PowerRanger

A software control plane for grid-responsive datacenters

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⚠ The Problem

AI trains in **lockstep**, and the grid pays for the rhythm. Synchronized GPUs swing datacenter power by **hundreds of megawatts in an instant**, and those oscillations can **stress and fatigue grid generators**. We must bound both the **magnitude** and the **rate of change** of datacenter load.

The Proposal · PowerRanger

PowerRanger holds datacenter power in a **range the grid can move**.

Four per-node APIs define it — **CPU and GPU versions** of each:

set_power_upper_bound	**Ceiling** (MW) — power may never draw above it
set_power_lower_bound	**Floor** (MW) — power may never drop below it
set_ramp_up_rate	**Climb limit** (MW/s) — how fast the band rises
set_ramp_down_rate	**Shed limit** (MW/s) — how fast power falls

PowerRanger in Action

Grid DR Signal

```
set_power_upper_bound(210)
set_power_lower_bound(144)
set_ramp_up_rate(5.0)
set_ramp_down_rate(5.0)
```

→ *set the power range*