

7 December 2021

Nucleus RTOS

Background

Nucleus RTOS is a real-time operating system (RTOS) from Siemens. It is used in many different embedded software solutions, including medical, industrial, consumer, and aerospace applications.

Forescout and the Cybersecurity and Infrastructure Security Agency (CISA) recently issued reports detailing 13 vulnerabilities in the Nucleus RTOS. These vulnerabilities were in the Nucleus Net component, specifically in the TCP/IP (transmission control protocol / internet protocol) stack and related networking services (e.g., FTP, TFTP). The reports can be found at:

<https://us-cert.cisa.gov/ics/advisories/icsa-21-313-03>

<https://www.forescout.com/research-labs/nucleus-13/>

Nucleus Use on ZOLL Defibrillators

ZOLL performed an examination of our defibrillators after we were made aware of these vulnerabilities. Nucleus RTOS is used on the following ZOLL products:

- AED Plus
- AED Pro
- R Series
- M Series
- E Series

Other ZOLL defibrillators do not use Nucleus.

Impact to ZOLL Products

An analysis of the five ZOLL defibrillators that use Nucleus RTOS was performed; the findings showed that **ZOLL defibrillators are not impacted by the Nucleus vulnerabilities.** The table below provides a high-level overview of the product analysis.

ZOLL's Commitment to Cyber Security

ZOLL takes the security of sensitive data very seriously and is continually enhancing the measures we take to protect that data against the latest threats. We take a layered approach to reduce the risk of a cyber-attack:

- Vulnerability Scanning — A third party has scanned all ZOLL externally facing systems and verified no indication of Log4j.
- ZOLL Systems Protections — All ZOLL computing devices have advanced security protections that will determine where vulnerable software exists.
- Next-Generation Firewalls — Next-Gen Firewalls have been used to deploy signature-based protections, as well as IP blocking of known malicious traffic specific to Log4j.
- Monitoring — ZOLL Security and Operations Center monitors security events and incidents 24X7.

If you have questions, concerns, or need technical assistance please contact your ZOLL Customer Success Manager or Tech Support team.

Regards,

ZOLL Technology Risk Organization

Analysis of Products Using Nucleus RTOS

Product	Analysis	Result/Finding
AED Plus	The software uses Nucleus RTOS but not the Nucleus NET components that contain the reported vulnerabilities	This product is not impacted by the Nucleus vulnerabilities.
AED Pro	The software uses Nucleus RTOS but not the Nucleus NET components that contain the reported vulnerabilities	This product is not impacted by the Nucleus vulnerabilities.
R Series	The software uses Nucleus RTOS but not the Nucleus NET components that contain the reported vulnerabilities	This product is not impacted by the Nucleus vulnerabilities.
M Series	The product does use the Nucleus NET package; however, the vulnerable TCP server subcomponent is not used and other components are not used in ways that are susceptible to the vulnerabilities.	This product is not impacted by the Nucleus vulnerabilities.
E Series	The product does use the Nucleus NET package; however, the vulnerable TCP Server subcomponent is not used (the device is a TCP client).	This product is not impacted by the Nucleus vulnerabilities.

Additional questions or customer inquiries should be directed to Global Product Management or technical support.



800-348-9011



techsupport@zoll.com