



## Auto Identity

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The Auto Identity feature provides a set of built-in policies at global configuration and interface configuration modes. This feature is available only in Class-Based Policy Language (CPL) control policy-equivalent new-style mode. To convert all the relevant authentication commands to their CPL control policy-equivalents, use the authentication convert-to new-style command.

This module describes the feature and consists of these sections:

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**Note**

For complete syntax and usage information for the switch commands used in this chapter, see the [Cisco IOS Command Reference Guides for the Catalyst 4500 Series Switch](#).

If a command is not in the *Cisco Catalyst 4500 Series Switch Command Reference*, you can locate it in the [Cisco IOS Master Command List, All Releases](#).

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## Information About Auto Identity

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## Auto Identity Overview

The Cisco Identity-Based Networking Services (IBNS) solution provides a policy and identity-based framework in which edge devices can deliver flexible and scalable services to subscribers. IBNS allows the concurrent operation of IEEE 802.1x (dot1x), MAC authentication bypass (MAB), and web authentication methods, making it possible to invoke multiple authentication methods in parallel, on a single subscriber session. These authentication methods, dot1x, authentication, authorization, and accounting (AAA), and RADIUS are available in global configuration and interface configuration modes.

The Auto Identity feature uses the Cisco Common Classification Policy Language-based configuration that significantly reduces the number of commands used to configure both authentication methods and interface-level commands. The Auto Identity feature provides a set of built-in policies that are based on policy maps, class maps, parameter maps, and interface templates.

In global configuration mode, the **source template AI\_GLOBAL\_CONFIG\_TEMPLATE** command enables the Auto Identity feature. In interface configuration mode, configure the **AI\_MONITOR\_MODE**, **AI\_LOW\_IMPACT\_MODE**, or **AI\_CLOSED\_MODE** interface templates to enable the feature on interfaces.

You can configure multiple templates; however, you must bind multiple templates together using the **merge** command. If you do not bind the templates, the last configured template is used. While binding templates, if the same command is repeated in two templates with different arguments, the last configured command is used.



### Note

You can also enable user-defined templates that are configured using the **template name** command in global configuration mode.

Use the **show template interface** or **show template global** commands to display information about built-in templates.

Built-in templates can be edited. Built-in template information is displayed in the output of the **show running-config** command, if the template is edited. If you delete an edited built-in template, the built-in template reverts to the default and is not deleted from the configuration. However; if you delete a user-defined template, it is deleted from the configuration.



### Note

Before you delete a template, ensure that it is not attached to a device.

## Auto Identity Global Template

To enable the global template, configure the **source template template-name** command in global configuration mode.



### Note

You must configure the RADIUS server commands, because these are not automatically configured when the global template is enabled.

The following example shows how to enable the global template:

```
Switch(config)# source template AI_GLOBAL_CONFIG_TEMPLATE
Switch(config)# radius server ISE
Switch(config-radius-server)# address ipv4 172.20.254.4 auth-port 1645 acct-port 1646
Switch(config-radius-server)# key cisco
```

```
Switch(config-radius-server)# end
```

The AI\_GLOBAL\_CONFIG\_TEMPLATE automatically configures the following commands:

```
dot1x system-auth-control
aaa new-model
aaa authentication dot1x default group radius
aaa authorization network default group radius
aaa authorization auth-proxy default group radius
aaa accounting identity default start-stop group radius
aaa accounting system default start-stop group radius
radius-server attribute 6 on-for-login-auth
radius-server attribute 6 support-multiple
radius-server attribute 6 voice 1
radius-server attribute 8 include-in-access-req
radius-server attribute 25 access-request include
```

## Auto Identity Interface Templates

The following interface templates are available in the Auto Identity feature:

- AI\_MONITOR\_MODE—Passively monitors sessions that have authentication in open mode.
- AI\_LOW\_IMPACT\_MODE—Similar to monitor mode, but with a configured static policy such as a port access control list (PACL).
- AI\_CLOSED\_MODE—Secure mode in which data traffic is not allowed into the network, until authentication is complete. This mode is the default.

The following commands are inbuilt in the AI\_MONITOR\_MODE:

```
switchport mode access
access-session port-control auto
access-session host-mode multi-auth
dot1x pae authenticator
mab
service-policy type control subscriber AI_DOT1X_MAB_POLICIES
```

The following commands are inbuilt in the AI\_LOW\_IMPACT\_MODE:

```
switchport mode access
access-session port-control auto
access-session host-mode multi-auth
dot1x pae authenticator
mab
ip access-group AI_PORT_ACL in
service-policy type control subscriber AI_DOT1X_MAB_POLICIES
```

The following commands are inbuilt in the AI\_CLOSED\_MODE:

```
switchport mode access
access-session closed
access-session port-control auto
access-session host-mode multi-auth
dot1x pae authenticator
mab
service-policy type control subscriber AI_DOT1X_MAB_POLICIES
```

## Auto Identity Built-in Policies

The following five built-in policies are available in the Auto Identity feature:

- **AI\_DOT1X\_MAB\_AUTH**—Enables flexible authentication with dot1x, and then MAC Address Bypass (MAB).
- **AI\_DOT1X\_MAB\_POLICIES**—Enables flexible authentication with dot1x, and then MAB. Applies critical VLAN in case the Authentication, Authorization, and Accounting (AAA) server is not reachable.
- **AI\_DOT1X\_MAB\_WEBAUTH**—Enables flexible authentication with dot1x, MAB, and then web authentication.
- **AI\_NEXTGEN\_AUTHBYBASS**—Skips authentication if an IP phone device is detected. Enables the **device classifier** command in global configuration mode and the **voice-vlan** command in interface configuration mode to detect the device. This is a reference policy map, and users can copy the contents of this policy map to other policy maps.
- **AI\_STANDALONE\_WEBAUTH**—Defines standalone web authentication.

## Auto Identity Class Map Templates

The following built-in class maps are supported by the Auto Identity feature:

- **AI\_NRH**—Specifies that the nonresponsive host (NRH) authentication method is enabled.
- **AI\_WEBAUTH\_METHOD**—Specifies that the web authentication method is enabled.
- **AI\_WEBAUTH\_FAILED**—Specifies that the web authentication method failed to authenticate.
- **AI\_WEBAUTH\_NO\_RESP**—Specifies that the web authentication client failed to respond.
- **AI\_DOT1X\_METHOD**—Specifies that the dot1x method is enabled.
- **AI\_DOT1X\_FAILED**—Specifies that the dot1x method failed to authenticate.
- **AI\_DOT1X\_NO\_RESP**—Specifies that the dot1x client failed to respond.
- **AI\_DOT1X\_TIMEOUT**—Specifies that the dot1x client stopped responding after the initial acknowledge (ACK) request.
- **AI\_MAB\_METHOD**—Specifies that the MAC Authentication Bypass (MAB) method is enabled.
- **AI\_MAB\_FAILED**—Specifies that the MAB method failed to authenticate.
- **AI\_AAA\_SVR\_DOWN\_AUTHD\_HOST**—Specifies that the Authentication, Authorization, and Accounting (AAA) server is down, and the client is in authorized state.
- **AI\_AAA\_SVR\_DOWN\_UNAUTHD\_HOST**—Specifies that the AAA server is down, and the client is in authorized state.
- **AI\_IN\_CRITICAL\_AUTH**—Specifies that the critical authentication service template is applied.
- **AI\_NOT\_IN\_CRITICAL\_AUTH**—Specifies that the critical authentication service template is not applied.
- **AI\_METHOD\_DOT1X\_DEVICE\_PHONE**—Specifies that the method is dot1x and the device type is IP phone.
- **AI\_DEVICE\_PHONE**—Specifies that the device type is IP phone.

## Auto Identity Parameter Maps

The following built-in parameter map templates are supported by the Auto Identity feature:

- AI\_NRH\_PMAP—Starts nonresponsive host (NRH) authentication.
- AI\_WEBAUTH\_PMAP—Starts web authentication.

## Auto Identity Service Templates

Service templates are available inside built-in policy maps. The following built-in service templates are supported by the Auto Identity feature:


- AI\_INACTIVE\_TIMER—Template to start the inactivity timer.
- AI\_CRITICAL\_ACL—Dummy template; users can configure this template as per their requirements.


## How to Configure Auto Identity

- [Configuring Auto Identity Globally, page 54-5](#)
- [Configuring Auto Identity at an Interface Level, page 54-6](#)

## Configuring Auto Identity Globally

To configure Auto Identity globally, perform this task:

	Command or Action	Purpose
Step 1	Switch> <b>enable</b>	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	Switch# <b>configure terminal</b>	Enters global configuration mode.
Step 3	Switch(config)# <b>source template</b> { <b>AI_GLOBAL_CONFIG_TEMPLATE</b>   <i>template-name</i> }	Configures an auto identity template. <ul style="list-style-type: none"> <li>• <b>AI_GLOBAL_CONFIG_TEMPLATE</b> is a built-in template.</li> <li>• The <i>template-name</i> argument is a user-defined template.</li> </ul>
Step 4	Switch(config)# <b>aaa new-model</b>	Enables the authentication, authorization, and accounting (AAA) access control mode.
Step 5	Switch(config)# <b>radius server name</b>	Specifies the name for the RADIUS server configuration for Protected Access Credential (PAC) provisioning and enters RADIUS server configuration mode.
Step 6	Switch(config-radius-server)# <b>address</b> <b>ipv4</b> { <i>hostname</i>   <i>ipv4-address</i> }	Configures the IPv4 address for the RADIUS server accounting and authentication parameters. <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">  <p><b>Note</b> This command is not a part of the global template, and you must configure it.</p> </div>

	Command or Action	Purpose
Step 7	Switch(config-radius-server)# <b>key ipv4</b> {0 string   7 string} string	Specifies the authentication and encryption key for all RADIUS communications between the device and the RADIUS server.   <b>Note</b> This command is not a part of the global template, and you must configure it.
Step 8	Switch(config-radius-server)# <b>end</b>	Exits RADIUS server configuration mode and returns to privileged EXEC mode.

## Configuring Auto Identity at an Interface Level

When you configure two interface templates, you must configure the **merge** keyword. If you do not, the last configured template is used.

	Command or Action	Purpose
Step 1	Switch# <b>enable</b>	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>Enter your password if prompted.</li> </ul>
Step 2	Switch# <b>configure terminal</b>	Enters global configuration mode.
Step 3	Switch(config)# <b>interface</b> type number	Configures an interface and enters interface configuration mode.
Step 4	Switch(config-if)# <b>source template</b> {AI_CLOSED_MODE   AI_LOW_IMPACT_MODE   AI_MONITOR_MODE   template-name} [merge]	Configures a source template for the interface.
Step 5	Switch(config-if)# <b>source template</b> {AI_CLOSED_MODE   AI_LOW_IMPACT_MODE   AI_MONITOR_MODE   template-name} [merge]	(Optional) Configures a source template for the interface and merges this template with the previously configured template. <ul style="list-style-type: none"> <li>When you configure two templates, if you do not configure the <b>merge</b> keyword, the last configured template is used.</li> </ul>
Step 6	Switch(config-if)# <b>switchport access vlan</b> vlan-id	Sets the VLAN when the interface is in access mode.
Step 7	Switch(config-if)# <b>switchport voice vlan</b> vlan-id	Configures a voice VLAN on a multiple VLAN access port.
Step 8	Repeat Steps 4, 6, and 7 on all interfaces that must have the Auto Identity feature configured.	—
Step 9	Switch(config-if)# <b>end</b>	Exits interface configuration mode and returns to privileged EXEC mode.

## Configuration Examples for Auto Identity

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- [Example: Configuring Auto Identity at an Interface Level, page 54-7](#)

## Example: Configuring Auto Identity Globally

```
Switch> enable
Switch# configure terminal
Switch(config)# source template AI_GLOBAL_CONFIG_TEMPLATE
Switch(config)# aaa new-model
Switch(config)# radius server ISE
Switch(config-radius-server)# address ipv4 10.1.1.1
Switch(config-radius-server)# key ipv4 cisco
Switch(config-radius-server)# end
```

## Example: Configuring Auto Identity at an Interface Level

```
Switch> enable
Switch# configure terminal
Switch(config)# interface gigabitethernet 1/0/1
Switch(config-if)# source template AI_CLOSED_MODE
Switch(config-if)# source template AI_MONITOR_MODE merge
Switch(config-if)# switchport access vlan 100
Switch(config-if)# switchport voice vlan 101
Switch(config-if)# end
```

## Verifying Auto Identity

To verify the Auto Identity configuration, use the following commands:

The following output from the **show template interface source built-in all** command displays all the configured built-in interface templates:

```
Switch# show template interface source built-in all

Template Name      : AI_CLOSED_MODE
Modified           : No
Template Definition :
  dot1x pae authenticator
  switchport mode access
  mab
  access-session closed
  access-session port-control auto
  service-policy type control subscriber AI_DOT1X_MAB_POLICIES
!

Template Name      : AI_LOW_IMPACT_MODE
Modified           : No
Template Definition :
  dot1x pae authenticator
  switchport mode access
  mab
  access-session port-control auto
  service-policy type control subscriber AI_DOT1X_MAB_POLICIES
  ip access-group AI_PORT_ACL in
!

Template Name      : AI_MONITOR_MODE
Modified           : No
Template Definition :
  dot1x pae authenticator
  switchport mode access
  mab
```

```

access-session port-control auto
service-policy type control subscriber AI_DOT1X_MAB_POLICIES
!

```

The following output from the **show template global source built-in all** command displays all the configured global built-in templates:

```

Switch# show template global source built-in all

Global Template Name      : AI_GLOBAL_CONFIG_TEMPLATE
Modified                  : No
Global Template Definition : global
dot1x system-auth-control
aaa new-model
aaa authentication dot1x default group radius
aaa authorization network default group radius
aaa authorization auth-proxy default group radius
aaa accounting identity default start-stop group radius
aaa accounting system default start-stop group radius
radius-server attribute 6 on-for-login-auth
radius-server attribute 6 support-multiple
radius-server attribute 6 voice 1
radius-server attribute 8 include-in-access-req
radius-server attribute 25 access-request include
!

```

The following output from the **show derived-config | include aaa | radius-server** command displays the composite results of all the configuration commands that apply to an interface, including commands that come from sources such as static templates, dynamic templates, dialer interfaces, and authentication, authorization, and accounting (AAA) per-user attributes:

```

Switch# show derived-config | include aaa | radius-server

aaa new-model
aaa authentication dot1x default group radius
aaa authorization network default group radius
aaa authorization auth-proxy default group radius
aaa accounting identity default start-stop group radius
aaa accounting system default start-stop group radius
aaa session-id common
radius-server attribute 6 on-for-login-auth
radius-server attribute 6 support-multiple
radius-server attribute 6 voice 1
radius-server attribute 8 include-in-access-req
radius-server attribute 25 access-request include
radius-server host 10.25.18.42 key cisco

```

The following output from the **show derived-config | interface type-number** command displays the composite results of all configuration for an interface:

```

Switch# show derived-config | interface gigabitethernet2/0/6

Building configuration...
Derived configuration : 267 bytes
!
interface GigabitEthernet2/0/6
 switchport mode access
 switchport voice vlan 100
 access-session closed
 access-session port-control auto
 mab

```



```

dot1x pae authenticator
spanning-tree portfast edge
service-policy type control subscriber AI_DOT1X_MAB_POLICIES
end

```

The following output from the **show access-session | interface *interface-type-number*** details command displays the policies applied to an interface:

```
Switch# show access-session interface gigabitethernet2/0/6 details
```

```

Interface          : GigabitEthernet2/0/6
MAC Address:       c025.5c43.be00
IPv6 Address:      Unknown
IPv4 Address:      Unknown
User-Name:         CP-9971-SEPC0255C43BE00
Device-type:      Cisco-IP-Phone-9971
Status:            Authorized
Domain:            VOICE
Oper host mode:   multi-auth
Oper control dir: both
Session timeout:  N/A
Common Session ID: 091A1C5B00000017002003EE
Acct Session ID:  0x00000005
Handle:            0xBB00000B
Current Policy:    AI_DOT1X_MAB_POLICIES

```

Local Policies:

Server Policies:

```

Vlan Group: Vlan: 100
Security Policy: Must Not Secure
Security Status: Link Unsecure

```

Method status list:

```

Method  State
dot1x   Authc Success

```

The following output from the **show running-config interface *type-number*** command displays the contents of the current running configuration file or the configuration for an interface:

```
Switch# show running-config interface gigabitethernet2/0/6
```

```

Building configuration...
Current configuration : 214 bytes
!
interface GigabitEthernet2/0/6
 switchport mode access
 switchport voice vlan 100
 access-session port-control auto
 spanning-tree portfast edge
 service-policy type control subscriber AI_NEXTGEN_AUTHBYPASS
end

```

The following output from the **show lldp neighbor** command displays information about one or all neighboring devices discovered using the Link Layer Discovery Protocol (LLDP):

```
Switch# show lldp neighbor
```

Capability codes:

```

(R) Router, (B) Bridge, (T) Telephone, (C) DOCSIS Cable Device
(W) WLAN Access Point, (P) Repeater, (S) Station, (O) Other

```

Device ID	Local Intf	Hold-time	Capability	Port ID
SEPC0255C43BE00	Gi2/0/6	180	B,T	C0255C43BE00:P1

Total entries displayed: 1