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1 Introduction

This document aims at guiding the school IT administrators through the deployment steps for Vision apps on the school enrolled Chromebooks.

Vision for Chromebooks has three components:

- Netop Vision Teacher – the teacher’s User Interface
- Netop Vision Student – the student’s User Interface
- Netop Vision Student Extension – a Chrome extension to manage teacher control features

Note: The extension can be located in the browser, at chrome://extensions:
2 Installation

2.1 Prerequisites
This section describes the technical specifications required in order to run the apps.

2.1.1 Operating system

**Vision Teacher:**
- On Chrome OS: the latest version of Chrome OS
- On Windows: Windows 7 or later
- On macOS: macOS 10.9 or later

More information regarding the system requirements is available [here](#).

**Vision Student:**
- The latest version of Chrome OS

2.1.2 G Suite for Education or Clever

G Suite for Education or Clever are required.

By default, Vision for Chromebooks uses G Suite authentication.

To switch to Clever authentication, check [Enable Clever authentication](#).

2.1.3 Networking considerations

Vision for Chromebooks uses WebRTC connectivity, a collection of protocols and interfaces that makes real-time peer-to-peer audio and video communication more efficient.

WebRTC uses the STUN protocol for establishing peer-to-peer connections, even when the endpoints are not in the same network.

To protect student privacy and to prevent accidental connections from outside your organization, Vision does not allow students to join classes unless the students’ and teacher’s external IP addresses are in the same range, sharing the same first two address octets (i.e., a 255.255.0.0 netmask is used for matching).

Ports are allocated dynamically and, in most cases, there is no need for any port configuration. However, if your current network configuration is preventing direct connectivity through the use of firewalls, or if you are using a restricted NAT model (i.e. restricted cone, symmetric NAT), you will need to apply additional settings to allow Vision traffic.

---

**Notes:** To allow Vision traffic in a restricted network, you may use the [WebRtcUdpPortRange Chromium Policy](#) to force Chrome to use WebRTC ports from within a given range, then configure your network equipment accordingly, allowing UDP traffic through those ports. For a list of active policies, see [chrome://policy > Chrome policies](#). For Windows and macOS, check the firewall and proxy considerations available [here](#).

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2.2 On Chrome OS

2.2.1 Sign in to the Google Administration Console

Go to [admin.google.com](http://admin.google.com) and sign in using your administrator account.
2.2.2 Enable Chrome Web Store

Before you can install Vision apps or extensions for your school users, you need to turn on their Chrome Web Store service in your Administration console. For more information, see Turn Additional Google services on or off.

2.2.3 Deploying through the Chrome Store

To quickly deploy Vision on user Chromebooks, do the following:

1. In Admin console, make sure that you have correctly configured a group of users under your domain (it is recommended to have separate groups for the teachers and students).
2. From the Admin console dashboard, click Device Management.
3. From the Devices Settings menu on the left, click Chrome Management and then click User Settings.
4. Select the corresponding user group (e.g. the teachers group) under Organizations on the left side.
5. From the Apps and Extensions > Force-installed Apps and Extensions section, click Manage force-installed apps.
6. Click Chrome Web Store, search for netop, then press Enter.
7. Add the desired applications from the list, then click Save.
8. From the bottom right-hand side of the screen, click Save.

Note: The process of choosing which user apps are pinned is identical. To start, click Pinned Apps and Extensions > Manage pinned apps, then follow steps 4-6.

2.2.4 Deploying without the Chrome store

To deploy the Vision components (Teacher or Student) on user Chromebooks, do the following:

1. From the Admin console dashboard, click Device Management.
2. From the **Devices Settings** menu on the left, click **Chrome Management** and then click **App Management**.

3. In the upper right corner of the Admin console, click the 📚 icon and choose **Add Custom App**. You are prompted to enter the app ID and URL:

![Add custom app](image)

Use the information below.

4. Click **Add**.

5. Repeat steps 3 and 4 to add all Vision components in the Admin console. Based on the policies you have set in the Google Admin console, the components will automatically be installed on the user Chromebooks.

The following table describes the information required for Vision apps:

- **Vision Teacher**

<table>
<thead>
<tr>
<th>Fields</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
<td>ncbcbpbchbjjmcjjaefdehmpfmioohndg</td>
</tr>
<tr>
<td>URL</td>
<td><a href="https://clients2.google.com/service/update2/crx">https://clients2.google.com/service/update2/crx</a></td>
</tr>
</tbody>
</table>

- **Vision Student**

<table>
<thead>
<tr>
<th>Fields</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
<td>hfpdkhblendlpcghglglcamnicbkppp</td>
</tr>
<tr>
<td>URL</td>
<td><a href="https://clients2.google.com/service/update2/crx">https://clients2.google.com/service/update2/crx</a></td>
</tr>
</tbody>
</table>

- **Vision Student extension**

<table>
<thead>
<tr>
<th>Fields</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
<td>hppkmolfplaopakfekiejedjapl</td>
</tr>
<tr>
<td>URL</td>
<td><a href="https://clients2.google.com/service/update2/crx">https://clients2.google.com/service/update2/crx</a></td>
</tr>
</tbody>
</table>

For more information on installations for specific users, see [Manage Chrome Apps Individually](#).

### 2.3 On Windows

Only the Teacher app can be installed on the Windows devices.

#### 2.3.1 To manually install the Teacher app do one of the following

1. Go to the [Microsoft Store](#) and install the Teacher app.
2. Download the EXE file from the [Netop site](#) and install it.

#### 2.3.2 To mass deploy the Teacher app do one of the following

1. Mass deploy the Teacher app using the [Microsoft Store app](#) (check Microsoft article [here](#)).
2. Mass deploy the Teacher app using the available MSI files (more info [here](#)).

### 2.4 On macOS

Only the Teacher app can be installed on the macOS devices.

To install the Teacher app go to the [Mac App Store app](#).
3 Administration

3.1 Custom Configuration

3.1.1 For Chrome OS

Through Google Administration, you can add files which contain various configurations for your apps running on Chrome OS (Teacher and/or Student side).

A configuration file begins with "{" and ends with "}". Between the brackets, multiple policy settings can be added.

Here is a sample configuration file:

```json
{
    "WebRTCPingIntervalDurationMs" : { "Value" : 30000 },
    "DisableAnalytics" : { "Value" : true }
}
```

To upload a configuration file to an app, do the following:

1. From Google Administration, click Device Management.
2. From the left menu, click Chrome management, then click App Management.
3. Click the app you wish to configure, and then click User settings.
4. Browse through the list, to the users you want to apply the configuration for.
5. By default, the Configure section is set to Setting inherited. Click Override, then click UPLOAD CONFIGURATION FILE.
6. Browse to the configuration file, click Ok, then click SAVE.

You can remove the file by clicking X or clicking on Inherit to default to inherit the settings of the previous user groups.

You can view active configurations by browsing to chrome://policy for each user, under the app name.

Sample configuration files can be retrieved here.

3.1.2 For Windows

Custom configuration is available on Windows using the registry. Registry keys can be updated individually on a device or deployed on several devices using tools like the Group Policy.

To update a device individually, a REG file can be created containing information on the registry items that need to be updated.

The configuration information starts at "{" and ends with "}". Between the brackets, multiple policy settings can be added (all " need to be escaped using the \ sign).

Here is a sample reg file (test.reg):

```reg
Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SOFTWARE\Policies\Netop\Vision\Chromebooks]
@=""
"ManagedStorage"="\\WebRTCSignalingServerHost":{"Value":\\testserver.com \\}"
```

10.06.2019
To manually run a .reg file, double click the file and accept the changes.

For deployment using a Group Policy, check the Microsoft article.

Sample configuration files can be retrieved here.

### 3.1.3 For macOS

Custom configuration is available on macOS using .plist files.

Here is a custom .plist file (myfile.plist):

```xml
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
  <dict>
    <key>ManagedStorage</key>
    <dict>
      <key>WebRTCSignalingServerHost</key>
      <dict>
        <key>Value</key>
        <string>peerserver.school.org</string>
      </dict>
      <key>WebRTCPingIntervalDurationMs</key>
      <dict>
        <key>Value</key>
        <integer>120000</integer>
      </dict>
    </dict>
  </dict>
</plist>
```

The configuration information starts after the first `<dict>`.

To import a .plist file on a device, open a Terminal, type the following and then press Enter:

```bash
defaults import com.netop.visionteacher <path to the .plist file>
```

where `<path to the .plist file>` is the location of the .plist file on the device.

To view the current configuration of the application, open a Terminal, type the following and then press Enter:

```bash
defaults read com.netop.visionteacher
```

Sample configuration files can be retrieved here.
3.2 Configuration options

3.2.1 Enable Keepalive Signal

If your network uses a proxy that disconnects idle WebSocket connections after timeout, you can use the WebRTCPingIntervalDurationMs managed policy setting, enabling a keepalive signal.

Setting this option to a value close to the proxy timeout will ensure the connection remains open. The value must be at least 30000.

Note: Keep in mind that this method slightly increases network traffic.

3.2.1.1 For Chrome OS

"WebRTCPingIntervalDurationMs": {"Value": 30000}

3.2.1.2 For Windows

"WebRTCPingIntervalDurationMs": {"Value": 30000}

3.2.1.3 For Mac

<key>WebRTCPingIntervalDurationMs</key>
<dict>
  <key>Value</key>
  <integer>120000</integer>
</dict>

3.2.2 Disable Analytics

By default, Netop Vision sends information such as clicks and view count to Google Analytics, which we use to make our product better. This option makes the application stop sending this kind of information.

3.2.2.1 For Chrome OS

"DisableAnalytics": { "Value": true }

3.2.2.2 For Windows

"DisableAnalytics": { "Value": true }

3.2.2.3 For Mac

<key>DisableAnalytics</key>
<dict>
  <key>Value</key>
  <true/>
</dict>

3.2.3 Add Relay Server for Restricted Networks

This option allows adding one or multiple relay servers to channel network traffic between Teacher and Student, in case direct connections are not possible.

3.2.3.1 For Chrome OS

"WebRTCServerList": {
  "Value": [
    {
      "urls": "turn:<server_url_turn>",
      "credential": "<password_turn>",
      "username": "<username_stun>"
    },
    {
      "urls": "stun:<server_url_stun>",
      "credential": "<password_turn>",
      "username": "<username_stun>"
    }
  ]
}
3.2.3.2 For Windows

```
"WebRTCServerList": {
  "Value": {
    "turn": "turn:<server_url_turn>",
    "credential": "<password_turn>",
    "username": "<username_turn>"
  },
  "stun": "stun:<server_url_stun>",
  "credential": "<password_stun>",
  "username": "<username_stun>"
}
```

3.2.3.3 For Mac

```
<key>WebRTCServerList</key>
<dict>
  <key>Value</key>
  <array>
    <dict>
      <key>urls</key>
      <string>turn.server.1.com</string>
    </dict>
    <dict>
      <key>urls</key>
      <string>turn.server.2.com</string>
    </dict>
    <dict>
      <key>urls</key>
      <string>turn.server.2.com</string>
      <key>credential</key>
      <string>mypassword</string>
      <key>username</key>
      <string>myaccount@domain.com</string>
    </dict>
  </array>
</dict>
```

Each section contains a url, username and password to connect to the server, either a TURN or STUN server.

3.2.4 Add On Premise Signaling Server

In the scenario where due to firewall and/or proxy conditions, WSS (Web secure sockets) are not allowed between the applications and the Netop servers, there is the option of setting up a signaling server locally. The following option needs to be added to use an on premise signaling server.

3.2.4.1 For Chrome OS

```
"WebRTCSignalingServerHost": {"Value": "mysite.local" }
```

3.2.4.2 For Windows

```
"WebRTCSignalingServerHost": {"Value": "mysite.local"}
```

3.2.4.3 For Mac

```
<key>WebRTCSignalingServerHost</key>
<dict>
  <key>Value</key>
  <string>mysite.local</string>
</dict>
```

Replace mysite.local with the domain for the signaling server. Click here for instructions on how to set up the on premise signaling server.

3.2.5 Enable Clever authentication

In order to provide an easy integration with your student information system (SIS), we are using the integration with Clever (www.clever.com). In order to enforce that the students and the teachers need to use Clever authentication, the following setting needs to be applied (DISTRICT_ID needs to be replaced with the ID provided by us).
3.2.5.1 For Chrome OS
{"CustomSISOptions": {
  "Value": {
    "Type": "clever",
    "Organization": "DISTRICT_ID"
  }
}}

3.2.5.2 For Windows
{"CustomSISOptions": {
  "Value": {
    "Type": "clever",
    "Organization": "DISTRICT_ID"
  }
}}

3.2.5.3 For Mac
<dict>
  <key>Value</key>
  <dict>
    <key>Type</key>
    <string>clever</string>
    <key>Organization</key>
    <string>DISTRICT_ID</string>
  </dict>
</dict>

3.2.6 Modify refresh interval for student screen capture
The rate at which the student desktop is captured as well as the interval at which updates are sent to
the Teacher app may be modified in order to save network resources. The refresh interval value may
be specified in milliseconds and needs to be larger than 5000 (5 seconds). The policy needs to be
applied to the student app.

3.2.6.1 For Chrome OS
"ThumbnailCaptureIntervalDurationMs": {
  "Value": 5000
}

3.2.7 Enforce student screen capture mode
Teachers have the option of configuring the way the student desktops are shared, via the Teacher
Settings section in the Netop Vision Portal.

The option within the Teacher Portal – “Monitoring students” - can be overridden by a policy set by an
admin. This policy needs to be enabled on the teacher app and takes any one of the following two
values:

- **“tab”** – for capturing and sharing the active browser tabs
- **“desktop”** – for capturing the full desktop, with sound. The “desktop” option will require the
student’s approval.

3.2.7.1 For Chrome OS
"StudentDesktopCaptureMode": {"Value": "tab" }

3.2.7.2 For Windows
"
"StudentDesktopCaptureMode": {"Value": "tab" }

3.2.7.3 For Mac
<key>StudentDesktopCaptureMode</key>
<dict>
  <key>Value</key>
  <string>screen</string>
</dict>
3.3 Disable Incognito Mode

By default, Incognito mode disables all preinstalled extensions. To override this and allow teacher access if students are using Incognito mode, do the following:

1. From the Admin console dashboard, click Device Management.
2. From the Devices Settings menu on the left, click Chrome Management and then click User Settings.
3. From the Incognito Mode drop-down, choose Disallow incognito mode.

3.4 Manage the Task Manager Google Domain Policy

Task Manager is a new Google domain policy allows you to block students from ending tasks with the Task Manager utility. This setting is available from the Google Admin Console, by browsing to Devices > Chrome Management > User Settings, and then searching for Task Manager.

Note: The Task Manager Google domain policy only applies to Chromebooks running version 52 and above.

3.5 Web Filter Allow Lists

While Filter Web is enabled, students’ entire Chrome web access is blocked by the Student Extension. Teachers can set Allow Lists to still allow access to some sites.

3.6 Logging

3.6.1 For Chrome OS

3.6.1.1 Retrieve Extension Logs

Access from the browser the following links:
- For the teacher: https://vision.netop.com/apps/chrome/teacher/logs
- For the student: https://vision.netop.com/apps/chrome/student/logs

This will trigger a log file download.

Notes: The corresponding apps (teacher or student) need to installed for this to work.

3.6.1.2 Retrieve detailed logs

To view the Netop Vision for Chromebooks logs (for each component), do the following:

1. In Chrome, click the ☰ icon and select More Tools, then choose Extensions.
2. Tick the Developer Mode checkbox to obtain access to developer tools.
3. Click the URL from the Inspect views section. The Console tab is displayed.
An example is shown below:

3.6.2 For Windows
Retrieve the logs by copy and pasting `%APPDATA%\Vision Teacher for Chromebooks\logs\` into the Windows file explorer.

3.6.3 For macOS
You can retrieve the logs from

(Your user name here)\Library\Containers/com.netop.visionteacher\Data/Library/Application Support/Vision Teacher for Chromebooks/logs/