Configuring AAA Dead-Server Detection

The AAA Dead-Server Detection feature allows you to configure the criteria to be used to mark a RADIUS server as dead. If no criteria are explicitly configured, the criteria are computed dynamically on the basis of the number of outstanding transactions. Using this feature will result in less deadtime and quicker packet processing.

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Prerequisites for AAA Dead-Server Detection

- You must have access to a RADIUS server.
- You should be familiar with configuring a RADIUS server.
- You should be familiar with configuring authentication, authorization, and accounting (AAA).
- Before a server can be marked as dead, you must first configure the **radius-server deadtime** command. If this command is not configured, even if the criteria are met for the server to be marked as dead, the server state will be in the up state.

Restrictions for AAA Dead-Server Detection

- Original transmissions are not counted in the number of consecutive timeouts that must occur on the device before the server is marked as dead; only the number of retransmissions are counted.
- VRF-aware DNS resolution is not supported if configured with FQDNs.

Information About AAA Dead-Server Detection

This section provides information about the AAA Dead-Server Detection feature.

Criteria for Marking a RADIUS Server As Dead

The AAA Dead-Server Detection feature allows you to determine the criteria that are used to mark a RADIUS server as dead. That is, you can configure the minimum amount of time, in seconds, that must elapse from the time that the device last received a valid packet from the RADIUS server to the time the server is marked as dead. If a packet has not been received since the device booted, and there is a timeout, the time criterion will be treated as though it has been met.

In addition, you can configure the number of consecutive timeouts that must occur on the device before the RADIUS server is marked as dead. If the server performs both authentication and accounting, both types of packets are included in the number. Improperly constructed packets are counted as though they are timeouts. Only retransmissions are counted, not the initial transmission. (Each timeout causes one retransmission to be sent.)

Note Both the time criterion and the tries criterion must be met for the server to be marked as dead.

The RADIUS dead-server detection configuration will result in the prompt detection of RADIUS servers that have stopped responding. This configuration will also result in the avoidance of servers being improperly marked as dead when they are swamped (responding slowly) and the avoidance of the state of servers being rapidly changed from dead to live to dead again. This prompt detection of nonresponding RADIUS servers and the avoidance of swamped and dead-to-live-to-dead-again servers will result in less deadtime and quicker packet processing.

Each AAA RADIUS global and server groups can have its own deadtime configured. The deadtime configured on the server group takes precedence over the global deadtime configuration. When a deadtime is configured on any AAA RADIUS server group, it clears the existing dead timer on all global server groups that are marked as dead, and not just the specified server group.

How to Configure AAA Dead-Server Detection

This section describes how to configure AAA dead-server detection.

Configuring AAA Dead-Server Detection

To configure AAA Dead-Server Detection, perform the following steps.

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.

	Command or Action	Purpose
Step 3	**aaa new-model** **Example:** `Device(config)# aaa new-model`	Enables the AAA access control model.
Step 4	**radius-server deadtime** *minutes* **Example:** `Device(config)# radius-server deadtime 5`	Improves RADIUS response times when some servers might be unavailable and causes the unavailable servers to be skipped immediately.
Step 5	**radius-server dead-criteria** [**time** *seconds*] [**tries** *number-of-tries*] **Example:** `Device(config)# radius-server dead-criteria time 5 tries 4`	Forces one or both of the criteria, used to mark a RADIUS server as dead, to be the indicated constant.
Step 6	**end** **Example:** `Device(config)# end`	Returns to privileged EXEC mode.
Step 7	**show running-config** **Example:** `Device# show running-config`	Verifies your configuration. After you have configured AAA Dead-Server Detection, you should verify your configuration using this command. This verification is especially important if you have used the **no** form of the **radius-server dead-criteria** command. The output of this command must show the same values in the **Dead Criteria Details** field that you configured using the **radius-server dead-criteria** command.

Verifying AAA Dead-Server Detection

To verify your AAA Dead-Server Detection configuration, perform the following steps. The **show** and **debug** commands may be used in any order.

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. Enter your password, if prompted.
Step 2	**debug aaa dead-criteria transactions** **Example:**	Displays AAA dead-criteria transaction values.

	Command or Action	Purpose
	`Device# debug aaa dead-criteria transactions`	
Step 3	**show aaa dead-criteria** **Example:** `Device# show aaa dead-criteria`	Displays dead-criteria information for a AAA server.
Step 4	**show aaa servers** [**private** | **public**] **Example:** `Device# show aaa server private`	Displays the status and number of packets that are sent to and received from all public and private authentication, authorization, and accounting (AAA) RADIUS servers. • The **private** keyword optionally displays the AAA servers only. • The **public** keyword optionally displays the AAA servers only.

Configuration Examples for AAA Dead-Server Detection

The following sections show configuration examples of AAA dead-server detection:

Example: Configuring AAA Dead-Server Detection

The following example shows that the device will be considered dead after 5 seconds and four tries:

```
Device> enable
Device# configure terminal
Device(config)# aaa new-model
Device(config)# radius-server deadtime 5
Device(config)# radius-server dead-criteria time 5 tries 4
```

The following output example shows dead-criteria transaction information for a particular server group:

```
Device> enable
Device# debug aaa dead-criteria transactions

AAA Transaction debugs debugging is on
*Nov 14 23:44:17.403: AAA/SG/TRANSAC: Computed Retransmit Tries: 22, Current Max Tries: 22
*Nov 14 23:44:17.403: AAA/SG/TRANSAC: Computed Dead Detect Interval: 25s, Current Max
Interval: 25s
*Nov 14 23:44:17.403: AAA/SG/TRANSAC: Estimated Outstanding Transactions: 6, Current Max
Transactions: 6
```

The following output example shows that dead-server-detection information has been requested for a RADIUS server at the IP address 192.0.2.1:

```
Device> enable
Device# show aaa dead-criteria radius 192.0.2.1 radius

RADIUS Server Dead Criteria:
============================
Server Details:
    Address : 192.0.2.1
```

```
    Auth Port : 1645
    Acct Port : 1646
Server Group : radius
Dead Criteria Details:
    Configured Retransmits : 62
    Configured Timeout : 27
    Estimated Outstanding Transactions: 5
    Dead Detect Time : 25s
    Computed Retransmit Tries: 22
    Statistics Gathered Since Last Successful Transaction
=====================================================
Max Computed Outstanding Transactions: 5
Max Computed Dead Detect Time: 25s
Max Computed Retransmits : 22
```

The following example shows that dead-criteria-detection information has been requested for a RADIUS server named ISE:

```
Device# show aaa dead-criteria radius server-name ISE

RADIUS Server Dead Criteria:
============================
Server Details:
    Address   : 192.0.2.2
    Auth Port : 1645
    Acct Port : 1646
Server Group  : radius
VRF           : Mgmt-vrf
Dead Criteria Details:
    Configured Retransmits   : 3
    Configured Timeout       : 5
    Estimated Outstanding Access Transactions: 0
    Estimated Outstanding Accounting Transactions: 0
    Dead Detect Time         : 5s
    Computed Retransmit Tries: 4
Statistics Gathered Since Last Successful Transaction
=====================================================
    Max Computed Outstanding Transactions: 1
    Max Computed Dead Detect Time: 10s
    Max Computed Retransmits : 10
```

Feature History for AAA Dead-Server Detection

This table provides release and related information for the features explained in this module.

These features are available in all the releases subsequent to the one they were introduced in, unless noted otherwise.

Release	Feature	Feature Information
Cisco IOS XE Everest 16.5.1a	AAA Dead-Server Detection	This feature allows you to configure the criteria to be used to mark a RADIUS server as dead. Support for this feature was introduced on the C9500-12Q, C9500-16X, C9500-24Q, C9500-40X models of the Cisco Catalsyt 9500 Series Switches.

Release	Feature	Feature Information
Cisco IOS XE Fuji 16.8.1a	AAA Dead-Server Detection	Support for this feature was introduced on the C9500-24Y4C, C9500-32C, C9500-32QC, and C9500-48Y4C models of the Cisco Catalsyt 9500 Series Switches.
Cisco IOS XE Cupertino 17.7.1	AAA Dead-Server Detection	This feature was implemented on the C9500X-28C8D model.
Cisco IOS XE Dublin 17.10.1b	AAA Dead-Server Detection	This feature was implemented on the C9500X-60L4D model.

Use the Cisco Feature Navigator to find information about platform and software image support. To access Cisco Feature Navigator, go to https://cfnng.cisco.com/.