



Autonomic Networking

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autonomic adjacency-discovery

To enable adjacency discovery (neighbor discovery) on an interface, use the **autonomic adjacency-discovery** command in interface configuration mode. To disable adjacency discovery, use the **no** form of this command.

autonomic adjacency-discovery

no autonomic adjacency-discovery

Command Default Adjacency discovery is not enabled.

Command Modes Interface configuration (config-if)

Command History

Release	Modification
	This command was introduced.

Examples

To enable adjacency discovery:

```
Device(config)# interface Tunnel100
Device(config-if)# autonomic adjacency-discovery
```

autonomic connect

To connect a non autonomic device to autonomic domain use the **autonomic connect** command in interface configuration mode. To disconnect a device from the domain, use the **no** form of this command.

autonomic connect

no autonomic connect

Command Default Device is not connected to the domain.

Command Modes Interface configuration (config-if)

Release	Modification
	This command was introduced.

Usage Guidelines You need to configure **no switchport** on the interface before configuring the **autonomic connect** command.

Examples To connect a non autonomic device to autonomic domain :

```
Device > enable
Device# configure terminal
Device(config)# int gig 1/0/1
Device(config-if)# no switchport
Device(config-if)# autonomic connect
Device(config-if)# ipv6 address 5000::1/64
```

clear autonomic

To clear or reset autonomic information, use the **clear autonomic** command in privileged EXEC configuration mode.

clear autonomic {*device*| *neighbor neighbor's UDI*| *registrar accepted-device device UDI*}

Syntax Description

device	Clears or resets device information.
neighbor <i>udi</i>	Clears or resets neighbor information.
registrar accepted-device <i>udi</i>	Clears public key stored for each enrolled device

Command Default

No default behavior or values.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
	This command was introduced.

Usage Guidelines

The **clear autonomic device** command clears or resets all device-specific autonomic information, including the information obtained in the bootstrapping process. The **clear autonomic neighbor** command clears the neighbor-related information learned during the neighbor discovery. If no neighbor is specified, the command clears the entire neighbor database. The **clear registrar accepted-device** clears the public key stored for each device enrolled by the registrar.

Examples

To clear all device-specific autonomic information:

```
Device #clear autonomic device

% invoke syslog_an_delete_host: vrf cisco_autonomic
discriminator
Device#
Jul 15 05:55:53.987: %SYS-5-CONFIG I: Configured from console by console
Jul 15 05:55:53.988: %PKI-4-NOCONFIGNOTOSAVE: Configuration was modified. Issue "write
memory" to save new IOS PKI configuration
Jul 15 05:55:53.990: %AN-6-ACP_DIKE_TO_NBR_REMOVED: Removed DIKE on ACP Tunnel100000 from
Device (Addr FD08:2EEF:C2EE:0:E865:493B:ACFB:7) to Neighbor (Addr
FD08:2EEF:C2EE:0:E865:493B:ACFB:5) connected on interface GigabitEthernet1/0/3
Jul 15 05:55:54.006: %AN-6-ACP_CHANNEL_TO_NBR_REMOVED: Removed ACP Tunnel100000 from Device
(Addr FD08:2EEF:C2EE:0:E865:493B:ACFB:7) to Neighbor (Addr FD08:2EEF:C2EE:0:E865:493B:ACFB:5)
connected on interface GigabitEthernet1/0/3
Jul 15 05:55:54.015: %SYS-5-CONFIG I: Configured from console by console
Jul 15 05:55:54.016: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback100000, changed
state to down
```

```
Jul 15 05:55:54.097: %SYS-5-CONFIG_I: Configured from console by console
Jul 15 05:55:54.104: %AN-5-NBR_LOST: Device with ACP (Addr FD08:2EEF:C2EE:0:E865:493B:ACFB:7)
lost connectivity to its Neighbor (Addr FD08:2EEF:C2EE:0:E865:493B:ACFB:5) on interface
GigabitEthernet1/0/3
Jul 15 05:55:54.113: %AN-5-CD_STATE_CHANGED: L2 Channel (0) Removed - Our Intf
(GigabitEthernet1/0/3), Nbr UDI (PID:WS-C3850-24U SN:FCW1934D05Z), Nbr Intf
(GigabitEthernet1/0/3)
Jul 15 05:55:56.004: %LINEPROTO-5-UPDOWN: Line protocol on Interface Tunnel100000, changed
state to down
Jul 15 05:55:56.005: %LINK-5-CHANGED: Interface Tunnel100000, changed state to
administratively down
Jul 15 05:56:04.128: %AN-6-UDI_AVAILABLE: UDI - PID:WS-C3650-24TD SN:FDO1942E1YK
Jul 15 05:56:36.306: %AN-5-CD_STATE_CHANGED: L2 Channel (0) Created - Our Intf
(GigabitEthernet1/0/3), Nbr UDI (PID:WS-C3850-24U SN:FCW1934D05Z), Nbr Intf
(GigabitEthernet1/0/3)
Jul 15 05:56:36.310: %LINK-3-UPDOWN: Interface ANI1, changed state to up
Jul 15 05:56:37.294: %LINEPROTO-5-UPDOWN: Line protocol on Interface ANI1, changed state
to up
Jul 15 05:56:44.138: %AN-5-NBR_ADDED: Device with UDI (PID:WS-C3850-24U SN:FCW1934D05Z) is
added as a Neighbor to Device with (Addr UNKNOWN) on the interface GigabitEthernet1/0/3
Jul 15 05:56:44.146: %SYS-5-CONFIG_I: Configured from console by console
Jul 15 05:56:44.148: %SYS-5-CONFIG_I: Configured from console by console
Jul 15 05:56:44.150: %SYS-5-CONFIG_I: Configured from console by console
Jul 15 05:56:44.247: %SYS-5-CONFIG_I: Configured from console by console
Jul 15 05:56:44.258: %SYS-5-CONFIG_I: Configured from console by console
Jul 15 05:56:44.269: %PKI-4-NOCONFIGAUTOSAVE: Configuration was modified. Issue "write
memory" to save new IOS PKI configuration
Jul 15 05:57:04.897: %CRYPTO-6-AUTOGEN: Generated new 3072 bit key pair
Jul 15 05:57:05.359: %SYS-5-CONFIG_I: Configured from console by console
Jul 15 05:57:05.815: %PKI-4-NOCONFIGAUTOSAVE: Configuration was modified. Issue "write
memory" to save new IOS PKI configuration
Jul 15 05:57:05.817: %SYS-5-CONFIG_I: Configured from console by console
Jul 15 05:57:05.830: %SYS-5-CONFIG_I: Configured from console by console
Jul 15 05:57:05.840: %PKI-4-NOCONFIGAUTOSAVE: Configuration was modified. Issue "write
memory" to save new IOS PKI configuration
Jul 15 05:57:05.841: %SYS-5-CONFIG_I: Configured from console by console
Jul 15 05:57:06.308: %PKI-4-NOCONFIGAUTOSAVE: Configuration was modified. Issue "write
memory" to save new IOS PKI configuration
Jul 15 05:57:06.311: %SYS-5-CONFIG_I: Configured from console by console
Jul 15 05:57:06.313: %SYS-5-CONFIG_I: Configured from console by console
Jul 15 05:57:06.314: %SYS-5-CONFIG_I: Configured from console by console
Jul 15 05:57:06.810: %SYS-5-CONFIG_I: Configured from console by console
Jul 15 05:57:06.811: %PKI-4-NOCONFIGAUTOSAVE: Configuration was modified. Issue "write
memory" to save new IOS PKI configuration
Jul 15 05:57:06.811: %AN-5-DEVICE_BOOTSTRAPPED_BY_ANR: Device with UDI (PID:WS-C3650-24TD
SN:FDO1942E1YK) and (Addr FD08:2EEF:C2EE:0:E865:493B:ACFB:7) has been boot trapped by
autonomic registrar, in autonomic domain cisco.com
Jul 15 05:57:06.815: %AN-6-ACP_VRF_GLOBAL_CREATE_SUCCESS: Device UDI (PID:WS-C3650-24TD
SN:FDO1942E1YK) Autonomic VRF created globally vrf name cisco_autonomic, vrf id 3
Jul 15 05:57:06.823: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback100000, changed
state to up
Jul 15 05:57:06.828: %AN-6-ACP_VRF_INTERFACE_CREATE_SUCCESS: Device UDI (PID:WS-C3650-24TD
SN:FDO1942E1YK) Autonomic VRF created successfully on interface Loopback100000, vrf name
cisco_autonomic, vrf id 3
Jul 15 05:57:06.837: %SYS-5-CONFIG_I: Configured from console by console
Jul 15 05:57:06.840: %SYS-5-CONFIG_I: Configured from console by console
Jul 15 05:57:06.842: %SYS-5-CONFIG_I: Configured from console by console
Jul 15 05:57:06.842: %PKI-4-NOCONFIGAUTOSAVE: Configuration was modified. Issue "write
memory" to save new IOS PKI configuration
Jul 15 05:57:07.905: %LINEPROTO-5-UPDOWN: Line protocol on Interface Tunnel100001, changed
state to up
Jul 15 05:57:08.159: %CRYPTO-6-IKMP_NO_ID_CERT_ADDR_MATCH: (NOT ERROR BUT WARNING ONLY) ID
of FE80::3A20:56FF:FEF3:7158 (type 5) and certificate addr with
Jul 15 05:57:08.160: %CRYPTO-6-IKMP_NO_ID_CERT_ADDR_MATCH: (NOT ERROR BUT WARNING ONLY) ID
of FE80::3A20:56FF:FEF3:7158 (type 5) and certificate addr with
Jul 15 05:57:11.959: %SYS-5-CONFIG_I: Configured from console by console
Jul 15 05:57:11.960: %PKI-4-NOCONFIGAUTOSAVE: Configuration was modified. Issue "write
memory" to save new IOS PKI configuration
Jul 15 05:57:11.963: %SYS-5-CONFIG_I: Configured from console by console
```

debug autonomic

To enable debugging of autonomic information, use the **debug autonomic** command in privileged EXEC mode. To stop the debugging, use the **no** form of this command.

```
debug autonomic {Bootstrap| Channel-Discovery| Infra| Intent| Neighbor-Discovery| Registrar| Services}
{aaa| all| database| events| ntp| packets} {info| moderate| severe}
```

```
no debug autonomic {Bootstrap| Channel-Discovery| Infra| Intent| Neighbor-Discovery| Registrar|
Services} {aaa| all| database| events| ntp| packets} {info| moderate| severe}
```

Syntax Description

bootstrap	Enables debugging of bootstrapping information.
Channel-Discovery	Enables debugging of channel discovery information
Infra	Enables debugging of infra information.
Intent	Enables debugging of intent information.
Neighbor-Discovery	Enables debugging of neighbor information.
Registrar	Enables debugging of registrar information.
Services	Enables debugging of autonomic services information.
aaa	Enables debugging authentication, authorization, and accounting information.
all	Enables all debugging.
events	Provides information about autonomic events.
ntp	Enables debugging of Network Time Protocol (NTP) information.
packets	Provides information about autonomic packets.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
	This command was introduced.

Usage Guidelines

Use this command to debug the autonomic networking information.

show autonomic control-plane

To display information about the autonomic control plane, use the **show autonomic control-plane** command in privileged EXEC mode.

show autonomic control-plane [detail]

Syntax Description	detail (Optional) Displays detailed information.				
Command Modes	Privileged EXEC (#)				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td></td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification		This command was introduced.
Release	Modification				
	This command was introduced.				

Examples

To display information about the autonomic control plane:

```
Device# show autonomic control-plane

VRF Name                cisco_autonomic
Device Address          FD08:2EEF:C2EE:0:E865:493B:ACFB:7
RPL                     floating-node, Dag-id = FD08:2EEF:C2EE:0:E865:493B:ACFB:5
```

```
Neighbor                ACP                Channel ACP Security
-----
PID:WS-C3850-24U SN:FCW1934D05Z Tunnel100002 DIKE
```

To display information about the autonomic control plane in detail:

```
Device# show autonomic control-plane detail

VRF Name                cisco_autonomic
Device Address          FD08:2EEF:C2EE:0:E865:493B:ACFB:7
RPL                     grounded-node, Dag-id = FD08:2EEF:C2EE:0:E865:493B:ACFB:1

Neighbor: PID:WS-C3850-24U SN:FCW1934D05Z
Uptime(Created Time): 00:12:16 ( 2016-07-15 05:38:53 UTC)
Supported ACP Channel: IPv6 GRE Tunnel
Negotiated ACP Channel: IPv6 GRE Tunnel
Tunnel Name Tunnel100000
Tunnel Source Interface ANI1
Tunnel Source FE80::5AAC:78FF:FE09:F383
Tunnel Destination FE80::3A20:56FF:FEF3:7158
Supported ACP Security: IPsec, DIKE
Negotiated ACP Security: DIKE
```

The following table describes the significant fields shown in the display.

Table 1: show autonomic control-plane Field Descriptions

Field	Description
VRF Name	VPN routing and forwarding (VRF) name.
Device Address	IPv6 address.
RPL	RPL node details.
Neighbor	Unique Device Identifier (UDI) of the neighbor.
Tunnel Name	Tunnel name.
Tunnel Source Interface	IP address of the source tunnel interface.
Tunnel Source	IP address of the tunnel source.
Tunnel Destination	IP address of the destination.

show autonomic device

To display the autonomic device information, use the **show autonomic device** command in privileged EXEC mode.

show autonomic device

Syntax Description This command has no arguments or keywords.

Command Modes Privileged EXEC (#)

Release	Modification
	This command was introduced.

Examples To display the autonomic device information:

```
Device# show autonomic device

      Status                Enabled
      Type                  Autonomic Node
      UDI                   PID:WS-C3650-24TD SN:FDO1942E1YK
      Device ID             e865.493b.acfb-7
      Domain ID             cisco.com
      Domain Certificate    (sub:) ou=cisco.com+serialNumber=PID:WS-C3650-24TD
SN:FDO1942E1YK,cn=e865.493b.acfb-7
      Certificate Serial Number 09
      Device Address          FD08:2EEF:C2EE:0:E865:493B:ACFB:7
      Domain Cert is Valid
```

show autonomic interfaces

To display information about the autonomic interfaces, use the **show autonomic interfaces** command in privileged EXEC mode.

show autonomic interfaces

Syntax Description This command has no arguments or keywords.

Command Modes Privileged EXEC (#)

Command History

Release	Modification
	This command was introduced.

Examples

To display information about the autonomic interfaces:

Device# **show autonomic interfaces**

Interface	Channel Disc	AD Enabled	Intf Type
GigabitEthernet0/0	None	No	L2 untagged If
GigabitEthernet1/0/1	None	No	L2 untagged If
GigabitEthernet1/0/2	None	No	L2 untagged If
GigabitEthernet1/0/3	Probing	No	L2 untagged If
GigabitEthernet1/0/4	None	No	L2 untagged If
GigabitEthernet1/0/5	None	No	L2 untagged If
GigabitEthernet1/0/6	None	No	L2 untagged If
GigabitEthernet1/0/7	None	No	L2 untagged If
GigabitEthernet1/0/8	None	No	L2 untagged If
GigabitEthernet1/0/9	None	No	L2 untagged If
GigabitEthernet1/0/10	None	No	L2 untagged If
GigabitEthernet1/0/11	None	No	L2 untagged If
GigabitEthernet1/0/12	None	No	L2 untagged If
GigabitEthernet1/0/13	None	No	L2 untagged If
GigabitEthernet1/0/14	None	No	L2 untagged If
GigabitEthernet1/0/15	None	No	L2 untagged If
GigabitEthernet1/0/16	None	No	L2 untagged If
GigabitEthernet1/0/17	None	No	L2 untagged If
GigabitEthernet1/0/18	None	No	L2 untagged If
GigabitEthernet1/0/19	None	No	L2 untagged If
GigabitEthernet1/0/20	None	No	L2 untagged If
GigabitEthernet1/0/21	None	No	L2 untagged If
GigabitEthernet1/0/22	None	No	L2 untagged If
GigabitEthernet1/0/23	None	No	L2 untagged If
GigabitEthernet1/0/24	None	No	L2 untagged If
GigabitEthernet1/1/1	None	No	L2 untagged If
GigabitEthernet1/1/2	None	No	L2 untagged If
TenGigabitEthernet1/1/3	None	No	L2 untagged If
TenGigabitEthernet1/1/4	None	No	L2 untagged If
Vlan1	None	No	Virtual If
ANI1	None	Yes	Virtual If
Loopback100000	None	No	Virtual If
Tunnel100002	None	No	Virtual If

The following table describes the significant fields shown in the display.

Table 2: show autonomic interface Field Descriptions

Field	Description
Interface	Interface name.
Channel Disc	Channel discovery.
AD Enabled	

show autonomic intent

To verify the configured intent range, use the **show autonomic intent** command in privileged EXEC mode.

show autonomic intent

Syntax Description This command has no arguments or keywords.

Command Modes Privileged EXEC (#)

Command History

Release	Modification
	This command was introduced.

Usage Guidelines

Intent is automatically sent to all nodes in an autonomic domain. So, every node should show the same intent

Examples

To display information about the configured intent range:

```
Device# show autonomic intent

Intent File : Available
Version Num : 1443520505 (Parsed)
Version Time: 2015-09-29 09:55:05 UTC
Outer Vlans : 30-35,40,45
Outer Vlans count : 8
```

show autonomic l2-channels

To display the results of Channel Discovery, use the **show autonomic l2-channels** command in privileged EXEC mode.

show autonomic l2-channels

Syntax Description This command has no arguments or keywords.

Command Modes Privileged EXEC (#)

Command History

Release	Modification
	This command was introduced.

Examples

To display the results of Channel Discovery:

```
Device# show autonomic l2-channels
```

```
AN L2 Channel Discovery Info :
Nbr UDI                               Encap   Our Intf   State   Retry
-----
PID:WS-C3850-24U SN:FCW1934D05Z  4018   Gi1/0/3   Active  1
```

To display more detailed information:

```
Device# show autonomic l2-channels detail
```

```
AN L2 Channel Discovery Info :
-----
Nbr UDI           : PID:WS-C3850-24U SN:FCW1934D05Z
ANI Intf          : ANI1
Encap             : 0
Nbr Intf          : GigabitEthernet1/0/3
Our Intf          : GigabitEthernet1/0/3
Keepalives Missed : 0
Channel Status    : Active
```

show autonomic service

To verify the service announcements distributed over the Autonomic Control Plane (ACP) to all devices, use the **show autonomic service** command in privileged EXEC mode.

show autonomic service

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
	This command was introduced.

Examples

To display information about the services:

Device# **show autonomic service**

```

Service                IP-Addr
Syslog                 5000::100
AAA                   5000::100
  AAA Accounting Port  1813
  AAA Authorization Port 1812
Autonomic registrar   FD08:2EEF:C2EE:0:E865:493B:ACFB:1
  ANR type              IOS CA
Config Server Address 5000::100
Auto IP Server         UNKNOWN

```

show autonomic neighbor

To display information about autonomic neighbors, use the **show autonomic neighbor** command in privileged EXEC mode.

show autonomic neighbor [detail]

Syntax Description	detail (Optional) Displays detailed information.				
Command Modes	Privileged EXEC (#)				
Command History	<table border="1"> <thead> <tr> <th style="border-bottom: none;">Release</th> <th style="border-bottom: none;">Modification</th> </tr> </thead> <tbody> <tr> <td style="border-top: none;"></td> <td style="border-top: none;">This command was introduced.</td> </tr> </tbody> </table>	Release	Modification		This command was introduced.
Release	Modification				
	This command was introduced.				

Examples

The following is sample output from the **show autonomic neighbor** command:

```
Device# show autonomic neighbor
UDI                               Device-ID           Domain             Interface
-----
PID:WS-C3850-24U  SN:FCW1934D05Z    e865.493b.acfb-5  cisco.com         ANI1
```

The following is sample output from the **show autonomic neighbor detail** command:

```
Device# show autonomic neighbor detail
UDI: "PID:WS-C3850-24U SN:FCW1934D05Z"

Device ID           e865.493b.acfb-5
Domain ID           cisco.com
Address              FD08:2EEF:C2EE:0:E865:493B:ACFB:5
State                Nbr inside the Domain
Credential           Domain Cert
Credential Validation Passed
Last Validated Time 2016-07-15 05:48:37 UTC
Certificate Expiry Date 2017-07-15 05:30:39 UTC
Certificate Expire Countdown 31534693 (secs)
Number of Links connected 1

Link:
  Local Interface:   ANI2
  Remote Interface:  ANI2
  IP Address:        FE80::3A20:56FF:FEF3:7158
  Uptime(Discovered Time): 00:14:21 ( 2016-07-15 05:38:05 UTC)
  Last Refreshed time: 0 seconds ago
```

The following table describes the significant fields shown in the display.

Table 3: show autonomic neighbor detail Field Descriptions

Field	Description
UDI	Unique device identifier.
Device Identifier	Device name.
Domain Identifier	Domain name.
State	Information about whether the neighbor is inside or outside the domain. If a device is inside an autonomic domain, it must have a valid domain certificate.
Credential	Detection method.
Credential Validation	Detection validation.
Number of Links connected	Number of neighbors detected.
Local Interface	Interface from which the neighbor is connected.
Remote Interface	Interface to which the neighbor is connected.
IP Address	IPv6 address of the neighbor,