Lessons from Real-World Pentesting and Emerging Threats

Securing Critical Infrastructure in the Era of Sovereign Cloud

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Securing Critical Infrastructure in the Era of Sovereign Cloud

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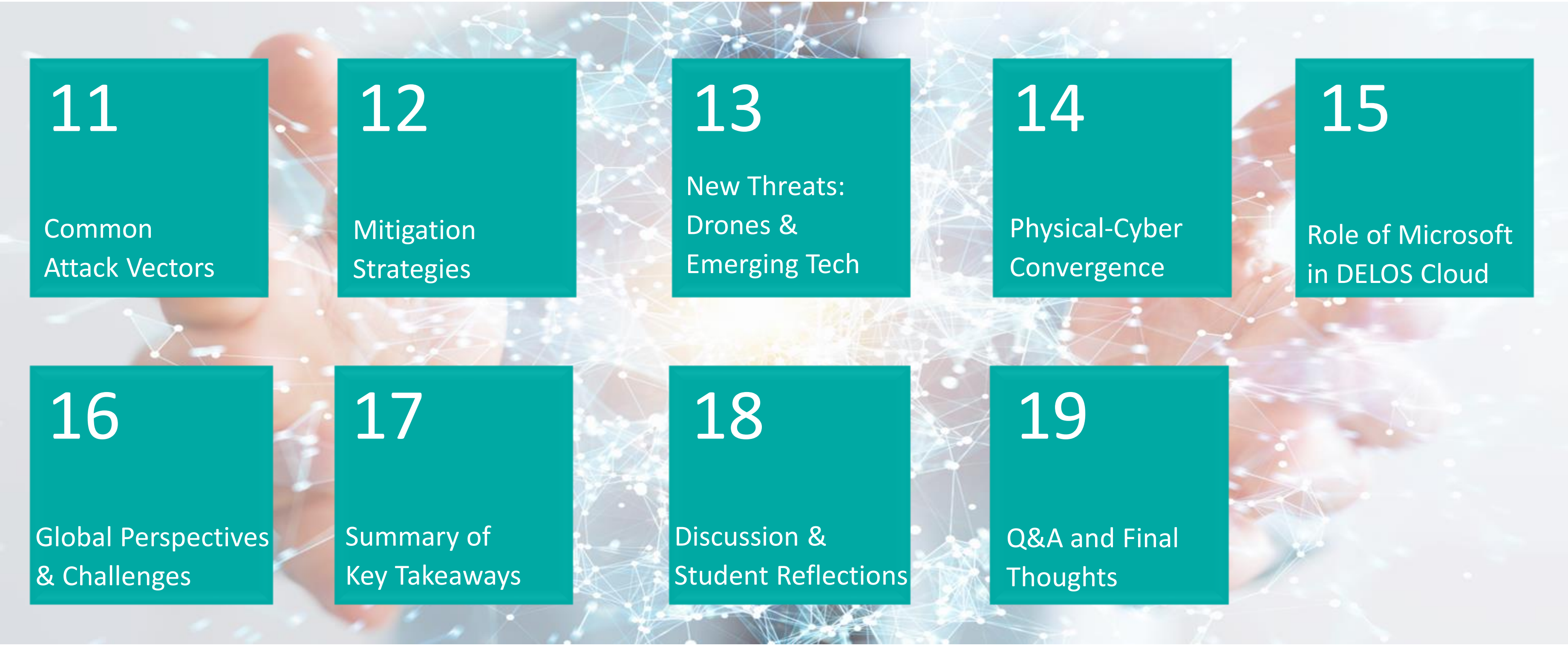
Agenda



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Welcome!

Talk Goal: Bridge Cloud Security & Critical Infrastructure

Founded in 1987

> 2,000 employees

> 300 million euros annual sales

21 locations in Germany, Austria, Switzerland, Spain & Croatia

Headquarter Bonn

The CONET Group:

Figures and Facts

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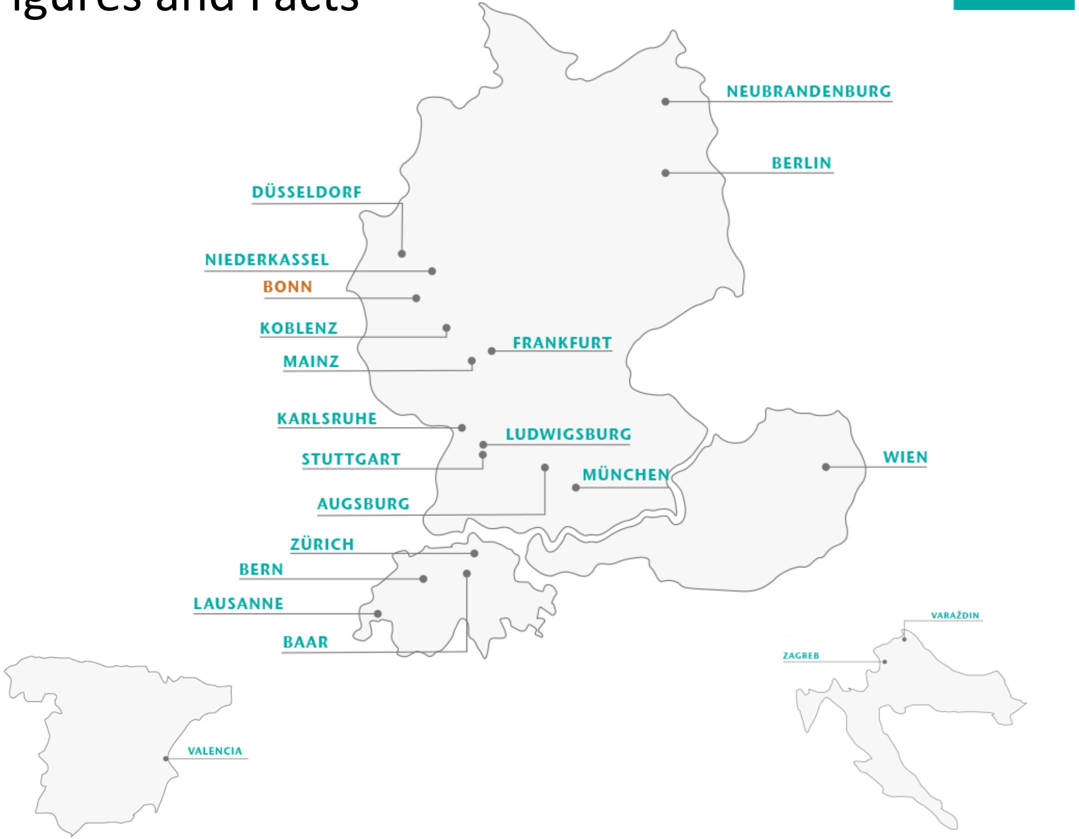

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Sovereign Cloud: What & Why

Definition:

- National control over data & infrastructure

Importance:

- **Compliance, Independence, Trust**

Relevance in the EU context

KRITIS – What is Critical Infrastructure?

- Energy, Water, Finance, Healthcare, IT
- Dependency on digital resilience
- Examples of disruption consequences

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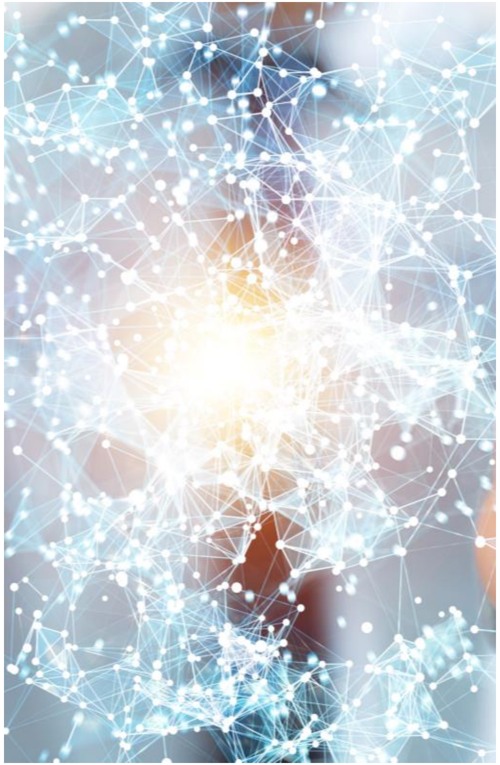
Legal & Regulatory Framework



BSI-KritisV (Germany)

Dependency on digital resilience

Examples of disruption consequences

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Case Study: DELOS Cloud

German sovereign cloud project

Partnership: Microsoft & Bundesdruckerei

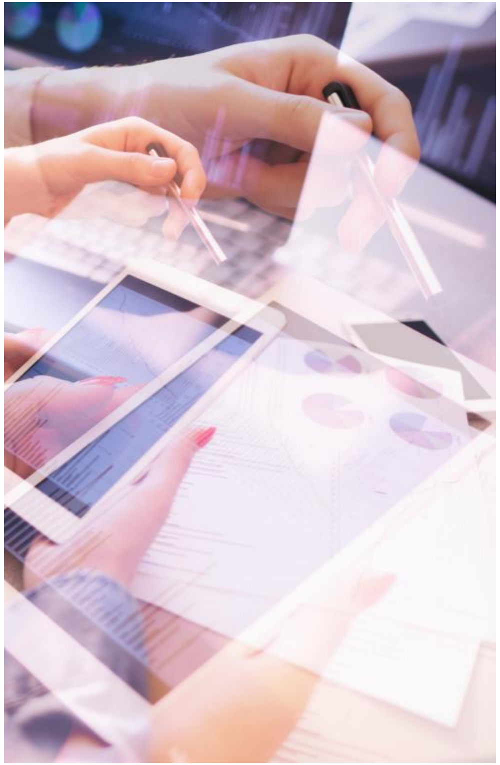
Key features: Isolation, transparency, security

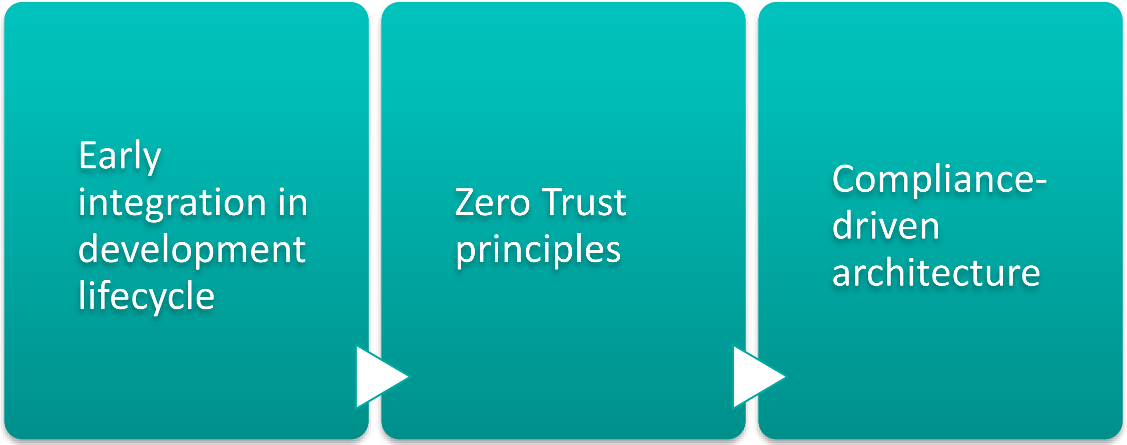
```
at r;
float area;

printf(" Input value of Radius : ");
scanf("%f", &r);

area = (M_PI * ( r * r) ) / 2;

printf("\n Area of the semicircle : %.2f \n\n", area );

return 0;

int hexagonSize;
  int r, s, i;

  printf(" Enter number for Hexagon size : ");
  scanf("%d", &hexagonSize);

  for(r=0; r<hexagonSize; r++)
  {
    for(s=0; s<=hexagonSize-r; s++){
      printf(" ");
```

Key Security Challenges

- Supply chain risks
- Identity & access management
- Logging & monitoring gaps

Security by Design




Early integration in development lifecycle

Zero Trust principles

Compliance-driven architecture

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Pentesting KRITIS Environments

Objectives: Identify weaknesses before attackers do

Red teaming vs. classic pentesting

Challenges: Complexity, legal constraints

Real-World Scenarios from Practice

- Simulated attacks on control systems
- Testing emergency response procedures
- Lessons from isolated networks
  - Water
  - Energy

Ethical & Legal Boundaries

- Consent and scope definition
- Handling sensitive data
- Reporting & responsible disclosure

- Regarding to national security all pentesters have to be approved by german goverment (Secuity Check, APT and BSI certified)

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Common Attack Vectors

- Misconfigurations
- Insider threats
- Remote access exploits

Mitigation Strategies

- Hardening systems
- Continuous monitoring
- Employee training
- Vulnerability Management

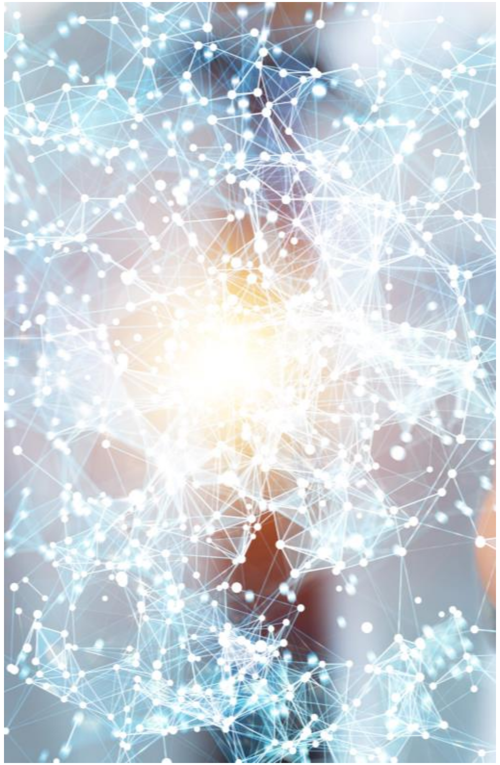
New Threats: Drones

Physical reconnaissance

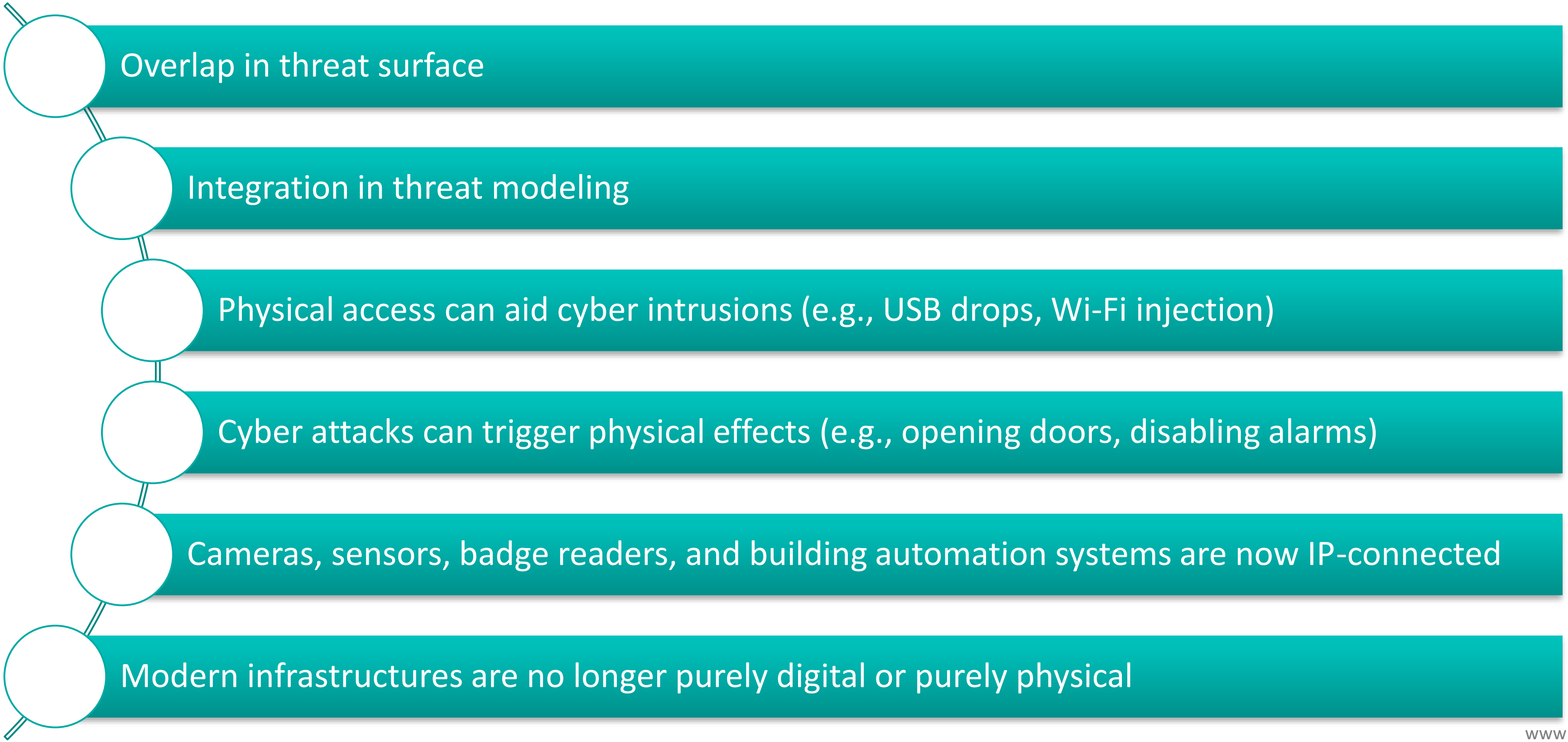
Wireless injection (Wi-Fi, Bluetooth)

Detection & defense techniques

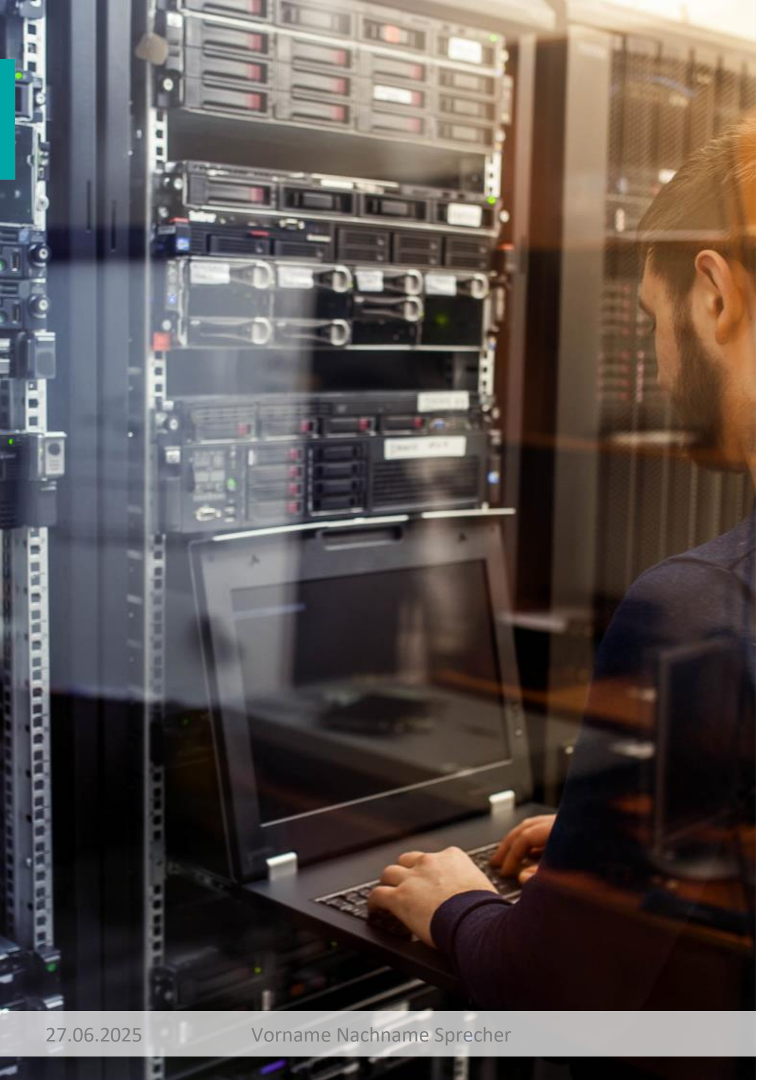
- Open World
- KRITIS Radar / Lida



Physical-Cyber Convergence



- Overlap in threat surface
- Integration in threat modeling
- Physical access can aid cyber intrusions (e.g., USB drops, Wi-Fi injection)
- Cyber attacks can trigger physical effects (e.g., opening doors, disabling alarms)
- Cameras, sensors, badge readers, and building automation systems are now IP-connected
- Modern infrastructures are no longer purely digital or purely physical

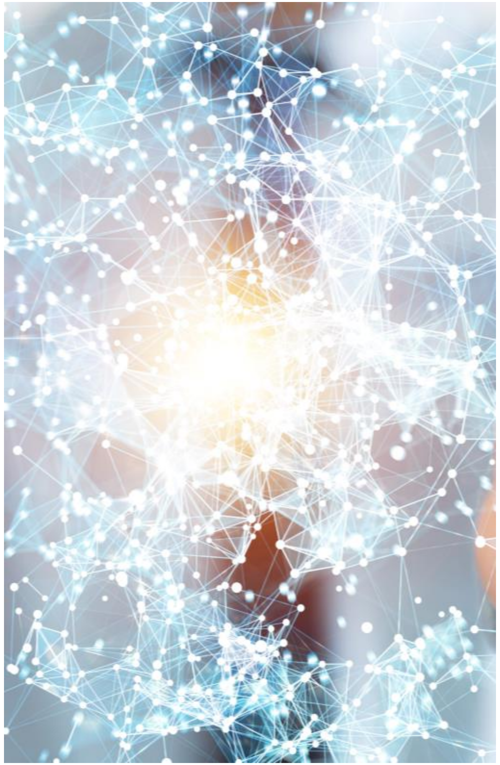


Role of Microsoft in Sovereign Cloud

- Azure under sovereign control
- Governance layer
- Separation of duties
- Other Key Players (Google / AWS)

Summary & Takeaways

- Sovereign cloud enhances resilience
- KRITIS requires special handling
- Pentesting must evolve with new threats



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Thank you for your attention!

Do you have any questions?

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