

## **SSA-201384: Predictable UDP Port Number Vulnerability (NAME:WRECK) in the DNS Module of Nucleus Products**

Publication Date: 2021-04-13  
Last Update: 2021-04-13  
Current Version: V1.0  
CVSS v3.1 Base Score: 5.3

### **SUMMARY**

Security researchers discovered and disclosed 9 vulnerabilities in several DNS implementations, also known as “NAME:WRECK” vulnerabilities. The vulnerability described in this advisories is from this set.

The DNS client of affected products contains a vulnerability related to the handling of UDP port numbers in DNS requests that could allow an attacker to poison the DNS cache or spoof DNS resolving.

Siemens has released updates for several affected products and recommends to update to the latest versions. Siemens recommends specific countermeasures for products where updates are not, or not yet available.

### **AFFECTED PRODUCTS AND SOLUTION**

<b>Affected Product and Versions</b>	<b>Remediation</b>
Nucleus NET: All versions	See recommendations from Section Workarounds and Mitigations or upgrade to the latest versions of Nucleus ReadyStart or Nucleus 4
Nucleus RTOS: versions including affected DNS modules	Contact customer support to receive patch and update information
Nucleus ReadyStart: All versions < V2013.08	Update to V2013.08 or later version <a href="https://support.sw.siemens.com/en-US/product/1009925838/">https://support.sw.siemens.com/en-US/product/1009925838/</a> (login required)
Nucleus Source Code: versions including affected DNS modules	Contact customer support to receive patch and update information
VSTAR: versions including affected DNS modules	Contact customer support to receive patch and update information

### **WORKAROUNDS AND MITIGATIONS**

Siemens has identified the following specific workarounds and mitigations that customers can apply to reduce the risk:

- Avoid using DNS client of affected versions
- For additional mitigation advice please contact customer support or your local Nucleus Sales team

### **GENERAL SECURITY RECOMMENDATIONS**

As a general security measure, Siemens strongly recommends to protect network access to devices with appropriate mechanisms. In order to operate the devices in a protected IT environment, Siemens

recommends to configure the environment according to Siemens' operational guidelines for Industrial Security (Download: <https://www.siemens.com/cert/operational-guidelines-industrial-security>), and to follow the recommendations in the product manuals.

Additional information on Industrial Security by Siemens can be found at: <https://www.siemens.com/industrialsecurity>

## **PRODUCT DESCRIPTION**

Nucleus NET module incorporates a wide range of standard-compliant networking and communication protocols, drivers, and utilities to deliver full-featured network support in any embedded device. The networking functionality is fully integrated into the Nucleus RTOS and supports a variety of processors and MCUs.

The Nucleus RTOS provides a highly scalable micro-kernel based real-time operating system designed for scalability and reliability in systems spanning the range of aerospace, industrial, and medical applications.

VSTAR is a complete AUTOSAR 4 based ECU solution providing the tools and embedded software for on-time product deployment. The VSTAR implementation enables scalable support from resource limited small ECUs to powerful multi core solutions. The VSTAR modules developed according to ISO 26262 requirements can be used to address up to and including ASIL D use-cases.

Nucleus ReadyStart is a platform with integrated software IP, tools, and services ideal for applications where a small footprint, deterministic performance, and small code size are essential.

## **VULNERABILITY CLASSIFICATION**

The vulnerability classification has been performed by using the CVSS scoring system in version 3.1 (CVSS v3.1) (<https://www.first.org/cvss/>). The CVSS environmental score is specific to the customer's environment and will impact the overall CVSS score. The environmental score should therefore be individually defined by the customer to accomplish final scoring.

An additional classification has been performed using the CWE classification, a community-developed list of common software security weaknesses. This serves as a common language and as a baseline for weakness identification, mitigation, and prevention efforts. A detailed list of CWE classes can be found at: <https://cwe.mitre.org/>.

### Vulnerability CVE-2021-27393

The DNS client does not properly randomize UDP port numbers of DNS requests. That could allow an attacker to poison the DNS cache or spoof DNS resolving.

CVSS v3.1 Base Score	5.3
CVSS Vector	<a href="#">CVSS:3.1/AV:N/AC:L/PR:N/UI:N/S:U/C:N/I:L/A:N/E:P/RL:O/RC:C</a>
CWE	CWE-330: Use of Insufficiently Random Values

## **ACKNOWLEDGMENTS**

Siemens thanks the following parties for their efforts:

- Daniel dos Santos from Forescout Technologies Inc. for coordinated disclosure

## **ADDITIONAL INFORMATION**

For further inquiries on security vulnerabilities in Siemens products and solutions, please contact the Siemens ProductCERT:

<https://www.siemens.com/cert/advisories>

## **HISTORY DATA**

V1.0 (2021-04-13): Publication Date

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