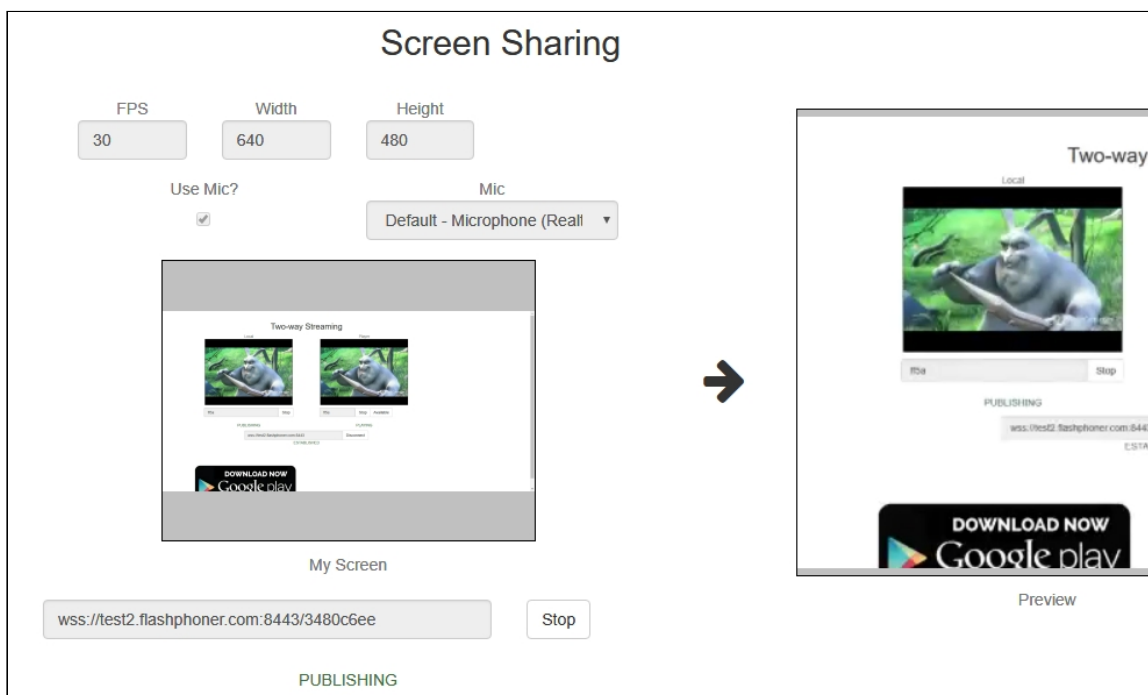


Screen Sharing

Screen sharing example

Screen sharing is available for Chrome and Firefox. To share screen in Chrome before 73 the extension need to build and install, in the latest Chrome versions (73 and newer), Firefox and Safari screen can be shared without extension. Today, it is not recommended to use extension.



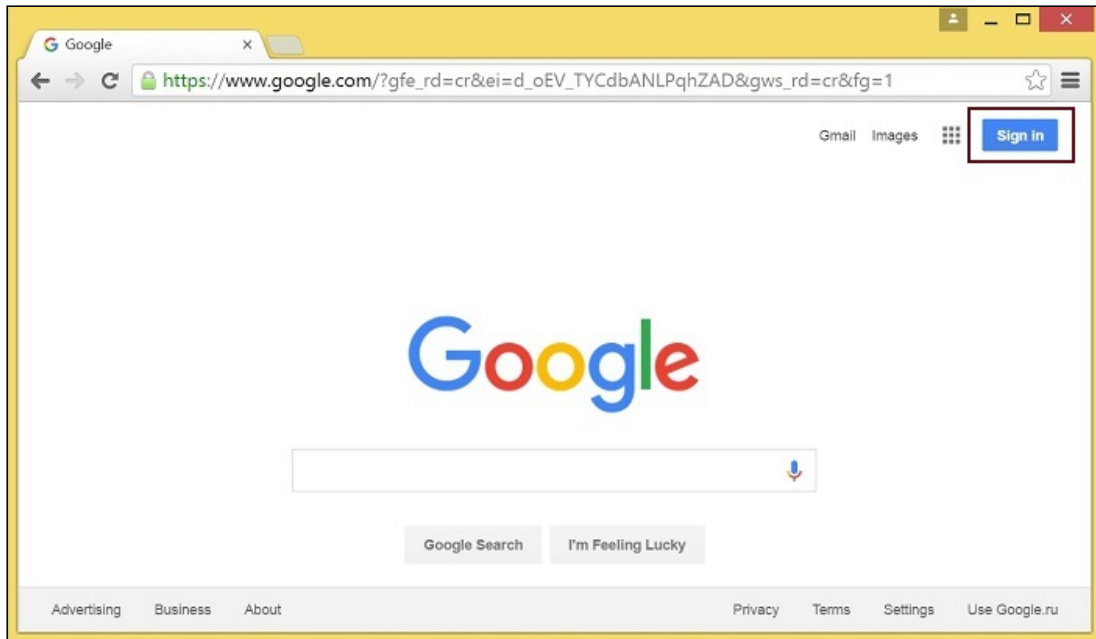
Extension for Google Chrome with publication in Chrome Store

Source code for the extension is available by the following link:

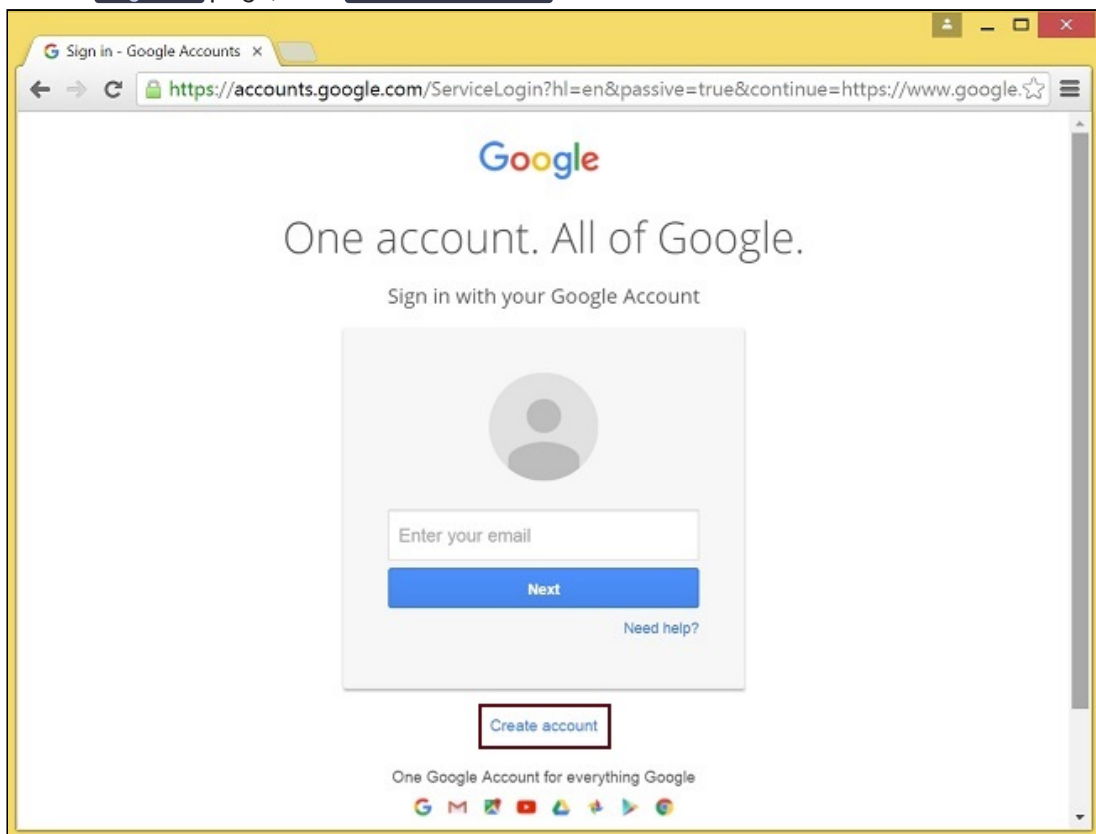
[Chrome Screen Sharing Extension](#)

Create a Google account

1. Go to [google.com](https://www.google.com) and click **Sign in** button



2. On the **Sign in** page, click **Create account** link

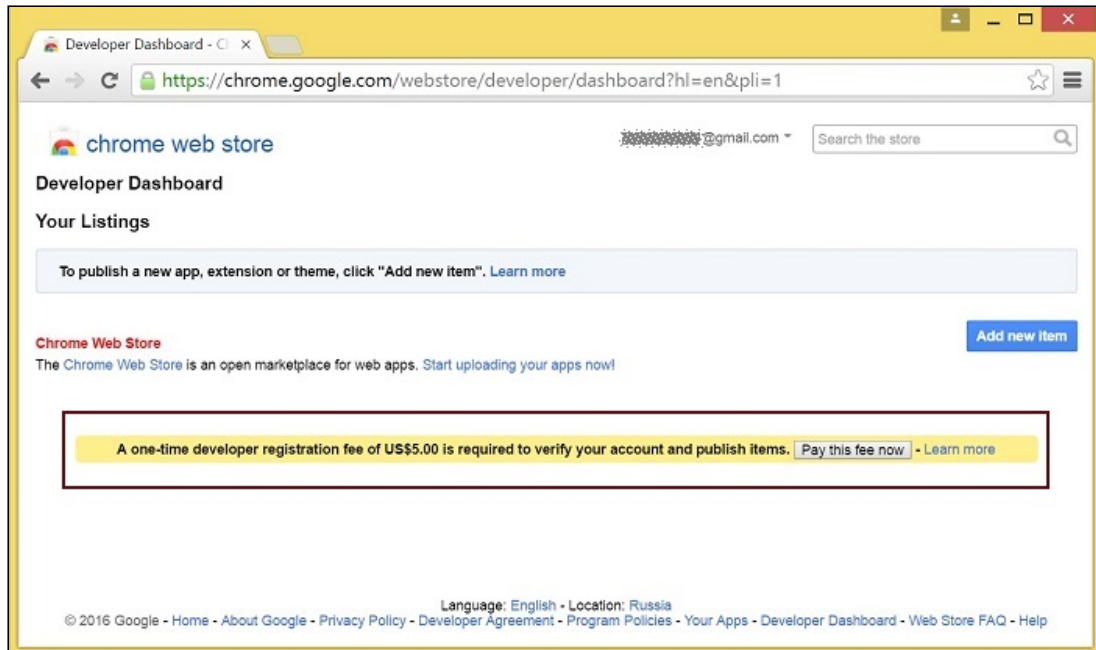


3. **Create your Google Account** page will be opened
Fill the required fields and click **Next step** button to create the account.

Register as Chrome Web Store Developer

1. Sign in to [Chrome Developer Dashboard](#) with the created Google account

2. Pay a one-time \$5 developer signup fee



Customization for your domain

Follow the procedures described below to use the extensions with your domain. Edit manifest file `manifest.json` of the Chrome extension.

Change:

- name
- author
- description
- homepage_url
- under `"externally_connectable": "matches"` change `flashphoner.com` to your domain

Save your icons for the extension to `chrome-extension` directory and edit the file names in `"icons"` and `"web_accessible_resources"`. (For more information, see [Manifest - Icons](#) and [Supplying Images](#).)

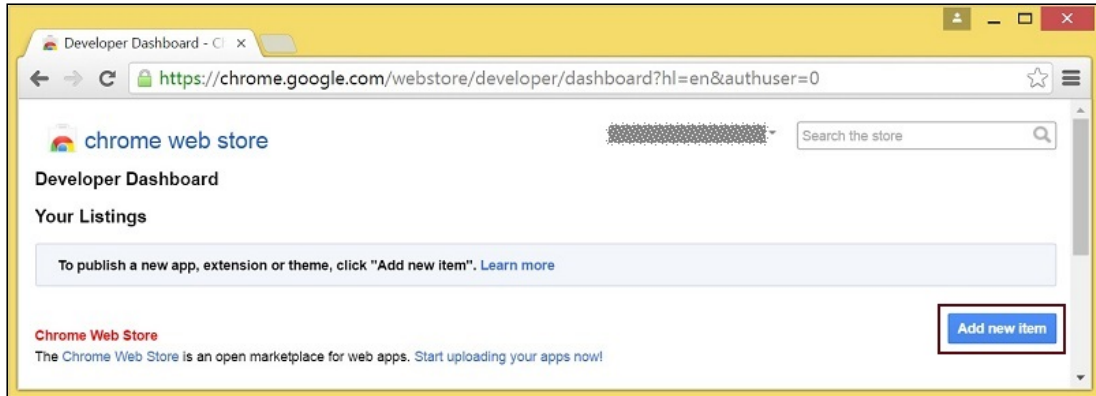
Pack the extension

Pack files from `chrome-extension` folder into ZIP archive.

Publish the extension

1. Sign in to [Chrome Developer Dashboard](#)

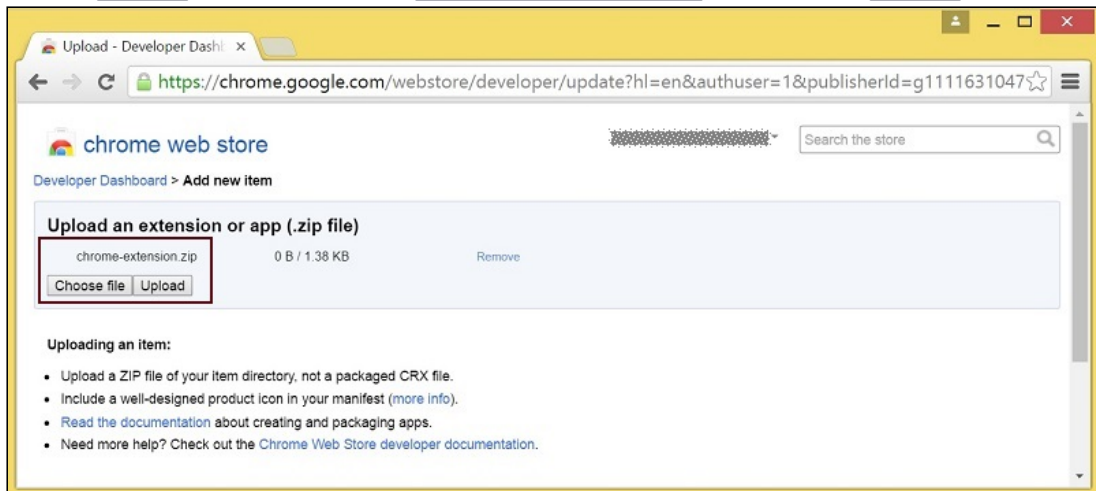
2. In the dashboard, click **Add new item** button



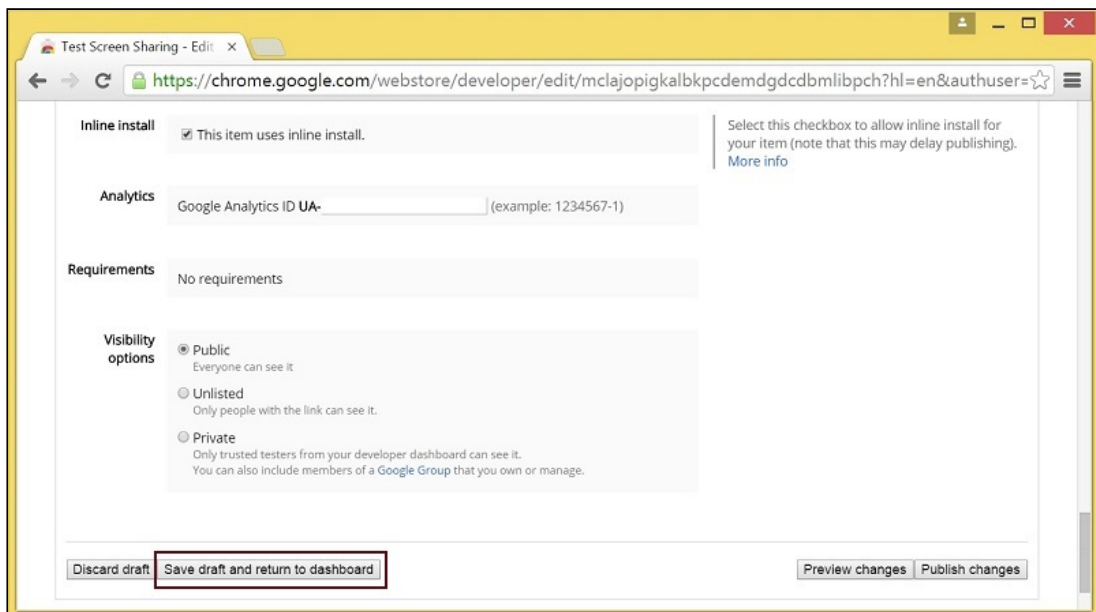
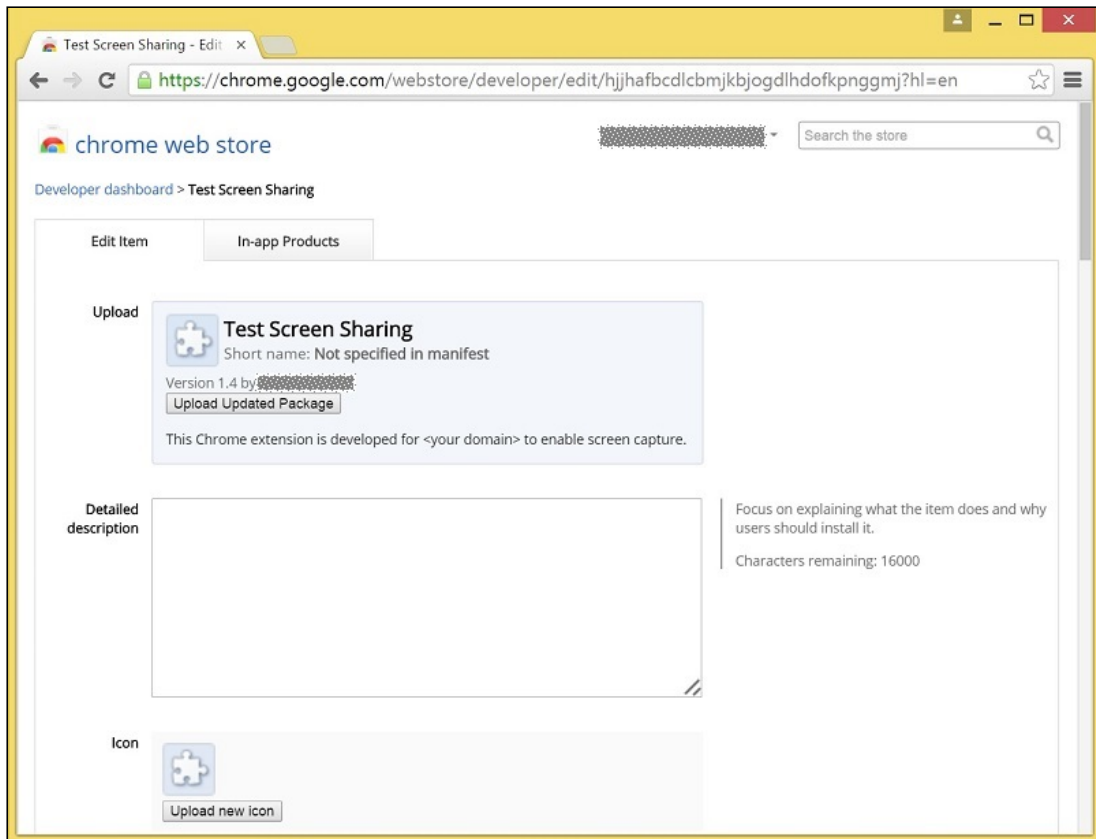
3. Accept the developer agreement



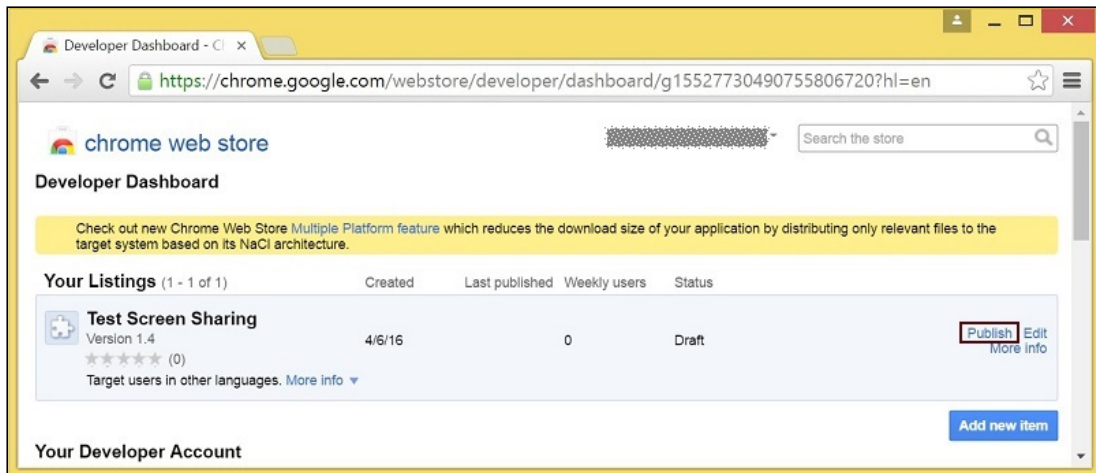
4. On the **Upload** page, choose the **chrome-extension.zip** file and click **Upload** button



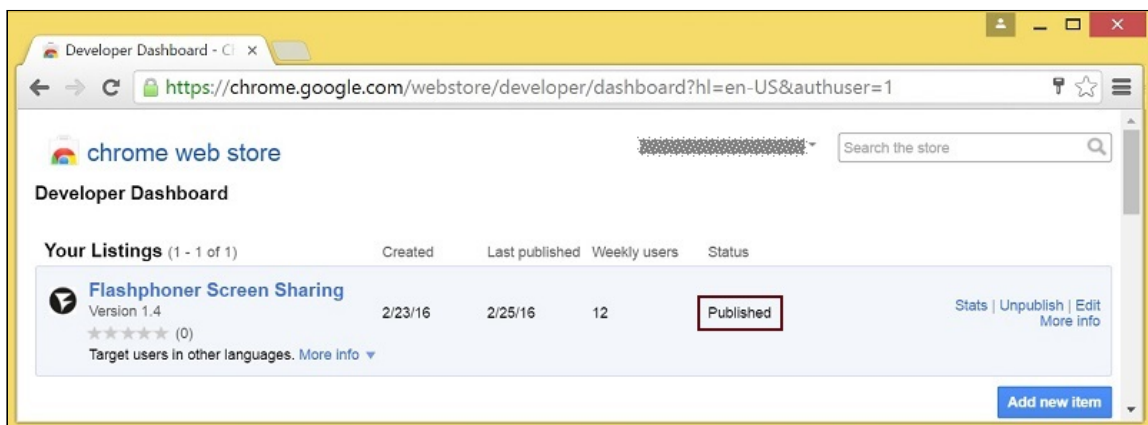
5. When the extension is uploaded, the page for editing the extension draft will be opened. Edit the extension as required and click **Save draft and return to dashboard** button at the bottom of the page



6. The extension will appear in the developer dashboard
Click **Publish** link to publish the extension



A published extension will have status **Published** as on the image below.



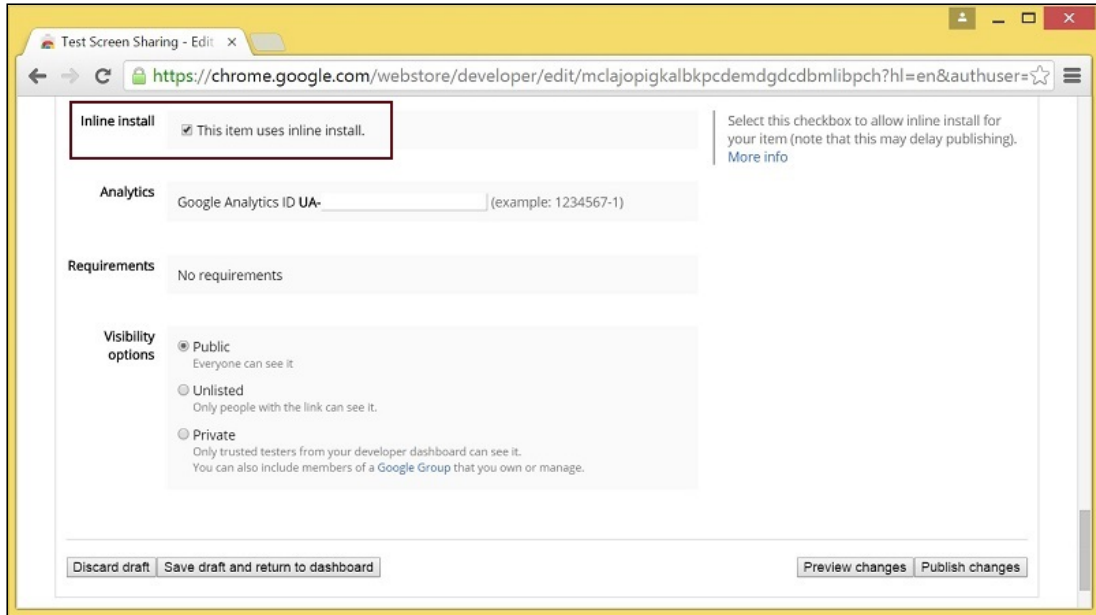
For more information, see [Chrome Web Store Publishing Tutorial](#).

Extension Inline Installation

Extension installation can be initiated by clicking a link on the Screen Sharing client page. Note that the extension to be installed should be customized, published and approved before inline installation can be used.

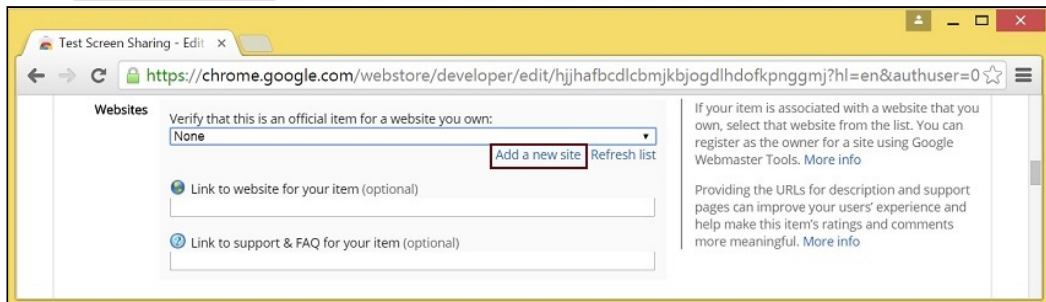
Follow the steps described below to use the client with your extensions:

1. When publishing, select **Inline Install** option

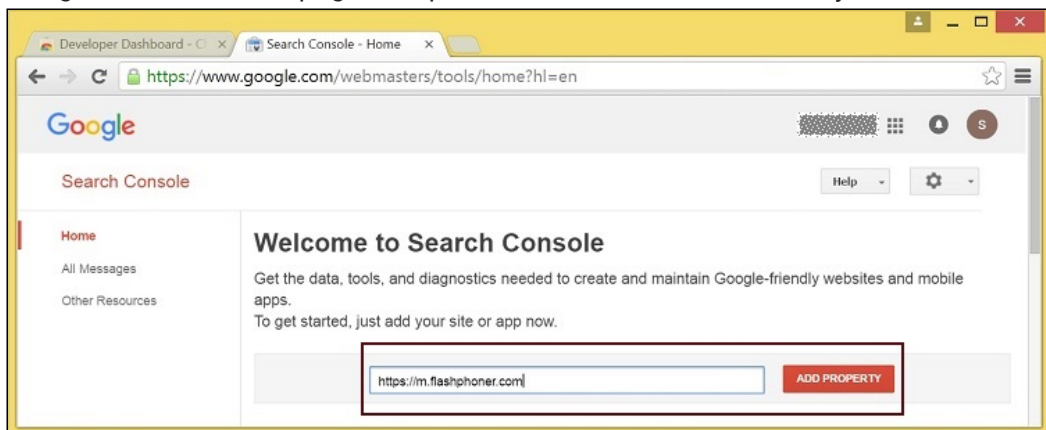


2. Verify and add website with your domain to the extension

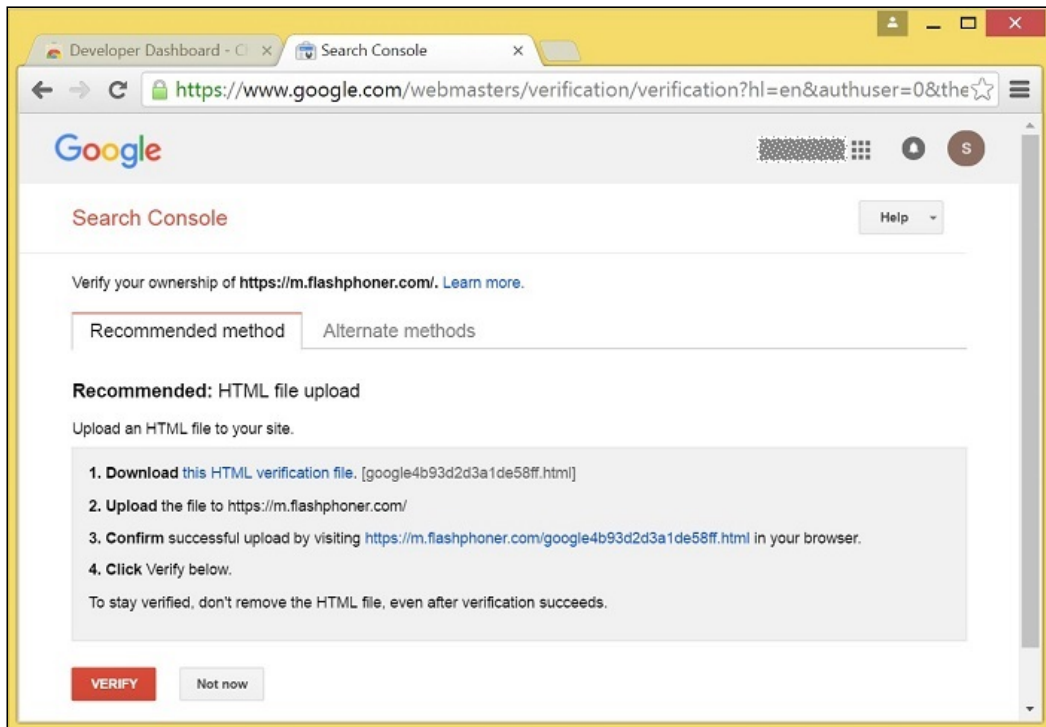
- Click **Add a New Site**



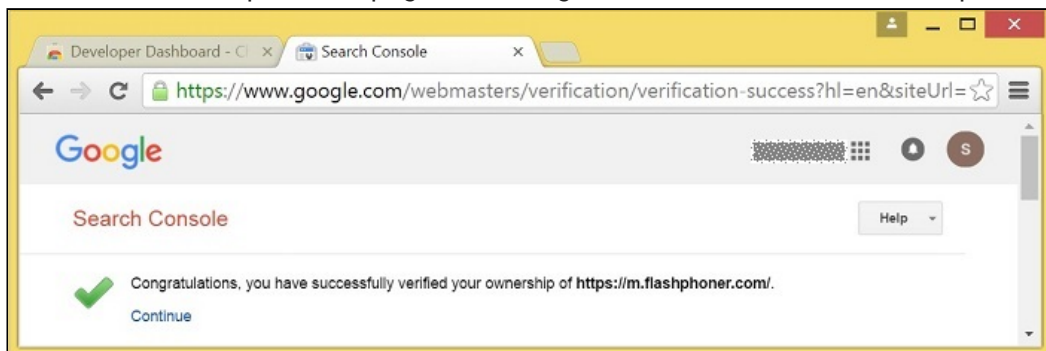
- Google Search Console page will open in a new tab. Enter URL with your domain



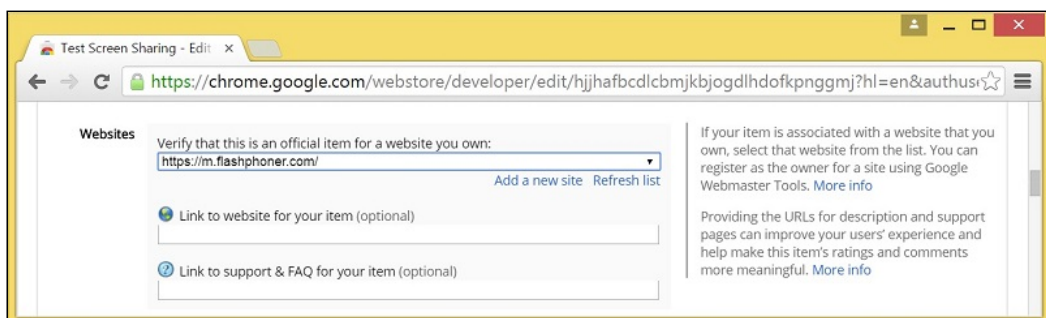
- A page with the instruction for the site verification will open. Follow the procedure steps and click **Verify** button



- If the verification is passed, a page confirming successful verification will be opened



- The website will appear in the list in the extension options and the extension can be associated with the site



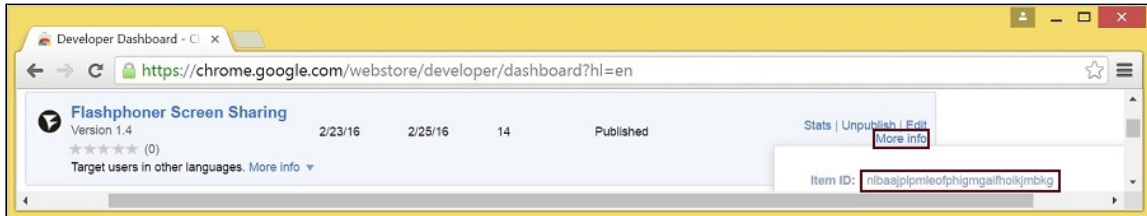
Configuring the client

Edit `Screen-sharing.html` and `Screen-sharing.js`

- In `Screen-sharing.html` the `chrome-webstore-item` parameter should point to your extension in the Chrome Store

- In `Screen-sharing.js` replace the value of the `chromeScreenSharingExtensionId` parameter to the ID of your extension

To get the ID of the extension, click **More info** of this extension in [Chrome Developer Dashboard](#)



Media source parameters

To configure screen media source parameters, use parameters of the `Configuration` object passed to the `init()` method upon initializing of the Flashphoner API instance.

```
var f = Flashphoner.getInstance();
var configuration = new Configuration();
....
configuration.screenSharingVideoWidth = 1920;
configuration.screenSharingVideoHeight = 1080;
configuration.screenSharingVideoFps = 10;
f.init(configuration);
```

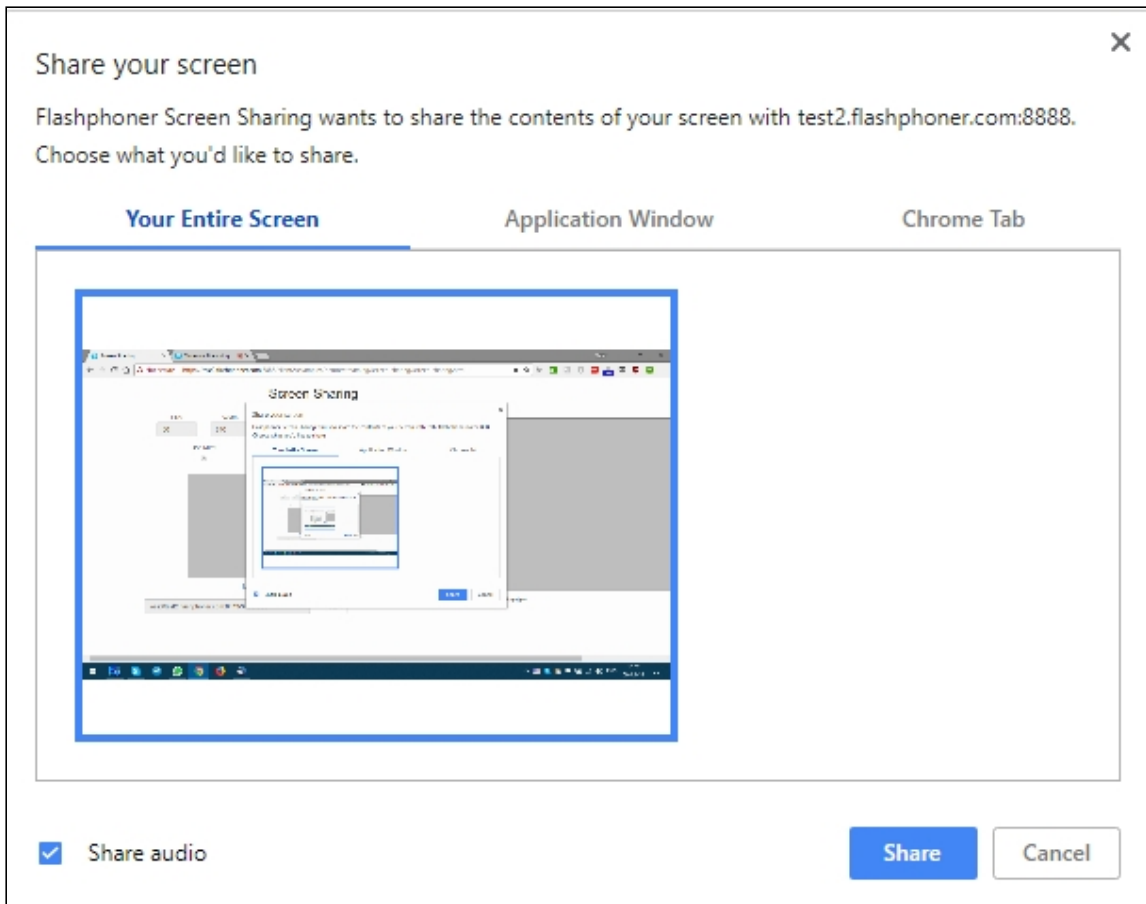
Parameter list

Parameter	Description
<code>screenSharingVideoWidth</code>	Screen media source width
<code>screenSharingVideoHeight</code>	Screen media source height
<code>screenSharingVideoFps</code>	Screen media source framerate

These parameters set marginal values of resolution and framerate (FPS). For instance, `screenSharingVideoWidth = 1080` means the width of the source video cannot be more than 1080 pixels, but can be less. (i.e. when sending a stream of an app window that has the width of 720 pixels).

System sound capture in Chrome browser

In Chrome browser, there is ability to translate audio stream from system sound source while capturing a screen. The feature is useful in screencasting, for example. To capture system sound, set **Share audio** option in Chrome extension dialog window while choosing streaming source window or browser tab:



Chrome extension [code](#):

```
callback({sourceId: sourceId, systemSoundAccess: opts.canRequestAudioTrack});
```

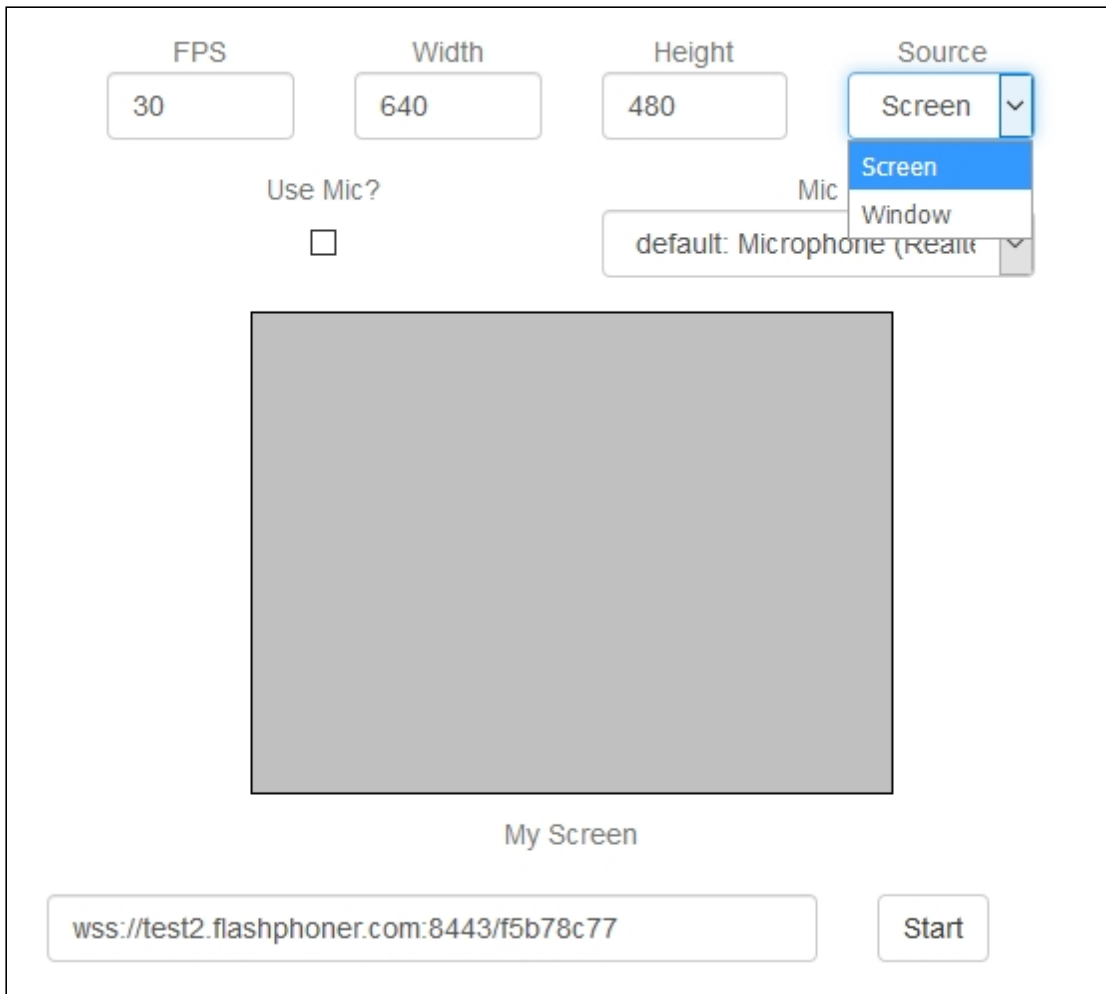
Capture source management in Firefox browser

In Firefox browser, all the screen or some program window can be chosen as video stream source with `constraints.video.mediaSource` parameter

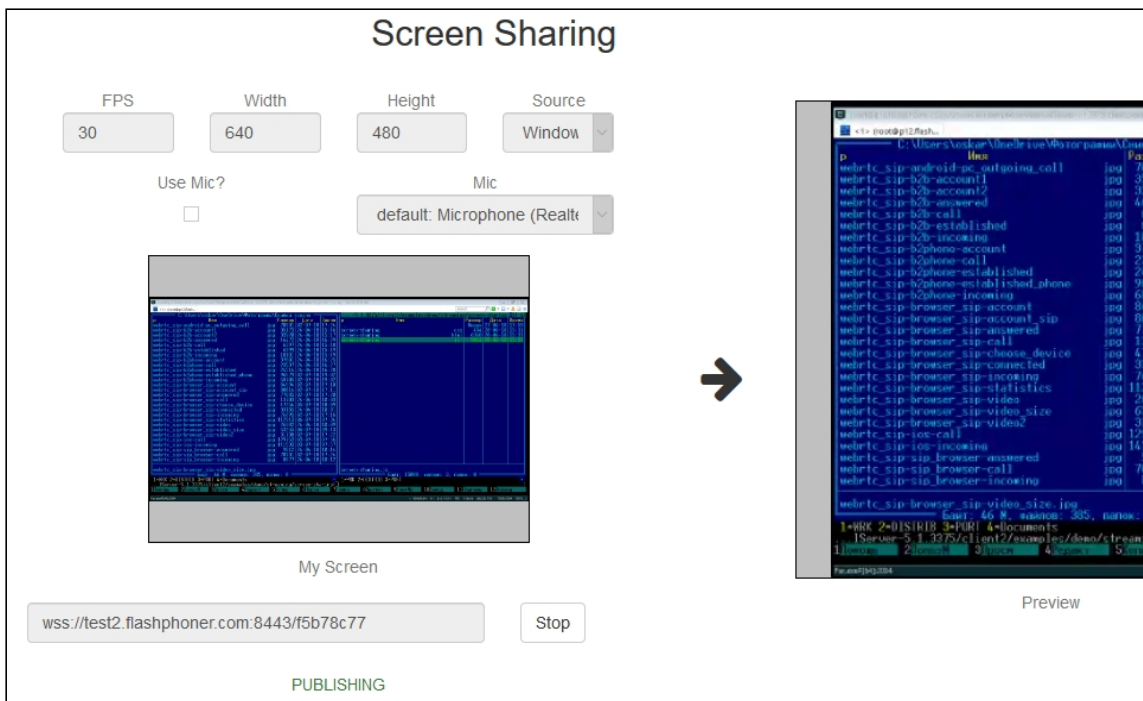
code:

```
constraints.video.type = "screen";
if (Browser.isFirefox()){
  constraints.video.mediaSource = $('#mediaSource').val();
}
session.createStream({
  name: streamName,
  display: localVideo,
  constraints: constraints
})
```

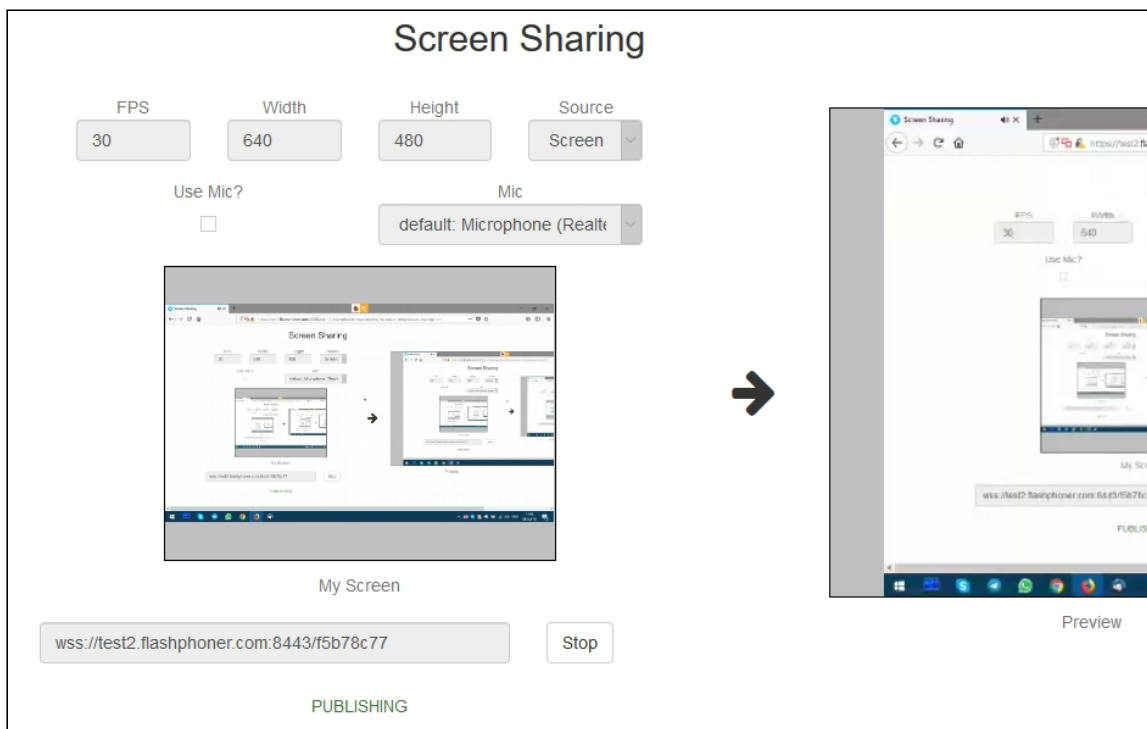
Source selection interface example:



Program window capture



Screen capture



Screen sharing without extension

Firefox browser

Firefox browser does not use extension to share screen

Chromium based browsers

Since Chrome 73 and Flashphoner WebSDK [0.5.28.2753.86](#) screen sharing is possible without extension. To do this `constraints.video.withoutExtension` parameter should be passed when stream is created

code

```
if ($("#woChromeExtension").prop('checked')) {  
    constraints.video.withoutExtension = true;  
}
```

Safari browser in MacOS

Since Safari 13 and Flashphoner WebSDK [0.5.28.2753.152](#) screen sharing is possible without extension. To do this `constraints.video.withoutExtension` parameter should be passed when stream is created

code

```
if ($("#woChromeExtension").prop('checked') || Browser.isSafari()) {
    constraints.video.withoutExtension = true;
}
```

Known limits

1. In Chrome browser, picture resolution and FPS are set by source dimensions (screen, windows or browser tab) and by real picture updating speed, not by constraints. This issue is fixed since Flashphoner WebSDK build [0.5.28.2753.152](#)
2. System sound capture only works starting from Chrome 74

Code of the example

This example uses Flashphoner extensions for work with domain *.flashphoner.com. For work with your domain, build up and publish your extensions as described above.

As temporary solution, IP address of your WCS server can be added to file `C:\Windows\System32\drivers\etc\hosts` (on Windows OS) as test.flashphoner.com. That way, you will be able to test your WCS server with domain test.flashphoner.com till the extensions for your domain are built up.

With Chrome, the example works only via HTTPS.

The path to the source code of the example on WCS server is:

`/usr/local/FlashphonerWebCallServer/client/examples/demo/streaming/screen-sharing`

- screen-sharing.css - file with styles
- screen-sharing.html - page of the screen sharing streamer
- screen-sharing.js - script providing functionality for the streamer

This example can be tested using the following address:

`https://host:8888/client/examples/demo/streaming/screen-sharing/screen-sharing.html`

Here host is the address of the WCS server.

For Chrome, link to the extension is specified directly in file `screen-sharing.html` [line 17](#)

```
<link rel="chrome-webstore-item"
href="https://chrome.google.com/webstore/detail/nlbaajplpml eofphigmgai fhoikjmbkg
```

Analyzing the code

1. Initialization of the API

`Flashphoner.init()` [code](#)

Chrome extension ID is passed to the `init()` method.

```
Flashphoner.init({screenSharingExtensionId: extensionId});
```

2. Connection to WCS server

`Flashphoner.createSession()` [code](#)

```
Flashphoner.createSession({urlServer: url}).on(SESSION_STATUS.ESTABLISHED,
function(session){
    //session connected, start streaming
    startStreaming(session);
}).on(SESSION_STATUS.DISCONNECTED, function(){
    setStatus(SESSION_STATUS.DISCONNECTED);
    onStopped();
}).on(SESSION_STATUS.FAILED, function(){
    setStatus(SESSION_STATUS.FAILED);
    onStopped();
});
```

3. Receiving the event confirming successful connection

`ConnectionStatusEvent ESTABLISHED` [code](#)

```
Flashphoner.createSession({urlServer: url}).on(SESSION_STATUS.ESTABLISHED,
function(session){
    //session connected, start streaming
    startStreaming(session);
}).on(SESSION_STATUS.DISCONNECTED, function(){
    ...
}).on(SESSION_STATUS.FAILED, function(){
    ...
});
```

4. Stream constraints setting

resolution and fps [code](#)

```
var constraints = {
  video: {
    width: parseInt($('#width').val()),
    height: parseInt($('#height').val()),
    //WCS-2014. fixed window/tab sharing
    frameRate: parseInt($('#fps').val())
  }
};
```

```
}  
};
```

microphone usage [code](#)

```
if ($("#useMic").prop('checked')) {  
  constraints.audio = {  
    deviceId: $('#audioInput').val()  
  };  
}
```

video source type and Chrome screen sharing without extension [code](#)

```
constraints.video.type = "screen";  
if ($("#woChromeExtension").prop('checked')) {  
  constraints.video.withoutExtension = true;  
}
```

Firefox media source [code](#)

```
if (Browser.isFirefox()){  
  constraints.video.mediaSource = $('#mediaSource').val();  
}
```

5. Video streaming

`Session.createStream()`, `Stream.publish()` [code](#)

```
session.createStream({  
  name: streamName,  
  display: localVideo,  
  constraints: constraints  
  ...  
}).publish();
```

6. Receiving the event confirming successful streaming

`StreamStatusEvent PUBLISHING` [code](#)

When the screen sharing stream is published, preview video stream is created with method `Session.createStream()`, and function `Stream.play()` is called to start playback of the stream in `div` element `remoteVideo`.

```
session.createStream({  
  name: streamName,  
  display: localVideo,  
  constraints: constraints  
}).on(STREAM_STATUS.PUBLISHING, function(publishStream){  
  /*
```

```

    * User can stop sharing screen capture using Chrome "stop" button.
    * Catch onended video track event and stop publishing.
    */
    document.getElementById(publishStream.id()).srcObject.getVideoTracks()
[0].onended = function (e) {
    publishStream.stop();
};
    document.getElementById(publishStream.id()).addEventListener('resize',
function(event){
    resizeVideo(event.target);
});
    setStatus(STREAM_STATUS.PUBLISHING);
    //play preview
    session.createStream({
        name: streamName,
        display: remoteVideo
        ...
    }).play();
}).on(STREAM_STATUS.UNPUBLISHED, function(){
    ...
}).on(STREAM_STATUS.FAILED, function(){
    ...
}).publish();

```

7. Receiving the event confirming successful preview stream playback

`StreamStatusEvent PLAYING` [code](#)

```

session.createStream({
    name: streamName,
    display: remoteVideo
}).on(STREAM_STATUS.PLAYING, function(previewStream){
    document.getElementById(previewStream.id()).addEventListener('resize',
function(event){
    resizeVideo(event.target);
});
    //enable stop button
    onStart(publishStream, previewStream);
}).on(STREAM_STATUS.STOPPED, function(){
    ...
}).on(STREAM_STATUS.FAILED, function(){
    ...
}).play();

```

8. Preview stream playback stop

`Stream.stop()` [code](#)

```

function onStart(publishStream, previewStream) {
    $("#publishBtn").text("Stop").off('click').click(function(){
        $(this).prop('disabled', true);
        previewStream.stop();
    });
}

```



```
}).prop('disabled', false);  
}
```

9. Receiving the event confirming successful playback stop

`StreamStatusEvent STOPPED` [code](#)

On receiving the event, `publishStream.stop()` is called to stop screen sharing streaming

```
session.createStream({  
  name: streamName,  
  display: remoteVideo  
}).on(STREAM_STATUS.PLAYING, function(previewStream){  
  ...  
}).on(STREAM_STATUS.STOPPED, function(){  
  publishStream.stop();  
}).on(STREAM_STATUS.FAILED, function(){  
  ...  
}).play();
```

10. Screen sharing streaming stop by click on Chrome extension button

`Stream.stop()` [code](#)

```
document.getElementById(publishStream.id()).srcObject.getVideoTracks()  
[0].onended = function (e) {  
  publishStream.stop();  
};
```

11. Receiving the event confirming successful streaming stop

`StreamStatusEvent UNPUBLISHED` [code](#)

```
session.createStream({  
  name: streamName,  
  display: localVideo,  
  constraints: constraints  
}).on(STREAM_STATUS.PUBLISHING, function(publishStream){  
  ...  
}).on(STREAM_STATUS.UNPUBLISHED, function(){  
  setStatus(STREAM_STATUS.UNPUBLISHED);  
  //enable start button  
  onStopped();  
}).on(STREAM_STATUS.FAILED, function(){  
  ...  
}).publish();
```