



The bridge to possible

Configuring and Troubleshooting mDNS in 9800 Wireless LAN Controller

Tim Padilla, Team Captain
Rosalia Alhourani, Escalation Engineer
TACENT-2019

CISCO *Live!*

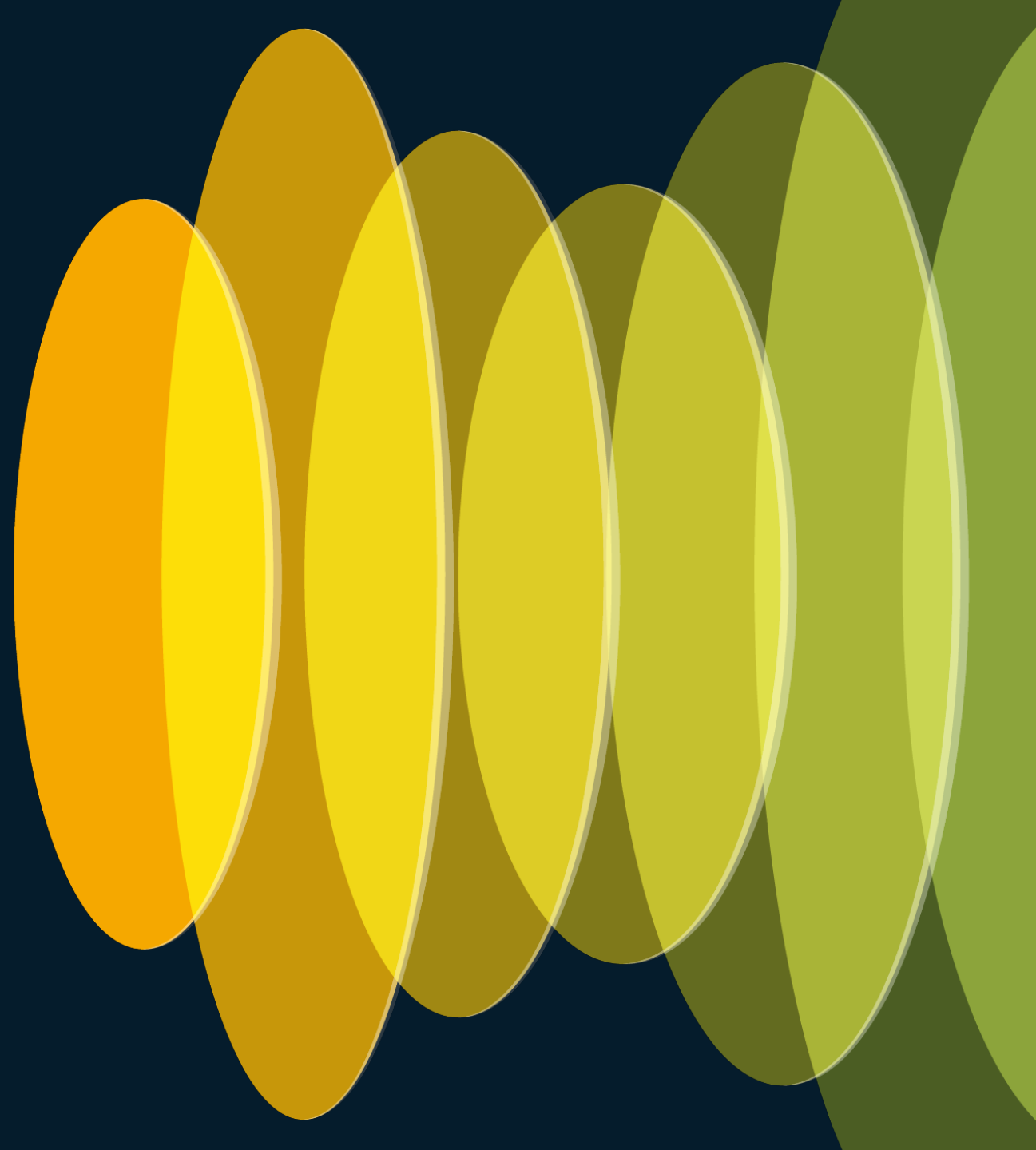
#CiscoLive



Agenda

- Overview
- Bridging mDNS mode
- Gateway mDNS mode
 - Central Switching
 - Anchor-Foreign
 - mDNS-AP
 - FlexConnect Local Switching
- Q&A

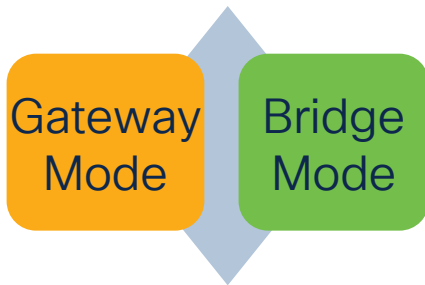
Overview



How to know if you need mDNS?

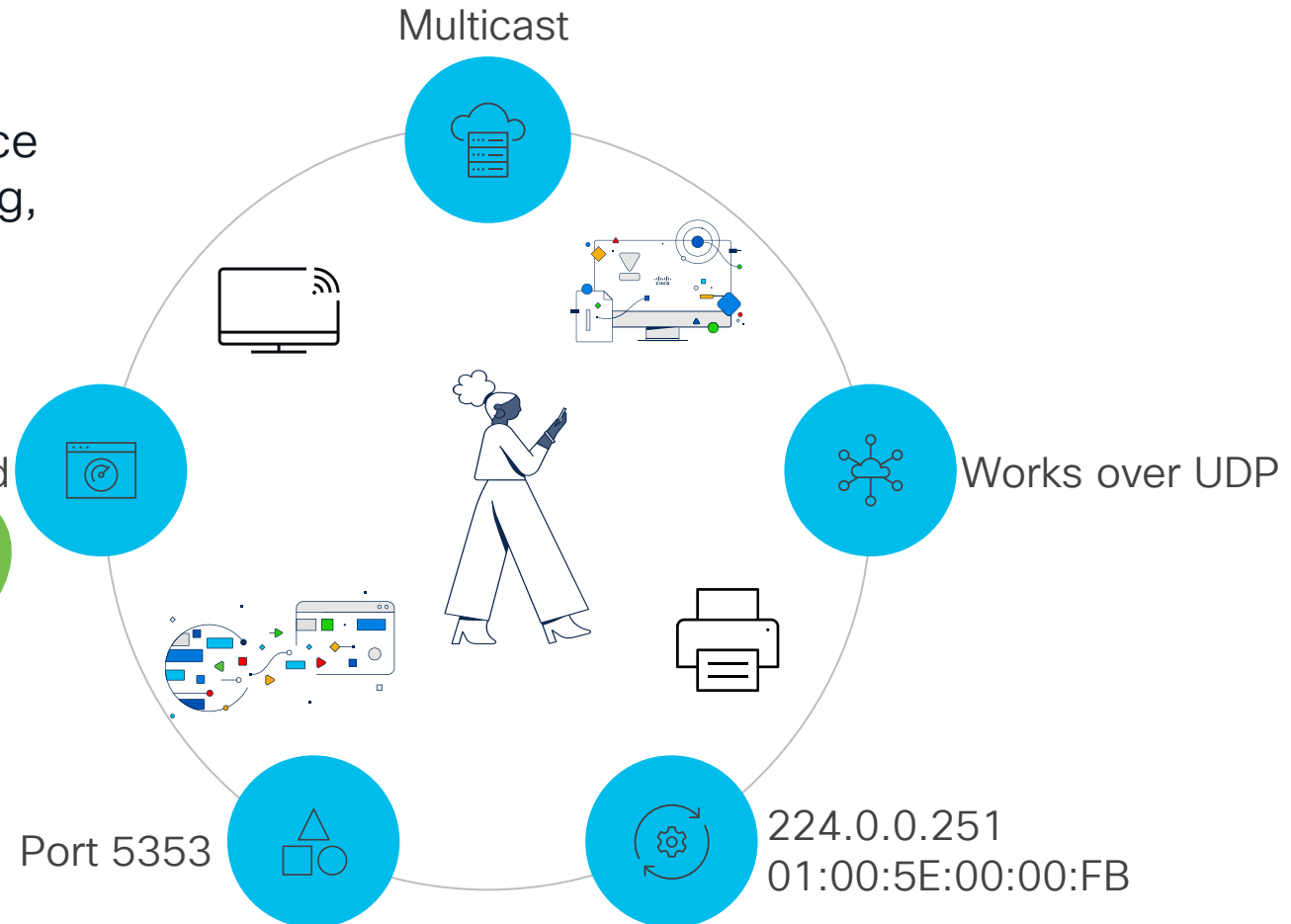
Quick mDNS Check

Service-based protocol that enables service discovery at layer 2 and layer 3 levels, by learning, caching, and distributing services.



fax	_fax-ipp._tcp.local
roku	_rsp._tcp.local
airplay	_airplay._tcp.local
scanner	_scanner._tcp.local
spotify	_spotify-connect._tcp.local
airtunes	_raop._tcp.local
apple-tv	_airplay._tcp.local, _raop._tcp.local
audinate	_dante-safe._udp.local, _dante-upgr._udp.local, _netaudio-arc._udp.local, _netaudio-chan._udp.local, _netaudio-cmc._udp.local, _netaudio-dbc._udp.local
airserver	_airplay._tcp.local, _airserver._tcp.local

Services Based



Let's Choose a mDNS Mode

Bridging mDNS

- Works only within layer 2.
- Multicast is not needed.
- Service providers can be Wireless or Wired.
- MDNS services are not cached on the controller.
- Default mDNS mode.
- It works in different deployments:



Central
Switching



FlexConnect
Local
Switching



Anchor - Foreign



RLAN



Wired Guest



Let's choose a mDNS Mode

Gateway mDNS

- Works within a layer 3 network.
- Requires Multicast.
- Service providers can be Wireless or Wired.
- MDNS services are cached and support filtering.
- TAC Recommended.
- It works in different deployments:



Central
Switching



FlexConnect
Local
Switching



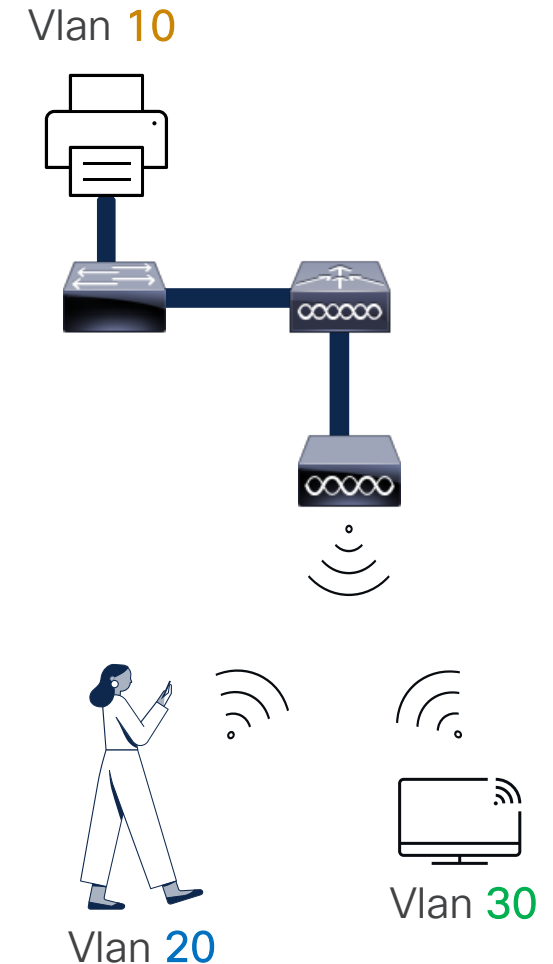
Anchor - Foreign



RLAN



Wired Guest



Let's Choose a mDNS Mode

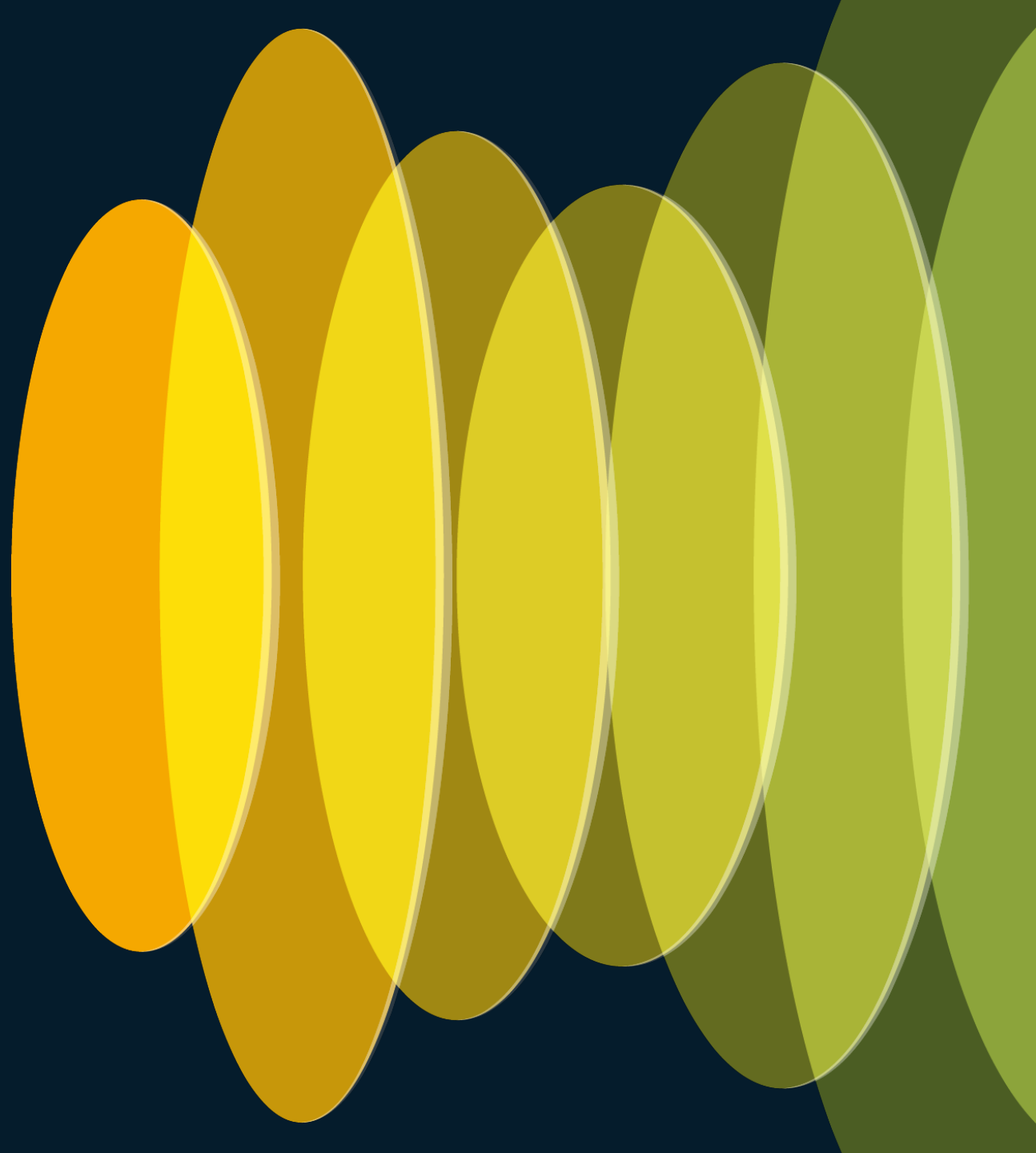
mDNS Bridging vs mDNS Gateway Summary

Bridge
Mode

	Bridging	Gateway
Supports Layer 2	✓	✓
Supports layer 3		✓
Services Cached		✓
WLC Multicast Need		✓
Supports Wired Service Provider	✓	✓
Supports Wireless Service Provider	✓	✓
Supports Filtering		✓
Recommended		✓

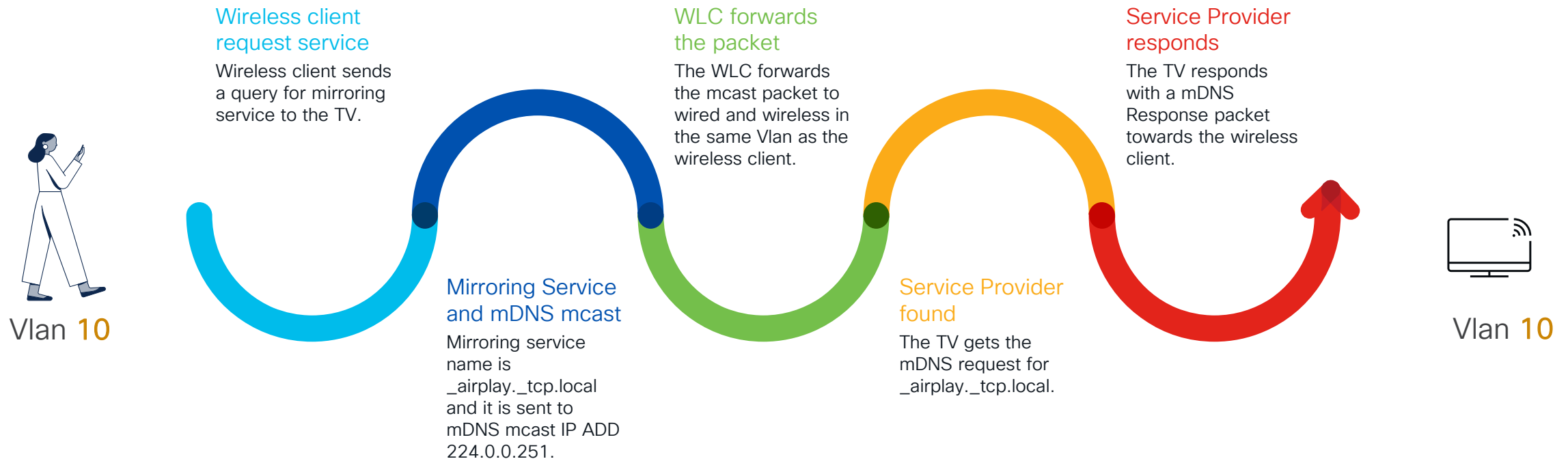
Gateway
Mode

mDNS Bridging Mode



Workflow mDNS Bridging Mode

mDNS Bridging



Configuring mDNS Bridging Mode

mDNS Bridging

- Go to the WLAN.
- Click on Advanced tab.
- Configure mDNS mode.
- Click on Apply.
 - Bottom right.

The screenshot shows the Cisco Meraki configuration interface. On the left, the 'WLANs' list is visible with a table of WLANs. The 'mDNSFlex' WLAN (ID 5) is selected. The main panel shows the 'Edit WLAN' configuration for 'mDNSFlex'. The 'Advanced' tab is selected, and the 'mDNS Mode' is set to 'Bridging'.

WLANs List:

Status	Name	ID
<input type="checkbox"/>	Vlan1	1
<input type="checkbox"/>	Vlan10	2
<input type="checkbox"/>	Vlan20	3
<input type="checkbox"/>	Vlan30	4
<input type="checkbox"/>	mDNSFlex	5

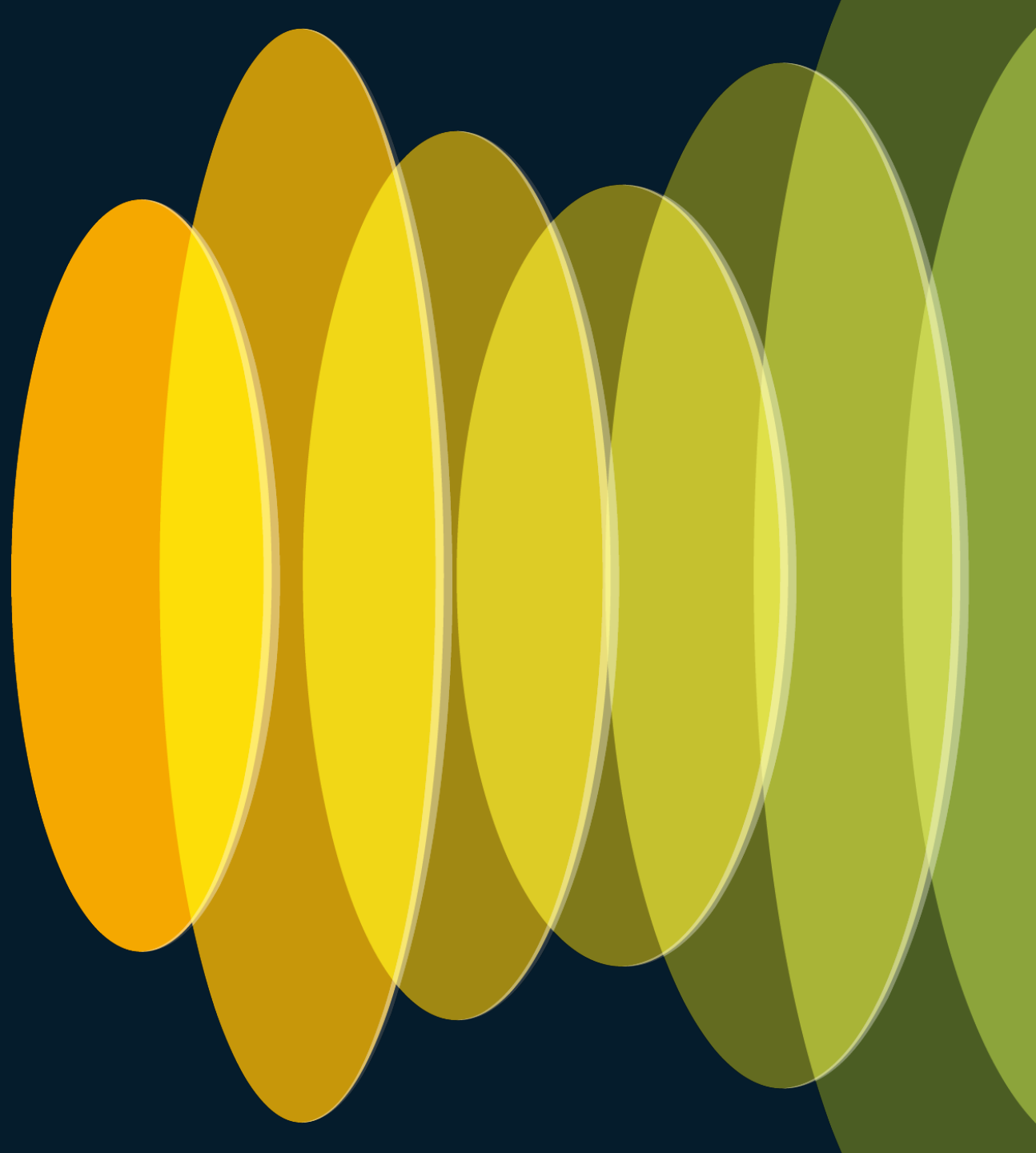
Edit WLAN: mDNSFlex

Changing WLAN parameters while it is enabled will result in loss of connectivity for clients connected to it.

Advanced Tab Settings:

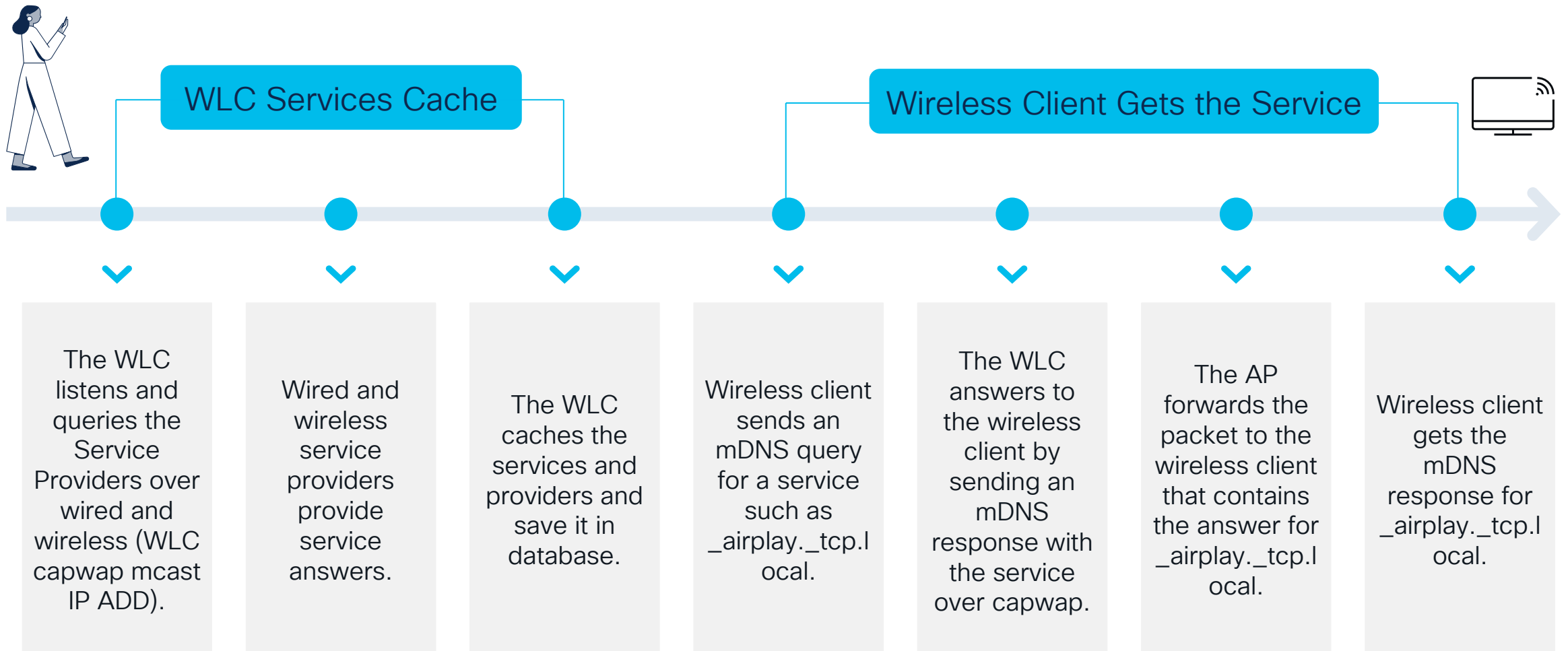
Setting	Value
Coverage Hole Detection	<input checked="" type="checkbox"/>
Aironet IE	<input type="checkbox"/>
Advertise AP Name	<input type="checkbox"/>
P2P Blocking Action	Disabled
Multicast Buffer	DISABLED
Media Stream Multicast-direct	<input type="checkbox"/>
11ac MU-MIMO	<input checked="" type="checkbox"/>
Universal Admin	<input type="checkbox"/>
OKC	<input checked="" type="checkbox"/>
Load Balance	<input type="checkbox"/>
Band Select	<input type="checkbox"/>
IP Source Guard	<input type="checkbox"/>
WMM Policy	Allowed
mDNS Mode	Bridging

mDNS Gateway Mode Central Switching



Workflow mDNS Gateway Mode

mDNS Gateway – Central Switching



Configuring mDNS Gateway Mode

mDNS Gateway - Central Switching

- The WLC will utilize **Multicast** with the Aps.
- This capwap mcast packets will carry inside the mDNS mcast packet.
- Mcast-Mcast mode is the recommended mode.
- Mcast-Unicast is supported as well.
- Configure the proper WLC mcast IP ADD.
- If the AP and WLC are in different Vlans enable mcast routing on wired.

Configuration > Services > Multicast

Global Wireless Multicast Mode	ENABLED <input checked="" type="checkbox"/>
AP CAPWAP Multicast	Multicast ▼
AP CAPWAP IPv4 Multicast group Address	239.21.21.1

No.	Time	Source	Destination	Protocol
1023	21:14:42.575958	192.168.10.2	224.0.0.251	MDNS

> Frame 1023: 623 bytes on wire (4984 bits), 623 bytes captured (4984 bits)
> Ethernet II, Src: Cisco_57:d8:cb (f4:bd:9e:57:d8:cb), Dst: IPv4mcast_15:15:01 (01:00:5e:15:15:01)
> Internet Protocol Version 4, Src: 192.168.10.2, Dst: 239.21.21.1
> User Datagram Protocol, Src Port: 5247, Dst Port: 5247
> Control And Provisioning of Wireless Access Points - Data
> IEEE 802.11 QoS Data, Flags:F.
> Logical-Link Control
> Internet Protocol Version 4, Src: 192.168.10.2, Dst: 224.0.0.251
> User Datagram Protocol, Src Port: 5353, Dst Port: 5353
> Multicast Domain Name System (query)

Configuring mDNS Gateway Mode

mDNS Gateway - Central Switching

- Enabling [mDNS Gateway](#), it comes disabled by default.
- Transport type can be IPv4, IPv6 or both.
- Default active query can be from 1 – 120 minutes.
- Active query lets the WLC query services every query timer configured interval to validate the already learnt services and learn new ones.

The screenshot shows the configuration page for mDNS Gateway. The breadcrumb navigation at the top is 'Configuration > Services > mDNS'. Below this, there are three tabs: 'Global' (selected), 'Service Policy', and 'mDNS Flex Profile'. The 'Global' tab contains the following configuration items:

mDNS Gateway	ENABLED <input checked="" type="checkbox"/>
Transport	ipv4
Active-Query Timer (Minutes) *	30
mDNS-AP Service Policy	default-mdns-ser...

A 'Clear' link is located at the bottom right of the configuration area.

Configuring mDNS Gateway Mode

mDNS Gateway - Central Switching

- Some Service Providers have specific services that are not well known.
- The [Service Definition](#) allows you to add services manually.
- These services can then be used in the Service Policy to allow wireless clients to use them.

The screenshot displays the Cisco configuration interface for mDNS Gateway Mode. The breadcrumb navigation at the top shows 'Configuration > Services > mDNS'. Below this, the 'Service Policy' tab is selected, and the 'Service Definition' sub-tab is active. A table lists the service definitions, with 'CiscoLive' and 'Mini Session' visible. The 'CiscoLive' service is selected, and its details are shown in a modal window titled 'Edit Service Definition'. The modal contains the following fields:

- Service Definition Name***: CiscoLive
- Description**: Mini Session
- Service Type**: minisession._tcp.local

The 'Service Type' field is highlighted with a red wavy line, indicating a warning or error. Below the modal, a text area shows the service type as 'ciscolive._tcp.local' with a trash icon next to it.

Configuring mDNS Gateway Mode

mDNS Gateway - Central Switching

- Add to the [Service List](#) the services of your preference (here one can add the Service Definition manually added services too)
- Create an IN and OUT Service List.

The image displays two screenshots of the Cisco mDNS Gateway configuration interface. The left screenshot shows the 'Service List' configuration page, and the right screenshot shows the 'Edit Service List' page.

Left Screenshot: Service List Configuration

The breadcrumb navigation is **Configuration > Services > mDNS**. The left sidebar shows the configuration tree with **Service List** selected. The main content area shows the 'Service List' table:

Service List	Direction	Assigned Services
mdnsIN	IN	airplay, apple-tv, airserver, apple-rdp, airtunes
mdnsOUT	OUT	airplay, apple-tv, airserver, airtunes, apple-rdp

Right Screenshot: Edit Service List

The breadcrumb navigation is **Configuration > Services > mDNS**. The left sidebar shows the configuration tree with **Service List** selected. The main content area shows the 'Edit Service List' form. The 'Service List Name' is **mdnsIN** and the 'Direction' is **IN**. The 'Available Services' table is shown below:

Services	Service String	Message Type
<input type="checkbox"/> all	all	<input checked="" type="radio"/> any <input type="radio"/> announcement <input type="radio"/> query
<input type="checkbox"/> fax	_fax-ipp._tcp.local	<input checked="" type="radio"/> any <input type="radio"/> announcement <input type="radio"/> query
<input type="checkbox"/> roku	_rsp._tcp.local	<input checked="" type="radio"/> any <input type="radio"/> announcement <input type="radio"/> query
<input checked="" type="checkbox"/> airplay	_airplay._tcp.local	<input checked="" type="radio"/> any <input type="radio"/> announcement <input type="radio"/> query
<input type="checkbox"/> scanner	_scanner._tcp.local	<input checked="" type="radio"/> any <input type="radio"/> announcement <input type="radio"/> query
<input type="checkbox"/> spotify	_spotify-connect._tcp.local	<input checked="" type="radio"/> any <input type="radio"/> announcement <input type="radio"/> query
<input type="checkbox"/> audinate	_dante-safe._udp.local, _dante-upgr._udp.local, _netaudio-arc._udp.local, _netaudio-chan._udp.local, _netaudio-cmc._udp.local, _netaudio-dbc._udp.local	<input checked="" type="radio"/> any <input type="radio"/> announcement <input type="radio"/> query
<input type="checkbox"/> web-server	_http._tcp.local	<input checked="" type="radio"/> any <input type="radio"/> announcement <input type="radio"/> query
<input type="checkbox"/> homesharing	_home-sharing._tcp.local	<input checked="" type="radio"/> any <input type="radio"/> announcement <input type="radio"/> query
<input type="checkbox"/> printer-ipp	_ipp._tcp.local	<input checked="" type="radio"/> any <input type="radio"/> announcement <input type="radio"/> query

Configuring mDNS Gateway Mode

mDNS Gateway - Central Switching

- Create a [Service Policy](#).
- Add the Service List created in previous step.
- This Service Policy will be configured later in the WLAN-Policy and SVI.
- Configure any Location if desired.

The screenshot displays the Cisco configuration interface for mDNS Gateway Mode. The breadcrumb navigation at the top reads 'Configuration > Services > mDNS'. The main interface has three tabs: 'Global', 'Service Policy' (selected), and 'mDNS Flex Profile'. Under the 'Service Policy' tab, there are four sections: 'Service Definition', 'Service List', 'Service Policy' (highlighted with a green box), and 'Wired Filter'. A modal dialog titled 'Edit Service Policy' is open, showing the configuration for the 'mdnsPolicy'. The dialog includes the following fields:

- Service Policy Name***: mdnsPolicy
- Service List Input**: mdnsIN
- Service List Output**: mdnsOUT
- Location**: A dropdown menu with 'None' selected. Other options include 'ap-location', 'ap-name', 'lss', 'regex ap-location', 'regex ap-name', 'site-tag', and 'ssid'.

Configuring mDNS Gateway Mode

mDNS Gateway - Central Switching

- Assign the mDNS Service Policy in the **WLAN-Policy**.

Configuration > Tags & Profiles > Policy Edit Policy Profile

Disabling a Policy or configuring it in 'Enabled' state, will result in loss of connectivity for clients associated with this Policy profile.

Admin Status Associated Policy Tags Policy Profile

<input type="checkbox"/>	<input checked="" type="checkbox"/>	Vlan1
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Vlan10
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Vlan20
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Vlan30
<input type="checkbox"/>	<input type="checkbox"/>	default-pol

WLAN Timeout

Session Timeout (sec) 28800

Idle Timeout (sec) 300

Idle Threshold (bytes) 0

Fabric Profile ☐ Search or Select

Link-Local Bridging ☐

mDNS Service Policy mdnsPolicy Clear

Hotspot Server Search or Select

- Configure mDNS Gateway at the **WLAN/SSID** level under the Advanced tab

Configuration > Tags & Profiles > WLANs Edit WLAN

Changing WLAN parameters while it is enabled will result in loss of connectivity for clients connected to it.

General Security Advanced Add To Policy Tags

Coverage Hole Detection ☒ Universal Admin ☐

Aironet IE ☐ OKC ☒

Advertise AP Name ☐ Load Balance ☐

P2P Blocking Action Disabled Band Select ☐

Multicast Buffer DISABLED IP Source Guard ☐

Media Stream Multicast-direct ☐ WMM Policy Allowed

11ac MU-MIMO ☒ mDNS Mode Gateway

Configuring mDNS Gateway Mode

mDNS Gateway - Central Switching

- Configure **SVI Vlan** in the WLC.
- If the service provider is on wired or wireless the SVI must exist for that Vlan.
- Enable mDNS Gateway in the SVI Vlan.
- Assign a mDNS Service Policy
 - If no Service Policy assigned the default service policy will be assigned automatically.

Configuration > Layer2 > VLAN

SVI VLAN VLAN Group

+ Add - Delete

	Name	Admin Status	Operational Status	IPv4 Address
<input type="checkbox"/>	Vlan1	↓	↓	unassigned
<input type="checkbox"/>	Vlan10	↑	↑	192.168.10.2
<input type="checkbox"/>	Vlan20	↑	↑	192.168.20.2
<input type="checkbox"/>	Vlan30	↑	↑	192.168.30.2

1 10

Configuration > Layer2 > VLAN

SVI VLAN VLAN Group

+ Add - Delete

Name	Admin Status	Operational Status
Vlan1	↓	↓
Vlan10	↑	↑
Vlan20	↑	↑
Vlan30	↑	↑

1 10

Edit SVI: Vlan20

General Advanced

IPv6 Outbound ACL None

DHCP Relay

IPv4 Helper Address xxx.xxx.xxx.xxx

Relay Information Option DISABLED

Subscriber Id

Server Id Override DISABLED

Option Insert DISABLED

Source-Interface Vlan None

Policy Management

mDNS Gateway ENABLED

mDNS Service Policy mDNSPolicy

Configuring mDNS Gateway Mode

mDNS Gateway - Central Switching

mDNS Gateway - Central Switching Configuration Checklist

	Configured	Not Configured
Global Multicast Enabled (mcast-mcast recommended)	✓	⚠
Global mDNS Gateway Enabled		
mDNS Service Definition (if needed)		
mDNS Service List (IN and OUT)		
mDNS Service Policy		
WLAN-Policy assigned with mDNS Service Policy		
WLAN/SSID mDNS mode Gateway		
SVI Vlan Configuration		

Troubleshooting mDNS Gateway Mode

mDNS Gateway - Central Switching

Capturing mDNS Packet Capture using EPC

- ACL to filter packets (change 231.21.21.1 for the correct mcast IP ADD of your WLC):

```
(config)#ip access-list extended mdnstshoot
(config-ext-nacl)#permit udp any nait eq 5353
(config-ext-nacl)#permit ip host 231.21.21.1 any
(config-ext-nacl)#permit ip any host 231.21.21.1
(config-ext-nacl)#permit ip host <AP IP ADD> any
(config-ext-nacl)#permit ip any host <AP IP ADD>
```

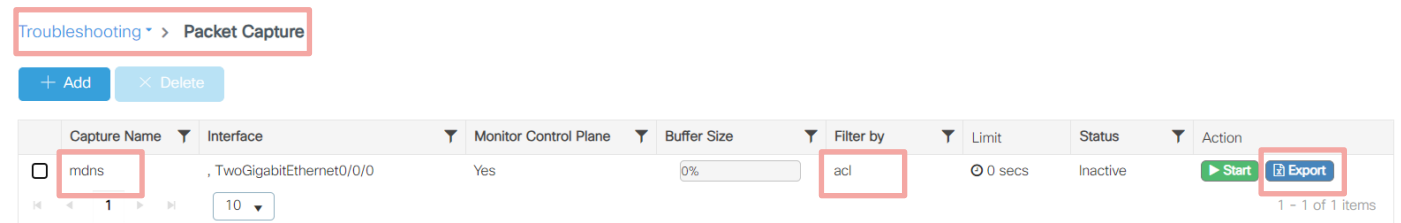
- Configure the pcap as follows (capture is named mdns):

```
#monitor capture mdns interface <Tw/Ten/Gig/Port-channel> both access-list mdnstshoot buffer size 80
```

- To start or stop the monitor capture:

```
#monitor capture mdns start/stop
```

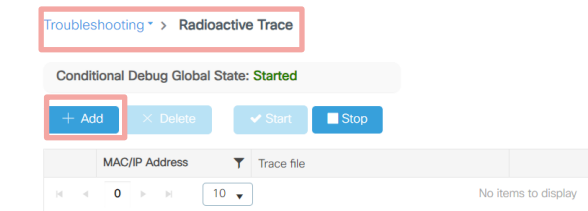
- Download the capture from WLC GUI:



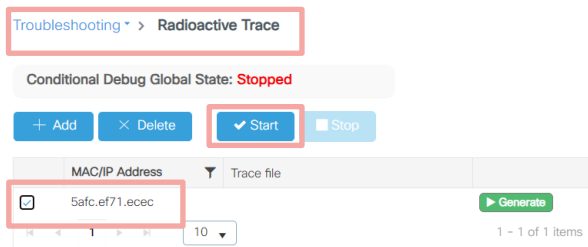
Troubleshooting mDNS Gateway Mode

mDNS Gateway - Central Switching

Capturing mDNS Debugs using Radioactive Trace



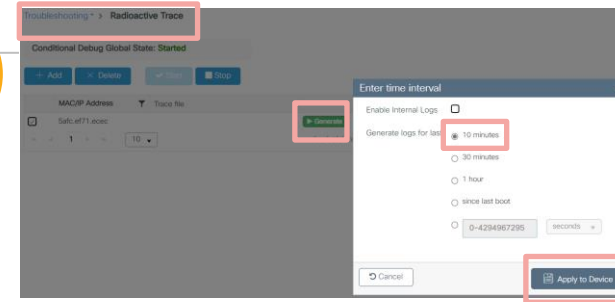
1



2



3



4



1 Add the Wireless Client Mac Add

2 Click the checkbox Hit Start button

Reproduce the issue


3 Click on Generate Select the time

4 Click on the download button

Troubleshooting mDNS Gateway Mode

mDNS Gateway - Central Switching

- Wireless client RA Traces provide wireless client facing information, if further troubleshooting is needed for mDNS, for example, database/cache services learning process in the WLC TAC will go deeper by running the following trace:



```
#set platform software trace wncd <number> chassis active R0 mdns verbose
```

- Once the issue is reproduced while the trace runs it can be collected as follows:

```
#request platform software trace archive last X minutes/hours/days target bootflash:mdns
```

- It is required to set the trace back to notice level as follows:

```
#set platform software trace wncd <number> chassis active R0 mdns notice
```

- The traces will be in .bin format copy the file to your server and share with TAC and it will be decoded.
- Once the tracing is decoded look for the wncd logs under the tmp > rp folder the file name will initiate with wncd_x_R, example:

```
wncd_x_R0-0.15471_0.20240429105348.bin_decoded.log
```

Troubleshooting mDNS Gateway Mode

mDNS Gateway - Central Switching



WLC Services
Query

Service Provider
Answer

WLC Cache
Services

Wireless Client
Service Request

WLC Share
Services



- Mcast-mcast capwap packet
- 802.11 mDNS Mac Add
- IP Add source SVI
- Udp 5353 mDNS service query



Vlan 10



Vlan 20

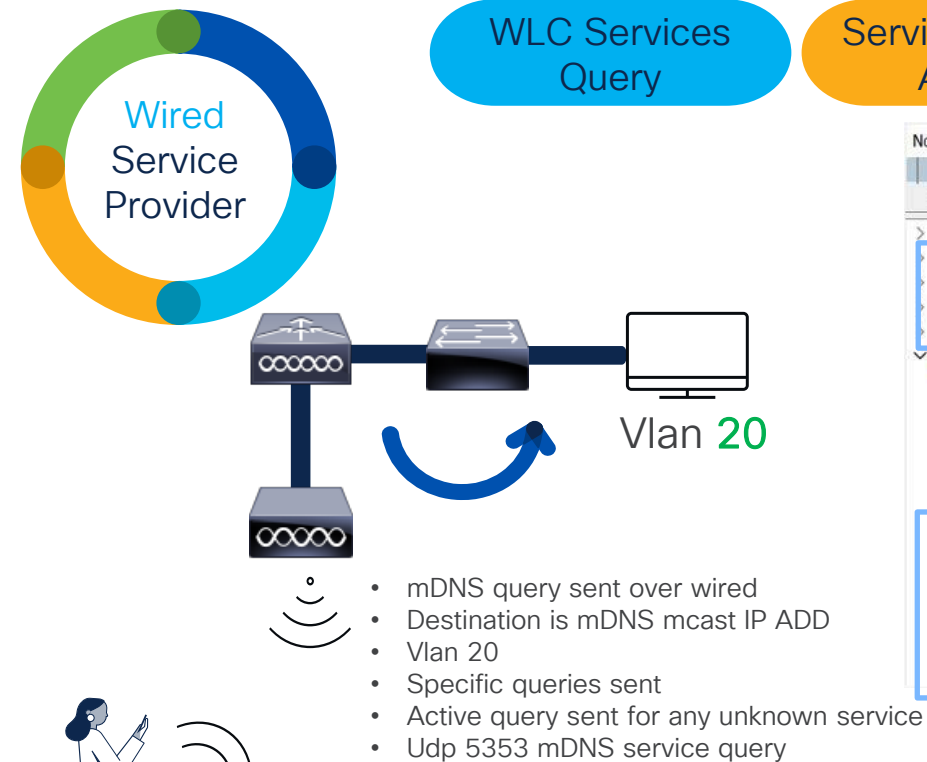
```
No.      Time      Source      Destination      Protocol  Length  Info
-----
1061  21:14:42.579956  192.168.10.2  224.0.0.251      MDNS      469     Standard query 0x0000 PTR _active-query._tcp.local,

> Internet Protocol Version 4, Src: 192.168.10.2, Dst: 239.21.21.1
> User Datagram Protocol, Src Port: 5247, Dst Port: 5247
> Control And Provisioning of Wireless Access Points - Data
  IEEE 802.11 QoS Data, Flags: .....F.
    Type/Subtype: QoS Data (0x0028)
    Frame Control Field: 0x0288(Swapped)
    Duration: 0 microseconds
    Receiver address: IPv4mcast_fb (01:00:5e:00:00:fb)
    Transmitter address: Cisco_ff:ff:ff (01:0b:85:ff:ff:ff)
    Destination address: IPv4mcast_fb (01:00:5e:00:00:fb)
    Source address: Cisco_57:d8:cb (f4:bd:9e:57:d8:cb)
    BSS Id: Cisco_ff:ff:ff (01:0b:85:ff:ff:ff)
    STA address: IPv4mcast_fb (01:00:5e:00:00:fb)
    .... = Fragment number: 0
    0000 0000 0000 .... = Sequence number: 0
    Qos Control: 0x0000
  Logical Link Control
    Internet Protocol Version 4, Src: 192.168.10.2, Dst: 224.0.0.251
    User Datagram Protocol, Src Port: 5353, Dst Port: 5353
  Multicast Domain Name System (query)
    Transaction ID: 0x0000
    Flags: 0x0100 Standard query
    Questions: 18
    Answer RRs: 0
    Authority RRs: 0
    Additional RRs: 0
  Queries
    _active-query._tcp.local: type PTR, class IN, "QU" question

(info): IPv4 mDNS Multicast Query packet sent to :0100.5e00.00fb
(verbose): MDNS record Search: record with wlan_id: 0 found
(verbose): MDNS record Search: record with wlan_id: 0 found
(verbose): MDNS record Search: record with wlan_id: 0 found
(verbose): MDNS record Search: record with wlan_id: 0 found
(verbose): MDNS record Search: record with wlan_id: 0 found
(verbose): SRVC_ENUMER: IPv4 packet inject success
(verbose): In ret_buffer pak: 0x5618c0f0aae8 bpak->buffer_start 0x5618c0f103d8 bpak->subblock 0x0
(verbose): SRVC ENUMER: set timer success
```


Troubleshooting mDNS Gateway Mode

mDNS Gateway - Central Switching



WLC Services Query

Service Provider Answer

WLC Cache Services

Wireless Client Service Request

WLC Share Services

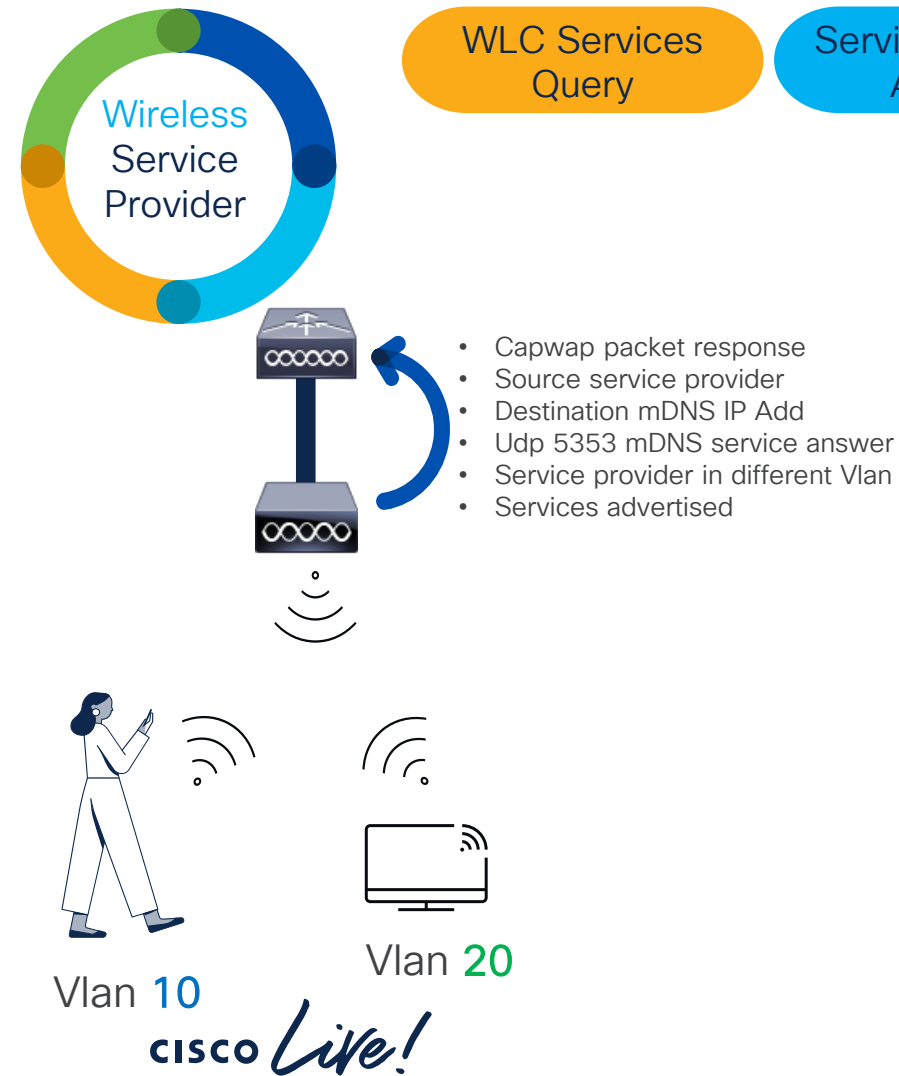
No.	Time	Source	Destination	Protocol	Length	Info
1032	21:14:42.576966	192.168.20.2	224.0.0.251	MDNS	549	Standard query 0x0000 PTR _active-query._tcp.local

> Frame 1032: 549 bytes on wire (4392 bits), 549 bytes captured (4392 bits)
> Ethernet II, Src: Cisco_57:d8:cb (f4:bd:9e:57:d8:cb), Dst: IPv4mcast_fb (01:00:5e:00:00:fb)
> 802.1Q Virtual LAN, PRI: 0, DEI: 0, ID: 20
> Internet Protocol Version 4, Src: 192.168.20.2, Dst: 224.0.0.251
> User Datagram Protocol, Src Port: 5353, Dst Port: 5353
> Multicast Domain Name System (query)
> Transaction ID: 0x0000
> Flags: 0x0100 Standard query
> Questions: 29
> Answer RRs: 0
> Authority RRs: 0
> Additional RRs: 0
> Queries
> _active-query._tcp.local: type PTR, class IN, "QU" question
> _adisk._tcp.local: type PTR, class IN, "QU" question
> _afpovertcp._tcp.local: type PTR, class IN, "QU" question
> _airplay._tcp.local: type PTR, class IN, "QU" question
> _airport._tcp.local: type PTR, class IN, "QU" question
> _airserver._tcp.local: type PTR, class IN, "QU" question

```
(debug): MCAST_ACTIVE_QUERY: Sent Multicast Active Query Packet (qcount = 29)
(verbose): MCAST_ACTIVE_QUERY: Total query count: 29
(verbose): MCAST_ACTIVE_QUERY: [vlan20]Adding service-type _adisk._tcp.local
(verbose): MCAST_ACTIVE_QUERY: [vlan20]Adding service-type afpovertcp._tcp.local
(verbose): MCAST_ACTIVE_QUERY: [vlan20]Adding service-type _airplay._tcp.local
(verbose): MCAST_ACTIVE_QUERY: [vlan20]Adding service-type _airport._tcp.local
(verbose): MCAST_ACTIVE_QUERY: [vlan20]Adding service-type _airserver._tcp.local
```

Troubleshooting mDNS Gateway Mode

mDNS Gateway - Central Switching



WLC Services
Query

Service Provider
Answer

WLC Cache
Services

Wireless Client
Service Request

WLC Share
Services

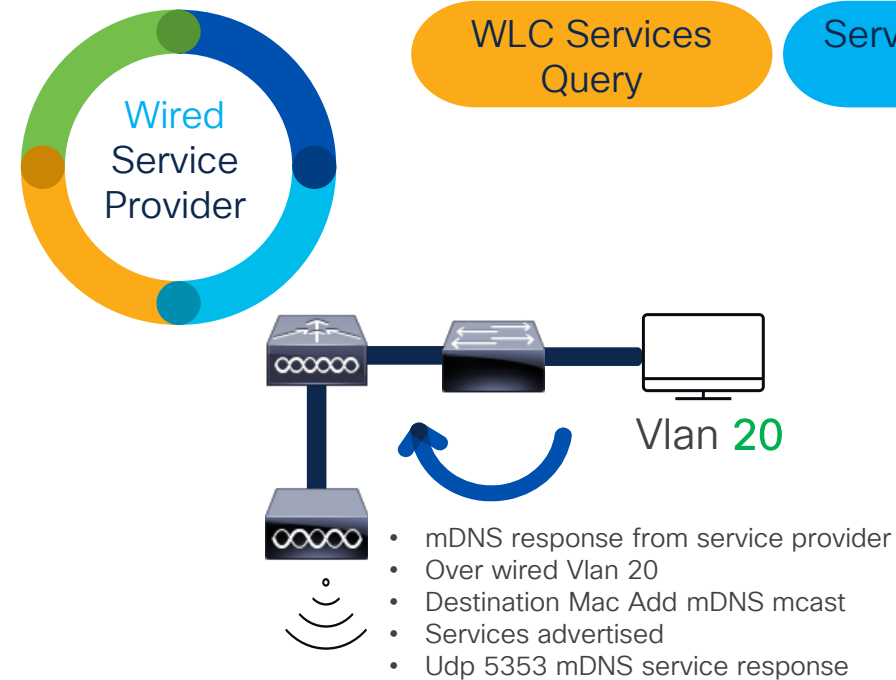
```
No.      Time          Source          Destination      Protocol  Length  Info
-----
1067    21:14:42.611967  192.168.20.103  224.0.0.251      MDNS      881     Standard query response 0x0000 PTR Samsung CU7000 55 TV._airplay

> Frame 1067: 881 bytes on wire (7048 bits), 881 bytes captured (7048 bits)
> Ethernet II, Src: Cisco_55:e4:28 (3c:57:31:55:e4:28), Dst: Cisco_57:d8:cb (f4:bd:9e:57:d8:cb)
> 802.1Q Virtual LAN, Prio: 0, DFI: 0, TI: 10
> Internet Protocol Version 4, Src: 192.168.10.194, Dst: 192.168.10.2
> User Datagram Protocol, Src Port: 5264, Dst Port: 5247
> Control And Provisioning of Wireless Access Points - Data
> IEEE 802.11 QoS Data, Flags: .....I
> Logical-Link Control
> Internet Protocol Version 4, Src: 192.168.20.103, Dst: 224.0.0.251
> User Datagram Protocol, Src Port: 5353, Dst Port: 5353
> Multicast Domain Name System (response)
  Transaction ID: 0x0000
  > Flags: 0x8400 Standard query response, No error
  Questions: 0
  Answer RRs: 2
  Authority RRs: 0
  Additional RRs: 9
  > Answers
    > _airplay._tcp.local: type PTR, class IN, Samsung CU7000 55 TV._airplay._tcp.local
    > _spotify-connect._tcp.local: type PTR, class IN, ed9583d2b239afa30d7b0e7106c3710ddcfe5769._spotify-connect._tcp.local
    > Additional records
      [unsolicited: true]

(info): IPv4 mDNS Advertisement packet received from 192.168.20.103 [VLAN:20, WLAN:3, MAC:68fc.ca6e.eb0c]
(verbose): DOM: id=0, response, opcode=0, aa=1, tc=0, rd=0, ra=0
(verbose):      rcode=0, qdcount=0, ancount=2, nscount=0, arcount=9
(verbose): Answer section:
(verbose):   Name='_airplay._tcp.local'
(verbose):   RR type=12, class=1, ttl=4500, data length=23
(verbose):   PTR='Samsung CU7000 55 TV._airplay._tcp.local'
(verbose):   Name='_spotify-connect._tcp.local'
(verbose):   RR type=12, class=1, ttl=4500, data length=43
(verbose):   PTR='ed9583d2b239afa30d7b0e7106c3710ddcfe5769._spotify-connect._tcp.local'
```

Troubleshooting mDNS Gateway Mode

mDNS Gateway - Central Switching



Vlan 10
CISCO Live!

```
No.      Time          Source          Destination      Protocol  Length  Info
-----
1410    19:39:45.824954  192.168.20.105  224.0.0.251      MDNS      803     Standard query response 0x0000 PTR Samsung CU7000 55 TV._airplay

> Frame 1410: 803 bytes on wire (6424 bits), 803 bytes captured (6424 bits)
> Ethernet II, Src: SamsungE_45:8e:26 (e0:03:6b:45:8e:26), Dst: IPv4mcast_fb (01:00:5e:00:00:fb)
> 802.1Q Virtual LAN, PRI: 0, DEI: 0, ID: 20
> Internet Protocol Version 4, Src: 192.168.20.105, Dst: 224.0.0.251
> User Datagram Protocol, Src Port: 5353, Dst Port: 5353
> Multicast Domain Name System (response)
  Transaction ID: 0x0000
  > Flags: 0x8400 Standard query response, No error
  Questions: 0
  Answer RRs: 2
  Authority RRs: 0
  Additional RRs: 9
  > Answers
    > _airplay._tcp.local: type PTR, class IN, Samsung CU7000 55 TV._airplay._tcp.local
    > _spotify-connect._tcp.local: type PTR, class IN, ed9583d2b239afa30d7b0e7106c3710ddcfe5769._spotify-connect._tcp.local
  > Additional records
    [Unsolicited: True]

(verbose): Received READ Callback for IPV4 mDNS packet
(verbose): Allocated bpak: 0x5618c0ee9c38, bpak->buffer_start: 0x5618c0f0db08, bpak->network_start: 0x5618c0f0db5c
(verbose): MDNS :Vlan Id 5120 wlan Id 0 from DP
(verbose): MDNS :Vlan Id :20 wlan Id :0 after ntohs
5c03, ra: 7 (info): IPv4 mDNS Advertisement packet received from 192.168.20.105[VLAN:20, MAC:e003.6b45.8e26]
5c03, ra: 7 (verbose): DOM: id=0, response, opcode=0, aa=1, tc=0, rd=0, ra=0
5c03, ra: 7 (verbose): rcode=0, qdcount=0, ancount=2, nscount=0, arcount=9
5c03, ra: 7 (verbose): Answer section:
5c03, ra: 7 (verbose): Name='_airplay._tcp.local'
5c03, ra: 7 (verbose): RR type=12, class=1, ttl=4500, data length=23
5c03, ra: 7 (verbose): PTR='Samsung CU7000 55 TV._airplay._tcp.local'
5c03, ra: 7 (verbose): Name='_spotify-connect._tcp.local'
5c03, ra: 7 (verbose): RR type=12, class=1, ttl=4500, data length=43
5c03, ra: 7 (verbose): PTR='ed9583d2b239afa30d7b0e7106c3710ddcfe5769._spotify-connect._tcp.local'
```

Troubleshooting mDNS Gateway Mode

mDNS Gateway - Central Switching

Wireless
Service
Provider

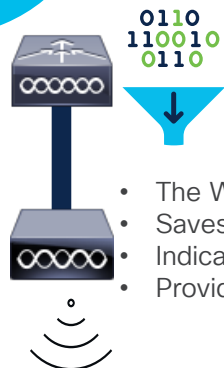
WLC Services
Query

Service Provider
Answer

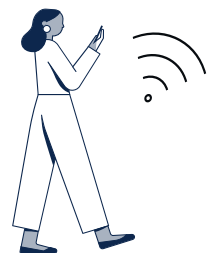
WLC Cache
Services

Wireless Client
Service Request

WLC Share
Services



- The WLC analyzes the mDNS packet response
- Saves the services advertised
- Indicates if the service is **wireless**
- Provide information about the Service Provider



Vlan 10

Vlan 20

CISCO Live!



From CLI the services in the database can be seen with the command

```
#show mdns-sd cache
```

Monitoring > Services > mDNS

ClearAll

Record Name	TTL(sec)	Client MAC	Client Type	Connection Type	AP MAC	Site Tag	WLAN/GLAN/RLAN ID	VLAN ID	Record Data
_airplay._tcp.local	4500	68fc.ca6e.eb0c	WLAN	Wireless	4ca6.4d1f.2c60	mDNSSiteTag	3	20	Samsung CU7000 55 TV._airplay._tcp.local
_spotify-connect._tcp.local	4500	68fc.ca6e.eb0c	WLAN	Wireless	4ca6.4d1f.2c60	mDNSSiteTag	3	20	ed9583d2b239afa30d7b0e7106c3710ddcfe5769connect._tcp.local

```
(debug): MDNS_DB :[MAC:68fc.ca6e.eb0c]:PTR record [_airplay._tcp.local : Samsung CU7000 55 TV._airplay._tcp.local] new record case
(verbose): MDNS_DB: rdata Samsung CU7000 55 TV._airplay._tcp.local and size 8
(verbose): MDNS_DB: UPN status = FALSE UPN ID = 0
(verbose): MDNS_DB: enqueued in the upn list
(verbose): MDNS_CACHE: Cache record(mac_to_ptrid) not found
(verbose): MDNS_RECORD inserted successfully
(verbose): MDNS_CACHE: Searching ptr rdata: Samsung CU7000 55 TV._airplay._tcp.local
(verbose): MDNS_CACHE: Cache record(srvname_to_ptrid) not found: Samsung CU7000 55 TV._airplay._tcp.local
(verbose): MDNS_CACHE: add case (tbl cache srvname to ptr id)
(verbose): MDNS_CACHE: ID = 74
(verbose): MDNS_CACHE: enqueued in the list
(verbose): MDNS_CACHE: Record inserted successfully
(verbose): MDNS_CACHE: Cache record(mac_to_ptrid) not found
(verbose): MDNS_CACHE: add case (tbl cache mac to ptr id)
(verbose): MDNS_CACHE: PTR ID = 74
(verbose): MDNS_CACHE: enqueued in the list
(verbose): MDNS_CACHE: Record inserted successfully
```

Troubleshooting mDNS Gateway Mode

mDNS Gateway - Central Switching



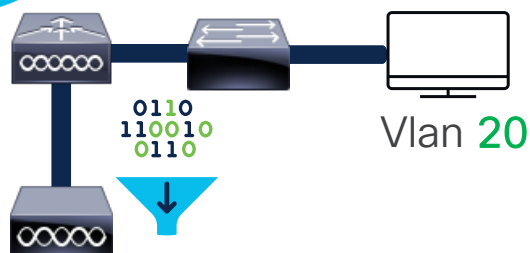
WLC Services
Query

Service Provider
Answer

WLC Cache
Services

Wireless Client
Service Request

WLC Share
Services



- The WLC analyzes the mDNS packet response
- Saves the services advertised
- Indicates if the service is **wired**
- Provide information about the Service Provider



Monitoring > Services > mDNS

ClearAll

Record Name	TTL(sec)	Client MAC	Client Type	Connection Type	AP MAC	Site Tag	WLAN/GLAN/RLAN ID	VLAN ID	Record Data
_airplay_tcp.local	4500	e003.6b45.8e26	WIRED	Wired	0000.0000.0000		20	20	Samsung CU7000 55 TV._airplay_tcp.local

```
(debug): MDNS_DB :[MAC:e003.6b45.8e26]:PTR record [_airplay_tcp.local : Samsung CU7000 55 TV._airplay_tcp.local] new record case
(verbose): MDNS_DB: rdata Samsung CU7000 55 TV._airplay_tcp.local and size 8
(verbose): MDNS_DB: UPN status = FALSE UPN ID = 0
(verbose): MDNS_DB: enqueued in the upn list
(verbose): MDNS_CACHE: Cache record(mac_to_ptrid) not found
7 (debug): ReplDB internal read cursor update: Read cursor on empty table table tbl_mdns_db_ptr/ec1e387211692bd7f8310161a9bfcf93
7 (debug): Add Cursor: table tbl_mdns_db_ptr/ec1e387211692bd7f8310161a9bfcf93 not in the list /tmp/rp/tdldb/0/WNCD_DB
7 (debug): ReplDB internal write cursor move: Assigning GC cursor to point to record for tablewith identifier: table tbl_mdns_db_ptr/ec1e387211692bd7f8310161a9bfcf93
7 (debug): ReplDB explicit record eng: Successfully enqueued record update for table with identifier: table tbl_mdns_db_ptr/ec1e387211692bd7f8310161a9bfcf93
(verbose): MDNS RECORD inserted successfully
(verbose): MDNS_CACHE: Searching ptr rdata: Samsung CU7000 55 TV._airplay_tcp.local
(verbose): MDNS_CACHE: Cache record(srvname_to_ptrid) not found: Samsung CU7000 55 TV._airplay_tcp.local
(verbose): MDNS_CACHE: add case (tbl cache srvname to ptr id)
(verbose): MDNS_CACHE: ID = 57
(verbose): MDNS_CACHE: enqueued in the list
7 (debug): ReplDB internal read cursor update: Read cursor on empty table table tbl_mdns_cache_srvname_to_ptr_ids/50d05f0afac4d2619d88a865ac307fcd not in the list /tmp/rp/tdldb/0/WNCD_DB
7 (debug): Add Cursor: table tbl_mdns_cache_srvname_to_ptr_ids/50d05f0afac4d2619d88a865ac307fcd not in the list /tmp/rp/tdldb/0/WNCD_DB
7 (debug): ReplDB internal write cursor move: Assigning GC cursor to point to record for tablewith identifier: table tbl_mdns_cache_srvname_to_ptr_ids/50d05f0afac4d2619d88a865ac307fcd
7 (debug): ReplDB explicit record eng: Successfully enqueued record update for table with identifier: table tbl_mdns_cache_srvname_to_ptr_ids/50d05f0afac4d2619d88a865ac307fcd
(verbose): MDNS CACHE: Record inserted successfully
```

Troubleshooting mDNS Gateway Mode

mDNS Gateway - Central Switching

WLC Services
Query

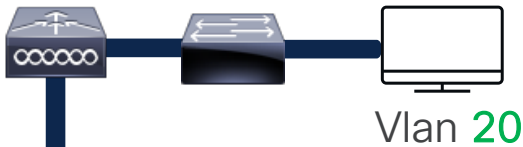
Service Provider
Answer

WLC Cache
Services

Wireless Client
Service Request

WLC Share
Services

WLC
&
Client



- Wireless client sends an mDNS query
- Asks for service `_airplay._tcp.local`
- AP sends over capwap the mDNS request
- Udp 5353 mDNS service query
- The WLC computes it and process it
- Confirms it is allowed in the mDNS policy



No.	Time	Source	Destination	Protocol	Length	Info
2679	21:15:11.770956	192.168.10.101	224.0.0.251	MDNS	161	Standard query 0x0000 PTR _airplay._tcp.local,

```
> Frame 2679: 161 bytes on wire (1288 bits), 161 bytes captured (1288 bits)
> Ethernet II, Src: Cisco_55:e4:28 (3c:57:31:55:e4:28), Dst: Cisco_57:d8:cb (f4:bd:9e:57:d8:cb)
> 802.1Q Virtual LAN, PRI: 0, DEI: 0, ID: 10
> Internet Protocol Version 4, Src: 192.168.10.194, Dst: 192.168.10.2
> User Datagram Protocol, Src Port: 5264, Dst Port: 5247
> Control And Provisioning of Wireless Access Points - Data
> IEEE 802.11 QoS Data, Flags: .....T
> Logical-Link Control
> Internet Protocol Version 4, Src: 192.168.10.101, Dst: 224.0.0.251
> User Datagram Protocol, Src Port: 5353, Dst Port: 5353
v Multicast Domain Name System (query)
  > Transaction ID: 0x0000
  > Flags: 0x0000 Standard query
    Questions: 1
    Answer RRs: 0
    Authority RRs: 0
    Additional RRs: 0
  v Queries
    > _airplay._tcp.local: type PTR, class IN, "QU" question
      [Retransmitted request. Original request in: 2523]
      [Retransmission: True]

(info): IPv4 mDNS Query packet received from 192.168.10.101 [VLAN:10, WLAN:2, MAC:5afc.ef71.ecec]
(verbose): DOM: id=0, query, opcode=0, aa=0, tc=0, rd=0, ra=0
(verbose):      rcode=0, qdcount=1, ancount=0, nscount=0, arcount=0
(verbose):      query name is _airplay._tcp.local, qtype=12, class=32769
(verbose): processing queryname_ptr: _airplay._tcp.local queryname: _airplay._tcp.local, service-policy: mdnsPolicy
(verbose): Matched alias name: airplay for srv_type: _airplay._tcp.local service-list: mdnsIN
(verbose): Matched alias name: airplay for srv_type: airplay._tcp.local service-list: mdnsOUT
(debug): MDNS_QUERY_FILTER :[MAC:5afc.ef71.ecec]Query allowed for: _airplay._tcp.local
```


Troubleshooting mDNS Gateway Mode

mDNS Gateway - Central Switching

WLC Services
Query

Service Provider
Answer

WLC Cache
Services

Wireless Client
Service Request

WLC Share
Services

WLC
&
Client

- The WLC finds the service in the database
- The WLC responds via capwap
- 802.11 wireless client Mac Add
- mDNS source IP add is the WLC SVI in Vlan 10
- mDNS source IP ADD same Vlan as wireless client
- Udp 5353 mDNS service query
- The Service was previously learnt in Vlan 20

```
No.      Time      Source      Destination      Protocol  Length  Info
-----
2683 21:15:11.771947 192.168.10.2 224.0.0.251      MDNS      665      Standard query response 0x0000 PTR, cache flush Samsung CU7000

> Internet Protocol Version 4, Src: 192.168.10.2, Dst: 192.168.10.19
> User Datagram Protocol, Src Port: 5247, Dst Port: 5264
> Control And Provisioning of Wireless Access Points - Data
  > IEEE 802.11 QoS Data, Flags: .....F.
    Type/Subtype: QoS Data (0x0028)
    > Frame Control Field: 0x0288(Swapped)
      .000 0000 0000 0000 = Duration: 0 microseconds
      Receiver address: 5a:fc:ef:71:ec:ec (5a:fc:ef:71:ec:ec)
      Transmitter address: Cisco_1f:2c:6e (4c:a6:4d:1f:2c:6e)
      Destination address: 5a:fc:ef:71:ec:ec (5a:fc:ef:71:ec:ec)
      Source address: Cisco_07:00:00 (14:00:0e:37:00:00)
      BSS Id: Cisco_1f:2c:6e (4c:a6:4d:1f:2c:6e)
      STA address: 5a:fc:ef:71:ec:ec (5a:fc:ef:71:ec:ec)
      .... 0000 = Fragment number: 0
      0000 0000 .... = Sequence number: 0
    > QoS Control: 0x0000
  > Logical Link Control
    > Internet Protocol Version 4, Src: 192.168.10.2, Dst: 224.0.0.251
    > User Datagram Protocol, Src Port: 5353, Dst Port: 5353
    > Multicast Domain Name System (response)
      > Transaction ID: 0x0000
      > Flags: 0x0000 Standard query response, No error
      Questions: 0
      Answer RRs: 1
      Authority RRs: 0
      Additional RRs: 3
      Answer
        > _airplay_tcp.local: type PTR, class IN, cache flush, Samsung CU7000 55 TV._airplay_tcp.local

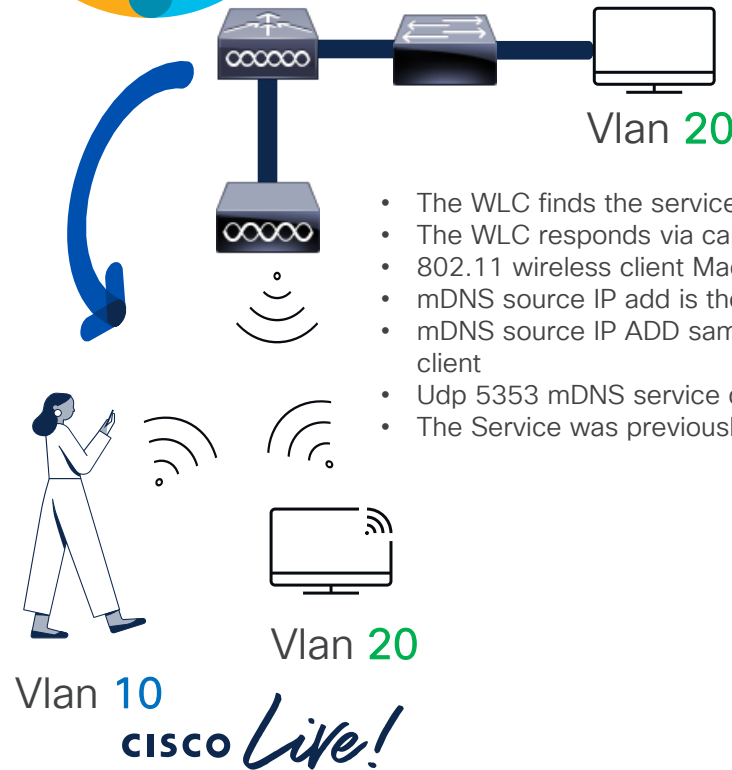
(verbose): ----- Respond to query : airplay. tcp.local -----
(verbose): MDNS_DB: name _airplay. tcp.local
(verbose): MDNS_DB: Found PTR record

(debug): WIRELESS_QUERY_RESP:[MAC:5afc.ef71.ecec] sending PTR [_airplay_tcp.local | Samsung CU7000 55 TV._airplay_tcp.local]
(verbose): adding a record from ptrQ
(verbose): PTR contains srv_id: 68and txt_id: 70
(verbose): MDNS_DB: Found SRV record
(verbose): Record name: Samsung CU7000 55 TV._airplay_tcp.local

(verbose): Answer section:
(verbose):   Name='_airplay_tcp.local'
(verbose):   RR type=12, class=32768, ttl=4471, data length=23
(verbose):   PTR='Samsung CU7000 55 TV._airplay_tcp.local'

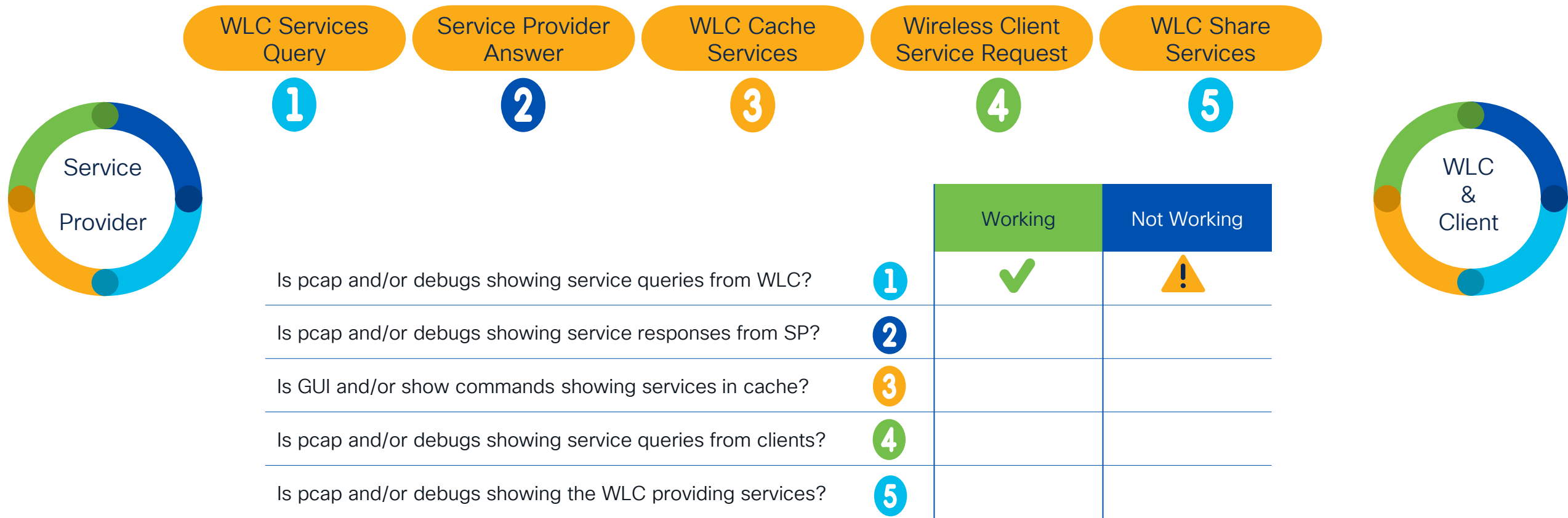
(verbose): Source IP4=192.168.10.2
(verbose): ifr.ifr_ifindex : 6
(verbose): Inject frame_length: 631
(verbose): IPv4 L2 packet sent successfully
(info): IPv4 mDNS Unicast Response packet sent to :5afc.ef71.ecec

(verbose): ----- End of Respond to query : _airplay. tcp.local -----
```

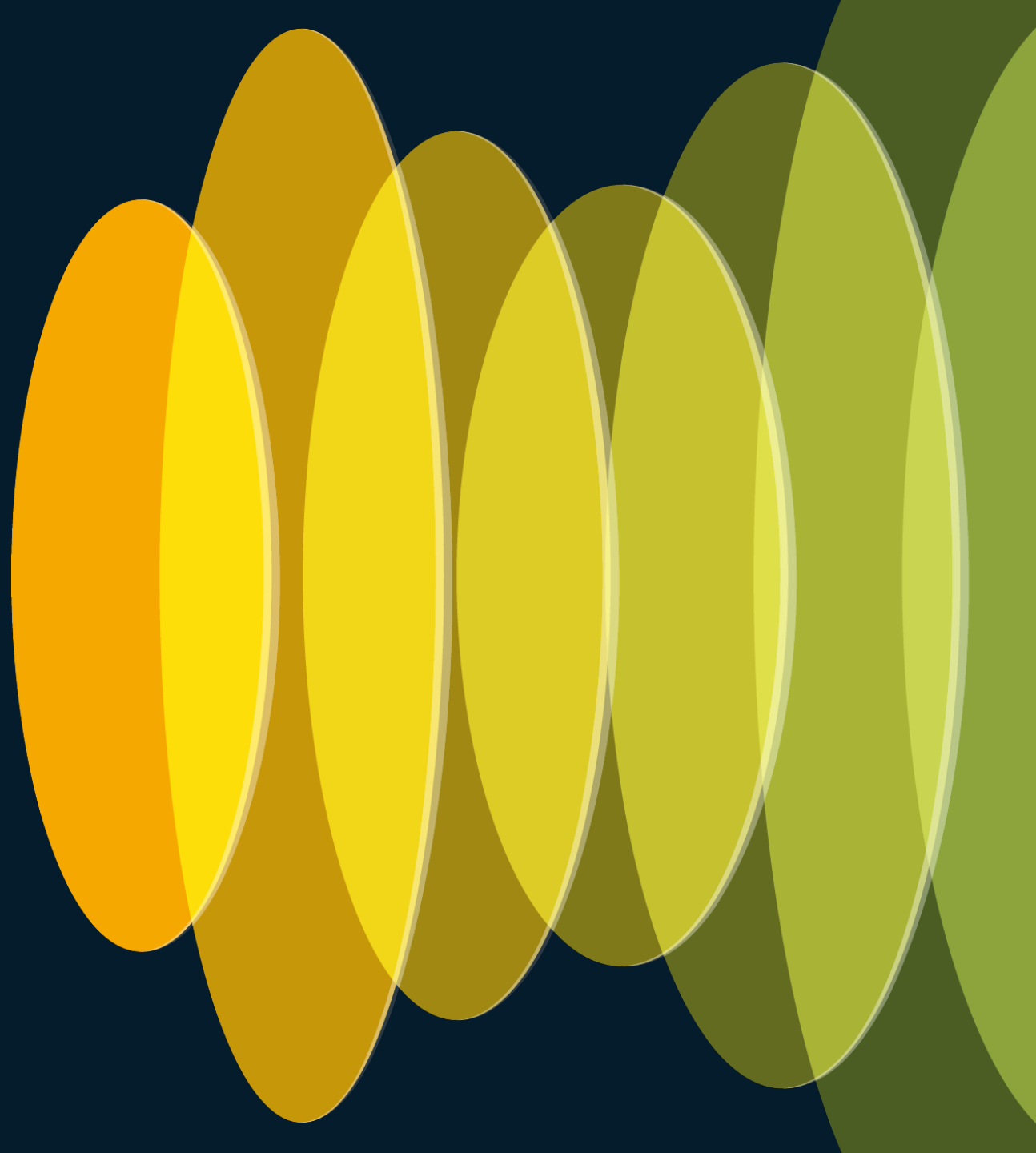


Troubleshooting mDNS Gateway Mode

mDNS Gateway - Central Switching



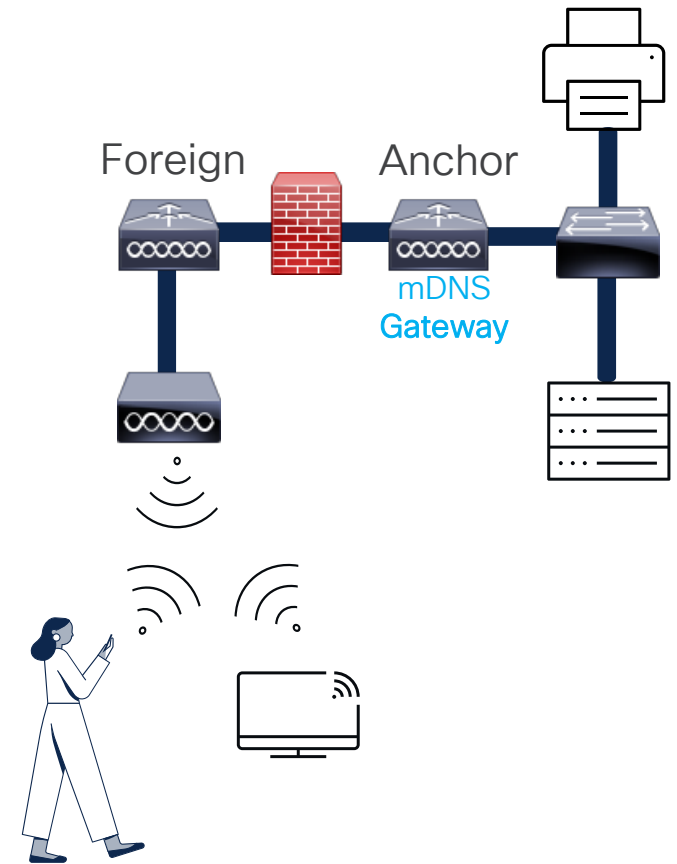
mDNS Gateway Mode Anchor-Foreign



Workflow mDNS Gateway Mode

mDNS Gateway – Anchor – Foreign

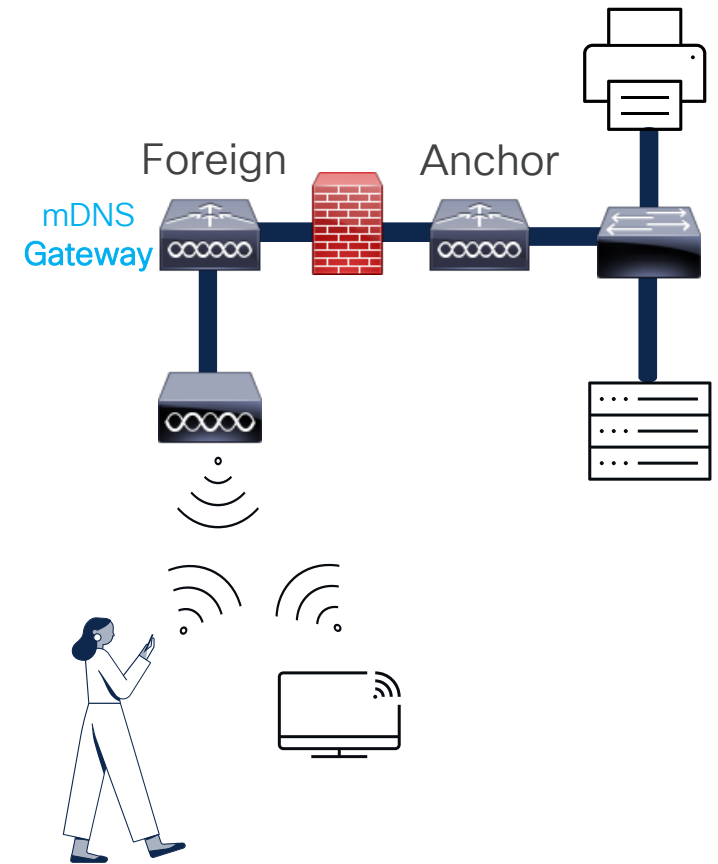
- The flow of the mDNS packets will be the same explained so far in mDNS Gateway mode.
- If the **Anchor** WLC is configured as the mDNS Gateway then it will be the one with the services in cache and providing mDNS services.
- The Foreign WLC will need to have Bridging mode enabled in the SSID and Anchor SSID in Gateway mode.
- mDNS must be enabled globally in both WLCs.



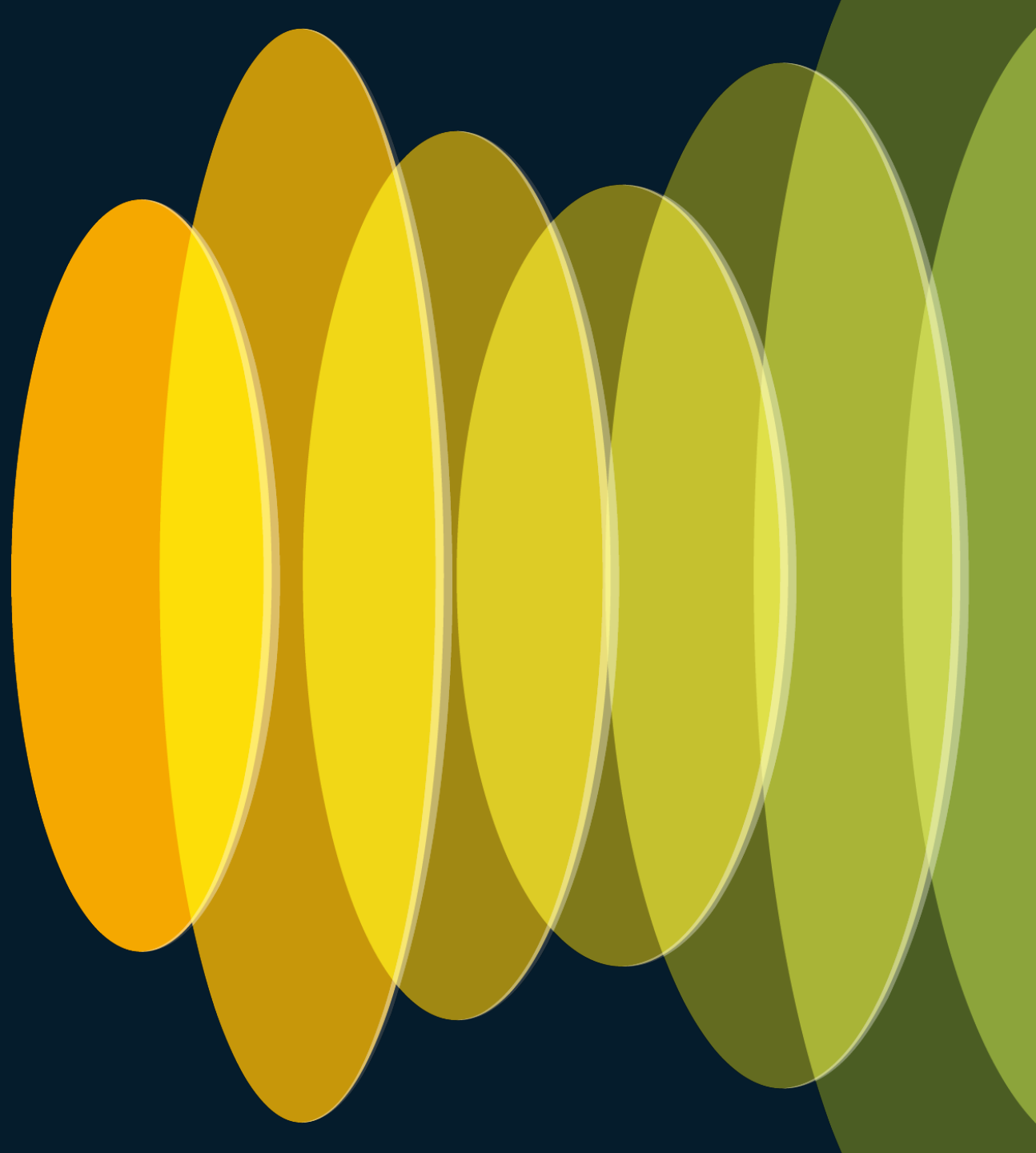
Workflow mDNS Gateway Mode

mDNS Gateway – Anchor – Foreign

- The flow of the mDNS packets will be the same explained so far in mDNS Gateway mode.
- If the **Foreign** WLC is configured as the mDNS Gateway then it will be the one with the services in cache and providing mDNS services.
- The Anchor WLC will need to have Bridging mode enabled in the SSID and Foreign SSID in Gateway mode.
- mDNS must be enabled globally in both WLCs.

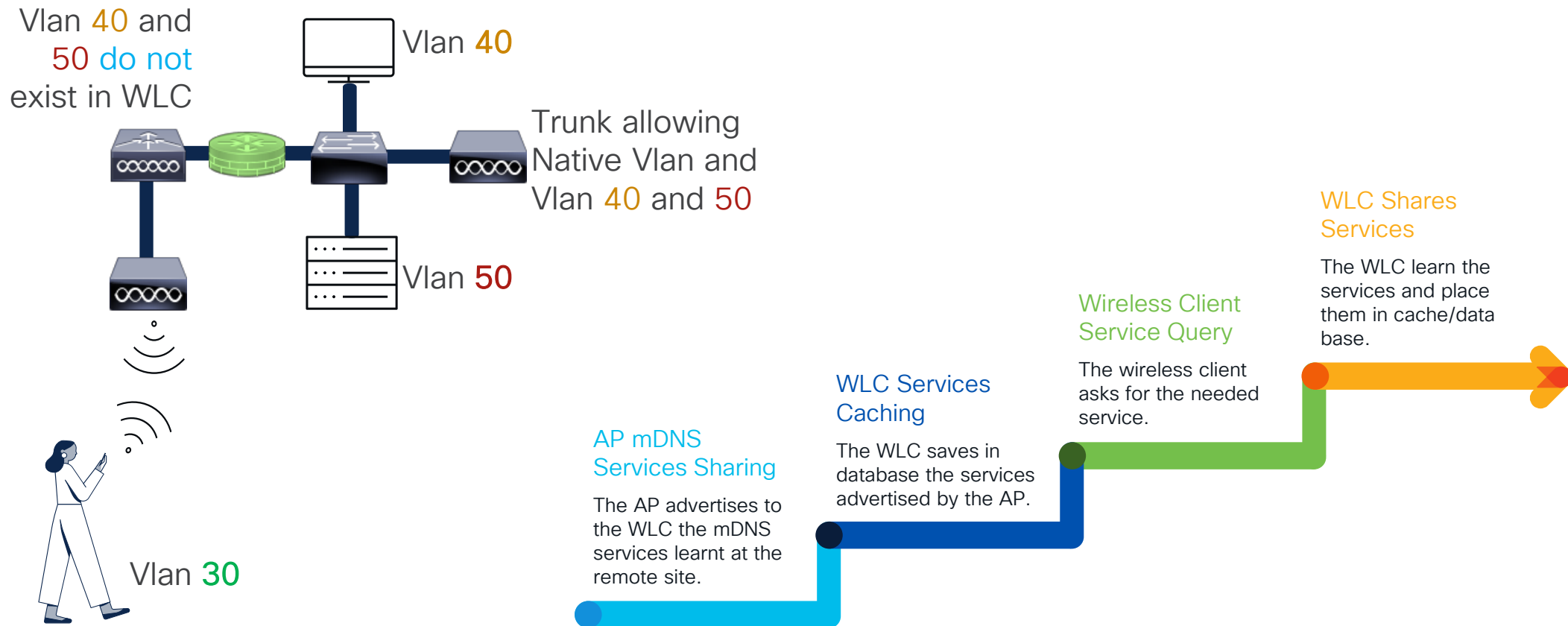


mDNS Gateway Mode mDNS-AP



Workflow mDNS Gateway Mode

mDNS Gateway - mDNS-AP



Configuring mDNS Gateway Mode

mDNS Gateway – mDNS-AP

- Configure mDNS-AP **Service Policy** of your preference.
 - default-mDNS Policy is pre-configured.

Configuration > Services > mDNS

Global Service Policy mDNS Flex Profile

mDNS Gateway ENABLED

Transport ipv4

Active-Query Timer (Minutes) * 30

mDNS-AP Service Policy mdnsPolicy Clear

- Configure the AP to be an **mDNS-AP**.
 - Configuration can only be done via CLI
 - Vlans can be added and deleted as needed.

```
#ap name <AP Name> mdns-ap enable vlan <1-4096>
```

```
#ap name <AP Name> mdns-ap vlan add <1-4096>
```

```
#ap name <AP Name> mdns-ap vlan del <1-4096>
```

Configuring mDNS Gateway Mode

mDNS Gateway – mDNS-AP

mDNS-AP Config Checklist

	Configured	Not configured
Global Multicast Enabled	✓	⚠
Global mDNS Gateway Enabled		
mDNS Service Definition (if needed)		
mDNS Service List (IN and OUT)		
mDNS Service Policy		
mDNS-AP Service Policy Selected		
WLAN/SSID mDNS mode Gateway		
WLAN-Policy assigned with mDNS Service Policy		
Enable mDNS AP and add remote Vlans via WLC CLI		
Remote Aps switchport mode trunk		

Troubleshooting mDNS Gateway Mode

mDNS Gateway – mDNS-AP



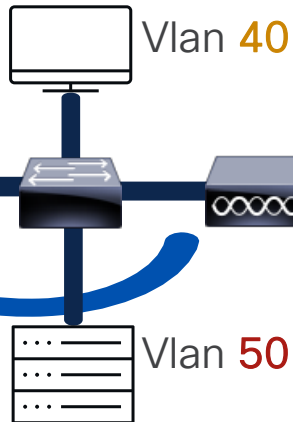
AP mDNS Service Sharing

WLC Services Caching

Wireless Client Service Query

WLC Shares Services

Vlan 40 and 50 do not exist in WLC



Trunk allowing Native Vlan And Vlan 40 and 50

- The AP advertises the WLC about the remote service providers.

No.	Time	Source	Destination	Protocol	Length	Info
605	15:09:31.750952	192.168.40.2	224.0.0.251	MDNS	881	Standard query response 0x0000 PTR Samsung CU7000 55 TV._airplay._tcp.local


```
> Frame 605: 881 bytes on wire (7048 bits), 881 bytes captured (7048 bits) on 0
> Ethernet II, Src: 3c:57:31:55:e4:28 (3c:57:31:55:e4:28), Dst: Cisco_57:d8:cb (f4:bd:9e:57:d8:cb)
> 802.1Q Virtual LAN, PRI: 0, DEI: 0, ID: 10
> Internet Protocol Version 4, Src: 192.168.10.194, Dst: 192.168.10.2
> User Datagram Protocol, Src Port: 5264, Dst Port: 5247
> Control And Provisioning of Wireless Access Points - Data
> IEEE 802.11 QoS Data, Flags: .....T
> Logical-Link Control
> Internet Protocol Version 4, Src: 192.168.40.2, Dst: 224.0.0.251
> User Datagram Protocol, Src Port: 5353, Dst Port: 5353
> Multicast Domain Name System (response)
  Transaction ID: 0x0000
  > Flags: 0x8400 Standard query response, No error
  Questions: 0
  Answer RRs: 2
  Authority RRs: 0
  Additional RRs: 9
  > Answers
    > _airplay._tcp.local: type PTR, class IN, Samsung CU7000 55 TV._airplay._tcp.local
    > _spotify-connect._tcp.local: type PTR, class IN, ed9583d2b239afa30d7b0e7106c3710ddcfe5769._spotify-connect._tcp.local
```

```
(info): IPv4 mDNS Advertisement packet received from 192.168.40.2[VLAN:40, MAC:e003.6b45.8e26]
(verbose): MDNS: client is connected via mDNS ap ap_eth_mac :3c57.3155.e428ap wtp mac :4ca6.4dlf.2c60 mdns ap status :ENABLE
(verbose): DOM: id=0, response, opcode=0, aa=1, tc=0, rd=0, ra=0
(verbose): rcode=0. qdcount=0. ancount=2. nscount=0. arcount=9
(verbose): Answer section:
(verbose): Name='_spotify-connect._tcp.local'
(verbose): RR type=12, class=1, ttl=4500, data length=43
(verbose): PTR='ed9583d2b239afa30d7b0e7106c3710ddcfe5769._spotify-connect._tcp.local'
(verbose): Name='_airplay._tcp.local'
(verbose): RR type=12, class=1, ttl=4500, data length=23
(verbose): PTR='Samsung CU7000 55 TV._airplay._tcp.local'
```



Troubleshooting mDNS Gateway Mode

mDNS Gateway – mDNS-AP

AP mDNS Service
Sharing

WLC Services
Caching

Wireless Client
Service Query

WLC Shares
Services

Wired
Service
Provider

Vlan 40 and
50 do not
exist in WLC

Vlan 40

Trunk allowing
Native Vlan
And Vlan 40
and 50

Vlan 50

- The WLC saves in cache the news service.
- The service will show as wired.
- The WLAN and Vlan will be the Vlan ID at the remote site allowed in the mDNS configuration.

Vlan 30

CISCO Live!

Monitoring > Services > mDNS

Clear All

Record Name	TTL(sec)	Client MAC	Client Type	Connection Type	AP MAC	Site Tag	WLAN/GLAN/RLAN ID	VLAN ID	Record Data
_airplay_tcp.local	4500	e003.6b45.8e26	MDNSAP	Wired	4ca6.4d1f.2c60		40	40	Samsung CU7000 55 TV._airplay_tcp.local
_companion-link_tcp.local	4500	48e1.5c5f.eef5	WLAN	Wireless	4ca6.4d1f.2c60	mDNSSiteTag	3	20	Living Room._companion-link_tcp.local
_airplay_tcp.local	4500	48e1.5c5f.eef5	WLAN	Wireless	4ca6.4d1f.2c60	mDNSSiteTag	3	20	Living Room._airplay_tcp.local
_raop_tcp.local	4500	48e1.5c5f.eef5	WLAN	Wireless	4ca6.4d1f.2c60	mDNSSiteTag	3	20	48E15C60120A@Living Room._raop_tcp.local

```
(debug): MDNS_DB :[MAC:e003.6b45.8e26]:PTR record [_airplay_tcp.local : Samsung CU7000 55 TV._airplay_tcp.local] new record case
(verbose): MDNS_DB: rdata Samsung CU7000 55 TV._airplay_tcp.local and size 8
(verbose): MDNS_DB: UPN status = FALSE UPN ID = 0
(verbose): MDNS_DB: enqueued in the upn list
(verbose): MDNS_CACHE: Cache record(mac_to_ptrid) not found
7 (debug): Add Cursor: table tbl_mdns_db_ptr/ec1e387211692bd7f8310161a9bfcf93 not in the list /tmp/rp/tdlodb/0/WNCD_DB
7 (debug): ReplDB explicit record enq: Successfully enqueued record update for table with identifier: table tbl_mdns_db_ptr/ec1e3872116
(verbose): MDNS_RECORD inserted successfully
(verbose): MDNS_CACHE: Searching ptr rdata: Samsung CU7000 55 TV._airplay_tcp.local
(verbose): MDNS_CACHE: Cache record(srvname_to_ptrid) not found: Samsung CU7000 55 TV._airplay_tcp.local
(verbose): MDNS_CACHE: add case (tbl_mdns_cache_srvname_to_ptr_id)
(verbose): MDNS_CACHE: ID = 8
(verbose): MDNS_CACHE: enqueued in the list
7 (debug): Add Cursor: table tbl_mdns_cache_srvname_to_ptr_ids/50d05f0afac4d2619d88a865ac307fcd not in the list /tmp/rp/tdlodb/0/WNCD_DB
7 (debug): ReplDB explicit record enq: Successfully enqueued record update for table with identifier: table tbl_mdns_cache_srvname_to_ptr
(verbose): MDNS_CACHE: Record inserted successfully
```

Troubleshooting mDNS Gateway Mode

mDNS Gateway - mDNS-AP

AP mDNS Service
Sharing

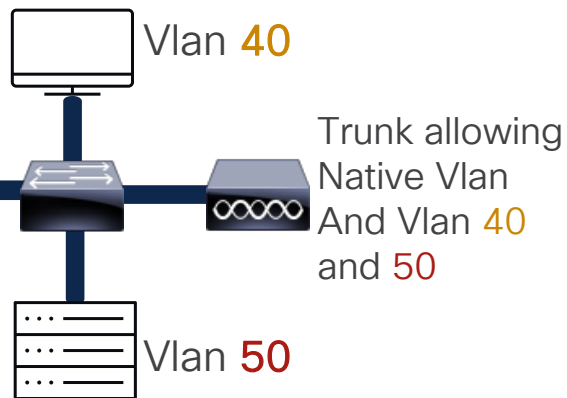
WLC Services
Caching

Wireless Client
Service Query

WLC Shares
Services

Wireless
client
query

Vlan 40 and
50 do not
exist in WLC



- The wireless client request a mirroring service.
- The inner capwap shows the wireless client IP Add.
- Also the mDNS mcast IP Add is the destination.
- The port us UDP 5353.

No.	Time	Source	Destination	Protocol	Length	Info
15442	15:14:06.746955	192.168.10.101	224.0.0.251	MDNS	161	Standard query 0x0000 PTR _airplay._tcp.local, "QU" question

> Frame 15442: 161 bytes on wire (1288 bits), 161 bytes captured (1288 bits)
> Ethernet II, Src: Cisco_55:e4:28 (3c:57:31:55:e4:28), Dst: Cisco_57:d8:cb (f4:bd:9e:57:d8:cb)
> 802.1Q Virtual LAN, PRT: 0, DEI: 0, ID: 10
> Internet Protocol Version 4, Src: 192.168.10.194, Dst: 192.168.10.2
> User Datagram Protocol, Src Port: 5264, Dst Port: 5247
> Control And Provisioning of Wireless Access Points - Data
> IEEE 802.11 QoS Data, Flags:T
> Logical-Link Control
> Internet Protocol Version 4, Src: 192.168.10.101, Dst: 224.0.0.251
> User Datagram Protocol, Src Port: 5353, Dst Port: 5353
> Multicast Domain Name System (query)
> Transaction ID: 0x0000
> Flags: 0x0000 Standard query
> Questions: 1
> Answer RRs: 0
> Authority RRs: 0
> Additional RRs: 0
> Queries
> _airplay._tcp.local: type PTR, class IN, "QU" question
> [Retransmitted request. Original request in: 15423]
> [Retransmission: True]


```
(info): IPv4 mDNS Query packet received from 192.168.10.101 [VLAN:10, WLAN:2, MAC:5afc.ef71.ecec]
(verbose): DOM: id=0, query, opcode=0, aa=0, tc=0, rd=0, ra=0
(verbose):      rcode=0, qdcount=1, ancount=0, nscount=0, arcount=0
(verbose):      query name is _airplay._tcp.local, qtype=12, class=32769
```

Vlan 10

CISCO Live!

Troubleshooting mDNS Gateway Mode

mDNS Gateway - mDNS-AP



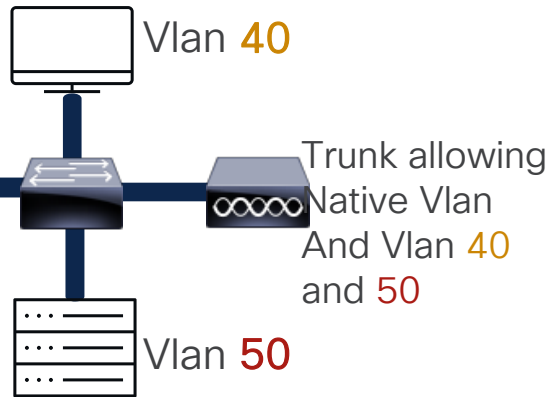
AP mDNS Service Sharing

WLC Services Caching

Wireless Client Service Query

WLC Shares Services

Vlan 40 and 50 do not exist in WLC



- The WLC processes the response against the mDNS policy.
- Provides the mDNS response with the proper service.
- The source IP Add if the WLC Vlan 10 SVI.
- Within the debug it can be noticed how the service shared by the WLC was learned from the device in Vlan 40 at the remote site (192.168.40.2).

No.	Time	Source	Destination	Protocol	Length	Info
15446	15:14:06.747947	192.168.10.2	224.0.0.251	MDNS	665	Standard query response

> Frame 15446: 665 bytes on wire (5320 bits), 665 bytes captured (5320 bits)
> Ethernet II, Src: Cisco 57:d8:cb (f4:bd:9e:57:d8:cb), Dst: 3c:57:31:55:e4:28 (3c:57:31:55:e4:28)
> Internet Protocol Version 4, Src: 192.168.10.2, Dst: 192.168.10.194
> User Datagram Protocol, Src Port: 5247, Dst Port: 5264
> Control And Provisioning of Wireless Access Points - Data
> IEEE 802.11 QoS Data, Flags:F.
> Logical-Link Control
> Internet Protocol Version 4, Src: 192.168.10.2, Dst: 224.0.0.251
> User Datagram Protocol, Src Port: 5353, Dst Port: 5353
> Multicast Domain Name System (response)
> Transaction ID: 0x0000
> Flags: 0x8000 Standard query response, No error
Questions: 0
Answer RRs: 1
Authority RRs: 0
Additional RRs: 3
> Answers
> _airplay._tcp.local: type PTR, class IN, cache flush, Samsung CU7000 55 TV._airplay._tcp.local

Vlan 10
cisco Live!

Troubleshooting mDNS Gateway Mode

mDNS Gateway - mDNS-AP

AP mDNS Service
Sharing

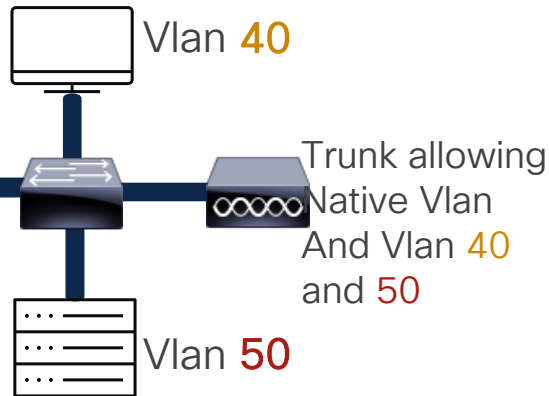
WLC Services
Caching

Wireless Client
Service Query

WLC Shares
Services

Wired
Service
Provider

Vlan 40 and
50 do not
exist in WLC



- The WLC processes the response against the mDNS policy.
- Provides the mDNS response with the proper service.
- The source IP Add if the WLC Vlan 10 SVI.
- Within the debug it can be noticed how the service shared by the WLC was learned from the device in Vlan 40 at the remote site (192.168.40.2).

Vlan 30

CISCO Live!

```
(verbose): ----- Respond to query : _airplay._tcp.local -----
(verbose): policy name: mdnsPolicy
(debug): MDNS_WIRELESS : [MAC:5afc.ef71.ecec]mDNS Service Policy to be used is mdnsPolicy
(verbose): MDNS_UPN: mDNS upn_id is 0 upn_status FALSE
(verbose): location queue size: 0
(verbose): qdcount in query: 1
(verbose): MDNS record Search: record with wlan_id: 2 found
(verbose): query type: 12
(verbose): processing queryname_ptr: _airplay._tcp.local queryname: _airplay._tcp.local, service-policy: mdnsPolicy
(verbose): Matched alias name: airplay for srv_type: _airplay._tcp.local service-list: mdnsIN
(verbose): Matched alias name: airplay for srv_type: _airplay._tcp.local service-list: mdnsOUT
(debug): MDNS_QUERY_FILTER : [MAC:5afc.ef71.ecec]Query allowed for: _airplay._tcp.local

(verbose): Answer section:
(verbose):   Name='_airplay._tcp.local'
(verbose):   RR type=12, class=32769, ttl=4225, data length=23
(verbose):   PTR='Samsung CU7000 55 TV._airplay._tcp.local'
(verbose): Authority section:
(verbose): Additional record section:
(verbose):   Name='Samsung CU7000 55 TV._airplay._tcp.local'
(verbose):   RR type=33, class=32769, ttl=120, data length=20
(verbose):   SRV= Priority=0 Weight=0 Port=7000 Hostname=localhost-2.local
(verbose):   Name='localhost-2.local'
(verbose):   RR type=1, class=32769, ttl=120, data length=4
(verbose):   IP=192.168.40.2
(verbose):   Name='Samsung CU7000 55 TV._airplay._tcp.local'
(verbose):   RR type=16, class=32769, ttl=4225, data length=427

(info): IPv4 mDNS Unicast Response packet sent to :5afc.ef71.ecec
(verbose): ----- End of Respond to query : _airplay._tcp.local -----
```

Troubleshooting mDNS Gateway Mode

mDNS Gateway – mDNS-AP

mDNS-AP Show Commands from WLC

```
WLC1#show mdns-sd ap  
mDNS AP details
```

AP-name	AP-Ethernet-MAC	#Vlans	Vlan-id(s)
mDNSAP	3c57.3155.e428	2	40 50

```
WLC1#show mdns-sd cache mdns-ap 3c57.3155.e428 detail
```

```
Name: _airplay._tcp.local  
Type: PTR  
Record Flags: None  
TTL: 4500  
Location Group: 0  
User Role: none  
VLAN: 40  
Client MAC: e003.6b45.8e26  
mDNS AP Radio MAC: 4ca6.4d1f.2c60  
mDNS AP Ethernet MAC: 3c57.3155.e428  
Remaining-Time: 4280  
mDNS Service Policy: default-mdns-service-policy  
Rdata: Samsung CU7000 55 TV. airplay. tcp.local
```

```
WLC1#show mdns-sd cache mdns-ap 3c57.3155.e428
```

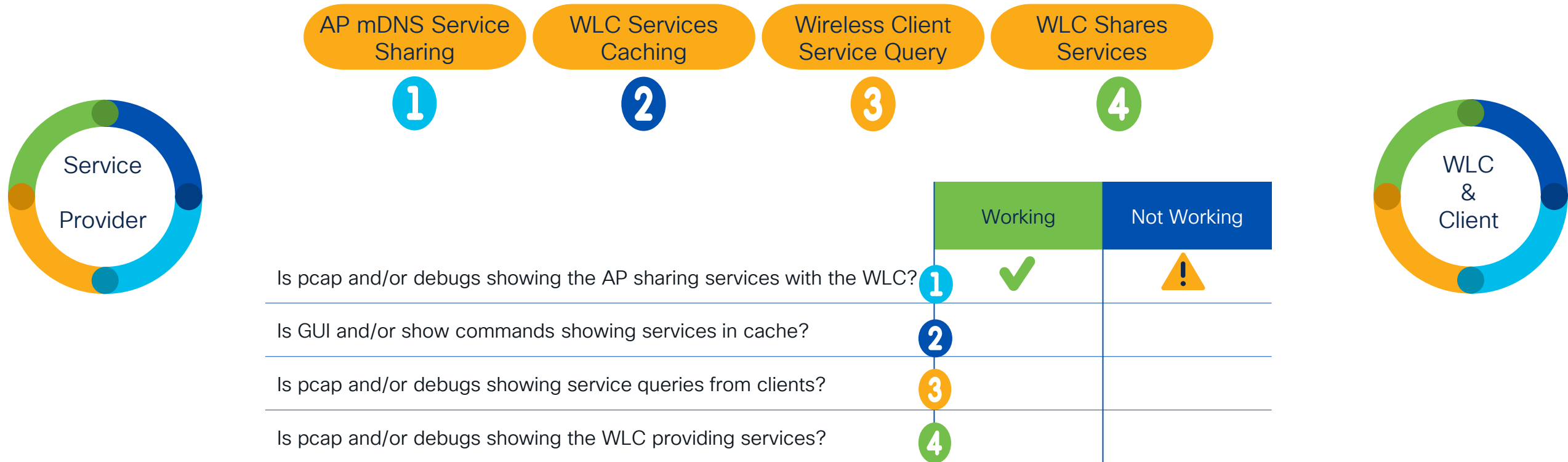
PTR Records					
RECORD-NAME	TTL	TYPE	VLAN	CLIENT-MAC	RR-RECORD-DATA
_airplay._tcp.local	4500	MDNS-AP	40	e003.6b45.8e26	Samsung CU7000 55 TV._airplay._tcp.local
SRV Records					
RECORD-NAME	TTL	TYPE	VLAN	CLIENT-MAC	RR-RECORD-DATA
Samsung CU7000 55 TV._airplay._tcp.local	4500	MDNS-AP	40	e003.6b45.8e26	0 0 7000 localhost-2.local
A/AAAA Records					
RECORD-NAME	TTL	TYPE	VLAN	CLIENT-MAC	RR-RECORD-DATA
localhost-2.local	4500	MDNS-AP	40	e003.6b45.8e26	192.168.40.2



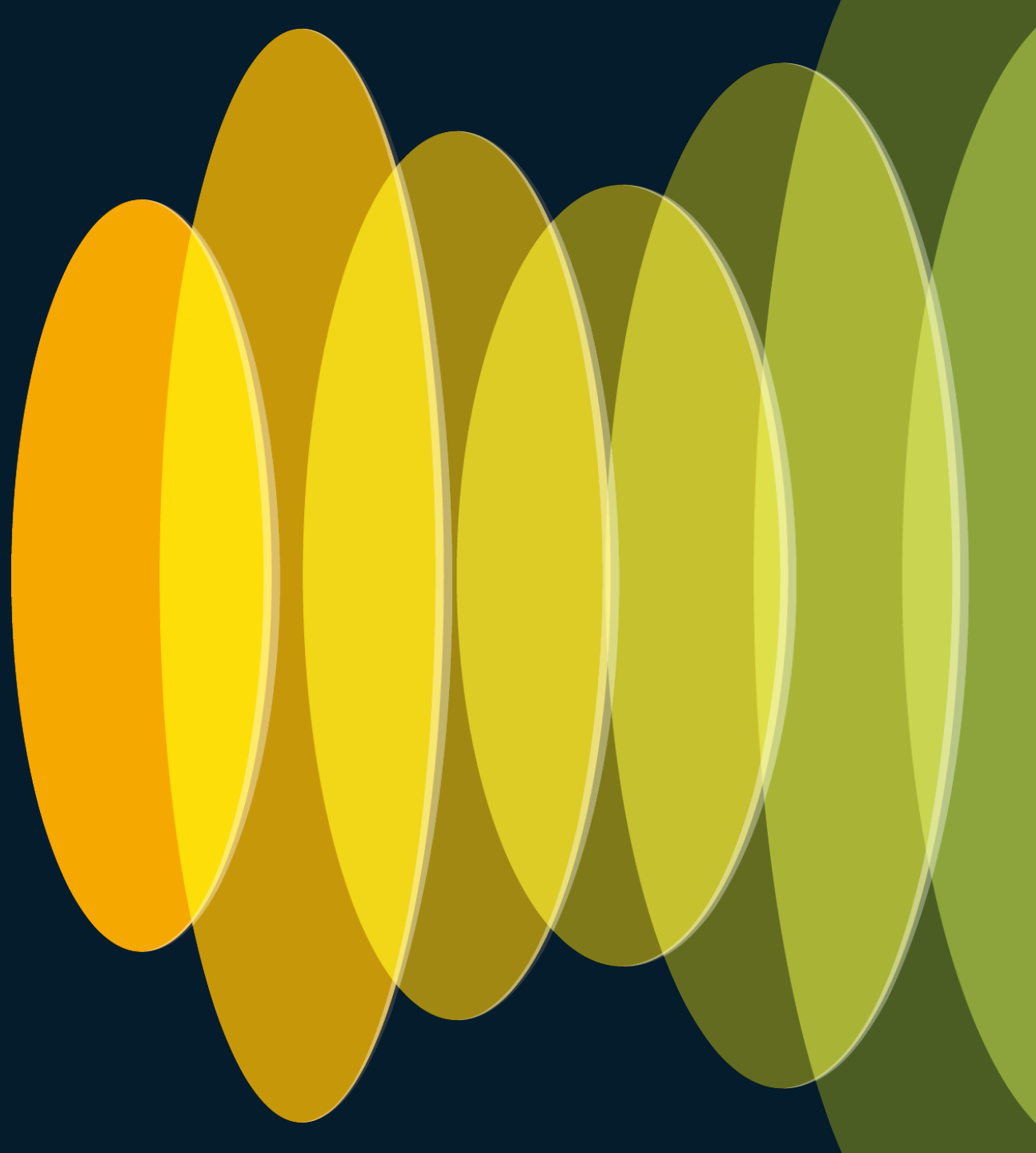
Here some useful commands to check from WLC CLI the mDNS -AP Learning and Configuration

Troubleshooting mDNS Gateway Mode

mDNS Gateway – mDNS-AP

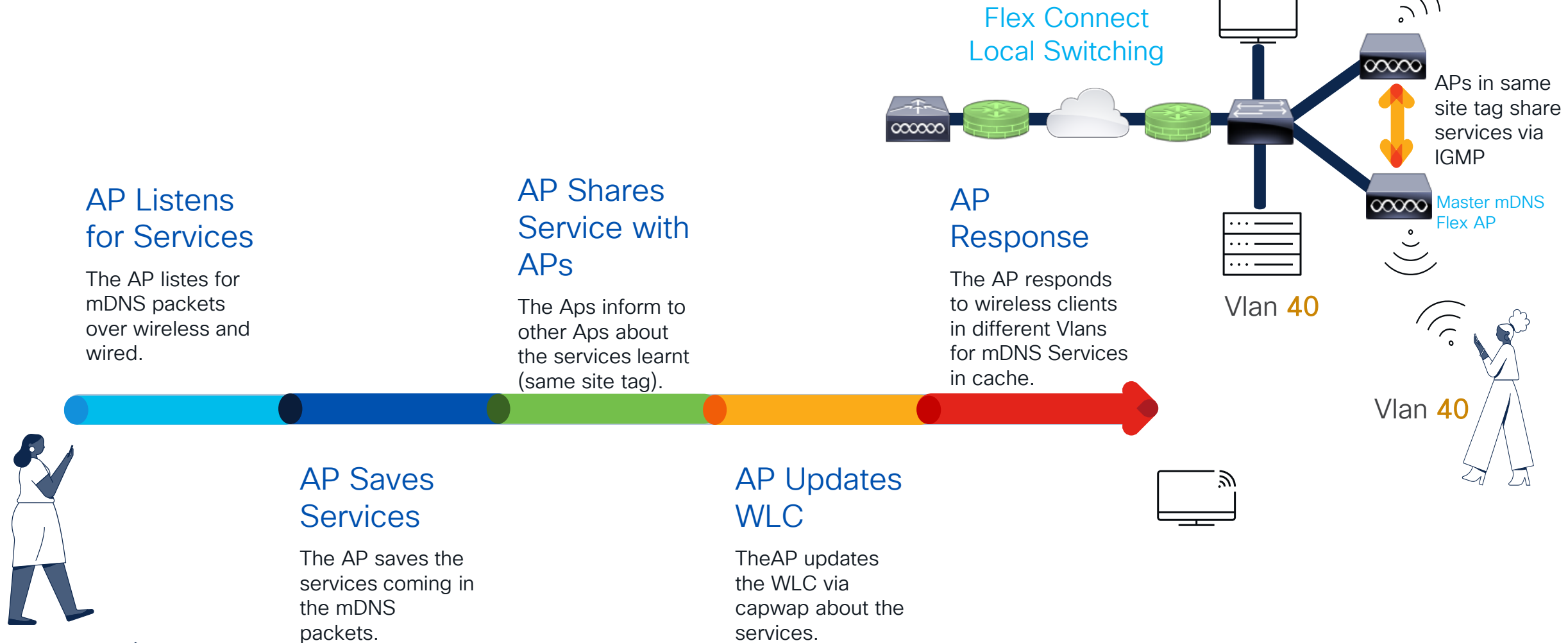


mDNS Gateway
Mode
Local Switching
FlexConnect



Workflow mDNS Gateway Mode

mDNS Gateway – FlexConnect Local Switching



Configuring mDNS Gateway Mode

mDNS Gateway – FlexConnect Local Switching

- Configure an [mDNS Flex Profile](#).
- Assign the Vlans of the Service Providers.

The screenshot shows the 'Edit mDNS Flex Profile' configuration page. The breadcrumb trail is 'Configuration > Services > mDNS'. The 'mDNS Flex Profile' tab is selected. The 'Profile Name' is 'mDNSFlex'. The 'Service Cache Update Timer' is set to 1. The 'Statistics Update Timer' is set to 1. The 'VLAN(s)' field is set to '40,50'. The 'mDNSFlex' profile is listed in the table below.

Profile Name	Service Cache Update Timer	Statistics Update Timer
<input type="checkbox"/> mDNSFlex	1	1

- Configure a Flex Profile.
- Assign the mDNS Flex Profile.

The screenshot shows the 'Edit Flex Profile' configuration page. The breadcrumb trail is 'Configuration > Tags & Profiles > Flex'. The 'mDNSAPFlex' profile is selected. The 'General' tab is active. The 'Name' is 'mDNSAPFlex'. The 'Description' is 'Enter Description'. The 'Native VLAN ID' is set to 40. The 'HTTP Proxy Port' is set to 0. The 'HTTP-Proxy IP Address' is set to 0.0.0.0. The 'CTS Policy' is set to 'mDNS Flex Profile'. The 'mDNS Flex Profile' is assigned to the 'mDNSFlex' profile.

General	Local Authentication	Policy ACL	VLAN	DNS Layer Security
Name*				Fallback Radio Shut
Description				Flex Resilient
Native VLAN ID				ARP Caching
HTTP Proxy Port				Efficient Image Upgrade
HTTP-Proxy IP Address				OfficeExtend AP
CTS Policy				Join Minimum Latency
Inline Tagging				IP Overlap
				mDNS Flex Profile

Configuring mDNS Gateway Mode

mDNS Gateway – FlexConnect Local Switching

- From the [Site Tag](#) disable the checkbox for Enable Local Site.
- Assign the Flex Profile created in the previous step.
- mDNS services are shared among Aps in the same Site Tag.
- From the SSID double check the mDNS mode is Gateway.

Configuration > Tags & Profiles > Tags

Policy **Site** RF AP

+ Add × Delete Clone Revert

Site Tag Name

<input type="checkbox"/>	mDNSFlexSite
<input type="checkbox"/>	default-site-tag

1 10

Edit Site Tag

Name* mDNSFlexSite

Description Enter Description

AP Join Profile default-ap-profile

Flex Profile mDNSAPFlex

Fabric Control Plane Name

Enable Local Site ☐

Configuration > Tags & Profiles > WLANs

+ Add × Delete Clone Enable

Selected WLANs : 0

<input type="checkbox"/>	Status	Name	ID
<input type="checkbox"/>	+	Vlan1	1
<input type="checkbox"/>	+	Vlan10	2
<input type="checkbox"/>	+	Vlan20	3
<input type="checkbox"/>	+	Vlan30	4
<input type="checkbox"/>	+	mDNSFlex	5

1 10

Edit WLAN

⚠ Changing WLAN parameters while it is enabled will result in loss of connectivity for clients connected to it.

General Security **Advanced** Add To Policy Tags

Coverage Hole Detection	<input checked="" type="checkbox"/>	Universal Admin	<input type="checkbox"/>
Aironet IE	<input type="checkbox"/>	OKC	<input checked="" type="checkbox"/>
Advertise AP Name	<input type="checkbox"/>	Load Balance	<input type="checkbox"/>
P2P Blocking Action	Disabled	Band Select	<input type="checkbox"/>
Multicast Buffer	DISABLED	IP Source Guard	<input type="checkbox"/>
Media Stream Multicast-direct	<input type="checkbox"/>	WMM Policy	Allowed
11ac MU-MIMO	<input checked="" type="checkbox"/>	mDNS Mode	Gateway

Configuring mDNS Gateway Mode

mDNS Gateway – FlexConnect Local Switching

mDNS FlexConnect Config Checklist

	Configured	Not configured
Global Multicast Enabled	✓	!
Global mDNS Gateway Enabled		
mDNS Service Definition (if needed)		
mDNS Service List (IN and OUT)		
mDNS Service Policy		
mDNS FlexConnect Profile		
WLAN/SSID mDNS mode Gateway		
WLAN-Policy assigned with mDNS Service Policy		
FlexConnect Profile assigned with mDNS Flex Profile		
Sita Tag assigned with FlexConnect Profile		
Remote Aps switchport mode trunk		

Troubleshooting mDNS Gateway Mode

mDNS Gateway – FlexConnect Local Switching



AP Listens for Services

AP Saves the Services in Cache

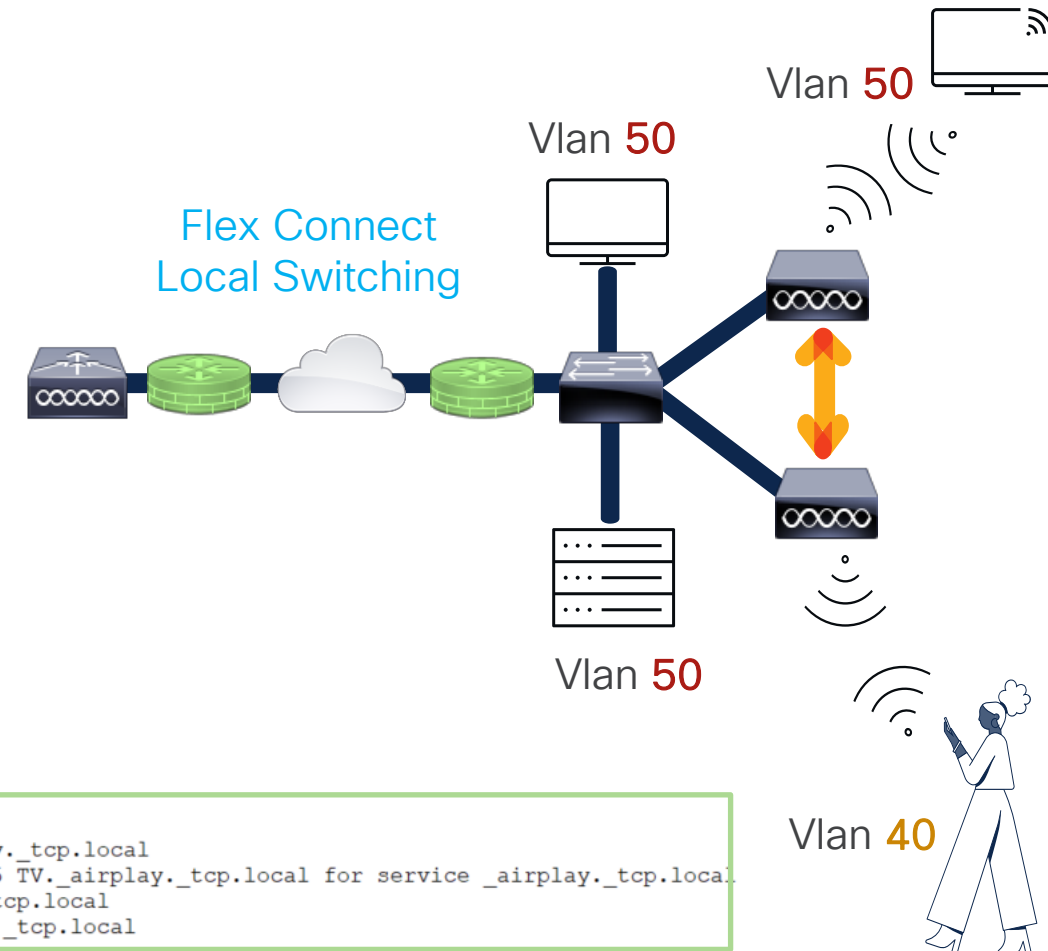
AP Shares the Services with APs

AP Sends Updates to the WLC

AP Shares Services

No.	Time	Source	Destination	Protocol	Length	Info
5737	18:10:12.454142	192.168.50.102	224.0.0.251	MDNS	249	Standard query 0x0000 ANY Samsung CU7000 55 TV._airplay._tcp.local
5887	18:10:12.555532	192.168.50.102	224.0.0.251	MDNS	896	Standard query response 0x0000 PTR, cache flush Samsung.local PTR,

```
> 802.11 radio information
v IEEE 802.11 QoS Data, Flags: .....TC
  Type/Subtype: QoS Data (0x0028)
  > Frame Control Field: 0x8801
    .000 0000 0011 0000 = Duration: 48 microseconds
    Receiver address: Cisco_b3:20:aa (0c:75:bd:b3:20:aa)
    Transmitter address: 68:fc:ca:6e:eb:0c (68:fc:ca:6e:eb:0c)
    Destination address: IPv4mcast_fb (01:00:5e:00:00:fb)
    Source address: 68:fc:ca:6e:eb:0c (68:fc:ca:6e:eb:0c)
    BSS Id: Cisco_b3:20:aa (0c:75:bd:b3:20:aa)
    STA address: 68:fc:ca:6e:eb:0c (68:fc:ca:6e:eb:0c)
    .... 0000 = Fragment number: 0
    0110 1101 0100 .... = Sequence number: 1748
    Frame check sequence: 0x00000000 [unverified]
    [FCS Status: Unverified]
  > QoS Control: 0x0000
> Logical-link Control
> Internet Protocol Version 4, Src: 192.168.50.102, Dst: 224.0.0.251
> User Datagram Protocol, Src Port: 5353, Dst Port: 5353
v Multicast Domain Name System (query)
  Transaction ID: 0x0000
  > Flags: 0x0000 Standard query
  Questions: 1
  Answer RRs: 0
  Authority RRs: 1
  Additional RRs: 0
v Queries
  > Samsung CU7000 55 TV._airplay._tcp.local: type ANY, class IN, "QM" question
  Authoritative Name Servers:
  [Response In: 5887]
```



```
MDNSGW-EVENT: flex mdns gw: Recieved wireless mdns packet
MDNSGW-EVENT: push: adding ptr record to cache: srv_name: _airplay._tcp.local
MDNSGW-EVENT: mdns_sp_db update: Adding SP name: Samsung CU7000 55 TV._airplay._tcp.local for service _airplay._tcp.local
MDNSGW-EVENT: mdns_ptr_db:added/updated PTR record for _airplay._tcp.local
MDNSGW-EVENT: push: added ptr record to cache: srv_name: _airplay._tcp.local
```

Troubleshooting mDNS Gateway Mode

mDNS Gateway – FlexConnect Local Switching



AP Listens for Services

AP Saves the Services in Cache

AP Shares the Services with APs

AP Sends Updates to the WLC

AP Shares Services

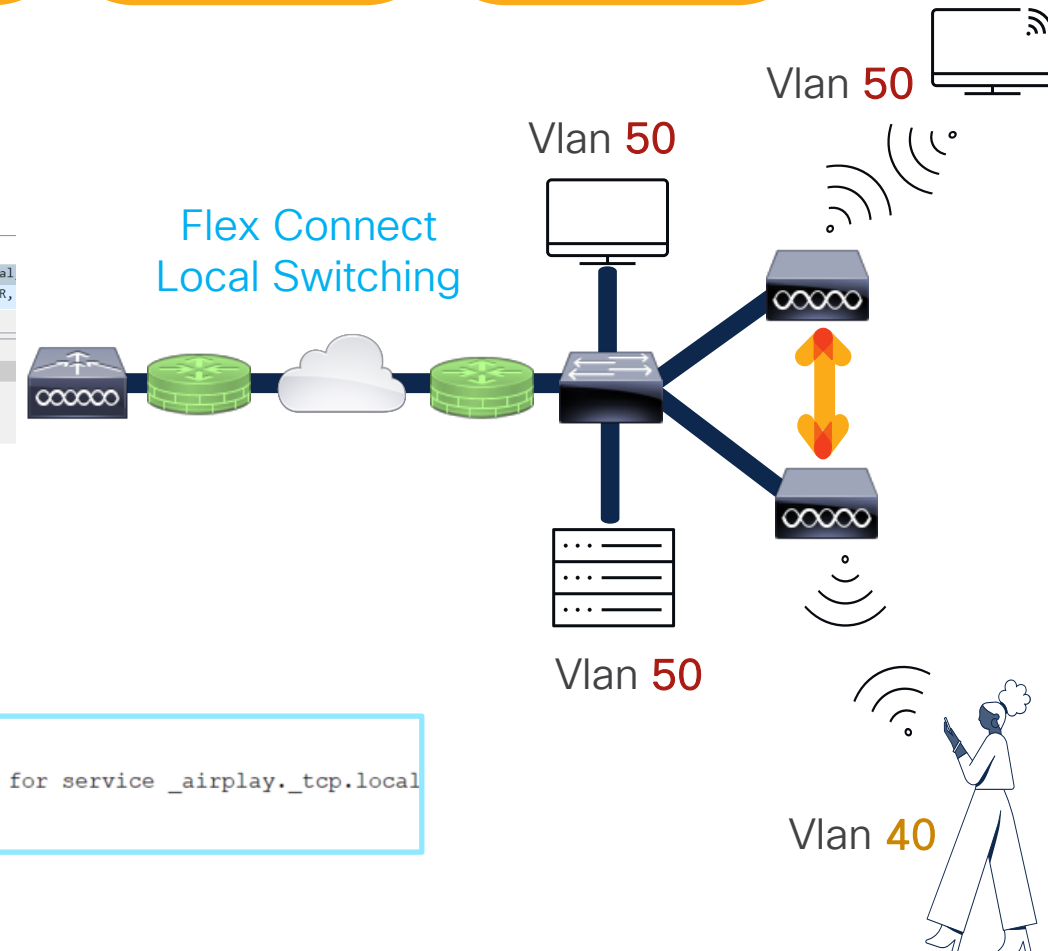
No.	Time	Source	Destination	Protocol	Length	Info
18993	18:30:06.745010	192.168.50.103	224.0.0.251	MDNS	128	Standard query 0x0000 ANY Samsung CU7000 55 TV._airplay._tcp.local
19140	18:30:06.878175	192.168.50.103	224.0.0.251	MDNS	467	Standard query response 0x0000 PTR, cache flush Samsung.local PTR,

```
> Frame 18993: 128 bytes on wire (1024 bits), 128 bytes captured (1024 bits) on interface 0
> Ethernet II, Src: e0:03:6b:45:8e:26 (e0:03:6b:45:8e:26), Dst: IPv4mcast_fb (01:00:5e:00:00:fb)
> Internet Protocol Version 4, Src: 192.168.50.103, Dst: 224.0.0.251
> User Datagram Protocol, Src Port: 5353, Dst Port: 5353
```

```
✓ Multicast Domain Name System (query)
  Transaction ID: 0x0000
  > Flags: 0x0000 Standard query
  Questions: 1
  Answer RRs: 0
  Authority RRs: 1
```

```
✓ Queries
  > Samsung CU7000 55 TV._airplay._tcp.local: type ANY, class IN, "QM" question
  > Authoritative nameservers
  [Response in: 19140]
```

```
MDNSGW-EVENT: flex mdns gw: Recieved wired mdns packet on vlan 50
MDNSGW-EVENT: push: adding ptr record to cache: srv_name: _airplay._tcp.local
MDNSGW-EVENT: mdns_sp_db update: Adding SP name: Samsung CU7000 55 TV (2)._airplay._tcp.local for service _airplay._tcp.local
MDNSGW-EVENT: mdns_ptr_db:added/updated PTR record for _airplay._tcp.local
MDNSGW-EVENT: push: added ptr record to cache: srv_name: _airplay._tcp.local
```



Troubleshooting mDNS Gateway Mode

mDNS Gateway – FlexConnect Local Switching



AP Listens for Services

AP Saves the Services in Cache

AP Shares the Services with APs

AP Sends Updates to the WLC

AP Shares Services

```
mDNSAPFlex#show mdns cache
```

----- Service Provider Records -----

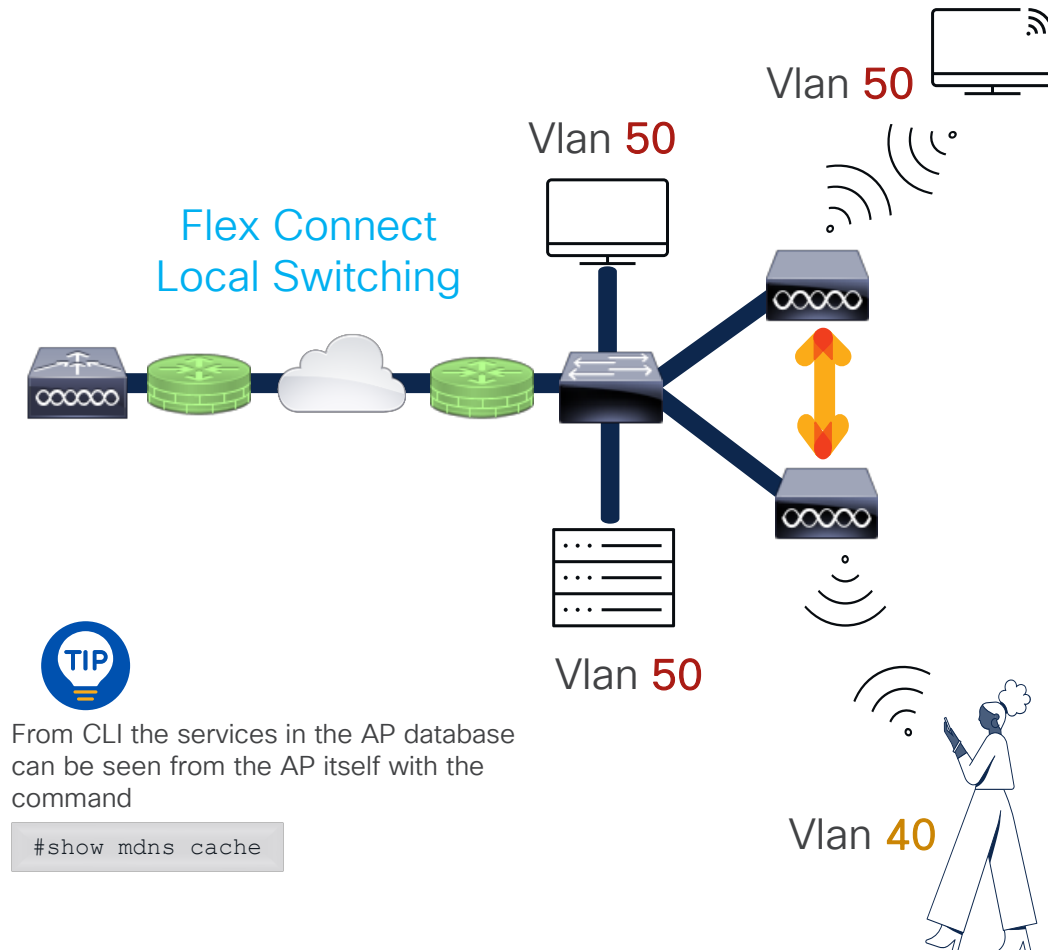
```
service_name
_7zubslp0qlui._sub._amzn-wplay._tcp.local
amzn.dmgr:D3FAB451C9C8401B58E690CF92C8D50A:IWtzu2uork:949476._amzn-wplay._tcp.local
amzn.dmgr:D3FAB451C9C8401B58E690CF92C8D50A:IWtzu2uork:500257._amzn-wplay._tcp.local
amzn.dmgr:D3FAB451C9C8401B58E690CF92C8D50A:IWtzu2uork:694784._amzn-wplay._tcp.local
_airplay._tcp.local
Samsung CU7000 55 TV._airplay._tcp.local
_amzn-wplay._tcp.local
amzn.dmgr:D3FAB451C9C8401B58E690CF92C8D50A:IWtzu2uork:949476._amzn-wplay._tcp.local
amzn.dmgr:D3FAB451C9C8401B58E690CF92C8D50A:IWtzu2uork:500257._amzn-wplay._tcp.local
amzn.dmgr:D3FAB451C9C8401B58E690CF92C8D50A:IWtzu2uork:694784._amzn-wplay._tcp.local
_spotify-connect._tcp.local
ed9583d2b239afa30d7b0e7106c3710ddcfe5769._spotify-connect._tcp.local
```

Total Services: 4

Total Service Providers: 8

```
MDNSGW-EVENT: push: added srv record to cache: srv_name: Samsung CU7000 55 TV._airplay._tcp.local
MDNSGW-EVENT: txt_rec: srv_name: Samsung CU7000 55 TV._airplay._tcp.local, txt: acl=0
features=0x7F8AD0,0x38BCF46
fex=0Ip/AEbPiwNA
rsf=0x3
fv=p20.T-KSU2ECAKUC-1402.8
at=0x1
flags=0x204
model=UCU7000
integrator=Samsung
manufacturer=Samsung
serialNumber=0FGF3CGW602184K
protovers=1.1
srcvers=377.40.00
pi=45:64:59:66:32:A1
psi=00000000-0000-0000-0000-4564596632A1
```

CISCO Live!



Troubleshooting mDNS Gateway Mode

mDNS Gateway – FlexConnect Local Switching



AP Listens for Services

AP Saves the Services in Cache

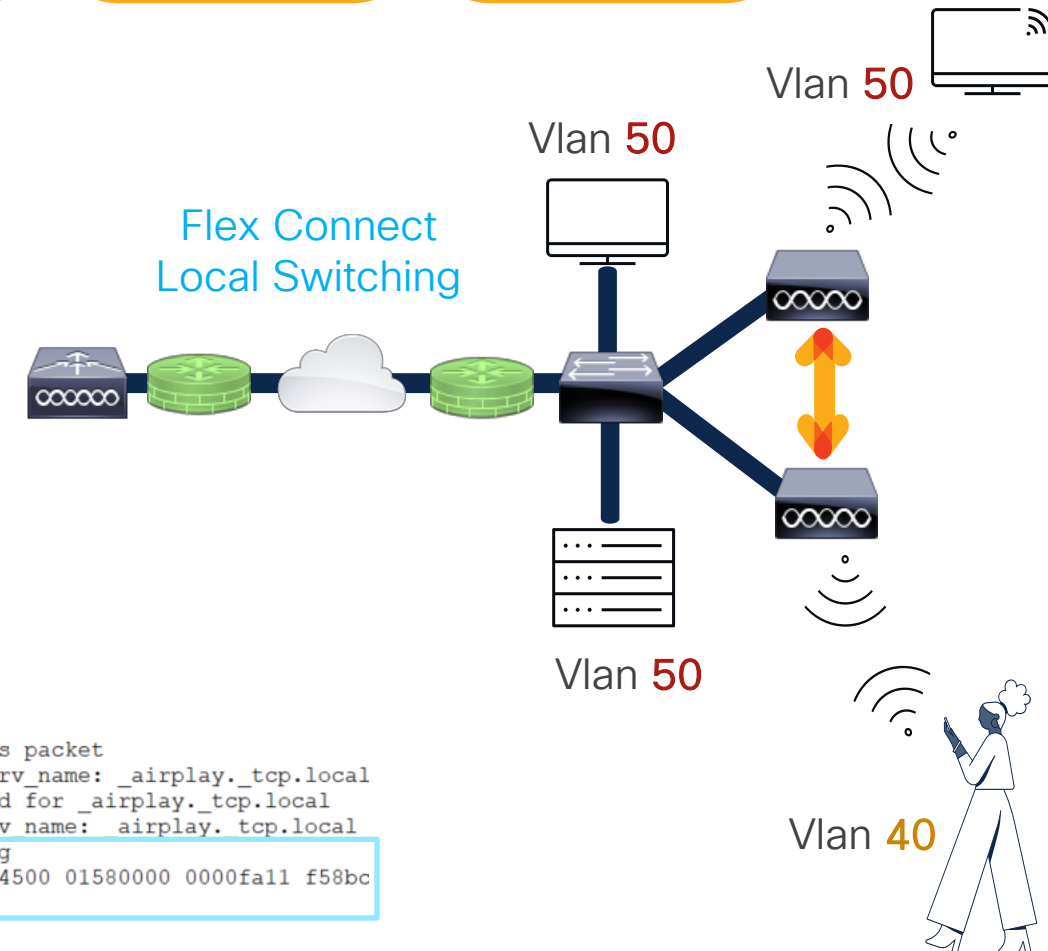
AP Service Share and Master AP

AP Sends Updates to the WLC

AP Shares Services

No.	Time	Source	Destination	Protocol	Length	Info
106735	18:11:59.841390	192.168.40.101	224.0.0.251	MDNS	177	Standard query response 0x0000 TXT
> Frame 106735: 177 bytes on wire (1416 bits), 177 bytes captured (1416 bits) on interface 0						
> Ethernet II, Src: Cisco_b5:e9:d0 (0c:75:bd:b5:e9:d0), Dst: IPv4mcast_fb (01:00:5e:00:00:fb)						
> Internet Protocol Version 4, Src: 192.168.40.101, Dst: 224.0.0.251						
> User Datagram Protocol, Src Port: 5353, Dst Port: 5353						
> Multicast Domain Name System (response)						
Transaction ID: 0x0000						
> Flags: 0x8000 Standard query response, No error						
Questions: 0						
Answer RRs: 1						
Authority RRs: 0						
Additional RRs: 0						
> Answers						
_heartbeat_mdns_gateway_ap_local: type TXT, class IN						
Name: heartbeat_mdns_gateway_ap_local						
Type: TXT (Text strings) (16)						
.000 0000 0000 0001 = Class: IN (0x0001)						
0... = Cache flush: False						
Time to live: 0						
Data length: 75						
TXT Length: 47						
TXT: digest=960fc06d4687d37976aab13a6c2ba6b5a735bb27						
TXT Length: 7						
TXT: seq=201						
TXT Length: 18						
TXT: is_primary_ap=true						
[Unsolicited: True]						

```
MDNSGW-EVENT: flex mdns gw: Recieved wireless mdns packet
MDNSGW-EVENT: push: adding ptr record to cache: srv_name: _airplay_tcp.local
MDNSGW-EVENT: mdns_ptr_db:added/updated PTR record for _airplay_tcp.local
MDNSGW-EVENT: push: added ptr record to cache: srv name: airplay_tcp.local
MDNSGW-PAK: vlan 40 is tagged for cache forwarding
fwd packet 358 | 01005e00 00fb0c75 bdb5e9d0 08004500 01580000 0000fa11 f58bc
MDNSGW-PAK: Sent cache update to other APs
```



Troubleshooting mDNS Gateway Mode

mDNS Gateway – FlexConnect Local Switching



AP Listens for Services

AP Saves the Services in Cache

AP Shares the Services with APs

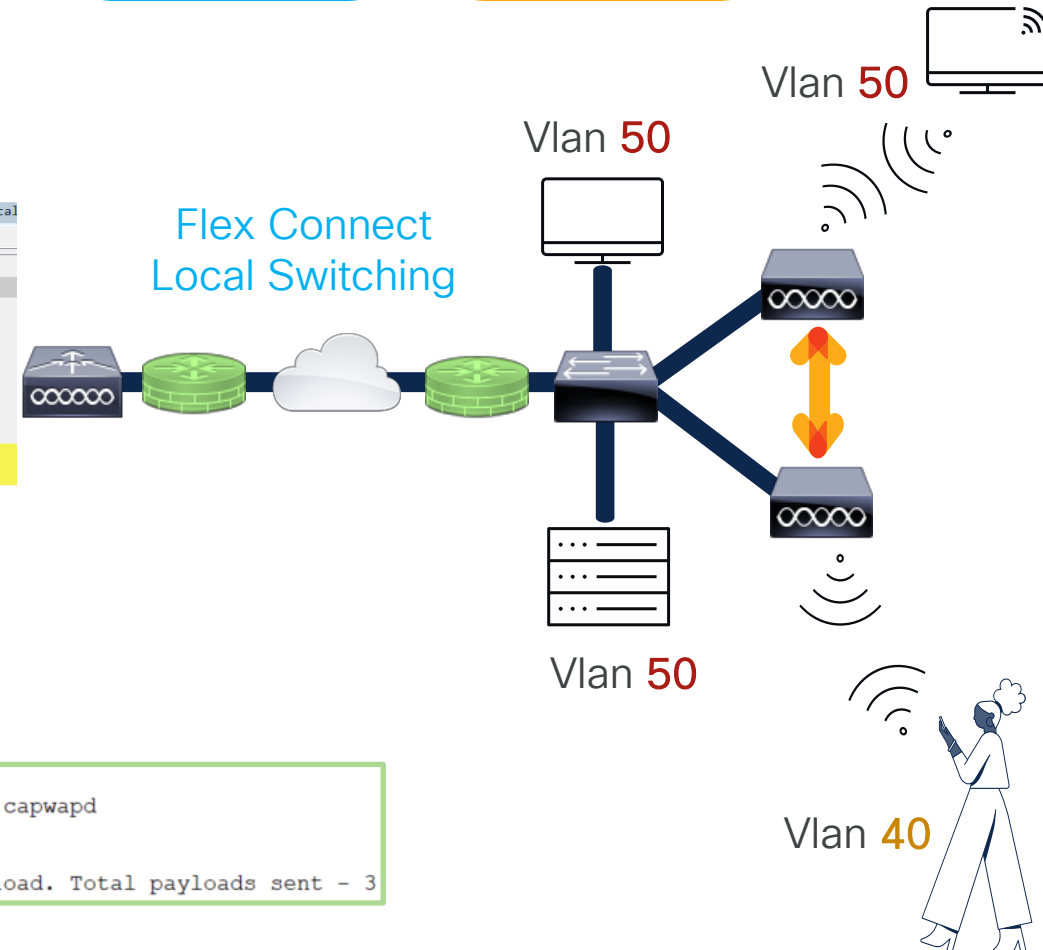
AP Sends Updates to the WLC

AP Shares Service with Client

No.	Time	Source	Destination	Protocol	Length	Info
170677	18:32:16.956959	192.168.40.102	224.0.0.251	MDNS	638	Standard query 0x0000 TXT samsung cu7000 55 tv._airplay._tcp.local

>	Frame 170677: 638 bytes on wire (5104 bits), 638 bytes captured (5104 bits) on interface 0
>	Ethernet II, Src: Cisco b5:a9:d0 (0c:75:bd:b5:a9:d0), Dst: c0:14:fe:64:6d:f4 (c0:14:fe:64:6d:f4)
>	Internet Protocol Version 4, Src: 192.168.40.101, Dst: 192.168.10.2
>	User Datagram Protocol, Src Port: 5272, Dst Port: 5247
>	Control And Provisioning of Wireless Access Points - Data
>	IEEE 802.11 QoS Data, Flags:T
>	Logical-Link Control
>	Internet Protocol Version 4, Src: 192.168.40.102, Dst: 224.0.0.251
>	User Datagram Protocol, Src Port: 5353, Dst Port: 5353
>	multicast domain name system (query)
>	Transaction ID: 0x0000
>	Flags: 0x0000 Standard query
>	Questions: 1
>	Answer RRs: 1
>	Authority RRs: 0
>	Additional RRs: 0
>	Queries
>	samsung cu7000 55 tv._airplay._tcp.local: type TXT, class IN, "QU" question
>	Answers

```
MDNSGW-EVENT: mdns_gw_visibility :: MdnsGwVisibility: MDNS Stats Timer triggered
MDNSGW-PAK: mdns_gw_visibility :: MdnsGwVisibility: sending mdns stats payload to capwapd
MDNSGW-EVENT: stats clear in click (flag 0) and wlan 0
MDNSGW-EVENT: mdns_gw_visibility :: MdnsGwVisibility: MDNS Cache Timer triggered
MDNSGW-EVENT: mdns_gw_visibility :: MdnsGwVisibility: sending mdns cache IAPP payload. Total payloads sent - 3
```



Troubleshooting mDNS Gateway Mode

mDNS Gateway – FlexConnect Local Switching



AP Listens for Services

AP Saves the Services in Cache

AP Shares the Services with APs

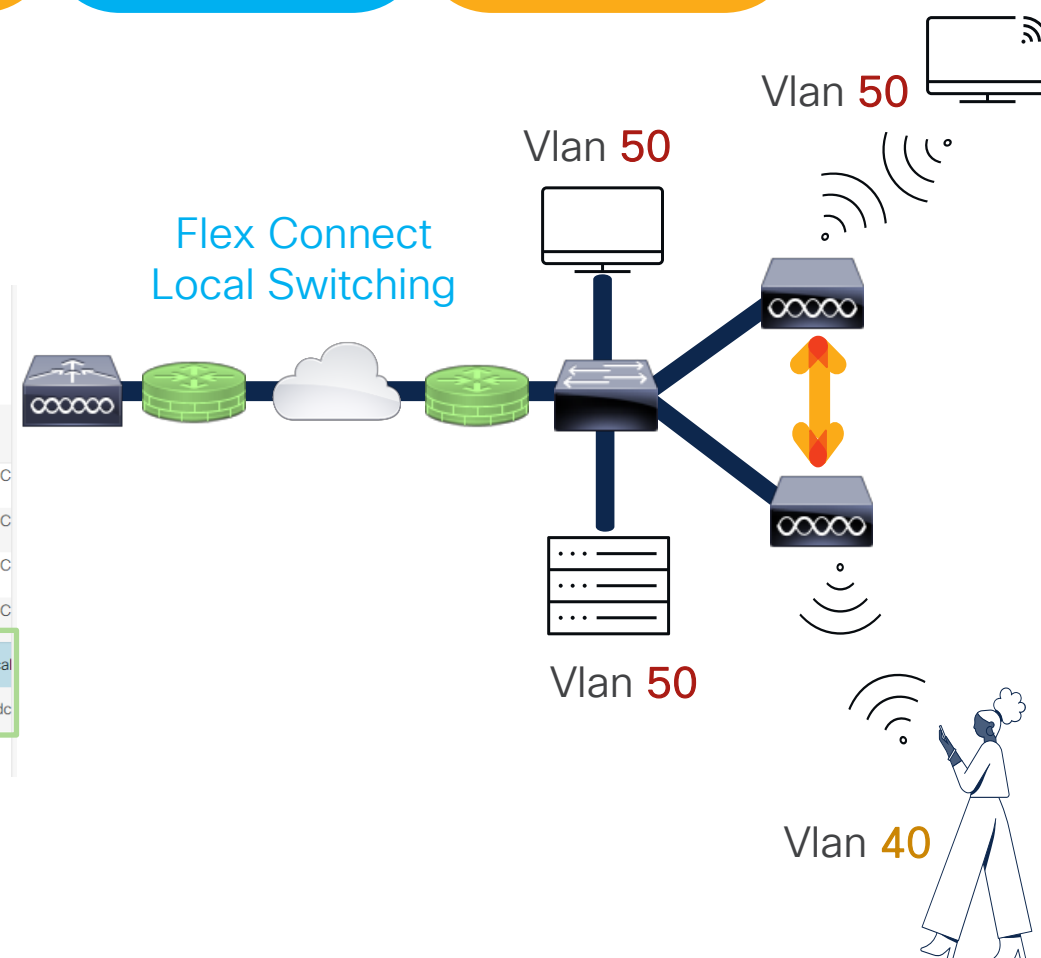
AP Sends Updates to the WLC

AP Shares Service with Client

Monitoring > Services > mDNS

ClearAll

Record Name	TTL(sec)	Client MAC	Client Type	Connection Type	AP MAC	Site Tag	WLAN/GLAN/RLAN ID	VLAN ID	Record Data
_amzn-wplay_tcp.local	4500	7ced.c65b.aebe	WIRED	Wired	0000.0000.0000	mDNSFlex (Flex)	1	1	amzn.dmgrp:D3FAB451C9C8401B58E690Cwplay_tcp.local
_7zubsip0qlui_sub_amz...wplay_tcp.local	4500	7ced.c65b.aebe	WIRED	Wired	0000.0000.0000	mDNSFlex (Flex)	1	1	amzn.dmgrp:D3FAB451C9C8401B58E690Cwplay_tcp.local
_amzn-wplay_tcp.local	4500	7ced.c65b.aebe	WIRED	Wired	0000.0000.0000	mDNSFlex (Flex)	1	1	amzn.dmgrp:D3FAB451C9C8401B58E690Cwplay_tcp.local
_7zubsip0qlui_sub_amz...wplay_tcp.local	4500	7ced.c65b.aebe	WIRED	Wired	0000.0000.0000	mDNSFlex (Flex)	1	1	amzn.dmgrp:D3FAB451C9C8401B58E690Cwplay_tcp.local
_airplay_tcp.local	4500	68fc.ca6e.eb0c	WLAN	Wireless	0c75.bdb3.20a0	mDNSFlex (Flex)	6	50	Samsung CU7000 55 TV_airplay_tcp.local
_spotify-connect_tcp.local	4500	68fc.ca6e.eb0c	WLAN	Wireless	0c75.bdb3.20a0	mDNSFlex (Flex)	6	50	ed9583d2b239afa30d7b0e7106c3710ddc



Troubleshooting mDNS Gateway Mode

mDNS Gateway – FlexConnect Local Switching



AP Listens for Services

AP Saves the Services in Cache

AP Shares the Services with APs

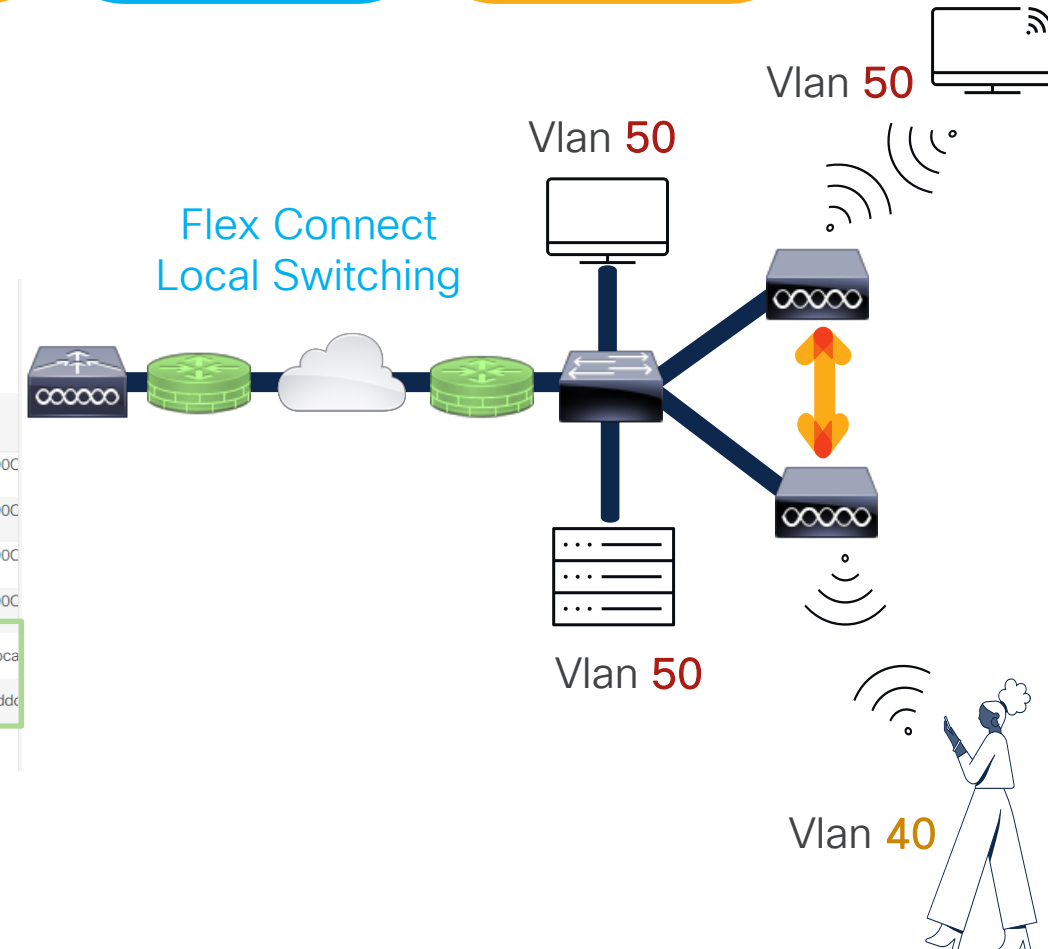
AP Sends Updates to the WLC

AP Shares Service with Client

Monitoring > Services > mDNS

ClearAll

Record Name	TTL(sec)	Client MAC	Client Type	Connection Type	AP MAC	Site Tag	WLAN/GLAN/RLAN ID	VLAN ID	Record Data
_amzn-wplay_tcp.local	4500	7ced.c65b.aebe	WIRED	Wired	0000.0000.0000	mDNSFlex (Flex)	1	1	amzn.dmgr:D3FAB451C9C8401B58E690Cwplay_tcp.local
_7zubslp0qlui_sub_amz...wplay_tcp.local	4500	7ced.c65b.aebe	WIRED	Wired	0000.0000.0000	mDNSFlex (Flex)	1	1	amzn.dmgr:D3FAB451C9C8401B58E690Cwplay_tcp.local
_amzn-wplay_tcp.local	4500	7ced.c65b.aebe	WIRED	Wired	0000.0000.0000	mDNSFlex (Flex)	1	1	amzn.dmgr:D3FAB451C9C8401B58E690Cwplay_tcp.local
_7zubslp0qlui_sub_amz...wplay_tcp.local	4500	7ced.c65b.aebe	WIRED	Wired	0000.0000.0000	mDNSFlex (Flex)	1	1	amzn.dmgr:D3FAB451C9C8401B58E690Cwplay_tcp.local
_airplay_tcp.local	4500	e003.6b45.8e26	WIRED	Wired	0000.0000.0000	mDNSFlex (Flex)	50	50	Samsung CU7000 55 TV_airplay_tcp.local
_spotify-connect_tcp.local	4500	e003.6b45.8e26	WIRED	Wired	0000.0000.0000	mDNSFlex (Flex)	50	50	ed9583d2b239afa30d7b0e71106c3710ddc



Troubleshooting mDNS Gateway Mode

mDNS Gateway – FlexConnect Local Switching



AP Listens for Services

AP Saves the Services in Cache

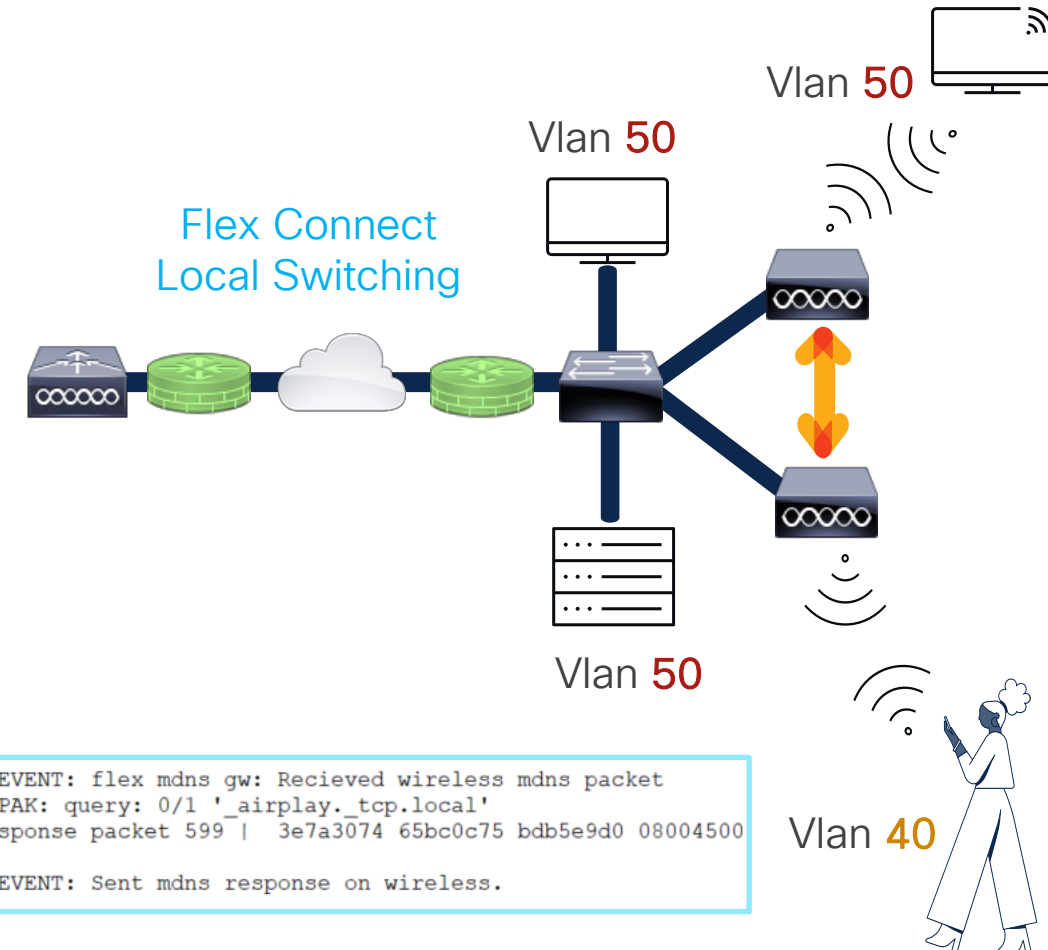
AP Shares the Services with APs

AP Sends Updates to the WLC

AP Shares Service with Client

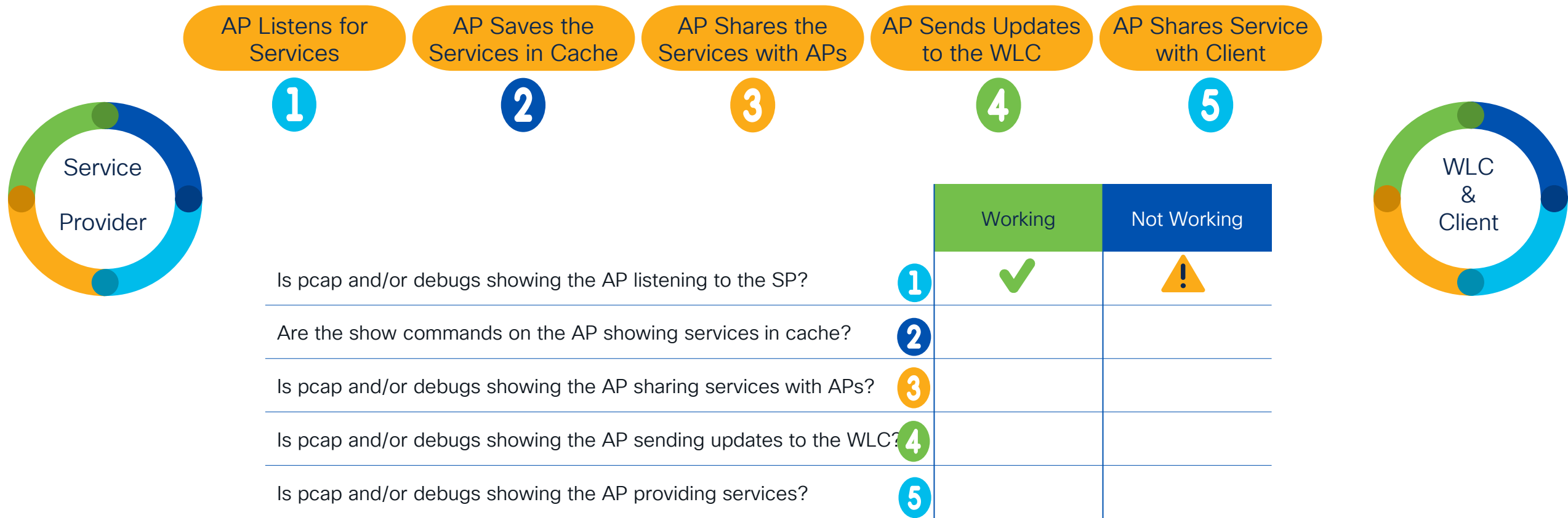
No.	Time	Source	Destination	Protocol	Length	Info
5830	18:10:12.514345	192.168.40.101	224.0.0.251	MDNS	281	Standard query response


```
> 802.11 radio information
> IEEE 802.11 QoS Data, Flags: .....F.C
  Type/Subtype: QoS Data (0x0028)
  > Frame Control Field: 0x8802
    .000 0000 0010 1100 = Duration: 44 microseconds
    Receiver address: 3e:7a:30:74:65:bc (3e:7a:30:74:65:bc)
    Transmitter address: Cisco_b3:20:ab (0c:75:bd:b3:20:ab)
    Destination address: 3e:7a:30:74:65:bc (3e:7a:30:74:65:bc)
    Source address: Cisco_b5:e9:d0 (0c:75:bd:b5:e9:d0)
    BSS Id: Cisco_b3:20:ab (0c:75:bd:b3:20:ab)
    STA address: 3e:7a:30:74:65:bc (3e:7a:30:74:65:bc)
    .... 0000 = Fragment number: 0
    0000 0000 0011 .... = Sequence number: 3
    Frame check sequence: 0x00000000 [unverified]
    [FCS Status: Unverified]
  > QoS Control: 0x0006
  > Logical Link Control
    Internet Protocol Version 4, Src: 192.168.40.101, Dst: 224.0.0.251
    User Datagram Protocol, Src Port: 5353, Dst Port: 5353
  > Multicast Domain Name System (response)
    Transaction ID: 0x0000
    > Flags: 0x8000 Standard query response, No error
    Questions: 0
    Answer RRs: 2
    Authority RRs: 0
    Additional RRs: 0
  > Answers
    > _meta_response.mdns.gateway.ap.local: type TXT, class IN
    > _airplay_tcp.local: type PTR, class IN, Samsung CU7000 55 TV._airplay_tcp.local
```



Troubleshooting mDNS Gateway Mode

mDNS Gateway – FlexConnect Local Switching



Complete Your Session Evaluations



Complete a minimum of 4 session surveys and the Overall Event Survey to be entered in a drawing to win 1 of 5 full conference passes to Cisco Live 2025.



Earn 100 points per survey completed and compete on the Cisco Live Challenge leaderboard.



Level up and earn exclusive prizes!



Complete your surveys in the Cisco Live mobile app.

Continue your education

- Visit the Cisco Showcase for related demos
- Book your one-on-one Meet the Engineer meeting
- Attend the interactive education with DevNet, Capture the Flag, and Walk-in Labs
- Visit the On-Demand Library for more sessions at www.CiscoLive.com/on-demand

Contact me at: ralhousa@cisco.com,
timpadil@cisco.com

Questions?





The bridge to possible

Thank you

CISCO *Live!*

#CiscoLive