



High performance. Delivered.

Building Systems with Ideas

Daniel Jackson, MIT



sneak preview

sneak preview

what does a software designer do?
build idea structures

sneak preview

what does a software designer do?

build idea structures

who designs software?

software designers

analysts and consultants

business process engineers

sneak preview

what does a software designer do?

build idea structures

who designs software?

software designers

analysts and consultants

business process engineers

so what?

to get better software,

focus more on these idea structures

sneak preview

what does a software designer do?

build idea structures

who designs software?

software designers

analysts and consultants

business process engineers

so what?

to get better software,

focus more on these idea structures

and it's not just software

policy, organizational systems

**a story of apps,
good and bad**

Field Trip Permission Form

Dear Parents:

Ms. Frizzle will again be taking her second grade class on an exciting field trip. Please sign and return the permission slip below.

Thank you!

Yes, I give permission for my child to go on the second grade "Touch and Feel" trip on Friday February 13th to the NastyCo Nuclear Dump. I understood that my child may encounter the normal risks of childhood play, including grazed knees, hurt feelings and exposure to toxic waste.

Parents signature

Date

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Count Olaf

Parents signature

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Count Olaf

February 11, 2013

Parents signature

Date

adobe acrobat to the rescue?

The image shows a screenshot of the Adobe Acrobat Reader application. The main window displays a document with the following text:

Parents:

Frizzle will again be taking her second grade
ting field trip. Please sign and return the pe
W.

Thank you!

I give permission for my child to go on the s
ch and Feel" trip on Friday February 13th to t
ear Dump. I understood that my child may encou
al risks of childhood play, including grazed l
ings and exposure to toxic waste.

Parents signature _____ Date _____

The top toolbar includes icons for Create, Save, Print, Email, Settings, Comments, Text, and other functions. The right-hand sidebar is open, showing the following menu items:

- Pages
 - Rotate
 - Delete
 - Extract
 - Replace
 - Crop
 - Split Document
- Insert Pages
 - Insert from File
 - More Insert Options
- Edit Page Design
 - Header & Footer
 - Background
 - Watermark
 - Bates Numbering
- Content
- Forms
- Action Wizard
- Recognize Text
- Protection
- Sign & Certify

adobe acrobat to the rescue?

The image shows a screenshot of the Adobe Acrobat application interface. At the top, there is a toolbar with various icons for file operations and editing. Below the toolbar, a document is open, displaying a text field with the following content:

Parents:

Frizzle will again be taking her second grade
ting field trip. Please sign and return the pe
W.

Overlaid on the bottom of the document is a text editor window titled "acrobat-sig-paste.txt". The text in this window is as follows:

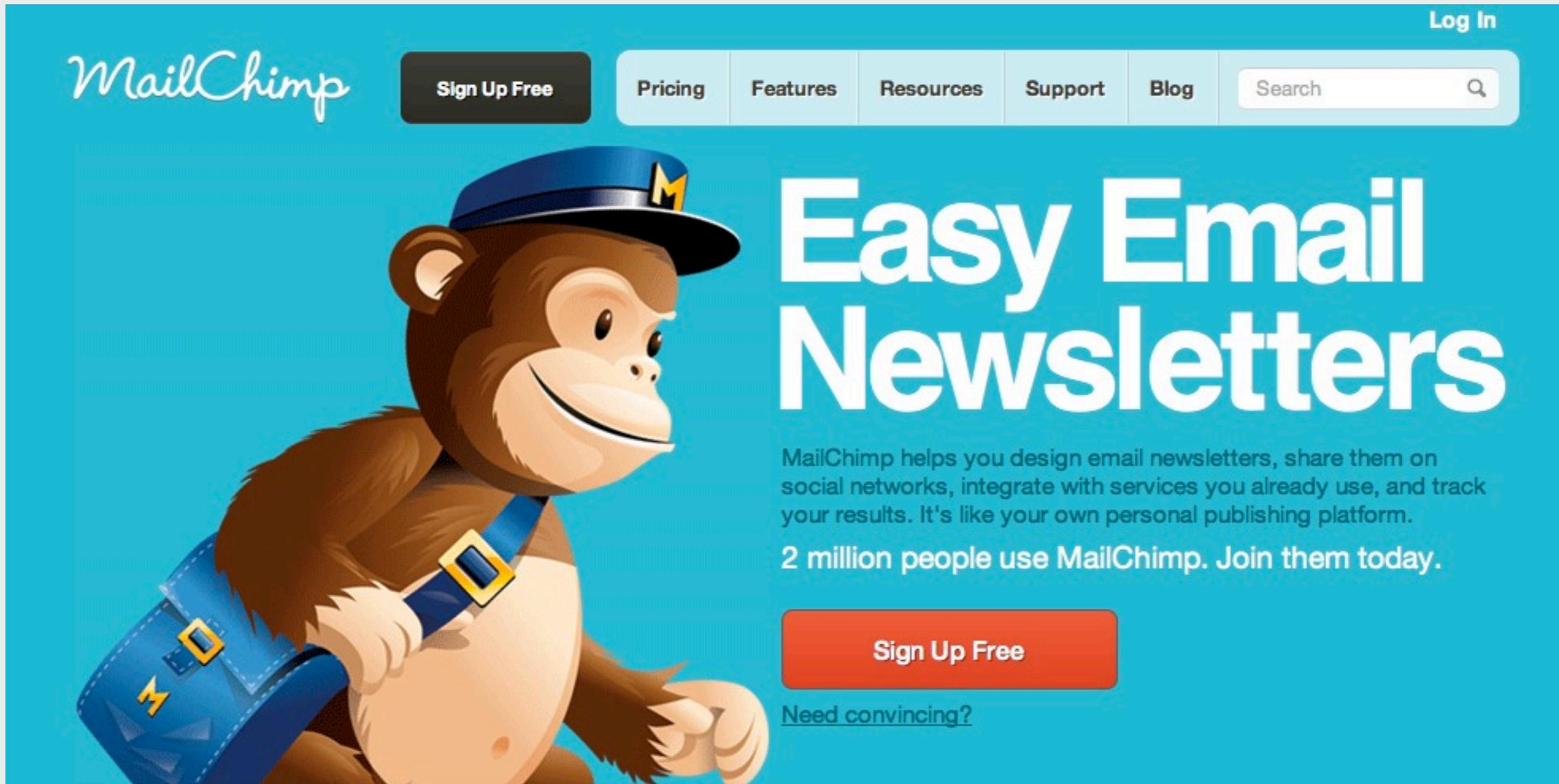
```
1 how to add a signature in acrobat
2 -- open document in acrobat
3 -- Tools->Advanced Editing->Touchup Object Tool
4 -- right click at desired point | Place Image...
5 then select jpg
6
7 how to add date
8 -- Tools->Typewriter
9
```

On the right side of the application, a sidebar menu is visible, listing various page and document actions:

- Pages
 - Rotate
 - Delete
 - Extract
 - Replace
 - Crop
 - Split Document
- Insert Pages
 - Insert from File
 - More Insert Options
- Edit Page Design
 - Header & Footer
 - Background
 - Watermark
 - Bates Numbering
- Content
- Forms
- Action Wizard
- Recognize Text
- Protection
- Sign & Certify

need a friendlier interface?

need a friendlier interface?



The image shows the top portion of the MailChimp website. On the left, the MailChimp logo is written in a white, cursive font. To its right is a dark blue button with the text "Sign Up Free". Further right is a navigation menu with links for "Pricing", "Features", "Resources", "Support", and "Blog". A search bar with the placeholder text "Search" and a magnifying glass icon is located to the right of the navigation menu. In the top right corner, there is a "Log In" link. The main hero section features a large illustration of a brown monkey wearing a blue cap with a yellow "M" and a blue messenger bag with a yellow buckle. To the right of the monkey, the headline "Easy Email Newsletters" is written in large, white, sans-serif font. Below the headline, a paragraph of text describes the service: "MailChimp helps you design email newsletters, share them on social networks, integrate with services you already use, and track your results. It's like your own personal publishing platform." Below this paragraph is another line of text: "2 million people use MailChimp. Join them today." At the bottom of the hero section is a large orange button with the text "Sign Up Free". Below the button is a link that says "Need convincing?".

MailChimp

Sign Up Free

Pricing Features Resources Support Blog

Search

Log In

Easy Email Newsletters

MailChimp helps you design email newsletters, share them on social networks, integrate with services you already use, and track your results. It's like your own personal publishing platform.

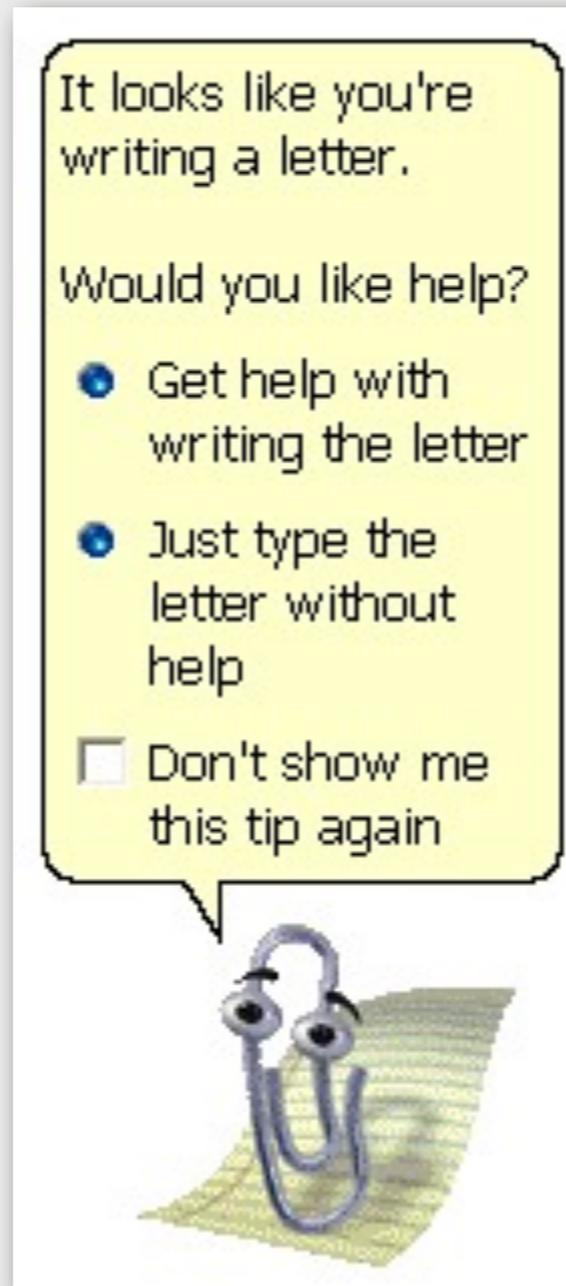
2 million people use MailChimp. Join them today.

Sign Up Free

[Need convincing?](#)

or a helping hand?

or a helping hand?



Clippy
2003-2008
RIP

no: can be complicated & usable

no: can be complicated & usable



i'm not alone

from <http://amplicate.com>

i'm not alone



LR Adobe Photoshop Lightroom is a photography software program developed by Adobe Systems for Mac OS X and Microsoft Windows, designed ... [»](#)

89% Love Lightroom



 **Tweet** 

 **+1** 

2,335 Positive Opinions out of 2,632

i'm not alone

 Adobe Photoshop Lightroom is a photography software program developed by Adobe Systems for Mac OS X and Microsoft Windows, designed ... [»](#)

89% Love Lightroom

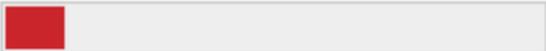


 **3** 

2,335 Positive Opinions out of 2,632

 Adobe Photoshop Lightroom is a photography software program developed by Adobe Systems for Mac OS X and Microsoft Windows, designed ... [»](#)

11% Hate Lightroom



 **5** 

297 Negative Opinions out of 2,632

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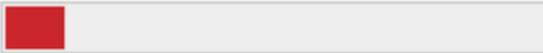


 Tweet 3  +1 

2,335 Positive Opinions out of 2,632

 Adobe Photoshop Lightroom is a photography software program developed by Adobe Systems for Mac OS X and Microsoft Windows, designed ... [»](#)

11% Hate Lightroom



 Tweet 5  +1 

297 Negative Opinions out of 2,632

 Adobe Acrobat is a family of computer programs developed by Adobe Systems, designed to view, create, manipulate and manage files ... [»](#)

47% Love Acrobat



 Tweet 1  +1 

207 Positive Opinions out of 444

i'm not alone

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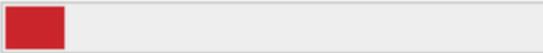


 **Tweet** 3  **+1** 

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 **Tweet** 1  **+1** 

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 Adobe Acrobat is a family of computer programs developed by Adobe Systems, designed to view, create, manipulate and manage files ... [»](#)

53% Hate Acrobat



 **Tweet** 15  **+1** 

237 Negative Opinions out of 444

i'm not alone

 Adobe Photoshop Lightroom is a photography software program developed by Adobe Systems for Mac OS X and Microsoft Windows, designed ... [»](#)

89% Love Lightroom



 Tweet 3  +1 +

2,335 Positive Opinions out of 2,632

 Adobe Photoshop is a graphics editing program developed and published by Adobe Systems Incorporated.

70% Love Photoshop



 Tweet 87  +1 +

30,305 Positive Opinions out of 43,283

 Adobe Acrobat is a family of computer programs developed by Adobe Systems, designed to view, create, manipulate and manage files ... [»](#)

47% Love Acrobat

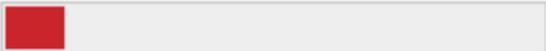


 Tweet 1  +1 +

207 Positive Opinions out of 444

 Adobe Photoshop Lightroom is a photography software program developed by Adobe Systems for Mac OS X and Microsoft Windows, designed ... [»](#)

11% Hate Lightroom



 Tweet 5  +1 +

297 Negative Opinions out of 2,632

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 Tweet 15  +1 +

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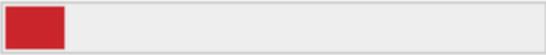


 Tweet 1  +1 +

207 Positive Opinions out of 444

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11% Hate Lightroom

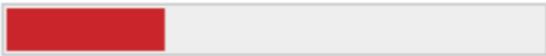


 Tweet 5  +1 +

297 Negative Opinions out of 2,632

 Adobe Photoshop is a graphics editing program developed and published by Adobe Systems Incorporated.

30% Hate Photoshop



 Tweet 105  +1 +

12,978 Negative Opinions out of 43,283

 Adobe Acrobat is a family of computer programs developed by Adobe Systems, designed to view, create, manipulate and manage files ... [»](#)

53% Hate Acrobat



 Tweet 15  +1 +

237 Negative Opinions out of 444

**so what makes
things easy to use?**

James Gibson (1977): "action possibilities" latent in environment



James Gibson (1977): "action possibilities" latent in environment

Donald Norman (1988): action possibilities that are perceivable





Donald Norman

THE DESIGN OF EVERYDAY THINGS

previously published as
THE PSYCHOLOGY
OF EVERYDAY THINGS

D O N A L D A . N O R M A N

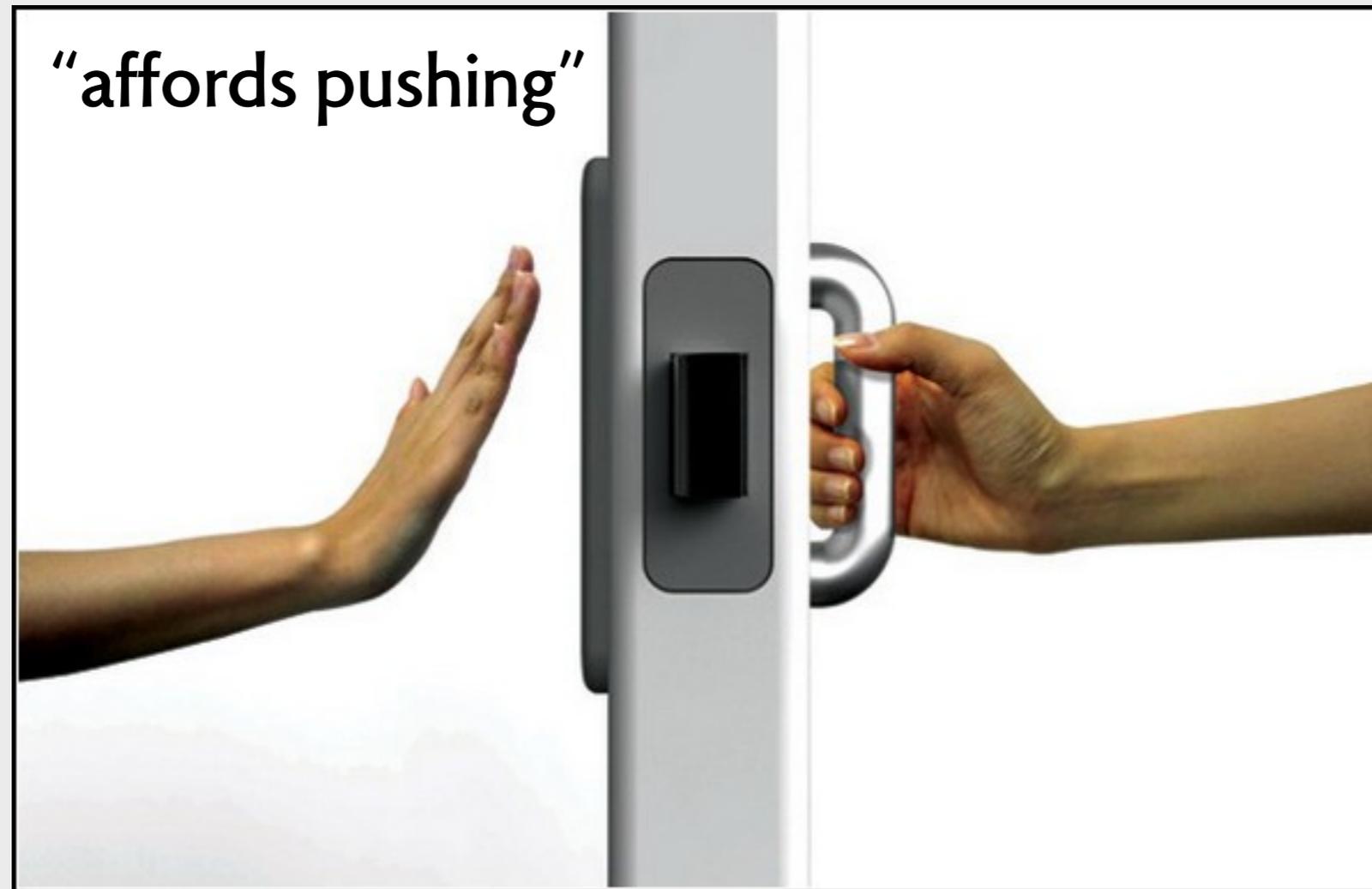


Donald Norman

a door with good affordances



a door with good affordances



a door with good affordances



unhappy doors

unhappy doors



push or pull?

unhappy doors



push or pull?



door with user manual

unhappy doors



push or pull?



door with user manual



unhappy doors



push or pull?

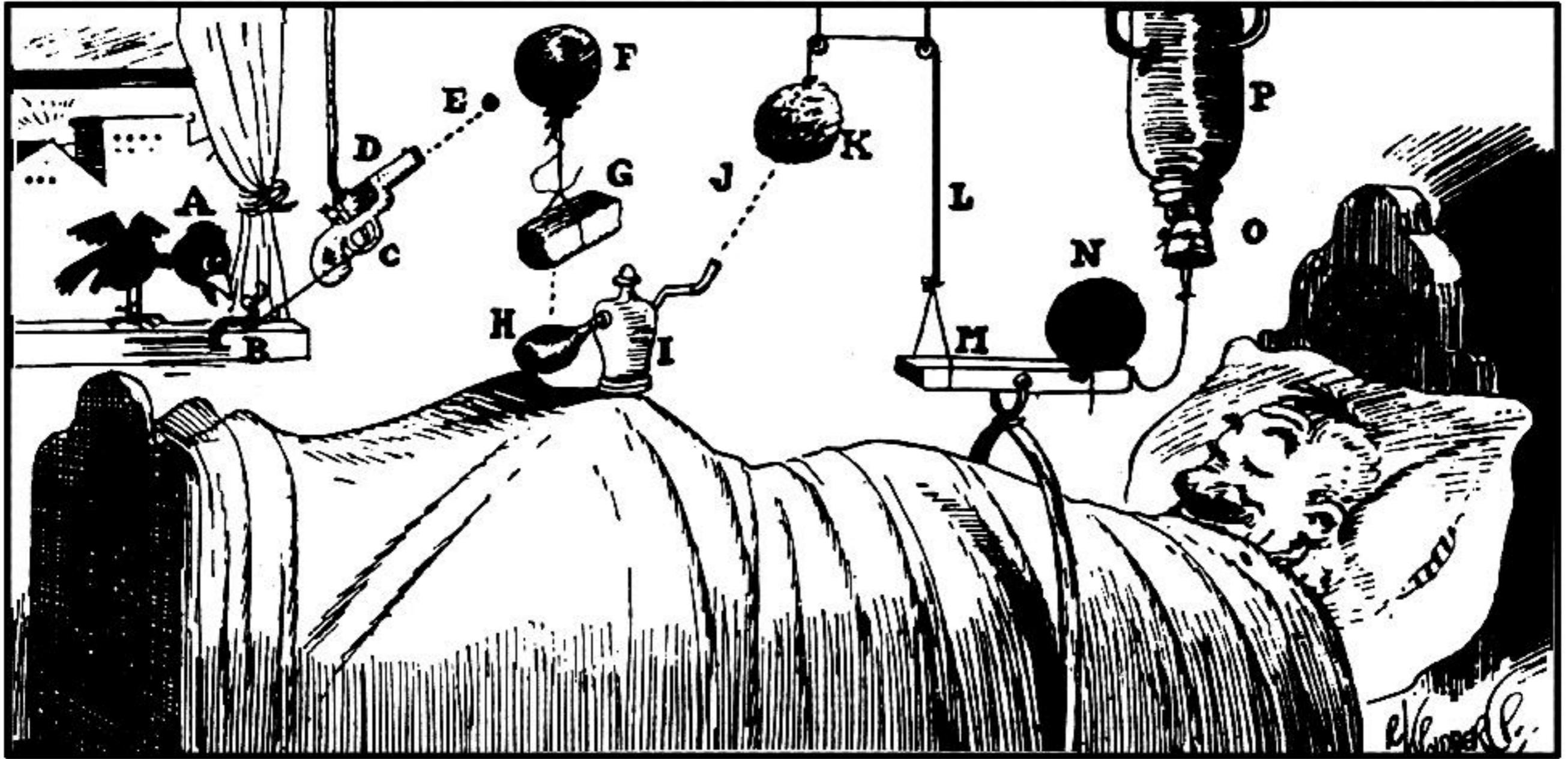


door with user manual



**using more
complex things**

Simple Alarm Clock



The early bird (A) arrives and catches worm (B), pulling string (C) and shooting off pistol (D). Bullet (E) busts balloon (F), dropping brick (G) on bulb (H) of atomizer (I) and shooting perfume (J) on sponge (K)—As sponge gains in weight, it lowers itself and pulls string (L), raising end of board

(M)—Cannon ball (N) drops on nose of sleeping gentleman—String tied to cannon ball releases cork (O) of vacuum bottle (P) and ice water falls on sleeper's face to assist the cannon ball in its good work.

how to use this?



Alarm Clock 1 © 2010 Mark Tomlinson

how to use this?



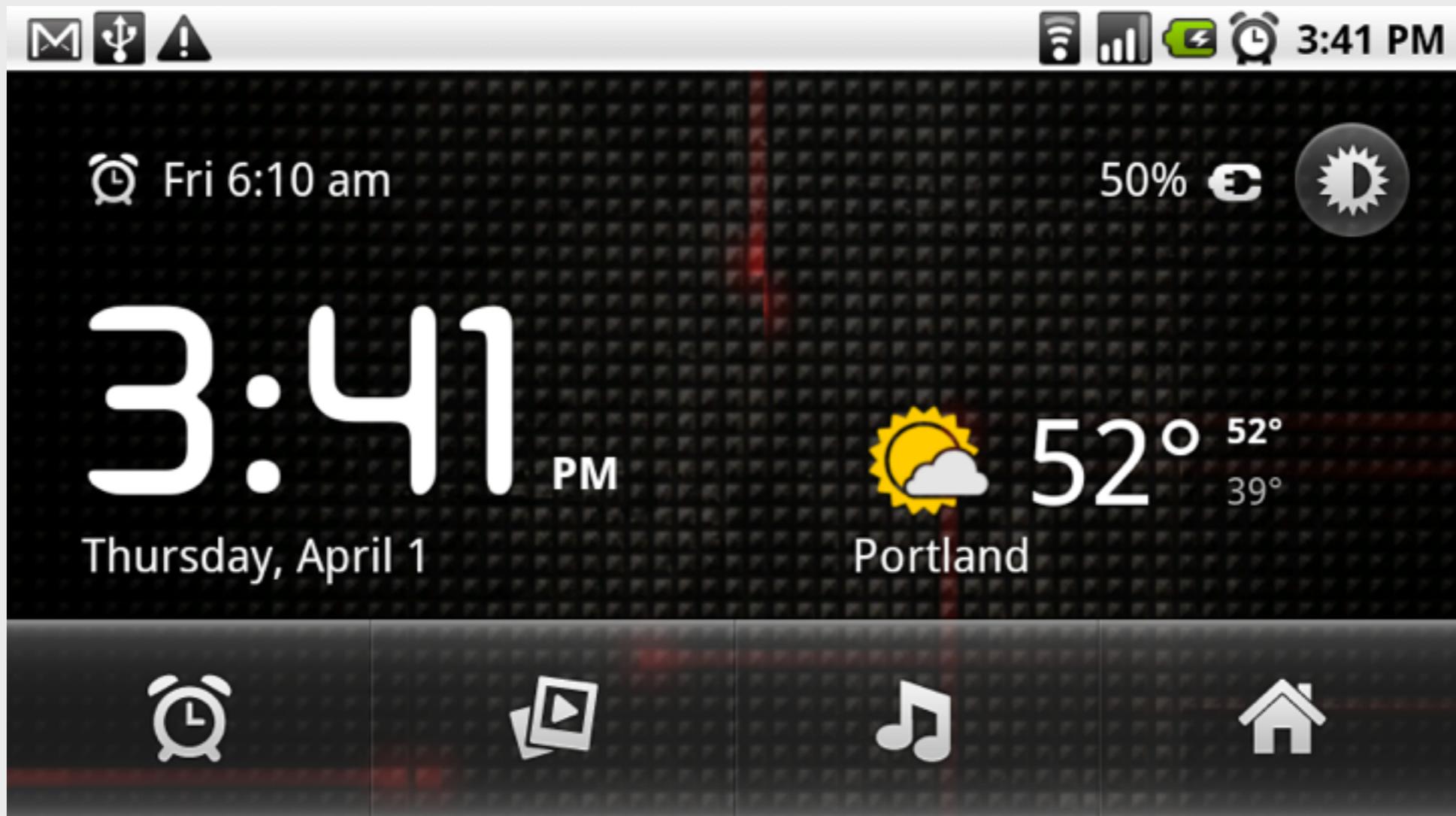
it's getting harder...



Dieter Rams



Braun Clock Radio (1978)



Android phone app

New Alarm

Time Alarm

Alarm Time:

6:00 AM



Alarm Date:

One time alarm

4/16/2013



Repeating alarm

Sun	Mon	Tue	Wed	Thu	Fri	Sat
-----	-----	-----	-----	-----	-----	-----

Enable Alarm

Delete

Cancel

OK

New Alarm



Invalid alarm time

Please select a date and time in the future.

Alarm Time: 6:00 AM

OK

Alarm Date:

One time alarm

4/16/2013

Repeating alarm

Sun

Mon

Tue

Wed

Thu

Fri

Sat

Enable Alarm

Delete

Cancel

OK

New Alarm

Time Alarm

Alarm Time:

6:00 AM



Alarm Date:

One time alarm

4/17/2013



Repeating alarm

Sun	Mon	Tue	Wed	Thu	Fri	Sat
-----	-----	-----	-----	-----	-----	-----

Enable Alarm

Delete

Cancel

OK

New Alarm

Time Alarm

Alarm Time: 6:00 AM 

Alarm Date:

One time alarm

4/17/2013 

Repeating alarm

Sun Mon Tue Wed Thu Fri Sat

Enable Alarm

Delete

Cancel

OK

✓ 06:00 AM Tomorrow

New Alarm...

New Timer...

New Stopwatch...

About Alarm Clock 2

Check for updates...

Preferences...

Quit



Who Is in These Photos?

To tag your friends, review the suggested names and click Save Tags at the bottom of this page. If a name is missing or incorrect, list a new name and press Enter.
Remember: If someone doesn't like a photo, they can untag themselves or ask you to take it down.

[Skip Tagging Friends](#)[Save Tags](#)

**so how do we
use these things?**

conceptual models

conceptual models

to use a complex application

we imagine what's inside

we form structures in our mind

we connect actions to structural changes

conceptual models

to use a complex application

we imagine what's inside

we form structures in our mind

we connect actions to structural changes

"abstract
affordances"

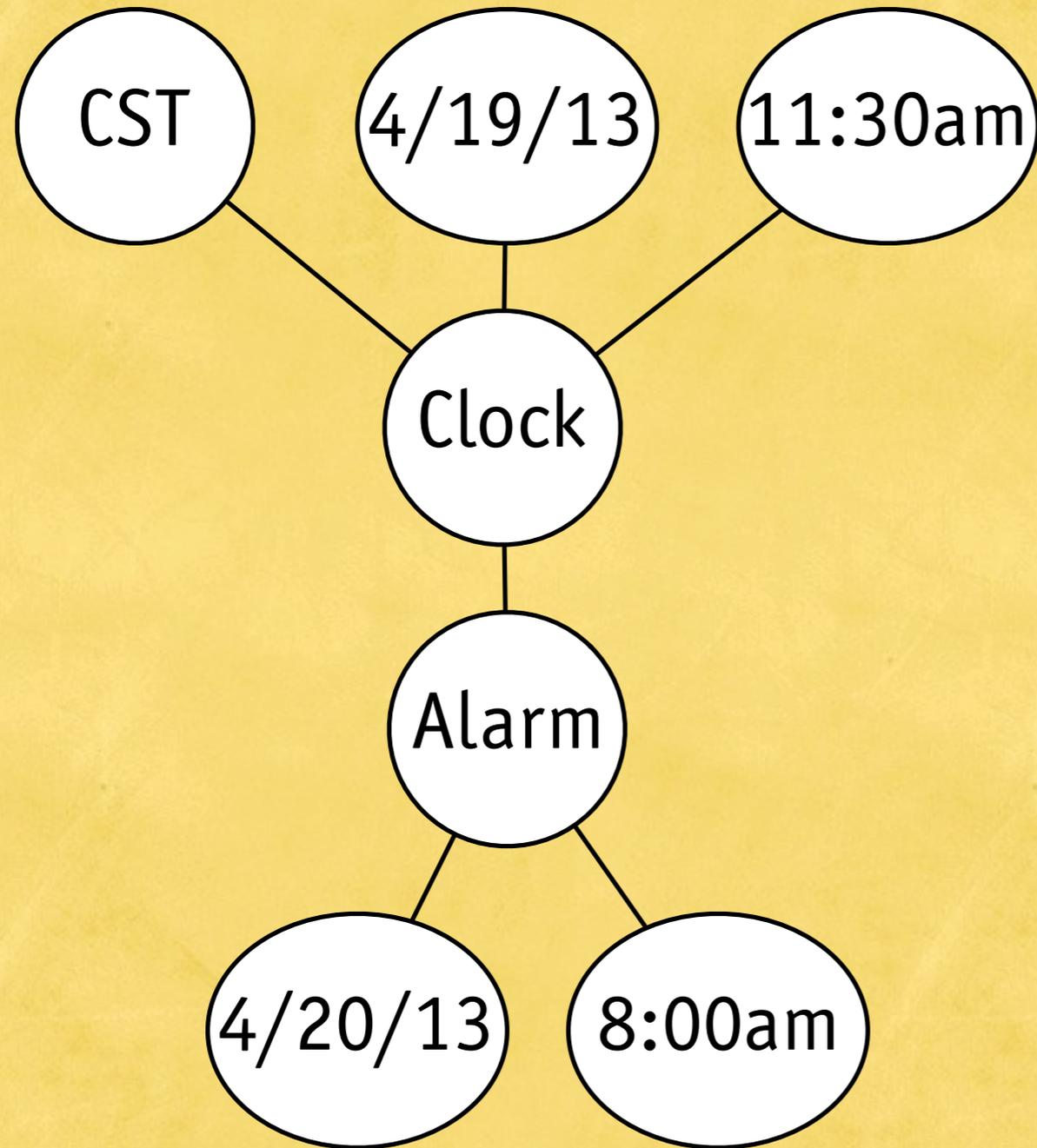
opening the box



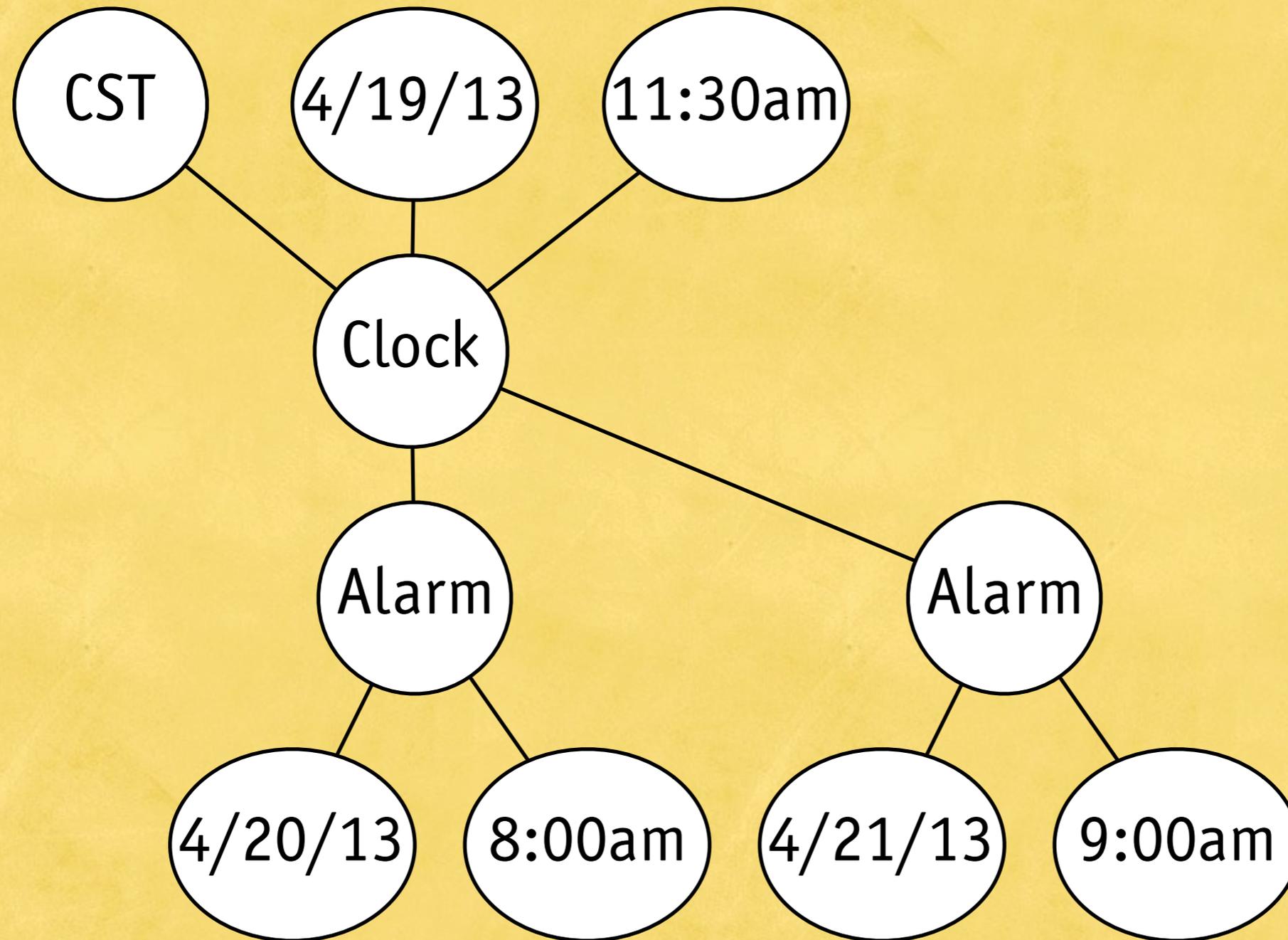
opening the box



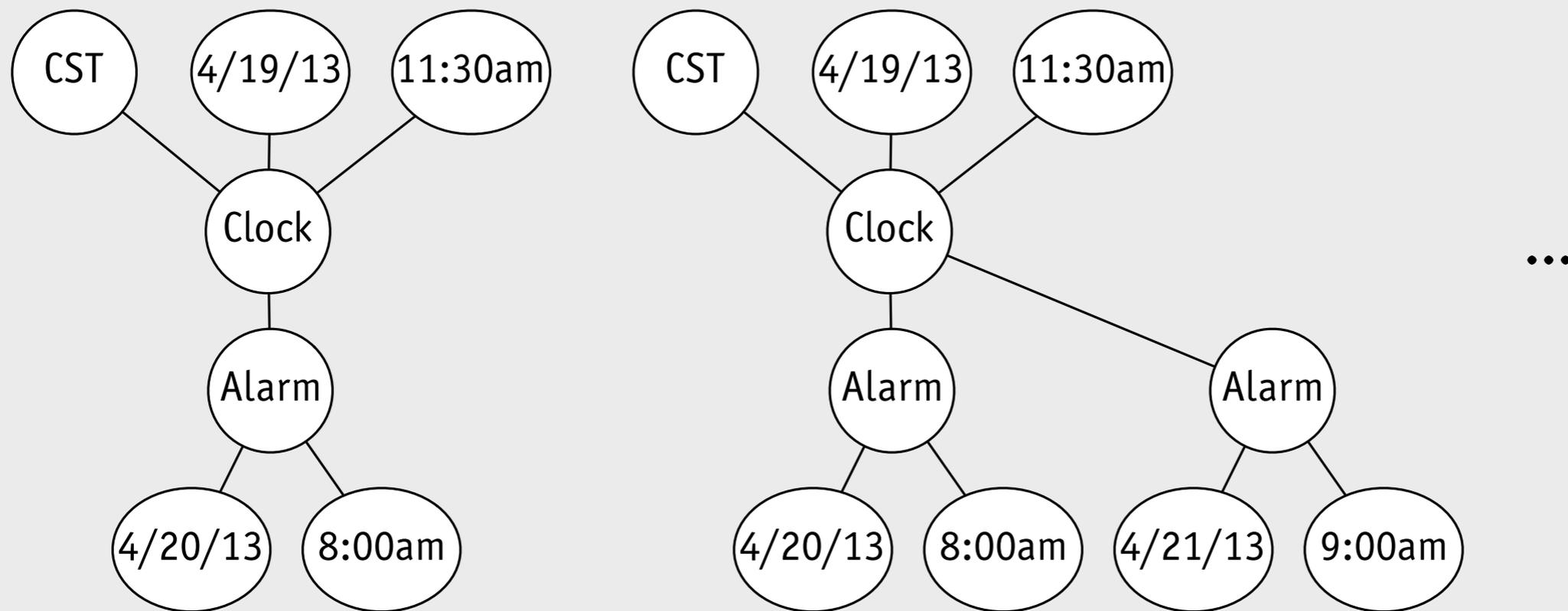
opening the box



opening the box

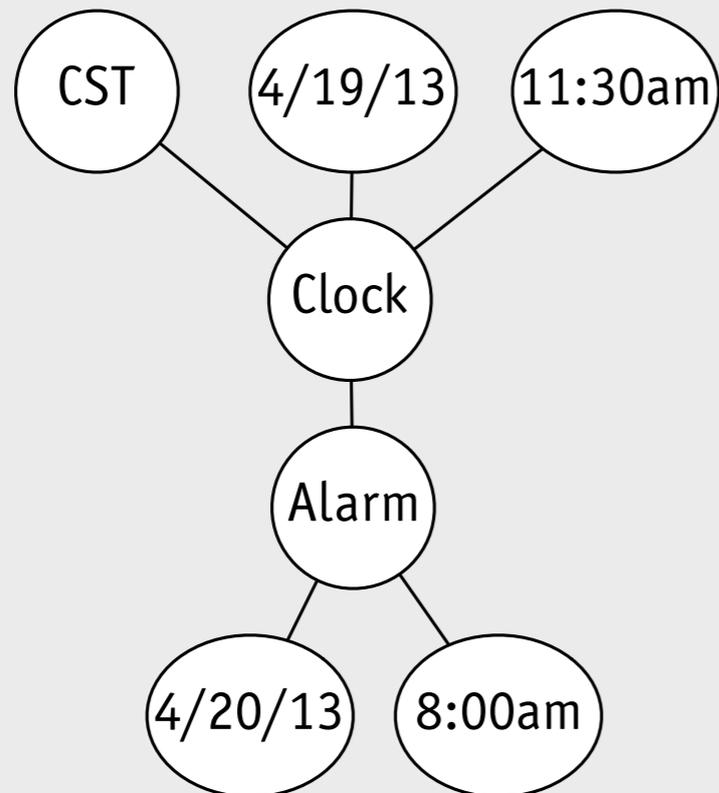


an infinity of abstract states

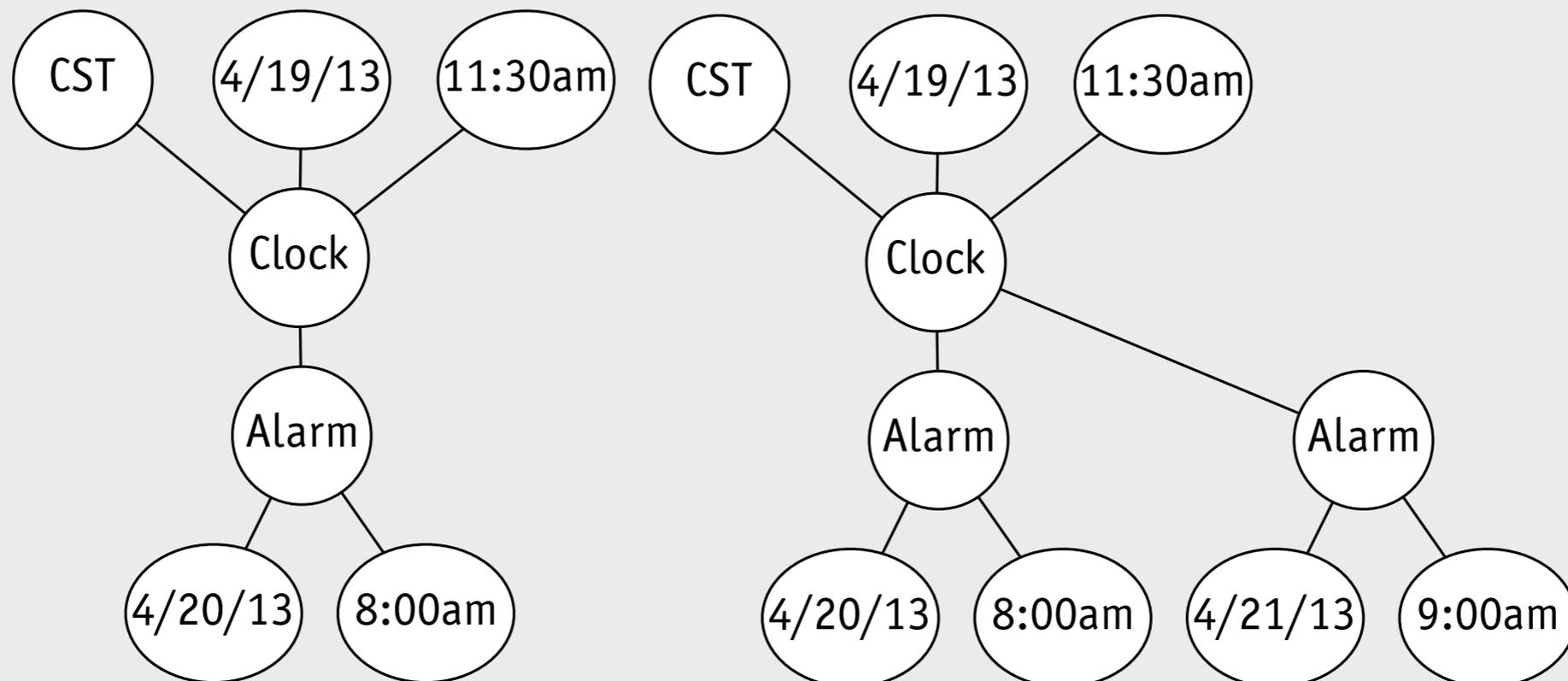


summarizing abstract states

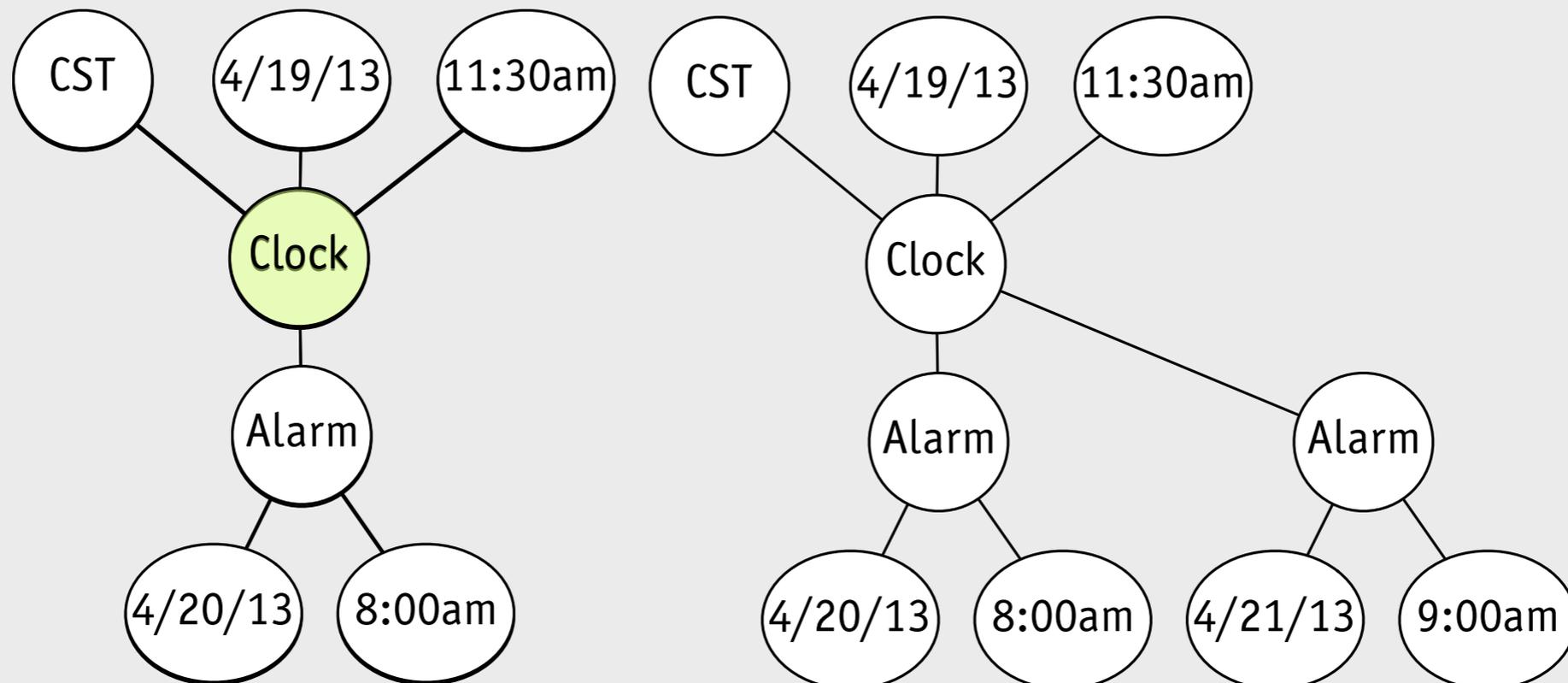
summarizing abstract states



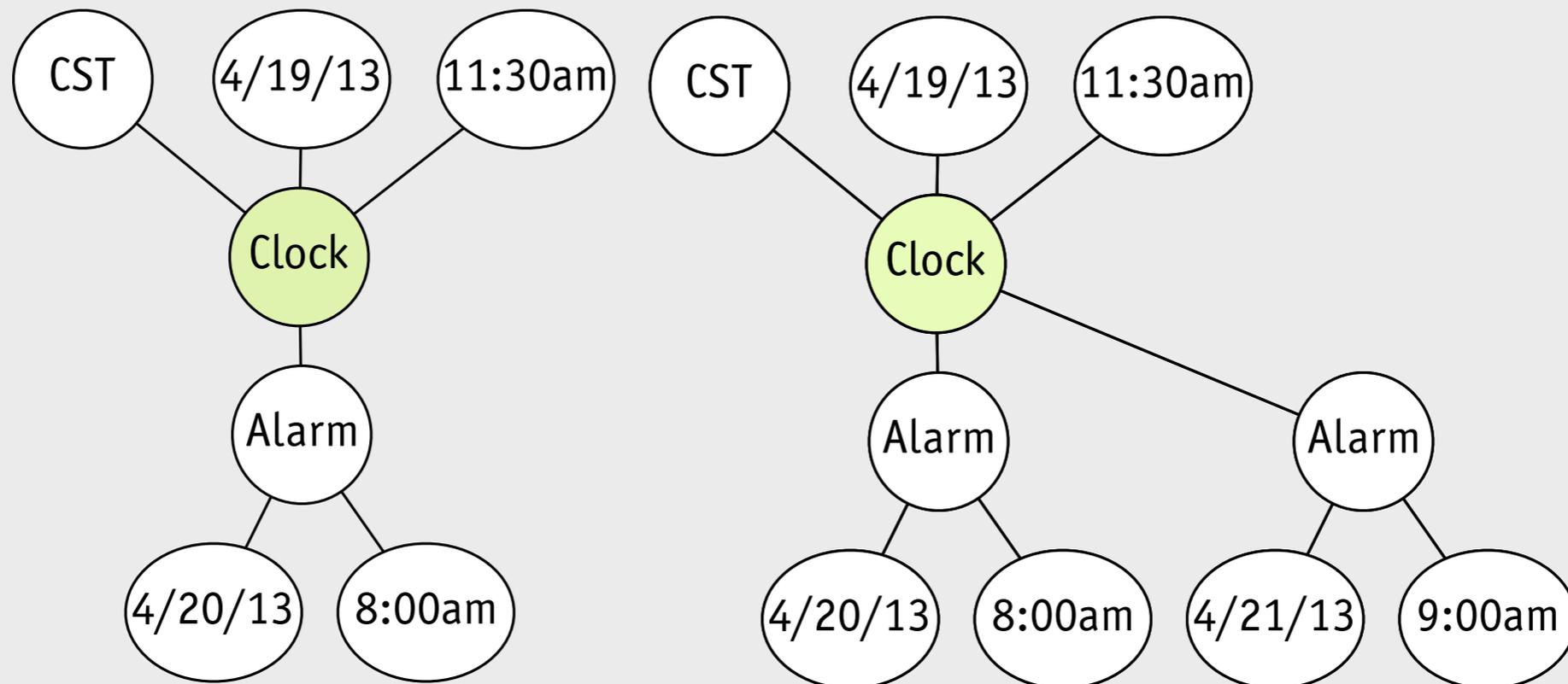
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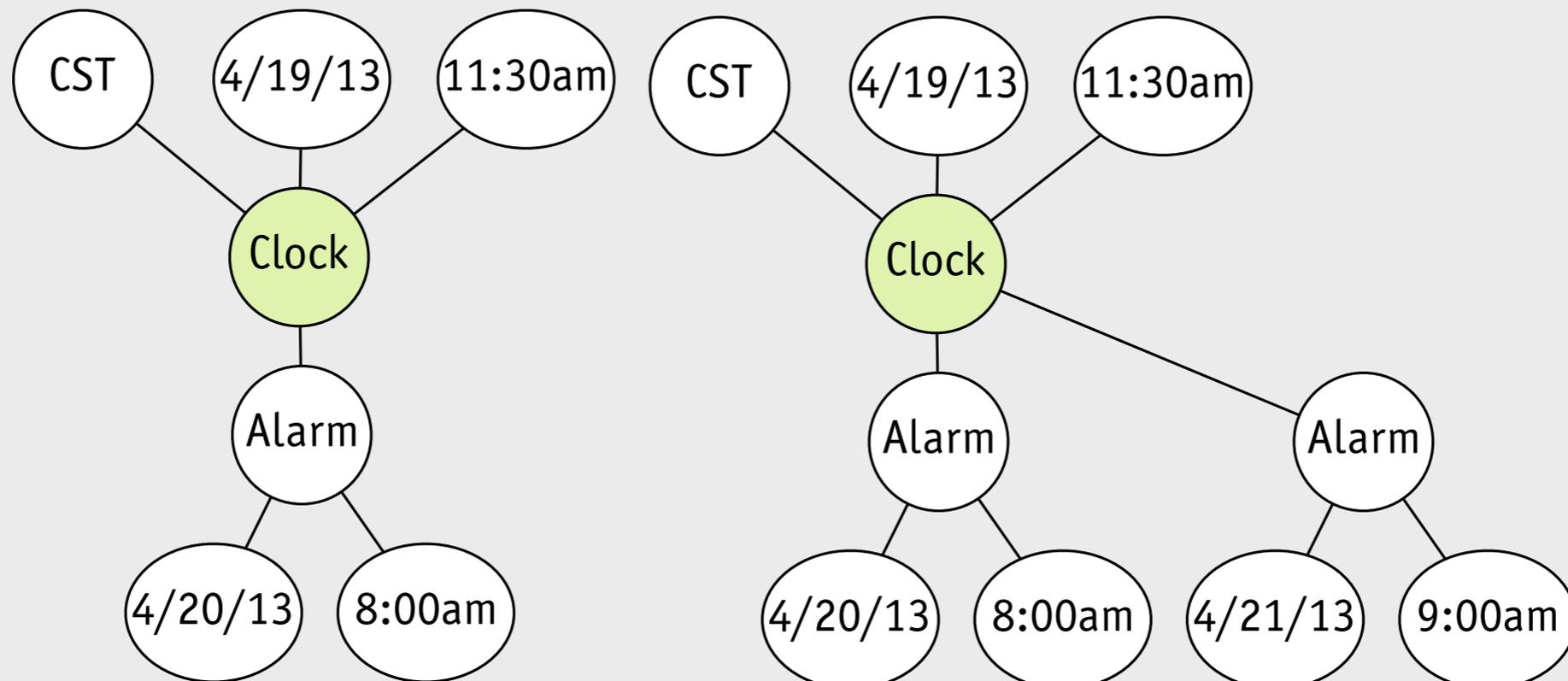
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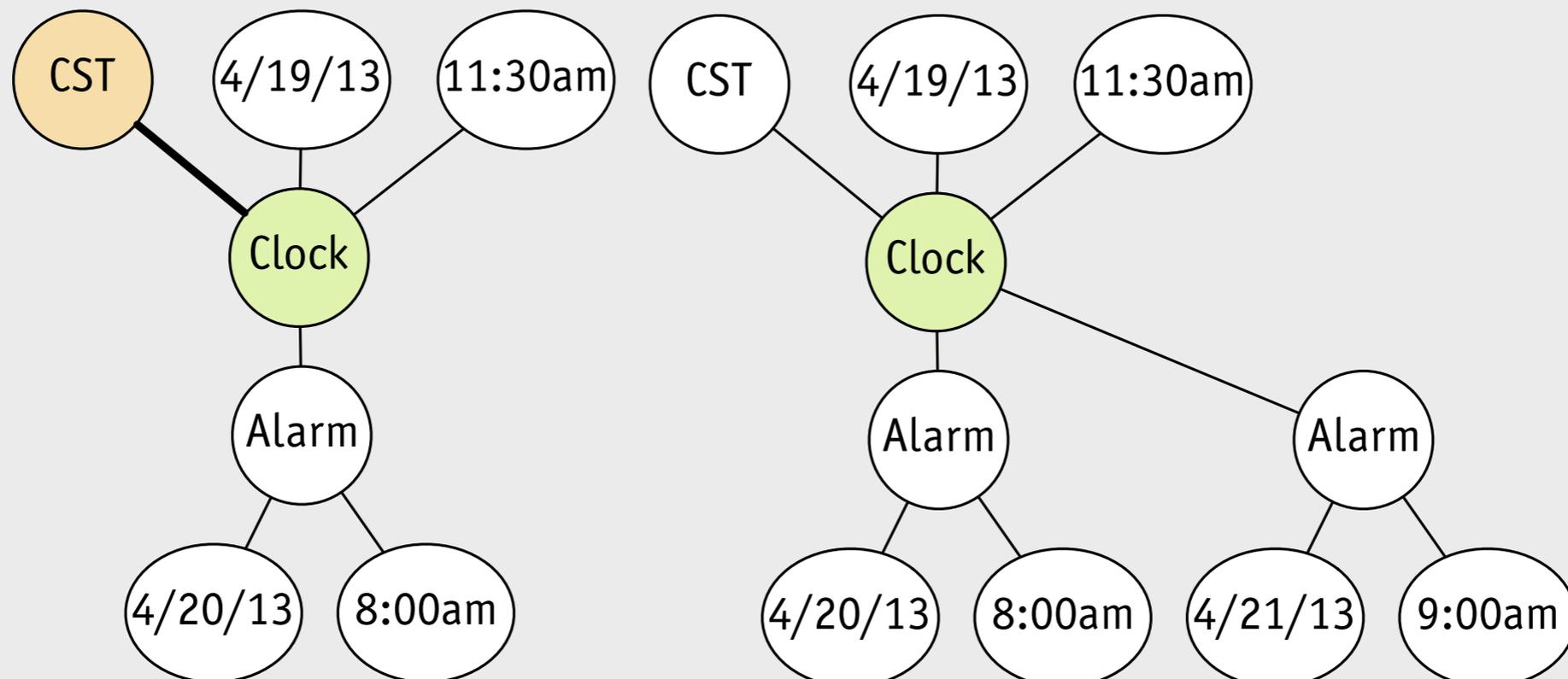
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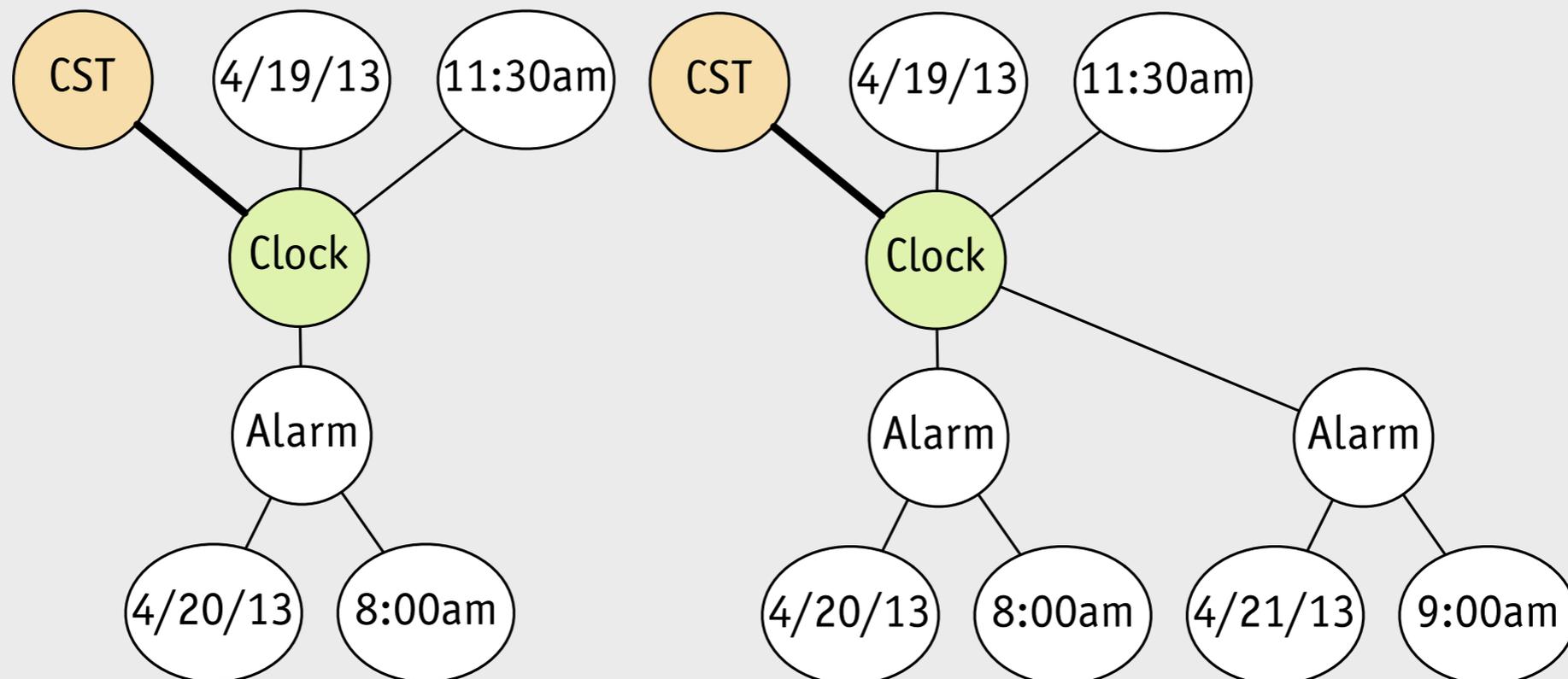
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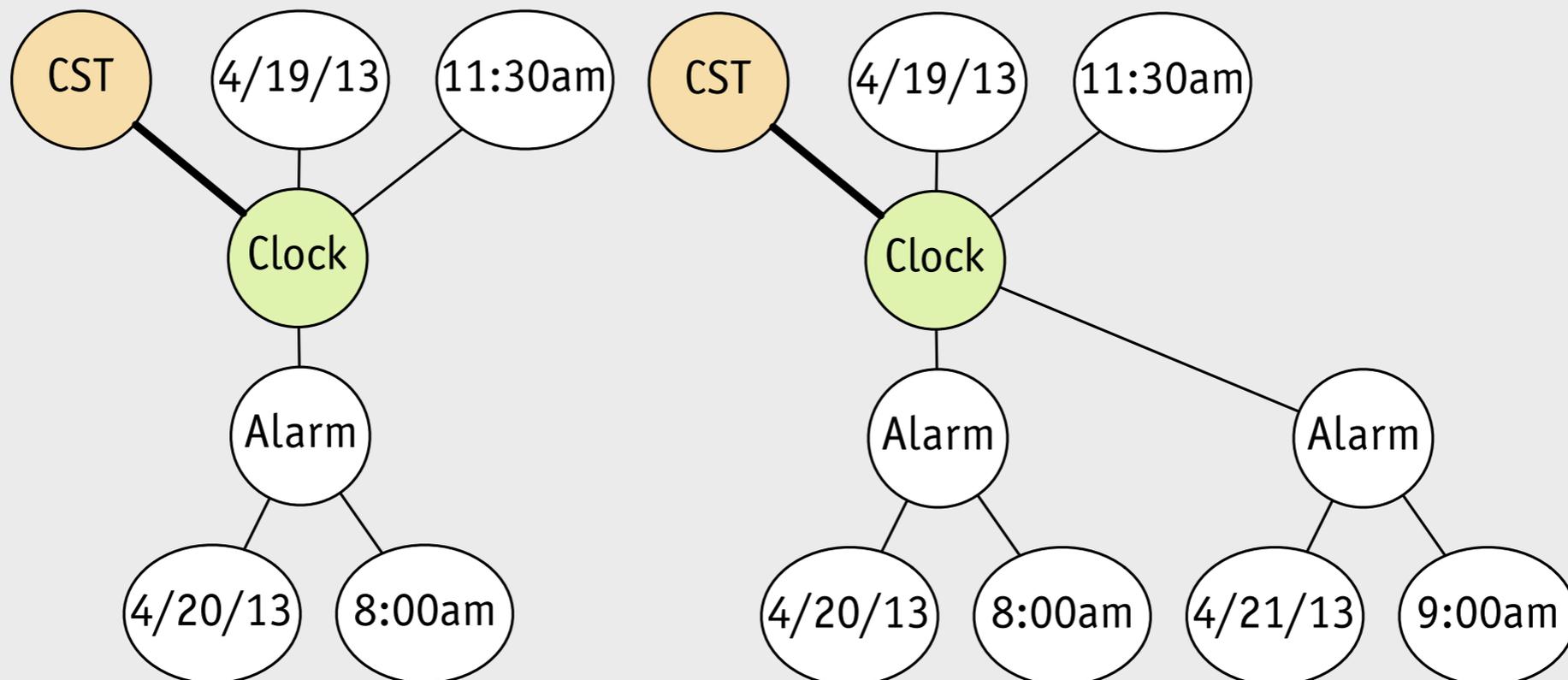
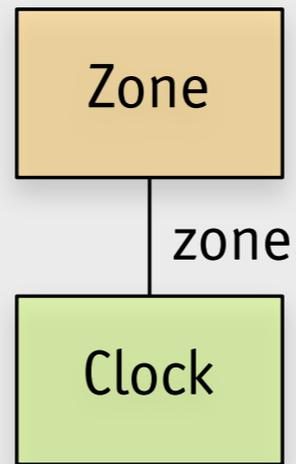
summarizing abstract states



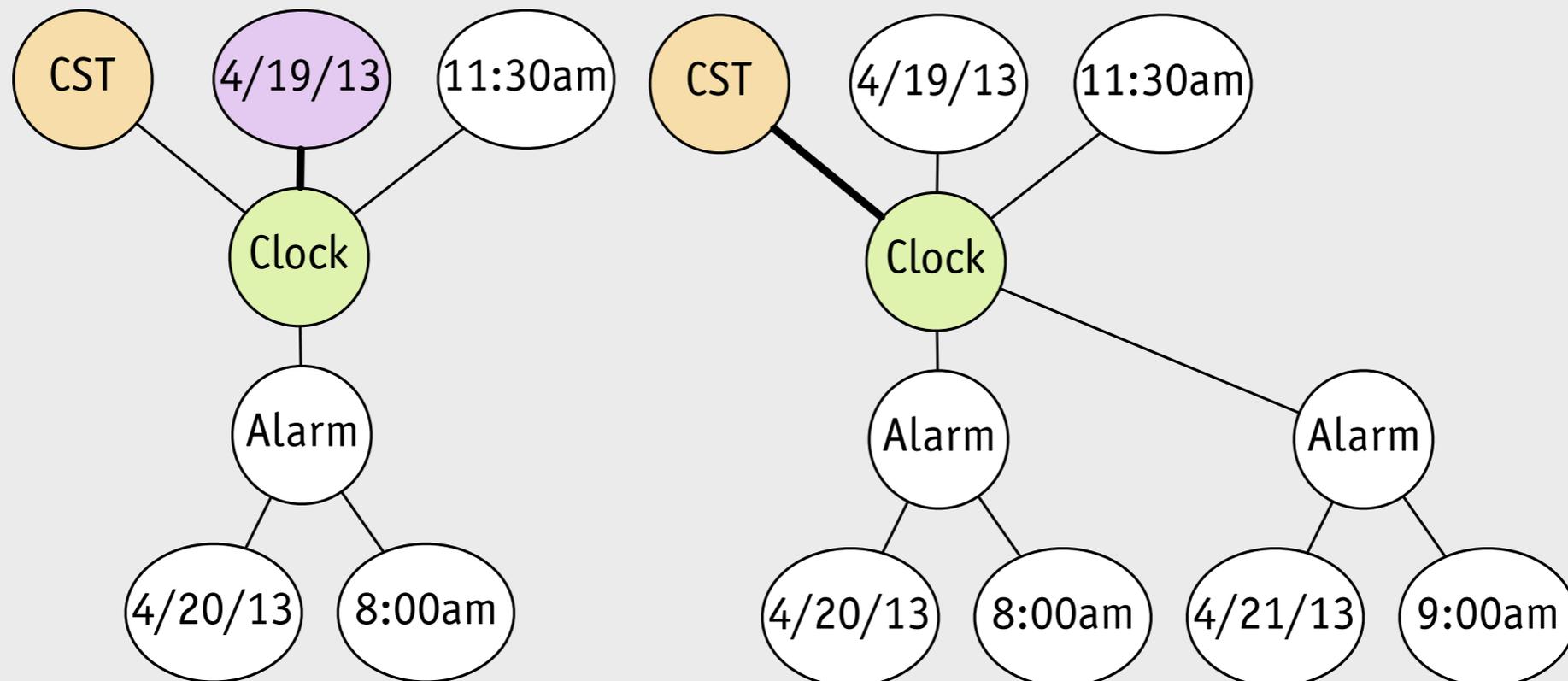
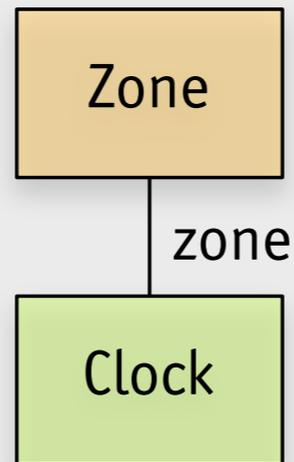
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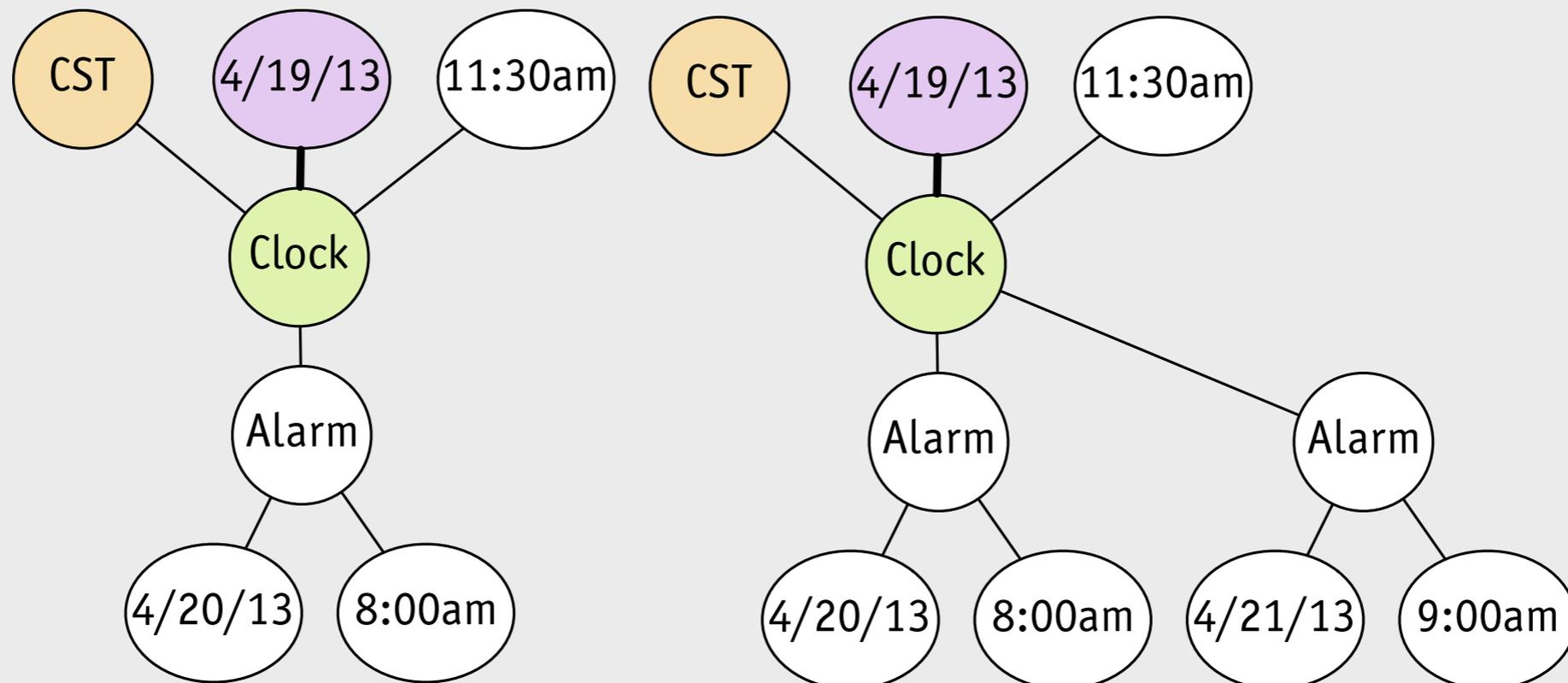
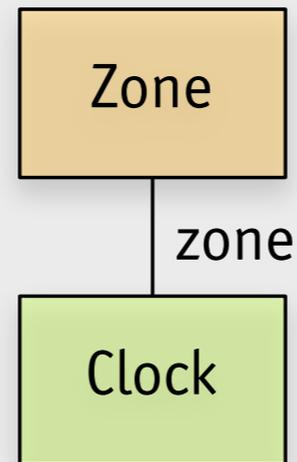
summarizing abstract states



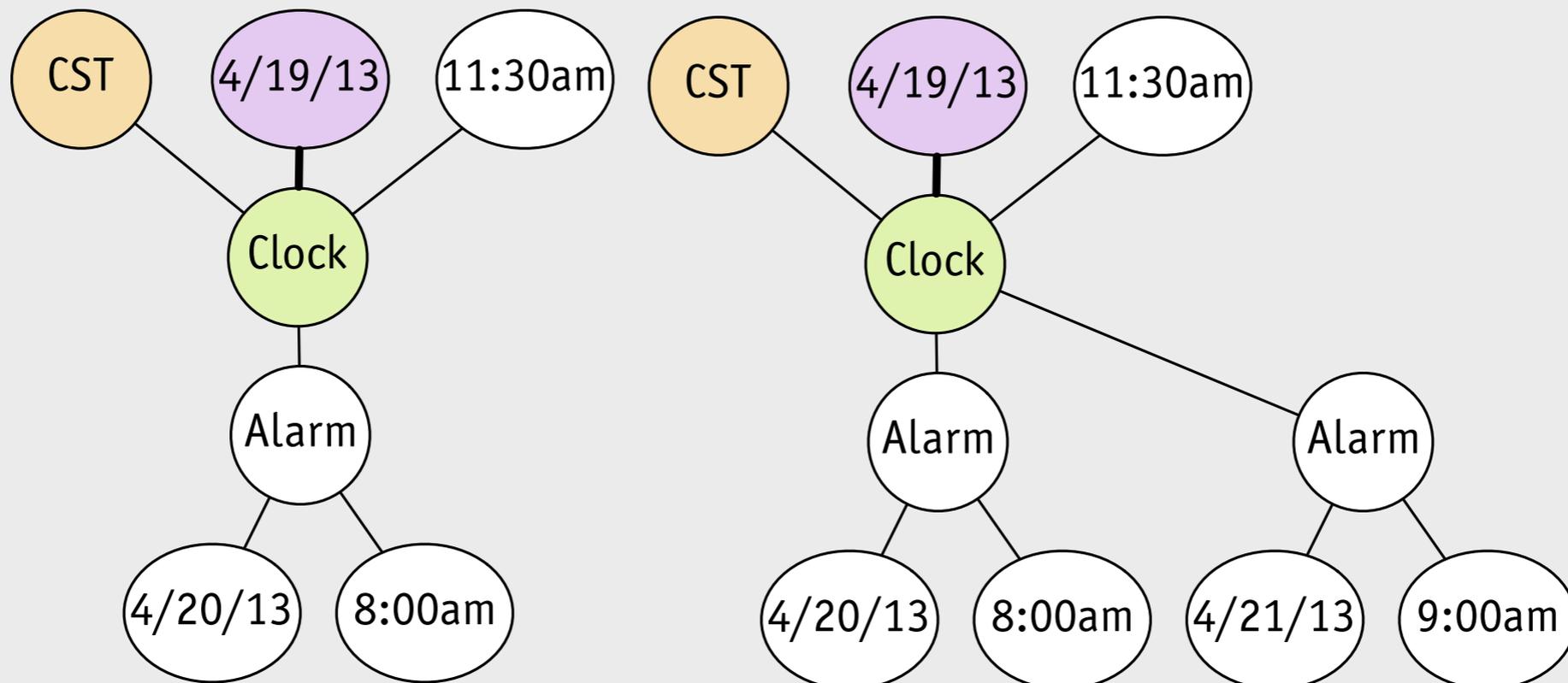
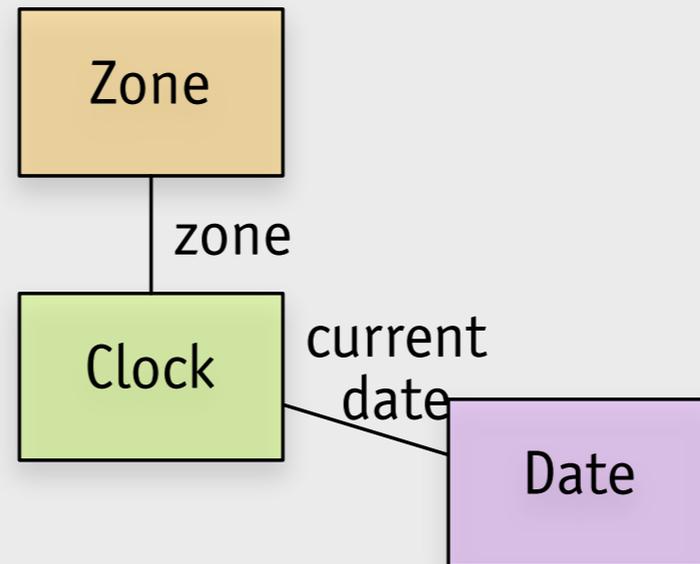
summarizing abstract states



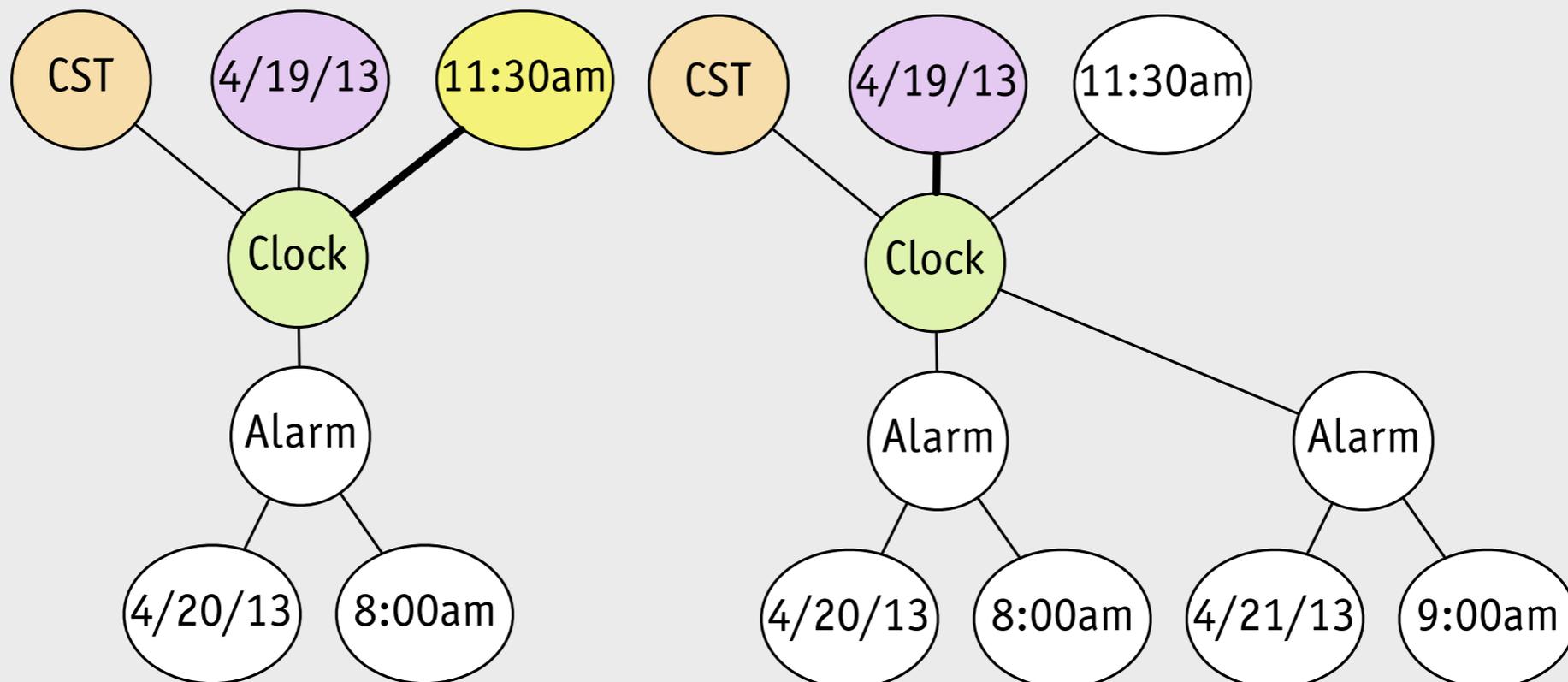
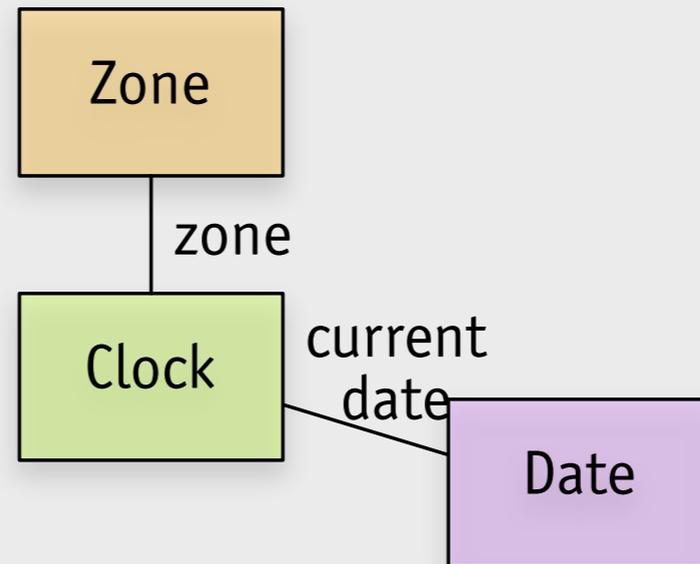
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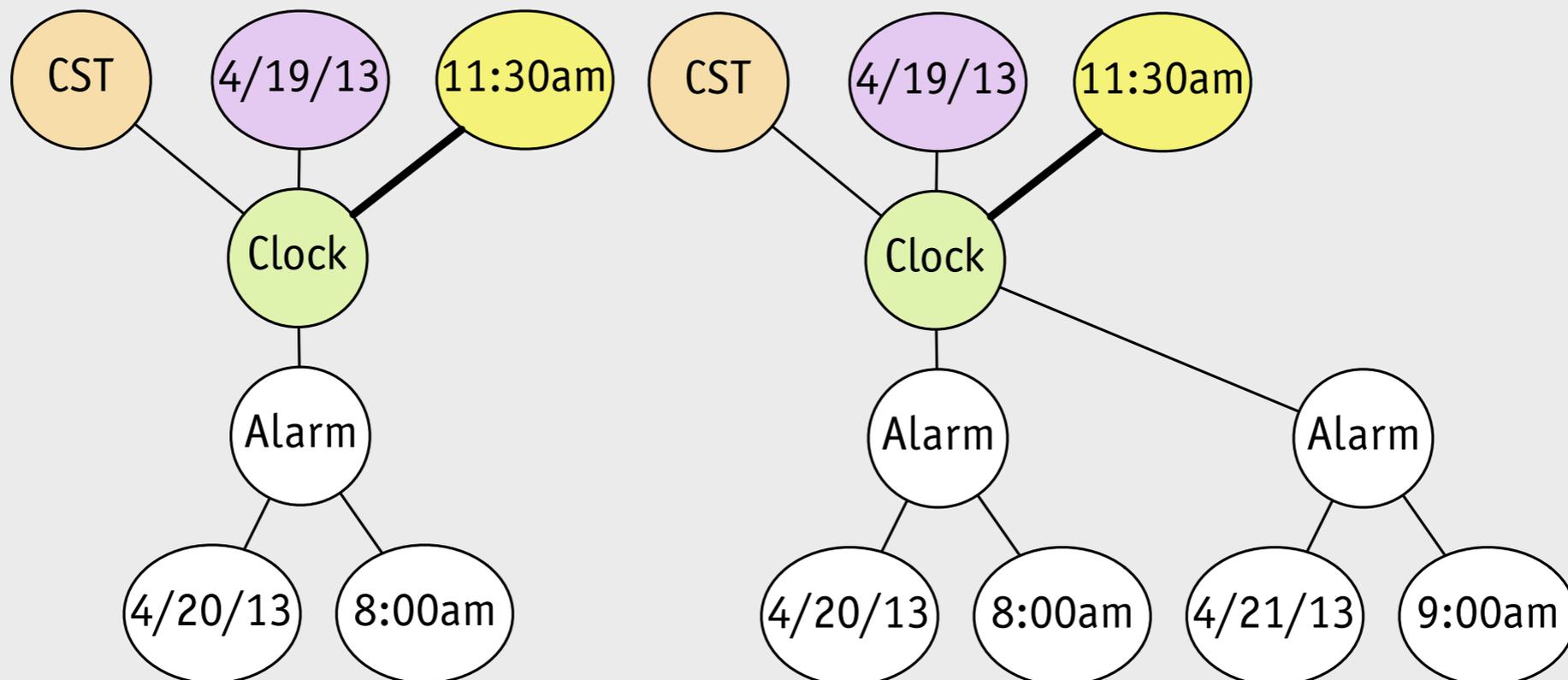
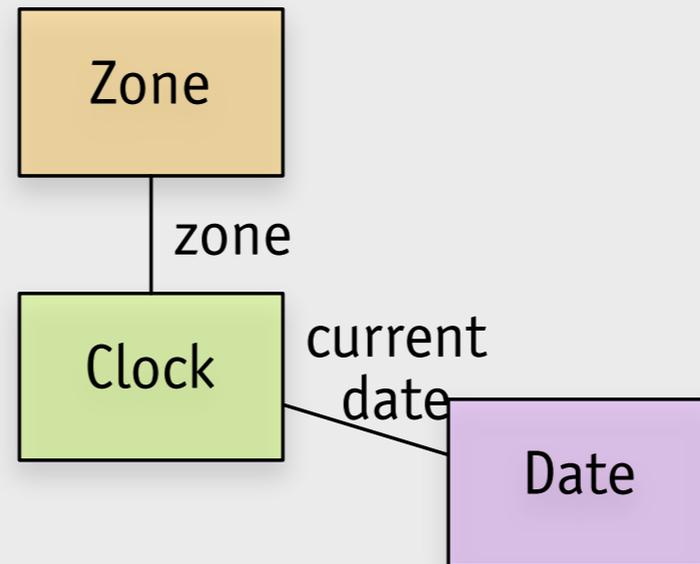
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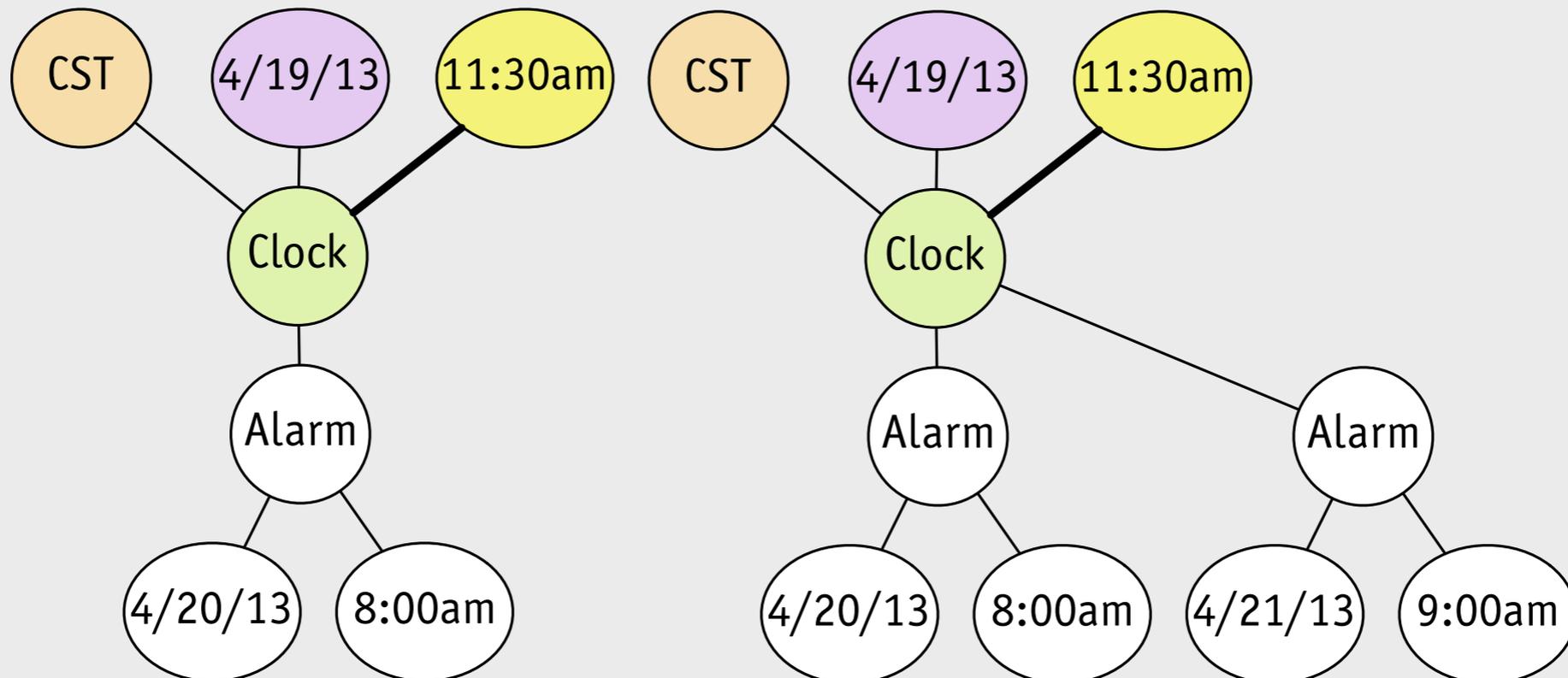
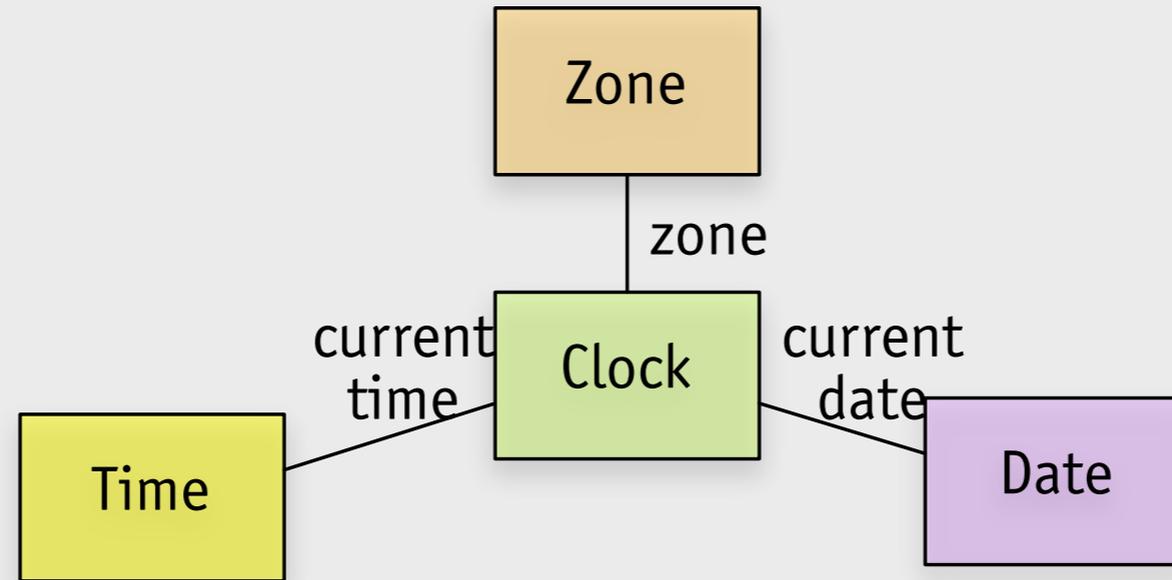
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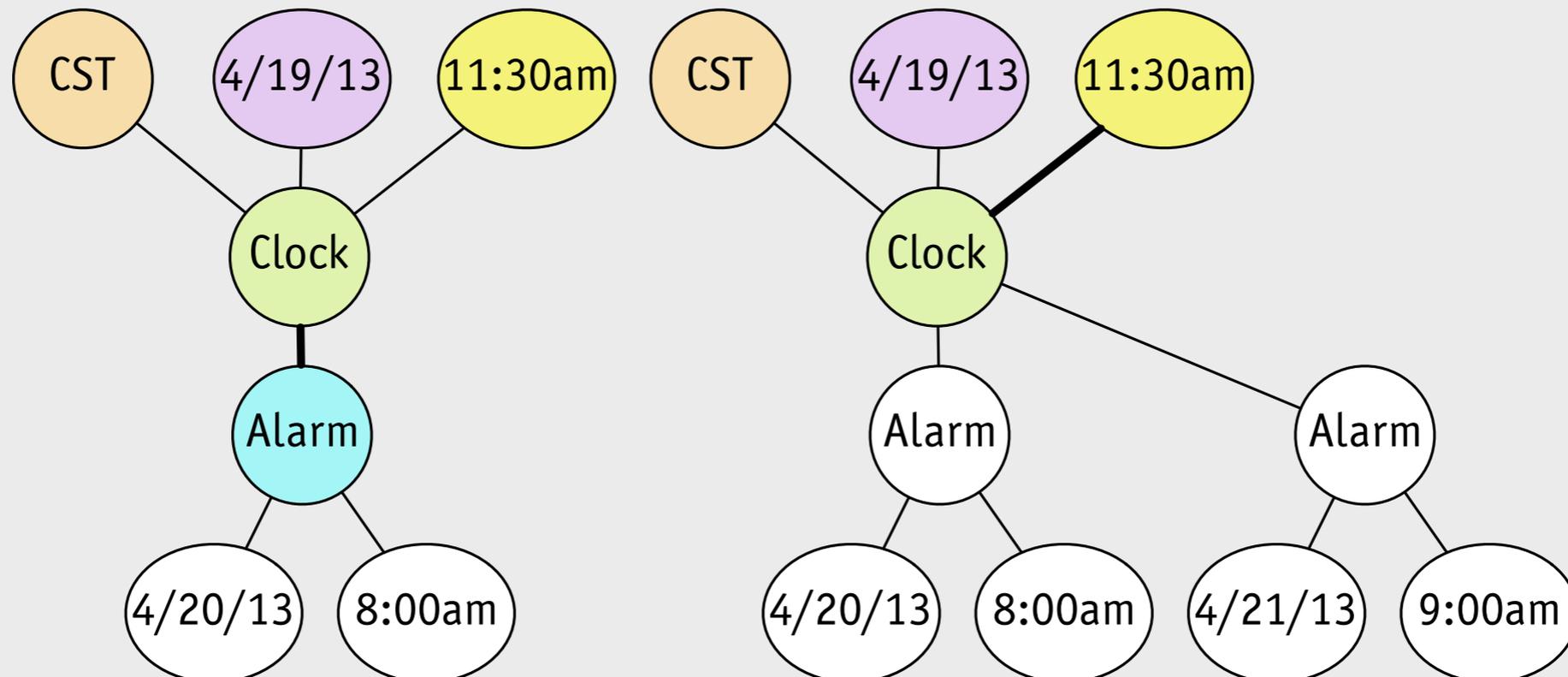
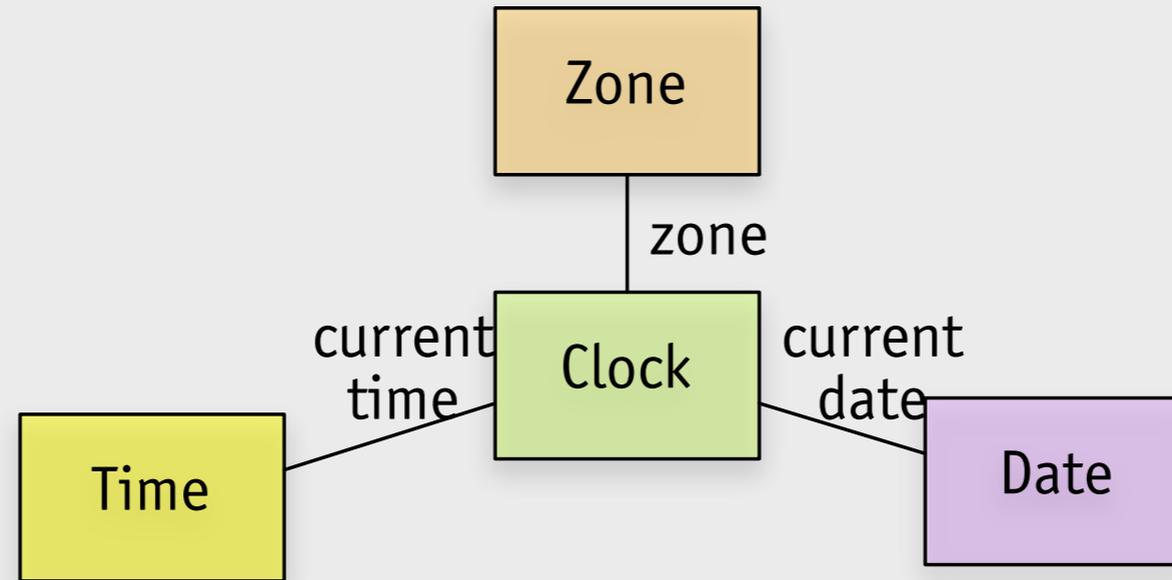
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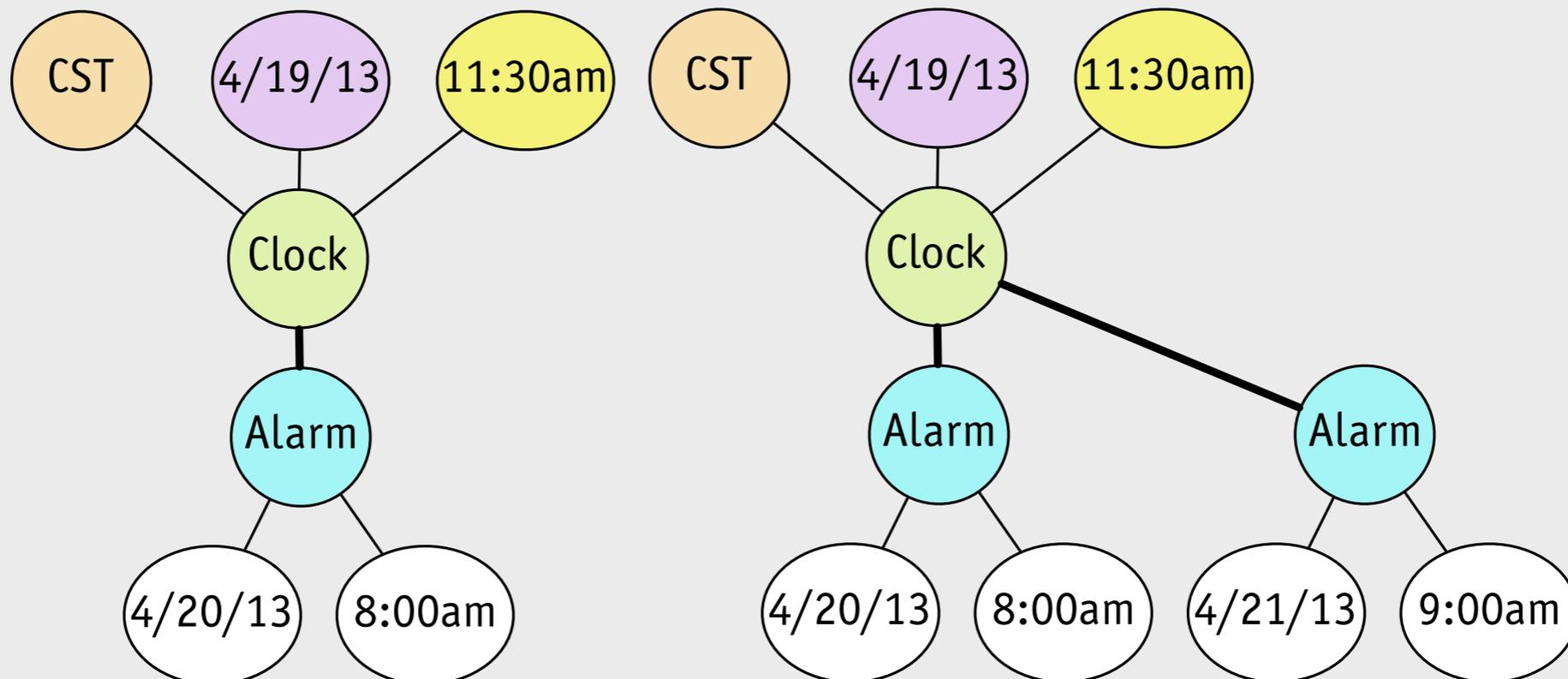
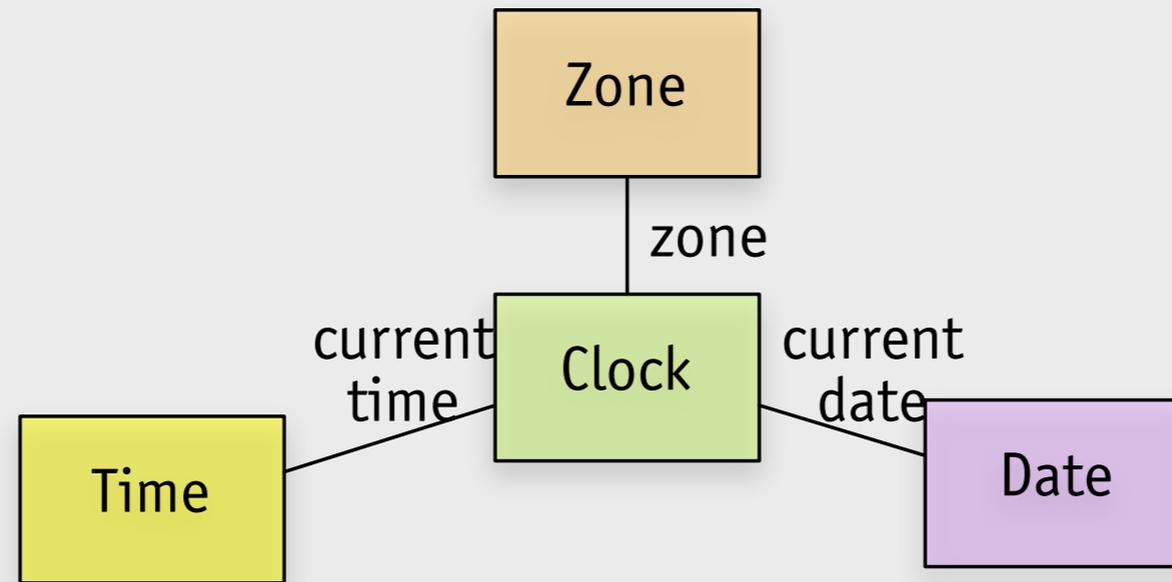
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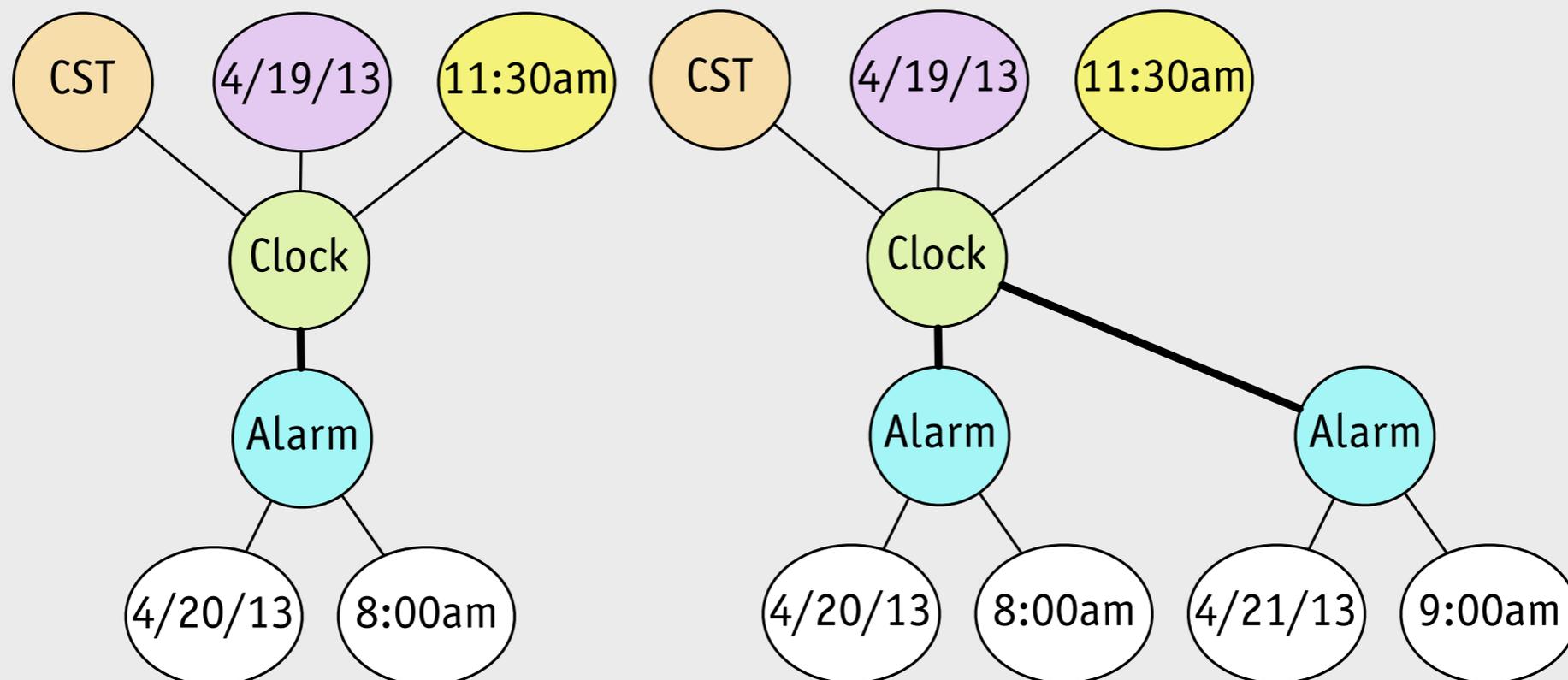
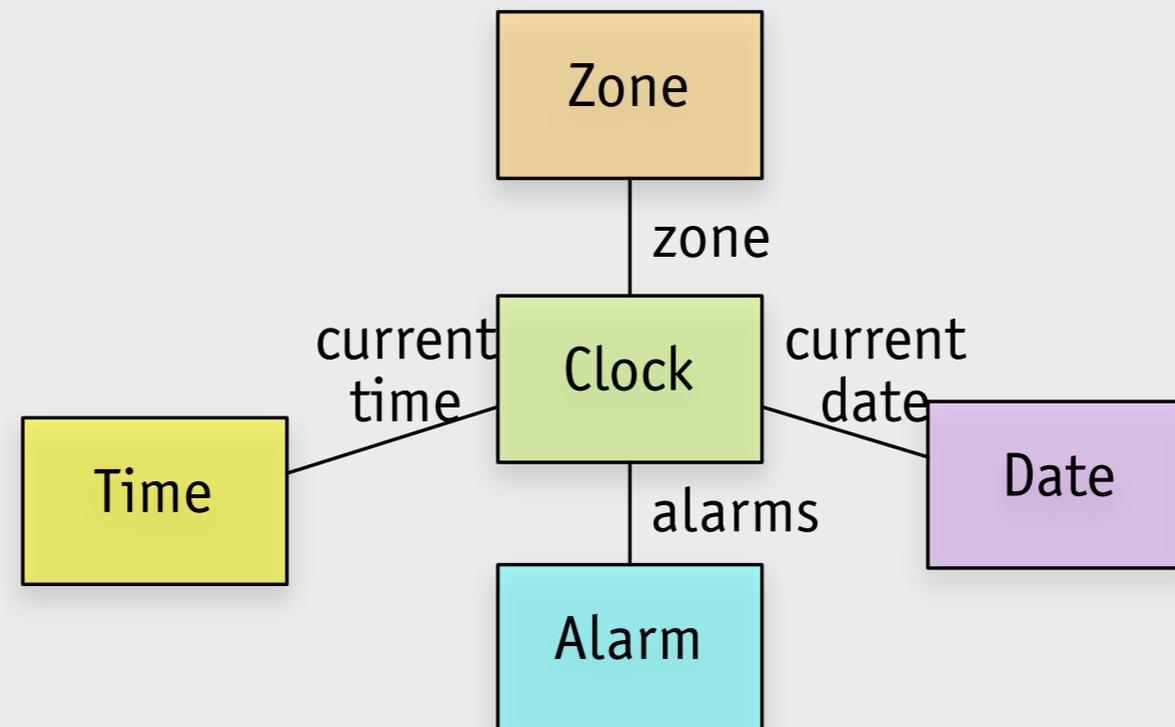
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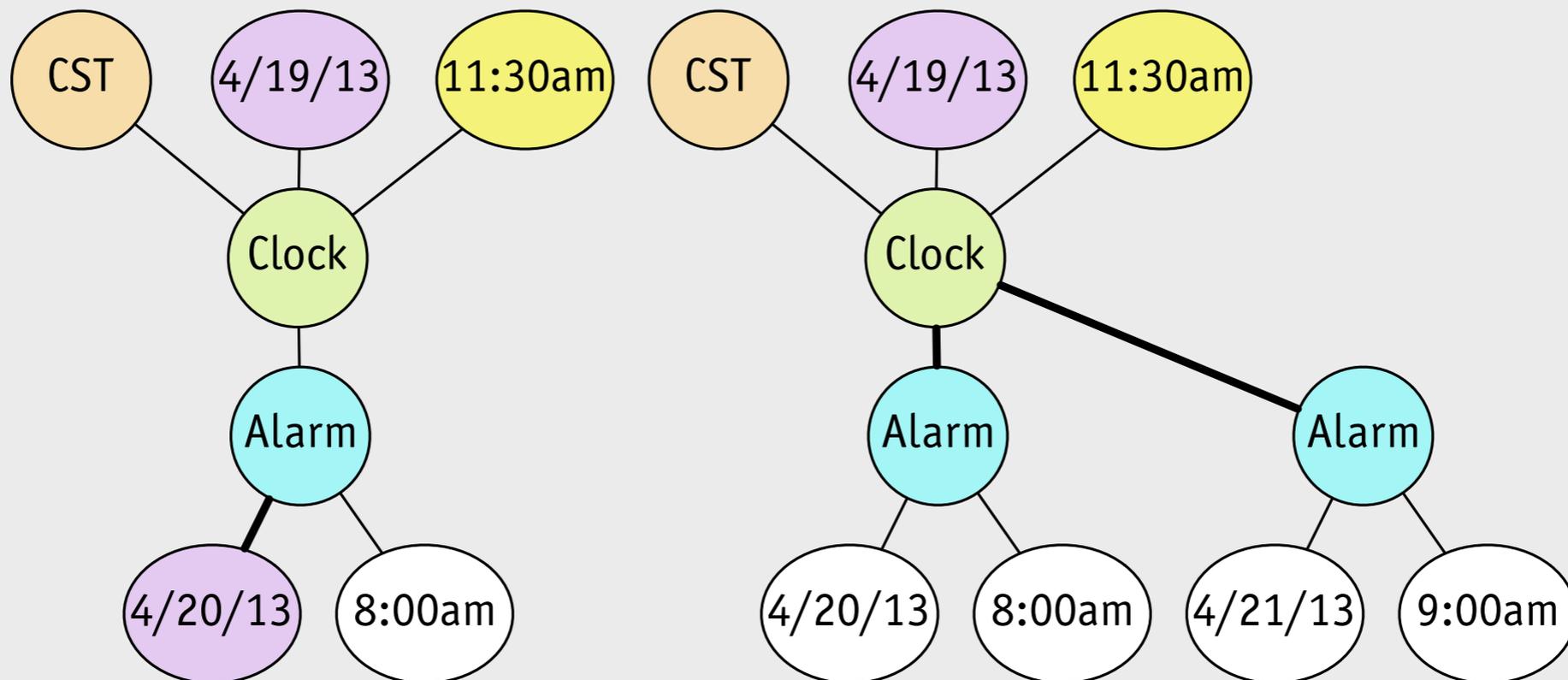
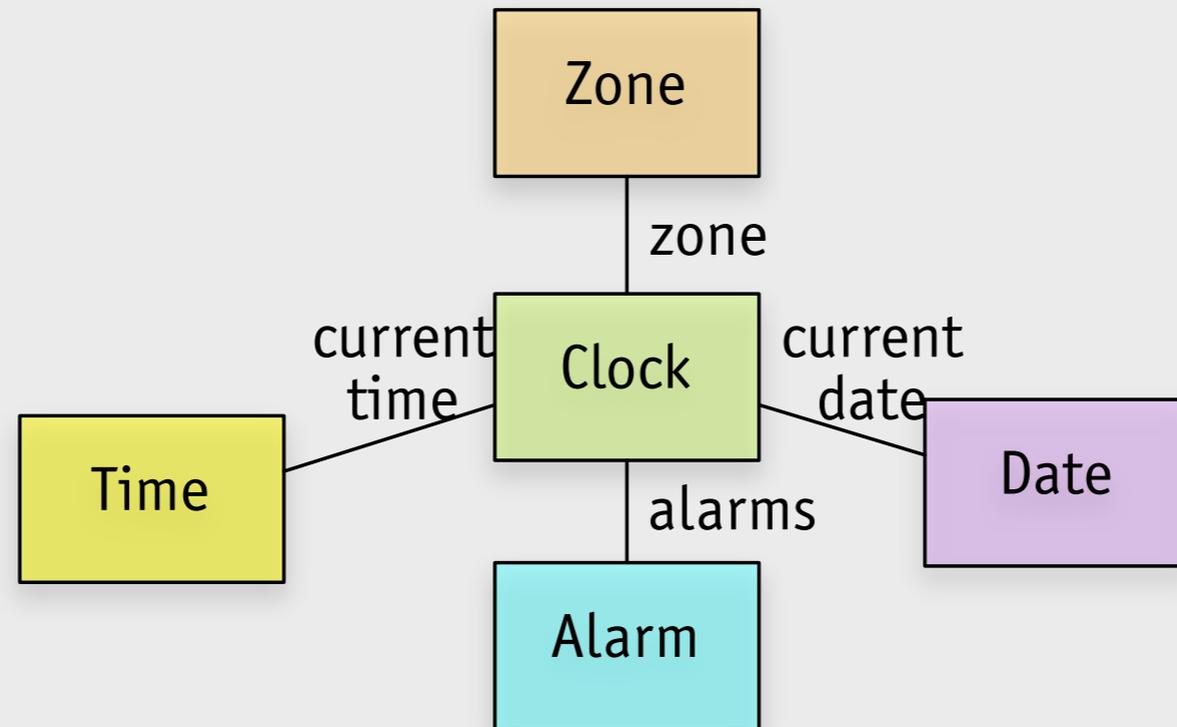
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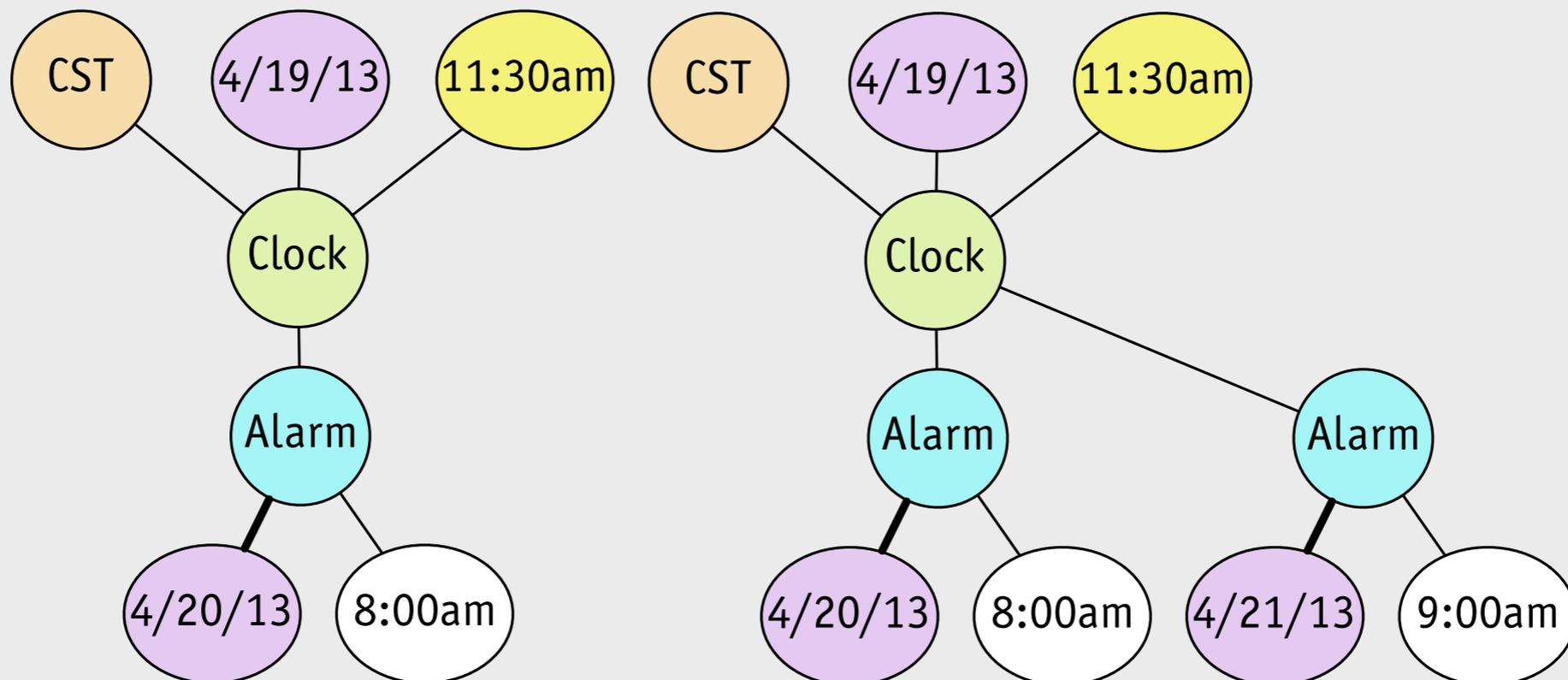
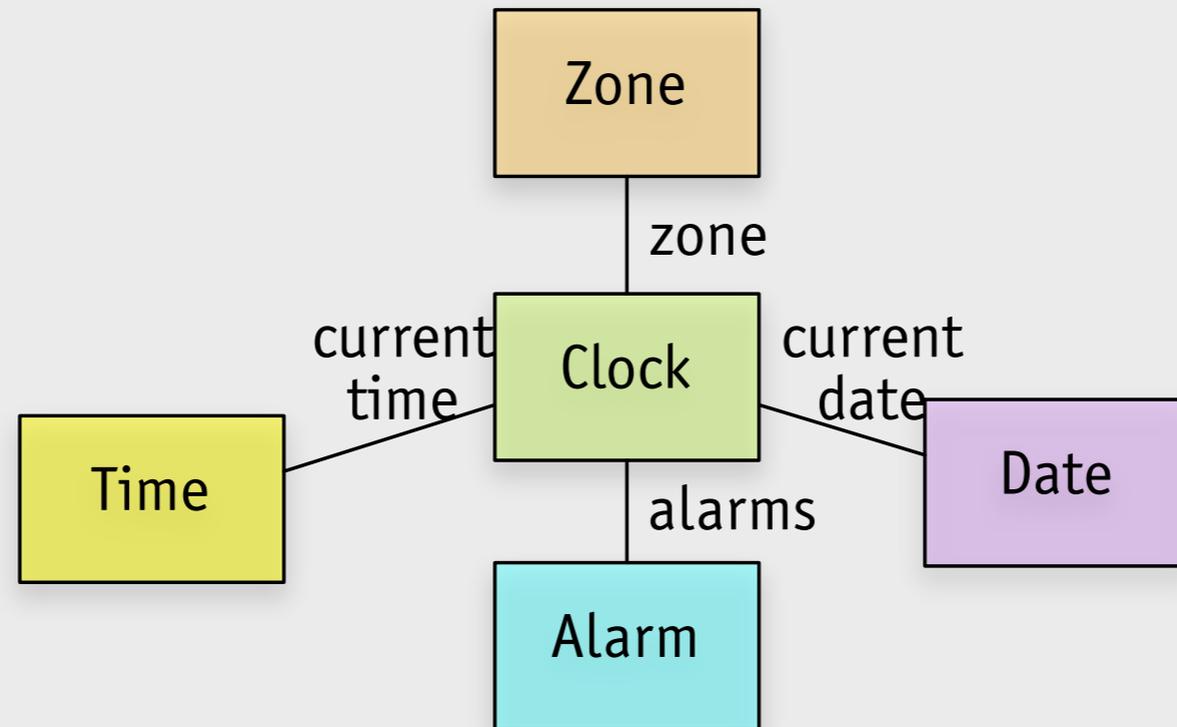
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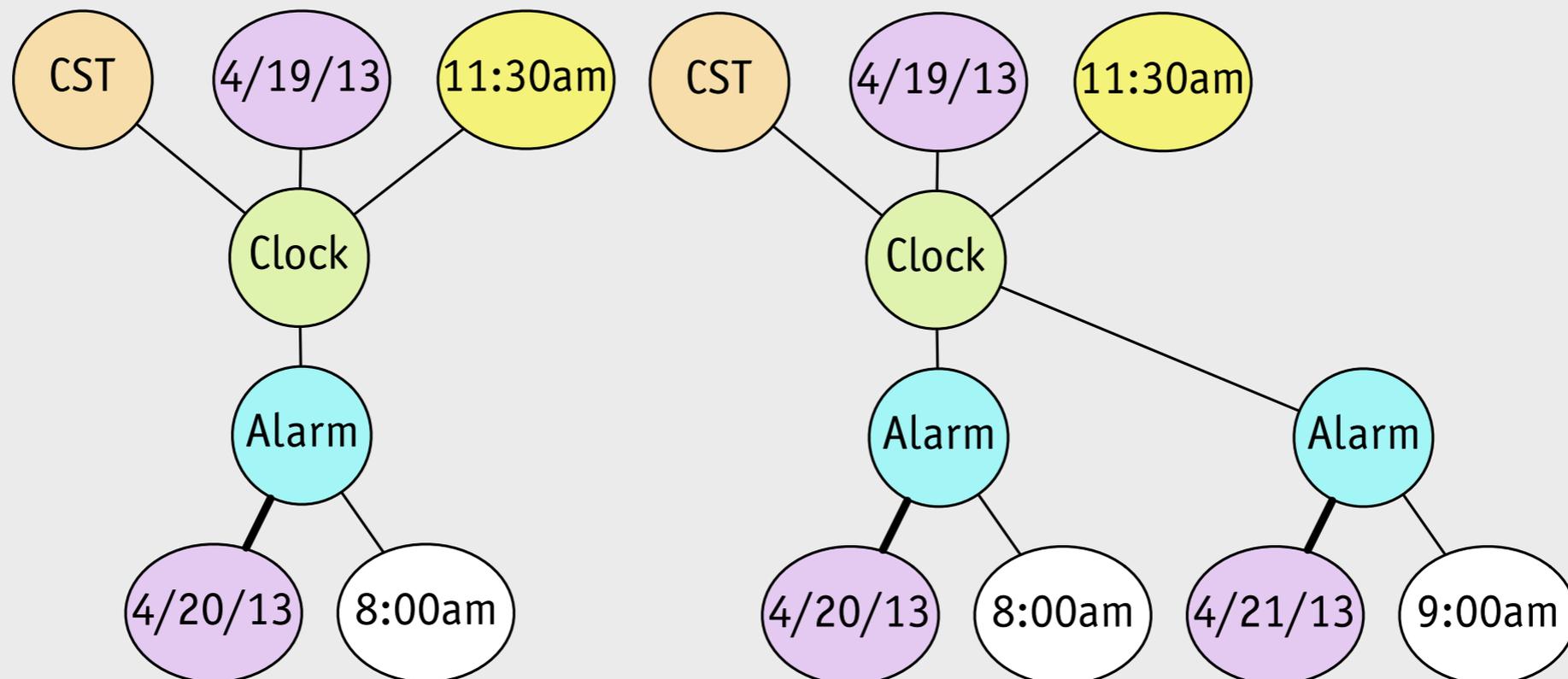
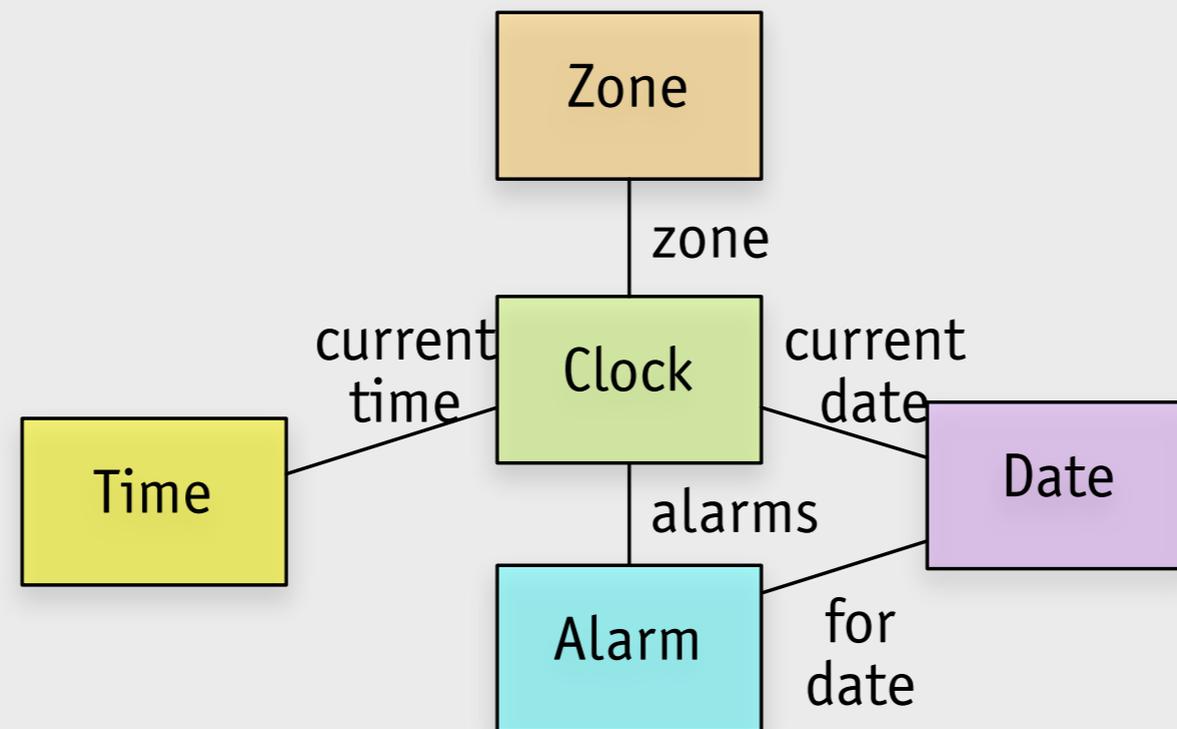
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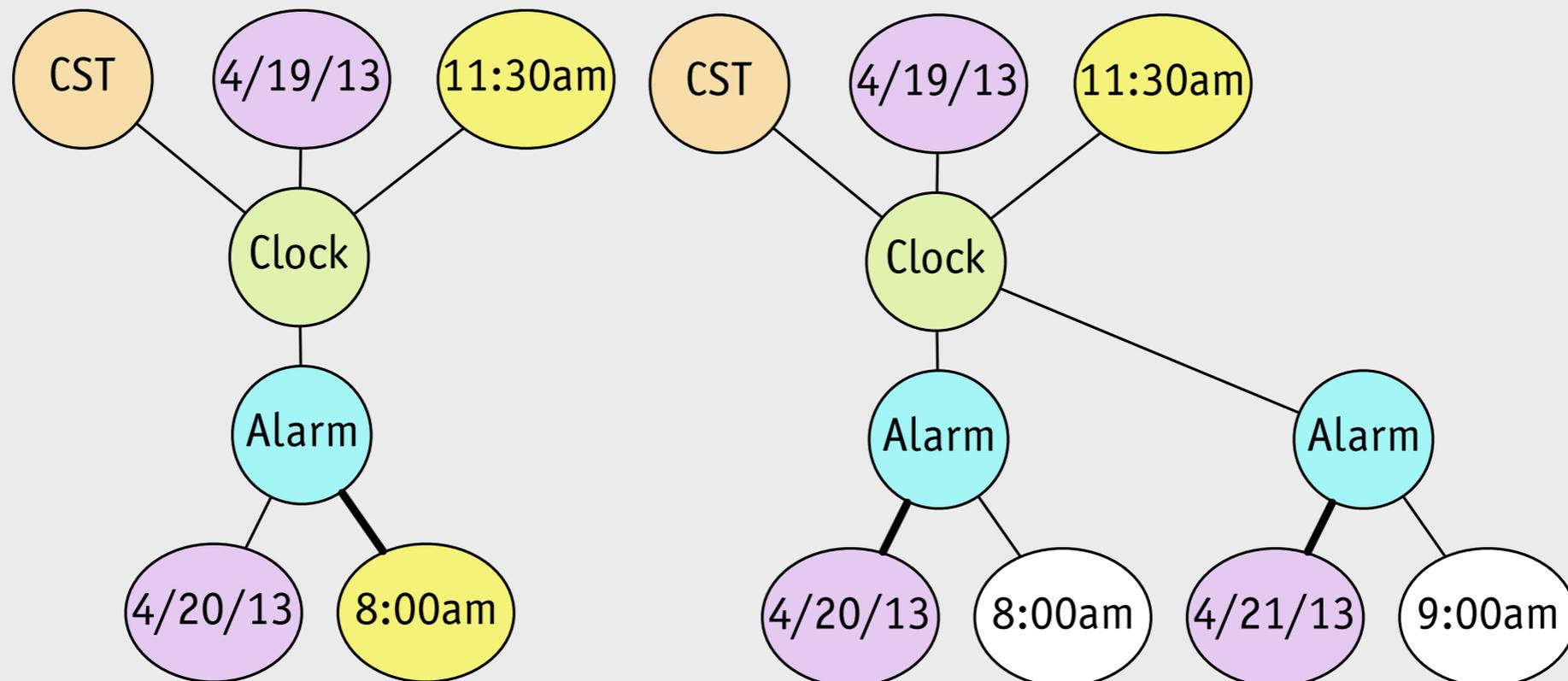
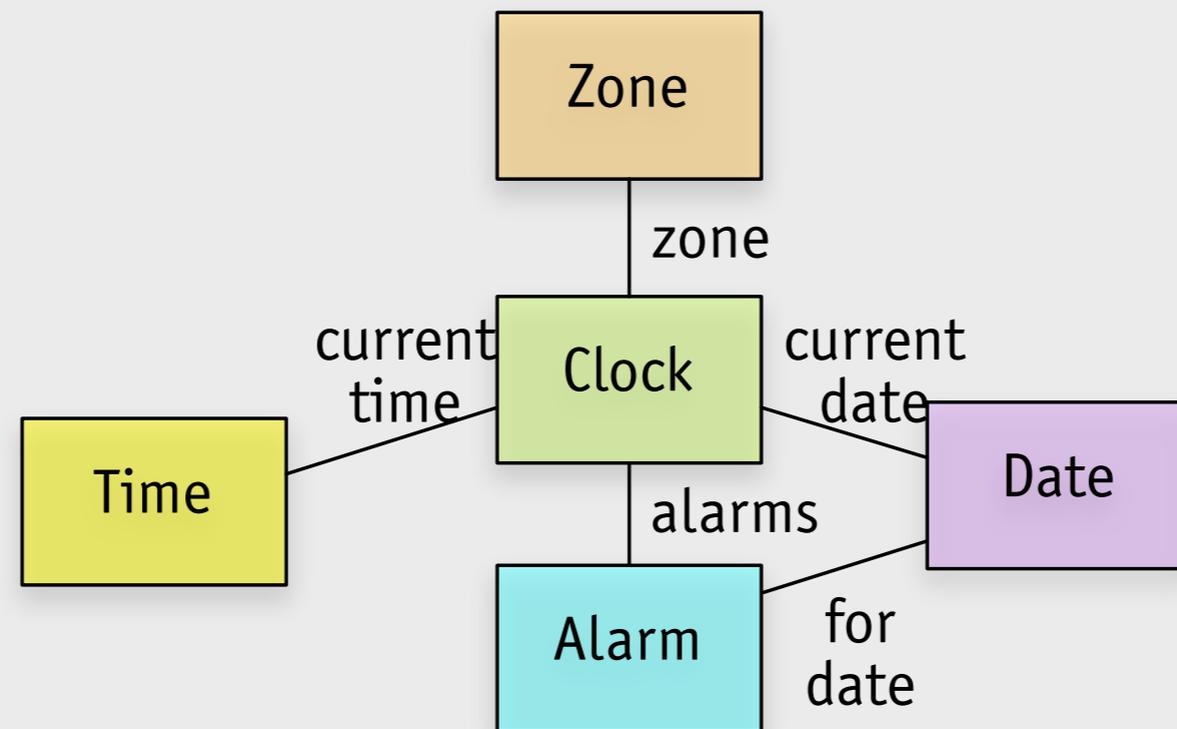
summarizing abstract states



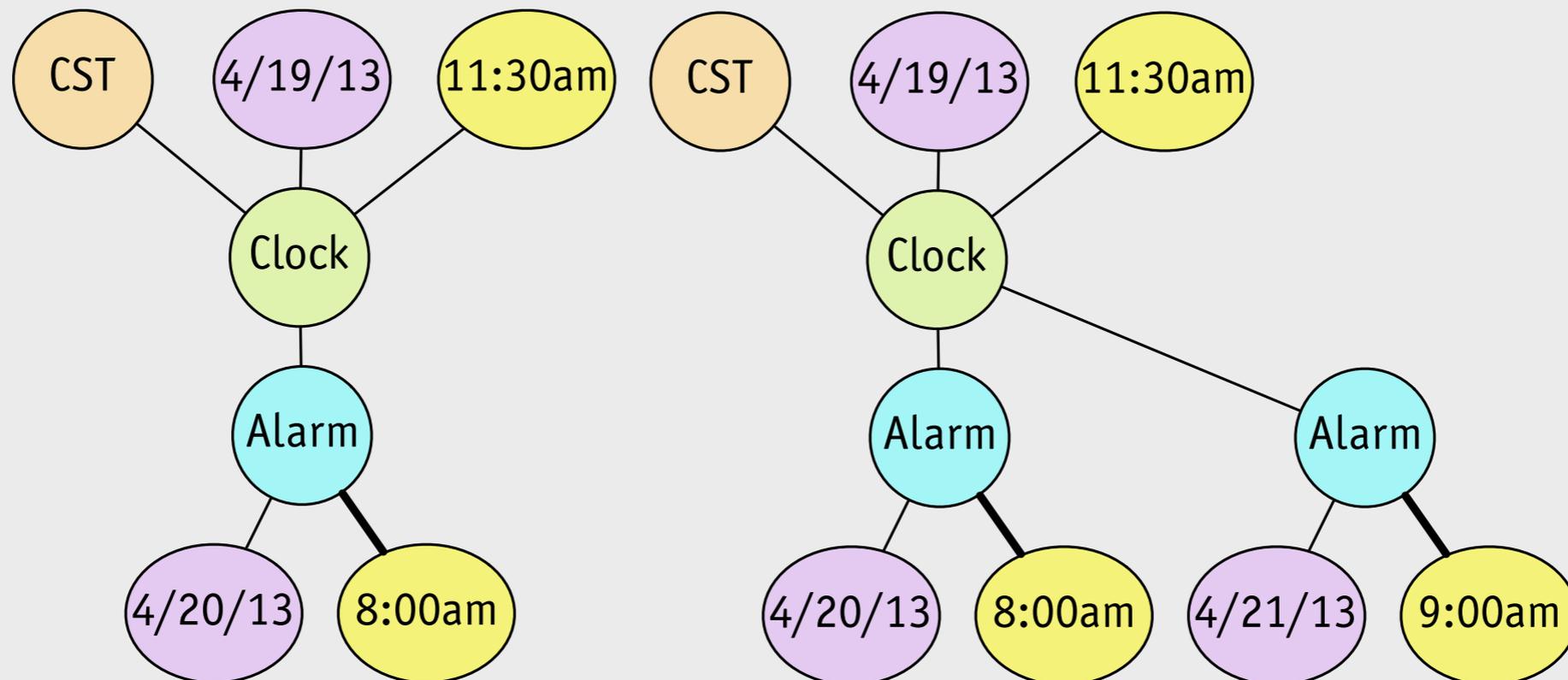
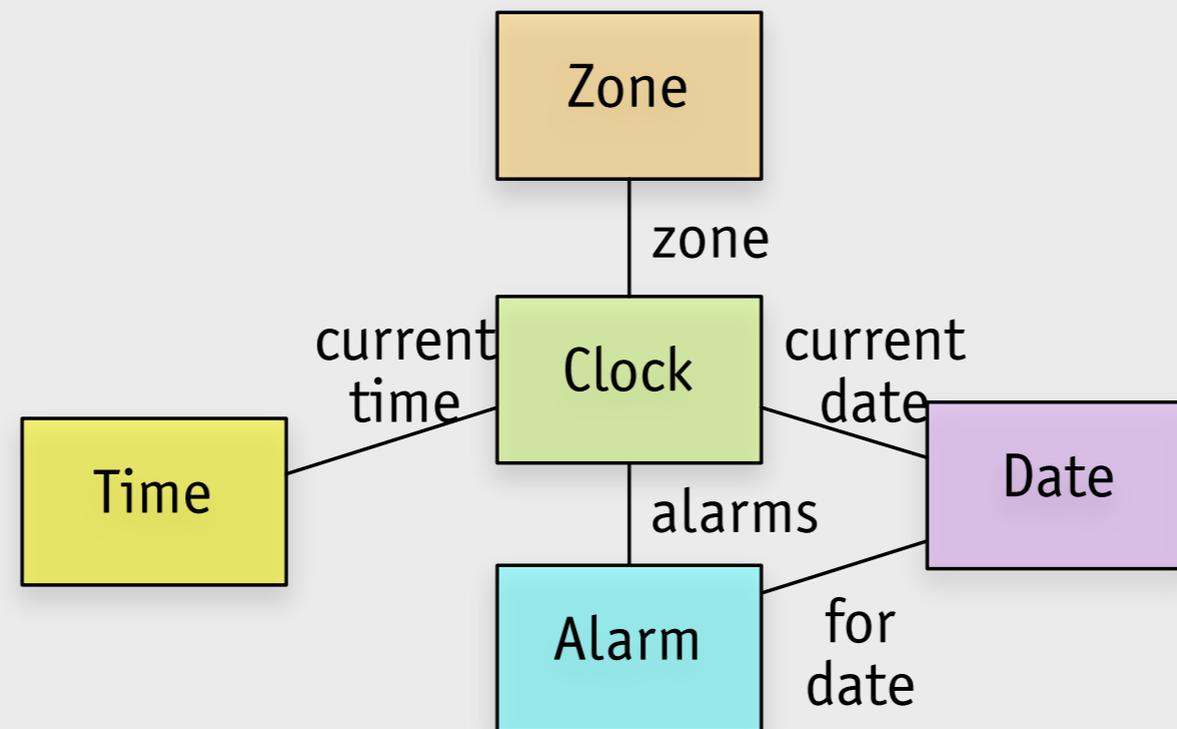
summarizing abstract states



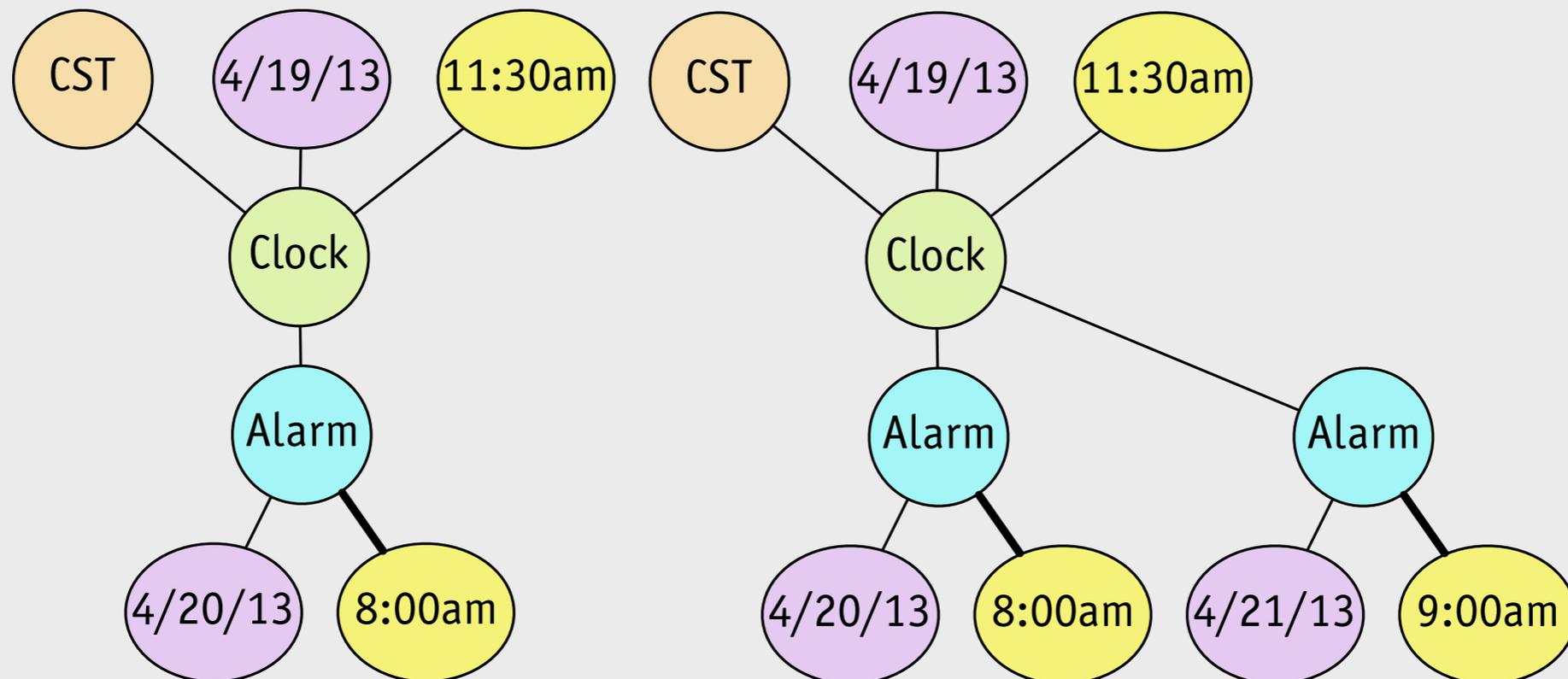
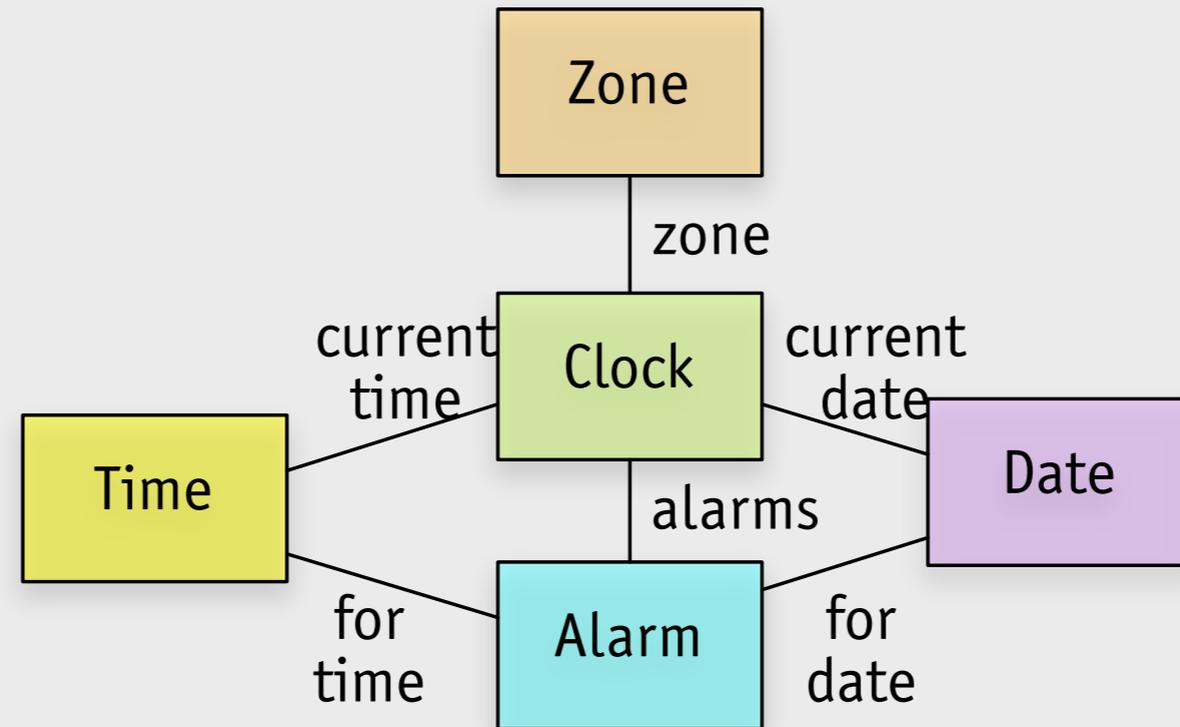
summarizing abstract states

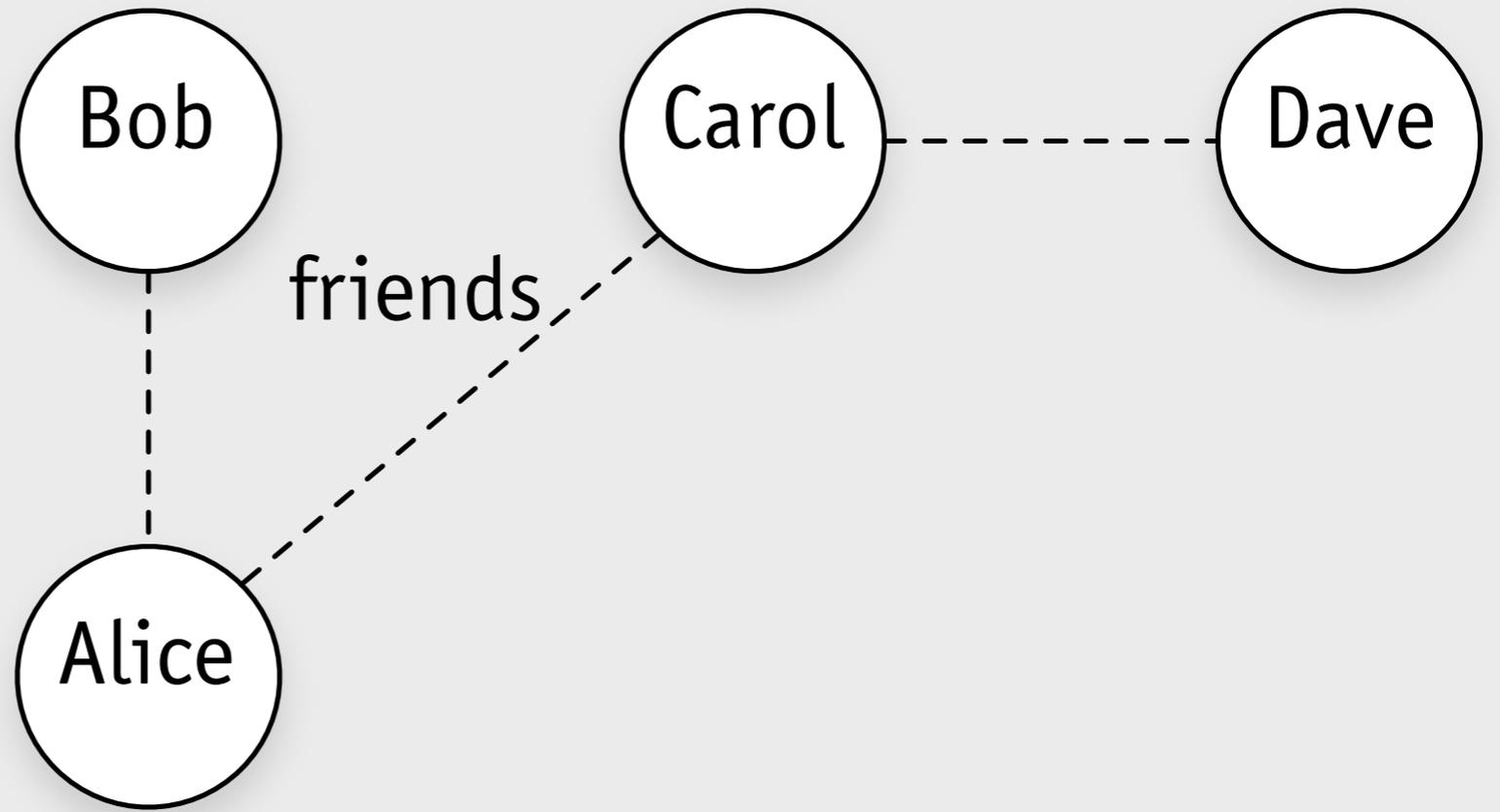


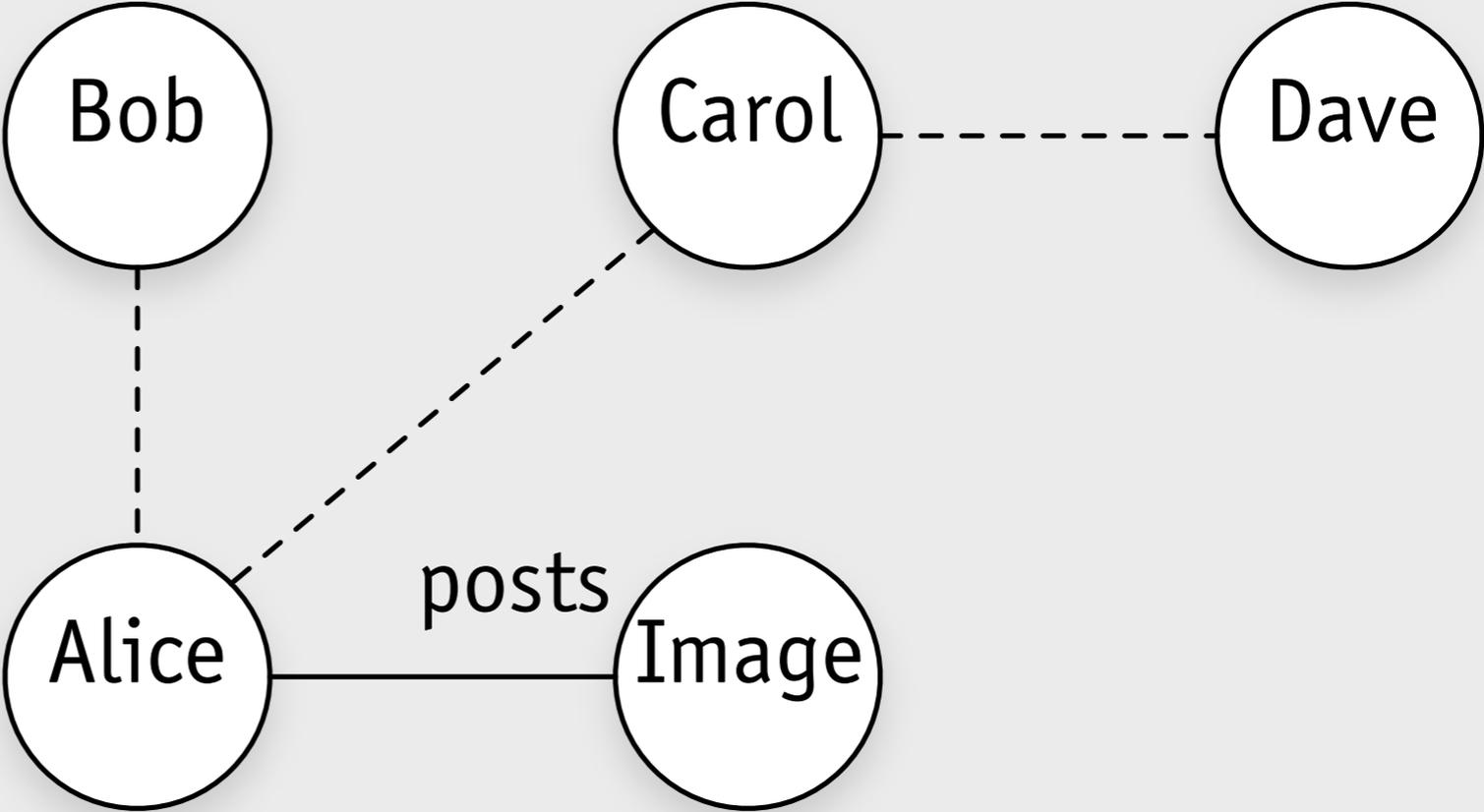
summarizing abstract states

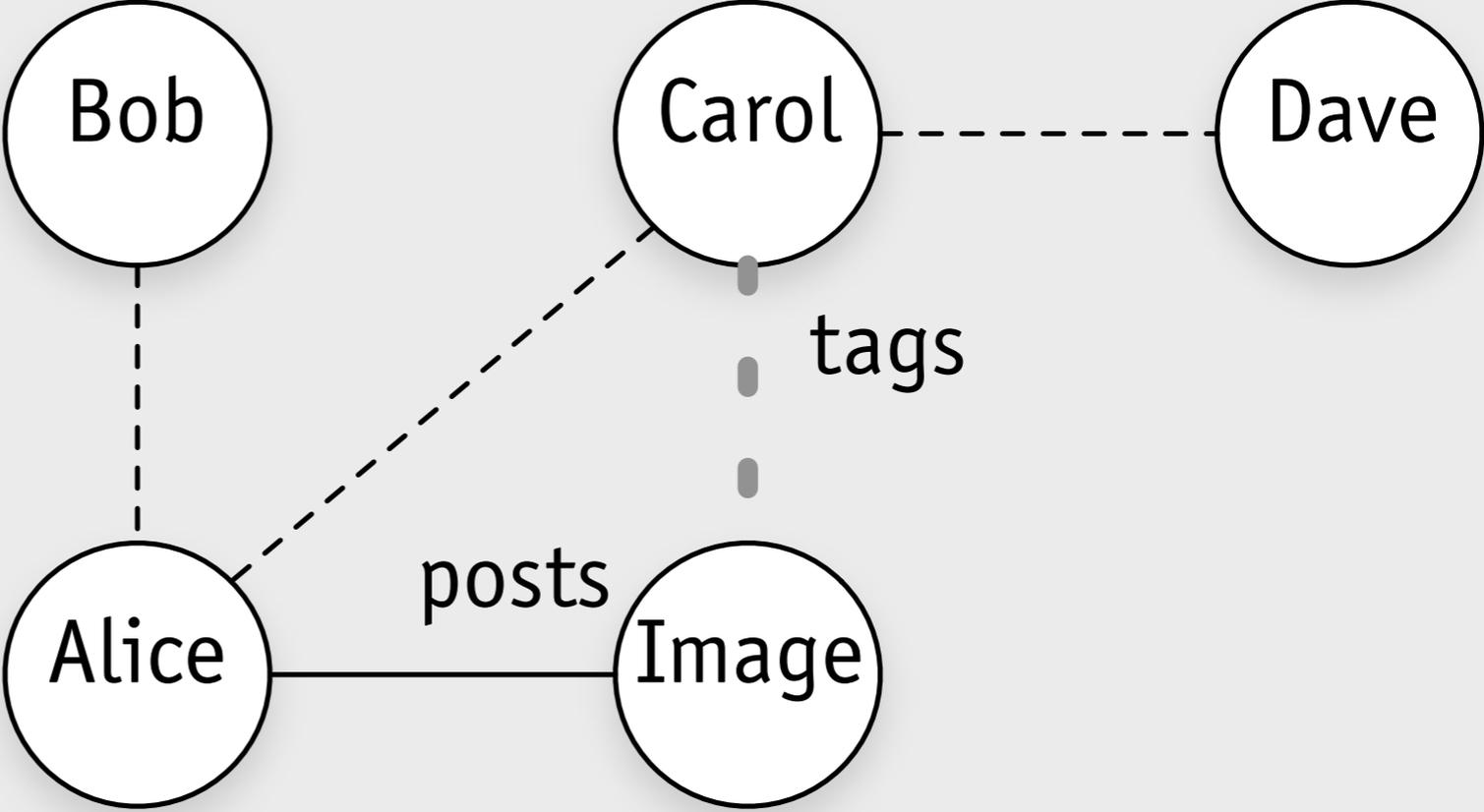


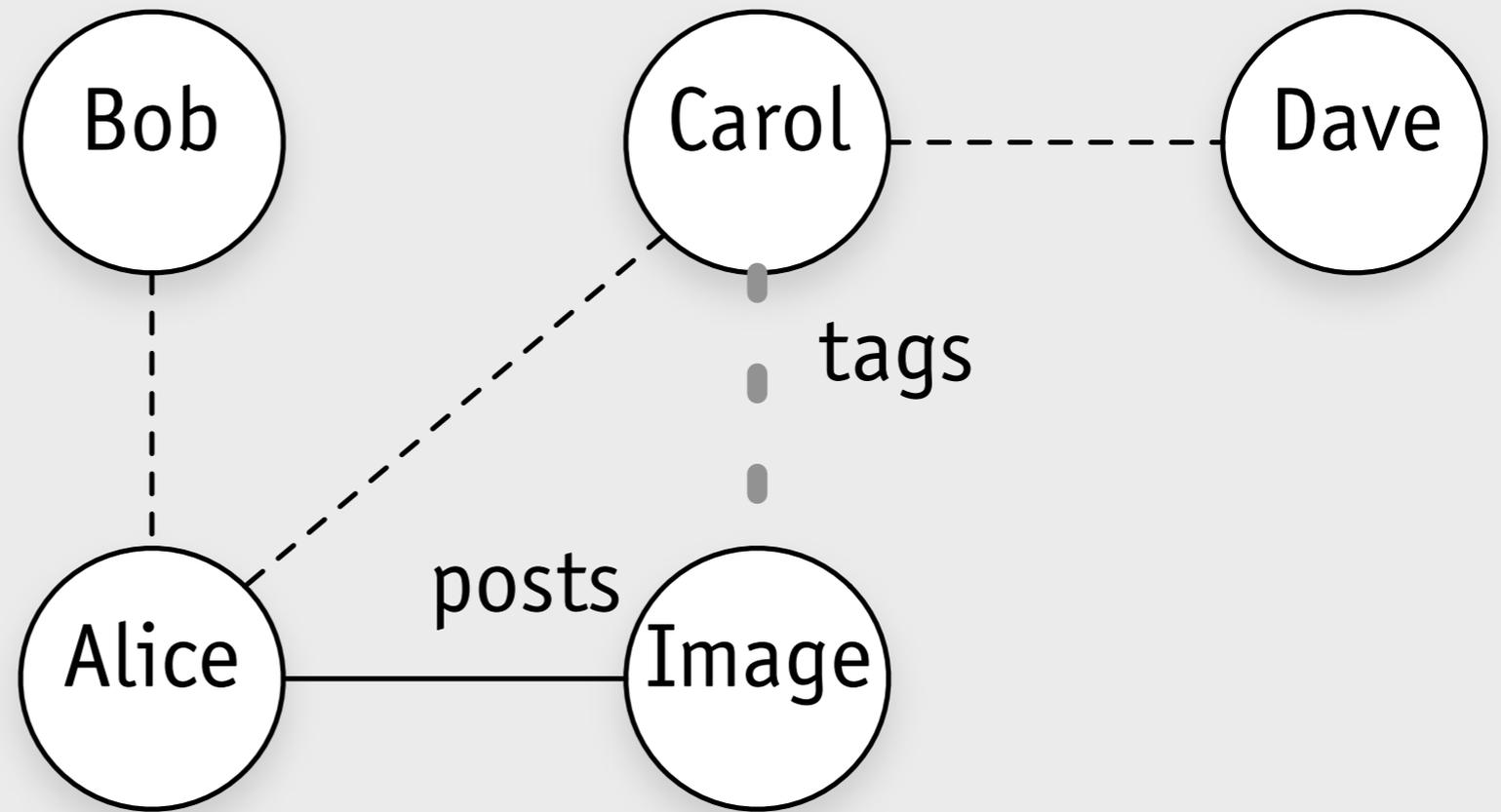
summarizing abstract states



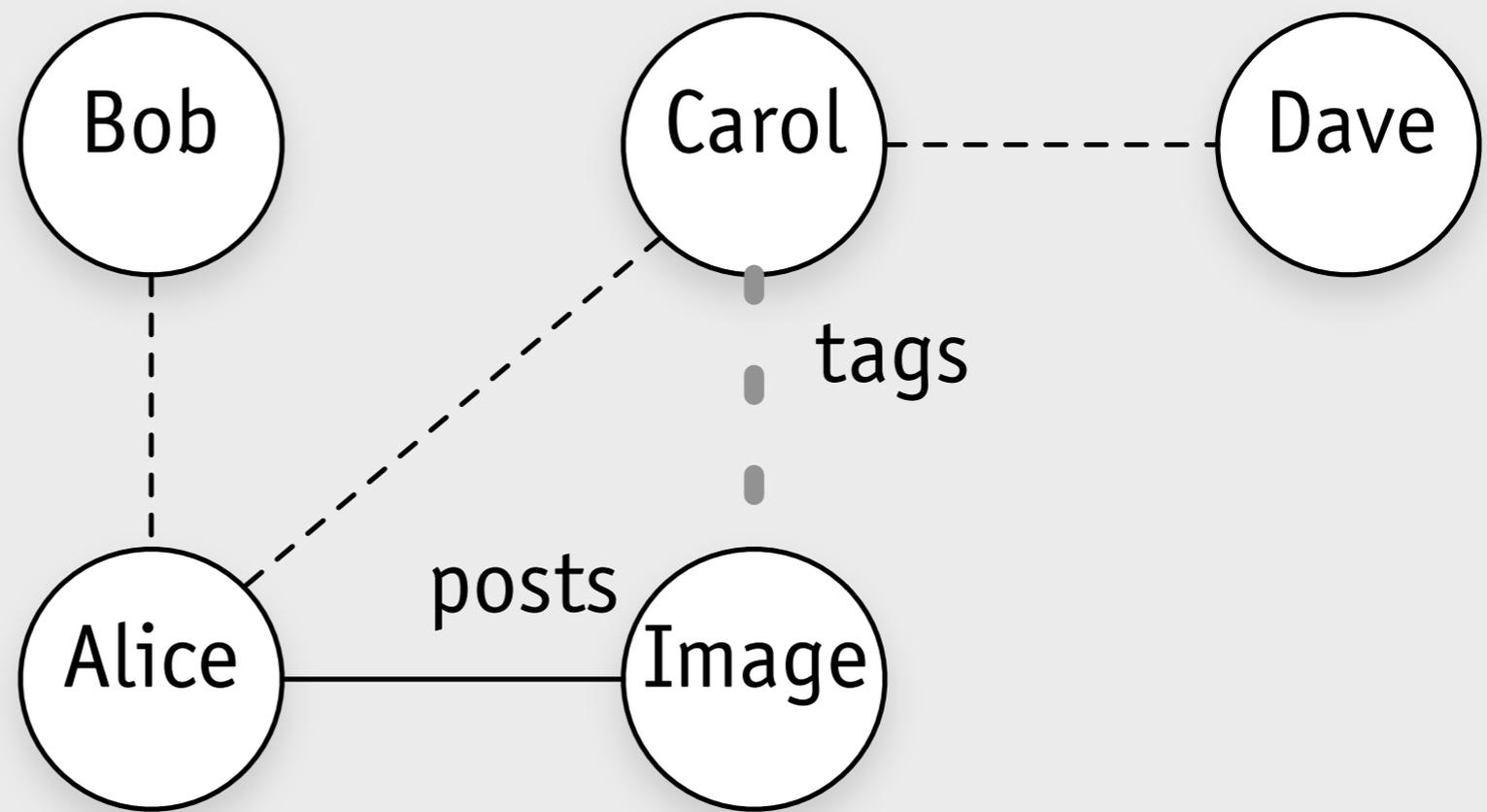








who can see the image?

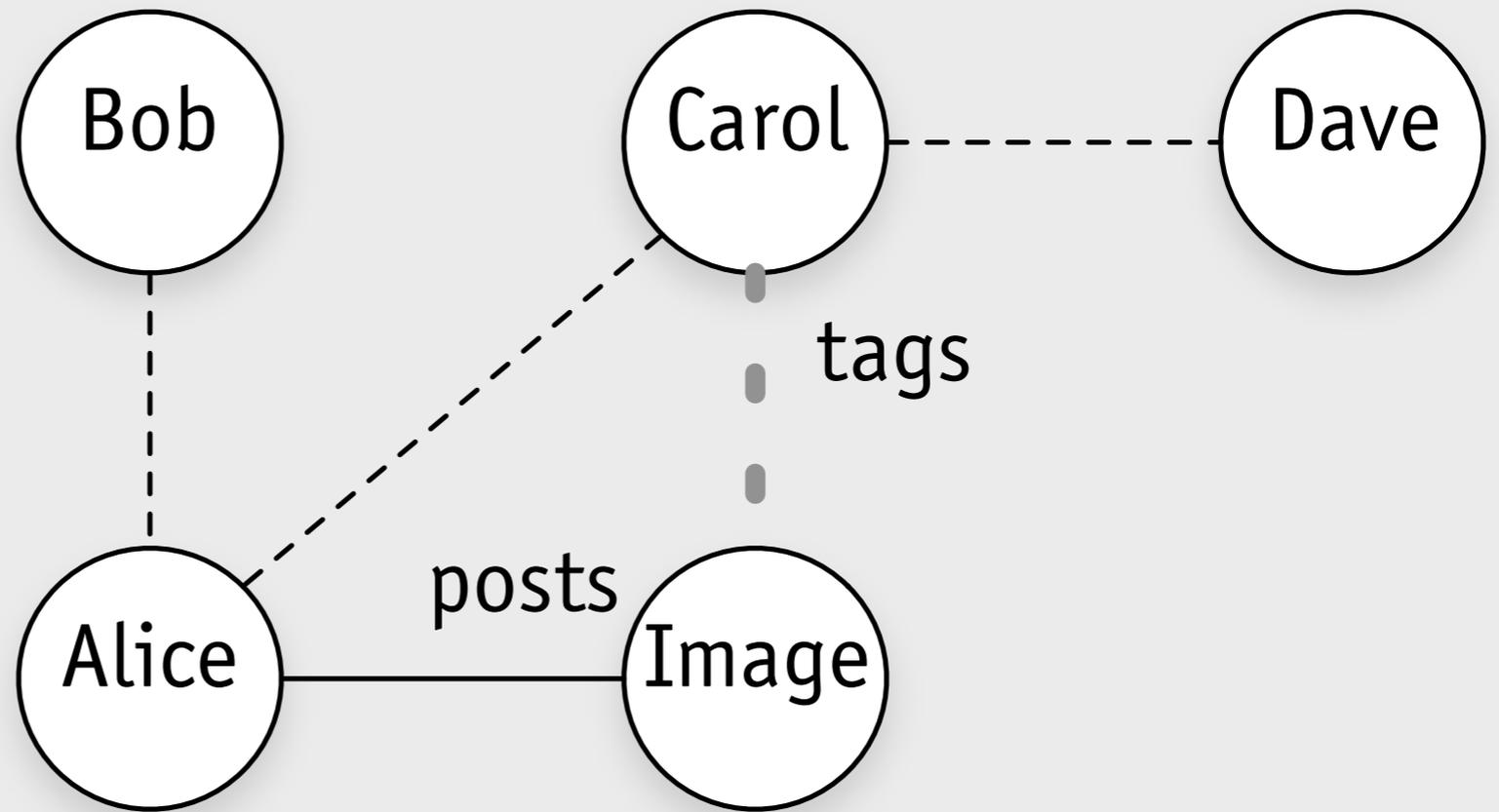


who can see the image?

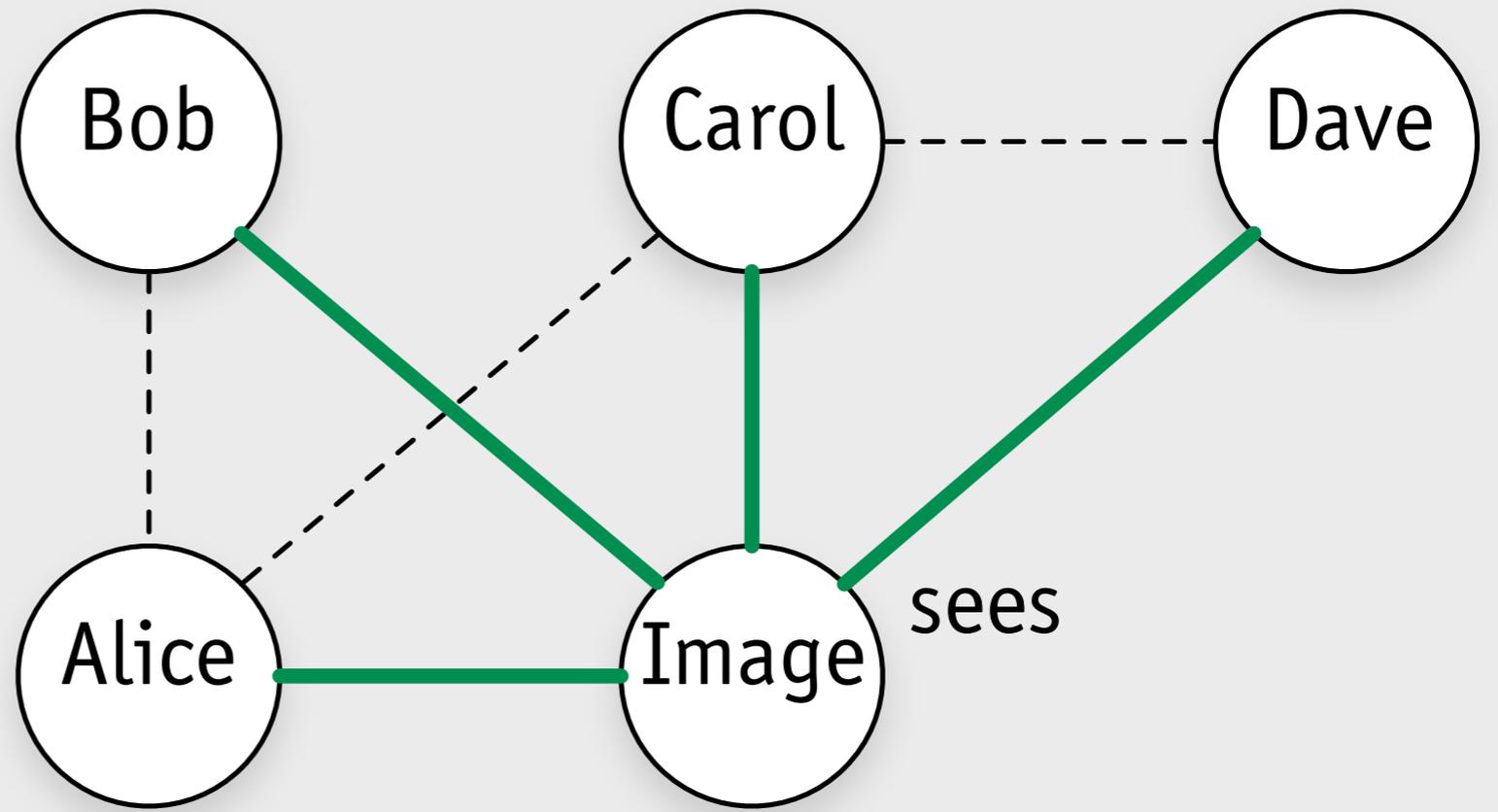
When someone adds a tag to a photo or other post I shared, who can see it?

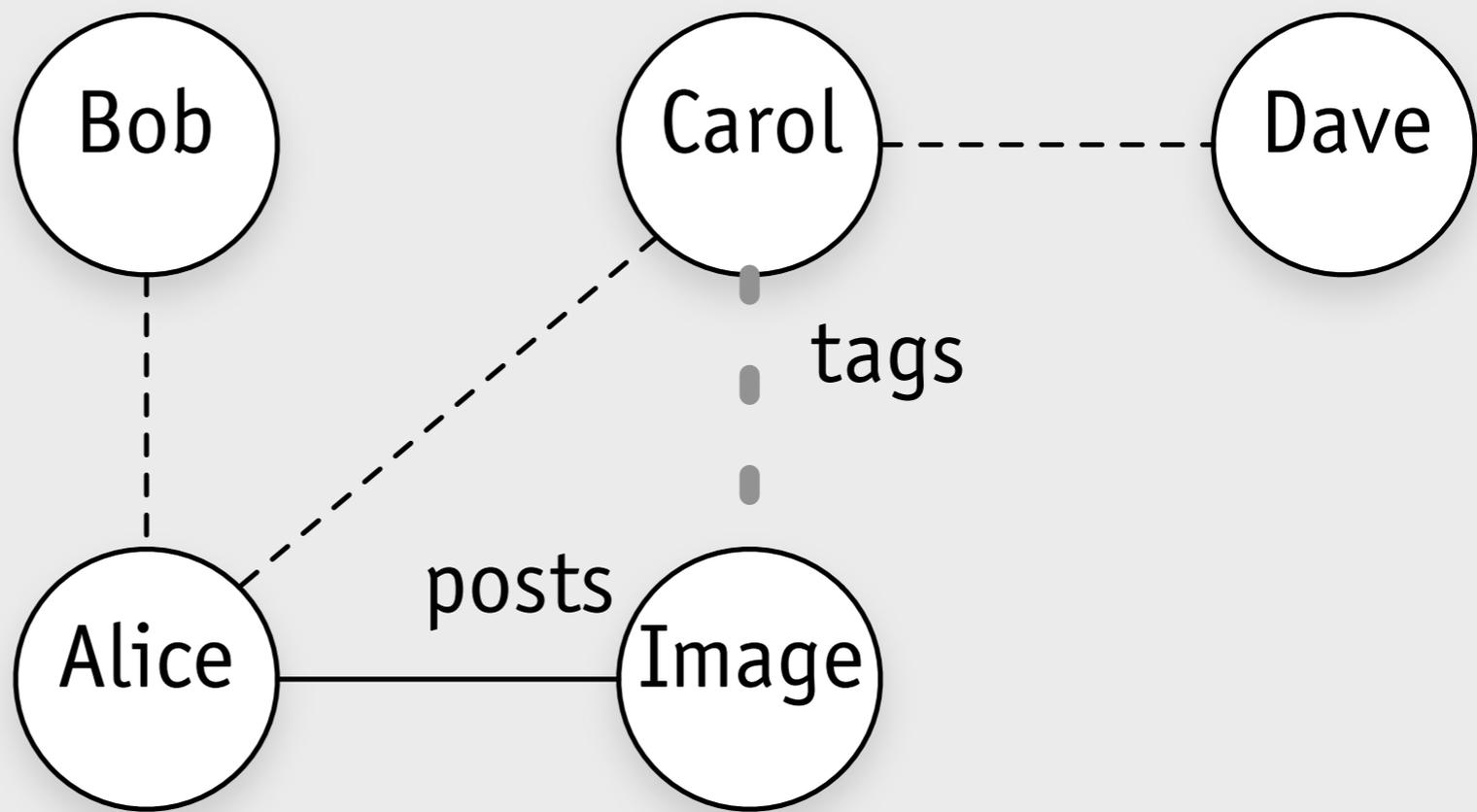
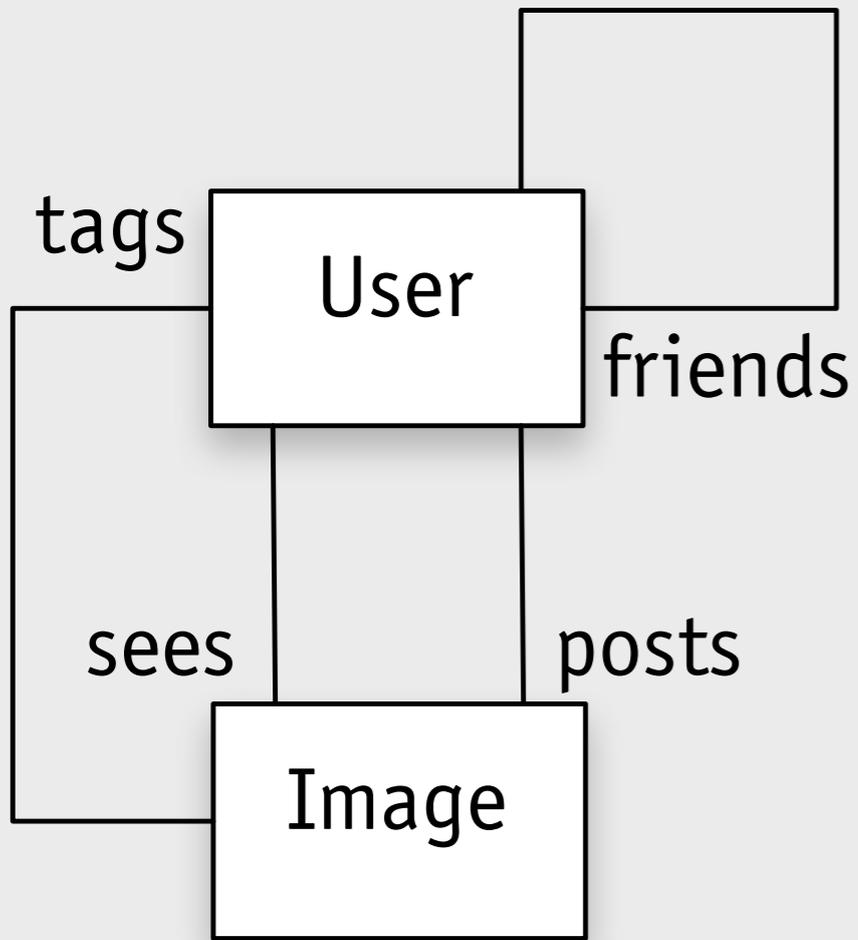
When someone adds a tag to something you shared, it's visible to:

1. The audience you chose for the post or photo
2. The person tagged in the post and their friends

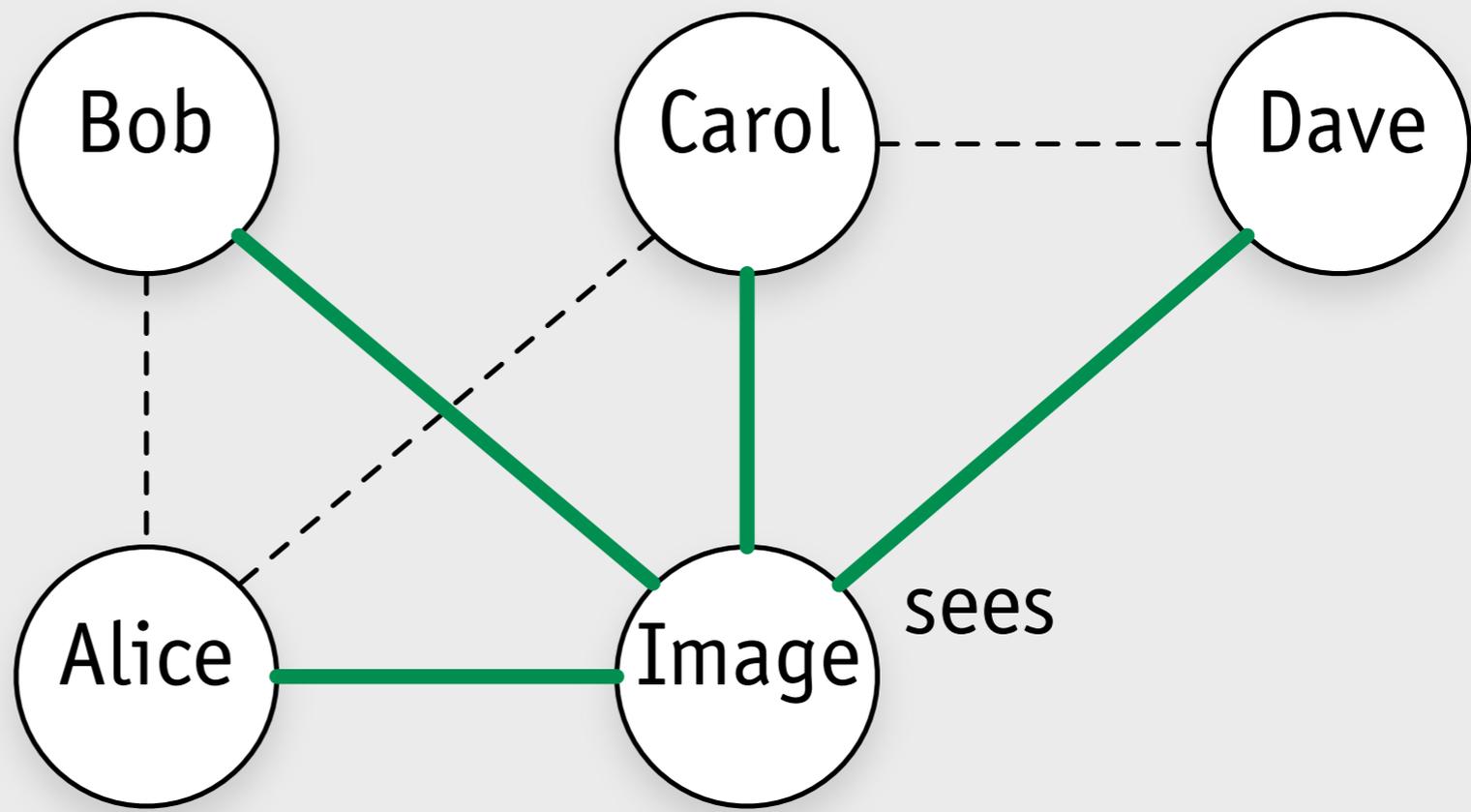


who can see the image?





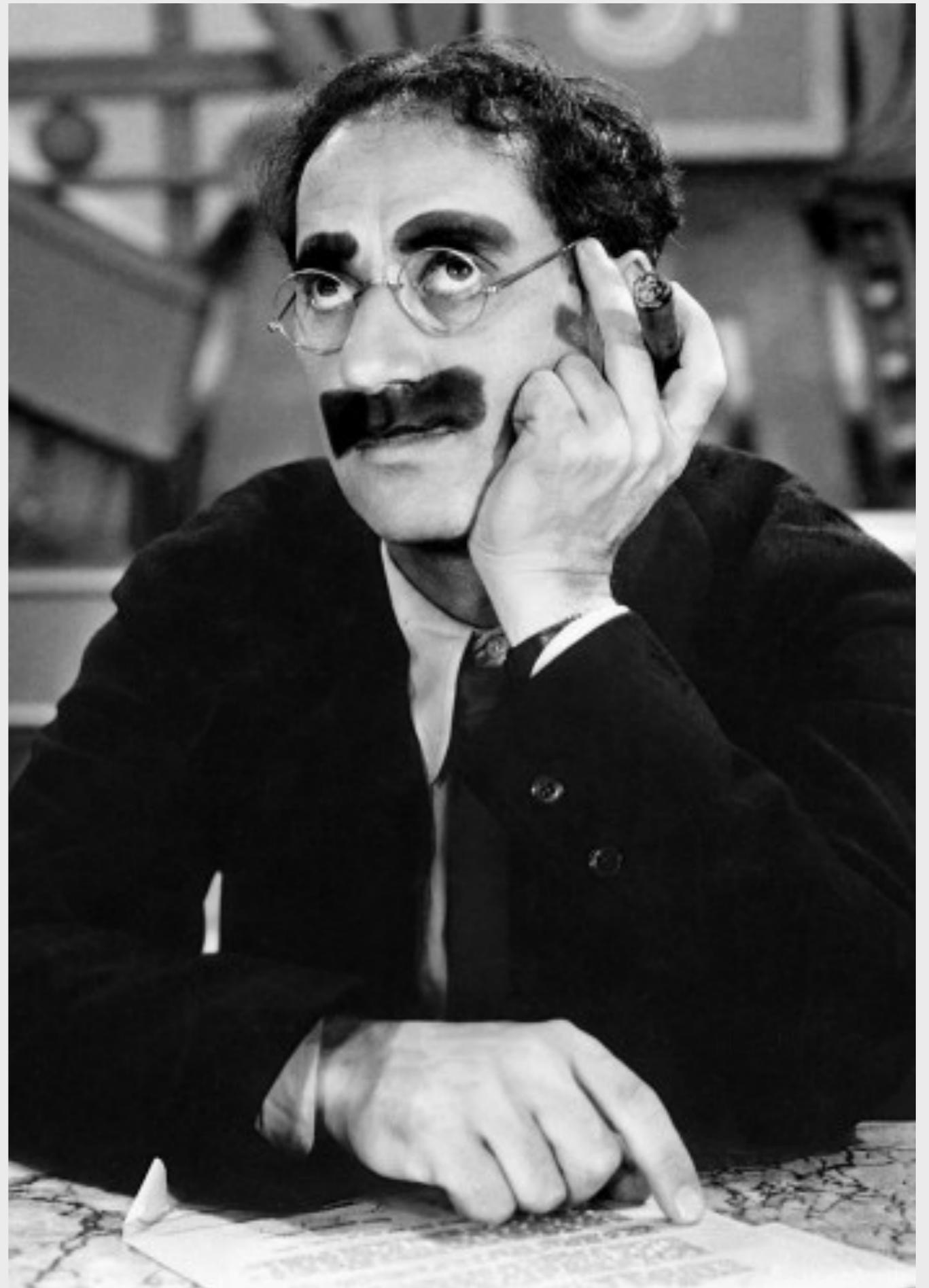
who can see the image?



**how do we learn
so many conceptual
models?**

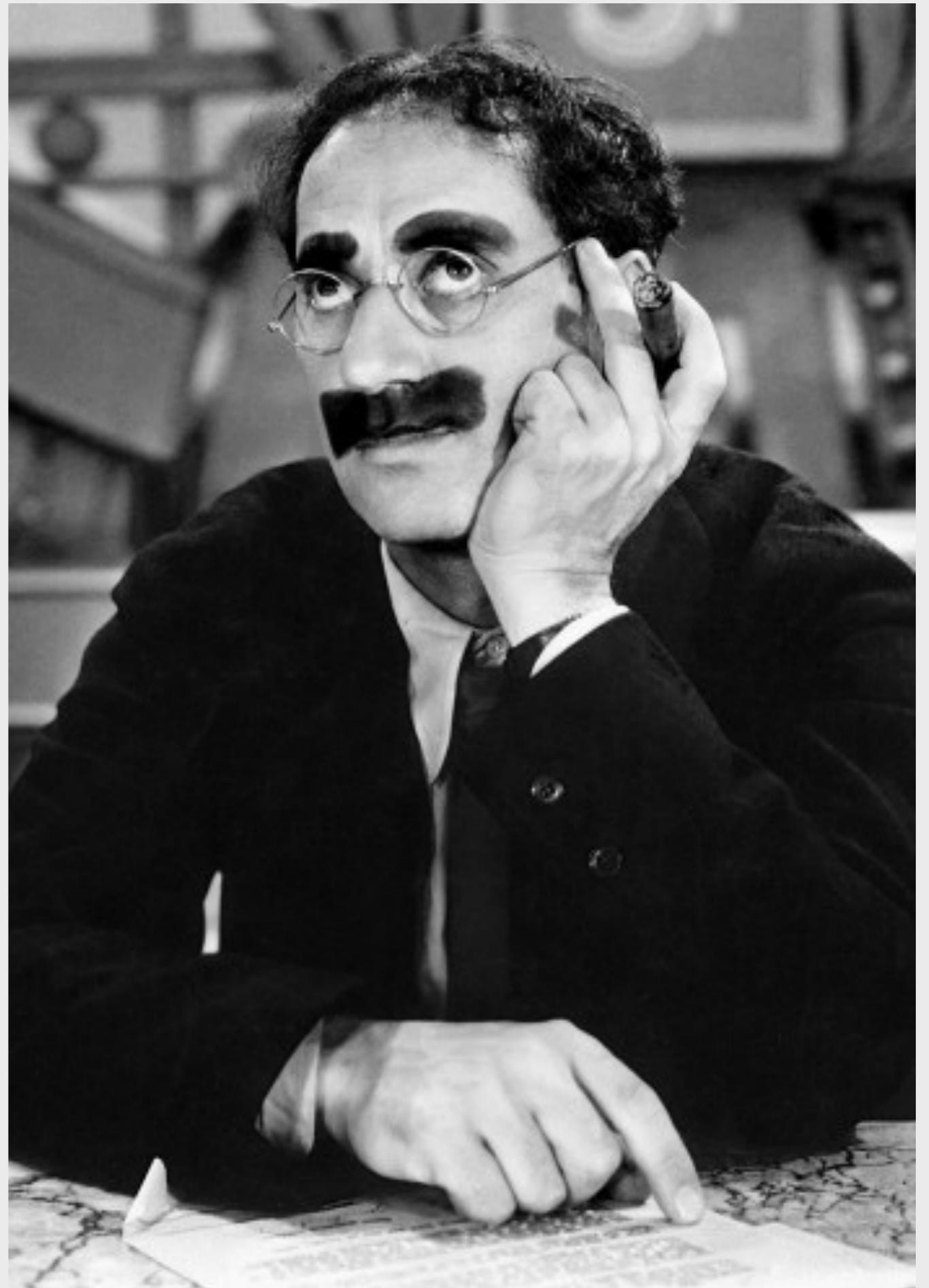


Why, a four-year-old child could understand this!



Why, a four-year-old child
could understand this!

Run out and get me a
four-year-old child!
I can't make head or
tail out of it.



conceptual idioms

conceptual idioms

applications

Lightroom

Powerpoint

Word

Gmail

Amazon

conceptual idioms

applications

Lightroom

Powerpoint

Word

Gmail

Amazon

idioms

tagging

style

selection

presets

conceptual idioms

applications

Lightroom

Powerpoint

Word

Gmail

Amazon

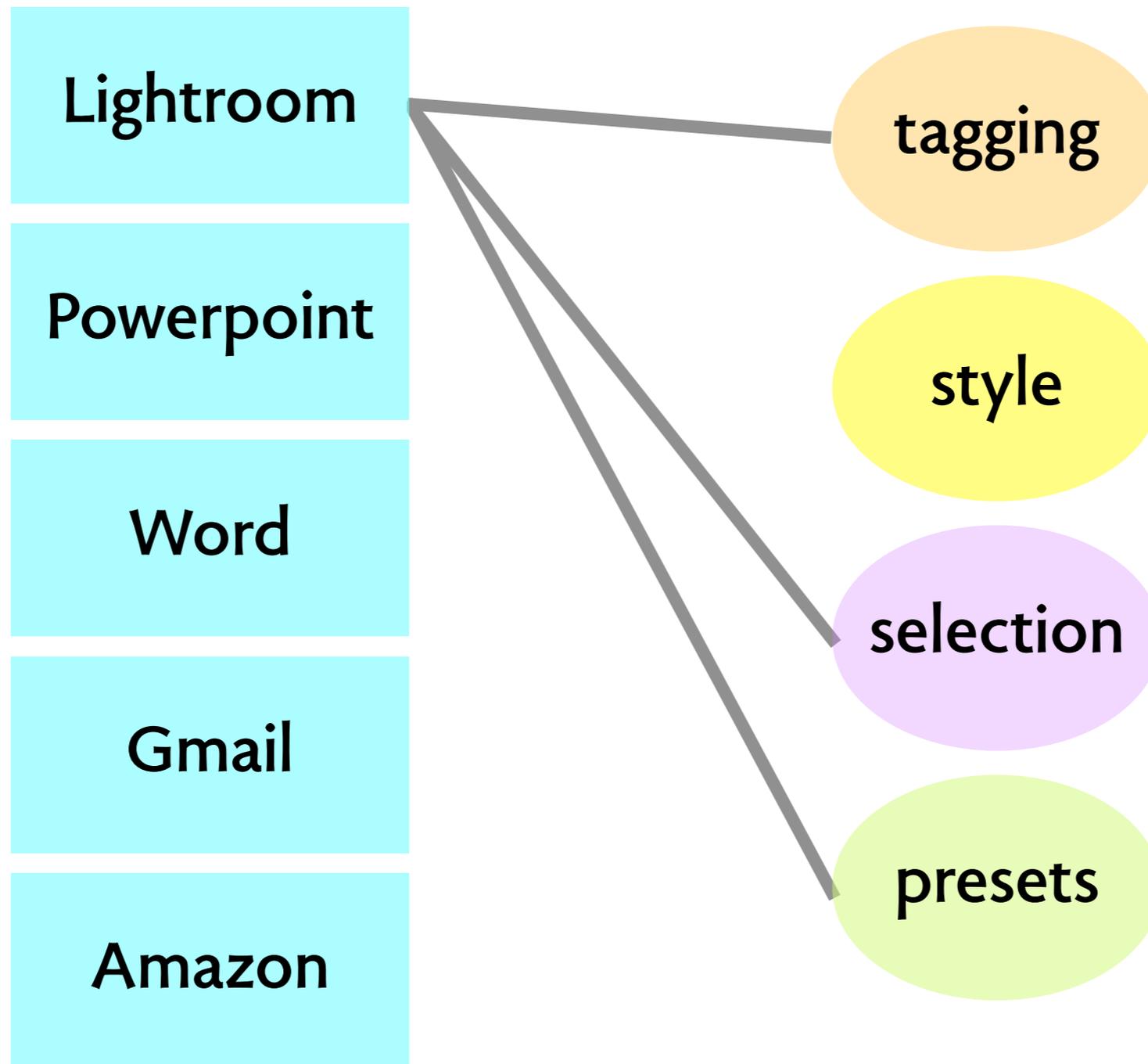
idioms

tagging

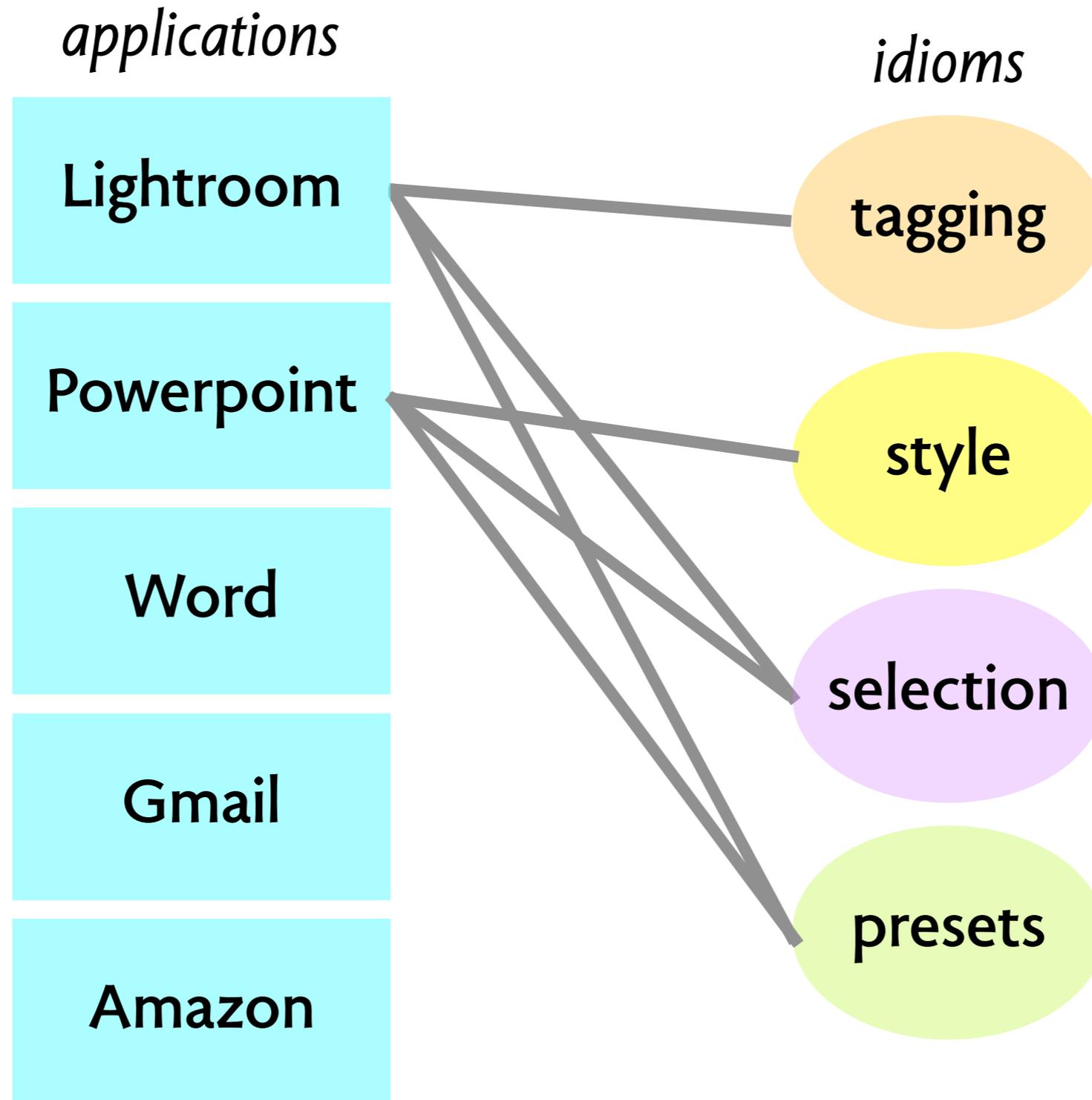
style

selection

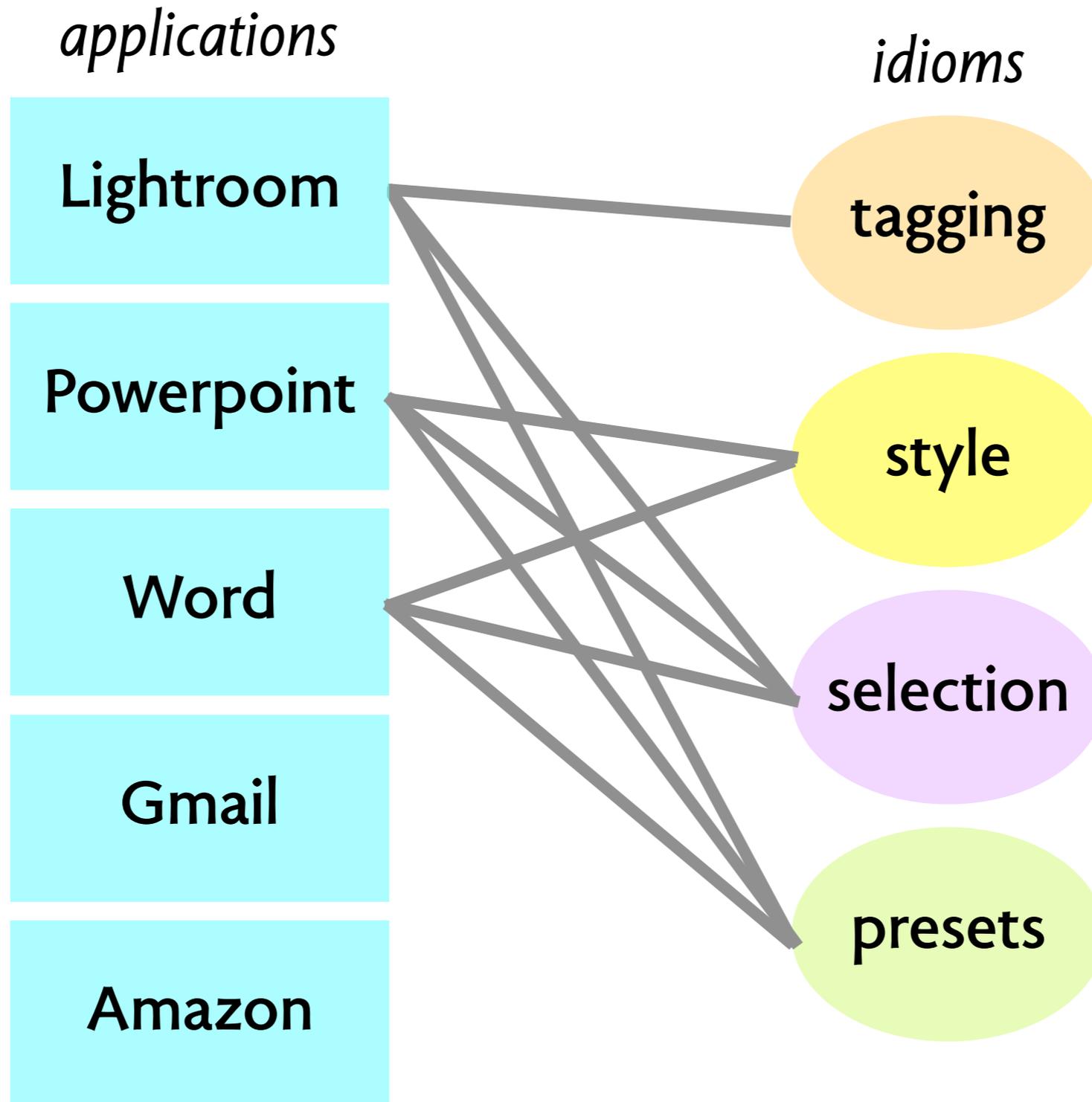
presets



conceptual idioms



conceptual idioms



conceptual idioms

applications

Lightroom

Powerpoint

Word

Gmail

Amazon

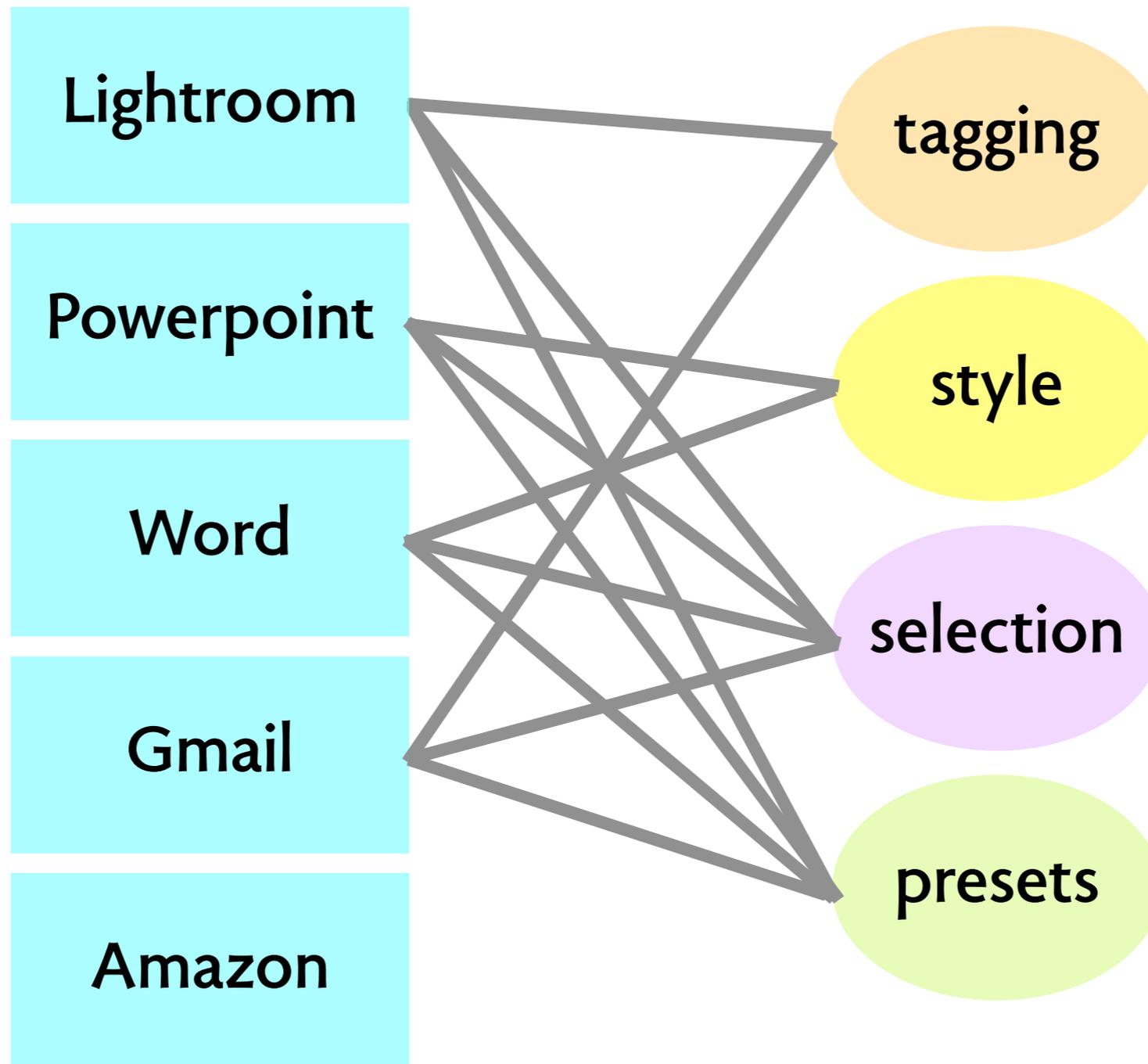
idioms

tagging

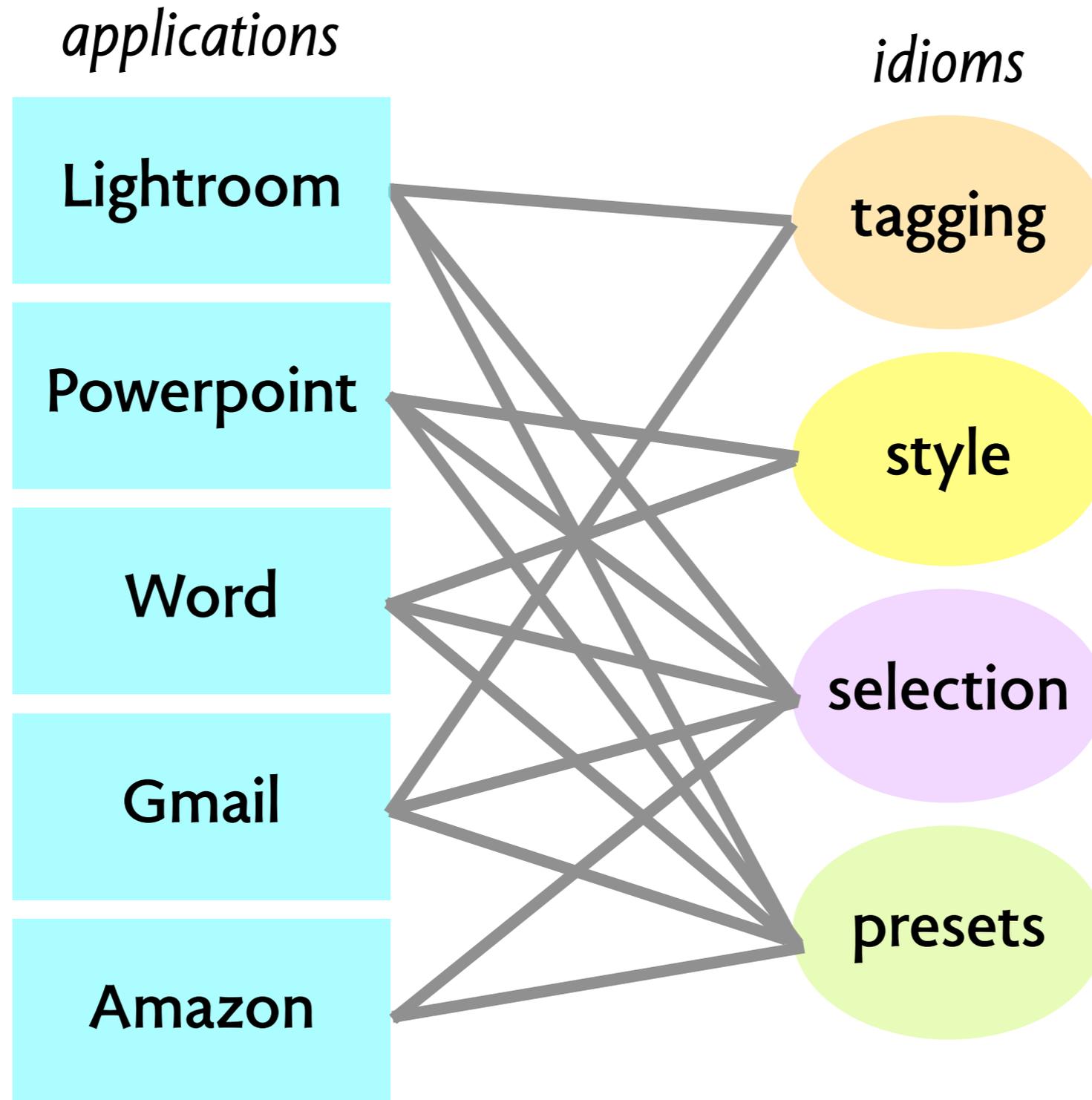
style

selection

presets



conceptual idioms



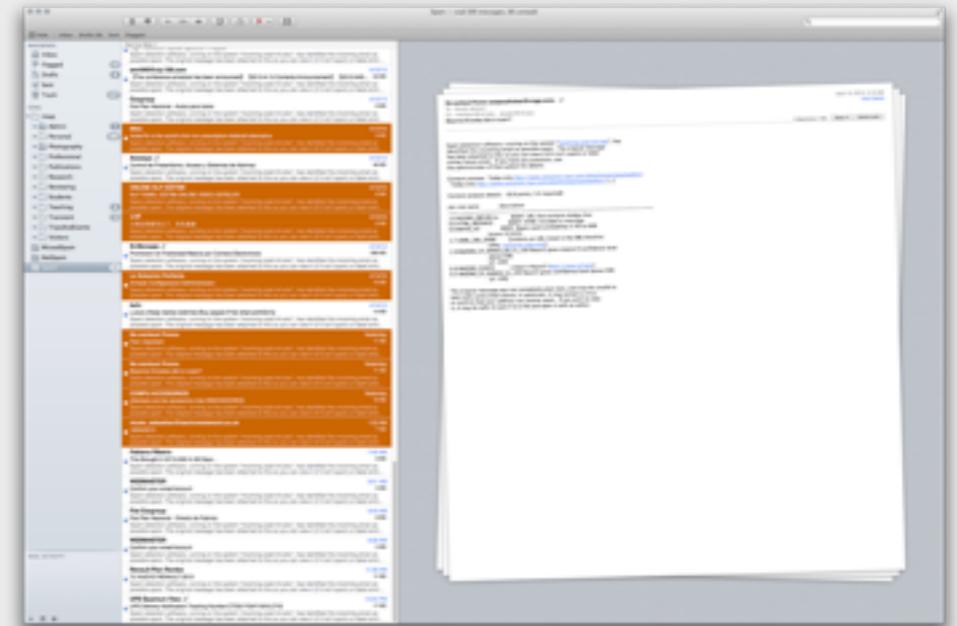
an idiom: selection



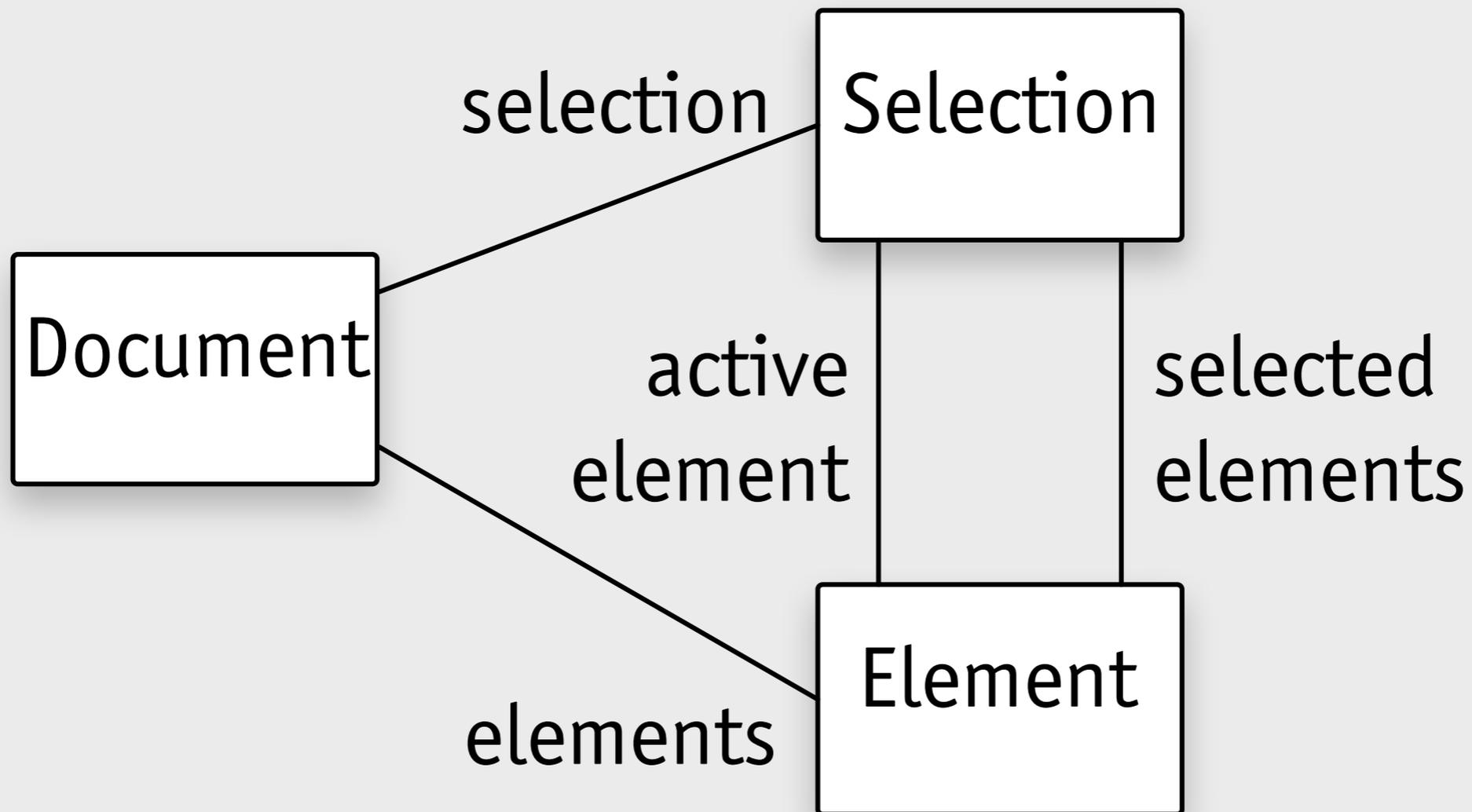
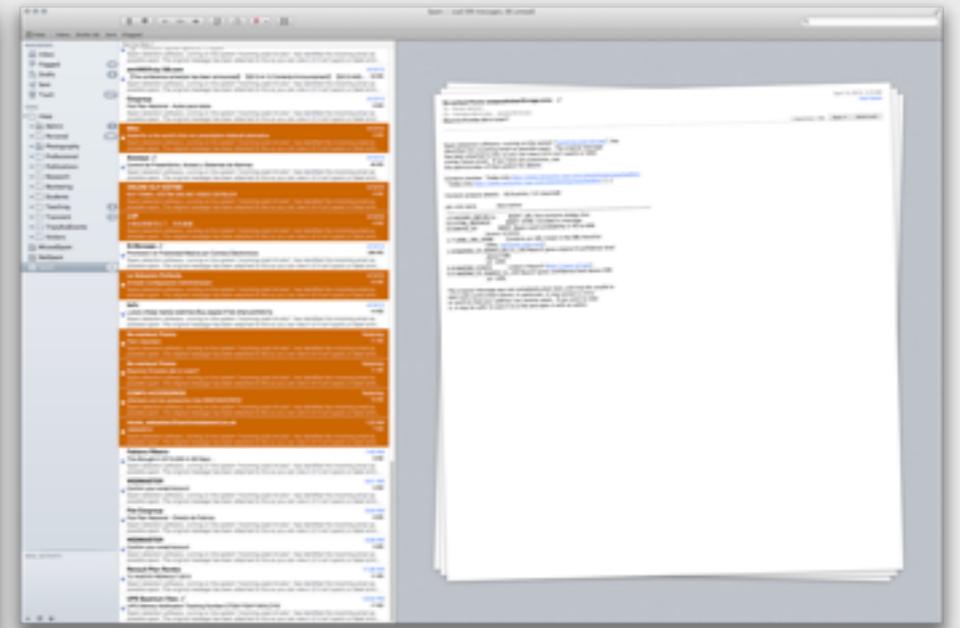
slides in
Keynote



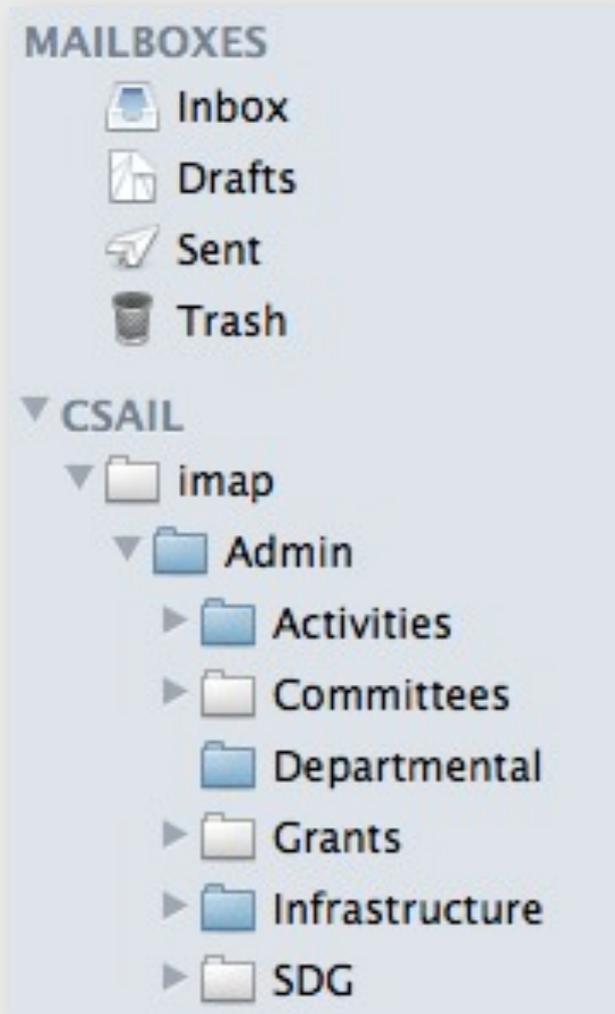
photos in Adobe Lightroom



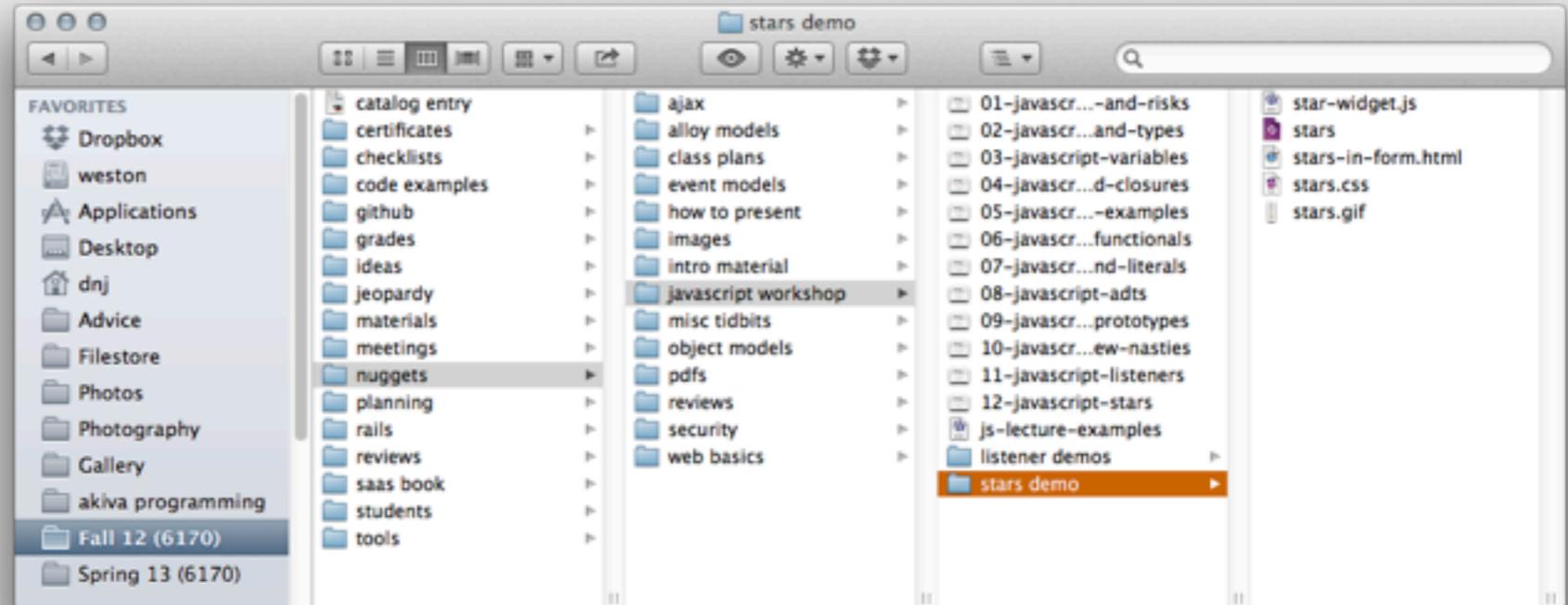
messages in Apple Mail



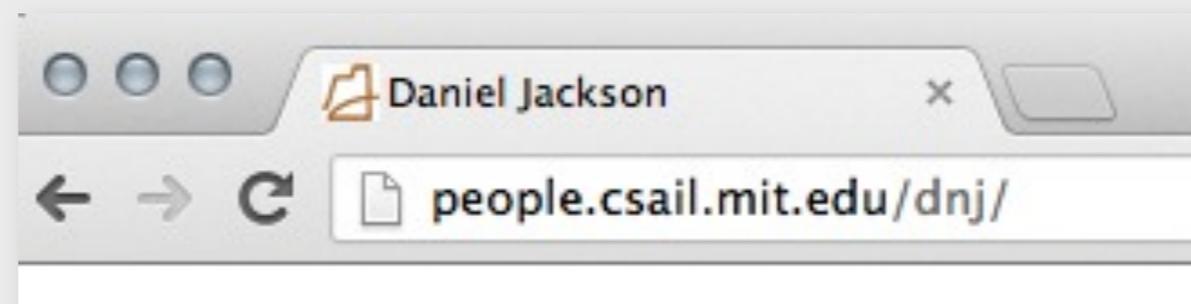
an idiom: directory



mailboxes
in Apple Mail



files and folder in Unix/OS X



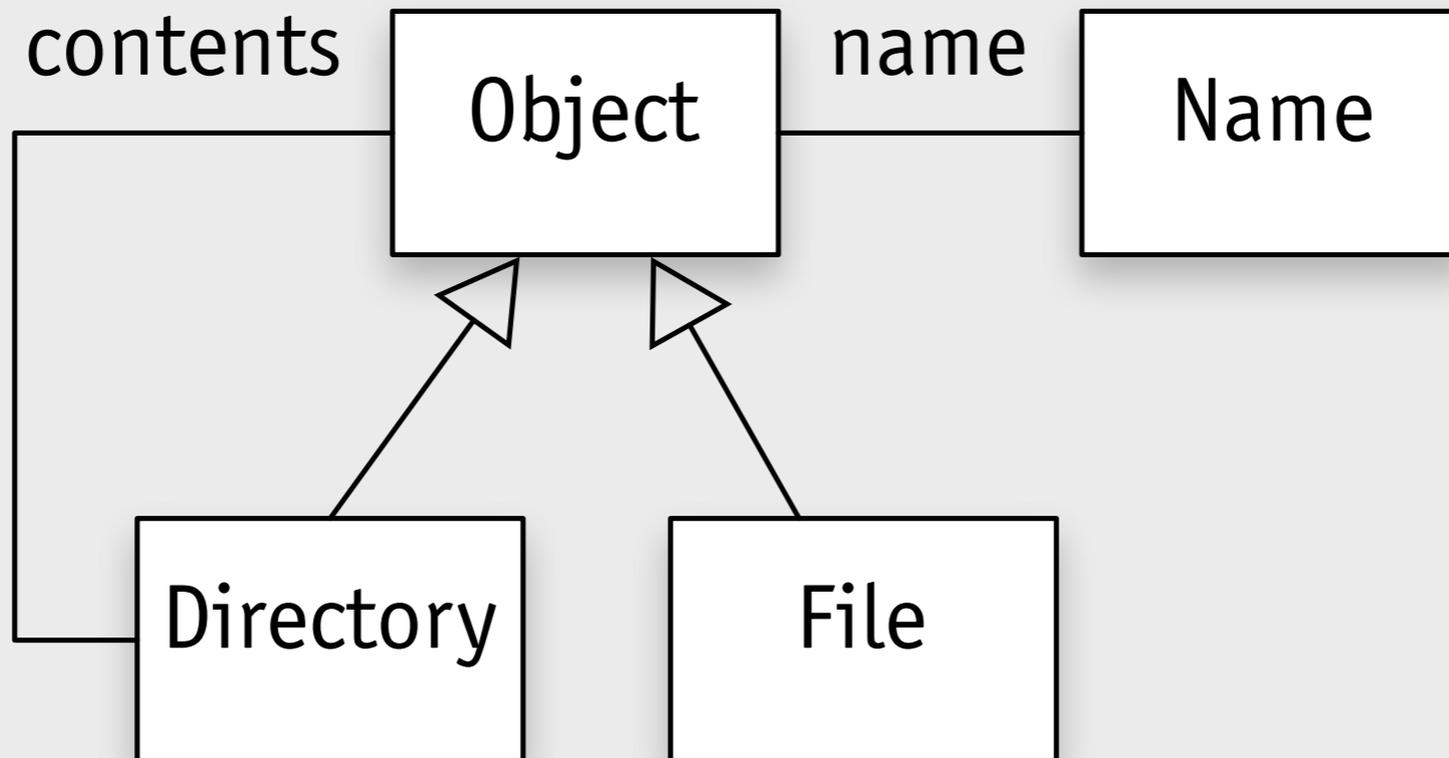
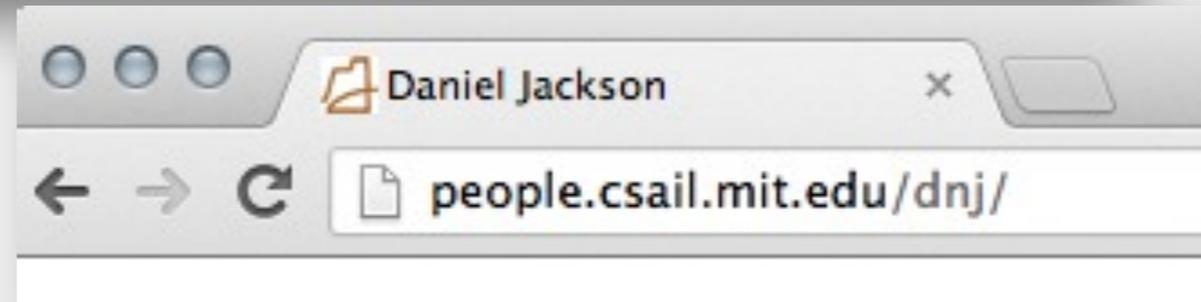
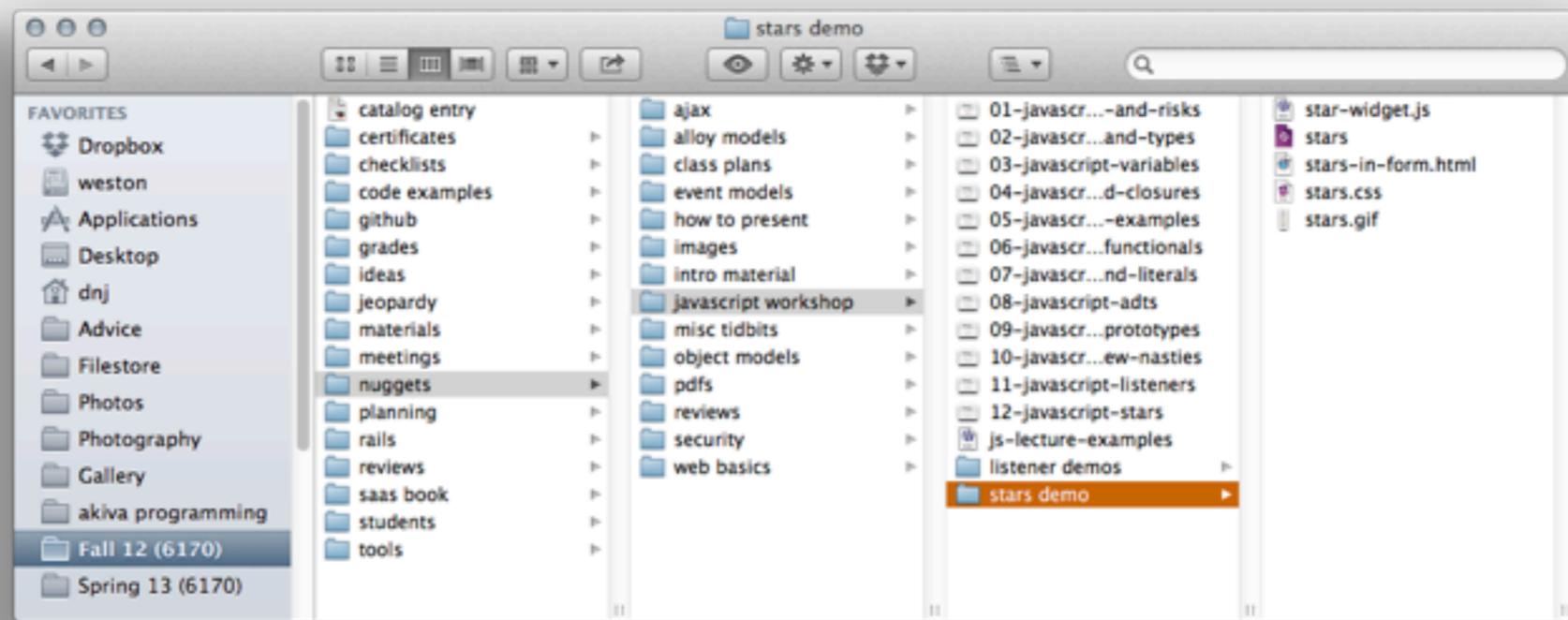
domain names in DNS

MAILBOXES

- Inbox
- Drafts
- Sent
- Trash

CSAIL

- imap
 - Admin
 - Activities
 - Committees
 - Departmental
 - Grants
 - Infrastructure
 - SDG



an idiom: tagging



twitter hashtags

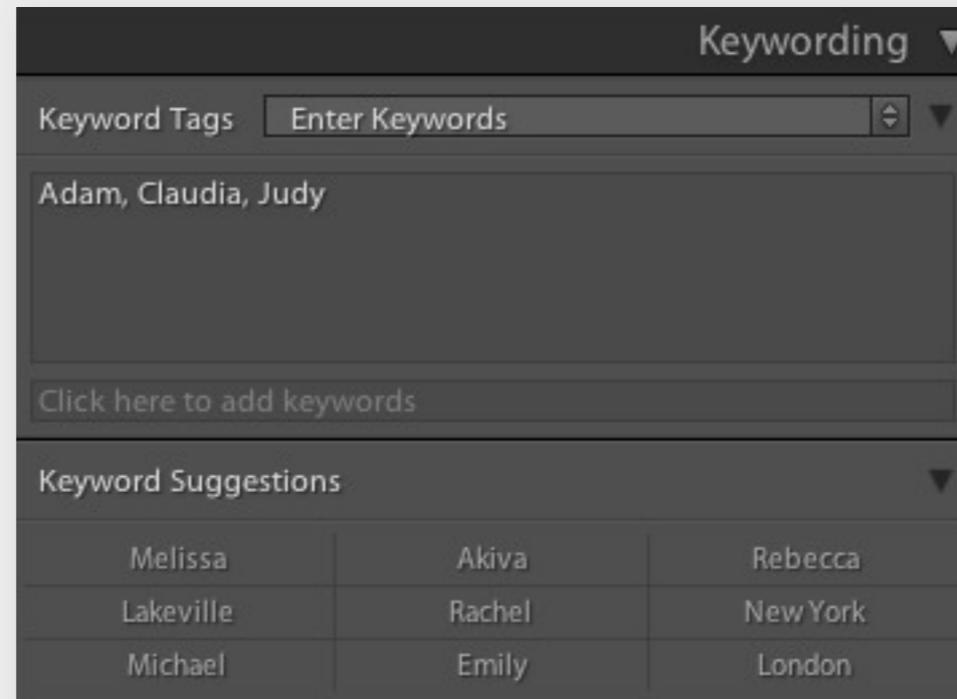
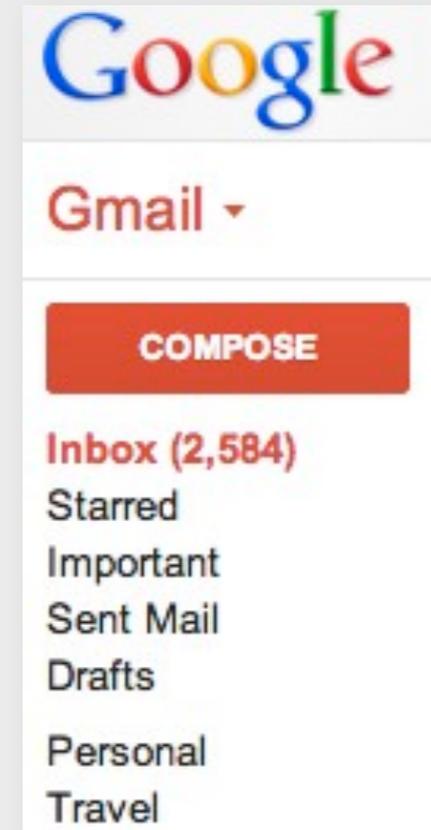


photo keywords



Gmail labels



Keywording

Keyword Tags

Adam, Claudia, Judy

[Click here to add keywords](#)

Keyword Suggestions

Melissa	Akiva	Rebecca
Lakeville	Rachel	New York
Michael	Emily	London

Google

Gmail

COMPOSE

Inbox (2,584)

Starred

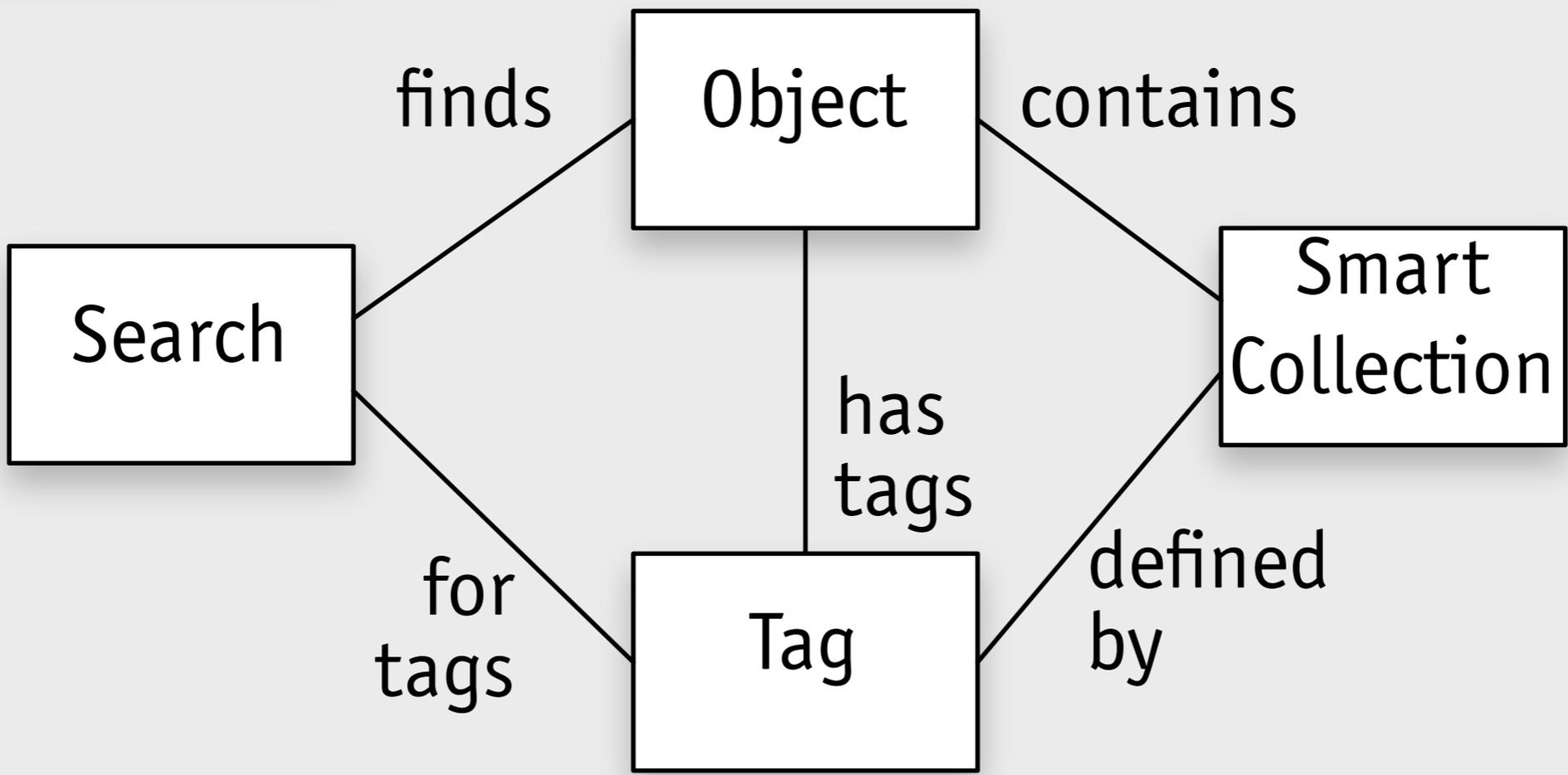
Important

Sent Mail

Drafts

Personal

Travel



an idiom: upvoting



A screenshot of a comment on the NY Times website. The comment is by Carolyn Egeli from Valley Lee, Md. The text of the comment discusses the political situation in France and Greece and the impact on the American public and stock markets. The comment was posted on May 7, 2012, at 3:23 p.m. and has 8 recommendations.

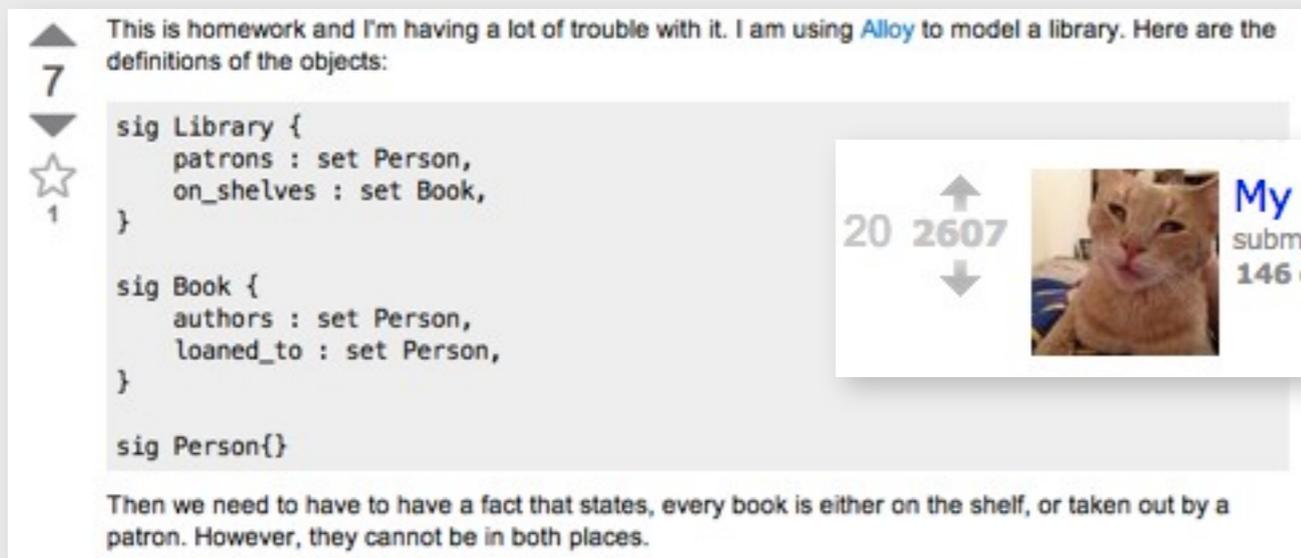
ALL | READER PICKS | NYT PICKS | Newest ▾ | Comments

Carolyn Egeli · Valley Lee, Md.

As always, the battle is set between the haves, and the rest. The haves have just lost out, and the movement back towards the greater good has begun. Let's hope the American public sees the sense in what the French and Greeks have done yesterday, by reclaiming their governments to represent the people for a change. The stock markets will likely be unhappy.

May 7, 2012 at 3:23 p.m. · RECOMMEND  8

recommending comments
on NY Times



A screenshot of a Stack Overflow question. The question is about modeling a library with Alloy. The user is asking for help with the definitions of the objects. The question has 7 votes and 1 answer.

▲ 7
▼
☆ 1

```
sig Library {  
  patrons : set Person,  
  on_shelves : set Book,  
}  
  
sig Book {  
  authors : set Person,  
  loaned_to : set Person,  
}  
  
sig Person{}
```

Then we need to have to have a fact that states, every book is either on the shelf, or taken out by a patron. However, they cannot be in both places.

questions on Stack Overflow



A screenshot of a Reddit post. The post is titled "My cat was sick and got meds. Now my cat is high as a kite." and was submitted 3 hours ago by user ogden24 to the funny subreddit. The post has 20 upvotes and 2607 downvotes, 146 comments, and a share button. There is a small image of a cat.

20 2607
▲
▼
 My cat was sick and got meds. Now my cat is high as a kite.
submitted 3 hours ago by ogden24 to funny
146 comments share

posts on reddit

ALL | READER PICKS | NYT PICKS | Newest ▾ | Comments

 **Carolyn Egeli** · Valley Lee, Md.

As always, the battle is set between the haves, and the rest. The haves have just lost out, and the movement back towards the greater good has begun. Let's hope the American public sees the sense in what the French and Greeks have done yesterday, by reclaiming their governments to represent the people for a change. The stock markets will likely be unhappy.

May 7, 2012 at 3:23 p.m. · RECOMMEND  8

▲ 7
▼
☆ 1

This is homework and I'm having a lot of trouble with it. I am using Alloy to model a library. Here are the definitions of the objects:

```
sig Library {
  patrons : set Person,
  on_shelves : set Book,
}

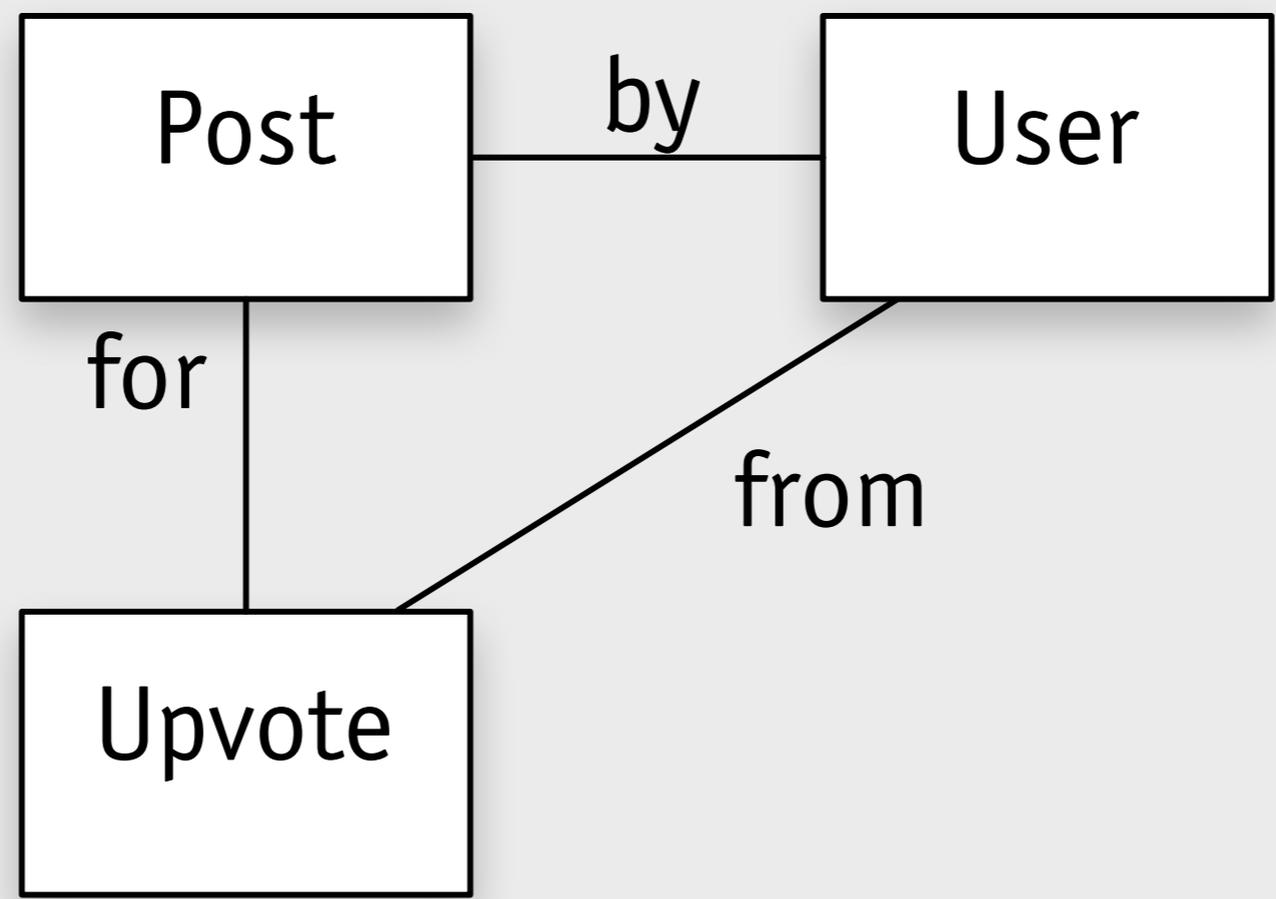
sig Book {
  authors : set Person,
  loaned_to : set Person,
}

sig Person{}
```

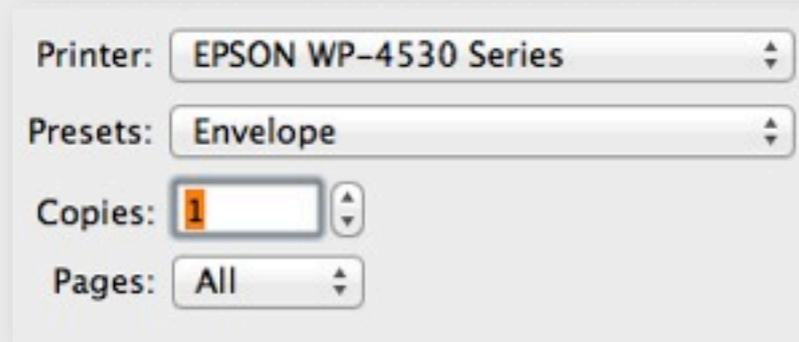
Then we need to have a fact that states, every book is either on the shelf, or taken out by a patron. However, they cannot be in both places.

20  2607  

My cat was sick and got meds. Now my cat is high as a kite.
submitted 3 hours ago by ogden24 to funny
146 comments share

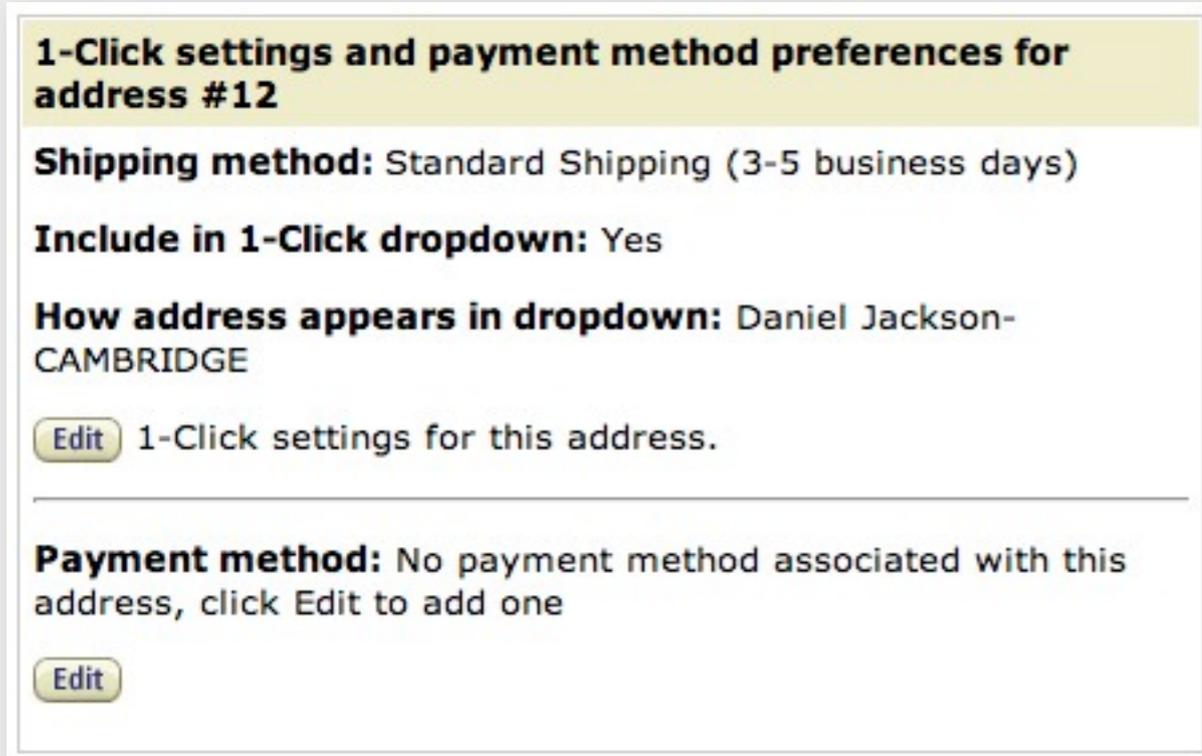


an idiom: presets



Printer: EPSON WP-4530 Series
Presets: Envelope
Copies: 1
Pages: All

printer settings



1-Click settings and payment method preferences for address #12

Shipping method: Standard Shipping (3-5 business days)

Include in 1-Click dropdown: Yes

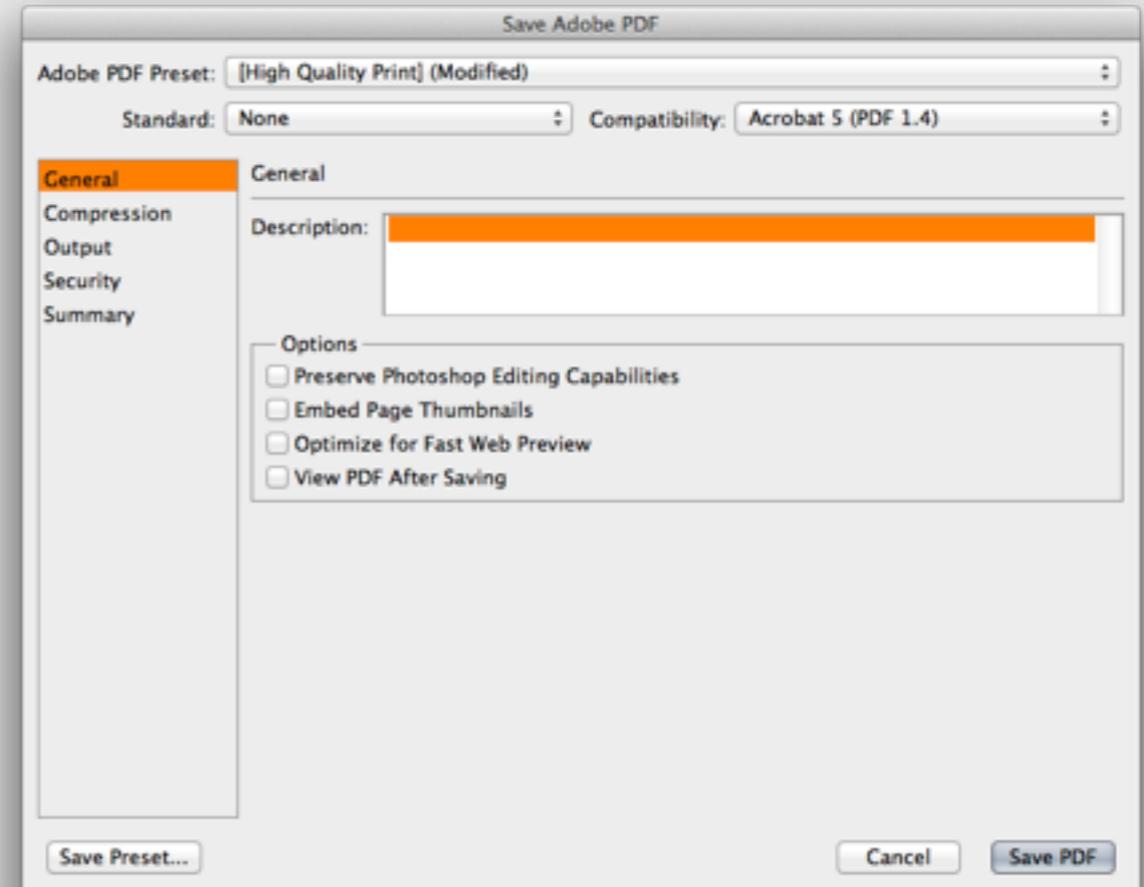
How address appears in dropdown: Daniel Jackson-CAMBRIDGE

[Edit](#) 1-Click settings for this address.

Payment method: No payment method associated with this address, click Edit to add one

[Edit](#)

Amazon's one-click settings



Save Adobe PDF

Adobe PDF Preset: [High Quality Print] (Modified)
Standard: None Compatibility: Acrobat 5 (PDF 1.4)

General
Description:
Options:
 Preserve Photoshop Editing Capabilities
 Embed Page Thumbnails
 Optimize for Fast Web Preview
 View PDF After Saving

[Save Preset...](#) [Cancel](#) [Save PDF](#)

exporting PDF

Adobe PDF Preset: [High Quality Print] (Modified) ▾

Standard: None ▾ Compatibility: Acrobat 5 (PDF 1.4) ▾

General

General

Description:

Options

- Preserve Photoshop Editing Capabilities
- Embed Page Thumbnails
- Optimize for Fast Web Preview
- View PDF After Saving

Save Preset... Cancel Save PDF

1-Click settings and payment method preferences for address #12

Shipping method: Standard Shipping (3-5 business days)

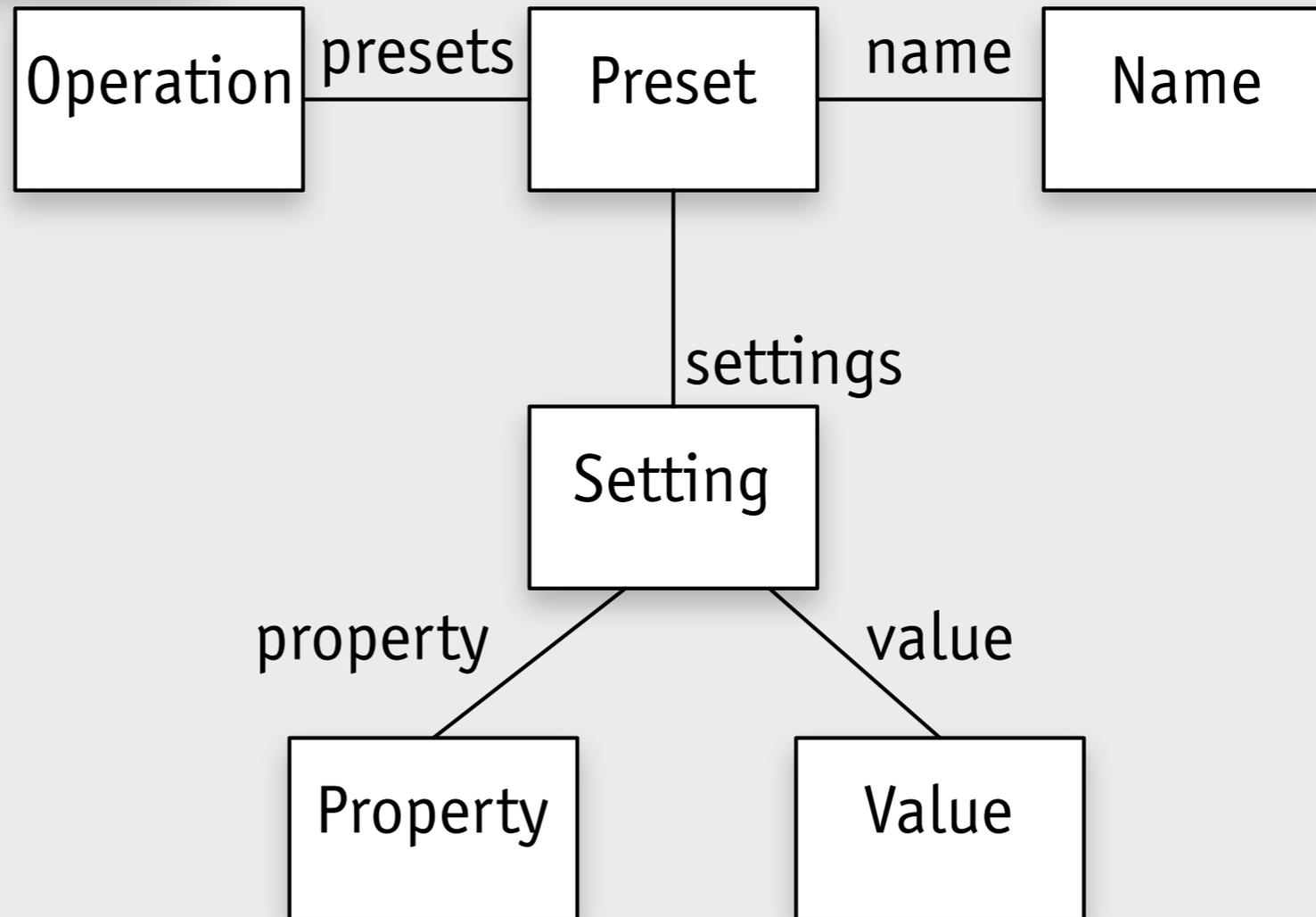
Include in 1-Click dropdown: Yes

How address appears in dropdown: Daniel Jackson-CAMBRIDGE

[Edit](#) 1-Click settings for this address.

Payment method: No payment method associated with this address, click Edit to add one

[Edit](#)



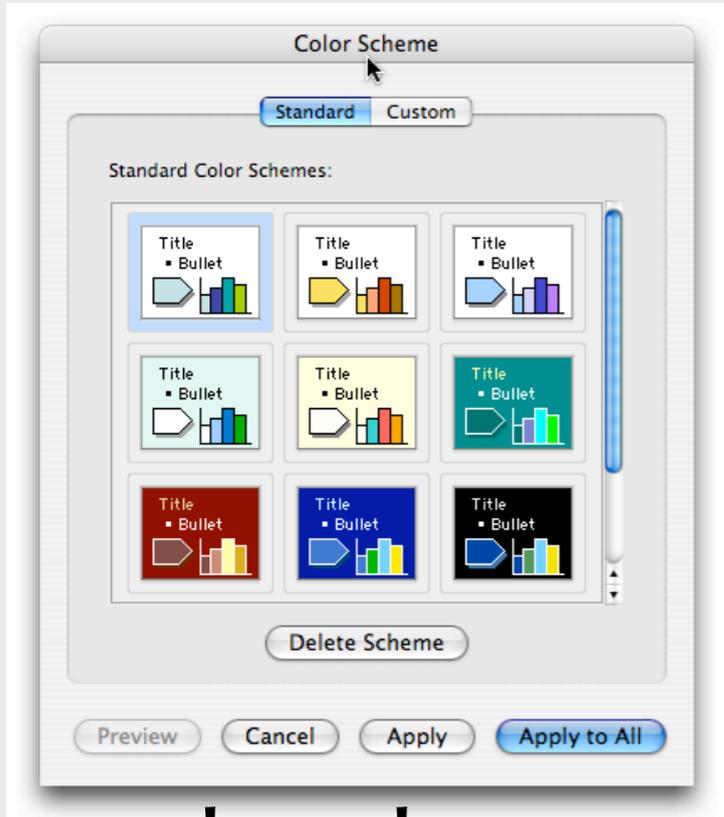
Printer: EPSON WP-4530 Series ▾

Presets: Envelope ▾

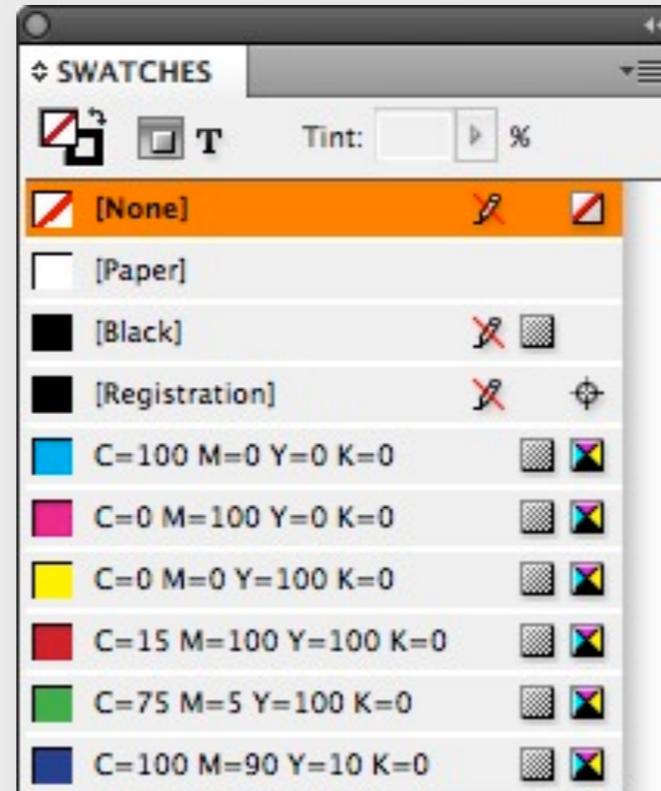
Copies: ▾

Pages: All ▾

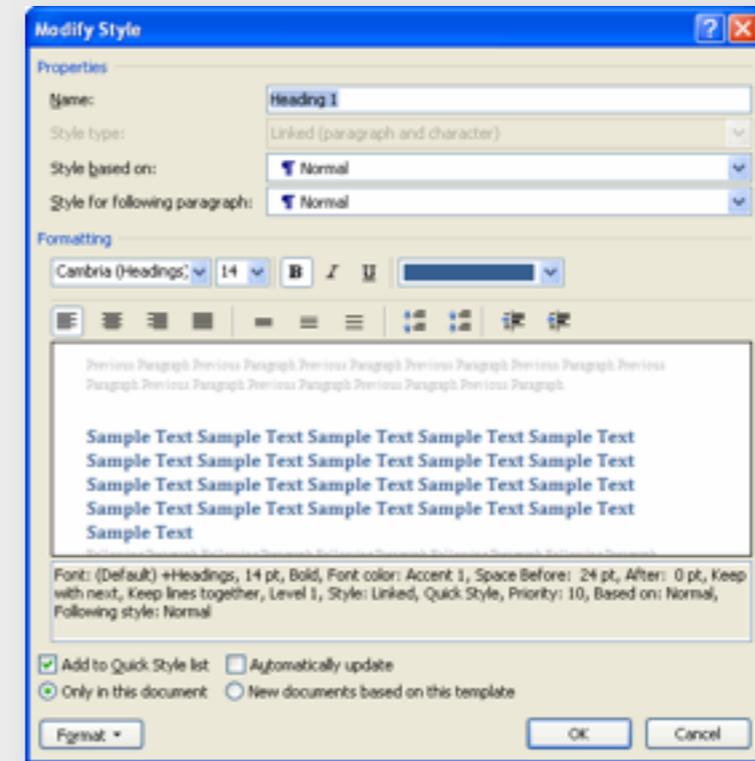
an idiom: styles



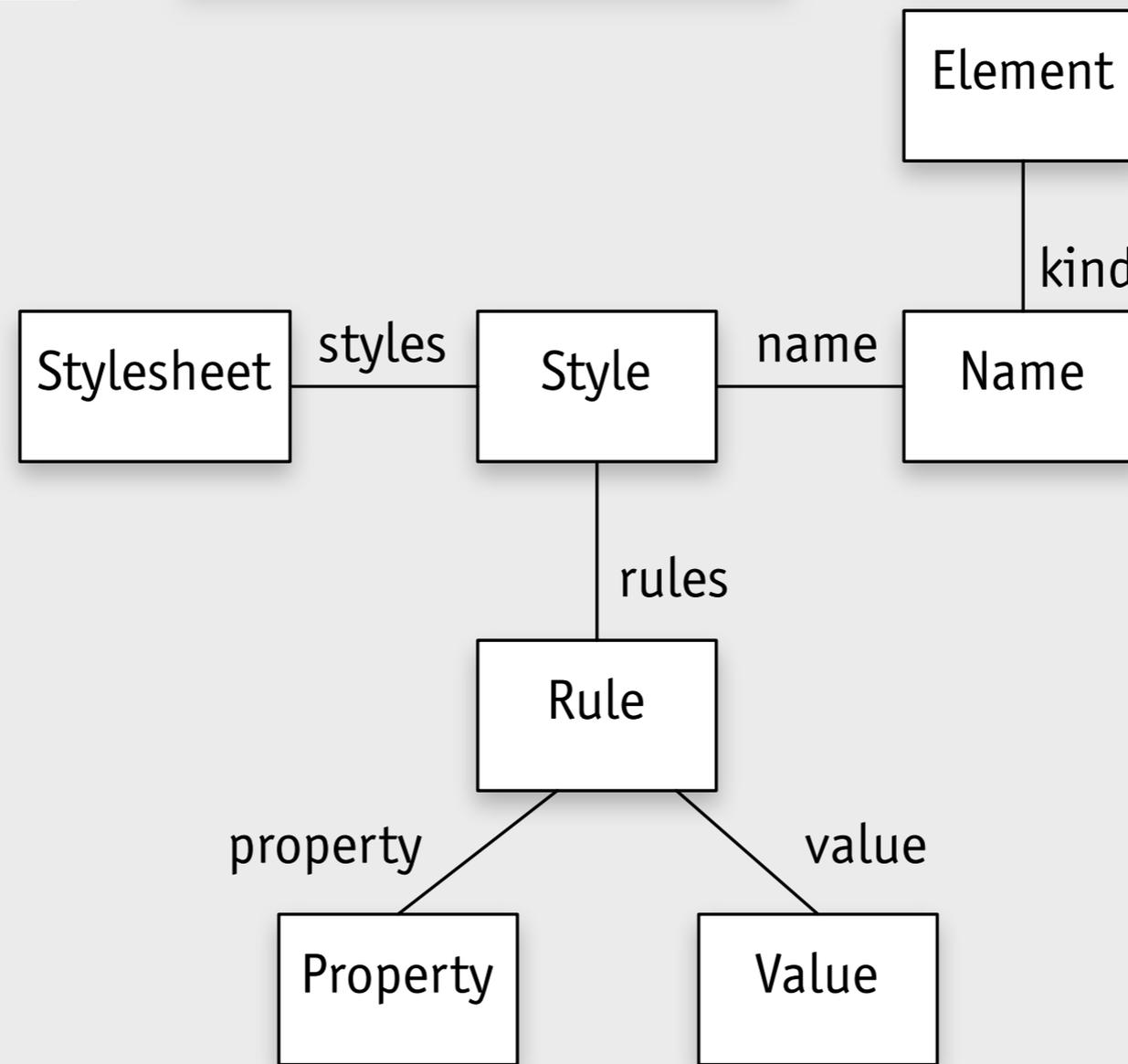
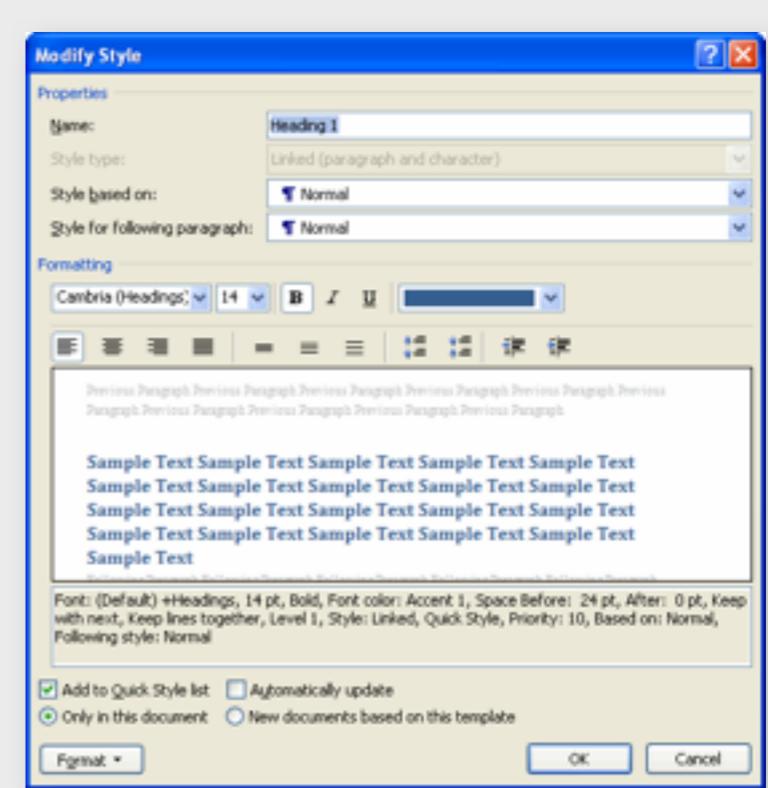
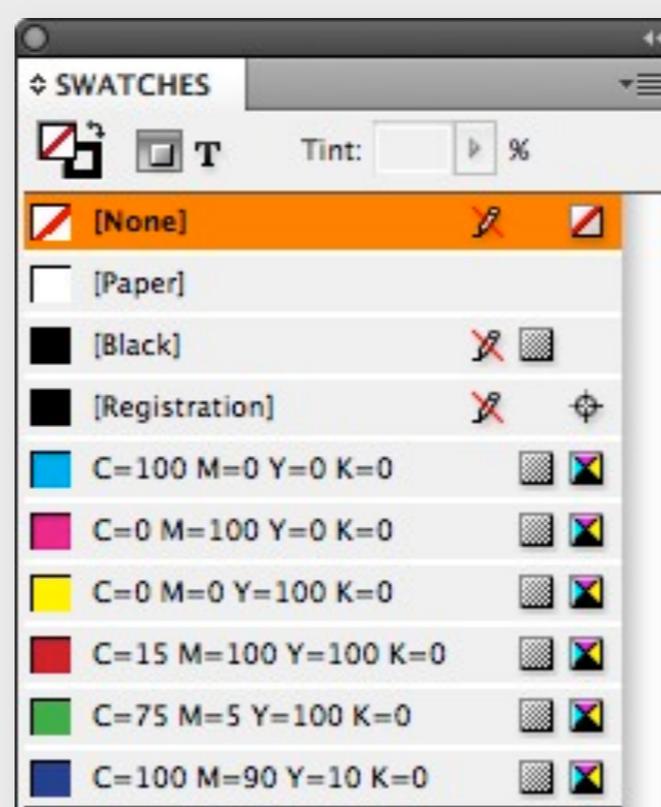
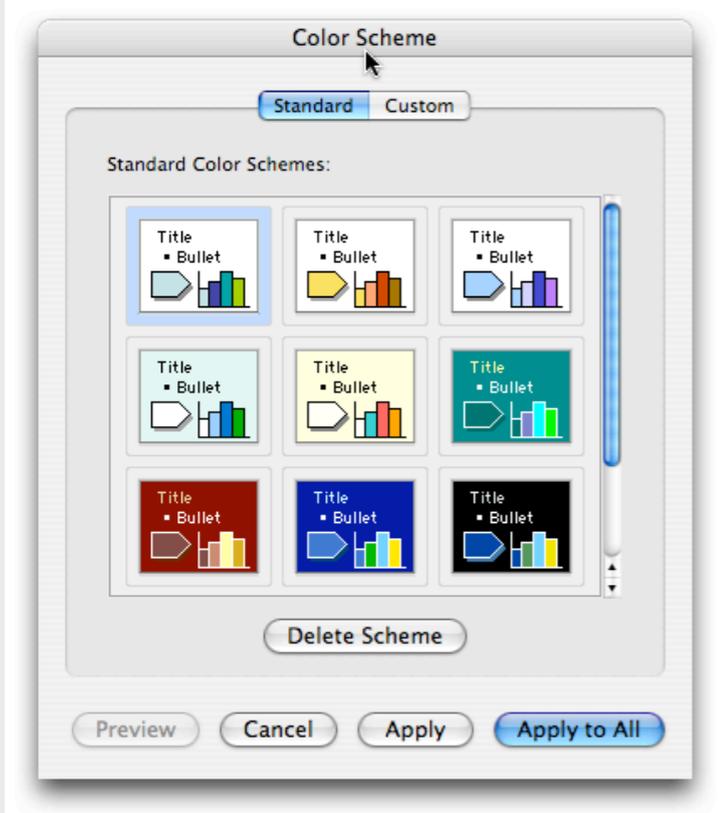
color schemes
in Powerpoint

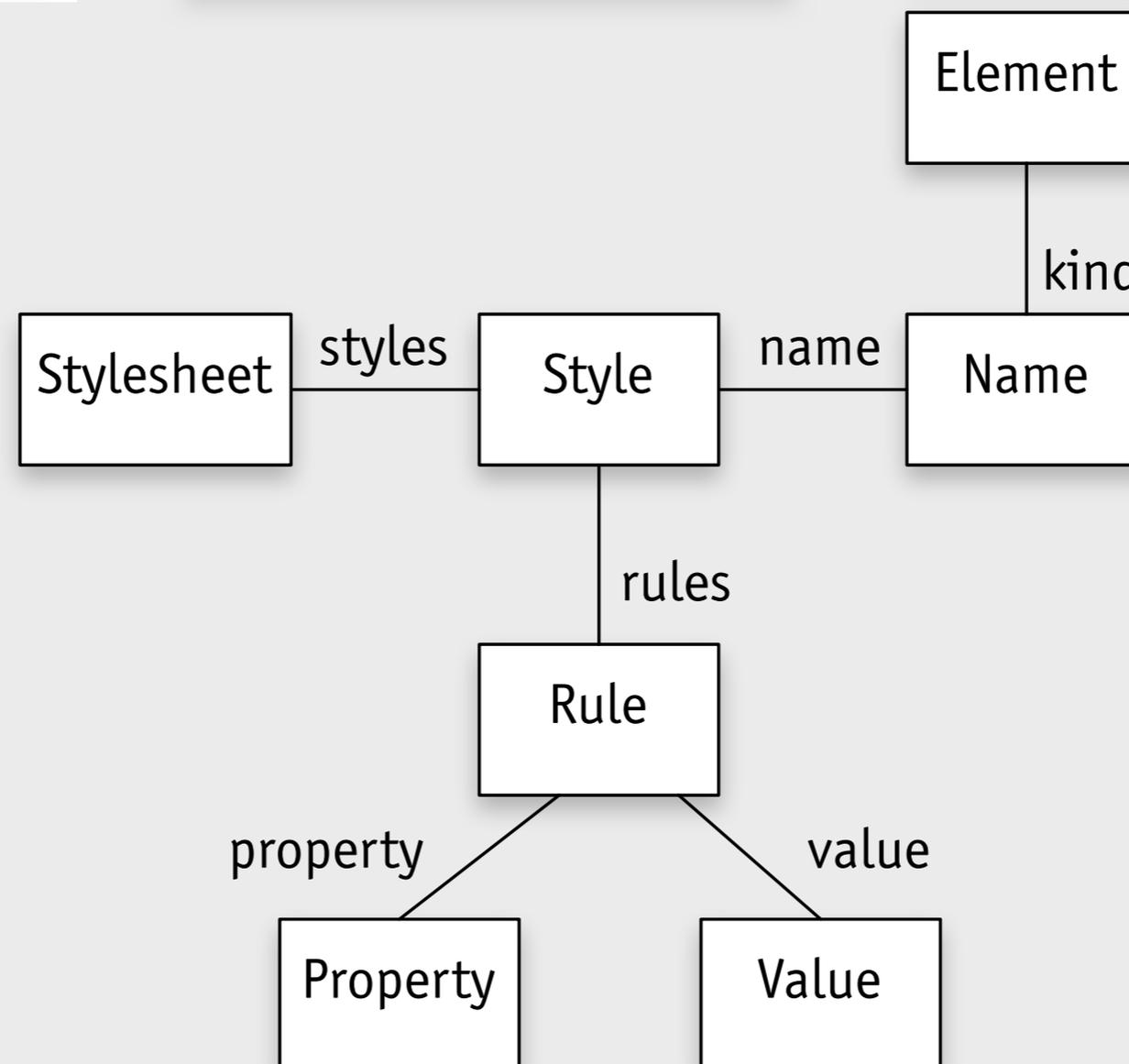
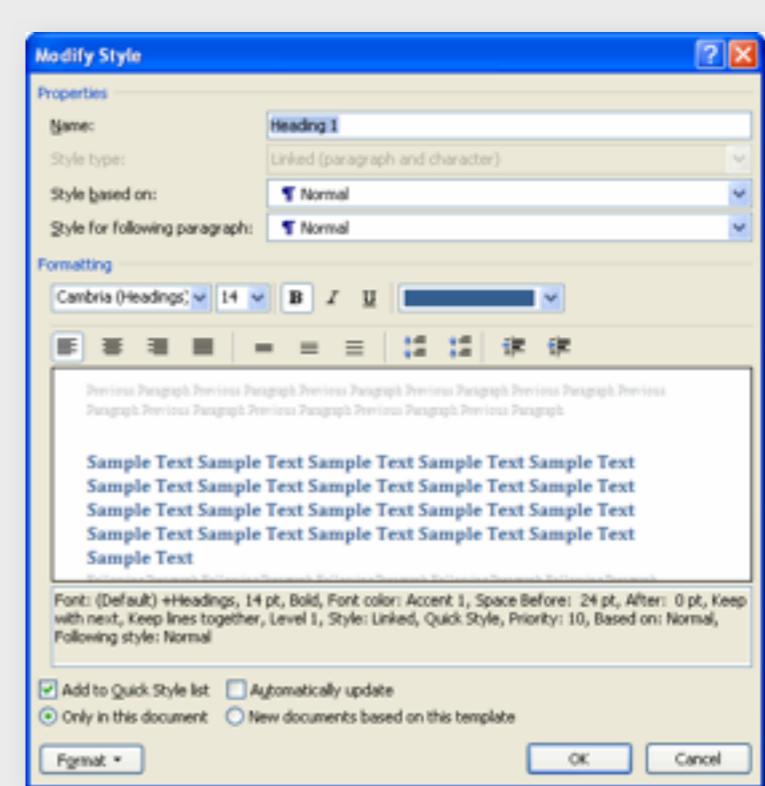
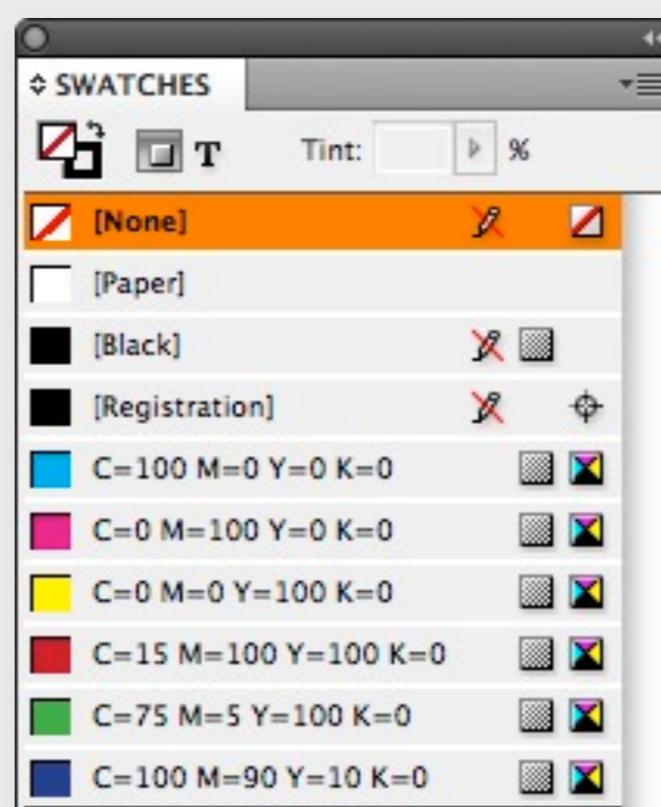
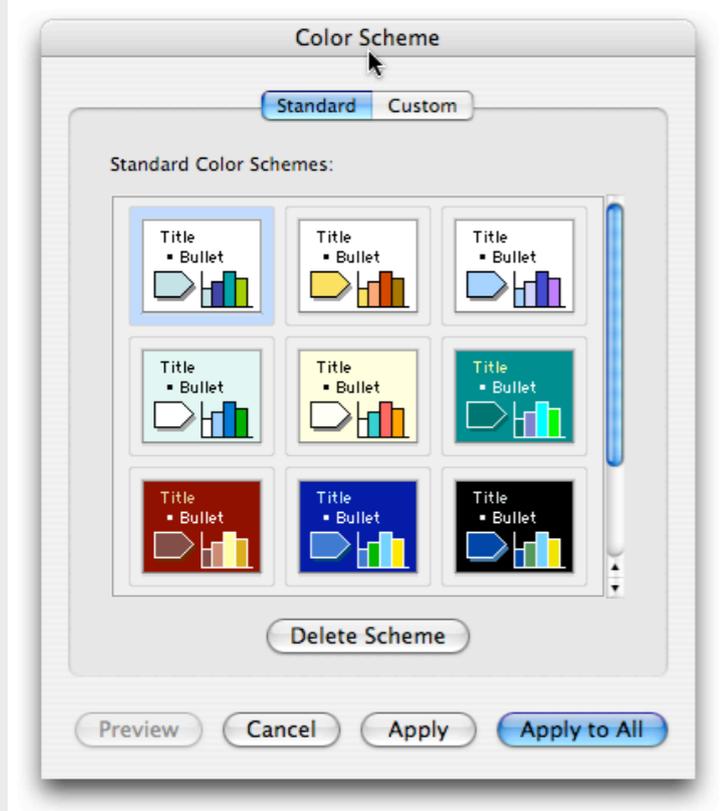


swatches
in Indesign



paragraph styles
in Word





*There is no problem in computer science that cannot be solved by introducing another level of indirection.
--David Wheeler*

**so is it a *good*
conceptual model?**

conceptual criteria

	are the concepts rich enough?
	are the concepts simple enough?
	are the concepts consistent?
	are idioms & conventions leveraged?
	are suitable generalizations introduced?
	are concepts decoupled?

conceptual criteria

✓	are the concepts rich enough?
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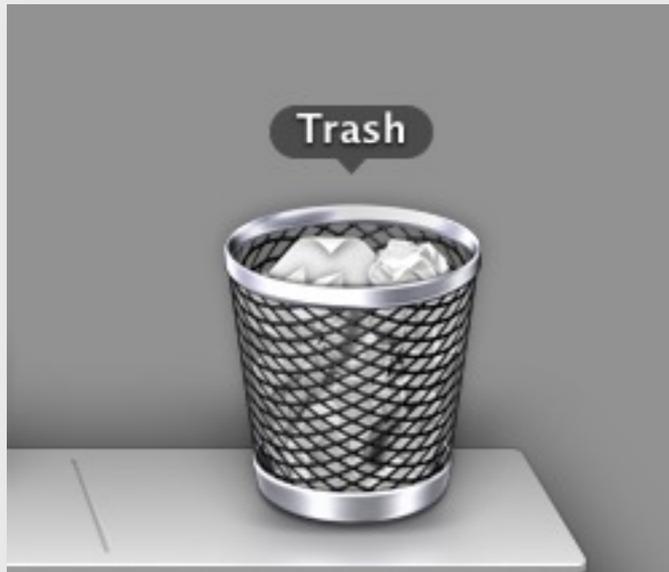
conceptual criteria

✓	are the concepts rich enough?
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conceptual criteria

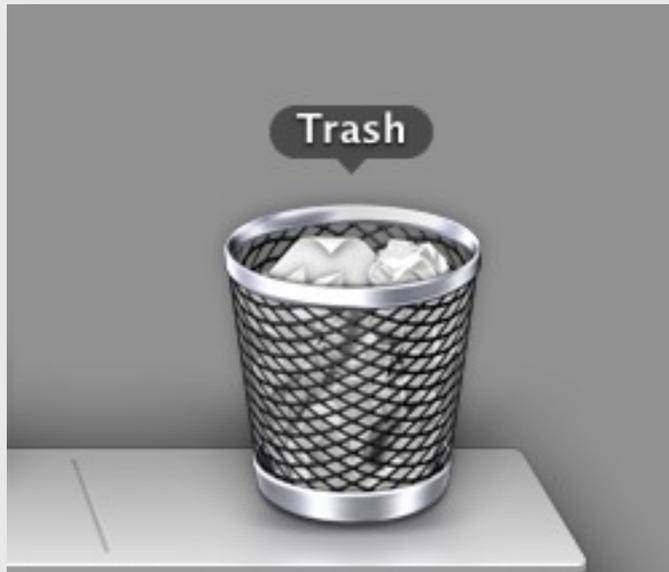
x	are the concepts rich enough?
x	are the concepts simple enough?
x	are the concepts consistent?
	are idioms & conventions leveraged?
	are suitable generalizations introduced?
	are concepts decoupled?

example: macintosh trash



Trash		
Name	Date Modified	Size
Screen Shot 2013-02-25 at 11.46.27 AM	Today 11:46 AM	58 KB
Screen Shot 2013-02-25 at 11.45.46 AM	Today 11:45 AM	39 KB
bits.key	Yesterday 7:09 PM	326 KB
▶ 2013 2.16.58 PM	Feb 22, 2013 2:16 PM	--
▶ 2013-02-18	Feb 22, 2013 2:12 PM	--
▶ 2013-02-17	Feb 22, 2013 2:12 PM	--
▶ 2013-02-15	Feb 22, 2013 2:12 PM	--

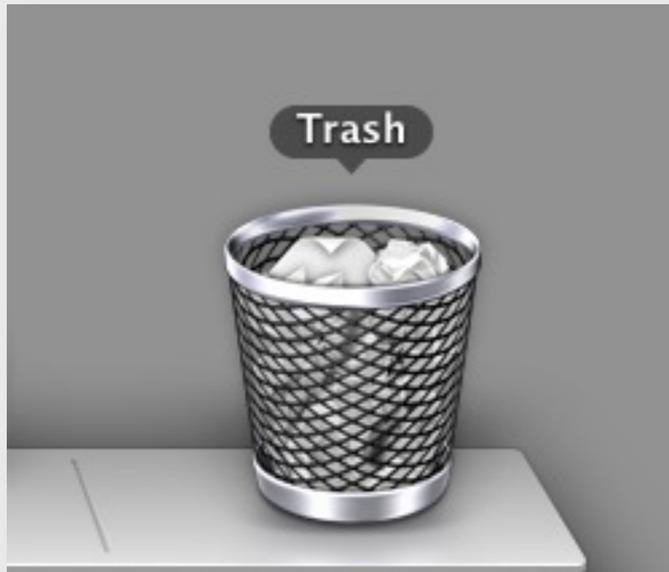
example: macintosh trash



Trash		
Name	Date Modified	Size
Screen Shot 2013-02-25 at 11.46.27 AM	Today 11:46 AM	58 KB
Screen Shot 2013-02-25 at 11.45.46 AM	Today 11:45 AM	39 KB
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▶ 2013 2.16.58 PM	Feb 22, 2013 2:16 PM	--
▶ 2013-02-18	Feb 22, 2013 2:12 PM	--
▶ 2013-02-17	Feb 22, 2013 2:12 PM	--
▶ 2013-02-15	Feb 22, 2013 2:12 PM	--

deleting from external drive (eg USB)
> can't reuse space until trash emptied

example: macintosh trash



Trash		
Name	Date Modified	Size
Screen Shot 2013-02-25 at 11.46.27 AM	Today 11:46 AM	58 KB
Screen Shot 2013-02-25 at 11.45.46 AM	Today 11:45 AM	39 KB
bits.key	Yesterday 7:09 PM	326 KB
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▶ 2013-02-15	Feb 22, 2013 2:12 PM	--

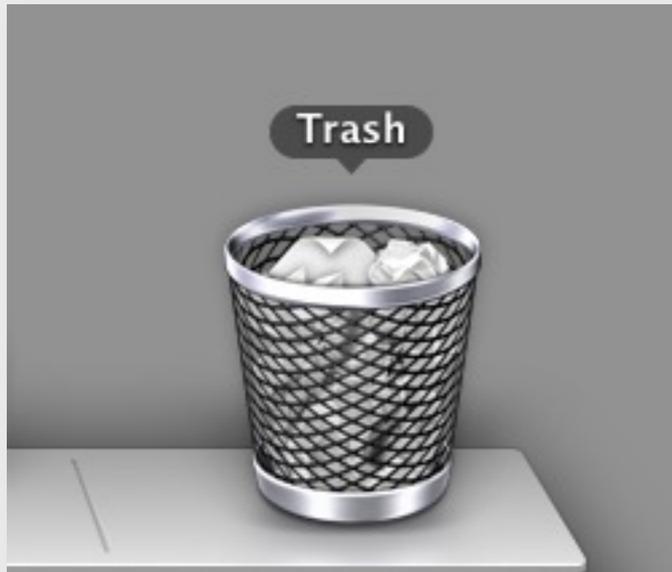
deleting from external drive (eg USB)

› can't reuse space until trash emptied

retrieving accidentally deleted files

› no date of deletion

example: macintosh trash



Trash		
Name	Date Modified	Size
Screen Shot 2013-02-25 at 11.46.27 AM	Today 11:46 AM	58 KB
Screen Shot 2013-02-25 at 11.45.46 AM	Today 11:45 AM	39 KB
bits.key	Yesterday 7:09 PM	326 KB
▶ 2013 2.16.58 PM	Feb 22, 2013 2:16 PM	--
▶ 2013-02-18	Feb 22, 2013 2:12 PM	--
▶ 2013-02-17	Feb 22, 2013 2:12 PM	--
▶ 2013-02-15	Feb 22, 2013 2:12 PM	--

deleting from external drive (eg USB)

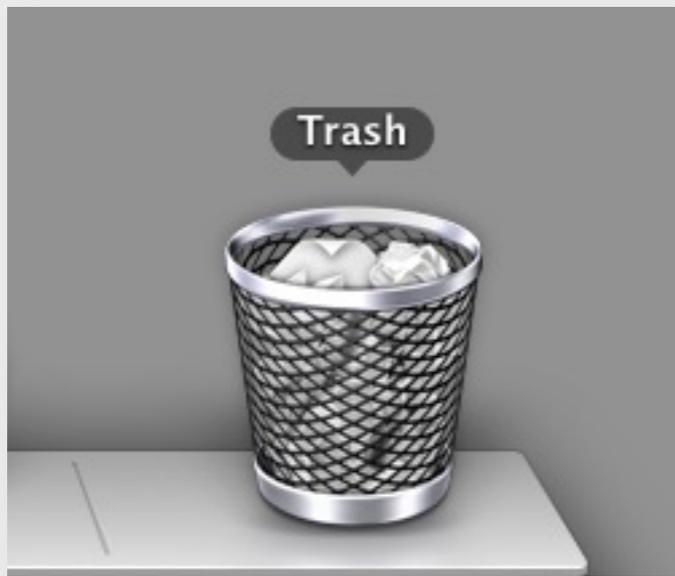
- › can't reuse space until trash emptied

retrieving accidentally deleted files

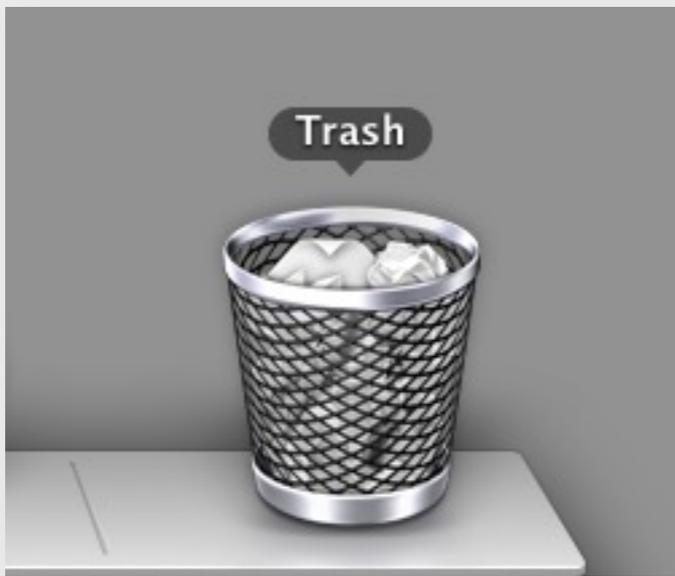
- › no date of deletion

partial emptying

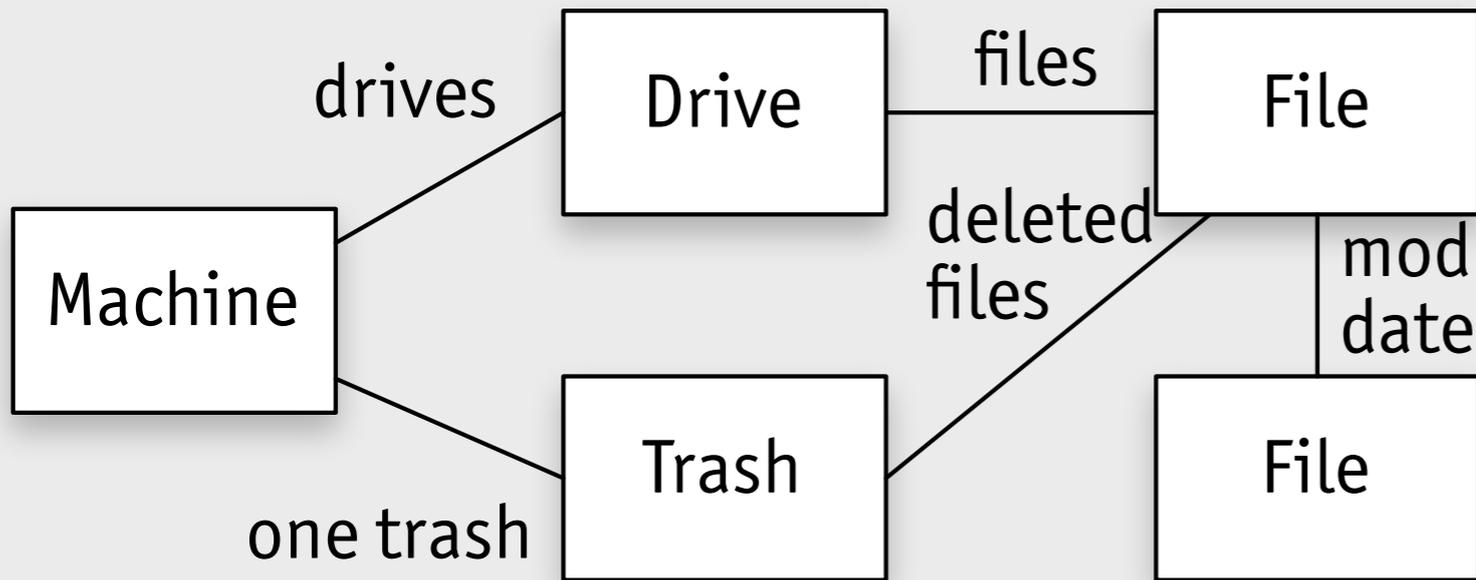
- › not possible



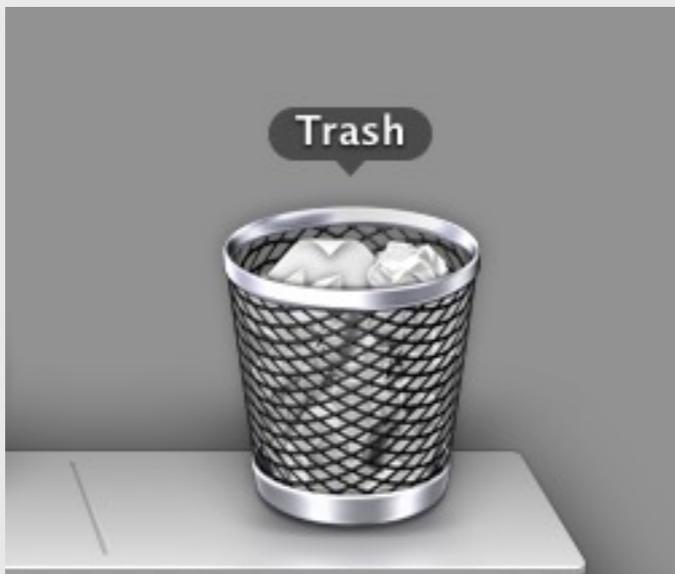
Trash		
Name	Date Modified	Size
 Screen Shot 2013-02-25 at 11.46.27 AM	Today 11:46 AM	58 KB
 Screen Shot 2013-02-25 at 11.45.46 AM	Today 11:45 AM	39 KB
 bits.key	Yesterday 7:09 PM	326 KB
 2013 2.16.58 PM	Feb 22, 2013 2:16 PM	--
 2013-02-18	Feb 22, 2013 2:12 PM	--
 2013-02-17	Feb 22, 2013 2:12 PM	--
 2013-02-15	Feb 22, 2013 2:12 PM	--



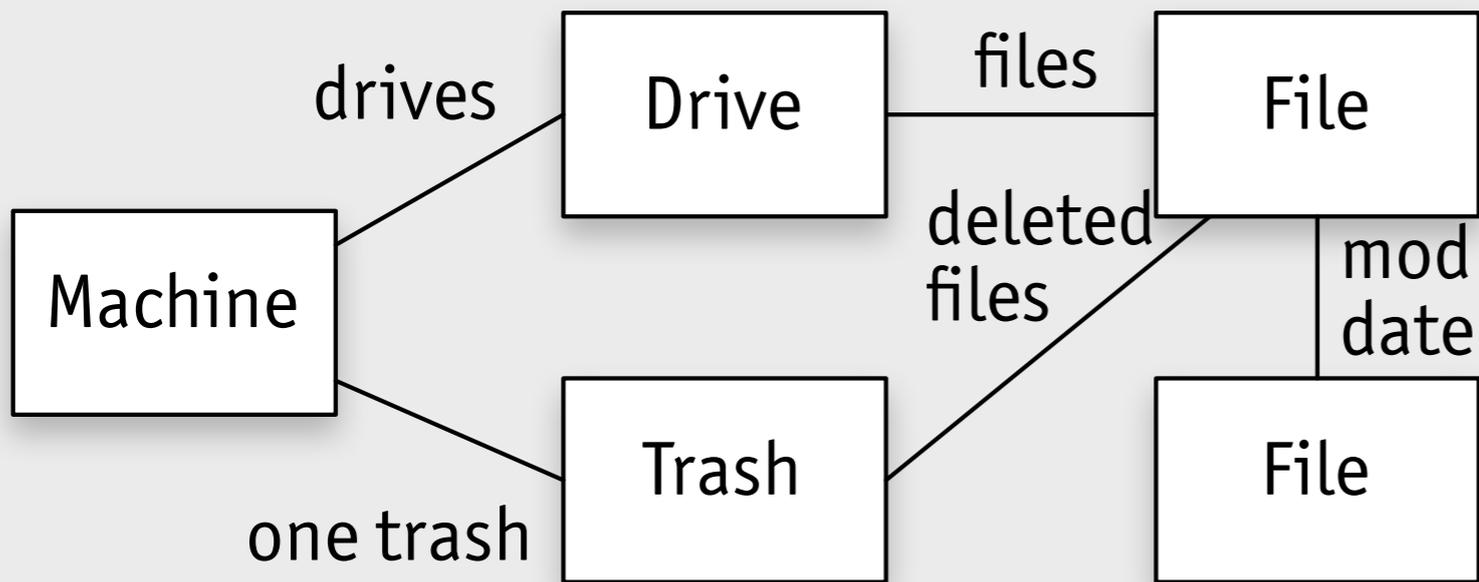
Trash		
Name	Date Modified	Size
Screen Shot 2013-02-25 at 11.46.27 AM	Today 11:46 AM	58 KB
Screen Shot 2013-02-25 at 11.45.46 AM	Today 11:45 AM	39 KB
bits.key	Yesterday 7:09 PM	326 KB
▶ 2013 2.16.58 PM	Feb 22, 2013 2:16 PM	--
▶ 2013-02-18	Feb 22, 2013 2:12 PM	--
▶ 2013-02-17	Feb 22, 2013 2:12 PM	--
▶ 2013-02-15	Feb 22, 2013 2:12 PM	--



what exists

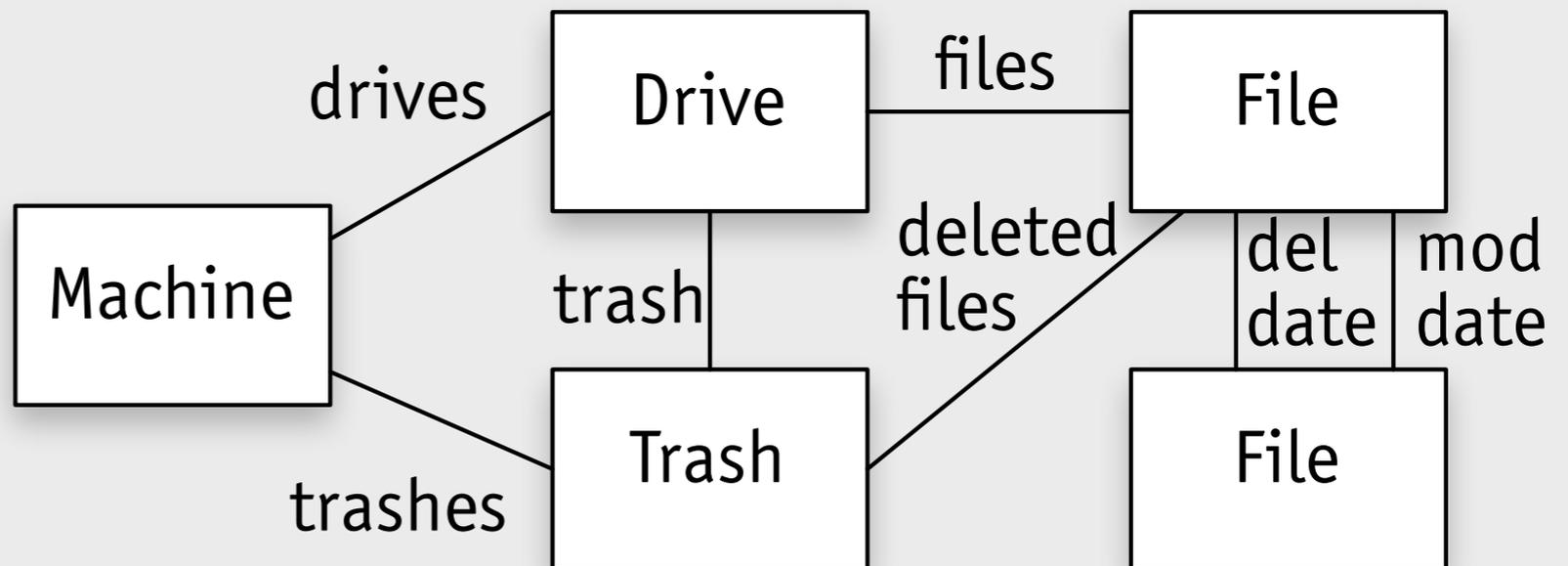


Trash		
Name	Date Modified	Size
Screen Shot 2013-02-25 at 11.46.27 AM	Today 11:46 AM	58 KB
Screen Shot 2013-02-25 at 11.45.46 AM	Today 11:45 AM	39 KB
bits.key	Yesterday 7:09 PM	326 KB
▶ 2013 2.16.58 PM	Feb 22, 2013 2:16 PM	--
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▶ 2013-02-17	Feb 22, 2013 2:12 PM	--
▶ 2013-02-15	Feb 22, 2013 2:12 PM	--



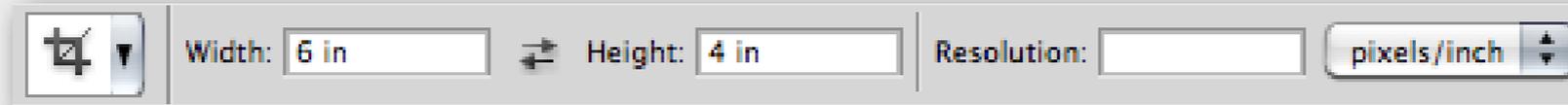
what exists

what we need

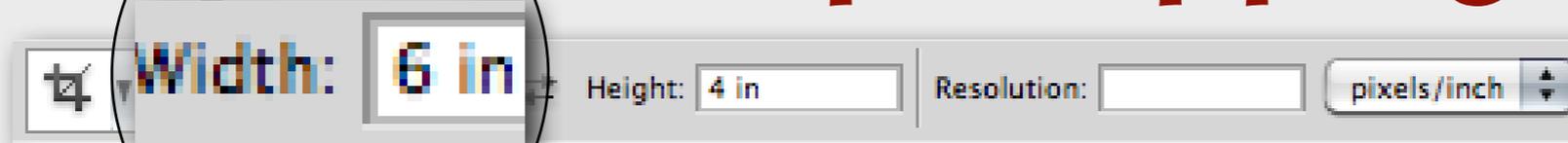


example: photoshop cropping

example: photoshop cropping



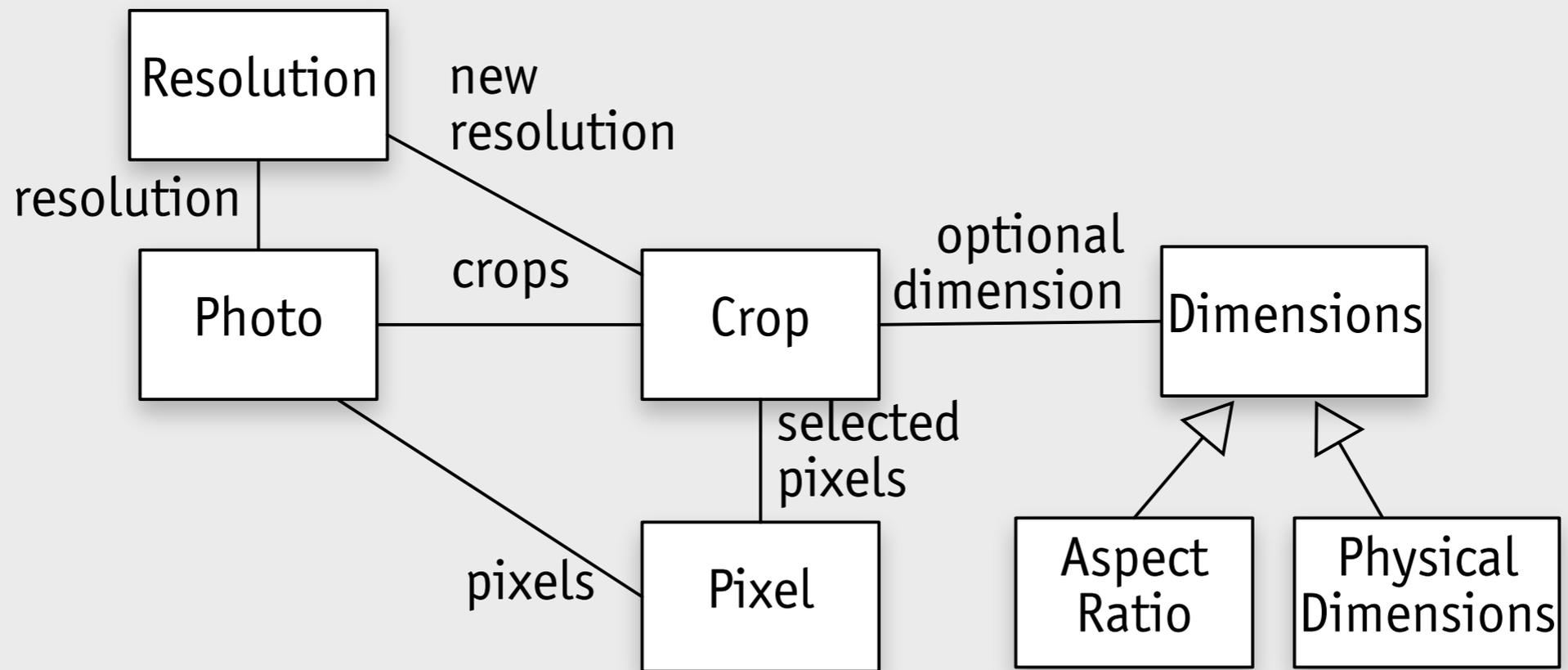
example: photoshop cropping



Width: 6 in Height: 4 in Resolution: pixels/inch



Width: 6 in Height: 4 in Resolution: pixels/inch



Photoshop 5 and before

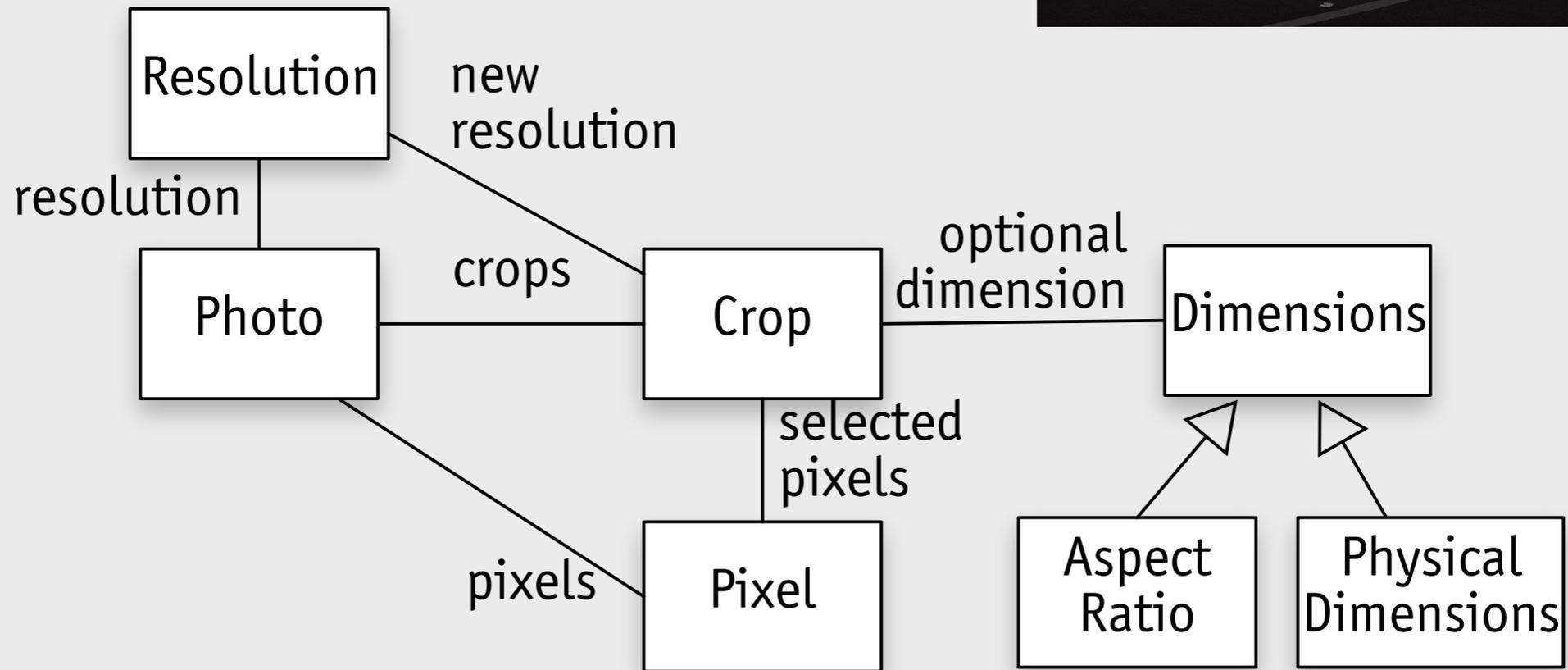
Width: 6 in Height: 4 in Resolution: pixels/inch



Tool : Crop & Straighten

Aspect : Original

Angle 0.00



Photoshop 5 and before

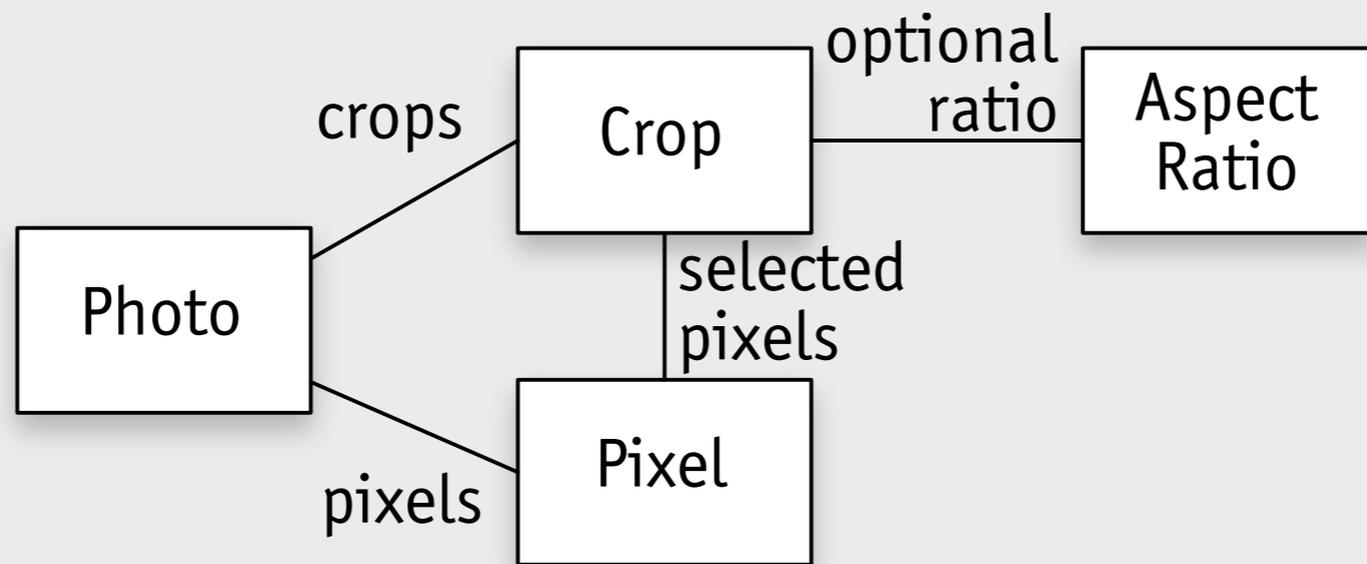
Width: 6 in Height: 4 in Resolution: pixels/inch



Tool : Crop & Straighten

Aspect : Original

Angle 0.00



Photoshop 6 and Lightroom

example: Apple Mail conversations

Disable conversation view in Mail.app 5.0 for OS X Lion

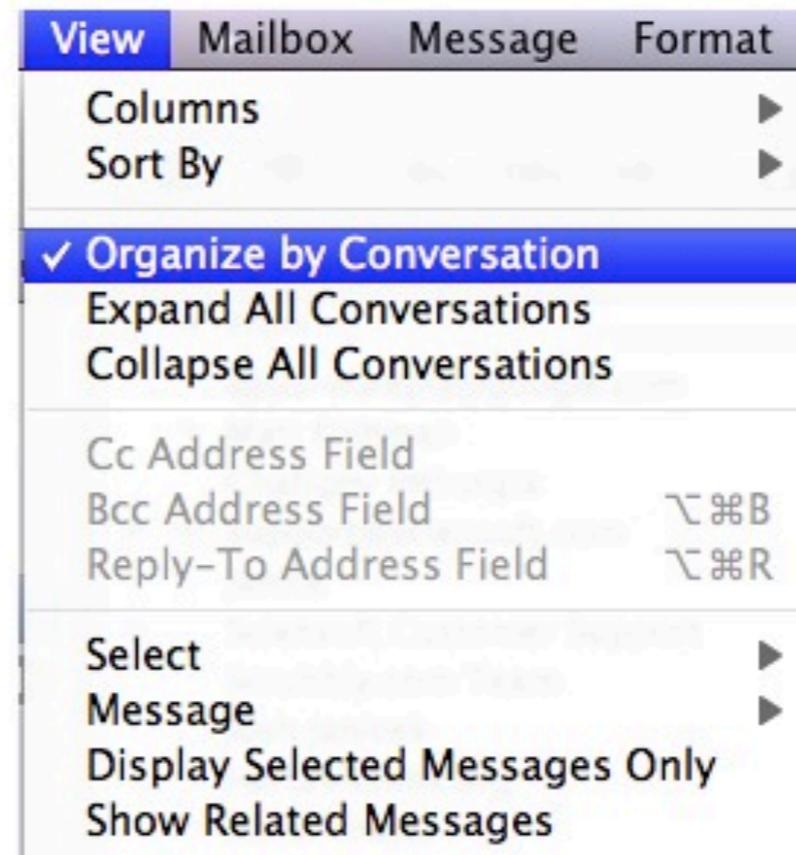
 Like 8

I abhor "conversation view" in my email client. To me, it just isn't intuitive and makes for more work. I might want to delete or file away a previous message, but keep a current message thread in my inbox as actionable. The conversation view for me just makes for more clutter. And it reminds me of Microsoft Outlook. Blech.

Reverting to the "classic" inbox style of Mail.app in [OS X Lion](#) is simple.

View > Organize by Conversation

By default, Mail.app should have this checked. When you click on 'Organize by Conversation', it will then become unchecked, and will bring your Mail.app inbox back to the way that you know and love.



example: Apple Mail conversations

The screenshot shows the Apple Mail application interface. On the left is a sidebar with mailboxes (Inbox, Flagged, Drafts, Sent, Trash) and a CSAIL folder containing various sub-folders like Admin, Personal, Photography, etc. The main area displays a list of emails in the inbox, sorted by date. The selected email is from Michael Maddox, dated April 16, 2013, 5:03 PM, with the subject "Reports deployed".

The detailed view of the conversation shows the following messages:

- Michael Maddox** (To: Daniel Jackson, Re: Reports deployed) - April 16, 2013 5:03 PM: "I'm going to head out for some dinner/fresh air, and will be back in a bit. I'll be able to put in some more time later tonight, so send me any other corrections. Perhaps we should push deployment to the new students until Thursday so your students have time to play with it tomorrow, and fix any other issues that crop up then?"
- Michael Maddox** (To: Daniel Jackson, Re: Reports deployed: some issues) - April 16, 2013 5:00 PM: "Last half --
4. Done.
12. Done.
13. Done.
14. Should be fixed, but investigating this further.
15. Done.
16. This is again an effect of Moira context switching. This flash is displayed if an admin manually attempts to view anything in the "/reports" namespace -- it redirects to the students table indicating that admins manipulate reports "here". This is just a case that should never happen, but is only occurring because you were within the reports namespace when you context-switched.
17. This is something I noticed recently and that has been on my "important" task list for a while. There's also a bug where selecting different filtering (say, "Student Pending") then going back to "Show All" will drop some entries from the table. Will look into this later, but for now a refresh fixes this.
18. We discovered this was in fact correct (Agarwal was your Graduate Counselor).
19. This is also on my todo list. I punted because there are no prior reports available, but will get to this soon.
20. Done.
21. Done."
[See More from Daniel Jackson](#)
- Daniel Jackson** (To: Michael Maddox, Re: Reports deployed: some issues) - April 16, 2013 3:26 PM: "On Apr 16, 2013, at 3:25 PM, Michael Maddox <maddox@MIT.EDU> wrote:
Edit Publications: Fair point, I'll add in the edit/update actions for publications now.
Messaging table sorting: Right, just on first inspection there seemed to be a lot going on with helper methods I wasn't familiar with, but it may not be that complicated. Want to get through the other items on your list first though.
Fine -- it's not urgent.
Formatting Rules overflow: This is odd. Safari on OSX? This is a jQuery UI modal dialog. The HTML is otherwise well-formed as far as I can tell. Do you have certificates on another browser to test?
Let's also punt on this for now. This is Chrome on OSX, on a Retina display."
Daniel
[See More](#)
- Michael Maddox** (To: Daniel Jackson, Re: Reports deployed: some issues) - April 16, 2013 3:25 PM: "Hide Details" (2)

example: Apple Mail conversations

The screenshot shows an Apple Mail inbox with 72 messages. The left sidebar lists mailboxes such as 'Inbox', 'Flagged', 'Drafts', and 'Sent'. The main pane displays a list of messages, with the selected message being 'Reports deployed' from Michael Maddox. A yellow box highlights the number '4' in the top right corner of the message preview, indicating the total number of messages in the conversation. An arrow points from this box to the message list, where the 'Reports deployed' message is highlighted. The right pane shows the full content of the selected message, including a list of tasks and a reply from Daniel Jackson.

number of messages in conversation

Michael Maddox
To: Daniel Jackson
Re: Reports deployed
April 16, 2013 5:03 PM
4

I'm going to head out for some dinner/fresh air, and will be back in a bit. I'll be able to put in some more time later tonight, so send me any other corrections. Perhaps we should push deployment to the new students until Thursday so students have time to play with it tomorrow, and fix any other issues that crop up then?

Michael
[See More from Daniel Jackson](#)

Michael Maddox
To: Daniel Jackson
Re: Reports deployed: some issues
April 16, 2013 5:00 PM
3

Last half --

4. Done.
12. Done.
13. Done.
14. Should be fixed, but investigating this further.
15. Done.
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20. Done.
21. Done.

[See More from Daniel Jackson](#)

Daniel Jackson
To: Michael Maddox
Re: Reports deployed: some issues
April 16, 2013 3:26 PM
Sent - csail

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Let's also punt on this for now. This is Chrome on OSX, on a Retina display.

Daniel
[See More](#)

Michael Maddox
To: Daniel Jackson
Re: Reports deployed: some issues
April 16, 2013 3:25 PM
[Hide Details](#)
2

example: Apple Mail conversations

The screenshot shows an Apple Mail interface with an inbox of 72 messages. A conversation thread is visible, starting with a message from Michael Maddox to Daniel Jackson. A yellow callout box with the text "number of messages in conversation" points to a "4" icon in the message list, indicating the total number of messages in the thread. The conversation includes messages from Michael Maddox and Daniel Jackson, with a list of 21 items in the thread. The interface also shows a sidebar with mailboxes and a bottom status bar.

number of messages in conversation

example: Apple Mail conversations

The screenshot shows an Apple Mail inbox with 72 messages. The left sidebar lists mailboxes like 'Inbox', 'Flagged', 'Drafts', and 'Sent'. The main pane shows a list of messages, with one selected. A red arrow points from this message to a conversation thread on the right. Two yellow callout boxes highlight specific details:

- number of messages in conversation**: A yellow box with black text pointing to the number '4' in the top right corner of the first conversation thread.
- sent message not included in message count**: A yellow box with black text pointing to a message in the second conversation thread that is not counted in the '3' message count shown in the top right corner.

The first conversation thread is from Michael Maddox to Daniel Jackson, dated April 16, 2013, 5:03 PM. It contains 4 messages. The second conversation thread is also from Michael Maddox to Daniel Jackson, dated April 16, 2013, 5:00 PM. It contains 3 messages. The third conversation thread is from Daniel Jackson to Michael Maddox, dated April 16, 2013, 3:26 PM. It contains 2 messages.

example: Apple Mail conversations

The screenshot shows an Apple Mail interface with an inbox of 72 messages. The left sidebar lists mailboxes like 'Inbox', 'Flagged', 'Drafts', and 'Sent'. The main pane displays a list of messages, with the message from Michael Maddox titled 'Reports deployed' selected, indicated by a blue border. A yellow box with the text 'number of messages in conversation' points to the number '4' in the top right corner of the selected message's header. Another yellow box with the text 'blue border means message is selected' points to the blue border of the selected message. A third yellow box with the text 'sent message not included in message count' points to a message in the 'Sent' mailbox on the left sidebar.

example: Apple Mail conversations

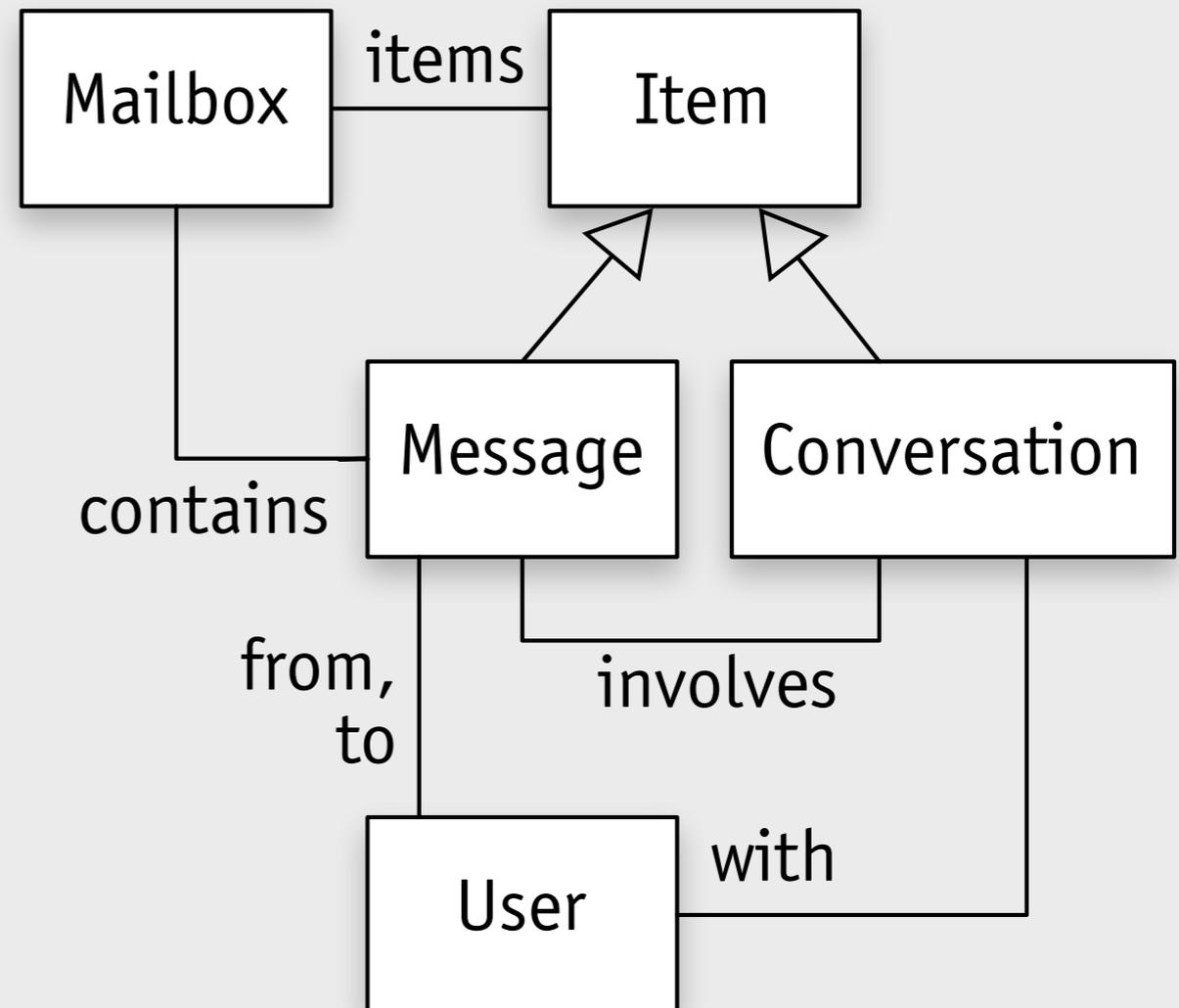
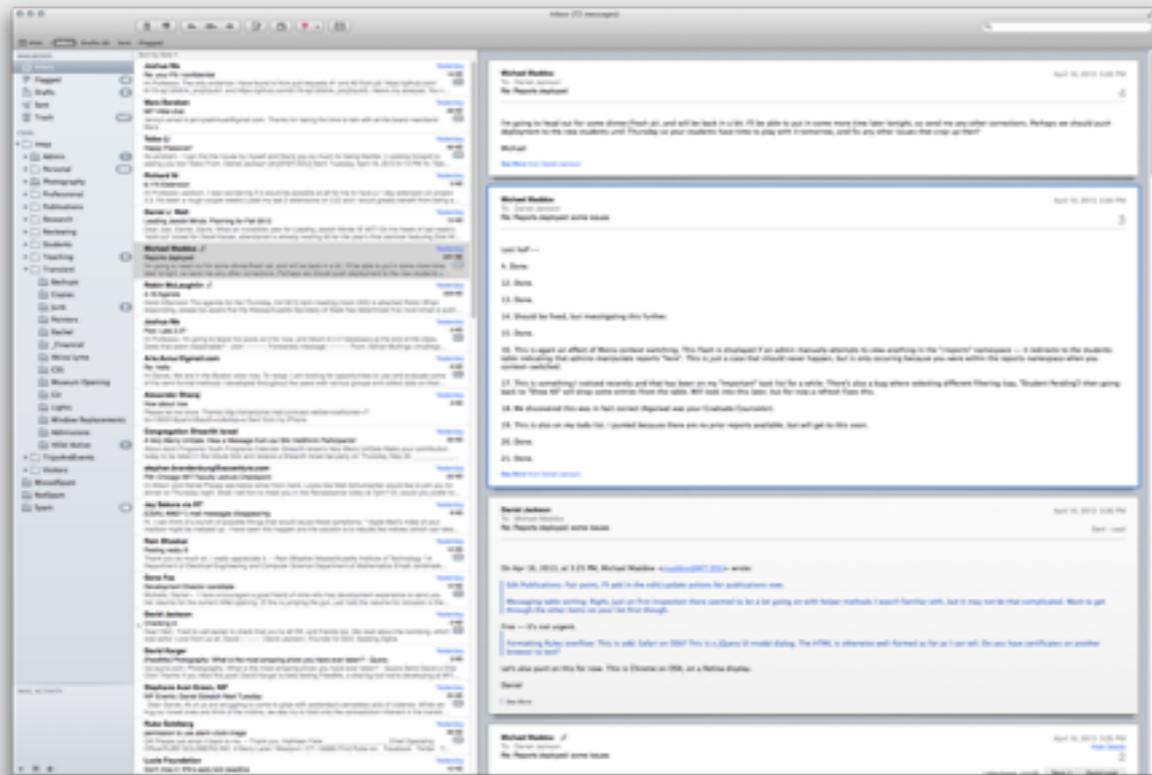
The screenshot shows an Apple Mail interface with an inbox of 72 messages. The left sidebar lists mailboxes like 'Inbox', 'Flagged', 'Drafts', and 'Sent'. The main area displays a list of messages, with one message selected, indicated by a blue border. A red arrow points from a yellow box to the selected message. Another red arrow points from a yellow box to a message in the list. A third red arrow points from a yellow box to a message in the conversation view on the right. The annotations explain that a grey background means a conversation is not selected, a blue border means a message is selected, and a message with a blue border in the conversation view is not included in the message count.

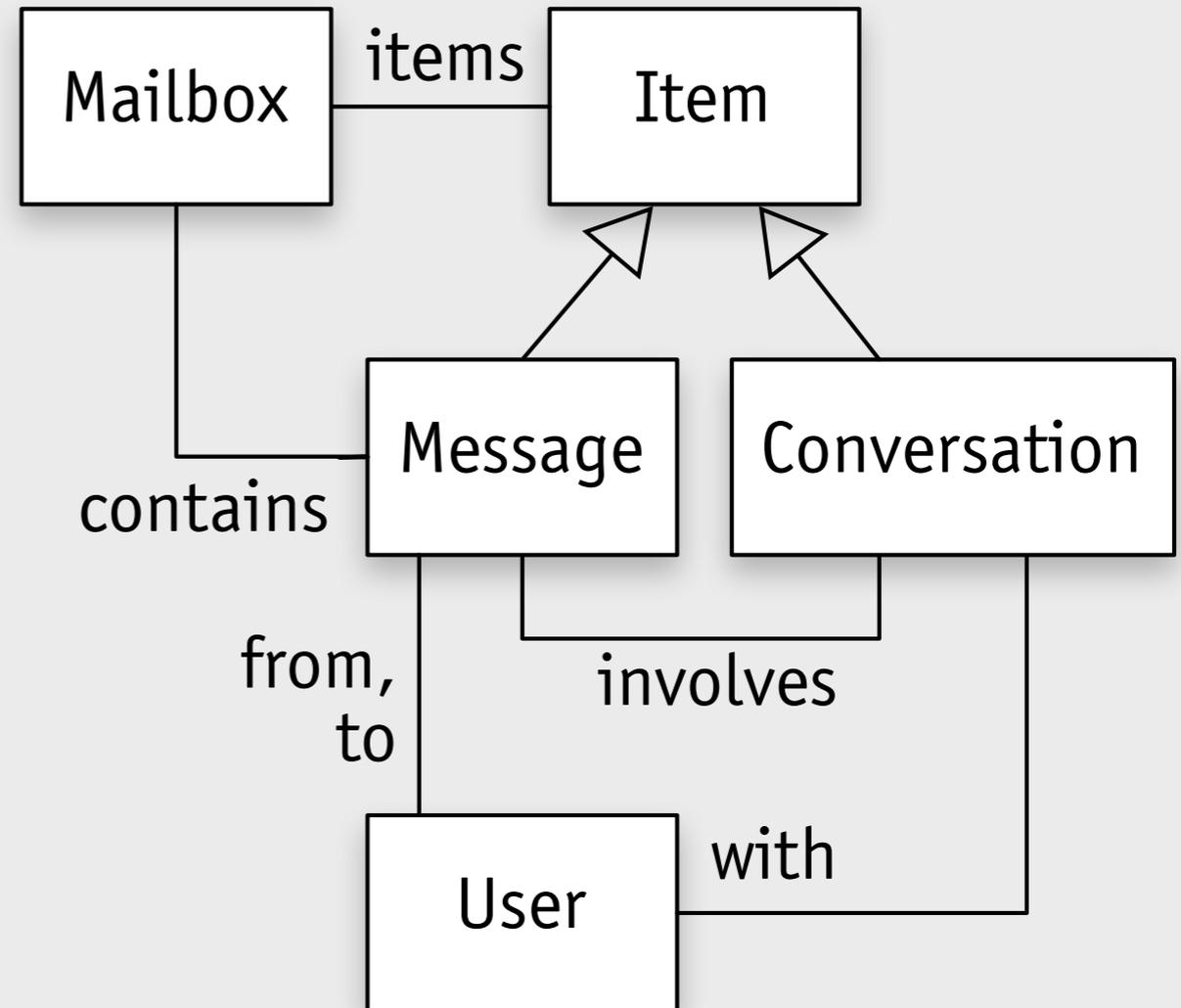
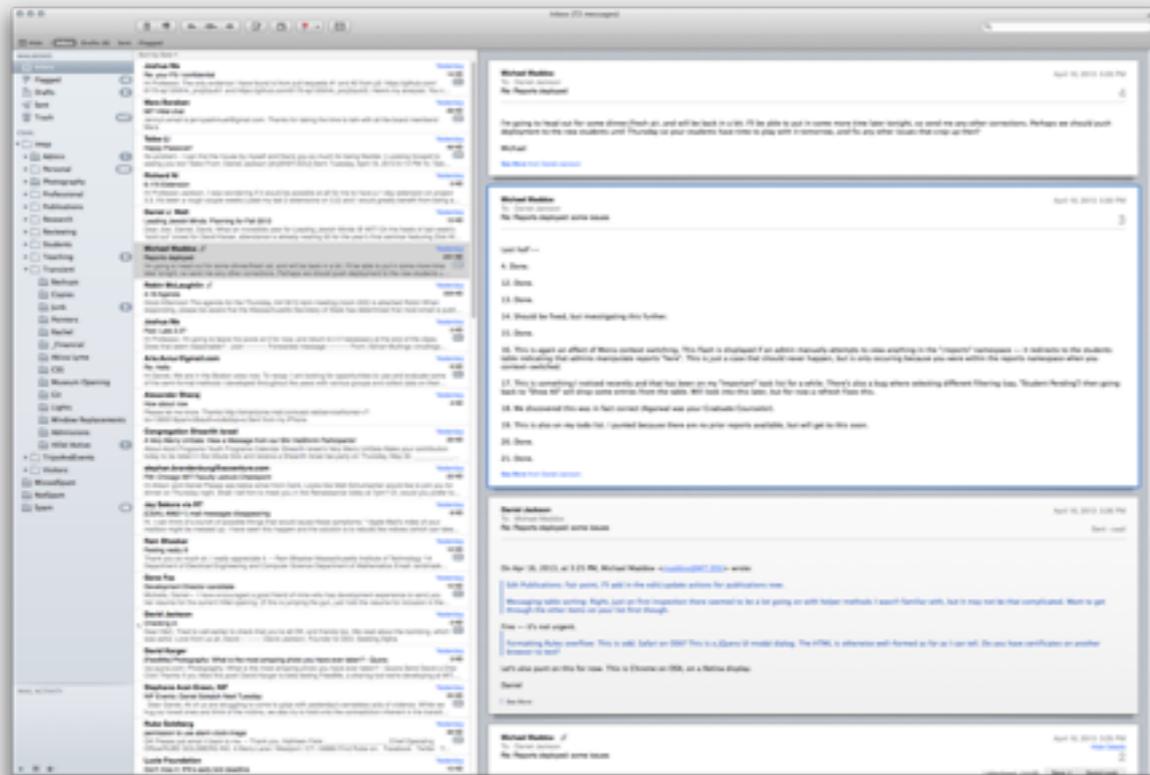
number of messages in conversation

blue border means message is selected

sent message not included in message count

grey background means conversation is not selected





some questions

- › does a mailbox contain all the messages its conversations involve? *no*.
- › do move, delete, etc apply to conversations? *yes*.
- › when you move a conversation to another mailbox, do all messages move with it? *no*.

closing thoughts

it's not just about usability

weak concepts	strong concepts
hard to use	intuitive, predictable
a mess to maintain	decoupling & localization
unreliable & buggy	more dependable

ANNIVERSARY EDITION WITH FOUR NEW CHAPTERS



ESSAYS ON SOFTWARE ENGINEERING

THE MYTHICAL MAN-MONTH

FREDERICK P. BROOKS, JR.



Conceptual integrity is the most important consideration in system design.

—Fred Brooks, 1975

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I am more convinced than ever.

Conceptual integrity is central to product quality.

—Fred Brooks, 1995

Conceptual integrity is the most important consideration in system design.

—Fred Brooks, 1975

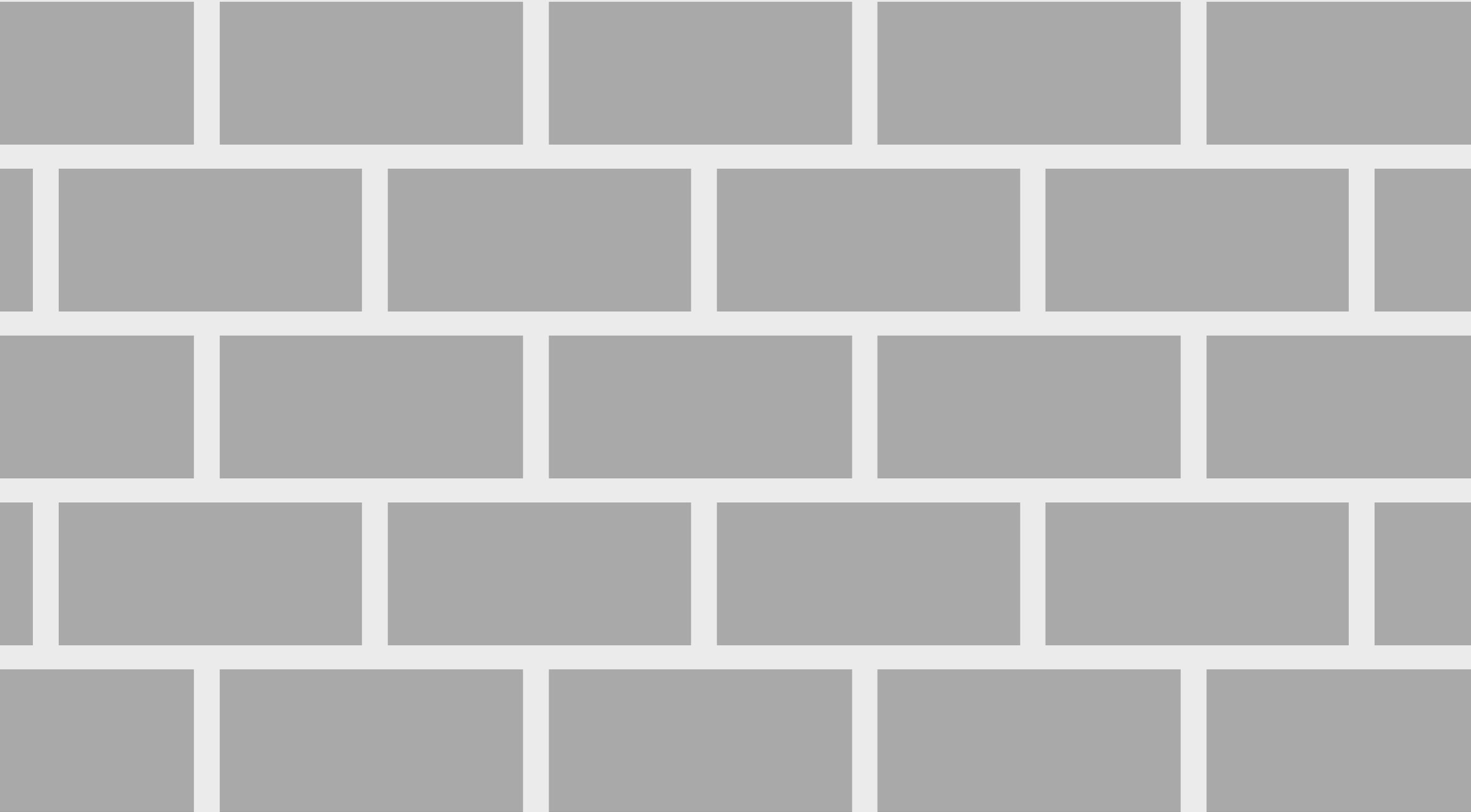
I am more convinced than ever.

Conceptual integrity is central to product quality.

—Fred Brooks, 1995

Because ease of use is the purpose, this ratio of function to conceptual complexity is the ultimate test of system design. Neither function alone nor simplicity alone defines a good design.

building a method of conceptual design



building a method of conceptual design

underlying
theory

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case studies

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alloy: a language & tool for relational models

about alloy

Alloy is a language for describing structures and a tool for exploring them. It has been used in a wide range of **applications** from finding holes in security mechanisms to designing telephone switching networks.

An Alloy model is a collection of constraints that describes (implicitly) a set of structures, for example: all the possible security configurations of a web application, or all the possible topologies of a switching network. Alloy's tool, the **Alloy Analyzer**, is a solver that takes the constraints of a model and finds structures that satisfy them. It can be used both to explore the model by generating sample structures, and to check properties of the model by generating counterexamples. Structures are displayed graphically, and their appearance can be customized for the domain at hand.

At its core, the Alloy language is a simple but expressive logic based on the notion of relations, and was inspired by the Z specification language and Tarski's relational calculus. Alloy's syntax is designed to make it easy to build models incrementally, and was influenced by modeling languages (such as the object models of OMT and UML). Novel features of Alloy include a rich subtype facility for factoring out common features and a uniform and powerful syntax for navigation expressions.

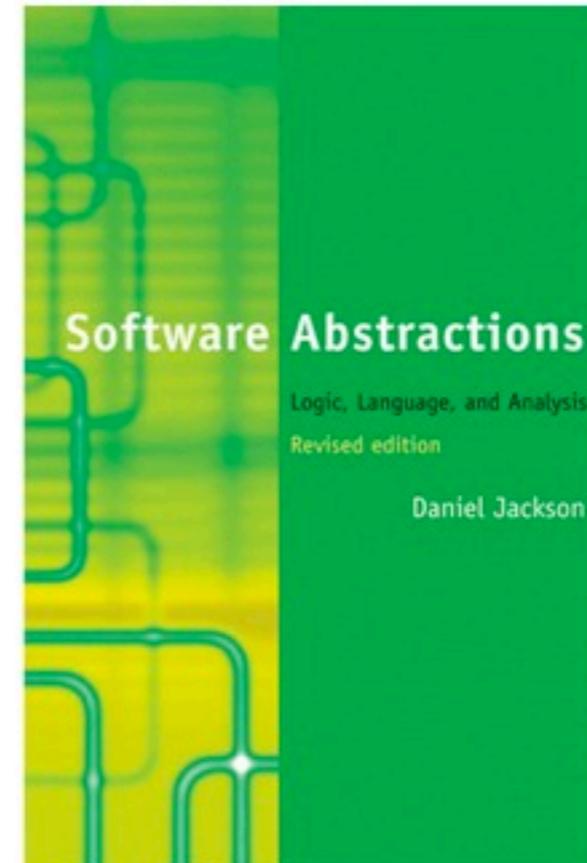
The Alloy Analyzer works by reduction to SAT. Version 4 was a complete rewrite that included **Kodkod**, a new model finding engine that optimizes the reduction, and a new front end.

news

ASM, Alloy, B and Z Conference: 6 new publications on Alloy.

A **Japanese translation** of book published!

Revised edition of book now out!
Available from **MIT Press**.



the heart of software

the heart of software



interface

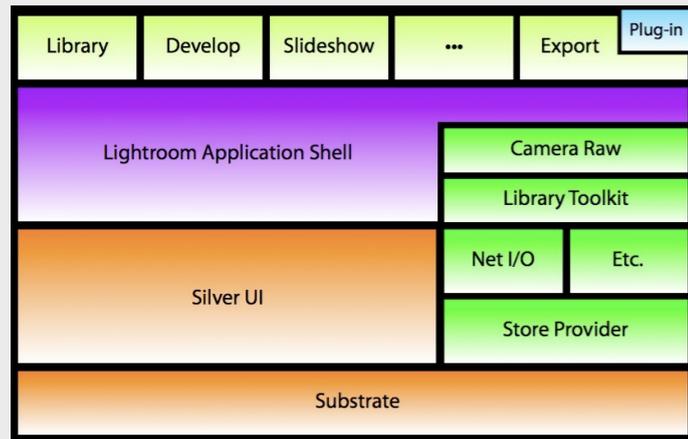
the heart of software



interface



the heart of software



code

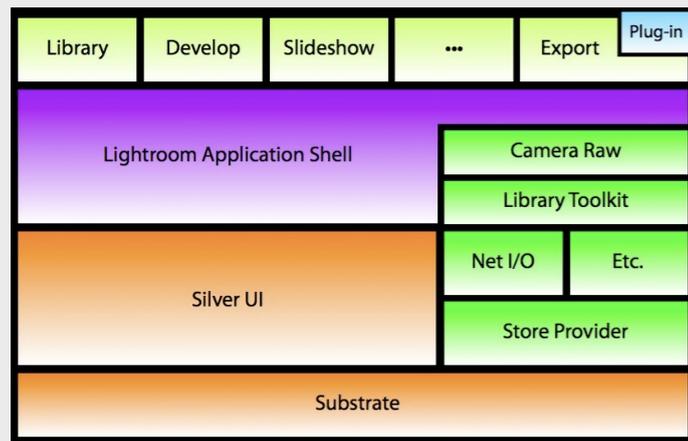


interface



user's model

the heart of software



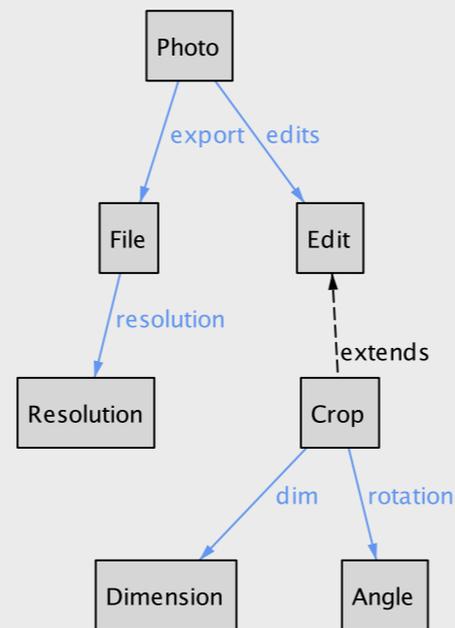
code



interface



user's model



conceptual model

takeaway

takeaway

conceptual design is
at the heart of the design of software
and many other complex systems

takeaway

conceptual design is

at the heart of the design of software
and many other complex systems

it's what you do

if you're an analysis, consultant, programmer...

takeaway

conceptual design is

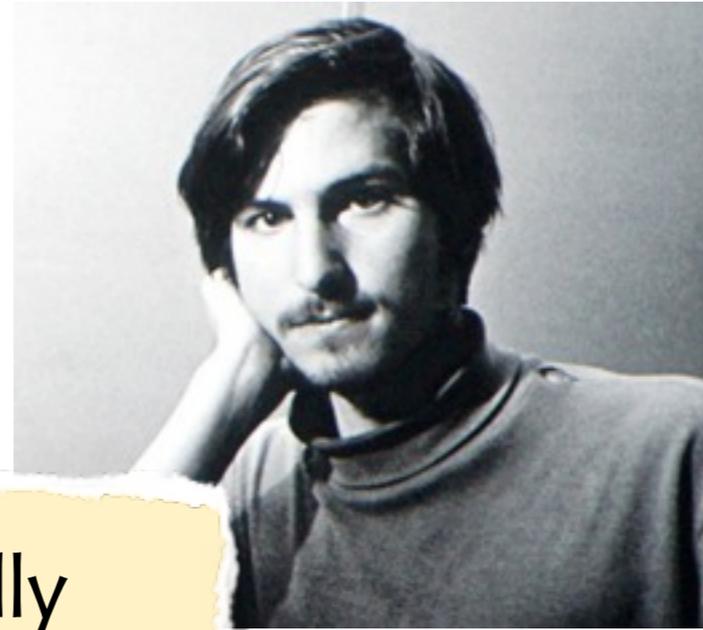
at the heart of the design of software
and many other complex systems

it's what you do

if you're an analysis, consultant, programmer...

focusing on concept structure

low cost, potentially high gain



To design something really well, you have to get it. You have to really grok what it's all about. It takes a passionate commitment to really thoroughly understand something, chew it up, not just quickly swallow it. Most people don't take the time to do that.