Linzhi E1400
ETC ASIC

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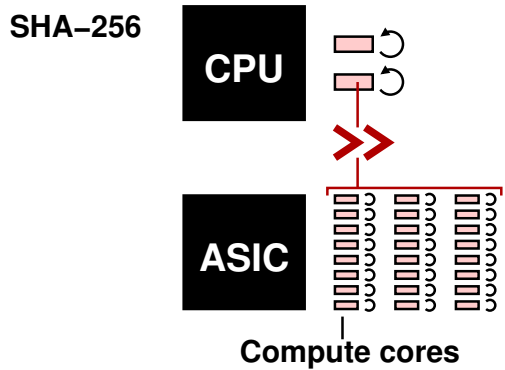
linzhi.io/summit2019.html

Linzhi Ltd.

- Shenzen-based fabless ASIC startup
- Design and build Ethash miner
  Announced at ETC Summit 2018 in Seoul
- Using custom ASIC
- 1400 MH/s at 1 kW (per board)

BTC: The rise of ASICs



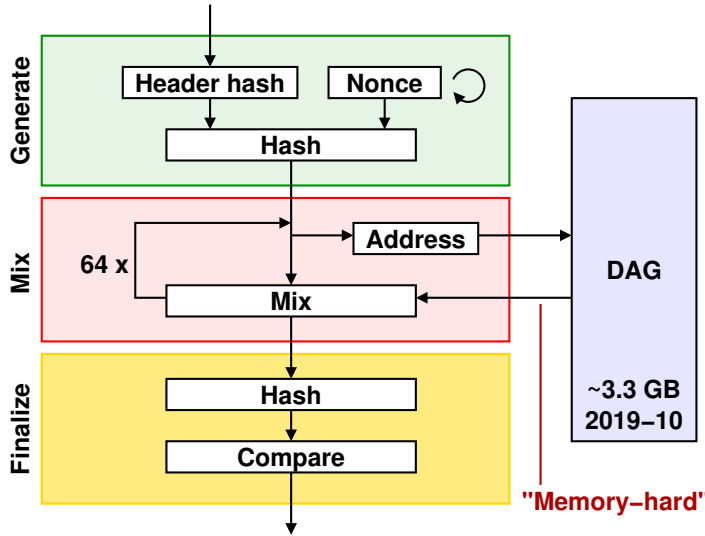
~30 MH/s
(i7–990X ~2011)

Global BTC hash rate July 2011–July 2012: ~10 TH/s

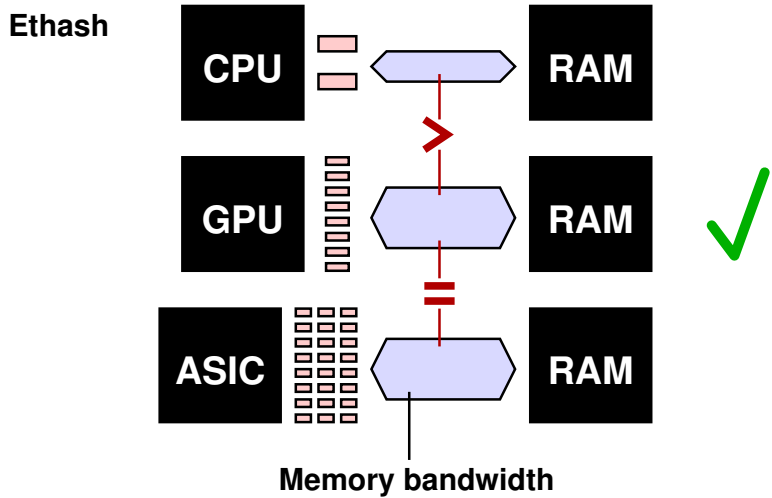
~60 TH/s
(per miner)

$$\frac{60\ \text{TH}}{30\ \text{MH} \cdot \text{Moore}(8\ \text{yr})} \approx 50\,000$$

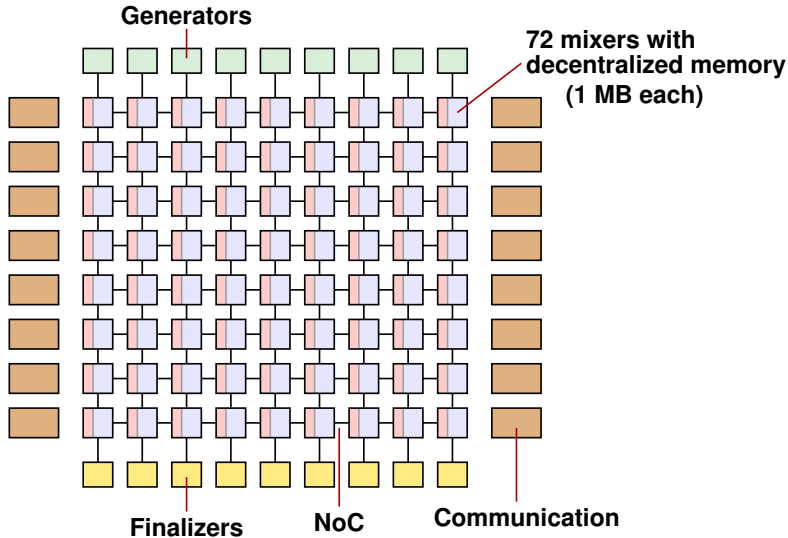
Ethash


Generate
Header hash
Nonce
Hash
Mix
64 x
Address
Mix
DAG
~3.3 GB
2019–10
Finalize
Hash
Compare
"Memory–hard"

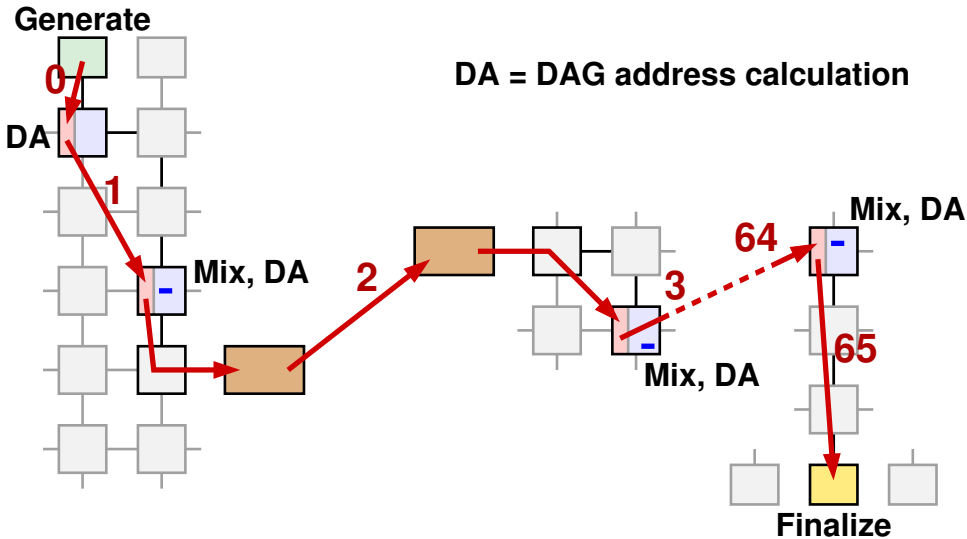
Ethash: The downfall of ASICs ?



Linzhi E1400: Decentralized memory



Hashing with the E1400



Memory bandwidth

GPUs:

- AMD Radeon RX 5700[1] (256 bits width): **448 GB/s**
- Nvidia TITAN RTX[2] (384 bits width): **672 GB/s**

Linzhi E1400:

- 600 MHz memory clock, 2 cycles per access
- 1024 bits memory width
- 38.4 GB/s peak (per mixer)
- 72 mixers per chip
- 2.8 TB/s per chip
- 64 chips per board
- **177 TB/s** per board

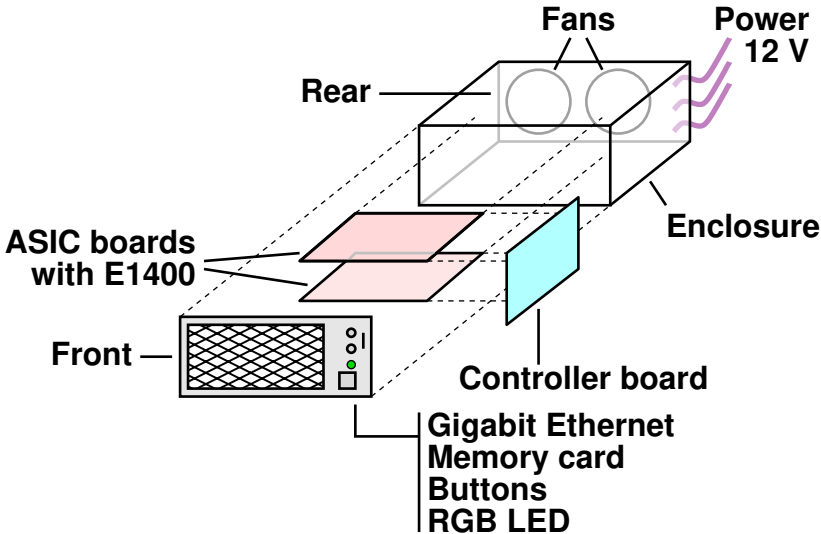
[1] https://en.wikipedia.org/wiki/AMD_Radeon_RX_5000_series
[2] https://en.wikipedia.org/wiki/GeForce_20_series

Communication bandwidth

Our real bottleneck is communication:

- up to 32 Gbps per link and direction
- 64 chips, fully connected, bidirectional
- **129 Tbps** per board (peak)
- $\approx$ 75 kbits per hash (all rounds)
- 1.7 GH/s (theoretical limit)
- **1.4 GH/s** (expected performance)

Linzhi Phoenix Miner 凤



What's next ?

- Tape-out: 2019-09-11
- Chips back from fab: mid-November
- Open bring-up, testing, and integration process
- Sales start: Q1/2020

Would you like to know more ?

- Linzhi Ltd.
  `linzhi.io`
- This talk:
  linzhi.io/summit2019.html
- Telegram:
  `t.me/LinzhiCorp`