

KHNOG

“Quantum In Cybersecurity”

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Title: AVP of Data Center and Network Security
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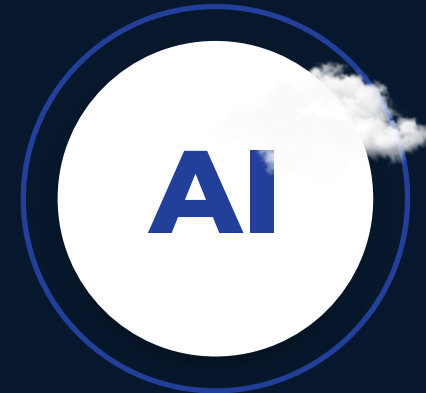
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Agenda

- 01** Overview
- 02** Challenges
- 03** Quantum Basics and Threats
- 04** Harvest Now, Decrypt Later (HNDL)
- 05** Solutions, Quantum Safe Approaches

“Overview”

Before **2022**
AI was “Experimental”

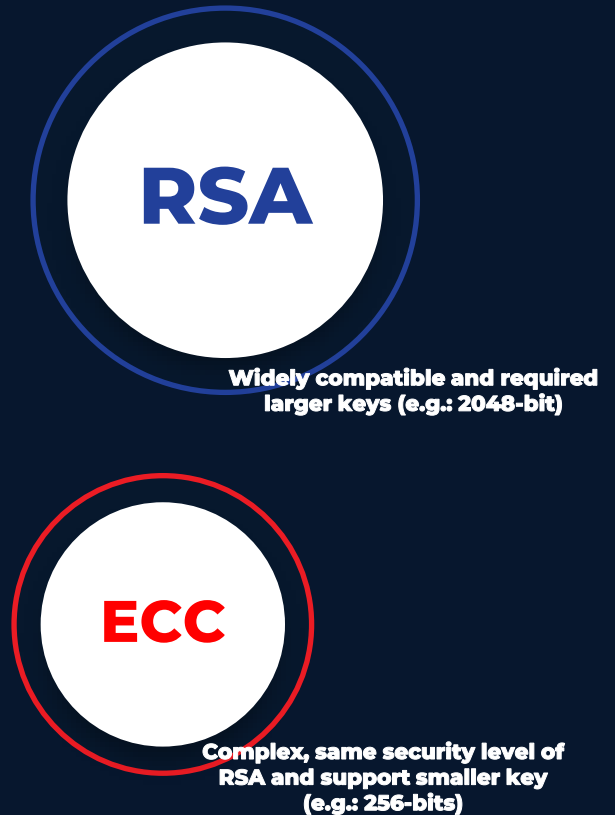
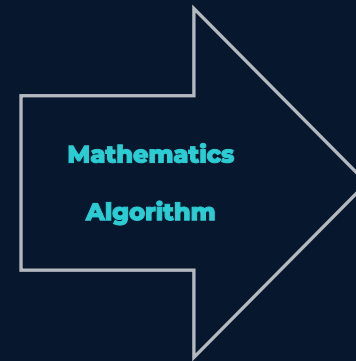
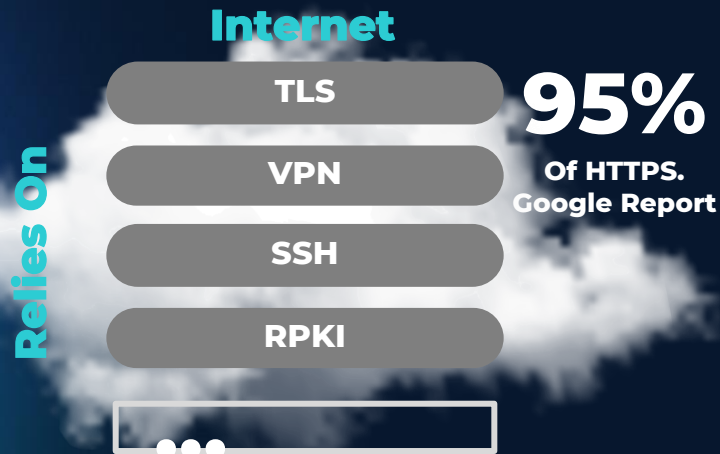


2024-2025

AI became Essential



“ Challenges ”



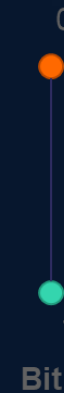
Quantum Computers will break this math – permanently!

“Quantum Basics”

Current Computer Readable Data Format

A bit (short for binary digit) is the fundamental and smallest unit of data in a computer, represented as either a 0 or a 1.

0 0 1 1 0 1 0 1

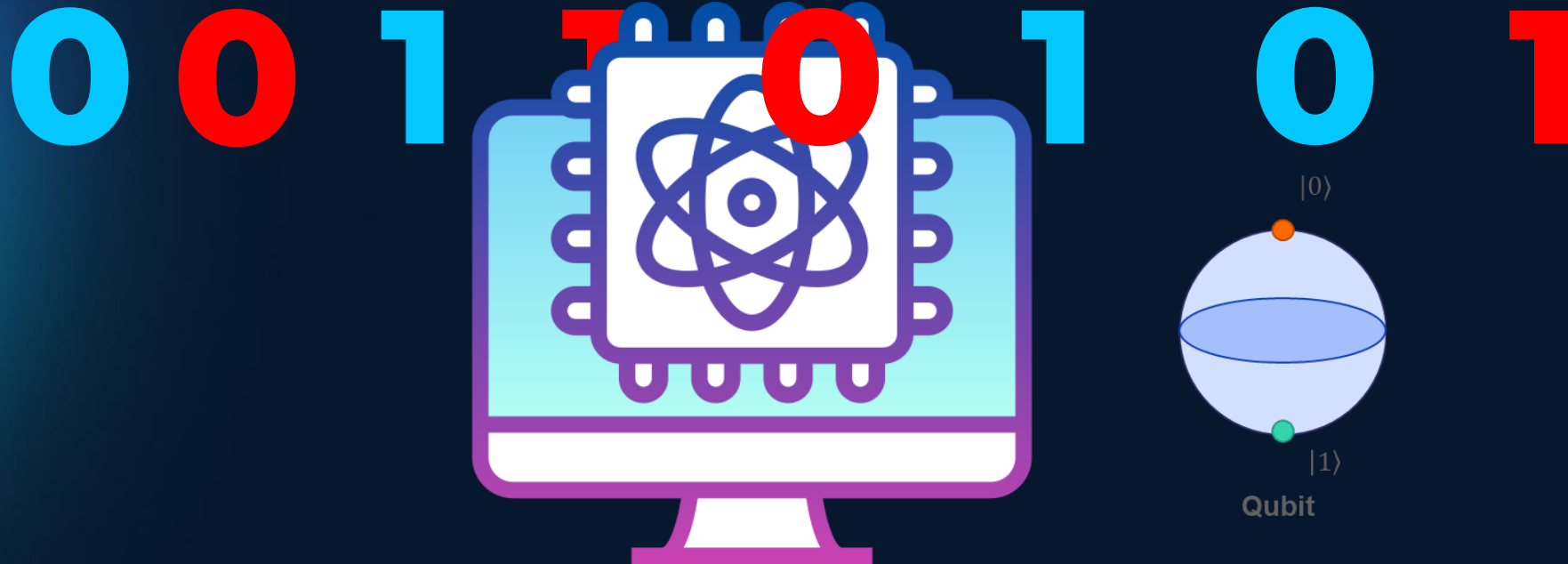


“Quantum Basics”

Quantum = Computers that use **qubits** instead of bits

Qubit **act** like:

- 0
- 1
- 0 and 1 at the same time



“Quantum Basics”

Power of Qubits

Quantum Computer Allows

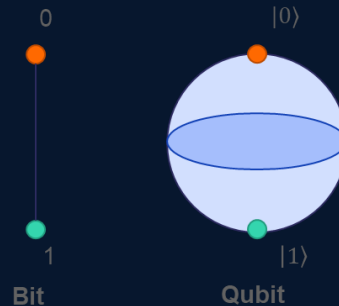
Massive Parallel Calculations

Breaking Encrypted Keys
Exponentially Faster

No Physics

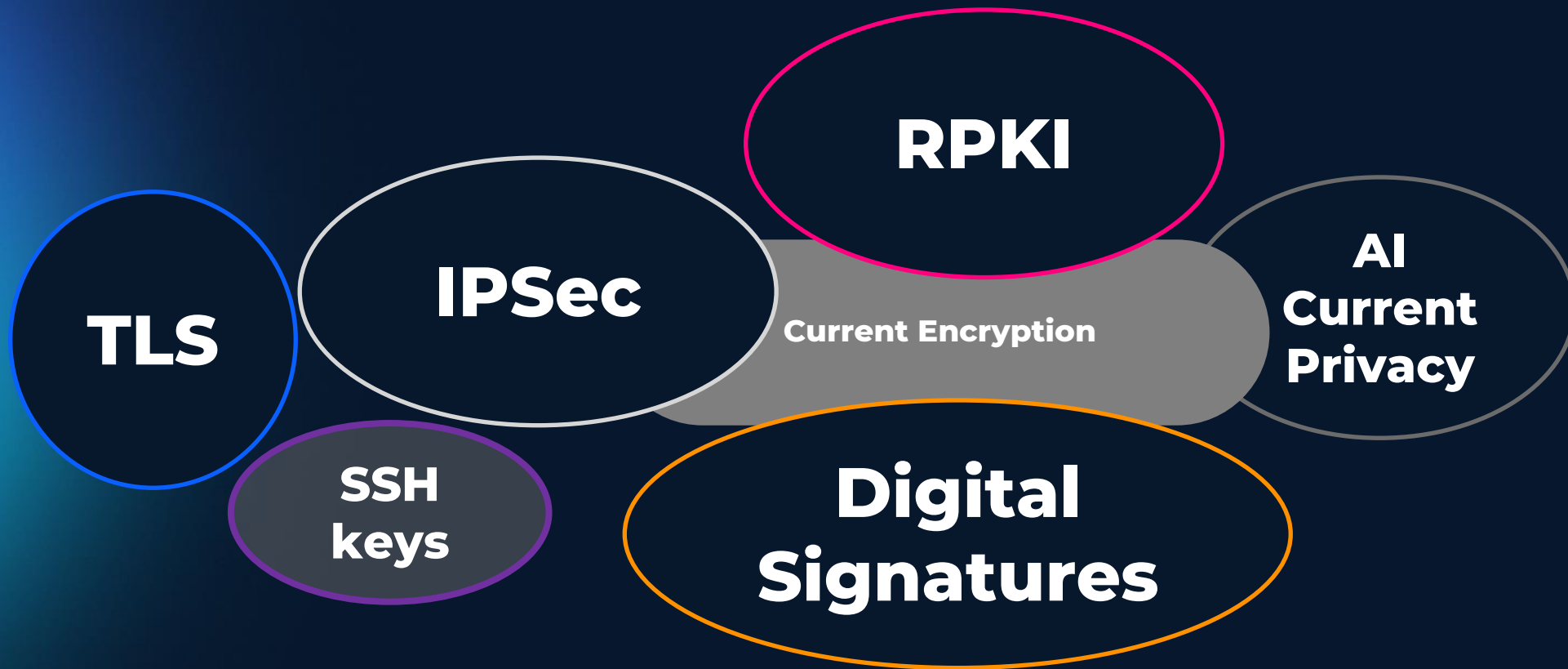
Just New Power

New Risks



“Threats”

Quantum Computers Can Crack:



“Harvest Now, Decrypt Later”

HN DL



When Quantum **Computers Arrives**, **attacker** don't need to attack your network.
They already have your **data stored!**

Quantum Simply unlock it!

“ **Gartner**’s primary prediction regarding quantum computing is that **by 2029, advances will render most conventional asymmetric cryptography unsafe to use.**

This has led to the urgent recommendation for organizations to begin transitioning to post-quantum cryptography (PQC) immediately to defend against "harvest now, decrypt later" attacks.

”

Your traffic from 10 year ago can be decrypted

Your network should be able to switch to PQC quickly

Industry leading vendor will rush

Operators will be last to adapt unless they prepare early

“Solutions, Quantum Safe Approaches”

How the World Is Preparing

ASEAN Government



Have now outlined strategies to advance quantum computing and allied technology. Singapore leads with a comprehensive national effort. In 2021–2023, it announced a National Quantum Strategy (NQS) backed by nearly S\$300 million (~US\$219 million) in new funding.

FYR: <https://postquantum.com/quantum-computing/quantum-singapore-asean/>

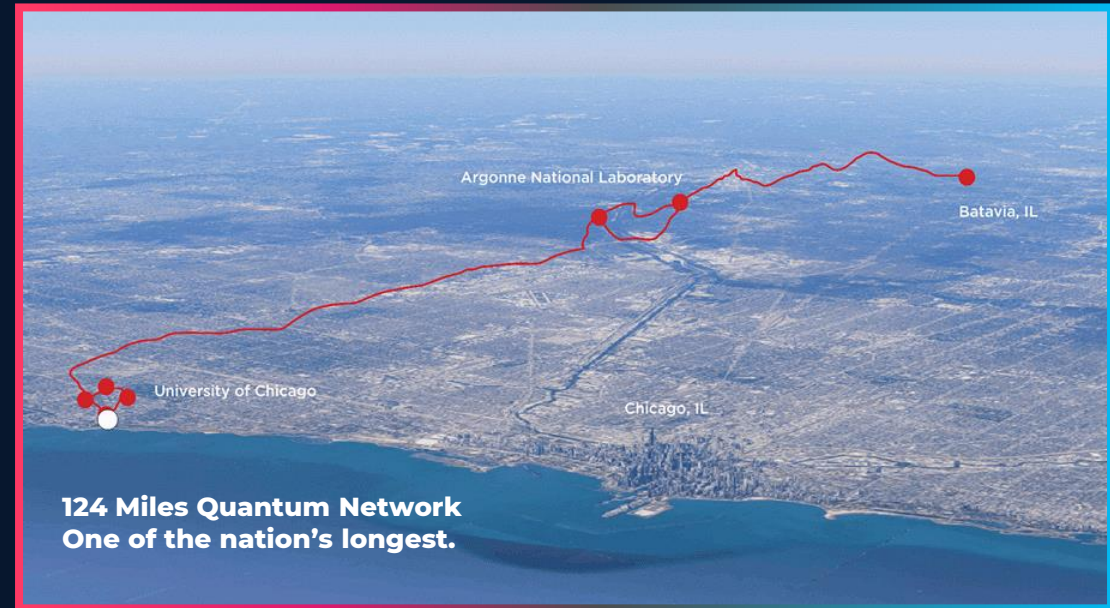
“Solutions, Quantum Safe Approaches”

How the World Is Preparing

USA 

(Chicago quantum network)

**A Unique Collaboration between Academy, Gov,
Private Company, Industry.**



FYR: <https://chicagoquantum.org/news/chicago-expands-and-activates-quantum-network-taking-steps-toward-secure-quantum-internet>

“Solutions, Quantum Safe Approaches”

How the World Is Preparing

European Quantum Communication – EuroQCI

The EuroQCI will be a secure quantum communication infrastructure spanning the whole EU, including its overseas territories.

FYR: <https://digital-strategy.ec.europa.eu/en/policies/european-quantum-communication-infrastructure-euroqci>

“Solutions, Quantum Safe Approaches”

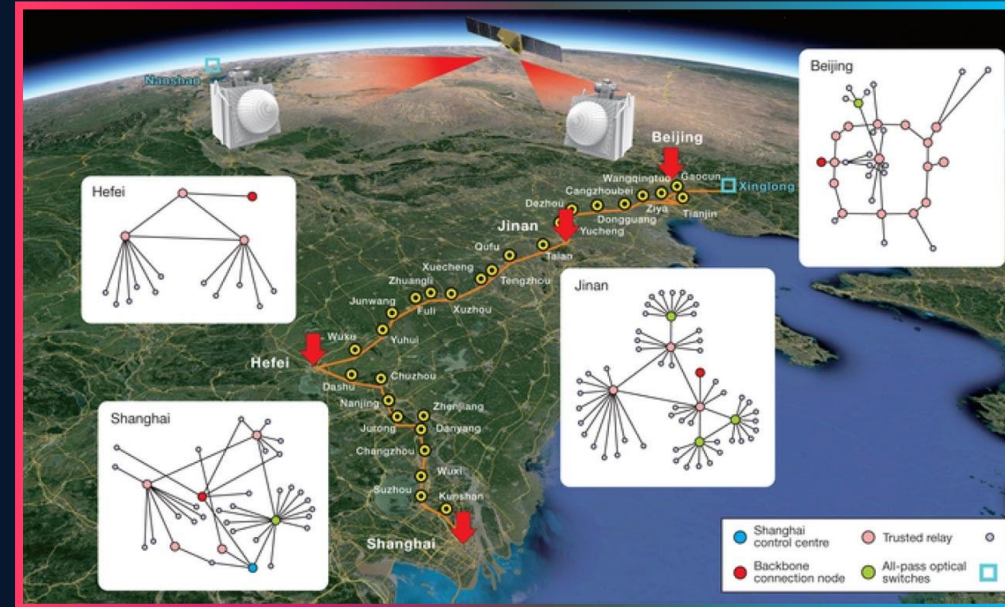
How the World Is Preparing

China



(4600KM)

The system integrates over 700 ground-based optical fibers and two ground-to-satellite links, a world first.



FYR: <https://en.people.cn/n3/2021/0107/c90000-9806786.html>

“Solutions, Quantum Safe Approaches”

Vendor adding PQC



Many More ...

“Solutions, Quantum Safe Approaches”

What We Should Start Doing Now?

Quantum In Action!

**Crypto
Inventory**

Know where RSA/ECC is
used.

**PQC
Testing**

Using NIST-Approved
Algorithms

**Ensure
Crypto
Agility**

Ensure network or
existing ICT devices
can switch algorithms

**Data
Protection
and
Retention**

Limit Risk of HNDL.

**Monitor
Quantum
Key
Distribution**

Inter-DC Links
FSI Networks
Critical Infrastructure
National Security Traffic

Industry Best Practices, Regulatory, Compliance

So ON!

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Quantum

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Thank You

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