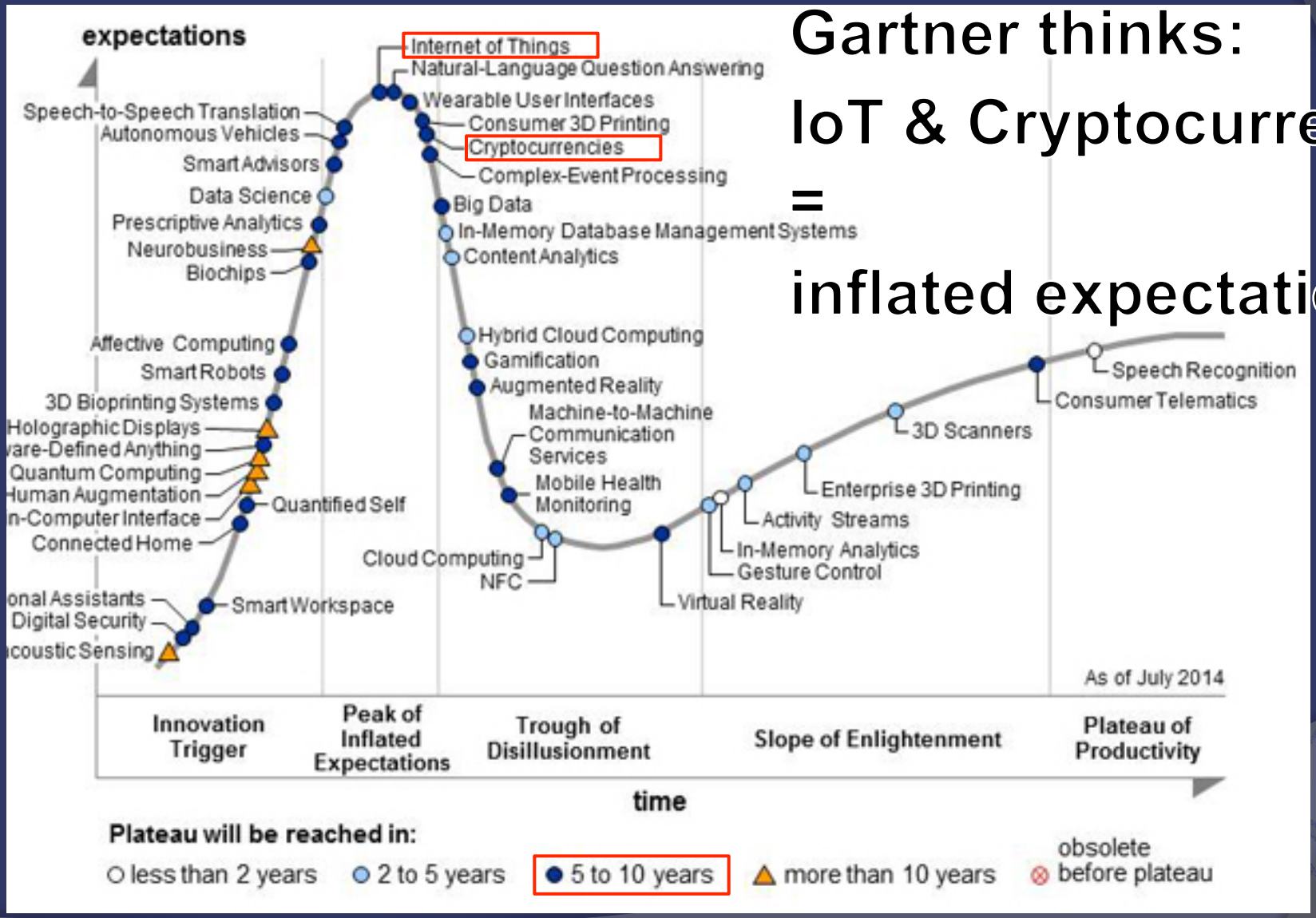
IoT ... the Hype



Gartner thinks:

IoT & Cryptocurrencies

=

inflated expectations

source(s): [1]

IoT ... what actually happens in 5y+

- Quantity:

- Home Automation
- Appliances
- Smart City Infrastructure
- Health Care
- Quantified Self

- Quality / Utility / Privacy / Security: ?
  - Locally confined systems: Lower maintenance cost & Energy efficiency … OK
  - Appropriating user data & central storage for firmware updates … **not** OK
  - Updating phones/printers already a pain
    - Now think about home surveillance, public street lights, sensor networks for farming optimization, etc.

source(s): [2, 3]

IoT ... Security is a known Issue

ETH zürich inf

Next Big Step for Low-power IP

- Interoperable, scalable security
  - Elliptic curve cryptography
  - Public key cryptography?
  - Crypto hardware acceleration
  - DTLS Profiles (DICE)
  - Authentication/Authorization in Constrained Environments (ACE)

Paul Brody
@pbrody

@robustus @mrseanpaul81 @twobitidiot @anders94 @adamludwin @danprimack We are forking Ethereum as part of that.

- MAC Addr: no good for authentication/ID
- TLS: does not *scale*
- must be end-to-end
- minimal effort for mass deployment needed

…but why?

source(s): [4, 5, 6, 7]

IoT ... missing Links for sustainable Business models

- Secure Messaging
  - Open home's door for a friend from remote
  - Share your GPS tracks with whom *you* authorize (emergency cases/theft)

- Telehash
- *Whisper*
- …

- Decentralized firmware
  - saves costs for producers → maintenance is out- and crowd-sourced→ User Innovation & Open Hardware/Firmware paradigm → promotes quality and longevity
  - No one wants Spy-/Bloatware anyway (see homebrew firmware for mobiles)

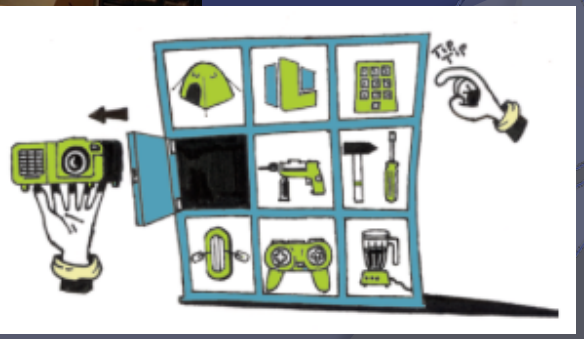
- DHT
- BitTorrent
- *Swarm*

source(s): [2, 7]

IoT ... missing Links for sustainable Business models

- Persistency and Contracts
  - ‘namereg’ for IoT Devices on the blockchain, e.g. charging station e-mobility (needs prior coordination/ reservation)
  - Autonomous Devices (no central intelligence, less user intervention)
  - Sensor networks → Insurance, Prediction Markets
  - Smart Property / Shared Property / Billing

- Blockchain w/ code



LEIHBAR.

source(s): [2, 7]

Takeaway

- Privacy concerns, trust in centralized providers and long-term management liabilities **choke** IoT business and innovation
- **Convergence** of Cryptocurrencies **+** IoT = plateau of productivity
- Pushing intelligence to the edges of the network requires extension of IoT Software stack (Ethereum) …
- **…and** Hardware (low powered, cryptography enabled, hard to crack, trusted) → build on hardware wallets technology

source(s): [8]

Sources

- [1] http://www.gartner.com/newsroom/id/2819918
- [2] http://public.dhe.ibm.com/common/ssi/ecm/en/gbe03620usen/GBE03620USEN.PDF
- [3] https://gigaom.com/2014/09/09/check-out-ibms-proposal-for-an-internet-of-things-architecture-using-bitcoins-block-chain-tech/
- [4] http://www.openmote.com/iot-tutorial-by-matthias-kovatsch/
- [5] DTLS: https://datatracker.ietf.org/doc/draft-ietf-dice-profile/
- [6] http://torlus.github.io/2014/05/08/mqtt-dht/
- [7] http://leihbar.org/sharing-box/
- [8] https://en.bitcoin.it/wiki/TREZOR

source(s): [ ]