CrXPRT

CrXPRT 2

User manual

Contents

Introduction

The purpose of the CrXPRT benchmark is to reliably evaluate the performance and battery life of devices running the Google Chrome operating system (OS). The benchmark provides an intuitive user interface and easy-to-understand results.

About the benchmark

The CrXPRT benchmark is published as an application (app) for Chrome OS. It is intended to be installed on devices running Chrome OS (Chromebooks) and launched from the Chrome App Launcher. The benchmark is divided into two test modes, performance and battery life, that run independently of each other. The benchmark calculates performance scores and reports battery life using results from tests based on real-world productivity and media scenarios.

The performance test includes six individual workloads. The battery-life test includes all six workloads from the performance test, plus media playback, gaming, and wait time scenarios.

After completing a test run, the benchmark displays a results page. The performance test produces an overall performance score and individual workload scores. The battery life test reports the rundown battery life expressed in hours and minutes, a separate performance score, and a frames per second (FPS) rate for the HTML5 gaming component. The battery life performance score is different than the main performance test score, so the two scores should not be compared. The following sections describe the performance and battery life tests in more detail.

About the performance test

The performance suite includes Web browsing and JavaScript workloads along with additional workloads based on WebGL technologies. The six performance scenarios are Photo Effects, Face Detection (JavaScript), Offline Notes, Stocks Dashboard, DNA Sequence Analysis, and 3D Shapes with WebGL. Further details about each workload can be found in Table 1.

The performance suite runs for seven iterations and reports an overall score and individual workload scores. The performance test takes approximately 20 minutes to complete, depending on the speed of the test system.

About the battery life test

The battery life test includes all six workloads from the performance suite, plus video playback, audio playback, and HTML5 gaming scenarios. It also incorporates realistic periods of wait time, for a total of 10 components. Table 1 describes the battery-life workloads in more detail.

Each iteration of the battery life test lasts for 30 minutes and is comprised of approximately 11 minutes of active workloads and 19 minutes of wait/idle time. However, since different devices work at different speeds, the exact amount of idle time will vary by device.

The battery life test produces detailed results information including the recorded rundown battery life, a performance score based on the six performance suite workloads, and a frames per second (FPS) rate from the HTML5 gaming scenario. The detailed results information also includes the test's

starting and ending battery levels for each iteration, and the percentage of battery level drop for each iteration.

Test workloads

Table 1 describes the CrXPRT 2 performance and battery life workloads. All six workloads from the performance test are included in the battery-life test, but the battery-life test also includes video playback, audio playback, HTML5 gaming, and wait time components.

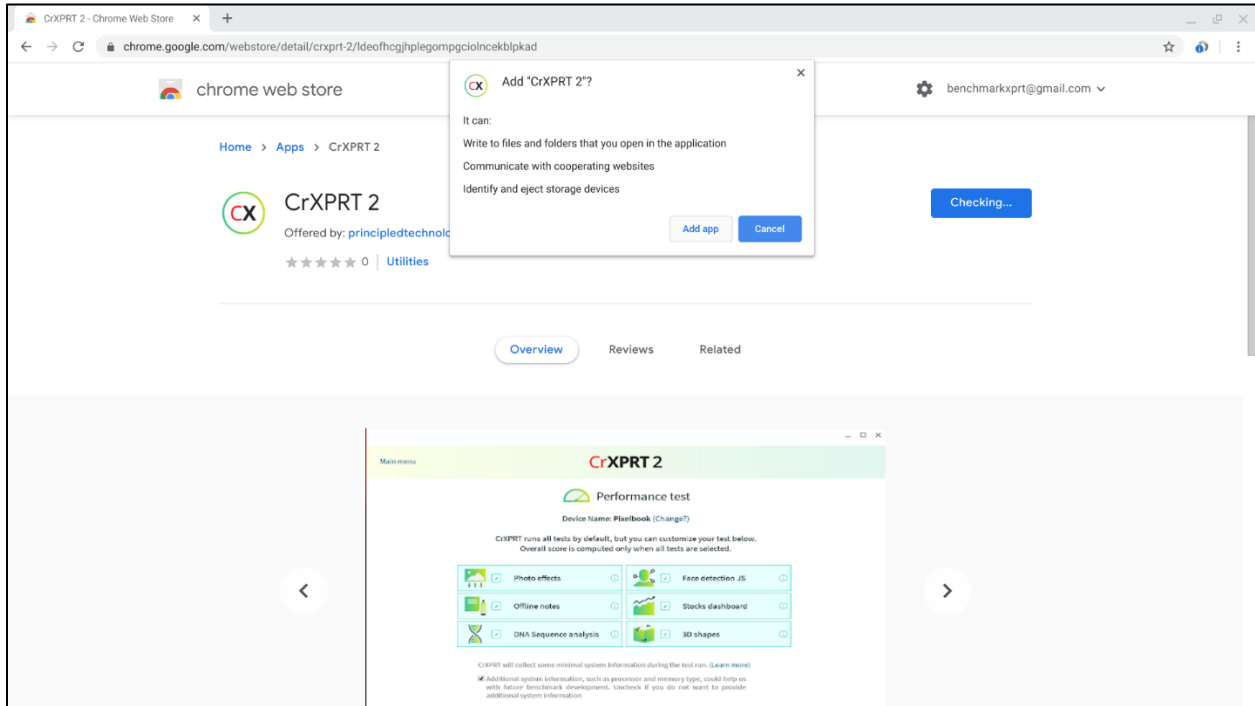| Workload	Category	Description	Performance Test	Battery-life Test
Photo Effects	HTML5 Canvas, Canvas 2D, and JavaScript	Measures the time to apply three effects (Sharpen, Emboss, and Glow) to two photos each, a set of six photos total.	✓	✓
Face Detection JS	HTML5 Canvas, Canvas 2D, and JavaScript	Measures the time it takes to check for human faces in a set of five photos (low resolution).	✓	✓
Offline Notes	HTML5 Local Storage, JavaScript, and AES encryption	Measures the time it takes to encrypt, store, and display notes from local storage.	✓	✓
Stocks Dashboard	HTML5 Canvas, SVG, and JavaScript	Measures the time it takes to calculate and display different graphical views of a stock portfolio.	✓	✓
DNA Sequence Analysis	HTML5 Web Worker and JavaScript	Measures the time it takes to process eight DNA sequences for ORFs and amino acids.	✓	✓
3D Shapes with WebGL	WebGL-based	Measures the time it takes to generate equation-based 3D shapes and display them with WebGL.	✓	✓
Video Player	Browser-based video playback	Plays a 2-minute 1080p H.264 video clip in a browser from the local system. The clip is played twice during the sequence of tasks.	-	✓
Music Player	Browser-based audio playback	Plays an audio clip for 3 minutes.	-	✓

Workload	Category	Description	Performance Test	Battery-life Test
HTML5-based game	HTML5 Canvas, Canvas 2D, and JavaScript	An impact.js-based game runs for about 2 minutes.	-	✓
Wait time	N/A	Device displays a wait page for the rest of the 30-minute cycle.	-	✓

Table 1: CrXPRT 2's performance and battery life test workloads.

Installing the benchmark

You can install the CrXPRT 2 app from the Chrome Web Store with just a few clicks.

1. On your Chromebook, open the Chrome browser.
2. Copy and paste the following URL into the browser address field, and press Enter:
   https://chrome.google.com/webstore/detail/ldeofhcgjhplegompgciolncekblpkad.
3. The CrXPRT 2 app page will appear. Click Add to Chrome.
4. In the Add "CrXPRT"? popup window, click Add app.

Figure 1: Click the Add app in the Confirm New App window.

5. The Chrome Download Manager should appear at the bottom of the screen, displaying download progress.
6. When the download process finishes, click Launch app to open CrXPRT.
7. Close the Chrome browser window.
8. You can also begin using CrXPRT by clicking the icon in the Chrome App Launcher.

Configuring the test device

The following test device configuration steps are recommended for reliable results using CrXPRT:

- If running a battery life test, you must charge the device battery to 100 percent.
- Make sure to close all running apps:
    1. Click the Chrome menu in the browser toolbar.
    2. Select More tools, then Task manager.

3. In the Task Manager window, select any unnecessary background tasks, and click End process.
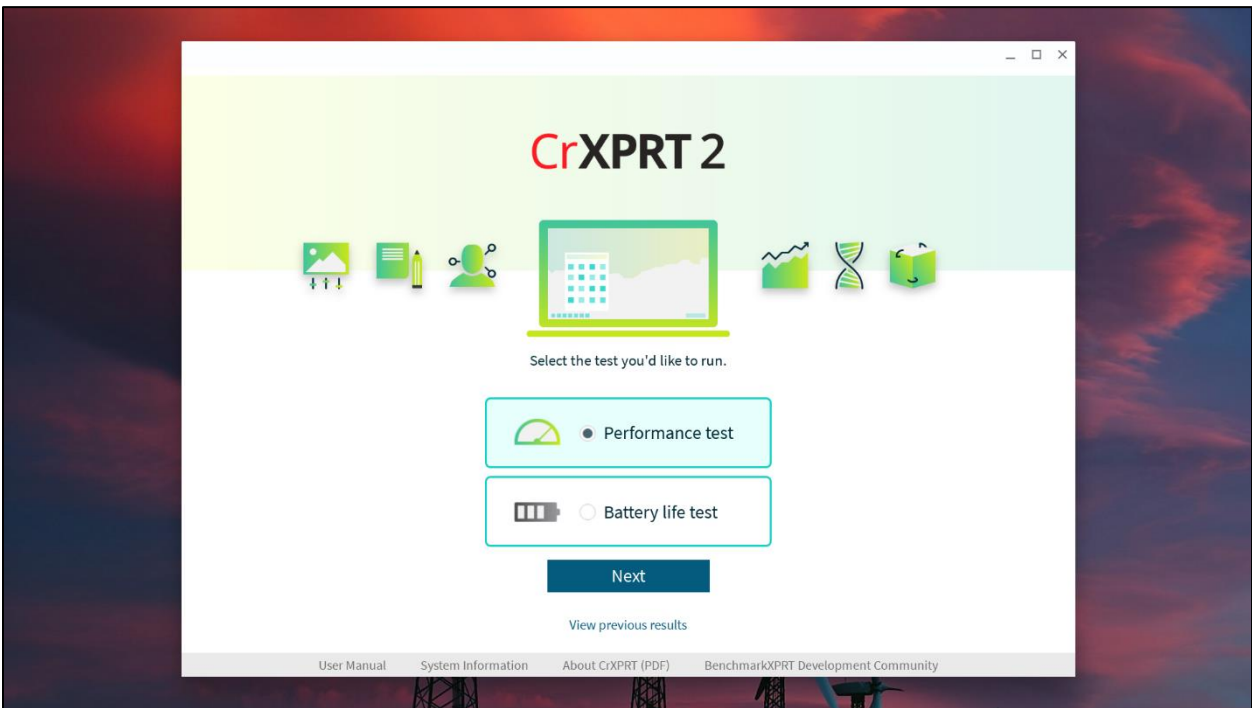- Verify that the device is connected to the Internet.

Running the tests

Before starting the test, please make sure the device is prepared according to the steps listed in the Configuring the test device section. After a successful run, the test displays a results screen.
To launch CrXPRT:

1. Open the Chrome App Launcher.
2. Click through the App Launcher until you see the CrXPRT icon.
3. Click on the CrXPRT icon to launch CrXPRT.
4. CrXPRT will display the main menu page.

The performance and battery life tests are both launched from the main menu page.
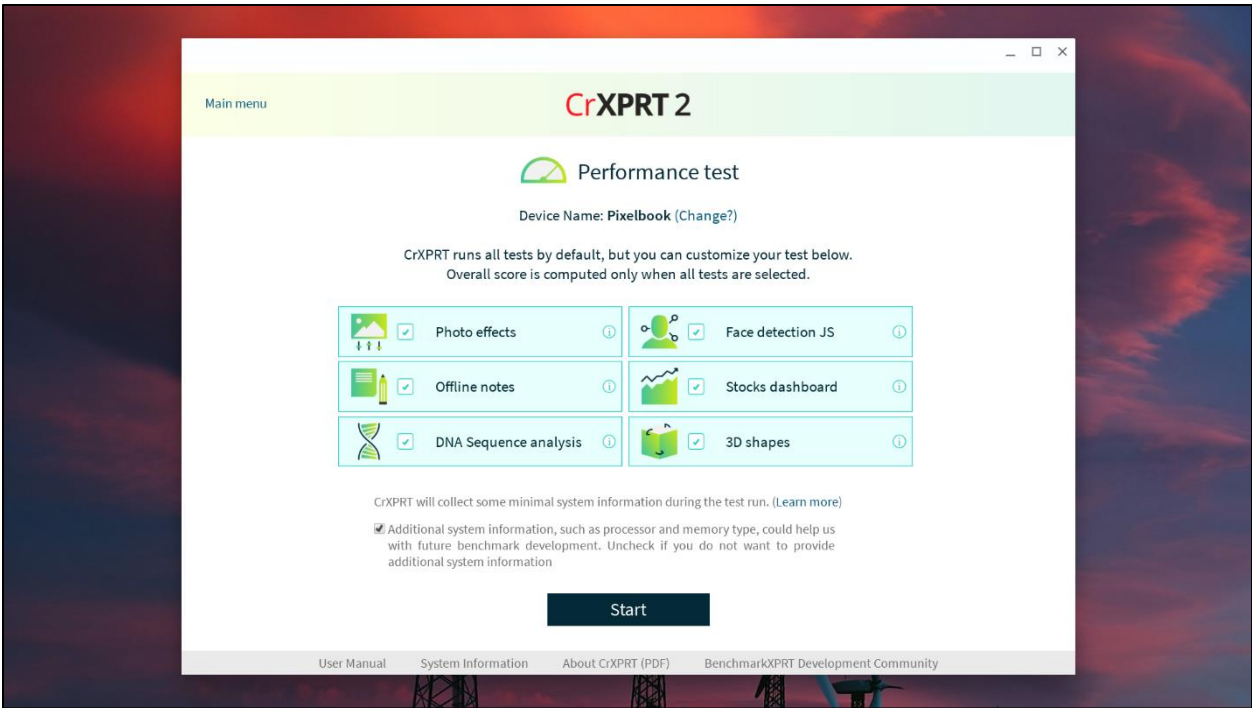

Figure 2: The CrXPRT main menu page.

Running the performance test

Running the performance test involves just a few steps:

1. After launching CrXPRT, click the Performance test button, and then Next.
2. Enter a name for the test run in the test name field.

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Figure 3: The CrXPRT performance test start page.

3. Click the Start button.

The performance test will kick off and run for approximately 20 minutes, depending on the speed of the system, displaying a results screen when the test is complete. See the Results section below for more information about test results.
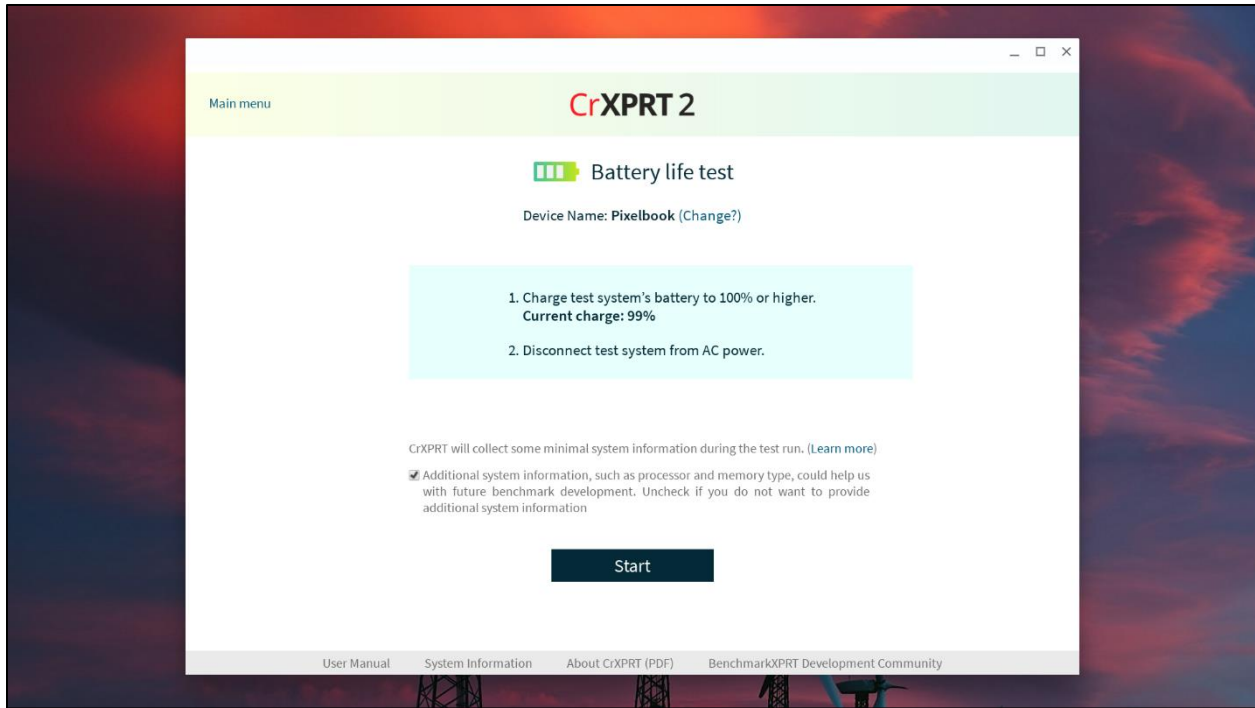
Running individual performance workloads

If you wish to run only one of the performance test workloads, or any combination of the workloads other than the default six, simply click to deselect the workloads you don't wish to run. The test will not provide you with an overall performance score, but will display scores for the individual workloads you selected.

Running the battery life test

Running the battery life test involves just a few steps:

1. After launching CrXPRT, click the Battery life test button on the main menu screen, and click Next.
2. Enter a name for the test run in the test name field.
3. Verify that the current battery charge is 100 percent.
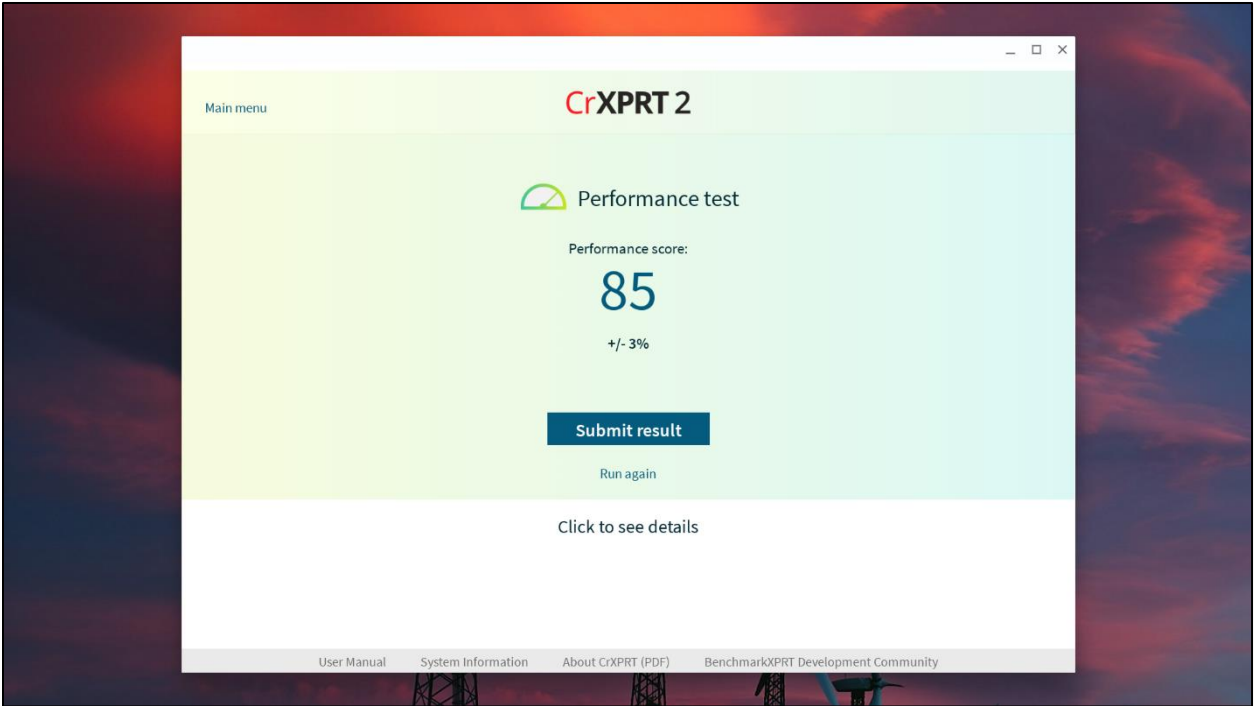4. When you're ready to start the test, unplug the system's power adapter and click Start.

Figure 4: The CrXPRT battery life test start page.

If the screen appears to be black during the battery life test, but you can still see the curser, the test is simply running the wait time component. The test will run until the system shuts down due to low battery capacity.
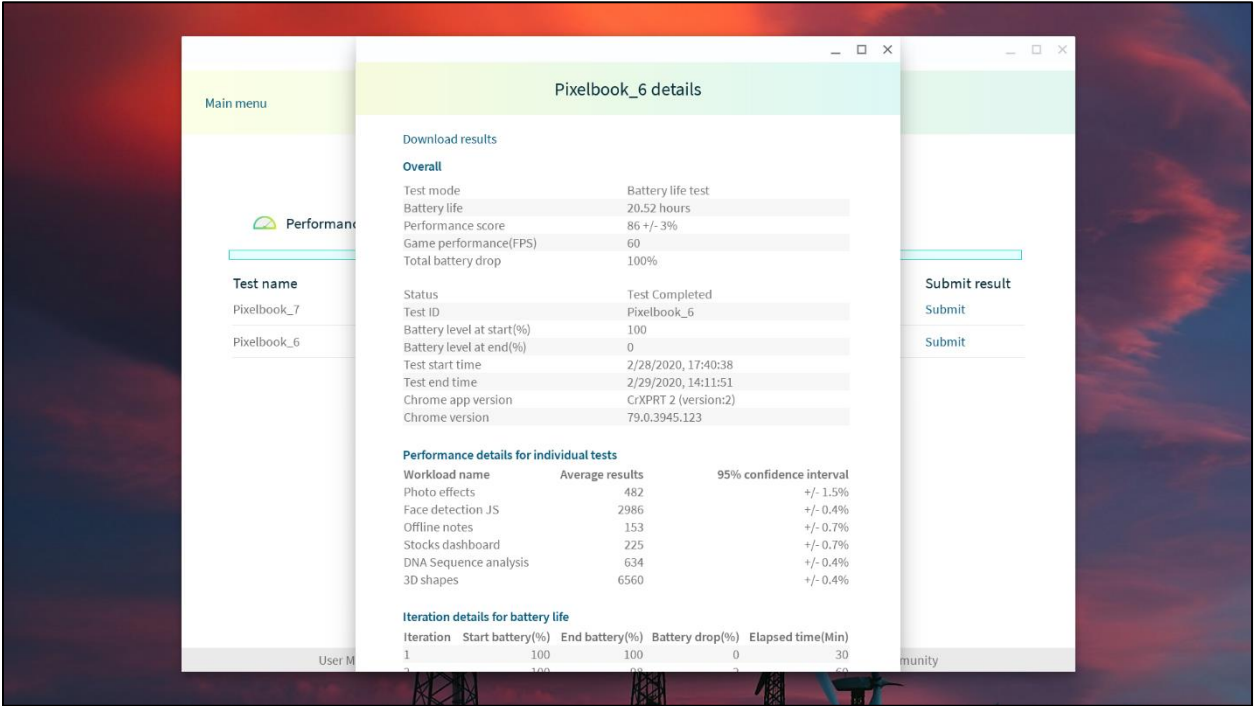
Results

At the end of a successful test, results are automatically displayed. The performance test produces an overall performance score and individual workload scores. The battery life test produces an estimated battery life expressed in hours and minutes, a separate performance score, and a frames per second (FPS) rate for the HTML5 gaming component.

Figure 5: Performance test results displaying after a test.

If you wish to see detailed results such as individual workload scores and confidence intervals, click the Click to see details link on the results page.
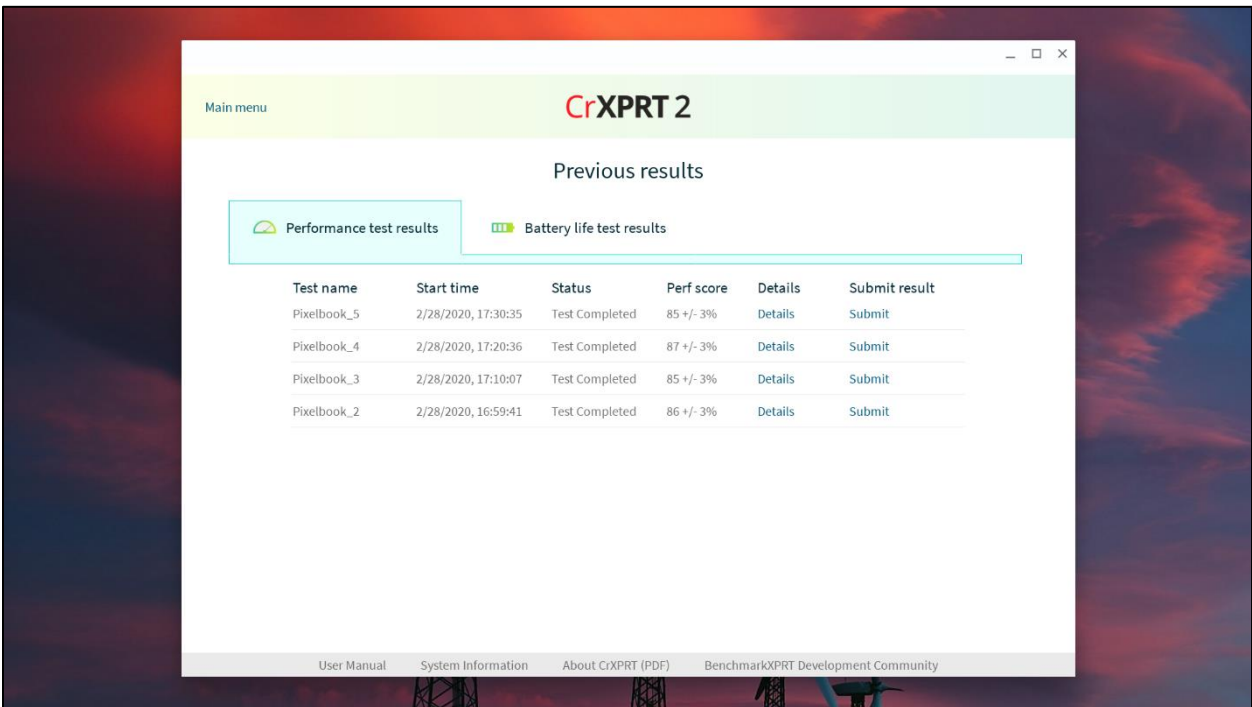

Figure 6: Detailed results for a battery life test.

Results for all previous tests are archived on the test device, and can be accessed by clicking View previous results towards the bottom of the main menu screen.

To save a result as a text file:

1. On the end-of-test results page, click the Click to see details link. If you've already closed the end-of-test results page, click View previous results on the main menu page, then click Details for the run you wish to save.

Figure 7: Viewing previous results.

2. On the Result Details page, click Download results.
3. Select the file destination, rename the file as needed, and click Save.

Results data collection

In order to help us with future benchmark development, CrXPRT 2 collects test information and some data about the device that produced those results, and stores the information in a secure database. To see the fields CrXPRT collects, click here.
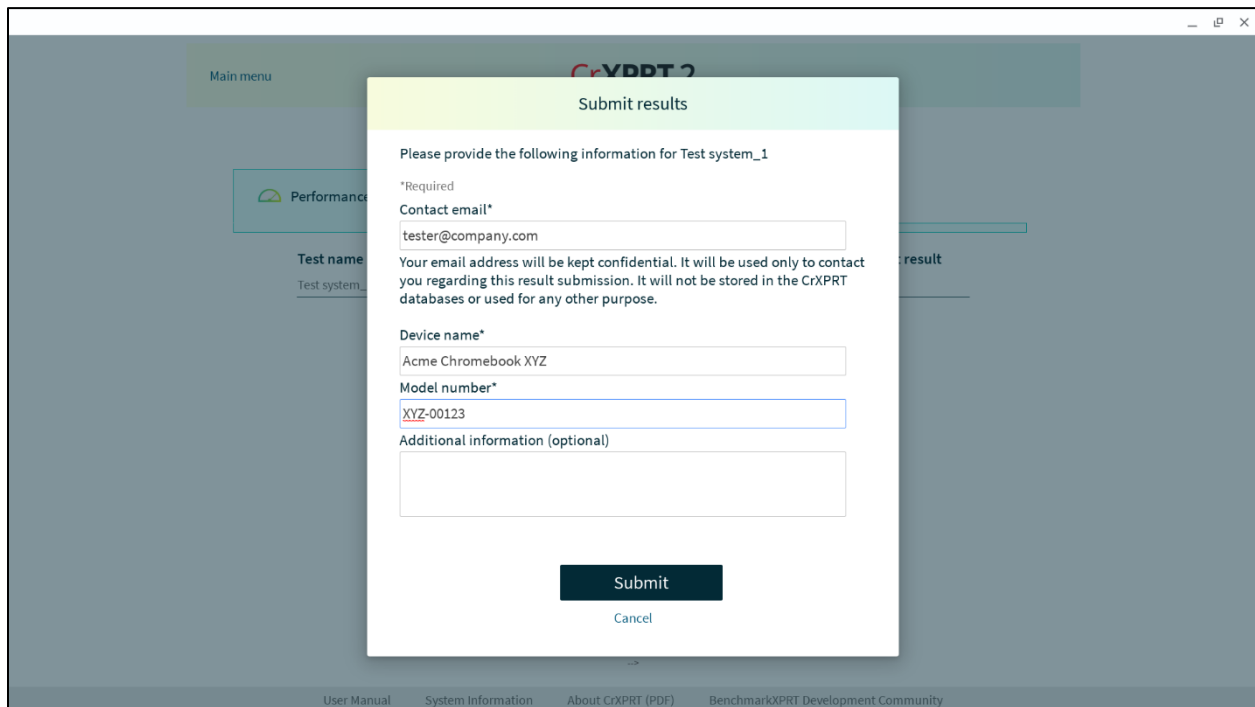
If you do not want to provide system information such as processor and memory type, you have the option to opt out of providing that information by unchecking a box on the test start page.

As with WebXPRT, we may quote aggregate results and result ranges, such as high and low scores, the number of results, or the average score, but we will never make individual CrXPRT 2 results public without the tester's permission. In addition, CrXPRT does not report, and therefore Principled Technologies cannot make public, identifying personal or corporate data, or any other potentially confidential information.

Submitting your results

If you would like to submit your test result for us to consider for publication:

1. On the end-of-test results page, click Submit result.
2. In the Submit results window, fill in the fields for contact email, device name, and device model number. If you wish, you may also add comments in the Additional information field.
3. Click Submit.

Figure 8: Submitting results after a performance test.

Uninstall

You can uninstall the CrXPRT 2 app in the same way you would uninstall any other Chrome app or extension. To uninstall CrXPRT 2:

1. Open a Chrome browser window, and enter chrome://extensions in the navigation field.
2. Find CrXPRT in the list of extensions, and click the Remove button.
3. At the Remove "CrXPRT 2?" pop-up window, click Remove.

OS versions

CrXPRT is designed to run on devices with Chrome 56 and above.

Known Issues

There are currently no known issues.

Technical Support

Contact us at BenchmarkXPRTsupport@principledtechnologies.com for technical support.