Lenovo ThinkBook 13x Gen 2:
Amplify performance without spending more

In tests, the ThinkBook 13x Gen 2 provided higher benchmark scores and better end-user experiences than a 13-inch MacBook Air—and at a lower cost

Consumers have many options when it comes to purchasing business laptops, which come in a range of prices. It can be difficult to know which device will offer the right combination of performance and value. Principled Technologies (PT) compared the performance and end-user experience of a Lenovo® ThinkBook 13x Gen 2 to that of a 13-inch Apple® MacBook Air®, and found that the ThinkBook 13x Gen 2 offered advantages in both categories, and costs less.

In performance benchmark testing, the ThinkBook 13x Gen 2 achieved slightly better or comparable single-core performance than the MacBook Air. It also completed a handful of tasks in Microsoft 365 applications faster than the MacBook Air. When we timed how long it took to boot both systems, the ThinkBook 13x Gen 2 booted in 8.3 percent less time, which means less time waiting to start your workday.

In speaker and camera quality evaluations, we found the ThinkBook 13x Gen 2 offered better noise canceling and higher speaker output than the MacBook Air, along with comparable image quality. Plus, unlike the MacBook Air, the ThinkBook 13x Gen 2 has a touchscreen, giving users more interaction options. The ThinkBook 13x Gen 2 cost $630.88 less and weighed about the same as the 13-inch MacBook Air, meaning you can get all the performance and experience advantages we identified in a less expensive package.

Work faster

Higher Cinebench R23 single-core score

Wait less

Less time to boot system and complete Microsoft 365 tasks

More affordable

$630.88 less expensive at the time of testing

About the Lenovo ThinkBook 13x Gen 2

This Intel® Evo™ ultralight business laptop features a 12th Generation Intel Core™ CPU and Intel Iris® Xe graphics. Lenovo claims they optimized the ThinkBook 13x Gen 2 for multitasking with "new hybrid architecture performance cores that can handle single- or lightly-threaded workloads while highly-threaded jobs go to efficient cores optimized for such work."[1] The Lenovo ThinkBook 13x Gen 2 starts at only 2.1 pounds and has a screen size of 13.2 inches, making it small and light enough for users to take along wherever they go.

Lenovo ThinkBook 13x Gen 2 *vs. 13-inch Apple MacBook Air*

Greater tactile interaction

Built in touchscreen
vs. no touchscreen

Comparable weight

2.10 lb. *vs. 2.11 lb.*

Built-in remote manageability[2]

Intel® vPro™ with Intel® Active Management Technology
vs. none

Connects with Android or iOS smartphones[3]

Intel Unison™ connects Android and/or iOS

Apple Continuity can connect only to iOS smartphones

About the Intel Core i7-1255U processor

According to Intel, the Core i7-1255U processor meets the needs of gamers, creators, and professionals who want to "harness both intelligence and power to enhance the experiences that matter most."[4] The Intel Core i7-1255U processor we tested has a 12MB Intel Smart Cache, a max turbo frequency of 4.7 GHz, 10 cores (two performance-cores and eight efficient-cores), 12 threads, and enhanced Intel Thread Director controller.

How we tested

Before we started our hands-on evaluation, we set the Windows power mode on the Lenovo ThinkBook 13x Gen 2 to "Best performance." Because the 13-inch MacBook Air has no such setting, we left it as-is. Other than making and verifying that single change, we used out-of-box OEM performance settings for both laptops:

- **Lenovo ThinkBook 13x Gen 2** running Windows 11 Pro, powered by a 12th generation Intel Core i7-1255U processor (3.5-4.70 GHz), 10 cores, Intel Iris Xe graphics, 16 GB of memory, and 1 TB of SSD storage. Cost on July 12, 2023: $1,168.12.
- **13-inch Apple MacBook Air** running macOS Ventura, powered by an M2 processor (3.49 GHz), 8 cores, M2 10-core GPU, 164 GB of memory, and 1 TB of SSD storage. Cost on July 12, 2023: $1,799.00.

We ran the following benchmark to measure performance on the two devices:

- **Cinebench R23** is a benchmark that evaluates CPU and GPU capabilities using Redshift, a Cinema 4D rendering engine, and reports system performance under a heavy load.

To analyze the experience users might expect from the devices, we also hand-timed how long the systems took to complete several common tasks:

- **Time to boot system from sleep** (including Windows Hello vs. Touch ID log-on experience)
- **Time to complete common tasks in Microsoft Word, Excel, and PowerPoint**

To better understand the end-user experience the devices offer, we also conducted specialized speaker, microphone, and camera comparisons on both systems.

All the results we report reflect the specific configurations we tested. Any differences in the configurations you test, as well as browsers, screen brightness, network traffic, or software additions can affect these results. For more information on these 13-inch laptops and our testing parameters and procedures, see the science behind the report.

System responsiveness (performance) results

While features such as display quality, ports for all your accessories, and portability are important, how quickly a laptop responds to requests and completes tasks is still its primary function—but not every user uses their laptop in the same way. That's why we conduct so many different performance-based benchmark tests: Each one stresses the systems in different ways.

Cinebench R23

The Cinebench R23 benchmark measures CPU performance by timing how long the device takes to render a 3D scene. The single-core subscore gives us an idea of the single-core performance of the devices. Single-core performance is important for tasks like web browsing, image and video editing, and office applications like Microsoft Word. The sustained single-core performance subscore gives an indication of how well the systems maintain their maximum single core performance under continuous load. Gaming and video editing are examples of common applications that require sustained single-core performance.

As Figure 1 shows, the ThinkBook 13x Gen 2 achieved a Cinebench single-core score that was comparable to the MacBook Air. These results suggest that business users might spend less time waiting for their system while they're engaged in their day-to-day work.

While not all business users are gamers or video-editors, a higher single-core sustained performance score (see Figure 2) suggests that the ThinkBook 13x Gen 2 was comparable to the MacBook Air at maintaining maximum performance under continuous load.

Cinebench R23 single-core

Overall score | Higher is better

Lenovo ThinkBook 13x Gen 2
1,651

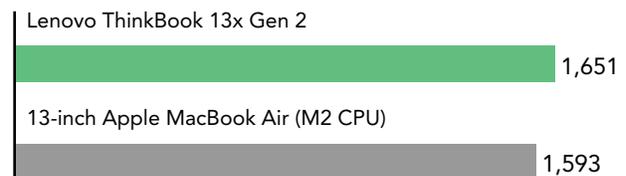13-inch Apple MacBook Air (M2 CPU)
1,593

Figure 1: Cinebench R23 single-core scores. Higher is better. Source: Principled Technologies.

Cinebench R23 sustained single-core

Overall score | Higher is better

Lenovo ThinkBook 13x Gen 2
1,615

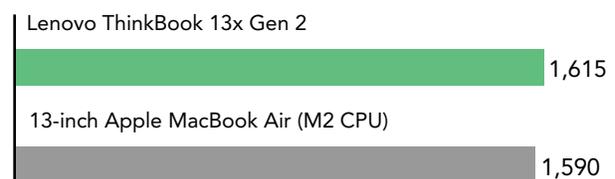13-inch Apple MacBook Air (M2 CPU)
1,590

Figure 2: Cinebench R23 single-core sustained performance scores. Higher is better. Source: Principled Technologies.

Hand-timed tasks

To understand the user experience each device might provide, we hand-timed a series of tasks that a business user would complete on a regular basis. The ThinkBook 13x Gen 2 was comparable to or faster than the MacBook Air in a number of these tests. While a difference of a few seconds may not feel like a lot, over thousands of repetitions, a few seconds can add up to significant wasted productivity.

Time to boot the system
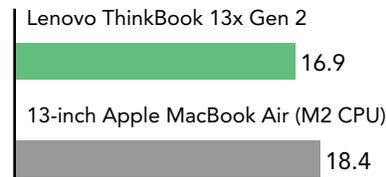Seconds | Less time is better

Lenovo ThinkBook 13x Gen 2
16.9

13-inch Apple MacBook Air (M2 CPU)
18.4

Figure 3: The time it took the systems to boot. Lower is better. Source: Principled Technologies.

Common tasks in Microsoft 365 applications

Time to complete tasks in Microsoft 365
Seconds | Less time is better

■ Lenovo ThinkBook 13x Gen 2   ■ 13-inch Apple MacBook Air (M2 CPU)

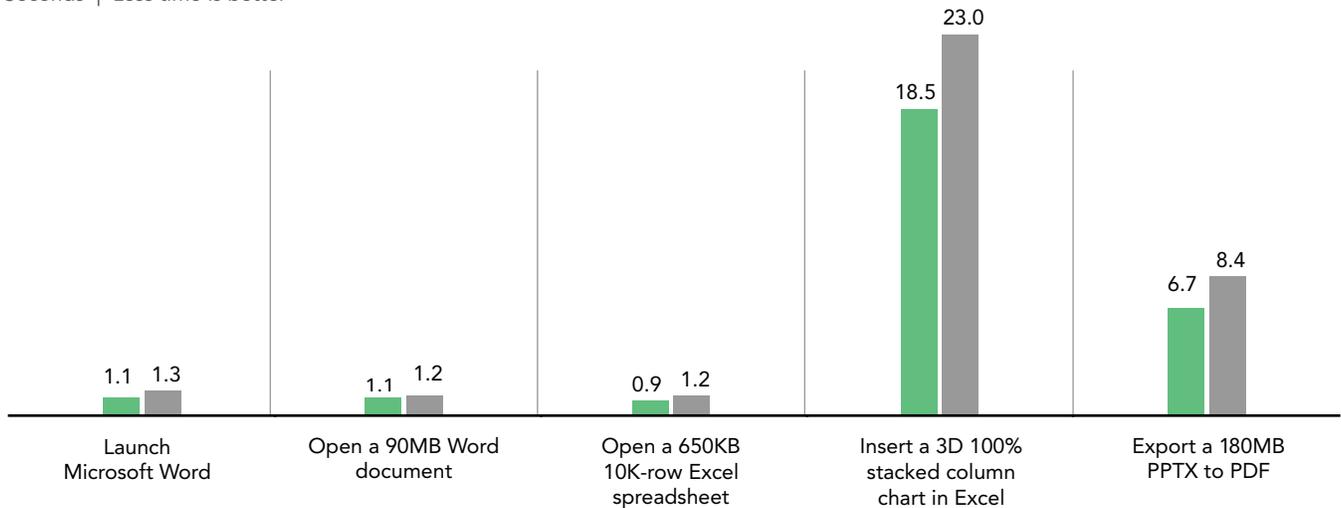| Launch Microsoft Word	Open a 90MB Word document	Open a 650KB 10K-row Excel spreadsheet	Insert a 3D 100% stacked column chart in Excel	Export a 180MB PPTX to PDF
1.1 / 1.3	1.1 / 1.2	0.9 / 1.2	18.5 / 23.0	6.7 / 8.4

Figure 4: The time it took to complete various tasks in Microsoft 365. Lower is better. Source: Principled Technologies.

Full lifecycle security with Lenovo ThinkShield

An organization's security depends on comprehensive security features across the full lifecycle of your devices. According to Lenovo, "ThinkShield evolves with the modern threat landscape to protect your business and adapt to the needs of the workforce."[5] ThinkShield provides security features such as:

- Endpoint security and management
- Data defense and secure cloud backup
- Passwordless authentication
- BIOS firmware
- Firmware, hardware, and software security and verification
- Trusted Supplier program[6]

Audio and visual experience (microphone, speaker, and camera) results

A system's speaker and camera are increasingly important as more and more workers use video conferencing applications to meet with clients and team members. We ran specialized tests to compare the quality of the audio and visual experience on both devices and found that the Lenovo ThinkBook 13x Gen 2 offered strong speaker and camera performance.

Noise cancellation

We've all been on a Zoom or Microsoft Teams meeting where a coworker's crying baby or barking dog interrupts the conversation. But even when there isn't such a disruption on the call, other things such as the fan in a participant's laptop can introduce distracting background noise. We measured the background noise elimination capabilities of both devices and found that the ThinkBook 13x Gen 2 was better at eliminating background noise than the MacBook Air, thanks to two integrated noise-canceling microphones (360° near- and far-field).

Louder speaker output

We found that the Lenovo ThinkBook 13x Gen 2, with its Harman Kardon® speakers with Dolby Atmos® surround sound technology, delivered louder speaker output than the 13-inch MacBook Air (see Figure 5). A louder speaker output means that you have the flexibility to turn up the volume of your device when the noisy world around you drowns out the sound of your HR training video, company meeting, or favorite song.

Maximum audio output needed to reach target dB

Percent of maximum system volume | Lower is better

Lenovo ThinkBook 13x Gen 2
64dB
46%
0%   100%

13-inch Apple MacBook Air (M2 CPU)
64dB
75%
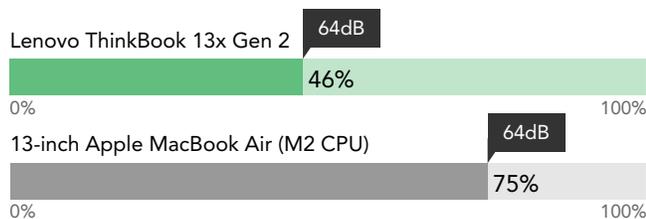0%   100%

Figure 5: Speaker volume output level results. Lower is better.
Source: Principled Technologies.

Camera quality

Evaluating camera image quality is subjective, so for the purposes of comparing the camera quality of the devices, a PT engineer took four selfies in the same well-lit room using the built-in webcams for both laptops. Figure 6 shows the unedited selfies to show how the cameras of both systems work in similar conditions. The ThinkBook 13x Gen 2 has a wider angle camera, so the images do not have the same aspect ratio.

Selfies in a well-lit room

Figure 6: Lenovo ThinkBook 13x Gen 2 (left) and 13-inch Apple MacBook Air (right) unedited selfies in a ~683 lux room with screen brightness set to ~200 nits.

Connected computing with Intel® Unison™

Few of us can work on our laptops for very long without needing to check our phone or take a call. Fortunately for users of the ThinkBook 13x Gen 2, this system comes equipped with Intel Unison that can pair with either Android- or iOS-based smartphones.[7] According to Intel, "Unison seamlessly connects your PC and devices for a universal, easy-to-use experience."[8] Unison gives users the flexibility to make calls, send and receive test messages, transfer files, and manage notifications right from their PC when paired with their phone. To learn more about the features of Unison, visit https://www.intel.com/content/www/us/en/products/docs/unison/overview.html.

We tested using Intel Unison to connect the ThinkBook 13x Gen 2 with an Apple iPhone®, and we were able to quickly pair the devices and share files between the devices.
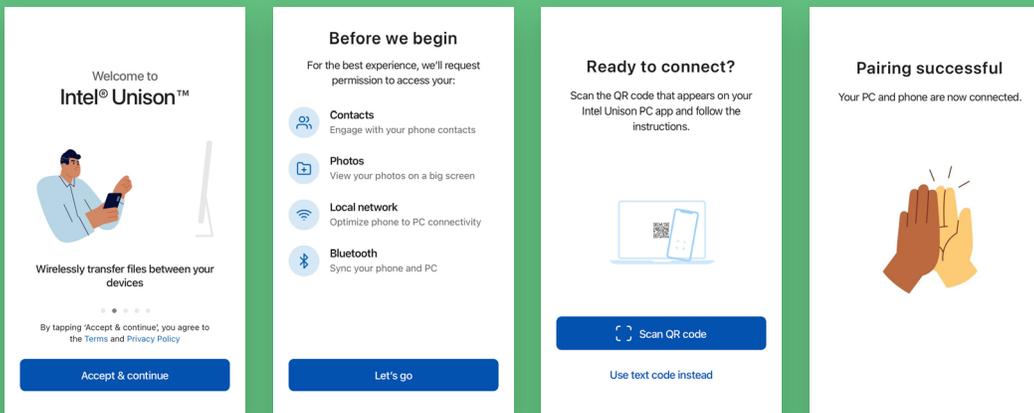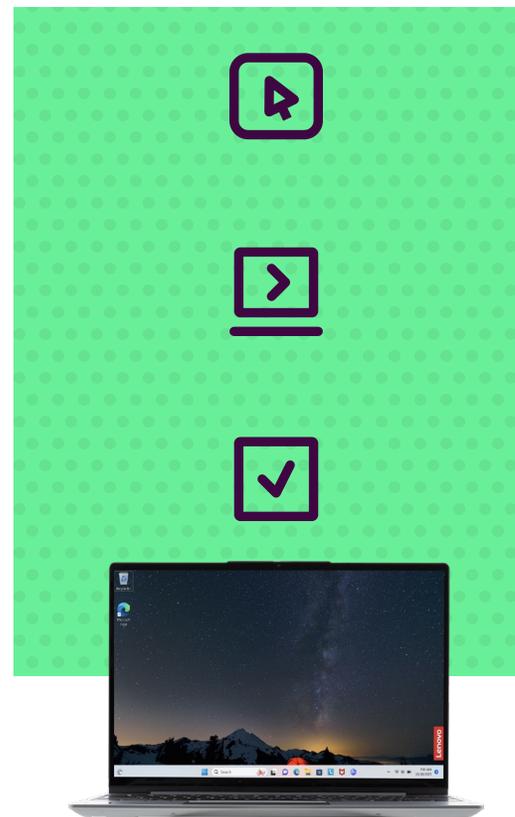

Figure 7: Screenshots of successful pairing of an Apple iPhone and a Lenovo ThinkBook 13x Gen 2 using Intel Unison. Source: Principled Technologies.

Conclusion

When it comes to choosing a business laptop, every user has different needs. While there is no single metric to determine the best device, business users often look for a device that combines performance, portability, and good support for the office productivity applications they use every day. When we compared a Lenovo ThinkBook 13x Gen 2 to a 13-inch MacBook Air, we found that the ThinkBook 13x Gen 2 offered better single-core performance, booted and completed the hand-timed tasks in Microsoft 365 applications faster, and provided good speaker and camera quality. The Lenovo ThinkBook 13x Gen 2 did all of this while being less expensive and weighing about the same as the 13-inch Apple MacBook Air.

1. Lenovo, "ThinkBook 13x Gen 2 (13" Intel) Laptop," accessed October 13, 2023, https://www.lenovo.com/us/en/p/laptops/thinkbook/thinkbook-x/think-book-13x-gen-2-(13-inch-intel)/len101b0006?org.

2. Intel, "What is the Intel vPro Platform?," accessed October 15, 2023, https://www.intel.com/content/www/us/en/architecture-and-technology/vpro/what-is-vpro.html.

3. Intel® Unison™ solution is currently available on Windows-based PCs to pair with Android- or iOS-based phones and tablets. Some premium features only available on eligible designs. All devices must run a supported OS version. See intel.com/performance-wireless for details.

4. Intel, "12th Gen Intel Core Processor," accessed October 13, 2023, https://www.intel.com/content/www/us/en/products/docs/processors/core/12th-gen-core-desktop-brief.html.

5. Lenovo, "Lenovo ThinkShield," accessed October 13, 2023, https://techtoday.lenovo.com/us/en/solutions/thinkshield.

6. Lenovo, "Lenovo ThinkShield."

7. Intel® Unison™ solution is currently available on Windows-based PCs to pair with Android- or iOS-based phones and tablets. Some premium features only available on eligible designs. All devices must run a supported OS version. See intel.com/performance-wireless for details.

8. Intel, "Put Your PC at the Center of All You Do," accessed October 13, 2023, https://www.intel.com/content/www/us/en/products/docs/unison/overview.html.

Read the science behind this report at https://facts.pt/W2RJIqC ▶

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