



# TACACS Attribute-Value Pairs

Terminal Access Controller Access Control System Plus (TACACS+) attribute-value (AV) pairs are used to define specific authentication, authorization, and accounting elements in a user profile that is stored on the TACACS+ daemon. This chapter lists the TACACS+ AV pairs currently supported.

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## Information About TACACS Attribute-Value Pairs

### TACACS Authentication and Authorization AV Pairs

The following table lists and describes the supported TACACS+ authentication and authorization AV pairs and specifies the Cisco IOS release in which they are implemented.

*Table 1: Supported TACACS+ Authentication and Authorization AV Pairs*

| Attribute | Description                                                                                                                                                                                      | IOS XE 2.1 |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| acl=x     | ASCII number representing a connection access list. Used only when service=shell.                                                                                                                | yes        |
| addr=x    | A network address. Used with service=slip, service=ppp, and protocol=ip. Contains the IP address that the remote host should use when connecting via SLIP or PPP/IP. For example, addr=10.2.3.4. | yes        |

| Attribute            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | IOS XE 2.1 |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| addr-pool=x          | <p>Specifies the name of a local pool from which to get the address of the remote host. Used with service=ppp and protocol=ip.</p> <p>Note that <b>addr-pool</b> works in conjunction with local pooling. It specifies the name of a local pool (which must be preconfigured on the network access server). Use the <b>ip-local pool</b> command to declare local pools. For example:</p> <pre>ip address-pool local ip local pool boo 10.0.0.1 10.0.0.10 ip local pool moo 10.0.0.1 10.0.0.20</pre> <p>You can then use TACACS+ to return addr-pool=boo or addr-pool=moo to indicate the address pool from which you want to get this remote node's address.</p> | yes        |
| autocmd=x            | Specifies an autocommand to be executed at EXEC startup (for example, autocmd=telnet example.com). Used only with service=shell.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | yes        |
| callback- dialstring | Sets the telephone number for a callback (for example: callback-dialstring=408-555-1212). Value is NULL, or a dial-string. A NULL value indicates that the service might choose to get the dial string through other means. Used with service=arap, service=slip, service=ppp, service=shell. Not valid for ISDN.                                                                                                                                                                                                                                                                                                                                                 | yes        |
| callback-line        | The number of a TTY line to use for callback (for example: callback-line=4). Used with service=arap, service=slip, service=ppp, service=shell. Not valid for ISDN.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | yes        |
| callback-rotary      | The number of a rotary group (between 0 and 100 inclusive) to use for callback (for example: callback-rotary=34). Used with service=arap, service=slip, service=ppp, service=shell. Not valid for ISDN.                                                                                                                                                                                                                                                                                                                                                                                                                                                           | yes        |
| cmd-arg=x            | <p>An argument to a shell (EXEC) command. This indicates an argument for the shell command that is to be run. Multiple cmd-arg attributes can be specified, and they are order dependent.</p> <p><b>Note</b> This TACACS+ AV pair cannot be used with RADIUS attribute 26.</p>                                                                                                                                                                                                                                                                                                                                                                                    | yes        |
| cmd=x                | <p>A shell (EXEC) command. This indicates the command name for a shell command that is to be run. This attribute must be specified if service equals "shell." A NULL value indicates that the shell itself is being referred to.</p> <p><b>Note</b> This TACACS+ AV pair cannot be used with RADIUS attribute 26.</p>                                                                                                                                                                                                                                                                                                                                             | yes        |
| data-service         | Used with the service=outbound and protocol=ip.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | yes        |
| dial-number          | Defines the number to dial. Used with the service=outbound and protocol=ip.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | yes        |

| Attribute                 | Description                                                                                                                                                                                                                                                                                                                                                                                                         | IOS XE 2.1 |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| dns-servers=              | Identifies a DNS server (primary or secondary) that can be requested by Microsoft PPP clients from the network access server during IPCP negotiation. To be used with service=ppp and protocol=ip. The IP address identifying each DNS server is entered in dotted decimal format.                                                                                                                                  | yes        |
| force-56                  | Determines whether the network access server uses only the 56 K portion of a channel, even when all 64 K appear to be available. To turn on this attribute, use the “true” value (force-56=true). Any other value is treated as false. Used with the service=outbound and protocol=ip.                                                                                                                              | yes        |
| gw-password               | Specifies the password for the home gateway during the L2TP tunnel authentication. Used with service=ppp and protocol=vpdn.                                                                                                                                                                                                                                                                                         | yes        |
| idletime=x                | Sets a value, in minutes, after which an idle session is terminated. A value of zero indicates no timeout.                                                                                                                                                                                                                                                                                                          | yes        |
| inacl#<n>                 | ASCII access list identifier for an input access list to be installed and applied to an interface for the duration of the current connection. Used with service=ppp and protocol=ip, and service service=ppp and protocol =ipx. Per-user access lists do not currently work with ISDN interfaces.                                                                                                                   | yes        |
| inacl=x                   | ASCII identifier for an interface input access list. Used with service=ppp and protocol=ip. Per-user access lists do not currently work with ISDN interfaces.                                                                                                                                                                                                                                                       | yes        |
| interface-config#<n>      | Specifies user-specific AAA interface configuration information with Virtual Profiles. The information that follows the equal sign (=) can be any Cisco IOS interface configuration command. Multiple instances of the attributes are allowed, but each instance must have a unique number. Used with service=ppp and protocol=lcp.<br><br><b>Note</b> This attribute replaces the “interface-config=” attribute.   | yes        |
| ip-addresses              | Space-separated list of possible IP addresses that can be used for the end-point of a tunnel. Used with service=ppp and protocol=vpdn.                                                                                                                                                                                                                                                                              | yes        |
| l2tp-busy-disconnect      | If a vpdn-group on an LNS uses a virtual-template that is configured to be pre-cloned, this attribute will control the disposition of a new L2TP session that finds no pre-cloned interface to which to connect. If the attribute is true (the default), the session will be disconnected by the LNS. Otherwise, a new interface will be cloned from the virtual-template. Used with service=ppp and protocol=vpdn. | yes        |
| l2tp-cm-local-window-size | Specifies the maximum receive window size for L2TP control messages. This value is advertised to the peer during tunnel establishment. Used with service=ppp and protocol=vpdn.                                                                                                                                                                                                                                     | yes        |
| l2tp-drop-out-of-order    | Respects sequence numbers on data packets by dropping those that are received out of order. This does not ensure that sequence numbers will be sent on data packets, just how to handle them if they are received. Used with service=ppp and protocol=vpdn.                                                                                                                                                         | yes        |

| Attribute                  | Description                                                                                                                                                                                                                                                                                                                                         | IOS XE 2.1 |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| l2tp-hello- interval       | Specifies the number of seconds for the hello keepalive interval. Hello packets are sent when no data has been sent on a tunnel for the number of seconds configured here. Used with service=ppp and protocol=vpdn.                                                                                                                                 | yes        |
| l2tp-hidden-avp            | When enabled, sensitive AVPs in L2TP control messages are scrambled or hidden. Used with service=ppp and protocol=vpdn.                                                                                                                                                                                                                             | yes        |
| l2tp-nosession-<br>timeout | Specifies the number of seconds that a tunnel will stay active with no sessions before timing out and shutting down. Used with service=ppp and protocol=vpdn.                                                                                                                                                                                       | yes        |
| l2tp-tos-reflect           | Copies the IP ToS field from the IP header of each payload packet to the IP header of the tunnel packet for packets entering the tunnel at the LNS. Used with service=ppp and protocol=vpdn.                                                                                                                                                        | yes        |
| l2tp-tunnel- authen        | If this attribute is set, it performs L2TP tunnel authentication. Used with service=ppp and protocol=vpdn.                                                                                                                                                                                                                                          | yes        |
| l2tp-tunnel-<br>password   | Shared secret used for L2TP tunnel authentication and AVP hiding. Used with service=ppp and protocol=vpdn.                                                                                                                                                                                                                                          | yes        |
| l2tp-udp- checksum         | This is an authorization attribute and defines whether L2TP should perform UDP checksums for data packets. Valid values are “yes” and “no.” The default is no. Used with service=ppp and protocol=vpdn.                                                                                                                                             | yes        |
| link- compression=         | Defines whether to turn on or turn off “stac” compression over a PPP link. Used with service=ppp.<br><br>Link compression is defined as a numeric value as follows: <ul style="list-style-type: none"> <li>• 0: None</li> <li>• 1: Stac</li> <li>• 2: Stac-Draft-9</li> <li>• 3: MS-Stac</li> </ul>                                                 | yes        |
| load-threshold= <n>        | Sets the load threshold for the caller at which additional links are either added to or deleted from the multilink bundle. If the load goes above the specified value, additional links are added. If the load goes below the specified value, links are deleted. Used with service=ppp and protocol=multilink. The range for <n> is from 1 to 255. | yes        |
| map-class                  | Allows the user profile to reference information configured in a map class of the same name on the network access server that dials out. Used with the service=outbound and protocol=ip.                                                                                                                                                            | yes        |
| max-links=<n>              | Restricts the number of links that a user can have in a multilink bundle. Used with service=ppp and protocol=multilink. The range for <n> is from 1 to 255.                                                                                                                                                                                         | yes        |

| Attribute         | Description                                                                                                                                                                                                                                                                                                                                                                  | IOS XE 2.1 |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| min-links         | Sets the minimum number of links for MLP. Used with service=ppp and protocol=multilink, protocol=vpdn.                                                                                                                                                                                                                                                                       | yes        |
| nas-password      | Specifies the password for the network access server during the L2TP tunnel authentication. Used with service=ppp and protocol=vpdn.                                                                                                                                                                                                                                         | yes        |
| nocallback-verify | Indicates that no callback verification is required. The only valid value for this parameter is 1 (for example, nocallback-verify=1). Used with service=arap, service=slip, service=ppp, service=shell. There is no authentication on callback. Not valid for ISDN.                                                                                                          | yes        |
| noescape=x        | Prevents user from using an escape character. Used with service=shell. Can be either true or false (for example, noescape=true).                                                                                                                                                                                                                                             | yes        |
| nohangup=x        | Used with service=shell. Specifies the nohangup option, which means that after an EXEC shell is terminated, the user is presented with another login (username) prompt. Can be either true or false (for example, nohangup=false).                                                                                                                                           | yes        |
| old-prompts       | Allows providers to make the prompts in TACACS+ appear identical to those of earlier systems (TACACS and Extended TACACS). This allows administrators to upgrade from TACACS or Extended TACACS to TACACS+ transparently to users.                                                                                                                                           | yes        |
| outacl#<n>        | ASCII access list identifier for an interface output access list to be installed and applied to an interface for the duration of the current condition. Used with service=ppp and protocol=ip, and service service=ppp and protocol=ipx. Per-user access lists do not currently work with ISDN interfaces.                                                                   | yes        |
| outacl=x          | ASCII identifier for an interface output access list. Used with service=ppp and protocol=ip, and service service=ppp and protocol=ipx. Contains an IP output access list for SLIP or PPP/IP (for example, outacl=4). The access list itself must be preconfigured on the router. Per-user access lists do not currently work with ISDN interfaces.                           | yes        |
| pool-def#<n>      | Defines IP address pools on the network access server. Used with service=ppp and protocol=ip.                                                                                                                                                                                                                                                                                | yes        |
| pool-timeout=     | Defines (in conjunction with pool-def) IP address pools on the network access server. During IPCP address negotiation, if an IP pool name is specified for a user (see the addr-pool attribute), a check is made to see if the named pool is defined on the network access server. If it is, the pool is consulted for an IP address. Used with service=ppp and protocol=ip. | yes        |

| Attribute               | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | IOS XE 2.1 |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| port-type               | <p>Indicates the type of physical port the network access server is using to authenticate the user.</p> <p>Physical ports are indicated by a numeric value as follows:</p> <ul style="list-style-type: none"> <li>• 0: Asynchronous</li> <li>• 1: Synchronous</li> <li>• 2: ISDN-Synchronous</li> <li>• 3: ISDN-Asynchronous (V.120)</li> <li>• 4: ISDN- Asynchronous (V.110)</li> <li>• 5: Virtual</li> </ul> <p>Used with service=any and protocol=aaa.</p>                                                                                                                                                                                                                                                                                      | yes        |
| ppp-vj-slot-compression | Instructs the Cisco router not to use slot compression when sending VJ-compressed packets over a PPP link.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | yes        |
| priv-lvl=x              | Privilege level to be assigned for the EXEC. Used with service=shell. Privilege levels range from 0 to 15, with 15 being the highest.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | yes        |
| protocol=x              | A protocol that is a subset of a service. An example would be any PPP NCP. Currently known values are <b>lcp, ip, ipx, atalk, vines, lat, xremote, tn3270, telnet, rlogin, pad, vpdn, osicp, deccp, ccp, cdp, bridging, xns, nbf, bap, multilink, and unknown.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | yes        |
| proxyacl#<n>            | Allows users to configure the downloadable user profiles (dynamic ACLs) by using the authentication proxy feature so that users can have the configured authorization to permit traffic going through the configured interfaces. Used with the service=shell and protocol=exec.                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | yes        |
| route                   | <p>Specifies a route to be applied to an interface. Used with service=slip, service=ppp, and protocol=ip.</p> <p>During network authorization, the route attribute can be used to specify a per-user static route, to be installed by TACACS+ as follows:</p> <p>route=" <i>dst_address mask [ gateway ]</i>"</p> <p>This indicates a temporary static route that is to be applied. The <i>dst_address</i>, <i>mask</i>, and <i>gateway</i> are expected to be in the usual dotted-decimal notation, with the same meanings as in the familiar <b>ip route</b> configuration command on a network access server.</p> <p>If <i>gateway</i> is omitted, the peer's address is the gateway. The route is expunged when the connection terminates.</p> | yes        |
| route#<n>               | Like the route AV pair, this specifies a route to be applied to an interface, but these routes are numbered, allowing multiple routes to be applied. Used with service=ppp and protocol=ip, and service=ppp and protocol=ipx.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | yes        |

| Attribute        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | IOS XE 2.1 |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| routing=x        | Specifies whether routing information is to be propagated to and accepted from this interface. Used with service=slip, service=ppp, and protocol=ip. Equivalent in function to the /routing flag in SLIP and PPP commands. Can either be true or false (for example, routing=true).                                                                                                                                                                                                                                         | yes        |
| rte-fltr-in#<n>  | Specifies an input access list definition to be installed and applied to routing updates on the current interface for the duration of the current connection. Used with service=ppp and protocol=ip, and with service=ppp and protocol=ipx.                                                                                                                                                                                                                                                                                 | yes        |
| rte-fltr-out#<n> | Specifies an output access list definition to be installed and applied to routing updates on the current interface for the duration of the current connection. Used with service=ppp and protocol=ip, and with service=ppp and protocol=ipx.                                                                                                                                                                                                                                                                                | yes        |
| sap#<n>          | Specifies static Service Advertising Protocol (SAP) entries to be installed for the duration of a connection. Used with service=ppp and protocol=ipx.                                                                                                                                                                                                                                                                                                                                                                       | yes        |
| sap-fltr-in#<n>  | Specifies an input SAP filter access list definition to be installed and applied on the current interface for the duration of the current connection. Used with service=ppp and protocol=ipx.                                                                                                                                                                                                                                                                                                                               | yes        |
| sap-fltr-out#<n> | Specifies an output SAP filter access list definition to be installed and applied on the current interface for the duration of the current connection. Used with service=ppp and protocol=ipx.                                                                                                                                                                                                                                                                                                                              | yes        |
| send-auth        | Defines the protocol to use (PAP or CHAP) for username-password authentication following CLID authentication. Used with service=any and protocol=aaa.                                                                                                                                                                                                                                                                                                                                                                       | yes        |
| send-secret      | Specifies the password that the NAS needs to respond to a chap/pap request from the remote end of a connection on an outgoing call. Used with service=ppp and protocol=ip.                                                                                                                                                                                                                                                                                                                                                  | yes        |
| service=x        | The primary service. Specifying a service attribute indicates that this is a request for authorization or accounting of that service. Current values are <b>slip</b> , <b>ppp</b> , <b>arap</b> , <b>shell</b> , <b>tty-daemon</b> , <b>connection</b> , and <b>system</b> . This attribute must always be included.                                                                                                                                                                                                        | yes        |
| source-ip=x      | Used as the source IP address of all VPDN packets generated as part of a VPDN tunnel. This is equivalent to the Cisco <b>vpdn outgoing</b> global configuration command.                                                                                                                                                                                                                                                                                                                                                    | yes        |
| spi              | Carries the authentication information needed by the home agent to authenticate a mobile node during registration. The information is in the same syntax as the <b>ip mobile secure host &lt;addr&gt;</b> configuration command. Basically it contains the rest of the configuration command that follows that string, verbatim. It provides the Security Parameter Index (SPI), key, authentication algorithm, authentication mode, and replay protection timestamp range. Used with the service=mobileip and protocol=ip. | yes        |

| Attribute     | Description                                                                                                                                                                                                                                                               | IOS XE 2.1 |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| timeout=x     | The number of minutes before an EXEC or ARA session disconnects (for example, timeout=60). A value of zero indicates no timeout. Used with service=arap.                                                                                                                  | yes        |
| tunnel-id     | Specifies the username that will be used to authenticate the tunnel over which the individual user MID will be projected. This is analogous to the <i>remote name</i> in the <b>vpdn outgoing</b> command. Used with service=ppp and protocol=vpdn.                       | yes        |
| wins-servers= | Identifies a Windows NT server that can be requested by Microsoft PPP clients from the network access server during IPCP negotiation. To be used with service=ppp and protocol=ip. The IP address identifying each Windows NT server is entered in dotted decimal format. | yes        |
| zonelist=x    | A numeric zonelist value. Used with service=arap. Specifies an AppleTalk zonelist for ARA (for example, zonelist=5).                                                                                                                                                      | yes        |

For more information about configuring TACACS+, refer to the chapter “Configuring TACACS+.” For more information about configuring TACACS+ authentication and authorization, refer to the chapters “Configuring Authentication” and “Configuring Authorization.”

## TACACS Accounting AV Pairs

The following table lists and describes the supported TACACS+ accounting AV pairs and specifies the Cisco IOS XE release in which they are implemented.

**Table 2: Supported TACACS+ Accounting AV Pairs**

| Attribute   | Description                                                                                                                                                                                                                                                                                 | IOS XE 2.1 |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Abort-Cause | If the fax session aborts, indicates the system component that signaled the abort. Examples of system components that could trigger an abort are FAP (Fax Application Process), TIFF (the TIFF reader or the TIFF writer), fax-mail client, fax-mail server, ESMTP client, or ESMTP server. | yes        |
| bytes_in    | The number of input bytes transferred during this connection.                                                                                                                                                                                                                               | yes        |
| bytes_out   | The number of output bytes transferred during this connection.                                                                                                                                                                                                                              | yes        |
| Call-Type   | Describes the type of fax activity: fax receive or fax send.                                                                                                                                                                                                                                | yes        |
| cmd         | The command the user executed.                                                                                                                                                                                                                                                              | yes        |
| data-rate   | This AV pair has been renamed. See nas-rx-speed.                                                                                                                                                                                                                                            |            |



| Attribute              | Description                                                                                                                                                                                                                                                                                                                                                                                              | IOS XE 2.1 |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| disc-cause             | Specifies the reason a connection was taken off-line. The Disconnect-Cause attribute is sent in accounting-stop records. This attribute also causes stop records to be generated without first generating start records if disconnection occurs before authentication is performed. Refer to the following table (Disconnect Cause Extensions) for a list of Disconnect-Cause values and their meanings. | yes        |
| disc-cause-ext         | Extends the disc-cause attribute to support vendor-specific reasons why a connection was taken off-line.                                                                                                                                                                                                                                                                                                 | yes        |
| elapsed_time           | The elapsed time in seconds for the action. Useful when the device does not keep real time.                                                                                                                                                                                                                                                                                                              | yes        |
| Email-Server- Address  | Indicates the IP address of the e-mail server handling the on-ramp fax-mail message.                                                                                                                                                                                                                                                                                                                     | yes        |
| Email-Server-Ack- Flag | Indicates that the on-ramp gateway has received a positive acknowledgment from the e-mail server accepting the fax-mail message.                                                                                                                                                                                                                                                                         | yes        |
| event                  | Information included in the accounting packet that describes a state change in the router. Events described are accounting starting and accounting stopping.                                                                                                                                                                                                                                             | yes        |
| Fax-Account-Id- Origin | Indicates the account ID origin as defined by system administrator for the <b>mmpoip aaa receive-id</b> or the <b>mmpoip aaa send-id</b> command.                                                                                                                                                                                                                                                        | yes        |
| Fax-Auth-Status        | Indicates whether or not authentication for this fax session was successful. Possible values for this field are success, failed, bypassed, or unknown.                                                                                                                                                                                                                                                   | yes        |
| Fax-Connect-Speed      | Indicates the modem speed at which this fax-mail was initially transmitted or received. Possible values are 1200, 4800, 9600, and 14400.                                                                                                                                                                                                                                                                 | yes        |
| Fax-Coverpage-Flag     | Indicates whether or not a cover page was generated by the off-ramp gateway for this fax session. True indicates that a cover page was generated; false means that a cover page was not generated.                                                                                                                                                                                                       | yes        |
| Fax-Dsn-Address        | Indicates the address to which DSNs will be sent.                                                                                                                                                                                                                                                                                                                                                        | yes        |
| Fax-Dsn-Flag           | Indicates whether or not DSN has been enabled. True indicates that DSN has been enabled; false means that DSN has not been enabled.                                                                                                                                                                                                                                                                      | yes        |
| Fax-Mdn-Address        | Indicates the address to which MDNs will be sent.                                                                                                                                                                                                                                                                                                                                                        | yes        |
| Fax-Mdn-Flag           | Indicates whether or not message delivery notification (MDN) has been enabled. True indicates that MDN had been enabled; false means that MDN had not been enabled.                                                                                                                                                                                                                                      | yes        |

| Attribute               | Description                                                                                                                                                                                                                                                                                                  | IOS XE 2.1 |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Fax-Modem-Time          | Indicates the amount of time in seconds the modem sent fax data (x) and the amount of time in seconds of the total fax session (y), which includes both fax-mail and PSTN time, in the form x/y. For example, 10/15 means that the transfer time took 10 seconds, and the total fax session took 15 seconds. | yes        |
| Fax-Msg-Id=             | Indicates a unique fax message identification number assigned by Store and Forward Fax.                                                                                                                                                                                                                      | yes        |
| Fax-Pages               | Indicates the number of pages transmitted or received during this fax session. This page count includes cover pages.                                                                                                                                                                                         | yes        |
| Fax-Process-Abort- Flag | Indicates that the fax session was aborted or successful. True means that the session was aborted; false means that the session was successful.                                                                                                                                                              | yes        |
| Fax-Recipient-Count     | Indicates the number of recipients for this fax transmission. Until e-mail servers support Session mode, the number should be 1.                                                                                                                                                                             | yes        |
| Gateway-Id              | Indicates the name of the gateway that processed the fax session. The name appears in the following format: hostname.domain-name                                                                                                                                                                             | yes        |
| mlp-links-max           | Gives the count of links which are known to have been in a given multilink session at the time the accounting record is generated.                                                                                                                                                                           | yes        |
| mlp-sess-id             | Reports the identification number of the multilink bundle when the session closes. This attribute applies to sessions that are part of a multilink bundle. This attribute is sent in authentication-response packets.                                                                                        | yes        |
| nas-rx-speed            | Specifies the average number of bits per second over the course of the connection's lifetime. This attribute is sent in accounting-stop records.                                                                                                                                                             | yes        |
| nas-tx-speed            | Reports the transmit speed negotiated by the two modems.                                                                                                                                                                                                                                                     | yes        |
| paks_in                 | The number of input packets transferred during this connection.                                                                                                                                                                                                                                              | yes        |
| paks_out                | The number of output packets transferred during this connection.                                                                                                                                                                                                                                             | yes        |
| port                    | The port the user was logged in to.                                                                                                                                                                                                                                                                          | yes        |
| Port-Used               | Indicates the slot/port number of the Cisco AS5300 used to either transmit or receive this fax-mail.                                                                                                                                                                                                         | yes        |
| pre-bytes-in            | Records the number of input bytes before authentication. This attribute is sent in accounting-stop records.                                                                                                                                                                                                  | yes        |
| pre-bytes-out           | Records the number of output bytes before authentication. This attribute is sent in accounting-stop records.                                                                                                                                                                                                 | yes        |
| pre-paks-in             | Records the number of input packets before authentication. This attribute is sent in accounting-stop records.                                                                                                                                                                                                | yes        |

| Attribute        | Description                                                                                                                                                                                                     | IOS XE 2.1 |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| pre-paks-out     | Records the number of output packets before authentication. The Pre-Output-Packets attribute is sent in accounting-stop records.                                                                                | yes        |
| pre-session-time | Specifies the length of time, in seconds, from when a call first connects to when it completes authentication.                                                                                                  | yes        |
| priv_level       | The privilege level associated with the action.                                                                                                                                                                 | yes        |
| protocol         | The protocol associated with the action.                                                                                                                                                                        | yes        |
| reason           | Information included in the accounting packet that describes the event that caused a system change. Events described are system reload, system shutdown, or when accounting is reconfigured (turned on or off). | yes        |
| service          | The service the user used.                                                                                                                                                                                      | yes        |
| start_time       | The time the action started (in seconds since the epoch, 12:00 a.m. Jan 1 1970). The clock must be configured to receive this information.                                                                      | yes        |
| stop_time        | The time the action stopped (in seconds since the epoch.) The clock must be configured to receive this information.                                                                                             | yes        |
| task_id          | Start and stop records for the same event must have matching (unique) task_id numbers.                                                                                                                          | yes        |
| timezone         | The time zone abbreviation for all timestamps included in this packet.                                                                                                                                          | yes        |
| xmit-rate        | This AV pair has been renamed. See nas-tx-speed.                                                                                                                                                                |            |

The following table lists the cause codes and descriptions for the Disconnect Cause Extended (disc-cause-ext) attribute.

**Table 3: Disconnect Cause Extensions**

| Cause Codes               | Description                                                                                                                          | IOS XE 2.1 |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------|------------|
| 1000 - No Reason          | No reason for the disconnect.                                                                                                        | yes        |
| 1001 - No Disconnect      | The event was not a disconnect.                                                                                                      | yes        |
| 1002 - Unknown            | The reason for the disconnect is unknown. This code can appear when the remote connection goes down.                                 | yes        |
| 1003 - Call Disconnect    | The call has disconnected.                                                                                                           | yes        |
| 1004 - CLID Auth Fail     | Calling line ID (CLID) authentication has failed.                                                                                    | yes        |
| 1009 - No Modem Available | The modem is not available.                                                                                                          | yes        |
| 1010 - No Carrier         | The modem never detected data carrier detect (DCD). This code can appear if a disconnect occurs during the initial modem connection. | yes        |

| Cause Codes             | Description                                                                                                                                                                                                                                                             | IOS XE 2.1 |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| 1011 - Lost Carrier     | The modem detected DCD but became inactive. This code can appear if a disconnect occurs during the initial modem connection.                                                                                                                                            | yes        |
| 1012 - No Modem Results | The result codes could not be parsed. This code can appear if a disconnect occurs during the initial modem connection.                                                                                                                                                  | yes        |
| 1020 - TS User Exit     | The user exited normally from the terminal server. This code is related to immediate Telnet and raw TCP disconnects during a terminal server session.                                                                                                                   | yes        |
| 1021 - Idle Timeout     | The user exited from the terminal server because the idle timer expired. This code is related to immediate Telnet and raw TCP disconnects during a terminal server session.                                                                                             | yes        |
| 1022 - TS Exit Telnet   | The user exited normally from a Telnet session. This code is related to immediate Telnet and raw TCP disconnects during a terminal server session.                                                                                                                      | yes        |
| 1023 - TS No IP Addr    | The user could not switch to Serial Line Internet Protocol (SLIP) or PPP because the remote host had no IP address or because the dynamic pool could not assign one. This code is related to immediate Telnet and raw TCP disconnects during a terminal server session. | yes        |
| 1024 - TS TCP Raw Exit  | The user exited normally from a raw TCP session. This code is related to immediate Telnet and raw TCP disconnects during a terminal server session.                                                                                                                     | yes        |
| 1025 - TS Bad Password  | The login process ended because the user failed to enter a correct password after three attempts. This code is related to immediate Telnet and raw TCP disconnects during a terminal server session.                                                                    | yes        |
| 1026 - TS No TCP Raw    | The raw TCP option is not enabled. This code is related to immediate Telnet and raw TCP disconnects during a terminal server session.                                                                                                                                   | yes        |
| 1027 - TS CNTL-C        | The login process ended because the user typed Ctrl-C. This code is related to immediate Telnet and raw TCP disconnects during a terminal server session.                                                                                                               | yes        |
| 1028 - TS Session End   | The terminal server session has ended. This code is related to immediate Telnet and raw TCP disconnects during a terminal server session.                                                                                                                               | yes        |
| 1029 - TS Close Vconn   | The user closed the virtual connection. This code is related to immediate Telnet and raw TCP disconnects during a terminal server session.                                                                                                                              | yes        |
| 1030 - TS End Vconn     | The virtual connection has ended. This code is related to immediate Telnet and raw TCP disconnects during a terminal server session.                                                                                                                                    | yes        |

| <b>Cause Codes</b>           | <b>Description</b>                                                                                                                                                                                                       | <b>IOS XE 2.1</b> |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| 1031 - TS Rlogin Exit        | The user exited normally from an Rlogin session. This code is related to immediate Telnet and raw TCP disconnects during a terminal server session.                                                                      | yes               |
| 1032 - TS Rlogin Opt Invalid | The user selected an invalid Rlogin option. This code is related to immediate Telnet and raw TCP disconnects during a terminal server session.                                                                           | yes               |
| 1033 - TS Insuff Resources   | The access server has insufficient resources for the terminal server session. This code is related to immediate Telnet and raw TCP disconnects during a terminal server session.                                         | yes               |
| 1040 - PPP LCP Timeout       | PPP link control protocol (LCP) negotiation timed out while waiting for a response from a peer. This code concerns PPP connections.                                                                                      | yes               |
| 1041 - PPP LCP Fail          | There was a failure to converge on PPP LCP negotiations. This code concerns PPP connections.                                                                                                                             | yes               |
| 1042 - PPP Pap Fail          | PPP Password Authentication Protocol (PAP) authentication failed. This code concerns PPP connections.                                                                                                                    | yes               |
| 1043 - PPP CHAP Fail         | PPP Challenge Handshake Authentication Protocol (CHAP) authentication failed. This code concerns PPP connections.                                                                                                        | yes               |
| 1044 - PPP Remote Fail       | Authentication failed from the remote server. This code concerns PPP sessions.                                                                                                                                           | yes               |
| 1045 - PPP Receive Term      | The peer sent a PPP termination request. This code concerns PPP connections.                                                                                                                                             | yes               |
| PPP LCP Close (1046)         | LCP got a close request from the upper layer while LCP was in an open state. This code concerns PPP connections.                                                                                                         | yes               |
| 1047 - PPP No NCP            | LCP closed because no NCPs were open. This code concerns PPP connections.                                                                                                                                                | yes               |
| 1048 - PPP MP Error          | LCP closed because it could not determine to which Multilink PPP bundle that it should add the user. This code concerns PPP connections.                                                                                 | yes               |
| 1049 - PPP Max Channels      | LCP closed because the access server could not add any more channels to an MP session. This code concerns PPP connections.                                                                                               | yes               |
| 1050 - TS Tables Full        | The raw TCP or Telnet internal session tables are full. This code relates to immediate Telnet and raw TCP disconnects and contains more specific information than the Telnet and TCP codes listed earlier in this table. | yes               |
| 1051 - TS Resource Full      | Internal resources are full. This code relates to immediate Telnet and raw TCP disconnects and contains more specific information than the Telnet and TCP codes listed earlier in this table.                            | yes               |

| <b>Cause Codes</b>                | <b>Description</b>                                                                                                                                                                                                        | <b>IOS XE 2.1</b> |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| 1052 - TS Invalid IP Addr         | The IP address for the Telnet host is invalid. This code relates to immediate Telnet and raw TCP disconnects and contains more specific information than the Telnet and TCP codes listed earlier in this table.           | yes               |
| 1053 - TS Bad Hostname            | The access server could not resolve the host name. This code relates to immediate Telnet and raw TCP disconnects and contains more specific information than the Telnet and TCP codes listed earlier in this table.       | yes               |
| 1054 - TS Bad Port                | The access server detected a bad or missing port number. This code relates to immediate Telnet and raw TCP disconnects and contains more specific information than the Telnet and TCP codes listed earlier in this table. | yes               |
| 1060 - TCP Reset                  | The host reset the TCP connection. The TCP stack can return this disconnect code during an immediate Telnet or raw TCP session.                                                                                           | yes               |
| 1061 - TCP Connection Refused     | The host refused the TCP connection. The TCP stack can return this disconnect code during an immediate Telnet or raw TCP session.                                                                                         | yes               |
| 1062 - TCP Timeout                | The TCP connection timed out. The TCP stack can return this disconnect code during an immediate Telnet or raw TCP session.                                                                                                | yes               |
| 1063 - TCP Foreign Host Close     | A foreign host closed the TCP connection. The TCP stack can return this disconnect code during an immediate Telnet or raw TCP session.                                                                                    | yes               |
| 1064 - TCP Net Unreachable        | The TCP network was unreachable. The TCP stack can return this disconnect code during an immediate Telnet or raw TCP session.                                                                                             | yes               |
| 1065 - TCP Host Unreachable       | The TCP host was unreachable. The TCP stack can return this disconnect code during an immediate Telnet or raw TCP session.                                                                                                | yes               |
| 1066 - TCP Net Admin Unreachable  | The TCP network was administratively unreachable. The TCP stack can return this disconnect code during an immediate Telnet or raw TCP session.                                                                            | yes               |
| 1067 - TCP Host Admin Unreachable | The TCP host was administratively unreachable. The TCP stack can return this disconnect code during an immediate Telnet or raw TCP session.                                                                               | yes               |
| 1068 - TCP Port Unreachable       | The TCP port was unreachable. The TCP stack can return this disconnect code during an immediate Telnet or raw TCP session.                                                                                                | yes               |
| 1100 - Session Timeout            | The session timed out because there was no activity on a PPP link. This code applies to all session types.                                                                                                                | yes               |
| 1101 - Security Fail              | The session failed for security reasons. This code applies to all session types.                                                                                                                                          | yes               |

| <b>Cause Codes</b>                 | <b>Description</b>                                                                                                                                               | <b>IOS XE 2.1</b> |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| 1102 - Callback                    | The session ended for callback. This code applies to all session types.                                                                                          | yes               |
| 1120 - Unsupported                 | One end refused the call because the protocol was disabled or unsupported. This code applies to all session types.                                               | yes               |
| 1150 - Radius Disc                 | The RADIUS server requested the disconnect.                                                                                                                      | yes               |
| 1151 - Local Admin Disc            | The local administrator has disconnected.                                                                                                                        | yes               |
| 1152 - SNMP Disc                   | Simple Network Management Protocol (SNMP) has disconnected.                                                                                                      | yes               |
| 1160 - V110 Retries                | The allowed retries for V110 synchronization have been exceeded.                                                                                                 | yes               |
| 1170 - PPP Auth Timeout            | Authentication timeout. This code applies to PPP sessions.                                                                                                       | yes               |
| 1180 - Local Hangup                | The call disconnected as the result of a local hangup.                                                                                                           | yes               |
| 1185 - Remote Hangup               | The call disconnected because the remote end hung up.                                                                                                            | yes               |
| 1190 - T1 Quiesced                 | The call disconnected because the T1 line that carried it was quiesced.                                                                                          | yes               |
| 1195 - Call Duration               | The call disconnected because the call duration exceeded the maximum amount of time allowed by the Max Call Mins or Max DS0 Mins parameter on the access server. | yes               |
| 1600 - VPDN User Disconnect        | The user disconnected. This value applies to virtual private dial-up network (VPDN) sessions.                                                                    | yes               |
| 1601 - VPDN Carrier Loss           | Carrier loss has occurred. This code applies to VPDN sessions.                                                                                                   | yes               |
| 1602 - VPDN No Resources           | There are no resources. This code applies to VPDN sessions.                                                                                                      | yes               |
| 1603 - VPDN Bad Control Packet     | The control packet is invalid. This code applies to VPDN sessions.                                                                                               | yes               |
| 1604 - VPDN Admin Disconnect       | The administrator disconnected. This code applies to VPDN sessions.                                                                                              | yes               |
| 1605 - VPDN Tunnel Down/Setup Fail | The tunnel is down or the setup failed. This code applies to VPDN sessions.                                                                                      | yes               |
| 1606 - VPDN Local PPP Disconnect   | There was a local PPP disconnect. This code applies to VPDN sessions.                                                                                            | yes               |
| 1607 - VPDN Softshut/Session Limit | New sessions cannot be established on the VPN tunnel. This code applies to VPDN sessions.                                                                        | yes               |
| 1608 - VPDN Call Redirected        | The call was redirected. This code applies to VPDN sessions.                                                                                                     | yes               |

| Cause Codes                         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | IOS XE 2.1 |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| 1801 - Q850 Unassigned Number       | The number has not been assigned. This code applies to ISDN or modem calls that came in over ISDN.                                                                                                                                                                                                                                                                                                                                                                                                                      | no         |
| 1802 - Q850 No Route                | The equipment that is sending this code has received a request to route the call through a particular transit network that it does not recognize. The equipment that is sending this code does not recognize the transit network because either the transit network does not exist or because that particular transit network, while it does exist, does not serve the equipment that is sending this code. This code applies to ISDN or modem calls that came in over ISDN.                                            | no         |
| 1803 - Q850 No Route To Destination | The called party cannot be reached because the network through which the call has been routed does not serve the destination that is desired. This code applies to ISDN or modem calls that came in over ISDN.                                                                                                                                                                                                                                                                                                          | no         |
| 1806 - Q850 Channel Unacceptable    | The channel that has been most recently identified is not acceptable to the sending entity for use in this call. This code applies to ISDN or modem calls that came in over ISDN.                                                                                                                                                                                                                                                                                                                                       | no         |
| 1816 - Q850 Normal Clearing         | The call is being cleared because one of the users who is involved in the call has requested that the call be cleared. This code applies to ISDN or modem calls that came in over ISDN.                                                                                                                                                                                                                                                                                                                                 | no         |
| 1817 - Q850 User Busy               | The called party is unable to accept another call because the user-busy condition has been encountered. This code may be generated by the called user or by the network. In the case of the user, the user equipment is compatible with the call. This code applies to ISDN or modem calls that came in over ISDN.                                                                                                                                                                                                      | no         |
| 1818 - Q850 No User Responding      | Used when a called party does not respond to a call-establishment message with either an alerting or connect indication within the prescribed period of time that was allocated. This code applies to ISDN or modem calls that came in over ISDN.                                                                                                                                                                                                                                                                       | no         |
| 1819 - Q850 No User Answer          | The called party has been alerted but does not respond with a connect indication within a prescribed period of time. This code applies to ISDN or modem calls that came in over ISDN.                                                                                                                                                                                                                                                                                                                                   | no         |
| 1821 - Q850 Call Rejected           | The equipment that is sending this code does not wish to accept this call although it could have accepted the call because the equipment that is sending this code is neither busy nor incompatible. This code may also be generated by the network, indicating that the call was cleared due to a supplementary service constraint. The diagnostic field may contain additional information about the supplementary service and reason for rejection. This code applies to ISDN or modem calls that came in over ISDN. | no         |



| Cause Codes                                 | Description                                                                                                                                                                                                                                                                                                                      | IOS XE 2.1 |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| 1822 - Q850 Number Changed                  | The number that is indicated for the called party is no longer assigned. The new called party number may optionally be included in the diagnostic field. This code applies to ISDN or modem calls that came in over ISDN.                                                                                                        | no         |
| 1827 - Q850 Destination Out of Order        | The destination that was indicated by the user cannot be reached because the interface to the destination is not functioning correctly. The term “not functioning correctly” indicates that a signaling message was unable to be delivered to the remote party. This code applies to ISDN or modem calls that came in over ISDN. | no         |
| 1828 - Q850 Invalid Number Format           | The called party cannot be reached because the called party number is not in a valid format or is not complete. This code applies to ISDN or modem calls that came in over ISDN.                                                                                                                                                 | no         |
| 1829 - Q850 Facility Rejected               | This code is returned when a supplementary service that was requested by the user cannot be provided by the network. This code applies to ISDN or modem calls that have come in over ISDN.                                                                                                                                       | no         |
| 1830 - Q850 Responding to Status Enquiry    | This code is included in the STATUS message when the reason for generating the STATUS message was the prior receipt of a STATUS ENQUIRY message. This code applies to ISDN or modem calls that came in over ISDN.                                                                                                                | no         |
| 1831 - Q850 Unspecified Cause               | No other code applies. This code applies to ISDN or modem calls that came in over ISDN.                                                                                                                                                                                                                                          | no         |
| 1834 - Q850 No Circuit Available            | No circuit or channel is available to handle the call. This code applies to ISDN or modem calls that came in over ISDN.                                                                                                                                                                                                          | no         |
| 1838 - Q850 Network Out of Order            | The network is not functioning correctly and the condition is likely to last a relatively long period of time. This code applies to ISDN or modem calls that came in over ISDN.                                                                                                                                                  | no         |
| 1841 - Q850 Temporary Failure               | The network is not functioning correctly and the condition is not likely to last a long period of time. This code applies to ISDN or modem calls that came in over ISDN.                                                                                                                                                         | no         |
| 1842 - Q850 Network Congestion              | The network is congested. This code applies to ISDN or modem calls that came in over ISDN.                                                                                                                                                                                                                                       | no         |
| 1843 - Q850 Access Info Discarded           | This code indicates that the network could not deliver access information to the remote user as requested. This code applies to ISDN or modem calls that came in over ISDN.                                                                                                                                                      | no         |
| 1844 - Q850 Requested Channel Not Available | This code is returned when the circuit or channel that is indicated by the requesting entity cannot be provided by the other side of the interface. This code applies to ISDN or modem calls that came in over ISDN.                                                                                                             | no         |
| 1845 - Q850 Call Pre-empted                 | The call was preempted. This code applies to ISDN or modem calls that came in over ISDN.                                                                                                                                                                                                                                         | no         |

| <b>Cause Codes</b>                            | <b>Description</b>                                                                                                                                                                                                                             | <b>IOS XE 2.1</b> |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| 1847 - Q850 Resource Unavailable              | This code is used to report a resource-unavailable event only when no other code in the resource-unavailable class applies. This code applies to ISDN or modem calls that came in over ISDN.                                                   | no                |
| 1850 - Q850 Facility Not Subscribed           | Not a subscribed facility. This code applies to ISDN or modem calls that came in over ISDN.                                                                                                                                                    | no                |
| 1852 - Q850 Outgoing Call Barred              | Although the calling party is a member of the closed user group for the outgoing closed user group call, outgoing calls are not allowed for this member. This code applies to ISDN or modem calls that came in over ISDN.                      | no                |
| Q850 Incoming Call Barred (1854)              | Although the called party is a member of the closed user group for the incoming closed user group call, incoming calls are not allowed to this member. This code applies to ISDN or modem calls that have come in over ISDN.                   | no                |
| 1858 - Q850 Bearer Capability Not Available   | The user has requested a bearer capability that is implemented by the equipment that generated this code but that is not available at this time. This code applies to ISDN or modem calls that have come in over ISDN.                         | no                |
| 1863 - Q850 Service Not Available             | The code is used to report a service- or option-not-available event only when no other code in the service- or option-not-available class applies. This code applies to ISDN or modem calls that have come in over ISDN.                       | no                |
| 1865 - Q850 Bearer Capability Not Implemented | The equipment that is sending this code does not support the bearer capability that was requested. This code applies to ISDN or modem calls that have come in over ISDN.                                                                       | no                |
| 1866 - Q850 Channel Not Implemented           | The equipment that is sending this code does not support the channel type that was requested. This code applies to ISDN or modem calls that have come in over ISDN.                                                                            | no                |
| 1869 - Q850 Facility Not Implemented          | The supplementary service requested by the user cannot be provided by the network. This code applies to ISDN or modem calls that have come in over ISDN.                                                                                       | no                |
| 1881 - Q850 Invalid Call Reference            | The equipment that is sending this code has received a message having a call reference that is not currently in use on the user-network interface. This code applies to ISDN or modem calls that have come in over ISDN.                       | no                |
| 1882 - Q850 Channel Does Not Exist            | The channel most recently identified is not acceptable to the sending entity for use in this call. This code applies to ISDN or modem calls that have come in over ISDN. This code applies to ISDN or modem calls that have come in over ISDN. | no                |

| Cause Codes                                   | Description                                                                                                                                                                                                                                                                                                                                                                 | IOS XE 2.1 |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| 1888 - Q850 Incompatible Destination          | The equipment that is sending this code has received a request to establish a call that has low-layer compatibility or other compatibility attributes that cannot be accommodated. This code applies to ISDN or modem calls that have come in over ISDN.                                                                                                                    | no         |
| 1896 - Q850 Mandatory Info Element Is Missing | The equipment that is sending this code has received a message that is missing an information element that must be present in the message before that message can be processed. This code applies to ISDN or modem calls that have come in over ISDN.                                                                                                                       | no         |
| 1897 - Q850 Non Existent Message Type         | The equipment that is sending this code has received a message with a message type that it does not recognize either because this is a message that is not defined or that is defined but not implemented by the equipment that is sending this code. This code applies to ISDN or modem calls that have come in over ISDN.                                                 | no         |
| 1898 - Q850 Invalid Message                   | This code is used to report an invalid message when no other code in the invalid message class applies. This code applies to ISDN or modem calls that have come in over ISDN.                                                                                                                                                                                               | no         |
| 1899 - Q850 Bad Info Element                  | The information element not recognized. This code applies to ISDN or modem calls that have come in over ISDN.                                                                                                                                                                                                                                                               | no         |
| 1900 - Q850 Invalid Element Contents          | The equipment that is sending this code has received an information element that it has implemented; however, one or more fields in the information element are coded in such a way that has not been implemented by the equipment that is sending this code. This code applies to ISDN or modem calls that have come in over ISDN.                                         | no         |
| 1901 - Q850 Wrong Message for State           | The message that was received is incompatible with the call state. This code applies to ISDN or modem calls that have come in over ISDN.                                                                                                                                                                                                                                    | no         |
| 1902 - Q850 Recovery on Timer Expiration      | A procedure has been initiated by the expiration of a timer in association with error-handling procedures. This code applies to ISDN or modem calls that have come in over ISDN.                                                                                                                                                                                            | no         |
| 1903 - Q850 Info Element Error                | The equipment that is sending this code has received a message that includes information elements or parameters that are not recognized because the information element identifiers or parameter names are not defined or are defined but not implemented by the equipment that is sending this code. This code applies to ISDN or modem calls that have come in over ISDN. | no         |
| 1911 - Q850 Protocol Error                    | This code is used to report a protocol error event only when no other code in the protocol error class applies. This code applies to ISDN or modem calls that have come in over ISDN.                                                                                                                                                                                       | no         |
| 1927 - Q850 Unspecified Internetworking Event | There has been an error when interworking with a network that does not provide codes for actions that it takes. This code applies to ISDN or modem calls that have come in over ISDN.                                                                                                                                                                                       | no         |

For more information about configuring TACACS+ accounting, see the Configuring TACACS+ feature module.