在工業無線(IW)存取點上配置點對點和第2層流量

目錄

簡介

本文檔介紹以CURWB模式運行的IW AP上的點對點鏈路配置以及第2層流量配置。

採用元件

有四種不同的硬體：

- Cisco Catalyst IW9167
- Cisco Catalyst IW9165D
- Cisco Catalyst IW9165E

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。

背景資訊

CURWB硬體透過固定和移動架構提供無線回傳。 本檔案介紹以CURWB模式執行的工業無線存取點(IW AP)上點對點連結的組態，以及流量第2層組態。

使用IW9165D配置點到點鏈路

1. 可以從IoT Operations Dashboard (IoT OD)或從AP Web介面手動配置無線電。在本文中，我們手動配置所有無線電。
2. 在初始設定期間，可能需要控制檯訪問。要連線到控制檯，如果軟體版本是17.12.1或更高版本，請使用115200波特率。
3. 預設情況下，所有無線電都處於IOT-OD聯機模式。發出此命令以驗證AP的狀態。

```
show iotod-iw status
```

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

如果已將AP配置為與IoT OD通訊，則使用此命令可將AP上的模式更改為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. 將無線電配置為離線模式後，可以使用預設IP地址192.168.0.10訪問Web GUI。
5. 在GUI中，從General Settings > General Mode頁為無線電配置點對點鏈路。

一般模式

- 無線電模式(頭端（連線到有線基礎設施）需要配置為網狀終端，而遠端配置為網狀點)

-IP 位址

- 子網掩碼和網關

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IOTOD IW — Offline
IW-MONITOR — Enabled
FM-QUADRO

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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).

Mode:
○ mesh point
● mesh end
○ gateway

Radio-off: ☐

LAN Parameters

Local IP: 10.122.136.9

Local Netmask: 255.255.255.192

Default Gateway: 10.122.136.1

Local Dns 1:

Local Dns 2:

Reset   Save

配置引數後，儲存設定。

無線電

- 通常，對於IW9165，Radio 1配置為點對點回傳鏈路，因為這是定向內部天線。如果僅使用點對點應用程式，則需要停用第二個無線電。
- 兩個無線電需要配置相同的共用密碼、頻率和通道寬度。

Cisco URWB IW9165DH Configurator
5.137.250.148 - MESH END MODE

IOTOD IW `Offline`
IW-MONITOR `Enabled`
FM-QUADRO

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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 indentifies 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

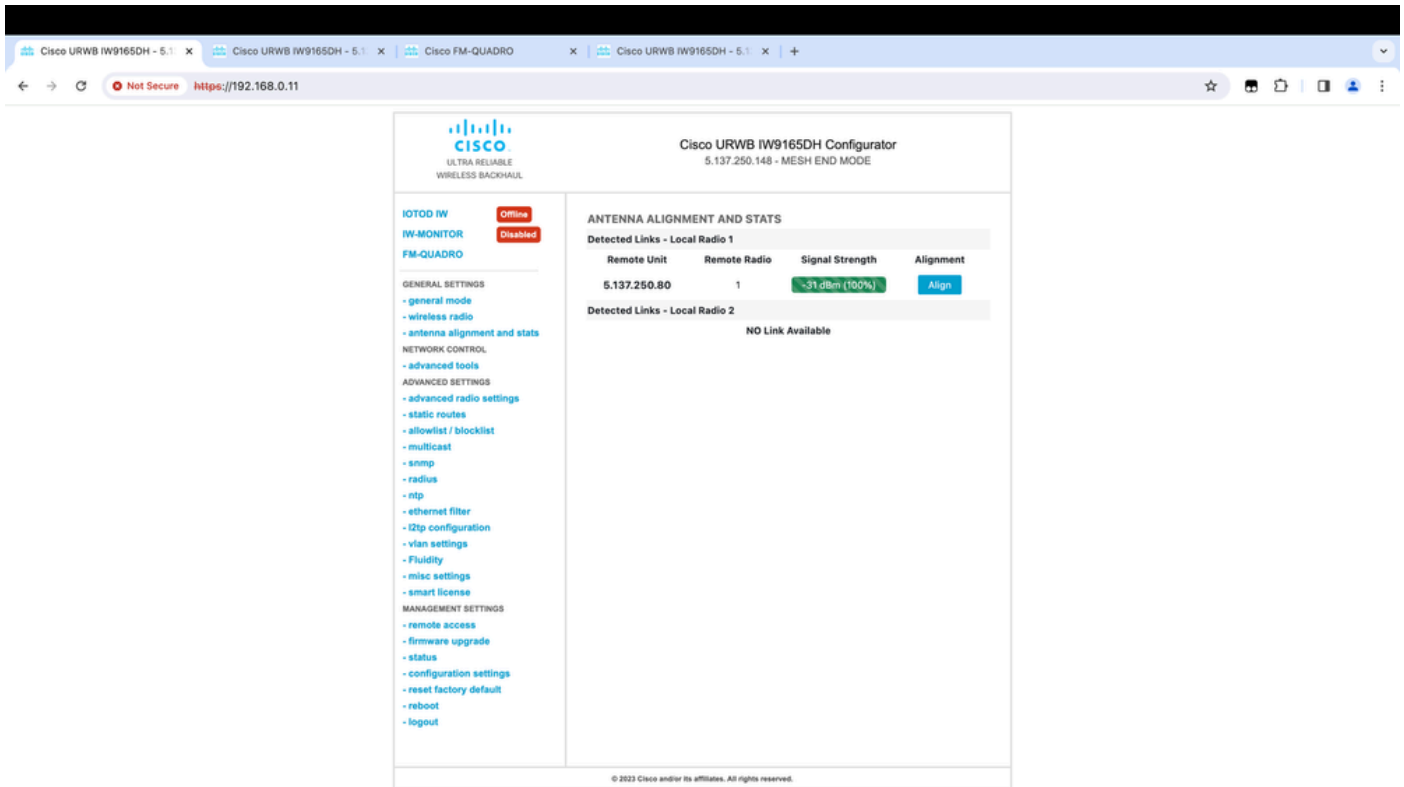**Radio 2 Settings**

Role: Disabled

Reset   Save

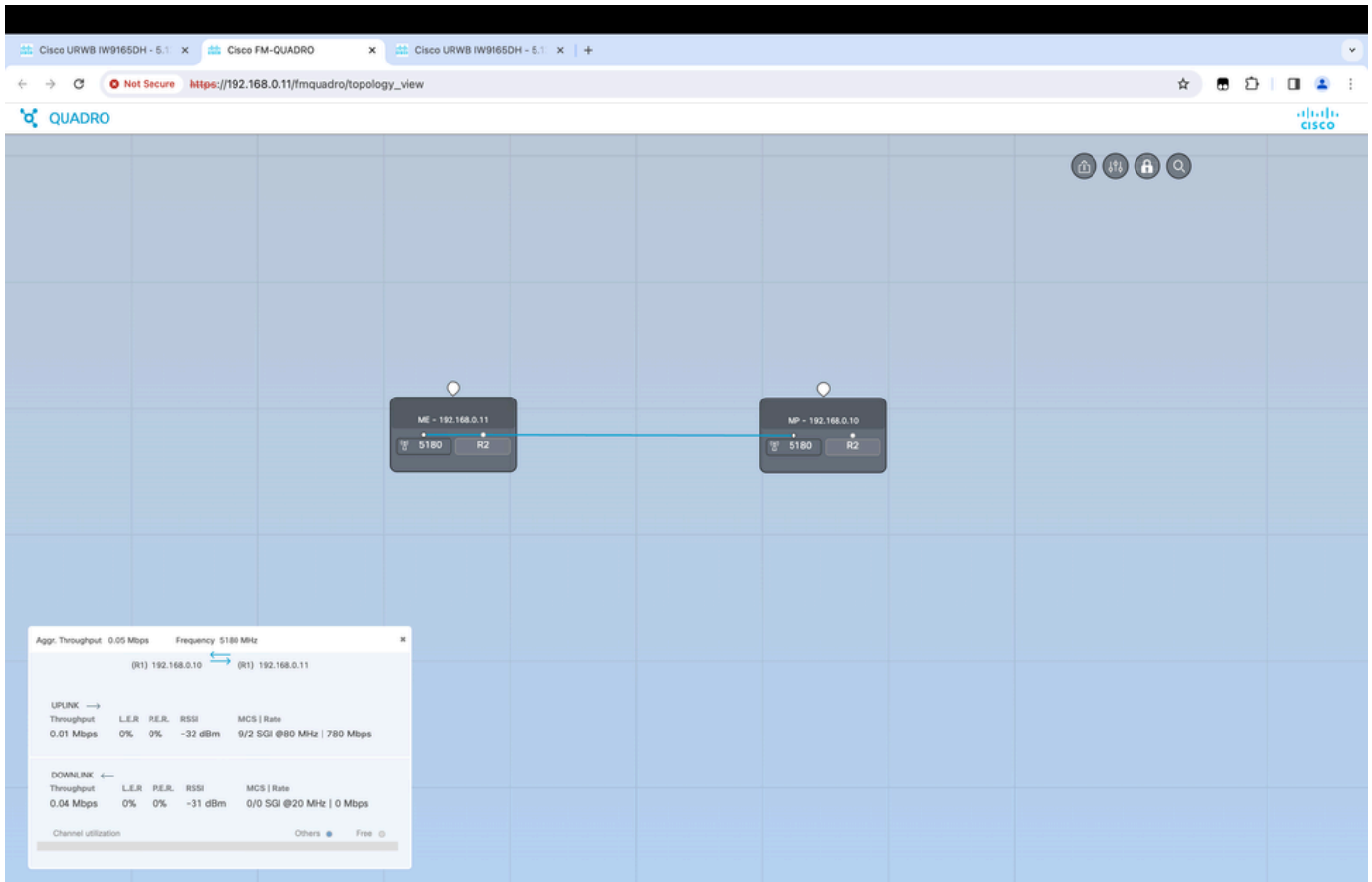配置頁面後，儲存兩個無線電上的設定並應用更改。這會重新啟動無線電，然後應用更改。

監控連線

無線電恢復後，可以檢查來自天線校準頁的訊號強度。建議的訊號強度在-45 dBm和-70 dBm之間。

務必驗證點對點鏈路兩端的訊號強度是否與RSSI值非常接近。

從FM Quadro監控

有關鏈路效能的詳細資訊，請參閱FM-Quadro頁面。這樣可提供鏈路的即時品質，包括鏈路錯誤率(LER)、資料包錯誤率(PER)、RSSI、吞吐量MCS、空間流、工作頻率等。

流動性

Cisco Fluidity（以前稱為Fluidmesh Fluidity）網路架構基於Prodigy 2.0。這是一種基於多協定標籤交換(MPLS)的技術，用於提供IP封裝資料。

在Cisco超可靠無線回程行動網路場景中，切換過程可以等同於網路拓撲變化，其中現有鏈路被破壞並建立了新鏈路。但是，檢測更改並重新配置節點的行業標準機制速度太慢，而且資料密集程度太高，無法在受限制的即時場景（如高速移動性）內提供足夠的效能。特別是，需要最小化重新配置延遲和交換的消息數，以減少在過程中丟失資料包的任何機會。為了緩解上述問題，Fluidity實施了一個快速切換解決方案，該解決方案提供了非常快速的路徑重新配置，延遲為1毫秒左右。主動機制是網路現有控制平面的擴展，基於有關節點MPLS FIB表的特定操作技術。

流動性方案允許移動節點和連線到它們的客戶端裝置在整個移動過程中保持其IP地址。此外，所有節點都是第2層網狀網路的一部分。

配置流動性

拓撲：兩個透過無線連線的IW9165D AP和IW9167作為使用第2層流動性的交通工具

1. 就像點對點連結一樣，我們需要設定「一般」模式頁面。請注意，CURWB L2流動網路的集群只有一個Mesh端。在此網路中，兩個IW9165D之間沒有光纖連線。它們透過無線介面1的點對點無線回程鏈路連線。該小型流動網路的網狀端是物理連線到核心網路的IW9165D。然後，集群中的所有其他無線電（包括車輛）被配置為網狀點。 在此拓撲中，我們有1個網狀端和1個網狀點，形成點對點鏈路，IW 9167AP作為載體（配置為網狀點）。

2. 無線電1配置用於點對點鏈路，而無線電2需要配置用於軌道側和車輛無線電的流暢性。對於車載無線電，只有一個介面配置了流動性，但第二個無線電被停用。

3. 在「高級設定」(Advanced Settings) >「流動性」(Fluidity)頁面中，需要為車輛提供覆蓋範圍的軌道側無線電裝置配置為「基礎設施」(Infrastructure)。另一方面，車輛無線電(IW 9167)需要配置為車輛。

IOTOD IW `Offline`

IW-MONITOR `Enabled`

FM-QUADRO

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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 form 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**]

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IW-MONITOR `Enabled`

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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: `Vehicle ⌄`

Automatic Vehicle ID: ☑ Enable

Network Type: `Flat ⌄`

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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`

4. 如果使用2x2 MIMO，請選取天線編號作為ab-antenna。

- 對於IW 9167，如果使用2x2 MIMO並且使用介面1，則使用天線埠3和4。如果針對介面2進行了配置，請使用天線埠5和6。

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IW-MONITOR `Enabled`

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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: 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.
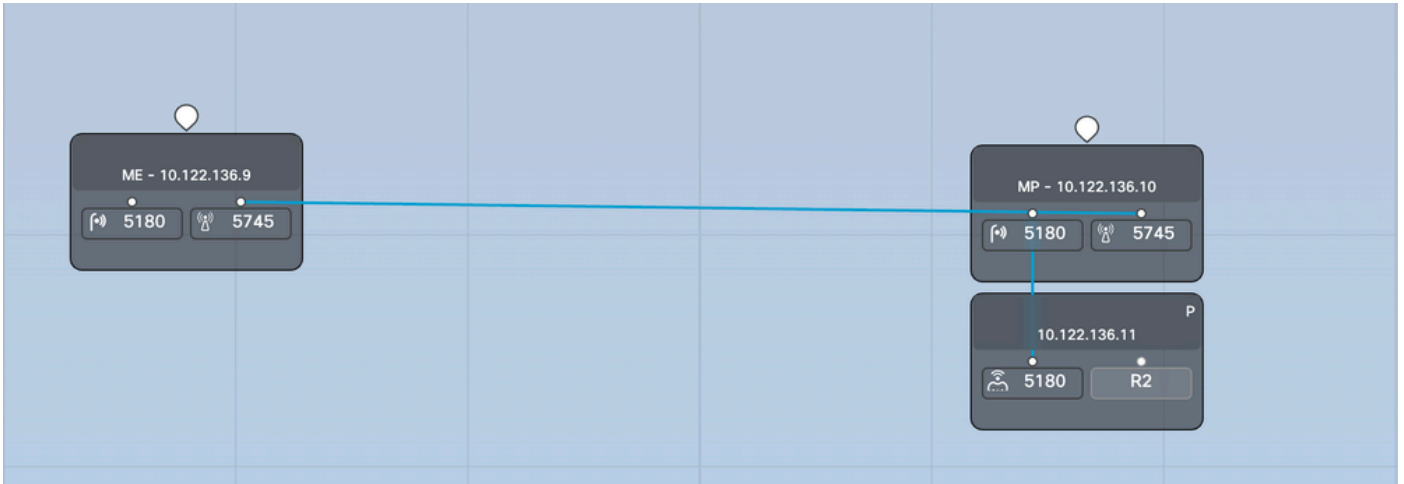
Enable AES: Disabled ⌄

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

5. 配置完每個設定後，儲存配置，最後應用更改。AP重新啟動後，無線電恢復線上後，我們可以從Antenna alignment頁面檢查RSSI，並從FM-Quadro頁面監控即時連線。

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