Integrating Incident Analysis and Digital Forensics Tooling for Automated Compromise Detection

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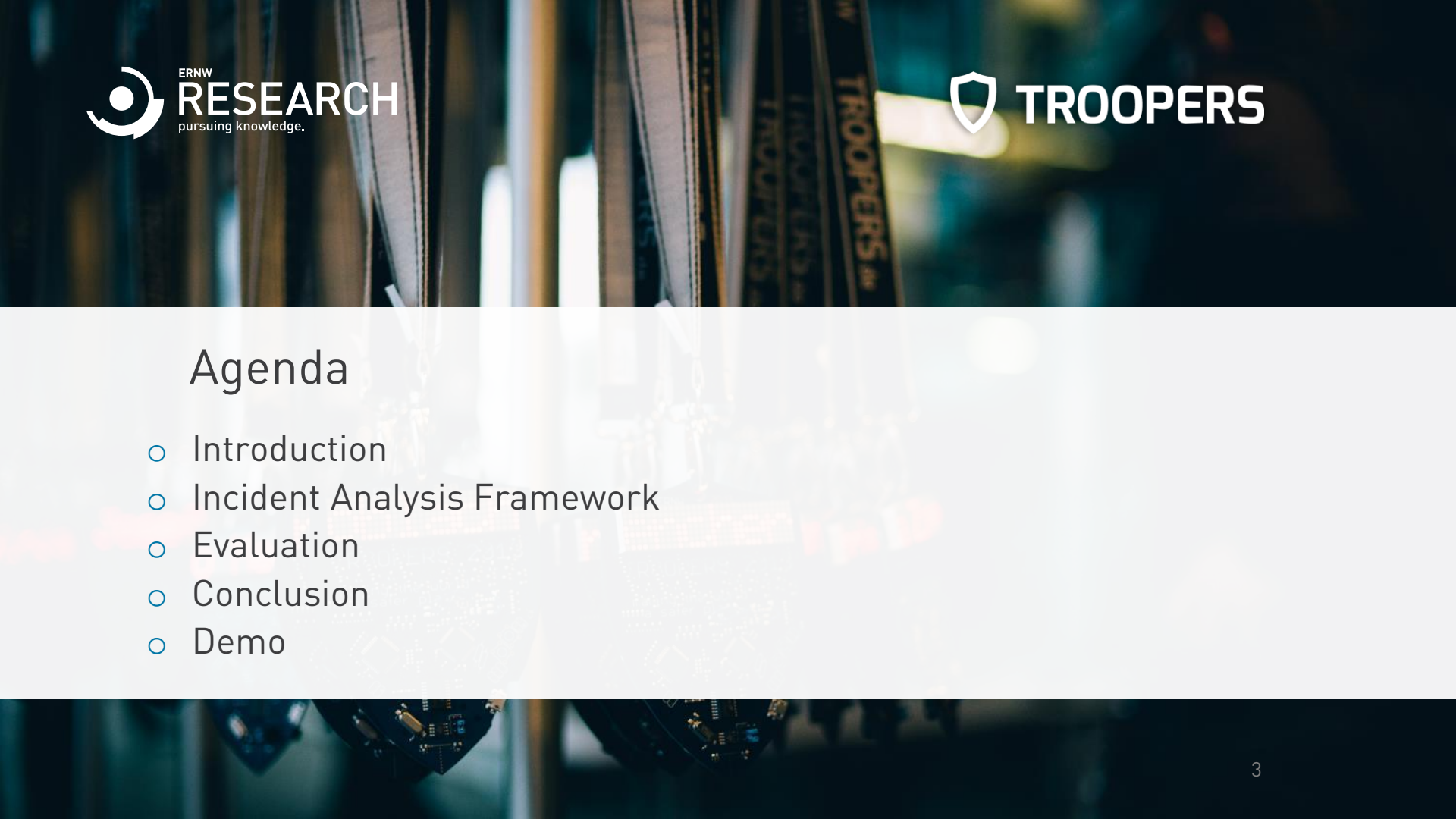
Who I Am

- B.Sc. and M.Sc. in Medical Informatics from Heidelberg University
- Security Analyst @ERNW Research
- Part of Penetration Testing & Incident Response Team



Agenda

- Introduction
- Incident Analysis Framework
- Evaluation
- Conclusion
- Demo

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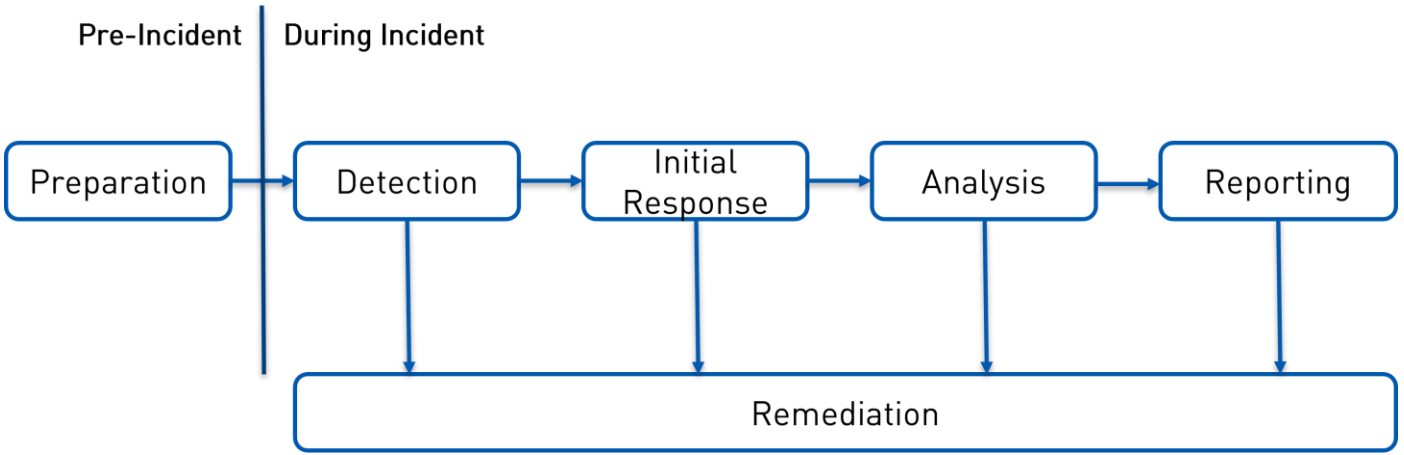
Incident Response Process



(Mandia et al., 2003)

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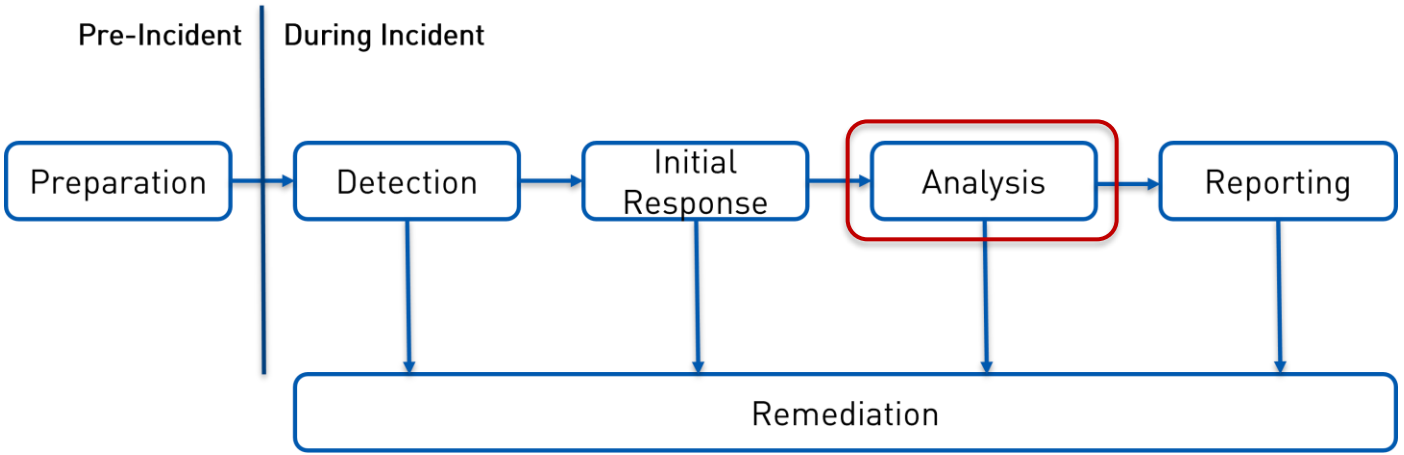
Incident Response Process



(Mandia et al., 2003)

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Challenges

- Time constraints
- Increasing storage capacities
- Expert knowledge required
- Lack of integration between tools

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⇨ Framework with flexible tool integration and automated decision making

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Incident Analysis

NTFS / Disk Artifacts	Windows Artifacts	Malware Analysis
Partition Table	Prefetch Files	Hash Comparison
Master File Table (MFT)	Registry	Static Analysis
Alternate Data Streams (ADS)	Event Logs	Dynamic Analysis

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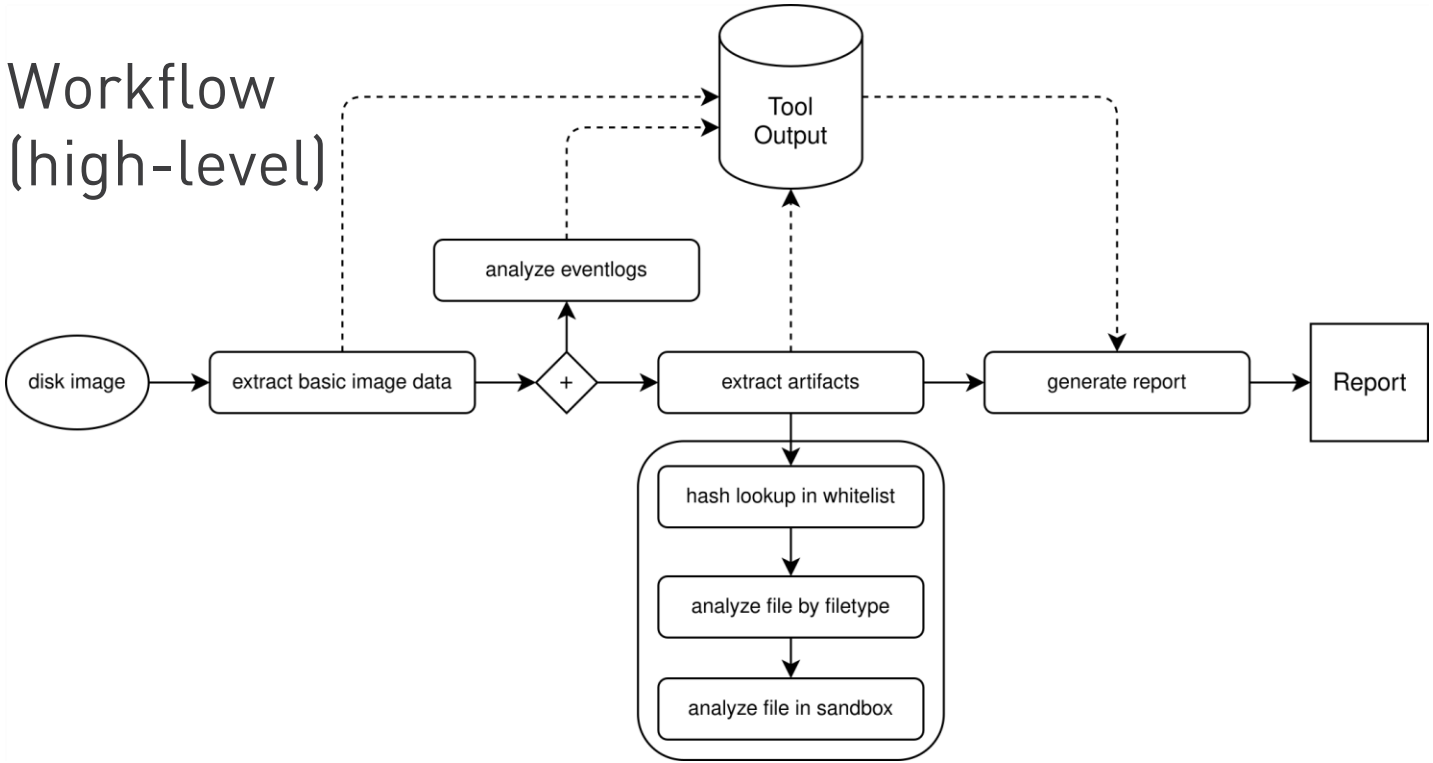
Workflow (high-level)



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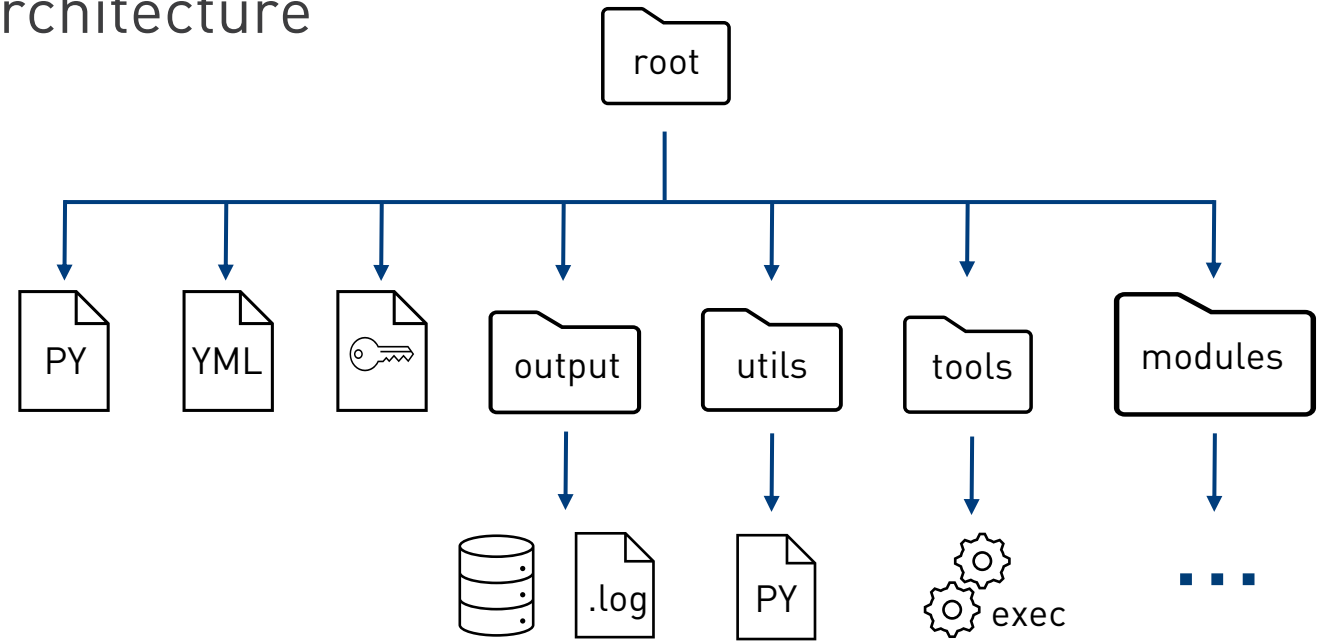
Architecture



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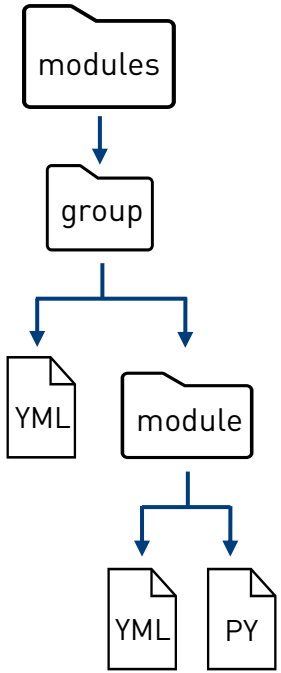
Modules

- Basic Information
- Event Log Analysis
- Artifact Extraction
- ADS Analysis
- Hash Lookup
- Static Filetype Analysis
- Dynamic Analysis
- Report Generation



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Analysis Results

- All compromised images detected
- False positive analysis results from VMRay (23 %) and Sigma (96 %)
- ~69 % of IoCs found
- Only ~0.19 % of files per image needed to be analyzed
- Most malicious files found in Prefetch files and UserAssist
- Overall performance time: 22.5 hours, without VMRay: 43.5 min

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Conclusion

- Framework can detect compromises
- Framework operates in parallel with analysts
- Future extensions e.g., file carving and contextual indicators
- Integration of artificial intelligence for additional decision support


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Thank you for your Attention!

Questions?

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