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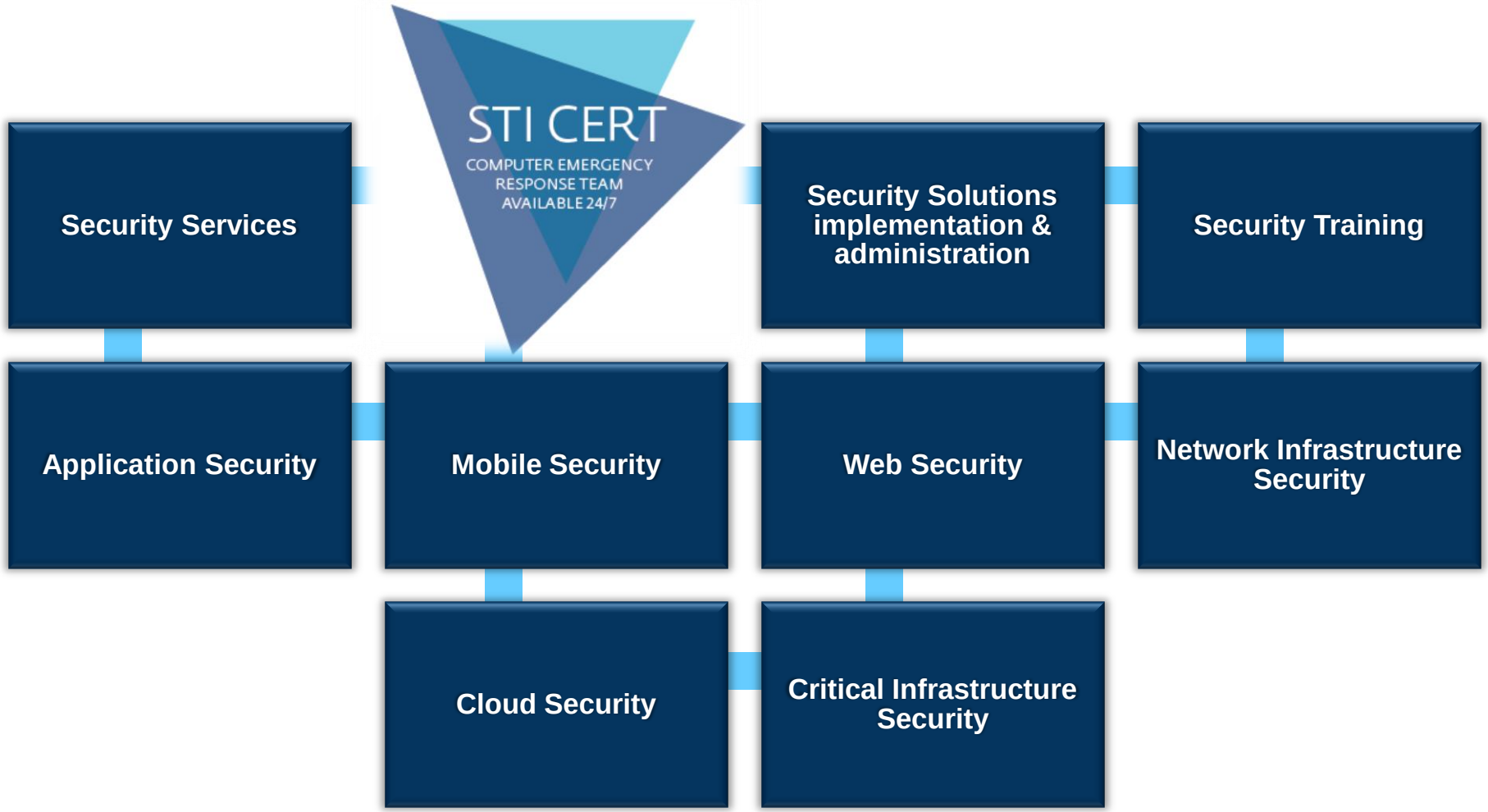
CORE COMPETENCIES




Securitatea informatica a infrastructurilor Critice
Mihai RAUTA
Senior Information Security Consultant

Critical Infrastructure at Risks

Critical and industrial systems makes our modern world

Like other IT systems, they are prone to attacks

The consequences of such attacks are much greater:

- **Power failures**
- **Water pollution or floods**
- **Disruption of transportation systems**
- **Malfunction of Production Lines**

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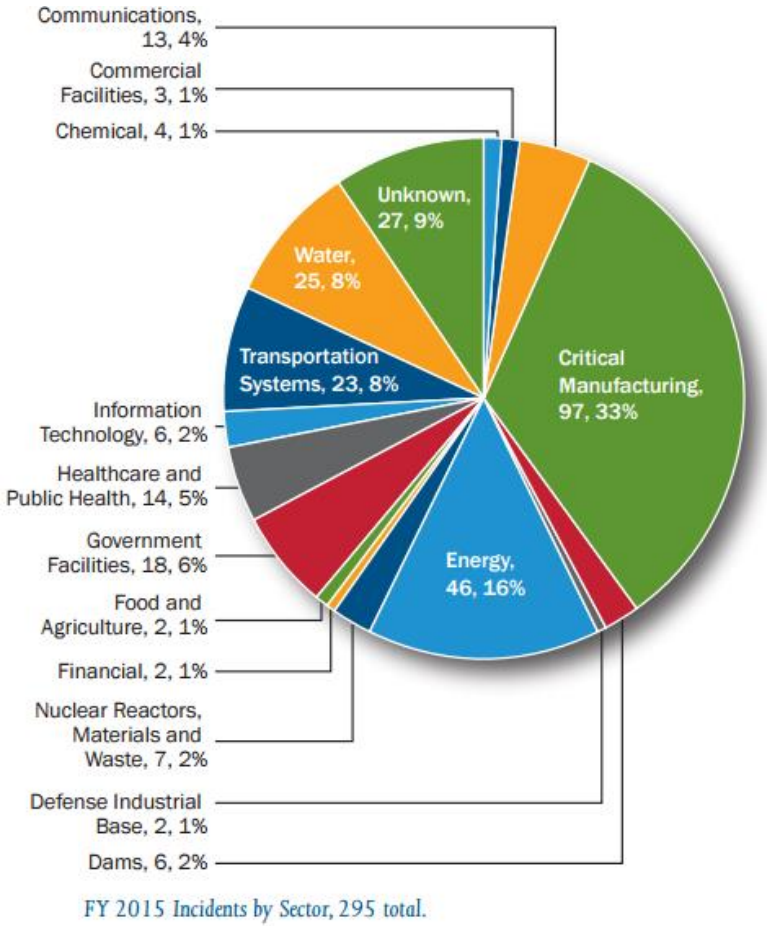
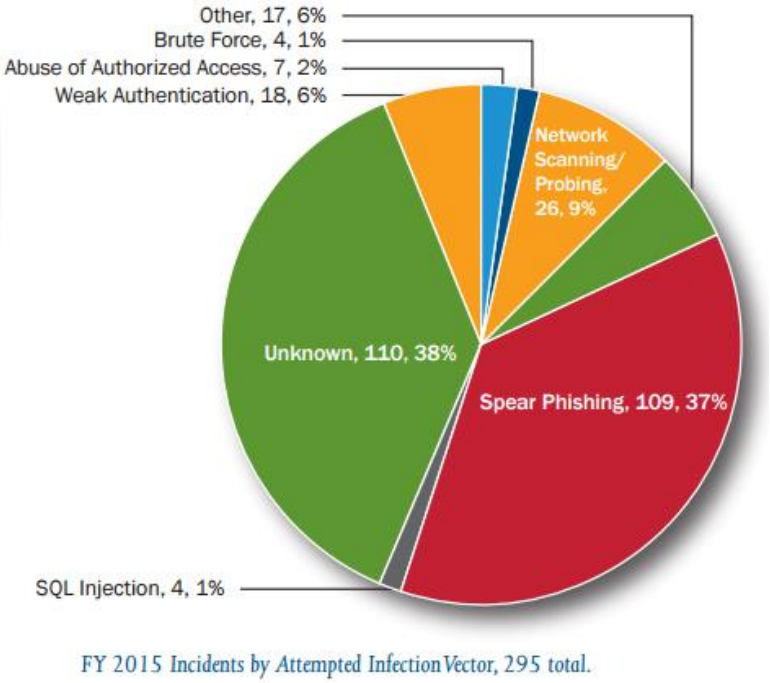
ICS-CERT Reported Targeted Attacks in 2015



FY 2015 Incidents by Sector, 295 total.



FY 2015 Incidents by Attempted Infection Vector, 295 total.

In 2015, ICS-CERT responded to **295 incidents** reported either directly from asset owners or through other trusted partners.

ICS-CERT assesses that many incidents are not detected due to a lack of sufficient detection or logging capabilities.

ICS-CERT Reported Vulnerabilities

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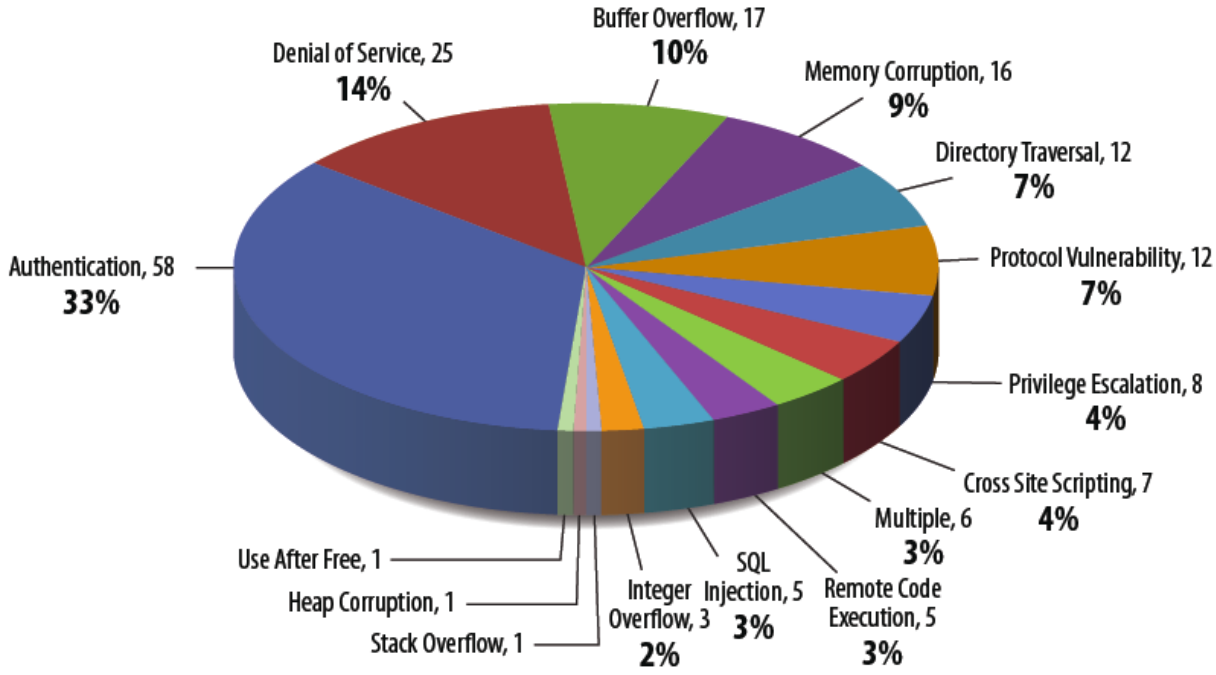

Authentication flaws, includes vulnerabilities like factory hard-coded credentials, weak authentication keys, etc. These tend to be of highest concern because an attacker with minimal skill level could potentially gain administrator level access to devices that are accessible remotely over the Internet.

Important Attacks

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- Stuxnet, Duqu, Flame
- Pacific Energy, Saudi Arabia Aramco
- German Power Utility, 50Hertz
- Queensland, Harrisburg and Willows Water System attacks

Computers and manuals sized in Al Qaeda training camps full of SCADA information related to dams and related structures

2015 December 23, Prykarpattya Oblenergo, Ukraine

The first confirmed hack to take down a power grid

3 power distribution centers attacked

60 substations, 110kV and 35kV, were taken offline

80,000 customers blackened out for about six hours, more than 230000 people affected

Since mid-2015, the BlackEnergy APT group has been actively using spear-phishing emails carrying malicious Excel or Word documents with macros to infect computers in a targeted network.

The BlackEnergy APT group captured Cyber Security community attention back in 2014 when it began deploying SCADA-related plugins against victims in the ICS and energy sectors around the world. The group is especially active in the following sectors:

- ICS, Energy, government and media in Ukraine
- ICS/SCADA companies worldwide
- Energy companies worldwide

Why attacks can happen ?

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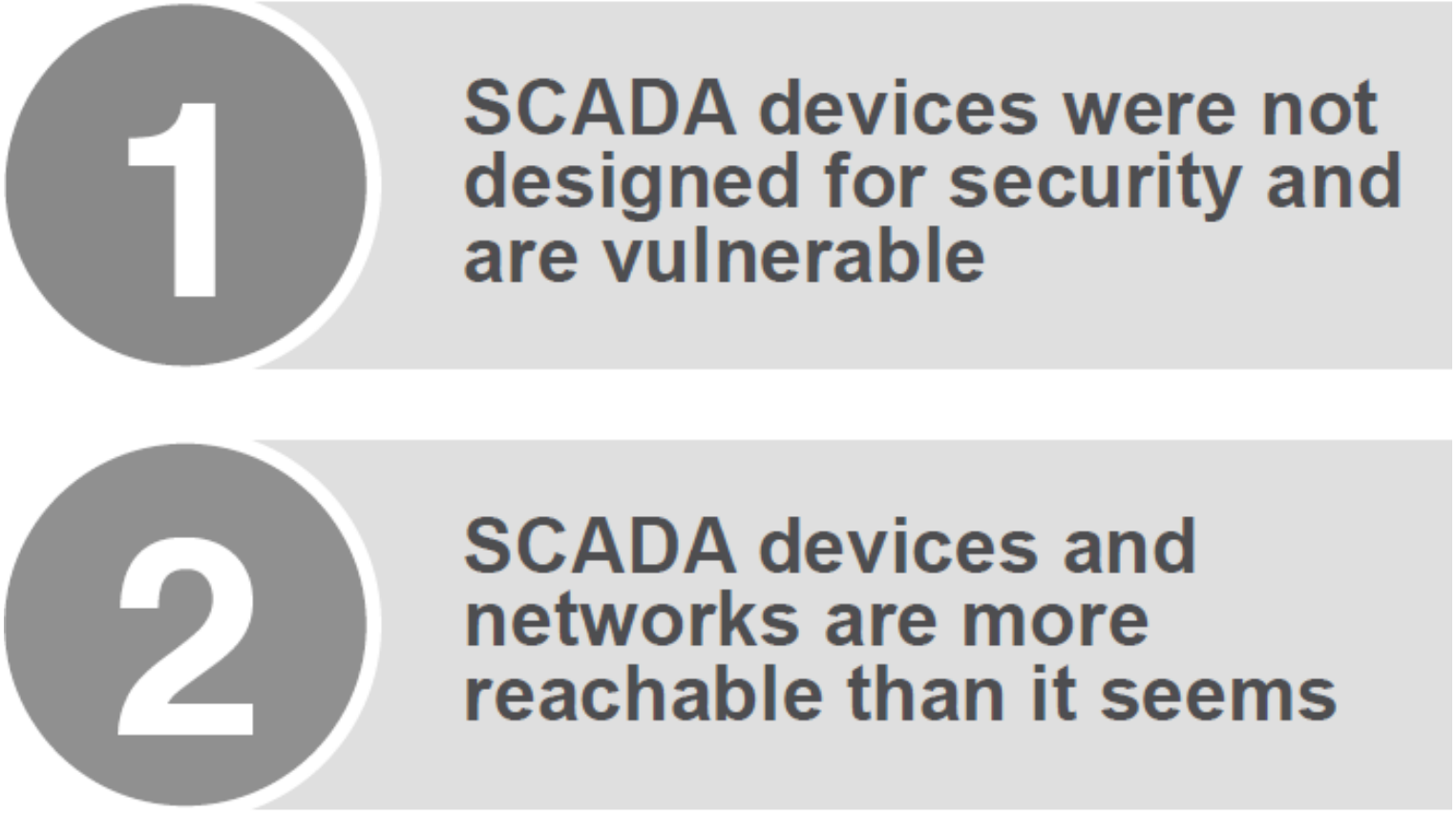

Controllers are vulnerable

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- Programmable Logic Controllers (PLC) are purpose-built computers used for automation of electromechanical processes such as control of pumps, valves, pistons, motors, etc.

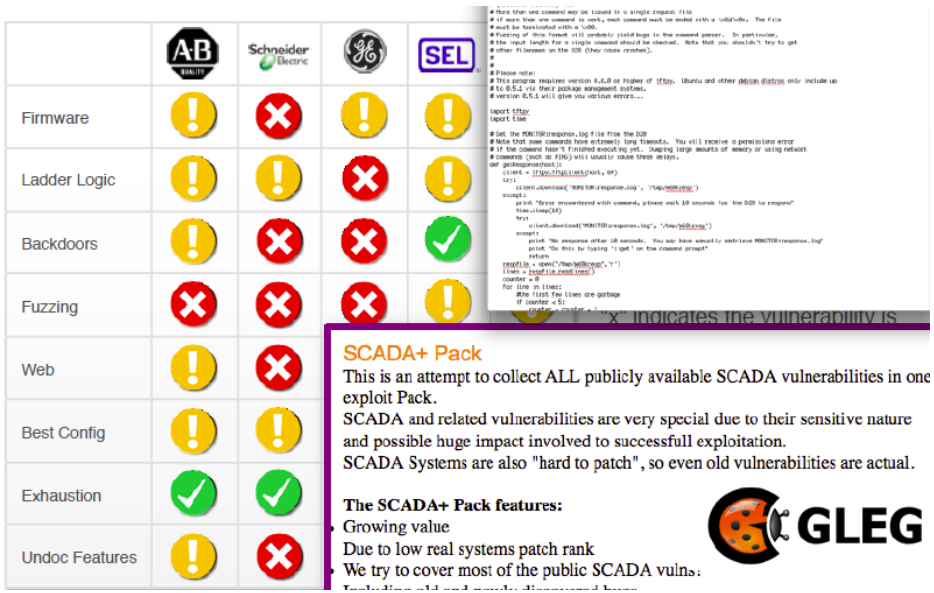
- PLCs are small computers. They have software applications, accounts and logins, communication protocols, etc.

- Analysis of PLCs from leading vendors shows variety of vulnerabilities:
  - Backdoors
  - Lack of authentication and encryption
  - Weak password storage
  - Bugs leading to buffer overruns

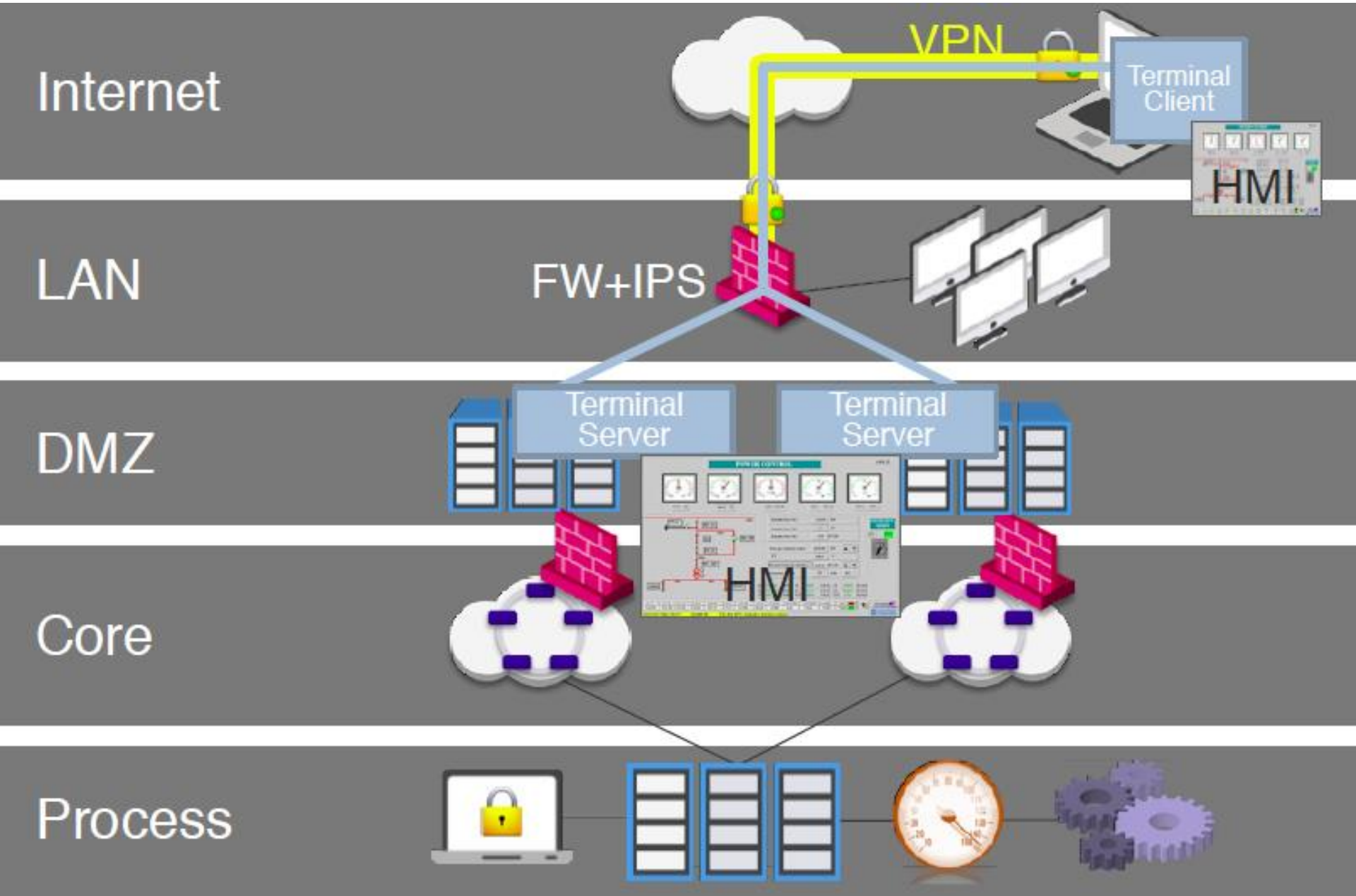
PLCs are Insecure By Design

If you have logical access to a PLC you can Read, Write and otherwise Access the tags/points. Write commands change the process, i.e. open or close valves, raise temperatures, turn things on or off. It is how operators control the process. These are ICS protocols that are insecure by design.

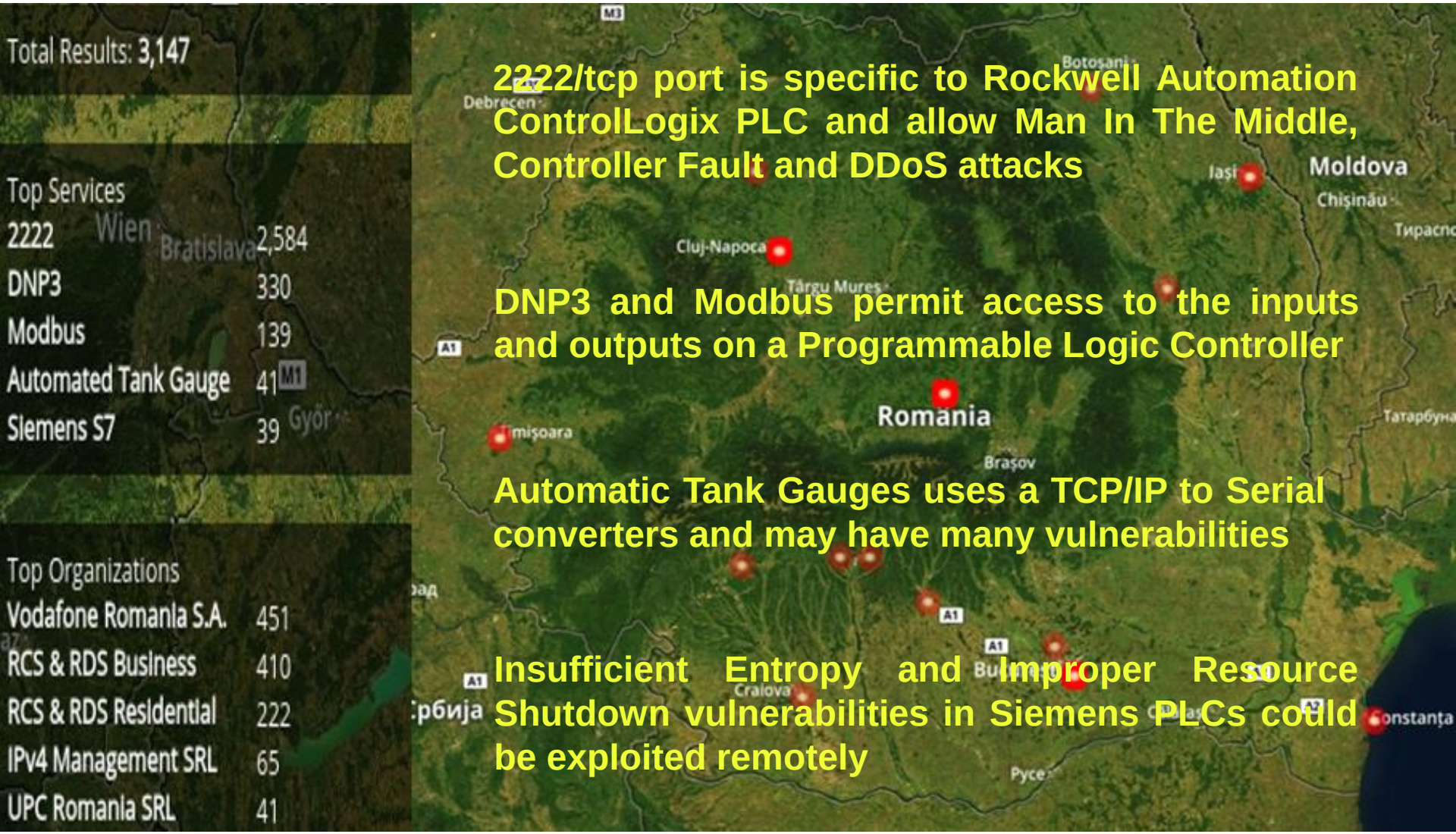
The SCADA and ICS are insecure by design and in most cases don't require an exploit to affect the process in disastrous ways.



IT and SCADA networks are interconnected



ROMANIA – SCADA Devices Connected to Internet*



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* source: CyberX Securing the Industrial Internet

Attack, How-To?

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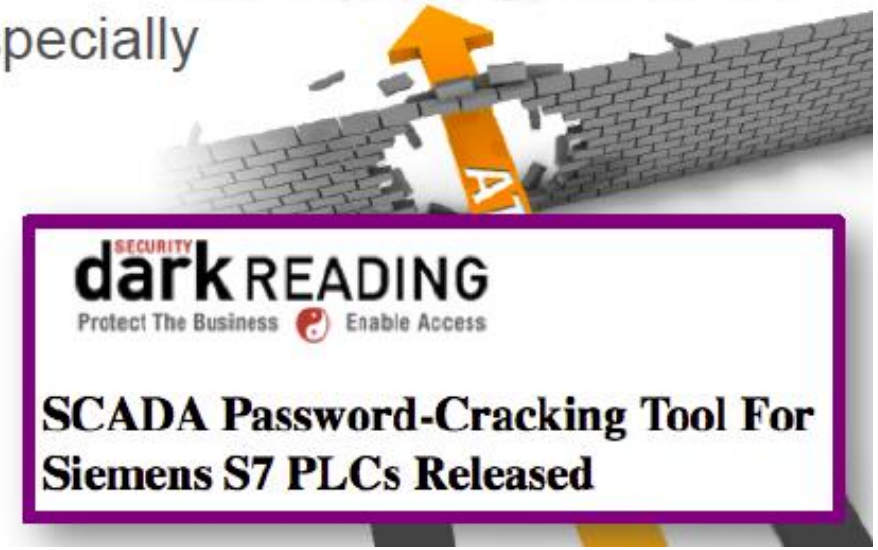
- **Step 1:** get access to the network
  - Social Engineering
  - Spear phishing
  - Drive-by
  - USB Keys
  - Contractor Laptops
  - Maintenance Remote Access Links

- **Step 2:** use a tool-kit or run specially crafted attack

- **Step 3:** alter commands sent to the controllers, or change sensors readings



Protect, How-To?

1. Specialization Required for Core and Process Networks

2. Defense in Depth for LAN and DMZ Networks

Safetech approach to protect ICS and SCADA networks

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Independently Log ALL SCADA activity

Define Baseline
(Allowed / Not Allowed / Suspicious)

Identify Deviations

Alert / Prevent

Specialization for Core and Process Networks with Xsense from CyberX

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- Learns and captures the “DNA signature”(*) of the network
  - No prior knowledge or configuration
- Securing every industrial network within a day
- High detection rates and low false-positive rate
- No risk to on going operations
- Physical appliance/ Virtual machine

Defense in depth for DNZ and LAN networks

- Firewall
- IPS/IDS
- Anti-Bot
- Gateway Anti-Virus
- DLP
- Zero-Day and Sandboxing solution
- SIEM
- Machine learning solutions for detecting pattern of life and deviations from normality

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WHAT WE
CAN DO
FOR YOU

THANK YOU!

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