



# Policy Classification Engine

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## Policy Classification Engine

The Policy Classification Engine feature helps configure device-based policies and client (network endpoint) profiling and enforces a per user or per device policy on a network. The policy classification engine enables bring-your-own-device (BYOD) deployments integrate user or wireless device policies into the wireless controller. This module explains how to configure policies and apply them to a wireless LAN (WLAN).

## Restrictions for Policy Classification Engine

Interface templates are not valid on wireless sessions.

## Information About Policy Classification Engine

### Policy Classification Engine Overview

The Policy Classification Engine feature helps configure device-based policies and client (network endpoint) profiling and enforces a per user or per device policy on a network.

You can configure sets of different policies that can be used for lookup and sequential matching. A policy is matched based on the configured policy statement. Use policies to profile devices based on the Dynamic Host Control Protocol (DHCP) or HTTP to identify end devices in a network. You can enforce specific policies at network endpoints.

The device (switch; for example, Cisco Catalyst 3850 Wireless LAN Controller) uses these attributes and predefined classification profiles to identify devices.

Policies are configured based on the following parameters:

- Device—Types of end devices. Examples are Windows machines, smart phones, Apple device like iPads, iPhones, and so on.
- Regular expressions
- User role—The user type or user group to which an user belongs. Examples are students, employees, and so on.

- Username—Login credentials entered by users.
- Time-of-day—The time-of-day when endpoints are allowed into a network.
- OUI—The MAC address that identifies the Organizational Unique Identifier (OUI).
- MAC address—The MAC address of the endpoint.

Once the device (switch) has a match corresponding to the policy parameters per end point, a policy is added. Policy enforcement is based on the following session attributes:

- VLAN—User-defined VLAN
- Access control list (ACL)
- Session timeout value—User-defined timeout for client sessions
- Quality of service (QoS)

You can configure policies and based on the session attributes, enforce these policies on end points.

## How to Configure Policy Classification Engine

### Configuring Policies in Cisco Identity Based Networking Services

To configure policies, perform the following tasks:

1. Configure a service template.

For more information, see the [b\\_1611\\_sec\\_9300\\_cg\\_chapter29.pdf#nameddest=unique\\_775 unique\\_775\\_Connect\\_42\\_GUID-7DB73719-E974-4BC7-8B9C-CB6B75365445](#) module.

2. Configure an interface template.

For more information, see the [About Interface Templates](#) module.

3. Create a parameter map.
4. Create a policy map.
5. Apply the policy on a wireless LAN (WLAN).

### Configuring a Subscriber Parameter Map

#### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **parameter-map type subscriber attribute-to-service** *parameter-map-name*
4. *priority-number* **map device-type eq** *device-type* **oui eq** *MAC-address*
5. *action-number* **interface-template** *interface-template-name*
6. **end**
7. **show parameter-map type subscriber attribute-to-service** *parameter-map-name*

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b> <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"><li>• Enter your password if prompted.</li></ul>
Step 2	<b>configure terminal</b> <b>Example:</b> Device# configure terminal	Enters global configuration mode.
Step 3	<b>parameter-map type subscriber attribute-to-service</b> <i>parameter-map-name</i> <b>Example:</b> Device(config)# parameter-map type subscriber attribute-to-service param-map	Configures a subscriber parameter map and enters parameter-map filter configuration mode.
Step 4	<b>priority-number map device-type eq device-type oui eq</b> <i>MAC-address</i> <b>Example:</b> Device(config-parameter-map-filter)# 1 map device-type eq "Cisco-IP-Phone-9971" oui eq "08.cc.68"	Maps the priority and the Organizationally Unique Identifier (OUI) of the configured device, and enters parameter-map filter submenu configuration mode.
Step 5	<b>action-number interface-template interface-template-name</b> <b>Example:</b> Device(config-parameter-map-filter-submode)# 2 interface-template IP-PHONE-INTERFACE-TEMPLATE	Maps the action number to an interface template.
Step 6	<b>end</b> <b>Example:</b> Device(config-parameter-map-filter-submode)# end	Exits parameter-map filter submenu configuration mode and returns to privileged EXEC mode.
Step 7	<b>show parameter-map type subscriber</b> <b>attribute-to-service</b> <i>parameter-map-name</i> <b>Example:</b> Device# show parameter-map type subscriber attribute-to-service parameter-map-name	Displays information about the specified parameter map.

**Example**

The following is sample output from the **show parameter-map type subscriber attribute-to-service** command:

```
Device# show parameter-map type subscriber attribute-to-service param-map

Parameter-map name: param-map
Map: 1 map device-type eq "Cisco-IP-Phone-9971" oui eq "08.cc.68"
Action(s):
```

```
2 interface-template IP-PHONE-INTERFACE-TEMPLATE
```

## Configuring a Subscriber Policy Map

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **policy-map type control subscriber** *policy-map-name*
4. **event identity-update** {**match-all** | **match-first**}
5. *priority-number* **class always** {**do-all** | **do-until-failure** | **do-until-success**}
6. *action-number* **map attribute-to-service table** *parameter-map-name*
7. **end**
8. **show policy-map type control subscriber** *policy-map-name*

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"><li>• Enter your password if prompted.</li></ul>
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> Device# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>policy-map type control subscriber</b> <i>policy-map-name</i> <b>Example:</b> Device(config)# policy-map type control subscriber pmap	Defines a control policy for subscriber sessions and enters control policy-map event configuration mode.
<b>Step 4</b>	<b>event identity-update</b> { <b>match-all</b>   <b>match-first</b> }	Specifies the event type that triggers actions in a control policy if conditions are met, and enters control policy-map class configuration mode.
<b>Step 5</b>	<i>priority-number</i> <b>class always</b> { <b>do-all</b>   <b>do-until-failure</b>   <b>do-until-success</b> }	Associates a control class with one or more actions in a control policy and enters control policy-map action configuration mode.
<b>Step 6</b>	<i>action-number</i> <b>map attribute-to-service table</b> <i>parameter-map-name</i> <b>Example:</b>	Maps identity-update attribute to an autoconf template.

	Command or Action	Purpose
	Device(config-action-control-policymap)# 2 map attribute-to-service table param-map	
<b>Step 7</b>	<b>end</b> <b>Example:</b> Device(config-action-control-policymap)# end	Exits control policy-map action configuration mode and returns to privileged EXEC mode.
<b>Step 8</b>	<b>show policy-map type control subscriber</b> <i>policy-map-name</i> <b>Example:</b> Device# show policy-map type control subscriber pmap	Displays information and statistics about the control policies.

### Example

The following is sample output from the **show policy-map type control subscriber** command:

```
Device# show policy-map type control subscriber pmap

show policy-map type control subscriber pmap
policy-map
  event identity-update match-all
    1 class always do-until-failure
      1 map attribute-to-service table param-map
```

## Configuration Examples for Policy Classification Engine

### Example: Configuring a Subscriber Parameter Map

```
Device# configure terminal
Device(config)# parameter-map type subscriber attribute-to-service param-map
Device(config-parameter-map-filter)# 1 map device-type eq "Cisco-IP-Phone-9971" oui "eq
08.cc.68"
Device(config-parameter-map-filter-submode)# 2 interface-template IP-PHONE-INTERFACE-TEMPLATE
Device(config-parameter-map-filter-submode)# end
```

### Example: Configuring a Subscriber Policy Map

```
Device# configure terminal
Device(config)# policy-map type control subscriber pmap
Device(config-event-control-policymap)# event identity-update match-all
Device(config-class-control-policymap)# 1 class always do-until-failure
Device(config-action-control-policymap)# 2 map attribute-to-service table param-map
Device(config-action-control-policymap)# end
```

## Feature Information for Policy Classification Engine

This table provides release and related information for the features explained in this module.

These features are available in all the releases subsequent to the one they were introduced in, unless noted otherwise.

**Table 1: Feature Information for Policy Classification Engine**

Release	Feature Name	Feature Information
Cisco IOS XE Everest 16.5.1a	Policy Classification Engine	The Policy Classification Engine feature helps configure device-based policies and client (network endpoint) profiling and enforces a per user or per device policy on a network. The policy classification engine enables bring-your-own-device (BYOD) deployments integrate user or wireless device policies into the wireless controller.

**Table 2: Feature Information for Policy Classification Engine**