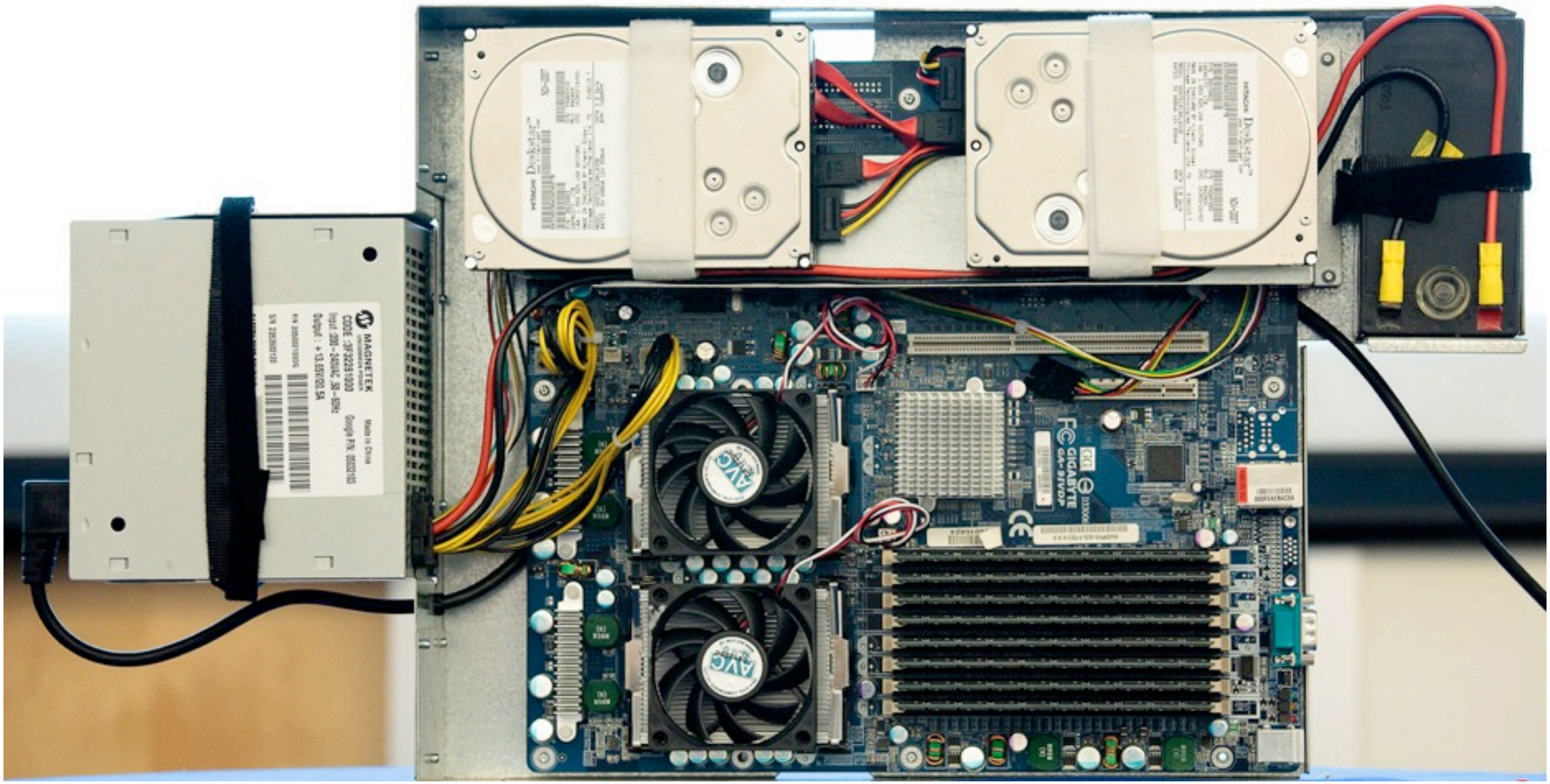
Scaleable Page Counter

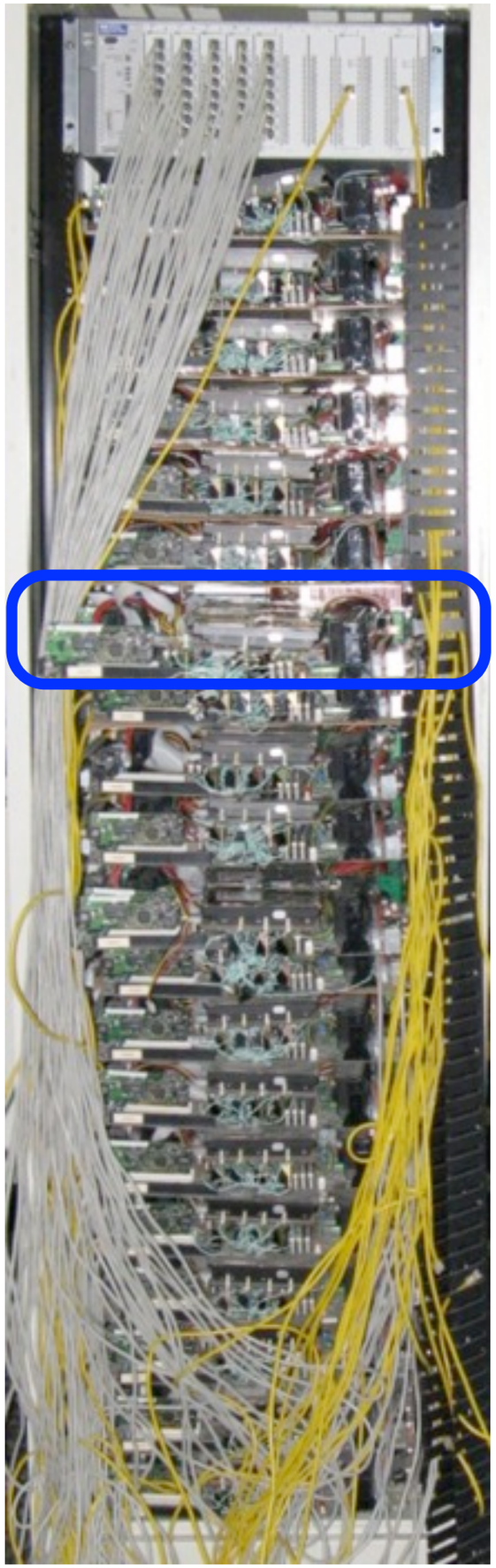
A gentle introduction to software engineering at Google scale

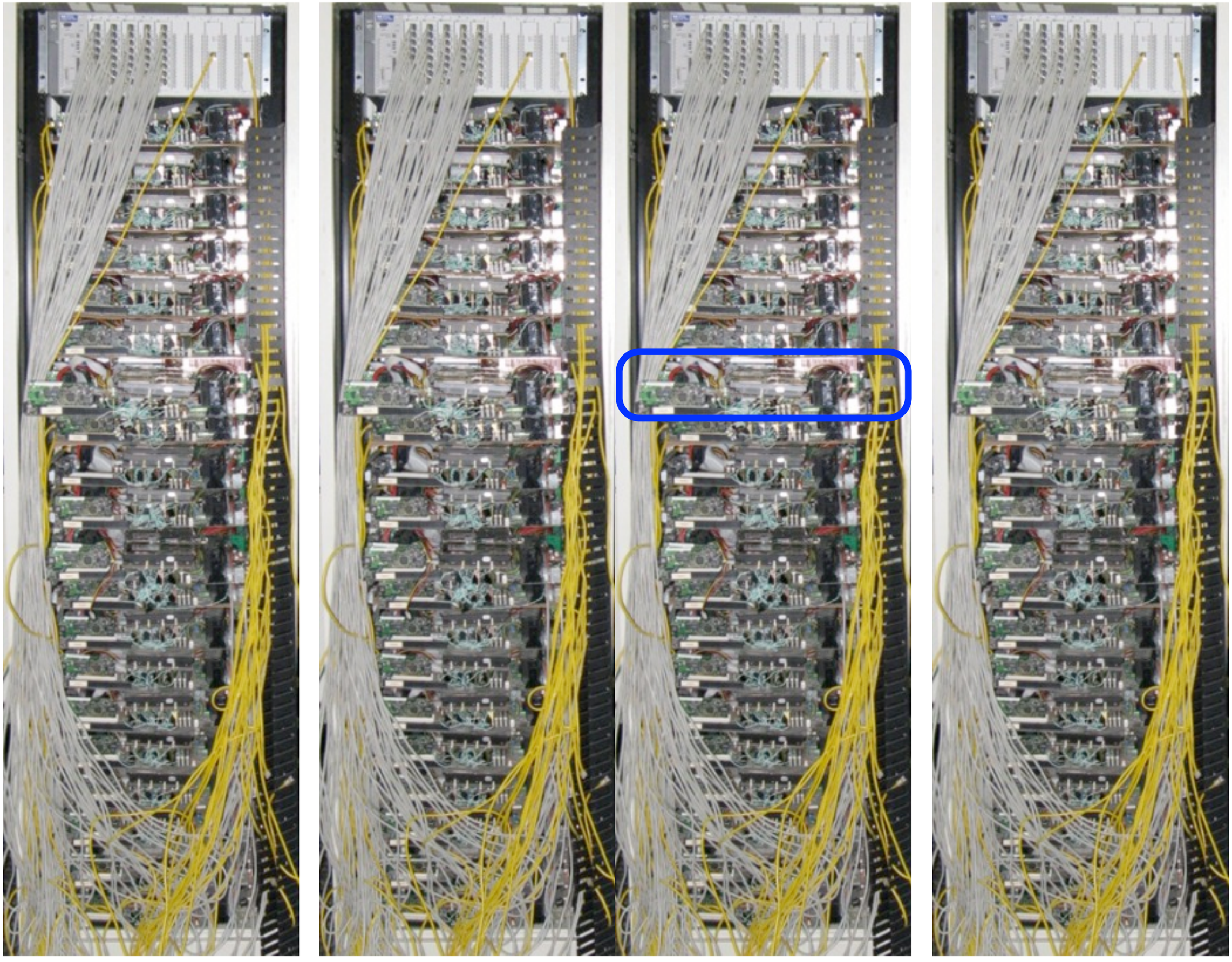
Jon Tirsen, Google

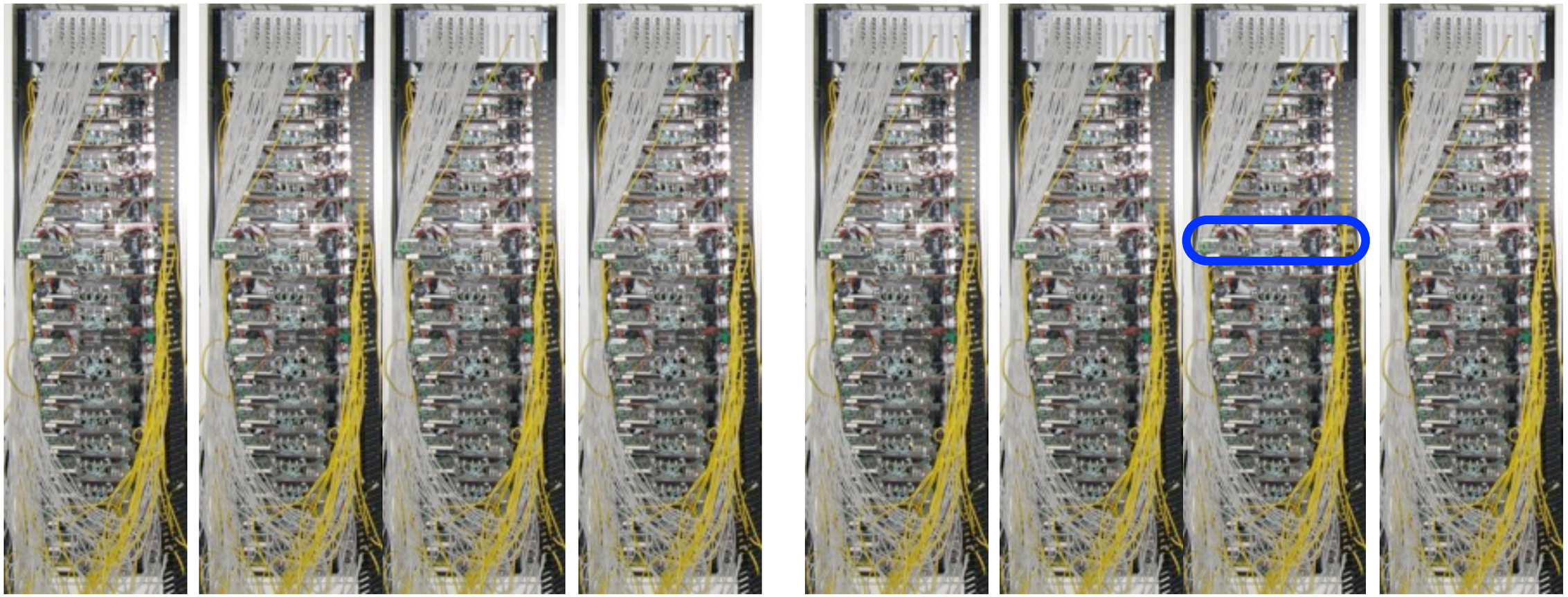
We've had 191849 visitors!

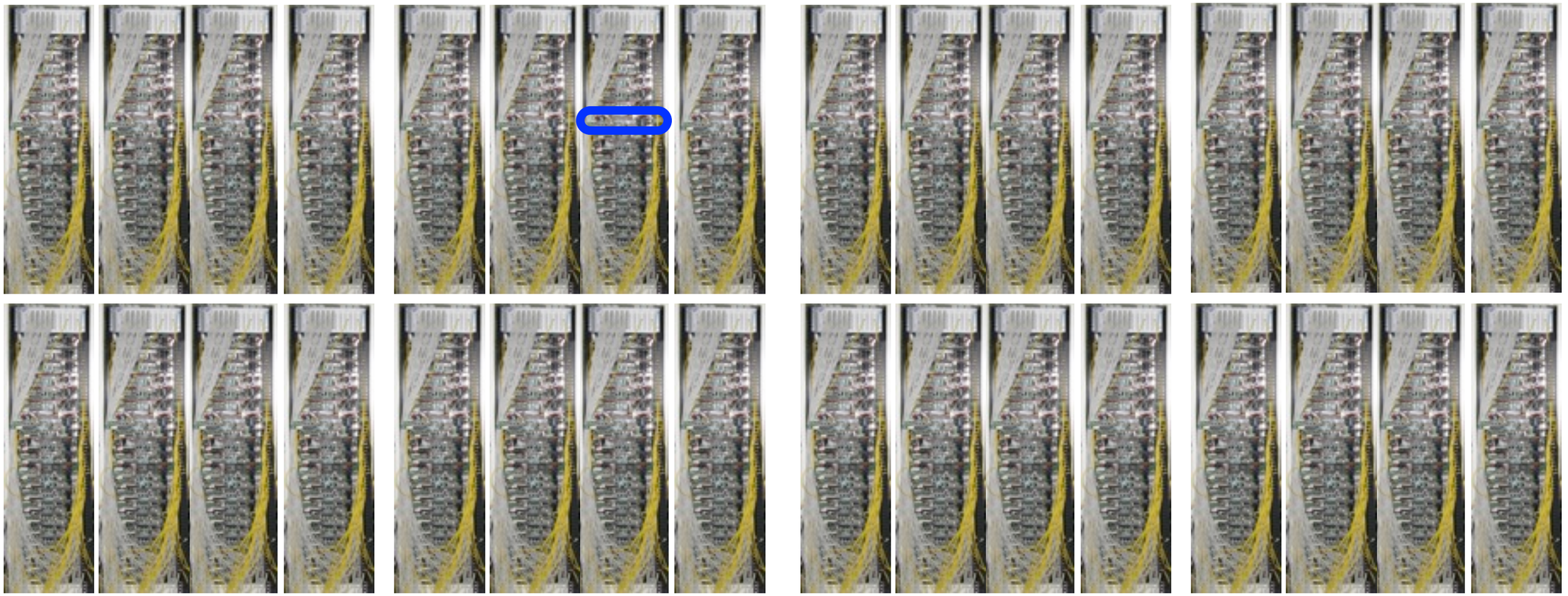
Google Search I'm Feeling Lucky

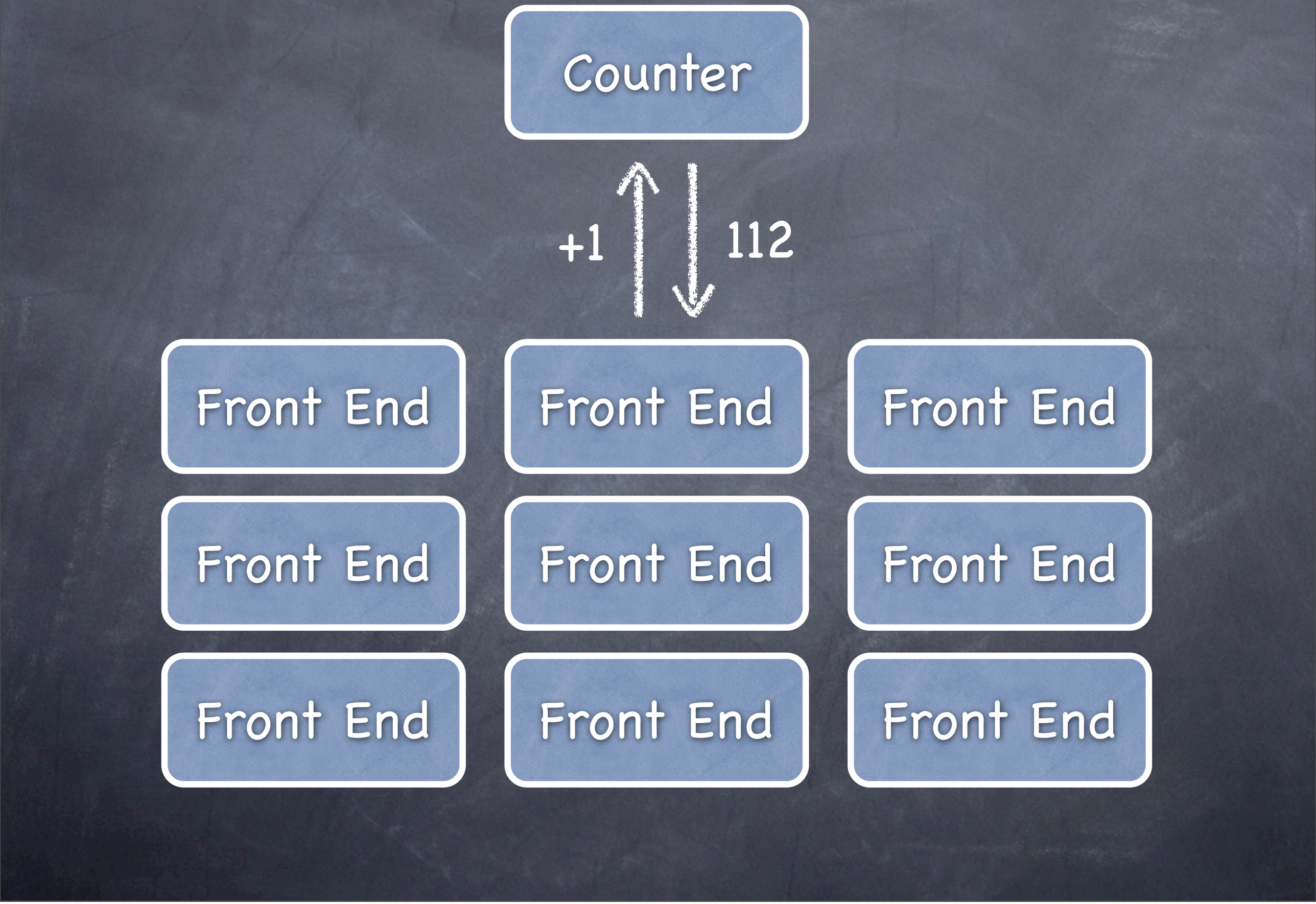

MAGNETEK
GIGABYTE
AVC

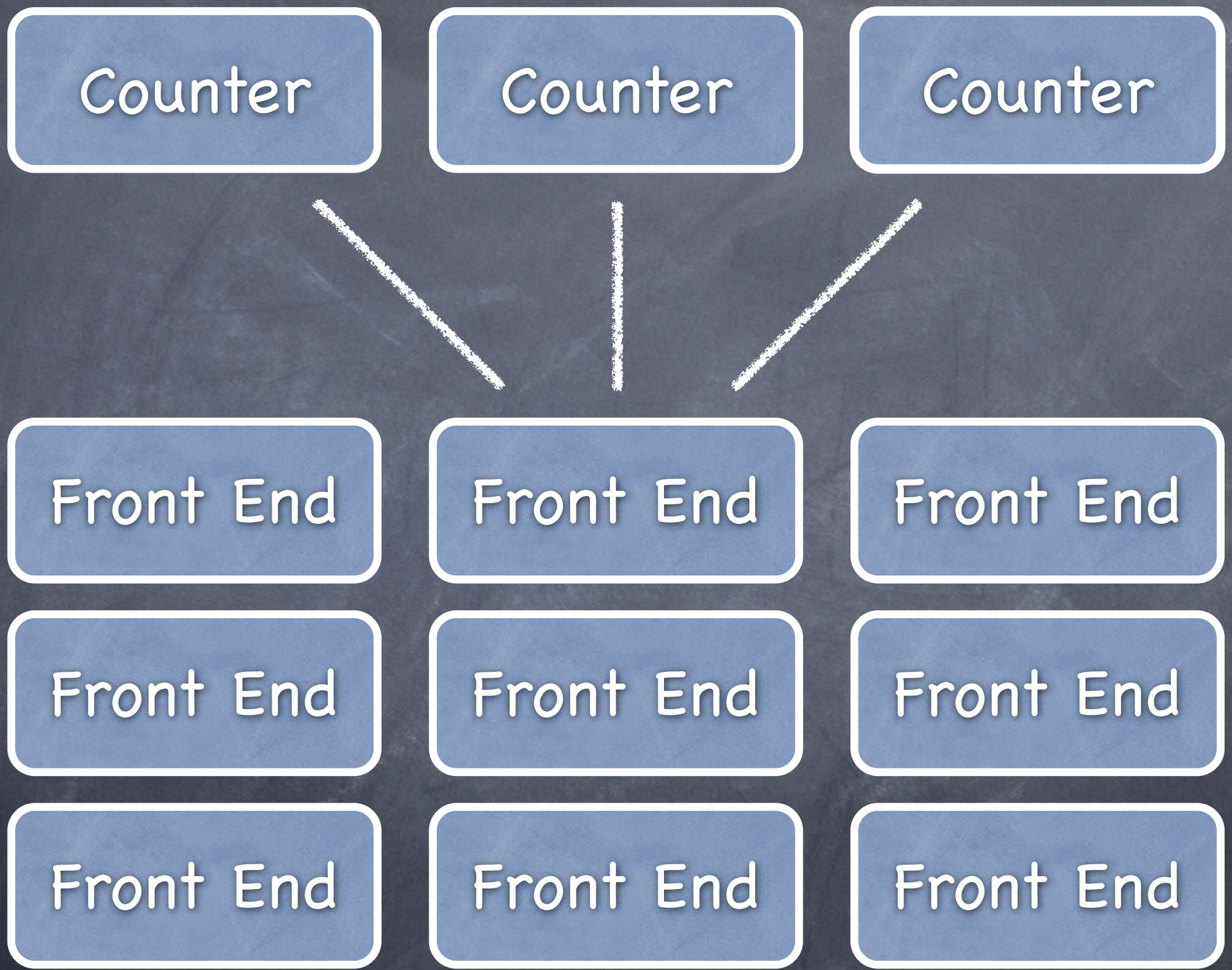









Counter
+1
112
Front End
Front End
Front End
Front End
Front End
Front End
Front End
Front End
Front End


Counter
Counter
Counter
Front End
Front End
Front End
Front End
Front End
Front End
Front End
Front End
Front End

Counter

Counter

Counter

Write

Front End

Shard by: random

einz.einz@gmail.com | Settings | Help | Sign out

Gmail by Google BETA

Search Mail | Search the Web | Show search options | Create a filter

Compose Mail

Inbox (1)
Starred
Chats
Sent Mail
Drafts (4)
All Mail
Spam (3765)
Trash

Contacts

About Email - Forever Lovers IncrediMail Letter — Web Clip < >

Archive | Report Spam | Delete | More Actions ... | Refresh — 1 - 1 of 1

Select: All, None, Read, Unread, Starred, Unstarred

Heinz Tschabitscher - Ab. » read me later **About Email: Meteoric Monday** - Email In the Spotligh **Feb 6**

Select: All, None, Read, Unread, Starred, Unstarred

Archive | Report Spam | Delete | More Actions ... — 1 - 1 of 1

Quick Contacts

Search, add, or invite

Heinz Tschabitscher went to get some

ladedu

Add contact | Show all

Labels

private (shhh...) (1)
read me later (5)
toodoo doll (2)
Edit labels

Invite a friend

Automatically **forward** your Gmail messages to another email account. Lea

53 MB (2%) of your 2692 MB.

ndard without chat | basic HTML Learn m

y - Program Policies - Google Home

006 Google

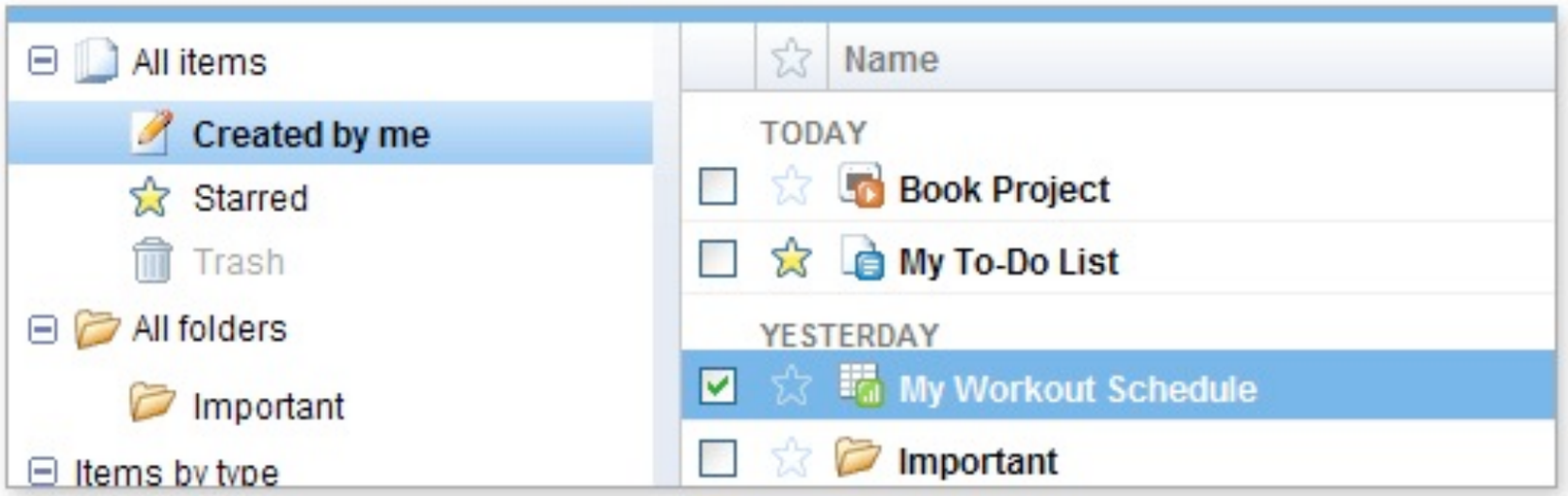
Mail | Chat

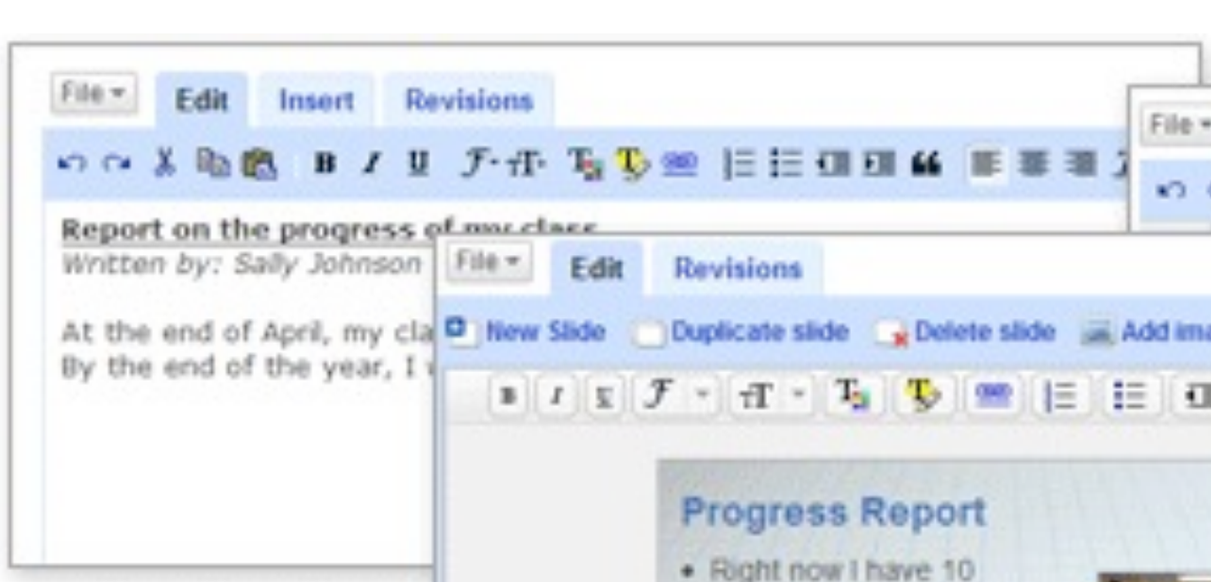
ladedu
ladedu@gmail.com

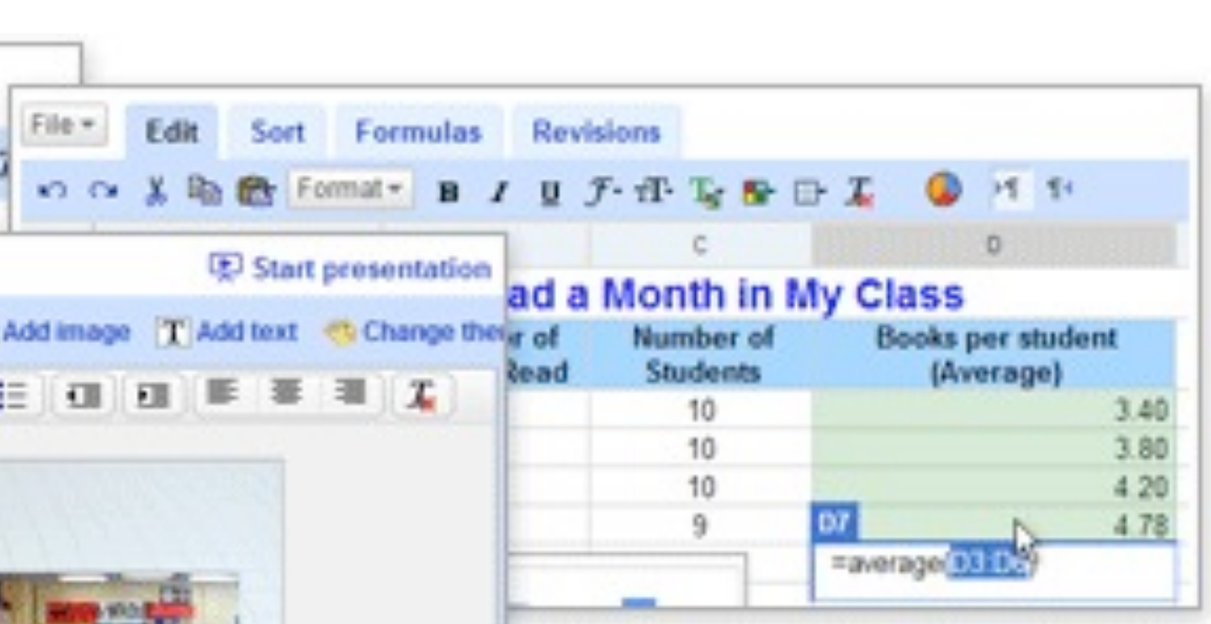
Contact details
Recent conversations
Show in Quick Contacts? Auto

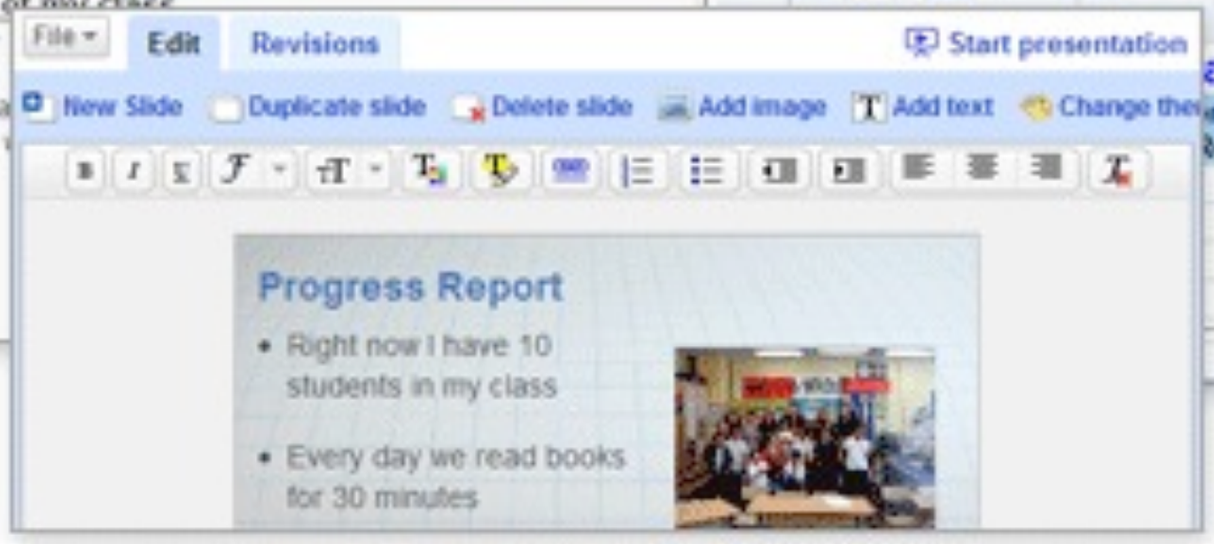
ladedu

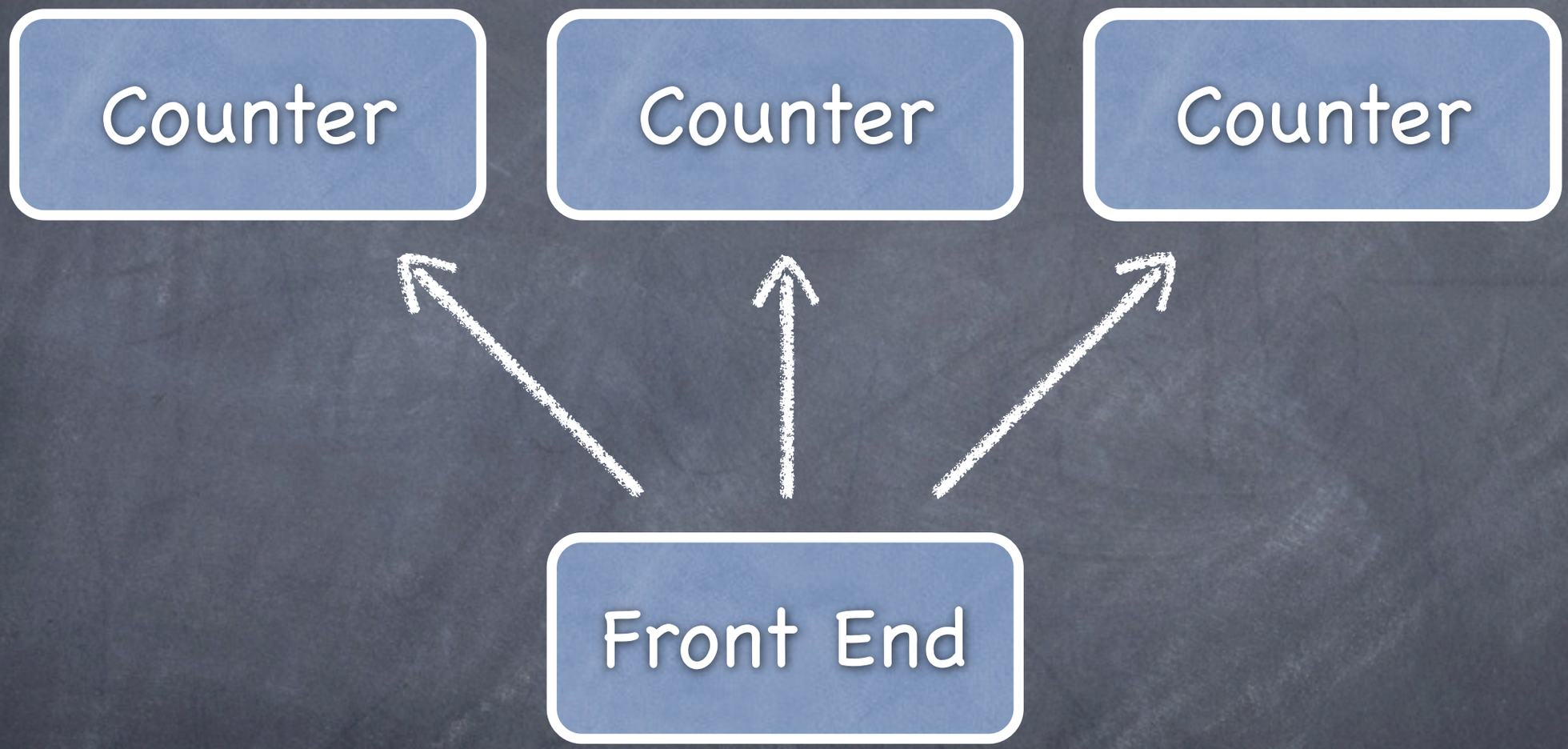
me: what are the flowers I want to water?
ladedu: The Azalea in the kitchen.
please. thanks!
me: sure!
hey, when does this stop?
ladedu: who knows?
does it pop up?
does it pop up now?


All items
Created by me
Starred
Trash
All folders
Important
Items by type
Name
TODAY
Book Project
My To-Do List
YESTERDAY
My Workout Schedule
Important

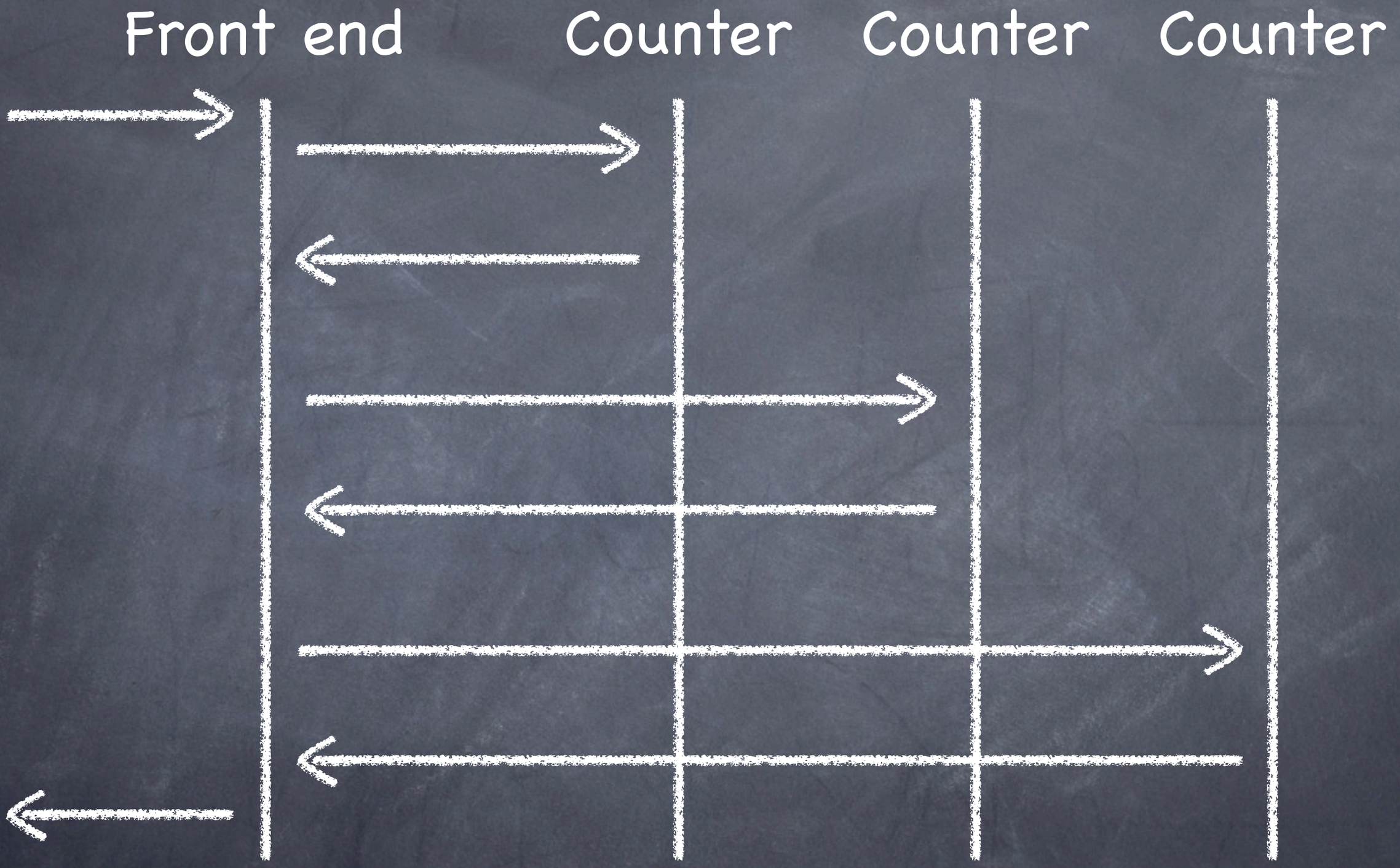

File
Edit
Insert
Revisions
Report on the progress of my class
Written by: Sally Johnson
At the end of April, my cla
By the end of the year, I


File
Edit
Sort
Formulas
Revisions
Format
ad a Month in My Class
Number of Students
Books per student (Average)
10
3.40
10
3.80
10
4.20
9
4.78
D7
=average(D3:D6)

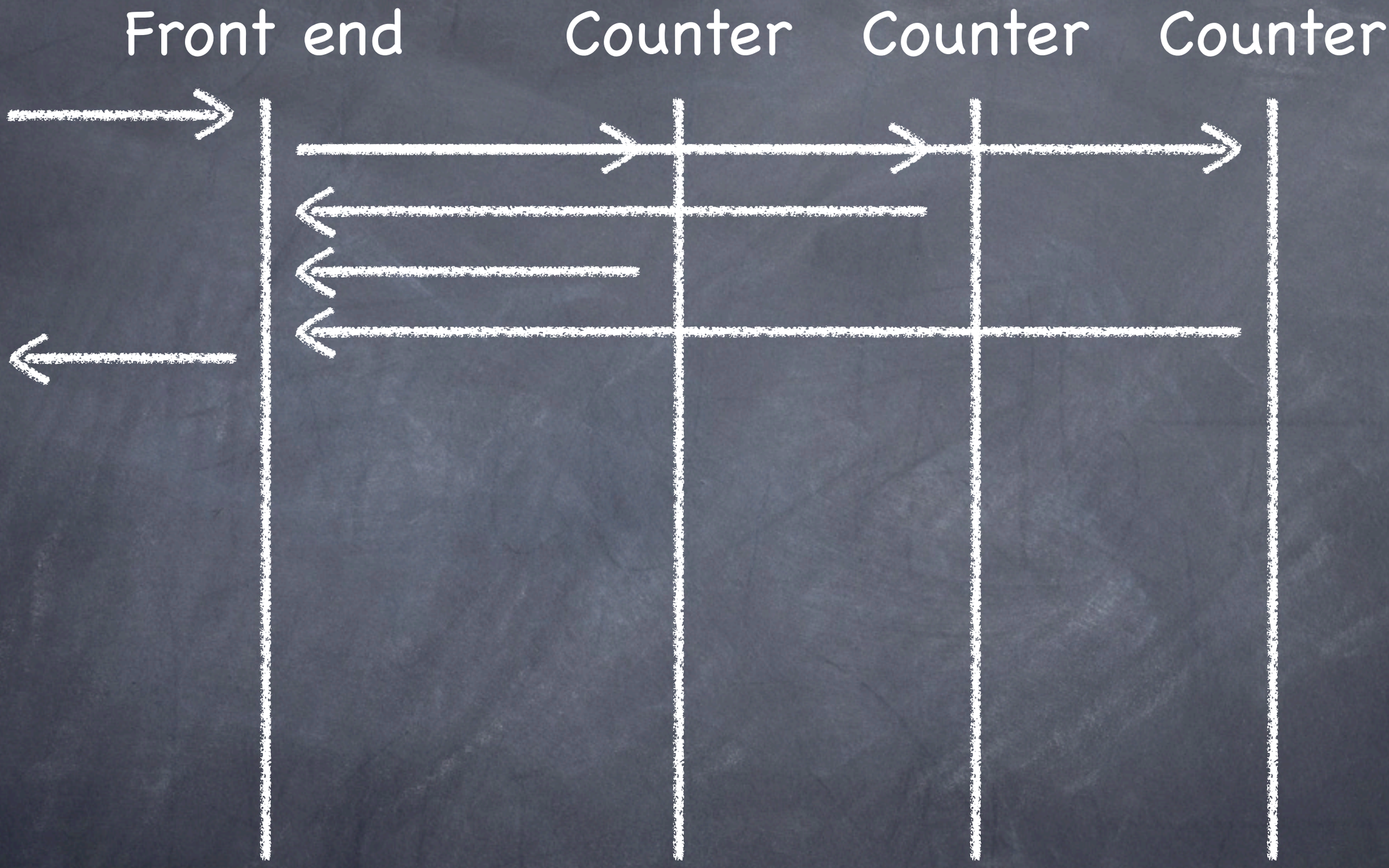

File
Edit
Revisions
Start presentation
New Slide
Duplicate slide
Delete slide
Add image
Add text
Progress Report
Right now I have 10 students in my class
Every day we read books for 30 minutes



Read fan out



Blocking reads



Async reads

twitter Search Home Profile Messages chrismessina

What's happening?

Timeline @Mentions Retweets Searches Lists

17 new tweets

christmasgorill chris muscarella
Any recs on excellent pepper grinders?
2 minutes ago

jassand Jas Sandhu
I'm at Residence Inn Marriott Redmond (7575 164th Ave NE, Redmond). http://4sq.com/b0sOIf
from Downtown Redmond, Redmond
2 minutes ago

aconbere Anders
Yesterday at #crossfit I did a 3x5 of 91 kg (200lb) back squats, that's a 50lb improvement since joining urbancrossfit 3 months ago.
2 minutes ago

Zhanna Zhanna Shamis by episod
Welcome to mission control #NewTwitter http://yfrog.com/mshufej
3 minutes ago Favorite Retweet Reply

themattharris Matt Harris
@adactio the infinite scrolling took some getting used to for me. When I don't use the site I use TweetDeck or YoruFukurou
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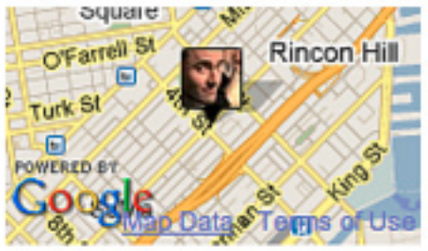
kleinmatic Scott Klein by mathewi
For the record, I love the Twitter iPad app. All that swiping gives it a pleasing tactility. #hatersgonnahate
6 minutes ago

← @Zhanna's Tweet close

@ev
Evan Williams

Today we're launching a new Twitter.com—a faster, easier, and richer way to discover what's new in your world. #NewTwitter

57 minutes ago via web Favorite Retweet Reply



from Twitter HQ
795 Folsom St
San Francisco, CA
View Tweets at this place

Retweeted by MashaelDc and 100+ others

Replies to this Tweet

laghid Jan LUVS freedom
@ev OK! Sounds cool to me!
1 minute ago

raiju Karyl
@ev What changed/is changing?
3 minutes ago

jeffsawyer Jeff Sawyer
@ev Looking forward to trying it! Good work on #NewTwitter
15 minutes ago

Bertilicia Carolina do Valle

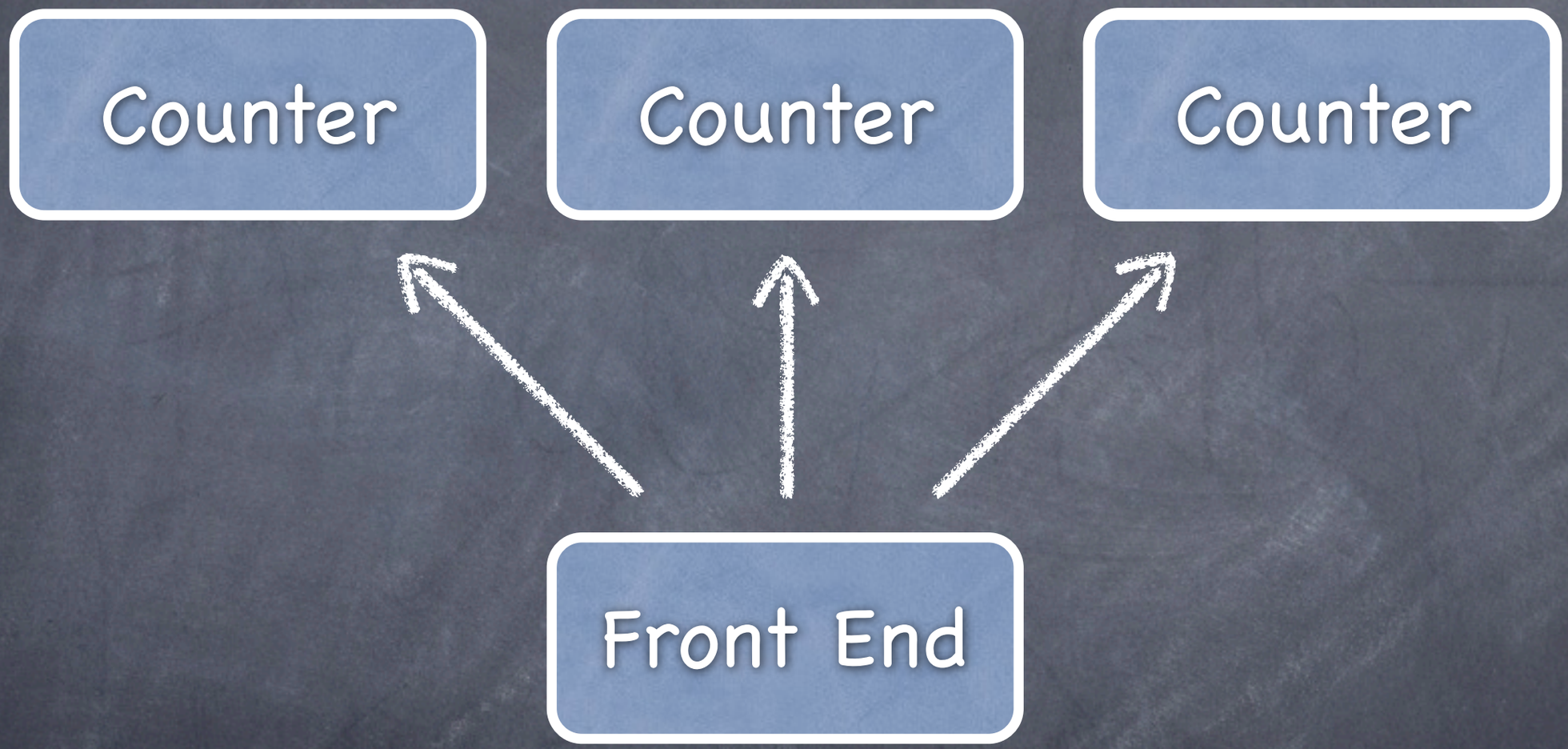
Counter

Counter

Counter

Front End

Write


Counter
Counter
Counter
Front End
Read

Availability

Availability

14 mins/day

7 hours/month

99% = 3 days/year

1 Number of shards 1000

99.9999...%

Availability

Writing

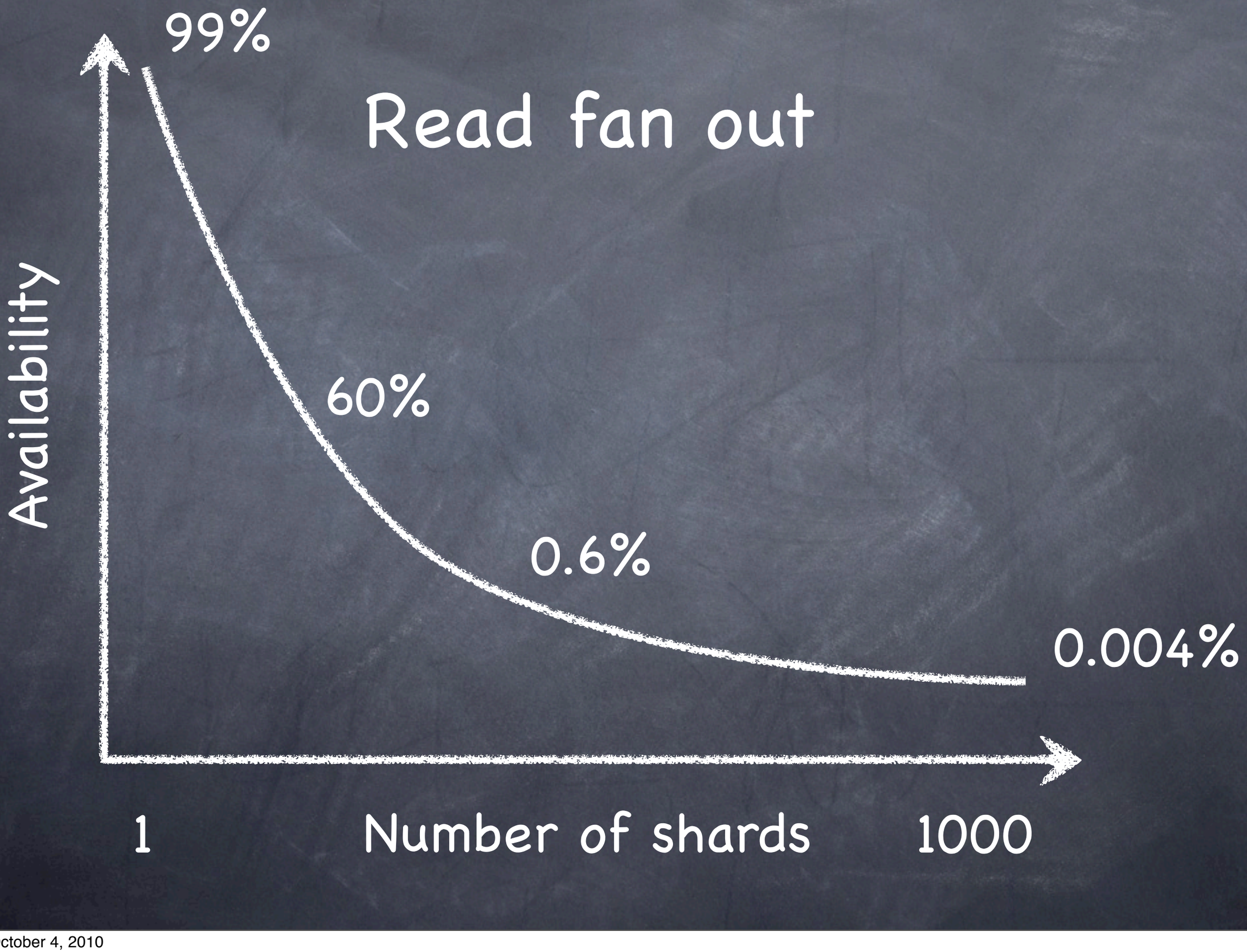
99%

1

Number of shards

1000

Read fan out



Update

Counter

Counter

Counter

Replicas

Replicas

Replicas

Write

Reads

Front End

8 nines

5 nines

6 nines

99.99%

Availability

Read fan out

to 5 replicas

1

Number of shards

1000

Read & Cache

Counter

Counter

Counter

Write & Read

Front End

99.9999...%

Availability

Read fan out

with caching

99%

1

Number of shards

1000

twitter Search Home Profile Messages chrismessina

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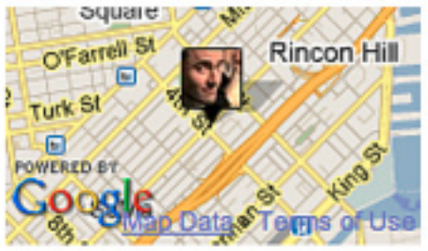

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Consistency

Probability

Read

Write

Write

Write

Write

Probability

Read

Write

Write

Write

Write

Probability

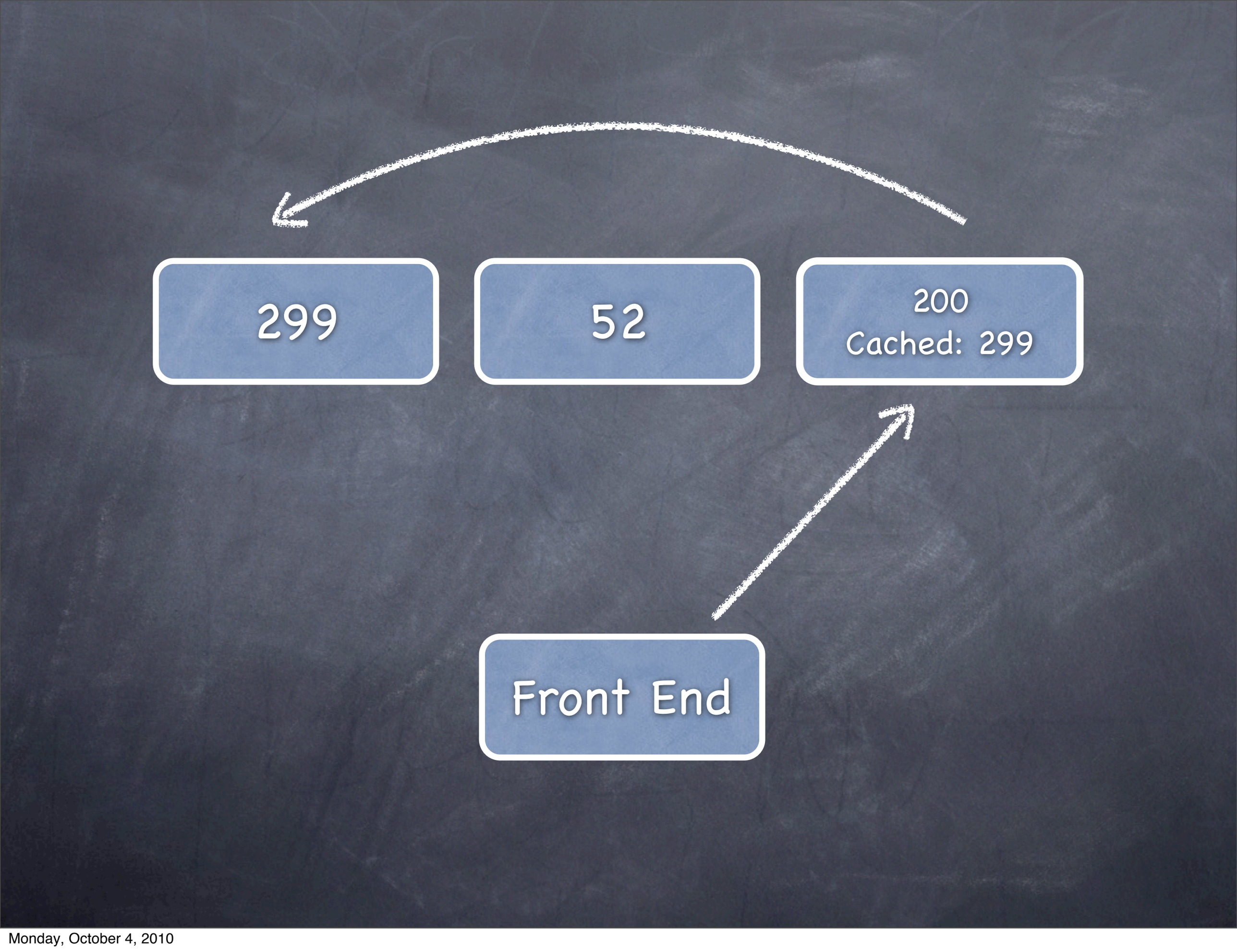
Read

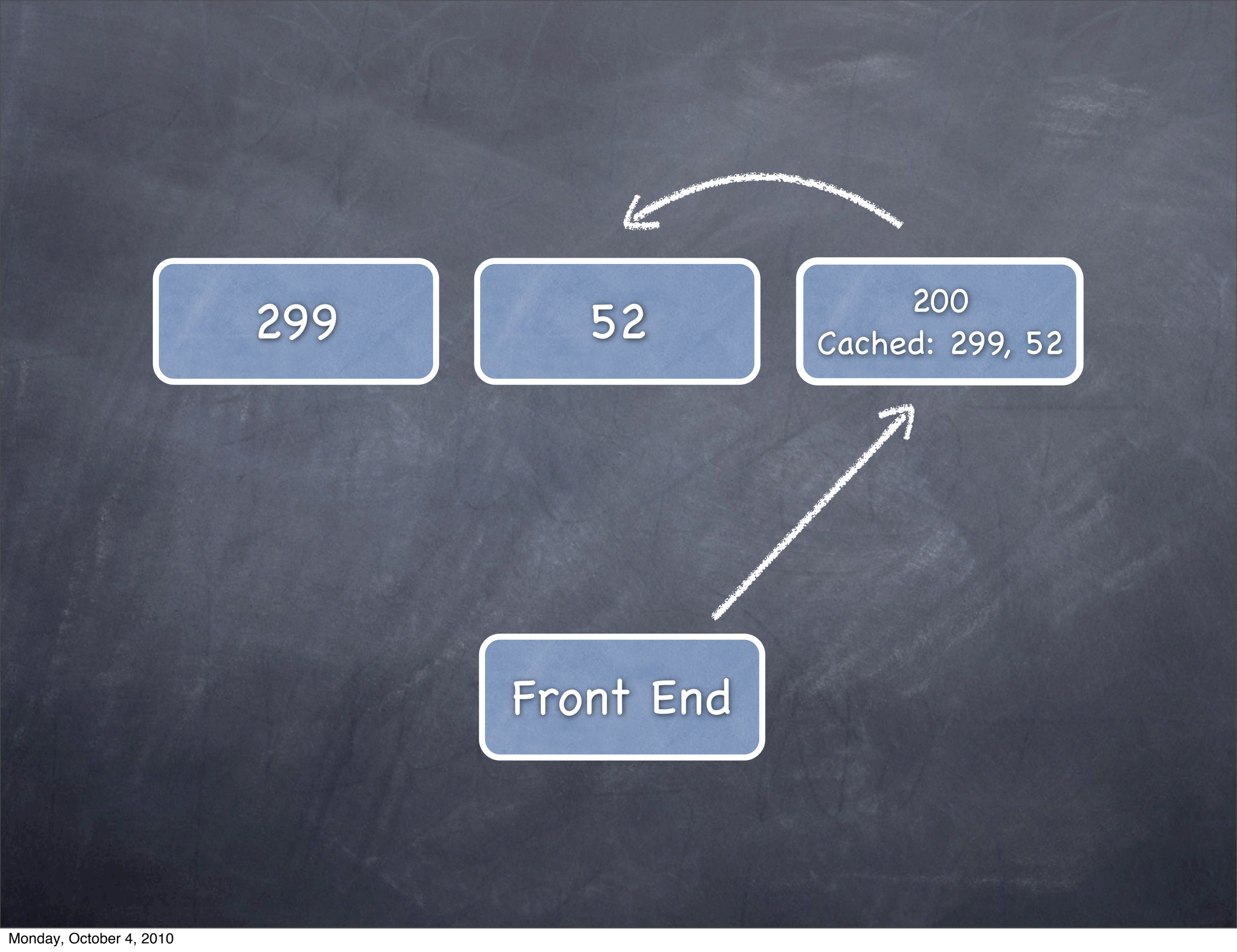
Write

Write

Write

Write


299
52
200
Cached: 299
Front End


299
52
200
Cached: 299, 52
Front End

299

56

200
Cached: 299, 52

Front End

302

56

200
Cached: 299, 52

Front End

302

56

201
Cached: 299, 52

+1

552
=299+52+201

Front End

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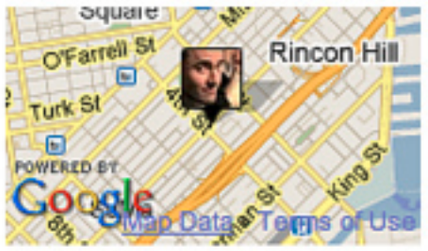

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15 minutes ago

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amazon.com

Hello, Jon Tirsen. We have recommendations for you. (Not Jon Tirsen?)

Get FREE 2-Day Shipping for Mother's Day

Jon's Amazon.com | Today's Deals | Gifts & Wish Lists | Gift Cards | Your Account | Help

Shop All Departments | Search | All Departments | GO | Cart | Your Lists

Get the Amazon.com Rewards Visa® Card instantly and Get $30 Back as a statement credit

Your current subtotal:	$8.99
Amazon.com Visa savings:	**-$30.00**
Your cost after savings:	**$0.00**
Savings remaining:	**$21.01**

Sign up now (Don't show this now)

Shopping Cart for Jon Tirsen (If you're not Jon Tirsen, click here.)

See more items like those in your Cart

subtotal = $8.99

Make any changes below? Update

Shopping Cart Items--To Buy Now	Price:	Qty:
Item added on May 4, 2009 — **Redemption Ark (Revelation Space)** - Alastair Reynolds; **Paperback** Condition: New In Stock Save for later Delete Eligible for FREE Super Saver Shipping Add gift-wrap/note (Learn more)	$8.99	1

About the Shopping Cart

- Items in your Shopping Cart always reflect the most recent price displayed on their product pages.
- Items remain in your Shopping Cart for 90 days.
- Learn more about the Shopping Cart and how to buy items at Amazon.com

Redeeming a gift card or gift certificate? We'll ask for your claim code when it's time to pay.

READY TO ORDER?

Wait! Add $16.01 to your order to qualify for FREE Super Saver Shipping.
See details

Proceed to Checkout

Sign in to turn on 1-Click ordering.

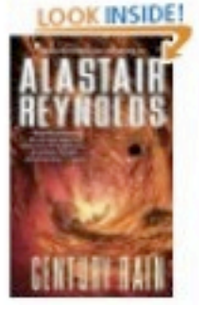
Show gift options during checkout

Recently Viewed Items

- Redemption Ark (Revelation Space) by Alastair Reynolds
- House of Suns (GollanczF.) by Alastair Reynolds
- The Prefect by Alastair Reynolds

View & edit Your Browsing History

Featured Item



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Search

PayPal

Australia (Australian English)

Home | Individuals | Business | Products & Services

Get Started | Send Money | Request Money | Sell on eBay

Join PayPal Today

Sign Up

Now over 150 million accounts worldwide

Log In

Forgotten your email address or password?

Top Questions

- How do I use my bank account with PayPal?
- How does PayPal keep me safe?
- How do I use PayPal for international purchases?

The safer, easier way to pay
for the things you love

How does my PayPal account work?

How can I contact PayPal?

Where can I use PayPal?

Pay With: BANK VISA MasterCard

Ideal for shopping online

Get a Personal account - It's a secure and fast way to send payments.

- Send Money
- Request Money

Accept payments for low fees

Get a Premier account and accept bank account, debit and credit card payments securely anywhere you sell online

- Receive and Manage Payments
- See more Premier account features

A different solution...

Read & sum

Analysers

Logs

Push new count

Front End

Front End

Front End

Append

Front End → Counter

Front End → Log → Analyser

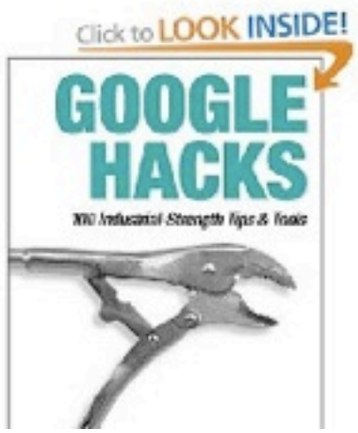
Analyser

Push new count

Front End

Front End

Front End



Google Hacks: 100 Industrial-Strength Tips & Tools (Paperback)

by Tara Calishain (Author), Rael Dornfest (Editor)

Key Phrases: import mail, search grid, track topics, Google Maps, Advanced Web, Extending Google (more...)

(62 customer reviews)

List Price: ~~$24.95~~

Price: **$18.21** & eligible for **FREE Super Saver Shipping** on orders over $25. Details

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Frequently Bought Together

Customers buy this book with Google: The Missing Manual by Sarah Milstein

Price For Both: $34.70

Add both to Cart

Customers who searched for "google hacks" also expressed interest in:

Spidering Hacks by Kevin Hemenway (2003) ~~$24.95~~ $16.47

Google: The Missing Manual by Sarah Milstein (2005) ~~$24.99~~ $16.49

Google Hacks: Tips & Tools for Finding and Using the World's Information by Rael Dornfest (2006) ~~$24.99~~ $16.49

Customers Who Bought This Item Also Bought

Page 1 of 17

Sharding

Shard selection: random, by user, by document

Fan out: writes, reads

Replication/Caching

Consistency model: eventual, shard local

Sync -> Async

Questions?

tirsen@google.com
Twitter: @tirsen