



## RADIUS Progress Codes

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The RADIUS Progress Codes feature adds additional progress codes to RADIUS attribute 196 (Ascend-Connect-Progress), which indicates a connection state before a call is disconnected through progress codes.

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## Finding Feature Information

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

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

## Prerequisites for RADIUS Progress Codes

Before attribute 196 (Ascend-Connect-Progress) can be sent in accounting “start” and “stop” records, you must perform the following tasks:

- Enable AAA.
- Enable exec, network, or resource accounting.

For information on completing these tasks, refer to the AAA sections of the *Cisco IOS Security Configuration Guide: Securing User Services*, Release 15.0.

When these tasks are completed, attribute 196 is active by default.

## Information About RADIUS Progress Codes

Attribute 196 is sent in network, exec, and resource accounting “start” and “stop” records. This attribute can facilitate call failure debugging because each progress code identifies accounting information relevant to the connection state of a call. The attribute is activated by default; when an accounting “start” or “stop” accounting record is requested, authentication, authorization, and accounting (AAA) adds attribute 196 into the record as part of the standard attribute list. Attribute 196 is valuable because the progress codes, which are sent in accounting “start” and “stop” records, facilitate the debugging of call failures.


**Note**

In accounting “start” records, attribute 196 does not have a value.

**Table 1: Newly Supported Progress Codes for Attribute 196**

Code	Description
10	Modem allocation and negotiation is complete; the call is up.
30	The modem is up.
33	The modem is waiting for result codes.
41	The max TNT is establishing the TCP connection by setting up a TCP clear call.
60	Link control protocol (LCP) is the open state with PPP and IP Control Protocol (IPCP) negotiation; the LAN session is up.
65	PPP negotiation occurs and, initially, the LCP negotiation occurs; LCP is in the open state.
67	After PPP negotiation with LCP in the open state occurs, IPCP negotiation begins.


**Note**

Progress codes 33, 30, and 67 are generated and seen through debugs on the NAS; all other codes are generated and seen through debugs and the accounting record on the RADIUS server.

# How to Configure RADIUS Progress Codes

No configuration is required to configure RADIUS Progress Codes.

## How to Verify Attribute 196

To verify attribute 196 in accounting “start” and “stop” records, perform the following steps.

### SUMMARY STEPS

1. **enable**
2. **debug aaa accounting**
3. **show radius statistics**

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b>  <b>Example:</b> Device> enable	Enables privileged EXEC mode.  <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>debug aaa accounting</b>  <b>Example:</b> Device# debug aaa accounting	Displays information on accountable events as they occur.
<b>Step 3</b>	<b>show radius statistics</b>  <b>Example:</b> Device# debug aaa authorization	Displays the RADIUS statistics for accounting and authentication packets.

## Troubleshooting Tips

The following example is a sample debug output from the **debug ppp negotiation** command. This debug output is used to verify that accounting “stop” records have been generated and that attribute 196 (Ascend-Connect-Progress) has a value of 65.

```
Tue Aug 7 06:21:03 2001
  NAS-IP-Address = 10.0.58.62
  NAS-Port = 20018
  Vendor-Specific = ""
  NAS-Port-Type = ISDN
```

```

User-Name = "peer_16a"
Called-Station-Id = "5213124"
Calling-Station-Id = "5212175"
Acct-Status-Type = Stop
Acct-Authentic = RADIUS
Service-Type = Framed-User
Acct-Session-Id = "00000014"
Framed-Protocol = PPP
Framed-IP-Address = 172.16.0.2
Acct-Input-Octets = 3180
Acct-Output-Octets = 3186
Acct-Input-Packets = 40
Acct-Output-Packets = 40
Ascend-Connect-Pr = 65
Acct-Session-Time = 49
Acct-Delay-Time = 0
Timestamp = 997190463
Request-Authenticator = Unverified

```

## Additional References

The following sections provide references related to RADIUS Progress Codes.

### Related Documents

Related Topic	Document Title
Cisco IOS Security commands	<i>Cisco IOS Security Command Reference</i>
Configuring Accounting	Configuring Accounting module
RADIUS Attributes	RADIUS Attributes Overview and RADIUS IETF Attributes module

### Standards

Standard	Title
None	--

### MIBs

MIB	MIBs Links
None	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>

**RFCs**

RFC	Title
None	---

**Technical Assistance**

Description	Link
<p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p> <p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p> <p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p>	<a href="http://www.cisco.com/techsupport">http://www.cisco.com/techsupport</a>

## Feature Information for RADIUS Progress Codes

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

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to [http://www.cisco.com/featurenavigator](#). An account on Cisco.com is not required.

**Table 2: Feature Information for RADIUS Progress Codes**

Feature Name	Releases	Feature Information
RADIUS Progress Codes	Cisco IOS XE 3.3SG Cisco IOS XE 3.5E Cisco IOS XE Release 3.6E	<p>The RADIUS Progress Codes feature adds additional progress codes to RADIUS attribute 196 (Ascend-Connect-Progress), which indicates a connection state before a call is disconnected through progress codes.</p> <p>In Cisco IOS XE Release 3.6E, this feature is supported on Cisco Catalyst 3850 Series Switches.</p>

# Glossary

**AAA** --authentication, authorization, and accounting. Suite of network security services that provide the primary framework through which access control can be set up on your Cisco router or access server.

**attribute** --RADIUS Internet Engineering Task Force (IETF) attributes are the original set of 255 standard attributes that are used to communicate AAA information between a client and a server. Because IETF attributes are standard, the attribute data is predefined and well known; thus all clients and servers who exchange AAA information through IETF attributes must agree on attribute data such as the exact meaning of the attributes and the general bounds of the values for each attribute.

**EXEC accounting**--Provides information about user EXEC terminal sessions of the network access server.

**IPCP** --IP Control Protocol. A protocol that establishes and configures IP over PPP.

**LCP** --link control protocol. A protocol that establishes, configures, and tests data-link connections for use by PPP.

**network accounting**--Provides information for all PPP, Serial Line Internet Protocol (SLIP), or AppleTalk Remote Access Protocol (ARAP) sessions, including packet and byte counts.

**PPP** --Point-to-Point Protocol. Successor to SLIP that provides router-to-router and host-to-network connections over synchronous and asynchronous circuits. Whereas SLIP was designed to work with IP, PPP was designed to work with several network layer protocols, such as IP, IPX, and ARA. PPP also has built-in security mechanisms, such as CHAP and PAP. PPP relies on two protocols: LCP and NCP.

**RADIUS**--Remote Authentication Dial-In User Service. RADIUS is a distributed client/server system that secures networks against unauthorized access. In the Cisco implementation, RADIUS clients run on Cisco routers and send authentication requests to a central RADIUS server that contains all user authentication and network service access information.

**resource accounting**--Provides "start" and "stop" records for calls that have passed user authentication, and provides "stop" records for calls that fail to authenticate.