



## Layer 2 Mesh Transparency

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## Overview of Layer 2 mesh transparency

From IEC6400 Release 1.1.0, the IEC6400 gateway supports Layer 2 Mesh Transparency feature. Layer 2 mesh transparency feature allows to forward non-IPv4 Layer 2 protocols across the URWB network by selectively filtering which ether-types are permitted. The selection of allowed ether-types can be performed from either the CLI or the GUI.

### Features of URWB MPLS Layer 2 mesh networks

The URWB mesh data plane supports these functionalities when used in MPLS Layer 2 mode:

- Detects and reports Ethertype present in the URWB network automatically.
- Supports the configurable list of Ethertypes allowed in the network.
- Manages transparency of Layer 2 protocols in a convenient manner.

### List of reserved Ethertypes

These Ethertypes are reserved and cannot be added to the allow list:

Ethertype (value)	Forwardable	Additional Information
0x0000 – 0x05FF	User-configurable	Ethernet-I frames: STP and CDP are subject to other configuration options
0x0800	Yes	IPv4
0x0806	Yes	ARP
0x0900 – 0x09FF	No	URWB signaling protocols
0x8100	Yes	IEEE 802.1Q VLAN encapsulation

Ethertype (value)	Forwardable	Additional Information
0x8847 – 0x8848	No	MPLS
0xFFFF	No	IANA reserved

#### Advantages of Layer 2 mesh transparency

- Provides detailed control over the forwarding of Layer 2 protocols.
- Ensures backward compatibility with existing deployments by default.
- Allows for full transparency to enable all Layer 2 protocols, if needed.
- Facilitates MAC address learning for generic Ethernet types.

## Manage Ethertypes using GUI

Perform these tasks to manage Layer 2 protocols parameters on the gateway:

### Add an Ethertype to allowed Ethernet list using GUI

#### Procedure

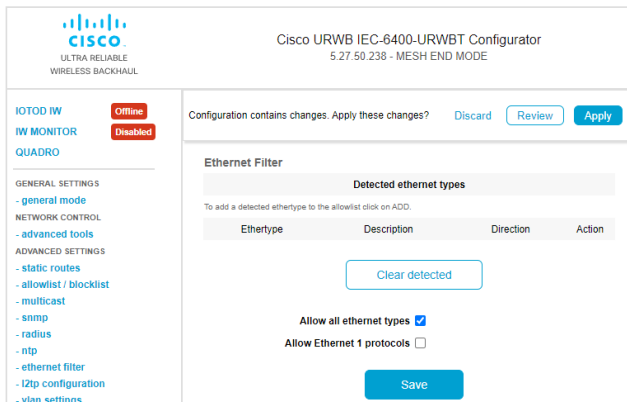
- 
- Step 1** Launch your computer's web browser and enter the URL to open the configurator login page.
- Step 2** Enter your username and password in the respective **Username** and **Enable Password** fields.
- Step 3** Click **Login**.  
Once you have successfully logged into the GUI, the URWB configurator is displayed.
- Step 4** From the **ADVANCED SETTINGS**, click **ethernet filter** to open the **Ethernet Filter** window.
- Step 5** In the **Detected ethernet types** section, click **Add** to add an Ethertype to the **Allowed ethernet types** section.
- Step 6** In the **Allowed ethernet types** section, to add an Ethertype that has not been detected yet, enter the specific Ethertype value in the text box and click **Add**.
- Step 7** Click **Save** and **Apply** to update the configuration.  
The gateway reboots to apply the changes.

The screenshot shows the Cisco URWB IEC-6400-URWB Configurator interface. The top header displays the Cisco logo and the text "Cisco URWB IEC-6400-URWB Configurator 5.27.50.238 - MESH END MODE". The left sidebar contains a navigation menu with sections: "IOTOD IW" (Offline), "IW MONITOR" (Disabled), "QUADRO", "GENERAL SETTINGS" (with sub-items: general mode, NETWORK CONTROL, advanced tools), "ADVANCED SETTINGS" (with sub-items: static routes, allowlist / blocklist, multicast, snmp, radius, ntp, ethernet filter, l2tp configuration, vlan settings, Fluidity, misc settings, smart license), and "MANAGEMENT SETTINGS" (with sub-items: remote access, status, configuration settings, local certificate, reset factory default, reboot, logout). The main content area is titled "Ethernet Filter". It features a "Detected ethernet types" section with a table header (Ethertype, Description, Direction, Action) and a "Clear detected" button. Below this are two checkboxes: "Allow all ethernet types" and "Allow Ethernet 1 protocols", both currently unchecked. The "Allowed ethernet types" section includes a table with headers (Ethertype, Description, Action) and two rows: one for "0x8892" with description "PROFINET" and a "Delete" button, and another for "0x8204" with description "QNX Qnet" and a "Delete" button. An "Add" button is at the bottom right of this section. There is also a "Clear allowed" button and a "Save" button at the very bottom.

## Allow all Ethertypes to the allow list using GUI

### Procedure

- Step 1** Launch your computer's web browser and enter the URL to open the configurator login page.
- Step 2** Enter your username and password in the respective **Username** and **Enable Password** fields.
- Step 3** Click **Login**.  
Once you have successfully logged into the GUI, the URWB configurator is displayed.
- Step 4** From the **ADVANCED SETTINGS**, click **ethernet filter** to open the **Ethernet Filter** window.
- Step 5** Check the **Allow all ethernet types** check box in the **Ethernet Filter** section to allow all Ethertypes.
- Step 6** Click **Save** and **Apply** to update the configuration.  
The gateway reboots to apply the changes.



## Clear list of allowed Ethertypes from the allowed Ethernet list using GUI

### Procedure

- Step 1** Launch your computer's web browser and enter the URL to open the configurator login page.
- Step 2** Enter your username and password in the respective **Username** and **Enable Password** fields.
- Step 3** Click **Login**.  
Once you have successfully logged into the GUI, the URWB configurator is displayed.
- Step 4** From the **ADVANCED SETTINGS**, click **ethernet filter** to open the **Ethernet Filter** window.
- Step 5** In the **Allowed ethernet types** section, click **Clear allowed** to clear all the Ethertypes from the **Allowed ethernet types** section.  
When you click **Clear allowed**, the **Allowed ethernet types** section is cleared.
- Step 6** Click **Save** and **Apply** to update the configuration.  
The gateway reboots to apply the changes.

## Delete list of detected Ethertypes in the detected Ethernet list using GUI

### Procedure

- Step 1** Launch your computer's web browser and enter the URL to open the configurator login page.
- Step 2** Enter your username and password in the respective **Username** and **Enable Password** fields.
- Step 3** Click **Login**.  
Once you have successfully logged into the GUI, the URWB configurator is displayed.
- Step 4** From the **ADVANCED SETTINGS**, click **ethernet filter** to open the **Ethernet Filter** window.
- Step 5** In the **Detected ethernet types** section, click **Clear detected** to clear all the detected Ethertypes from the list.

When you click **Clear detected**, the **Detected ethernet types** section is cleared.

## Manage Ethernet 1 protocols using GUI

### Procedure

- Step 1** Launch your computer's web browser and enter the URL to open the configurator login page.
- Step 2** Enter your username and password in the respective **Username** and **Enable Password** fields.
- Step 3** Click **Login**.  
Once you have successfully logged into the GUI, the URWB configurator is displayed.
- Step 4** From the **ADVANCED SETTINGS**, click **ethernet filter** to open the **Ethernet Filter** window.
- Step 5** Check the **Allow Ethernet 1 protocols** check box in the **Ethernet Filter** window to enable Ethernet 1 protocols.
- Step 6** Click **Save** and **Apply** to update the configuration.  
The gateway reboots to apply the changes.

The screenshot shows the Cisco URWB IEC-6400-URWBT Configurator interface. The top header displays the Cisco logo and the device name. The left sidebar contains a navigation menu with categories like IOTOD IW, IW MONITOR, QUADRO, GENERAL SETTINGS, NETWORK CONTROL, and ADVANCED SETTINGS. The main content area is titled 'Ethernet Filter' and contains the following elements:

- A status bar at the top indicating 'Configuration contains changes' with buttons for 'Discard', 'Review', and 'Apply'.
- A section for 'Detected ethernet types' with a 'Clear detected' button.
- Checkboxes for 'Allow all ethernet types' (unchecked) and 'Allow Ethernet 1 protocols' (checked).
- A section for 'Allowed ethernet types' with a table listing current entries and an 'Add' button.
- A 'Clear allowed' button.
- A 'Save' button at the bottom.

Ethertype	Description	Action
0x8892	PROFINET	Delete
0x8204	QNX Qnet	Delete

## Manage Ethertypes using CLI

Perform these tasks to manage Layer 2 protocols parameters on the gateway:

## Add an Ethertype to the allow list using CLI

Use the **mpls ether-filter allow-list add** *Ethertype value* command to add a specific Ethertype to the allow list.

```
Device#mpls ether-filter allow-list add 0x86DD
```

## Delete an Ethertype from the allow list using CLI

Use the **mpls ether-filter allow-list delete** *Ether-type value* command to delete a specific Ethertype from the allow list.

```
Device#mpls ether-filter allow-list delete 0x86DD
```

## Verify list of allowed Ethertypes using CLI

Use the **mpls** command to view the list of allowed Ethertypes from the Ethernet filter allow list.

```
Device#mpls
.
.
.
Ethernet Filter allow-list: 0x8892 0x8204 0x86dd, ethernet-I block
.
.
.
```




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**Note** If Ethernet-I is enabled, the **mpls** show output is shown with **Ethernet Filter allow-list: 0x8892 0x8204 0x86dd**.

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## Clear all Ethertypes from the allow list using CLI

Use the **mpls ether-filter allow-list clear** command to delete all the detected and allowed Ethertypes from the allow list.

```
Device#mpls ether-filter allow-list clear
```

## Verify removed Ethernet filter allow list status using CLI

Use the **mpls** command to view the Ethernet filter allow list.

```
Device#mpls
.
.
.
Ethernet Filter allow-list: none, ethernet-I block
.
.
.
```



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**Note** If the allowed ethertypes has been cleared the **mpls** show output is shown with **Ethernet Filter allow-list: none**.

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## Add all Ethertypes to the allow list using CLI

Use the **mpls ether-filter allow-list add all** command to add all the Ethertypes to allow list.

```
Device#mpls ether-filter allow-list add all
```

## Verify all Ethertypes in the allow list using CLI

Use **mpls** command to view the Ethernet filter allow list.

```
Device#mpls
.
.
.
Ethernet Filter allow-list: all, ethernet-I block
```



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**Note** If all Ethertypes are allowed, the **mpls** show output is shown with **Ethernet Filter allow-list: all**.

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## Enable Ethernet 1 protocol using CLI

Use the **mpls ether-filter ethernet-I forward** command to enable Ethernet 1 protocol.

```
Device#mpls ether-filter ethernet-I forward
```

## Block Ethernet 1 protocol using CLI

Use the **mpls ether-filter ethernet-I block** command to block the Ethernet 1 protocol.

```
Device#mpls ether-filter ethernet-I block
```

## Verify Ethernet 1 allowed Ethertypes using CLI

Use the **mpls** command to view the list of allowed Ethertypes from the Ethernet filter allow list.

```
Device#mpls
.
.
.
Ethernet Filter allow-list: 0x8892 0x8204 0x86dd, ethernet-I block
.
.
.
```




---

**Note** If Ethernet-I is enabled, the **mpls** show output is shown with **ethernet-I forward**.

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## Clear all detected Ethertypes using CLI

Use the **mpls ether-filter table clear** command to delete all the detected Ethertypes.

```
Device#mpls ether-filter table clear
```




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**Note** The detection process works in background after clearing the detected Ethernet types.

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## Verify list of detected Ethertypes using CLI

Use the **mpls ether-filter table** command to view the list of detected Ethertypes from the Ethernet filter allow list.

```
Device#mpls ether-filter table
Ether-type Direction Description
0x8899      INGRESS   ---
0x86DD      INGRESS   IPv6
```