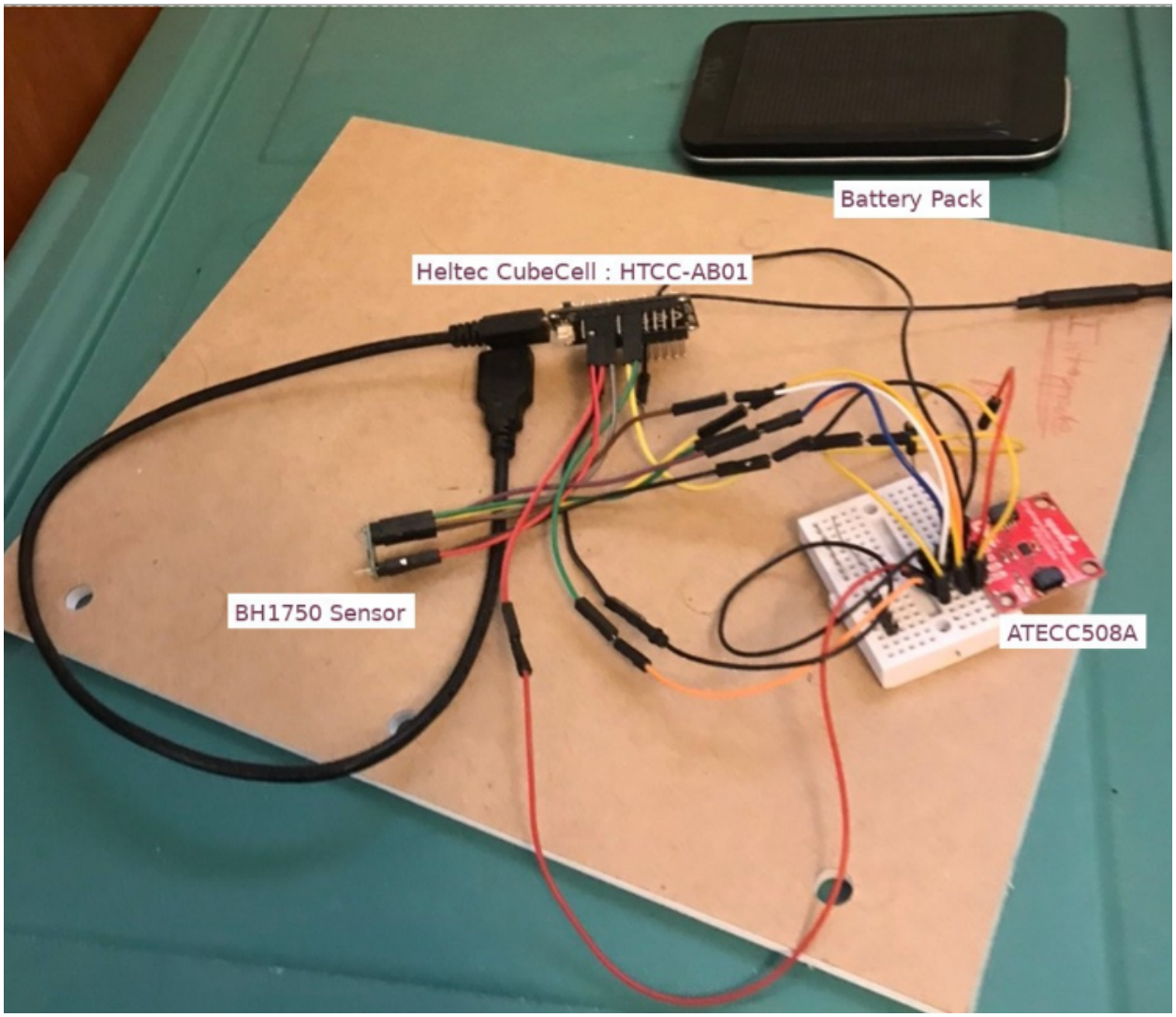
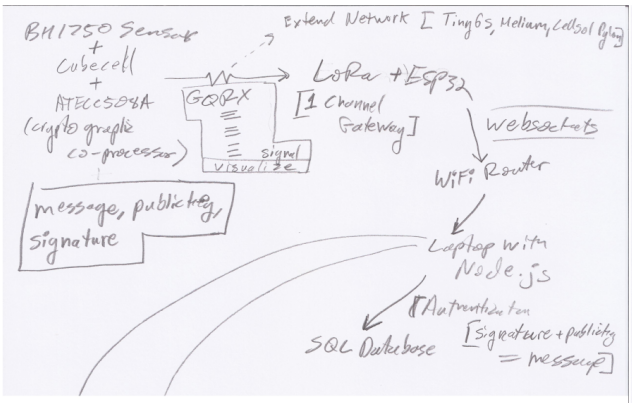
DEMO Table #22

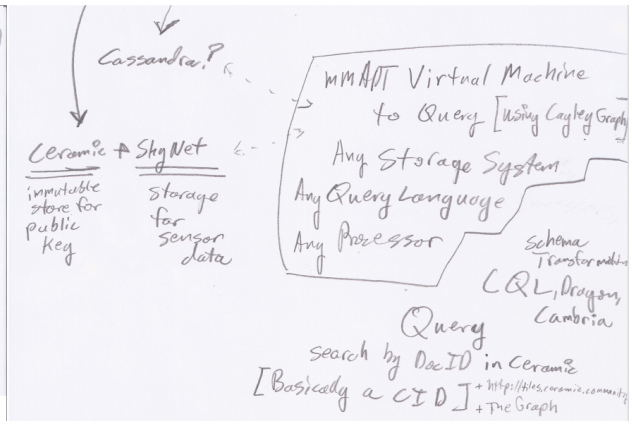
The Blinky Project (I.o.T) Update : Brent Shambaugh

"Explorations with LoRa wireless modulation technology, cryptographic coprocessors, and the Ceramic Protocol"

Demo: **Blinky Project YouTube Playlist:**
https://www.youtube.com/playlist?list=PLbVZNfQhcZ3eQpiBUY_0IaXPmPE5pZoOT







Presentation: https://theholo.space/presentation.pdf

Code in progress:
In https://github.com/bshambaugh?tab=repositories there are several related repositories. A few of interest:
- https://github.com/bshambaugh/BlinkyProject
- https://github.com/bshambaugh/key-did-provider-secp256r1 -
-https://github.com/bshambaugh/js-ceramic/tree/develop/packages/key-did-resolver

tl;dr: I have a public key, message, and signature streaming over LoRa. DIDs are a work in progress for me with : https://www.ceramic.network/

Work in progress:

Following:
CIP-79 : CREATE, READ, UPDATE, DELETE

https://github.com/ceramicnetwork/CIP/blob/main/CIPs/CIP-79/CIP-79.md

key did provider testing https://www.youtube.com/watch?v=r9UurBgkVwM
Consider together:
https://github.com/decentralized-identity/did-jwt
https://github.com/ceramicnetwork/js-did
https://github.com/bshambaugh/key-did-provider-secp256r1
Consider https://specs.ipld.io/block-layer/codecs/dag-jose.html and familiarize oneself with JWT, JWS, JWE
“@bshambaugh the key-did-provider-secp256k1 library can be used in combination with https://github.com/ceramicnetwork/js-did to create JWS tokens. If you are interested in creating JWS in general you can look at the more low level did-jwt library: https://github.com/decentralized-identity/did-jwt This library allows you to pass a remote signer into it. So for example you could create and encode the jws payload on a different device than the remote device that is doing the signing.” - Joel T. from Ceramic

IIW31 Demo (last fall): https://theholo.space/

Ockam IoT Project. Many supported devices. Secure Channels. Loosely communicating.
https://www.ockam.io/

Links for the parts, see presentation.

Ceramic and IDX:
https://developers.ceramic.network/build/quick-start/
https://developers.idx.xyz/learn/welcome/

Extending LoRa Network:
Helium Network ESP32 Connect
https://github.com/bshambaugh/longfi-arduino

CellSol Pylon Repeater
https://www.f3.to/cellsol/about-cellsol/user-guide/

TinyGS and Satellites
How to receive and track LoRa Satellites (TinyGS). Incl. innovative ideas for your projects - A.S.
https://www.youtube.com/watch?v=ltJQjqm5bKA
https://tinygs.com/ (Ground Station Software)
https://www.nasa.gov/ames/v-r3x (915MHz LoRa Satellite)
Uses PyCubed:
https://www.hackster.io/news/pycubed-sends-python-based-projects-to-space-8697a6e5d8b3
https://www.notion.so/PyCubed-4cbfac7e9b684852a2ab2193bd485c4d
https://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=4364&context=smallsat

Experiment:
Early Explorations Receiving Data from Satellites:

Receiving NOAA Satellites. Either 15, 18, 19 (experiment 1)

https://www.youtube.com/watch?v=cjqio2wei58

Schema Mapping:

How to Build a Dragon (Logical Data Model - mapping to centralized common types)
https://www.meetup.com/Category-Theory/events/past/
https://arxiv.org/abs/1909.04881 Algebraic Property Graphs , Polynomial Functors

Project Cambria: managing schema change in distributed systems, Geoffrey Litt and Peter van Hardenberg (Bidirectional lenses) https://vimeo.com/511271022
3 Parts:
- “Lens language for defining bidirectional transformations”

- “Lens graph for composing multiple schemas and lenses together”
- “**version-tagged edit log** for storing documents that can simulaneous inhabit multiple schemas”
https://github.com/inkandswitch/cambria

Categorical Query Language https://www.categoricaldata.net/
“Open-source CQL and its integrated development environment (IDE) performs data-related tasks — such as querying, combining, migrating, and evolving databases — using category theory **…”**

Also of interest:

Is using ceramic as a decentralized data layer to hold my did:key and reference other material such as ledgers and storage(SkyDB) fall in the scope of encrypted data vaults?

Encrypted Data Vaults:

https://github.com/WebOfTrustInfo/rwot9-prague/blob/master/draft-documents/encrypted-data-vaults.md

https://digitalbazaar.github.io/encrypted-data-vaults/

https://medium.com/transmute-techtalk/encrypted-data-vaults-c794055b170e

Ceramic Protocol Specification:

https://github.com/ceramicnetwork/ceramic/blob/master/SPECIFICATION.md
https://www.youtube.com/watch?v=ZAYf98QdYoY&t=2094s
https://www.youtube.com/watch?v=0yR1COmyxhM&t=8910s

---> **Uses DagJOSE:**

https://specs.ipld.io/block-layer/codecs/dag-jose.html#format

https://github.com/ipld/specs/pull/269

https://www.npmjs.com/package/dag-jose

https://github.com/ceramicnetwork/js-dag-jose#readme

https://eips.ethereum.org/EIPS/eip-2844