

在工业无线(IW)接入点上配置点对点 and 第2层流动性

目录

[简介](#)

[使用的组件](#)

[背景信息](#)

[使用IW9165D配置点到点链路](#)

[常规模式](#)

[无线电](#)

[监控连接](#)

[从FM Quadro监控](#)

[流动性](#)

[配置流动性](#)

简介

本文档介绍在IW AP上以CURWB模式运行的点对点链路的配置以及第2层流量配置。

使用的组件

有四种不同的硬件：

- 思科Catalyst IW9167
- 思科Catalyst IW9165D
- 思科Catalyst IW9165E

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

CURWB硬件通过固定和移动架构提供无线回传。本文档介绍在CURWB模式下运行的工业无线接入点(IW AP)上的点对点链路配置以及第二层流量配置。

使用IW9165D配置点到点链路

1. 可以从IoT操作控制面板(IoT OD)配置无线电设备，也可以从AP Web界面手动配置无线电设备。在本文中，我们手动配置所有无线电。
2. 在初始设置期间，可能需要控制台访问。要连接到控制台，请使用波特率115200（如果软件版本为17.12.1或更高版本）。

3. 默认情况下，所有无线电均处于IOT-OD在线模式。发出此命令以验证AP的状态。

```
show iotod-iw status
```

```
Cisco-137.250.148#show iotod-iw status
IOTOD IW mode: Offline
Cisco-137.250.148#
```

如果将AP配置为与IoT OD通信，则使用此命令可将AP上的模式更改为offline。

```
configure iotod-iw offline
```

```
Cisco-137.250.148#configure iotod-iw
offline Set up IOTOD IW mode to offline
online Set up IOTOD IW mode to online. The device can be managed from the
IOTOD IW Cloud Server (if it is connected to the Internet)
Cisco-137.250.148#configure iotod-iw █
```

4. 将无线电配置为脱机模式后，可以使用默认的IP地址192.168.0.10访问Web GUI。

5. 在GUI中，通过General Settings > General Mode页面上的无线电配置点对点链路。

常规模式

- 无线电模式(头端 (连接到有线基础设施) 需要配置为网状终端，而远端配置为网状点)
- IP Address
- 子网掩码和网关

IOTOD IW

Offline

IW-MONITOR

Enabled

FM-QUADRO

GENERAL SETTINGS

- **general mode**
- wireless radio
- antenna alignment and stats

NETWORK CONTROL

- advanced tools

ADVANCED SETTINGS

- advanced radio settings
- static routes
- allowlist / blocklist
- multicast
- snmp
- radius
- ntp
- ethernet filter
- l2tp configuration
- vlan settings
- Fluidity
- misc settings
- smart license

MANAGEMENT SETTINGS

- remote access
- firmware upgrade
- status
- configuration settings
- reset factory default
- reboot
- logout

Configuration contains changes. Apply these changes?

Discard

Review

Apply

GENERAL MODE

General Mode

Select MESH END mode if you are installing this Cisco IOT IW9165DH Series Access Point at the head end and connecting this unit to a wired network (i.e. LAN).

mesh point

Mode: mesh end

gateway

Radio-off:

LAN Parameters

Local IP:

Local Netmask:

Default Gateway:

Local Dns 1:

Local Dns 2:

Reset

Save

配置参数后，保存设置。

无线电

- 通常，对于IW9165，无线电1配置为点对点回传链路，因为这是定向内部天线。如果仅使用点对点应用程序，则需要禁用第二个无线电。
- 两个无线电需要配置相同的共享密码、频率和信道宽度。

IOTOD IW

Offline

IW-MONITOR

Enabled

FM-QUADRO

GENERAL SETTINGS

- general mode
- wireless radio
- antenna alignment and stats

NETWORK CONTROL

- advanced tools

ADVANCED SETTINGS

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- static routes
- allowlist / blocklist
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MANAGEMENT SETTINGS

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WIRELESS RADIO

Wireless Settings

"Shared Passphrase" is an alphanumeric string or special characters excluding '[apex]' '[double apex]' '[backtick]' '\$[dollar]' '=' '[backslash]' and whitespace (e.g. "mysecurecamnet") that identifies your network. It MUST be the same for all the Cisco URWB units belonging to the same network.

Shared Passphrase:

Show passphrase:

In order to establish a wireless connection between Cisco URWB units, they need to be operating on the same frequency.

Radio 1 Settings

Role: Fixed

Frequency (MHz): 5180

Channel Width (MHz): 20

Radio 2 Settings

Role: Disabled

Reset

Save

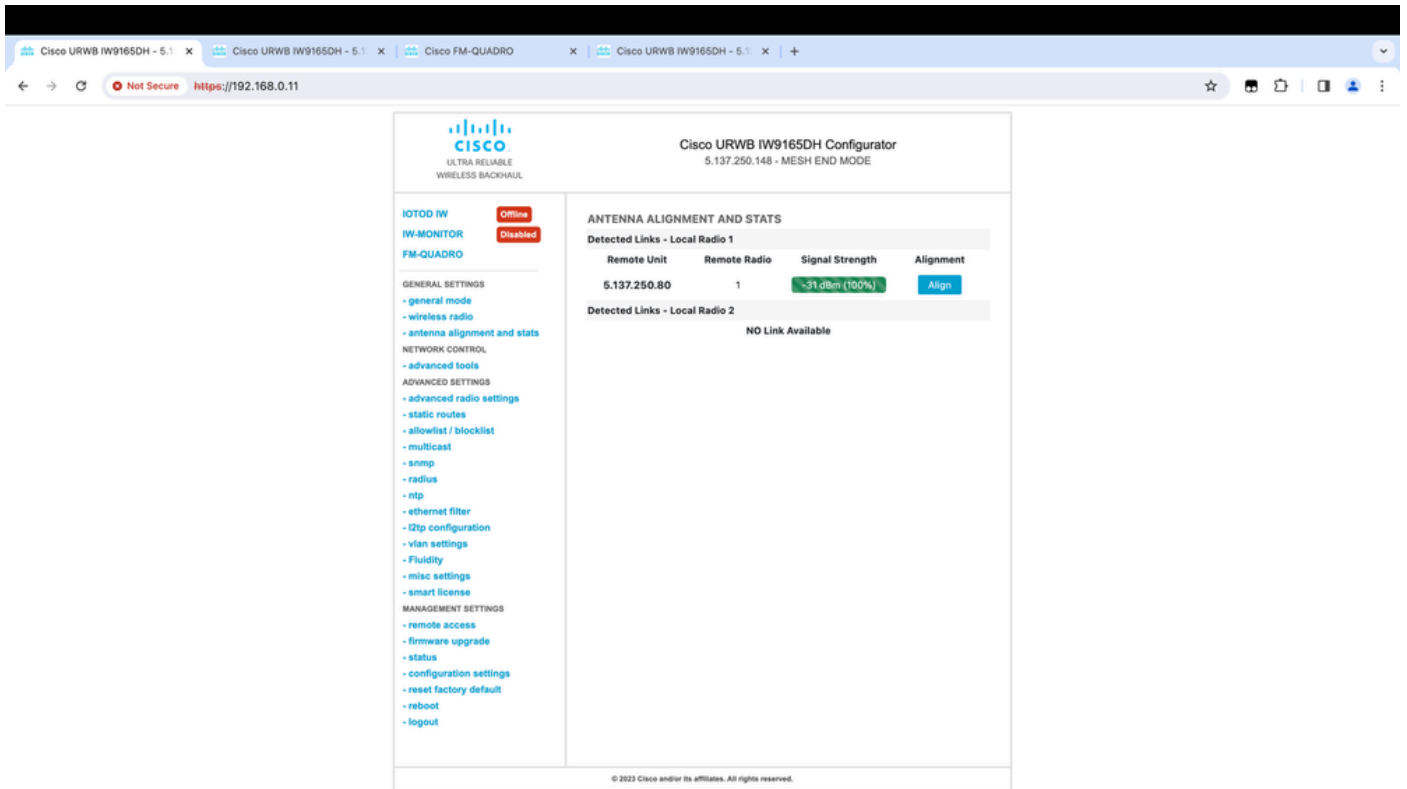
配置页面后，在两个无线电上保存设置并应用更改。这将重新启动无线电，然后应用更改。

监控连接

无线电恢复后，可以检查天线对齐页面中的信号强度。建议的信号强度介于-45 dBm和-70 dBm之间。

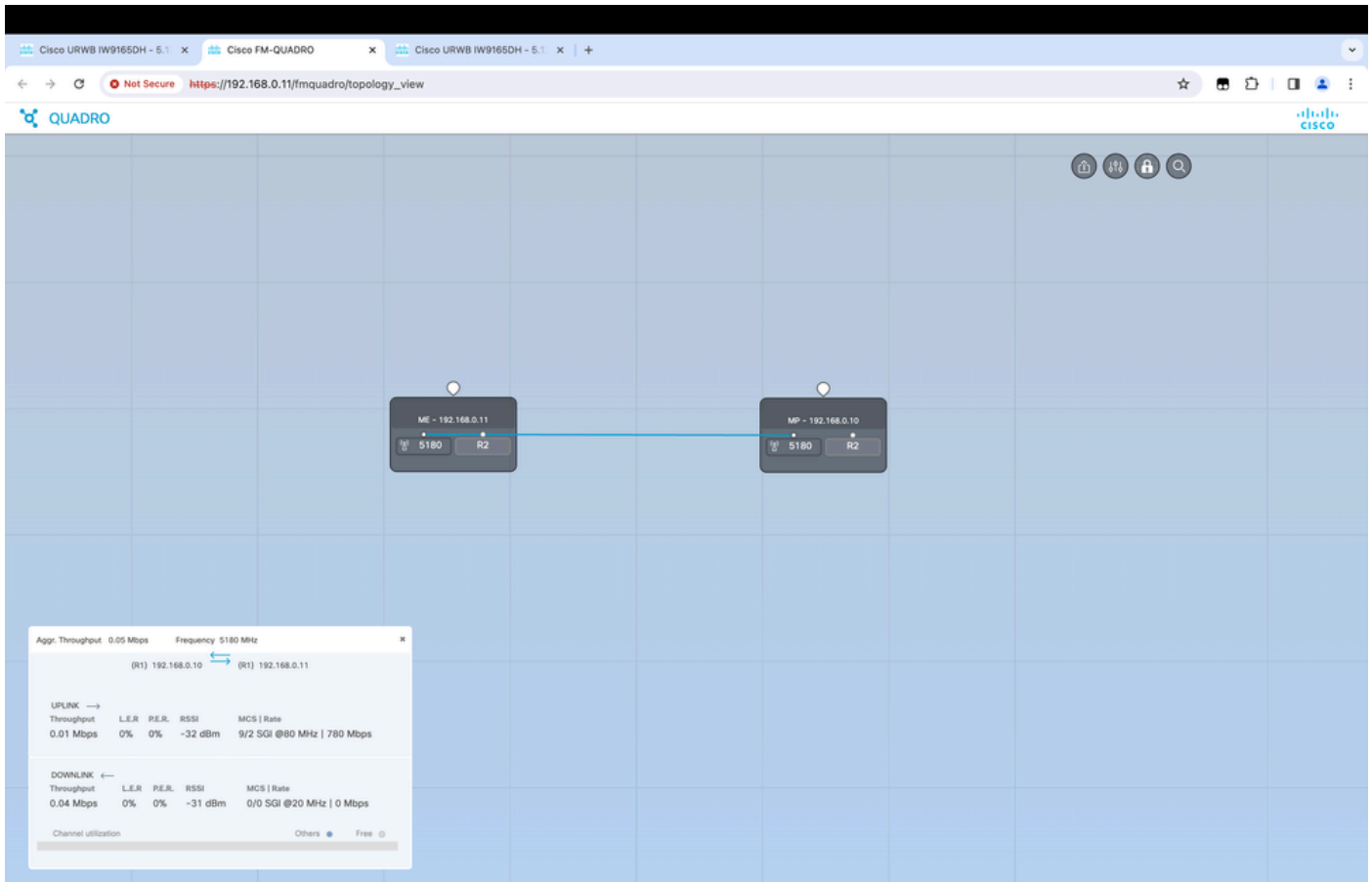
。

必须验证来自点对点链路两端的信号强度是否与RSSI值非常接近。



从FM Quadro监控

有关链路性能的详细信息，请参阅FM-Quadro页面。这样可以提供链路的实时质量，包括链路错误率(LER)、数据包错误率(PER)、RSSI、吞吐量MCS、空间流、工作频率等。



流动性

Cisco Fluidity (以前称为Fluidmesh Fluidity) 网络架构基于Prodigy 2.0。这是一种基于多协议标签交换(MPLS)的技术，用于传输IP封装的数据。

在Cisco超可靠无线回程移动网络场景中，切换过程可以同化为一个网络拓扑变化，其中现有链路中断并创建新链路。但是，用于检测更改和重新配置节点的行业标准机制速度太慢，并且数据密集程度太高，无法在受限的实时场景（例如高速移动）中提供足够的性能。特别是，需要将重新配置延迟和交换的消息数降至最低，以减少在此过程中丢失数据包的任何机会。为了缓解上述问题，Fluidity实施了一个快速切换解决方案，该解决方案提供非常快速的路径重新配置，延迟为1毫秒级。主动机制是网络现有控制平面的扩展，基于有关节点MPLS FIB表的特定操作技术。

流动性方案允许移动节点和连接到它们的客户端设备在整个移动过程中保持其IP地址。此外，所有节点都是单个第2层网状网络的一部分。

配置流动性

拓扑：两个IW9165D AP通过无线连接，IW9167作为使用第2层流动性的交通工具

1. 与点对点链路一样，我们需要配置General mode页面。请注意，CURWB L2流量网络的集群只有一个网状网端。在此网络中，两个IW9165D之间没有光纤连接。它们通过无线接口1的点对点无线回传链路连接。该小型流动网络的网状端是物理连接到核心网络的IW9165D。然后将集群中的所有其他无线电（包括车辆）配置为网状点。在此拓扑中，我们有1个网状终端和1个网状点，形成了点对点链路，并将IW 9167AP作为载体（配置为网状点）。

2. 无线电1配置用于点对点链路，无线电2需要配置用于轨道侧和车辆无线电的流动性。对于车载无线电，只有一个接口配置了流动性，但禁用了第二个无线电。

The screenshot displays the Cisco URWB IW9165DH Configurator interface. The top left features the Cisco logo and the text "ULTRA RELIABLE WIRELESS BACKHAUL". The top right shows the device name "Cisco URWB IW9165DH Configurator" and the IP address "5.137.250.148 - MESH END MODE".

On the left sidebar, there are three main sections: "IOTOD IW" (Offline), "IW-MONITOR" (Enabled), and "FM-QUADRO". Below these are several menu items categorized under "GENERAL SETTINGS", "NETWORK CONTROL", "ADVANCED SETTINGS", and "MANAGEMENT SETTINGS".

The main content area is titled "WIRELESS RADIO" and contains the following sections:

- Wireless Settings:** A text box for "Shared Passphrase" with masked characters (●●●●●●●●) and a "Show passphrase" checkbox. A note explains that the passphrase must be the same for all units in the network.
- Radio 1 Settings:** Includes "Role" (Fixed), "Frequency (MHz)" (5180), and "Channel Width (MHz)" (20).
- Radio 2 Settings:** Includes "Role" (Fluidity), "Frequency (MHz)" (5745), and "Channel Width (MHz)" (20).

At the bottom of the main content area, there are "Reset" and "Save" buttons. The footer contains the copyright notice: "© 2023 Cisco and/or its affiliates. All rights reserved."

3. 在“高级设置”(Advanced Settings) > “流动性”(Fluidity)页面中，需要将覆盖车辆的轨道旁无线电配置为基础设施。另一方面，车辆无线电(IW 9167)需要配置为车辆。

IOTOD IW

Offline

IW-MONITOR

Enabled

FM-QUADRO

GENERAL SETTINGS

- general mode
- wireless radio
- antenna alignment and stats

NETWORK CONTROL

- advanced tools

ADVANCED SETTINGS

- advanced radio settings
- static routes
- allowlist / blocklist
- multicast
- snmp
- radius
- ntp
- ethernet filter
- l2tp configuration
- vlan settings
- Fluidity
- misc settings
- smart license

MANAGEMENT SETTINGS

- remote access
- firmware upgrade
- status
- configuration settings
- reset factory default
- reboot
- logout

FLUIDITY

Fluidity Settings

The unit can operate in 3 modes: Infrastructure, Infrastructure (wireless relay), Vehicle.

The unit must be set as Infrastructure when it acts as the entry point of the infrastructure for the mobile vehicles and it is connected to a wired network (backbone) which possibly includes other Infrastructure nodes. The unit must be set as Infrastructure (wireless relay) ONLY when it is used as a wireless relay agent to other Infrastructure units. In this operating mode, the unit MUST NOT be connected to the wired network backbone as it will use the wireless connection to relay the data coming from the mobile units.

The unit must be set as Vehicle when it is mobile. Vehicle ID must be set ONLY when the unit is configured as Vehicle. Specifically, Vehicle ID must be a unique among all the mobile units installed on the same vehicle. Unit installed on different vehicles must use different Vehicle IDs.

The Network Type filed must be set according to the general network architecture. Choose Flat if the mesh and the infrastructure networks belong to a single layer-2 broadcast domain. Use Multiple Subnets if they are organized as different layer-3 routing domains.

Unit Role: Infrastructure

Network Type: Flat

The following advanced settings allow to fine-tune the performance of the system depending on the specific environment. Please do not alter this settings unless you have read the manual first and you know what you are doing.

The Handoff Logic controls the algorithm used by a mobile radio to select the best infrastructure point to connect to. In Normal mode, the point providing the strongest signal is selected. In Load Balancing mode, the mobile radio prefers the point which provides the best balance between signal strength and amount of traffic carried.

Handoff Logic: Standard

Reset

Save

IOTOD IW

Offline

IW-MONITOR

Enabled

GENERAL SETTINGS

- general mode
- wireless radio
- antenna alignment and stats

NETWORK CONTROL

- advanced tools

ADVANCED SETTINGS

- advanced radio settings
- static routes
- allowlist / blocklist
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- logout

FLUIDITY

Fluidity Settings

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The unit must be set as Vehicle when it is mobile. Vehicle ID must be set ONLY when the unit is configured as Vehicle. Specifically, Vehicle ID must be a unique among all the mobile units installed on the same vehicle. Unit installed on different vehicles must use different Vehicle IDs.

The Network Type filed must be set according to the general network architecture. Choose Flat if the mesh and the infrastructure networks belong to a single layer-2 broadcast domain. Use Multiple Subnets if they are organized as different layer-3 routing domains.

Unit Role:

Automatic Vehicle ID: Enable

Network Type:

The following advanced settings allow to fine-tune the performance of the system depending on the specific environment. Please do not alter this settings unless you have read the manual first and you know what you are doing.

The Handoff Logic controls the algorithm used by a mobile radio to select the best infrastructure point to connect to. In Normal mode, the point providing the strongest signal is selected. In Load Balancing mode, the mobile radio prefers the point which provides the best balance between signal strength and amount of traffic carried.

Handoff Logic:

Reset

Save

4. 如果使用2x2 MIMO，请选择天线编号作为ab-antenna。

- 对于IW 9167，如果使用2x2 MIMO并且使用接口1，请使用天线端口3和4。如果针对接口2进行了配置，请使用天线端口5和6。

IOTOD IW Offline
IW-MONITOR Enabled

- GENERAL SETTINGS
 - general mode
 - wireless radio
 - antenna alignment and stats
- NETWORK CONTROL
 - advanced tools
- ADVANCED SETTINGS
 - advanced radio settings
 - static routes
 - allowlist / blocklist
 - snmp
 - radius
 - ntp
 - ethernet filter
 - l2tp configuration
 - vlan settings
 - Fluidity
 - misc settings
- MANAGEMENT SETTINGS
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ADVANCED RADIO SETTINGS

Radio 1

FluidMAX Management

Force the FluidMAX operating mode of this unit. If the operating mode is Primary/Secondary a FluidMAX Cluster ID can be set. If the FluidMAX Autoscan is enabled, the Secondary units will scan the frequencies to associate with the Primary with the same Cluster ID. In this case, the frequency selection on the Secondarys will be disabled.

Radio Mode: OFF

Max TX Power

Select the max power level that the radio shall use to transmit (power level 1 sets the highest transmit power). The Cisco URWB TPC (Transmit Power Control) will automatically select the optimum transmission power according to the channel condition while not exceeding the MAX TX Power parameter. Note: in Europe TPC is automatically enabled.

Select TX Max Power:

Antenna Configuration

Select radio 1 antenna gain and antenna number.

Select Antenna Gain:

Antenna number:

Data Packet Encryption

Enable AES to cypher all wireless traffic. This setting must be the same on all the Cisco URWB units.

Enable AES:

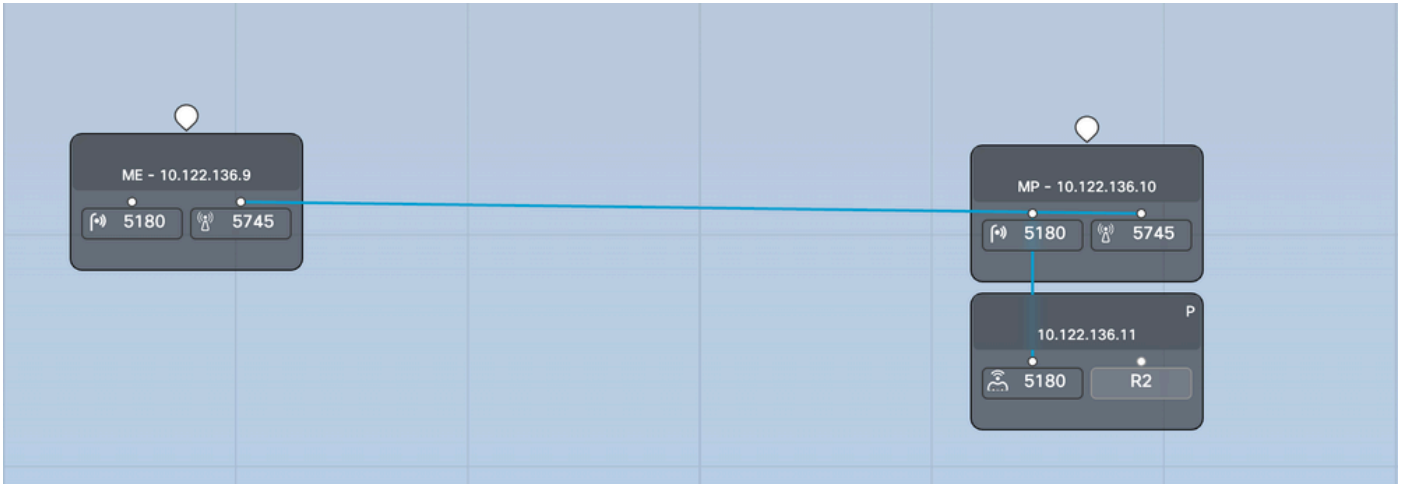
Maximum link length

Insert the length of the longest link in the net, or let the system select an optimal value.

Distance:

Unit: Km Miles

5. 配置完每个设置后，保存配置，最后应用更改。AP重新启动，一旦无线电重新联机，我们可以从Antenna alignment页面检查RSSI，并从FM-Quadro页面监控实时连接。



Cisco URWB IW9167EH Configurator

5.246.2.120 - MESH POINT MODE

IOTOD IW

Offline

IW-MONITOR

Enabled

GENERAL SETTINGS

- general mode
- wireless radio
- antenna alignment and stats

NETWORK CONTROL

- advanced tools

ADVANCED SETTINGS

- advanced radio settings

ANTENNA ALIGNMENT AND STATS

Detected Links - Local Radio 1

Remote Unit	Remote Radio	Signal Strength	Alignment
5.137.250.148	1	-67 dBm (100%)	Align
5.137.250.80	1	-52 dBm (100%)	Align

Detected Links - Local Radio 2

NO Link Available

关于此翻译

思科采用人工翻译与机器翻译相结合的方式将此文档翻译成不同语言，希望全球的用户都能通过各自的语言得到支持性的内容。

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