

U.S. Department of Homeland Security

CYBERSECURITY AND INFRASTRUCTURE SECURITY AGENCY

Daniel Brown, CISSP, CISM Cybersecurity Advisor (CSA) Region 10 - Inland Northwest Cybersecurity and Infrastructure Security Agency





Agenda

- Protective Security Advisor (PSA) and Services
- Cybersecurity Advisor (CSA) and Services
- CISA Partnerships/ Initiatives
- Cyber Risk Landscape
- Nation-state Adversaries
- Cyber Tools (used by both sides)
- Security Planning/Incident Response resources







What is CISA?





CYBERSECURITY & INFRASTRUCTURE SECURITY AGENCY

Cybersecurity and Infrastructure Security Agency (CISA)

VIISSION



Secure and resilient infrastructure for the American people.

We lead the National effort to understand, manage, and reduce risk to our cyber and physical infrastructure.



OVERALL GOALS

GOAL 1

DEFEND TODAY

Defend against urgent threats and hazards

seconds | days | weeks

GOAL 2

SECURE TOMORROW

Strengthen critical infrastructure and address long-term risks

months | years | decades







The Nation's Risk Advisors

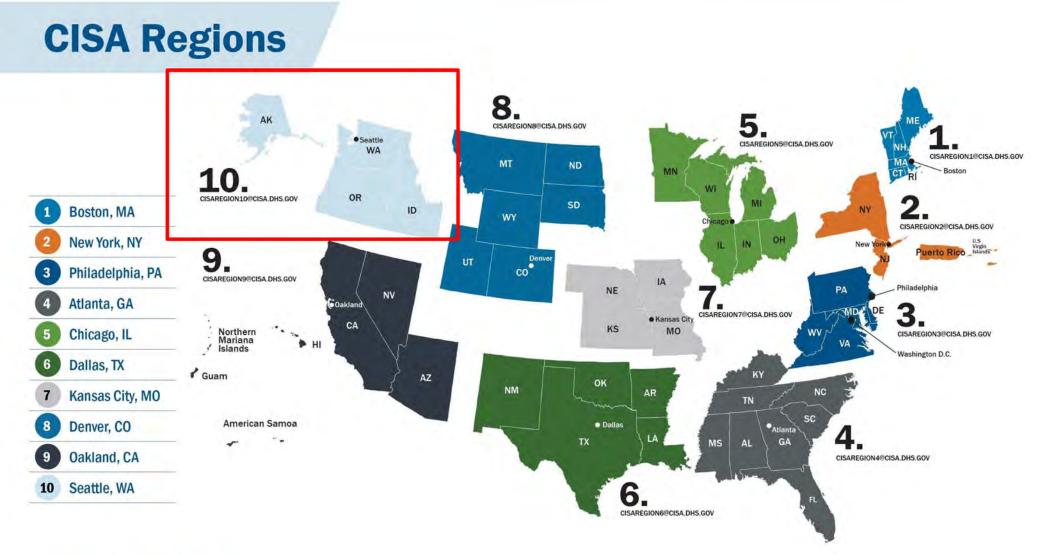
The Cybersecurity and Infrastructure Security Agency (CISA) is the pinnacle of national risk management for cyber and physical infrastructure





Region 10

CYBER+INFRASTRUCTURE



Securing Critical Infrastructure

16 Critical Infrastructure Sectors & Corresponding Sector Risk Management Agencies





State, Local, and Tribal Governments and Private Industry

As Nations Risk Advisors, support all governments within the United States of America with cybersecurity.

- State government and executive agencies
- City governments
- Tribal governments
- County governments
- K-12 Education
- Higher Education
- Private Industry is supported for 16 Critical Infrastructure Sectors.







Protective Security Advisor (PSA)



CISA Protective Security Advisors (PSA)

PSAs are physical security & resiliency subject matter experts who engage with Federal, State, local, tribal, and territorial (FSLTT) government mission partners and members of the private sector stakeholder community to protect the nation's critical infrastructure.

- Plan, coordinate, and conduct security surveys and assessments
- Plan and conduct outreach activities
- Support National Special Security Events (NSSE) and Special Event Activity Rating (SEAR) events
- Respond to significant natural or man-made incidents
- Coordinate and support improvised explosive device awareness and risk mitigation training



CISA Protective Security Advisors (PSA)

PSA's provide access to tools and resources to support physical security and resilience.

- Active Shooter Preparedness
- Bombing Prevention
- Insider Threat Mitigation
- Non-Confrontational Techniques
- Protecting Houses of Worship

- School Safety
- Securing Public Gatherings
- Unmanned Aircraft Systems
- Vehicle Ramming Mitigation



CISA PSA Assessments & Services

Assist Visit ------Security Assessment at First Entry (SAFE) ------Infrastructure Survey Tool (IST) -------Multi-Asset and System Assessment (MASA) ------Regional Resiliency Assessment Program (RRAP) ------







Cyberecurity Advisor (CSA)



CISA CYBER+INFRASTRUCTURE

Cybersecurity Advisor (CSA) Program

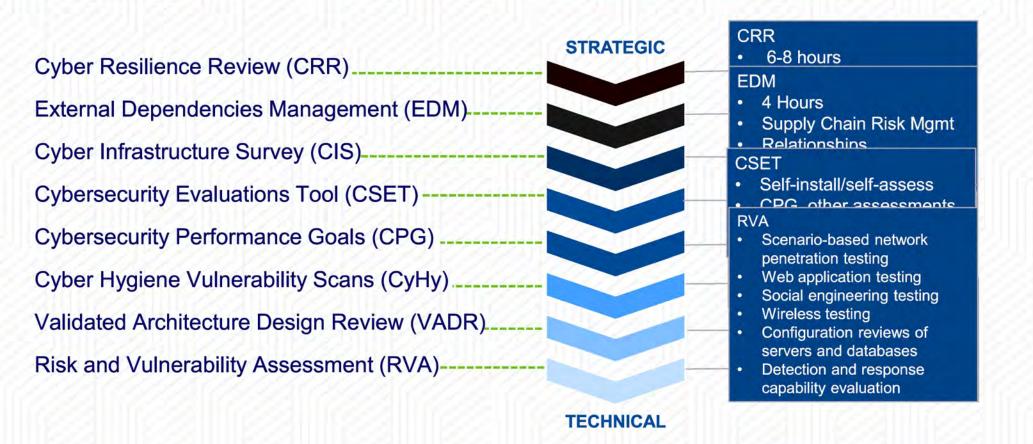
CISA mission: Lead the collaborative national effort to strengthen the security and resilience of America's critical infrastructure

In support of that mission: Cybersecurity Advisors (CSAs):

- Assess: Evaluate critical infrastructure cyber risk.
- Promote: Encourage best practices and risk mitigation strategies.
- Build: Initiate, develop capacity, and support cyber communities-ofinterest and working groups.
- · Educate: Inform and raise awareness.
- Listen: Collect stakeholder requirements.
- Coordinate: Bring together incident support and lessons learned.



CISA Assessments and Services



Cyber Protective Visit (CPV) – discuss stakeholder environment and appropriate CISA services





CISA Partnerships





CISA Threat Intel Collaboration

Joint Cyber Defense Collaborative (JCDC)

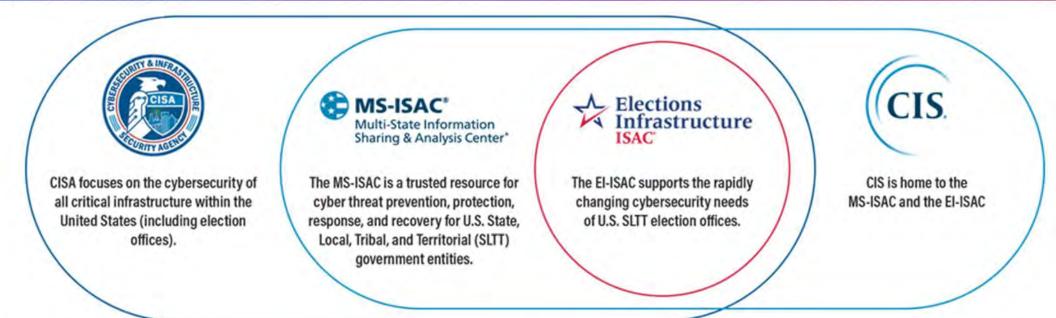
- JCDC is a public-private cybersecurity collaborative that leverages new authorities granted by Congress in the 2021 NDAA.
- JCDC collaborates with over 100 international cyber defense organizations, often known as "CERTs," to ensure that information about cyber threat is disseminated.
 - PNW Examples:
 - Initial Access Brokers selling credentials/access.
 - Breached data for sale.
 - Pre-Ransomware/Ransomware
 - Known Exploited Vulnerability (KEV) present on a system.

https://www.cisa.gov/jcdc





MS-ISAC (and other industry-specific ISAC's)



- Multi-State Information Sharing and Analysis Center
- The mission of the MS-ISAC is to improve the overall cybersecurity posture of U.S. State, Local, Tribal, and Territorial (SLTT) government organizations through coordination, collaboration, cooperation, and increased communication.



PNNL Test lab for drinking Water and Wastewater treatment





Operational Technology (OT) networks - convergence with IT networks





CISA Initiatives





Software Bill of Materials (SBOM)

Software Bill of Materials (SBOM)

- Key building block in Software Security.
 - A SBOM is a nested inventory, a list of ingredients that make up software components.

SBOM resources

https://www.cisa.gov/sbom





Data Field	Description
Supplier Name	The name of an entity that creates, defines, and identifies components.
Component Name	Designation assigned to a unit of software defined by the original supplier.
Version of the Component	Identifier used by the supplier to specify a change in software from a previously identified version.
Other Unique Identifiers	Other identifiers that are used to identify a component, or serve as a look-up key for relevant databases.
Dependency Relationship	Characterizing the relationship that an upstream component X is included in software Y.
Author of SBOM Data	The name of the entity that creates the SBOM data for this component.
Timestamp	Record of the date and time of the SBOM data assembly.

Secure by Design / Secure by Default

Secure by Design requirements include:

- The security of the customers is a core business requirement
- Security principles should be implemented during the design phase of a product's development lifecycle

Secure by Default features include:

- Products that are secure to use out of the box
- No additional cost for security features (i.e. MFA)
- Gather & log evidence of potential intrusions
- Control access to sensitive information <u>https://www.cisa.gov/secureb</u>





"Consumer safety must be front and center in all phases of the technology product lifecycle with security designed in from the beginning."

DIRECTOR JEN EASTERLY



CISA Initiative Pre-Ransomware Notifications

2023 Pre-Ransomware Notifications

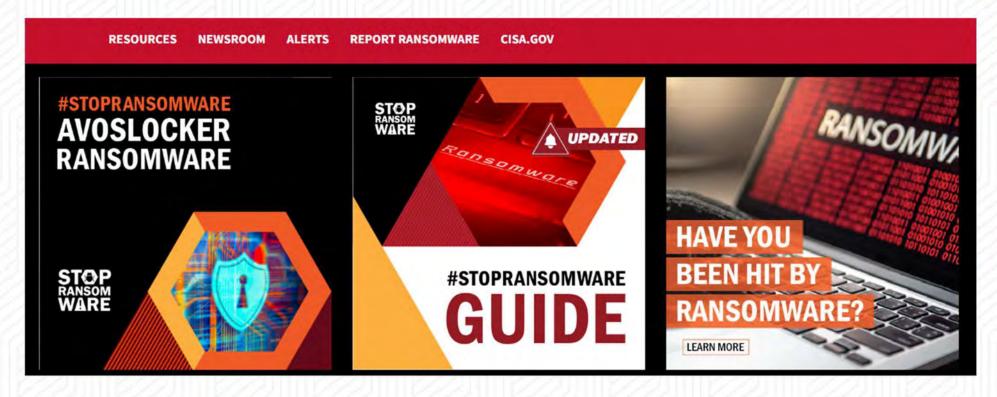
CISA has conducted more than 150 pre-ransomware notifications, including over 40 notifications to our international partners. Including: K-12 school districts, institutions of higher education, state and local organizations, and Healthcare organizations.

These notifications have helped organizations mitigate effects before threat actors have been able to fully compromise systems/networks.



New resources for Ransomware

https://www.cisa.gov/stopransomware







Cyber Risk Landscape



Infrastructure Assistance Coordinating Council (IACC) October 23, 2024

25

Cybersecurity statistics from FBI Internet Crime Complaint Center (IC3.gov)

FBI IC3 2023 Report →

- 3.26 million total complaints
- \$27.6 Billion Total Losses
 - Networth of YouTube ~\$25 Billion
- 870x Ransomware Victims
 - 1. Healthcare
 - 2. Critical Manufacturing
 - 3. Government Facilities
- Washington State was ranked 10th in terms of victim in the US.
- 58% increase in number of published vulnerabilities since 2017.
 - 2022 = ~25k Vulnerabilities.





Additional alerts from www.IC3.gov

Consumer Alerts



Additional Guidance on the Democratic People's Republic of Korea Information Technology Workers

Wed, 18 Oct 2023 15:00:00 EDT



Cybercriminals are Targeting Plastic Surgery Offices and Patients

Tue, 17 Oct 2023 15:00:00 EDT



Situation in Israel

Tue, 10 Oct 2023 18:40:00 EDT

"Phantom Hacker" Scams Target Senior Citizens and Result in Victims Losing their Life Savings

Fri, 29 Sep 2023 09:00:00 EDT

Violent Online Groups Extort Minors to Self-Harm and Produce Child Sexual Abuse Material

Tue, 12 Sep 2023 09:00:00 EDT



Industry Alerts



#StopRansomware Guide

Thu, 19 Oct 2023



Phishing Guidance: Stopping the Attack Cycle at Phase One

Wed, 18 Oct 2023



Shifting the Balance of Cybersecurity Risk: Principles and Approaches for Security by Design and Default

Mon, 16 Oct 2023



Threat Actors Exploit Atlassian Confluence CVE-2023-22515 for Initial Access to Networks

Mon, 16 Oct 2023



Improving Security of Open Source Software in Operational Technology and Industrial Control Systems

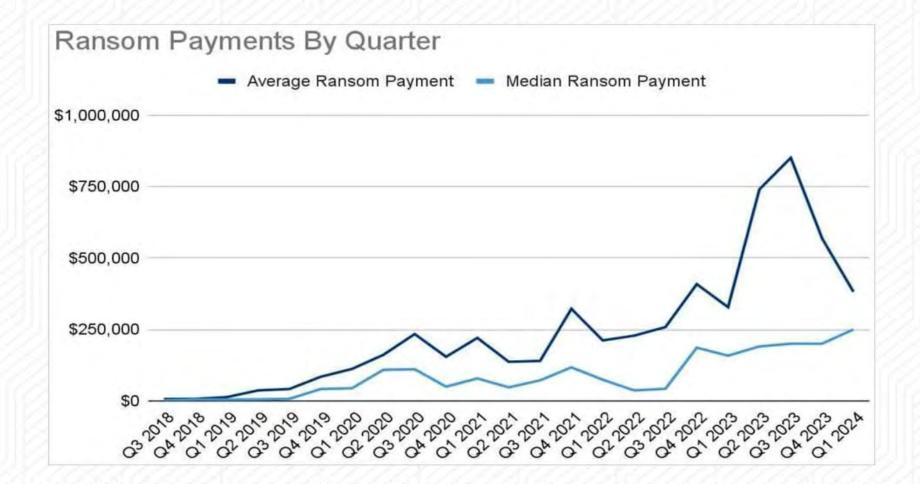
Wed, 11 Oct 2023

Ransomware payment rates





Ransomware payment amounts





Cyber Insurance Trends

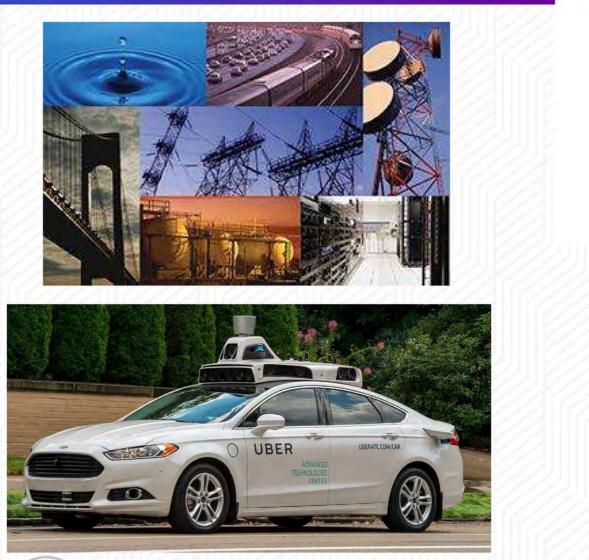
Insurers Have Responded By Making Insurance Harder To Qualify For, Pulling Back On Limits And Available Coverages







An Expanding Attack Surface











Nation State Adversaries



CISA VBER+INFRASTRUCTURE

Volt Typhoon



This CSA focuses on PRC-sponsored cyber actor, Volt Typhoon, targeting IT networks of communications, energy, transportation, water, and wastewater organizations in the U.S. and its territories.



Volt Typhoon - Living Off the Land (LOTL)

- Tactics involve using built-in tools that appear as normal activity and often do not set off alerts
- In some cases, the cyber actors have been living inside IT networks for years
- They are pre-positioned for disruptive or destructive cyberattacks against operational technology (OT) in the event of a major crisis or conflict with the United States.
- Joint Guidance: Identifying and Mitigating Living off the Land Techniques



Chinese Cyber Program



Capabilities:

- Highly capable, nimble operators; more sophisticated following public attribution
- Gain access via common vulnerabilities and zero-days
- Target software supply chains and Managed Service Providers
- Growing capability to engage in information operations Intent:
- Targets a broad spectrum of U.S. interests, often for economic espionage
- Goal is to surpass Western industrial and defense capabilities
- Seeking to become less dependent on foreign technology
- Long-term strategy to gain advantage over the United States

China's cyber program supports economic and military development, primarily through espionage, and Beijing continues to develop cyber attack capabilities for wartime use.

Major Cyber Operations Attributed to China

- 2011 -2013: State-sponsored cyber actors conducts spearphishing and intrusion campaign targeting 23 US natural gas pipeline operators
- 2013: IP Commission Report highlights Chinese efforts at intellectual property theft efforts linked to an estimated \$300 billion in business losses a year.
- 2014-2015: OPM is breached, exposing sensitive information for security background checks on 21 million federal employees.
- 2017: Chinese military hackers breach the networks of Equifax stealing the personal information of over 145 million Americans.
- 2018: Hackers breach servers of Marriot International, extracting information on 500 million guests.
- 2020: Suspected Chinese cyber actors exploited a known virtual private network vulnerability to compromise at least five federal agencies and entities in the defense, high-tech, transportation, and financial industries.
- 2021: APT 40 compromised as many as 100,000 e-mail servers worldwide in a range of industrial sectors, including infectious disease researchers, defense contractors, and more.



Russian Cyber Program



Capabilities:

- Assertive in its cyber operations even when detected
- Infiltrates software supply chains and broad campaigns exploiting vulnerabilities in networking devices
- Robust information operations program
- Historical precedent for targeting US and foreign elections

Intent:

- Collect information to support decision makers, influence military-political objectives
- Prep cyber environment for contingencies
- Divide and undermine US global standing and sow discord in US elections

Russia is aggressive in cyber ops—espionage and prepositioning for attack against US government and critical infrastructure networks, including energy and transportation systems.

Major Cyber Operations Attributed to Russia

- 2011-18: Russian state-sponsored APT actors conducted a multi-stage intrusion campaign in which they gained remote access to U.S. and international Energy Sector networks, deployed ICS-focused malware, and collected and exfiltrated enterprise and ICS-related data.
- 2015-16: Russian state-sponsored APT actors conducted a cyberattack against Ukrainian energy distribution companies, leading to multiple companies experiencing power outages in 2015. In 2016, these actors conducted a cyber-intrusion campaign against a Ukrainian electrical transmission company and deployed malware designed to attack power grids.
- 2016: During the 2016 US presidential campaign, Russian operatives use cyber operations to seek vulnerabilities in election infrastructure, collect on political parties, and candidates and conduct influence operations using social media.
- 2017: NotPetya ransomware attack spills out of Ukraine affecting businesses globally.
- 2018: Russian cyber actors targeted the 2018 Winter Olympic Games' opening ceremony and deployed data deletion malware against Olympic related entities.
- 2020: Russian state-sponsored actors target state, local, tribal, and territorial (SLTT) governments and aviation networks.
- 2020-2021: A Russian software supply chain operation in 2020 distributed malware that compromised major US companies and multiple US federal agencies.

CISA CYBER+INFRASTRUCTURE

North Korean Cyber Program



Capabilities:

- Emphasis on Korean Peninsula, but history of successful cyber operations against US networks
- Have progressively developed their resources and operator capabilities
- Social engineering becoming increasingly sophisticated Intent:
- Cyber criminal generation of revenue to support regime, its nuclear and ballist missile programs, and to counter international sanctions
- Signal to adversaries that they are capable of harm

North Korea uses cyber operations as a tool of coercion, espionage, attack, and a source of illicit financing via cyber criminal activities

Graphic is UNCLASSIFIED

Major Cyber Operations Attributed to DPRK

- 2011-13:
- 2014: North Korea conducts destructive attack against US-based Sony Pictures Entrainment
- 2015: North Korean-linked group use 5,986 phishing emails containing malicious code to gain access to noncritical systems at a South Korean nuclear power plant.
- 2016: North Korean groups are linked to an estimated \$81 million cyber heist of Bangladesh's central bank account at the Federal Reserve Bank of New York.
- 2017: North Korea launches the WannaCry ransomware attack that infects over 300,000 computers in 150 countries; its effects include temporarily knocking some UK hospitals offline.
- 2019: A UN report concludes that North Korea used cyberattacks against financial institutions and cryptocurrency exchanges to steal and estimated \$2 billion it used to fund its weapons of mass destruction program.
- 2020-2021: North Korean hackers target coronavirus vaccine developers.
- 2021: North Korean conducts social engineering campaign against cybersecurity researchers.



Iranian Cyber Program



Capabilities:

- Less sophisticated than Russian and Chinese counterparts but still able to disrupt and damage US networks
- Conducted disruptive and destructive cyberattacks on US financial institutions, companies, election infrastructure, other critical infrastructure, and academic institutions
- Research into Industrial Control Systems; capability to cause unspecified short-term effects
- Conducted malign influence operations targeting the US 2020 presidential election, including violence-related themes

Intent:

- Cyber operations are a tool for political retaliation and support its security priorities, including sanctions relief.
- "Eye for an eve" approach and response to provocations.

Iran's willingness to conduct aggressive cyber operations make it a significant threat to US networks and data; more recent demonstrations of cyber-enabled influence activities.

Graphic is UNCLASSIFIED

Major Cyber Operations Attributed to Iran

- 2011-13: Iran targeted 46 US financial institutions and a dam in Rye, New York, with distributed denial-of-service attacks.
- 2012: Iran conducted destructive attacks against the Saudi Arabian state-owned oil firm, Saudi Aramco, with Shamoon malware, which resulted in 30,000 computer rendered unusable and taken offline.
- 2014: Iranian hackers attacked the Sands Casino, infecting multiple systems and wiping hard drives.
- 2017: Iran launched Shamoon 2, affecting 15 government agencies and organizations in Saudi Arabia.
- 2021: Iranian government-sponsored APT actors leverage Microsoft Exchange and Fortinet vulnerabilities to gain initial access in advance of follow-on operations, which included deploying ransomware. They targeted a broad range of US critical infrastructure sectors, including a US municipal government, a US hospital, and the transportation sector.
- 2021-22: Iranian cyber actors observed leveraging the Log4j vulnerability.
- 2022: US Cyber Command connected actor MuddyWater to the Iranian Ministry of Intelligence and Security (MOIS) and noted open source tools they have recently leveraged to compromise US computer networks.



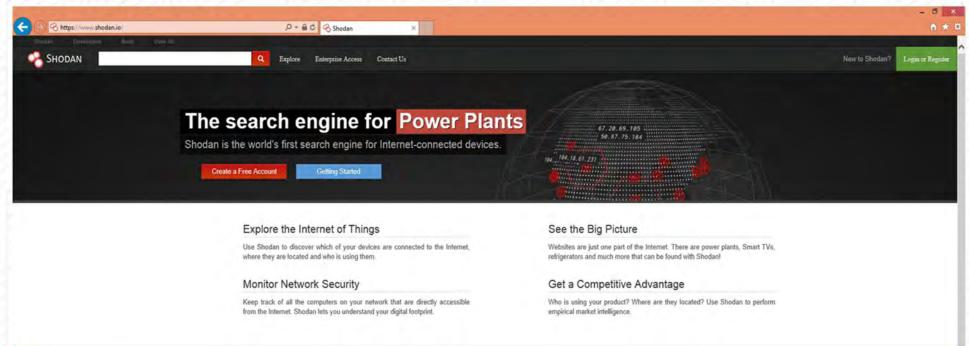


CYBERSECURITY AWARENESS MONTH

Cyber Tools



Tools used to identify vulnerabilities Shodan



56% of Fortune 100

1,000+ Universities

Shodan is used around the world by researchers, security professionals, large enterprises, CERTs and everybody in between.

Analyze the Internet in Seconds

Shodan has servers located around the world that crawl the Internet 24/7 to provide the latest Internet Intelligence. Who buys Smart TVs? Which countries are building the most wind farms? What companies are affected by Heartbleed? Shodan provides the tools to answer questions at the Internet-scale.

Sample Report on Heartbleed



Shodan – search on device metadata

SHODAN Explore	Downloads	Pricing 2 http.htm	I:"nginx" Country:"US" Sta	ate:"WA" City:"Pullman"	Acco
TOTAL RESULTS		勐 View Report 品	Download Results 🔟 H	listorical Trend D View on Map	
83		Product Spotlight	Free Fast IP Lookups fr	or Open Ports and Vulnerabilities using InternetDB	
		Charles and a feature of the state of the st			
TOP PORTS	alassia.	Test Page for the M 134.121.22.147		n AlmaLinux 🗹	2023-09-17T02:32:38,59971
80	58	Washington State	HTTP/1.1 200 OK Server: nginx/1.14.1		
443	20	University	Date: Sun, 17 Sep 2023 8	2:32:36 GMT	
		United States, Pullman	Content-Type: text/html		
81	1	eol-product Content-Length: 3854 Last-Modified: Mon, 19 Apr 2021 10:05:11 GMT			
3000	1		Connection: keep-alive ETag: "607d55d7-f0e"		
5357	1				
More			Accept-Ranges: bytes		
TOP ORGANIZATIONS		Welcome to nginx			2023-09-16T22:43:53,140810
Washington State University	52	50.52.114.95 vanvanmojo.kallisti.us	SSL Certificate	HTTP/1.1 200 OK	
Ziply Fiber	16	Ziply Fiber	Issued By: - Common Name:	Server: nginx/1.22.1 Date: Sat, 16 Sep 2023 22:43:53 GMT	
FIRST STEP INTERNET, LLC	8	United States, Pullman	R3	Content-Type: text/html	
FIRST STEP INTERNET, LLC	0	eol-product	- Organization:	Content-Length: 612	
Charter Communications Inc	3		Let's Encrypt	Last-Modified: Sun, 21 Mar 2021 19:59:21 GMT Connection: keep-alive	
Advanced Hardware Architectur	res 2		Issued To:	ETag: "60578599-264"	
More			- Common Name: vanvanmojo.kallisti.us	Accept-Ranges: bytes	
			Supported SSL Versions:		
TOP PRODUCTS			TLSv1.2, TLSv1.3		

Infrastru

October 23, 2024

Shodan

"Savvy searchers can find heating and security control systems for condominium buildings, banks, universities and corporate giants."

> -Forbes, <u>The Crazy Things A Savvy Shodan Searcher Can Find Exposed</u> <u>On The Internet</u>, September 2013

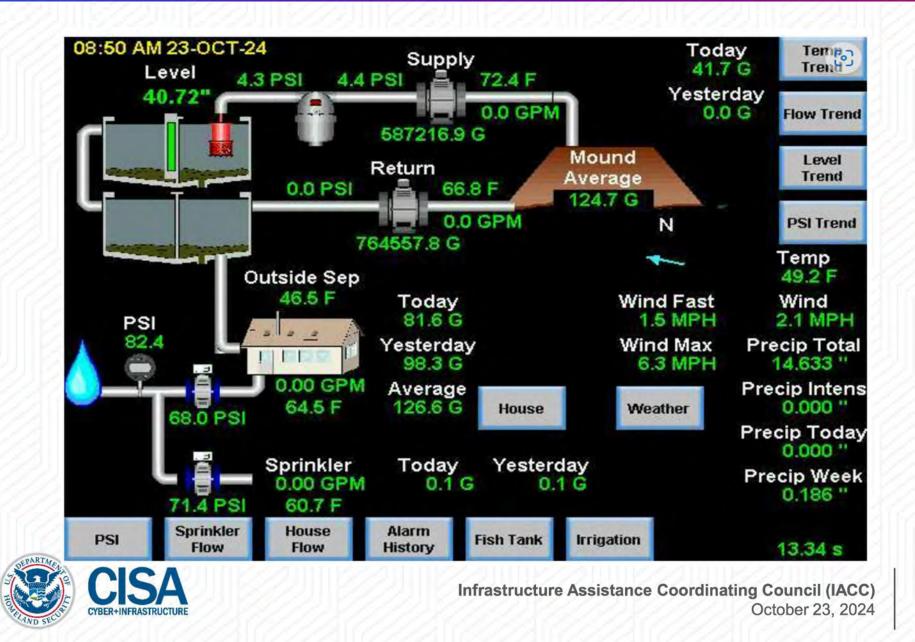


Analyze the Internet in Seconds

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Sample Report on Heartbleed

WA system found using Shodan



Copilot – "Grant funding for cities in Washington State" There are several grant funding opportunities available for cities in Washington State1 . Here are a few notable ones:

Growth Management Act (GMA) Grants: These grants assist cities and counties in updating their comprehensive plans and meeting the requirements of RCW 36.70A.130(5)1 . The current funding cycle is open until October 31, 20241

Connecting Housing to Infrastructure Program (CHIP): This program provides approximately \$12 million to support the development of affordable housing by funding water utility improvements or system development1

Climate Planning Grants: Administered by the Washington State Department of Commerce, these grants provide funding and technical assistance for climate change planning1 . Approximately \$30 million is available for the 2023-2025 biennium1

Community Development Block Grants (CDBG): These grants are funded by the U.S. Department of Housing and Urban Development (HUD) and assist small cities, towns, and counties in carrying out community development projects2

. The current funding availability is \$2 million, with an additional \$11 million anticipated in fall 20242

Capital Grants and Loans: These grants and loans support various capital projects, including careerconnected learning opportunities, safety improvements at agricultural fairgrounds, and historic preservation projects3

For more detailed information and application processes, you can visit the Washington State Department of Commerce website or the Association of Washington Cities website

Is there a specific type of grant you're interested in, or do you need help with the application process? 1. www.commerce.wa.gov 2. www.commerce.wa.gov 3.fiscal.wa.gov 4. www.sos.wa.gov





SECURITY PLANNING WORKBOOK

Incident Response Resources



Security Planning Workbook

Objectives

- Provide an overview of topics, resources, products, and practical knowledge to help organizations build a holistic security plan.
- Guide security planners through the risk assessment process to mitigate potential impacts to people and property.

Audience

 Individuals involved in an organization's security planning efforts, including individuals or groups with varying degrees of security expertise, charged with safety and security for people and property.



The **Security Planning Workbook** helps critical infrastructure owners and operators develop a foundational security plan.

Available 9/18/2023:

cisa.gov/resources-tools/resources/security-planning-workbook



Security Planning Workbook Framework

CRITICAL ACTIONS



Identify Planning Team: Develop and implement identified security practices.



Understand Risk: Organizations should identify potential threats and hazards, as well as consider the consequences to determine and prioritize risk.



Mitigate Risk: The decision to accept and mitigate risk is unique to each organization and should be based on its goals, objectives, and available resources.



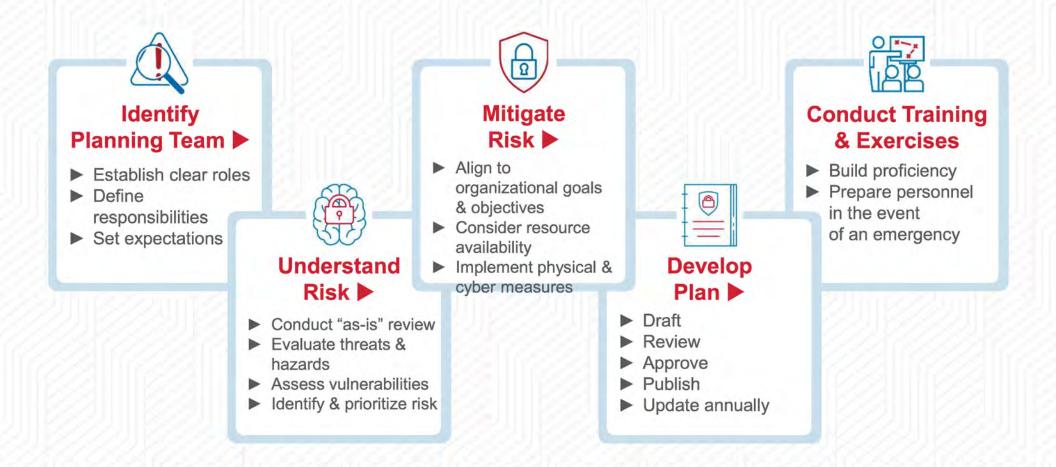
Develop Plan: Create security and emergency action plans to document steps personnel should take to prepare for, respond to, and recover from an incident.



Conduct Training & Exercises: Develop and regularly practice effective training and exercise programs to prepare for emergency situations.



Security Planning Workbook Critical Actions: Key Steps





Security Planning Workbook

Security Planning Workbook https://www.cisa.gov/resources-tools/resources/securityplanning-workbook





Incident Response Resources

- Incident Response Planning
- Incident Response References:
 - CISA.gov "Incident Response Plan"
 - CISA.gov "Incident Response Training"
 - (https://www.cisa.gov/resources-tools/programs/Incident-Response-Training)
 - CISA.gov "Cyber Incident Response"
 - NIST Computer Security Incident Handling Guide (NIST SP 800-61)
- CISA Assessments and Services.....



Questions?



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CISA Resources

For inquiries or further information, contact <u>central@cisa.dhs.gov</u>

CISA CYBER+INFRASTRUCTURE

Infrastructure Assistance Coordinating Council (IACC) October 23, 2024

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