



Configuration Guide

Configuring Dynamic Counters

Dynamic counters enable you to set up a counter that monitors traffic as it is transmitted to or received from Ethernet interfaces and Ethernet in the First Mile (EFM) groups. Included in the guide is an overview and instructions for configuring counter profiles and dynamic counters, as well as configuration examples for common uses for dynamic counters.

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Dynamic Counter Overview

Dynamic counters provide the ability to view counts of various traffic types throughout the system that are not generally available using typical performance monitoring buckets or counters. Dynamic counters enable you to set up a counter that monitors traffic as it is transmitted to or received from Ethernet interfaces and EFM groups. In addition to the interface to be monitored, the virtual local area network identifier (VLAN ID), VLAN p-bit, and color of the traffic can be specified. For example, you can choose to monitor any green traffic being received on a particular VLAN from a specified EFM bonding group, or you can choose to monitor red traffic on a particular VLAN being discarded by the policer.

Hardware and Software Requirements and Limitations

Dynamic counters are supported on AOS products as outlined in the *Product Feature Matrix*, available online at <https://supportforums.adtran.com>.

Configuring a Dynamic Counter

Follow these steps to create and configure a dynamic counter:

- *Step 1: Access the CLI on page 2*
- *Step 2: Create and Edit a Counter Profile (Optional) on page 3*
- *Step 3: Create and Configure a Dynamic Counter on page 4*

Step 1: Access the CLI

To access the command line interface (CLI) on your AOS unit, follow these steps:

1. Boot up the unit.
2. Telnet to the unit (**telnet** <ip address>), for example:

```
telnet 10.10.10.1
```



*If during the unit's setup process you have changed the default Internet Protocol (IP) address (**10.10.10.1**), use the configured IP address.*

3. Enter your user name and password at the prompt.



*The AOS default user name is **admin** and the default password is **password**. If your product no longer has the default user name and password, contact your system administrator for the appropriate user name and password.*

4. Enter the Enable mode by entering **enable** at the prompt as follows:

```
>enable
```

5. Enter your Enable mode password at the prompt.



*The default Enable mode password is **password**. If your product no longer has the default Enable password, contact your system administrator for the appropriate password.*

6. Enter the unit's Global Configuration mode as follows:

```
#configure terminal
(config)#
```

Step 2: Create and Edit a Counter Profile (Optional)

Counter profiles help define what types of packets are counted by dynamic counters. After configuring a counter profile, it can be used to define the behavior of one or more dynamic counters.



This step is optional. If you do not wish to filter the traffic counted by the dynamic counter, you can skip to [Step 3: Create and Configure a Dynamic Counter on page 4](#).

To create a counter profile, follow these steps:

1. From the Global Configuration mode, use the **counter-profile** *<slot/index>* command to create a counter profile and access the Counter Profile Configuration mode. The *<slot/index>* variable specifies a slot and index that uniquely identify the counter profile. The following example creates counter profile **0/1**:

```
(config)#counter-profile 0/1
(config-count-prof 0/1)#
```

2. Optional. If you would like to include the color marking of the packets in the matching criteria for the counter profile, use the **color** command from the Counter Profile Configuration mode. Color parameters represent bandwidth profiles. There are four basic profiles:
 - Committed information rate (CIR) is the average rate up to which service frames are delivered. Service frames are always sent at the User-to-Network (UNI) speed.
 - Committed burst size (CBS) is the maximum number of bytes allowed for incoming service frames to still be CIR compliant.
 - Excess information rate (EIR) is the average rate up to which excess service frames (frames whose average rate is greater than CIR) are admitted into the network.
 - Excess burst size (EBS) is the maximum number of bytes allowed for incoming service frames to be EIR compliant.

A service frame is green if it is compliant with CIR/CBS of the bandwidth profile. A service frame is yellow if it is greater than the CIR/CBS of the profile, but less than the EIR/EBS. A service frame is red if it is not compliant with either the CIR/CBS or EIR/EBS.

Green service frames are delivered per the performance objective and not generally discarded because they are in profile. Yellow service frames are out of profile, but are not typically discarded unless network conditions (for example, congestion) prevents delivery. Red service frames are out of profile and immediately discarded.

```
(config-count-prof 0/1)#color [green | red | yellow]
```

Syntax	Description
green	Matches packets that comply with CIR/CBS.
red	Matches packets that violate CIR/CBS and EIR/EBS.
yellow	Matches packets that violate CIR/CBS but comply with EIR/EBS.

The following example specifies that the counter profile will count packets marked **red**:

```
(config-count-prof 0/1)#color red
```

- Optional. If you would like to include the specified VLAN priority bit in the matching criteria for the counter profile, use the **pbit** *<number>* command from the Counter Profile Configuration mode. Valid range for the *<number>* variable is **0** to **7**. The following example includes VLAN priority bit **4** in the matching criteria for the counter profile:

```
(config-count-prof 0/1)#pbit 4
```

- Optional. If you would like to include the VLAN ID in the matching criteria for the counter profile, use the **vlan** command from the Counter Profile Configuration mode.

```
(config-count-prof 0/1)#vlan [<vlan id> | none]
```

Syntax	Description
<i><vlan id></i>	Specifies the VLAN ID to include in the matching criteria for the counter profile. Valid range is 0 to 4094 .
none	Specifies that only untagged traffic is included in the matching criteria for the counter profile.

The following example specifies that only untagged traffic is included in the matching criteria for the counter profile:

```
(config-count-prof 0/1)#vlan none
```

Step 3: Create and Configure a Dynamic Counter

To create and configure a dynamic counter, follow these steps:

- From the Global Configuration command prompt, use the **dynamic-counter** *<slot/index>* command to create a dynamic counter and access the Dynamic Counter Configuration mode. The *<slot/index>* variable specifies a slot and index that uniquely identify the dynamic counter. The following example creates dynamic counter **0/1**:

```
(config)#dynamic-counter 0/1
(config-dyn-count 0/1)#
```

- Use the following command to specify an interface to be monitored by the dynamic counter:

```
(config-dyn-count 0/1)#set interface <interface> [rx | tx | queue <queue> [ congestion-drop | dequeue | enqueue ]]
```

Syntax	Description
<interface>	Specifies an interface to be monitored by the dynamic counter in the format <interface type [slot/port]>. For example, for a Gigabit Ethernet interface, use gigabit-ethernet 0/1 ; for an EFM group, use efm-group 1/1 .
rx	Specifies that packets received by the specified interface are counted.
tx	Specifies that packets transmitted by the specified interface are counted.
queue <queue>	Specifies that statistics for the specified queue will be collected by the dynamic counter. Valid range is 0 to n .
congestion-drop	Specifies that packets chosen by the congestion manager to be dropped rather than enqueued are counted.
dequeue	Specifies that packets that have successfully left the queue to be transmitted on the interface are counted.
enqueue	Specifies that packets that have entered the queue are counted.

The following example specifies that the dynamic counter will count packets received by Gigabit Ethernet interface **0/1**:

```
(config-dyn-count 0/1)#set interface gigabit-ethernet 0/1 rx
```

- Optional. Use the following command to specify the counter profile to be used by the dynamic counter:

```
(config-dyn-count 0/1)#set counter-profile <slot/index> [exclude | include]
```

Syntax	Description
<slot/index>	Specifies the index of the counter profile to assign to the dynamic counter in the format <slot/index>.
exclude	Specifies that the dynamic counter will count packets that do not match the counter profile.
include	Specifies that the dynamic counter will count packets that match the counter profile.

The following example specifies that the dynamic counter will count packets on the interface that match the criteria specified in counter profile **0/1**:

```
(config-dyn-count 0/1)#set counter-profile 0/1 include
```

- Use the **no shutdown** command to enable the dynamic counter.

```
(config-dyn-count 0/1)#no shutdown
```

Dynamic Counter Configuration Examples

This section provides configuration examples for common uses of dynamic counters. Included is an example configuration for counting packets received and transmitted by an interface and an example configuration for counting packets dropped due to queue congestion.

Counting Packets Received and Transmitted by an Interface

The following configuration example creates and configures dynamic counters that will count packets received and transmitted on an interface. Packets received by the interface tagged with VLAN ID **100** are counted by dynamic counter **0/1**, and packets transmitted by the interface tagged with VLAN ID **101** are counted by dynamic counter **0/2**.

```
!  
counter-profile 0/1  
  vlan 100  
!  
dynamic-counter 0/1  
  set interface gigabit-ethernet 0/1 rx  
  set counter-profile 0/1 include  
  no shutdown  
!  
counter-profile 0/2  
  vlan 101  
!  
dynamic-counter 0/2  
  set interface gigabit-ethernet 0/1 tx  
  set counter-profile 0/1 include  
  no shutdown  
!
```

Counting Packets Dropped Due to Congestion

The following configuration example creates a congestion drop counters for EFM group **1/1**. Counting congestion drops can help show when overutilization is occurring. In the example, individual counters are used for queues **0** through **3** to count the packets dropped for each queue by the congestion manager.

```
!  
dynamic-counter 0/1  
  set interface efm-group 1/1 queue 0 congestion-drop  
  no shutdown  
!  
dynamic-counter 0/2  
  set interface efm-group 1/1 queue 1 congestion-drop  
  no shutdown  
!  
dynamic-counter 0/3  
  set interface efm-group 1/1 queue 2 congestion-drop  
  no shutdown  
!  
dynamic-counter 0/4  
  set interface efm-group 1/1 queue 3 congestion-drop  
  no shutdown  
!
```

Viewing Dynamic Counter Statistics

To view the statistics of a dynamic counter use the **show dynamic-counter** command from the Enable mode.

>show dynamic-counter *<slot/index>*

Syntax	Description
<i><slot/index></i>	Optional. Specifies the slot and index of the dynamic counter in the format <i><slot/index></i> , for example, 0/1 . Omitting this parameter will show the count statistics for all dynamic counters.

The following example shows the count statistics for all dynamic counters:

>show dynamic-counter

Counter	Type	Port/Queue	Bytes	Packets	Avg Rate (kbps)	Status
0/1	CONGEST	Gig Eth 5/Q 2	2341120	1829	106472	ACTIVE
0/2	TX	Gig Eth 5/Q 2	2348436	1829	105871	ACTIVE
0/3	RX	Gig Eth 5/Q 2	2341120	1829	106472	ACTIVE
0/4	CONGEST	Gig Eth 5/Q 3	2341120	1829	106240	ACTIVE
0/5	TX	Gig Eth 5/Q 3	1223652	953	55678	ACTIVE
0/6	RX	Gig Eth 5/Q 3	2341120	1829	106240	ACTIVE
0/7	CONGEST	Gig Eth 5/Q 4	2342400	1830	106472	ACTIVE
0/8	TX	Gig Eth 5/Q 4	1223652	953	56029	ACTIVE
0/9	RX	Gig Eth 5/Q 4	2342400	1830	106472	ACTIVE
0/10	CONGEST	Gig Eth 5/Q 6	2342400	1830	106356	ACTIVE
0/11	TX	Gig Eth 5/Q 6	3852	3	233	ACTIVE
0/12	RX	Gig Eth 5/Q 6	2342400	1830	106356	ACTIVE
0/13	TX	Gig Eth 5/Q 6	0	0	0	NOT IN SVC
0/14	RX	Gig Eth 5/Q 6	0	0	0	NOT IN SVC
0/15	TX	Gig Eth 5/Q 7	0	0	0	NOT IN SVC
0/16	RX	Gig Eth 5/Q 7	0	0	0	NOT IN SVC

Deleting or Disabling a Dynamic Counter

To delete a dynamic counter, use the **no dynamic-counter** *<slot/index>* command from the Global Configuration mode. The following example removes dynamic counter **0/1** from the configuration:

#configure terminal

(config)#**no dynamic-counter 0/1**

To shut down a dynamic counter without deleting its settings, use the **shutdown** command from the Dynamic Counter Configuration mode. The following example shuts down an existing counter:

#configure terminal

(config)#**dynamic-counter 0/1**

(config-dyn-count 0/1)#**shutdown**