**Commonwealth of Massachusetts**
Executive Office of Technology Services and Security (EOTSS)
Enterprise Security Office

# Vulnerability Management Standard

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| Document Name: Vulnerability Management | Effective Date: October 15th, 2018 |
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# 1. PURPOSE

1.1. ***Vulnerability Management Standard*** — The purpose of this ***standard*** is to document the requirements to protect, detect and recover from vulnerabilities in the technology environment.

# 2. AUTHORITY

2.1. M.G.L. Ch. 7d provides that "Notwithstanding any general or special law, rule, regulation, executive order, policy or procedure to the contrary, all executive department agencies shall, and other state agencies may, adhere to the policies, procedures and objectives established by the executive office of technology services and security with respect to activities concerning information technology."

# 3. SCOPE

3.1. This document applies to the use of information, information systems, electronic and computing devices, applications, and network resources used to conduct business on behalf of the Commonwealth. The document applies to the Executive Department including all executive offices, and all boards, commissions, agencies, departments, divisions, councils, and bureaus.. Other Commonwealth entities that voluntarily use or participate in services provided by the Executive Office of Technology Services and Security, such as mass.gov, must agree to comply with this document as a condition of use. Executive Department agencies and offices are required to implement procedures that ensure their ***personnel*** comply with the requirements herein to safeguard information.

# 4. RESPONSIBILITY

4.1 The Enterprise Security Office is responsible for the development and ongoing maintenance of this ***standard***.

4.2 The Enterprise Security Office is responsible for this ***standard*** and may enlist other departments to assist in the monitoring and maintenance of compliance with this ***standard***.

4.3 Any inquiries or comments regarding this ***standard*** shall be submitted to the Enterprise Security Office by contacting the Security Program Office at EOTSS-DL-Security Office.

4.4 Additional information regarding this ***standard*** may be found at https://www.mass.gov/cybersecurity/policies.

# 5. COMPLIANCE

5.1. Compliance with this document is mandatory for the Executive Department including all executive offices, boards, commissions, agencies, departments, divisions, councils, and bureaus. Violations are subject to disciplinary action in accordance to applicable employment and collective bargaining agreements, up to and including the termination of their employment and/or assignment with the Commonwealth.

Exceptions to any part of this document must be requested via email to the Security Office (EOTSS-DL-Security Office). A policy exception may be granted only if the benefits of the exception outweigh the increased risks, as determined by the Commonwealth CISO.

# 6. STANDARD STATEMENTS

## 6.1. Vulnerability Management

Processes to identify, classify and remediate ***vulnerabilities*** across all technology environments and platforms to reduce the Commonwealth's exposure to cyber threats must be documented.

6.1.1. Establish a vulnerability and patch management process to:

6.1.1.1. Ensure information systems are patched in a timely manner.

6.1.1.2. Ensure that the patch management process and cadence is consistent with the recommendation of patch providers.

6.1.1.3. Reduce the number of service disruptions, incidents and problems caused by ***vulnerabilities.***

6.1.1.4. Provide a defined, repeatable method for ensuring consistent execution of associated patch management activities and tasks.

6.1.1.5. Provide clarity around stakeholder/participant roles and responsibilities.

6.1.1.6. Enable key performance metrics to be captured for performance monitoring and improvement.

6.1.1.7. Define roles and responsibilities associated with ***vulnerability*** management.

6.1.2. Identify ***vulnerabilities*** within the IT environments:

6.1.2.1. In support and consistent with the *Asset Management* standard (IS.004), perform asset discovery scans on the internal network; update asset inventories as necessary.

6.1.2.2. Monitor security-related email alerts and/or vendor notification sites for vulnerabilities that may affect systems or applications.

6.1.2.3. As appropriate, generate internal security alerts.

6.1.2.4. Ensure alerts are distributed to the Commonwealth SOC and ensure that associated directives are implemented within established timeframes, or the issuing organization is notified of noncompliance.

6.1.2.5. Perform credentialed ***vulnerability*** scans. Where technically feasible, include endpoints (i.e., desktops and laptops).

6.1.2.6. Conduct automated vulnerability scans, at a minimum monthly, on internal and external networks.

6.1.2.6.1. For PCI-specific environments, perform vulnerability scans on externally facing IP addresses; use an Approved Scanning Vendor (ASV) and track findings through remediation.

6.1.2.6.2. Perform ad hoc vulnerability assessments after any significant change to the PCI environment (e.g., new system component

installations, changes in network topology, firewall rule modification, major version upgrade).

6.1.2.7. Perform vulnerability scanning before any significant infrastructure or application upgrade or modification (e.g., new system component installations, changes in network topology, firewall rule modifications) is implemented into production.

6.1.2.8. Perform manual vulnerability assessments on a periodic basis to identify difficult to detect vulnerabilities.

6.1.2.9. Test for the presence of unauthorized wireless access points on Commonwealth networks on a quarterly basis.

6.1.2.10. Review public-facing web applications via manual or automated application vulnerability security assessment tools or methods at least quarterly.

6.1.2.10.1. For PCI specific environments, perform reviews on public-facing web applications after any change to the PCI environment, or install a web application firewall in front of a public-facing web application as a mitigating control.

6.1.2.11. Conduct internal and third-party network-layer and application-layer penetration testing at least annually or collect evidence to attest that the third party has had a vulnerability assessment performed.

6.1.3. Perform timely reviews of vulnerability information received from internal and external sources (e.g., software suppliers) and report to the Enterprise Security Office**.** The report shall include:

6.1.3.1. Vulnerability description

6.1.3.2. Hosts affected

6.1.3.3. Current status at the time of reporting

6.1.3.4. Recommendations for remediation

6.1.3.5. Supporting information

6.1.4. Vulnerabilities shall be prioritized using a risk-based approach

| Severity | Level | Description | Remediation timeframe |
|---|---|---|---|
|  | Critical | Threat actor may gain control of the host, or there may be potential leakage of confidential information. | 30 calendar days |
|  | High | Threat actor may gain access to sensitive information stored on the host, including security settings resulting in potential misuse. | 60 calendar days |
|  | Medium | Threat actor may be able to collect sensitive information from the host, such as the precise version of software installed. | 90 calendar days |

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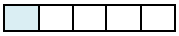
|  | Low | Limited risk to host. | Best effort |

6.1.5. Perform necessary actions to ensure that the likelihood and impact of threats, which can potentially exploit vulnerabilities, are minimized by implementing security controls within the established timeframes (section 6.1.4).

6.1.5.1. Remediate ***vulnerabilities*** by deploying patches or making configuration changes as a mitigation strategy. Appropriate testing must be conducted prior to patch deployment. Configuration changes to ***information systems*** must follow the *Change Management* process and obtain the required approvals. (*See Change Management in Asset Management Standard)*

6.1.5.2. In the event that a patch or mitigation strategy is not available to remediate the vulnerability, a mitigating control shall be enacted or a security exception from the Commonwealth CISO is required.

6.1.6. Report through the various stages of the ***vulnerability*** and patch management process using established performance metrics. Summary reports shall be used to inform management of the current status and effectiveness of the vulnerability and patch management program.

6.1.6.1. The agencies must report vulnerabilities on a monthly basis to the Enterprise Security Office:

6.1.6.1.1. Vulnerabilities by severity and aging

6.1.6.1.2. Vulnerabilities with exceptions in place

6.1.6.1.3. Open and closed vulnerabilities

# 7. CONTROL MAPPING

| Section | NIST SP800-53 Rev 5 | CIS 18 | NIST CSF |
|---|---|---|---|
| 6.1 Vulnerability Management | RA-3 | - | ID.RA-1 |
| | RA-5 | CSC 7 | ID.RA-1 |
| | SI-2 | CSC 7 | ID.RA-1 |
| | SI-5 | CSC 7 | ID.RA-1 |
| | CA-8 | CSC 16 | ID.RA-1 |
| | SA-8 | - | PR.IP-2 |
| | SC-7 | CSC 4 | PR.AC-5 |
| | SC-38 | - | - |
| | SI-3 | CSC 10 | DE.CM-4 |
| | SI-7 | CSC 10 | PR.DS-6 |

# 8. RELATED DOCUMENTS

| Document | Effective date |
|---|---|
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# 9. DOCUMENT CHANGE CONTROL

| Version No. | Revised by | Effective date | Description of changes |
|---|---|---|---|
| 0.9 | Jim Cusson | 10/01/2017 | Corrections and formatting. |
| 0.92 | John Merto | 01/02/2018 | Corrections |
| 0.95 | Sean Vinck | 5/7/2018 | Corrections and formatting. |
| 0.97 | Andrew Rudder | 5/31/2018 | Corrections and formatting. |
| 0.98 | Anthony O'Neill | 05/31/2018 | Corrections and Formatting |
| 1.0 | Dennis McDermitt | 06/01/2018 | Pre-publication review |
| 1.0 | Andrew Rudder | 10/4/2018 | Approved for Publication by: John Merto |
| 1.1 | Megan Perkins | 7/15/2020 | Annual Review; Minor corrections and formatting |
| 1.2 | Sean M. Hughes | 11/04/2021 | Annual Review |
| 1.3 | Sean M. Hughes | 08/29/2022 | NIST 800-53 R5 mapping and Annual Review |
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The owner of this document is the Commonwealth CISO (and or his designee). It is the responsibility of the document owner to maintain, update and communicate the content of this document. Questions or suggestions for improvement should be submitted to the document owner.

*9.1 Annual Review*

This *Vulnerability Management Standard* document should be reviewed and updated by the document owner on an annual basis or when significant policy or procedure changes necessitate an amendment.