

Network Interfaces

For all Mediatrix units

DGW 49.2.2941

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1 Basic Concepts

1.1 Important Information About Network Interfaces

Naming

- The name of the network interface is case sensitive.
- Using the special values All, Loop, LoopV6, and Rescue are not allowed to name a network interface
- A valid network interface name:
 - must start with a letter
 - cannot contain characters other than letters, numbers, and underscores

Configuration

- It is not possible to have different IP addresses from the same subnet on one interface.
- It is possible to create up to 48 network interfaces.
- LLDP cannot be activated on multiple network interfaces simultaneously.
- If no network is configured in IPv6, the unit does not have any IPv6 address, not even the Link-Local address. When a network is configured in IPv6, the Link-Local (FE80 ::...) address is automatically created and displayed in the Network Status information.
- In case of address conflicts between two or more network interfaces, the network interface with the highest priority will remain enabled and the other interfaces will be disabled. If the priority is the same, only the first enabled network interface will be able to use the IP address. When a conflict ends, all network interfaces concerned automatically return to an operational state.
- Media5 recommends to reserve an IP address with an infinite lease for each Mediatrix unit on the network.
- The Rescue Network Interface cannot be deleted.

IMPORTANT: Use extreme care when configuring network interfaces, especially when configuring the network interface used to contact the unit for management. Be careful never to disable or delete the network interface used to contact the unit. Also be careful to always set the unit's management interface to be an interface that you can contact.

1.2 Default Network Interfaces

There are four Network Interfaces created by default on the Mediatrix unit: Uplink, Lan 1, UplinkV6, and Rescue.

- The **Uplink** network interface defines the uplink information required by the Mediatrix unit to properly connect to the WAN. (By default eth1 for all platforms, except for the 4102S which is WAN . By default, this interface uses the **IpDhcp (IPv4 DHCP)** connection type. If you are using only one Network Interface, you must use **Uplink**.
- The **Lan1** network interface defines the information required by the Mediatrix unit to properly connect to the LAN.(By default eth2-5 for all platforms, except for the 4102 which is LAN) By default, the **Lan1** Network Interface uses the **IpStatic (IPv4 Static)** connection type. The **Lan1** network interface can only be added on units with 2 network ports.
- The **Rescue** network interface, is used to display the **Rescue** Management Interface when a partial reset of the unit is performed. By default, the **Rescue** network interface
 - is disabled and automatically enabled when a partial reset is performed.
 - uses the **IpStatic (IPv4 Static)** or the **Ip6Static (IPv6 Static)** addresses.

The **Rescue** Network Interface cannot be deleted. Refer to the [Technical Bulletin - Performing a Partial Reset](#) document published on the [Media5 Documentation Portal](#).

- The **UplinkV6** network interface defines the IPv6 uplink information required by the Mediatrix unit to properly connect to the WAN. By default, this interface uses the **IP6autoConf (IPv6 Auto-Conf)** configuration mode.

It is possible to create up to 48 Network Interfaces.

1.2.1 Link Default Values for the Uplink Network Interface

Unit Type	Link Default Value
Sentinel 400	eth1
Sentinel 100	eth1
Mediatrix G7	eth1
Mediatrix S7	eth1
Mediatrix C7 series	eth1
Mediatrix 4102S	Wan

1.2.2 Link Default Values for the Lan1 Network Interface

Unit Type	Link Default Value
Sentinel 400	eth2-5
Sentinel 100	eth2-5
Mediatrix G7 series	eth2-5
Mediatrix S7 series	eth2-5
Mediatrix C7 series	eth2
Mediatrix 4102	lan

1.3 IP Address Reservation

Before connecting the Mediatrix unit to the network, Media5 strongly recommends to reserve an IP address in your network server – if using one – for the unit you are about to connect.

This way, the IP address associated with a particular unit will be known. Network servers generally allocate a range of IP addresses for use on a network and reserve IP addresses for specific devices using a unique identifier for each device. The Mediatrix unit unique identifier is the media access control (MAC) address. Refer to [Locating the MAC Address of Your Mediatrix Unit](#) (p.13).

1.4 Link Layer Discovery Protocol (LLDP)

The Link Layer Discovery Protocol (LLDP) service is used by network devices for advertising their identity, capabilities, and neighbors on a IEEE 802 local area network, usually wired Ethernet.

LLDP cannot be activated on more than one network interface at a time.

1.5 Link Connectivity Detection

Each Ethernet port of the Mediatrix unit is associated with an Ethernet link.

An Ethernet link has connectivity if at least one of its port status is not disconnected. The link connectivity is periodically polled (every 500 milliseconds). It takes two consecutive detections of the same link state before reporting a link connectivity transition. This avoids reporting many link connectivity transitions if the Ethernet cable is plugged and unplugged quickly.

1.6 PPP Negotiation

When the Mediatrix unit restarts, it establishes the connection to the access concentrator in conformance with RFC 2516 section 5.1.

When establishing a PPP connection, the Mediatrix unit goes through three distinct phases:

- **Discovery phase:** The Mediatrix unit broadcasts the value of the Service Name field. The access concentrator with a matching service name answers the Mediatrix unit.
 - If no access concentrator answers, this creates a **PPPoE failure** error.
 - If more than one access concentrators respond to the discovery, the Mediatrix unit tries to establish the PPP connection with the first one that supports the requested service name.
- **Authentication phase:** If the access concentrator requests authentication, the Mediatrix unit sends the ID/secret pair configured in the User Name and Password fields. If the access concentrator rejects the authentication, this creates an “authentication failure” error.
- **Network-layer protocol phase:** The Mediatrix unit negotiates an IP address. The requested IP address is the one from the last successful PPPoE connection. If the Mediatrix unit never connected by using PPPoE (or after a factory reset), it does not request any specific IP address.

2 Basic Tasks

2.1 Creating a Network Interface

Steps

- 1) Go to **Network/Interfaces**.
- 2) In the **Network Interface Configuration** table, click +.
- 3) Enter a name in the **Name** field.

Note: The Network Interface name must be unique and is case sensitive.

- 4) From the **Link** selection list, select **Ip6Static (IPv6 Static)**.
- 5) In the **Static IP Address** field, enter the FQDN or IP address of
- 6) Click **Apply**.

Result

The new Network Interface will be available in the:

- **Media Interface Configuration** table under the **SBC/ Configuration** tabs (provided you have the Sbc service)
- **Signaling Interface Configuration** table under **SBC/ Configuration** tabs (provided you have the Sbc service)
- **DHCP Server Configuration** table under the **Network/ DHCP Server** tabs
- **Signaling Network** table under the **SIP/Gateways** tabs
- **Network Interface** table under the **SIP Proxy/Configuration** tabs.
- **Network Interface** table under the **Management/Misc** tabs.
- **Forward To Network** table under the **Network/IP Routing** tabs.

2.2 Creating a VLAN

Steps

- 1) Go to **Network/VLAN**.
- 2) In the **VLAN Configuration** table, from the **Link** selection list, select the Ethernet link the vlan will use.
- 3) Complete the **VlanId** and the **Default User Priority** fields as required.
- 4) Click **+** located at the end of the newly created Vlan.

- 5) Click **Apply**.

Note: Do not forget to enable the VLAN under **Network/Interfaces**

2.3 Configuring a Network Interface

Information

When configuring network interfaces, Media5 recommends to have a syslog client properly configured and enabled in order to receive any message related to the network interfaces behaviour. The interface used to access the syslog client must also be properly enabled.

Steps

- 1) Go to **Network/Interfaces**.

IMPORTANT: Use extreme care when configuring network interfaces, especially when configuring the network interface used to contact the unit for management. Be careful never to disable or delete the network interface used to contact the unit. Also be careful to always set the unit's management interface to be an interface that you can contact.

- 2) In the **Network Interface Configuration** table, complete the fields as required.
- 3) From the **Activation** drop-down list, select **Enable**.
- 4) Click **Apply**.

2.4 Associating an Ethernet Link to a Network Interface

Steps

- 1) Go to **Network/Interfaces**.
- 2) In the **Network Interface Configuration** table, from the **Link** field , select the link to be associated with a Network Interface (the link will appear as ethx.VlanId).

Note: Once the changes are applied, the connection with the unit might be lost. You may need to reconnect to the Web page.

- 3) Complete the fields as required.
- 4) Click **Apply**.

Result

The Network interface is associated with a physical interface i.e. an Ethernet Link.

Network Interface Configuration						
Name	Link	Type	Static IP Address	Static Default Router	Activation	
Lan1	eth1	IpStatic (IPv4 Static)	192.168.0.10/24		Enable	-
Uplink	eth2-5.4	IpDhcp (IPv4 DHCP)	192.168.10.1/24		Enable	-
						+

2.5 Disabling the Rescue Interface

Information

By default the Rescue interface is disabled. However, after a partial reset the rescue interface is enabled.

IMPORTANT: The Rescue interface is bound to the unit's WAN port (wan for the Mediatrix 4102S, and ETH1 for all other Mediatrix units). The IP address of the Rescue interface is 192.168.0.1 (IPv4) or an IPv6 Link Local address.

Steps

- 1) Go to **Management/Misc.**
- 2) From the **Network Interface** drop-down menu, select the interface that will be used to manage the unit.

IMPORTANT: If you keep the **Rescue Interface** selected, you will not be able to get into the management interface after disabling it.

- 3) Click **Apply**
- 4) Go to **Network/Interfaces.**
- 5) In the **Rescue Interface** table, from the **Activation** selection list, select **Disable**.
- 6) Click **Apply**.

IMPORTANT: Make sure to reconfigure at least the user's authentication and firewall rules (if applicable), otherwise it may leave the unit unsecure.

Result

The unit will be reachable either on the new configured static IP address or on the DHCP .

Rescue Network Configuration			
Family	Link	IP Address	Activation
IP version 4	eth1	192.168.0.1/24	Disable ▼
IP version 6	All	fe80::0290:f8ff:fe09:b3db	

2.6 Configuring the PPPoE Connection Type

Before you start

The **User Name** and **Password** fields are not accessible if you have the User or Observer access right.

Information

Perform this procedure only if you have selected **Ppplpcp (IPv4 PPPoE)** as a connection type for your Network Interfaces.

Steps

- 1) Go to **Network/Interfaces**.
- 2) In the **PPPoE Configuration** table, complete the fields as required.
- 3) Click **Apply**.

Result

The current PPPoE information is displayed in the **Status** page.

2.7 Configuring the Link Layer Discovery Protocol (LLDP)

Before you start

The Lldp service must be started.

Steps

- 1) Go to **Network/Interfaces**.
- 2) In the **LLDP Configuration** table, select the network interface name on which LLDP should be enabled.

Note: LLDP cannot be activated on multiple network interfaces simultaneously.

- 3) Select the address type to populate the chassis ID device identifier.
- 4) Select whether to enable the LLDP-MED protocol override of the VLAN ID.
- 5) Click **Apply** if you do not need to set other parameters.

Result

The current LLDP information is displayed in the **Status** tab.

2.8 Configuring the Ethernet Link linked to a Network Interface

Steps

- 1) Go to **Network/Interfaces**.
- 2) In the **Ethernet Link Configuration** table, set the **MTU** field of a specific Ethernet link with required value.

Note: The MTU value applied for a PPPoE connection is the smallest of the value negotiated with the server and the value configured here.

Note: Each Network interface used by TCP/IP may have a different MTU value specified. All VLAN connections use the MTU size configured on their related Ethernet link.

- 3) From the **802.1x Authentication** select **Enable** for each Ethernet link requiring 802.1x Authentication.
- 4) Enter the **EAP username** used to authenticate each Ethernet link interfaces during the IEEE 802.1x EAPTLS authentication process..
- 5) From the **EAP Certificate Validation** field, choose the IEEE 802.1x level of validation used by the device to authenticate the IEEE 802.1x EAPTLS peer's certificate.
- 6) Click **Apply** if you do not need to set other parameters.

Result

The current status of the network interfaces is displayed in the **Status** page.

2.9 Selecting the IEEE 802.1x Version

Steps

- 1) Go to **Network/Interfaces**.
- 2) In the **EAP 802.1x Configuration** table, select the IEEE 802.1x version.
- 3) Click **Apply** if you do not need to set other parameters.

Result

EAP 802.1x Configuration	
EAP 802.1x Version:	Version 2001 ▾

2.10 Locating the MAC Address of Your Mediatrix Unit

Information

The MAC address of the unit is:

- printed on a label located under the Mediatrix unit
- displayed in the **Current Status** table of the Web Interface (**System/Information**)

3 Advanced Parameters

3.1 IPv6 Autoconfiguration Interfaces

When the Type drop-down menu is set to IPv6 Auto-Conf, the network interface is an IPv6 over Ethernet connection with IP parameters obtained by stateless auto-configuration or stateful (DHCPv6) configuration.

Autoconfiguration of IPv6 address is first initiated using state-less autoconfiguration. Stateful autoconfiguration is initiated only if one of the following conditions is met:

- The router explicitly required stateful autoconfiguration by setting the “managed” or “other” flag of the router advertisement.
- No router advertisement was received after 3 router solicitations. RFC 4861 defines the number of router solicitations to send and the 4 seconds interval between the sent router solicitations.

3.2 Stateless Autoconfiguration

All IPv6 addresses present in the router advertisements are applied to the network interface

Each IPv6 address is assigned a network name based on the configured network name with a suffix in the following format: ConfiguredNetworkName-XX-Y. XX is the address scope

- GU (Global Unique)
- UL (Unique Local)
- LL (Link-Local)

Y is a unique ID for the address scope.

3.3 Spanning Tree Protocol vs Stateless Autoconfiguration

Many network switches use the Spanning Tree Protocol (STP) to manage Ethernet ports activity.

STP uses a detection timeout before a router advertisement is sent to the Mediatrix unit. The default value for this timeout is usually 30 seconds. However, when the unit wants to get an IPv6 address in Stateless autoconfiguration, this timeout is too long and the unit falls into Stateful Autoconfiguration mode before it receives the router advertisement. This results in the unit receiving a DHCPv6 address. To solve the issue, check if the default STP detection timeout value in your router can be modified. If so, set it to a value of 8 s or less. If you cannot modify the timeout value, Media5 recommends to disable the Spanning Tree Protocol on the network to which the unit is connected.

3.4 Statefull Autoconfiguration

Stateful autoconfiguration is managed by DHCPv6. The DHCPv6 lease is negotiated according to the limitations listed in section 1.5 of RFC 3315.

DHCPv6 may be used to obtain the following information (depending on the router advertisement flags):

- IPv6 addresses (when the router advertisement “managed” flag is set)
- Other configuration (when the router advertisement “other” flag is set)

If only the “other” flag is set in the router advertisement, the DHCPv6 client only sends an information request to the DHCPv6 server, otherwise it sends a DHCPv6 solicit message. If the flags change over time, only the transitions from “not set” to “set” are handled.

3.5 Speed and Duplex Detection Issues

There are two protocols for detecting the Ethernet link speed: parallel detection and auto-negotiation (IEEE 802.3u).

The auto-negotiation protocol allows the detection of the connection speed and duplex mode. It exchanges capabilities and establishes the most efficient connection. When both endpoints support the auto-negotiation, there are no problems. However, when only one endpoint supports auto-negotiation, the parallel detection protocol is used. This protocol can only detect the connection speed; the duplex mode cannot be detected. In this case, the connection may not be established. The Mediatrix unit has the possibility to force the desired Ethernet link speed and duplex mode by disabling the auto-negotiation and selecting the proper setting. When forcing a link speed at one end, be sure that the other end (a hub, switch, etc.) has the same configuration. To avoid any problem, the link speed and duplex mode of the other endpoint must be exactly the same.

3.6 Advanced Network Interface Parameters

Although the services can be configured in great part in the Web browser, some aspects of the configuration can only be completed with the configuration parameters by :

- using a MIB browser
- using the CLI
- creating a configuration script containing the configuration parameters

For more details on the following parameters, refer to [DGW Configuration Guide - Reference Guide](#) published on the [Media5 Documentation Portal](#).

Network Interfaces Priority

Refer to **eth.networkInterfacesPriority**

DHCP Client Identifier Presentation

Refer to **bni.dhcpClientIdentifierPresentation**

Ethernet Connection Speed

Refer to **eth.portsSpeed**

4 Online Help

If you are not familiar with the meaning of the fields and buttons, click **Show Help**, located at the upper right corner of the Web page. When activated, the fields and buttons that offer online help will change to green and if you hover over them, the description will be displayed.

5 DGW Documentation

Mediatrix devices are supplied with an exhaustive set of documentation.

Mediatrix user documentation is available on the [Media5 Documentation Portal](#).

Several types of documents were created to clearly present the information you are looking for. Our documentation includes:

- **Release notes:** Generated at each GA release, this document includes the known and solved issues of the software. It also outlines the changes and the new features the release includes.
- **Configuration notes:** These documents are created to facilitate the configuration of a specific use case. They address a configuration aspect we consider that most users will need to perform. However, in some cases, a configuration note is created after receiving a question from a customer. They provide standard step-by-step procedures detailing the values of the parameters to use. They provide a means of validation and present some conceptual information. The configuration notes are specifically created to guide the user through an aspect of the configuration.
- **Technical bulletins:** These documents are created to facilitate the configuration of a specific technical action, such as performing a firmware upgrade.
- **Hardware installation guide:** They provide the detailed procedure on how to safely and adequately install the unit. It provides information on card installation, cable connections, and how to access for the first time the Management interface.
- **User guide:** The user guide explains how to customise to your needs the configuration of the unit. Although this document is task oriented, it provides conceptual information to help the user understand the purpose and impact of each task. The User Guide will provide information such as where and how TR-069 can be configured in the Management Interface, how to set firewalls, or how to use the CLI to configure parameters that are not available in the Management Interface.
- **Reference guide:** This exhaustive document has been created for advanced users. It includes a description of all the parameters used by all the services of the Mediatrix units. You will find, for example, scripts to configure a specific parameter, notification messages sent by a service, or an action description used to create Rulesets. This document includes reference information such as a dictionary, and it does not include any step-by-step procedures.

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