Grandstream Networks, Inc.

GXV34xx Series

GXV34x0 SDK Framework Service Guide

GXV34x0 SDK Framework Service Guide

OVERVIEW

GXV3470/GXV3480/GXV3450 operating system is developed based on Android™ platform. Besides inheriting the Android interface functions, more interfaces have been supported from users requirements. This document describes how to use the APIs for users' application development on GXV3470/GXV3480/GXV3450.

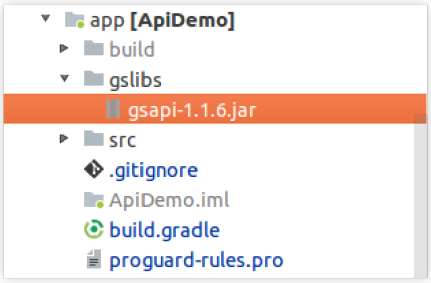
> **Note**
>
> Before starting the API demo or testing your own apps, please upgrade your GXV3470/GXV3480 /GXV3450 to the latest firmware version. The firmware release information can be found in the following link: http://www.grandstream.com/support/firmware

APPLICATION BUILDING

With GS JAR files, users can start building the apps with Android Studio (or another IDE) following the steps in this guide.

Create dir "gslibs" under App Module

Under App module, create "gslibs" directory. Then copy the JAR files "gsapi-1.2.1.jar" under "gslibs" directory so the JAR files are reachable from the app files.



Create gslibs under App Module

Build.gradle

Add dependencies on the build.gradle file using compileOnly or provided. Please see JAR files path below for reference:

```
dependencies {

. . . . . .

compileOnly files ('gslibs/gsapi-1.2.1.jar')

}
```

> **Note**
>
> Please do not package the JARs into APK. Please refer to below table that has listed the JARs that can be included when compiling your app. They should be added in "build.gradle" file if used

Package	Description

com.gs.common	Support Gs ApiClient
com.gs.account	Support Gs Account APIs
com.gs.phone	Support Gs Phone APIs
com.gs.contacts	Support Gs Contacts APIs
com.gs.calllog	Support Gs Calllog APIs
com.gs.sms	Support Gs sms APIs

Descriptions for JARs

Main API list in JARs

Here is a list of main APIs included in the above JARs:

API	Description
AudioRoutetApi	APIs related to audio route. This is used for switching audio route and checking audio route.
BaseAccountApi	APIs related to accounts. This is used for calls.
BaseLineApi	APIs related to lines. This is used for creating line channel upon outgoing call and incoming call.
BaseCallApi	APIs related to calls. This is used for making a call, receiving a call and etc.
BasePhoneService	APIs for the target app as default phone app.
ContactsContext	Useful API constants for Create-Read-Update-Delete (CRUD) contacts.
CalllogContext	Useful API constants for Create-Read-Update-Delete (CRUD) call logs.
SmsManagerAPI	APIs related to SMS. This is used for sending SMS, adding SMS lis and etc.

Descriptions for APIs

> **Note**
>
> All classes, functions and members of classes are NOT part of any supported API, which are not defined in gsApiExternal-en. If the code written depends on these, please proceed at your own risks. This code and its internal interfaces are subject to change or deletion without notice.

USE APIs

All APIs are named as **XXXApi**, such as: **BaseAccountApi**, **BaseCallApi**, **BaseLineApi, SmsMAnagerApi**.

- Before using the APIs, users must initialize ApiClient first
- Use a function such as XXXApi.function1()
- Use a monitor such as XXXApi.function2(callback2)

Details of the API functions can be found under ***gsApiExternal-en*** directory.

Initialize ApiClient

Supported Products: GXV3470, GXV3480, GXV3450.

The app can use ApiClient by com.gs.com. To initialize ApiClient, use setContext, addApi and build functions in the Application block.

> **Note**
>
> Initialization shall be performed only one time for each process. Please do not initialize the same process more than once.

Please follow the below code to initialize ApiClient:

```
public class DemoApplication extends Application {
@Override
public void onCreate() {
super.onCreate();
ApiClient.builder.setContext (getApplicationContext())
.addApi(BaseAccountApi.API)
.addApi(BaseCallApi.API)
.addApi(BaseLineApi.API)
.addApi(SmsManagerApi.API)
.addApi(AudioRouteApi.API)
.build();
}
}
```

BaseAccountApi

*Supported Products: GXV3470, GXV3480, GXV3450***.**

Account API can be used to obtain account information, modify account information and monitor account changes.

Account Information

You can get all account information by using ***BaseAccountApi.getAllSipAccounts***. Here is an example of how to use Account Info APIs:

```
public void getAllAccount() {
List<SipAccount> sipAccounts = BaseAccountApi.getAllSipAccounts();
}
```

Monitor Account Status

Users can monitor account status by using ***BaseAccountApi.addStatusListener*** and ***BaseAccountApi.removeStatusListener***. Here is an example on how to use monitor account status APIs.

Start Account Status Monitor

```
private void startMonitorAccountChange() {
mAccountStatusListener = new AccountStatusListener();
BaseAccountApi.addStatusListener (“MonitorAccount”,
mAccountStatusListener.callback,
AccountContext.ListenType.SIP_ACCOUNT_STATUS, false);
}
```

Stop Account Status Monitor

```
private void stopMonitorAccountChange() {
BaseAccountApi.removeStatusListener (mAccountStatusListener.callback);
mAccountStatusListener.callback.destroy();
mAccountStatusListener.callback = null;
}
```

Monitor Account using AccountStatusListener

```
private class MyAccountStatusListener extends AccountStatusListener {
@Override
public void onSipAccountStatusChanged(List<SipAccount> list, SipAccount sipAccount) {
}
};
AccountStatusListener mAccountStatusListener = null;
```

Update Account

Account information can be updated using **BaseAccountApi.updateSipAccount.** Here is an example showing how to use Update Account function:

```
public void updateAccount() {
BaseAccount account= BaseAccountApi.getAccountbyId(0);
Log.d(TAG,”updateAccount,original:”+account);
if(account != null && account instanceof SipAccount){
account.setAccountName(”Test Account”);
boolean ret = BaseAccountApi.updateSipAccount((SipAccount) account);
if(ret){
Log.d(TAG,”updateAccount,changed to:”+account);
}
}
}
```

BaseCallApi

Call functions allow users to make calls, end calls and monitor call status.

Make a Call

*Supported Products: GXV3470, GXV3480, GXV3450***.**

Users can make a call by using ***BaseCallApi.makeCalls***. Here is an example on how to use Call function API to make a call:

```
public void call(String num) {
List<DialingInfo> dialingInfos = new ArrayList<DialingInfo>();
DialingInfo dialingInfo = new DialingInfo();
dialingInfo.setAccountID(BaseAccountApi.getDefaultAccount().getAccountID());
dialingInfo.setOriginNumber(num);
dialingInfos.add(dialingInfo);
DialResults dialResults = BaseCallApi.makeCalls(dialingInfos);
int result = dialResults.getDialResult(dialingInfo);
}
```

End a Call

*Supported Products: GXV3470, GXV3480, GXV3450***.**

```
public void endCall(View view) {
DemoApplication app = (DemoApplication) getApplication();
int lineId = app.getCurLineId();
BaseCallApi.endCall(lineId);
}
```

Monitor Incoming Call

Supported Products: GXV3470, GXV3480, GXV3450.

In order to answer an incoming call, users need to monitor the incoming call first. Here is an example of monitoring an incoming call.

Start Call Status Monitor

To start monitoring a line's status, use ***BaseCallApi.addStatusListener*** with ***LINE_STATUS***, and monitor a call line that has id ***LINE_ID***.

```
private void startMonitorCallLines() {
mCallStatusListener = new MyCallStatusListener();
BaseCallApi.addStatusListener ("MonitorCall",
mCallStatusListener.callback,
PhoneContext.ListenType.LINE_ID |PhoneContext.ListenType.LINE_STATUS,
false);
}
```

Stop Call Status Monitor

```
private void stopMonitorCallLines() {
BaseCallApi.removeStatusListener (mCallStatusListener.callback);
mCallStatusListener.callback.destroy();
mCallStatusListener.callback = null;
}
```

Monitor Call Status using CallStatusListener

```
private class MyCallStatusListener extends CallStatusListener {
@Override
public void onLineStatusChanged(int notifyType, BaseLine baseline, List<Baseline> list) {
}
@Override
public void onLineIdChanged(int oldLineId, int newLineId) {
}
}
private CallStatusListener mCallStatusListener = null;
```

Monitor Handset Hook ON/OFF

*Supported Products: GXV3470, GXV3480, and GXV3450***.**

Similar to monitoring the incoming calls, handset monitoring uses ***add/removeStatusListener***. Here is an example of monitoring the hook event status:

Start Handset Hook Event Monitor

Users can monitor handset hook event status by using ***BaseCallApi.addStatusListener*** with ***HOOK_EVENT_STATUS***.

```
private void startMonitorHandsetChange() {
mHookStatusListener = new MyHookStatusListener();
BaseCallApi.addStatusListener (“MonitorHandset”,
mHookStatusListener.callback,
PhoneContext.ListenType.HOOK_EVENT_STATUS, false);
}
```

Stop Handset Hook Event Monitor

```
private void stopMonitorHandsetChange() {
BaseCallApi.removeStatusListener (mHookStatusListener.callback);
mHookStatusListener.callback.destroy();
mHookStatusListener.callback = null;
}
```

CallStatusListener Implement

```
private class MyHookStatusListener extends CallStatusListener {
@Override
public void onHookEventChanged(int device, boolean isOffHook) {
}
}
private CallStatusListener mHookStatusListener = null;
```

Transfer a Call

Supported Products: GXV3470, GXV3480, GXV3450

Users can perform blind transfer and attended transfer through ***transferBlind/transferAttended***. The current call needs to be held before the transfer.

After blind transfer, the current call ends directly, and the transferred party directly calls the transfer target.

After the attended transfer, the current call will not be ended after the specified transfer, and the phone will call the transfer target. When the transfer target does not answer the call, the transfer can be canceled/completed immediately; the phone can transfer immediately or split after the transfer target answers.

The relevant interfaces are as follows:

BaseCallApi.transferBlind(int lineId, String number) ;

BaseCallApi.transferAttended(int lineId, String number) ;

BaseCallApi.transferAttendedCancel(int lineId) ;

BaseCallApi.endCall(int lineId) ;

BaseCallApi.transferAttendedEnd(int lineId) ;

BaseCallApi.transferSplit() ;

Default Phone App

Supported Products: GXV3470, GXV3480 and GXV3450

Multiple phone applications are allowed in the Grandstream phone system, and all of them can take control of calls using **BaseCallApi** functions. However, only one phone application can respond to line events and on/off-hook events, which is the default phone application. A default phone application is required to handle the logic of a call.

In general, **System Phone** is the default phone application and it can meet most needs. However, users can also develop their own phone application and make it the default phone APP.

Implement Customized Phone Service

Customizing your own phone service requires extending **BasePhoneService** and handling on-hook/off-hook events.

> **Note**
>
> Gs JARs currently do not support subscriptions for phone line change events when System Phone is not the default phone app. This means once a customized app is chosen to be the default phone app, it's not allowed to use the System Phone line for making calls anymore

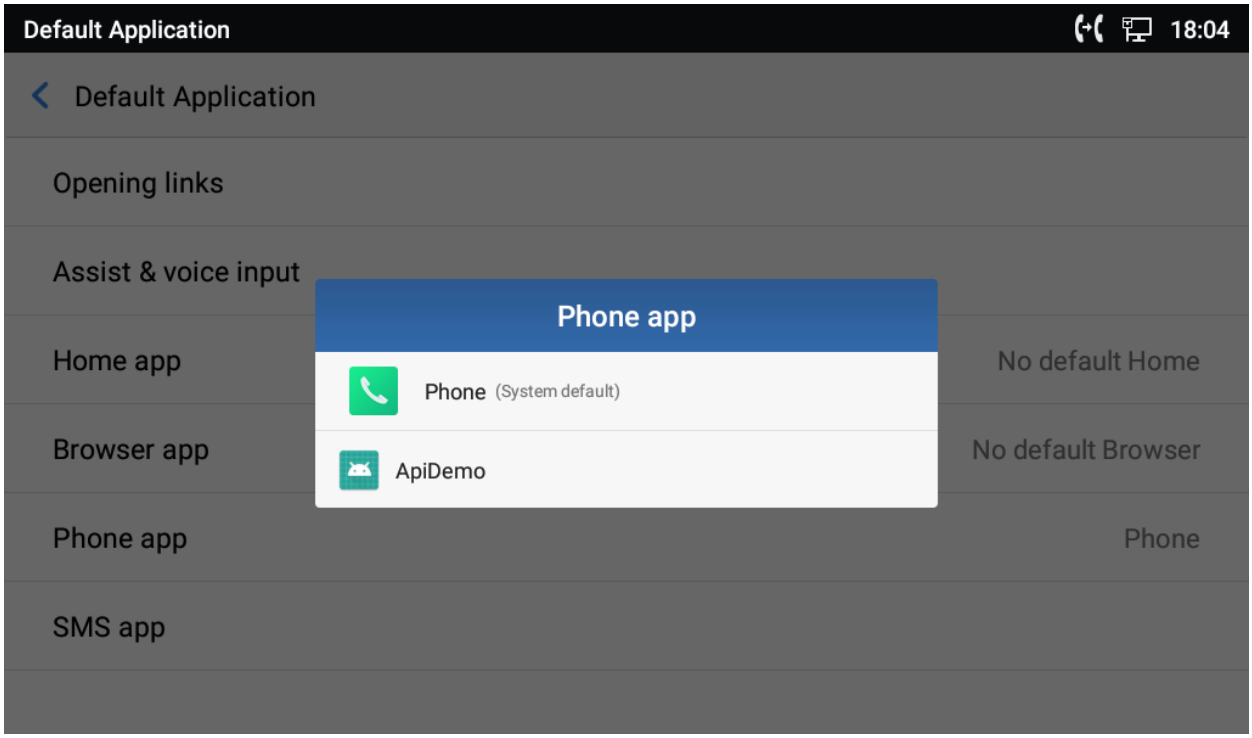
```
public class DemoService extends BasePhoneService {
@Override
public void onHookEvent(boolean OffHook) {
super.onHookEvent(offHook);
//TODO:do something
}
public void onEhsHookEvent(boolean OffHook) {
super.onEhsHookEvent(offHook);
//TODO:do something
}
public void onLineStateChanged(int lineId, int status) {
super.onLineStateChanged(lineId, status);
//TODO:do something
}
/**
* return true means this click event was cost by this service.
* else this event will call the system emergency dialer.
*/
public boolean onEmergencyCallButtonClicked(int lineId, int status) {
super.onLineStateChanged(lineId, status);
//TODO:do something
return true;
}
}
```

Register Customized Phone Service

```
<service android:name=".DemoService" >
<intent-filter>
<action android:name="com.gs.phone.service"/>
</intent-filter>
</service>
```

Configure the Default Phone App

1. Install the target phone app.
2. Open System Settings and go under APPs → Default Application → Phone app.
3. Choose the target phone app as the default phone app.



Default Phone app

SmsManagerApi

Supported Products: GXV3470, GXV3480, GXV3450

SMS functions allow users to send/receive SMS as well as handle failed SMS.

Send an SMS

Use **SmsManagerApi.sendSmsAfterSaved** to send an SMS to a single contact or a group of contacts.

```
int accountId = 0;

String numberStr = "36324";

String content = "Test SMS to single one.";

long msgId = SmsManagerApi.sendSmsAfterSaved(accountId, numberStr, content);

if(msgId > -1){

Log.d(TAG,"Sending sms(" + msgId + ")..");

}

String group = numberStr + "_," + "36325";

content = "Test SMS to a group of contacts.";

msgId = SmsManagerApi.sendSmsAfterSaved(accountId, group, numberStr, content);

if(msgId > -1){

Log.d(TAG,"Sending sms(" + msgId + ")..");

}

The sending result can be monitored using SmsManagerApi.addSmsListener.

SmsManagerApi.addSmsListener(new SmsListener() {

@Override

public void onSend(long msgId, boolean sendOk) {

Log.d(TAG,"This is main thread.");

Log.d(TAG,"sms("+msgId+") is send "+(sendOk ? "success" : "fail"));

}

});
```

Resend Failed SMS

Use **SmsManagerApi.resendFailedSms** to resend a failed SMS.

```
boolean ret = SmsManagerApi.resendFailedSms(msgId);

if(ret){

Log.d(TAG,"ReSending sms(" + msgId + ")..");

}else{

Log.e(TAG,"ReSending sms(" + msgId + ") fail.");

}
```

Receive SMS

Users can register a **BroadcastReceiver** with an **SmsContext.SMS_RECEIVED_ACTION** to receive SMS and use the constants defined in **SmsContext.ReceiveSms** to get the content of the received SMS.

```
vate SmsReceiver smsReceiver;

private void registerSmsReceiver(){

IntentFilter filter = new IntentFilter();

filter.addAction(SmsContext.SMS_RECEIVED_ACTION);

smsReceiver = new SmsReceiver();

registerReceiver(smsReceiver, filter);

}

private void unRegisterSmsReceiver(){

if(smsReceiver != null){

unregisterReceiver(smsReceiver);

}

}

class SmsReceiver extends BroadcastReceiver{

@Override

public void onReceive(Context context, Intent intent) {

if(SmsContext.SMS_RECEIVED_ACTION.equals(intent.getAction())){

long id = intent.getLongExtra(SmsContext.ReceiveSms.ID,-1);

String number = intent.getStringExtra(SmsContext.ReceiveSms.NUMBER);

int accountId = intent.getIntExtra(SmsContext.ReceiveSms.ACCOUNT_ID,-1);

String content = intent.getStringExtra(SmsContext.ReceiveSms.CONTENT);

}

}

}
```

Delete SMS

Use **SmsManagerApi.removeSmsById** and **SmsManagerApi.removeSmsByType** to delete a SMS. The interfaces are defined as follows:

```
public static int removeSmsById(long smsId);

Delete SMS based on smsId;

Parameter: smsId, SMS ID;

Return Value: int <0:error; ≥0: the number of deleted sms

Return 0: there is no such message in the database; Return ≥0: delete successfully.

public static int removeSmsByType(int removeType);

Delete SMS based on removeType;

Parameter removeType: 0 – delete received messages,1 – delete sent messages, 2 – delete draft messages;

Return Value: int <0:error; ≥0: the number of deleted sms;

Return 0: there is no such message in the database; Return ≥0: delete successfully.
```

AudioRouteApi

Supported Products: GXV3470, GXV3480, GXV3450

With AudioRouteApi, the audio route can be switched or checked by the app.

Switch Audio Route

Use ***AudioRouteApi.switchVoiceToXXX*** to switch audio route. Please make sure the route switched to is supported by the product. Otherwise, it will fail to switch.

AudioRouteApi.switchVoiceToSpeaker();

AudioRouteApi.switchVoiceToHandset();

AudioRouteApi.switchVoiceToRJ9Headset();

AudioRouteApi.switchVoiceToBlueToothHeadset();

AudioRouteApi.switchVoiceToHdmi();

AudioRouteApi.switchVoiceToEarphone();

AudioRouteApi.switchVoiceToUsbHeadset();

Check Audio Route

Use ***AudioRouteApi.isVoiceOnXXX*** to check the current audio route.

AudioRouteApi.isVoiceOnSpeaker();

AudioRouteApi.isVoiceOnHandset();

AudioRouteApi.isVoiceOnRJ9Headset();

AudioRouteApi.isVoiceOnBlueToothHeadset();

AudioRouteApi.isVoiceOnHdmi();

AudioRouteApi.isVoiceOnEarphone();

AudioRouteApi.isVoiceOnUsbHeadset();

EHS Headset

- ***setEhsHookStatus*:** to set the EHS status.
- ***isEhsOffHook*:** to check whether the EHS headset is off hook.
- ***isEhsHeadsetConnected*:** check whether the EHS headset connected or not.

> **Note**
>
> 1. When the EHS headset is onhook, EHS will not play any sound. 2. When calling setEhsHookStatus, the audio route must be on EHS headset, which means the result of isVoiceOnRJ9Headset() must be true. Also, please do not switch to other audio route within 500ms after calling setEhsHookStatus.

Always Ring Speaker

If the config WebUI → Phone Settings → Call Settings → "Always Ring Speaker" is checked, this means an incoming call will ring with speaker, even though current voice channel is not on speaker.

In order to perform as above, the custom phone app should use the api ***switchCurrentVoiceWithSpeaker*** and ***switchCurrentVoiceWithoutSpeaker*** when the ringing finished.

Below is a sample code when a new call is incoming.

```
private class MyCallStatusListener extends CallStatusListener {

@Override
public void onLineStatusChanged(int notifyType, BaseLine baseLine, List<BaseLine> list) {
final BaseLine line = baseLine;
if (line.getStatus() == 2) { // 2 means ringing
if (CallSettingApi.isAlwaysRingSpeaker()) {
AudioRouteApi.switchCurrentVoiceWithSpeaker();
startTone(); // start ringing
}
} else {
if (mPrevStatus == 2) {
stopTone(); // stop ringing
AudioRouteApi.switchCurrentVoiceWithoutSpeaker();
}
}
mPrevStatus = line.getStatus();
}
}

CallSett
```

CallSettingApi

Supported Products: GXV3470, GXV3480, GXV3450

With ***CallSettingApi***, the config status can be checked by the app.

DeviceApi

Supported Products: GXV3470, GXV3480, GXV3450

DeviceApi provides the management and information SDK about the device.

Below is a sample code to get the system information.

```
SystemInfo systemInfo = DeviceApi.getSystemInfo();

String productBaseName = systemInfo.getProductBase();

String systemVersion = systemInfo.getSystemVersion();
```

CallToneApi

Supported Products: GXV3470, GXV3480, GXV3450.

Below are the related CallToneApi interfaces:

```
//Check if the tone is playing

public static boolean isAnyToneInPlay();

//Check if the ringtone is playing

public static boolean isRingToneInPlay();

//Check if the dialtone is playing

public static boolean isDialToneInPlay();

//Check if the dtmf tone is playing

public static boolean isDtmfToneInPlay();

//Stop all tone

public static void stopAllTone();

//Stop all ringtone

public static void stopRingtone();

//Start play dtmf tone

public static void startDtmfTone(int keyValue);

//Stop play dtmf tone

public static void stopDtmfTone(int keyValue);

//Start play call waiting tone

public static void startCallWaitingTone();

//Stop play call waiting tone

public static void stopCallWaitingTone();

//Start play ringback tone

public static void startRingbackTone();

//Stop play ringback tone

public static void stopRingbackTone();

//Start play busy tone

public static void startBusyTone();

//Stop play busy tone

public static void stopBusyTone();

//Start play dial tone

public static void startDialTone();

//Stop play dial tone

public static void stopDialTone();

//Start play second dial tone

public static void startSecondDialTone();

//Stop play second dial tone

public static void stopSecondDialTone();

//Start play confirm tone

public static void startConfirmTone();

//Stop play confirm tone

public static void stopConfirmTone();

//Start play reorder tone
```

```
public static void startReorderTone();

//Stop play reorder tone

public static void stopReorderTone();

//Play the matched ringtone according to the line

public static void startRingtone(int lineId);

//Start play system ringtone

public static void playSystemRingtone();

//Start play the ringtone in the DND mode

public static void playDndTone();

//Start play dial tone when there is unread voice mail

public static void startVMDialTone();

//Stop play dial tone when there is unread voice mail

public static void stopVMDialTone();

//Start play auto answer tone

public static void startAutoAnswerTone();

//Stop play auto answer tone

public static void stopAutoAnswerTone();

//Gets the type of tone currently playing

public static int getCurToneType();
```

Gs Core SDK

These SDK can be used without init ApiClient. These SDKs are named as **XXXManager**, such as: **GsDevStateManager**.

Device Manager

Supported Products: GXV3470, GXV3480 and GXV3450

Get device connected state.

// is 3.5mm earphone device connected

```
GsDevStateManager.instance().isDeviceConnected(GsDevStateManager.NAME_EARPHONE);
```

// is ehs device connected

```
GsDevStateManager.instance().isDeviceConnected(GsDevStateManager.NAME_EHS);
```

// is hdmi device connected

```
 GsDevStateManager.instance().isDeviceConnected(GsDevStateManager.NAME_HDMI);
```

// is hdmi in device connected

```
GsDevStateManager.instance().isDeviceConnected(GsDevStateManager.NAME_HDMI_IN);
```

// is usb headset device connected

```
GsDevStateManager.instance().isDeviceConnected(GsDevStateManager.NAME_USB_HEADSET);
```

Reboot device

```
GsDevStateManager.instance().reboot();
```

DND Manager

```
DndManager.instance().setDndOn();

DndManager.instance().setDndOff();

DndManager.instance().isDndOn();
```

Get Device MAC

```
GsDevStateManager.instance().getDeviceMac();
```

CONTACTS

Supported Products: GXV3470, GXV3480, GXV3450

android.content.ContentResolver has already provided Create-Read-Update-Delete (CRUD) APIs for operating contacts. Please refer to below links for the APIs information:

https://developer.android.google.cn/reference/android/content/ContentProvider

For more details of the contacts database, please refer to:

https://developer.android.google.cn/reference/android/provider/ContactsContract.

By using ***android.content.ContentResolver*** to **CRUD** contacts, it should be able to meet most of the needs.

> **IMPORTANT**
>
> Please make sure to read below content for the changes applied to Grandstream supported products before you CRUD contacts. Some new columns and some reserved columns are used in the database table to store important information. These columns' keys and constant values are defined in com.gs.contacts.context.ContactsContext. Please refer to gsApiExternal-en for more details

Changes for ContactsContract.Data

Here is the change in contacts database table ContactsContract.Data:

Key	Type	Description

ContactsContext.ContactsItem#ITEM_ACCOUNT_ID	INTEGER (long)	Special use.

Contacts Contract.Data

Changes for ContactsContract.RawContacts

Here is the change in contacts database table ContactsContract.RawContacts:

Key	Type	Description
ContactsContext.ContactsItem#ITEM_SORT_KEY_T9	TEXT	New column.
ContactsContext.ContactsItem#ITEM_SORT_KEY_T9_FL	TEXT	New column.

ContactsContract.RawContacts

Changes for ContactsContract.Contacts#CONTENT_FILTER_URI

In addition to the Android native filter, a function for fuzzy searching is also added. With fuzzy searching, users can query by a condition such like “number=123” to get all matching results with 123 included in the number such as “123456” or “0123” instead of only “123”. This filter can be enabled by setting **ContactsContext.SearchSnippets.FUZZY_KEY** as follows:

```
Uri.Builder builder = ContactsContract.Contacts.CONTENT_FILTER_URI.buildUpon();

builder.appendPath(query);

builder.appendQueryParameter(ContactsContract.DIRECTORY_PARAM_KEY, String.valueOf(directoryId));

builder.appendQueryParameter(ContactsContract.SearchSnippets.DEFERRED_SNIPPETING_KEY,”1”);

builder.appendQueryParameter(com.gs.contacts.context.ContactsContext.SearchSnippets.FUZZY_KEY,”1”);

Uri uri = builder.build();

Cursor cursor = mContext.getContentResolver().query(uri,null,null,null,null);

}
```

Create a Contact

A contact can be added and all the parameters can be manipulated. Here is an example:

```
public void addContact(String name,String number,long accountId) {
<ContentProviderOperation> ops
= new ArrayList<ContentProviderOperation>();
int rawContactInsertIndex = ops.size();
ops.add(ContentProviderOperation
.newInsert(ContactsContract.RawContacts.CONTENT_URI)
.withValue(ContactsContract.RawContacts.ACCOUNT_TYPE, null)
.withValue(ContactsContract.RawContacts.ACCOUNT_NAME, null)
.withYieldAllowed(true).build());
ops.add(ContentProviderOperation
.newInsert(ContactsContract.Data.CONTENT_URI)
.withValue(ContactsContext.ContactsItem.ITEM_ACCOUNT_ID, accountId)
.withValueBackReference(ContactsContract.Data.RAW_CONTACT_ID,
rawContactInsertIndex)
.withValue(ContactsContract.Data.MIMETYPE,
ContactsContract.CommonDataKinds.StructuredName.CONTENT_ITEM_TYPE)
.withValue(ContactsContract.CommonDataKinds.StructuredName
.DISPLAY_NAME, name)
.withYieldAllowed(true).build());
ops.add(ContentProviderOperation
.newInsert(android.provider.ContactsContract.Data.CONTENT_URI)
.withValueBackReference(ContactsContract.CommonDataKinds.Phone
.RAW_CONTACT_ID,rawContactInsertIndex)
.withValue(ContactsContract.CommonDataKinds.Phone.MIMETYPE,
ContactsContract.CommonDataKinds.Phone.CONTENT_ITEM_TYPE)
.withValue(ContactsContract.CommonDataKinds.Phone.TYPE,
ContactsContract.CommonDataKinds.Phone.TYPE_MOBILE)
.withValue(ContactsContract.CommonDataKinds.Phone.NUMBER, number)
.withYieldAllowed(true).build());
try {
contentResolver.applyBatch(ContactsContract.AUTHORITY, ops);
} catch (Exception e) {
e.printStackTrace();
}
}
```

Update a Contact

A contact can be added and all the parameters can be manipulated. Here is an example:

```
public void updateContact(long rawContactId,String name) {

ArrayList<ContentProviderOperation> ops

= new ArrayList<ContentProviderOperation>();

ops.add(ContentProviderOperation

.newUpdate(ContactsContract.Data.CONTENT_URI)

.withSelection(ContactsContract.Data.RAW_CONTACT_ID+"=?",

new String[]{rawContactId+""})

.withValue(ContactsContract.CommonDataKinds.StructuredName

.DISPLAY_NAME, name)

.build());

try {

contentResolver.applyBatch(ContactsContract.AUTHORITY, ops);

} catch (Exception e) {

e.printStackTrace();

}

}
```

Read Contacts

Here is an example to read contacts and manipulate all the parameters:

```
public void getContacts() {
String[] projection = new String[]{
ContactsContext.ContactsItem.ITEM_CONTACT_ID_IN_DATA,
ContactsContext.ContactsItem.ITEM_ACCOUNT_ID,
ContactsContext.ContactsItem.ITEM_PHONE_NUMBER,
ContactsContext.ContactsItem.ITEM_DISPLAY_NAME
};
Cursor cursor = contentResolver
.query(ContactsContract.CommonDataKinds.Phone.CONTENT_URI
, projection, null,null,null);
if(cursor != null) {
while (cursor.moveToNext()) {
long contactId = cursor.getLong
(cursor.getColumnIndex(ContactsContext.ContactsItem
.ITEM_CONTACT_ID_IN_DATA));
long accountId = cursor.getInt(cursor.getColumnIndex
(ContactsContext.ContactsItem.ITEM_ACCOUNT_ID));
String number = cursor.getString(cursor.getColumnIndex
(ContactsContext.ContactsItem.ITEM_PHONE_NUMBER));
String name = cursor.getString(cursor.getColumnIndex
(ContactsContext.ContactsItem.ITEM_DISPLAY_NAME));
}
cursor.close();
}
}
```

Delete a Contact

The following is an example of deleting contacts:

```
public void deleteContactById(long contactId) {

ArrayList<ContentProviderOperation> ops

= new ArrayList<ContentProviderOperation>();

ops.add(ContentProviderOperation

.newDelete(ContactsContract.RawContacts.CONTENT_URI)

.withSelection(ContactsContract.RawContacts.CONTACT_ID

+"="+contactId, null)

.build());

ops.add(ContentProviderOperation

.newDelete(ContactsContract.Data.CONTENT_URI)

.withSelection(ContactsContract.Data.CONTACT_ID

+ "=" + contactId, null)

.build());

try {

contentResolver.applyBatch(ContactsContract.AUTHORITY, ops);

} catch (Exception e) {

e.printStackTrace();

}

}
```

CALL LOGS

Supported Products: GXV3470, GXV3480, GXV3450

android.content.ContentResolver has already provided Create-Read-Update-Delete(CRUD) APIs for operating calllogs. Please refer to below link for the APIs information:

https://developer.android.google.cn/reference/android/content/ContentProvider

For more details about calllog database, please refer to:

https://developer.android.google.cn/reference/android/provider/CallLog

In general, after calling the APIs in BaseCallApi, calllogs will be added or changed by default. Gs JARS do not provide additional APIs for independent calllog function. Using **android.content.ContentResolver** to **CRUD** calllogs should be able to meet most of the needs.

IMPORTANT:

Please make sure to read below content for the changes applied o Grandstream supported products before you **CRUD** calllogs. Some new columns and some reserved columns are used in the database table o store important information. These columns' keys and constant values are defined in **com.gs.calllog.context.CallLogContext**. Please refer to **gsApiExternal-en** for more details.

Changes for CallLog.Calls

The changes applied to CallLog.Calls are listed in below table:

Key	Type	Description

CallLogContext.CallLogItem#ITEM_ACCOUNT	INTEGER(long)	New column.
CallLogContext.CallLogItem#ITEM_CALL_MODE	INTEGER(int)	New column.
CallLogContext.CallLogItem#ITEM_MEDIA_TYPE	INTEGER(int)	New column.
CallLogContext.CallLogItem#ITEM_NUMBER_ORIGINAL	TEXT	New column.
CallLogContext.CallLogItem#ITEM_CONTACT_CACHE_NAME	TEXT	New column.
CallLogContext.CallLogItem#ITEM_END_TIME	TEXT	New column.
CallLogContext.CallLogItem#ITEM_IS_IN_CONFERENCE	INTEGER(int)	New column.
CallLogContext.CallLogItem#ITEM_GROUP_ID	INTEGER(long)	New column.

CallLog.Calls

Note

Public static methods in CallLog.Calls are not recommended, you may get unexpected results.

Create a Call Log

As the call log is closely related to the call, we strongly suggest using **BaseCallApi** to make a call and save the call log by default. Here is an example:

```
public void addCalllog(String name,String number,long accountId) {
ArrayList<ContentProviderOperation> ops
= new ArrayList<ContentProviderOperation>();
ops.add(ContentProviderOperation.newInsert(CallLogContext.CALL_LOG_URI)
.withValue(CallLogContext.CallLogItem.ITEM_ACCOUNT, accountId)
.withValue(CallLogContext.CallLogItem.ITEM_CACHE_NAME, name)
.withValue(CallLogContext.CallLogItem.ITEM_CALL_MODE,
PhoneContext.CallMode.SIP_CALL)
.withValue(CallLogContext.CallLogItem.ITEM_START_TIME,
System.currentTimeMillis())
.withValue(CallLogContext.CallLogItem.ITEM_IS_IN_CONFERENCE,false)
.withValue(CallLogContext.CallLogItem.ITEM_NUMBER_ORIGINAL,number)
.withValue(CallLogContext.CallLogItem.ITEM_NUMBER,number)
.withValue(CallLogContext.CallLogItem.ITEM_CALL_TYPE,
CallLogContext.CallLogType.TYPE_MISSED)
.withValue(CallLogContext.CallLogItem.ITEM_DURATION, 0)
.withValue(CallLogContext.CallLogItem.ITEM_MEDIA_TYPE,
CallLogContext.MediaType.AUDIO)
.build());
try {
contentResolver.applyBatch(CallLog.AUTHORITY, ops);
} catch (Exception e) {
e.printStackTrace();
}
}
```

Read Call Logs

The following is an example of reading call logs using **ContentResolver**:

```
public void getCallLogs() {
Cursor cursor = contentResolver.query(CallLogContext.CALL_LOG_URI,
null,null,null,null);
StringBuilder res = new StringBuilder("");
if(cursor!= null){
if(cursor.moveToFirst()){
do{
long calllogId = cursor.getLong(
cursor.getColumnIndex(CallLogContext.CallLogItem.ITEM_ID));
String cacheName = cursor.getString(cursor.
getColumnIndex(CallLogContext.CallLogItem.ITEM_CACHE_NAME));
int mediaType = cursor.getInt(cursor.
getColumnIndex(CallLogContext.CallLogItem.ITEM_MEDIA_TYPE));
}while (cursor.moveToNext());
}
cursor.close();
}
}
```

Update Call Logs

Here is an example to update call logs using **ContentResolver**:

```
public void updateCalllogById(long callId) {
ArrayList<ContentProviderOperation> ops
= new ArrayList<ContentProviderOperation>();
ops.add(ContentProviderOperation
.newUpdate(CallLogContext.CALL_LOG_URI)
.withSelection(CallLogContext.CallLogItem.ITEM_ID+"="+callId, null)
.withValue(CallLogContext.CallLogItem.ITEM_DURATION,1000)
.build());
try {
contentResolver.applyBatch(CallLog.AUTHORITY, ops);
} catch (Exception e) {
e.printStackTrace();
}
}
```

Delete call logs

Here is an example to delete call logs using **ContentResolver**:

```
public void deleteCalllogById(long callId) {

ArrayList<ContentProviderOperation> ops

= new ArrayList<ContentProviderOperation>();

ops.add(ContentProviderOperation

.newDelete(CallLogContext.CALL_LOG_URI)

.withSelection(CallLogContext.CallLogItem.ITEM_ID+"="+callId, null)

.build());

try {

contentResolver.applyBatch(CallLog.AUTHORITY, ops);

} catch (Exception e) {

e.printStackTrace();

}

}
```

LED

Supported Products: GXV3470, GXV3480 and GXV3450

In the Android standard interface, notification is the only method is use LED. Here is an example to use notifications with LED:

```
int color = 0xFF00FF00;

int onMs = 1000;

int offMs = 1000;

NotificationManager manager = (NotificationManager) getSystemService(NOTIFICATION_SERVICE);
Notification notification = null;
notification = new Notification.Builder(this)
.setContentTitle("This is content title")
.setContentText("This is content text")
.setWhen(System.currentTimeMillis())
.setSmallIcon(R.mipmap.ic_launcher)
.setLargeIcon(BitmapFactory.decodeResource(getResources(), R.mipmap.ic_launcher))
.setLights(color, onMs, offMs)
.build();

manager.notify(1, notification);
```

Please find a list of supported colors and frequencies for the LED on GXV3470, GXV3480 and GXV3450. If the color or the frequency setting is not supported by the device, the device will automatically choose the default color or the nearest frequency.

Product	GXV3470	GXV3480	GXV3450
Red LED	On/Off	On/Off	On/Off
Green LED	On/Off	On/Off	On/Off
Blue LED	N/A	N/A	N/A
Keep on frequency	onMs: 1000, offMs: 0	onMs: 1000, offMs: 0	onMs: 1000, offMs: 0
Slow splash frequency	onMs: 1000, offMs: 3000	onMs: 1000, offMs: 3000	onMs: 1000, offMs: 3000

Fast splash frequency	onMs: 1000, offMs: 1000	onMs: 1000, offMs: 1000	onMs: 1000, offMs: 1000

LED Colors and Frequencies

GsLightsManager

Except controlling LED with Notification, the GsLightsManager provided functions to control the LED freely. The following are method definition:

public void openCustom(int color, int shineType);

public void closeCustom();

The parameters:

shineType: control the shine type with fast splash, slow splash or keep on.

color: the LED color to open. According to the product, it can support red, green or blue.

Programmable Keys

Supported Products: GXV3450

Programmable Keys API can be used to monitor extension module click events, etc.

Monitor Extension Module Click Event

Users can monitor extension module click event by using ***MpkApi.addStatusListener*** and ***MpkApi.removeStatusListener***.

Here is an example on how to use monitor extension module click event APIs.

Start Ext Click Event Monitor

```
private void initExtClickListener() {
mMpkStatusListener = new MpkStatusListener();
MpkApi.addStatusListener ("ExtEvent",
mMpkStatusListener.callback,
MpkContext.ListenType.EXT_EVENT);
}
```

Stop Ext Click Event Monitor

```
private void removeExtClickListener() {
        MpkApi.removeStatusListener (mMpkStatusListener.callback);
        mMpkStatusListener.destroy();
        <strong>mMpkStatusListener </strong>= <strong>null</strong>;
    }
```

Monitor Ext Event Using MpkStatusListener

```
private class MyMpkStatusListener extends MpkStatusListener {
@Override
public void onExtItemClick(MpkEntity entity) {
  }

  };
MpkStatusListener mMpkStatusListener = null;
```

Control settings button in taskbar via API

To control whether to display settings button on device taskbar, users could use below API commands to hide/display it and get the display status.

Send broadcast to hide settings button

```
Intent intent = new Intent("com.android.systemui.settings_button.visibility");
intent.putExtra("visibility", false);
sendBroadcast(intent);
```

Send broadcast to display settings button

```
Intent intent = new Intent("com.android.systemui.settings_button.visibility");
intent.putExtra("visibility", true);
sendBroadcast(intent);
```

Get hide status (1 – display; 0 – hide)

```
Settings.Global.getInt(getContentResolver(), "settings_button_visibility", 0))
```

DEVELOP APPS WITH ADB

Developing apps on Grandstream android devices requires the device to be connected to network. This is different from development using USB connection to the Android device directly.

Enable Developer Mode on Device

Please enable developer mode under device web UI. Log in device web UI and go to Settings→System security→Developer mode.

ADB Connect

Use the command “adb connect IP” to connect to the device. For example:

adb connect 192.168.100.1

Allow Debug on Device

After successful "adb connect", the device will show a prompt requesting to allow debugging. Please choose "OK" to proceed. It is suggested to check "Always allow from this computer" so that the dialog will not show again when the device is connected to the same computer next time.

Check ADB Connect Status

Use the command "adb devices" to check the adb connect status. If below content is displayed, it means connection is successful:

List of devices attached

192.168.100.1:5555 device

ADB Disconnect

Use the command "adb disconnect" to disconnect all devices.

> **Note**
>
> Only one PC is allowed to connect to the device at a time

API DEMO

In the SDK package, users can find a Demo Application using the SDK APIs of GXV34x0, named **ApiDemo**.

CHANGE LOG

This section documents significant changes from previous versions of SDK Framework Service guide for GXV3470/GXV3480/GXV3450. Only major new features or major document updates are listed here. Minor updates for corrections or editing are not documented here.

Firmware Version 1.0.1.29

Product Name: GXV3480 / GXV3450 / GXV3470

- Added support to remove the Settings button in the Taskbar via API. [CONTROL SETTINGS BUTTON IN TASKBAR VIA API]

SUPPORTED DEVICES

The following table shows Grandstream products supporting SDK APIs listed in this guide:

Model	Supported	Firmware
GXV3470	Yes	1.0.1.15 or Higher
GXV3480	Yes	1.0.1.15 or Higher
GXV3450	Yes	1.0.1.15 or Higher

Supported Device

Need Support?

Can’t find the answer you’re looking for? Don’t worry we’re here to help!

CONTACT SUPPORT