Quantum Cryptography - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts 2019 - 2029

Market Report | 2024-02-17 | 100 pages | Mordor Intelligence

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Report description:

The Quantum Cryptography Market size is estimated at USD 0.88 billion in 2024, and is expected to reach USD 4.68 billion by 2029, growing at a CAGR of 39.69% during the forecast period (2024-2029).

Key Highlights
-Organizations across the globe increasingly implement quantum cryptography solutions to boost network and application security. The market is expected to witness new opportunities owing to the increasing uptake of these solutions in the government and BFSI verticals. The industry players focus on advanced solutions to improve security and secure transactions.
-The rising incidents of cyber-attacks with acceleration in digitalization, growing cybersecurity funding, increasing demand for next-generation security resolutions for cloud and IoT technologies, and the development of next-generation wireless network technologies are anticipated to propel the growth of the global quantum cryptography market.
-The evolution of wireless network technologies has driven the development and adoption of quantum cryptography. Wireless networks like Wi-Fi, Bluetooth, and cellular networks have become ubiquitous in modern society. Their use has led to an increase in the amount of data being transmitted wirelessly.
-The high implementation and installation costs are one of the factors that restrain the adoption of quantum cryptography. Quantum cryptography is a relatively new technology requiring specialized hardware and software. This hardware can be expensive, and the cost of installation and maintenance can also be high. Additionally, the technology is still in the early stages of development, so the availability of sollutions and services incorporating quantum cryptography is currently limited.
-The pandemic has accelerated the shift towards remote work and increased the use of digital technologies for communication and collaboration. This has led to an increased demand for secure communication technologies, including quantum cryptography, which offers a higher security level than traditional cryptographic methods.
-The post-pandemic era would likely increase demand for quantum cryptography from emerging technologies such as the Internet

of Things (IoT), autonomous vehicles, and smart cities. These technologies generate and exchange massive amounts of sensitive data, which requires robust security measures to protect against cyber-attacks.

Quantum Cryptography Market Trends

Rising Number of Cyber Attacks is Expected to Drive the Market Growth

- The rising number of cyber attacks has driven the development and adoption of quantum cryptography. Quantum cryptography is a technology that uses the principles of quantum mechanics to secure communication channels. It offers a high level of security that traditional cryptographic methods cannot compromise.
- The increasing frequency and sophistication of cyber-attacks have made traditional cryptographic methods vulnerable to attacks. For example, conventional encryption methods rely on mathematical algorithms, which can break faster computing power or advanced algorithms. Quantum cryptography, on the other hand, depends on the principles of quantum mechanics to ensure the security of communication channels.
- Quantum cryptography offers several advantages over traditional cryptographic methods. For example, it provides high secrecy, meaning an eavesdropper cannot read the encrypted message, even with unlimited computing power. Any attempt to eavesdrop on a quantum-encrypted message will also disrupt communication, alerting the legitimate parties involved.
- As a result, quantum cryptography is being increasingly adopted by governments, military organizations, financial institutions, and other entities that require high levels of security for their communication channels. However, the technology is still in its early stages, and some challenges need to be addressed before it can be widely adopted. These challenges include the high cost of implementation, the need for specialized hardware, and the limited distance over which quantum-encrypted communication can be transmitted.
- Organizations must remain vigilant and continuously assess the security of their communication channels, including those secured with quantum cryptography. They should also invest in ongoing research and development to identify and address quantum cryptography vulnerabilities and ensure they stay ahead of emerging threats. By taking a proactive approach to security, organizations can minimize the risk and cost of a data breach, even in the face of a rising number of cyber-attacks. According to IBM, the global average data breach cost from May 2020 to March 2022 was USD 4.35 Million.

North America is Expected to Hold Significant Market Share

- North America accounts for a significant share of the global quantum cryptography market owing to the factors such as the rising number of cyber-attacks, increasing focus on cyber security by end-users, and growing investments in data privacy. Furthermore, the significant presence of major quantum cryptography market vendors in North America boosts the market growth in the region.
- Furthermore, supportive government regulations for data security, especially in the United States, make North America a leading segment in the quantum cryptography market.
- For instance, in July 2022, the US Department of Commerce's National Institute of Standards and Technology (NIST) revealed the first four encryption tools designed to withstand future cyber attacks powered by quantum computing. The four selected encryption algorithms would become part of NIST's post-quantum cryptographic standard, which is expected to be finalized in two years.
- Data breaches and network intrusions are very recurrent in the region. The adoption of smart devices and extensive use of digital technologies have increased the number of cyber-attacks. Quantum cryptography technology can defend data against these evolving threats.
- The region is seeing multiple partnerships and collaborations to promote and develop apprenticeship programs to enhance the

workforce's skills in cryptography. Such programs are expected to help the collective growth of the market by providing the necessary skills and encouraging more companies to adopt these technologies.

Quantum Cryptography Industry Overview

Quantum Cryptography Market is fragmented, with the presence of major players like QuintessenceLabs, Crypta Labs, ID Quantique, MagiQ Technologies, Inc., and NuCrypt. Players in the market are adopting strategies such as partnerships, innovations, and acquisitions to enhance their product offerings and gain sustainable competitive advantage.

- February 2023 - At MWC23, ID Quantique, KCS, and SK Telecom launched new quantum-enhanced cryptography hardware. IDQ's quantum random number generator (QRNG) technology and KCS' cryptographic communication semiconductor technology are combined into a single security chipset. The next-generation security chip offers protection against hackers and the most significant security for IoT and linked devices.
- November 2022 - QuintessenceLabs, one of the quantum cybersecurity industry leaders, announced today at Quantum World Congress that its qOptica Quantum Key Distribution (QKD) solution provides enhanced key enabling technology to assist in improving security against harmful cyber-attacks such as "harvest now, decrypt later" (HNDL) threats, in which proprietary data is stolen now with the intent of decrypting it later with quantum technology. The second version of qOptica QKD offers greater security while safely providing key material resistant to brute force and algorithmic assaults by conventional or quantum computers.

Additional Benefits:

- The market estimate (ME) sheet in Excel format
- 3 months of analyst support

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