



# ISG Subscriber Aware Ethernet

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The ISG Subscriber Aware Ethernet feature provides Intelligent Services Gateway (ISG) functionality in distributed IP and PPPoE sessions on Cisco 7600 series routers that have SIP-400 or Ethernet Services Plus (ES+) access-facing line cards.

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## Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see 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 at the end of this document.

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 ISG Subscriber Aware Ethernet

You understand the following:

- High availability (HA)
- In-service software upgrades (ISSU)

- Session maintenance control
- Port-Bundle Host Key (PBHK)
- Layer 4 redirect (L4RD)
- Accounting
- Access control lists (ACL)
- Quality of service (QoS)

For information on how ISG works with these and other features, see the Cisco IOS ISG Configuration Library.

### Hardware

The following hardware must be installed on the Cisco 7600 series routers:

- Cisco SIP-400 line card with Cisco Gigabit Ethernet V2 shared port adapter (SPA)
- Cisco Ethernet Services Plus (ES+) line card
- Cisco RSP720 Route Switch Processor (required) and with 4 gigabytes of memory (recommended)

RADIUS and policy servers are not mandatory. However, a typical implementation of ISG on a Cisco 7600 series router requires an off-box RADIUS authorization, authentication, and accounting (AAA) server, that is, a separate physical server storing AAA information.

### Software

Contact your Cisco account representative to find out how to get an image that has the ISG: Subscriber Aware Ethernet feature for Cisco 7600 series routers with SIP-400 or Ethernet Services Plus (ES+) access-facing line cards.

## Restrictions for ISG Subscriber Aware Ethernet

The following ISG features are not available on the Cisco 7600 series routers:

- IP subscriber functionality is not supported on the following access interfaces:
  - Virtual template
  - Gigabit EtherChannel (GEC) (port channel)



#### Note

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Beginning in Cisco IOS Release 12.2(33)SRE, port channel is only supported on the Ethernet Services Plus (ES+) line card in Cisco 7600 series routers, and port channel does not support IP interface sessions.

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- ◦ Switched virtual interface (SVI)
- ◦ Generic routing encapsulation (GRE)
- ◦ Layer 2 Tunnel Protocol (L2TP)
- ◦ L2TP access concentrator (LAC)
- ◦ L2TP network server (LNS)

**Note**

For more information about the access interface, see the "IP Subscriber Awareness over Ethernet" chapter in the *Cisco 7600 Series Cisco IOS Software Configuration Guide*.

- Subscriber redundancy is available on 1:1 access standby model only.
- Load balancing is not supported for IP and PPPoE subscribers.
- Interface statistics on a multiservice interface (MSI).
- Traffic classes are not supported. Because traffic classes cannot be configured on the Cisco 7600 series router, some features (accounting, idle timeout, session timeout, policer, and L4RD) that can be applied at a flow level on other routers must be applied at a session level on the Cisco 7600 series router.
- L4RD and PBHK functionality are implemented at the Route Processor (RP) level.
- Prepaid functionality.
- Dynamic subscriber bandwidth selection (DBS).
- The following restrictions apply to ISG HA features:
  - Idle timer and session timers start on switchover.
  - PBHK and L4RD translations are not checkpointed. Therefore on switchover, all translations refresh. This refresh can result in the disconnection of existing TCP and HTTP sessions.
- Ambiguous VLAN support for PPPoE sessions only.
- Lawful intercepts on access subinterfaces in IP and PPPoE sessions.
- Session grouping.

Note the following information about statistical polling on the Cisco 7600 series router:

- Statistics are sent from the line card to the router every 10 seconds. Therefore, statistics are delayed by 10 seconds on each poll.
- The lower limit for idle timeout values and keepalive intervals is 30 seconds.

The segment switching manager (SSM) infrastructure does not disconnect sessions even when the SPA is removed in compliance with Cisco Online Insertion and Removal (OIR) unless the configuration is also removed. To ensure that a session is disconnected in that case, you must configure the session keepalive feature or use the **clear ip subscriber slot slotnum no-hardware** command to clear the sessions manually when a line card or SPA is OIR removed.

The following table shows whether sessions are reprovisioned (that is, reprogrammed on the line card after the OIR insert) or terminated on the router after various line-card, interface, and configuration events.

**Table 1**      **Event Statistics**

Event	Reprovision	Disconnect
Line card or SPA OIR insert	Yes	No
Line card or SPA OIR removal	No	No
Line card reload	Yes	No
Interface admin down	No	No
Interface down	No	No

Event	Reprovision	Disconnect
Configuration removed on subscriber interface	No	Yes

**Note**

The SPA OIR insert and removal effects do not apply to the Ethernet Services Plus (ES+) line card. The reprovisioning and disconnection effects only apply to PPPoE and IP sessions (12 connected and routed), not to IP interface sessions.

For more information about OIR support in routers, see [Cisco Online Insertion and Removal \(OIR\) Support in Routers](#).

## Information About ISG Subscriber Aware Ethernet

### Supported Access Session Types

- Interface
- Static and DHCP IP
- PPPoE

### Supported Access Interfaces

- Ethernet
- QinQ VLAN
- .1Q and QinQ access interfaces (that is, with an **access** keyword)

**Note**

The access keyword is specific for Cisco 7600 series routers.

- Gigabit EtherChannel (GEC) (port channel)

The port channel is on 1:1 redundancy and Link Aggregation Control Protocol (LACP) is enabled to allow dynamic handling of member links in a port channel bundle. The port channel has two members, of which one member is active and the other is in standby state. The member ports can be across line cards but must originate from Ethernet Services Plus (ES+) line card.

For information about access interfaces see the "IP Subscriber Awareness over Ethernet" chapter in the *Cisco 7600 Series Cisco IOS Software Configuration Guide*.

### Supported IP Sessions

- DHCP integration with IP sessions
- Static IP subnet sessions
- Source IP address and MAC address sessions (IP sessions)

### Supported PPP Sessions

- PPPoE

- PPPoEoVLAN
- PPPoEoQinQ

**Note**

In Cisco IOS Release 12.2(33)SRC, PPP and IP sessions are supported only on Ethernet interfaces on the Cisco 7600 series router.

**Supported Services**

- Idle timeout
- Session timeout
- Internet Control Message Protocol (ICMP) and Address Resolution Protocol (ARP) keepalive for IP sessions
- Conditional debugging (supported on routers but not on line cards)
- Dynamic virtual private network (VPN) selection
- Limited PBHK and L4RD
- Policy control: policy server--change of authorization (CoA) ASCII command code support
- QoS
- Session accounting
- Security: per user ACL

**Session and Call Support**

- The ISG: Subscriber Aware Ethernet feature supports up to 32,000 sessions with ISG features.
- Up to 50 calls per second are supported on dynamic host control protocol (DHCP).

## How to Configure ISG Subscriber Aware Ethernet

For information on configuring ISG: Subscriber Aware Ethernet on Cisco 7600 series routers, see the "IP Subscriber Awareness over Ethernet" chapter of the *Cisco 7600 Series Cisco IOS Software Configuration Guide*.

## Configuration Examples for ISG Subscriber Aware Ethernet

For information on and specific tasks to configure ISG: Subscriber Aware Ethernet, see the "Configuration Examples" section of the *Cisco 7600 Series Cisco IOS Software Configuration Guide*.

## Additional References

**Related Documents**

Related Topic	Document Title
Configuring ISG features	<ul style="list-style-type: none"> <li>IP Subscriber Awareness over Ethernet</li> <li><i>Cross-Platform Release Notes for Cisco IOS Release 12.2SB</i></li> </ul>
ISG commands	<a href="#">Cisco IOS ISG Command Reference</a>
OIR support in routers	<i>Cisco Online insertion and Removal (OIR) Support in Routers</i>

**Standards**

Standard	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	--

**MIBs**

MIB	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.	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
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	--

## 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>	<p><a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a></p>

# Feature Information for ISG Subscriber Aware Ethernet

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](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

**Table 2** Feature Information for ISG: Subscriber Aware Ethernet

Feature Name	Releases	Feature Information
ISG: Subscriber Aware Ethernet	12.2(33)SRC 15.0(1)S	<p>The ISG: Subscriber Aware Ethernet feature provides Intelligent Services Gateway (ISG) functionality in distributed IP and PPPoE sessions on Cisco 7600 series routers having SIP-400 access-facing line cards.</p> <p>In 12.2(33)SRC, this feature was introduced on the Cisco 7600 series routers.</p> <p>The following commands were introduced or modified: <b>clear ip subscriber</b> , <b>show ccm clients</b> , <b>show ccm queues</b> , <b>show ccm sessions</b> , <b>show ip subscriber</b> .</p>

Feature Name	Releases	Feature Information
ISG: Session: Multicast: Coexistence	12.2(33)SRE	In Cisco IOS Release 12.2(33)SRE, ISG Session Multicast Coexistence feature support was added on Cisco 7600 series routers.
IP Session support on the Cisco 7600 ES+ Series Line Cards	12.2(33)SRE	In Cisco IOS Release 12.2(33)SRE, IP and PPPoE Sessions support for ES+ Series Line Cards was added on Cisco 7600 series routers.
PPPoE and IPoE Session Support on Port Channel (1:1 Redundancy)	12.2(33)SRE	In Cisco IOS Release 12.2(33)SRE, PPPoE and IPoE Sessions Support for Port Channel was added on Cisco 7600 series routers.

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