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Quantum Computing

Chase Boddison

What are Quantum Computers?

Quantum computers are one of those cutting-edge technological advancements that are talked about in the news and on social media that a lot of people may turn a blind eye to or just shrug off. However, I'm here to tell you that these new supercomputers are nothing to just shrug off, in fact they will be the way of the future, without a doubt! Quantum computers' main difference from digital computers is that they use qubits instead of bits. This results in quantum computers being able to solve extremely complex equations that would take the most advanced supercomputers decades to solve, in mere minutes! While the computing speed of these machines is astronomically faster, they are still in their early testing stages and only a handful of them exist. The top researchers developing these computers are repeatedly starstruck about their capabilities, and they have a very vague understanding about how they work.

Quantum Mechanics

To understand quantum computing you first need to understand how it works using quantum mechanics. Quantum mechanics is the study of the motion and interaction between subatomic particles, for example electrons. Quantum mechanics differs from fundamental physics in that electrons exist in multiple states simultaneously, defying the common understanding of classical physics that was once thought complete.

Qubits

Qubits or quantum bits are used to power quantum computers, and their capabilities exceed traditional bits on an exponential level. A traditional bit can only represent one binary value, either a 0 or 1 meaning it only has 2 possible states. Whereas a qubit can exist as a linear combination of both using the phenomena of superposition that appears in quantum mechanics. Another interesting property of qubits is quantum entanglement, which means that two or more qubits can be correlated to each other in such a way that the state of one is completely dependent on the state of the other. Quantum entanglement allows quantum computers to store substantially more data than supercomputers in qubits and allows for extremely fast and accurate solutions to complicated equations or questions that would take traditional supercomputers centuries to solve!

What Does the Future Hold for Quantum Computing?

Quantum computers are still in their early testing phases and as scientists begin fully understanding how exactly they function, we will get a better timeline outlook on when to expect to see them in any sort of practical applications. I would say the timeline will be closer to 20 years to be on the safe side; however, there's plenty of physicists that put that timeline closer to 10-15 years. Time will tell as we begin to formulate a better understanding of these magnificent machines, on when we might see them taking the world by storm. Once they do come into the limelight and make their "Opening Day" debut, the world will see a technological jump similar to that of the switch from analog to digital computers. With analog computers the technology could only get so efficient before the products began to look and perform similarly year over year. Now we're getting to the point where digital computers' bell curve is beginning to round similarly to how analog computers did. Quantum computers are going to be that next big jump in technology that digital computers were to analog computers. That's why it's so lucrative to learn as much as you can about them now before they take the world by storm, so you can position yourself to make money by either investing into them or be one of the first people to utilize them.

Companies to Watch

Amid this new technological revolution that's happening before us, there are companies that are positioning themselves to come out on top. These companies already have departments dedicated to building, understanding, and testing the technology so that one day in the near future we may see this technology on the shelves of our local stores. According to BlueQubit, a leading quantum computing company, these are the top companies to keep an eye on.

(<https://www.bluequbit.io/quantum-computing-companies>)

- **Google (Quantum AI):** With the help of the latest innovations, Google Quantum AI is pushing the limits of computation in the field of quantum computing. The platform has achieved significant milestones with a focus on quantum supremacy. Its continued advancements showcase the company's commitment to pushing the boundaries of quantum computing applications.
- **Microsoft (Azure Quantum):** As a technological giant on the global stage, Microsoft Corporation is playing a key role in quantum computing through its Azure Quantum initiative. Microsoft's efforts in building a quantum supercomputer underscore the company's commitment to advancing scalable quantum computing technologies, including areas like quantum data loading.
- **D-Wave Systems:** A significant company in the quantum computing space, D-Wave Systems, has made a name for itself as a driving force in the sector. D-Wave has made a substantial contribution to the investigation of revolutionary quantum computing techniques thanks to its concentrated focus on quantum annealing. The company has made progress in developing and commercializing quantum processors. This includes efforts to demonstrate the efficiency of quantum annealing in solving optimization problems. In terms of research and development, D-Wave Systems is currently at the forefront of quantum annealing. The company's research raises the possibility of a synergy between AI and quantum computing, opening the door to creative solutions to challenging issues.

- **Xanadu:** The company, an alumnus of the Creative Destruction Lab seed-stage accelerator, specializes in designing and building photonic quantum computers. With total funding of \$250 million to date, Xanadu aims to push the boundaries further by building a quantum computer capable of scaling up to one million qubits. Xanadu recently introduced Aurora, a quantum system that uses light-based qubits for quantum processing. It is accessible through PennyLane, an open-source quantum machine learning library, allowing researchers to develop and execute quantum algorithms efficiently.

For investors it's important to note that the quantum computer age isn't quite on our doorstep yet, but you can stay up to date on all these companies' quantum computer programs. Companies like Google and Microsoft post consistent reports and research papers on their findings, better yet to check out D-Wave or Xanadu's advancements they post them right on their websites. The quantum age is looming right in front of us.

Innovative Solutions & Support (ISSC)

Sean Murphy



What is ISSC?

Innovative Solutions & Support is a small-cap avionics company that specializes in cockpit modernization. ISSC has been around since the late 1980s and has built its reputation on developing display systems, autothrottles, and advanced flight management solutions that extend the operational life of aging aircraft. Over this time, ISSC has supplied their products to a variety of business jets, regional airlines, and military fleets. Unlike aerospace giants, ISSC runs lean with only a few hundred employees, but it has proven adept at winning retrofit business where operators prefer affordable upgrades over buying new aircraft. That history of delivering certified, lower-cost modernization options has positioned ISSC as a unique player poised to benefit from upcoming waves of mandated avionics compliance.

Aging Aircraft & FAA Mandates

One of the biggest drivers of ISSC's opportunity lies in the problem of aging aircraft and the steady stream of FAA mandates that govern them. Many commercial, business, and military aircraft remain in service for 20 to 30 years, long after their original avionics technology is outdated. While these airframes are still structurally sound, their cockpit systems often fail to meet modern safety and navigation requirements. The FAA has addressed this through mandates such as ADS-B Out, terrain awareness (TAWS), collision avoidance (TCAS), and, more

recently, performance-based navigation (PBN) standards. Each of these rules has forced operators to upgrade their avionics to remain compliant and legally fly in controlled airspace.

For operators, replacing older aircraft with new builds is rarely economical. Instead, retrofitting the cockpit with modern flight displays, autothrottle systems, and upgraded navigation capabilities offers a far less expensive path to compliance. This is where ISSC thrives. Its certified retrofit solutions allow legacy fleets, regional jets, business aircraft, and even military transports to extend service life while satisfying the FAA's evolving requirements. For investors, the combination of a large global backlog of older aircraft and a regulatory environment that compels compliance creates a recurring demand cycle. ISSC doesn't need to convince operators to upgrade; the FAA does that for them, positioning the company to benefit each time a new mandate is introduced.

Our Outlook

Looking forward, ISSC has positioned itself exceptionally well for the future of aircraft modernization. With a business model built around cost-effective retrofits, the company is uniquely aligned with the inevitable FAA guidelines that will push aging fleets toward mandatory upgrades. As compliance deadlines draw closer, the demand for ISSC's certified systems should only accelerate, creating a long runway for growth. However, despite this promising backdrop, ISSC remains a small-cap stock, which makes it more vulnerable to volatility. Earnings misses, integration costs, or delays in mandate rollouts could trigger sharp downside swings, even if the long-term thesis remains intact. For investors, this duality of strong secular tailwinds coupled with small-cap risk defines the ISSC opportunity: significant upside potential if execution remains solid, but with the understanding that quarterly performance will likely bring larger-than-average stock price moves.

Arista Networks (ANET)

The Arista Networks logo, consisting of the word "ARISTA" in a bold, blue, sans-serif font.

Paul Reilly

Company Overview

Arista Networks is an industry leader in client to cloud networking for both large scale data centers and artificial intelligence networks. Their platforms provide availability, automation, and security for modern technological networks. More specifically they offer cloud computing software components such as operating systems and network switches, essential applications for efficient data centers and networks. Arista sells hardware to numerous fortune 500 companies across multiple sectors. They deliver products to companies involved in financials, specialty cloud service providers, and enterprises.

The Market

Main consumers are data centers in need of cloud computing hardware. The infrastructure offers companies the opportunity to increase the scale and outreach of their company. This occurs through data centers containing critical information such as financial records, consumer information and applications essential for business operations. This market has surged in recent years and is currently worth 80.8 billion in 2025 and is expected to nearly double in size by 2033 to 157 billion. The increased demand in this market is driven by the growing need for computing services that AI and cloud computers require. Globally, organizations are transitioning to cloud computing and AI workloads. Big time consumers of Arista's products and services in the United States include Microsoft, Google, SpaceX, Citigroup and others. These companies implement extensive networking solutions into high scale data centers and cloud computing environments.

Arista Networks and Broadcom

Arista Networks and Broadcom work together to design and produce data center components. Arista has performed well this year as the position has seen a gain of 20.56% which is great for Broadcom as they almost piggyback off Arista. Broadcom sells the chips that Arista uses on both their routers and switches, so with high demand for routers and switches, Arista need to purchase a greater amount of Broadcom chips to meet demand. Later in the year Arista will combine its hardware with Broadcom next generation networking chip, Tomahawk 6. The Tomahawk 6 has a switching capacity of 102.4 terabits/sec, double the bandwidth of any available chip. Senior VP at Broadcom believes "Tomahawk 6 is not just an upgrade-it's a breakthrough". This could potentially increase revenues for Arista as the chip incorporates Arista hardware when applied in centers. Data centers are expected to create a strong demand for the chip in order to benefit from the perks new technology in business operations provides. The combination of services and innovative strategies fit for specific solutions between both companies has offered customers a seamless experience.

Arista Competition and Why them?

Arista Networks biggest competitor within the computer networking industry is Cisco Systems (CSCO). Cisco is objectively larger and has a broader portfolio of products and services. However, the key difference between the companies is Arista's differentiated strategy. Arista uses third party chips, (primarily from Broadcom) rather than designing their own like Cisco. This business model gives Arista the ability to provide its clients with cheaper solutions that offer greater flexibility. Cisco uses a more complicated operating system that hinders efficiency, reliability and versatility; Arista uses an extensible operating system (EOS). The primary difference between this system and Cisco's is that it does not require different operating systems in different environments, cutting costs significantly. Regarding full scale growth, Arista Networks has grown far more than Cisco in the five years from 2019-2024. Over that period of time Cisco grew at a compound annual growth rate of less than 1%, as for Arista their CAGR rose 24%. Although during a couple of those years there was market turbulence for an extended

period so the argument could be made that conditions weren't in Cisco's favor, Arista fared better under pressure as their clients continued to grow during the crisis.

Arista Networks' revenue has been growing quarter to quarter at a high rate. Arista networks revenue consists of two segments, product revenue and service revenue. Product revenue being the company's key source of income is their main focus; this segment includes the sales of switches and routers. Service revenue can be attributed to revenue coming from technical support, software updates and general maintenance on hardware they sell. Arista Networks released earnings for Q2 2025 August 5th, EPS beat the consensus estimate by \$0.08. Quarterly revenue was reported at \$2.2 billion, a YoY increase of 30%. Earnings expectations for next year are expected to grow 17% from \$2.20 to \$2.58 per share.

Thank You for reading and good luck.

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