



Configuration Example for Local Mode - Wireless and Wired

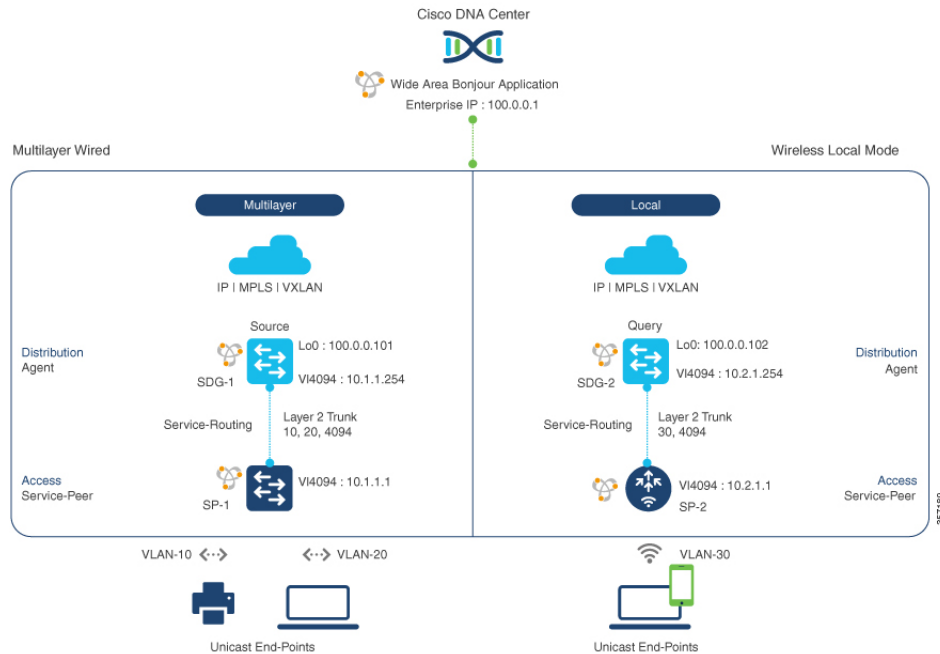
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Overview

This chapter provides configuration guidelines to implement Wide Area Bonjour enabling end-to-end policy-based mDNS service discovery and distribution across multilayer wired and wireless local mode. The first hop mDNS gateway at Layer 2 access switch and the controller must be implemented in service peer mode and paired with LAN and wireless distribution-layer switch in SDG agent role. The network-wide distributed SDG agent must be paired with the Cisco Catalyst Center to enable mDNS service-routing across IP core network based on multiple services and network attributes.

The following figure illustrates unicast mode bonjour network environment with AirPrint capable printer and user computer (macOS, Microsoft Windows, etc.) connected to same Ethernet switch. The computers and mobile devices of the wireless user are associated to wireless AP in local mode across multi-hop IP boundary from printers.

Figure 1: Wide Area Bonjour Service-Routing Multilayer Wired and Wireless Local Mode



Configuring Wireless AP Multicast Mode

This procedure configures wireless AP multicast on the controller for local mode APs and IP network.

The controller must be configured with unique IP multicast address for wireless AP in local mode to permit mDNS communication across wired and wireless networks.

Step	Controller Service Peer Configuration
Step-1 Enable global IP Multicast on Cisco Catalyst 9800 series controller.	<pre>! wireless multicast !</pre>
Step-2 Configure Wireless AP mode to Multicast with unique IP Multicast address.	<pre>! wireless multicast 239.254.254.1 !</pre>

The following table provides step-by-step IP multicast configuration guidelines on SDG agent (SDG-1 and SDG-2) at the distribution layer network.

Step	Switch SDG Agent Configuration	WLC SDG Agent Configuration
Step-1 Enable IP multicast-routing on distribution layer switches connecting Cisco Wireless Local Mode Access Point and Cisco Wireless LAN Controller.	<pre>! ip multicast-routing !</pre>	<pre>! ip multicast-routing !</pre>
Step-2 Configure IP PIM Rendezvous-Point (RP) on distribution layer switches.	<pre>! ip pim rp-address 10.150.255.1 !</pre>	<pre>! ip pim rp-address 10.150.255.1 !</pre>
Step-3 Enable IP PIM on SVI Interface of distribution layer switches connected Cisco Wireless Local Mode Access Point and Cisco WLC Management VLAN.	<pre>! interface Vlan 101 description CONNECTED TO WIRELESS AP - LOCAL MODE ip pim sparse-mode !</pre>	<pre>! interface Vlan 4094 description CONNECTED TO WIRELESS MGMT - WLC ip pim sparse-mode !</pre>
Step-4 Enable IP PIM on Layer 3 uplink Interface of distribution layer switches connected Cisco Wireless Local Mode Access Point and Cisco WLC Management VLAN.	<pre>! interface range FortyGigabitEthernet 1/1/1 - 2 description CONNECTED TO IP CORE NETWORK ip pim sparse-mode !</pre>	<pre>! interface range FortyGigabitEthernet 1/1/1 - 2 description CONNECTED TO IP CORE NETWORK ip pim sparse-mode !</pre>



Note IP Multicast must be enabled in the Layer 3 core network to allow Cisco wireless APs in local mode to successfully join the WLC announced multicast group. For more information, refer to the Cisco online documentation to implement IP multicast networks.

Configuration Example for Default Service List and Policy in Wide Area Bonjour Between Multilayer Wired and Wireless Endpoints

This section provides guidance on configuring Service-Peer, SDG Agent, and Cisco Catalyst Center, allowing the wired and wireless endpoints to dynamically discover default service list using Layer 2 unicast and policy.

Example: Wired and Wireless Access Layer Service Peer Configuration

The following table provides a sample configuration of wired and wireless controller access layer service peer.

Table 1: Configuring Wired and Wireless Access Layer Service Peer

Configuration Step	Sample Configuration: SP-1 Service-Peer Configuration	Sample Configuration: SP-2 Service-Peer Configuration
Step-1: Enable mDNS gateway and set the gateway mode. Note In wireless controller, service peer mode is enabled by default with mDNS gateway configuration.	<pre>! mdns-sd gateway mode service-peer !</pre>	<pre>! mdns-sd gateway mode service-peer !</pre>
Step-2: Activate unicast mDNS gateway and attach service policy on wired VLAN and wireless FlexConnect user VLAN of SP-1 and SP-2 Layer 2 access switch.	<pre>! vlan configuration 10, 30 mdns-sd gateway service-policy LOCAL-AREA-POLICY active-query timer 3600 !</pre>	<pre>! vlan configuration 20, 30 mdns-sd gateway service-policy LOCAL-AREA-POLICY active-query timer 3600 !</pre>
Step-3: Enable unicast service routing between wired and wireless service peer and SDG agent using wired management source VLAN ID and IP address.	<pre>vlan configuration 10, 30 mdns-sd gateway source-interface vlan 4094 sdg-agent 10.1.1.254 !</pre>	<pre>! vlan configuration 20, 30 mdns-sd gateway source-interface vlan 4094 sdg-agent 10.1.1.254 !</pre>

Example: Wired and Wireless Distribution Layer SDG Agent Configuration

The following table provides a sample configuration of distribution layer SDG agent.

Table 2: Configuring Wired and Wireless Distribution Layer SDG Agent

Configuration Step	Sample Configuration: SDG-1 – SDG Agent
Step-1: Enable mDNS gateway and set the gateway mode. The default mode is sdg-agent.	<pre>! mdns-sd gateway !</pre>
Step-2: Activate unicast mDNS gateway on wired VLAN and wireless user VLAN on SDG agents.	<pre>! vlan configuration 10, 20, 30 mdns-sd gateway !</pre>
Step-3: Configure the service peer-group and attach service-policy on the SDG agent distribution switch and enable service-routing between the assigned Service Peer switch group.	<pre>! mdns-sd service-peer group peer-group 1 service-policy LOCAL-AREA-POLICY service-peer 10.1.1.1 location-group default service-peer 10.1.1.2 location-group default !</pre>

Configuration Step	Sample Configuration: SDG-1 – SDG Agent
Step-4: Associate outbound service-list to a unique service-policy.	<pre>! mdns-sd service-policy WIDE-AREA-POLICY service-list WIDE-AREA-SERVICES-OUT !</pre>
Step-5: Enable Wide Area Bonjour service-routing with service export configuration association controller IP Address, source interface for stateful connection, and mandatory egress policy for Wide Area service-routing.	<pre>! service-export mdns-sd controller DNAC-CONTROLLER-POLICY controller-address 100.0.0.1 controller-source-interface LOOPBACK 0 controller-service-policy WIDE-AREA-POLICY !</pre>

Configuration Example for Customized Service List and Policy in Wide Area Bonjour Between Multilayer Wired and Wireless Endpoints

This section provides guidance on configuring Service-Peer, SDG Agent and Cisco Catalyst Center, allowing the wired and wireless endpoints to dynamically discover printer using Layer 2 unicast and policy.

Example: Wired and Wireless Access Layer Service Peer Configuration

The following table provides a sample configuration of wired and wireless controller access layer service peer.

Table 3: Configuring Wired and Wireless Access Layer Service Peer

Configuration Step	Sample Configuration: Switch Service Peer	Sample Configuration: Wireless Controller Service Peer
Step-1: Enable mDNS gateway and set the gateway mode. Note In wireless controller, service peer mode is enabled by default with mDNS gateway configuration.	<pre>! mdns-sd gateway mode service-peer !</pre>	<pre>! mdns-sd gateway !</pre>
Step-2: Create unique mDNS inbound policy to permit ingress AirPrint service announcement on the Catalyst Switch and wireless controller in service peer mode.	<pre>! mdns-sd service-list LOCAL-AREA-SERVICES-IN in match printer-ipp !</pre>	<pre>! mdns-sd service-list LOCAL-AREA-SERVICES-IN in match printer-ipp !</pre>

Example: Wired and Wireless Access Layer Service Peer Configuration

Configuration Step	Sample Configuration: Switch Service Peer	Sample Configuration: Wireless Controller Service Peer
Step-3: Create unique mDNS outbound policy to permit egress AirPrint service response on the Catalyst Switch and wireless controller in service peer mode	<pre>! mdns-sd service-list LOCAL-AREA-SERVICES-OUT out match printer-ipp !</pre>	<pre>! mdns-sd service-list LOCAL-AREA-SERVICES-OUT out match printer-ipp !</pre>
Step-4: Associate inbound and outbound service list to a unique service policy.	<pre>! mdns-sd service-policy LOCAL-AREA-POLICY service-list LOCAL-AREA-SERVICES-IN service-list LOCAL-AREA-SERVICES-OUT !</pre>	<pre>mdns-sd service-policy LOCAL-AREA-POLICY service-list LOCAL-AREA-SERVICES-IN service-list LOCAL-AREA-SERVICES-OUT !</pre>
Step-5: Activate unicast mDNS gateway and attach service policy on wired VLAN and WLAN. <ul style="list-style-type: none"> • Switch: Activate mDNS gateway per VLAN. • Controller: Activate mDNS gateway per WLAN policy profile and SSID 	<pre>! vlan configuration 10, 20 mdns-sd gateways service-policy LOCAL-AREA-POLICY active-query timer 3600 !</pre>	<pre>! wireless profile policy WLAN-PROFILE shutdown mdns-sd service-policy LOCAL-AREA-POLICY no shutdown ! wlan WLAN-PROFILE 1 blizzard shutdown mdns-sd-interface gateway no shutdown !</pre>
Step-6: (Optional) Enable service routing on wired service peer mDNS between local VLANs. Also, enable location-based wireless service on the controller. <ul style="list-style-type: none"> • Switch: Configure location filter group to discover and distribute between paired local VLAN. • Controller: Configure wireless location-based services. 	<pre>! mdns-sd location-filter LOCAL-PROXY match location-group default vlan 10 match location-group default vlan 20 ! mdns-sd service-list LOCAL-AREA-SERVICES-OUT OUT match printer-ipps location-filter LOCAL-PROXY !</pre>	<pre>! mdns-sd service-policy LOCAL-AREA-POLICY location ap-location !</pre>

Configuration Step	Sample Configuration: Switch Service Peer	Sample Configuration: Wireless Controller Service Peer
Step-7: Enable unicast service routing between wired and wireless service peer and SDG agent. <ul style="list-style-type: none"> • Switch: Configure SDG agent IP and wired management source VLAN ID and IP address. • Controller: Configure SDG Agent IP and wireless management source VLAN ID and IP address. 	<pre>vlan configuration 10, 20 mdns-sd gateways source-interface vlan 4094 sdg-agent 10.1.1.254 !</pre>	<pre>! mdns-sd gateway source-interface vlan 4094 sdg-agent 10.2.1.254 !</pre>

Example: Wired and Wireless Distribution Layer SDG Agent Configuration

The following table provides a sample configuration of distribution layer SDG agent.

Table 4: Configuring Distribution Layer SDG Agent

Configuration Step	Sample Configuration: Wired SDG Agent	Sample Configuration: Wireless SDG Agent
Step-1: Enable mDNS gateway and set the gateway mode.	<pre>! mdns-sd gateway !</pre>	<pre>! mdns-sd gateway !</pre>
Step-2: Activate unicast mDNS gateway on wired VLAN and wireless user VLAN on respective SDG agents.	<pre>! vlan configuration 10, 20 mdns-sd gateway !</pre>	<pre>! vlan configuration 30 mdns-sd gateway !</pre>
Step-3: Create unique controller bound mDNS policy to permit egress AirPrint service discovery and distribution from Catalyst Switch in SDG agent mode. Inbound policy towards controller is not required.	<pre>! mdns-sd service-list WIDE-AREA-SERVICES-OUT out match printer-ipp !</pre>	<pre>! mdns-sd service-list WIDE-AREA-SERVICES-OUT out match printer-ipp !</pre>
Step-4: Associate outbound service-list to a unique service-policy.	<pre>! mdns-sd service-policy WIDE-AREA-POLICY service-list WIDE-AREA-SERVICES-OUT !</pre>	<pre>! mdns-sd service-policy WIDE-AREA-POLICY service-list WIDE-AREA-SERVICES-OUT !</pre>

Configuration Step	Sample Configuration: Wired SDG Agent	Sample Configuration: Wireless SDG Agent
Step-5: Enable Wide Area Bonjour service-routing with service export configuration association controller IP Address, source interface for stateful connection and mandatory egress policy for Wide Area service-routing.	<pre>! service-export mdns-sd controller DNAC-CONTROLLER-POLICY controller-address 100.0.0.1 controller-source-interface LOOPBACK 0 controller-service-policy WIDE-AREA-POLICY !</pre>	<pre>! service-export mdns-sd controller DNAC-CONTROLLER-POLICY controller-address 100.0.0.1 controller-source-interface LOOPBACK 0 controller-service-policy WIDE-AREA-POLICY !</pre>

Cisco Catalyst Center Traditional Multilayer Wired and Wireless Configuration

Configuring Service Filters for Traditional Multilayer Wired and Wireless - Local Mode (GUI)

This procedure implements global service filters, which permit the Cisco Wide Area Bonjour application to dynamically discover and distribute service information between trusted Cisco Catalyst SDG agent switches across the IP network.

Procedure

-
- Step 1** Navigate to the **Configuration** tab in the Wide Area Bonjour application.
 - Step 2** From the sidebar, select the subdomain for which you want to create the service filter.
 - Step 3** Check the **Service Filter** box.
 - Step 4** Click **Service Filter** icon from the topology to view a list of the service filters for the selected domain. You can also manually edit existing service filters from this list.
 - Step 5** Click **Create Service Filter**.
 - Step 6** From the **Network Mode** drop-down list, choose **Traditional** (the default mode).
 - Step 7** Enter a unique name for the service filter.
 - Step 8** (Optional) Enter a description for the service filter.
 - Step 9** Select one or more service types to permit announcements and queries.
 - Step 10** Enable or disable service filters after creating them. By default, service filters are enabled.
-

Configuring Source SDG Agents in Traditional Multilayer Wired and Wireless - Local Mode (GUI)

This procedure configures discovery of wired printer sources from the LAN distribution switches paired with Layer 2 Catalyst Switches in a service peer role. The wireless distribution switches paired with a controller in a service peer role receive query responses for wired printers and distribute the responses to querying devices over the wireless local mode network.

Procedure

-
- | | |
|----------------|--|
| Step 1 | Click Add in the upper-right portion of the Catalyst Center Policy screen. |
| Step 2 | Select the Query SDG agent radio button. By default, the Source radio button is selected. |
| Step 3 | From the SDG Agent/IP drop-down list, select an SDG agent (100.0.0.101) which announces the services, for example, Printer. |
| Step 4 | Select Peer from the Service Layer drop-down list. |
| Step 5 | Uncheck the box Any . By default, this is enabled. |
| Step 6 | Select the query VLAN (Vlan-10) to distribute services (Printer) from a specific network. |
| Step 7 | Enable or disable services from the selected query IPv4 subnet. By default, this is enabled. |
| Step 8 | Enable or disable services from the selected query IPv6 subnet. By default, this is enabled. |
| Step 9 | Enter the service peer IPv4 address (10.1.1.1). |
| Step 10 | Click the + icon to add more service peers, if any. Select Any to accept services from any peer on a selected VLAN. |
| Step 11 | (Optional) Click Add Next to add more source SDG agents. (Repeat the preceding steps.) |
| Step 12 | Click DONE . |
| Step 13 | Click CREATE . |
-

Configuring Query SDG Agents in Traditional Multilayer Wired and Wireless - Local Mode (GUI)

This procedure configures distributed services to query SDG agents connected to a controller in service peer mode, based on a policy.

Procedure

-
- | | |
|---------------|--|
| Step 1 | Click Add in the upper-right portion of the DNA-Center Policy screen. |
| Step 2 | Select the Query SDG agent radio button. By default, the Source radio button is selected. |
| Step 3 | From the SDG Agent/IP drop-down list, select an SDG agent (100.0.0.102) that receives queries for the services (Printer). |
| Step 4 | Select Peer from the Service Layer drop-down list. |
| Step 5 | Uncheck the box Any . By default, this is enabled. |
| Step 6 | Select the query VLAN (Vlan-30) to distribute services (Printer) to a specific network. |

- Step 7** Enable or disable services from the selected query IPv4 subnet. By default, this is enabled.
- Step 8** Enable or disable services from the selected query IPv6 subnet. By default, this is enabled.
- Step 9** Enter the **service peer IPv4 address** (10.2.1.254).
- Step 10** Click the + icon to add more service-peers, if any. Select **Any** to accept services from any peer on a selected VLAN.
- Step 11** (Optional) Click **Add Next** to add more query agents. (Repeat the preceding steps.)
- Step 12** Click **DONE**.
- Step 13** Click **CREATE**.

Verifying Wide Area Bonjour Between Multilayer Wired and Wireless Local Mode

This section provides step-by-step mDNS configuration and service discovery and distribution status based on applied policy on Wired Layer 2 access switch in service peer and SDG agent mode.

Verifying Wired Service-Peer Configuration

Use the following commands on the Cisco Catalyst switch in service peer (SP-1) mode to determine the operational status after applying configuration and discovering the AirPrint service from the local network.

```
Device# show mdns-sd summary vlan 10

VLAN: 10
=====
mDNS Gateway: Enabled
mDNS Service Policy: LOCAL-AREA-POLICY
Active Query: Enabled
               : Periodicity 3600 Seconds
Transport Type: IPv4
Service Instance Suffix: Not Configured
mDNS Query Type: ALL
SDG Agent IP: 10.1.1.254
Source Interface: Vlan4094

Device# show mdns-sd service-policy name LOCAL-AREA-POLICY

Service Policy Name Service List IN Name Service List Out Name
=====
LOCAL-AREA-POLICY      LOCAL-AREA-SERVICES-IN      LOCAL-AREA-SERVICES-OUT

Device# show mdns-sd cache vlan 10
```

Name	Type	TTL/ Remaining	Vlan-Id/ Interface-name	MAC Address	RR Record Data
_universal._sub._ipp.	PTR	4500/4486	Vl10	ac18.2651.03fe	Bldg-1-FL1-PRN.
_tcp.local					_ipp._tcp.local

Name	Type	TTL/ Remaining	Vlan-Id/ Interface-name	MAC Address	RR Record Data
_ipp. _tcp.local	PTR	4500/4486	Vl10	ac18.2651.03fe	Bldg-1-FL1-PRN. _ipp. _tcp.local
Bldg-1-FL1- PRN. _ipp. _tcp.local	SRV	4500/4486	Vl10	ac18.2651.03fe	Bldg-1-FL1-PRN. local
Bldg-1-FL1- PRN.local	A	4500/4486	Vl10	ac18.2651.03fe	10.153.1.1
Bldg-1-FL1- PRN.local	AAAA	4500/4486	Vl10	ac18.2651.03fe	2001:10:153: 1:79: A40C:6BEE: AEEC
Bldg-1-FL1- PRN. _ipp. _tcp.local	TXT	4500/4486	Vl10	ac18.2651.03fe	(451)'txtvers=1"priori ty=EPSON WF-3620 usb_MFG=EPSON" usb_MDL=W~'

Device# **show mdns-sd statistics vlan 10**

mDNS Statistics

Vl10:

```

mDNS packets sent           : 612
  IPv4 sent                  : 612
    IPv4 advertisements sent : 0
    IPv4 queries sent        : 612
  IPv6 sent                  : 0
    IPv6 advertisements sent : 0
    IPv6 queries sent        : 0
Unicast sent                 : 0
mDNS packets rate limited    : 0
mDNS packets received        : 42
  advertisements received    : 28
  queries received           : 14
    IPv4 received            : 42
      IPv4 advertisements received: 28
      IPv4 queries received      : 14
    IPv6 received            : 0
      IPv6 advertisements received: 0
      IPv6 queries received      : 0
mDNS packets dropped         : 0

```

```

=====
Query Type                   : Count
=====
PTR                           : 12
SRV                           : 0
A                             : 0
AAAA                         : 0
TXT                           : 0
ANY                           : 3
=====

```

```

PTR Name                     Advertisement      Query

```

```
=====
_ipp. _tcp.local          9          4
```

Verifying Wired SDG Agent Configuration and Service-Routing Status

This section provides information on mDNS configuration and service-routing on Wired SDG Agent (SDG-1) with locally attached Layer 2 access switches in Service-Peer (SP-1) mode and with centrally paired Cisco Catalyst Center for Wide Area Bonjour service-routing.

```
Device# show mdns-sd summary vlan 10
```

```
VLAN: 10
```

```
=====
mDNS Gateway           : Enabled
mDNS Service Policy    : LOCAL-AREA-POLICY
Active Query           : Disabled
Transport Type         : IPv4
Service Instance Suffix : Not-Configured
mDNS Query Type        : ALL
SDG Agent IP           : Not-Configured
Source Interface       : Not-Configured
```

```
Device# show mdns-sd cache vlan 10
```

```
VLAN: 10
```

```
=====
mDNS Gateway           : Enabled
mDNS Service Policy    : LOCAL-AREA-POLICY
Active Query           : Disabled
Transport Type         : IPv4
Service Instance Suffix : Not-Configured
mDNS Query Type        : ALL
SDG Agent IP           : Not-Configured
Source Interface       : Not-Configured
```

Name	Type	TTL/ Remaining	Vlan-Id /Interface-name	MAC Address	RR Record Data
_universal. _sub._ipp ._tcp.local	PTR	4500/4500	V110	ac18.2651.03fe	Bldg-1-FL1-PRN. _ipp. _tcp.local
_ipp. _tcp.local	PTR	4500/4500	V110	ac18.2651.03fe	Bldg-1-FL1-PRN. _ipp. _tcp.local
Bldg-1-FL1- PRN. _ipp. _tcp.local	SRV	4500/4500	V110	ac18.2651.03fe	0 0 631 Bldg-1-FL1-PRN. local
Bldg-1-FL1 -PRN.local	A	4500/4500	V110	ac18.2651.03fe	10.153.1.1

Name	Type	TTL/ Remaining	Vlan-Id /Interface-name	MAC Address	RR Record Data
Bldg-1-FL1- PRN.local	AAAA	4500/4500	V110	ac18.2651.03fe	2001:10:153: 1:79: A40C:6BEE: AEEC
Bldg-1-FL1- PRN._ipp. _tcp.local	TXT	4500/4500	V110	ac18.2651.03fe	(51) was priority=30 ty=EPSON WF-3620 Series" to Epson to Epson

Device# **show mdns-sd sp-sdg statistics**

```

                                One min, 5 mins, 1 hour
Average Input rate (pps)      : 0,      0,      0
Average Output rate (pps)    : 0,      0,      0
Messages received:
  Query                       : 15796
  ANY query                   : 0
  Advertisements              : 28
  Advertisement Withdraw      : 0
  Interface down              : 0
  Vlan down                   : 0
  Service-peer ID change      : 0
  Service-peer cache clear    : 12
  Resync response             : 6
Messages sent:
  Query response              : 5975
  ANY Query response          : 0
  Cache-sync                  : 61
  Get service-instance        : 0

```

Device# **show mdns-sd controller detail**

```

Controller: DNAC-Policy
IP: 100.0.0.1, Dest Port : 9991, Src Port : 42446, State : UP
Source Interface : Loopback0, MD5 Disabled
Hello Timer 30 sec, Dead Timer 120 sec, Next Hello 00:00:24
Uptime 2d05h (17:02:37 UTC Jan 15 2021)
Service Buffer: Enabled

Service Announcement:
Filter: DNAC-CONTROLLER-POLICY
Count 50, Delay Timer 30 sec, Pending Announcement 0, Pending Withdraw 0
Total Export Count 56, Next Export in 00:00:24

Service Query:
Query Suppression Enabled
Query Count 50, Query Delay Timer 15 sec, Pending 0
Total Query Count 15791, Next Query in 00:00:09

```

Verifying Wireless Service-Peer Configuration and Service Status

The command given below helps determine the operational status after applying configuration and discovering the AirPrint service from the remote network.

```
Device# show mdns-sd summary
```

```
mDNS Gateway: Enabled
Mode: Service Peer
Service Announcement Periodicity (in seconds): 30
Service Announcement Count: 50
Service Query Periodicity (in seconds): 15
Service Query Count: 50
Active Response Timer (in seconds): Disabled
ANY Query Forward: Disabled
SDG Agent IP: 10.2.1.254
Source Interface: Vlan4094
Active Query Periodicity (in minutes): 15
Transport Type: IPv4
mDNS AP service policy: default-mdns-service-policy
```

```
Device# show wireless profile policy detailed WLAN-PROFILE | sec mDNS
```

```
mDNS Gateway
  mDNS Service Policy name      : LOCAL-AREA-POLICY
```

```
Device# show mdns-sd statistics wlan-id 1
```

```
mDNS Packet Statistics
-----
mDNS stats last reset time: 01/10/21 21:38:19
mDNS packets sent: 4592
  IPv4 sent: 4592
    IPv4 advertisements sent: 4592
    IPv4 queries sent: 0
  IPv6 sent: 0
    IPv6 advertisements sent: 0
    IPv6 queries sent: 0
  Multicast sent: 0
    IPv4 sent: 0
    IPv6 sent: 0
mDNS packets received: 297
  advertisements received: 80
  queries received: 217
  IPv4 received: 297
    IPv4 advertisements received: 80
    IPv4 queries received: 217
  IPv6 received: 0
    IPv6 advertisements received: 0
    IPv6 queries received: 0
mDNS packets dropped: 297
Query Type Statistics
  PTR queries received: 1720
  SRV queries received: 8
  A query received: 8
  AAAA queries received: 8
  TXT queries received: 97
  ANY queries received: 153
  OTHER queries received: 0
```

```
Device# show mdns-sd sp-sdg statistics
```

```
mDNS SP Statistics
```

```

last reset time: 01/10/21 21:37:36

Messages sent:
  Query                : 12675
  ANY query            : 0
  Advertisements       : 24
  Advertisement Withdraw : 0
  Service-peer ID change : 0
  Service-peer cache clear : 7
  Resync response      : 5
Messages received:
  Query response       : 4619
  ANY Query response   : 0
  Cache-sync          : 48
  Get service-instance : 0

```

```
Device# show mdns-sd query-db
```

```
MDNS QUERY DB
```

```

Client MAC: 4c32. 7593.e3af
Vlan ID: 30
Wlan ID: 1
Location Group ID: 0
PTR Name(s):
  _ipp. _tcp.local

```

Verifying Wireless SDG Agent Configuration and Service-Routing Status

This section provides information on mDNS configuration and service-routing on Wireless SDG Agent (SDG-2) with locally attached controller in service peer (SP-2) mode and with centrally paired Cisco DNA-Center for Wide Area Bonjour service-routing.

```
Device# show mdns-sd summary vlan 30
```

```

VLAN: 30
=====
mDNS Gateway      : Enabled
mDNS Service Policy : LOCAL-AREA-POLICY
Active Query      : Disabled
Transport Type    : IPv4
Service Instance Suffix : Not Configured
mDNS Query Type   : ALL
SDG Agent IP      : Not Configured
Source Interface  : Not Configured

```

```
Device# show mdns-sd sp-sdg statistics
```

```

One min, 5 mins, 1 hour
Average Input rate (pps) :0,      0,      0
Average Output rate (pps):0,      0,      0
Messages received:
  Query                : 12191
  ANY query            : 0
  Advertisements       : 0
  Advertisement Withdraw : 0
  Interface down       : 0
  Vlan down            : 0
  Service-peer ID change : 0
  Service-peer cache clear : 18
  Resync response      : 10

```

```

Messages sent:
Query response           : 1975
ANY Query response       : 0
Cache-sync               : 19
Get service-instance     : 0

Device# show mdns-sd controller detail

Controller: DNAC-Policy
IP: 100.0.0.1, Dest Port : 9991, Src Port : 42931, State : UP
Source Interface: Loopback0, MD5 Disabled
Hello Timer 30 sec, Dead Timer 120 sec, Next Hello 00:00:19
Uptime 2d05h (17:10:18 UTC Jan 15 2021)
Service Buffer: Enabled

Service Announcement:
Filter: DNAC-CONTROLLER-POLICY
Count 50, Delay Timer 30 sec, Pending Announcement 0, Pending Withdraw 0
Total Export Count 0, Next Export in 00:00:19

Service Query:
Query Suppression Enabled
Query Count 50, Query Delay Timer 15 sec, Pending 0
Total Query Count 17093, Next Query in 00:00:19

```

Verifying Cisco Catalyst Center Configuration and Service-Routing Status

The Cisco Wide Area Bonjour application supports comprehensive assurance capabilities to manage service-routing with network-wide distributed Cisco Catalyst switches in SDG-Agent role and mDNS services discovered over Wide Area Bonjour domain. The assurance capabilities in Cisco Wide Area Bonjour provides ability to determine service-routing state, mDNS service state and many more information at various levels for day-2 operations, analysis and troubleshooting. Each category serves unique function to manage and troubleshoot Wide Area Bonjour service-routing for day-2 operation.

This sub-section provides brief overview for each category of monitor function:

- **Dashboard:** The landing page of Cisco Wide Area Bonjour application provides key statistics in various formats to quickly determine service-routing health across the network. The network administrator can monitor operational status of service-routing with SDG Agent devices, historical chart of service discovery request, processing and drops from network-wide distributed devices and top five talkers across the network.
- **Sub-Domain 360°:** The network administrator can briefly collect statistics and status counts in 360° view. The left-panel monitoring, and configuration bar is automatically open upon clicking selected sub-domain to verify configured policies, discovered service-instances on per sub domain basis of the configuration section.
- **Monitor:** A comprehensive 3-tier monitoring and troubleshooting function of Cisco Wide Area Bonjour application for various day-2 operations. The detail view of SDG Agent, Service-Instance and advanced Troubleshooting capabilities allows network administrator to manage and troubleshoot Wide Area Bonjour domain with single of glass on Cisco Catalyst Center.

For more information, see [Cisco Wide Area Bonjour on Cisco Catalyst Center User Guide, Release 2.1.2](#) guide. The assurance capabilities and operation details are explained in Monitor the Cisco Wide Area Bonjour Application chapter to manage Cisco Wide Area Bonjour application with various supporting service-routing assurance function.

Reference

Table 5:

Related Topic	Document Title
DNA Service for Bonjour Deployment on Cisco Catalyst 9600 Switch	Cisco Catalyst 9600 Series Switch Software Configuration Guide, Release 17.5.X
DNA Service for Bonjour Deployment on Cisco Catalyst 9500 Switch	Cisco Catalyst 9500 Series Switch Software Configuration Guide, Release 17.5.X
DNA Service for Bonjour Deployment on Cisco Catalyst 9400 Switch	Cisco Catalyst 9400 Series Switch Software Configuration Guide, Release 17.5.X
DNA Service for Bonjour Deployment on Cisco Catalyst 9300 Switch	Cisco Catalyst 9300 Series Switch Software Configuration Guide, Release 17.5.X
Cisco Wide Area Bonjour Application on Cisco Catalyst Center User Guide	Cisco Wide Area Bonjour Application on Cisco Catalyst Center User Guide, Release 2.2.2

