Configuring ISG as a RADIUS Proxy

Intelligent Services Gateway (ISG) is a Cisco software feature set that provides a structured framework in which edge devices can deliver flexible and scalable services to subscribers. The ISG RADIUS proxy feature enables ISG to serve as a proxy between a client device that uses RADIUS authentication and an authentication, authorization, and accounting (AAA) server. When configured as a RADIUS proxy, ISG is able to "sniff" (look at) the RADIUS packet flows and, on successful authentication, it can transparently create a corresponding ISG session. This module describes how to configure ISG as a RADIUS proxy.

In public wireless LAN (PWLAN) deployments, service providers must absolutely ensure the billing accuracy of a user's session. The billing accuracy must also be met in case of a network component failure. The RADIUS proxy billing accuracy feature ensures that the start and stop session events are accurate and the events are the main references for session management.

Finding Feature Information

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

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

Prerequisites for ISG RADIUS Proxy

The Cisco software image must support authentication, accountability and authorization (AAA) and Intelligent Services Gateway (ISG).

Restrictions for ISG RADIUS Proxy

Wireless Internet service provider roaming (WISPr) attributes are not supported.

Information About ISG RADIUS Proxy

Overview of ISG RADIUS Proxy

Public wireless LANs (PWLANs) and wireless mesh networks can contain hundreds of access points, each of which must send RADIUS authentication requests to an authentication, addressing and authorization (AAA) server. The Intelligent Services Gateway (ISG) RADIUS proxy functionality allows the access points to send authentication requests to ISG, rather than directly to the AAA server. ISG relays the requests to the AAA server. The AAA server sends a response to ISG, which then relays the response to the appropriate access point.

When serving as a RADIUS proxy, ISG can pull user-specific data from the RADIUS flows that occur during subscriber authentication and authorization, and transparently create a corresponding IP session upon successful authentication. This functionality provides an automatic login facility with respect to ISG for subscribers that are authenticated by devices that are closer to the network edge.

When configured as a RADIUS proxy, ISG proxies all RADIUS requests generated by a client device and all RADIUS responses generated by the corresponding AAA server, as described in RFC 2865, RFC 2866, and RFC 2869.

ISG RADIUS proxy functionality is independent of the type of client device and supports standard authentication (that is, a single Access-Request/Response exchange) using both Password Authentication Protocol (PAP) and Challenge Handshake Authentication Protocol (CHAP), Access-Challenge packets, and Extensible Authentication Protocol (EAP) mechanisms.

In cases where authentication and accounting requests originate from separate RADIUS client devices, ISG associates all requests with the appropriate session through the use of correlation rules. For example, in a centralized PWLAN deployment, authentication requests originate from the wireless LAN (WLAN) access point, and accounting requests are generated by the Access Zone Router (AZR). The association of the disparate RADIUS flows with the underlying session is performed automatically when the Calling-Station-ID (Attribute 31) is sufficient to make the association reliable.

Following a successful authentication, authorization data collected from the RADIUS response is applied to the corresponding ISG session.

Sessions that were created using ISG RADIUS proxy operation are generally terminated by receipt of an Accounting-Stop packet.

To configure RADIUS proxy billing, you can use the **timer reconnect** command and **show radius-proxy session** command in the appropriate configuration modes.

To enable session reconnection for ISG RADIUS proxy servers and clients, use **pwlan-session reconnect** command in the appropriate configuration mode.

ISG RADIUS Proxy Handling of Accounting Packets

By default, ISG RADIUS proxy responds locally to accounting packets it receives. The **accounting method-list** command can be used to configure ISG to forward RADIUS proxy client accounting packets to a specified server. Forwarding of accounting packets can be configured globally for all RADIUS proxy clients or on a per-client basis.

RADIUS Client Subnet Definition

If Intelligent Services Gateway (ISG) is acting as a proxy for more than one client device, all of which reside on the same subnet, the clients may be configured using a subnet definition rather than a discrete IP address for each device. This configuration method results in the sharing of a single configuration by all the client devices.

ISG RADIUS Proxy Support for Mobile Wireless Environments

ISG RADIUS proxy uses mobile wireless-specific processes to provide support for Gateway General Packet Radio Service (GPRS) Support Node (GGSN) environments.

Attribute Processing and RADIUS Request Correlation

When authentication and accounting requests originate from separate RADIUS client devices, ISG uses correlation rules to associate all the requests with the appropriate session. The association of the disparate RADIUS flows with the underlying session is performed automatically when the Calling-Station-ID (Attribute 31) is sufficient to make the association reliable.

In mobile wireless environments, attribute processing and the correlation of RADIUS requests with a session are implemented differently than in a PWLAN environment. For example, in a PWLAN environment the Attribute 31 is a MAC address, and in a GGSN environment Attribute 31 is a Mobile Station Integrated Services Digital Network (MSISDN), which is a plain number or alphanumeric string. In addition, in a GGSN environment the correlation of RADIUS requests can be performed using attributes other than Attribute 31.

ISG RADIUS proxy supports mobile wireless environments by allowing you to specify whether the RADIUS-proxy client uses a MAC or MSISDN format for Attribute 31. The format is specified using the **calling-station-id format** command. In addition, you can use the **session-identifier** command to configure ISG RADIUS proxy to use other attributes (apart from Attribute 31) to perform RADIUS request correlation.

3GPP Attribute Support

In GGSN environments, ISG RADIUS proxy must understand and parse the Third Generation Partnership Project (3GPP) attributes described in the table below. These attributes form part of the accounting requests.

Table 1: 3GPP Attributes Supported by ISG RADIUS Proxy

Attribute	Description	Vendor ID/type
3GPP-IMSI	International Mobile Subscriber Identity (IMSI) for the user.	10415/1
3GPP-Charging-ID	Charging ID for this Packet Data Protocol (PDP) context (this together with the GGSN address constitutes a unique identifier for PDP context).	10415/2

Attribute	Description	Vendor ID/type
3GPP-SGSN-Address	Serving GPRS Support Node (SGSN) address that is used by the GPRS Tunneling Protocol (GTP) control plane for handling of control messages. It may be used to identify the Public Line Mobile Network (PLMN) to which the user is attached.	10415/6

Benefits of ISG RADIUS Proxy

Use of Intelligent Services Gateway (ISG) RADIUS proxy has the following benefits:

- Allows the complete set of ISG functionality to be applied to extensible authentication protocol (EAP) subscriber sessions.
- Allows an ISG device to be introduced into a network with minimum disruption to the existing network access server (NAS) and authentication, authorization and accounting (AAA) servers.
- Simplifies RADIUS server configuration because only the ISG, not every access point, must be configured as a client.

How to Configure ISG as a RADIUS Proxy

Initiating ISG RADIUS Proxy IP Sessions

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type slot/subslot/port*
4. **ip subscriber** {**interface** | **l2-connected** | **routed**}
5. **initiator radius-proxy**
6. **end**

DETAILED STEPS

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

	Command or Action	Purpose
Step 3	**interface** *type slot/subslot/port* **Example:** `Device(config)# interface GigabitEthernet 2/1/0`	Specifies an interface for configuration and enters interface configuration mode.
Step 4	**ip subscriber** {**interface** | **l2-connected** | **routed**} **Example:** `Device(config-if)# ip subscriber routed`	Enables Intelligent Services Gateway (ISG) IP subscriber support on an interface, specifies the access method used by IP subscribers to connect to ISG on an interface, and enters subscriber configuration mode.
Step 5	**initiator radius-proxy** **Example:** `Device(config-subscriber)# initiator radius-proxy`	Configures ISG to initiate IP sessions upon receipt of any RADIUS packet.
Step 6	**end** **Example:** `Device(config-subscriber)# end`	Exits the subscriber configuration mode and returns to privileged EXEC mode.

Configuring ISG RADIUS Proxy Global Parameters

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **aaa new-model**
4. **aaa server radius proxy**
5. **pwlan-session reconnect**
6. **session-identifier** {**attribute** *number* | **vsa vendor** *id* **type** *number*}
7. **calling-station-id format** {**mac-address** | **msisdn**}
8. **accounting method-list** {*method-list-name* | **default**}
9. **accounting port** *port-number*
10. **authentication port** *port-number*
11. **key** [**0** | **7**] *word*
12. **timer** {**ip-address** | **request**} *seconds*
13. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:**	Enables privileged EXEC mode. • Enter your password if prompted.

	Command or Action	Purpose
	`Device> enable`	
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**aaa new-model** **Example:** `Device(config)# aaa new-model`	Enables the authentication, authorization and accounting (AAA) access control model.
Step 4	**aaa server radius proxy** **Example:** `Device(config)# aaa server radius proxy`	Enters Intelligent Services Gateway (ISG) RADIUS proxy server configuration mode.
Step 5	**pwlan-session reconnect** **Example:** `Device(config-locsvr-proxy-radius)# pwlan-session reconnect`	Enables the Public Wireless LAN (PWLAN) session reconnect feature.
Step 6	**session-identifier** {**attribute** *number* | **vsa vendor** *id* **type** *number*} **Example:** `Device(config-locsvr-proxy-radius)# session-identifier attribute 1`	(Optional) Correlates the RADIUS server requests of a session and identifies the session in the RADIUS proxy module.
Step 7	**calling-station-id format** {**mac-address** | **msisdn**} **Example:** `Device(config-locsvr-proxy-radius)# Calling-Station-ID format msisdn`	Specifies the Calling-Station-ID format.
Step 8	**accounting method-list** {*method-list-name* | **default**} **Example:** `Device(config-locsvr-proxy-radius)# accounting method-list fwdacct`	Specifies the server to which accounting packets from RADIUS clients are forwarded. **Note** By default, ISG RADIUS proxy handles accounting packets locally.
Step 9	**accounting port** *port-number* **Example:** `Device(config-locsvr-proxy-radius)# accounting port 2222`	Specifies the port on which the ISG listens for accounting packets from RADIUS clients. • The default port is 1646.

	Command or Action	Purpose
Step 10	**authentication port** *port-number* **Example:** `Device(config-locsvr-proxy-radius)# authentication port 1111`	Specifies the port for which the ISG listens for authentication packets from RADIUS clients. • The default port is 1645.
Step 11	**key** [**0** | **7**] *word* **Example:** `Device(config-locsvr-proxy-radius)# key radpro`	Configures the encryption key to be shared between ISG and RADIUS clients. • 0 specifies that an unencrypted key will follow. • 7 specifies a hidden key will follow.
Step 12	**timer** {**ip-address** | **request**} *seconds* **Example:** `Device(config-locsvr-proxy-radius)# timer ip-address 5`	Specifies the amount of time for which ISG waits for the specified event before terminating the session.
Step 13	**end** **Example:** `Device(config-locsvr-proxy-radius)# end`	Exits the ISG RADIUS proxy server configuration mode and returns to privileged EXEC mode.

Configuring ISG RADIUS Proxy Client-Specific Parameters

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **aaa new-model**
4. **aaa server radius proxy**
5. **client** {**name** \| *ip-address*} [*subnet-mask* [**vrf** *vrf-id*]]
6. **pwlan-session reconnect**
7. **session-identifier** {**attribute** *number* \| **vsa vendor** *id* **type** *number*}
8. **calling-station-id format** {**mac-address** \| **msisdn**}
9. **accounting method-list** {*method-list-name* \| **default**}
10. **accounting port** *port-number*
11. **authentication port** *port-number*
12. **key** [**0** \| **7**] *word*
13. **timer** {**ip-address** \| **reconnect** \| **request**} *seconds*
14. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**aaa new-model** **Example:** `Device(config)# new-model`	Enables the authentication, authorization and accounting(AAA) access control model.
Step 4	**aaa server radius proxy** **Example:** `Device(config)# aaa server radius proxy`	Enters Intelligent Services Gateway (ISG) RADIUS proxy server configuration mode.
Step 5	**client** {**name** | *ip-address*} [*subnet-mask* [**vrf** *vrf-id*]] **Example:** `Device(config-locsvr-proxy-radius)# client 172.16.54.45 vrf myvrftable`	Specifies a RADIUS proxy client for which client-specific parameters can be configured, and enters RADIUS client configuration mode.
Step 6	**pwlan-session reconnect** **Example:** `Device(config-locsvr-radius-client)# pwlan-session reconnect`	Enables the Public Wireless LAN (PWLAN) session reconnect feature.
Step 7	**session-identifier** {**attribute** *number* | **vsa vendor** *id* **type** *number*} **Example:** `Device(config-locsvr-radius-client)# session-identifier vsa vendor 5335 type 123`	(Optional) Correlates the RADIUS requests of a session and identifies the session in the RADIUS proxy module.
Step 8	**calling-station-id format** {**mac-address** | **msisdn**} **Example:** `Device(config-locsvr-radius-client)# calling-station-id format msisdn`	Specifies the Calling-Station-ID format.

	Command or Action	Purpose
Step 9	**accounting method-list** {*method-list-name* | **default**} **Example:** `Device(config-locsvr-radius-client)# accounting method-list fwdacct`	Specifies the server to which accounting packets from RADIUS clients are forwarded.
Step 10	**accounting port** *port-number* **Example:** `Device(config-locsvr-radius-client)# accounting port 2222`	Specifies the port on which the ISG listens for accounting packets from RADIUS clients. • The default port is 1646.
Step 11	**authentication port** *port-number* **Example:** `Device(config-locsvr-radius-client)# authentication port 1111`	Specifies the port on which the ISG listens for authentication packets from RADIUS clients. • The default port is 1645.
Step 12	**key** [**0** | **7**] *word* **Example:** `Device(config-locsvr-radius-client)# key radpro`	Configures the encryption key to be shared between ISG and RADIUS clients. • 0 specifies that an unencrypted key will follow. • 7 specifies a hidden key will follow.
Step 13	**timer** {**ip-address** | **reconnect** | **request**} *seconds* **Example:** `Device(config-locsvr-radius-client)# timer ip-address 5`	Specifies the amount of time ISG waits for the specified event before terminating the session.
Step 14	**end** **Example:** `Device(config-locsvr-radius-client)# end`	Exits the ISG RADIUS client configuration mode and returns to privileged EXEC mode.

Defining an ISG Policy for RADIUS Proxy Events

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **aaa new-model**
4. **aaa authorization radius-proxy** {**default** | *list-name*} *method1* [*method2* [*method3...*]]
5. **policy-map type control** *policy-map-name*
6. **class type control** {*control-class-name* | **always**} **event session-start**
7. *action-number* **proxy** [**aaa list** {**default** | *list-name*}]

8. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**aaa new-model** **Example:** `Device(config)# aaa new-model`	Enables the AAA access control model.
Step 4	**aaa authorization radius-proxy** {**default** | *list-name*} *method1* [*method2* [*method3...*]] **Example:** `Device(config)# aaa authorization radius-proxy RP group radius`	Configures AAA authorization methods for ISG RADIUS proxy subscribers.
Step 5	**policy-map type control** *policy-map-name* **Example:** `Device(config)# policy-map type control proxyrule`	Creates or modifies a control policy map, which defines an ISG control policy and enters control policy-map configuration mode.
Step 6	**class type control** {*control-class-name* | **always**} **event session-start** **Example:** `Device(config-control-policymap-class-control)# class type control always event session-start`	Specifies a control class for which actions may be configured and enters control policy-map class configuration mode.
Step 7	*action-number* **proxy** [**aaa list** {**default** | *list-name*}] **Example:** `Device(config-control-policymap-class-control)# 1 proxy aaa list RP`	Sends RADIUS packets to the specified server. • Use this command to configure ISG to forward RADIUS proxy packets to the server specified by the **aaa authorization radius-proxy** command in Step 4.
Step 8	**end** **Example:**	Exits the config-control policymap-class-control mode and returns to privileged EXEC mode.

	Command or Action	Purpose
	`Device(config-control-policymap-class-control)# end`	

Verifying ISG RADIUS Proxy Configuration

SUMMARY STEPS

1. **show radius-proxy client** *ip-address* [**vrf** *vrf-id*]
2. **show radius-proxy session** {**id** *id-number* | **ip** *ip-address*}
3. **show subscriber session** [**identifier** {**authen-status** {**authenticated** | **unauthenticated**} | **authenticated-domain** *domain-name* | **authenticated-username** *username* | **dnis** *dnis* | **media** *type* | **nas-port** *identifier* | **protocol** *type* | **source-ip-address** *ip-address subnet-mask* | **timer** *timer-name* | **tunnel-name** *name* | **unauthenticated-domain** *domain-name* | **unauthenticated-username** *username*} | **uid** *session-identifier* | **username** *username*] [**detailed**]

DETAILED STEPS

	Command or Action	Purpose
Step 1	**show radius-proxy client** *ip-address* [**vrf** *vrf-id*] **Example:** `Device# show radius-proxy client 10.10.10.10`	Displays RADIUS proxy configuration information and a summary of sessions for an ISG RADIUS proxy client.
Step 2	**show radius-proxy session** {**id** *id-number*	**ip** *ip-address*} **Example:** `Device# show radius-proxy session ip 10.10.10.10`	Displays information about an ISG RADIUS proxy session. **Note** The ID can be found in the output of the **show radius-proxy client** command.
Step 3	**show subscriber session** [**identifier** {**authen-status** {**authenticated**	**unauthenticated**}	**authenticated-domain** *domain-name*	**authenticated-username** *username*	**dnis** *dnis*	**media** *type*	**nas-port** *identifier*	**protocol** *type*	**source-ip-address** *ip-address subnet-mask*	**timer** *timer-name*	**tunnel-name** *name*	**unauthenticated-domain** *domain-name*	**unauthenticated-username** *username*}	**uid** *session-identifier*	**username** *username*] [**detailed**] **Example:** `Device# show subscriber session detailed`	Displays information about subscriber sessions on an ISG device.

Clearing ISG RADIUS Proxy Sessions

SUMMARY STEPS

1. **enable**
2. **clear radius-proxy client** *ip-address*
3. **clear radius-proxy session** {**id** *id-number* | **ip** *ip-address*}

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**clear radius-proxy client** *ip-address* **Example:** `Device# clear radius-proxy client 10.10.10.10`	Clears all ISG RADIUS proxy sessions that are associated with the specified client device.
Step 3	**clear radius-proxy session** {**id** *id-number*	**ip** *ip-address*} **Example:** `Device# clear radius-proxy session ip 10.10.10.10`	Clears a specific ISG RADIUS proxy session. **Note** The ID can be found in the output of the **show radius-proxy client** command.

Examples for Configuring ISG as a RADIUS Proxy

ISG RADIUS Proxy Configuration Example

The following example configures ISG to serve as a RADIUS proxy and to send RADIUS packets to the method list called RP. FastEthernet interface 0/0 is configured to initiate IP sessions upon receipt of RADIUS packets.

```
!
aaa new-model
!
aaa group server radius EAP
server 10.2.36.253 auth-port 1812 acct-port 1813
!
aaa authorization radius-proxy RP group EAP
aaa accounting network FWDACCT start-stop group EAP
aaa accounting network FLOWACCT start-stop group EAP
!
aaa server radius proxy
session-identifier attribute 1
calling-station-id format msisdn
```

```
authentication port 1111
accounting port 2222
key radpro
message-authenticator ignore
! The method list "FWDACCT" was configured by the aaa accounting network FWDACCT
! start-stop group EAP command above.
accounting method-list FWDACCT
client 10.45.45.2
timer request 5
!
client 10.45.45.3
key aashica#@!$%&/
timer ip-address 120
!
!
! This control policy references the method list called "RP" that was configured using the
 aaa authorization radius-proxy command above.
policy-map type control PROXYRULE
class type control always event session-start
1 proxy aaa list RP
!
!
!
bba-group pppoe global
!
!
interface GigabitEthernet 2/1/0
ip address 10.45.45.1 255.255.255.0
ip subscriber routed
initiator radius-proxy
no ip route-cache cef
no ip route-cache
no cdp enable
!
! The control policy "PROXYRULE" is applied to the interface.
service-policy type control PROXYRULE
!
!
radius-server host 10.2.36.253 auth-port 1812 acct-port 1813 key cisco
radius-server host 10.76.86.83 auth-port 1665 acct-port 1666 key rad123
radius-server vsa send accounting
radius-server vsa send authentication
aaa new-model
!
!
aaa group server radius EAP
server 10.2.36.253 auth-port 1812 acct-port 1813
!
```

Example: ISG RADIUS Proxy and Layer 4 Redirect

```
aaa authorization network default local
!
redirect server-group REDIRECT
 server ip 10.255.255.28 port 23
 !
class-map type traffic match-any traffic1
match access-group input 101
!
policy-map type service service1
 class type traffic traffic1
  redirect list 101 to group REDIRECT
```

```
!
policy-map type control PROXYRULE
 class type control always event session-start
  1 proxy aaa list RP
  2 service-policy type service name service1
!
access-list 101 permit tcp host 10.45.45.2 any
```

The following is sample output from the containing RADIUS proxy details using the **show subscriber session** command, which displays RADIUS proxy details:

```
Device# show subscriber session username 12345675@example

Unique Session ID: 66
Identifier: aash
SIP subscriber access type(s): IP
Current SIP options: Req Fwding/Req Fwded
Session Up-time: 00:00:40, Last Changed: 00:00:00
Policy information:
  Authentication status: authen
  Active services associated with session:
    name "service1", applied before account logon
  Rules, actions and conditions executed:
    subscriber rule-map PROXYRULE
      condition always event session-start
        1 proxy aaa list RP
        2 service-policy type service name service1
Session inbound features:
Feature: Layer 4 Redirect
Traffic classes:
  Traffic class session ID: 67
   ACL Name: 101, Packets = 0, Bytes = 0
Unmatched Packets (dropped) = 0, Re-classified packets (redirected) = 0
Configuration sources associated with this session:
Service: service1, Active Time = 00:00:40
Interface: FastEthernet0/1, Active Time = 00:00:40
```

Additional References for Configuring ISG as a RADIUS Proxy

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Command List, All Releases
ISG commands	Cisco IOS Intelligent Services Gateway Command Reference
Overview of ISG RADIUS proxy	*Configuring Intelligent Service Gateway Configuration Guide*

Standards and RFCs

Standard/RFC	Title
RFC 2865	Remote Authentication Dial In User Service (RADIUS)
RFC 2866	RADIUS Accounting

Standard/RFC	Title
RFC 2869	RADIUS Extensions

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for Configuring ISG as a RADIUS Proxy

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 www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 2: Feature Information for Configuring ISG as a RADIUS Proxy

Feature Name	Releases	Feature Information
RADIUS Proxy Enhancements for ISG	Cisco IOS XE Release 2.2	RADIUS proxy enhancements enable ISG to serve as a proxy between a client device that uses RADIUS authentication and an AAA server. This functionality enables ISG to be deployed in PWLAN and wireless mesh networks where authentication requests for mobile subscribers must be sent to specific RADIUS servers. The following commands were introduced or modified by this feature: **aaa authorization radius-proxy**, **aaa server radius proxy**, **accounting method-list**, **accounting port**, **authentication port**, **clear radius-proxy client**, **clear radius-proxy session**, **client (ISG RADIUS proxy)**, **debug radius-proxy**, **initiator radius-proxy**, **key (ISG RADIUS proxy)**, **message-authenticator ignore**, **proxy (ISG RADIUS proxy)**, **show radius-proxy client**, **show radius-proxy session**, **timer (ISG RADIUS proxy)**.

Feature Name	Releases	Feature Information
ISG—AAA Wireless Enhancements	Cisco IOS XE Release 2.5.0	AAA Wireless Enhancements enable ISG RADIUS proxy to provide additional support for mobile wireless environments. It includes changes to RADIUS attribute 31 processing. The following commands were introduced by this feature: **session-identifier**, **calling-station-id format**.
ISG—Authentication:RADIUS Proxy WiMax Enhancements	Cisco IOS XE Release 2.5.0	This feature enhances ISG RADIUS proxy to provide additional support for WiMax broadband environments.
ISG—PWLAN Reconnect	Cisco IOS XE Release 3.8S	PWLAN Reconnect enhances user authentication and security while authenticating over PWLAN networks. The following command was introduced by this feature: **pwlan-session reconnect**.