Throttling of AAA RADIUS Records

The Throttling of AAA (RADIUS) Records feature supports throttling of access (authentication and authorization) and accounting records that are sent to the RADIUS server. This feature allows a user to configure the appropriate throttling rate to avoid network congestion and instability; such as when there is insufficient bandwidth to accommodate a sudden burst of records generated from the router to the RADIUS server.

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Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see Bug Search Tool and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Information About Throttling of AAA RADIUS Records

Benefits of the Throttling of AAA RADIUS Records Feature

A Network Access Server (NAS), acting as RADIUS client, can generate a burst of accounting or access requests, causing severe network congestion or causing the RADIUS server to become overloaded with a burst of RADIUS traffic. This problem could be compounded when multiple NASs interact with the RADIUS servers.

The following conditions can trigger a sudden burst of RADIUS traffic:
• An interface flap, which in turn brings down all the subscriber sessions and generates accounting requests for each subscriber.

• The High Availability (HA) program generating a START record for every session that survived a switchover, such as the scenario described the preceding bullet.

A large number of generated requests can make the network unstable if there is insufficient bandwidth or if the RADIUS server is slow to respond. Neither the User Datagram Protocol (UDP) transport layer nor the RADIUS protocol has a flow control mechanism. The throttling mechanism provided by this feature provides a solution for these issues.

**Throttling Access Requests and Accounting Records**

The Throttling of AAA (RADIUS) Records feature introduces a mechanism to control packets (flow control) at the NAS level, which improves the RADIUS server performance.

Because of their specific uses, access requests and accounting records must be treated separately. Access request packets are time sensitive, while accounting record packets are not.

• If a response to an access request is not returned to the client in a timely manner, the protocol or the user will time out, impacting the device transmission rates.

• Accounting records packets are not real-time critical.

When configuring threshold values on the same server, it is important to prioritize threshold values for the handling of the time-sensitive access request packets and to place a lesser threshold value on the accounting records packets.

In some cases, when an Internet Service Provider (ISP) is using separate RADIUS servers for access requests and accounting records, only accounting records throttling may be required.

**Summary**

• The Throttling of AAA (RADIUS) Records is disabled, by default.

• Throttling functionality can be configured globally or at server group level.

**How to Configure Throttling of AAA RADIUS Records**

This section describes how to configure throttling of access (authentication and authorization) and accounting records that are sent to the RADIUS server for both, global and server groups.

Server-group configurations are used to enable or disable throttling for a particular server group and to specify the threshold value for that server group.

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**Note**

Server-group configurations override any configured global configurations.
Throttling Accounting and Access Request Packets Globally

To globally configure the throttling of accounting and access request packets, perform the following task.

**SUMMARY STEPS**

1. `enable`
2. `configure terminal`
3. `radius-server throttle { accounting threshold [access threshold [access-timeout number-of-timeouts]]}
4. `exit`

**DETAILED STEPS**

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><code>enable</code></td>
<td>Enables privileged EXEC mode.</td>
</tr>
<tr>
<td></td>
<td><strong>Example:</strong></td>
<td>• Enter your password if prompted.</td>
</tr>
<tr>
<td></td>
<td><code>Router&gt; enable</code></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td><code>configure terminal</code></td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td></td>
<td><strong>Example:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><code>Router# configure terminal</code></td>
<td></td>
</tr>
</tbody>
</table>
| 3    | `radius-server throttle { accounting threshold [access threshold [access-timeout number-of-timeouts]]}
      | **Example:**     | Configures global throttling for accounting and access request packets. For this example: |
|      | `Router(config)# radius-server throttle accounting 100 access 200 access-timeout 2` | • The accounting threshold value (the range is 0-65536) is set to 100, and the access threshold value is set to 200. |
|      |                   | **Note** The default threshold value is 0 (throttling disabled). |
|      |                   | • The number of timeouts per transaction value (the range is 1-10) is set to 2. |
| 4    | `exit`            | Exits global configuration mode. |
|      | **Example:**     |         |
|      | `Router(config)# exit` |         |

**Throttling Accounting and Access Request Packets Per Server Group**

The following server-group configuration can be used to enable or disable throttling for a specified server group and to specify the threshold value for that server group.
To configure throttling of server-group accounting and access request packets, perform the following task.

**SUMMARY STEPS**

1. enable
2. configure terminal
3. aaa group server radius server-group-name
4. throttle \{\[accounting threshold\] [access threshold [access-timeout number-of-timeouts]]\}
5. exit

**DETAILED STEPS**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> enable</td>
<td>Enables privileged EXEC mode.</td>
</tr>
<tr>
<td>Example: Device&gt; enable</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong> configure terminal</td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td>Example: Device# configure terminal</td>
<td></td>
</tr>
<tr>
<td><strong>Step 3</strong> aaa group server radius server-group-name</td>
<td>Enters server-group configuration mode.</td>
</tr>
<tr>
<td>Example: Device(config)# aaa group server radius myservergroup</td>
<td></td>
</tr>
<tr>
<td><strong>Step 4</strong> throttle {[accounting threshold] [access threshold [access-timeout number-of-timeouts]]}</td>
<td>Configures the specified server-group throttling values for accounting and access request packets. For this example:</td>
</tr>
<tr>
<td>Example: Device(config-sg-radius)# throttle accounting 100 access 200 access-timeout 2</td>
<td></td>
</tr>
<tr>
<td><strong>Step 5</strong> exit</td>
<td>Exits server-group configuration mode.</td>
</tr>
<tr>
<td>Example: Device(config-sg-radius)# exit</td>
<td></td>
</tr>
</tbody>
</table>
Configuration Examples for Throttling of AAA RADIUS Records

Throttling Accounting and Access Request Packets Globally Example

The following example shows how to limit the number of accounting requests sent to a server to 100:

```
enable
cfg-term
radius-server throttle accounting 100
```

The following example shows how to limit the number of access requests packets sent to a server to 200 and sets the number of time-outs allowed per transactions to 2:

```
enable
cfg-term
radius-server throttle access 200
radius-server throttle access 200 access-timeout 2
```

The following example shows how to throttle both accounting and access request packets:

```
enable
cfg-term
radius-server throttle accounting 100 access 200
```

Throttling Accounting and Access Request Packets Per Server Group Example

The following example shows how to limit the number of accounting requests sent to server-group-A to 100:

```
enable
cfg-term
aaa group server radius server-group-A
throttle accounting 100
```

The following example shows how to limit the number of access requests packets sent to server-group-A to 200 and sets the number of time-outs allowed per transactions to 2:

```
enable
cfg-term
aaa group server radius server-group-A
throttle access 200 access-timeout 2
```

The following example shows how to throttle both accounting and access request packets for server-group-A:

```
enable
cfg-term
aaa group server radius server-group-A
throttle accounting 100 access 200
```
### Additional References

The following sections provide references related to the Throttling of AAA (RADIUS) Records feature.

#### Related Documents

<table>
<thead>
<tr>
<th>Related Topic</th>
<th>Document Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security commands</td>
<td><em>Cisco IOS Security Command Reference</em></td>
</tr>
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</table>

#### Standards

<table>
<thead>
<tr>
<th>Standard</th>
<th>Title</th>
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<tr>
<td>No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.</td>
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#### MIBs

<table>
<thead>
<tr>
<th>MIB</th>
<th>MIBs Link</th>
</tr>
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<tbody>
<tr>
<td>No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.</td>
<td>To locate and download MIBs for selected platforms, Cisco IOS XE software releases, and feature sets, use Cisco MIB Locator found at the following URL: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a></td>
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#### RFCs

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<tr>
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<tr>
<td>No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.</td>
<td>--</td>
</tr>
</tbody>
</table>
Feature Information for Throttling of AAA RADIUS Records

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

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Table 1: Feature Information for Throttling of AAA (RADIUS) Records

<table>
<thead>
<tr>
<th>Feature Name</th>
<th>Releases</th>
<th>Feature Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Throttling of AAA (RADIUS) Records</td>
<td>Cisco IOS XE Release 2.1</td>
<td>The Throttling of AAA (RADIUS) Records feature supports throttling of access (authentication and authorization) and accounting records that are sent to the RADIUS server. This feature allows a user to configure the appropriate throttling rate to avoid network congestion and instability; such as when there is insufficient bandwidth to accommodate a sudden burst of records generated from the Cisco IOS XE router to the RADIUS server. In Cisco IOS XE Release 2.1, this feature was introduced on Cisco ASR 1000 Series Aggregation Services Routers. The following commands were introduced or modified by this feature: radius-server throttle, throttle</td>
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</tbody>
</table>