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Overview

PhoneGnome™ provides a platform Extension API (EAPI) whereby partner applications can be tightly integrated with the PhoneGnome platform, and thereby with the end-user's telephony experience.

Partners can programmatically interact over the network with the PhoneGnome™ platform in two distinct but complimentary roles. In the first role, PhoneGnome™ fires actions to the partner as a result of PhoneGnome™ platform *triggers*. In the second role, partners make XML-RPC calls on behalf of their customers to initiate messaging or otherwise effect behaviors in the PhoneGnome platform. Each of these roles features EAPI semantics that go beyond traditional SIP methods and messaging, yet remain within the domain of standard Internet Protocol network programming.

In the first role, partners can receive from the PhoneGnome™ platform realtime event notification when certain of the partner's business rules are satisfied on a per call basis. The meeting of a business rule as a result of a some set of condition events is termed a *trigger*. The PhoneGnome™ platform can fire actions to partners as a result of *triggers* on either inbound or outbound calling events. In turn, partners can issue their own network actions based on these events on behalf of their customers.

Triggers can be delivered from the PhoneGnome platform to the partner's application using one of two protocols, as preferred by the partner: XML-RPC or SIP. For partner applications requiring only signaling information (or the metadata) associated with calls, the simplest protocol option is XML-RPC. If the partner application must participate in the media of a call, the SIP-based EAPI partner interface is required.

A simple example of servicing a trigger is the sending of an instant message to the customer's IM session if a call from a specified party is incoming. This is a useful service, and essentially requires of the partner only an XML-RPC server and network connection. Gesturing toward this simple example, it is worth emphasizing that taking advantage of the platform EAPI does not necessarily require the partner be a provider of full PSTN services. Pure IP-based partners can also provide interesting and compelling services to their subscribers using the PhoneGnome™ EAPI.

At this time the definition of triggers associated with a given partner application is a manual (off-line) process that requires coordination between TelEvolution Inc. and the partner. In the future, such interface definitions will be self-service via a developer portal.

In the second role, partners can issue their own action-like events to the PhoneGnome™ platform through the use of XML-RPC calls.

Developers may find it helpful to view the SIP-based EAPI as an additional messaging mechanism on top of SIP. EAPI provides for powerful coded SIP URIs included in normal call flow to induce the platform or the partner call handling systems into states that more conventional SIP URIs do not admit. EAPI resides on top of standard SIP and is SIP compliant.

We have designed the EAPI mechanism to be lightweight and easy to implement. The purpose of this document is to describe the EAPI mechanisms by which partners can offer custom calling or messaging services for their customers.

We treat the PhoneGnome™ EAPI by breaking it into two general categories:

- Actions initiated by PhoneGnome™ EAPI to the partner
- Actions initiated by partner to PhoneGnome™ EAPI

Actions Initiated by PhoneGnome™ EAPI to partner

Actions initiated by the PhoneGnome™ EAPI to the partner fall into three basic categories:

- Inbound call flow
- Outbound call flow
- Change notifications
- Provisioning

Inbound call flow includes the following

- Busy event handler
- Unavailable event handler
- Thru handler

Outbound call flow includes the following

- Dial tone (hot dial)
- General handler, including all calls or a *class* of calls

Provisioning includes the following

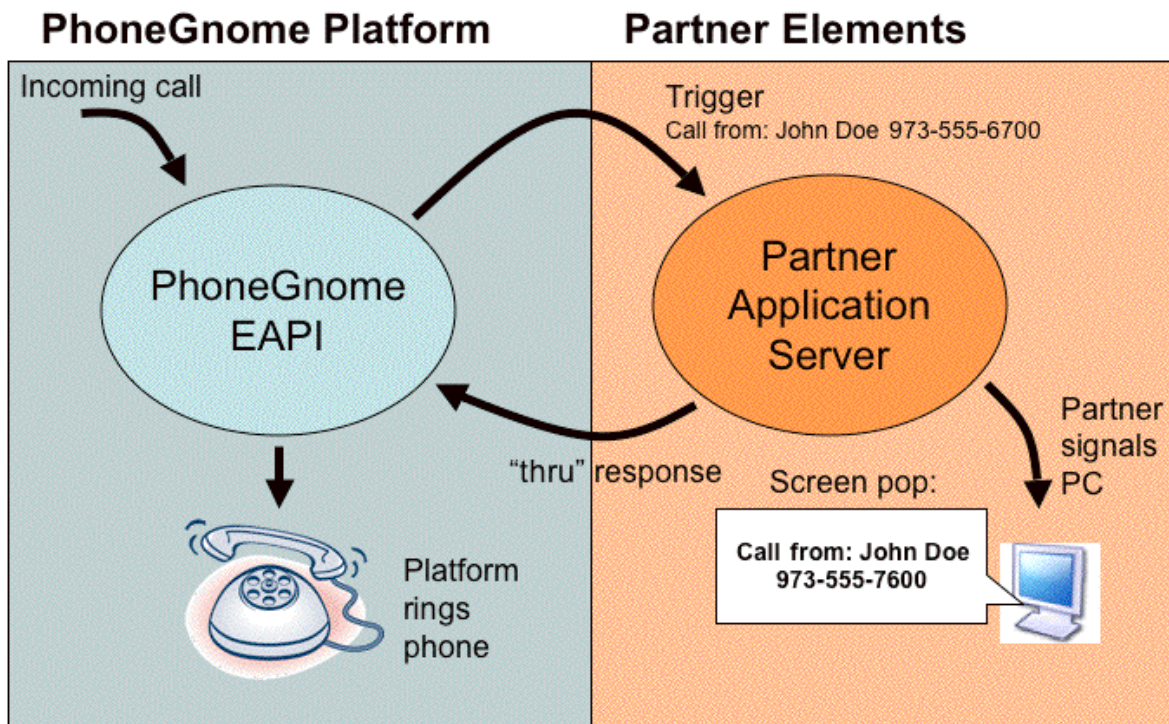
- Adding subscribers to the partner service
- Unsubscribing customers from the partner service
- Querying status of customers on the partner service

Change Notifications are triggers delivered to partner applications as needed when integrated or shared database and other relevant parameters are updated outside the actions of the partner application

In the above, an inbound call is a call bound for a specific PhoneGnome™ end-node and an outbound call is a call initiated by a PhoneGnome user.

Simple Example Application: PC Screen-pop for incoming calls

For illustration purposes, consider a relatively simple application that causes the caller information for an incoming call to pop-up on a customer's PC screen in real-time. In this case, the partner application can use either the SIP-based EAPI or XML-RPC. In either case, the basic flow is identical, as shown below.



The PhoneGnome EAPI platform would be configured for this partner application to deliver an event to the partner application for all inbound calls. The above diagram depicts the elements that are intrinsic to the PhoneGnome platform on the left in blue, and the elements developed and operated by the partner on the right, in orange.

When an incoming call arrives (whether from the PSTN, another PhoneGnome, or an external VoIP peer), the EAPI platform would signal the partner application (via SIP or XML-RPC). The partner application receives this event, collecting the calling party information, and returns to the EAPI a response that instructs the PhoneGnome platform to continue with the normal processing of the call, which in the simple case, means it rings the customer's phone.

In this example, upon receiving the inbound call event, with the calling party data, the partner application also forwards that info, via some partner-specified implementation, to the customer's PC and an application on the PC pops up the calling party data on the customer's PC screen.

In this simple example, the partner has minimal responsibilities. They are providing a hosted service for processing the EAPI events and they of course provide all the application-specific elements, such as the PC screen-pop application. The interface with the PhoneGnome platform is a simple IP networked interface. The partner application service is a pure IP application and has no telephony-related requirements.

Trigger Event Details

Events delivered by the EAPI to the partner application always include the following parameters:

Action	Action/event being triggered
acct	Acct number of user/end-point
Id	Opaque value identifying transaction
params	Action-specific parameters (if any)

His or her unique account number identifies each PhoneGnome subscriber. This account number is used in provisioning a subscriber for a given partner application/service and subsequently in trigger events.

Partners must associate subscriber accounts on the partner service with the PhoneGnome subscriber account number. All event triggers and provisioning services will specify subscriber accounts using the account number.

The possible actions are listed below. The specific meaning of a given action can vary depending on the context of the trigger (e.g. whether for on inbound or outbound call):

1	Dial – indicates a dialed destination given in the dialplan associated with the specific PhoneGnome
2	Busy – destination busy event
3	Unavailable – call not answered event
4	Thru – a generic trigger for calls meeting defined business rules for the application
5	Direct – route call to a specific destination

In response to the above trigger actions, the partner application responds with similar actions as appropriate to redirect or otherwise process the given call flow. Some partner applications will handle and dispose of the call themselves (e.g. a Voicemail application) and others will take advantage of the PhoneGnome platform, via the EAPI, to cause the PhoneGnome platform to handle or dispose of the call on behalf of the partner application (e.g. a call screening, or call forwarding application).

When using the XML-RPC form of the EAPI, the trigger parameters are provided via XML-RPC parameters. When using the SIP-based EAPI, the trigger parameters are delivered to the partner application SIP server via a specially encoded SIP URI, as follows:

*sip:*action*acct*id*params@partnerhost*

These relatively simple building blocks permit very simple, as well as very complex and powerful, tightly integrated partner applications. Some examples are given below:

Applications that do not require media (may use XML-RPC or SPI-based EAPI):

After hours forwarding	This application would redirect calls based on the time of day. This application receives “thru” events for incoming calls, and redirects the call using a “dial” action response to the EAPI platform for calls that are to be redirected or a “thru” response for those that are not to be redirected.
Call redirection money saver	In the UK, some numbers like those starting with 0870, have alternative numbers that can be called at much lower rates. UK customers might subscribe to a service that automatically redirected such calls to the lower priced alternative number. This application would receive “thru” actions for outbound calls placed by PhoneGnome users. The application would search for alternatives, and if one is found, respond to the EAPI platform with a “dial” action to redirect the call, or respond with the “thru” action if no redirection applies.

Applications that require media (must use the SIP-based EAPI):

Voicemail	A partner-provided voicemail service would be configured to receive “busy” and “unavailable” events for incoming calls. The application would send these SIP calls to the Voicemail feature server operated by the partner, and dispose of the call.
Live call screening	This application would permit a subscriber to listen to an inbound call in real-time, and elect to either pick up the call, let it go to voicemail, or take other actions (perhaps redirect the call). This would be a fairly complex application, requiring telephony expertise on the partner’s part. The application would be configured to receive “thru” events for incoming calls and be part of the media for those calls. The partner application would prompt the calling party to leave a message while ringing the PhoneGnome phone via a SIP INVITE to the EAPI with a “direct” action. If the PhoneGnome phone is picked up, the application could bridge the PhoneGnome user into the media so that user could hear the message being left by the calling party in real-time. If the PhoneGnome user presses a given key, they could be connected live to the calling

party, or they could hang up and let the call go to voicemail.

Overview of actions initiated by partner applications to the EAPI platform

In general, partner applications may invoke XML-RPC services on the EAPI platform to access and control the PhoneGnome experience for subscribers of the given partner applications. Such operations may include access to the PhoneGnome customer's contact list, setting or querying various parameters, initiating click-to-dial operations, accessing call log data, and so on.

Each partner application is provided a master account with credentials that permit the operations appropriate and necessary for the partner application, without exposing the individual PhoneGnome user credentials. Only those functions required by the partner application will be available to the partner application, in compliance with the PhoneGnome end-user privacy policy.

Not all partner applications require these services.