Layer 3 Routing (UI 2.0) User Manual

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www.moxa.com/products

Models covered by this manual:
IKS-G6824A, ICS-G7826A, ICS-G7828A, ICS-G7848A, ICS-G7850A, ICS-G7852A, PT-G7828 Series

Layer 3 Routing (UI 2.0) User Manual

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1. Introduction to Layer 3 Switches

Moxa offers Layer-3 switches that perform data switching on the Network Layer (Layer 3) of the ISO OSI layer model. Unlike Layer-2 switching, which uses the MAC address for exchanging data, a Layer-3 switch uses the IP address to represent the destination of a data packet.

The Layer 3 Switching Concept

IP (Internet Protocol) is a protocol defined on layer 3 of the 7-layer OSI model. The IP address is used to address data packets on the Network Layer, and is not tied to the hardware of a device or PC. The IP address can be assigned by the system operator or network administrator.

Since Layer 2 switches use the MAC address to determine the destination of transmitted data packets, and Layer 3 switches use the IP address, some mechanism is needed to associate MAC addresses with IP addresses. This is done by ARP (Address Resolution Protocol), which creates a table that matches MAC addresses to IP addresses.

When a PC sends out an ARP request, which is just a broadcast packet requiring the IP address owner to send back his MAC address, two situations could occur:

- If your PC and the IP address owner are on the same subnet, the IP address owner will use a unicast packet, which contains his MAC address, to reply to your PC. Thereafter, your PC will use this MAC address to transmit to the IP address owner directly.
- If your PC and the IP address owner are not on the same subnet, your PC will not receive a reply, so it will ask for the MAC address of the Layer-3 switch (gateway/router). To transmit data packets to the IP address owner, your PC packs the data packet with the IP address, and sends the packet to the Layer-3 switch (gateway/router) using its MAC address. The Layer-3 switch (gateway/router) receives the data packet, re-packs it, and then forwards it to the next hop according to the routing rules.

NOTE

The subnet of management VLAN for Moxa Layer 3 switch is isolated from other subnets. It means the packet cannot be routed to other subnets from the subnet of the management VLAN.

Static Routing and Dynamic Routing

The Moxa Layer 3 switch supports two routing methods: static routing and dynamic routing. Dynamic routing makes use of RIP V1/V1c/V2, and OSPF. You can either choose one routing method, or combine the two methods to establish your routing table.

A routing entry includes the following items: the destination address, the next hop address (which is the next router along the path to the destination address), and a metric that represents the cost we need to pay to access a different network.

Static Routing

You can define the routes yourself by specifying what is the next hop (or router) that the Layer 3 switch forwards data to for a specific subnet. The settings of the Static Route will be added to the routing table and stored in the Layer 3 switch.

Dynamic Routing with RIP (Routing Information Protocol)

RIP is a distance vector-based routing protocol that can be used to automatically build up a routing table in the Moxa Layer 3 switch.

The Moxa Layer 3 switch can efficiently update and maintain the routing table, and optimize the routing by identifying the smallest metric and most matched mask prefix.

Dynamic Routing with OSPF (Open Shortest Path First)

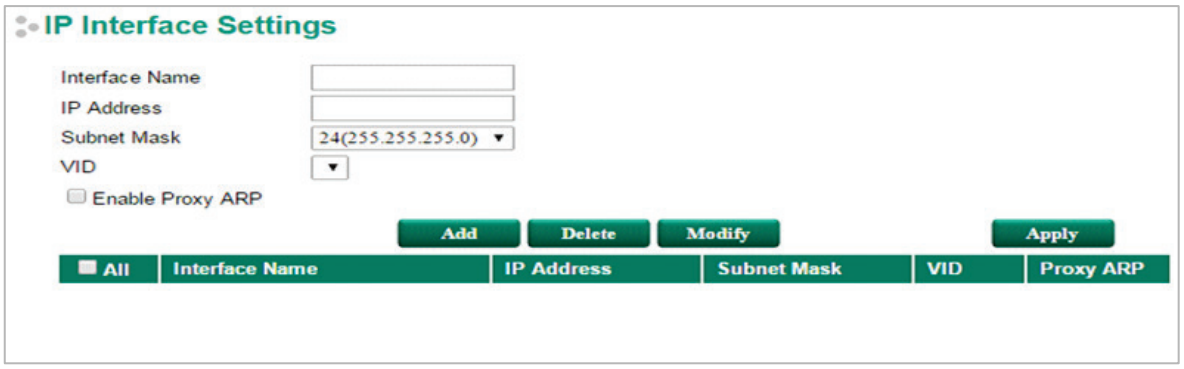
The Moxa Layer 3 switch also supports OSPF (open shortest path first), which uses “Link State” instead of “hop count” to determine the network route. OSPF is more complicated than RIP. However, compared to RIP, OSPF has faster network convergence and results in less network traffic. Both RIP and OSPF are usually referred to as Interior Gateway Protocols (IGPs).

2. IP Interface

Before configuring the routing protocols, we first need to set the correct IP interfaces for the network.

IP Interface Setting

The IP Interface Setting page is used to assign the interface.



Interface Name

Choose a name that describes this interface (max. of 15 characters).

IP Address

The IP address of this interface.

Subnet Mask

The subnet mask for this IP address.

VID

Setting	Description	Factory Default
ID numbers	Display all available VLAN IDs that you have set in the Virtual LAN. To establish an interface, you must first assign an available ID to this interface. If a VLAN ID is assigned twice, a warning message will appear.	None (if no VLAN ID is available)

Enable Proxy ARP

Setting	Description	Factory Default
Enable/Disable	This option is used to enable or disable the Proxy ARP.	Disabled

There are three action buttons for setting up the **IP Interface Table**:

Add

To add an entry into the IP Interface Table.

Delete

To remove the selected entries from the IP Interface Table.

Modify

To modify the content of a selected entry in the IP Interface Table.

NOTE

The entries in the IP Interface Table will not be added to the Moxa Layer 3 switch's interface table until you click the Activate button.

3. Unicast Routing Protocols

Moxa Layer 3 switches support two unicast routing methods: static routing and dynamic routing. Dynamic routing makes use of Routing Information Protocol (RIP) V1/V1c/V2, or Open Shortest Path First (OSPF). You can either choose static routing only, or combine static routing and one of the dynamic routing methods to establish your routing table.

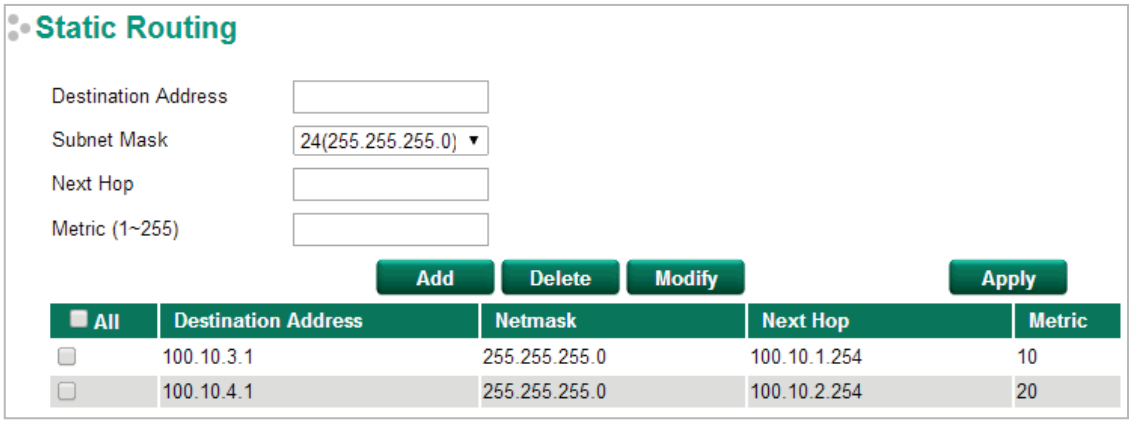
A routing entry includes the following items: the destination address, the next hop address (which is the next router along the path to the destination address), and a metric that represents the cost we need to pay to access a different network.

Static Routing

You can define the routes yourself by specifying what is the next hop (or router) that the Layer 3 switch forwards data for a specific subnet. The settings of the Static Route will be added to the routing table and stored in the Layer 3 switch.

Static Routing Settings

The Static Routing page is used to set up the static routing table for the Moxa Layer 3 switch.



Destination Address

The destination's IP address.

Netmask

The subnet mask for this IP address.

Next Hop

The next router along the path to the destination.

Metric

This option is a value assigned to an IP route for a particular network interface. The value identifies the cost associated with using that route to access the neighboring network.

There are three action buttons for setting up the Static Routing Table:

Add

To add a new entry into the Static Routing Table.

Delete

To remove the selected entries from the Static Routing Table.

Modify

To modify the contents of a selected entry in the Static Routing Table.

NOTE

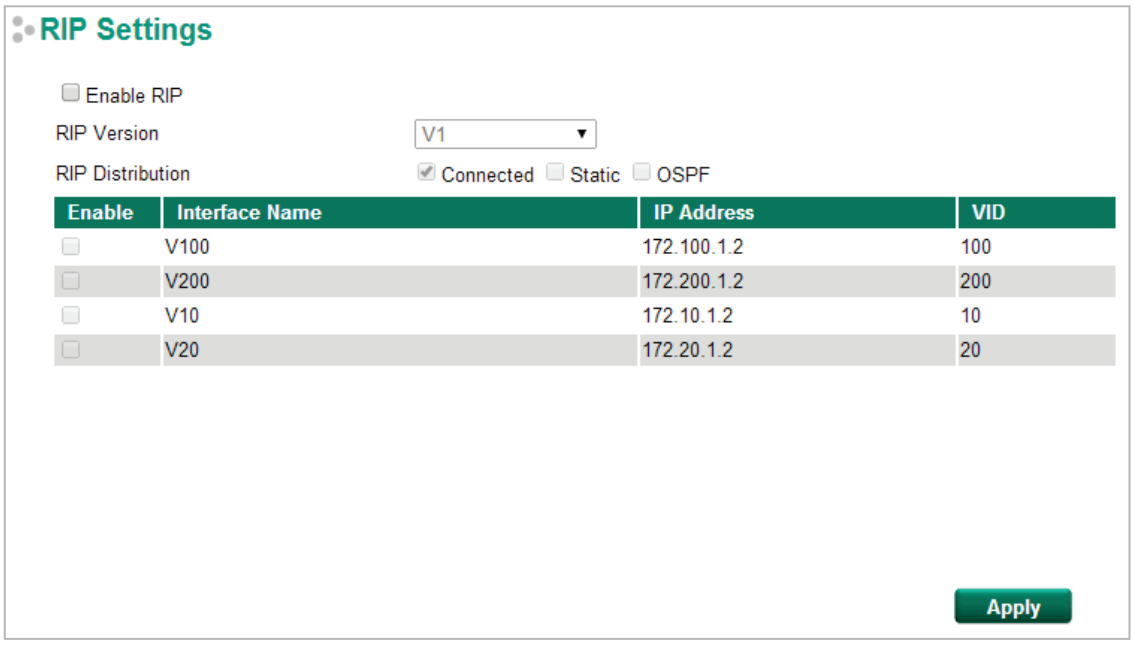
After inputting all of the information for a static routing configuration, click the Add button to add it to the static routing table. The entries in the Static Routing Table will not be added to the Moxa Layer 3 switch's routing table until you click the Apply button.

Dynamic Routing with Routing Information Protocol (RIP)

Routing Information Protocol (RIP) is a distance vector-based routing protocol that can be used to automatically build up a routing table in the Moxa Layer 3 switch. The Moxa Layer 3 switch can efficiently update and maintain the routing table, and optimize the routing by identifying the smallest metric and most matched mask prefix.

RIP Settings

RIP employs the hop count as a routing metric. RIP prevents routing loops by implementing a limit on the number of hops allowed in a path from the source to a destination. The RIP page is used to set up the RIP parameters.



Enable RIP

Setting	Description	Factory Default
Enable/Disable	This option is used to enable or disable the RIP function globally.	Disable

RIP Version

Setting	Description	Factory Default
V2/V1/V1Compatibility	Determines which version of RIP will be followed. Selecting "V1 Compatibility" ensures that Version 1 RIP packets can be received.	V1

RIP Distribution

Setting	Description	Factory Default
Connected	Entries learned from directly connected interfaces will be re-distributed if this option is enabled.	Checked (Enable)
Static	Entries set in a static route will be re-distributed if this option is enabled.	Unchecked (disable)
OSPF	Entries learned from the OSPF will be re-distributed if this option is enabled.	Unchecked (disable)

RIP Table

This is a table showing the entries learned from RIP.

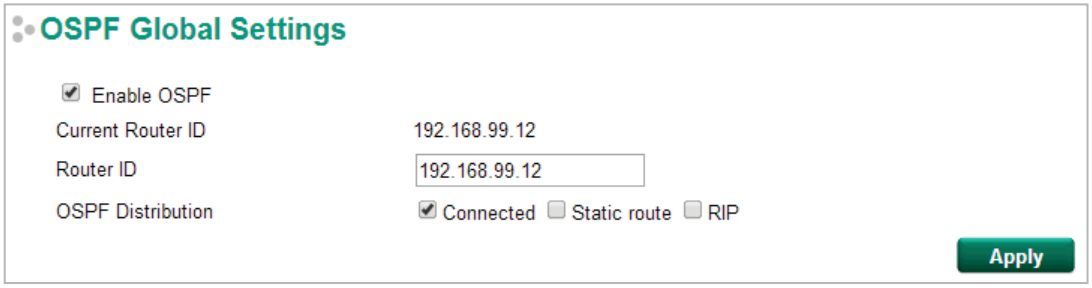
NOTE

The RIP settings will not function until you click the Apply button.

Dynamic Routing with Open Shortest Path First (OSPF)

Open Shortest Path First (OSPF) is a dynamic routing protocol for use on Internet Protocol (IP) networks. Specifically, it is a link-state routing protocol, and falls into the group of interior gateway protocols, operating within a single autonomous system. As a link-state routing protocol, OSPF establishes and maintains neighbor relationships in order to exchange routing updates with other routers. The neighbor relationship table is called an adjacency database in OSPF. OSPF forms neighbor relationships only with the routers directly connected to it. In order to form a neighbor relationship between two routers, the interfaces used to form the relationship must be in the same area. An interface can only belong to a single area. With OSPF enabled, the Moxa Layer 3 switch is able to exchange routing information with other L3 switches or routers more efficiently in a large system.

OSPF Global Settings



Each L3 switch/router has an OSPF router ID, customarily written in the dotted decimal format (e.g., 1.2.3.4) of an IP address. This ID must be established in every OSPF instance. If not explicitly configured, the default ID (0.0.0.0) will be regarded as the router ID. Since the router ID is an IP address, it does not need to be a part of any routable subnet on the network.

Enable OSPF

Setting	Description	Factory Default
Enable/Disable	This option is used to enable or disable the OSPF function globally.	Disable

Current Router ID

Setting	Description	Factory Default
Current Router ID	Shows the current L3 switch's Router ID.	0.0.0.0

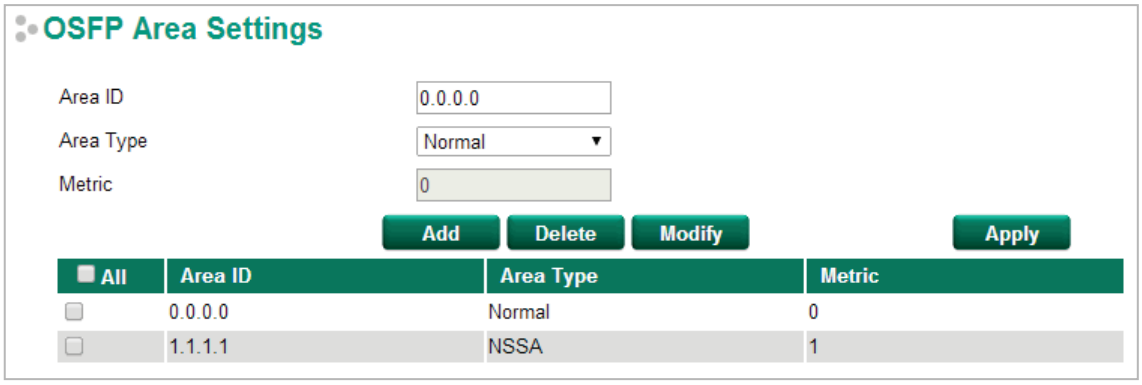
Router ID

Setting	Description	Factory Default
Router ID	Sets the L3 switch's Router ID.	0.0.0.0

OSPF Distribution

Setting	Description	Factory Default
Connected	Entries learned from the directly connected interfaces will be re-distributed if this option is enabled.	Checked (Enable)
Static	Entries set in a static route will be re-distributed if this option is enabled.	Unchecked (disable)
RIP	Entries learned from the RIP will be re-distributed if this option is enabled.	Unchecked (disable)

OSPF Area Settings



An OSPF domain is divided into areas that are labeled with 32-bit area identifiers, commonly written in the dot-decimal notation of an IPv4 address. Areas are used to divide a large network into smaller network areas. They are logical groupings of hosts and networks, including the routers connected to a particular area. Each area maintains a separate link state database whose information may be summarized towards the rest of the network by the connecting router. Thus, the topology of an area is unknown outside of the area. This reduces the amount of routing traffic between parts of an autonomous system.

Area ID

Setting	Description	Factory Default
Area ID	Defines the areas that this L3 switch/router connects to.	0.0.0.0

Area Type

Setting	Description	Factory Default
Normal/Stub/NSSA	Defines the area type.	Normal

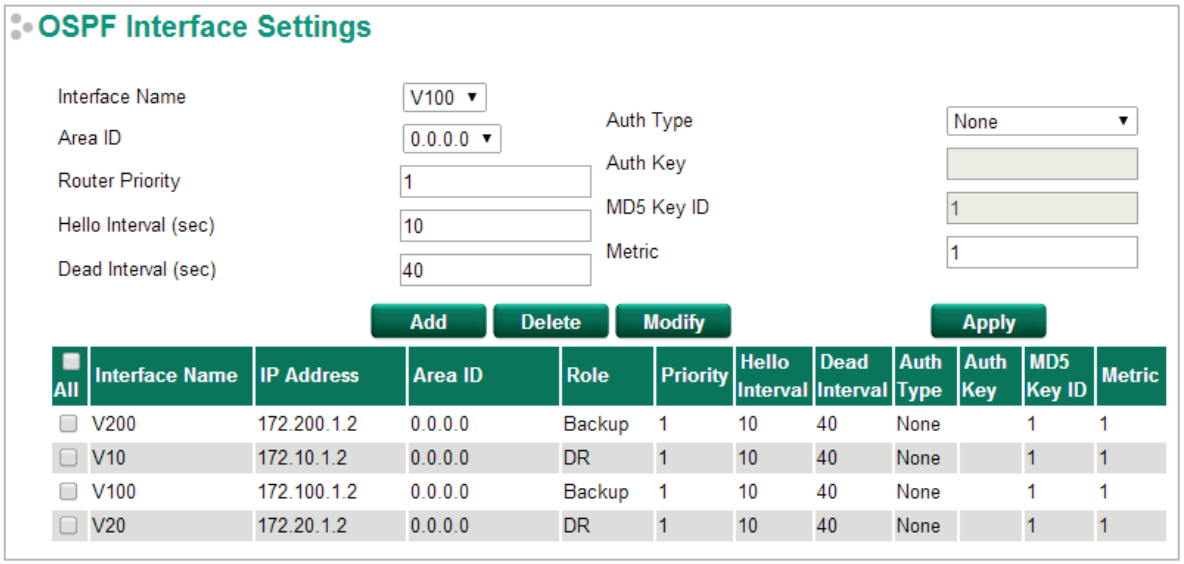
Metric

Setting	Description	Factory Default
Metric	Defines the metric value.	0

OSPF Area Table

This is a table showing the current OSPF area table.

OSPF Interface Settings



Before using OSPF, you need to assign an interface for each area. Detailed information related to the interface can be defined in this section.

Interface Name

Setting	Description	Factory Default
Interface Name	Defines the interface name.	N/A

Area ID

Setting	Description	Factory Default
Area ID	Defines the Area ID.	N/A

Router Priority

Setting	Description	Factory Default
Router Priority	Defines the L3 switch/router's priority.	1

Hello Interval (sec)

Setting	Description	Factory Default
Hello Interval	Hello packets are packets that an OSPF process sends to its OSPF neighbors to maintain connectivity with those neighbors. The hello packets are sent at a configurable interval (in seconds). The value of all hello intervals must be the same within a network.	10

Dead Interval (sec)

Setting	Description	Factory Default
Dead Interval	The dead interval is also a configurable interval (in seconds), and defaults to four times the value of the hello interval.	40

Auth Type

Setting	Description	Factory Default
None/Simple/MD5	OSPF authentication provides the flexibility of authenticating OSPF neighbors. Users can enable authentication to exchange routing update information in a secure manner. OSPF authentication can either be none, simple, or MD5. However, authentication does not need to be configured. If it is configured, all L3 switches/routers on the same segment must have the same password and authentication method.	None

Auth Key

Setting	Description	Factory Default
Auth Key	• pure-text password if Auth Type = Simple • encrypted password if Auth Type = MD5	N/A

MD5 Key ID

Setting	Description	Factory Default
MD5 Key ID	MD5 authentication provides higher security than plain text authentication. This method uses the MD5 to calculate a hash value from the contents of the OSPF packet and the authentication key. This hash value is transmitted in the packet, along with a key ID.	1

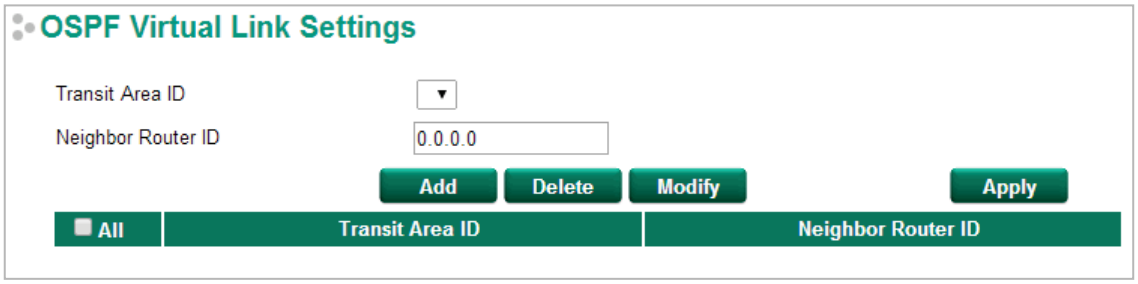
Metric

Setting	Description	Factory Default
Metric	Manually set Metric/Cost of OSPF.	1

OSPF Interface Table

This is a table showing the current OSPF interface table.

OSPF Virtual Link Settings



All areas in an OSPF autonomous system must be physically connected to the backbone area (Area 0.0.0.0). However, this is impossible in some cases. For those cases, users can create a virtual link to connect to the backbone through a non-backbone area and also use virtual links to connect two parts of a partitioned backbone through a non-backbone area.

Transit Area ID

Setting	Description	Factory Default
Transit Area ID	Defines the areas that this L3 switch/router connect to.	N/A

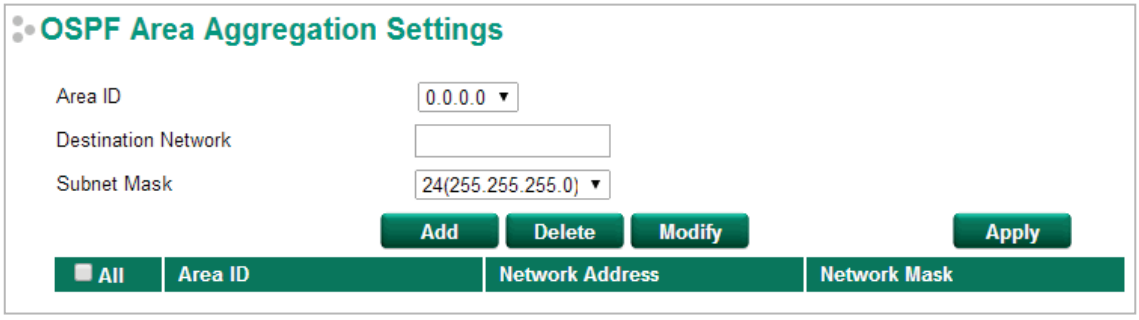
Neighbor Router ID

Setting	Description	Factory Default
Neighbor Router ID	Defines the neighbor L3 switch/route's ID.	0.0.0.0

OSPF Virtual Link Table

This is a table showing the current OSPF Virtual Link table.

OSPF Area Aggregation Settings



Each OSPF area, which consists of a set of interconnected subnets and traffic, is handled by routers attached to two or more areas, known as Area Border Routers (ABRs). With the OSPF aggregation function, users can combine groups of routes with common addresses into a single routing table entry. The function is used to reduce the size of routing tables.

Area ID

Setting	Description	Factory Default
Area ID	Select the Area ID that you want to configure.	0.0.0.0

Destination Network

Setting	Description	Factory Default
Destination Network	Fill in the network address in the area.	

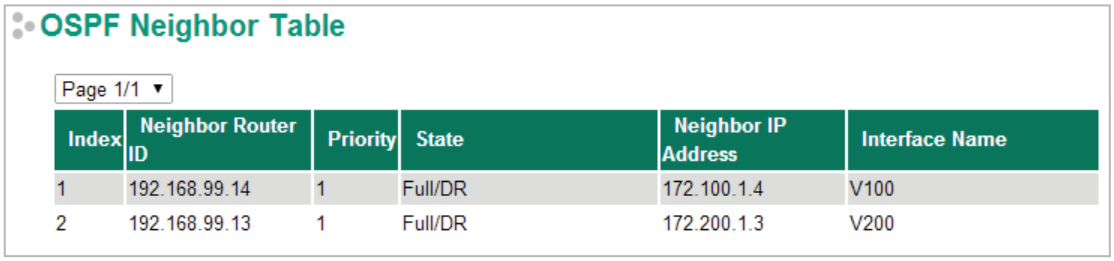
Subnet Mask

Setting	Description	Factory Default
4(240.0.0.0) to 30(255.255.255.252)	Select the network mask.	24(255.255.255.0)

OSPF Area Aggregation Table

This is a table showing the current OSPF Area Aggregation table.

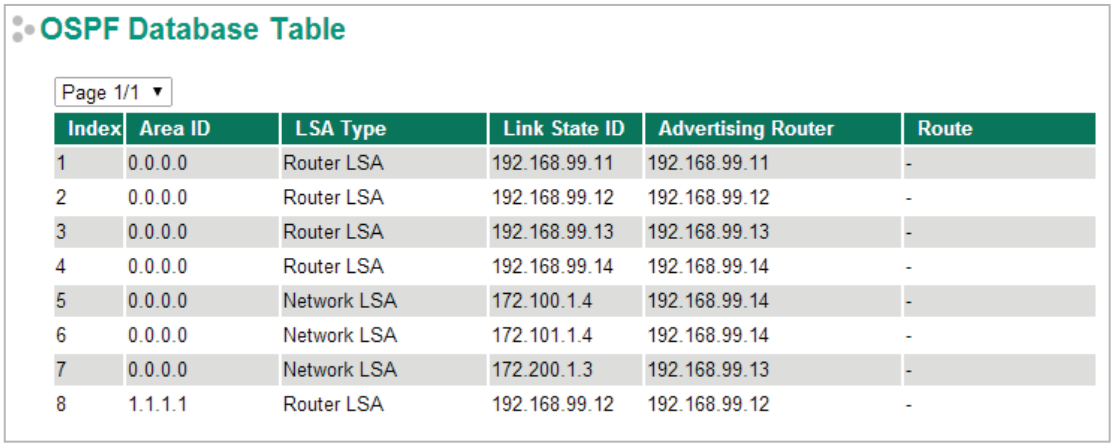
OSPF Neighbor Table



OSPF Neighbor Table

This is a table showing the current OSPF Neighbor table.

OSPF Database Table

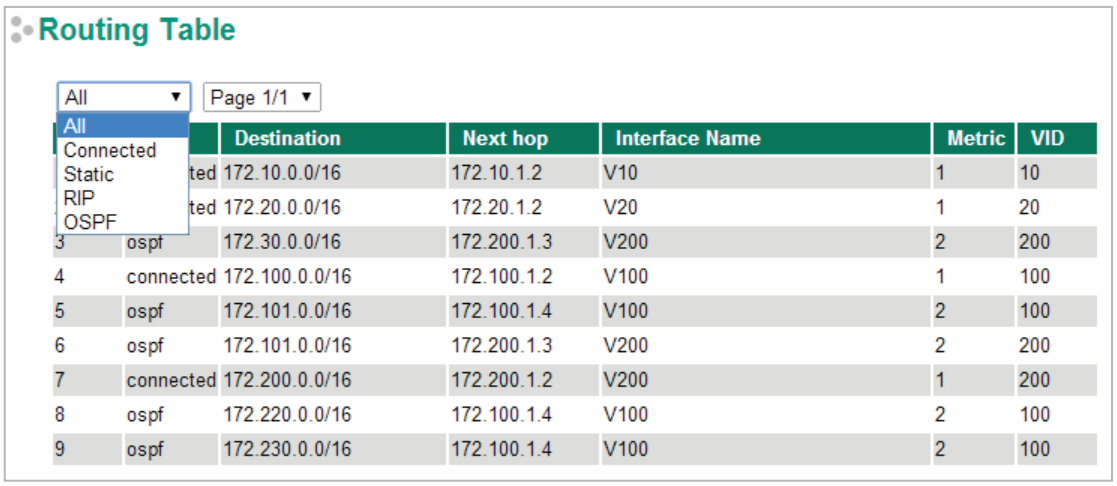


OSPF Database Table

This is a table showing the current OSPF Database table.

Routing Table

The Routing Table page shows all routing entries used by the Moxa Layer 3 switch.



Routing Table

Setting	Description	Factory Default
All	Show all routing rules	N/A
Connected	Show connected routing rules	N/A
Static	Show static routing rules	N/A
RIP	Show RIP exchanged routing rules	N/A
OSPF	Show OSPF exchanged routing rules	N/A

4. Multicast Routing Protocols

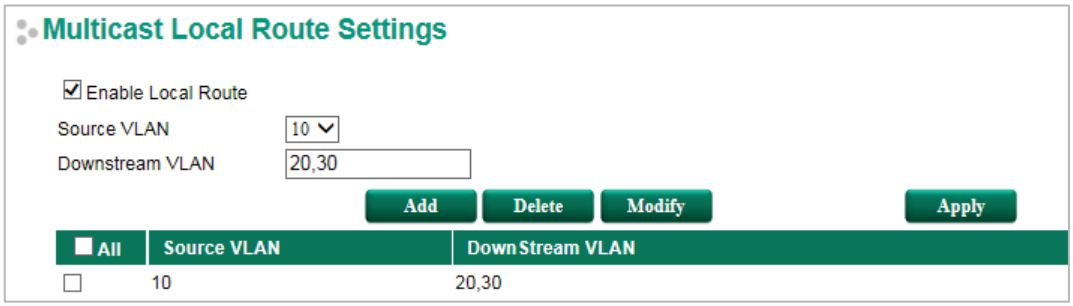
Moxa Layer 3 switches support four multicast routing protocols: Distance Vector Multicast Routing Protocol (DVMRP), Protocol Independent Multicast Dense Mode (PIM-DM), Protocol Independent Multicast Sparse Mode (PIM-SM), and proprietary multicast local route protocol.

Local Route

Multicast Local Route is a method of forwarding traffic to multicast groups based on source and downstream VLAN settings.

Multicast Local Route Settings

This page is used to set up the Multicast Local Route functions for Moxa Layer 3 switches.



Enable Local Route

Setting	Description	Factory Default
Enable/Disable	Enable Local Route function	Disabled

Source VLAN

The VLAN ID that the source multicast stream comes from.

Downstream VLAN

The VLAN ID(s) that the source multicast stream is going to.

Add

Add a new rule for multicast routing.

Delete

Remove the selected rule(s) from the table.

Modify

Modify the contents of the selected rule(s) in the Table.

NOTE

The maximum number of Rules is 16.

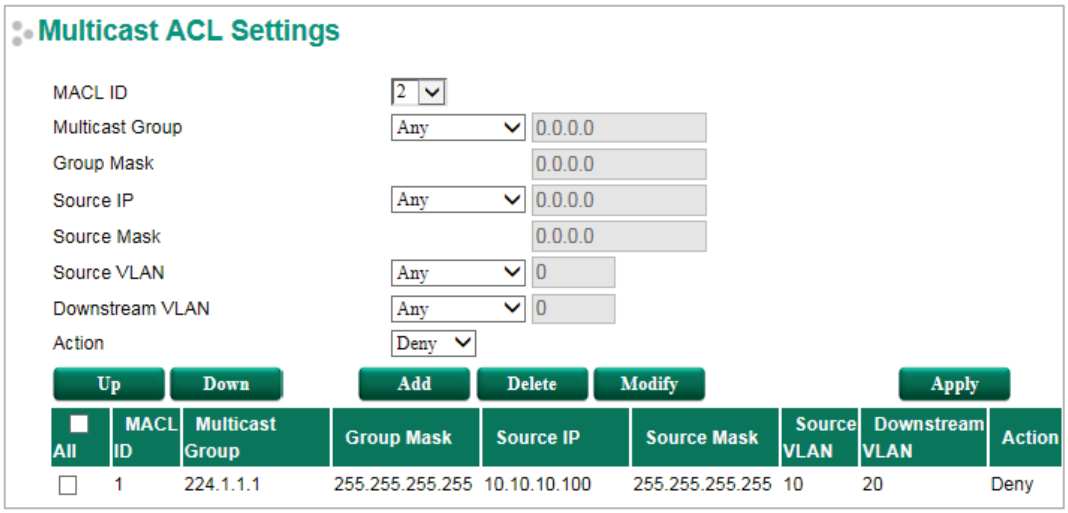
The maximum number of Downstream VLAN in each Rule is 16.

NOTE

Multicast Local Route is one function of V-ON technology that should be enabled in a layer 3 switch. For a detailed introduction, please refer to *Moxa Managed Ethernet Switch Redundancy Protocol (UI 2.0) User's Manual*.

Multicast ACL Settings

This page is used to set up the Multicast ACL rules for Moxa Layer 3 switches.



MACL ID

The Multicast Access Control List ID. The Multicast ACL checking sequence is based on these IDs. Smaller ID numbers have higher priority for multicast routing filtering. If a multicast routing is filtered by an MACL profile with higher priority, access control profiles with lower priority will not be executed. Note that the maximum number of MACL Rules is 16.

Multicast Group/Group Mask

Defines the multicast group rule. By using the mask, you can assign specific subnet ranges to filter. Choose **Any** if you do not need to use this criteria.

Source IP/Source Mask

Defines the IP address rule. By using the mask, you can assign specific subnet ranges to filter. Choose **Any** if you do not need to use this criteria.

Source VLAN

Defines the VLAN ID that the source multicast stream comes from. Choose **Any** if you do not need to use this criteria.

Downstream VLAN

Defines VLAN ID(s) that the source multicast stream is going to. Choose **Any** if you do not need to use this criteria.

Action

Choose to **Deny** or **Permit** access if the rule criterion is met.

Up/Down

Click the **Up** or **Down** button to adjust the sequence. The MACL ID will change with the profile's position.

Add

Add a new rule for multicast routing.

Delete

Remove the selected rule(s) from the table.

Modify

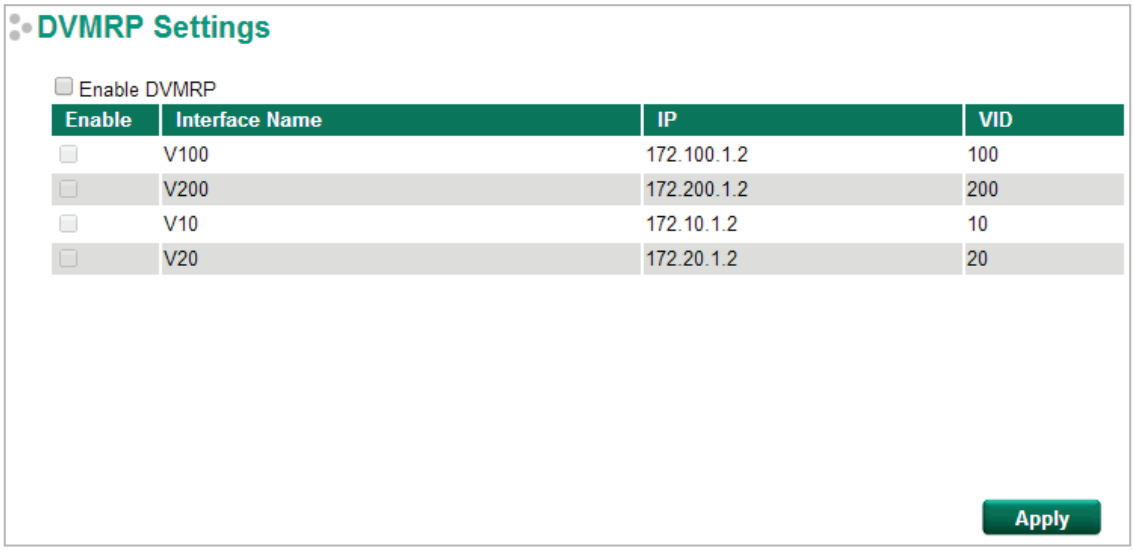
Modify the contents of the selected rule(s) in the Table.

Distance Vector Multicast Routing Protocol (DVMRP)

Distance Vector Multicast Routing Protocol (DVMRP) is used to build multicast delivery trees on a network. When a Layer 3 switch receives a multicast packet, DVMRP provides a routing table for the relevant multicast group, and include distance information on the number of devices between the router and the packet destination. The multicast packet will then be forwarded through the Layer 3 switch interface specified in the multicast routing table.

DVMRP Settings

This page is used to set up the DVMRP table for Moxa Layer 3 switches.



Enable DVMRP

Setting	Description	Factory Default
Enable/Disable	Enable or disable DVMRP globally	Disable

Enable (individual)

Setting	Description	Factory Default
Enable/Disable	Enable or disable DVMRP by the selected interface	Disable

NOTE

Only one multicast routing protocol can be enabled on one Moxa Layer 3 switch. DVMRP, PIM-DM, and PIM-SM can NOT be enabled simultaneously.

DVMRP Routing Table

DVMRP Routing Table

This is a table showing the current DVMRP Routing table.

DVMRP Neighbor Table

DVMRP Neighbor Table

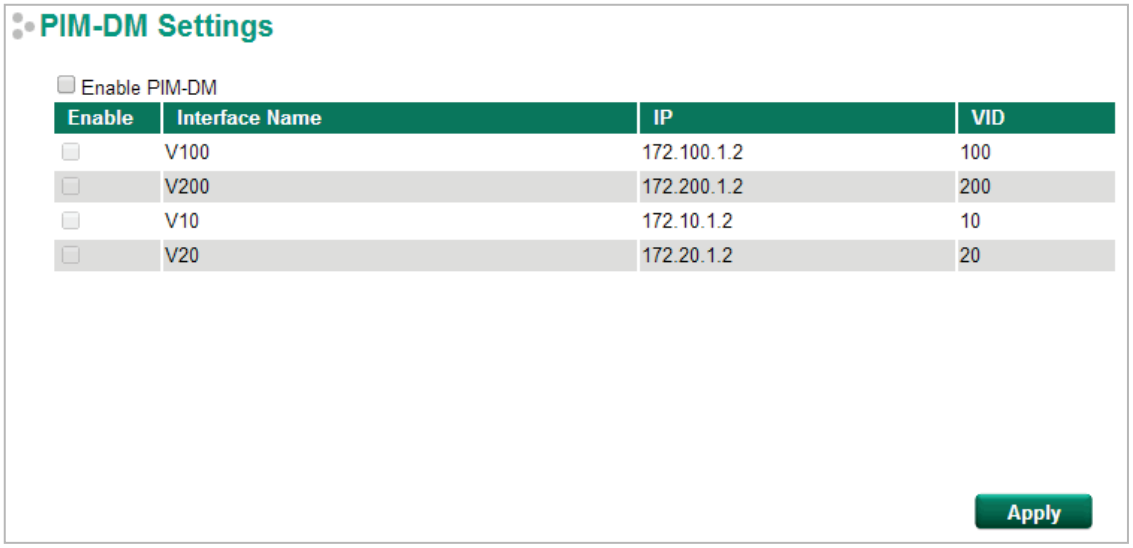
This is a table showing the current DVMRP Neighbor table.

Protocol Independent Multicast Dense Mode (PIM-DM)

Protocol Independent Multicast (PIM) is a method of forwarding traffic to multicast groups over the network using any pre-existing unicast routing protocol, such as RIP or OSPF, set on routers within a multicast network. Protocol Independent Multicast Dense Mode (PIM-DM) protocol will flood multicast traffic on the network and revise the multicast routing table based on the responses.

PIM-DM Settings

This page is used to set up the PIM-DM table for Moxa Layer 3 switches.



Enable PIM-DM

Setting	Description	Factory Default
Enable/Disable	Enable or disable PIM-DM globally	Disable

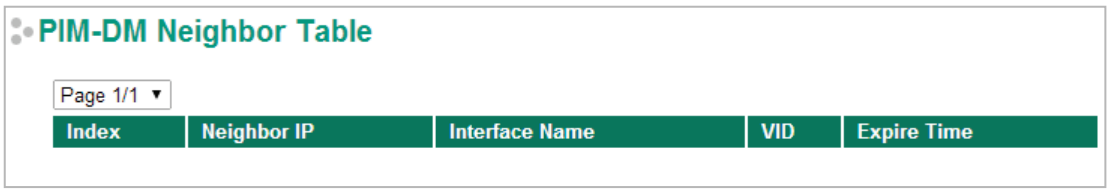
Enable (individual)

Setting	Description	Factory Default
Enable/Disable	Enable or disable PIM-DM by selected interface	Disable

NOTE

Only one multicast routing protocol can be enabled on one Moxa Layer 3 switch. DVMRP, PIM-DM, and PIM-SM can NOT be enabled simultaneously.

PIM-DM Neighbor Table



PIM-DM Neighbor Table

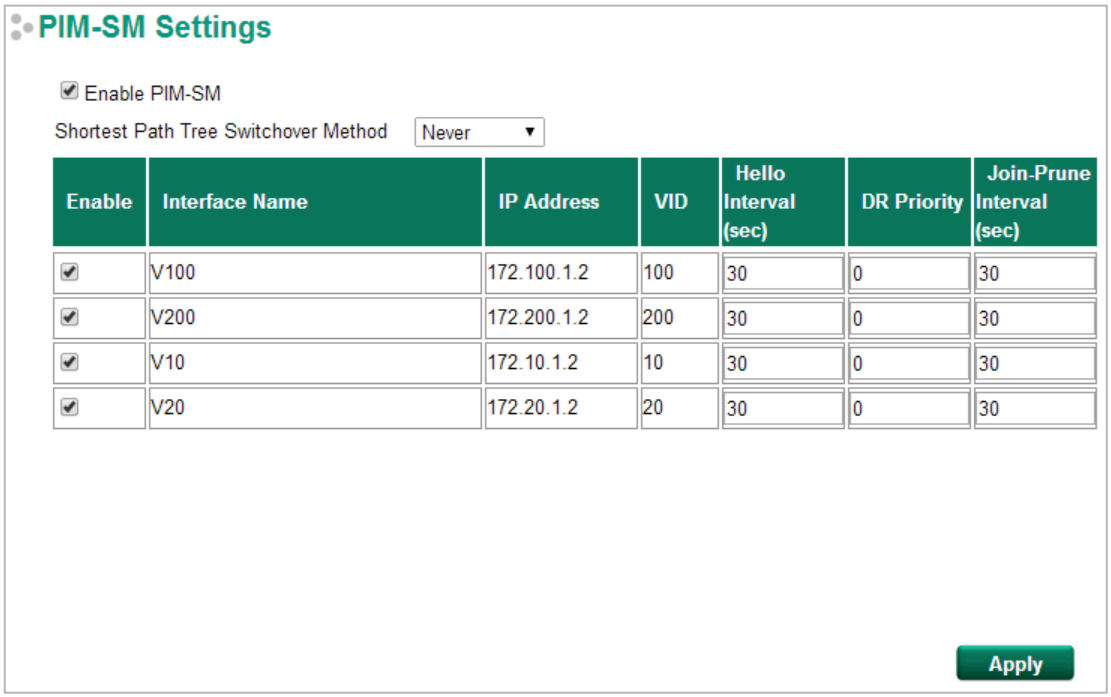
This is a table showing the current PIM-DM Neighbor table.

Protocol Independent Multicast Sparse Mode (PIM-SM)

Protocol Independent Multicast (PIM) is a method of forwarding traffic to multicast groups over the network using any pre-existing unicast routing protocol, such as RIP or OSPF, set on routers within a multicast network. Protocol Independent Multicast Sparse Mode (PIM-SM) protocol builds unidirectional shared trees rooted at a Rendezvous Point (RP) per group, and optionally creates shortest-path trees per source. Protocol Independent Multicast Source-Specific Multicast (PIM-SSM) builds trees that are rooted in just one source, offering a more secure and scalable model for a limited number of applications.

PIM-SM Settings

This page is used to set up the PIM-SM table for Moxa Layer 3 switches.



Enable PIM-SM

Setting	Description	Factory Default
Enable/Disable	Enable or disable PIM-SM globally	Disable

Shortest Path Tree Switchover Method

Setting	Description	Factory Default
Never/Immediate	Define how Shortest Path Tree switch over	Never

Enable (individual)

Setting	Description	Factory Default
Enable/Disable	Enable or disable PIM-SM by the selected interface	Disable

NOTE

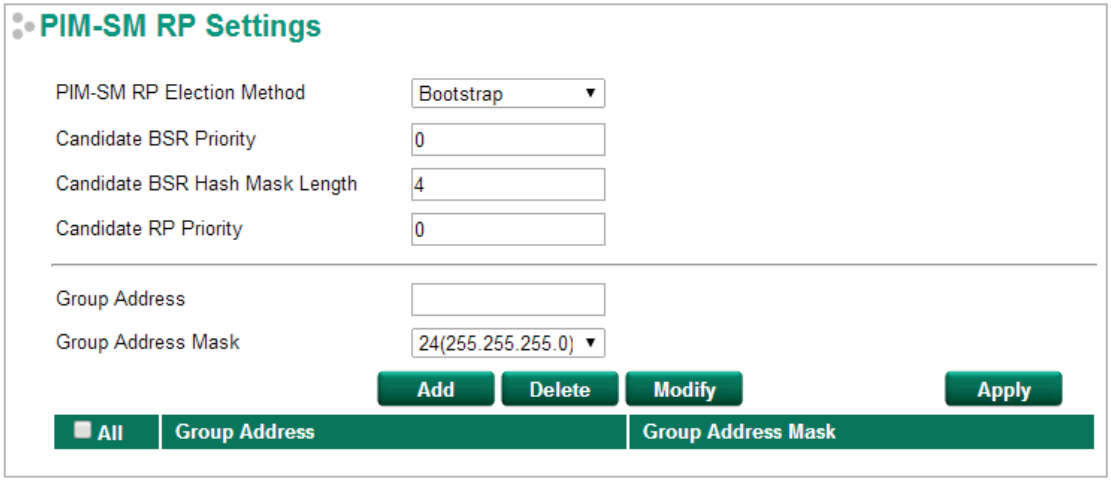
Only one multicast routing protocol can be enabled on one Moxa Layer 3 switch. DVMRP, PIM-DM, and PIM-SM can NOT be enabled simultaneously.

PIM-SM RP Settings

This page is used to set up the PIM-SM RP settings for Moxa Layer 3 switches.

There are two RP Election Methods: Bootstrap and Static.

Bootstrap



Candidate BSR Priority

Setting	Description	Factory Default
0 to 255	Define the priority of BSR election	0

Candidate BSR Hash Mask Length

Setting	Description	Factory Default
4 to 32	Define the Hash mask length of BSR election	4

Candidate RP Priority

Setting	Description	Factory Default
0 to 255	Define the priority of RP election	0

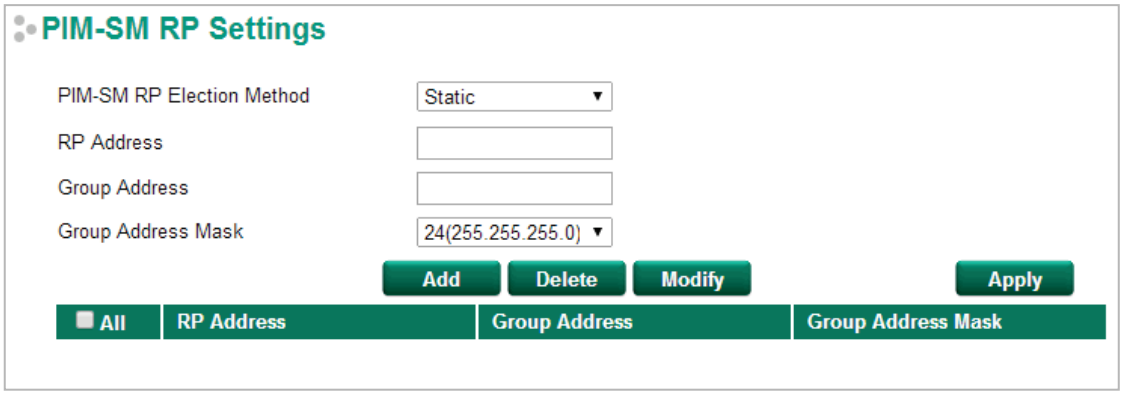
Group Address

Setting	Description	Factory Default
Group Address	Define the group address	N/A

Group Address Mask

Setting	Description	Factory Default
4(240.0.0.0) to 32(255.255.255.255)	Select the group address mask.	24(255.255.255.0)

Static



RP Address

Setting	Description	Factory Default
RP Address	Define the RP address	N/A

Group Address

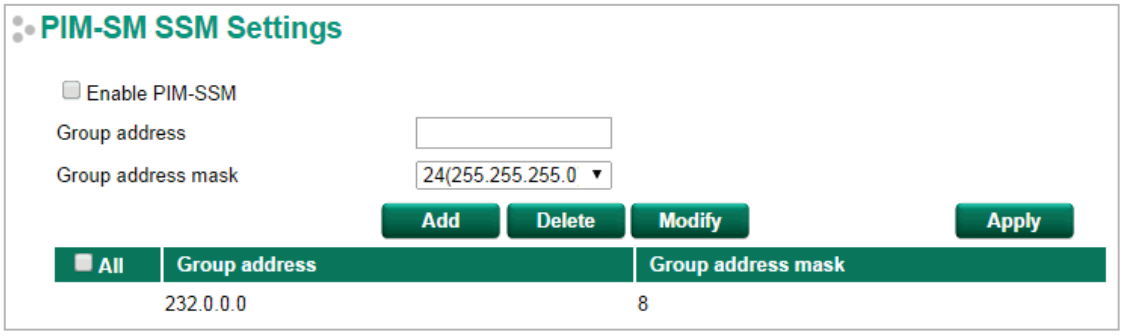
Setting	Description	Factory Default
Group Address	Define the group address	N/A

Group Address Mask

Setting	Description	Factory Default
4(240.0.0.0) to 32(255.255.255.255)	Select the group address mask.	24(255.255.255.0)

PIM-SM SSM Settings

This page is used to set up the PIM-SM SSM settings for Moxa Layer 3 switches.



Enable PIM-SSM

Setting	Description	Factory Default
Enable/Disable	Enable or disable PIM-SSM	Disable

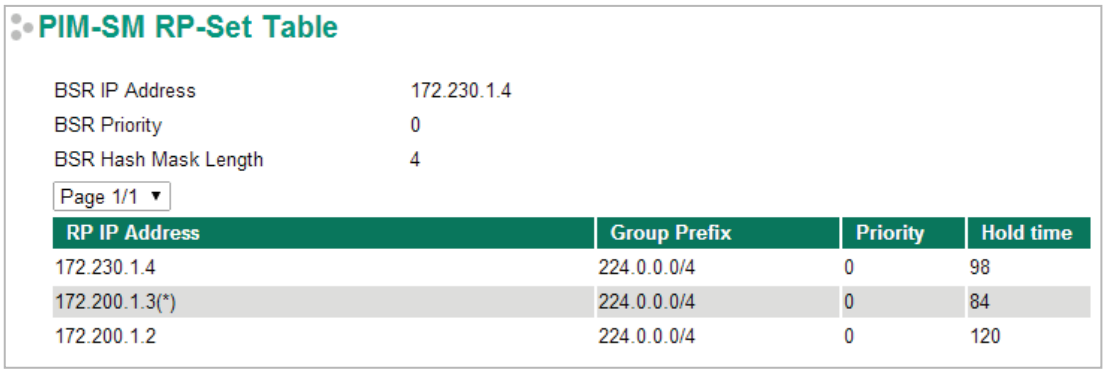
Group Address

Setting	Description	Factory Default
Group Address	Define the group address	N/A

Group Address Mask

Setting	Description	Factory Default
4(240.0.0.0) to 32(255.255.255.255)	Select the group address mask.	24(255.255.255.0)

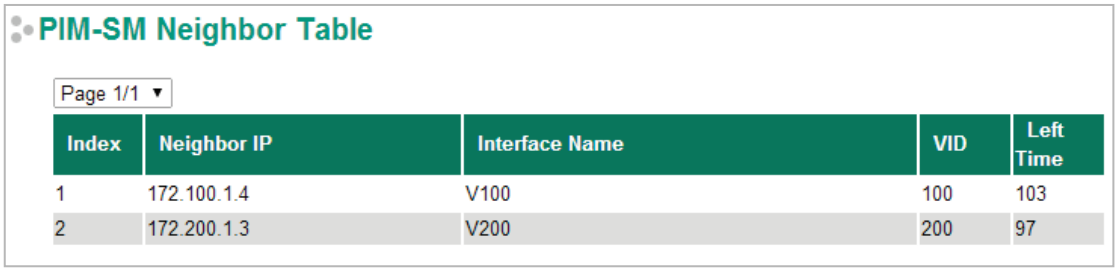
PIM-SM RP-Set Table



PIM-SM RP-Set Table

This is a table showing the current PIM-SM RP-Set table.

PIM-SM Neighbor Table

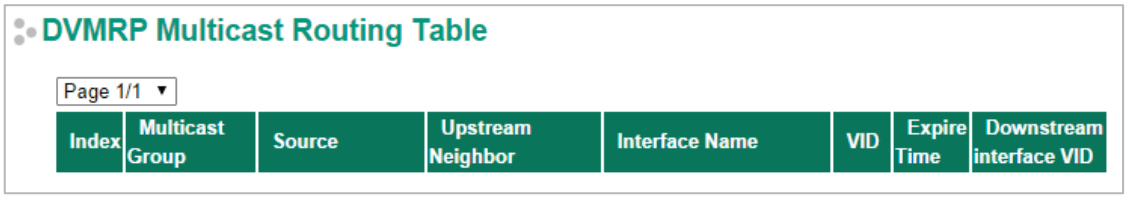


PIM-SM Neighbor Table

This is a table showing the current PIM-SM Neighbor table.

Multicast Routing Table

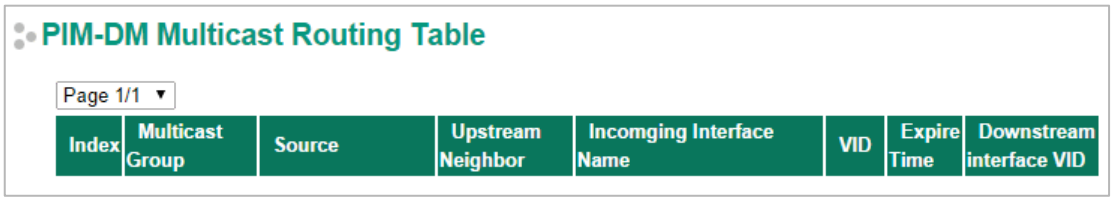
DVMRP Multicast Routing Table



DVMRP Multicast Routing Table

This is a table showing the current DVMRP multicast routing table.

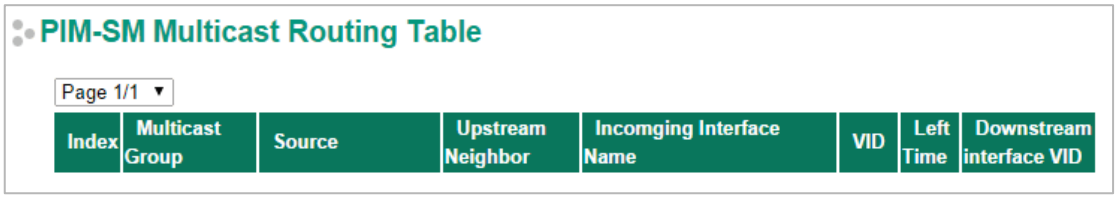
PIM-DM Multicast Routing Table



PIM-DM Multicast Routing Table

This is a table showing the current PIM-DM multicast routing table.

PIM-SM Multicast Routing Table



PIM-SM Multicast Routing Table

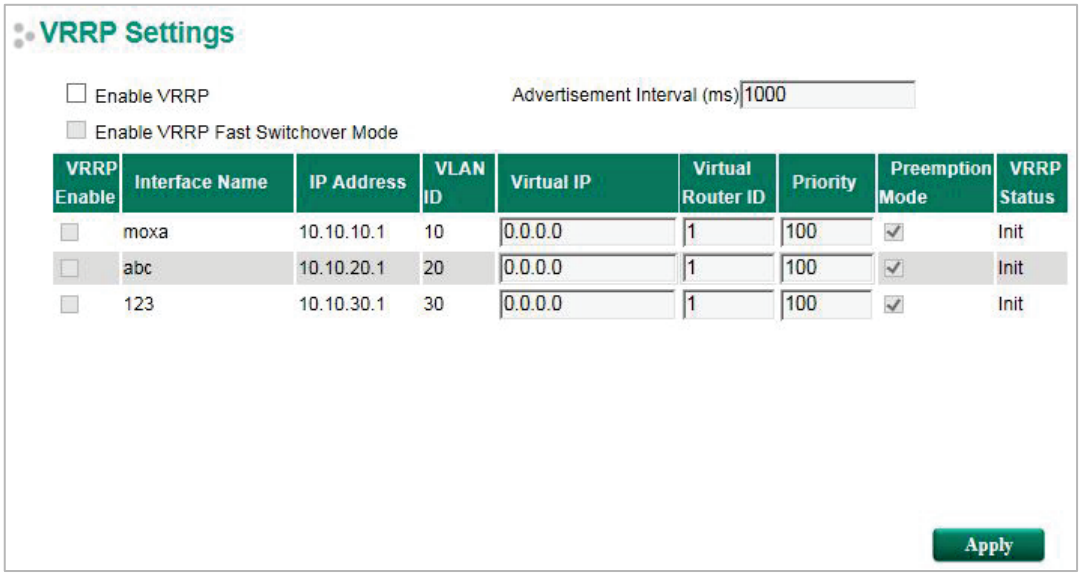
This is a table showing the current PIM-SM multicast routing table.

5. Gateway Redundancy

Virtual Router Redundancy Protocol (VRRP)

VRRP Settings

The Virtual Router Redundancy Protocol (VRRP) enables a group of routers to form a single virtual router with a virtual IP address. The LAN clients can then be configured with the virtual router's virtual IP address as their default gateway. The virtual router is the combination of a group of routers, also known as a VRRP group.



Enable VRRP

Setting	Description	Factory Default
Enable/Disable	Enable or disable VRRP	Disable

Advertisement Interval (ms)

Setting	Description	Factory Default
25 to 1000	Defines the VRRP advertisement interval	1000

Enable VRRP Fast Switchover Mode

Setting	Description	Factory Default
Enable/Disable	Checkmark the Enable VRRP Fast Switchover Mode checkbox to achieve fast VRRP backup router take over the role of master while VRRP master is down.	Disabled

VRRP Interface Table

Setting	Description	Factory Default
VRRP Enable	Enable or disable the VRRP entry	Disabled
Virtual IP	L3 switch/router in the same VRRP group must have the identical virtual IP address. This virtual IP address must belong to the same address range as the real IP address of the interface.	0.0.0.0

Setting	Description	Factory Default
Virtual Router ID	Virtual Router ID is used to assign a VRRP group. The L3 switch/router, which operate as master/backup, should have the same ID. The Moxa L3 switch/router supports one virtual router ID for each interface. IDs can range from 1 to 255.	1
Priority	Determines priority in a VRRP group. The priority value range is 1 to 254, with 254 the highest priority. If several L3 switches/routers have the same priority, the router with higher IP address will have the higher priority. The usable range is "1 to 254".	100
Preemption Mode	Determines whether or not a backup L3 switch/router will take over the authority of the master.	Enable

NOTE

When enabling VRRP Fast Switchover Mode, the maximum number of VRRP Interfaces is 60.

NOTE

VRRP Fast Switchover Mode is one function of V-ON technology that should be enabled in a layer 3 switch. For a detailed introduction, please refer to *Moxa Managed Ethernet Switch Redundancy Protocol (UI 2.0) User's Manual (UI 2.0)*.

Do not enable VRRP Fast Switchover Mode if you do not intend to use V-ON technology.

6. Tracking

The tracking function allows users to monitor the destined interface or the port availability. The tracking function is a mechanism that is designed to complement defective current protocols, which provides better redundancy for the overall system.

The device will continuously monitor the status of the tracked interface or port, and transfer these status changes into the action. e.g. enable the port, decrease the priority of the VRRP interface and activate the routing interface.

Moxa's devices provide 3 types of tracking functions: Interface Tracking, Ping Tracking, and Logic Tracking. A maximum of 64 tracking entries can be supported.

- **Interface Tracking**

  Track the status of each port or layer 3 interfaces.
- **Ping Tracking**

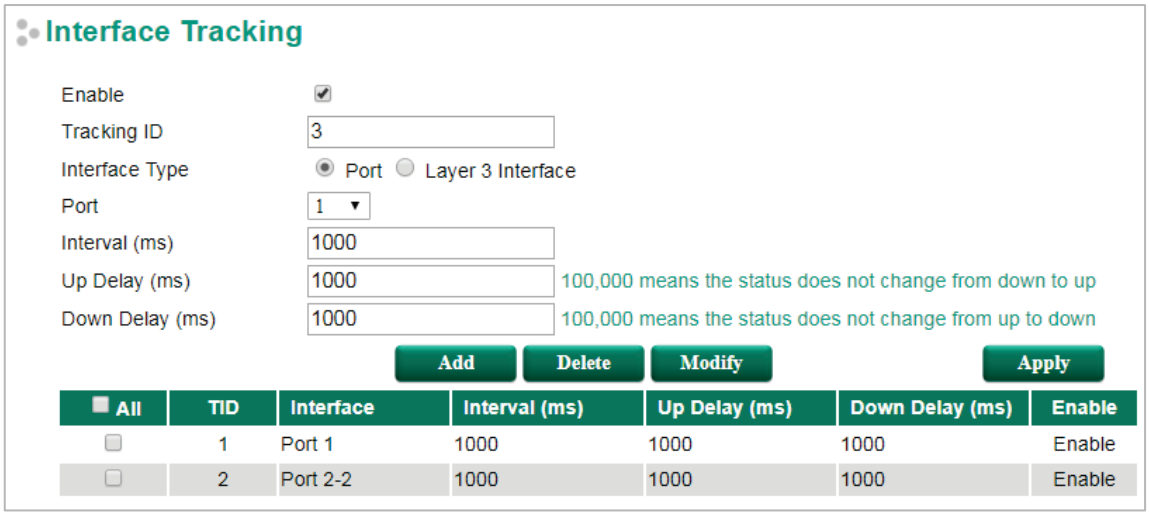
  Track the status of certain remote devices by IP address.
- **Logic Tracking**

  This function is a logic flow that can combine the interface tracking, ping tracking, and the logic tracking item with AND or OR logic.

Tracking Function

Setting	Description	Factory default
Enable/Disable	Enable or disable the tracking feature	Disabled

Interface Tracking



Enable

Setting	Description	Factory default
Enable/Disable	Enable or disable the interface tracking entry	Enabled

Tracking ID

The tracking ID is the ID of the interface tracking entry. The tracking ID is unique in interface tracking, ping tracking, and logical tracking.

Interface Type

Setting	Description
Port	Track the port of the device
Layer 3 Interface	Track the interface of the device

Port/VLAN

Choose the Port or VLAN that will be monitored.

Interval

Setting	Description	Factory default
Range: 100 to 100,000ms	The frequency to check the status of the monitored port or interface.	1000

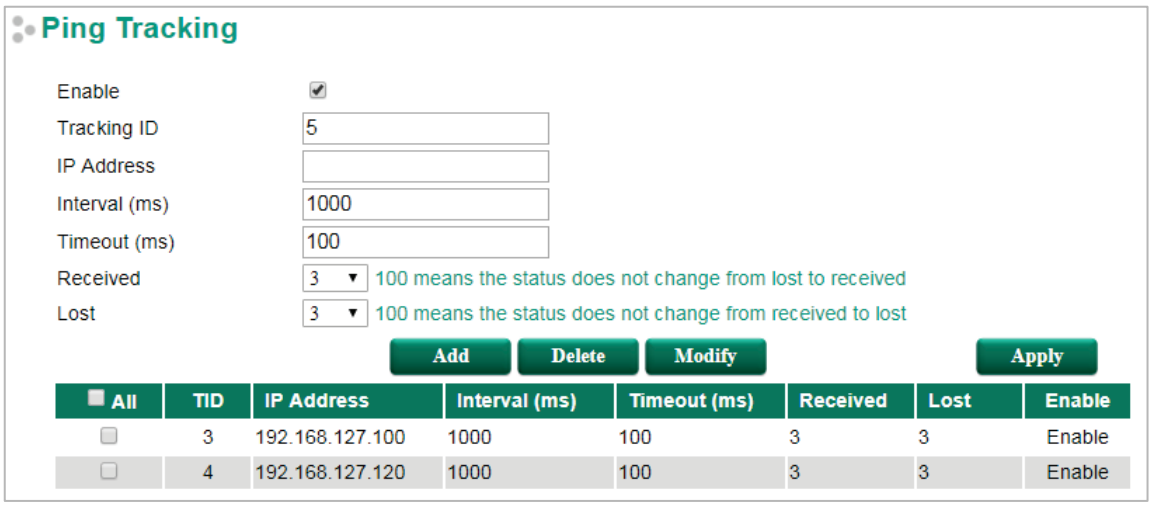
Up delay

Setting	Description	Factory default
Range: 0 to 100,000ms	The status will change from down to up once the status of the monitored port or interface exceeds the delay time. If 100,000 ms is entered, the status will not change to up even if the monitored port/interface is up.	1000

Down delay

Setting	Description	Factory default
Range: 0 to 100,000ms	The status will change from up to down once the status of the monitored port or interface is less than the delay time. If 100,000 ms is entered, the status will not change to down even if the monitored port/interface is down.	1000

Ping Tracking



Enable

Setting	Description	Factory default
Enable/Disable	Enable or disable the interface tracking feature.	Enabled

Tracking ID

This is the ID of the ping tracking entry. The tracking ID is unique in interface tracking, ping tracking, and logical tracking.

IP address

The IP address that the user wants to monitor.

Interval

Setting	Description	Factory default
Range: 100 to 100,000 ms	The frequency to check the status of the monitored IP address.	1000

Timeout

Setting	Description	Factory default
Range: 1 to 100,000 ms	Specific period of time to determine that the ping request has no response.	100

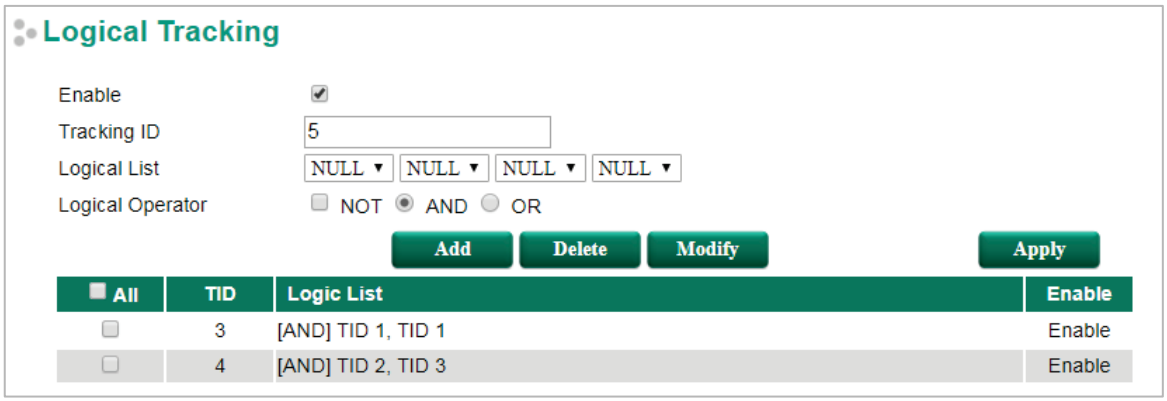
Received

Setting	Description	Factory default
Range: 1 to 100 times	The status will change from down to up once the ping replies are greater or equal to the count. If 100 times is entered, the status will not change to up even if the condition is reached.	3

Lost

Setting	Description	Factory default
Range: 1 to 100 times	The status will change from up to down once lost the ping replies are greater or equal to the count. If 100 times is entered, the status will not change to down even if the condition is reached.	3

Logical Tracking



Enable

Setting	Description	Factory default
Enable/Disable	Enable or disable the interface tracking feature.	Disabled

Tracking ID

This is the ID of the logical tracking entry. The tracking ID is unique in interface tracking, ping tracking, and logical tracking.

NOTE

The new tracking ID in "Logical Tracking" can not be smaller than the chosen tracking ID.

Logic List

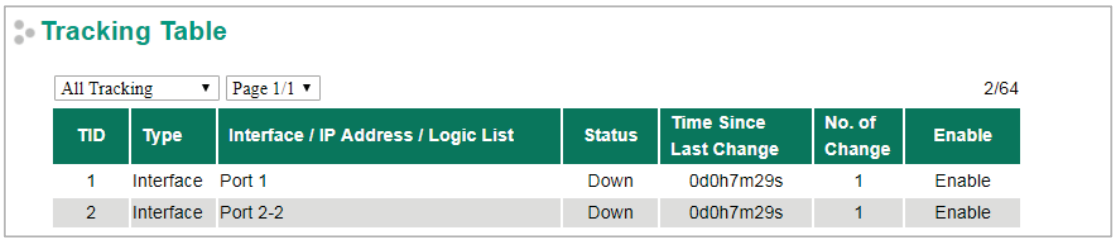
Choose the Tracking ID that the user wants to put in the logic list; up to 4 tracking IDs are allowed.

Logic Operator

NOT is used to reverse the status of the logic tracking entry. If AND is chosen, then the status of the logical tracking entry will be up when all the status of the tracking entries are up. If OR is chosen, then any status of tracking id entries are up, the status of the logical tracking entry will be up.

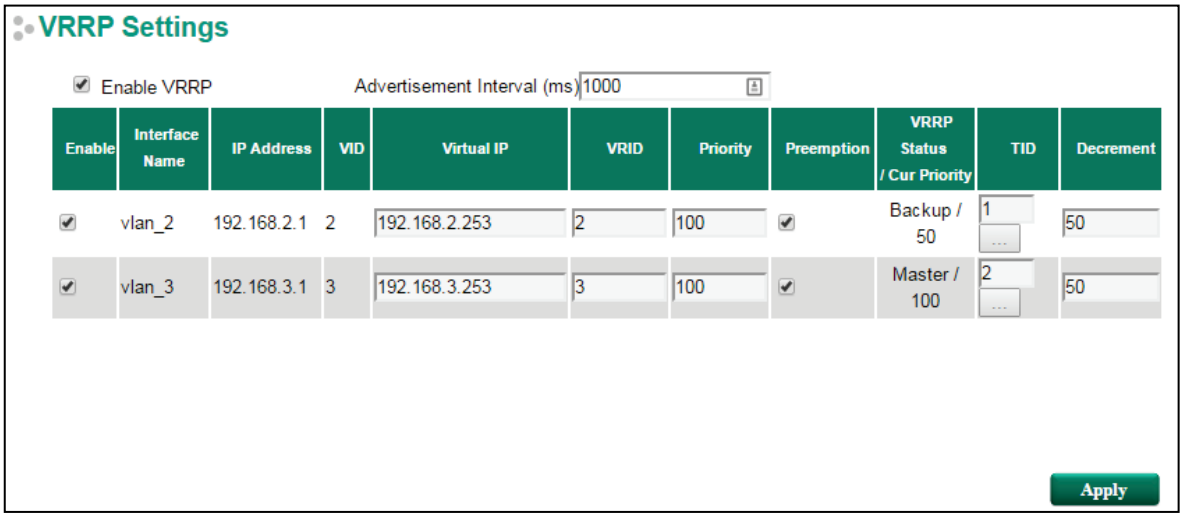
Tracking Table

This table shows all of the information of the tracking entries.



VRRP and Static Routing can be modified by the triggered tracking entry.

VRRP Settings



For detailed VRRP settings please refer to the VRRP section in the Layer 3 Routing user's manual.

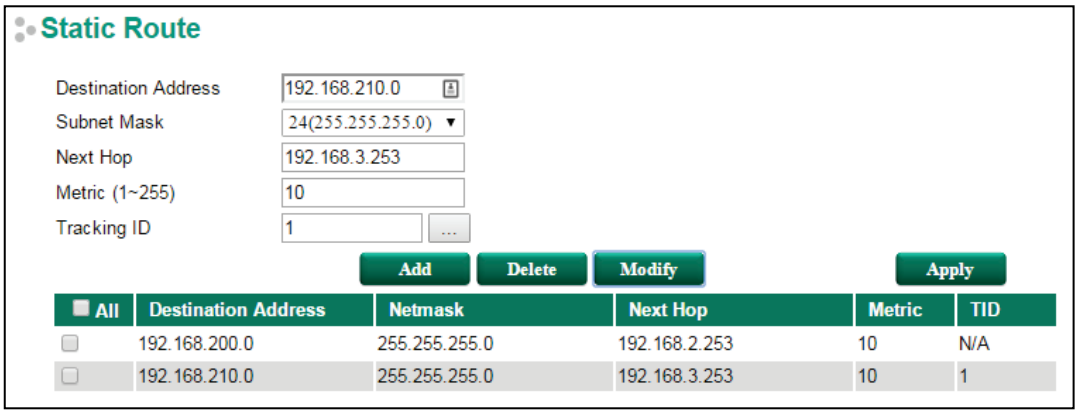
If the VRRP entry does not bind any tracking entry or the status of the bound tracking entry is "up", the running VRRP priority would be equal to the VRRP priority configuration. If the VRRP entry binds a tracking entry and the status of the bound tracking entry is "down", then the running VRRP priority would be (VRRP priority configuration minus decrement).

TID: The tracking entry ID can affect the VRRP entry.

Decrement

Settings	Description	Factory Default
Decrement (Range: 0 to 255)	This is the amount that will be reduced from the priority of the VRRP entry once the status of TID entry is down	0 (The value cannot be greater than the VRRP priority)

Static Route Settings

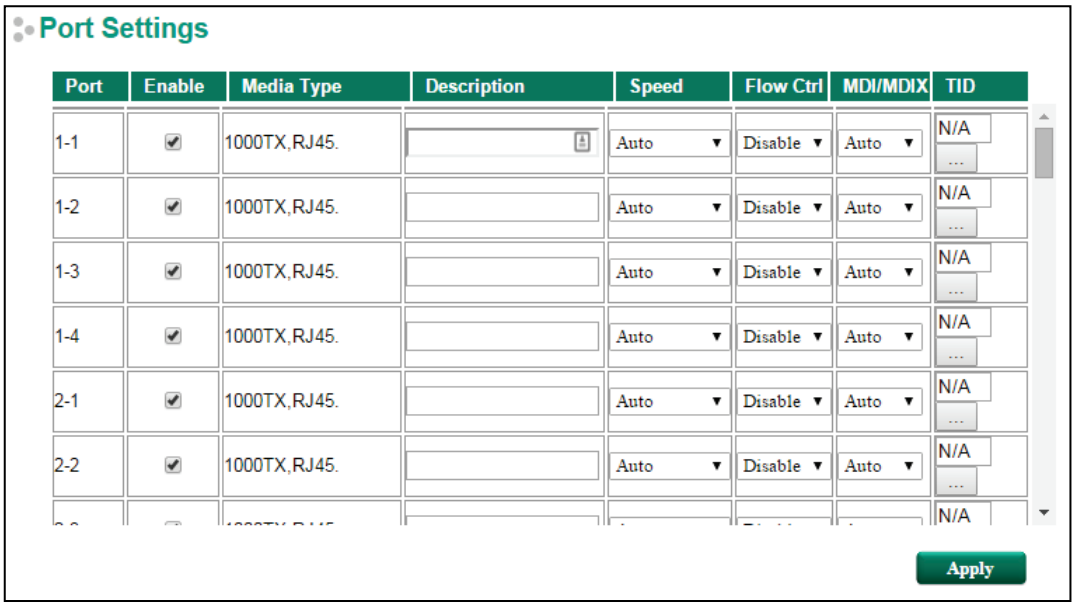


For detailed Static Route settings please refer to the Static Routing section in the Layer 3 Routing user's manual.

If the status of related TID entry is up, the routing address will remain at the routing table. If the status of TID entry is down, the routing address will be erased from the routing table.

TID: The tracking entry ID can affect the Static Route.

Port Settings



For detailed port settings please refer to the port section settings.

If the status of related TID entry is up, the port will be enabled. If the status of TID entry is down, the port will be disabled. This can be observed in the page port status.

TID: The tracking entry ID can affect the port settings.