SSA-646763: DNSpooq - Dnsmasq Vulnerabilities in SCALANCE and RUGGEDCOM Devices

Publication Date: 2021-01-19
Last Update: 2021-05-11
Current Version: V1.3
CVSS v3.1 Base Score: 4.0

SUMMARY

Security researchers discovered and disclosed seven vulnerabilities in the open-source DNS component “dnsmasq”, also known as “DNSpooq” vulnerabilities (CVE-2020-25681 through CVE-2020-25687). Three vulnerabilities (CVE-2020-25684 through CVE-2020-25686) affect the validation of DNS responses and impact several SCALANCE and RUGGEDCOM devices as listed below.

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 available.

AFFECTED PRODUCTS AND SOLUTION

<table>
<thead>
<tr>
<th>Affected Product and Versions</th>
<th>Remediation</th>
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</thead>
<tbody>
<tr>
<td>RUGGEDCOM RM1224:</td>
<td>Update to V6.4 or later version <a href="https://support.industry.siemens.com/cs/ww/en/view/109794349/">link</a></td>
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<tr>
<td>All versions &lt; V6.4</td>
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<tr>
<td>SCALANCE M-800:</td>
<td>Update to V6.4 or later version <a href="https://support.industry.siemens.com/cs/ww/en/view/109794349/">link</a></td>
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<tr>
<td>All versions &lt; V6.4</td>
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<tr>
<td>SCALANCE S615:</td>
<td>Update to V6.4 or later version <a href="https://support.industry.siemens.com/cs/ww/en/view/109794349/">link</a></td>
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<tr>
<td>All versions &lt; V6.4</td>
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<tr>
<td>SCALANCE SC-600:</td>
<td>Update to V2.1.3 or later version <a href="https://support.industry.siemens.com/cs/ww/en/view/109793041/">link</a></td>
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<tr>
<td>All versions &lt; V2.1.3</td>
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<tr>
<td>SCALANCE W1750D:</td>
<td>See recommendations from section Workarounds and Mitigations</td>
</tr>
<tr>
<td>All versions</td>
<td></td>
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</tbody>
</table>

WORKAROUNDS AND MITIGATIONS

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

- SCALANCE M-800: Disable DNS proxy in the device configuration (System - DNS - DNS Proxy - Disable Checkbox „Enable DNS Proxy”), and configure the connected devices in the internal network to use a different DNS server. Note that the DNS proxy is enabled by default.
- RUGGEDCOM RM1224: Same as for SCALANCE M-800. Note that the DNS proxy is enabled by default.
- SCALANCE S615: Same as for SCALANCE M-800. Note that the DNS proxy is disabled by default.
- SCALANCE SC-600: Same as for SCALANCE M-800. Note that the DNS proxy is disabled by default.
• SCALANCE W1750D: If “OpenDNS”, “Captive Portal” or “URL redirection” functionality is not used, deploy firewall rules in the device configuration to block incoming access to port 53/UDP

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

RUGGEDCOM RM1224 is a 4G ROUTER for wireless IP-communication from Ethernet based devices via LTE(4G)- mobile radio.

The SCALANCE M-800 / S615 industrial routers are used for secure remote access to plants via mobile networks, e.g. GPRS or UMTS with the integrated security functions of a firewall for protection against unauthorized access and VPN to protect data transmission.


The SCALANCE W1750D controller-based Direct Access Points support radio transmission according to the latest IWLAN standard IEEE 802.11ac Wave 2.

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-2020-25684

Affected devices lack proper address/port check in the DNS reply_query function of dnsmasq.

This could make it easier for remote off-path attackers to forge replies.

CVSS v3.1 Base Score 4.0
CWE CWE-290: Authentication Bypass by Spoofering
Vulnerability CVE-2020-25685

Affected devices lack query resource name (RRNAME) checks in the DNS reply_query function of dnsmasq.
This could allow a remote attacker to spoof DNS traffic that can lead to DNS cache poisoning.

CVSS v3.1 Base Score: 4.0
CWE: CWE-290: Authentication Bypass by Spoofing

Vulnerability CVE-2020-25686

Affected devices lack sufficient entropy in dnsmasq to handle multiple DNS query requests from the same resource name (RRNAME).
This could allow a remote attacker to spoof DNS traffic, using a birthday attack (RFC 5452), than can lead to DNS cache poisoning.

CVSS v3.1 Base Score: 4.0
CWE: CWE-330: Use of Insufficiently Random Values

ACKNOWLEDGMENTS

Siemens thanks the following parties for their efforts:

• Moshe Kol and Shlomi Oberman from JSOF for coordinated disclosure
• CERT Coordination Center (CERT/CC) for coordination efforts
• Industrial Control System Cyber Emergency Response Team (ICS-CERT) for coordination efforts

ADDITIONAL INFORMATION

For more details regarding the DNSpooq vulnerabilities in dnsmasq refer to:

• JSOF Publication “DNSpooq”
• CERT/CC Advisory VU#434904

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 (2021-01-19): Publication Date
V1.1 (2021-03-09): Added solution for SCALANCE SC-600
V1.2 (2021-04-13): Added solution for SCALANCE M-800/S615 and RUGGEDCOM RM1224
V1.3 (2021-05-11): Clarified that a solution for SCALANCE W1750D is not expected

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