THREAT PICTURE OF OPERATIONAL TECHNOLOGY AND CONTROL SYSTEMS

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ADVERSARIAL TARGETING OF OT/CS SYSTEM

Adversaries demonstrate capabilities and intent of targeting Operational Technology (OT) and Control Systems (CS) through cyber means to impact physical processes

- This presents risk to mission readiness, production, and safety.

OT/CS Attacks

Volt Typhoon Threat Group

Joint CISA Alert-State Sponsored Compromise and Persistent across US. Critical Infrastructure

22 Danish Power Organizations breached in 2023

Required shift to local control

6 Hours and 230k people

Time Ukraine lost power due to Cyberattack

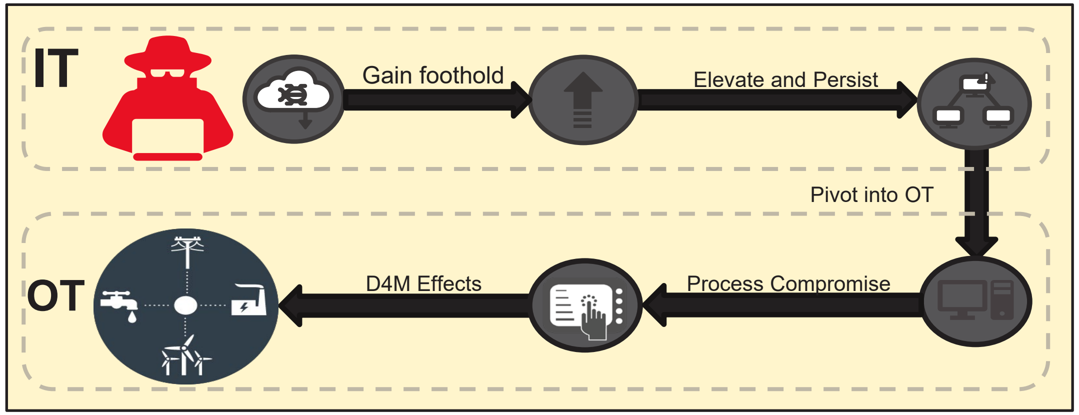
$5M

Paid in ransom by Colonial Pipeline

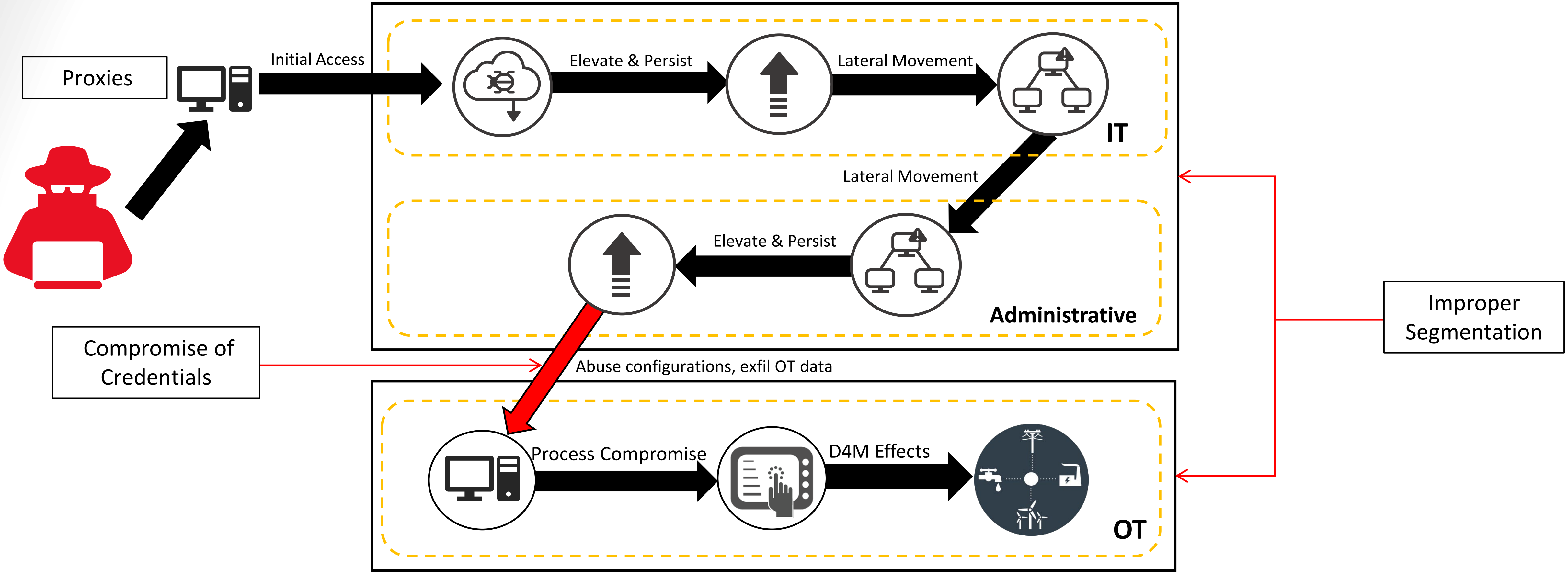
OBSERVED TTPS

Adversary goal: Gain and Maintain persistence to the environment for future action

- Extensive reconnaissance conducted against organization, network, and staff
- Initial access gained to IT or OT network
  - Network appliances
  - Engineer Workstations
- Harvesting credentials targeting domain controllers, remote access tools, and administrators
- Network Discovery and mapping using Live of the Land binaries (LoLBins) or tailored malware
- Maintain, expand, and fortify access to persist on network
- File obfuscation, log clearing
- Slow exfiltration of OT documents, diagrams, process data for attack development
- Effects: process change/manipulation, Ransomware, wiping, physical damage



Attacking OT/CS Networks



PERSPECTIVES ON SECURE ARCHITECTURE NETWORK DESIGN

- Design your architecture with the knowledge you are being targeted (and they may know how your systems work)
- Design with system resilience in mind
- Limit surface area
- Be prepared to operate in degraded operations/ local control (islanding)
  - Test your Defensive Cyber Plan
  - Backup and restoration capability
- Auditing & logging (network and host), and time sync
  - Log offloading
- Plan for failures, know what will happen when they do.

PERSPECTIVES ON OT CYBER PROGRAM DESIGN

- Create ownership
  - Establish roles, responsibilities, and duties.
  - If no one is assigned that task no one is doing it
- Define your boundaries and know what you have
  - Understand dependencies on other systems and what systems depend on you
- Choose a framework (Nist 800-53r5 RMF, NIST 800-82r3, 800-171r2, NIST CSF, CIS)
- Find the engineer workstations! How is media moved between domains?
- Locate your project files/logic files determine ownership
- If compromise is detected assume full domain compromise

SOURCES AND REFERENCES

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- *PRC State-Sponsored Actors Compromise and Maintain Persistent Access to U.S. Critical Infrastructure*, Joint Publication led by DHS CISA, https://www.cisa.gov/news-events/cybersecurity-advisories/aa24-038a

- *Russian State-Sponsored and Criminal Cyber Threats to Critical Infrastructure*, Joint Publication led by DHS CISA multiple co-authors, https://www.cisa.gov/news-events/cybersecurity-advisories/aa22-110a

- The attack agasint Danish, critical infrastructure, SEKTORCert, https://sektorcert.dk/wp-content/uploads/2023/11/SektorCERT-The-attack-against-Danish-critical-infrastructure-TLP-CLEAR.pdf

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Questions?