Software & Supply Chain Assurance for GSA IT

Office of the Chief Information Security Officer

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Meet the team - GSA IT, Office of the CISO

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Agenda

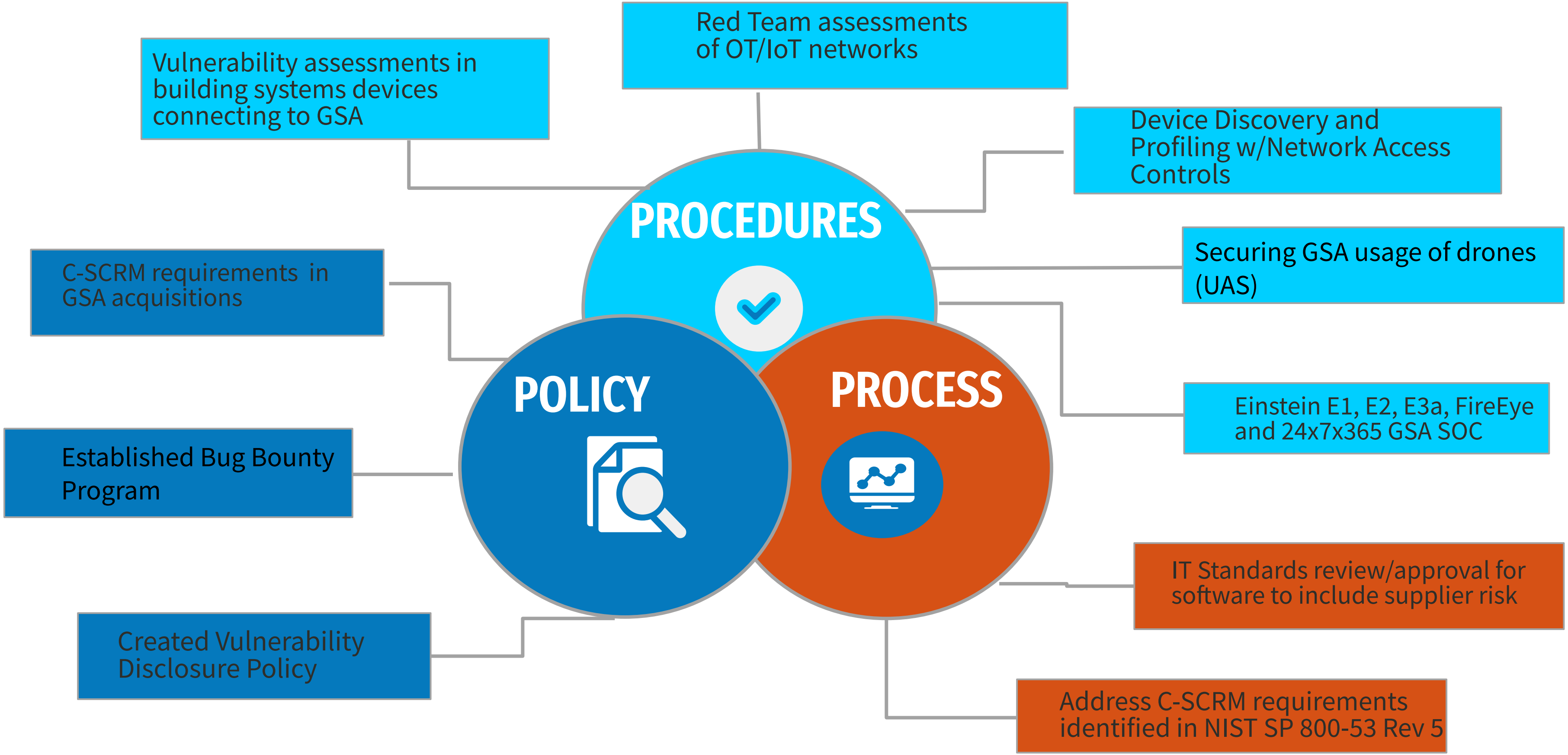
- 01 Overview
- 02 C-SCRM Program
- 03 Enterprise Vulnerability Management Program

Who are we?

- We work for the GSA Office of the CISO, within GSA's CIO office leading programs for:
  - Cyber supply chain risk management for the systems that we manage or oversee
  - Enterprise Vulnerability Management for identifying and prioritizing known vulnerabilities
  - DevSecOps where we work with development teams to integrate security best practices into their development pipelines
- Our organization is responsible for securing the GSA enterprise and systems and is distinct from the government-wide services provided by the Federal Acquisition Service or the Office of Government-wide Policy.
- GSA provides solutions used by other agencies and by vendors that want to work with the government. This is done via solutions that are custom-developed by GSA, supported by COTS products, and also SaaS vendors. Each of these software types pose risks that are managed in different ways.

C-SCRM Program

Foundational Activities



Vulnerability assessments in building systems devices connecting to GSA

Red Team assessments of OT/IoT networks

Device Discovery and Profiling w/Network Access Controls

Securing GSA usage of drones (UAS)

Einstein E1, E2, E3a, FireEye and 24x7x365 GSA SOC

IT Standards review/approval for software to include supplier risk

Address C-SCRM requirements identified in NIST SP 800-53 Rev 5

C-SCRM requirements in GSA acquisitions

Established Bug Bounty Program

Created Vulnerability Disclosure Policy

C-SCRM Program: Goals and Objectives

Synergize

GSA OCISO Cyber Security and Supply Chain Risk Management expertise

GSA IT procurement knowledge and experience

Assess

GSA IT’s Cyber risk from 3rd party suppliers and their products prior to a major business award

Continuously Monitor

Assess risks from awarded IT products and services

Advise

Establish C-SCRM governing policies for GSA IT acquisitions and systems (on-prem + vendor)

Critical IT Supplier List Methodology

Hardware & Software Assets

- Any contracted SW or HW which connects to GSA network (Includes buildings devices)
- Device and software list compiled and suppliers identified for risk analysis

FISMA Systems

- Ultimate suppliers for FISMA High and Moderate systems
- Results are recorded for continuous monitoring through VRA tools

Integrators

- Contractor support for IT development and other technical services

Financial Risk

- Financial Exposure (overall cost can indicate criticality)

C-SCRM Program: Component Breakdowns

Pre-Award

Assessment of suppliers and their products prior to award

- **Analysis focused on possible supplier risks**
- **Utilize Supplier Illumination tools and other OSINT capabilities**

Selection factor in RFQ or requirement for sole source

Ongoing C-SCRM Support

Maintain the operational effectiveness of the program

- **NIST SP 800-53 Rev 5 Supply Chain common controls**
- **Periodic updates to GSA Critical IT Suppliers**

Post-Award

Activities relating to supplier continuous monitoring and auditing

- **Hardware Device Component Testing**
- **Use third party supplier illumination tools & SME analysis**
- **Automated alerting for cyber supply chain events**

Respond to Cyber Supply Chain events and incidents

SBOMs for GSA IT

- The Cyber Executive Order 14028 has resulted in substantial changes in how the government buys software:
  - The Cyber EO tasked NTIA to define ‘minimum elements’ for a Software Bill of Materials (SBOM).
  - NIST updated NIST SP 800-218 and OMB issued M-22-18 to require vendor attestations to software security best practices to include provenance (e.g. SBOMs)
  - The scope for a mandate for SBOMs for software the government purchases is still forthcoming.
- What will we do with these SBOMs once we have them?
  - One of the best use cases for having SBOMs came during the response Log4j
  - What was a difficult process in data calls to internal teams and external vendors could be immediately available the next time something happens if we have SBOMs and a view of the software components for software in our systems.

Enterprise Vulnerability Management Program

Current Vulnerability Management Program State

The GSA program is made up of a variety of resources to determine the risk posture of the environment, including the following:

- CyHy Report
- Bug Bounty / Vulnerability Disclosure Program
- OS & Database Scanning
- Web Application Scanning)
- Containers Scanning
- Multi-Cloud Environment Scanning

- KEVs Reports (BOD-22-01)
- Critical/High Vulnerability (BOD-19-02)
- Penetration Testing / Red Team Results
- Mobile Vulnerability - Lookout for Work
- SAST w/ SCA (**coming**)
- AWARE Report (**Future State)**

GSA Asset/Software Discovery Solution

- GSA uses a semi-active discovery solution
- Uses a variety of methods:
- Agents (provide additional contextual information)
  - Appliances installed in each region & data center with connections to core switches
  - Passive listening to network via span ports
  - Connection to wireless APs

Vulnerability Enumeration - OS and Database

Faster enumeration means more accurate results of threat risk

Agent-based vulnerability enumeration every **72 hrs**

Active scans are run against all hosts every **7 days**

Combination Agent / Active Vulnerability Enumeration

30,000+ devices

15,000+ Workstations across CONUS

Mobile Vulnerability

11,000+ Android/iOS

Vulnerability Enumeration - Web (Internal / External)

Faster enumeration means more accurate results of threat risk

Unauthenticated Scan

Monthly

Authenticated Scan

Annually

2,500+ URL

(Internal/External)

continuous integration/continuous deployment (CI/CD) pipelines

Challenges

Manual Authentication Scan

API Scan (Initial)

Container Vulnerability Management

1 GSA-managed & built

- Less risk
- Faster patching

2 Vendor-provided

- Moderate risk
- Hold vendor accountable for patching

3 Open source

- High risk
- Patched by Open Source Community

Challenges:

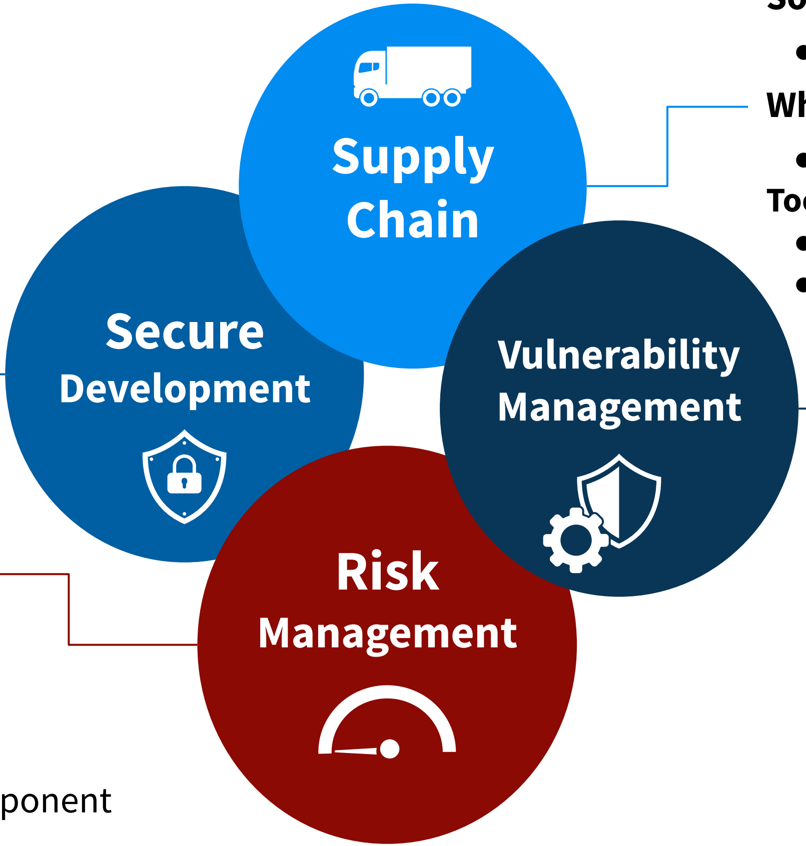
1. Vendor recommends application/system teams **not to alter** vendor container images.
2. Multiple (different) teams are working on fixing vulnerabilities in the **same images**.
3. Deployment CVE management becomes **more difficult** than traditional OS, due to the nature of container images.

GSA Prioritization Considerations

- More frequent scanning helps technical team know if patches are remediate

Prioritized Patching		
Devices with Public Presence	**Others**	**Known Exploitable Vulnerability**
Critical: 15 days	Critical: 30 days	Within 14 days
High: 30 days	High: 30 days	
Moderate: 90 days	Moderate: 90 days	
Low: 180 days	Low: 180 days	

Software Security for GSA IT



Supply Chain

Software Types

- COTS/GOTS/Open Source

Who maintains code

- Vendor/Open Source Community

Tools

- SBOMs
- Vendor C-SCRM assessments

Secure Development

- CI/CD pipeline
- Static code scanning
- Dynamic code scanning
- Dependencies / Software Composition Analysis
- DevSecOps

Vulnerability Management

Understand vulnerabilities of underlying systems & apps

- OS/Database/Apps
- VDP/BB
- DAST/IAST/RASP

Risk Management

- Understand how code is maintained from start to finished
- Response to critical component vulnerabilities (e.g log4j)

Thank you!

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