Implementing a Crypto Services Strategy at ABN AMRO Bank

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RWC 2020

Studies on encryption trends have shown that 45% of large organizations have implemented an enterprise-wide **“encryption and key management strategy”** in 2018 [1].

45%

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[1] Ponemon Institute. “2019 Global Encryption Trends Study”. https://www.ncipher.com/2019/global-encryption-trends-study. 2019.

Let’s see how ABN AMRO started this journey in

2016

- Smart card CA for user authentication ☺
- TLS certificate management is a mailbox ☹
- Key management is a 3FA safe with good procedures 😐
- HSMs are kept up and running for payment systems (regulated) 😐
- Google and Microsoft announced SHA-1 Deprecation ☹

First Step: Definition Strategy in 2016

WHAT: Crypto Services Portfolio 2019

CS 2019 >>

1
Cryptographic Services Application

- Key and Certificate Management
- Data in Transit and Data at Rest
- Application of Crypto Solutions

2
Cryptographic Services Innovation

- Crypto Intelligence
- Consulting, Information and Knowledge Sharing
- Development of Crypto Solutions

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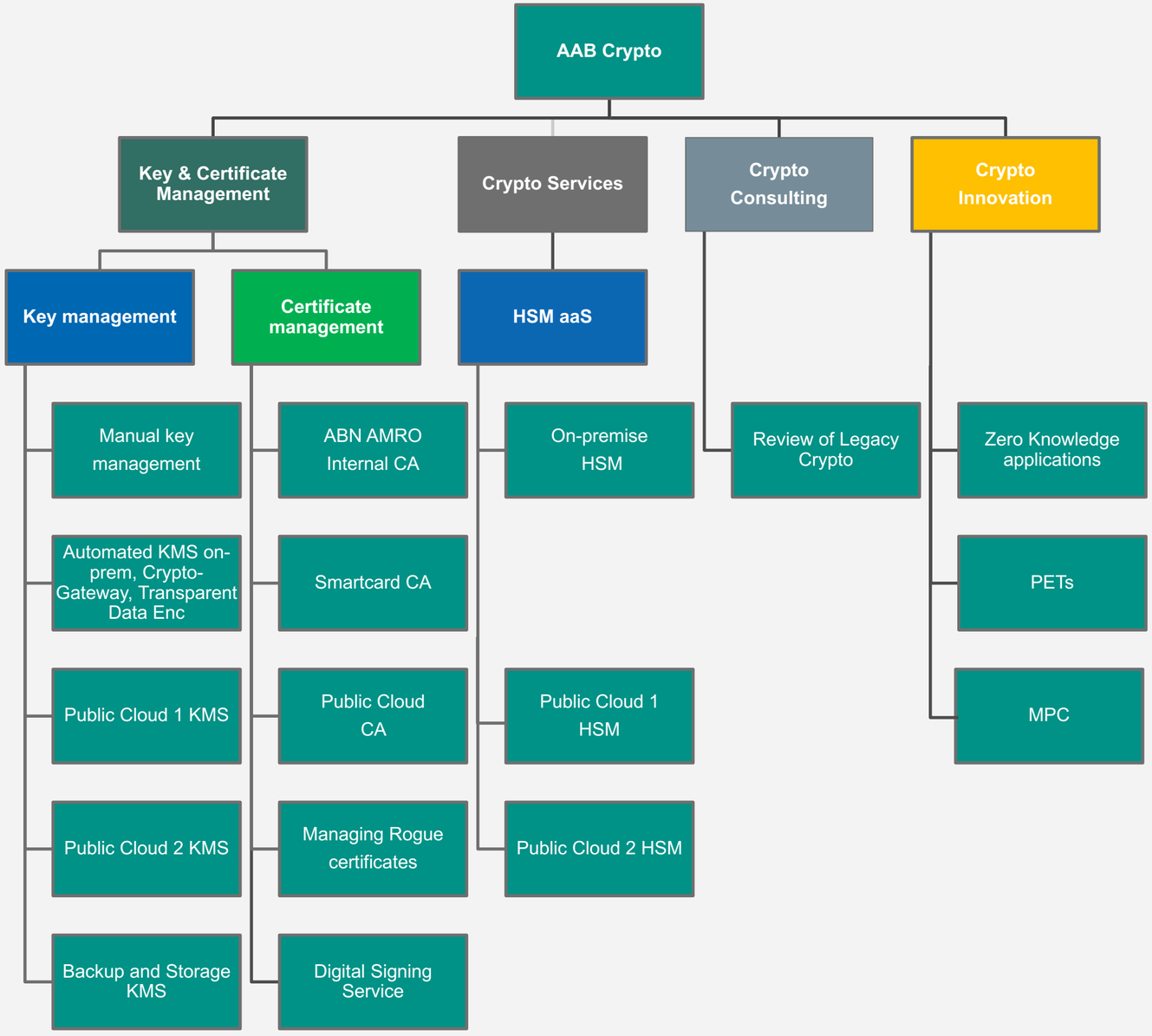
Crypto Services Overview 2020



SHA-1 Deprecation

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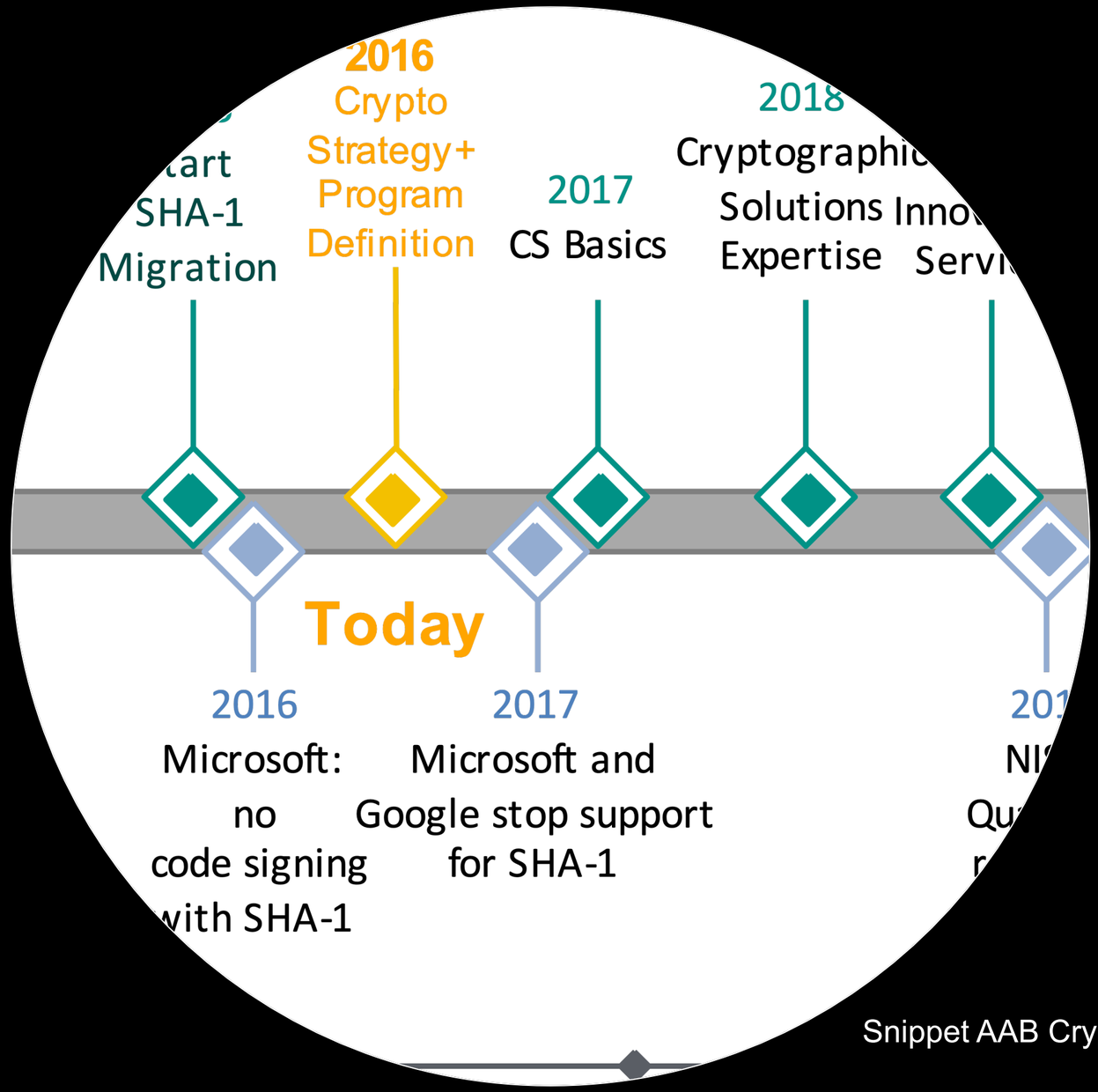
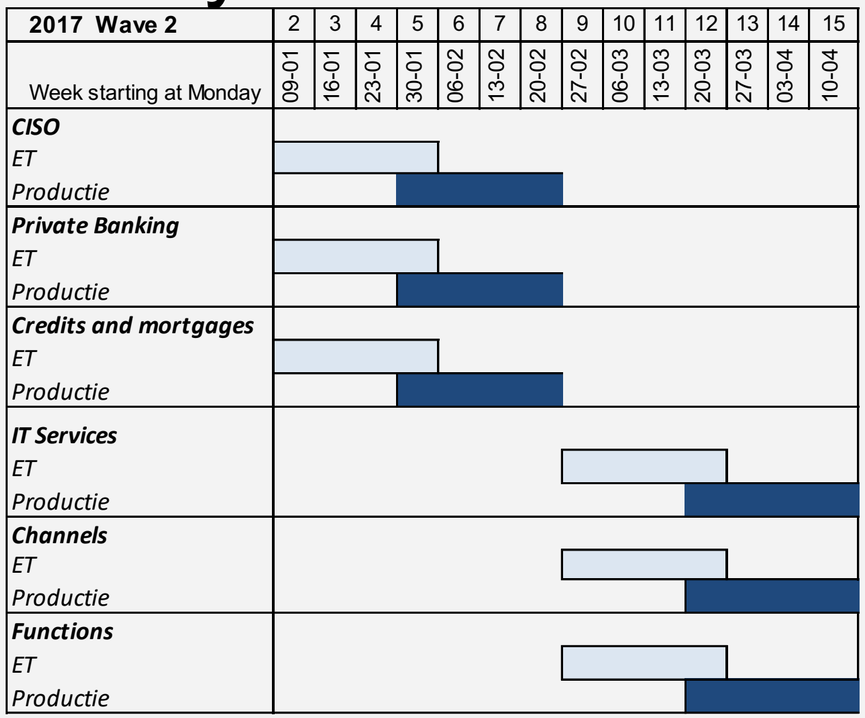
SHA-1 deprecation

- Taskforce 1 to migrate external (client facing) certificates to secure certificates.
  - ➢ TF1 ended in the first week of January 2016.
- Taskforce 2 to migrate internal certificates to secure certificates, or to propose other solutions to mitigate this risk.
  - ➢ TF2 ran from 2016 to 2017.



Snippet AAB Crypto strategy 2016

Weekly Stats on Task Force 2 SHA1 Migration



Wave	WAS	MQ	NETWORK	Wintel W1	Wintel W2
Systems in scope	182	1573	497	57	189
Systems to be changed, in scope Match	64	n.a.	n.a.	0	0
Verified migration Match	18	n.a.	n.a.	0	0
Systems in research (SHA 1)	0	0	n.a.	0	0
Systems change started (project)	0	322	27	0	64
Systems remaining for change (project)	0	0	429	0	42
Systems finished (SHA 2)	112	1107	32	57	11
Systems in Backlog SHA 2 incompatible	6	144	9	0	11

Number of systems migrated

Status 2017

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Key Management – HSM as a Service

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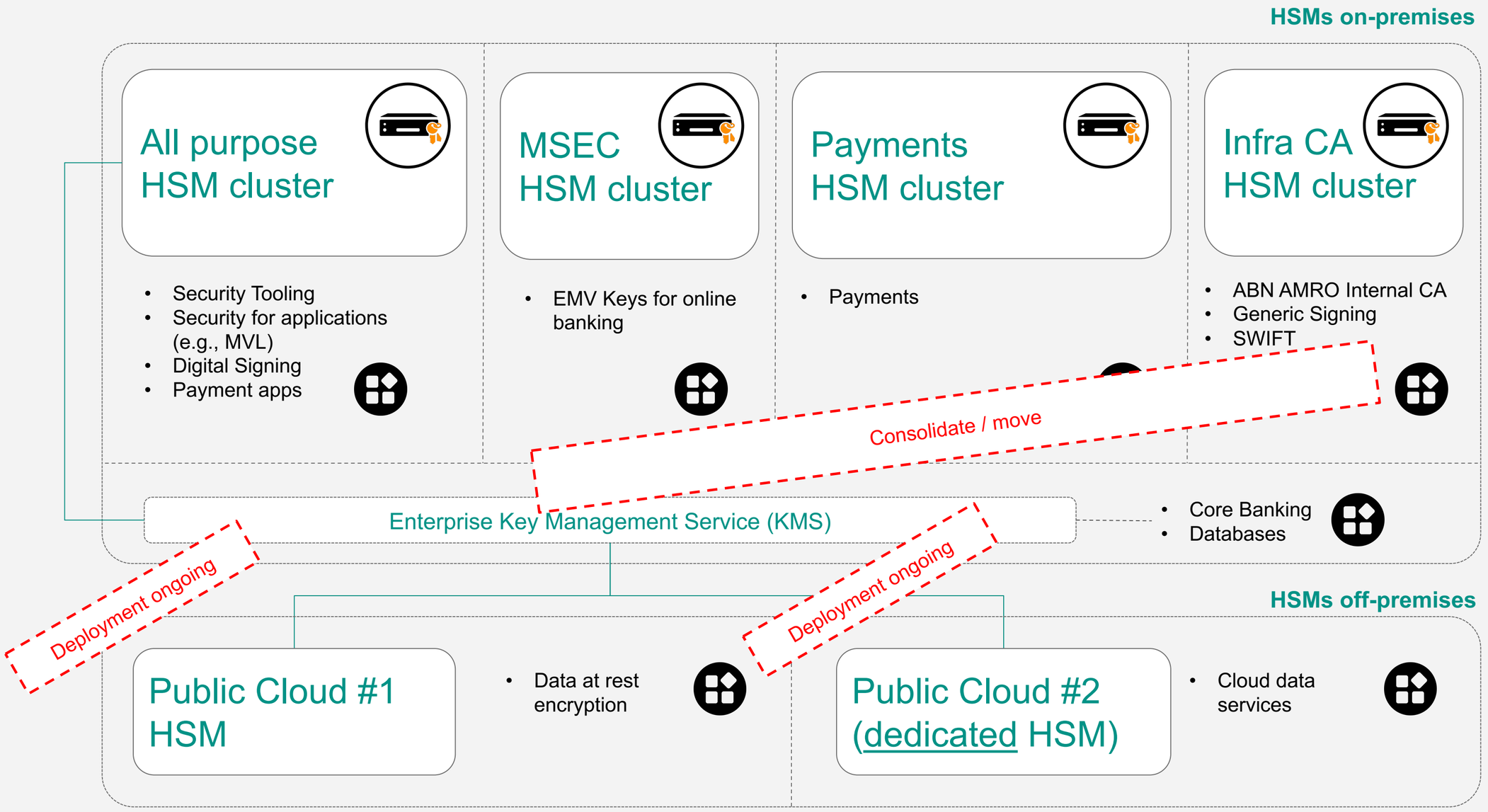
HSM as a Service landscape



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Crypto Consulting

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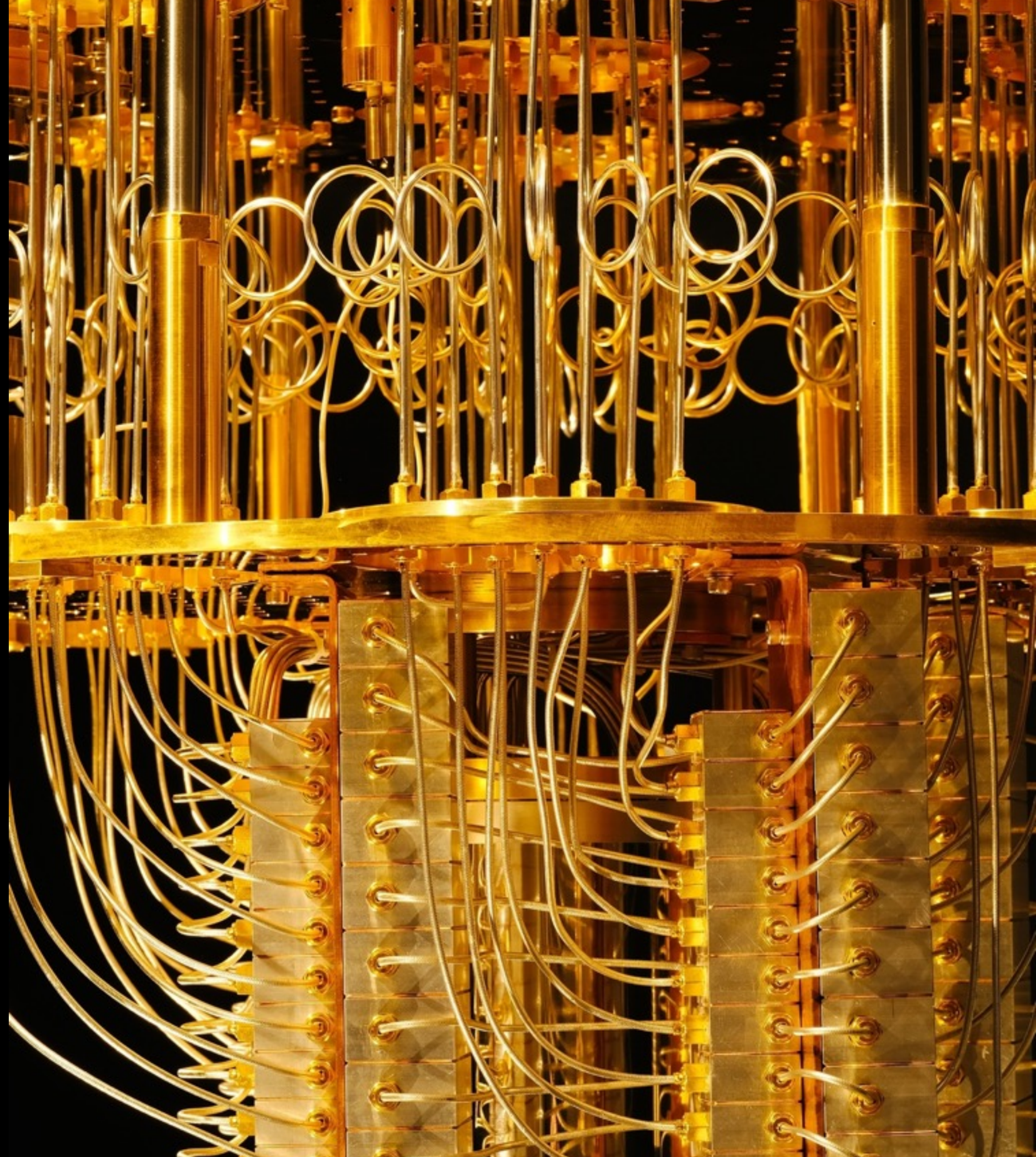
Quantum computing puts data at risk

Lessons learned from SHA-1 deprecation:

do nothing will keep bank unprepared

Crypto migrations take time and are very costly.



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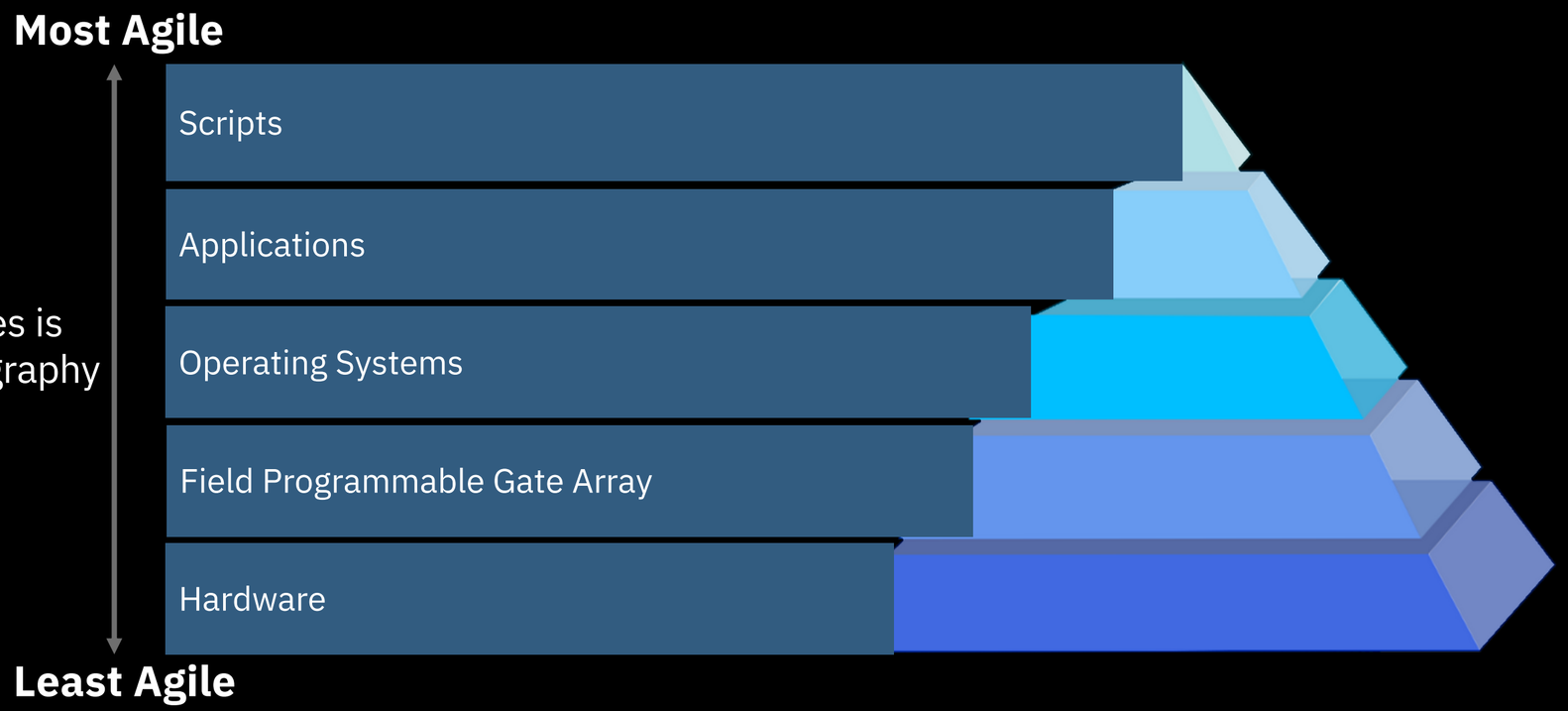
Crypto Agility: end-to-end view needed

The ease of crypto migrations can be viewed as follows:

The ability to migrate crypto implementations to new schemes is dependent on how today's cryptography is deployed.



Crypto Innovation

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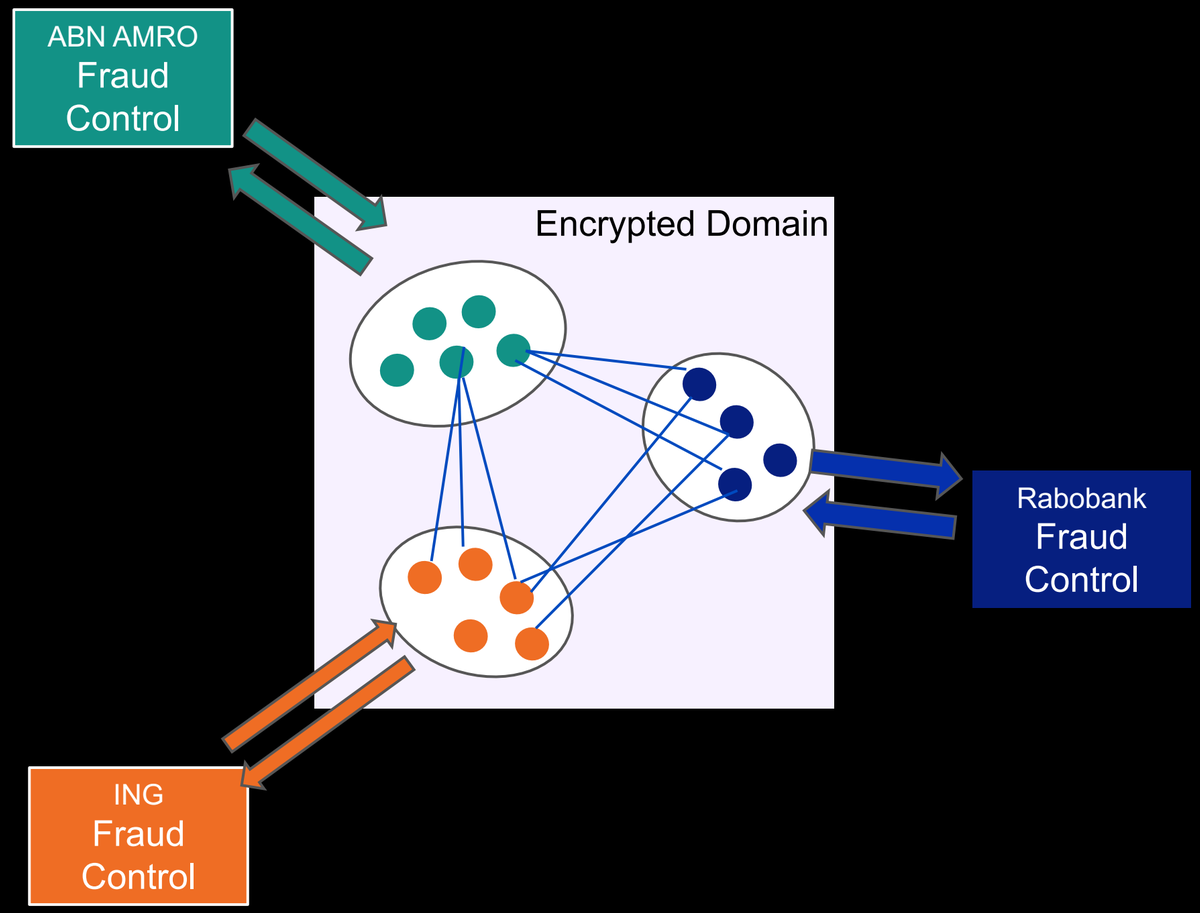
Research Collaborations

- ABN AMRO Innovation Center works together with Crypto experts in CISO department.
- Collaborations with industrial and academic researchers
- Success Story: Fraud Detection
  - MPC to solve the problem to exchange insights with other banks
  - Implemented in practice



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TNO, ABN AMRO, RABOBANK, ING, CWI:
A. Sangers, M. van Heesch, T. Attema, T. Veugen, M. Wiggerman, J. Veldsink, O. Bloemen, D. Worm: **Secure Multiparty PageRank Algorithm for Collaborative Fraud Detection.** Financial Cryptography 2019.

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What’s next?

WHAT: Crypto Services Portfolio 2023

CS 2023 >>

Challenges

- Crypto and Quantum Challenges
- Crypto Agility
- Crypto in DevSecOps
- Crypto in / for Public Cloud
- Secure Crypto Keys in times of Big Data

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Thank you

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