



## Clear Hold IPs by Moving to Release State

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## Feature Summary and Revision History

### Summary Data

Applicable Product(s) or Functional Area	P-GW
Applicable Platform(s)	<ul style="list-style-type: none"> <li>• ASR 5500</li> <li>• VPC-DI</li> <li>• VPC-SI</li> </ul>
Feature Default	<ul style="list-style-type: none"> <li>• Disabled - Configuration Required for Thresholds</li> <li>• Not applicable for exec mode Clear CLIs</li> </ul>
Related Changes in This Release	Not Applicable
Related Documentation	<ul style="list-style-type: none"> <li>• <i>P-GW Administration Guide</i></li> <li>• <i>Command Line Interface Reference</i></li> <li>• <i>Thresholding Configuration</i></li> </ul>

### 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 introduced. 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.




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

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- 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.




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

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### 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.

**Step 1** Enter a specific context in the exec mode.

**context** *context\_name*

#### Example:

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

**Step 1** Enter a specific context in the exec mode

**context***context\_name*

**Example:**

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

**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 parameters 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.

**Step 1** Enter a specific context in the exec mode.

**context** *context\_name*

**Example:**

```
[local]qvpn-si#context egress
[egress]qvpn-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]qvpn-si#context egress
[egress]qvpn-si# clear ipv6 hold-to-releasestate { pool-name <ipv6-pool-name>} {age <hold-age-in-seconds
> count <1-5000>}
-----
[egress]qvpn-si# clear ipv6 hold-to-releasestate pool-name ?
[egress]qvpn-si# clear ipv6 hold-to-releasestate pool-name poolA age?
[egress]qvpn-si# clear ipv6 hold-to-releasestate pool-name poolA age 90 ?
[egress]qvpn-si# clear ipv6 hold-to-releasestate pool-name poolA age 90 count ?
[egress]qvpn-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]qvpn-si# show ipv6 pool pool-name ipv6-public
Pool Name:      ipv6-public
Group Name:
Pool Type:      Public      Priority: 0
```

## Set Poll Intervals

```

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          9cd3cb187bcd63c 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.



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]qvpn-si# configure
[local]qvpn-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.

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

**Example:**

```
[local]qvpn-si# configure
[local]qvpn-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]qvpn-si#context egress
[egress]qvpn-si# threshold ip-pool-usable <low_thresh> [ clear <high_thresh> ] [ip-pool-usable-final
<low_thresh> [ clear <high_thresh> ]]
[egress]qvpn-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]qvpn-si# configure
[local]qvpn-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]qvpn-si#context egress
[egress]qvpn-si# threshold ip-pool-usable <low_thresh> [ clear <high_thresh> ] [ip-pool-usable-final
<low_thresh> [ clear <high_thresh> ] ]
[egress]qvpn-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]qvpn-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*.

**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]qvpn-si# context egress
[egress]qvpn-si[egress]qvpn-si #ip pool name alert-threshold pool-usable < low_thresh > [ clear <
high_thresh > ] [pool-usable-final < low_thresh > [ clear < high_thresh > ]]
[egress]qvpn-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]qvpn-si# context egress
[egress]qvpn-si[egress]qvpn-si #ip pool name alert-threshold pool-usable < low_thresh > [ clear <
high_thresh > ] [pool-usable-final < low_thresh > [ clear < high_thresh > ]]
[egress]qvpn-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.

**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]qvpn-si# context egress
[egress]qvpn-si# ipv6 pool testv6 alert-threshold pool-usable <low_thresh> [ clear <high_thresh> ]
[ pool-usable-final <low_thresh> [ clear <high_thresh> ] ]
[egress]qvpn-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]qvpn-si# context egress
[egress]qvpn-si# ipv6 pool testv6 alert-threshold pool-usable <low_thresh> [ clear <high_thresh> ]
[ pool-usable-final <low_thresh> [ clear <high_thresh> ] ]
[egress]qvpn-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

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]qvpn-si(config-ctx)# default threshold ip-pool-usable
[egress]qvpn-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

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

**Step 2** Verify the default values of thresholds.

#### Example:

```
[local]qvpn-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
```