



The first and only quantum computer built for business

The Advantage™ system is the first and only quantum system designed for business and is the most powerful and connected commercial quantum computer in the world. With more than 5000 qubits, 15-way connectivity, and powerful hybrid solvers, Advantage gives customers the ability to solve far larger, more complex problems and drive real-world value for their businesses. The all-new Advantage performance update includes a newly fabricated QPU for even better business performance. Now, customers can solve even larger and more complex problems faster, with more precision.

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Key Benefits of Advantage

Advantage is the most connected and powerful commercial quantum computer in the world, allowing customers to solve larger, more complex real-world problems.

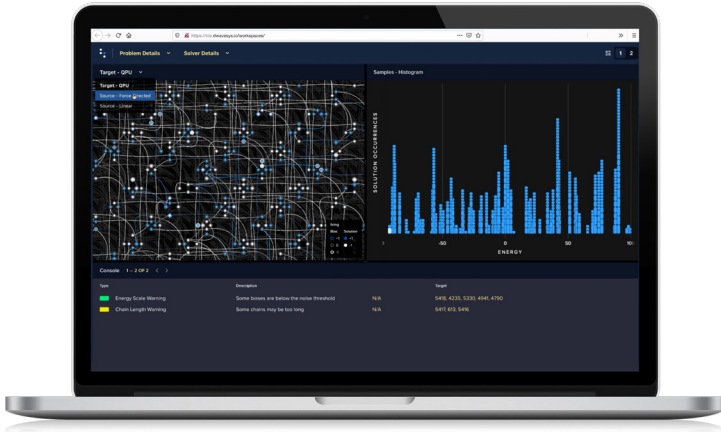
- **Richer topology:** The Advantage quantum processing unit (QPU) has 5000+ qubits with 15-way connectivity. This topology makes Advantage ideal for solving real-world optimization problems in the enterprise, such as employee scheduling and transportation routing.
- **Better solutions:** With 2.5x greater connectivity, larger, more complex problems can be more efficiently mapped to Advantage than to previous-generation systems, giving customers higher quality solutions.
- **Much larger problems:** The Leap hybrid solver service (HSS) accepts business-sized problems and solves them on a combination of quantum and classical resources using advanced algorithms. The HSS accepts problems of up to 1 million variables making it suitable for truly enterprise-scale problem solving. In addition to discrete and continuous variables, the HSS accepts up to 100,000 constraints, giving customers more flexibility and a more native representation of problems
- **Quantum annealing controls:** The Advantage system gives power users fine-grained control over the quantum annealing process, supporting:
 - Per-qubit anneal offsets.
 - Changes to the global anneal schedule, including annealing time, anneal pause and quench, and reverse anneal.
 - Time-dependent gain on linear coefficients.



For more information about the system, contact us at sales@dwavesys.com, or visit us at www.dwavequantum.com.

Leap Quantum Cloud Service

Leap brings quantum computing to the real world by providing secure, real-time cloud access to Advantage and hybrid quantum-classical solvers. Sign up here: <https://cloud.dwavesys.com/leap>



Ocean SDK

D-Wave's Python-based software development kit, Ocean™, reduces time to application development for D-Wave solvers. Open-sourced on GitHub, Ocean facilitates collaborative projects that can leverage quantum and hybrid quantum/classical resources.

Try it out:

- Ocean SDK: <https://github.com/dwavesystems>
- Ocean docs: <https://docs.ocean.dwavesys.com>

Solver API

Calls to the system go through the Solver API (SAPI), a RESTful interface responsible for user authentication, user interaction, and work scheduling. SAPI connects to back-end servers that send problems to and return results from Advantage and other solvers.

QPU Specifications

Number of qubits	5000+
Number of couplers	35,000+
Graph size	P16 (Pegasus)
Qubit temperature	< 15 mK

Dimensions

Length	3.0 m (10 ft.)
Width	2.1 m (7 ft.)
Height	3.0 m (10 ft.)
Mass	3800 kg (8400 lbs.)

Power

Rated power	25 kW, maximum
Mains voltage	120/208 V, 60 Hz (standard) 230/400 V, 50 Hz (international)
Mains connection	3 Wire + N + PE

Cooling

Coolant	15 kW of cooling (4.3 refrigeration tons)
Max. water pressure	6 bar (88 psi)
Min. temperature	15 °C @ 9.4 L/minute (2.5 gpm @ 50 °F)
Max. temperature	25 °C @ 20.5 L/minute (5.4 gpm @ 77 °F)
HVAC	5 kW (17,000 BTU/h) in normal mode 12.5 kW (43,000 BTU/h) in auxiliary mode

Regulatory Compliance

US	UL 62368-1, FCC Part 15 part B Class A
Canada	CSA C22.2 NO. 62368-1:19, Industry Canada ICES-003, Class A

Environmental Requirements

Temperature	
Operating	20 to 25 °C (68 to 77 °F)
Rate of change	1 °C (1.8 °F) in 15 minutes (maximum allowable)
Shipping/storage	-10 to 40 °C (14 to 104 °F)
Humidity	
Operating	5 to 80% RH (noncondensing)
Shipping/storage	< 85% RH (noncondensing)
Pressure	
Operating	65 to 106 kPa (9.4 to 15.4 psi)
Shipping/storage	65 to 106 kPa (9.4 to 15.4 psi)
Altitude	0 to 2300 m (7500 ft.)
Max. building vibration	50 µm per second
Ambient magnetic field	100 µT (maximum allowable)
Noise level	75 dBA

Consumable Materials

Gases	Nitrogen gas Grade 4.8 (99.998%) Helium gas Grade 5.0 (99.999%) Usage: ~1 T-size cylinder each per year
Cryogenics	Liquid nitrogen Usage: ~6L/day (1.6 U.S. gal./day)

Networking Requirements

L2, L3 requirements	Dedicated L2 block; /27 internal IP addresses
Ethernet speed	E100 (can be capped at 10 Mbps)
IP addresses	IPv4 externally available; assigned
Physical connections	RJ-45 GE (1000BASE-TX)