

在CURWB模式下配置AP的第2層流動性並對其進行故障排除

目錄

[簡介](#)

[採用元件](#)

[什麼是流動性？](#)

[配置流動性：](#)

[通過GUI配置第2層流動性：](#)

[通過CLI配置第2層流動性：](#)

[跟蹤端配置：](#)

[車輛配置：](#)

[故障排除流動性：](#)

[訊號強度的物理問題：](#)

[高通道利用率：](#)

[吞吐量問題：](#)

[延遲問題：](#)

[故障排除工具：](#)

簡介

本文檔介紹CURWB裝置的第2層流量設定的配置，並提供排除網路故障的指導。

採用元件

該配置涉及四個不同的硬體元件：

- Cisco Catalyst IW9167
- Cisco Catalyst IW9165E
- FM4200F
- FM3500

本文中的資訊是根據特定實驗室環境內的裝置所建立。文中使用到的所有裝置皆從已清除（預設）的組態來啟動。如果您的網路運作中，請確保您瞭解任何指令可能造成的影響。

什麼是流動性？

在CURWB中，Fluidity是基於使用多重協定標籤交換(MPLS)技術來傳送IP封裝資料的網路架構。

在Cisco超可靠無線回程行動網路場景中，切換過程類似於網路拓撲更改，即現有鏈路被斷開，並且建立了新鏈路。

但是，傳統的檢測更改和重新配置節點的行業機制通常速度太慢，而且需要大量資料，無法在即時場景（如高速移動）中保持最佳效能。

為了應對這些挑戰，Fluidity實施了一個快速切換解決方案，該解決方案提供了低至1毫秒延遲的快速路徑重新配置。

此主動機制擴展了網路的現有控制平面，利用針對節點MPLS FIB表的特定操作技術。

在Fluidity方案中，移動節點在相互檢測時與軌道邊無線電建立偽線。當車輛沿軌道移動時，它基於各種流動性引數開始從一個軌道側到另一個的越區切換。

這可確保板載客戶端裝置在整個移動過程中保持其IP地址，並且所有節點都整合到單個第2層網狀網路中。

配置流動性：

拓撲：一個IW9167 AP和一個FM3500無線電，用作軌道邊或路邊無線電。這兩家公司為車輛提供保險。它們通過乙太網電纜連線到核心網路。同時，我們有三輛車。一個FM4200F，一個FM3500，最後一個IW9165E充當車輛。

通過GUI配置第2層流動性：

1. GENERAL SETTINGS > General Mode: IW9167充當CURWB網路的輸入/輸出點，因此IW9167需要配置為網狀終端。其餘無線電裝置（包括車輛）必須處於網狀點模式。

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

GENERAL MODE

General Mode

Select MESH END mode if you are installing this Cisco Catalyst IW9167E Heavy Duty 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:

Enable IPv6:

Reset

Save

2. GENERAL SETTINGS > Wireless Radio:所有軌道端和車輛無線電需要共用相同的共用密碼、頻率和通道寬度。

IOTOD IW Offline
IW-MONITOR Enabled
FM-QUADRO

GENERAL SETTINGS

- general mode
- wireless radio
- antenna alignment and stats

NETWORK CONTROL

- advanced tools

ADVANCED SETTINGS

- 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

WIRELESS RADIO

Wireless Settings

"Shared Passphrase" is an alphanumeric string or special characters excluding [apex] "[double apex] "[backtick] "\$[dollar] "[equal] "\[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:

Frequency (MHz):

Channel Width (MHz):

Radio 2 Settings

Role:

3. 高級設定>流動性：為車輛提供覆蓋的軌道邊無線電需要配置為基礎設施。另一方面，需要將車輛無線電配置為車輛。



ULTRA RELIABLE
WIRELESS BACKHAUL

Cisco URWB IW9167EH Configurator 5.246.2.0 - MESH END MODE

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 field 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
- snmp
- radius
- ntp
- ethernet filter
- l2tp configuration
- vlan settings
- Fluidity
- misc settings

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 field 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. Advanced Settings > Advanced Radio Settings: 使用2x2 MIMO時，請選擇ab-antenna作為天線編號。

- 對於IW9167，如果對介面1使用2x2 MIMO，則連線到天線埠3和4。如果為介面2配置，則使用天線埠5和6。
- 對於IW9165D，介面1具有內建天線。如果連線外部天線，請使用介面2。



ULTRA RELIABLE
WIRELESS BACKHAUL

Cisco URWB IW9167EH Configurator

5.246.2.0 - MESH END MODE

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

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 Secondaries 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: 1

Antenna Configuration

Select radio 1 antenna gain and antenna number.

Select Antenna Gain: UNSELECTED

Antenna number: ab-antenna

Data Packet Encryption

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

Enable AES: Disabled

Maximum link length

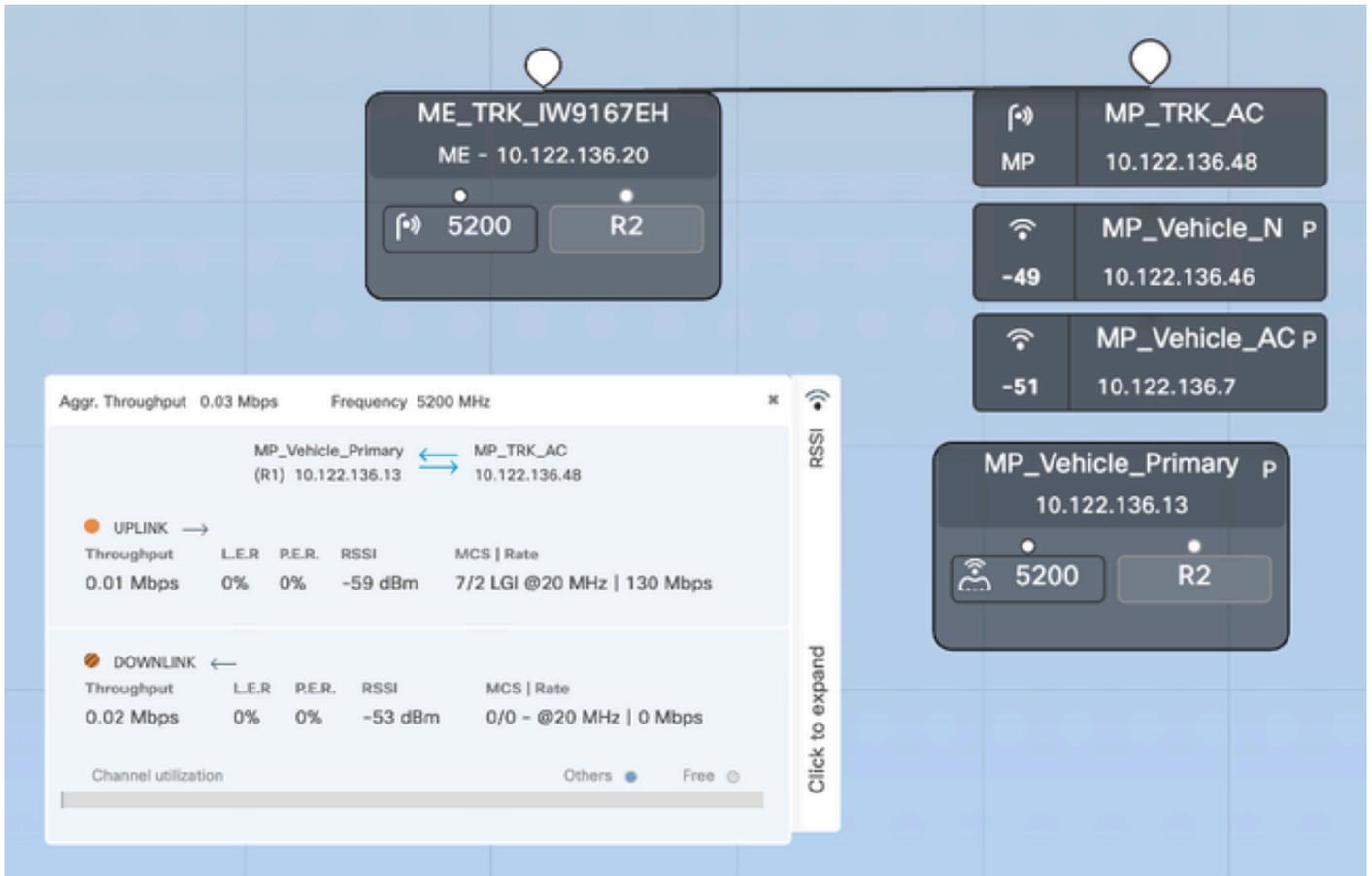
Insert the length of the longest link in the net, or let the system select an optimal value.

Distance: 3

Unit: Km Miles

© 2024 Cisco and/or its affiliates. All rights reserved.

5. 正在完成配置：配置完所有設定後，儲存配置並應用更改。一旦接入點(AP)重新啟動且無線電重新聯機，您就可以從Antenna Alignment (天線對齊) 頁面檢查RSSI，並從FM-Quadro (調頻四頭) 頁面監控即時連線。





MP_TRK_AC FM3500 Configurator

5.1.88.75 - MESH POINT MODE

Sun Feb 23 15:02:10 EST 2025

RACER™ Offline

MONITOR™ On-Premises

GENERAL SETTINGS

- general mode
- wireless radio
- antenna alignment and stats

NETWORK CONTROL

- ping softdog
- advanced tools

ADVANCED SETTINGS

- advanced radio settings

ANTENNA ALIGNMENT AND STATS

Detected Links

Remote Unit	Signal Strength	Alignment
5.1.80.170	-43 dBm (100%)	Align
5.0.191.222	-45 dBm (100%)	Align
5.66.194.36	-58 dBm (100%)	Align

通過CLI配置第2層流動性：

跟蹤端配置：

```
ME_TRK_IW9167EH#configure modeconfig mode meshend
```

Note: Tracksides other than mesh end needs to be configured as “meshpoint”

```
ME_TRK_IW9167EH#configure ap address ipv4 static IP NETMASK GATEWAY DNS1 DNS2
ME_TRK_IW9167EH#configure dot11Radio 1 frequency 5180
ME_TRK_IW9167EH#configure dot11Radio 1 bandwidth 20
ME_TRK_IW9167EH#configure wireless passphrase URWB
ME_TRK_IW9167EH#configure dot11Radio 1 mode fluidity
ME_TRK_IW9167EH#configure fluidity id infrastructure
ME_TRK_IW9167EH#write
ME_TRK_IW9167EH#reload
```

車輛配置：

```
MP_V_IW9165E#configure modeconfig mode meshpoint
MP_V_IW9165E#configure ap address ipv4 static IP NETMASK GATEWAY DNS1 DNS2
MP_V_IW9165E#configure dot11Radio 1 frequency 5180
MP_V_IW9165E#configure dot11Radio 1 bandwidth 20
MP_V_IW9165E#configure wireless passphrase URWB
MP_V_IW9165E#configure dot11Radio 1 mode fluidity
MP_V_IW9165E#configure fluidity id vehicle-auto
MP_V_IW9165E#write
MP_V_IW9165E#reload
```

故障排除流動性：

在移動/流動性應用中，可能會出現各種問題，例如低於預期的吞吐量、間歇性連線、延遲挑戰和干擾。

訊號強度的物理問題：

- 確保使用支援CURWB的天線，按照建議的準則正確連線到無線電，並且朝向正確的方向。
- 確認覆蓋範圍在整個跟蹤範圍內都足夠重疊。
- 保持無線電裝置的直接視線。

高通道利用率：

- 通過戰略性的RF規劃減少干擾。
- 利用具有頻率掃描的多頻率部署實現無縫切換，每輛車需要兩個無線電。
- 確保無線電在相同高度上至少相隔10英尺，並且在同一無線電之間保持至少3英尺以避免來自附近裝置的干擾。

吞吐量問題：

吞吐量問題可能由多個因素導致：

- 強訊號強度對於最佳吞吐量至關重要；較弱訊號會降低調制速率和吞吐量。目標訊號強度在-45 dBm和-70 dBm之間。

- 高通道利用率也會導致吞吐量降低。

延遲問題：

延遲問題（特別是在敏感應用程式中）可能是由以下原因造成的：

- 沿軌道訊號強度不足。
- 影響頻率效能的干擾。
- 無線電和交換機上需要服務品質(QoS)配置。
- 需要根據PLC配置進行驗證和微調的流動性設定。

故障排除工具：

IW監控器是監測網路流動效能的有效工具。在發生故障時，利用有關RSSI、抖動、延遲、LER和PER的歷史資料來診斷根本原因。

關於此翻譯

思科已使用電腦和人工技術翻譯本文件，讓全世界的使用者能夠以自己的語言理解支援內容。請注意，即使是最佳機器翻譯，也不如專業譯者翻譯的內容準確。Cisco Systems, Inc. 對這些翻譯的準確度概不負責，並建議一律查看原始英文文件（提供連結）。