Configure Local Area Bonjour Unicast Mode on Catalyst 9000 Switches

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Introduction

This document describes how to configure and troubleshoot Local Area Bonjour in the unicast-based approach.

Prerequisites

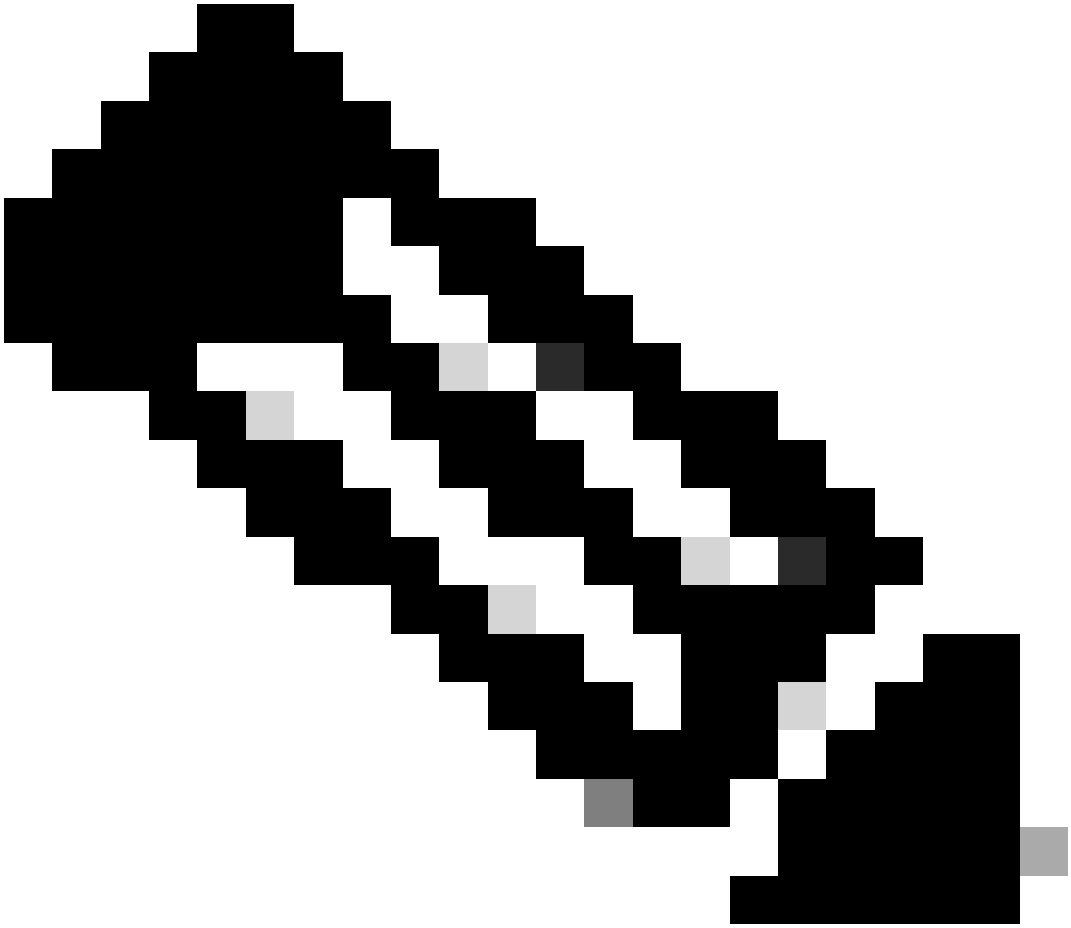
Requirements

There are no specific requirements for this document.

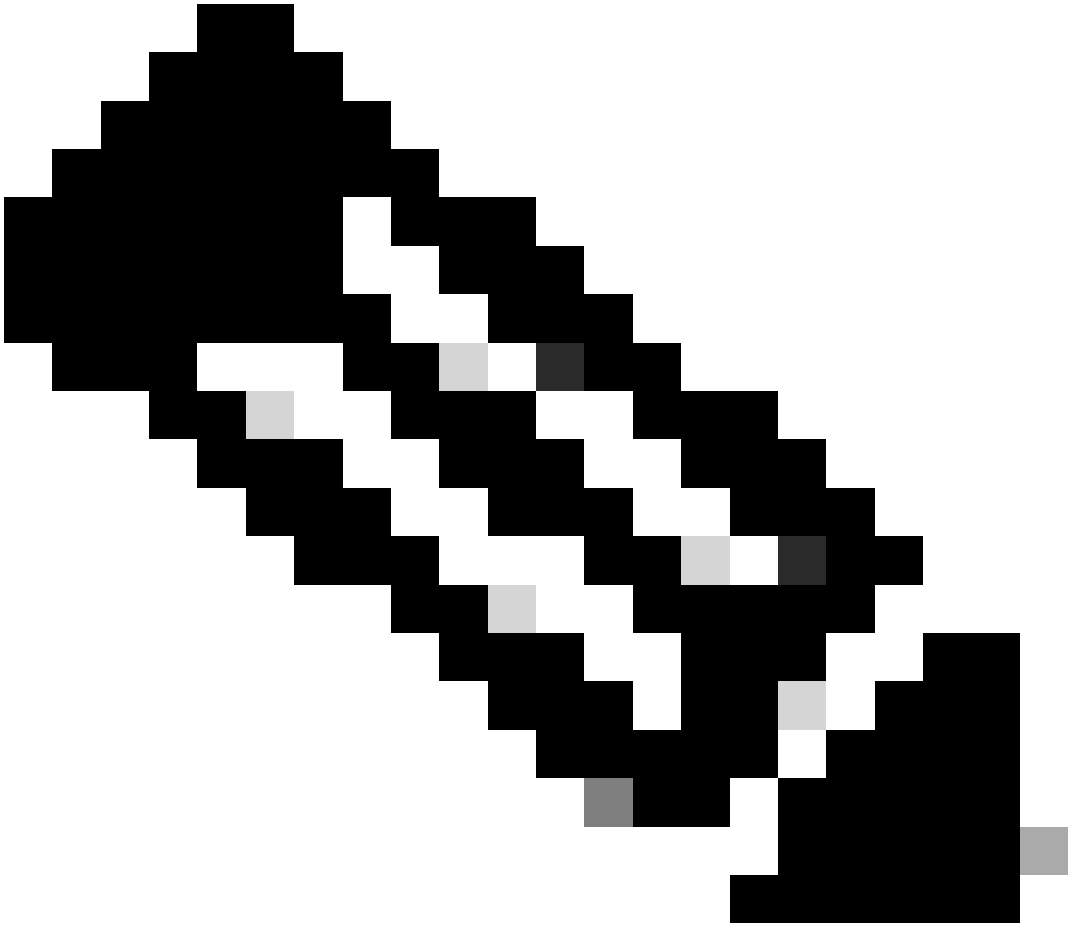
Components Used

The information in this document is based on these software and hardware versions:

- Catalyst 9200
- Catalyst 9300
- Catalyst 9400
- Catalyst 9500
- Catalyst 9600
- Cisco IOS® XE 17.6.2 and later versions



Note: Consult the appropriate configuration guide for the commands that are used in order to enable these features on other Cisco platforms.



Note: Cisco DNA Advantage License is required to run Local Area Bonjour. Validate that the Cisco Catalyst platform is supported in Service Discovery Gateway (SDG) Agent or Service Peer (SP) mode from the support matrix, which can be found in the configuration guide for the specific Cisco IOS XE version.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Terminology

- Service Type: Endpoints announce their singles or multiple services in the network. Examples of service types are: Apple TV, Airplay, IPP, and so on.
- Service Instance: Each endpoint is considered an instance in the network. Each instance has its own identification (name) in the network.

Background Information

Starting from Cisco IOS XE Amsterdam Release 17.3.2, a new approach of mDNS Service Gateway was introduced to replace the traditional flood-based implementation. This new approach provides a Unicast model with the next enhancements:

- mDNS snooping to suppress flooding of mDNS packets.
- A query database (query-db), which tracks the hosts that have queried for a specific service.
- Unicast mDNS response, the SDG Agent sends unicast mDNS responses only to hosts that are contained in the query database for each specific service.

Understand the mDNS Packet Records

An mDNS query have the next Record:

- PTR: The data in the PTR record is the service type being queried, it expects to get a node name offering the service type. For example: **_airplay._tcp.local**

An mDNS response or advertisement have the next records:

- PTR (pointer): The data in each PTR record is the name of the node representing the service instance. For example: **myPC._airplay._tcp.local**
- SRV (service): The SRV record data identifies the host on which the service instance is running and the port it is listening on. For example: **service instance myPC._airplay._tcp.local is running on host LAPTOP-1 on port 3000.**
- TXT (text): One or more key value pairs (key=value). The key value pairs provide additional information about the service. This is optional.
- A (IPv4 address): The A record is used to resolve a hostname into an IPv4 address. For example: **HostLAPTOP-1 has an IP address 10.24.81.11.**
- AAAA (IPv6 address): The A record is used to resolve a hostname into an IPv6 address (global and link-local). For example: **HostLAPTOP-1 has an IPv6 address 2001:0db8:1234::1.**

Flood-based vs. Unicast-based mDNS Gateway

The key difference is how the mDNS gateway (Cat9k switch) routes the mDNS advertisement to the queriers:

- In the flood-based approach, the advertisement is sent to the destination IP address 224.0.0.251 and its the corresponding multicast MAC address 0100.5e00.00fb.
- In the unicast-based approach, the advertisement is sent to the destination IP address 224.0.0.251, but the destination MAC address is the one from the device that queried for the service.

Additionally, in the multicast-based implementation, received mDNS packets are flooded to other ports that allow the VLAN in which the packet was received.

In the unicast-based approach, a flooding prevention mechanism is provided by mDNS snooping, which is enabled for every VLAN configured **mdns-sd gateway** under VLAN configuration. This way, mDNS packets are going to be sent in a unicast fashion:

- For queries, only to the devices that query specifically for the service (in the query-db)
- For advertisements, only to upstream SDG Agents or to the Cisco WAB (Wide Area Bonjour) application.

When troubleshooting an mDNS gateway, to identify if the switch is running flood-based or unicast-based mode, you can verify where **mdns-sd gateway** is configured.

- If it is configured under the SVI, flood-based approach is being used and mDNS snooping is not

enabled.
- If it is configured under VLAN configuration, unicast-based approach is being used and mDNS snooping is enabled.

Types of Unicast-based mDNS Gateway Configurations

There are 2 types of setups to provide a flood-free Service Discovery Gateway. Which to use depends mostly on where is the Layer 3 boundary:

- If the L3 boundary is at the access layer, then the Routed-access setup is used.
- If the L3 boundary is at the distribution layer, then the Multilayer setup is preferred.

Routed Access mDNS Gateway Setup

- The access switch acts as the SDG Agent.
- The SDG Agent performs service routing between endpoints on the same VLAN as well as between different VLANs.

Multilayer mDNS Gateway Setup

- The distribution switch (L3 boundary) acts as the SDG Agent.
- Layer 2 access switches are know as Service Peers.
- The Service Peer performs service routing between endpoints on the same VLAN.
- The SDG Agent performs service routing between endpoints that are connected in different Service Peers.
- The SDG Agent performs service routing between endpoints in different VLANs event if both endpoints are connected to the same Service Peer.
- The SDG Agent communicates with the Service Peers with a unicast UDP session. They do not exchange mDNS queries/advertisements. They rather communicate using Bonjour Control Protocol (BCP) Packets. This protocol uses UDP on port 10991.
- This way, when a Service Peer receives an mDNS query/advertisement from an endpoint it does not forward it immediately to the SDG Agent. Instead, it waits for a specific timer to export the mDNS queries/advertisements to the SDG Agent in a bulk fashion:
    - For queries, the default timer is 15 seconds. This can be modified with **service-query-timer periodicity <seconds>** command.
    - For advertisements, the default timer is 30 seconds. This can be modified with **service-announcement-timer periodicity <seconds>** command.
- When the SDG Agent receives a query from a Service Peer (contained in a BCP packet), it process it and if the service being requested is in its mDNS cache, it responds to the Service Peer with a BCP packet that contains the corresponding advertisement.
- As exchange of mDNS packets between the Service Peers and SDG Agent is not needed thanks to BCP, **mdns-sd trust** command is used in inter-switch trunk links to make the ports drop both ingress and egress mDNS packets.

Test mDNS Service Discovery

One of the struggles when testing mDNS gateway configurations in the lab is finding out how to get:

- one endpoint that advertises the service under test (mDNS responder).
- another endpoint that requests for this given service (mDNS querier).

These 2 roles can be accomplished using DNS-SD command. The DNS-SD command is a network diagnostic tool that enables a device to test mDNS Service Discovery. The most important function is that it

can advertise the existence of a service as well as to discover it.

Install the DNS-SD Test Tool

- macOS supports DNS-SD test tool natively, to use it just go the the terminal and type **dns-sd** to get information about the command.
- On the other hand, Windows does not support this test tool natively, it is needed to install Apple's Bonjour SDK, once this is installed the **dns-sd** could be available in the command prompt.
- The DNS-SD command syntax is the same for macOS and Windows.

Advertise a Service with DNS-SD

To advertise an mDNS service, use the next command:

```
dns-sd -R name _app._protocol local port
```

Where:

- name is the name of the service instance (entity which implements a service of a given type).
- the app is the application (service type) such as airplay, ipp, http, and so on.
- protocol is either TCP or UDP.
- local refers to the local domain.
- port is the port in which the service instance would be listening for the service.

Example: Node name testpc advertising Airplay service on TCP port 3000.

```
dns-sd -R testpc _airplay._tcp local 3000
```

Request for a Service with DNS-SD

To query for an mDNS service, use the next command:

```
dns-sd -B _app._protocol local
```

Where:

- the app is the application (service type) such as airplay, ipp, http, and so on.
- protocol is either TCP or UDP.
- local refers to the local domain.

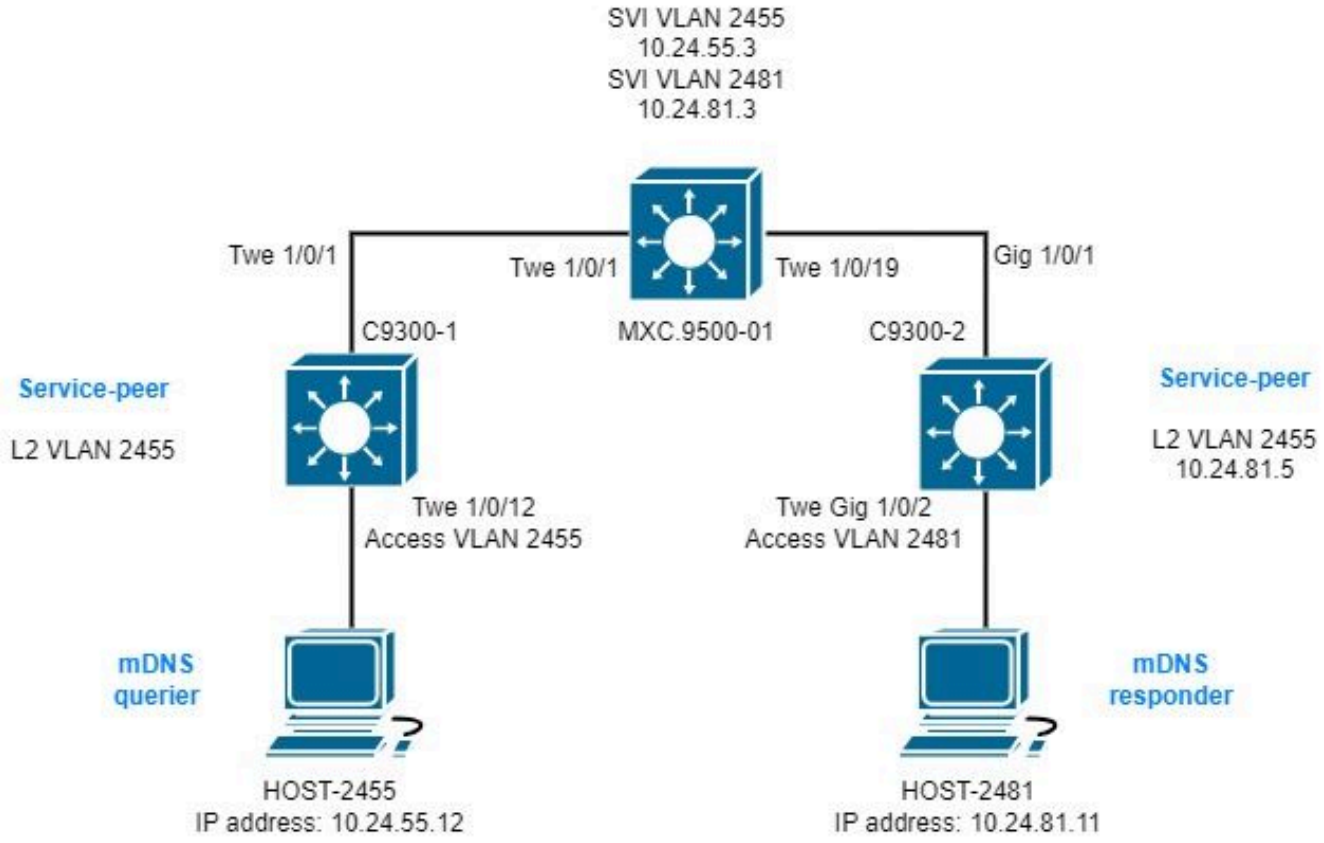
Example: Querying for Airplay service.

```
dns-sd -B _airplay._tcp local
```

Configure

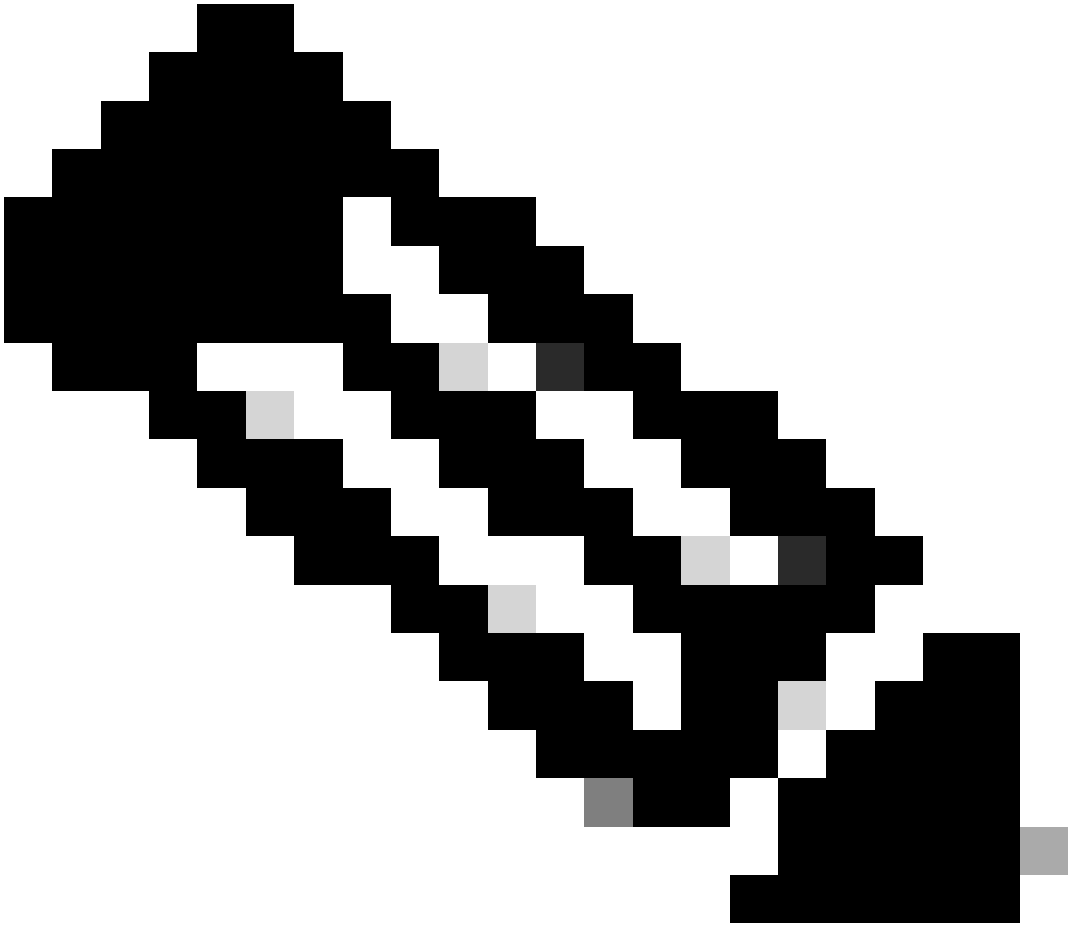
Configuration Example for Routed Access Networks

Topology



Configuration on the SDG Agent

1. Enable mDNS gateway globally.



Note: Starting on Cisco IOS XE 17.9.1, the mode in which the SDG Agent handles queries and responds can be configured. The default mode is recurring, in this mode once a query is received from endpoints, a response is sent at regular intervals of 15 seconds by default. The other mode is on-demand; in this mode, a response is sent only when a query is received from the endpoints. On-demand is how earlier Cisco IOS XE versions would handle the queries from endpoints.

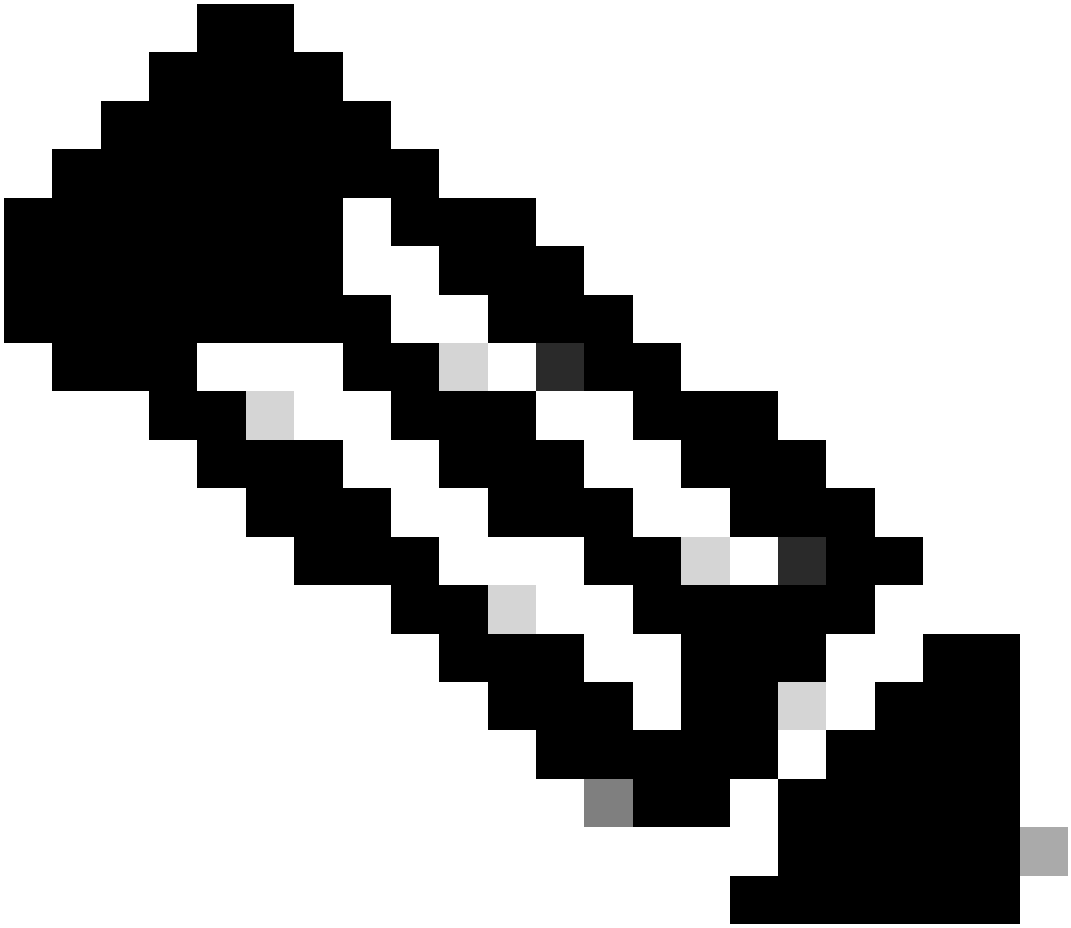
```
mdns-sd gateway
 active-query timer 1  <----- Optionally enable Active querying to discover mDNS responders that might
 query-response mode on-demand    <----- Sets the response mode to on-demand instead of the default rec
```

2. Create a location filter

A location filter is required for inter-VLAN service routing in custom policies. In this specific case, Service routing between VLANs 2455 and 2481 is required so those VLANs are added to the location filter **LOCAL-PROXY**.

```
mdns-sd location-filter LOCAL-PROXY
match location-group default vlan 2481
match location-group default vlan 2455
```

3. Create an inbound and outbound service list that permits the services of interest.



Note: The services permitted in the outbound service-policy are associated with the location-filter defined in step 2. This is required for inter-VLAN service routing.

<#root>

```
mdns-sd service-list LOCAL-AREA-SERVICES-IN IN
 match airplay
 match apple-tv
!
mdns-sd service-list LOCAL-AREA-SERVICES-OUT OUT
 match airplay
```

location-filter LOCAL-PROXY

```
 match apple-tv
location-filter LOCAL-PROXY
```

4. Create a service policy and associate the service lists created in step 3.

```
mdns-sd service-policy LOCAL-AREA-SERVICE-POLICY
service-list LOCAL-AREA-SERVICES-IN IN
service-list LOCAL-AREA-SERVICES-OUT OUT
```

5. Activate unicast mDNS gateway on VLANs of interest.

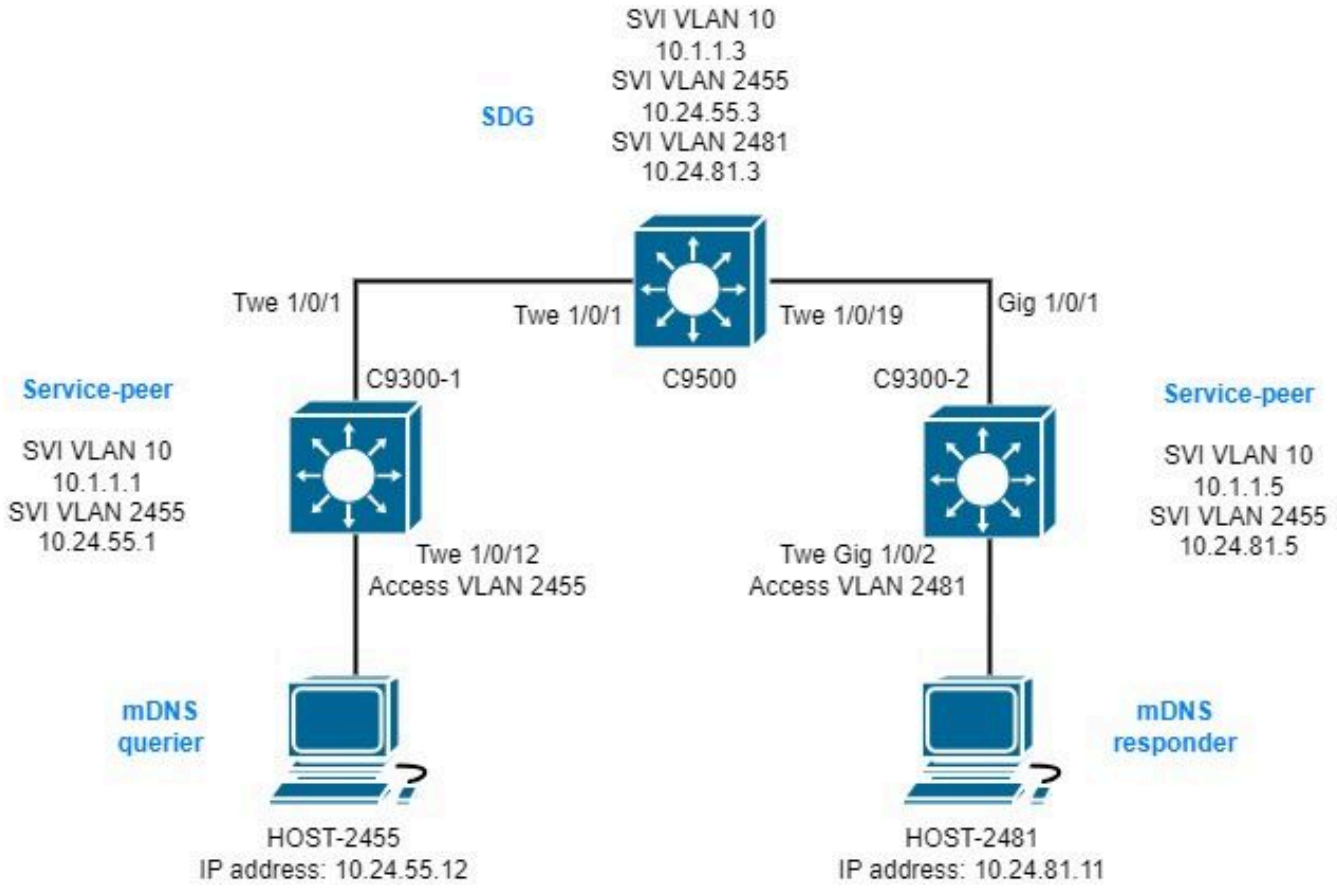
<#root>

```
vlan configuration 2455
 mdns-sd gateway
  service-policy LOCAL-AREA-SERVICE-POLICY
  source-interface Vlan2455                  <---- This is the source IP address that mDNS packets are
!
vlan configuration 2481

 mdns-sd gateway
  service-policy LOCAL-AREA-SERVICE-POLICY
  source-interface Vlan2481                  <---- This is the source IP address that mDNS packets are
```

Configuration Example for Multilayer Networks

Topology



Configuration on the SDG Agent

1. Enable mDNS gateway globally.

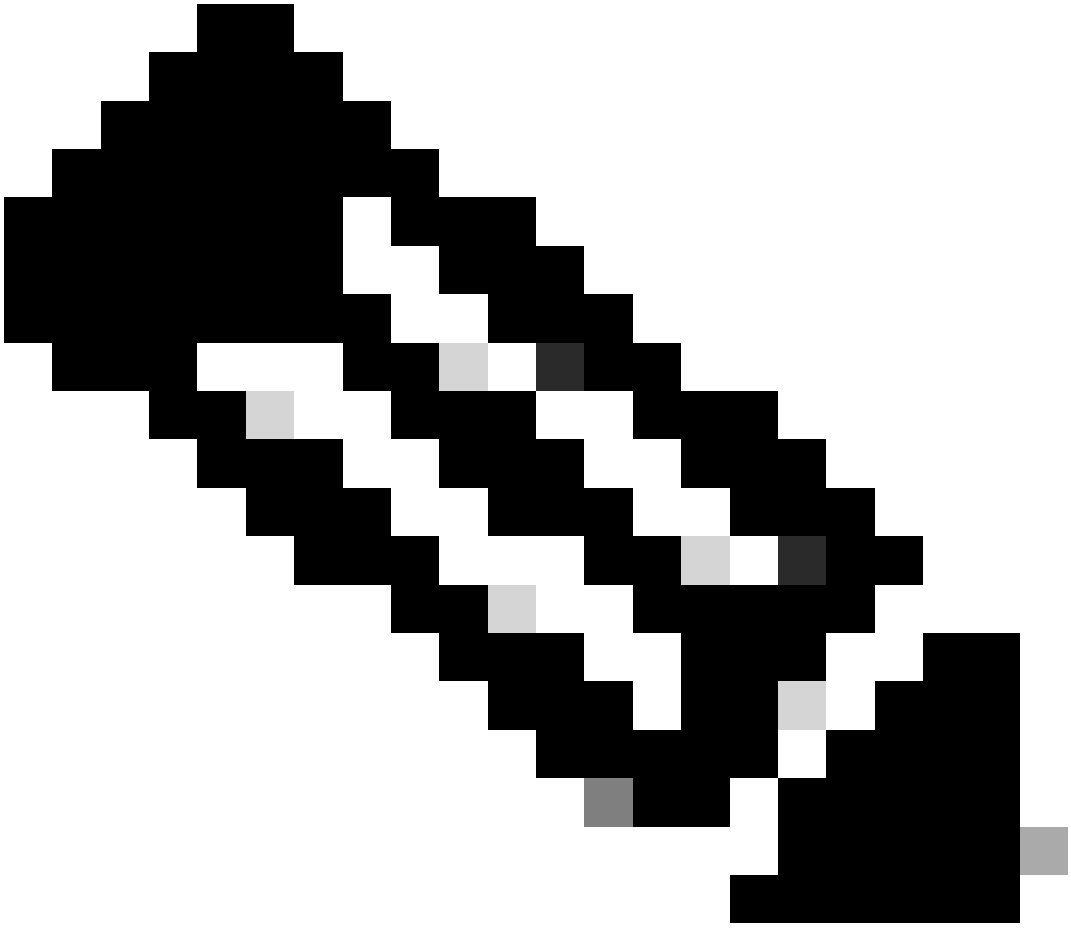
```
mdns-sd gateway
 source-interface vlan10  <----- This is the IP source that the SDG Agent are going to be use to establ
```

2. Create a location filter

A location filter is required for inter-VLAN service routing in custom policies. In this specific case, Service routing between VLANs 2455 and 2481 is required so those VLANs are added to the location filter **LOCAL-PROXY**.

```
mdns-sd location-filter LOCAL-PROXY
match location-group default vlan 2481
match location-group default vlan 2455
```

3. Create an inbound and outbound service list that permits the services of interest.



Note: The services permitted in the outbound service-policy are associated with the location-filter defined in step 2. This is required for inter-VLAN service routing.

<#root>

```
mdns-sd service-list LOCAL-AREA-SERVICES-IN IN
 match airplay
 match apple-tv
!
mdns-sd service-list LOCAL-AREA-SERVICES-OUT OUT
 match airplay
```

location-filter LOCAL-PROXY

```
 match apple-tv
```

location-filter LOCAL-PROXY

4. Create a service policy and associate the service lists created in step 3.

```
mdns-sd service-policy LOCAL-AREA-SERVICE-POLICY
service-list LOCAL-AREA-SERVICES-IN IN
service-list LOCAL-AREA-SERVICES-OUT OUT
```

5. Activate unicast mDNS gateway on VLANs of interest.

<#root>

```
vlan configuration 2455


 mdns-sd gateway
  service-policy LOCAL-AREA-SERVICE-POLICY
!
vlan configuration 2481


 mdns-sd gateway
  service-policy LOCAL-AREA-SERVICE-POLICY
```

6. Configure a Service Peer group to enable service routing between Service Peers.

It is needed to add each of the Service Peers source IP that it is needed to perform Service Routing.

```
mdns-sd service-peer group
peer-group 1
service-policy LOCAL-AREA-SERVICE-POLICY
service-peer 10.1.1.1 location-group default
service-peer 10.1.1.5 location-group default
```

7. Configure mDNS trust on inter-switch trunk ports.

This configuration is not mandatory but it is recommended so that the port drops any mDNS packet in either ingress or egress. This is because on these ports it is no longer expected to see mDNS packets but rather BCP packets.

```
int range tw1/0/1, tw1/0/19
 mdns-sd trust
```

Configuration on the Service Peers

1. Enable mDNS gateway globally and configure Service Peer mode.

<#root>

```
mdns-sd gateway
 active-query timer 1
 mode
```

service-peer

```
  sdg-agent 10.1.1.3   <------ IP address of the SDG Agent
```

2. Create a location filter

A location filter is required for inter-VLAN service routing in custom policies. In this specific case, Service routing between VLANs 2455 and 2481 is required so those VLANs are added to the location filter **LOCAL-PROXY**.

```
mdns-sd location-filter LOCAL-PROXY
match location-group default vlan 2481
match location-group default vlan 2455
```

3. Create an inbound and outbound service list that permits the services of interest.

<#root>

```
mdns-sd service-list LOCAL-AREA-SERVICES-IN IN
 match airplay
 match apple-tv
!
mdns-sd service-list LOCAL-AREA-SERVICES-OUT OUT
 match airplay
```

location-filter LOCAL-PROXY

```
 match apple-tv
```

location-filter LOCAL-PROXY

4. Create a service policy and associate the service lists created in step 3.

```
mdns-sd service-policy LOCAL-AREA-SERVICE-POLICY
service-list LOCAL-AREA-SERVICES-IN IN
service-list LOCAL-AREA-SERVICES-OUT OUT
```

5. Activate unicast mDNS gateway on VLANs of interest.

For Service Peer 10.1.1.1:

<#root>

```
vlan configuration 2455


 mdns-sd gateway
  service-policy LOCAL-AREA-SERVICE-POLICY
```

For Service Peer 10.1.1.5:

<#root>

```
vlan configuration 2481


 mdns-sd gateway
  service-policy LOCAL-AREA-SERVICE-POLICY
```

6. Configure mDNS trust on inter-switch trunk ports.

This configuration is not mandatory but it is recommended so that the port drops any mDNS packet in either ingress or egress. This is because on these ports it is no longer expected to see mDNS packets but rather BCP packets.

For Service Peer 10.1.1.1:

```
int range tw1/0/1
 mdns-sd trust
```

For Service Peer 10.1.1.5:

```
int range Gig1/0/1
 mdns-sd trust
```

Troubleshoot

Routed Access Networks

1. Validate that send/receive the mDNS query from the SDG Agent.

<#root>

```
C9500#show
 mdns-sd statistics vlan <vlan/interface> | i mDNS|send|received


 mDNS Statistics
  mDNS packets sent                : 5 <---Validate that this number increments in multiple readings.
```

```
  mDNS packets rate limited         : 0
  mDNS packets received             : 3 <---mDNS queries received and processed by the SDG Agent.
   advertisements received          : 0
   queries received                 : 3
     IPv4 received                  : 3
       IPv4 advertisements received : 0
       IPv4 queries received        : 3
     IPv6 received                  : 0
       IPv6 advertisements received : 0
       IPv6 queries received        : 0
  mDNS packets dropped              : 0
```

2. Validate that the SDG Agent has the advertisement in its mDNS cache.

<#root>

```
C9500#show
```

mdns-sd cache

```
                                                    mDNS CACHE
==================================================================================================
[<NAME>]                                            [<TYPE>] [<TTL>/Remaining] [Vlan-Id/If-name] [Mac A
CXLabs-W10.local                                       A       4500/3717       31      0050.56b3.d162
CXLabs-W10.local                                       A       4500/4224       30      0050.56b3.e409
_airplay._tcp.local                                    PTR     4500/4472       31      0050.56b3.d162
test31._airplay._tcp.local                             SRV     4500/4472       2481      0050.56b3.d162
test31._airplay._tcp.local                             TXT     4500/4472       2481      0050.56b3.d162
CXLabs-W10-3.local                                     A       4500/4472       31      0050.56b3.d162
```

3. Validate the service-policy is enabled on the VLAN associated with the mDNS service.

<#root>

```
C9500#
```

show mdns-sd service-policy association vlan

```
========== VLAN policy association =============
VLAN            Service-policy
------------------------------------------------
1                 LOCAL-AREA-POLICY
2481              LOCAL-AREA-POLICY
2455              LOCAL-AREA-POLICY
```

4. Validate mDNS cache service, querier, and responder are advertising.

<#root>

```
C9500#
```

show mdns-sd statistics cache all

```
mDNS cache statistics :
Number of service types : 1
Number of records of type PTR : 1
Number of records of type SRV : 1
Number of records of type A : 3
Number of records of type AAAA : 0
Number of records of type TXT : 1

Top service types by instances :
Service type : (count of service instances)
_mirrorp2s._tcp.local : 1    <------Verify the service is display.

Top advertisers of record :
MAC Address : (count of records)
0050.56b3.d162 : 5
0050.56b3.e409 : 1           <-------Verify that interested MACs are mDNS Querier/Responder displays.
```

5. If entry is not seen on the cache, only mDNS packets are received and there is not an exchange of the SDG Agent towards mDNS responder, review the service policy and make sure the service is on the list.

<#root>

```
C9500#
```

show mdns-sd service-list

```
Name                              Type                        Service       Msg-Type
==================================================================================================
LOCAL-AREA-SERVICES-IN             IN                            all            any
default-mdns-in-service-list       IN                apple-airprint            any
                                   IN            apple-remote-login            any
                                   IN            apple-screen-share            any
                                   IN                      apple-tv            any
                                   IN       apple-windows-fileshare            any
                                   IN             google-chromecast            any
                                   IN            google-expeditions            any
                                   IN                   homesharing            any
                                   IN         multifunction-printer            any
                                   IN                  printer-ipps            any
LOCAL-AREA-SERVICES-OUT           OUT                            all            any
default-mdns-out-service-list     OUT                apple-airprint            any
                                  OUT            apple-remote-login            any
                                  OUT            apple-screen-share            any
                                  OUT                      apple-tv            any
                                  OUT       apple-windows-fileshare            any
                                  OUT             google-chromecast            any
                                  OUT            google-expeditions            any
                                  OUT                   homesharing            any
                                  OUT         multifunction-printer            any
```

6. Take debugs to review the mDNS process.

```
debug mdns all
```

Multilayer Networks

Validate the mDNS Advertisement on the Service Peer and SDG Agent

1. Validate that there is a BCP session between the Service Peer and the SDG Agent (Keep-Alive exchange).

On Service Peer:

<#root>

```
C9500#
```

```
show mdns-sd sp-sdg statistics | i Keep|Message
```

```
 Messages sent:
  Keep-Alive                : 69439    <---- Validate that this number increments in multiple readings
 Messages received:
  Keep-Alive Response       : 69420    <---- Validate that this number increments in multiple readings
```

```
C9300-2#
```

```
show udp | i Proto|10991
```

```
Proto        Remote      Port      Local       Port  In Out  Stat TTY OutputIF
 17       --listen--          --any--         10991   0   0 2001221   0
 17(v6)   --listen--          --any--         10991   0   0 2020221   0
```

On SDG Agent:

<#root>

```
C9500#
```

```
show mdns-sd sp-sdg statistics | i Keep|Message
```

```
 Messages received:
  Keep-Alive                : 138901   <---- Validate that this number increments in multiple readings
 Messages sent:
  Keep-Alive Response       : 138901   <---- Validate that this number increments in multiple readings
```

```
C9500#
```

```
show mdns-sd sdg service-peer summary
```

```
==========================================================================================
Service-Peer/Port                                Cache-Sync                 Uptime          Record Cou
                                              Sent       Time
==========================================================================================
10.1.1.5/10991                                124     Sep  5 15:24:03 2023  62 Hrs 15 Mins   0
10.1.1.1/10991                                360     Sep  5 15:32:03 2023  180 Hrs 7  Mins   0
```

2. Validate that the Service Peer has the advertisement in its mDNS cache.

If not seen in mDNS cache, take a packet capture in the interface connected to the mDNS responder and validate the endpoint is sending valid mDNS advertisements.

<#root>

```
C9500#
```

sh mdns cache

```
                                                    mDNS CACHE
==================================================================================================
[<NAME>]                                              [<TYPE>] [<TTL>/Remaining] [Vlan-Id/If-name] [Mac A

_airplay._tcp.local                                     PTR     4500/4500       2481    0050.56b3.e9c2

PC-vlan2481._airplay._tcp.local                         SRV     4500/4500       2481    0050.56b3.e9c2

CXLabs-WIN10.local                                      A       4500/4500       2481    0050.56b3.e9c2

PC-vlan2481._airplay._tcp.local                         TXT     4500/4500       2481    0050.56b3.e9c2
```

3. Validate that the Service Peer advertisement sent counter is increasing.

Each Service Peer send the advertisements to the SDG Agent every service-announcement-timer. The default is 30 seconds.

<#root>

```
C9300-2#
```

sh mdns summary

```
Global mDNS Gateway
==========================================
mDNS Gateway               : Enabled
Rate Limit                 : 60 PPS (default)
AirPrint Helper            : Disabled
Mode                       : Service-Peer
SDG Agent IP               : 10.1.1.3         <----- SDG Agent configured
Source Interface           : Vl10
ANY Query Forward          : Disabled
Next Advertisement to SDG  : 00:00:12         <----- Time left for sending next advertisement to SDG Ag
Next Query to SDG          : 00:00:12
Active Response Timer      : Disabled
Active Query Timer         : Enabled 1 Minutes
mDNS Query Type            : PTR only
Service Enumeration period : Default
SSO                        : Inactive


C9300-2#
```

show mdns-sd service-peer statistics

```
 mDNS Packet statistics:
    Packets received from client  : 11560
```

```
      Queries                    : 281
        IPv4                     : 281
        IPv6                     : 0
      Advertisements             : 11279
        IPv4                     : 11279                    <---- Validate that this number incremen
        IPv6                     : 0
    Packets sent to client       : 23939
      Advertisements             : 6
        IPv4                     : 6
        IPv6                     : 0
      Queries                    : 23933
        IPv4                     : 23933
        IPv6                     : 0
    Packets sent to SDG          : 110
      Queries                    : 92
      Advertisements             : 18                       <---- Validate that this number increment
    Packets received from SDG    : 0
```

C9300-2#

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 sent:
  Query                      : 92
  ANY query                  : 0
  Advertisements             : 18                           <---- Validate that this number incremen
  Advertisement Withdraw     : 15
  Interface down             : 0
  Vlan down                  : 0
  Service-peer cache clear   : 2
  Resync response            : 365
  Srvc Discovery response    : 0
  Keep-Alive                 : 71056
 Messages received:
  Query response             : 0
  ANY Query response         : 0
  Cache-sync                 : 395
  Get service-instance       : 0
  Srvc Discovery request     : 0
  Keep-Alive Response        : 71037
```

4. Validate that the SDG Agent has the advertisement in its mDNS cache.

<#root>

C9500#

show mdns cache

```
                                                    mDNS CACHE
==================================================================================================
[<NAME>]                                            [<TYPE>] [<TTL>/Remaining] [Vlan-Id/If-name] [Mac
```

```
_airplay._tcp.local                                    PTR     4500/4500       2481    0050.56b3.e9c2

PC-vlan2481._airplay._tcp.local                        SRV     4500/4500       2481    0050.56b3.e9c2

CXLabs-WIN10.local                                     A       4500/4500       2481    0050.56b3.e9c2

PC-vlan2481._airplay._tcp.local                        TXT     4500/4500       2481    0050.56b3.e9c2

==========================================================================================================
```

5. Take debugs to review the mDNS process.

```
debug mdns all
```

Validate the mDNS Query on the Service Peer and SDG Agent

1. Validate that the Service Peer has the query in its mDNS query-db.

If not seen in mDNS query-db, take a packet capture in the interface connected to the mDNS querier and validate the endpoint is sending valid mDNS queries.

```
<#root>

C9300-1#

show mdns query-db


-------------------------------------------------------------------
Client MAC       Vlan ID    Location ID                  User Role
-------------------------------------------------------------------

PTR Name: _airplay._tcp.local
0050.56b3.2ec1     2455        Default                        none
```

2. Validate that there is a BCP session between the Service Peer and the SDG Agent (Keep-Alive exchange).

```
<#root>

C9300-1#

show mdns sp-sdg statistics | i Keep|Message

 Messages sent:
  Keep-Alive                : 71232      <---- Validate that this number increments in multiple readin
 Messages received:
  Keep-Alive Response       : 71218       <---- Validate that this number increments in multiple readi

C9300-1#

show udp | i Proto|10991
```

```
Proto        Remote      Port      Local       Port  In Out  Stat TTY OutputIF
 17       --listen--          --any--         10991   0   0 2001221   0
 17(v6)   --listen--          --any--         10991   0   0 2020221   0
```

3. Validate that the Service Peer query sent counter is increasing. Also, the query response received is increasing.

The Service Peer sends the queries to the SDG Agent every service-query-timer. The default is 15 seconds.

<#root>

C9300-1#

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 sent:
  Query                     : 608       <---- Validate that this number increments in multiple reading
  ANY query                 : 0
  Advertisements            : 2
  Advertisement Withdraw    : 0
  Interface down            : 0
  Vlan down                 : 0
  Service-peer cache clear  : 6
  Resync response           : 0
  Srvc Discovery response   : 0
  Keep-Alive                : 71192
 Messages received:
  Query response            : 178        <---- Validate that this number increments in multiple readin
  ANY Query response        : 0
  Cache-sync                : 395
  Get service-instance      : 0
  Srvc Discovery request    : 0
  Keep-Alive Response       : 71178
```

4. Validate that the SDG Agent is sending an advertisement in response.

```
C9500#show mdns 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                     : 704
  ANY query                 : 0
  Advertisements            : 19
  Advertisement Withdraw    : 15
  Interface down            : 0
  Vlan down                 : 0
  Service-peer cache clear  : 8
  Resync response           : 366
  Srvc Discovery response   : 0
```

```
  Keep-Alive                : 142377
 Messages sent:
  Query response            : 191           <---- Validate that this number increments in multiple re
  ANY Query response        : 0
  Cache-sync                : 791
  Get service-instance      : 0
  Srvc Discovery request    : 0
  Keep-Alive Response       : 142377
```

5. Take debugs to review the mDNS process.

```
debug mdns all
```

Commands Used for Troubleshooting

```
show running-config mdns-sd
show mdns-sd summary
show mdns-sd service-policy association vlan
show mdns-sd service-policy association role
show mdns-sd statistics all
show mdns-sd statistics debug
show mdns-sd cache all
show mdns-sd query-db
show mdns-sd statistics cache all
show mdns-sd service-peer statistics
show mdns-sd sp-sdg statistics
show mdns-sd sdg service-peer summary
show mdns-sd controller summary
show mdns-sd controller detail
show mdns-sd controller statistics
show mdns-sd controller export-summary

show tech-support mdns-sd

debug mdns-sd all
```

Related Information

- Bonjour Configuration Guide for Service Discovery Gateway in Catalyst 9500 switches
- Cisco Technical Support & Downloads