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Quantum Cryptography (QC) Market by Solution (Quantum Key Distribution (QKD), Quantum Random Number Generators (QRNG), Quantum-safe Cryptography)), Service (Professional, Managed), Security Type (Network, Application, Cloud) - Global Forecast to 2030

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Abstracts

The global quantum cryptography (QC) market size is estimated to grow from USD 1.15 billion in 2024 to USD 7.59 billion by 2030 at a Compound Annual Growth Rate (CAGR) of 36.8% during the forecast period. The drivers for the quantum cryptography market are the rising levels of cybersecurity attacks and threats, improved approaches related to the progression of quantum computing, investments from government and military setups, the need for regulatory compliance, and integration with emerging technologies like IoT and AI. Main challenges-from both high deployment costs, largely QKD systems as well as technical complexity associated with the technology (requiring 'specialized knowledge' for deployment and possibly becoming complex to integrate into already existing IT infrastructures) -are said to be the biggest barriers to entry for the market, more so among SMEs. Low awareness of the benefits of quantum cryptography is another reason for which many organizations depend on conventional measures of security. Indefinite clarity about the maturity of the market and the intense competition by established solutions with encryption also prevents its widespread adoption. Overcoming these challenges is crucial to the quantum cryptography's extensive usage.

By Solution Segment, Quantum Key Distribution (QKD) solutions account for a larger market share during the forecast period

Quantum Key Distribution is an essential product in the quantum cryptography market,

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as it offers security that can never be faked with any other technology. It detects attempts at interception using principles of quantum mechanics. With the ability to survive against the rising threats from quantum computers, encryption is secured in the long term; hence, there is an increasing need to adopt QKD as new cybersecurity threats are on the rise. QKD can easily be applied to the existing infrastructures.

Progress toward security improvement, scalability, and cost-effectiveness are ongoing developments in quantum cryptography. CV-QKD uses the light waves inherent in quantum states for scalable, secure key distribution, making it more deployable and compatible with existing telecom infrastructures. The measurement device-independent QKD further increases security by removing the two-state detection vulnerabilities; this enhances protection from all sidechannel attacks. Chip-based QKD systems based on integrated photonic circuits present compact and cost-effective solutions that really improve the scalability.The emergence of QKD as a Service (QKDaaS) brings quantum-safe communications to even more citizens. National initiatives like the National Quantum-Safe Network Plus of Singapore aim to integrate QKD in national infrastructure, foster industry collaborations between government agencies and private sector players, and position QKD as a fast-growing cybersecurity solutions.

By region, North America accounts for the highest market size during the forecast period.

The quantum cryptography market, being the fastest growing in North America, is driven primarily by the surge in cyber-attacks and the added focus on improving data security. Growth drivers of this market include a mature technological infrastructure, intensified government investment in cybersecurity, and landmark data protection regulations like HIPAA and GDPR, compelling organizations to promote advanced encryption solutions. Early adoption of digital transformation across the region increases demand for quantum-safe encryption as technologies such as cloud computing and IoT only expand the attack surface. A strong presence of market giants that deal in leading quantum cryptography companies and government initiatives such as the National Quantum Initiative Act also helps develop market growth. Gradually, quantum cryptography has emerged as necessary in the sectors involved in finance, healthcare, and cloud services to protect sensitive data, thus emphasizing the importance of countering evolving cyber threats.

Breakdown of primaries

The study contains insights from various industry experts, from component suppliers to

Tier 1 companies and OEMs. The break-up of the primaries is as follows:

By Company Type: Tier 1 – 40%, Tier 2 – 35%, and Tier 3 – 25%

By Designation: C-level Executives – 45%, Directors – 35%, and Managers– 20%

By Region: North America – 35%, Asia Pacific – 30%, Europe – 25%, Middle East & Africa– 5%, and Latin America – 5%

Major vendors in the PQC market include Toshiba (Japan), NXP Semiconductor (Netherlands), Thales (France), IDEMIA (France), Palo Alto Networks (US), DigiCert (US), Quintessence Labs (Australia), QuantumCtek (China), ISARA (Canada), IBM (US), ID Quantique (Switzerland), MagiQ Technologies (US), Crypto Labs (South Korea), Qasky (China), Qubitekk (US), Nucrypt (US), Quantum Xchange (US).

The study includes an in-depth competitive analysis of the key players in the PQC market, their company profiles, recent developments, and key market strategies.

Research Coverage

The report segments the QC market by solution, service, security type, transmission medium, deployment mode, organization size, vertical, and region. It forecasts its size by Solution (Quantum Key Distribution, Quantum Random Number Generator, Quantum-Safe Cryptography, Quantum Key Management), By Service (Professional Services, Managed Services), By Security Type (Network Security, Application Security, Cloud Security), By Transmission Medium (Fibre-Optic Cable Transmission, Satellite-Based Transmission), By Deployment (On-Premises, Cloud) By Organization Size (SME's and Large Enterprises), By Vertical (BFSI, government and Defense, Healthcare, IT & ITeS, Automotive, Energy and Utilities and Other Verticals), By Region (North America, Europe, Asia Pacific, Rest of the World).

The study also includes an in-depth competitive analysis of the market's key players, their company profiles, key observations related to product and business offerings, recent developments, and key market strategies.

Key Benefits of Buying the Report

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The report will help the market leaders/new entrants with information on the closest approximations of the revenue numbers for the overall quantum cryptography market and the subsegments. This report will help stakeholders understand the competitive landscape and gain more insights to position their businesses better and plan suitable go-to-market strategies. The report also helps stakeholders understand the market pulse and provides information on key market drivers, restraints, challenges, and opportunities.

The report provides insights on the following pointers:

Analysis of key drivers such as (Rising cyberattacks in the digitalization era, Rising investments in Research and Development (R&D), Rising demand for next-generation security solutions for cloud and IoT technologies, Growing demand for advanced encryption techniques in real-world applications, Growing advancements in Quantum Computing); Restraints (High Implementation Costs, Rising technical complexities, Lack of expertise); Opportunities (Spur in demand for security solutions across industry verticals, Increasing need for integrated solutions, Strategic Collaborations Accelerating Innovation in Quantum Cryptography) and Challenges (Commercialization of quantum cryptography, Technological implementation challenges, Integration of Quantum Cryptography with existing system, scalability issues to meet high volume data transmission).

Product Development/Innovation: Detailed insights on upcoming technologies, research development activities, new products, and service launches in the QC market.

Market Development: Comprehensive information about lucrative markets – the report analyses the QC market across varied regions.

Market Diversification: Exhaustive information about new products and services, untapped geographies, recent developments, and investments in the QC market.

Competitive Assessment: In-depth assessment of market shares, growth strategies, and service offerings of leading players Toshiba (Japan), NXP Semiconductor (Netherlands), Thales (France), IDEMIA (France), Palo Alto Networks (US), DigiCert (US), Quintessence Labs (Australia), QuantumCtek (China), ISARA (Canada), IBM (US), ID Quantique (Switzerland), MagiQ Technologies (US), Crypta Labs (UK), Qasky (China), Qubitekk (US), Nucrypt

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(US), Quantum Xchange (US) among others, in the QC market strategies.

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