

在Mobility Express AP上使用以太网桥接配置点对点网状链路

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简介

本文档介绍使用Cisco Mobility Express(ME)软件通过以太网桥接部署点对点网状链路的过程。

关于Mobility Express

本文档使用Cisco 1542室外无线接入点。版本8.10中引入了Mobility Express软件对Flex+Bridge模式下的室内和室外AP的网状支持。

支持以下AP型号：

- 作为ME根AP: Cisco AireOS 1542、1562、1815s、3802s AP
- 作为网状AP: Cisco AireOS 1542、1562、1815s、3802s AP

Mobility Express(ME)是一种替代自治AP模式和软件的解决方案。它允许基于AireOS的无线局域网控制器(WLC)软件的精简版在接入点上运行。WLC和AP代码都存储在AP内存的单个分区内。

Mobility Express部署不需要许可证文件，也不需要许可证激活。

一旦启动运行支持Mobility Express软件的设备，“AP部分”将首先启动。几分钟后，控制器部分也会初始化。建立控制台会话后，支持ME的设备将显示WLC提示符。要进入底层AP外壳，可以使用命令apcoshell:

```
<#root>
```

```
(Cisco Controller) >
```

```
apciscoshell
```

```
!!Warning!!: You are entering ap shell. This will stop you from establishing new telnet/SSH/Web session.  
Also the existing sessions will be suspended till you exit the ap shell.  
To exit the ap shell, use 'logout'
```

```
User Access Verification
```

```
Username:
```

```
admin
```

```
Password:
```

```
*****
```

```
RAP>
```

```
logout
```

```
(Cisco Controller) >
```

先决条件

使用的组件

- 2个1542D-E接入点
- 2个3560-CX思科交换机
- 2台笔记本电脑
- 1根控制台电缆

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。

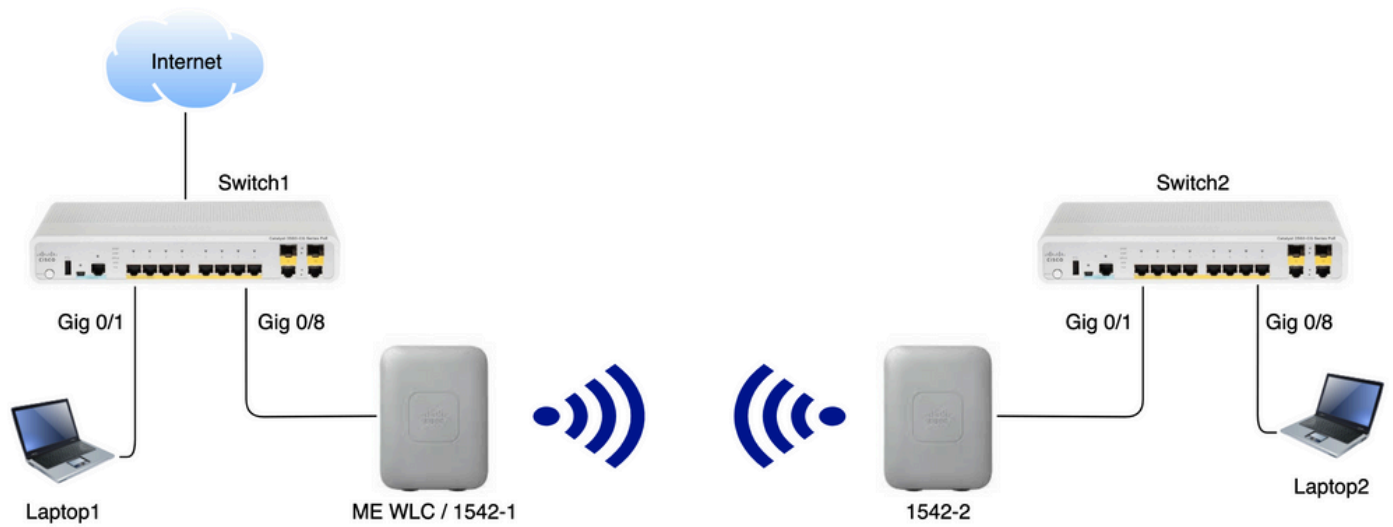
网络图

此网络中的所有设备都将位于192.168.1.0/24子网内。Mobility Express AP（控制器）的管理接口未标记，而所有端口上的本征VLAN都是VLAN 39。AP 1542-1将充当控制器和根接入点(RAP)的角色，而AP 1542-2将充当网状无线接入点(MAP)的角色。下表包含网络中所有设备的IP地址：

注意：标记管理接口可能导致加入内部WLC进程的AP出现问题。如果您决定标记管理接口，请确保相应地配置有线基础设施部分。

设备	IP Address
默认网关	192.168.1.1
笔记本电脑1	192.168.1.100
笔记本电脑2	192.168.1.101

Mobility Express WLC	192.168.1.200
1542-1(RAP)	192.168.1.201
1542-2 (地图)	192.168.1.202



配置

交换机配置

连接笔记本电脑的交换机端口配置为接入端口，VLAN设置为39:

```
<#root>
```

```
switch1
```

```
#show run interface Gig 0/1
```

```
Current configuration : 205 bytes
```

```
!
```

```
interface GigabitEthernet0/1
```

```
description Laptop1
```

```
switchport access vlan 39
```

```
switchport mode access
```

```
end
```

```
<#root>
```

```
switch2
```

```
#show run interface Gig 0/8
```

```
Current configuration : 205 bytes
```

```
!
```

```
interface GigabitEthernet0/8
```

```
description Laptop2
```

```
switchport access vlan 39
```

```
switchport mode access
```

```
end
```

连接AP的交换机端口将处于中继模式，本征VLAN设置为39:

```
<#root>
```

```
Switch1
```

```
#show run interface Gig 0/8
Building configuration...
!
interface GigabitEthernet0/8
  description 1542-1 (RAP)
  switchport mode trunk
  switchport trunk native vlan 39
end
```

```
<#root>
```

```
Switch2
```

```
#show run interface Gig 0/1
Building configuration...
!
interface GigabitEthernet0/1
  description 1542-1 (RAP)
  switchport mode trunk
  switchport trunk native vlan 39
end
```

AP的出厂重置

建议在开始新部署之前对AP执行出厂重置。这可以通过按下AP上的模式/重置按钮、插入电源并继续将其保持20秒以上来完成。这将确保已擦除所有以前的配置。AP将通过控制台连接访问，默认用户名是Cisco，密码是Cisco（区分大小写）。

如果某个AP已在Mobility Express中运行，则出厂重置不一定会将其移回轻量模式。重要步骤是确定AP是运行轻量级映像还是Mobility Express映像。

如果您的AP是轻量级，您可以通过下载mobility express代码将其转换为Mobility Express。如果AP已处于mobility express模式，则必须按照接入点/控制器GUI中的升级过程更改软件版本。

运行轻量级映像的AP的show version示例：

```
cisco AIR-AP1562I-E-K9 ARMv7 Processor rev 1 (v7l) with 1028616/605344K bytes of memory. Processor board ID FCZ2150Z099 AP
Running Image : 8.5.151.0 Primary Boot Image : 8.5.151.0 Backup Boot Image : 0.0.0.0 1 Gigabit Ethernet interfaces 2 802.11 Radios Radio
Driver version : 9.0.5.5-W8964 Radio FW version : 9.1.8.1 NSS FW version : 2.4.26
```

以下是Mobility Express软件中已运行的AP的示例：

```
AP#show version ... AP Running Image : 8.10.185.0 Primary Boot Image : 8.10.185.0 Backup Boot Image : 8.10.185.0 ... AP Image type :
```

将轻量capwap映像下载到1542-2(MAP)

笔记本电脑1将用作TFTP服务器。AP 1542-2最初可连接到Switch 1 Gig 0/8端口，以便执行升级。在software.cisco.com上，在1542个轻量级映像下，下载与8.10.185版本映像对应的15.3.3-JJ1(全称ap1g5-k9w8-tar.153-3.JK9.tar)。最新的轻量AP映像将始终与最新的ME版本对应。将映像放置在TFTP根文件夹中。连接控制台电缆，使用默认凭证登录(用户名是Cisco，密码也是Cisco)。为AP分配IP地址并使用以下命令执行升级：

```
#capwap ap ip 192.168.1.202 255.255.255.0 192.168.1.1
#archive download-sw /reload tftp://192.168.1.100/ap1g5-k9w8-tar.153-3.JK9.tar
```

AP将执行升级，然后重新启动。使用show version命令确认升级成功：

```
<#root>
```

```
MAP#
```

```
show version
```

```
.
..
AP Running Image      : 8.10.185.0
Primary Boot Image    : 8.10.185.0
Backup Boot Image     : 8.8.125.0
```

AP将从交换机1上拔下，然后重新插入交换机2。

注：通过手动升级MAP的映像，我们避免在网状链路建立后立即进行映像升级过程。

将支持Mobility Express的映像下载到AP 1542-1(RAP)

在1542 AP的Mobility Express 8.10.105版本下，我们可以看到2个可用文件：.tar和.zip。下载.tar文件









Aironet 1542I Outdoor Access Point

Release 8.10.185.0

[My Notifications](#)

Related Links and Documentation

[Release Notes for 8.10.185.0](#)

File Information	Release Date	Size	
Cisco 1540 Series Mobility Express Release 8.10 Software, to be used for conversion from Lightweight Access Points only.  AIR-AP1540-K9-ME-8-10-185-0.tar Advisories 	24-Mar-2023	60.80 MB	 
Cisco 1540 Series Mobility Express Release 8.10 Software. Access Point image bundle, to be used for software update and/or supported access points images.  AIR-AP1540-K9-ME-8-10-185-0.zip Advisories 	24-Mar-2023	503.27 MB	 

下载.tar文件

与物理WLC不同，ME接入点没有足够的闪存来存储所有AP映像，因此，如果要更多AP加入到Mobility Express接入点中，必须随时访问TFTP服务器。如果我们像本示例中那样手动升级AP，则无需执行此步骤。

要执行升级，请将控制台连接到AP 1542-1，为其分配IP地址并执行映像升级：

```
#capwap ap ip 192.168.1.201 255.255.255.0 192.168.1.1  
#ap-type mobility-express tftp://192.16.1.100/AIR-AP1540-K9-ME-8-10-185.tar
```

升级完成后，AP重新启动。在AP启动后不久，控制器部分也开始启动。我们很快看到零日调配SSID“CiscoAirProvision”正在广播。

如果您位于控制台，可以看到CLI向导，但不会以这种方式配置AP。空中GUI向导便是理想之选。

零日SSID调配

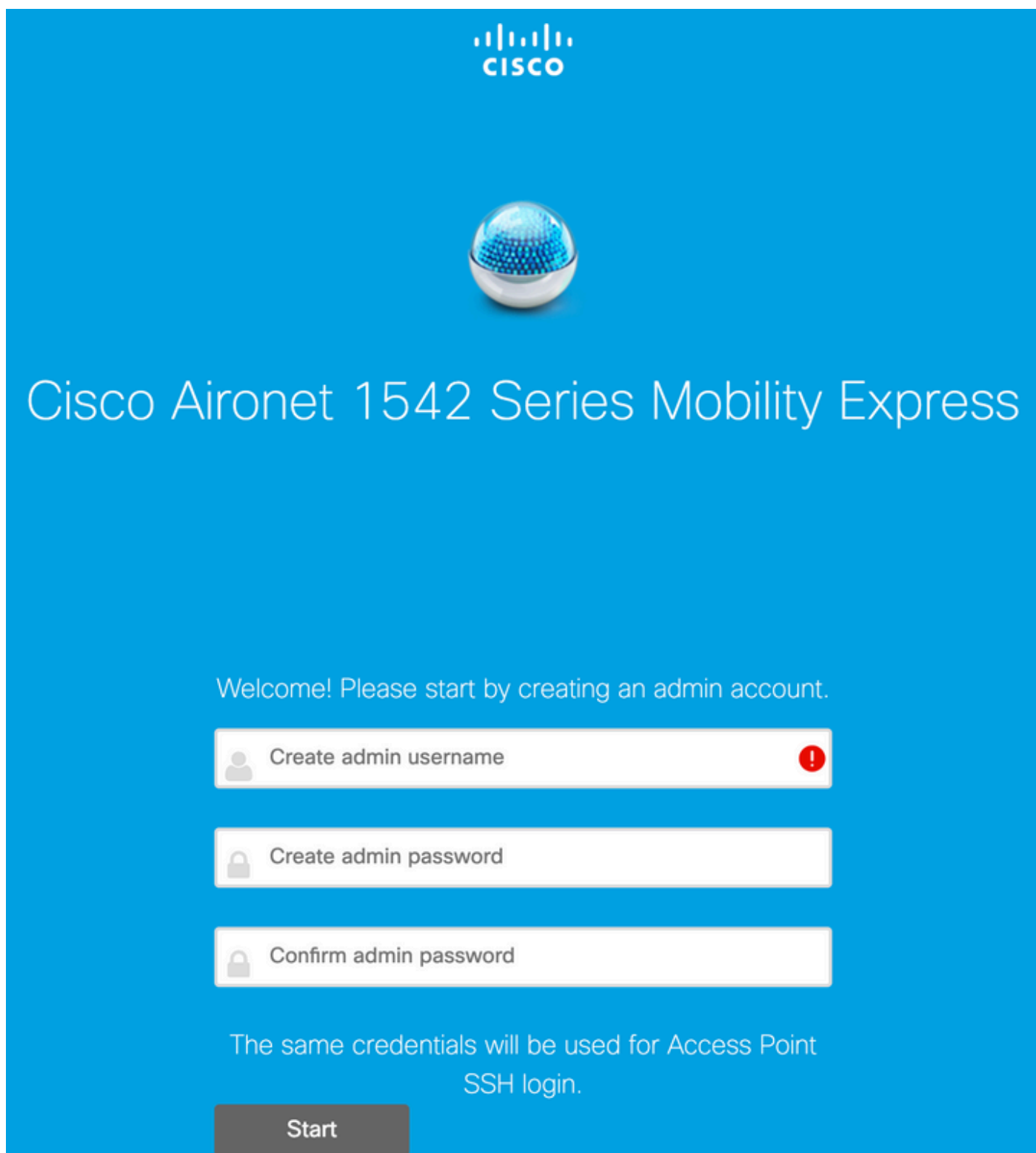
使用密码连接到AP广播的“CiscoAirProvision”SSID。笔记本电脑从子网192.168.1.0/24获取IP地址。

如果您没有看到正在广播的SSID，则仍有可能该AP处于“Mobility express CAPABLE”状态，但不作为mobility express运行。然后，您必须连接到AP CLI并输入ap type mobility-express，然后AP重新启动并广播调配SSID。

如果需要，也可以使用“capwap ap mode local/flex-bridge”在本地模式和网状模式之间转换AP。

在Web浏览器中打开地址<http://192.168.1.1>。此页面重定向到初始配置向导。通过指定管理员用户

名和密码在控制器上创建管理员帐户，然后单击Start。



The image shows the initial setup screen for a Cisco Aironet 1542 Series Mobility Express controller. The background is blue with the Cisco logo at the top center. Below the logo is a small image of the device. The main heading reads "Cisco Aironet 1542 Series Mobility Express". A welcome message says "Welcome! Please start by creating an admin account." There are three input fields: "Create admin username" (with a red warning icon), "Create admin password", and "Confirm admin password". Below these fields, a note states "The same credentials will be used for Access Point SSH login." At the bottom is a "Start" button.

在下一步中，通过指定值设置控制器。

字段名称	描述
系统名称	输入Mobility Express AP的系统名称。示例： ： MobilityExpress-WLC

国家/地区	从下拉列表中选择一个国家/地区。
日期和时间	选择当前日期和时间。 注意：向导尝试使用JavaScript从计算机导入时钟信息（日期和时间）。强烈建议您在继续之前确认时钟设置。接入点取决于加入WLC的时钟设置。
时区	选择当前时区。
NTP 服务器	输入NTP服务器详细信息。
管理IP	输入管理IP地址。注意：它必须与分配给接入点的IP不同！在本例中，当AP获得。201 IP时，我们在配置向导中分配。200。将使用这两个地址。
子网掩码	输入子网掩码地址。
默认网关	输入默认网关。

在此设置中，DHCP服务器将在交换机1上运行，因此无需在ME WLC上启用它。将“网格”选项滑动到 enable 然后单击下一步。



1 Set Up Your Controller

System Name ?

Country ?

Date & Time

Timezone ?

NTP Server ?

Enable IP Management(Management Network) ?

Management IP Address ?

Subnet Mask

Default Gateway

Mesh

Enable DHCP Server (Management Network)

在下一步中，通过指定以下字段创建无线网络：

字段名称	描述
网络名称	输入网络名称。
安全	选择 下拉列表中的WPA2个人安全类型。
口令	指定预共享密钥(PSK)。
确认口令	重新输入并确认密码。

此网络可在以后阶段禁用。

The image shows the configuration interface for a Cisco Aironet 1542 Series Mobility Express device. At the top, there is a blue header with the Cisco logo and the text "Cisco Aironet 1542 Series Mobility Express". Below the header, there are two main steps in a progress bar: "1 Set Up Your Controller" (which is completed, indicated by a checkmark) and "2 Create Your Wireless Networks" (which is the current step, indicated by a chevron). The "Employee Network" section contains four input fields: "Network Name" with the value "Employee", "Security" with the value "WPA2 Personal", "Passphrase" with masked characters ".....", and "Confirm Passphrase" with masked characters ".....". Each input field has a help icon (question mark) to its right. At the bottom of the form, there are two buttons: "Back" and "Next".

在Advanced Settings (高级设置) 选项卡中，保留 RF参数优化 滑块已禁用，然后点击下一步



1 Set Up Your Controller 



2 Create Your Wireless Networks



3 Advanced Setting



RF Parameter Optimization

Back

Next

确认设置后，WLC将重新启动：



The controller has been fully configured and will restart in 60 seconds.

Next Steps:

After the controller is restarted, it will be accessible from the network by going to this URL -

<https://192.168.1.200>

1 Controller Settings

Username	admin
System Name	ME
Country	Netherlands (NL)
Date & Time	11/05/2019 10:31:39
Timezone	Amsterdam, Berlin, Rome, Vienna
NTP Server	-
Management IP Address	192.168.1.200
Management IP Subnet	255.255.255.0
Management IP Gateway	192.168.1.1
Mesh	Yes

x Controller DHCP

2 Wireless Network Settings

✓ Employee Network

Network Name	Employee
Security	WPA2 Personal
Passphrase:	*****

其他网状配置

在建立网状链路之前，需要将MAP转换为flex-bridge模式。如果在初始配置期间启用了mesh选项，则RAP已经处于flex-bridge模式。这可以从CLI完成：

```
<#root>
```

```
MAP#
```

```
capwap ap mode flex-bridge
```

MAP#[*11/05/2019 18:26:28.1599] AP Rebooting: Reset Reason - AP mode changed

要使MAP top加入ME控制器，需要获得授权。在MAP上，查找其以太网接口的mac地址：

<#root>

MAP#

show interfaces wired 0

wired0 Link encap:Ethernet HWaddr

00:EE:AB:83:D3:20

```
inet addr:192.168.1.202 Bcast:192.168.1.255 Mask:255.255.255.0
UP BROADCAST RUNNING PROMISC MULTICAST MTU:1500 Metric:1
RX packets:183 errors:0 dropped:11 overruns:0 frame:0
TX packets:192 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:80
RX bytes:19362 (18.9 KiB) TX bytes:22536 (22.0 KiB)
```

从laptop 1，通过<https://192.168.1.200>访问ME控制器Web界面。启用专家模式（右上角）后，“Wireless settings（无线设置）”下将出现网状选项卡。在mac filtering下，添加MAP的以太网MAC地址：

The screenshot shows the Cisco Aironet 1542 Series Mobility Express web interface. The left sidebar contains navigation options: Monitoring, Wireless Settings, WLANs, Access Points, Access Points Groups, WLAN Users, Guest WLANs, DHCP Server, Mesh (highlighted with a red box), Management, Services, and Advanced. The main content area is titled 'Mesh settings' and includes a 'Mesh' button. Below this, there are tabs for 'General', 'Mesh RAP Downlink backhaul', 'Convergence', 'Ethernet bridging', 'Security', and 'MAC Filtering' (highlighted with a red box). The 'MAC Filtering' page features a search bar, an 'Add MAC Address' button, a 'Refresh' button, and a table with columns for 'MAC Address', 'Type', 'Profile Name', and 'Description'. The table currently shows 'Number of Blacklist:0' and 'Number of Whitelist:0'.



Add MAC Address

MAC Address

00:EE:AB:83:D3:20

Description

MAP



Type

WhiteList



Profile Name

Any WLAN/RLAN



Apply

Cancel

注:要加入ME WLC的网桥模式或flex-bridge模式中的任何后续AP也需要授权

设置此设置后，应建立网状链路。为了使MAP后的有线客户端能够通过网状链路传递流量，需要在MAP的无线设置>接入点> MAP >网状网下启用以太网桥接:

Cisco Aironet 1542 Series Mobility Express

ACCESS POINTS ADMINISTRATION

Access Points 1

Q Search

Refresh

Select	Manage	Type	Location
<input type="checkbox"/>		ME Capable	default location

10 Items per page

RAP(Active Controller)

General Controller Radio 1 (2.4 GHz) Radio 2 (5GHz) **Mesh**

AP Role: Root

Bridge Type: Outdoor

Bridge Group Name:

Strict Matching BGN:

Daisy Chaining:

Preferred Parent:

Backhaul Interface: 802.11a/n/ac

Bridge Data Rate (Mbps): auto

Install Mapping on Radio Backhaul:

Ethernet Link Status: UP

PSK Key TimeStamp: Delete PSK

Mesh RAP Downlink backhaul

5 GHz 2.4 GHz

Ethernet Bridging

State

Acti...	Interface Name	Oper Status	Mode	VLAN Id
<input type="checkbox"/>	GigabitEthernet0	UP	Access	0

1 - 1 of 1 items

Apply Cancel

如果网状链路使用5GHz频段，可能会受到雷达信号的影响。一旦RAP检测到雷达事件，它将切换到另一个信道。建议启用信道更改通知，以便RAP通知MAP将交换信道。这显著降低了收敛时间，因为MAP无需扫描所有可用信道：

General Mesh RAP Downlink backhaul **Convergence** Ethernet bridging Security MAC Filtering

Mode: Standard

Channel Change Notification:

Background Scanning:

Apply

验证

我们可以通过运行show mesh ap summary命令验证MAP是否已连接：

```
<#root>
```

```
(Cisco Controller) >
```

```
show mesh ap summary
```

AP Name	AP Model	BVI MAC	CERT MAC	Hop	Bridge Group Name
RAP	AIR-AP1542I-E-K9	00:fd:22:19:8c:f8	11:22:33:44:55:66	0	default
MAP	AIR-AP1542D-E-K9	00:ee:ab:83:d3:20	11:22:33:44:55:66	1	default


```
Number of Mesh APs..... 0  
Number of RAPs..... 0  
Number of MAPs..... 0  
Number of Flex+Bridge APs..... 2  
Number of Flex+Bridge RAPs..... 1  
Number of Flex+Bridge MAPs..... 1
```

为了测试链路是否通过流量，我们将尝试从Laptop 1 ping Laptop 2:

```
<#root>
```

```
VAPEROVI:~ vaperovi$
```

```
ping 192.168.1.101
```

```
PING192.168.1.101 (192.168.1.101): 56 data bytes  
64 bytes from192.168.1.101: icmp_seq=0 ttl=64 time=5.461 ms  
64 bytes from192.168.1.101: icmp_seq=1 ttl=64 time=3.136 ms  
64 bytes from192.168.1.101: icmp_seq=2 ttl=64 time=2.875 ms
```

注：只有网状链路建立后，您才能ping通MAP或RAP ip地址。

故障排除

在MAP/RAP上：

- debug map events

在ME WLC上：

- debug capwap events enable
- debug capwap errors enable

- debug mesh events enable

从MAP观察到的成功加入过程的示例（某些消息由于不相关而被编辑）：

<#root>

MAP#debug mesh events

Enabled all mesh event debugs

```
[*11/05/2019 18:28:24.5699] EVENT-MeshRadioBackhaul[1]: Sending SEEK_START to Channel Manager
[*11/05/2019 18:28:24.5699] EVENT-MeshChannelMgr[1]:
```

Starting regular seek

```
[*11/05/2019 18:28:24.5699] EVENT-MeshChannelMgr[1]: channels to be sought: 100
[*11/05/2019 18:28:06.5499] EVENT-MeshChannelMgr[0]: start scanning on channel 1.
[*11/05/2019 18:28:06.5499] EVENT-MeshChannelMgr[1]: start scanning on channel 100.
[*11/05/2019 18:28:06.5699] EVENT-MeshRadioBackhaul[1]: Sending ADD_LINK to MeshLink
[*11/05/2019 18:28:06.5699] EVENT-MeshAwpAdj[1][D4:78:9B:7B:DF:11]: AWPP adjacency added channel(100)
[*11/05/2019 18:28:06.5699] EVENT-MeshRadioBackhaul[1]: Sending ADJ_FOUND to Channel Manager 0x64
[*11/05/2019 18:28:06.5699] EVENT-MeshChannelMgr[1]: Adj found on channel 100.
[*11/05/2019 18:28:07.2099] ipv6 gw config loop in Ac discovery
[*11/05/2019 18:28:08.5499] EVENT-MeshChannelMgr[0]: scanning timer expires.
[*11/05/2019 18:28:08.7899] EVENT-MeshChannelMgr[0]: continue scanning on channel 2.
[*11/05/2019 18:28:08.7899] EVENT-MeshChannelMgr[1]: scanning timer expires.
[*11/05/2019 18:28:09.0399] EVENT-MeshChannelMgr[1]: continue scanning on channel 104.
[*11/05/2019 18:28:09.2099] ipv6 gw config loop in Ac discovery
[*11/05/2019 18:28:10.7899] EVENT-MeshChannelMgr[0]: scanning timer expires.
[*11/05/2019 18:28:11.0199] EVENT-MeshChannelMgr[0]: continue scanning on channel 3.
[*11/05/2019 18:28:11.0399] EVENT-MeshChannelMgr[1]: scanning timer expires.
[*11/05/2019 18:28:11.2099] ipv6 gw config loop in Ac discovery
[*11/05/2019 18:28:11.3099] EVENT-MeshChannelMgr[1]: continue scanning on channel 108.
[*11/05/2019 18:28:13.0199] EVENT-MeshChannelMgr[0]: scanning timer expires.
[*11/05/2019 18:28:13.2099] ipv6 gw config loop in Ac discovery
[*11/05/2019 18:28:13.2499] EVENT-MeshChannelMgr[0]: continue scanning on channel 4.
[*11/05/2019 18:28:13.3099] EVENT-MeshChannelMgr[1]: scanning timer expires.
[*11/05/2019 18:28:13.5599] EVENT-MeshChannelMgr[1]: continue scanning on channel 112.
[*11/05/2019 18:28:15.2099] ipv6 gw config loop in Ac discovery
[*11/05/2019 18:28:15.2499] EVENT-MeshChannelMgr[0]: scanning timer expires.
[*11/05/2019 18:28:15.5099] EVENT-MeshChannelMgr[0]: continue scanning on channel 5.
[*11/05/2019 18:28:15.5599] EVENT-MeshChannelMgr[1]: scanning timer expires.
[*11/05/2019 18:28:15.8099] EVENT-MeshChannelMgr[1]: continue scanning on channel 116.
.
..
.
[*11/05/2019 18:28:35.7999] EVENT-MeshChannelMgr[1]: Mesh BH requests to switch to channel 100, width 20 MHz
[*11/05/2019 18:28:35.8199] EVENT-MeshChannelMgr[0]: abort scanning.
[*11/05/2019 18:28:35.8199] EVENT-MeshChannelMgr[0]: Set to configured channel 1, width 20 MHz
[*11/05/2019 18:28:36.6699] ipv6 gw config loop in Ac discovery
[*11/05/2019 18:28:37.5099] EVENT-MeshRadioBackhaul[1]: Sending LINK_UP to MeshLink
[*11/05/2019 18:28:37.5099] CRIT-MeshLink: Set Root port Mac: D4:78:9B:7B:DF:11 BH Id: 2 Port:54 Device:1
[*11/05/2019 18:28:37.5099] EVENT-MeshLink: Sending NOTIFY_SECURITY_LINK_UP to MeshSecurity
[*11/05/2019 18:28:37.5099] EVENT-MeshSecurity: Intermodule message NOTIFY_SECURITY_LINK_UP
[*11/05/2019 18:28:37.5099] EVENT-MeshSecurity: Start full auth to parent D4:78:9B:7B:DF:11
[*11/05/2019 18:28:37.5099] EVENT-MeshSecurity: start_auth, Parent(D4:78:9B:7B:DF:11) state changed to AUTHENTICATING
[*11/05/2019 18:28:37.5199] EVENT-MeshSecurity: Opening wpas socket
[*11/05/2019 18:28:37.5199] EVENT-MeshSecurity: start socket to WPA supplicant
[*11/05/2019 18:28:37.5199] EVENT-MeshSecurity: MeshSecurity::wpas_init my_mac=00:EE:AB:83:D3:20, user=
[*11/05/2019 18:28:38.6699] ipv6 gw config loop in Ac discovery
```

```
[*11/05/2019 18:28:40.6699] ipv6 gw config loop in Ac discovery
[*11/05/2019 18:28:40.6799] EVENT-MeshSecurity: Generating pmk r0 as child(D4:E8:80:A0:D0:B1)
[*11/05/2019 18:28:40.6899] EVENT-MeshSecurity: pmk(eap) r0 generated for D4:78:9B:7B:DF:11: 5309c9fb 0
[*11/05/2019 18:28:40.6899] EVENT-MeshSecurity: EAP authentication is done, Parent(D4:78:9B:7B:DF:11) s
[*11/05/2019 18:28:40.6899] EVENT-MeshSecurity: Child(D4:E8:80:A0:D0:B1) generating keys to Parent D4:7
[*11/05/2019 18:28:40.6899] EVENT-MeshSecurity: Processing TGR_AUTH_RSP, Parent(D4:78:9B:7B:DF:11) stat
[*11/05/2019 18:28:40.6899] CRIT-MeshSecurity: Mesh Security successful authenticating parent D4:78:9B:
[*11/05/2019 18:28:40.6899] EVENT-MeshLink: Mac: D4:78:9B:7B:DF:11 bh_id:2 auth_result: 1
[*11/05/2019 18:28:40.6899] EVENT-MeshLink: Sending NOTIFY_SECURITY_DONE to Control
[*11/05/2019 18:28:40.6899] EVENT-MeshLink: Mesh Link:Security success on parent :D4:78:9B:7B:DF:11
[*11/05/2019 18:28:40.6899] EVENT-MeshLink: Uplink Auth done: Mac: D4:78:9B:7B:DF:11 Port:54 Device:DEV
[*11/05/2019 18:28:40.6899] EVENT-MeshSecurity: Processing TGR_REASSOC_RSP, Parent(D4:78:9B:7B:DF:11)
```

state changed to STATE_RUN

```
[*11/05/2019 18:28:40.6899] EVENT-MeshAwppAdj[1][D4:78:9B:7B:DF:11]: auth_complete Result(PASS)
```

.
..
.

```
[*11/05/2019 18:28:45.6799] CAPWAP State: Discovery
[*11/05/2019 18:28:45.6799] Discovery Request sent to 192.168.1.200, discovery type STATIC_CONFIG(1)
[*11/05/2019 18:28:45.6899] Discovery Request sent to 192.168.1.200, discovery type STATIC_CONFIG(1)
[*11/05/2019 18:28:45.6899] Sent Discovery to mobility group member 1. 192.168.1.200, type 1.
[*11/05/2019 18:28:45.7099] Discovery Request sent to 255.255.255.255, discovery type UNKNOWN(0)
[*11/05/2019 18:28:46.9699] AP GW IP Address updated to 192.168.1.1
[*11/05/2019 18:28:47.3999] Flexconnect Switching to Standalone Mode!
[*11/05/2019 18:28:47.4599] EVENT-MeshLink: Sending NOTIFY_CAPWAP_COMPLETE to Control
[*11/05/2019 18:28:47.4599] EVENT-MeshControl: Capwap Complete Notification: bh:2 Result:2
[*11/05/2019 18:28:47.4599] EVENT-MeshControl: Received CAPWAP Disconnect for: bh_id(2), D4:78:9B:7B:DF:
[*11/05/2019 18:28:47.4899]
```

Discovery Response from 192.168.1.200

.
..
.

```
Adding Ipv4 AP manager 192.168.1.200 to least load
[*11/05/2019 18:28:55.1299] WLC: ME ApMgr count 1, ipTransportTried 0, prefer-mode 1, isIpv4orIpv6Stati
[*11/05/2019 18:28:55.1399] IPv4 Pref mode. Choosing AP Mgr with index 0, IP 192.168.1.200, load 1, AP
[*11/05/2019 18:28:55.1399] capwapSetTransportAddr returning: index 0, apMgrCount 0
[*11/05/2019 18:28:55.1399]
```

```
[*11/06/2019 13:23:36.0000]
[*11/06/2019 13:23:36.0000] CAPWAP State: DTLS Setup
[*11/06/2019 13:23:36.0000] DTLS connection created successfully local_ip: 192.168.1.202 local_port: 524
[*11/06/2019 13:23:36.8599] Dtls Session Established with the AC 192.168.1.200, port 5246
[*11/06/2019 13:23:36.8599]
[*11/06/2019 13:23:36.8599] CAPWAP State: Join
[*11/06/2019 13:23:36.8699] Sending Join request to 192.168.1.200 through port 5248
[*11/06/2019 13:23:36.8899] Join Response from 192.168.1.200
[*11/06/2019 13:23:36.8899] AC accepted join request with result code: 0
```

.
..
.

```
CAPWAP data tunnel UPDATE to forwarding SUCCEEDED
[*11/06/2019 13:23:37.4999] Starting Post Join timer
[*11/06/2019 13:23:37.4999]
[*11/06/2019 13:23:37.4999] CAPWAP State: Image Data
[*11/06/2019 13:23:37.5099] AP image version 8.10.105.0 backup 8.8.125.0, Controller 8.10.105.0
[*11/06/2019 13:23:37.5099] Version is the same, do not need update.
[*11/06/2019 13:23:37.6399] do NO_UPGRADE, part1 is active part
[*11/06/2019 13:23:37.6499]
[*11/06/2019 13:23:37.6499] CAPWAP State: Configure
```

```
[*11/06/2019 13:23:37.6599] DOT11_CFG[0] Radio Mode is changed from Remote Bridge to Remote Bridge
.
..
.
[*11/06/2019 13:23:38.7799] DOT11_CFG[0]: Starting radio 0
[*11/06/2019 13:23:38.7799] DOT11_CFG[1]: Starting radio 1
[*11/06/2019 13:23:38.8899] EVENT-MeshRadioBackhaul[0]: BH_RATE_AUTO
[*11/06/2019 13:23:38.8899] EVENT-MeshSecurity: Intermodule message LSC_MODE_CHANGE
[*11/06/2019 13:23:38.9099] CAPWAP data tunnel UPDATE to forwarding SUCCEEDED
[*11/06/2019 13:23:38.9999] Setting Prefer-mode IPv4
[*11/06/2019 13:23:39.0499]
[*11/06/2019 13:23:39.0499]
```

CAPWAP State: Run

```
[*11/06/2019 13:23:39.0499] EVENT-MeshCapwap: CAPWAP joined controller
[*11/06/2019 13:23:39.0599] CAPWAP moved to RUN state stopping post join timer
[*11/06/2019 13:23:39.1599] CAPWAP data tunnel ADD to forwarding SUCCEEDED
[*11/06/2019 13:23:39.2299]
```

AP has joined controller ME

```
[*11/06/2019 13:23:39.2599]
```

Flexconnect Switching to Connected Mode

!

技巧、技巧和常见错误

- 通过在线上将MAP和RAP升级到相同的映像版本，我们避免通过空中下载映像（在“脏”射频环境中可能会出现这个问题）。
- 增加5GHz回程链路的信道宽度会导致较低的SNR和错误的雷达检测（主要在80MHz和160MHz）。
- 不应通过ping MAP或RAP来测试网状链路连通性。一旦网状链路恢复正常，它们将无法ping通。
- 强烈建议在现场部署之前先在受控环境中测试该设置。
- 如果使用的是带有外部天线的AP，请务必参考部署指南，检查哪些天线是兼容的，以及应该插入哪个端口。
- 为了通过网状链路桥接来自不同VLAN的流量，需要禁用VLAN透明功能。
- 考虑在AP本地设置系统日志服务器，因为它可以提供调试信息，否则只能通过控制台连接提供。

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