Incident Response in the SDLC

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{devday.23}

/root/00_agenda

Introduction

What is Incident Response

Responsibilities

Challenges

Preparing for Incidents in the Software Lifecycle

Honorable Mentions

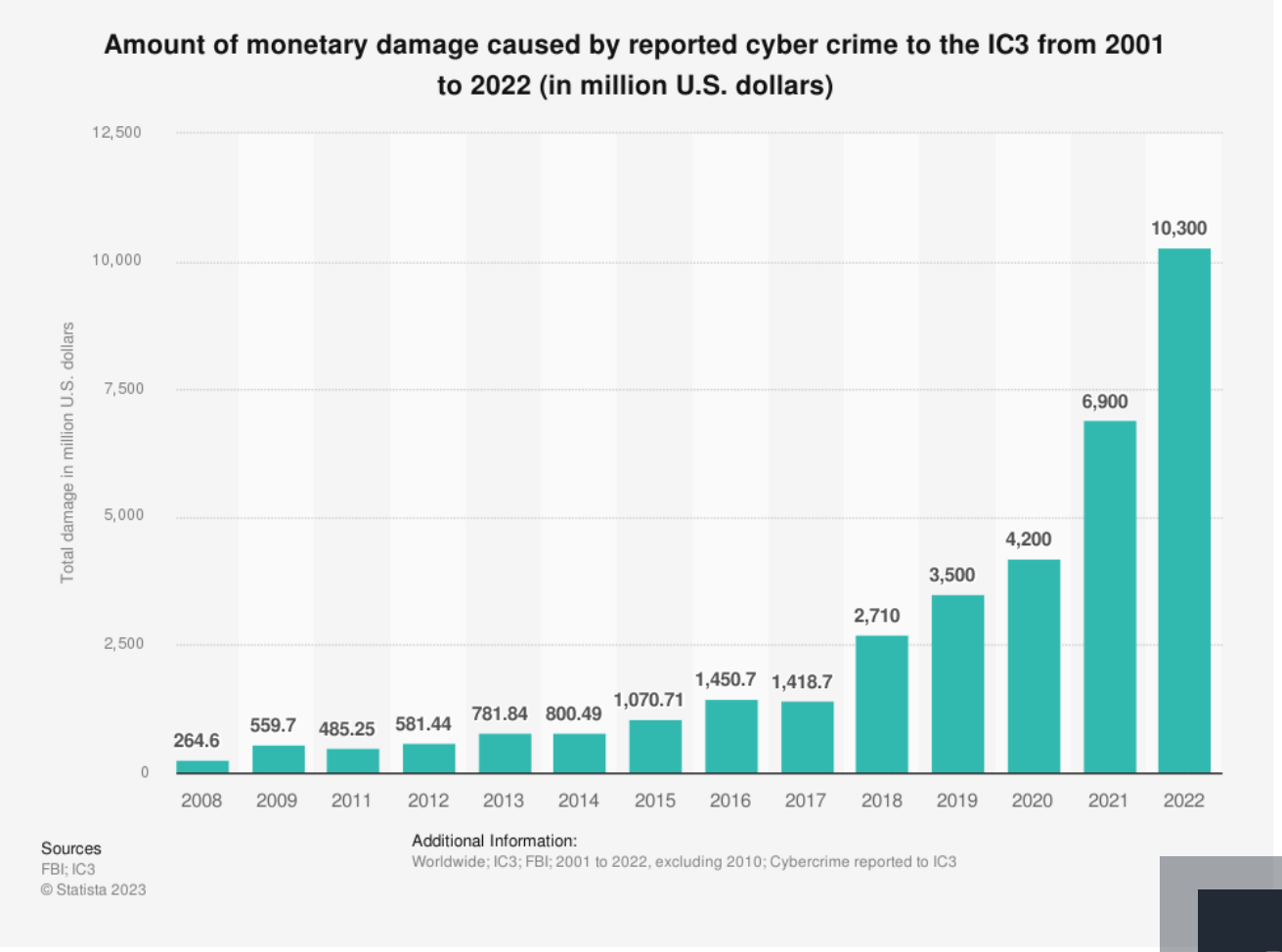
Introduction

/root/01_whoami

- **Incident Responder &Forensic Analyst**
  Telekom MMS
- Former Pentester and DevSecOps Guy
- Open Source Advocate

/root/02_background

- Recent Security Breaches
  - Adesso
  - Materna
  - 3CX
  - Continental
  - WesternDigital
  - SolarWinds

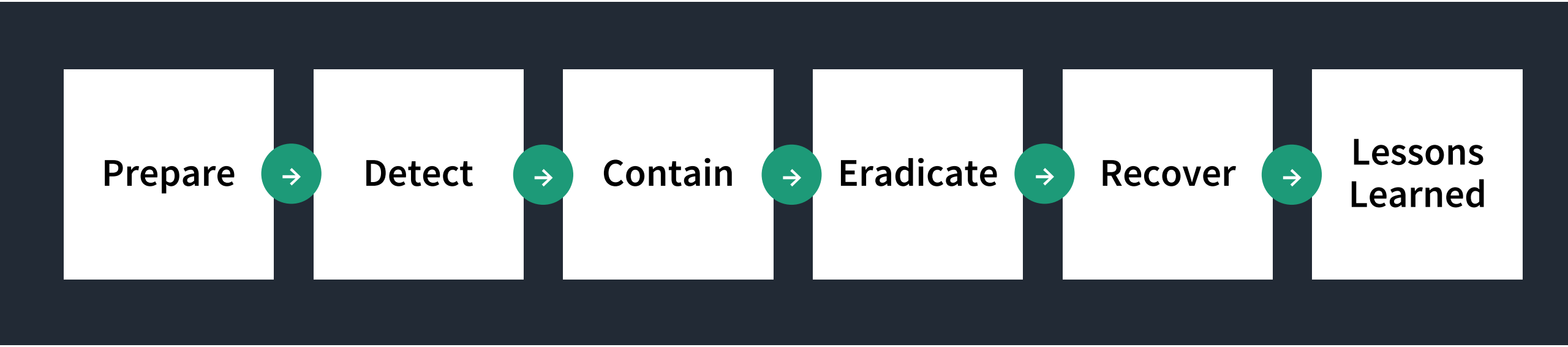


/root/03_goals

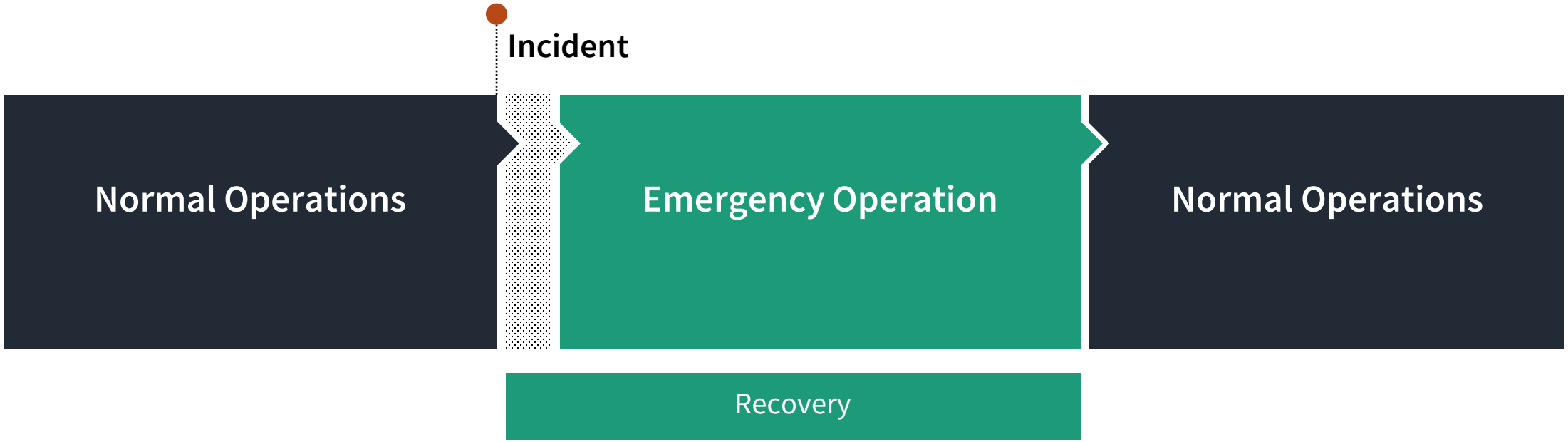
- Kickstart your knowledge in incident response (IR)
- Integrating your domain and mine (in theory)
- Have a good discussion afterwards

What is Incident Response

/root/04_incident.response

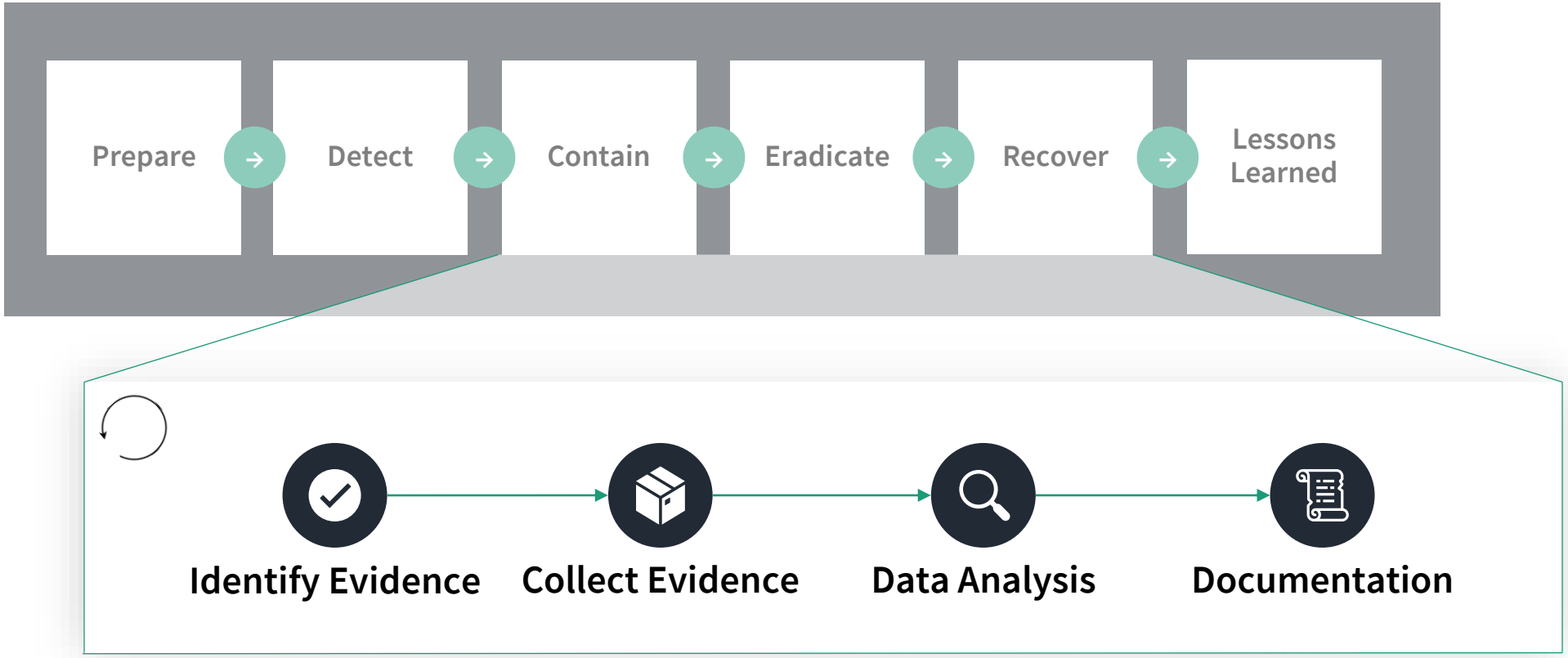


/root/05_emergency.operation



- Prioritization
- Workarounds
- Manual Tasks

/root/06_digital-forensics



/root/07_key.artefacts

- Depends on the highly on the operating model
  - On premise vs Cloud
  - Container vs. VMs
  - Etc.

- In an optimal world you would only need reliable log sources
  - Connection Logs
  - Authentication Logs
  - Audit Logs
  - Request Logs

Responsibilities in Incident Response

/root/08_responders.responsibilities

- Keep outages short and reputation loss low
- Keep IT managers sane
- Often lack system or infrastructure specific knowledge

/root/09_operations.responsibilities

- Have to do all the heavy lifting

- May participate in building the IR strategy and are invited to exercises

/root/10_software.teams.responsibilities

- Most likely none at all

- Sometimes abused for simple tasks

But:

- The often have very useful insights and expertise

Challenges in Incident Response

/root/11_time

- Analysis vs. Recovery efforts have to be weighted
- Stakeholders are waiting for answers
- There are industries were a day of outage may cost millions

/root/12_data.sources.and.quality

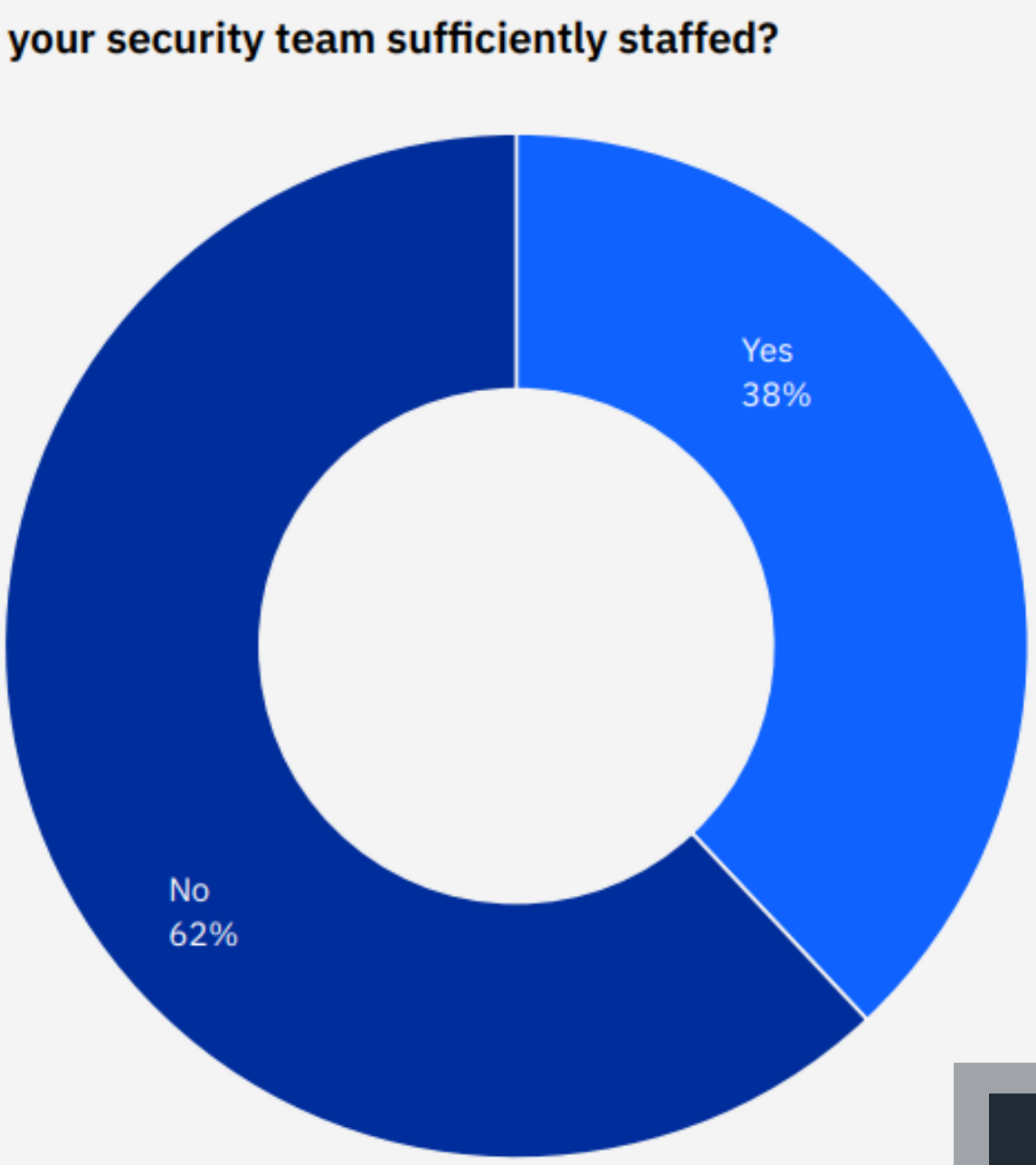
- Logs are the #1 artefact for all analysis steps yet they are often:
  - Not well documented
  - Not centrally available
  - Not secured from manipulation
  - Not configured correctly
  - Not retained long enough
  - Not known
  - Not available at all
  - Behind vendor lock (proprietary formats)

/root/13_available.documentation

- Missing documentation means Trial and Error
  - Which business processes and system are needed?
  - How can they be recovered?
  - What actions are logged?
  - Where are logs stored?
  - Who is responsible for what?
  - How can data be migrated?
  - How can data be sanitized?
  - …

/root/14_available .expertise

- Need for external help
- Prioritizing and Preparation are key



/root/15_learnings

- Prepare for breaches on each abstraction layer of the business as early as possible
- Include Blue Team members early in all decision making
- Make use of all the skills available in your teams
- Do not reinvent the wheel except it’s absolutely necessary

Preparing for Incidents in the Software Lifecycle

/root/16_state.of.the.art

- Software engineers are disengaged from the incident response (IR) structures

- Information exchange between these domains is very limited

/root/17_microsoft.sdl

- Security Training

- Establish Security Req.
- Create Quality Gates
- Conduct Risk Assessment

- Define Security Requirements
- Threat Modelling
- Analyse Attack Surface

- Use approved tooling
- Deprecate unsafe functions
- Static Analysis

- Dynamic Analysis
- Fuzz Testing
- Attack Surface Review

- Create Incident Response Plan
- Final Security Review

- Execute Incident Response Plan

/root/18_microsoft.sdl

- Security Training
- Joined Lessons Learned

- Establish Security Req.
- Create Quality Gates
- Conduct Risk Assessment
- Create Abuse Cases

- Define Security Requirements
- Threat Modelling
- Analyse Attack Surface

- Use approved tooling
- Deprecate unsafe functions
- Static Analysis
- Create Incident Response Plan

- Dynamic Analysis
- Fuzz Testing
- Attack Surface Review
- Test Incident Response Plan

- Final Security Review
- Dedicated IR information packages

- Execute Incident Response Plan

/root/19_joined.lessons.learned

- Joined Lessons Learned help both worlds
- Software Teams better understand risks and threats
- Response Teams can sharpen their tools and procedures

/root/20_establish.security.requirements

- Decide whether incorporating an business continuity scenario is necessary:
  - Is my application or data critical to the business?
  - Is access to the data a critical threat?
  - How long could the application be offline without affecting the business?
  - Are there manual work-arounds available?

/root/21_abuse.cases (misuse cases)

- Describe how an attacker would misuse weaknesses in software features

> “As an attacker, I manipulate the primary key and change it to access another's users record, allowing viewing or editing someone else's account.”

/root/22_abuse.cases (misuse cases)

- Not all risks can be fully prevented
  - E.g. Using stolen valid credentials.

- Think of detection and mitigation instead:
  - Add authentication attempts and user actions to the audit log
  - Include IP / User agent / Client ID and other data to allow mapping of actions
  - Allow for central password reset and account deactivation via the admin menu

/root/23_define.security.requirements

- Allow proper response through early decisions:
  - Extensive log collection
  - Export of log files in standardized, machine readable format
  - Data import, export and sanitization
  - Define unsafe system states
  - Plan for a minimal viable emergency operation

/root/24_IR.plan

- Create an Incident Response Plan for your application
  - Detect
  - Contain
  - Eradicate
  - Recover
- Make a dry run recovery test for with your plan and your operations

/root/25_IR.publish

- Make clear what is documented and where it can be found
- Make sure to keep all information up to date and allow for offline storage (USB Drives etc.)

Some honorable mentions

- Atlassian Disaster Recovery Guides
- Atlassian Bitbucket Auditing
- MSSQL Business Continuity Guide
- Azure/AWS Response Guide

/root/26_wrap.up

- Large-Scale Security Incidents require a lot of preparation
- Resources and Workforce are always short in IR scenarios
- Thinking IR while designing software drastically shortens outages and enables analysts
- Not every Software requires continuity management
  - Propper business risk analysis is key

Ask away!

https://github.com/Explie/presentations

/root/99_references

https://resources.sei.cmu.edu/asset_files/WhitePaper/2013_019_001_299145.pdf

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https://learn.microsoft.com/en-us/security/operations/incident-response-overview

https://docs.aws.amazon.com/whitepapers/latest/aws-security-incident-response-guide/introduction.html

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