IPv6 Snooping

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The IPv6 Snooping feature bundles several Layer 2 IPv6 first-hop security features, including IPv6 neighbor discovery inspection, IPv6 device tracking, IPv6 address glean, and IPv6 binding table recovery, to provide security and scalability. IPv6 ND inspection operates at Layer 2, or between Layer 2 and Layer 3, to provide IPv6 functions with security and scalability.

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see Bug Search Tool and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table at the end of this module.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Information About IPv6 Snooping

IPv6 Global Policies

IPv6 global policies provide storage and access policy database services. IPv6 ND inspection and IPv6 RA guard are IPv6 global policies features. Every time an ND inspection or RA guard is configured globally,

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the policy attributes are stored in the software policy database. The policy is then applied to an interface, and the software policy database entry is updated to include this interface to which the policy is applied.

IPv6 Snooping

The IPv6 snooping feature bundles several Layer 2 IPv6 first-hop security features, including IPv6 neighbor discovery (ND) inspection, IPv6 address glean, and IPv6 device tracking. IPv6 snooping operates at Layer 2, or between Layer 2 and Layer 3, and provides IPv6 features with security and scalability.

When IPv6 ND inspection is configured on a target (which varies depending on platform target support and may include device ports, switch ports, Layer 2 interfaces, Layer 3 interfaces, and VLANs), capture instructions are downloaded to the hardware to redirect the ND protocol and Dynamic Host Configuration Protocol (DHCP) for IPv6 traffic up to the switch integrated security features (SISF) infrastructure in the routing device. For ND traffic, messages such as NS, NA, RS, RA, and REDIRECT are directed to SISF. For DHCP, UDP messages sourced from port 546 or 547 are redirected.

IPv6 ND inspection registers its "capture rules" to the classifier, which aggregates all rules from all features on a given target and installs the corresponding ACL down into the platform-dependent modules. Upon receiving redirected traffic, the classifier calls all entry points from any registered feature (for the target on which the traffic is being received), including the IPv6 ND inspection entry point. This entry point is the last to be called, so any decision (such as drop) made by another feature supersedes the IPv6 ND inspection decision.

IPv6 ND Inspection

IPv6 ND inspection learns and secures bindings for stateless autoconfiguration addresses in Layer 2 neighbor tables. IPv6 ND inspection analyzes neighbor discovery messages in order to build a trusted binding table database, and IPv6 neighbor discovery messages that do not have valid bindings are dropped. A neighbor discovery message is considered trustworthy if its IPv6-to-MAC mapping is verifiable.

This feature mitigates some of the inherent vulnerabilities for the neighbor discovery mechanism, such as attacks on duplicate address detection (DAD), address resolution, device discovery, and the neighbor cache.

IPv6 Device Tracking

IPv6 device tracking provides IPv6 host liveness tracking so that a neighbor table can be immediately updated when an IPv6 host disappears.

IPv6 First-Hop Security Binding Table

The IPv6 First-Hop Security Binding Table recovery mechanism feature enables the binding table to recover in the event of a device reboot. A database table of IPv6 neighbors connected to the device is created from information sources such as ND snooping. This database, or binding, table is used by various IPv6 guard features to validate the link-layer address (LLA), the IPv4 or IPv6 address, and prefix binding of the neighbors to prevent spoofing and redirect attacks.

This mechanism enables the binding table to recover in the event of a device reboot. The recovery mechanism will block any data traffic sourced from an unknown source; that is, a source not already specified in the binding table and previously learned through ND or DHCP gleaning. This feature recovers the missing binding table entries when the resolution for a destination address fails in the destination guard. When a failure occurs, a binding table entry is recovered by querying the DHCP server or the destination host, depending on the configuration.

Recovery Protocols and Prefix Lists

The IPv6 First-Hop Security Binding Table Recovery Mechanism feature introduces the capability to provide a prefix list that is matched before the recovery is attempted for both DHCP and NDP.

If an address does not match the prefix list associated with the protocol, then the recovery of the binding table entry will not be attempted with that protocol. The prefix list should correspond to the prefixes that are valid for address assignment in the Layer 2 domain using the protocol. The default is that there is no prefix list, in which case the recovery is attempted for all addresses. The command to associate a prefix list to a protocol is **protocol** {**dhcp** | **ndp**} [**prefix-list** *prefix-list-name*].

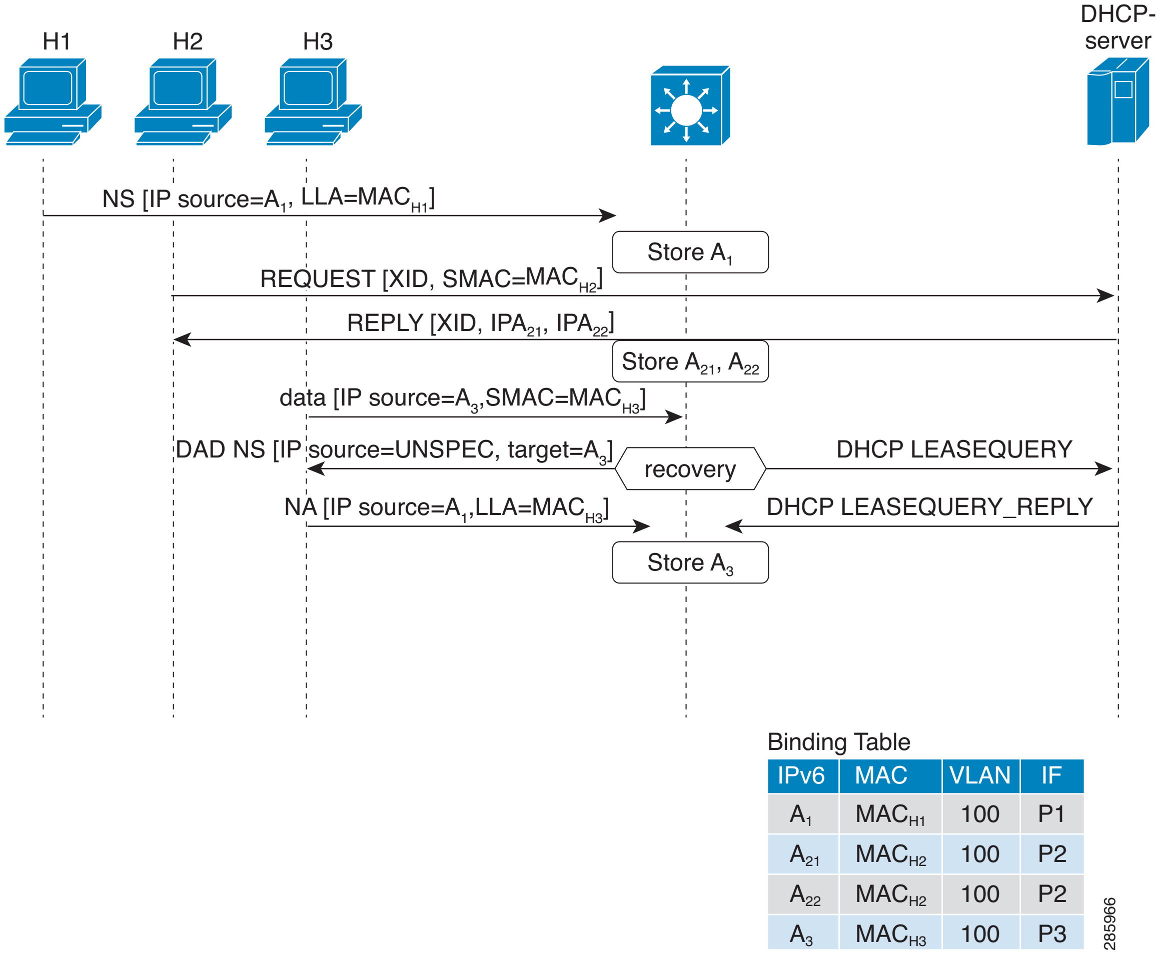
IPv6 Device Tracking

The IPv6 Device Tracking feature provides IPv6 host liveness tracking so that a neighbor table can be immediately updated when an IPv6 host disappears. The feature tracks the liveness of the neighbors connected through the Layer 2 device on a regular basis in order to revoke network access privileges as they become inactive.

IPv6 Address Glean

IPv6 address glean is the foundation for many other IPv6 features that depend on an accurate binding table. It inspects ND and DHCP messages on a link to glean addresses, and then populates the binding table with these addresses. This feature also enforces address ownership and limits the number of addresses any given node is allowed to claim.

The following figure shows how IPv6 address glean works.


H1
H2
H3
DHCP-server
NS [IP source=A_1, LLA=MAC_{H1}]
Store A_1
REQUEST [XID, SMAC=MAC_{H2}]
REPLY [XID, IPA_{21}, IPA_{22}]
Store A_{21}, A_{22}
data [IP source=A_3,SMAC=MAC_{H3}]
DAD NS [IP source=UNSPEC, target=A_3]
recovery
DHCP LEASEQUERY
NA [IP source=A_1,LLA=MAC_{H3}]
DHCP LEASEQUERY_REPLY
Store A_3
Binding Table
285966

IPv6	MAC	VLAN	IF
A_1	MAC_{H1}	100	P1
A_{21}	MAC_{H2}	100	P2
A_{22}	MAC_{H2}	100	P2
A_3	MAC_{H3}	100	P3

How to Configure IPv6 Snooping

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- Configuring IPv6 Device Tracking, page 9
- Configuring IPv6 Address Glean, page 16

Configuring IPv6 ND Inspection

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ipv6 snooping policy** *snooping-policy*
4. **ipv6 snooping attach-policy** *snooping-policy*

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**ipv6 snooping policy** *snooping-policy* **Example:** `Device(config)# ipv6 snooping policy policy1`	Configures an IPv6 snooping policy and enters IPv6 snooping configuration mode.
Step 4	**ipv6 snooping attach-policy** *snooping-policy* **Example:** `Device(config-ipv6-snooping)# ipv6 snooping attach-policy policy1`	Attaches the IPv6 snooping policy to a target.

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- Applying IPv6 ND Inspection on an Interface, page 7
- Verifying and Troubleshooting IPv6 ND Inspection, page 8

Configuring IPv6 ND Inspection Globally

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ipv6 nd inspection policy** *policy-name*
4. **drop-unsecure**
5. **sec-level minimum** *value*
6. **device-role** {**host** | **monitor** | **router**}
7. **tracking** {**enable** [**reachable-lifetime** {*value* | **infinite**}] | **disable** [**stale-lifetime** {*value* | **infinite**}]}
8. **trusted-port**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**ipv6 nd inspection policy** *policy-name* **Example:** `Device(config)# ipv6 nd inspection policy policy1`	Defines the ND inspection policy name and enters ND inspection policy configuration mode.
Step 4	**drop-unsecure** **Example:** `Device(config-nd-inspection)# drop-unsecure`	Drops messages with no options, invalid options, or an invalid signature.
Step 5	**sec-level minimum** *value* **Example:** `Device(config-nd-inspection)# sec-level minimum 2`	Specifies the minimum security level parameter value when cryptographically generated address (CGA) options are used.

Step 6	**device-role** {**host** | **monitor** | **router**}
	Example:
	`Device(config-nd-inspection)# device-role monitor`
		Specifies the role of the device attached to the port.

Step 7	**tracking** {**enable** [**reachable-lifetime** {*value* | **infinite**}] | **disable** [**stale-lifetime** {*value* | **infinite**}]}
	Example:
	`Device(config-nd-inspection)# tracking disable stale-lifetime infinite`
		Overrides the default tracking policy on a port.

	Command or Action	Purpose
Step 8	**trusted-port** **Example:** `Device(config-nd-inspection)# trusted-port`	Configures a port to become a trusted port.

Applying IPv6 ND Inspection on an Interface

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type number*
4. **ipv6 nd inspection** [**attach-policy** [**policy** *policy-name*] | **vlan** {**add** | **except** | **none** | **remove** | **all**} *vlan* [*vlan1, vlan2, vlan3*...]]

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**interface** *type number* **Example:** `Device(config)# interface fastethernet 0/0`	Specifies an interface type and number and enters interface configuration mode.
Step 4	**ipv6 nd inspection** [**attach-policy** [**policy** *policy-name*] | **vlan** {**add** | **except** | **none** | **remove** | **all**} *vlan* [*vlan1, vlan2, vlan3*...]] **Example:** `Device(config-if)# ipv6 nd inspection`	Applies the ND Inspection feature on the interface.

Verifying and Troubleshooting IPv6 ND Inspection

SUMMARY STEPS

1. **enable**
2. **show ipv6 snooping capture-policy** [**interface** *type number*]
3. **show ipv6 snooping counter** [**interface** *type number*]
4. **show ipv6 snooping features**
5. **show ipv6 snooping policies** [**interface** *type number*]
6. **debug ipv6 snooping** [**binding-table** | **classifier** | **errors** | **feature-manager** | **filter** *acl* | **ha** | **hw-api** | **interface** *interface* | **memory** | **ndp-inspection** | **policy** | **vlan** *vlanid* | **switcher** | **filter** *acl* | **interface** *interface* | *vlanid*]

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**show ipv6 snooping capture-policy** [**interface** *type number*] **Example:** `Device# show ipv6 snooping capture-policy interface ethernet 0/0`	Displays snooping ND message capture policies.
Step 3	**show ipv6 snooping counter** [**interface** *type number*] **Example:** `Device# show ipv6 snooping counter interface FastEthernet 4/12`	Displays information about the packets counted by the interface counter.
Step 4	**show ipv6 snooping features** **Example:** `Device# show ipv6 snooping features`	Displays information about snooping features configured on the device.
Step 5	**show ipv6 snooping policies** [**interface** *type number*] **Example:** `Device# show ipv6 snooping policies`	Displays information about the configured policies and the interfaces to which they are attached.

	Command or Action	Purpose
Step 6	**debug ipv6 snooping** [**binding-table** | **classifier** | **errors** | **feature-manager** | **filter** *acl* | **ha** | **hw-api** | **interface** *interface* | **memory** | **ndp-inspection** | **policy** | **vlan** *vlanid* | **switcher** | **filter** *acl* | **interface** *interface* | *vlanid*] **Example:** `Device# debug ipv6 snooping`	Enables debugging for snooping information in IPv6.

Configuring IPv6 Device Tracking

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- Configuring IPv6 Device Tracking, page 15

Configuring IPv6 First-Hop Security Binding Table Recovery

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ipv6 neighbor binding vlan** *vlan-id* {**interface** *type number* | *ipv6-address* | *mac-address*} [**tracking** [**disable** | **enable** | **retry-interval** *value*] | **reachable-lifetime** *value*]
4. **ipv6 neighbor binding max-entries** *entries* [**vlan-limit** *number* | **interface-limit** *number* | **mac-limit** *number*]
5. **ipv6 neighbor binding logging**
6. **exit**
7. **show ipv6 neighbor binding** [**vlan** *vlan-id* | **interface** *type number* | **ipv6** *ipv6-address* | **mac** *mac-address*]

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.

	Command or Action	Purpose
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**ipv6 neighbor binding vlan** *vlan-id* {**interface** *type number* | *ipv6-address* | *mac-address*} [**tracking** [**disable** | **enable** | **retry-interval** *value*] | **reachable-lifetime** *value*] **Example:** `Device(config)# ipv6 neighbor binding vlan 100 interface Ethernet 0/0 reachable-lifetime 100`	Adds a static entry to the binding table database.
Step 4	**ipv6 neighbor binding max-entries** *entries* [**vlan-limit** *number* | **interface-limit** *number* | **mac-limit** *number*] **Example:** `Device(config)# ipv6 neighbor binding max-entries 100`	Specifies the maximum number of entries that are allowed to be inserted in the binding table cache.
Step 5	**ipv6 neighbor binding logging** **Example:** `Device(config)# ipv6 neighbor binding logging`	Enables the logging of binding table main events.
Step 6	**exit** **Example:** `Device(config)# exit`	Exits global configuration mode and enters privileged EXEC mode.
Step 7	**show ipv6 neighbor binding** [**vlan** *vlan-id* | **interface** *type number* | **ipv6** *ipv6-address* | **mac** *mac-address*] **Example:** `Device# show ipv6 neighbor binding`	Displays the contents of a binding table.

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- Associating Recovery Protocols with Prefix Lists, page 14

Configuring the IPv6 First-Hop Security Binding Table Recovery Mechanism

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ipv6 neighbor binding vlan** *vlan-id ipv6-address* **interface** *type number*
4. **ipv6 prefix-list** *list-name* **permit** *ipv6-prefix/prefix-length* **ge** *ge-value*
5. **ipv6 snooping policy** *snooping-policy-id*
6. **destination-glean** {**recovery** | **log-only**} [**dhcp**]
7. **protocol dhcp** [**prefix-list** *prefix-list-name*]
8. **exit**
9. **ipv6 destination-guard policy** *policy-name*
10. **enforcement** {**always** | **stressed**}
11. **exit**
12. **ipv6 dhcp guard policy** *policy-name*
13. **device-role server**
14. **exit**
15. **vlan configuration** *vlan-list-id*
16. **ipv6 snooping attach-policy** *policy-name*
17. **ipv6 destination-guard attach-policy** *policy-name*
18. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**ipv6 neighbor binding vlan** *vlan-id ipv6-address* **interface** *type number* **Example:** `Device(config)# ipv6 neighbor binding vlan 100 2001:db8::1 interface ethernet3/0`	Adds a static entry to the binding table database.

	Command or Action	Purpose
Step 4	**ipv6 prefix-list** *list-name* **permit** *ipv6-prefix/prefix-length* **ge** *ge-value* **Example:** `Device(config)# ipv6 prefix-list abc permit 2001:DB8::/64 ge 128`	Creates an entry in an IPv6 prefix list.
Step 5	**ipv6 snooping policy** *snooping-policy-id* **Example:** `Device(config)# ipv6 snooping policy xyz`	Enters IPv6 snooping configuration mode and allows you to modify the configuration of the snooping policy specified.
Step 6	**destination-glean** {**recovery** | **log-only**} [**dhcp**] **Example:** `Device(config-ipv6-snooping)# destination-glean recovery dhcp`	Specifies that destination addresses should be recovered from DHCP. **Note** If logging (without recovery) is required, use the **destination-glean log-only** command.
Step 7	**protocol dhcp** [**prefix-list** *prefix-list-name*] **Example:** `Device(config-ipv6-snooping)# protocol dhcp prefix-list abc`	(Optional) Specifies that addresses should be gleaned with DHCP and associates the protocol with a specific IPv6 prefix list.
Step 8	**exit** **Example:** `Device(config-ipv6-snooping)# exit`	Exits IPv6 snooping configuration mode and returns to global configuration mode.
Step 9	**ipv6 destination-guard policy** *policy-name* **Example:** `Device(config)# ipv6 destination-guard policy xyz`	(Optional) Enters destination guard configuration mode and allows you to modify the configuration of the specified destination guard policy.

Step 10	**enforcement** {**always** | **stressed**}
	Example:
	`Device(config-destguard)# enforcement stressed`
		Sets the enforcement level of the policy to be either enforced under all conditions or only when the system is under stress.

	Command or Action	Purpose
Step 11	**exit** **Example:** `Device(config-destguard)# exit`	Exits destination guard configuration mode and returns to global configuration mode.
Step 12	**ipv6 dhcp guard policy** *policy-name* **Example:** `Device(config)# ipv6 dhcp guard policy server_side`	Enters DHCP guard configuration mode and allows you to modify the configuration of the specified DHCP guard policy.
Step 13	**device-role server** **Example:** `Device(config-dhcp-guard)# device-role server`	Sets the role of the device that is attached to the server.
Step 14	**exit** **Example:** `Device(config-destguard)# exit`	Exits DHCP guard configuration mode and returns to global configuration mode.
Step 15	**vlan configuration** *vlan-list-id* **Example:** `Device(config)# vlan configuration 100`	Enters VLAN configuration mode and allows you to modify the configuration of the specified VLAN.
Step 16	**ipv6 snooping attach-policy** *policy-name* **Example:** `Device(config-vlan-config)# ipv6 snooping attach-policy xyz`	Attaches the IPv6 snooping policy to a VLAN.
Step 17	**ipv6 destination-guard attach-policy** *policy-name* **Example:** `Device(config-vlan-config)# ipv6 destination-guard attach-policy xyz`	Attaches the destination guard policy to the specified VLAN. **Note** For information about how to configure an IPv6 destination guard policy, see the “IPv6 Destination Guard” module.

	Command or Action	Purpose

Step 18	**end**
	Example:
	`Device(config-vlan-config)# end`
		Exits VLAN configuration mode and returns to privileged EXEC mode.

Associating Recovery Protocols with Prefix Lists

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ipv6 snooping policy** *snooping-policy-id*
4. **protocol** {**dhcp** | **ndp**} [**prefix-list** *prefix-list-name*]
5. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**ipv6 snooping policy** *snooping-policy-id* **Example:** `Device(config)# ipv6 snooping policy 200`	Enters IPv6 snooping configuration mode and allows you to modify the configuration of the snooping policy specified.
Step 4	**protocol** {**dhcp** | **ndp**} [**prefix-list** *prefix-list-name*] **Example:** `Device(config-ipv6-snooping)# protocol dhcp prefix-list dhcp_prefix_list`	Associates a recovery protocol (DHCP or NDP) with a prefix list.

	Command or Action	Purpose

Step 5	**end**
	Example:
	`Device(config-ipv6-snooping)# exit`
		Exits IPv6 snooping configuration mode and returns to privileged EXEC mode.

Configuring IPv6 Device Tracking

Perform this task to provide fine tuning for the life cycle of an entry in the binding table for the IPv6 Device Tracking feature. For IPv6 device tracking to work, the binding table needs to be populated.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ipv6 neighbor tracking** [**retry-interval** *value*]

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**ipv6 neighbor tracking** [**retry-interval** *value*] **Example:** `Device(config)# ipv6 neighbor tracking`	Tracks entries in the binding table.

Configuring IPv6 Address Glean

Note You must configure an IPv6 snooping policy and attach the policy to a target before configuring IPv6 address glean.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ipv6 snooping policy** *snooping-policy*
4. **ipv6 snooping attach-policy** *snooping-policy*
5. **prefix-glean** [**only**]

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**ipv6 snooping policy** *snooping-policy* **Example:** `Device(config)# ipv6 snooping policy policy1`	Configures an IPv6 snooping policy and enters IPv6 snooping configuration mode.
Step 4	**ipv6 snooping attach-policy** *snooping-policy* **Example:** `Device(config-ipv6-snooping)# ipv6 snooping attach-policy policy1`	Attaches the IPv6 snooping policy to a target.
Step 5	**prefix-glean** [**only**] **Example:** `Device(config-ipv6-snooping)# prefix-glean`	Enables the device to glean prefixes from IPv6 RAs or DHCPv6.

Configuration Examples for IPv6 Snooping

Example: Configuring IPv6 ND Inspection

```
Device(config)# ipv6 snooping policy policy1
Device(config-ipv6-snooping)# ipv6 snooping attach-policy policy1
Device(config-ipv6-snooping)# exit
.
.
.
Device# show ipv6 snooping policies policy1
Policy policy1 configuration:
  trusted-port
  device-role node
Policy applied on the following interfaces:
   Et0/0                vlan all
   Et1/0       vlan all
Policy applied on the following vlans:
   vlan 1-100,200,300-400
```

Example: Configuring IPv6 ND Inspection and RA Guard

This example provides information about an interface on which both the Neighbor Discovery Inspection and RA Guard features are configured:

```
Device# show ipv6 snooping capture-policy interface ethernet 0/0

Hardware policy registered on Ethernet 0/0
Protocol     Protocol value   Message    Value     Action    Feature
ICMP         58               RS         85        punt      RA Guard
                                                   punt      ND Inspection
ICMP         58               RA         86        drop      RA guard
                                                   punt      ND Inspection
ICMP         58               NS         87        punt      ND Inspection
ICM          58               NA         88        punt      ND Inspection
ICMP         58               REDIR      89        drop      RA Guard
                                                   punt      ND Inspection
```

Example: Configuring IPv6 Binding Table Content

```
ipv6 neighbor binding vlan 100 ethernet 0/0 reachable-entries 100
 ipv6 neighbor binding max-entries 100
 ipv6 neighbor binding logging
 exit
```

Example: Configuring IPv6 First-Hop Security Binding Table Recovery

```
ipv6 dhcp-client leasequery server 2001:db8::1 vlan 100
ipv6 neighbor binding vlan 100 2001:db8::1 interface ethernet3/0
```

```
ipv6 prefix-list abc permit 2001:DB8::/64 ge 128
ipv6 snooping policy xyz
destination-glean recovery dhcp
protocol dhcp prefix-list abc
 ipv6 destination-guard policy xyz
 exit

ipv6 dhcp guard policy server_side
 device-role server

vlan configuration 100
 ipv6 snooping attach-policy xyz
 ipv6 destination-guard attach-policy xyz

interface ethernet3/0
 switchport
 switchport access vlan 100
 switchport mode access
 duplex auto
 ipv6 dhcp guard attach-policy server_side

interface vlan100
 no ip address
 ipv6 address 2001:DB8::100/64
```

Example: Associating Recovery Protocols with Prefix Lists

The following example shows that NDP will be used for the recovery for all addresses and that DHCP will be used to recover addresses that match the prefix list called dhcp_prefix_list:

```
Device(config-ipv6-snooping)# protocol ndp
Device(config-ipv6-snooping)# protocol dhcp prefix-list dhcp_prefix_list
```

Example: Verifying IPv6 Device Tracking

```
Device# show ipv6 neighbor

    IPv6 address                Link-Layer addr Interface vlan prlvl age   state      Time
left
ND  FE80::A8BB:CCFF:FE01:F500  AABB.CC01.F500  Et0/0     100  0002    0   REACHABLE  8850
L   FE80::21D:71FF:FE99:4900   001D.7199.4900  Vl100     100  0080 7203   DOWN       N/A
ND  2001:600::1                AABB.CC01.F500  Et0/0     100  0003    0   REACHABLE  3181
ND  2001:300::1                AABB.CC01.F500  Et0/0     100  0007    0   REACHABLE  9559
L   2001:400::1                001D.7199.4900  Vl100     100  0080 7188   DOWN       N/A
```

Additional References

Related Documents

Related Topic	Document Title
IPv6 addressing and connectivity	*IPv6 Addressing and Basic Connectivity Configuration Guide*
Cisco IOS commands	Cisco IOS Master Command List, All Releases
IPv6 commands	*Cisco IOS IPv6 Command Reference*

Related Topic	Document Title
Cisco IOS IPv6 features	Cisco IOS IPv6 Feature Mapping

Standards and RFCs

Standard/RFC	Title
RFCs for IPv6	*IPv6 RFCs*

MIBs

MIB	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for IPv6 Snooping

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 1 Feature Information for IPv6 Snooping

Feature Name	Releases	Feature Information
IPv6 Snooping	12.2(50)SY 15.0(1)SY 15.0(2)SE 15.1(2)SG 15.3(1)S Cisco IOS XE Release 3.2SE Cisco IOS XE Release 3.8S	IPv6 snooping bundles several Layer 2 IPv6 first-hop security features, including IPv6 ND inspection, IPv6 device tracking, IPv6 address glean, and IPv6 first-hop security binding table recovery, to provide security and scalability. IPv6 snooping operates at Layer 2, or between Layer 2 and Layer 3, to provide IPv6 functions with security and scalability. The following commands were introduced or modified: **debug ipv6 snooping**, **destination-glean**, **device-role**, **drop-unsecure**, **ipv6 nd inspection**, **ipv6 nd inspection policy**, **ipv6 neighbor binding logging**, **ipv6 neighbor binding max-entries**, **ipv6 neighbor binding vlan**, **ipv6 neighbor tracking**, **ipv6 snooping attach-policy**, **ipv6 snooping policy**, **prefix-glean**, **protocol (IPv6)**, **sec-level minimum**, **show ipv6 neighbor binding**, **show ipv6 snooping capture-policy**, **show ipv6 snooping counters**, **show ipv6 snooping features**, **show ipv6 snooping policies**, **tracking**, **trusted-port**.

Any Internet Protocol (IP) addresses and phone numbers used in this document are not intended to be actual addresses and phone numbers. Any examples, command display output, network topology diagrams, and other figures included in the document are shown for illustrative purposes only. Any use of actual IP addresses or phone numbers in illustrative content is unintentional and coincidental.