SOLID SECURITY

Security at scale.

Natural Language Processing Methods for Software-Based Leak Detection, Prevention, and Mitigation

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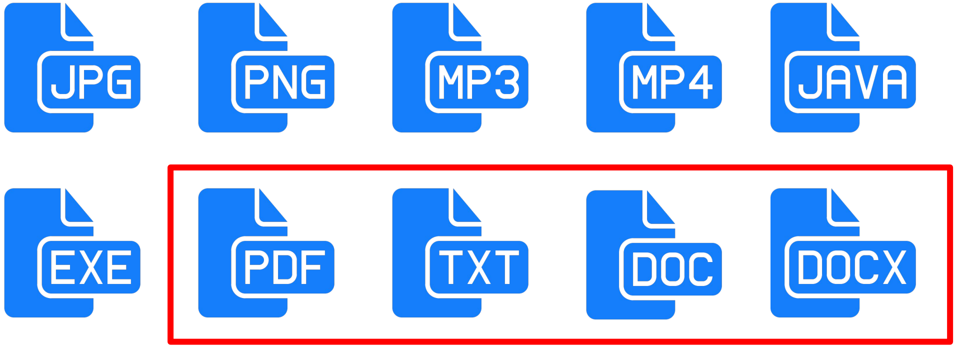
Project Tailspin

{|} PROJECT TAILSPIN

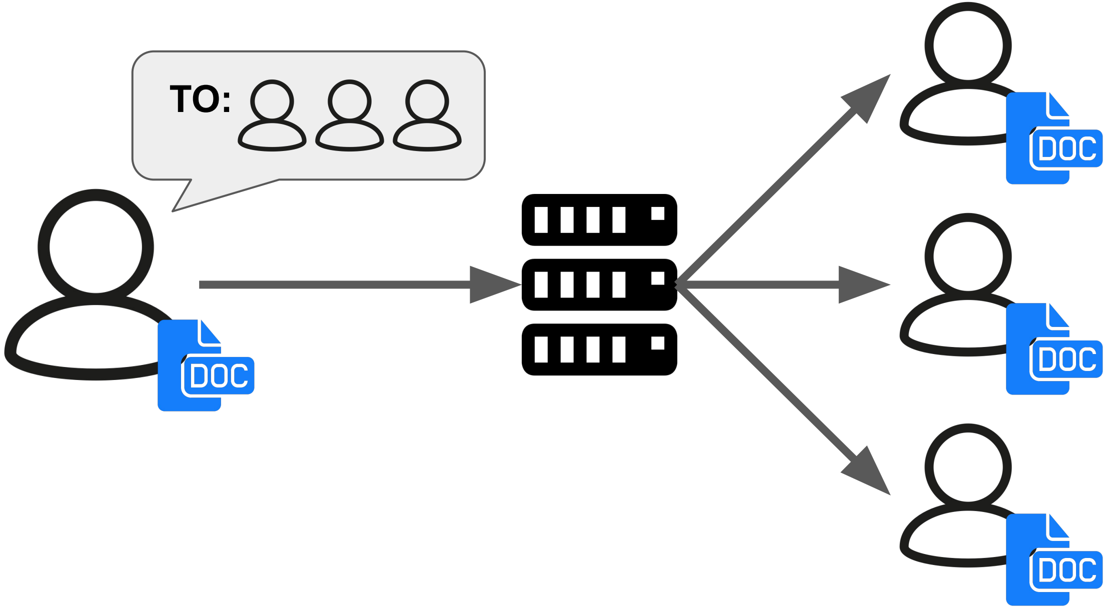


Project tailspin was created to focus on leak mitigation for text-based documents.

Before Tailspin

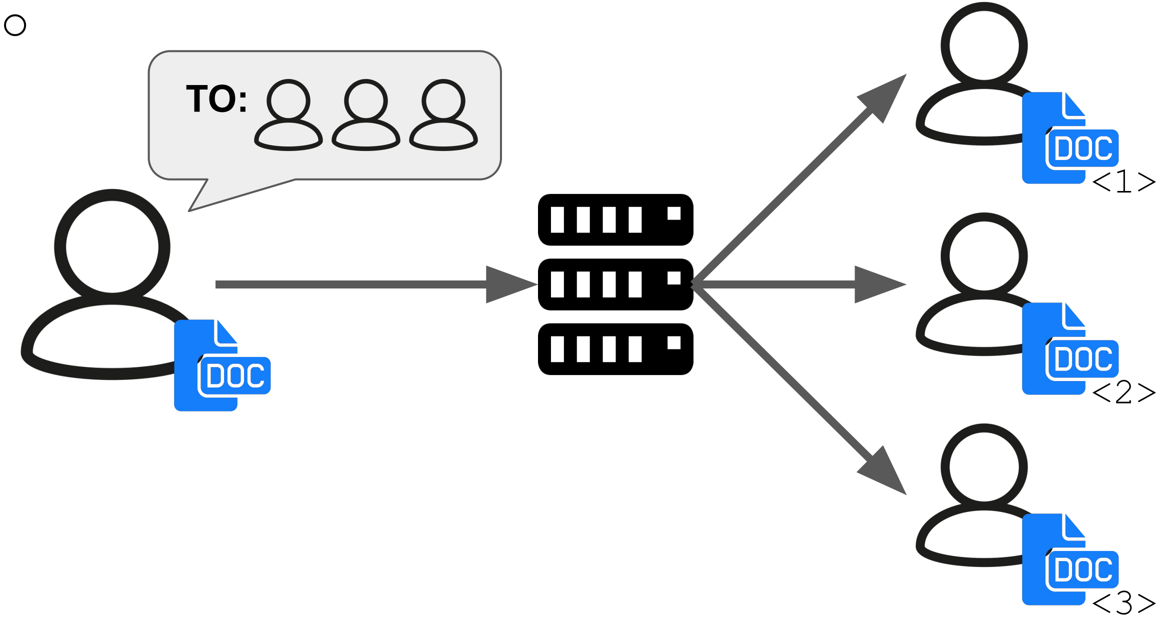
Before { | } *PROJECT TAILSPIN*

Original documents are distributed directly to intended recipients.



Metadata Tagging

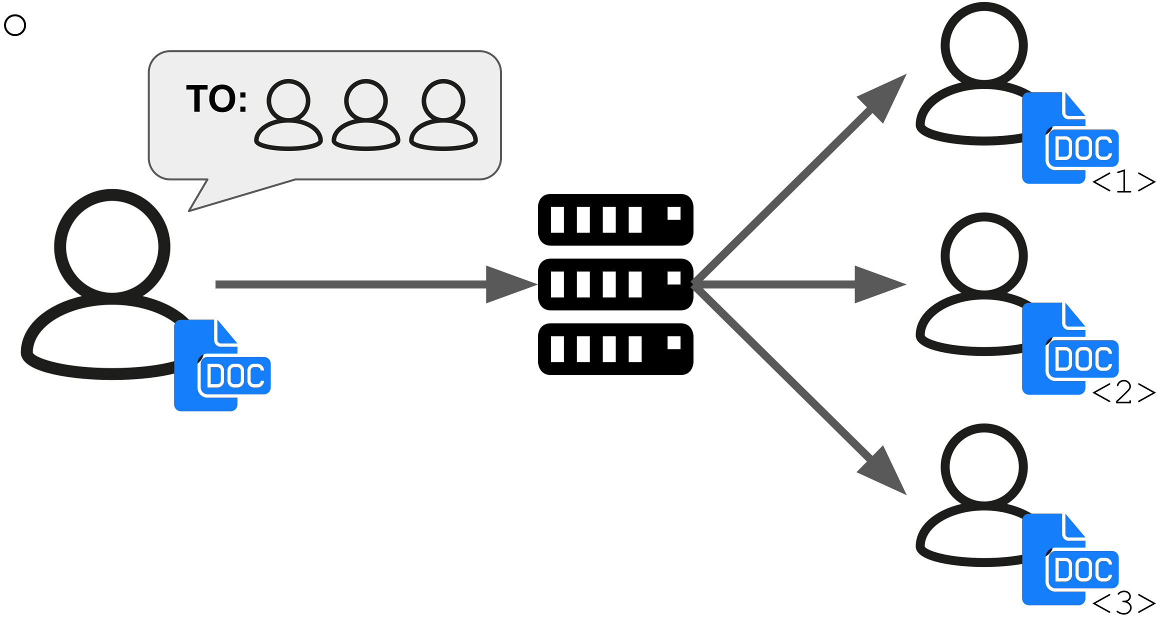
Original documents are tagged with unique metadata before being distributed directly to intended recipients.



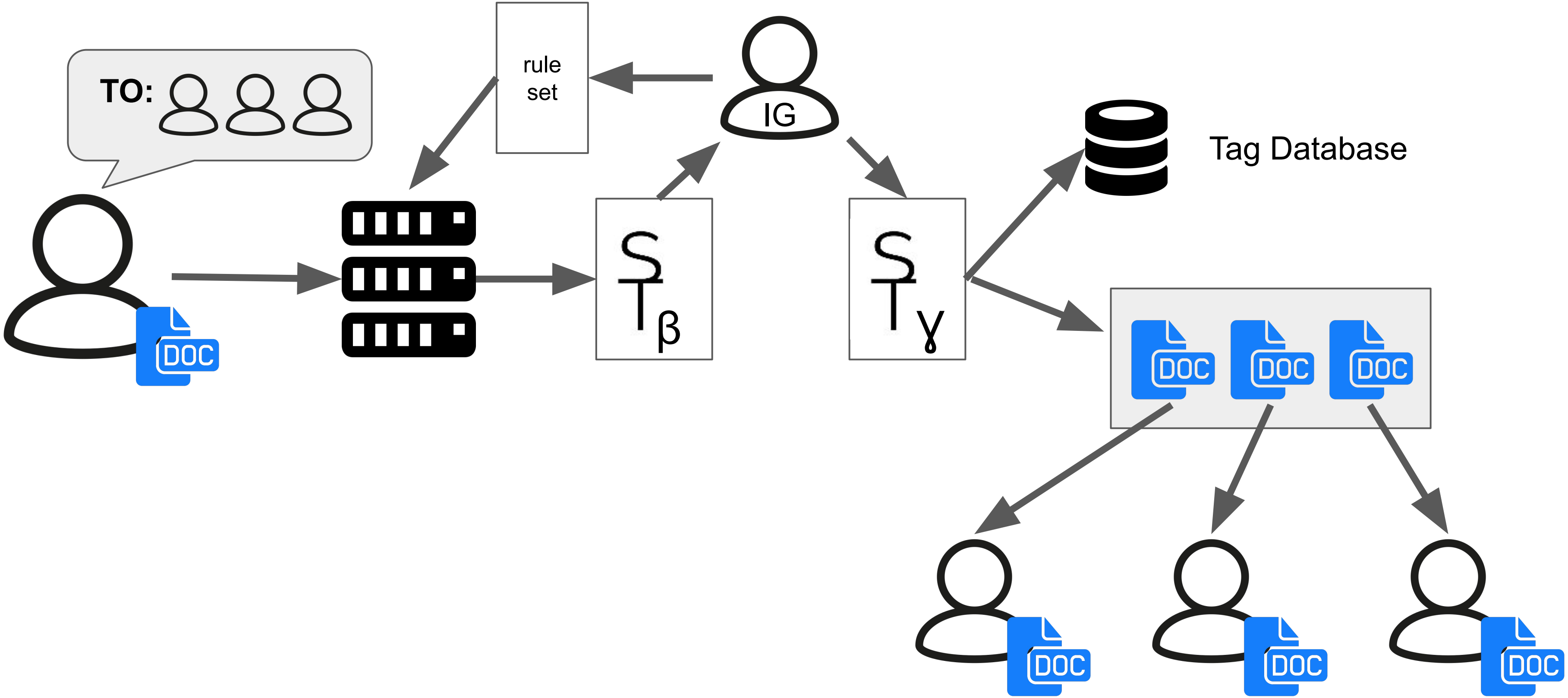
Metadata Tagging

Original documents are tagged with unique metadata before being distributed directly to intended recipients.

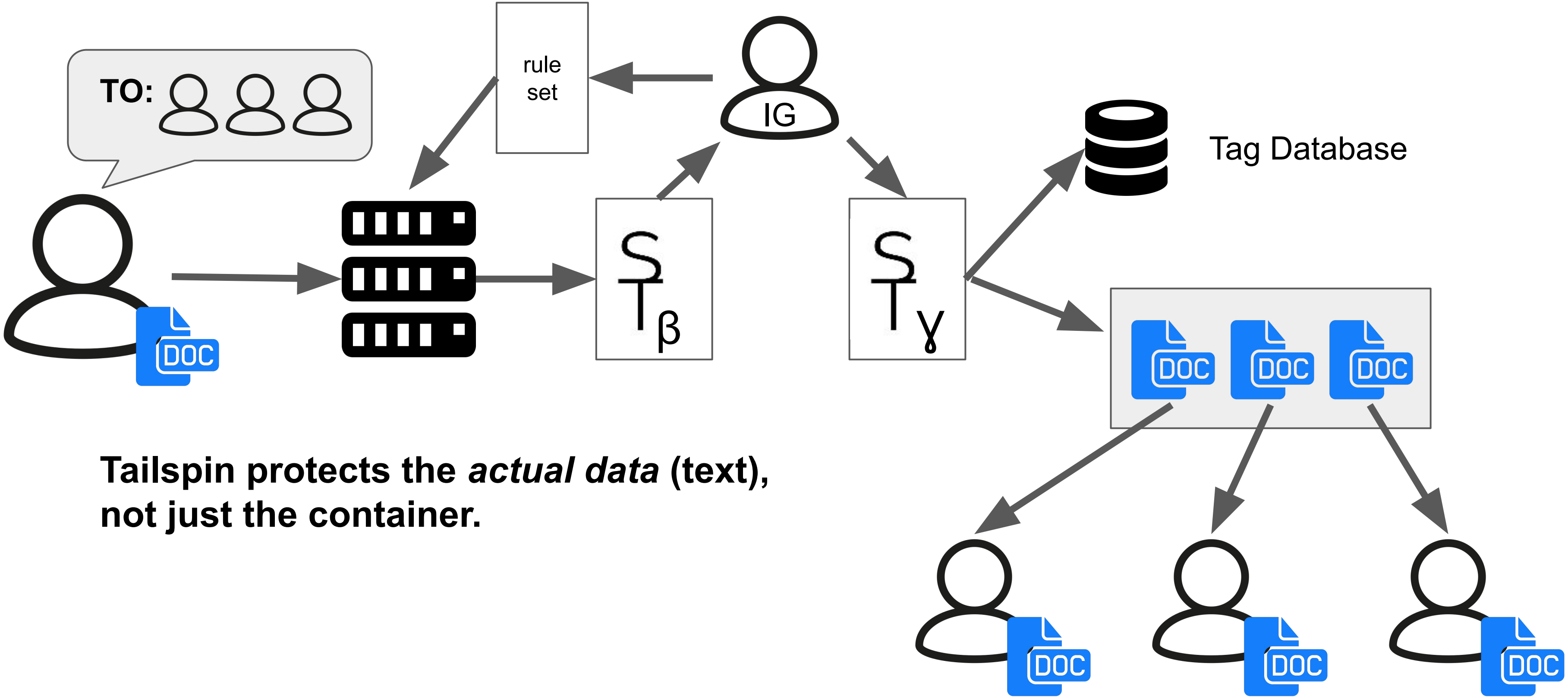
This method protects the *container*, not the "*real data*" content.



With Tailspin



With Tailspin



Tailspin protects the *actual data* (text), not just the container.

{|} PROJECT TAILSPIN

Objective 1: use NLP techniques to make text uniquely identifiable.

What is Spintax?

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“Spintax”

(sentence permutation syntax)

```
Writing spintax is fun!
```

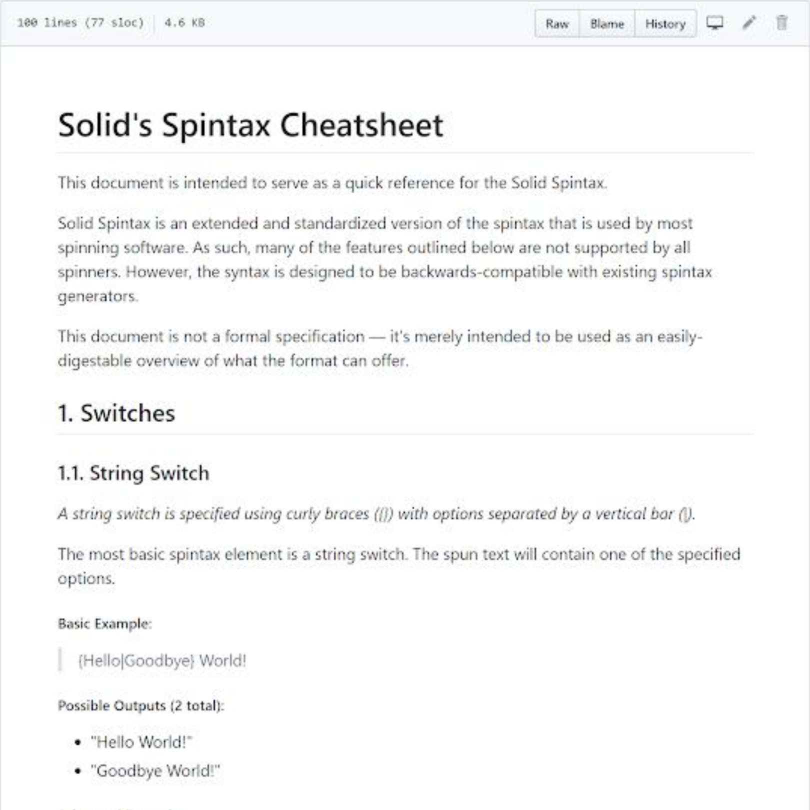
```
{Writing|Creating} spintax is {fun|great}!
```

```
> Writing spintax is fun!
> Creating spintax is fun!
> Writing spintax is great!
> Creating spintax is great!
```

What is Solid Spintax?

Solid Security's advanced standardized spintax format

- Integer Switches
- Nested Switches
- Global Switches
- Ruleset Operations
- Special Characters
- Version Indexing



Solid's Spintax Cheatsheet

This document is intended to serve as a quick reference for the Solid Spintax.

Solid Spintax is an extended and standardized version of the spintax that is used by most spinning software. As such, many of the features outlined below are not supported by all spinners. However, the syntax is designed to be backwards-compatible with existing spintax generators.

This document is not a formal specification — it's merely intended to be used as an easily-digestable overview of what the format can offer.

1. Switches

1.1. String Switch

A string switch is specified using curly braces ({}) with options separated by a vertical bar (|).

The most basic spintax element is a string switch. The spun text will contain one of the specified options.

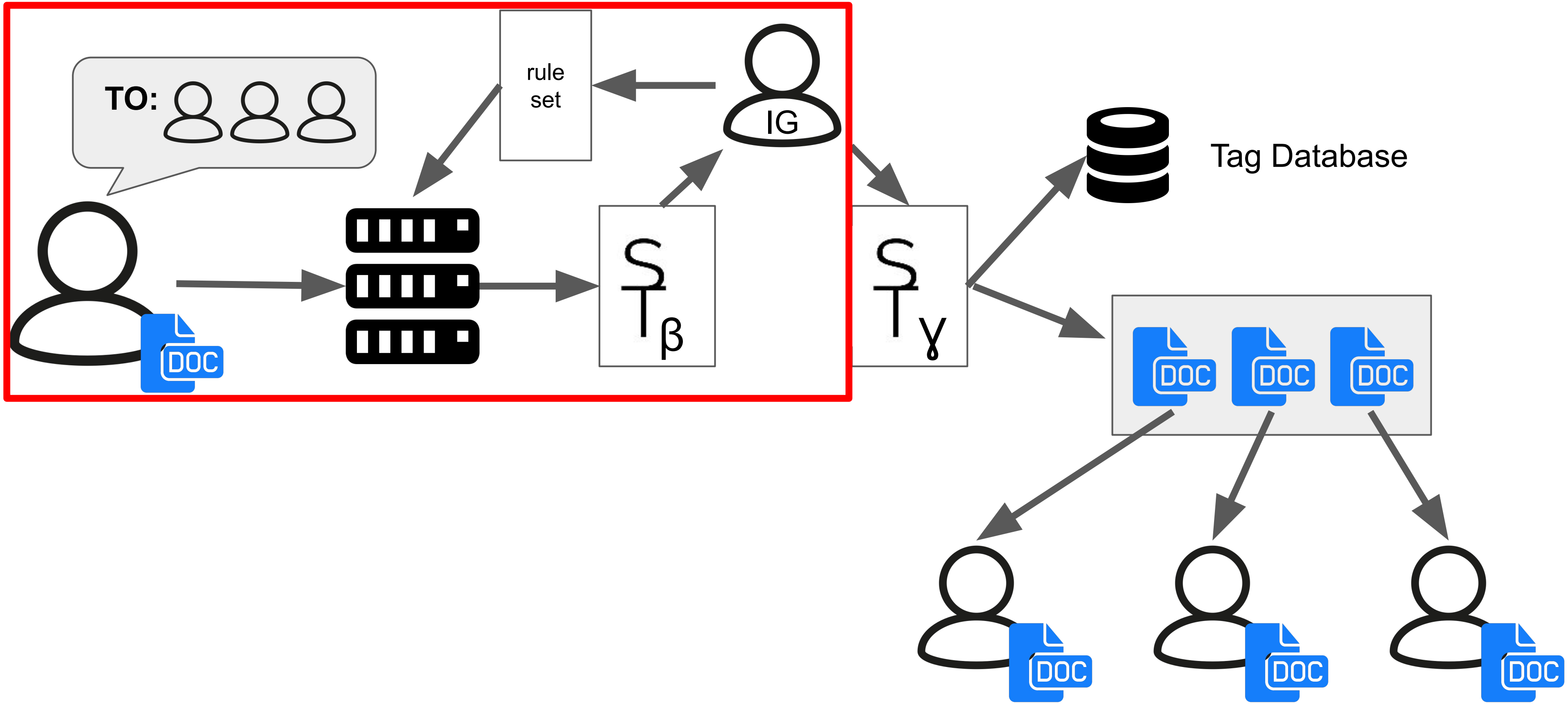
Basic Example:

> {Hello|Goodbye} World!

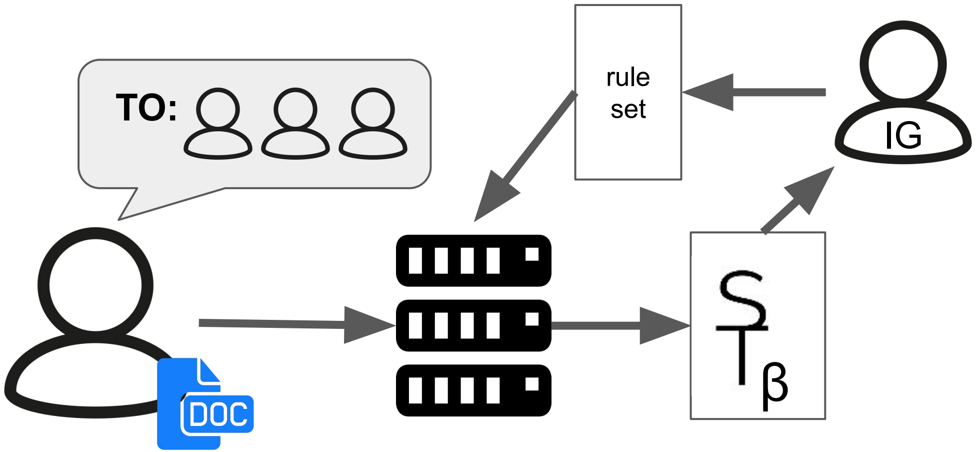
Possible Outputs (2 total):

- "Hello World!"
- "Goodbye World!"

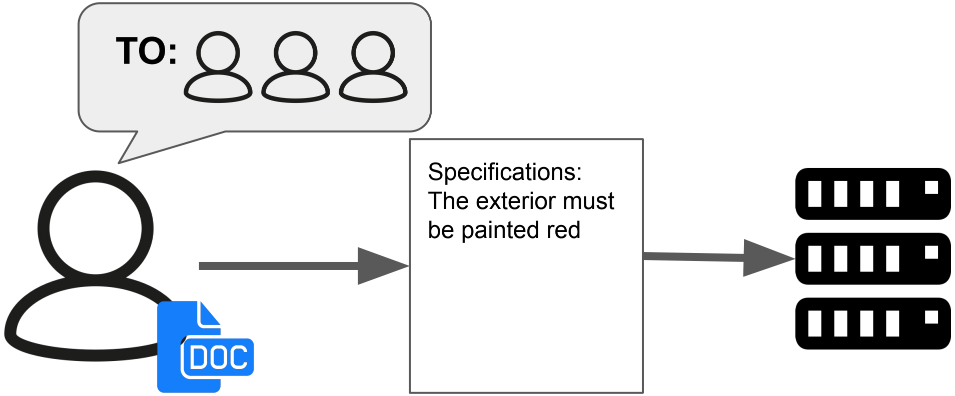
With Tailspin



With Tailspin

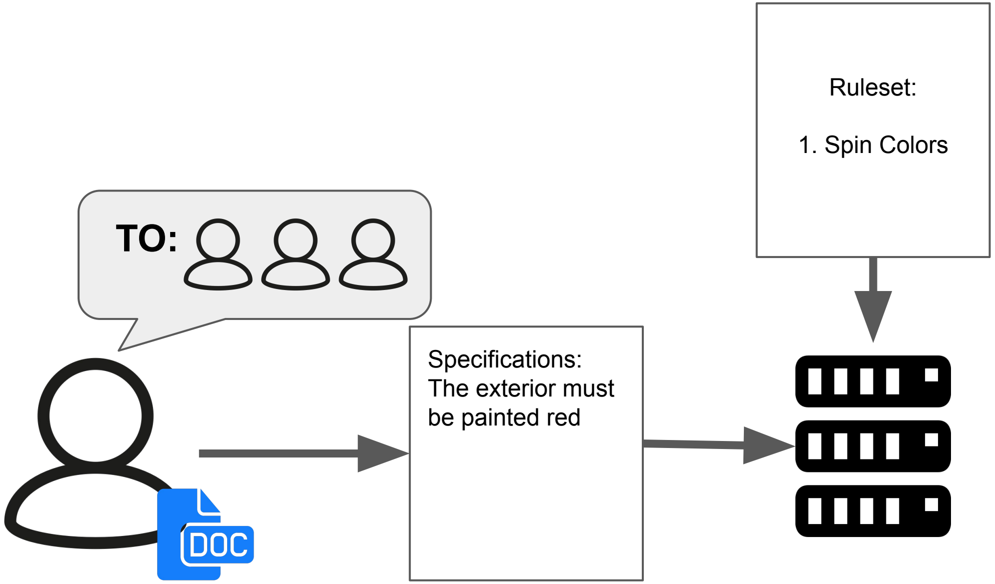


With Tailspin



Specifications:
The exterior must
be painted red

With Tailspin



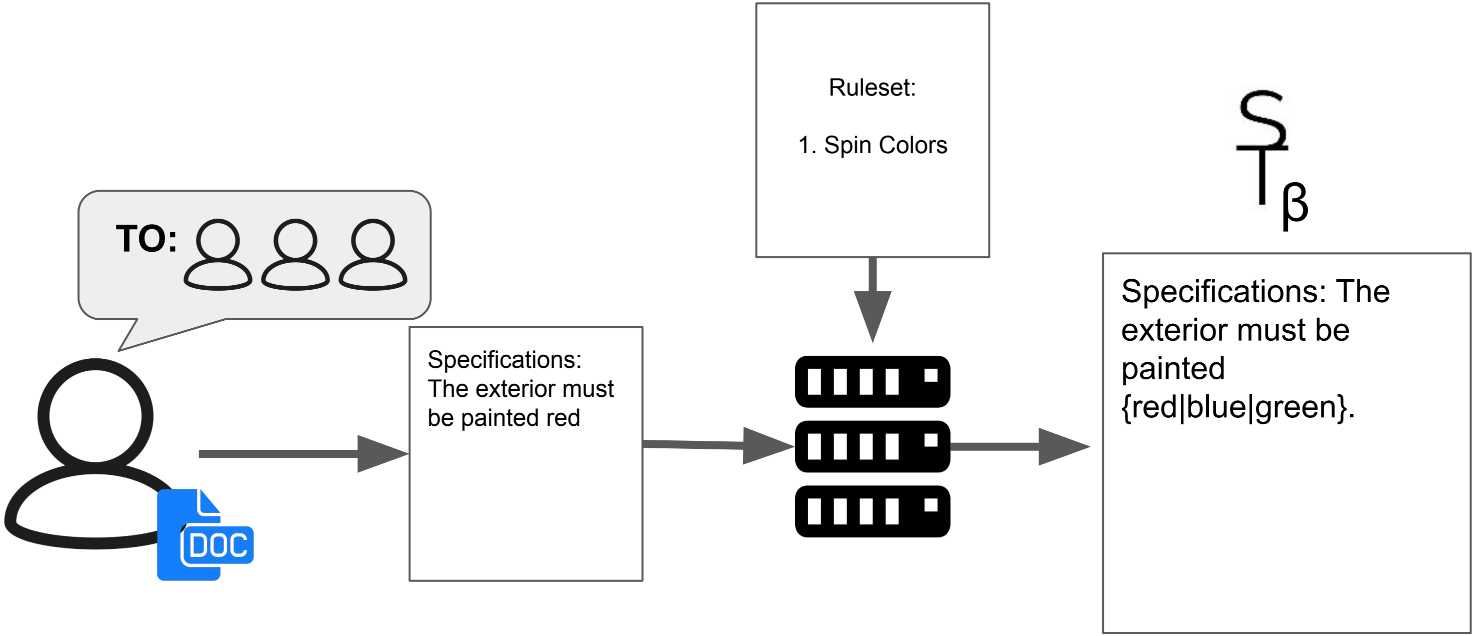
TO:

Specifications:
The exterior must
be painted red

Ruleset:

1. Spin Colors

With Tailspin



TO:

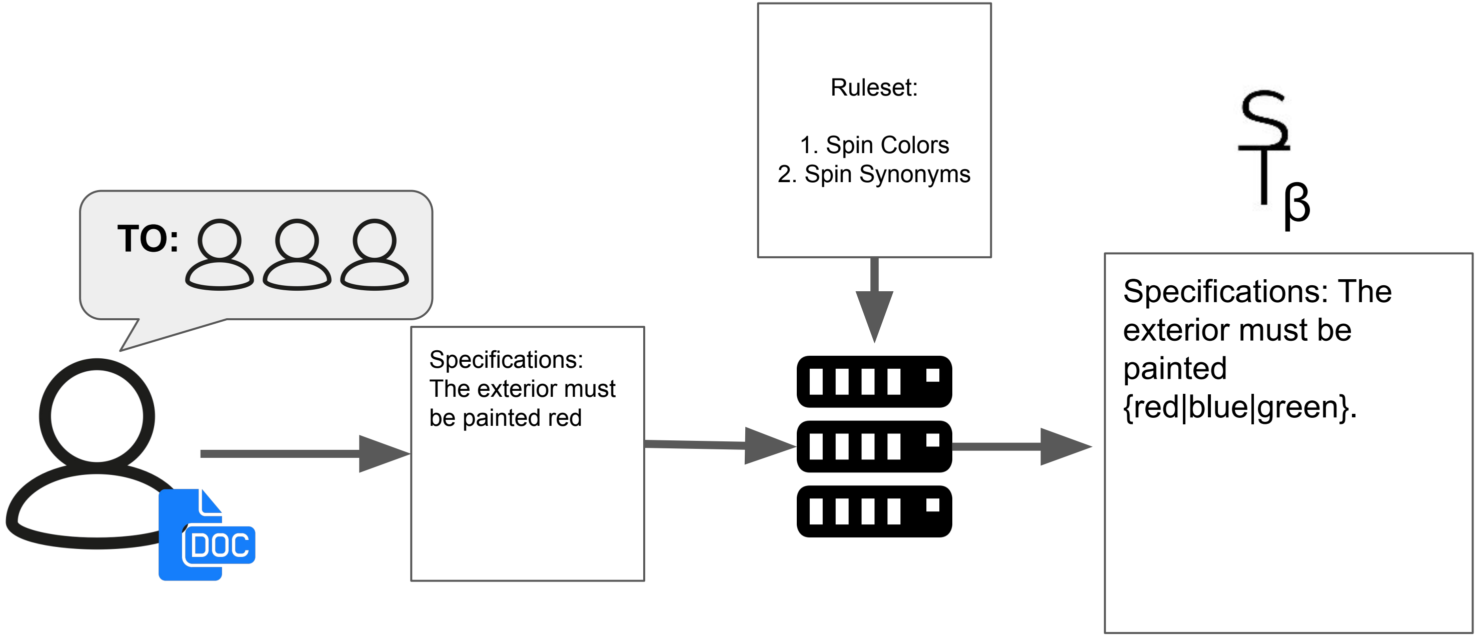
Specifications: The exterior must be painted red

Ruleset:

1. Spin Colors

Specifications: The exterior must be painted {red|blue|green}.

With Tailspin



TO:

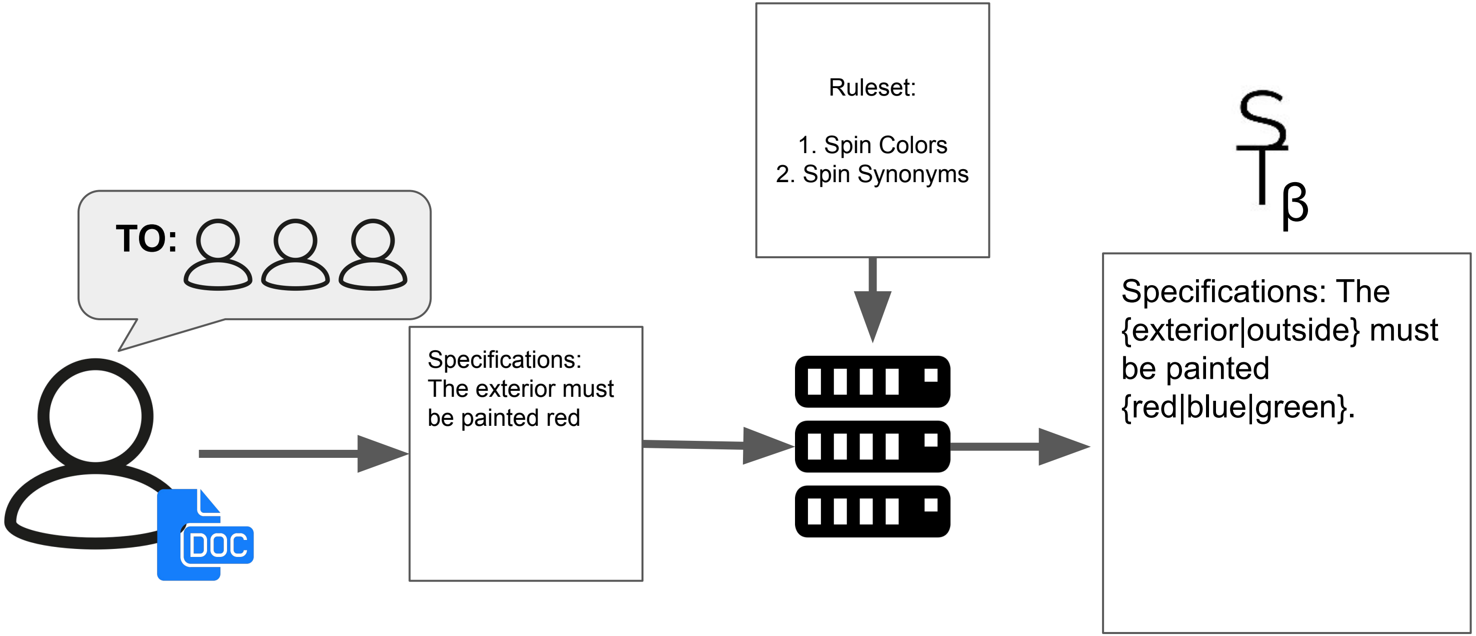
Specifications: The exterior must be painted red

Ruleset:

1. Spin Colors
2. Spin Synonyms

Specifications: The exterior must be painted {red|blue|green}.

With Tailspin



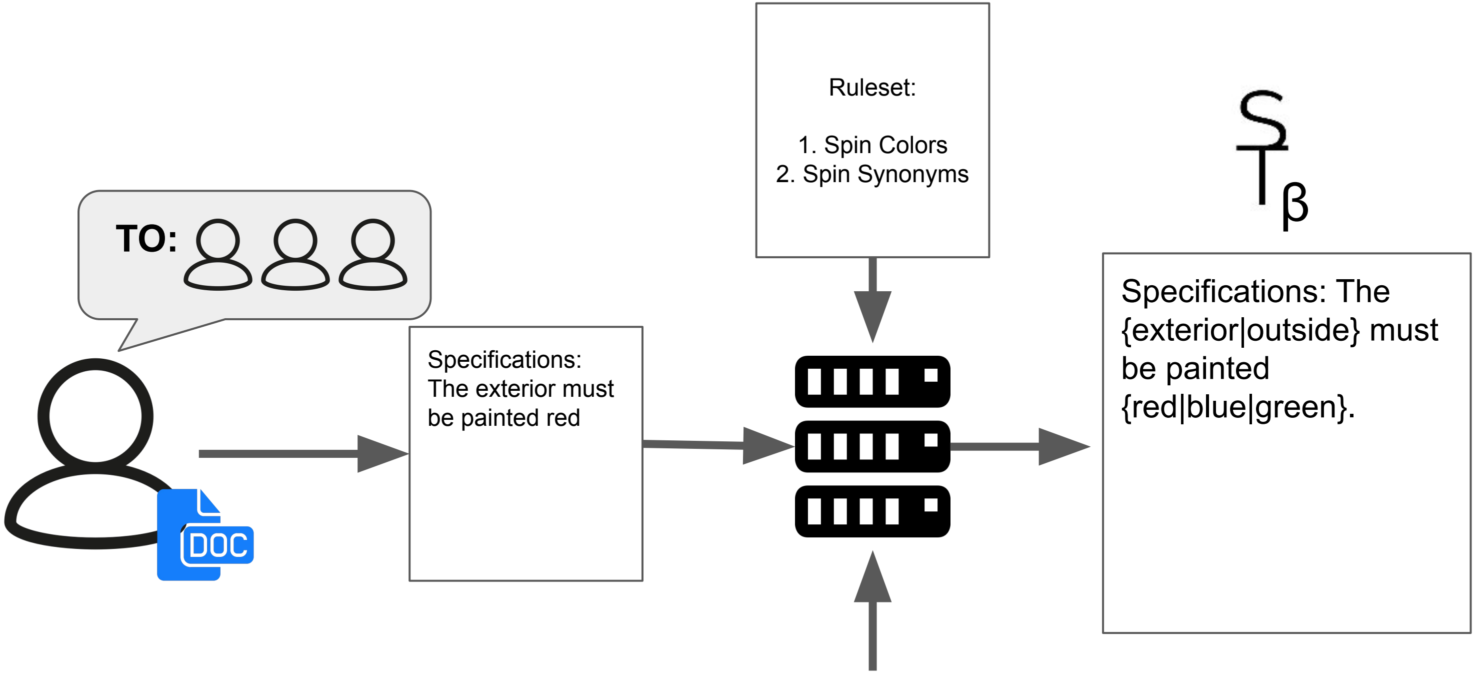
Specifications: The exterior must be painted red

Ruleset:

1. Spin Colors
2. Spin Synonyms

Specifications: The {exterior|outside} must be painted {red|blue|green}.

With Tailspin



Specifications:
The exterior must
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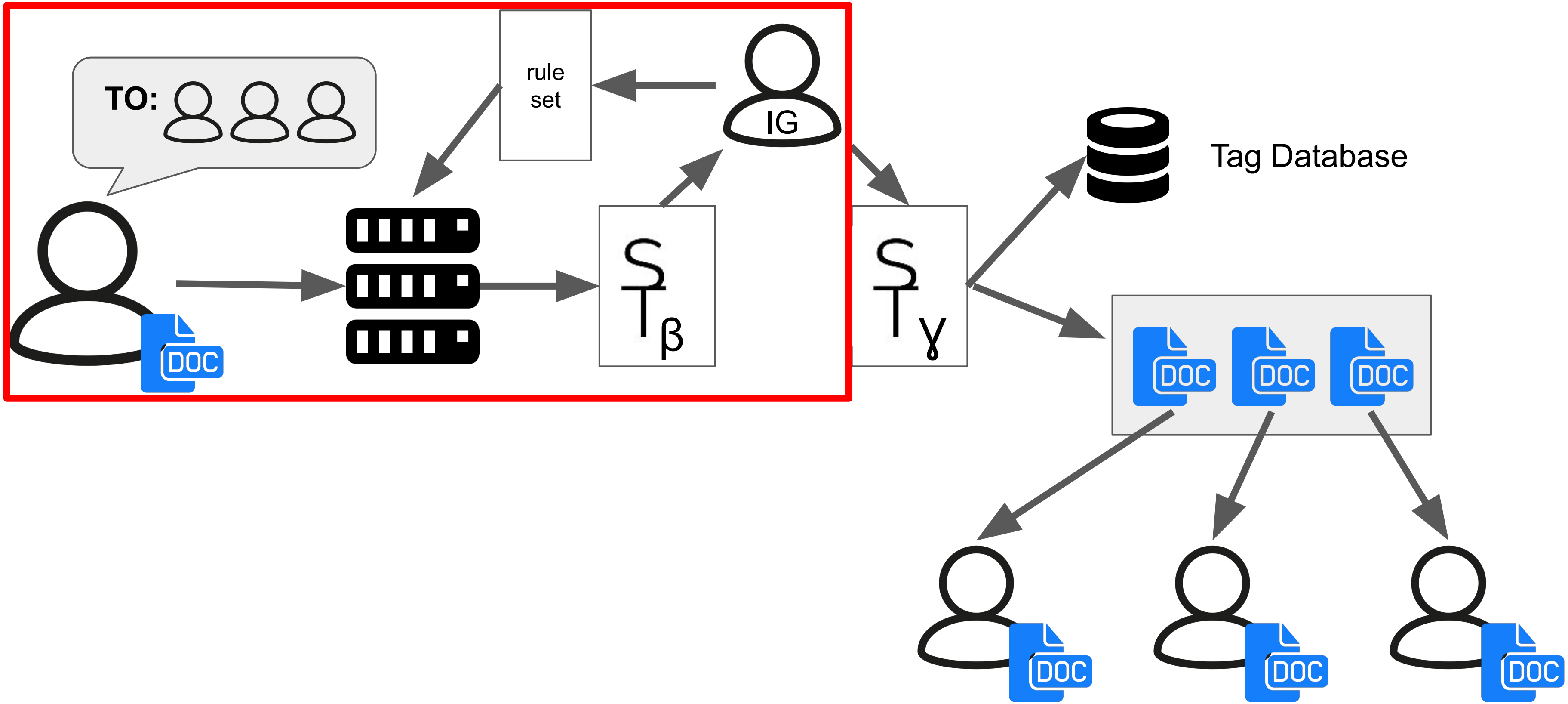
Ruleset:

1. Spin Colors
2. Spin Synonyms

Specifications: The {exterior|outside} must be painted {red|blue|green}.

Doing this convincingly is a very difficult NLP challenge!

With Tailspin



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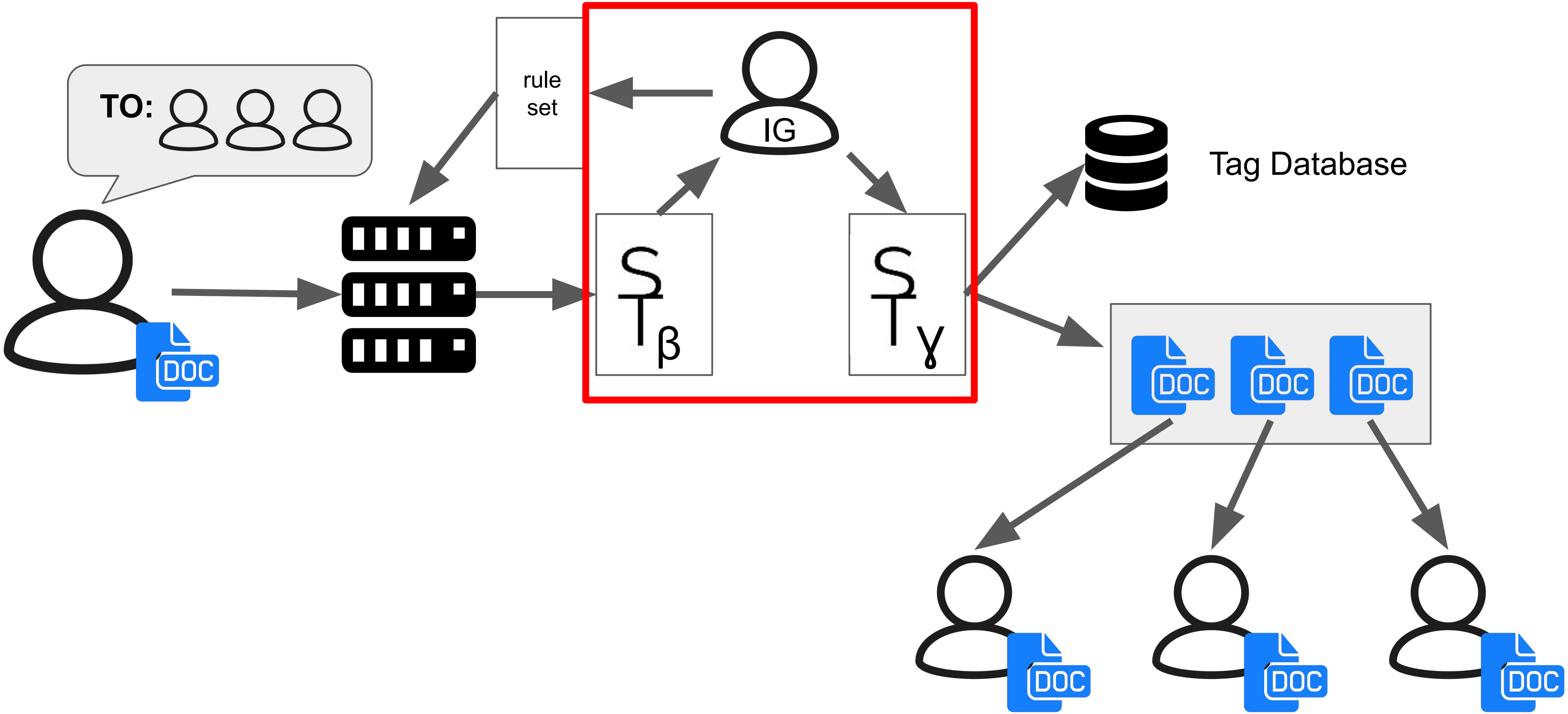
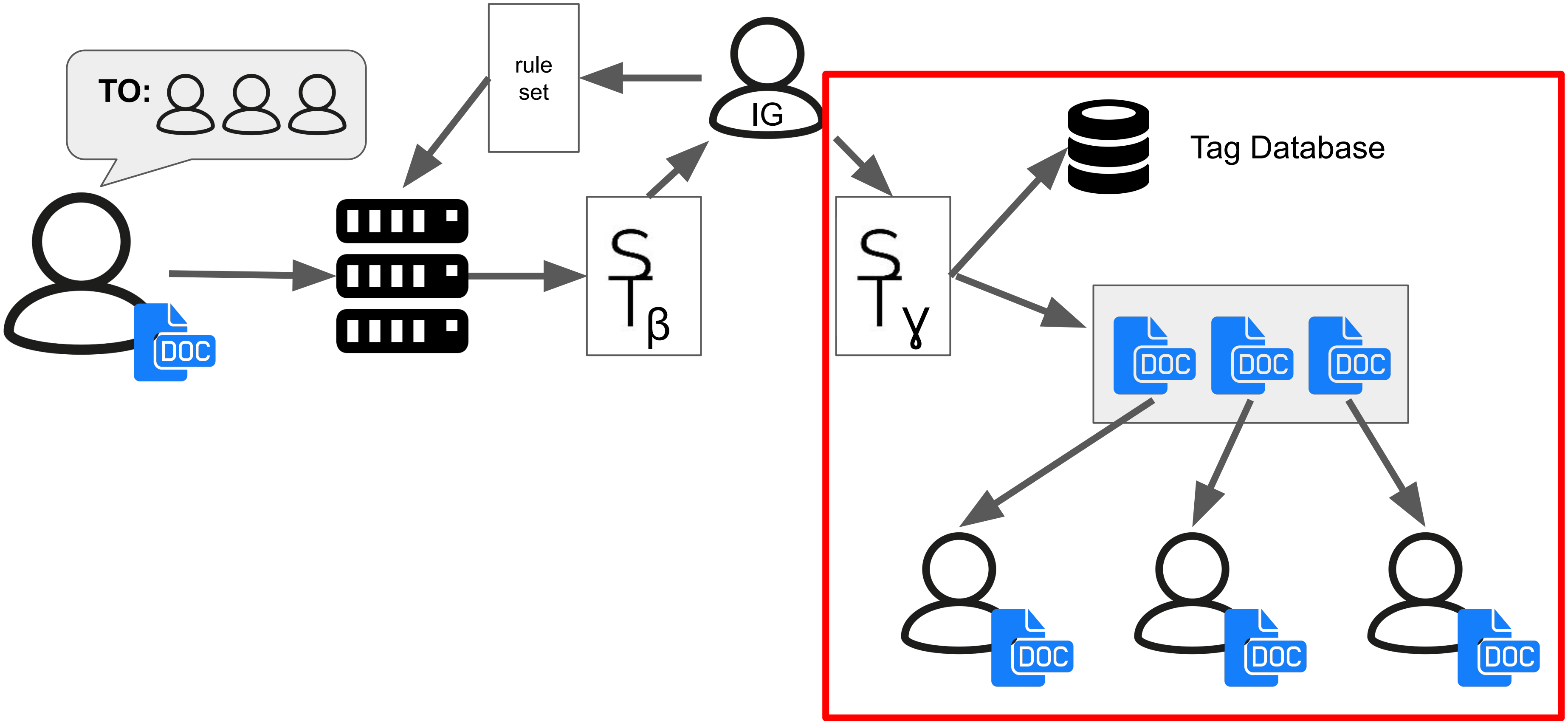
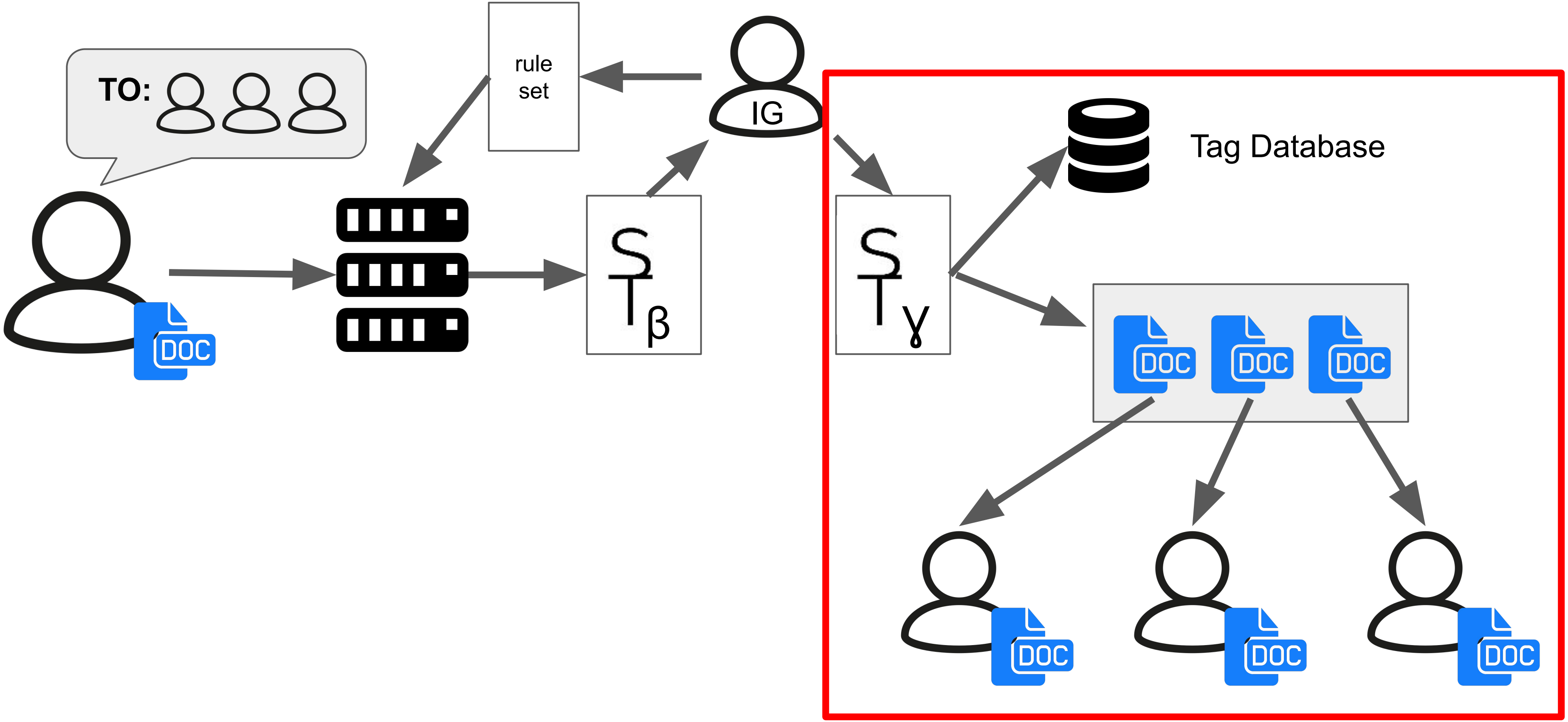


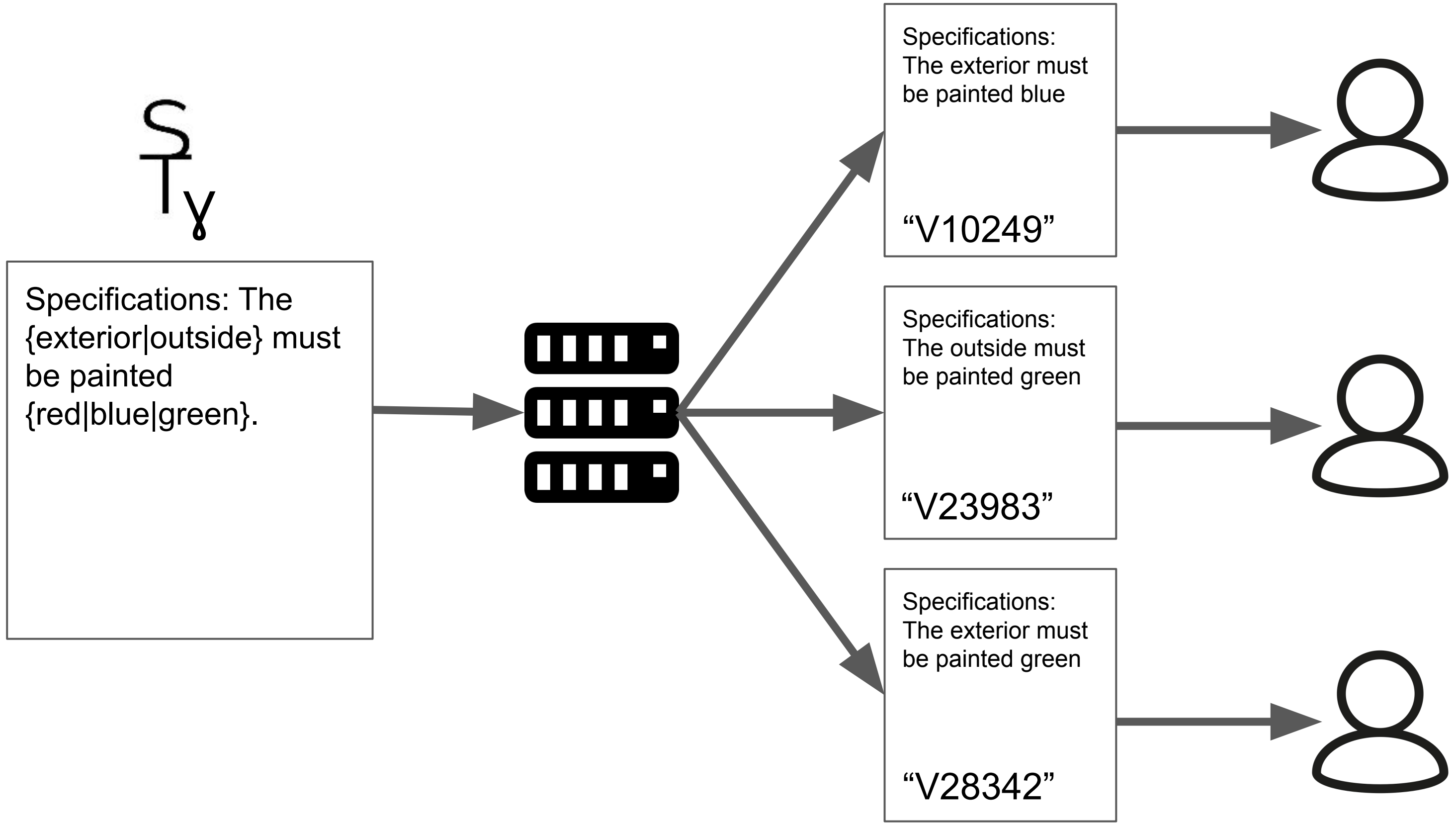
With Tailspin



With Tailspin



With Tailspin



Specifications: The {exterior|outside} must be painted {red|blue|green}.

Specifications: The exterior must be painted blue

“V10249”

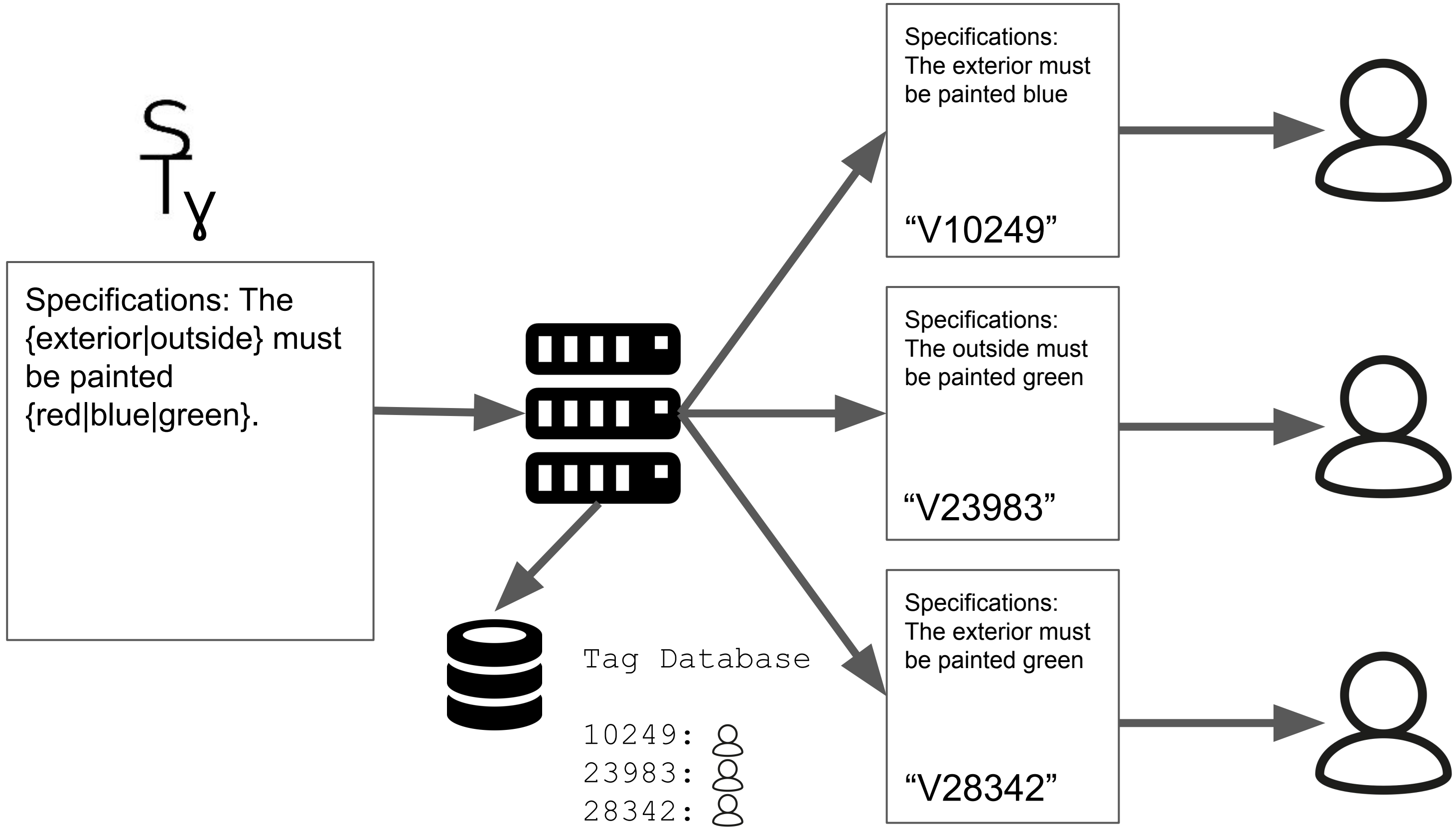
Specifications: The outside must be painted green

“V23983”

Specifications: The exterior must be painted green

“V28342”

With Tailspin



Specifications: The {exterior|outside} must be painted {red|blue|green}.

Specifications: The exterior must be painted blue

“V10249”

Specifications: The outside must be painted green

“V23983”

Specifications: The exterior must be painted green

“V28342”

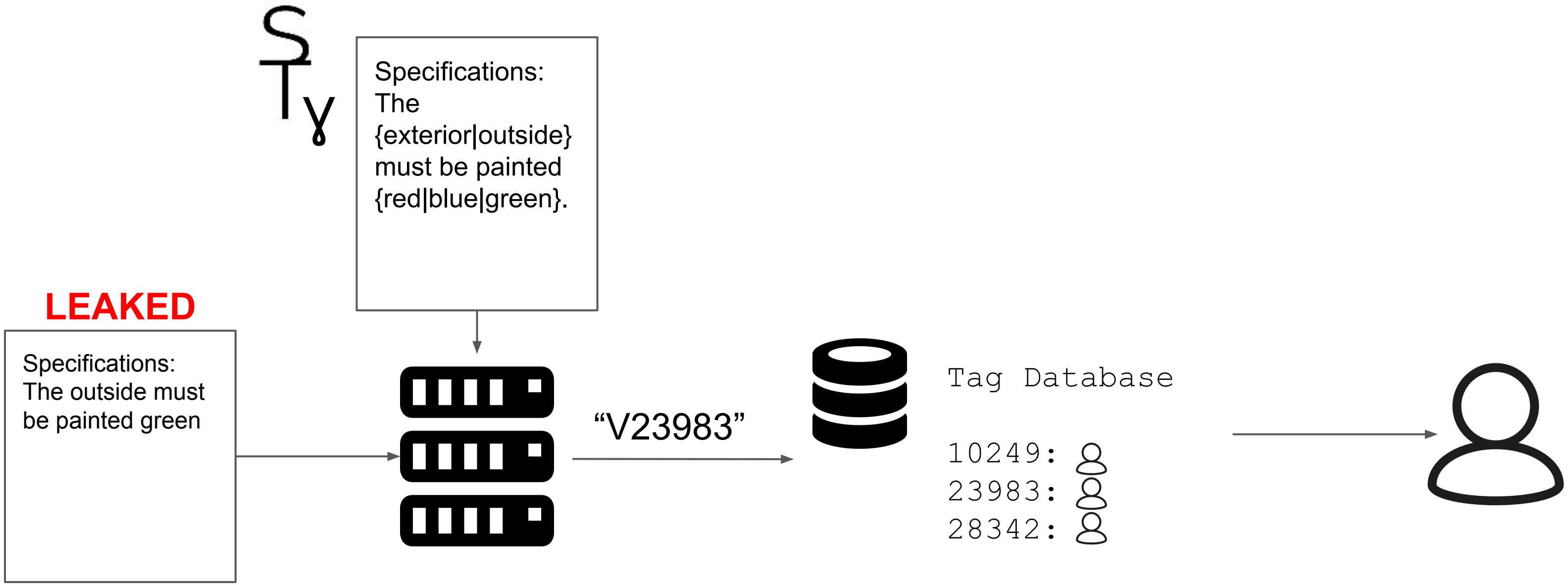
Tag Database

10249:

23983:

28342:

With Tailspin



Specifications:
The {exterior|outside} must be painted {red|blue|green}.

LEAKED

Specifications:
The outside must be painted green

“V23983”

Tag Database

10249:
23983:
28342:

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Objective 2: use data science to build a dynamic threat model.

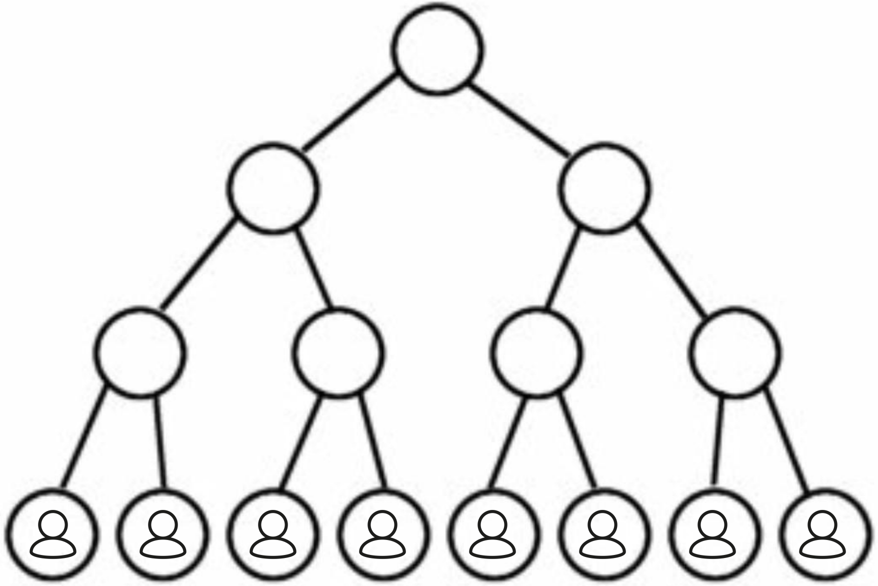
Red-Black Modelling

Red-Black Modelling uses individual data points to construct a comprehensive risk model.

Red-Black Modelling

Red-Black Modelling uses individual data points to construct a comprehensive risk model.

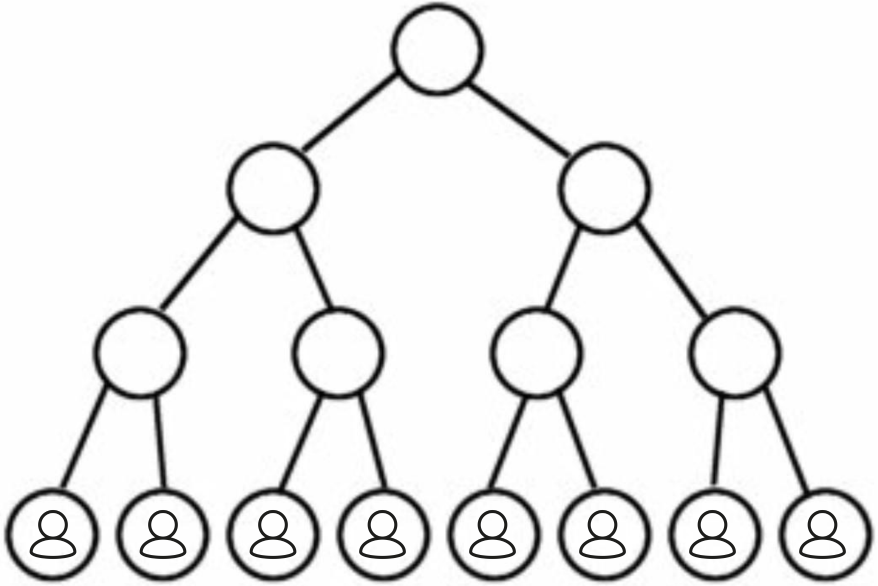
A tree is constructed with document recipients at the leaf nodes.



Red-Black Modelling (Simple Example)

Suppose you have a piece of data you wish to share with a set of personnel...

D_1



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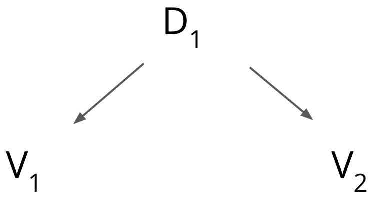
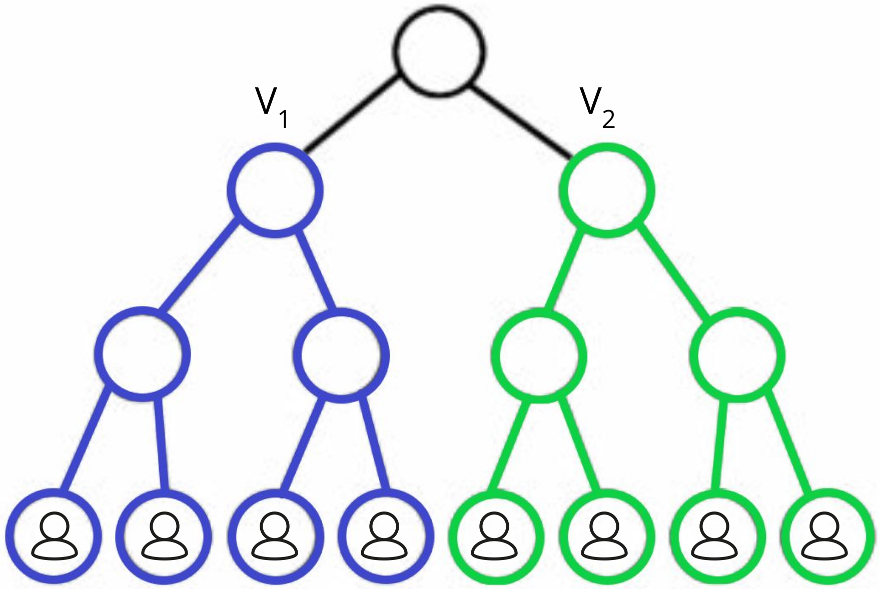
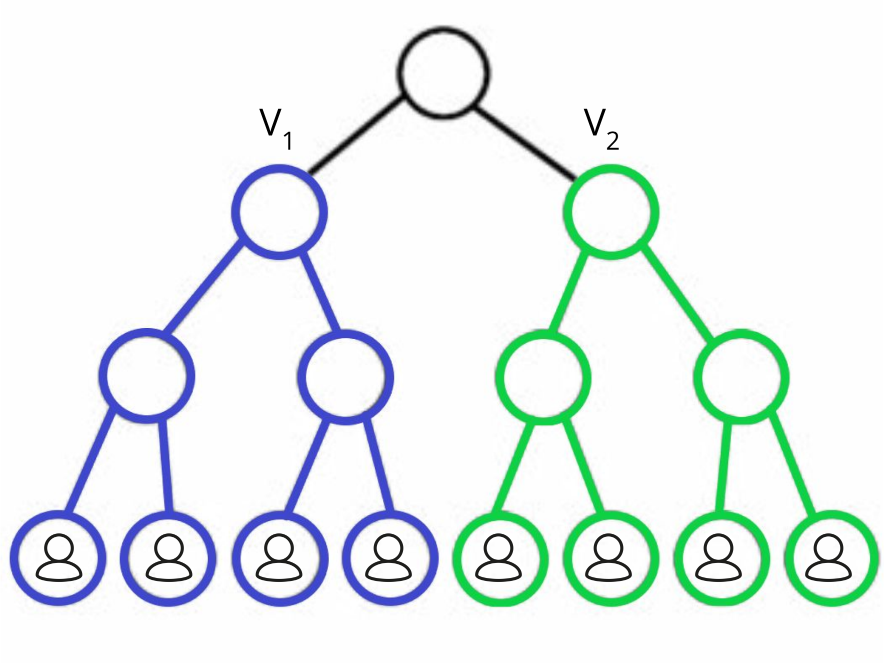
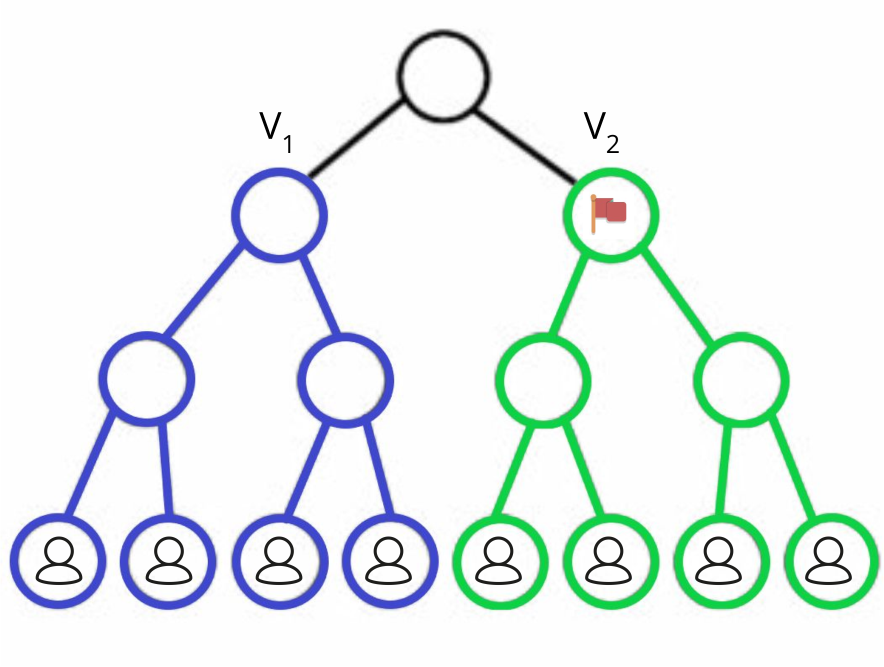




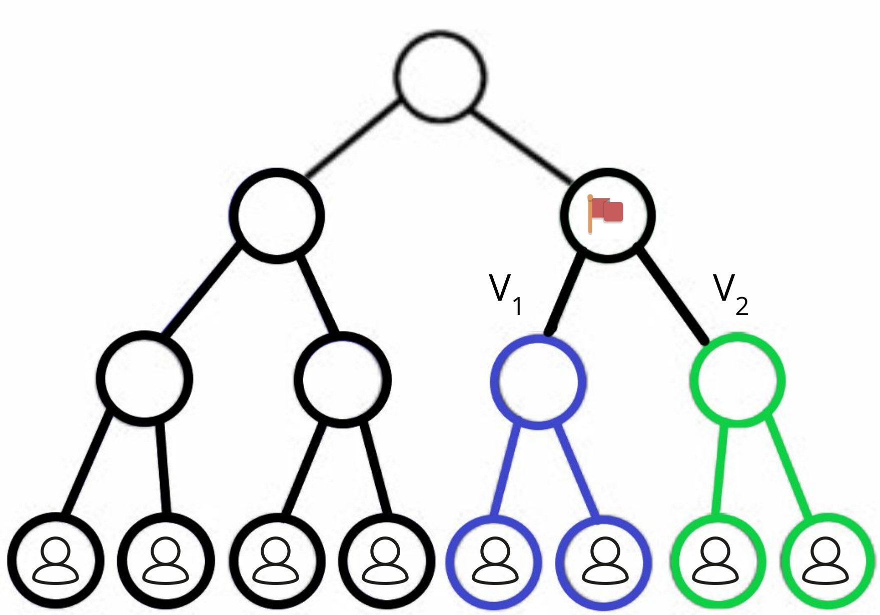
Red-Black Modelling (Simple Example)



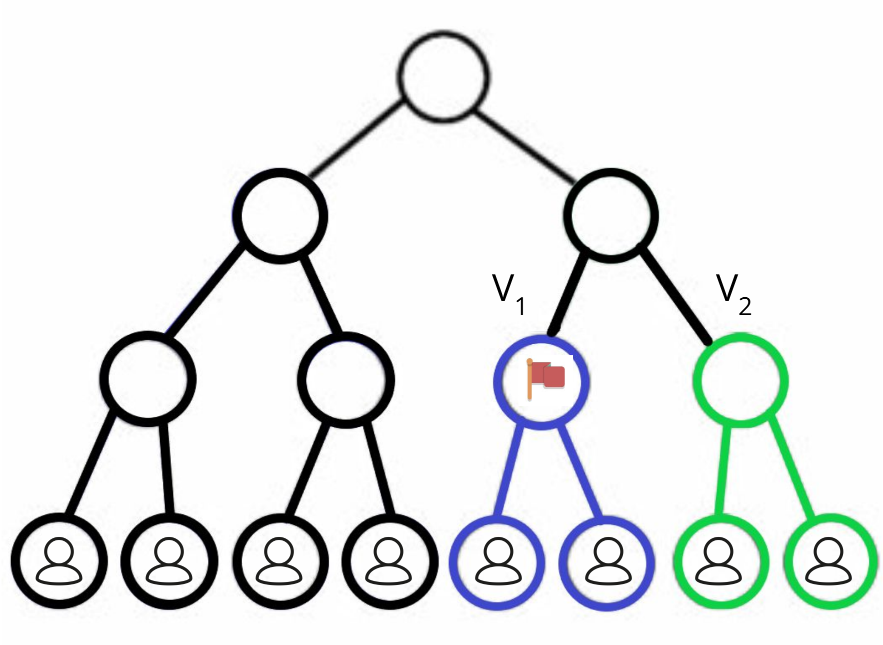
Leak Occurs at v_2



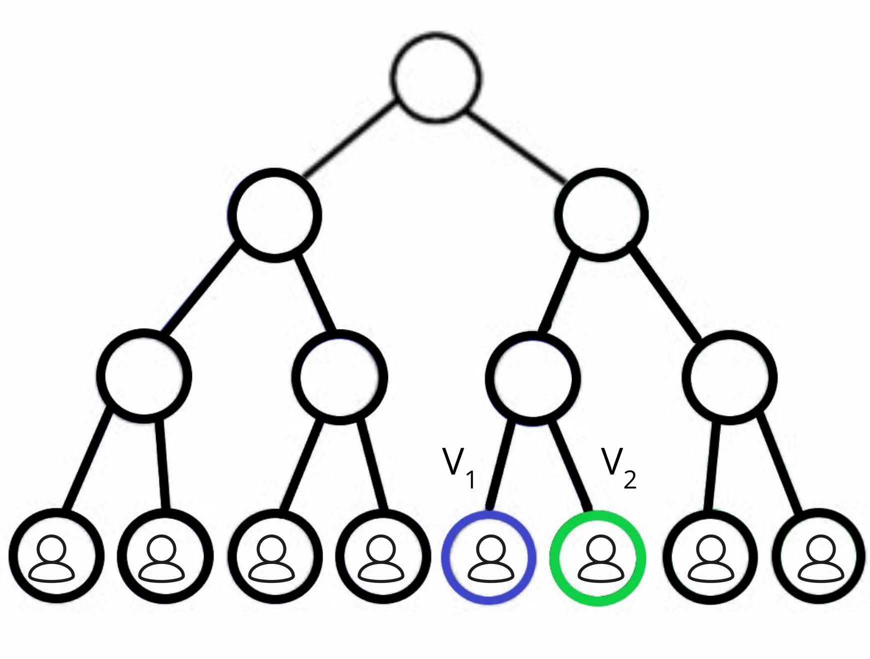
D_2: v_1 and v_2 sent relative to flag



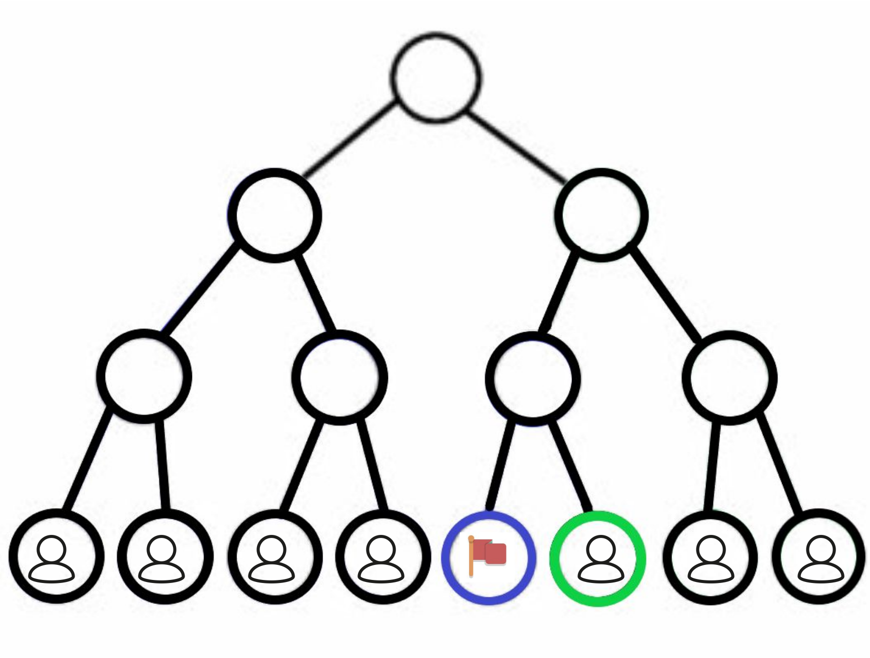
Leak Occurs at v_1



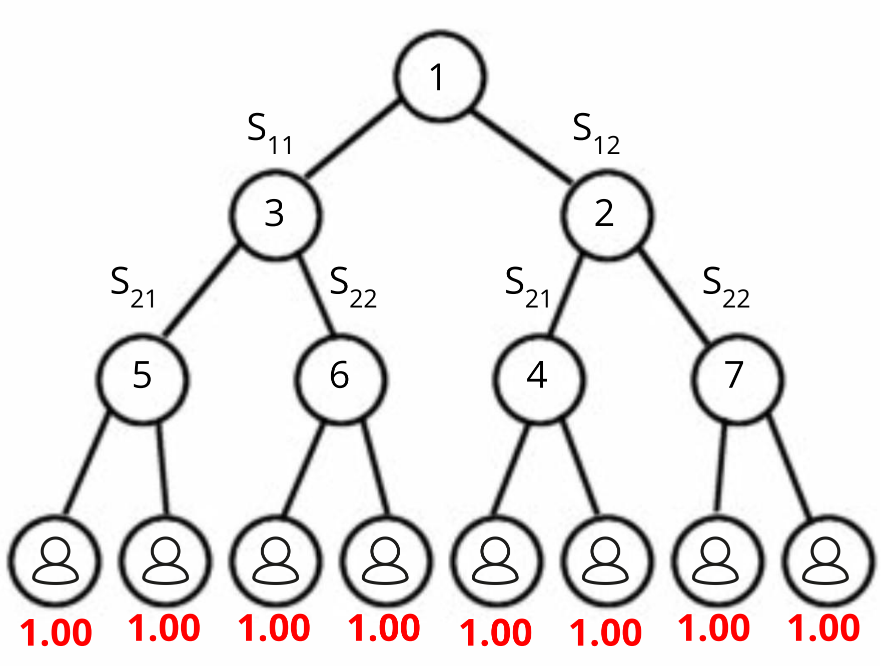
D_3: v_1 and v_2 sent relative to flag



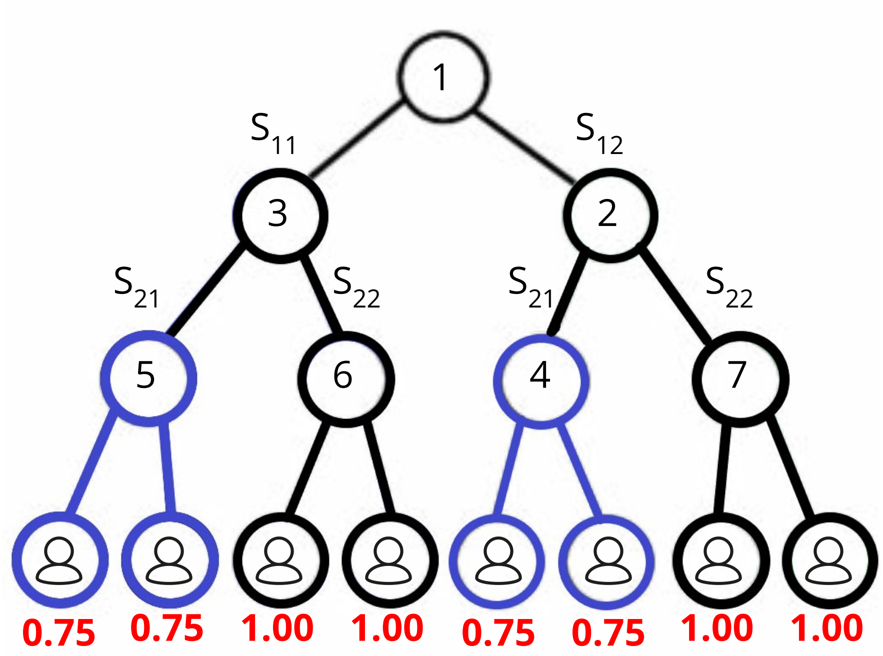
Leak Occurs at v_1: suspect identified



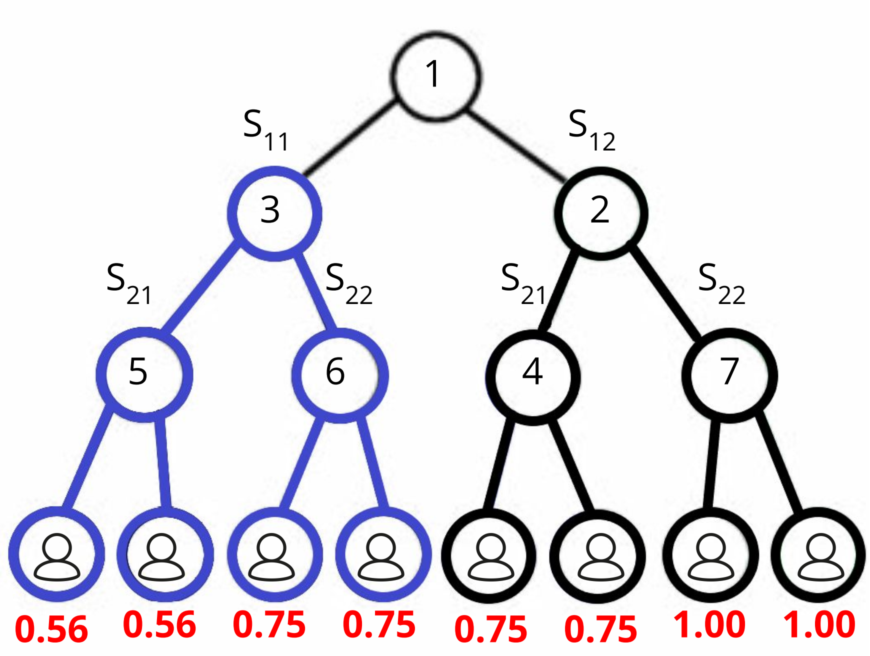
True Red-Black Threat Model



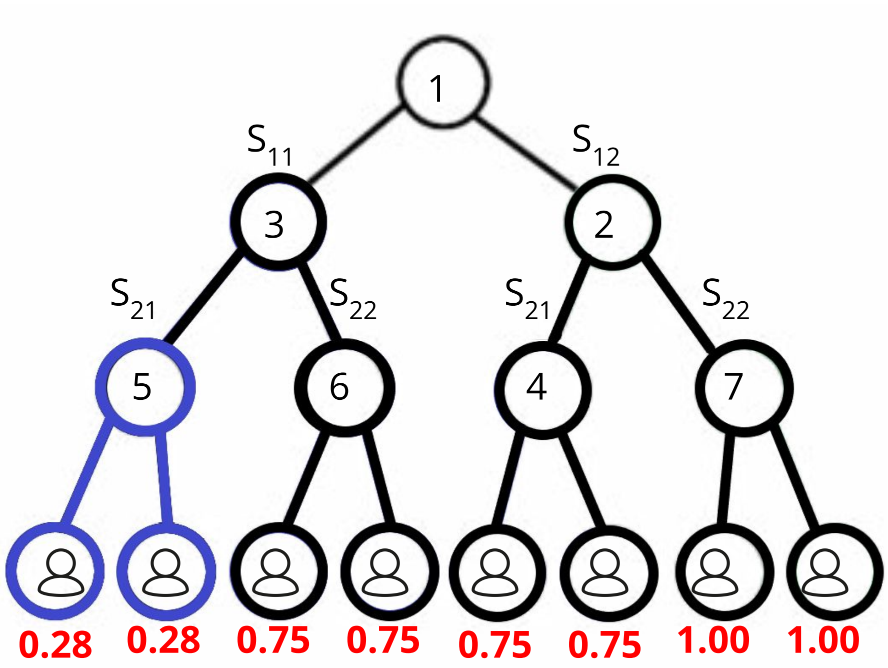
True Red-Black Threat Model

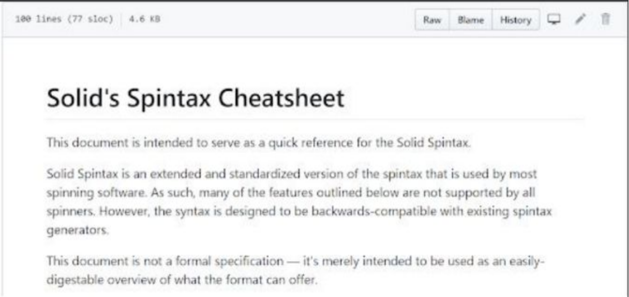


True Red-Black Threat Model



True Red-Black Threat Model





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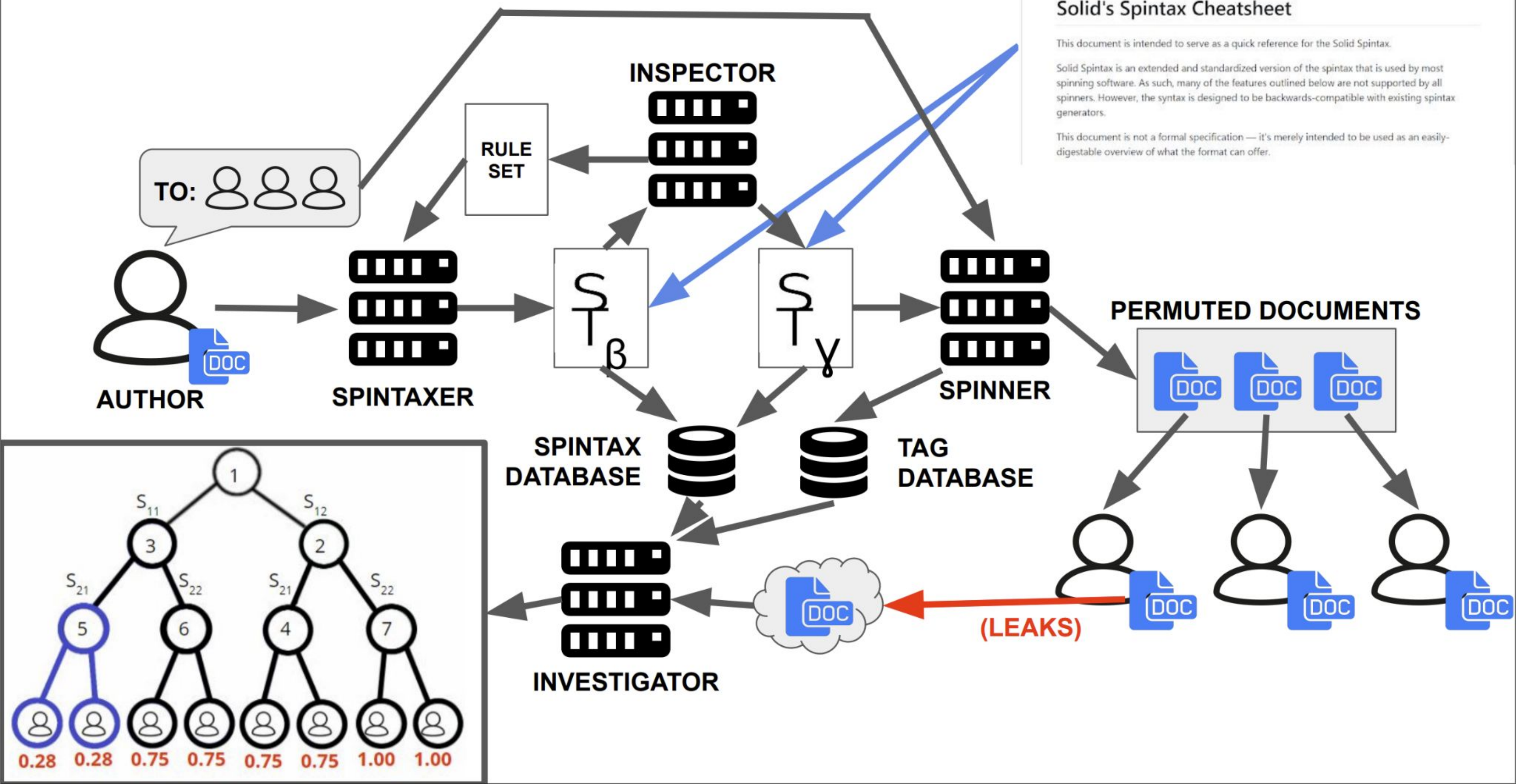
TO:
AUTHOR
DOC
SPINTAXER
RULE SET
INSPECTOR
S T_β
S T_γ
SPINNER
PERMUTED DOCUMENTS
DOC
DOC
DOC
SPINTAX DATABASE
TAG DATABASE
INVESTIGATOR
DOC
DOC
DOC
DOC
(LEAKS)
1
S_{11}
S_{12}
3
2
S_{21}
S_{22}
S_{21}
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0.28
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