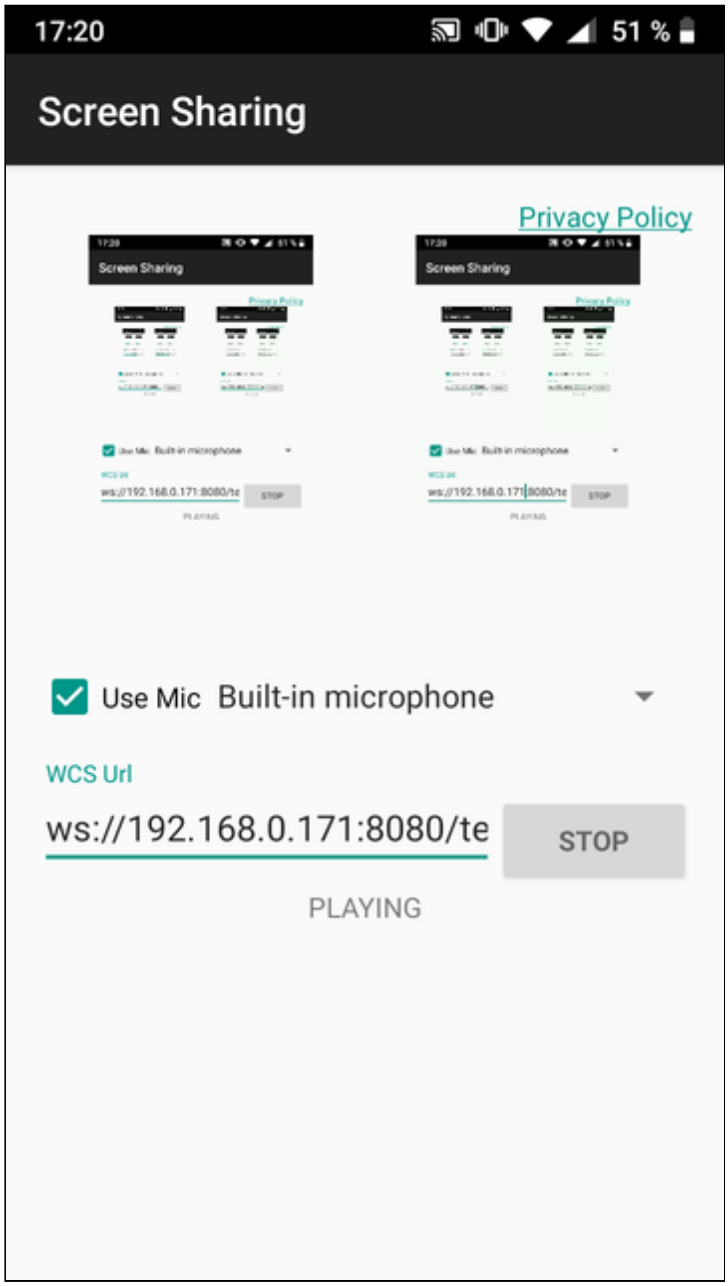
Android Screen sharing

Example of Android application to publish device screen



Analyzing the example code

To analyze the code let's take the class ScreenSharingActivity.java of the `screen-sharing` example, which can be downloaded with build 1.1.0.55.

1. Initialization of the API

`Flashphoner.init()` code

`Context` object is passed to method `init()` for initialization.

```
Flashphoner.init(this);
```

2. Request the permission to use microphone

code

```
mMicCheckBox.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        if (mMicCheckBox.isChecked()) {
            ActivityCompat.requestPermissions(ScreenSharingActivity.this,
                    new String[]{Manifest.permission.RECORD_AUDIO},
                    PUBLISH_REQUEST_CODE);
        }
    }
});
```

3. Choose the microphone

code

```
mMicSpinner = (Spinner) findViewById(R.id.spinner_mic);
ArrayAdapter<MediaDevice> arrayAdapter = new ArrayAdapter<MediaDevice>(this,
android.R.layout.simple_spinner_item,
Flashphoner.getMediaDevices().getAudioList());
arrayAdapter.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_it

mMicSpinner.setAdapter(arrayAdapter);
```

4. Session creation

`Flashphoner.createSession()` code

`SessionOptions` object is passed to the method with the following parameters

- WCS server URL
- `SurfaceViewRenderer localRender` to display local video
- `SurfaceViewRenderer remoteRender` to display video published

```
SessionOptions sessionOptions = new SessionOptions(url);
sessionOptions.setLocalRenderer(localRender);
sessionOptions.setRemoteRenderer(remoteRender);
```

```
/**
 * Session for connection to WCS server is created with method
createSession().
 */
session = Flashphoner.createSession(sessionOptions);
```

5. Connection to the server

`Session.connect()` code

```
session.connect(new Connection());
```

6. Receiving the event confirming successful connection

`Session.onConnected()` code

```
@Override
public void onConnected(final Connection connection) {
   runOnUiThread(new Runnable() {
       @Override
       public void run() {
           mStartButton.setText(R.string.action_stop);
           mStartButton.setTag(R.string.action_stop);
           mStartButton.setEnabled(true);
           mStatusView.setText(connection.getStatus());
           ...
       }
   });
}
```

7. Video stream creation

`Session.createStream()` code

```
StreamOptions streamOptions = new StreamOptions(streamName);
VideoConstraints videoConstraints = new VideoConstraints();
DisplayMetrics metrics = getResources().getDisplayMetrics();
videoConstraints.setResolution(metrics.widthPixels, metrics.heightPixels);
videoConstraints.setVideoFps(metrics.densityDpi);
streamOptions.getConstraints().setVideoConstraints(videoConstraints);
streamOptions.getConstraints().updateAudio(mMicCheckBox.isChecked());

/**
 * Stream is created with method Session.createStream().
 */
publishStream = session.createStream(streamOptions);
...
startScreenCapture();
```

8. Prepare to capture device screen

code

```
private void startScreenCapture() {
    mMediaProjectionManager = (MediaProjectionManager) getSystemService(
            Context.MEDIA_PROJECTION_SERVICE);
    Intent permissionIntent =
mMediaProjectionManager.createScreenCaptureIntent();
    startActivityForResult(permissionIntent, REQUEST_CODE_CAPTURE_PERM);
}
```

9. Start foreground service, capture the screen and publish the stream

`startService()`, `setVideoCapturer()`, `Stream.publish()` code

```
@Override
protected void onActivityResult(int requestCode, int resultCode, @Nullable
Intent data) {
    if (REQUEST_CODE_CAPTURE_PERM == requestCode && resultCode == RESULT_OK)
{
        serviceIntent = new Intent(this, ScreenSharingService.class);
        startService(serviceIntent);
        videoCapturer = new ScreenCapturerAndroid(data, new
MediaProjection.Callback() {
            @Override
            public void onStop() {
                super.onStop();
            }
        });
        WebRTCMediaProvider.getInstance().setVideoCapturer(videoCapturer);

        /**
         * Method Stream.publish() is called to publish stream.
         */
        publishStream.publish();
        Log.i(TAG, "Permission has been granted by user");
        ...
    }
}
```

10. Receiving the event confirming the successful stream publishing

`StreamStatusEvent.PUBLISHING` code

On receiving this event preview stream is created with `Session.createStream()` and `Stream.play()` is invoked to play it.

```
publishStream.on(new StreamStatusEvent() {
    @Override
    public void onStreamStatus(final Stream stream, final StreamStatus
```

```
streamStatus) {
        runOnUiThread(new Runnable() {
            @Override
            public void run() {
                if (StreamStatus.PUBLISHING.equals(streamStatus)) {

                    /**
                     * The options for the stream to play are set.
                     * The stream name is passed when StreamOptions object is
created.
                     */
                    StreamOptions streamOptions = new
StreamOptions(streamName);

streamOptions.getConstraints().updateAudio(mMicCheckBox.isChecked());

                    /**
                     * Stream is created with method Session.createStream().
                     */
                    playStream = session.createStream(streamOptions);
                    ...
                    playStream.play();
                } else {
                    Log.e(TAG, "Can not publish stream " + stream.getName() +
" " + streamStatus);
                }
                mStatusView.setText(streamStatus.toString());
            }
        });
    }
});
```

11. Session disconnection

`Session.disconnect()` code

```
mStartButton.setEnabled(false);

/**
  * Connection to WCS server is closed with method Session.disconnect().
  */
session.disconnect();
```

12. Starting foreground service

`Service.onCreate()`, `startForeground()` code

```
@Override
public void onCreate() {
    super.onCreate();

    NotificationChannel chan =
            new NotificationChannel(
```

```
                    CHANNEL_ID, CHANNEL_NAME,
NotificationManager.IMPORTANCE_NONE);
    NotificationManager manager =
            (NotificationManager)
getSystemService(Context.NOTIFICATION_SERVICE);
    chan.setLockscreenVisibility(Notification.VISIBILITY_PRIVATE);
    manager.createNotificationChannel(chan);

    final int notificationId = (int) System.currentTimeMillis();
    NotificationCompat.Builder notificationBuilder =
            new NotificationCompat.Builder(this, CHANNEL_ID);
    Notification notification =
            notificationBuilder
                    .setSmallIcon(R.drawable.service_icon)
                    .setOngoing(true)
                    .setShowWhen(true)
                    .setContentTitle("ScreenSharingService is running in the
foreground")
                    .setPriority(NotificationManager.IMPORTANCE_MIN)
                    .setCategory(Notification.CATEGORY_SERVICE)
                    .build();
    NotificationManager notificationManager
            = (NotificationManager)
getSystemService(Context.NOTIFICATION_SERVICE);
    notificationManager.notify(NOTIFICATION_ID, notification);

    startForeground(notificationId, notification);
}
```

13. Stopping foreground service

`Service.onDestroy()`, `stopForeground()` code

```
@Override
public void onDestroy() {
    stopForeground(true);
    super.onDestroy();
}
```