IoT Challenges

1. Security and Safety
2. Embedded and Real-time
3. Distributed and Decentralized
4. Main Stream Programming
5. User Content Monetization
A Decentralized (Server-less) App Scenario

Instant app without intermediaries

pay

A Decentralized Internet with Trust Worthy IDs
Connect the virtual & physical world

Blockchain Computers

Mobile & IoT Devices Run on Different Carrier Networks
Creating Scarcity of Digital Contents

- Amazon does NOT sell eBooks, it sells a life time lease, instead;
- Blockchain solves the scarcity problem, but piracy remains a threat;
- Authors mandate business model via smart-contracts;
- Sharing apps via social networks heralds a new era of possibilities.
  - Media players used to be intermediaries that control profits;
  - An unified runtime VM is the key for digital content execution.
Smart Terminals and Smart Peripherals

- Same app for all smart terminals;
- Cloud storage for all apps;
- IoT devices as peripherals (no Internet);
- Apps access IoT devices via Web services;
- Languages inter-operate automatically;
- No OS runtime fragmentations.
End-to-End Solution for a Safer Cyberspace

- Apps run inside virtual machines;
- Metadata driven programming paradigm;
- Linux kernel is merely a modern BIOS;
- Apps, Services and IoT devices are prohibited from accessing the Internet directly;
- Drivers, Demons and Sockets are deprecated.
What is a Blockchain?

- A blockchain is really a blockchain computer;
- The peer-to-peer network of a blockchain is merely an internal bus;
- Apps of a blockchain are called smart-contracts or DApps;
- A single computer CAN NOT scale to a network of computers.

Duplicated Computing
(the computation power is less than a single node)
The TrustZone of a Smart Phone

- Fingerprint information are NOT stored on the hard-drive to guard from viruses;
- There is a special purpose computer called TrustZone;
- The TrustZone has its own kernel, storage and apps;
- The app ecosystem are build on top the main CPU.
Building a Decentralized Smart-Web Platform

The Network is the Computer
Unified Blockchain & IoT P2P Network

Virtual Machines
Mobile and IoT Devices are Apps

Physical Computers/Nodes
Net Protocols are hidden from Apps

The Public Blockchain is the TrustZone
What if I can replace a file-path with URL?

C:/Programs/elastos.org/local-app.exe
E:/Programs/tangle-app.exe
X:/Programs/network-app.exe

elastos.org://foo.eco
utube.com://vedio.eco
university.edu://paper.eco

Software Defined Computer Consists of:

- Multi-CPU,
- Multi-Screen,
- Multi-Storage,
- Multi-Compute

You Own Your Own Data
You Own Your Own Data (Blockstack)

Decentralized Apps Planned on Blockstack:

- Voting
- Marketplaces
- Identity verification
- Crowdfunding
- Messaging
- File sharing
- Document signing
- Video sharing
- Decentralized Reddit
- Decentralized Twitter

Blockstack.org
A Van Neumann machine, with cloud mass storage and local HD as cache, is an Elastos computer;

An Elastos carrier consists of a peer-to-peer network of Elastos computers;

Apps execute inside VMs on an Elastos computer of an Elastos carrier.

Industrial IoT and Smart homes require a P2P Network that facilitates video streaming, text messaging, and P2P file sharing protocols.
## Three Open Source Projects of Elastos

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- Elastos Runtime
- Elastos P2P Network
- Elastos Blockchain

**IoT Devices**

- Smart Terminals
- IoT Gateways
- IoT Devices
- IoT Sensors

**Elastos Applications**

- Personal Clouds/Portals
- Apps/Services
- Social Groups/Consortiums
Elastos 2015

- Elastos on Banana Pi
- Elastos Smart-Router

Elastos 2016

- Elastos Smart-Phone XT1085
- Elastos on Raspberry Pi 3
Elastos Hybrid Programming Model

- **C/C++ (CAR)**
  - Powerful, native technology for expert developers to extend the platform and create custom solutions.

- **Elastos Scripting**
  - Easy-to-program, efficient ways to create exciting user experiences for applications and services.

- **Java**
  - Practical, portable ways to deploy components and applications across different devices and platforms.
Android-Like Programming in JS, Java & C/C++
var eventHandler = {
    OnEvent: function(i) {
        var s = 'call OnEvent, i: ' + i;
        elastos.log(s);
    }
};

var module = elastos.require('Demo.eco');
var demoObj = module.createObject('CDemo');
demoObj.addEventHandler(eventHandler);
demoObj.doTask();
Elastos Value Propositions

1. **Secure**
   - Elastos Runtime provides end-to-end solutions.

2. **Trusted**
   - Blockchain makes faking identities impossible.

3. **Open**
   - Peer-to-Peer Platform is open source.

4. **Rewards**
   - Eco System needs its own electric currency.
Vision: Turning Digits into Assets

- To build a digital economy for both centralized apps and decentralized apps;
- To issue a crypto token, i.e., ELA, for the digital economy;
- To sustain growth of the market value of all digital goods and services.
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5. *Elastos Source Code on GitHub.com and Elastos.org*