# D-Wave's Advantage2 Ushers in the Era of Enterprise-Ready Quantum Computing

May 22, 2025 By: Heather West, PhD

## **IDC'S QUICK TAKE**

D-Wave Quantum Inc. announced the general availability of Advantage2, its sixthgeneration annealing quantum computer designed for real-world enterprise use. This launch builds on earlier strategic milestones and reflects a broader shift from quantum experimentation to enterprise adoption, positioning D-Wave as a major player in the emerging landscape of commercially viable quantum computing.

### **PRODUCT ANNOUNCEMENT HIGHLIGHTS**

On May 20, 2025, quantum computing vendor, D-Wave Quantum Inc. (D-Wave) <u>announced</u> the general availability of its sixth-generation quantum computer, Advantage2. Customers can access the system through Leap, D-Wave's quantum cloud service. Alternatively, organizations can procure a dedicated, on-premises Advantage2 system, which can be integrated with their existing classical compute infrastructure.

As noted by D-Wave, Advantage2 is an energy-efficient annealing quantum computer designed to solve complex problems beyond the capabilities of classical systems. This system features D-Wave's most advanced quantum processor to date and is built for real-world applications in optimization, materials simulation, and artificial intelligence (AI).

The Advantage2 processor leverages D-Wave's Zephyr topology to deliver 20-way connectivity, enabling it to be used for more complex quantum computations. It also incorporates Fast Anneal, a proprietary feature that supports coherent quantum annealing at scale by minimizing the impact of external disturbances. To support large-scale, production-grade applications, Advantage2 provides access to hybrid solvers via the Leap quantum cloud service, including D-Wave's nonlinear hybrid solver, which can manage up to two million variables and constraints.

According to D-Wave, in comparison with the earlier D-Wave quantum annealing systems, the Advantage2 demonstrates a 40% increase in energy scale, a 75% reduction in noise, and a twofold increase in coherence, all of which contribute to faster, more accurate, and higher-quality quantum solutions.

### **IDC'S POINT OF VIEW**

D-Wave's launch of the general availability of Advantage2 quantum system represents a pivotal moment not just in quantum computing technology but also in its real-world adoption by enterprises and organizations. Unlike gate-based quantum computing systems that are still confined to research labs or experimental use, Advantage2 is designed with immediate commercial application in mind. By focusing on practical usability and delivering it through accessible platforms like its Leap cloud service, D-Wave is positioning quantum computing as an enterprise-ready tool capable of transforming how businesses approach complex problem-solving.

This launch builds on a consistent pattern of announcements from D-Wave that reflect a strategic push toward industry integration and real-world impact. For example, the recent procurement of a D-Wave Advantage system by Germany's Julich Supercomputing Centre (JSC) makes it the first high-performance center in the world to own a D-Wave annealing quantum computer. This installation will support advanced research in AI and optimization, enabling scientists to conduct quantum experiments with direct access to a quantum computer. This move signifies a growing global confidence in the practicality and relevance of D-Wave's technology.

Equally significant is D-Wave's collaboration with Davidson Technologies to install an onpremises Advantage2 system at Davidson's Alabama facility. This marks one of the first such deployments in the United States and reinforces the feasibility of integrating quantum computing into mission-critical environments such as defense and national security. For other enterprises, this installation serves as a proof point that D-Wave's quantum solutions are mature enough for on-site use, enabling greater control, data security, and operational customization.

In parallel, D-Wave has continued to push the boundaries of real-world quantum applications. A recent international research effort led by D-Wave demonstrated the quantum simulation of programmable spin classes-complex magnetic materials is relevant to both business applications and scientific exploration. This study highlights D-Wave's potential to deliver a computational advantage over classical systems in modeling materials science problems, a domain critical to industries like energy, semiconductors, and manufacturing. D-Wave also ventured into blockchain innovation by introducing a quantum-enhanced blockchain architecture. This proposed design leverages quantum computing to improve both the efficiency and security of blockchain protocols, addressing scalability and energy consumption concerns that limit classical implications. By enabling more nuanced modeling of enterprise problems, these developments extend the reach of quantum computing into a diverse range of real-world applications.

Ultimately, D-Wave's trajectory — punctuated by the Advantage2 launch and complementary initiatives — signals a shift from quantum promise to quantum delivery. Enterprises now have an opportunity to pilot, deploy, and scale quantum applications that align with their strategic goals. As the ecosystem continues to grow and quantum solutions become more deeply embedded in industry workflows, the approach undertaken by D-Wave ensures that its technology remains at the center of this next wave of computational transformation.

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