Post–Quantum operation system, firmware & cloud solutions

post-quantum solutions for your business

Contents

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This is the first and only complex software and hardware solution for businesses and industries protecting from quantum threats in the world

↗ Company Quros is a high-tech IT company responsible for developing cybersecurity products which protect business and industries from next-generation cyberattacks.

↗ Company Quros is doing research in the field of cryptography, discrete math, secure network architecture, communications, operating systems design and embedded software development.

↗ Due to the actively developing quantum computing systems our company was targeted to develop network applications and devices able to resist future quantum threats, such as recovering private keys from public parameters.

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Our Goals

↗ Quros is aimed to develop, adopt and integrate quantum-resistant solutions for heterogeneous systems in different industries

↗ Our products are designed to keep secure codebase to minimize classical attack surface and prepare businesses be protected from quantum-threats

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Problem

↗ In 4 May 2022, the White House released a National Security Memorandum, laying out the administration's plan for securing critical systems against potential quantum threats.

Now

The current information systems and networks rely on classical cryptosystems where secret key shared via publickeys and parameters transmitted over Internet

It takes millions of years for an attacker to recover secret key by public parts passively sniffing network traffic

2025

But, In 2025, with the power of <u>Kookaburra</u> quantum processor developed by IBMan attacker can easily recover private key knowing only the public in minutes

Thus, commercial companies, government and industries have a little time to make their information systems and networks quantum-resistant

An attacker can already collect public keys and encrypted streams for the further breaking via quantum chips

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Market scales

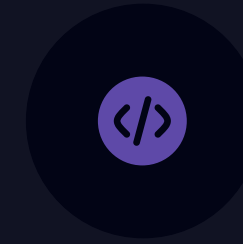↓ Industries that are significant and vulnerable to quantum threats:

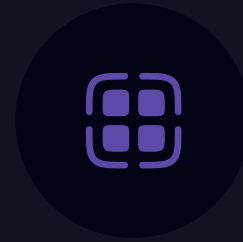Market scale

Personal **private data**
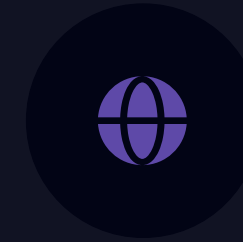
Financial, Medical and Genetic data

Industrial and government networks

Smart homes and IoT in common

Decentralized systems

Data encrypted using TLS and VPN protocols

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Market scale

Considering that the digital economy is estimated to be worth $20.8 trillion by 2025, the repercussions could be staggering

$20.8 trillion

→ Data source - IBM.com

Now

2022

2024

2025

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Our quantum resistant solutions

↗ Quros distribution for cloud servers with kernel-based post-quantum cryptography under the hood

↗ Quantum-resistant applications with hardware acceleration based on GPU, FPGA and CPU-specific instructions

↗ Post-quantum TLS implementations for network services protection

↗ Hardware shielding which protects cryptographic implementations from side-channel attacks

↗ Quantum-resistant operating system is supplied with PQC-ready network services like DNS, SMTP, HTTP, SNMP and other

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QUROS
APPLICATIONS

Qpps are mostly written in Rust programming language to make applications secure, memory-safe and reliable eliminating many bug classes
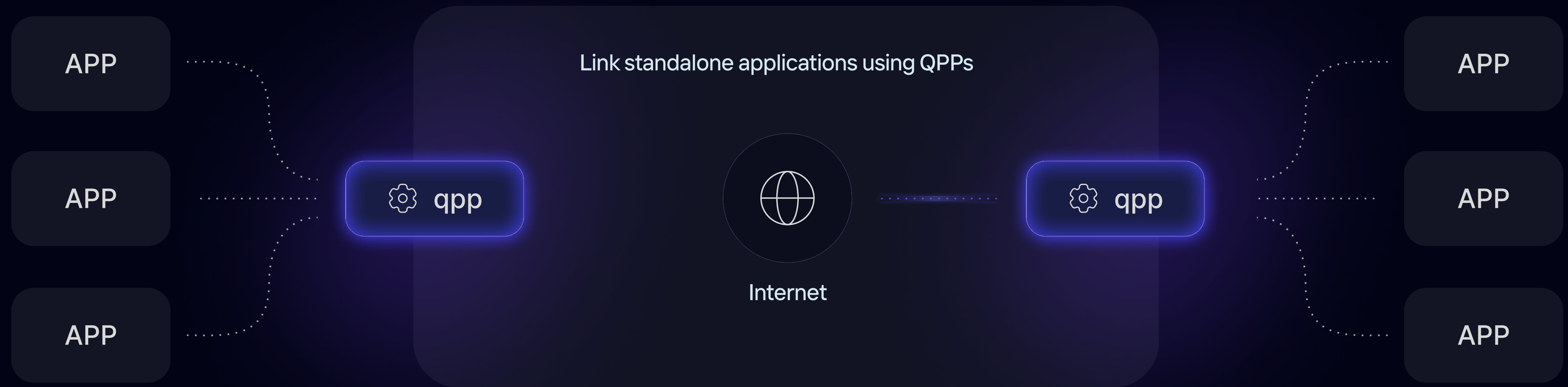
app

qpp

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APP

PQC services

PQC net

APP · · · qpp with PQC tls

APP · · · qpp with PQC tunnel

Converting app to qpp

Use Case 1

↗ Quros provides businesses a service to convert their
applications to quantum-resitant one

APP

APP

APP

Link standalone applications using QPPs

⚙ qpp

🌐

Internet

⚙ qpp

APP

APP

APP

Quantum-resistant bridges on PQC proxies

Use Case 2

↗ If a vendor has a complex ecosystem with multiple segments spreaded across the world, QUROS can link networks using stable post-quantum channels

APP ···· ⚙ qpp ···· ⚙ | PQC tls ···· 🌐 Internet

Construct quantum-resisted reverse proxy

Use Case 3

↗ Vendor can easily secure current web services via Qpps constructinga post-quantum TLS encryption for incoming connection

Our approach

to construct secure connections

TLS 1.2/1.3

PQC TLS 1.2/1.3

TLS 1.2/1.3

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Why us?

Quros has universal solutions for any business domain

↗ Quros in the basic version is cross-platform and can be installed on most platforms

↗ Quros introduces a novel approach of how to convert standalone network applications to quantum-resistant services

↗ Quros is highly scalable: using multiple clicks, administrators can secure hundreds of applications in seconds

↗ QPPs are accelerated using GPU and FPGA to handle high-load network applications

Ever-evolving solutions for security protection

↗ Quros is ready to secure your business and make it quantum-resistant in a short time

↗ Qpps are developed using memory-safe programming languages which significantly decreases attacker's possibilities

↗ Our company is actively tracking NIST's post-quantum cryptography standardization process and updating Quros distribution with new approved algorithms

↗ Quros helps businesses and industries to boost their security state on the next-generation level and prevent irretrievable financial losses

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Qpp allows to:

- Protect current network applications from quantum threats
- Web, mail, dns, snmp, http and other services
- Link multiple network segments using approved post-quantum cryptographic algorithms
- Secure a long-term data storage

The Qpp architecture

combines the following ideas:

- Limited attack surface
- Secure code base through memory-safe programming languages
- Small size
- Can be easily integrated into vendor's applications

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Main Competitors

↓ Comparative analysis
of their solutions

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Main competitors

Company	Products	Stages of developmen	Compatibility with network microservicesin high level programming languages	Hardware acceleration	Implementation according to NIST	Protection against hardware attacks, time attacks, attacks with the introduction of errors and others	Modular architecture for scaling and updating postquantum algorithms	Stages of development	Modular architecture for scaling and updating postquantum algorithms
Quros	Server Solution	Ready-made solution	✓	✓	✓	✓	✓	✓	✓
IBM	data storage	Prototype	⚠	✗	⚠	✓	✗	⚠	✗
LG U+	hardware module for optical equipment	Theoretical development	✓	✗	✗	✗	✗	✗	✗
Amazon	Cloud solution	Ready-made solution	✗	✓	✓	✓	✗	✗	✗
IOTA	Scientific results	Theoretical development	✗	✗	✗	✓	✗	✓	✗
ArQit	Cloud solution	Ready-made solution	✗	✗	✗	✗	✗	✗	✗
QRL	Blockchain	Ready-made solution	✗	✗	✗	✓	✗	✗	✗
HyperCash	Blockchain	Ready-made solution	✗	✗	✗	⚠	✗	✗	✗
Starkware	Blockchain	Ready-made solution	✗	✗	✗	✗	✗	✗	✗
ENTRUST	Cloud solution	Ready-made solution	✗	✗	✗	✓	✗	✗	✗
Qapp	VPN tunnels	Ready-made solution	✗	✗	✗	⚠	✗	✗	✗
Cryptoexperts	External libraries	Theoretical development	✓	✗	✗	✗	✓	✓	✗

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