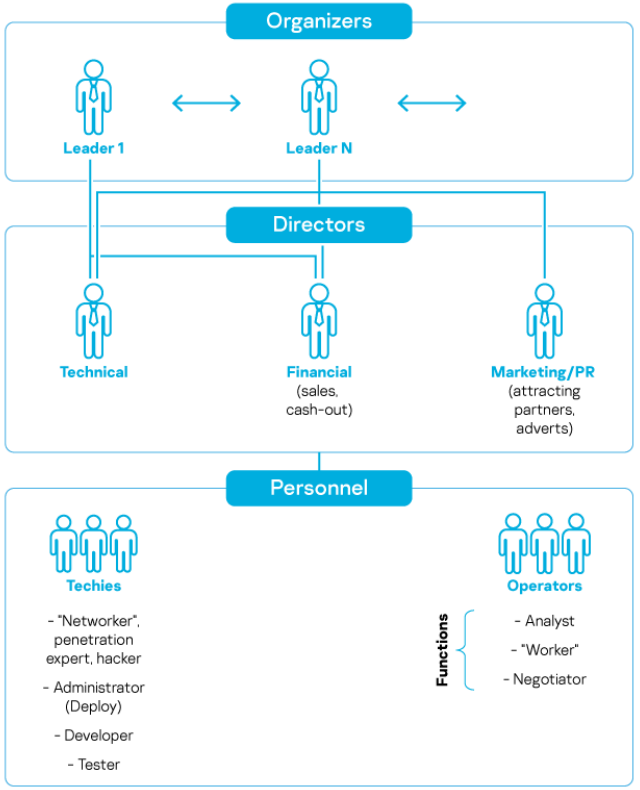
Security Landscape
and
Introduction to the course

David Crooks

Landscape: the world has changed

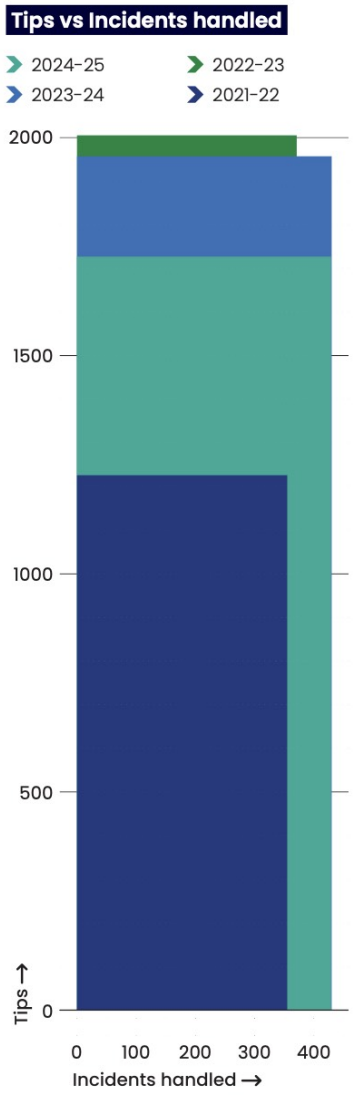
- In the past, biggest risk for academic security
  - Relatively simple, untargeted attacks
  - Belief that research computing was major risk
- This is no longer the case
  - Determined, well-resourced attackers
    - **9-5 jobs** working on malware services
  - Phishing and identity theft are major risk
    - Research computing security can be **major asset**
- Big business: we are targets

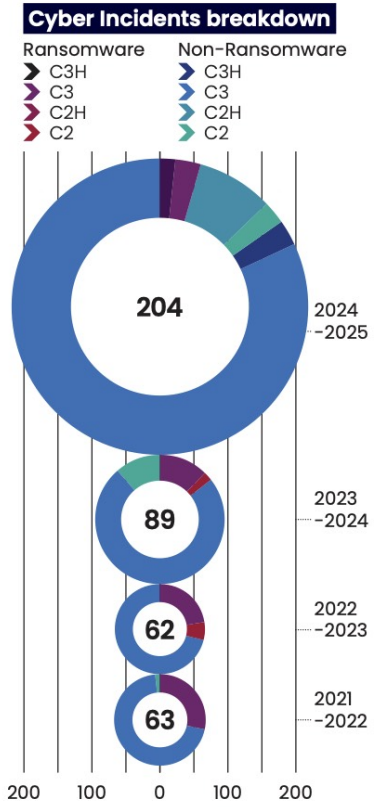


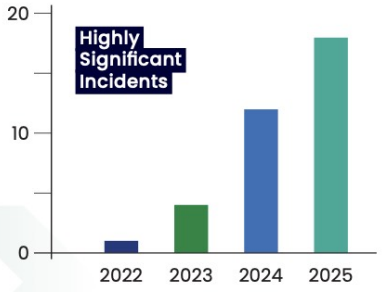
https://securelist.com/russian-speaking-cybercrime-evolution-2016-2021/104656/

UK National Cybersecurity Centre

- NCSC 2025 Report







andscape and intro to course

UK National Cybersecurity Centre

- NCSC 2025 Report

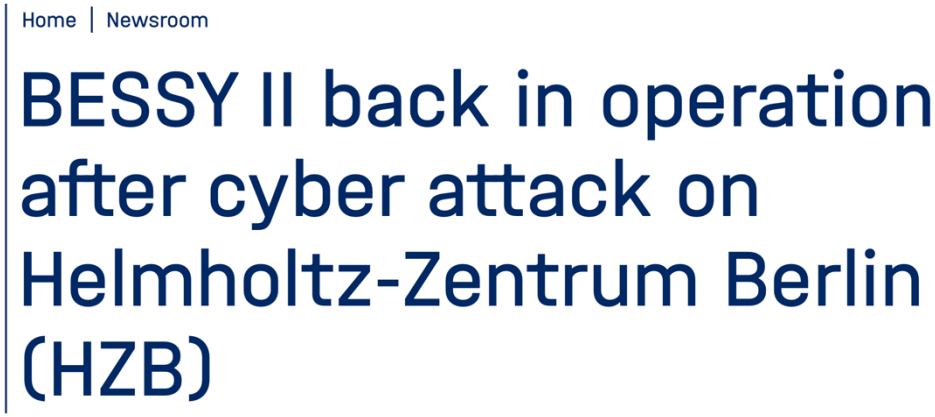
  - Highly significant incident: A cyber attack which has a serious impact on central government, UK essential services, a large proportion of the UK population, or the UK economy.
  - Significant incidents: A cyber attack which has a serious impact on a large organisation or on wider/local government, or which poses a considerable risk to central government or UK essential services.
  - *Increase in reports attributed to change in data collection and cannot be compared directly to previous years.

2025 ransomware

- Top sectors reporting ransomware
  - **academia**, finance, engineering, retails and manufacturing

Incidents in or near our sector

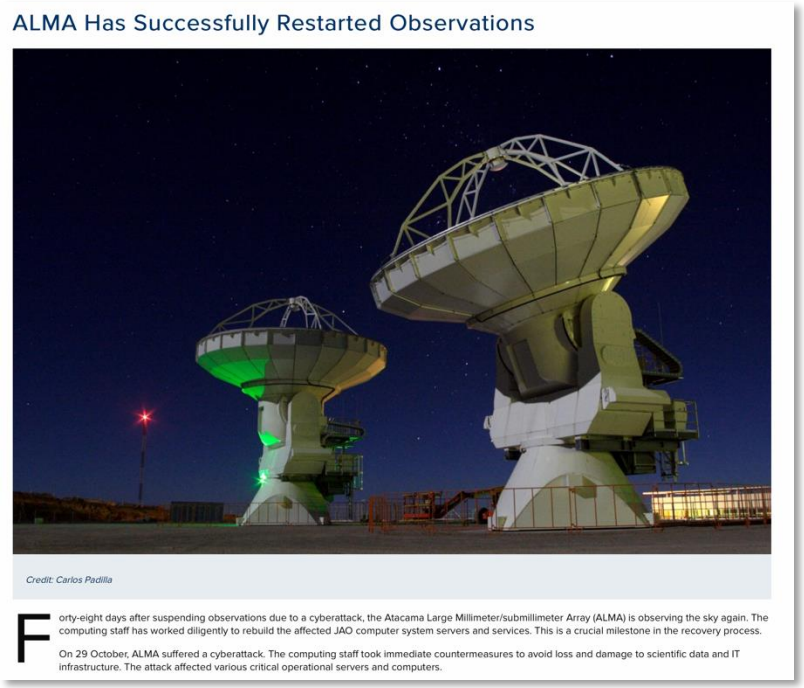
British Library



HZB

Incidents in or near our sector

ALMA



ALMA Has Successfully Restarted Observations

Credit: Carlos Padilla

Forty-eight days after suspending observations due to a cyberattack, the Atacama Large Millimeter/submillimeter Array (ALMA) is observing the sky again. The computing staff has worked diligently to rebuild the affected JAO computer system servers and services. This is a crucial milestone in the recovery process.

On 29 October, ALMA suffered a cyberattack. The computing staff took immediate countermeasures to avoid loss and damage to scientific data and IT infrastructure. The attack affected various critical operational servers and computers.

Lincoln College, IL

Lincoln College to close after 157 years due ransomware attack

By Sergiu Gatlan May 9, 2022 06:17 PM 4

Lincoln College, a liberal-arts school from rural Illinois, says it will close its doors later this month, 157 years since its founding and following a brutal hit on its finances from the COVID-19 pandemic and a recent ransomware attack.

BL lessons learned

- Enhance network monitoring capabilities
- Retain on-call external security expertise
- Fully implement multi-factor authentication
- Enhance intrusion response processes
- Implement network segmentation
- Practice comprehensive business continuity plans
- Maintain a holistic overview of cyber-risk
- Manage systems lifecycles to eliminate legacy technology
- Prioritise remediation of issues arising from legacy technology
- Prioritise recovery alongside security
- Cyber-risk awareness and expertise at senior level
- Regularly train all staff in evolving risks
- Proactively manage staff and user wellbeing
- Review acceptable personal use of IT
- Collaborate with sector peers
- Implement Government standards, review and audit policies and processes regularly

Vulnerabilities

- Have to address one of the major changes this year
- Sharp rise in vulnerabilities, especially found using AI tooling
- Often widely reported before patches/mitigations available
- Sharing ways to approach these essential

Approach

- Over last years we have seen very high-profile attacks
  - Particularly ransomware
  - Many in the press

- For an organisation an attack can be **catastrophic**
  - Months of complete organisational shutdown

- It is **essential** that we work together to defend our community

Motivation for this school

- Emphasise training and skills for system managers and others deploying IT capabilities
  - Alongside cybersecurity professional colleagues

- Build community of practice around security in our sector

Security frameworks and research computing

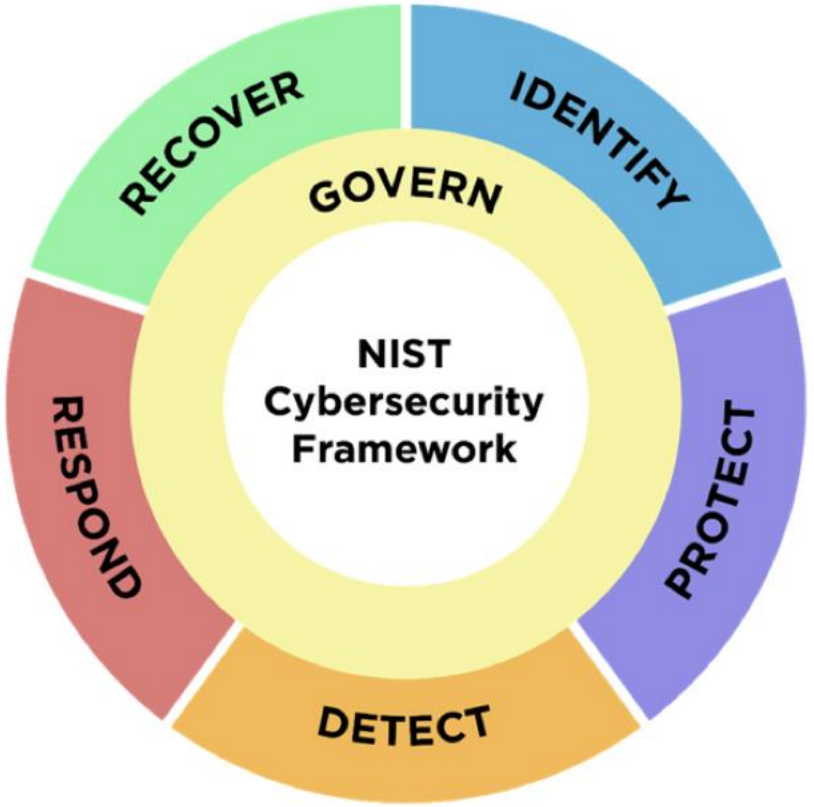
- Broad historical experience of the relationship between research computing security and corporate IT security
  - Often challenging
  - Necessarily more open risk appetite required for research computing may be at odds with corporate IT risk appetite
  - Research computing may well require **different** controls, but it still requires controls

- Frameworks help in a research context as much as anywhere else

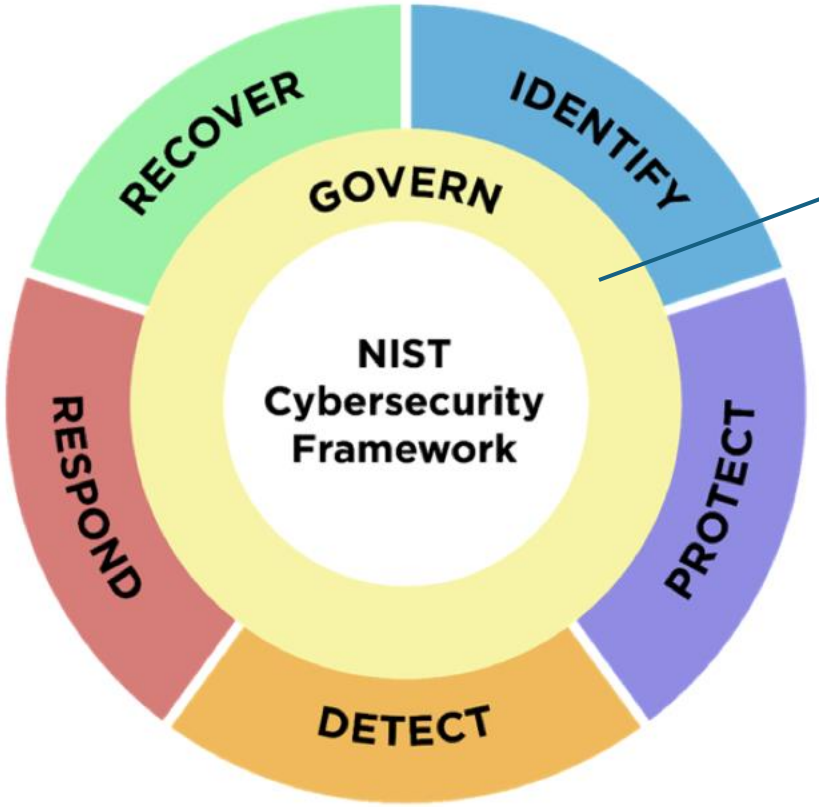
About the program: frameworks

- Not getting into the meat of the course yet, but…
- Note the importance of security frameworks in supporting and driving this work
  - Compliance can be useful!
- ISO27k, UK NCSC Cyber Assessment Framework, NIST Cybersecurity Framework

About the program: frameworks

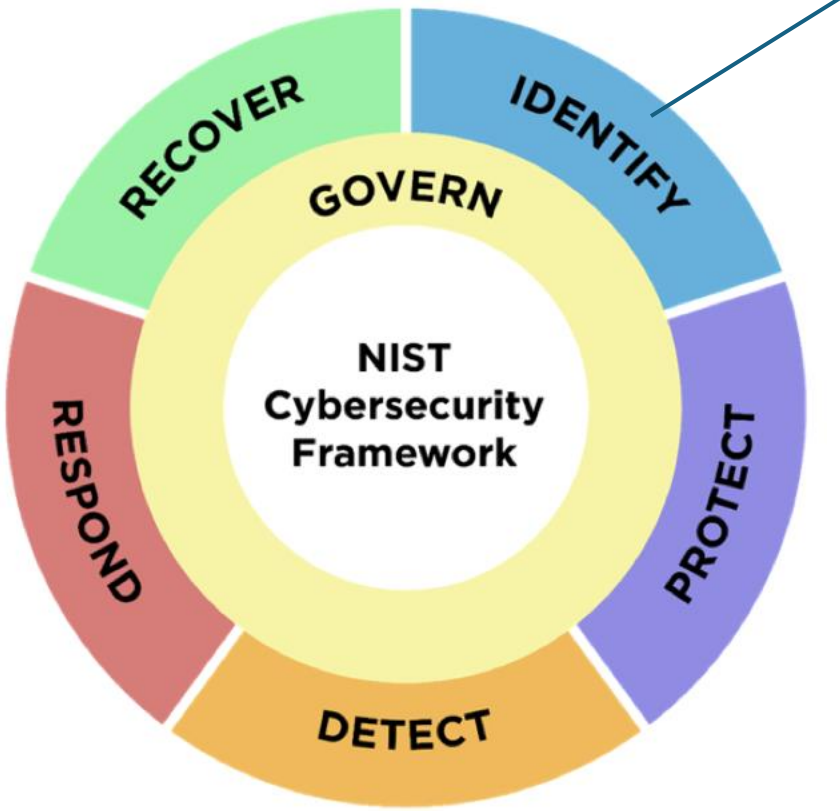


About the program: frameworks

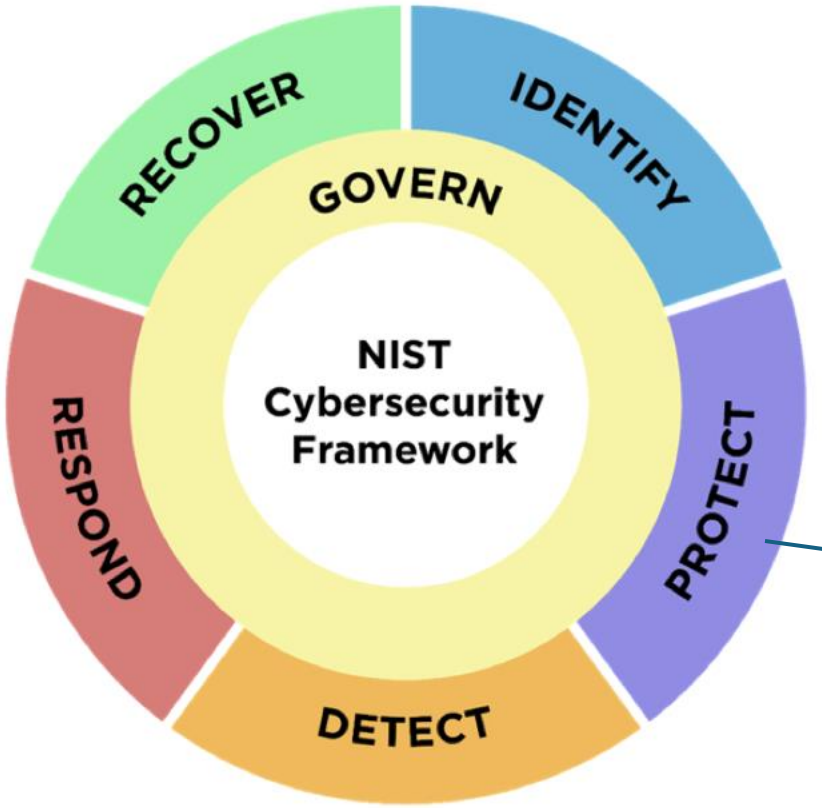


organization's cybersecurity risk management strategy

About the program: frameworks

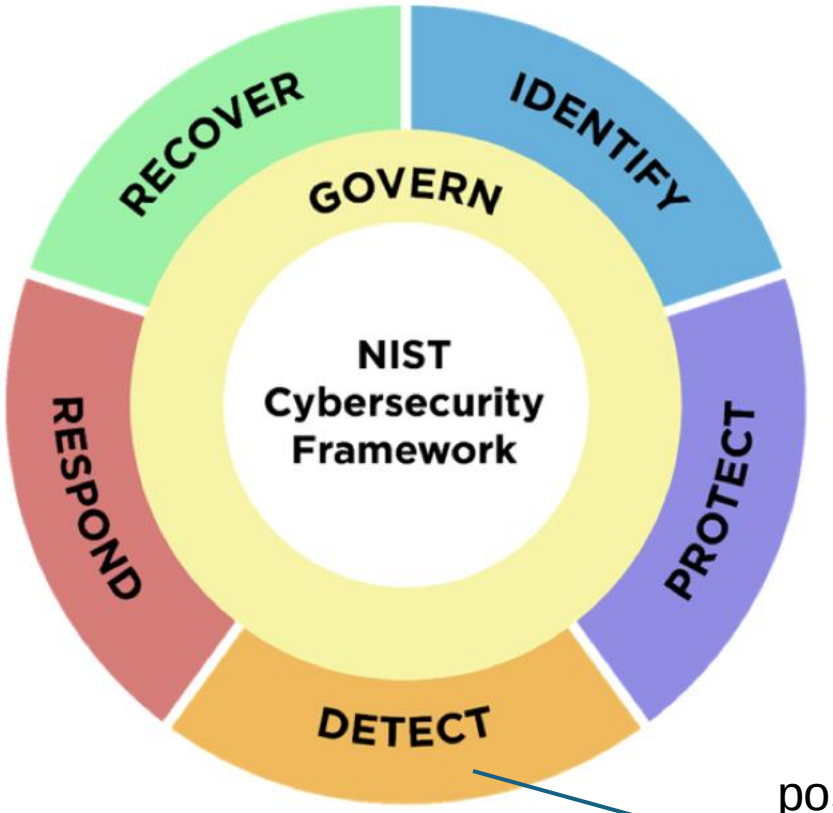


About the program: frameworks



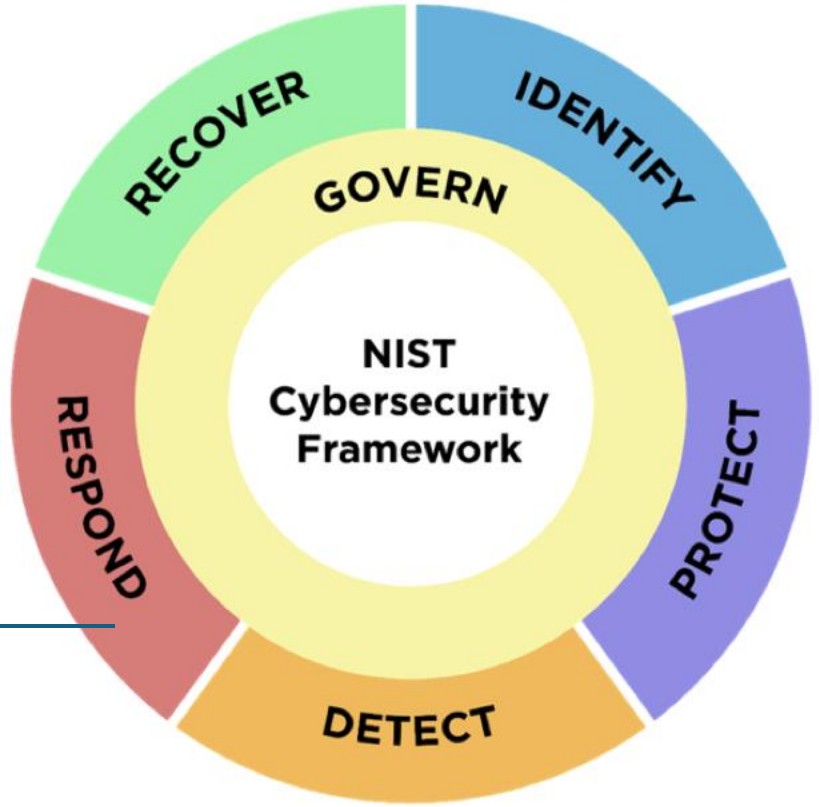
safeguards to manage the organization's cybersecurity risks

About the program: frameworks



possible cybersecurity attacks and compromises are found and analyzed

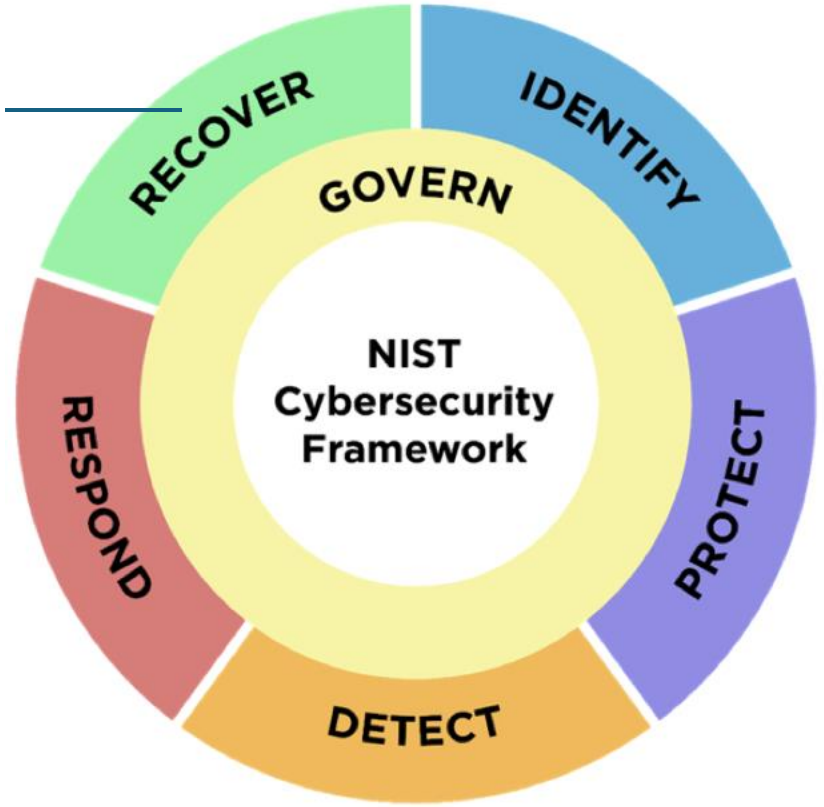
About the program: frameworks



actions regarding a detected cybersecurity incident are taken

About the program: frameworks

assets and operations affected by a cybersecurity incident are restored



About the program: frameworks

GOVERN

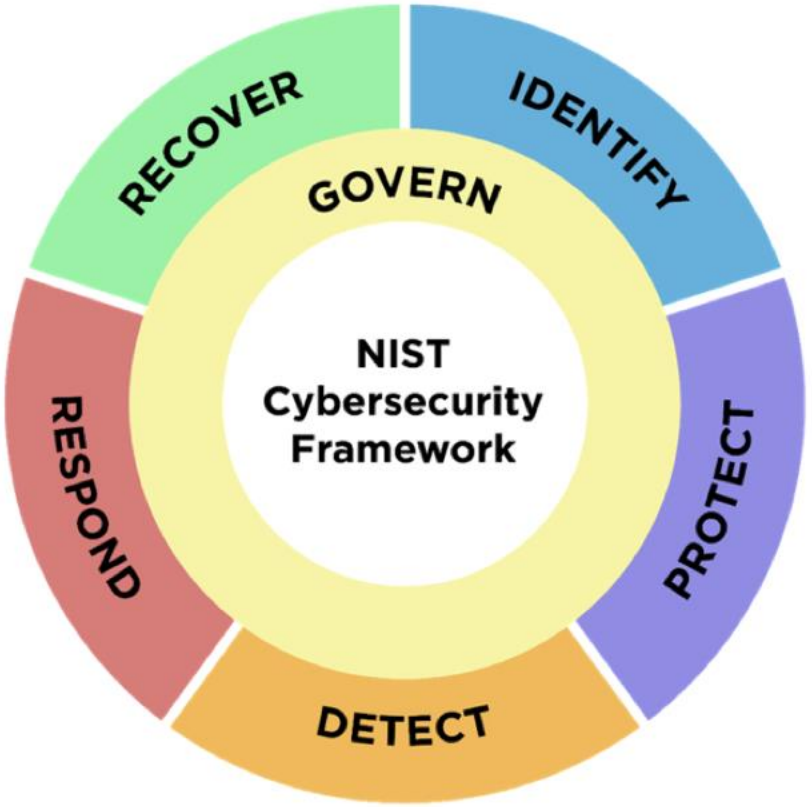
IDENTIFY

PROTECT

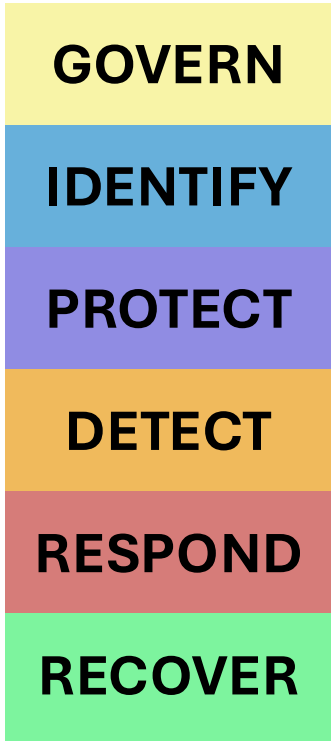
DETECT

RESPOND

RECOVER



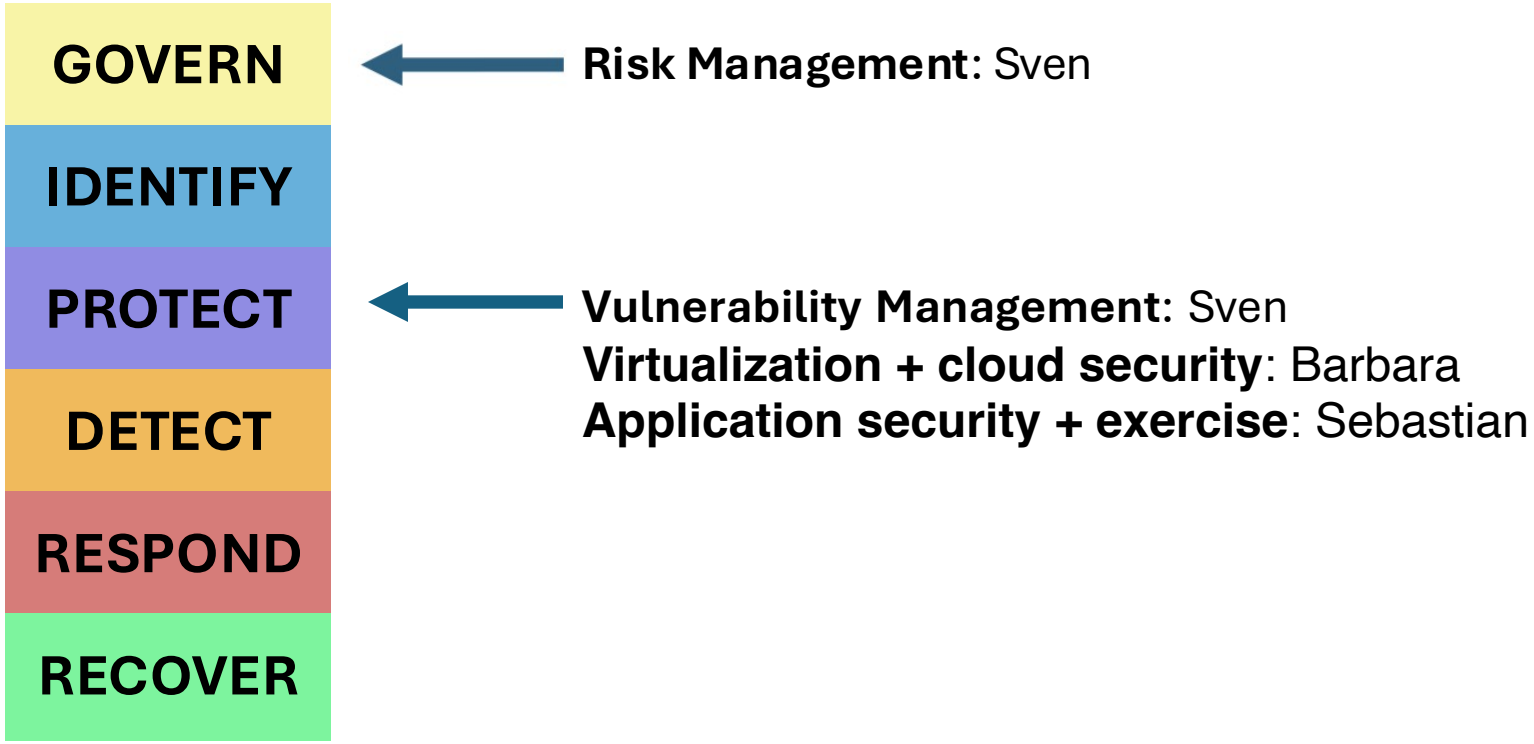
Monday



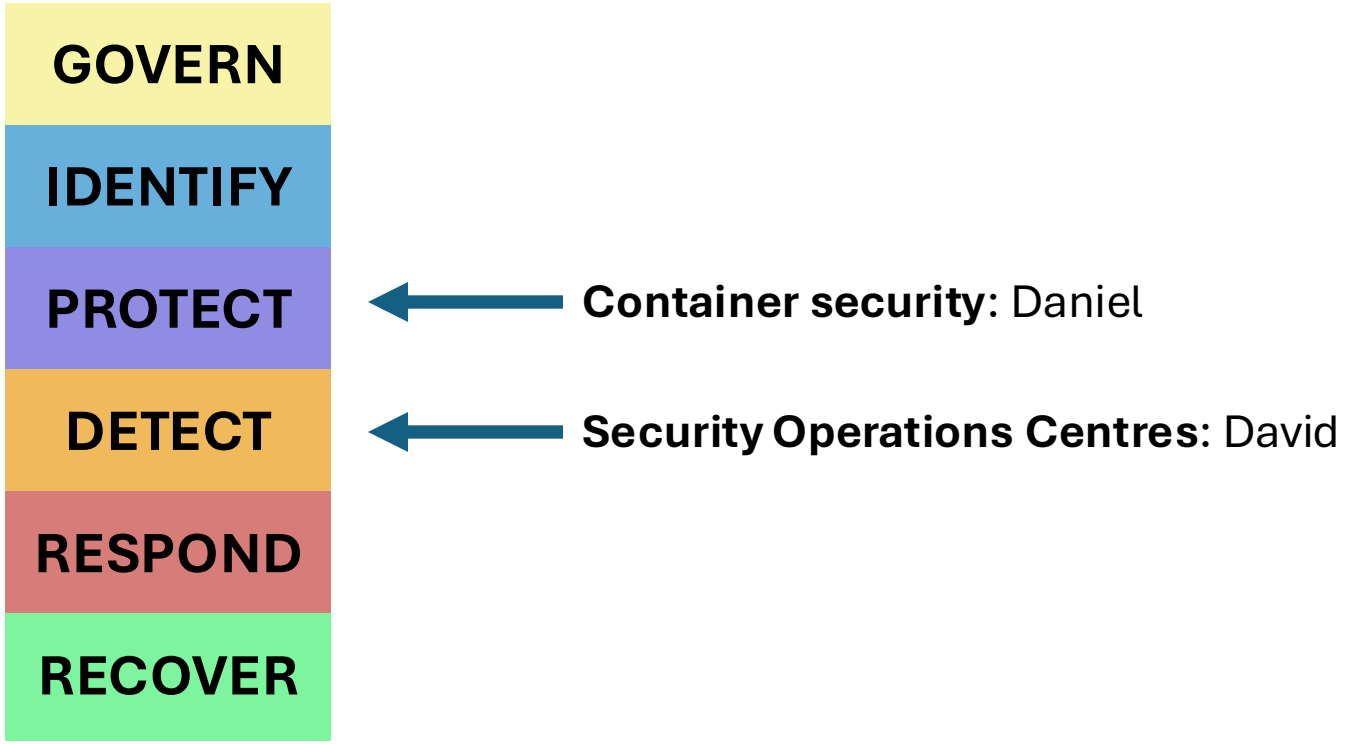
Security Architecture: Barbara
Identity, authentication, authorisation + exercise: Tom and Donald

Logging and Traceability: David

Tuesday


GOVERN
IDENTIFY
PROTECT
DETECT
RESPOND
RECOVER
Risk Management: Sven
Vulnerability Management: Sven
Virtualization + cloud security: Barbara
Application security + exercise: Sebastian

Wednesday


GOVERN
IDENTIFY
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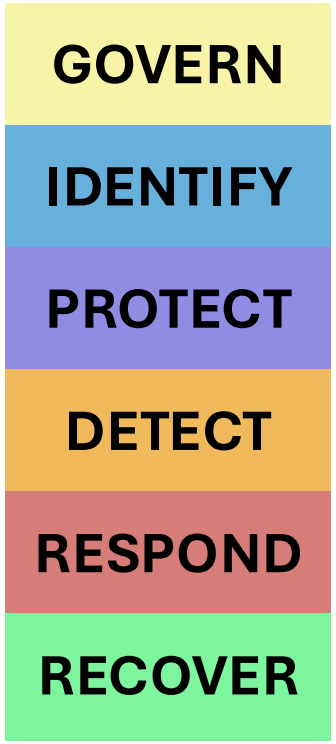
Container security: Daniel
Security Operations Centres: David

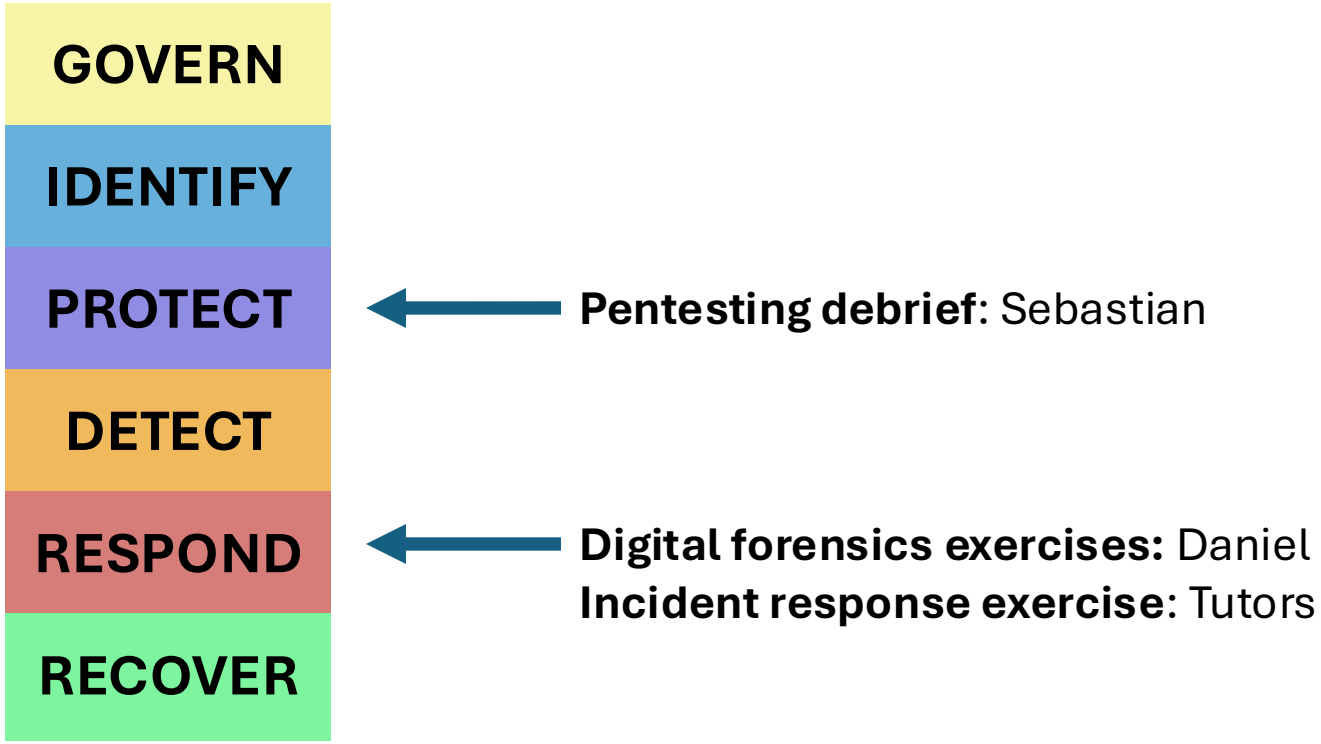
Thursday



SOC exercise: David + Dawid

Security Operations: Sven
Incident response management: Barbara
Digital forensics: Daniel

Friday


GOVERN
IDENTIFY
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RESPOND
RECOVER
Pentesting debrief: Sebastian
Digital forensics exercises: Daniel
Incident response exercise: Tutors

On to the lectures

- First lecture:

- 1130: Security Architecture fundamentals with Barbara