

corasdiagram Manual

Version 0.1.2

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1 Overview

`corasdiagram` is a notation-first LaTeX package for the five core CORAS diagram families:

- asset diagrams
- threat diagrams
- risk diagrams
- treatment diagrams

- treatment overview diagrams

The package also provides high-level analysis risk tables with CORAS header icons. The package ships with pre-rendered CORAS icons, semantic diagram environments, concept-level node macros, and semantic edge macros. The current supported engines are `pdflatex` and `lualatex`.

2 Installation

2.1 Repository-Local Use

Compile from the repository root with:

```
TEXINPUTS=tex/latex//: pdflatex -interaction=nonstopmode -halt-on-error \
  examples/corasdiagram-minimal.tex
```

2.2 User TEXMF Tree

Copy `tex/latex/corasdiagram/` to `$HOME/texmf/tex/latex/corasdiagram/`. Refresh the TeX file-name database if your TeX distribution requires it.

2.3 Release Bundle

The release tooling assembles a CTAN-friendly bundle. Once the package is published, installation can happen through the normal TeX package manager.

3 Package Options

Option	Default	Meaning
<code>iconset=color bw</code>	color	Select the color or black-and-white icon set for the base, outlined, and shaded icon variants.
<code>icons-path=<path></code>	package icons	Override the icon directory path.

4 Diagram Environments

`corasassetdiagram` Stakeholders, assets, asset relations, and scope containers.

`corasthreatdiagram` Threat sources, vulnerabilities, threat scenarios, unwanted incidents, and impacted assets.

`corasriskdiagram` Threat sources, risks, and impacted assets.

`corastreatmentdiagram` Treatment nodes together with the selected threat chain they mitigate.

`corastreatmentoverviewdiagram` Treatments, risks, assets, and treatment fan-in via a junction.

Each environment enforces its legal CORAS vocabulary. Illegal node types or edge relations raise package errors during compilation.

5 High-Level Analysis Tables

The package provides `corashighlevelanalysistable` and the alias `corashighlevelrisktable` for the high-level analysis table style used in CORAS reports. The environments are built on `longtable`, so they can span multiple pages while repeating the icon header.

Key	Values	Description
caption	empty or free text	Optional longtable caption shown above the first header.
label	empty or reference key	Optional <code>\label</code> written together with the caption.
cause heading	<u>Who/what causes it?</u> or free text	Header text for the left column.
event heading	<u>How? What is the scenario/incident/asset?</u> or free text	Header text for the middle column.
possibility heading	<u>What makes it possible?</u> or free text	Header text for the right column.
cause width	<u>24% of <code>\textwidth</code></u> or dimension	Width of the left text column.
event width	<u>40% of <code>\textwidth</code></u> or dimension	Width of the middle text column.
possibility width	<u>30% of <code>\textwidth</code></u> or dimension	Width of the right text column.
column sep	<u>10pt</u> or dimension	Horizontal spacing between columns.
row sep	<u>0.8ex</u> or dimension	Extra vertical space inserted after each data row.
icon scale	<u>1</u> or positive factor	Scales the header icon groups. Useful when the table is placed in a narrow minipage or column.
cause icons	default CORAS threat-source header content or raw TeX content	Override the icon content in the left header cell.
event icons	default CORAS scenario/incident/asset header content or raw TeX content	Override the icon content in the middle header cell.
possibility icons	default CORAS vulnerability header content or raw TeX content	Override the icon content in the right header cell.

Data rows are emitted with `\corashighlevelanalysisrow` or the alias `\corashighlevelriskrow`. Both commands take three mandatory arguments: cause, scenario/incident/harmed asset text, and possibility text.

```

\begin{corashighlevelanalysisistable}[
  caption={Documenting the high-level analysis}
]
  \corashighlevelanalysisrow
    {Hacker}
    {Breaks into system and compromises integrity\
    or confidentiality of databases}
    {Use of web application and remote access;\
    insufficient access control}
\end{corashighlevelanalysisistable}

```

6 Public API

6.1 Canonical Node Macros

Macro	Meaning
<code>\corashighlevelanalysisrow</code>	One data row in a high-level analysis table.
<code>\corashighlevelriskrow</code>	Alias for <code>\corashighlevelanalysisrow</code> .
<code>\corasasset</code>	Asset node with CORAS asset icon.
<code>\corasindirectasset</code>	Indirect asset node with the dotted indirect-asset icon.
<code>\corasstakeholder</code>	Stakeholder node with stakeholder icon.
<code>\corasthreataccidental</code>	Accidental human threat source.
<code>\corasthreatdeliberate</code>	Deliberate human threat source.
<code>\corasthreatnonhuman</code>	Non-human threat source.
<code>\corasvulnerability</code>	Vulnerability node.
<code>\corasscenario</code>	Threat scenario node.
<code>\corasincident</code>	Unwanted incident node.
<code>\corasunwantedincident</code>	Alias for <code>\corasincident</code> .
<code>\corasrisk</code>	Risk node with title and level metadata.
<code>\corastreatment</code>	Treatment node.
<code>\corasjunction</code>	Junction node for treatment overview fan-in.

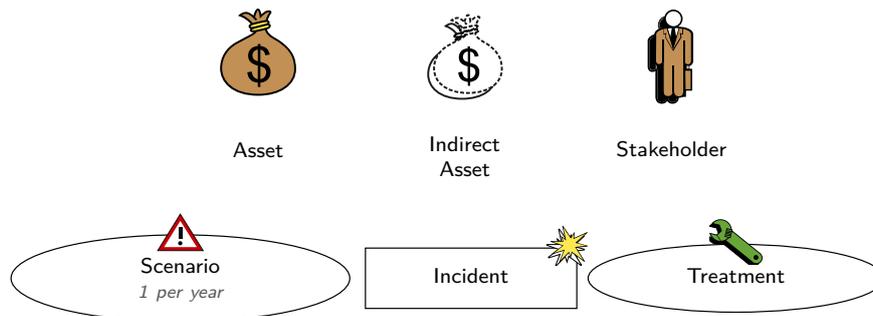
Indirect Assets `\corasindirectasset` is semantically an asset node with a distinct dotted indirect-asset symbol. It can therefore be used anywhere the package expects an asset concept, including asset-diagram auto-layout lanes, asset-scope grouping, and the normal asset relation macros.

Change-Modeling Perspectives The `perspective` key is the public change-modeling switch used across icon-backed nodes and mounted-icon body nodes: `before` keeps the base icon, `before-after` selects the outlined transition variant, and `after` selects the shaded result variant.

This applies to icon-backed nodes such as `\corasasset`, `\corasindirectasset`, `\corasstakeholder`, the threat-source macros, and `\corasvulnerability`; to mounted-icon body nodes such as `\corasscenario`, `\corasunwantedincident`, `\corasrisk`, and `\corastreatment`; and to `\corasriskref`.

Underlined values in the key tables below are the defaults used by the package.

Worked Perspective Example



The first row shows the three perspective states on icon-backed nodes. The second row shows the same key on mounted-icon body nodes, where only the icon changes and the underlying ellipse or rectangle geometry stays the same.

Key	Values	Description
<code>name</code>	auto-generated identifier	Public node name used by later edges, scopes, and references.
<code>title</code>	free text	Primary label text rendered in the node.
<code>meta</code>	empty or free text	Secondary metadata line below the title.
<code>level</code>	empty or free text	Secondary level line, mainly used by risk nodes.
<code>perspective</code>	<code>before</code> — <code>before-after</code> — <code>after</code>	Selects the CORAS change-modeling perspective: base icon, outlined icon, or shaded icon.
<code>scope at</code>	empty or scope name	Adds the node to a named scope fit group.
	empty or TikZ coordinate	Explicit placement; wins over automatic placement.
<code>order</code>	empty or positive integer	Sets the lane order used by auto layout.
<code>text width</code>	empty or dimension	Overrides the node type's built-in text wrapping width.
<code>layout</code>	<code>auto</code> — <code>manual</code>	Overrides the diagram's placement mode for a node.
<code>min edge gap</code>	empty or dimension	Node-level override for the minimum border-to-border spacing enforced by auto layout and relative placement helpers.
<code>right of</code>	empty or node name	Relative placement to the right of another node.
<code>below of</code>	empty or node name	Relative placement below another node.
<code>incident of</code>	empty or node name	Relative placement to the right of an incident node.
<code>treats</code>	empty or node name	Relative placement above the treated node.
<code>harms</code>	empty or node name	Relative placement to the left of the harmed node.
<code>horizontal gap</code>	<code>12mm</code> or dimension	Horizontal offset used by relative placement helpers.
<code>vertical gap</code>	<code>14mm</code> or dimension	Vertical offset used by relative placement helpers.
<code>tikz</code>	empty or raw TikZ options	Advanced style override passed to the underlying node.

6.2 Semantic Edge Macros

Macro	Meaning
<code>\corascauses</code>	Solid causal edge with open line arrowhead.
<code>\corasrelates</code>	Solid relation/impact edge with open line arrowhead.
<code>\corasconcerns</code>	Dashed concern edge, typically stakeholder to asset.
<code>\corasassociates</code>	Dashed non-causal association edge.
<code>\corastreats</code>	Dashed curved treatment edge leaving the source orthogonally.

Key	Values	Description
<code>from</code>	node name	Start node for the edge.
<code>to</code>	node name	End node for the edge.
<code>label</code>	empty or free text	Optional label placed on the edge.
<code>pos</code>	<code>.5</code> or number	Relative position for the edge label or risk reference anchor.
<code>route</code>	<code>auto</code> — <code>straight</code> — <code>hv</code> — <code>vh</code>	Selects the default routing strategy for non-treatment edges.
<code>path</code>	empty or raw TikZ path operator	Advanced override for the edge path, such as <code>- </code> .
<code>tikz</code>	empty or raw TikZ draw options	Advanced style override passed to the underlying draw command.
<code>label options</code>	<code>fill=white,inner sep=1pt</code> or raw TikZ options	Advanced style override for the edge label node.

The higher-level semantic edge macros choose the underlying edge type and semantic relation auto-

matically, so the low-level `type` and `semantic` keys are normally only needed with `\corasedge`.

6.3 Scopes and Containers

`\corasscope` is the public scope/container helper. The important keys are:

Key	Values	Description
<code>name</code>	auto-generated identifier	Public scope/container node name.
<code>title</code>	empty or free text	Optional title shown on the scope.
<code>scope</code>	empty or scope name	Reuses all nodes previously tagged with the same scope name.
<code>fit</code>	empty or TikZ fit list	Explicit fit list such as (a) (b) (c).
<code>kind</code>	<code>system</code> — <code>asset-scope</code> — <code>analysis</code> — <code>risk-group</code> — <code>treatment-scope</code>	Selects the container styling.
<code>padding</code>	<code>5mm</code> or dimension	General scope padding; <code>asset-scope</code> falls back to <code>1.0mm</code> .
<code>stakeholder</code>	empty or node name	Selects the stakeholder node used for the asset-scope corner compartment.
<code>stakeholder corner</code>	<code>left</code> — <code>right</code>	Chooses which top corner gets the stakeholder compartment.
<code>stakeholder xsep</code>	empty or dimension	Horizontal padding inside the asset-scope stakeholder square; defaults to <code>0.25mm</code> .
<code>stakeholder ysep</code>	empty or dimension	Vertical padding inside the asset-scope stakeholder square; defaults to <code>0.25mm</code> .
<code>tikz</code>	empty or raw TikZ options	Advanced style override for the container node.
<code>title tikz</code>	empty or raw TikZ options	Advanced style override for the scope title node.

The `asset-scope` kind renders the rounded asset-diagram container with the stakeholder corner compartment. The official threat, risk, treatment, and treatment overview examples do not use containers.

6.4 Advanced Compatibility API

The package still ships the lower-level primitives `\corasnode`, `\corasedge`, and `\corascontainer`. They remain available for advanced usage and backward compatibility, but the semantic wrappers are the preferred public API.

7 Layout Behavior

The package supports both explicit coordinates and role-aware automatic placement. Manual placement always wins when `at=<...>` is given. The `min edge gap` key acts as a lower bound on visible border-to-border spacing for both auto placement and the relative helper keys. Explicit `horizontal gap` and `vertical gap` values still matter, but they can only increase that spacing.

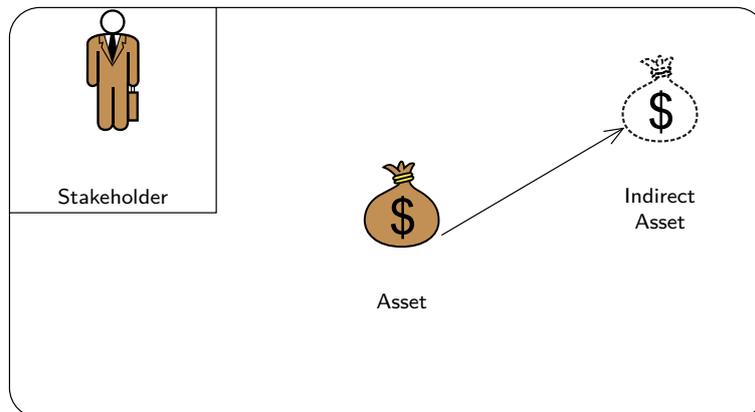
Important layout-related keys:

Key	Values	Description
layout	<code>auto</code> — <code>manual</code>	Switch between role-aware automatic placement and fully explicit placement.
at	empty or TikZ coordinate	Place a node directly at a coordinate; takes precedence over all other layout keys.
order	empty or positive integer	Controls row ordering inside the role lane used by auto layout.
min edge gap	<code>8mm</code> or dimension	Minimum border-to-border spacing preserved for auto placement and relative helpers; ignored when <code>at=<...></code> is given.
scope	empty or scope name	Groups asset-diagram nodes into a fit-based container.
right of	empty or node name	Places a node to the right of another node using <code>horizontal gap</code> .
below of	empty or node name	Places a node below another node using <code>vertical gap</code> .
incident of	empty or node name	Places a node to the right of an incident node.
treats	empty or node name	Places a node above the treated node.
harms	empty or node name	Places a node to the left of the harmed node.

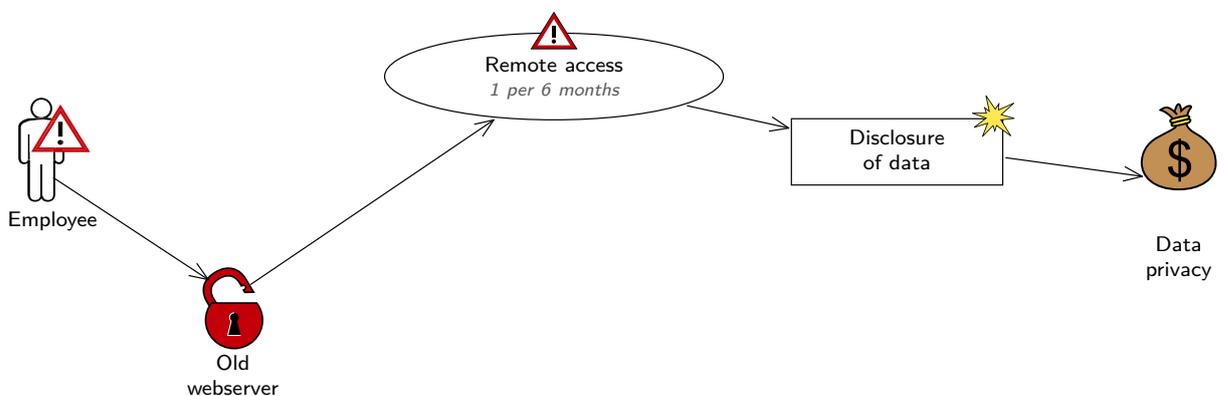
8 Complete Examples

8.1 Asset Diagram

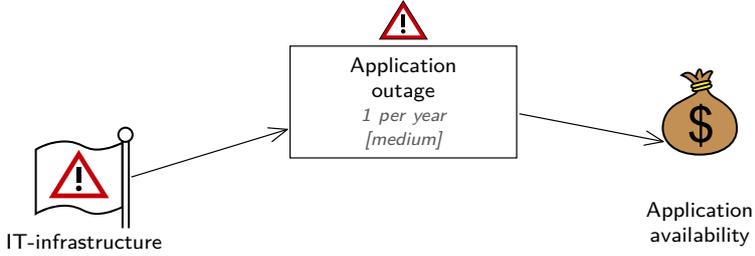
This example uses `\corasindirectasset` for the dependent asset. Semantically it is still an asset node, but it renders with the dotted indirect-asset symbol.



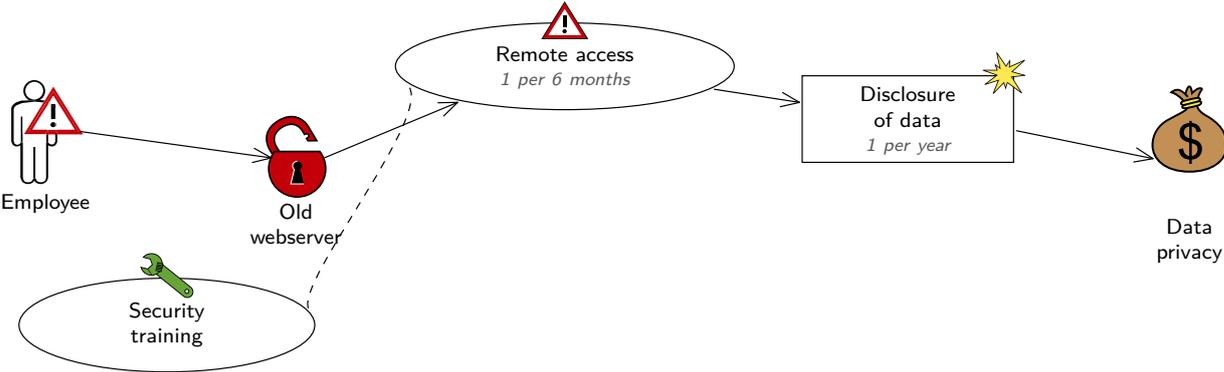
8.2 Threat Diagram



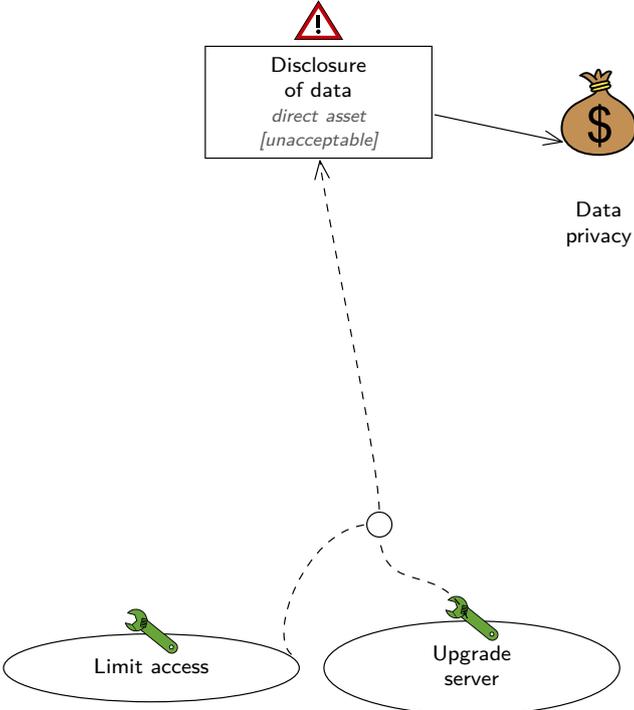
8.3 Risk Diagram



8.4 Treatment Diagram

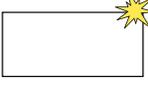


8.5 Treatment Overview Diagram



8.6 High-Level Analysis Table

Table 1: Documenting the high-level analysis

  	 	 
Who/what causes it?	How? What is the scenario or incident? What is harmed?	What makes it possible?
Hacker	Breaks into system and compromises integrity or confidentiality of databases	Use of web application and remote access; insufficient access control
Employee	Sloppiness compromises integrity or confidentiality of databases	Lack of competence; work processes not aligned with policy
System failure	Online store goes down because of failure of web application or loss of network connection	Immature technology; loss of network connection
Employee	Collection and processing of personal data diverge from data protection laws	Lack of competence on data protection laws; insufficient routines for processing personal data

9 Source Files

The repository ships these main author-facing files:

- `tex/latex/corasdiagram/corasdiagram.sty`
- `examples/corasdiagram-minimal.tex`
- `examples/corasdiagram-demo.tex`
- `tests/corasdiagram/*.tex`

10 Build and Release Tooling

The project includes helper scripts for:

- building icon PDFs from the original SVG files
- running semantic failure tests
- assembling a CTAN-friendly release bundle
- building a static documentation site with rendered screenshots

See `CONTRIBUTING.md` for the current repository-root commands.

11 License

MIT License

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12 Notice

This project includes certain CORAS symbol assets derived from or copied from CORAS-The-Explorer:

<https://github.com/stverdal/CORAS-The-Explorer>

The vendored package sources in `assets/icons-src/` are normalized copies of SVG assets from:

`src/js/components/molecules/Editor/svg/`

The package preserves the upstream CORAS symbol concepts, renames the files to package-native stems, and generates package-local PDF and black-and-white variants from those vendored SVGs.

Original license:

The MIT License (MIT)

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