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Global Post-Quantum Cryptography Market Size study, by Type (Lattice-Based Cryptography, Code-Based Cryptography), Solution, Services, Enterprise Size, Vertical, and Regional Forecasts 2022-2032

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Abstracts

Global Post-Quantum Cryptography Market is valued approximately at USD 0.84 billion in 2023 and is anticipated to grow with an extraordinary CAGR of more than 37.60% over the forecast period 2024-2032. As quantum computing approaches practical maturity, the world faces a pressing cryptographic inflection point. Post-quantum cryptography (PQC) has emerged as a critical defense mechanism, designed to protect digital infrastructure from quantum-enabled decryption threats. Unlike classical encryption schemes, PQC leverages complex mathematical constructs such as lattice-based and code-based algorithms that are resilient against the computational power of quantum machines. Governments, corporations, and cybersecurity providers are rapidly mobilizing resources to implement quantum-resistant protocols before the advent of cryptographic obsolescence.

Rising digitalization across industries has led to massive data exchanges over networks, amplifying the need for future-proof security. As standard encryption algorithms like RSA and ECC stand on the brink of being compromised by Shor's algorithm running on quantum processors, enterprises are compelled to future-proof their systems. Initiatives like the National Institute of Standards and Technology's (NIST) PQC standardization project and collaborations with cryptographic solution vendors have catalyzed the market. Cloud service providers, payment processors, and telecom operators are beginning to integrate hybrid cryptographic frameworks—combining classical and quantum-resistant algorithms to ensure backward compatibility and forward security. However, the high complexity of implementation and the need for skilled personnel may hinder immediate widespread adoption.

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A particularly potent growth lever lies in the adoption of PQC across government defense systems, critical infrastructure, and regulated sectors such as finance and healthcare. These domains prioritize zero-trust architecture, secure key exchanges, and end-to-end encryption, all of which benefit from PQC advancements. At the same time, as zero-day exploits and sophisticated nation-state attacks proliferate, PQC is being increasingly viewed not just as an optional upgrade, but a foundational pillar of next-generation cybersecurity strategies. Tech startups and established cryptography firms alike are launching APIs, toolkits, and migration services to assist enterprises in this complex transition.

As post-quantum technologies mature, cloud-native deployment and cryptographic agility platforms are making it easier for organizations to pilot, scale, and maintain secure environments. This evolution has given rise to managed PQC-as-a-Service (PQCaaS), enabling smaller enterprises to access enterprise-grade protection without overhauling their tech stack. Open-source communities and global alliances such as ETSI and IETF are also contributing to interoperable standards and compliance frameworks, further accelerating trust and adoption. As more organizations perform crypto-agility assessments, the PQC market is poised for an exponential shift in mainstream deployment.

Regionally, North America leads the charge with extensive R&D, federal cybersecurity mandates, and early vendor deployment strategies. The United States is home to major quantum research hubs and houses many key players in both quantum computing and cryptography. Europe is not far behind, with the EU’s digital resilience act and quantum flagship initiatives aligning cybersecurity with quantum advancement. Meanwhile, the Asia Pacific region is set to grow at the fastest pace, thanks to robust investments from China, India, South Korea, and Japan into quantum-safe technologies. Latin America and the Middle East & Africa are gradually entering the landscape, especially through multinational collaborations and cloud service expansions.

Major market player included in this report are:

IBM Corporation

ISARA Corporation

Quantinuum Ltd.

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Post-Quantum Ltd.

SandboxAQ

Thales Group

Microsoft Corporation

Toshiba Corporation

Amazon Web Services (AWS)

Intel Corporation

PQShield Ltd.

CryptoNext Security

EvolutionQ Inc.

Qrypt Inc.

Utimaco GmbH

The detailed segments and sub-segment of the market are explained below:

By Type

Lattice-Based Cryptography

Code-Based Cryptography

By Solution

Hardware Security Modules (HSM)

Cryptographic Libraries

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- Encryption Keys & Algorithms
- Others

By Services

- Integration & Deployment
- Support & Maintenance
- Consulting & Training

By Enterprise Size

- Large Enterprises
- Small & Medium Enterprises

By Vertical

- Government & Defense
- BFSI
- IT & Telecom
- Healthcare
- Retail
- Energy & Utilities
- Others

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By Region:

North America

- U.S.
- Canada

Europe

- UK
- Germany
- France
- Spain
- Italy
- Rest of Europe

Asia Pacific

- China
- India
- Japan
- Australia
- South Korea
- Rest of Asia Pacific

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Latin America

Brazil

Mexico

Middle East & Africa

Saudi Arabia

South Africa

Rest of Middle East & Africa

Years considered for the study are as follows:

Historical year – 2022

Base year – 2023

Forecast period – 2024 to 2032

Key Takeaways:

Market Estimates & Forecast for 10 years from 2022 to 2032.

Annualized revenues and regional level analysis for each market segment.

Detailed analysis of geographical landscape with Country-level analysis of major regions.

Competitive landscape with information on major players in the market.

Analysis of key business strategies and recommendations on future market approach.

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Analysis of competitive structure of the market.

Demand side and supply side analysis of the market.

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