Powering the future of hybrid AI with Lenovo, AMD, and Windows 11 Pro

Executive summary

In today's rapidly evolving technology landscape, IT and business decision-makers face the challenge of charting the right AI path for their organizations.

Hybrid AI, which strategically integrates public and private cloud resources with on-device processing[1] is expected to unlock enhanced productivity, stronger data privacy, and broader democratization of AI across sectors. It represents a pivotal advancement for both consumer and enterprise environments, enabling real-time insights, reduced latency, and local decision-making across distributed workplaces.[2]

The value of hybrid AI cannot be realized through hardware alone. It requires an operating system designed to handle the demands of AI at the edge. **Windows 11 Pro**, when combined with **AMD Ryzen™ AI PRO 300 Series processors** and enterprise-grade **Lenovo ThinkPad devices**, provides a critical foundation — delivering system-level AI acceleration, enterprise security, and seamless manageability. For IT leaders, this is not just a technology upgrade — it's a chance to redefine how people work, how data is protected, and how businesses scale AI securely and cost-effectively.

This white paper explores the transformative potential of hybrid AI through the lens of AMD Ryzen™ AI PRO 300 Series processors, Windows 11 Pro, and **Lenovo's next-generation ThinkPad T14s**. It unpacks their architecture and capabilities — then dives into real-world use cases and the strategic implications for enterprise leaders looking to future-proof their organizations.

AMD RYZEN AI 300 Series

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Introduction to hybrid AI

Historically, AI processing has relied heavily on cloud-based infrastructure due to the substantial computational resources required for model training and execution. However, the rapid escalation in AI compute demands, growing security and privacy concerns, latency limitations, and innovations in chip architecture — as well as modern hardware and software stacks (i.e., Lenovo ThinkPad T14s running Windows 11 Pro with Microsoft Copilot) — are encouraging businesses toward a hybrid AI approach.

What is hybrid AI?

Hybrid AI combines cloud-based and on-device processing to strategically distribute AI workloads, enhancing efficiency and adaptability across environments. By utilizing both public/private cloud resources and local processing capabilities, hybrid AI optimizes performance, cost and latency.

Hybrid AI strategies are most effective when paired with secure, AI-ready operating systems like Windows 11 Pro — engineered to support real-time inference, on-device processing, and enterprise-grade AI workflows.

Traditional cloud-only AI systems often face limitations, including high operational costs, bandwidth constraints, latency delays, and data security vulnerabilities. Hybrid AI mitigates these issues by intelligently offloading workloads. Computationally intensive tasks, such as model training, are executed in the cloud, while real-time inference, lightweight processing, and decision-making run locally. This approach delivers faster responses, minimizes data transmission overhead, and preserves sensitive information.

The Ryzen AI PRO 300 Series processors now powering many AI PCs offer the performance and features hybrid AI deployments are likely to require. These processors are equipped with a dedicated AI engine known as an NPU and enable real-time AI execution, even for complex tasks, without relying solely on the cloud.

Tangible benefits of hybrid AI

Hybrid AI enables AI to operate closer to the data and provides organizations with the means to leverage AI across both cloud and on-device environments. Additional benefits include:

Optimized cost and resource efficiency

Shifting workloads to hybrid AI-enabled devices minimizes costs related to data transfer, storage, and cloud compute resources. A recent study suggests that **re-allocating 20% of generative AI processing to local devices could save organizations up to $16 billion by 2028.**[3] Using Windows 11 Pro with Microsoft Copilot, organizations can amplify this benefit. Devices experience up to U.S. $58 in time-savings[4] per device from faster deployment, and businesses report a 250% ROI over three years with payback in under six months.[5] Additionally, Lenovo Digital Workplace Solutions combined with Windows 11 can lower end-user support costs by 30%.[6]

Responsive performance through tailored workload management

Hybrid AI strategically allocates workloads to the most suitable environment, whether it's on the Lenovo ThinkPad T14s, on prem, or in the cloud. Tasks requiring real-time decision-making or low latency — such as inventory updates, device-level analytics, or user-facing AI features — are processed locally. Meanwhile, computationally heavy functions like model training or long-term optimization remain in the cloud. For example, in logistics, edge devices can provide immediate updates on inventory, while cloud-based AI optimizes delivery schedules. According to studies, **organizations using Windows 11 report a 50% increase in workflow speed,**[7] and 65% of Lenovo users reported a productivity improvement with Copilot+ PC — alongside smoother multi-device experiences, key for time-sensitive use cases.[8]

Enhanced data security and privacy

Hybrid AI processes sensitive data locally, minimizing the risk of exposure during transmission to the cloud. Critical information remains under the organization's control and directly on devices like the Lenovo ThinkPad T14s, reducing vulnerabilities and improving compliance with data privacy regulations. Devices running Windows 11 Pro report a **58% drop in security-related incidents**[9] and a **20% reduced risk of successful security attacks.**[4]

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The role of advanced processors in hybrid AI

The expansion of AI workloads is reshaping both how and where data is processed. By 2025, more than 50% of all data is expected to be generated on edge devices.[10] To meet this demand for low-latency, high-efficiency AI processing, a new class of specialized AI processors has emerged.

These advanced processors integrate dedicated Neural Processing Units (NPUs) — specialized engines optimized for accelerating AI workloads. Unlike traditional CPUs and GPUs, which are general-purpose compute engines, NPUs are purpose-built to handle AI model operations like inference and matrix multiplications with exceptional energy efficiency.

When paired with Windows 11 Pro, these AI processors operate within a secure and intelligent OS environment purpose-built to support localized AI workloads. Windows 11 is optimized to leverage NPUs to enable real-time inferencing, advanced automation, and device-level analytics while maintaining enterprise-grade security.

AMD Ryzen™ AI PRO 300 Series processors include an XDNA™ 2 NPU and deliver an industry-leading 50 TOPS. The design of AMD Ryzen™ AI PRO 300 Series processors enables efficient execution of complex tasks such as natural language processing, computer vision, and predictive analytics without relying solely on cloud infrastructure. This localized processing not only improves performance but also aligns with hybrid AI strategies by reducing latency, bandwidth usage, and operational costs.

Together, AMD AI processors and Windows 11 Pro provide a foundation for secure, scalable, and future-ready hybrid AI deployments — tailored for the demands of modern enterprise environments.

By 2025, more than 50% of all data is expected to be generated on edge devices.

Use cases

When combined with edge computing, IoT devices, and backend systems, **AMD Ryzen™ AI PRO 300 Series processors** can optimize real-time processing and dynamic resource allocation for hybrid AI workloads. Below are several cross-industry applications for AI PCs which the **Lenovo ThinkPad T14s running Windows 11 Pro** is bringing to life:

Healthcare

Smarter, context-aware consultations

Instant imaging analysis for faster diagnoses

Finance

Real-time fraud detection at the endpoint

High-speed financial modeling, on demand

Retail

Personalized in-store experiences that convert

Autonomous inventory monitoring and replenishment

Manufacturing

Real-time quality control with visual AI

Predictive maintenance that prevents downtime

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Healthcare

Smarter, context-aware consultations: Physicians can engage in more informed, dynamic consultations with real-time AI support that contextualizes symptoms, history, and lab results — all during a live session. This level of fluid AI interaction is made possible by on-device inference powered by Ryzen AI, optimized for natural language understanding, and tightly integrated with Windows 11's Copilot and productivity ecosystem, allowing clinicians to stay in flow while navigating patient records, AI insights, and follow-up actions securely on the ThinkPad T14s.

Instant imaging analysis for faster diagnoses: Radiologists can now review and interpret high-resolution scans in real time, without waiting on cloud uploads. AI PCs process complex imaging locally, highlighting anomalies within seconds and allowing clinicians to make confident, timely decisions — even during patient consultations. This is enabled by the AMD Ryzen™ AI PRO processor's XDNA™ 2 NPU, which accelerates AI workloads like pattern recognition, while the RDNA™ 3.5 iGPU delivers crystal-clear visualization. Windows 11 Pro ensures secure on-device execution and responsive multitasking, helping clinical teams streamline diagnostics without compromising patient privacy.

Finance

Real-time fraud detection at the endpoint: Financial institutions can stop fraudulent activity at the point of interaction. Whether at a teller counter or within a trading app, AI PCs analyze behavior patterns, geolocation anomalies, and transaction history locally — flagging threats instantly without relying on external servers. This is secured by Windows 11 Pro's Microsoft Pluton chip for hardware-level protection, while AMD Memory Guard encrypts data in use. Ryzen AI PRO's on-device AI acceleration ensures low-latency pattern analysis to protect both customers and operations.

High-speed financial modeling, on demand: Financial analysts can generate risk scenarios, simulate forecasts, and visualize portfolio shifts — all on-device, with no need to offload to the cloud. This shortens decision cycles and ensures sensitive models stay local. Powered by AMD Zen 5 CPU cores and accelerated by the iGPU for fluid visualization, these workloads are enhanced by Windows 11's native support for AI-integrated apps like Excel with Copilot, giving finance teams the ability to model, pivot, and present insights — faster and more securely.

Retail

Personalized in-store experiences that convert: Digital signage and kiosks powered by AI PCs offer real-time, personalized product recommendations based on browsing history and purchase behavior — right at the point of sale. No cloud roundtrips, no latency. Ryzen AI PRO's on-device inference enables this rapid personalization, while Windows 11 Pro ensures seamless visual rendering, app integration, and secure data handling — turning the Lenovo ThinkPad T14s into a retail intelligence hub.

Autonomous inventory monitoring and replenishment: Retailers can now automate inventory control through AI PCs that process shelf and sensor data in real time. When stock runs low, restocking workflows are triggered instantly reducing stockouts and labor costs. This is enabled by Ryzen AI and GPU coordination for real-time sensor data analysis, and Windows 11's multitasking capabilities and Wi-Fi 7 readiness, ensuring reliable connectivity and low-latency alerts across distributed store networks.

Manufacturing

Real-time quality control with visual AI: Real time to catch defects — such as microcracks or fill inconsistencies — immediately, avoiding costly rework or recalls. The RDNA™ 3.5 iGPU processes high-resolution visual data, while XDNA™ 2 NPUs run defect detection models on-device. Windows 11's AI-enhanced performance stack and security protocols ensure these insights stay protected and actionable, even in high-throughput environments.

Predictive maintenance that prevents downtime: AI PCs at the edge monitor equipment signals — temperature, vibration, load — and identify patterns that suggest wear or failure before it happens. This allows technicians to intervene proactively, reducing unplanned outages and increasing asset longevity. Ryzen AI's local compute capabilities handle real-time inference, while Windows 11 Pro provides the secure OS layer and remote management tools needed for industrial environments. Combined with Lenovo's enterprise-grade durability, these AI PCs are engineered for the factory floor.

These cross-industry examples underscore the transformative role AI PCs play in enabling Hybrid AI.

AMD Ryzen™ AI PRO 300 Series processors and pro technologies deep dive

Designed specifically for enterprise applications, AMD Ryzen AI PRO 300 Series processors include a 3x faster NPU compared to previous generation Ryzen 8040 Series processors.[11] These processors are designed to support Microsoft Copilot+ PCs to enhance workplace productivity and efficiency.

In addition, devices like the Lenovo ThinkPad T14s equipped with AMD Ryzen™ AI PRO 300 Series processors deliver a robust and reliable experience built on the secure foundation of AMD PRO Technologies. AMD PRO provides enterprise-grade multilayered security features, simplified manageability, and long-term reliability needed to support enterprise-scale IT management.

Combined with Windows 11 Pro, these platforms offer an end-to-end enterprise stack — enabling secure, responsive, and policy-compliant AI deployments across distributed environments. AMD PRO Technologies offer a comprehensive suite of management and security features designed to meet the demands of hybrid AI environments.

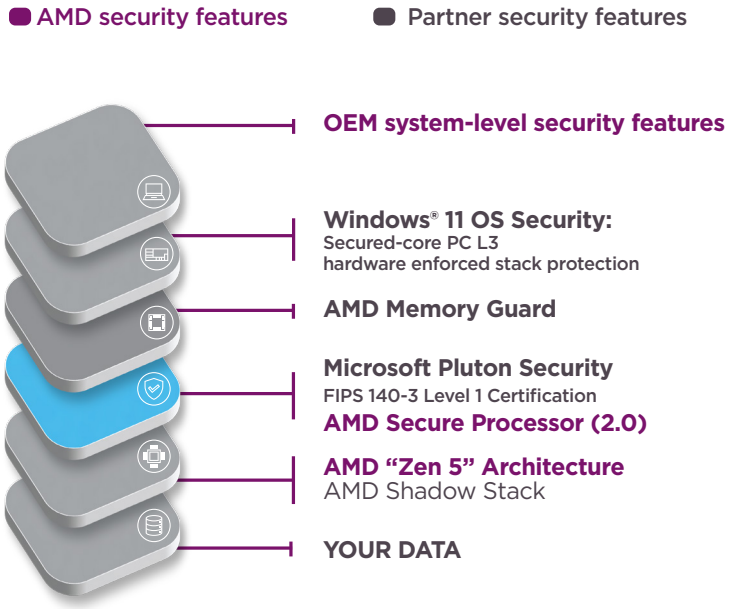
AMD PRO Security

Hybrid AI workflows often involve processing sensitive data across distributed systems. AMD PRO Security embeds multi-layered protection directly into the hardware, operating system, and system levels, reducing exposure to vulnerabilities. Integrated technologies, such as the Microsoft Pluton Security Processor, safeguard credentials, encryption keys, and sensitive data during AI tasks. Windows 11 Pro complements this with built-in virtualization-based security (VBS), secure boot, and kernel isolation — ensuring endpoint resilience against advanced threats. Together, AMD PRO and Windows 11 create a zero-trust-ready environment, ideal for regulated industries.

AMD Ryzen™ AI Pro 300 Series processors delivering multi-layered security from hardware, OS to the system level	
AMD Memory Guard	Helps protect the company's sensitive business data when an employee's PC is lost or stolen.
NEW Cloud Bare Metal Recovery (cBMR)	Communicates PreOS to recover the system (via cloud) without shipping the system.
NEW Supply Chain Security (AMD Device Identity)	Authenticates genuine AMD SoCs in customer platforms and its traceability across the supply chain.
NEW Watchdog Timer	Augments resiliency support through detection and recovery of hung SoC processes.

Architecture diagram

AMD Ryzen™ AI PRO 300 processor security levels



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AMD PRO Manageability

AMD PRO Manageability provides the highest level of compliance with open standards for remote systems management.[12] It simplifies device lifecycle management by offering robust tools for remote monitoring, asset tracking, and secure control of AI PCs. Windows 11 extends this with cloud-native device provisioning, Microsoft Endpoint Manager integration, and advanced policy enforcement — enabling IT to deploy and manage AI PCs like the ThinkPad T14s at scale, across hybrid workforces. Features like KVM (Keyboard, Video, and Mouse) enhancements enable IT teams to securely manage devices across on-premises and cloud environments, optimizing resource utilization and reducing system downtime.

AMD PRO business ready

Supplies platform consistency and quality assurance to support mission-critical AI workloads. With long-term platform stability, enterprises can confidently integrate AMD Ryzen PRO processors into their infrastructures, optimizing performance, minimizing disruptions, and reducing total cost of ownership. These benefits are amplified on Windows 11 Pro, which is engineered for long-term support cycles, ISV certification alignment, and forward compatibility with AI-enhanced enterprise workloads.

Together, AMD PRO Technologies and Windows 11 Pro deliver the performance, protection, and manageability needed to scale hybrid AI.

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Windows 11 Pro: Built for enterprise AI workloads

As hybrid AI adoption accelerates, operating systems must actively enable secure, responsive, and intelligent computing. Windows 11 Pro is designed to meet this demand, with features purpose-built for AI performance, enterprise security, and modern IT management at scale.

Productivity and performance: Empowering the AI-enhanced workforce: Windows 11 Pro with Microsoft Copilot delivers measurable productivity gains through native support for AI workloads, fast multitasking, and seamless application integration by enabling 50% faster completion of common workflows compared to older devices.[7] With features like Snap Assist, Copilot, and DirectStorage, users experience smoother workflows and faster data access. Whether it's a healthcare provider reviewing imaging results or a financial analyst running complex simulations in Excel, Windows 11 Pro ensures the AI PC becomes a real-time decision-making assistant, not just a computing device.

Enterprise-grade security: Built-in, not bolted on: Windows 11 Pro is Microsoft's most secure operating system yet, designed to protect users, credentials, and data across all layers of the enterprise stack and delivering a 58% reduction in security incidents[9] (as reported by organizations migrating to Windows 11).

- Microsoft Pluton Security Processor integrates directly into the CPU (including AMD Ryzen AI PRO) to safeguard credentials, encryption keys, and firmware.
- Virtualization-Based Security (VBS), Secure Boot, BitLocker, and Credential Guard provide hardware-rooted protections against modern threats.

Combined with AMD PRO Security and Lenovo ThinkShield, Windows 11 Pro supports a zero-trust architecture that ensures enterprise data stays protected.

50%

faster completion of common workflows compared to older devices

58%

reduction in security incidents

33%

faster CPU performance than Apple's M3 Pro 12-core chip

Manageability and stability: Windows 11 Pro simplifies IT operations with advanced remote management, lifecycle support, and policy control tools that allow organizations to deploy and manage AI PCs at scale.

- Seamless integration with Microsoft Intune and Endpoint Manager for unified device provisioning and policy enforcement.
- Modern device management features, including Autopilot and remote wipe, reduce manual intervention and deployment time.
- Long-term platform stability and support provide consistency for enterprise-scale rollouts, particularly on certified devices like the Lenovo ThinkPad T14s.
- Supports Windows Autopatch and cloud-native servicing models to reduce downtime and ensure compliance.

These capabilities enable IT teams to deliver intelligent, secure, and performant AI experiences to end users — while maintaining full operational control across a distributed enterprise.

By combining the AI acceleration of AMD Ryzen™ AI PRO processors, the durability of Lenovo ThinkPad devices, and the intelligent foundation of Windows 11 Pro, organizations gain a future-ready hybrid AI platform that delivers a clear competitive edge over other platforms.

- Copilot+ PCs built on this stack are up to 58% faster than the MacBook Air M3, based on Cinebench 24 multi-core benchmarks (see aka.ms/cpclaims) — delivering smoother performance for AI-driven workflows.
- The AMD Ryzen™ AI 9 HX PRO 375 CPU extends this lead further with up to 33% faster CPU performance[13] than Apple's M3 Pro 12-core chip, providing enhanced responsiveness for complex enterprise tasks. When it comes to endurance, AMD delivers up to 64% longer video playback time[13] and 22% longer runtime on Microsoft Teams, making it the superior choice for productivity and longevity[13] in hybrid work environments.

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Outlook

Advancements in AI capabilities and the expanding range of AI-driven use cases are accelerating the need for powerful, efficient, and scalable on-device processing.

Implications for IT Decision-Makers (ITDMs)

AI processors such as the AMD Ryzen™ AI PRO 300 Series are no longer just incremental upgrades — they are rethinking the role of the PC in enabling intelligent automation, safeguarding sensitive data, and supporting distributed workforces. In this environment, AI PCs powered by AMD Ryzen™ AI PRO 300 Series processors, Lenovo ThinkPad devices, and Windows 11 Pro form a strategic foundation for the hybrid AI enterprise. To future-proof their infrastructure, IT leaders must respond to three pressing challenges:

Workflows are outpacing legacy hardware
Today's workloads — AI inference, content generation, real-time analytics — are too demanding for legacy PCs. Employees need devices that can handle it all without cloud reliance or slowdown. The AMD Ryzen™ AI PRO 300 Series delivers up to 50 TOPS of NPU performance and powers these AI tasks locally. Paired with Windows 11 Pro, Microsoft Copilot, Snap Assist, optimized multitasking, and the durability of Lenovo ThinkPads, organizations are seeing up to 50% faster workflows[7] and real productivity gains.

Rising AI adoption increases risk exposure
As AI becomes embedded in daily workflows, endpoints are processing more sensitive data — making security a top concern. AMD PRO Security, built into Ryzen processors, works with Microsoft Pluton to protect credentials and data at the silicon level. Windows 11 Pro adds layered protections with VBS, Secure Boot, and Credential Guard, while Lenovo ThinkShield strengthens device-level defenses. Together, these technologies form a zero-trust-ready platform that has helped reduce security incidents by 58%.[9]

Cloud dependency drives cost and complexity
Offloading AI workloads to the cloud strains networks, increases latency, and inflates compute costs. On-device AI acceleration from AMD eliminates these inefficiencies by processing data locally. Windows 11 Pro streamlines management with tools like Intune, Endpoint Manager, and Autopilot, while Lenovo's TruScale DaaS model helps reduce support costs by up to 30% and improves lifecycle control[6]. The result: lower TCO, higher control, and a modern, scalable endpoint environment.

organizations are seeing up to 50% faster workflows and real productivity gains

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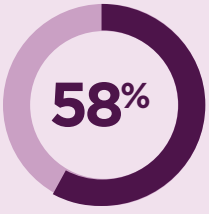

Lenovo's TruScale DaaS model helps reduce support costs by up to 30% and improves lifecycle control

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Conclusion

The AMD Ryzen™ AI PRO 300 Series processors represent an advancement in hybrid AI technology. With advanced AI capabilities directly embedded into the processor, these chips enable real-time AI applications with minimal latency and on-device data privacy. When paired with Windows 11 Pro, they unlock a secure, intelligent, and enterprise-ready AI experience at the endpoint.

As businesses tackle the complexities of AI integration, the AMD Ryzen™ AI PRO 300 Series Processor — combined with Windows 11 Pro and Lenovo ThinkPad reliability — offers a scalable, secure, and future-ready solution that meets diverse enterprise needs.

Next-gen AI performance is here. Unlock the benefits of AI for your organization — without compromise — with the Lenovo ThinkPad T14s Gen 6, powered by the AMD Ryzen™ AI PRO 300 Series processors and built for Windows 11 Pro.

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