

# **Web Semântica e a evolução da Web**

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**nic**.br

**cgi**.br

**ceweb**.br

**W3C**  
Brasil

**ceweb.br**

# ceweb.br

Centro de Estudos sobre  
Tecnologias Web

» Saiba mais sobre  
este importante passo  
para a Web brasileira



## Confira como foi o Workshop de Acessibilidade na Web

No dia 15 de fevereiro, o Ceweb.br promoveu um Workshop de Acessibilidade na Web em São Paulo, que teve como objetivo trazer especialistas para debater e apresentar boas práticas no desenvolvimento de sistemas acessíveis.



## Hoje é dia Mundial de conscientização da Acessibilidade

No dia 18 de maio acontece ao redor do mundo o Global Accessibility Awareness Day (GAAD), um movimento para conscientizar as pessoas sobre a importância da acessibilidade digital. O Ceweb apoia este movimento. Confira o vídeo produzido por nossa equipe.

### PRÓXIMOS EVENTOS

JUN  
07

VII Ciclo de Oficinas  
Segurança, Ética e  
Cidadania na Internet  
- Macapá/AP

Macapá/AP 7 de junho de  
2017

JUN  
13

1ª Convenção  
ABRANET  
Salvador/BA 14 e 15 de junho  
de 2017

» VEJA OUTROS

**W3C**<sup>®</sup>



Skip

## TECHNICAL REPORTS

By date

By group

## WEB AND INDUSTRY

Automotive

Publishing

Entertainment (TV and  
Broadcasting)

Web and Telecommunications

Web of Data

Web of Things

Web Payments

Web Security

## WEB FOR ALL

## ► W3C Strategic Highlights, Spring 2017

7 June 2017 | [Archive](#)

W3C made public its [W3C Strategic Highlights – Spring 2017](#), a comprehensive survey of select recent work. The Web has grown to be the technical infrastructure of Society –the universal connectivity platform. It continues to change business and society, and just as business and society evolve, new needs arise, new opportunities for more captivating experiences need addressing. The Web needs scaling to the opportunity and an organization focused on addressing opportunities. From everyday needs of Web users, to Industry impact, W3C's vision has four areas of excellence: Strengthening the core of the Web, exciting with the next level experiences, extending the reach of the Web, and meeting Industry needs. This report, was prepared for discussion during the Spring W3C Advisory Committee Meeting. Read W3C CEO Jeff Jaffe's [perspectives on this meeting](#) and [W3C's Vision](#) on our Blog.

## ► Cloud Browser Architecture Note Published

9 June 2017 | [Archive](#)

## ► XSL Transformations (XSLT) Version 3.0 is now a W3C Recommendation

8 June 2017 | [Archive](#)

The World Wide Web Consortium (W3C) is an international community that develops open standards to ensure the long-term growth of the Web.

W3C operates under our [Code of Ethics](#) and [Professional Conduct](#).

Become a [Friend of W3C](#) to support the [W3C mission](#) and free developer tools.

## W3C BLOG

## Introducing the W3C Strategy Funnel

8 June 2017 by Wendy Seltzer

## W3C Strategic Highlights for Spring 2017 and Advisory Committee Meeting

7 June 2017 by Jeff Jaffe

## Reflections on GAAD 2017

25 May 2017 by Shadi Abou-Zahra

## JOBS

Open position for a Web Accessibility...

# Data on the Web Best Practices

W3C Recommendation 31 January 2017

**This version:**

<https://www.w3.org/TR/2017/REC-dwbp-20170131/>

**Latest published version:**

<https://www.w3.org/TR/dwbp/>

**Latest editor's draft:**

<http://w3c.github.io/dwbp/bp.html>

**Implementation report:**

<http://w3c.github.io/dwbp/dwbp-implementation-report.html>

**Previous version:**

<https://www.w3.org/TR/2016/PR-dwbp-20161215/>

**Editors:**

Bernadette Farias Lóscio, [CIn - UFPE, Brazil](#)

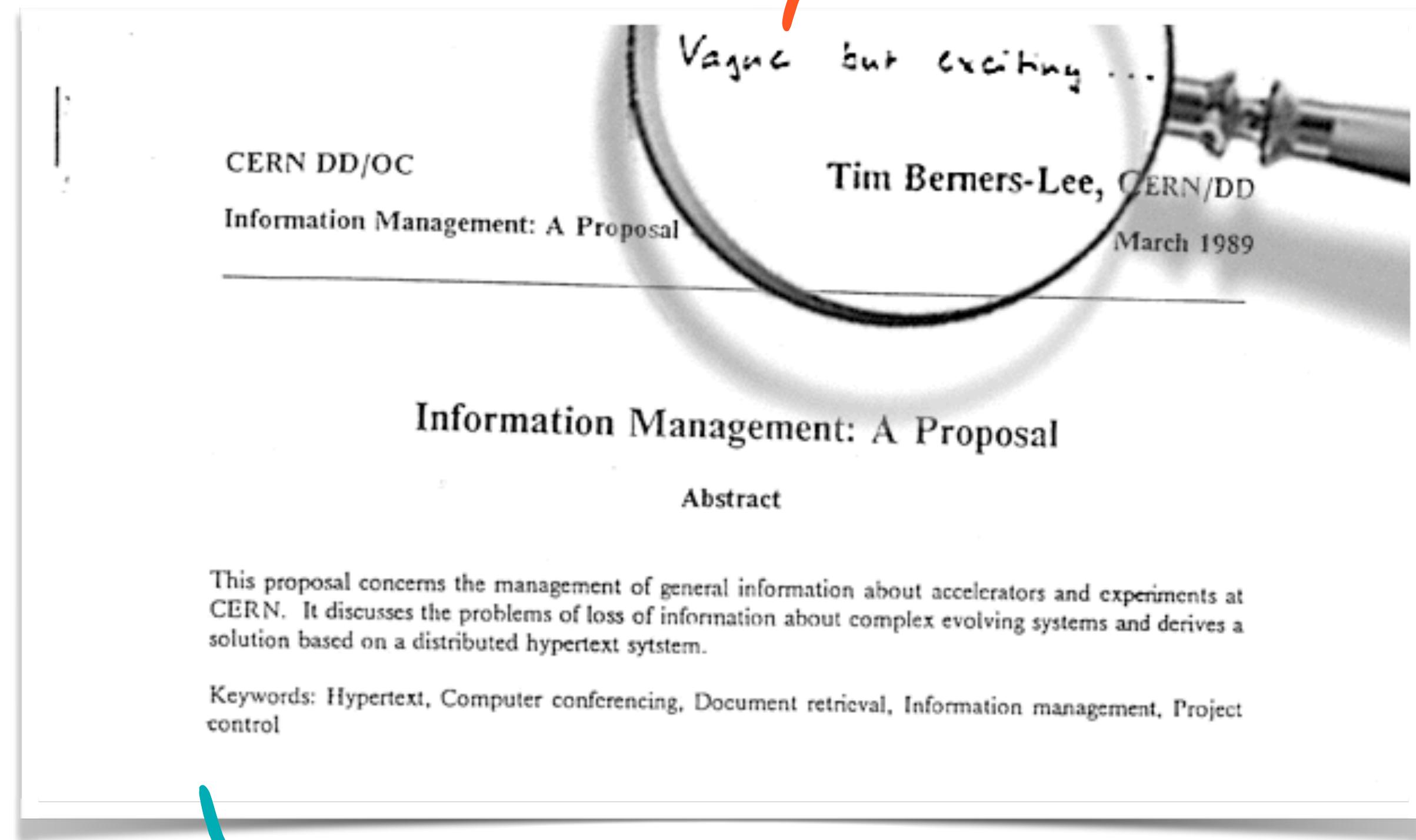
Caroline Burle, [NIC.br, Brazil](#)

Newton Calegari, [NIC.br, Brazil](#)

# O que é Web?

**Internet e Web  
não são as mesmas coisas**

**“vague but exciting”**



**a proposta da World Wide Web**

# WORLD WIDE WEB TECNOLOGIAS FUNDAMENTAIS

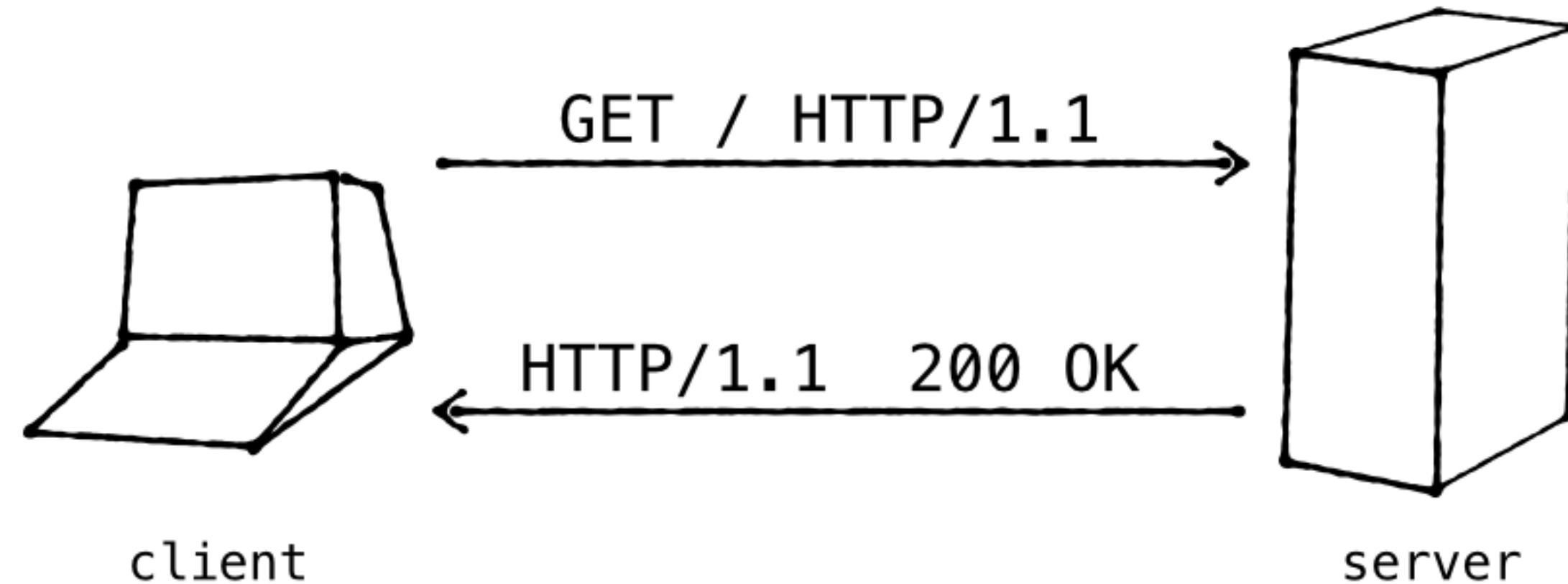
- Páginas web (documentos de hipertexto)
- Protocolo HTTP
- Linguagem HTML
- Identificador de recursos (URI)

**<http://info.cern.ch> - home of the first website**

From here you can:

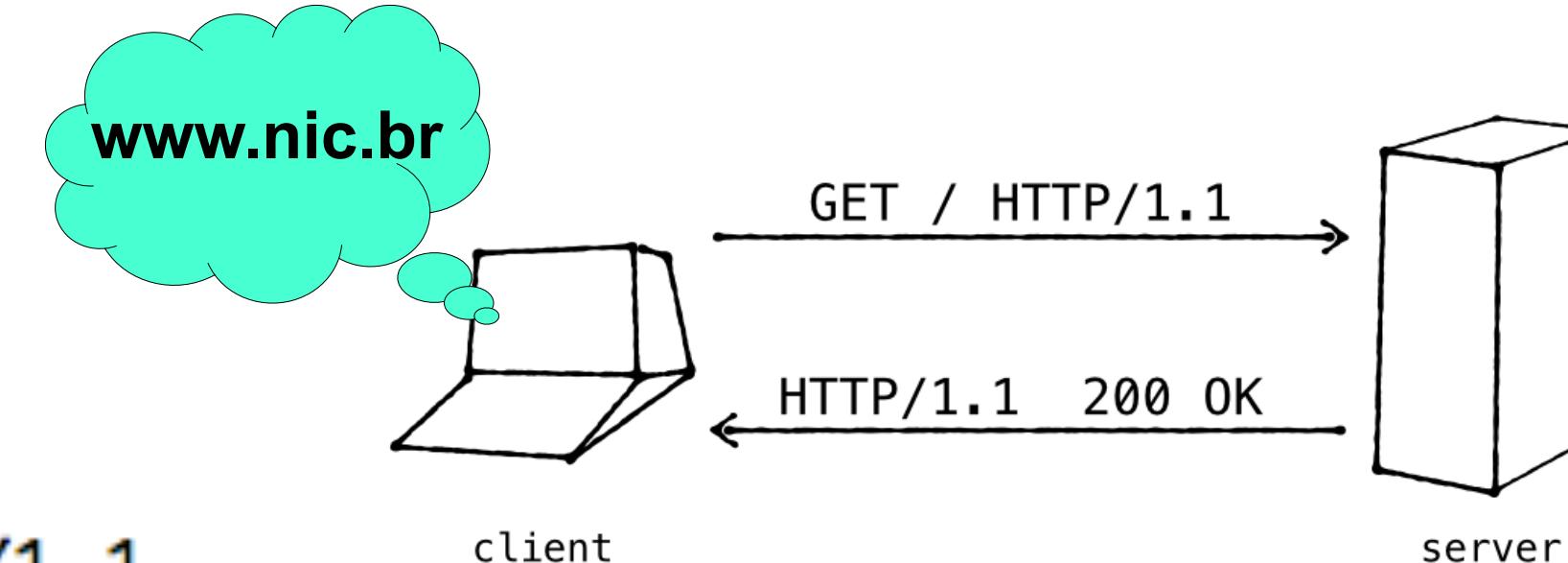
- [Browse the first website](#)
- [Browse the first website using the line-mode browser simulator](#)
- [Learn about the birth of the web](#)
- [Learn about CERN, the physics laboratory where the web was born](#)

# WWW PROTOCOLO HTTP



- **HTTP 0.9** [Tim Berners-Lee 1991]
- **HTTP/1.0** [RFC 1945, Maio 1996]
- **HTTP/1.1** [RFC 2068, Janeiro 1997]
- **HTTP/2** [RFC 7540, Maio 2015]

# HTTP REQUEST



GET / HTTP/1.1

Host: nic.br

Connection: close

User-Agent: Mozilla/5.0 Firefox/39.0

Accept-Encoding: gzip

Accept-Charset: ISO-8859-1,UTF-8;q=0.7,\*;q=0.7

Cache-Control: no-cache

Accept-Language: de,en;q=0.7,en-us;q=0.3

# HTTP RESPONSE

HTTP/1.1 200 OK

Date: Tue, 18 Aug 2015 00:26:31 GMT

Server: Apache/2.2.22

Last-Modified: Mon, 17 Aug 2015 19:21:31 GMT

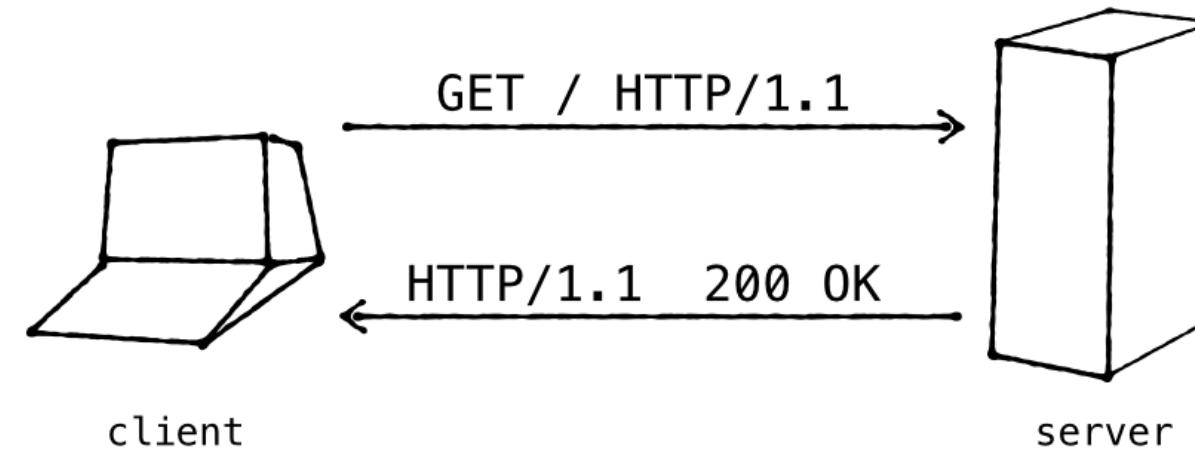
Accept-Ranges: bytes

Content-Length: 42093

Vary: Accept-Encoding

Content-Type: text/html

```
<!DOCTYPE html>
<html lang="pt-br">
  <head>
    <meta charset="utf-8">
```



# WWW LINGUAGEM HTML

- Linguagem de hipertexto para documentos (páginas web)
- Baseada em SGML [ISO 8879:1986]
- Formada por tags (<html> <head> <body> ...)
- Possui link hipertexto (<a href=...>)
- Interpretada pelos navegadores/browsers
- Lista WWW-talk criada em 1991
- Atual versão HTML5

# WWW LINGUAGEM HTML

```
<!DOCTYPE html>
<html lang="pt-br">
<head>
    <meta charset="utf-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="initial-scale = 1.0,maximum-scale=1.0">
    <meta name="author" content="NIC.br">
    <meta name="keywords" content="nic, nic.br, internet no brasil, domínio, domínios, site, sites, web, webmaster, webmaster.br, webmaster.br">
    <meta name="description" content="O Núcleo de Informação e Coordenação do Ponto Brasil (NIC.br) é o responsável pela administração do espaço de endereços IP e nomes de domínio (.br) no Brasil.">
    <meta name="google-site-verification" content="nDjnC4ZPe8Y4pwA9JLjwvQWzg" />
```

# WWW URI, URL, DOMÍNIOS

- Nomes de domínios \*
- DNS [RFC 882, Novembro 1983]
- URIs na WWW [RFC 1630, Junho 1994]
- URL: localizador de recursos na Web
- Importância para Web semântica
- Identificar recursos e conceitos

\* Mais sobre TLDs em <https://www.iana.org/domains/root/db>

# WWW URL

http://ceweb.br/contato/index.html

esquema://domínio:porta/caminho/recurso?query\_string#fragmento

esquema: http

domínio: ceweb.br

porta: 80

caminho: /contato

recurso: index.html

# WORLD WIDE WEB TECNOLOGIAS FUNDAMENTAIS

- Páginas web (documentos de hipertexto)
- Protocolo HTTP
- Linguagem HTML
- Identificador de recursos (URI)

# Porque padrões web são importantes?

# Os padrões estão consolidados

Tim Berners-Lee inventou a Web em 1989 e fundou o W3C em 1994

Já foram publicados mais de 110 padrões



A.M. Turing Award

amturing.acm.org

A.M. TURING CENTENARY CELEBRATION WEBCAST

acm

MORE ACM AWARDS

# A.M. TURING AWARD

A.M. TURING AWARD WINNERS BY...

ALPHABETICAL LISTING

YEAR OF THE AWARD

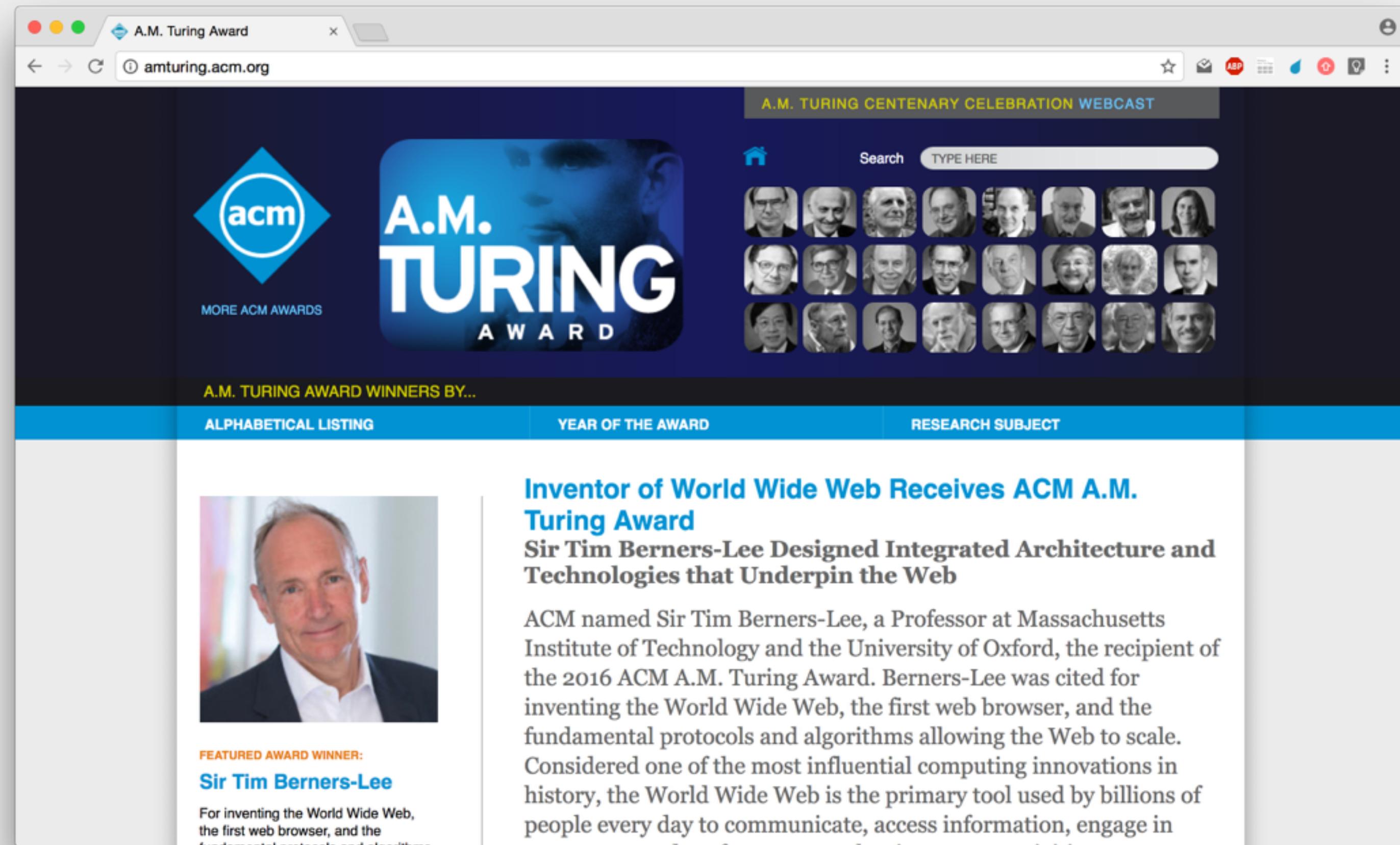
RESEARCH SUBJECT

FEATURED AWARD WINNER:  
**Sir Tim Berners-Lee**

For inventing the World Wide Web, the first web browser, and the fundamental protocols and algorithms

Inventor of World Wide Web Receives ACM A.M. Turing Award  
Sir Tim Berners-Lee Designed Integrated Architecture and Technologies that Underpin the Web

ACM named Sir Tim Berners-Lee, a Professor at Massachusetts Institute of Technology and the University of Oxford, the recipient of the 2016 ACM A.M. Turing Award. Berners-Lee was cited for inventing the World Wide Web, the first web browser, and the fundamental protocols and algorithms allowing the Web to scale. Considered one of the most influential computing innovations in history, the World Wide Web is the primary tool used by billions of people every day to communicate, access information, engage in



# O processo e os padrões são abertos

São desenvolvidos pela equipe do W3C,  
membros e com participação ativa da  
comunidade.

# Status das especificações

*Indicam o nível de estabilidade dos documentos*

Working Draft (WD)

Last Call (LC)

Candidate Recommendation (CR)

Proposed Recommendation (PR)

Recommendation (REC)

# Os padrões são interoperáveis

O uso de padrões proporciona que as páginas sejam acessadas por todos.

# Garante compatibilidade

Sua página abre corretamente nos navegadores que seguem padrões.

# Passado



# Presente



página em [http://www.gutenberg.org](#) diz



**ATENÇÃO !** Para o registro de ocorrências, utilize MICROSOFT INTERNET EXPLORER VERSÃO 4 ou superior.

OK

Para que a oco  
corretos.

Durante a conferência, pode ser feita uma ligação pelo telefone informado.

Após, a ocorrência narrado, no caso Delegacia da locação "Dados Básicos".

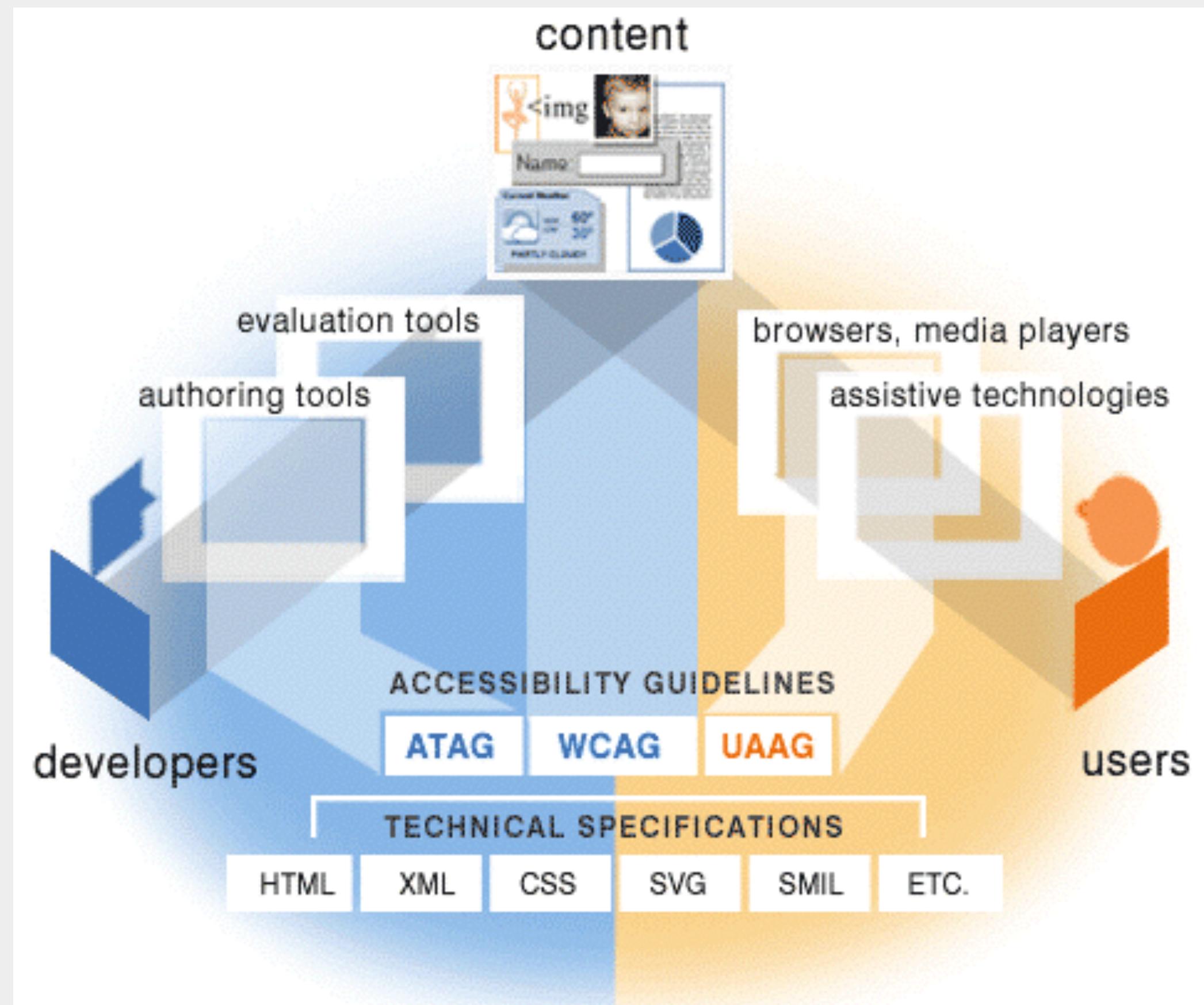
**Esclarecemos que o seu computador será monitorado durante o registro virtual da ocorrência e lembramos que a comunicação falsa de crime ou contravenção tem pena prevista no artigo 340 do Código Penal Brasileiro.**

Pessoa  
Desaparecida

Ajud

# É acessível

Possibilita o acesso de pessoas com deficiências às informações.



Você também pode criar um padrão

Mas vai ter muito trabalho pela frente...

HOW STANDARDS PROLIFERATE:  
(SEE: A/C CHARGERS, CHARACTER ENCODINGS, INSTANT MESSAGING, ETC)

SITUATION:  
THERE ARE  
14 COMPETING  
STANDARDS.

14?! RIDICULOUS!  
WE NEED TO DEVELOP  
ONE UNIVERSAL STANDARD  
THAT COVERS EVERYONE'S  
USE CASES.



YEAH!

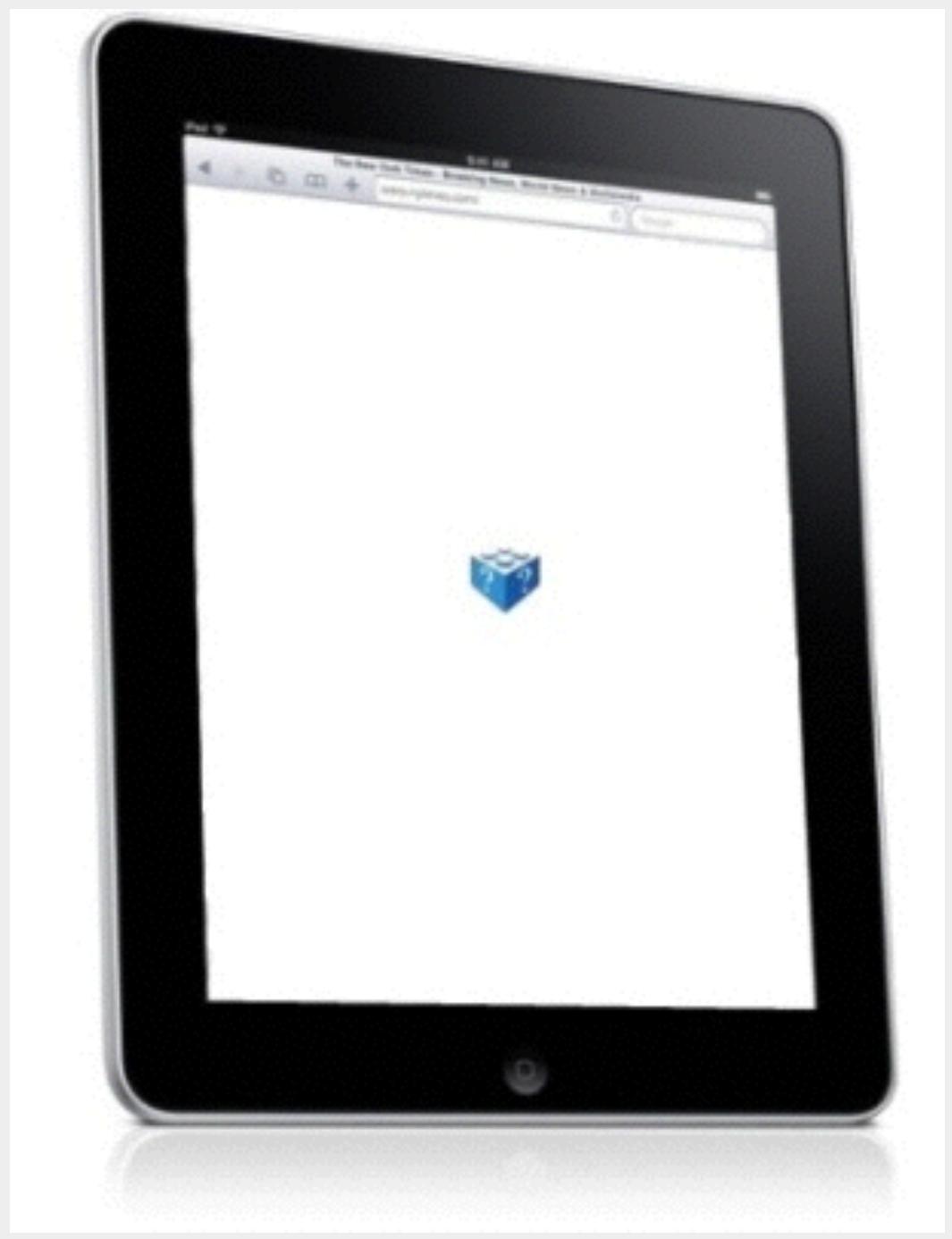
SOON:

SITUATION:  
THERE ARE  
15 COMPETING  
STANDARDS.



# Compatibilidade

Instalação de plug-ins e dependência de sistemas operacionais





buscar

[Brasil](#) | [Mundo](#) | [Economia](#) | [Política](#) | [Esportes](#) | [Carros](#) | [Emprego](#) | [Educação](#) | [Saúde](#) | [Tech](#) | [Bizarro](#) | [Pop&Arte](#) | [MG](#) | [RJ](#) | [SP](#) | [Telejornais](#) | [Virada de ano](#)

| CES 2014

29/04/2010 17h39 - Atualizado em 20/05/2010 07h09

# Steve Jobs explica razões para não usar Flash em iPhone e iPad

Carta aberta foi publicada no site da Apple nesta quinta-feira (29). 'Aplicativos mostram que o Flash não é necessário', diz Jobs.

Do G1, em São Paulo

imprimir



Em carta aberta publicada no site da Apple nesta quinta-feira (29), Steve Jobs listou algumas das razões para não utilizar o Adobe Flash em aparelhos como o iPad ou iPhone.

O documento, intitulado "Thoughts on Flash" ("Pensamentos sobre o Flash") começa reconhecendo a "longa relação" entre as companhias. "Nós conhecemos os fundadores da Adobe quando eles ainda estavam em sua garagem. A Apple foi seu primeiro grande cliente, adotando sua linguagem Postscript em nossas então novas impressoras Laserwriter. A Apple investiu na Adobe e possuiu cerca de 20% da companhia por muitos anos", escreveu Jobs.

## Tecnologia e Games

17 AGO



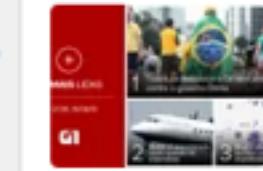
10:31

Conheça os 'Zuckerbergs' latino-americanos; brasileiro criou...



08:17

Alphabet: veja lista de todas as letras da 'nova Google', de...



16 AGO

19:32

Mais lidas do dia:  
16/agosto/2015



08:38

Como recuperar os arquivos que você apagou com a ajuda do...

PUBLICIDADE

“Nós realmente acreditamos que todos os padrões pertencentes à web deveriam ser abertos. Em vez de usar Flash, a Apple adotou o HTML5, CSS e JavaScript – todos padrões abertos”

<http://www.apple.com/hotnews/thoughts-on-flash/>

“Recentemente, a Symantec destacou o Flash por possuir um dos piores recordes de segurança em 2009. Nós também sabemos em que o Flash é a razão número um para crash nos Macs”

<http://www.apple.com/hotnews/thoughts-on-flash/>

## CURRENT MEMBERS

As of 22 June 2012, the World Wide Web Consortium (W3C) has 393 members. You can [view statistics about W3C Members](#) and view an [animation of current members](#).

A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q  
R | S | T | U | V | W | Y | Z

- [28msec Inc.](#)
- [Aalto University](#)
- [Academia Sinica](#)
- [ACCESS CO., LTD.](#)
- [ACORD Corporation](#)
- [Adesis Netlife S.L. — \*testimonial\*](#)
- [Adobe Systems Inc.](#)
- [AdTruth](#)
- [Afilias Limited](#)
- [Agencia para el Desarrollo del Gobierno de Gestión](#)
- [Electronica y la Sociedad de la Informacion y del Conocimiento \(AGESIC\)](#)
- [AgileDelta, Inc. — \*testimonial\*](#)
- [Akmin](#)
- [Alcatel-Lucent](#)
- [Algebraix Data Corporation](#)
- [Alisys Software](#)
- [Altova GmbH — \*testimonial\*](#)
- [Amadeus](#)
- [AME Info FZ LLC — \*testimonial\*](#)
- [ANBOTO — \*testimonial\*](#)
- [ANDANZA TECHNOLOGIES](#)
- [Apple, Inc.](#)
- [association BrailleNet — \*testimonial\*](#)
- [Astra Zeneca](#)
- [AT&T](#)
- [Atal Behari Vajpayee - Indian Institute of Information Technology and Management, Gwalior](#)



A web não morreu

Mas ela está mudando

# Tim Berners-Lee: we need to re-decentralise the web

POLITICS / 06 FEBRUARY 14 / by LIAT CLARK



5606 shares  
12 comments

Twenty-five years on from the web's inception, its creator has urged the public to re-engage with its original design: a decentralised internet that at its very core, remains open to all.

Speaking with Wired editor David Rowan at an event launching the magazine's **March issue**, Tim Berners-Lee said that although part of this is about keeping an eye on for-profit internet monopolies such as search engines and social networks, the greatest danger is the emergence of a balkanised web.



Tim Berners-Lee with David Rowan *Chris Woods / chrismwoods.com*

<http://www.wired.co.uk/news/archive/2014-02/06/tim-berners-lee-reclaim-the-web>

# A web está evoluindo

## O que esperar do futuro da Web?



# O futuro da Web

que já é quase presente

[Todas](#)[Notícias](#)[Vídeos](#)[Imagens](#)[Shopping](#)[Mais](#) ▾[Ferramentas de pesquisa](#)

## Stranger Things / Elenco



Winona Ryder  
Joyce



Millie Brown  
Eleven



Natalia Dyer  
Nancy



David Harbour  
Chief Hopper



Charlie Heaton  
Jonathan



Noah Schnapp  
Will



Matthew Modine  
Dr. Martin Brenner



Cara Buono  
Karen



Gaten Matarazzo  
Mike

## Notícias em destaque



### [De "Stranger Things": veja Millie Brown, Gaten Matarazzo e o restante do elenco na vida real!](#)

Purebreak Brasil - 2 dias atrás

De "Stranger Things": Gaten Matarazzo é tão fofo quanto o seu ... De

"Stranger Things": David Harbour é mais estiloso que o Chief Hopper, né?

De "Stranger Things": Natalia Dyer e Nancy Wheeler são ...

[Nova febre entre os amantes de séries, 'Stranger Things' recupera anos 1980 - 31/07/2016 - Ilustrada - Folha de S.Paulo](#)

Folha de S.Paulo - 2 dias atrás

[De "Stranger Things": Larissa Manoela, Chay Suede, Mel Maia e mais no elenco brasileiro da série!](#)

Purebreak Brasil - 1 dia atrás

[Mais notícias sobre elenco stranger things](#)

### [5 coisas "estranhas" \(e fofas!\) sobre as crianças de "Stranger Things" ...](#)

[tvefamosos.uol.com.br/listas/5-coisas-estranhas-e-fofas-sobre-as-criancas-de-stranger-t... ▾](#)

5 dias atrás - Veja cenas da série "Stranger Things", da Netflix8 fotos ... Bobby Brown e Gaten Matarazzo em cena de "Stranger Things" Imagem: ... algo semelhante ao que acontece com o elenco de "Todo Mundo Odeia o Chris". ... Não foi difícil para Finn Wolfhard, o Mike, se ambientar à época de "Stranger Things".

## Stranger Things

Seriado de ficção científica



Stranger Things é uma websérie americana dos gêneros suspense, ficção científica e terror criada pelos irmãos Matt e Ross Duffer e distribuída pela Netflix. [Wikipédia](#)

Emissora original: [Netflix](#)

Número De Episódios: 8

Número De Temporadas: 1

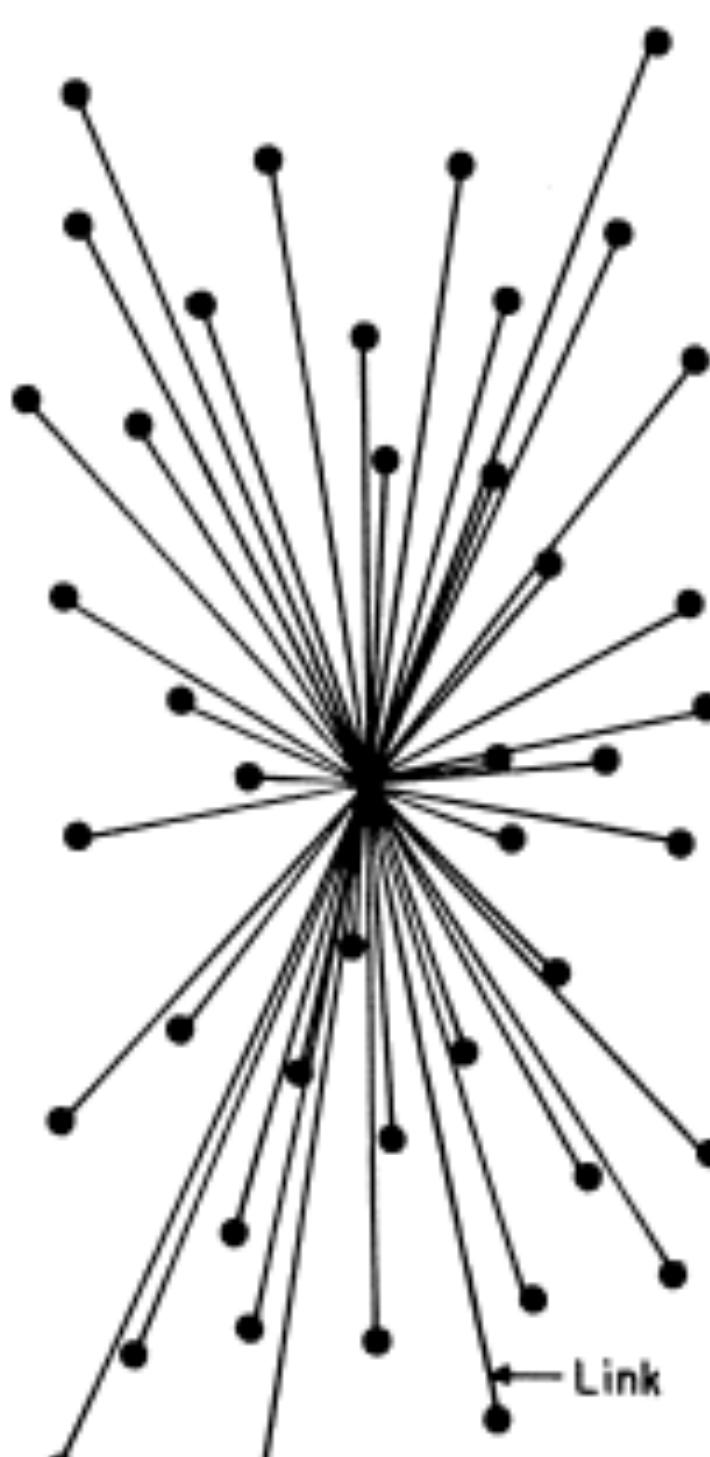
Idioma: Língua inglesa

Gêneros: Thriller, Ficção científica, Terror, Mistério, Supernatural fiction

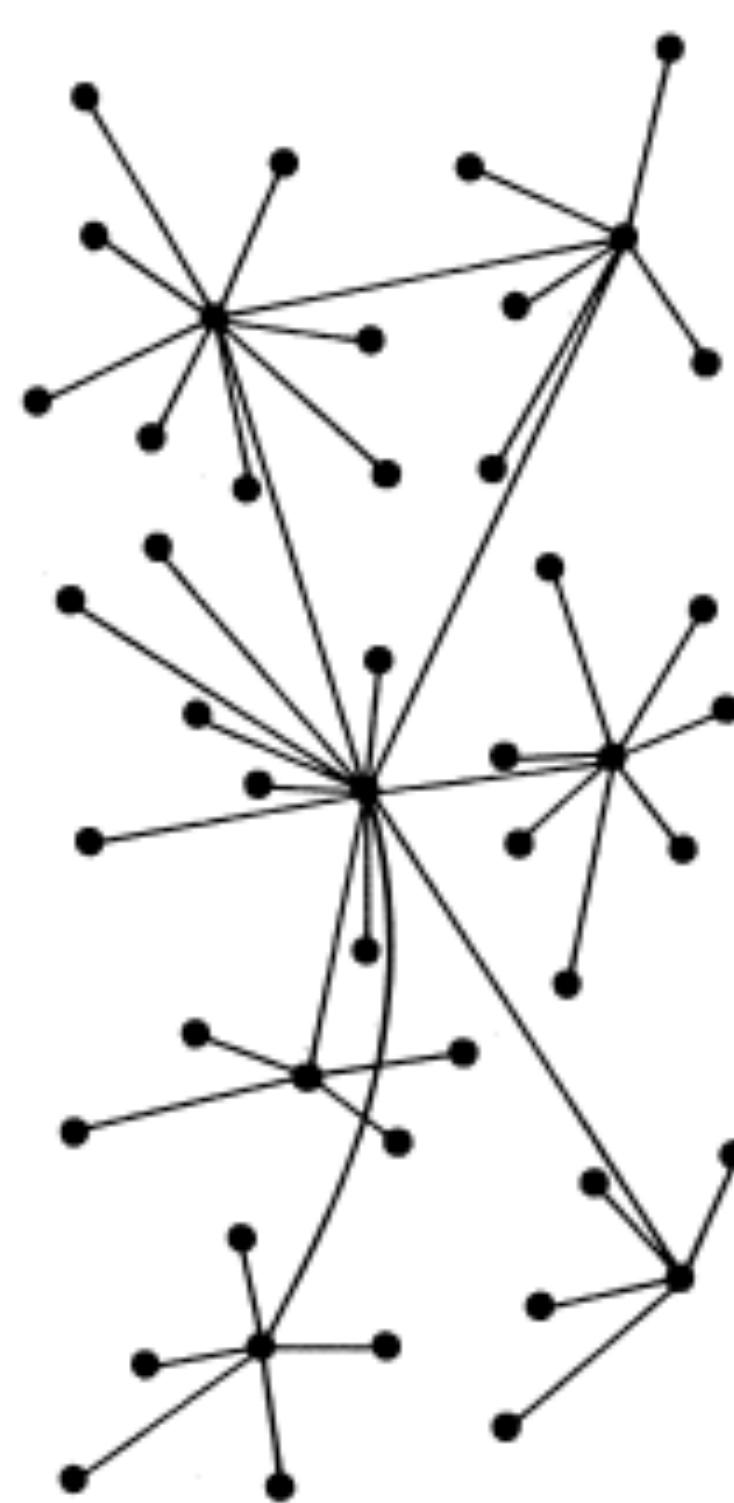
Pesquisas relacionadas



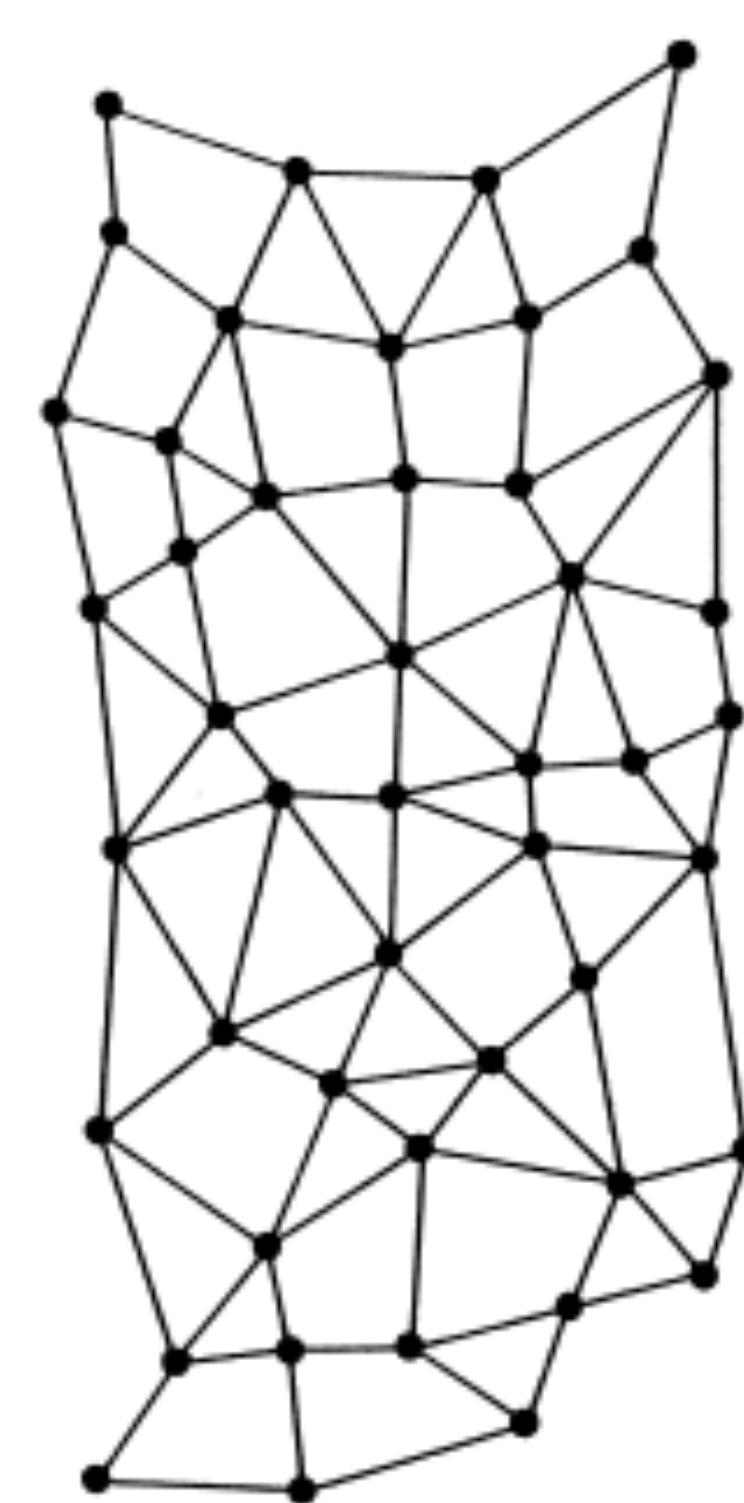




CENTRALIZED  
(A)



DECENTRALIZED  
(B)



DISTRIBUTED  
(C)

FIG. I – Centralized, Decentralized and Distributed Networks



# Web Semântica

CERN DD/OC

Information Management: A Proposal

Vague but exciting ...

Tim Berners-Lee, CERN/DD

March 1989

## Information Management: A Proposal

### Abstract

This proposal concerns the management of general information about accelerators and experiments at CERN. It discusses the problems of loss of information about complex evolving systems and derives a solution based on a distributed hypertext system.

Keywords: Hypertext, Computer conferencing, Document retrieval, Information management, Project control

**Web**

*of*



**Documents**

**Data**

**Things**

# Web Semântica

Berners-Lee et al., 2001

“The Semantic Web aims to describe the meaning of information published on the Web to enable retrieval based on an accurate understanding of that information’s semantics”

(RODRÍGUEZ-ROCHA et al., 2015)

LONG READ | SECRETS OF THE MOST PRODUCTIVE PEOPLE

# At Sundar Pichai's Google, AI Is Everything—And Everywhere

A year into his tenure as CEO of Google, the low-key company is, where it's going, and how it gets things



The wide scope represented by that lineup may suggest that Pichai isn't picking his competitive battles. But his key ambitions are bound by a core prediction: that the world is moving from the smartphone age into, in Pichai's phrase, an "AI-first" era, in which Google products will **help people accomplish tasks in increasingly sophisticated, even anticipatory ways**. The Pixel phones and Google Home, for instance, are the first devices with embedded support for Google Assistant, a rival to Apple's Siri and Amazon's Alexa that is designed not only to handle straightforward commands but also fuzzier requests such as "Play that

EXCLUSIVE: WARP DRIVE UNDERWATER • ARCTIC OIL VS. WILDLIFE

# SCIENTIFIC AMERICAN

Get the Idea?  
(TOMORROW'S WEB WILL)



PLUS:

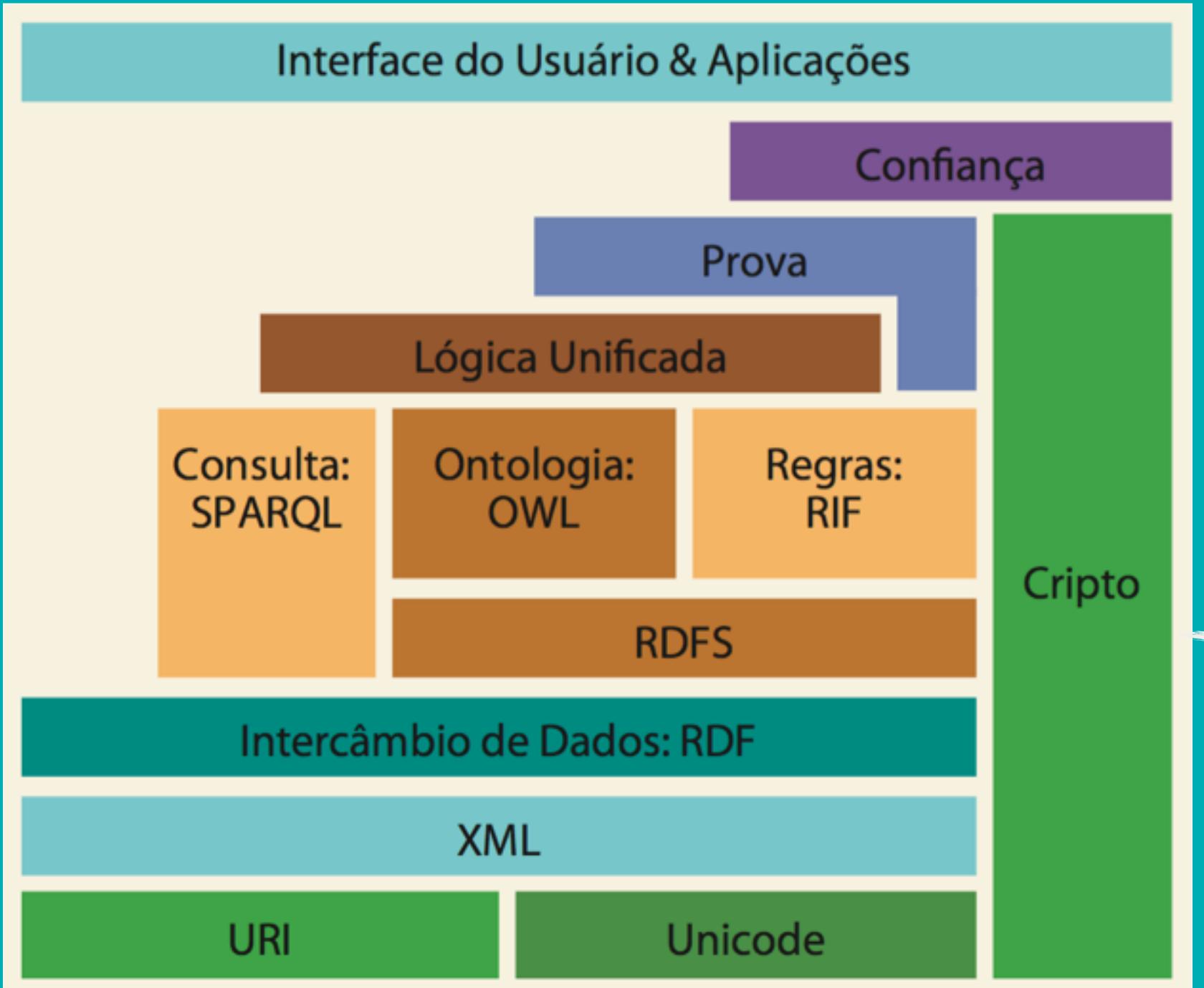
Antibiotics'  
Dim Future  
Rorschach:  
A Waste of Ink  
The Oldest Stars

MAY 2005  
www.sciam.com \$4.95

**human-readable vs machine-readable**

**~ 10 anos**

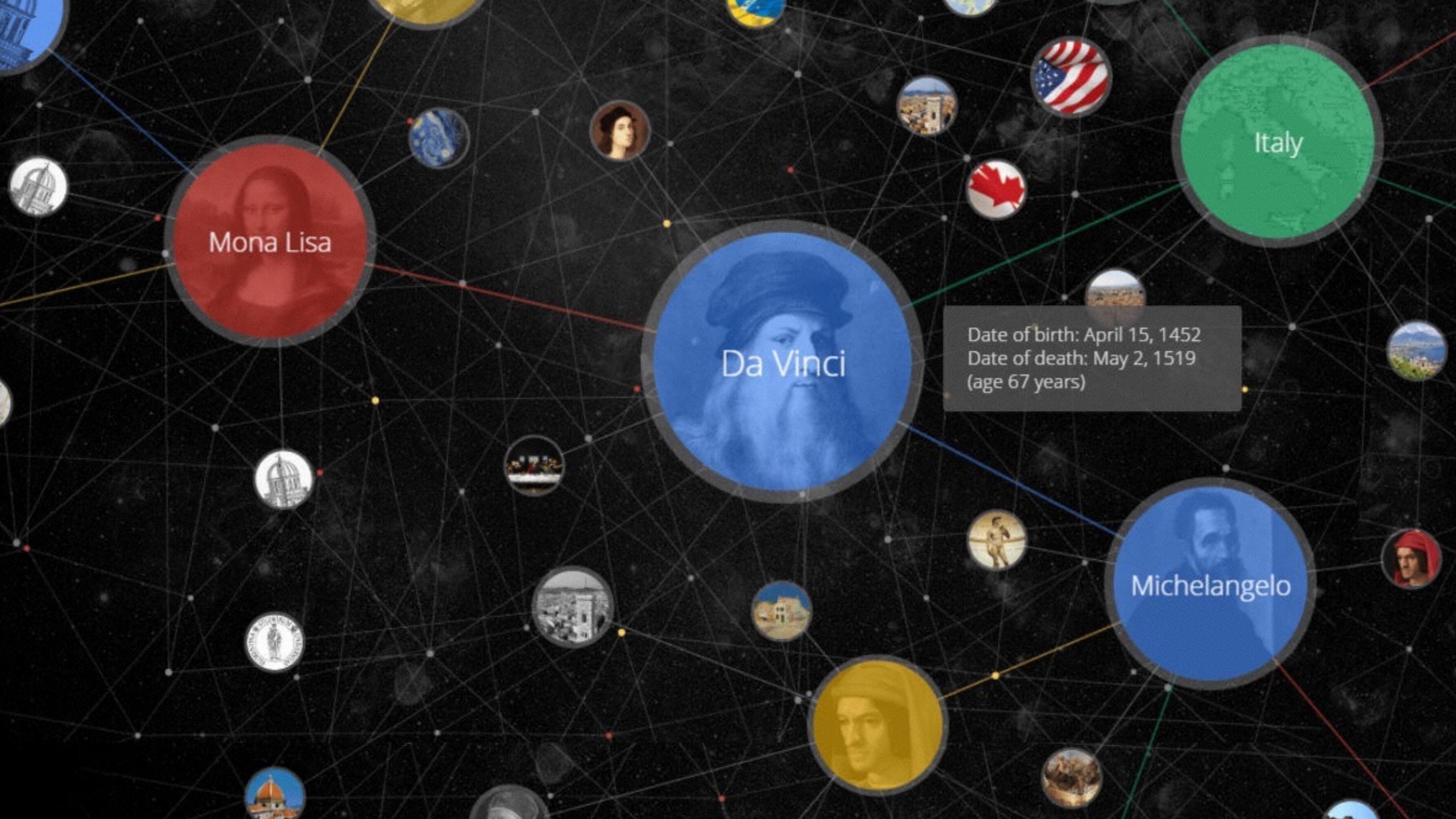
**... para vermos grandes aplicações**



# Semantic Web Stack



# *Dados estruturados no Google*



A network graph on a dark background showing connections between historical figures and their works. Nodes include large circles for 'Mona Lisa' (red), 'Da Vinci' (blue), 'Michelangelo' (blue), and 'Italy' (green). Smaller nodes include portraits, flags, and scenes related to the文艺复兴三杰. A central node for Da Vinci is connected to a box with his birth and death details.

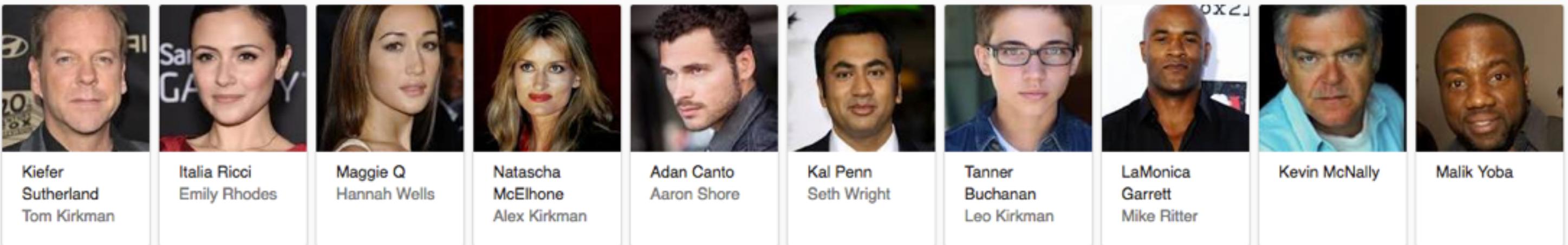
Italy

Mona Lisa

Da Vinci

Michelangelo

Date of birth: April 15, 1452  
Date of death: May 2, 1519  
(age 67 years)

[All](#) [Videos](#) [Images](#) [News](#) [Shopping](#) [More](#)[Settings](#) [Tools](#)[Designated Survivor > Cast](#)

### [Designated Survivor: Elenco da 1ª temporada - AdoroCinema](#)

[www.adorocinema.com/series/serie-20098/temporada.../elenco/](http://www.adorocinema.com/series/serie-20098/temporada.../elenco/) - Translate this page

Encontre todos os astros (como Kiefer Sutherland, Natascha McElhone...) e equipe técnica da 1ª Temporada de Designated Survivor.

### [Designated Survivor - Série 2016 - AdoroCinema](#)

[www.adorocinema.com/.../Todas as séries/Séries Drama](http://www.adorocinema.com/.../Todas_as_s%C3%A9ries/S%C3%A9ries_Drama) - Translate this page

Rating: 4.6 - 242 votes

Designated Survivor, uma série criada por David Guggenheim com Kiefer Sutherland, Natascha McElhone: O Presidente dos ... Elenco Designated Survivor.

### [Designated Survivor – Wikipédia, a encyclopédia livre](#)

[https://pt.wikipedia.org/wiki/Designated\\_Survivor](https://pt.wikipedia.org/wiki/Designated_Survivor) - Translate this page

Jump to [Elenco](#) - Elenco[editar | editar código-fonte]

[Enredo](#) · [Elenco](#) · [Episódios](#) · [Referências](#)

### [Designated Survivor \(2016\) | Elenco | Omelete](#)

[omelete.uol.com.br/series-tv/designated-survivor/elenco/](http://omelete.uol.com.br/series-tv/designated-survivor/elenco/) - Translate this page

Confira o elenco de Designated Survivor: Kiefer Sutherland, Maggie Q, Kal Penn...

### [Designated Survivor \(1ª temporada\) - 2016 | Filmow](#)

## Designated Survivor

American drama series



4.6/5

AdoroCinema

4.2/5

Filmow

7.9/10

IMDb

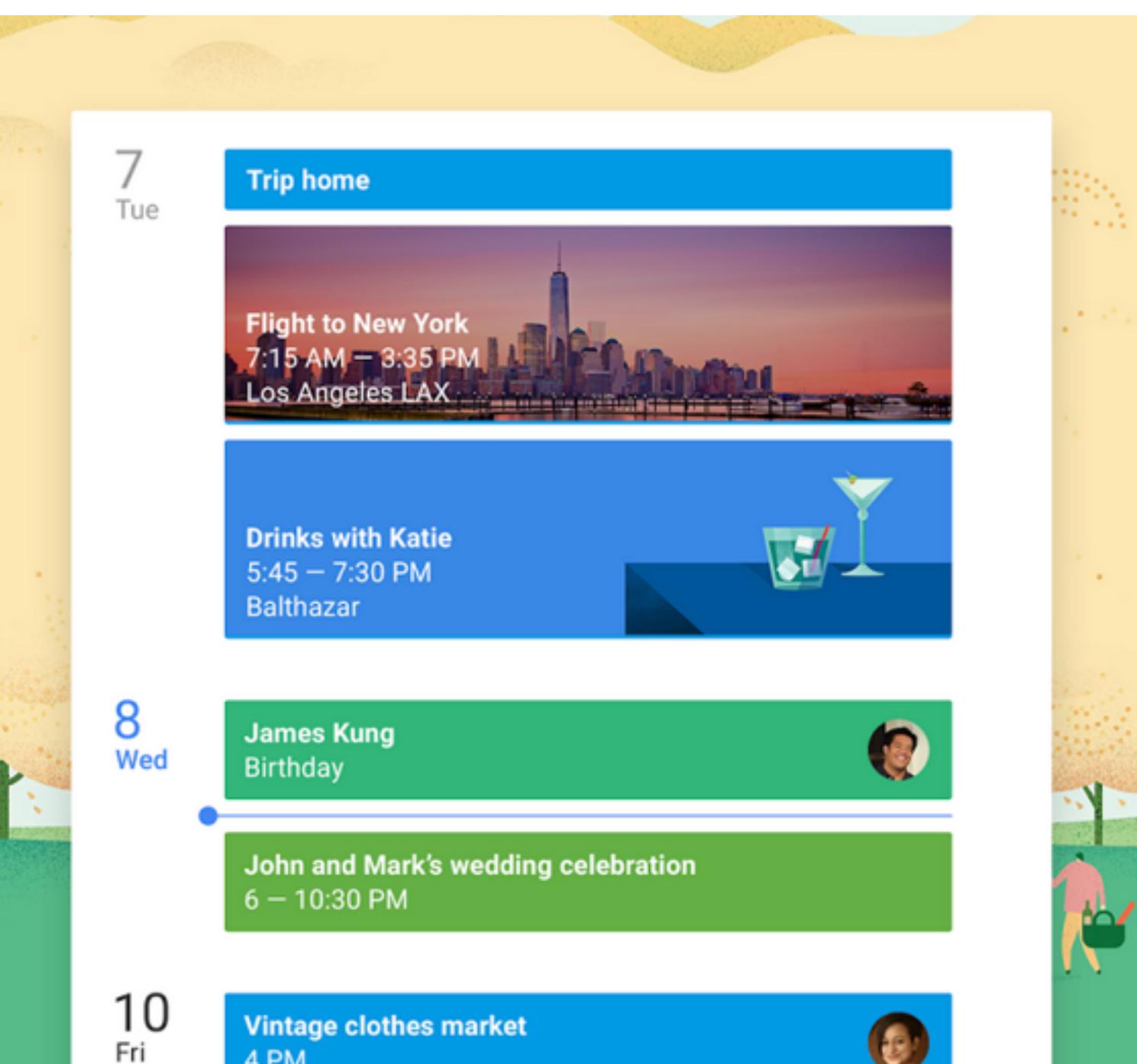
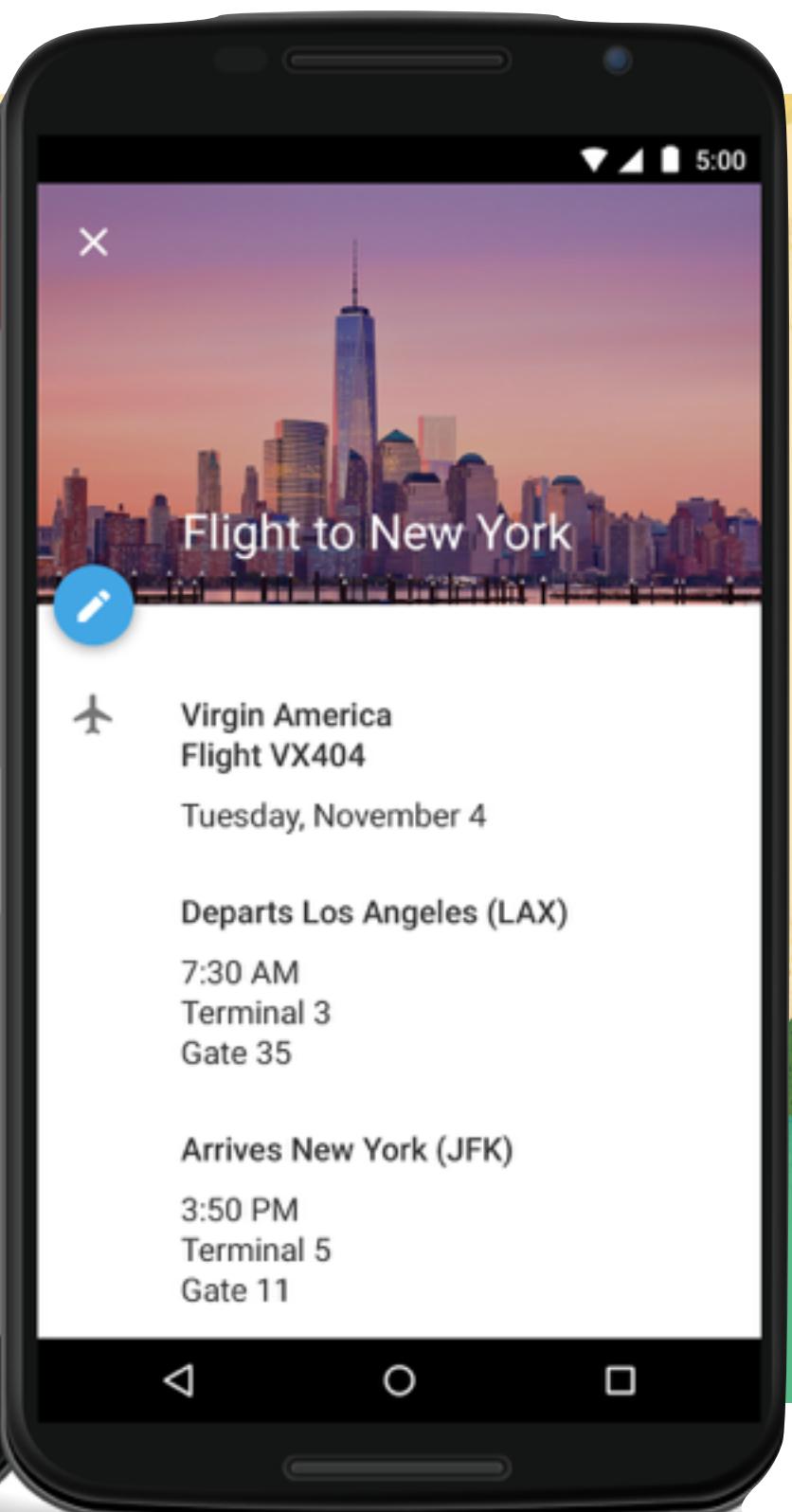
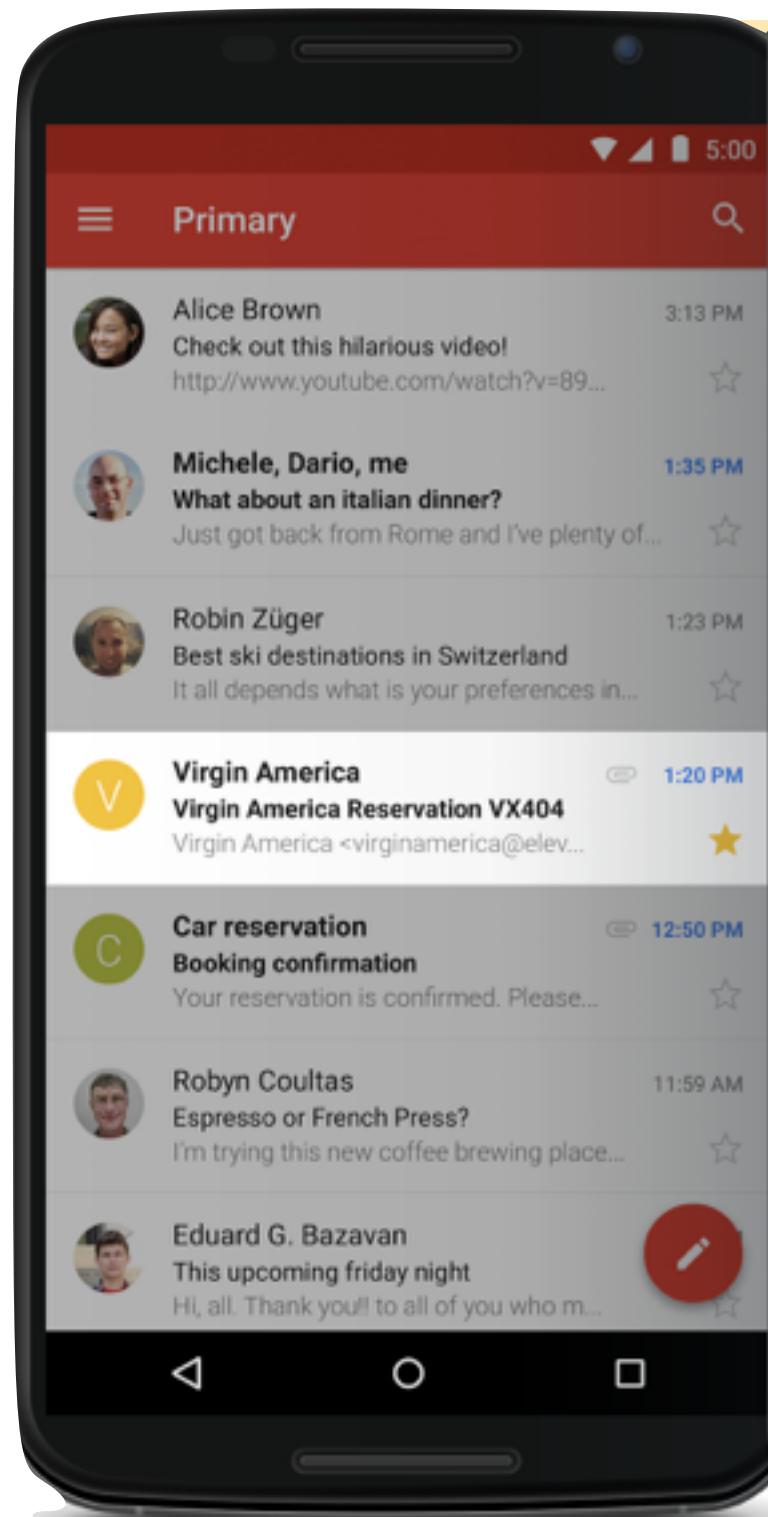
As a lower-level cabinet member, Tom Kirkman never imagined something would happen that would catapult him to the oval office. When a devastating attack on the night of the State of the Union address claims the lives of the president and most of the Cabinet, the Housing and Urban Development secreta... [More](#)

**Network:** American Broadcasting Company

**Production location:** Toronto

**Characters:** Aaron Shore, Emily Rhodes, Tom Kirkman, Hannah Wells, Alex Kirkman, Leo Kirkman, Seth Wright, Mike Ritter

**Executive producers:** Mark Gordon, Jeff Melvoin, more



Sep 17, 2014

**View Pull Request ➔**

33

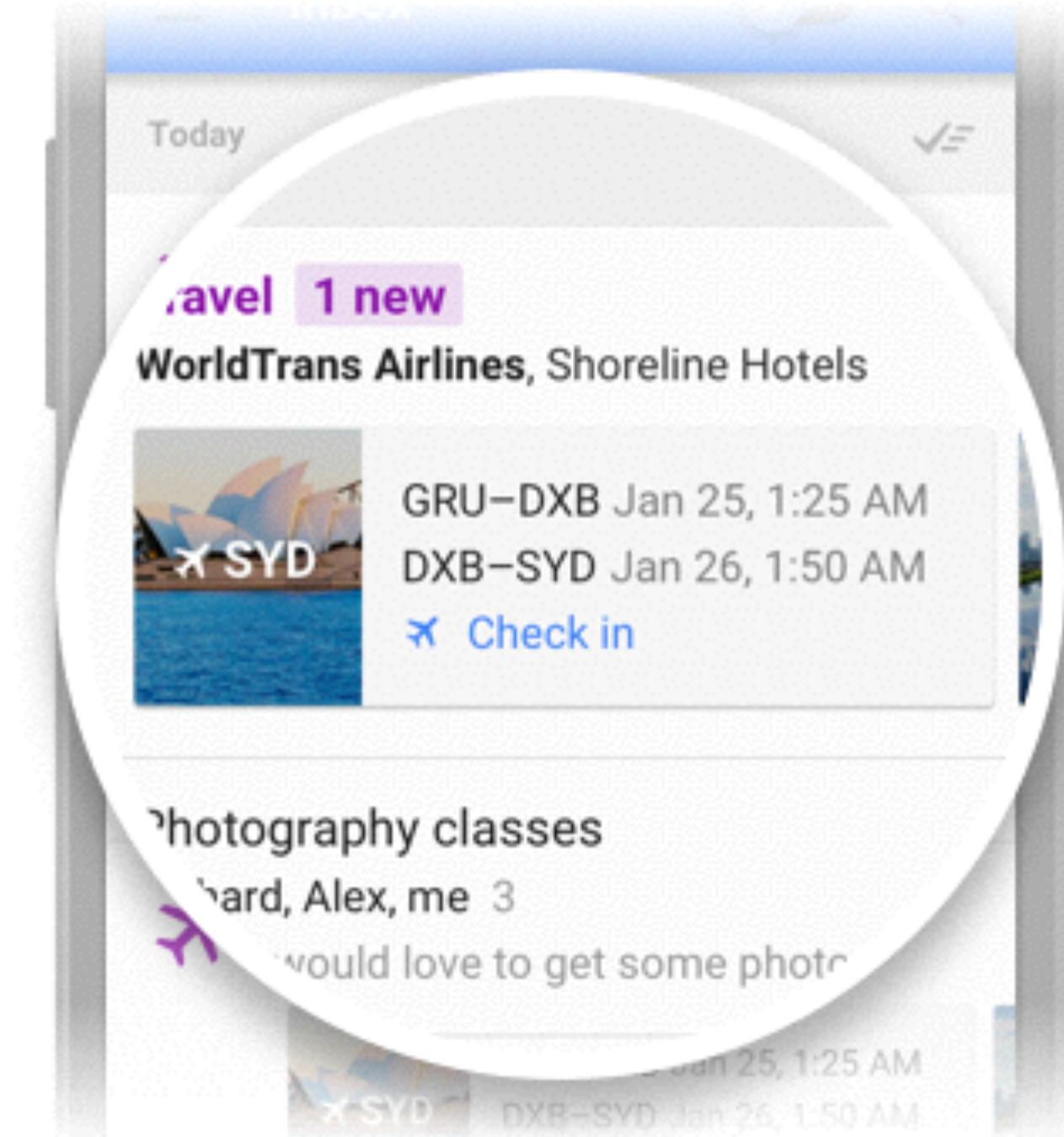
**View Issue ➔**

at! However. '

# GMail Actions



# GMail Highlights

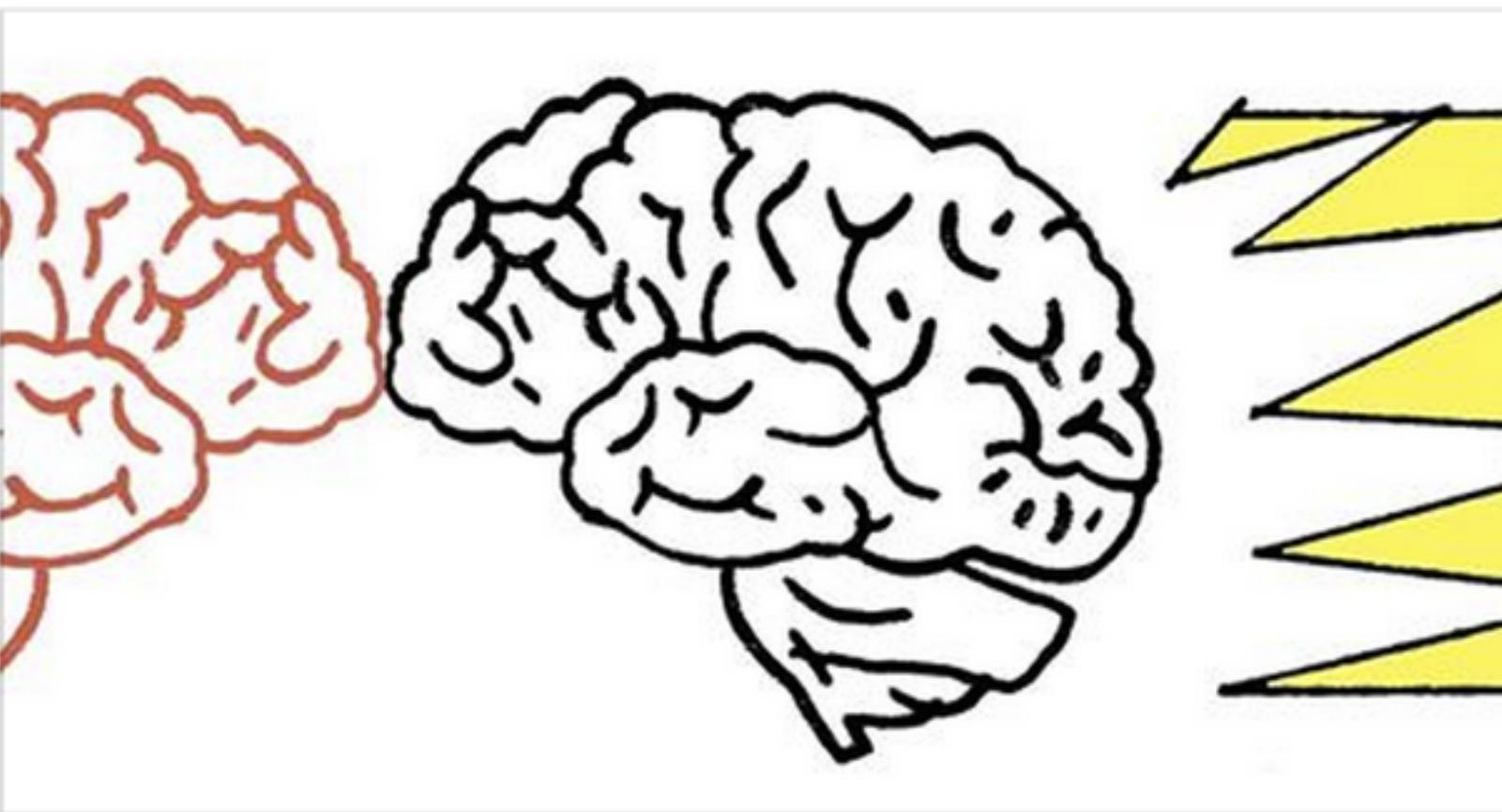




The New York Times

35 mins ·

How an identical brainstorming exercise produced very different results in two distinct cultural contexts.



## When Great Minds Don't Think Alike

How much does culture influence creative thinking?

NYTIMS | BY STEPHEN HEYMAN

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# A evolução da Web

# **BLOCKCHAIN**



CoinDesk   
@coindesk

 Follow

Freshly-delivered Papa John's pizza at the CoinDesk office -  
Happy #BitcoinPizzaDay everyone!

8:31 AM - 22 May 2014

↪ 32    ⚡ 32    ❤ 23

**Naquela época, 10000 bitcoins valiam cerca de 41 dólares,  
hoje, 20/02/2018, esse valor chega a mais de 110 milhões de dólares.**

## HOW DO BITCOINS WORK?



'Miners' create Bitcoins by using computers to solve mathematical functions. The same process also verifies previous transactions



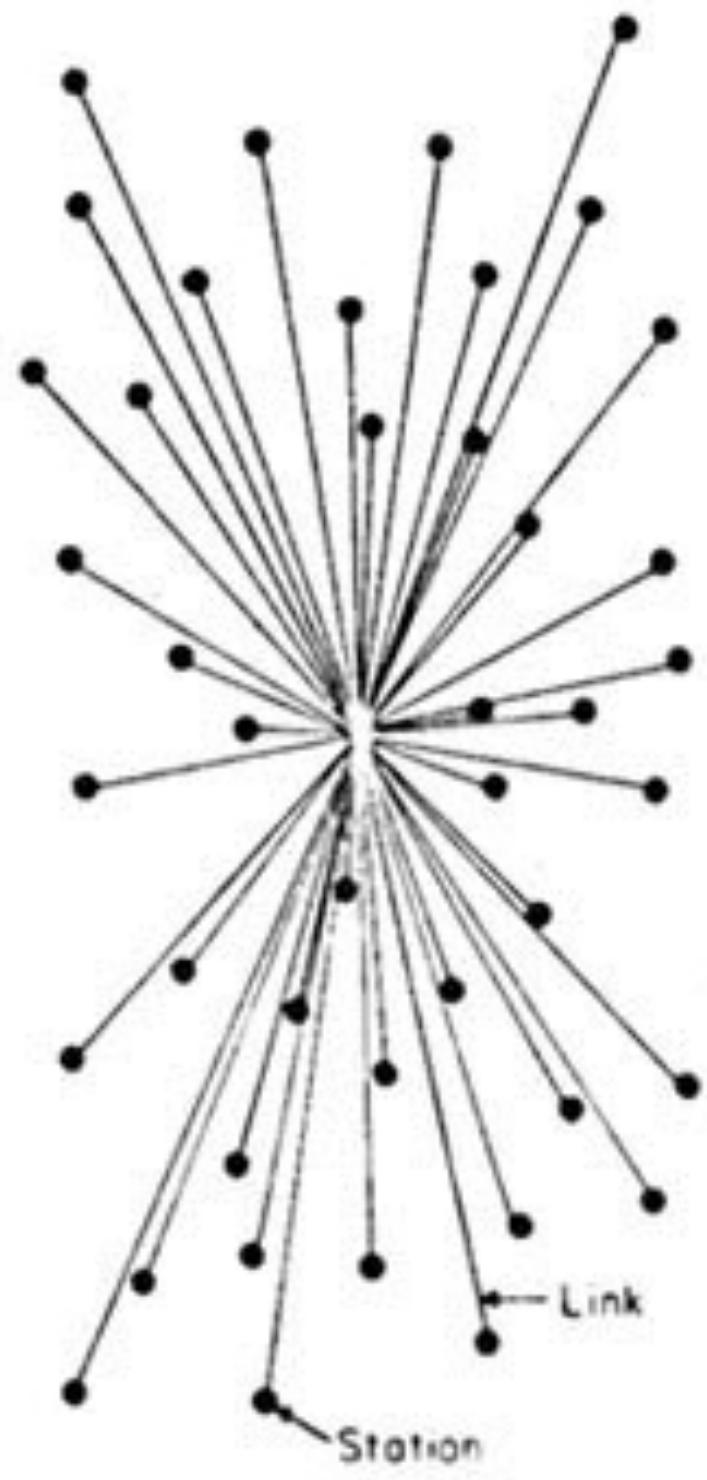
Users download a Bitcoin 'wallet' that works a little like an email address, providing a way to store and receive currency. Bitcoins can be transferred from one wallet to another using a web browser or a phone app



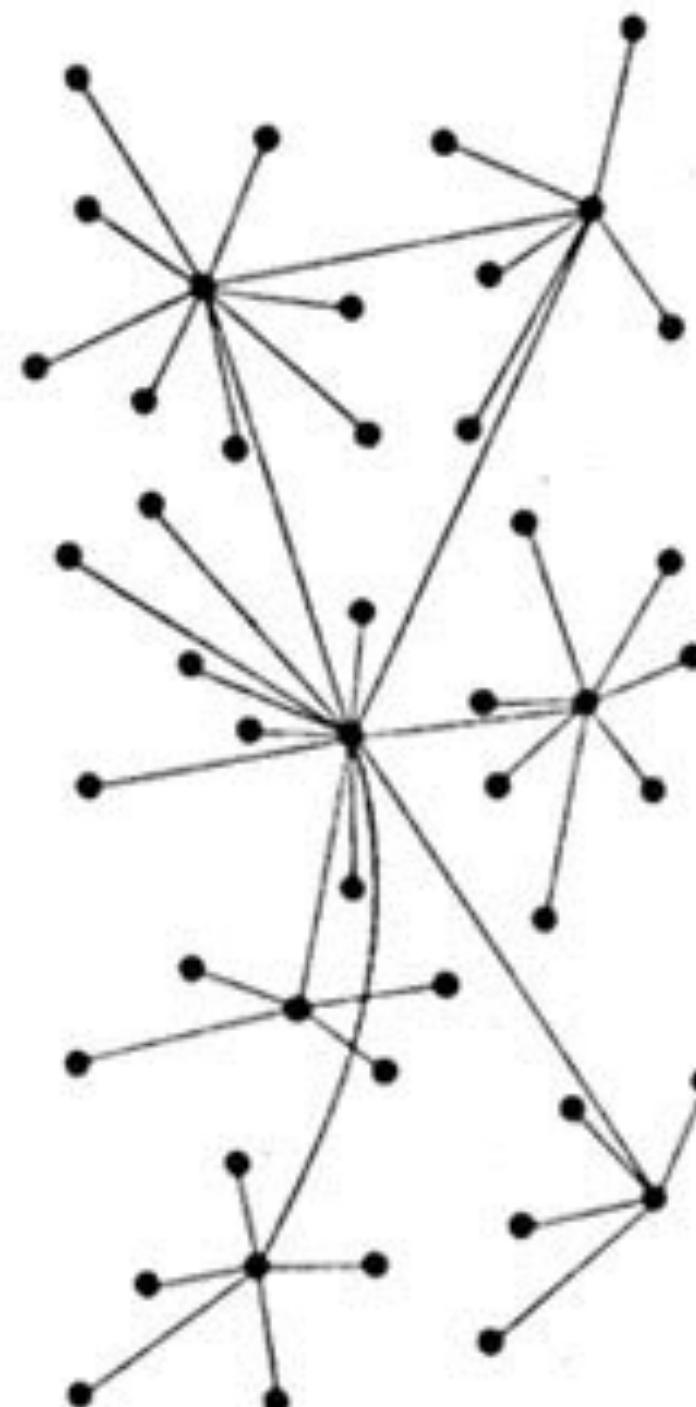
Bitcoin exchanges will trade between conventional currencies and Bitcoin, offering a way into the market for non-miners, as well as a way to cash out



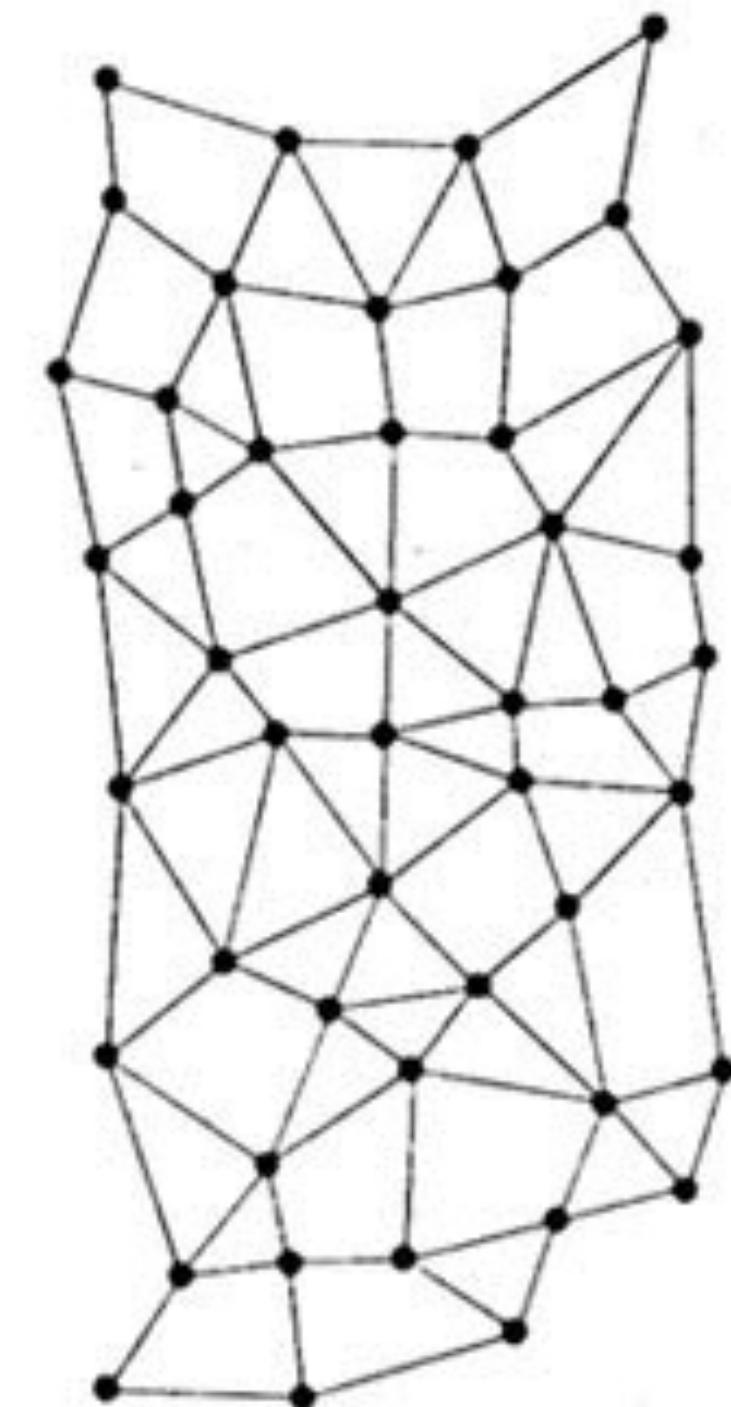
Businesses create a wallet in the same way as an individual user, typically using a website button to enable a Bitcoin payment. For in-the-flesh enterprises, QR codes can be used to let customers pay quickly and easily



CENTRALIZED  
(A)



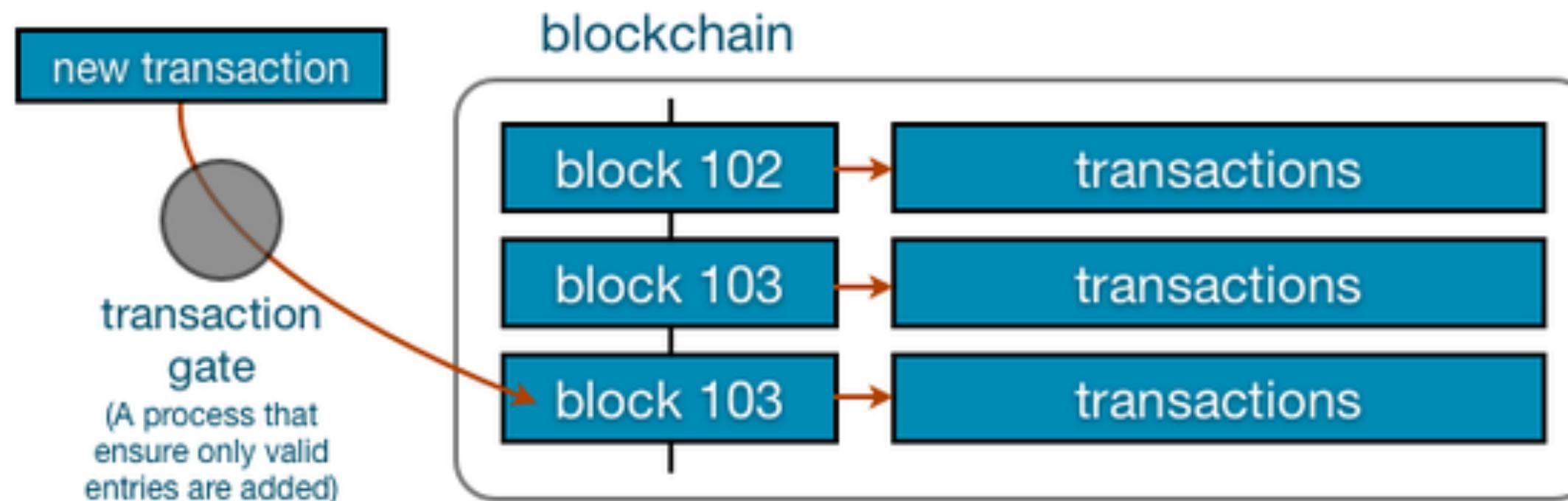
DECENTRALIZED  
(B)



DISTRIBUTED  
(C)

# How blockchain works

A blockchain is a database shared by every participant in a given system. The blockchain stores the complete transaction history of a cryptocurrency or other record keeping system.



Transactions aren't recognized until they are added to the blockchain. Tampering is immediately evident, and the blockchain is safe as record because everyone has a copy. The source of discrepancies is also immediately obvious.

# **REALIDADE VIRTUAL**



## História da Realidade Virtual



**60' - Sensorama**  
Morton Heiling



**65' – Ultimate Display**  
Ivan Sutherland



**97' – Hamlet on the Holodeck**  
Janet H. Murray



**2012 – Oculus**  
Palmer Luckey



Sentidos e Emoções



Fonte: A Web na era da realidade virtual, <http://ceweb.br/publicacao/a-web-na-era-da-realidade-virtual>



# CLOUDS OVER SIDRA

*by Gabo Arora & Chris Milk*







# Experiência Munduruku



WebVR is an experimental JavaScript API that provides access to Virtual Reality devices, such as the [Oculus Rift](#), [HTC Vive](#), [Samsung Gear VR](#), or [Google Cardboard](#), in your browser.

# A-FRAME

Blog

A Week of A-Frame 63

Examples

Hello WebVR

Hello Metaverse

360° Image

360° Image Gallery

360° Video

Animation

Anime UI

Audio Visualization

Lights

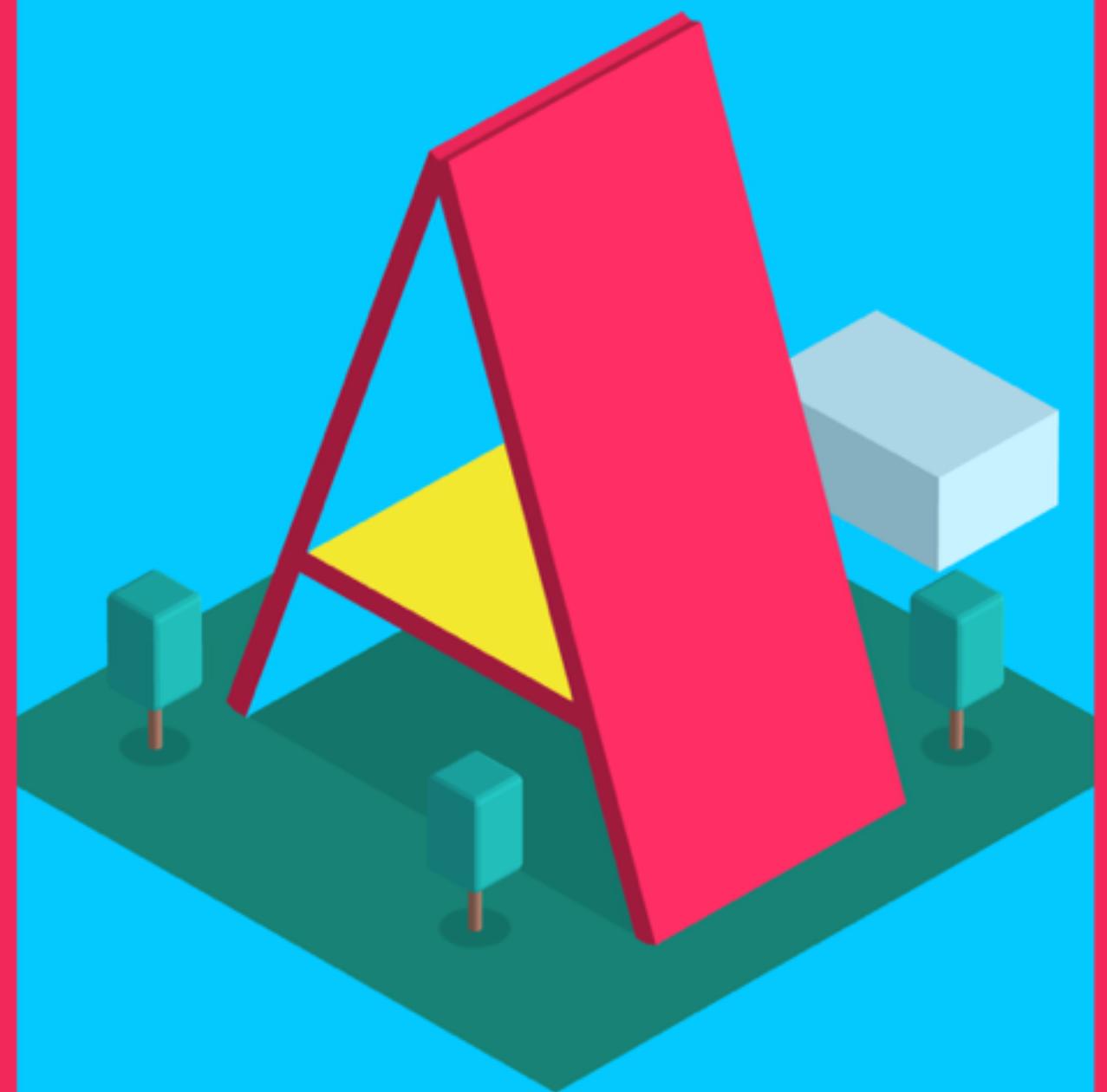
Shopping

Snowglobe

Tracked Controllers 

A-Blast 

A-Painter 



DOCS FAQ BLOG COMMUNITY GITHUB

A web framework for building virtual reality experiences

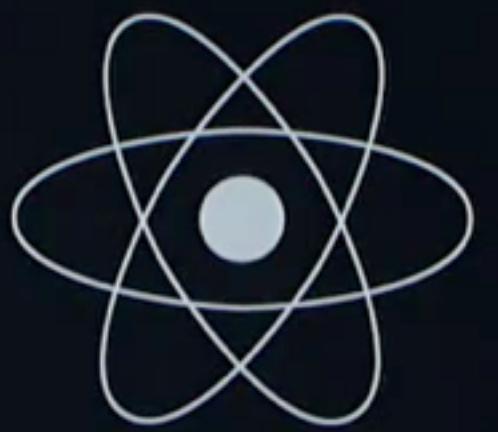
Make WebVR with HTML and Entity-Component

Works on Vive, Rift, Daydream, GearVR, desktop

GET STARTED

Supported by





React VR



# OBRIGADO!

@newtoncalegari

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