Cybersecurity in e-Estonia:

Lessons learned

Siim Sikkut
Government CIO of Estonia
siim.sikkut@mkm.ee
@sikkut

www.e-estonia.com
27.01.2563

REPUBLIC OF ESTONIA
GCIO Office

REPUBLIC OF ESTONIA
Ministry of Economic Affairs and Communications

Part I: e-Estonia intro

a mod*est*
country that
extends beyond
its borders

+ population: 1.3 million
+ area: 45,339 km2
+ currency: euro
+ member of: EU, NATO, WTO, OECD,
      DIGITAL NATIONS

Finland

Sweden

EST

Russia

Latvia

Lithuania

Poland

Europe

empowering

Easi**est** life: only marriage,
divorce and selling your house
cannot be done online.

Yet.

ease of doing business

Simpl*est* and fast*est* business environment.

+ a few hours to start a company
+ hassle-free e-taxation
+ full automatization in tax reporting by 2020
+ e-Residency — Estonian e-services to every world citizen / SME

© EAS

EESTI VABARIIK · DIGITAALNE ISIKUTUNNISTUS
REPUBLIC OF ESTONIA · DIGITAL IDENTITY CARD

KEHTIV KUNI / DATE OF EXPIRY

DOKUMENDI NUMBER / DOCUMENT NUMBER

ISIKUKOOD / PERSONAL CODE

AINULT ELEKTROONILISEKS KASUTAMISEKS
ELECTRONIC USE ONLY

#eResidency

apply.gov.ee

© Anneli Arusaar

health

The health**est** system.

+ digital health data
+ digital prescription
+ digital registration country-wide
+ e-Ambulance
+ personalised medicine in the works

© Anete Palmik

engaging

The saf**est** way is to vote online.
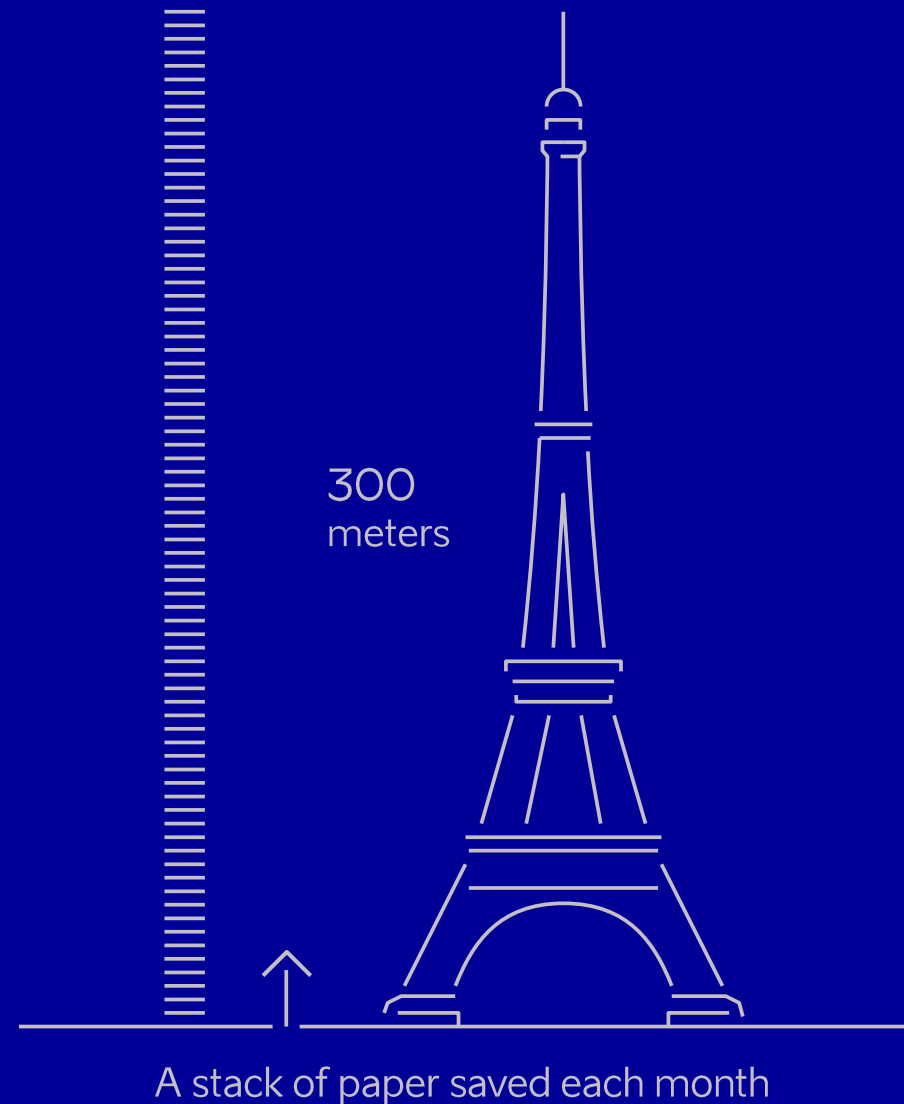
+ 2005 — first in the world
+ 44% vote online
+ votes cast from 140+ countries
+ saving over 10,000 working days

© Renee Altrov

efficient

The bigg*est* savings.

+ digital signature saves 2% of GDP per year
+ 50 times more efficient connected police
+ 1/3 less queues at the hospitals
+ best tax collector in the world

300
meters

A stack of paper saved each month

electronic ID

The strong**est** identity.

+ every Estonian has an electronic ID
+ eIDAS assurance level „high"
+ 17% of mobile-ID
+ 34% of smart-ID
+ e-Residency

exchange

The busi**est** highway of e-Estonia —
X-Road from 2001.

+ saving 1400+ full years annually
+ over 1000 institutions and enterprises
+ 150 public sector institutions
+ 2700+ different services
+ over 900 million transactions per year
+ technology exported to Finland, Iceland, Faroe
  Islands, Ukraine and other countries
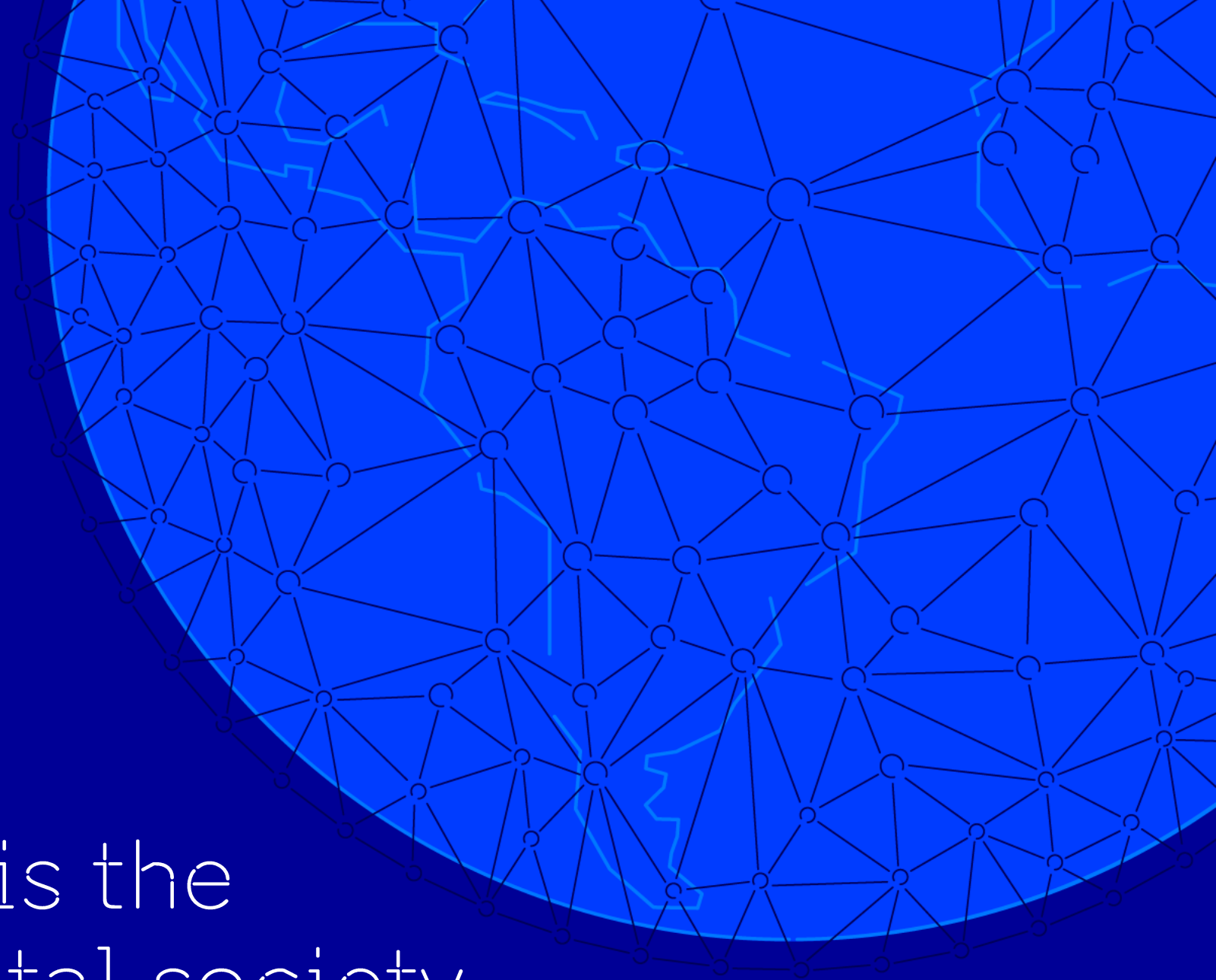+ core tech built in consortium with Finland (NIIS)
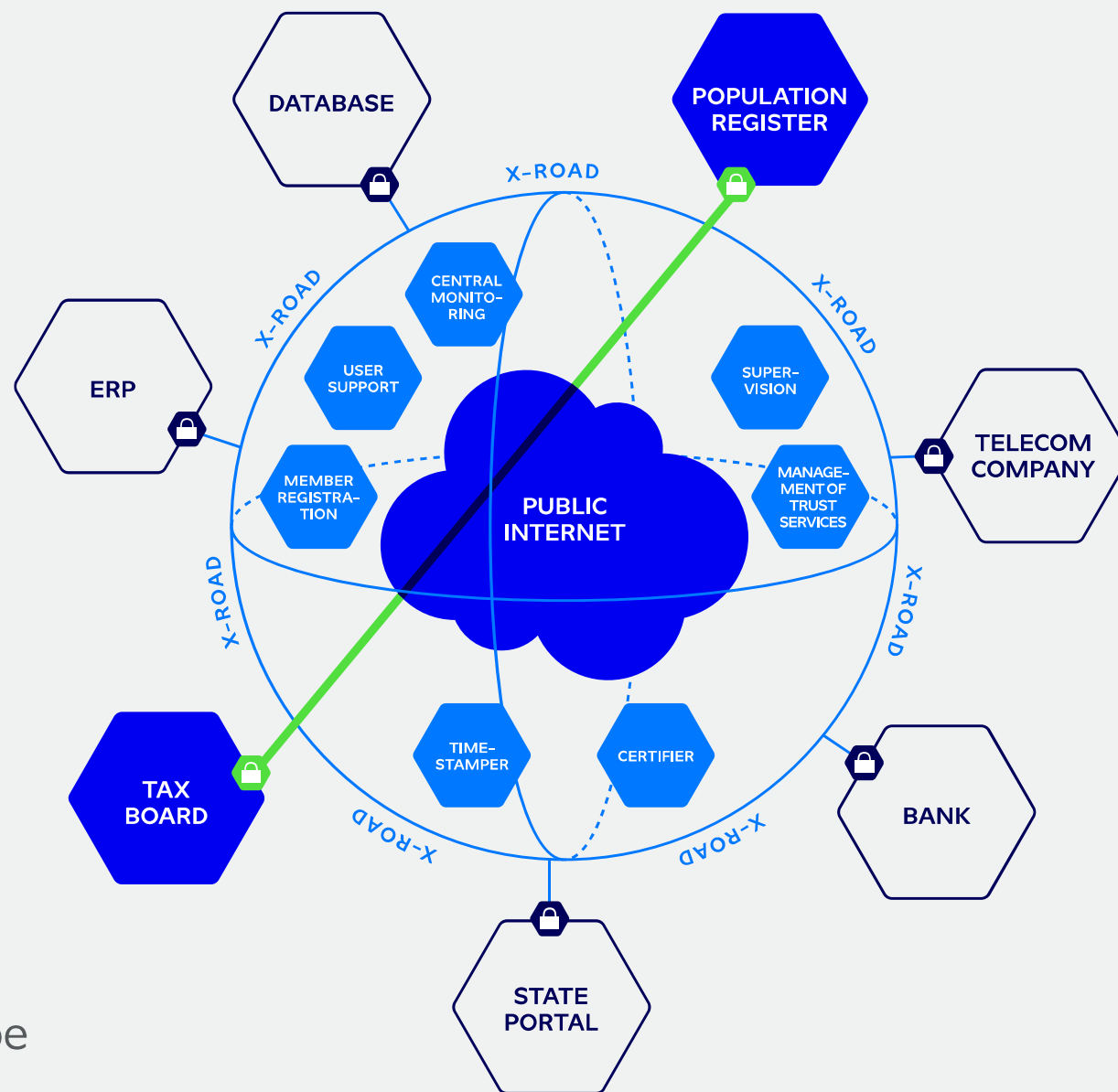
best laws
are enablers

+ People own their data
+ Once only rule
+ Digital signatures

Boldest leadership

It's not about money, it's not about tech,
it's about change

Part II: cybersecurity scene in e-Estonia

Cybersecurity is the
enabler of digital society
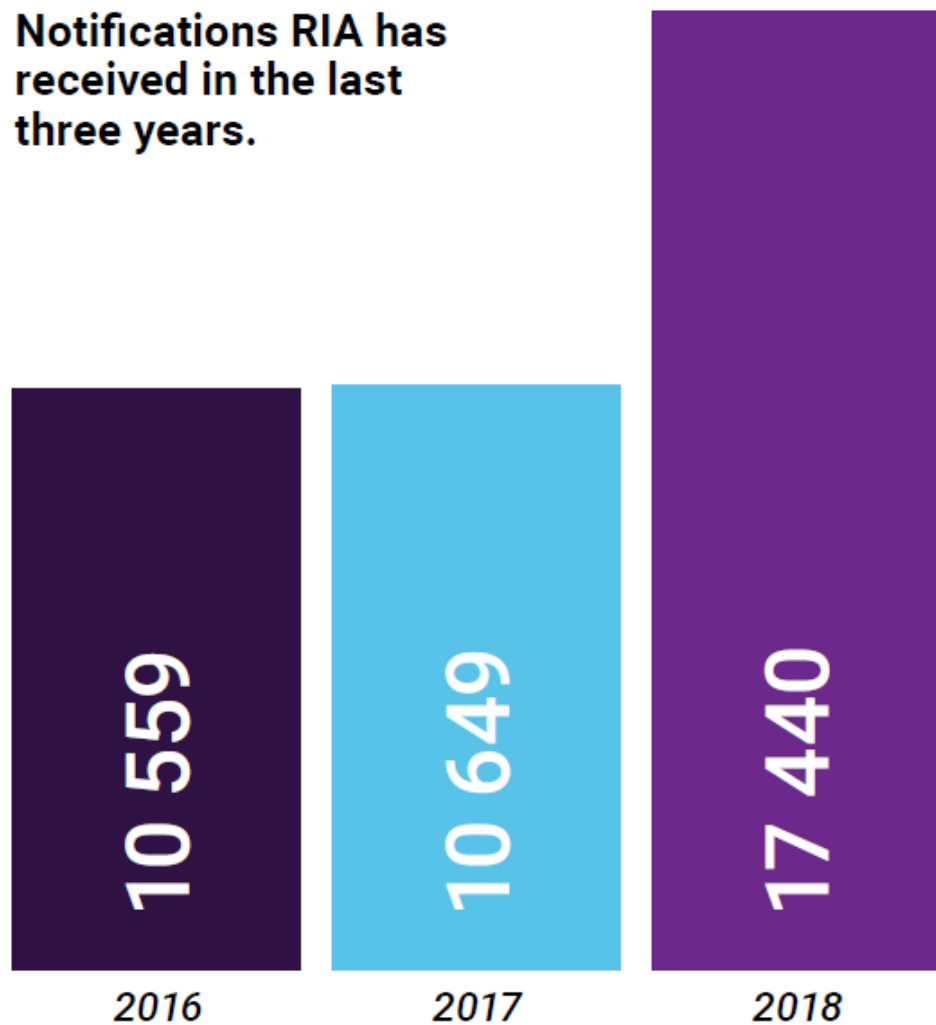
Holy trinity of trust

The safest combination.

confidentiality

availability

integrity

Threats we are facing

Notifications RIA has received in the last three years.

- 2016: 10 559
- 2017: 10 649
- 2018: 17 440

Incidents registered in 2018 which impacted data or systems

- Malware
- Compromised accounts
- Phishing
- Service interruption
- Administration error
- Defacement
- Ransomware
- Financial fraud
- Denial of service attack
- Network scanning
- C&C juhtserver
- Other
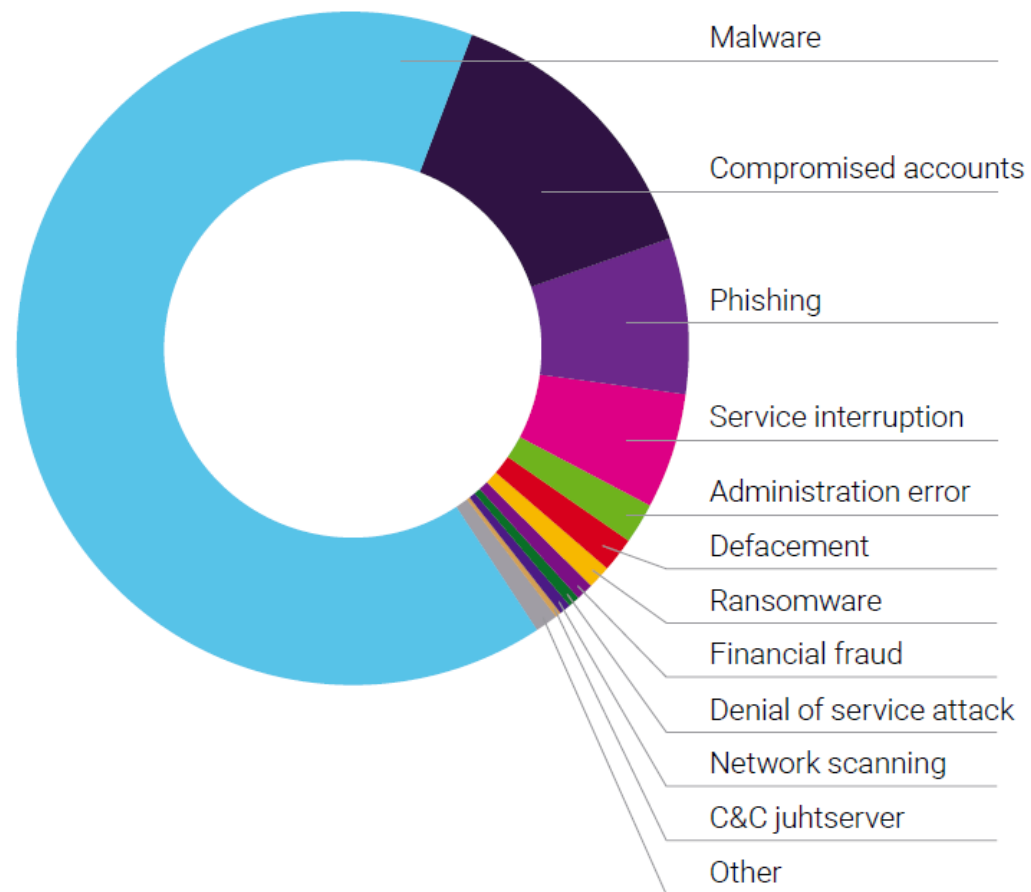
Policy aim: turning risk into strength

Cartoon: Urmas Nemvalts/PM
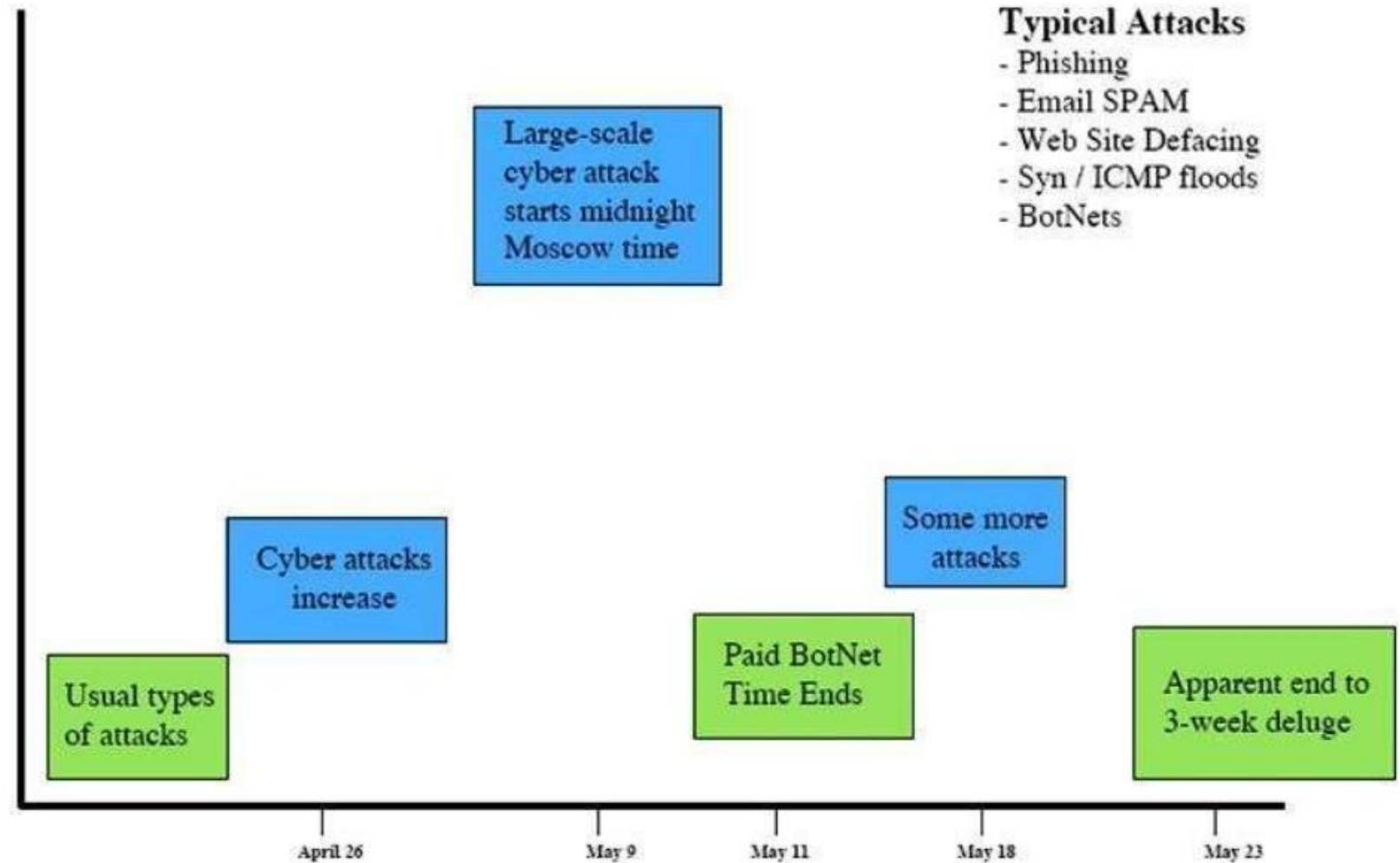
Cybersecurity Policy Management in Estonia

Government of Estonia

Government Office

Government's Security Committee

Ministry of Economic Affairs and Communications

Cyber Security Council
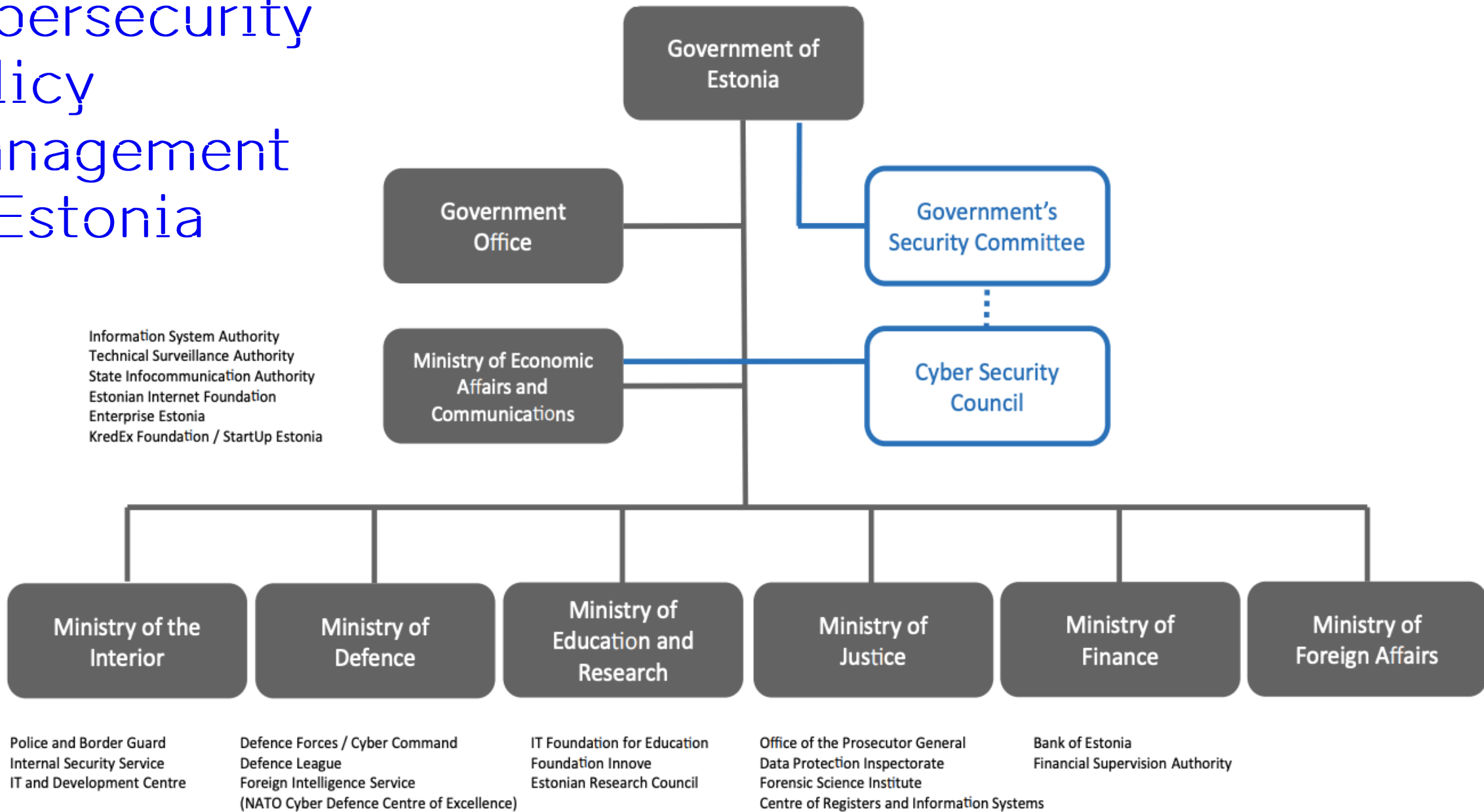
Information System Authority
Technical Surveillance Authority
State Infocommunication Authority
Estonian Internet Foundation
Enterprise Estonia
KredEx Foundation / StartUp Estonia

Ministry of the Interior

Ministry of Defence

Ministry of Education and Research

Ministry of Justice

Ministry of Finance

Ministry of Foreign Affairs

Police and Border Guard
Internal Security Service
IT and Development Centre

Defence Forces / Cyber Command
Defence League
Foreign Intelligence Service
(NATO Cyber Defence Centre of Excellence)

IT Foundation for Education
Foundation Innove
Estonian Research Council

Office of the Prosecutor General
Data Protection Inspectorate
Forensic Science Institute
Centre of Registers and Information Systems

Bank of Estonia
Financial Supervision Authority

REPUBLIC OF ESTONIA
GCIO Office

=

REPUBLIC OF ESTONIA
MINISTRY OF ECONOMIC AFFAIRS
AND COMMUNICATIONS

National cybersecurity policy setting and coordination
www.mkm.ee

REPUBLIC OF ESTONIA
INFORMATION SYSTEM AUTHORITY

Effectively national cybersecurity agency
Roles: national CERT, CIIP coordination, crisis
management centre, supervision and standard setting
www.ria.ee

Every agency has to manage their information security

Policy coordination formats

Cyber Security Council
GOV body for policy coordination, MEAC leads
Permanent secretaries, Directors

Cyber Security Strategy Commission
GOV body for strategy development and monitoring (MEAC leads)
Cyber Security heads from relevant ministries

National Cyber Security Advisory Council
GOV, academia and business associations, MEAC leads

Cyber Attack Attribution Commission
GOV body for International attribution, MFA leads

Cybersecurity Act[1]

Passed 09.05.2018

Applies to:
+ all government agencies at all levels
+ critical service providers (energy, medical, transportation, financial, telecom sectors) and public broadcaster
+ larger digital service providers (online marketplace, cloud hosting, search engine)

Requirements for service providers:
+ risk assessment, security processes and measures
+ monitoring of systems
+ notifying RIA in case of compromises
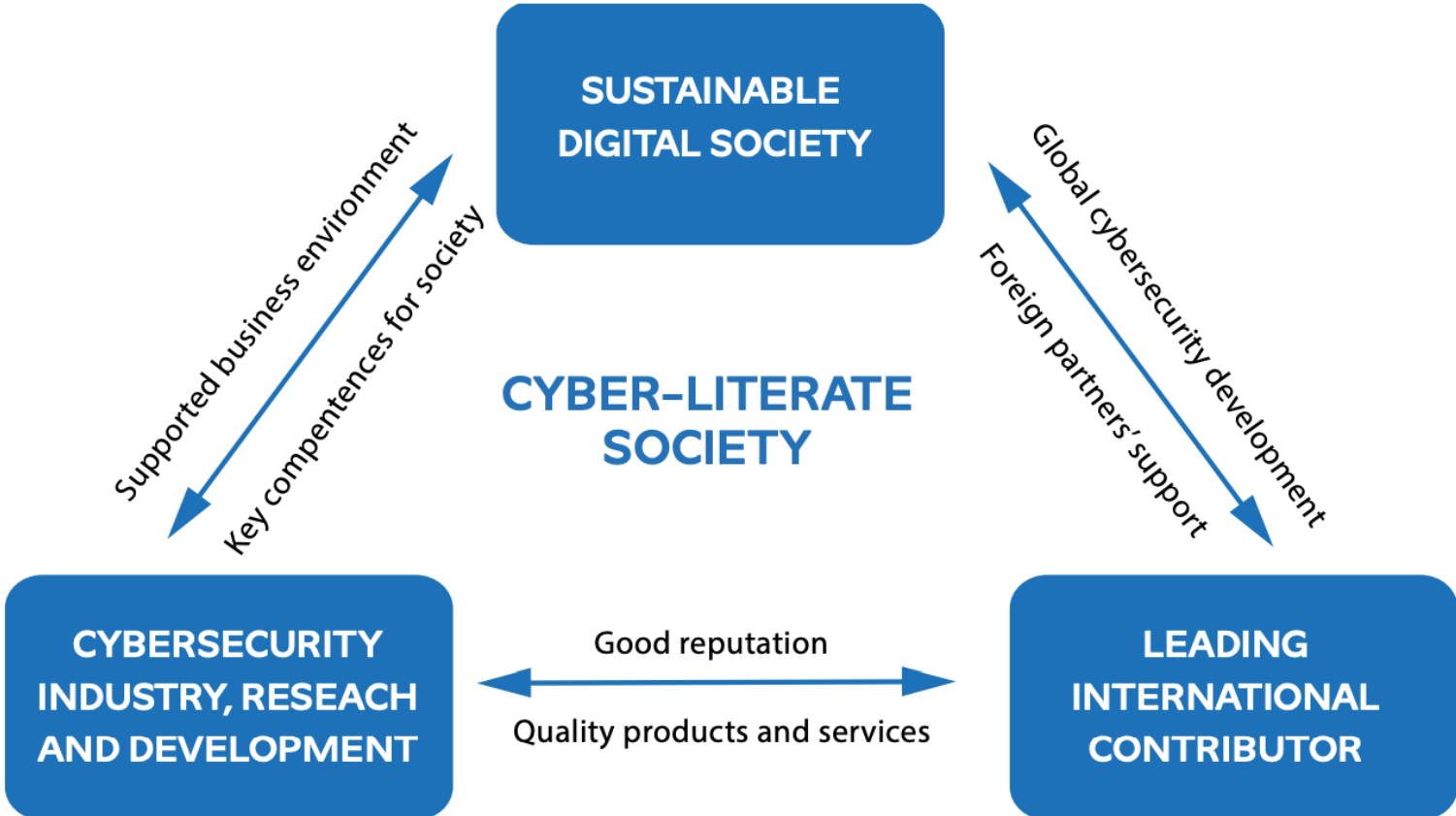+ taking measures to reduce impact and spread of incidents
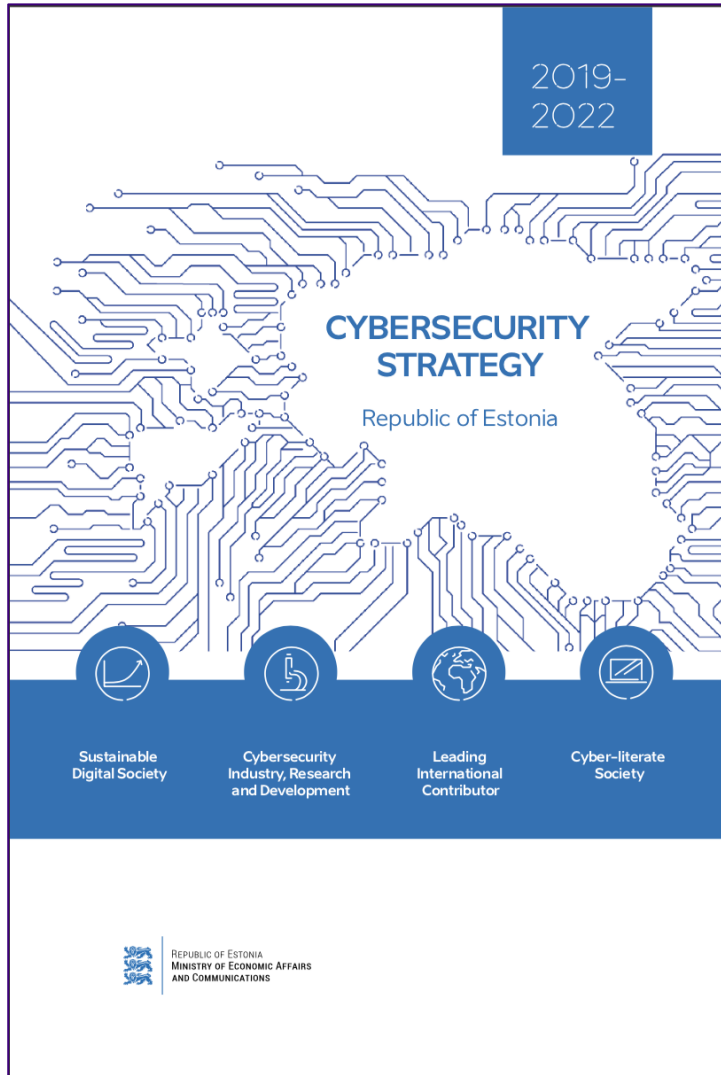
Vision: Estonia is the most resilient digital society

General goals:

1) No major incident occurs

2) Estonians residents feel safe online and trust digital public services

OBJECTIVE 1
Sustainable Digital Society

Estonia has strong technological resilience and emergency preparedness

- Renewing security standards
- Consolidating state's capabilities
- Managing digital interdependencies (incl cross-border)
- Developing near real-time situational view
- Further developing a cohesive cybersecurity community

OBJECTIVE 2
Cybersecurity Industry, R&D

Estonian cybersecurity industry is strong, innovative, research-oriented and globally competitive, covering all key competences for Estonia

- Supporting and promoting Estonian cybersecurity R&D: national plan
- Supporting and promoting research-driven cyber industry cluster

OBJECTIVE 3
Leading International Contributor

Estonia is a credible and capable partner in the international arena

- Advancing substantial cooperation on cyber issues with strategic international partners
- Promoting sustainable cybersecurity capacity building across the globe
- Advancing international cyber legal norms

OBJECTIVE 4
Cyber-literate Society

Estonia is a cyber-literate society and ensures sufficient and forward-looking talent supply

- Raising cybersecurity awareness among citizens and private sector: cyber hygiene for prevention
- Training govt officials: mandatory tests
- Developing talent to meet the needs of both state and private sector

Part III: 9 cybersecurity lessons

Risk-based approach

Risk-based approach

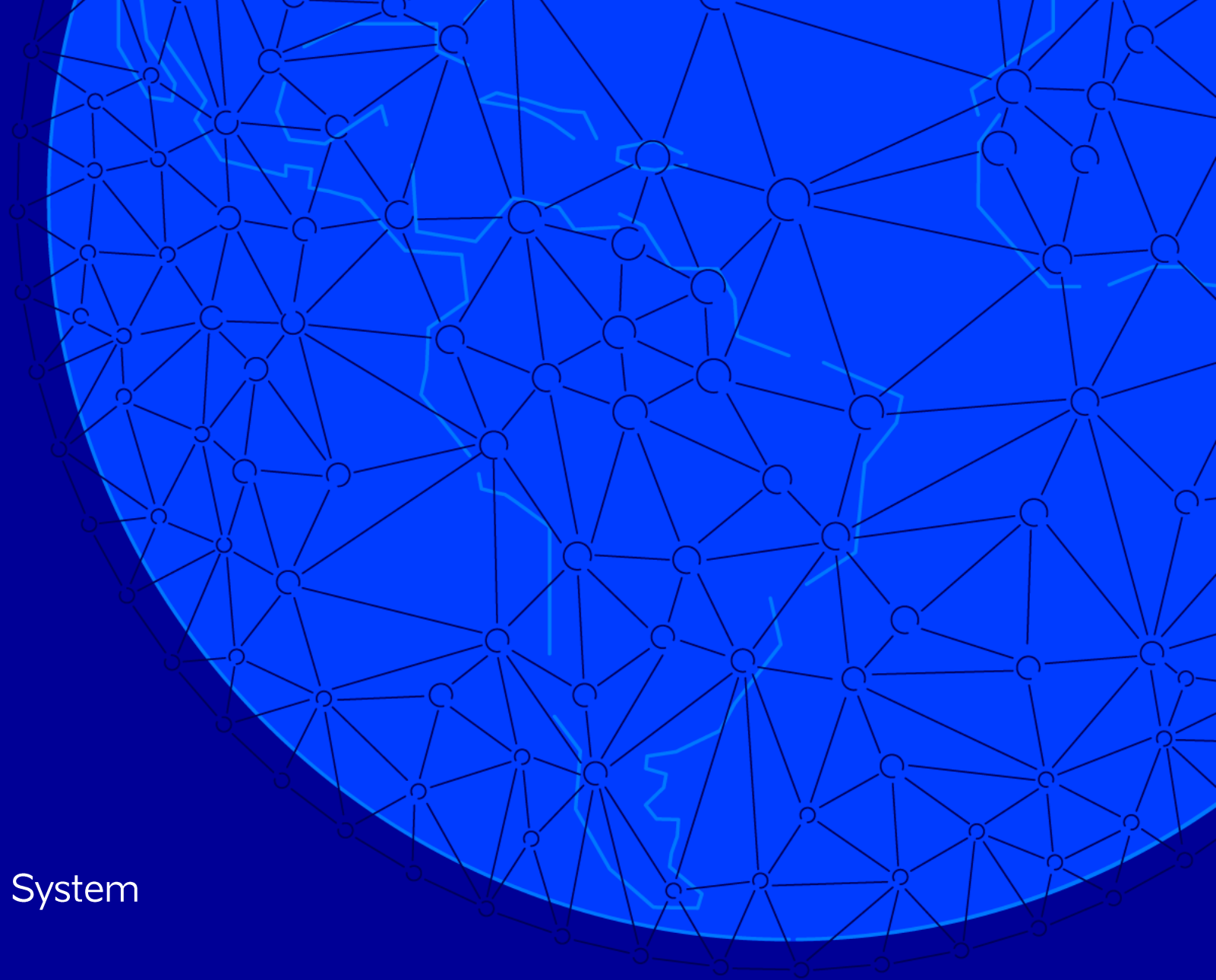Security-by-design

Risk-based approach

Security-by-design

(New) tech itself helps

blockchain

Guarding the integrity: first in the world

+ e-Health
+ Property and Land Registry
+ Business Registry
+ Succession Registry
+ e-Court
+ Surveillance / Tracking Information System
+ State Gazette
+ Official State Announcements

Risk-based approach

Security-by-design

(New) tech itself helps

Platforms make it easier

Risk-based approach

Security-by-design

(New) tech itself helps

Platforms make it easier

Prepare, prepare, prepare

Risk-based approach

Security-by-design

(New) tech itself helps

Platforms make it easier

Prepare, prepare, prepare

Community effort

KÜBERKAITSELIIT
ESTONIAN CYBER DEFENCE LEAGUE

Risk-based approach

Security-by-design

(New) tech itself helps

Platforms make it easier

Prepare, prepare, prepare

Community effort

International alliances

CCDCOE
Cooperative Cyber Defence
Centre of Excellence
Tallinn, Estonia

Risk-based approach

Security-by-design

(New) tech itself helps

Platforms make it easier

Prepare, prepare, prepare

Community effort

International alliances

Gotta have alternatives

Data embassies: for toughest times

+ Back-up (now) and mirror (future) of systems and data that country runs on
+ Cloud technology
+ Own premise hosted by allied government
+ Legal innovation: sovereignty over data hosted abroad under international law
+ First one in Luxembourg since 2019 (pilot with 10 most critical datasets)

Risk-based approach	Security-by-design	(New) tech itself helps
Platforms make it easier	Prepare, prepare, prepare	Community effort
International alliances	Gotta have alternatives	Transparency works

2017 digital ID vulnerability case

Photo: Sander Ilvest/PM/Scanpix

Fundamental lesson:

risks can be managed

Part IV: e- Estonia future

estonishing future

+ invisible services = zero bureaucracy
+ AI-powered government
+ government-as-a-platform
+ experimentation as a strategy

kratid.ee/in-english

EE national AI strategy
(July 2019)

pathfinders

Brav*est* transformation

+ Experimentation as a strategy
+ Open innovation
+ Estonia as testbed

© Ajujaht

Biggest cybersec challenge:

managing risks of innovations

© Taaniel Malleus

Let's build the
future together!

Siim Sikkut
Government CIO of Estonia
siim.sikkut@mkm.ee
@sikkut

f 𝕏 in ▷ e-Estonia

e-estonia@eas.ee

© Reimo Roonet