nexthink

Nexthink Insights

Understanding Startup Time Across 3M Devices

What factors truly impact your computer's startup time? You'll be surprised with what we discovered...

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Introduction

By Yassine Zaied,
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The inspiration for this report came about some months ago from what was supposed to be a routine meeting with our engineering team.

I can't remember who or how it started, but the conversation turned to 'what if?' regarding a few big picture problems that impact businesses and IT departments today:

> ***What if*** *IT could recover dozens of hours or more of lost focus time for employees?*
>
> ***What if*** *IT could save millions of dollars by avoiding unnecessary device upgrades with a few subtle configuration changes?*
>
> ***What if*** *IT could slash its company's CO2 emissions and reduce its carbon footprint by making informed decisions based on facts, not assumptions?*

Of course, in order to solve big picture problems in IT, you need to uncover very straight-forward, concrete, bite-sized answers—and that's what we reveal in this report.

During the first few weeks of trialling our platform, customers receive a full experience audit across their devices. Looking at that initial time period, our engineers examined 3M devices and made several interesting discoveries, but two in particular stood out:

1. The Average Startup Time across those 3M devices was 4.64 minutes. Roughly 43% of those devices took even longer to boot up, posting an alarmingly slow average of 9 minutes!

   That might not sound alarming at first but think of it this way: most employees don't report a slow startup time, they simply tolerate the inconvenience and wait. So if an employee reboots his or her device at least once per week, they could lose nearly one full workday each year (9 minutes x 48 weeks = 7.2 hours) just waiting for their device to load!

   And for many employees the wait is even longer. Roughly 25% averaged a startup time between 4-8 minutes, and 16% of devices averaged a startup performance of over 8 minutes!

2. We also found evidence that contrary to what many might say in IT, the number of software applications installed—not device age—impacts start up time the most. In many instances, we found that an older device boots up faster than the 4.64m average and performs perfectly well. This discovery proves that IT can save millions AND protect the environment simply by refurbishing existing hardware.

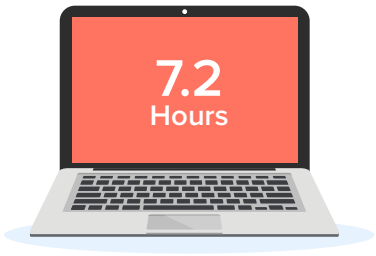
It is our hope that this information will help IT departments objectively weigh their decisions when purchasing new software and hardware, and realize that they too can solve big picture problems.

At the end of the report, learn how Nexthink can help you:

- Improve user experience and focus time by eliminating reboots and a slow startup time;
- Save millions on unnecessary hardware upgrades by using old hardware; and
- Reduce your company's carbon footprint.

Average Startup Time Across 3M Devices

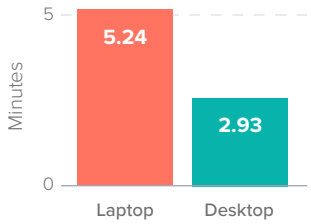
The average start-up time was 4.64 minutes, which leads to a loss of 9 minutes of productivity per device per week, or roughly one full workday (7.2 hours) each year!



Desktops Win the Race!

Desktops recorded an average startup time of around 3 minutes and laptops took about 5 minutes.

Average Startup Time by Computer Type

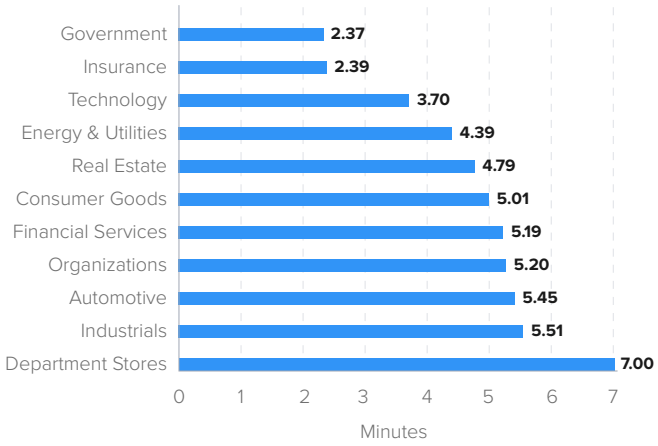


One likely reason desktops are faster is because they are more stringently controlled by IT policies. Laptop users often require local admin privileges to get their work done on the go, and hence, they often have to install applications that can impact their devices' startup performance.

Device Startup Time by Job Sector

Devices from the government sector averaged the fastest startup time with 2.37 minutes, while Retail Department stores had the slowest average time of 7.0 minutes. One plausible reason government devices are faster is because they often come with limited applications and functionality, tighter security guidelines, and strict IT policies and compliance measures.

Average Startup Time by Industry



So does Job Sector predict or correlate heavily with a slow startup time?

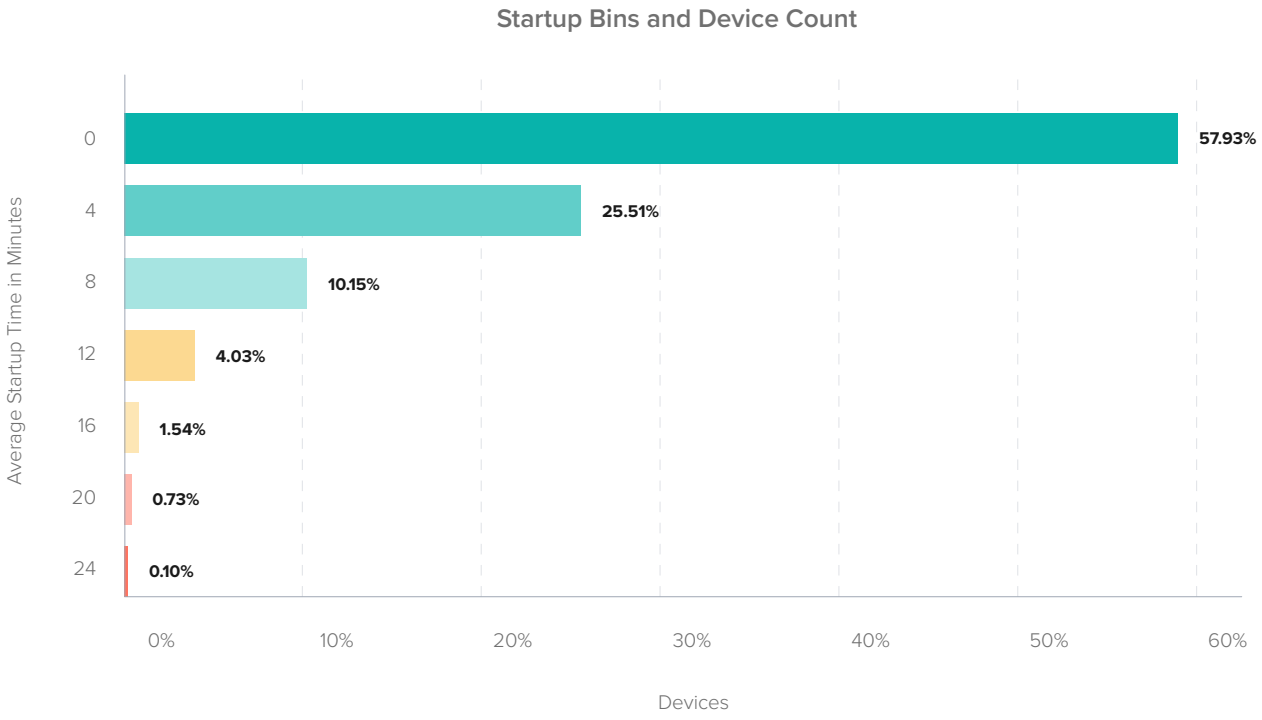
No—at least not in this data set. As you'll see, we identified a few contributing factors, but job sector wasn't one of them.

The Slowest of the Slow

We also discovered that roughly 16% of devices had a degraded start-up performance of over 8 mins on average, and 25% of devices had an average start-up time of 4 – 8 minutes.

When we examined the subset of the slowest performing devices (9 – 24 minutes), we were able to cross off metrics that didn't impact startup time—which we will explain in detail in the next chapters.

Note that the revelations we highlight at the end of the report are based on the 3 million devices we analyzed.



Does Device Age Matter? (No, not really)

The old adage that younger is faster isn't completely true when it comes to hardware.

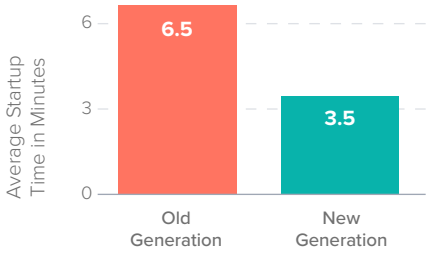
Here's why:

We did discover that 65% of the devices that were old generation* hardware had a slower average startup time (6.5 minutes) compared to the remaining 35% of new generation devices (3.5 minutes).

However, 38% of old generation devices recorded an average speed under 4 minutes. Clearly, many older laptops and desktops perform perfectly well.

*'Old generation' refers to any device with a CPU model released pre-2019.

Startup Time of Old vs. New Generation Devices



38% of old generation devices had an average startup speed under 4 minutes.

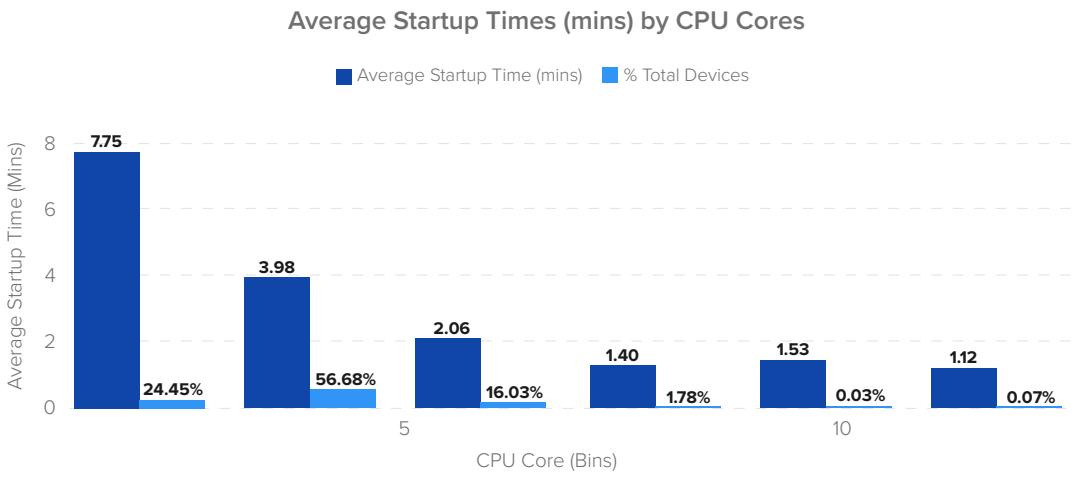
Advice for Smarter 'Green IT'

Our advice to IT decision-makers: Make sure you truly need to replace your older hardware! You might be able to salvage perfectly performing devices, reduce eWaste, and contribute to a greener planet.

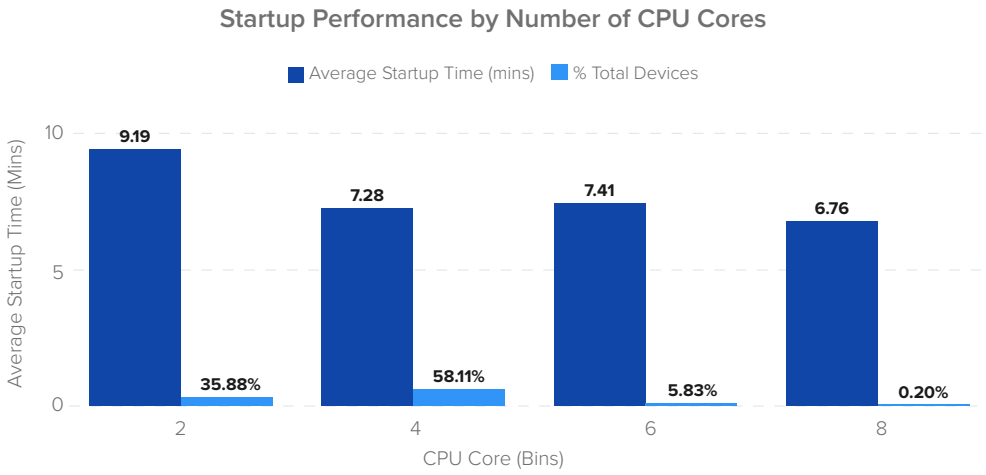
Does Processor Speed or the # of CPU Cores Matter? (No, not really)

CPU Cores

When examining devices with an average startup time of 0 – 4 minutes, we found a slight linear correlation with processor speed (MHz) and the number of CPU cores.

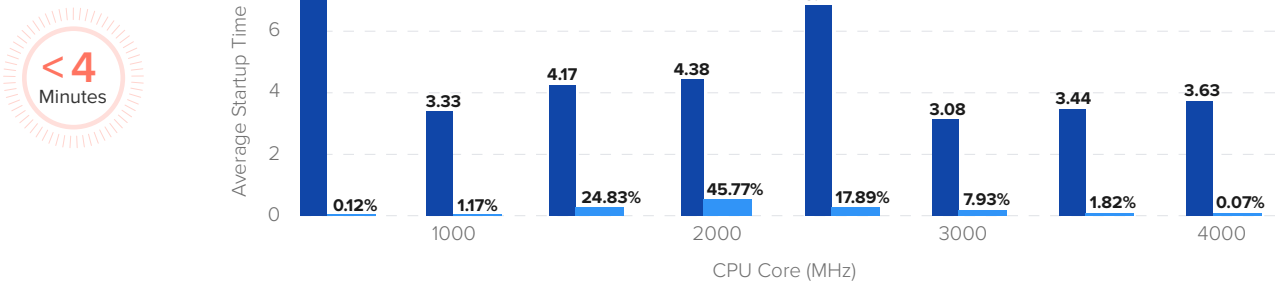


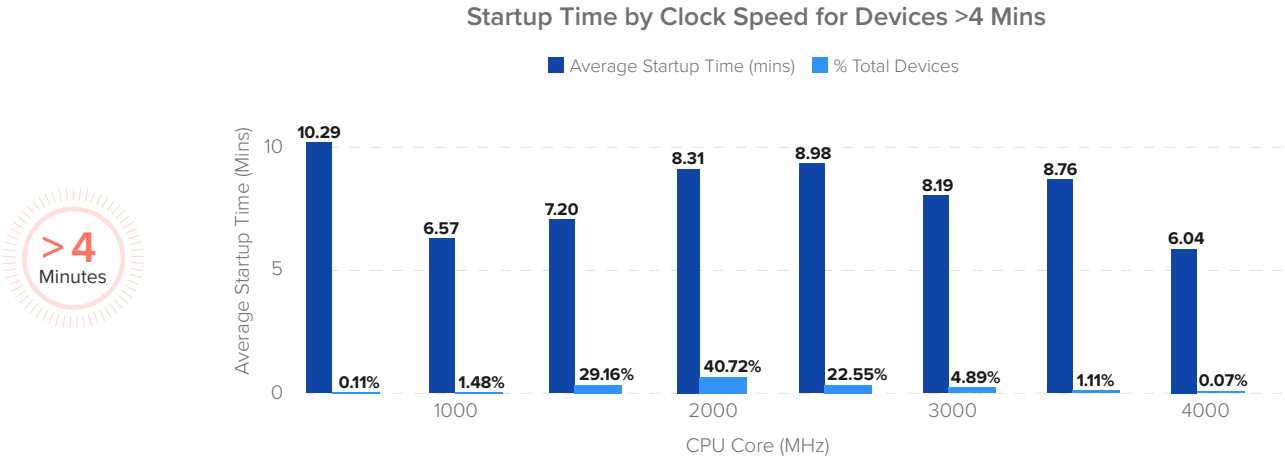
But when we focused specifically on the slowest devices (> 4 minute avg.), there wasn't enough evidence available—performance was slow across the board.



CPU Speed

Similarly, we didn't find any correlations based on CPU speed—not among the fastest devices, nor the slowest.





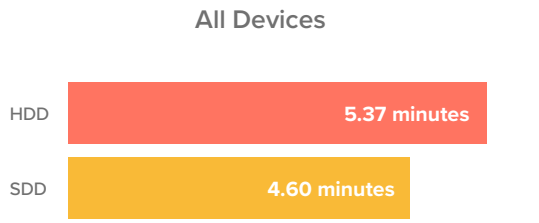
Advice for Smarter 'Green IT'

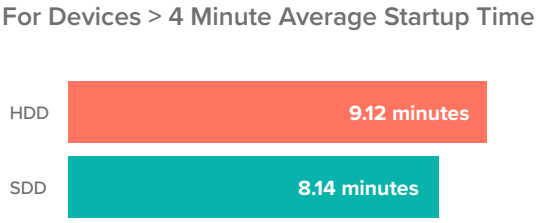
As a general rule more the CPU Cores and higher the clock speed, the more energy that's required to run the computer. If you can avoid procuring high clock speed and more CPU cores for a workload that's optimized, you'll wind up saving a significant amount of power consumption and be able to reduce your CO2 footprint

Does Disk Type or Memory Capacity Matter? (No, not really)

SSD vs. HDD

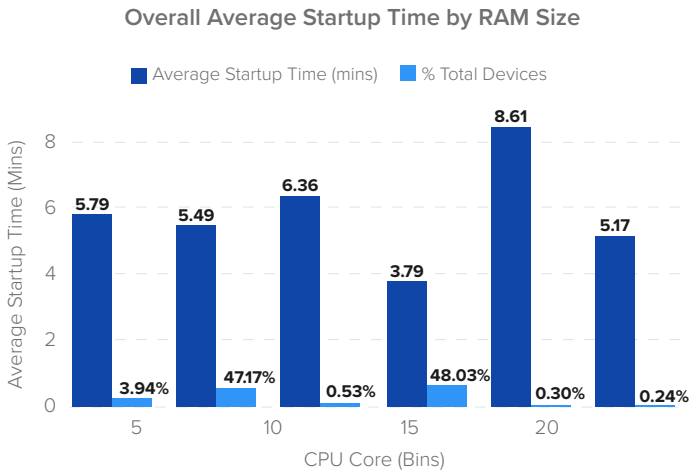
We did find that devices with a SSD (solid-state drive) boot type performed ~14% faster compared to HDD (hard disk drive), but when we examined the slower subset of devices (> 4 minute avg.), neither seemed to significantly impact startup time.

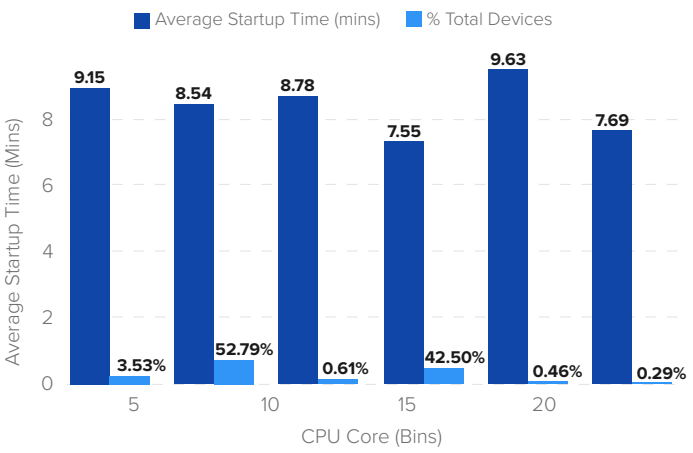




RAM

The same can be said for RAM—on average, devices with 16 GB of RAM or less had a better startup time than those with +16 GB, but when you home in on slower devices (> 4 minute avg.), RAM size doesn't matter.





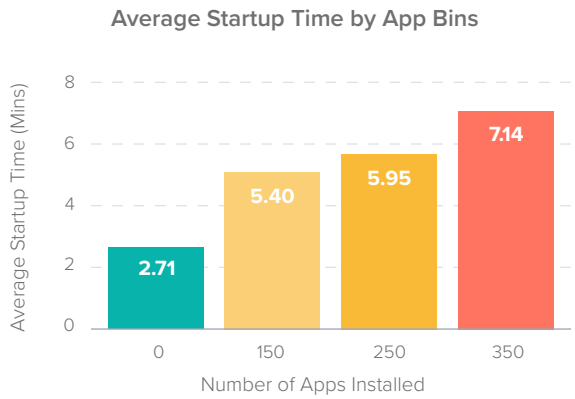
Advice for Smarter 'Green IT'

Based on our findings, SSD takes much less energy compared to HDD as it loads and boots faster. Switching to SSD could be beneficial for your Green IT initiative. And since RAM size doesn't make a huge dent on power consumption, we recommend you refrain from replacing old RAM chips when you can to help cut down on discarding chips (and eWaste).

The 3 Key Influencers to Startup Time

1) Number of Applications Installed

While the type of application running on your employee's device is certainly important, we found that the number of applications installed had the biggest impact on startup time.



The majority of devices (~80%) we examined had less than 100 applications installed, but a considerable amount (20%) had more than 150 applicants installed!

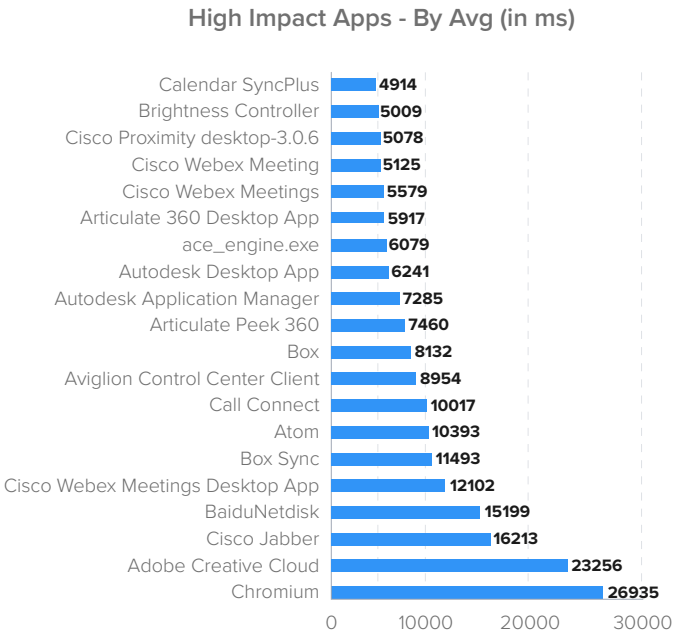
Typically, when applications are installed on a device, the background service components related to each application will launch automatically, which adds an overhead on the startup performance. IT can control for this factor by selecting which applications can launch automatically and which ones can be delayed or set to a Manual start.

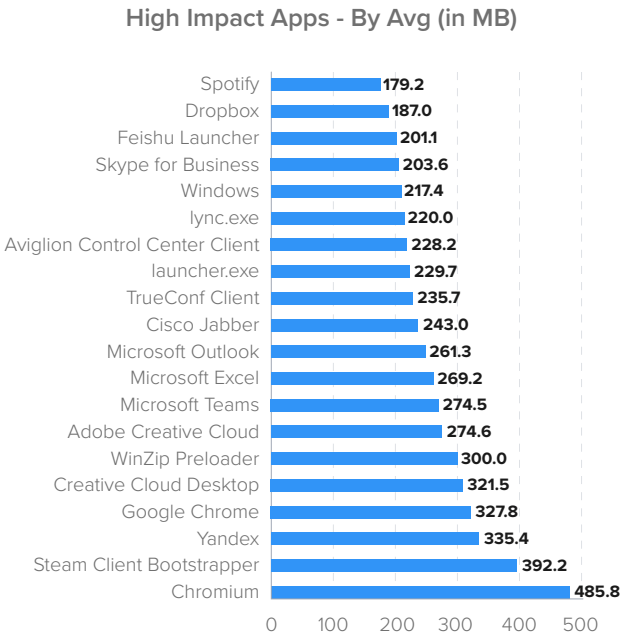
2) Number of Applications in Startup

When your device runs multiple applications at the same time in startup this can significantly impact performance.

One explanation for this trend is that typically, when new applications are installed on a device, users are asked: *Do you want to run this application when your system starts?* Most will select "yes," which will trigger their application(s) to automatically run each and every time the employee boots his or her device.

Of course, most users don't know this is happening. Instead, IT could intervene and prevent certain applications from auto-starting.





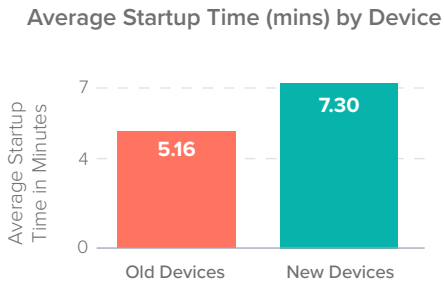
Some of the software programs we found that impact startup performance were popular non-standard or non-corporate applications like Spotify, iTunes Helper, Clickshare, Box, Google Drive, and Dropbox, to name a few.

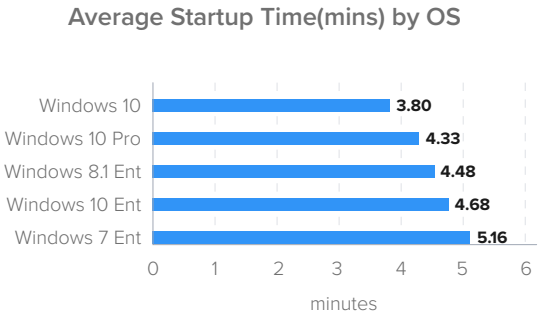
We also found other apps like Cisco WebEx, Autodesk, Adobe Creative Cloud, Chromium, Outlook, were correlated with a slow startup time.

3) Old Windows Versions

Start-up performance is more dependent on your device's Windows version than its hardware configuration or age.

We detected that newer generation devices (< 2 years) running on older OS versions (like Windows 7) had a 50% longer average start-up time compared to newer OS Versions.





And devices running on Windows 7 Ent Edition were ~10% slower than other OS versions.

We always recommend upgrading to the latest Windows version. By doing so, you can optimize for stronger ransomware prevention, malware security tools, safer web browsing, and streamline faster updates and system configurations—among a host of other benefits.

How You Can Solve Big Picture Problems

You cannot fix what you don't know.

What started with 'what if' for our engineering team, quickly evolved into 'let's figure this out.' As implied in the previous chapters, solving big picture problems starts with small, but important wins.

Uncovering what factors truly impact the Digital Employee Experience, like a slow startup time, arms IT with actionable intelligence, but they'll next need the right tools to intervene.

Explore Nexthink's Green IT library pack and learn how you can:

- Proactively identify devices with startup issues (and other "hidden" problems)
- Engage with employees via smart onscreen notifications and survey collection
- Take automated actions that scale across your entire user base
- Enable employees to solve issues for themselves when appropriate

So that your company can:

- Improve user experience and focus time by eliminating reboots and a slow startup time;
- Save millions on unnecessary hardware upgrades by using old hardware; and
- Reduce your company's carbon footprint.

Nexthink Experience is the only full-service Digital Employee Experience management platform for IT teams today.

Need help figuring out what's really going on with your devices? Contact Us

ABOUT NEXTHINK

Nexthink is the global leader in Digital Employee Experience management.
The company's products allow enterprises to create highly productive digital workplaces for their employees by delivering optimal end-user experiences. Through a unique combination of real-time analytics, automation and employee feedback across all endpoints, Nexthink helps IT teams meet the needs of the modern digital workplace.

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Want to learn more about how Nexthink can help you improve employee experience?

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