



Critical Flaw in VMware vCenter Server

CRITICALITY



23/09/2021

Recommendations



Prevention



Detection



Remediation



Response



MITRE ATT&CK

Summary

Threat actors are scanning for vulnerable VMware vCenter Server to take advantage of a critical Remote Code Execution vulnerability. VMware warns all the customers to patch the affected versions immediately.



Threat Details

On the 22nd of September, VMware has released a patch to plug several vulnerabilities in the vCenter Server, including a critical file upload vulnerability tracked as CVE-2021-22005 with a severity score of 9.8 out of 10. The threat actors can take advantage of the vulnerability by accessing port 443 regardless of the configuration settings in the vCenter Server.

Successful exploitation of the vulnerability on the unpatched products detected by threat actors' scanner tools will allow the attacker to upload critical files that could lead to remote code execution. Although the vulnerability has been identified, no public exploit code or technical findings have been released yet.

Below is the list of the patched vulnerabilities:

CVE	DESCRIPTION	CVSSV3
CVE-2021-22005	vCenter Server file upload vulnerability	9.8
CVE-2021-21991	vCenter Server local privilege escalation vulnerability	8.8
CVE-2021-22006	vCenter Server reverse proxy bypass vulnerability	8.3
CVE-2021-22011	vCenter server unauthenticated API endpoint vulnerability	8.1
CVE-2021-22015	vCenter Server improper permission local privilege escalation vulnerabilities	7.8
CVE-2021-22012	vCenter Server unauthenticated API information disclosure vulnerability	7.5
CVE-2021-22013	vCenter Server file path traversal vulnerability	7.5
CVE-2021-22016	vCenter Server reflected XSS vulnerability	7.5
CVE-2021-22017	vCenter Server rhttpproxy bypass vulnerability	7.3
CVE-2021-22014	vCenter Server authenticated code execution vulnerability	7.2
CVE-2021-22018	vCenter Server file deletion vulnerability	6.5



CVE-2021-21992	vCenter Server XML parsing denial-of-service vulnerability	٦,٥
CVE-2021-22007	vCenter Server local information disclosure vulnerability	٥,٥
CVE-2021-22019	vCenter Server denial of service vulnerability	٥,٣
CVE-2021-22009	vCenter Server VAPI multiple denial of service vulnerabilities	٥,٣
CVE-2021-٢٢٠١٠	vCenter Server VPXD denial of service vulnerability	٥,٣
CVE-2021-٢٢٠٠٨	vCenter Server information disclosure vulnerability	٥,٣
CVE-2021-٢٢٠٢٠	vCenter Server Analytics service denial-of-service Vulnerability	٥
CVE-2021-٢١٩٩٣	vCenter Server SSRF vulnerability	٤,٣



Recommendations



Prevention

- **Appendix A** contains the recommendations to prevent such attacks.



Detection

- **Appendix B** contains a sample of Indicators of compromise of this threat the full list is in the attached file.

References

CVE-2021-22005: Critical File Upload Vulnerability in VMware vCenter Server. (2021, 9 22).

Retrieved from Tenable: <https://www.tenable.com/blog/cve-2021-22005-critical-file-upload-vulnerability-in-vmware-vcenter-server>

Gatlan, S. (2021, 9 22). *Hackers are scanning for VMware CVE-2021-22005 targets, patch now!*

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Haworth, J. (2021, 9 23). *VMware security warning: Multiple vulnerabilities in vCenter Server could allow remote network access.* Retrieved from The Daily Swig | Cybersecurity news and views: <https://portswigger.net/daily-swig/vmware-security-warning-multiple-vulnerabilities-in-vcenter-server-could-allow-remote-network-access>



Contact Us

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Appendix A – Prevention

The National Cyber Security Centre recommends that all entities update the below-affected vCenter Server versions immediately to the latest version.

Affected versions:

- vCenter Server version 6.5.
- vCenter Server version 6.7.
- vCenter Server version 7.0.



Appendix B – Detection

The National Cyber Security Centre recommends all the entities to check for any scanning activities from the following IP address:

- 116[.]48.233.234



Appendix C – Best Practices

Bahrain National CERT team recommends organizations to implement the following security best practices.

- Daily backups of important new/changed data, software and configuration settings, stored disconnected, retained for at least three months. Test restoration initially, annually and when IT infrastructure changes.
- Patch operating systems. Patch/mitigate computers (including network devices) with 'extreme risk' vulnerabilities within 48 hours. Use the latest operating system version. Don't use unsupported versions.
- Patch applications e.g. Flash, web browsers, Microsoft Office, Java and PDF viewers. Patch/mitigate computers with 'extreme risk' vulnerabilities within 48 hours. Use the latest version of applications.
- Restrict administrative privileges to operating systems and applications based on user role. Regularly reassess the need for privileges. Don't use privileged accounts for reading email and web browsing.
- Configure Microsoft Office macro settings to block macros from the Internet, and only allow vetted macros either in 'trusted locations' with limited write access or digitally signed with a trusted certificate.
http://www.asd.gov.au/publications/protect/Microsoft_Office_Macro_Security.pdf
- Application whitelisting of approved/trusted programs to prevent execution of unapproved/malicious programs including .exe, DLL, scripts (e.g. Windows Script Host, PowerShell and HTA) and installers.
- User application hardening. Configure web browsers to block Flash (ideally uninstall it), ads and Java on the Internet. Disable unneeded features in Microsoft Office (e.g. OLE), web browsers and PDF viewers.
- Multi-factor authentication for VPNs, Outlook Web Access (OWA), RDP, SSH and other remote access, and for all users when they perform a privileged action or access an important (sensitive or high-availability) data repository.
- Implement CIS Critical Security Controls, while prioritizing the implementation of the Top 5 CIS Controls. (<https://www.cisecurity.org/critical-controls.cfm>)
- Implement Strategies to mitigate cyber security incidents.
(<http://www.asd.gov.au/infosec/mitigationstrategies.htm>)

CERT.bh recommends organizations to implement the following strategies to detect and respond to cyber security incidents:

- Network-based intrusion detection/prevention system using signatures and heuristics to identify anomalous traffic both internally and crossing network perimeter boundaries.
- Host-based intrusion detection/prevention system to identify anomalous behaviour during program execution e.g. process injection, keystroke logging, driver loading and persistence mechanisms.
- Endpoint detection and response software on all computers to centrally log systems' behaviour and facilitate incident response. Microsoft's free SysMon tool is an entry level option.
- Enhance visibility through PowerShell logging to provide investigators a detection mechanism for malicious activity and a historical record of how PowerShell was used on systems.
https://www.fireeye.com/blog/threat-research/2016/02/greater_visibility.html
- Hunt to discover incidents using threat intelligence consisting of analyzed threat data with indicators of compromise and mitigating threats based on behaviour patterns.



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- Capture network traffic to and from internal systems that store important data or are considered critical assets, and network traffic traversing the network perimeter, to assist with incident detection and analysis.
 - Continuous incident detection and response with automated immediate analysis of centralised time-synchronised logs of permitted and denied: computer events, authentication, file access, network activity.
 - MITRE Corporation provides a public repository that includes a model and framework for describing the actions attackers may take while operating within an enterprise network. These details can aid organizations in detecting attacker activities.
 - https://attack.mitre.org/wiki/Main_Page
 - https://car.mitre.org/wiki/Full_Analytic_List
 - <https://car.mitre.org/caret/#/>



Appendix D – TLP Definitions

TLP:RED = Not for disclosure, restricted to participants only.

Sources may use TLP:RED when information cannot be effectively acted upon by additional parties, and could lead to impacts on a party's privacy, reputation, or operations if misused. Recipients may not share TLP:RED information with any parties outside of the specific exchange, meeting, or conversation in which it was originally disclosed. In the context of a meeting, for example, TLP:RED information is limited to those present at the meeting. In most circumstances, TLP:RED should be exchanged verbally or in person.

TLP:AMBER = Limited disclosure, restricted to participants' organizations.

Sources may use TLP:AMBER when information requires support to be effectively acted upon, yet carries risks to privacy, reputation, or operations if shared outside of the organizations involved. Recipients may only share TLP:AMBER information with members of their own organization, and with clients or customers who need to know the information to protect themselves or prevent further harm. **Sources are at liberty to specify additional intended limits of the sharing: these must be adhered to.**

TLP:GREEN = Limited disclosure, restricted to the community.

Sources may use TLP:GREEN when information is useful for the awareness of all participating organizations as well as with peers within the broader community or sector. Recipients may share TLP:GREEN information with peers and partner organizations within their sector or community, but not via publicly accessible channels. Information in this category can be circulated widely within a particular community. TLP:GREEN information may not be released outside of the community.

TLP:WHITE = Disclosure is not limited.

Sources may use TLP:WHITE when information carries minimal or no foreseeable risk of misuse, in accordance with applicable rules and procedures for public release. Subject to standard copyright rules, TLP:WHITE information may be distributed without restriction.