



# Redirecting ISA Subscriber Traffic

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The Intelligent Service Architecture (ISA) is a core set of Cisco IOS components that provide a structured framework in which edge access devices can deliver flexible and scalable services to subscribers. A Cisco device that is running a Cisco IOS image with ISA is called an Intelligent Service Gateway (ISG). This module describes how to configure ISA to redirect subscriber traffic by using the ISA Layer 4 Redirect feature. The ISA Layer 4 Redirect feature enables service providers to better control the user experience by allowing subscriber TCP or User Datagram Protocol (UDP) packets to be redirected to specified servers for appropriate handling. ISA Layer 4 redirection can be used to facilitate subscriber authentication, initial and periodic advertising captivation, redirection of application traffic, and DNS redirection.

## Module History

This module was first published on April 28, 2005, and last updated on April 28, 2005.

## Finding Feature Information in This Module

Your Cisco IOS software release may not support all features. To find information about feature support and configuration, use the [“Feature Information for Redirecting ISA Subscriber Traffic”](#) section on page 170.

## Contents

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# Prerequisites for Redirecting ISA Subscriber Traffic

The tasks in this document assume you know how to configure access control lists.

## Restrictions for Redirecting ISA Subscriber Traffic

The ISA Layer 4 Redirect feature applies only to TCP or UDP traffic.

## Information About Redirecting ISA Subscriber Traffic

Before you configure Layer 4 Redirect, you should understand the following concepts:

- [Overview of ISA Layer 4 Redirect, page 160](#)
- [Layer 4 Redirect Applications, page 161](#)

## Overview of ISA Layer 4 Redirect

The ISA Layer 4 Redirect feature redirects specified packets to servers that handle the packets in a specified manner. For example, packets sent upstream by unauthorized users can be forwarded to a server that redirects the users to a logon page. Similarly, if users try to access a service to which they have not logged on, the packets can be redirected to a server that provides a service logon screen.

The Layer 4 Redirect feature supports three types of redirection, which can be applied to subscriber sessions or to flows:

- Permanent redirection—Specified traffic is redirected to the specified server all the time.
- Initial redirection—Specified traffic is redirected for a specific duration of the time only, starting from when the feature is applied.
- Periodic redirection—Specified traffic is periodically redirected. The traffic is redirected for a specified duration of time. The redirection is then suspended for another specified duration. This cycle is repeated.

The Layer 4 Redirect feature uses access lists to define which traffic will be redirected. Multiple access lists can be used to redirect packets to different server groups. Only the first packet of a TCP session must match the access list; subsequent packets for the session will be sent to the same server.

A redirect server can be any server that is programmed to respond to the redirected packets. If ISA is used with a web portal, unauthenticated subscribers can be sent automatically to a logon page when they start a browser session. Web portal applications can also redirect to service logon pages, advertising pages, and message pages.

Redirected packets are sent to an individual redirect server or redirect server group that consists of one or more servers. The ISG selects one server from the group in a rotating fashion to receive the redirected packets.

When traffic is redirected, ISG modifies the destination IP address and TCP port of upstream packets to reflect the destination server. For downstream packets, ISG returns the source IP address and port to the original packet's destination.

## Layer 4 Redirect Applications

The Layer 4 Redirect feature supports the following applications:

- TCP redirection for unauthenticated users and unauthorized services

HTTP traffic from subscribers can be redirected to a web dashboard where the subscribers can log on so that authentication and authorization can be performed.

- Initial and periodic redirection for advertising captivation

Subscriber traffic can be redirected to a sponsor's web page for a brief period of time at the start of the session or periodically throughout the session.

- Redirection of application traffic

Application traffic from a subscriber can be redirected so as to provide value-added services. For example, a subscriber's SMTP traffic can be redirected to a local mail server that can function as a forwarding agent for the mail.

- Domain Name System (DNS) redirection

DNS queries may be redirected to a local DNS server. In some deployments, such as public wireless LAN (PWLAN) hotspots, subscribers may have a static DNS server addresses, which may not be reachable at certain locations. Redirecting DNS queries to a local DNS server allows applications to work properly without requiring reconfiguration.

## How to Configure ISA Layer 4 Redirect

There are three ways to apply Layer 4 redirection to sessions. One way is to configure redirection directly on the subscriber interface. A second way is to configure a service profile or service policy map with the Layer 4 redirect attribute in it, and apply that service to the session. A third way is to configure the Layer 4 redirect attribute in the user profile.

The following tasks describe how to configure Layer 4 redirection. The first task is optional. One or more of the next three tasks is required. The last task is optional.

For examples of Layer 4 redirection configuration for specific applications (such as unauthenticated user redirect), see the [“Configuration Examples for ISA Layer 4 Redirect”](#) section on page 167.

- [Defining a Redirect Server Group, page 162](#)
- [Configuring Layer 4 Redirection on an Interface, page 162](#)
- [Configuring Layer 4 Redirection in a Service Policy Map, page 164](#)
- [Configuring Layer 4 Redirection in a Service Profile or User Profile on the AAA Server, page 165](#)
- [Verifying ISA Traffic Redirection, page 165](#)

## Defining a Redirect Server Group

Perform this task to define a group of one or more servers to which traffic will be redirected. Traffic will be forwarded to servers in a rotating fashion.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **redirect server-group** *group-name*
4. **server ip** *ip-address* **port** *port-number*

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"><li>• Enter your password if prompted.</li></ul>
Step 2	<b>configure terminal</b>  <b>Example:</b> Router# configure terminal	Enters global configuration mode.
Step 3	<b>redirect server-group</b> <i>group-name</i>  <b>Example:</b> Router(config)# redirect server-group ADVT-SERVER	Defines a group of servers that make up a named redirection server group.
Step 4	<b>server ip</b> <i>ip-address</i> <b>port</b> <i>port-number</i>  <b>Example:</b> Router(config-sg-l4redirect-group)# server ip 10.0.0.1 port 8080	Adds a server to a redirect server group. <ul style="list-style-type: none"><li>• You can enter this command more than one time to add multiple servers to the server group.</li></ul>

## Configuring Layer 4 Redirection on an Interface

Perform this task to redirect all matching Layer 4 subscriber traffic that arrives on an interface.

### Prerequisites

An IP access list must be configured if you choose to use an access list to identify traffic for redirection.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**

3. **interface** *type number*
4. **ip subscriber**
5. **identifier interface**
6. **exit**
7. **redirect** [*list access-list-number*] **to** {*group server-group-name* | **ip** *ip-address* [*port port-number*]} [*duration seconds*] [*frequency seconds*]

**DETAILED STEPS**

	Command or Action	Purpose
Step 1	<p><b>enable</b></p> <p><b>Example:</b> Router&gt; enable</p>	<p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<p><b>configure terminal</b></p> <p><b>Example:</b> Router# configure terminal</p>	<p>Enters global configuration mode.</p>
Step 3	<p><b>interface</b> <i>type number</i></p> <p><b>Example:</b> Router(config)# interface fastethernet 0/0.505</p>	<p>Specifies an interface and enters interface configuration mode.</p>
Step 4	<p><b>ip subscriber</b></p> <p><b>Example:</b> Router(config-if)# ip subscriber</p>	<p>Enables ISA IP subscriber configuration mode.</p>
Step 5	<p><b>identifier interface</b></p> <p><b>Example:</b> Router(config-subscriber)# identifier interface</p>	<p>Creates an ISA IP interface session.</p>
Step 6	<p><b>exit</b></p> <p><b>Example:</b> Router(config-subscriber)# exit</p>	<p>Returns to interface configuration mode.</p>
Step 7	<p><b>redirect</b> [<i>list access-list-number</i>] <b>to</b> {<i>group server-group-name</i>   <b>ip</b> <i>ip-address</i> [<i>port port-number</i>]} [<i>duration seconds</i>] [<i>frequency seconds</i>]</p> <p><b>Example:</b> Router(config-if)# redirect list 100 to group advt-server duration 30 frequency 3600</p>	<p>Redirects specified traffic to a specified server or server group.</p>

## Configuring Layer 4 Redirection in a Service Policy Map

Perform this task to configure ISA layer 4 redirection in a service policy map.

### Prerequisites

The ISA Layer 4 Redirect feature is configured under a traffic class within a service policy map. This task assumes that you have defined the traffic class map. See the module “[Configuring ISA Subscriber Services](#)” for more information.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **policy-map service** *policy-map-name*
4. **class type traffic** *class-name*
5. **redirect** [*list access-list-number*] **to** {**group** *server-group-name* | **ip** *ip-address* [**port** *port-number*]} [**duration** *seconds*] [**frequency** *seconds*]

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<code>enable</code>  <b>Example:</b> Router> enable	Enables privileged EXEC mode.  • Enter your password if prompted.
Step 2	<code>configure terminal</code>  <b>Example:</b> Router# configure terminal	Enters global configuration mode.
Step 3	<code>policy-map type service</code> <i>policy-map-name</i>  <b>Example:</b> Router(config)# policy-map type service service1	Creates or modifies a service policy map, which is used to define an ISA service.
Step 4	<code>class type traffic</code> <i>class-name</i>  <b>Example:</b> Router(config-service-policymap)# class type traffic class1	(Optional) Specifies a traffic class map that identifies the traffic to which this service applies.
Step 5	<code>redirect</code> [ <i>list access-list-number</i> ] <b>to</b> { <b>group</b> <i>server-group-name</i>   <b>ip</b> <i>ip-address</i> [ <b>port</b> <i>port-number</i> ]} [ <b>duration</b> <i>seconds</i> ] [ <b>frequency</b> <i>seconds</i> ]  <b>Example:</b> Router(config-service-policymap-class-traffic)# redirect to ip 10.10.10.10	Redirects traffic to a specified server or server group.

## What to Do Next

You may want to configure a method of activating the service policy map; for example, control policies can be used to activate services. For more information about methods of service activation, see the module “[Configuring ISA Subscriber Services](#).”

## Configuring Layer 4 Redirection in a Service Profile or User Profile on the AAA Server

The Layer 4 Redirect feature can be configured as a Cisco vendor-specific attribute (VSA) in a user or service profile on an authentication, authorization, and accounting (AAA) server. This attribute can appear more than once in a profile to define different types of redirections for a session and can be used in both user and service profiles simultaneously.

### SUMMARY STEPS

1. Add the Layer 4 Redirect VSA to the user profile or service profile on the AAA server.

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<p>Add the Layer 4 Redirect VSA to the user profile or subscriber profile on the AAA server.</p> <pre>26,9,1= "ip:l4redirect=redirect [list access-list-number] to {group server-group-name   ip ip-address [port port-number]} [duration seconds] [frequency seconds]"</pre>	Redirects traffic to a specified server or server group.

## What to Do Next

If you configure ISA Layer 4 redirection in a service profile, you may want to configure a method of activating the service profile; for example, control policies can be used to activate services. For more information about methods of service activation, see the module “[Configuring ISA Subscriber Services](#).”

## Verifying ISA Traffic Redirection

Perform this task to verify the configuration and operation of ISA Layer 4 traffic redirection.

### SUMMARY STEPS

1. **enable**
2. **show redirect translations** [**ip** *ip-address*]
3. **show redirect group** [*group-name*]
4. **show subscriber session** [**detailed**] [**identifier** *identifier* | **uid** *session-id* | **username** *name*]

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<pre>enable</pre> <p><b>Example:</b> Router&gt; enable </p>	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>Enter your password if prompted.</li> </ul>
Step 2	<pre>show redirect translations [ip ip-address]</pre> <p><b>Example:</b> Router# show redirect translations ip 10.0.0.0 </p>	Displays ISA Layer 4 redirect translations for sessions.
Step 3	<pre>show redirect group [group-name]</pre> <p><b>Example:</b> Router# show redirect group redirect1 </p>	Displays information about ISA redirect server groups.
Step 4	<pre>show subscriber session [detailed] [identifier identifier   uid session-id   username name]</pre> <p><b>Example:</b> Router# show subscriber session detailed </p>	Displays ISA subscriber session information.

## Examples

The following example shows sample output for the **show redirect translations** command:

```
Router# show redirect translations ip 53.0.0.2
```

```
Destination IP/port   Server IP/port   Prot  In  Flags  Out  Flags  Timestamp
152.0.0.2           23              9.2.36.253     23    TCP   none   none   May 08 2003
12:37:10
```

The following example show sample output for the **show subscriber session** command. This output shows that Layer 4 redirect is being applied from the service profile.

```
Router# show subscriber session uid 135
```

```
Subscriber session handle: 7C000114, state: connected, service: Local Term
Unique Session ID: 135
Identifier: blind-rdt
SIP subscriber access type(s): IP-Interface
Root SIP Handle: CF000020, PID: 73
Current SIP options: Req Fwding/Req Fwded
Session Up-time: 40 minutes, 30 seconds, Last Changed: 40 minutes, 30 seconds
AAA unique ID: 135
Switch handle: F000086
Interface: ATM2/0.53
```

Policy information:

```
Authentication status: unauthen
Config downloaded for session policy:
From Access-Type: IP-Interface, Client: SM, Event: Service Selection Request, Service
Profile name: blind-rdt, 2 references
username           "blind-rdt"
l4redirect         "redirect list 100 to group sesm-grp"
Rules, actions and conditions executed:
```



```
subscriber rule-map blind-rdt
  condition always event session-start
  action 1 service-policy type service "blind-rdt"
```

```
Session inbound features:
  Feature: Layer 4 Redirect
  Rule Cfg Definition
  #1 SVC Redirect list 100 to group sesm-grp !! applied redirect
Configuration sources associated with this session:
Service: blind-rdt, Active Time = 40 minutes, 32 seconds
Interface: ATM2/0.53, Active Time = 40 minutes, 32 seconds
```

The following is sample output for the **show subscriber session** command for a session in which the Layer 4 redirection is applied on the interface:

```
Router# show subscriber session uid 133

Subscriber session handle: D7000110, state: connected, service: Local Term
Unique Session ID: 133
Identifier:
SIP subscriber access type(s): IP-Interface
Root SIP Handle: 1E, PID: 73
Current SIP options: Req Fwding/Req Fwded
Session Up-time: 42 minutes, 54 seconds, Last Changed: 42 minutes, 54 seconds
AAA unique ID: 133
Switch handle: 17000084
Interface: FastEthernet0/0.505

Policy information:
  Authentication status: unauthen

Session inbound features:
  Feature: Layer 4 Redirect
  Rule Cfg Definition
  #1 INT Redirect list 100 to group sesm-grp
Configuration sources associated with this session:
Interface: FastEthernet0/0.505, Active Time = 42 minutes, 54 seconds
```

## Configuration Examples for ISA Layer 4 Redirect

This section contains the following examples:

- [Redirecting Unauthenticated Subscriber Traffic: Example, page 167](#)
- [Redirecting Unauthorized Subscriber Traffic: Example, page 168](#)
- [Initial Redirection: Example, page 169](#)
- [Periodic Redirection: Examples, page 169](#)
- [Redirecting DNS Traffic: Example, page 170](#)

### Redirecting Unauthenticated Subscriber Traffic: Example

The following example shows the configuration of redirection for unauthenticated users. In this case, Layer 4 traffic from unauthenticated subscribers is redirected to the web portal.

```
service-policy type control all-rdt
!
```

```

class-map type traffic match-any CLASS-ALL
!
policy-map type service blind-rdt
  class type traffic CLASS-ALL
    redirect to group PORTAL
!
policy-map type control all-rdt
  class type control always event session-start
    1 service-policy type service blind-rdt

  class type control always event account-logon
    1 authenticate
    2 service-policy type service unapply blind-rdt
!
redirect server-group PORTAL
server ip 9.2.36.253 port 80

```

## Redirecting Unauthorized Subscriber Traffic: Example

The following example shows the configuration of redirection for unauthorized subscribers. If the subscriber is not logged onto service “svc2”, traffic matching the service “SVC” is redirected to the server group “PORTAL”. Once the subscriber logs in to the service, the traffic is no longer redirected. When the subscriber logs out of the service, redirection is applied again.

```

service-policy type control THE_RULE
!
class-map type traffic match-any CLASS-ALL
!
class-map type traffic match-any CLASS-100_110
  match access-group input 100
  match access-group output 110
!
policy-map type service blind-rdt
  class type traffic CLASS-ALL
    redirect to group PORTAL
!
policy-map type service svc-rdt
  class type traffic CLASS-ALL
    redirect list 100 to group PORTAL
!
policy-map type service svc
  class type traffic CLASS-100_110
  class type traffic default in-out
  drop
!
policy-map type control THE_RULE
  class type control always event account-logon
    1 authenticate
    2 service-policy type service svc-rdt
  class type control cond-svc-logon event service-start
    1 service-policy type service unapply svc-rdt
    2 service-policy type service identifier service-name
  class type control cond-svc-logon event service-stop
    1 service-policy type service unapply svc
    2 service-policy type service svc-rdt
!
class-map type control match-all cond-svc-logon
  match identifier service-name svc
!
redirect server-group PORTAL
server ip 9.2.36.253 port 80

```

## Initial Redirection: Example

The following example shows ISA configured to redirect user traffic that comes over interface FastEthernet0/0.505 to a server group called “ADVT” for the initial 60 seconds of the session. After the initial 60 seconds, ISA will stop redirecting the traffic for the rest of the lifetime of the session.

```
interface FastEthernet0/0.505
 encapsulation dot1Q 505
 ip address 10.0.0.1 255.255.255.0
 ip subscriber
   identifier interface
 redirect to group ADVT duration 60
 no cdp enable
```

The following example shows ISA configured to redirect the Layer 4 traffic of all subscribers to a server group called “ADVT” for the initial 60 seconds of the session. After the initial 60 seconds, ISA will stop redirecting the traffic for the rest of the lifetime of the session.

```
service-policy type control initial-rdt
policy-map type control intial-rdt
 class type control always event session-start
   1 service-policy type service initial-rdt-profile
 !
policy-map type service initial-rdt-profile
 class type traffic CLASS-ALL
   redirect to group ADVT duration 60
```

## Periodic Redirection: Examples

The following example shows how to redirect subscriber traffic coming over FastEthernet interface 0/0.505 for a period of 60 seconds every 3600 seconds.

```
interface FastEthernet0/0.505
 encapsulation dot1Q 505
 ip address 50.0.0.1 255.255.255.0
 subscriber session
 redirect to group ADVT duration 60 frequency 3600
 no cdp enable
 !
```

The following example shows how to redirect all subscriber traffic for a period of 60 seconds every 3600 seconds.

```
service-policy control periodic-rdt session-start
 !
policy-map control periodic-rdt
 class type control always event session-start
   1 service-policy service periodic-rdt-profile
 !
policy-map service periodic-rdt-profile
 redirect to group ADVT duration 60 frequency 3600
```

## Redirecting DNS Traffic: Example

The following example shows how to redirect all subscriber DNS packets to the server group “DNS-server”.

```
service-policy type control DNS-rdt
policy-map type control DNS-rdt
  class type control event session-start
    1 service-policy type service DNS-rdt-profile
  !
policy-map type service DNS-rdt-profile
  class type traffic CLASS-ALL
    redirect list 120 to group DNS-server
  !
access-list 100 permit udp any any eq domain
```

## Additional References

The following sections provide references related to the ISA Layer 4 Redirect feature.

## Related Documents

Related Topic	Document Title
ISA commands	<i>Cisco IOS Intelligent Service Architecture Configuration Guide</i>

## Technical Assistance

Description	Link
Technical Assistance Center (TAC) home page, containing 30,000 pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	<a href="http://www.cisco.com/public/support/tac/home.shtml">http://www.cisco.com/public/support/tac/home.shtml</a>

## Feature Information for Redirecting ISA Subscriber Traffic

Table 16 lists the features in this module and provides links to specific configuration information. Only features that were introduced or modified in Cisco IOS Releases 12.2(27)SBA or later appear in the table.

Not all commands may be available in your Cisco IOS software release. For details on when support for specific commands was introduced, see the command reference documents.

If you are looking for information on a feature in this technology that is not documented here, see the “[Intelligent Service Architecture Features Roadmap](#).”

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**Table 16** Feature Information for Redirecting ISA Subscriber Traffic

Feature Name	Software Releases	Feature Configuration Information
ISA: Flow Control: Flow Redirect	12.2(27)SB A	<p>The ISA Layer 4 Redirect feature enables service providers to better control the user experience by allowing subscriber TCP or UDP packets to be redirected to specified servers for appropriate handling. ISA Layer 4 redirection can be applied to individual subscriber sessions or flows.</p> <p>The following sections provide information about this feature:</p> <ul style="list-style-type: none"> <li>• <a href="#">Information About Redirecting ISA Subscriber Traffic, page 160</a></li> <li>• <a href="#">How to Configure ISA Layer 4 Redirect, page 161</a></li> </ul>

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