Incident response in the energy sector

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Incident response

• IR is more than just a characterization of an incident, it includes analysis
• Many companies are reluctant to share incident data because of reputation or fear of repercussions from the regulatory authority
• Unfortunately this is a policy that hinders good incident response
Combination attacks
Combination attacks
Combination attacks

Vendor

Target

Link
Combination attacks
Combination attacks
Combination attacks

Vendor

Target

Callback, control and information leakage
Detecting, assessing and reconstructing

Vendor

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Callback, control and information leakage
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Callback, control and information leakage

Link
Detecting, assessing and reconstructing:

- Vendor
- Target
- Link

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Information removal
Why a specialized incident response team?

- Incident handling is done faster and in a uniform manner
- Avoid costly mistakes
- The team knows what to do and whom to inform
- They regain control
- They reassure the organization AND the customers
- They can be an internal bridge between departments
CSIRT vs the emergency response team

• This team gathers at a certain severity level.
• The CSIRT starts earlier and work continuously together
• ERT deal with physical disasters and accidents
• Most CSIRTs deal only with information security incidents with an adversary (even if it is information leakage)
• The CSIRT must know when to call upon the ERT
• The ERT uses the IRT to assess damage, decide how to contain the incident, how to gather evidence etc.
The levels of severity need to be harmonized

• What the CSIRT calls a code red is not the same as for the ERT

• If the impact in production systems are unclear, all of the organization should be on alert, for example if a computer or a user that has access to the production network is hit by malware

• Again: the CSIRT should span all of the organization
Working together

• The communication and setting the criticality should be exercised
• They should be aware of the other group's classification scheme
• The collaboration will evolve, and be dynamic
• They can be one team to rule it all, but you probably don't need the whole ERT in every meeting
Continuous improvement

- The feedback loop is crucial
- A CSIRT can improve the processes of
  - Policy making
  - Risk analysis
  - Security planning
  - Emergency planning
  - Evaluations & audits
Reorganizing large organizations is like reorganizing a cemetery.
Organizational obstacles

• We have managed for years without!
• We *have* people doing security
• We have enough competence to cover this
• This will become a state within the state
• Will this just not cost us more money?
The stages of change

- Shock
- Resistance
- Fight
- Passiveness
- Disclaimer
- Acceptance
Organizational issues
Organizational issues

• Clear constituency
Organizational issues

- Clear constituency
- Mandate to manage and make changes
Organizational issues

• Clear constituency
• Mandate to manage and make changes
• Give the team time to develop culture
Who is your team?
Who is your team?

• The ones that log
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• The ones that log
• The ones that operate equipment that may be compromised
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• The ones that log
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• Communication
Who is your team?

• The ones that log
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• Legal department
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• Communication
• Legal department
• People who are interested
They should be team players with

- Common sense
- Communication-and diplomatic skills
- Patience and persistence
- Creativity
- Serenity
- Discretion
- Concentration
- Tidy
- With technical skills and a good legal instinct
Incident detection

• Always difficult to identify an incident among false positives or from human error

• Even worse in control system: vague indicators, small changes, incomplete symptoms

• Baseline the system activity, the events and the traffic is useful, and of course log correlation with alarms.
The importance of tidiness

• Focus on *what* has happened
• Think of how you obtain evidence keeping the chain of custody
• Think of how you store evidence (sanitize and write lock)
• Digital signing and checksum
• Involve the legal department
Do I have SSL v.1.0.1? I don't knooooooooow...
Knowing your network

• It's too late to take inventory
• How does the information flow?
• What kind of information flows where?
• Knowing your protocols
• Knowing the best way to contain an incident (especially SCADA)
• Knowing the criticality of the resources
Knowing your logs

- Servers and user devices (including tablets and phones)
- ICS devices
- Network traffic (when the device does not log)
- Security appliances, VPN servers
- Directory services
- Name servers and DHCP-servers
- Web servers, proxy logs and application logs
- Databases
- Email and chat applications
- IP telephony logs
- Key cards, surveillance camera
- **Clocks and time format**
Establishing a timeline

• Some PLCs became unavailable
• Technician is in Ouagadougou
• There was an email from their vendor with a link that did not work
• The technician asked to have his phone number changed in the 2-factor authentication system to a new domestic number
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Email systems
Proxy and firewall
Vendor – link
User system - pcap

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Email systems
Support logs
VPN concentrator
Proxy and firewall
User system

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Evidence:
Statements, logs, pcap, forensic images from user, vendor and possibly control system.
The answer should be "yes" to these questions

• Can you fire up packet capture?
  • Corollary: do you have active taps, span ports or a hub?
  • In the process network?
• Can you do a forensic image?
  • Corollary: do you have somewhere to store it?
• Can you capture volatile data?
• USB forensic tools ready
Information plans

• To keep people happy
• To build trust
• To leave the team working uninterrupted
• To create predictability and standards
• Do not release info too soon. It may be plain wrong.
Information list

• Systems owner
• Several levels of management
• Emergency team/disaster recovery/business continuity
• Legal department
• Communications
• Regulatory authority
• The public
Being lazy
Automation

• If you're going to do this again, you need to automate
• If you can't find somebody who can
• If you can't find anybody, team up with someone else
I need HELP!

- Forensics analysis
- Reverse engineering
- Behavioral analysis
- Identifying the attacker
- Recovery is often not done by the CSIRT
The important process of lessons learned

- When you know how it happened, you know how to prevent it
- This can be powerful knowledge to share with other teams
- The measures should be part of the lessons learned
Incident
• If the report is put in a drawer or otherwise hidden, you are back at:

  1
Collaboration and sharing

• Some attacks happen sector wise (and technology wise)
• Some attacks happen country wise
• Attack patterns follow certain trends
• We should link up for relevant early warning and for learning purposes
• Ideally we should learn from other people's lessons as well as our own
• Questions?

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