SSA-518824 Multiple File Parsing Vulnerabilities in Simcenter Femap and Parasolid

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Current Version: V1.0
CVSS v3.1 Base Score: 7.8

SUMMARY

Simcenter Femap and Parasolid are affected by multiple file parsing vulnerabilities that could be triggered when the application reads files in X_T file formats. If a user is tricked to open a malicious file with the affected applications, an attacker could leverage the vulnerability to perform remote code execution in the context of the current process.

Siemens has released updates for the affected products and recommends to update to the latest versions.

AFFECTED PRODUCTS AND SOLUTION

Affected Product and Versions	Remediation
Parasolid V33.1: All versions < V33.1.262	Update to V33.1.262 or later version https://support.sw.siemens.com/ See further recommendations from section Workarounds and Mitigations
Parasolid V33.1: All versions >= V33.1.262 < V33.1.263 only affected by CVE-2022-39142, CVE-2022-39143, CVE-2022-39144, CVE-2022-39145, CVE-2022-39146, CVE-2022-39147, CVE-2022-39148, CVE-2022-39149, CVE-2022-39150, CVE-2022-39151, CVE-2022-39152, CVE-2022-39153, CVE-2022-39154, CVE-2022-39155, CVE-2022-39156	Update to V33.1.263 or later version https://support.sw.siemens.com/ See further recommendations from section Workarounds and Mitigations
Parasolid V34.0: All versions < V34.0.252	Update to V34.0.252 or later version https://support.sw.siemens.com/ See further recommendations from section Workarounds and Mitigations
Parasolid V34.1: All versions < V34.1.242	Update to V34.1.242 or later version https://support.sw.siemens.com/ See further recommendations from section Workarounds and Mitigations
Parasolid V35.0: All versions < V35.0.161	Update to V35.0.161 or later version https://support.sw.siemens.com/ See further recommendations from section Workarounds and Mitigations

Parasolid V35.0: All versions >= V35.0.161 < V35.0.164 only affected by CVE-2022-39142, CVE-2022-39143, CVE-2022-39144, CVE-2022-39145, CVE-2022-39146, CVE-2022-39147, CVE-2022-39148, CVE-2022-39149, CVE-2022-39150, CVE-2022-39151, CVE-2022-39152, CVE-2022-39153, CVE-2022-39154, CVE-2022-39155, CVE-2022-39156	Update to V35.0.164 or later version https://support.sw.siemens.com/ See further recommendations from section Workarounds and Mitigations
Simcenter Femap V2022.1: All versions < V2022.1.3	Update to V2022.1.3 or later version https://support.sw.siemens.com/ See further recommendations from section Workarounds and Mitigations
Simcenter Femap V2022.2: All versions < V2022.2.2	Update to V2022.2.2 or later version https://support.sw.siemens.com/ See further recommendations from section Workarounds and Mitigations

WORKAROUNDS AND MITIGATIONS

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

- Do not open untrusted X_T files in Simcenter Femap or Parasolid

Product-specific remediations or mitigations can be found in the section Affected Products and Solution. Please follow the General Security Recommendations.

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

Parasolid is a 3D geometric modeling tool that supports various techniques, including solid modeling, direct editing, and free-form surface/sheet modeling.

Simcenter Femap is an advanced simulation application for creating, editing, and inspecting finite element models of complex products or systems.

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-2022-39137

The affected application is vulnerable to out of bounds read past the end of an allocated buffer when parsing X_T files. An attacker could leverage this vulnerability to leak information in the context of the current process. (ZDI-CAN-17276)

CVSS v3.1 Base Score	3.3
CVSS Vector	CVSS:3.1/AV:L/AC:L/PR:N/UI:R/S:U/C:L/I:N/A:N/E:P/RL:O/RC:C
CWE	CWE-125: Out-of-bounds Read

Vulnerability CVE-2022-39138

The affected application contains an out of bounds write past the end of an allocated buffer while parsing specially crafted X_T files. This could allow an attacker to execute code in the context of the current process. (ZDI-CAN-17284)

CVSS v3.1 Base Score	7.8
CVSS Vector	CVSS:3.1/AV:L/AC:L/PR:N/UI:R/S:U/C:H/I:H/A:H/E:P/RL:O/RC:C
CWE	CWE-787: Out-of-bounds Write

Vulnerability CVE-2022-39139

The affected application contains an out of bounds write past the end of an allocated buffer while parsing specially crafted X_T files. This could allow an attacker to execute code in the context of the current process. (ZDI-CAN-17289)

CVSS v3.1 Base Score	7.8
CVSS Vector	CVSS:3.1/AV:L/AC:L/PR:N/UI:R/S:U/C:H/I:H/A:H/E:P/RL:O/RC:C
CWE	CWE-787: Out-of-bounds Write

Vulnerability CVE-2022-39140

The affected application contains an out of bounds write past the end of an allocated buffer while parsing specially crafted X_T files. This could allow an attacker to execute code in the context of the current process. (ZDI-CAN-17292)

CVSS v3.1 Base Score	7.8
CVSS Vector	CVSS:3.1/AV:L/AC:L/PR:N/UI:R/S:U/C:H/I:H/A:H/E:P/RL:O/RC:C
CWE	CWE-787: Out-of-bounds Write

Vulnerability CVE-2022-39141

The affected application is vulnerable to out of bounds read past the end of an allocated buffer when parsing X_T files. An attacker could leverage this vulnerability to leak information in the context of the current process. (ZDI-CAN-17296)

CVSS v3.1 Base Score	3.3
CVSS Vector	CVSS:3.1/AV:L/AC:L/PR:N/UI:R/S:U/C:L/I:N/A:N/E:P/RL:O/RC:C
CWE	CWE-125: Out-of-bounds Read

Vulnerability CVE-2022-39142

The affected application contains an out of bounds write past the end of an allocated buffer while parsing specially crafted X_T files. This could allow an attacker to execute code in the context of the current process. (ZDI-CAN-17485)

CVSS v3.1 Base Score	7.8
CVSS Vector	CVSS:3.1/AV:L/AC:L/PR:N/UI:R/S:U/C:H/I:H/A:H/E:P/RL:O/RC:C
CWE	CWE-787: Out-of-bounds Write

Vulnerability CVE-2022-39143

The affected application contains an out of bounds write past the end of an allocated buffer while parsing specially crafted X_T files. This could allow an attacker to execute code in the context of the current process. (ZDI-CAN-17493)

CVSS v3.1 Base Score	7.8
CVSS Vector	CVSS:3.1/AV:L/AC:L/PR:N/UI:R/S:U/C:H/I:H/A:H/E:P/RL:O/RC:C
CWE	CWE-787: Out-of-bounds Write

Vulnerability CVE-2022-39144

The affected application contains an out of bounds write past the end of an allocated buffer while parsing specially crafted X_T files. This could allow an attacker to execute code in the context of the current process. (ZDI-CAN-17494)

CVSS v3.1 Base Score	7.8
CVSS Vector	CVSS:3.1/AV:L/AC:L/PR:N/UI:R/S:U/C:H/I:H/A:H/E:P/RL:O/RC:C
CWE	CWE-787: Out-of-bounds Write

Vulnerability CVE-2022-39145

The affected application is vulnerable to out of bounds read past the end of an allocated buffer when parsing X_T files. This could allow an attacker to execute code in the context of the current process. (ZDI-CAN-17496)

CVSS v3.1 Base Score	7.8
CVSS Vector	CVSS:3.1/AV:L/AC:L/PR:N/UI:R/S:U/C:H/I:H/A:H/E:P/RL:O/RC:C
CWE	CWE-125: Out-of-bounds Read

Vulnerability CVE-2022-39146

The affected application is vulnerable to uninitialized pointer access while parsing specially crafted X_T files. An attacker could leverage this vulnerability to execute code in the context of the current process. (ZDI-CAN-17502)

CVSS v3.1 Base Score	7.8
CVSS Vector	CVSS:3.1/AV:L/AC:L/PR:N/UI:R/S:U/C:H/I:H/A:H/E:P/RL:O/RC:C
CWE	CWE-824: Access of Uninitialized Pointer

Vulnerability CVE-2022-39147

The affected application is vulnerable to uninitialized pointer access while parsing specially crafted X_T files. An attacker could leverage this vulnerability to execute code in the context of the current process. (ZDI-CAN-17506)

CVSS v3.1 Base Score	7.8
CVSS Vector	CVSS:3.1/AV:L/AC:L/PR:N/UI:R/S:U/C:H/I:H/A:H/E:P/RL:O/RC:C
CWE	CWE-824: Access of Uninitialized Pointer

Vulnerability CVE-2022-39148

The affected application contains an out of bounds write past the end of an allocated buffer while parsing specially crafted X_T files. This could allow an attacker to execute code in the context of the current process. (ZDI-CAN-17513)

CVSS v3.1 Base Score	7.8
CVSS Vector	CVSS:3.1/AV:L/AC:L/PR:N/UI:R/S:U/C:H/I:H/A:H/E:P/RL:O/RC:C
CWE	CWE-787: Out-of-bounds Write

Vulnerability CVE-2022-39149

The affected application contains an out of bounds write past the end of an allocated buffer while parsing specially crafted X_T files. This could allow an attacker to execute code in the context of the current process. (ZDI-CAN-17733)

CVSS v3.1 Base Score	7.8
CVSS Vector	CVSS:3.1/AV:L/AC:L/PR:N/UI:R/S:U/C:H/I:H/A:H/E:P/RL:O/RC:C
CWE	CWE-787: Out-of-bounds Write

Vulnerability CVE-2022-39150

The affected application contains an out of bounds write past the end of an allocated buffer while parsing specially crafted X_T files. This could allow an attacker to execute code in the context of the current process. (ZDI-CAN-17735)

CVSS v3.1 Base Score	7.8
CVSS Vector	CVSS:3.1/AV:L/AC:L/PR:N/UI:R/S:U/C:H/I:H/A:H/E:P/RL:O/RC:C
CWE	CWE-787: Out-of-bounds Write

Vulnerability CVE-2022-39151

The affected application contains an out of bounds write past the end of an allocated buffer while parsing specially crafted X_T files. This could allow an attacker to execute code in the context of the current process. (ZDI-CAN-17736)

CVSS v3.1 Base Score	7.8
CVSS Vector	CVSS:3.1/AV:L/AC:L/PR:N/UI:R/S:U/C:H/I:H/A:H/E:P/RL:O/RC:C
CWE	CWE-787: Out-of-bounds Write

Vulnerability CVE-2022-39152

The affected application contains an out of bounds write past the end of an allocated buffer while parsing specially crafted X_T files. This could allow an attacker to execute code in the context of the current process. (ZDI-CAN-17740)

CVSS v3.1 Base Score	7.8
CVSS Vector	CVSS:3.1/AV:L/AC:L/PR:N/UI:R/S:U/C:H/I:H/A:H/E:P/RL:O/RC:C
CWE	CWE-787: Out-of-bounds Write

Vulnerability CVE-2022-39153

The affected application is vulnerable to out of bounds read past the end of an allocated buffer when parsing X_T files. This could allow an attacker to execute code in the context of the current process. (ZDI-CAN-18187)

CVSS v3.1 Base Score	7.8
CVSS Vector	CVSS:3.1/AV:L/AC:L/PR:N/UI:R/S:U/C:H/I:H/A:H/E:P/RL:O/RC:C
CWE	CWE-125: Out-of-bounds Read

Vulnerability CVE-2022-39154

The affected application contains an out of bounds write past the end of an allocated buffer while parsing specially crafted X_T files. This could allow an attacker to execute code in the context of the current process. (ZDI-CAN-18188)

CVSS v3.1 Base Score	7.8
CVSS Vector	CVSS:3.1/AV:L/AC:L/PR:N/UI:R/S:U/C:H/I:H/A:H/E:P/RL:O/RC:C
CWE	CWE-787: Out-of-bounds Write

Vulnerability CVE-2022-39155

The affected application contains an out of bounds write past the end of an allocated buffer while parsing specially crafted X_T files. This could allow an attacker to execute code in the context of the current process. (ZDI-CAN-18192)

CVSS v3.1 Base Score	7.8
CVSS Vector	CVSS:3.1/AV:L/AC:L/PR:N/UI:R/S:U/C:H/I:H/A:H/E:P/RL:O/RC:C
CWE	CWE-787: Out-of-bounds Write

Vulnerability CVE-2022-39156

The affected application is vulnerable to out of bounds read past the end of an allocated buffer when parsing X_T files. This could allow an attacker to execute code in the context of the current process. (ZDI-CAN-18196)

CVSS v3.1 Base Score	7.8
CVSS Vector	CVSS:3.1/AV:L/AC:L/PR:N/UI:R/S:U/C:H/I:H/A:H/E:P/RL:O/RC:C
CWE	CWE-125: Out-of-bounds Read

ACKNOWLEDGMENTS

Siemens thanks the following parties for their efforts:

- Trend Micro Zero Day Initiative 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 (2022-09-13): Publication Date

TERMS OF USE