



## Policy Configuration Tagging



### Note

To achieve simplification and consistency, the Cisco SD-WAN solution has been rebranded as Cisco Catalyst SD-WAN. In addition, from Cisco IOS XE SD-WAN Release 17.12.1a and Cisco Catalyst SD-WAN Release 20.12.1, the following component changes are applicable: **Cisco vManage** to **Cisco Catalyst SD-WAN Manager**, **Cisco vAnalytics** to **Cisco Catalyst SD-WAN Analytics**, **Cisco vBond** to **Cisco Catalyst SD-WAN Validator**, **Cisco vSmart** to **Cisco Catalyst SD-WAN Controller**, and **Cisco Controllers** to **Cisco Catalyst SD-WAN Control Components**. See the latest Release Notes for a comprehensive list of all the component brand name changes. While we transition to the new names, some inconsistencies might be present in the documentation set because of a phased approach to the user interface updates of the software product.

**Table 1: Feature History**

Feature Name	Release Information	Description
Support for Cisco Catalyst SD-WAN Policy Configuration Tagging Using the Cisco Catalyst SD-WAN Controller CLI Template	Cisco IOS XE Catalyst SD-WAN Release 17.9.1a Cisco vManage Release 20.9.1	This feature allows you to group multiple policy objects under a tag. The tag mechanism, when used in Cisco Catalyst SD-WAN centralized or localized policies, provides the following functionalities: <ul style="list-style-type: none"><li>• Controls the download speed of a policy between the Cisco Catalyst SD-WAN Controller and the Cisco IOS XE Catalyst SD-WAN devices.</li><li>• Improves management of defined lists in the Cisco Catalyst SD-WAN Controller.</li><li>• Better organizes the configurations of the intent-based network.</li></ul>

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## Supported Devices for Policy Configuration Tagging

*Table 2: Supported Devices and Releases*

Release	Supported Devices
Cisco IOS XE Catalyst SD-WAN Release 17.9.1a and later	<ul style="list-style-type: none"> <li>• Cisco Catalyst 8500 Series Edge Platforms</li> <li>• Cisco Catalyst 8300 Series Edge Platforms</li> <li>• Cisco Catalyst 8200 Series Edge Platforms</li> <li>• Cisco Catalyst 8200 uCPE Series Edge Platforms</li> <li>• Cisco ASR 1000 Series Aggregation Services Routers</li> <li>• Cisco ISR 1000 and ISR 4000 Series Integrated Services Routers (ISRs)</li> <li>• Cisco ISR 1100 and ISR 1100X Series Integrated Services Routers (ISRs)</li> <li>• Cisco IR1101 Integrated Services Router Rugged</li> <li>• Cisco CSR 1000v Series Cloud Services Routers (CSR 1000V)</li> <li>• Cisco Catalyst 8000V Edge Software (Catalyst 8000V)</li> </ul>

For details on supported models for each of these device families, refer to [Cisco SD-WAN Device Compatibility](#) page.

## Restrictions for Policy Configuration Tagging

- Only data-prefix-lists, data-ipv6-prefix-lists, and app-lists tag members are supported.
- Configuration of both direction and direction-less tags within the same TAG is not supported.
- Configuration of tags using only Cisco SD-WAN Controller CLI templates is supported.
- Multi-tenancy is not supported.
- Configuration of number of tags is limited to maximum of 255.
- Configuration of objects per tag is limited to 64.

# Information About Policy Configuration Tagging

The policy configuration tagging feature allows you to group policy objects and to assign tag values to various traffic flows by defining a policy. You can name the tags based on the functionality of the policy objects used to achieve the intent-based network configurations. These tags that are provisioned through the Cisco SD-WAN Controller are used in the policy rules for traffic classification.

You can assign unique tag IDs while creating each of the tags.

You can define members under a tag name, which are referenced directly under tag objects. The members can be directional or directionless. Supported tag member types are:

- Data-prefix-list
- Data-ipv6-prefix-list
- App-list

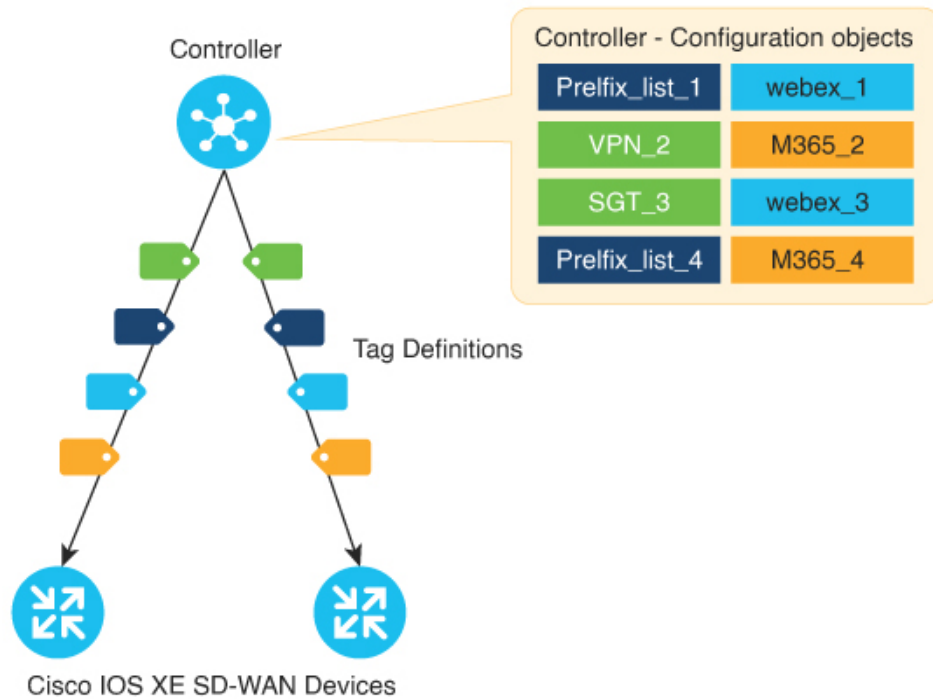
Data-prefix-list and data-ipv6-prefix-list are directional attributes, which are matched as source or destination keywords in the data-policy match statements. App-list is a directionless attribute. You can use directionless keyword such as application id in the app-list policy match statements. Directional and directionless attributes cannot be grouped under the same tag.

You can apply the configured tags in a match criterion under localized and centralized policies. Devices process the tag configurations and apply the configurations to the data plane when the tag is referenced in the policy.

You can use the configuration type feature to tag objects in a configuration. The configuration tags are used in Cisco Catalyst SD-WAN centralized policy such as data policy, and app-aware routing policy and localized access-list policy. The following tag attributes are used in a policy match sequence statement:

- Source-tag-instance
- Destination-tag-instance
- Tag-instance

Figure 1: Policy Configuration Tagging in a Cisco Catalyst SD-WAN Network



As shown in the figure, at the Cisco SD-WAN Controller you can configure the tags using the policy objects with unique tag IDs. Once the tag IDs are assigned these tags are pushed to the Cisco IOS XE Catalyst SD-WAN devices in the network, which reference these tags. The devices then extract the policy list objects from the tags, which are used in the policy rules.

### Features of Policy Configuration Tagging

- Supports only configuration type tag.
- Supports tagging a group of objects configuration.
- Supported tag members are data-prefix-lists, data-ipv6-prefix-lists, and app-lists.
- Supports defining configuration tags through a tag-centric model called **Defined Tag**.
- Supports adding configuration only through Cisco SD-WAN Controller CLI templates from Cisco SD-WAN Manager.

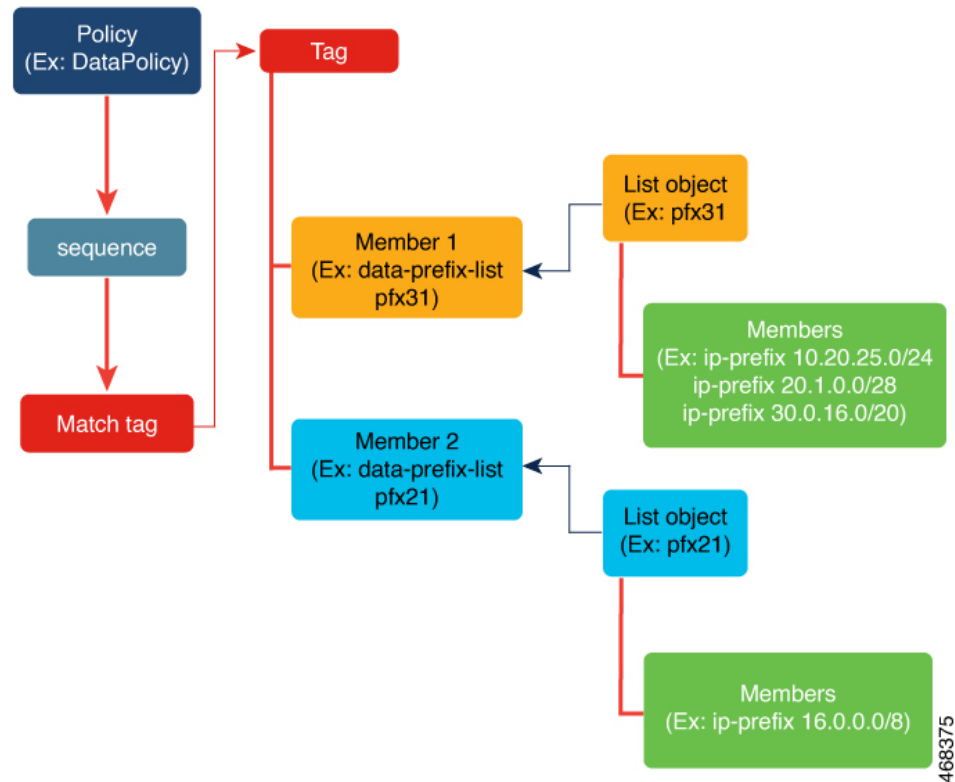
### Tag Workflow

1. In Cisco SD-WAN Controller, create a tag that is based on the network intent.
2. Add the following policy list object members:
  - Data-prefix for each location
  - App-lists for applications

The policy list objects can be defined anytime in the workflow, even after adding them in the tag instances.

3. Push these tags to the Cisco IOS XE Catalyst SD-WAN devices in the network.
4. Create a policy with multiple match sequences and include the tag objects in the Cisco Catalyst SD-WAN data-policy, app-aware-routing policy, and access-list policy.
5. If you add or remove a tag, the status is automatically reflected in the policy.
6. Update the policy to include new tag objects.

**Figure 2: Tagging Workflow with Examples**



## Benefits of Policy Configuration Tagging

The benefits of using policy configuration tagging are:

- Enables reusability of policy objects.
- Enables faster policy download on a device with reduced configuration size and sequences.
- Tag sharing across different policies is supported.
- Enables visibility or correlation across the network in a user-defined intent.
- Controls the policy configuration download speed between the Cisco SD-WAN Controller and the Cisco IOS XE Catalyst SD-WAN devices.
- Improves management of the defined lists in the controller.

- Better organization of the configurations for the intent-based network.

# Configure Policy Configuration Tagging Using a CLI Template

## Before You Begin

Ensure that the controllers and the edge devices are all updated to the latest versions—Cisco Catalyst SD-WAN Control Components Release 20.9.x, Cisco vManage Release 20.9.1, and Cisco IOS XE Catalyst SD-WAN Release 17.9.1a.

## Configure Policy Configuration Tagging Using a CLI Template

For more information about using CLI templates, see [CLI Add-On Feature Templates](#) and [CLI Templates](#).



**Note** By default, CLI templates execute commands in global config mode.

This section provides example CLI configurations to configure tag-instances and centralized policy using Cisco SD-WAN Controller CLI templates.

### Creating Policy Configuration Tagging

1. Configure a new object tag-instance on Cisco SD-WAN Controller:

```
tag-instances [tag-instance] [lists]
```

2. Create tag-instance with member attributes such as app-lists, data-ipv6-prefix-list, and data-prefix-list. Configure tag instances with a global unique ID for each of the tag names. The tag configuration is pushed to only those devices which reference these TAGs:

```
tag-instance tag-instance-name [id global-unique-id] [app-list app-list-name]
[data-prefix-list prefix-list-name] [data-ipv6-prefix-list ipv6-prefix-list-name]
```

3. Configure tag-instance lists:

```
lists[app-list app-list-name] [data-prefix-list prefix-list-name]
[data-ipv6-prefix-list ipv6-prefix-list-name]
```

### Adding Tag-Instances in a policy match criteria

1. Configure localized access-list policy (ACLs and IPv6 ACLs) to include destination or source tag instances in matching attributes:

```
match [destination-tag-instance dest-tag-name | source-tag-instance
src-tag-name]
```

2. Configure centralized data policy to include destination-tag-instance, source-tag-instance, or tag-instance in matching attributes:

```
match [destination-tag-instance dest-tag-name | source-tag-instance
src-tag-name | tag-instance tag-name]
```

3. Configure centralized Application Aware Route (AAR) policy to include destination-tag-instance, source-tag-instance, or tag-instance in matching attributes:

```

match[destination-tag-instance dest-tag-name | source-tag-instance
src-tag-name | tag-instance tag-name]

```

Here's the complete configuration example for creating tag-instances, including the tag instances as matching attribute in localized and centralized policies:

```

****Tag Configuration****
tag-instances
tag-instance blue
  id 2000
  data-ipv6-prefix-list v6_pfx1 v6_pfx2
!
tag-instance orange
  id 3000
  app-list appl1 appl2
!
lists
data-prefix-list pfx1
  ip-prefix 10.0.0.1/32
!
data-ipv6-prefix-list v6_pfx1
  ipv6-prefix 2001::1/128
!
app-list appl1
  app amazon
!
!
!
****Localized Policy****
policy
lists
data-prefix-list pfx1
  ip-prefix 10.20.24.0/24
!
!
access-list acl
sequence 10
  match
    source-tag-instance blue
  !
  action accept
  count acl_input_wc
!
!
default-action drop
!
!
****Centralized Policy ****
policy
data-policy DP1
vpn-list vpn1
sequence 100
  match
    tag-instance orange
  !
  action accept
!
!
sequence 200
  match
    source-tag-instance blue
!

```

```

    action drop
      count count1
    !
  !
sequence 300
match
  destination-tag-instance blue
!
action accept
!

```

## Verify Tag-Instances Configuration Using the CLI

The following is a sample output from the **show sdwan tag-instances from-vsmart** command displaying the downloaded tags from Cisco SD-WAN Controller on Cisco IOS XE Catalyst SD-WAN device:

```

Device# show sdwan tag-instances from-vsmart
tag-instances-from-vsmart
tag-instance APP_facebook_TAG9
  id 60000
  app-list apps_facebook
tag-instance APP_office_TAG10
  id 70000
  app-list apps_ms apps_zoom
tag-instance APP_webex_TAG8
  id 50000
  app-list apps_webex
lists data-prefix-list multicast_pfx
  ip-prefix 10.10.20.30/8
lists data-prefix-list pfx1
  ip-prefix 10.20.24.0/24
lists data-prefix-list pfx21
  ip-prefix 172.16.10.10/8
lists data-prefix-list pfx22
  ip-prefix 172.16.20.20/16
  ip-prefix 192.168.10.20/8
lists data-ipv6-prefix-list v6_pfx1
  ipv6-prefix 2001::/64
lists data-ipv6-prefix-list v6_pfx21
  ipv6-prefix 2001::1/128
  ipv6-prefix 2001::/64
lists app-list apps_facebook
  app dns
  app facebook
lists app-list apps_ms
  app ms-office-365
  app ms-office-web-apps
  app ms-services
  app ms-teams
  app pop3
lists app-list apps_webex
  app sip
  app webex-audio
  app webex-control
  app webex-media
  app webex-meeting
  app webex-video
lists app-list apps_zoom
  app zoom-meetings

```



The following is a sample output from the **show sdwan policy from-vsmart** command displaying the policy that is downloaded from the Cisco SD-WAN Controller on Cisco IOS XE Catalyst SD-WAN device:

```
Device# show sdwan policy from-vsmart
from-vsmart sla-class SLA1
  latency 100
from-vsmart data-policy DATA_POLICY
  direction from-service
  vpn-list vpn_1
  sequence 11
    match
      destination-port      5060
      protocol              17
      source-tag-instance    DP_V4_TAG1
      destination-tag-instance DP_V4_TAG3
    action accept
      count src_dst_legacy_v4
  sequence 21
    match
      source-tag-instance    DP_V4_TAG1
    action drop
      count src_v4
  sequence 31
    match
      source-tag-instance    DP_V4_TAG2
      destination-tag-instance DP_V4_TAG3
      tag-instance           APP_webex_TAG8
    action drop
      count src_dst_app_v4
  sequence 41
    match
      source-tag-instance    DP_V4_TAG1
      destination-tag-instance DP_V4_TAG3
      tag-instance           APP_facebook_TAG9
    action accept
      count src_dst_app2_v4
```

The following is a sample output from the **show platform software common-classification** command displaying the tag information from a forwarding manager on a forwarding plane (FMAN-FP):

```
Device# show platform software common-classification F0 tag all
Total Number of TAGs: 9
tag id      tag name      tag type      num clients  num sets      num member types
total members
-----
900         special_TAG7      Per Type OR   0            2            1
2
10000       DP_V4_TAG1        Per Type OR   1            1            1
1
11000       DP_V4_TAG2        Per Type OR   1            2            1
2
12000       DP_V4_TAG3        Per Type OR   1            6            1
6
20000       DP_V6_TAG4        Per Type OR   1            1            1
1
21000       DP_V6_TAG5        Per Type OR   1            2            1
2
50000       APP_webex_TAG8    Per Type OR   1            1            1
1
60000       APP_facebook_TAG9 Per Type OR   1            1            1
1
70000       APP_office_TAG10  Per Type OR   1            2            1
2
```

```

Device# show platform software common-classification f0 tag 1 summary
TAG ID: 1
TAG TYPE: Per Type OR
TAG Name: net1
Is Dummy: F

```

```

client data:
  client id      client name
  -----
  166            SDWAN

```

```

member data:
  Prefix List      6
  App List         3

```

```

Device# show platform software common-classification f0 tag 1 prefixList

```

```

member details:
  member detail type  member id  member data
  -----
  IPv4 Prefix List    65537    100
  IPv6 Prefix List    65538    101
  IPv4 Prefix List    65540    103
  IPv6 Prefix List    65541    104
  IPv6 Prefix List    65544    107
  IPv4 Prefix List    65546    109

```

```

Device# show platform software common-classification f0 tag 1 applist

```

```

member details:
  member detail type  member id  member data
  -----
  App List            65539    102
  App List            65542    105
  App List            65545    108

```

```

Device# show platform software common-classification f0 tag 1 set

```

```

Total Number of SETs: 18
  Set ID      member detail type  member id  member data
  -----
  1            IPv4 Prefix List    65537    100
  1            App List            65539    102
  2            IPv4 Prefix List    65537    100
  2            App List            65542    105
  3            IPv4 Prefix List    65537    100
  3            App List            65545    108
  4            IPv6 Prefix List    65538    101
  4            App List            65539    102
  5            IPv6 Prefix List    65538    101

```