Human and Technical Factors in the Adoption of Quantum Cryptographic Algorithms

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Introduction

The purpose of the research is to understand what factors would cause users to choose quantum key distribution (QKD) over other methods of cryptography.

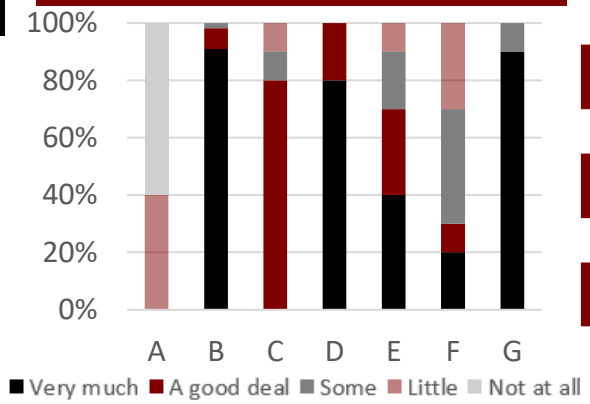
Background

- An AES key can be exchanged through communication using RSA, QKD, or post-quantum cryptography (PQC)
- QKD relies on quantum physics, AES and PQC use complex mathematics
- BB84 Quantum Cryptographic Protocol involves communication over a quantum channel and a public channel
- Technical attacks include beamsplitting and intercept/resend
- Other attacks might be industrial espionage or person-in-the-middle
- QKD products can transmit over maximum distances ranging from 40-150 km with key rates as low as 1.4 kb/s up to over 150 kb/s.

Survey Results

The company makes security a top priority, and thinks protection is the most important factor in security decisions. No survey participant fully trusts current security systems.

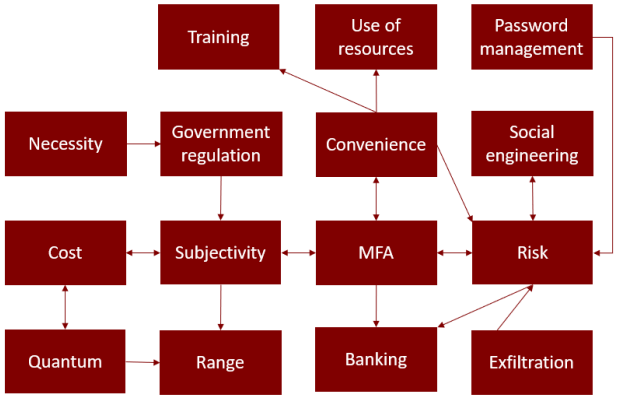
Security Risk and Trust



A: familiarity with quantum cryptography
B: individual values protecting data
C: individual trusts current systems
D: company values security
E: importance of convenience
F: importance of cost
G: importance of protection

Research Results

The focus group discussion centered around threat model, subjectivity of tradeoffs, convenience, and MFA. Range proved to be a critical factor.



Conclusion

Incentives for adoption of QKD would be due to regulation and necessity, but currently adoption is viewed as more inconvenient than the security is worth.

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