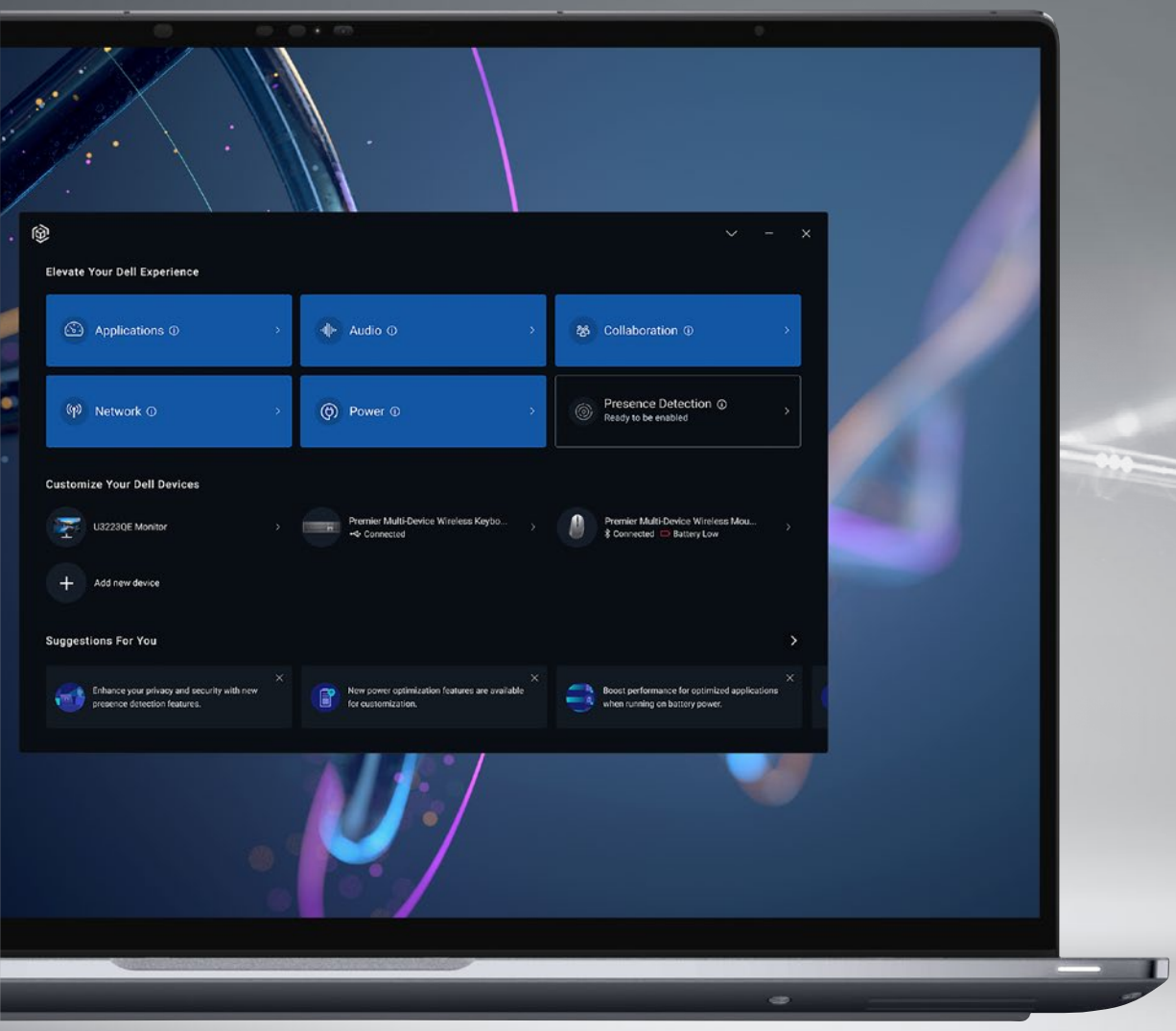
MAXIMISING POWER EFFICIENCY WITH DELL OPTIMIZER

Adapted from Maximizing Power Efficiency with Dell Optimizer: A Technical White Paper by Travis North and Mitch Markow, 2022



DELL Technologies

intel vPRO i7 intel vPRO i9 intel vPRO i5

THE BEST OF **BOTH WORLDS**

Finding the optimal balance between performance and power efficiency is key in getting the best from your hardware. By allowing you to customise your PC's thermal management settings, Dell Optimizer with the help of Intel® Energy Performance Optimizer, running on 12th Gen Intel® Core™processors, can ensure you better runtime efficiency in performance per watt for your workload.

- Quiet & Cool mode provide 12% improvement in performance per watt
- 21.9% performance per watt improvement in quiet mode over the default mode

THERMAL MANAGEMENT MODES

Dell Optimizer with the latest Intel® Core™ processors is an AI-based optimisation software that learns and responds to the way you work, automatically improving application and device performance, PC and accessory battery run-time, audio and video settings, and privacy – all in the background while you're working. The software with the help of Intel® Energy Performance Optimizer, can help push PC performance to the edge of the system's thermal limits, while configurable CPU and GPU power settings dynamically adjust to provide customised performance.

Dell Optimizer offers four thermal management settings that users can choose, each directly affecting power efficiency:

PERFORMANCE MODE

OPTIMISED MODE

COOL MODE

QUIET MODE

TESTING
THE SETTINGS

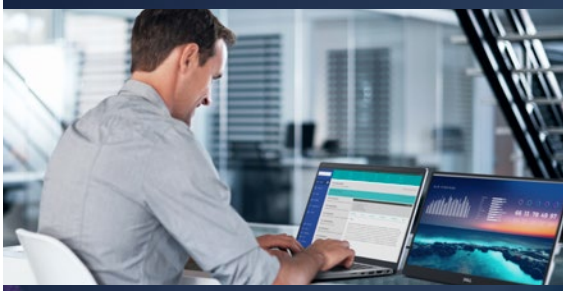
Each of the four Thermal Management Modes were run on a Dell Latitude 7430, and measured against three sub-test categories of the PCMark 10 benchmark:

ESSENTIALS
TYPICAL ACTIVITIES SUCH AS WEB BROWSING, VIDEO CONFERENCING AND APPLICATION START-UP

PRODUCTIVITY
OFFICE APPLICATION-BASED WORKLOADS INCLUDING SPREADSHEETS AND WORD PROCESSING

DIGITAL CONTENT CREATION (DCC)
HEAVY WORKLOADS FOCUSED ON PHOTO EDITING, VIDEO EDITING, RENDERING AND VISUALISATION

As well as a score being obtained for each of the PCMark categories, average power (W) consumption was measured.



RESULTS

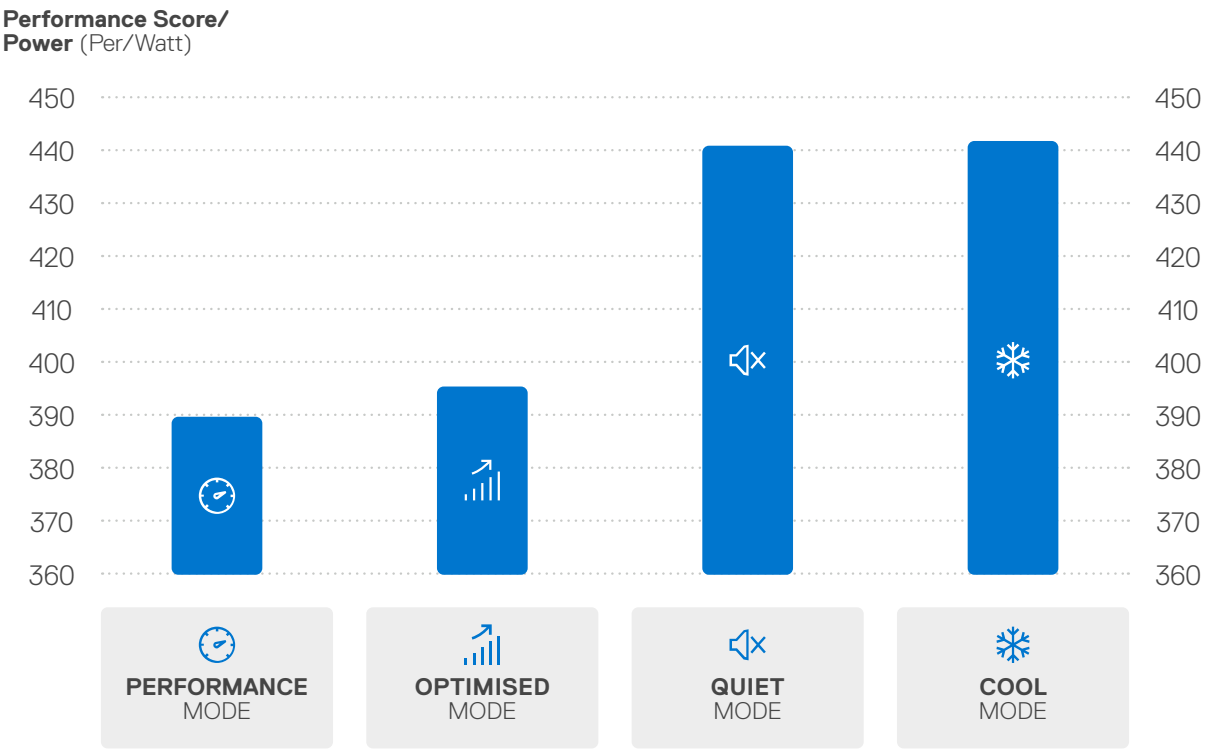
The **best overall performance is achieved in Performance Mode**, when the system is not constrained on thermals, acoustics and power, and **the greatest power savings are achieved in Quiet Mode**. However, by analysing performance per watt, we can explore which modes offer the best balance between efficiency and performance, depending on the type of workload the system is handling.

	Overall	Essential	Productivity	DCC	Average Power (W)
PERFORMANCE MODE	5259	10447	6997	5399	**13.5**
OPTIMISED MODE	5231	10388	6964	5369	**13.24**
QUIET MODE	4783	10317	6815	4223	**10.85**
COOL MODE	4952	10297	6972	4590	**11.21**

PCMark 10 Scoring and Power

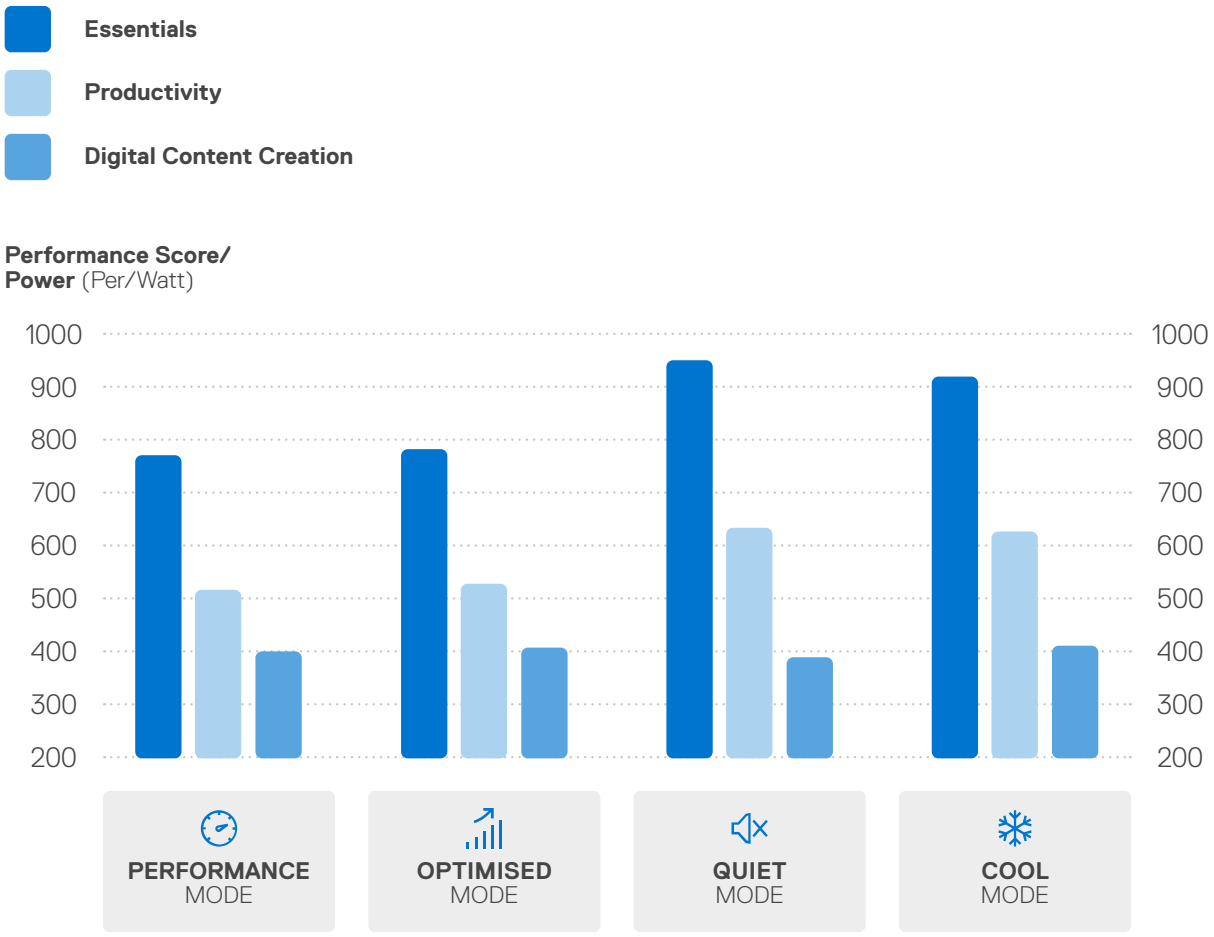
RESULTS CONT.

Quiet and Cool Mode both provide a 12% improvement in performance per watt over the default Optimised Mode. When broken-down by the three test categories, Essentials, Productivity and Digital Content Creation, we see that Quiet Mode is optimal for two of the use cases and Digital Content Creation is best served by Cool Mode.



Overall performance per watt impact of thermal management modes in Dell Optimizer

RESULTS CONT.

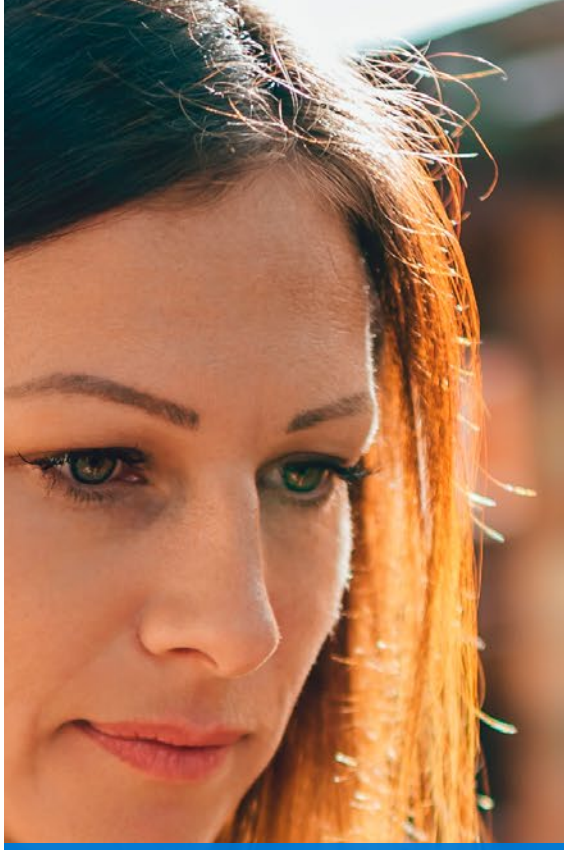


Dell Optimizer PCMark Performance Score Per Watt Comparison

RECOMMENDATIONS

For customers focused on typical office activities such as video conferencing and web browsing, or using standard applications, Dell Optimizer paired with Intel® Energy Performance Optimizer provide a Performance per Watt improvement of 21.9% in Quiet Mode over the default mode.

Latitude 7430



21.9%

PERFORMANCE PER WATT IMPROVEMENT IN QUIET MODE OVER THE DEFAULT MODE

RECOMMENDATIONS CONT.

For raw performance without a focus on power efficiency, Performance Mode provides the greatest overall benefit in computational performance. However, Cool Mode improves the overall efficiency for Digital Content Creation by 1%.

Latitude 7430

PERFORMANCE MODE PROVIDES THE GREATEST OVERALL BENEFIT IN COMPUTATIONAL PERFORMANCE

CONCLUSION

Whatever shape your work takes, there's a thermal management setting that gets the most from your Latitude system, thanks to Dell Optimizer's thermal management technology with Intel® Energy Performance Optimizer. Performance Mode ensures best performance, but at the cost of power efficiency. To achieve a balance, a Thermal Management Mode can be selected according to the type of workload your team is managing. Quiet Mode is ideal for typical office tasks and applications, while Cool Mode optimises heavier workloads. Ultimately, Dell Optimizer's thermal management with Intel® Energy Performance Optimizer, running on the 12th Gen Intel® Core™ processors, gives you the flexibility to strike the right balance between performance and efficiency, tuning your systems to your unique business needs.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