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ADTRAN

Configuration Guide

DoS Protection

This configuration guide provides an overview of the denial of service (DoS) protection feature available in some ADTRAN Operating System (AOS) switch products. This guide is an overview of the information provided by the DoS protection feature, as well as how to configure the feature using the Web-based graphical user interface (GUI) and the AOS command line interface (CLI).

This guide consists of the following sections:

Introduction to DoS Protection

DoS attacks are malicious attacks intended to prevent network resources from being available for use by legitimate network traffic. DoS attacks, in a general sense, consume resources. Often this is done by bombarding the target with communication requests. This puts a strain on hardware resources and prevents normal network function.

The AOS DoS protection feature has been designed to use built-in hardware security registers to protect against many common DoS attacks.

The DoS protection feature provides protection similar to that achieved by configuring hardware access control lists (ACLs) in AOS. The primary advantage of the DoS protection feature is that it uses registers built into the chipset. Using the chipset registers allows the DoS protection feature to be enabled without negatively impacting the hardware resources of the switch.

DoS threats are broken down into five categories according to error statistics. Each threat is assigned a threat ID for ease of configuration through the CLI. A categorized list of these threats and their corresponding IDs can be found using the **show dos-id** command in the CLI.

This guide contains a detailed list of available CLI commands related to the DoS protection feature, as well as screenshots from the GUI that provide an outline of the displayed information and configuration of the feature.

Hardware and Software Requirements and Limitations

The DoS protection feature was implemented in AOS version 17.7 and is available on AOS products as outlined in the ADTRAN knowledge base article number 2272, *Product Feature Matrix*. This matrix is available online at http://kb.adtran.com.

The DoS protection feature is disabled by default.

The DoS protection feature does not protect against every possible type of DoS attack that can occur.

Configuring DoS Protection Using the GUI

To configure DoS protection using the GUI, follow these steps:

1. Open a new Web page in your Internet browser.
2. Type your AOS product's IP address in the Internet browser's address field in the following form: **http://**<*ip address*>. For example:

   http://65.162.109.200

3. At the prompt, enter your user name and password and select **OK**.

NOTE *The default user name is **admin** and the default password is **password**.*

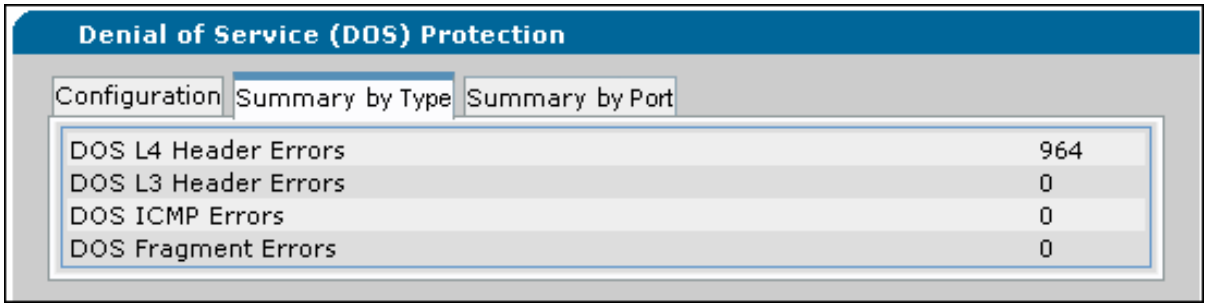
4. Navigate to **Data > Switch > DOS Protection**.

5. Select the **Configuration** tab to display the Configuration pane. This pane is the default view, and displays all DoS threat protections that can be enabled using the DoS protection feature. The threats are organized into five threat categories: **DOS L4 Header Error**, **DOS L3 Header Error**, **DOS ICMP Error**, **DOS Fragment Error**, and **Miscellaneous**.

6. To enable protection for a threat, select the blank check box next to the desired threat name. Once all threats have been checked, select the **Apply** button to save the new settings. To return the check boxes to their original status, select the **Reset** button (before selecting **Apply**).

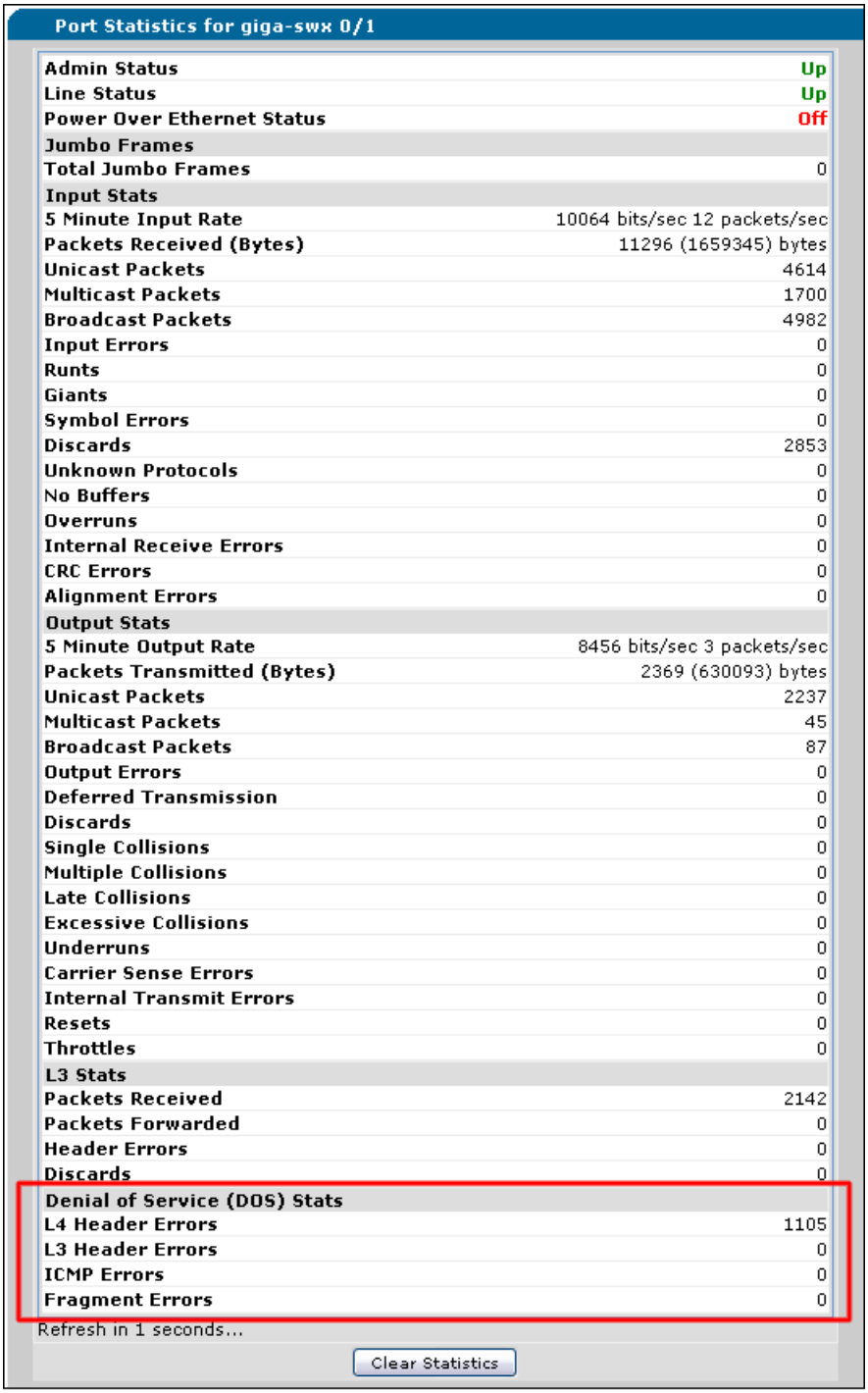
> NOTE
>
> *Selecting a threat type in the **Configuration** pane opens a new browser window that contains a detailed description of that particular threat.*

7. Select the **Summary by Type** tab to display the DoS attack statistics. Selecting this tab displays the number of DoS attacks, broken down by the five threat categories. The **Summary by Type** tab is only a representation of threat data, no configuration options or additional data are available from this tab. The threat counters can be reset by selecting the **Clear Statistics** button located on the **Port Statistics** pane.



8. Select the **Summary by Port** tab. Selecting this tab opens a pane containing a list of all ports on the unit. Next to each port is the total number of DoS attacks since the last time the port statistics were cleared.

9. Select an individual port to open the **Port Statistics** pane for that particular port. DoS protection statistics are located at the bottom of the **Port Statistics** pane, as indicated by the red outline. DoS protection statistics can be cleared, along with other port statistics, by selecting **Clear Statistics** located at the bottom of the pane. To open the **Port Statistics** pane without going through the **Summary by Port** pane, navigate to **Data** > **Ports** using the sidebar, and select the desired port.



Configuring DoS Protection Using the CLI

The following section outlines the procedure for configuring the DoS protection feature using the CLI.

Accessing the DoS Protection Feature in the CLI

The CLI can be accessed by several different methods. A VT100 terminal, a terminal emulation program on a PC, or Telnet can all be used. In order to access any AOS unit, you must know the login information. The IP address of the unit is also required if accessing the unit using Telnet. For more information on connecting to your AOS unit, refer to the quick start guide shipped with your unit. The quick start guide can also be found on the *AOS Documentation* CD shipped with your unit or online at http://kb.adtran.com.

All DoS protection commands are entered from the Enable or Global Configuration modes. A password is required to enter the Enable mode.

Show Commands

DoS protection information can be displayed in the CLI using **show** commands. All **show** commands are entered from the Enable mode. To display a categorized list of DoS threats along with their corresponding threat IDs, use the **show dos-id** command. The **show interface** command also includes a section displaying DoS protection statistics for any enabled threat IDs.

Show Command Example

The following example displays a list of DoS threats along with their corresponding threat IDs:

```
>enable
Password:
#show dos-id
DOS L4 Header Error
        TCP pkts w/ control flags and seq# equal to 0                    [1]
        TCP pkts w/ SYN and FIN bits set                                 [2]
        TCP pkts w/ FIN, URG, PSH bits set with ACK bit & seq# equal to 0 [3]
        TCP pkts w/ source port equal to destination port                [4]
        UDP pkts w/ source port equal to destination port                [5]
        TCP SYN pkts w/ source port 0-1023 for the first fragment        [6]

DOS L3 Header Error
        Source IP equal to Destination IP                                [20]

DOS ICMP Error
        Fragmented ICMP pkts                                             [40]
        ICMPV4 ping pkts w/payload greater than specified                [41]
        ICMPV6 ping pkts w/payload greater than specified                [42]

DOS Fragment Error
        TCP fragments w/ offset value set to 1                           [60]
        First TCP fragments w/ TCP header smaller than specified         [61]

Source MAC equal Destination MAC                                         [100]
```


Configuration Commands

Configuration commands allow the user to enable or disable the DoS protection feature. DoS protection may be enabled or disabled globally, or by specific threat IDs. Warning thresholds may be set for certain DoS attacks as well.

A complete listing of configuration commands can be found in the table *Configuration Commands* on page 10.

Configuration Command Example

The following example enables DoS protection against all available threats except for the Source MAC equal Destination MAC threat (Threat ID 100).

```
>enable
Password:
#config
(config)#dos-protection except 100
(config)#
```

Troubleshooting

No debug commands are currently associated with the DoS protection feature. DoS protection is a hardware-based feature.

To clear attack data collected by the DoS Protection feature, issue the **clear counters** command from the Enable mode.

Command Summary Tables

Configuration Commands

Prompt	Command	Description
(config)#	**[no] dos-protection <all | except** *<id(s)>* **|** *<id(s)>***>**	Enables or disables DoS protection on all threats or only indicated threats. The **all** keyword enables protection against all threats. The **except** keyword enables protection against all threats except the specified threat ID(s). The **no** form of this command disables all DoS protection.
(config)#	**[no] dos-protection max-icmpv4-payload** *<bytes>*	Sets the maximum Internet Control Message Protocol (ICMP) payload size for IPv4 packets. The range is **0** to **16** kB with a default of **512** bytes. A warning will be given if ICMPv4 protection has not been enabled. The **no** form of this command returns the maximum ICMP payload size for IPv4 packets to the default.
(config)#	**[no] dos-protection max-icmpv6-payload** *<bytes>*	Sets the maximum ICMP payload size for IPv6 packets. The range is **0** to **16** kB with a default of **512** bytes. A warning will be given if ICMPv6 protection has not been enabled. The **no** form of this command returns the maximum ICMP payload size for IPv6 packets to the default.
(config)#	**[no] dos-protection min-tcp-header** *<bytes>*	Sets the minimum Transmission Control Protocol (TCP) header size. The range is **0** to **255** bytes with a default of **20** bytes. A warning will be given if TCP protection has not been enabled.

Show Command

Prompt	Command	Description
#	**show dos-id**	Provides a categorized list of DoS threats and their corresponding threat IDs.

