IBCF Processing Support

Users can configure Cisco Unified Border Element (SP Edition) to perform the role of an Interconnection Border Control Function (IBCF) Session Initiation Protocol (SIP) border gateway, both managing requests across a network border between IP Multimedia Subsystem (IMS) core networks and interworking with non-IMS core networks.

When functioning as an IBCF, Cisco Unified Border Element (SP Edition) supports the following IBCF functions:

- Adding to Path header on REGISTER
- Modifying Service Route header
- Routing based on SIP Route headers
- Topology hiding
- Screening of SIP signaling
- IBCF inherit profiles
- Passthrough of From, To, and Contact headers
- Passthrough of request Uniform Resource Identifier (URI) on REGISTER
- Interworking with Proxy Call Session Control Function (P-CSCF), Interrogating Call Session Control Function (I-CSCF, and Serving Call Session Control Function (S-CSCF)
- Handling messages from untrusted domains
- Adding Record-Route headers on outbound messages for adjacencies with IBCF profiles.

Cisco Unified Border Element (SP Edition) was formerly known as Integrated Session Border Controller and may be commonly referred to in this document as the session border controller (SBC).

For a complete description of the commands used in this chapter, refer to the Cisco Unified Border Element (SP Edition) Command Reference: Unified Model at:

For information about all Cisco IOS commands, use the Command Lookup Tool at http://tools.cisco.com/Support/CLILookup or a Cisco IOS master commands list.

Note
For Cisco IOS XE Release 2.4, this feature is supported in the unified model only.
Feature History for IBCF Support

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco IOS XE Release 2.4</td>
<td>This feature was introduced on the Cisco CRS-1 along with support for the unified model.</td>
</tr>
</tbody>
</table>

Contents

This module contains the following sections:

- Restrictions for Implementing IBCF Support, page 56-2
- Information About IBCF Support, page 56-2
- Implementing IBCF Support, page 56-5

Restrictions for Implementing IBCF Support

The following features are not included in the IBCF support:

- Blacklist or whitelist header-values-content-type, content-disposition, and content-language headers
- Blacklist or whitelist MIME bodies
- Session timer
- Co-location with I-CSCF
- Cisco Unified Border Element (SP Edition) does not reject long message bodies.
- Cisco Unified Border Element (SP Edition) does not check the length of SIP bodies.
- Cisco Unified Border Element (SP Edition) does not provide a default implementation of the Encryption User Exit.
- Cisco Unified Border Element (SP Edition) does not hide network devices that are identified by IP addresses.
- Cisco Unified Border Element (SP Edition) does not support the full IBCF handling of failed REGISTERs.
- Cisco Unified Border Element (SP Edition) does not provide interoperability between IMS and other SIP domains.
- The IBCF selection of a new entry point for forwarding REGISTER requests is limited to SIP Server Location procedures (as per IETF RFC 3263) and is applicable only if the initial server selected does not respond.

Information About IBCF Support

This section contains the following subsections:

- Adding to Path Header on REGISTER, page 56-3
- Modifying Service-Route Header on REGISTER, page 56-3
- Routing Based on SIP Route Headers, page 56-3
Adding to Path Header on REGISTER

When Cisco Unified Border Element (SP Edition) is configured to perform the role of an IBCF gateway, the IBCF adds itself to the Path header to ensure that all INVITE requests to the subscriber are routed via the IBCF.

Modifying Service-Route Header on REGISTER

The Service-Route header is analogous to the Path header, but it is used to specify the list of devices a call should traverse for calls originating from a subscriber. By default, the IBCF does not modify the Service-Route header sent on REGISTER responses. However, if topology hiding is required, then the IBCF encrypts the header elements that match its configured HomeNetworkId.

Routing Based on SIP Route Headers

You can configure Cisco Unified Border Element (SP Edition) to route Dialog-creating requests, such as INVITE, to the next hop-IP address based on the Route header, which ensures that the SIP messages go through the specified border gateways between networks and the S-CSCF that handled the User Agent (UA) REGISTER.

Topology Hiding

Cisco Unified Border Element (SP Edition) hides those parts of the routing-related headers that reveal the internal topology of the SBC network. But this feature also ensures that the headers are usable for INVITE requests and other methods.

Screening of SIP Signaling

When configured to perform the role of an IBCF gateway, Cisco Unified Border Element (SP Edition) does not screen certain SIP headers using profile whitelists and blacklists.

IBCF Inherit Profiles

IBCF inherit profiles comprise a collection of related configuration appropriate to a particular network role. IBCF Inherit profiles may be configured for an application on a per-adjacency basis.
Cisco Unified Border Element (SP Edition) supports the following IBCF inherit profiles:

- preset-ibcf-ext-untrusted
- preset-ibcf-external
- preset-ibcf-internal

Use of an IBCF inherit profile dynamically assigns a method profile, header profile, and/or option profile to a call based on the inherit-profile selected. Table 56-1 shows which IBCF inherit profile has an effect on which specific method profile, header profile, and option profile.

The effect is not visible in the adjacency configuration for header-profile, method-profile or option profiles, and can be overridden by explicit configuration of header, method, option profiles as needed.

**Table 56-1  Effect of IBCF Inherit Profiles on Method, Header and Option Profiles**

<table>
<thead>
<tr>
<th>IBCF Inherit Profile</th>
<th>Method Profile</th>
<th>Header Profile</th>
<th>Option Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>preset-ibcf-utr-out-mth</td>
<td></td>
<td>preset-ibcf-utr-out-opt</td>
</tr>
<tr>
<td></td>
<td>Type: Blacklist</td>
<td>Actions: No methods rejected</td>
<td>Type: Blacklist</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Actions: No options (passes on all)</td>
</tr>
<tr>
<td></td>
<td>preset-ibcf-ext-out-mth</td>
<td></td>
<td>preset-ibcf-ext-out-opt</td>
</tr>
<tr>
<td></td>
<td>Type: Blacklist</td>
<td>Actions: No headers (passes all)</td>
<td>Type: Blacklist</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Actions: No options (passes on all)</td>
</tr>
<tr>
<td></td>
<td>preset-ibcf-int-out-mth</td>
<td></td>
<td>preset-ibcf-int-out-opt</td>
</tr>
<tr>
<td></td>
<td>Type: Blacklist</td>
<td>Actions: Removes no headers (passes all)</td>
<td>Type: Blacklist</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Actions: No options (passes on all)</td>
</tr>
</tbody>
</table>

The table shows the effect of each IBCF inherit profile on the method, header, and option profiles. For example, the preset-ibcf-ext-untrusted profile sets the method profile to preset-ibcf-utr-in-mth and preset-ibcf-utr-out-mth, with the type being Blacklist and actions indicating no methods rejected.
Passthrough of From, To, and Contact Headers

For Dialog-creating and Out-of-dialog requests, Cisco Unified Border Element (SP Edition) allows the From, To, and Contact header URIs to pass through without modifying them. For dialog headers, Cisco Unified Border Element (SP Edition) uses the values corresponding to those on the Out-of-dialog requests.

Passthrough of Request URI on REGISTER

Cisco Unified Border Element (SP Edition) allows the Request URI on a REGISTER message to pass through without modifying it.

Interworking with P-CSCF, I-CSCF, and S-CSCF

When performing the role of an IBCF gateway, Cisco Unified Border Element (SP Edition) allows the CSCF-specific headers on SIP messages to pass through.

Handling Messages from Untrusted Domains

When Cisco Unified Border Element (SP Edition) is acting as an IBCF entry point, it handles out-of-dialog requests from untrusted domains as follows:

- Cisco Unified Border Element (SP Edition) rejects all REGISTER requests with a 403 response.
- Cisco Unified Border Element (SP Edition) removes all P-Asserted-Identity headers, P-Access-Network-Info headers, P-Charging-Vector headers, and P-Charging-Function-Address headers from other requests.
- Cisco Unified Border Element (SP Edition) rejects requests if the router contains the Orig parameter.

Implementing IBCF Support

Configuring the Domain Names to Use for IBCF Adjacencies

SUMMARY STEPS

1. configure terminal
2. sbc service-name
3. sbe
4. sip home network identifier domain-name
5. sip encryption key string
6. adjacency sip adjacency-name
7. inherit profile preset-ibcf-internal
8. home network identifier domain-name
## Implementing IBCF Support

9. **encryption key** *string*

10. **exit**

### DETAILED STEPS

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>configure terminal</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>Router# configure terminal</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>sbc service-name</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>Router(config)# sbc mysbc</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>sbe</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>Router(config-sbc)# sbe</td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td>sip home network identifier <em>domain-name</em></td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>Router(config-sbc-sbe)# sip home network identifier mydomain.com</td>
</tr>
<tr>
<td><strong>Step 5</strong></td>
<td>sip encryption key <em>string</em></td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>Router(config-sbc-sbe)# encryption key code1</td>
</tr>
<tr>
<td><strong>Step 6</strong></td>
<td>adjacency sip adjacency-name</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>Router(config-sbc-sbe)# adjacency sip sipadj</td>
</tr>
<tr>
<td><strong>Step 7</strong></td>
<td>inherit profile preset-ibcf-internal</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>Router(config-sbe-adj-sip)# inherit profile preset-ibcf-internal</td>
</tr>
<tr>
<td><strong>Step 8</strong></td>
<td>home network identifier <em>network-name</em></td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>Router(config-sbc-sbe-adj-sip)# home network identifier Cisco.com</td>
</tr>
</tbody>
</table>
### Command or Action

**Step 9**

**encryption key string**

**Example:**
```
Router(config-sbc-sbe-adj-sip)# encryption key code2
```

**Purpose**

Configures an encryption key on the SIP IBCF adjacency.

- Use the `string` argument to specify the encryption key for the SIP IBCF adjacency.

**Step 10**

**exit**

**Example:**
```
Router(config-sbc-sbe-adj-sip)# exit
```

**Purpose**

Exits the SIP adjacency mode to the SBE mode.