

Assembling Freedom #27

From POD256 ep. 115 - Bitaxe to Exahash: Inside HydraPool's Record Stress Test and What's Next



256 FOUNDATION

MAY 27, 2026



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Tech Enthusiast Edition – Deep Dive into Open-Source Bitcoin Mining, Pool Scalability, and Hardware Innovation

Welcome to this in-depth newsletter recap of POD256 Episode 115 (streamed live from Bitcoin Park). Hosts [@econoalchemist](#), [@skot9000](#), and [@tylerkstevens](#) break down the open-source Bitcoin mining ecosystem's biggest recent milestone: HydraPool's record live stress test during Telehash #4. They explore how hobbyist-grade single-chip Bitaxe miners can coexist with exahash-scale renters, the technical wizardry behind ultra-low rejection rates and server efficiency, cooling tech shifts, and the push for industry-wide open standards via the 256 Foundation.

This episode is a masterclass in decentralized mining infrastructure. Expect detailed metrics, protocol deep dives, hardware specs, and actionable insights for anyone building, hacking, or scaling Bitcoin miners.

1. The Record-Breaking HydraPool Stress Test: Raw Metrics & Why They Matter

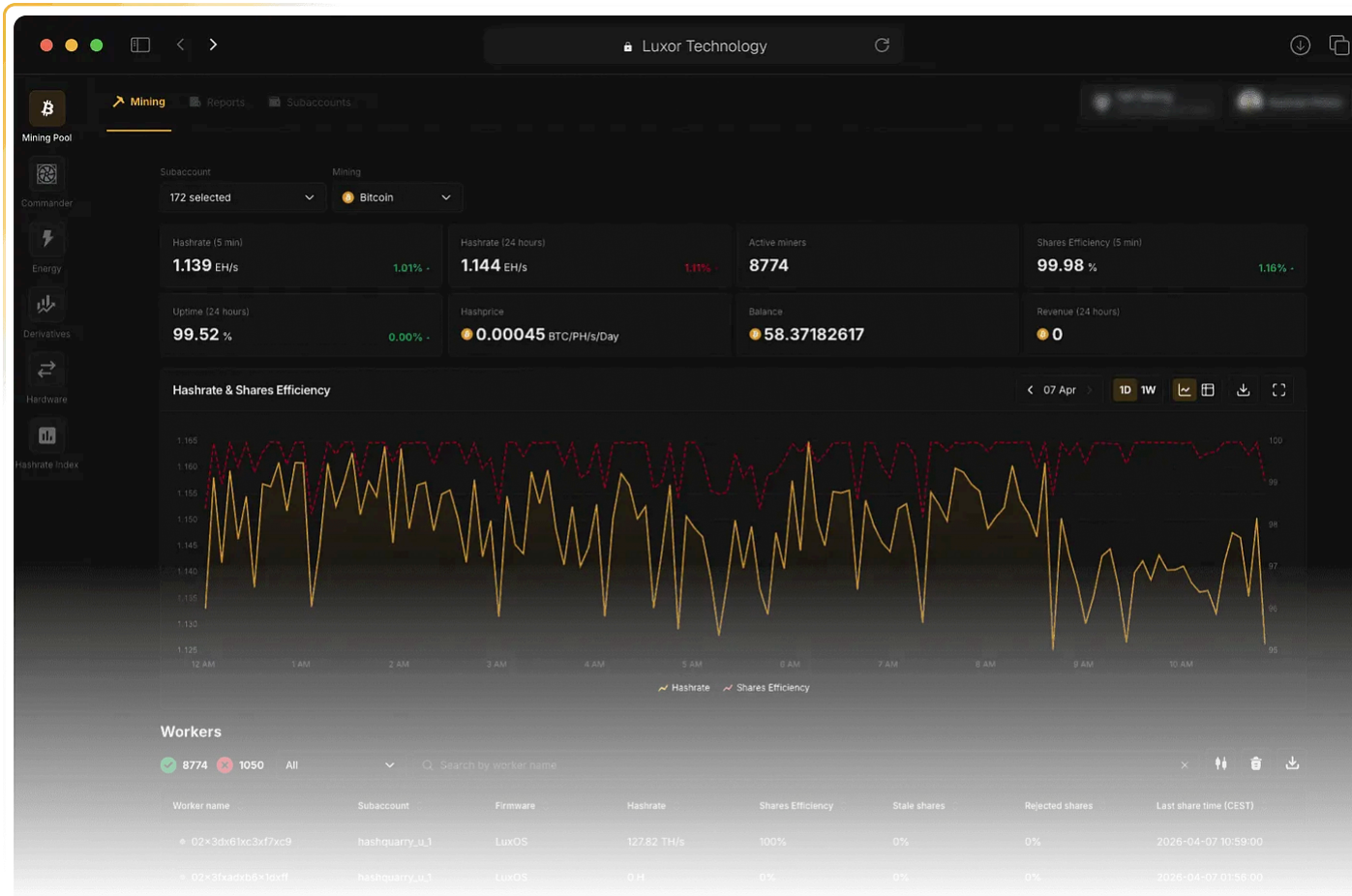
HydraPool (part of the 256 Foundation's open-source stack) handled a 6.5-hour live stress test that pushed real-world limits while staying rock-solid. Key takeaway: a self-hosted pool can scale from tiny hobby rigs to massive fleets with minimal overhead.

Stress Test Breakdown Table

Metric	Value	Why It's Impressive (Tech Perspective)
Duration	6.5 hours	Sustained high-load without degradation
Total Hashes Processed	30.8 zettahashes (ZH)	Equivalent to ~1.32 EH/s average over test period
Average Hashrate	1.32 EH/s	Enterprise-scale from community-driven test
Peak Hashrate	2.495 EH/s	Burst capability under >2,000 connections
Workers	2,231	Massive concurrency from mixed hardware
Unique Users	59	Inclusive for both exahash renters and single-chip miners
Server CPU Usage	~1%	Extremely efficient Stratum server under heavy load
Rejection Rate	< ~2%	Critical for profitability; low stale/diff-too-low shares

Key Technical Insights (Bullet Breakdown):

- **Rejection rates matter:** In pooled mining, stale shares (late submissions) and “difficulty too low” shares waste bandwidth and reduce payouts. Sub-2% keeps efficiency sky-high vs. solo mining’s higher variance.
- **Scalability win:** >2,000 simultaneous connections at ~1% CPU proves HydraPool’s lightweight design (P2Pool v2-inspired with modern payout strategies). Perfect for self-hosting on modest hardware.
- **Inclusivity engineering:** Stratum “suggest difficulty” + custom password parameters (d= for starting difficulty, h= for hashrate hint) dynamically right-size difficulty. A 1 TH/s Bitaxe and a 1 EH/s fleet both connect seamlessly without manual tweaks.



(Example of a modern mining pool dashboard showing real-time hashrate, shares efficiency, and worker stats – HydraPool’s HashDash delivers similar live visibility.)

2. From Bitaxe to Exahash: Hardware Spectrum & Open-Source UX Upgrades

Bitaxe represents the democratization of mining: affordable, Wi-Fi-enabled, fully open-source design anyone can mod or build. The episode highlights how these tiny rigs fit into exahash pools.

Bitaxe Model Comparison Table (Current Generation Examples)


Model	Hashrate (Typical)	Power Draw	Efficiency (J/TH)	Notes
Bitaxe Gamma (single-chip)	~1–1.5 TH/s	~15–25 W	~15–20	Entry-level, ultra-quiet home miner
Bitaxe Gamma Duo/Turbo	~2–2.5 TH/s	~20–40 W	~15–18	Dual-chip variants for more solo odds
Bitaxe Hex (6-chip)	~2.7–3.3 TH/s	Higher	Comparable	Max single-board open-source power
NerdQaxe Hydro (water-cooled variant)	~2.5–6 TH/s	Optimized	~20	Liquid cooling for sustained high clocks

Bullet Deep Dive:


- **UX revolution:** New LVGL-based UI (Figma-designed) + support for external displays/knobs. No more clunky web dashboards – plug-and-play like consumer

electronics.

- **DOOMAXE fun:** Community easter eggs show the playful hacker spirit behind serious infrastructure.
- **Scale math:** 1 EH/s \approx 1.4 million Bitaxe Supra units. These home miners are debt-free, electricity-neutral, and censorship-resistant.



skot
@skot9000



1 EH/s hashrate would solve (on average, currently) a block every 4 days.
solochance.com

1 EH/s is 1 million TH/s, or about 1.4M #Bitaxe Supra

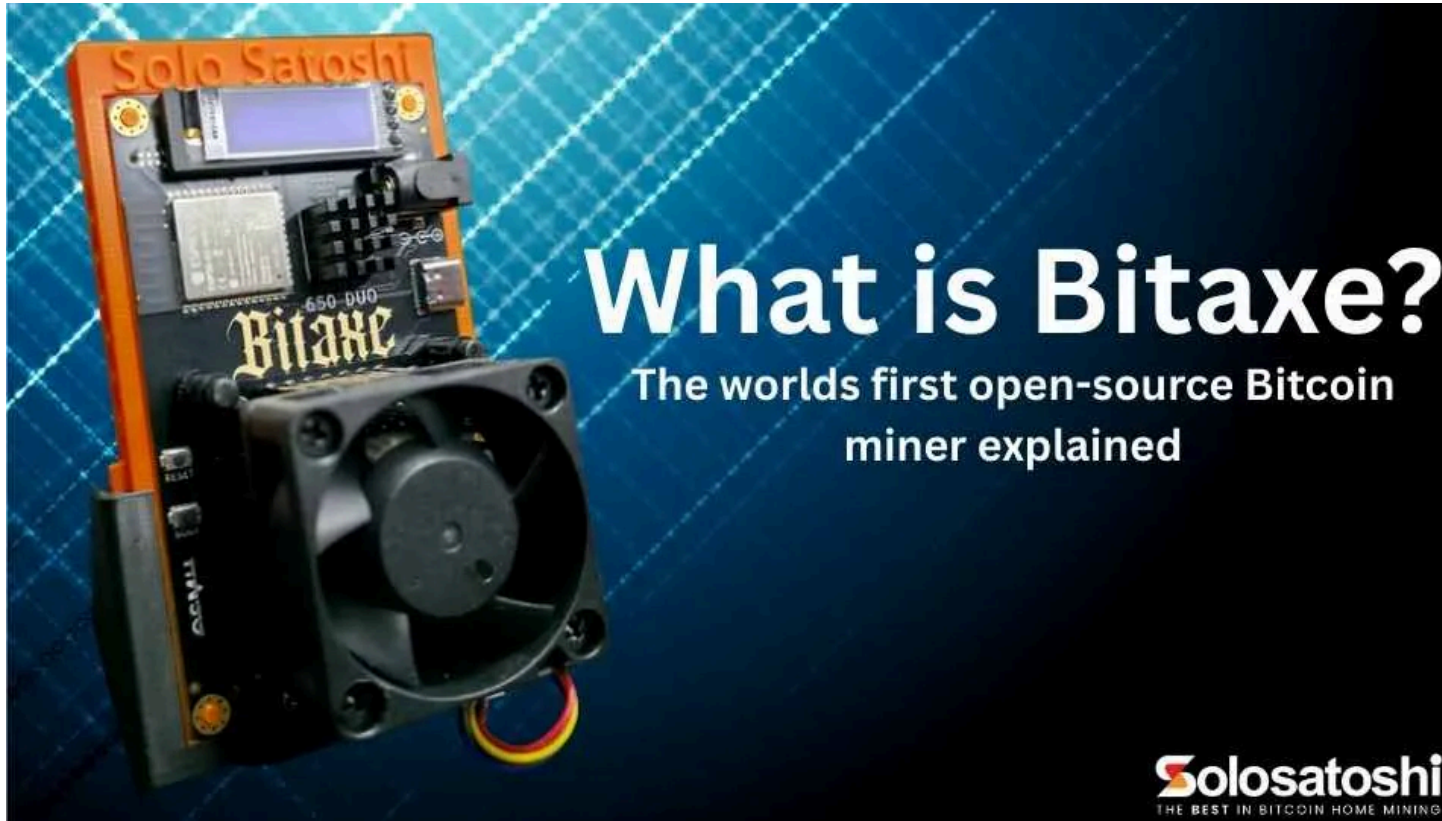
That's a legion of miners that;

- didn't take on debt to finance their hardware
- have no noticeable change in their

11:03 AM · May 9, 2024 · 30.8K Views

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(Upper: Bitaxe Gamma 602 in orange stand – compact, fan-cooled. Lower: Classic Bitaxe Duo setup with clear open-source PCB visibility.)

3. Cooling Wars: Why Hydro Is Winning Over Immersion

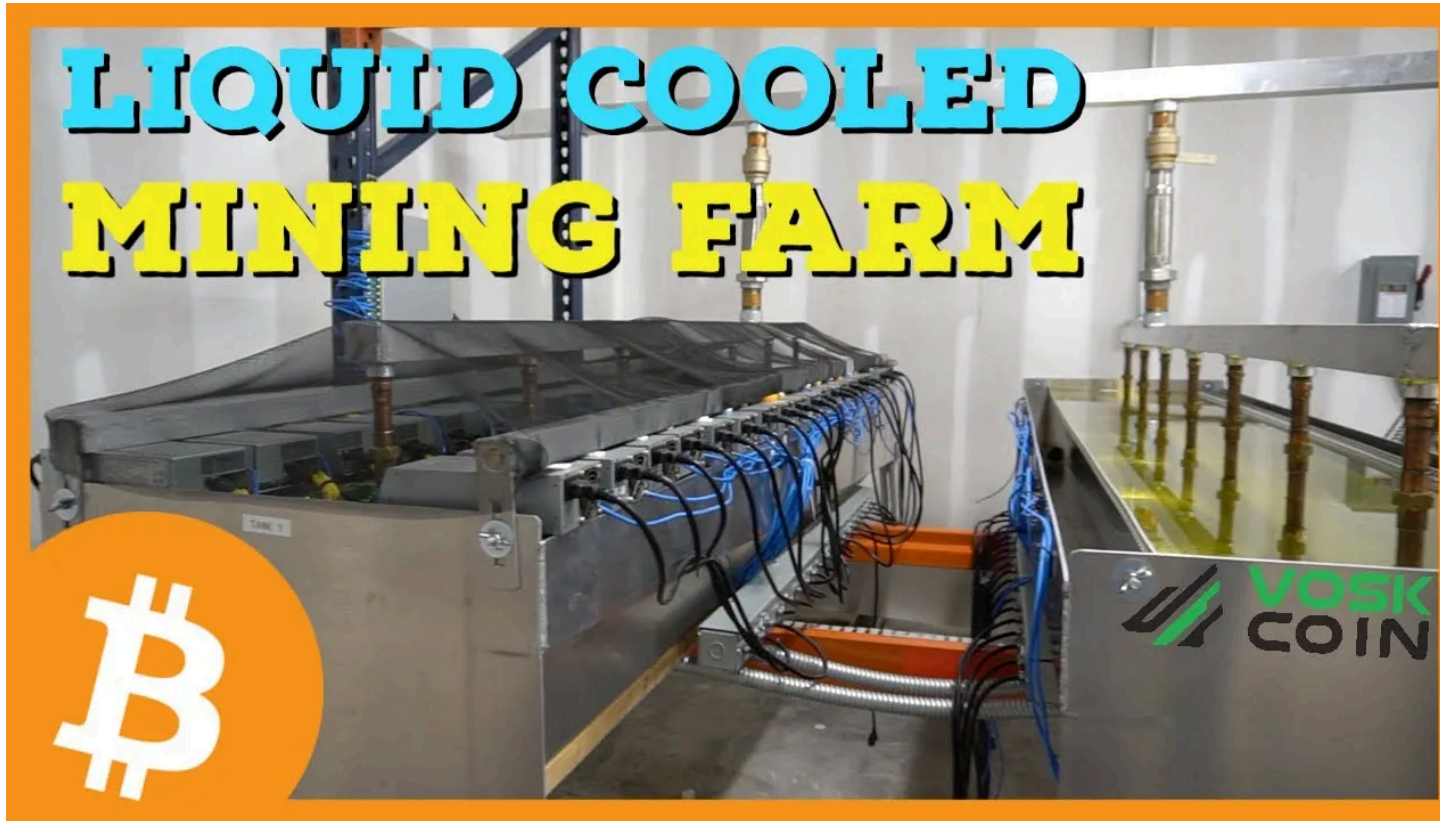
The episode contrasts declining immersion cooling (dielectric fluid baths) with rising hydro (water-based) solutions.

Pros/Cons Table

Cooling Type	Efficiency	Maintenance	Noise/Heat	Scalability	Trend per Episode
Immersion	Excellent	High (fluid changes)	Low noise	Good for dense racks	Declining
Hydro (water/liquid)	Excellent	Lower (closed loops)	Very low	Excellent for mixed fleets	Preferred & rising

Insights: - Hydro enables quieter, more modular deployments – ideal for both home Bitaxe rigs and industrial fleets. - Example: NerdQaxe Hydro variants hit sustained high hashrates with integrated radiators and glowing aesthetics.





(Upper: NerdQaxe Hydro – glowing water-cooled Bitaxe variant. Lower: Industrial immersion farm tanks for contrast.)

4. Industry Standardization & The 256 Foundation Vision

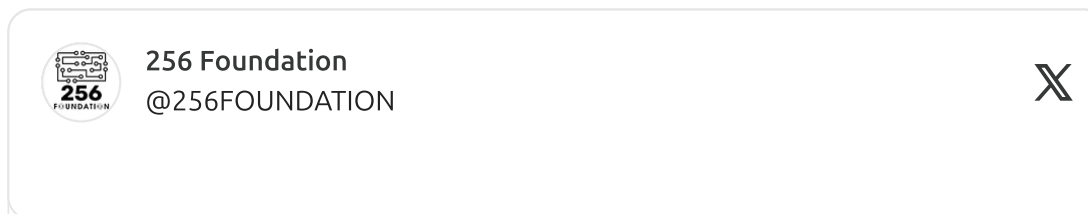
Open reference designs for firmware (Mujina), control boards (LibreBoard), hashboards (Ember One), and pools (HydraPool) slash costs and vendor lock-in risks.

Key Initiatives:

- **GridPool “winners list”**: Decentralized variance smoothing.
- **Vardiff dynamics & Patoshi story**: Historical context on nonce handling and difficulty adjustment.
- **Security angle**: FCC Wi-Fi rules, avoiding vendor backdoors – open firmware is critical.
- **Privacy**: VPN mining options for anonymity.
- **Roadmap**: Slowing ASIC efficiency gains mean software/infra innovation is the new frontier. Telehash #5 incoming; 256 Foundation’s Discourse forum and dev calls for collaboration.

Related X Posts (Community Pulse):

- From 256 Foundation (Jan 2026): “Lots of working going on behind the scenes... [@D_plus_plus](#) built this amazing public facing hashdash for us, you can start helping us stress test Hydra Pool now: <https://dash.256f.org/>” – Direct tie-in to the stress test prep.



Lots of working going on behind the scenes to put together a very special Telehash fundraiser, happening in just 9 days!

[@D_plus_plus](#) built this amazing public facing hashdash for us, you can start helping us stress test Hydra Pool now:

dash.256f.org

256 Foundation • Hashdash



6:33 PM · Jan 12, 2026 · 3.61K Views

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- From [@skot9000](#) (Bitaxe project instigator): “1 EH/s hashrate would solve (on average, currently) a block every 4 days... That’s a legion of miners that; - didn’t take on debt... are undetectable...” – Perfect encapsulation of the Bitaxe-to-exahash ethos.



skot
[@skot9000](#)



1 EH/s hashrate would solve (on average, currently) a block every 4 days.
solochance.com

1 EH/s is 1 million TH/s, or about 1.4M [#Bitaxe](#) Supra

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(Aerial view of massive Bitcoin mining farm – visualizing the exahash end of the spectrum.)

What's Next?

- Telehash #5 and expanded gamification (leaderboards, loyalty uptime).
- Call to ASIC makers and big miners: Adopt open standards for firmware, racks, cooling, and power.
- 256 Foundation's four pillars (Ember One, Mujina, LibreBoard, HydraPool) get runway extension via community grants.

This episode proves open-source Bitcoin mining isn't niche anymore – it's the scalable, resilient future. Whether you run a single Bitaxe on your desk or rent exahash, the tools are here.

Tune in: Full episode on Fountain, Spotify, or pod256.org. Support via zaprite link in show notes.

Stay hashin' – the open future is being built one pull request at a time.

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