SLOOCE TECHNOLOGY, INC.

SLOOCE PARTNER INTERFACE

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Table of Contents

Introduction

This document describes the interface through which a *Partner* may deliver one or more *Partner Services* via the *Slooce* platform to *end-users* (a.k.a. S*ubscribers*). The interface described here assumes reliable TCP/IP connectivity between the *Slooce* server and the Partner's server(s).

The interface assumes that Slooce manages end-user communications, including:

- End-user subscription management and access control.
- Receives messages from end-users and forwards them to the Partner.
- Routes messages from Partner to end-users.

The interface is designed with the following considerations in mind:

- Simplicity: integration should be simple, especially for initial and common-case scenarios.
- Flexibility: the interface should enable integration with different Partner infrastructures.
- Extensible: the interface should be extensible to be able to handle specific Partner needs.
- Scalable: the interface must be able to handle high message volumes.

Each Partner is assigned a unique <partnerid> and may register (subject to availability) one or more <keyword>s for every service. Mobile subscribers are identified by their 11-digit mobile numbers beginning with a 1 (herein referred to as <user>s).

General Aspects

API Overview

To enable a Partner to send and receive messages, and for various subscription management requests and queries, Slooce provides a REST API. Generally, in order to perform various actions, the Partner will do an HTTP POST to a URL of the following form provided by Slooce:

http://<sloocehost>.<sloocedomain>:<slooceport>*/spi/*<partnerid>/<user>/<keyword>/<action>

This indicates a request by <partnerid> to perform an <action> regarding a given <user> on a service <keyword>. The message body of the HTTP POST is an XML document with further details and parameters for that <action>. Note that the Content-Type HTTP Request Header must be set to either application/xml or text/xml for the XML document to be processed.

Example of XML submission to Slooce:

```
<message id="abcdef123">
<partnerpassword>jTUWufdis</partnerpassword>
...other parameters...
</message>
```

The message id submitted to Slooce can be any alphanumeric string, and is simply logged for debugging and reporting purposes. It is highly recommended that a unique message id be submitted for each Slooce API call. Each Partner is also provided a <partnerpassword> which is an alphanumeric string used for authenticating connections to the Slooce platform.

Similarly, mobile-originated (MO) messages - text messages sent by mobile subscribers to the Slooce platform in order to interact with a Partner's service - are delivered to the Partner via an HTTP POST of an XML document to a callback URL provided by the Partner. The XML message will identify the user and keyword, and will contain the user's message.

Example MO message delivered to Partner:

<message id="1234567898765-1234567898765">
<user>14085551212</user>
<keyword>KEYWORD</keyword>
<content>hello world</content>
</message>

Message Encoding

XML messages are exchanged in ISO-8859-1 (a.k.a. Latin-1) encoding. End-user message content submitted to Slooce should use HTML escape sequences for any characters that may otherwise conflict with XML syntax:

&	&amp;
<	<
>	>
“	"

API Responses

Well-formed API calls to Slooce, with valid parameters and XML content, return an HTTP_Accepted (202) response. A response of HTTP_Accepted (202) indicates that the request was received, parsed and authenticated, whereas any other HTTP error code indicates that something prevented the request from being completed.

However, an HTTP_Accepted response alone does not necessarily indicate success. Independently of the HTTP response code, additional information and the results for the API call are returned as an XML message. In most cases, the XML response takes the following form:

<response id="1234567898765-1234567898765" result="ok">ok</response>

Other possible response values are discussed below in their respective sections below. The response id returned by Slooce can be any alphanumeric string, and is provided for your records (e.g., to track delivery receipts as explained below).

New User Eligibility

Prior to signing up a new user for a given service, it may be necessary to verify that the user's mobile operator is supported and that Slooce is able to deliver service to that user. This may, for instance, be useful if the Partner needs to establish user eligibility before charging a user's credit card.

In such cases, the Partner may optionally use this interface to perform a preliminary validation before actually signing up the user. A new user eligibility request takes the following form:

http://<sloocehost>.<sloocedomain>:<slooceport>*/spi/*<partnerid>/<user>/<keyword>/messages/supported

Where <user> is the 11-digit mobile number of the subscriber. The XML message to submit in the body of the request is of the following form:

Example of XML for new user eligibility check:

<message id="abcdef123">
<partnerpassword>jTUWufdis</partnerpassword>
<content></content>
</message>

New User Eligibility Response

A response of HTTP_Accepted (202) indicates that the API call was received successfully. All other HTTP response codes indicate an error that prevented the eligibility check from completing. An HTTP_Accepted response does not in itself indicate that the user is eligible for the service. Rather, the XML message sent in response includes a value attribute indicating whether the user can be signed up, or a reason why the user is not supported.

In addition to the eligibility check, when a user's mobile number is supported, the API also returns the state of that user relative to that keyword. This is useful, for instance, if the Partner needs to know whether a user is already active on a service or not before attempting to register the user for that service.

Example responses to new user eligibility submission:

<response id="1234567898765-1234567898765"
result="supported" state="new">supported</response>

<response id="1234567898765-1234567898765"
result="unknown operator">unknown operator</response>

The possible states for a user in relation to a given a keyword are:

new	User has never been registered for this keyword
started	User is currently registered and active on this keyword
stopped	User was previously registered before but has now opted out or been stopped

The possible result values are:

supported (202 Accepted)	User's operator is supported
unsupported operator (202 Accepted)	User's operator is not supported
invalid phonenumber (202 Accepted)	The specified phone number is not valid
invalid keyword (202 Accepted)	The keyword is invalid
service deactivated (202 Accepted)	The keyword has been deactivated
unknown operator (202 Accepted)	The user's operator cannot be determined
unknown error (202 Accepted)	An unknown error occurred

New User Sign-up

To sign up for a Partner's service, a user has to register for the corresponding keyword on the Slooce platform. This happens automatically if the user texts that keyword to a Slooce shortcode. However, there are times when a Partner needs to register a user with Slooce, as might happen with a web sign-up process, for example.

In such cases, the Partner would use this interface to register a user for a keyword first and then start delivering content to that user. The purpose of this registration step is to prevent accidental spamming of users who have not explicitly signed up for a service or keyword. A new user sign-up request takes the following form:

http://<sloocehost>.<sloocedomain>:<slooceport>/*spi*/<partnerid>/<user>/<keyword>/messages/start

Where <user> is the 11-digit mobile number of the new subscriber for the service <keyword>. The XML format to submit in body of the message is as follows:

Example of XML for new user sign-up submission:

```
<message id="abcdef123">
<partnerpassword>jTUWufdis</partnerpassword>
<content></content>
</message>
```

New User Sign-up Response

An eligibility check similar to the “New User Eligibility” check above is first performed.

Since passing this check is a condition for completing the sign-up process, failure to pass the check will result in an HTTP error. This is different from the “New User Eligibility” check, where completing the request, but failing eligibility, still results in an HTTP_Accepted response.

Validation includes checking the user's phone number format, and whether the user's operator is

supported for that keyword. Passing this validation doesn't guarantee that sign-up will succeed, but it catches many cases where it cannot work.

A response of HTTP_Accepted (202) indicates that the request has been received and the user is eligible to sign up for this service. All other responses indicate an error that prevented the signup request to complete, and will be accompanied by an XML response with a descriptive error value.

Example response to new user sign-up submission:

<response id="1427786731136-1427944926200" result="ok">ok</response>

The possible result values are:

ok (202 Accepted)	Operation completed without errors
unsupported operator (202 Accepted)	User's operator is not supported
invalid phonenumber (202 Accepted)	The specified phone number is not valid
invalid keyword (202 Accepted)	The keyword is invalid
service deactivated (202 Accepted)	The keyword has been deactivated
unknown operator (202 Accepted)	The user's operator cannot be determined
unknown error (202 Accepted)	An unknown error occurred

New User Sign-up Success Notification

Once eligibility is established, a new user sign-up command is executed asynchronously by the Slooce platform. If sign-up is successful, the Slooce platform basically behaves as if the <user> had texted <keyword> to the shortcode or longcode where the service is configured. The Slooce platform then simulates an incoming MO message from the user that results in a callback to the Partner's notification URL (See section on MO messages below).

Example new user sign-up simulated MO message:

<message id="123456789">
<keyword>KEYWORD</keyword>
<user>14085551212</user>
<content></content>
</message>

IMPORTANT: The new user sign-up feature cannot be used to simulate arbitrary user actions, but is designed exclusively to allow signing-up of new users who have indicated an initial opt-in by an alternate method (e.g. the user may have entered his or her phone number through the Partner's web-site). The Partner is responsible for logging the user's actions indicating intent to sign up for the service. Misuse of this feature may result in program suspension or termination.

Mobile Terminated (MT) Messages

MT messages are text messages sent by the Partner to subscribers via the Slooce platform. Once a user is signed up for a keyword, MT messages can be sent to that user via an HTTP POST to a URL of the following form:

http://<sloocehost>.<sloocedomain>:<slooceport>*/spi/*<partnerid>/<user>/<keyword>/messages/mt

The content of the POST is an XML document containing the outgoing message content.

Example of XML for MT message submission:

<message id="abcdef123">
<partnerpassword>jTUWufdis</partnerpassword>
<content>Correct! Mount Everest is the tallest peak in the world.</content>
</message>

MT Response

The response for a successful MT message submission is an XML document containing a unique message id.

Example response to message submission:

<response id="1427786731136-1427944926200" result="ok">ok</response>

Note: The maximum allowable length for any given MT message is 160 characters. Any MT messages longer than 160 characters will be truncated to length 160 before delivery to users.

A response of HTTP_Accepted (202) indicates that the message has been received, parsed, authenticated, validated, and queued for delivery. All other responses indicate an error that prevented command execution.

The possible result values are:

ok (202 Accepted)	Operation completed without errors
invalid mt request (403 Forbidden)	User's session is invalid
unsupported operator (403 Forbidden)	User's operator is not supported
empty mt request (400 Bad Request)	The specified content is not valid
unknown error (500 Internal Server Error)	An unknown error occurred

Supported Characters

Generally speaking, only a subset of the standard ASCII character set is supported for content being delivered to the user via SMS. The list of supported characters are A-Z, a-z, 0-9 and the following: @$_/.,"():;-=+*&%#!?<>' plus space and newline "\n".

Most special characters are not supported and will cause messages to be rejected by the wireless

operators. In particular, accented characters and the following are NOT supported: tab [ ] ~ { } ^ | € \

When authoring content for delivery via SMS, it is also important to use the simple ASCII characters for the apostrophe, the ellipsis, and single and double quotes:

use ' instead of <`> and <’>
use " instead of <“> and <”>
use ... instead of … (Note: that's three separate periods instead of the single ellipsis character)

For Spanish content accented characters, Spanish punctuation marks and the tilde are not supported. So Spanish content needs to be mapped to the equivalent unaccented ASCII characters first. The proper meaning is generally expected to be understood from context.

Mobile Originated (MO) Messages

MO messages are text messages sent by mobile subscribers to the Slooce platform in order to interact with a Partner's service. MO messages are delivered to the Partner via an HTTP POST of an XML document to a callback URL provided by the Partner. The XML message will include the user, the keyword, and the user's message.

Example MO message:

<message id="123456789">
<user>14085551212</user>
<keyword>KEYWORD</keyword>
<content>hello world</content>
</message>

The Slooce platform manages keyword-based sessions for mobile subscribers. In short, a user selects a particular service by texting the associated keyword. Any subsequent messages from that user are associated with that keyword and are delivered to the Partner on that keyword, until the user selects a different service by texting a different keyword.

A user's session may also be changed upon receiving a Mobile Terminated (MT) message from another service, thereby generally allowing users to simply respond to the last MT message they received in order to interact with that service.

Special cases: STOP and HELP

STOP and HELP commands from the user require special handling, per the Mobile Marketing Association (MMA) guidelines. When a user texts STOP (or any of its equivalents: CANCEL, END, UNSUBSCRIBE, QUIT), the Slooce platform will pass a special STOP command to the Partner and will also terminate that user's service.

Example STOP message:

<message id="123456789">

<user>14085551212</user>
<keyword>KEYWORD</keyword>
<command>Q</command>
</message>

Please note the use of the <command> tag instead of <content> in these special messages.

The Partner must then send one and only one response back to the user confirming the user's request to terminate service. This response must contain the phrase “opted out” (As in “You have opted out of ABC service by XYZ Corp...”) No other messages destined for that user on that keyword will be delivered after the optout confirmation message is sent to the user. This is to prevent accidental spamming of users who have opted out of a service. A user may reactivate a previously terminated service by texting the keyword for that service again. Alternatively, the Partner may reactivate service for a user via the New User Sign-up API above.

Similarly, when a user texts HELP (or any of its equivalents: HLP, SUPPORT) the Slooce platform will pass a special HELP command to the Partner. It is required that a response be sent back to the user outlining the nature and terms of the service along with instructions for how to opt out, how to get support, and the phrase “Message & Data Rates May Apply” or its shortened form “Msg&Data Rates May Apply”.

Example HELP message:

<message id="123456789">
<user>14085551212</user>
<keyword>KEYWORD</keyword>
<command>H</command>
</message>

Please note the use of the <command> tag instead of the <content> tag here as well.

Please refer to the MMA guidelines for detailed information on how HELP and STOP need to be implemented. Slooce and Partner will need to adhere to these guidelines at all times.

MO Response

An HTTP_OK response is expected. All other HTTP response codes are interpreted by Slooce as if the message was not delivered due to communication issues.

Partner-Initiated STOP

A Partner can choose to terminate service for an existing user on a given keyword. If the Partner simply stops delivering service without notifying the Slooce platform, the user could continue to get unsolicited messages. To prevent such scenarios, the Partner must make a partner-initiated STOP request for that user. Note: this is not necessary if the user texts STOP.

In response to a partner-initiated STOP, the Slooce platform will terminate that user's session and simulate a STOP command from the user as if the user had texted STOP from their mobile handset. The Partner is then expected to handle the STOP command as in the case of an MO message above.

A partner-initiated stop request looks similar to an MT message. The URL to use is:

http://<sloocehost>.<sloocedomain>:<slooceport>*/spi/*<partnerid>/<user>/<keyword>/messages/stop

Where <user> is an existing subscriber for the service <keyword>.

The XML format to submit is the same as for an MT message, except the content element can be empty.

Example of XML for partner-initiated stop submission:

```
<message id="abcdef123">
<partnerpassword>jTUWufdis</partnerpassword>
<content></content>
</message>
```

Partner-Initiated Stop Response

The response for a successful Stop request is an XML document containing a unique message id.

Example response to partner-initiated stop submission:

```
<response id="1234567898765-1234567898765" result="ok">ok</response>
```

A response of HTTP_Accepted (202) indicates that the message has been received, parsed, authenticated, validated, and queued for delivery. All other responses indicate an error that prevents command execution

The possible result values are:

ok (202 Accepted)	Operation completed without errors
invalid stop request (403 Forbidden)	User's session is invalid
unknown error (500 Internal Server Error)	An unknown error occurred

Delivery Receipts

Upon request, a Partner 's account could be configured to receive a delivery receipt for every MT message when reported by the subscriber's wireless operator. A delivery receipt will contain the current state of the MT message, a receipt id matching the original MT message response id, the user, and the keyword.

Delivery receipts are delivered to the Partner via an HTTP POST of an XML document to the same callback URL as MO messages. NOTE: Be sure not to mistake incoming delivery receipts as MO messages, as that could mislead your system into sending spurious MT messages to the subscriber.

Example delivery receipt:

```
<?xml version="1.0" encoding="ISO-8859-1" standalone="no"?>
<receipt id="1234567898765-1234567898765" state="delivered">
  <user>14085551212</user>
  <keyword>KEYWORD</keyword>
</receipt>
```

The possible MT message states in a delivery receipt are:

enroute	The message is in transit
delivered	The operator successfully delivered the message to the subscriber
expired	The message validity period has expired
undeliverable	The message is undeliverable
accepted	The message was delivered to the operator but not acknowledged
unknown	General error occurred while processing request
rejected	The message was rejected by the operator

Subscriber Lookups

Upon request, a partner's account could be configured to allow lookups of the wireless operator associated with a mobile phone number using the following interface:

http://<sloocehost>.<sloocedomain>:<slooceport>*/spi/*<partnerid>/<user>/operator

Where <user> is a valid US phone number in international format (e.g. 12345678900).

The XML format to submit is the same as for an MT message, except the content element can be empty.

Example of XML for operator lookup submission:

```
<message id="abcdef123">
<partnerpassword>jTUWufdis</partnerpassword>
<content></content>
</message>
```

Subscriber Lookup Response

A response of HTTP_Accepted (202) indicates that the message has been received, parsed, authenticated, validated, and queued for delivery. All other responses indicate an error that prevents command execution.

Example response to subscriber operator lookup:

```
<response id="123456789" operator="123" />
```

Operator Mappings

Below is the mapping between operator names and the encodings returned by the lookup interface:

Wireless Operator	**Encoding**
Unknown	0
ACS Wireless	6
Alltel	16
All West Wireless	17
Appalachian Wireless	22
AT&T	25
Bell Mobility	26
Bandwidth	28
Bluegrass Cellular	29
Boost Mobile CDMA	30
Boost Mobile iDEN	31
Carolina West	35
Cellcom	38
Cellular One Of NE Arizona	42
C-Spire	46
US Chariton Valley Cellular	49
Chat Mobility	50
Copper Valley	62
Cricket	67
CTC US	69
Dobson	73
Cellular One East Central Illinois	76
Pioneer Cellular	79
Epic Touch Co	80
Farmers Mutual Telephone Co	82
Fido Wireless	83
Flat Wireless	87
GCI Wireless	88
Golden State	91
Helio	99
Illinois Valley Cellular	103
Immix Wireless	106
Inland Cellular	107
Iwireless	108
Leaco	111
MTA Wireless	131
Nex Tech Wireless	140
Nextel	141
NNTC Wireless	142
Northwest Missouri Cellular	146
nTelos	148

Panhandle Wireless	155
Peoples Wireless	158
Pine Cellular	160
Plateau Wireless	164
Pocket	165
Revol Wireless	171
Rogers Wireless	172
Rural Cellular	176
SaskTel	180
SouthernLINC	187
Sprint	189
SRT Communications	191
Syringa Wireless	195
TELUS	199
Thumb Cellular	201
T-Mobile	205
Tmp Simmetry	208
TracFone	209
Union Wireless	212
United Wireless	213
US Cellular	214
Verizon Wireless	217
Videotron	218
Virgin Mobile Canada	222
Virgin Mobile USA	223
Claro Puerto Rico	226
West Central Wireless	228
Viaero Wireless	236
Duet Wireless	238
Element Mobile	239
Mobi PCS	241
MobileNation	242
Mosaic Telecom	243
Cellular One of Montana	244
DTC Wireless	247
Cricket GSM	248
Google Voice	249
Breakaway Wireless	250
Snake River PCS	251
Sprocket Wireless	252
Strata Networks	253
Open Mobile Puerto Rico	254
Cellular One of NEPA	255
Cablevision	256
Century Tel Wireless	257
Einstein Wireless	258

Ice Wireless	259
Kajeet	260
Mobilicity	261
MTS Mobility	262
Silver Star PCS	263
Sogetel	264
Tbaytel	265
Unicel	266
Wind Mobile	267
Lynx Mobility	268
Eastlink	269
Sagebrush Cellular	270
Peerless Wireless	271
Mast Mobile	272
Truphone	273
Cable and Cellular Communications	274
Enflick	275
ASTAC	276
AT&T Puerto Rico	277
AT&T US Virgin Islands	278
Brightlink Communications	279
Layered Communications	280
Sprint Puerto Rico	281
Sprint US Virgin Islands	282
Triangle Communication System	283
T-Mobile Puerto Rico	284
Cordova Wireless	285
Inteliquent	286