Clear Hold IPs by Moving to Release State

Feature Summary and Revision History

Summary Data

Applicable Product(s) or Functional Area	P-GW
Applicable Platform(s)	• ASR 5500 • VPC-DI • VPC-SI
Feature Default	• Disabled - Configuration Required for Thresholds • Not applicable for exec mode Clear CLIs
Related Changes in This Release	Not Applicable
Related Documentation	• *P-GW Administration Guide* • *Command Line Interface Reference* • *Thresholding Configuration*

Revision History

Revision Details	Release
P-GW supports clearing of IPs from Address Hold List for both IPv4 and IPv6 Pools.	2024.03.0

Feature Description

In P-GW, support for an exec level command to move IP address from HOLD to RELEASE state is introdcued.

When an IPv4/IPv6 pool is having huge number of addresses in HOLD state, you can use this clear CLI to move addresses from HOLD to RELEASE state.

You can perform the Address Hold Timer (AHT) clear operation to:

- manually change IPv4 or IPv6 state from hold to release for a specific IP or range of IPs belonging to an IPv4 or IPv6 pool name that is in the hold state.
- manually change IPv4 or IPv6 state from hold to release for the selected oldest IPs based on the age given for an IPv4 or IPv6 pool whose hold-age should be greater than or equal to specified age.

Guidelines, Limitations, and Restrictions for Clearing Address Hold Timer

Guidelines

Follow these guidelines for clearing Address Hold Timer:

- Check if the Address Hold Timer is enabled for the IP Pool. For more information, refer the Address Hold Timer Support chapter.
- For upgrade, you must enable the **ip-pool-usable** threshold CLI to provision again.

Note By default the IP Pool usable threshold both at context and pool level CLI configuration is disabled.

- For downgrade, remove the **ip-pool-usable** thresholds both at context and pool level CLI configurations, else IP Pool configuration will fail.

  To perform the removal, either reconfigure the required pool level CLI parameter or load the downgraded version configuration file that was already saved.
- Threshold configuration for the SNMP traps are applied on the fly.

Limitations

The Interchassis Session Recovery (ICSR) Checkpointing is not supported for **Clear HoldToRelease** CLI configuration. Following are the recommendations due to this limitation:

- Execute the **Clear HoldToRelease** CLI on both the chassis at the same time.

- All Clear range, age, and specific IP CLIs must be run on ICSR peer at the same time.

  Age-based clearing should be executed simultaneously on both Active and Standby chassis in an ICSR setup. Any time gap in running this command between the Active and Standby chassis may result in discrepancies in the Hold and Release IPs, potentially clearing more Hold IPs on the chassis where the command was executed later. Therefore, using the 'clear by range' command is preferred over the 'clear by age' command.

Note Clear command does not cause any changes to the Used IP addresses.

Restrictions

These restrictions apply to IP pool thresholds for clearing AHT:

- **ip-pool-usable** threshold must be less than its clear threshold value.
- **ip-pool-usable-final** threshold must be less than its clear threshold value.
- **ip-pool-usable-final** threshold should be less than ip-pool-usable threshold, and
- **ip-pool-usable-final** clear threshold must be less than ip-pool-usable clear threshold.

Change IPv4 Address State from Hold to Release for Single IP or Range of IPs

You can manually change the IPv4 IP state from HOLD to RELEASE for a single IP or range of IPs that belong to an IP pool,

Before you begin

Review the "Guidelines", "Limitations", and "Restrictions" sections of Clear Hold IPs by Moving to Release State , on page 1.

Procedure

Step 1 Enter a specific context in the exec mode.

context *context_name*

Example:

```
[local]qvpc-si#context egress
[egress]qvpc-si# clear ip hold-to-releasestate { pool-name <ipv4-pool-name>}  { <ipv4_address >| {
range <start_ip_address> <end_ip_address> count <1-5000>}}
```

Step 2 Enter the **clear ip hold-to-releasestate** parameters using the following command in the exec mode.

clear ip hold-to-releasestate{ pool-name *ipv4_pool_name } { ipv4_address* **| range** *start_ip_address end_ip_address* **count** *value* **} }**

- The **clear ip hold-to-releasestate** parameter moves the address from HOLD to RELEASE state.
- The IPv4 pool name indicates from where mentioned ip/range is removed from AHT hold list.You can configure a pool name of size 1 to 31 and the pool name is case sensitive.
- Specify the start IP address range from which the IP address is to removed from AHT list. Maximum of 5000 Hold IPs only gets cleared.
- The count parameter specifies MAXIMUM number of Ips to be moved from HOLD state to RELEASE state .Specify the count of ip addresses to be cleared in integer 1 -.5000

Example:

```
[local]qvpc-si#context egress
[egress]qvpc-si# clear ip hold-to-releasestate { pool-name <ipv4-pool-name>}  { <ipv4_address >|
{range <start_ip_address> <end_ip_address> count <1-5000>}}
 ---------------------------------------------------------------------
[egress]qvpc-si# clear ip hold-to-releasestate pool-name ?
[egress]qvpc-si# clear ip hold-to-releasestate pool-name poolA  ?
[egress]qvpc-si# clear ip hold-to-releasestate pool-name poolA 11.0.2.3
---------------------------------------------------------------------
[egress]qvpc-si# clear ip hold-to-releasestate pool-name poolA range?
[egress]qvpc-si# clear ip hold-to-releasestate pool-name poolA range 11.0.2.3?
[egress]qvpc-si# clear ip hold-to-releasestate pool-name poolA range 11.0.2.3 11.0.2.20
 ---------------------------------------------------------------------
[egress]qvpc-si# clear ip hold-to-releasestate pool-name poolA range 11.0.2.3 11.0.2.20 coun?
[egress]qvpc-si# clear ip hold-to-releasestate pool-name poolA range 11.0.2.3 11.0.2.20 count ?
[egress]qvpc-si# clear ip hold-to-releasestate pool-name poolA range 11.0.2.3 11.0.2.20 count 60
<cr>                - newline
```

Change IPv6 Address State from Hold to Release for Single IP or Range of IP Prefixes

You can manually change the IPv6 IP state from HOLD to RELEASE for a single IP prefix or range of IP prefixes that belong to an IPv6 pool,

Before you begin

Review the "Guidelines", "Limitations", and "Restrictions" sections of Clear Hold IPs by Moving to Release State , on page 1.

Procedure

Step 1 Enter a specific context in the exec mode

context*context_name*

Example:

```
[local]qvpc-si#context egress
[egress]qvpc-si# clear ipv6  hold-to-releasestate { pool-name <ipv6-pool-name>}  {{ prefix
<ipv6_address>} | {range <startIPv6prefix> <endIPv6prefix> count <1-5000>}}
```

Step 2 Enter the clear ipv6 hold-to-release parameters using the following command in the exec mode

clear ipv6 hold-to-releasestate{ pool-name *ipv6_pool_name }* **{ { prefix** *ipv6_address }* **| { range** *startIPv6prefix endIPv6prefix* **count** *value* **} }**

- The **clear ipv6 hold-to-releasestate** parameter moves the address from HOLD to RELEASE state.
- The IPv6 pool name indicates from where mentioned *IPv6 range of prefixes* is cleared from the AHT hold list. You can configure a pool name of size 1 to 31 and the pool name is case sensitiveve.
- Specify the start and end IPv6 prefixes from which the IP address is to be cleared from AHT list. .
- The count parameter specifies maximum number of IPs to be moved from HOLD state to RELEASE state .Specify the count of IP addresses to be cleared in integer 1 -.5000.

View the example configuration output for single IP prefix clearing :

Example:

```
[local]qvpc-si#context egress
[egress]qvpc-si# clear ipv6  hold-to-releasestate { pool-name <ipv6-pool-name>}  {{ prefix
<ipv6_address>} | {range <startIPv6prefix> <endIPv6prefix> count <1-5000>}}
 ----------------------------------------
[egress]qvpc-si# clear ipv6 hold-to-releasestate pool-name?
[egress]qvpc-si# clear ipv6 hold-to-releasestate pool-name poolA?
[egress]qvpc-si# clear ipv6 hold-to-releasestate pool-name poolA prefix 2068::323
  <cr>                - newline
 ----------------------------------------------------------------------------------
```

View the example configuration output for range IP prefix clearing:

Example:

```
[local]qvpc-si#context egress
[egress]qvpc-si# clear ipv6  hold-to-releasestate { pool-name <ipv6-pool-name>}  {{ prefix
<ipv6_address>} | {range <startIPv6prefix> <endIPv6prefix> count <1-5000>}}
 ----------------------------------------
[egress]qvpc-si# clear ipv6 hold-to-releasestate pool-name poolA range?
[egress]qvpc-si# clear ipv6 hold-to-releasestate pool-name poolA range 3001::?
[egress]qvpc-si# clear ipv6 hold-to-releasestate pool-name poolA range 3001::  3001:0:0:5:: ?
[egress]qvpc-si# clear ipv6 hold-to-releasestate pool-name poolA range 3001::  3001:0:0:5:: count
[egress]qvpc-si# clear ipv6 hold-to-releasestate pool-name poolA range 3001::  3001:0:0:5:: count 60

 <cr>                - newline
 ----------------------------------------------------------------------------------
```

Age-based Clear IPv4 State for Address Hold Timer

You can manually change IPv4 state from hold to release for the selected IP's based on the age specifies for an IP pool,

Procedure

Step 1 Enter a specific context in the exec mode.

context *context_name*

Example:

```
[local]qvpc-si#context egress
[egress]qvpc-si# clear ip hold-to-releasestate { pool-name <ipv4-pool-name>} {age <hold-age-in-seconds
> count <1-5000>}
```

Step 2 Enter age parametes using the following command in the exec mode.

clear ip hold-to-releasestate { pool-name *ipv4_pool_name }* **{ age** *hold-age-in-seconds* **count** *value* **}**

Additional information:

- The **hold-to-releasestate** parameter moves the address from HOLD state to RELEASE state.
- The IPv4 pool name indicates the IPv4 Pool from where mentioned ip or range is cleared from AHT hold list. You can configure a pool name of size 1 to 31 and the pool name is case sensitive.
- The hold-age must be in seconds 60 - 31556926.
- The count parameter specifies MAXIMUM number of IPs to be moved. from HOLD state to RELEASE state .Specify the count of ip addresses to be cleared in integer 1 - 5000.

Example:

```
[local]qvpc-si#context egress
[egress]qvpc-si# clear ip hold-to-releasestate { pool-name <ipv4-pool-name>} {age  < hold-age-in-seconds
 > count <1-5000>}
  -----------------------------------------------------
[egress]qvpc-si# clear ip hold-to-releasestate pool-name?
[egress]qvpc-si# clear ip hold-to-releasestate pool-name poolA age?
[egress]qvpc-si# clear ip hold-to-releasestate pool-name poolA age 120
-----------------------------------------------------
[egress]qvpc-si# clear ip hold-to-releasestate pool-name?
[egress]qvpc-si# clear ip hold-to-releasestate pool-name poolA?
-----------------------------------
[egress]qvpc-si# clear ip hold-to-releasestate pool-name poolA age?
[egress]qvpc-si# clear ip hold-to-releasestate pool-name poolA age 300 ?
[egress]qvpc-si# clear ip hold-to-releasestate pool-name poolA age 300 count ?
[egress]qvpc-si# clear ip hold-to-releasestate pool-name poolA age 300 count 60
<cr>                - newline
```

Step 3 Verify the configured age for IPv4 addresses using the **show ip pool address** show commands

Example:

```
[egress]qvpc-si# show ip pool address pool-name ipv4-public
+-------- (B) Busyout
|
|+------- (F)-FREE (U)-USED (H)-HOLD (Q)-QUARANTINE (R)-RELEASE
||+------ Quarantine
||| Address         NAI/MSID Hash   Hold/Qrntn Timer/ Session Start/Disconnect  Hold Age
```

```
||                                  Session ID
vv ==============  ================ ================      ========================== =========

Pool: ipv4-public
 U 10.0.0.12       9cd3cb187bcbd63c         1          Wed Jul 03 06:14:54 2024   -
 F 10.0.0.13       0000000000000000         -                      -              -
 F 10.0.0.14       0000000000000000         -                      -              -
 H 10.0.0.10       4a97ad2930ffc700 230               Wed Jul 03 06:18:19 2024   70
 H 10.0.0.11       0c645044e6b388b9 249               Wed Jul 03 06:18:38 2024   51
```

Age-based Clear IPv6 State for Address Hold Timer

You can manually change IPv6 state from hold to release for the selected IP's based on the age specifies for an IP pool, Clear specific IP information, and specify age to select IPs having hold-age greater than or equal to the specified value in CLI and move their state from HOLD to RELEASE.

Procedure

Step 1 Enter a specific context in the exec mode.

context *context_name*

Example:

```
 [local]qvpc-si#context egress
 [egress]qvpc-si# clear ipv6 hold-to-releasestate { pool-name <ipv6-pool-name>} {age
<hold-age-in-seconds > count <1-5000>}
```

Step 2 Enter the age parameters using the following command in the exec mode.

clear ipv6 hold-to-releasestate { pool-name *ipv6_pool_name }* { **age** *hold-age-in-seconds* **count** *value***}**

Additional information:

- The **hold-to-releasestate** parameter moves the address from HOLD state to RELEASE state.
- The IPv6 pool name indicates from where mentioned IPv6 range of prefixes is cleared from AHT hold list. You can configure a pool name of size 1 to 31 and the pool name is case sensitive.
- The hold-age must be in seconds 60 - 31556926 .
- The count parameter specifies MAXIMUM number of IPs to be moved. from HOLD state to RELEASE state .Specify the count of ip addresses to be cleared in integer 1 - 5000.

Example:

```
[local]qvpc-si#context egress
[egress]qvpc-si# clear ipv6 hold-to-releasestate { pool-name <ipv6-pool-name>} {age <hold-age-in-seconds
 > count <1-5000>}
----------------------------------------
[egress]qvpc-si# clear ipv6 hold-to-releasestate pool-name ?
[egress]qvpc-si# clear ipv6 hold-to-releasestate pool-name poolA age?
```

```
[egress]qvpc-si# clear ipv6 hold-to-releasestate pool-name poolA age 90 ?
[egress]qvpc-si# clear ipv6 hold-to-releasestate pool-name poolA age 90 count ?
[egress]qvpc-si# clear ipv6 hold-to-releasestate pool-name poolA age 64 count 60   <cr>
     - newline
```

Step 3 Verify the configured age for IPv6 addresses using the **show ipv6 pool pool-name** show command.

Example:

```
[egress]qvpc-si# show ipv6 pool pool-name ipv6-public
    Pool Name:     ipv6-public
    Group Name:
    Pool Type:     Public        Priority: 0
    Pool Id:       2001          Vrf: n/a
    Pool Status:   Good
    Start Prefix:  5001::/64
    End Prefix:    5001:0:0:4::/64
    Addr-Hold-Timer: 300
    Total Prefix:  5        Used Prefix: 1      Free Prefix: 1       On-Hold Prefix: 2       Released
 Prefix: 1
    Pool Address Type: Normal
    Configured Prefix: N/A
    User-Plane  ID   : N/A
    Virtual-FE  ID   : N/A
                 Nexthop Forwarding Address: Disabled
      Network Reachability Detection Server: Disabled
                  Suppress-Switchover-ADVS: Disabled
                   Allow-Static-Allocation: Disabled
                  Duplicate-Addr-Detection: Disabled
                         Send-Pilot-Packet: Enabled
                         Advertise-if-used: Disabled
                Group Available Threshold: Disabled    Clear: Disabled
                      Pool-Free Threshold: Disabled    Clear: Disabled
                      Pool-Used Threshold: Disabled    Clear: Disabled
             cip-local-pool-used Threshold: Disabled    Clear: Disabled
       cip-local-pool-in-use-addr Threshold: Disabled    Clear: Disabled
                    Pool-Usable Threshold: Disabled    Clear: Disabled
              Pool-Usable-Final Threshold: Disabled    Clear: Disabled    age: Disabled

+-------- (B) Busyout
|
|+------- (F)-FREE (U)-USED (H)-HOLD (R)-RELEASE
||
|| Address                  NAI/MSID Hash    Hold Timer/           Session Start/Disconnect  Hold
Age
||                                           Session ID

vv ======================= ================ ================     ======================== =========

Pool Name: ipv6-public
 U 5001:0:0:1::/64          4a97ad2930ffc700 2                     Wed Jul 03 06:29:02 2024      -

 F 5001:0:0:4::/64          0000000000000000         -                        -                -

 R 5001::/64                c9600956165ae917         -             Wed Jul 03 05:13:02 2024      -

 H 5001:0:0:2::/64          0c645044e6b388b9 276                   Wed Jul 03 06:30:16 2024  24

 H 5001:0:0:3::/64          9cd3cb187bcbd63c 292                   Wed Jul 03 06:30:32 2024  8
```

Set Poll Intervals

Use this task to define poll intervals for **ip-pool-usable** and **ip-pool-usable-final** thresholds. This configuration is applicable for both pre and final threshold configurations.

Procedure

Configure poll intervals in the Global configuration mode.

threshold poll { available-ip-pool-group | ip-pool-free | ip-pool-hold | ip-pool-release | ip-pool-used | **ip-pool-usable** } interval time

Example:

```
[local]qvpc-si# configure
[local]qvpc-si# threshold poll { available-ip-pool-group | ip-pool-free | ip-pool-hold | ip-pool-release
 | ip-pool-used | ip-pool-usable } interval <time>
```

Configure Pre and Final Thresholds at Context Level

The Clear Hold IPs by Moving to Release State feature supports two thresholds at context level.

Use this task to enable the **ip-pool-usable** and **ip-pool-usable-final** thresholds for ip pool usable of IPs, which are in either FREE or RELEASE states.

These are the types of Pre and final threshold SNMP alarms generated based on the configured thresholds:

- PreThreshIPPoolUsable alarm for entering condition
- PreThreshClearIPPoolUsable alarm for clearing condition
- FinalThreshIPPoolUsable alarm for entering condition
- FinalThreshClearIPPoolUsable alarm for clearing condition

Before you begin

Check if you have configured **ip-pool-usable** for configuring **ip-pool-usable-final**.

To enable the IP Pool Threshold monitoring at pool-level and context-level, refer the IP Pool Thresholds chapter in the Thresholding Configuration Guide.

Procedure

Step 1 Configure the IP pool usable pre threshold state as either free or release.

Example:

```
[local]qvpc-si# configure
[local]qvpc-si# threshold poll { available-ip-pool-group | ip-pool-free | ip-pool-hold | ip-pool-release
 | ip-pool-used | ip-pool-usable } interval <time>
[local]qvpc-si#context egress
[egress]qvpc-si# threshold ip-pool-usable <low_thresh> [ clear <high_thresh> ] [ip-pool-usable-final
 <low_thresh> [ clear <high_thresh> ]]
[egress]qvpc-si# threshold ip-pool-usable 40 clear 50 ip-pool-usable-final 35 clear 36
```

The **PreThreshIPPoolUsable** trap is raised if the ip pool usable is less than or equal to the configured **ip-pool-usable** low threshold value.

The **PreThreshClearIPPoolUsable** trap gets triggered if the pool usable value is greater than a clear high threshold value.

Step 2 Configure the IP pool usable final threshold state in either free or release state.

threshold ip-pool-usable *low_thresh* [clear *high_thresh*] **[ip-pool-usable-final** *low_thresh* **[clear** *high_thresh* **]]]**

The **FinalThreshIPPoolUsable** alarm is raised when the measured pool usable value is less than or equal to the ip-pool-usable-final value. The **FinalThreshClearIPPoolUsable** trap clears when the **ip-pool-usable-final** clear value is greater than a clear threshold.

Example:

```
[local]qvpc-si# configure
[local]qvpc-si# threshold poll { available-ip-pool-group | ip-pool-free | ip-pool-hold | ip-pool-release
 | ip-pool-used | ip-pool-usable } interval <time>
[local]qvpc-si#context egress
[egress]qvpc-si# threshold ip-pool-usable <low_thresh> [ clear <high_thresh> ] [ip-pool-usable-final
 <low_thresh> [ clear <high_thresh> ]]
[egress]qvpc-si# threshold ip-pool-usable 40 clear 50 ip-pool-usable-final 35 clear 36
```

Step 3 Verify the configured values for **ip-pool-usable** and **ip-pool-usable-final** using the **show threshold** CLI command..

Example:

```
 [egress]qvpc-si# show threshold

Threshold operation model: ALARM

No non-default threshold configured

Active thresholds:

Name:             ip-pool-used
Config Scope:     Context[egress]
Threshold:        0%
Clear Threshold:  0%
                        Poll Interval:    60Seconds
Next Poll Time:   2024-Mar-28+13:08:00
```

```
Name:             ip-pool-hold
Config Scope:     Context[egress]
Threshold:        0%
Clear Threshold:  0%
Poll Interval:    300Seconds
Next Poll Time:   2024-Mar-28+13:10:00

Name:             ip-pool-release
Config Scope:     Context[egress]
Threshold:        0%
Clear Threshold:  0%
Poll Interval:    300Seconds
Next Poll Time:   2024-Mar-28+13:10:00

Name:             ip-pool-free
Config Scope:     Context[egress]
Threshold:        0%
Clear Threshold:  0%
Poll Interval:    300Seconds
Next Poll Time:   2024-Mar-28+13:10:00

Name:             ip-pool-usable
Config Scope:     Context[egress]
Threshold:        0%
Clear Threshold:  0%
Poll Interval:    60Seconds
Next Poll Time:   2024-Mar-28+13:10:00

Name:             ip-pool-usable-final
Config Scope:     Context[egress]
Threshold:        0%
Clear Threshold:  0%
Poll Interval:    60Seconds
Next Poll Time:   2024-Mar-28+13:10:00


Name:             available-ip-pool-group
Config Scope:     Context[egress]
Threshold:        10%
Clear Threshold:  10%
Poll Interval:    300Seconds
Next Poll Time:   2024-Mar-28+13:10:00

Name:             cip-local-pool-used
Config Scope:     Context[egress]
Threshold:        0%
Clear Threshold:  0%
Poll Interval:    300Seconds
Next Poll Time:   2024-Mar-28+13:10:00

Name:             cip-local-pool-in-use-addr
Config Scope:     Context[egress]
Threshold:        0
Clear Threshold:  0
Poll Interval:    300Seconds
Next Poll Time:   2024-Mar-28+13:10:00


NOTE: IP pool threshold values can be overridden
      by IP pool configurations.

Enabled threshold groups: (name, scope)
available-ip-pool-group        Context[egress]
```

```
Non-default poll intervals:
ip-pool-used                              60Sec
place-holder                               0Sec
ip-pool-usable                            60Sec
```

Configure Pre and Final Thresholds IPv4 Pool Level

The Clear Hold IPs by Moving to Release State feature supports two thresholds at IPv4 Pool level.

Use this task to enable the **pool-usable** and **pool-usable final** thresholds for ip pool usable of IPs, which are in either FREE or RELEASE states.

These are the types of Pre and final threshold SNMP alarms generated based on the configured thresholds:

- PreThreshIPPoolUsable alarm for entering condition
- PreThreshClearIPPoolUsable alarm for clearing condition
- FinalThreshIPPoolUsable alarm for entering condition
- FinalThreshClearIPPoolUsable alarm for clearing condition

Before you begin

Check if you have configured **pool-usable** for configuring **pool-usable-final**.

To enable the IP Pool Threshold monitoring at pool-level and context-level, refer the IP Pool Thresholds chapter in the *Thresholding Configuration Guide*.

Procedure

Step 1 Configure the IP pool usable pre threshold state as either free or release.

ip pool name alert-threshold [pool-usable *low_thresh* **[clear** *high_thresh* **]]**

Example:

```
 [local]qvpc-si# context egress
 [egress]qvpc-si[egress]qvpc-si #ip pool name alert-threshold pool-usable < low_thresh > [ clear <
high_thresh > ] [pool-usable-final < low_thresh > [ clear < high_thresh > ]]
[egress]qvpc-si# ip pool name alert-threshold pool-usable 50 clear 60 pool-usable-final 30 [clear 50
```

The **PreThreshIPPoolUsable** trap is raised if the ip pool usable is less than or equal to the configured **ip-pool-usable** low threshold value.

The **PreThreshClearIPPoolUsable** trap gets triggered if the pool usable value is greater than a clear high threshold value.

Step 2 Configure the IP pool usable final threshold state in either free or release.

ip pool name alert threshold [pool-usable low_thresh [clear high_thresh] **[pool-usable-final** *low_thresh* **[clear** *high_thresh* **]]]**

The **FinalThreshIPPoolUsable** alarm is raised when the measured pool usable value is less than or equal to the **pool-usable** value. The **FinalThreshClearIPPoolUsable** trap clears when the **pool-usable-final** clear value is greater than clear threshold.

Example:

```
 [local]qvpc-si# context egress
 [egress]qvpc-si[egress]qvpc-si #ip pool name alert-threshold pool-usable < low_thresh > [ clear <
high_thresh > ] [pool-usable-final < low_thresh > [ clear < high_thresh > ]]
[egress]qvpc-si# ip pool name alert-threshold pool-usable 50 clear 60 pool-usable-final 30 [clear 50
```

Configure Pre and Final Thresholds at IPv6 Pool Level

The Clear Hold IPs by Moving to Release State feature supports two thresholds at IPv6 Pool level.

Use this task to enable the **pool-usable** and **pool-usable-final** thresholds for ip pool usable of IPs, which are in either FREE or RELEASE states.

These are the types of Pre and final threshold SNMP alarms generated based on the configured thresholds:

- PreThreshIPPoolUsable alarm for entering condition
- PreThreshClearIPPoolUsable alarm for clearing condition
- FinalThreshIPPoolUsable alarm for entering condition
- FinalThreshClearIPPoolUsable alarm for clearing condition

Before you begin

Check if you have configured **pool-usable** for configuring **pool-usable-final**.

To enable the IP Pool Threshold monitoring at pool-level and context-level, refer the IP Pool Thresholds chapter in the Thresholding Configuration Guide.

Procedure

Step 1 Configure the IP pool usable pre threshold state as either free or release.

ipv6 pool name alert-threshold [pool-usable *low_thresh* **[clear** *high_thresh* **]]**

Example:

```
 [local]qvpc-si# context egress
[egress]qvpc-si# ipv6 pool testv6 alert-threshold pool-usable <low_thresh> [ clear <high_thresh> ]
[ pool-usable-final <low_thresh> [ clear <high_thresh> ]]
[egress]qvpc-si#  ipv6 pool testv6 alert-threshold pool-usable 40 clear 50 pool-usable-final 35 clear
 36
```

The **PreThreshIPPoolUsable** trap is raised if the ip pool usable is less than or equal to the configured **pool-usable** low threshold value.

The **PreThreshClearIPPoolUsable** trap gets triggered if the pool usable value is greater than a clear high threshold value.

Step 2 Enter the IP pool usable final threshold state as either free or release.

ipv6 pool *alert_name* **alert-threshold pool-usable** *low_thresh* [clear *high_thresh* **[pool-usable-final** *low_thresh* **[clear** *high_thresh* **]]**

Example:

```
[local]qvpc-si# context egress
[egress]qvpc-si# ipv6 pool testv6 alert-threshold pool-usable <low_thresh> [ clear <high_thresh> ]
[ pool-usable-final <low_thresh> [ clear <high_thresh> ]]
[egress]qvpc-si#  ipv6 pool testv6 alert-threshold pool-usable 40 clear 50 pool-usable-final 35 clear
 36
```

The **FinalThreshIPPoolUsable** alarm is raised when the measured pool usable value is less than or equal to the **pool-usable-final** low threshold value. The **FinalThreshClearIPPoolUsable** trap clears when the **pool-usable** value is greater than a clear high threshold value.

Set Default Threshold Configurations

Use this task to configure default value for context level **ip-pool-usable** and **ip-pool-usable-final** thresholds.

Before you begin

Procedure

Configure the following to set default value for context level **ip-pool-usable** and **ip-pool-usable-final threshold**.

default threshold ip-pool-usable

Example:

```
[egress]qvpc-si(config-ctx)# default threshold ip-pool-usable
[egress]qvpc-si(config-ctx)# default threshold ?
available-ip-pool-group cip-local-pool-in-use-addr cip-local-pool-used ip-pool-free ip-pool-hold
ip-pool-release ip-pool-used ip-pool-usable monitoring
```

Set Default Poll Intervals

Use this task to configure default poll interval for **ip-pool-usable** and **ip-pool-usable-final** thresholds

Procedure

Step 1 Configure default poll interval for **ip-pool-usable** and **ip-pool-usable-final** thresholds.

default threshold poll ip-pool-usable interval

Example:

```
[egress]qvpc-si(config)# default threshold poll ?
ip-pool-free ip-pool-hold ip-pool-release ip-pool-used ip-pool-usable
[egress]qvpc-si(config)# default threshold poll ip-pool-usable ?
[egress]qvpc-si(config)# default threshold poll ip-pool-usable interval
```

Step 2 Verify the default values of thresholds.

Example:

```
[local]qvpc-si# show threshold default | grep -i pool
(context)ip-pool-used 5Min Notify Above 0%
(context)ip-pool-hold 5Min Notify Above 0%
(context)ip-pool-release 5Min Notify Above 0%
(context)ip-pool-free 5Min Notify Below 0%
(context)ip-pool-usable 5Min Notify Below 0%
(context)ip-pool-usable-final 5Min Notify Below 0%
(context)available-ip-pool-group 5Min Notify Below 10%
(context)cip-local-pool-used 5Min Notify Above 0%
(context)cip-local-pool-in-use-addr 5Min Notify Above 0
(disc-rsn)Pool-IP-address-not-valid 15Min Notify Above 0
(disc-rsn)lpool-ip-validation-failed 15Min Notify Above 0
(disc-rsn)lpool-static-ip-addr-not-allowed 15Min Notify Above 0
(disc-rsn)mipha-ip-pool-busyout 15Min Notify Above 0
(disc-rsn)All-dynamic-pool-addr-occupied 15Min Notify Above 0
(disc-rsn)NAT-Pool-BusyOut-Or-Pend-Delete 15Min Notify Above 0
```