

# Configuring RADIUS Attributes

This chapter identifies the RADIUS attributes supported by the ERX system and describes the RADIUS attributes you can configure via the CLI.

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## Overview

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Remote Authentication Dial-In User Service (RADIUS) is a distributed client/server system that protects networks against unauthorized access. RADIUS clients running on a system send authentication requests to a central RADIUS server.

You can access the RADIUS server through either a subscriber line or the command line interface (CLI).



**Note for CLI/Telnet users only:** For CLI security, the system supports the RADIUS access-challenge message. The RADIUS server uses this message to send the user a challenge requiring a response. The system then displays the single reply message and attempts to authenticate the user with the new response as the password.

The central RADIUS server stores all the required user authentication and network access information. RADIUS informs the system of the privilege levels for which RADIUS-authenticated users have enable access. The system permits or denies enable access accordingly.

The RADIUS server is configured and managed by a RADIUS administrator. Refer to your RADIUS server documentation for information on how to configure and manage a RADIUS server.

The ERX RADIUS client uses the IP address found in the router ID unless you have explicitly set an IP address by using the **radius update-source-addr** command. See *Configuring Authentication and Accounting Servers in Chapter 1, Configuring Remote Access to the ERX System*.

To explicitly set the source address:

- Configure the RADIUS update-source address.
- Set this address on the RADIUS server if required.



**Note:** For additional RADIUS information on topics such as restricting user access, vty line authentication, or Secure Shell Server (SSH), see *ERX System Basics Configuration Guide, Chapter 6, Passwords and Security*.

### *RADIUS Services*

RADIUS provides three distinct services:

- Authentication – determines whether or not a user is allowed to access a specific service or resource
- Authorization – associates connection attributes or characteristics with a specific user
- Accounting – tracks service use by subscribers

### *RADIUS Attributes*

Your ERX system supports the RADIUS attributes listed in this chapter. RADIUS attributes define specific authentication, authorization, and accounting elements in a user's profile. The profile is stored on the RADIUS server. RADIUS messages contain RADIUS attributes to communicate information between the ERX system and the RADIUS server.

Three types of RADIUS attributes are supported by your system:

- Authentication
- Authorization

- Accounting

Note these guidelines about RADIUS attribute numbers:

- The number, such as [1], that appears in brackets before each attribute is the attribute's standard number.
- Any attribute number beginning with 26, such as [26-1], identifies a vendor-specific attribute.



**Note:** See Appendix A, *ERX-Supported RADIUS Attribute Descriptions for a complete list of RADIUS attributes supported by the ERX system.*

## References

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For more information about RADIUS, consult the following resources:

- RFC 2865 – Remote Authentication Dial In User Service (RADIUS) (June 2000)
- RFC 2866 – RADIUS Accounting (June 2000)
- RFC 2867 – RADIUS Accounting Modifications for Tunnel Protocol Support (June 2000)
- RFC 2868 – RADIUS Attributes for Tunnel Protocol Support (June 2000)
- RFC 2869 – RADIUS Extensions (June 2000)

## Subscriber AA Access Messages

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Authorization and authentication (AA) access messages identify subscribers before the RADIUS server grants or denies them access to the network or network services. When an application requests user authentication, the request must have certain authenticating attributes, such as a user's name, password, and the particular type of service the user is requesting. This information is sent in the authentication request via the RADIUS protocol to the RADIUS server. In response, the RADIUS server grants or denies the request.

Four groups of authentication/authorization messages are supported by your system software:

- Access-Request
- Access-Accept
- Access-Reject

- Access-Challenge (for CLI users only) – causes access deny for subscribers

*Access-Request Messages*

A RADIUS client authentication request is called an Access-Request message and can contain a number of RADIUS attributes. Table 2-1 provides the Access-Request attributes supported by the ERX system.

**Table 2-1** ERX-supported Access-Request attributes

Standard Number	Attribute Name	Standard Number	Attribute Name
[1]	User-Name	[44]	Acct-Session-Id
[2]	User-Password	[60]	CHAP-Challenge
[3]	CHAP-Password	[61]	NAS-Port-Type
[4]	NAS-IP-Address	[64]	Tunnel-Type*
[5]	NAS-Port	[65]	Tunnel-Medium-Type*
[6]	Service-Type	[66]	Tunnel-Client Endpoint*
[7]	Framed-Protocol	[67]	Tunnel-Server-Endpoint*
[8]	Framed-IP-Address	[68]	Acct-Tunnel-Connection*
[26-24]	Pppoe-Description	[77]	Connect-Info
[30]	Called-Station-Id	[87]	NAS-Port-Id
[31]	Calling-Station-Id	[90]	Tunnel-Client-Auth-Id*
[32]	NAS-Identifier	[91]	Tunnel-Server-Auth-Id*

\* Attribute used when terminating a PPP connection at the L2TP network server (LNS).

*Access-Accept Messages*

A RADIUS response to a client authorization request can be either an Access Accept or an Access Reject message. Access-Accept messages provide specific configuration information necessary to begin delivery of service to the user. Table 2-2 provides the Access-Accept attributes supported by the ERX system.

**Table 2-2** ERX-supported Access-Accept attributes

Standard Number	Attribute Name	Standard Number	Attribute Name
[1]	User-Name	[26-16]	Atm-SCR
[6]	Service-Type	[26-17]	Atm-MBS
[7]	Framed-Protocol	[26-22]	Sa-Validate

**Table 2-2** ERX-supported Access-Accept attributes (continued)

Standard Number	Attribute Name	Standard Number	Attribute Name
[8]	Framed-IP-Address	[26-23]	IGMP-Enable
[9]	Framed-IP-Netmask	[26-25]	Redirect-VR-Name
[11]	Filter-Id	[26-26]	Qos-Profile-Name
[18]	Reply-Message	[26-31]	SSC-Service-Bundle-Name
[22]	Framed-Route	[26-34]	Framed-IP-Addr-Tag
[25]	Class	[27]	Session-Timeout
[26-1]	Juniper-Virtual-Router	[28]	Idle-Timeout
[26-2]	Address-Pool-Name	[62]	Port-Limit
[26-3]	Local-Loopback-Interface	[64]	Tunnel-Type
[26-4]	Primary-DNS	[65]	Tunnel-Medium-Type
[26-5]	Secondary-DNS	[66]	Tunnel-Client Endpoint
[26-6]	Primary-WINS (NBNS)	[67]	Tunnel-Server-Endpoint
[26-7]	Secondary-WINS (NBNS)	[69]	Tunnel-Password
[26-8]	Tunnel-Virtual-Router	[82]	Tunnel-Assignment-Id
[26-9]	Tunnel-Password	[83]	Tunnel-Preference
[26-10]	Ingress-Policy-Name	[85]	Acct-Interim-Interval
[26-11]	Egress-Policy-Name	[88]	Framed-Pool
[26-12]	Ingress-Statistics	[90]	Tunnel-Client-Auth-Id
[26-13]	Egress-Statistics	[91]	Tunnel-Server-Auth-Id
[26-14]	Atm-Service-Category	[242]	Ascend-Data-Filter
[26-15]	Atm-PCR		

*Access-Reject Message*

A RADIUS response to a client authorization request can be either an Access-Accept or an Access-Reject message. If any value of the received attributes is not acceptable, the RADIUS server sends an Access-Reject message. There is only one Access-Reject attribute supported by the ERX system:

Standard Number	Attribute Name
[18]	Reply-Message

## Subscriber AA Accounting Messages

Accounting messages identify service provisions and use on a per user basis. They keep track of when a particular service is initiated and terminated for a specific user. RADIUS attributes are used by each group of accounting messages. The accounting messages include:

- Acct-Start
- Acct-Stop
- Interim-Acct
- Acct-On
- Acct-Off
- Acct-Tunnel-Start
- Acct-Tunnel-Stop
- Acct-Tunnel-Reject
- Acct-Tunnel-Link-Start
- Acct-Tunnel-Link-Stop
- Acct-Tunnel-Link Reject

### *Acct-Start Messages*

Table 2-3 lists the Acct-Start attributes supported by the ERX system.

**Table 2-3** Acct-Start attributes

Standard Number	Attribute Name	Standard Number	Attribute Name
[1]	User-Name	[41]	Acct-Delay-Time
[4]	NAS-IP-Address	[44]	Acct-Session-Id
[5]	NAS-Port	[45]	Acct-Authentic
[6]	Service-Type	[55]	Event-Timestamp
[7]	Framed-Protocol	[61]	NAS-Port-Type
[8]	Framed-IP-Address	[64]	Tunnel-Type*
[9]	Framed-IP-Netmask	[65]	Tunnel-Medium-Type*
[13]	Framed-Compression	[66]	Tunnel-Client Endpoint*
[25]	Class	[67]	Tunnel-Server-Endpoint*
[26-10]	Ingress-Policy-Name	[68]	Acct-Tunnel-Connection*
[26-11]	Egress-Policy-Name	[77]	Connect-Info
[26-24]	Pppoe-Description	[82]	Tunnel-Assignment-Id (LAC only)*

**Table 2-3** Acct-Start attributes (continued)

Standard Number	Attribute Name	Standard Number	Attribute Name
[30]	Called-Station-Id	[83]	Tunnel-Preference (LAC only)
[31]	Calling-Station-Id	[87]	NAS-Port-Id
[32]	NAS-Identifier	[90]	Tunnel-Client-Auth-Id*
[40]	Acct-Status-Type	[91]	Tunnel-Server-Auth-Id*

\* Attribute used when terminating a PPP connection at the LNS or the initiating L2TP Access Concentrator (LAC).

### Acct-Stop Messages

Table 2-4 lists the Acct-Stop attributes supported by the ERX system.

**Table 2-4** Acct-Stop attributes

Standard Number	Attribute Name	Standard Number	Attribute Name
[1]	User-Name	[44]	Acct-Session-Id
[4]	NAS-IP-Address	[45]	Acct-Authentic
[5]	NAS-Port	[46]	Acct-Session-Time
[6]	Service-Type	[47]	Acct-Input-Packets
[7]	Framed-Protocol	[48]	Acct-Output-Packets
[8]	Framed-IP-Address	[49]	Acct-Terminate-Cause
[9]	Framed-IP-Netmask	[52]	Acct-Input-Gigawords
[13]	Framed-Compression	[53]	Acct-Output-Gigawords
[25]	Class	[55]	Event-Timestamp
[26-10]	Ingress-Policy-Name	[61]	NAS-Port-Type
[26-11]	Egress-Policy-Name	[64]	Tunnel-Type*
[26-24]	Pppoe-Description	[65]	Tunnel-Medium-Type*
[26-42]	Acct-Input-Gigapackets	[66]	Tunnel-Client-Endpoint*
[26-43]	Acct-Output-Gigapackets	[67]	Tunnel-Server-Endpoint*
[30]	Called-Station-Id	[68]	Acct-Tunnel-Connection*
[31]	Calling-Station-Id	[77]	Connect-Info
[32]	NAS-Identifier	[82]	Tunnel-Assignment-ID (LAC only)*
[40]	Acct-Status-Type	[83]	Tunnel-Preference (LAC only)
[41]	Acct-Delay-Time	[87]	NAS-Port-Id
[42]	Acct-Input-Octets	[90]	Tunnel-Client-Auth-Id*
[43]	Acct-Output-Octets	[91]	Tunnel-Server-Auth-Id*

\* Attribute used when terminating a PPP connection at the LNS or the initiating LAC.

*Interim-Acct Messages*

Table 2-5 lists the Interim-Acct attributes supported by the ERX system.

**Table 2-5** Interim-Acct attributes

Standard Number	Attribute Name	Standard Number	Attribute Name
[1]	User-Name	[45]	Acct-Authentic
[4]	NAS-IP-Address	[46]	Acct-Session-Time
[5]	NAS-Port	[44]	Acct-Session-Id
[6]	Service-Type	[47]	Acct-Input-Packets
[7]	Framed-Protocol	[48]	Acct-Output-Packets
[8]	Framed-IP-Address	[52]	Acct-Input-Gigawords
[9]	Framed-IP-Netmask	[53]	Acct-Output-Gigawords
[13]	Framed-Compression	[55]	Event-Timestamp
[25]	Class	[61]	NAS-Port-Type
[26-10]	Ingress-Policy-Name	[64]	Tunnel-Type*
[26-11]	Egress-Policy-Name	[65]	Tunnel-Medium-Type*
[26-24]	Pppoe-Description	[66]	Tunnel-Client-Endpoint*
[26-42]	Acct-Input-Gigapackets	[67]	Tunnel-Server-Endpoint*
[26-43]	Acct-Output-Gigapackets	[68]	Acct-Tunnel-Connection*
[30]	Called-Station-Id	[77]	Connect-Info
[31]	Calling-Station-Id	[82]	Tunnel-Assignment-ID (LAC only)*
[32]	NAS-Identifier	[83]	Tunnel-Preference (LAC only)
[40]	Acct-Status-Type	[87]	NAS-Port-Id
[41]	Acct-Delay-Time	[90]	Tunnel-Client-Auth-Id*
[42]	Acct-Input-Octets	[91]	Tunnel-Server-Auth-Id*
[43]	Acct-Output-Octets		

\* Attribute used when terminating a PPP connection at the LNS or the initiating LAC.

*Acct-On Messages*

Table 2-6 lists the Acct-On attributes supported by the ERX system.

**Table 2-6** Acct-On attributes

Standard Number	Attribute Name	Standard Number	Attribute Name
[4]	NAS-IP-Address	[44]	Acct-Session-Id
[32]	NAS-Identifier	[45]	Acct-Authentic
[40]	Acct-Status-Type	[55]	Event-Timestamp
[41]	Acct-Delay-Time		

Your system supports the *accounting-on* message for the following event:

- On start-up or configuration of the first Accounting server

*Acct-Off Messages*

Table 2-7 lists the Acct-Off attributes supported by the ERX system.

**Table 2-7** Acct-Off attributes

Standard Number	Attribute Name	Standard Number	Attribute Name
[4]	NAS-IP-Address	[44]	Acct-Session-Id
[32]	NAS-Identifier	[45]	Acct-Authentic
[40]	Acct-Status-Type	[49]	Acct-Terminate-Cause (always NAS request)
[41]	Acct-Delay-Time	[55]	Event-Timestamp

Your ERX system supports *accounting-off* messages for the following events:

- When the last RADIUS accounting server in a virtual router is removed
- When the system is shut down
- When a virtual router containing configured RADIUS accounting servers is deleted

*Acct-Tunnel-Start Messages*

Table 2-8 lists the Acct-Tunnel-Start attributes supported by the ERX system.

**Table 2-8** Acct-Tunnel-Start attributes

Standard Number	Attribute Name	Standard Number	Attribute Name
[4]	NAS-IP-Address	[65]	Tunnel-Medium-Type
[32]	NAS-Identifier	[66]	Tunnel-Client-Endpoint
[40]	Acct-Status-Type	[67]	Tunnel-Server-Endpoint
[41]	Acct-Delay-Time	[68]	Acct-Tunnel-Connection
[44]	Acct-Session-Id	[82]	Tunnel-Assignment-ID (LAC only)
[55]	Event-Timestamp	[90]	Tunnel-Client-Auth-Id
[64]	Tunnel-Type	[91]	Tunnel-Server-Auth-Id

*Acct-Tunnel-Stop Messages*

Table 2-9 lists the Acct-Tunnel-Stop attributes supported by the ERX system.

**Table 2-9** Acct-Tunnel-Stop attributes

Standard Number	Attribute Name	Standard Number	Attribute Name
[4]	NAS-IP-Address	[64]	Tunnel-Type
[32]	NAS-Identifier	[65]	Tunnel-Medium-Type
[40]	Acct-Status-Type	[66]	Tunnel-Client-Endpoint
[41]	Acct-Delay-Time	[67]	Tunnel-Server-Endpoint
[44]	Acct-Session-Id	[68]	Acct-Tunnel-Connection
[46]	Acct-Session-Time	[82]	Tunnel-Assignment-ID (LAC only)
[49]	Acct-Terminate-Cause	[90]	Tunnel-Client-Auth-Id
[55]	Event-Timestamp	[91]	Tunnel-Server-Auth-Id

*Acct-Tunnel-Reject Messages*

Table 2-10 lists the Acct-Tunnel-Reject attributes supported by the ERX system.

**Table 2-10** Acct-Tunnel-Reject attributes

Standard Number	Attribute Name	Standard Number	Attribute Name
[4]	NAS-IP-Address	[65]	Tunnel-Medium-Type
[32]	NAS-Identifier	[66]	Tunnel-Client-Endpoint
[40]	Acct-Status-Type	[67]	Tunnel-Server-Endpoint
[41]	Acct-Delay-Time	[68]	Acct-Tunnel-Connection
[44]	Acct-Session-Id	[82]	Tunnel-Assignment-ID (LAC only)
[49]	Acct-Terminate-Cause	[90]	Tunnel-Client-Auth-Id
[55]	Event-Timestamp	[91]	Tunnel-Server-Auth-Id
[64]	Tunnel-Type		

*Acct-Tunnel-Link-Start Messages*

Table 2-11 lists the Acct-Tunnel-Link-Start attributes supported by the ERX system.

**Table 2-11** Acct-Tunnel-Link-Start attributes

Standard Number	Attribute Name	Standard Number	Attribute Name
[1]	User-Name	[65]	Tunnel-Medium-Type
[4]	NAS-IP-Address	[66]	Tunnel-Client-Endpoint
[32]	NAS-Identifier	[67]	Tunnel-Server-Endpoint
[40]	Acct-Status-Type	[68]	Acct-Tunnel-Connection
[41]	Acct-Delay-Time	[82]	Tunnel-Assignment-ID (LAC only)
[44]	Acct-Session-Id	[83]	Tunnel-Preference (LAC only)
[55]	Event-Timestamp	[90]	Tunnel-Client-Auth-Id
[64]	Tunnel-Type	[91]	Tunnel-Server-Auth-Id

*Acct-Tunnel-Link-Stop Messages*

Table 2-12 lists the Acct-Tunnel-Link-Stop attributes supported by the ERX system.

**Table 2-12** Acct-Tunnel-Link-Stop attributes

Standard Number	Attribute Name	Standard Number	Attribute Name
[1]	User-Name	[65]	Tunnel-Medium-Type
[4]	NAS-IP-Address	[66]	Tunnel-Client-Endpoint
[32]	NAS-Identifier	[67]	Tunnel-Server-Endpoint
[40]	Acct-Status-Type	[68]	Acct-Tunnel-Connection
[41]	Acct-Delay-Time	[82]	Tunnel-Assignment-ID (LAC only)
[44]	Acct-Session-Id	[83]	Tunnel-Preference (LAC only)
[46]	Acct-Session-Time	[86]	Acct-Tunnel-Packets-Lost
[49]	Acct-Terminate-Cause	[90]	Tunnel-Client-Auth-Id
[55]	Event-Timestamp	[91]	Tunnel-Server-Auth-Id
[64]	Tunnel-Type		

*Acct-Tunnel-Link-Reject Messages*

Table 2-13 lists the Acct-Tunnel-Link-Reject attributes supported by the ERX system.

**Table 2-13** Acct-Tunnel-Link-Reject attributes

Standard Number	Attribute Name	Standard Number	Attribute Name
[4]	NAS-IP-Address	[66]	Tunnel-Client-Endpoint
[32]	NAS-Identifier	[67]	Tunnel-Server-Endpoint
[40]	Acct-Status-Type	[68]	Acct-Tunnel-Connection
[41]	Acct-Delay-Time	[82]	Tunnel-Assignment-ID (LAC only)
[44]	Acct-Session-Id	[83]	Tunnel-Preference (LAC only)
[49]	Acct-Terminate-Cause	[86]	Acct-Tunnel-Packets-Lost
[65]	Tunnel-Medium-Type	[90]	Tunnel-Client-Auth-Id
[55]	Event-Timestamp	[91]	Tunnel-Server-Auth-Id
[64]	Tunnel-Type		

## CLI AA Messages

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There are four types of AA messages used by CLI users:

- Access-Request
- Access-Accept
- Access-Challenge
- Access-Reject

### *Access-Request Messages*

Table 2-14 lists the Access-Request CLI AA attributes supported by a RADIUS request.

**Table 2-14** Access-Request attributes

Standard Number	Attribute Name	Standard Number	Attribute Name
[1]	User-Name	[24]	State
[2]	User Password	[32]	NAS-Identifier
[4]	NAS-IP-Address	[44]	Acct-Session-Id
[6]	Service-Type		

### *Access-Accept Messages*

Table 2-15 provides the Access-Accept CLI user attributes supported by a RADIUS request.

**Table 2-15** Access-Accept attributes

Standard Number	Attribute Name
[6]	Service-Type
[26-1]	Juniper-Virtual-Router
[26-18]	Juniper-Initial-CLI-Access-Level
[26-19]	Juniper-Allow-All-VR-Access
[26-20]	Juniper-Alt-CLI-Access-Level
[26-21]	Juniper-Alt-CLI-Virtual-Router-Name
[26-25]	Redirect-VR-Name

### Access-Challenge Messages

The RADIUS server may send the user a challenge requiring a response. Two Access-Challenge messages are supported by the ERX system; these messages pertain only to CLI/Telnet users.

Standard Number	Attribute Name
[24]	State
[18]	Reply-Message

### Access-Reject Messages

One Access-Reject message is supported by the system; it pertains to CLI/Telnet users.

Standard Number	Attribute Name
[18]	Reply-Message

## CLI Commands Used to Modify RADIUS Attributes

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Table 2-16 describes the RADIUS attributes that you can configure using the CLI commands.

For many attributes, you can configure the system to include the attribute in RADIUS messages. To see a list of RADIUS attributes that are included in or excluded from RADIUS messages, use the **show radius attributes-included** command, which is described at the end of the table.

**Table 2-16** CLI commands related to ERX-supported attributes**[4] NAS-IP-Address****radius override nas-ip-addr tunnel-client-endpoint**  
**show radius override****radius override nas-ip-addr tunnel-client-endpoint**

- Use to configure the RADIUS client (LNS) to use the tunnel-client-endpoint (LAC) IP address for the NAS-IP-Address attribute. The **no** version restores the default address.
- Example

```
host1(config)#radius override nas-ip-addr-tunnel-client-endpoint
```

**show radius override**

- Use to display the current setting for the NAS-IP-Address. This setting can be changed; see the **radius override nas-ip-addr tunnel-client-endpoint** command.
- Example

```
host1#show radius override
nas-ip-addr: tunnel-client-endpoint
```

**[5] NAS-Port****radius include nas-port**  
**radius nas-port-format, show radius nas-port-format****radius include nas-port**

- Use to include the NAS-Port attribute in Access-Request, Acct-Start, and Acct-Stop messages.
- You can control inclusion of the attribute by enabling or disabling this command. The default is **enable**.
- Example

```
host1(config)#radius include nas-port acct-start enable
```

**radius nas-port-format**

- For ATM and Ethernet only
- Use to set the NAS-Port format attribute to either *0ssssppp* or *ssss0ppp*.
- The format is a 4-octet integer. The remaining bits are not changed (8 bits VPI and 16 bits VCI; or 24 bits VLAN).
- The “s” indicates a bit used to represent the *slot*; the “p” indicates a bit used to represent the *port* from which the authentication request originates.
- Example: If the PPP user is received on a VC from the card in slot 7, port 2, then the bit pattern is either 00111010 (for *0ssssppp*) or 01110010 (for *ssss0ppp*).

```
host1(config)#radius nas-port-format 0ssssppp
```

- Use the **no** version to set to default.

**show radius nas-port-format**

- Use to display setting for the NAS-Port attribute.
- Example

```
host1#show radius nas-port-format
0ssssppp
```

**Table 2-16** CLI commands related to ERX-supported attributes (continued)**[8] Framed-Ip-Address**  
**radius include framed-ip-addr****radius include framed-ip-addr**

- Use to include the Framed-Ip-Address attribute in Acct-Start and Acct-Stop messages.
- You can control inclusion of the attribute by enabling or disabling this command. The default is **enable**.
- Example

```
host1(config)#radius include framed-ip-addr acct-start enable
```

**[9] Framed-Ip-Netmask**  
**radius include framed-ip-netmask, radius ignore framed-ip-netmask**  
**show radius attributes-ignored****radius include framed-ip-netmask**

- Use to include the Framed-Ip-Netmask attribute in Acct-Start or Acct-Stop messages.
- You can control inclusion of the attribute by enabling or disabling this command. The default is **enable**.
- Example

```
host1(config)#radius include framed-ip-netmask acct-start enable
```

**radius ignore framed-ip-netmask**

- Use to ignore the Framed-Ip-Netmask attribute, returned by RADIUS in the access-accept packet. The default is enable. The **no** version restores the default.
- Example

```
host1(config)#radius ignore framed-ip-netmask disable
```

**show radius attributes-ignore**

- Use to display whether the Framed-Ip-Netmask attribute is accepted or ignored by the RADIUS server. See **radius ignore framed-ip-netmask** command.
- Example

```
host1#show radius attributes-ignored  
attribute framed-ip-netmask accepted from RADIUS server
```

**[13] Framed-Compression**  
**radius include framed-compression****radius include framed-compression**

- Use to include the Framed-Compression attribute in Acct-Start or Acct-Stop messages.
- You can control inclusion of the attribute by enabling or disabling this command. The default is **enable**.
- Example

```
host1(config)#radius include framed-compression acct-start disable
```

**[25] Class**  
**radius include class****radius include class**

- Use to include the Class attribute in Acct-Start or Acct-Stop messages.
- You can control inclusion of the attribute by enabling or disabling this command. The default is **enable**.
- Example

```
host1(config)#radius include class acct-start disable
```

**Table 2-16** CLI commands related to ERX-supported attributes (continued)

<b>[26-10] Ingress-Policy-Name</b> <b>radius include ingress-policy-name</b>
<b>radius include ingress-policy-name</b> <ul style="list-style-type: none"><li>• Use to include the Ingress-Policy-Name attribute in Acct-Start or Acct-Stop messages.</li><li>• You can control inclusion of the attribute by enabling or disabling this command. The default is <b>enable</b>.</li><li>• Example <pre>host1(config)#radius include ingress-policy-name acct-start enable</pre></li></ul>
<b>[26-11] Egress-Policy-Name</b> <b>radius include egress-policy-name</b>
<b>radius include egress-policy-name</b> <ul style="list-style-type: none"><li>• Use to include the Egress-Policy-Name attribute in Acct-Start or Acct-Stop messages.</li><li>• You can control inclusion of the attribute by enabling or disabling this command. The default is <b>enable</b>.</li><li>• Example <pre>host1(config)#radius include egress-policy-name acct-start enable</pre></li></ul>
<b>[26-24] Pppoe-Description</b> <b>radius include pppoe-description</b>
<b>radius include pppoe-description</b> <ul style="list-style-type: none"><li>• Use to include the Pppoe-Description attribute in Access-Request, Acct-Start, or Acct-Stop messages.</li><li>• You can control inclusion of the Pppoe-Description attribute by enabling or disabling this command. The default is <b>enable</b>.</li><li>• Example <pre>host1(config)#radius include pppoe-description acct-start enable</pre></li></ul>
<b>[26-35] Acct-Input-Gigapackets</b> <b>radius include input-gigapkts</b>
<b>radius include input-gigapkts</b> <ul style="list-style-type: none"><li>• Use to include Acct-Input-Gigapackets in Acct-Stop messages.</li><li>• You can control inclusion of the attribute by enabling or disabling this command. The default is <b>enable</b>.</li><li>• Example <pre>host1(config)#radius include input-gigapkts acct-stop disable.</pre></li></ul>
<b>[26-36] Acct-Output-Gigapackets</b> <b>radius include output-gigapkts</b>
<b>radius include output-gigapkts</b> <ul style="list-style-type: none"><li>• Use to include the Acct-Output-Gigapackets attribute in Acct-Stop messages.</li><li>• You can control inclusion of the attribute by enabling or disabling this command. The default is <b>enable</b>.</li><li>• Example <pre>host1(config)#radius include output-gigapkts acct-stop disable.</pre></li></ul>

**Table 2-16** CLI commands related to ERX-supported attributes (continued)**[30] Called-Station-Id**  
**radius include called-station-id****radius include called-station-id**

- Use to include the Called-Station-Id attribute in Access-Request, Acct-Start, or Acct-Stop messages.
- You can control inclusion of the Called-Station-Id attribute by enabling or disabling this command. The default is **enable**.
- Example

```
host1(config)#radius include called-station-id acct-start enable
```

**[31] Calling-Station-Id**  
**radius calling-station-format, radius calling-station-delimiter,**  
**radius include calling-station-id**  
**show radius calling-station-format, show radius calling-station-delimiter****radius calling-station-format**

- Use to specify the format the Calling-Station-Id attribute on a virtual router, when the PPP user is terminated at the non-LNS ERX system. Configure RADIUS client to use:
  - › delimited format – The format is: <delimiter> <system name> <delimiter> <port name> <delimiter> <VPI> <delimiter> <VCI><delimiter>
  - › fixed-format – All fields are in ASCII, making the format up to 15 characters in length; system name [4] slot [2] port [1] and either (VPI [3] VCI [5]) or (VLAN [8])
- For Ethernet, the VPI and VCI bytes are replaced by an 8-byte VLAN.
- In the case of PPP terminated from LNS, the Calling-Station-Id attribute is the value passed as the calling-station attribute value pair (AVP).
- Example

```
host1(config)#radius calling-station-format delimited
```

- Attribute 31, Calling-Station-Id, is used with Attribute 30, Called-Station-Id, in a standard way when the system is the LNS and the LAC is a dial-up LAC (not an ERX system). When the LNS receives the Calling-Station-Id and Called-Station-Id AVPs, the ERX system includes the values as they are, with no format changes in the RADIUS messages.
- Use the **no** version to return the Calling-Station-Id format to delimited.

**radius calling-station-delimiter**

- Use to specify the Calling-Station-Id attribute's delimiter for DSL PPP users.
- *The* delimiter is one special character you select to set off items in the Calling-Station-Id's definition (for example, # or %).
- Example

```
host1(config)#radius calling-station-delimiter &
```

**radius include calling-station-id**

- Use to include the Calling-Station-Id attribute in Access-Request, Acct-Start, or Acct-Stop messages.
- You can control inclusion of the attribute by enabling or disabling this command. The default is **enable**.
- Example

```
host1(config)#radius include calling-station acct-start disable
```

- Use the **no** version to remove the delimiter.

**Table 2-16** CLI commands related to ERX-supported attributes (continued)**show radius calling-station-format**

- Use to display the format for the Calling-Station-Id attribute.
- Example

```
host1#show radius calling-station-format
delimited
```

**show radius calling-station-delimiter**

- Use to display the delimiter used in the Calling-Station-Id for authenticated ATM PPP users.
- Example

```
host1#show radius calling-station-delimiter
&
```

**[32] NAS-Identifier****radius nas-identifier, radius include nas-identifier****show radius nas-identifier****radius nas-identifier**

- Use to set a value for the NAS-Identifier attribute. This value is used in the NAS-Identifier attribute for authentication and accounting requests.
- Example

```
host1(config)#radius nas-identifier fox
```

**radius include nas-identifier**

- Use to include the NAS-Identifier attribute in Access-Request, Acct-Start, and Acct-Stop messages.
- You can control inclusion of the attribute by enabling or disabling this command. The default is **enable**.
- Example

```
host1(config)#radius include nas-identifier acct-start disable
```

**show radius nas-identifier**

- Use to display the NAS-Identifier value.
- Example

```
host1#show radius nas-identifier
fox
```

**Table 2-16** CLI commands related to ERX-supported attributes (continued)**[44] Acct-Session-Id**

**radius include acct-session-id, radius acct-session-id-format,  
show radius acct-session-id-format**

**radius include acct-session-id**

- Use to include the Acct-Session-Id attribute in Access-Request messages.
- You can control inclusion of the Acct-Session-Id attribute by enabling or disabling this command. The default is **enable**.
- Example

```
host1(config)#radius include acct-session-id access-request disable
```

**radius acct-session-id-format**

- Use to set the Acct-Session-Id attribute format. Two formats are supported:
  - › **description** – configures RADIUS client to use the generic format: *erx <interface identifier>:<hex number>*
    - Example: **erx atm 12/1:0.3:0000ef1**
  - › **decimal** – configures the RADIUS client to use a decimal format
    - Example: **435264**
- Example

```
host1(config)#radius acct-session-id-format decimal
```

**show radius acct-session-id-format**

- Use to display the format used for the Acct-Session-Id attribute.
- Example

```
host1#show radius acct-session-id-format
decimal
```

**[52] Acct-Input-Gigawords**

**radius include input-gigawords**

**radius include input-gigawords**

- Use to include the Acct-Input-Gigawords attribute in Acct-Stop messages.
- You can control inclusion of the Acct-Input-Gigawords attribute by enabling or disabling this command. The default is **enable**.
- Example

```
host1(config)#radius include input-gigawords acct-stop disable
```

**[53] Output-Gigawords**

**radius include output-gigawords**

**radius include output-gigawords**

- Use to include the Acct-Output-Gigawords attribute in Acct-Stop messages.
- You can control inclusion of the Acct-Output-Gigawords attribute by enabling or disabling this command. The default is **enable**.
- Example

```
host1(config)#radius include output-gigawords acct-stop enable
```

**Table 2-16** CLI commands related to ERX-supported attributes (continued)**[55] Event-Timestamp****radius include event-timestamp****radius include event-timestamp**

- Use to include the Event-Timestamp attribute in Acct-Start or Acct-Stop messages.
- You can control inclusion of the Event-Timestamp attribute by enabling or disabling this command. The default is **enable**.
- Example

```
host1(config)#radius include event-timestamp acct-start disable
```

**[61] NAS-Port-Type****radius dsl-port-type, radius ethernet-port-type, radius include nas-port-type****show radius dsl-port-type, show radius ethernet-port-type****radius dsl-port-type**

- Use to configure the NAS-Port-Type attribute for the DSL port type.
- This attribute can have several values. If the interface (port) is DSL, then the attribute can have any value listed in the command and uses the value configured. If the interface (port) is Ethernet, then it sets the attribute to Ethernet and disregards the parameter set with this command. Options:

- › adsl-cap
- › adsl-dmt
- › idsl
- › sdsl
- › virtual
- › xdsl – default

- Example

```
host1(config)#radius dsl-port-type xdsl
```

- Use the **no** version to set to default, **xdsl**.

**radius ethernet-port-type**

- Use to set the NAS-Port-Type attribute for Ethernet interfaces. Options:

- › Ethernet
- › Virtual

- Example

```
host1(config)#radius ethernet-port-type virtual
```

- Use the **no** version to set to default, **ethernet**.

**radius include nas-port-type**

- Use to include the NAS-Port-Type attribute in Access-Request, Acct-Start, and Acct-Stop messages.
- You can control inclusion of the attribute by enabling or disabling this command. The default is **enable**.
- Example

```
host1(config)#radius include nas-port-type acct-start enable
```

**Table 2-16** CLI commands related to ERX-supported attributes (continued)**show radius dsl-port-type**

- Use to display the DSL port type for NAS-Port-Type attribute for ATM users.
- Example

```
host1#show radius dsl-port-type
xdsl
```

**show radius ethernet-port-type**

- Use to display the NAS-Port-Type attribute for Ethernet interfaces.
- Example

```
host1#show radius ethernet-port-type
virtual
```

**[64] Tunnel-Type****radius include tunnel-type****radius include tunnel-type**

- Use to include the Tunnel-Type attribute in Access-Request, Acct-Start, and Acct-Stop messages.
- You can control inclusion of the Tunnel-Type attribute by enabling or disabling this command. The default is **enable**.
- Example

```
host1(config)#radius include tunnel-type access-request enable
```

**[65] Tunnel-Medium-Type****radius include tunnel-medium-type****radius include tunnel-medium-type**

- Use to include the Tunnel-Medium-Type attribute in Access-Request, Acct-Start, and Acct-Stop messages.
- You can control inclusion of the Tunnel-Medium-Type attribute by enabling or disabling this command. The default is **enable**.
- Example

```
host1(config)#radius include tunnel-medium-type acct-start enable
```

**[66] Tunnel-Client-Endpoint****radius include tunnel-client-endpoint****radius include tunnel-client-endpoint**

- Use to include the Tunnel-Client-Endpoint attribute in Access-Request, Acct-Start, and Acct-Stop messages.
- You can control inclusion of the Tunnel-Client-Endpoint attribute by enabling or disabling this command. The default is **enable**.
- Example

```
host1(config)#radius include tunnel-client-endpoint acct-start enable
```

**Table 2-16** CLI commands related to ERX-supported attributes (continued)

<b>[67] Tunnel-Server-Endpoint</b> <b>radius include tunnel-server-endpoint</b>
<b>radius include tunnel-server-endpoint</b> <ul style="list-style-type: none"><li>• Use to include the Tunnel-Server-Endpoint attribute in Access-Request, Acct-Start, and Acct-Stop messages.</li><li>• You can control inclusion of the Tunnel-Server-Endpoint attribute by enabling or disabling this command. The default is <b>enable</b>.</li><li>• Example<pre>host1(config)#radius include tunnel-server-endpoint acct-stop disable</pre></li></ul>
<b>[68] Acct-Tunnel-Connection</b> <b>radius include acct-tunnel-connection</b>
<b>radius include acct-tunnel-connection</b> <ul style="list-style-type: none"><li>• Use to include the Acct-Tunnel-Connection attribute in Access-Request, Acct-Start, or Acct-Stop messages.</li><li>• You can control inclusion of the Acct-Tunnel-Connection attribute by enabling or disabling this command. The default is <b>enable</b>.</li><li>• Example<pre>host1(config)#radius include acct-tunnel-connection acct-stop enable</pre></li></ul>
<b>[77] Connect-Info</b> <b>radius include connect-info</b>
<b>radius include connect-info</b> <ul style="list-style-type: none"><li>• Use to include the Connect-Info attribute in Access-Request, Acct-Start, or Acct-Stop messages.</li><li>• You can control inclusion of the Connect-Info attribute by enabling or disabling this command. The default is <b>enable</b>.</li><li>• Example<pre>host1(config)#radius include connect-info access-request disable</pre></li></ul>
<b>[82] Tunnel-Assignment-Id</b> <b>radius include tunnel-assignment-id</b>
<b>radius include tunnel-assignment-id</b> <ul style="list-style-type: none"><li>• Use to include the Tunnel-Assignment-Id attribute in Acct-Start or Acct-Stop messages.</li><li>• You can control inclusion of the Tunnel-Assignment-Id attribute by enabling or disabling this command. The default is <b>enable</b>.</li><li>• Example<pre>host1(config)#radius include tunnel-assignment-id acct-stop enable</pre></li></ul>
<b>[83] Tunnel-Preference</b> <b>radius include tunnel-preference</b>
<b>radius include tunnel-preference</b> <ul style="list-style-type: none"><li>• Use to include the Tunnel-Preference attribute in Acct-Start or Acct-Stop messages.</li><li>• You can control inclusion of the Tunnel-Preference attribute by enabling or disabling this command. The default is <b>enable</b>.</li><li>• Example<pre>host1(config)#radius include tunnel-preference acct-start enable</pre></li></ul>

**Table 2-16** CLI commands related to ERX-supported attributes (continued)**[87] NAS-Port-Id**  
**radius include nas-port-id****radius include nas-port-id**

- Use to include the NAS-Port-Id attribute in the Access-Request, Acct-Start, or Acct-Stop messages.
- You can control inclusion of the NAS-Port-Id attribute by enabling or disabling this command. The default is **enable**.
- Example

```
host1(config)#radius include nas-port-id access-request enable
```

**[90] Tunnel-Client-Auth-Id**  
**radius include tunnel-client-auth-id****radius include tunnel-client-auth-id**

- Use to include the Tunnel-Client-Auth-Id attribute in Access-Request, Acct-Start, or Acct-Stop messages.
- You can control inclusion of the Tunnel-Client-Auth-Id attribute by enabling or disabling this command. The default is **enable**.
- Example

```
host1(config)#radius include tunnel-client-auth-id access-request disable
```

**[91] Tunnel-Server-Auth-Id**  
**radius include tunnel-server-auth-id****radius include tunnel-server-auth-id**

- Use to include the Tunnel-Server-Auth-Id attribute in Access-Request, Acct-Start, or Acct-Stop messages.
- You can control inclusion of the Tunnel-Server-Auth-Id attribute by enabling or disabling this command. The default is **enable**.
- Example

```
host1(config)#radius include tunnel-server-auth-id acct-start enable
```

**All Tunnel Server Attributes**  
**radius include tunnel-server-attributes****radius include tunnel-server-attributes**

- Use to include all supported tunnel server attributes in Access-Request, Acct-Start, or Acct-Stop messages.
- When the ERX system functions as an LNS with a terminating PPP, then the LAC tunnel attributes are included.
- You can control inclusion of all tunnel server attributes by enabling or disabling this command. The default is **disable**.
- Example

```
host1(config)#radius include tunnel-server-attributes access-request enable
```

**Table 2-16** CLI commands related to ERX-supported attributes (continued)

<b>All Include Attributes</b>																																																																																																											
<b>show radius attributes-included</b>																																																																																																											
<b>show radius attributes-included</b>																																																																																																											
<ul style="list-style-type: none"> <li>Use to display the RADIUS attributes that are included in and excluded from Access-Request, Acct-Start, and Acct-Stop messages. You configure attribute inclusion or exclusion using the <b>radius include</b> commands.</li> <li>Field descriptions                             <ul style="list-style-type: none"> <li>Attribute Name – name of the RADIUS attribute</li> <li>Access Request – include status of the attribute in Access Request messages: enabled, disabled, not configurable (n/c)</li> <li>Account Start – include status of the attribute in Acct-Start messages: enabled, disabled, not configurable (n/c)</li> <li>Account Stop – include status of the attribute in Acct-Stop messages: enabled, disabled, not configurable (n/c)</li> </ul> </li> <li>Example                             <pre>host1#show radius attributes-included</pre> <table border="1"> <thead> <tr> <th>Attribute Name</th> <th>Access Request</th> <th>Account Start</th> <th>Account Stop</th> </tr> </thead> <tbody> <tr><td>acct-session-id</td><td>enabled</td><td>n/c</td><td>n/c</td></tr> <tr><td>acct-tunnel-connection</td><td>enabled</td><td>enabled</td><td>enabled</td></tr> <tr><td>called-station-id</td><td>enabled</td><td>enabled</td><td>enabled</td></tr> <tr><td>calling-station-id</td><td>enabled</td><td>enabled</td><td>enabled</td></tr> <tr><td>class</td><td>n/c</td><td>enabled</td><td>enabled</td></tr> <tr><td>connect-info</td><td>enabled</td><td>enabled</td><td>enabled</td></tr> <tr><td>egress-policy-name(vsa)</td><td>n/c</td><td>enabled</td><td>enabled</td></tr> <tr><td>event-timestamp</td><td>n/c</td><td>enabled</td><td>enabled</td></tr> <tr><td>framed-compression</td><td>n/c</td><td>enabled</td><td>enabled</td></tr> <tr><td>framed-ip-address</td><td>n/c</td><td>enabled</td><td>n/c</td></tr> <tr><td>framed-ip-netmask</td><td>n/c</td><td>enabled</td><td>enabled</td></tr> <tr><td>ingress-policy-name(vsa)</td><td>n/c</td><td>enabled</td><td>enabled</td></tr> <tr><td>input-gigapkts(vsa)</td><td>n/c</td><td>n/c</td><td>enabled</td></tr> <tr><td>input-gigawords</td><td>n/c</td><td>n/c</td><td>enabled</td></tr> <tr><td>nas-identifier</td><td>enabled</td><td>enabled</td><td>enabled</td></tr> <tr><td>nas-port</td><td>enabled</td><td>enabled</td><td>enabled</td></tr> <tr><td>nas-port-id</td><td>enabled</td><td>enabled</td><td>enabled</td></tr> <tr><td>nas-port-type</td><td>enabled</td><td>enabled</td><td>enabled</td></tr> <tr><td>output-gigapkts(vsa)</td><td>n/c</td><td>n/c</td><td>enabled</td></tr> <tr><td>output-gigawords</td><td>n/c</td><td>n/c</td><td>enabled</td></tr> <tr><td>pppoe-description(vsa)</td><td>enabled</td><td>enabled</td><td>enabled</td></tr> <tr><td>tunnel-assignment-id</td><td>n/c</td><td>enabled</td><td>enabled</td></tr> <tr><td>tunnel-client-auth-id</td><td>enabled</td><td>enabled</td><td>enabled</td></tr> <tr><td>tunnel-client-endpoint</td><td>enabled</td><td>enabled</td><td>enabled</td></tr> <tr><td>tunnel-medium-type</td><td>enabled</td><td>enabled</td><td>enabled</td></tr> </tbody> </table> </li> </ul>				Attribute Name	Access Request	Account Start	Account Stop	acct-session-id	enabled	n/c	n/c	acct-tunnel-connection	enabled	enabled	enabled	called-station-id	enabled	enabled	enabled	calling-station-id	enabled	enabled	enabled	class	n/c	enabled	enabled	connect-info	enabled	enabled	enabled	egress-policy-name(vsa)	n/c	enabled	enabled	event-timestamp	n/c	enabled	enabled	framed-compression	n/c	enabled	enabled	framed-ip-address	n/c	enabled	n/c	framed-ip-netmask	n/c	enabled	enabled	ingress-policy-name(vsa)	n/c	enabled	enabled	input-gigapkts(vsa)	n/c	n/c	enabled	input-gigawords	n/c	n/c	enabled	nas-identifier	enabled	enabled	enabled	nas-port	enabled	enabled	enabled	nas-port-id	enabled	enabled	enabled	nas-port-type	enabled	enabled	enabled	output-gigapkts(vsa)	n/c	n/c	enabled	output-gigawords	n/c	n/c	enabled	pppoe-description(vsa)	enabled	enabled	enabled	tunnel-assignment-id	n/c	enabled	enabled	tunnel-client-auth-id	enabled	enabled	enabled	tunnel-client-endpoint	enabled	enabled	enabled	tunnel-medium-type	enabled	enabled	enabled
Attribute Name	Access Request	Account Start	Account Stop																																																																																																								
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acct-tunnel-connection	enabled	enabled	enabled																																																																																																								
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connect-info	enabled	enabled	enabled																																																																																																								
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tunnel-medium-type	enabled	enabled	enabled																																																																																																								

**Table 2-16** CLI commands related to ERX-supported attributes (continued)

tunnel-preference	n/c	enabled	enabled
tunnel-server-attributes	disabled	disabled	disabled
tunnel-server-auth-id	enabled	enabled	enabled
tunnel-server-endpoint	enabled	enabled	enabled
tunnel-type	enabled	enabled	enabled