



# Configuring High Availability in a SIP-Based Network

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## Caution

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All Cisco SPS 1.x versions require manual configuration. Therefore, for backward compatibility, Cisco SPS supports manual editing of all configuration files. However, if you use the GUI-based provisioning system, do not attempt manual editing. Manual changes to any configuration file written by the GUI are overwritten when the GUI is used again.

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## Note

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- For troubleshooting information, refer to *Cisco SIP Proxy Server Administrator Guide, Version 2.1*.
  - In all configuration windows, an asterisk, \*, indicates a required entry.
  - The GUI-based provisioning system contains menus for activities described both in this chapter and in *Cisco SIP Proxy Server Administrator Guide, Version 2.1*.
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This chapter provides high availability configuration information for SI-based networks. The following table provides a list of procedures that must be performed to complete the selected SIP function.



Note

Do only the tasks required to complete the function.

*Table 1 Cisco SPS Tasks*

Cisco SPS Task	High Availability Task	Security Task	Voice Routing Task	Other Task
<a href="#">Prerequisites, page 13</a>	Yes	Yes	Yes	Yes
<a href="#">How to Configure a Proxy Server, page 14 (see Table 2)</a>	Yes	Yes	Yes	Yes
<a href="#">How to Configure Subscribers, page 17</a>	No	No	Yes	No
<a href="#">How to Configure Registries, page 18 (see Appendix O: Registry Services Directives)</a>	No	No	Yes	No
<a href="#">How to Configure Routes, page 19 (see Appendix P: Next Hop Routing Directives)</a>	Yes	Yes	Yes	No
<a href="#">How to Import and Export Bulk Data, page 21</a>	No	No	No	Yes
<a href="#">How to Configure a User ID, page 21</a>	No	No	No	Yes
<a href="#">How to Configure TLS Support on the Proxy Server, page 22</a>	No	Yes	Yes	No
<a href="#">How to Configure Proxy-Server DNS Behavior, page 24 (see Appendix Q: DNS Setup)</a>	Yes	Yes	Yes	No

*Table 2 How to Configure a Proxy Server Subtasks*

Cisco SPS Task	High Availability Task	Security Tasks	Voice Routing Tasks	Other Task
<a href="#">Access Control (see Appendix A: Access Control Directives, page 29)</a>	No	Yes	Yes	No
<a href="#">Accounting (see Appendix B: Accounting Directives, page 33)</a>	No	Yes	Yes	No

Table 2 How to Configure a Proxy Server Subtasks (continued)

Cisco SPS Task	High Availability Task	Security Tasks	Voice Routing Tasks	Other Task
Authentication (see <a href="#">Appendix C: Authentication Directives, page 35</a> )	No	Yes	Yes	No
Call Forwarding (see <a href="#">Appendix D: Call Forwarding Directives, page 39</a> )	No	No	Yes	No
ENUM (see <a href="#">Appendix E: ENUM Directives, page 41</a> )	No	No	Yes	No
Farming (see <a href="#">Appendix F: Farming Directives, page 43</a> )	Yes	Yes	Yes	No
GKMTP (see <a href="#">Appendix G: GKTMP Directives, page 45</a> )	No	No	Yes	No
MySQL (see <a href="#">Appendix H: MySQL Directives, page 47</a> )	No	No	Yes	No
Number Expansion (see <a href="#">Appendix I: Number Expansion Directives, page 49</a> )	No	No	Yes	No
RAS (see <a href="#">Appendix J: RAS Directives, page 51</a> )	No	No	Yes	No
RPMS (see <a href="#">Appendix K: RPMS Directives, page 55</a> )	No	No	Yes	No
Server (see <a href="#">Appendix L: Server Directives, page 57</a> )	No	No	Yes	No
Server Core (see <a href="#">Appendix M: Server Core Directives, page 61</a> )	No	No	Yes	No
Virtual Proxy Hosts (see <a href="#">Appendix N: Virtual Proxy Hosts Directives, page 73</a> )	No	No	Yes	No

## Prerequisites

- Install Cisco SPS (refer to the [Cisco SIP Proxy Server Installation Guide, Version 2.1](#)).
- Activate the license (refer to the [Cisco SIP Proxy Server Installation Guide, Version 2.1](#), chapter [How to Manage Cisco SPS Licenses](#)).
- Locate the GUI on your system.

**Tip**

To access the Cisco SPS GUI, use this procedure:

1. Go to the following (default) directory or your Windows desktop:
  - Linux:**    /usr/local/sip/gui/
  - Solaris:** /opt/sip/gui/
2. Enter the **CiscoSPS** command or double-click the CiscoSPS icon to open the Cisco SPS GUI.
3. Enter your password (default is cspuser).
4. During installation, did you enter the correct value for the pserver location?
  - If yes, click **OK**.
  - If no, click **more>>**, enter the pserver host name and port number, and click **OK** (the default port is 26005).

The Cisco SPS main menu appears. The pserver host name and port number automatically reappear at the next login.

## How to Configure a Proxy Server

The GUI-based provisioning system allows you to access a large number of proxy-server settings. If you wish to add or delete a proxy server, however, you must use the `sps_setup` script, as described in the [Cisco SPS Proxy Server Installation Guide, Version 2.1](#).

## Prerequisites

- Physically install and configure each proxy server that is to become a farm member.
- Set up a proxy-server farm as described in the [Cisco SIP Proxy Server Installation Guide, Version 2.1](#).

## Information About Proxy-Server Settings

You can enable and enter details for a number of proxy-server settings (see an alphabetical listing of setting tabs in [Table 3](#) and a rendition of the screen that shows the tabs in [Figure 10](#)).

**Table 3**    *Proxy-Server Settings*

Setting Tab	Purpose
Access control	Defines or restricts the rights of other network devices to send requests through the proxy server (see <a href="#">Appendix A: Access Control Directives, page 29</a> ).
Accounting	Controls the sending of accounting records by the proxy server to a pair of RADIUS servers (see <a href="#">Appendix B: Accounting Directives, page 33</a> ).
Authentication	Verifies the identity of a person or a process for purposes of security (see <a href="#">Appendix C: Authentication Directives, page 35</a> ).

**Table 3** *Proxy-Server Settings (continued)*

Setting Tab	Purpose
Call Forward	Redirects incoming calls on a per-subscriber basis (see <a href="#">Appendix D: Call Forwarding Directives, page 39</a> ).
Debug and logs	Discussed in <i>Cisco SIP Proxy Server Administrator Guide, Version 2.1</i> .
ENUM	Translates phone numbers into URLs and IP addresses (see <a href="#">Appendix E: ENUM Directives, page 41</a> ). Specifically, maps the E.164 number space into the Internet Domain Name System (DNS). The E.164 number space is the global plan for telephone numbers wherein every device connected to the telephone network is assigned a unique numerical address. DNS is the system used on the Internet for translating names of network nodes into addresses.
Farming	Sets routing and registry directives (see <a href="#">Appendix F: Farming Directives, page 43</a> ).
GKTMP	GateKeeper Transaction Message Protocol (see <a href="#">Appendix G: GKTMP Directives, page 45</a> ). Facilitates communication between the proxy server and an external application. For this communication, Cisco SPS supports ARQ-Request messages only.
MySQL	Customizes the MySQL database (a popular open-source database whose architecture makes it extremely fast and easy to customize [see <a href="#">Appendix H: MySQL Directives, page 47</a> ]).  <b>Note</b> You cannot change the MySQL database name, table name, or field names from those provided by the GUI-based provisioning system.
Number expansion	Expands an extension number to its full E.164 telephone number (see <a href="#">Appendix I: Number Expansion Directives, page 49</a> ). You can also use number expansion to strip numbers. Consider these examples: <ul style="list-style-type: none"> <li>• To expand x-0123 to 303-555-0123, add this rule: from 50123 to 303-555-0123</li> <li>• To strip +888-555-xxxx to xxxx, add this rule: from +888555.... to ....</li> </ul>
RAS	Registration, Admission, and Status protocol (see <a href="#">Appendix J: RAS Directives, page 51</a> ). Facilitates communication between the proxy server and an H.323 gatekeeper by querying a gatekeeper for the location of an available gateway.
RPMS	Cisco Resource Policy Management System (see <a href="#">Appendix K: RPMS Directives, page 55</a> ). Provides policy management for platform resources, whether data or voice, and thus enables you to offer a variety of services to a variety of customers on a single set of gateways.
Server	Controls system behavior (see <a href="#">Appendix L: Server Directives, page 57</a> ). Parameters that you set here reside in the system's configuration file.
SIP server core	Sets server core parameters for the SIP proxy server, including those for DNS behavior (see <a href="#">Appendix M: Server Core Directives, page 61</a> ).
Virtual proxy host	Maintains multiple servers on one machine (see <a href="#">Appendix N: Virtual Proxy Hosts Directives, page 73</a> ). For example, companies sharing a web server can each have their own domain (www.company1.com and www.company2.com) and access to the web server.

Figure 10 Edit Existing Farm Screen

**Edit existing Farm**

Farming | Virtual Proxy Host | RAS | RPMS | Debug and Logs  
 Access Control | Authentication | Call Forward | Number Expansion | ENUM  
 Server Directives | SIP Server Core | MySQL | GKTMP | Accounting

**Server Directives**

Farm Label: Defaults \*  
 Server Root: /usr/local/sip \*  
 Lock File: logs/accept.lock  
 PID File: logs/sipd.pid \*  
 Scoreboard File: logs/apache\_runtime\_status \*

**Server-Pool Size Regulation**

Start Servers: 5 \*  
 Minimum Spare Servers: 5 \*  
 Maximum Spare Servers: 10 \*  
 Maximum Clients: 20 \*  
 Maximum Requests per Child: 0 \*

**Listen**

port or ip:port

Add Row | Delete Row | Move Up | Move Down

User: csps \*  
 Group: csps \*  
 Server Name:

Hostname Lookups:  On  Off

Submit | Cancel | Help | << advanced

## Procedure

- Step 1 From the Cisco SPS main menu (see [Tip](#) for how to access), click **Farm/Proxies**.
- Step 2 Verify that farm label, server root, and proxy domain display automatically if you installed Cisco SPS with the SPS setup (sps\_setup) script. If they do not, enter the information.
- Step 3 Click **Advanced>>**.
- Step 4 Click the tab for a configurable setting. (All of the tabs are listed in [Table 3](#) and shown in [Figure 10](#).)
- Step 5 Turn the setting On or Off as needed.

- Step 6** To display associated directives, select or type new setting details as needed. (Click **Help** to view context-sensitive online help as needed.) If a setting is off, all associated directives are dimmed. You can make changes only if the setting is On.
- Step 7** Click **Submit**.
- Step 8** If prompted, click **OK** (to restart later) or **Go to Proxy Control screen** (to restart now). Otherwise, proceed with the next step.
- Step 9** Restart all farm servers:
- From the Control Proxy screen, select all farm members.
  - Click **Graceful restart > Yes**.
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## How to Configure Subscribers



### Tip

A number of sorting and searching tools are available to you:

- To resize a column, place the cursor on the vertical line dividing column headers and drag it to a desired position. To rearrange column order, place the cursor on a header and drag it to a desired position.
  - To display only specific subscribers, use the search tool (field, operator, search string) at page top.
  - To display all subscribers, use the search tool with the search string set to \*. If your list of subscribers is extremely large (the system limit is 20,000 records), do not display all subscribers. Apply a filter to display only specific subscribers.
  - To display subscribers in a particular order, use the column-heading sort arrows.
  - To repeat the last search that you performed, click **Refresh**.
- 

### Procedure

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- Step 1** From the Cisco SPS main menu (see [Tip](#) for how to access), click **Subscribers**.
- Step 2** To add a new subscriber, do the following:
- Click **Add**.
  - Enter subscriber information. (Any field that has a red asterisk must have an entry.) Enter each subscriber's first, middle, and last name as might be useful to you for sorting, searching, and filtering. They are not used by Cisco SPS.
- Step 3** To edit or delete an existing subscriber, do the following:
- Locate the subscriber (see tips above) and click to select.
  - To edit subscriber information, do the following:
    - Click **Edit**.
    - Edit fields as needed. A password displays as a series of asterisks (example: \*\*\*\*\*). If a system user has forgotten a password, assign a new one.
    - Click **Submit**.

- c. To delete the subscriber, click **Delete** > **Yes**.
- Step 4** When done, confirm your changes by performing a search to display the new or changed information (see [Tip](#) above).
- 

## What to Do Next

You can continue with any configuration tasks in this guide.

## How to Configure Registries

Use the following procedure to add, edit, or delete a single registry. If you need to add many registries, you can do bulk provisioning as described in the [“How to Import and Export Bulk Data”](#) section on [page 21](#).



**Tip**

A number of sorting and searching tools are available to you:

- To resize a column, place the cursor on the vertical line dividing column headers and drag it to a desired position. To rearrange column order, place the cursor on a header and drag it to a desired position.
  - To display all registries, use the search tool with the search string set to \*. If your list of registries is extremely large (the system limit is 20,000 records), do not display all registries. Apply a filter to display only specific registries.
  - To display registries in a particular order, use the column-heading sort arrows.
  - To repeat the last search that you performed, click **Refresh**.
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### Procedure

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- Step 1** From the Cisco SPS main menu (see [Tip](#) for how to access), click **Registry** (see [Appendix O: Registry Services Directives, page 75](#)).
- Step 2** Display existing registries by performing a search with the search tool (see tips above). Both dynamic and static registries display; you can differentiate dynamic from static by their expiration times.
- Step 3** To add a new registry, do the following:
- a. Click **Add**.
  - b. Enter registry information. (Any field that has a red asterisk must have an entry.)
    - If you set an expiration time, the registry automatically expires from Cisco SPS at the time you specify. However, the data remains in the system until you manually remove it.
    - You cannot use wildcards in a registry. If you want to use wildcards, configure a route instead.
  - c. Click **Submit**.

- Step 4** To edit or delete an existing registry, do the following:
- a. Locate the registry (see tips above) and click to select it.
  - b. To edit the registry, do the following:
    - Click **Edit**.
    - Edit fields as needed.
    - Click **Submit**.
  - c. To delete the registry, click **Delete > Yes**.
- Step 5** When done, confirm your changes by performing a search to display the new or changed information (see tips above).
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## What to Do Next

You can continue with any configuration tasks in this guide.

## How to Configure Routes

A dynamic route is a path through the network that is automatically calculated according to routing protocols and routing update messages. A static route is a fixed path through the network that you explicitly configure. Static routes take precedence over dynamic routes.

Static routes are synchronized among farm members.

Use the following procedure to add, edit, or delete a single route. If you need to add many routes, you can do bulk provisioning as described in the [“How to Import and Export Bulk Data”](#) section on page 21.

**Tip**

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A number of sorting and searching tools are available to you:

- To resize a column, place the cursor on the vertical line dividing column headers and drag it to a desired position. To rearrange column order, place the cursor on a header and drag it to a desired position.
  - To display all routes, use the search tool with the search string set to \*. If your list of routes is extremely large (the system limit is 20,000 records), do not display all routes. Apply a filter to display only specific routes.
  - To display routes in a particular order, use the column-heading sort arrows.
  - To repeat the last search that you performed, click **Refresh**.
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## Procedure

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- Step 1** From the Cisco SPS main menu (see [Tip](#) for how to access), click **Routes** (see [Appendix P: Next Hop Routing Directives, page 79](#)).
- Step 2** Display existing routes by performing a search with the search tool (see tips above).
- Step 3** To add a new route, do the following:
- a. Click **Add**.
  - b. Enter route information. (Any field that has a red asterisk must have an entry.)
  - c. Click **Submit**.
- Step 4** To edit or delete an existing route, do the following:
- a. Locate the route (see tips above) and click to select it.
  - b. To edit the route, do the following:
    - Click **Edit**.
    - Edit fields as needed.
    - Click **Submit**.
  - c. To delete the route, click **Delete > Yes**.
- Step 5** When done, confirm your changes by performing a search to display the new or changed information (see tips above).
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## What to Do Next

You can continue with any configuration tasks in this guide.

## How to Import and Export Bulk Data

You can import and export bulk routing and registry data in comma-separated-value (csv) form. You can manipulate csv data manually or load it into Microsoft Excel for a more user-friendly table format. Each line should contain one registry or routing entry.

### Procedure

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- Step 1** From the Cisco SPS main menu (see [Tip](#) for how to access), click **Registry** or **Routes**.
- Step 2** Right-click the page.
- Step 3** To import data into the GUI-based provisioning system, do the following:
- Click **Import**.
  - Select the source directory and enter the source filename.
  - Click **Import**.  
The data is read into memory and sent to the pserver for parsing and storage.
  - Review status messages and address any errors that are generated during import. Errors can be any of the following:
    - Syntax errors: missing quotes, too many or too few elements in a line
    - Semantic errors: out-of-range values, characters instead of numbers
    - Other errors: database overflow
  - Verify that import is successful by refining your search parameters to display the new data. and clicking **Search**.
- Step 4** To export data from the GUI-based provisioning system, do the following:
- Click **Export**.
  - Select a destination directory and enter a destination filename.
  - Click **Export**.
- 

## How to Configure a User ID

You can configure user IDs on your Cisco SPS—that is, control who, in addition to yourself, can access Cisco SPS and, among those with access, who can change each configurable parameter. To do so, you set up user IDs, optional passwords, and various levels of read-write permission, including read only.

### Procedure

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- Step 1** To edit your own account, do the following:
- From the Cisco SPS main menu (see [Tip](#) for how to access), click **My Account**.
  - Edit fields as needed.
  - Click **Submit**.

- Step 2** To add a new account, do the following:
- From the Cisco SPS main menu (see [Tip](#) for how to access), click **Administrator Accounts**.
  - Click **Add**.
  - Enter account information. (Any field that has a red asterisk must have an entry.)
  - Click **Submit**.
- Step 3** To edit or delete an existing account, do the following:
- From the Cisco SPS main menu (see [Tip](#) for how to access), click **Administrator Accounts**.
  - Locate the account (see tips above) and click to select it.
  - To edit the account, do the following:
    - Click **Edit**.
    - Edit fields as needed. A password displays as a series of asterisks (example: \*\*\*\*\*). If a system user has forgotten a password, assign a new one.
    - Click **Submit**.
  - To delete the account, click **Delete > Yes**.
- Step 4** When done, click **Refresh** to redisplay all accounts, unfiltered.

## How to Configure TLS Support on the Proxy Server



**Note** To learn how to set up Transport Layer Security (TLS) certificates, refer to the [Cisco SIP Proxy Server Installation Guide, Version 2.1](#).

### Procedure

- Step 1** In the (Linux) `/usr/local/sip/conf/` or (Solaris) `/opt/sip/conf` directory, open the Cisco SPS configuration (`sipd.conf`) file using a text editor such as `vi`.
- Step 2** Set the following parameters as needed. (They directly control TLS functionality [see [Table 4](#)].) Except for `Allow Sip Tls Conversion To Sip` and `Sip Tls Enable`, parameters are read-only during start and restart.

*Table 4 TLS Directly Control Parameters*

Parameter Name	Parameter Definition	Parameter Values
<b>Sip Tls Enable</b>	Enables TLS.	Default is Off.
<b>Allow Sip Tls Conversion To Sip</b>	Gives explicit permission for a proxy server to terminate incoming SIPS requests on the SIP contacts. This is a security risk, and should be used very carefully. Use it only if you know in advance that your endpoints and gateways are incapable of receiving sips/TLS connections.	Default is Off.

**Table 4** *TLS Directly Control Parameters (continued)*

Parameter Name	Parameter Definition	Parameter Values
<b>Sip Tls Port</b>	TLS port.	Default is 5061.
<b>Sip Tls Session Timeout</b>	Server-side session cache timeout value, in seconds. Sessions are not reusable after this timeout expires.	Default is 300.
<b>Sip Tls Certificate File</b>	Location of the privacy-enhanced mail (PEM)-encoded certificate file for the server.	—
<b>Sip Tls Certificate Key File</b>	Location of the PEM-encoded private key file for the server.	—
<b>Sip Tls CA Certificate File</b>	Location of certificates of the certification authorities with whose clients Cisco SPS deals. These certificates are used for client authentication. The file is simply a concatenation of the various PEM-encoded certificate files, in order of preference.	—
<b>Sip Tls Mutual Authentication</b>	Directs the server-side TLS to perform mutual authentication when accepting a new connection from TLS clients.	—

- Step 3** Set the following parameters as needed. (They indirectly control TLS functionality [Table 5].)

*Table 5 TLS Indirectly Control Parameters*

Parameter Name	Parameter Definition	Parameter Values
<b>Stateful Server</b>	Enables TLS functionality only when SPS runs in stateful mode.	—
<b>Add Record Route</b>	If the proxy server is not configured to add record routes, disables translation from SIP to SIPS and vice versa.	—
<b>Sip Tcp Reuse Connection</b>	If the proxy server is configured not to reuse TCP connections, also prevents TLS from reusing the connections. This might result in poor performance; hence, whenever you intend to use TLS, set this to On.	—

- Step 4** Save and close the file.
- 

## How to Configure Proxy-Server DNS Behavior

You can configure proxy-server DNS behavior—that is, you can configure varying degree of DNS support, depending on your requirement. You configure the proxy server to locate other SIP services and then you set directives.

### Procedure

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- Step 1** From the Cisco SPS main menu (see [Tip](#) for how to access), click **Farm/Proxies** (see [Appendix Q: DNS Setup, page 83](#)).
- Step 2** Verify that farm label, server root, and proxy domain display automatically if you installed Cisco SPS with the SPS setup (sps\_setup) script. If they do not, enter the information.
- Step 3** Click **Advanced>>**.
- Step 4** Click **SIP Server Core**.
- Step 5** Turn the setting on or off.
- Step 6** Select or type new setting details as needed. (Click **Help** to view context-sensitive online help as needed.) If a setting is Off, all associated directives are grayed out. You can make changes only if the setting is On.

**Step 7** Set the following DNS parameters as needed (see [Table 6](#)):

*Table 6 DNS Parameters*

Parameter Name	Parameter Definition	Parameter Values
<b>Allow Naptr Lookup</b>	Enables naming-authority-pointer (NAPTR) lookup logic on the proxy server.	Default is On. If this parameter is Off, use TransportPrefOrder to select a transport.
<b>Transport PrefOrder</b>	Transport preferences for times when NAPTR cannot be used or is unsuccessful.	TLS_TCP_UDP (default) TLS_UDP_TCP TCP_TLS_UDP TCP_UDP_TLS UDP_TLS_TCP UDP_TCP_TLS TLS_TCP, TLS_UDP TCP_TLS, TCP_UDP UDP_TLS UDP_TCP TLS (if SipTlsEnable is disabled, TLS is ignored) TCP UDP
<b>Srv For Fqdn Only</b>	Enables SRV DNS lookups only on FQDN hosts (an FQDN is a fully qualified domain name). A Request-URI's URL whose host portion is not an IP address and has a period is considered an FQDN. The system normally performs SRV DNS lookup for any host portion that does not contain a target port.	Default is Off.

**Step 8** Set the following proxy-server parameters as needed (see [Table 7](#)):

*Table 7 Proxy-Server Parameters*

Parameter Name	Parameter Definition	Parameter Values
<b>Proxy Address Resolution Type</b>	Type of DNS configuration for SIP services in the proxy-server domain.	<p>IP—No DNS configuration is available; the proxy server should use IP addresses in the headers. This is the default setting.</p> <p>A—DNS is set up with A records corresponding to the ServerName directive. The proxy server uses this value in headers.</p> <p>SRV—If the ServerName directive is not enabled, the proxy server uses its host-name SRV (which indicates that the proxy server domain has SRV records configured), and hence uses the value of the ProxyDomain parameter in headers.</p> <p><b>Note</b> To set up DNS records for the proxy-server domain (Proxy Domain parameter) and proxy-server farm name (Server Name parameter), refer to <a href="#">Cisco SIP Proxy Server Administrator Guide, Version 2.1</a>.</p>
<b>Ip Addr In Path Headers</b>	IP address to be used in Via and Record-Route path headers when Proxy Address Resolution Type parameter is set to IP. If this parameter is not configured, the first value returned from Get Host By Name parameter is used. The primary purpose of this parameter is to control which address is used on multihomed servers.	—

- Step 9** Click **Submit**.
- Step 10** If prompted, click **OK** (to restart later) or **Go to Proxy Control screen** (to restart now). Otherwise, proceed with the next step.
- Step 11** Restart all farm servers:
- a. From the Control Proxy screen, select all farm members.
  - b. Click **Graceful restart > Yes**.
-

