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Protecting Smart Buildings with STIG

August 2022

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Protecting Smart Buildings with STIG

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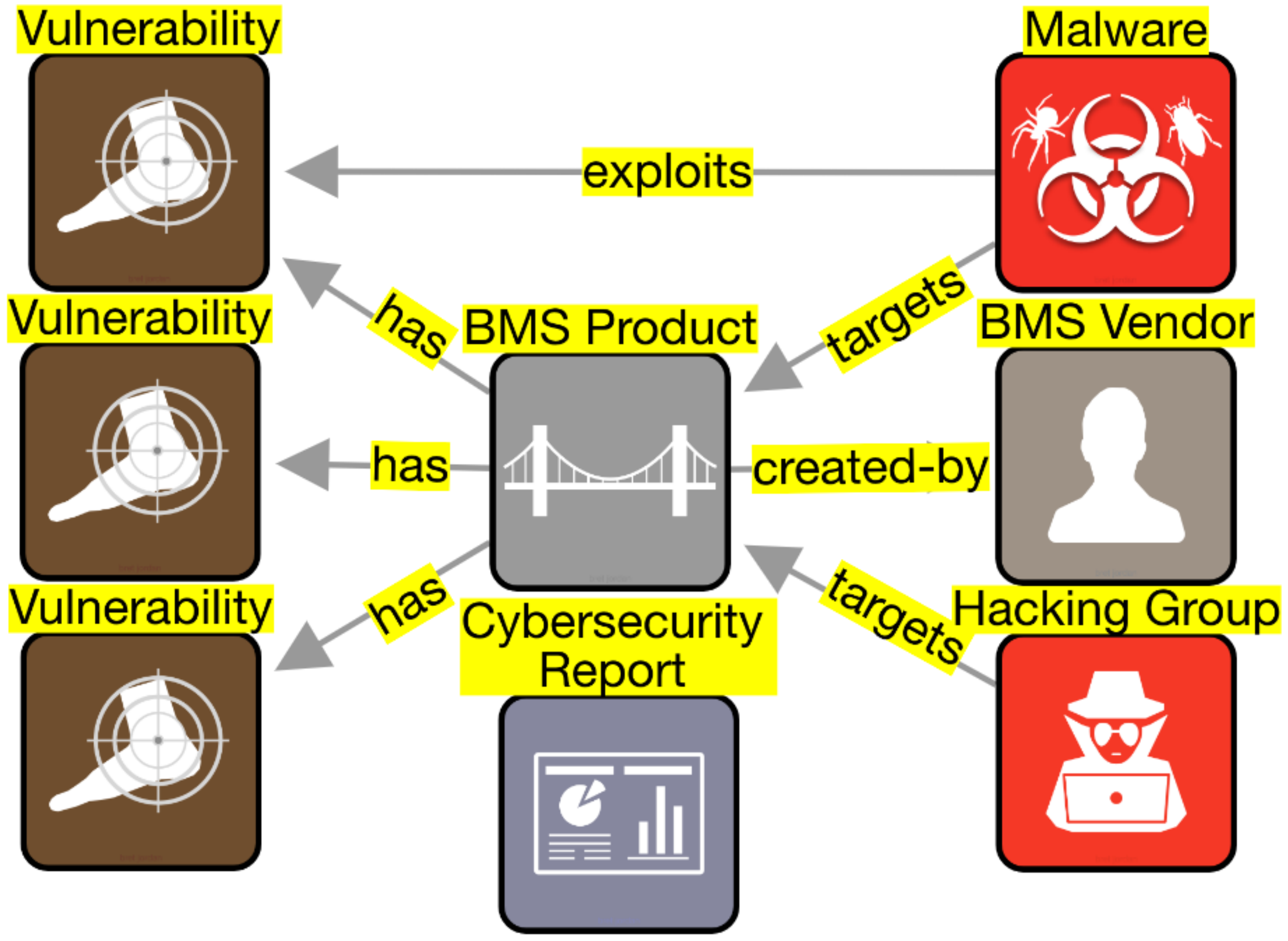
Problem

- Smart buildings are common now, whether they're businesses, hospitals, or homes
- They have **Building Management Systems (BMS)** that digitally control physical systems like security, HVAC, appliances, alarms, and networks
- All these can fall victim to cyber attacks
- Not only can they be controlled by hackers, but they can allow access to other devices through the **Internet of Things (IoT)**
- Attacks on BMS are getting more common and can result in hospitals shutting down, ventilation being cut off, intruders bypassing all locks, and spying in your own home
- This threat is new, so many people don't recognize the importance of good BMS defense

Goals

- Consolidate tons of BMS product and weakness information into one location
- Make BMS cybersecurity data useful and easy to share



Vulnerability

Malware

exploits

Vulnerability

has

BMS Product

targets

BMS Vendor

has

created-by

Vulnerability

has

Cybersecurity Report

targets

Hacking Group

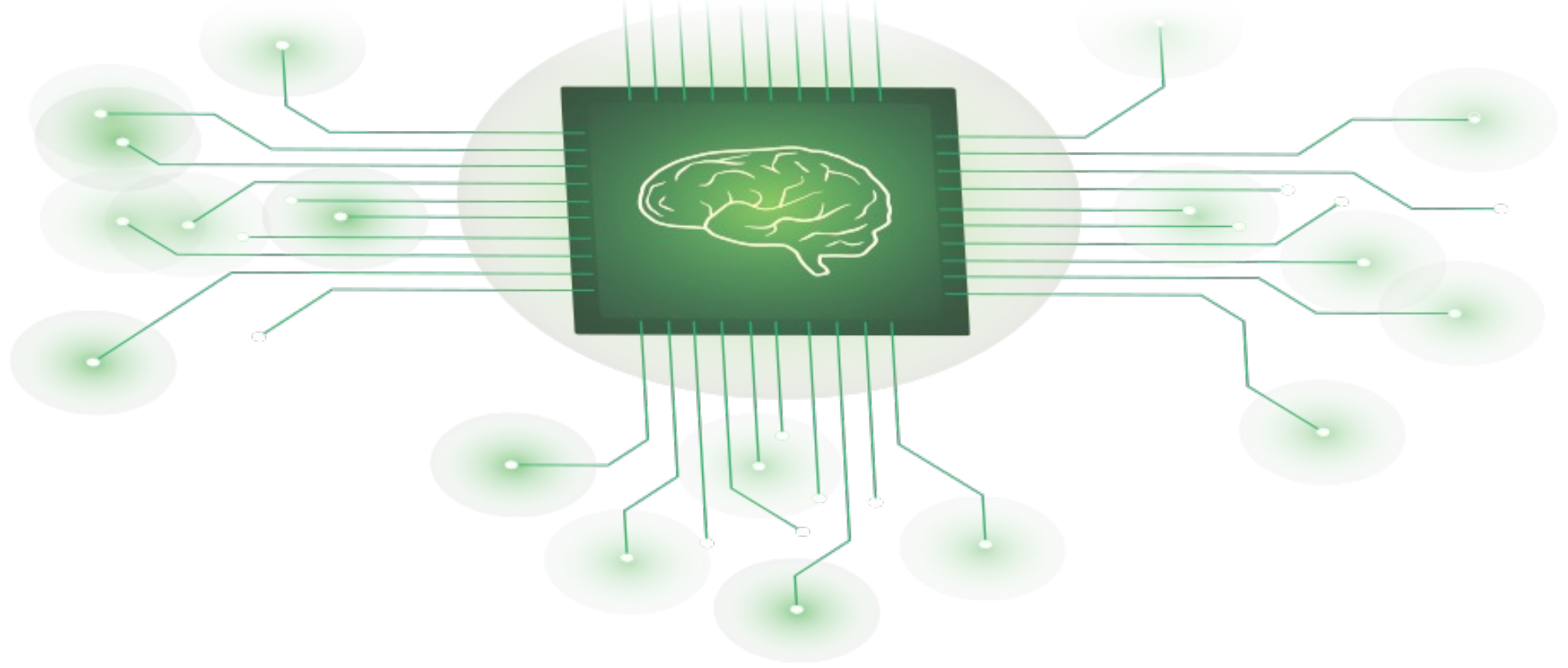
The above is a generalized STIG graph showing what one part of the real file looks like. Each icon contains inner details about the object it represents.

Solution

- Cybersecurity improvements rely on fast information sharing and responses to attacks
- **Structured Threat Intelligence Graph (STIG)** is an INL product that represents cybersecurity data from dozens of sources and thousands of words as an intuitive graph
- Graphs made in STIG create **Structured Threat Information Expression (STIX)** code, an industry standard for sharing cybersecurity info
- Creating the BMS attack surface in STIX would make it unified, actionable threat intelligence

STIG

Structured Threat Intelligence Graph



Methods

- Researched the top BMS producers and products across different sectors: residential, commercial, industrial, medical, military, and hospitality
- Found each product's history of vulnerabilities and attacks
- Created a comprehensive graph in STIG with all the information

Results

- Large visual file of where widely-used BMS technology is vulnerable
- All vendor, product, and vulnerability information collected in one place
- Since this info is in STIX, it can be shared, expanded, and automated into defense systems quickly
- This ease of analysis allows for better defenses ahead of time, faster response times to an attack, and safer product choices by customers

https://github.com/idaholab/STIG
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