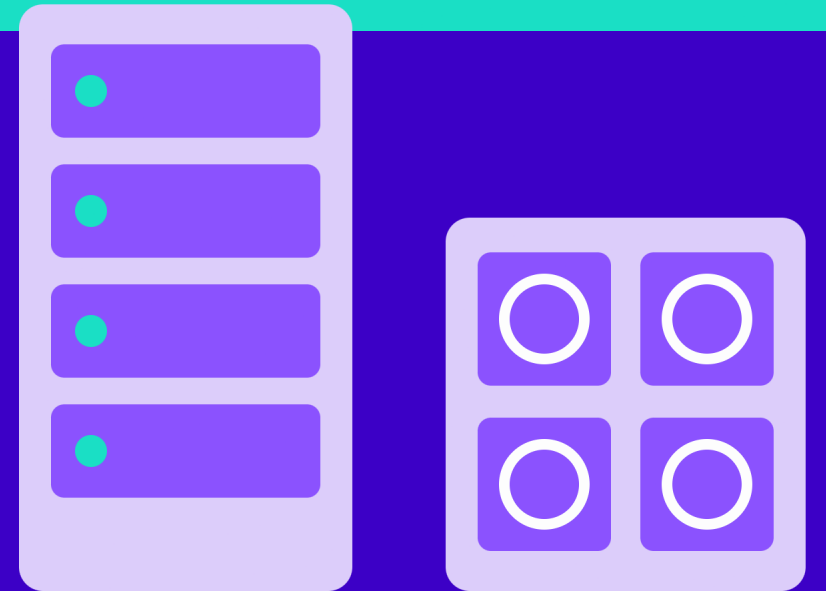


Bringing the Mullet Data Center to Life

AI and Bitcoin mining on one grid connection

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But first, a little background on Bitcoin mining



A race every 10 minutes

Miners compete to add the next block of transactions to the ledger.



Guesses win at random

Each machine computes trillions of guesses per second. More guesses give more chances to win.



The winner is paid

The reward is 3.125 bitcoin today. It halves about every four years.

Bitcoin miners are becoming AI hosts

Mining revenue per machine fell

The 2024 halving cut the block reward in half. Revenue per machine fell with it.

Miners already have what AI needs

Grid connections, land, substations and cooling, already built and running.

AI hosting pays fixed contracts

GPU customers sign multi-year leases. Mining revenue moves with the bitcoin price.

Most sites that convert remove their miners. Few run both kinds of computer behind one grid connection.

What is a mullet data center?

One site. One grid connection. Two kinds of computer sharing the same power.

IN FRONT

GPUs running AI

They serve paying customers under service agreements. They take power first.

IN BACK

Bitcoin miners

They use whatever power is left over. They can switch down when the AI side or the grid needs the power.

76 GW

of new load the US grid could connect if those loads accept curtailment for 0.25% of their hours.

That is about **10% of US peak demand**.

The reward for a flexible site is **a faster grid connection**. Waiting years in the queue costs more than any demand-response payment.

A typical curtailment event lasts **1.7 to 2.5 hours**, and most keep at least half the load running.

Why miners can switch off on request



Stopping harms no customer

A paused AI server leaves its users without answers. A paused miner only loses the revenue for that time.



Seconds to respond

Miners can switch off and on again within seconds. AI loads can to varying degrees with opportunity costs.



A built-in price signal

Above a break-even power price, mining loses money. Miners already switch off then. AI is driven by demand.

Why are mullet data centers rare?

1 Miners must keep pace

AI power jumps in under a second. Nobody has published how fast a mining chip can follow.

2 AI pays more per megawatt

A megawatt leased to an AI tenant earns more than the same megawatt spent on mining.

3 The buildings differ

AI tenants expect backup power, redundant feeds and dense cooling. Mining sites are built without them.

4 No software runs both

Mining control and GPU control are separate products. Neither decides which fleet gives up power.

Each device responds at its own speed

UNDER 1 SECOND

Capacitors

Fast, but they hold little energy.

SECONDS TO MINUTES

Bitcoin miners

Large and cheap to turn down.

MINUTES TO HOURS

Shifting AI work

Possible, but customers notice.

Faster



Slower

THE APPROACH

Miners with capacitance

Miners carry the slow part of every AI power swing.

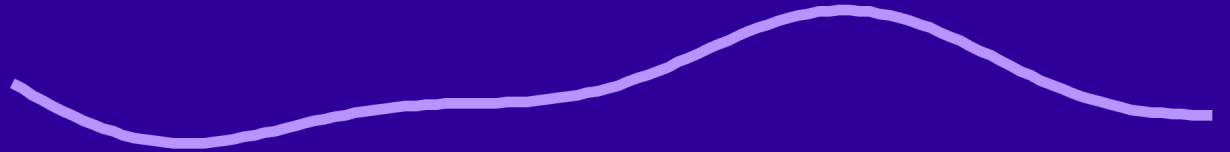
A small capacitor bank carries the fast part.

The grid sees a steady load.

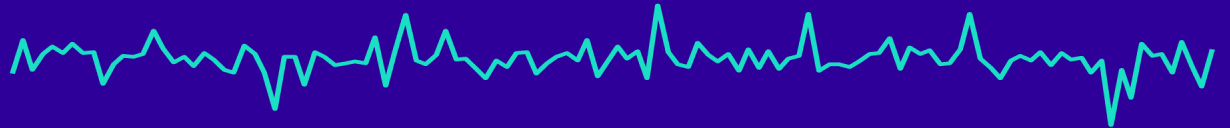
AI power



Miners take the slow swings



Capacitors take the fast remainder



What the grid sees



Illustration, not data

EXPERIMENT 1 · SEPTEMBER 2026

How fast does AI power move?



Rented one **NVIDIA H100** GPU running a language model.



Replayed real **chat and coding requests** published by Microsoft Azure.



Logged GPU power **every 100 ms** over four hours.



Fed the measured power into a **simulation of miners and capacitors** balancing it.

EXPERIMENT 1 • RESULTS

AI power moves fast

CHAT REQUESTS

36%

of peak power, in a tenth of a second

17% in one second

CODING REQUESTS

54%

of peak power, in a tenth of a second

34% in one second

Power follows arrivals

GPU power tracks when requests arrive and how long their prompts are.

The hour was split into tenth-of-a-second intervals. In 1 interval out of 100, power changed by at least the amount shown. The sensor reports a new value only every tenth of a second, so it misses faster changes. The true figures are at least this large.

EXPERIMENT 1 · SIMULATION

Miners shrink the capacitor bank about 40 times

Storage needed per GPU, over the measured hour



Miners held at constant power



Miners following the slow swings, with a 1-second response

0.08 Wh is about 280 J for one GPU. Across 128 GPUs whose swings are independent, it falls to about **25 J per GPU**. Supercapacitors handle that.

The capacitors' power rating stays about the same. The fastest steps pass the miners by. Fleet size is what lowers it.

The miners were modelled, with response times from 0.2 to 5 seconds. Experiment 2 measures a real chip.

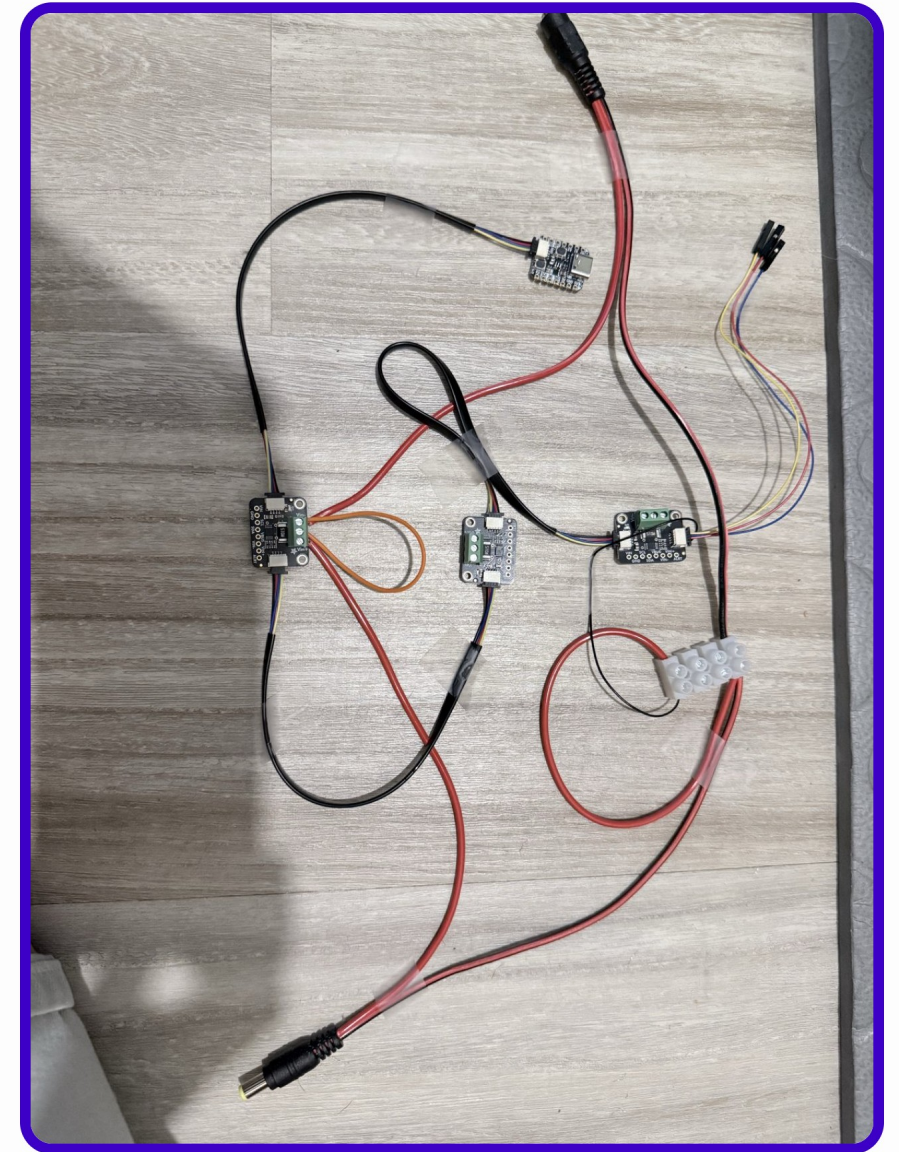
EXPERIMENT 2 · UNDER WAY

How fast can a mining chip respond?

Three **Bitaxe Supra** boards. Each carries one **BM1368**, the chip inside the Antminer S21. One is the newer revision 403, and two are the older revision 401.

The photo shows the home grown power meter: one precision power sensor per board, all read by one small microcontroller.

The meter is built. Its first sensor reads current within 2% of a multimeter. Chip tests come next.



EXPERIMENT 2 · HOW IT WORKS

Step the clock, then time the power

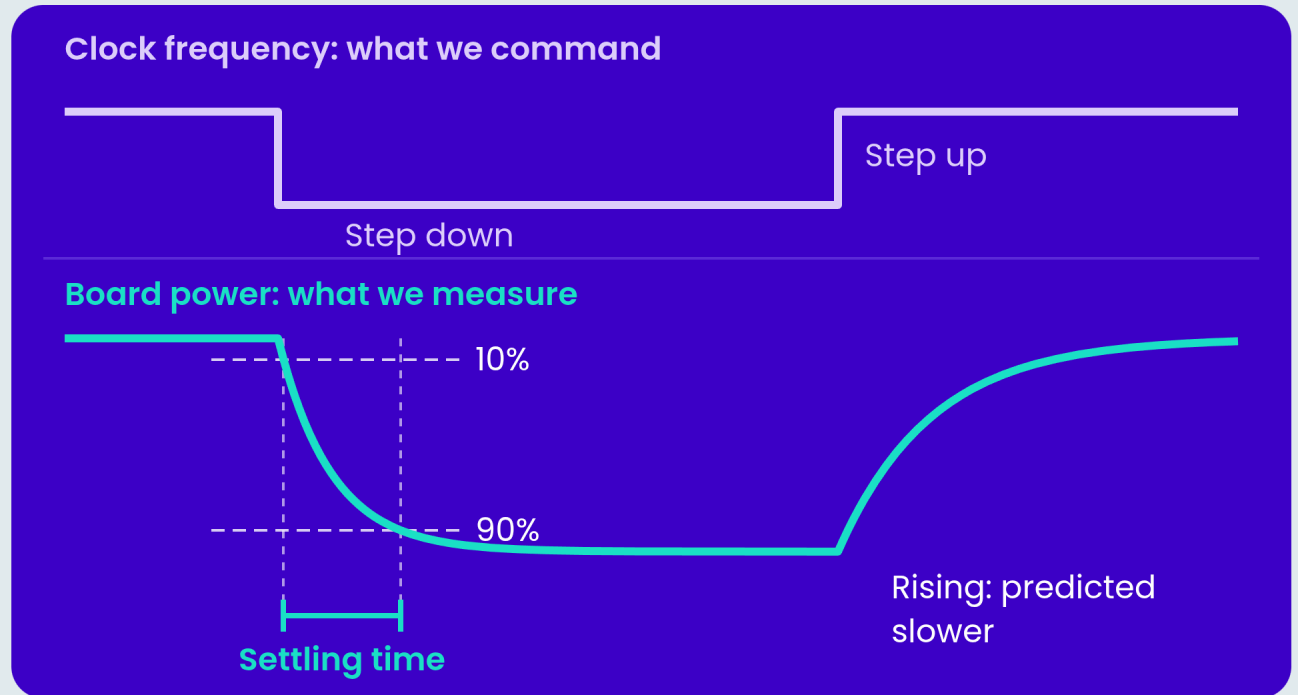
$$P = F + k V^2 f$$

f is the chip's clock frequency. It is the only thing we change.

V is the chip's voltage. We hold it fixed.

k is a constant set by the chip's design.

F is power that does not change with **f**: the supply, the fan, the controller and the chip's leakage.



A board draws 15–20 W. An S21 draws 3.5 kW through a power supply that adds its own delay. Illustration, not data.

OPEN SOURCE

Building on Mujina

What Mujina is

Open-source Bitcoin mining firmware from the 256 Foundation.

Written in Rust. Licensed GPL-3.0. No developer fee.

Today it runs one Bitaxe model, the Gamma. It has no controls for clock, voltage or power.

What we are adding

Support for the Bitaxe Supra and its BM1368 chip.

A command that changes the chip's clock frequency while it mines.

Public firmware for the older Supra's USB controller, so that it can switch its chip on.

Why open firmware matters here

A grid operator needs to know how a load will respond.

Most miner firmware is closed. Nobody outside the vendor can check how it controls power.

Open firmware lets anyone build and improve the ecosystem.

“Read every line, modify it without permission, control it through a documented API, and pay no dev fee.”

MUJINA README, 256 FOUNDATION

Back to the mullet

IN FRONT

AI serves its customers at full speed.

IN BACK

Miners and capacitors hold the site's power steady.

THE RESULT

AI data centers that are safer and easier to energize.

▶ margotbits.com/contact

💬 @jyn_urso

Thank you!