



VMware Patches Critical RCE Vulnerability

CRITICALITY 

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Recommendations



Prevention



Detection



Remediation



Response



MITRE ATT&CK

Summary

VMware released a new patch to address a critical Remote Code Execution (RCE) vulnerability in its VMware Cloud Foundation and NSX Data Center for vSphere (NSX-V).



Threat Details

VMware has released security update to address a critical Remote Code Execution (RCE) vulnerability in its VMware Cloud Foundation and NSX Data Center for vSphere (NSX-V). The addressed vulnerability is tracked as CVE-2021-39144 with CVSS score of 9.8. Successful exploitation of the vulnerability allows an attacker to get remote code execution in the context of 'root' on the appliance through XStream open-source library for input serialization in VMware Cloud Foundation (NSX-V).

According to VMware advisory, the security update addressed another vulnerability. It is a medium-severity XML External Entity (XXE) vulnerability tracked as CVE-2022-31678 with CVSS score of 5.3, the exploitation could lead to Denial-of-Service (DoS) or unauthorized information disclosure.

The company highly recommends all customers install the latest update.



Recommendations



Prevention

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

References

Gatlan, S. (2022, October 25). *VMware fixes critical Cloud Foundation remote code execution bug*. Retrieved from BleepingComputer:
<https://www.bleepingcomputer.com/news/security/vmware-fixes-critical-cloud-foundation-remote-code-execution-bug/>

Lakshmanan, R. (2022, October 26). *VMware Releases Patch for Critical RCE Flaw in Cloud Foundation Platform*. Retrieved from The Hacker News:
<https://thehackernews.com/2022/10/vmware-releases-patch-for-critical-rce.html>

VMware. (2022, October 25). *VMSA-2022-0027*. Retrieved from VMware:
<https://www.vmware.com/security/advisories/VMSA-2022-0027.html>



Contact Us

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Appendix A – Prevention

The National Cyber Security Center recommends all the entities to follow these steps:

- Apply the latest supported update.
- Upgrade the XStream library to version 1.4.19.

The affected products:

- VMware Cloud Foundation (VCF) 3.x.
- NSX-V versions prior to 6.4.14.
- All XStream iterations until and including version 1.4.17.



Appendix B – Best Practices

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

- Backup daily important new/changed data, software and configuration settings, store disconnected data 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 to read emails or to browse the web.
- 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
- Whitelist applications 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.
- Harden user application. 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.
- Activate multi-factor authentication for VPNs, Outlook Web Access (OWA), RDP, SSH and other remote access 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:

- Use network-based intrusion detection/prevention system using signatures and heuristics to identify anomalous traffic both internally and crossing network perimeter boundaries.
- Use The host-based intrusion detection/prevention system to identify anomalous behaviour during program execution e.g. process injection, keystroke logging, driver loading and persistence mechanisms.
- Use 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.
- 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.
- Detect and response to incidents continuously with automated immediate analysis of centralised time-synchronised logs of permitted and denied: computer events, authentication, file access, network activity.
- Refer to MITRE Corporation which 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 C – TLP Definitions

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.

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.*

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.

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.