Let's Fix the Internet

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## Elastos Development Community Manager

State of the network

History of the internet

- Internet was built on trust - coffeeparty(john hawley)

- Can't keep rogue actors out

- SPAM

- DOS attacks

- Cookies are bad

- EU made laws against cookies

IoT made it worse

- IoT devices are hopelessly insecure

   -> Block IoT Devices from the internet

   -> John Hawley: Good Fences Make Good Neighbors in IoT
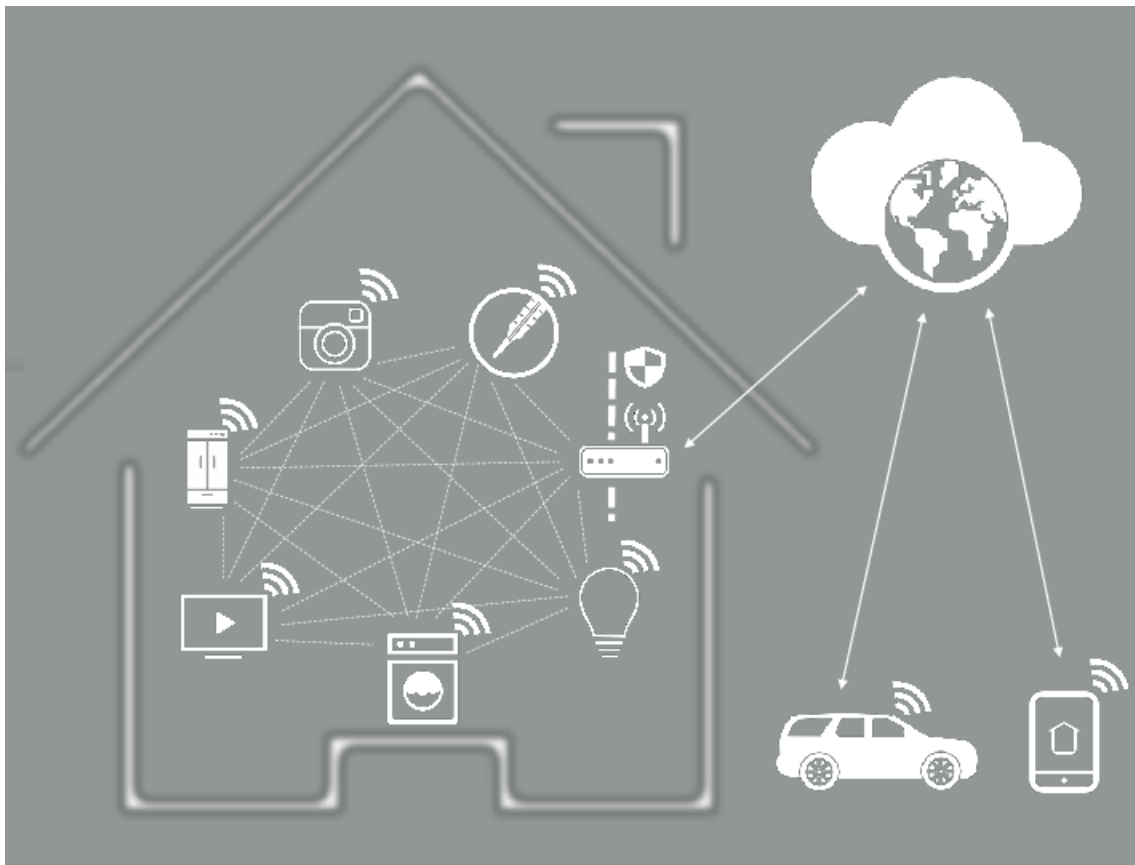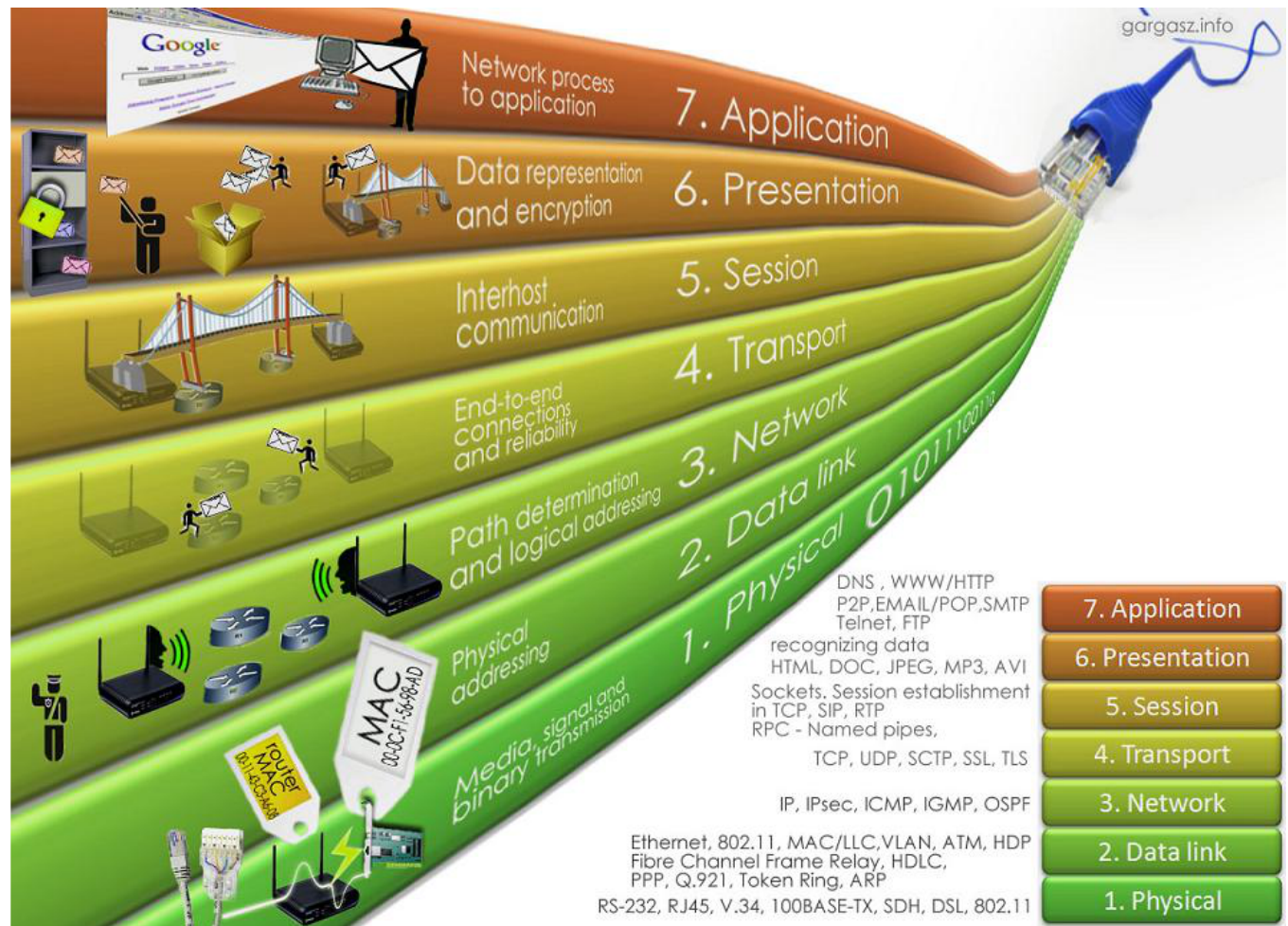
IoT Challenges

1. Security and Safety

2. Embedded and Real-time

3. Distributed and Decentralized

4. Main Stream Programming

5. User Content Monetization

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- Identification happens in the application layer

- Every application is responsible for its own user identification
  -> Spam comes from missing user identification
  -> Denial Of Service attacks happen at the network/transport layer before user identification

so how do we get out of this mess?

put User Identification first

create an OS that allows apps to be built on a Users First paradigm.

What is Elastos?

1. complete set of C/C++ APIs and frameworks
2. a distributed OS runtime with end-to-end security accross a P2P network
3. Elastos runtime, designed for containers/virtual-machines
4. uses blockchains for authentication

1. C/C++ APIs and frameworks

-> Sandbox apps at C level

- C++ runtime introspection system (CAR)
  -> allow distributed apps to talk to each other
- Elastos rewrote the complete android stack in C++

ELASTOS

REWROTE

THE COMPLETE

ANDROID STACK

IN C++

WHY?

- performance and footprint

- write android style apps in c/c++

- port apps from Android to Elastos

2. distributed OS runtime

- P2P connections between nodes

- end-to-end security and integrity across the internet

- prohibit apps from sending/receiving network packets directly

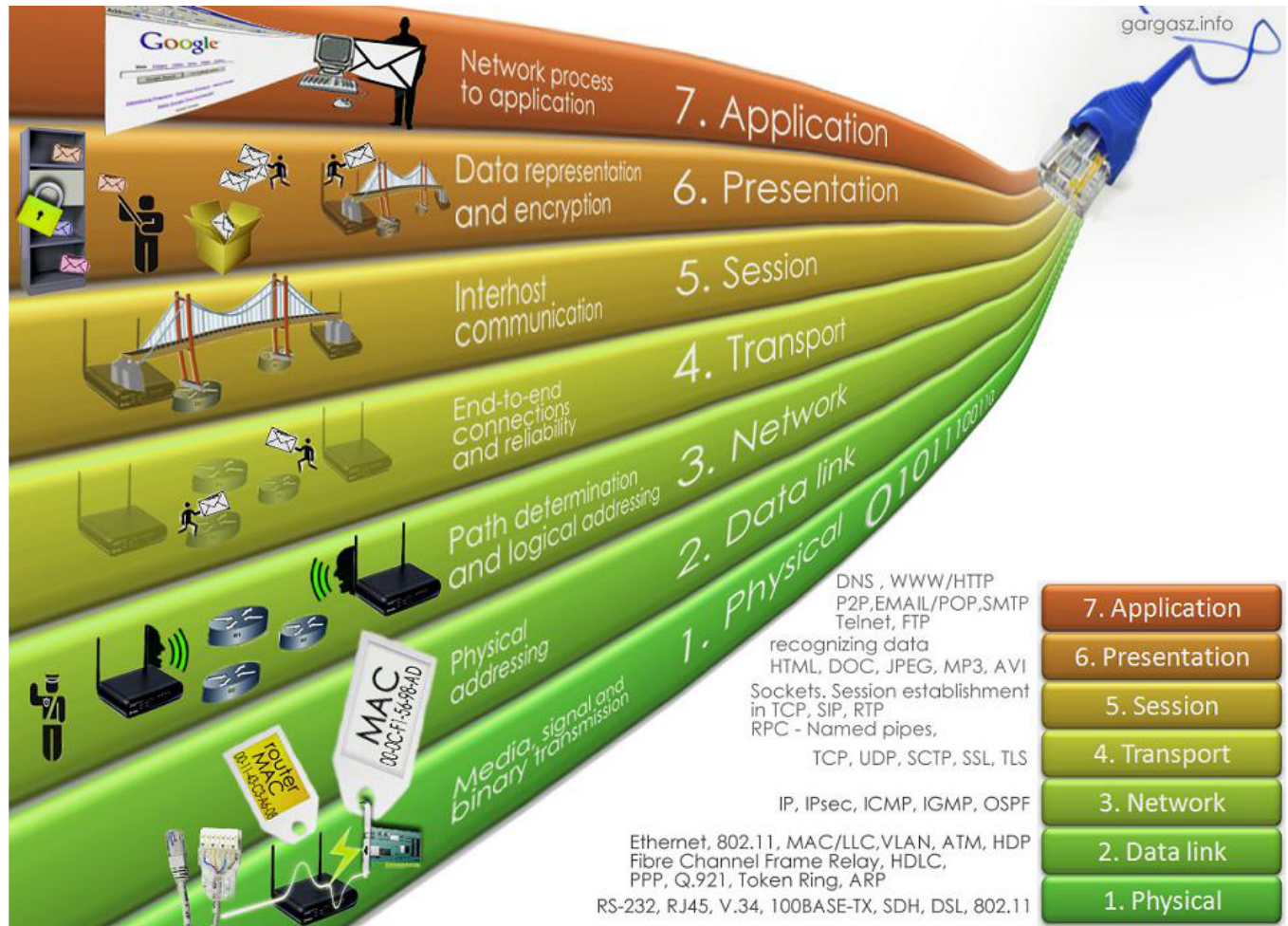- every network connection is controlled and sanctioned by the OS

Elastos prevents apps from making their own network connections.

End User Identification

APPLICATIONS

KERNEL

HARDWARE

gargasz.info

Network process to application — 7. Application
Data representation and encryption — 6. Presentation
Interhost communication — 5. Session
— 4. Transport
End-to-end connections and reliability — 3. Network
Path determination and logical addressing — 2. Data link
Physical addressing — 1. Physical 010111
Media, signal and binary transmission

Google

MAC 00-0C-F1-56-98-AD
router MAC 00-11-44-C84-98

DNS , WWW/HTTP P2P,EMAIL/POP,SMTP Telnet, FTP	7. Application
recognizing data HTML, DOC, JPEG, MP3, AVI	6. Presentation
Sockets. Session establishment in TCP, SIP, RTP RPC - Named pipes,	5. Session
TCP, UDP, SCTP, SSL, TLS	4. Transport
IP, IPsec, ICMP, IGMP, OSPF	3. Network
Ethernet, 802.11, MAC/LLC,VLAN, ATM, HDP Fibre Channel Frame Relay, HDLC, PPP, Q.921, Token Ring, ARP	2. Data link
RS-232, RJ45, V.34, 100BASE-TX, SDH, DSL, 802.11	1. Physical

elastos

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APPLICATIONS

ELASTOS RUNTIME

User Identification

P2P Networking

KERNEL

HARDWARE

Network process to application — 7. Application

Data representation and encryption — 6. Presentation

5. Session

Interhost communication

4. Transport

End-to-end connections and reliability

3. Network

Path determination and logical addressing

2. Data link

1. Physical 0101110010

Physical addressing

Media, signal and binary transmission

DNS, WWW/HTTP
P2P, EMAIL/POP, SMTP
Telnet, FTP
recognizing data
HTML, DOC, JPEG, MP3, AVI
Sockets. Session establishment
in TCP, SIP, RTP
RPC - Named pipes,
     TCP, UDP, SCTP, SSL, TLS

IP, IPsec, ICMP, IGMP, OSPF

Ethernet, 802.11, MAC/LLC, VLAN, ATM, HDP
Fibre Channel Frame Relay, HDLC,
PPP, Q.921, Token Ring, ARP
RS-232, RJ45, V.34, 100BASE-TX, SDH, DSL, 802.11

Layer
7. Application
6. Presentation
5. Session
4. Transport
3. Network
2. Data link
1. Physical

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Elastos prevents apps from making their own network connections.

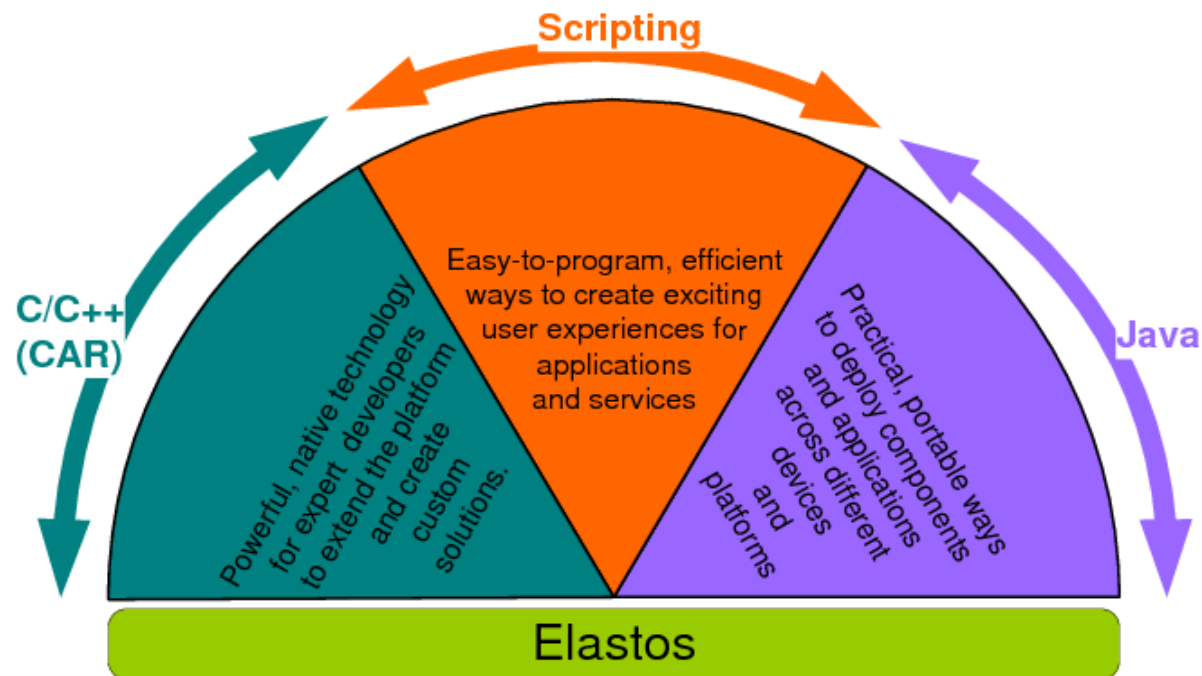**Elastos moves user identification away from the application layer.**

Connections are opened after User IDs have been verified

- prevents SPAM, Denial of Service attacks, worms and viruses.
- identities on the app level are replaced with **verifiable** network identities at the OS level.
- a P2P network is used to find the location of identities

3. Elastos runtime is designed for containers/virtual-machines

- CppVM (like JavaVM but for C/C++)

- no need for JNI to write native code

- no need to break out of the sandbox

Elastos Hybrid Programming Model

Scripting

C/C++ (CAR)

Java

Easy-to-program, efficient ways to create exciting user experiences for applications and services

Powerful, native technology for expert developers to extend the platform and create custom solutions.

Practical, portable ways to deploy components and applications across different devices and platforms

Elastos

Android-Like Programming in JS, Java & C/C++

Launcher   Settings   Pinyin IME   Calculator   Dialer   Browser

Files   Calendar   Contacts   Messages   Music

4. Blockchain

- authenticate user IDs, application IDs, as well as machine IDs
- implement apps that use blockchains
  -> digital asset management
- Elastos coins to enable trading of apps and digital assets

(What are Digital Assets?)

Types of Digital Content Today:

- free to share (GNU, Creative Commons)
- leased, thightly controlled by Distributors (DRM)
- DRM-free, but not free to share

Digital Assets

- Track ownership through the blockchain
- allow reselling of content (enables secondary market - *first sale doctrine*)
- Take away control from Distributors to Consumers

Elastos History

- Started in 2000 to research smartphone OS

  -> lost the race against Android and IOS

- Restart in 2012 adding IoT focus

  -> $30mil funding by Foxcon

  -> reached beta status

Elastos 2015

Elastos on Banana Pi

Elastos Smart-Router

Elastos 2016

Elastos Smart-Phone XT1085

Elastos on Raspberry Pi 3

2017

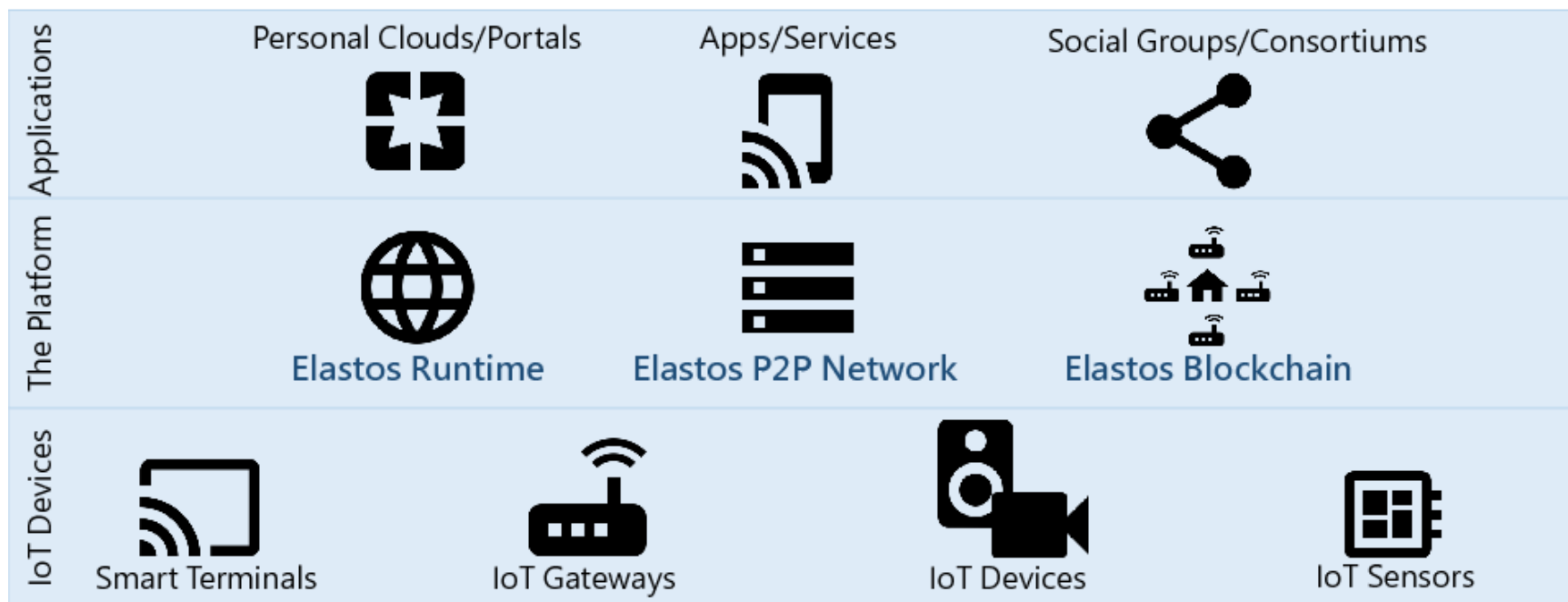- Start blockchain development

- 4K Bitcoins funding

2018

- (*January*) ICO (*2.5K Bitcoins*)

Roadmap

- (*Spring*) Develop P2P Network

- (*Spring*) Work with Development Partners to build Apps

- (*Summer*) Sidechains for Blockchain Applications

- (*Summer*) Framework for Webapplications

- (*December*) Public Mining of ELA Tokens

Three Open Source Projects of Elastos

Applications	Personal Clouds/Portals	Apps/Services	Social Groups/Consortiums
The Platform	Elastos Runtime	Elastos P2P Network	Elastos Blockchain
IoT Devices	Smart Terminals	IoT Gateways	IoT Devices	IoT Sensors

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what are the chances that Elastos will succeed?

- we like to make changes in small steps

BUT

- Costly incremental improvements are slow to adapt: IPv6
- cheap disruptive improvements are adapted quickly: twitter, facebook, web

Elastos is disruptive

BUT

Getting Elastos is as easy as getting a webbrowser

- likely installed as part of an application that bundles Elastos (like a java app bundling java)

References

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- https://techcrunch.com/2017/01/08/the-future-is-a-decentralized-internet/

Elastos Executive Summary
- https://www.linkedin.com/pulse/elastos-executive-summary-rong-chen

Elastos Source Code on GitHub.com and Elastos.org
- https://www.github.com/elastos/ and http://elastos.org/

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let's build a FOSS-Blockchain community

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Blockchain Community Track at HongKong Open Source Conference in June 2018

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Hire me

- Development Community Consulting
- CTO services

REAL SOFTSERVICE
锐业软服

- Webdevelopment for Educational Institutions that grow with your School
- http://realss.com/

videos of this talk

devconf.cz

- https://www.youtube.com/watch?v=-ZTXYwFTxrQ

LUGA *(german)*

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FOSDEM

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