

排除无线局域网控制器(WLC)上的mDNS网关故障

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简介

本文档介绍如何在无线控制器上实施Bonjour协议，并提供帮助排除问题的指南。

先决条件

要求

Cisco 建议您了解以下主题：

- Bonjour协议的基础知识
- 有关如何在WLC上配置mDNS的基本知识
- 组播路由的基本知识

使用的组件

本文档中的信息基于以下软件和硬件版本：

- AIR-CT2504-K9 WLC , 8.2.141.0
- WS-C3560CX-8PC-S
- AIR-CAP3702I-E-K9
- 苹果电视

- Iphone5s , 10.2

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您的网络处于活动状态，请确保您了解所有命令的潜在影响。

背景信息

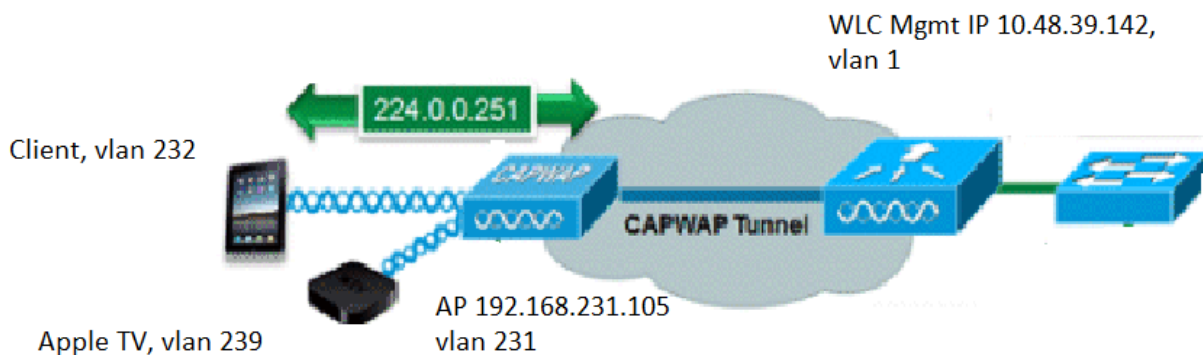
Bonjour协议是一种Apple服务发现协议，它使用组播域名系统(mDNS)服务记录定位本地网络上的设备和服务。Bonjour协议适用于服务通告和服务查询。每个查询或通告都发送到Bonjour组播地址 ipv4 224.0.0.251(ipv6 FF02::FB)。该协议在UDP端口5353上使用mDNS。

Bonjour协议使用的地址是本地链路组播地址，因此只转发到本地L2网络。由于生存时间(TTL)设置为1，路由器无法使用组播路由重定向流量。这意味着所有服务提供商/源（通告该服务）和 Bonjour客户端（请求服务）必须位于同一子网中。这会导致可扩展性问题。

为了解决此问题，思科无线局域网控制器(WLC)充当Bonjour网关。WLC侦听Bonjour服务，从源/主机缓存这些Bonjour广告（AirPlay、AirPrint等）。例如，Apple TV和Bonjour客户端在请求/请求服务时作出回复。这样，您可以在不同的子网中拥有源和客户端。

配置

网络图



带调试的数据包流

在Cisco WLC上运行mDNS时，需要执行四个基本步骤。这些步骤说明如下：

步骤1:在WLC上全局启用mDNS时

如果您没有创建自定义的mDNS配置文件（如图所示），WLC将侦听这些默认服务。

Service Name	Service String	Query Status	LSS Status	Origin
AirPrint	_ipp._tcp.local.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ALL
AirTunes	_raop._tcp.local.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ALL
AppleTV	_airplay._tcp.local.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ALL
HP Photosmart Printer 1	_universal._sub._ipp._tcp.local.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ALL
HP Photosmart Printer 2	_cups._sub._ipp._tcp.local.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ALL
Printer	_printer._tcp.local.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ALL

每个服务都有一个与其关联的服务字符串。服务字符串用于将服务实例与服务查询相匹配。服务类型始终包含服务名称和协议。此外，它可以包含一个或多个子类型标识符。AppleTV服务使用:_airplay._tcp.local。

当全局启用mDNS时，控制器会针对有线（管理和动态接口）和无线网络上的所有服务向224.0.0.251发送mDNS查询。

在此捕获的WLC交换机端口上，数据包80、81和82显示WLC通过有线网络将查询发送到224.0.0.251，其中具有管理源IP(10.48.39.142)和动态接口（192.168.232.11和192.168.239.8），如图所示。

No.	Time	Source	Destination	Protocol	Length	Signal strength (dBm)	Channel	Info
80	15:24:18.206675	10.48.39.142	224.0.0.251	MDNS	216			Standard query 0x0000 ANY ...
81	15:24:18.207010	192.168.232.11	224.0.0.251	MDNS	216			Standard query 0x0000 ANY ...
82	15:24:18.207663	192.168.239.8	224.0.0.251	MDNS	216			Standard query 0x0000 ANY ...
83	15:24:18.208051	10.48.39.142	224.0.0.251	MDNS	292			Standard query 0x0000 ANY ...

> Frame 80: 216 bytes on wire (1728 bits), 216 bytes captured (1728 bits) on interface 0
> Ethernet II, Src: Cisco_b9:62:60 (00:a2:89:b9:62:60), Dst: IPv4mcast_fb (01:00:5e:00:00:fb)
> Internet Protocol Version 4, Src: 10.48.39.142, Dst: 224.0.0.251
> User Datagram Protocol, Src Port: 5353, Dst Port: 5353
> Multicast Domain Name System (query)

数据包83显示WLC通过无线发送查询。内部数据包显示从管理接口到224.0.0.251的WLC查询。由于此查询通过无线进行，因此capwap报头会添加到数据包中，而外部源IP仍然是管理源IP，但目的地是组播IP 239.100.100.100，如图所示。

No.	Time	Source	Destination	Protocol	Length	Signal strength (dBm)	Channel	Info
83	16:24:18.208051	10.48.39.142	224.0.0.251	MDNS	292			Standard query 0x0000 ANY _ipp._tcp.local, "QU" que


> Frame 83: 292 bytes on wire (2336 bits), 292 bytes captured (2336 bits) on interface 0
> Ethernet II, Src: Cisco_b9:62:64 (00:a2:89:b9:62:64), Dst: IPv4mcast_64:64:64 (01:00:5e:64:64:64)
> Internet Protocol Version 4, Src: 10.48.39.142, Dst: 239.100.100.100
> User Datagram Protocol, Src Port: 5247, Dst Port: 5247
> Control And Provisioning of Wireless Access Points - Data
> IEEE 802.11 Data, Flags:F.
> Logical-Link Control
> Internet Protocol Version 4, Src: 10.48.39.142, Dst: 224.0.0.251
> User Datagram Protocol, Src Port: 5353, Dst Port: 5353
> Multicast Domain Name System (query)

现在，此组播IP 239.100.100.100来自哪里？在WLC上，接入点(AP)组播模式(controller >

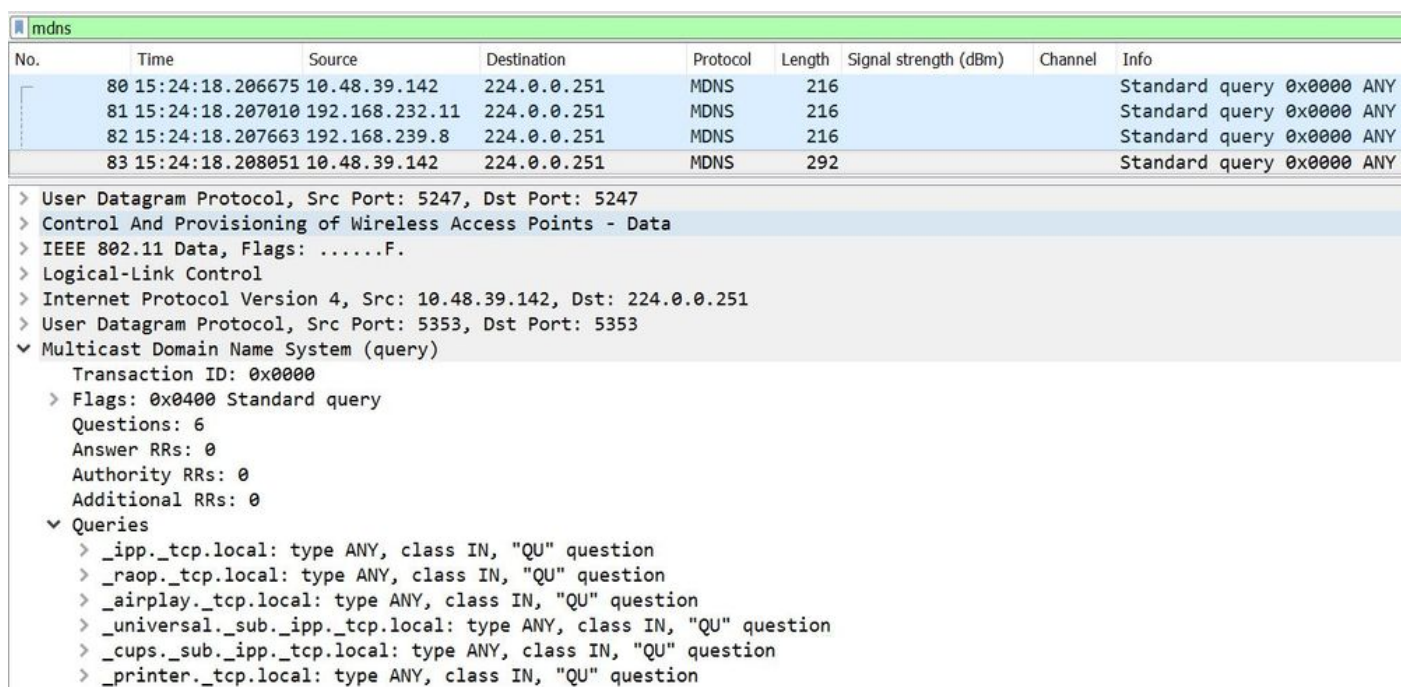
general)设置为组播，组播组地址为239.100.100.100（这只是一个示例，即239范围内的任何ip）。AP加入此组播组并在组上进行监听。WLC将查询转发到此组，AP接收查询并通过无线发送查询。地址239.100.100.100（这不是静态地址，这是您在下一个示例中配置的地址）仅出现在WLC和AP之间的capwap报头中，无线客户端看不到其中的任何内容（但可以看到内部原始mdns数据包），如图所示。



请记住，在此设置中，WLC是VLAN 1中的2504，而AP是VLAN 231。由于设备位于不同的vlan中，您需要有线上为vlan 1和239启用组播路由，这样才能正常工作。

 **注：**如果在有线上未为wlc和AP管理vlan启用组播路由，则必须将AP组播模式设置为单播。在此模式下，控制器将每个组播数据包单播到与控制器关联的每个AP。此模式效率非常低，不建议使用。

此捕获是详细的查询数据包，如图所示。



这些调试反映了捕获中所看到的内容。在此代码片断仅显示来自管理接口的查询。

<#root>

(Cisco Controller) >

debug mdns all enable

Cisco Controller) >*emWeb: Feb 22 16:24:18.203: bgSetBonjourAccessPolicy :1192 Bonjour AccessPolicy sta
*emWeb: Feb 22 16:24:18.203: bgSetBonjourQueryInterval :1359

Bonjour query interval is already configured for requested value = 15

*Bonjour_Process_Task: Feb 22 16:24:18.215: bonjourProcessTask :

220 Processing message type = BONJOUR_AGGREGATED_QUERY

*Bonjour_Process_Task: Feb 22 16:24:18.215: sendBonjourPkt : 3881 sendBonjourPkt msg-type = BONJOUR_AGG

*Bonjour_Process_Task: Feb 22 16:24:18.216: Send to Wired, All vlan is TRUE

*Bonjour_Process_Task: Feb 22 16:24:18.216: sendBonjourPacketToWired : 3652 sending aggregated query on

*Bonjour_Process_Task: Feb 22 16:24:18.216: buildBonjourPacket : 2916 Preparing for 12 Multicast send

*Bonjour_Process_Task: Feb 22 16:24:18.216: buildBonjourPacket : 2936 allVlan = 0 ,

vlanId = 0

*Bonjour_Process_Task: Feb 22 16:24:18.216: buildBonjourPacket : 2948 simInterfaceMacAddrGet(

management

) = 00:A2:89:B9:62:60

*Bonjour_Process_Task: Feb 22 16:24:18.216: Inside buildBonjourAggregatedQuery, available len = 1458

*Bonjour_Process_Task: Feb 22 16:24:18.216: fillBonjourAggregatedQuery : 7339 Sending mDNS AGGREGATED q

*Bonjour_Process_Task: Feb 22 16:24:18.216: fillBonjourAggregatedQuery : [1] Including SRV = AirPrint

*Bonjour_Process_Task: Feb 22 16:24:18.216: fillBonjourAggregatedQuery : [2] Including SRV = AirTunes

*Bonjour_Process_Task: Feb 22 16:24:18.216: fillBonjourAggregatedQuery : [3] Including SRV = AppleTV i

*Bonjour_Process_Task: Feb 22 16:24:18.216: fillBonjourAggregatedQuery : [4] Including SRV = HP_Photo

*Bonjour_Process_Task: Feb 22 16:24:18.216: fillBonjourAggregatedQuery : [5] Including SRV = HP_Photo

*Bonjour_Process_Task: Feb 22 16:24:18.216: fillBonjourAggregatedQuery : [6] Including SRV = Printer

*Bonjour_Process_Task: Feb 22 16:24:18.216: -----

*Bonjour_Process_Task: Feb 22 16:24:18.216

: fillBonjourAggregatedQuery : PACKET-1 mDNS-QUERY sent for [6] services

*Bonjour_Process_Task: Feb 22 16:24:18.216: fillBonjourAggregatedQuery : mDNS-QUERY sent for all service

*Bonjour_Process_Task: Feb 22 16:24:18.216: -----

*Bonjour_Process_Task: Feb 22 16:24:18.216: buildBonjourPacket : 3054 BONJOUR_AGGREGATED_QUERY: buildBo

*Bonjour_Process_Task: Feb 22 16:24:18.216: buildBonjourPacket MCAST-DST-IP ADDR = 224.0.0.251

第二步：WLC缓存Bonjour服务（Apple TV广告）

在此数据包中，Apple TV(192.168.239.37)向224.0.0.251发送通告。由于在本例中，Apple TV是无线的，因此您可以看到通过capwap发送的广告。WLC只记录一次mDNS服务响应，但是，缓存条

目具有TTL，并且必须保持连接才能维护它，如图所示。

No.	Time	Source	Destination	Protocol	Length	Signal strength (dBm)	Channel	Info
9363	15:22:02.388333	192.168.239.37	224.0.0.251	MDNS	1436			Standard query response 0x0000 TXT, cache
9364	15:22:02.389688	fe80::10c1:887...	ff02::fb	MDNS	1456			Standard query response 0x0000 TXT, cache
9369	15:22:02.402261	192.168.239.8	224.0.0.251	MDNS	714			Standard query response 0x0000 PTR, cache
9371	15:22:02.406054	192.168.239.8	224.0.0.251	MDNS	707			Standard query response 0x0000 PTR, cache
10039	15:22:03.390977	192.168.239.37	224.0.0.251	MDNS	1436			Standard query response 0x0000 TXT, cache
10043	15:22:03.391354	fe80::10c1:887...	ff02::fb	MDNS	1456			Standard query response 0x0000 TXT, cache

```

> Frame 9363: 1436 bytes on wire (11488 bits), 1436 bytes captured (11488 bits) on interface 0
> Ethernet II, Src: Cisco_5f:f7:ca (00:14:f1:5f:f7:ca), Dst: Cisco_b9:62:60 (00:a2:89:b9:62:60)
> Internet Protocol Version 4, Src: 192.168.231.105, Dst: 10.48.39.142
> User Datagram Protocol, Src Port: 24505, Dst Port: 5247
> Control And Provisioning of Wireless Access Points - Data
> IEEE 802.11 Data, Flags: .....T
> Logical-Link Control
> Internet Protocol Version 4, Src: 192.168.239.37, Dst: 224.0.0.251
> User Datagram Protocol, Src Port: 5353, Dst Port: 5353
> Multicast Domain Name System (response)

```

Apple TV的详细响应如图所示。

No.	Time	Source	Destination	Protocol	Length	Signal strength (dBm)	Channel	Info
9363	15:22:02.388333	192.168.239.37	224.0.0.251	MDNS	1436			Standard query response 0x0000 TXT, cache f1
9364	15:22:02.389688	fe80::10c1:887...	ff02::fb	MDNS	1456			Standard query response 0x0000 TXT, cache f1
9369	15:22:02.402261	192.168.239.8	224.0.0.251	MDNS	714			Standard query response 0x0000 PTR, cache f1
9371	15:22:02.406054	192.168.239.8	224.0.0.251	MDNS	707			Standard query response 0x0000 PTR, cache f1
10039	15:22:03.390977	192.168.239.37	224.0.0.251	MDNS	1436			Standard query response 0x0000 TXT, cache f1
10043	15:22:03.391354	fe80::10c1:887...	ff02::fb	MDNS	1456			Standard query response 0x0000 TXT, cache f1

```

[Request In: 9327]
[Time: 0.040960000 seconds]
Transaction ID: 0x0000
> Flags: 0x8400 Standard query response, No error
Questions: 0
Answer RRs: 21
Authority RRs: 0
Additional RRs: 8
Answers
> 70-35-60-63.1 Wireless Team (4)._sleep-proxy._udp.local: type TXT, class IN, cache flush
> _services._dns-sd._udp.local: type PTR, class IN, _sleep-proxy._udp.local
> _sleep-proxy._udp.local: type PTR, class IN, 70-35-60-63.1 Wireless Team (4)._sleep-proxy._udp.local
> 70-35-60-63.1 Wireless Team (4)._sleep-proxy._udp.local: type SRV, class IN, cache flush, priority 0, weight 0, port 53104, target Wirel
> Wireless Team (4)._airplay._tcp.local: type TXT, class IN, cache flush
> _services._dns-sd._udp.local: type PTR, class IN, _airplay._tcp.local
> _airplay._tcp.local: type PTR, class IN, Wireless Team (4)._airplay._tcp.local
> Wireless Team (4)._device-info._tcp.local: type TXT, class IN
> 18EE6911DC61@Wireless Team._raop._tcp.local: type TXT, class IN, cache flush

```

这些调试显示Apple TV响应WLC的查询。在这种情况下，Apple TV回应了21项服务，其中只有Airplay服务感兴趣。

<#root>

*Bonjour_Msg_Task: Feb 23 16:22:02.372:

18:ee:69:11:dc:60

Parsing 21 Bonjour Answers.

*Bonjour_Msg_Task: Feb 23 16:22:02.374: bgProcessServiceAdvRsp : 1562 aStringNameStr = Wireless Team (4)

*Bonjour_Msg_Task: Feb 23 16:22:02.374: bgProcessServiceAdvRsp : 1579 RR: Wireless Team (4)._airplay._t

*Bonjour_Msg_Task: Feb 23 16:22:02.374: bgProcessServiceAdvRsp : 1581 aStringNameStr : Wireless Team (4)

*

Bonjour_Msg_Task: Feb 23 16:22:02.374: Found Service Name:_airplay._tcp.local., Service Provider Name:Wi

```

*Bonjour_Msg_Task: Feb 23 16:22:02.374: bgServiceAllowedInMsa1Db : 181 srv_str = _airplay._tcp.local. t
*Bonjour_Msg_Task: Feb 23 16:22:02.374: bgServiceAllowedInMsa1Db : 195 Incoming Service Advertisement s
*Bonjour_Msg_Task: Feb 23 16:22:02.374: Service-Name = AppleTV Service-String = _airplay._tcp.local. Typ

<<< Airplay service registered in WLC DB >>
*Bonjour_Msg_Task: Feb 23 16:22:02.374: Service Name:_airplay._tcp.local. is supported in Master-service
*Bonjour_Msg_Task: Feb 23 16:22:02.374: aDataLen: 2, aSrPtrRecord.aSrvProName.size: 39
*Bonjour_Msg_Task: Feb 23 16:22:02.374: Updating updateBonjourSrPtrDb:
*Bonjour_Msg_Task: Feb 23 16:22:02.374: aType: 12, aClass: 1, aTTL: 4500, aDataLen: 2, ptr: 0x327a9d93,
*Bonjour_Msg_Task: Feb 23 16:22:02.374:          bgProcessServiceAdvRsp : .. < SP-SR_PTR PKT >...

*Bonjour_Msg_Task: Feb 23 16:22:02.374:          bgProcessServiceAdvRsp : SERVICE NAME ..... = Appl

*Bonjour_Msg_Task: Feb 23 16:22:02.374:          bgProcessServiceAdvRsp : SERVICE STRING ..... = _air

*Bonjour_Msg_Task: Feb 23 16:22:02.374:          bgProcessServiceAdvRsp : SERVICE PROVIDER ..... = Wire

.
*Bonjour_Msg_Task: Feb 23 16:22:02.374:          bgProcessServiceAdvRsp : aTTL ..... = 4500
*Bonjour_Msg_Task: Feb 23 16:22:02.374: bgProcessServiceAdvRsp : 1546 msg : 0x327a9bda, ptr : 0x327a9d93

```

第三步：WLC侦听客户端的服务查询

之后，在任意时间点，无线客户端(192.168.232.98)发送请求空中播放服务的查询（通常当客户端打开支持空中播放的应用程序时），如图所示。

No.	Time	Source	Destination	Protocol	Length	Signal strength (dBm)	Channel	Info
2544	16:03:27.563772	192.168.232.98	224.0.0.251	MDNS	188			Standard query 0x0000 PTR _sleep-proxy._udp.local, "QM"
2545	16:03:27.563785	fe80::87c:cc5c...	ff02::fb	MDNS	208			Standard query 0x0000 PTR _sleep-proxy._udp.local, "QM"
3198	16:03:45.206702	192.168.232.98	224.0.0.251	MDNS	196			Standard query 0x0000 PTR _raop._tcp.local, "QU" questio
3199	16:03:45.207216	fe80::87c:cc5c...	ff02::fb	MDNS	216			Standard query 0x0000 PTR raop._tcp.local, "QU" questio

```

> Frame 3198: 196 bytes on wire (1568 bits), 196 bytes captured (1568 bits) on interface 0
> Ethernet II, Src: Cisco_5f:f7:ca (00:14:f1:5f:f7:ca), Dst: Cisco_b9:62:60 (00:a2:89:b9:62:60)
> Internet Protocol Version 4, Src: 192.168.231.105, Dst: 10.48.39.142
> User Datagram Protocol, Src Port: 24505, Dst Port: 5247
> Control And Provisioning of Wireless Access Points - Data
> IEEE 802.11 Data, Flags: .....T
> Logical-Link Control
> Internet Protocol Version 4, Src: 192.168.232.98, 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: 2
  Answer RRs: 0
  Authority RRs: 0
  Additional RRs: 1
  v Queries
    > _raop._tcp.local: type PTR, class IN, "QU" question
    > _airplay._tcp.local: type PTR, class IN, "QU" question
  > Additional records

```

<#root>

```

*Bonjour_Msg_Task: Feb 27 17:03:15.603: 00:6d:52:5d:5a:7d Parsing 2 bonjour questions
*Bonjour_Msg_Task: Feb 27 17:03:15.603: 00:6d:52:5d:5a:7d Query Service Name: _airplay._tcp.local., RR-T

```

```
*Bonjour_Msg_Task: Feb 27 17:03:15.603: processBonjourPacket : 1017 qNameStr : _airplay._tcp.local., bor
```

```
*Bonjour_Msg_Task: Feb 27 17:03:15.603: Service Name : AppleTV Service String : _airplay._tcp.local. i
```

```
*Bonjour_Msg_Task: Feb 27 17:03:15.603: 00:6d:52:5d:5a:7d SRV : _airplay._tcp.local. is supported by cl
```

第四步：WLC发送单播响应到客户端对Bonjour服务的查询

WLC使用缓存的服务Wireless Team(4)。_airplay._tcp.local进行响应。内部数据包的源IP是客户端VLAN的动态接口，在本例中为192.168.232.11，如图所示。

No.	Time	Source	Destination	Protocol	Length	Signal strength (dBm)	Channel	Info
8885	16:06:45.782278	192.168.232.11	224.0.0.251	MDNS	775			Standard query response 0x0000 PTR, cache flush 1
8886	16:06:45.783030	192.168.232.11	224.0.0.251	MDNS	782			Standard query response 0x0000 PTR, cache flush W
8887	16:06:45.783869	192.168.232.11	224.0.0.251	MDNS	775			Standard query response 0x0000 PTR, cache flush 1
8888	16:06:45.784786	192.168.232.11	224.0.0.251	MDNS	782			Standard query response 0x0000 PTR, cache flush W
8965	16:06:46.120078	192.168.239.40	224.0.0.251	MDNS	196			Standard query response 0x0000 TXT
8966	16:06:46.121534	fe80::10c1:887...	ff02::fb	MDNS	216			Standard query response 0x0000 TXT

```

> Frame 8886: 782 bytes on wire (6256 bits), 782 bytes captured (6256 bits) on interface 0
> Ethernet II, Src: Cisco_b9:62:64 (00:a2:89:b9:62:64), Dst: Cisco_5f:f7:ca (00:14:f1:5f:f7:ca)
> Internet Protocol Version 4, Src: 10.48.39.142, Dst: 192.168.231.105
> User Datagram Protocol, Src Port: 5247, Dst Port: 24505
> Control And Provisioning of Wireless Access Points - Data
> IEEE 802.11 Data, Flags: .....F.
> Logical-Link Control
> Internet Protocol Version 4, Src: 192.168.232.11, Dst: 224.0.0.251
> User Datagram Protocol, Src Port: 5353, Dst Port: 5353
v Multicast Domain Name System (response)
  Transaction ID: 0x0000
  > Flags: 0x8400 Standard query response, No error
  Questions: 0
  Answer RRs: 7
  Authority RRs: 0
  Additional RRs: 0
v Answers
  > _airplay._tcp.local: type PTR, class IN, cache flush, Wireless Team (4)._airplay._tcp.local
  > services.dns-sd.udp.local: type PTR, class IN, _airplay._tcp.local

```

调试片段

```
<#root>
```

```
BONJOUR_AGGREGATED_QUERY_RESPONSE
```

```
*Bonjour_Process_Task: Feb 27 17:03:45.229: buildBonjourQueryResponsePld : SRV-NAME ..... : AppleTV
```

```
*Bonjour_Process_Task: Feb 27 17:03:45.229: buildBonjourQueryResponsePld : SP-NAME..... :
```

```
*Bonjour_Process_Task: Feb 27 17:03:45.229: buildBonjourQueryResponsePld : SEND TO ..... : BONJOUR_PKT
```

```
*Bonjour_Process_Task: Feb 27 17:03:45.229: buildBonjourQueryResponsePld : VLAN ..... : 232
```

```
*Bonjour_Process_Task: Feb 27 17:03:45.229: buildBonjourQueryResponsePld : IS MCAST ..... : NO
```

```
*Bonjour_Process_Task: Feb 27 17:03:45.230: buildBonjourQueryResponsePld : DST-MAC ..... : 00:6D:52:5D:5A:7D
```



```

*Bonjour_Process_Task: Feb 27 17:03:45.230: buildBonjourQueryResponsePld : DST-IP ..... : 192.168.232.
*Bonjour_Process_Task: Feb 27 17:03:45.230: buildBonjourQueryResponsePld : ALL mDNS-AP .. : 0
*Bonjour_Process_Task: Feb 27 17:03:45.230: buildBonjourQueryResponsePld : TTL COUNTER .. : TIMEOUT_RES
*Bonjour_Process_Task: Feb 27 17:03:45.230: buildBonjourQueryResponsePld : RESTART TIME . : 0
*Bonjour_Process_Task: Feb 27 17:03:45.230: buildBonjourQueryResponsePld : SNOOP STATUS . : 0
*Bonjour_Process_Task: Feb 27 17:03:45.230: buildBonjourQueryResponsePld : LSS STATUS ... : DISABLED
*Bonjour_Process_Task: Feb 27 17:03:45.230: buildBonjourQueryResponsePld : RSP SRV NAME . : AppleTV
*Bonjour_Process_Task: Feb 27 17:03:45.230: buildBonjourQueryResponsePld : MSG-ID ..... : 0
*Bonjour_Process_Task: Feb 27 17:03:45.230: buildBonjourQueryResponsePld : POLICY STATUS : DISABLED
*Bonjour_Process_Task: Feb 27 17:03:45.230: buildBonjourQueryResponsePld INCLUDING SpData : Wireless Te

*Bonjour_Process_Task: Feb 27 17:03:45.233: VALID SR-PTR RR FOUND, attaching.....
*Bonjour_Process_Task: Feb 27 17:03:45.233: VALID SD-PTR RR FOUND, attaching.....
*Bonjour_Process_Task: Feb 27 17:03:45.233: VALID SRV RR FOUND, attaching.....
*Bonjour_Process_Task: Feb 27 17:03:45.233: VALID TXT RR FOUND, attaching.....
*Bonjour_Process_Task: Feb 27 17:03:45.233: VALID NSEC RR FOUND, attaching.....
*Bonjour_Process_Task: Feb 27 17:03:45.233: VALID DOMAIN RR FOUND, attaching.....
*Bonjour_Process_Task: Feb 27 17:03:45.233: fillBonjourDomain : 6055 : attaching SP-DOMAIN RR
*Bonjour_Process_Task: Feb 27 17:03:45.233: VALID DOMAIN-NSEC RR FOUND, attaching.....
*Bonjour_Process_Task: Feb 27 17:03:45.233: buildBonjourPacket DST-IP ADDR = 192.168.232.98
*Bonjour_Process_Task: Feb 27 17:03:45.233: Transmitting Bonjour Pkt to STA: 00:6D:52:5D:5A:7D

*Bonjour_Process_Task: Feb 27 17:03:45.233: Unicast Packet sent to client 00:6D:52:5D:5A:7D success.

```

验证和故障排除

本部分提供可用于确认和排除配置故障的信息。

为了在mDNS中识别和隔离问题，需要配置正确，因此几乎不需要基本检查。

步骤1.必须全局启用mDNS。

在GUI中导航控制器> mDNS 如图所示。

The screenshot shows the Cisco GUI interface for configuring mDNS. The top navigation bar includes 'MONITOR', 'WLANs', 'CONTROLLER', 'WIRELESS', 'SECURITY', 'MANAGEMENT', and 'COMMAND'. The 'CONTROLLER' tab is active. On the left, a sidebar lists 'Controller' options: General, Icons, Inventory, Interfaces, and Interface Groups. The main content area is titled 'Global Configuration' and contains three settings: 'mDNS Global Snooping' with a checked checkbox, 'mDNS Policy' with a dropdown menu showing '1', and 'Query Interval (10-120)' with a text input field containing '15' and '(mins)' next to it.

从CLI:

```
<#root>
```

```
show network summary
```

(snippet)

```
mDNS snooping..... Enabled
mDNS Query Interval..... 15 minutes
```

第二步：如果使用自定义mDNS配置文件，请确保所有必需的服务都添加到该配置文件。

第三步：确保在SSID下启用了mDNS，并且正确的mdns配置文件已映射到SSID。

从GUI导航至WLAN > WLAN ID > Advanced，如图所示。



从CLI:

```
<#root>
```

```
show wlan
```

(snippet)

```
mDNS Status..... Enabled
mDNS Profile Name..... default-mdns-profile
```

第四步：验证mDNS域服务中是否列出了mDNS服务提供程序。这列出了WLC缓存的服务的域名 (Apple TV、airprinters)。

从GUI中，导航到Controller > mDNS > mDNS Domain Name IP> Summary，如图所示。

mDNS Domain Name IP > Summary

Number of Domain Name-IP Entries 1

Domain Name	MAC Address	IP Address	Vlan Id	Type	TTL (seconds)	Time Left (seconds)
Wireless-Team-3.local.	18:ee:69:11:dc:60	192.168.239.37	239	Wireless	4725	4492

1. Maximum of 500 entries will be displayed.

从CLI:

```
<#root>
```

```
show mdns domain-name-ip summary
```

```

Number of Domain Name-IP Entries..... 1
DomainName          MAC Address      IP Address      Vlan Id Type      TTL Time left (sec) (sec)
-----
Wireless-Team-3.local. 18:ee:69:11:dc:60 192.168.239.37 239      Wireless 4725      4163

```

第五步：验证服务提供商是否也在特定服务本身下列出。

在GUI中，导航到Controller > mDNS > General > Service Name，如图所示。

mdns Service > Detail < Back Apply

Service Name	AppleTV
Service String	_airplay._tcp.local.
Service Id	3
Service Query Status	<input checked="" type="checkbox"/>
LSS Status	<input type="checkbox"/>
Origin	ALL
Profile Count	1
Service Provider Count	1

Profile Information	Service Provider Information				
Profile Name	MAC Address	Service Provider Name	AP Radio MAC	Vlan Id	Type
default-mdns-profile	18:ee:69:11:dc:60	Wireless Team (4)._airplay._tcp.local.	a4:6c:2a:7c:8f:80	239	Wireless

Priority MAC Information

Priority MAC	<input type="text"/>
AP Group	default-group
	<input type="button" value="Add"/>

[Priority MAC](#) [AP Group](#)

从CLI:

```
<#root>
```

```
show mdns service detailed AppleTV
```

```

Service Name..... AppleTV
Service String..... _airplay._tcp.local.
Service Id..... 3
Service query status..... Enabled
Service LSS status..... Disabled
Service learn origin..... Wireless and Wired
Number of Profiles..... 1
Profile..... default-mdns-profile
Number of Service Providers ..... 1
Number of priority MAC addresses ..... 0

ServiceProvider MAC Address AP Radio MAC Vlan Id Type TTL Time left(sec) (sec)
-----
Wireless Team (4)._airplay._tcp.local. 18:EE:69:11:DC:60 A4:6C:2A:7C:8F:80 239 Wireless 4500 3841

```

第六步：如果WLC未发现该服务，则检查是否要在bonjour浏览器（Controller>>mDNS>>mDNS浏览器）下获取该服务。Bonjour浏览器是在WLC上看到的所有服务通告的缓存，由于配置不允许学习，因此未发现该缓存。您可以从Bonjour浏览器中选择和添加服务，这在您测试和实施新服务时非常方便。

步骤 7.以下是调试Bonjour的命令：

```
<#root>
```

```
debug mdns error enable
```

```
debug mdns message enable
```

```
debug mdns detail enable
```

```
debug mdns all enable
```

Bonjour浏览器和show mdns service not-learned也可以用作调试工具。

步骤 8如前所述，如果WLC和AP位于不同的子网中，并且AP组播模式设置为组播，则请确保在两个vlan之间的有线网络上启用组播路由。在此设置中，vlan为vlan 1(WLC)和vlan 231(AP)。

```
Conf t
!
interface Vlan1
ip pim sparse-dense-mode

!
interface Vlan231
ip pim sparse-dense-mode
!
```

正在运行的组播路由：

```
<#root>
```

```
Gateway#sh ip mroute 239.100.100.100
IP Multicast Routing Table
```

```
-----snippet-----
```



```
(* , 239.100.100.100), 2w4d/stopped, RP 10.48.39.5, flags: SJC
Incoming interface: Null, RPF nbr 0.0.0.0
Outgoing interface list:
  Vlan231, Forward/Sparse-Dense, 2w0d/00:02:10
  Vlan232, Forward/Sparse-Dense, 2w4d/00:02:11
```

```
(
```

```
10.48.39.142
```

```
, 239.100.100.100), 2w4d/00:02:50, flags: T
```

```
  Incoming interface: Vlan1
```

```
, RPF nbr 0.0.0.0, RPF-MFD
```

```
  Outgoing interface list:
```

```
Vlan231, Forward/Sparse-Dense, 2w0d/00:02:10, H
```

除了这些核对表，关键是要了解mDNS在WLC上运行时的数据包流。数据包流和调试有助于深入了解先前的

验证命令不足。

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