Cisco BTS 10200 Softswitch SIP P-Charge-Info Header Feature, Release 6.0.4

Last Updated: May 14, 2012

The support for the SIP P-Charge-Info Header feature allows the Cisco BTS 10200 Softswitch to convey the charge party information of a call.

Note
This implementation is based on the IETF document: P-Charge-Info—A Private Header (P-Header) Extension to the Session Initiation Protocol (SIP) draft-york-sipping-p-charge-info-08.

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Overview of the Feature

The BTS 10200 Softswitch identifies the caller to be charged for a call using the following headers:

- P-Asserted-Identity
- FROM header
- P-DCS-Billing-Info (if enabled)
- Diversion Header

The identity or number collected is received by the SIP User Agent (UA), and displayed to the end user. This number is also used for billing purposes by the network entities involved in carrying out the session.
Overview of the Feature

However, in some network configurations, the caller ID presented to the receiving UA may be different from the number desired for billing purposes. The SIP P-Charge-Info header fulfills the need to pass an additional billing identifier that is used to convey the billing information about the calling party. This identifier is used between network entities for accurate billing of services.

Prerequisites

A prerequisite for SIP P-Charge-Info header feature is that all inbound calls to the BTS 10200 Softswitch should be from trusted entities, and provide a trusted Universal Resource Identifier (URI).

Additionally, the SIP P-charge-Info header is applicable only within a single private administrative domain, or between different administrative domains having a trust relationship.

P-Charge-Info Header in Outbound Calls

For outbound calls, BTS 10200 Softswitch SIP interface creates a SIP invite message and checks if the ENABLE_P_CHARGE_INFO_HDR token is set to SEND_ONLY/SEND_RECV in the SOFTSW_TG_PROFILE table. When enabled, BTS 10200 Softswitch adds the P-Charge-Info header to the outbound invite message.

The P-charge-Info header consists of a SIP URI that indicates the number to be charged for the session. It may also contain optional parameters, such as Nature Of Address (NOA) and Numbering Plan Indicator (NPI). The NPI and NOA are used when the ISUP charge number value needs to be sent as part of P-Charge-Info header. The ISUP charge number is required in a SIP message when SIP is used to connect two PSTN segment and charging information is conveyed between them.

The NOA/NPI parameters are sent in the P-Charge-Info header only if ENABLE_NOA_NPI_IN_P_CHARGE is set to true in softsw_tg_profile.

Additionally, the routing number (RN) parameter will be sent in P-Charge-Info header in the outgoing invite if ENABLE_JIP_IN_P_CHARGE is set to true in the outgoing trunk-group profile.

A JIP value in the RN is always a six digit number (NPA-NXX). For direct calls, the JIP value in the RN parameter is populated from the POP associated with the main subscriber ID of calling party's ANI screening. For forwarded calls, this value is populated from the POP associated with the main subscriber ID found in the ANI screening of the diversion header.

Note

If the ANI screening fails, and ani_screening_action is set to “ALLOW”, the JIP value in the RN parameter is populated from the POP associated with the trunk group.

Example of P-Charge-Info Header in a SIP INVITE

```
P-Charge-Info: sip:4075555555@sia-SYS04CA146.ipclab.cisco.com
```

Example of a P-Charge-Info Header with NOA/NPI parameter

```
P-Charge-Info: <sip:6835555555@sia-SYS04CA146.ipclab.cisco.com>;npi=ISDN;noa=3
```

The NPI parameter may contain these values:

- 000—unknown (no interpretation)
- 001—ISDN (Telephony) numbering plan (Recommendation E-164)
Overview of the Feature

SIP P-Charge-Info Header

Example of P-Charge-Info-header with the RN parameter:

```
P-Charge-Info: <sip:4075555555@sia-SYS04CA146.ipclab.cisco.com;rm=407555>
```

Note

In case the charge number is not received in the incoming invite, or the incoming charge number is not processed, the NPI of the charge number is used instead; else the default value of NPI is taken as ISDN. The NOA is populated with the default value 3.

The ENABLE_P_CHARGE_INFO_HDR token can only be set to SEND_ONLY/SEND_RECV/RECV_ONLY when the ENABLE_P_DCS_BILLING_INFO_HDR token present in SOFTSW_TG_PROFILE table is set to N.

P-Charge-Info Header in Inbound Calls

When the P-Charge-Info header feature is activated (in case of inbound calls), the P-Charge-Info field is used exclusively to populate the charging party information. The ENABLE_P_CHARGE_INFO_HDR should be set to RECV_ONLY/SEND_RECV in the softsw_tg_profile of the incoming trunk group. Absence of a P-Charge-Info header or disabling the feature indicates that charge party information is not available. In such scenarios, the charge number is generated in the billing record as being done currently in BTS10200, and the same number is sent in the outgoing invite of the P-Charge-Info header.
If the charging information is not received, or it is not processed due to disability of flags, and the diversion header is present in the incoming invite, the diversion header is used to send the charging information in the P-Charge-Info header of the outgoing invite.

**Note**
When the `ENABLE_P_CHARGE_INFO_HDR` is set to `IGNORE`, a P-Charge-Info header received in the invite message is ignored by BTS 10200 Softswitch.

**Note**
If carrier routing is provisioned, the `send_CN` token in the `CARRIER` table should be enabled to send the charge number in the outbound SIP INVITE message.

**Provisioning the Feature**

This section explains how to provision the feature. In this procedure, “you” refers to the service provider.

**Note**
The commands shown in this section are only examples; you need to enter values that are appropriate for your network and service requirements. The CLI syntax allows you to use commands in uppercase or lowercase. It also allows you to enter hyphens (-) or underscores (_) interchangeably. (Exceptions, if any, are noted in the procedures.)

For a complete list of tokens for each CLI table, as well as the allowed values, default values, and detailed descriptions for each token, see the *Cisco BTS 10200 Softswitch CLI Database* at this website: [http://www.cisco.com/en/US/docs/voice_ip_comm/bts/6.0.4/BTS604_Mainpage.html](http://www.cisco.com/en/US/docs/voice_ip_comm/bts/6.0.4/BTS604_Mainpage.html)

**SUMMARY STEPS**

1. `add softsw_tg_profile`
2. `change softsw_tg_profile`
DETAILED STEPS

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>The <code>ENABLE_P_CHARGE_INFO_HDR</code> in the softswitch trunk group profile table specifies whether to process the P-Charge-Info header when received in the invite message, and/or insert the P-Charge-Info header in the outgoing invite message.</td>
</tr>
<tr>
<td><code>add softsw_tg_profile id=tg_profile-1; ENABLE_P_CHARGE_INFO_HDR = SEND_RECV;</code></td>
<td>The <code>ENABLE_P_CHARGE_INFO_HDR</code> in the softswitch trunk group profile table specifies whether to process the P-Charge-Info header when received in the invite message, and/or insert the P-Charge-Info header in the outgoing invite message. The <code>ENABLE_P_DCS_BILLING_INFO_HDR</code> token in the <code>SOFTSW_TG_PROFILE</code> table must be disabled to enable the P-Charge-Info header feature.</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>The <code>ENABLE_JIP_IN_P_CHARGE</code> in the softswitch trunk group profile table specifies whether or not to send the RN parameter in the p-charge-info header in the outgoing invite.</td>
</tr>
<tr>
<td><code>change softsw_tg_profile id=tg_profile-1; ENABLE_JIP_IN_P_CHARGE = Y</code></td>
<td>The <code>ENABLE_JIP_IN_P_CHARGE</code> in the softswitch trunk group profile table specifies whether or not to send the RN parameter in the p-charge-info header in the outgoing invite. <strong>Note</strong> The <code>ENABLE_JIP_IN_P_CHARGE</code> can be set to <code>Y</code> only when the <code>ENABLE_P_CHARGE_INFO_HDR</code> is set to <code>SEND_ONLY</code> or <code>SEND_RECV</code>.</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>The <code>ENABLE_NOA_NPI_IN_P_CHARGE</code> in the softswitch trunk group profile table specifies whether or not to send the NOA and NPI parameters to the p-charge-info-header in the outgoing invite.</td>
</tr>
<tr>
<td><code>change softsw_tg_profile id=tg_profile-1; ENABLE_NOA_NPI_IN_P_CHARGE = Y</code></td>
<td>The <code>ENABLE_NOA_NPI_IN_P_CHARGE</code> in the softswitch trunk group profile table specifies whether or not to send the NOA and NPI parameters to the p-charge-info-header in the outgoing invite. <strong>Note</strong> The <code>ENABLE_NOA_NPI_IN_P_CHARGE</code> can be set to <code>Y</code> only when the <code>ENABLE_P_CHARGE_INFO_HDR</code> is set to <code>SEND_ONLY</code> or <code>SEND_RECV</code>.</td>
</tr>
</tbody>
</table>

Managing the Feature

Table 1 shows how the charge (number) information in the outgoing invite is populated in the SIP invite based on these token values: `ENABLE_P_CHARGE_INFO_HDR= SEND_RECV`, `ENABLE_P_DCS_BILLING_INFO_HDR= N`, and `USE_PA1_HDR_FOR_ANI= Y`.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Charge Number Information in SIP Invite</th>
</tr>
</thead>
</table>

SIP P-Charge-Info Header
### Managing the Feature

#### SIP P-Charge-Info Header

<table>
<thead>
<tr>
<th>p-charge-info</th>
<th>p-asserted d-ID</th>
<th>From</th>
<th>Diversion</th>
<th>Outgoing Invite result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>N/Y</td>
<td>Y</td>
<td>N/Y</td>
<td>The outgoing P-Charge-Info header corresponds to the charge number in the incoming P-Charge-Info header.</td>
</tr>
<tr>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>The outgoing P-Charge-Info header is sent using the calling number in the FROM header as the charge number.</td>
</tr>
<tr>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Outgoing P-Charge Info Header is sent using the calling number in the DIVERSION header as the charge number.</td>
</tr>
<tr>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>The outgoing P-Charge Info Header is sent using the redirection number in the DIVERSION header as the charge number.</td>
</tr>
</tbody>
</table>

#### Note

The above table is applicable when the call forwarding feature is not invoked.

The BTS 10200 sends the P-Charge-Info header in the outgoing INVITE in the following scenarios. Note that the `ENABLE_P_CHARGE_INFO_HDR` should be `SEND_ONLY/SEND_RECV`.

- The incoming INVITE had P-Charge-Info or P-DCS-Billing-INFO header, or a Diversion header information.
- The incoming Initial Address Message (IAM) had charge number.
- When a call is forwarded from a BTS 10200 subscriber to a SIP trunk-group.
- When an incoming trunk group has main subscriber ID, and has a billing DN associated with it. And, the call is routed to a SIP trunk group.
- The incoming trunk group has ANI screening enabled, and ANI screening has a main subscriber ID with a billing DN associated with it. The ANI screening is passed, and call is routed to a SIP trunk group.
- When a 8XX or LNP query returns a charge number.
- All direct calls where the charge number and calling number are the same.
Additional References

Related Documents

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<th>Related Topic</th>
<th>Document Title</th>
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<tr>
<td>Summary of features and usage guidelines for this release</td>
<td>Cisco BTS 10200 Softswitch Release Notes</td>
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<tr>
<td>Reference listing of all CLI tables and tokens</td>
<td>Cisco BTS 10200 Softswitch CLI Database</td>
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<td>SIP Trunks and SIP Trunk Provisioning Example</td>
<td>Cisco BTS 10200 Softswitch SIP Guide, Release 6.0.4</td>
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<tr>
<td>SIP Subscribers</td>
<td>Cisco BTS 10200 Softswitch Provisioning Guide, Release 6.0.4</td>
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Standards

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