CONFIGURATION GUIDE



Cloudpath Enrollment System Chromebook Configuration Guide, 5.5

Supporting Cloudpath Software Release 5.5

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Overview

The Cloudpath Enrollment System (ES) extends the benefits of certificates to Chromebooks in environments with an existing Public Key Infrastructure (PKI).

The certificate is installed in the Trusted Platform Module (TPM), and can be used for certificate-based Wi-Fi (WPA2-Enterprise with EAP-TLS), web SSO authentication, web two-factor authentication and more.

Cloudpath can automatically distribute user and device certificates to both IT-managed and unmanaged (BYOD) Chromebooks.

- For IT-managed Chromebooks, Cloudpath deploys both user and device certificates via a Chrome extension provisioned through the Chromebook management console. Whether tied to the user or the device, the certificates are TPM-backed, which means they are burned into hardware for maximum protection.
- For unmanaged Chromebooks, Cloudpath provides a web portal for self-service and automated installation of the certificate along with configuration of related services, such as WPA2- Enterprise Wi-Fi using EAP-TLS.

Whether your network supports IT-managed, or unmanaged Chromebook devices (or both), Cloudpath provides a secure method for Automatic Device Enablement.

Cloudpath can differentiate the devices on your network by ownership, not just device type, offering the worlds first solution to extend secure Set-It-And-Forget-It-Wi-Fi[™] to all users, devices, and networks without IT involvement.

Supported Devices

Cloudpath supports all Chrome OS devices supported by Google.

Configuring Cloudpath

To create a Chromebook configuration in Cloudpath, enable the Chromebook OS on the ES Admin UI and configure the user experience appropriate for your network.

During user enrollment, if the Chrome OS is detected, Cloudpath displays Chrome OS-specific instructions for downloading the configuration file and installing it on the device, or if extensions are configured, the certificate and Wi-Fi settings are installed in the TPM.

Enable the Chrome OS

The Chrome operating is enabled by default. If needed, use these instructions to enable the Chrome OS for a device configuration.

- 1. On the Cloudpath Admin UI, go to **Configuration** > **Device Configurations**.
- 2. Select the device configuration to support the Chrome OS.

3. On the **OS Settings** tab, edit the **Chrome: Configuration from the Network(s) and Trust tabs**.

FIGURE 1 Enable Chrome OS

onfigurations > Modify Network	Cancel	Save
es will be applied to the operating systems selected below.		
Chrome		
avior		
Ily need to be adjusted.		
Yes, validate RADIUS server(s). (Strongly Recommende	•	
	ies will be applied to the operating systems selected below. Chrome avior Illy need to be adjusted. Yes, validate RADIUS server(s). (Strongly Recommende	ies will be applied to the operating systems selected below. Cancel ies will be applied to the operating systems selected below. Chrome avior Ity need to be adjusted. Yes, validate RADIUS server(s). (Strongly Recommende

- 4. Select Operating System: Chrome.
- 5. Leave the default settings for Validate Server Certificate, and Save.

Chromebook User Experience

The Chromebook user experience can be configured for managed or unmanaged devices.

- For unmanaged devices, the user downloads the ONC file, which contains the certificate and Wi- Fi settings required to connect to the secure network. This is similar to the mobileconfig file process for Mac OS X and iOS devices.
- For managed devices, the Cloudpath extension, which is configured in the Chrome Management Console, installs the certificate and settings into the TPM as the user or as the device.

NOTE

The Chrome extension uses the information provided by the Cloudpath configuration. See Configuring the Chrome Extension to configure the Cloudpath extension to be dispersed to managed devices.

After the configuration file is installed (manually, or using the extension), the user simply connects the secure network.

User Experience Settings

To configure the Chromebook user experience:

- 1. Go to **Configuration** > **Advanced** > **Device Configuration**.
- 2. Select the **OS Settings** tab for the appropriate device configuration.

3. Edit the **Chrome: User experience** options.

FIGURE 2 Chrome User Experience Settings

i) Sup	ported Methods:	Unmanaged via ONC + Managed via User Extension	٠
nman	aged Chromebooks	s (ONC) Messages	
The o	ptions below control the mes	saging for unmanaged Chrome users.	
ON(C Install Instructions:	<div id="chromeUnmanagedDiv"><div class="cpx-wizard-
download-subnote"><ul style="margin-top: 0px; margin-
bottom: 0px;">If you are not logged in as the Chromebook owner, log out and log back in as the</div></div>	•
tens	ion Messages		
The o	ptions below control the mes	saging when a certificate is installed on a managed device via the Chrome <div id="chromeManagedDiv" style="display: none;"><a id='chromeManagedButton' class='cpx-wizard-download-</a </div>	e Exte
The o	ptions below control the mes	saging when a certificate is installed on a managed device via the Chrome <div id="chromeManagedDiv" style="display: none;"><div class="cpx-
wizard-configure-image"></div><div chromemanageddiv'="" class="cpx-wizard-</td><td>e Exte</td></tr><tr><td>The o</td><td>ptions below control the mes
ension Install Instructions:
npleted Message:</td><td>saging when a certificate is installed on a managed device via the Chrome
<div id=" style="display: none;"><div class="cpx-
wizard-configure-image"></div><div class="cpx-wizard-
</div class=" cpx-pagechromeosextensiondone-title'=""> </div> </a </div> </a </div> <td>e Exte</td>	e Exte
The o Extens	ptions below control the mest ension Install Instructions: npleted Message: ion - Advanced Beh	saging when a certificate is installed on a managed device via the Chrome <div id="chromeManagedDiv" style="display: none;"><div class="cpx-wizard-
wizard-configure-image"><div class="cpx-pageChromeOsExtensionDone-title"> <td>e Exte</td></div></div></a </div>	e Exte
The o Extens The o Extens	ptions below control the mess ension Install Instructions: npleted Message: ion - Advanced Beh ptions below control the mess sting Certificates:	saging when a certificate is installed on a managed device via the Chrome <div id="chromeManagedDiv" style="display: none;"><div class="cpx-
wizard-configure-image"></div><div class="cpx-wizard-
<div class=" cpx-pagechromeosextensiondone-title'=""> </div> </a </div> <td>e Exte</td>	e Exte

- 4. Select the **Behavior** settings for the device configuration.
 - The **Supported Method** setting controls the installation methods available to end-users. By default, installation is handled using an ONC file, which can be used by both unmanaged and managed devices.
 - ONC Only Allows installation using the ONC file only.
 - ONC + User Extension Allows installation using the ONC file or Chrome extension. If the extension is used, the certificate is installed as the user.
 - ONC + Device Extension Allows installation using the ONC file or Chrome extension. If the extension is used, the certificate is installed as the device.
 - User Extension Only Allows installation to the user TPM using only the Chrome extension.
 - Device Extension Only Allows installation to the device TPM using only the Chrome extension.
 - The ONC Install Instructions contain the instructions displayed to the user if the ONC file is used to install the certificate and Wi-Fi settings. This occurs if ONC Only is enabled or if ONC + (User or Device) Extension is enabled, but the user does not have the extension installed.

5. Configure Extension Messages.

- The **Extension Install Instructions** are displayed to the user if an extension is used to install the certificate on the device.
- After the certificate has been successfully installed using the extension, the **Completed Message** appears.
- 6. Configure ONC Messages.
 - The **App ID to Notify** notifies an app when the certificate installation is complete. This can be useful if an app is managing the enrollment process for the user.
 - If using extensions, you can specify that the extension remove existing certificates from the certificate manager. This can be useful in cleaning up the device.
- 7. Save the configuration settings.

If the active workflow in Cloudpath supports the Chromebook OS with extensions, the **Explain Chrome Setup** button displays Chromebook setup instructions on the **Configuration** > **Deploy** page.

Download the Root CA

The Chrome extension (Cloudpath Certificate Generator) installs the root CA certificate (and any additional CAs) into the TPM as the user or as the device, depending on the Chrome OS configuration in Cloudpath.

NOTE

If your root CA certificate chain includes an intermediate certificate, the Chromebook setup instructions provide a link to the Root CA on Step 1 and any intermediate CAs in step 2.

Use the link in Step 1 of the **Managed Chromebook Setup** page to download the root CA.

This certificate will be imported into the Chrome management console later in this configuration process.

Download Additional CAs

If you have additional CAs configured (in the Cloudpath Admin UI, see the Trusted RADIUS chain in the device configuration network settings), use the link in Step 2 to download the additional CAs.

FIGURE 3 Managed Chromebook Setup Instructions

Enrollment Portal URL:		https://newul.cloudpath.net/enrollRegression/Production/			
Passpoint OSU URL:	ht	tps://newui.cloudpath.net/passpoint/Regression/Production/entry			
QR Code:					
Managed Chromebo	ook Setu	qu			
Managed Chromebook Setup:	Step 1:	Download the root certificate authority for the RADIUS server.			
	Step 2	Download each additional CA certificate in the client certificate chain: Regression Intermediate CA I			
	Step 3:	In the Chrome management console, navigate to Device Management -> Network -> Certificates. Add the CA certificate(s) downloaded above.			
	Step 4	Navigate to Device Management -> Network -> Wi-Fi and clck Add Wi-Fi. Create the 'CloudpathTest' wireless network. Check Automatically Connect. Set Security Type to 'WPA/WPA2-Enterprise'. Set Extensible Authentication Protocol to 'EAP-TLS'. Set Username to '@byodt.company.com' or the desired value. Set Server Certificate Authonity to 'Regression Root CA.F. Set Client Enrollment URL to 'https://newui.cloudpath.net/enroll/Regression/Production/. Set Issuer Common Name to 'Regression Intermediate CA.F. Set Issuer Organization to 'Sample Company, Inc.'. Set Issuer Organization to 'Sample Company, Inc.'.			
	Step 5:	Navigate to Device Management -> Chrome Management -> User Settings -> Manage force-installed apps. Search for ID obbhcliftnbkdobgnejfoajgfiooeifeb (Cloudpath Certificate Generator) and add it to the force-install list. (if you need the beta version, the ID is dnnhnbjplägdnnfdliepjhnabjcbjon (Cloudpath Certificate Generator - Beta).) If prompted for a URL, use https://clients2.google.com/service/update2/crx			
	Step 6:	At this point, the extension will be deployed to the managed Chromebooks along with the 'CloudpathTest' wireless network. When the user clicks on the wireless network, the operating system will look for a certificate with the issuer characteristics above. If one is not found, the browser will be opened to the Client Enrollment URL above. Once authorized, the extension will install the certificate and the SSID will then be joinable.			

NOTE

The extension ID is listed in the Chromebook Setup Instructions.

Configuring the Chrome Extension

Cloudpath provides all of the information you need to set up the Chrome extension, which is used to install the certificate and Wi-Fi settings on Chromebook devices.

After configuring the Chrome OS settings in Cloudpath, use the Chrome management console to set up the extension.

Chrome Admin Console Settings

The web-based management console for the Chrome OS allows you to centrally configured network settings for users and configure extensions for your managed Chromebooks devices.

The **Admin Console** > **Device Management** is the portal for configuring Wi-Fi and network settings for the user. Configure Wi-Fi and Certificates on the **Networks** page. Configure force-installed apps on the **Chrome Management** page.

To access network and wireless settings:

1. Log into the Chrome management console at https://admin.google.com.

FIGURE 4 Chrome Admin Console

Admin console			
Device management Settings and security for devices			

Configuring the Chrome Extension Chrome Admin Console Settings

2. Select Device Management.

FIGURE 5 Device Management

\equiv Device management	it		
SETTINGS Network		Ø	
	Mobile devices More about Mobile	2 Chrome devices Manage Chrome devices	Chromebox for meetings More about Chromebox for meetings

Use the **Network** link to set up Wi-Fi and **Certificates** for managed devices. Use the **Chrome management** link to set up Wi-Fi and Certificates for managed devices.

Network Settings

Navigate to the **Networks** page to import the CA certificate and configure the Wi-Fi settings, which will be dispersed to users or devices through the Chrome extension.

FIGURE 6 Network Settings

Device management > Network	
Networks Set up WiFi, VPN, and Ethernet networks for managed devices	
Wi-Fi Set up and manage Wi-Fi networks Ethernet Set up and manage Ethernet networks	
VPN Set up and manage VPN networks	
Certificates Manage network access certificates and requests	
General settings Manage network related settings for your company	

Import CA certificate

1. Click the **Networks** > **Certificates** link to import the CA certificate.

FIGURE 7 Manage Certificates

ORGANIZATIONS	SETTINGS for cloudpath.net	
cloudpath.net Employees End-Of-Life Accounts	Locally applied Issued by: Test Root CA I, IT, Sample Company, Inc. Issued to: Test Root CA I, IT, Sample Company, Inc. Issued on: Jul 2, 2014 Expires on: Aug 2, 2034 Restricted to: Chromebooks	
Servers	This certificate is not being used by any networks. Multiple sign-in will be disabled for users where SSL-inspecting certs are in effect Use this certificate as an HTTPS certificate authority.	REVERT
	Locally applied Issued by: McKinnon VIC Root CA I, IT, McKinnon Secondary College Issued to: McKinnon VIC Root CA I, IT, McKinnon Secondary College Issued on:Sep 20, 2014 Expires on: Oct 20, 2034 Restricted to: Chromebooks	
	This certificate is not being used by any networks. Multiple sign-in will be disabled for users where SSL-inspecting certs are in effect Use this certificate as an HTTPS certificate authority.	REVERT
	Locally applied Issued by Regression Boot CA LIT, Sample Company, Inc. ADD CERTIFICATE	

- 2. On the left side, select the organization for which you want to import the certificate, or if you don't select an organization, the certificate settings apply to all organizations and groups.
- 3. Click Add Certificate.
- 4. Locate and import the root CA certificate that was downloaded from the Chrome Setup Instructions page in the Cloudpath Admin UI (see Managed Chromebook Setup Instructions).

NOTE

You must install the entire certificate chain. If the root CA contains an intermediate certificate, you must install both the root and intermediate certificates. Additionally, the common name must match on the root and intermediate certs.

- If your Cloudpath configuration contains additional CAs, you must also import the additional CAs.
 The link for downloading additional CAs can be found in Step 2 of the Managed Chromebook Setup Instructions.
- 6. When the certificates have been successfully uploaded, return to the **Networks** page to configure **Wi-Fi** settings.

Configure Wi-Fi

Configure Wi-Fi settings for the managed Chrome devices enrolled in your domain, or for logged-in users from specific suborganizations within your domain.

- 1. Return to the **Networks** page and click the **Networks** > **Wi-Fi** link.
- 2. On the left side, select the organization for which you want to import the certificate, or if you don't select an organization, the certificate settings apply to all organizations and groups.

FIGURE 8 Wi-Fi Networks

Device management	> Network > Wi	-Fi	Ø
	SETTINGS for cloudpath.net		
 cloudpath.net 			
Employees	Wi-Fi: Cloudpath	SSID:cloudpath	
End-Of-Life Accounts	Total abbred	SSID hidden:No	
External Contractors		Restricted to:Chromebooks	
Servers			
	WI-FI: Test73 Locally applied	SSID:Test73 Applied to:Users SSID hidden:No Auto-Connect:Yes Restricted to:Chromebooks	
	Wi-Fi: CloudpathTest Locally applied	SSID:CloudpathTest Applied to:Users SSID hidden:No Auto-Connect:No Restricted to:Chromebooks	
	Wi-Fi: R-DVES-Secure Locally applied	SSID:R-DVES-Secure Applied to:Users SSID hidden:No Auto-Connect:Yes Restricted to:Chromebooks	
	Wi-Fi: Demo4 Locally applied	SSID:Demo4 Applied to:Users SSID hidden:No Auto-Connect:Yes Restricted to:Chromebooks	
	Add Wi-Fi		

3. Click Add Wi-Fi. The Add Wi-Fi page displays.

FIGURE 9 Wi-Fi Settings

Add Wi-Fi network	
Name	Help
Demo4	
Service set identifier (SSID)	
Demo4	
This SSID is not broadcast Automatically connect	
Security type	
WPA/WPA2 Enterprise (802.1X) 🔻	
Extensible Authentication Protocol	
EAP-TLS 🔻	
Username	
@cloudpath.net	
Server Certificate Authority	
Demo Root CA I	
Issued by: Demo Root CA I, Demo Issued to: Demo Intermediate CA I, Demo Issued on: Nov 9, 2014 Expires on: Dec 9, 2034	
Restricted to: Chromebooks	

4. Enter the Wi-Fi data according to Step 3 in the Chromebook setup instructions (see Managed Chromebook Setup Instructions).

NOTE

The instructions differ by configuration. Configure the Wi-Fi settings for your network according to the Managed Chromebook Setup Instructions in the Cloudpath Admin UI.

- It is not required that the **Name** and the **SSID** match. Name is an internal value.
- Typically the SSID is broadcast.
- Automatically connect is optional.
- Security type must be WPA/WPA2 Enterprise (802.1x).
- EAP type must be **EAP-TLS**.
- The Username must be populated. Typically, the value for this field is <user>@<domain>, but @<domain> also works.

NOTE

If using a Microsoft CA instead of the Cloudpath onboard CA, use \${CERT_SAN_UPN} in the Username field to bring the Microsoft CA User Principle Name into the identity box. For more information, see this Google link for more information: https://support.google.com/chrome/a/answer/2634553? hl=en#top&add&wifi&thirdparty&variables&change&managecerts&autoconnect&

5. Select the Root CA listed in the setup instructions (see Managed Chromebook Setup Instructions). When selecting the **Server Certificate Authority**, be sure to select the certificate that contains both the root and intermediate certificates.

NOTE

Be sure to select the Root CA that includes any intermediate CAs in your configuration. The following screen capture shows that the selected root CA also contains the intermediate CA.

FIGURE 10 Imported Root CA with Intermediate CA

Locally applie		
Issued by Den	Root CA I, Cloudpath Networks	
Issued to: Den	Intermediate CA I, Cloudpath Networks	
looued on Dec	1, 2012 Expires on: Jan 10, 2000	
Restricted to:	romebooks, Mobile devices	
This certificate	not being used by any networks.	
Multiple sign-i	will be disabled for users where SSL-inspecting certs a	e in effect
Use this c	tificate as an HTTPS certificate authority.	

FIGURE 11 WiFi Setup Continued

https://demo4.cloud	lpath.r
Issuer pattern	
Common name Demo Root CA I	
Locality	
Organization	
Organizational unit	
Subject pattern	
Common name	
Locality	
Organization	
Organizational unit	
Direct Internet Conne	ection
Restrict access to this	Wi-Fi network by platform
his Wi-Fi network will	be available to users using:
Mobile devices	
Chromebooks	
- Chromebox for me	eetings devices
apply network	
by user	•

- a) Enter the **Client enrollment URL** that is listed on the Chromebook setup instructions (see Managed Chromebook Setup Instructions).
- b) Enter the Issuer pattern fields as directed by the Managed Chromebook Setup instructions.
 Common Name is a required field.

NOTE

If using a Microsoft CA instead of the Cloudpath onboard CA, use the "Issued by" value of the CA certificate.

- c) Apply network by **user**.
- 6. Click **Add** to add the Wi-Fi configuration for the organization.
- 7. Return to the **Device Management** page to configure the force-install application.

Configure Policies for Device Users

Configure policies for Chrome device users within an organizational unit. Configure the policy for the Cloudpath extension in the **Apps and Extensions** section.

Force-installed Apps

You can force install apps on your users' managed Chrome devices so that they see the apps from their apps list when they're signed in to their Chrome devices.

Configure Force install apps in **User** settings.

1. Navigate to **Device Management > Chrome Management**, and select **User Settings**.

NOTE

Even if the Cloudpath user experience settings (see User Experience Settings) are configured for **ONC + Device** extensions, the **Force install apps** are configured in **User settings**.

2. Scroll down to the Apps and Extensions section.

3. Click Manage force-installed apps.

FIGURE 12 Force-Installed Apps and Extensions

Chrome Web Store	>	Total to force install: 1	
💦 Domain Apps	>	XpressConnect C	Details Remove
Specify a Custom App	>		
Business Apps	>		
Business Extensions	>		

The left side lists the available apps and extensions, and the right side lists the apps and extensions to install on the managed devices for this network.

4. Search for the Cloudpath Certificate Generator and add to the force-install list.

The extension is installed on the user device according to the Chrome OS user experience Behavior

NOTE

Alternatively, you can access policy settings by navigating to **Device Management** > **Chrome Management** > **App Management**, select the **Cloudpath Certificate Generator**, and then **User Settings**.

Force Install Unlisted (Beta) Apps

If your application is unlisted, you must load it as a custom application.

1. Navigate to **Device Management > Chrome > App Management**.

FIGURE 13 Chrome App Management

\equiv Device management > Chr	rome
	Chrome Management ON for everyone
	User settings Manage user-based settings on Chrome browsers and Chrome devices
	Public session settings Manage public session settings on Chrome devices
	Device settings Manage Chrome device settings
	Devices View and manage Chrome devices
	App Management Find and Manage Chrome apps

2. From the top-right **Settings** menu, select **Add Custom App**.

FIGURE 14 Add Custom App

\equiv Device management >	Chrome > Chrome App Management	
Filters	Apps	Add custom app
Type My configured apps -	AIRSecureTest	Manage Apps in User Settings
Find or Update Apps	XpressConnect Cert Generator - Offline Device	Configured
SEARCH	XpressConnect Certificate Generator	Configured
	XpressConnect Certificate Generator - Beta	Installed

3. Enter the App **ID** and **URL**.

FIGURE 15 Custom App Parameters

Device management > Chron	ne > Chron	ne App Management	₹ 0 :
Filters		×	
Type . My configured appe -	ARSecure	Add custom app You must supply both the extension id and the url where the extension is hosted.	
Find is Update Apps	XpressCon	ID abcdefghijkimnopqrstuvvxyz URL https://clients2.google.com/service/upp	
SEARCH	XpressCon	ADD	
	XpressConne	ct Certificate Generator - Beta	Installed

NOTE

To find the app **ID**, hover over the **More Info** for the app on the **Developer Dashboard** page.

After the app is created, configure the settings for users that log in with an account in your domain.

4. Select User settings.

FIGURE 16 Custom App User Settings

⊟ Device management → Chres	ome App Management > abcdefghijklmnopqrstuvwzyz
	abcdefghijklmnopqrst https://dients2.google.com/service/update2/crx
	User settings Configure this app for users that log in with an account in your domain.
	Public session settings Configure this app for users that log in to a public session on your devices.
	Kiosk settings Deploy this app as a Klosk App

5. On the **User settings** page for your application, select an organization under **Orgs** in the left pane.

FIGURE 17 Configure Custom App

\equiv Device management > Chron	ne App Management > a	abcdefghijklmnopqr	stuvwzyz	
~ User	abcde https://clients2	efghijklmnoj	oqrst //ex	
	Orgs	Settings	for cloudpath.net	
	 clicudpath.net Employees End-Of-Life Accounts 	Allow installation	Force installation	
	External Contractors Servers	Pin to taskbar	Configure UPLOAD CONFIGURATION FILE	
		SAV	E CANCEL	

- 6. In the right pane, enable **Force installation**.
- 7. **Save** the configuration.

The unlisted application can now be added as a Force-install app. See Force-installed Apps for more information.

Chromebook User Experience

Cloudpath provides the prompts that guide the user through the sequence of steps that make up the enrollment workflow. During this process, the user enters information as requested, and makes selections about user type, device type, among others. The sequence of steps for the enrollment differ, depending on the selection that is made.

Enrollment Workflow

During enrollment, the Chrome OS is detected and Cloudpath provides Chrome OS-specific instructions for downloading the configuration file and installing it on the device manually, or automatically if extensions are configured. After the configuration file is installed, the user simply connects the secure network.

The following section provides an example of the Chromebook user experience. The sequence of steps for the enrollment differ, depending on the selection that is made.

- 1. The user connects to the deployment URL (either directly, or through a Captive Portal).
- 2. The Cloudpath Welcome screen displays.

FIGURE 18 Wizard Welcome Page



The login screen is typically customized with the logo, colors, and text for the organization or institution. The screens in this example use the default look and feel of the application.

User Type Prompt

If required by the network, the user might see a User Type prompt. A user type prompt can provided a branch in the workflow for the different types of users on your network. For example, in an education network, the user types might be Student/Staff/ Faculty, or in Enterprise network, they might be Employees/Guests/Contractors.

FIGURE 19 User Type Prompt



User Credentials

If required by the network, the user can be prompted enter their credentials. A user credential prompt might request credentials from an AD or LDAP server, or from RADIUS via PAP.

FIGURE 20 User Credentials

Your Logo	Here
'our unwrname act) personord are required	to access the reducerk.
Username:	
Password:	
keed Assistance?	

Device Type

If required by the network, the user might see a Device Type prompt. A device type prompt can provided a branch in the workflow for the different types of devices on your network.

FIGURE 21 Device Type Prompt



Managed or Unmanaged Chromebooks

The final portion of the user experience differs, depending on if the certificate and Wi-Fi settings are set for delivery using the ONC file (unmanaged devices) or an extension (managed devices). See the following sections to continue with the user experience example for your configuration.

- Unmanaged Chromebook User Experience
- Managed Chromebooks With Extension User Experience

Unmanaged Chromebook User Experience

1. With an unmanaged Chromebook device, the user downloads and installs the ONC file, which contains configuration information required to access the secure network, including the certificate and Wi-Fi settings.

2. For unmanaged devices, the application detects the Chrome operating system and displays instructions for installing the Chrome configuration on the device.

FIGURE 22 Configuration Installation Instructions

Mac OS X L	ion & Greater
Mac OS X S	now Leopard & Leopard
Apple iPhor	ne, iPad, & iPod Touch
Android De	vices
Ubuntu & F	edora Linux
Windows Se	urface RT
Chrome O	s
 Eyeu a 	re not logged in as the Chromebook owner, log Lion back in as the owner
Ł	Step 1: Download the Network File Singly download the file. Do not open it yet.
.± ¢	Step 1: Download the Network File Singly download the file. Do not open it yet. Step 2: Import Network File Inport the Downloaded CNC File.
• Open a • Type (o	Step 1: Download the Network File Siruly download the file. Do not open it yet Step 2: Import Network File Inport the Download on C File Inport the Download on C File International file address into the browser esthet-internabilitichremeos

The manual download page shows the Chromebook instructions.

- **Step 1** provides the link to download the ONC file.
- **Step 2** provides instructions for importing the ONC file.
- 3. Copy the URL from the instructions.

4. Paste the URL into a new browser window. The Chrome OS Import ONC File page displays.

FIGURE 23 Import ONC File

XpressConnect by Cloud × C chrome://net-internals/# ×
← → C C chrome://net-internals/#chromeos
ChromeOS • capturing events (25927)
Import ONC file
Choose File No file chosen
ONC file successfully parsed
Store Logs
Store Debug Logs
Network Debugging
Select interface for debugging Wi-Fi Ethernet Cellular WiMAX None

5. Click **Choose File** and browse to select the **<NetworkName>.onc** file.

6. After the ONC file installed, click the **Wi-Fi** icon in the bottom right corner of your screen and select the secure network.

FIGURE 24 Select Secure Wi-Fi Network

Sample Campus	Secure
Searching for Wi-Fi netw	orks
😪 cloudpath	
🗢 Shin OnRamp	
< cpn-moto-help-eul	a
Join other	Settings
< Network	▼ i
1	9:48 マ 🖬 🁮

7. Typically, user credentials are populated using the information passed during the enrollment process. Click **Connect**.

FIGURE 25 Enter User Credentials

joint in the inclusion		
SSID:	Sample Campus Secure	
EAP method:	PEAP	•
Phase 2 authentication:	MSCHAPv2	-
Server CA certificate:	Cloudpath IT Root CA I [Cloudpath IT Root (•
Subject Match:		
User certificate:	None installed	•
Identity:		
Password:		0
Anonymous identity:		
	Save identity and password	
	Connect	Cancel

The user should now be connected to the secure network.

Managed Chromebooks With Extension User Experience

If managed Chromebooks are configured, the download page does not display.

1. When Cloudpath detects the Chrome OS during enrollment, the extension automatically generates and installs the CA certificate into the TPM.

The extension generates the certificate.

FIGURE 26 Generating Certificate

/ 🗅 XpressConnectEnrollm= ×			_ @ X
← → C A https://bvtes.cloudpath.net/enrol	/BVTEnrollmentSystem/Production/wizar	d/2/page4_download.html#	승 🚼 🗏
	Start. Gyer	Powered by Claudpath Tensories	
	Your Logo	Here	
	To access based on y Proc Microsoft Windows	essing ons below	
	Mac OS X Lion & Greater		
	Mac OS X Snow Leopard #1	Loopard	
	Apple iPhone, iPad, & iPod	Touch	
	Android Devices		
	Ubuntu & Fedora Linux		
	Windows Surface RT		
	Chrome OS		
		or ChromeOS	
In DVES Secure.onc			Generating Certificate X The certificate is being generated. This may take up to a minute.
II 🌍 🖬 🖪 📄 💷			ं २३१ 💎 🔳 🔶

2. The extension imports the certificate into the TPM.

FIGURE 27 Certificate Imported

/ C XpressConnectEnrolme x		_ d ⁰ ×
← → X 🔒 https://bvtes.cloudpath.net/enroll/BVTEnrol	mentSystem/Production/wizard/2/page4_download.html#	☆ 🔒 🔳
	Start. Cyst. Powered by Coulputh Tensorks	
	Your Logo Here	
	To access Processing ons below Microsoft Windows	
de beleforie de	Mac OS X Lion & Greater	
	Mae OS X Snow Leopard & Leopard	
	Apple IPhone, iPad, & iPod Touch	
	Android Devices	
	Ubuntu & Fedora Linux	
	Windows Surface RT	
	Chrome OS	
	Install for ChromeOS	
Connecting. In DVES-Secure.onc '		Certificate Imported X The certificate was imported into the TPM.
II 🌍 🖬 🗏 📄 👀		0 231 🐨 🖩 🌊

3. When the certificate installation is complete, a message displays indicating that the certificate is installed and ready for use.

FIGURE 28 Certificate Installed

/ C XpressConnectEnroline x			_ @ ×
← → X 🙆 https://bvtes.cloudpath.net/er	nroll/BVTEnrollmentSystem/Production	/wizərd/2/pəge4_download.html#	술 🚹 🗉
	Start Over	Powered by Caudputh Renworks	
	Your	ogo Here	
	To access	Processing ans below	
hiririzi	Microsoft Windows		
	Mac OS X Lion & Gre	ater	
	Mac OS X Seow Leo	oard & Leopard	
	Apple iPhone, iPad,	k Pod Touch	
	Android Devices		
	Uburdu & Fedora Ur	un	
	Windows Surface R1		
	Chrome QS		
	a -	istall for ChromeOS	
Convecting	~	Circle by build Contribute	Certificate Imported X The certificate was imported into the TPM.
II DVES-Secure.onc			
III 🌍 🖬 💈 🖹 💴			0 231 🔻 🗎 🤶

4. Click the Wi-Fi icon in the bottom right corner of your screen and select the secure network.

FIGURE 29 Select Wi-Fi Network



The user should now be connected to the secure network.

Troubleshooting Tips

This section describes issues to consider when testing or troubleshooting the configuration for the Cloudpath extension.

Error Messages

If a user receives a message "This device requires management controlled extension <extension name>", typically this means that the device does not have the extension installed.

Server CA

If the network does not accept the CA certificate, check that the **Issued to** section for the Server CA includes both the root and intermediate CA.

Access to URL

If the user unable to reach the enrollment URL, be sure that the client enrollment URL begins with HTTPS://.

Length of Private Key

While older versions of the Chromium OS did not enforce the minimum key length of 1024, the newer releases appear to enforce this change. However, it appears that this change does not support a 4096-bit key.

If you see an error that says "Error: The operation failed for an operation-specific reason.", view the page source on the page4download.html and locate the **keylength/alg info**. If it lists the following:

```
<input type='hidden' id='cpnKeyLength' value='4096'/>
<input type='hidden' id='cpnAlgorithm' value='SHA-512'/>
```

The fix for this issue is to navigate to the **certificate template** in the Cloudpath Admin UI and change the private key length to 2048 and the algorithm to SHA-256.

Chromebook Testing Shortcuts

Use the following browser shortcuts to manage different aspects of your Chrome configuration.

- chrome://policy Displays all the policies which are currently in effect for the browser. Use the **Reload policies** button to force a re-sync with an updated policy.
- chrome://extensions Manage installed extensions. Check the Developer mode box (upper-right) to display the Update extensions now button. This is a useful testing tool.
- chrome://settings Directs you to the Menu > Settings page. From here you can control various browser related settings.
- chrome://net-internals This displays all networking related information. Use this to capture network events generated by the browser. You can also export this data.
- chrome://certificate-manager Manage user, server, and CA certificates.
- chrome://dns Displays the list of hostnames for which the browser will prefetch the DNS records.
- chrome://chrome-urls View all the available chrome:// commands



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