Case Study: Stuxnet

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View as it was **analyzed**

View as an **incident response analyst**

- How would it have been **discovered**?
- What would you see?
- What can you **infer from the investigation**?

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Stuxnet: The First Cyberweapon

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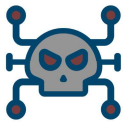

0-day exploits are extremely valuable and extremely rare
Stuxnet used 5 of them:

Against Windows:

- LNK file exploit to spread between USB media
- Print spooler exploit to spread on a local network
- Keyboard handler exploit to escalate privileges
- Task scheduler exploit also used to escalate privileges

Against Seimens Programmable Logic Controller (PLC):

- static password hardcoded into controller

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Other Peculiarities

- **Auto-update mechanism**
- **Two different, valid code certificates.** Both apparently stolen.
- **No internet use**
- **Would spread, but take no action, unless the system drove a Siemens PLC with one of two specific cards in it,** driving at least 33 centrifuges at specific spin rates. Indicates the **author had a specific lab in mind as a target** and **intimate knowledge of the target configuration.**

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Actions

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Incidence Response Perspective

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Network behavior

Antivirus signatures

Logging of new executables or libraries

Installations of unsigned binaries

Things You Would Not Have Seen

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What Is Your First Sign of an Incident?

- If you're really lucky, **unusual behavior of a client**
- **Application whitelisting,** maybe
- **An unusual number of centrifuges failing**
- **Your AV company** finally finds it

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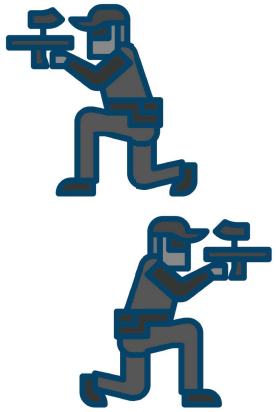

What is Hunt Teaming?

Advanced security operations function attempting to find a compromise by **manually searching for it**

Methods of hunt teaming:

- Attack systems and see how to find the attack
- Model usage patterns and investigate departure from normal (may have found updates to Stuxnet)
- Assume a compromise and try to find it

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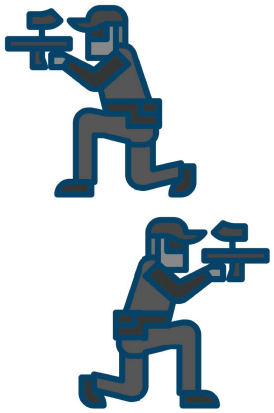

What is Hunt Teaming?

Tooling

- Log management
- Endpoint detection and response

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How Would a Hunt Team Identify Stuxnet?

- **New DNS query for update traffic**
- **Executing a tmp file**
- **Unusual executables in memory**

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