Le web décentralisé

Breizh C@mp

Qui suis-je ?

@AntoineCailly

acailly

zenika
<animés par la passion>

Great Place To Work.
Best Workplaces™
50 à 500 salariés
FRANCE 2018

Il était une fois le web en 2019...

Censure

Turkey Blocks
@TurkeyBlocks

Suivre

Confirmed: All editions of the #Wikipedia online encyclopedia blocked in #Turkey as of 8:00AM local timeturkeyblocks.org/2017/04/29/wik…

07:22 - 29 avr. 2017

86 2 875 1 015

Vikipedi üzerinde ara

Vikipedi'ye hoş geldiniz

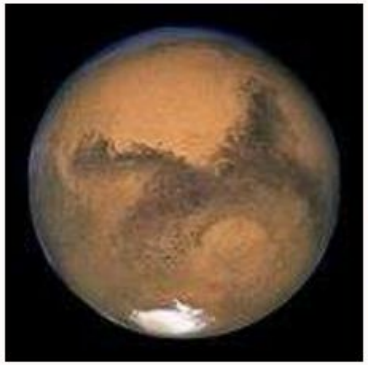
Herkesin katkıda bulunabildiği *Özgür Ansiklopedi*

Türkçe madde sayısı: 288.931

9 Ocak 2017, Pazartesi

- Bilim
- Coğrafya
- Din
- Fizik
- Matematik
- Sanat
- Spor
- Tarih
- **Tüm portaller**

Haftanın seçkin maddesi



Mars, Güneş Sistemi'nin Güneş'ten itibaren dördüncü gezegeni. Roma mitolojisindeki savaş tanrısı Mars'a ithafen adlandırılmıştır. Yüzeyindeki yaygın demir oksitten dolayı kızılımsı bir görünüme sahip olduğu için *Kızıl Gezegen* de denir. İnce bir atmosferi olan Mars gerek Ay'daki gibi meteor kraterlerini, gerekse Dünya'daki gibi volkan, vadi, çöl ve kutup bölgelerini içeren çehresiyle bir yerbenzeri gezegendir. Ayrıca dönme periyodu ve mevsim dönemleri Dünya'nınkine çok benzer. İ… Güneş Sistemi'nde bilinen en yüksek dağ ve Marineris Vadisi adlı kanyon en büyük kanyondur. Ayrıca Haziran 2008'de *Nature* dergisinde yayımlanan üç makalede

https://ipfs.io/ipfs/QmT5NvUtoM5nWFfrQdVrFtvGfKFmG7AHE8P34isapyhCxX/wiki/Anasayfa.html

Günün seçkin resmi

Generalitat de Catalunya
gencat.cat

Català Castellano Aranés English

Referèndum 2017

Inici | Normativa electoral | Sindicatures electorals | Sala de premsa | Com s'ha de votar | On votar

Col·laboradors del referèndum

El més destacat

- Material per descarregar
- Calendari electoral
- Call for international monitoring

Preguntes més freqüents

Electors

Meses electorals

https://ipfs.io/ipns/QmZxWEBJBVkGDGaKdYPQUXX4KC5TCWbvuR4iYZrTML8XCR/

Suppression des
données

Donald J. Trump
@realDonaldTrump

Suivre

It's freezing in New York—where the hell is global warming?

21:37 - 23 avr. 2013

397 470 281

Trump Just Deleted Obama's Climate Change Webpages

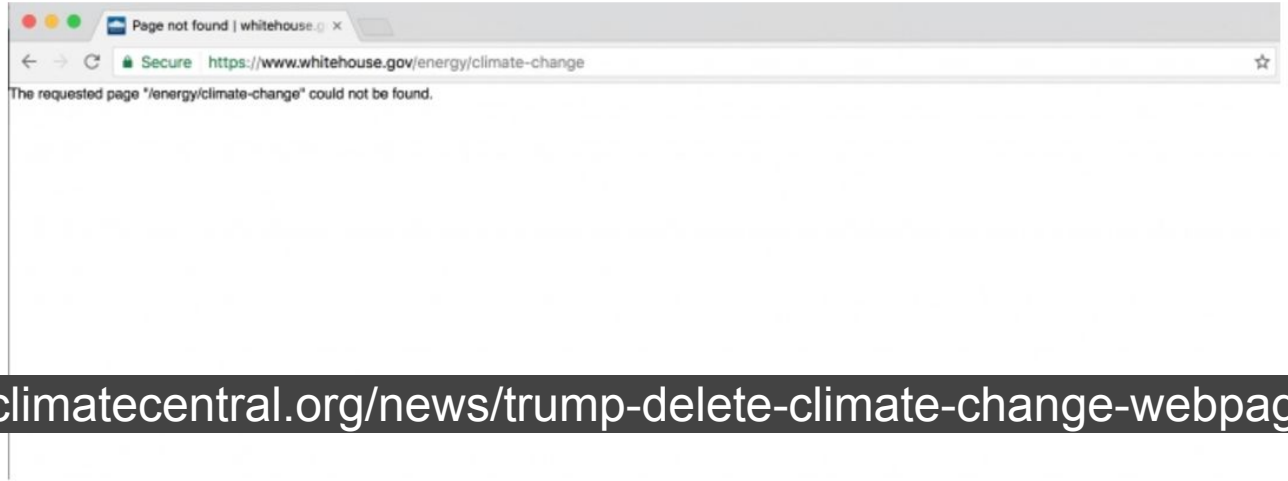
By *Brian Kahn*

Follow @blkahn 9,117 followers

Published: *January 20th, 2017*

At the exact hour when the presidency transferred hands, the Obama administration's climate and energy webpages became some of the first casualties of the new Trump administration.

In their place is an "America first" energy plan, which talks at length about tapping fossil fuel resources in the U.S. but makes no mention of climate change or renewable energy. Investing in the latter will be crucial to avert catastrophic changes to the world.



http://www.climatecentral.org/news/trump-delete-climate-change-webpage-21091

Obama's climate page has been sent off to the archive.

DataRefuge

Datasets Organizations Groups About

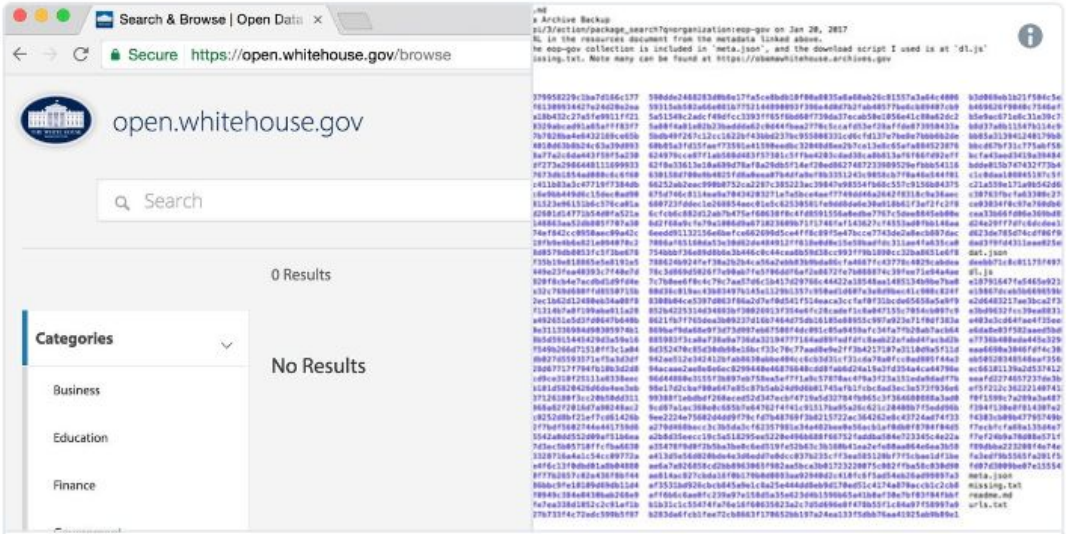
Search

Building refuge for federal climate & environmental data

DataRefuge helps to build refuge for federal data and supports climate and environmental research and advocacy. We are committed to fact-based arguments. DataRefuge preserves the facts we need at a time of ongoing climate change.

This site is one part of the project. The vast majority of the government information gathered through this project is available from the Internet Archive through the End of Term project. This data catalog is a place to store data that is difficult or impossible to harvest through web crawlers. Data was added to this site by volunteers at Data Rescue events. You can see the workflow used at many of these events on the Data Refuge project site, however this workflow is no longer supported.

https://www.datarefuge.org/



maxwell ogden
@denormalize

Suivre

Today Trump removed all open data (9GB) from the White House open.whitehouse.gov/browse but I grabbed it all Jan 20! Will distribute soon

21:12 - 14 févr. 2017

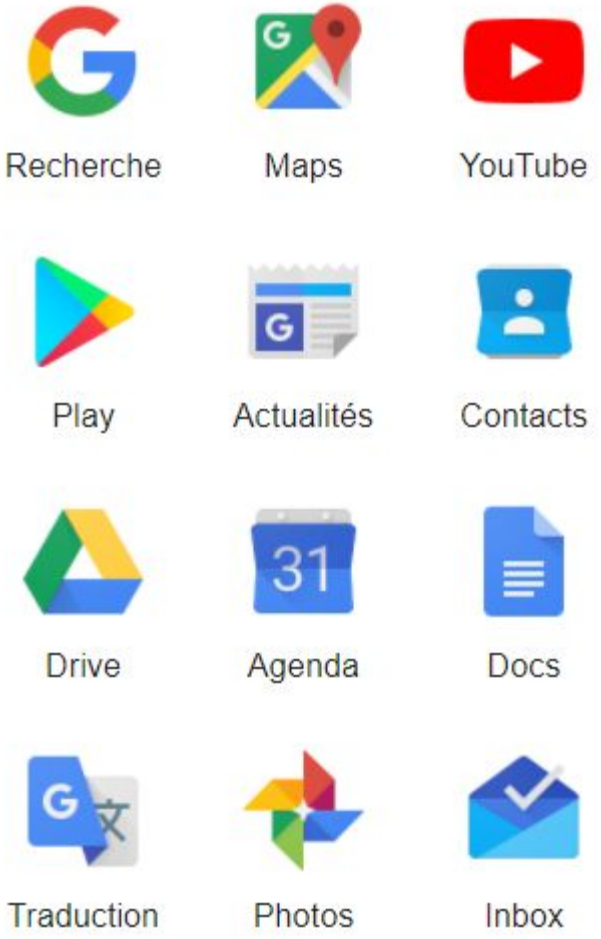
288 8 854 12 877

Shared with Dat

Explore public data shared with Dat.

https://datproject.org/explore

Centralisation des services



facebook

WhatsApp

waze

Instagram

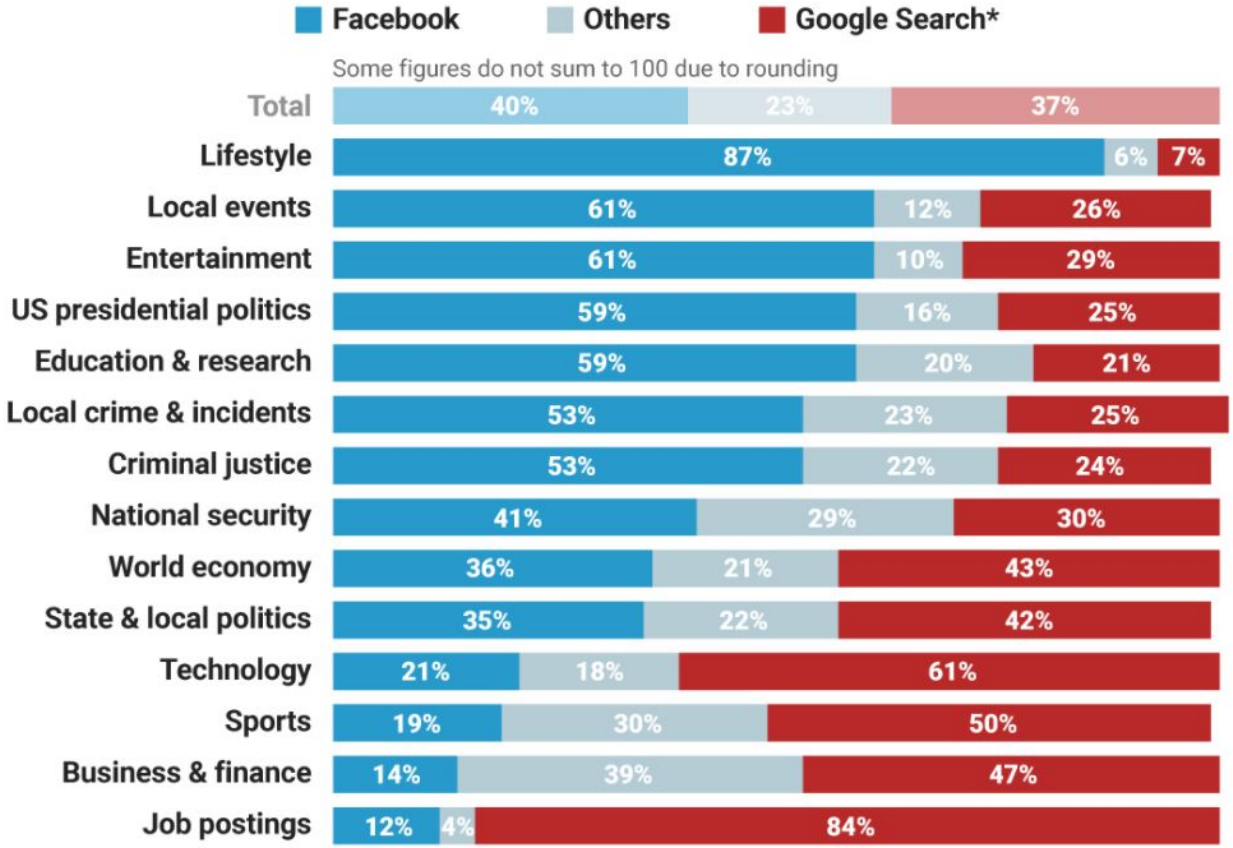
ANDROID

chrome

et Google, Amazon, Microsoft, Apple, Uber...

Centralisation du trafic

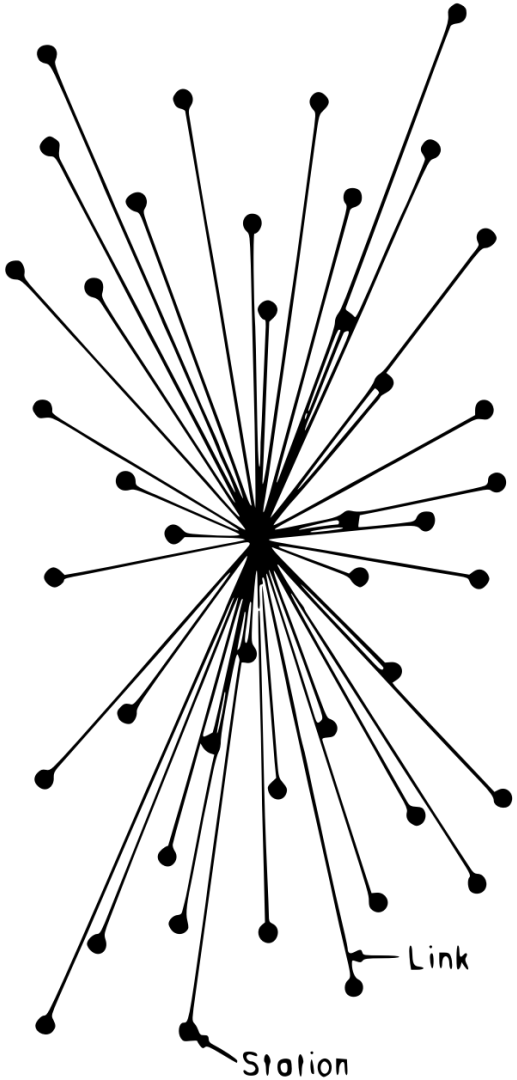
DISTRIBUTION OF REFERRAL TRAFFIC SOURCES BY TOPIC



SOURCE: Parse.ly *Not including Google AMP

statista | BUSINESS INSIDER

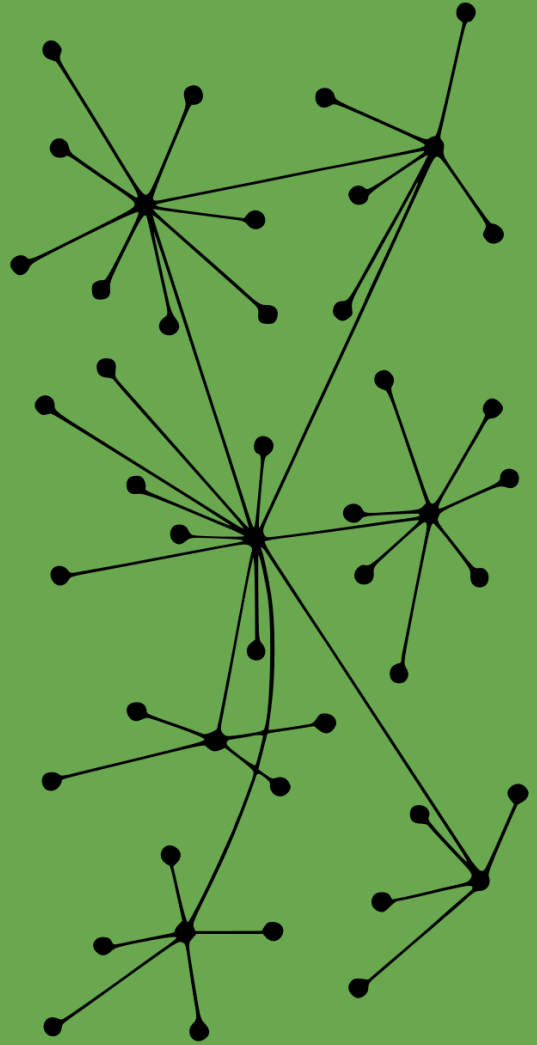
Un point commun ?


Link
Station

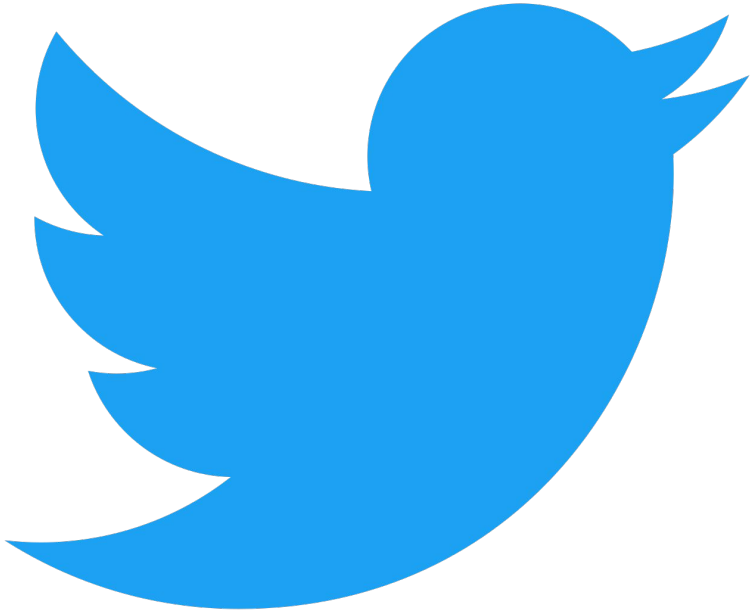
Single point of failure

Single point of control

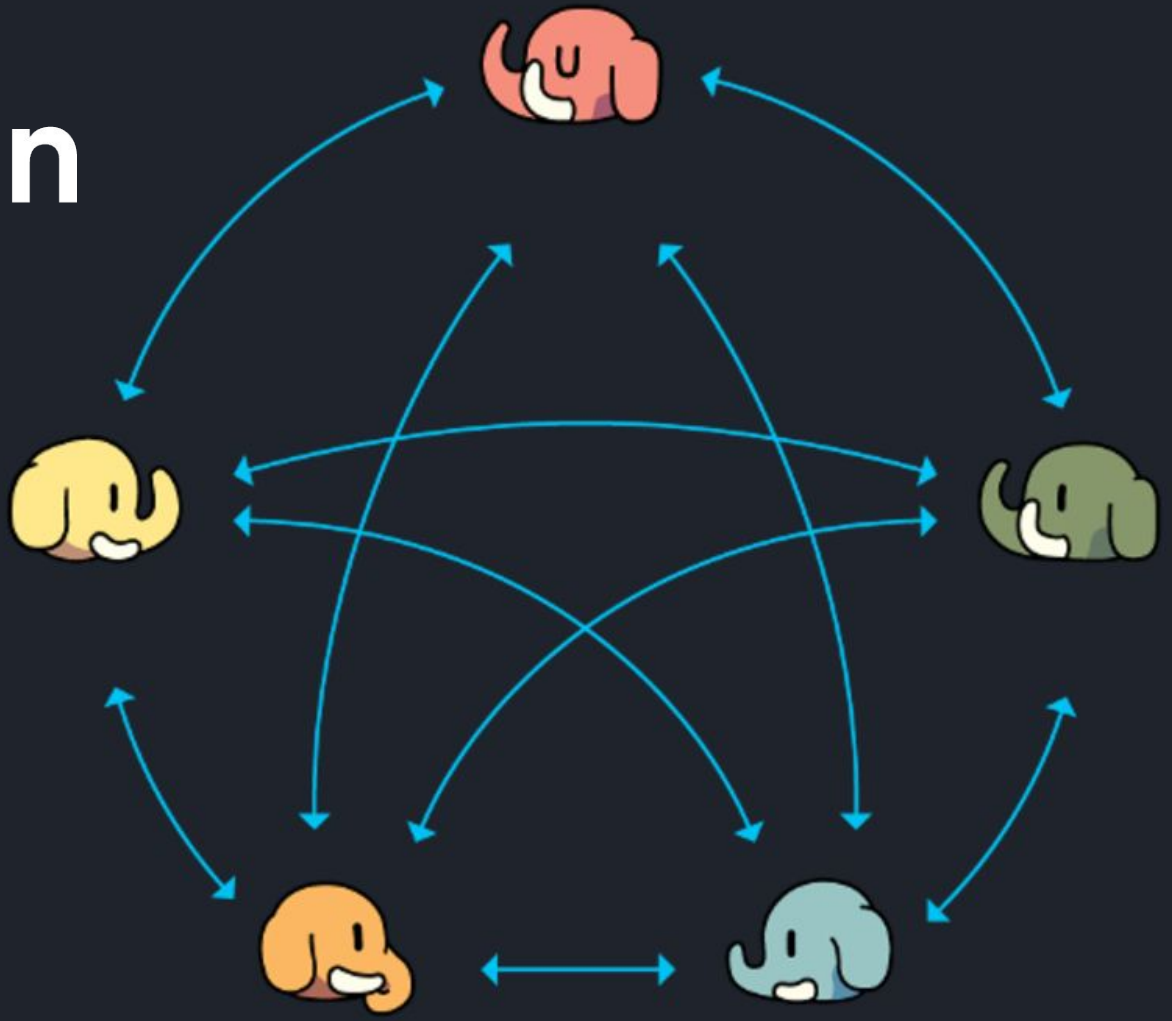
Une solution ?



Fédéré

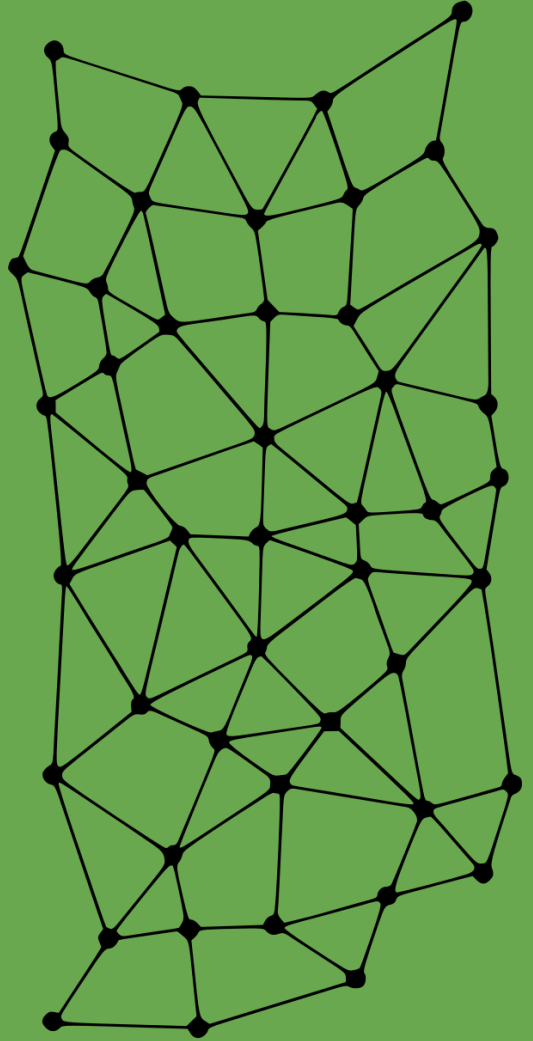


mastodon

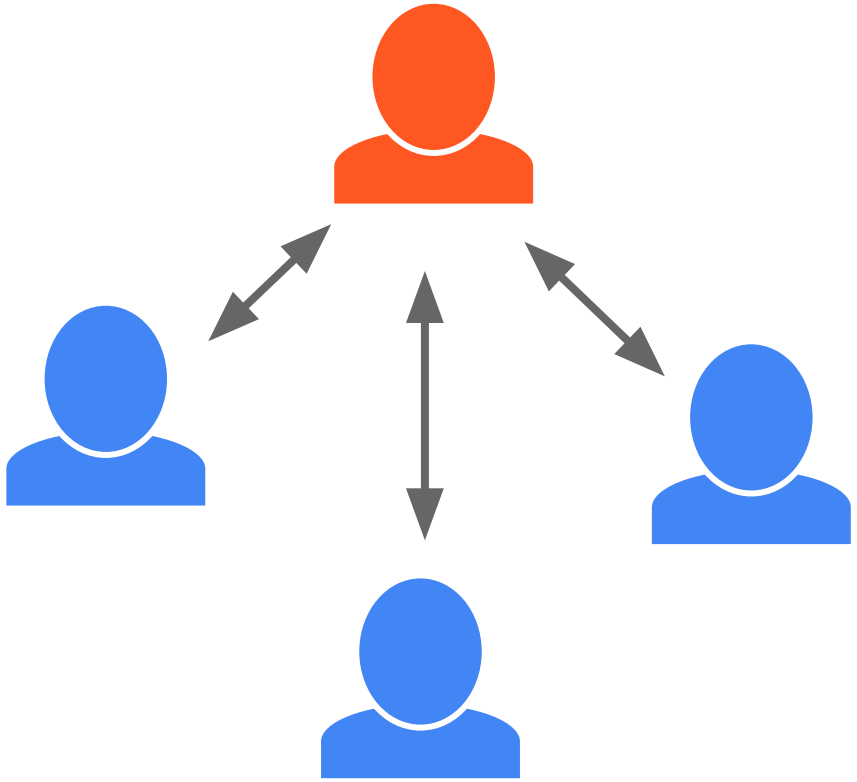


https://joinmastodon.org/

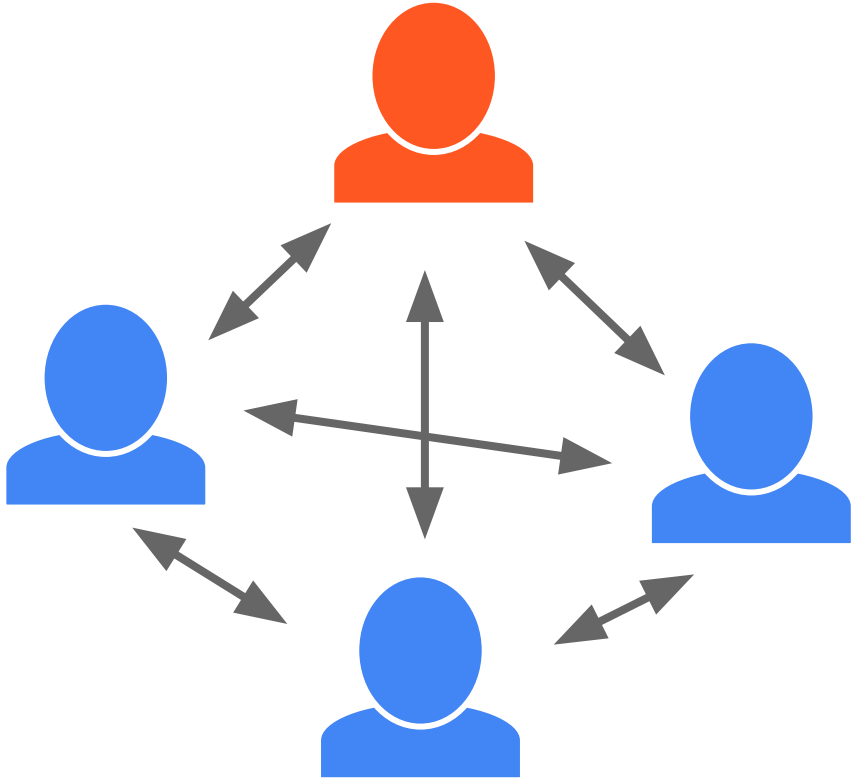
Distribué



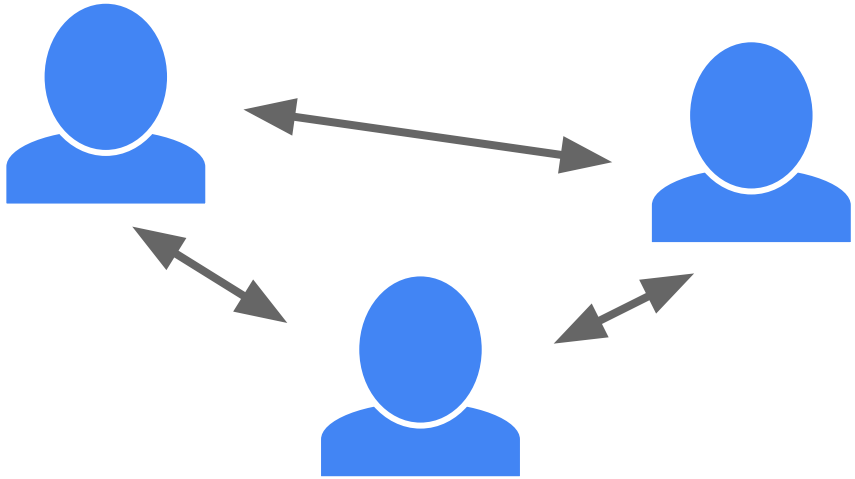
SUBVERSION



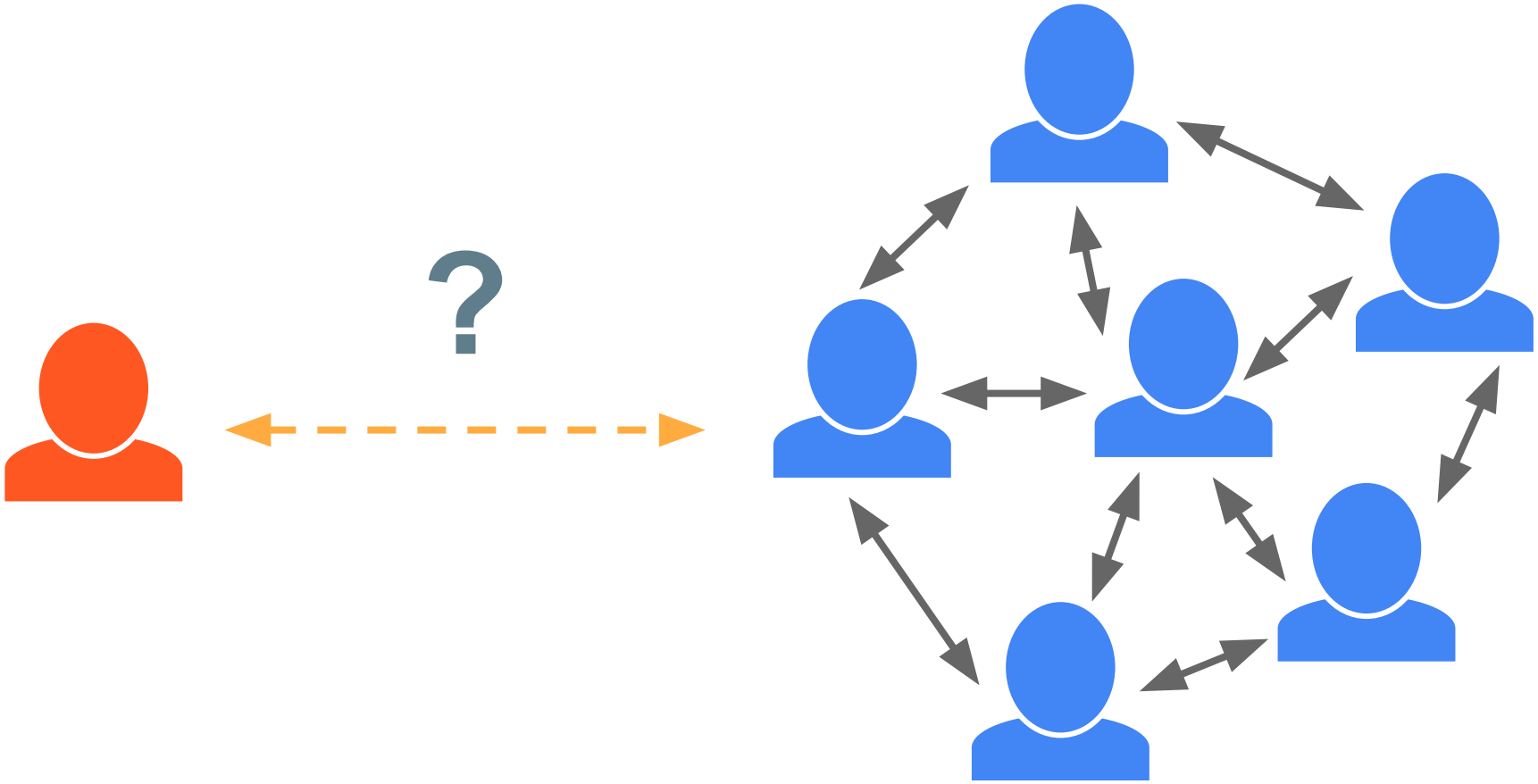
git



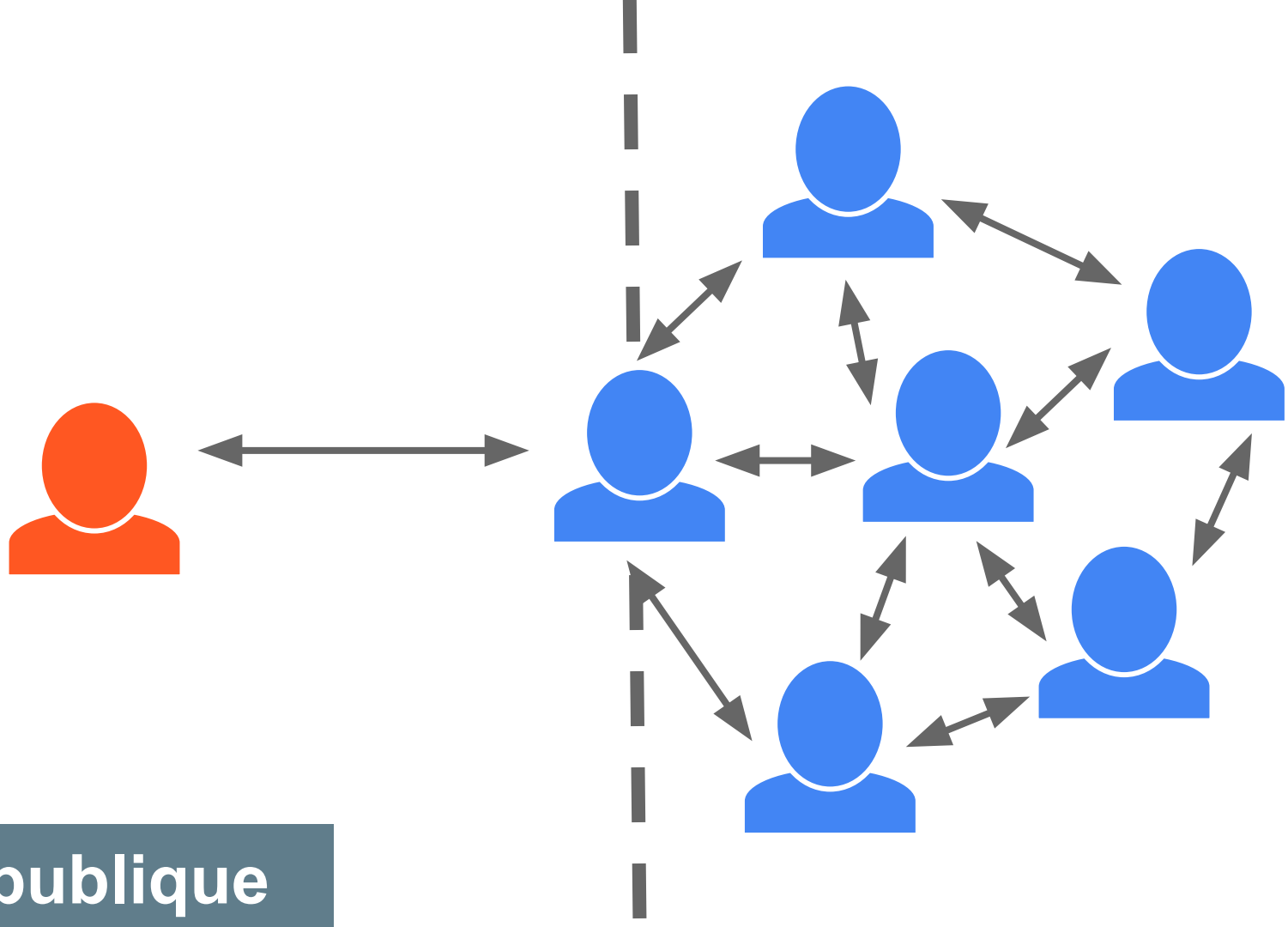
git



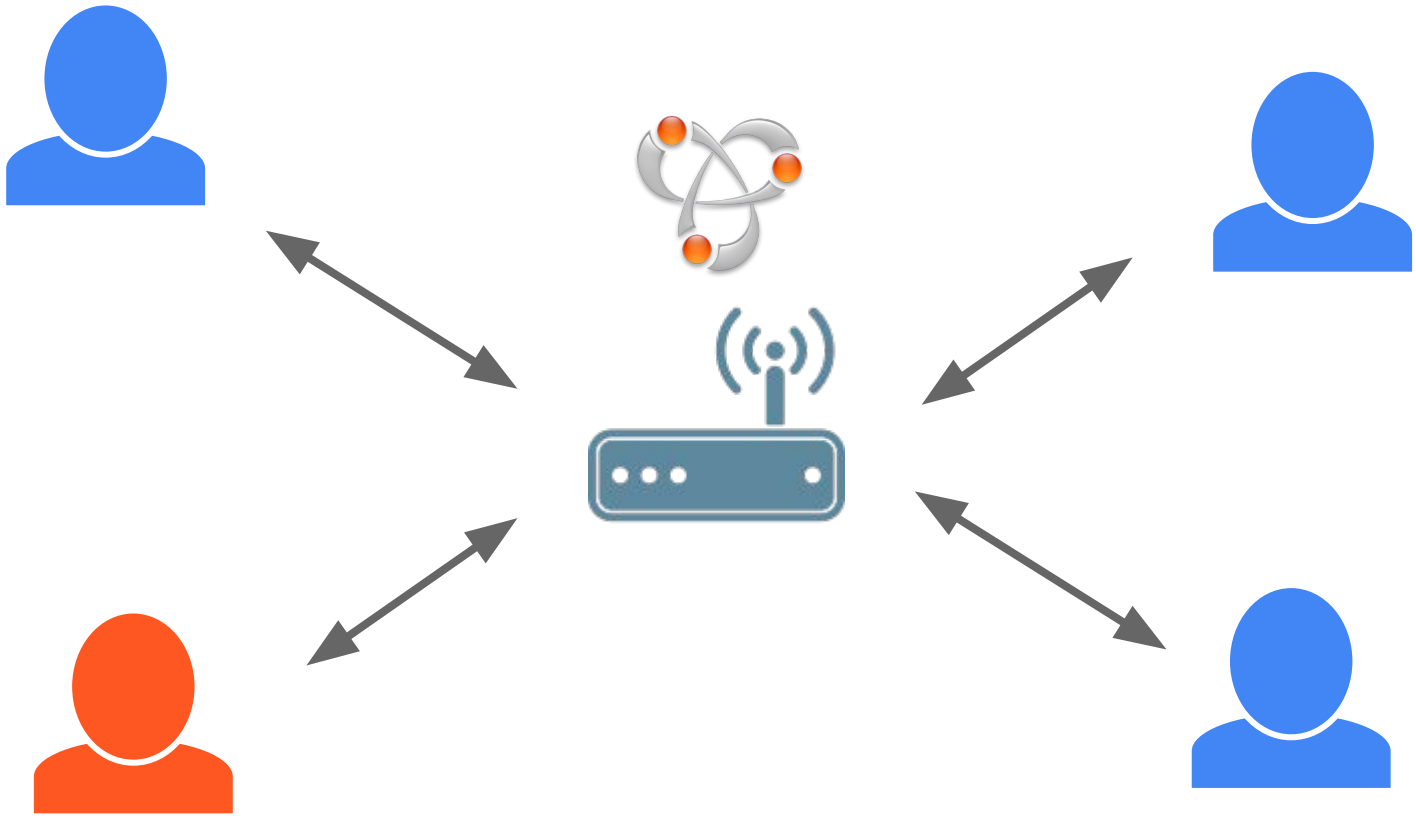
Comment ça marche ?



Bootstraping



Node publique



Multicast DNS (ZeroConf, Apple Bonjour)

Démo

Trouver une node
publique Bitcoin

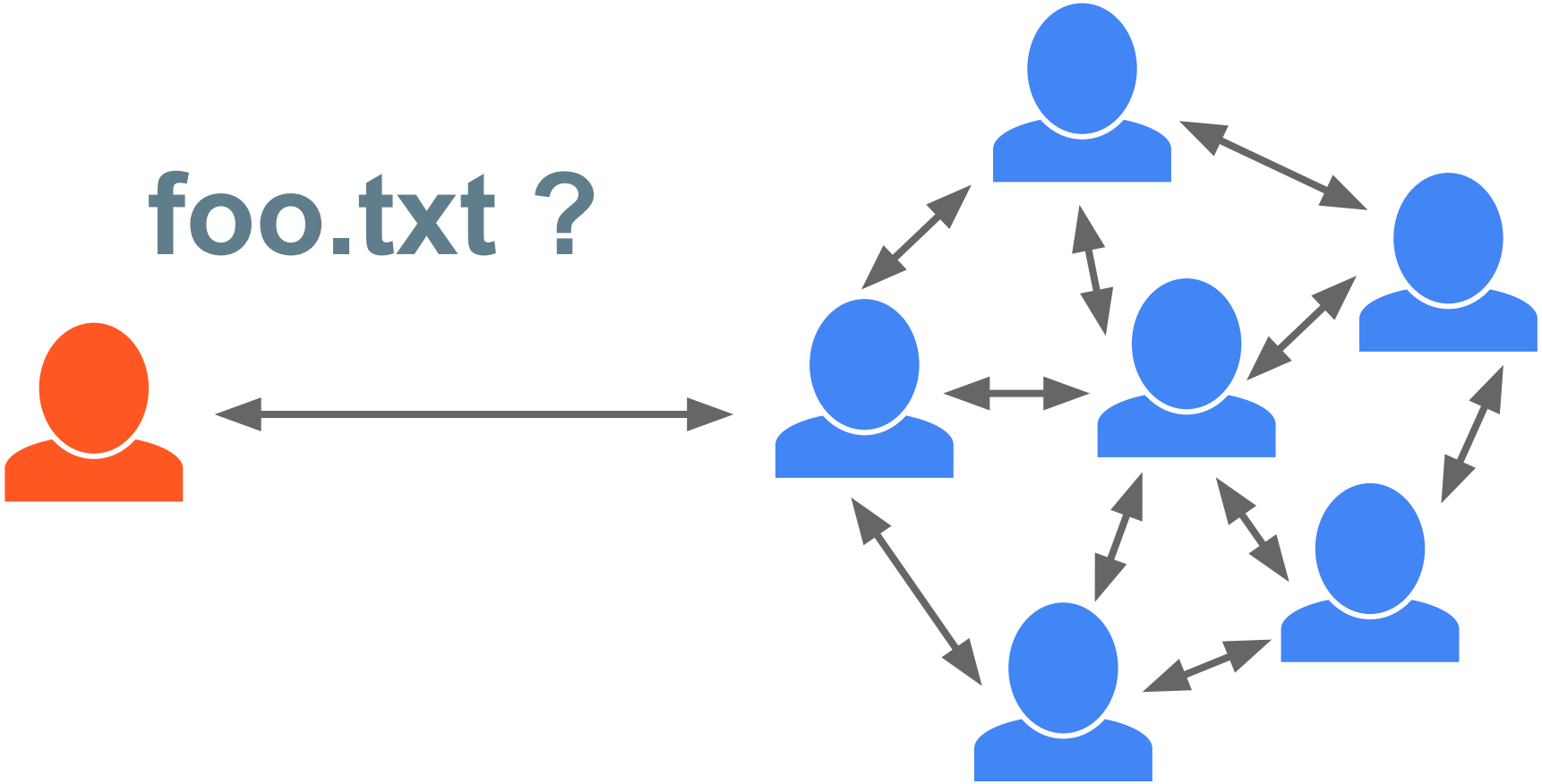
```
PS C:\_Projets\Perso\doc> nslookup bitseed.xf2.org
Serveur :   dns2.proxad.net
Address:  212.27.40.241

Réponse ne faisant pas autorité :
Nom :    bitseed.xf2.org
Addresses:  24.52.35.44
          50.177.196.160
          68.48.214.241
          76.111.96.126
          85.214.90.1
          94.226.111.26
          96.2.103.25
          97.117.255.48
          99.242.230.163
          162.243.194.210
          173.69.49.106
          198.38.93.227
          209.208.110.92
```

```
PS C:\_Projets\Perso\doc> nslookup bitseed.xf2.org
Serveur :   dns2.proxad.net
Address:  212.27.40.241

Réponse ne faisant pas autorité :
Nom :    bitseed.xf2.org
Addresses:  24.52.35.44
          50.177.196.160
          68.48.214.241
          76.111.96.126
          85.214.90.1
          99.242.230.163
          162.243.194.210
          173.69.49.106
          198.38.93.227
          209.208.110.92
```

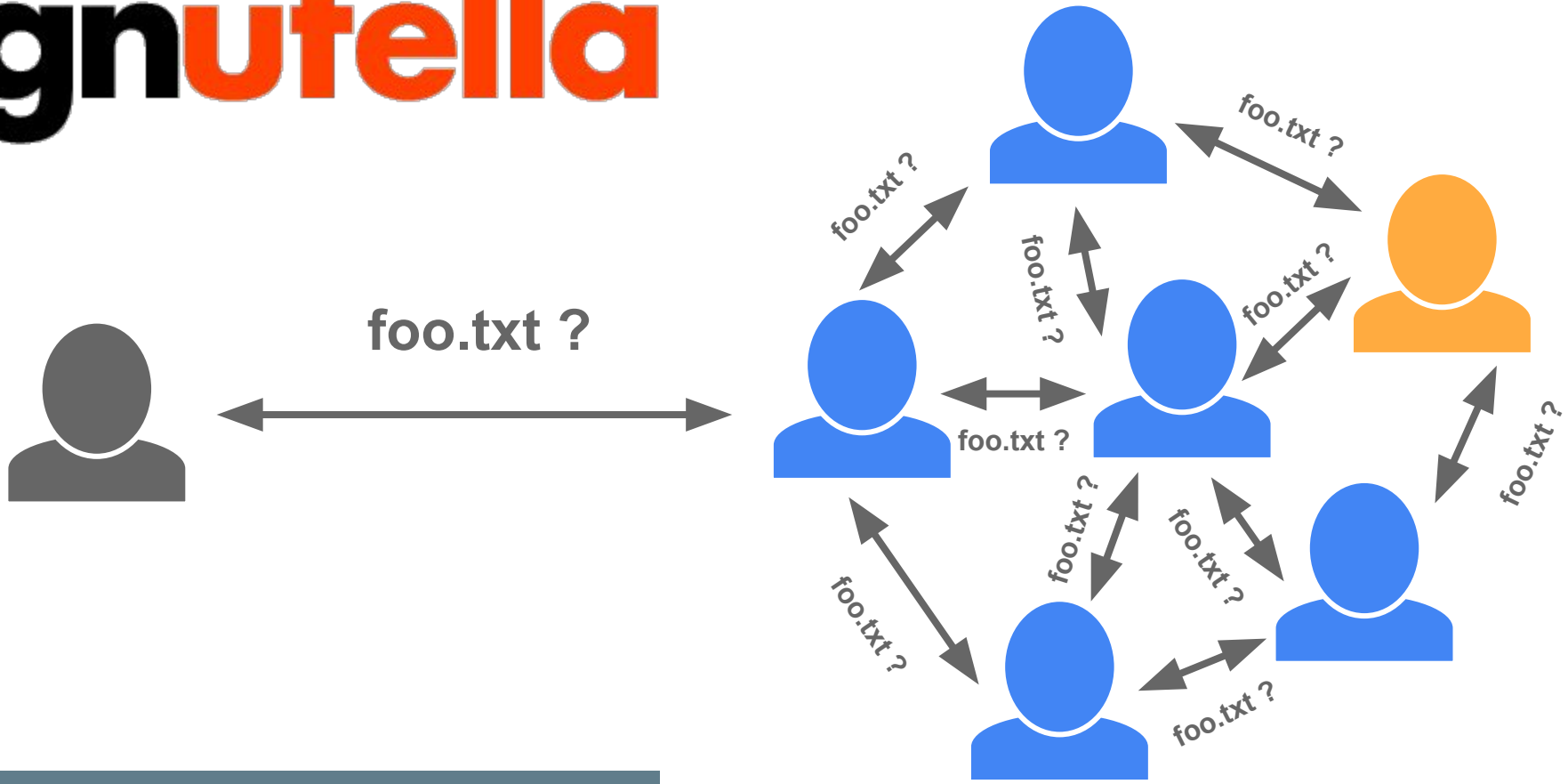
85.214.90.1:8333 /Satoshi:0.15.99(UASF-SegWit-BIP148)/


foo.txt ?

Discovery

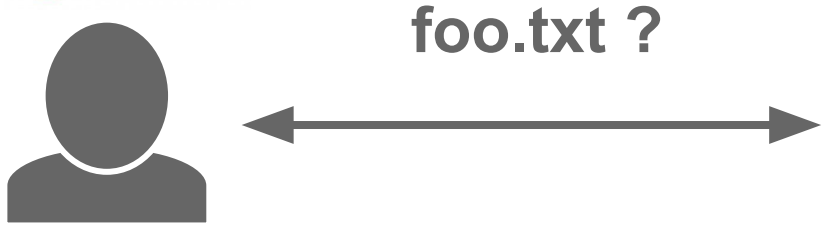
Retour dans les années 2000...

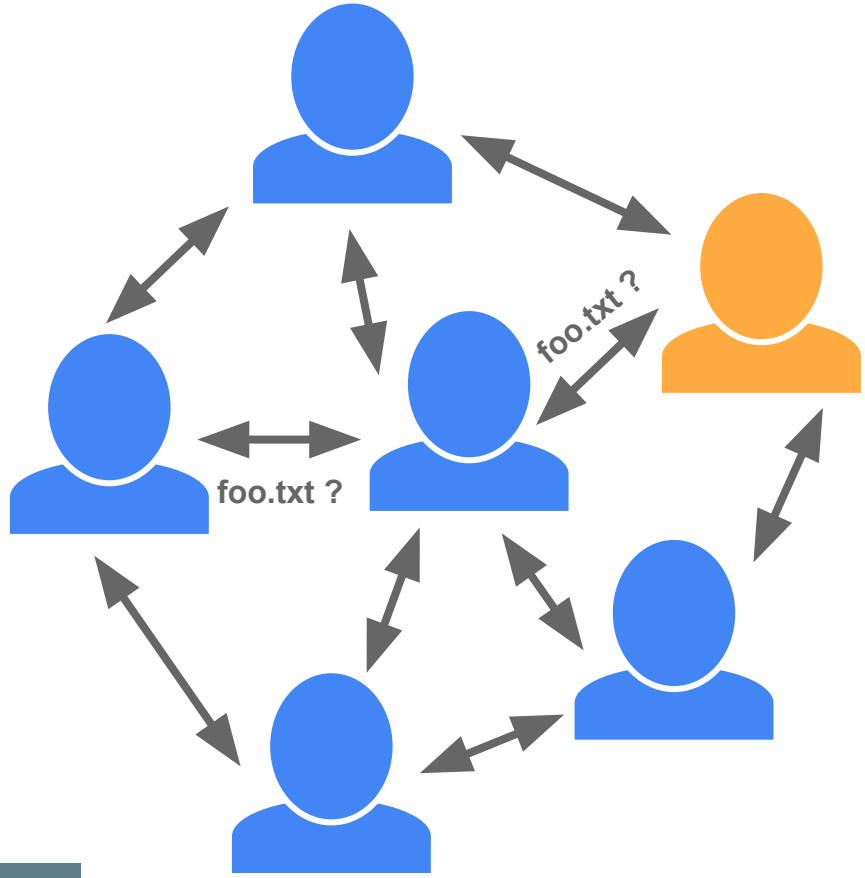
gnutella



Query Flooding

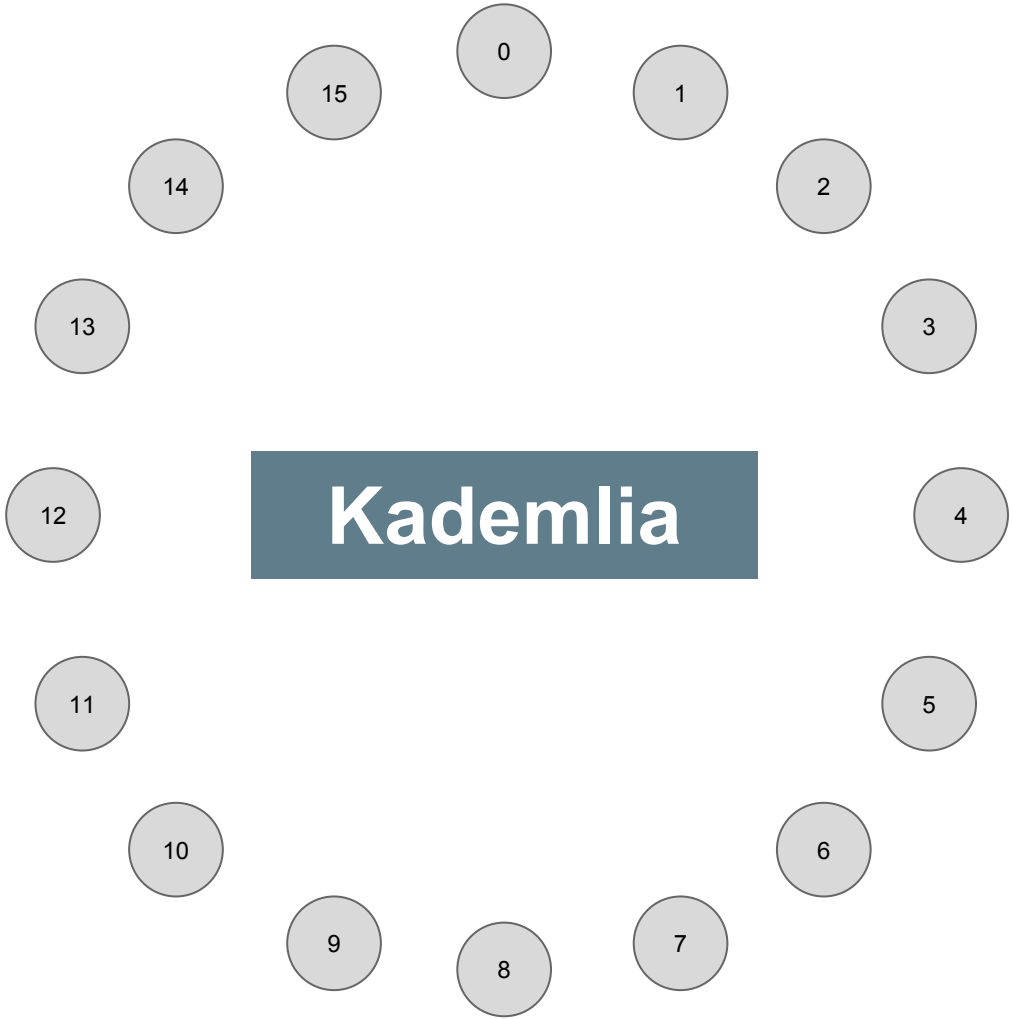
BitTorrent™





Distributed Hash Table

Distributed Hash Table
DHT ?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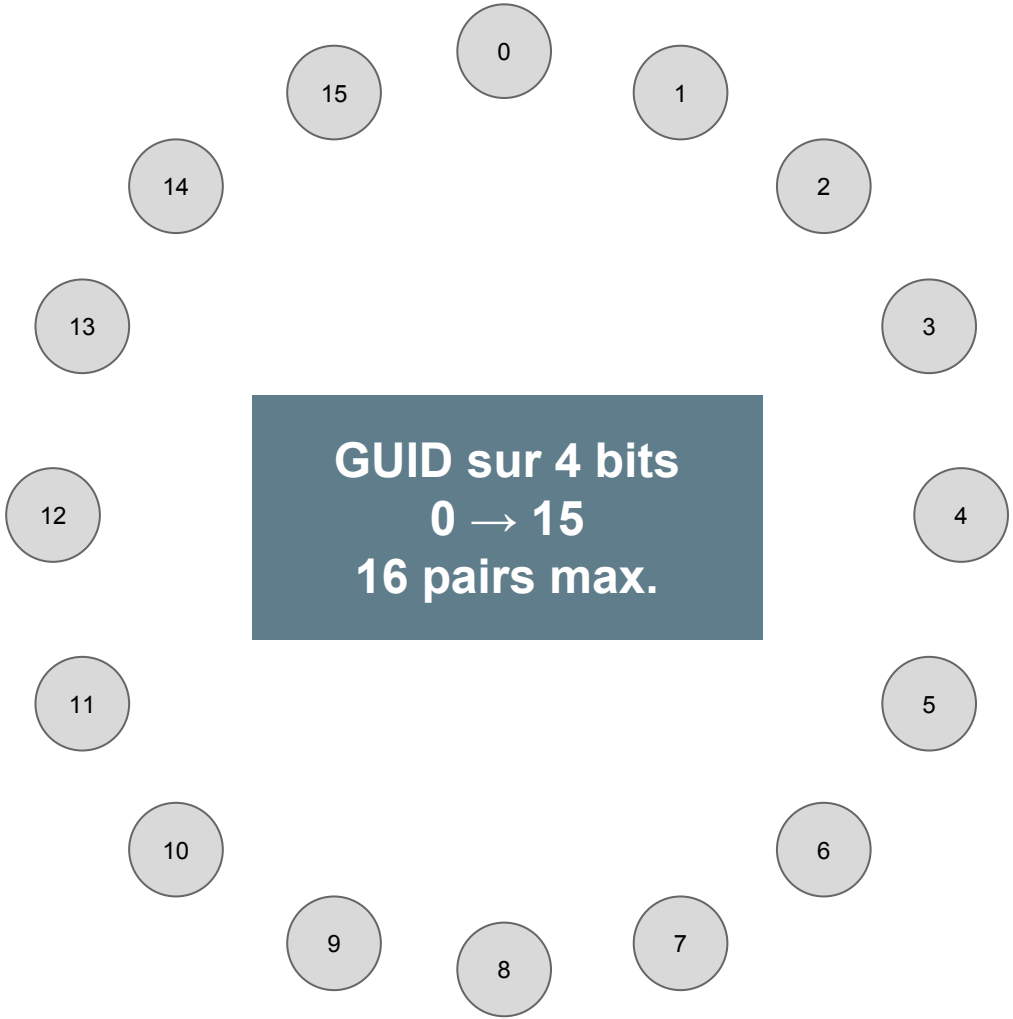
Kademlia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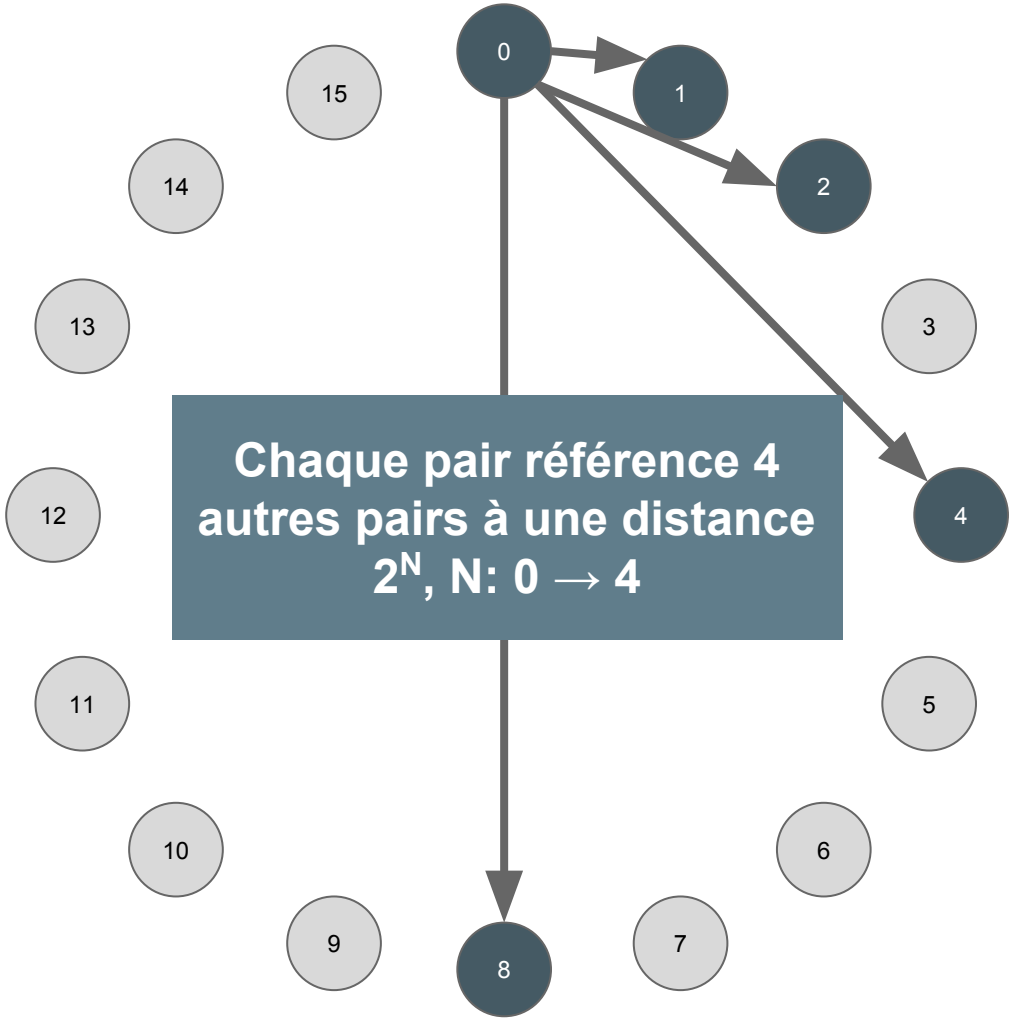
GUID sur 4 bits
0 → 15
16 pairs max.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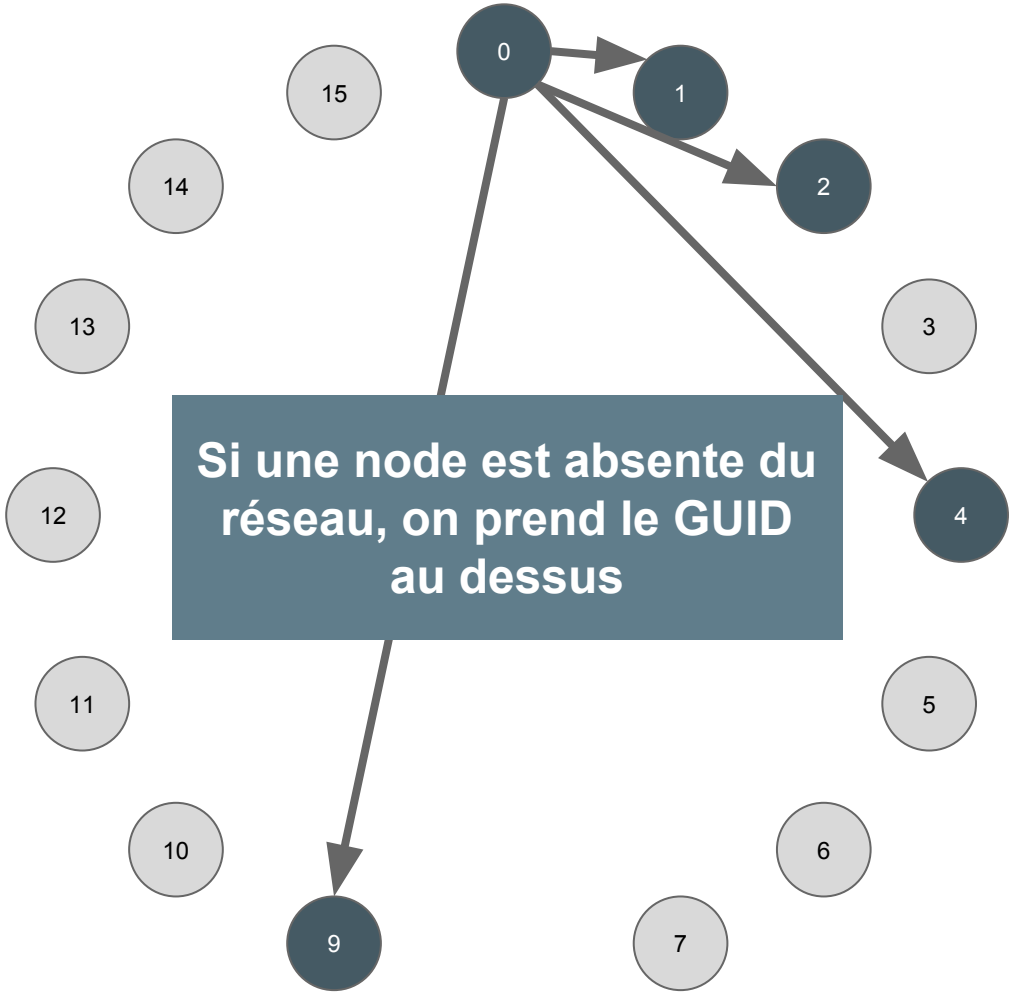
Chaque pair référence 4 autres pairs à une distance 2^N, N: 0 → 4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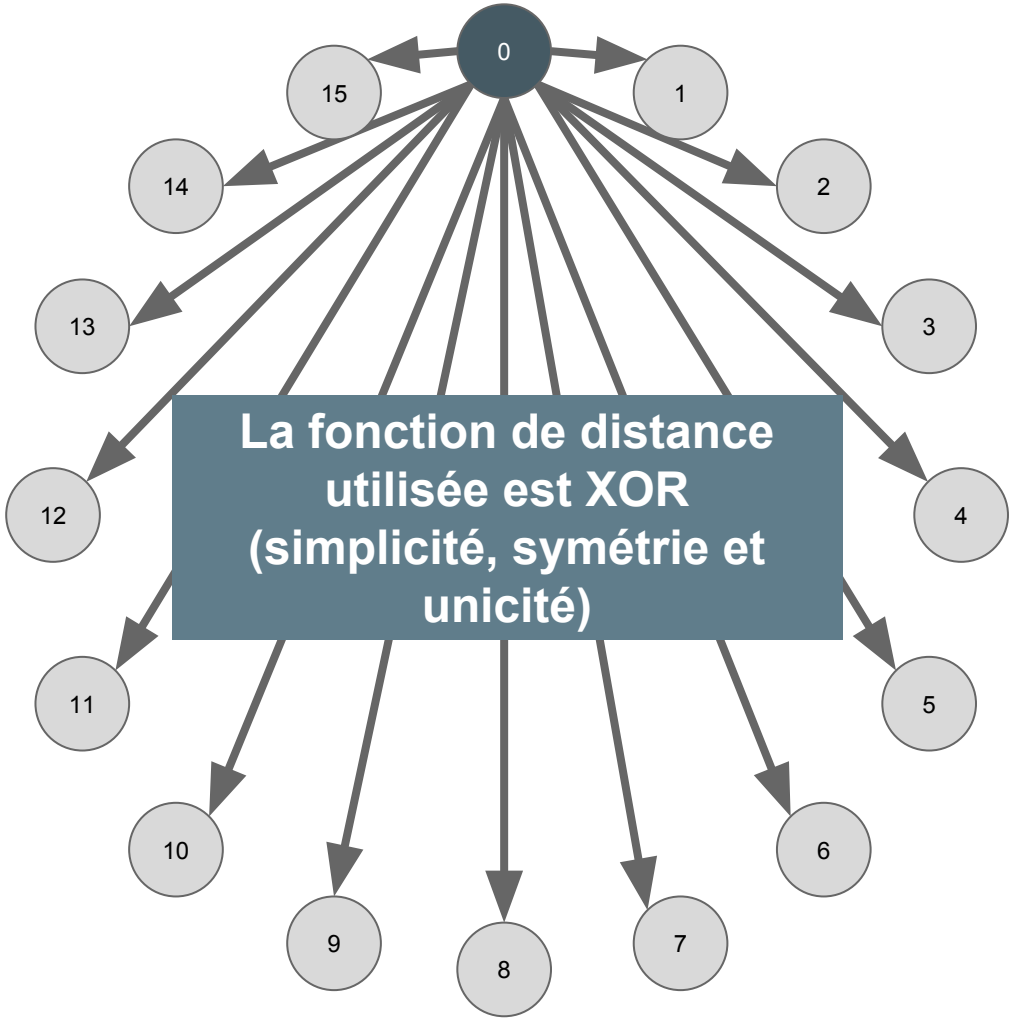
Si une node est absente du réseau, on prend le GUID au dessus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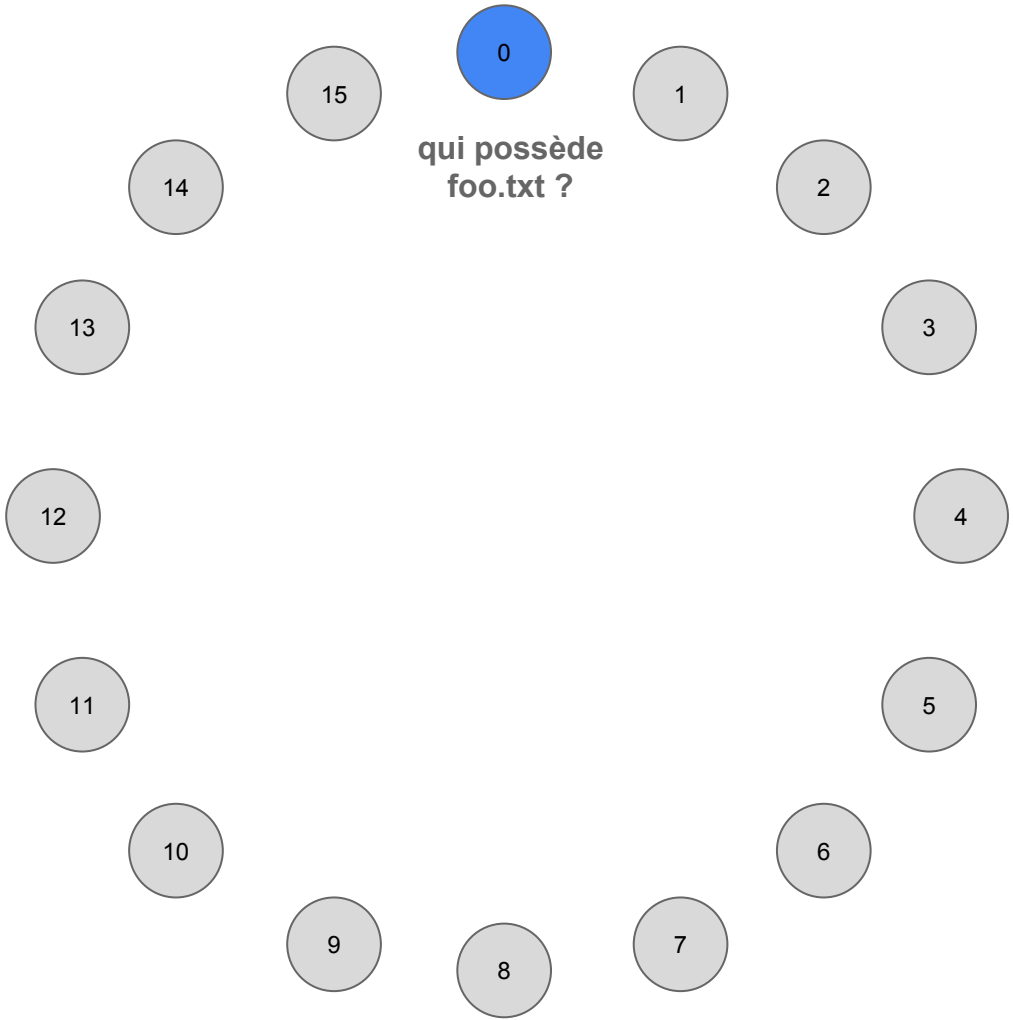
La fonction de distance utilisée est XOR (simplicité, symétrie et unicité)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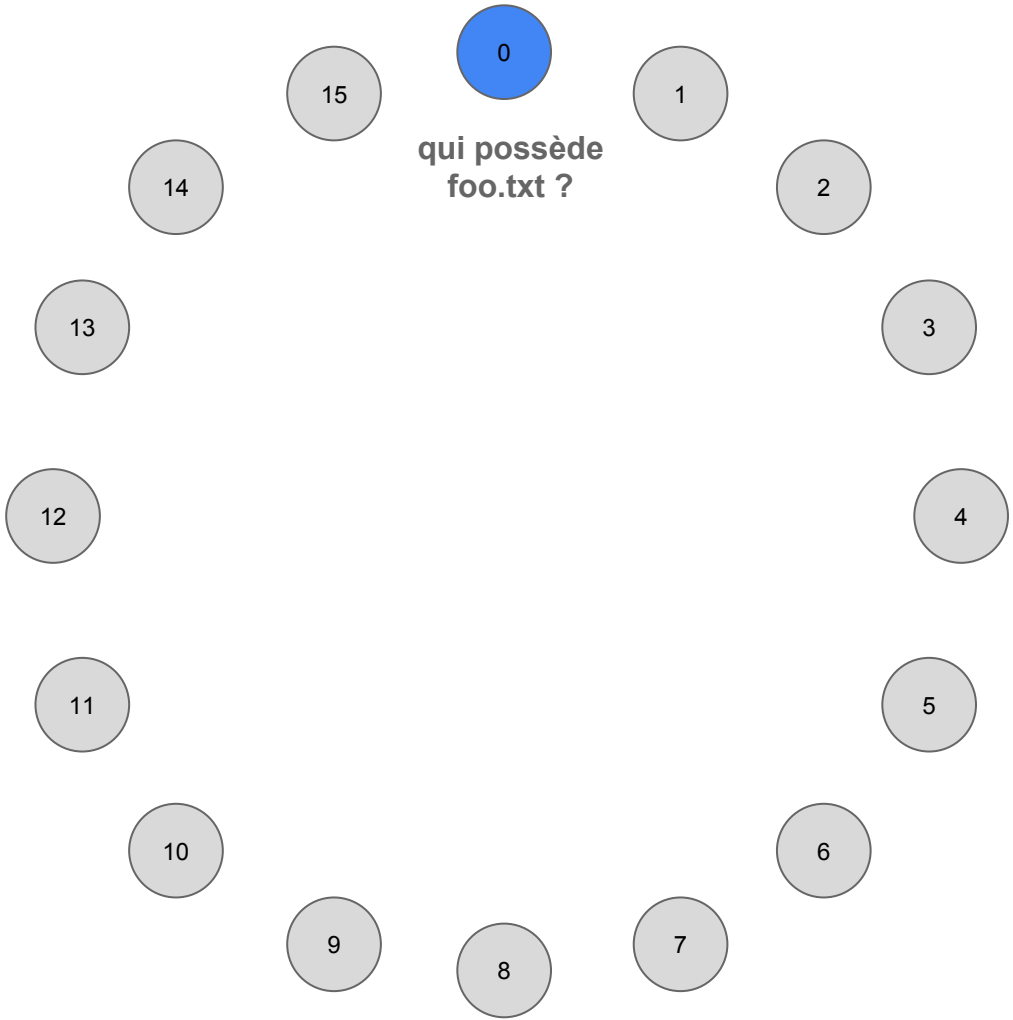
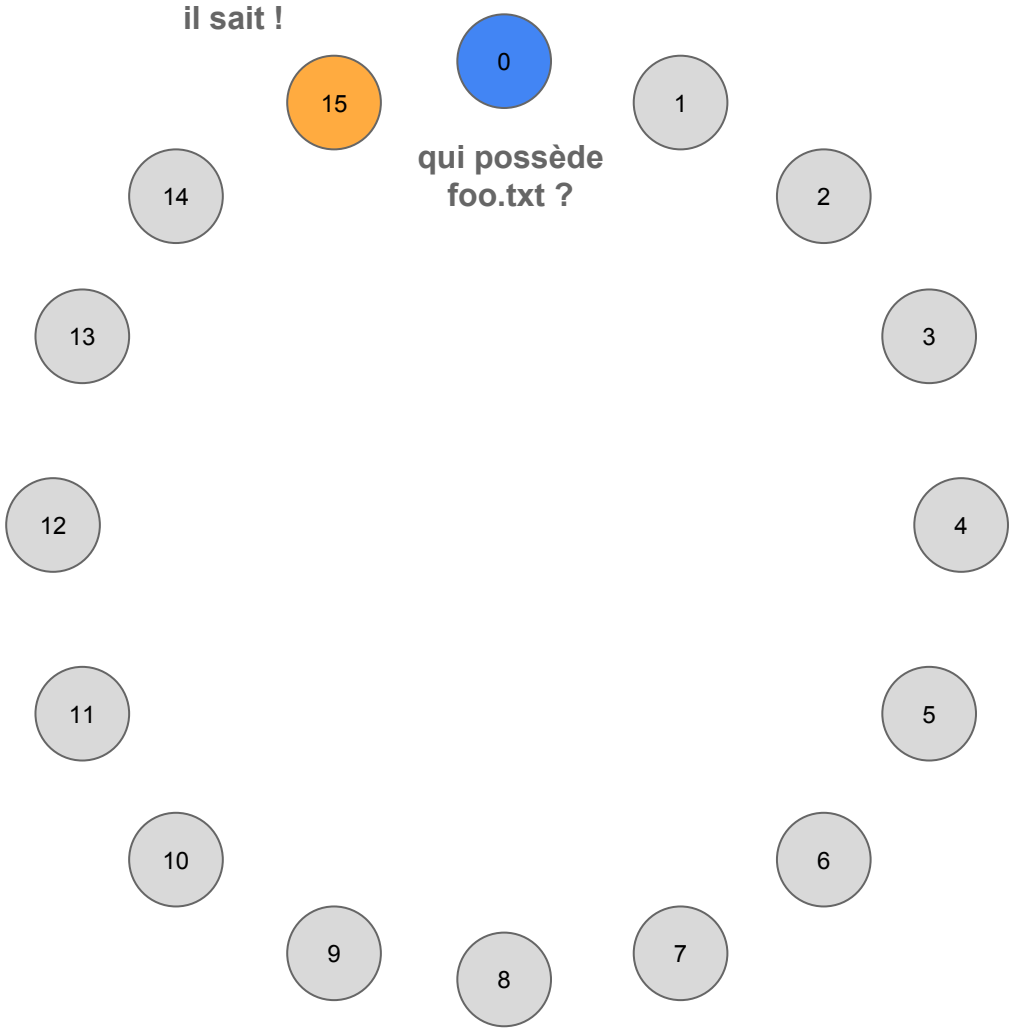
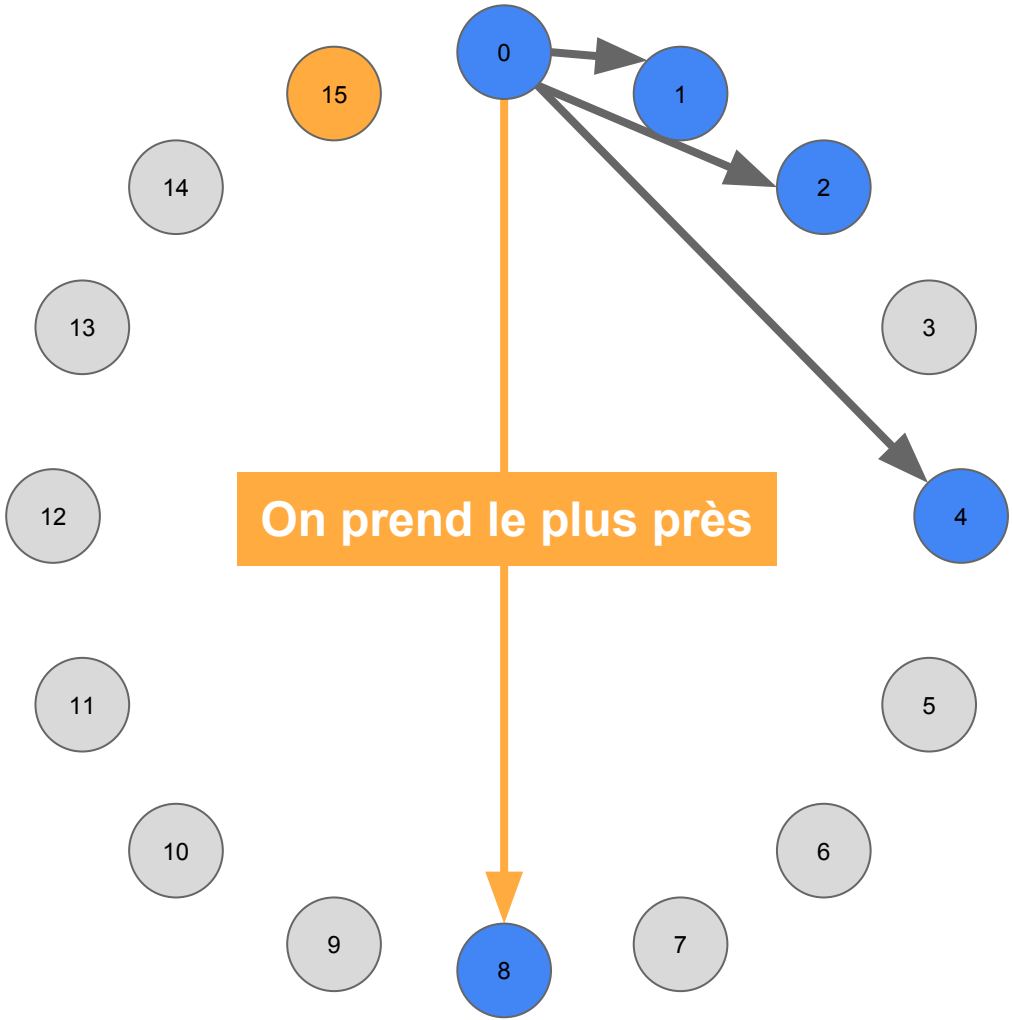
qui possède
foo.txt ?

infohash(foo.txt) = 15





infohash(foo.txt) = 15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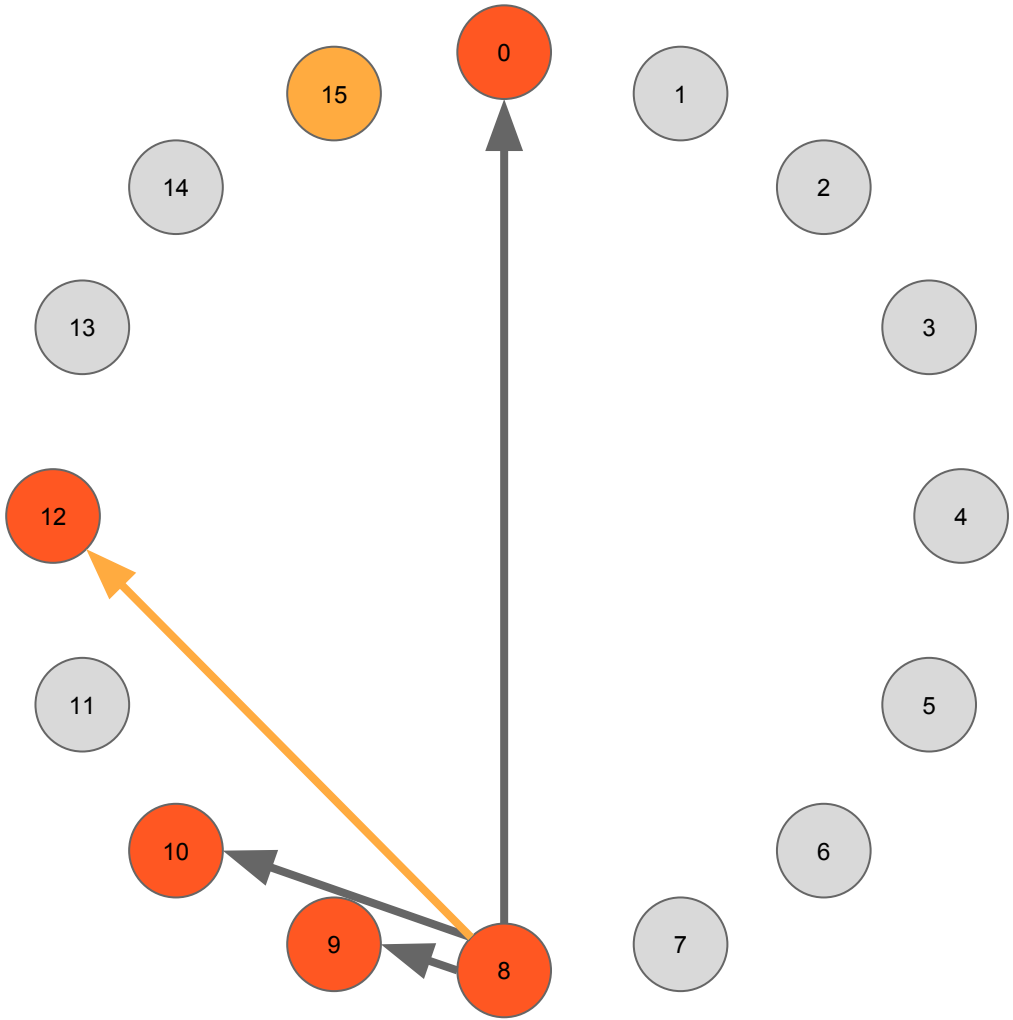
On prend le plus près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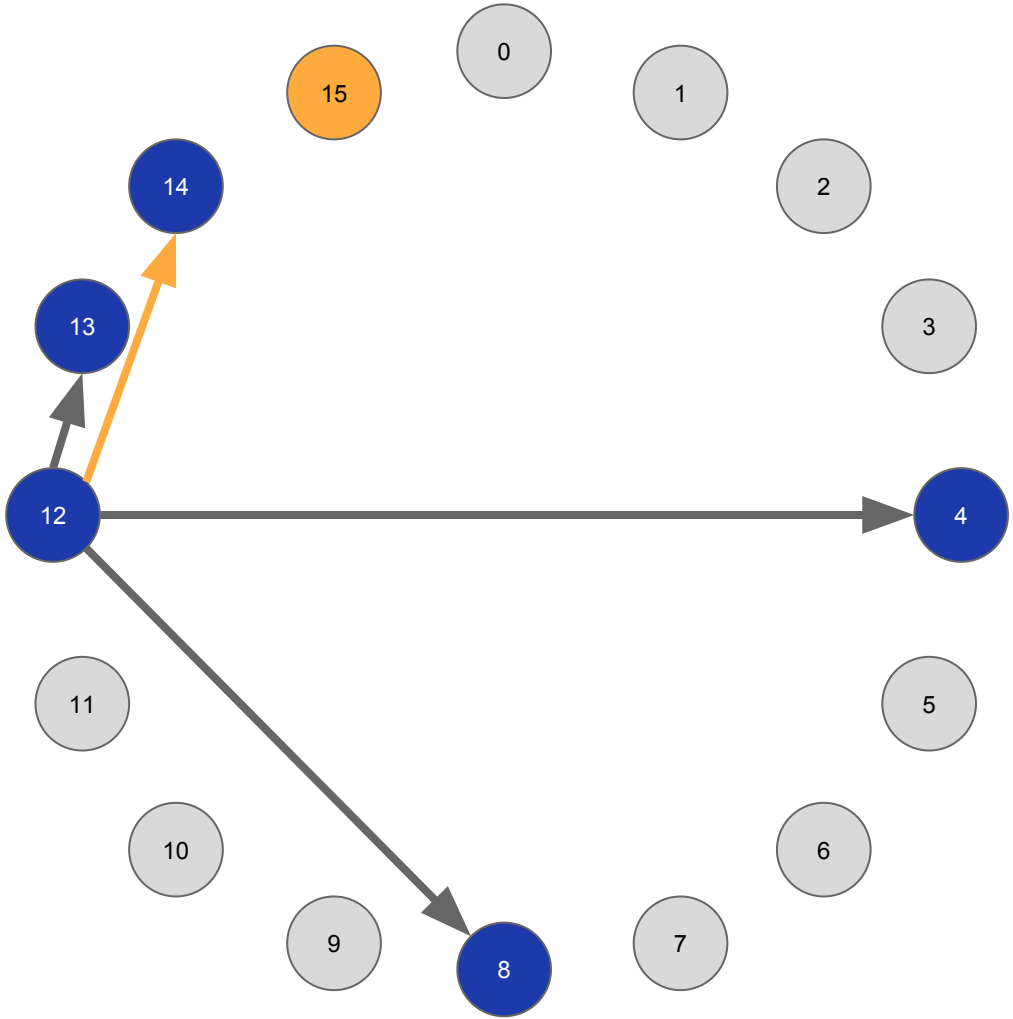
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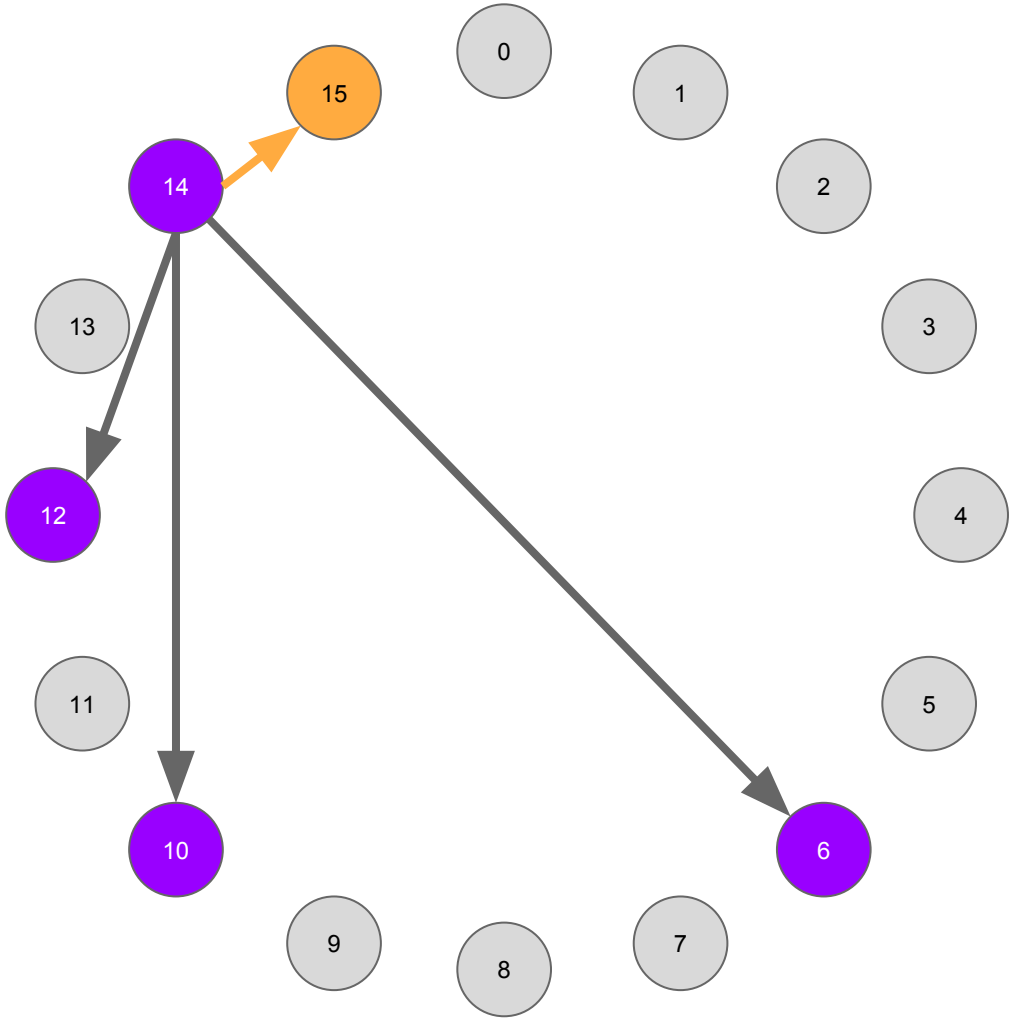
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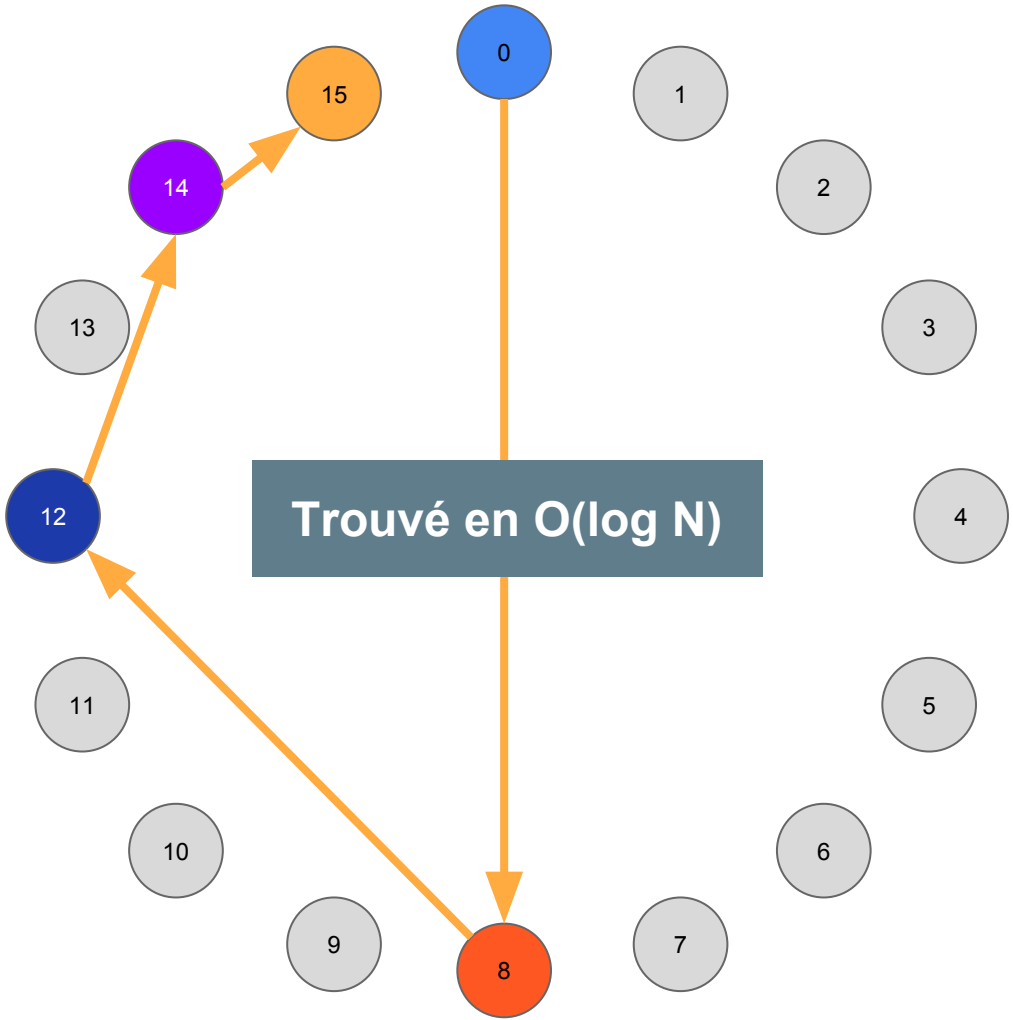
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Trouvé en O(log N)

Démo

Les magnet links
sur Bittorrent

Hadopi
Haute Autorité pour la diffusion des œuvres
et la protection des droits sur internet

TELEMA ET LE STUDIO CANAL+ PRESENTENT UN FILM
PRODUIT PAR CHARLES GASSOT
LE FILM DE LES NULS
LA CITÉ DE LA PEUR
Une comédie familiale.
RÉALISÉ PAR ALAIN BERBERIAN
TELEMA ET LE STUDIO CANAL+ PRESENTENT UN FILM PRODUIT PAR CHARLES GASSOT LE FILM DE LES NULS LA CITÉ DE LA PEUR UNE COMÉDIE FAMILIALE
CHANTAL LAUBY • ALAIN CHABAT • DOMINIQUE FARRUGIA • GÉRARD DARMON • CAMI KARMANN
SCÉNARIO ORIGINAL CHANTAL LAUBY ALAIN CHABAT DOMINIQUE FARRUGIA • DIRECTEUR DE LA PHOTOGRAPHIE LAURENT DAILLAND
MUSIQUE PHILIPPE CHANY • MONTAGE VÉRONIQUE PARNET
PRODUCTEUR DÉLÉGUÉ CHARLES GASSOT • PRODUCTEUR EXÉCUTIF DOMINIQUE BRUNNER
UNE PRODUCTION TELEMA LE STUDIO CANAL+ FRANCE 3 CINEMA M6 FILMS

Details for this torrent

La citÃ© de la Peur by LADB

Type:	Video > Movies	**Uploaded:**	2008-05-02 19:15:37 GMT
Files:	2	**By:**	wazany
Size:	691.28 MiB (724855831 Bytes)	**Seeders:**	13
Spoken language(s):	French	**Leechers:**	0
Texted language(s):	French	**Comments**	1

Info Hash:
96BFF9E1F47398C3807071B55AD658ED50F2042F

GET THIS TORRENT PLAY/STREAM TORRENT
(Problems with magnets links are fixed by upgrading your torrent client!)

Synopsis :

Odile Deray, attachÃ©e de presse, vient au Festival de Cannes pour prÃ©senter le film "Red is Dead".
Malheureusement, celui-ci est d'une telle faiblesse que personne ne souhaite en faire l'Ã©cho.
Mais lorsque les projectionnistes du long-mÃ©trage en question meurent chacun leur tour dans d'Ã©tranges circonstances,
"Red is dead" bÃ©nÃ©ficie d'une incroyable publicitÃ©. Serge Karamazov est alors chargÃ© de protÃ©ger le nouveau projectionniste du film...

```
var _ = require('lodash')
var DHT = require('bittorrent-dht')
var geoip = require('geoip-lite-country')
```

```
var _ = require('lodash')
var DHT = require('bittorrent-dht')
var geoip = require('geoip-lite-country')
```

```
var peers = []
var dht = new DHT()
```

```
var _ = require('lodash')
var DHT = require('bittorrent-dht')
var geoip = require('geoip-lite-country')

var peers = []
var dht = new DHT()
```

```
dht.on('peer', function (peer, infoHash, from) {
  var geo = geoip.lookup(peer.host)
  peers.push(
    peer.host + ':' +
    peer.port + ':' +
    geo.country
  )
})
```

```
var _ = require('lodash')
var DHT = require('bittorrent-dht')
var geoip = require('geoip-lite-country')

var peers = []
var dht = new DHT()

dht.on('peer', function (peer, infoHash, from) {
  var geo = geoip.lookup(peer.host)
  peers.push(
    peer.host + ':' +
    peer.port + ':' +
    geo.country
  )
})
```

```
setTimeout(function () {
  dht.destroy()
  console.log(_.uniq(peers))
}, 10 * 1000)
```

```
var _ = require('lodash')
var DHT = require('bittorrent-dht')
var geoip = require('geoip-lite-country')

var peers = []
var dht = new DHT()

dht.on('peer', function (peer, infoHash, from) {
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  )
})

setTimeout(function () {
  dht.destroy()
  console.log(_.uniq(peers))
}, 10 * 1000)
```

```
dht.lookup(infoHash)
```

```
var _ = require('lodash')
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var geoip = require('geoip-lite-country')

var peers = []
var dht = new DHT()

dht.on('peer', function (peer, infoHash, from) {
  var geo = geoip.lookup(peer.host)
  peers.push(
    peer.host + ':' +
    peer.port + ':' +
    geo.country
  )
})

setTimeout(function () {
  dht.destroy()
  console.log(_.uniq(peers))
}, 10 * 1000)

dht.lookup(infoHash)
```

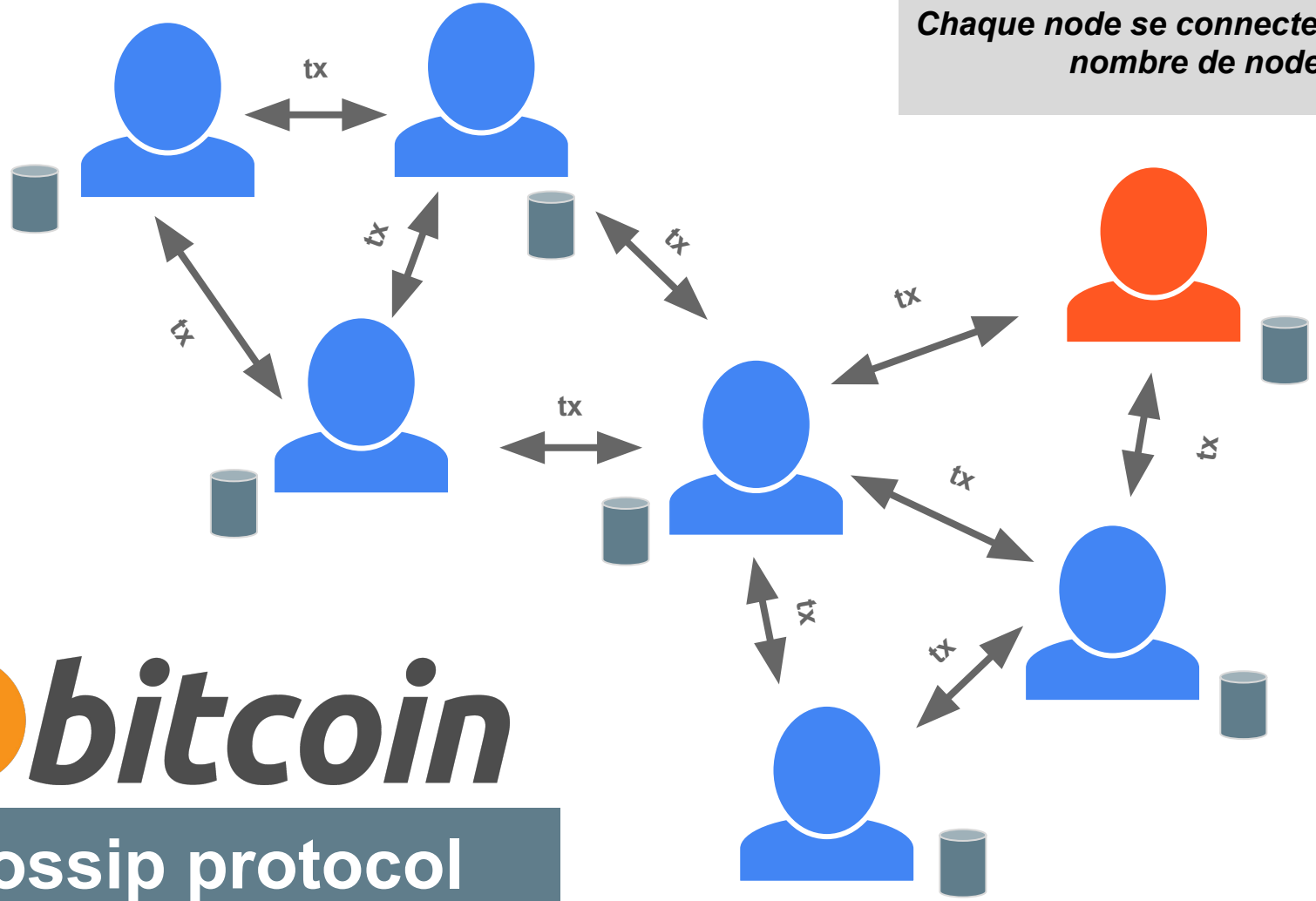
```
Done crawling
Found 12 peers
[ '91.138.225.[redacted]:62762:GR',
  '178.194.206.[redacted]:17132:CH',
  '5.51.42.[redacted]:33457:FR',
  '51.15.3.[redacted]:54728:NL',
  '5.51.42.[redacted]:45442:FR',
  '88.191.54.[redacted]:62348:FR',
  '51.15.3.[redacted]:51413:NL',
  '178.194.206.[redacted]:60482:CH',
  '82.253.38.[redacted]:61818:FR',
  '82.249.8.[redacted]:33876:FR',
  '178.194.206.[redacted]:45429:CH',
  '178.194.206.[redacted]:37603:CH' ]
Crawl ended
Done in 10.57s.
```

Peer to Peer

Privé

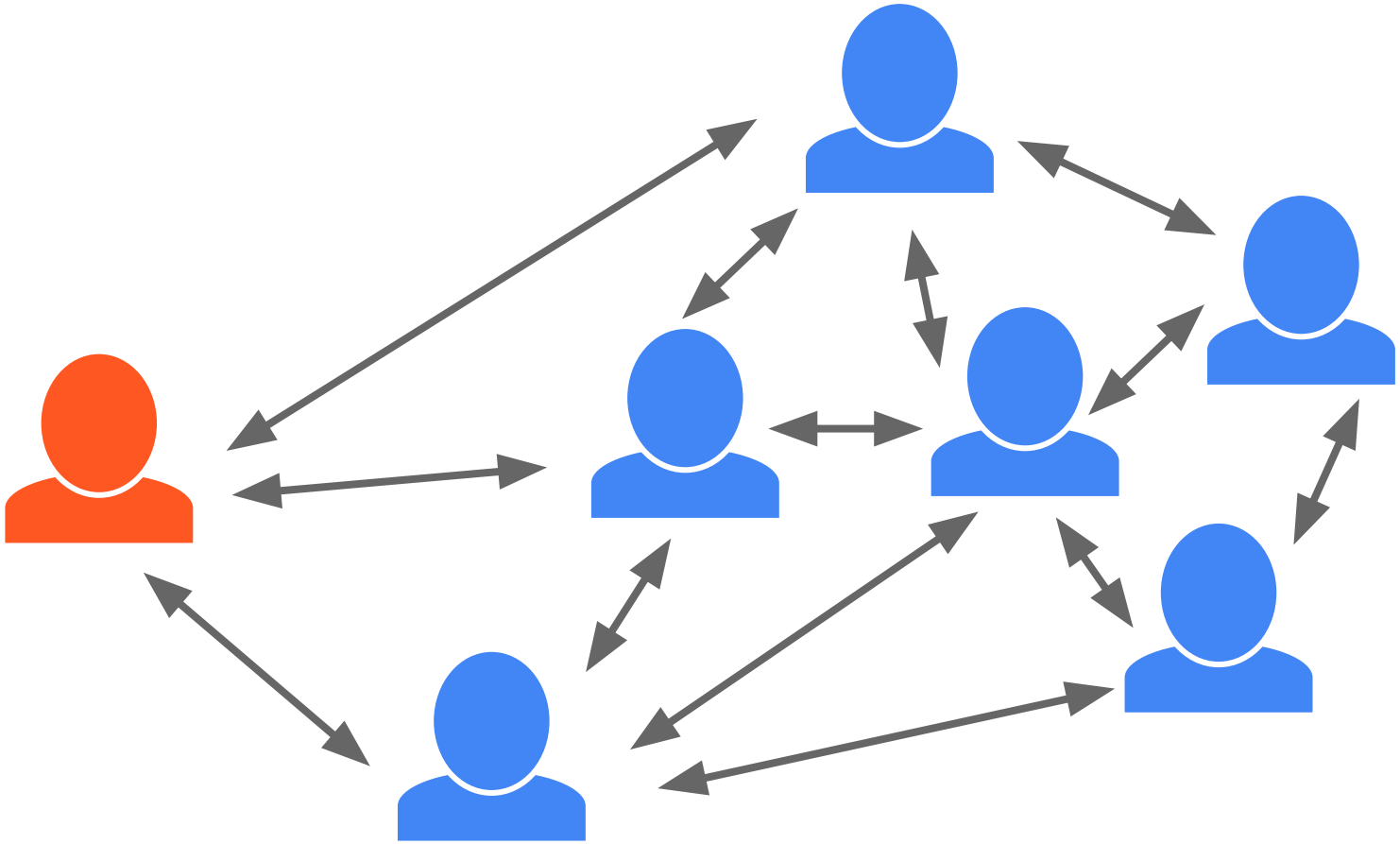
Et la blockchain dans tout ca ?

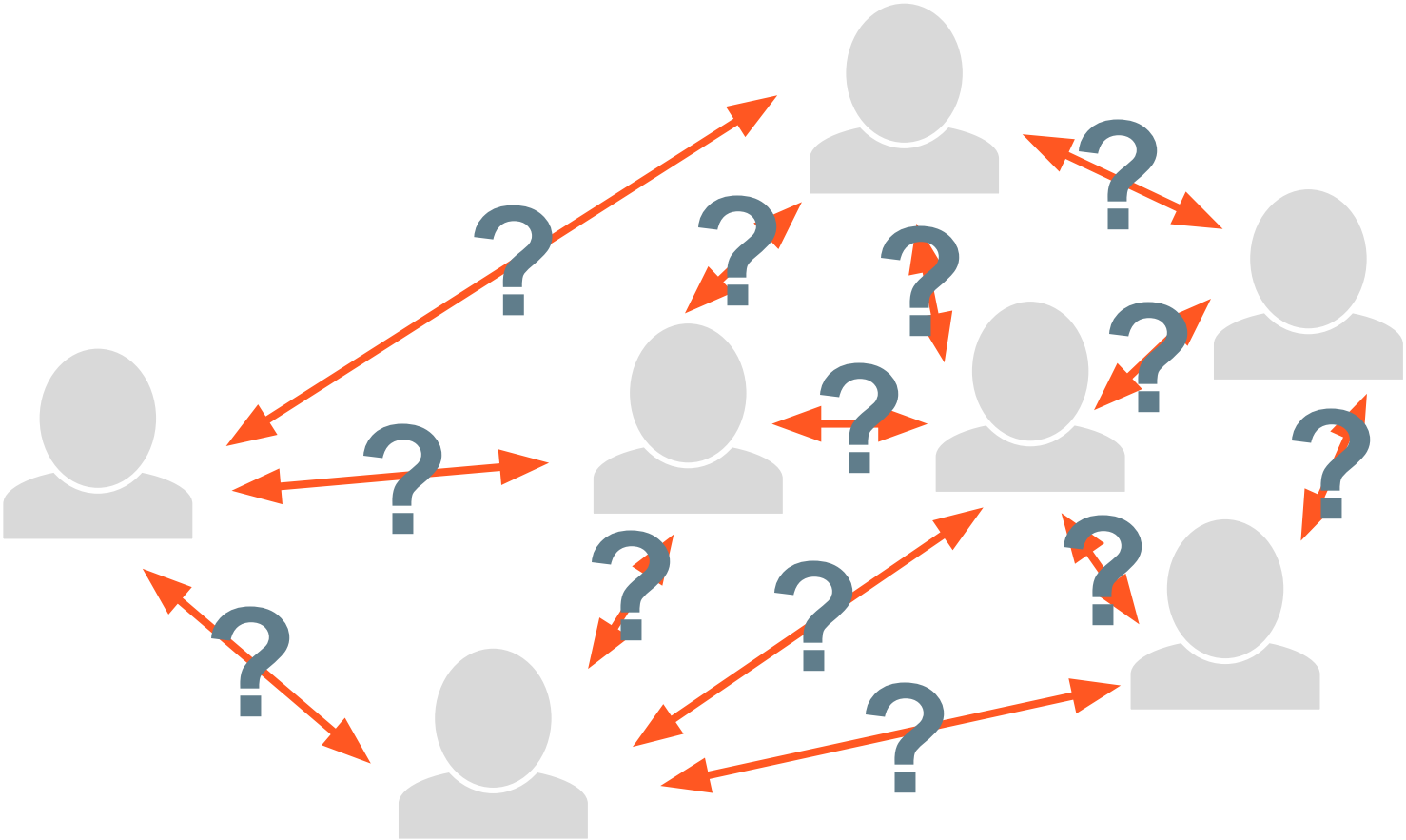
Chaque node se connecte à un grand nombre de nodes



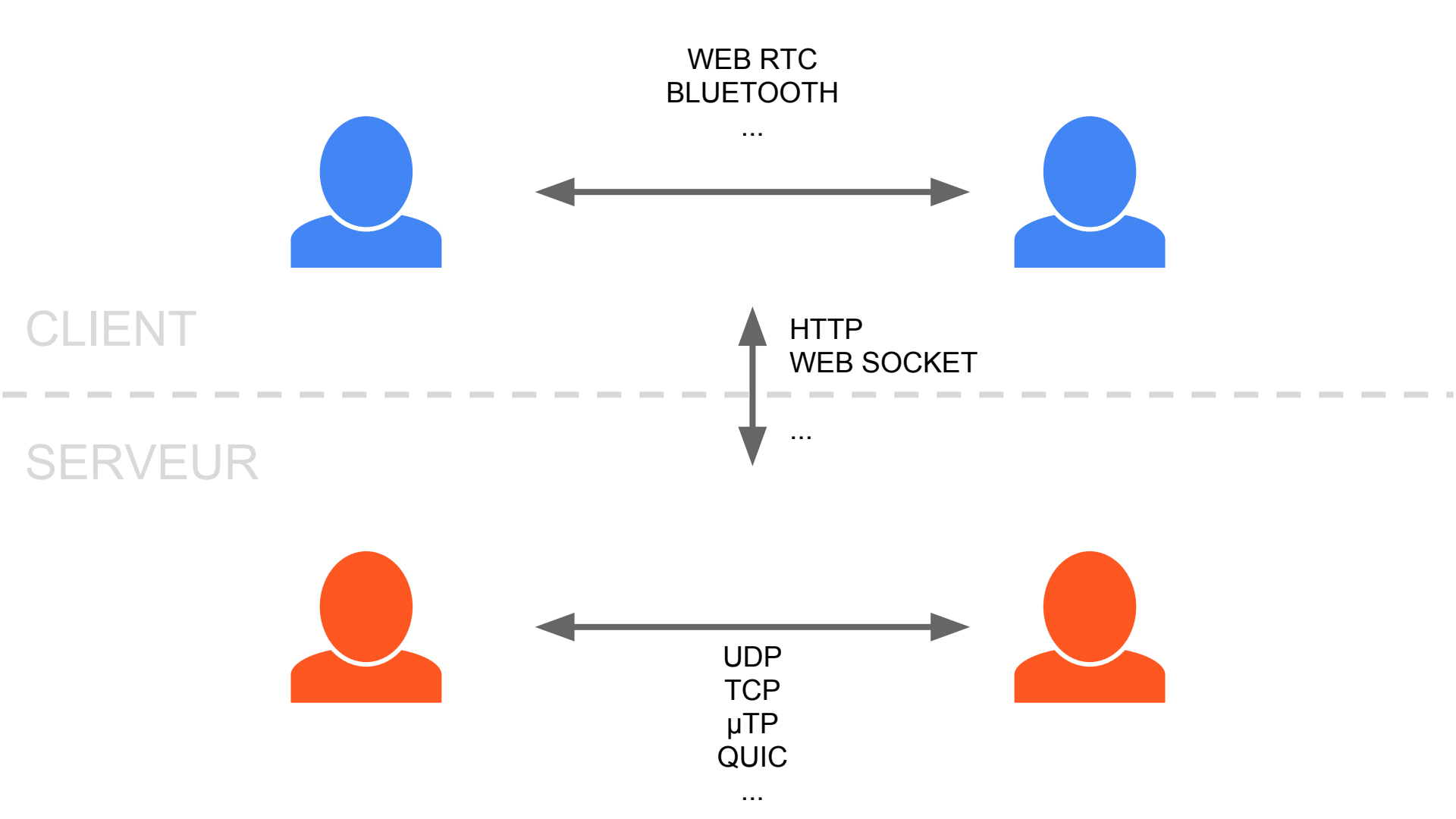
bitcoin

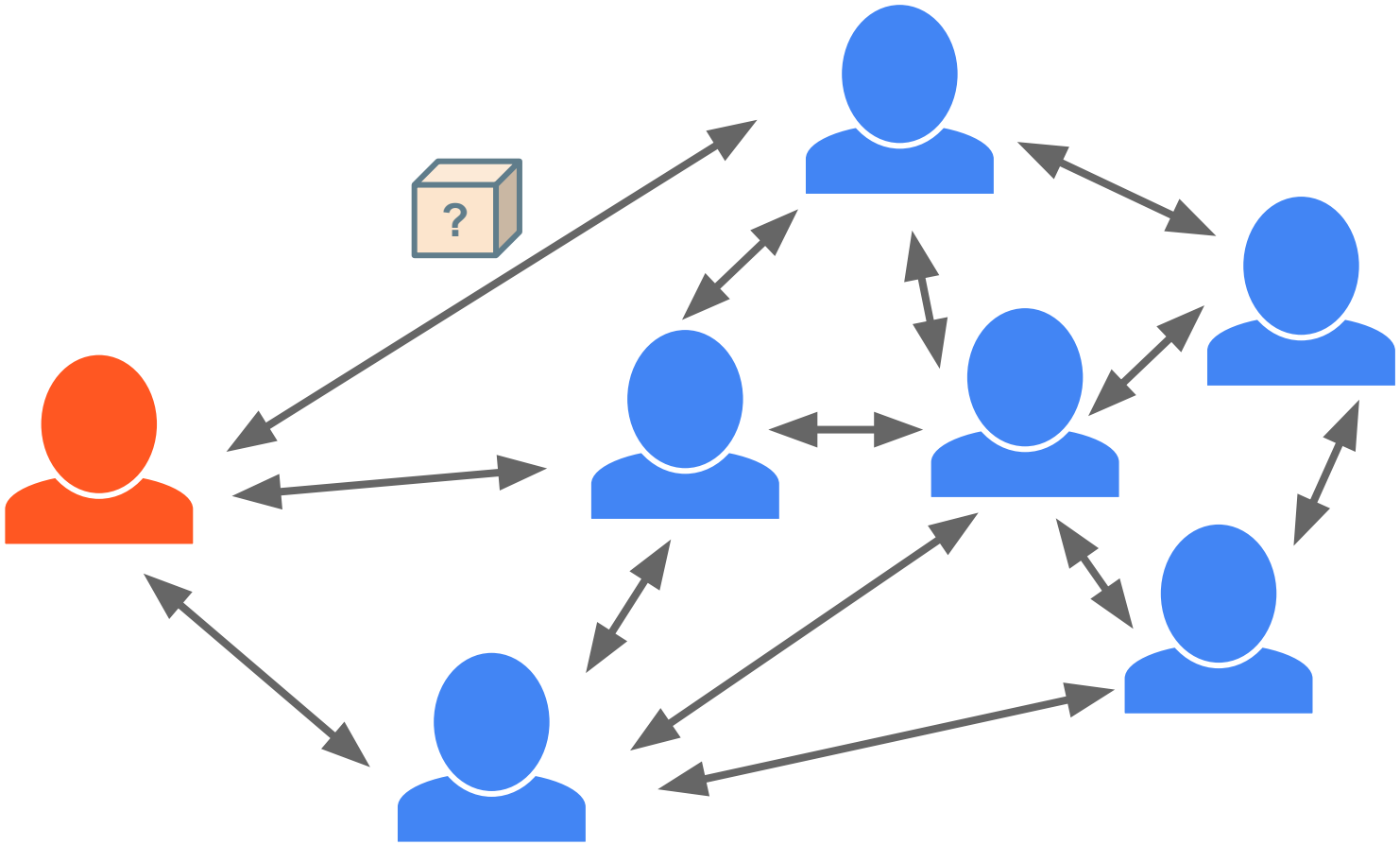
Gossip protocol

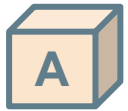




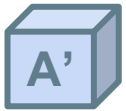
Transport


WEB RTC
BLUETOOTH
...
CLIENT
HTTP
WEB SOCKET
...
SERVEUR
UDP
TCP
µTP
QUIC
...





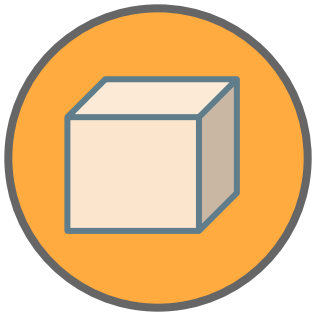
diff ?



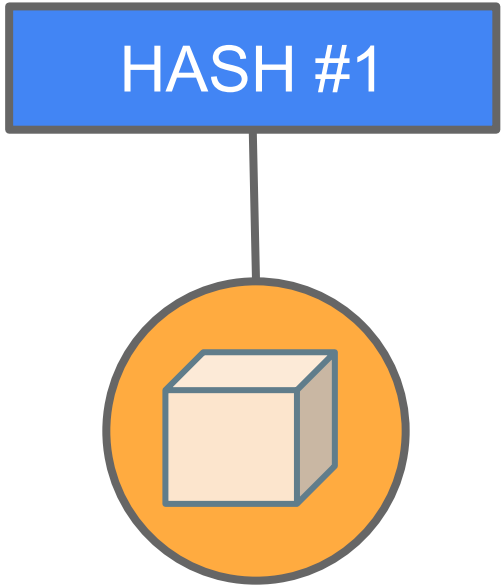
Data integrity

Merkle “Tree”
Merkle Directed Acyclic Graph

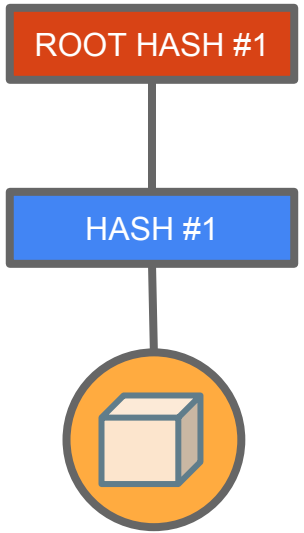
Merkle “Tree”
Merkle Directed Acyclic Graph



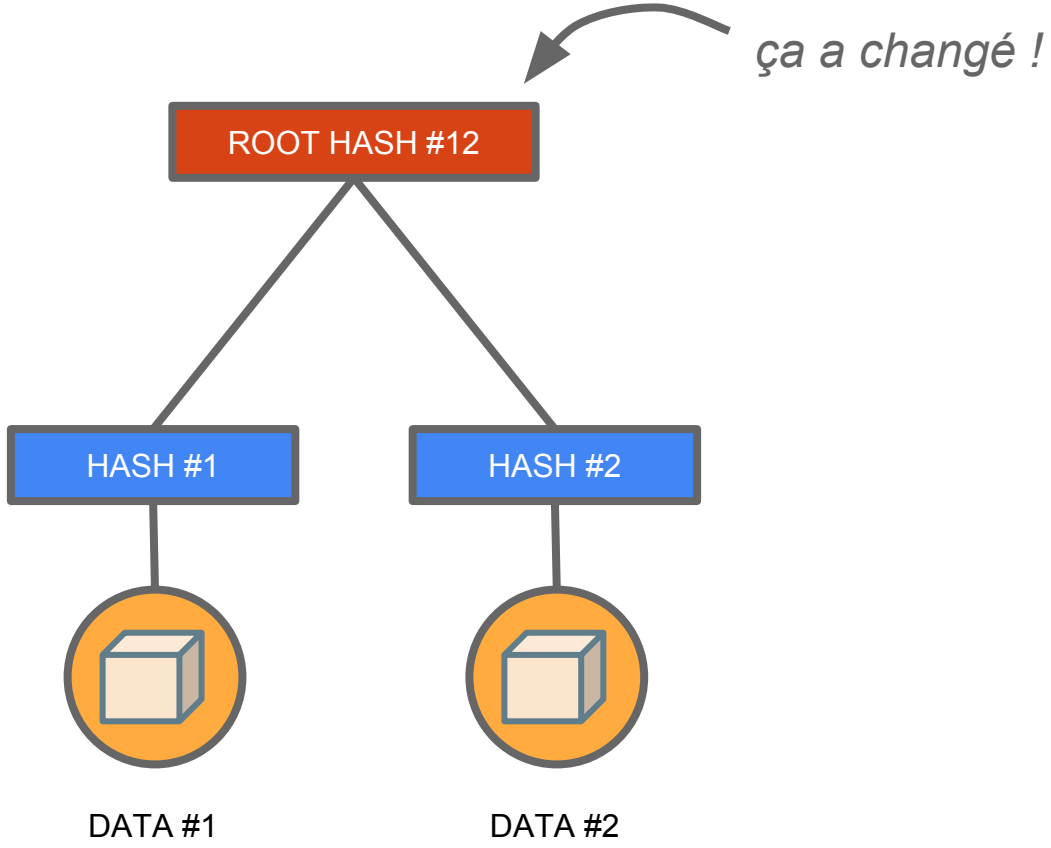
DATA #1

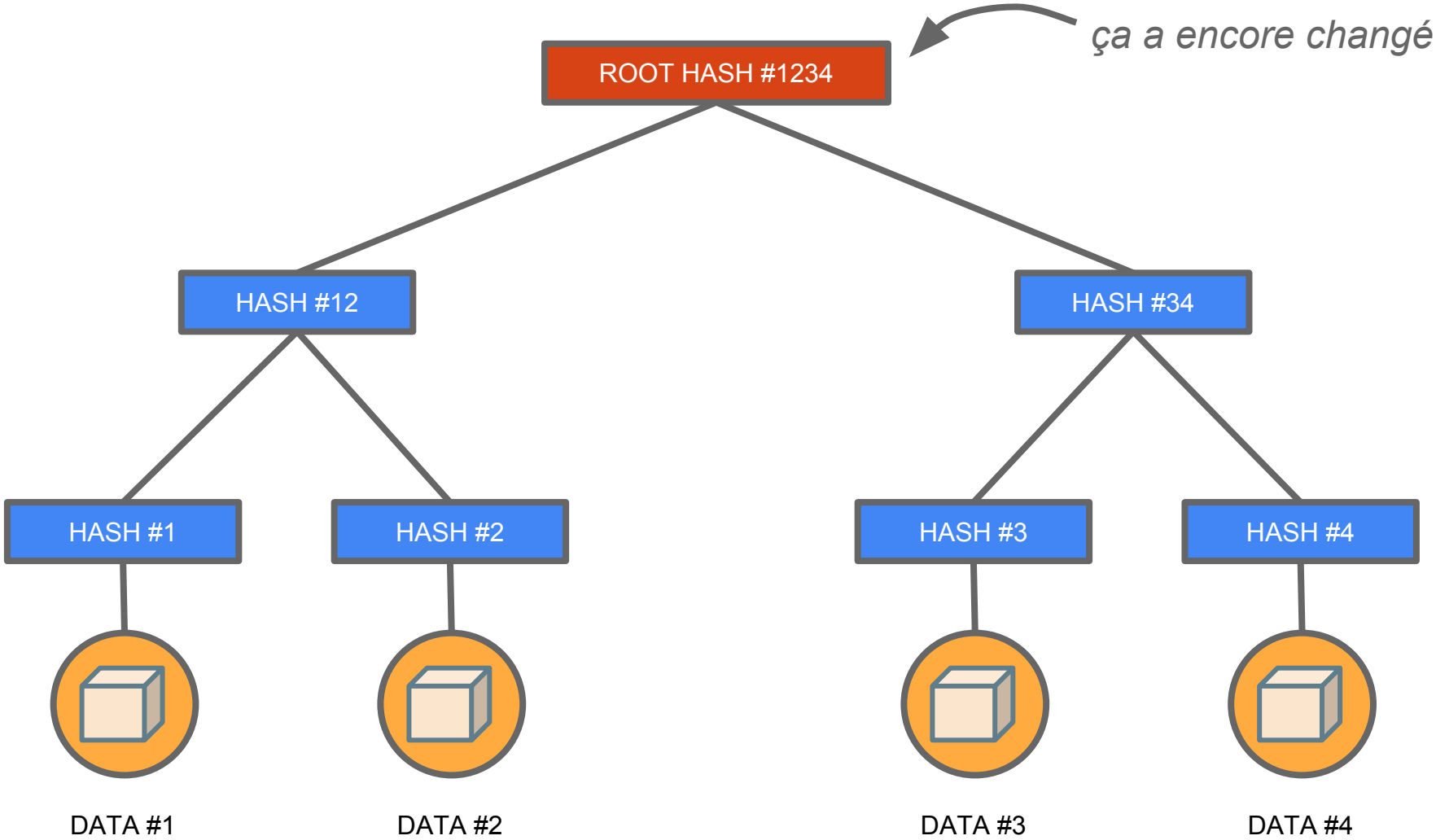


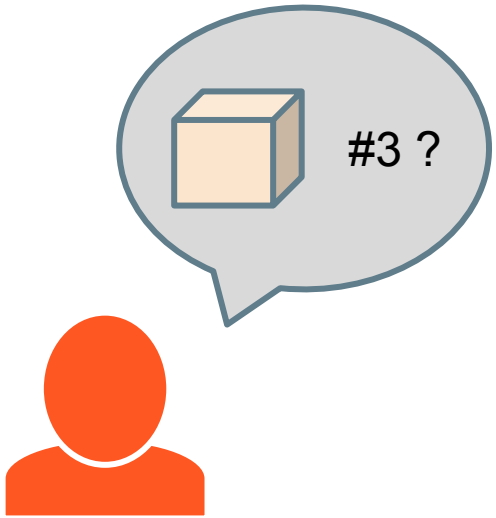
DATA #1



DATA #1


ça a changé !
ROOT HASH #12
HASH #1
HASH #2
DATA #1
DATA #2


ça a encore changé !
ROOT HASH #1234
HASH #12
HASH #34
HASH #1
HASH #2
HASH #3
HASH #4
DATA #1
DATA #2
DATA #3
DATA #4


#3 ?

je connais le root hash de source sûre

ROOT HASH #1234

HASH #12

HASH #34

HASH #1

HASH #2

HASH #3

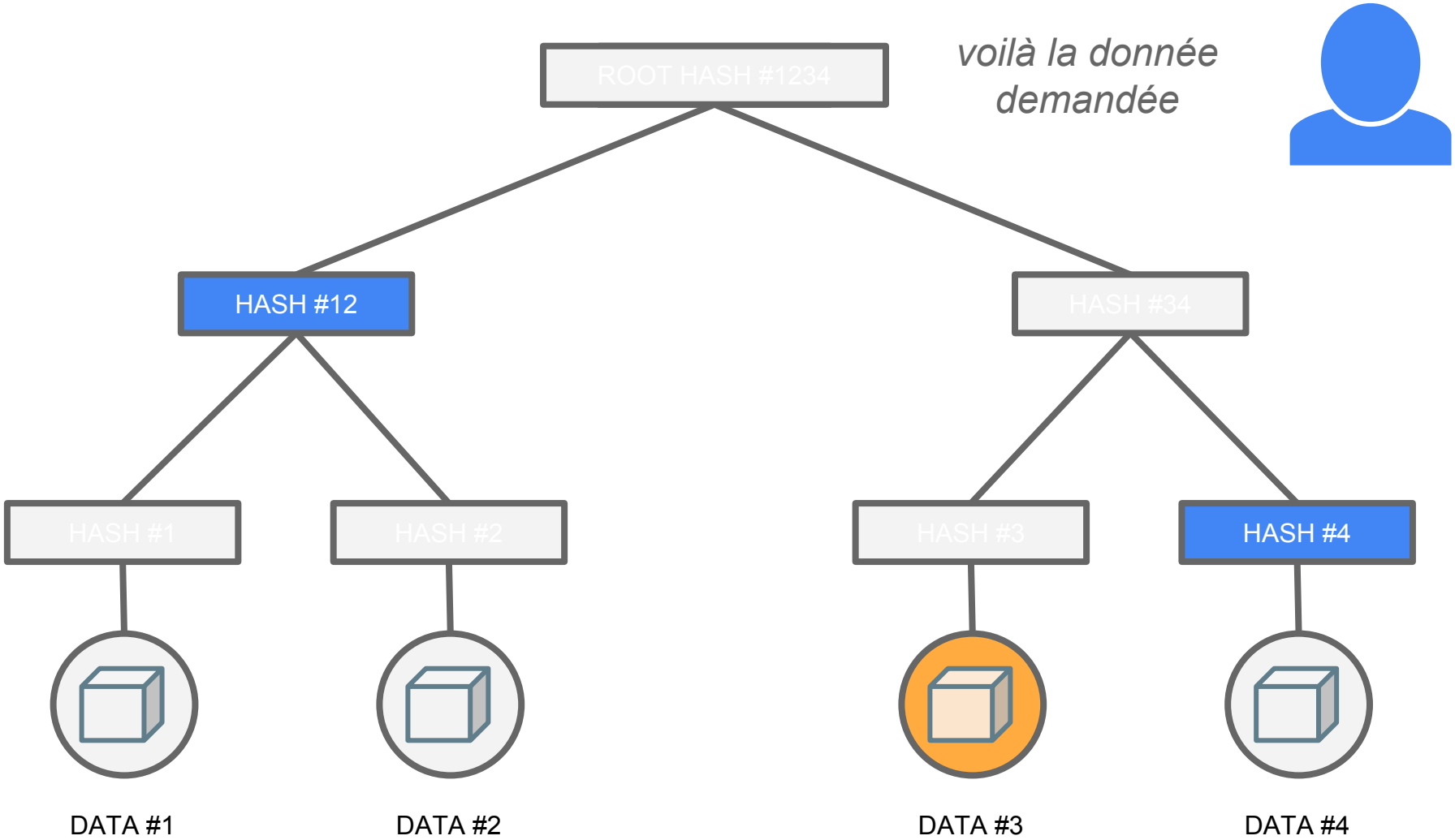
HASH #4

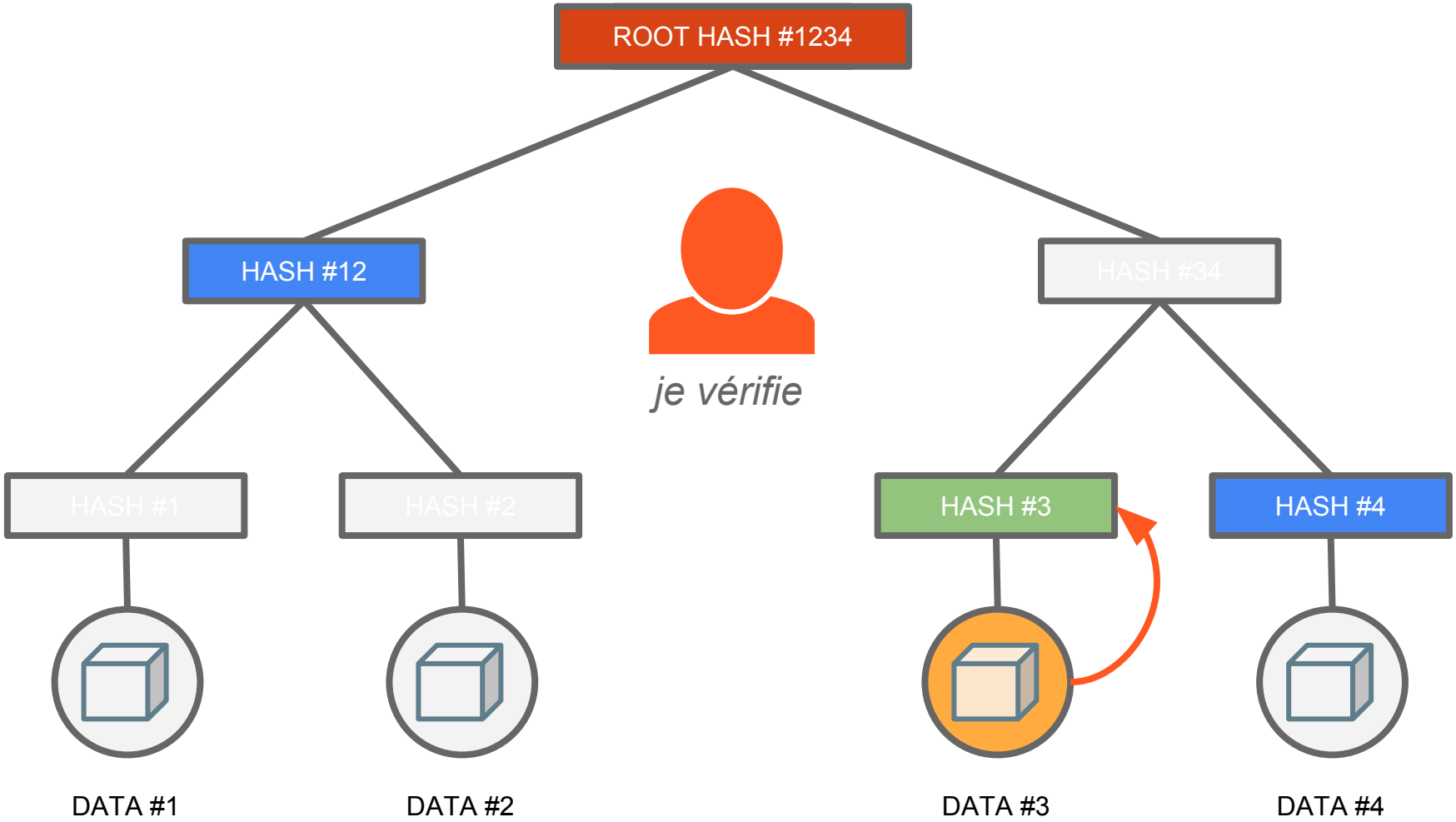
DATA #1

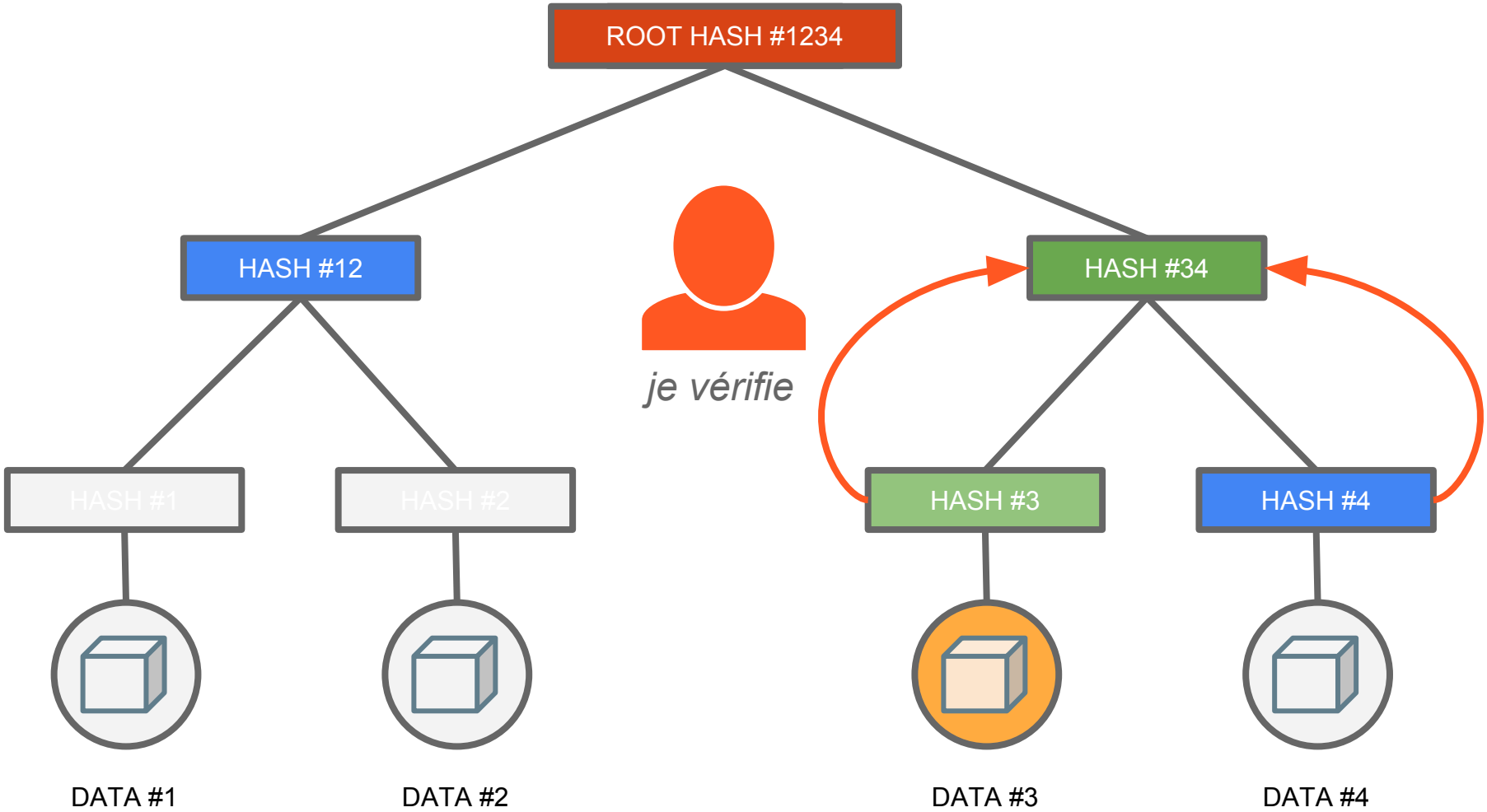
DATA #2

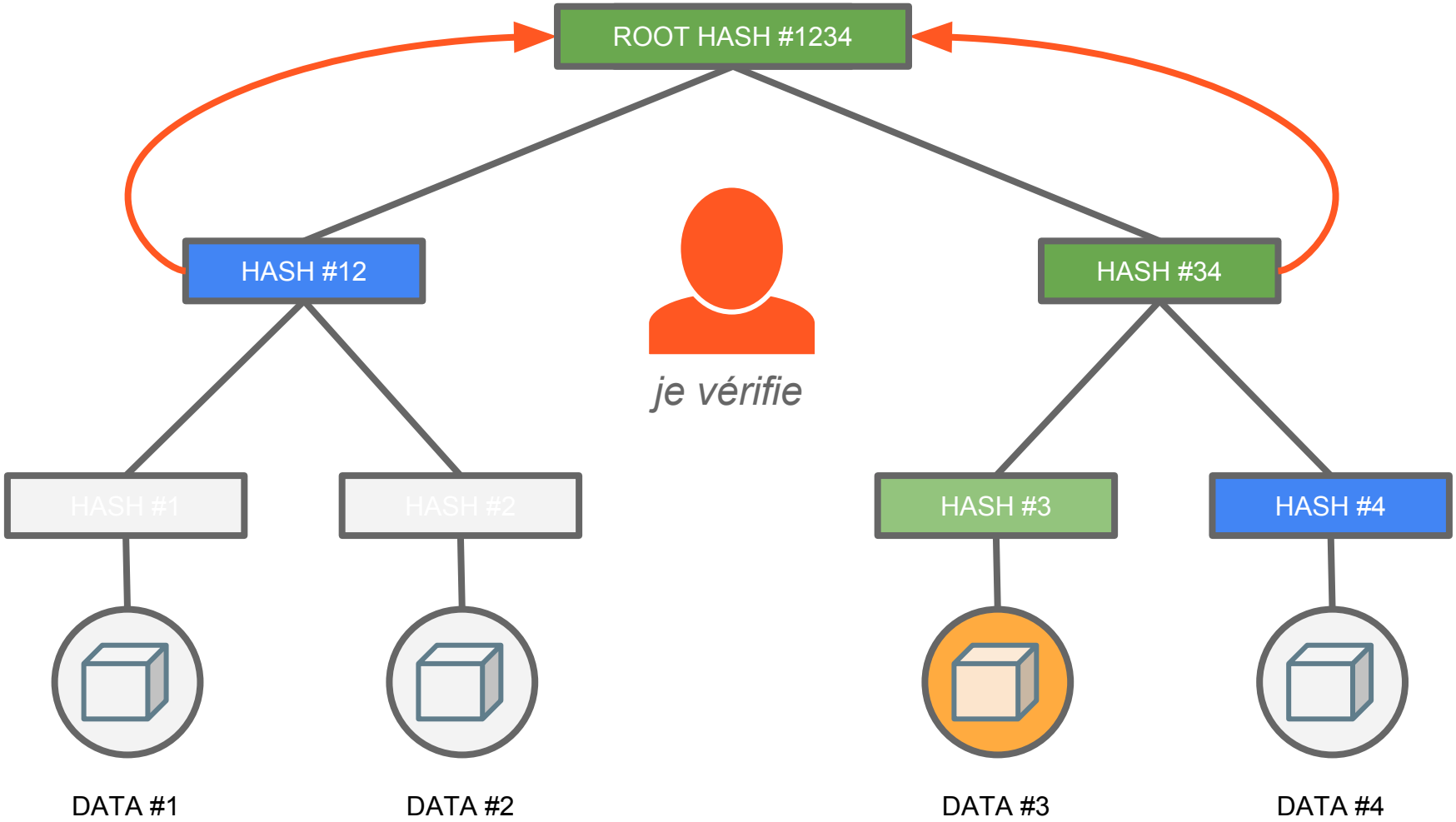
DATA #3

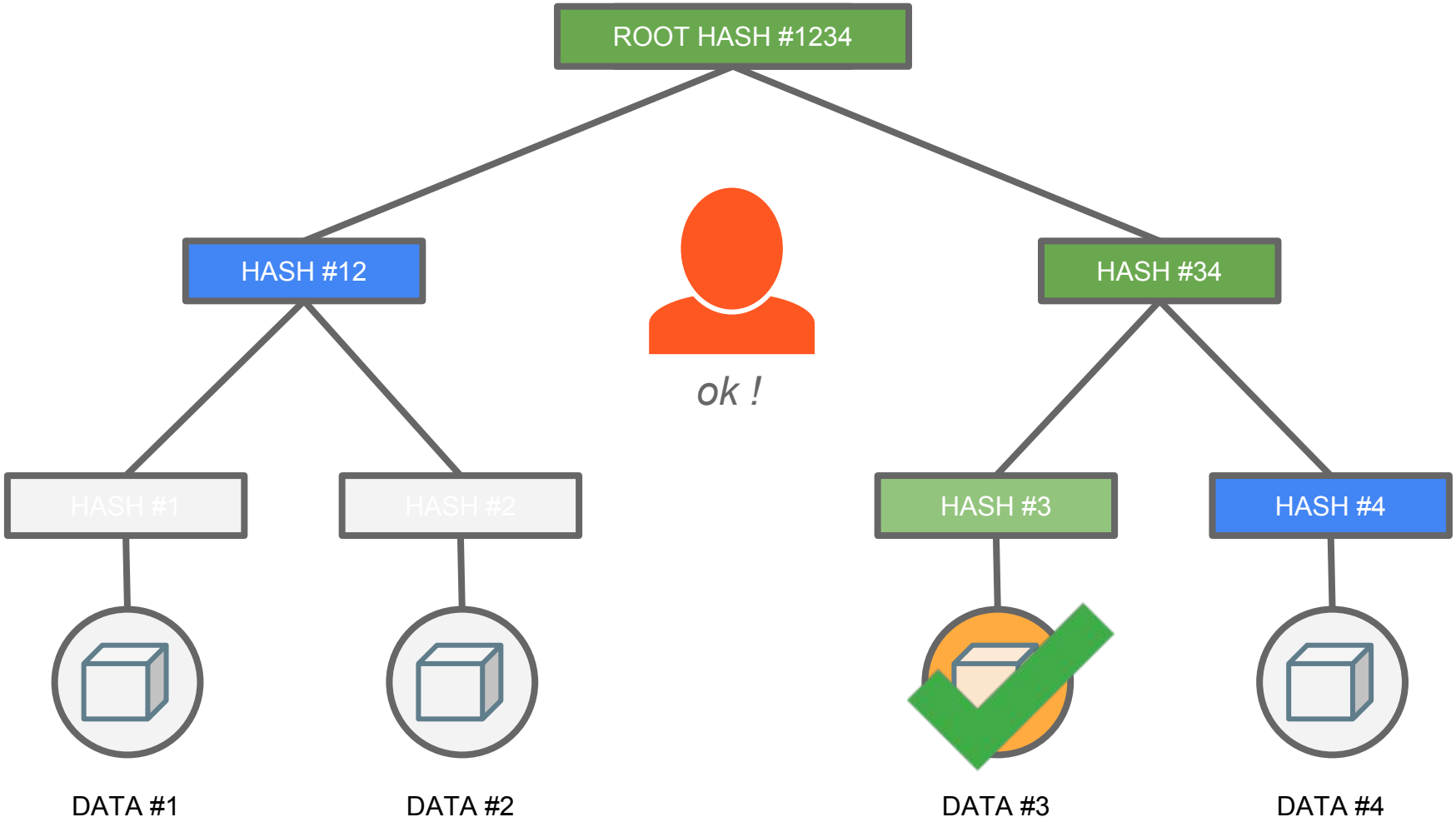
DATA #4


ROOT HASH #1234
voilà la donnée demandée
HASH #12
HASH #34
HASH #1
HASH #2
HASH #3
HASH #4
DATA #1
DATA #2
DATA #3
DATA #4

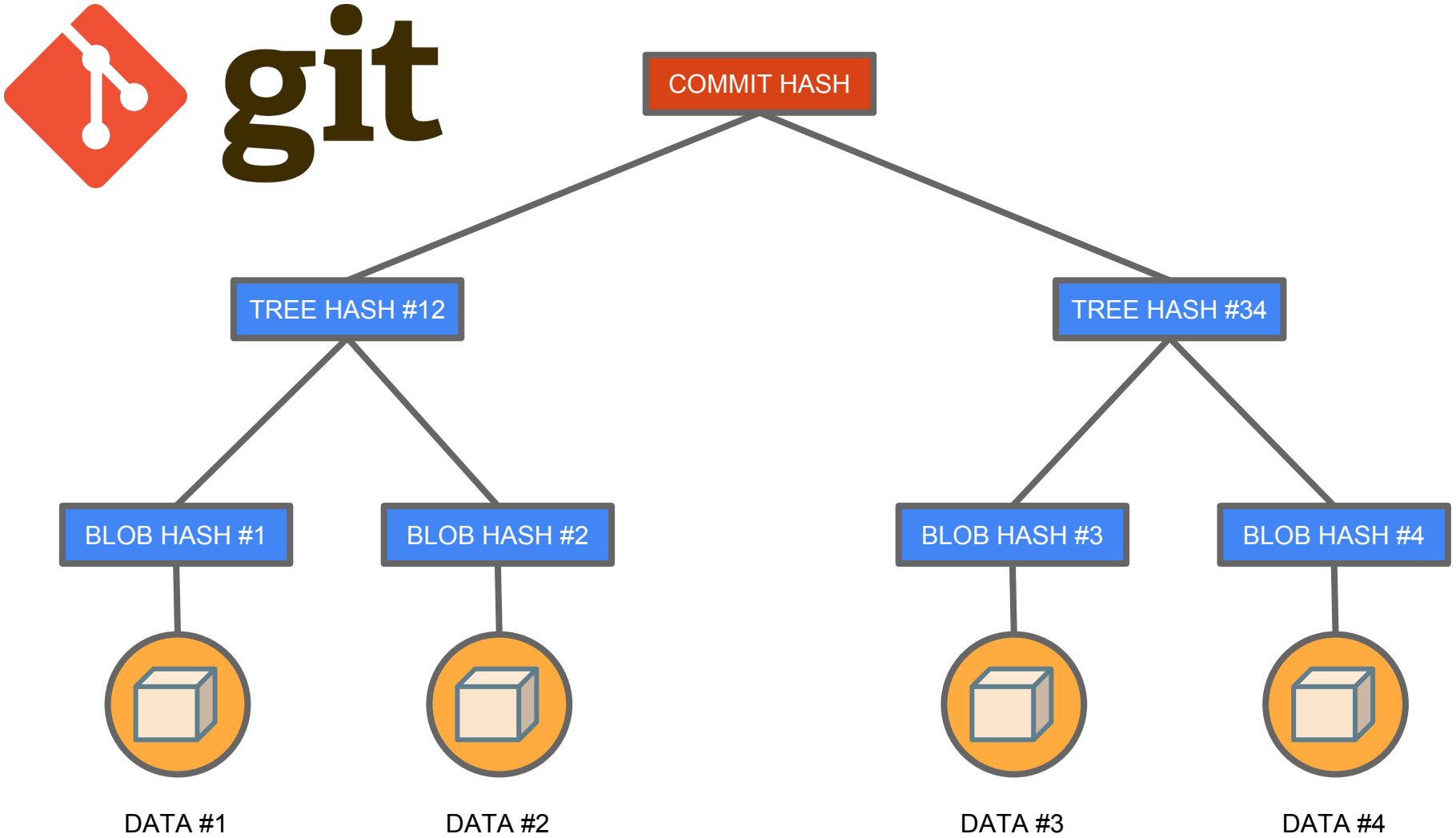

ROOT HASH #1234
HASH #12
HASH #34
je vérifie
HASH #1
HASH #2
HASH #3
HASH #4
DATA #1
DATA #2
DATA #3
DATA #4

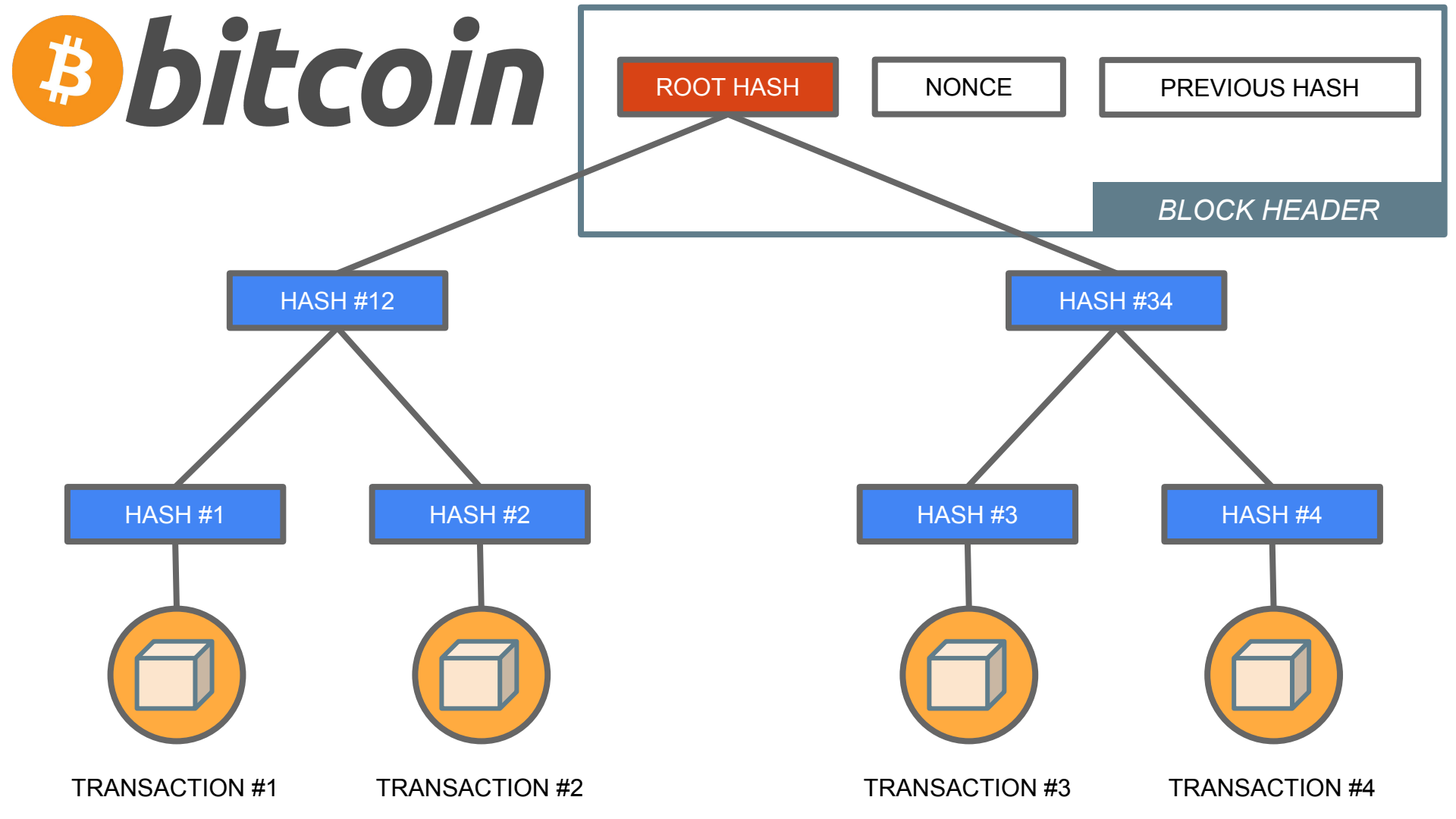

ROOT HASH #1234
HASH #12
HASH #34
je vérifie
HASH #1
HASH #2
HASH #3
HASH #4
DATA #1
DATA #2
DATA #3
DATA #4

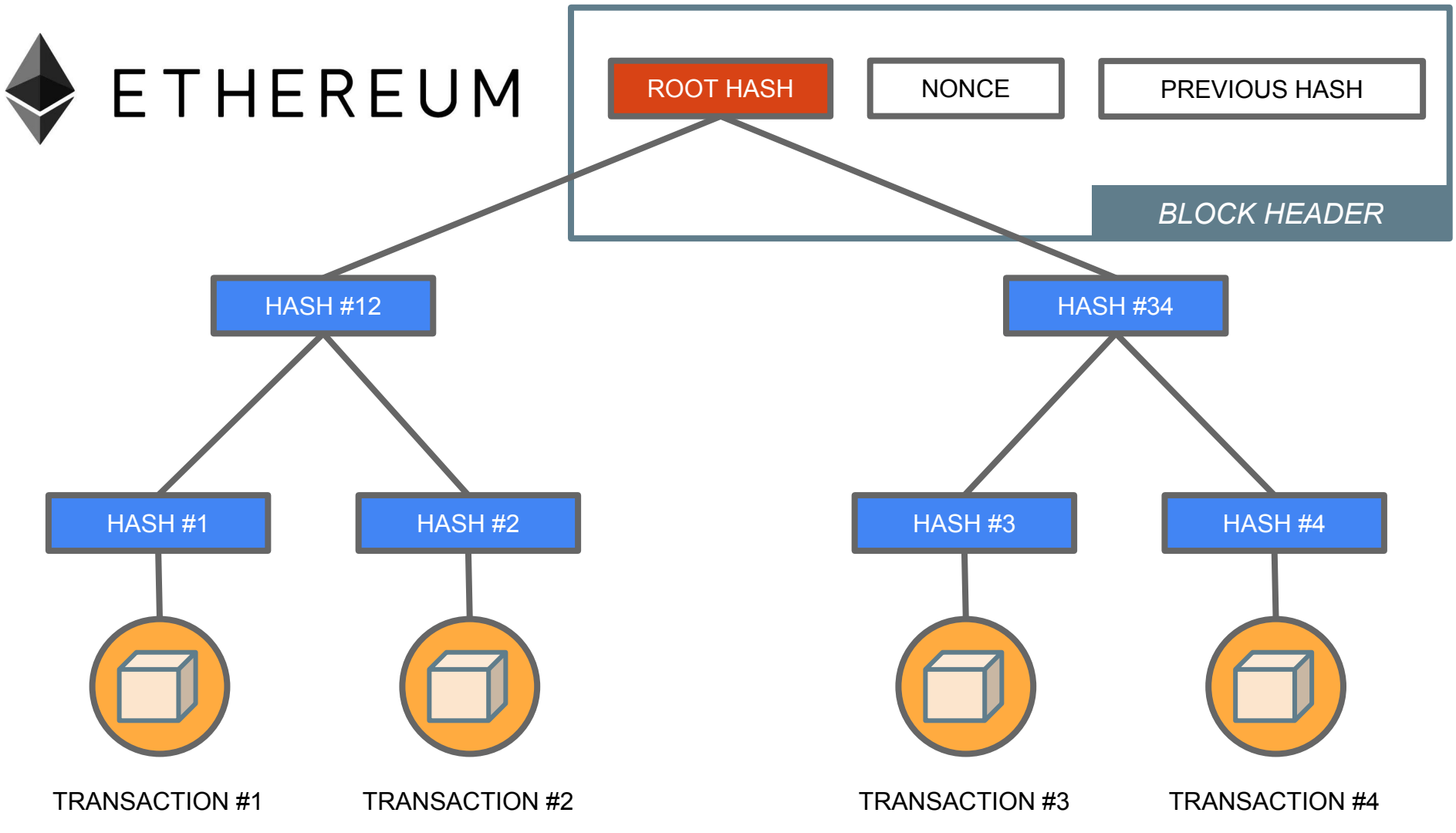

ROOT HASH #1234
HASH #12
HASH #34
je vérifie
HASH #1
HASH #2
HASH #3
HASH #4
DATA #1
DATA #2
DATA #3
DATA #4

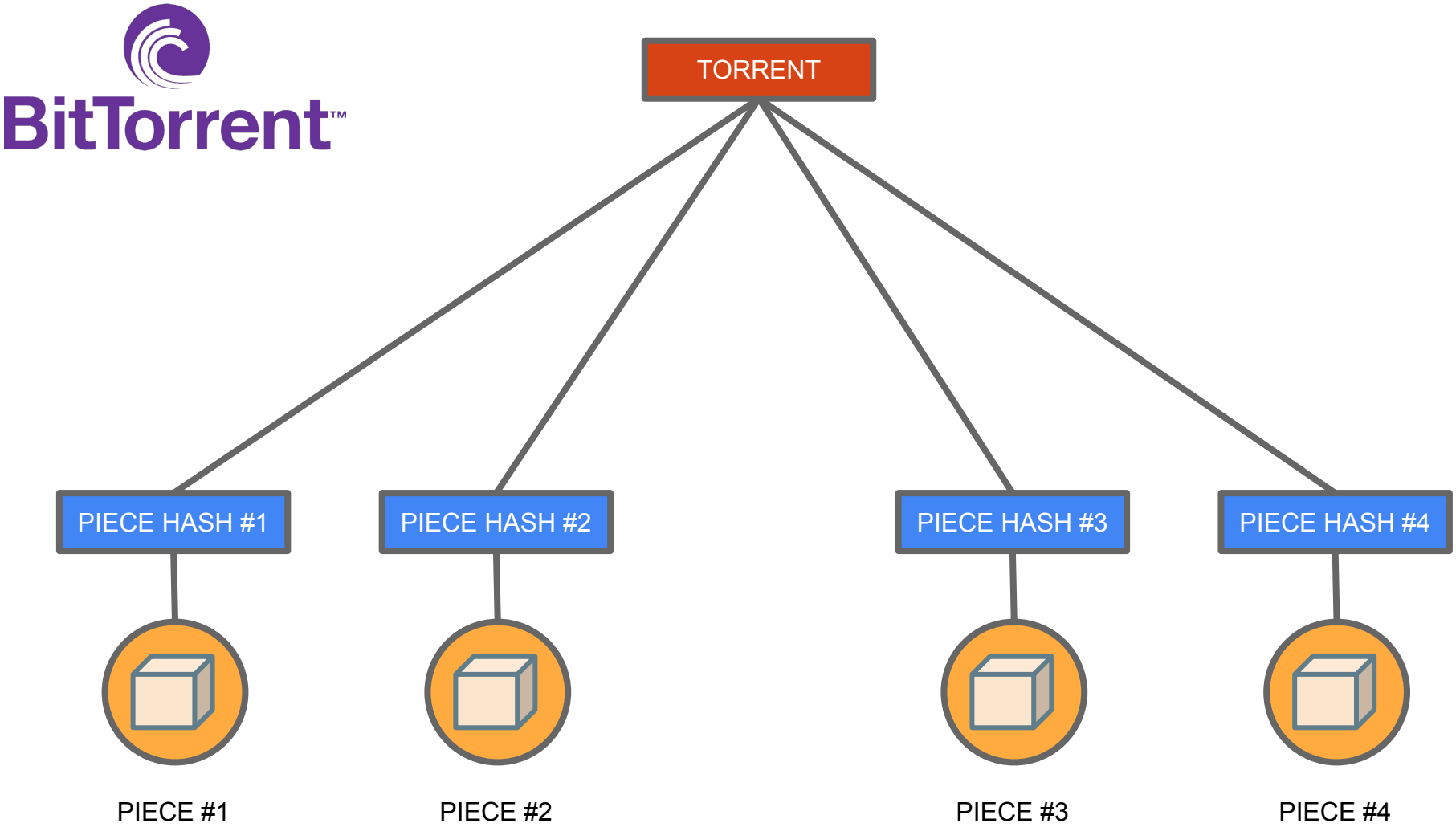

ROOT HASH #1234
HASH #12
HASH #34
ok !
HASH #1
HASH #2
HASH #3
HASH #4
DATA #1
DATA #2
DATA #3
DATA #4

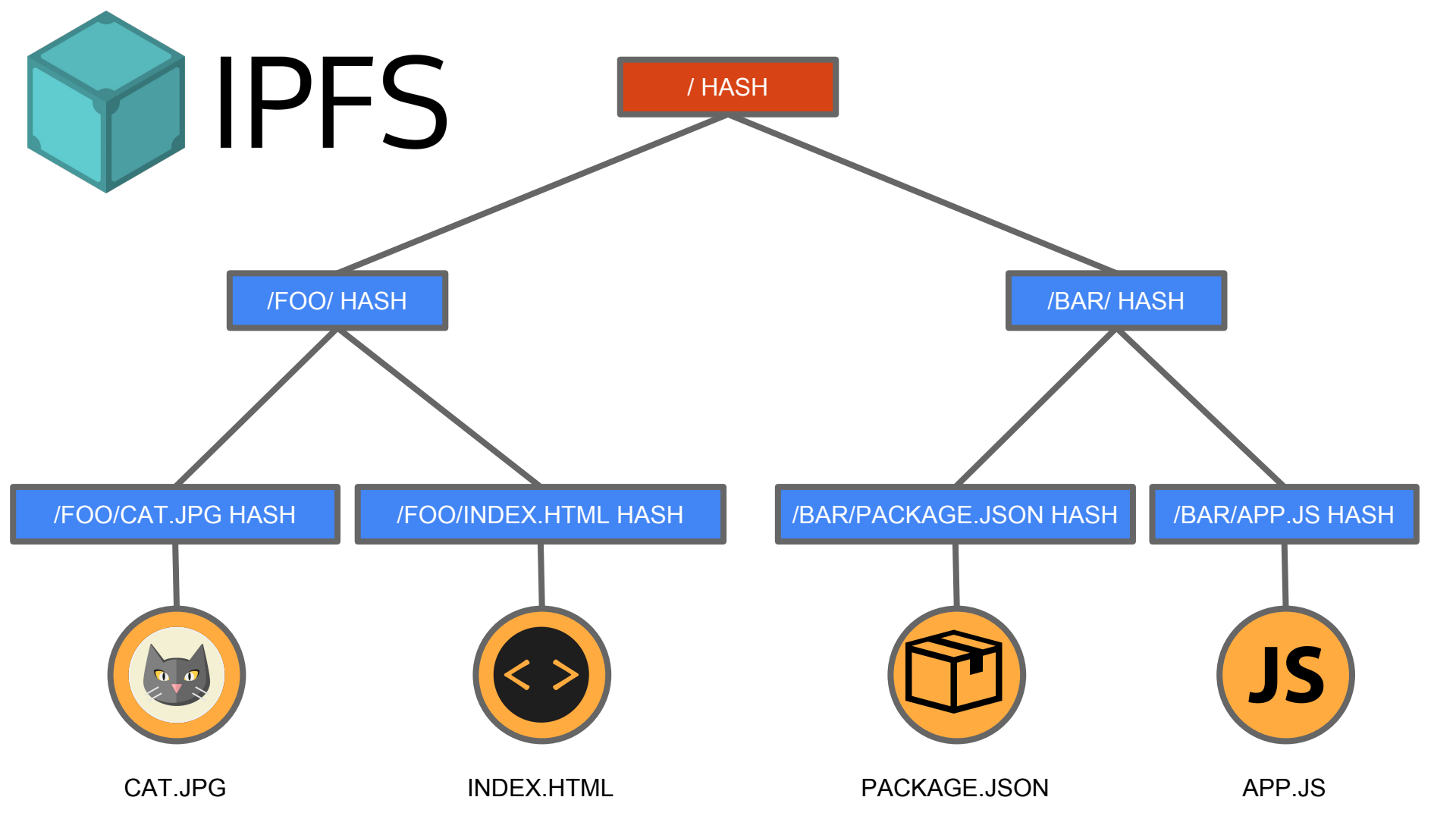
Utilisé ?


git
COMMIT HASH
TREE HASH #12
TREE HASH #34
BLOB HASH #1
BLOB HASH #2
BLOB HASH #3
BLOB HASH #4
DATA #1
DATA #2
DATA #3
DATA #4


bitcoin
ROOT HASH
NONCE
PREVIOUS HASH
BLOCK HEADER
HASH #12
HASH #34
HASH #1
HASH #2
HASH #3
HASH #4
TRANSACTION #1
TRANSACTION #2
TRANSACTION #3
TRANSACTION #4


ETHEREUM
ROOT HASH
NONCE
PREVIOUS HASH
BLOCK HEADER
HASH #12
HASH #34
HASH #1
HASH #2
HASH #3
HASH #4
TRANSACTION #1
TRANSACTION #2
TRANSACTION #3
TRANSACTION #4

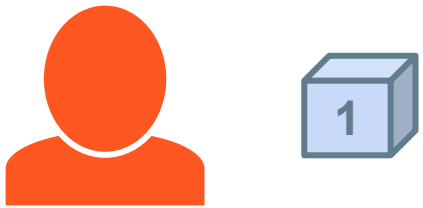

BitTorrent™
TORRENT
PIECE HASH #1
PIECE HASH #2
PIECE HASH #3
PIECE HASH #4
PIECE #1
PIECE #2
PIECE #3
PIECE #4


IPFS
/ HASH
/FOO/ HASH
/BAR/ HASH
/FOO/CAT.JPG HASH
/FOO/INDEX.HTML HASH
/BAR/PACKAGE.JSON HASH
/BAR/APP.JS HASH
JS
CAT.JPG
INDEX.HTML
PACKAGE.JSON
APP.JS

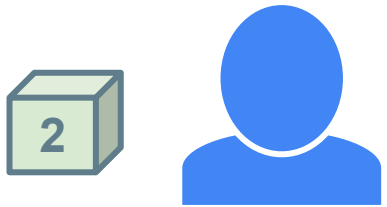
https://ipld.io

0
0

+1
1
0



+2



?
1
2

Conflict resolution

Conflict-free Replicated Data Types

CRDT ?

INSTITUT NATIONAL DE RECHERCHE EN INFORMATIQUE ET EN AUTOMATIQUE

Conflict-free Replicated Data Types

Marc Shapiro, INRIA & LIP6, Paris, France
Nuno Preguiça, CITI, Universidade Nova de Lisboa, Portugal
Carlos Baquero, Universidade do Minho, Portugal

Marek Zawirski, INRIA & UPMC, Paris, France

?
1
2

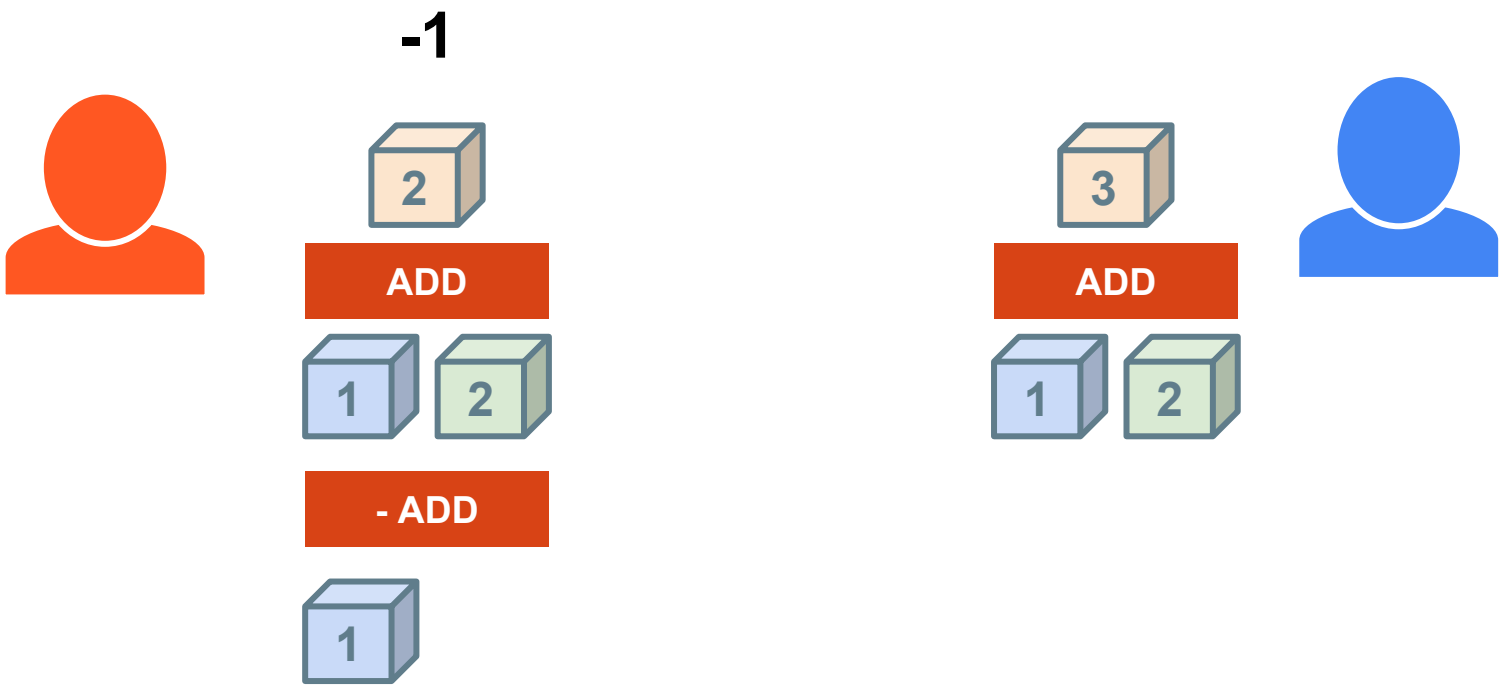
1
2
1
2

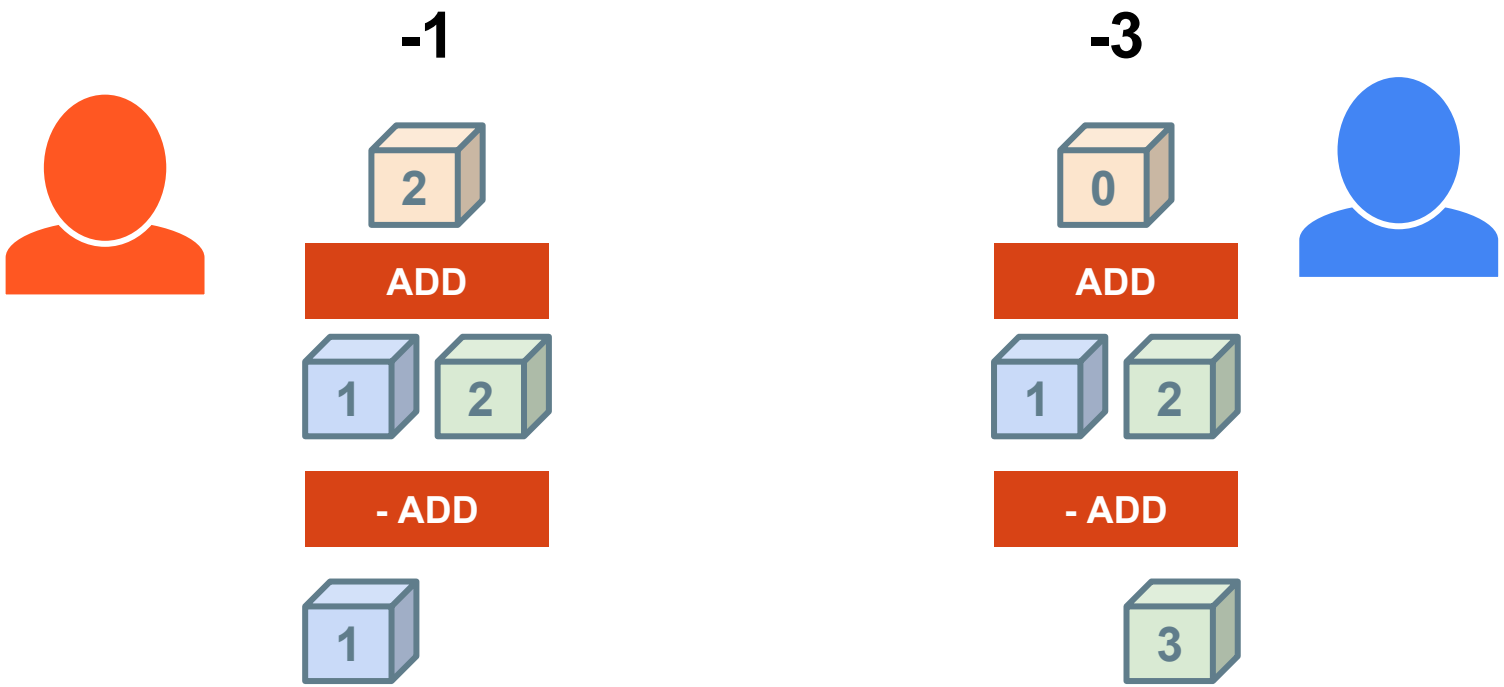
3
ADD
1
2
3
ADD
1
2

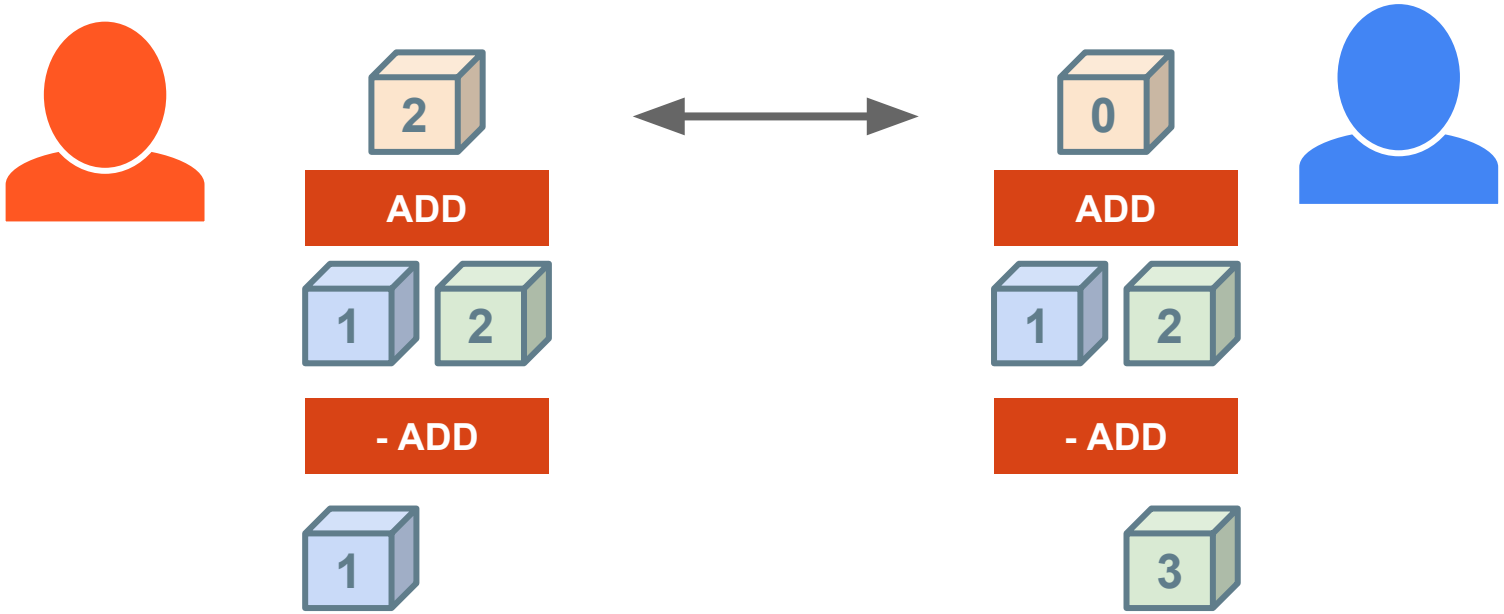
3
ADD
1
2
3
ADD
1
2

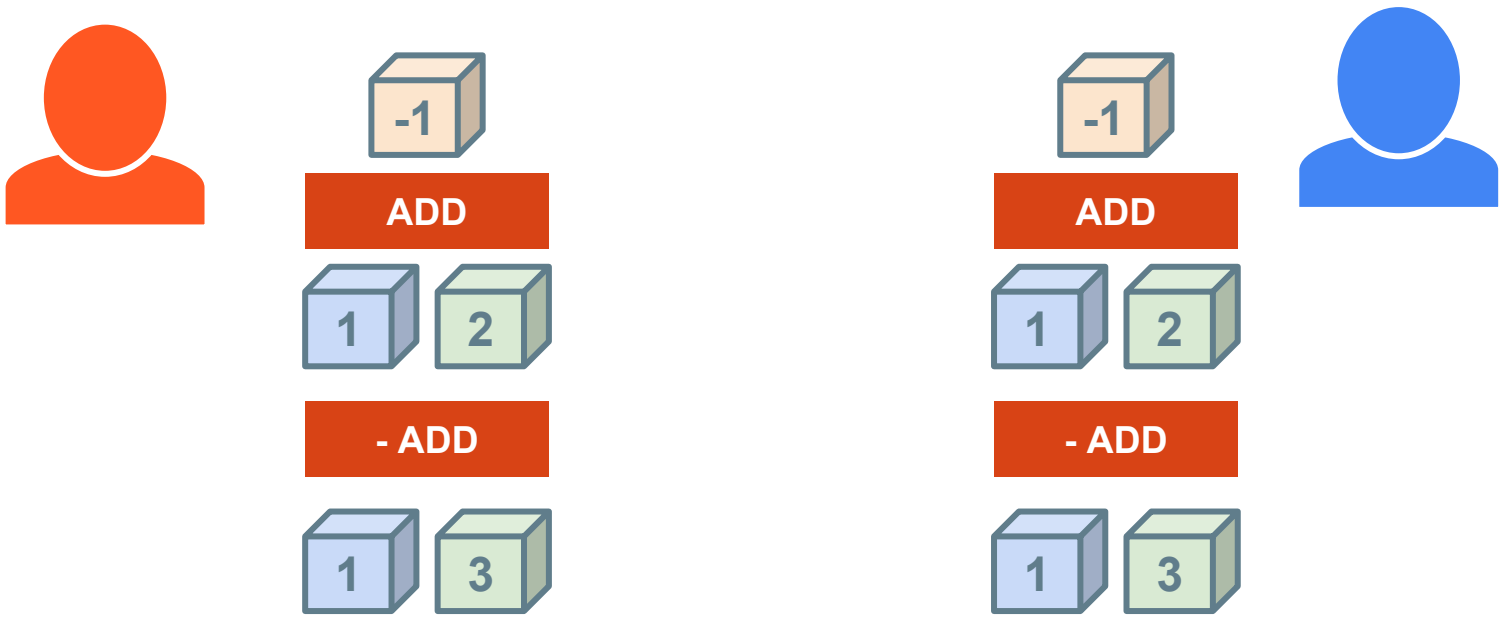
Grow-only Counter

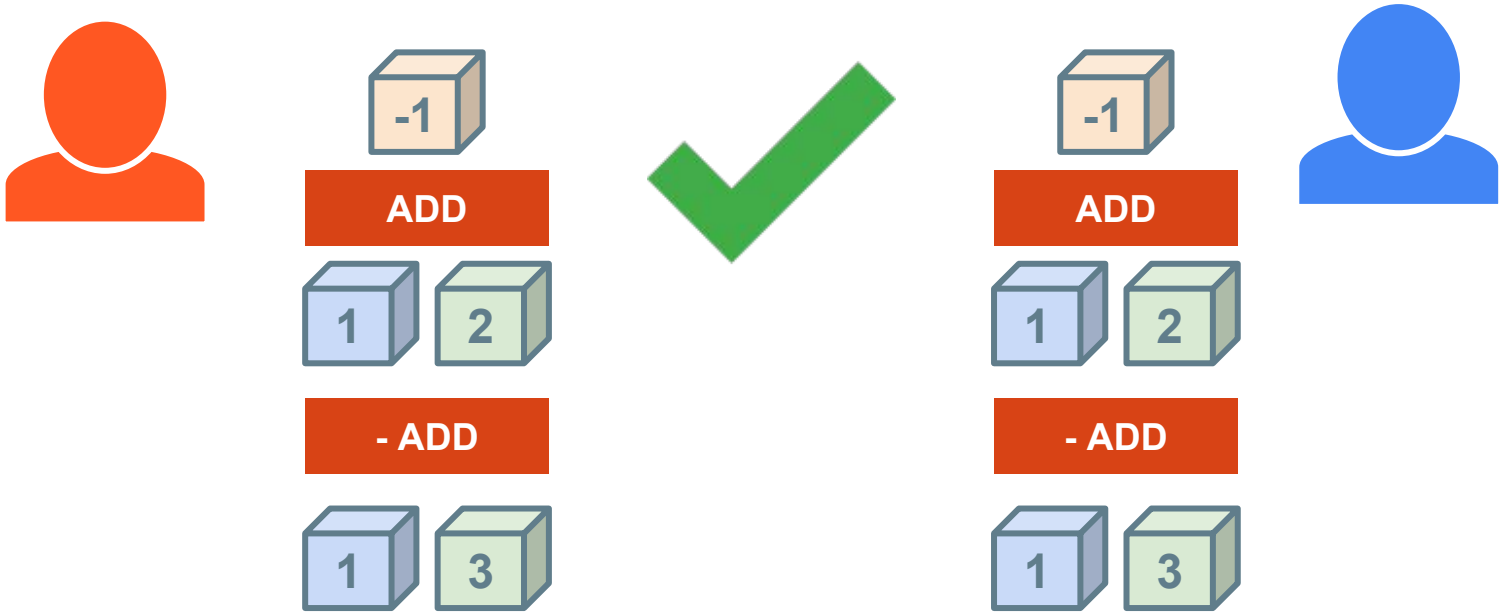
-1
3
ADD
1
2
3
ADD
1
2


-1
2
ADD
1
2
- ADD
1
3
ADD
1
2

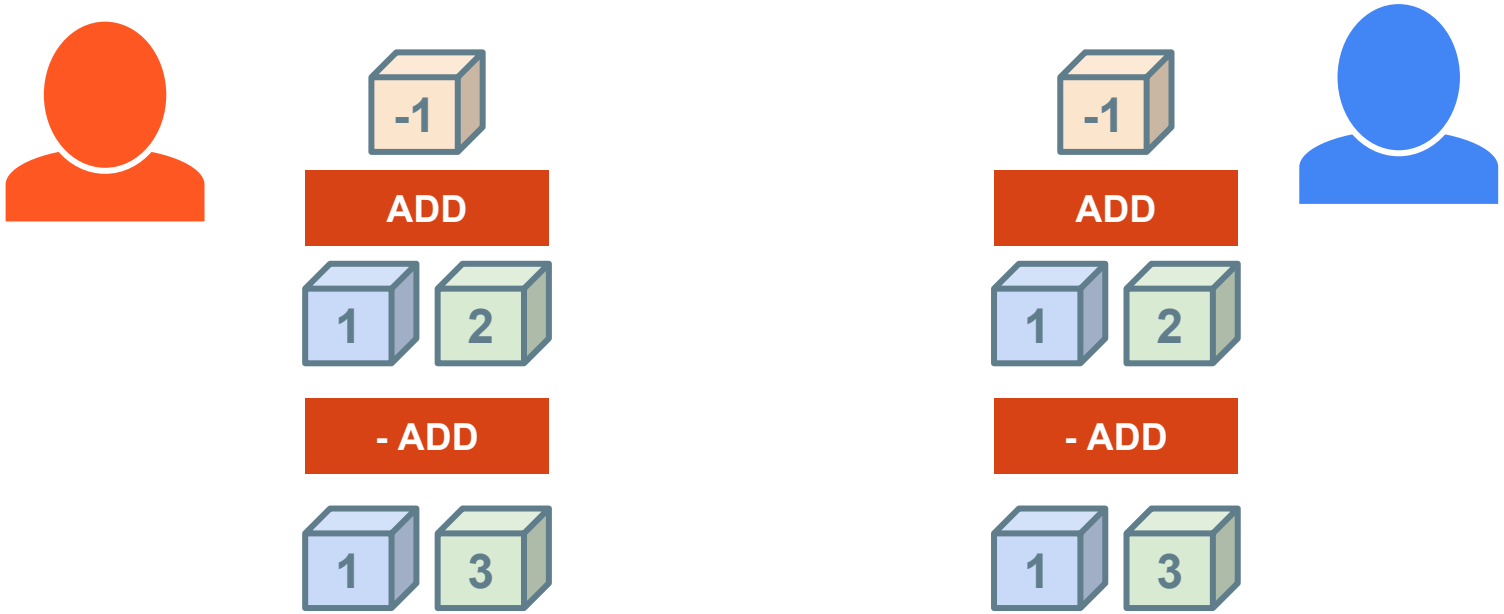

-1
2
ADD
1
2
- ADD
1
-3
0
ADD
1
2
- ADD
3


2
ADD
1
2
- ADD
1
0
ADD
1
2
- ADD
3

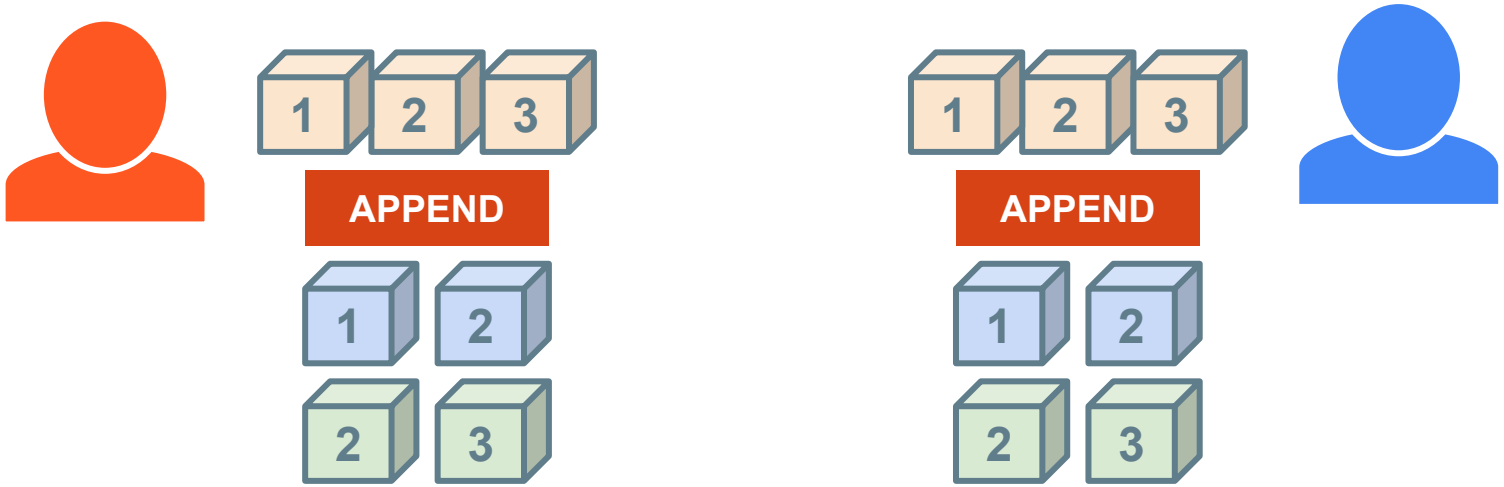

-1
ADD
1
2
- ADD
1
3
-1
ADD
1
2
- ADD
1
3


-1
ADD
1
2
- ADD
1
3
-1
ADD
1
2
- ADD
1
3

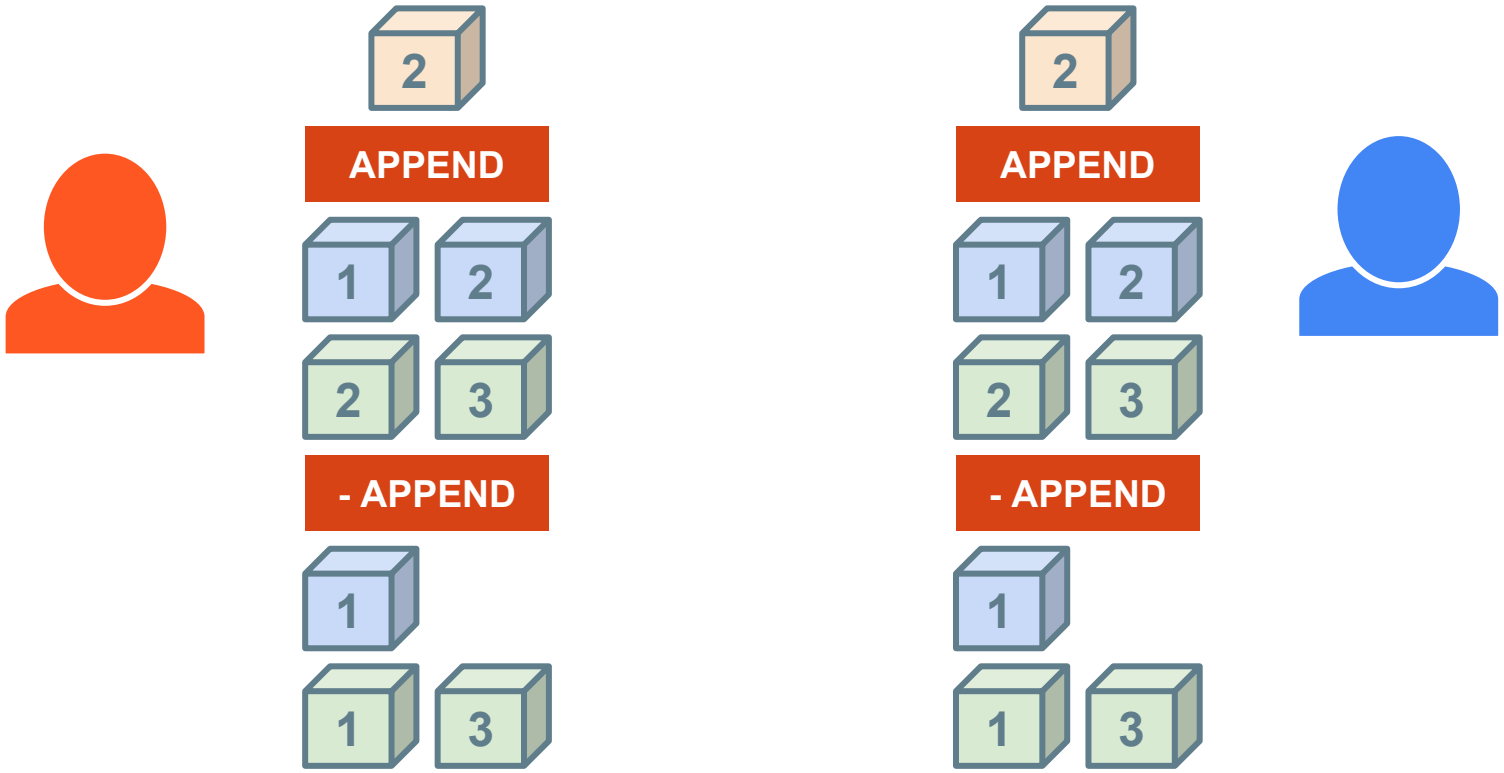
Positive-Negative Counter



Grow-only Set



2-Phase Set



2-Phase Set

+

Timestamp

=

Last-Write-Wins-Element-Set

OR-Set

MC-Sets

U-Set

LWW-Register

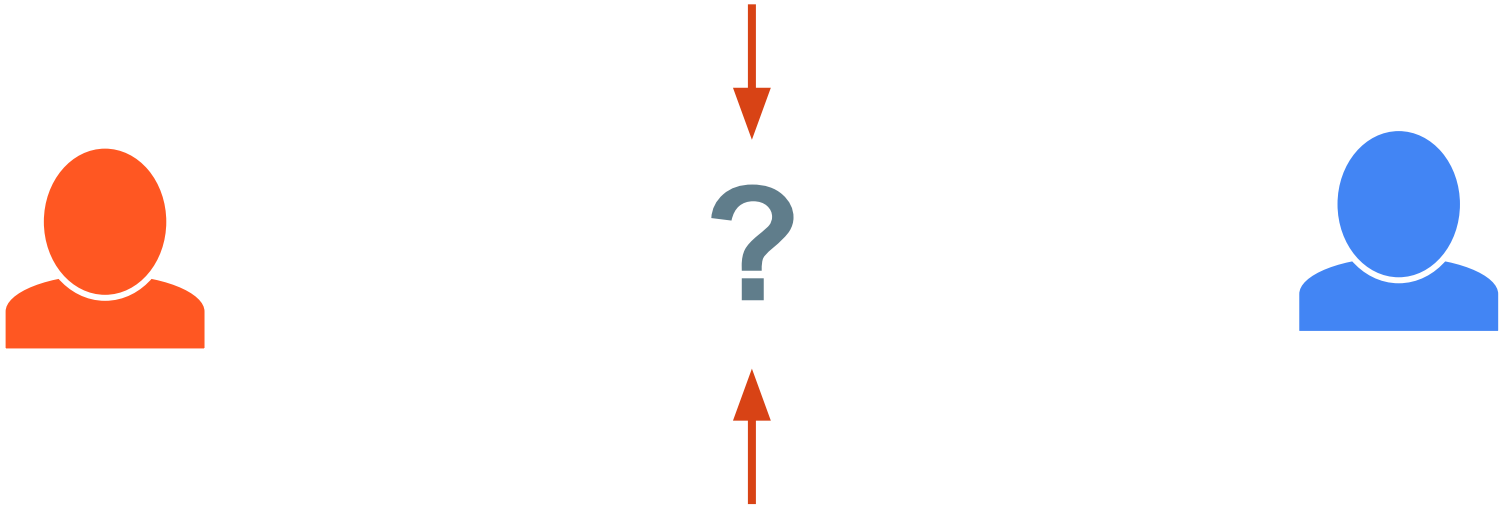
MV-Register

Add-only monotonic DAG

Add-Remove Partial Order

...

Compromis sur les fonctionnalités
(Ajout, Suppression, Modification…)



Compromis sur la performance
(bande passante, perte de paquet, mémoire...)

Utilisé ?

Bases de données distribuées

Distributed Data

Chat (70M utilisateurs)

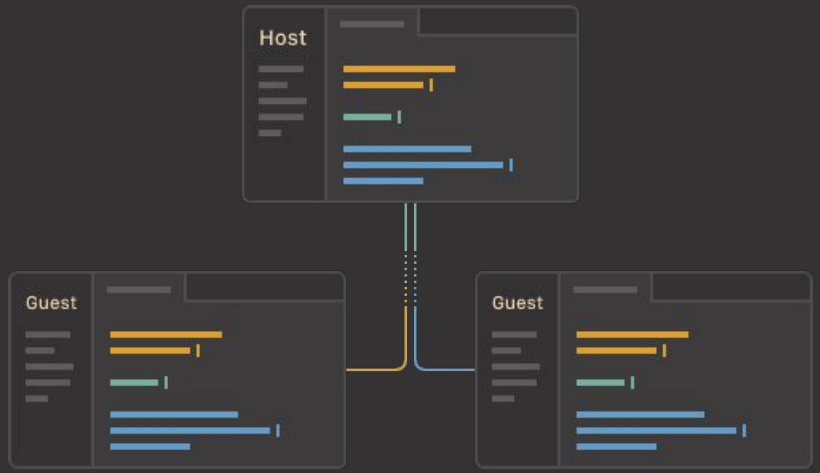
News feed

Sync. des localisations favorites

Mais aussi...

Collaborate in real time in Atom

Teletype(beta) **for Atom** lets developers share their workspace with team members and collaborate on code in real time.



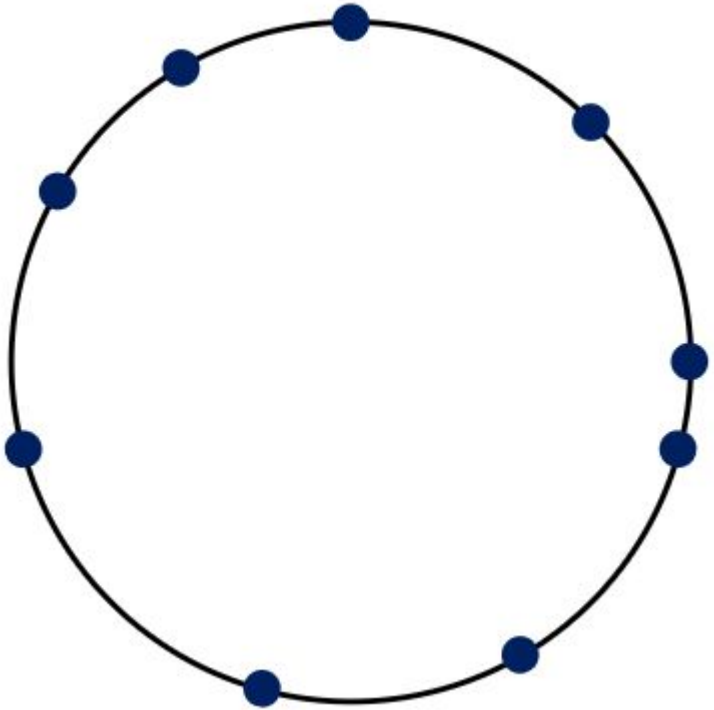
Mais aussi...

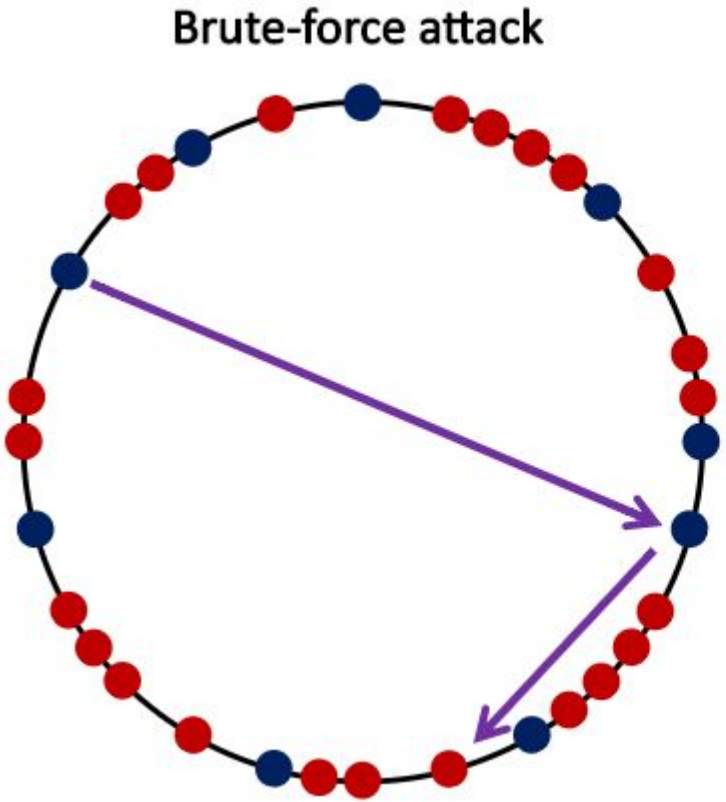
Démo

à la fin...

https://acailly.github.io/roti/

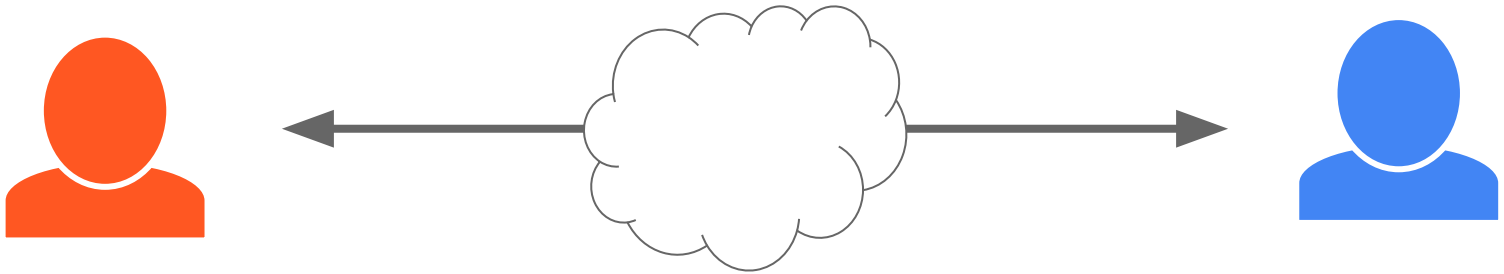
Et si on quittait le monde des bisounours ?

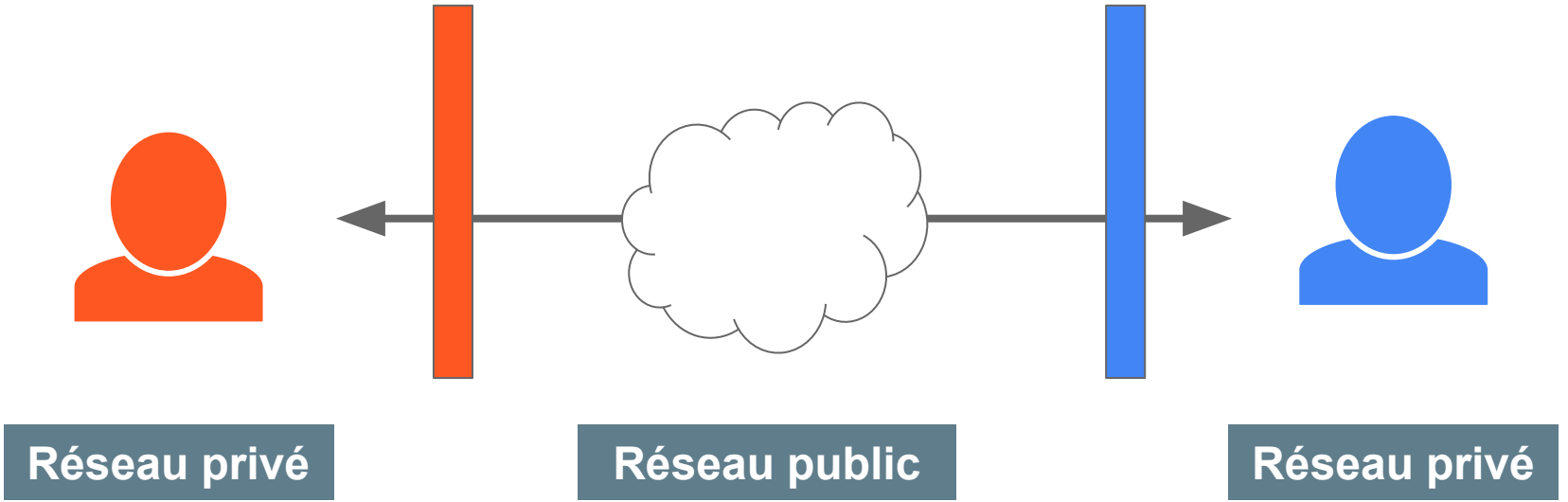




Sybil attack

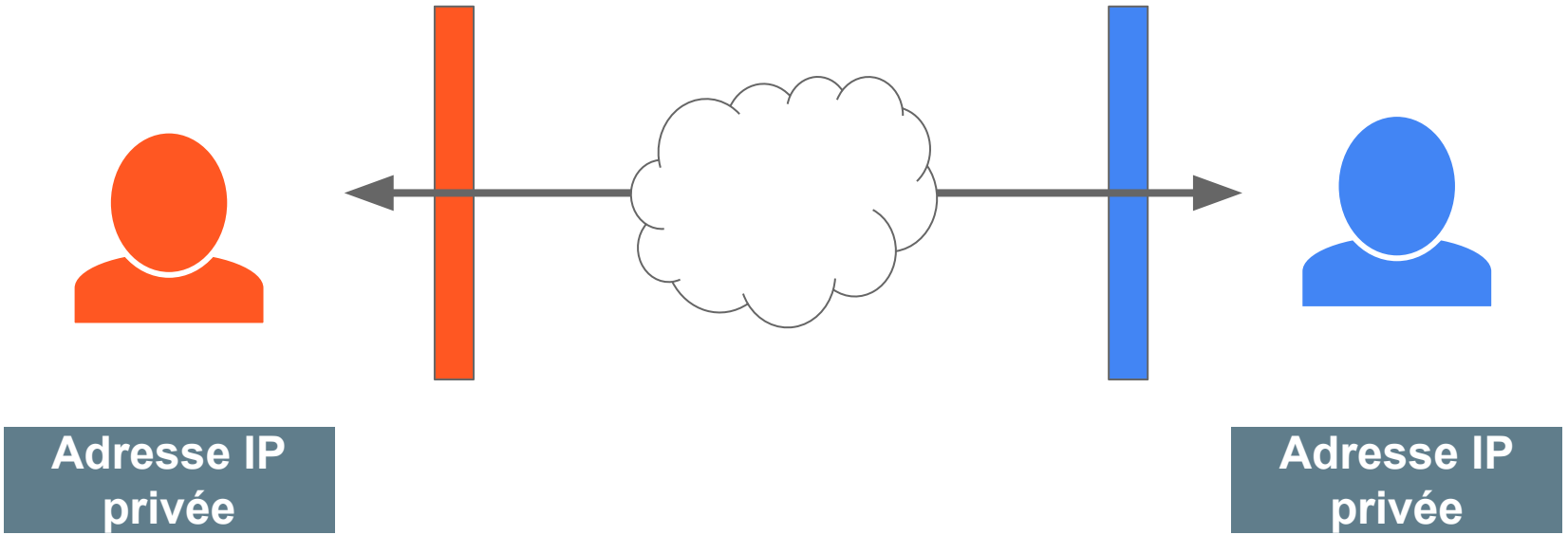
http://slideplayer.com/slide/9719156/



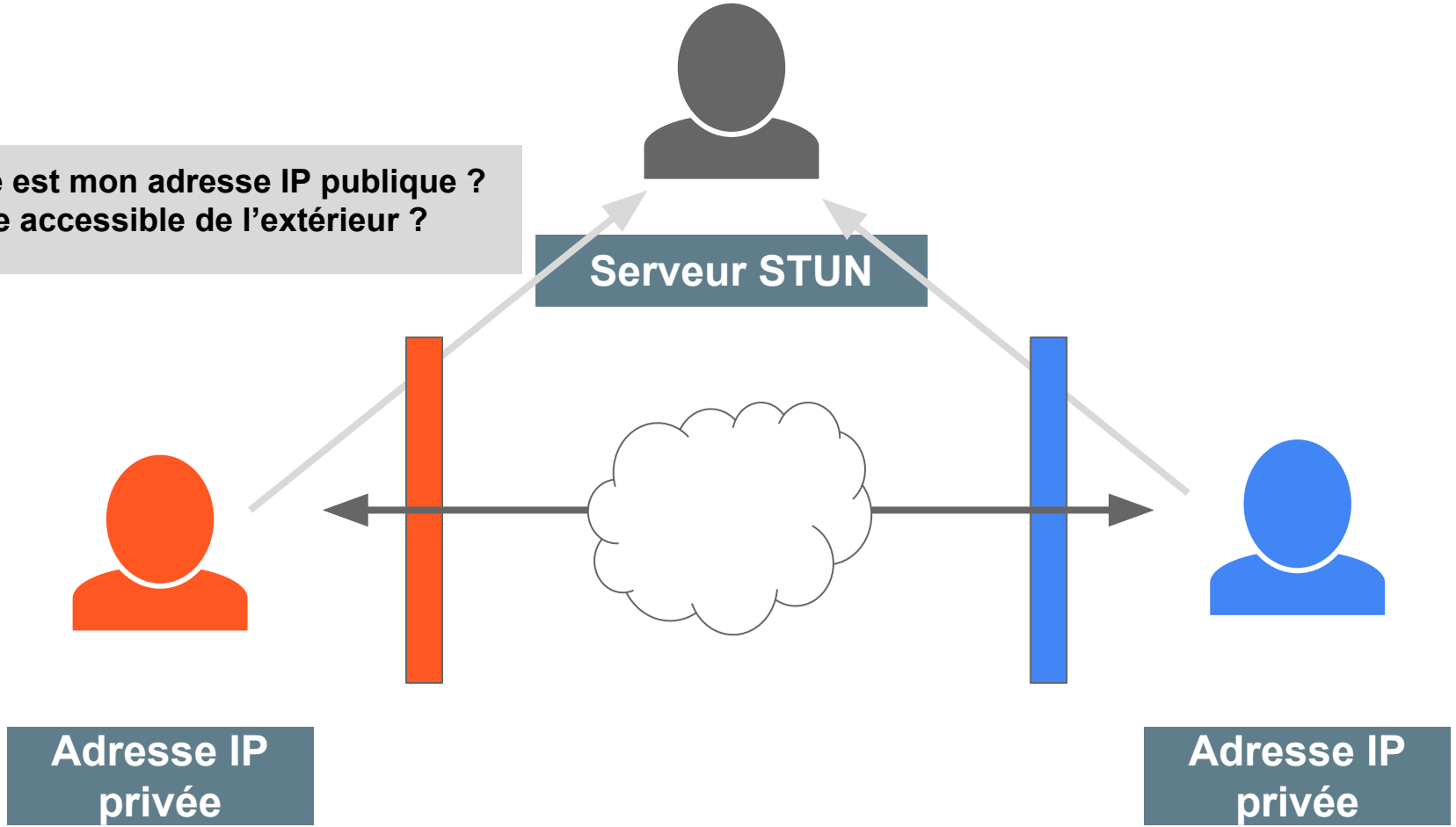

Réseau privé
Réseau public
Réseau privé

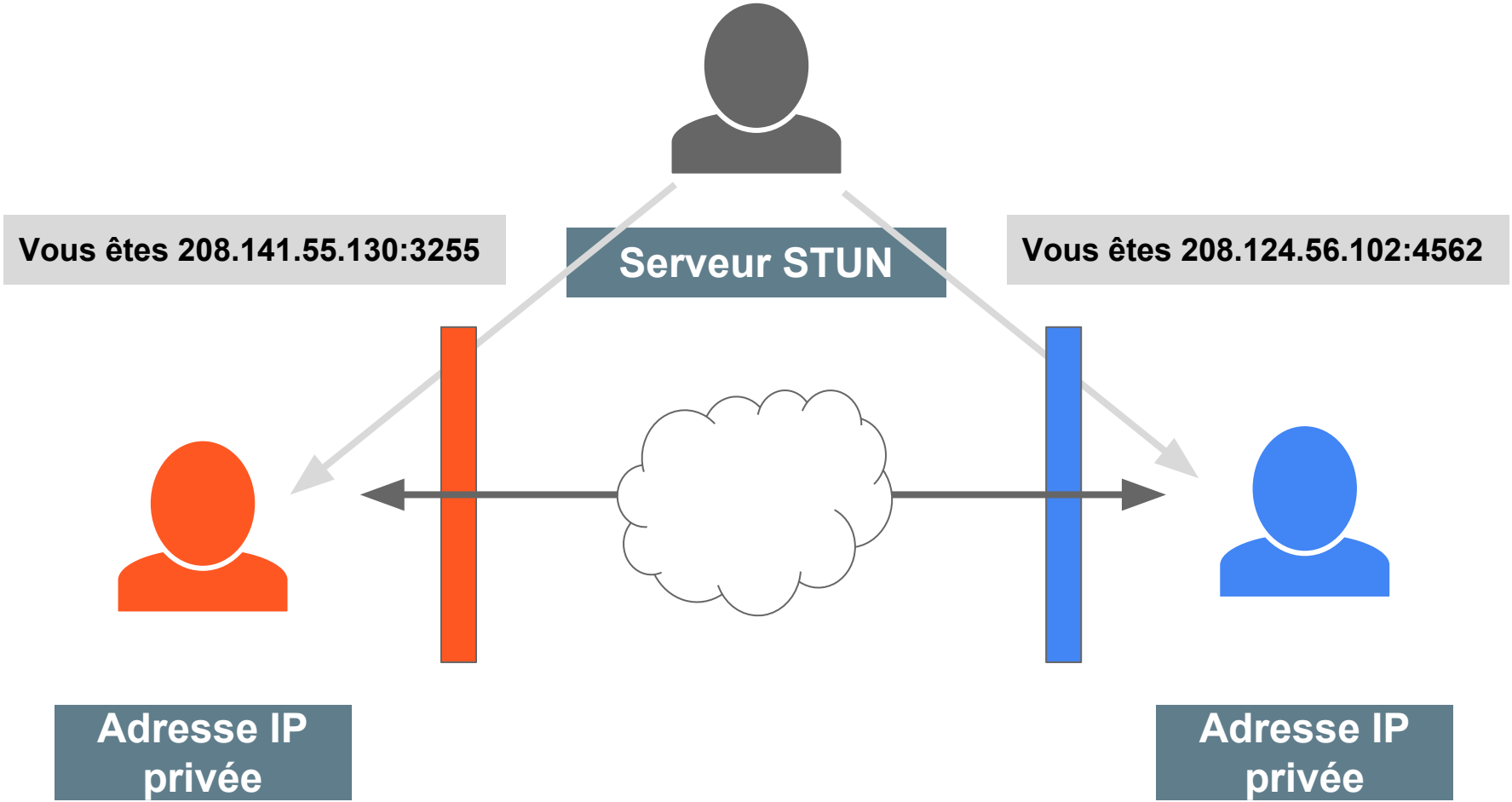
NAT Traversal

Session Traversal Utilities for NAT (STUN)

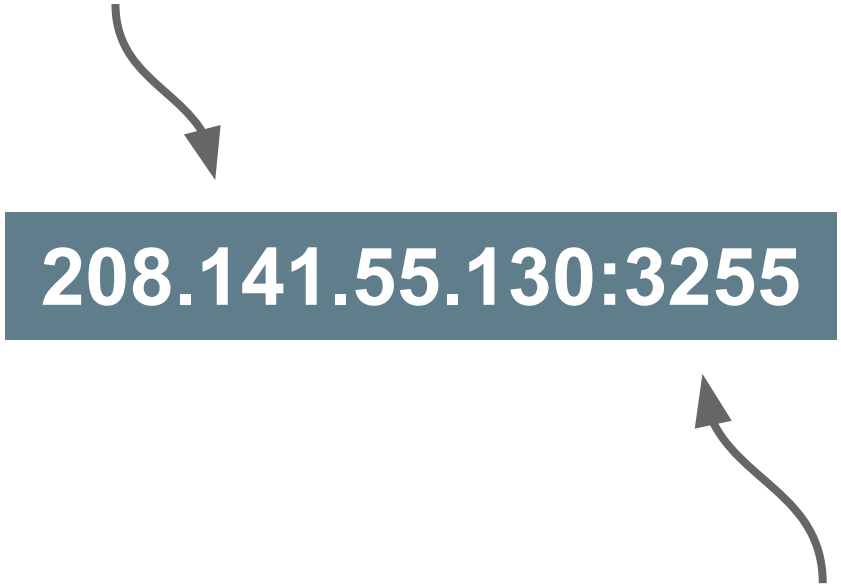

Adresse IP privée
Adresse IP privée

Quelle est mon adresse IP publique ?
Suis-je accessible de l'extérieur ?



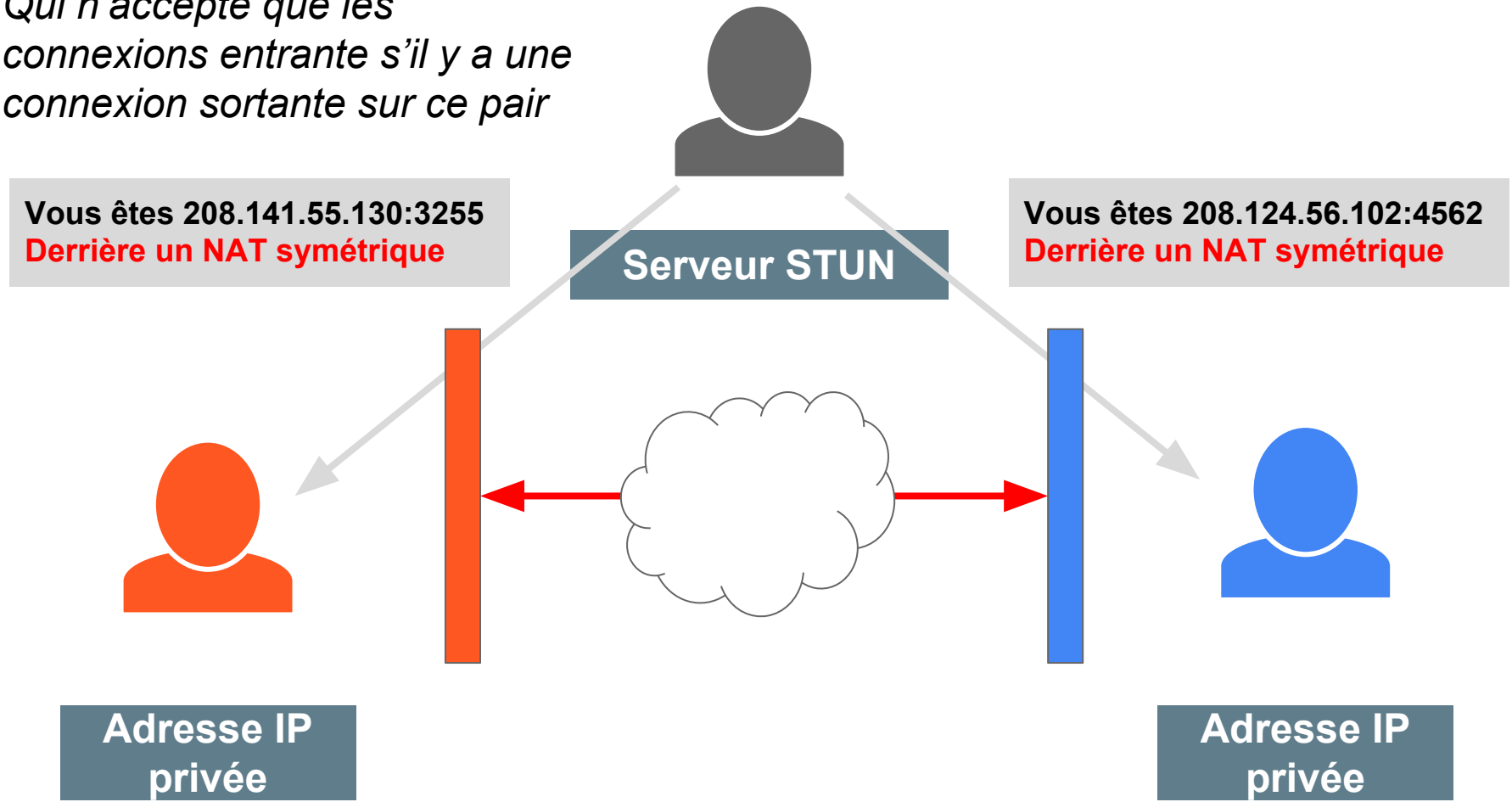

Vous êtes 208.141.55.130:3255
Serveur STUN
Vous êtes 208.124.56.102:4562
Adresse IP privée
Adresse IP privée

Adresse publique du routeur

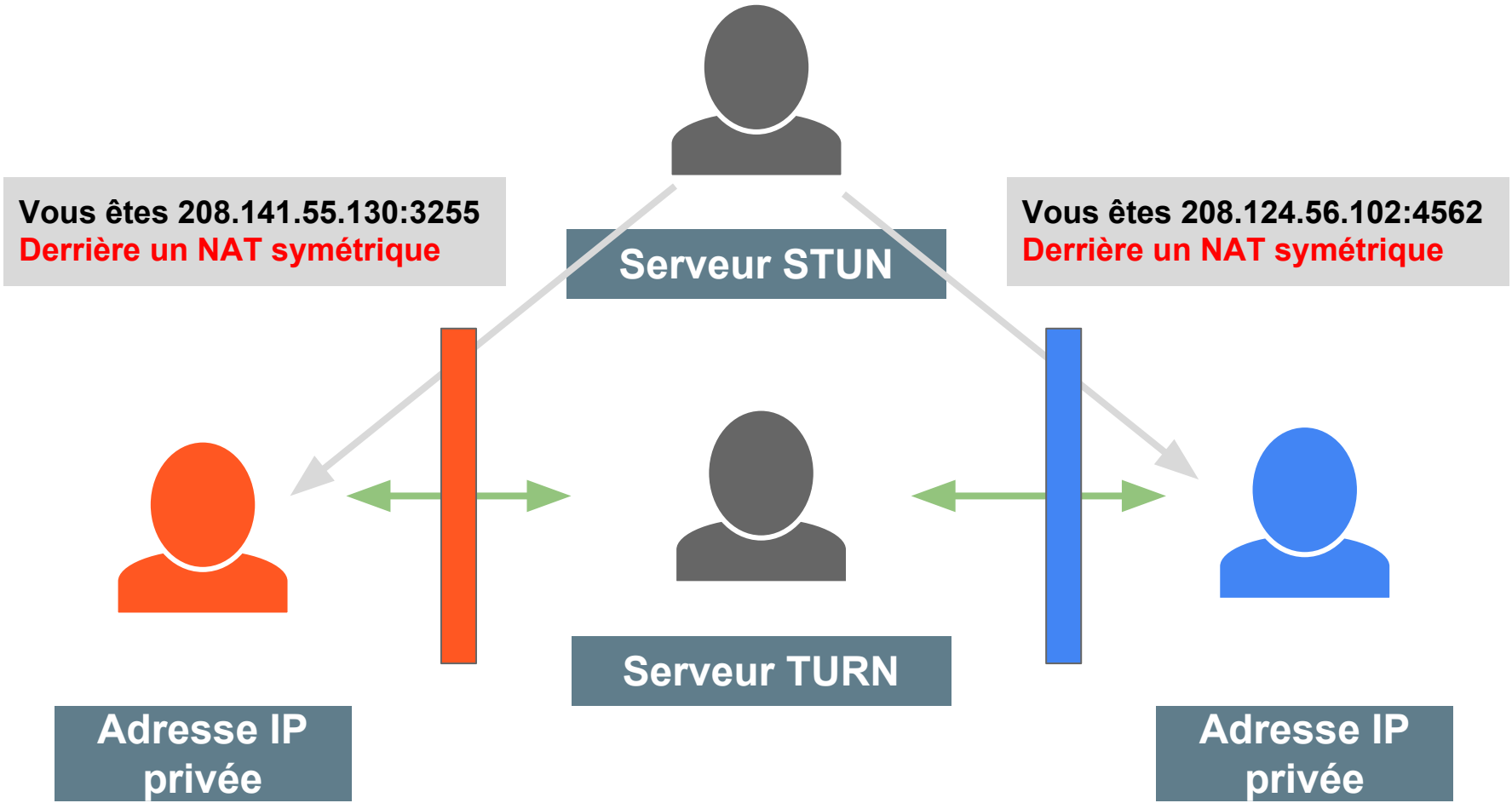


Port unique pour chaque device
derrière le routeur

Qui n'accepte que les connexions entrante s'il y a une connexion sortante sur ce pair



Traversal Using Relays around NAT (TURN)


Vous êtes 208.141.55.130:3255
Derrière un NAT symétrique
Serveur STUN
Vous êtes 208.124.56.102:4562
Derrière un NAT symétrique
Serveur TURN
Adresse IP privée
Adresse IP privée

Que nous
réserve le futur ?

Scalabilité ?
Impact écologique ?
Arnaques ?
Centralisation ?

True data ownership

Users should have the freedom to choose where their data resides and who is allowed to access it. By decoupling content from the application itself, users are now able to do so.

Modular design

Because applications are decoupled from the data they produce, users will be able to avoid vendor lock-in, seamlessly switching between apps and personal data storage servers, without losing any data or social connections.

Reusing existing data

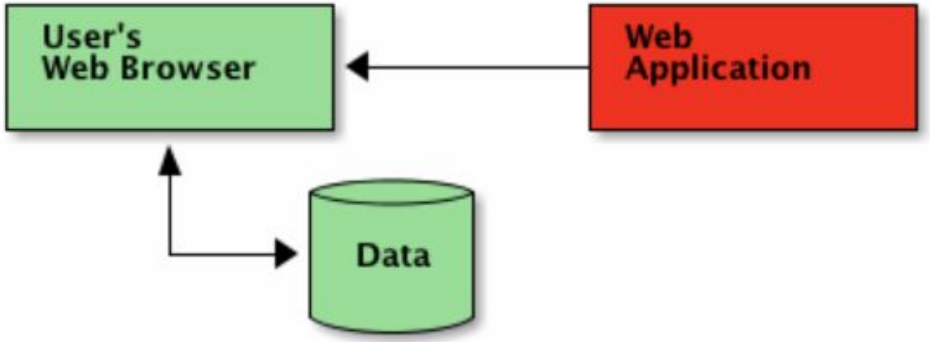
Developers will be able to easily innovate by creating new apps or improving current apps, all while reusing existing data that was created by other apps.

https://solid.mit.edu/

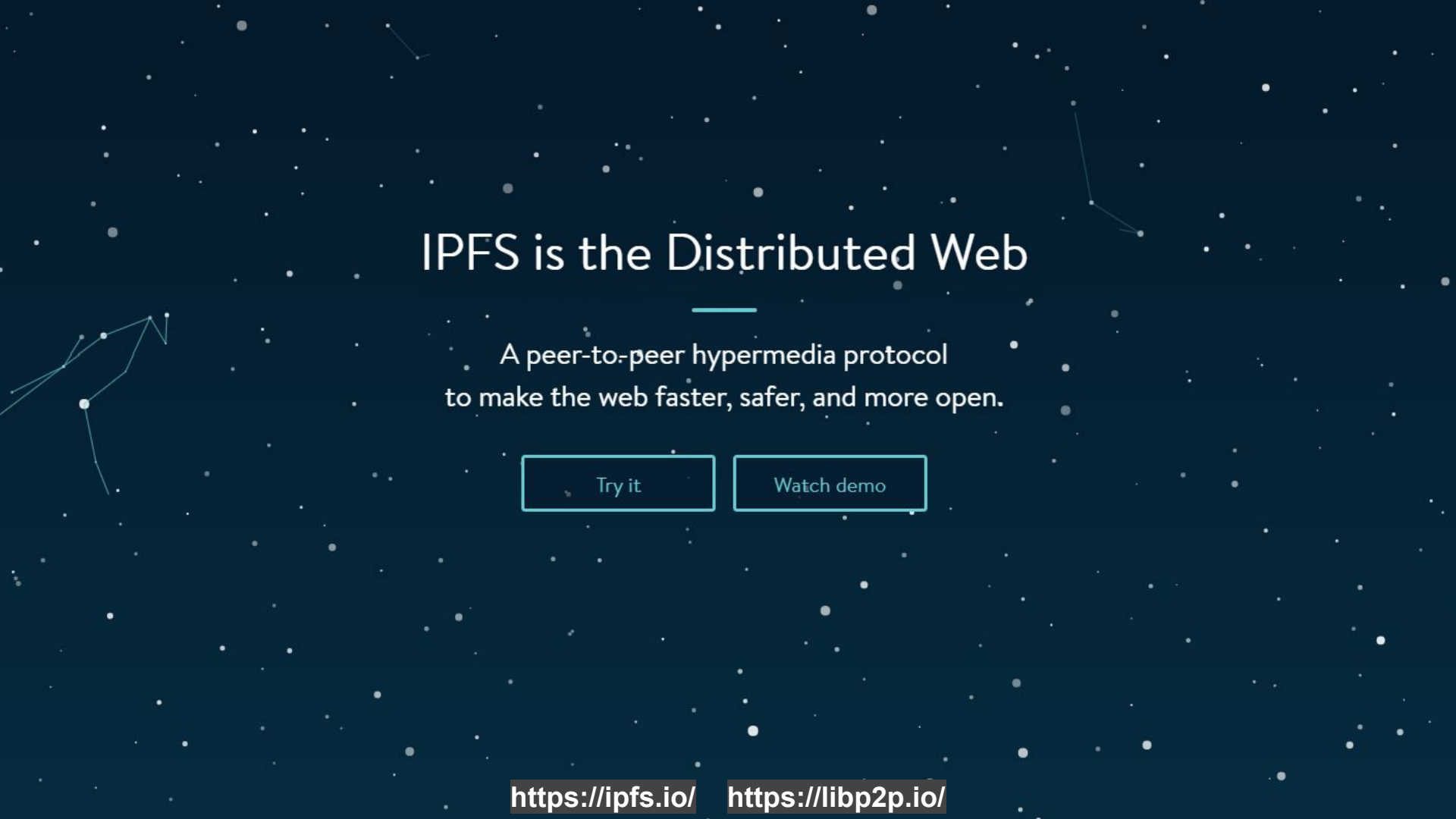
remoteStorage

An open protocol for per-user storage on the Web

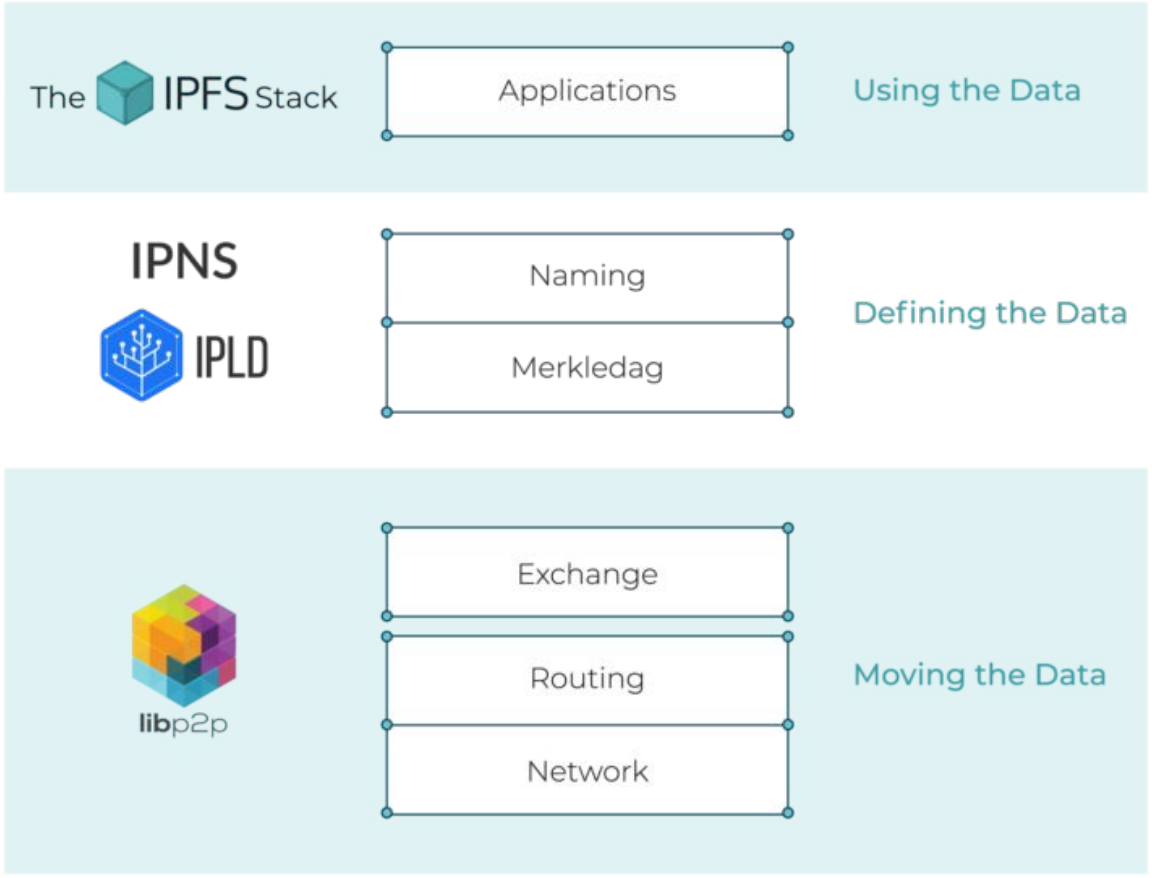
https://remotestorage.io/



https://unhosted.org/

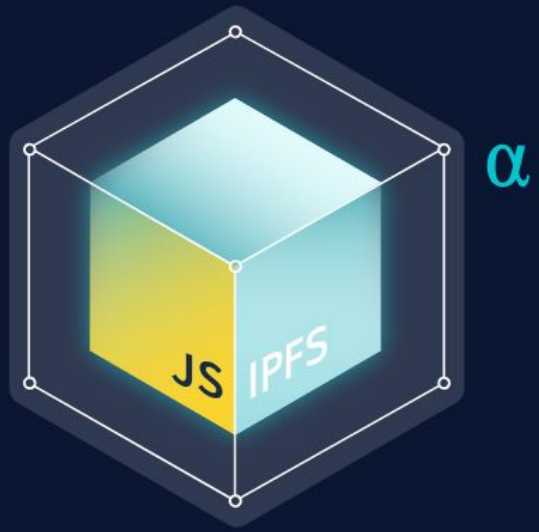


https://ipfs.io/ https://libp2p.io/



https://ipfs.io/ https://libp2p.io/

https://js.ipfs.io/



α

A full P2P protocol written entirely in JavaScript

js-ipfs paves the way for the Browser implementation of the IPFS protocol. Written entirely in JavaScript, it runs in a Browser, a Service Worker, a Web Extension and Node.js, opening the door to a world of possibilities.

https://www.coindesk.com/257-million-filecoin-breaks-time-record-ico-funding/

$257 Million: Filecoin Breaks All-Time Record for ICO Funding

Sep 7, 2017 at 20:45 UTC by Stan Higgins

Cloudflare goes InterPlanetary - Introducing Cloudflare's IPFS Gateway

17 Sep 2018 by Andy Parker.

https://blog.cloudflare.com/distributed-web-gateway/

https://datproject.org/

Dat Project

TRY DAT BLOG DOCS ABOUT

dat:// — a peer-to-peer protocol

A community-driven project powering a next-generation Web

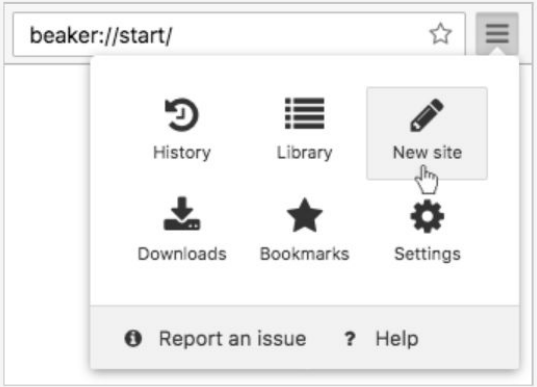
Beaker

Blog Docs Install Beaker

Rethink the Web browser

Beaker is a peer-to-peer browser with tools to create and host websites. Don't just browse the Web, build it.

https://beakerbrowser.com/



Can your browser do this?

Medium

None of us are as smart as all of us.

Fork

@leokewitz
December 13th, 2017
3 min read

New release 0.2.0

I'm really happy to announce that I finally learned how to version [1]! Also there are a lot of new features!

Footnotes

As you might noticed one of the new features is being able to add footnotes [2]. Footnotes can be inlined or manually referenced.

```
This is how you manually[^manual] reference something[^1].

This is how you add inline^[You don't need to specify inlined notes
at the end of the file.] notes.

...

// In the end of the file...
[^1]: Thi
[^manual
```

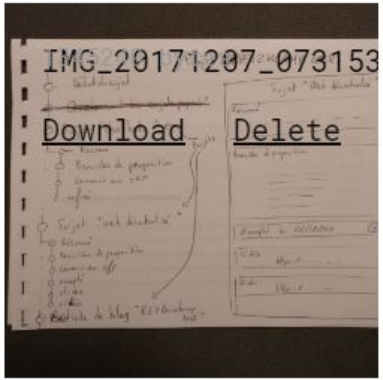
https://github.com/kewitz/dat-medium

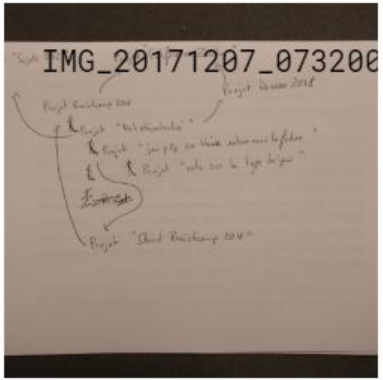
ntain 0.0.4 peer-to-peer file sharing drop files anywhere

carbon.png

```
require('lodash')
= require('bittorrent-dht'
ip = require('geoip-lite-co
```

guide.txt

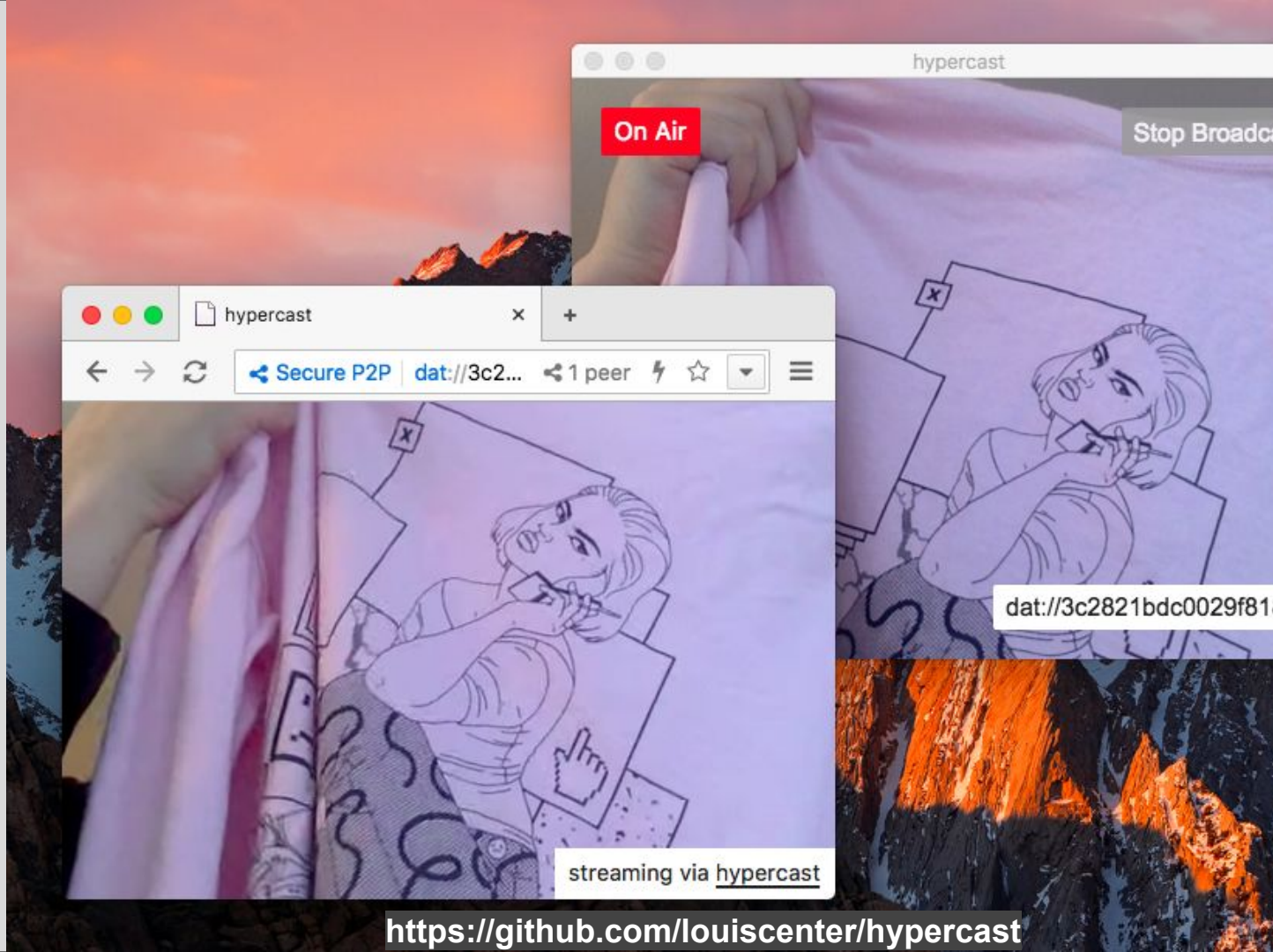




http://hex22.org/projects/ntain/

Dropbox

Skype


hypercast
On Air
Stop Broadc
hypercast
Secure P2P
dat://3c2...
1 peer
dat://3c2821bdc0029f81
streaming via hypercast
https://github.com/louiscenter/hypercast

Home Notifications Settings acailly New post

Paul Frazee Following

Web nerd re-decentralizing the Web. Unblockchain consultant. Founder of the Beaker browser and Hashbase. Previously Secure Scuttlebutt.

Make sure your profile stays online! Share your profile URL with a public peer like Hashbase.

Feeling ambitious? Deploy your own public peer.

Copy your profile URL

Who to follow

Tim Caswell Follow

Ross Schulman Follow

Sander Moolin Follow

PsaeBrai Follow

Posts 68 Following 39

Paul Frazee · 4d ago

No need to fret that you're missing frets. Fritter now tells you (once again) when there are new frets.

Paul Frazee · 4d ago

Fritter update was published. You shouldn't need to be afraid to click on links anymore.

Paul Frazee · 4d ago

Doing some work on Fritter today, fixing some of the annoying things like the issue clicking on links and the lack of "new posts" notification. Also going to look at Sander's mentions PR (finally!). Also using this to QA our 0.8 fork & edit flows... which needs a little work but it's working ok so far.

Paul Frazee · 4d ago

Replying to this post

Cool idea! I'm certain people will find that interesting and worth talking about.

https://github.com/beakerbrowser/fritter

Mozilla Add-ons Blog

https://blog.mozilla.org/addons/2018/01/26/extensions-firefox-59/

JAN 26 2018

Extensions in Firefox 59

Support for Decentralization Protocols

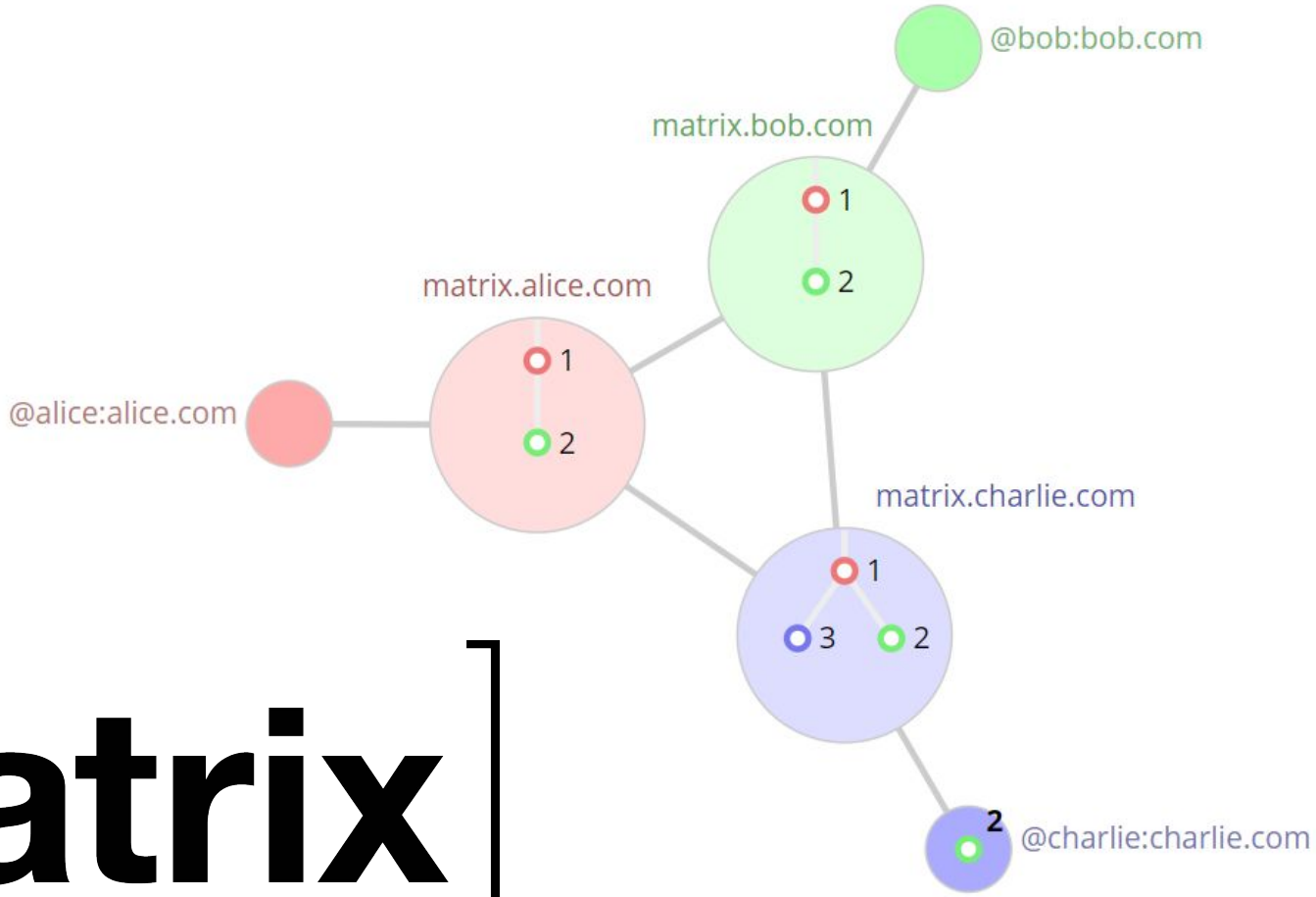
Mozilla has always been a proponent of decentralization, recognizing that it is a key ingredient of a healthy Internet. Starting with Firefox 59, several protocols that support decentralized architectures are approved for use by extensions. The newly approved protocols are:

- Dat Project (dat://)
- IPFS (dweb:// ipfs:// ipns://)
- Secure Scuttlebutt (ssb://)

Firefox itself does not implement these protocols, but having them on the approved list means the browser recognizes them as valid protocols and extensions are free to provide implementations.

Cette après midi
13h30
Amphi C

https://www.scuttlebutt.nz/



matrix

https://matrix.org

Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE

Premier ministre

SECRÉTARIAT D'ÉTAT CHARGÉ DU NUMÉRIQUE

Direction interministérielle du numérique et du système d'information et de communication de l'État

Paris, le 20/04/2018

L'État adopte sa propre messagerie instantanée sécurisée

D'ici l'été 2018, l'État disposera de sa propre messagerie instantanée, alternative aux applications WhatsApp et Telegram.

Elle garantira des **échanges sécurisés**, chiffrés de bout en bout, sans dégradation de l'expérience utilisateur. Elle sera compatible avec n'importe quel terminal mobile ou poste de travail, d'État ou personnel. En effet jusqu'à maintenant l'installation des applications comme WhatsApp ou Telegram n'était pas possible sur les téléphones mobiles professionnels ce qui ne permettait pas une fluidité parfaite de l'information et des partages de documents.

Piloté par la **direction interministérielle du numérique et du système d'information et de communication de l'Etat (DINSIC)**, le projet reçoit les contributions de **l'Agence nationale de la sécurité des systèmes d'information (ANSSI),** des DSI du **ministère des Armées** et du **ministère de l'Europe et des affaires étrangères**.

L'outil développé s'appuie sur un **logiciel open source** (Riot) qui implémente un **standard ouvert** (Matrix). Porté par une startup Franco-Britannique (New Vector), et bénéficiant de nombreuses contributions, ce standard d'échanges de messages instantanés a déjà retenu l'attention d'autres États tels que les **Pays-Bas** et le **Canada**, avec qui la DINSIC collabore étroitement.

https://matrix.org/blog/2018/04/26/matrix-and-riot-confirmed-as-the-basis-for-frances-secure-instant-messenger-app/

Thalès, ce qui a conduit les équipes à se rapprocher pour garantir l'interopérabilité des outils et

Introducing the Dweb

By Dietrich Ayala

Posted on July 31, 2018 in Dweb, Featured Article, Mission:Mozilla, and P2P Web ❤ Share This

Introducing the Dweb

The web is the most successful programming platform in history, resulting in the largest open and accessible collection of human knowledge ever created. So yeah, it's pretty great. But there are a set of common problems that the web is *not* able to address.

https://hacks.mozilla.org/2018/07/introducing-the-d-web/

Démo

Beaker Browser,
un navigateur P2P

https://explore.beakerbrowser.com/

Démo

ROTI en peer to peer

https://acailly.github.io/roti/

https://acailly.github.io/roti/
Merci