# Threat-risk-conceptual-model::Threat and Risk Specific Concepts::Attack Defense Trees

The attack-defense tree model is based on [Schweitzer 2013]  
The attack-defense tree formalism can informally be described as follows. For a security scenario, the main goal of the attacker is depicted by the root node of a tree, an attack goal. Two types of refinement relations help to detail the model. Disjunctive (or) and constructive (and). Both types of refinement are recursively applied. Defense goals lower the probability of an attackers success, attack goals increase the probability.

## Diagram: Attack Defense Trees



1. Attack Defense Trees

A performance goal that is an objective to disrupt some resource.

## Class Attack Defense Tree

Attack-defense trees are assessments of how an asset, or target, might be attacked and defended.  
[Schweitzer 2013] Attack-Defense Tree

Direct Supertypes

[Assessment](#_810fb326e2f925bfeb5f8b116e81bd0d)

Associations

: [Performance Goal](#_22bca6f8b6f2004efafe75579d457cb1) [1..\*] *Redefines*: assesses:[Assessed Entity](#_058d45ec272aef64681c6a25b28a78ae)



## Class Attack Goal

A performance goal that is an objective to disrupt some resource.  
[Schweitzer 2013] Attack node

Direct Supertypes

[Objective to Disrupt](#_5d196d97c255bb26c7ece015d149f4d8), [Performance Goal](#_22bca6f8b6f2004efafe75579d457cb1)

## Class Defense Goal

A performance goal that is an objective to protect some resource.  
[Schweitzer 2013] Defense node

Direct Supertypes

[Performance Goal](#_22bca6f8b6f2004efafe75579d457cb1), [Risk Reduction Objective](#_776d60fce8516dacf9ec47f77bef3822)

## Association Class Goal Refinement <<Relationship>>

A refinement of a performance goal such that   
[Schweitzer 2013] Refinement (conjunctive or disjunctive)



1. Goal Refinement

Direct Supertypes

[Impact](#_e33780607cd553fb55b8907600848b66)

Association Ends

enables : [Performance Goal](#_22bca6f8b6f2004efafe75579d457cb1) [\*] *Redefines*: assesses: [Assessed Entity](#_058d45ec272aef64681c6a25b28a78ae)



enabled by : [Performance Goal](#_22bca6f8b6f2004efafe75579d457cb1) [\*] *Redefines*: assesses: [Assessed Entity](#_058d45ec272aef64681c6a25b28a78ae)



## Class Performance Goal

A goal for which the likelihood and contributing conditions may be assessed.

Direct Supertypes

[Objective](#_1a3b26382bc038a9cd845e258d24db0f)

Attributes

likelihood : [Metric](#_23c4326044009f885190c5ab985800db)



Likelihood that the goal can be achieved.

condition : [Refinement Condition](#_741e690ba9983bfad472033a882bedbb) [1]



Defines the goal refinement as conjunctive or disjunctive.   
Any disjunctive goal will enable the performance goal.  
THe set of all conjunctive goals must all be satisfied to enable the performance goal.

Associations

enables : [Performance Goal](#_22bca6f8b6f2004efafe75579d457cb1) [1..\*] *Redefines*: assesses:[Assessed Entity](#_058d45ec272aef64681c6a25b28a78ae)



*through association:* [Goal Refinement](#_09127cf625e4fd365abe2cdbeea3e0f8)

enabled by : [Performance Goal](#_22bca6f8b6f2004efafe75579d457cb1) [1..\*] *Redefines*: assesses:[Assessed Entity](#_058d45ec272aef64681c6a25b28a78ae)



*through association:* [Goal Refinement](#_09127cf625e4fd365abe2cdbeea3e0f8)

: [Attack Defense Tree](#_77315a6e6f51e35691da0535d136ef65) [1] *Subsets*: assessed by:[Assessment](#_810fb326e2f925bfeb5f8b116e81bd0d)



### Enumeration Refinement Condition

Possible refinement conditions for performance goals.

package Threat-risk-conceptual-model::Threat and Risk Specific Concepts::Attack Defense Trees

public enum Refinement Condition

{Disjunctive Refinement, Conjunctive Refinement}

Literals

Disjunctive Refinement



The "or" condition for goals. Any disjunctive refinement may enable a performance goal.

Conjunctive Refinement



The "and" condition for goals. All conjunctive refinements are required to enable a performance goal.