

Threat Model Report Model Stub

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Table of Contents

Results Overview	
Management Summary	4
Impact Analysis of 5 Initial Risks in 5 Categories	5
Risk Mitigation	6
Impact Analysis of 5 Remaining Risks in 5 Categories	7
Application Overview	8
Data-Flow Diagram	9
Security Requirements	10
Abuse Cases	11
Tag Listing	12
STRIDE Classification of Identified Risks	13
Assignment by Function	15
RAA Analysis	16
Data Mapping	17
Out-of-Scope Assets: 0 Assets	18
Potential Model Failures: 3 / 3 Risks	19
Questions: 0 / 0 Questions	20
Risks by Vulnerability Category Identified Risks by Vulnerability Category Server-Side Request Forgery (SSRF): 1 / 1 Risk	21 22
Missing Vault (Secret Storage): 1 / 1 Risk	24
Missing Web Application Firewall (WAF): 1 / 1 Risk	26
Unnecessary Communication Link: 1 / 1 Risk	28
Wrong Communication Link Content: 1 / 1 Risk	30
Risks by Technical Asset	
Identified Risks by Technical Asset	32
Some Technical Asset: 3 / 3 Risks	33
Some Other Technical Asset: 1 / 1 Risk	35
Data Breach Probabilities by Data Asset	
Identified Data Breach Probabilities by Data Asset	37
Some Data Asset: 3 / 3 Risks	38
Trust Boundaries	
Some Trust Boundary	39

About Threagile

Risk Rules Checked by Threagile	41
Disclaimer	54

Management Summary

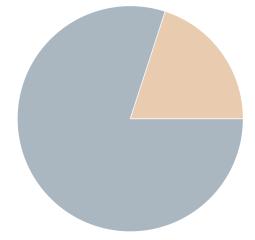
Threagile toolkit was used to model the architecture of "Model Stub" and derive risks by analyzing the components and data flows. The risks identified during this analysis are shown in the following chapters. Identified risks during threat modeling do not necessarily mean that the vulnerability associated with this risk actually exists: it is more to be seen as a list of potential risks and threats, which should be individually reviewed and reduced by removing false positives. For the remaining risks it should be checked in the design and implementation of "Model Stub" whether the mitigation advices have been applied or not.

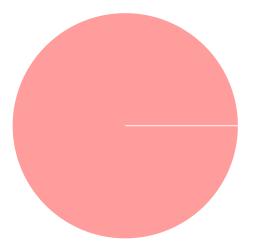
Each risk finding references a chapter of the OWASP ASVS (Application Security Verification Standard) audit checklist. The OWASP ASVS checklist should be considered as an inspiration by architects and developers to further harden the application in a Defense-in-Depth approach. Additionally, for each risk finding a link towards a matching OWASP Cheat Sheet or similar with technical details about how to implement a mitigation is given.

In total 5 initial risks in 5 categories have been identified during the threat modeling process:

- 0 critical risk
- 0 high risk
- 0 elevated risk
- 1 medium risk
- 4 low risk

- 5 unchecked
- 0 in discussion
- 0 accepted
- 0 in progress
- 0 mitigated
- 0 false positive





Impact Analysis of 5 Initial Risks in 5 Categories

The most prevalent impacts of the **5 initial risks** (distributed over **5 risk categories**) are (taking the severity ratings into account and using the highest for each category):

Risk finding paragraphs are clickable and link to the corresponding chapter.

Medium: **Server-Side Request Forgery (SSRF)**: 1 Initial Risk - Exploitation likelihood is *Likely* with *Low* impact.

If this risk is unmitigated, attackers might be able to access sensitive services or files of network-reachable components by modifying outgoing calls of affected components.

Low: **Missing Vault (Secret Storage)**: 1 Initial Risk - Exploitation likelihood is *Unlikely* with *Low* impact.

If this risk is unmitigated, attackers might be able to easier steal config secrets (like credentials, private keys, client certificates, etc.) once a vulnerability to access files is present and exploited.

Low: **Missing Web Application Firewall (WAF)**: 1 Initial Risk - Exploitation likelihood is *Unlikely* with *Low* impact.

If this risk is unmitigated, attackers might be able to apply standard attack pattern tests at great speed without any filtering.

Low: **Unnecessary Communication Link**: 1 Initial Risk - Exploitation likelihood is *Unlikely* with *Low* impact.

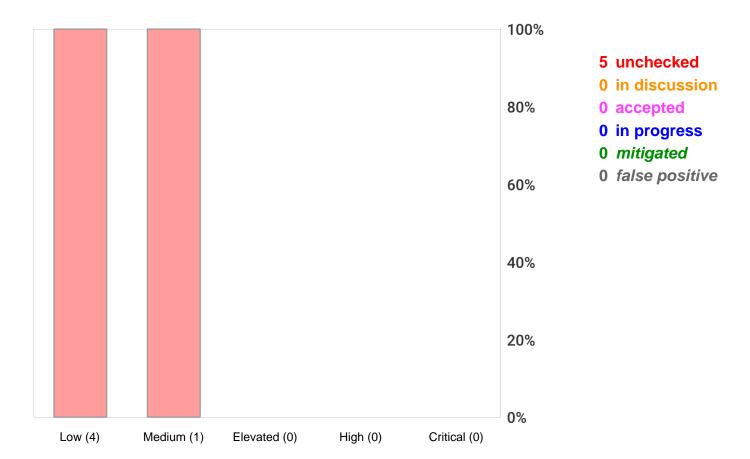
If this risk is unmitigated, attackers might be able to target unnecessary communication links.

Low: **Wrong Communication Link Content**: 1 Initial Risk - Exploitation likelihood is *Unlikely* with *Low* impact.

If this potential model error is not fixed, some risks might not be visible.

Risk Mitigation

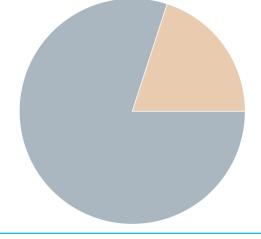
The following chart gives a high-level overview of the risk tracking status (including mitigated risks):

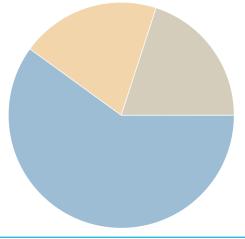


After removal of risks with status *mitigated* and *false positive* the following **5 remain unmitigated**:

- 0 unmitigated critical risk
- 0 unmitigated high risk
- 0 unmitigated elevated risk
- 1 unmitigated medium risk
- 4 unmitigated low risk

- 0 business side related
- 3 architecture related
- 1 development related
- 1 operations related





Impact Analysis of 5 Remaining Risks in 5 Categories

The most prevalent impacts of the **5 remaining risks** (distributed over **5 risk categories**) are (taking the severity ratings into account and using the highest for each category):

Risk finding paragraphs are clickable and link to the corresponding chapter.

Medium: **Server-Side Request Forgery (SSRF)**: 1 Remaining Risk - Exploitation likelihood is *Likely* with *Low* impact.

If this risk is unmitigated, attackers might be able to access sensitive services or files of network-reachable components by modifying outgoing calls of affected components.

Low: **Missing Vault (Secret Storage)**: 1 Remaining Risk - Exploitation likelihood is *Unlikely* with *Low* impact.

If this risk is unmitigated, attackers might be able to easier steal config secrets (like credentials, private keys, client certificates, etc.) once a vulnerability to access files is present and exploited.

Low: **Missing Web Application Firewall (WAF)**: 1 Remaining Risk - Exploitation likelihood is *Unlikely* with *Low* impact.

If this risk is unmitigated, attackers might be able to apply standard attack pattern tests at great speed without any filtering.

Low: **Unnecessary Communication Link**: 1 Remaining Risk - Exploitation likelihood is *Unlikely* with *Low* impact.

If this risk is unmitigated, attackers might be able to target unnecessary communication links.

Low: **Wrong Communication Link Content**: 1 Remaining Risk - Exploitation likelihood is *Unlikely* with *Low* impact.

If this potential model error is not fixed, some risks might not be visible.

Application Overview

Business Criticality

The overall business criticality of "Model Stub" was rated as:

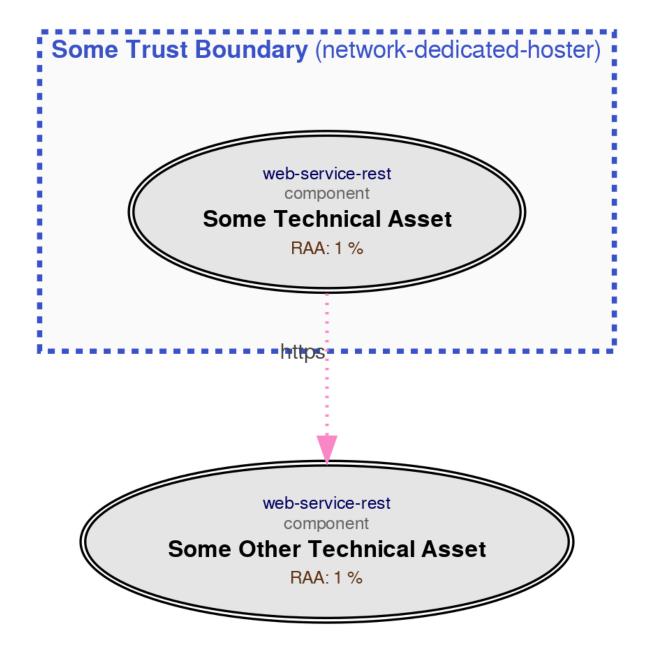
(archive | operational | IMPORTANT | critical | mission-critical)

Business Overview

Technical Overview

Data-Flow Diagram

The following diagram was generated by Threagile based on the model input and gives a high-level overview of the data-flow between technical assets. The RAA value is the calculated *Relative Attacker Attractiveness* in percent. For a full high-resolution version of this diagram please refer to the PNG image file alongside this report.



Security Requirements

This chapter lists the custom security requirements which have been defined for the modeled target.

This list is not complete and regulatory or law relevant security requirements have to be taken into account as well. Also custom individual security requirements might exist for the project.

Abuse Cases

This chapter lists the custom abuse cases which have been defined for the modeled target.

This list is not complete and regulatory or law relevant abuse cases have to be taken into account as well. Also custom individual abuse cases might exist for the project.

Tag Listing

This chapter lists what tags are used by which elements.

STRIDE Classification of Identified Risks

This chapter clusters and classifies the risks by STRIDE categories: In total **5 potential risks** have been identified during the threat modeling process of which **0 in the Spoofing** category, **1 in the Tampering** category, **0 in the Repudiation** category, **3 in the Information Disclosure** category, **0 in the Denial of Service** category, and **1 in the Elevation of Privilege** category.

Risk finding paragraphs are clickable and link to the corresponding chapter.

Spoofing

n/a

Tampering

Low: **Missing Web Application Firewall (WAF)**: 1 / 1 Risk - Exploitation likelihood is *Unlikely* with *Low* impact.

To have a first line of filtering defense, security architectures with web-services or web-applications should include a WAF in front of them. Even though a WAF is not a replacement for security (all components must be secure even without a WAF) it adds another layer of defense to the overall system by delaying some attacks and having easier attack alerting through it.

Repudiation

n/a

Information Disclosure

Medium: **Server-Side Request Forgery (SSRF)**: 1 / 1 Risk - Exploitation likelihood is *Likely* with *Low* impact.

When a server system (i.e. not a client) is accessing other server systems via typical web protocols Server-Side Request Forgery (SSRF) or Local-File-Inclusion (LFI) or Remote-File-Inclusion (RFI) risks might arise.

Low: **Missing Vault (Secret Storage)**: 1 / 1 Risk - Exploitation likelihood is *Unlikely* with *Low* impact.

In order to avoid the risk of secret leakage via config files (when attacked through vulnerabilities being able to read files like Path-Traversal and others), it is best practice to use a separate hardened process with proper authentication, authorization, and audit logging to access config secrets (like credentials, private keys, client certificates, etc.). This component is usually some kind of Vault.

Low: **Wrong Communication Link Content**: 1 / 1 Risk - Exploitation likelihood is *Unlikely* with *Low* impact.

When a communication link is defined as readonly, but does not receive any data asset, or when it is defined as not readonly, but does not send any data asset, it is likely to be a model failure.

Denial of Service

n/a

Elevation of Privilege

Low: **Unnecessary Communication Link**: 1 / 1 Risk - Exploitation likelihood is *Unlikely* with *Low* impact.

When a technical communication link does not send or receive any data assets, this is an indicator for an unnecessary communication link (or for an incomplete model).

Assignment by Function

This chapter clusters and assigns the risks by functions which are most likely able to check and mitigate them: In total **5 potential risks** have been identified during the threat modeling process of which **0 should be checked by Business Side**, **3 should be checked by Architecture**, **1 should be checked by Development**, and **1 should be checked by Operations**.

Risk finding paragraphs are clickable and link to the corresponding chapter.

Business Side

n/a

Architecture

Low: **Missing Vault (Secret Storage)**: 1 / 1 Risk - Exploitation likelihood is *Unlikely* with *Low* impact.

Consider using a Vault (Secret Storage) to securely store and access config secrets (like credentials, private keys, client certificates, etc.).

Low: **Unnecessary Communication Link**: 1 / 1 Risk - Exploitation likelihood is *Unlikely* with *Low* impact.

Try to avoid using technical communication links that do not send or receive anything.

Low: **Wrong Communication Link Content**: 1 / 1 Risk - Exploitation likelihood is *Unlikely* with *Low* impact.

Try to model the correct readonly flag and/or data sent/received of communication links. Also try to use communication link types matching the target technology/machine types.

Development

Medium: **Server-Side Request Forgery (SSRF)**: 1 / 1 Risk - Exploitation likelihood is *Likely* with *Low* impact.

Try to avoid constructing the outgoing target URL with caller controllable values. Alternatively use a mapping (whitelist) when accessing outgoing URLs instead of creating them including caller controllable values. When a third-party product is used instead of custom developed software, check if the product applies the proper mitigation and ensure a reasonable patch-level.

Operations

Low: **Missing Web Application Firewall (WAF)**: 1 / 1 Risk - Exploitation likelihood is *Unlikely* with *Low* impact.

Consider placing a Web Application Firewall (WAF) in front of the web-services and/or web-applications. For cloud environments many cloud providers offer pre-configured WAFs. Even reverse proxies can be enhances by a WAF component via ModSecurity plugins.

RAA Analysis

For each technical asset the "Relative Attacker Attractiveness" (RAA) value was calculated in percent. The higher the RAA, the more interesting it is for an attacker to compromise the asset. The calculation algorithm takes the sensitivity ratings and quantities of stored and processed data into account as well as the communication links of the technical asset. Neighbouring assets to high-value RAA targets might receive an increase in their RAA value when they have a communication link towards that target ("Pivoting-Factor").

The following lists all technical assets sorted by their RAA value from highest (most attacker attractive) to lowest. This list can be used to prioritize on efforts relevant for the most attacker-attractive technical assets:

Technical asset paragraphs are clickable and link to the corresponding chapter.

Some Other Technical Asset: RAA 1%

Some Description

Some Technical Asset: RAA 1%

Some Description

Data Mapping

Some Data Asset

The following diagram was generated by Threagile based on the model input and gives a high-level distribution of data assets across technical assets. The color matches the identified data breach probability and risk level (see the "Data Breach Probabilities" chapter for more details). A solid line stands for *data is stored by the asset* and a dashed one means *data is processed by the asset*. For a full high-resolution version of this diagram please refer to the PNG image file alongside this report.

Some Other Technical Asset

Some Technical Asset

Out-of-Scope Assets: 0 Assets

This chapter lists all technical assets that have been defined as out-of-scope. Each one should be checked in the model whether it should better be included in the overall risk analysis:

Technical asset paragraphs are clickable and link to the corresponding chapter.

No technical assets have been defined as out-of-scope.

Potential Model Failures: 3 / 3 Risks

This chapter lists potential model failures where not all relevant assets have been modeled or the model might itself contain inconsistencies. Each potential model failure should be checked in the model against the architecture design:

Risk finding paragraphs are clickable and link to the corresponding chapter.

Low: **Missing Vault (Secret Storage)**: 1 / 1 Risk - Exploitation likelihood is *Unlikely* with *Low* impact.

In order to avoid the risk of secret leakage via config files (when attacked through vulnerabilities being able to read files like Path-Traversal and others), it is best practice to use a separate hardened process with proper authentication, authorization, and audit logging to access config secrets (like credentials, private keys, client certificates, etc.). This component is usually some kind of Vault.

Low: **Unnecessary Communication Link**: 1 / 1 Risk - Exploitation likelihood is *Unlikely* with *Low* impact.

When a technical communication link does not send or receive any data assets, this is an indicator for an unnecessary communication link (or for an incomplete model).

Low: **Wrong Communication Link Content**: 1 / 1 Risk - Exploitation likelihood is *Unlikely* with *Low* impact.

When a communication link is defined as readonly, but does not receive any data asset, or when it is defined as not readonly, but does not send any data asset, it is likely to be a model failure.

Questions: 0 / 0 Questions

This chapter lists custom questions that arose during the threat modeling process.

No custom questions arose during the threat modeling process.

Identified Risks by Vulnerability Category

In total 5 potential risks have been identified during the threat modeling process of which 0 are rated as critical, 0 as high, 0 as elevated, 1 as medium, and 4 as low.

These risks are distributed across **5 vulnerability categories**. The following sub-chapters of this section describe each identified risk category.

Server-Side Request Forgery (SSRF): 1 / 1 Risk

Description (Information Disclosure): <u>CWE 918</u>

When a server system (i.e. not a client) is accessing other server systems via typical web protocols Server-Side Request Forgery (SSRF) or Local-File-Inclusion (LFI) or Remote-File-Inclusion (RFI) risks might arise.

Impact

If this risk is unmitigated, attackers might be able to access sensitive services or files of network-reachable components by modifying outgoing calls of affected components.

Detection Logic

In-scope non-client systems accessing (using outgoing communication links) targets with either HTTP or HTTPS protocol.

Risk Rating

The risk rating (low or medium) depends on the sensitivity of the data assets receivable via web protocols from targets within the same network trust-boundary as well on the sensitivity of the data assets receivable via web protocols from the target asset itself. Also for cloud-based environments the exploitation impact is at least medium, as cloud backend services can be attacked via SSRF.

False Positives

Servers not sending outgoing web requests can be considered as false positives after review.

Mitigation (Development): SSRF Prevention

Try to avoid constructing the outgoing target URL with caller controllable values. Alternatively use a mapping (whitelist) when accessing outgoing URLs instead of creating them including caller controllable values. When a third-party product is used instead of custom developed software, check if the product applies the proper mitigation and ensure a reasonable patch-level.

ASVS Chapter: V12 - File and Resources Verification Requirements
Cheat Sheet: Server Side Request Forgery Prevention Cheat Sheet

Check

Are recommendations from the linked cheat sheet and referenced ASVS chapter applied?

Risk Findings

The risk **Server-Side Request Forgery (SSRF)** was found **1 time** in the analyzed architecture to be potentially possible. Each spot should be checked individually by reviewing the implementation whether all controls have been applied properly in order to mitigate each risk.

Risk finding paragraphs are clickable and link to the corresponding chapter.

Medium Risk Severity

Server-Side Request Forgery (SSRF) risk at **Some Technical Asset** server-side web-requesting the target **Some Other Technical Asset** via **Some Traffic**: Exploitation likelihood is *Likely* with *Low* impact.

server-side-request-forgery@14a25d63-7fb2-47ef-837f-3a31247dacd0@57845c50-5ca4-454d-a226-e5834a80e8de@14a25d63-7fb2-47ef-837f-3a31247dacd0>some-traffic

Missing Vault (Secret Storage): 1 / 1 Risk

Description (Information Disclosure): <u>CWE 522</u>

In order to avoid the risk of secret leakage via config files (when attacked through vulnerabilities being able to read files like Path-Traversal and others), it is best practice to use a separate hardened process with proper authentication, authorization, and audit logging to access config secrets (like credentials, private keys, client certificates, etc.). This component is usually some kind of Vault.

Impact

If this risk is unmitigated, attackers might be able to easier steal config secrets (like credentials, private keys, client certificates, etc.) once a vulnerability to access files is present and exploited.

Detection Logic

Models without a Vault (Secret Storage).

Risk Rating

The risk rating depends on the sensitivity of the technical asset itself and of the data assets processed and stored.

False Positives

Models where no technical assets have any kind of sensitive config data to protect can be considered as false positives after individual review.

Mitigation (Architecture): Vault (Secret Storage)

Consider using a Vault (Secret Storage) to securely store and access config secrets (like credentials, private keys, client certificates, etc.).

ASVS Chapter: V6 - Stored Cryptography Verification Requirements

Cheat Sheet: Cryptographic Storage Cheat Sheet

Check

Is a Vault (Secret Storage) in place?

Risk Findings

The risk **Missing Vault (Secret Storage)** was found **1 time** in the analyzed architecture to be potentially possible. Each spot should be checked individually by reviewing the implementation whether all controls have been applied properly in order to mitigate each risk.

Risk finding paragraphs are clickable and link to the corresponding chapter.

Low Risk Severity

Missing Vault (Secret Storage) in the threat model (referencing asset as an example): Exploitation likelihood is *Unlikely* with *Low* impact.

missing-vault@

Unchecked

Missing Web Application Firewall (WAF): 1 / 1 Risk

Description (Tampering): CWE 1008

To have a first line of filtering defense, security architectures with web-services or web-applications should include a WAF in front of them. Even though a WAF is not a replacement for security (all components must be secure even without a WAF) it adds another layer of defense to the overall system by delaying some attacks and having easier attack alerting through it.

Impact

If this risk is unmitigated, attackers might be able to apply standard attack pattern tests at great speed without any filtering.

Detection Logic

In-scope web-services and/or web-applications accessed across a network trust boundary not having a Web Application Firewall (WAF) in front of them.

Risk Rating

The risk rating depends on the sensitivity of the technical asset itself and of the data assets processed and stored.

False Positives

Targets only accessible via WAFs or reverse proxies containing a WAF component (like ModSecurity) can be considered as false positives after individual review.

Mitigation (Operations): Web Application Firewall (WAF)

Consider placing a Web Application Firewall (WAF) in front of the web-services and/or web-applications. For cloud environments many cloud providers offer pre-configured WAFs. Even reverse proxies can be enhances by a WAF component via ModSecurity plugins.

ASVS Chapter: V1 - Architecture, Design and Threat Modeling Requirements

Cheat Sheet: Virtual_Patching_Cheat_Sheet

Check

Is a Web Application Firewall (WAF) in place?

Risk Findings

The risk **Missing Web Application Firewall (WAF)** was found **1 time** in the analyzed architecture to be potentially possible. Each spot should be checked individually by reviewing the implementation whether all controls have been applied properly in order to mitigate each risk.

Risk finding paragraphs are clickable and link to the corresponding chapter.

Low Risk Severity

Missing Web Application Firewall (WAF) risk at **Some Other Technical Asset**: Exploitation likelihood is *Unlikely* with *Low* impact.

missing-waf@57845c50-5ca4-454d-a226-e5834a80e8de

Unchecked

Unnecessary Communication Link: 1/1 Risk

Description (Elevation of Privilege): <u>CWE 1008</u>

When a technical communication link does not send or receive any data assets, this is an indicator for an unnecessary communication link (or for an incomplete model).

Impact

If this risk is unmitigated, attackers might be able to target unnecessary communication links.

Detection Logic

In-scope technical assets' technical communication links not sending or receiving any data assets.

Risk Rating

low

False Positives

Usually no false positives as this looks like an incomplete model.

Mitigation (Architecture): Attack Surface Reduction

Try to avoid using technical communication links that do not send or receive anything.

ASVS Chapter: V1 - Architecture, Design and Threat Modeling Requirements

Cheat Sheet: Attack Surface Analysis Cheat Sheet

Check

Are recommendations from the linked cheat sheet and referenced ASVS chapter applied?

Risk Findings

The risk **Unnecessary Communication Link** was found **1 time** in the analyzed architecture to be potentially possible. Each spot should be checked individually by reviewing the implementation whether all controls have been applied properly in order to mitigate each risk.

Risk finding paragraphs are clickable and link to the corresponding chapter.

Low Risk Severity

Unnecessary Communication Link titled Some Traffic at technical asset Some Technical Asset: Exploitation likelihood is *Unlikely* with *Low* impact.

unnecessary-communication-link@14a25d63-7fb2-47ef-837f-3a31247dacd0>some-traffic@14a25d63-7fb2-47ef-837f-3a31247dacd0

Unchecked

Wrong Communication Link Content: 1 / 1 Risk

Description (Information Disclosure): <u>CWE 1008</u>

When a communication link is defined as readonly, but does not receive any data asset, or when it is defined as not readonly, but does not send any data asset, it is likely to be a model failure.

Impact

If this potential model error is not fixed, some risks might not be visible.

Detection Logic

Communication links with inconsistent data assets being sent/received not matching their readonly flag or otherwise inconsistent protocols not matching the target technology type.

Risk Rating

low

False Positives

Usually no false positives as this looks like an incomplete model.

Mitigation (Architecture): Model Consistency

Try to model the correct readonly flag and/or data sent/received of communication links. Also try to use communication link types matching the target technology/machine types.

ASVS Chapter: V1 - Architecture, Design and Threat Modeling Requirements

Cheat Sheet: Threat_Modeling_Cheat_Sheet

Check

Are recommendations from the linked cheat sheet and referenced ASVS chapter applied?

Risk Findings

The risk **Wrong Communication Link Content** was found **1 time** in the analyzed architecture to be potentially possible. Each spot should be checked individually by reviewing the implementation whether all controls have been applied properly in order to mitigate each risk.

Risk finding paragraphs are clickable and link to the corresponding chapter.

Low Risk Severity

Wrong Communication Link Content (data assets sent/received not matching the communication link's readonly flag) at **Some Technical Asset** regarding communication link **Some Traffic**: Exploitation likelihood is *Unlikely* with *Low* impact.

wrong-communication-link-content@14a25d63-7fb2-47ef-837f-3a31247dacd0@14a25d63-7fb2-47ef-837f-3a31247dacd0>some-traffic

Unchecked

Identified Risks by Technical Asset

In total 5 potential risks have been identified during the threat modeling process of which 0 are rated as critical, 0 as high, 0 as elevated, 1 as medium, and 4 as low.

These risks are distributed across **2** in-scope technical assets. The following sub-chapters of this section describe each identified risk grouped by technical asset. The RAA value of a technical asset is the calculated "Relative Attractiveness" value in percent.

Some Technical Asset: 3 / 3 Risks

Description

Some Description

Identified Risks of Asset

Risk finding paragraphs are clickable and link to the corresponding chapter.

Medium Risk Severity

Server-Side Request Forgery (SSRF) risk at **Some Technical Asset** server-side web-requesting the target **Some Other Technical Asset** via **Some Traffic**: Exploitation likelihood is *Likely* with *Low* impact.

server-side-request-forgery@14a25d63-7fb2-47ef-837f-3a31247dacd0@57845c50-5ca4-454d-a226-e5834a80e8de@14a25d63-7fb2-47ef-837f-3a31247dacd0>some-traffic

Unchecked

Low Risk Severity

Unnecessary Communication Link titled **Some Traffic** at technical asset **Some Technical Asset**: Exploitation likelihood is *Unlikely* with *Low* impact.

unnecessary-communication-link@14a25d63-7fb2-47ef-837f-3a31247dacd0>some-traffic@14a25d63-7fb2-47ef-837f-3a31247dacd0

Unchecked

Wrong Communication Link Content (data assets sent/received not matching the communication link's readonly flag) at **Some Technical Asset** regarding communication link **Some Traffic**: Exploitation likelihood is *Unlikely* with *Low* impact.

wrong-communication-link-content @14a25d63-7fb2-47ef-837f-3a31247 dacd0 @14a25d63-7fb2-47ef-837f-3a31247 dacd0 > some-trafficed by the communication of the content of th

Unchecked

Asset Information

ID: 14a25d63-7fb2-47ef-837f-3a31247dacd0

Type: process
Usage: business

RAA: 1 %

Size: component

Technology: web-service-rest

Tags: none
Internet: false
Machine: virtual
Encryption: none

Multi-Tenant: false
Redundant: true
Custom-Developed: false
Client by Human: false

Data Processed: Some Data Asset

Data Stored: none

Formats Accepted: none of the special data formats accepted

Asset Rating

Owner: Some Owner

Confidentiality: public (rated 1 in scale of 5)
Integrity: archive (rated 1 in scale of 5)
Availability: archive (rated 1 in scale of 5)

CIA-Justification:

Outgoing Communication Links: 1

Target technical asset names are clickable and link to the corresponding chapter.

Some Traffic (outgoing)

Some Description

Target: Some Other Technical Asset

none

Protocol: https Encrypted: true Authentication: none Authorization: none Read-Only: false Usage: business Tags: none VPN: false IP-Filtered: false Data Sent: none

Data Received:

Some Other Technical Asset: 1 / 1 Risk

Description

Some Description

Identified Risks of Asset

Risk finding paragraphs are clickable and link to the corresponding chapter.

Low Risk Severity

Missing Web Application Firewall (WAF) risk at **Some Other Technical Asset**: Exploitation likelihood is *Unlikely* with *Low* impact.

missing-waf@57845c50-5ca4-454d-a226-e5834a80e8de

Unchecked

Asset Information

ID: 57845c50-5ca4-454d-a226-e5834a80e8de

Type: process
Usage: business

RAA: 1 %

Size: component

Technology: web-service-rest

Tags: none
Internet: false
Machine: virtual
Encryption: none
Multi-Tenant: false
Redundant: true
Custom-Developed: false
Client by Human: false

Data Processed: Some Data Asset

Data Stored: none

Formats Accepted: none of the special data formats accepted

Asset Rating

Owner: Some Owner

Confidentiality: public (rated 1 in scale of 5)

Integrity: archive (rated 1 in scale of 5)
Availability: archive (rated 1 in scale of 5)

CIA-Justification:

Incoming Communication Links: 1

Source technical asset names are clickable and link to the corresponding chapter.

Some Traffic (incoming)

Some Description

Source: Some Technical Asset

Protocol: https
Encrypted: true
Authentication: none
Authorization: none
Read-Only: false

Usage: business

Tags: none
VPN: false
IP-Filtered: false
Data Received: none
Data Sent: none

Identified Data Breach Probabilities by Data Asset

In total 5 potential risks have been identified during the threat modeling process of which 0 are rated as critical, 0 as high, 0 as elevated, 1 as medium, and 4 as low.

These risks are distributed across **1 data assets**. The following sub-chapters of this section describe the derived data breach probabilities grouped by data asset.

Technical asset names and risk IDs are clickable and link to the corresponding chapter.

Some Data Asset: 3 / 3 Risks

Some Description

ID: 6dd44b9a-0dda-432a-b551-231d906c8970

Usage: business
Quantity: many
Tags: none

Origin: Some Origin
Owner: Some Owner

Confidentiality: public (rated 1 in scale of 5)
Integrity: archive (rated 1 in scale of 5)
Availability: archive (rated 1 in scale of 5)

CIA-Justification:

Processed by: Some Other Technical Asset, Some Technical Asset

Stored by: none
Sent via: none
Received via: none
Data Breach: possible

Data Breach Risks: This data asset has data breach potential because of 3 remaining risks:

Possible:

traffic

Improbable: missing-waf@57845c50-5ca4-454d-a226-e5834a80e8de

Improbable: unnecessary-communication-link@14a25d63-7fb2-47ef-837f-3a31247dacd0>some-traffic@14a25d63-7fb2-47ef-837f-3a31247dacd0

Trust Boundaries

In total 1 trust boundaries has been modeled during the threat modeling process.

Some Trust Boundary

Some Description

ID: 93ae8a4d-a612-4e4b-99b4-ace41baea6b8

Type: network-dedicated-hoster

Tags: none

Assets inside: Some Technical Asset

Boundaries nested: none

Shared Runtimes

In total **0 shared runtime** has been modeled during the threat modeling process.

Risk Rules Checked by Threagile

Threagile Version: 1.0.0

Threagile Build Timestamp: 20211121124511
Threagile Execution Timestamp: 20220618221604

Model Filename: /dev/shm/threagile-input-1830290178/threagile-model-1949242304

Model Hash (SHA256): f74343f31322ff9efff48671f9eda0bb96255a7566de65119af9fac47fdbeb0a

Threagile (see https://threagile.io for more details) is an open-source toolkit for agile threat modeling, created by Christian Schneider (https://christian-schneider.net): It allows to model an architecture with its assets in an agile fashion as a YAML file directly inside the IDE. Upon execution of the Threagile toolkit all standard risk rules (as well as individual custom rules if present) are checked against the architecture model. At the time the Threagile toolkit was executed on the model input file the following risk rules were checked:

Accidental Secret Leak

accidental-secret-leak

STRIDE: Information Disclosure

Description: Sourcecode repositories (including their histories) as well as artifact registries can

accidentally contain secrets like checked-in or packaged-in passwords, API tokens,

certificates, crypto keys, etc.

Detection: In-scope sourcecode repositories and artifact registries.

Rating: The risk rating depends on the sensitivity of the technical asset itself and of the data

assets processed and stored.

Code Backdooring

code-backdooring

STRIDE: Tampering

Description: For each build-pipeline component Code Backdooring risks might arise where

attackers compromise the build-pipeline in order to let backdoored artifacts be shipped into production. Aside from direct code backdooring this includes

backdooring of dependencies and even of more lower-level build infrastructure, like

backdooring compilers (similar to what the XcodeGhost malware did) or

dependencies.

Detection: In-scope development relevant technical assets which are either accessed by

out-of-scope unmanaged developer clients and/or are directly accessed by any kind of internet-located (non-VPN) component or are themselves directly located on the

internet.

Rating: The risk rating depends on the confidentiality and integrity rating of the code being

handled and deployed as well as the placement/calling of this technical asset

on/from the internet.

Container Base Image Backdooring

container-baseimage-backdooring

STRIDE: Tampering

Description: When a technical asset is built using container technologies, Base Image

Backdooring risks might arise where base images and other layers used contain

vulnerable components or backdoors.

Detection: In-scope technical assets running as containers.

Rating: The risk rating depends on the sensitivity of the technical asset itself and of the data

assets.

Container Platform Escape

container-platform-escape

STRIDE: Elevation of Privilege

Description: Container platforms are especially interesting targets for attackers as they host big

parts of a containerized runtime infrastructure. When not configured and operated with security best practices in mind, attackers might exploit a vulnerability inside an

container and escape towards the platform as highly privileged users. These

scenarios might give attackers capabilities to attack every other container as owning

the container platform (via container escape attacks) equals to owning every

container.

Detection: In-scope container platforms.

Rating: The risk rating depends on the sensitivity of the technical asset itself and of the data

assets processed and stored.

Cross-Site Request Forgery (CSRF)

cross-site-request-forgery

STRIDE: Spoofing

Description: When a web application is accessed via web protocols Cross-Site Request Forgery

(CSRF) risks might arise.

Detection: In-scope web applications accessed via typical web access protocols.

Rating: The risk rating depends on the integrity rating of the data sent across the

communication link.

Cross-Site Scripting (XSS)

cross-site-scripting

STRIDE: Tampering

Description: For each web application Cross-Site Scripting (XSS) risks might arise. In terms of

the overall risk level take other applications running on the same domain into

account as well.

Detection: In-scope web applications.

Rating: The risk rating depends on the sensitivity of the data processed or stored in the web

application.

DoS-risky Access Across Trust-Boundary

dos-risky-access-across-trust-boundary

STRIDE: Denial of Service

Description: Assets accessed across trust boundaries with critical or mission-critical availability

rating are more prone to Denial-of-Service (DoS) risks.

Detection: In-scope technical assets (excluding load-balancer) with availability rating of critical

or higher which have incoming data-flows across a network trust-boundary

(excluding devops usage).

Rating: Matching technical assets with availability rating of critical or higher are at low risk.

When the availability rating is mission-critical and neither a VPN nor IP filter for the

incoming data-flow nor redundancy for the asset is applied, the risk-rating is

considered medium.

Incomplete Model

incomplete-model

STRIDE: Information Disclosure

Description: When the threat model contains unknown technologies or transfers data over

unknown protocols, this is an indicator for an incomplete model.

Detection: All technical assets and communication links with technology type or protocol type

specified as unknown.

Rating: low

LDAP-Injection

Idap-injection

STRIDE: Tampering

Description: When an LDAP server is accessed LDAP-Injection risks might arise. The risk rating

depends on the sensitivity of the LDAP server itself and of the data assets

processed or stored.

Detection: In-scope clients accessing LDAP servers via typical LDAP access protocols.

Rating: The risk rating depends on the sensitivity of the LDAP server itself and of the data

assets processed or stored.

Missing Authentication

missing-authentication

STRIDE: Elevation of Privilege

Description: Technical assets (especially multi-tenant systems) should authenticate incoming

requests when the asset processes or stores sensitive data.

Detection: In-scope technical assets (except load-balancer, reverse-proxy, service-registry,

waf, ids, and ips and in-process calls) should authenticate incoming requests when the asset processes or stores sensitive data. This is especially the case for all

multi-tenant assets (there even non-sensitive ones).

Rating: The risk rating (medium or high) depends on the sensitivity of the data sent across

the communication link. Monitoring callers are exempted from this risk.

Missing Two-Factor Authentication (2FA)

missing-authentication-second-factor

STRIDE: Elevation of Privilege

Description: Technical assets (especially multi-tenant systems) should authenticate incoming

requests with two-factor (2FA) authentication when the asset processes or stores highly sensitive data (in terms of confidentiality, integrity, and availability) and is

accessed by humans.

Detection: In-scope technical assets (except load-balancer, reverse-proxy, waf, ids, and ips)

should authenticate incoming requests via two-factor authentication (2FA) when the asset processes or stores highly sensitive data (in terms of confidentiality, integrity,

and availability) and is accessed by a client used by a human user.

Rating: medium

Missing Build Infrastructure

missing-build-infrastructure

STRIDE: Tampering

Description: The modeled architecture does not contain a build infrastructure (devops-client,

sourcecode-repo, build-pipeline, etc.), which might be the risk of a model missing

critical assets (and thus not seeing their risks). If the architecture contains

custom-developed parts, the pipeline where code gets developed and built needs to

be part of the model.

Detection: Models with in-scope custom-developed parts missing in-scope development (code

creation) and build infrastructure components (devops-client, sourcecode-repo.

build-pipeline, etc.).

Rating: The risk rating depends on the highest sensitivity of the in-scope assets running

custom-developed parts.

Missing Cloud Hardening

missing-cloud-hardening

STRIDE: Tampering

Description: Cloud components should be hardened according to the cloud vendor best

practices. This affects their configuration, auditing, and further areas.

Detection: In-scope cloud components (either residing in cloud trust boundaries or more

specifically tagged with cloud provider types).

Rating: The risk rating depends on the sensitivity of the technical asset itself and of the data

assets processed and stored.

Missing File Validation

missing-file-validation

STRIDE: Spoofing

Description: When a technical asset accepts files, these input files should be strictly validated

about filename and type.

Detection: In-scope technical assets with custom-developed code accepting file data formats.

Rating: The risk rating depends on the sensitivity of the technical asset itself and of the data

assets processed and stored.

Missing Hardening

missing-hardening

STRIDE: Tampering

Description: Technical assets with a Relative Attacker Attractiveness (RAA) value of 55 % or

higher should be explicitly hardened taking best practices and vendor hardening

guides into account.

Detection: In-scope technical assets with RAA values of 55 % or higher. Generally for

high-value targets like datastores, application servers, identity providers and ERP

systems this limit is reduced to 40 %

Rating: The risk rating depends on the sensitivity of the data processed or stored in the

technical asset.

Missing Identity Propagation

missing-identity-propagation

STRIDE: Elevation of Privilege

Description: Technical assets (especially multi-tenant systems), which usually process data for

endusers should authorize every request based on the identity of the enduser when

the data flow is authenticated (i.e. non-public). For DevOps usages at least a

technical-user authorization is required.

Detection: In-scope service-like technical assets which usually process data based on enduser

requests, if authenticated (i.e. non-public), should authorize incoming requests based on the propagated enduser identity when their rating is sensitive. This is especially the case for all multi-tenant assets (there even less-sensitive rated ones).

DevOps usages are exempted from this risk.

Rating: The risk rating (medium or high) depends on the confidentiality, integrity, and

availability rating of the technical asset.

Missing Identity Provider Isolation

missing-identity-provider-isolation

STRIDE: Elevation of Privilege

Description: Highly sensitive identity provider assets and their identity datastores should be

isolated from other assets by their own network segmentation trust-boundary

(execution-environment boundaries do not count as network isolation).

Detection: In-scope identity provider assets and their identity datastores when surrounded by

other (not identity-related) assets (without a network trust-boundary in-between).

This risk is especially prevalent when other non-identity related assets are within the

same execution environment (i.e. same database or same application server).

Rating: Default is high impact. The impact is increased to very-high when the asset missing

the trust-boundary protection is rated as strictly-confidential or mission-critical.

Missing Identity Store

missing-identity-store

STRIDE: Spoofing

Description: The modeled architecture does not contain an identity store, which might be the risk

of a model missing critical assets (and thus not seeing their risks).

Detection: Models with authenticated data-flows authorized via enduser-identity missing an

in-scope identity store.

Rating: The risk rating depends on the sensitivity of the enduser-identity authorized

technical assets and their data assets processed and stored.

Missing Network Segmentation

missing-network-segmentation

STRIDE: Elevation of Privilege

Description: Highly sensitive assets and/or datastores residing in the same network segment

than other lower sensitive assets (like webservers or content management systems

etc.) should be better protected by a network segmentation trust-boundary.

Detection: In-scope technical assets with high sensitivity and RAA values as well as datastores

when surrounded by assets (without a network trust-boundary in-between) which are of type client-system, web-server, web-application, cms, web-service-rest, web-service-soap, build-pipeline, sourcecode-repository, monitoring, or similar and there is no direct connection between these (hence no requirement to be so close to

each other).

Rating: Default is low risk. The risk is increased to medium when the asset missing the

trust-boundary protection is rated as strictly-confidential or mission-critical.

Missing Vault (Secret Storage)

missing-vault

STRIDE: Information Disclosure

Description: In order to avoid the risk of secret leakage via config files (when attacked through

vulnerabilities being able to read files like Path-Traversal and others), it is best

practice to use a separate hardened process with proper authentication,

authorization, and audit logging to access config secrets (like credentials, private

keys, client certificates, etc.). This component is usually some kind of Vault.

Detection: Models without a Vault (Secret Storage).

Rating: The risk rating depends on the sensitivity of the technical asset itself and of the data

assets processed and stored.

Missing Vault Isolation

missing-vault-isolation

STRIDE: Elevation of Privilege

Description: Highly sensitive vault assets and their datastores should be isolated from other

assets by their own network segmentation trust-boundary (execution-environment

boundaries do not count as network isolation).

Detection: In-scope vault assets when surrounded by other (not vault-related) assets (without a

network trust-boundary in-between). This risk is especially prevalent when other non-vault related assets are within the same execution environment (i.e. same

database or same application server).

Rating: Default is medium impact. The impact is increased to high when the asset missing

the trust-boundary protection is rated as strictly-confidential or mission-critical.

Missing Web Application Firewall (WAF)

missing-waf

STRIDE: Tampering

Description: To have a first line of filtering defense, security architectures with web-services or

web-applications should include a WAF in front of them. Even though a WAF is not a replacement for security (all components must be secure even without a WAF) it adds another layer of defense to the overall system by delaying some attacks and

having easier attack alerting through it.

Detection: In-scope web-services and/or web-applications accessed across a network trust

boundary not having a Web Application Firewall (WAF) in front of them.

Rating: The risk rating depends on the sensitivity of the technical asset itself and of the data

assets processed and stored.

Mixed Targets on Shared Runtime

mixed-targets-on-shared-runtime

STRIDE: Elevation of Privilege

Description: Different attacker targets (like frontend and backend/datastore components) should

not be running on the same shared (underlying) runtime.

Detection: Shared runtime running technical assets of different trust-boundaries is at risk. Also

mixing backend/datastore with frontend components on the same shared runtime is

considered a risk.

Rating: The risk rating (low or medium) depends on the confidentiality, integrity, and

availability rating of the technical asset running on the shared runtime.

Path-Traversal

path-traversal

STRIDE: Information Disclosure

Description: When a filesystem is accessed Path-Traversal or Local-File-Inclusion (LFI) risks

might arise. The risk rating depends on the sensitivity of the technical asset itself

and of the data assets processed or stored.

Detection: Filesystems accessed by in-scope callers.

Rating: The risk rating depends on the sensitivity of the data stored inside the technical

asset.

Push instead of Pull Deployment

push-instead-of-pull-deployment

STRIDE: Tampering

Description: When comparing push-based vs. pull-based deployments from a security

perspective, pull-based deployments improve the overall security of the deployment targets. Every exposed interface of a production system to accept a deployment increases the attack surface of the production system, thus a pull-based approach

exposes less attack surface relevant interfaces.

Detection: Models with build pipeline components accessing in-scope targets of deployment (in

a non-readonly way) which are not build-related components themselves.

Rating: The risk rating depends on the highest sensitivity of the deployment targets running

custom-developed parts.

Search-Query Injection

search-query-injection

STRIDE: Tampering

Description: When a search engine server is accessed Search-Query Injection risks might arise.

Detection: In-scope clients accessing search engine servers via typical search access

protocols.

Rating: The risk rating depends on the sensitivity of the search engine server itself and of

the data assets processed or stored.

Server-Side Request Forgery (SSRF)

server-side-request-forgery

STRIDE: Information Disclosure

Description: When a server system (i.e. not a client) is accessing other server systems via typical

web protocols Server-Side Request Forgery (SSRF) or Local-File-Inclusion (LFI) or

Remote-File-Inclusion (RFI) risks might arise.

Detection: In-scope non-client systems accessing (using outgoing communication links) targets

with either HTTP or HTTPS protocol.

Rating: The risk rating (low or medium) depends on the sensitivity of the data assets

receivable via web protocols from targets within the same network trust-boundary as well on the sensitivity of the data assets receivable via web protocols from the target asset itself. Also for cloud-based environments the exploitation impact is at least

medium, as cloud backend services can be attacked via SSRF.

Service Registry Poisoning

service-registry-poisoning

STRIDE: Spoofing

Description: When a service registry used for discovery of trusted service endpoints Service

Registry Poisoning risks might arise.

Detection: In-scope service registries.

Rating: The risk rating depends on the sensitivity of the technical assets accessing the

service registry as well as the data assets processed or stored.

SQL/NoSQL-Injection

sql-nosql-injection

STRIDE: Tampering

Description: When a database is accessed via database access protocols SQL/NoSQL-Injection

risks might arise. The risk rating depends on the sensitivity technical asset itself and

of the data assets processed or stored.

Detection: Database accessed via typical database access protocols by in-scope clients.

Rating: The risk rating depends on the sensitivity of the data stored inside the database.

Unchecked Deployment

unchecked-deployment

STRIDE: Tampering

Description: For each build-pipeline component Unchecked Deployment risks might arise when

the build-pipeline does not include established DevSecOps best-practices. DevSecOps best-practices scan as part of CI/CD pipelines for vulnerabilities in source- or byte-code, dependencies, container layers, and dynamically against running test systems. There are several open-source and commercial tools existing

in the categories DAST, SAST, and IAST.

Detection: All development-relevant technical assets.

Rating: The risk rating depends on the highest rating of the technical assets and data assets

processed by deployment-receiving targets.

Unencrypted Technical Assets

unencrypted-asset

STRIDE: Information Disclosure

Description: Due to the confidentiality rating of the technical asset itself and/or the processed

data assets this technical asset must be encrypted. The risk rating depends on the

sensitivity technical asset itself and of the data assets stored.

Detection: In-scope unencrypted technical assets (excluding reverse-proxy, load-balancer, waf,

ids, ips and embedded components like library) storing data assets rated at least as

confidential or critical. For technical assets storing data assets rated as strictly-confidential or mission-critical the encryption must be of type

data-with-enduser-individual-key.

Rating: Depending on the confidentiality rating of the stored data-assets either medium or

high risk.

Unencrypted Communication

unencrypted-communication

STRIDE: Information Disclosure

Description: Due to the confidentiality and/or integrity rating of the data assets transferred over

the communication link this connection must be encrypted.

Detection: Unencrypted technical communication links of in-scope technical assets (excluding

monitoring traffic as well as local-file-access and in-process-library-call) transferring

sensitive data.

Rating: Depending on the confidentiality rating of the transferred data-assets either medium

or high risk.

Unguarded Access From Internet

unguarded-access-from-internet

STRIDE: Elevation of Privilege

Description: Internet-exposed assets must be guarded by a protecting service, application, or

reverse-proxy.

Detection: In-scope technical assets (excluding load-balancer) with confidentiality rating of

confidential (or higher) or with integrity rating of critical (or higher) when accessed directly from the internet. All web-server, web-application, reverse-proxy, waf, and gateway assets are exempted from this risk when they do not consist of custom developed code and the data-flow only consists of HTTP or FTP protocols. Access from monitoring systems as well as VPN-protected connections are exempted.

Rating: The matching technical assets are at low risk. When either the confidentiality rating

is strictly-confidential or the integrity rating is mission-critical, the risk-rating is considered medium. For assets with RAA values higher than 40 % the risk-rating

increases.

Unguarded Direct Datastore Access

unguarded-direct-datastore-access

STRIDE: Elevation of Privilege

Description: Datastores accessed across trust boundaries must be guarded by some protecting

service or application.

Detection: In-scope technical assets of type datastore (except identity-store-ldap when

accessed from identity-provider and file-server when accessed via file transfer protocols) with confidentiality rating of confidential (or higher) or with integrity rating of critical (or higher) which have incoming data-flows from assets outside across a network trust-boundary. DevOps config and deployment access is excluded from

this risk.

Rating: The matching technical assets are at low risk. When either the confidentiality rating

is strictly-confidential or the integrity rating is mission-critical, the risk-rating is considered medium. For assets with RAA values higher than 40 % the risk-rating

increases.

Unnecessary Communication Link

unnecessary-communication-link

STRIDE: Elevation of Privilege

Description: When a technical communication link does not send or receive any data assets, this

is an indicator for an unnecessary communication link (or for an incomplete model).

Detection: In-scope technical assets' technical communication links not sending or receiving

any data assets.

Rating: low

Unnecessary Data Asset

unnecessary-data-asset

STRIDE: Elevation of Privilege

Description: When a data asset is not processed or stored by any data assets and also not

transferred by any communication links, this is an indicator for an unnecessary data

asset (or for an incomplete model).

Detection: Modelled data assets not processed or stored by any data assets and also not

transferred by any communication links.

Rating: low

Unnecessary Data Transfer

unnecessary-data-transfer

STRIDE: Elevation of Privilege

Description: When a technical asset sends or receives data assets, which it neither processes or

stores this is an indicator for unnecessarily transferred data (or for an incomplete model). When the unnecessarily transferred data assets are sensitive, this poses an

unnecessary risk of an increased attack surface.

Detection: In-scope technical assets sending or receiving sensitive data assets which are

neither processed nor stored by the technical asset are flagged with this risk. The risk rating (low or medium) depends on the confidentiality, integrity, and availability

rating of the technical asset. Monitoring data is exempted from this risk.

Rating: The risk assessment is depending on the confidentiality and integrity rating of the

transferred data asset either low or medium.

Unnecessary Technical Asset

unnecessary-technical-asset

STRIDE: Elevation of Privilege

Description: When a technical asset does not process or store any data assets, this is an

indicator for an unnecessary technical asset (or for an incomplete model). This is also the case if the asset has no communication links (either outgoing or incoming).

Detection: Technical assets not processing or storing any data assets.

Rating: low

Untrusted Deserialization

untrusted-deserialization

STRIDE: Tampering

Description: When a technical asset accepts data in a specific serialized form (like Java or .NET

serialization), Untrusted Deserialization risks might arise.

Detection: In-scope technical assets accepting serialization data formats (including EJB and

RMI protocols).

Rating: The risk rating depends on the sensitivity of the technical asset itself and of the data

assets processed and stored.

Wrong Communication Link Content

wrong-communication-link-content

STRIDE: Information Disclosure

Description: When a communication link is defined as readonly, but does not receive any data

asset, or when it is defined as not readonly, but does not send any data asset, it is

likely to be a model failure.

Detection: Communication links with inconsistent data assets being sent/received not matching

their readonly flag or otherwise inconsistent protocols not matching the target

technology type.

Rating: low

Wrong Trust Boundary Content

wrong-trust-boundary-content

STRIDE: Elevation of Privilege

Description: When a trust boundary of type network-policy-namespace-isolation contains

non-container assets it is likely to be a model failure.

Detection: Trust boundaries which should only contain containers, but have different assets

inside.

Rating: low

XML External Entity (XXE)

xml-external-entity

STRIDE: Information Disclosure

Description: When a technical asset accepts data in XML format, XML External Entity (XXE)

risks might arise.

Detection: In-scope technical assets accepting XML data formats.

Rating: The risk rating depends on the sensitivity of the technical asset itself and of the data

assets processed and stored. Also for cloud-based environments the exploitation impact is at least medium, as cloud backend services can be attacked via SSRF (and XXE vulnerabilities are often also SSRF vulnerabilities).

Disclaimer

John Doe conducted this threat analysis using the open-source Threagile toolkit on the applications and systems that were modeled as of this report's date. Information security threats are continually changing, with new vulnerabilities discovered on a daily basis, and no application can ever be 100% secure no matter how much threat modeling is conducted. It is recommended to execute threat modeling and also penetration testing on a regular basis (for example yearly) to ensure a high ongoing level of security and constantly check for new attack vectors.

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By using the resulting information you agree that John Doe and the Threagile toolkit shall be held harmless in any event.

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In this particular project, a timebox approach was used to define the analysis effort. This means that the author allotted a prearranged amount of time to identify and document threats. Because of this, there is no guarantee that all possible threats and risks are discovered. Furthermore, the analysis applies to a snapshot of the current state of the modeled architecture (based on the architecture information provided by the customer) at the examination time.

Report Distribution

Distribution of this report (in full or in part like diagrams or risk findings) requires that this disclaimer as well as the chapter about the Threagile toolkit and method used is kept intact as part of the distributed report or referenced from the distributed parts.