Extreme Protocol Solutions

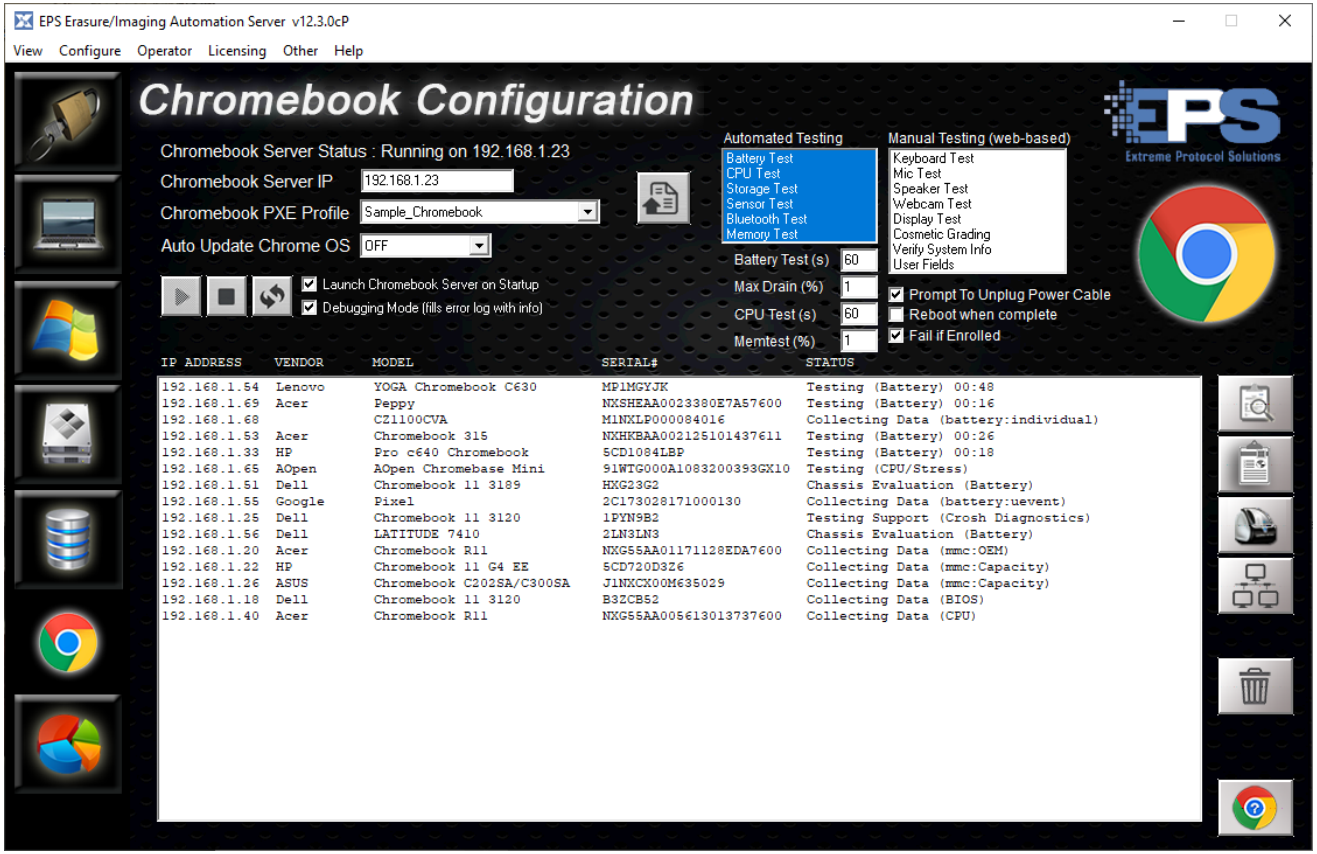
Chromebook Erasure Solution

Extreme Protocol Solutions, Inc.
www.EnterpriseDataErasure.com
Version 9.2.2022

Chromebook Erasure – Introduction

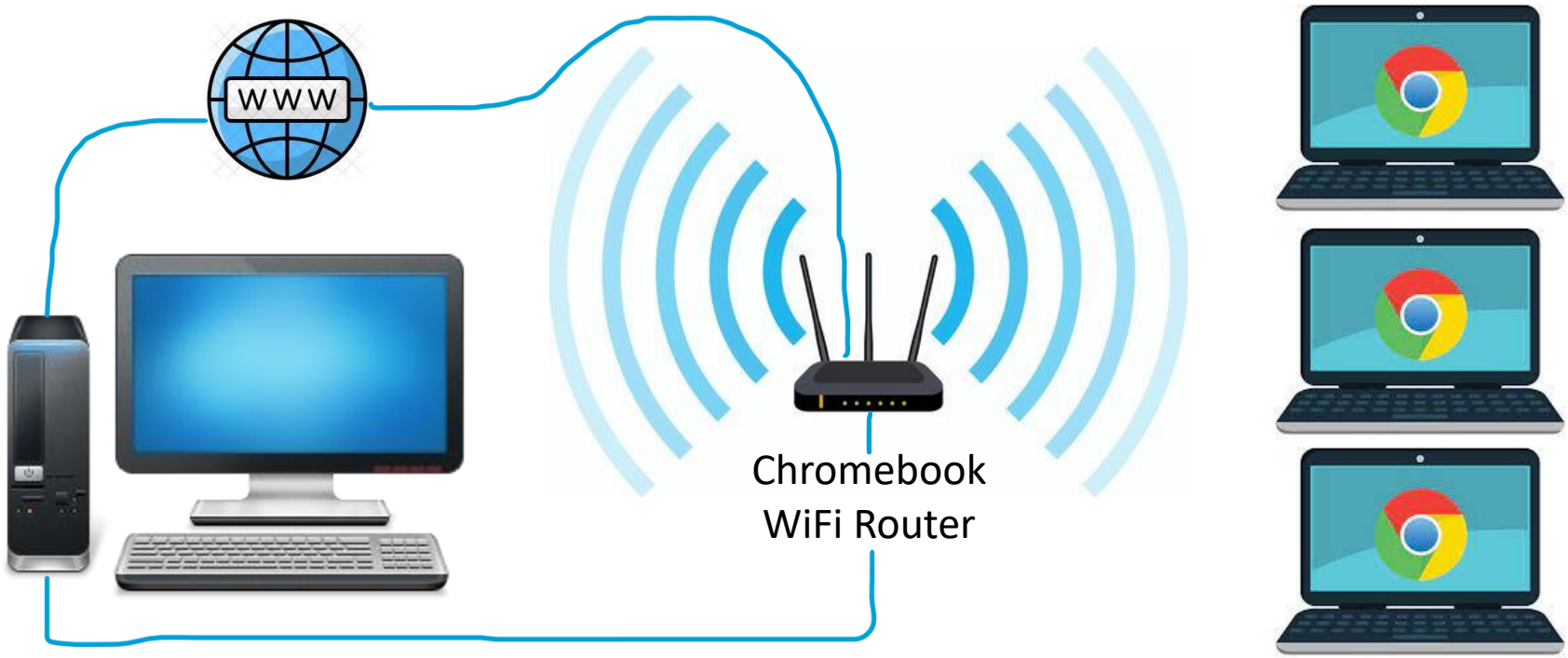
The latest release of the EPS Imaging Automation Server (LCServer) incorporates a Chromebook erasure interface that provides several options for setting up your Chromebook Erasure Server. Follow the simple instructions (on the following page) and you'll be erasing and capturing all relevant information from the Chromebook in no time. When you are finished, the Chromebook will be back in Out-of-Box Experience mode ready for resale.

- Server Status
- Server IP Setting
- Server Autostart and manual start options.
- PXE Profile (used for reporting, labels, database injection etc.)
- Chrome OS Auto Update options to check for and update to the latest Chrome OS.
- Selectable Diagnostics and test configuration options.
- Auto Reboot of device once the process completes.
- Debugging mode to capture all data and network traffic to our error log.
- Automatic Failure if Device is enrolled.



Chromebook Erasure – Physical Setup

1. Install LCServer on a computer.
   - The LCServer Computer should have two network connections, one connection to the internet and the other connection can be wired (or wireless) to the Chromebook WiFi router.
   - The router should be set up to provide DHCP and should be connected to the internet (WAN).
   - The LCServer Computer must have a static IP Address on the Chromebook WiFi Router network.
   - The process on the following pages will eventually require you to connect to the WiFi network you have set up on the Chromebook WiFi Router. After that connection you will need to execute a command to the static IP address of the LCServer Computer



Chromebook Erasure – Physical Setup

1. Setting up a static IP
   - Hit the Window button and type View Network Connections and select it. The window in Figure A will appear.
   - Right click on the network that is connected to your Wi-Fi router and select Properties, you will see Figure B.
   - Select Internet Protocol Version 4 and hit the Properties button and the window in Figure C will appear.
   - Select Use the following IP address and enter the desired static IP Address (shown as 10.0.0.2 below).
   - Enter a Subnet mask of 255.255.255.0 and hit OK. In the Wi-Fi Properties Window hit OK. You now have a static IP Address. This is the IP Address you will be using as your Chromebook Server IP.

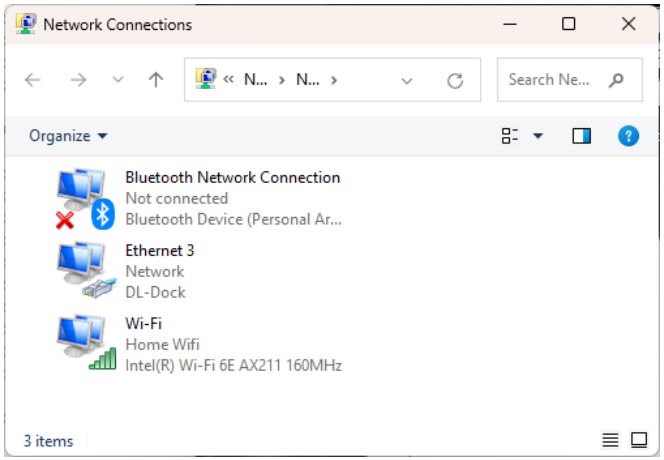


Figure A

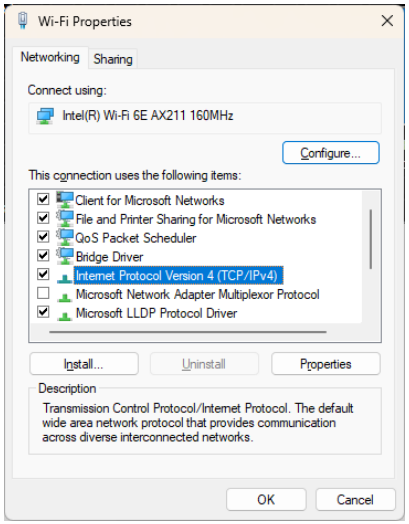


Figure B

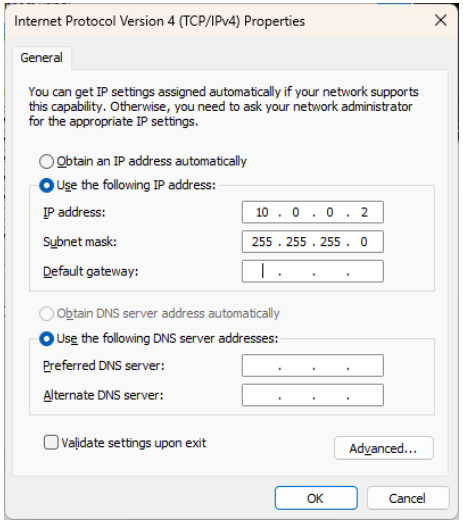


Figure C

Chromebook Erasure – Process Flow

Once your Chromebook Erasure Server is configured to your desired settings erasing a Chromebook can be accomplished by following the steps to the right of the of the device list. These steps are outlined below, followed by screenshots detailing each step. The system will be erased twice, once when entering developer mode and again when exiting developer mode.

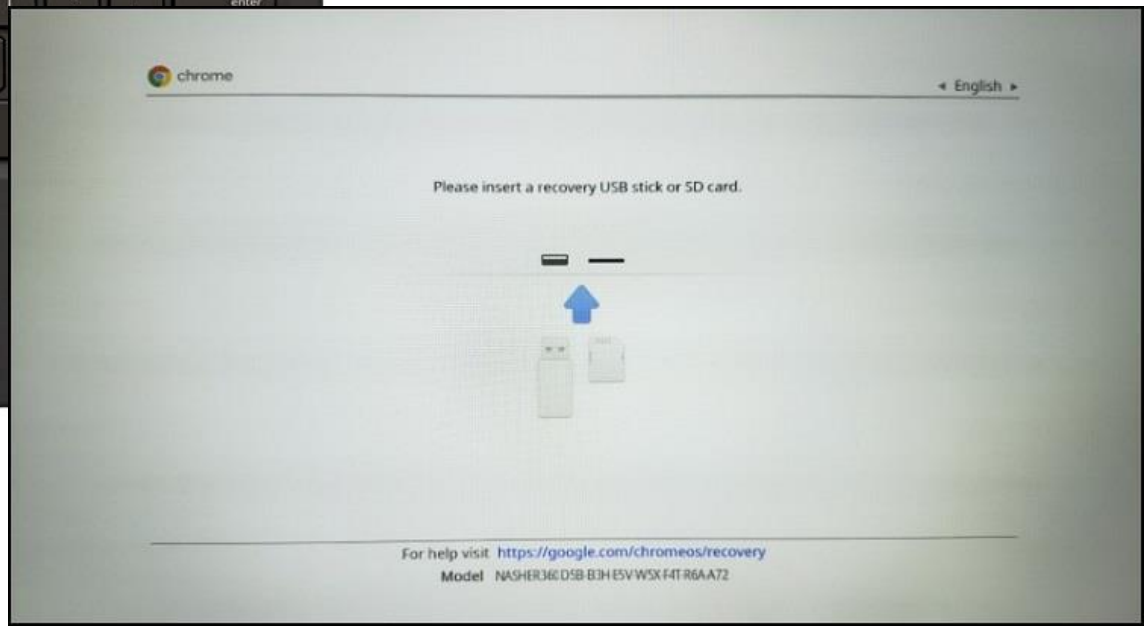
- Enter Recovery Mode
  - Laptop – Hold Down Power + ESC + Refresh Keys
  - Tablet – Hold Power, Vol+ and Vol- for 10 Seconds
- Enter Developer Mode (performs a PowerWash erasure to enter Developer Mode)
  - Laptop – Hit CTRL+D and press ENTER on the next page. After the laptop reboots, hit CTRL+D
  - Tablet – Press Vol+ and Vol- then use those buttons to navigate the menu
- Connect to Wi-Fi Erasure Network
  - Click Get Started and select your erasure network on the Connect to Network Screen. Enter the password if your network has one.
- Connect to the EPS Chromebook Server
  - Hit CTRL+ALT+T to enter the Chrome Terminal and type “shell” at the “crosh>” prompt.
  - Type “curl <Chromebook Server IP> | bash” and hit enter. For example, “curl 192.168.1.10 | bash”
  - You will now connect to the Chromebook Server and launch audit collection and diagnostics.
- Reboot and Seal to Out of Box (performs a PowerWash erasure to exit Developer Mode)
  - Once the software reboots the unit press space to re-enable OS Verification when prompted and press ENTER to to confirm. The system will re-erase and reboot.

Chromebook Erasure – Recovery Mode

The first step in the Chromebook Erasure process is to enter Recovery Mode. Start with the power OFF.

Press and hold esc, refresh and power simultaneously until the recovery screen is shown

At the Recovery Screen, press Ctrl-D



Chromebook Erasure – Recovery Mode

The first step in the Chromebook Erasure process is to enter Recovery Mode. Start with the power OFF.

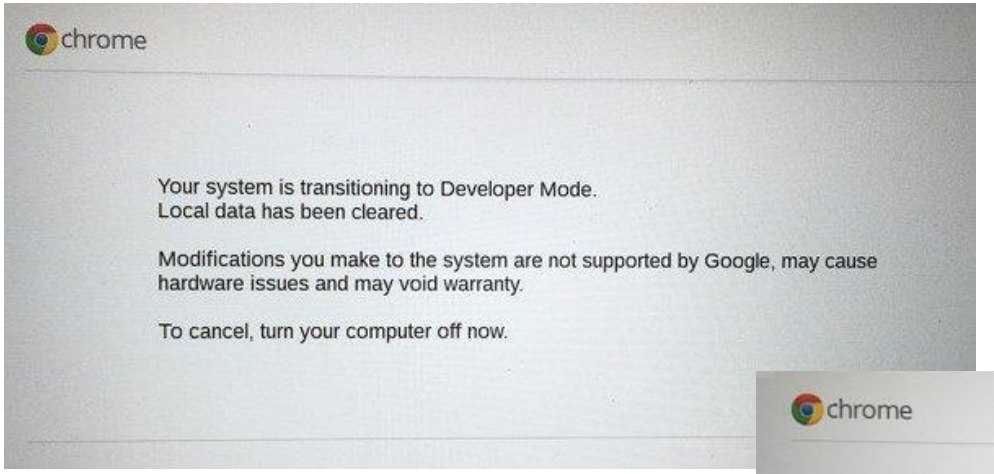
At the OS Verification Option Screen, press ENTER

At the OS Verification Notification Screen, press Ctrl-D

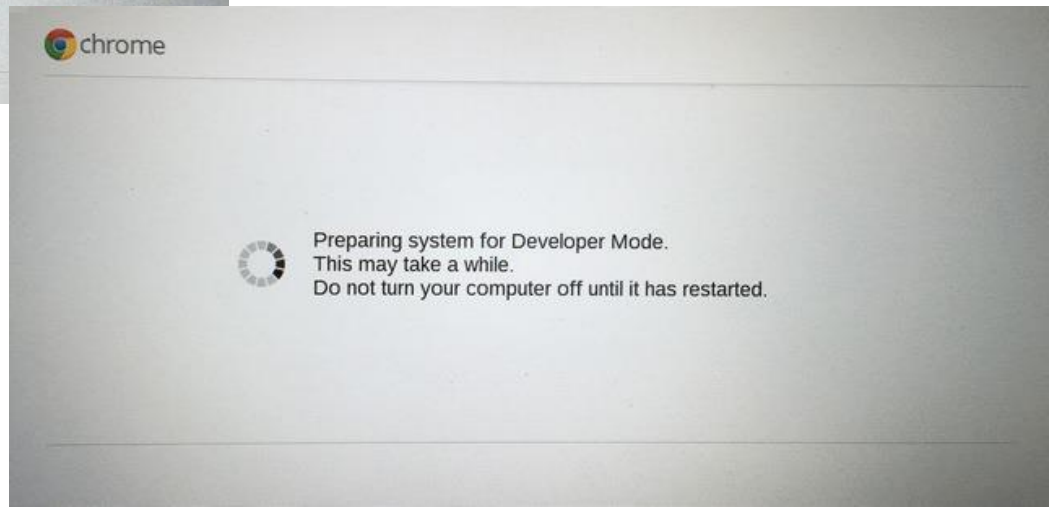
Chromebook Erasure – Developer Mode

The first step in the Chromebook Erasure process is to enter Recovery Mode. Start with the power OFF.

You will now see a screen that explains that your system is transitioning to Developer Mode.



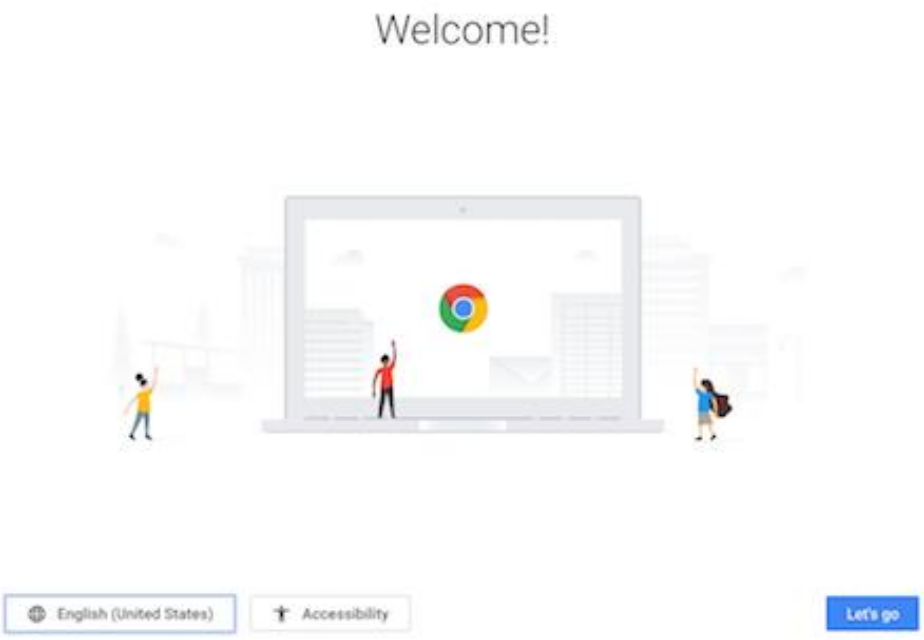
Followed by a Preparing System for Developer Mode Screen. This part typically takes a few minutes to complete then the system will reboot.



Chromebook Erasure – Developer Mode

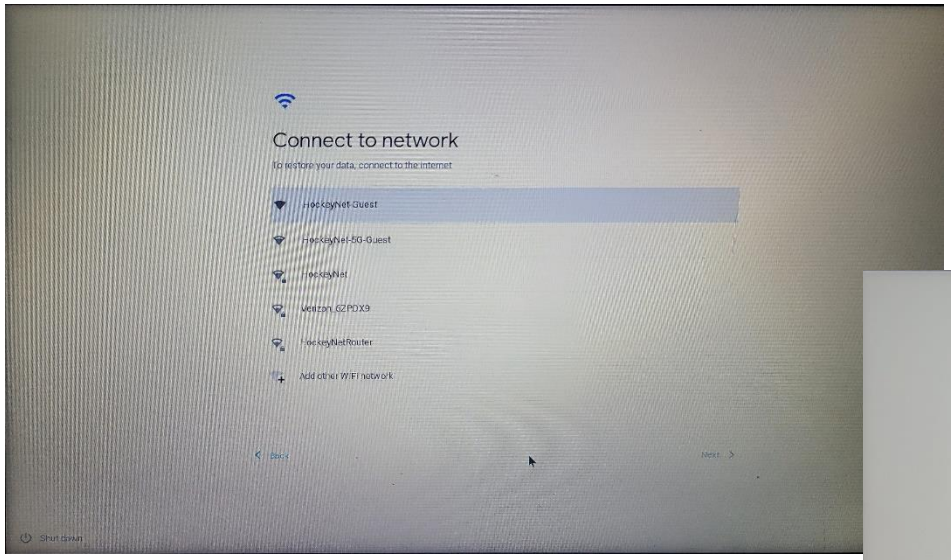
After Reboot, you will see the OS Verification is Off Screen, Press CTRL-D to boot into Developer Mode.

The Chromebook will now boot to the welcome screen. Hit the Let's go button to continue.

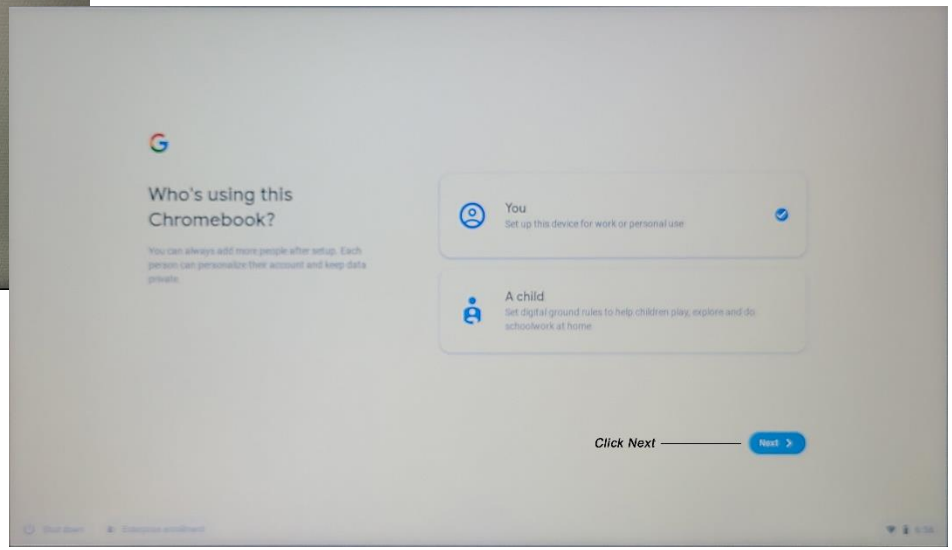


Chromebook Erasure – XErase Process

A WiFi Connection screen will appear. Click on your erasure network and enter the password (if any)

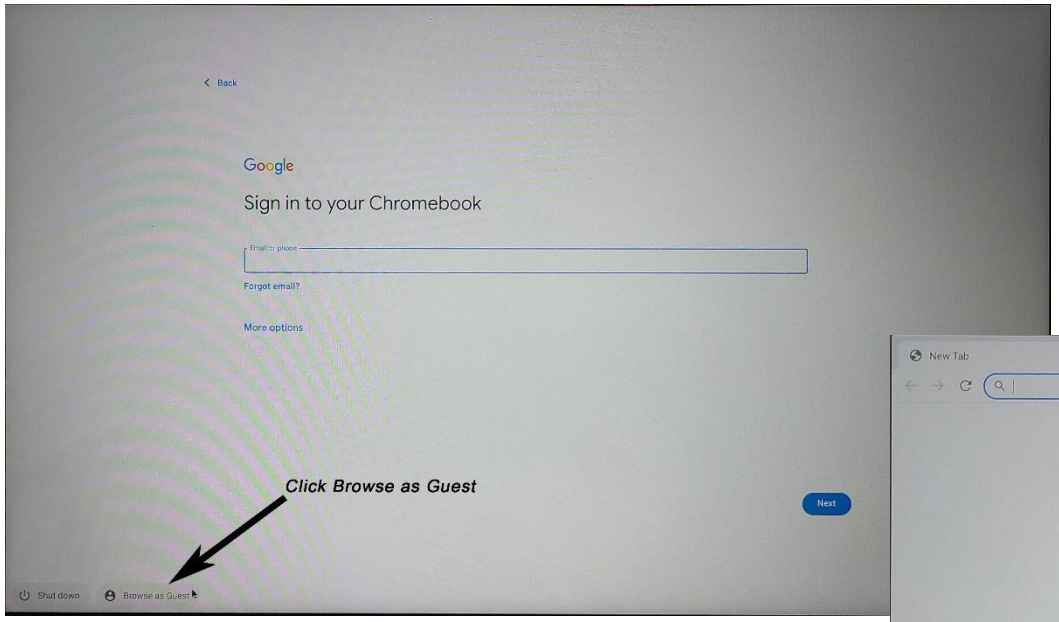


You will now be brought to a Who's using this Chromebook screen. Hit Next to continue.

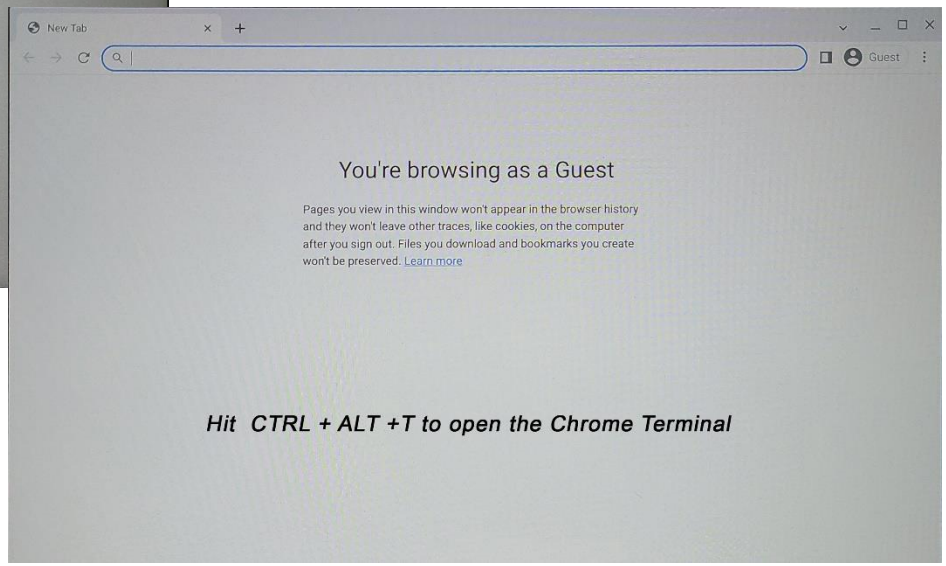


Chromebook Erasure – XErase Process

At the sign in screen, click “Browse As Guest” in the botton left hand corner of the screen.



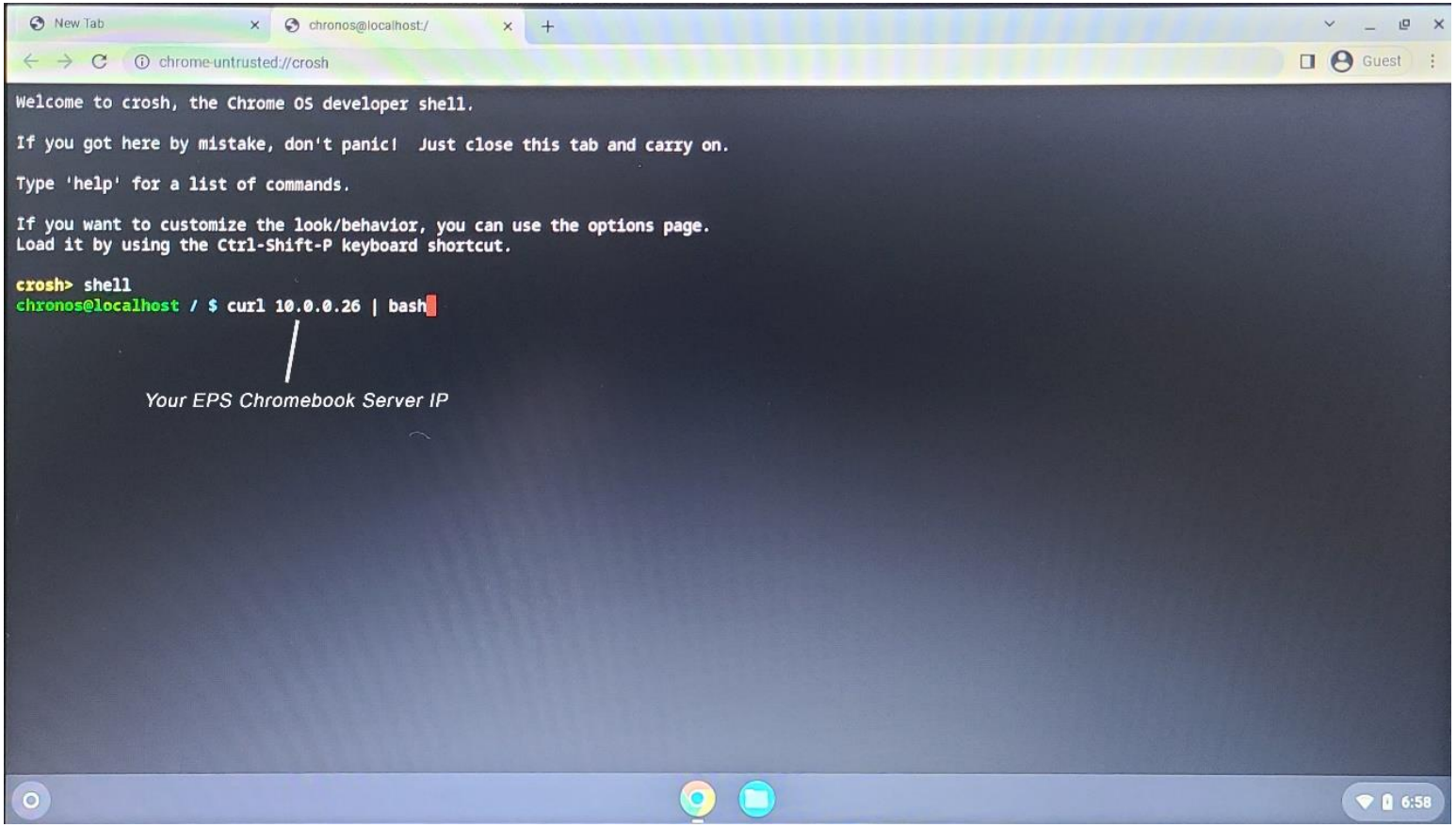
At the You’re browsing as a Guest screen hit CTRL-ALT-T to open the Chrome Terminal.



Chromebook Erasure – XErase Process

This opens a crosh> window.

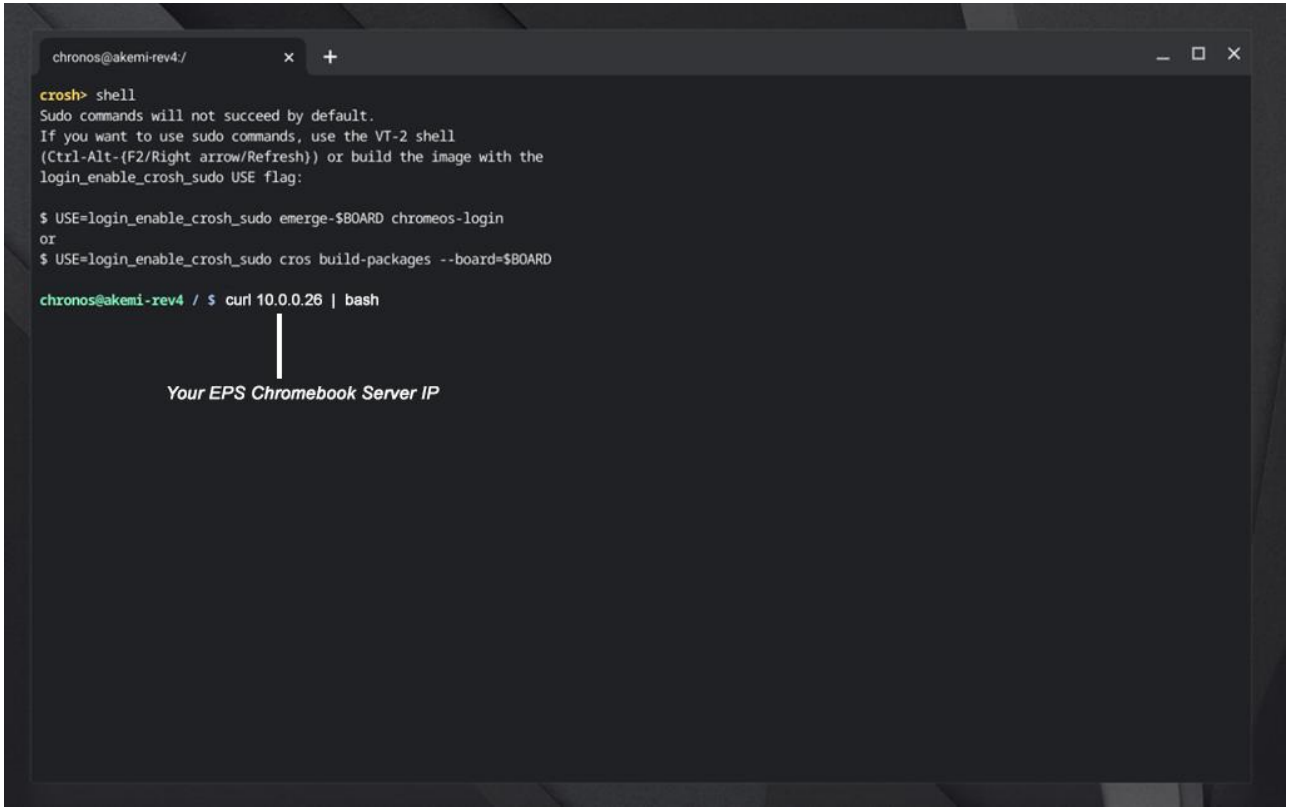
1. Type shell and hit enter.
2. Type curl <EPS Chromebook Server IP> | bash and hit enter to launch the erasure.



Chromebook Erasure – XErase Process

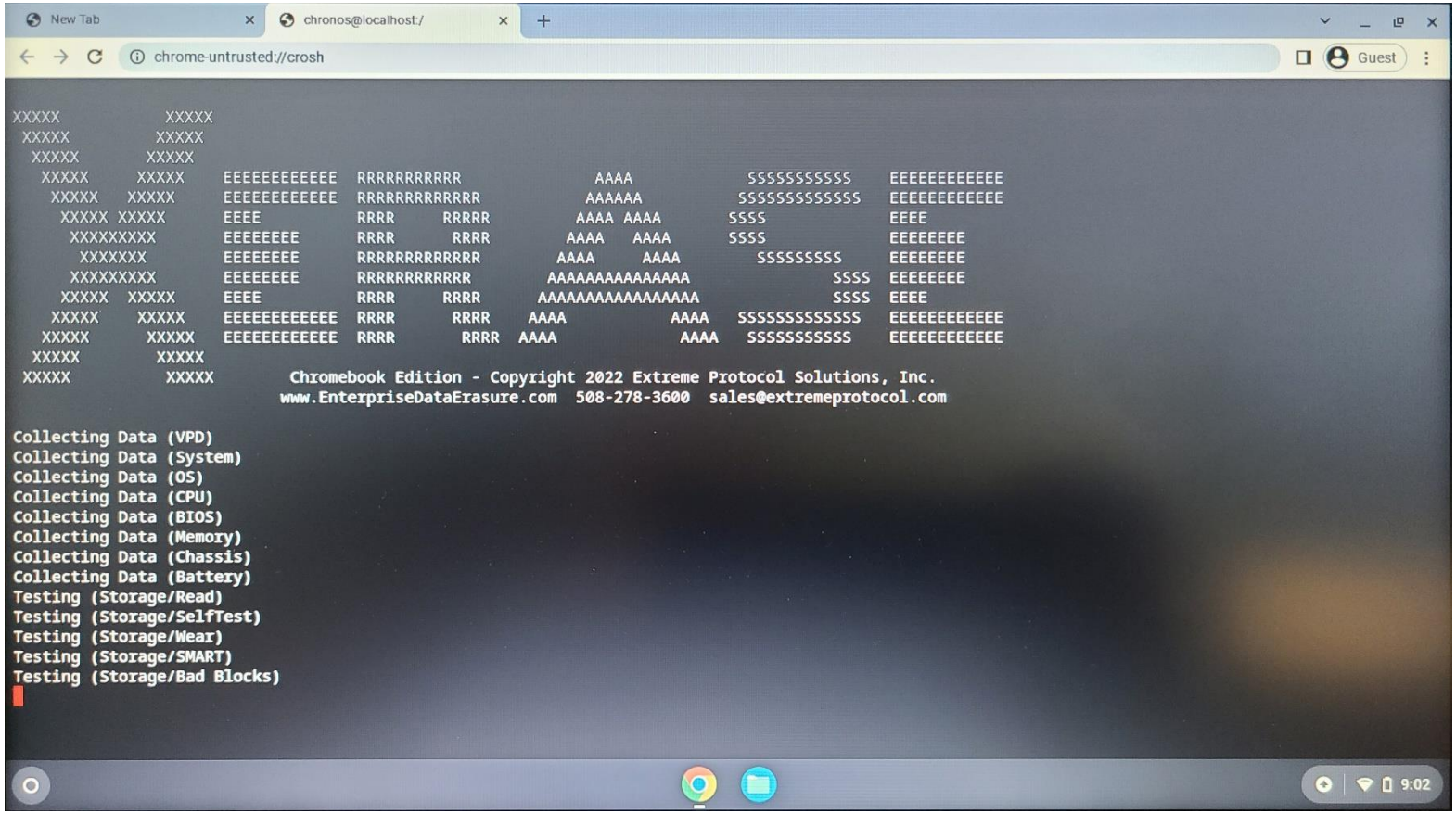
If you have a newer version of ChromeOS, you may see the screen below. This, unfortunately, means that performing manual diagnostics will be a two-part process.

1. Hit CTRL-ALT-Right Arrow/Refresh to open the elevated permissions shell.
2. Type the curl command into this shell.
3. Once device audit and automated testing are complete exit out of this shell by using CTRL-ALT-Left Arrow and type the curl command into that shell.
4. The manual testing URL will be displayed, and you can copy and paste it into a new browser tab to begin testing.



Chromebook Erasure – XErase Process

At this point the EPS Chromebook Server will take over and the rest of the process is automated and controlled by the settings in LCServer. Those settings are shown on the following slide. These include optional diagnostics tests for Storage, CPU, Memory and Battery.

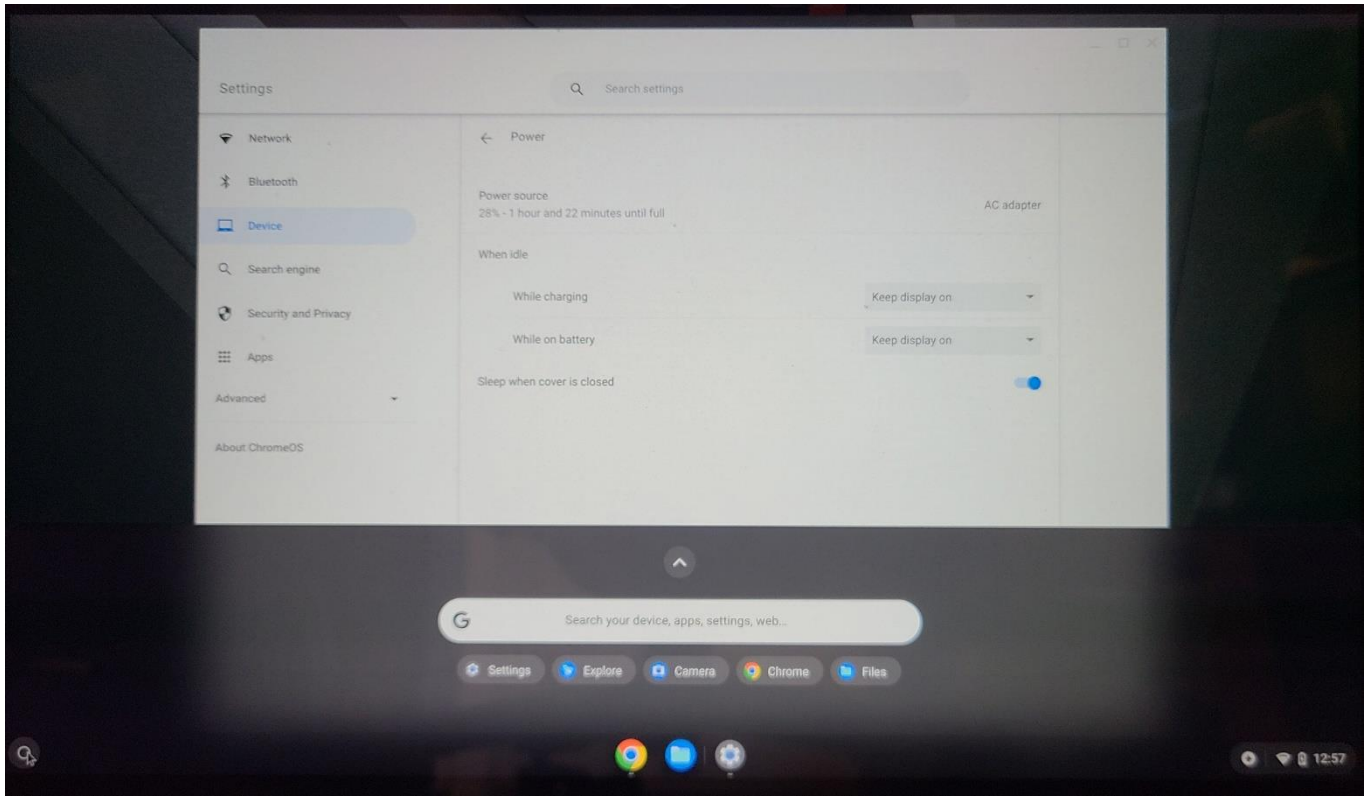


Chromebook Erasure – Sleep Mode

The default setting for Chromebooks is to enter sleep mode after a certain amount of time. If you are using the diagnostics features, especially the memory test, this can cause issues as the device will sleep and no longer provide status updates to the Chromebook Erasure Server. To avoid this, use the following steps…

- Click the circle at the bottom left corner of the screen.
- Click on the Settings Button
- Click on the Device Icon
- Click on Power
- Change both settings to Keep display On
- Close the Window

Chromebook Power Settings

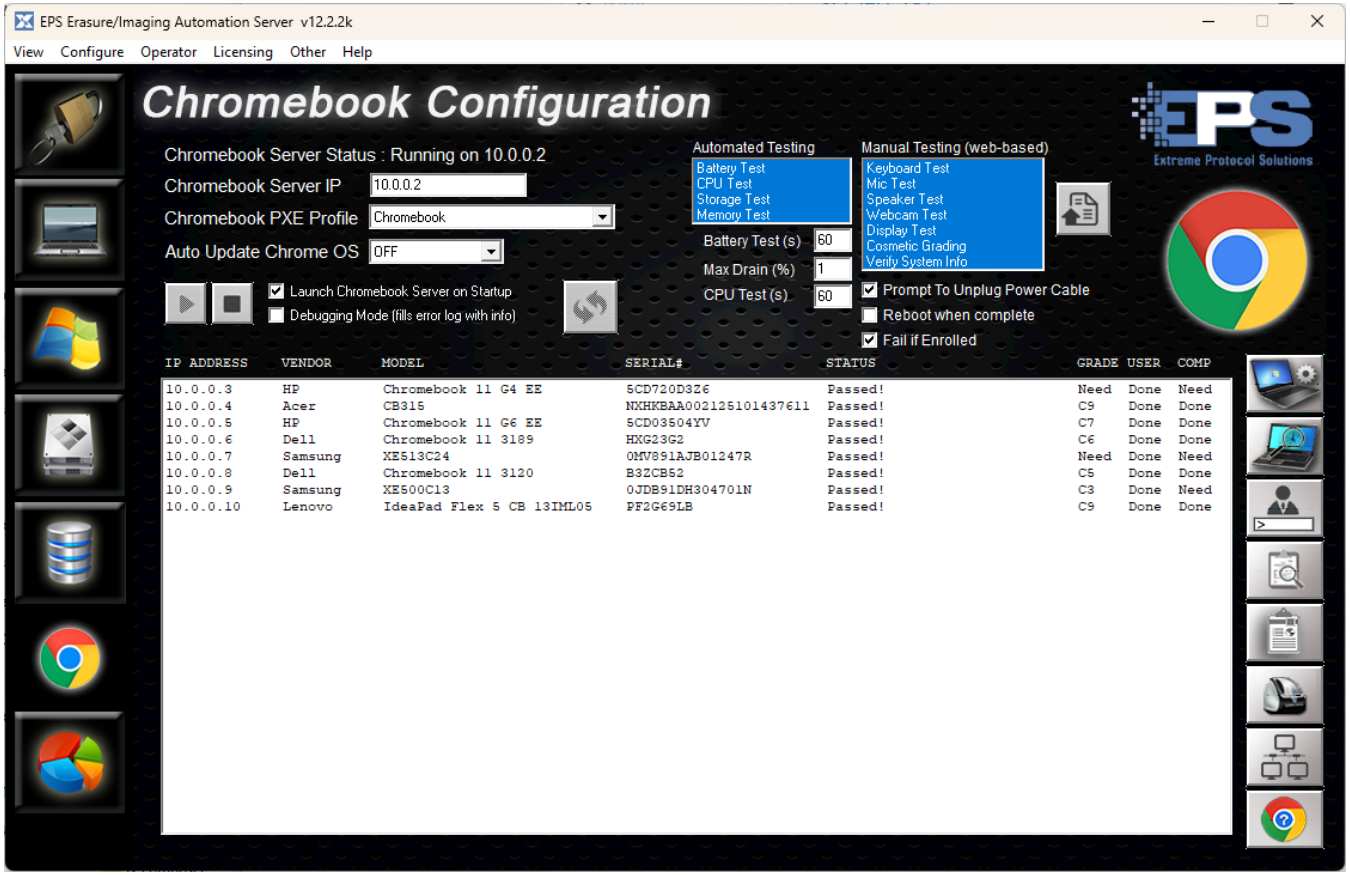


Chromebook Device List

The device list contains relevant information such as IP Address, Vendor, Model, Serial Number and Current Status. In addition, should the Chromebook PXE Profile contain Cosmetic Grading, User Fields or if you have Component Testing turned on, additional fields will appear. Those fields are described below. If Need appears in the field, it means the task associated with the field needs to be completed. Done indicates it was completed.

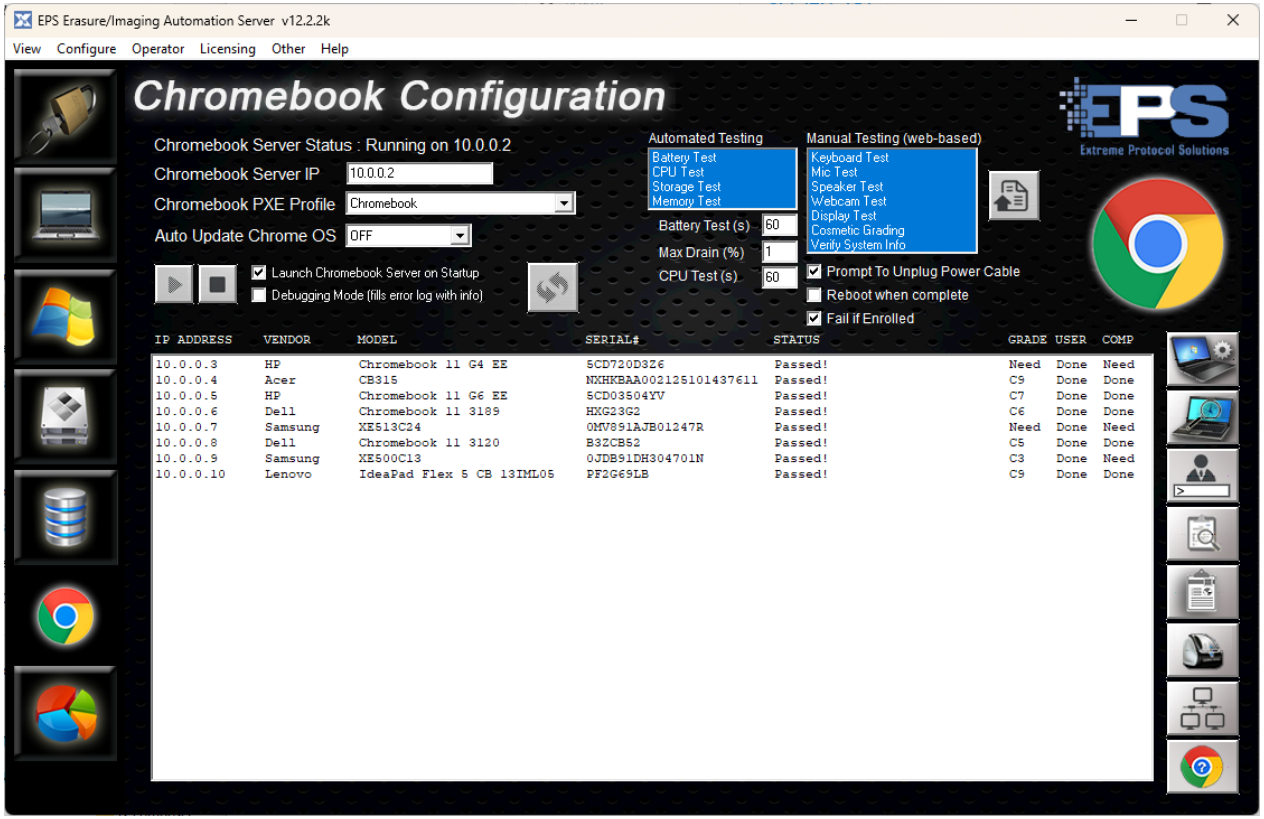
MANUAL TESTS

- Refers to Web-Based Component Tests, Cosmetic Grading and the filling out of User-Defined fields
- Valid Values are Incomplete and Done



Chromebook Side Panel

On the right-hand side of the Chromebook Device List are a series of buttons that offer a variety of options from editing device data, cosmetic grading information and user-defined fields to opening this documentation.



Opens Device Information Window

Opens Cosmetic Grading Window

Opens User-Defined Fields Window

Opens the Drive Log File for the selected System

Opens the latest System Report for the selected System

Prints the user-specified label for the selected system

XView network-based asset viewer

Opens This Documentation

Chromebook Side Panel – System Information

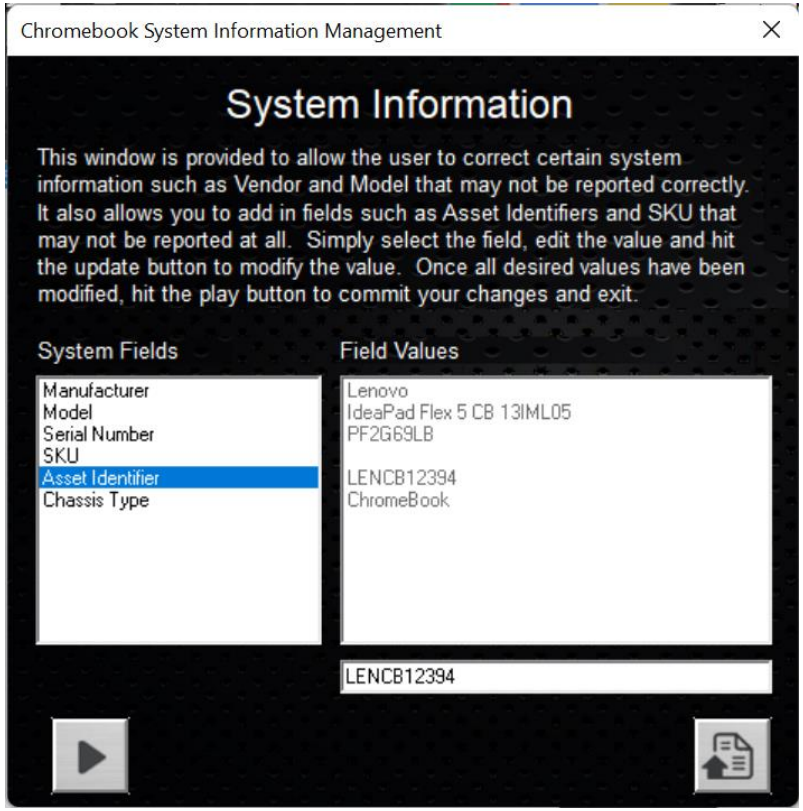
Some Chromebook manufacturers do not properly report data such as manufacturer or model in the expected locations on certain models. Sometimes they even report an incorrect serial number (this has only been seen on much older systems). As these are all bugs in their process, it is possible that there could be no to obtain the data for some models. In order to allow for the correct data to be included in logs, reports, databases and ERP systems, the Chromebook Erasure Server contains a feature that allows for the correcting of several data points.

To update Incorrect or Missing System information…

1. Select the Field to update from the User Fields List, the existing value (if any) will appear in the edit field below the Field Value List.

2. Enter the correct data into the edit field and hit the Update button at the bottom right side of the window. The new value will now appear in the Field Value List.

3. Once all values have been updated to the correct data, hit the Play button at the bottom left of the window to commit the changes. The new data will now be used to generate the reports and logs. If the system is done processing, the new data will be used to re-generate any reports and logs.



Chromebook Side Panel – Cosmetic Grading

Using the same process as the EPS PXE Solution, Cosmetic Grading can be performed on the Asset. In the PXE Profile you have assigned for your Chromebook processing make sure you have the desired System Condition input file selected under Startup / System Testing. This file will determine all System Fields and Field Values available for the user to enter as well as the grading scheme, for example, R2v3.

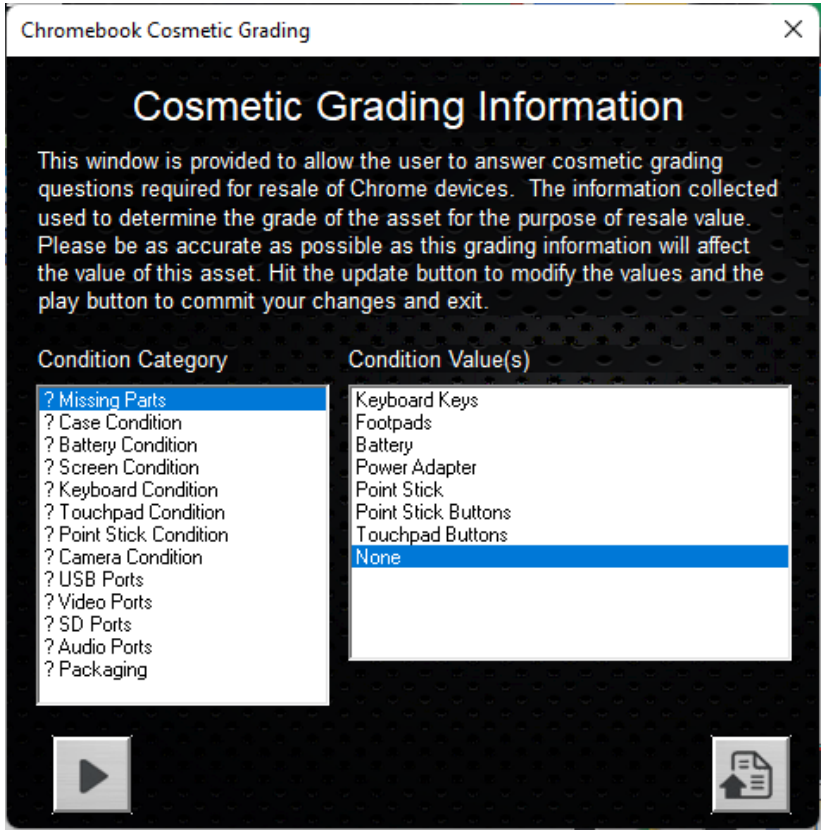
To enter Cosmetic Grading information for an Asset…

1. Select the Category to fill out from the Condition Category List.

2. In the Condition Values list, select the appropriate condition.

3. Hit the Update button at the bottom right of the window. This will automatically move you to the next Category. All Categories MUST be filled out. The question marks at the left of the Category names indicate that they have not yet been filled out.

4. Once all categories are filled out, hit the Play button at the bottom left side of the window. You can enter in conditions during multiple sessions if you close the window before completing all entries.



Chromebook Side Panel – User-Defined Fields

Using the same User-Defined Fields data entry process as the EPS PXE Solution, users can enter in custom field data such as P.O. Number, Job Number, RMA Number, Unique ID, etc. for the selected Asset. In the PXE Profile you have assigned for your Chromebook processing make sure you have the desired User Fields Template selected under Program Settings > User-Defined Fields. This file will determine all the custom fields the end user must enter.

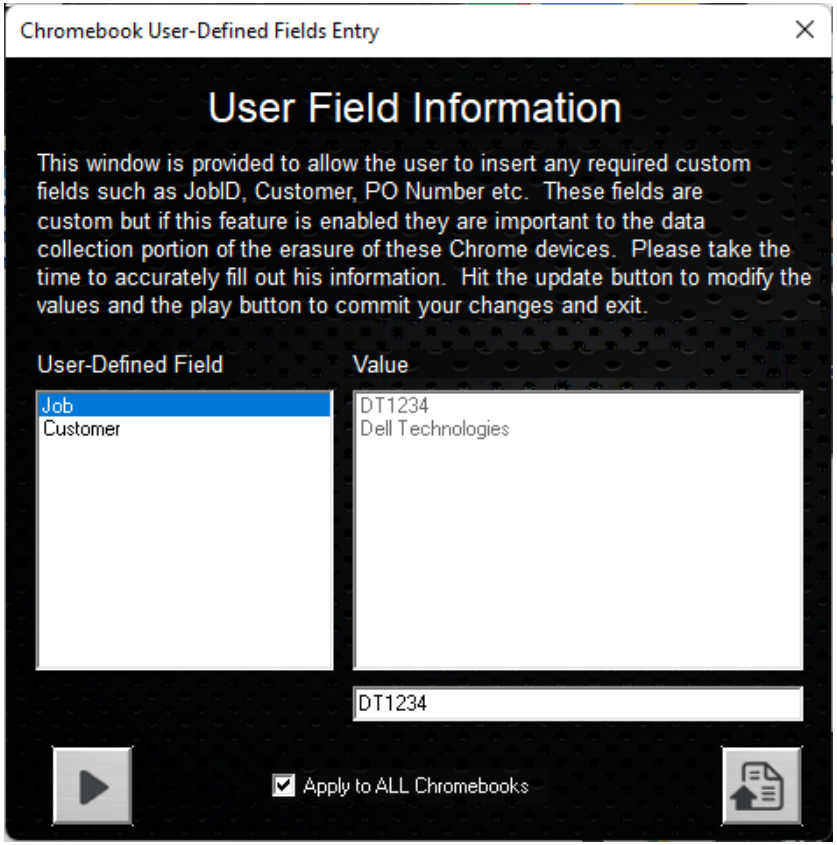
To enter User-Defined Field information for an Asset…

1. Select the User Field to fill out from the User Fields List.

2. Enter the correct data into the edit field and hit the Update button at the bottom right side of the window. The new value will now appear in the Field Values List.

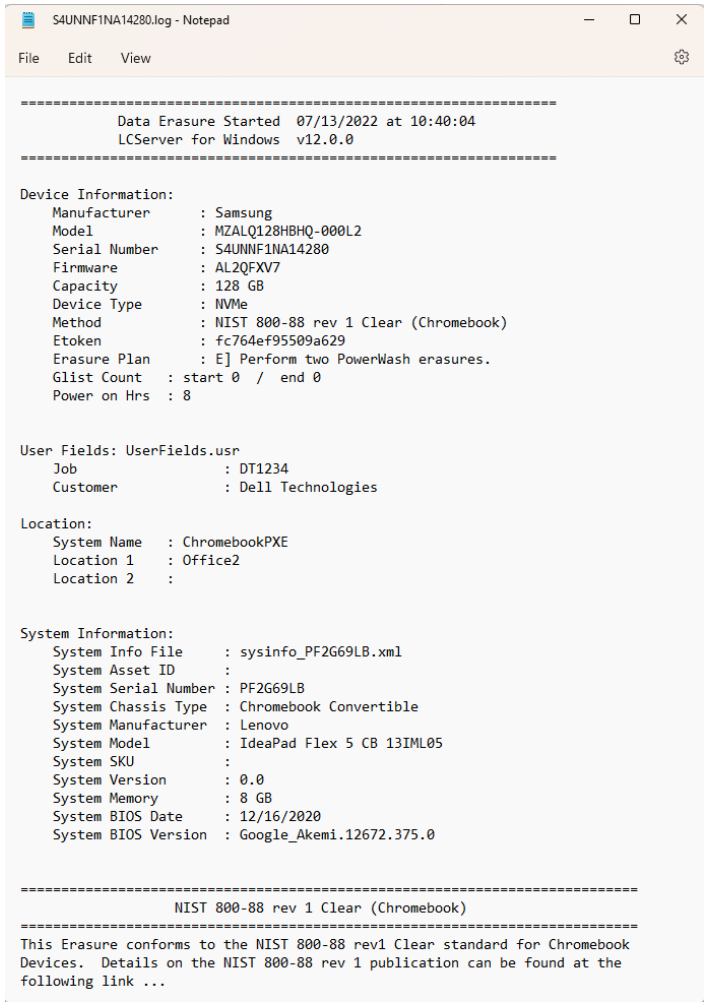
3. Check the Apply to ALL Chromebooks if you would like to have the user fields copied to all currently connected Chromebooks as well as all Chromebooks that will be processed in the future.

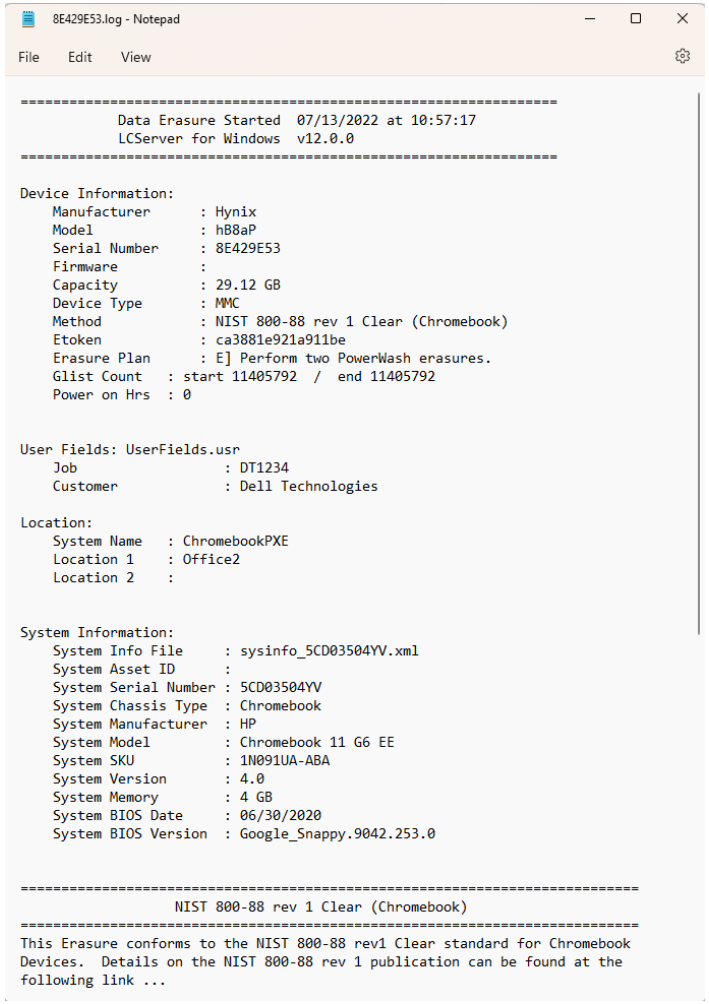
4. Once all values have been updated to the correct data, hit the Play button at the bottom left of the window to commit the changes. The new data will now be used to generate the reports and logs. If the system is done processing, the new data will be used to re-generate any reports and logs.



Chromebook Side Panel – Log Viewer

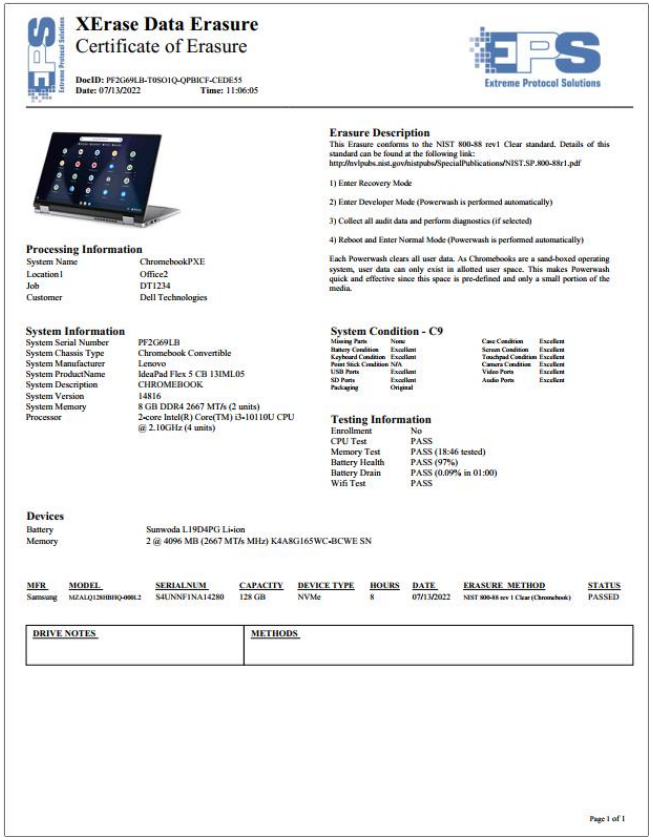
The Log Viewer button opens the Device Log for the storage device in the currently selected System.





Chromebook Side Panel – Report Viewer

The Report Viewer button opens the most recent System Report for the currently selected System. Once the Audit, Diagnostic, and OS Update Process are complete, Reports can be automatically generated and printed using the selected Chromebook PXE Profile settings. Those settings can be configured in Report Options where you can select the desired Page Printer as well as the desired Report Template from the Generate Report configuration option. You can generate, generate and print or generate and display reports with this setting.



XErase Data Erasure
Certificate of Erasure

Extreme Protocol Solutions

DocID: PF2G69LB-T0SO1Q-QPBICF-CEDE55
Date: 07/13/2022 **Time:** 11:06:05

Erasure Description
This Erasure conforms to the NIST 800-88 rev1 Clear standard. Details of this standard can be found at the following link: http://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-88r1.pdf

1) Enter Recovery Mode

2) Enter Developer Mode (Powerwash is performed automatically)

3) Collect all audit data and perform diagnostics (if selected)

4) Reboot and Enter Normal Mode (Powerwash is performed automatically)

Each Powerwash clears all user data. As Chromebooks are a sand-boxed operating system, user data can only exist in allotted user space. This makes Powerwash quick and effective since this space is pre-defined and only a small portion of the media.

Processing Information

System Name	ChromebookPXE
Location1	Office2
Job	DT1234
Customer	Dell Technologies

System Information

System Serial Number	PF2G69LB
System Chassis Type	Chromebook Convertible
System Manufacturer	Lenovo
System ProductName	IdeaPad Flex 5 CB 13IML05
System Description	CHROMEBOOK
System Version	14816
System Memory	8 GB DDR4 2667 MT/s (2 units)
Processor	2-core Intel(R) Core(TM) i3-10110U CPU @ 2.10GHz (4 units)

System Condition - C9

Missing Parts	None	Case Condition	Excellent
Battery Condition	Excellent	Screen Condition	Excellent
Keyboard Condition	Excellent	Touchpad Condition	Excellent
Point Stick Condition	N/A	Camera Condition	Excellent
USB Ports	Excellent	Video Ports	Excellent
SD Ports	Excellent	Audio Ports	Excellent
Packaging	Original		

Testing Information

Enrollment	No
CPU Test	PASS
Memory Test	PASS (18:46 tested)
Battery Health	PASS (97%)
Battery Drain	PASS (0.09% in 01:00)
Wifi Test	PASS

Devices

Battery	Sunwoda L19D4PG Li-ion
Memory	2 @ 4096 MB (2667 MT/s MHz) K4A8G165WC-BCWE SN

MFR	MODEL	SERIALNUM	CAPACITY	DEVICE TYPE	HOURS	DATE	ERASURE METHOD	STATUS
Samsung	MZALQ128HBHQ-00002	S4UNNF1NA14280	128 GB	NVMe	8	07/13/2022	NIST 800-88 rev 1 Clear (Chromebook)	PASSED

DRIVE NOTES	METHODS

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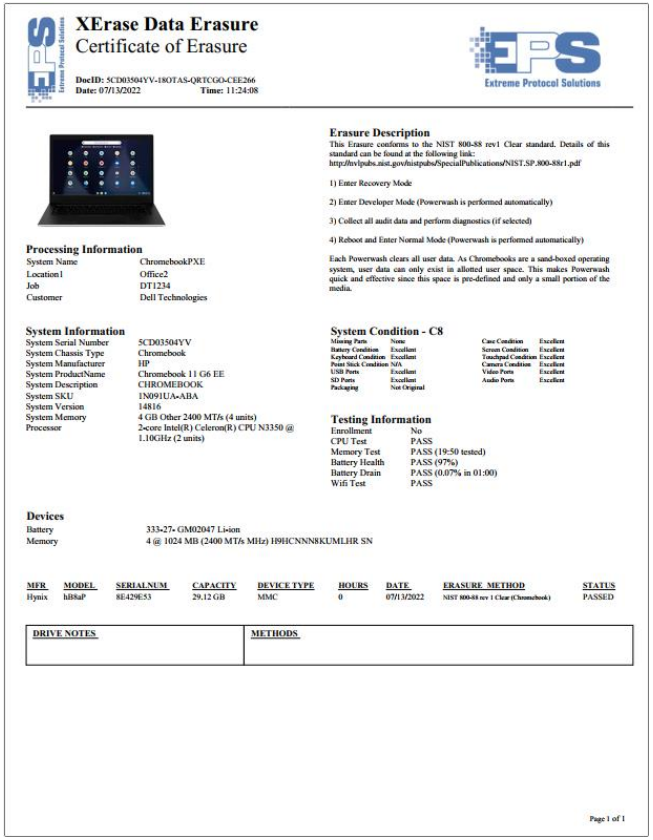

XErase Data Erasure
Certificate of Erasure

Extreme Protocol Solutions

DocID: 5CD03504YV-18OTAS-QRTCGO-CEE266
Date: 07/13/2022 **Time:** 11:24:08

Erasure Description
This Erasure conforms to the NIST 800-88 rev1 Clear standard. Details of this standard can be found at the following link: http://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-88r1.pdf

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Processing Information

System Name	ChromebookPXE
Location1	Office2
Job	DT1234
Customer	Dell Technologies

System Information

System Serial Number	5CD03504YV
System Chassis Type	Chromebook
System Manufacturer	HP
System ProductName	Chromebook 11 G6 EE
System Description	CHROMEBOOK
System SKU	1N091UA-ABA
System Version	14816
System Memory	4 GB Other 2400 MT/s (4 units)
Processor	2-core Intel(R) Celeron(R) CPU N3350 @ 1.10GHz (2 units)

System Condition - C8

Missing Parts	None	Case Condition	Excellent
Battery Condition	Excellent	Screen Condition	Excellent
Keyboard Condition	Excellent	Touchpad Condition	Excellent
Point Stick Condition	N/A	Camera Condition	Excellent
USB Ports	Excellent	Video Ports	Excellent
SD Ports	Excellent	Audio Ports	Excellent
Packaging	Not Original		

Testing Information

Enrollment	No
CPU Test	PASS
Memory Test	PASS (19:50 tested)
Battery Health	PASS (97%)
Battery Drain	PASS (0.07% in 01:00)
Wifi Test	PASS

Devices

Battery	333-27- GM02047 Li-ion
Memory	4 @ 1024 MB (2400 MT/s MHz) 189HCNNN8KUMLHR SN

MFR	MODEL	SERIALNUM	CAPACITY	DEVICE TYPE	HOURS	DATE	ERASURE METHOD	STATUS
Hynix	hB8aP	8E429E53	29.12 GB	MMC	0	07/13/2022	NIST 800-88 rev 1 Clear (Chromebook)	PASSED

DRIVE NOTES	METHODS

Page 1 of 1

Chromebook Side Panel – Print Label

Once the Audit, Diagnostic and, OS Update Process is complete, Labels can be automatically printed using the selected Chromebook PXE Profile settings. Those settings can be configured in Report Options where you can select the desired Label Printer as well as the desired Label Template from the Generate System Labels configuration option. You can also elect to print labels based on PASS/FAIL status. Should you not have automatic label printing turned on but do have a Label Template selected in your PXE Profile, you can use the Print Label button to manually print the label. Label Templates can be created and customized in the Report Configuration section of LCServer.

Hewlett-Packard
HP Pavilion dv7 Notebook PC
2CE1502JT8

SKU : A6W99UA#ABA
4-core Core Xeon x5570 @ 2.93GHz
MEMORY : 8GB DDR3 Multi-Bit ECC
SEAGATE - ST373454SS
1.0 TB (512 format)

Serial Number	**2CE1502JT8**
Manufacturer	Hewlett-Packard
Model	HP Pavilion dv7 Notebook PC
Chassis Type	Laptop
CPU	4-core Core Xeon x5570 @ 2.93GHz
Memory	8GB DDR3 Multi-Bit ECC
Video	Nvidia Graphics Adapter
Optical	HP A243-32 (DVDW)
WiFi	No
Bluetooth	No
Drive Mfg/Mode	SEAGATE - ST373454SS
Drive Capacity	1.0 TB (512 format)
Drive Type	3.5 SAS SSHD
Spindle Speed	7200
Drive SN#	3KP2FYYD
Installed OS	Win10 Pro
Physical Grade	PhysicalGrade>
Function Grade	FunctionalGrade>
Testing Date	07/02/2012
Bay #	Bay 3
Notes	

Chromebook Side Panel – XView

XView is a remote monitoring tool. For laptops, desktops and servers it also has remote-control capabilities. For Chromebooks, it can be used to view a large number of Chromebooks on screen simultaneously and see their current status. The two display fields for each system are user-definable. Once a device is selected (shown below) all of the options available for that device are displayed in the bottom right corner of the screen.

Creating a Layout

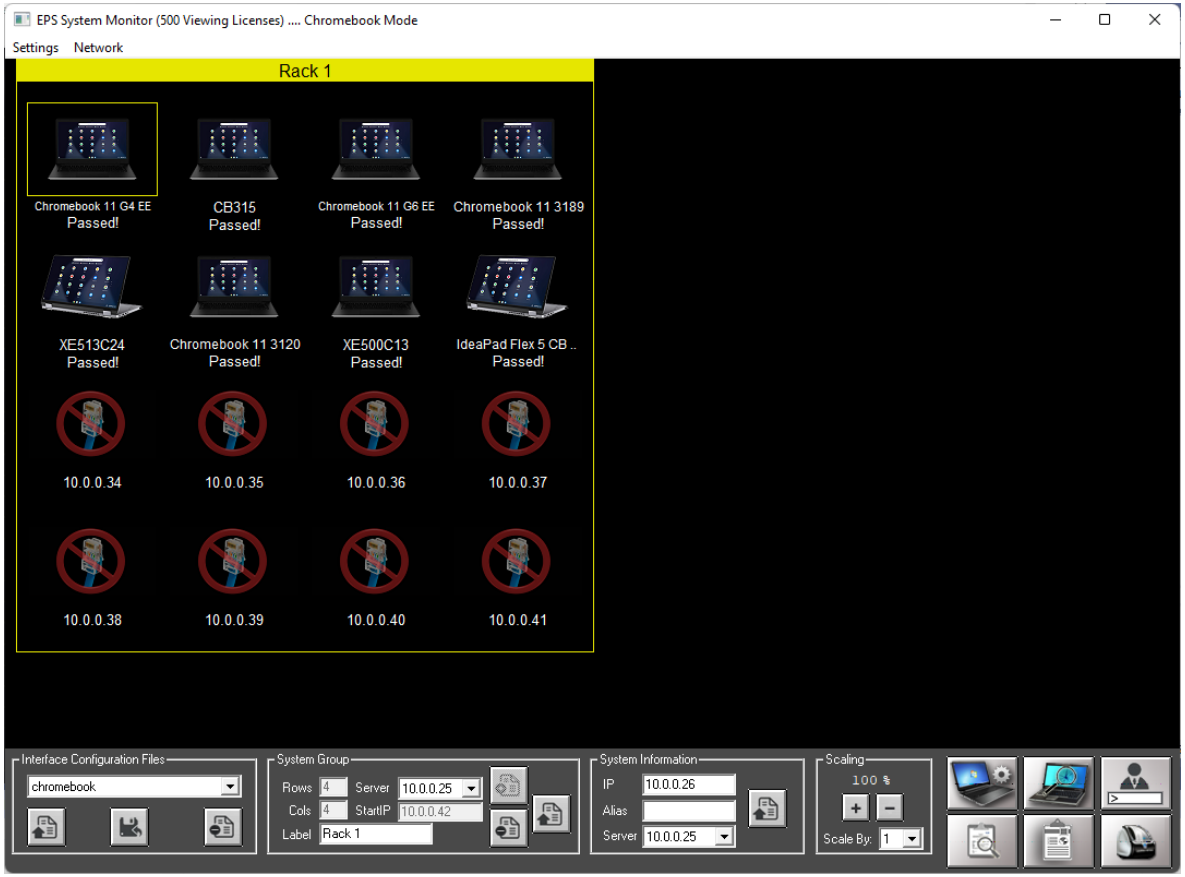
1. Type in the number of rows and columns for the desired layout

2. Type in a Label for that layout ex: Rack1.

3. Hit the Add Button 

4. The layout will appear and a prompt to save the current interface configuration will be displayed. Type in a name for the Interface Configuration and hit save.

5. Repeat the process for each additional desired layout. You can have as many layouts on screen as your screen can fit. You can also use the Scaling option to fit more on screen at once.

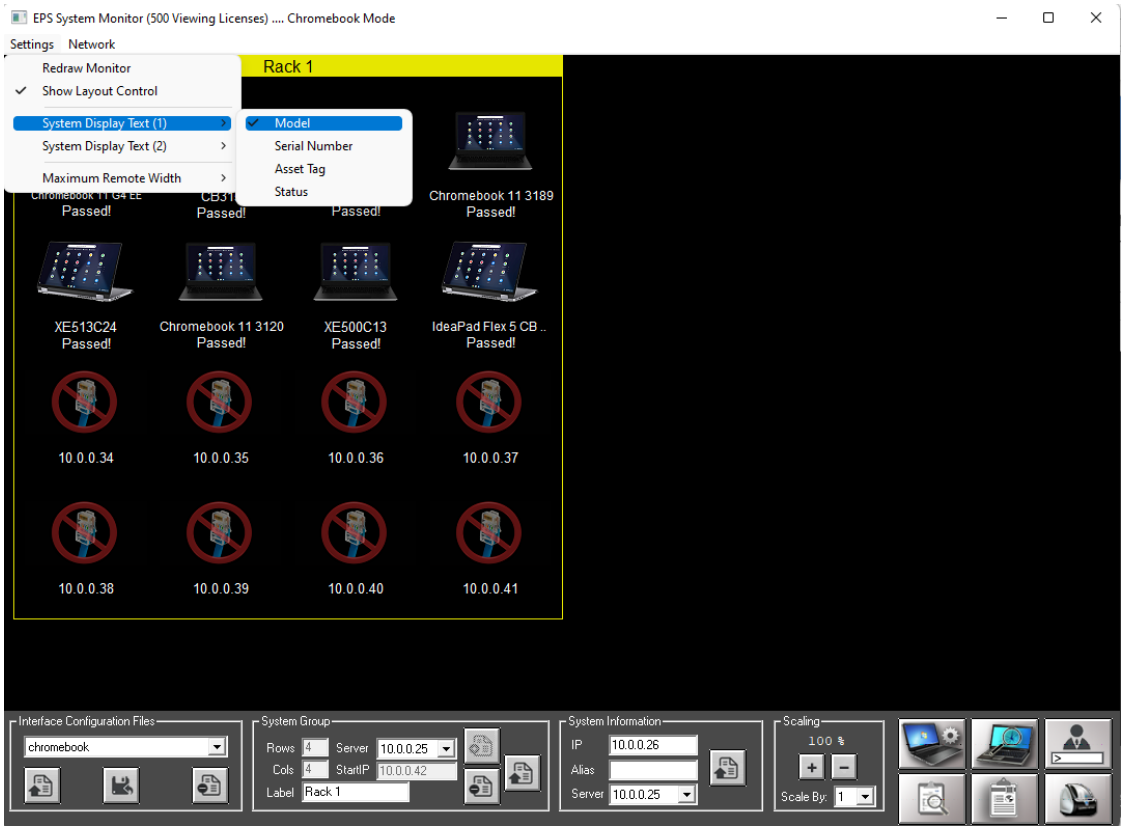


Chromebook Side Panel – XView

XView provides customization of the two display fields for each system. This data can be different combinations of Model, Serial Number, Asset Tag, Status, IP Address or, an Assigned Alias.

Customizing The Display Data

1. Click Settings
2. Select System Display Text(1)
3. Select the desired data for that line
4. Repeat for System Display Text(2)



Automated Diagnostics

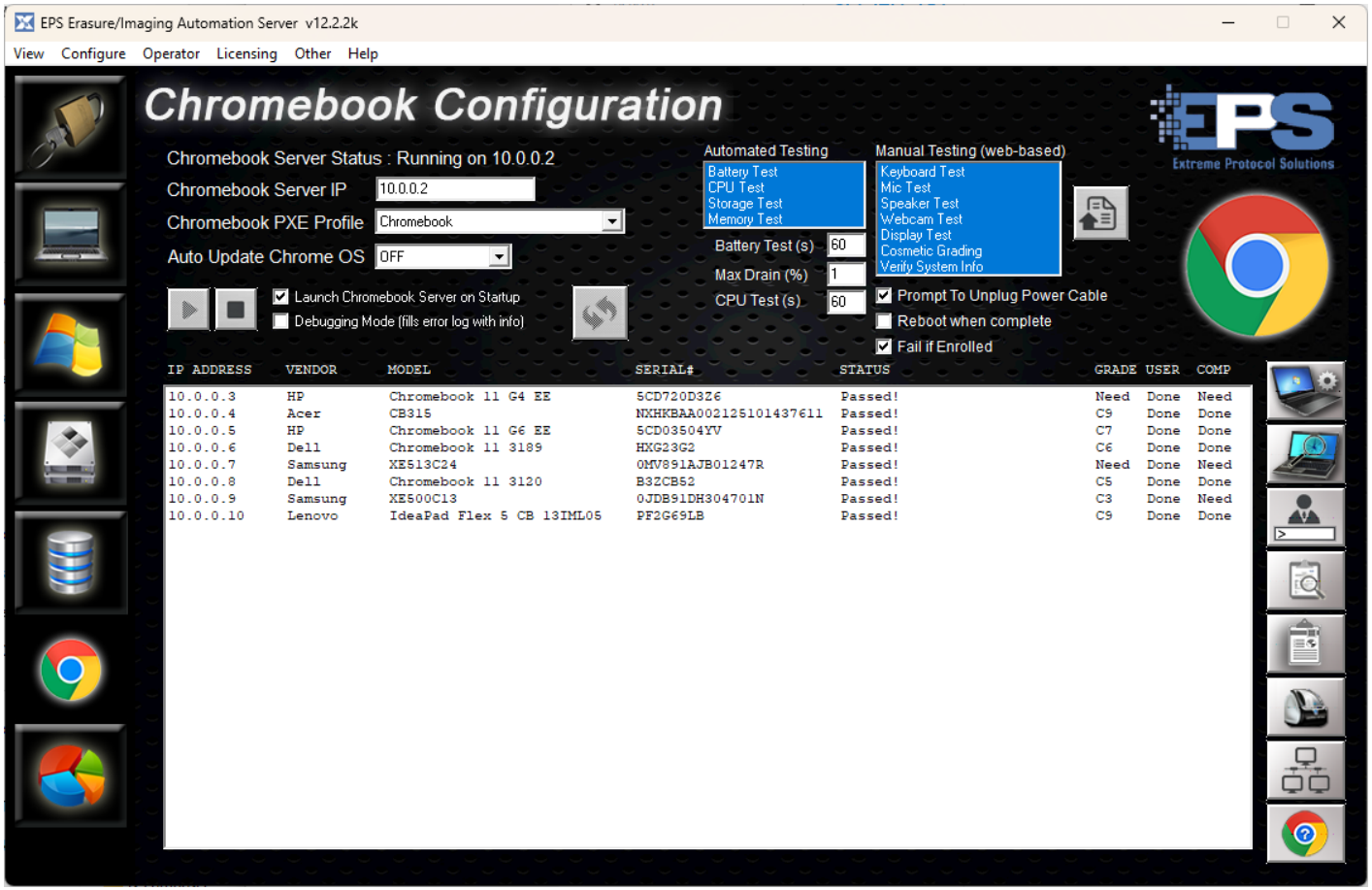
The EPS Chromebook Erasure Solution provides configurable automated and manual diagnostic tests for Chromebooks. The next few pages will discuss these diagnostics and their results.

Automated Diagnostics

- Battery Testing
  - Health, Drain Test
- Storage Testing
  - Read, Self Test
  - SMART, Wear Level
- CPU Testing
  - Stress,Cache
  - Prime Numbers
  - Floating Point
- Memory Testing

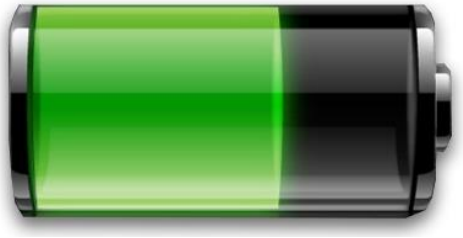
Manual Diagnostics

- Keyboard Testing
- Microphone Testing
- Speaker Testing
- Webcam Testing
- Display, Touch Screen Testing
- Cosmetic Grading
- System Information Verification



Automated Diagnostics – Battery Testing

The Battery Test provides a means of gathering the Battery Health (shown as a percentage) and testing battery drain over a period of time. The default test time for Battery Drain is 60 seconds with a 1% Maximum Drain Percentage, this can be modified via the GUI. In addition, the maximum allowable drain percentage can also be adjusted to accommodate any specific test requirements.



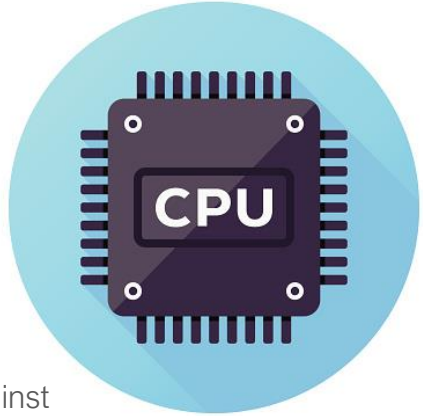
For the Battery Drain Test to run properly…

1. Before running the erasure on the Chromebook, make sure the Chromebook is sufficiently charged and unplug the power source. Failure to unplug the power source will result in the drain test being skipped as the battery cannot drain while charging.
2. Adjust the test time and maximum allowable drain percentage to your requirements.
3. Make sure to select the Battery Test from the Diagnostic List.

Make sure to hit the **Update button**  to the right of the Diagnostic List for all your changes to take effect.

Automated Diagnostics – CPU Testing

The CPU Test provides a means of stressing the CPU using a sequence of diagnostics that vary work-load and type. The default test time for CPU Testing is 60 seconds, this can be modified via the GUI.



The following is a description of each CPU Test

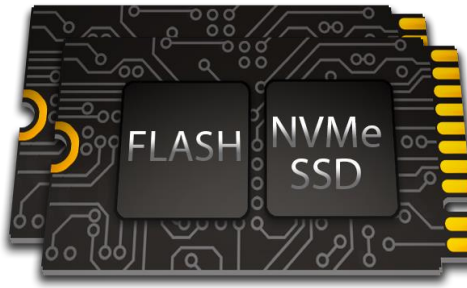
1. **Stress Test** – Performs stress-testing which mimics a realistic high-load situation.
2. **Floating Point** Accuracy - Repeatedly checks the accuracy of millions of floating-point operations against known good values for the duration of the routine.
3. **Prime Search** - Repeatedly checks the CPU's brute-force calculations of prime numbers from 2 to the given maximum number for the duration of the routine.
4. **Random** - Stresses the CPU by performing complex random number generation for the specified length of time.
5. **Cache** - Performs cache coherency testing.

The entirety of the test length is divided by the 5 tests. For example, if the user specifies 60 seconds, then each test is run for 12 seconds.

Make sure to hit the **Update button**  to the right of the Diagnostic List for all your changes to take effect.

Automated Diagnostics – Storage Testing

The Battery Test provides a means of gathering the Battery Health (shown as a percentage) and testing battery drain over a period of time. The default test time for Battery Drain is 30s, this can be modified via the GUI. In addition, the maximum allowable drain percentage can also be adjusted to accommodate any specific test requirements.

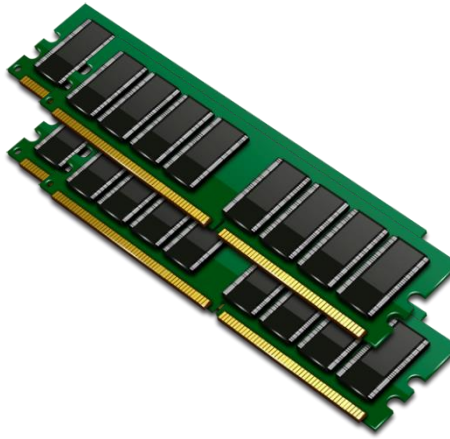


For the Battery Drain Test to run properly…

1. **Disk Read** – If supported, uses the fio utility to write a temporary file with random data, then repeatedly read the file either randomly or linearly for the duration of the routine. Checks to see that the data read matches the data written.
2. **NVMe Self Test** – If supported, conducts a short self-test of the NVMe Storage device.
3. **NVMe Wear Level** – If supported, compares the device's NVMe storage's wear level against the input threshold.
4. **SMART Check** – If supported, checks to see if the drive's remaining spare capacity is high enough to protect against asynchronous event completion.
5. **Bad Block Test** – Reads a set amount of data from the device and checks for any errors or bad blocks. Analyzes the pending and reallocated sector count upon completion to confirm results.

Make sure to hit the **Update button**  to the right of the Diagnostic List for all your changes to take effect.

Automated Diagnostics – Memory Testing



The Memory Test provides a means of validating all available (not in use by the OS) bits and bytes of memory via various subtests designed to test different memory operations. This test can take anywhere from 15 to 20 minutes depending on the amount of memory in the Chromebook.

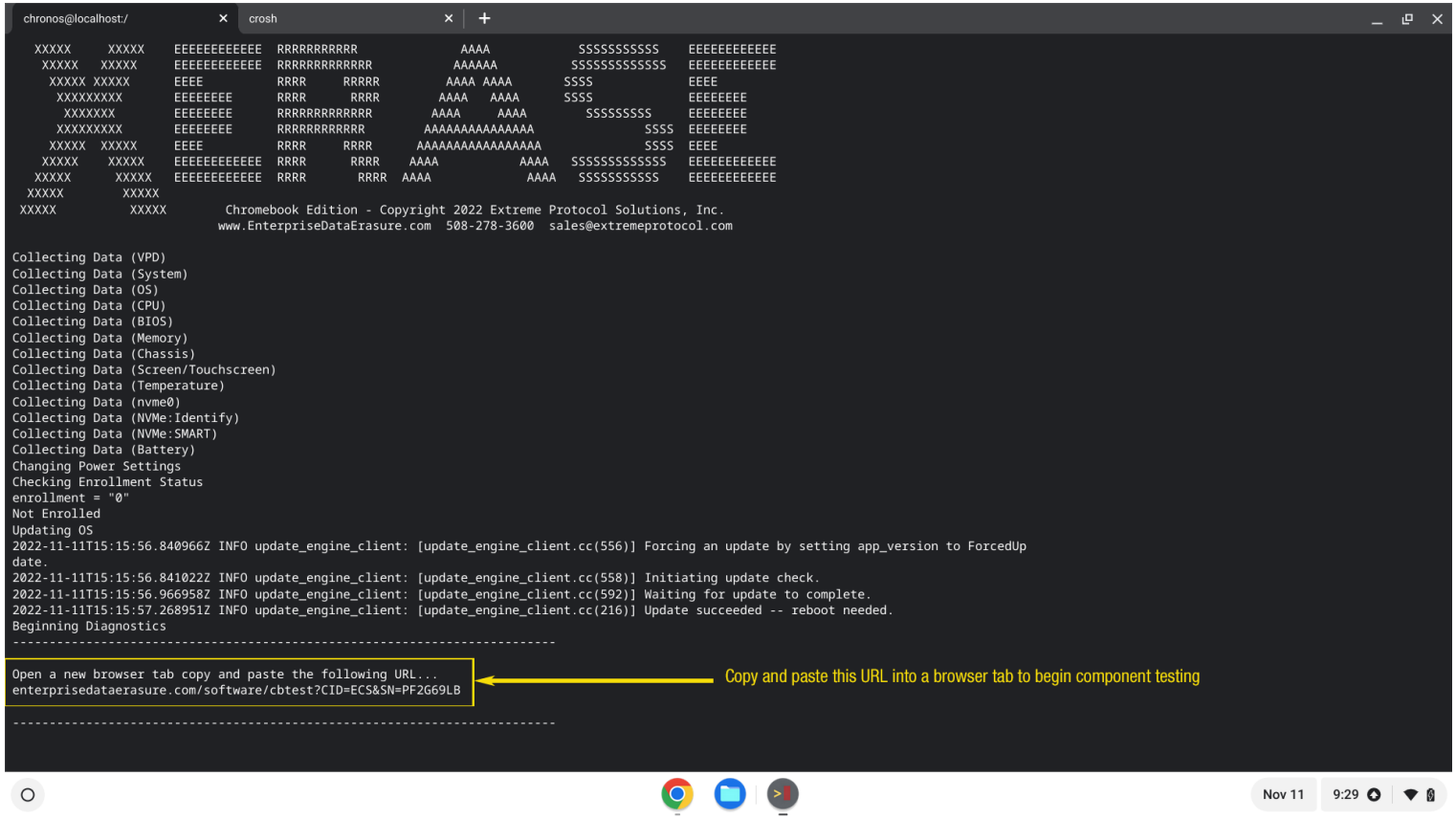
This option runs a native tool that performs the following tests and provides a Pass/Fail result at the end.

Bit Flip	Compare OR	Bit Spread	Compare SUB
Block Sequential	Random Value	Compare MUL	Stuck Solid Bits
Compare DIV	Solid Bits	Address	
Walking One's	Walking Zero's	Compare AND	Seq Increment
Compare XOR	Checkerboard		

Make sure to hit the **Update button** to the right of the Diagnostic List for all your changes to take effect.

Chromebook Diagnostics – Manual Testing

By selecting Component Testing from the Diagnostics List, the technician will be provided with a URL to copy and instructions to open a new browser tab and paste that URL into the Address Bar (Internet Access Required).



Manual Diagnostics – Keyboard Testing

Keyboard Testing is an integral part of preparing a Chromebook for resale. With that in mind, we designed a web-based keyboard test that records all keystrokes and allows for the recording of bad/undetected keys. If your keyboard has a numpad, click on the numpad button on the top left. If your keyboard is different than the US default, simply select the country flag (above the keyboard in the top left) that matches your desired keyboard layout.

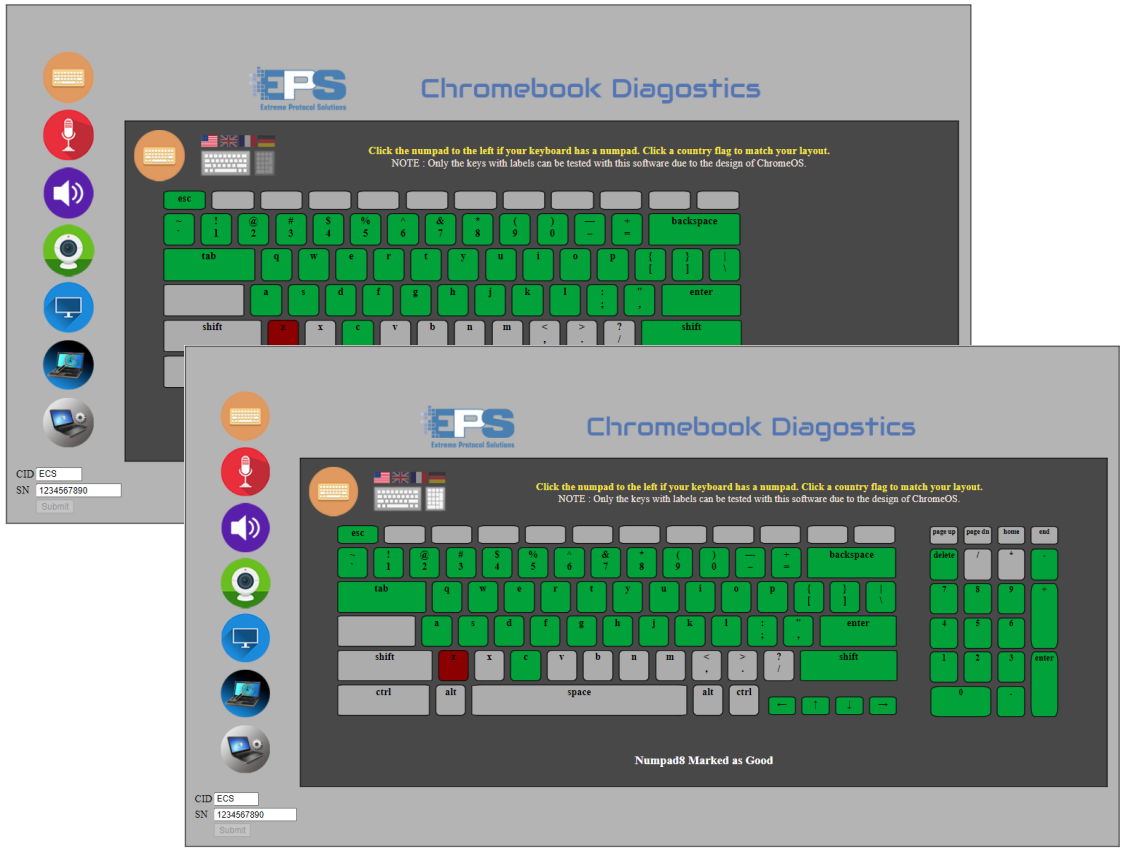
Keyboard Testing

1. Press any key to begin testing.

2. Hit all the keys on your Chromebook that have labels on them. The blank keys are OS reserved and cannot be detected with this test.

3. If you have a key that does not light up green when pressed, simply left-click on it and it will mark it as bad. If you click on a key marked as bad it will remove the bad marking and set it to the light grey neutral color. If the key actually works and is pressed but was marked as red, it will automatically mark it as green

4. Once all keys have been pressed or marked as bad, the window will advance to the microphone test automatically.



Manual Diagnostics – Microphone Testing

The Microphone Test records audio over a five-second period and plays it back to the user. Once playback is complete, the user is asked to hit OK or Cancel to denote PASS or FAIL.

Microphone Testing

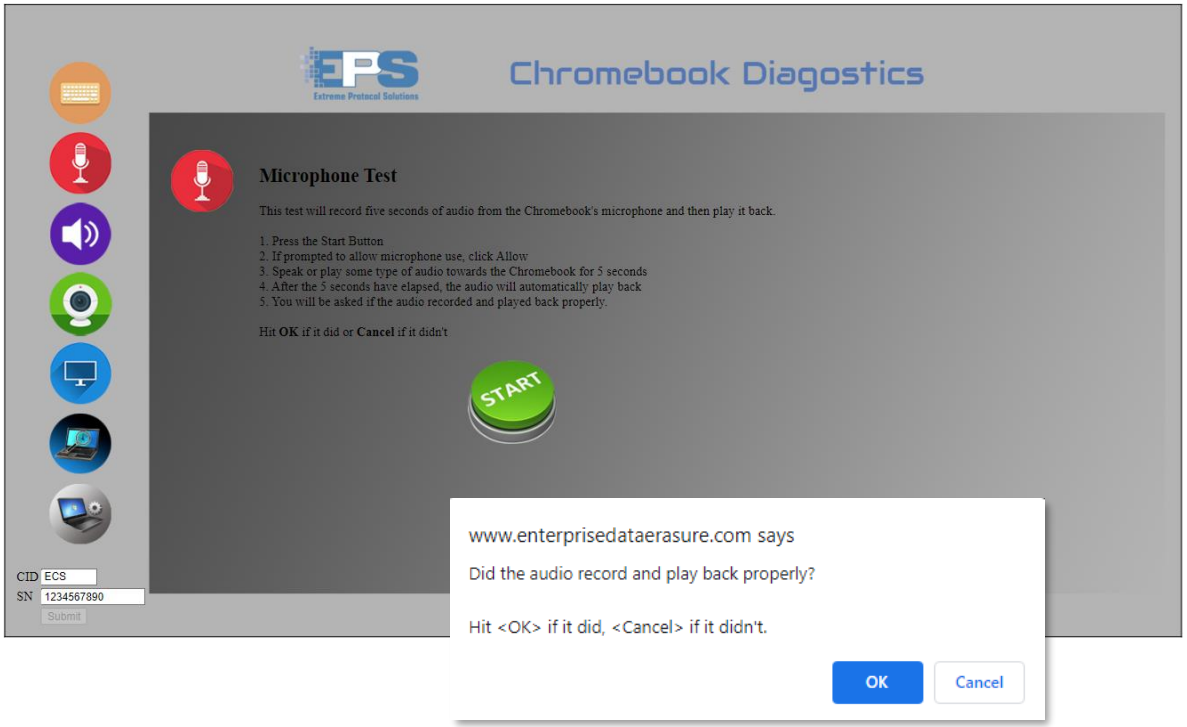
1. Click the Start Button

2. Speak, play audio, or make some other sound that can be recorded.

3. After the five seconds have elapsed, the audio will play back.

4. Once playback is complete, a prompt will appear.

If you hear the recorded audio playback then hit the OK button, if the audio wasn't recorded or playback doesn't work, hit the cancel button.



Manual Diagnostics – Speaker Testing

The Speaker Test plays a five-second audio recording to allow the user to listen to the left and right speakers individually and in stereo. Once playback is complete, the user is asked to hit OK or Cancel to denote PASS or FAIL for each audio channel.

Speaker Testing

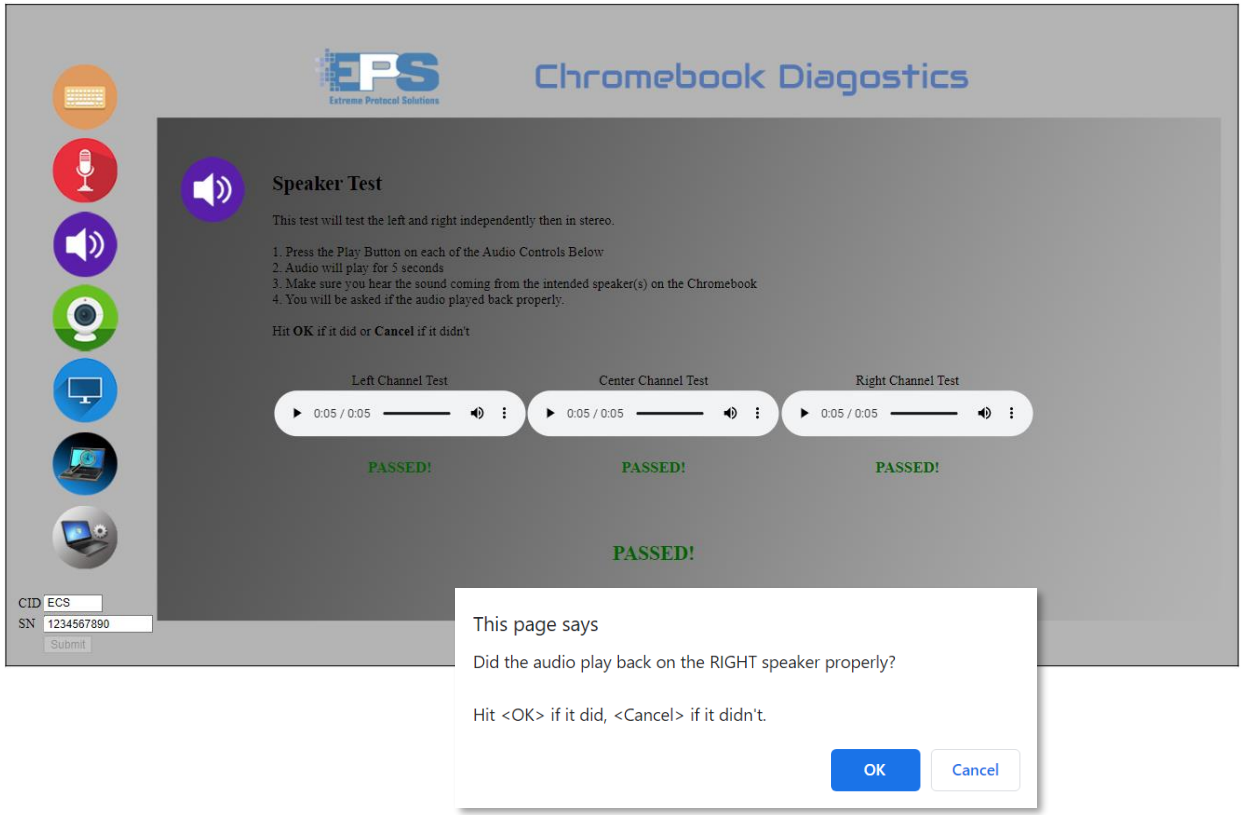
1. Click the Play Button

2. Audio will play for 5 seconds

3. Make sure you hear the sound coming from the selected speaker channel(s) and that it sounds as expected (not scratchy or broken up).

4. Once playback is complete, a prompt will appear.

If you hear the recorded audio playback and it sounds as expected, then hit the OK button, if the audio didn't sound right or didn't play at all, hit the cancel button.



Manual Diagnostics – Webcam Testing

The Webcam Test displays a live video of the current camera view. The user is instructed to click the Capture Image button. Once the image capture is complete, the user is asked to hit OK or Cancel to denote PASS or FAIL.

Webcam Testing

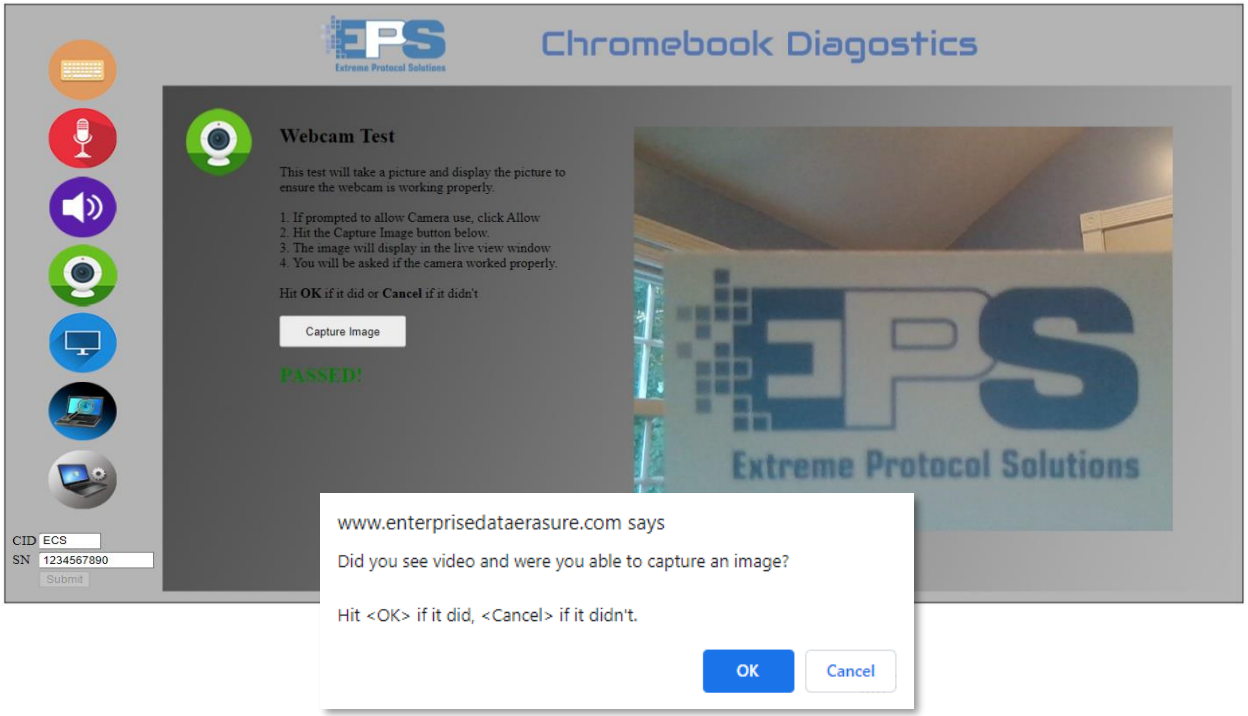
1. If prompted to allow Camera use, click the Allow button.

2. Hit the Capture Image button

3. The current contents of the camera video will be captured as an image and displayed.

4. Once the capture is complete, a prompt will appear.

If you saw the live video and were able to capture an image, then hit the OK button, if the video wasn't visible and/or the image didn't capture, hit the cancel button.



Manual Diagnostics – Display Testing

The Display Test has five multi-colored rectangular buttons. The user is instructed to click the button to turn the screen that color. Once the screen is changed to that color, the user is asked to hit OK or Cancel to denote PASS or FAIL.

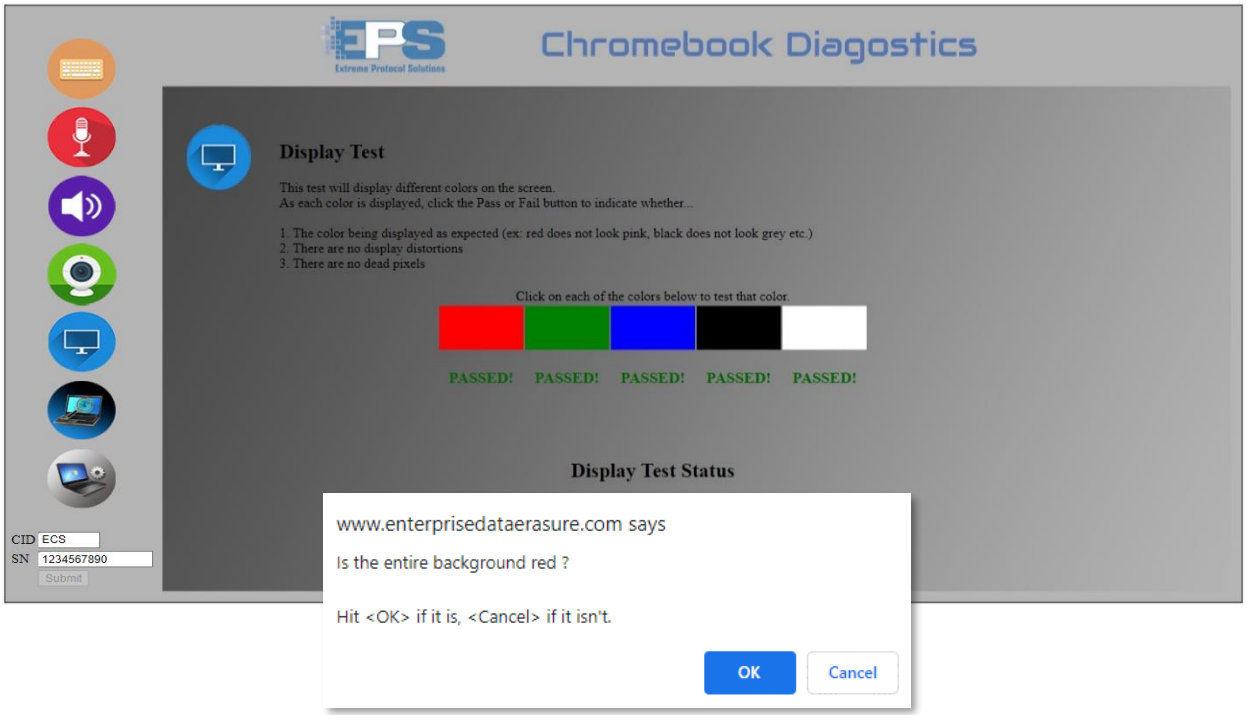
Display Testing

1. Click on the Color to test.

2. The entire screen will turn that color

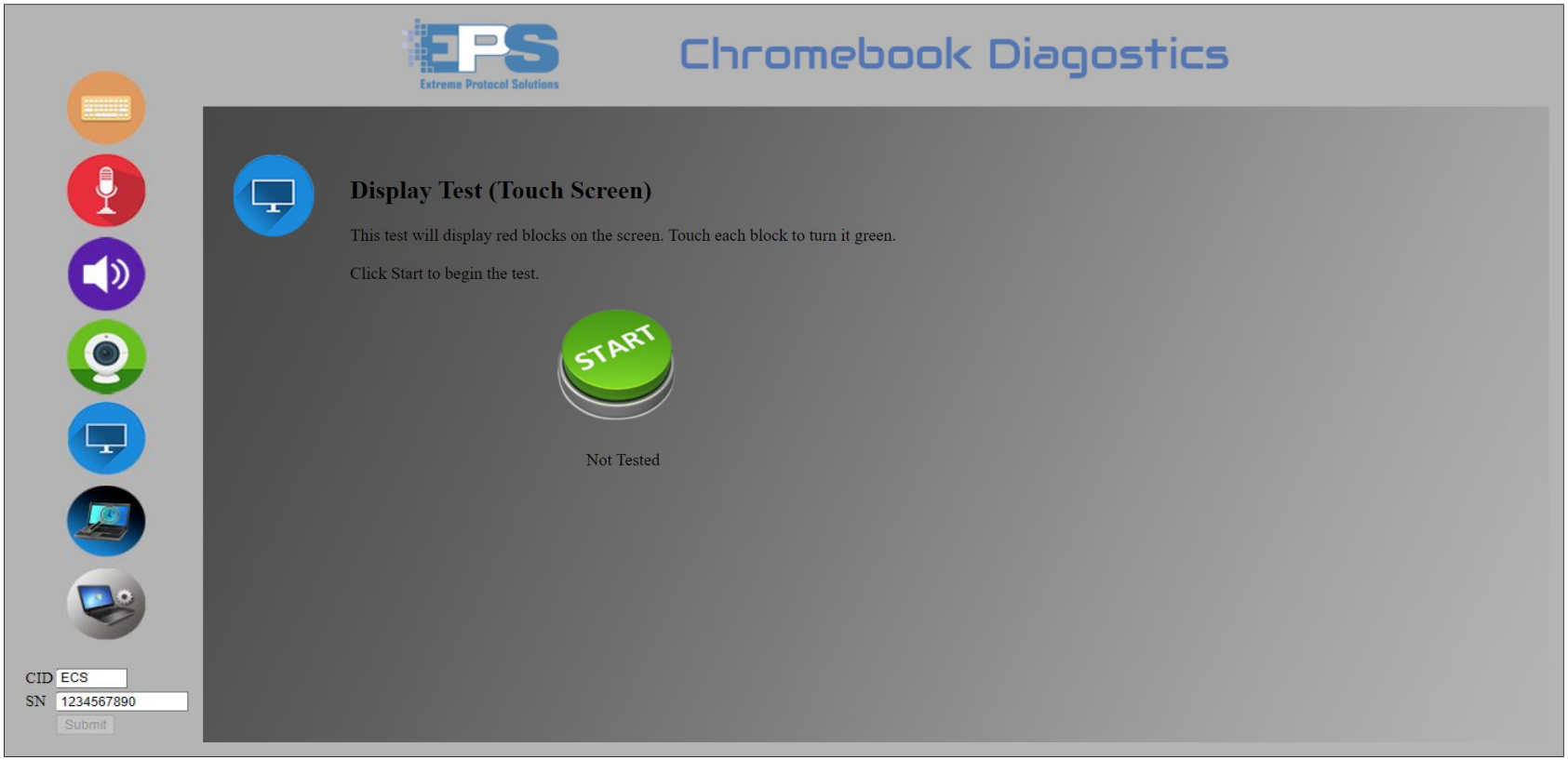
3. After a second or two, a prompt will appear asking about the color.

If you saw the intended color and it displayed as expected with no dead pixels or distortions, then hit the OK button, if the color was off (red was pink, black was grey, etc.) or there were dead pixels or distortions, hit the cancel button.



Manual Diagnostics – Touchscreen Testing

If a Touchscreen is detected, the display test will switch over to touchscreen testing once complete. The Touchscreen Test puts up a grid of rectangles and has the user touch the red rectangles to turn them green. As each touch is registered it increments the counter. Once all are touched, the test automatically passes.

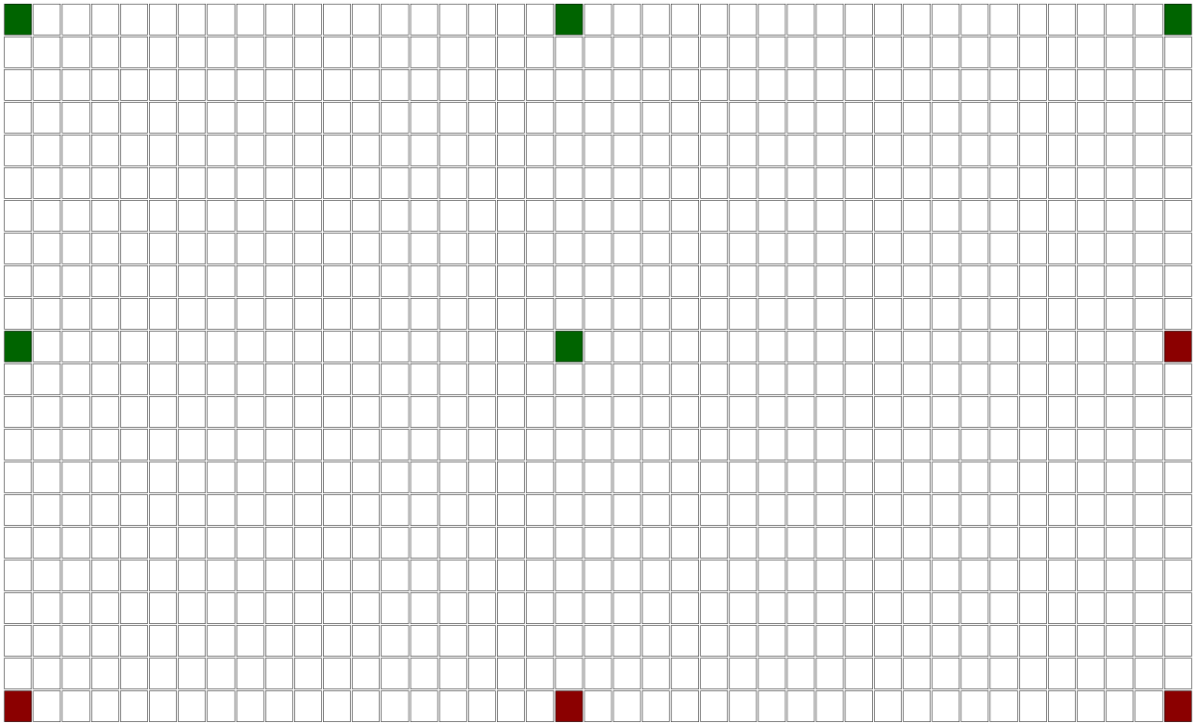


Manual Diagnostics – Touchscreen Testing

Touchscreen Testing

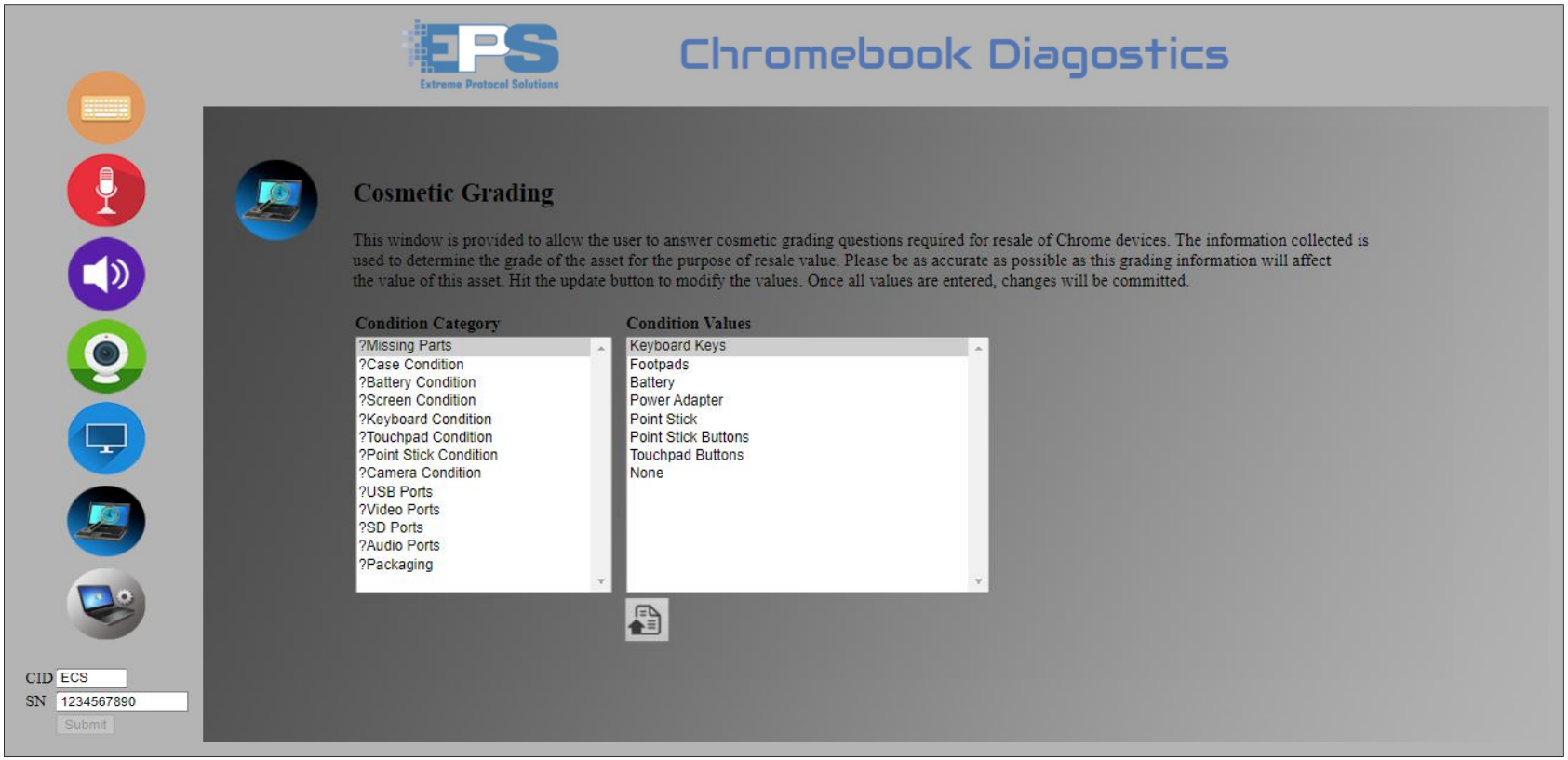
1. Touch each red block to turn it green.

2. Once all nine are green, the test passes, and the results can be submitted.



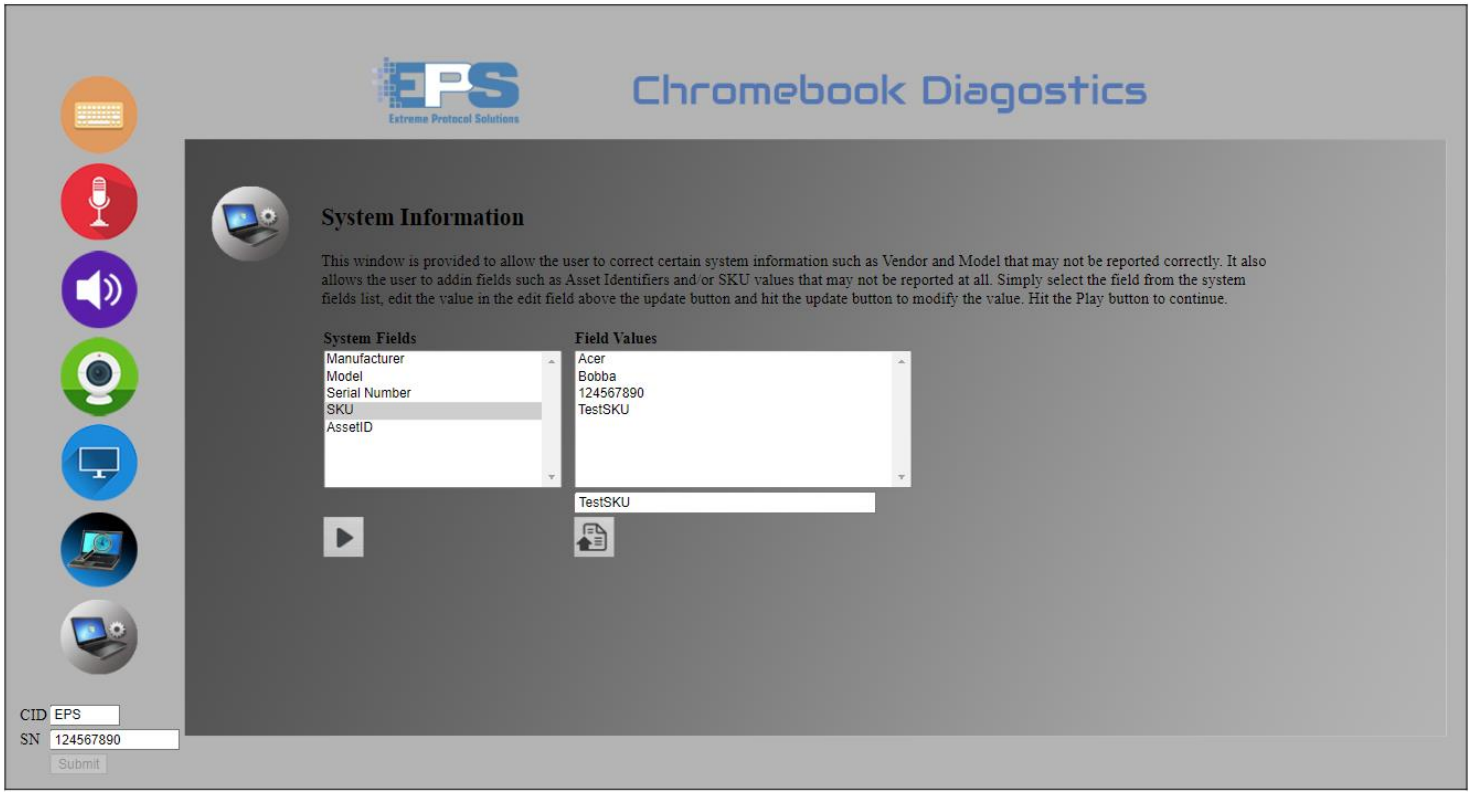
Manual Diagnostics – Cosmetic Grading

Even though cosmetic grading can be performed using the side button in the Chromebook configuration window (see Page 15), an option is available to use on-asset Cosmetic Grading. This provides the same Condition Categories and Values as local grading but allows it to be performed at the asset itself, creating a more practical implementation of this important feature.



Manual Diagnostics – System Info Verification

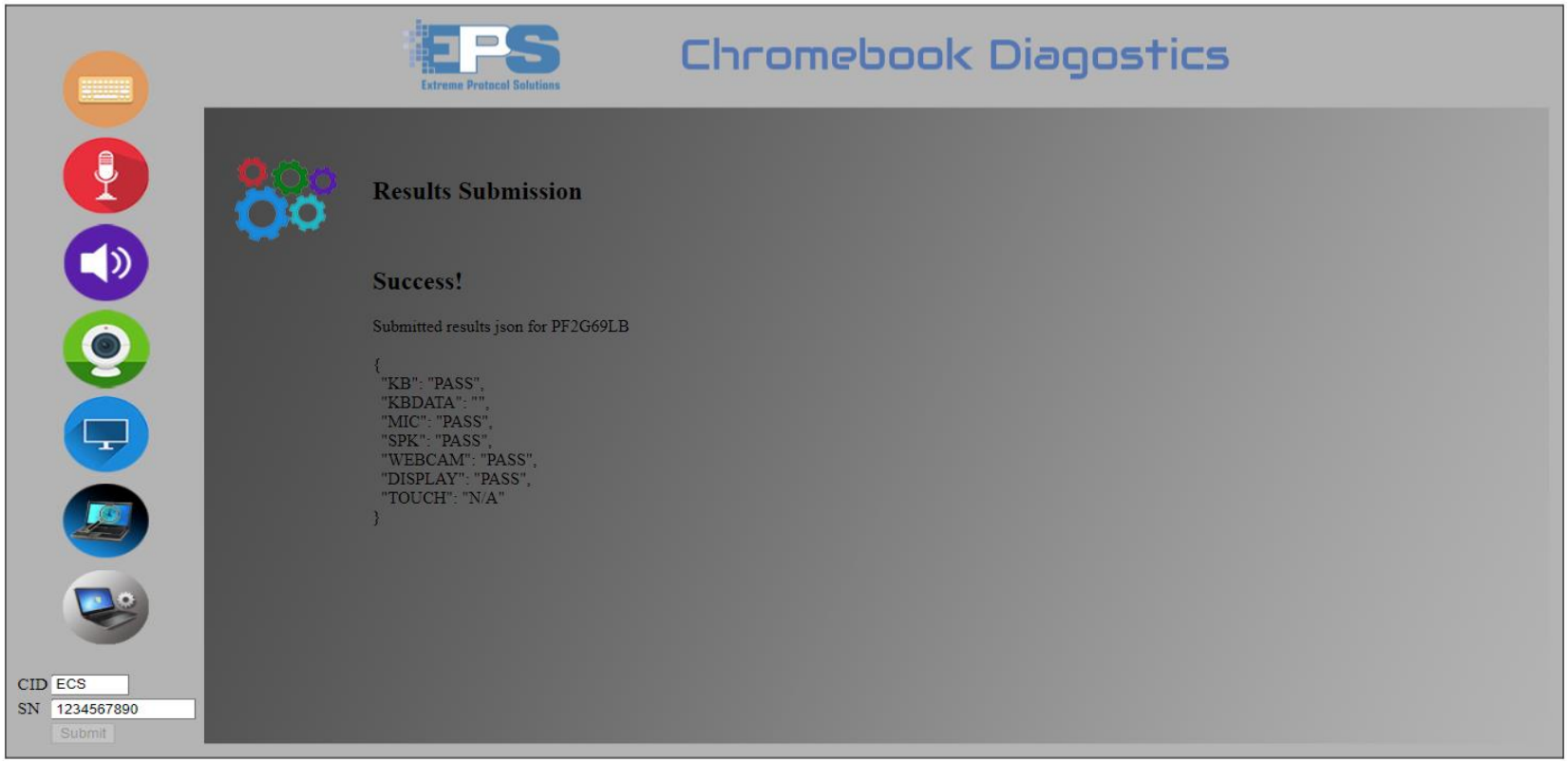
Even though System Information Verification can be performed using the side button in the Chromebook configuration window (See Page 16), an option is available to use on-asset Verification and editing. This provides the same functionality but allows it to be performed at the asset itself, creating a more practical implementation of this important feature.



Chromebook Diagnostics – Submitting Results

Submitting the Testing Results

Once all required tests have been completed, the submit button in the bottom left corner of the screen will be enabled. Click submit and the results of the submission will appear on-screen.



ChromeOS – Auto Update

The EPS Chromebook Erasure Server provides an option allowing for automatic checking and updating of the ChromeOS on any Chrome device. This provides the security of knowing that any asset that has updates available is automatically updated without user interaction.

This functionality has three selectable options…

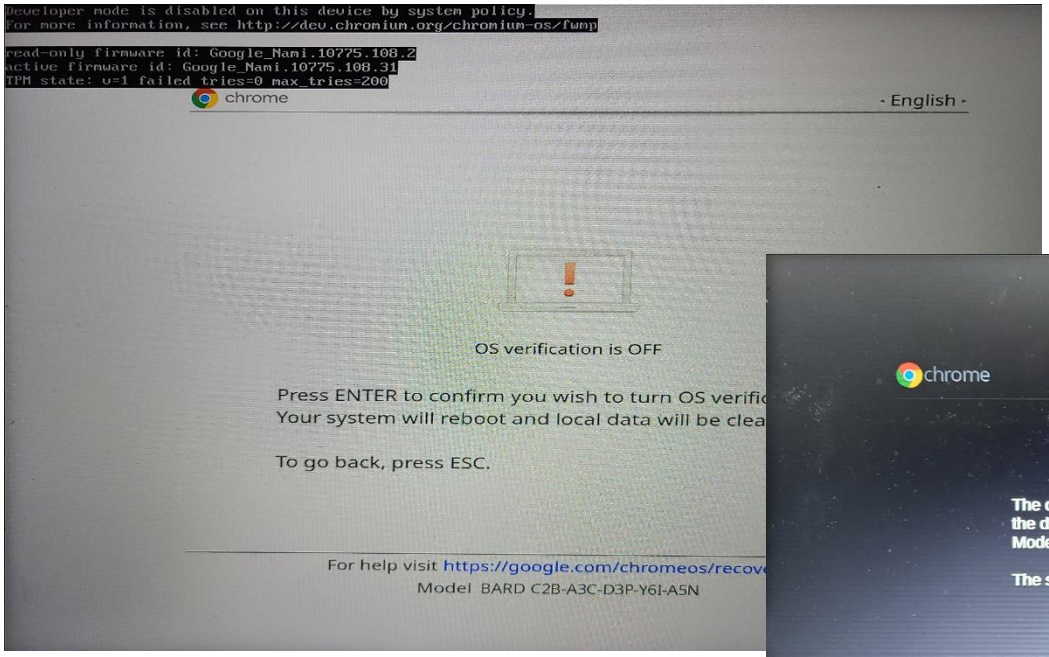
1. **OFF** – No check or update of the ChromeOS is performed.
2. **Before Testing** – Automatic Checking and Updating (if any update is available) of the ChromeOS will be performed prior to any diagnostics.
3. **After Testing** – Automatic Checking and Updating (if any update is available) of the ChromeOS will be performed after ALL diagnostics are complete.

Make sure to hit the **Update button**  to the right of the Diagnostic List for all your changes to take effect.

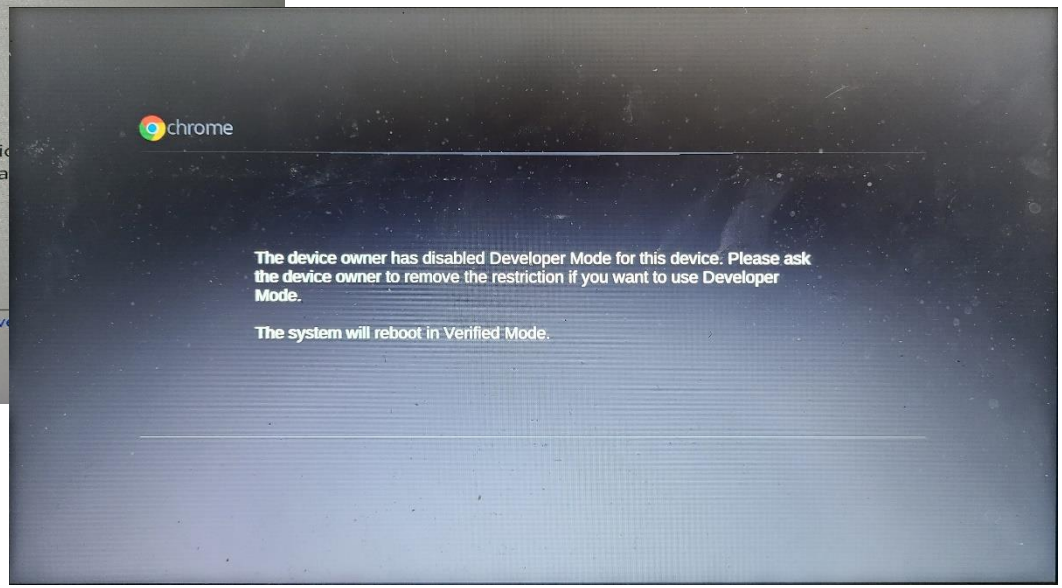
Chromebook Erasure – Enterprise Lock/Enrollment

Unfortunately for Chromebooks that are Enterprise Enrolled or Enterprise Locked cannot be erased, audited and placed back into out-of-box experience mode due to their inability to be placed in Developer Mode. We've included an article from IFIXIT as a reference.

Enterprise Enrolled Chromebook



Enterprise Locked Chromebook



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