Configure Layer 2 Mesh Transparency in Industrial Wireless Access Points

Contents

Introduction

This document describes the functions and configuration of layer 2 mesh transparency features.

Layer 2 Mesh Transparency

Layer 2 Transparency is a feature available on the IW9165 and IW9167 Access Points with firmware version 17.12.1 and above.

This feature allows the option to either block or allow generic Layer 2 packets through the IW network. The Ether types on the packets traversing the IW network are detected automatically and reported.

It enables the seamless transmission of non-IP Layer 2 protocols across the wireless mesh network, extending the reach and capabilities of various industrial applications.

Ether type is a two-octet field in the Ethernet Frame that indicates what type of protocol is being encapsulated inside the payload.

Apart from reserved Ether types, users are allowed the option to allow specific Ether types, Layer 2 Ether types, and Ethernet-I packets. The packet filtering is done at the ingress/egress points of the MPLS Tunnels.

The egress point is always the Mesh End of the network, and the ingress points can be Mesh points in the Fixed Infrastructure setup or the Vehicle radios in the Fluidity setup.

Many industrial devices and systems rely on legacy protocols like Modbus, DNP3, or proprietary protocols that operate at Layer 2 of the OSI model. Layer 2 mesh transparency allows these devices to communicate seamlessly over the wireless mesh network, even if they are not IP-based.

CLI Configuration

Detecting and Adding Ether types

The Ether type for Profinet packets 0x8892 and the Ether type for QNet 0x8204 are allowed by default.

1. The list of detected Ether types can be displayed with the command below.

```
MP#show mpls ether-filter
Ether-type   Direction       Description
0x6002       INGRESS         ---
0x86DD       INGRESS         IPv6
0x8035       INGRESS         RARP
```

2. The detected Ether types or all available Ether types can be added with the commands below.

```
MP#config mpls ether-filter allow-list add 0x86DD
MP#write
MP#reload
```

```
MP#config mpls ether-filter allow-list add all
MP#write
MP#reload
```

3. The added ether type configuration can be checked from the running config.

```
MP#show run
```

```
Ethernet Filter allow-list: 0x8035 0x86dd 0x8899, ethernet-I block
```

4. Specific Ether types can be deleted from the allow-list as well.

```
MP#config mpls ether-filter allow-list delete 0x86DD
MP#write
MP#reload
```

5. The detected Ether types can also be cleared with the command below.

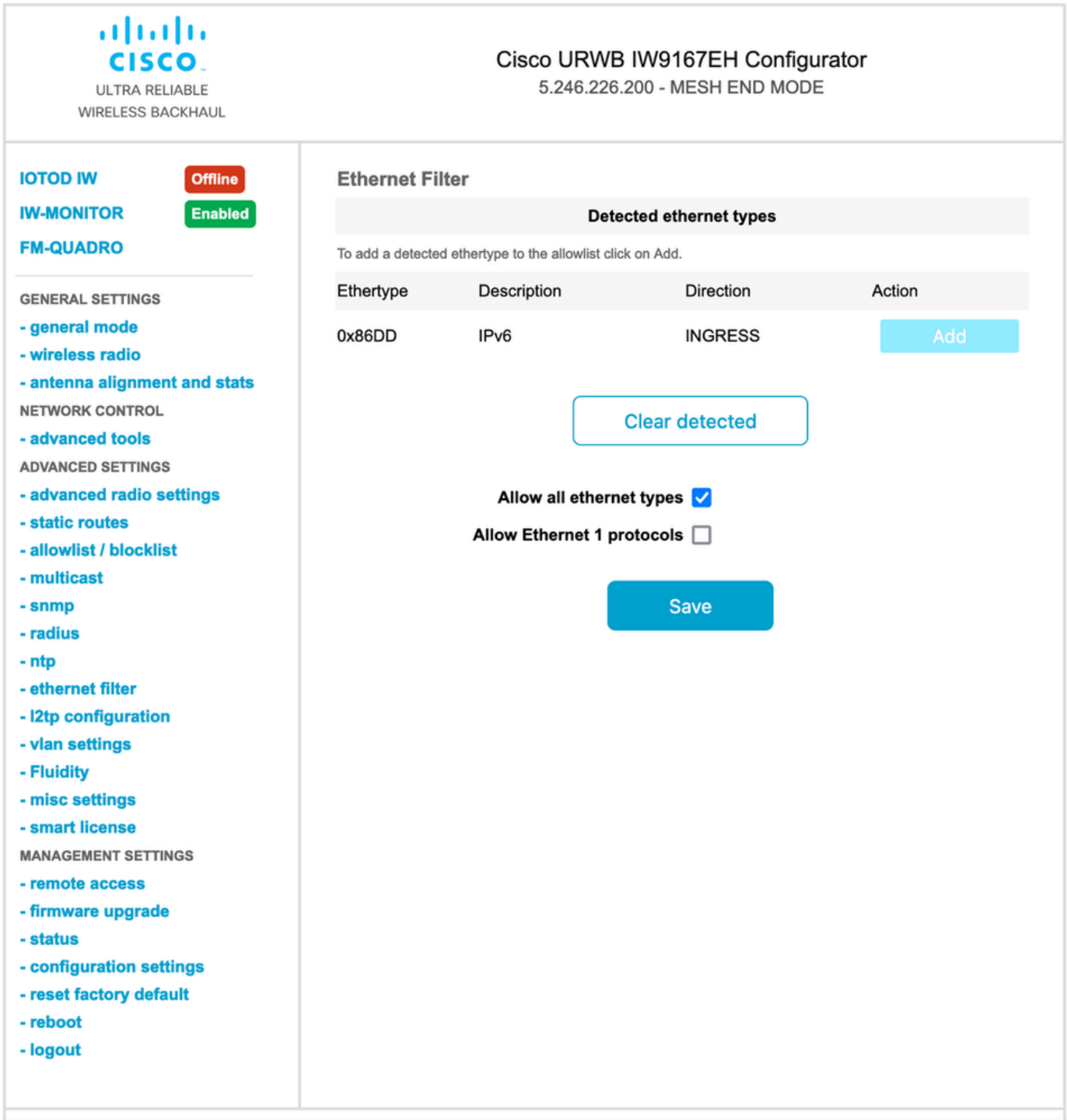
```
MP#config mpls ether-filter table clear
```

```
[ME_Primary#config mpls ether-filter table clear
[ME_Primary#
[ME_Primary#
[ME_Primary#show mpls ether-filter
 Ether-type   Direction       Description
 0x86DD       INGRESS         IPv6
```

GUI Configuration

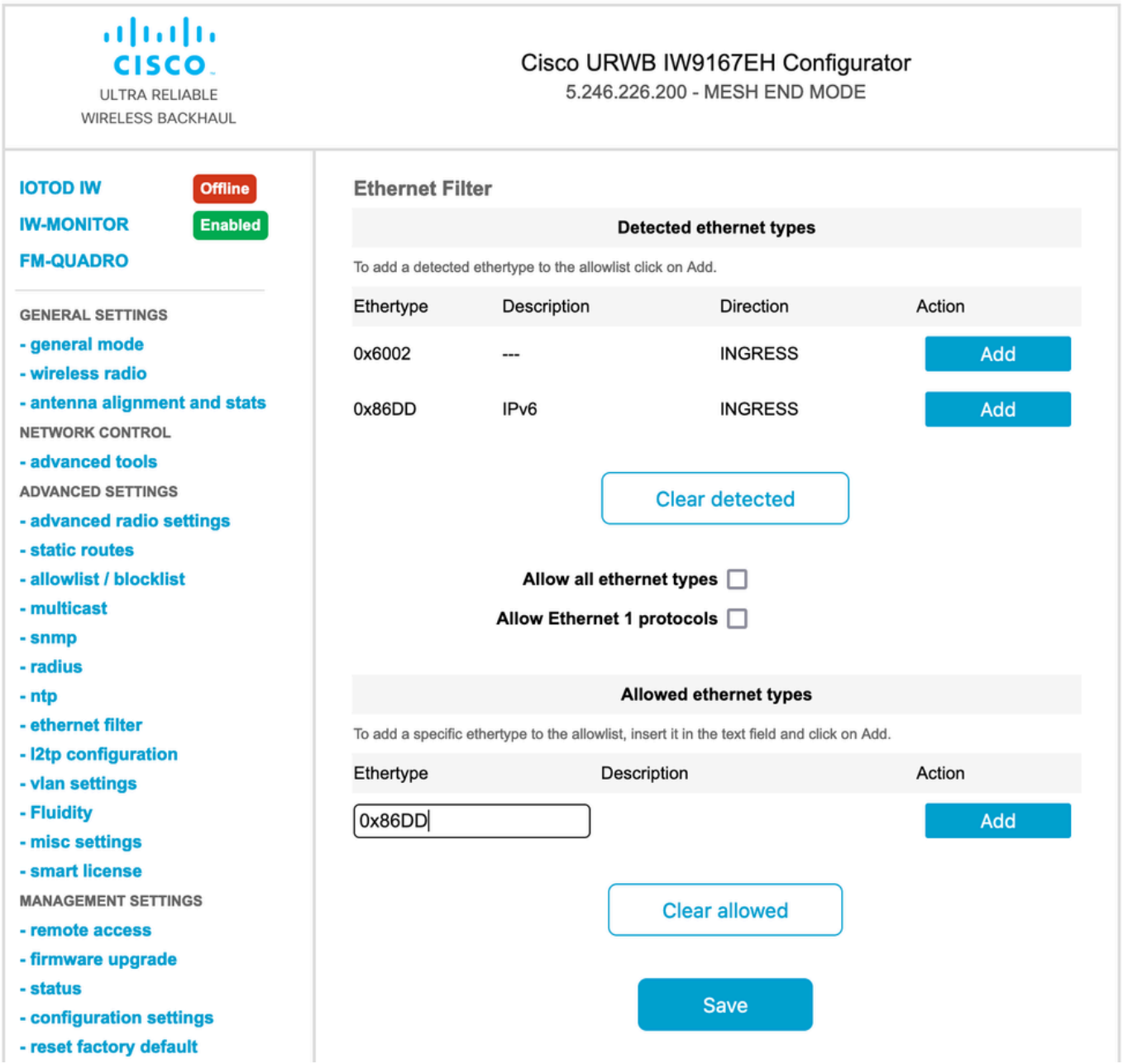
The same configuration can be from the GUI of the Access Point (in CURWB mode). Navigate to the **Ethernet filter** field under **Advanced Settings** on the side panel of the GUI.

Allowing all Ether types by selecting the check box for it.

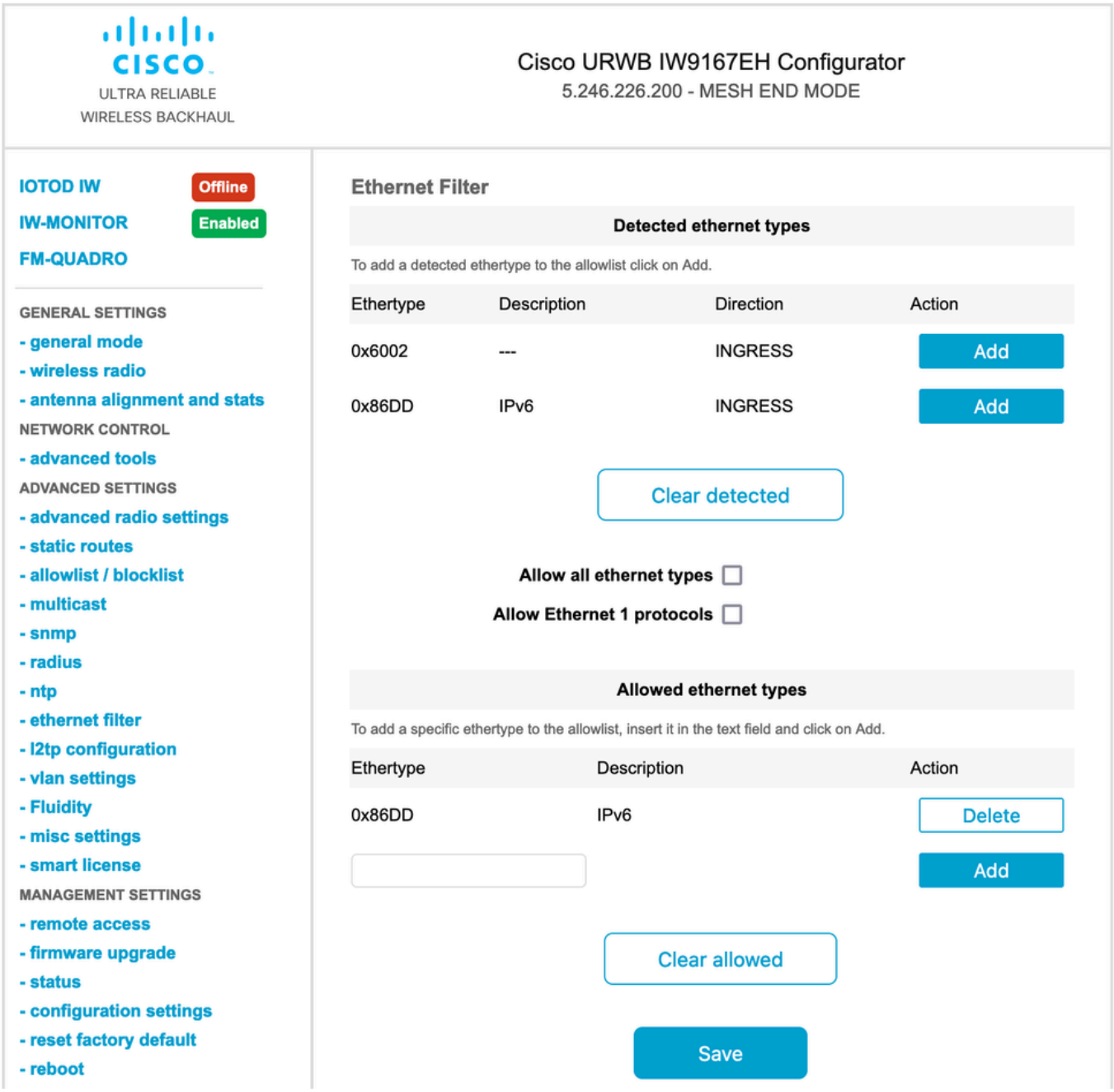


Allowing only certain Ether types

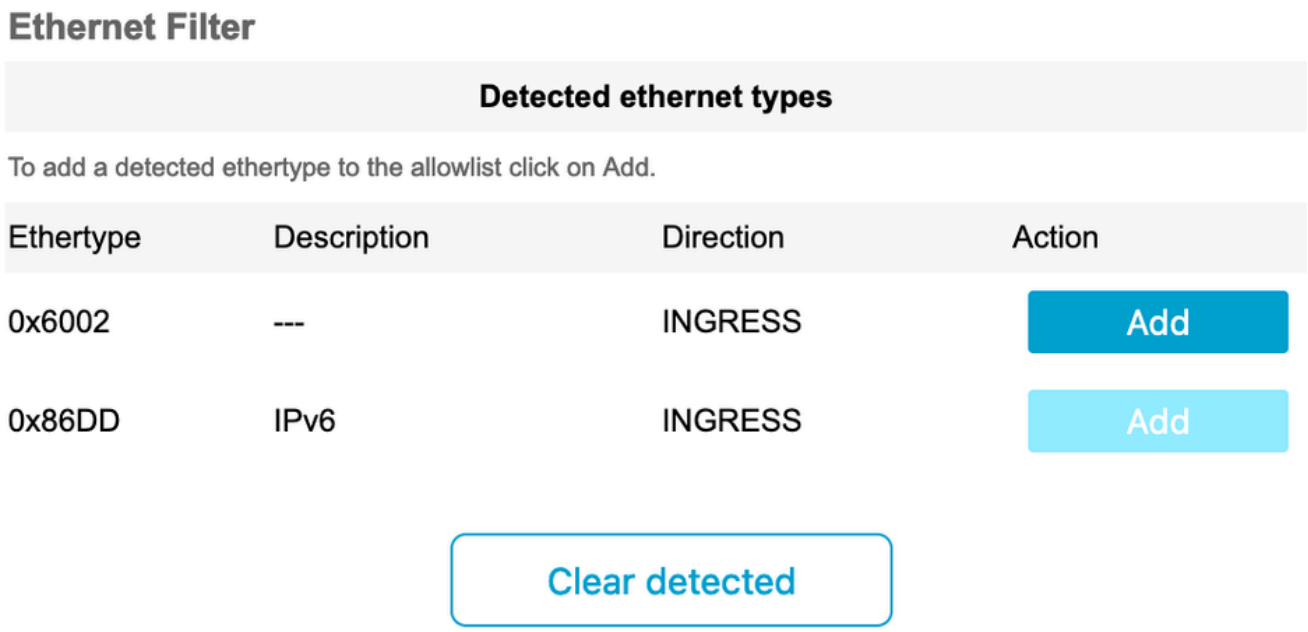
Uncheck the **Allow all ethernet types** option and add the required Ether type. Click **Save and Apply** to execute the changes.


CISCO
ULTRA RELIABLE
WIRELESS BACKHAUL
Cisco URWB IW9167EH Configurator
5.246.226.200 - 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
Ethernet Filter
Detected ethernet types
To add a detected ethertype to the allowlist click on Add.
Ethertype
Description
Direction
Action
0x6002

INGRESS
Add
0x86DD
IPv6
INGRESS
Add
Clear detected
Allow all ethernet types
Allow Ethernet 1 protocols
Allowed ethernet types
To add a specific ethertype to the allowlist, insert it in the text field and click on Add.
Ethertype
Description
Action
0x86DD
Add
Clear allowed
Save



Clear detected Ether types by clicking on the **Clear detected** option on the GUI



Reserved Ether types

Certain Ether types are reserved and cannot be added or deleted from the list.

Ether-type (range)	Forwardable	Notes
0x0000 – 0x05FF	User-configurable	Ethernet-I frames. STP and CDP are subject to other configuration options
0x0800	Yes	IPv4
0x0806	Yes	ARP (IPv4)
0x0900 – 0x09FF	No	Cisco URWB signaling protocols
0x8100	Yes	IEEE 802.1Q VLAN encapsulation
0x8847 – 0x8848	No	MPLS
0xFFFF	No	IANA reserved

Any attempt to use it results in an error as shown below:

```
ME_Primary#conf mpls ether-filter allow-list add 0x8847
error: ether-type 0x8847 is reserved
ME_Primary#
```

Ethernet 1 protocol

Ethernet 1 protocol can be blocked or allowed from the CLI or the GUI as well.

```
MP#config mpls ether-filter ethernet-I block

MP#write

MP#show run
```

Ethernet Filter allow-list: 0x86dd, ethernet-I block

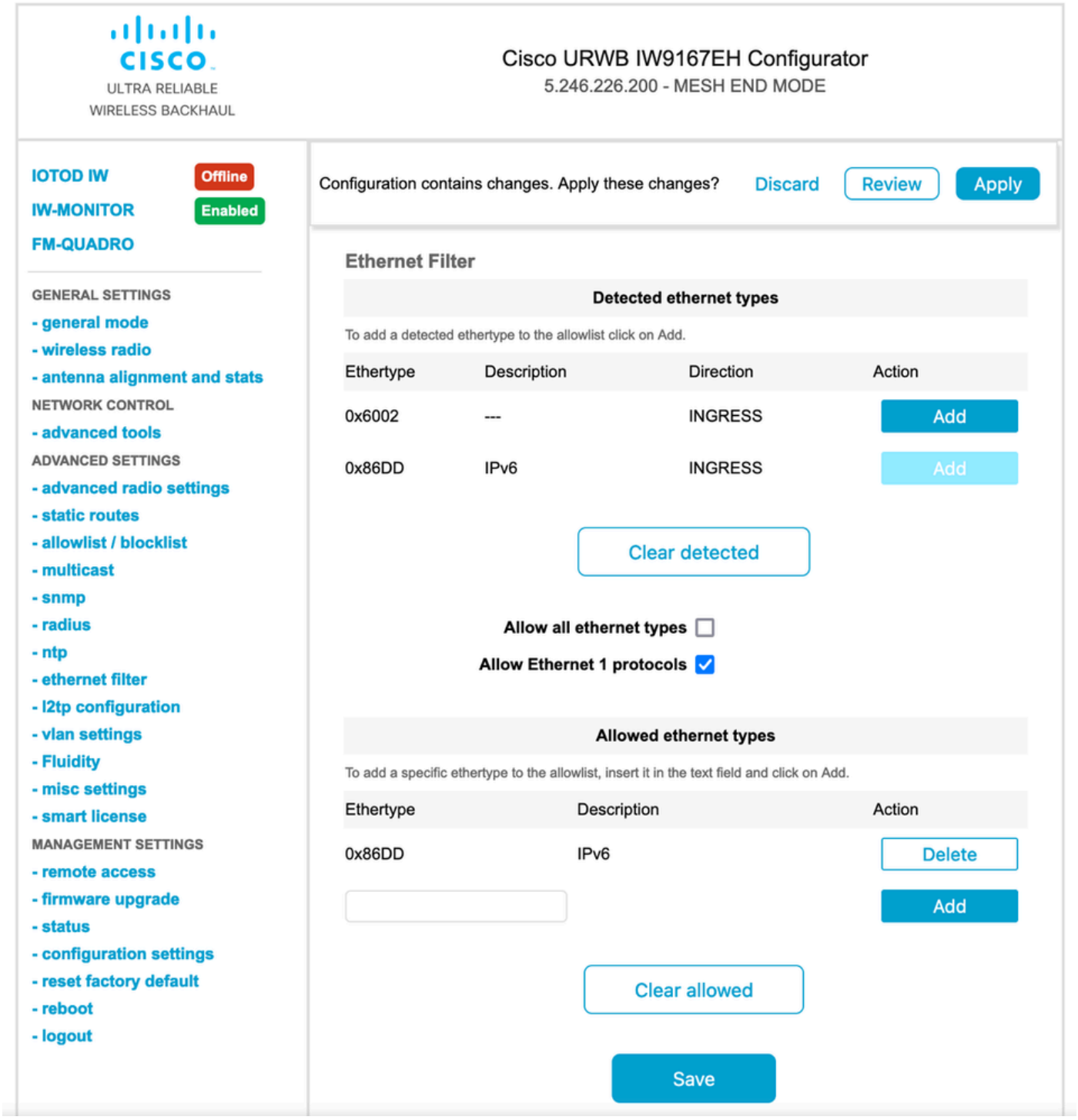
```
MP#config mpls ether-filter ethernet-I forward

MP#write

MP#show run
```

Ethernet Filter allow-list: 0x86dd, ethernet-I forward

From the GUI of the radio, the **Allow Ethernet 1 protocols** checkbox can be checked to allow and unchecked to block Ethernet 1 frames. Click **Save and Apply** for the change to be applied.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- smart license
MANAGEMENT SETTINGS
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- firmware upgrade
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- configuration settings
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- logout
Configuration contains changes. Apply these changes?
Discard
Review
Apply
Ethernet Filter
Detected ethernet types
To add a detected ethertype to the allowlist click on Add.
Ethertype
Description
Direction
Action
0x6002

INGRESS
Add
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INGRESS
Add
Clear detected
Allow all ethernet types
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Ethertype
Description
Action
0x86DD
IPv6
Delete
Add
Clear allowed
Save