



## Native Profiling

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## Information About Native Profiling

You can profile devices based on HTTP and DHCP to identify the end devices on the network. You can configure device-based policies and enforce these policies per user or per device policy on the network.

Policies allow profiling of mobile devices and basic onboarding of the profiled devices to a specific VLAN. They also assign ACL and QoS or configure session timeouts.

You can configure policies as two separate components:

- Defining policy attributes as service templates that are specific to clients joining the network and applying policy match criteria
- Applying match criteria to the policy.



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**Note** Before proceeding with the native profile configuration, ensure that HTTP Profiling and DHCP Profiling are enabled.

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To configure Native Profiling, use one of the following procedures:

- Create a service template
- Create a class map



**Note** You can apply a service template using either a class map or parameter map.

- Create a parameter-map and associate the service template to parameter-map
  - Create a policy map
    1. If class-map has to be used: Associate the class-map to the policy-map and associate the service-template to the class-map.
    2. If parameter-map has to be used: Associate the parameter-map to the policy-map
  - Associate the policy-map to the policy profile.

## Creating a Class Map (GUI)

### Procedure

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- Step 1** Click **Configuration > Services > QoS**.
- Step 2** In the **QoS – Policy** area, click **Add** to create a new QoS Policy or click the one you want to edit.
- Step 3** Add **Add Class Map** and enter the details.
- Step 4** Click **Save**.
- Step 5** Click **Update and Apply to Device**.
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## Creating a Class Map (CLI)



**Note** Configuration of class maps via CLI offer more options and can be more granular than GUI.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>configure terminal</b>  <b>Example:</b> Device# <code>configure terminal</code>	Enters global configuration mode.
<b>Step 2</b>	<b>class-map type control subscriber</b> <b>match-any</b> <i>class-map-name</i>  <b>Example:</b>	Specifies the class map type and name.

	Command or Action	Purpose
	Device(config)# class-map type control subscriber match-any cls_user	
<b>Step 3</b>	<b>match username</b> <i>username</i> <b>Example:</b> Device(config-filter-control-classmap)# match username ciscoise	Specifies the class map attribute filter criteria.
<b>Step 4</b>	<b>class-map type control subscriber match-any</b> <i>class-map-name</i> <b>Example:</b> Device(config)# class-map type control subscriber match-any cls_userrole	Specifies the class map type and name.
<b>Step 5</b>	<b>match user-role</b> <i>user-role</i> <b>Example:</b> Device(config-filter-control-classmap)# match user-role engineer	Specifies the class map attribute filter criteria.
<b>Step 6</b>	<b>class-map type control subscriber match-any</b> <i>class-map-name</i> <b>Example:</b> Device(config)# class-map type control subscriber match-any cls_oui	Specifies the class map type and name.
<b>Step 7</b>	<b>match oui</b> <i>oui-address</i> <b>Example:</b> Device(config-filter-control-classmap)# match oui 48.f8.b3	Specifies the class map attribute filter criteria.
<b>Step 8</b>	<b>class-map type control subscriber match-any</b> <i>class-map-name</i> <b>Example:</b> Device(config)# class-map type control subscriber match-any cls_mac	Specifies the class map type and name.
<b>Step 9</b>	<b>match mac-address</b> <i>mac-address</i> <b>Example:</b> Device(config-filter-control-classmap)# match mac-address 0040.96b9.4a0d	Specifies the class map attribute filter criteria.
<b>Step 10</b>	<b>class-map type control subscriber match-any</b> <i>class-map-name</i> <b>Example:</b> Device(config)# class-map type control subscriber match-any cls_devtype	Specifies the class map type and name.

	Command or Action	Purpose
<b>Step 11</b>	<b>match device-type</b> <i>device-type</i> <b>Example:</b> <pre>Device(config-filter-control-classmap)# match device-type windows</pre>	Specifies the class map attribute filter criteria.
<b>Step 12</b>	<b>match join-time-of-day</b> <i>start-time end-time</i> <b>Example:</b> <pre>Device(config-filter-control-classmap)# match join-time-of-day 10:30 12:30</pre>	<p>Specifies a match to the time of day.</p> <p>Here, join time is considered for matching. For example, if the match filter is set from 11:00 am to 2:00 pm, a device joining at 10:59 am is not considered, even if it acquires credentials after 11:00 am.</p> <p>Here,</p> <p><i>start-time</i> and <i>end-time</i> specifies the 24-hour format.</p> <p>Use the <b>show class-map type control subscriber name</b> <i>name</i> command to verify the configuration.</p> <p><b>Note</b> You should also disable AAA override for this command to work.</p>

## Creating a Service Template (GUI)

### Procedure

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- Step 1** Choose **Configuration > Security > Local Policy**.
- Step 2** On the **Local Policy** page, **Service Template** tab, click **ADD**.
- Step 3** In the **Create Service Template** window, enter the following parameters:
- **Service Template Name:** Enter a name for the template.
  - **VLAN ID:** Enter the VLAN ID for the template. Valid range is between 1 and 4094.
  - **Session Timeout (secs):** Sets the timeout duration for the template. Valid range is between 1 and 65535.
  - **Access Control List:** Choose the Access Control List from the drop-down list.
  - **Ingress QOS:** Choose the input QoS policy for the client from the drop-down list
  - **Egress QOS:** Choose the output QoS policy for the client from the drop-down list.
- Step 4** Click **Save & Apply to Device**.
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# Creating a Service Template (CLI)

## Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>configure terminal</b> <b>Example:</b> Device# configure terminal	Enters global configuration mode.
<b>Step 2</b>	<b>service-template <i>service-template-name</i></b> <b>Example:</b> Device(config)# service-template svcl	Enters service template configuration mode.
<b>Step 3</b>	<b>access-group <i>access-list-name</i></b> <b>Example:</b> Device(config-service-template)# access-group acl-auto	Specifies the access list to be applied.
<b>Step 4</b>	<b>vlan <i>vlan-id</i></b> <b>Example:</b> Device(config-service-template)# vlan 10	Specifies VLAN ID. Valid range is from 1-4094.
<b>Step 5</b>	<b>absolute-timer <i>timer</i></b> <b>Example:</b> Device(config-service-template)# absolute-timer 1000	Specifies session timeout value for a service template. Valid range is from 1-65535.
<b>Step 6</b>	<b>service-policy qos input <i>qos-policy</i></b> <b>Example:</b> Device(config-service-template)# service-policy qos input in_qos	Configures an input QoS policy for the client.
<b>Step 7</b>	<b>service-policy qos output <i>qos-policy</i></b> <b>Example:</b> Device(config-service-template)# service-policy qos output out_qos	Configures an output QoS policy for the client.

## Creating a Parameter Map

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>configure terminal</b> <b>Example:</b> Device# configure terminal	Enters global configuration mode.
<b>Step 2</b>	<b>parameter-map type subscriber attribute-to-service <i>parameter-map-name</i></b> <b>Example:</b> Device(config)# parameter-map type subscriber attribute-to-service param	Specifies the parameter map type and name.
<b>Step 3</b>	<b>map-indexmap device-type eq <i>filter-name</i></b> <b>Example:</b> Device(config-parameter-map-filter)# 1 map device-type eq "windows" mac-address eq 3c77.e602.2f91 username eq "cisco"	Specifies the parameter map attribute filter criteria. Multiple filters are used in the example provided here.
<b>Step 4</b>	<b>map-indexservice-template <i>service-template-name</i> precedence <i>precedence-num</i></b> <b>Example:</b> Device(config-parameter-map-filter-submode)# 1 service-template svcl precedence 150	Specifies the service template and its precedence.

## Creating a Policy Map (GUI)

### Procedure

- Step 1** Choose **Configuration > Security > Local Policy > Policy Map** tab..
- Step 2** Enter a name for the Policy Map in the **Policy Map Name** text field.
- Step 3** Click **Add**
- Step 4** Choose the service template from the **Service Template** drop-down list.
- Step 5** For the following parameters select the type of filter from the drop-down list and enter the required match criteria
  - Device Type
  - User Role
  - User Name

- OUI
- MAC Address

- Step 6** Click **Add Criteria**
- Step 7** Click **Update & Apply to Device**.

## Creating a Policy Map (CLI)

### Before you begin

Before removing a policy map or parameter map, you should remove it from the target or shut down the WLAN profile or delete the session.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>configure terminal</b> <b>Example:</b> Device# configure terminal	Enters global configuration mode.
<b>Step 2</b>	<b>policy-map type control subscriber</b> <i>policy-map-name</i> <b>Example:</b> Device(config)# policy-map type control subscriber polmap5	Specifies the policy map type.
<b>Step 3</b>	<b>event identity-update match-all</b> <b>Example:</b> Device(config-event-control-policymap)# event identity-update match-all	Specifies the match criteria to the policy map.
<b>Step 4</b>	You can apply a service template using either a class map or a parameter map, as shown here. <ul style="list-style-type: none"> <li>• <i>class-num</i> <b>class</b> <i>class-map-name</i> <b>do-until-failure</b></li> <li>• <i>action-index</i> <b>activate service-template</b> <i>service-template-name</i></li> <li>• <i>action-index</i> <b>map attribute-to-service table</b> <i>parameter-map-name</i></li> </ul> <b>Example:</b> The following example shows how a class-map with a service-template has to be applied: Device(config-class-control-policymap)# 10 class cls_mac do-until-failure	Configures the local profiling policy class map number and specifies how to perform the action or activates the service template or maps an identity-update attribute to an auto-configured template.

	Command or Action	Purpose
	<pre>Device(config-action-control-policymap)# 10 activate service-template svcl</pre> <p><b>Example:</b></p> <p>The following example shows how a parameter map has to be applied (service template is already associated with the parameter map 'param' while creating it):</p> <pre>Device(config-action-control-policymap)#1 map attribute-to-service table param</pre>	
<b>Step 5</b>	<p><b>end</b></p> <p><b>Example:</b></p> <pre>Device(config-action-control-policymap)# end</pre>	Exits configuration mode.
<b>Step 6</b>	<p><b>configure terminal</b></p> <p><b>Example:</b></p> <pre>Device# configure terminal</pre>	Enters global configuration mode.
<b>Step 7</b>	<p><b>wireless profile policy</b> <i>wlan-policy-profile-name</i></p> <p><b>Example:</b></p> <pre>Device(config)# wireless profile policy wlan-policy-profilename</pre>	<p>Configures a wireless policy profile.</p> <p><b>Caution</b> Do not configure aaa-override for native profiling under a named wireless profile policy. Native profiling is applied at a lower priority than AAA policy. If aaa-override is enabled, the AAA policies will override native profile policy.</p>
<b>Step 8</b>	<p><b>description</b> <i>profile-policy-description</i></p> <p><b>Example:</b></p> <pre>Device(config-wireless-policy)# description "default policy profile"</pre>	Adds a description for the policy profile.
<b>Step 9</b>	<p><b>dhcp-tlv-caching</b></p> <p><b>Example:</b></p> <pre>Device(config-wireless-policy)# dhcp-tlv-caching</pre>	Configures DHCP TLV caching on a WLAN.
<b>Step 10</b>	<p><b>http-tlv-caching</b></p> <p><b>Example:</b></p> <pre>Device(config-wireless-policy)# http-tlv-caching</pre>	Configures client HTTP TLV caching on a WLAN.
<b>Step 11</b>	<p><b>subscriber-policy-name</b> <i>policy-name</i></p> <p><b>Example:</b></p> <pre>Device(config-wireless-policy)# subscriber-policy-name polmap5</pre>	Configures the subscriber policy name.



	Command or Action	Purpose
<b>Step 12</b>	<b>vlan</b> <i>vlan-id</i>  <b>Example:</b> Device(config-wireless-policy)# vlan 1	Configures a VLAN name or VLAN ID.
<b>Step 13</b>	<b>no shutdown</b>  <b>Example:</b> Device(config-wireless-policy)# no shutdown	Saves the configuration.

## Configuring Native Profiling in Local Mode

To configure native profiling in the local mode, you must follow the steps described in [#unique\\_1026](#). In the policy profile, you must enable central switching as described in the step given below in order to configure native profiling.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>central switching</b>  <b>Example:</b> Device(config-wireless-policy)# central switching	Enables central switching.

## Verifying Native Profile Configuration

Use the following **show** commands to verify the native profile configuration:

```
Device# show wireless client device summary
```

```
Active classified device summary
MAC Address      Device-type      User-role
Protocol-map
-----
1491.82b8.f94b   Microsoft-Workstation   sales
          9
1491.82bc.2fd5   Windows7-Workstation    sales
          41
```

```
Device# show wireless client device cache
```

```
Cached classified device info
MAC Address      Device-type      User-role
Protocol-map
-----
2477.031b.aa18   Microsoft-Workstation
          9
30a8.db3b.a753   Un-Classified Device
```

```

          9
4400.1011.e8b5   Un-Classified Device
          9
980c.a569.7dd0   Un-Classified Device

Device# show wireless client mac-address 4c34.8845.e32c detail | s
Session Manager:
Interface :
IIF ID      : 0x90000002
Device Type : Microsoft-Workstation
Protocol Map : 0x000009
Authorized  : TRUE
Session timeout : 1800
Common Session ID: 78380209000000174BF2B5B9
Acct Session ID : 0
Auth Method Status List
Method : MAB
  SM State      : TERMINATE
  Authen Status : Success
Local Polices:
  Service Template : wlan_svc_C414.3CCA.0A51 (priority 254)
  Absolute-Timer   : 1800
Server Polices:
Resultant Policies:
Filter-ID      : acl-auto
Input QOS      : in_qos
Output QOS     : out_qos
Idle timeout   : 60 sec
VLAN           : 10
Absolute-Timer : 1000

```

Use the following **show** command to verify the class map details for a class map name:

```

Device# show class-map type control subscriber name test
Class-map          Action                Exec  Hit  Miss  Comp
-----          -
match-any test    match day Monday                      0    0    0    0
match-any test    match join-time-of-day 8:00 18:00    0    0    0    0
Key:
"Exec" - The number of times this line was executed
"Hit"  - The number of times this line evaluated to TRUE
"Miss" - The number of times this line evaluated to FALSE
"Comp" - The number of times this line completed the execution of its
        condition without a need to continue on to the end

```