QUANT-X SECURITY & CODING

API Protection on Highly Volatile Threat Landscapes

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Our Expertise

- Information and IT Security
- Information Risk Management
- Post-Quantum Security
- Quantum Algorithms
- System- and Algorithm Engineering

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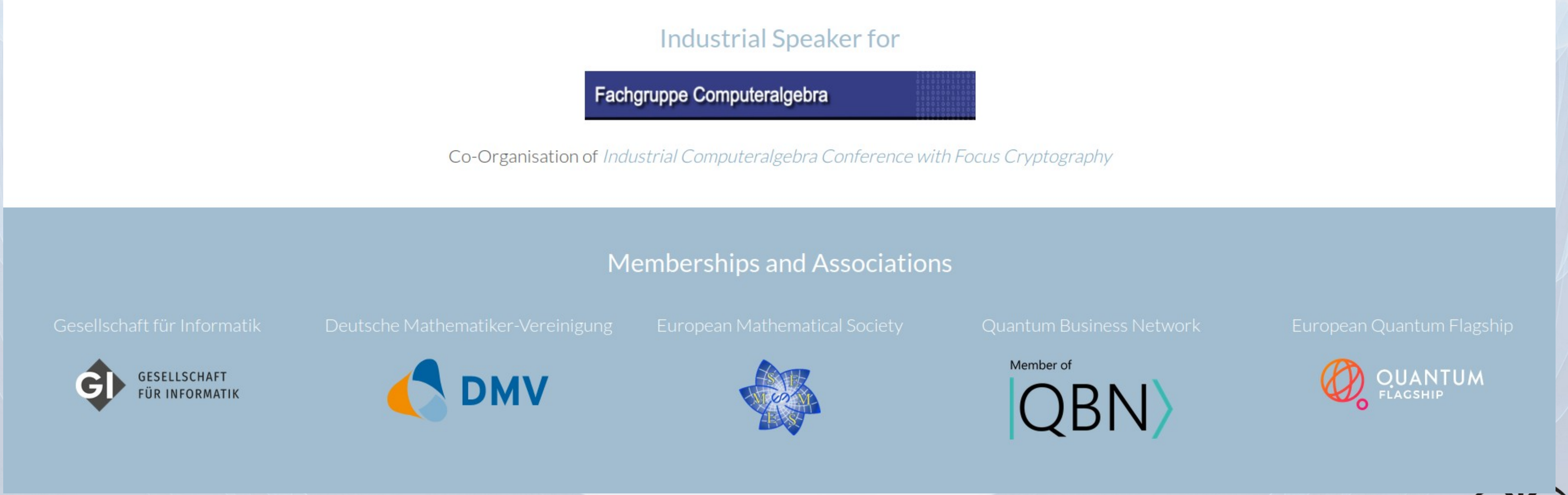
Industrial/Scientific Activities

Integration of quantum technologies to classical infrastructures

Investigation of open questions in Post-Quantum Security, see
https://github.com/Quant-X-Security-Coding-GmbH/QAA_Condition_Number

Quantum feasibility studies of algorithmic problems



Industrial Speaker for

Fachgruppe Computeralgebra

Co-Organisation of *Industrial Computeralgebra Conference with Focus Cryptography*

Memberships and Associations

Gesellschaft für Informatik

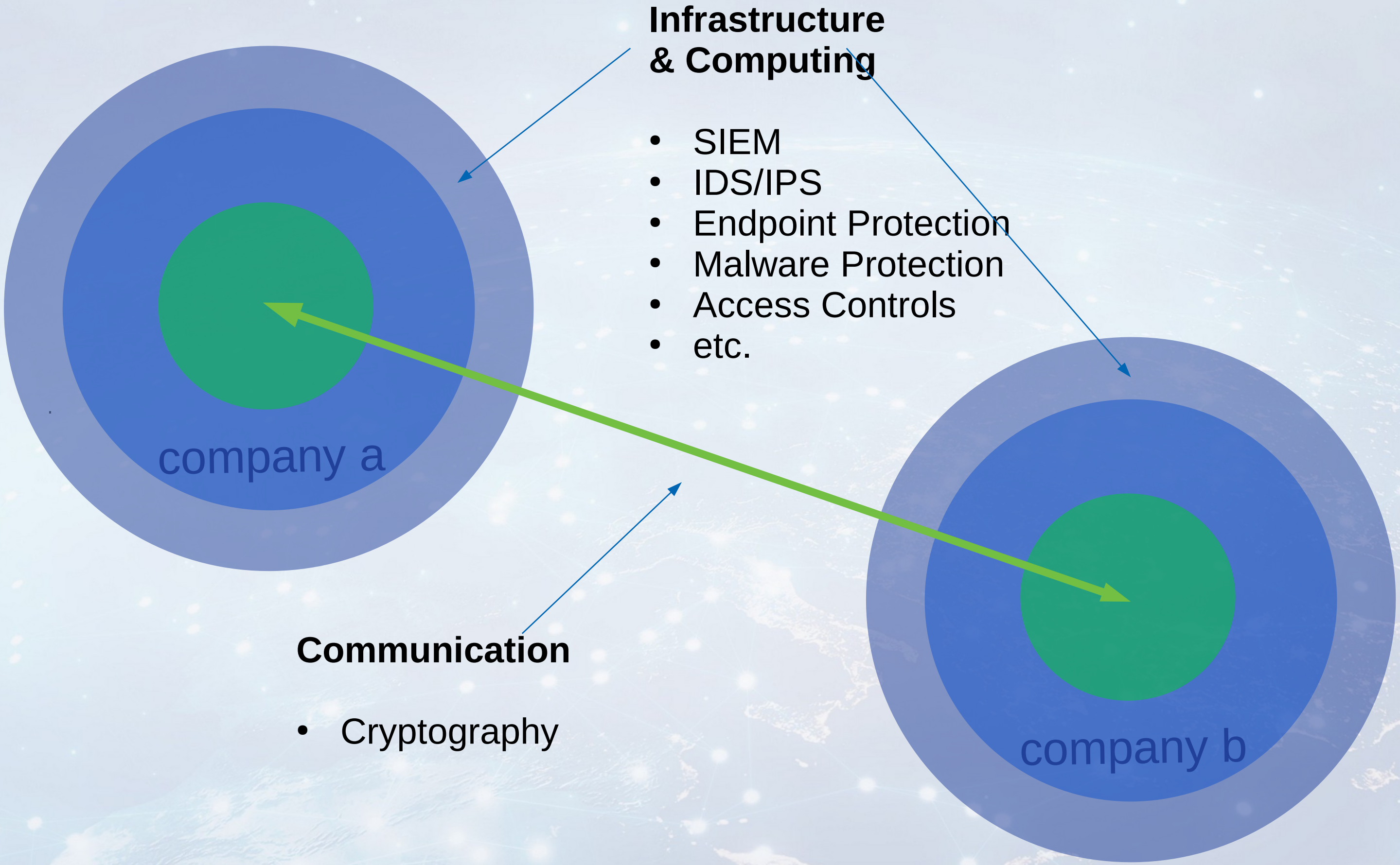
Deutsche Mathematiker-Vereinigung

European Mathematical Society

Quantum Business Network

European Quantum Flagship

The Unique Meaning of Cryptography in Information Security



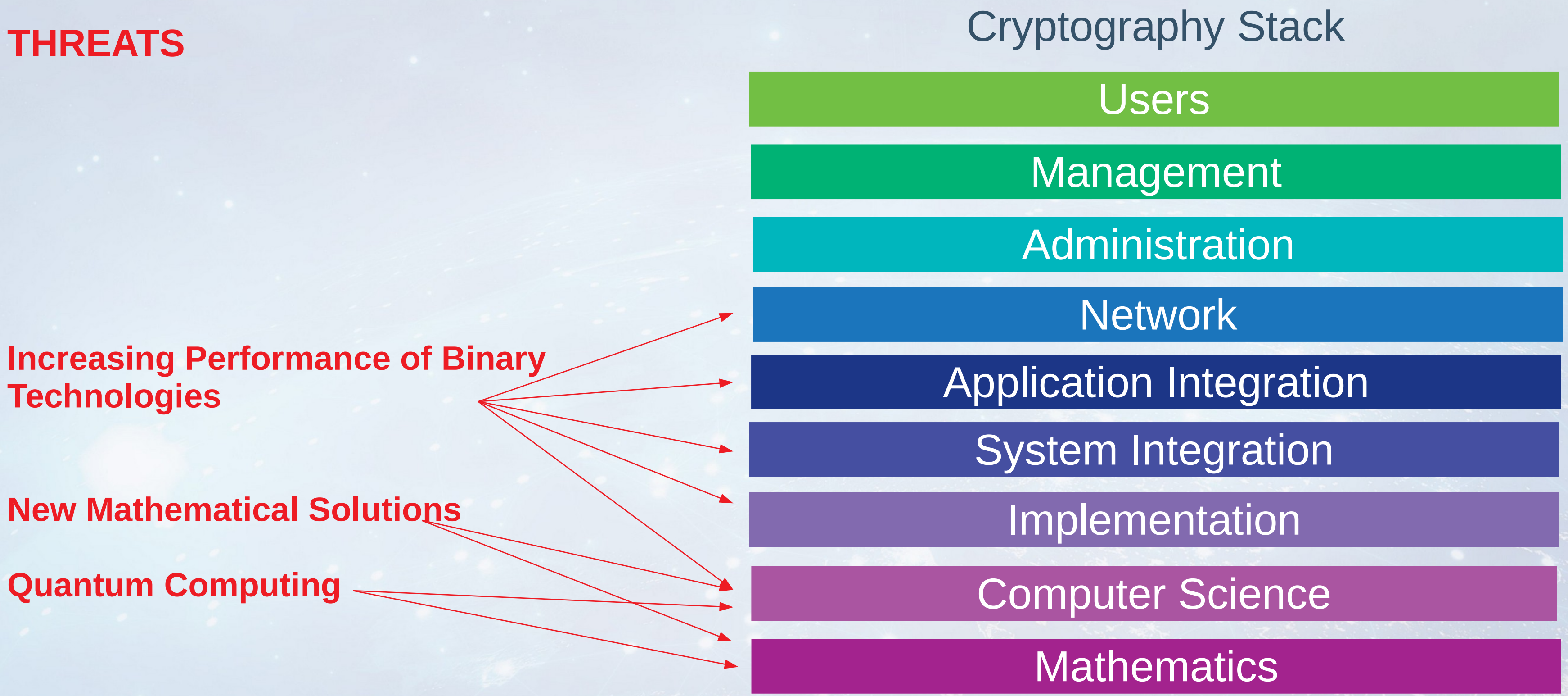
Infrastructure & Computing

- SIEM
- IDS/IPS
- Endpoint Protection
- Malware Protection
- Access Controls
- etc.

Communication

- Cryptography

Preserving Privacy in the Face of High Performance Attack Vectors



THREATS

Increasing Performance of Binary Technologies

New Mathematical Solutions

Quantum Computing

Cryptography Stack

- Users
- Management
- Administration
- Network
- Application Integration
- System Integration
- Implementation
- Computer Science
- Mathematics

Overview on High Performance Attack Vectors - Current

Threats

- Password and Cryptography Cracking Tools (Hashcat and similar tools)
- Aggregated computing resources and parallelization of attack processes
- New mathematical solutions affecting parameters and configuration of classical crypto

Countermeasures

Regularly check RFCs and recommendations of official Data Protection and InfoSec institutes for

1) Choice of algorithms
2) Key length
3) Algorithm parameter configuration

… and update your systems accordingly in alignment with depending parties.

Overview on High Performance Attack Vectors – Near Future

Threats

Evolving Quantum Computing Technologies will make it possible to decrypt data encrypted by

1) Diffie-Hellmann
2) RSA
3) Elliptic Curves

Timeline: IBM guesses by 2023

Countermeasures

1) New post-quantum crypto algorithms
(NIST standardization round 3: *https://csrc.nist.gov/Projects/post-quantum-cryptography/round-3-submissions*)
2) Homomorphic Encryption (not based on 1) -3) in Threats :-)
3) Quantum Communication (new quantum hardware, expensive)

Identify Assets of High Privacy Criticality by Information Risk Assessment

Your Business Processes and the respective IT-systems are your Assets!

1) Perform a CIA-Rating on your systems connected to the APIs. This will indicate the protection need of the APIs.

The best candidates for post-quantum cryptography are the ones which process data which needs to remain confidential for many years in the future.

The best candidates for a near time transition to homomorphic encryption are the ones with

- High Confidentiality and Integrity Classification
- Low Availability Rating

2) Perform an Information Risk Assessment to consider threats vs. the systems protection need. This will help you to determine which new cryptography you might want to apply to which system.

(Guide for conduction IRAs: *https://www.nist.gov/publications/guide-conducting-risk-assessments*)

Conclusion

Stay aware about upcoming threats and solutions.

… and

Introduce swift crypto patch processes!

Thank you!!!

Find these slides on https://quant-x-sec.com/published.htm
(in the section Talks/Presentations at Conferences and Events)

Public Key Infrastructure Provider MTG PQC
https://www.mtg.de/en/public-key-infrastructures/post-quantum-cryptography/