Depreciation Useful Life (DUL) – Whitepaper v1.0

Overview

Data centers traditionally rely on fixed 3–5 year depreciation cycles. These cycles ignore real-world aging factors: thermal stress, PSU efficiency drift, SSD wear curves, vibration, humidity, ECC error slopes, and GPU duty cycles.

DUL provides a physics- and data-driven view of true hardware lifespan.

System Architecture
----
dc-ai-dul v1.0 uses:
- Telemetry ingestion (OCP/Prometheus/SNMP/Modbus)
- ML degradation features
- DUL models (GBR, LSTM, Cox survival)
- Fleet planner for replacement forecasting
- DB schema supporting long-term trend analysis

Key Benefits

- Reduce CapEx by extending healthy assets
- Avoid outages by replacing components before failure
- Identify aging racks or hotspots
- Financial clarity for operators and CFOs

Comparison to RUL

RUL = engineering remaining useful life.
DUL = depreciation useful life aligned with financial treatment.

DUL bridges engineering data and financial decision-making.

Conclusion

DUL transforms DCIM from reactive health checks into predictive lifecycle intelligence.