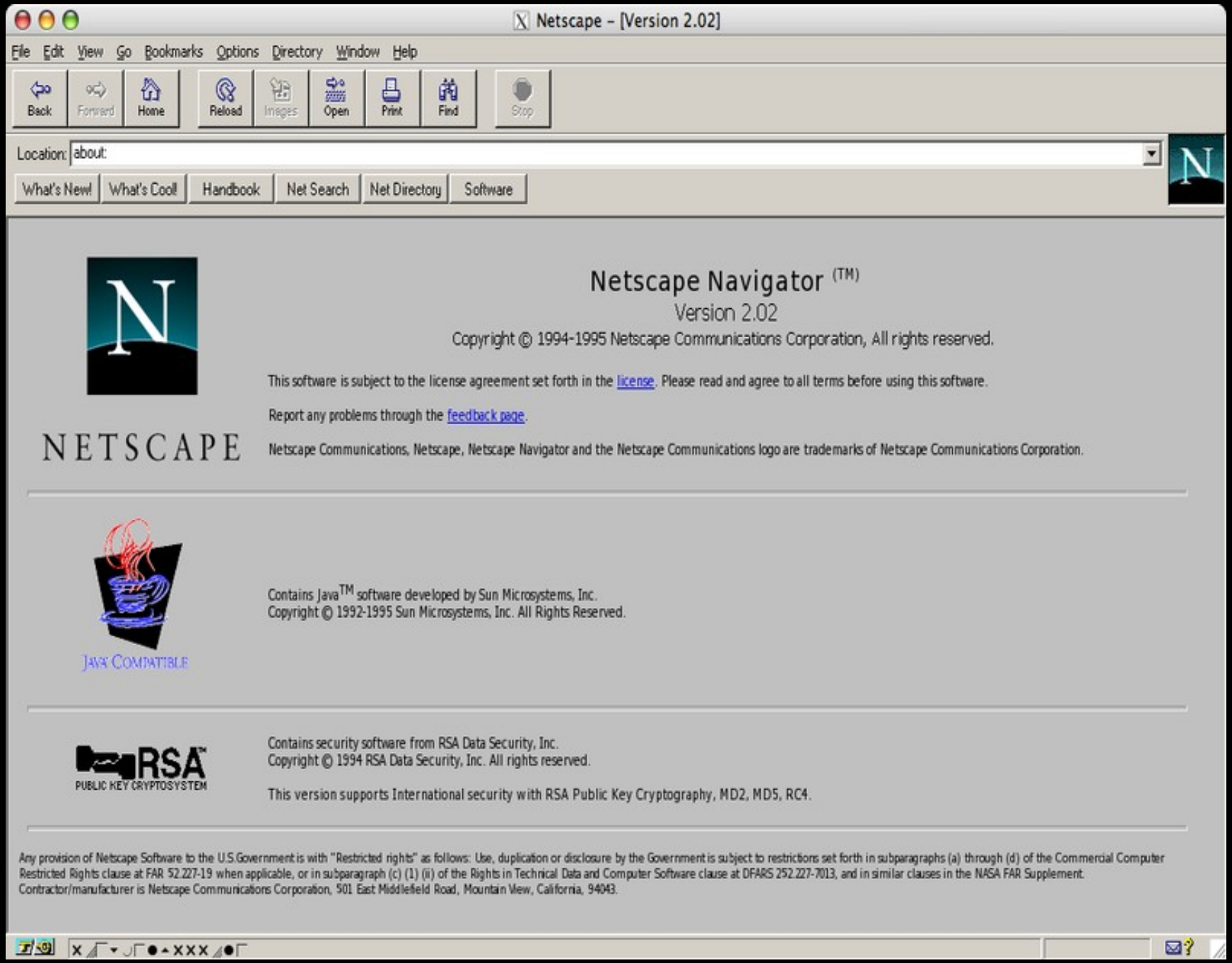
Changing Threats To Privacy

moxie@thoughtcrime.org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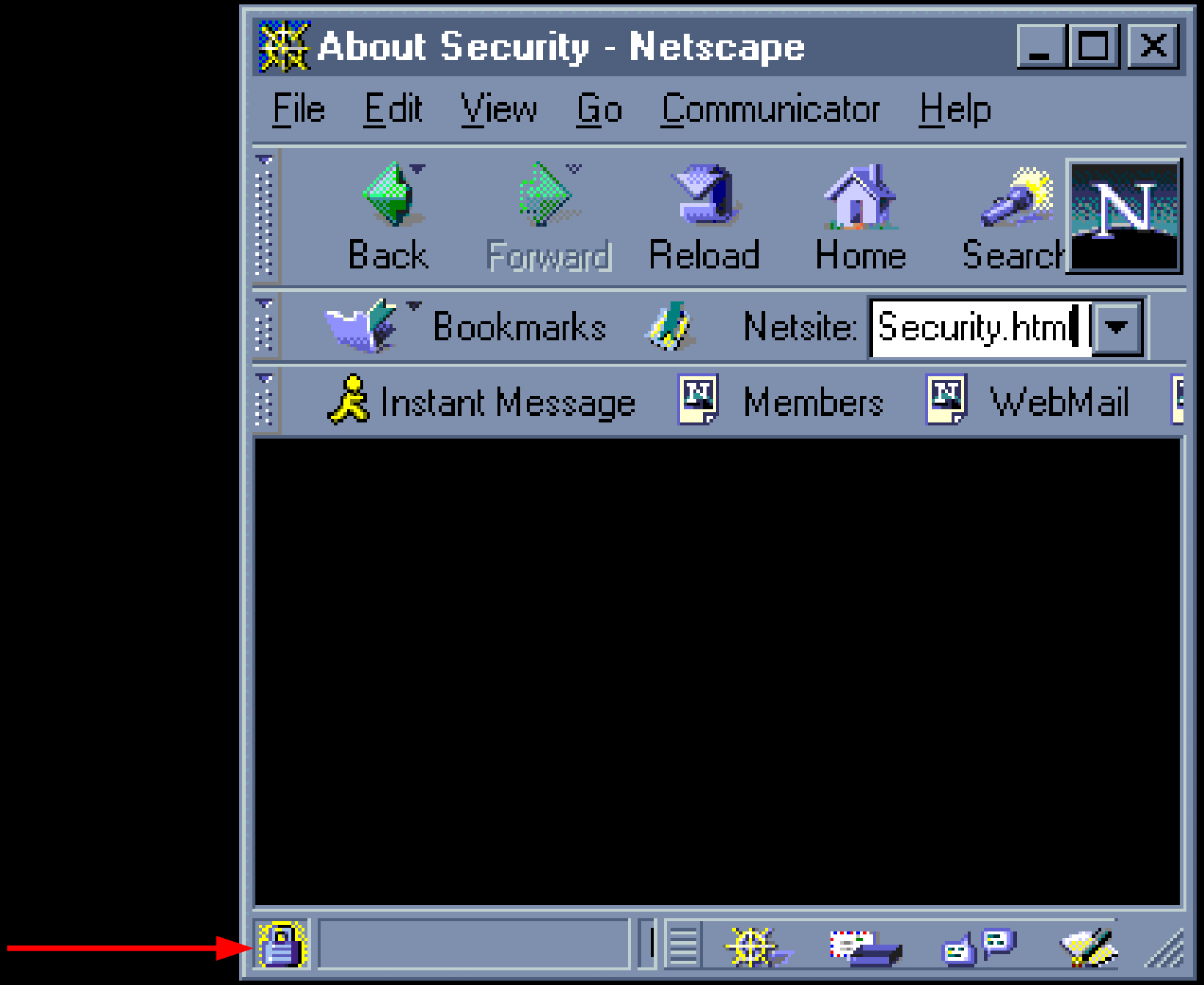
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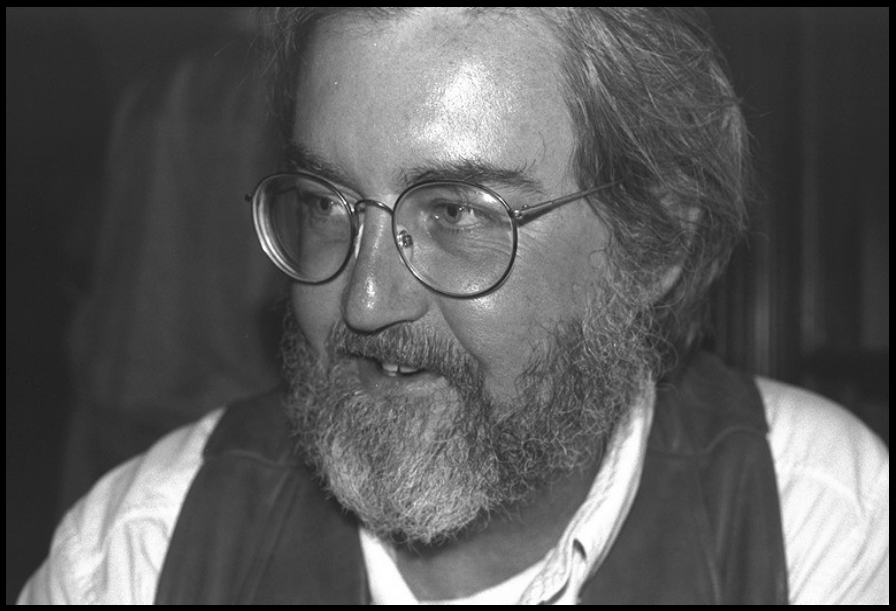
Cypherpunks

Moxie Marlinspike
Institute For Disruptive Studies

Government


David Chaum



Dangerous

Scared

The Fuck

Out Of Them

Ultimate Control → No Control

As Dangerous?

=


Mykotronx
MYK78T
22422
200005

Cryptography Is Not A Banana

!=

Cypherpunks Write Code!

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Institute For Disruptive Studies

"PGP: source code and internals"
MIT Press 1995

2000 == GAME OVER?

THE SPREAD OF INFORMATION IS INEVITABLE

PREDICTIONS

- Anonymous digital cash will flourish.
- Intellectual property will disappear.
- Surveillance will become impossible.
- Governments will be unable to continue collecting taxes.
- Governments will fall.

IO YEARS ON

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Institute For Disruptive Studies

Is This Victory?

- Everyone's mother has an illegal copy of an mp3 somewhere.
- Cryptography is everywhere.
- There are actual darknets which should make the eradication of information impossible.

SURVEILLANCE > PRIVACY

What Happened?

FUTURE

FACISM

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SOCIAL DEMOCRACY

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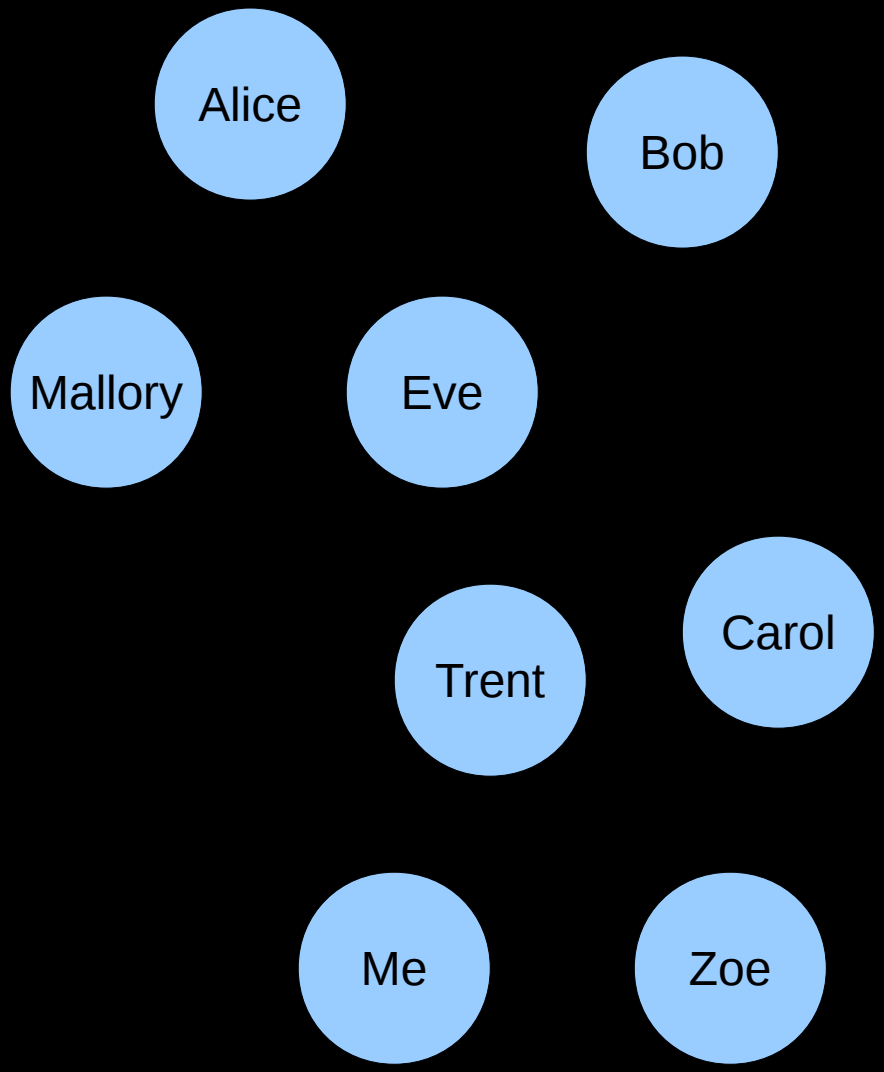
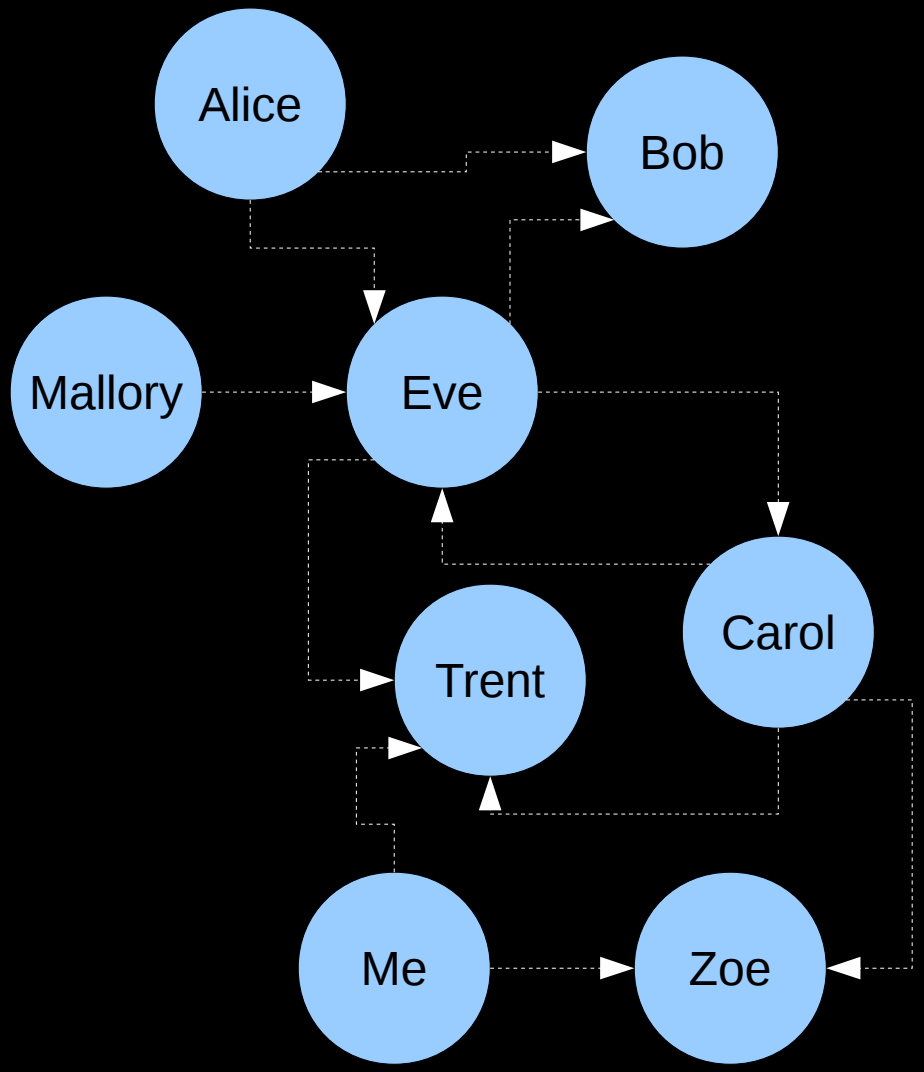
Choice


NOKIA
NOKIA
1 qo
2 abc
def 3
4 ghi
5 jkl
mno 6
7 pqrs
8 tuv
wxyz 9
0
#


Alice
Bob
Mallory
Eve
Carol
Trent
Me
Zoe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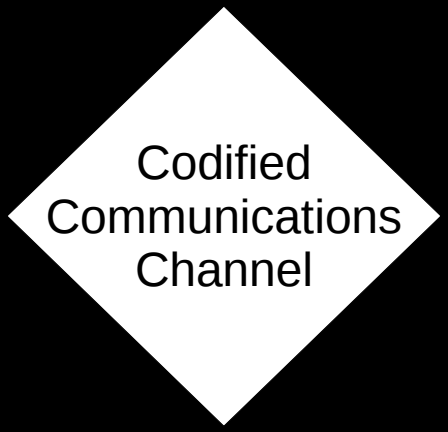
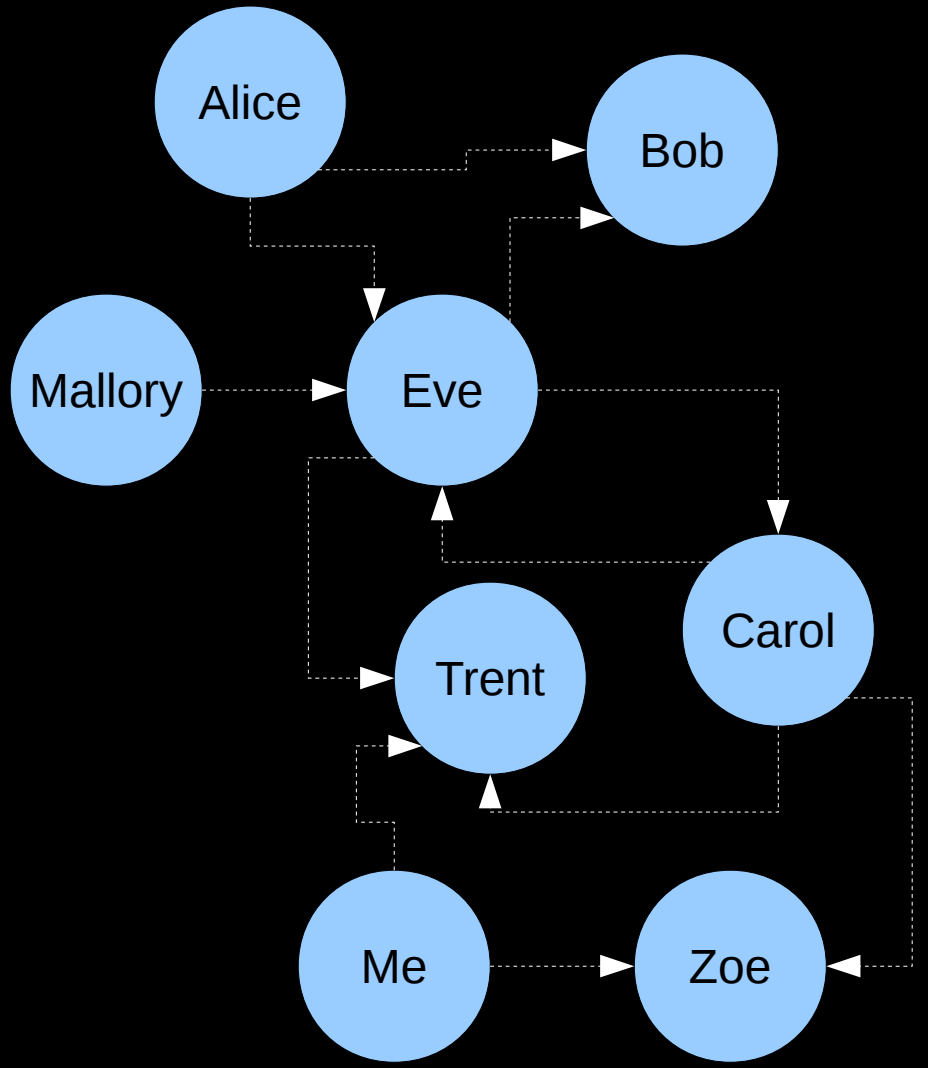

Codified
Communications
Channel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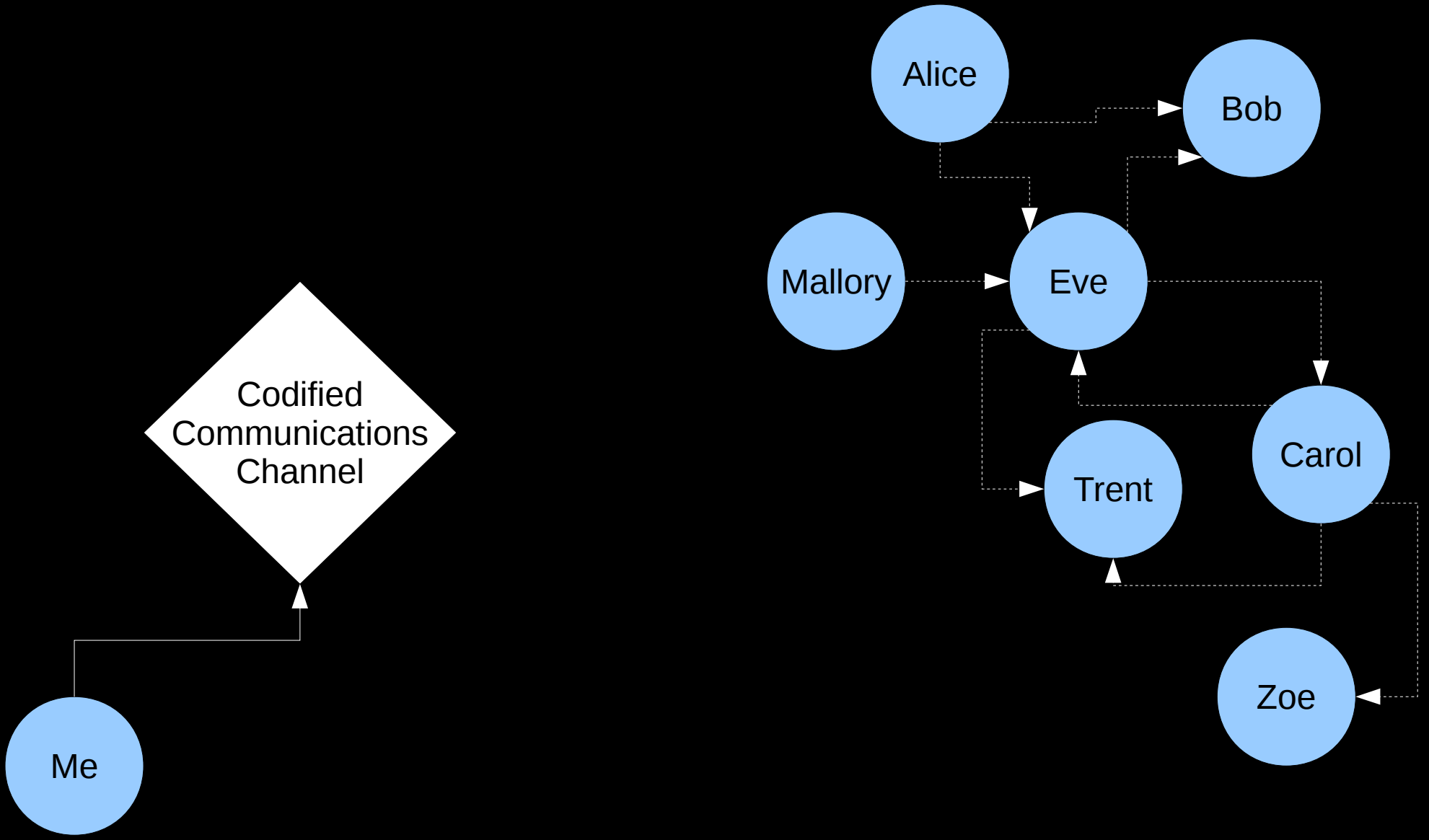
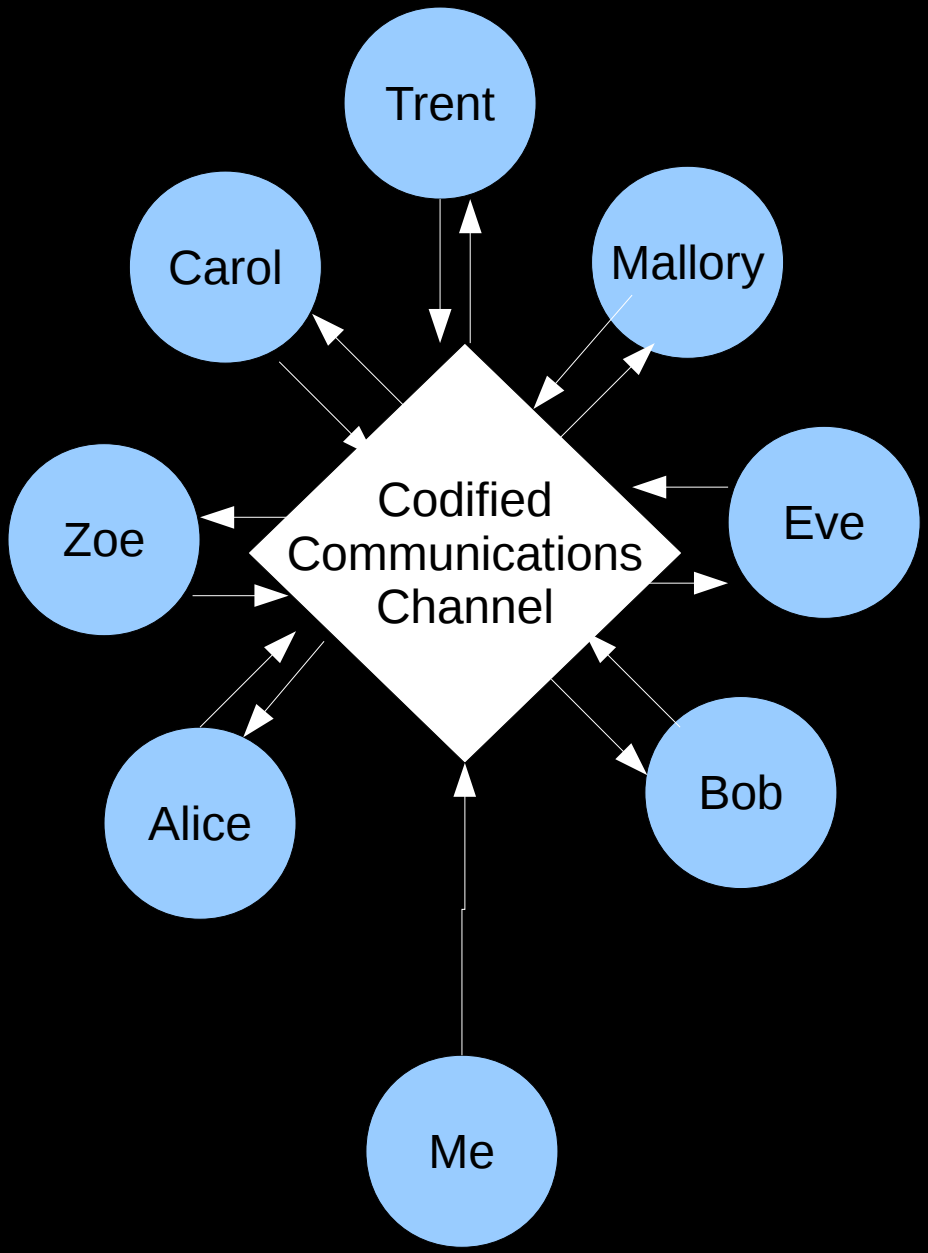
“No Network Effect”

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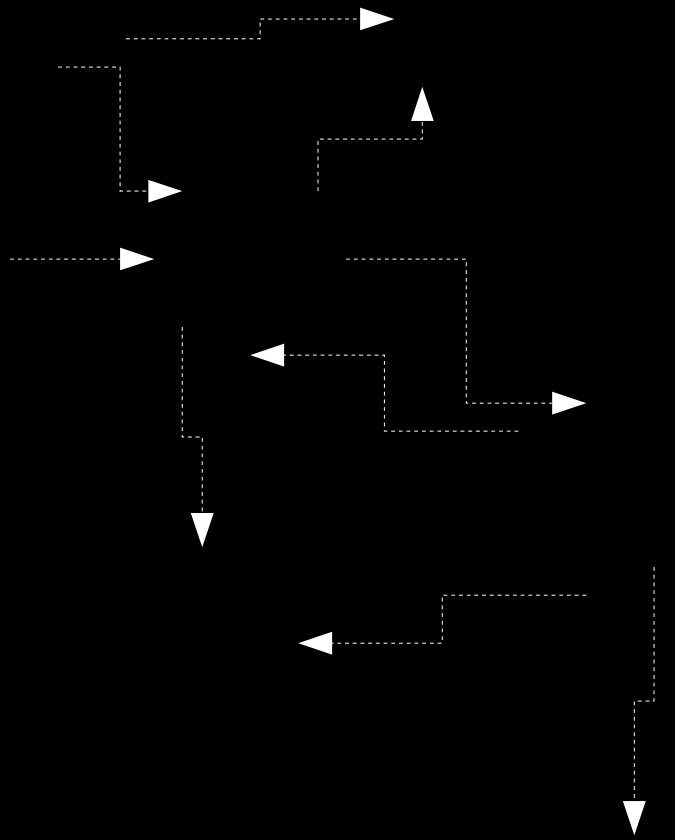

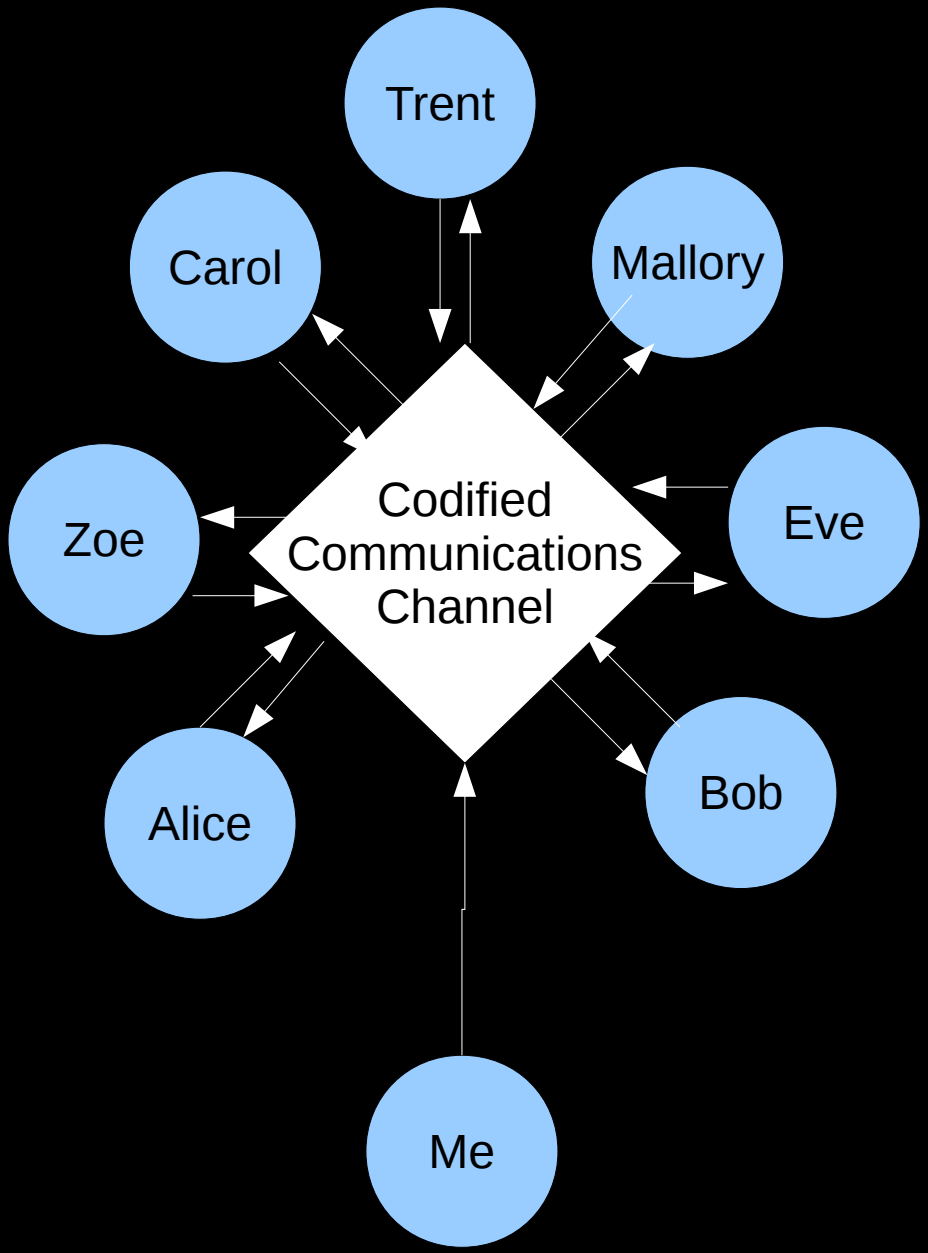
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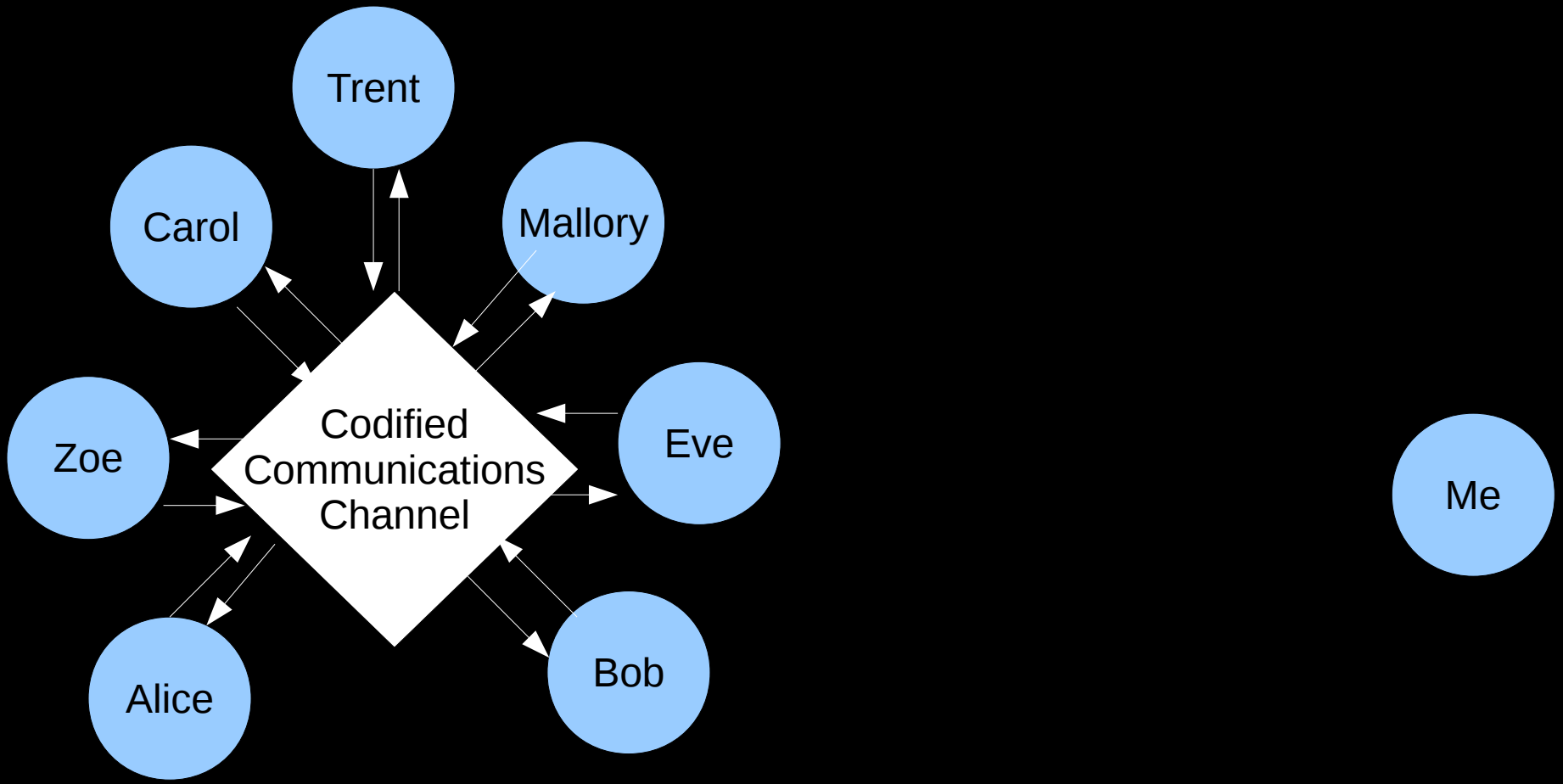
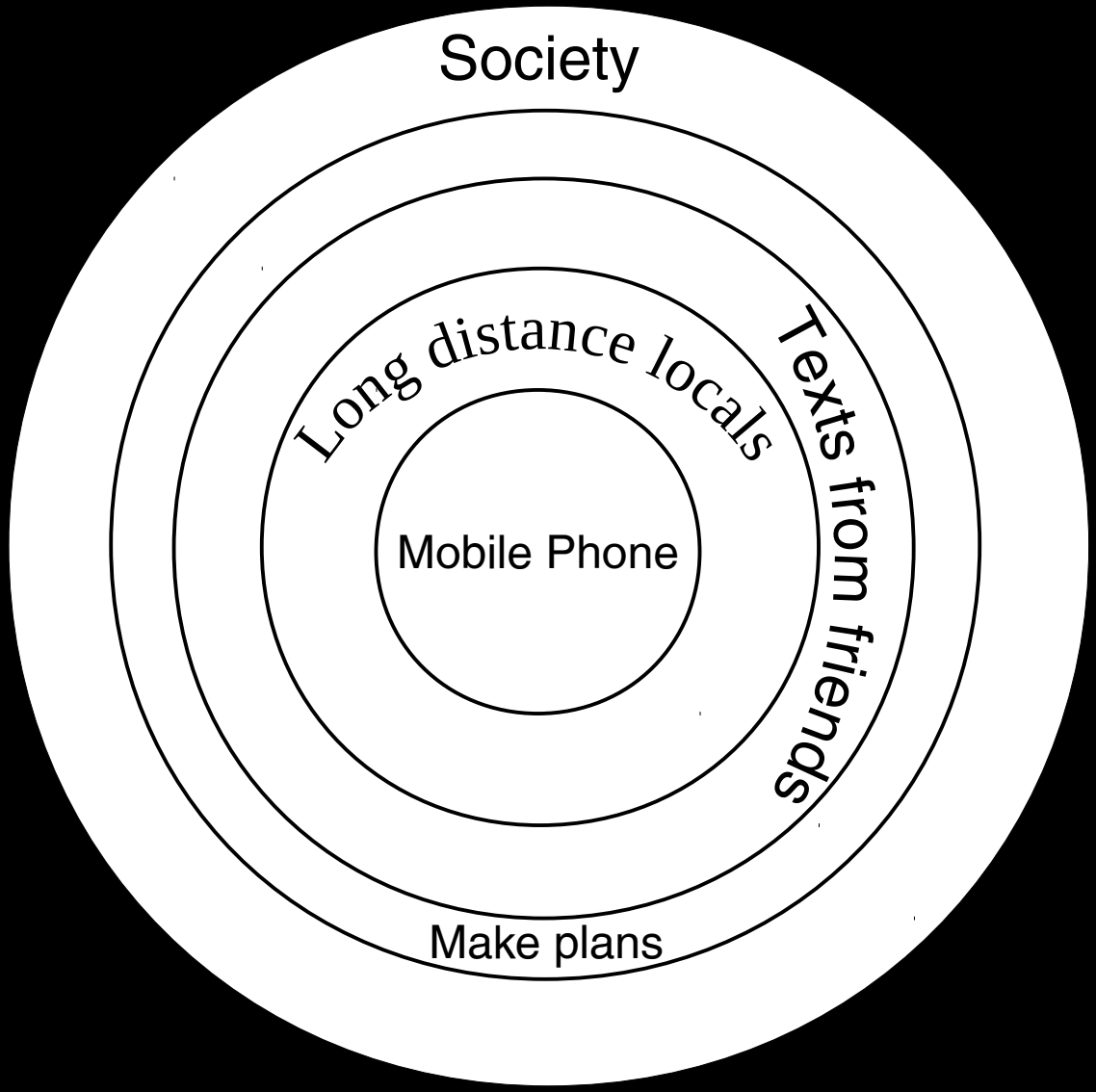
“No Network Effect”

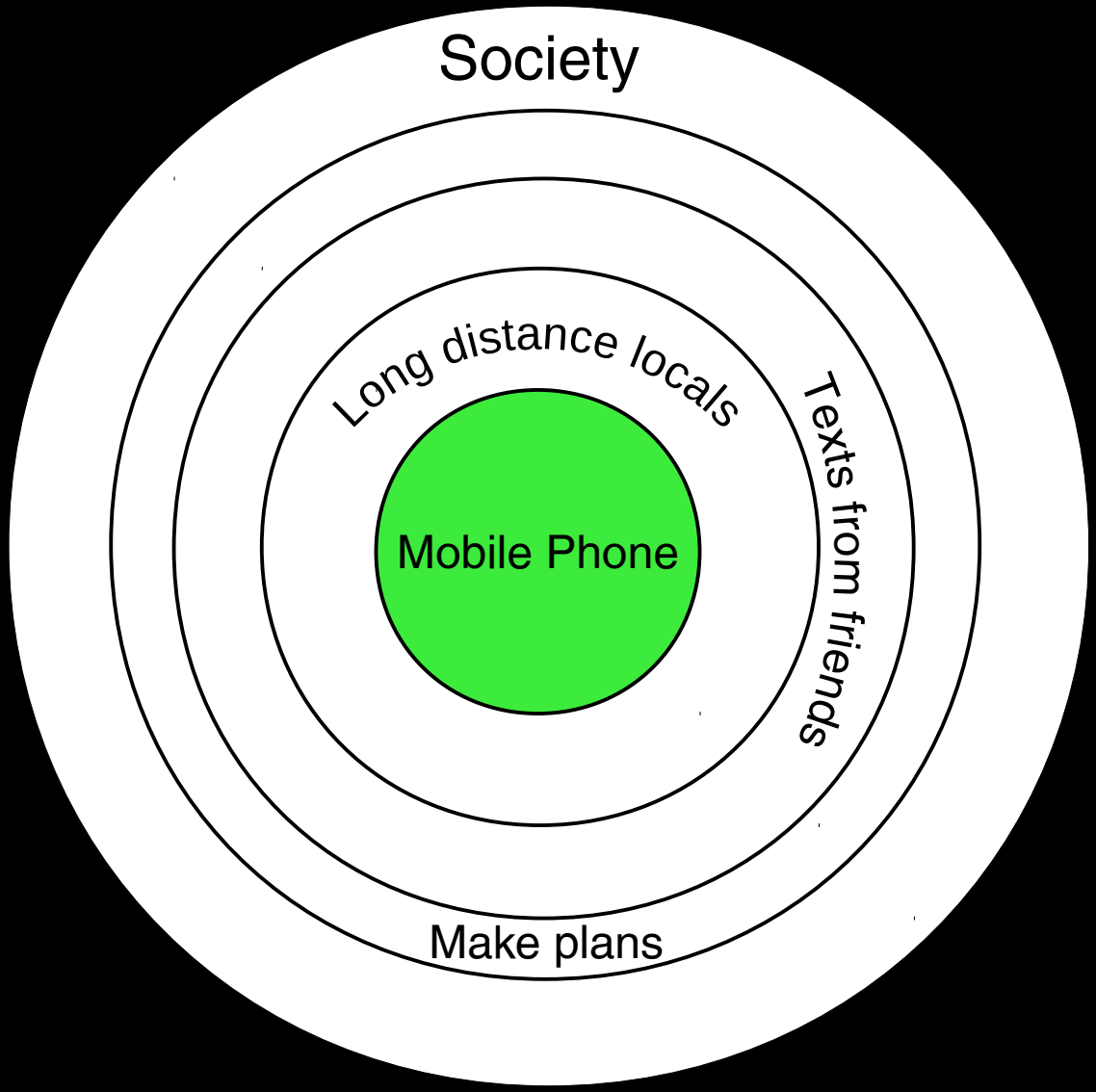


What *kind* of choice?

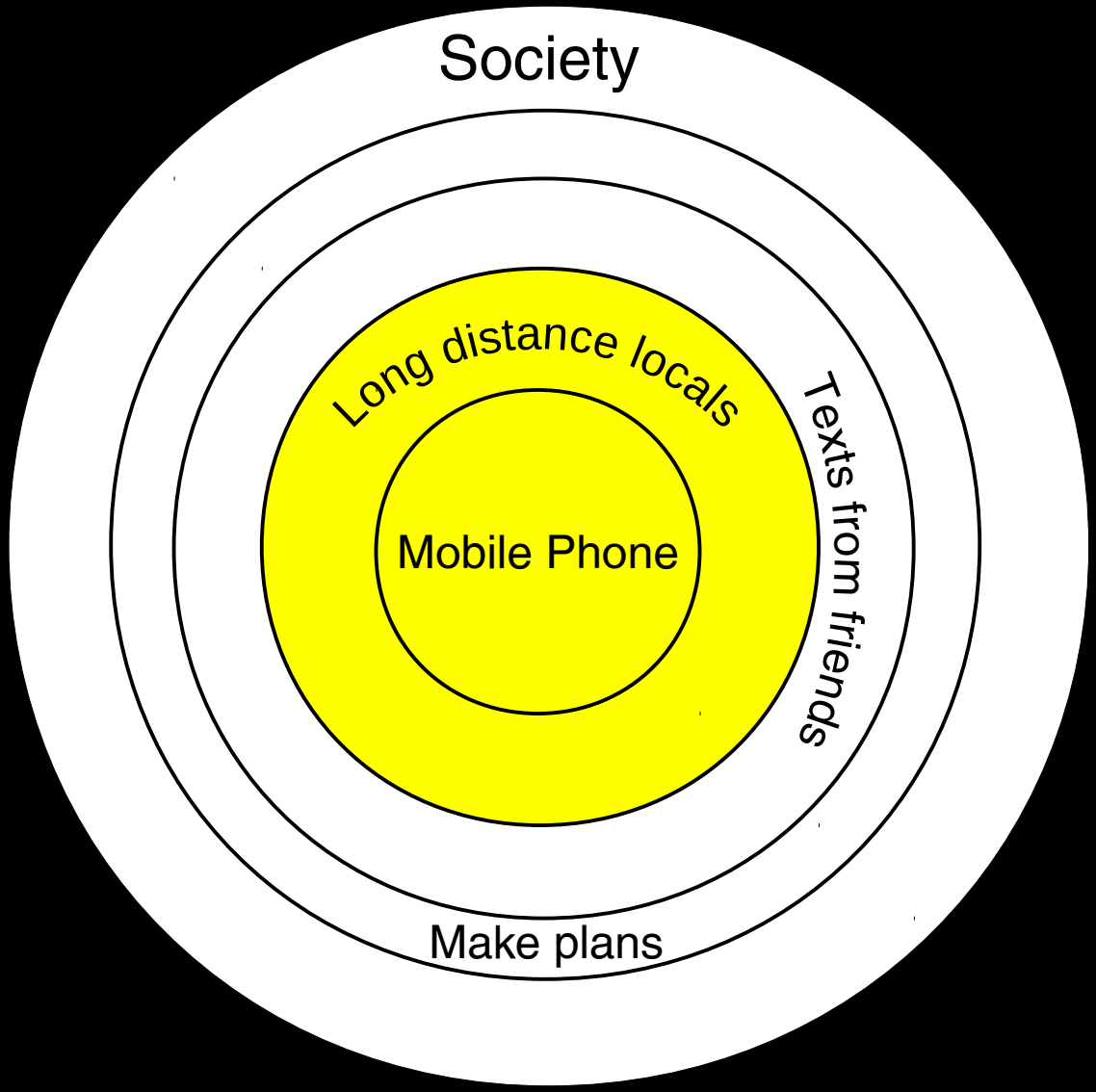
The push to expand choice scope



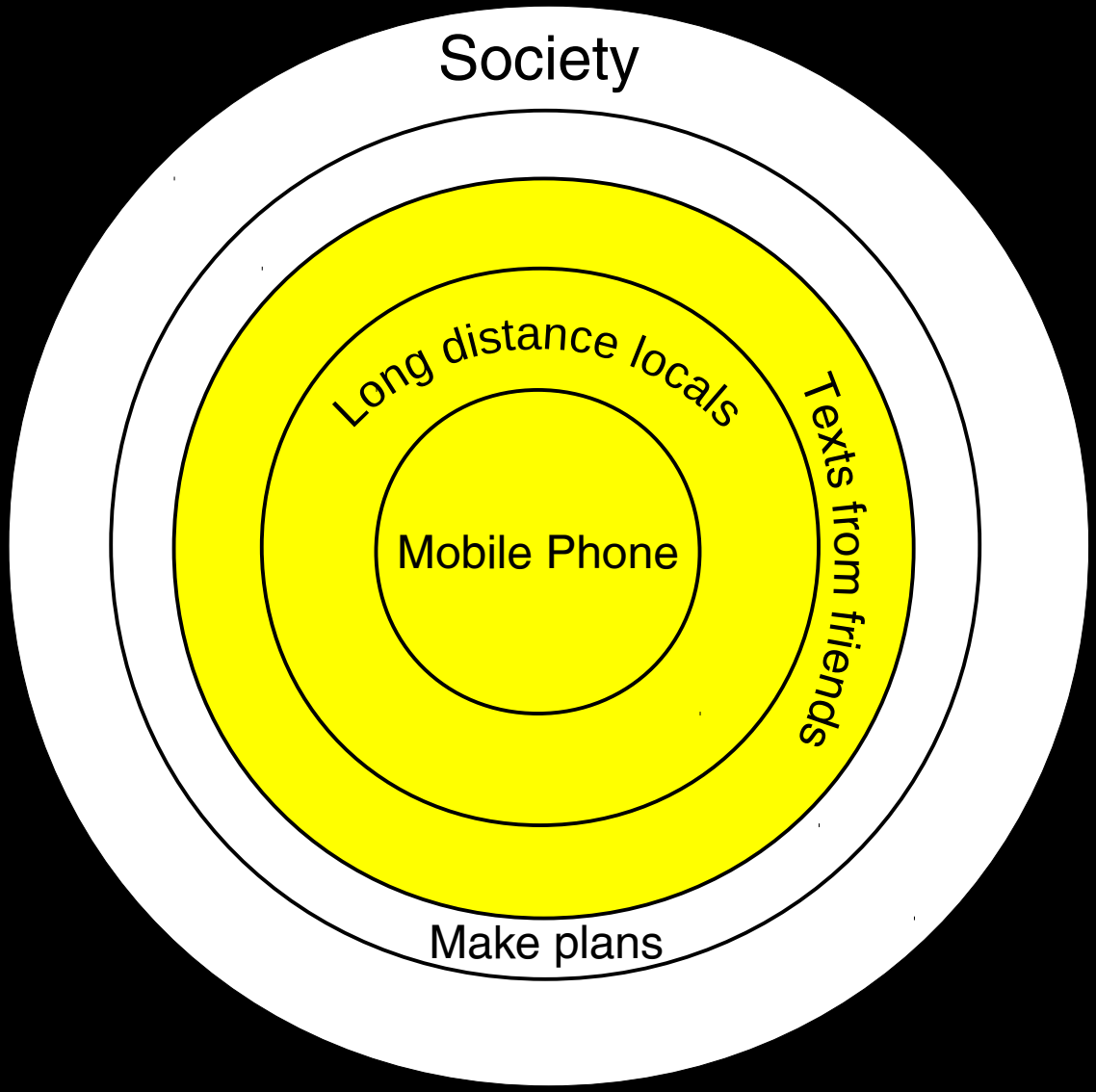
The push to expand choice scope



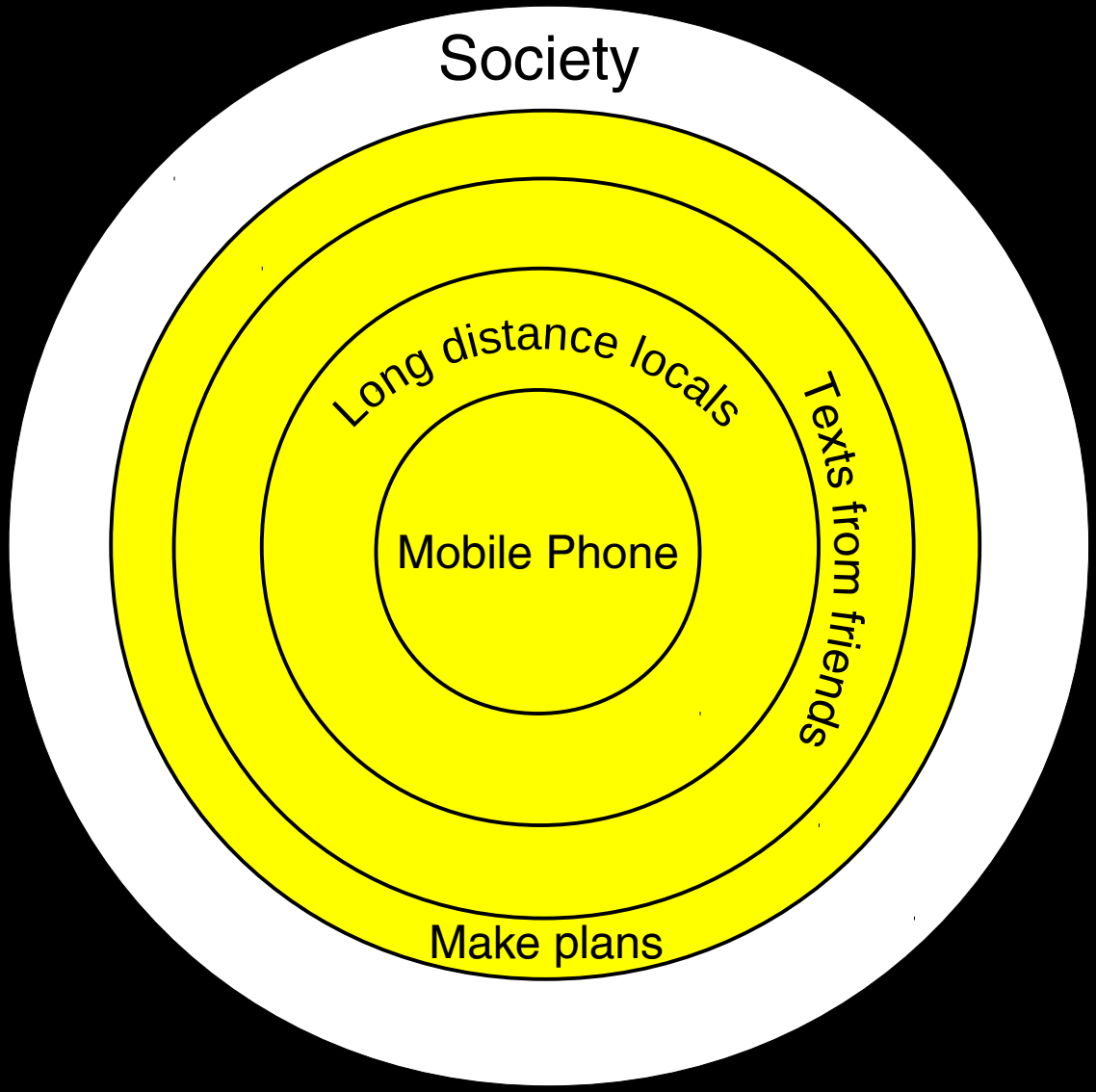
The push to expand choice scope



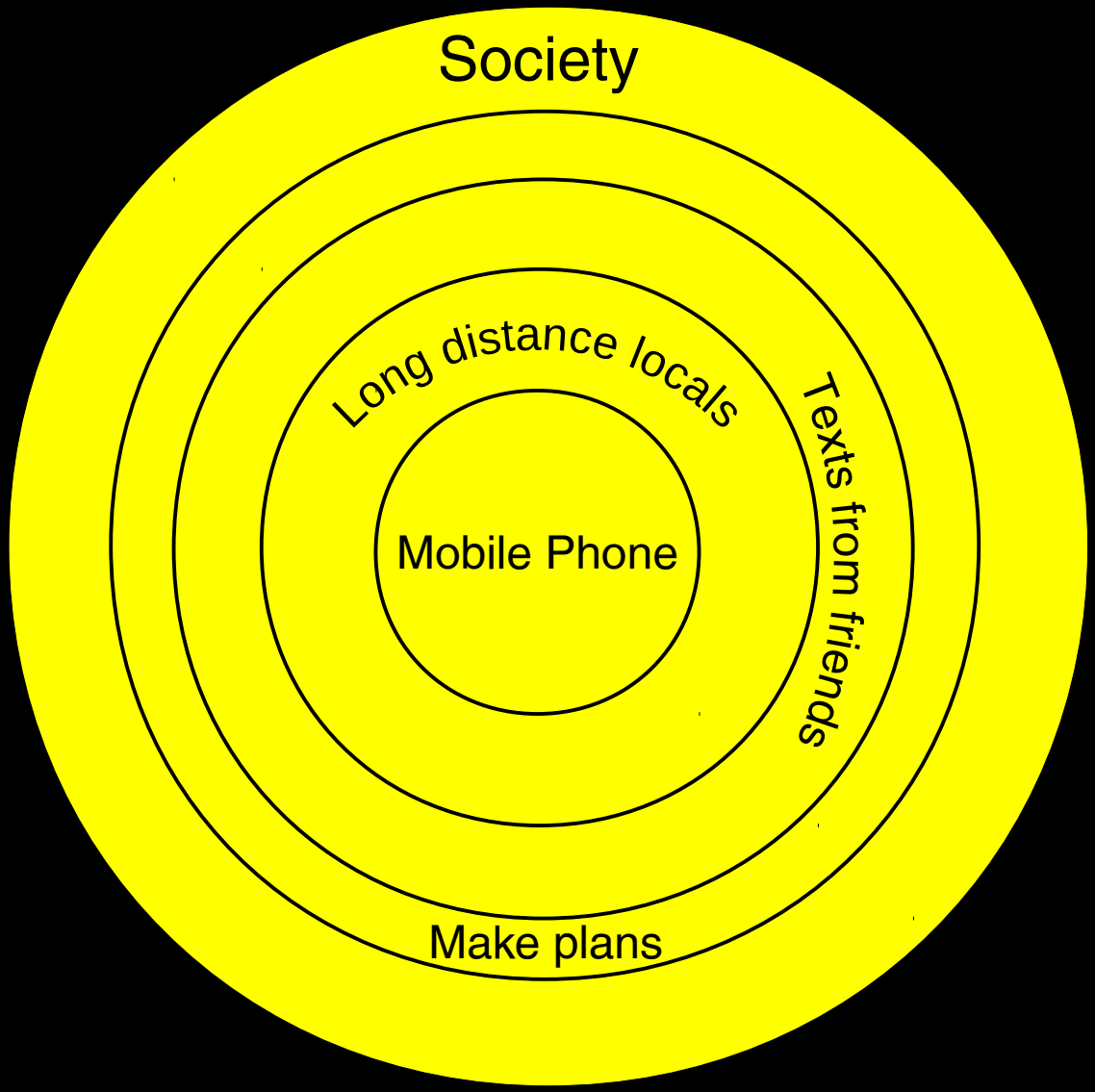
The push to expand choice scope



The push to expand choice scope



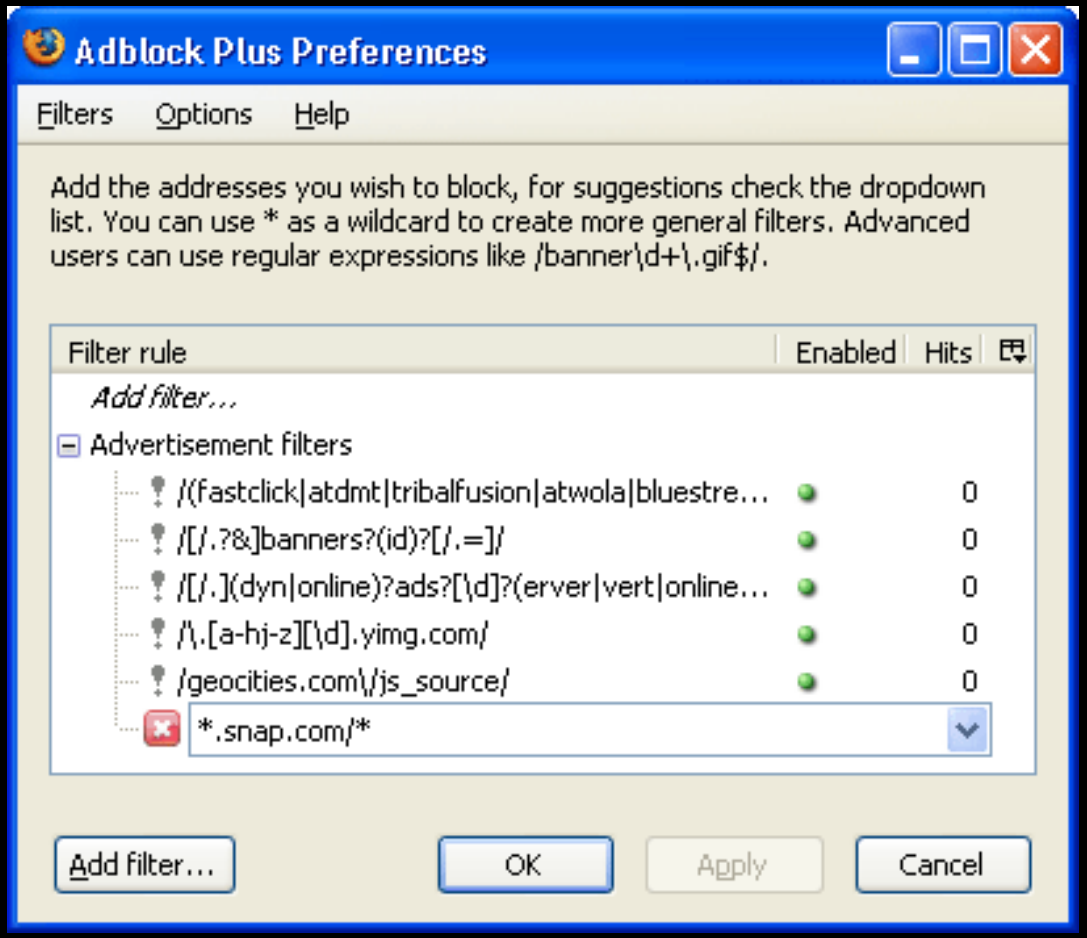
The push to expand choice scope



Small Chocies → Big Choices

EVERYWHERE

Another Example



Another Example

GOOGLE ANALYTICS == NOT EVIL?

Another Example

```
      <!-- BEGIN google analytics -->
  <script type="text/javascript">
    var gaJsHost = (("https:" == document.location.protocol) ?
"https://ssl." : "http://www.");
    document.write(unescape("%3Cscript src='" + gaJsHost +
"google-analytics.com/ga.js' type='text/javascript'%3E%3C
/script%3E"));
  </script>
  <script type="text/javascript">
    var pageTracker = _gat._getTracker("UA-30775-6");
    pageTracker._setDomainName("twitter.com");
          url = '/statuses/rebeccakelley/1207938518';
              pageTracker._setVar('Logged In');
        pageTracker._setVar('lang: en');
        pageTracker._trackPageview(url);
  </script>

  <!-- END google analytics -->
```

Expand the scope of the choice

SIGNIFICANT?

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Institute For Disruptive Studies


INFORMATION AWARENESS OFFICE
DARPA
SCIENTIA EST POTENTIA

Total Information Awareness

"...data must be made available in large-scale repositories with enhanced semantic content for easy analysis..."

-John Poindexter

A System For Easy Data Mining

- Store all:
  - Email
  - Web Traffic
  - Credit Card History
  - Medical Records
- Develop the technology to easily mine the massive amount of data you collect.

THE TOTALITARIAN FUTURE, THE CYPHERPUNK NIGHTMARE

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Institute For Disruptive Studies

People Freaked Out

People Freaked Out

People Freaked Out

People Freaked Out

People Freaked Out

Google™

A System For Easy Data Mining

- Store all:
  - Email
  - Web Traffic
  - Credit Card History
  - Medical Records

- Develop the technology to easily mine the massive amount of data you collect.
  - That's Google's jam!

Intent

Surveillance Business

Moxie Marlinspike
Institute For Disruptive Studies

Effect is the same

Who knows more about the citizens in their own country, Kim Jong-Il or Google?

Choice

The choice is expanding

SOCIETY

Trends Have Changed

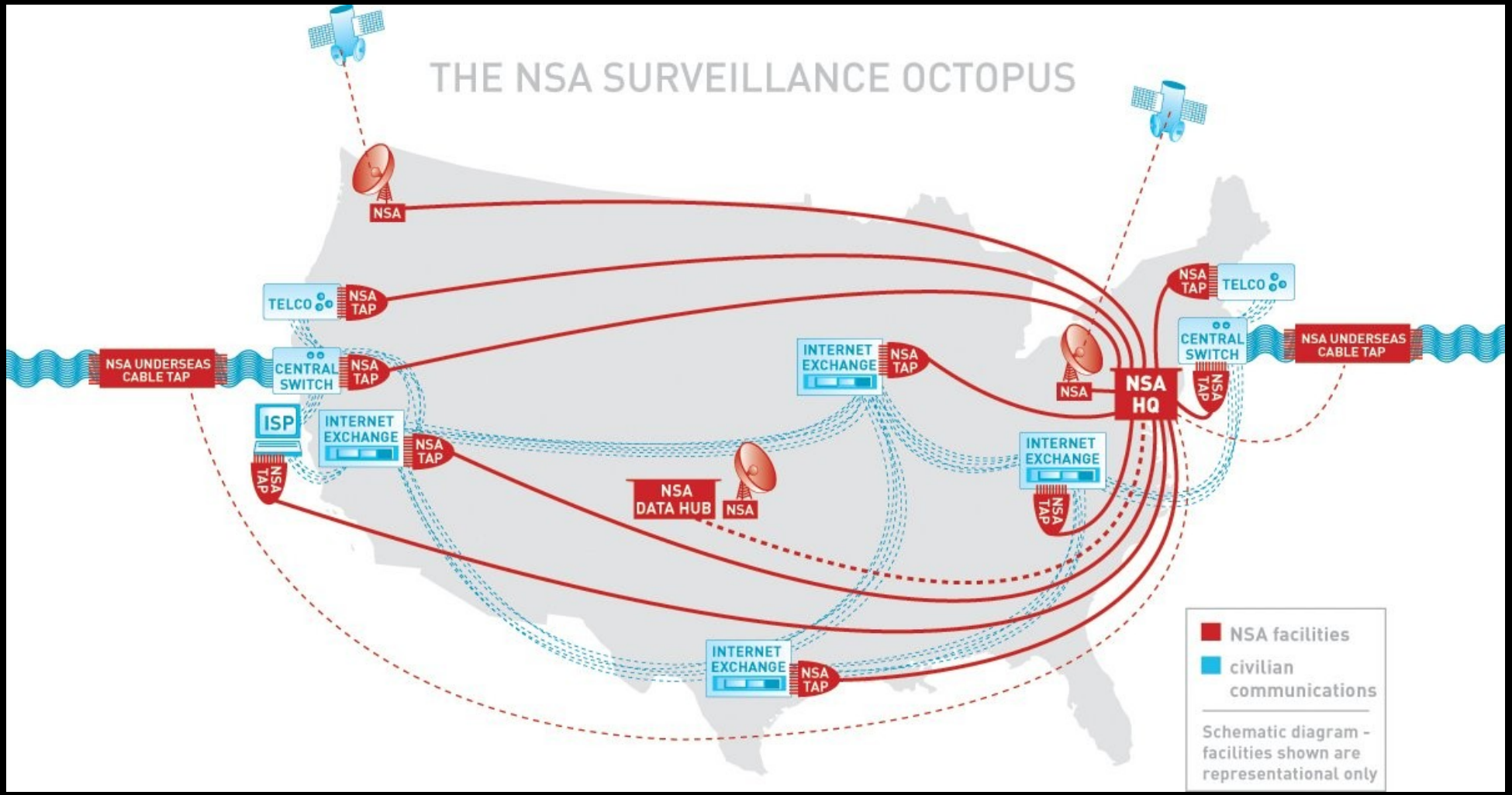
- Technology alters society.
- Information accumulates in distinct places as a result.
- Eavesdroppers move to those points of accumulation.

Past was direct

Past

Present is subtle

Present


THE NSA SURVEILLANCE OCTOPUS
NSA
TELCO
NSA TAP
NSA UNDERSEAS CABLE TAP
CENTRAL SWITCH
ISP
INTERNET EXCHANGE
NSA DATA HUB
NSA HQ
NSA facilities
civilian communications
Schematic diagram - facilities shown are representational only

Present

Past was direct

Present is subtle

Thoughts for the future

1. Deal with the choices that aren't choices.

Acknowledge

Choices → Expanding

Choices → Demands

Some Projects

What's up with Google?

- They have an awful lot of data.
  - They record everything. Your IP address, the cookie they issue, your search requests, the contents of every email you've sent or received, the news you read, the places you go, even your TCP headers. They're even collecting realtime GPS location and DNS lookups.
  - The know who your friends are, where you live, where you work, and where you spend your free time. They know about your health, your love life, and your political leanings.
  - They know not just what you're *doing*, but also a lot about what you're *thinking*.

Control the terms

- “We anonymize your data after nine months.”
  - “Anonymize” means drop the last octet of an IP address. And cookies are simply translated.
- “We take privacy so seriously that we put it under your control.”
  - Only shows you some of the information that they are most obviously capable of connecting to you.
  - Requires that you have an account, be logged in while using services, and maintain a consistent cookie in order to participate.

“If there's something you don't want anyone to know, maybe you shouldn't be doing it in the first place.”

– Eric Schmidt, Google CEO

“AURORA” WAS ABOUT INTERCEPT

GoogleSharing

Moxie Marlinspike
Institute For Disruptive Studies

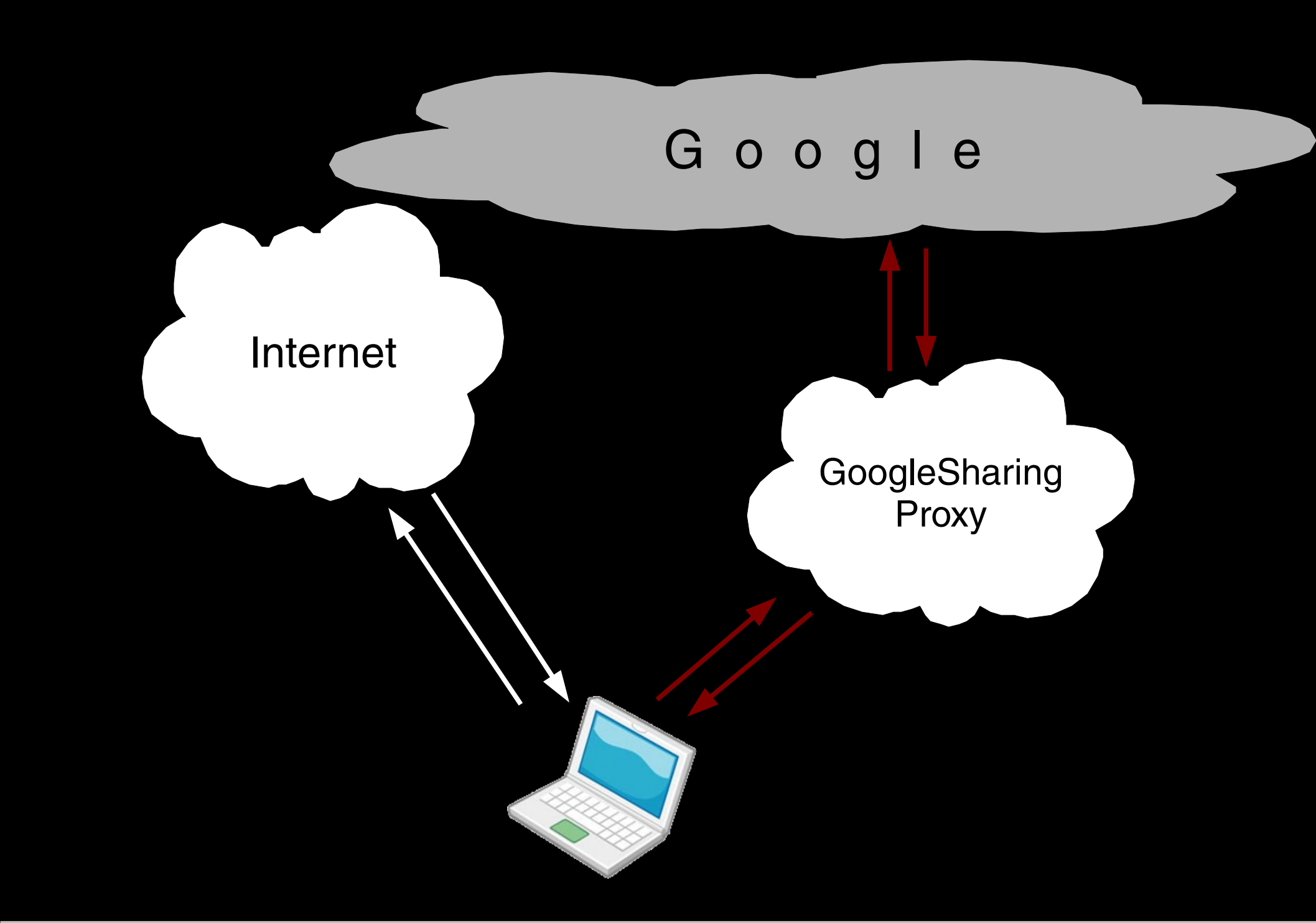
Premise

- The scope of the “Google choice” has become quite large.
- We need some innovation that allows us to reject this type of false choice while still maintaining anonymity.
- We need anonymous access to Google services that is fast and reliable.

GoogleSharing

+

+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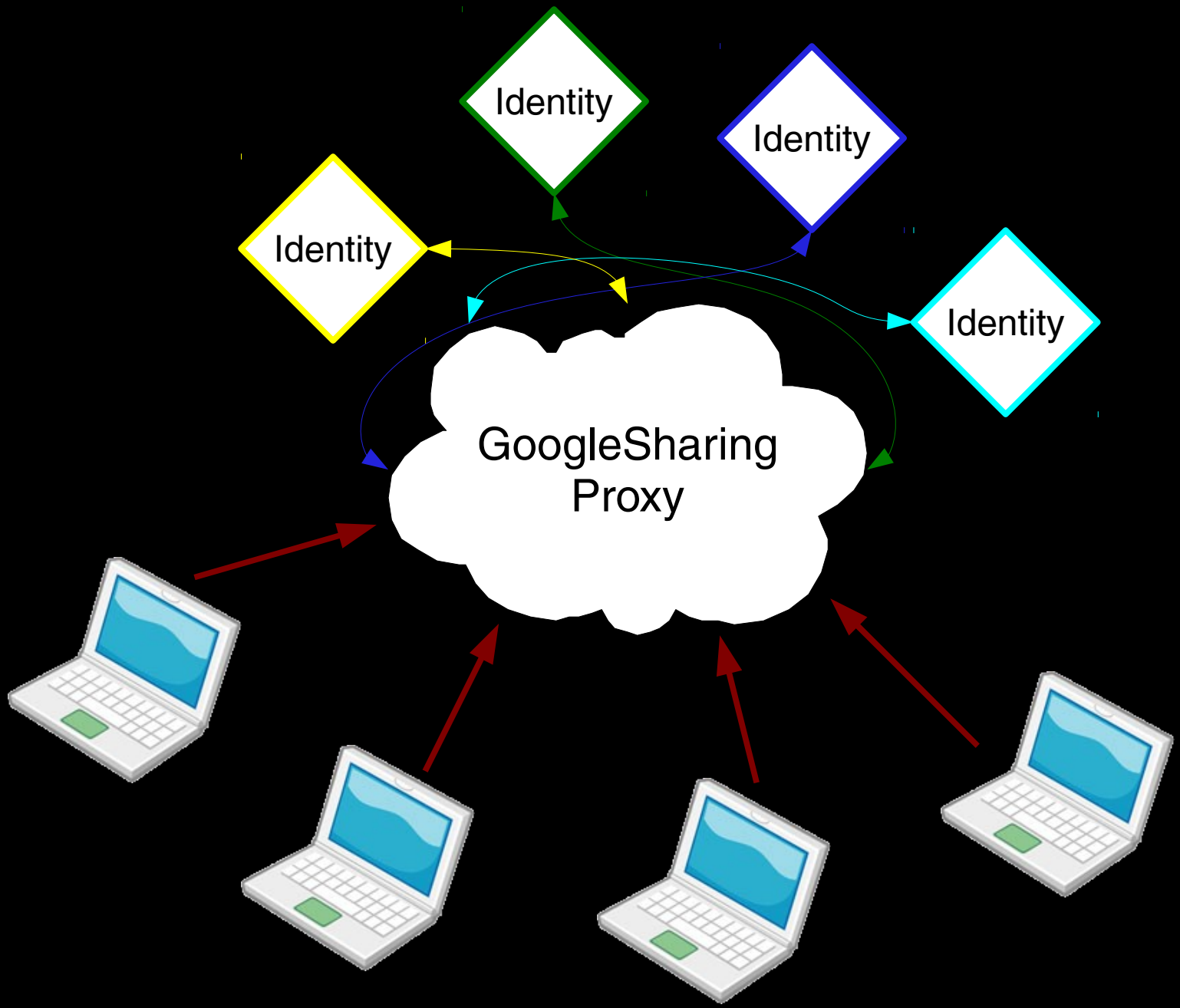
GoogleSharing
Proxy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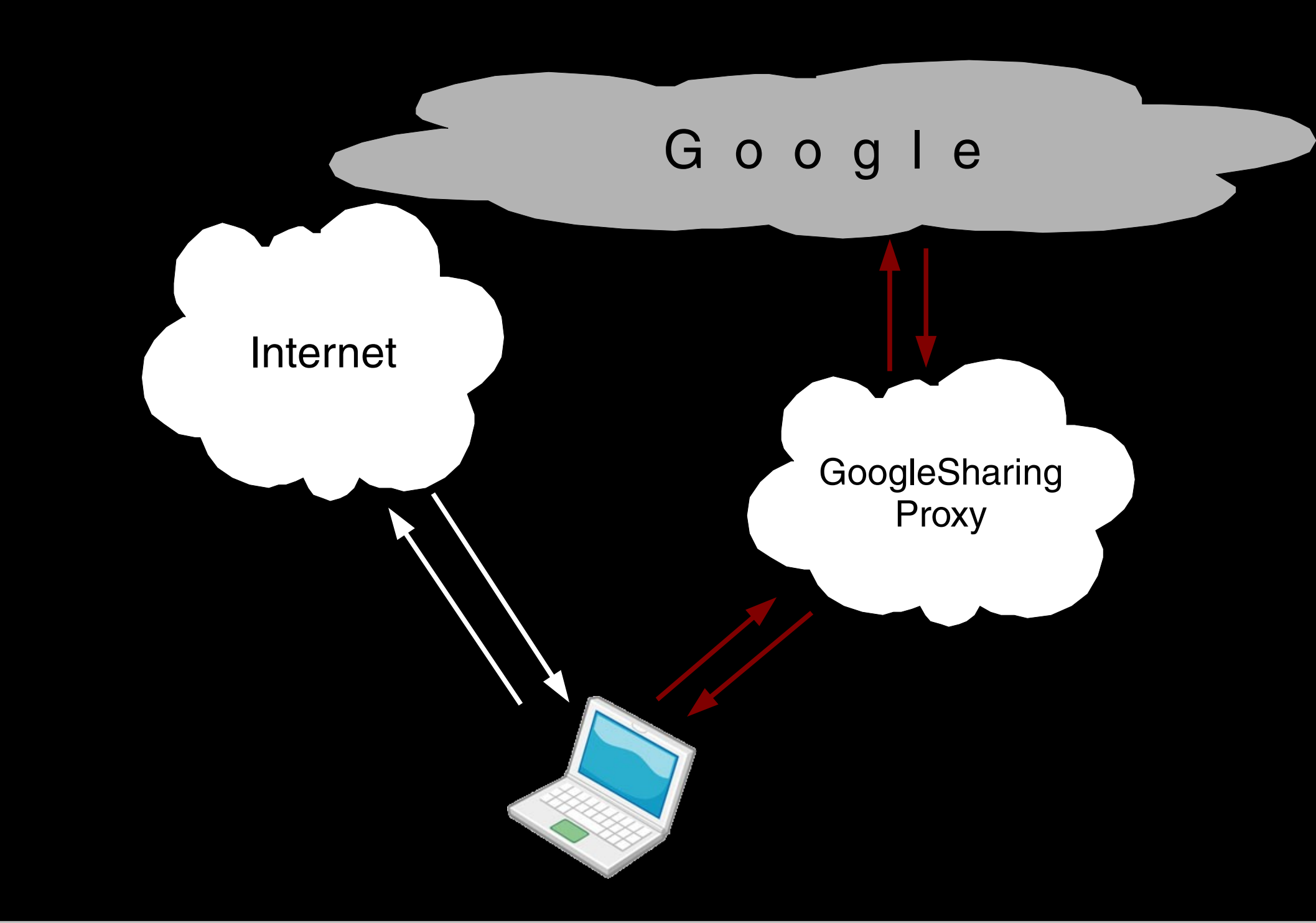
GoogleSharing
Proxy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GoogleSharing
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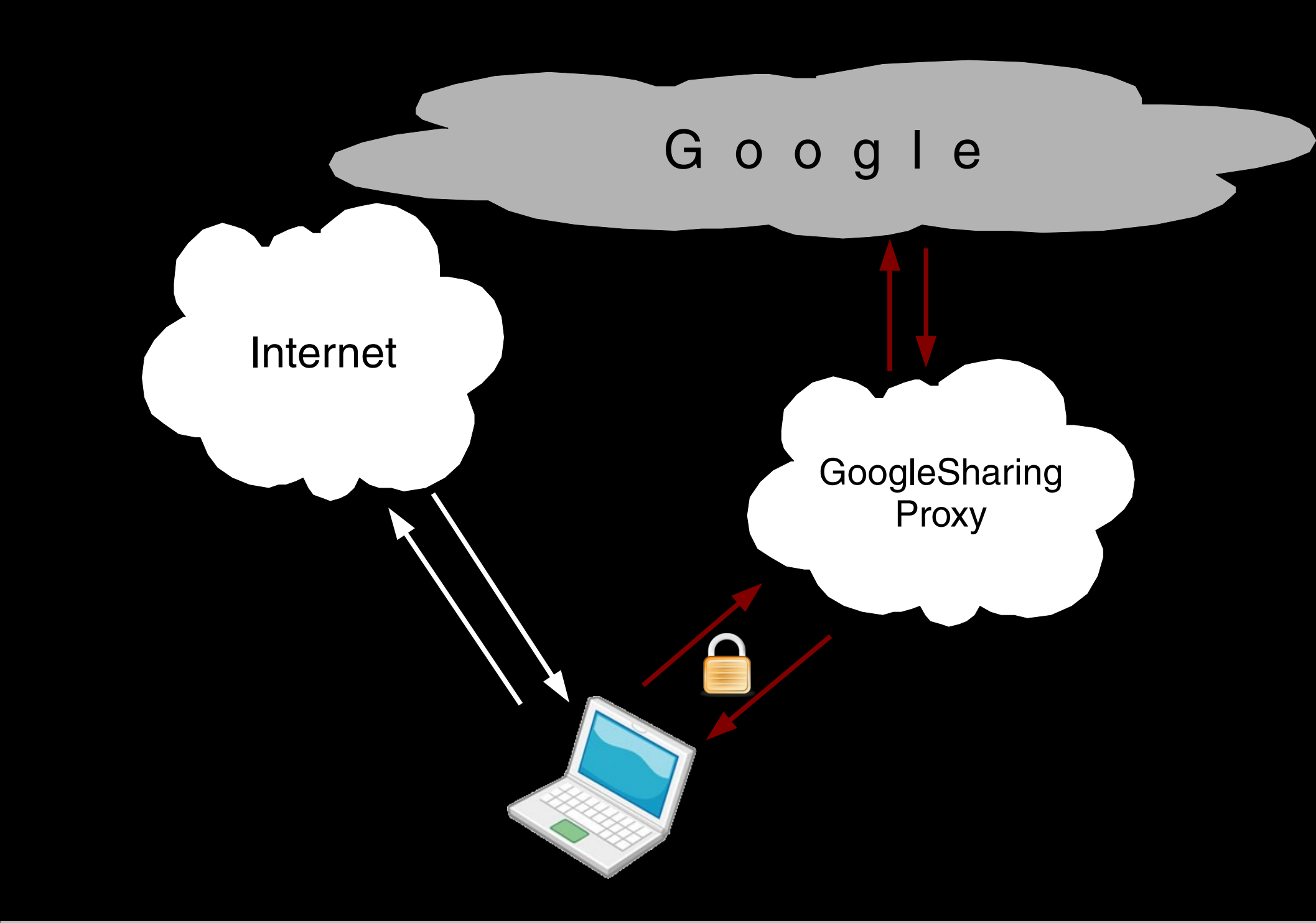
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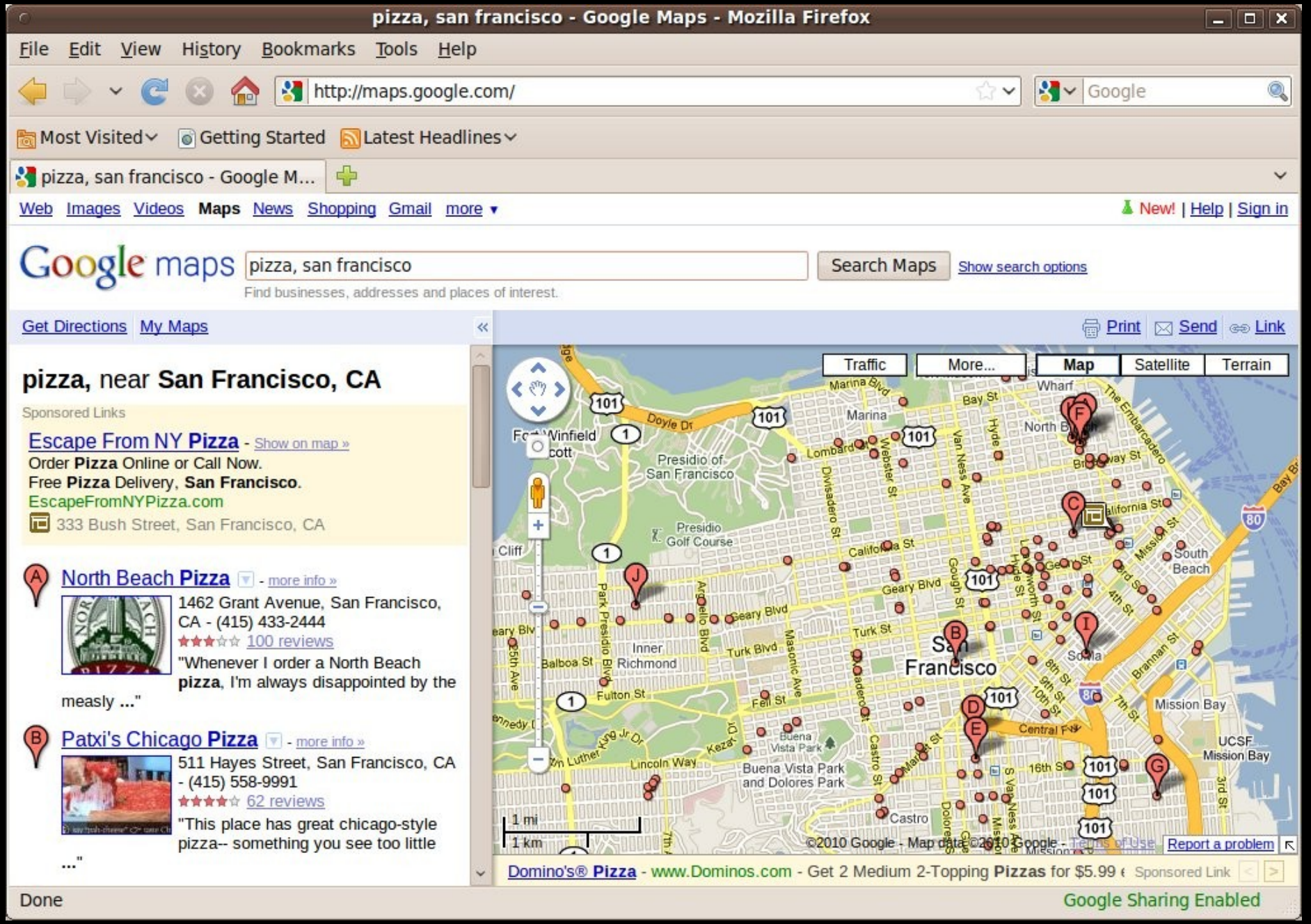
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Find businesses, addresses and places of interest.
Get Directions
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Sponsored Links
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Order Pizza Online or Call Now.
Free Pizza Delivery, San Francisco.
EscapeFromNYPizza.com
333 Bush Street, San Francisco, CA
A
North Beach Pizza - more info »
1462 Grant Avenue, San Francisco, CA - (415) 433-2444
100 reviews
"Whenever I order a North Beach pizza, I'm always disappointed by the measly ..."
B
Patxi's Chicago Pizza - more info »
511 Hayes Street, San Francisco, CA - (415) 558-9991
62 reviews
"This place has great chicago-style pizza-- something you see too little ..."
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More...
Map
Satellite
Terrain
San Francisco
Marina
Presidio of San Francisco
Presidio Golf Course
Inner Richmond
Buena Vista Park and Dolores Park
South Beach
Mission Bay
UCSF Mission Bay
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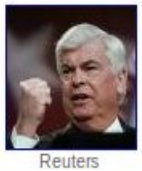

Reuters

Fed gets new oversight powers under Dodd bill: sources

Reuters - Jim Young - **15 minutes ago**

Senator Christopher Dodd (D-CT) addresses the AFL-CIO Building and Construction Trades Presidential Candidates Forum in Washingtonn,in this March 28, 2007 file photo.

Dodd's Financial Overhaul Plan Said to Transform Fed Powers BusinessWeek
Dodd seeking middle ground on new financial rules The Associated Press
New York Times - Politico - Financial Times - WBUR
all 144 news articles » Email this story


Times Online

Wen Rebuffing Yuan Calls Risks Retaliation From US Congress

BusinessWeek - **4 hours ago**

March 15 (Bloomberg) -- Chinese Premier Wen Jiabao rebuffed calls for the yuan to appreciate, risking a further downturn in relations with the US where lawmakers and economists say his stance is hampering a global recovery.

Chinese premier slams US 'protectionism,' says yuan is not too low Los Angeles Times
Wen links inflation to Communist party future Financial Times
Wall Street Journal - Economic Times - Washington Post
all 2,185 news articles » GOOG Email this story


ABC News

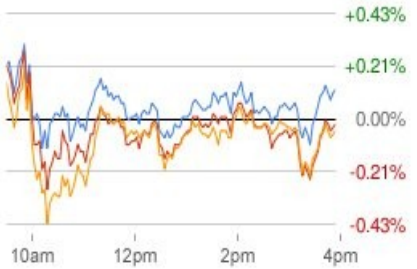
Toyota, US Can't Replicate Prius Acceleration (Correct)

BusinessWeek - Angela Greiling Keane - **58 minutes ago**

March 15 (Bloomberg) -- Tests by Toyota Motor Corp. and US regulators on a Prius hybrid whose driver said it accelerated out of control couldn't replicate his account, according to a report prepared for US lawmakers.

Investigation questions Prius driver's story: report Reuters

Finance Powered by Google Finance



Dow	10,624.69	+12.85	(0.12%)
S&P 500	1,149.99	-0.25	(-0.02%)
Nasdaq	2,367.66	-0.80	(-0.03%)

Quotes

Get quotes
Example: "CSCO" or "Google"

In the news

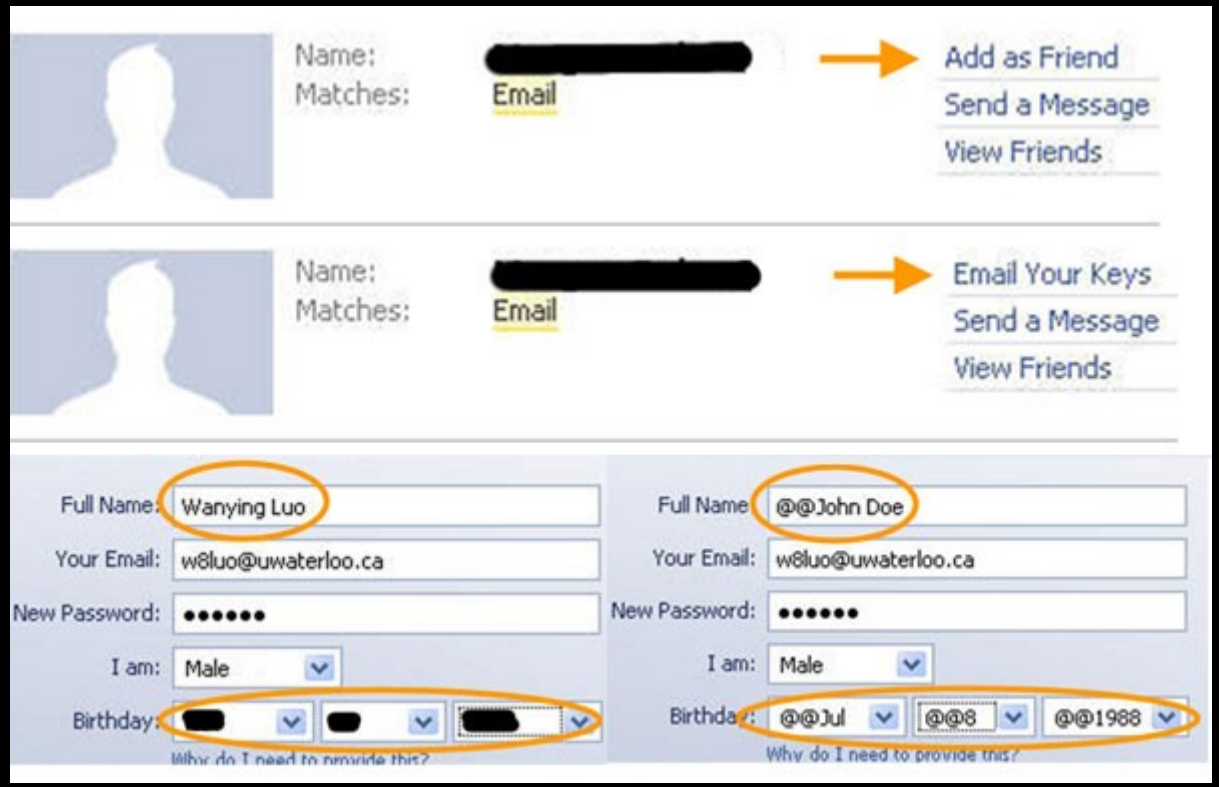
GOOG	579.54	-1.60	(-0.28%)
TM	76.99	+0.05	(0.06%)
TOM	28.19	-0.10	(-0.37%)

Done Google Sharing Enabled

FACECLOAK

Moxie Marlinspike
Institute For Disruptive Studies

Prof. Urs Hengartner


Name:
Matches:
Email
Add as Friend
Send a Message
View Friends
Name:
Matches:
Email
Email Your Keys
Send a Message
View Friends
Full Name:
Wanying Luo
Your Email:
w8luo@uwaterloo.ca
New Password:
I am:
Male
Birthday:
Why do I need to provide this?
Full Name
@@John Doe
Your Email:
w8luo@uwaterloo.ca
New Password:
I am:
Male
Birthday:
@@Jul
@@8
@@1988
Why do I need to provide this?

TWITTER

BROADCAST || CONVERSATION

Second thesis

CRYPTO WAR → DATA FREEDOM

Moxie Marlinspike
Institute For Disruptive Studies

Future of data control

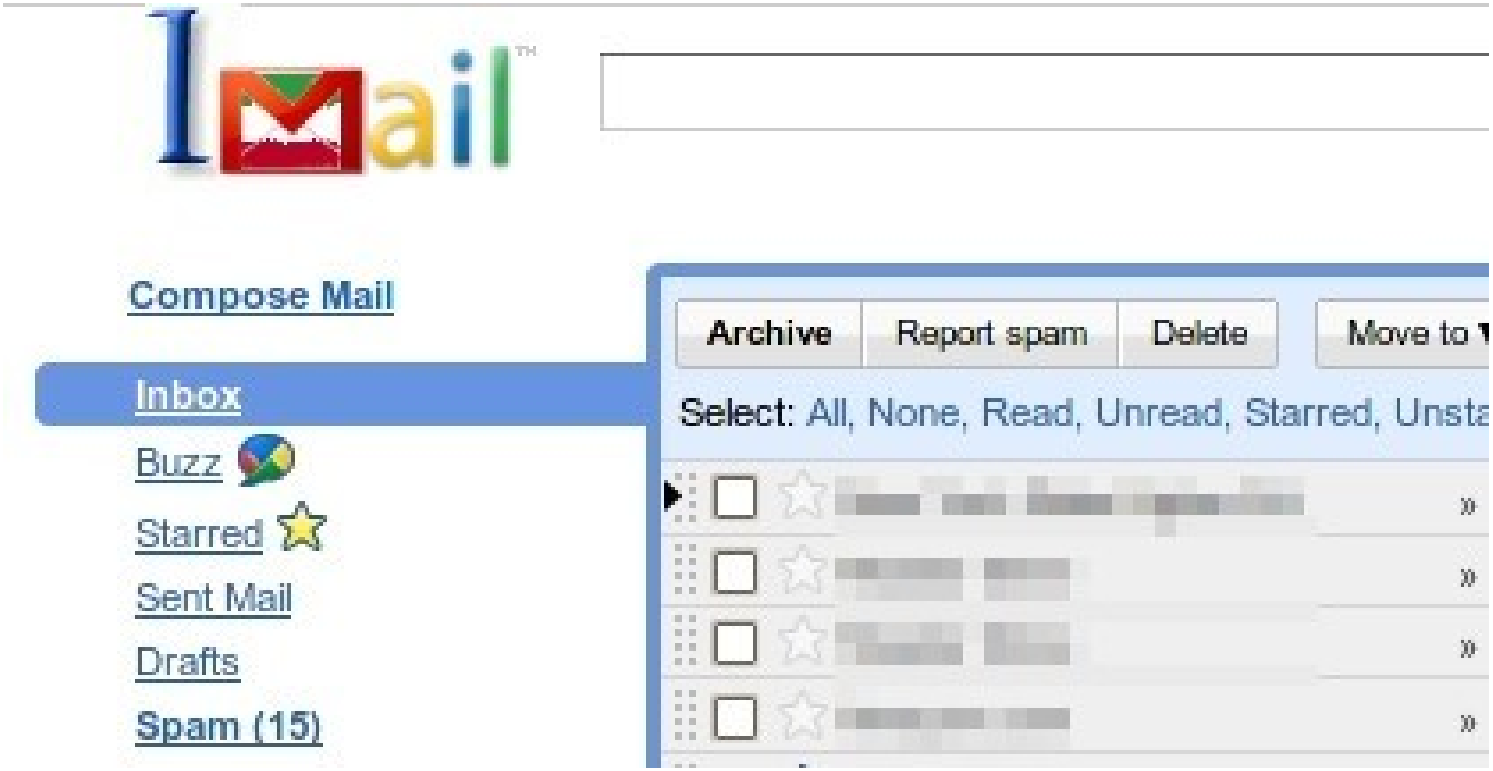
Projects born out of reality

DARKNETS, DATA HAVENS, HIDDEN SERVICES

Not the future we got

Privacy advocates love "the other."

“Iran launches national email service”



LOSS ON CRYPTO

GIVING UP → CHANGING STRATEGIES

Key escrow → Key disclosure

Regulation of Investigatory Powers Act (RIPA)

KEY DISCLOSURE

NO FORWARD SECURITY

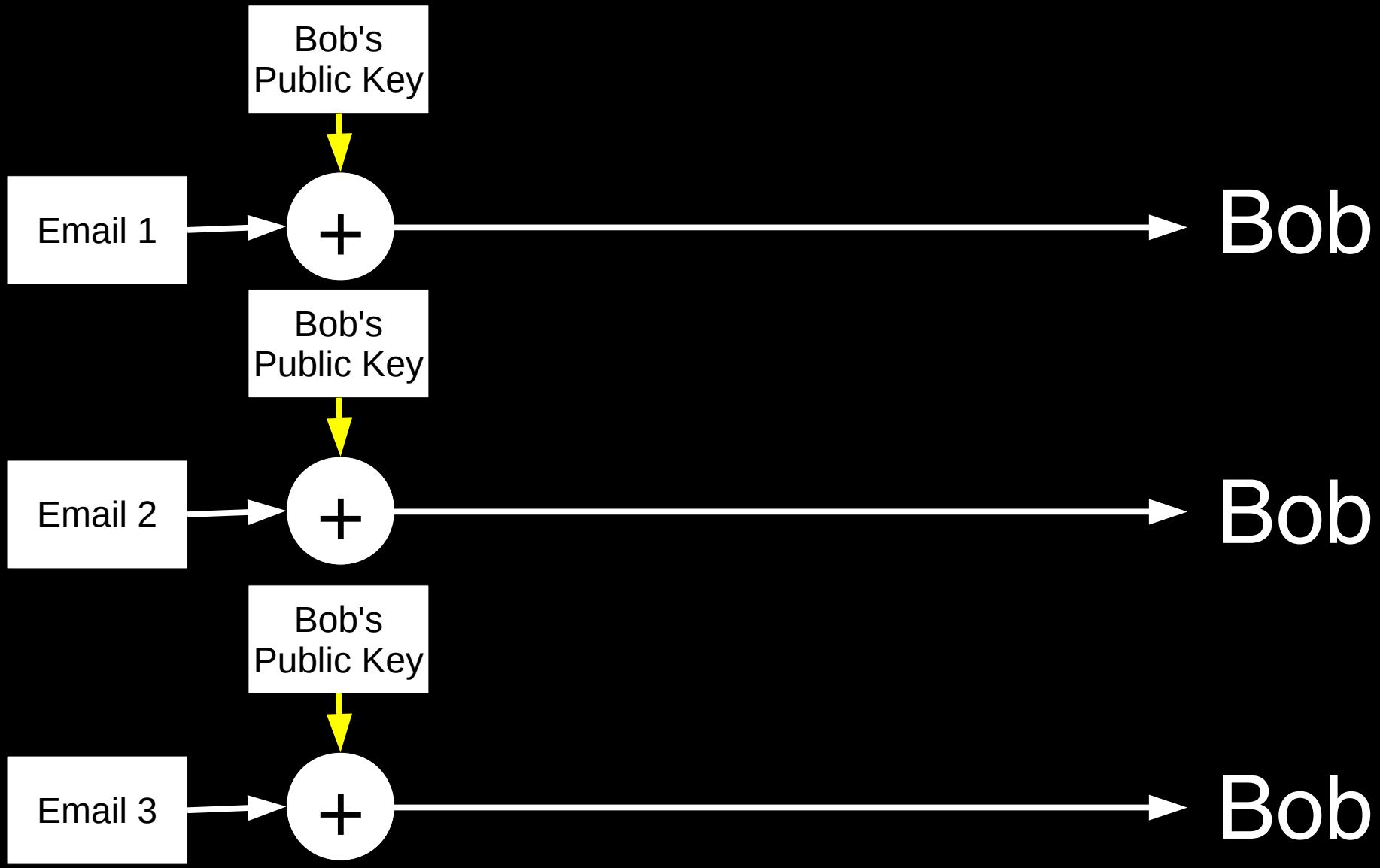
Tasks For The Future

1. Deal with the choices that aren't choices.
2. Worry a little less about information freedom.
3. Worry a lot more about forward security.

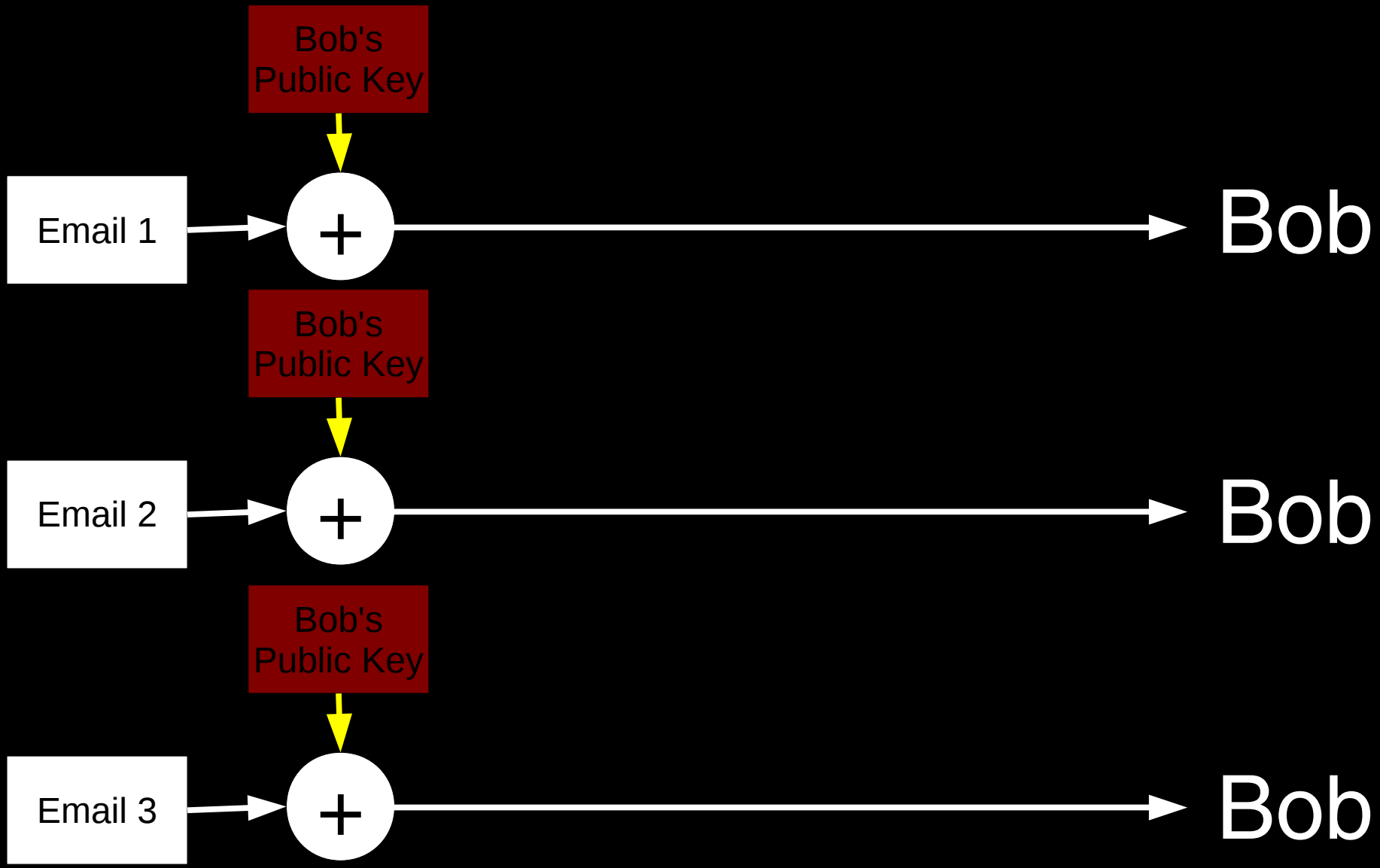
"Off-the-record communication, or, why not to use PGP"

- Nikita Borisov, Ian Goldberg, Eric Brewer

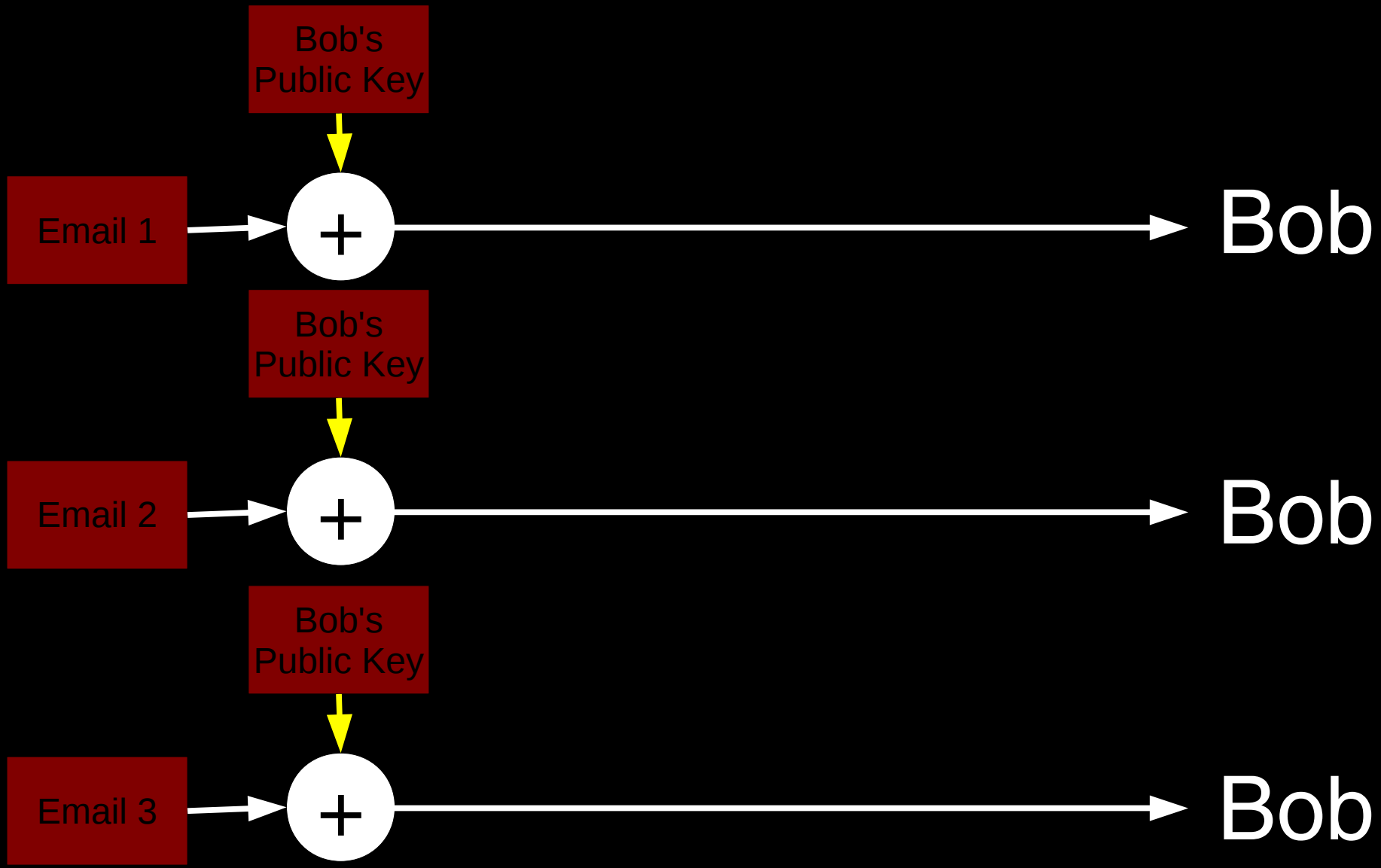
PGP Model


Bob's Public Key
Email 1
+
Bob
Bob's Public Key
Email 2
+
Bob
Bob's Public Key
Email 3
+
Bob

PGP Model


Bob's Public Key
Email 1
+
Bob
Bob's Public Key
Email 2
+
Bob
Bob's Public Key
Email 3
+
Bob

PGP Model


Bob's Public Key
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+
Bob
Bob's Public Key
Email 2
+
Bob
Bob's Public Key
Email 3
+
Bob

PGP Model

- One key compromise affects all previous correspondence.

PGP Model

- One key compromise affects all previous correspondence.
- The secrecy of what *I* write is function of *your* security practices.

PGP Model

- One key compromise affects all previous correspondence.
- The secrecy of what *I* write is function of *your* security practices.
- There is authenticity, but no deniability.

PGP Model

-----BEGIN PGP SIGNED MESSAGE-----

Hash: SHA1

Hey Bob, today I was thinking that Eve is a real jerk.

-----BEGIN PGP SIGNATURE-----

iEYEARECAAYFAkumY0MACgkQ2yS3tG03iIJhAACgiufmacfyU
M/9PYcVS2Mdb9tdmhYAoO4P0pZug2D7BuFEPkLovKpipore=8
rKh

-----END PGP SIGNATURE-----

UNDENIABLE

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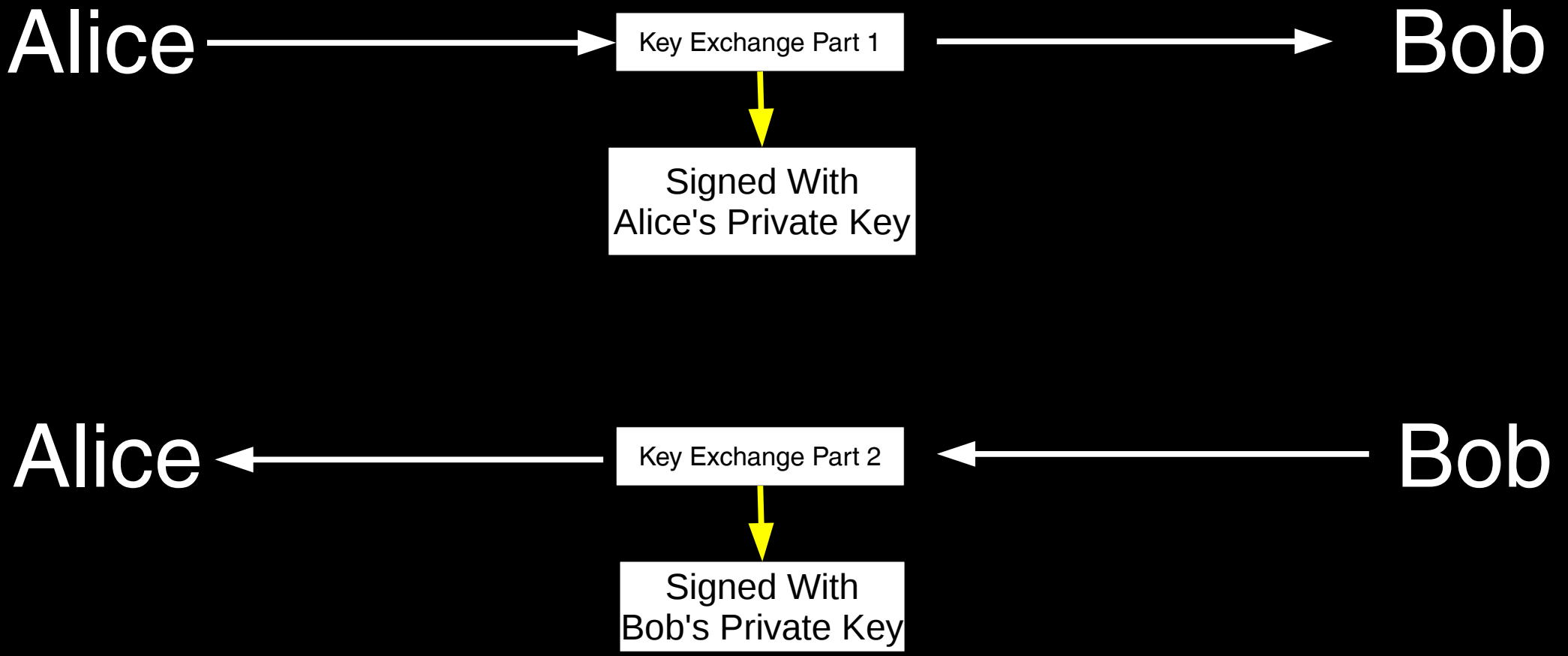
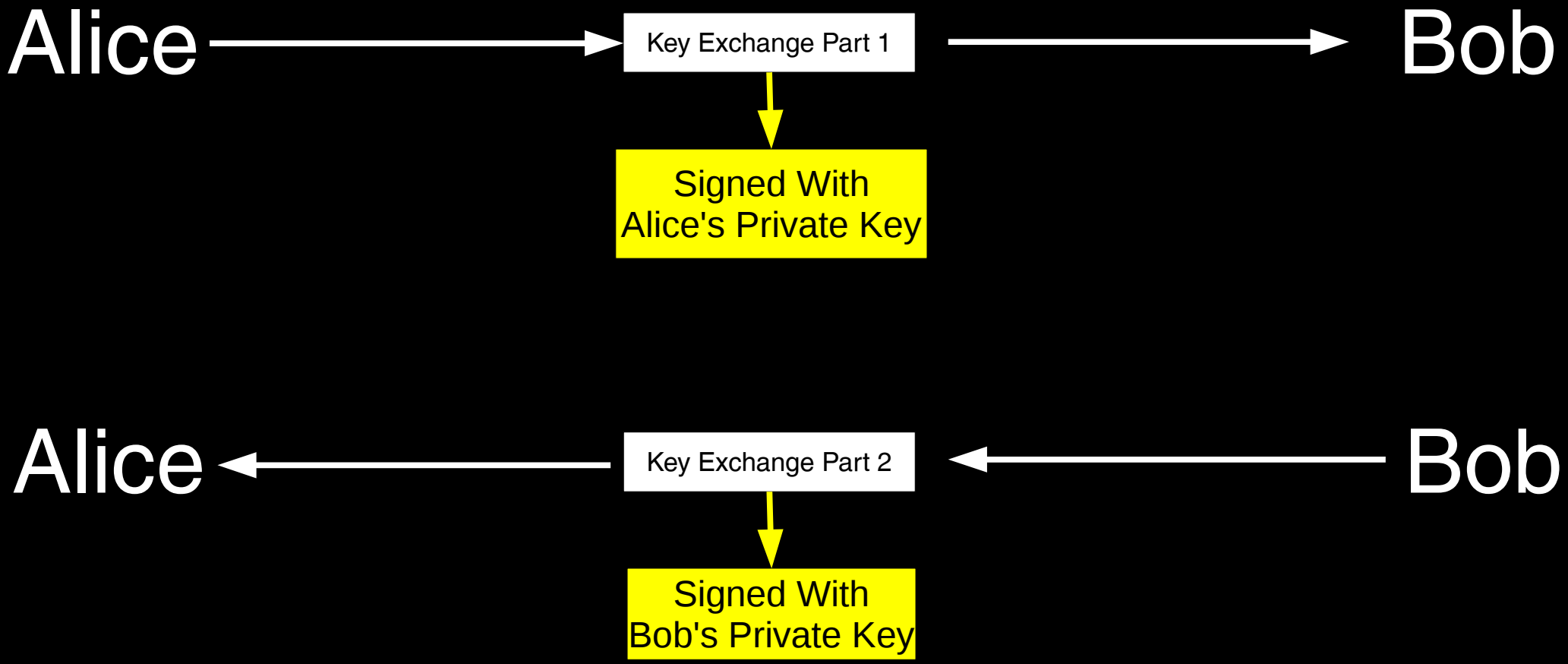
OTR Model


Alice
Key Exchange Part 1
Bob
Signed With
Alice's Private Key
Alice
Key Exchange Part 2
Bob
Signed With
Bob's Private Key

OTR Model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Key Exchange Part 1
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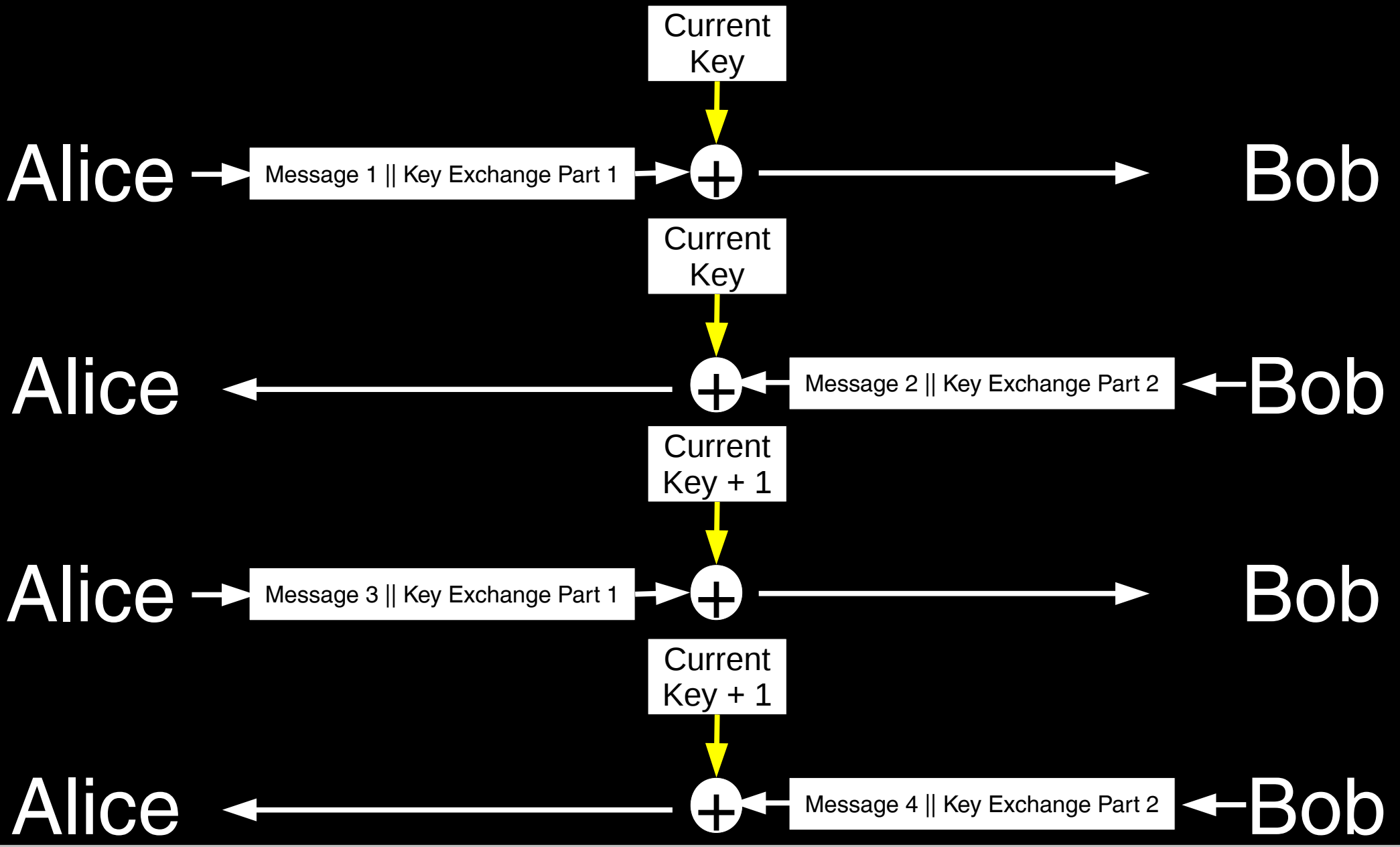
OTR Model



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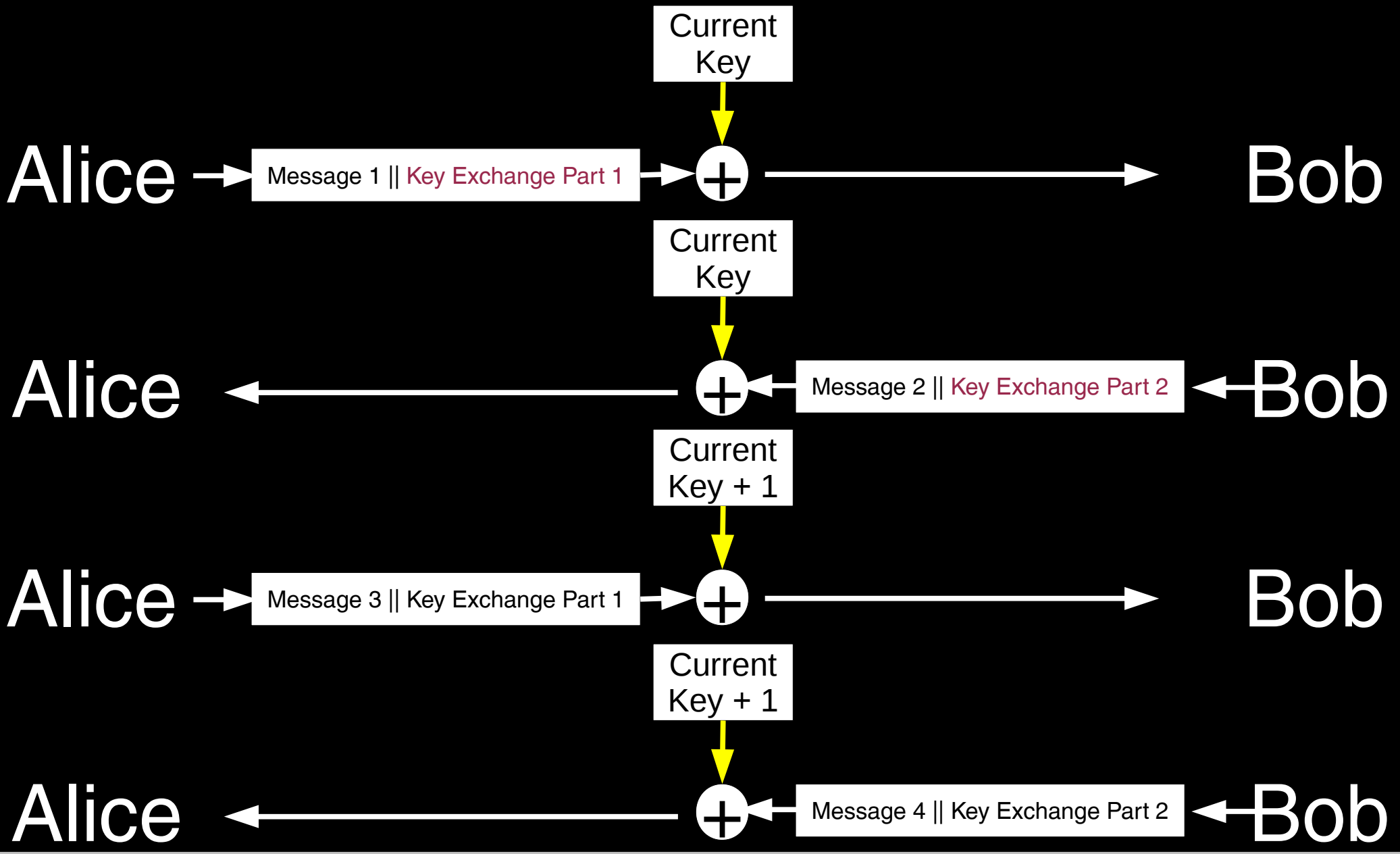
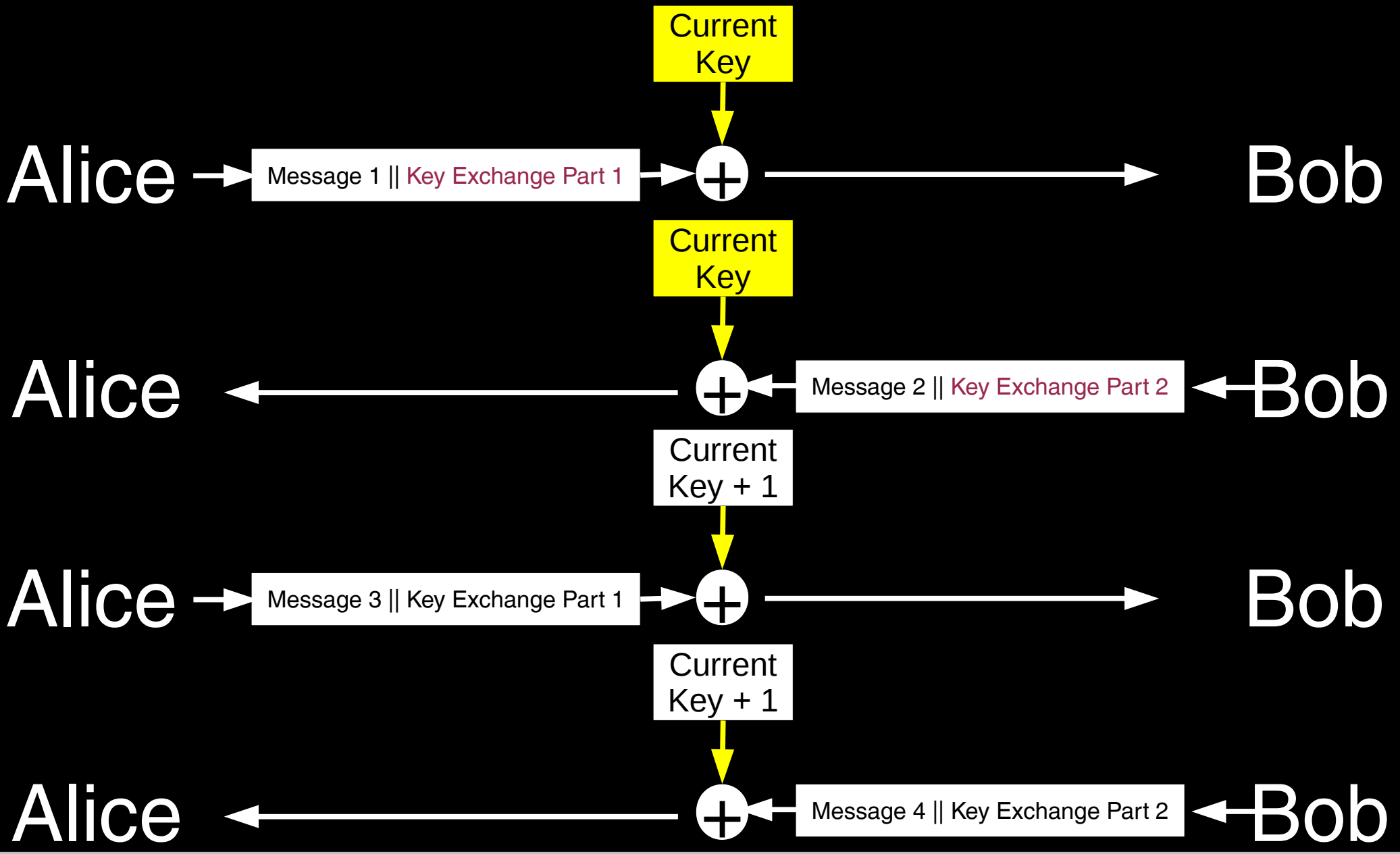
OTR Model


Current Key
Alice
Message 1 || Key Exchange Part 1
Bob
Current Key
Alice
Message 2 || Key Exchange Part 2
Bob
Current Key + 1
Alice
Message 3 || Key Exchange Part 1
Bob
Current Key + 1
Alice
Message 4 || Key Exchange Part 2
Bob

OTR Model



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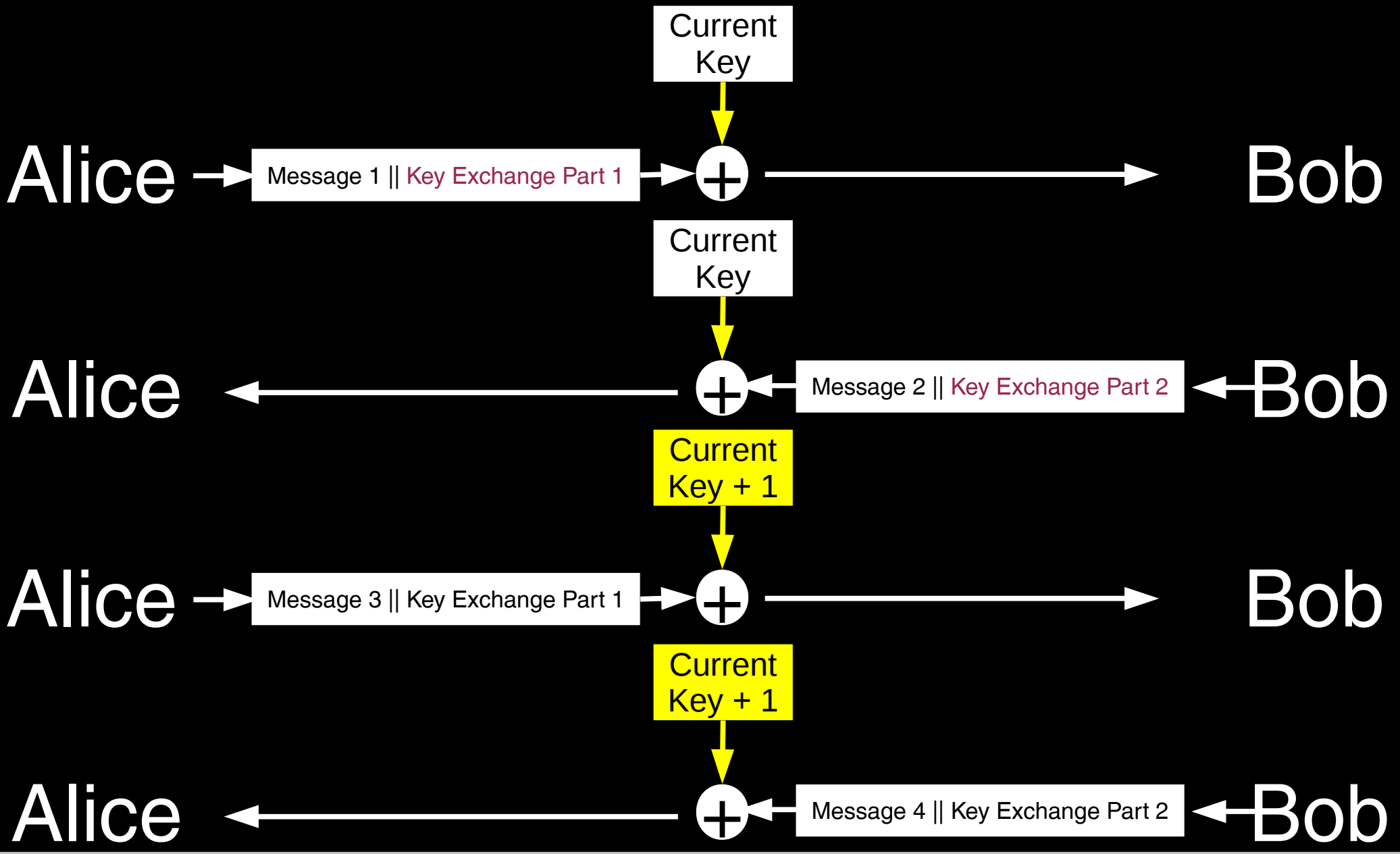
OTR Model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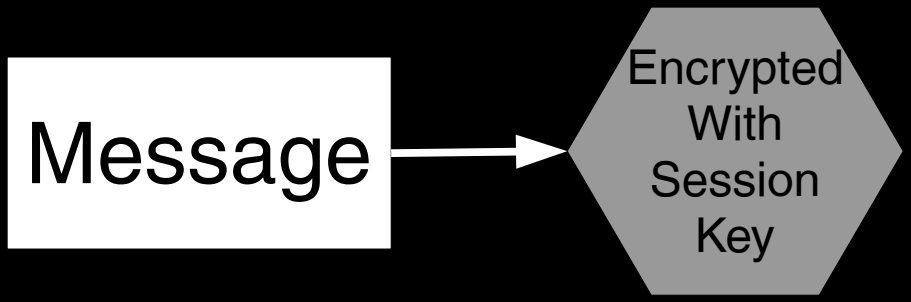
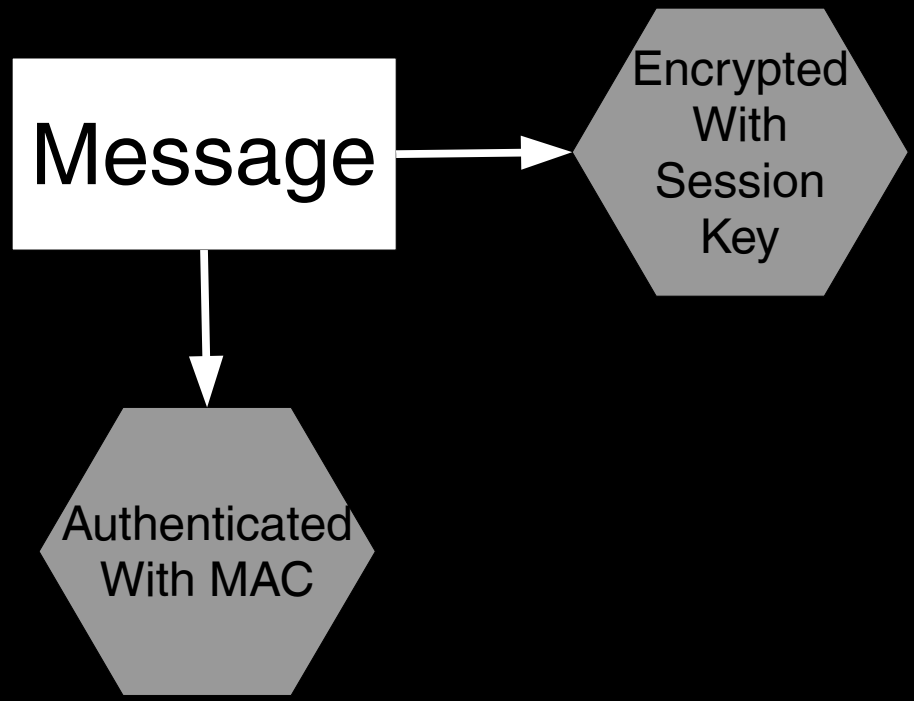
Message 4 || Key Exchange Part 2
Bob

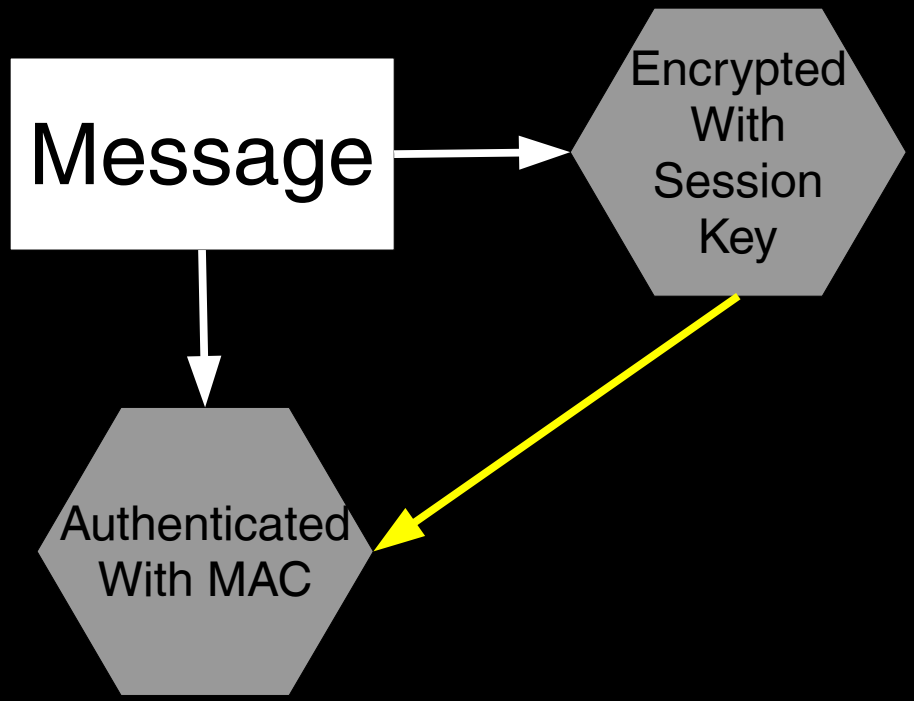
OTR Model



OTR Model


Message
Encrypted With Session Key
Authenticated With MAC

OTR Model


Message
Encrypted With Session Key
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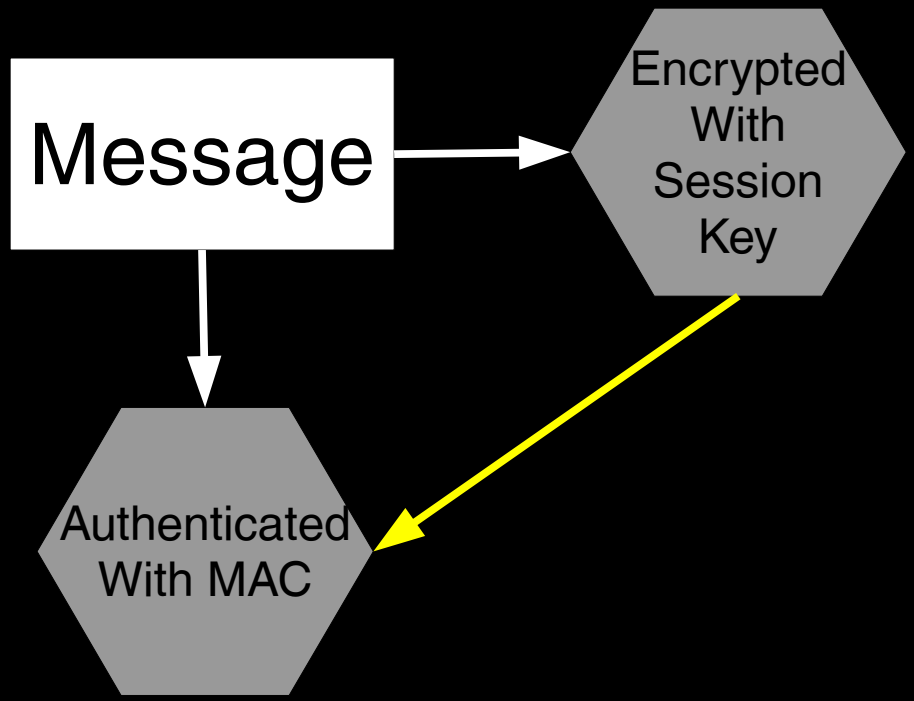
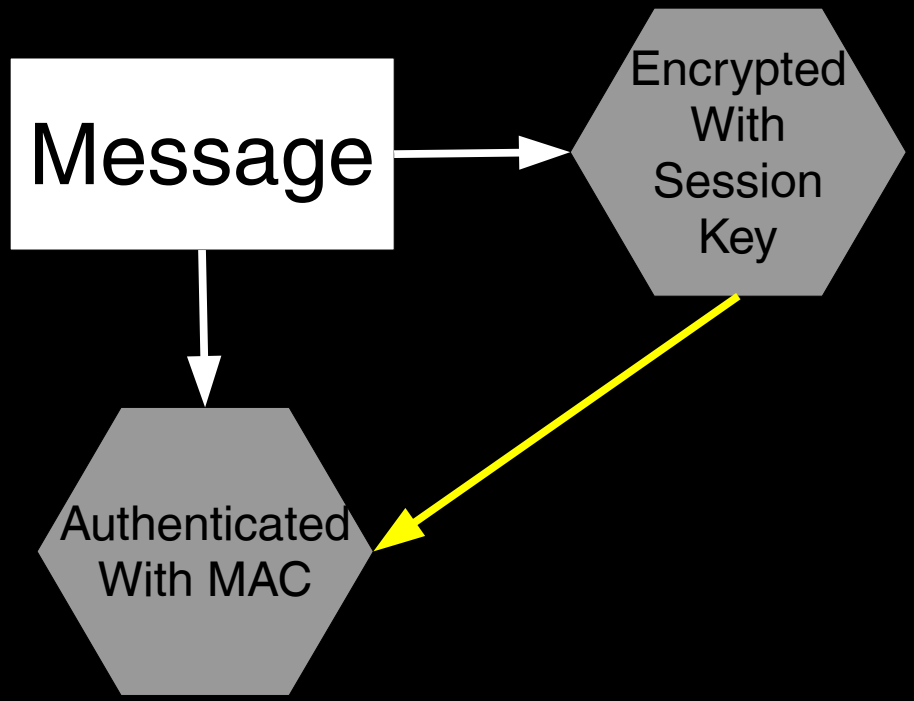
OTR Model



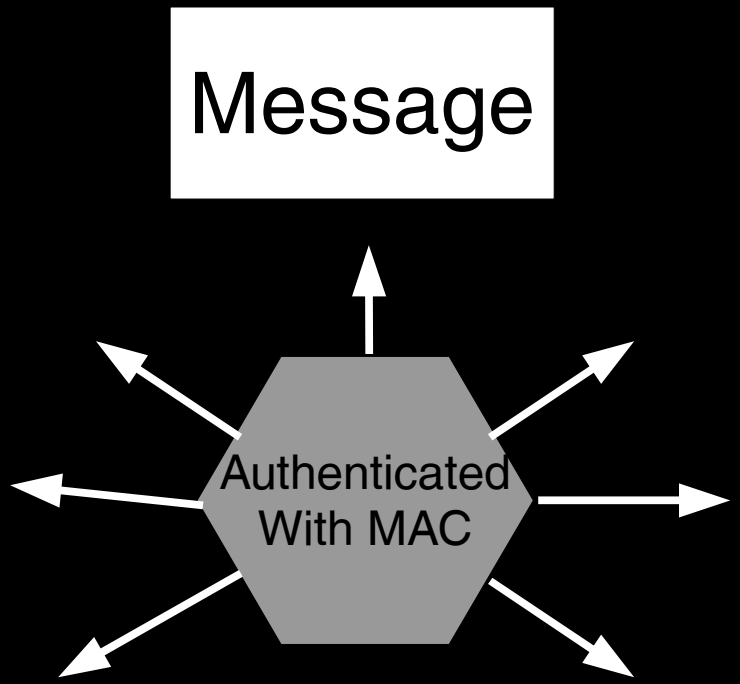
Signatures are undeniable because they have only one possible author.

OTR Model



MACs have *two* possible authors.

OTR Model



After a broadcast, *anyone* can forge an old message.

OTR Model

- A key compromise does not affect previous messages.
- You get authenticity, but also deniability.

Future

Whisper Systems

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Bring forward secure protocols into mobile phones

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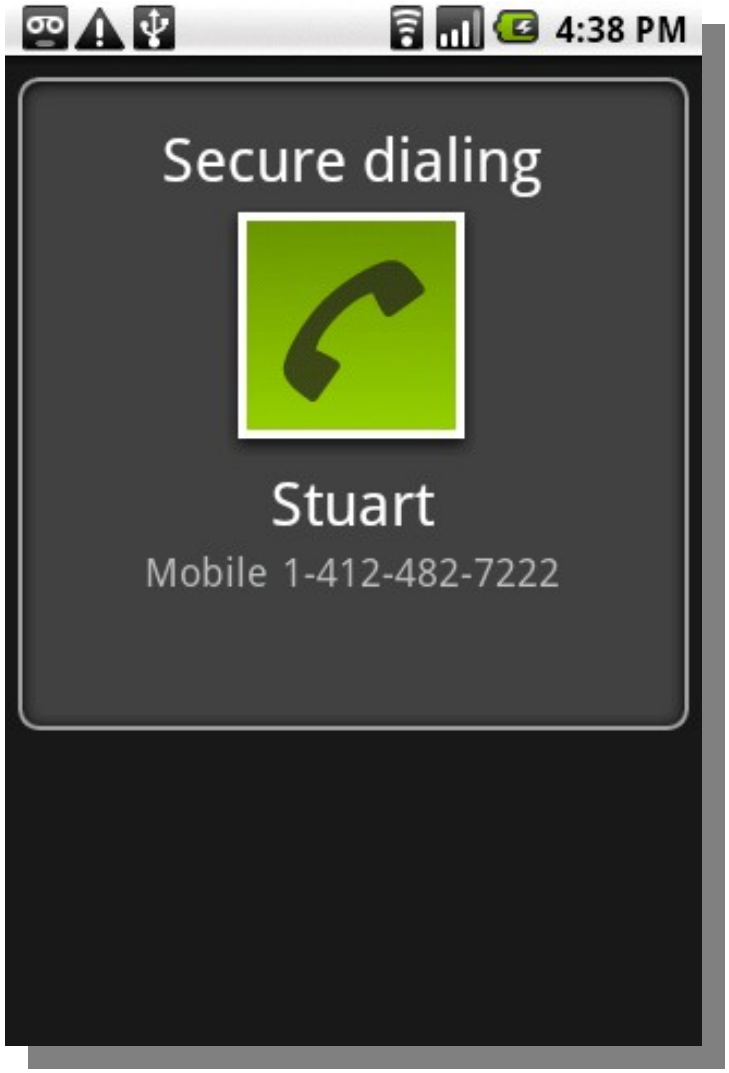
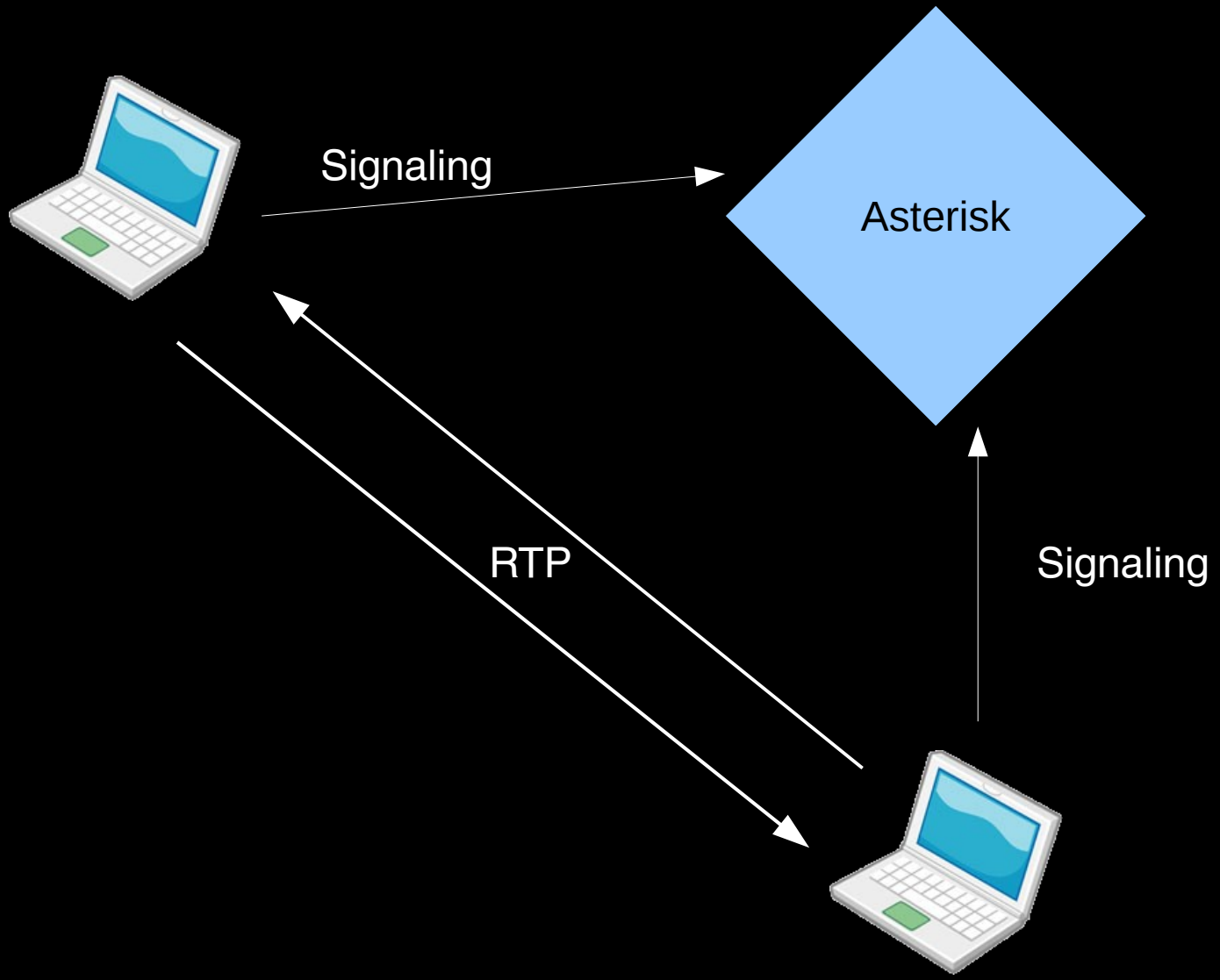
Institute For Disruptive Studies

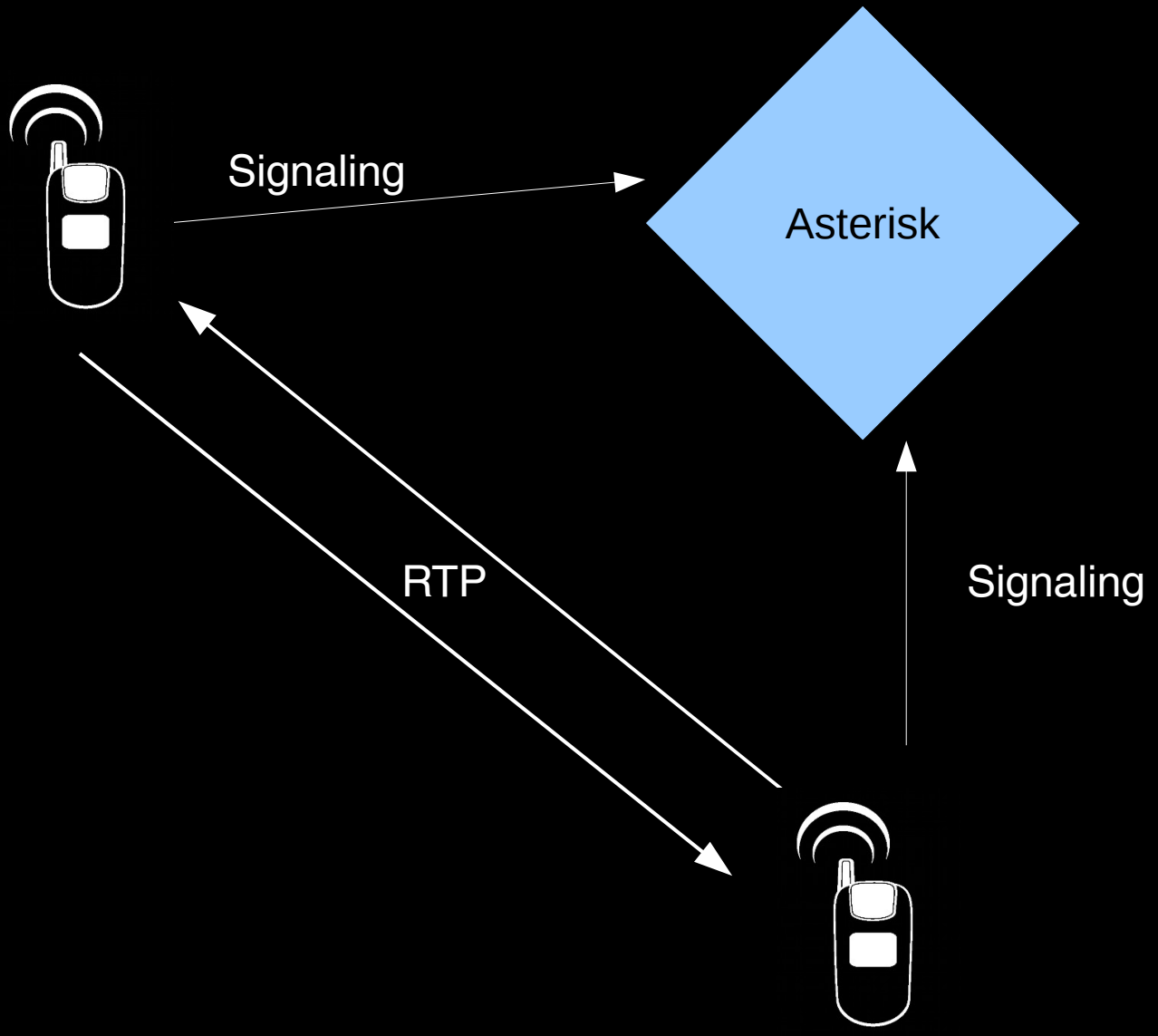
Whisper Systems



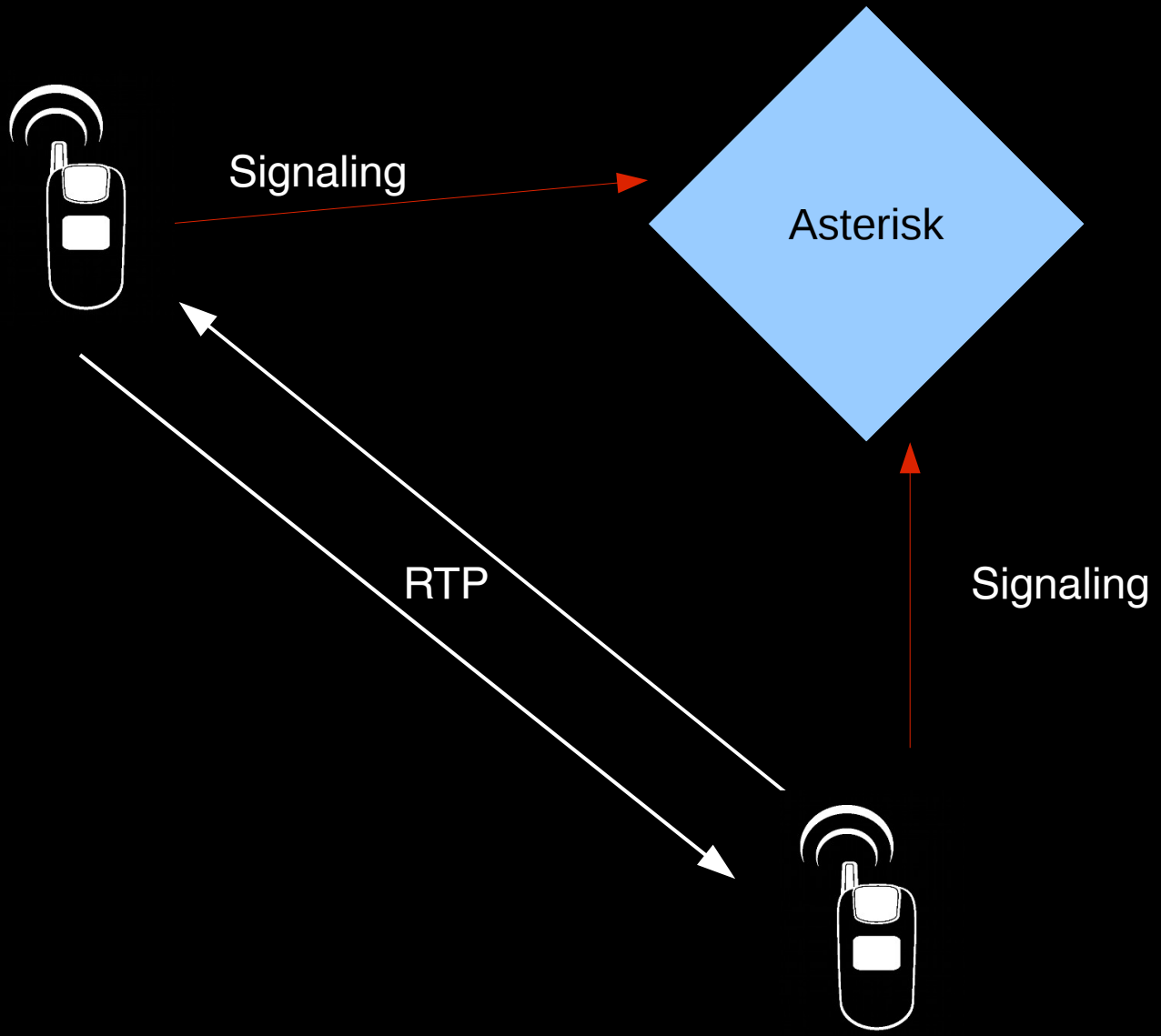
Whisper Systems
But doesn't voip Suck?



Whisper Systems
But doesn't *mobile* voip Suck?



Whisper Systems
But doesn't *mobile* voip Suck?



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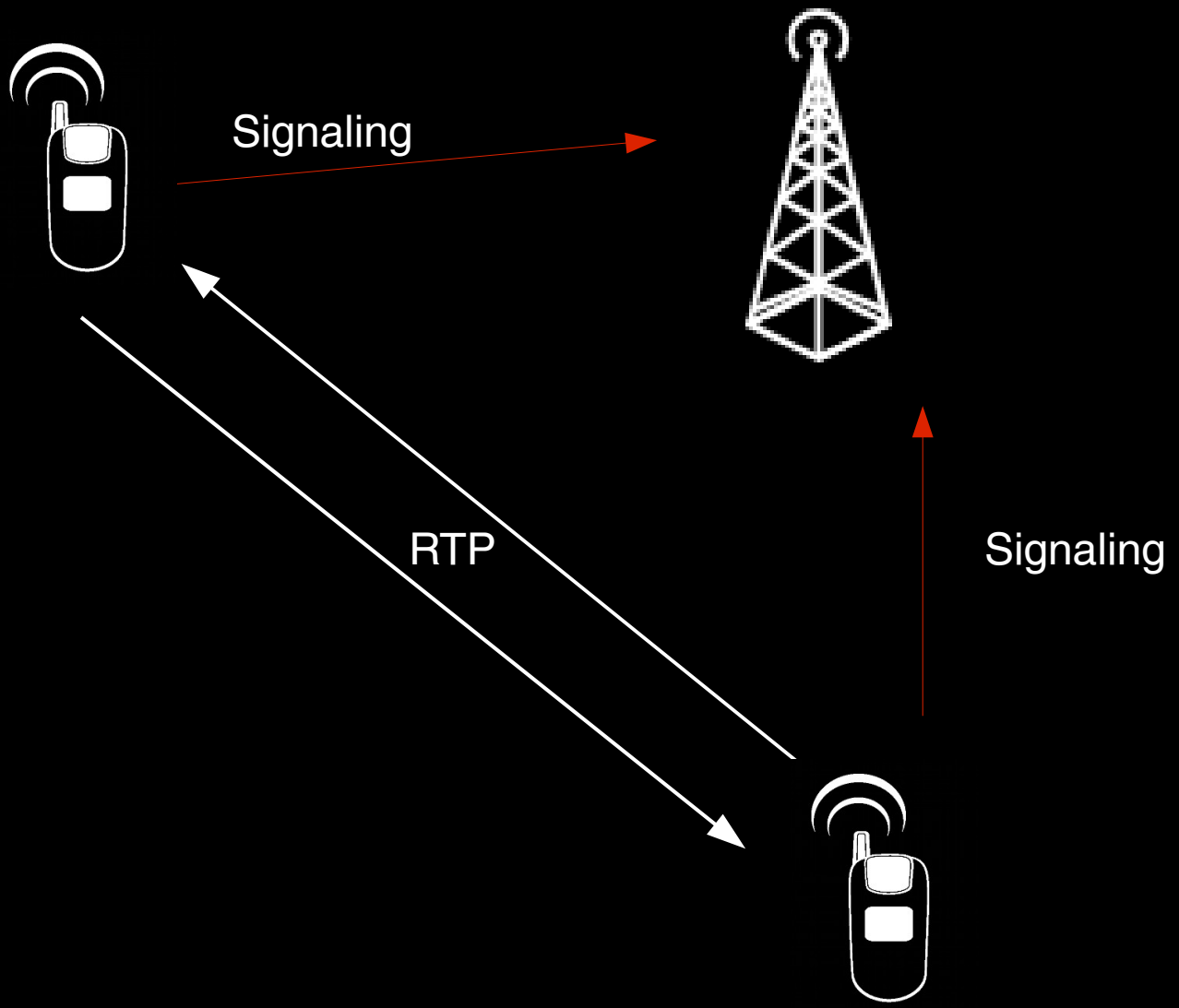

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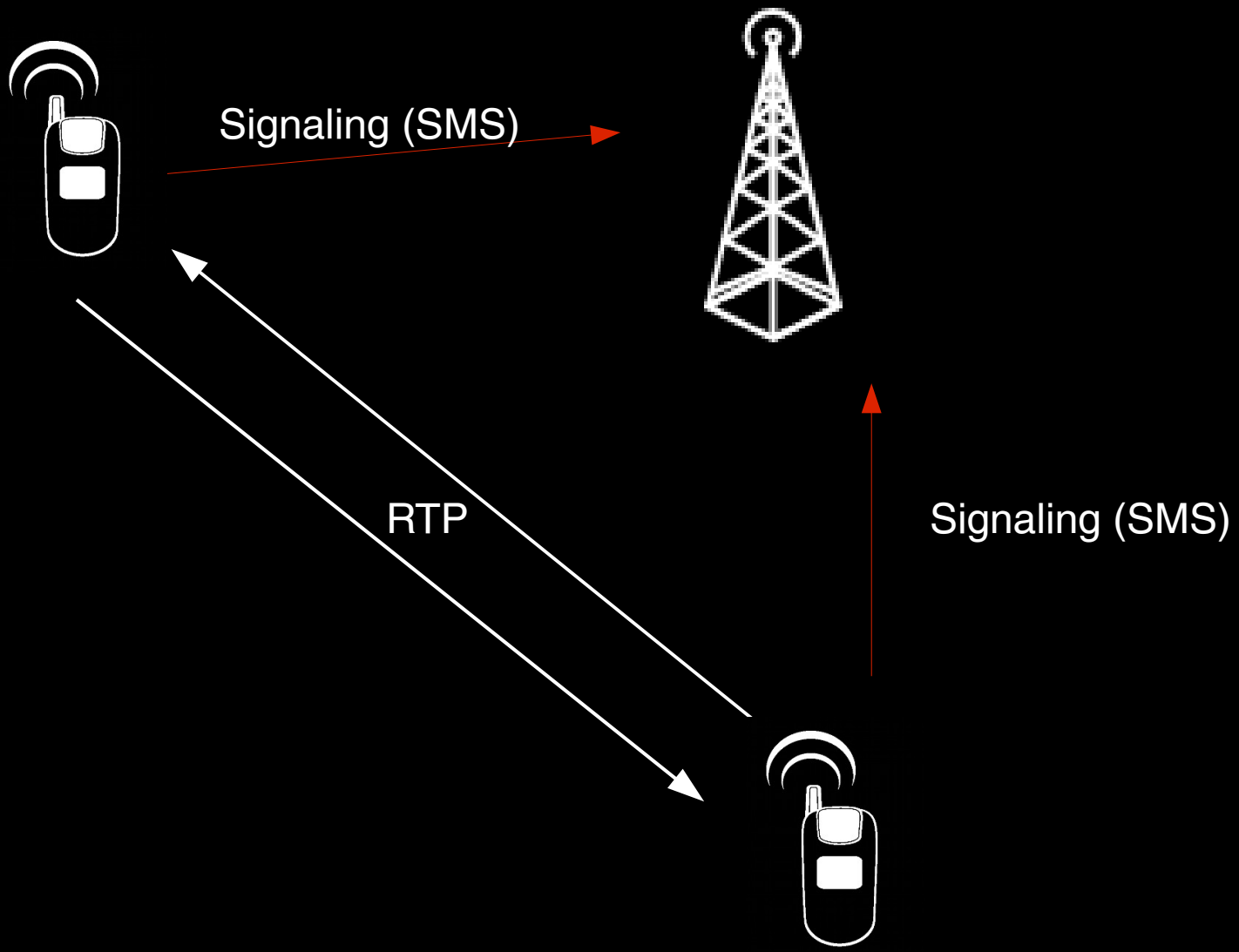
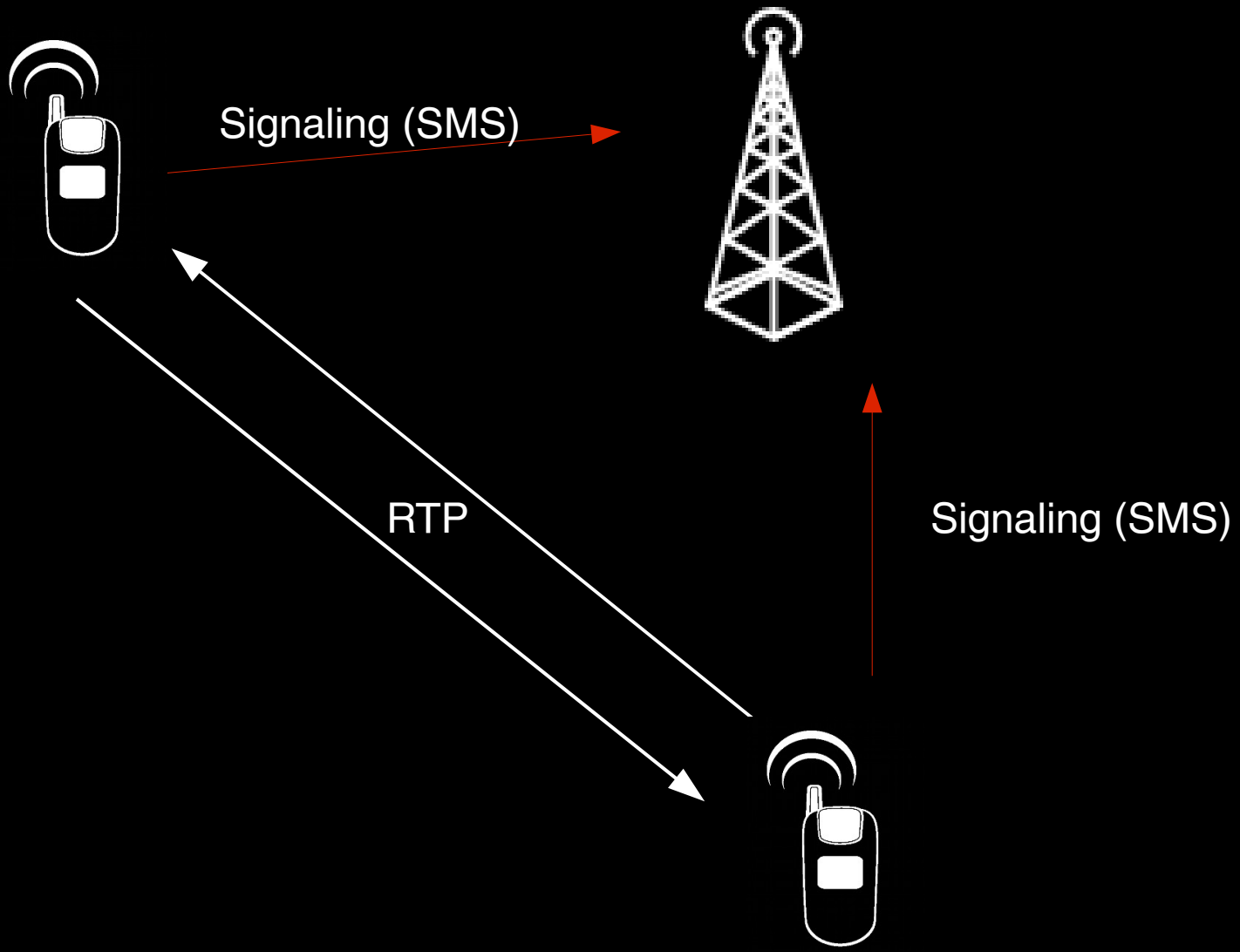
Whisper Systems
But doesn't *mobile* voip Suck?



Whisper Systems

- Your phone doesn't need to maintain a constant network connection to a SIP server.
  - (Your phone can go to sleep!)
- You don't need the equivalent of a Skype ID.
  - (Addressing is based on existing phone numbers!)
- You don't need to run a VOIP server.
  - (Just install the app and you're ready!)

Whisper Systems
But doesn't *mobile* voip Suck?



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Whisper Systems
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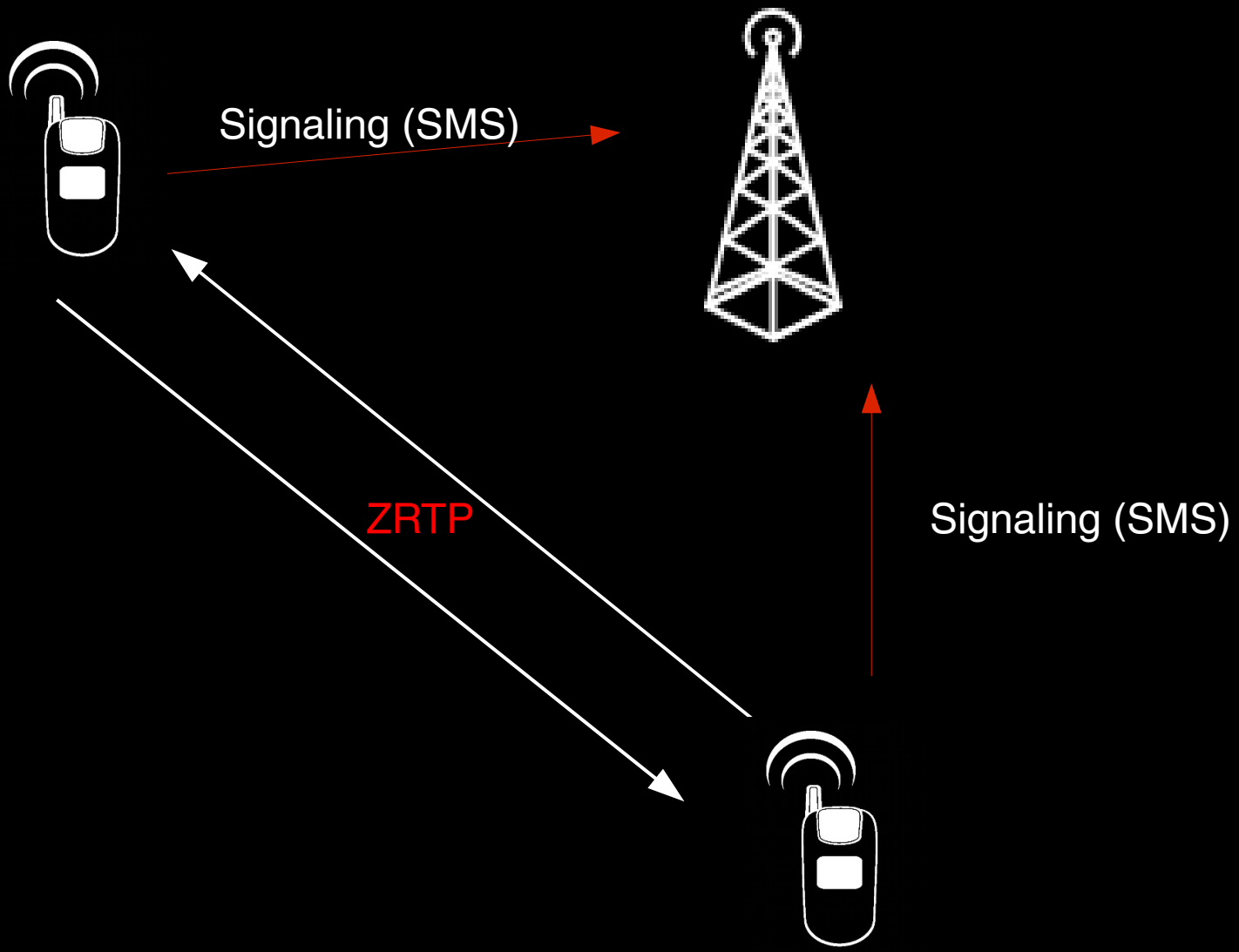
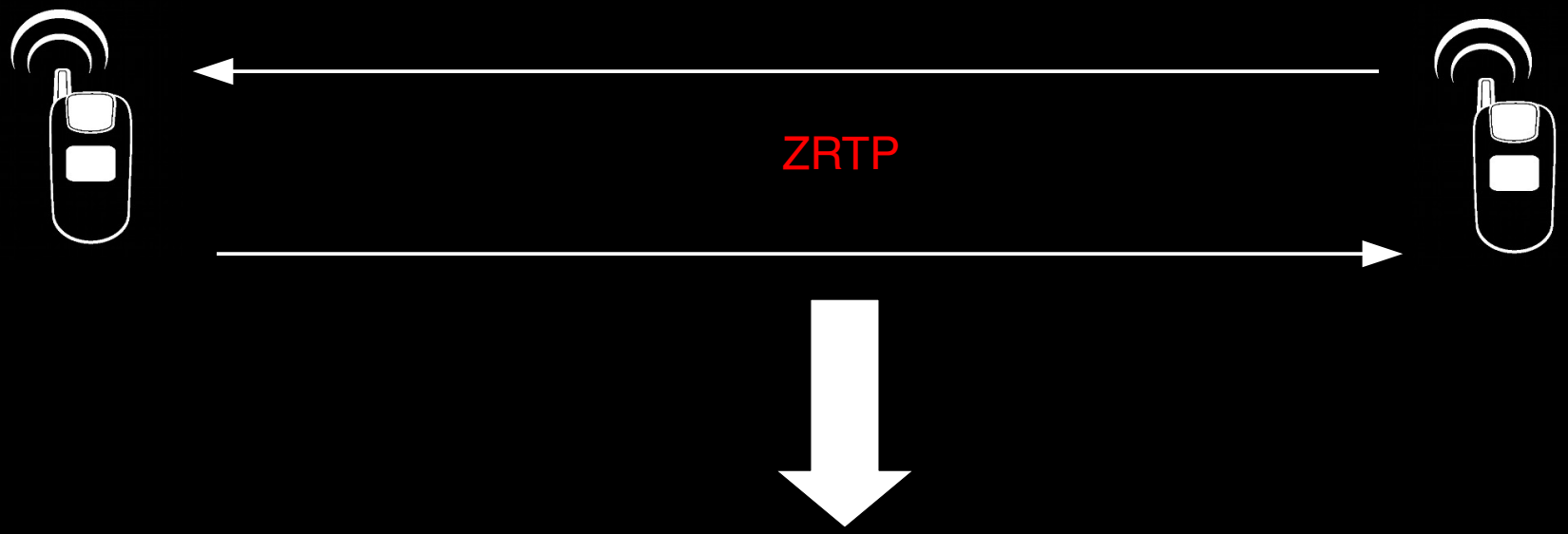


ZRTP

ZRTP



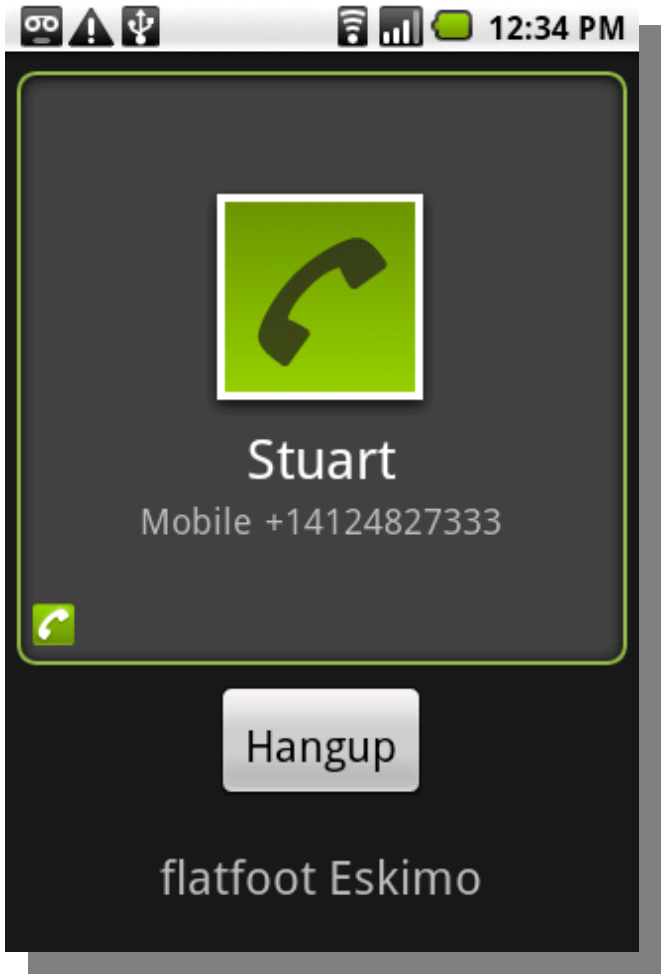
Negotiate ephemeral session key.

ZRTP

Negotiate ephemeral session key.

Derive “Short Authentication String”.

ZRTP



Whisper Systems
OTR-Derived SMS

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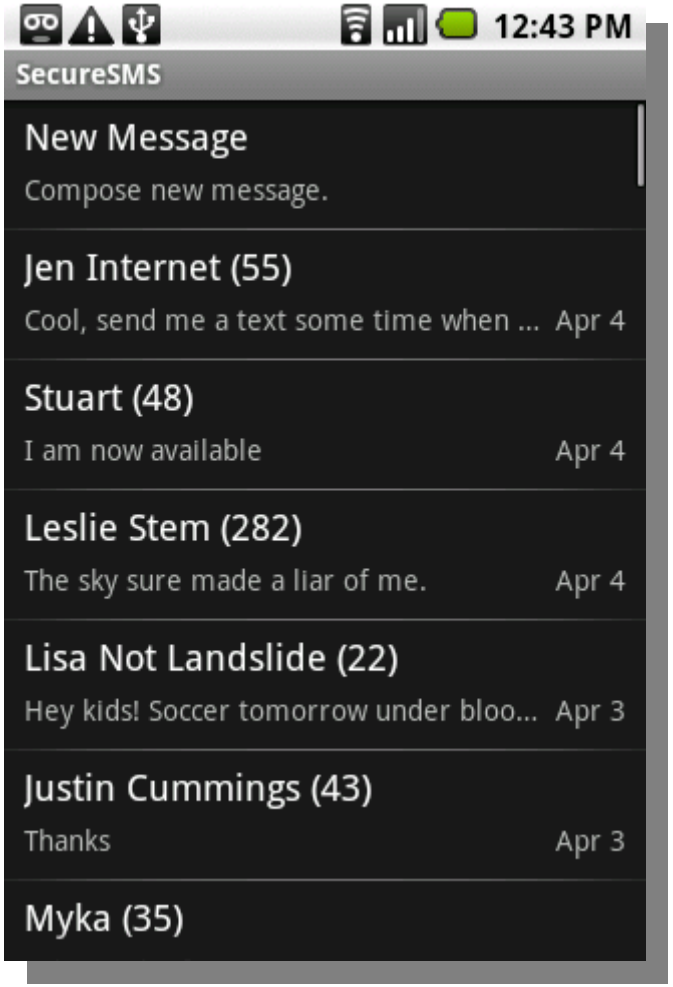
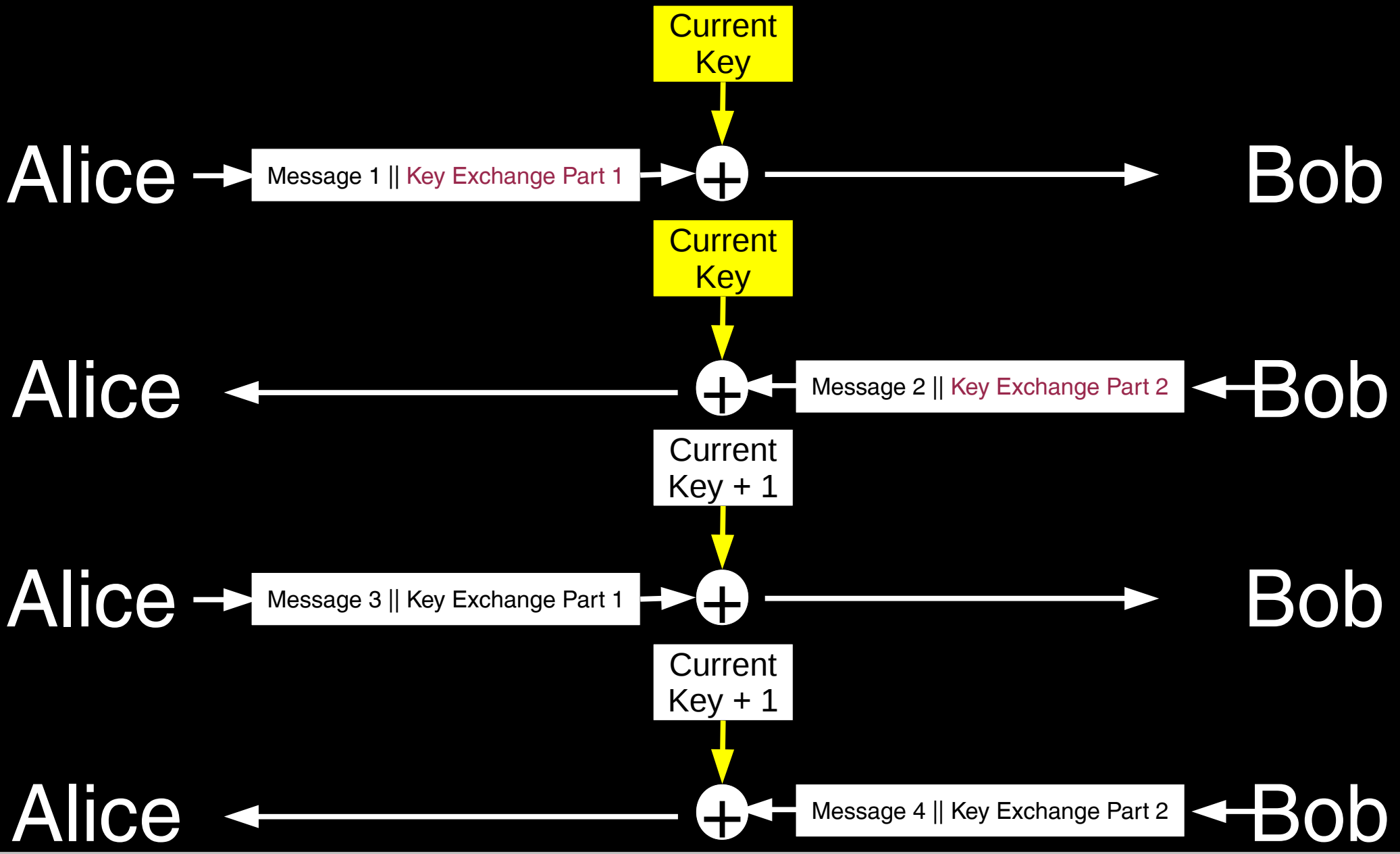
Whisper Systems



OTR Model


Current Key
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Message 1 || Key Exchange Part 1
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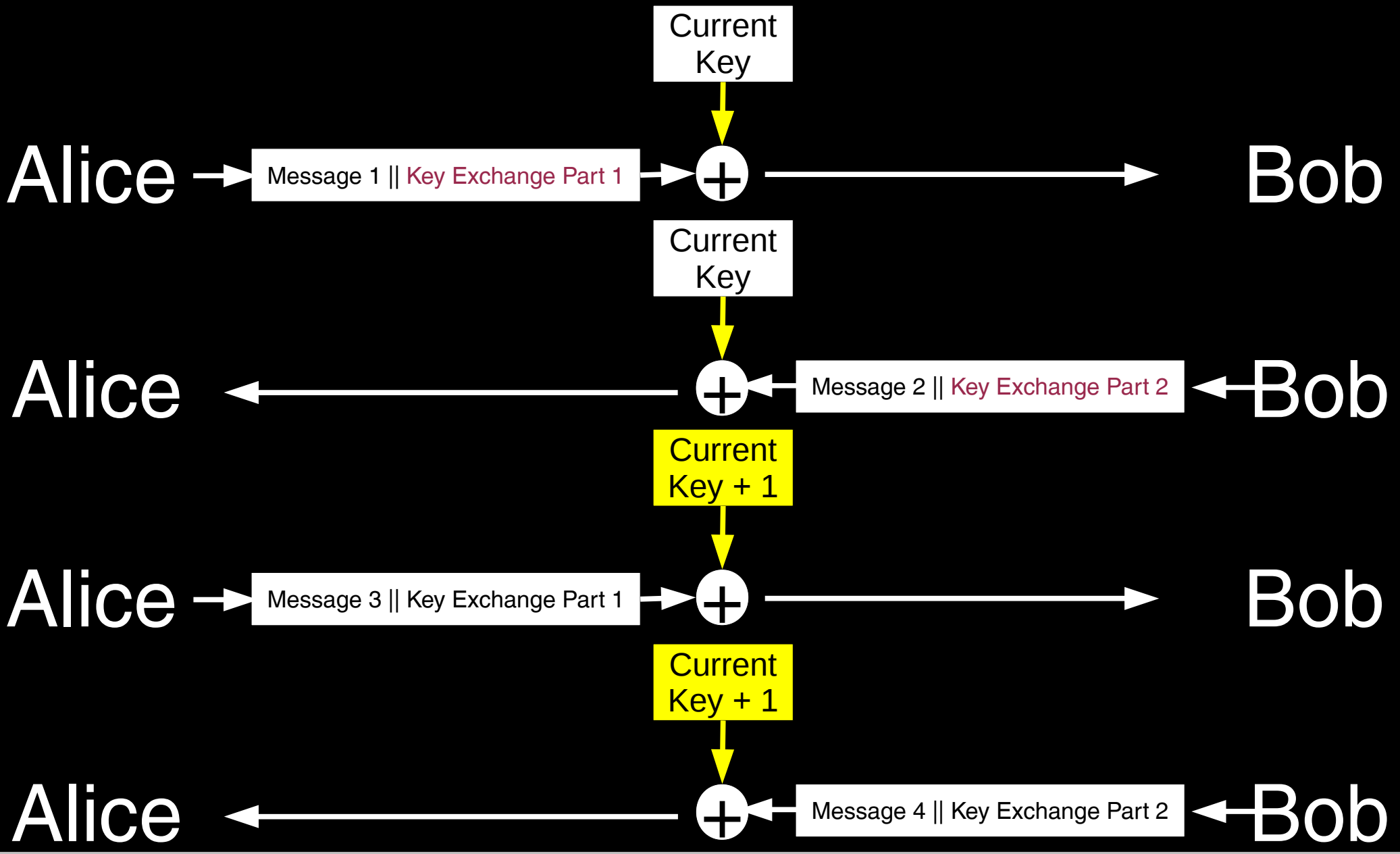
Current Key
Alice
Message 2 || Key Exchange Part 2
Bob
Current Key + 1
Alice
Message 3 || Key Exchange Part 1
Bob
Current Key + 1
Alice
Message 4 || Key Exchange Part 2
Bob

OTR Model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Alice
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Bob
Current Key + 1
Alice
Message 3 || Key Exchange Part 1
Bob
Current Key + 1
Alice
Message 4 || Key Exchange Part 2
Bob

Small hope to reduce choice scope

www.thoughtcrime.org
moxie@thoughtcrime.org