EdgeMarc
Back-to-Back User Agent (B2BUA)

User Guide

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Documentation History

Table 1. Revision History

Date	Version	Author	Comments
1/21/2012	1	Daniel Loftus, Trish McBride	This is the first release of this document.

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Preface

Document Purpose

This document explains how to configure the B2BUA feature on the EdgeMarc.

Document Audience

This document is written for Network and System Administrators.

Typographic Conventions

Task steps are presented in numbered lists. Command Line Interface (CLI) output displays in `courier font`. Button names and text fields are displayed in **bold face** type.



Note

Notes emphasize information that is important or that has special interest.



Tip

Tips draw your attention to useful information in addition to that provided in a procedure.



Caution

Cautions indicate situations in which proper procedures must be followed to avoid the risk of data loss or equipment damage.



Warning

Warnings indicate situations in which proper procedures must be followed to avoid the risk of bodily injury.

Related Documentation

The following documents provided additional information related to this guide.

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- *VoIP Operating System (VOS) for EdgeMarc User Manual*

You can download this document and any additional application notes to help you configure, administer, and troubleshoot your EdgeMarc appliance from http://www.edgewaternetworks.com/kb.

Contact and Support Information

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1

Overview

The EdgeMarc Back-to-Back User Agent (B2BUA) enables the EdgeMarc to control all aspects of a call that are defined in a SIP INVITE request or in subsequent SIP methods that inherit the header contents of a SIP INVITE request. Because the B2BUA can control these definitions, it provides the system administrator with the ability to finely tune the rules by which SIP traffic is distributed between a SIP Server and a PBX on your network.

As a B2BUA, the EdgeMarc can establish rules that help route SIP INVITE requests more quickly, enforce SIP session security policies, and manipulate the headers of SIP INVITE requests so that SIP traffic is normalized. In a few cases, it may be more advantageous to use the ALG to route SIP INVITE requests, but if the requirements of your network include the reliable distribution of traffic between a variety of PBXs, because of the wider scope of the B2BUA's impact upon individual calls, it is recommended that you use the B2BUA.

The following table details the unique advantages of the B2BUA and ALG.

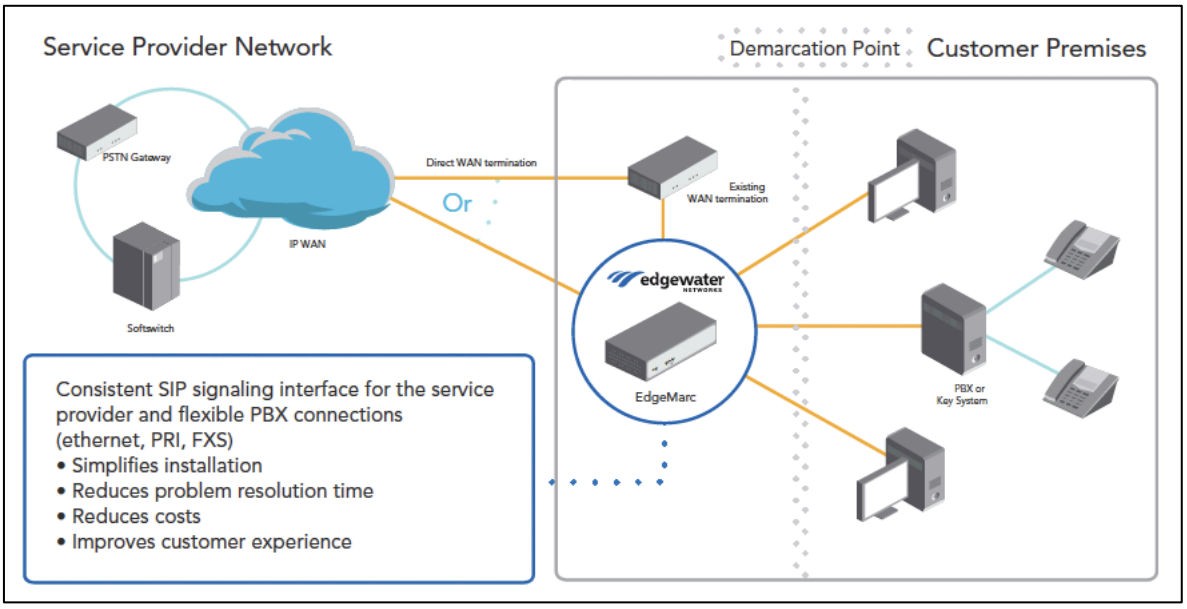
Table 2. Unique Advantages of B2BUA and ALG

If...	Use the B2BUA	Use the ALG
The EdgeMarc is primarily operating within a hosted-type network topology.		X
The EdgeMarc will function in both proxy and transparent proxy mode during the call.		X
Your network topology includes a variety of PBXs, or includes older PBXs that do not have the ability perform SIP registrations.	X	
Your network topology includes legacy PBXs that do not have the ability perform SIP registrations.	X	
Your network requires normalization of SIP headers.	X	
The EdgeMarc will switch between proxy and transparent proxy mode on a per-call basis.	X	

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The following figure illustrates a standard network topology within which the B2BUA feature can be deployed.

Figure 1. The EdgeMarc as a proxy between the Softswitch and a LAN-side PBX



Inbound Calls

Before being routed to a trunking device, the headers of inbound SIP INVITE requests can be modified to match the requirements of a PBX.

The EdgeMarc can route inbound SIP INVITE requests from the SIP Server to the PBX, from the SIP server to a local SIP client, or from the SIP server to any SIP client with a valid URI. Inbound calls can be routed from the SIP Server to the EdgeMarc's FXO or FXS ports. Inbound calls can also be placed in a queue such that if the call fails, the call will be rerouted to any valid SIP URI.

Outbound Calls

Before being routed to the SIP Server, the headers of outbound SIP INVITE requests between the PBX and the SIP Server can be modified to match the requirements of the SIP Server.

The EdgeMarc can restrict outbound calls so that they are routed only between the PBX and the SIP Server. The EdgeMarc can change any headers in a subset of the SIP INVITE requests it routes between a SIP Server and the PBX. The EdgeMarc can also forward outbound calls to a sequential list of SIP URIs on the LAN or elsewhere, if the initial SIP INVITE request is rejected.

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Tip

Before configuring the settings on the B2BUA Trunking Settings Page, plan how SIP traffic will flow between LAN endpoints and the SIP Server.

Define which actions the EdgeMarc should take for both inbound and outbound SIP INVITE requests, solely for outbound SIP INVITE requests, and solely for inbound SIP INVITE requests.

Determine the scope of each operation that the EdgeMarc will perform. The EdgeMarc can perform an operation for calls between the SIP Server and the SIP client, calls between the IP PBX and the SIP Server, and calls between the SIP client and the IP PBX. In the EdgeMarc's web GUI, each operation can be defined independently of the call's designation as outbound or inbound. Additionally, you can restrict each operation to a subset of calls, based on patterns which are shared by a subset of DIDs.

See Configuring the Actions Settings and Configuring the Match Settings for examples and details of the operations which an EdgeMarc can perform with outbound and inbound SIP INVITE requests.

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2

Setting up the EdgeMarc as a B2BUA

This section describes how to set up the EdgeMarc as a B2BUA using the B2BUA Trunking Settings page on the EdgeMarc's web GUI.

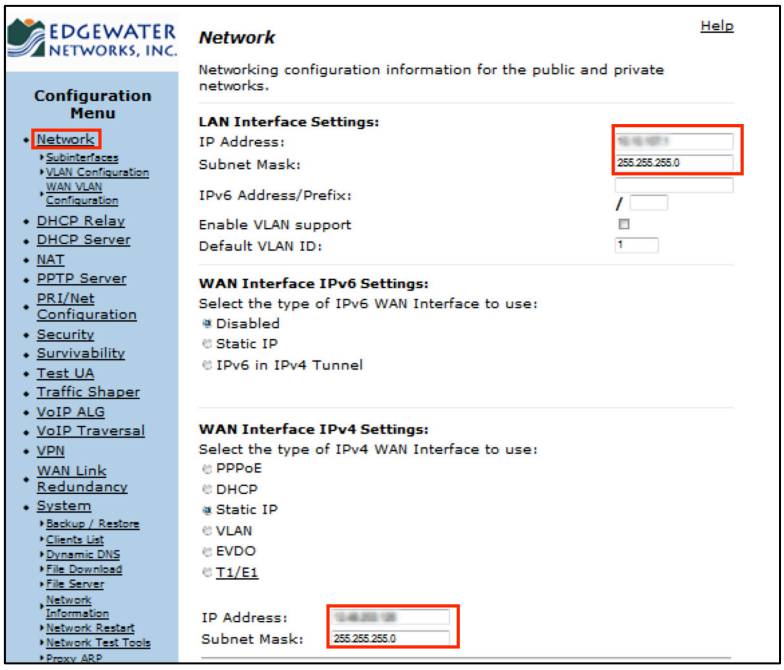
Before Getting Started

Configure the settings on the following pages of the EdgeMarc's web GUI:

- Network Settings Page: at a minimum, the **LAN IP Address** and **WAN IP Address interface** settings must be configured.

  The following figure displays the link to the SIP Settings Page in the EdgeMarc's web GUI's left-hand navigation pane. It also displays the location of the fields on the Network Settings Page that must be configured.

Figure 2. LAN and WAN Settings on the Network Settings Page



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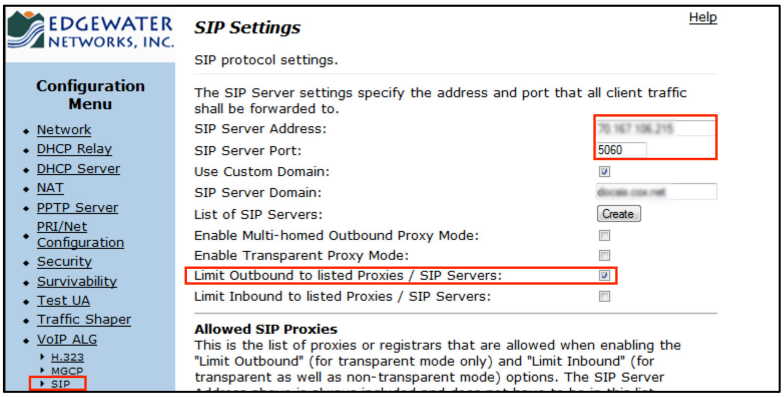
- SIP Settings Page: at a minimum, the SIP Server's **IP Address** and **Port settings** must be configured.

Tip

On the SIP Settings Page, enable the **Outbound to listed Proxies / SIP Servers** checkbox to ensure that the EdgeMarc only forwards outbound / inbound SIP messages received from the PBX to the SIP Server.

The following figure displays the link to the SIP Settings Page in the EdgeMarc's web GUI's left-hand navigation pane. It also displays the location of the fields on the SIP Settings Page that should be configured.

Figure 3. Required SIP Server Settings on the SIP Settings Page



Gather the following information for each PBX connected to the EdgeMarc:

- The LAN IP address of the PBX and the PBX's port number (usually 5060) (or)
- The username and password by which the EdgeMarc can authenticate the PBX. Retrieve these settings from the PBX.
- If the SIP Server requires registration, but the PBX cannot register with the SIP Server, retrieve the username and password for the pilot DID. The EdgeMarc will use these credentials to register on behalf of the PBX.
- If the EdgeMarc will be forwarding calls from the SIP Server or the PBX to a SIP Phone that is not registered with the PBX, retrieve that phone's SIP URI.

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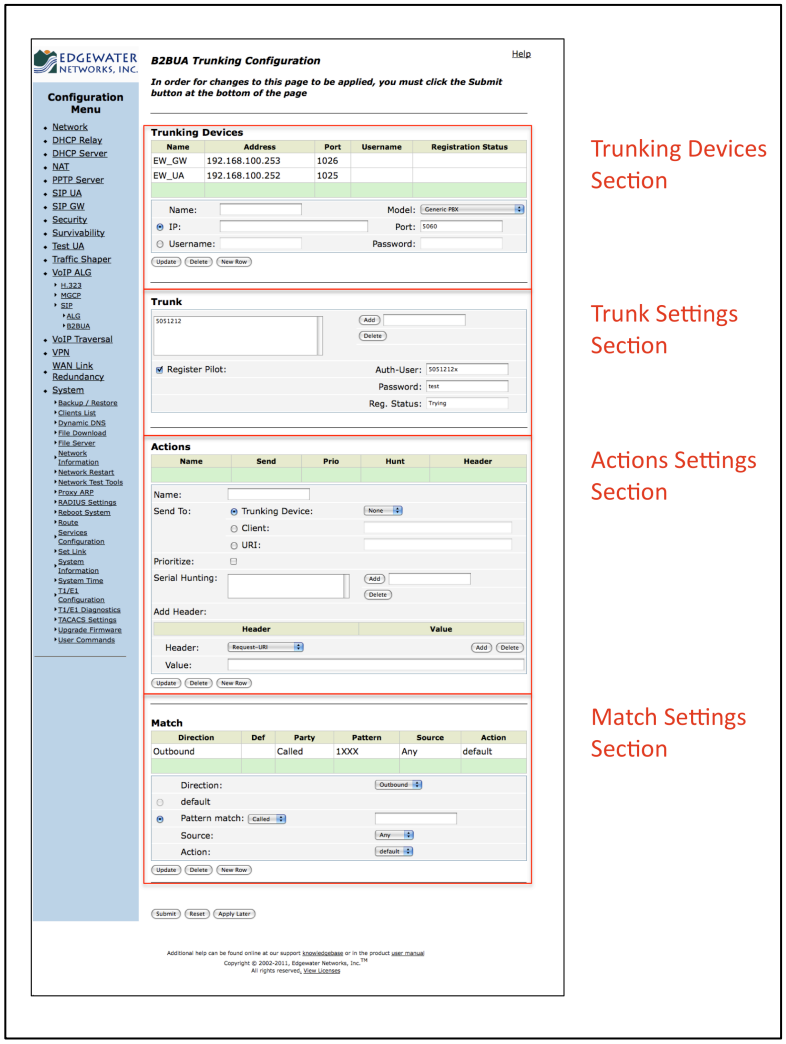
B2BUA Trunking Settings Page

The B2BUA Trunking Settings Page contains the following four sections:

- Trunking Devices
- Trunk
- Actions
- Match

The following figure displays the four sections of the B2BUA Trunking Settings Page.

Figure 4. B2BUA Trunking Settings Page



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Note

Click **Update** to update each section's settings. Note that clicking **Update** updates the page display and has no effect upon the EdgeMarc. To save changes to the EdgeMarc, click **Submit** at the bottom of the page.

To make a new entry in the tables, click **New Row**.

Configuring the B2BUA Trunking Settings Page

Here are the steps to configure B2BUA settings for the EdgeMarc:

Step 1. Configure Trunking Devices Settings

Step 2. Configure Trunk Settings

Step 3. Configure Actions Settings

Step 4. Configure Match Settings

Step 1. Configure Trunking Devices Settings

You can configure the Trunking Devices section to enable the EdgeMarc to identify the PBX. If this PBX has a static IP address, the EdgeMarc can establish a connection with the PBX using its IP address and port number. If the PBX has a dynamic IP address, the PBX must provide the EdgeMarc with its IP address (i.e., register with the EdgeMarc) before you complete the Trunking Devices section.



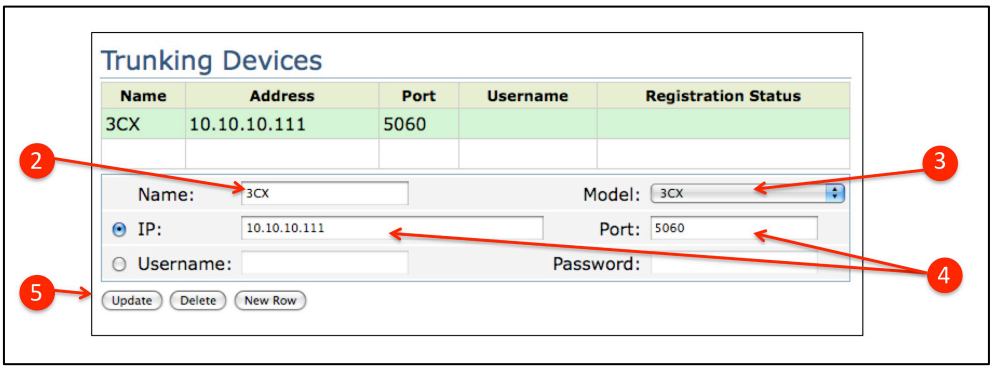
Note

Review the list of PBX Configuration Instructions at http://www.edgewaternetworks.com/edgemarc_interop.htm. If Configuration Instructions for your PBX are listed, use those instructions to set up your PBX for use with the EdgeMarc.

If the PBX uses a static IP address, refer to the following figure and configure these settings:

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Figure 5. Trunking Devices Settings Section with a PBX Using a Static IP Address



1. From the EdgeMarc's web GUI, select **VoIP ALG > SIP > B2BUA**.
2. In the **Name** text field, enter a name by which the EdgeMarc can identify the PBX.
3. In the **Model** text field, select the PBX Model type.

Note

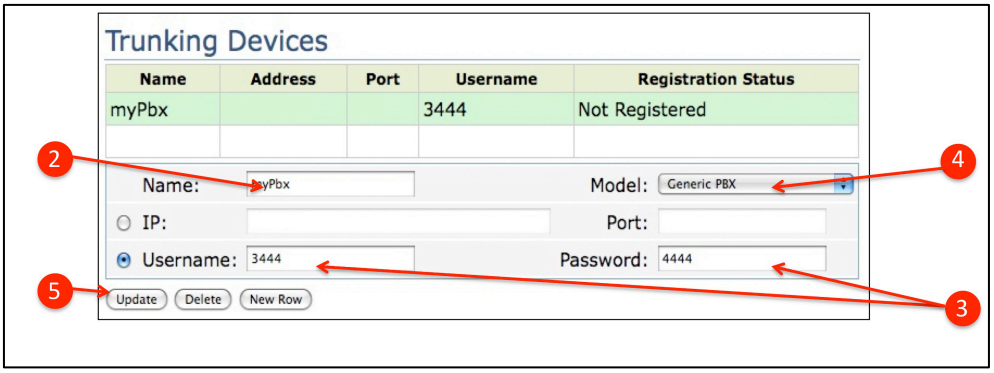
If your PBX is not listed, select "Generic PBX" from the dropdown menu.

4. In the **IP** field, enter the IP address and in the **Port** field, enter its corresponding SIP Port.
5. At the bottom of the Trunking Devices section, click **Update** to update the page settings.

   The PBX displays in the Trunking Devices Table.

If the PBX has a dynamic IP address, refer to the following figure and configure these settings:

Figure 6. Trunking Devices Settings Section with a PBX using a Dynamic IP Address



1. From the EdgeMarc's web GUI, select **VoIP ALG > SIP > B2BUA**.
2. In the **Name** text field, enter a name by which the EdgeMarc can identify the PBX.
3. In the **Username** and **Password** text fields, enter the authentication credentials (supplied by the PBX) by which the EdgeMarc can identify the PBX.
4. From the **Model** dropdown menu, select the PBX model.

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Note

If your PBX does not appear in the dropdown menu, select Generic PBX. PBXs that are not in the dropdown menu have not been tested by Edgewater Networks for interoperability.

5. At the bottom of the Trunking Devices section, click **Update** to update the page settings.

   The PBX displays in the Trunking Devices Table.

Tip

The EdgeMarc can establish a relationship with multiple PBXs. Refer to Configure Additional Trunking Devices in the Trunking Devices Settings for an example configuration of the Trunking Devices Section with more than one PBX connected to the EdgeMarc.

Step 2. Configure Trunk Settings

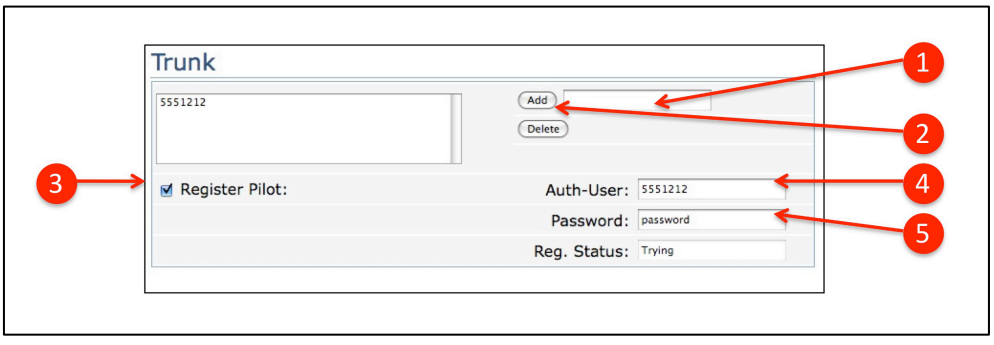
To enable the EdgeMarc as a B2BUA between a PBX and the SIP Server, some PBXs require the EdgeMarc to register the Pilot DID of the PBX with the SIP Server. You can enable the EdgeMarc to register the pilot DID of the PBX with the SIP Server in the Trunk Settings section.

Tip

If your network topology includes multiple PBXs, the EdgeMarc can register only one pilot DID. Determine the PBX that should register its pilot DID. For more information about establishing a connection between multiple PBXs and the EdgeMarc, refer to the Appendix.

Refer to the following figure, and configure these settings:

Figure 7. Trunk Settings Section



1. In the text field to the right of the **Add** button, enter the pilot DID.
2. Click **Add**.

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The DID displays in the list to the left of the **Add** button.

3. Enable the **Register Pilot** checkbox.
4. If the username used to register the Pilot ID differs from the DID number, enter this name in the **Auth-User** text field.
5. Enter the password used to register the DID in the **Password** text field.
6. Scroll to the bottom of the page and click **Submit** to initiate registration of the Pilot DID.

   The page is refreshed. If the trunking device has registered with the EdgeMarc, the Registration status column in the Trunking Devices table for the trunking device will display “Registered”. The Address and Port columns will be updated with the address information from the Contact header of the Register request sent from the EdgeMarc to the SIP Server.

Step 3. Configure Actions Settings

You can configure settings in the Actions Settings section to define operations that the EdgeMarc can perform between selected devices as a B2BUA. The EdgeMarc can perform the following operations:

- Send SIP INVITE requests to a PBX or another SIP URI
- Prioritize a SIP INVITE request
- Place a SIP INVITE request into a queue
- Manipulate the header of a SIP INVITE request to increase interoperability or traceability between LAN endpoints and the SIP Server.



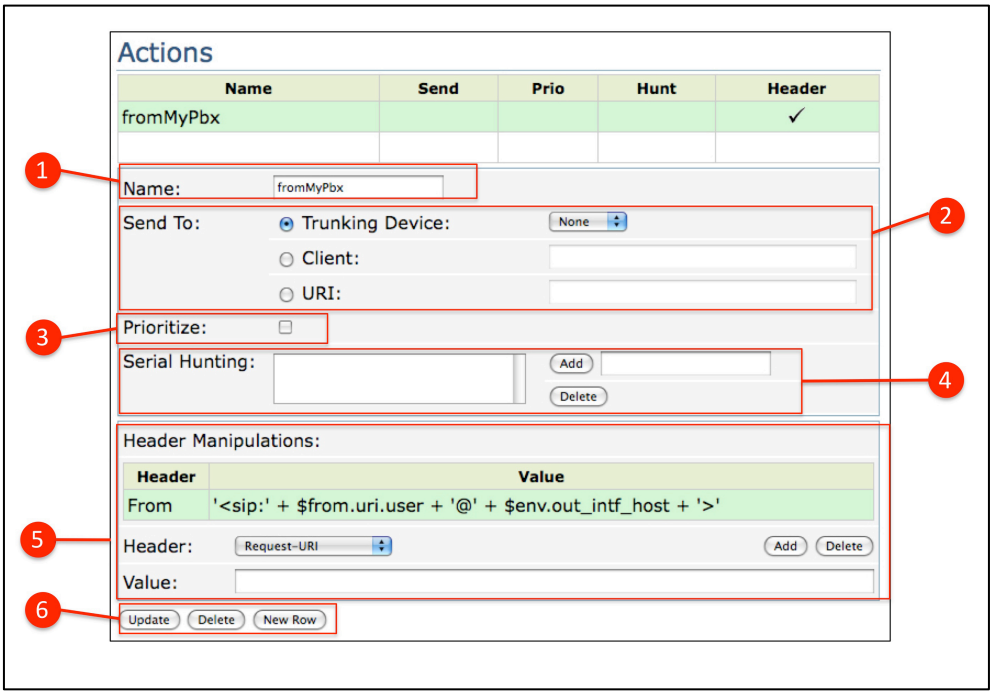
Note

Instances of Actions that are configured in this section will be enabled only if they are saved and selected from the dropdown menu in the Match Settings section.

Refer to the following figure, and configure these settings:

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Figure 8. Actions Settings Section



1. In the **Name** text field, enter a name for the Action. This is the name by which the EdgeMarc will identify the Action in the Match section that follows the Actions Settings section.
2. If the EdgeMarc should apply this Action to inbound SIP INVITE requests, in the **Send To** section, select the device to which the EdgeMarc should direct the inbound SIP INVITE request:
    a. If the EdgeMarc should direct the SIP INVITE request to the PBX as defined in the Trunking Devices Settings section, select the PBX from the **Trunking Device** dropdown menu.



Note

The EdgeMarc also lists any groups of FXS or FXO ports in the **Send To Trunking Device** dropdown menu. These port groups are listed in the Trunking Devices section table as EW_UA and EW_GW, respectively. Only EdgeMarcs with FXS or FXO ports will display these trunking devices.

    b. If the EdgeMarc should direct calls to a SIP client with a DID behind the EdgeMarc (as defined on the SIP Client's list web GUI page), specify the SIP client's DID in the **Client** text field.
    c. If the EdgeMarc should direct calls to a local or public SIP client with a SIP URI, specify the full SIP URI in the **URI** text field.
    d. If the EdgeMarc should apply this action to outbound SIP INVITE requests, in the **Send To** section, confirm that **None** is selected from the Trunking Device dropdown menu.

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Warning

For Actions applying to outbound SIP INVITE requests that are directed to the SIP Server, **None** must be selected from the **Send To** dropdown menu in order for the message to reach the SIP Server. Failure to specify **None** will result in the message not reaching the SIP Server.

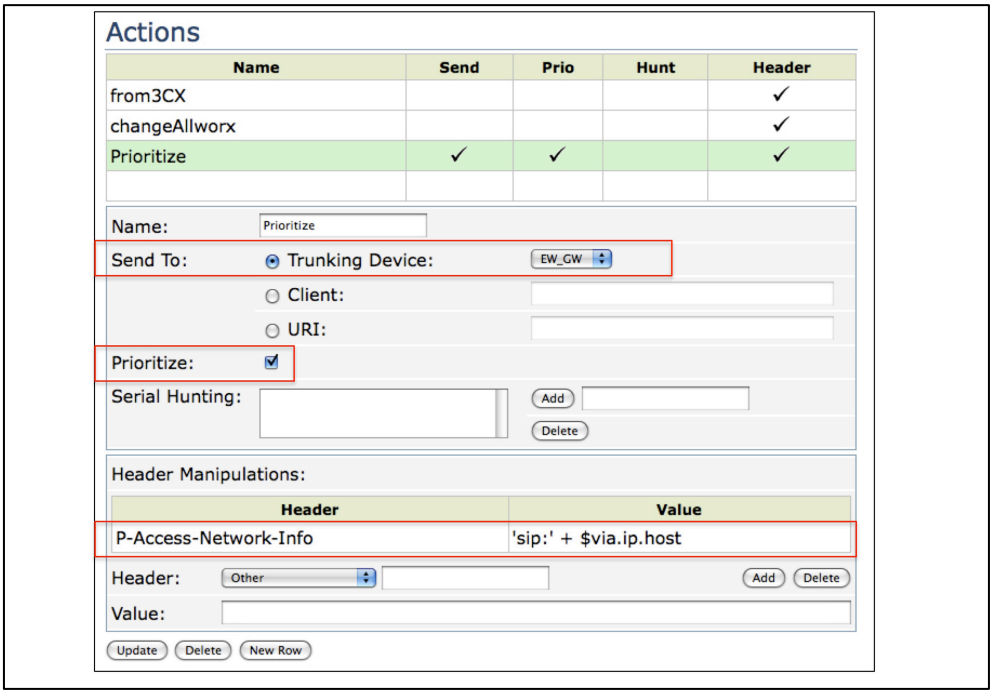
3. If the EdgeMarc should prioritize a SIP INVITE request from the Trunking Device, select the **Prioritize** checkbox.

Note

If the prioritized outbound SIP INVITE request will be sent from or to the EdgeMarc's SIP/GW FXO line (PSTN), make sure that the EdgeMarc's Trunking Device FXO port group (usually listed as EW_GW) has been selected from the **Send To** dropdown menu.

When the **Prioritize** checkbox is enabled the following figure displays a typical configuration for the Actions Setting Section.

Figure 9. Typical Configuration for Prioritizing a SIP INVITE Request using the Actions Setting Section



In the preceding figure, the EW_GW trunking device is selected, and the Header Manipulations table displays a rule indicating that the P-Access-Network-Info header has customized contents. For more information about populating the P-Access-Network-Info header, refer to Populating a Custom P-Access-Network-Info Header Example.

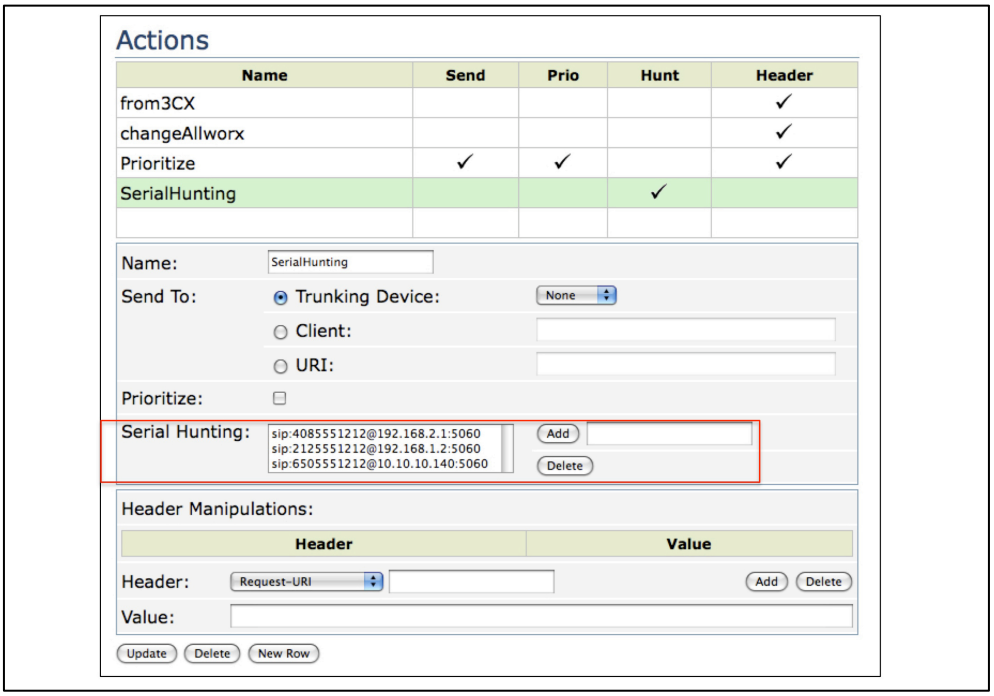
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4. If the EdgeMarc should direct a SIP INVITE request to an alternate DID, SIP URI, or a set of alternate DIDs and SIP URIs, include the following DID information in the text field to the right of the **Serial Hunting** text box:
    a. Specify the DID or SIP URI in the text field to the left of the **Add** button.
    b. Click **Add**.

       The number displays in the window to the right of the **Add** button.
    c. Repeat step a and step b. The call will be rerouted to the DID or SIP URI in the order in which they are entered in the window to the right of the **Add** button.

   The following figure displays a typical configuration for the Actions Setting Section when the **Serial Hunting** text box is populated.

Figure 10. Typical Configuration for Serial Hunting using the Actions Setting Section



Note that the preceding figure displays SIP URIs in the **Serial Hunting** text box from multiple domains. The EdgeMarc can forward a SIP INVITE request to any valid URI.

5. If the EdgeMarc should make changes to the header of an inbound or outbound call, refer to the section Header Manipulation Notation for more details about how to configure the **Header Manipulations** section.
6. Click **Update** to update the page settings.

   The Action displays in the Actions table. Repeat this step for all operations that the EdgeMarc should perform as a B2BUA.

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Tip

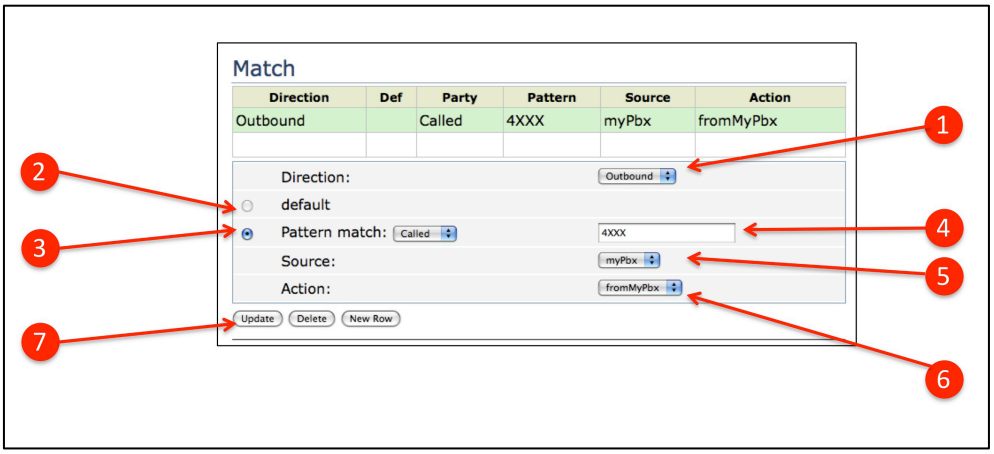
If your network topology includes multiple PBXs, you should enter all operations that will occur between the EdgeMarc and each PBX in this section, even if the PBX displayed in the Trunking Devices section is not displayed or yet registered with the EdgeMarc.

Step 4. Configure Match Settings

You can define which operations should be applied from the Actions Settings section to a defined selection of SIP INVITE requests. Select the operation and define the selection of SIP INVITE requests in the Match Settings Section.

Referring to the following figure, configure these settings:

Figure 11. Match Settings Section



1. Select one of the following options from the **Direction** dropdown menu:
   - Select **Inbound** if the operation should be performed upon SIP INVITE requests that are coming to the EdgeMarc.
   - Select **Outbound** if the operation should be performed upon SIP INVITE requests that are coming from the PBX or a SIP client to the EdgeMarc.
2. Select the **default** radio button if the operation should be performed upon all inbound SIP INVITE requests for which the EdgeMarc cannot find a registered SIP client.
3. Select one of the following options from the **Pattern Match** dropdown menu:
   - Select **Calling** if the operation should be performed upon a subset of inbound or outbound SIP INVITE requests that originate from a particular device.
   - Select **Called** if the operation should be performed upon a subset of inbound or outbound SIP INVITE requests that are destined for a particular device.
4. In the **Pattern Match** text field, enter a pattern for which the EdgeMarc should search in the DID as specified in the particular device's SIP INVITE request. If the

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EdgeMarc finds a match, it will perform a selected operation upon the SIP INVITE request.

The EdgeMarc can look for DIDs in the To or From header that have a certain number of digits, share the same one or two digits, or a part of whose contents fall within a narrower range than 0 and 9. Alternatively, the EdgeMarc can apply a corresponding action to all SIP INVITE requests that have a populated To or From Header.

The following table lists examples of Pattern Match text settings and the resulting scope of action.

Table 3. Example Pattern Matches

Pattern Match Text Field	Scope of Action
.	The EdgeMarc will perform an operation upon all inbound or outbound SIP INVITE requests that contain a one or more digit DID.
1XXX	The EdgeMarc will perform an operation upon all inbound or outbound SIP INVITE requests that contain a 4-digit DID, if the first digit is a 1. The EdgeMarc will search for DIDs with this pattern in the header of SIP INVITE requests that either originate or are destined for a particular device, as specified in the **Pattern Match** dropdown menu.
9NXXXXXX	The EdgeMarc will perform an operation upon all inbound or outbound SIP INVITE requests that contain an 8-digit DID, if the first digit is a 9 and the second digit is a number between 2 and 9. The EdgeMarc will search for DIDs with this pattern in the header of SIP INVITE requests that either originate or are destined for a particular device, as specified in the **Pattern Match** dropdown menu.
91NXXNXXXXXX	The EdgeMarc will perform an operation upon all inbound or outbound SIP INVITE requests containing a 12-digit DID, if the first digit is a 9, the second digit is a 1, the third digit is a number between 2 and 9, and the sixth digit is a number between 2 and 9. The EdgeMarc will search for DIDs with this pattern in the header of SIP INVITE requests that either originate or are destined for a particular device, as specified in the **Pattern Match** dropdown menu.
1[3-6]XX	The EdgeMarc will perform an operation upon all inbound or outbound SIP INVITE requests that contain a 4-digit DID, if the first digit is a 1 and the second digit is a number between 3 and 6. The EdgeMarc will search for DIDs with this pattern in the header of SIP INVITE requests that either originate or are destined for a particular device, as specified in the **Pattern Match** dropdown menu.

5. Select one of the following options from the **Source** dropdown menu:
   - Select the **PBX** if the scope of the Action should only include outbound calls that originate from the PBX.
   - Select **Any** if the scope of the Action should include any outbound call that originates from the PBX or a SIP Client on the LAN that is within the SIP Clients List.
6. From the **Action** dropdown menu, select the **Action** that should apply.

   If the Action is not selected, the default Action will be selected.

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Note

Selecting the default action will result in the stripping of any unnecessary headers from the SIP INVITE request.

7. Click **Update** to update the page settings.

   The rule displays in the Match table.



Tip

The EdgeMarc can direct SIP INVITE requests between multiple PBXs and one SIP Server. Refer to Configure Match Settings for the Additional Trunking Device for an example configuration of the Match Settings section when the EdgeMarc acts as a B2BUA with more than one PBX.

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3

Header Manipulation Notation

You can define custom headers for any SIP INVITE request sent between endpoints on the LAN and the SIP Server. Custom headers can contain strings or concatenations of strings and functions. Custom headers increase interoperability between LAN endpoints and the SIP Server. Custom headers can also be used to increase call traceability across devices.

The following table provides a list of custom headers and their potential usages.

Table 4. Custom Headers and Their Potential Usages

Header	Potential Usage
User-Agent	You can transmit user agent client information to the target destination. Refer to Populating a Text-Only Custom Header Example 1 for an example.
Subject	You can transmit more information about the call. Refer to Populating a Text-Only Custom Header Example 2 for an example.
P-Preferred Identity	You can provide customized authentication credentials for billing records. Refer to Populating a Custom P-Preferred Identity Header Example for an example.
P-Charge-Info	You can charge outbound calls to a different number. Refer to Populating a Custom P-Charge-Info Header Example for an example.
Contact	You can enable the Edgemarc to supply a trunk group and trunk context identifier. Refer to Populating a Custom Contact Header Example for an example.
From	You can replace the host IP address with a local IP address. Refer to Populating a Custom From Header Example 1 for an example.
	You can replace the FQDN with its corresponding IP address. Refer to Populating a Custom From Header Example 2 for an example.
	You can include an identifier for all SIP INVITE requests that are outbound from a particular trunking device. Refer to Populating a Custom From Header Example 3 for an example.
P-Asserted Identity	You can replace the From header for all outbound SIP INVITE requests to the SIP Server. Refer to Populating a Custom P-Asserted Identity Header Example for an example.
P-Access-Network-Info	You can direct a 911 call to the correct public safety answering point (PSAP). Refer to Populating a Custom P-Access-Network-Info Header Example for an example.
Request-URI	You can route an extension to a Cisco UC520. Refer to Populating a Custom Request-URI Header Example for an example.

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Header	Potential Usage
Route	You can bypass an existing route. Refer to Populating a Custom Route Header Example for an example.
To	You can add additional parameters with the domain name. Refer to Populating a Custom To Header Example for an example.
Diversion	You can replace a non-configurable DID in the Diversion header with a configurable 10-digit number. Refer to Populating a Custom Diversion Header Example for an example.

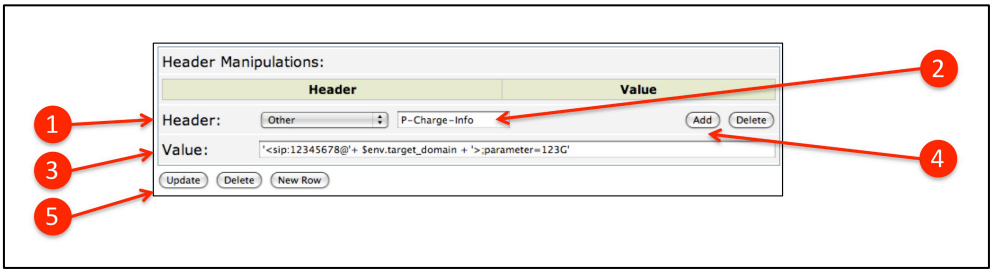
Header Manipulations Section

You can construct custom headers in the Header Manipulations section of the EdgeMarc B2BUA Trunking Settings Page. In the Header Manipulations section, the **Header** drop down menu lists a set of headers that the EdgeMarc can manipulate. The **Value** field, located beneath the **Header** drop down menu, is then used to populate the specified Header with a single value, or a concatenation, consisting of strings, values, and functions.

Task Flow for Creating a Custom Header

To construct a custom header, refer to the following figure and complete the following steps:

Figure 12. Header Manipulations Section



1. From the EdgeMarc's web GUI, select **VoIP ALG > SIP > B2BUA**.
2. Select the header to customize from the **Header** drop down menu.
3. If the value of **Other** is selected from the Header drop down menu, enter the name of the header in the Header text field. The following figure displays an example of the P-Charge-Info header when **Other** is selected from the Header drop down menu.
4. In the **Value** text field, enter one of the following:

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- A complete concatenation of the variables, strings, and functions that will form the custom header.



Note

Strings that are not the name of a custom header variable or a function must always be enclosed in single quotes. The plus sign concatenates each variable, string, or function.



Warning

Any header field can be customized, but the custom header must be entered exactly as the output of the variables, strings and function should be displayed. The EdgeMarc will accept any input in the Value text field, but in order for the custom header field to function as intended, the input entered in the value field must conform to the custom header field's corresponding RFC. To locate the RFC for each custom header field that can be Refer to Custom Headers for more details.

- A single string that is not the name of a custom header variable or custom header function in single quotes.

5. To the right of the **Header** drop down menu (and text field if **Other** was selected), click **Add**.

   The custom header displays in the Header Manipulations table.

6. Click **Update** to update the page settings.

   The Action displays in the Actions table.

Custom Headers

Each SIP INVITE message header field must comply with the standards for the header field as specified in the field's Request for Comments (RFC) document.

Table 2 displays both the header fields in a SIP INVITE message that can be customized on the B2BUA Trunking Settings Page and the corresponding RFC with which the notation for each customized header field must comply.

Table 5. SIP Header RFCs

SIP Header	Corresponding RFC
Request URI	RFC 3261
From	RFC 3261
To	RFC 3261
Contact	RFC 3261
Route	RFC 3261
User-Agent	RFC 3261

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SIP Header	Corresponding RFC
Subject	RFC 3261
P-Asserted Identity	RFC 3325
P-Preferred Identity	RFC 3325
Other	Varies according to header specified.

Text-Only Custom Headers

Some header fields provide additional information for the end-user and do not direct the origin or the destination of the SIP INVITE request to take any additional action. Two such header fields can be selected from the Header Manipulations dropdown menu on the B2BUA Trunking Settings Page: the User-Agent and Subject header fields.

Text-Only Custom Header Examples

The following two examples demonstrate how text-only custom headers can be used to enhance traceability of a call for billing or diagnostic purposes:

- Populating a Text-Only Custom Header Example 1
- Populating a Text-Only Custom Header Example 2

Populating a Text-Only Custom Header Example 1

Prerequisite Task: Configure SIP Settings as described in the *VoIP Operating System (VOS) for EdgeMarc User Manual*.

You can construct a custom User-Agent header that provides the target destination with additional information about the origin of the SIP INVITE request.

In the Header Manipulations section on the B2BUA Trunking Settings Page, configure the following settings:

1. In the **Name** field, enter the name of the Action.
2. Select **User-Agent** from the dropdown menu.
3. In the **Value** field, enter the following text (include single quotes):

   `'Insert information here about the origin of the SIP INVITE request'`



Caution
Except for portions of the SIP Header that are in red italic text, the contents of the **Value** field, including single or double quotes, must be entered exactly as shown in this step. Failure to enter the text exactly as shown will result in failure of the customized SIP Header's intended function.

4. To the right of the **Header** drop down menu, click **Add**.

   The custom header displays in the Header Manipulations table.

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5. Click **Update** to update the page settings.

   The Action displays in the Actions table.

In the Match section on the B2BUA Trunking Settings Page, configure the following settings:

1. From the **Direction** dropdown menu, select **Outbound** or **Inbound**.
2. In the **Pattern Match Text Field** enter the rule for which the custom User-Agent header should apply.



Note

If all SIP INVITE requests should have this header, enter '.'

3. From the Pattern Match Dropdown Menu, select Calling or Called.
4. From the **Source Dropdown Menu**, select the entry corresponding with the PBX or select **Any** if the custom header should be included with all SIP INVITE requests originating on the LAN.
5. From the **Action Dropdown Menu**, select the Action configured in the preceding task in this example.
6. Click **Update** to update the page settings.

   The Match Rule displays in the Match table.

7. Scroll to the bottom of the page. Click **Submit** to save your changes to the EdgeMarc**.**

   The B2BUA Trunking Settings Page is refreshed. No error messages should be displayed.

Populating a Text-Only Custom Header Example 2

Prerequisite Task: Configure SIP Settings as described in the *VoIP Operating System (VOS) for EdgeMarc User Manual*.

You can construct a custom Subject header that provides any additional information to the destination about the call that is not already captured in the SIP Invite request, such as billing information.

In the Header Manipulations section on the B2BUA Trunking Settings Page, configure the following settings:

1. In the **Name** field, enter the name of the Action.
2. Select **Subject** from the dropdown menu.
3. In the **Value** field, enter the following text (include single quotes):

   `'Insert additional information about the call here'`

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Caution
Except for portions of the SIP Header that are in red italic text, the contents of the **Value** field, including single or double quotes, must be entered exactly as shown in this step. Failure to enter the text exactly as shown will result in failure of the customized SIP Header's intended function.

4. To the right of the **Header** drop down menu, click **Add**.

   The custom header displays in the Header Manipulations table.

5. Click **Update** to update the page settings.

   The Action displays in the Actions table.

In the Match section on the B2BUA Trunking Settings Page, configure the following settings:

1. From the **Direction** dropdown menu, select **Outbound** or **Inbound**.
2. In the **Pattern Match Text Field** enter the rule for which the custom Subject header should apply.



Note

. If all SIP INVITE requests should have this header, enter '.'

3. From the Pattern Match Dropdown Menu, select Calling or Called.
4. From the **Source Dropdown Menu**, select the entry corresponding with the PBX, or select **Any** if the custom header should be included with all SIP INVITE requests originating on the LAN.
5. From the **Action Dropdown Menu**, select the Action configured in the preceding task in this example.
6. Click **Update** to update the page settings.

   The Match Rule displays in the Match table.

7. Scroll to the bottom of the page. Click **Submit** to save your changes to the EdgeMarc**.**

   The B2BUA Trunking Settings Page is refreshed. No error messages should be displayed.

Custom Header Variables

Custom Header Variables retrieve and contain parsed components of SIP INVITE requests that are sent or received between LAN endpoints--usually the PBX--and the SIP Server.

The Custom Header Variable consists of the following fields and subfields:

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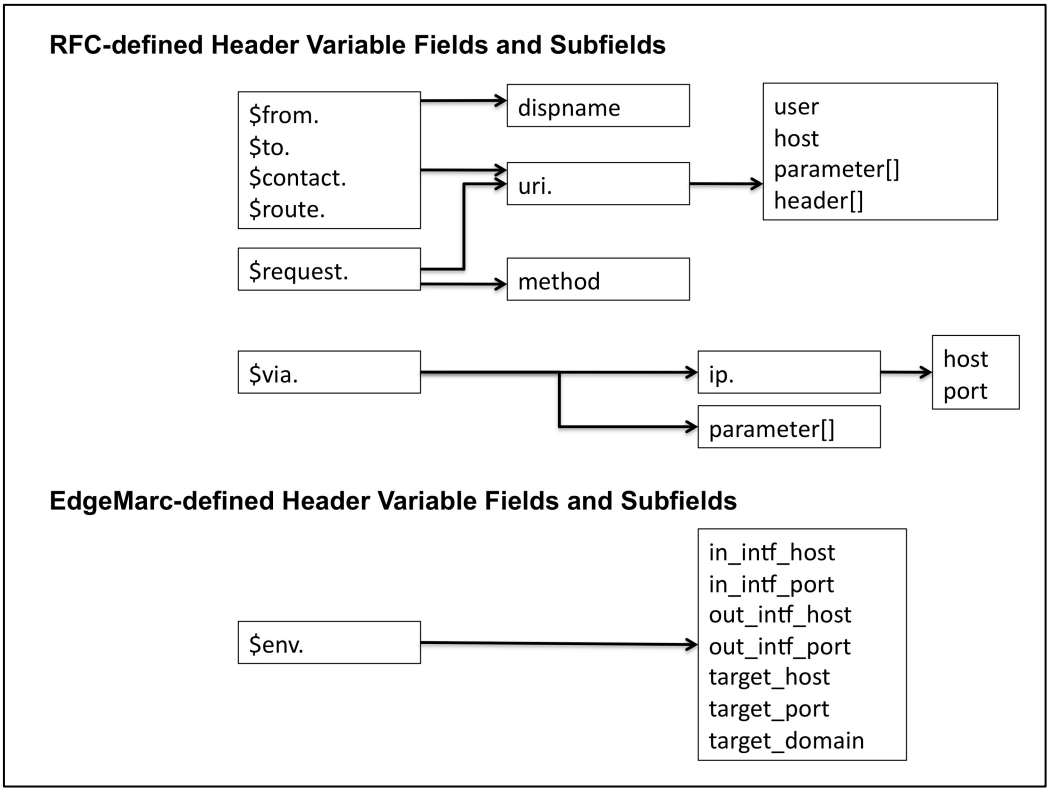
```
$header.field.subfield
```

The EdgeMarc retrieves the following six headers from the SIP INVITE request and stores them in the following corresponding Custom Header Variables:

- From → `$from`
- To → `$to`
- Contact → `$contact`
- Route → `$route`
- Request → `$request`
- Via → `$via`

Figure 8 uses arrows to show the fields and subfields can be used with their corresponding custom header variables.

Figure 13. Custom Header Variable Fields and Subfields



Also in Figure 8, it is possible to determine if an instance of the custom header variable field is valid. The arrows point to the fields that are valid subfields of the parent field's custom header variable.

An example of a valid custom header variable field and subfield would be `$from.uri.host`. An invalid example would be `$request.dispname`, because the field `dispname` is not listed as a valid subfield of the `$request` custom header variable.

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SIP Headers and Custom Header Variables

SIP headers must contain valid fields for their contents, as defined in their corresponding RFC.

Table 6. SIP Headers and Custom Header Variables

SIP Header	Corresponding Custom Header Variables	Description
From	$from.uri.user	The $from custom header variable field contains the From header for the SIP INVITE request. The From header as it originates from LAN endpoints, such as a PBX or IP Phone, may not meet the requirements of the SIP Server. The Edgemarc, as a proxy, can change the contents of the From Header originating from the PBX or IP Phone so that it meets the requirements of the SIP Server. Combine the subfields of the $from variable with the subfields of the $env custom header variable to meet local and SIP Server requirements. $from.dispname may not be referenced in the Request-URI SIP Header,
	$from.uri.host	
	$from.uri.parameter[]*	
	$from.uri.header[]*	
	$from.dispname	
To	$to.uri.user	The $to custom header variable field contains the subfields of the To header for the SIP INVITE request. The To header contains the logical destination for the SIP INVITE request. The To header can be customized to meet the particular requirements of a SIP Server. Subfields of the To header can also be used to populate other custom headers, such as the Request-URI header or the Route header. $to.dispname may not be referenced in the Request-URI SIP Header,
	$to.uri.host	
	$to.uri.parameter[]*	
	$to.uri.header[]*	
	$to.dispname	
Contact	$contact.uri.user	The $contact custom header variable field contains the Contact header for the SIP INVITE request. The subfields of $contact can be used to construct custom headers that are used for all SIP INVITE requests which follow the initial SIP INVITE request in a session. $contact.dispname may not be
	$contact.uri.host	
	$contact.uri.parameter[]*	
	$contact.uri.header[]*	
	$contact.dispname	

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SIP Header	Corresponding Custom Header Variables	Description
		referenced in the Request-URI SIP Header,
Route	$route.uri.user	The $route custom header variable field enables the EdgeMarc to modify an existing route. $route.dispname may not be referenced in the Request-URI SIP Header,
	$route.uri.host	
	$route.uri.parameter[]*	
	$route.uri.header[]*	
	$route.dispname	
Via	$via.ip	The $via custom header variable field contains the subfields of the Via header for the SIP INVITE request. The $via.ip.host subfield identifies the nearest IP address where the SIP INVITE request is to be sent. Populate the header of a SIP INVITE request with the subfields of the $via custom header variable field to retrieve and store the information about the network from which a SIP INVITE request has originated.
	$via.host	
	$via.port	
	$via.parameter[]*	
Request	$request.method	The $request custom header field contains the supfields of the Request-URI.
	$request.host	
	$request.port	
N/A	$env.in_intf_host	The $env.target custom header variable subfield contains the final destination for the SIP INVITE request. $env contains the IP address and port number from which the SIP message was received (beginning with the prefix in_), the IP address and port number to which the SIP message is directed (beginning with the prefix out_), and the final destination for which the SIP message is targeted (beginning with the prefix target_). The fields of $env do not map to existing headers as defined by an RFC.
	$env.in_intf_port	
	$env.out_intf_host	
	$env.out_intf_port	
	$env.target_host	
	$env.target_port	
	$env.target_domain	

* Custom header variables that end with brackets ([]) take a variable that is optionally and previously defined in the header. For example, the following SIP From header includes the variable otg:

```
From: <sip:sipaddress@sipdomain.com;otg=123456>
```

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The string variable `$from.uri.parameter[otg]` will return `123456`.

** The Subject and User-Agent custom headers can take any of the custom header variables, but the result is treated strictly as text.

Custom SIP Header Examples

Using header manipulation notation, the EdgeMarc can normalize SIP INVITE requests. The EdgeMarc can also insert additional information into the header that ensures your network is secure.

The following examples demonstrate how to use custom SIP Headers to ensure normalization of SIP traffic and meet security objectives:

- Populating a Custom P-Preferred Identity Header Example
- Populating a Custom P-Charge-Info Header Example
- Populating a Custom Contact Header Example
- Populating a Custom From Header Example 1
- Populating a Custom From Header Example 2
- Populating a Custom From Header Example 3
- Populating a Custom P-Asserted Identity Header Example
- Populating a Custom P-Access-Network-Info Header Example
- Populating a Custom Request-URI Header Example
- Populating a Custom Route Header Example
- Populating a Custom To Header Example

Populating a Custom P-Preferred Identity Header Example

Prerequisite Task: Configure SIP Settings as described in the *VoIP Operating System (VOS) for EdgeMarc User Manual*.

You can construct a custom P-Preferred Identity header that provides the SIP Server with a unique identity for the LAN-side originator of the SIP INVITE request (i.e., an identity which could be used for billing purposes). Use the subfields of `$env.target` to populate the custom P-Preferred Identity header. The subfields can be used to transmit or designate which entity should be billed for the LAN-side originator's SIP INVITE request.

In the Header Manipulations section on the B2BUA Trunking Settings Page, configure the following settings:

1. In the **Name** field, enter the name of the Action.
2. Select **P-Preferred Identity** from the dropdown menu.
3. In the **Value** field, enter the following text (as instructed, replace the italic red text with the desired text):

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```
"insert p-preferred-identity display name here" <sip:insert p-
preferred-identity here@' + $env.target_host + ':' +
$env.target_port + ';user=phone>'
```



Caution
Except for portions of the SIP Header that are in red italic text, the contents of the **Value** field, including single or double quotes, must be entered exactly as shown in this step. Failure to enter the text exactly as shown will result in failure of the customized SIP Header's intended function.

4. To the right of the **Header** drop down menu, click **Add**.

   The custom header displays in the Header Manipulations table.

5. Click **Update** to update the page settings.

   The Action displays in the Actions table.

In the Match section on the B2BUA Trunking Settings Page, configure the following settings:

1. From the **Direction** dropdown menu, select **Outbound** or **Inbound**.
2. In the **Pattern Match Text Field** enter the rule for which the custom P-Preferred Identity should apply.



Note

If all SIP INVITE requests should have this header, enter '.'

3. From the Pattern Match Dropdown Menu, select Calling or Called.
4. From the **Source Dropdown Menu**, select the entry corresponding with the PBX or select **Any** if the custom header should be included with all SIP INVITE requests originating on the LAN.
5. From the **Action Dropdown Menu**, select the Action configured in the preceding task in this example.
6. Click **Update** to update the page settings.

   The Match Rule displays in the Match table.

7. Scroll to the bottom of the page. Click **Submit** to save your changes to the EdgeMarc**.**

   The B2BUA Trunking Settings Page is refreshed. No error messages should be displayed.

Populating a Custom P-Charge-Info Header Example

Prerequisite Task: Configure SIP Settings as described in the *VoIP Operating System (VOS) for EdgeMarc User Manual*.

You can construct a custom P-Charge-Info header that enables the EdgeMarc to specify which DID should be charged for a subset or all of the outbound calls between the EdgeMarc and the SIP Server. Use the subfields of `$env.target` to populate the

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custom P-Charge-Info header. The subfields can be used to transmit or designate which entity should be billed for the LAN-side originator's SIP INVITE request.

In the Header Manipulations section on the B2BUA Trunking Settings Page, configure the following settings:

1. In the **Name** field, enter the name of the Action.
2. Select **Other** from the dropdown menu.
3. In the **Other Text Field**, enter the following text: `P-Charge-Info`
4. In the **Value** field, enter the following text (as instructed, replace the italic red text with the desired text):

```
'<sip:insert number to be charged here@'+ $env.target_domain
+ '>;parameter=parametercontents'
```



Caution
Except for portions of the SIP Header that are in red italic text, the contents of the **Value** field, including single or double quotes, must be entered exactly as shown in this step. Failure to enter the text exactly as shown will result in failure of the customized SIP Header's intended function.

5. To the right of the **Other Text Field**, click **Add**.

   The custom header displays in the Header Manipulations table.

6. Click **Update** to update the page settings.

   The Action displays in the Actions table.

In the Match section on the B2BUA Trunking Settings Page, configure the following settings:

1. From the **Direction** dropdown menu, select **Outbound** or **Inbound**.
2. In the **Pattern Match Text Field** enter the rule for which the custom P-Charge Info header should apply.



Note

If all SIP INVITE requests should have this header, enter '.'

3. From the Pattern Match Dropdown Menu, select Calling or Called.
4. From the **Source Dropdown Menu**, select the entry corresponding with the PBX or select **Any** if the custom header should be included with all SIP INVITE requests originating on the LAN.
5. From the **Action Dropdown Menu**, select the Action configured in the preceding task in this example.
6. Click **Update** to update the page settings.

   The Match Rule displays in the Match table.

7. Scroll to the bottom of the page. Click **Submit** to save your changes to the EdgeMarc**.**

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The B2BUA Trunking Settings Page is refreshed. No error messages should be displayed.

Populating a Custom Contact Header Example

Prerequisite Task: Configure the Trunking Devices Settings

You can construct a custom Contact header that enables the EdgeMarc to maintain credentials on a DOCSIS network that requires trunk group and trunk context information (i.e., for RFC-4904 support).

In the Header Manipulations section on the B2BUA Trunking Settings Page, configure the following settings:

1. In the **Name** field, enter the name of the Action.
2. Select **Contact** from the dropdown menu.
3. In the **Value** field, enter the following text (as instructed, replace the italic red text with the desired text):

```
$contact.dispname + '<sip:' + $contact.uri.user +
';tgrp=insert tgrp identifier here, no spaces;trunk-
context=insert trunk-context alias here, no spaces@' +
$env.target_domain + ':' + $env.target_port +
';transport=udp;user=phone>'
```



Caution
Except for portions of the SIP Header that are in red italic text, the contents of the **Value** field, including single or double quotes, must be entered exactly as shown in this step. Failure to enter the text exactly as shown will result in failure of the customized SIP Header's intended function.

4. To the right of the **Header** drop down menu, click **Add**.

   The custom header displays in the Header Manipulations table.

5. Click **Update** to update the page settings.

   The Action displays in the Actions table.

In the Match section on the B2BUA Trunking Settings Page, configure the following settings:

1. From the **Direction** dropdown menu, select **Outbound** or **Inbound**.
2. In the **Pattern Match Text Field** enter the rule for which the custom Contact header should apply.



Note

If all SIP INVITE requests should have this header, enter '.'

3. From the Pattern Match Dropdown Menu, select Calling or Called.
4. From the **Source Dropdown Menu**, select the entry corresponding with the PBX.
5. From the **Action Dropdown Menu**, select the Action configured in the preceding task in this example.

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6. Click **Update** to update the page settings.

   The Match Rule displays in the Match table.

7. Scroll to the bottom of the page. Click **Submit** to save your changes to the EdgeMarc**.**

   The B2BUA Trunking Settings Page is refreshed. No error messages should be displayed.

Populating a Custom From Header Example 1

Prerequisite Task: Configure SIP Settings as described in the *VoIP Operating System (VOS) for EdgeMarc User Manual*.

You can construct a custom From header that enables the EdgeMarc to communicate with a SIP Server whose security policy requires the transmission of the EdgeMarc's local IP address.

In the Header Manipulations section on the B2BUA Trunking Settings Page, configure the following settings:

1. In the **Name** field, enter the name of the Action.
2. Select **From** from the dropdown menu.
3. In the **Value** field, enter the following text:

```
'<sip:' + $from.uri.user +'@' + $env.out_intf_host + '>'
```



Caution
The contents of the **Value** field, including single or double quotes, must be entered exactly as shown in this step. Failure to enter the text exactly as shown will result in failure of the customized SIP Header's intended function.

4. To the right of the **Header** drop down menu, click **Add**.

   The custom header displays in the Header Manipulations table.

5. Click **Update** to update the page settings.

   The Action displays in the Actions table.

In the Match section on the B2BUA Trunking Settings Page, configure the following settings:

1. From the **Direction** dropdown menu, select **Outbound** or **Inbound**.
2. In the **Pattern Match Text Field** enter the rule for which the custom From header should apply.



Note

If all SIP INVITE requests should have this header, enter '.'

3. From the Pattern Match Dropdown Menu, select Calling or Called.
4. From the **Source Dropdown Menu**, select the entry corresponding with the PBX or select **Any** if the custom header should be included with all SIP INVITE requests originating on the LAN.

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5. From the **Action Dropdown Menu**, select the Action configured in the preceding task in this example.
6. Click **Update** to update the page settings.

   The Match Rule displays in the Match table.
7. Scroll to the bottom of the page. Click **Submit** to save your changes to the EdgeMarc**.**

   The B2BUA Trunking Settings Page is refreshed. No error messages should be displayed.

Populating a Custom From Header Example 2

Prerequisite Task: Configure SIP Settings as described in the *VoIP Operating System (VOS) for EdgeMarc User Manual*.

You can construct a custom From header that enables the EdgeMarc to communicate with a SIP Server whose security policy requires the transmission of the EdgeMarc's public IP address rather than its FQDN.

In the Header Manipulations section on the B2BUA Trunking Settings Page, configure the following settings:

1. In the **Name** field, enter the name of the Action.
2. Select **From** from the dropdown menu.
3. In the **Value** field, enter the following text:

```
'<sip:' + $from.uri.user +'@' + $env.target_host + '>'
```



Caution
The contents of the **Value** field, including single or double quotes, must be entered exactly as shown in this step. Failure to enter the text exactly as shown will result in failure of the customized SIP Header's intended function.

4. To the right of the **Header** drop down menu, click **Add**.

   The custom header displays in the Header Manipulations table.
5. Click **Update** to update the page settings.

   The Action displays in the Actions table.

In the Match section on the B2BUA Trunking Settings Page, configure the following settings:

1. From the **Direction** dropdown menu, select **Outbound** or **Inbound**.
2. In the **Pattern Match Text Field** enter the rule for which the custom From header should apply.



Note

If all SIP INVITE requests should have this header, enter '.'

3. From the Pattern Match Dropdown Menu, select Calling or Called.

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4. From the **Source Dropdown Menu**, select the entry corresponding with the PBX or select **Any** if the custom header should be included with all SIP INVITE requests originating on the LAN.
5. From the **Action Dropdown Menu**, select the Action configured in the preceding task in this example.
6. Click **Update** to update the page settings.

   The Match Rule displays in the Match table.
7. Scroll to the bottom of the page. Click **Submit** to save your changes to the EdgeMarc**.**

   The B2BUA Trunking Settings Page is refreshed. No error messages should be displayed.

Populating a Custom From Header Example 3

Prerequisite Task: Configure the Trunking Devices Settings

You can construct a custom From header that enables the EdgeMarc to provide the SIP Server with an identifier for all SIP INVITE requests that are outgoing from a specific PBX.

In the Header Manipulations section on the B2BUA Trunking Settings Page, configure the following settings:

1. In the **Name** field, enter the name of the Action.
2. Select **From** from the dropdown menu.
3. In the **Value** field, enter the following text (as instructed, replace the italic red text with the desired text):

```
'<sip:' + $from.uri.user + '@' + $env.target_domain +
';otg=insert outgoing trunk group identifier, no spaces>'
```



Caution
Except for portions of the SIP Header that are in red italic text, the contents of the **Value** field, including single or double quotes, must be entered exactly as shown in this step. Failure to enter the text exactly as shown will result in failure of the customized SIP Header's intended function.

4. To the right of the **Header** drop down menu, click **Add**.

   The custom header displays in the Header Manipulations table.
5. Click **Update** to update the page settings.

   The Action displays in the Actions table.

In the Match section on the B2BUA Trunking Settings Page, configure the following settings:

1. From the **Direction** dropdown menu, select **Outbound**.
2. In the Pattern Match Text Field, enter '.'
3. From the Pattern Match Dropdown Menu, select Calling or Called.

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4. From the **Source Dropdown Menu**, select the entry corresponding with the PBX.
5. From the **Action Dropdown Menu**, select the Action configured in the preceding task in this example.
6. Click **Update** to update the page settings.

   The Match Rule displays in the Match table.
7. Scroll to the bottom of the page. Click **Submit** to save your changes to the EdgeMarc**.** 0.

   The B2BUA Trunking Settings Page is refreshed. No error messages should be displayed.

Populating a Custom P-Asserted Identity Header Example

Prerequisite Task: Configure SIP Settings as described in the *VoIP Operating System (VOS) for EdgeMarc User Manual*.

You can construct a custom P-Asserted Identity header to globally replace the From header for all outbound SIP INVITE requests from the EdgeMarc to the SIP Server.

In the Header Manipulations section on the B2BUA Trunking Settings Page, configure the following settings:

1. In the **Name** field, enter the name of the Action.
2. Select **P-Asserted Identity** from the dropdown menu.
3. In the **Value** field, enter the following text:

```
$from.dispname + '<sip:' + $from.uri.user + '@' +
$from.uri.host + ':' + $env.target_domain + ';user=phone>'
```



Caution
The contents of the **Value** field, including single or double quotes, must be entered exactly as shown in this step. Failure to enter the text exactly as shown will result in failure of the customized SIP Header's intended function.

4. To the right of the **Header** drop down menu, click **Add**.

   The custom header displays in the Header Manipulations table.
5. Click **Update** to update the page settings.

   The Action displays in the Actions table.

In the Match section on the B2BUA Trunking Settings Page, configure the following settings:

1. From the **Direction** dropdown menu, select **Outbound**.
2. In the Pattern Match Text Field, enter '.'
3. From the Pattern Match Dropdown Menu, select Calling or Called.
4. From the **Source Dropdown Menu**, select the entry corresponding with the PBX or select **Any** if the custom header should be included with all SIP INVITE requests originating on the LAN.

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5. From the **Action Dropdown Menu**, select the Action configured in the preceding task in this example.
6. Click **Update** to update the page settings.

   The Match Rule displays in the Match table.
7. Scroll to the bottom of the page. Click **Submit** to save your changes to the EdgeMarc**.** 0.

   The B2BUA Trunking Settings Page is refreshed. No error messages should be displayed.

Populating a Custom P-Access-Network-Info Header Example

Prerequisite Task: Configure SIP Settings as described in the *VoIP Operating System (VOS) for EdgeMarc User Manual*.

You can construct a custom P-Access-Network-Info header that enables the EdgeMarc to provide the SIP Server with the IP address nearest in physical proximity to the originator of the SIP INVITE request when the originator has dialed “911”.

In the Header Manipulations section on the B2BUA Trunking Settings Page, configure the following settings:

1. In the **Name** field, enter the name of the Action.
2. Select **Other** from the dropdown menu.
3. In the **Other Text Field**, enter the following text: `P-Access-Network-Info`
4. In the **Value** field, enter the following text:

```
'sip:' + $via.ip.host
```



Caution
The contents of the **Value** field, including single or double quotes, must be entered exactly as shown in this step. Failure to enter the text exactly as shown will result in failure of the customized SIP Header’s intended function.

5. To the right of the **Header** drop down menu, click **Add**.

   The custom header displays in the Header Manipulations table.
6. Click **Update** to update the page settings.

   The Action displays in the Actions table.

In the Match section on the B2BUA Trunking Settings Page, configure the following settings:

1. From the **Direction** dropdown menu, select **Outbound** or **Inbound**.
2. In the Pattern Match Text Field, enter ‘911’.
3. From the Pattern Match Dropdown Menu, select Calling or Called.
4. From the **Source Dropdown Menu**, select the entry corresponding with the PBX or select **Any** if the custom header should be included with all SIP INVITE requests originating on the LAN.

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5. From the **Action Dropdown Menu**, select the Action configured in the preceding task in this example.
6. Click **Update** to update the page settings.

   The Match Rule displays in the Match table.
7. Scroll to the bottom of the page. Click **Submit** to save your changes to the EdgeMarc**.** 0.

   The B2BUA Trunking Settings Page is refreshed. No error messages should be displayed.

Populating a Custom Request-URI Header Example

Prerequisite Task: **Configure the Trunking Devices Settings**

You can construct a custom Request-URI header that enables the SIP Server to meet the requirements for routing an extension to a Cisco UC520.

In the Header Manipulations section on the B2BUA Trunking Settings Page, configure the following settings:

1. In the **Name** field, enter the name of the Action.
2. Select **Request-URI** from the dropdown menu.
3. In the **Value** field, enter the following text :

```
'sip:' + $to.uri.user + '@' + $to.uri.host
```



Caution
The contents of the **Value** field, including single or double quotes, must be entered exactly as shown in this step. Failure to enter the text exactly as shown will result in failure of the customized SIP Header's intended function.



Note

In accordance with RFC 3261, angle brackets are not used with the Request-URI header.

4. To the right of the **Header** drop down menu, click **Add**.

   The custom header displays in the Header Manipulations table.
5. Click **Update** to update the page settings.

   The Action displays in the Actions table.

In the Match section on the B2BUA Trunking Settings Page, configure the following settings:

1. From the **Direction** dropdown menu, select **Outbound** or **Inbound**.
2. In the **Pattern Match Text Field** enter the rule for which the custom Request-URI should apply.



Note

If all SIP INVITE requests should have this header, enter '.'

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3. From the Pattern Match Dropdown Menu, select Calling or Called.
4. From the **Source Dropdown Menu**, select the entry corresponding with the Cisco UC520.
5. From the **Action Dropdown Menu**, select the Action configured in the preceding task in this example.
6. Click **Update** to update the page settings.

   The Match Rule displays in the Match table.
7. Scroll to the bottom of the page. Click **Submit** to save your changes to the EdgeMarc**.**

   The B2BUA Trunking Settings Page is refreshed. No error messages should be displayed.

Populating a Custom Route Header Example

Prerequisite Task: Configure SIP Settings as described in the *VoIP Operating System (VOS) for EdgeMarc User Manual*.

You can construct a custom Route header that enables the EdgeMarc to modify an existing route.

In the Header Manipulations section on the B2BUA Trunking Settings Page, configure the following settings:

1. In the **Name** field, enter the name of the Action.
2. Select **Route** from the dropdown menu.
3. In the **Value** field, enter the following text:

```
'<sip:' + $to.uri.user  + '@'+ $to.uri.host + ':' +
$env.target_domain + ';user=phone;lr>'
```



Caution
The contents of the **Value** field, including single or double quotes, must be entered exactly as shown in this step. Failure to enter the text exactly as shown will result in failure of the customized SIP Header's intended function.

4. To the right of the **Header** drop down menu, click **Add**.

   The custom header displays in the Header Manipulations table.
5. Click **Update** to update the page settings.

   The Action displays in the Actions table.

In the Match section on the B2BUA Trunking Settings Page, configure the following settings:

1. From the **Direction** dropdown menu, select **Outbound** or **Inbound**.
2. In the **Pattern Match Text Field** enter the rule for which the custom Route header should apply.

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Note

If all SIP INVITE requests should have this header, enter '.'

3. From the Pattern Match Dropdown Menu, select Calling or Called.
4. From the **Source Dropdown Menu**, select the entry corresponding with the PBX or select **Any** if the custom header should be included with all SIP INVITE requests originating on the LAN.
5. From the **Action Dropdown Menu**, select the Action configured in the preceding task in this example.
6. Click **Update** to update the page settings.

   The Match Rule displays in the Match table.
7. Scroll to the bottom of the page. Click **Submit** to save your changes to the EdgeMarc**.**

   The B2BUA Trunking Settings Page is refreshed. No error messages should be displayed.

Populating a Custom To Header Example

Prerequisite Task: Configure SIP Settings as described in the *VoIP Operating System (VOS) for EdgeMarc User Manual*.

You can construct a custom To header that enables the EdgeMarc to include additional parameters, as required by the policy of the SIP Server.

In the Header Manipulations section on the B2BUA Trunking Settings Page, configure the following settings:

1. In the **Name** field, enter the name of the Action.
2. Select **To** from the dropdown menu.
3. In the **Value** field, enter the following text (as instructed, replace the italic red text with the desired text):

```
'<sip:' + $to.uri.user + '@' + $env.target_domain +
';parameter=parametercontents>'
```



Caution

Except for portions of the SIP Header that are in red italic text, the contents of the **Value** field, including single or double quotes, must be entered exactly as shown in this step. Failure to enter the text exactly as shown will result in failure of the customized SIP Header's intended function.

4. To the right of the **Header** drop down menu, click **Add**.

   The custom header displays in the Header Manipulations table.
5. Click **Update** to update the page settings.

   The Action displays in the Actions table.

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In the Match section on the B2BUA Trunking Settings Page, configure the following settings:

1. From the **Direction** dropdown menu, select **Outbound** or **Inbound**.
2. In the **Pattern Match Text Field** enter the rule for which the custom To header should apply.



Note

If all SIP INVITE requests should have this header, enter '.'

3. From the Pattern Match Dropdown Menu, select Calling or Called.
4. From the **Source Dropdown Menu**, select the entry corresponding with the PBX or select **Any** if the custom header should be included with all SIP INVITE requests originating on the LAN.
5. From the **Action Dropdown Menu**, select the Action configured in the preceding task in this example.
6. Click **Update** to update the page settings.

   The Match Rule displays in the Match table.
7. Scroll to the bottom of the page. Click **Submit** to save your changes to the EdgeMarc**.**

   The B2BUA Trunking Settings Page is refreshed. No error messages should be displayed.

Custom Header Functions

Custom header functions perform operations on strings in SIP headers, such as extraction, finding, and replacing text within the header with text that the function specifies.

Custom Header Function Examples

The following two examples demonstrate how to use custom header functions to replace text within a header:

- Populating a Custom From Header using the Substr Function Example
- Populating a Custom Diversion Header using the Replace Function Example

Populating a Custom From Header using the Substr Function Example

Prerequisite Task: Configure SIP Settings as described in the *VoIP Operating System (VOS) for EdgeMarc User Manual*.

You can construct a custom From header that enables the EdgeMarc to strip the "+" sign from the calling DID.

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In the Header Manipulations section on the B2BUA Trunking Settings Page, configure the following settings:

1. In the **Name** field, enter the name of the Action.
2. Select **From** from the dropdown menu.
3. In the **Value** field, enter the following text (as instructed, replace the italic red text with the desired text):

```
'<sip:' + substr($from.uri.user, 2, 13) + '@' +
$env.target_domain + '>'
```



Caution
The contents of the **Value** field, including single or double quotes, must be entered exactly as shown in this step. Failure to enter the text exactly as shown will result in failure of the customized SIP Header's intended function.

4. To the right of the **Header** drop down menu, click **Add**.

   The custom header displays in the Header Manipulations table.

5. Click **Update** to update the page settings.

   The Action displays in the Actions table.

In the Match section on the B2BUA Trunking Settings Page, configure the following settings:

1. From the **Direction** dropdown menu, select **Outbound** or **Inbound**.
2. In the **Pattern Match Text Field** enter the rule for which the custom From header should apply.



Note

If all SIP INVITE requests should have this header, enter '.'

3. From the Pattern Match Dropdown Menu, select **Calling**.
4. From the **Source Dropdown Menu**, select the entry corresponding with the PBX or select **Any** if the custom header should be included with all SIP INVITE requests originating on the LAN.
5. From the **Action Dropdown Menu**, select the Action configured in the preceding task in this example.
6. Click **Update** to update the page settings.

   The Match Rule displays in the Match table.

7. Scroll to the bottom of the page. Click **Submit** to save your changes to the EdgeMarc**.**

   The B2BUA Trunking Settings Page is refreshed. No error messages should be displayed.

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Populating a Custom Diversion Header using the Replace Function Example

Prerequisite Task: Configure SIP Settings as described in the *VoIP Operating System (VOS) for EdgeMarc User Manual*.

You can construct a custom Diversion header that enables the EdgeMarc to replace a non-configurable DID in the Diversion header with a configurable 10-digit DID.

In the Header Manipulations section on the B2BUA Trunking Settings Page, configure the following settings:

1. In the **Name** field, enter the name of the Action.
2. Select **Other** from the dropdown menu.
3. In the **Other Text Field**, enter the following text: `Diversion`
4. In the **Value** field, enter the following text (as instructed, replace the italic red text with the desired text):

```
replace($diversion, 'insert DID in single quotes here',
'insert 10-digit configurable number in single quotes here')
```



Caution
Except for portions of the SIP Header that are in red italic text, the contents of the **Value** field, including single or double quotes, must be entered exactly as shown in this step. Failure to enter the text exactly as shown will result in failure of the customized SIP Header's intended function.



Note

The replace function can be concatenated with custom header variables and strings in the **Value** field. The replace function does not always replace a header as shown here in this example.

5. To the right of the **Header** drop down menu, click **Add**.

   The custom header displays in the Header Manipulations table.

6. Click **Update** to update the page settings.

   The Action displays in the Actions table.

In the Match section on the B2BUA Trunking Settings Page, configure the following settings:

1. From the **Direction** dropdown menu, select **Outbound** or **Inbound**.
2. In the **Pattern Match Text Field** enter the rule for which the custom Diversion header should apply.



Note

If all SIP INVITE requests should have this header, enter '.'

3. From the Pattern Match Dropdown Menu, select Calling or Called.

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4. From the **Source Dropdown Menu**, select the entry corresponding with the PBX or select **Any** if the custom header should be included with all SIP INVITE requests originating on the LAN.
5. From the **Action Dropdown Menu**, select the Action configured in the preceding task in this example.
6. Click **Update** to update the page settings.

   The Match Rule displays in the Match table.
7. Scroll to the bottom of the page. Click **Submit** to save your changes to the EdgeMarc**.**

   The B2BUA Trunking Settings Page is refreshed. No error messages should be displayed.

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A

Appendix

You can establish a relationship between more than one PBX and the EdgeMarc on the B2BUA Trunking Settings Page. Define each PBX to which the EdgeMarc will act as a B2BUA in the Trunking Devices section. The EdgeMarc will send inbound SIP INVITE requests to the PBX that you specify in the Actions Settings and Match Settings sections.

To enable the EdgeMarc to act as a B2BUA with more than one PBX, first, complete the steps as defined in Configuring the B2BUA Trunking Settings Page and then complete the following additional steps:

Step 5. Configure an Additional Trunking Device in the Trunking Devices Settings

Step 6. Configure Match Settings for an Additional Trunking Device

Step 5. Configure an Additional Trunking Device in the Trunking Devices Settings

Prerequisite Task: Step 1. Configure Trunking Devices Settings

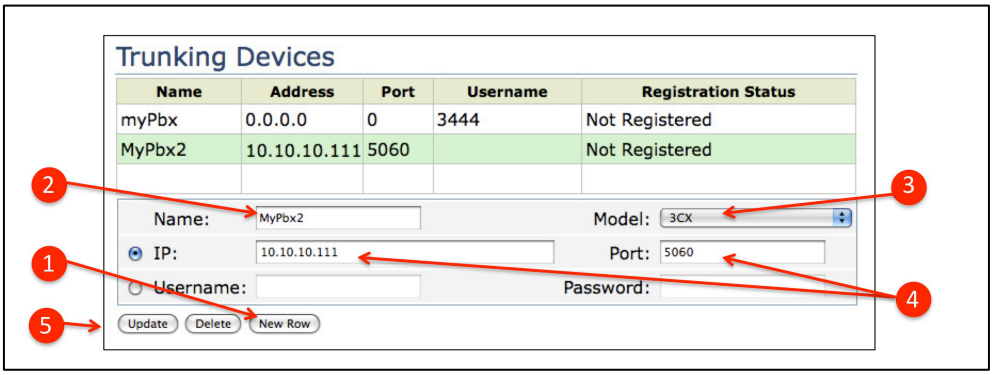


Note

Review the list of PBX Configuration Instructions at http://www.edgewaternetworks.com/edgemarc_interop.htm. If Configuration Instructions for your additional PBX are listed, use those instructions to set up your PBX for use with the EdgeMarc.

If the additional PBX has a static IP address, refer to the following figure and configure these settings:

Figure 14. Trunking Devices Settings Section with an Additional PBX Using a Static IP Address



1. Click **New Row** to add a new entry for the PBX in the Trunking Devices Table.

   The New Row displays in the Trunking Devices table and all input fields are blank.

2. In the **Name** text field, enter a name by which the EdgeMarc can identify the additional PBX.

3. In the **Model** text field, select the PBX Model type.

Note

If your PBX is not listed, select “Generic PBX” from the dropdown menu.

---

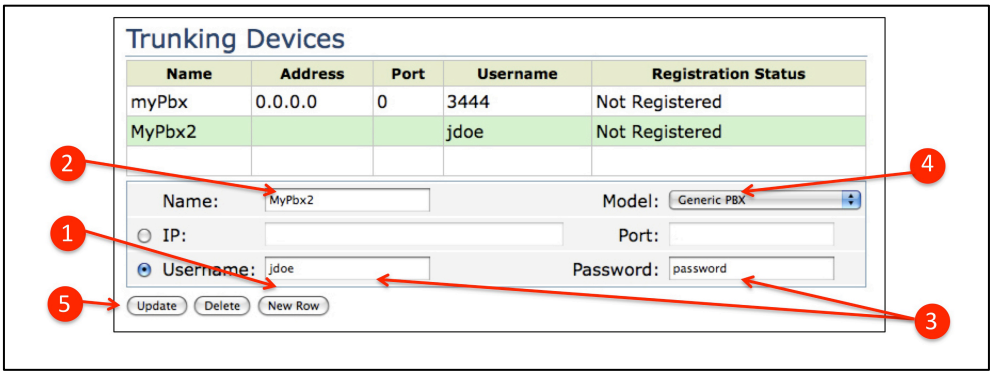
4. In the **IP** field, enter the IP address and in the **Port** field, enter the PBX’s corresponding SIP Port.

5. At the bottom of the Trunking Devices section, click **Update** to update the page settings.

   The PBX displays in the Trunking Devices Table.

If the additional PBX has a dynamic IP address, refer to the following figure and configure these settings:

Figure 15. Trunking Devices Settings Section with an Additional PBX using a Dynamic IP Address



1. Click **New Row** to add a new entry for the PBX in the Trunking Devices Table.

   The New Row displays in the Trunking Devices table and all input fields are blank.

2. In the **Name** text field, enter a name by which the EdgeMarc can identify the PBX.

3. In the **Username** and **Password** text fields, enter the authentication credentials (supplied by the PBX) by which the EdgeMarc can identify the PBX.
4. From the **Model** dropdown menu, select the PBX model.

Note

If your PBX does not appear in the dropdown menu, select Generic PBX. PBXs that are not in the dropdown menu have not been tested by Edgewater Networks for interoperability.

5. At the bottom of the Trunking Devices section, click **Update** to update the page settings.

   The PBX displays in the Trunking Devices Table.

Tip

If the EdgeMarc will perform operations on SIP INVITE requests between this PBX and the SIP Server, before proceeding to the next step, confirm that these operations have been defined these operations as described in Step 3. Configure Actions Settings.

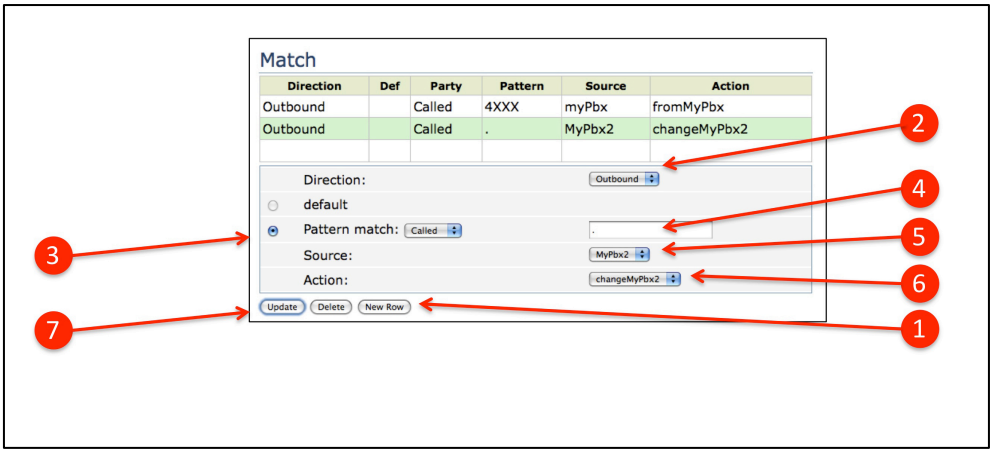
Step 6. Configure Match Settings for an Additional Trunking Device

Prerequisite Task: Step 3. Configure Actions Settings

You can define which operations should be applied from the Actions Settings section to a defined selection of SIP INVITE requests that originate from or are destined for more than one trunking device. Select the operation, define the selection of SIP INVITE requests, and specify additional trunking devices in the Match Settings Section.

Referring to the following figure, configure these settings:

Figure 16. Match Settings Section For More Than One PBX



1. Click **New Row** to add a new entry for the PBX in the Match Table.

   The New Row displays in the Match table and all input fields are blank.

2. Select **Outbound** from the **Direction** dropdown menu.
3. Select one of the following options from the **Pattern Match** dropdown menu:
   - Select **Calling** if the operation should be performed upon a subset of outbound SIP INVITE requests that originate from the additional PBX.
   - Select **Called** if the operation should be performed upon a subset of inbound or outbound SIP INVITE requests that are destined for the additional PBX
4. In the **Pattern Match** text field, enter a pattern for which the EdgeMarc should search in the DID, as specified in the additional PBX's SIP INVITE request. If the EdgeMarc finds a match, it will perform a selected operation upon the SIP INVITE request.



Tip

For more information about patterns, refer to Table 1. Example Pattern Matches.

5. Select the additional PBX from the **Source** dropdown menu.
6. From the **Action** dropdown menu, select the **Action** that should apply.

   If the Action is not selected, the default Action will be selected.



Note

Selecting the default action will result in the stripping of any unnecessary headers from the SIP INVITE request.

7. Click **Update** to update the page settings.

   The rule displays in the Match table.

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