AhP-Tech delivers Quantum Cryptography as a Service with Volt Active Data.

Future-Proofing Data Security in the Quantum Age.

In an era defined by the convergence of quantum computing and artificial intelligence, cybersecurity paradigms are undergoing radical transformation. Traditional mechanisms like OTP (One-Time Passwords), long trusted for access control, are now facing unprecedented threats. Pseudo-random number generators (PRNGs) that underpin most commercial OTP systems are increasingly vulnerable—especially as AI accelerates the discovery of statistical patterns and quantum computers push the limits of brute force attacks.

As the demand grows for *quantum-resilient* security solutions, **AhP-Tech** is leading the charge with its Platform-as-a-Service offering—**AQCCP** (AhP Quantum Computing Cloud Platform). This next-generation system integrates **quantum hash generation, secure OTP management**, and **enhanced key protection**, all delivered via a highly scalable, real-time platform backed by **Volt Active Data**. AND the need for a **real-time, high-integrity data platform** to make its PaaS vision a reality.

The Challenges with Conventional OTPs

Most existing OTP solutions rely on PRNGs—algorithms that generate number sequences which only appear random. As research shows, these patterns can often be reverse-engineered through statistical analysis, especially when passwords are limited to short decimal strings. In today's AI-driven world, these weaknesses are no longer theoretical.

The limitations of current OTP systems include:

- Known vulnerabilities in standard libraries (e.g., Java-based RNGs)
- Predictable patterns in decimal-only passcodes
- Limited password lengths that simplify data profiling

Such flaws make it easier for threat actors to compromise authentication flows, particularly in high-value environments like finance, critical infrastructure, and government services.

AhP-Tech's Vision: Quantum Hashes as a Security Backbone

AhP-Tech's approach pivots away from pseudo-random models toward **true entropy-driven quantum hash generation**. Through AQCCP, organizations gain access to **enhanced OTP mechanisms** that are:

- Resistant to reverse-engineering via AI or quantum algorithms
- Generated from **true random sources** hosted in AhP-Tech's data centers
- Delivered with **multi-dimensional indexing** for tamper-resistant lookups
- Built to support NIST-certified **Post-Quantum Cryptography (PQC)** standards like FIPS-203 and FIPS-204

These hashes are designed to be one-time use or valid for a limited number of accesses, and are dynamically generated on-demand based on usage thresholds.

How Volt Active Data enables Quantum Security at Scale

While AhP-Tech pioneered the cryptographic science behind AQCCP, it needed a **real-time, high-integrity data platform** to make its PaaS vision a reality. That's where **Volt Active Data** came in.

By choosing Volt Active Data, AhP-Tech was able to fulfill its core requirements for delivering quantum-secure services:

- **Real-Time Quantum Hash Access**

  Each hash value must be assigned to a user session instantly without collisions or delays. Volt's **in-memory, single-partition execution engine** guarantees sub-millisecond responses, essential for OTP flows and transaction-critical systems.

- **ACID-Guaranteed Isolation for Security**

  Quantum hash records and their one-time usage statuses required strict transaction boundaries. Volt's **serializable isolation and ACID-compliant processing** ensure that every hash allocation is unique, secure, and never duplicated.

- **Dynamic Scaling for Hash Inventory Management**

  With Volt's **elastic horizontal scaling**, AhP-Tech's AQCCP can instantly increase or decrease hash storage and processing capacity as business needs evolve—without service interruptions or downtime. This means the business can efficiently onboard new clients and handle spikes in demand in real time, eliminating costly delays and over-provisioning. As a result, AQCCP reduces operational costs, improves system reliability, and enables faster, uninterrupted global growth across AWS-deployed zones.

- **Efficient Cleanup and Retention Policies**

  Quantum hashes lose relevance after use. Volt's **TTL, data migration, and custom retention policies** allow AhP-Tech to continuously clean up expired entries, keeping memory use optimal while maintaining audit capabilities.

- **Global Availability with Localized Control**

  Volt Active Data is deployed across **multiple AWS regions**, so AhP-Tech can ensure low-latency access to hash inventories while complying with regional data residency and latency-sensitive use cases.

Quantum Cryptography, Delivered as a Platform

By building AQCCP on Volt Active Data, **AhP-Tech transformed its cryptographic expertise into a fully operational platform** that:

- Abstracts the complexity of quantum-resistant key generation
- Delivers security capabilities as APIs for OTP, encryption, and key management
- Offers centralized control with distributed performance

This synergy allows enterprise customers—especially in regulated or high-risk industries—to **adopt quantum-ready security** without needing quantum infrastructure themselves.

A New Standard for Post-Quantum Security

As the lines between classical and quantum computing blur, Volt Active Data and AhP-Tech together demonstrate how innovation in **data platforms and cryptographic science** can work hand-in-hand. The collaboration enables not just stronger OTP systems, but an entirely new model for **resilient, real-time, and scalable security** in the quantum age.

AhP-Tech's AQCCP is more than a service—it's a blueprint for the future of cybersecurity, where **quantum cryptography is not a niche feature**, but a foundational pillar.

About Volt Active Data

The Volt Active Data Platform enables companies to unlock the full value of their data and applications by making it possible to have scale without compromising on speed, accuracy, or consistency. Based on a simplified stack and an ingest-to-action layer that can perform sub 10-millisecond decisioning, Volt's unique, no-compromises foundation gives enterprises the ability to maximize the ROI of their 5G, IoT, AI/ML, and other investments, ensure "five 9's" uptime, prevent fraud and intrusion, deliver hyper-personalized customer engagement, and save on operational costs.

About AhP-Tech

AhP-Tech, Inc. HQ in Taiwan is a company dedicated to developing cutting-edge quantum computing technologies. We apply these innovations to diverse fields including cybersecurity, artificial intelligence, and bio-chemistry, focusing on commercialising integrated quantum solutions. Our goal is to provide advanced PaaS solutions, support R&D, and help enterprises overcome technical challenges. Visit https://www.ahptech.com.tw/en/index.html to learn more.