



Matrix CLI 17.5.1.0

User Guide

1 Dec 2018



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Chapter 1: Matrix CLI

The Matrix command line interface offers control of the appliance and software that can be scripted or entered manually for those who prefer terminal windows over graphical interfaces.

Matrix CLI

Although many command line interfaces share similarities, each is also unique to the product. Use this section to learn about how to start a CLI session; the command structure, command completion, control characters; the online help and the conventions used to document the Matrix CLI.

Conventions used in this document:

Commands typed by the user will be shown in Bold Courier

Output from the CLI will be display in Courier

The CLI command prompt will be shown by '#'

- ◆ Commands are written in *red*.
- ◆ Angled brackets < and > surround required arguments.
- ◆ Square brackets [and] surround optional arguments.
- ◆ Parentheses (and) denote a choice.
- ◆ Choices are separated by a vertical bar |.
- ◆ Where multiple parameters may be specified an ellipsis ... is used.
- ◆ Double quotes " " are required for any name or description containing a space.

Starting a CLI session

A new session can be started from a Linux terminal session using the following command:

```
ssh username@ipaddress
```

```
Example: $ ssh admin@10.0.64.33
```

```
Example: $ ssh -l admin 10.0.64.33
```

On Windows, putty can be used start a new CLI session with the Matrix.

CLI Command Structure

The commands in the CLI are organized in a hierarchical structure which groups together common commands under a parent command name. A list of all commands with description (that are available to the user) can be viewed by typing `help all`. Only commands available in the current operating mode and privilege level can be executed and viewed. Each command may have one or more additional arguments.

Only the first part of the command needs to be typed if it uniquely identifies the command in the CLI. For example, the command to set terminal timeout can be typed as:

```
matrix_host# terminal timeout
                 3600
matrix_host# terminal t
                 3600
matrix_host# term time
                 3600
matrix_host# t t 3600
```

Each command and argument must be separated by at least one space. If the argument includes a space in the value, then it must be enclosed in double quotes (" ").

Some commands that take a variable number of arguments have the format *id=value*. Where *id* is the setting and *value* is the value to set. If the value contains a space, then it must be enclosed by quotes: *id="This is a value with spaces"*.

Command Help

Help and usage information can be displayed for each of the CLI commands.

To display a short 1-line description of the command type the command string immediately followed by a '?':

Example:

```
matrix_host# terminal timeout?  
timeout Set timeout period for this session
```

To display the usage description of the command, type the command string followed by a space and '?':

Example:

```
matrix_host# terminal timeout ?  
Usage:  
  terminal timeout <TimeOut>  
Description:  
Set terminal timeout value in seconds. The CLI will timeout after this number of  
seconds have elapsed with no user activity.  
Parameters:  
  TimeOut Timeout period in seconds (0=disable timeout)  
Examples:  
1) Set timeout period to 1 hour  
matrix_host# terminal timeout 3600  
2) Disable timeout  
matrix_host# terminal timeout 0
```

The usage description of the command shows usage information of the command, a full command description, a description for each argument and examples.

Command Completion

Only the first part of a command that uniquely identifies a command needs to be typed in order for it to be recognized. A partially entered command can be completed by typing a single **TAB**. If unique, the full command will be displayed on the command line. To show a list of sub commands or a list of commands that complete a partially entered command, press **TAB** twice.

If a full command has been entered on the command line and there are required arguments. Double **TAB** will either show a list of acceptable arguments or will display the current setting for that argument.

Control Characters

There are a number of special control characters that serve special purposes in the CLI.

- ◆ **Ctrl-A** Moves cursor to start of line.
- ◆ **Ctrl-B** Moves cursor left one character (left-arrow).
- ◆ **Ctrl-C** Kills the CLI session if it is unresponsive.
- ◆ **Ctrl-D** Ends CLI session.
- ◆ **Ctrl-E** Moves cursor to end of line.
- ◆ **Ctrl-F** Moves cursor right one character (right-arrow).
- ◆ **Ctrl-H** Deletes one character to the left of the cursor (Backspace).
- ◆ **Ctrl-K** Deletes characters from cursor to end of line.
- ◆ **Ctrl-L** Redraws line.
- ◆ **Ctrl-N** Recalls next history line (down-arrow).
- ◆ **Ctrl-P** Recalls previous history line (up-arrow).
- ◆ **Ctrl-U** Clears line.
- ◆ **Ctrl-W** Deletes left to the next word boundary.
- ◆ **Ctrl-X** Cancels the current operation.

Understanding the CLI modes

There are four CLI modes in the CLI. Each mode enables a different set of commands that are available to the user.

Default—The initial mode after logging in. This mode contains mostly commands that display current settings and statistics on the device. The prompt is `matrix_host>` when the CLI is in default mode. The commands available in the default mode start with:

- ◆ `clear`
- ◆ `enable`
- ◆ `exit`
- ◆ `help`
- ◆ `history`
- ◆ `show`
- ◆ `terminal`

Enabled—The next level of access. This enables additional commands which allow system level configuration (authentication, logging, network interface settings, time settings, licensing and power settings). To enter this mode type `enable`. To exit this level type `disable`. The command prompt will be set to `matrix_host#`.

Configure—The highest level of access. To access the 'configure' mode, you must first be in 'enabled' mode. This enables additional commands that allow changing configuration settings. Here layouts can be created, deleted, modified or activated. Rules and filters can be created, modified or deleted. To enter this mode type `configure terminal`. To exit this mode and go back to Enabled, type `exit`. The command prompt will be set to `matrix_host(layout_name)#`. The *layout_name* is the name of the current layout that is loaded for modification (defaults to the active layout).

Power Off—This mode is entered when the power to the Matrix is turned off (`system power off`). It contains only a limited set of commands to either exit the CLI session or turn the power back on.

To end the CLI session, type `exit` while in Default or Enabled mode.

In addition to operation mode, each CLI command has a security level. Every user logging into the system (either by the web interface or CLI) is associated with one or more security levels. The security levels are:

- ◆ `read-only`: Allowed to view current configuration settings and system statistics.
- ◆ `support`: All of read-only, plus the ability to configure system settings.
- ◆ `administrator`: All of support, plus the ability to configure layouts, rules, and filters.

clear alert

The `clear alert` command removes an alert based on the alert's ID number from the `clear alert` list. Alerts are cleared based on a single ID, a list of IDs, or all at once. A maximum of 64 alert IDs can be removed at one time.

You may want to clear alerts that have already been acknowledged and resolved while keeping alerts for issues that are still pending.

Usage

```
clear alert <AlertID|AlertList|all>
```

Parameters

Parameter	Description
<i>AlertID</i>	The ID of the alert you want to clear. For example, 10.
<i>AlertList</i>	List of alert IDs you wish to clear. The list is IDs separated by commas or a range of message IDs separated by a hyphen (-). For example, 1,2,3; 1-3; and 1,2,3,5-8.
all	Clears all alert notifications.

Examples

- ◆ `matrix_host> clear alert all` Clears all alerts (up to a maximum of 64).
- ◆ `matrix_host> clear alert 10` Clears just alert with the ID of 10.
- ◆ `matrix_host> clear alert 1,3,5-10` Clears alerts 1, 3, 5, 6, 7, 8, 9, and 10.

clear port

The command `clear port` clears cumulative physical port counters from memory.

Usage

```
clear port <PortID|PortList|all>
```

Parameters

Parameter	Description
<i>PortID</i>	The ID of the port you want to clear. For example, 10.
<i>PortList</i>	List of physical ports you wish to clear. The list is ports separated by commas or a range of ports separated by a hyphen (-). For example, 1,2,3; 1-3; and 1,2,3,5-8.
all	Clears all ports.

Examples

- ◆ `matrix_host> clear port 1-10`
- ◆ `matrix_host> clear port 1,2,3,5-8`
- ◆ `matrix_host> clear port all`

configure terminal

The command `configure terminal` changes the CLI mode of operation from system-support to system-config. This enables commands requiring administrative privileges. In this mode you can modify layouts, rules, and filters.

Mode	Description
read-only	Default mode after logging in. You can view statistics and network configurations. The prompt looks like <code>matrix_host></code> .
enabled	Everything in read-only plus the ability to change network configurations. The prompt looks like <code>matrix_host#</code> .
config	Everything in enabled plus the ability to change layouts, rules, and filters. The prompt looks like <code>matrix_host(layout_name)#</code> .

Usage

```
configure terminal
```

Examples

```
◆ matrix_host# configure terminal
```

create connection

The command `create connection` creates a new connection in the currently loaded layout which can reference an existing Rule by name or ID.

New rules and filters can optionally be created with this command if they are referenced by the connection. To create a new rule, a RuleName must be specified in the command along with the option 'create-rule=RuleName'. Additional rule creation options can be specified at this time. If the FilterString of the new rule references a filter with a filter variable (`{FilterVariable}`) and that filter does not exist on the system, a create-filter=FilterName option must also be present in the command.

New connections are attributes of the loaded layout. The layout must be saved in order for them to be made permanent. The saved layout can then be activated and used by the hardware.

Usage

```
create connection <ConnectionName>
<NetworkPortID|NetworkPortList> <ToolPortID|ToolPortList>
<("RuleName"|RID|0)> [create-
filter="FilterName","FilterString"[,"FilterDesc"]...[create-
rule="RuleName"[,"RuleDesc"] [value="FilterString"]
[balance=(enable|disable) [balance-type=(packet|conversation)]]
[trailer=(enable|disable)] [trim=(enable|disable)
[trimlen=(64|128|192|256|384|512)]] [dedup=(enable|disable)]]]
```

Parameters

Parameter	Description
<i>ConnectionName</i>	The case-sensitive name of the connection. This name is only used in the CLI and does not appear in the web UI. The name must be unique within a layout. You may use the same name in different layouts. Spaces are not allowed.
<i>NetworkPortID</i>	The ID of a single network port. For example, 10.
<i>NetworkPortList</i>	Network (ingress) ports. A comma-separated list of physical ports or a range of ports. For example, 1,4,6-8. No spaces are allowed.
<i>ToolPortID</i>	The ID of a single tool port. For example, 10.
<i>ToolPortListList</i>	Tool (egress) ports. A comma-separated list of physical ports or a range of ports. For example, 1,4,6-8. No spaces are allowed.
<i>RuleName</i>	The case-sensitive name of the rule. Consider the purpose of the rule when creating a name.
<i>RID</i>	The ID of the rule. The ID is a numeric value associated with the name. When referencing the rule, you may use either the name or the ID.
0	0 for no rule. This means that all data received on the network ports is integrated and replicated without modification or advanced processing logic to any associated tool ports.
<code>create-filter=FilterName,"FilterString"[,"FilterDesc"]</code>	
<i>FilterName</i>	The case-sensitive name of the filter.

Parameter	Description
<i>FilterString</i>	If it contains a space character, the entire string must be enclosed in quotes. A filter that conforms to the BPF syntax. See help filter for more details about BPF. If it contains a space character, the entire string must be enclosed in quotes.
<i>FilterDesc</i>	The filter description is optional and appears in the Filters list.
<code>create-rule=RuleName[, "RuleDesc"] [value="FilterString"] [balance=(enable disable)] [trailer=(enable disable)] [trim=(enable disable) [trimlen=(64 128 192 256 384 512)]] [dedup=(enable disable)]</code>	
<i>RuleName</i>	The case-sensitive name of the rule. Consider the purpose of the rule when creating a name. If it contains a space character, the entire string must be enclosed in quotes.
<i>RuleDesc</i>	Rule descriptions are optional and displayed in the Rules list. If it contains a space character, the entire string must be enclosed in quotes.
<code>value=<"FilterString"></code>	A filter that conforms to the BPF syntax. See help filter for more details about BPF. If it contains a space character, the entire string must be enclosed in quotes.
<code>balance=(enable disable)</code>	Enables load balancing. If selected, load balancing changes how traffic is moved from network ports to tool ports.
<code>balance-type=(packet conversation)</code>	packet: Packets are equally distributed to tool ports using a round-robin method. By dividing the packet volume equally, link utilization is decreased between tool ports and connected tools by a factor of how many tool ports are connected to the rule. Network conversations are severed by using this type, so ensure that any connected tools can operate effectively without intact conversations. conversation: Packets with identical characteristics, such as an identical IP pair, are forwarded exclusively to one tool port. By keeping these packets together, an intact conversation is likely being forwarded. Other unique conversations might be forwarded to the same or different tool port, creating a balanced distribution of conversations to all tool ports connected to the rule. Load balancing of this type is useful when connected tools need to perform analysis on complete network conversations.
<code>conversation-type=(ip L4port mac vlan)</code>	Sets the conversation behavior to load balance. If choosing multiple conversation types, use a comma separated list with no spaces. For example, <code>ip,L4port,vlan</code> . Conversations are traffic streams that must be kept together and forwarded intact to a tool port. How the system determines a conversation must be specified. For example, selecting only 'Include IP pair' indicates all connections between a unique IP pair must be kept intact and forwarded to the same tool port.
<code>trailer=(enable disable)</code>	Specifies if additional information is added to the packets. If selected, an identifying trailer is appended to ingress packets as they arrive. Each trailer contains a timestamp and the Group ID, Box ID, and Port ID identifying where the packet arrived.

Parameter	Description
<code>trailer-uplink=(enable disable)</code>	If selected, an identifying trailer is appended to ingress packets as they arrive. Each trailer contains a timestamp and the Group ID, Box ID, and Port ID identifying where the packet arrived.
<code>dedup=(enable disable)</code>	If selected, hardware-accelerated packet deduplication removes duplicate ingress packets in real time.
<code>enable</code>	Specifies if packet trimming is enabled.
<code>disable</code>	Specifies if packet trimming is disabled.
<code>trimlen=(64 128 192 256 384 512)</code>	Only the first N-bytes of each ingress packet are forwarded to tool ports. A new 4-byte CRC value is affixed to each trimmed packet. Valid values are: 64, 128, 192, 256, 384, and 512.

Examples

- ◆ `matrix_host(layout_name) # create connection conn1 1,2 19 0`
Creates a new connection called 'conn1' between network ports 1 and 2 to tool port 19 without an associated rule.
- ◆ `matrix_host(layout_name) # create connection conn2 1-3 20 rule1`
Create a new connection called 'conn2' between network ports 1,2 and 3 to tool port 20 with saved rule 'rule1'.
- ◆ `matrix_host(layout_name) # create connection conn3 4 21 rule-new create-rule=rule-new,"Description of rule-new"`
Create a new connection called 'conn3' between network ports 4 and tool port 21 with a new rule called 'rule-new'.
- ◆ `matrix_host(layout_name) # create connection conn4 5 22 rule2 create-rule=rule2 value="tcp port 80 and ${localnet}" create-filter=localnet,"net 10.0.64.0/24"`
Create a new connection 'conn4', a new rule and a new filter in one command. This creates a new connection which references 'rule2'. Rule 'rule2' references a new filter named localnet. The new rule and filter will be saved and can be reused by other connections and rules.

create filter

The command `create filter` creates a new filter using Berkeley Packet Filter (BPF). The BPF implemented has been extended to enhance its functionality. A quick reference of the BPF syntax can be viewed by typing 'help filter'.

Usage

```
create filter <"FilterName"> <"FilterString"> ["FilterDesc"]
```

Parameters

Parameter	Description
<i>FilterName</i>	The case-sensitive name of the filter.
<i>FID</i>	The ID of the filter. The ID is a numeric value associated with the name. When referencing the filter, you may use either the name or ID.
<i>FilterDesc</i>	The filter description is optional and appears in the Filters list. If it contains a space character, the entire string must be enclosed in quotes.
<i>NewFilterName</i>	The filter's new name.
<i>FilterString</i>	A filter that conforms to the BPF syntax. See help filter for more details about BPF.

Examples

- ◆ `matrix_host(layout_name) # create filter filter1 "ip src host 10.0.64.31" "This is the description of filter1"`

create rule

The command `create rule` creates a new rule. Rules can be referenced by layout connections.

Usage

```
create rule <"RuleName"> [value= <"FilterString">]
[desc="RuleDesc"] [balance=(enable|disable)] [balance-
type=(packet|conversation)] [conversation-
type=(ip|L4port|mac|vlan)] [trailer=(enable|disable)]
[trailer-uplink=(enable|disable)] [trim=(enable|disable)]
[trimlen=64|128|192|256|384|512] [dedup=(enable|disable)]
[create-filter="FilterName", "FilterString" [, "FilterDesc"]]
```

Parameters

Parameter	Description
<code>RuleName</code>	The case-sensitive name of the rule. Consider the purpose of the rule when creating a name. If it contains a space character, the entire string must be enclosed in quotes.
<code>desc="RuleDesc"</code>	Rule descriptions are optional and displayed in the Rules list.
<code>value= <"FilterString"></code>	A filter that conforms to the BPF syntax. See help filter for more details about BPF. If it contains a space character, the entire string must be enclosed in quotes.
<code>balance=(enable disable)</code>	If selected, load balancing changes how traffic is moved from network ports to tool ports.
<code>balance-type=(packet conversation)</code>	<code>packet</code> : Packets are equally distributed to tool ports using a round-robin method. By dividing the packet volume equally, link utilization is decreased between tool ports and connected tools by a factor of how many tool ports are connected to the rule. Network conversations are severed by using this type, so ensure that any connected tools can operate effectively without intact conversations. <code>conversation</code> : Packets with identical characteristics, such as an identical IP pair, are forwarded exclusively to one tool port. By keeping these packets together, an intact conversation is likely being forwarded. Other unique conversations might be forwarded to the same or different tool port, creating a balanced distribution of conversations to all tool ports connected to the rule. Load balancing of this type is useful when connected tools need to perform analysis on complete network conversations.
<code>conversation-type=(ip L4port mac vlan)</code>	Sets the conversation behavior to load balance. If choosing multiple conversation types, use a comma separated list with no spaces. For example, <code>ip,L4port,vlan</code> . Conversations are traffic streams that must be kept together and forwarded intact to a tool port. How the system determines a conversation must be specified. For example, selecting only 'Include IP pair' indicates all connections between a unique IP pair must be kept intact and forwarded to the same tool port.

Parameter	Description
<code>trailer=(enable disable)</code>	If selected, an identifying trailer is appended to ingress packets as they arrive. Each trailer contains a timestamp and the Group ID, Box ID, and Port ID identifying where the packet arrived.
<code>trailer-uplink=(enable disable)</code>	If selected, an identifying trailer is appended to ingress packets as they arrive. Each trailer contains a timestamp and the Group ID, Box ID, and Port ID identifying where the packet arrived.
<code>dedup=(enable disable)</code>	If selected, hardware-accelerated packet deduplication removes duplicate ingress packets in real time.
<code>trim=(enable disable)</code>	If selected, packets larger than the Trim Length value are truncated to a specified size. Packets smaller than the Trim Length value are unchanged.
<code>trimlen=64 128 192 256 384 512</code>	Only the first N-bytes of each ingress packet are forwarded to tool ports. A new 4-byte CRC value is affixed to each trimmed packet. Valid values are: 64, 128, 192, 256, 384, and 512.

Examples

- ◆ `matrix_host(layout_name) # create rule rule1 value="portrange 2000-2010 and host 10.0.64.30"`
- ◆ `matrix_host(layout_name) # create rule rule2 dedup=enable`

delete connection

The command `delete connection` deletes a connection in the currently loaded layout by connection name or ID. The layout must be saved to make changes permanent.

Usage

```
delete connection <ConnectionName|CID>
```

Parameters

Parameter	Description
<i>ConnectionName</i>	The case-sensitive name of the connection. This name is only used in the CLI and does not appear in the web UI. The name must be unique within a layout. You may use the same name in different layouts. Spaces are not allowed.
<i>CID</i>	The ID of the connection. The ID is a numeric value associated with the name. When referencing the connection, you may use either the name or the ID.

Examples

```
◆ matrix_host(layout_name) # delete connection conn1
```

delete filter

The command `delete filter` deletes a saved filter. If the filter is referenced by a rule or filter, the value of the deleted filter is first replaced in all referenced rules and filters.

Usage

```
delete filter <"FilterName" | FID>
```

Parameters

Parameter	Description
<i>FilterName</i>	The case-sensitive name of the filter. If it contains a space character, the entire string must be enclosed in quotes.
<i>FID</i>	Filter ID to delete

Examples

- ◆ `matrix_host(layout_name) # delete filter filter1`

delete rule

The command `delete rule` deletes a saved rule.

Rules cannot be deleted if they are in use by the active layout.

Usage

```
delete rule <"RuleName" | RID>
```

Parameters

Parameter	Description
<i>RuleName</i>	The case-sensitive name of the rule. If it contains a space character, the entire string must be enclosed in quotes.
<i>RID</i>	The ID of the rule. The ID is a numeric value associated with the name. When referencing the rule, you may use either the name or the ID.

Examples

- ◆ `matrix_host(layout_name) # delete rule rule1`

disable

The `disable` command changes the mode of operation for the CLI from the enable mode to the read-only mode.

It also disables commands requiring system-support privileges. If you are in 'configure' mode, you must exit configure mode which puts you in 'enabled' mode before you can use `disable`.

Usage

```
disable
```

Examples

```
◆ matrix_host# disable
```

enable

The `enable` command changes the CLI mode of operation to access commands that start with `configure`, `system`, and `terminal`, which allow you to create and configure groups, users, filters, network settings, and more.

Mode	Description
read-only	Default mode after logging in. You can view statistics and network configurations. The prompt looks like <code>matrix_host></code> .
enabled	Everything in read-only plus the ability to change network configurations. The prompt looks like <code>matrix_host#</code> .
config	Everything in enabled plus the ability to change layouts, rules, and filters. The prompt looks like <code>matrix_host(layout_name)#</code> .

Usage

`enable`

Examples

◆ `matrix_host> enable`

exit

The `exit` command leaves the current mode of operation or closes the CLI session. If in configuration mode, this leaves the configuration mode and returns to enabled mode. If in the default or enabled mode, this closes the CLI session.

Usage

`exit`

Examples

◆ `matrix_host> exit`

help

The command `help` demonstrates how to use the CLI interface.

Using the CLI interface

History:

Previously issued commands can be recalled by using the UP and DOWN arrow keys. The full list of previously entered commands can be viewed by issuing the command `history`.

Command Help (?):

To view command help for a command, type the name of the command immediately followed by '?'; for example, `<command>?`. To view the command usage description, type the name of the command, then a space followed by '?'. For example, `<command><space>?`. If there are child commands defined under this command, a list of child commands will be displayed along with their command help descriptions.

1) terminal ?

2) terminal timeout?

3) terminal timeout ?

Example 1 will show the list of valid subcommands defined under 'terminal'.

Example 2 will show the command description for 'terminal timeout'.

Example 3 will show the command usage for 'terminal timeout'.

TAB Completion:

Only the first part of a command that uniquely identifies the command needs to be typed in order for it to be recognized. A partially entered command can be completed by typing a single TAB. If unique, the full command will be displayed on the command line. To show a list of sub commands or a list of commands that complete a partially entered command, press TAB twice.

Control Characters

There are a number of special control characters that serve special purposes in the CLI.

- ◆ **Ctrl-A** Moves cursor to start of line.
- ◆ **Ctrl-B** Moves cursor left one character (left-arrow).
- ◆ **Ctrl-C** Kills the CLI session if it is unresponsive.
- ◆ **Ctrl-D** Ends CLI session.
- ◆ **Ctrl-E** Moves cursor to end of line.
- ◆ **Ctrl-F** Moves cursor right one character (right-arrow).
- ◆ **Ctrl-H** Deletes one character to the left of the cursor (Backspace).
- ◆ **Ctrl-K** Deletes characters from cursor to end of line.
- ◆ **Ctrl-L** Redraws line.
- ◆ **Ctrl-N** Recalls next history line (down-arrow).
- ◆ **Ctrl-P** Recalls previous history line (up-arrow).

- ◆ **Ctrl-U** Clears line.
- ◆ **Ctrl-W** Deletes left to the next word boundary.
- ◆ **Ctrl-X** Cancels the current operation.

Usage

`help`

Examples

- ◆ `matrix_host> help`

help all

The command `help all` displays a list of all commands available for the user based on his privilege level and current command mode.

Usage

```
help all
```

Examples

- ◆ `matrix_host> help all`

help filter

The command `help filter` briefly describes the Berkeley Packet Filter (BPF) syntax and the custom extensions for it.

A BPF expression consists of one or more primitives. A primitive consists of an id (value) preceded by one or more qualifiers. There are three types of qualifiers. They are listed in the order in which they must appear in an expression.

Filter expressions can be combined using logic operators: **and**, **&&**, **or**, **||**, **not**, **!**. **and** and **or** have equal precedence and are evaluated from left to right. Negation (**!**, **not**) has the highest precedence. Expressions can be logically grouped using parenthesis (**(**, **)**).

Identical qualifier lists can be omitted to shorten the expression. For example `ip src host 1.2.3.4 or ip src host 1.2.3.5` can be written as `ip src host 1.2.3.4 or 1.2.3.5`.

For more details about the BPF syntax, see <http://biot.com/capstats/bpf.html>. The syntax has been extended in the following ways:

- ◆ Added support for protocol: sctp, tcpdata, and udpdata.
- ◆ Added types: hostnet and netport.
- ◆ Removed support for protocols: fddi, tr, wlan and decnet.
- ◆ Removed support for: atalk, aarp, decnet, iso, stp, ipx, and netbeui.
- ◆ These primitives do not conform to the standard pattern: broadcast, less, greater, len, multicast, and data accessors.
- ◆ These primitives are not supported: gateway, protochain, decnet, ifname, on, rnr, rulenum, reason, rst, ruleset, srnr, subrulenum, action, pppoad, pppoes, iso proto, vpi, vci, lane, llc, oamf4s, oamf4e, oamf4, oam, metac, bcc, sc, ilmic, connectmsg, and metaconnect.

Usage

```
help filter
```

Examples

- ◆ `matrix_host> help filter`

history

The `history` command displays a list of the last 64 commands used.

The list is numbered with the highest number being the most recent command.

Previously entered commands are associated with a user and saved between sessions. A previous command can be recalled by pressing the `up-arrow` key or pressing `Ctrl-P`. The next command in the history buffer can be recalled by pressing the `down-arrow` or `Ctrl-N` key.

Usage

```
history
```

Examples

```
◆ matrix_host# history
```

layout activate

The command `layout activate` activates the specified layout. If no layout name is specified, the currently loaded layout is activated.

Activating a layout does not automatically load the layout. Loading is a separate action that is described in [layout load](#).

Usage

```
layout activate ["LayoutName"]
```

Parameters

Parameter	Description
<i>LayoutName</i>	The name of this layout. The maximum number of layouts is 16. If it contains a space character, the entire string must be enclosed in quotes.

Examples

- ◆ `matrix_host(layout_name) # layout activate` Make the currently loaded layout the activate layout.
- ◆ `matrix_host(layout_name) # layout activate "My Layout"` Activate a saved layout by name.

layout clear

The `layout clear` removes all layout settings associated with the currently loaded layout. All connections, port settings, and associated rules are removed. The layout name is preserved, but all of its settings are empty.

Usage

```
layout clear
```

Examples

- ◆ `matrix_host(layout_name) # layout clear`

layout create

The command `layout create` creates a new empty layout with the specified name in `LayoutName` and becomes the loaded layout. The layout is temporary until it is saved and made permanent. Layout names are case sensitive and must be quoted if they contain spaces.

Usage

```
layout create <"LayoutName">
```

Parameters

Parameter	Description
<i>LayoutName</i>	The name of this layout. The maximum number of layouts is 16. If it contains a space character, the entire string must be enclosed in quotes.

Examples

- ◆ `matrix_host(layout_name) # layout create newlayout`
- ◆ `matrix_host(layout_name) # layout create "New Layout"`

layout delete

The `layout delete` command deletes a saved layout.

Usage

```
layout delete <"LayoutName">
```

Parameters

Parameter	Description
<i>LayoutName</i>	The name of this layout. The maximum number of layouts is 16. If it contains a space character, the entire string must be enclosed in quotes.

Examples

- ◆ `matrix_host(layout_name) # layout delete "My Layout"`

layout export

The `layout export` command prints to the screen the CLI commands that create the currently loaded layout, or a specific layout if its name is provided.

Usage

```
layout export ["LayoutName"]
```

Parameters

Parameter	Description
<i>LayoutName</i>	The name of this layout. The maximum number of layouts is 16. If it contains a space character, the entire string must be enclosed in quotes.

Examples

- ◆ `matrix_host(layout_name) # layout export "My Layout" Export name "My Layout"`
- ◆ `matrix_host(layout_name) # layout export Export the currently loaded layout`

layout import

The `layout import` command puts the CLI into "paste" mode.

Use `Ctrl-V` (or whatever paste command is defined for your terminal session) to paste the contents of `layout export` from your clipboard one command at a time. After pasting the layout, type `Ctrl-W` to start the import process.

The layout contains numerous commands that set network and tool ports, rules, deduplication settings, and more. Each setting is mapped to a CLI command. All of the CLI commands are processed in a single transaction. System resources and the syntax of each line are verified before being processed. If the verification fails, any created resources are removed from the system. If the import is successful, the imported layout becomes the currently loaded layout. Layout configurations can be generated from the web interface, scp, or the command `layout export`.

Type `Ctrl-X` to cancel the import process.

Usage

```
layout import
```

Examples

```
◆ matrix_host(layout_name) # layout import
```

layout list

The `layout list` command lists all saved layouts. Use the `layout list` to see all layouts on this Matrix. The list includes a layout's status: (A)ctive, (L)oaded, or (M)odified; its name, and its description if one is present.

Usage

```
layout list
```

Examples

- ◆ `matrix_host(layout_name) # layout list`

layout load

The `layout load` command loads a saved layout for modification or viewing. Layout names are case sensitive and must be quoted if they contain spaces.

Usage

```
layout load <"LayoutName">
```

Parameters

Parameter	Description
<i>LayoutName</i>	The name of this layout. The maximum number of layouts is 16. If it contains a space character, the entire string must be enclosed in quotes.

Examples

- ◆ `matrix_host(layout_name) # layout load "My Layout"`

layout rename

The command `layout rename` renames a saved layout.

Usage

```
layout rename <LayoutName> <NewLayoutName>
```

Parameters

Parameter	Description
<i>LayoutName</i>	The name of this layout. The maximum number of layouts is 16. If it contains a space character, the entire string must be enclosed in quotes.
<i>NewLayoutName</i>	The new name for the layout. If it contains a space character, the entire string must be enclosed in quotes.

Examples

- ◆ `matrix_host(layout_name) # layout rename "Test Layout"
"Monitor Layout"`

layout save

The `layout save` command saves the current layout or saves the current layout to the specified layout name. If the layout name does not exist, a new layout is created; otherwise the existing layout is overwritten.

The current layout is the loaded layout, which is not necessarily the active layout since you can load a non-active layout to modify it. The current layout's name is in parentheses.

Usage

```
layout save ["LayoutName"]
```

Parameters

Parameter	Description
<i>LayoutName</i>	The name of this layout. The maximum number of layouts is 16. If it contains a space character, the entire string must be enclosed in quotes.

Examples

- ◆ `matrix_host(layout_name) # layout save "10Gb Rules and Filters"` Saves the loaded layout naming it "10Gb Rules and Filters"
- ◆ `matrix_host(layout_name) # layout save` Saves the currently loaded layout.

modify connection in

The `modify connection in` command changes the network (ingress) ports used by an existing connection.

The connections available to modify with this command are created from [create connection](#) .

Usage

```
modify connection in <ConnectionName|CID> <PortList>
```

Parameters

Parameter	Description
<i>ConnectionName</i>	The case-sensitive name of the connection. This name is only used in the CLI and does not appear in the web UI. The name must be unique within a layout. You may use the same name in different layouts. Spaces are not allowed.
<i>CID</i>	The ID of the connection. The ID is a numeric value associated with the name. When referencing the connection, you may use either the name or the ID.
<i>PortList</i>	Network (ingress) ports. A comma-separated list of physical ports or a range of ports. For example, 1,4,6-8. No spaces are allowed.

Examples

- ◆ `matrix_host(layout_name) # modify connection in conn1 5` Use network port 5 for connection "conn1".
- ◆ `matrix_host(layout_name) # modify connection in conn2 1,2,4-6`

modify connection name

The `modify connection name` command changes the name of a connection in the active layout.

The connections available to modify with this command are created from [create connection](#).

Changes to the layout are automatically saved if the changes are successful. If you are modifying the active layout, those changes take effect immediately.

Usage

```
modify connection name <ConnectionName|CID> <NewConnectionName>
```

Parameters

Parameter	Description
<i>ConnectionName</i>	Current connection name. The case-sensitive name of the connection. This name is only used in the CLI and does not appear in the web UI. The name must be unique within a layout. You may use the same name in different layouts. Spaces are not allowed.
<i>CID</i>	The ID of the connection. The ID is a numeric value associated with the name. When referencing the connection, you may use either the name or the ID.
<i>NewConnectionName</i>	New name for the connection. The case-sensitive name of the connection. This name is only used in the CLI and does not appear in the web UI. The name must be unique within a layout. You may use the same name in different layouts. Spaces are not allowed.

Examples

- ◆ `matrix_host(layout_name) # modify connection name conn1 connection1`

modify connection out

The `modify connection out` command changes the tool (egress) ports on a connection.

The connections available to modify with this command are created from [create connection](#).

Changes to the layout are automatically saved if the changes are successful. If you are modifying the active layout, those changes take effect immediately.

Usage

```
modify connection out <ConnectionName|CID> <PortList>
```

Parameters

Parameter	Description
<i>ConnectionName</i>	The case-sensitive name of the connection. This name is only used in the CLI and does not appear in the web UI. The name must be unique within a layout. You may use the same name in different layouts. Spaces are not allowed.
<i>CID</i>	The ID of the connection. The ID is a numeric value associated with the name. When referencing the connection, you may use either the name or the ID.
<i>PortList</i>	Network (ingress) ports. A comma-separated list of physical ports or a range of ports. For example, 1,4,6-8. No spaces are allowed.

Examples

- ◆ `matrix_host(layout_name)# modify connection out conn1 20`
- ◆ `matrix_host(layout_name)# modify connection out conn2 21-24`

modify connection rule

The `modify connection rule` command changes or removes the rule associated with a connection.

The connections available to modify with this command are created from [create connection](#).

Changes to the layout are automatically saved if the changes are successful. If you are modifying the active layout, those changes take effect immediately.

Usage

```
modify connection rule <ConnectionName|CID> <"RuleName"|RID|0>
```

Parameters

Parameter	Description
<i>ConnectionName</i>	The case-sensitive name of the connection. This name is only used in the CLI and does not appear in the web UI. The name must be unique within a layout. You may use the same name in different layouts. Spaces are not allowed.
<i>CID</i>	The ID of the connection. The ID is a numeric value associated with the name. When referencing the connection, you may use either the name or the ID.
<i>RuleName</i>	Name of a saved rule or new rule specified in option <code>create-rule</code> . If it contains a space character, the entire string must be enclosed in quotes.
<i>RID</i>	The ID of the rule. The ID is a numeric value associated with the name. When referencing the rule, you may use either the name or the ID.
0	0 for no rule. This means that all data received on the network ports is integrated and replicated without modification or advanced processing logic to any associated tool ports.

Examples

```
◆ matrix_host(layout_name) # modify connection rule conn1 rule1
```

modify connection state

The `modify connection state` command enables or disables a connection in a layout. No traffic transfers from the network ports to the tool ports if the connection is disabled.

The connections available to modify with this command are created from [create connection](#).

Changes to the layout are automatically saved if the changes are successful. If you are modifying the active layout, those changes take effect immediately.

To delete a connection instead of enable or disable it, refer to [delete connection](#) instead.

Usage

```
modify connection state <ConnectionName|CID> <enable|disable>
```

Parameters

Parameter	Description
<i>ConnectionName</i>	The case-sensitive name of the connection. This name is only used in the CLI and does not appear in the web UI. The name must be unique within a layout. You may use the same name in different layouts. Spaces are not allowed.
<i>CID</i>	The ID of the connection. The ID is a numeric value associated with the name. When referencing the connection, you may use either the name or the ID.
<code>enable</code>	Creates the connection.
<code>disable</code>	Breaks the connection.

Examples

- ◆ `matrix_host(layout_name) # modify connection state conn1 enable`
- ◆ `matrix_host(layout_name) # modify connection state conn2 disable`

modify filter desc

The `modify filter desc` command changes the description of a saved filter. This command only makes changes to a filter with an existing description. For creating a filter description where one does not exist, refer to [create filter](#).

Usage

```
modify filter desc <"FilterName"|FID> <"FilterDesc">
```

Parameters

Parameter	Description
<i>FilterName</i>	The case-sensitive name of the filter. If it contains a space character, the entire string must be enclosed in quotes.
<i>FID</i>	The ID of the filter. The ID is a numeric value associated with the name. When referencing the filter, you may use either the name or ID.
<i>FilterDesc</i>	The filter description is optional and appears in the Filters list. If it contains a space character, the entire string must be enclosed in quotes.

Examples

- ◆ `matrix_host(layout_name) # modify filter desc filter1 "This is the description for filter1"`

modify filter name

The `modify filter name` command modifies the name of a saved filter.

If this filter is used in another filter or rule and you change this filter's name, the new name is automatically picked up by the referencing filters and rules. The changes take effect immediately.

Usage

```
modify filter name <"CurrentFilterName"|FID> <NewFilterName>
```

Parameters

Parameter	Description
<i>CurrentFilterName</i>	The case-sensitive name of the filter. If it contains a space character, the entire string must be enclosed in quotes.
<i>FID</i>	The ID of the filter. The ID is a numeric value associated with the name. When referencing the filter, you may use either the name or ID.
<i>NewFilterName</i>	The filter's new name. If it contains a space character, the entire string must be enclosed in quotes.

Examples

- ◆ `matrix_host(layout_name) # modify filter name RedPill BluePill`

modify filter value

The `modify filter value` command changes the value of a saved filter.

If this filter is used in the active layout and you change its value, the new value is automatically used by the layout.

The value is defined in the Berkeley Packet Filter (BPF) format. For the Matrix, BPF has been extended to enhance its functionality.

Usage

```
modify filter value <"FilterName"|FID> <"FilterString">
```

Parameters

Parameter	Description
<i>FilterName</i>	The case-sensitive name of the filter. If it contains a space character, the entire string must be enclosed in quotes.
<i>FID</i>	The ID of the filter. The ID is a numeric value associated with the name. When referencing the filter, you may use either the name or ID.
<i>FilterString</i>	A filter that conforms to the BPF syntax. See help filter for more details about BPF. If it contains a space character, the entire string must be enclosed in quotes.

Examples

- ◆ `matrix_host(layout_name) # modify filter value filter1 "ip src host 10.0.64.30"`

modify layout dedup ignore-ip

The `modify layout dedup ignore-ip` command enables or disables packet deduplication testing of IP address pairs on packets passing through rules with deduplication enabled.

This is a global layout setting that affects all rules with deduplication enabled.

Usage

```
modify layout dedup ignore-ip < enable | disable >
```

Parameters

Parameter	Description
<code>enable</code>	Ignore IP address pair. If selected, the criteria is ignored and not evaluated when determining duplicate packets.
<code>disable</code>	Include IP address pair when determining duplicate packets. Default.

Examples

- ◆ `matrix_host(layout_name) # modify layout dedup ignore-ip enable` Ignore IP address pair when determining duplicate packets
- ◆ `matrix_host(layout_name) # modify layout dedup ignore-ip disable` Do not ignore IP address pair when determining duplicate packets

modify layout dedup ignore-mac

The `modify layout dedup ignore-mac` command enables or disables packet deduplication testing of MAC address pairs on packets passing through rules with deduplication enabled.

This is a global layout setting that affects all rules with deduplication enabled.

Usage

```
modify layout dedup ignore-mac < enable | disable >
```

Parameters

Parameter	Description
<code>enable</code>	Ignore MAC address pair. If selected, the criteria is ignored and not evaluated when determining duplicate packets.
<code>disable</code>	Include MAC address pair when determining duplicate packets. Default.

Examples

- ◆ `matrix_host(layout_name)# modify layout dedup ignore-mac enable` Ignore MAC address pair when determining duplicate packets.
- ◆ `matrix_host(layout_name)# modify layout dedup ignore-mac disable` Do not ignore MAC address pair when determining duplicate packets.

modify layout dedup ignore-tos

The `modify layout dedup ignore-tos` command enables or disables packet deduplication testing of TOS/TC on packets passing through rules with deduplication enabled.

This is a global layout setting that affects all rules with deduplication enabled.

Usage

```
modify layout dedup ignore-tos < enable | disable >
```

Parameters

Parameter	Description
<code>enable</code>	Ignore TOS/TC packets in IP header. If selected, the criteria is ignored and not evaluated when determining duplicate packets.
<code>disable</code>	Include TOC/TC packets in IP header when determining duplicate packets. Default.

Examples

- ◆ `matrix_host(layout_name) # modify layout dedup ignore-tos enable` Ignore TOS/TC when determining duplicate packets.
- ◆ `matrix_host(layout_name) # modify layout dedup ignore-tos disable` Do not ignore TOS/TC when determining duplicate packets.

modify layout dedup ignore-ttl

The `modify layout dedup ignore-ttl` command enables or disables testing for duplicate packets using the IPv4 TTL field.

This is a layout setting. It affects all rules with deduplication enabled. This option does not enable or disable packet deduplication. To enable or disable packet deduplication within a rule, use `modify rule dedup`.

This command has no effect on IPv6 networks because IPv6 uses maximum hops rather than TTL.

This is a global layout setting that affects all rules with deduplication enabled.

Usage

```
modify layout dedup ignore-ttl <enable|disable>
```

Parameters

Parameter	Description
<code>enable</code>	Ignore TTL. If selected, the criteria is ignored and not evaluated when determining duplicate packets.
<code>disable</code>	Include TTL when determining duplicate packets. Default.

Examples

- ◆ `matrix_host(layout_name) # modify layout dedup ignore-ttl enable`

modify layout dedup ignore-vlan

The `modify layout dedup ignore-vlan` command enables or disables packet deduplication testing of Ethertype and VLAN layers.

This is a global layout setting that affects all rules with deduplication enabled.

Usage

```
modify layout dedup ignore-vlan <enable|disable>
```

Parameters

Parameter	Description
<code>enable</code>	Ignore Ethertype and VLAN. If selected, the criteria is ignored and not evaluated when determining duplicate packets.
<code>disable</code>	Include Ethertype and VLAN when determining duplicate packets. Default.

Examples

- ◆ `matrix_host(layout_name)# modify layout dedup ignore-vlan enable`
- ◆ `matrix_host(layout_name)# modify layout dedup ignore-vlan disable`

modify layout desc

The `modify layout desc` command sets the description for the currently loaded layout.

The description is visible in the web UI in **Ports > Layout Properties**.

Usage

```
modify layout desc <"Description">
```

Parameters

Parameter	Description
<i>Description</i>	Layout descriptions should reveal how operation of the system changes if activated. If it contains a space character, the entire string must be enclosed in quotes.

Examples

- ◆ `matrix_host(layout_name)# modify layout desc "The default layout that only connects 2 ports with no filter."`

modify port auto-negotiate

The `modify port auto-negotiate` command enables or disables auto-negotiation on one or more ports.

Ports are set to auto-negotiate by default. Use `show layout` to view which ports have auto-negotiate enabled or disabled.

Usage

```
modify port auto-negotiate <PortList> <enable|disable>
```

Parameters

Parameter	Description
<i>PortList</i>	A comma-separated list of physical ports or a range of ports. For example, 1,4,6-8. No spaces are allowed.
enable	Enables auto-negotiation on the specified ports. If selected, enables link speed auto-negotiation between this network port or tool port and its connected devices.
disable	Disables auto-negotiation on the specified ports.

Examples

- ◆ `matrix_host(layout_name) # modify port auto-negotiate 1 enable`
- ◆ `matrix_host(layout_name) # modify port auto-negotiate 7,8,9,10 disable`
- ◆ `matrix_host(layout_name) # modify port auto-negotiate 7-10 enable`
- ◆ `matrix_host(layout_name) # modify port auto-negotiate 1,2,4-6 disable`

modify port name

The `modify port name` command modifies the name of a port in the currently loaded layout.

Usage

```
modify port name <PortList> <"PortName">
```

Parameters

Parameter	Description
<i>PortList</i>	A comma-separated list of physical ports or a range of ports. For example, 1,4,6-8. No spaces are allowed.
<i>PortName</i>	Port name. If it contains a space character, the entire string must be enclosed in quotes. Giving names to ports can help when designing a layout. When naming a port, consider the purpose of the port or the devices connecting to it.

Examples

```
◆ matrix_host(layout_name) # modify port name 20 "GigaStor 5"
```

modify port speed

The `modify port speed` command sets the port's speed designation.

Ports are grouped in blocks of four. All ports in a block must have the same speed designation. For example, ports 1-4 might be configured for 1G while ports 5-8 are 10G. If you change the speed for port 6 from 10G to 1G, then ports 5, 7, and 8 are also changed to 1G.

Usage

```
modify port speed <PortList> <1G|10G>
```

Parameters

Parameter	Description
<i>PortList</i>	A comma-separated list of physical ports or a range of ports. For example, 1,4,6-8. No spaces are allowed.
1G	Sets the port speed (of selected ports) to one gigabit per second.
10G	Sets the port speed (of selected ports) to ten gigabits per second.

Examples

- ◆ `matrix_host(layout_name) # modify port speed 7 1G` Setting port speed on port 7 to 1G (sets all ports in port block with port 7 (5-8))
- ◆ `matrix_host(layout_name) # modify port speed 9-11 10G` Setting port speed on ports 9-11 to 10G (sets all ports in port block with ports (9-12))

modify port type

The `modify port type` command modifies the port type in the currently loaded layout.

There are two types of ports: network and tool.

The appliance ports can change modes of operation.

Network Port Ingress port that accepts network traffic

Tool Port Egress port that forwards network traffic to tools and analyzers

You cannot modify the port type if the port actively has traffic passing through it.

The currently loaded layout is shown at the prompt in parentheses, such as `matrix_host(layout_name)#`. You can also use [show layout](#) .

Usage

```
modify port type <PortList> <network|tool>
```

Parameters

Parameter	Description
<i>PortList</i>	A comma-separated list of physical ports or a range of ports. For example, 1,4,6-8. No spaces are allowed.
network	Changes the ports to network (ingress) ports.
tool	Changes the ports to tool (egress) ports.

Examples

```
◆ matrix_host(layout_name)# modify port type 20-23 tool
```

modify port uplink

The command `modify port uplink` sets a network port, or ports, to be an uplink. An uplink is a network port that can selectively exclude packet trailers from being added which can be useful when daisy chaining.

Usage

```
modify port uplink <PortList> <yes|no>
```

Parameters

Parameter	Description
<i>PortList</i>	A comma-separated list of physical ports or a range of ports. For example, 1,4,6-8. No spaces are allowed.
yes	If selected, this port is identified as an uplink port. Uplink ports are used in conjunction with trailer settings to determine if trailers should 'stack' as they traverse additional Matrix switches or not.
no	Removes the uplink declaration from this port. This is the default value for all network ports.

Examples

- ◆ `matrix_host(layout_name) # modify port uplink 6,12 yes` Declare ports 6 and 12 as uplink.
- ◆ `matrix_host(layout_name) # modify port uplink 12 no` Remove uplink declaration from port 12.

modify rule balance

The `modify rule balance` command enables or disables load balancing for tool (egress) ports for packets passing through this rule.

Changes to the layout are automatically saved if the changes are successful. If you are modifying the active layout, those changes take effect immediately.

Usage

```
modify rule balance <"RuleName"|RID> <enable|disable>
```

Parameters

Parameter	Description
<i>RuleName</i>	The case-sensitive name of the rule. If it contains a space character, the entire string must be enclosed in quotes.
<i>RID</i>	The ID of the rule. The ID is a numeric value associated with the name. When referencing the rule, you may use either the name or the ID.
enable	Enables load balancing. If selected, load balancing changes how traffic is moved from network ports to tool ports.
disable	Disables load balancing.

Examples

```
◆ matrix_host(layout_name) # modify rule balance rule1 enable
```

modify rule balance-type

The command `modify rule balance-type` sets the type of load balancing used by a rule.

This command does not enable load balancing. Refer to [modify rule balance](#) .

Usage

```
modify rule balance-type <"RuleName"|RID> <packet|conversation>
```

Parameters

Parameter	Description
<i>RuleName</i>	The case-sensitive name of the rule. If it contains a space character, the entire string must be enclosed in quotes.
<i>RID</i>	The ID of the rule. The ID is a numeric value associated with the name. When referencing the rule, you may use either the name or the ID.
packet	Packets are equally distributed to tool ports using a round-robin method. By dividing the packet volume equally, link utilization is decreased between tool ports and connected tools by a factor of how many tool ports are connected to the rule. Network conversations are severed by using this type, so ensure that any connected tools can operate effectively without intact conversations.
conversation	Packets with identical characteristics, such as an identical IP pair, are forwarded exclusively to one tool port. By keeping these packets together, an intact conversation is likely being forwarded. Other unique conversations might be forwarded to the same or different tool port, creating a balanced distribution of conversations to all tool ports connected to the rule. Load balancing of this type is useful when connected tools need to perform analysis on complete network conversations.

Examples

- ◆ `matrix_host(layout_name)# modify rule balance-type "Test Rule" packet` Sets the rule "Test Rule" to use packet-based load balancing if load balancing is enabled.
- ◆ `matrix_host(layout_name)# modify rule balance-type "Test Rule" conversation` Sets the rule "Test Rule" to use conversation-based load balancing if load balancing is enabled.

modify rule conversation-type

The command `modify rule conversation-type` sets how conversation-based load balancing is performed.

Conversations are traffic streams that must be kept together and forwarded intact to a tool port. How the system determines a conversation must be specified. For example, selecting only 'Include IP pair' indicates all connections between a unique IP pair must be kept intact and forwarded to the same tool port.

This command does not enable load balancing. Refer to [modify rule balance](#) .

The effects of this command only apply to rules that have the conversation-based load balancing type selected.. Refer to [modify rule balance-type](#).

Usage

```
modify rule conversation-type <"RuleName"|RID>  
<ip|L4port|mac|vlan>
```

Parameters

Parameter	Description
<i>RuleName</i>	The case-sensitive name of the rule. If it contains a space character, the entire string must be enclosed in quotes.
<i>RID</i>	The ID of the rule. The ID is a numeric value associated with the name. When referencing the rule, you may use either the name or the ID.
<i>ip L4port mac vlan</i>	Sets the conversation behavior to load balance. If choosing multiple conversation types, use a comma separated list with no spaces. For example, <code>ip,L4port,vlan</code> .

Examples

- ◆ `matrix_host(layout_name)# modify rule conversation-type "Test Rule" ip,L4port` Sets the load balancing conversation types of rule "Test Rule" to include IP pairs and TCP, UDP, and SCTP port pairs.
- ◆ `matrix_host(layout_name)# modify rule conversation-type 1 mac` Sets the load balancing conversation type of the rule having rule ID number 1 to include MAC address pairs.

modify rule dedup

The `modify rule dedup` command enables or disables packet deduplication on packets passing through this rule.

Usage

```
modify rule dedup <"RuleName"|RID> <enable|disable>
```

Parameters

Parameter	Description
<i>RuleName</i>	The case-sensitive name of the rule. If it contains a space character, the entire string must be enclosed in quotes.
<i>RID</i>	The ID of the rule. The ID is a numeric value associated with the name. When referencing the rule, you may use either the name or the ID.
<code>enable</code>	Enables deduplication
<code>disable</code>	Disable deduplication

Examples

```
◆ matrix_host(layout_name) # modify rule dedup rule1 enable
```

modify rule desc

The `modify rule desc` command modifies the rule description for a saved ruled.

The rule description can be edited by pressing TAB twice after typing the rule name or rule ID.

Usage

```
modify rule desc <"RuleName"|RID> <"RuleDesc">
```

Parameters

Parameter	Description
<i>RuleName</i>	The case-sensitive name of the rule. If it contains a space character, the entire string must be enclosed in quotes.
<i>RID</i>	The ID of the rule. The ID is a numeric value associated with the name. When referencing the rule, you may use either the name or the ID.
<i>RuleDesc</i>	Rule descriptions are optional and displayed in the Rules list. If it contains a space character, the entire string must be enclosed in quotes.

Examples

- ◆ `matrix_host(layout_name) # modify rule desc rule1 "This is a description for rule1"`

modify rule name

The `modify rule name` command modifies the rule name for a saved rule. To see a list of all of the rules in the current layout, use `show rules`.

Usage

```
modify rule name <"RuleName"|RID> <"NewRuleName">
```

Parameters

Parameter	Description
<i>RuleName</i>	The case-sensitive name of the rule. If it contains a space character, the entire string must be enclosed in quotes.
<i>RID</i>	The ID of the rule. The ID is a numeric value associated with the name. When referencing the rule, you may use either the name or the ID.
<i>NewRuleName</i>	The rule's new case-sensitive name. If it contains a space character, the entire string must be enclosed in quotes.

Examples

```
◆ matrix_host(layout_name) # modify rule name rule1 testrule
```

modify rule trailer

The `modify rule trailer` command enables or disables packet timestamping on packets passing through this rule.

In addition to the timestamp the trailer contains the group, box, port ID where the packet was received, and the source of the timestamp (NTP, GPS, etc.).

Usage

```
modify rule trailer <RuleName|RID> <enable|disable>
```

Parameters

Parameter	Description
<i>RuleName</i>	The case-sensitive name of the rule. If it contains a space character, the entire string must be enclosed in quotes.
<i>RID</i>	The ID of the rule. The ID is a numeric value associated with the name. When referencing the rule, you may use either the name or the ID.
<code>enable</code>	If selected, an identifying trailer is appended to ingress packets as they arrive. Each trailer contains a timestamp and the Group ID, Box ID, and Port ID identifying where the packet arrived.
<code>disable</code>	Traffic passes through the rule without a trailer being attached. Default.

Examples

```
◆ matrix_host(layout_name) # modify rule trailer rule1 enable
```

modify rule trailer-uplink

The command `modify rule trailer-uplink` sets if trailers are appended to packets arriving at a network (ingress) port that is marked as an uplink port.

You can only enable the trailer uplink if `modify rule trailer` is already enabled otherwise you will get an error.

Usage

```
modify rule trailer-uplink <enable|disable>
```

Parameters

Parameter	Description
<code>enable</code>	If selected, an identifying trailer is appended to ingress packets as they arrive. Each trailer contains a timestamp and the Group ID, Box ID, and Port ID identifying where the packet arrived.
<code>disable</code>	Trailers are not appended to packets coming in an ingress port that is marked an uplink port.

Examples

- ◆ `matrix_host(layout_name) # modify rule trailer-uplink enable`
Enables appending trailers to packets arriving from a marked uplink port.
- ◆ `matrix_host(layout_name) # modify rule trailer-uplink disable`
Disables appending trailers to packets arriving from a marked uplink port.

modify rule trim

The `modify rule trim` command enables or disables packet trimming by packet size on packets passing through this rule.

The packet trimming length is set in a different command. Refer to [modify rule trimlen](#).

Usage

```
modify rule trim <"RuleName"|RID> <enable|disable>
```

Parameters

Parameter	Description
<i>RuleName</i>	The case-sensitive name of the rule. If it contains a space character, the entire string must be enclosed in quotes.
<i>RID</i>	The ID of the rule. The ID is a numeric value associated with the name. When referencing the rule, you may use either the name or the ID.
<code>enable</code>	If selected, packets larger than the Trim Length value are truncated to a specified size. Packets smaller than the Trim Length value are unchanged.
<code>disable</code>	Traffic passes through the rule without being truncated. Default.

Examples

- ◆ `matrix_host(layout_name) # modify rule trim rule1 enable`

modify rule trimlen

The `modify rule trimlen` command specifies the trim size when packet trimming is enabled. The packet length is truncated to this size.

Packet trimming is enabled and disabled using a different command. Refer to [modify rule trim](#).

Usage

```
modify rule trimlen <"RuleName"|RID> <64|128|192|256|384|512
```

Parameters

Parameter	Description
<i>RuleName</i>	The case-sensitive name of the rule. If it contains a space character, the entire string must be enclosed in quotes.
<i>RID</i>	The ID of the rule. The ID is a numeric value associated with the name. When referencing the rule, you may use either the name or the ID.
64 128 192 256 384 512	Sets the trim length to a chosen value. Only the first N-bytes of each ingress packet are forwarded to tool ports. A new 4-byte CRC value is affixed to each trimmed packet. Valid values are: 64, 128, 192, 256, 384, and 512.

Examples

```
◆ matrix_host(layout_name) # modify rule trimlen rule1 128
```

modify rule value

The `modify rule value` command changes filter string used for a saved rule. The string is expressed using BPF syntax. A quick reference of the BPF syntax is in [help filter](#).

Usage

```
modify rule value <"RuleName"|RID> <"FilterString">
```

Parameters

Parameter	Description
<i>RuleName</i>	The case-sensitive name of the rule. If it contains a space character, the entire string must be enclosed in quotes.
<i>RID</i>	The ID of the rule. The ID is a numeric value associated with the name. When referencing the rule, you may use either the name or the ID.
<i>FilterString</i>	A filter that conforms to the BPF syntax. See help filter for more details about BPF. If it contains a space character, the entire string must be enclosed in quotes.

Examples

- ◆ `matrix_host(layout_name) # modify rule value rule1 "tcp src portrange 3000-3010"`

show auth groups

The `show auth groups` command lists the different security groups. Use `show auth groups` to see the group name, ID, its permission level, and the settings.

In addition to operation mode, each CLI command has a security level. Every user logging into the system (either by the web interface or CLI) is associated with one or more security levels. The security levels are:

- ◆ read-only: Allowed to view current configuration settings and system statistics.
- ◆ support: All of read-only, plus the ability to configure system settings.
- ◆ administrator: All of support, plus the ability to configure layouts, rules, and filters.

Usage

```
show auth groups
```

Examples

- ◆ `matrix_host# show auth groups`

show auth remote-users

The `show auth remote-users` command lists the different users defined on the remote authentication server if you are using OMS or LDAP. Use `show auth remote-users` to identify which groups should be imported.

In addition to operation mode, each CLI command has a security level. Every user logging into the system (either by the web interface or CLI) is associated with one or more security levels. The security levels are:

- ◆ read-only: Allowed to view current configuration settings and system statistics.
- ◆ support: All of read-only, plus the ability to configure system settings.
- ◆ administrator: All of support, plus the ability to configure layouts, rules, and filters.

Usage

```
show auth remote-users
```

Examples

- ◆ `matrix_host# show auth remote-users`

show auth settings

The `show auth settings` command displays user authentication settings.

Use `show auth settings` to see the current authentication scheme and the default group. If a remote authentication server is defined, all settings for that scheme are displayed.

The system or service for managing user names, passwords, groups, and authentication, can be specified.

Local Exclusively managed within this system.

LDAP Any LDAP directory service (do not select for configuring Windows Active Directory)

Active Directory Windows Active Directory service

OMS Observer Analyzer Management Server appliance

RADIUS RADIUS authentication server

TACACS+ TACACS+ authentication server

Any end user who is not assigned to a user group is automatically placed into the group chosen from this list and given the permissions it grants. The default is **None**.

The permission level of users within this group.

None Group has no permissions (permissions revoked).

Read-only Able to view user interface tabs, modify Status page widgets, clear counters, and access the base of the CLI.

Support Owns all permissions of the Read-Only group, plus able to modify System page settings and access more options within the enable prompt of the CLI.

Administrator Able to access and modify all settings, and is the only permission level able to modify layouts, rules, and filters. Allowed access to more options within the configure terminal prompt of the CLI. This group cannot be set to read-only.

Usage

```
show auth settings
```

Examples

```
◆ matrix_host> show auth settings
```

show auth users

The `show auth users` command displays a list of all defined users on the Matrix, their associated group/s, login capability, management settings and authentication settings.

Usage

```
show auth users
```

Examples

```
◆ matrix_host> show auth users
```

show filters

The `show filters` command lists all saved filters. Use `show filters` to show the name, description, and the filter definition.

To see where a filter is used, use `show rules` .

Usage

```
show filters
```

Examples

```
◆ matrix_host# show filters
```

show general time

The `show general time` command displays system time information. Use `show general time` to see the system time in UTC, the global time zone, user time zone, and time source (for instance, NTP servers or GPS), if any.

Usage

```
show general time
```

Examples

```
◆ matrix_host> show general time
```

show general trailer

The command `show general trailer` displays the current packet trailer settings.

Usage

```
show general trailer
```

Examples

- ◆ `matrix_host> show general trailer`

show layout

The `show layout` command displays the configuration settings for the currently loaded layout or the specified layout.

The layout configuration contains port settings, connection settings, referenced rules and filters, and several global layout settings.

Usage

```
show layout ["LayoutName"]
```

Parameters

Parameter	Description
<i>LayoutName</i>	The name of this layout. The maximum number of layouts is 16. If it contains a space character, the entire string must be enclosed in quotes.

Examples

- ◆ `matrix_host# show layout` Show the current layout.
- ◆ `matrix_host# show layout layout1` Show the layout named "layout1".

show license

The `show license` command lists license information. Use `show license` to see the Device License ID of your product; the organization to whom the license was issued; and what ports are licensed, including count and speed.

Ports are licensed in blocks of four (a total of six blocks). Each block is either 1 Gb or 10 Gb.

Usage

```
show license
```

Examples

```
◆ matrix_host> show license
```

show log events

The `show log events` command shows log events with optional sort and filter options. If no options are specified, the log entries will be sorted by date in ascending order.

You can navigate the log file using keyboard commands shown after using the command.

Control Characters

There are a number of special control characters that serve special purposes in the CLI.

- ◆ **Ctrl-A** Moves cursor to start of line.
- ◆ **Ctrl-B** Moves cursor left one character (left-arrow).
- ◆ **Ctrl-C** Kills the CLI session if it is unresponsive.
- ◆ **Ctrl-D** Ends CLI session.
- ◆ **Ctrl-E** Moves cursor to end of line.
- ◆ **Ctrl-F** Moves cursor right one character (right-arrow).
- ◆ **Ctrl-H** Deletes one character to the left of the cursor (Backspace).
- ◆ **Ctrl-K** Deletes characters from cursor to end of line.
- ◆ **Ctrl-L** Redraws line.
- ◆ **Ctrl-N** Recalls next history line (down-arrow).
- ◆ **Ctrl-P** Recalls previous history line (up-arrow).
- ◆ **Ctrl-U** Clears line.
- ◆ **Ctrl-W** Deletes left to the next word boundary.
- ◆ **Ctrl-X** Cancels the current operation.

Usage

```
show log events [sort=(severity|category|source)]  
[order=(ascending|descending)] [date=(ascending|descending)]  
[filter=FilterString]
```

Parameters

Parameter	Description
<code>sort=(severity category source)</code>	
<code>severity</code>	Choose to sort by severity (info, warn, error, fatal). This is the primary sort field. Default is none (sort by date only).
<code>category</code>	Choose to sort by classification (Authentication, None, User).
<code>source</code>	Choose to sort by source (fcgi-api, hwcommd, nicli).
<code>order=(ascending descending)</code>	
<code>ascending</code>	Sort order of the primary sort field. Ignored when no sort field is specified. Default is ascending.
<code>descending</code>	Sort order of the primary sort field.
<code>date=(ascending descending)</code>	
<code>ascending</code>	Sort by date with the oldest first. Default is ascending.

Parameter	Description
descending	Sort by date with the earliest first.
filter	
<i>FilterString</i>	Filter log events by a string. If it contains a space character, the entire string must be enclosed in quotes.

Examples

- ◆ `matrix_host> show log events`
- ◆ `matrix_host> show log events date=ascending`
- ◆ `matrix_host> show log events sort=severity order=descending date=descending`
- ◆ `matrix_host> show log events filter=nicli`

show log settings

The `show log settings` command lists current log settings.

Use `show log settings` to see SysLog and SNMP settings, such as whether logging is enabled, the severity threshold, host name, port, and community string.

For reference, these are the severity thresholds `show log settings` and example log events.

Parameter	Description
info	Informational messages. They can be queried for trends. No action is required. Example: <code>New network settings have been applied</code>
warn	Warning messages. They indicate a potential issue. An error might occur if corrective action is not taken in a given time. Example: <code>Error reading general config file</code>
error	Error messages. They indicate non-urgent failures. These indicate changes or events that did not match expected results, such as a file could not be opened or program was busy. Typically, these are critical messages and must be addressed by changing some input value before the desired result is achieved or by your device administrator or developer. Example: <code>Unable to open CLI config file. No such file or directory</code>
fatal	Fatal message. These messages indicate an imminent issue that should be corrected immediately, such as during updating the firmware or resetting the system defaults. Contact your support staff. Example: <code>Unable to apply firmware update!</code>

Usage

```
show log settings
```

Examples

```
◆ matrix_host> show log settings
```

show network

The `show network` command lists network settings for the Matrix. Use `show network` to see the IPv4 and IPv6 settings, including whether DHCP is enabled; IP address; subnet mask; gateway; and DNS servers.

Usage

```
show network
```

Examples

```
◆ matrix_host> show network
```

show port

The `show port` command prints current counter values and status of each physical port.

Usage

```
show port [PortList] [view=column|row|list] [fields=  
<Type,Status,Pkts,Bytes,Bits,Util,DropPkts,DropBytes,DropBits,Errors>]  
[refresh=sec]
```

Parameters

Parameter	Description
<i>PortList</i>	A comma-separated list of physical ports or a range of ports. For example, 1,4,6-8. No spaces are allowed. Default includes all ports.
view =row list column	Changes the report view. The default is to view by row.
fields	List of port values: Type, Status, Pkts, Bytes, Bits, Util, DropPkts, DropBytes, DropBits, and Errors. The default includes all fields.
refresh=sec	Continuously refresh display on the specified interval in seconds. For example, 15 updates every 15 seconds.

Examples

- ◆ `matrix_host> show port` Show all ports, using default row view.
- ◆ `matrix_host> show port view=column` Show all ports, using column view
- ◆ `matrix_host> show port 1-5,12,8` Show ports 1, 2, 3, 4, 5, 8, 12, using default row view.
- ◆ `matrix_host> show port view=list fields=Pkts,Bytes` Show all ports, using list view and only the Pkts and Bytes values.
- ◆ `matrix_host> show port refresh=15` Show all ports, using default row view and refresh every five seconds.

show power

The `show power` command displays the power mode used when the Matrix loses AC power.

The power modes are:

Parameter	Description
<code>power-off</code>	Always keep the system off when AC power is restored. You must manually start the system after power is restored. Best used if you plan frequent restarts.
<code>last-state</code>	Restores the previous power state (ON or OFF) before AC power was lost.
<code>always-on</code>	The system starts automatically when AC power is restored. Best used if you do not want to manually press the Power button.

Usage

```
show power
```

Examples

```
◆ matrix_host> show power
```

show rules

The `show rules` command lists all saved rules. Use `show rules` to show the rule name, its description, ID, settings, what layout(s) use the rule, and the definition of any filters in the rule.

Usage

```
show rules
```

Examples

```
◆ matrix_host# show rules
```

show system alerts

The `show system alerts` lists alerts.

Use `show system alerts` to see the alert's ID, the date and time the event occurred, and its status and description.

Alert messages are pushed to all attached systems for notification that some event occurred. The alert categories are listed here.

Usage

```
show system alerts
```

Examples

```
◆ matrix_host> show system alerts
```

show system faults

The `show system faults` lists system faults.

Use `show system faults` to see the date and time the fault occurred and a description of it.

Alert messages are pushed to all attached systems for notification that some event occurred. These events can include:

- ◆ Power
- ◆ Temperature
- ◆ Configuration file
- ◆ System fan
- ◆ Rule overrun
- ◆ Load balance overrun
- ◆ Deduplication overrun
- ◆ Tool port overrun

Usage

```
show system faults
```

Examples

- ◆ `matrix_host> show system faults`

show terminal

The `show terminal` lists current settings for the terminal timeout value and what local time zone is set, if any.

To set these, see [terminal timeout](#) and [system general time localtime user](#) .

Usage

```
show terminal
```

Examples

```
◆ matrix_host> show terminal
```

show version

The `show version` shows the current firmware version. Support level or higher permissions are required.

Usage

```
show version
```

Examples

```
◆ matrix_host> show version
```

system auth create group

The `system auth create group` command creates a locally managed group with a given permission set. Group-wide login access can also be enabled or disabled.

Usage

```
system auth create group <GroupName> <Permission>  
[desc="UserDesc"] [login=enable|disable]
```

Parameters

Parameter	Description
<i>GroupName</i>	The case-sensitive name of the group. Group names are case-sensitive. An effective group name is identifiable to other users.
<i>Permission</i> <read-only support administrator>	The permission level of users within this group. None Group has no permissions (permissions revoked). Read-only Able to view user interface tabs, modify Status page widgets, clear counters, and access the base of the CLI. Support Owns all permissions of the Read-Only group, plus able to modify System page settings and access more options within the enable prompt of the CLI. Administrator Able to access and modify all settings, and is the only permission level able to modify layouts, rules, and filters. Allowed access to more options within the configure terminal prompt of the CLI. This group cannot be set to read-only.
<i>desc=UserDesc</i>	Descriptions are optional and displayed in the Users table. If it contains a space character, the entire string must be enclosed in quotes.
<i>login=enable disable</i>	This option is selected by default. As an alternative to deletion, a group can be disabled. The default is enable.

Examples

- ◆ `matrix_host# system auth create group admin-group administrator desc="Group of administrators"` Create a new group called admin-group and give it administrator privileges.

system auth create user

The `system auth create user` command creates a locally managed user and associates it with one or more groups.

When creating a locally managed user, a password creation prompt appears after executing the `system auth create user` command.

Authentication is done either locally or through a remote authentication server.

To see which authentication scheme is active, use the `show auth settings` command.

To change the authentication scheme, use the `system auth modify remote scheme` command.

Usage

```
system auth create user <UserName> <GroupName, ... | GID, ...>
[desc="UserDesc"] [authenticate=local|remote]
[login=enable|disable]
```

Parameters

Parameter	Description
<i>UserName</i>	The case-sensitive user name for this user.
<i>GroupName</i>	Group names are case-sensitive. An effective group name is identifiable to other users.
<i>GID</i>	The ID of the group. The ID is a numeric value associated with the name. When referencing the group, you may use either the name or the ID.
<code>desc="UserDesc"</code>	Descriptions are optional and displayed in the Users table. If it contains a space character, the entire string must be enclosed in quotes.
<code>authenticate=local remote</code>	Specifies if the user name and password of this user is maintained by a third-party authentication tool ('Authenticates Remotely') or by ('Local User'). If you import users, this field defaults to 'Local User.' You must change it to 'Authenticates Remotely' if you want to use the remote authentication server regardless of whether you imported users or not.
<code>login=enable disable</code>	Sets whether a user may log in. The default is enable. As an alternative to deletion, a user can be disabled.

Examples

- ◆ `matrix_host# system auth create user Neo administrators desc="The One"` Create a new user Neo and assign it to the administrators group.
- ◆ `matrix_host# system auth create user Morpheus 100,101,102` Create a new user Morpheus and assign it to groups with the ID of 100, 101 and 102.

system auth delete group

The `system auth delete group` command deletes a group from the system. Any group except for 'administrators' may be deleted.

If a user is assigned to a group that is deleted, the group is removed from that user. The user remains a member of all other groups to which it belonged. If this was the last group, the user will not be able to log in.

Usage

```
system auth delete group <GroupName|GID>
```

Parameters

Parameter	Description
<i>GroupName</i>	The case-sensitive name of the group.
<i>GID</i>	The ID of the group. The ID is a numeric value associated with the name. When referencing the group, you may use either the name or the ID.

Examples

- ◆ `matrix_host# system auth delete group read-only` Delete group read-only from the system.

system auth delete user

The `system auth delete user` command deletes a user from the Matrix. Any user can be deleted from the Matrix except for the 'admin' user.

Usage

```
system auth delete user <UserName|UID>
```

Parameters

Parameter	Description
<i>UserName</i>	User name
<i>UID</i>	The ID of the user. The ID is a numeric value associated with the name. When referencing the user, you may use either the name or ID.

Examples

- ◆ `matrix_host# system auth delete user Neo` Delete user Neo from the Matrix

system auth modify remote default-group

The `system auth modify remote default-group` command sets the group assigned to a user who logs into the system for the first time and is remotely authenticated (for instance, through OMS).

This ensures that the user has a minimum level of access to the system. It may be as little as none up to full rights depending on the permissions assigned to the default group you choose. This field is optional and only applies to authentication schemes that authenticate remotely, such as OMS, LDAP, RADIUS, and TACACS+.

Any end user who is not assigned to a user group is automatically placed into the group chosen from this list and given the permissions it grants. The default is **None**.

Usage

```
system auth modify remote default-group <GroupName|GID>
```

Parameters

Parameter	Description
<i>GroupName</i>	The case-sensitive name of the group. Group names are case-sensitive. An effective group name is identifiable to other users.
<i>GID</i>	The ID of the group. The ID is a numeric value associated with the name. When referencing the group, you may use either the name or the ID.

Examples

- ◆ `matrix_host# system auth modify remote default-group administrators`

system auth modify group description

The `system auth modify group description` command changes an authentication group description.

Usage

```
system auth modify group description <GroupName|GID>  
<"Description">
```

Parameters

Parameter	Description
<i>GroupName</i>	The case-sensitive name of the group. Group names are case-sensitive. An effective group name is identifiable to other users.
<i>GID</i>	The ID of the group. The ID is a numeric value associated with the name. When referencing the group, you may use either the name or the ID.
<i>Description</i>	Descriptions are optional and displayed in the Groups table. If it contains a space character, the entire string must be enclosed in quotes.

Examples

- ◆ `matrix_host# system auth modify group description supportgroup "Support group"`

system auth modify group login

The `system auth modify group login` command enables or disables login by group. This will disable login ability for all users belonging to this group.

Usage

```
system auth modify group login <GroupName|GID> <enable|disable>
```

Parameters

Parameter	Description
<i>GroupName</i>	The case-sensitive name of the group.
<i>GID</i>	The ID of the group. The ID is a numeric value associated with the name. When referencing the group, you may use either the name or the ID.
enable	Enables login for a group
disable	Disable logging for a group

Examples

- ◆ `matrix_host# system auth modify group login readonlygroup disable`

system auth modify group name

The `system auth modify group name` command changes an authentication group name.

Usage

```
system auth modify group name <CurrentGroupName|GID>  
<NewGroupName>
```

Parameters

Parameter	Description
<i>CurrentGroupName</i>	The case-sensitive name of the group.
<i>GID</i>	The ID of the group. The ID is a numeric value associated with the name. When referencing the group, you may use either the name or the ID.
<i>NewGroupName</i>	The case-sensitive name of the group. Group names are case-sensitive. An effective group name is identifiable to other users.

Examples

- ◆ `matrix_host# system auth modify group name supportgroup support`

system auth modify group permission

The `system auth modify group permission` command changes a group's permission setting.

Usage

```
system auth modify group permission <GroupName|GID> <read-only|support|administrator>
```

Parameters

Parameter	Description
<i>GroupName</i>	The case-sensitive name of the group.
<i>GID</i>	The ID of the group. The ID is a numeric value associated with the name. When referencing the group, you may use either the name or the ID.
<code>read-only support administrator</code>	The permission level of users within this group. None Group has no permissions (permissions revoked). Read-only Able to view user interface tabs, modify Status page widgets, clear counters, and access the base of the CLI. Support Owns all permissions of the Read-Only group, plus able to modify System page settings and access more options within the enable prompt of the CLI. Administrator Able to access and modify all settings, and is the only permission level able to modify layouts, rules, and filters. Allowed access to more options within the configure terminal prompt of the CLI. This group cannot be set to read-only.

Examples

- ◆ `matrix_host# system auth modify group permission supportgroup support`

system auth modify remote import users

The `system auth modify remote import users` command imports users defined on a remote authentication server. Imported users will still be authenticated remotely, but these users can be assigned to groups relevant to the device configuration.

A list of remote users and IDs can be viewed with `show auth remote-users` .

Usage

```
system auth modify remote import users [UserIdList]
```

Parameters

Parameter	Description
<i>UserIdList</i>	Comma separated list of remote user ID numbers.

Examples

- ◆ `matrix_host# system auth modify remote import users 1001,1002,1005` Import a list of remote users with IDs 1001,1002 and 1005

system auth modify remote scheme

The `system auth modify remote scheme` command changes the Matrix authentication scheme to one of the supported schemes.

Authentication can be done locally (Local) or by one of the supported authentication servers. Supported authentication servers include: LDAP, OMS, RADIUS and TACACS+. When a remote server is specified, the server settings for remote server must be specified by settings various attributes specific to that remote server. The current authentication scheme can be viewed with the `show auth settings` command. This will display the current settings and a description for each field. Settings can be defined using the `system auth modify remote setting` .

Usage

```
system auth modify remote scheme <AuthScheme>
```

Parameters

Parameter	Description
<i>AuthScheme</i>	<p>The system or service for managing user names, passwords, groups, and authentication, can be specified.</p> <ul style="list-style-type: none">Local Exclusively managed within this system.LDAP Any LDAP directory service (do not select for configuring Windows Active Directory)Active Directory Windows Active Directory serviceOMS Observer Management Server applianceRADIUS RADIUS authentication serverTACACS+ TACACS+ authentication server

Examples

- ◆ `matrix_host# system auth modify remote scheme Local` Set authentication scheme to be done locally.
- ◆ `matrix_host# system auth modify remote scheme LDAP` Set authentication scheme to be done remotely by a LDAP server.

system auth modify remote setting

The command `system auth modify remote setting` sets or modifies remote authentication server settings.

A list of available settings can be viewed by pressing TAB twice. The current value can be edited by pressing TAB twice after typing a valid setting name. Available settings are listed by remote authentication server type.

Usage

```
system auth modify remote setting <Setting> <Value>
```

Parameters

Parameter	Description
<code>ldap.host</code>	The host address of the LDAP server. Required.
<code>ldap.port</code>	The port number accepting connections to the LDAP server. The default is 389.
<code>ldap.baseDn</code>	The Base Distinguished Name is the point in the directory tree from which users are verified. This might be the root or some place lower in the tree to limit the number of users returned. Required.
<code>ldap.version</code>	The LDAP protocol version the LDAP server uses.
<code>ldap.useTLS</code>	Sets the LDAP connection to use TLS. The security type for authenticating and encrypting connections.
<code>ldap.useSSL</code>	Sets the LDAP connection to use SSL. The security type for authenticating and encrypting connections.
<code>ldap.bindDn</code>	The Bind Distinguished Name (Bind DN) is required for importing user accounts from the LDAP server.
<code>ldap.bindPwd</code>	The password of the Bind DN.
<code>ldap.timeout</code>	The duration (in seconds) a connection attempt waits before aborting. The default is 10.
<code>ldap.userFilter</code>	The user filter restricts who may use the Observer Platform . The filter limits what part of the LDAP tree is used to validate user accounts so that OMS does not have large lists of users who do not require access to the Observer Platform . Required.
<code>ldap.userIdAttribute</code>	The name of the attribute in which the user ID for each user is stored. If no user ID attribute is provided, then IDs are created sequentially starting with 90000000.
<code>ldap.userNameAttribute</code>	The name of the attribute in which the user name for each user is stored. Required. This used primarily when importing users. When importing users, values in the <code>uid</code> attribute are mapped to the Username field for display in the Users list.
<code>ldap.userDescAttribute</code>	The name of the attribute in which the description for each user is stored. This used primarily when importing users. When importing users, values in the <code>displayName</code> attribute are mapped to the Description field for display in the Users list.
<code>ldap.userDn</code>	The User Distinguished Name (DN) is a user that will authenticate to the LDAP tree using a bind request. This user will be someone with access to search all or part of the LDAP directory tree. If left blank, and an anonymous bind request is used.
<code>ldapAD.host</code>	The host address of the Active Directory server.

Parameter	Description
<code>ldapAD.port</code>	The port number of the Active Directory server. The default is 389.
<code>ldapAD.version</code>	The protocol version of LDAP the Active Directory host uses.
<code>ldapAD.timeout</code>	The duration (in seconds) a connection attempt waits before aborting. The default is 10.
<code>ldapAD.useTLS</code>	Sets the Active Directory connection to use TLS. The security type for authenticating and encrypting connections.
<code>ldapAD.useSSL</code>	Sets the Active Directory connection to use SSL. The security type for authenticating and encrypting connections.
<code>ldapAD.domain</code>	The parent domain name.
<code>ldapAD.baseDn</code>	The Base Distinguished Name is the point in the directory tree from which users are verified. This might be the root or some place lower in the tree to limit the number of users returned. Required.
<code>nims.retryCount</code>	The maximum number of connection retries per authentication attempt.
<code>nims.timeout</code>	The duration a connection attempt waits before aborting.
<code>nims.host1</code>	The first OMS server host name or IP address. At least one OMS server is required. If two servers are declared, the first server is used unless unreachable.
<code>nims.host2</code>	The second OMS server host name or IP address. At least one OMS server is required. If two servers are declared, the first server is used unless unreachable.
<code>nims.keyfile</code>	A OMS authentication server keyfile is required when using OMS.
<code>radius.sharedSecret</code>	Providing the shared secret, a text string, is necessary for authenticating with the RADIUS host.
<code>radius.authType</code>	The authentication method of the server(s) must be specified.
<code>radius.retryCount</code>	The maximum number of connection retries per authentication attempt.
<code>radius.timeout</code>	The amount of time to wait for a response per RADIUS request. The duration a connection attempt waits before aborting.
<code>radius.host1</code>	The first RADIUS server host name or IP address. One RADIUS server is required. If two servers are declared, the first server is used unless unreachable.
<code>radius.port1</code>	The authentication port of the first RADIUS server. Modern port assignments for RADIUS access servers are UDP 1812 and 1813.
<code>radius.host2</code>	The second RADIUS server host name or IP address. One RADIUS server is required. If two servers are declared, the first server is used unless unreachable.
<code>radius.port2</code>	The authentication port of the second RADIUS server. Modern port assignments for RADIUS access servers are UDP 1812 and 1813.
<code>tacacs.sharedSecret</code>	The shared secret for the TACACS+ server. Providing the pre-shared key, a secret text string, is necessary for authenticating with the TACACS+ host.
<code>tacacs.authType</code>	The authentication protocol the TACACS+ server accepts requests over must be specified.
<code>tacacs.host1</code>	The first TACACS+ server host name or IP address. One TACACS+ server is required. If two servers are declared, the first server is used unless unreachable.
<code>tacacs.port1</code>	The authentication port of the first TACACS+ server.

Parameter	Description
<code>tacacs.host2</code>	The standard port assignment for TACACS+ login is TCP port 49. The second TACACS+ server host name or IP address. One TACACS+ server is required. If two servers are declared, the first server is used unless unreachable.
<code>tacacs.port2</code>	The authentication port of the second TACACS+ server. The standard port assignment for TACACS+ login is TCP port 49.

Examples

- ◆ `matrix_host# system auth modify remote setting ldap.host 10.0.64.81` Sets the remote LDAP server to 10.0.64.81
- ◆ `matrix_host# system auth modify remote setting ldap.port 686` Sets the remote LDAP server port to 686

system auth modify user authenticate

The `system auth modify user authenticate` command changes a user's authentication to be done locally or remotely.

Usage

```
system auth modify user authenticate <UserName|UID>  
<local|remote>
```

Parameters

Parameter	Description
<i>UserName</i>	The case-sensitive user name for this user.
<i>UID</i>	The ID of the user. The ID is a numeric value associated with the name. When referencing the user, you may use either the name or ID.
local	Specifies if the user name and password of this user is maintained by a third-party authentication tool ('Authenticates Remotely') or by ('Local User'). If you import users, this field defaults to 'Local User.' You must change it to 'Authenticates Remotely' if you want to use the remote authentication server regardless of whether you imported users or not.
remote	Authentication is managed by a third-party authentication tool.

Examples

- ◆ `matrix_host# system auth modify user authenticate Neo remote`
Change user Neo's authentication to be done remotely

system auth modify user description

The `system auth modify user description` command modifies a user's description.

Usage

```
system auth modify user description <UserName|UID>  
<"Description">
```

Parameters

Parameter	Description
<i>UserName</i>	The case-sensitive user name for this user.
<i>UID</i>	The ID of the user. The ID is a numeric value associated with the name. When referencing the user, you may use either the name or ID.
<i>Description</i>	Descriptions are optional and displayed in the Users table. If it contains a space character, the entire string must be enclosed in quotes.

Examples

- ◆ `matrix_host# system auth modify user description Neo "Neo is The One."`

system auth modify user group add

The `system auth modify user group add` command adds a user to a group.

Usage

```
system auth modify user group add <UserName|UID> <GroupName|GID>
```

Parameters

Parameter	Description
<i>UserName</i>	The case-sensitive user name for this user.
<i>UID</i>	The ID of the user. The ID is a numeric value associated with the name. When referencing the user, you may use either the name or ID.
<i>GroupName</i>	The case-sensitive name of the group.
<i>GID</i>	The ID of the group. The ID is a numeric value associated with the name. When referencing the group, you may use either the name or the ID.

Examples

- ◆ `matrix_host# system auth modify user group add Neo administrators` Add user Neo to group administrators.

system auth modify user group remove

The command `system auth modify user group remove` removes a user from a group.

Usage

```
system auth modify user group remove <UserName|UID>  
<GroupName|GID>
```

Parameters

Parameter	Description
<i>UserName</i>	The case-sensitive user name for this user.
<i>UID</i>	The ID of the user. The ID is a numeric value associated with the name. When referencing the user, you may use either the name or ID.
<i>GroupName</i>	The case-sensitive name of the group.
<i>GID</i>	The ID of the group. The ID is a numeric value associated with the name. When referencing the group, you may use either the name or the ID.

Examples

- ◆ `matrix_host# system auth modify user group remove AgentSmith administrators` Remove user AgentSmith from group administrators.

system auth modify user login

The `system auth modify user login` command enables or disables login by user.

Usage

```
system auth modify user login <UserName|UID> <enable|disable>
```

Parameters

Parameter	Description
<i>UserName</i>	The case-sensitive user name for this user.
<i>UID</i>	The ID of the user. The ID is a numeric value associated with the name. When referencing the user, you may use either the name or ID.
enable	Allows user to access the system using the permissions assigned to the group(s) to which it belongs.
disable	Disables system access. As an alternative to deletion, a user can be disabled.

Examples

- ◆ `matrix_host# system auth modify user login Neo disable` Disable user login capabilities for user Neo.

system auth modify user password

The `system auth modify user password` command changes a locally managed user's password. The CLI immediately prompts the command giver to type the user's new password.

Usage

```
system auth modify user password <UserName|UID>
```

Parameters

Parameter	Description
<i>UserName</i>	The case-sensitive user name for this user.
<i>UID</i>	The ID of the user. The ID is a numeric value associated with the name. When referencing the user, you may use either the name or ID.

Examples

- ◆ `matrix_host# system auth modify user password Neo` Change user Neo's password.

system auth restart

The `system auth restart` command restarts the remote authentication subsystem and applies the currently configured remote authentication settings.

The remote authentication subsystem communicates with LDAP, OMS, RADIUS, or TACACS+ systems and must be restarted after any changes are made to how authentication is performed.

Restarting the remote authorization subsystem is transparent to any users logged into the system. In other words, they will not notice the change until they log out and log in again.

Use [show auth settings](#) to ensure all settings are correct before proceeding.

Usage

```
system auth restart
```

Examples

```
◆ matrix_host# system auth restart
```

system auth root-access disable

The `system auth root-access disable` command turns off root access.

Use `system auth root-access disable` after completing any tasks under `system auth root-access enable` to return the system to normal system access privileges.

Usage

```
system auth root-access disable
```

Examples

```
◆ matrix_host# system auth root-access disable
```

system auth root-access enable

The `system auth root-access enable` command enables troubleshooting access to the underlying operating system and should only be used at the direction of [VIAVI Support](#).

This command generates a unique password key that must be sent to [VIAVI Support](#) to decrypt. Support will provide additional instructions as necessary.

Access to the operating system is automatically disabled after 24 hours, or sooner if you use [system auth root-access disable](#) .

Usage

```
system auth root-access enable
```

Examples

```
◆ matrix_host# system auth root-access enable
```

system factory-reset

The `system factory-reset` command erases all of the layouts, rules, filters, and other customizations before restoring the factory defaults and restarting the system.

Use `system factory-reset` if the device is malfunctioning and other support methods have failed or before decommissioning the device. Any firmware updates you have applied are unaffected by this command.

The IP address changes to 192.168.1.10 after a factory reset. The license that was on the system is also removed. Ensure you have access to the license prior to performing a reset if you intend to use the system. See [system license import](#).

Usage

```
system factory-reset
```

Examples

```
◆ matrix_host# system factory-reset
```

system firmware-flash

The `system firmware-flash` command is the final command that applies a new firmware file.

The firmware file must already be present on the system. Use the web interface or scp (secure copy) to upload the firmware file to the system. When the firmware update begins, all CLI connections are closed.

Usage

```
system firmware-flash
```

Examples

- ◆ `matrix_host# system firmware-flash`

system general time localtime global

The `system general time localtime global` command sets or clears the global default time zone setting in time zone format used to convert UTC time to local time.

Use this setting if there is no user-defined time zone setting. See [system general time localtime user](#).

Usage

```
system general time localtime global <TZString|clear>
```

Parameters

Parameter	Description
UserName	The case-sensitive user name for this user. Only available when setting a user's time zone. It is not available when setting the global time zone.
TZString: <STDoffsetDSToffset [,DSTstart [/time]] [,DSTend [/time]]>	Although spaces are shown here, they are for readability purposes only. No spaces are allowed between arguments or an error will occur.
STD	Standard time abbreviation for your time zone. For example, EST (Eastern Standard Time), CST (Central Standard Time), CEST (Central European Summer Time), WEST (Western European Summer Time), and so on.
offset	Offset in hours from UTC for <i>STD</i> . The offset specifies the time value you must add to the <i>STD</i> to get a Coordinated Universal Time value. Its syntax is <code>[+ -]hh[:mm[:ss]]</code> . This is positive if the local time zone is west of the Prime Meridian and negative if it is east. The hour must be between 0 and 23, and the minute and seconds between 0 and 59. For example, CST+6.
DST	Daylight savings time abbreviation for your time zone. For example, EDT (Eastern Daylight Time), CDT (Central Daylight Time), CEDT (Central European Daylight Time), WEDT (Western European Daylight Time), and so on. If no offset is provided, DST defaults to one hour ahead of <i>STD</i> .
DSTstart	<code>[,Mxx.W.D]</code> <i>Mxx</i> specifies the month. Accepted values are M1-M12. M1=January, M2=February,...,M12=December. <i>W</i> specifies the week. Accepted values are 1-5. 5=last week. <i>D</i> specifies the day. Accepted values are 0-6. 0=Sunday, 1=Monday, ...,6=Saturday.
DSTend	Specifies when <i>DST</i> ends.
time	Specifies the time at which <i>DST</i> starts in <code>hh:mm:ss</code> . If omitted, the default is <code>02:00:00</code> .
clear	Removes the time zone value.

Examples

- ◆ `matrix_host# system general time localtime global CST6CDT5`
- ◆ `matrix_host# system general time localtime global CST6CDT5,M3.2.0,M11.1.0`

- ◆ `matrix_host# system general time localtime global
CST6CDT5,M3.2.0/02:00:00,M11.1.0/02:00:00`
- ◆ `matrix_host# system general time localtime global global clear`

system general time localtime user

The `system general time localtime user` command sets or clears the user specific time zone setting in time zone format used to convert UTC time to local time.

This setting overrides `system general time localtime global` if defined.

Usage

```
system general time localtime user <UserName> <TZString|clear>
```

Parameters

Parameter	Description
UserName	The case-sensitive user name for this user. Only available when setting a user's time zone. It is not available when setting the global time zone.
TZString: <STDoffsetDSToffset [,DSTstart [/time] [,DSTend [/time]] >	Although spaces are shown here, they are for readability purposes only. No spaces are allowed between arguments or an error will occur.
STD	Standard time abbreviation for your time zone. For example, EST (Eastern Standard Time), CST (Central Standard Time), CEST (Central European Summer Time), WEST (Western European Summer Time), and so on.
offset	Offset in hours from UTC for <i>STD</i> . The offset specifies the time value you must add to the <i>STD</i> to get a Coordinated Universal Time value. Its syntax is <code>[+ -]hh[:mm[:ss]]</code> . This is positive if the local time zone is west of the Prime Meridian and negative if it is east. The hour must be between 0 and 23, and the minute and seconds between 0 and 59. For example, CST+6.
DST	Daylight savings time abbreviation for your time zone. For example, EDT (Eastern Daylight Time), CDT (Central Daylight Time), CEDT (Central European Daylight Time), WEDT (Western European Daylight Time), and so on. If no offset is provided, DST defaults to one hour ahead of <i>STD</i> .
DSTstart	<code>[,Mxx.W.D]</code> <i>Mxx</i> specifies the month. Accepted values are M1-M12. M1=January, M2=February,...,M12=December. <i>W</i> specifies the week. Accepted values are 1-5. 5=last week . <i>D</i> specifies the day. Accepted values are 0-6. 0=Sunday, 1=Monday, ...,6=Saturday.
DSTend	Specifies when <i>DST</i> ends.
time	Specifies the time at which <i>DST</i> starts in <code>hh:mm:ss</code> . If omitted, the default is <code>02:00:00</code> .
clear	Removes the time zone value.

Examples

- ◆ `matrix_host# system general time localtime user admin CST6CDT5`
- ◆ `matrix_host# system general time localtime user admin CST6CDT5,M3.2.0/02:00:00,M11.1.0/02:00:00`
- ◆ `matrix_host# system general time localtime user admin CST6CDT5,M3.2.0,M11.1.0`
- ◆ `matrix_host# system general time localtime user admin clear`

system general time ntp add pool

The `system general time ntp add pool` command adds an NTP server pool to the list of NTP servers. Up to two entries can be added.

The list of configured NTP servers can be viewed with the command `show general time`.

Entries can be deleted with the command `system general time ntp delete`.

Usage

```
system general time ntp add pool <HostName|IPAddress>
```

Parameters

Parameter	Description
<i>HostName</i>	Host name for the NTP server pool.
<i>IPAddress</i>	IPv4 or IPv6 address for the NTP server.

Examples

- ◆ `matrix_host# system general time ntp add pool pool.ntp.org`

system general time ntp add server

The `system general time ntp add server` command adds an NTP server to the list of NTP servers. Up to two entries can be added.

The list of configured NTP servers can be view with the command `show general time` .

Entries can be deleted with the command `system general time ntp delete` .

Usage

```
system general time ntp add server <HostName|IPAddress>
```

Parameters

Parameter	Description
<i>HostName</i>	Host name for the NTP server.
<i>IPAddress</i>	IPv4 or IPv6 address for the NTP server.

Examples

```
◆ matrix_host# system general time ntp add server 10.0.64.200
```

system general time ntp delete

The `system general time ntp delete` command deletes an NTP server or server pool that was previously configured.

You must restart the time subsystem afterwards. Use the command `system general time restart`.

Usage

```
system general time ntp delete <HostName|IPAddress|ReferenceID>
```

Parameters

Parameter	Description
<i>HostName</i>	Host name of a NTP server or server pool
<i>IPAddress</i>	IP address of an NTP server
<i>ReferenceID</i>	ID associated with the entry (display with 'show time') This reference ID is not permanent and can change as entries are added and deleted.

Examples

```
◆ matrix_host# system general time ntp delete 10.0.64.200
```

system general time restart

The `system general time restart` command restarts the time subsystem to apply the current settings.

Usage

```
system general time restart
```

Examples

- ◆ `matrix_host# system general time restart`

system general time set

The `system general time set` command sets the time used by the device. It is required only when `system general time source` is set to NONE.

Usage

```
system general time set <"Time">
```

Parameters

Parameter	Description
<i>Time</i>	The Time parameter must be enclosed in double quotes and entered in "MM/DD/YYYY HH:MM:SS" format, where HH assumes a 24 hour clock. Use the local time if the local time time zone variable was configured using <code>system general time localtime global</code> or <code>system general time localtime user</code> , otherwise Coordinated Universal Time (UTC) is used.

Examples

```
◆ matrix_host# system general time set "04/03/2013 14:20:45"
```

system general time source

The `system general time source` command defines how system time is set on the Matrix.

Usage

```
system general time source <TimeSource>
```

Parameters

Parameter	Description
<i>TimeSource</i>	<p>Clock source establishes the system time and is used for packet timestamping.</p> <p>NONE No configuration is necessary, but any system's time is highly vulnerable to clock drift unless it uses an outside time synchronization source.</p> <p>IEEE-1588 IEEE-1588 is the Precision Time Protocol (PTP) specification. An IEEE 1588-2008 server with an accurate time source can provide higher resolution and accuracy than NTP. The IEEE 1588-2008 master time server must be accessible on the same network subnet as the monitor port.</p> <p>GPS Uses an external GPS connected to the GPS port on the rear of the device. Only GPS Time Synchronization System appliances sold by VIAVI may be used. The GPS Time Synchronization System can provide the highest resolution and accuracy.</p> <p>NTP Synchronizing with Network Time Protocol servers or pools can provide a low resolution, accurate time source. If NTP is chosen, one or more NTP servers or pools must be defined.</p>

Examples

- ◆ `matrix_host# system general time source NTP`
- ◆ `matrix_host# system general time source NONE`

system general trailer box-id

The command `system general trailer box-id` sets an ID number that is placed into packet trailers.

This command does not enable packet trailers. Refer to [modify rule trailer](#) .

Usage

```
system general trailer box-id <BoxID>
```

Parameters

Parameter	Description
<i>BoxID</i>	If identifying trailers are enabled in a rule, this value is written into the trailer as the Box ID.

Examples

- ◆ `matrix_host# system general trailer box-id 15` Sets the ID number to 15.

system general trailer group-id

The command `system general trailer group-id` sets an ID number that is placed into packet trailers.

This command does not enable packet trailers. Refer to [modify rule trailer](#) .

Usage

```
system general trailer group-id <GroupID>
```

Parameters

Parameter	Description
<i>GroupID</i>	If identifying trailers are enabled in a rule, this value is written into the trailer as the Group ID.

Examples

- ◆ `matrix_host# system general trailer group-id 5` Sets the ID number to 5.

system license import

The command `system license import` re-licenses your device. The CLI expects the multi-line license string to be pasted into the console after executing this command.

Use this command after receiving a new license from [VIAVI](#). The license is a long, multi-line string of characters that you must paste into the terminal session after executing this command.

Before using this command, you must have new license string ready.

The new license was sent to you in an e-mail or as an attachment to an e-mail message. If you are unable to find your license, contact Nlsupport@viavisolutions.com with your contact name, company name, and device serial number or maintenance serial number.

To import your license via the CLI:

1. Issue `system license import` .
2. From the e-mail message, select and copy the license string from the e-mail message or PDF.
3. Paste the license key. See your terminal emulator's documentation for more details.
4. Press Ctrl-W to process the pasted license string, or press Ctrl-X to cancel.

Usage

```
system license import
```

Examples

```
◆ matrix_host# system license import
```

system license request

The command `system license request` generates a license request string which is used to generate the license string.

Usage

```
system license request ["Organization"]
```

Parameters

Parameter	Description
<i>Organization</i>	Name of the company or organization. If no organization is defined, the string from the current license is used. If it contains a space character, the entire string must be enclosed in quotes.

Examples

```
◆ matrix_host# system license request "Company XYZ"
```

system log remote disable

The `system log remote disable` command turns off the ability to send system log events to a SysLog server.

You must use `system log restart` to save your changes. Use `show log settings` to check settings before making any changes.

Usage

```
system log remote disable
```

Examples

```
◆ matrix_host# system log remote disable
```

system log remote enable

The `system log remote enable` command turns on the ability to send system log events to a SysLog server.

By default, sending of SNMP traps is disabled and must be explicitly enabled. This command is one of four used to configure sending events as SysLog messages. The other three are: `system log remote severity` , `system log remote host` , and `system log remote port` .

System logs remain accessible through the dashboard and CLI interfaces.

You must use `system log restart` to save your changes. Use `show log settings` to check settings before making any changes.

Usage

```
system log remote enable
```

Examples

```
◆ matrix_host# system log remote enable
```

system log remote host

The `system log remote host` command sets the SysLog server using a host name or IP address.

The SysLog host is required.

This command is one of four used to configure sending events as SysLog messages. The other three are: `system log remote severity` , `system log remote enable` , and `system log remote port` .

You must use `system log restart` to save your changes. Use `show log settings` to check settings before making any changes.

Usage

```
system log remote host <HostName|IPAddress>
```

Parameters

Parameter	Description
<i>HostName</i>	The host name address of the SysLog server.
<i>IPAddress</i>	The IPv4 or IPv6 address of the SysLog server.

Examples

```
◆ matrix_host# system log remote host 10.0.64.30
```

system log remote port

The `system log remote port` command sets port used by the SysLog server. The SysLog port is required.

This command is one of four used to configure sending events as SysLog messages. The other three are: `system log remote severity` , `system log remote enable` , and `system log remote host` .

You must use `system log restart` to save your changes. Use `show log settings` to check settings before making any changes.

Usage

```
system log remote port <Port>
```

Parameters

Parameter	Description
<i>Port</i>	The SysLog server port number. The default SysLog server port is 514, but must be explicitly provided.

Examples

```
◆ matrix_host# system log remote port 514
```

system log remote severity

The `system log remote severity` command sets the minimum severity level of log events sent to the SysLog server. Log events of lower severity are not sent.

This command is useful if you want to filter or minimize messages to a specific severity level and higher. By default, all messages in the `info` class and higher are included in the SysLog messages and SNMP traps.

This command is one of four used to configure sending events as SysLog messages. The other three are: `system log remote enable` , `system log remote host` , and `system log remote port` .

You must use `system log restart` to save your changes. Use `show log settings` to check settings before making any changes.

Usage

```
system log remote severity <info|warn|error|fatal>
```

Parameters

Parameter	Description
info	Informational messages. They can be queried for trends. No action is required. Example: <code>New network settings have been applied</code>
warn	Warning messages. They indicate a potential issue. An error might occur if corrective action is not taken in a given time. Example: <code>Error reading general config file</code>
error	Error messages. They indicate non-urgent failures. These indicate changes or events that did not match expected results, such as a file could not be opened or program was busy. Typically, these are critical messages and must be addressed by changing some input value before the desired result is achieved or by your device administrator or developer. Example: <code>Unable to open CLI config file. No such file or directory</code>
fatal	Fatal message. These messages indicate an imminent issue that should be corrected immediately, such as during updating the firmware or resetting the system defaults. Contact your support staff. Example: <code>Unable to apply firmware update!</code>

Examples

◆ `matrix_host# system log remote severity error`

system log restart

The `system log restart` command restarts the SysLog logging and SNMP trap generation subsystem.

This command must be used after you use any command starting with `system log`.

Usage

```
system log restart
```

Examples

```
◆ matrix_host# system log restart
```

system log snmp community

The `system log snmp community` command sets the community string used with your SNMP trap server.

Only SNMP v1 is supported.

This command is one of four used to configure sending SNMP traps of log information. The other three are: `system log snmp enable` , `system log snmp host` , and `system log snmp severity` .

You must use `system log restart` to save your changes. Use `show log settings` to check settings before making any changes.

Usage

```
system log snmp community <CommunityString>
```

Parameters

Parameter	Description
<i>CommunityString</i>	Community string for your SNMP trap server.

Examples

```
◆ matrix_host# system log snmp community private
```

system log snmp disable

The `system log snmp disable` command turns off the ability to send system log events as SNMP traps.

You must use `system log restart` to save your changes. Use `show log settings` to check settings before making any changes.

Usage

```
system log snmp disable
```

Examples

```
◆ matrix_host# system log snmp disable
```

system log snmp enable

The `system log snmp enable` command turns on the ability to send system log events as SNMP traps.

By default, sending of SNMP traps is disabled and must be explicitly enabled. This command is one of four used to configure sending SNMP traps of log information. The other three are: `system log snmp severity` , `system log snmp host` , and `system log snmp community` .

System logs remain accessible through the dashboard and CLI interfaces.

You must use `system log restart` to save your changes. Use `show log settings` to check settings before making any changes.

Usage

```
system log snmp enable
```

Examples

```
◆ matrix_host# system log snmp enable
```

system log snmp host

The `system log snmp host` command sets the SNMP trap server using a host name or IP address.

The SNMP trap server is required when configuring remote logging and SNMP settings.

This command is one of four used to configure sending SNMP traps of log information. The other three are: `system log snmp enable` , `system log snmp severity` , and `system log snmp community` .

You must use `system log restart` to save your changes. Use `show log settings` to check settings before making any changes.

Usage

```
system log snmp host <HostName|IPAddress>
```

Parameters

Parameter	Description
<i>HostName</i>	The host name address of the SNMP trap recipient.
<i>IPAddress</i>	The IPv4 or IPv6 address of the SNMP trap recipient.

Examples

```
◆ matrix_host# system log snmp host 10.0.64.33
```

system log snmp severity

The `system log snmp severity` command sets the minimum severity level of log events sent as SNMP traps. Log events of lower severity are not sent.

This command is useful if you want to filter or minimize messages to a specific severity level and higher. By default, all messages in the `info` class and higher are included in the SysLog messages and SNMP traps.

This command is one of four used to configure sending SNMP traps of log information. The other three are: `system log snmp enable` , `system log snmp host` , and `system log snmp community` .

You must use `system log restart` to save your changes. Use `show log settings` to check settings before making any changes.

Usage

```
system log snmp severity <info|warn|error|fatal>
```

Parameters

Parameter	Description
info	Informational messages. They can be queried for trends. No action is required. Example: <code>New network settings have been applied</code>
warn	Warning messages. They indicate a potential issue. An error might occur if corrective action is not taken in a given time. Example: <code>Error reading general config file</code>
error	Error messages. They indicate non-urgent failures. These indicate changes or events that did not match expected results, such as a file could not be opened or program was busy. Typically, these are critical messages and must be addressed by changing some input value before the desired result is achieved or by your device administrator or developer. Example: <code>Unable to open CLI config file. No such file or directory</code>
fatal	Fatal message. These messages indicate an imminent issue that should be corrected immediately, such as during updating the firmware or resetting the system defaults. Contact your support staff. Example: <code>Unable to apply firmware update!</code>

Examples

```
◆ matrix_host# system log snmp severity error
```

system network hostname

The `system network hostname` command sets the network host name of the system.

After issuing this command, you must use `system network restart` to activate your changes.

Usage

```
system network hostname <HostName>
```

Parameters

Parameter	Description
<i>HostName</i>	The host name of this system. If it contains a space character, the entire string must be enclosed in quotes.

Examples

```
◆ matrix_host# system network hostname Nebuchadnezzar
```

system network ipv4 address

The `system network ipv4 address` assigns the IPv4 address for the network interface.

After issuing this command, you must use `system network restart` to activate your changes.

Usage

```
system network ipv4 address <IpAddress>
```

Parameters

Parameter	Description
<i>IpAddress</i>	The IPv4 address of this system.

Examples

- ◆ `matrix_host# system network ipv4 address 10.0.64.208`

system network ipv4 dhcp

The `system network ipv4 dhcp` command enables the IPv4 network interface to use a DHCP server.

After issuing this command, you must use `system network restart` to activate your changes.

Usage

```
system network ipv4 dhcp <enable|disable>
```

Parameters

Parameter	Description
enable	Enables or disables using Dynamic Host Configuration Protocol (DHCP) for address assignments.
disable	Disables DHCP for IPv4. If you are using IPv4, you must configure the network settings with <code>system network ipv4</code> commands.

Examples

- ◆ `matrix_host# system network ipv4 dhcp enable`
- ◆ `matrix_host# system network ipv4 dhcp disable`

system network ipv4 dns1

The `system network ipv4 dns1` command assigns a primary IPv4 DNS server for the network interface.

After issuing this command, you must use `system network restart` to activate your changes.

Usage

```
system network ipv4 dns1 <IpAddress|clear>
```

Parameters

Parameter	Description
<i>IpAddress</i>	The IPv4 address of at least one DNS server is required. If two servers are declared, the first server is used unless unreachable.
<code>clear</code>	Clears the entry for the primary DNS server.

Examples

- ◆ `matrix_host# system network ipv4 dns1 192.168.1.3`
- ◆ `matrix_host# system network ipv4 dns1 clear`

system network ipv4 dns2

The `system network ipv4 dns2` command assigns a secondary IPv4 DNS server for the network interface.

After issuing this command, you must use `system network restart` to activate your changes.

Usage

```
system network ipv4 dns2 <IpAddress|clear>
```

Parameters

Parameter	Description
<i>IpAddress</i>	The IPv4 address of at least one DNS server is required. If two servers are declared, the first server is used unless unreachable.
<code>clear</code>	Clears the entry for the secondary DNS server.

Examples

- ◆ `matrix_host# system network ipv4 dns2 192.168.1.3`
- ◆ `matrix_host# system network ipv4 dns2 clear`

system network ipv4 gateway

The `system network ipv4 gateway` command assigns a IPv4 gateway address. After issuing this command, you must use `system network restart` to activate your changes.

Usage

```
system network ipv4 gateway <IpAddress|clear>
```

Parameters

Parameter	Description
<i>IpAddress</i>	The IPv4 address of the gateway.
<code>clear</code>	Clears the entry for the gateway address.

Examples

- ◆ `matrix_host# system network ipv4 gateway 10.0.64.1`
- ◆ `matrix_host# system network ipv4 gateway clear`

system network ipv4 subnet

The `system network ipv4 subnet` command assigns the IPv4 subnet mask for the network interface.

After issuing this command, you must use `system network restart` to activate your changes.

Usage

```
system network ipv4 subnet <NetMask>
```

Parameters

Parameter	Description
<i>NetMask</i>	The full netmask associated with the IPv4 address of this system.

Examples

```
◆ matrix_host# system network ipv4 subnet 255.255.255.0
```

system network ipv6 address

The `system network ipv6 address` command assigns the IPv6 address for the network interface.

After issuing this command, you must use `system network restart` to activate your changes.

Usage

```
system network ipv6 address <Ip6Address>
```

Parameters

Parameter	Description
<i>Ip6Address</i>	The IPv6 address of this system.

Examples

- ◆ `matrix_host# system network ipv6 address 2001:db8::2:1`

system network ipv6 dhcp

The `system network ipv6 dhcp` command enables the IPv6 network interface on the system to use a DHCP server for address assignments.

After issuing this command, you must use `system network restart` to activate your changes.

Usage

```
system network ipv6 dhcp <enable|disable>
```

Parameters

Parameter	Description
<code>enable</code>	Enables the IPv6 DHCP client on the system.
<code>disable</code>	Disable the IPv6 DHCP client on the system. Default.

Examples

- ◆ `matrix_host# system network ipv6 dhcp enable`
- ◆ `matrix_host# system network ipv6 dhcp disable`

system network ipv6 disable

The `system network ipv6 disable` command disables IPv6 on the system network interface.

To enable IPv6, refer to [system network ipv6 enable](#) .

After issuing this command, you must use [system network restart](#) to activate your changes.

Usage

```
system network ipv6 disable
```

Examples

```
◆ matrix_host# system network ipv6 disable
```

system network ipv6 dns1

The `system network ipv6 dns1` command assigns a primary IPv6 DNS server for the network interface.

After issuing this command, you must use `system network restart` to activate your changes. To see what network settings are set before making any changes, use `show network`.

Usage

```
system network ipv6 dns1 <Ip6Address|clear>
```

Parameters

Parameter	Description
<i>Ip6Address</i>	IPv6 address for the primary DNS server. The IPv6 address of at least one DNS server is required. If two servers are declared, the first server is used unless unreachable.
<code>clear</code>	Removes the primary DNS server.

Examples

- ◆ `matrix_host# system network ipv6 dns1 2001:4860:4860::8888`
- ◆ `matrix_host# system network ipv6 dns1 clear`

system network ipv6 dns2

The `system network ipv6 dns2` command assigns a secondary IPv6 DNS server for the network interface.

After issuing this command, you must use `system network restart` to activate your changes. To see what network settings are set before making any changes, use `show network`.

Usage

```
system network ipv6 dns2 <Ip6Address|clear>
```

Parameters

Parameter	Description
<i>Ip6Address</i>	IPv6 address for the secondary DNS server. The IPv6 address of at least one DNS server is required. If two servers are declared, the first server is used unless unreachable.
<code>clear</code>	Removes the entry for the secondary DNS server.

Examples

- ◆ `matrix_host# system network ipv6 dns2 2001:4860:4860::8888`
- ◆ `matrix_host# system network ipv6 dns2 clear`

system network ipv6 enable

The `system network ipv6 enable` command enables IPv6 on the system network interface.

The system supports dual-stack IP implementations, which means that IPv4 and IPv6 can be processed simultaneously without any need for tunneling or encapsulation.

After issuing this command, you must use `system network restart` to activate your changes. To disable IPv6, refer to `system network ipv6 disable`.

Usage

```
system network ipv6 enable
```

Examples

```
◆ matrix_host# system network ipv6 enable
```

system network ipv6 gateway

The `system network ipv6 gateway` command assigns an IPv6 gateway address to the network interface.

After issuing this command, you must use `system network restart` to activate your changes. To see what network settings are set before making any changes, use `show network`.

Usage

```
system network ipv6 gateway <Ip6Address|clear>
```

Parameters

Parameter	Description
<i>Ip6Address</i>	The IPv6 address of the gateway.
clear	Removes the entry for the gateway address.

Examples

- ◆ `matrix_host# system network ipv6 gateway 2001:db8::2:2`
- ◆ `matrix_host# system network ipv6 gateway clear`

system network ipv6 prefix

The `system network ipv6 prefix` command sets the IPv6 prefix value, which specifies the number of significant bits in the network address used for routing. After issuing this command, you must use `system network restart` to activate your changes.

Usage

```
system network ipv6 prefix <PrefixSize>
```

Parameters

Parameter	Description
<i>PrefixSize</i>	Size of IPv6 prefix (1-128)

Examples

- ◆ `matrix_host# system network ipv6 prefix 48`

system network restart

The `system network restart` command restarts the network interface using the currently defined network interface settings.

Unlike the web UI, which sets all network options upon saving and restarts the network interface in the background, the CLI requires that the network interface be explicitly restarted.

The system supports dual-stack IP implementations, which means that IPv4 and IPv6 can be processed simultaneously without any need for tunneling or encapsulation.

Usage

```
system network restart
```

Examples

```
◆ matrix_host# system network restart
```

system power off

The `system power off` command turns off the main traffic processing systems while keeping the web UI and CLI available, but in a downgraded mode.

Use this command to disable any processing of network port (ingress) or tool port (egress) traffic. The web UI and CLI remain accessible, but in a mode that only allows you to restart the processing subsystem using `system power on`.

You might use this command when you are configuring connections and you do not want traffic processed. It is the equivalent of pressing the Power button for one second.

Usage

```
system power off
```

Examples

```
◆ matrix_host# system power off
```

system power on

The `system power on` command powers on the system and allows traffic to flow.

The web server and SSH/CLI server are always on, albeit in a low-level state if the appliance is OFF but has power to it. The only way to ensure all systems are off is to completely remove all power. By having the web server and SSH/CLI server in a low-power state allows you to remotely turn on the system when you do not have immediate physical access to the appliance. Another reason might be that the settings in `system power power-loss` are configured to have the system power off if power is lost and then restored. In this instance, the system would be OFF, but because it has power you can remotely turn the system on. This command has the same effect as pressing the Power button on the front of the system.

Usage

```
system power on
```

Examples

```
◆ matrix_host# system power on
```

system power power-loss

The `system power power-loss` command sets how the system reacts to AC power loss.

Usage

```
system power power-loss <power-off|last-state|always-on>
```

Parameters

Parameter	Description
<code>power-off</code>	Always keep the system off when AC power is restored. You must manually start the system after power is restored. Best used if you plan frequent restarts.
<code>last-state</code>	Restores the previous power state (ON or OFF) before AC power was lost.
<code>always-on</code>	The system starts automatically when AC power is restored. Best used if you do not want to manually press the Power button.

Examples

```
◆ matrix_host# system power power-loss always-on
```

system reboot

The `system reboot` command initiates a full restart of the device.

After issuing this command you are prompted to confirm you want to restart the system. Additionally, an event notification appears in all active CLI and web UI sessions. After confirming that you want to restart the system, the restart begins immediately.

Usage

```
system reboot
```

Examples

```
◆ matrix_host# system reboot
```

terminal timeout

The `terminal timeout` command sets the terminal timeout value in seconds. The CLI session ends after this number of seconds have elapsed with no user activity.

Usage

```
terminal timeout <TimeOut>
```

Parameters

Parameter	Description
<i>TimeOut</i>	The number of seconds that must pass before the CLI session automatically disconnects and closes. A value of 0 disables the timeout for this CLI session. The smallest accepted value is 60 seconds. This value does not survive CLI sessions and must be reset each time you use the CLI. The default timeout is 300 seconds (five minutes).

Examples

- ◆ `matrix_host# terminal timeout 3600` Sets timeout period to one hour.
- ◆ `matrix_host# terminal timeout 0` Disables the timeout.

Understanding log categories

Matrix logs hundreds of interactions into one of four log categories: informational, warning, error, and fatal.

Parameter	Description
info	Informational messages. They can be queried for trends. No action is required. Example: <code>New network settings have been applied</code>
warn	Warning messages. They indicate a potential issue. An error might occur if corrective action is not taken in a given time. Example: <code>Error reading general config file</code>
error	Error messages. They indicate non-urgent failures. These indicate changes or events that did not match expected results, such as a file could not be opened or program was busy. Typically, these are critical messages and must be addressed by changing some input value before the desired result is achieved or by your device administrator or developer. Example: <code>Unable to open CLI config file. No such file or directory</code>
fatal	Fatal message. These messages indicate an imminent issue that should be corrected immediately, such as during updating the firmware or resetting the system defaults. Contact your support staff. Example: <code>Unable to apply firmware update!</code>

<STRING> is a variable and may be a: word or words (for example, user name, host name, filter) or a number (for example, port number, version number, group ID).

Informational

Warning

Error

Fatal

Informational

Informational or `info` messages provide details about normal operational changes or events.

```
Accepted client tunnel connection
activated layout (<STRING>)
Apply firmware update requested
Applying Firmware Update.
Attempting to import new license
Authenticating user at DN: <STRING>
Authentication system restarted using scheme (<STRING>)
Authentication via web interface failed
Beginning Factory Reset.
Beginning Firmware Update.
Changed auth scheme (<STRING>)
changed default group id (<STRING>)
Changed IPv4 network interface setting '<STRING>' to <STRING>
Changed IPv6 network interface setting '<STRING>' to <STRING>
changed remote authentication setting <STRING> = <STRING>
Changed remote logging settings.
Changed time and/or time source.
Changed time source to <STRING>
CLI shutting down, invalid run mode
Closed client tunnel connection
Configuration backup restored
Created default layout
created filter (<STRING>)
created group (<STRING>)
created group <STRING>
created rule (<STRING>)
created user (<STRING>)
created user <STRING>
Created web session <STRING> for user <STRING>
Current extended version: <STRING>.<STRING>.<STRING>.<STRING>
(<STRING>.<STRING>.<STRING>.<STRING>.<STRING>) <STRING>/<STRING>
deleted filter (<STRING>)
deleted group <STRING>
deleted layout (<STRING>)
deleted rule (<STRING>)
deleted user <STRING>
Dummy log entry <STRING>
Ending <STRING>
Expiring web session: <STRING>
Factory clean initiated
Factory reset initiated
Factory reset requested
failed to create group <STRING>
failed to import <STRING> groups
failed to import <STRING> users
failed to update group <STRING>
<STRING> fault cleared.
Firmware status server listening on port: <STRING>
Firmware update succeeded. Rebooting system!
Firmware upgrade process complete.
Flash partition <STRING> attempt #<STRING>
Flash partition <STRING> succeeded
FPGA tunnel listening on port <STRING>
imported <STRING> groups
```

```
imported <STRING> users
Imported group <STRING>:<STRING>
Imported user <STRING>:<STRING>
IPv4 - Address: <STRING>, Netmask: <STRING>, Gateway: <STRING>
IPv4 - DHCP: <STRING>
IPv4 - DNS Servers: <STRING>, <STRING>
IPv6 - Address: <STRING>/<STRING>, Gateway: <STRING>
IPv6 - DHCP: <STRING>
IPv6 - DNS Servers: <STRING>, <STRING>
IPv6 - OFF
Last system reset caused by AHB.
Last system reset caused by SRESET.
Layout export finished without error
Layout import finished without error
Layout import operation started from CLI
LDAP URL: <STRING>
Listening on <STRING>
Log initialized. Version: <STRING>
modified filter (<STRING>)
modified network interface hostname
modified rule (<STRING>)
Network configuration was reset to default values
New network configuration was saved.
New network settings have been applied
NIMS Auth key update successful
NIMS Update Thread shutting down
NIMS Update Thread started
No user interface sections in firmware upgrade,
  switch firmware upgrade.
Pending extended version: <STRING>.<STRING>.<STRING>.<STRING>
  (<STRING>.<STRING>.<STRING>.<STRING>.<STRING>)
Ping thread ending.
Ping thread using gateway address '<STRING>'
Port <STRING> changed type. Wiping statistics.
Rebooting device
Rebooting the system
Received file <STRING> exceeds maximum length of <STRING>, length = <STRING>
Received file <STRING>, length = <STRING>
Received flash file <STRING>, length = <STRING>
Rejecting login by user <STRING> because the account is disabled
Rejecting login by user <STRING> because the user does
  not belong to a group where login is enabled
Rejecting login by user <STRING> because the user does
  not belong to any group
Reloading nilogd configuration file
Reloading time configuration file
Removing resources created by layout import
Request to <STRING> <STRING>
Reset to factory defaults succeeded. Rebooting system!
Resetting network configuration
restarting network interface
Restarting networking
saved layout (<STRING>)
Scp process finished
Scp process started
Select canceled, most likely due to interrupt
Select failed, most likely due to signal interrupt
Setting <STRING> power loss run state to <STRING>
Setting <STRING> power to OFF
```

Setting <STRING> power to ON
Shared Memory Size: <STRING>
Shutting down ping thread
Shutting down Socket Server
Shutting down SPI thread
Shutting down time sync thread
Shutting down watch thread
sizeof(HWCountsEntry): <STRING>
Skipping group <STRING>:<STRING> because a group
with that ID already exists
Skipping group <STRING>:<STRING> because a group
with that name already exists
Skipping user <STRING>:<STRING> because a user
with that ID already exists
Skipping user <STRING>:<STRING> because a user
with that username already exists
SPI thread shutting down
Starting <STRING>
Starting export of layout '<STRING>' to file '<STRING>'
Starting factory reset!
Starting import of layout file '<STRING>'
Starting NIMS update thread
State changed from <STRING> to <STRING>
Stopping NIMS update thread
System reboot requested
Time changed, clearing all statistics memory.
Unhandled HWApi event: 0x<STRING>
updated group (<STRING>)
updated group <STRING>
updated remote log and SNMP settings
updated user (<STRING>)
updated user <STRING>
User <STRING> was authenticated
User activated layout: <STRING>
User changed authentication configuration
User firmware update accepted
User generated a license request
User is uploading a backup
User is uploading new firmware
User logged in via web interface
User logged out via web interface
User saved layout: <STRING>
User uploaded NIMS key
Using <STRING> authentication
Watch thread shutting down

Warning

Warning or `warn` messages provide details about changes or events that are normal, but did not match expected results. Typically, these can be addressed by changing some input value and trying again.

```
Connections removed from unlicensed ports in layout '<STRING>'.
Could not find format for <STRING> Filter version: <STRING>
Could not get active layout id
Could not open filter file '<STRING>' for writing: <STRING>:<STRING>
Couldn't remove entry in file <STRING> because an entry with id
    <STRING> doesn't exist
Couldn't replace entry in file <STRING> because an entry with id
    <STRING> doesn't exist
Creating new layout ID for layout (<STRING>), layout ID not found on system
Did not receive OK command after file transfer
Error compiling <STRING> layout: <STRING>
Error getting file info - <STRING>:<STRING>
Error opening file '<STRING>' for reading: <STRING>:<STRING>
Error reading general config file
Error receiving handshake response: <STRING>-<STRING>
Error receiving handshake response: length was [<STRING>], expected [<STRING>]
Error sending apply layout response.
Error sending handshake request: <STRING>-<STRING>
Error sending notification of type <STRING>: <STRING>-<STRING>
Error setting ldap option: <STRING> - <STRING>
Excessive SPI bus errors: <STRING> CRC / <STRING> RX / <STRING> Loop
Filter file does not exist '<STRING>', cannot delete
Group description larger than <STRING> bytes
Invalid argument to RestoreBackupFileBytes
Invalid firmware finalize request - no firmware update active
Invalid layout name '<STRING>', cannot delete
Invalid RADIUS challenge length <STRING>
<STRING> layout did not pass validation
Layout '<STRING>' does not exist, cannot delete
Log file <STRING> was not loaded
LongPollThread unable to open counts object!
NIMS Unable to open socket to primary server: <STRING>:<STRING>
NIMS Unable to open socket to secondary server: <STRING>:<STRING>
No NIMS key available
Overwriting groups of new user <STRING> with default group: <STRING>
Ping: not an echo reply
Ping: received wrong id <STRING>
Ping: received wrong sequence # <STRING>
Response authenticator is invalid
Rule file does not exist '<STRING>', cannot delete
select error: <STRING> - <STRING>
Speed reduced on ports P%02d, P%02d, P%02d, P%02d in layout '<STRING>'
    due to license restrictions.
TACACS+ Unable to connect to primary server: <STRING>:<STRING>
Truncating RADIUS attribute of <STRING> bytes
Trying to load active or pending <STRING> layout directly
Unable to acquire semaphores to update counts
Unable to allocate <STRING> bytes for request body
Unable to aquire lock to update counts
Unable to calculate RADIUS ResponseAuthenticator
Unable to configure blocking on socket: <STRING> - <STRING>
Unable to connect to NIMS at <STRING>:<STRING>
Unable to connect to NIMS at <STRING>:<STRING> - request timed out
```

Unable to create group <STRING> because it already exists!
Unable to create user <STRING> because name is not allowed!
Unable to create user <STRING> because they already exist!
Unable to create worker thread #<STRING>
Unable to find authentication scheme: <STRING>
Unable to find group: <STRING>
Unable to find groups from BaseDN=<STRING>, Filter=<STRING>:
 <STRING> - <STRING>
Unable to find user: <STRING>
Unable to find users from BaseDN=<STRING>, Filter=<STRING>:
 <STRING> - <STRING>
Unable to free lock after updating counts
Unable to generate a unique ID for filter: <STRING>
Unable to generate a unique ID for rule: <STRING>
Unable to get capabilities
Unable to get socket address: <STRING> - <STRING>. Using default values.
Unable to hash user password
Unable to iterate users from BaseDN=<STRING>, Filter=<STRING>:
 <STRING> - <STRING>
Unable to locate command in CLI command description file (<STRING>):
 <STRING> - <STRING>
Unable to lock HWApi mutex
Unable to lock mutex!
Unable to open CLI command description file (<STRING>):
 <STRING> - <STRING>
Unable to open RADIUS connection to: <STRING>:<STRING>
Unable to read filter at: <STRING>
Unable to read from file <STRING>: <STRING> - <STRING>
Unable to read layout at: <STRING>
Unable to read property: <STRING>
Unable to read rule at: <STRING>
Unable to realloc <STRING> bytes for file: <STRING>
Unable to remove old layout <STRING> after renaming to <STRING>
Unable to remove rule references from layout: <STRING>
Unable to retrieve user DN
Unable to retrieve user entry
Unable to send auth packet to NIMS at <STRING>:<STRING>:
 <STRING> - <STRING>
Unable to send notification (<STRING>) to hwcommd:
 <STRING> - <STRING>
Unable to set read lock on file: <STRING> - <STRING>:<STRING>
Unable to set write lock on file: <STRING> - <STRING>:<STRING>
Unable to shutdown LongPollThread
Unable to start watch thread
Unable to stat file: <STRING> - <STRING>:<STRING>
Unable to stop NIMS update thread!
Unable to synchronize time to <STRING>: <STRING> - <STRING>
Unable to terminate firmware update
Unable to unlock mutex!
Unable to update remote user's groups: <STRING>
Unexpected FCGI Message Type: <STRING>
Unexpected message type from client: <STRING>
Unexpected NIMS Type: <STRING>
Unexpected version from client: <STRING>
Unhandled notification type: <STRING>
Unknown timestamp type specified: <STRING>
User <STRING> cannot be authorized because no default group is set.
User <STRING> failed authentication
User description larger than <STRING> bytes

UserDN <STRING> larger than maximum expected length: <STRING>
Warn: STDIN Padding - <STRING>
Warning, no work queue slots available for request
Warning, received message type <STRING> when expecting <STRING>
Warning, unable to allocate memory for client connection
Warning: Deleting rule (<STRING>) that is in use by active layout!
Warning: padding on FCGI_STDIN message!
Worker thread could not find work

Error

Error messages indicate changes or events that did not match expected results, such as a file could not be opened or program was busy. Typically, these are critical messages and must be addressed by changing some input value before the desired operation or result is achieved.

```
<STRING> fault detected!
Base64 encoded hash is an invalid length: <STRING>
Boundary length too large: <STRING>
Call to inotify_init failed - <STRING>:<STRING>
Can not set time before Jan 1, 2000
Canceling firmware update
Cannot apply firmware because no valid firmware is available.
Cannot begin firmware update because an update is already in progress.
Cannot begin firmware update due to insufficient memory.
Cannot begin firmware upload because an upload is already in progress.
Cannot cancel firmware upload because an upload is not in progress.
Cannot delete the group: <STRING>
Cannot delete the user: <STRING>
Cannot disable or change to remote login for group <STRING>!
Cannot disable or change to remote login for user <STRING>!
Cannot get permissions for user: <STRING>
Cannot lower permissions for group: <STRING>
Cannot lower permissions for user: <STRING>
Cannot parse multipart body - content type is not multipart: <STRING>
Cannot parse multipart body - no boundary specified for content type
Cannot parse multipart body - no content type provided
CLI error initializing cli system
Command failure during layout import (<STRING>), command: <STRING>
Critical sub-component firmware version mismatch!
DIGI_COMMAND_UNION_SIZE should be increased by <STRING>
DIGI_REGISTERS_UNION_SIZE should be increased by <STRING>
Duplicate wildcard entries for URI!
Entry <STRING> has invalid message size: <STRING>
Error accepting TLS connection from client
Error allocating data for multipart parser
Error allocating memory command nodes
Error allocating memory for PCLIStruct
Error allocating receive buffer of size <STRING>, file: <STRING>
Error binding to LDAP at <STRING>: <STRING> - <STRING>
Error compiling default <STRING> layout - <STRING>
Error connecting to hwcmd: <STRING>-<STRING>
Error copying license file: <STRING> - <STRING>
Error creating encrypted password buffer: <STRING>
Error creating group filter: '<STRING>' with '<STRING>'
Error creating license request, buffer too small
Error creating license request: <STRING>
Error creating LongPollThread
Error creating mutex
Error creating new user: <STRING>
Error creating temporary file - <STRING>:<STRING>
Error creating user filter: '<STRING>' with '<STRING>'
Error decompressing NIMS response
Error decrypting bind password
Error decrypting NIMS response
Error deleting filter file '<STRING>' (errno=<STRING>, <STRING>)
Error deleting filter: <STRING> - Unable to begin transaction
```


Error deleting layout file '<STRING>'
 Error deleting layout: <STRING> - Unable to begin transaction
 Error deleting rule file '<STRING>' (errno=<STRING>, <STRING>)
 Error deleting rule: <STRING> - Unable to begin transaction
 Error ending layout transaction: <STRING>-<STRING>
 Error executing command <STRING>: <STRING> - <STRING>
 Error expected filter file identifier of (0x<STRING>) but got
 (0x<STRING>) instead
 Error in NIMS response. Expected bulk header id of 0x<STRING>
 Error initializing <STRING> authentication
 Error initializing BPFParser!
 Error initializing gzip
 Error initializing hardware api
 Error initializing HwApi
 Error initializing LDAP: <STRING> - <STRING>
 Error initializing LicenseSec library!
 Error initializing mutex
 Error initializing TLS connection with client
 Error initializing TLS context
 Error initializing TLS for firmware status
 Error loading command definitions
 Error mapping memory
 Error moving pending layout to active layout: <STRING> - <STRING>
 Error opening file <STRING> for writing: <STRING> - <STRING>
 Error opening file <STRING>: <STRING> (<STRING>)
 Error opening mem file: <STRING>
 Error parsing scp command: <STRING>, command='<STRING>'
 Error populating user dn: '<STRING>' with '<STRING>'
 Error reading entry <STRING>: <STRING> - <STRING>
 Error reading file <STRING> contents: <STRING>:<STRING>
 Error reading from HttpRequest
 Error reading from stdin - read() error, errno = <STRING>:<STRING>
 Error reading from stdin - select() error, errno = <STRING>:<STRING>
 Error reading header (<STRING> bytes)
 Error reading pending layout
 Error receiving firmware update!
 Error receiving response: <STRING> - <STRING>
 Error releasing queued item semaphore! <STRING> - <STRING>
 Error reloading auth api configuration!
 Error replacing filter references '<STRING>' -> '<STRING>' in saved
 filters and rules
 Error replacing filter references with filter value for
 filter '<STRING>'
 Error saving auth config file
 Error saving compiled <STRING> layout
 Error saving default <STRING> layout!
 Error saving filter: <STRING>
 Error saving filter: <STRING> - Unable to begin transaction
 Error saving rule: <STRING> - Unable to begin transaction
 Error send file command for file <STRING>
 Error send file command for file <STRING>: <STRING> (<STRING>)
 Error sending <STRING> bytes: <STRING> - <STRING>
 Error starting socket server
 Error starting TLS: <STRING> - <STRING>
 Error transmitting SPI data. fd=<STRING>: <STRING> - <STRING>
 Error truncating file to <STRING> bytes: <STRING> - <STRING>
 Error upload is no longer active!
 Error with flash firmware file, aborting flash operation
 Error writing <STRING> bytes - <STRING>:<STRING>

Error writing entry <STRING> (<STRING> bytes):
 <STRING> - <STRING>
Error writing entry <STRING>: <STRING> - <STRING>
Error writing file <STRING> contents: <STRING>:<STRING>
Error writing header (<STRING> bytes)
Error writing NIMS key to <STRING>
Error writing to file <STRING>
Error writing to file <STRING>: <STRING> (<STRING>)
Error writing to file: <STRING> - <STRING>
Error writing to partition <STRING> - <STRING>:<STRING>
Error, HTTP Response neither handled nor delegated
Error, invalid version from server: <STRING>
Error, unexpected filter file version found: <STRING>,
 type: <STRING>
Failed to import group <STRING>:<STRING>
Failed to import user <STRING>:<STRING>
FATAL ERROR! Unable to start firmware upgrade
Fatal error, unable to open SPI slave pin!
Fatal error, unable to read WS_PPS: <STRING> - <STRING>
Fatal error, unable to read WS_SLAVE: <STRING> - <STRING>
FILTER_BUFFER_SIZE should be changed by <STRING>
Firmware update is not valid, aborting.
Firmware update status socket accept error
Firmware upgrade in progress, interface not available.
FIRMWARE_BUFFER_SIZE should be changed by <STRING>
fwrite() error
Group filter
Group name larger than <STRING> bytes
Handling unknown response!
Hardware returns error activating layout
Invalid backup file
Invalid config file
Invalid data size!
Invalid event type: <STRING>
Invalid file header!
Invalid firmware finalize request - did not receive all file sections
Invalid firmware finalize request - not all sections are valid
Invalid flash file: length = 0
Invalid shared memory pointer
Invalid state for Finalize EAPMD5
Keep Connection specified for worker thread request
Kernel image size is larger than kernel partition. Image Size:
 <STRING> bytes, Partition Size: <STRING> bytes,
Last system reset caused by CPU Watchdog!
Layout export is not allowed when <STRING> is powered off
Layout file exceeds maximum size of <STRING> bytes
Layout file missing signature string: '<STRING>'
Layout import is not allowed when <STRING> is powered off
Layout import syntax error with line (<STRING>): '<STRING>'
LDAP API is not initialized
License does not specify # of licensed ports
License does not specify a valid Serial #
License does not specify max # of 10Gbps Blocks
License Serial # does not match our Serial #
License specifies an invalid # of 10Gbps Blocks
License specifies an invalid # of ports
Max number of clients (<STRING>) reached!
MCU returned error transferring firmware update!
nicli: expected format: -auth <username> <password>

```

nicli: expected format: -cmdhelp
nicli: expected format: -cmdusage
nicli: expected format: -exportlayout <layoutname> <exportfilename>
nicli: expected format: -help
nicli: expected format: -importlayout <importfilename>
nicli: unknown parameter: <STRING>
NIMS unable to open socket to any server.
No accessor for property: <STRING>
No Group ID attribute <STRING> for filter <STRING>
No Group Name attribute <STRING> for filter <STRING>
No ping reply within one second.
No read buffer
No User ID attribute <STRING> for filter <STRING>
No User Name attribute <STRING> for filter <STRING>
Not initialized or connected, state error.
Only <STRING> can set the password for <STRING>
Ping: malloc error
Ping: packet too short (<STRING> bytes) from <STRING>
Ping: recvfrom error
Ping: select()
Ping: sendto error
Ping: unable to open ICMP socket!
Port <STRING> is over-subscribed and has dropped packets
read() error
Received flash file <STRING>, length = <STRING>
RootFS image size is larger than rootfs partition. Image Size:
  <STRING> bytes, Partition Size: <STRING> bytes,
select() error
Session manager not initialized
SHA1 Hash failed for section (<STRING>)
sizeof(digiRegisters_st): <STRING>
SPI_BUFFER_SIZE is not 4096!
Switch board firmware upgrade failed!
TACACS+ Error decrypting shared secret
TACACS+ Error reading from socket: <STRING> - <STRING>
TACACS+ Error sending request: <STRING> - <STRING>
TACACS+ Incomplete response received (<STRING> bytes)
TACACS+ Incomplete response received (<STRING>/<STRING> bytes)
TACACS+ Invalid SessionId
TACACS+ Unable to connect to any remote host
TACACS+ Unable to connect to secondary server: <STRING>:<STRING>
TACACS+ Unexpected packet type: <STRING>
TACACS+ Unexpected sequence. Expected: <STRING>, Got: <STRING>
TACACS+ Unknown Authentication Method: <STRING>,
  pClient->pCfg->szAuthType
TACACS+ Unknown state!
TACACS+ Unknown status: <STRING>
The filter name \"<STRING>\" is already in use
The layout name \"<STRING>\" is already in use
The rule name \"<STRING>\" is already in use
There was an error resetting the network defaults via script:
  <STRING>
There was an error updating network settings via script, restart
  recommended: <STRING>
Too many wildcard URI parameters
Unable to add watch to <STRING> - <STRING>:<STRING>
Unable to allocate <STRING> bytes for file <STRING>
Unable to allocate <STRING> bytes for firmware update
Unable to allocate key for <STRING>:<STRING>

```

Unable to allocate memory
Unable to allocate UriTreeNode
Unable to apply firmware update!
Unable to attach memory for <STRING>:<STRING>
Unable to begin firmware update
Unable to bind firmware update socket: <STRING>-<STRING>
Unable to cancel firmware update transfer
Unable to change watchdog timeout. System will reset!
Unable to copy data, size exceeds buffer
Unable to create a session for user: <STRING>
Unable to create default layout
Unable to create firmware update socket: <STRING>-<STRING>
Unable to create license request, cannot property
Unable to create license request, cannot set property
Unable to create memory for <STRING>:<STRING>
Unable to create mutex
Unable to create RADIUS authentication type: <STRING>
Unable to create semaphore
Unable to create semaphore for <STRING>:<STRING>
Unable to create temporary file (<STRING>) for layout export:
 <STRING> (<STRING>)
Unable to create temporary file (<STRING>) for layout import:
 <STRING> (<STRING>)
Unable to decrypt AES key for file!
Unable to decrypt TACACS+ shared secret
Unable to erase memory block <STRING>(<STRING>-<STRING>) -
 <STRING>:<STRING>
Unable to erase partition <STRING> - <STRING>:<STRING>
Unable to find queue match for RequestId: <STRING>
Unable to generate unique ID for layout '<STRING>'
Unable to get board serial
Unable to get clock time - aborting LongPollThread
Unable to get network addresses: <STRING> - <STRING>
Unable to get partition info <STRING> - <STRING>:<STRING>
Unable to get the current capabilities
Unable to get the current capabilities to activate layout
Unable to get the current capabilities.
Unable to import the license.
Unable to initialize gzip
Unable to initialize recv semaphore
Unable to listen firmware update socket: <STRING>-<STRING>
Unable to load active layout.
Unable to load filter list
Unable to load layout '<STRING>': <STRING>:<STRING>
Unable to load layout list
Unable to load rule list
Unable to load the active <STRING> layout
Unable to lock mutex
Unable to lock mutex - aborting LongPollThread
Unable to lock session manager lock
Unable to open <STRING>
Unable to open <STRING> for writing: <STRING> - <STRING>
Unable to open <STRING>: (<STRING>)
Unable to open CLI config file <STRING>: <STRING> - <STRING>
Unable to open EULA.txt: <STRING> - <STRING>
Unable to open file '<STRING>' - <STRING>:<STRING>
Unable to open file <STRING> for writing: <STRING> (<STRING>)
Unable to open file <STRING>: <STRING> - <STRING>
Unable to open log file <STRING>: <STRING> - <STRING>", pszPath

Unable to open memory for <STRING>:<STRING>
Unable to open ntpd.conf file for writing <STRING>:
 <STRING> - <STRING>
Unable to open partition <STRING> for validation:
 <STRING>:<STRING>
Unable to open ptpd.conf file for writing <STRING>:
 <STRING> - <STRING>
Unable to open semaphore for <STRING>:<STRING>
Unable to open watchdog!
Unable to open WS_PPS: <STRING> - <STRING>
Unable to open WS_RDY: <STRING> - <STRING>
Unable to open WS_SLAVE: <STRING> - <STRING>
Unable to ping gateway!
Unable to populate user data
Unable to publish capabilities
Unable to queue firmware data in time allowed.
Unable to queue version info command.
Unable to read auth configuration file!
Unable to read entry <STRING>: <STRING> - <STRING>
Unable to read EULA version from file: <STRING>! <STRING>:<STRING>
Unable to read EULA version from file: '<STRING>'! <STRING>:<STRING>
Unable to read exported layout file <STRING>: <STRING> (<STRING>)
Unable to read file <STRING>: <STRING> (<STRING>)
Unable to read logging config file <STRING>: <STRING> - <STRING>
Unable to read logging configuration
Unable to read netmask: <STRING> - <STRING>
Unable to read network address: <STRING> - <STRING>
Unable to read nitime.cfg
Unable to read properties from license: <STRING>
Unable to read time config file <STRING>: <STRING> - <STRING>
Unable to reallocate memory
Unable to release semaphore
Unable to reload log configuration
Unable to reload logging configuration, restart may be necessary:
 <STRING> - <STRING>
Unable to reload time configuration
Unable to rename layout <STRING> to <STRING> - Unable to save layout
Unable to rename layout: <STRING> - Layout <STRING> already exists
Unable to rename layout: <STRING> to <STRING> - Unable to load layout
Unable to request capabilities.
Unable to reset network config
Unable to resize file <STRING> to <STRING> bytes
Unable to restart networking
Unable to return semaphores after updating counts
Unable to save compiled <STRING> layout
Unable to save device id to file - <STRING>:<STRING>
Unable to save device id: <STRING>
Unable to save general configuration
Unable to save log configuration
Unable to save network configuration
Unable to save time configuration
Unable to seek in file: <STRING> - <STRING>
Unable to seek in file: <STRING> - <STRING>:<STRING>
Unable to send Factory Clean request
Unable to send queued SPI packet!
Unable to set hostname to: <STRING>
Unable to set power options
Unable to set semaphore value for <STRING>:<STRING> to <STRING>
Unable to set the options.

Unable to set the time.
Unable to set WS_PPS as INPUT: <STRING> - <STRING>
Unable to set WS_PPS as IRQ: <STRING> - <STRING>
Unable to set WS_RDY as OUTPUT: <STRING> - <STRING>
Unable to set WS_RDY to <STRING>: <STRING> - <STRING>
Unable to set WS_SLAVE as INPUT: <STRING> - <STRING>
Unable to set WS_SLAVE as IRQ: <STRING> - <STRING>
Unable to setup watchdog!
Unable to start firmware status thread
Unable to start firmware update
Unable to start NIMS update thread!
Unable to start SPI thread
Unable to start thread
Unable to stat file <STRING>: <STRING> (<STRING>)
Unable to truncate file: <STRING> - <STRING>
Unable to unlock memory block <STRING>(<STRING>-<STRING>) -
 <STRING>:<STRING>
Unable to write alerts header: <STRING> - <STRING>
Unable to write entry: <STRING> - <STRING>
Unable to write layout to temporary file (<STRING>) for layout import:
 <STRING> (<STRING>)
Unable to write ntpd.conf
Unable to write partition <STRING> - <STRING>:<STRING>
Unable to write ptpd.conf
Unable to write to file '<STRING>' - <STRING>:<STRING>
Unexpected NIMS Command: <STRING>
Unexpected NIMS Mode: <STRING>
Unknown FCGI Message Type: <STRING>
Unknown firmware file!
User password larger than <STRING> bytes
User: '<STRING>' does not have any permissions defined
Username larger than <STRING> bytes
Validate: error reading partition <STRING> - <STRING>:<STRING>
Validate: SHA1 Checksum failed for partition <STRING>

Fatal

Fatal messages indicate a serious problem that must be addressed before continuing.

```
Error initializing operation list
Error initializing Session Manager
Error initializing URI Tree
Invalid type type: <STRING>, expected: <STRING>
No read filter function defined for filter file
  version: <STRING>, type: <STRING>
No read filter info function defined for filter file version:
  <STRING>, type: <STRING>
Unable to allocate AuthScheme instance
Unable to apply firmware update!
Unable to initialize operation: <STRING>
Unable to read NI Public Key file!
Unable to reset to factory defaults!
```