannot set Timeout to be less than Threshold.
```

## Common Errors

- The configured timeout interval is greater than the frequency value.
- The configured timeout interval is smaller than the threshold value.

## Platform Description

N/A

## Related Commands

N/A

# 1.27 tos

## Function

Run the **tos** command to configure the type of service (TOS) field in the IPv4 packet of a test.

Run the **no** form of this command to remove this configuration.

The default TOS value for IPv4 packet of the test is **0**.

## Syntax

```
tos tos-value
```

```
no tos
```

## Parameter Description

*tos-value*: TOS field in the IPv4 packet of a test. The value range is from 0 to 255.

## Command Modes

IP RNS DNS configuration mode

IP RNS ICMP-Echo configuration mode

IP RNS TCP configuration mode

IP RNS UDP-Echo configuration mode

## Default Level

1

## Usage Guidelines

TOS is an 8-bit field in the IPv4 packet header. You can set the TOS field to control the priority of the test packet. For different TOS fields, the processing priorities are different on the intermediate devices.

## Examples

The following example configures an ICMP echo test, specifies the destination address of the test as 10.1.1.1, and sets the TOS value in IPv4 test packet header to 128.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip rns 1
Hostname(config-ip-rns)# icmp-echo 10.1.1.1
Hostname(config-ip-rns-icmp-echo)# tos 128
```

## Notifications

N/A

## Common Errors

N/A

## Platform Description

N/A

## Related Commands

N/A

# 1.28 track interface line-protocol

## Function

Run the **track interface line-protocol** command to configure a track object, which is used to track the link status of an interface.

Run the **no** form of this command to remove this configuration.

The function of clearing all the tests is not configured by default.

## Syntax

**track** *object-number* **interface** *interface-type interface-number* **line-protocol**

**no track** *object-number*

## Parameter Description

*object-number*: Number of a track object. The value range is from 1 to 700.

*Interface-type interface-number*: Type and number of the interface.

## Command Modes

Global configuration mode

## Default Level

1



## Usage Guidelines

Run this command to configure a track object for tracking the link status of an interface. When the link status of the interface is up, the status of the corresponding track object is also up.

## Examples

The following example configures track object 3, which is used to track the link status of the interface GigabitEthernet 0/1.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# track 3 interface GigabitEthernet 0/1 line-protocol
```

## Notifications

When a track object is configured, if the resource on the device is insufficient, the following notification will be displayed:

```
Failed to create track obj, no resource.
```

When you run the **no track** command to delete a specified track object, if the track object is not configured on the device, the following notification will be displayed:

```
the track object does not exist.
```

## Common Errors

- The track object for tracking the link status of an interface is configured, but the corresponding interface is not configured.

## Platform Description

N/A

## Related Commands

N/A

## 1.29 track list

### Function

Run the **track list** command to configure a track object for tracking the status of a track list.

Run the **no** form of this command to remove this configuration.

No status is configured for a track list by default.

### Syntax

```
track object-number list boolean { and | or }
```

```
no track object-number
```

### Parameter Description

*object-number*: Number of a track object. The value range is from 1 to 700.

## Command Modes

Global configuration mode

## Default Level

1

## Usage Guidelines

Run this command to configure a track object for tracking the status of a track list. The result can be the AND or OR operation result of all member status.

**track *object-number* list boolean and:** Configures a track object to track the status of a track list. The result is the AND operation result of all member status.

**track *object-number* list boolean or:** Configures a track object to track the status of a track list. The result is the OR operation result of all member status.

## Examples

The following example configures track object 4, which is used to track the status of a track list. The result is the AND operation result of all member status.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# track 4 list boolean and
```

## Related Commands

Run the **show track** command to display the statistics of a track object.

## Notifications

When a track object is configured, if the resource on the device is insufficient, the following notification will be displayed:

```
Failed to create track obj, no resource.
```

When you run the **no track** command to delete a specified track object, if the track object is not configured on the device, the following notification will be displayed:

```
the track object does not exist.
```

## Common Errors

- The track object for tracking the status of a track list is configured, but no member of the track list is configured.

## Platform Description

N/A

## Related Commands

N/A

## 1.30 track rns

### Function

Run the **track rns** command to configure a track object, which is used to track the test result of a track instance.

Run the **no** form of this command to remove this configuration.

No track test result is configured by default.

### Syntax

```
track object-number rns entry-number
```

```
no track object-number
```

### Parameter Description

*object-number*: Number of a track object. The value range is from 1 to 700.

*entry-number*: Track operation number. The value range is from 1 to 500.

### Command Modes

Global configuration mode

### Default Level

1

### Usage Guidelines

Run this command to configure a track object for tracking the test result of a track instance. When the track instance test succeeds, the corresponding track object is in up status.

### Examples

The following example configures track object 5 for tracking track instance 7.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# track 5 rns 7
```

### Notifications

When a track object is configured, if the resource on the device is insufficient, the following notification will be displayed:

```
Failed to create track obj, no resource.
```

When you run the **no track** command to delete a specified track object, if the track object is not configured on the device, the following notification will be displayed:

```
the track object does not exist.
```

### Common Errors

- The track object for tracking an RNS test is configured, but the corresponding track instance is not configured.

## Platform Description

N/A

## Related Commands

N/A

# 1.31 track rns-list

## Function

Run the **track rns-list** command to configure a track object, which is used to track the test result of an rns-list instance.

Run the **no** form of this command to remove this configuration.

No object of track test result is configured by default.

## Syntax

```
track object-number rns-list men-list { and | or }
```

```
no track object-number
```

## Parameter Description

*object-number*: Number of a track object. The value range is from 1 to 700.

*men-list*: Tracked RNS list. Here, *men-list* can be an RNS test instance or a series of RNS test instances. If *men-list* is a series of RNS IDs, the format is as follows: Minimum RNS ID-Maximum RNS ID, for example, 10-20. The value range of RNS ID is from 1 to 500.

## Command Modes

Global configuration mode

## Default Level

1

## Usage Guidelines

Run this command to configure a track object for tracking the status of an RNS list. The result can be the AND or OR operation result of all member status.

**track** *object-number* **rns-list** *men-list* **and**: Configures a track object to track the status of a track list. The result is the AND operation result of all member status.

**track** *object-number* **rns-list** *men-list* **or**: Configures a track object to track the status of an RNS list. The result is the OR operation result of all member status.

## Examples

The following example configures track object 5 for tracking track instances 1, 2-5, and 8.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# track 5 rns-list 1,2-5,8 and
```

## Notifications

When a track object is configured, if the resource on the device is insufficient, the following notification will be displayed:

```
Failed to create track obj, no resource.
```

When you run the **no track** command to delete a specified track object, if the track object is not configured on the device, the following notification will be displayed:

```
the track object does not exist.
```

## Common Errors

- The track object for tracking rns-list is configured, but the corresponding track instance is not configured.

## Platform Description

N/A

## Related Commands

N/A

# 1.32 udp-echo

## Function

Run the **udp-echo** command to configure a test object of UDP echo type.

No test object of UDP echo type is configured by default.

## Syntax

```
udp-echo { oob destination-ipv4-address port-number [ via interface-type interface-number next-hop next-hop-ip ] | destination-ipv4-address port-number [ out-interface interface-type interface-number next-hop next-hop-ip ] }
```

```
udp-echo destination-ipv4-address port-number [ out-interface interface-type interface-number next-hop next-hop-ip ]
```

## Parameter Description

**oob**: Indicates the test on the MGMT port.

*destination-ipv4-address*: Destination IP address.

*port-number*: Destination port.

**out-interface** *interface-type interface-number*: Specifies the outbound interface (not the MGMT port) for test packets.

**next-hop** *next-hop-ip*: Indicates the next hop IP address.

**via** *interface-type interface-number*: Specifies the outbound interface (MGMT port) for the test packets.

## Command Modes

IP RNS configuration mode

## Default Level

1

## Usage Guidelines

You must enable the RNS server at the peer end of the test to implement a UDP echo test.

The value of *port-number* must be consistent with the port number configured for the RNS server.

## Examples

The following example configures test instance 1 of UDP echo type.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip rns 1
Hostname(config-ip-rns)# udp-echo 10.10.10.1 1025
Hostname(config-ip-rns-udp-echo)#
```

## Notifications

When you configure a test of UDP echo type, if the memory allocation fails, the configuration fails and the following notification will be displayed:

```
rns object entry %d create fail
```

## Common Errors

- The configured udp-echo destination host name is incorrect.

## Platform Description

N/A

## Related Commands

N/A

## 1.33 vrf

### Function

Run the **vrf** command to configure the VRF of a test.

Run the **no** form of this command to remove this configuration.

No VRF name is configured for the test by default.

### Syntax

**vrf** *vrf-name*

**no vrf**

### Parameter Description

*vrf-name*: Virtual routing and forwarding (VRF) name.

### Command Modes

IP RNS DNS configuration mode

IP RNS ICMP-Echo configuration mode

IP RNS TCP configuration mode

IP RNS UDP-Echo configuration mode

### Default Level

1

### Usage Guidelines

This command specifies the VRF of the test packet.

### Examples

The following example configures test instance 1 of ICMP echo type, and specifies the test destination address as 10.1.1.1 and the VRF of the test as VPN1.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip rns 1
Hostname(config-ip-rns)# icmp-echo 10.1.1.1
Hostname(config-ip-rns-icmp-echo)# vrf VPN1
```

### Notifications

When the specified VRF name is invalid, the configuration fails and the following notification will be displayed:

```
no vrf named.
```

### Common Errors

- The specified VRF name is invalid.

### Platform Description

N/A

### Related Commands

N/A