Tape Updates:
Tape vs Red-Hot Power Hogs

Alistair Symon, VP, Storage Systems Development

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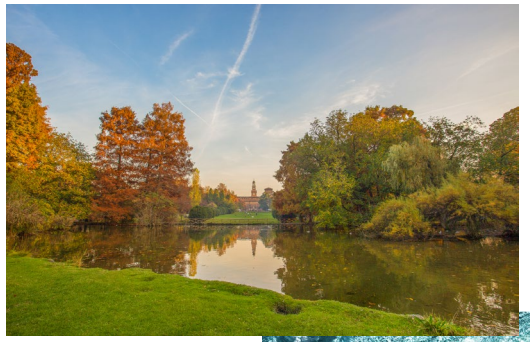
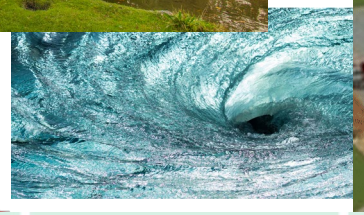
AI is driving power &





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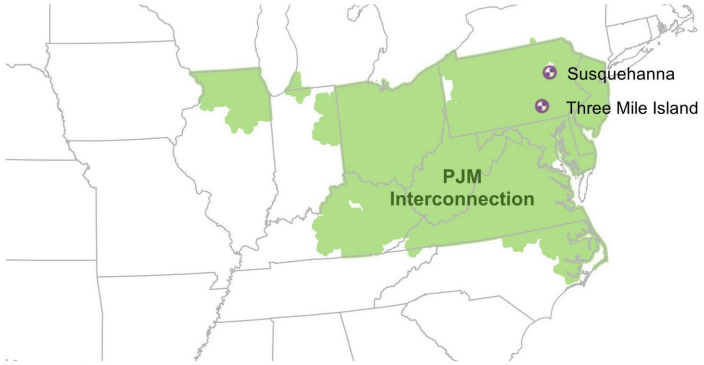
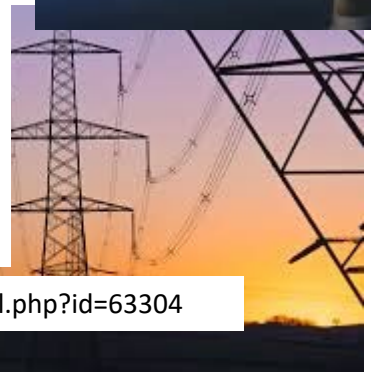
Data center owners turn to nuclear as potential electricity source



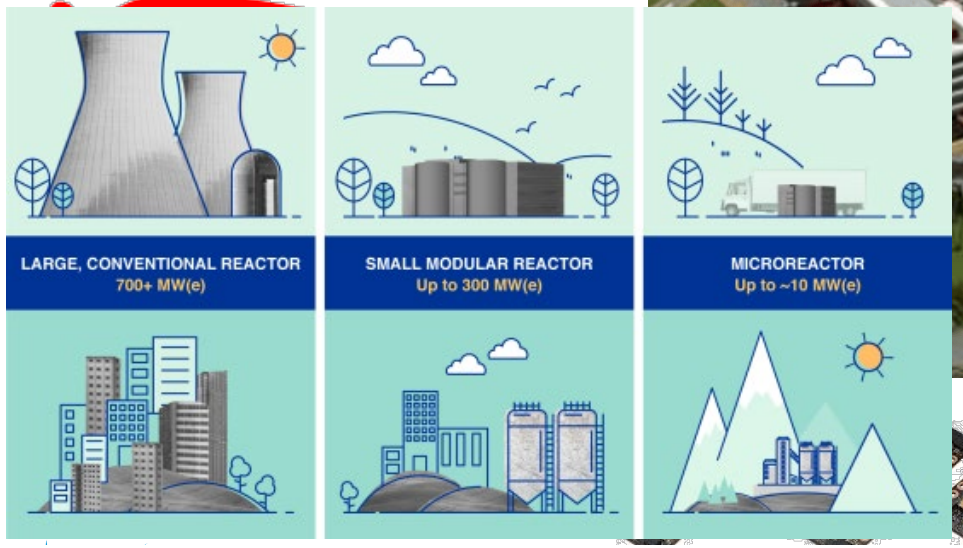
Data source: U.S. Energy Information Administration



https://www.eia.gov/todayinenergy/detail.php?id=63304

Amazon, Google make dueling nuclear investments to power data centers with clean energy

https://apnews.com/article/climate-data-centers-amazon-google-nuclear-energy-e404d52241f965e056a7c53e88abc91a



https://www.iaea.org/newscenter/news/what-are-small-modular-reactors-smrs

On-Site Nuclear Power: SMRs Create New Opportunities for Colocation Data Centers

Colocation data centers explore the possibility of on-site nuclear power, supplied by SMRs.

https://www.lastenergy.com/blog/smrs-colocation-data-centers

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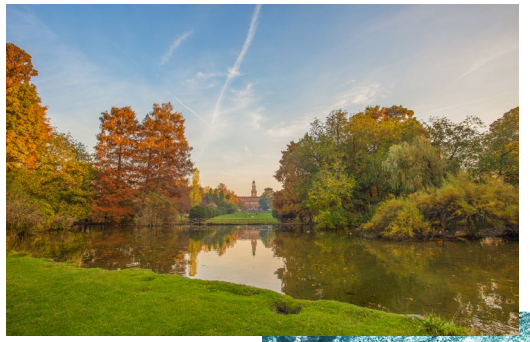

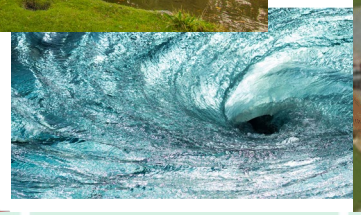

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Data center owners turn to nuclear as potential electricity source

INTERESTING ENGINEERING

US breakthrough nuclear battery generates electricity from atomic waste products

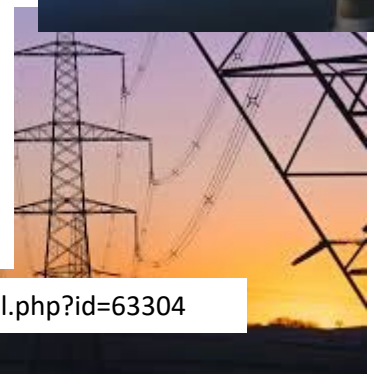
Aman Tripathi

Tue, February 25, 2025 at 12:13 PM GMT-7 · 3 min read

34

Researchers at The Ohio State University have developed a battery that can convert nuclear waste into electricity.

https://www.yahoo.com/news/us-breakthrough-nuclear-battery-generates-191347103.html



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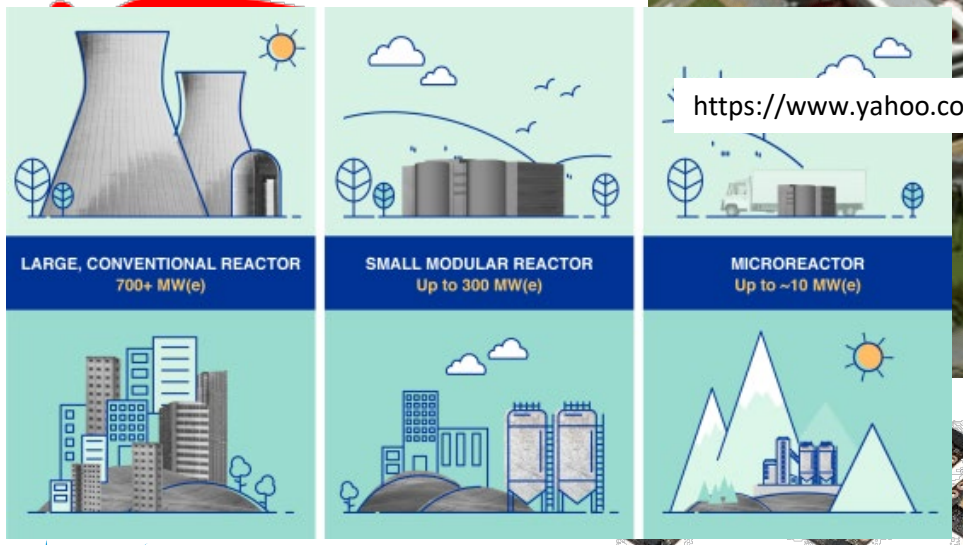

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The State of Archive Data – An Analyst View

The Energy of Data

If the surging tide of stuff to be stored cannot be stemmed—and apparently it cannot—then new enterprise data infrastructures must not only cost less but must also consume less power to be in crucial and resilient alignment with the total availability of energy.

Current Process Sustainability

"We fear there will continue to be immense waste of energy and money expended in the ways we choose to store and manage the active installed base of enterprise data. This will be tragic—'tragic' because the consequences of this waste can be so easily avoided."

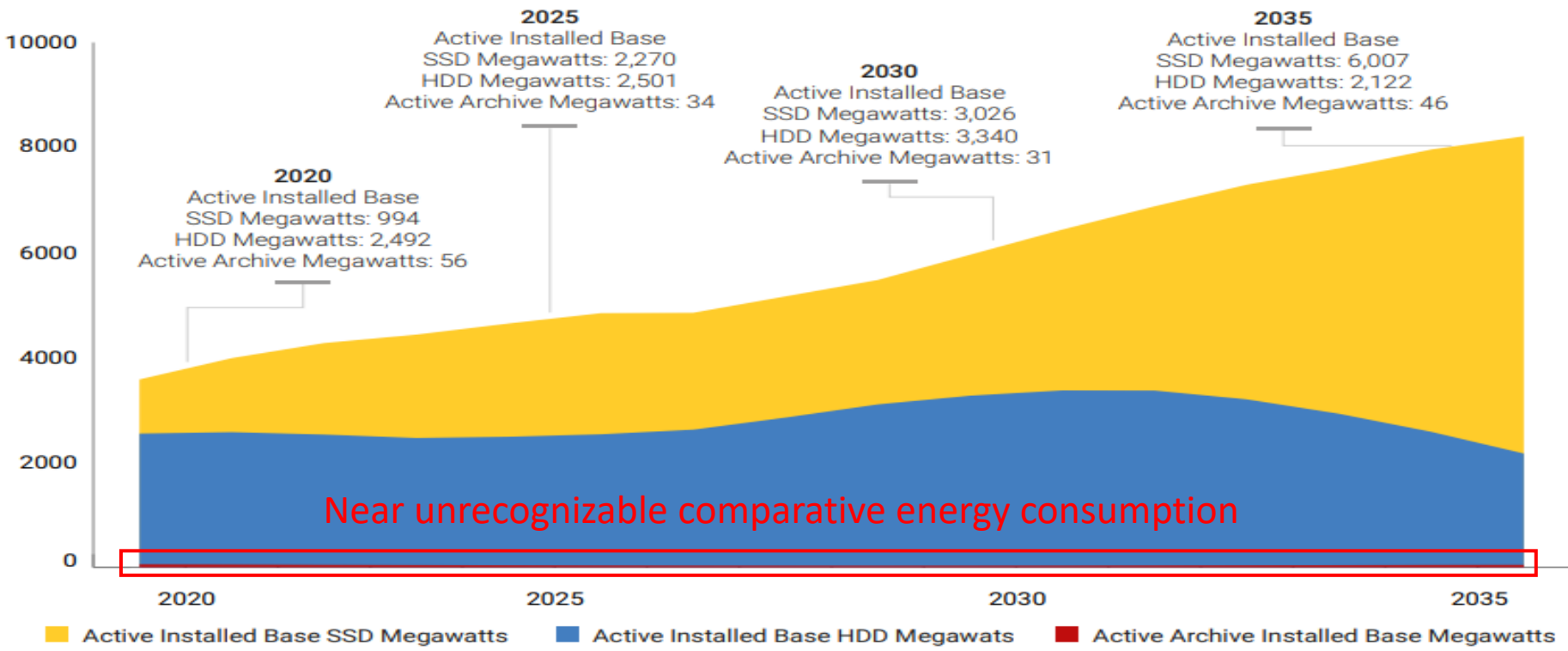
Archive Capacity Requirements

With the advent of new tape and enterprise emerging storage technologies, we have forecast that active archive shipments will expand to comprise more than 50% of the fresh enterprise zettabytes delivered in 2034 and 2035.

Furthurdata.com – The Sustainable Preservation of Enterprise Data

http://furthurdata.com/wp-content/uploads/2024/02/Sustainable-Preservation-of-Enterprise-Data_V13.pdf

Storage Power Usage

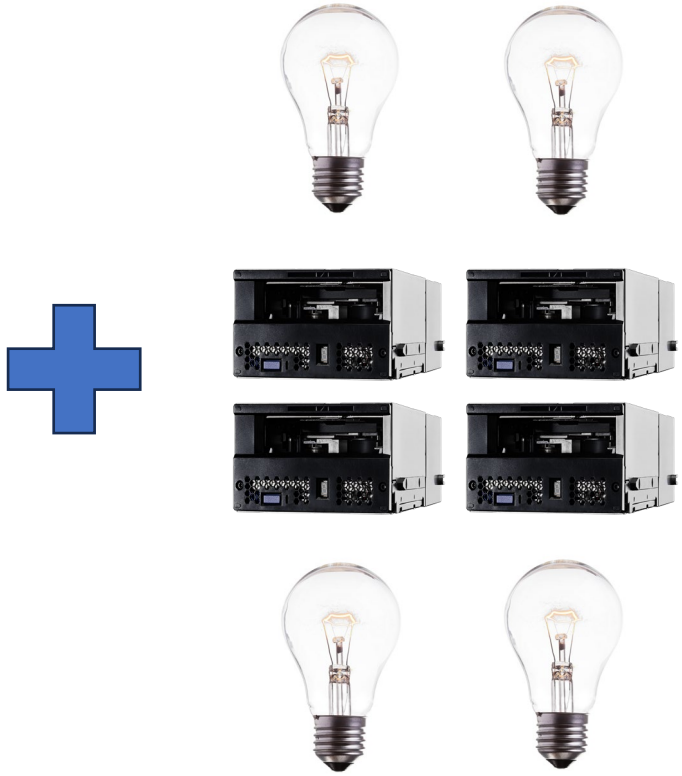


You can't even see the tape portion of the chart!

Note the steep decline in HDD power draw as shipments decline after 2030. The active archive megawatts are barely discernible in this format.

Source: Furthur Market Research and Brad Johns Consulting (January 2024)

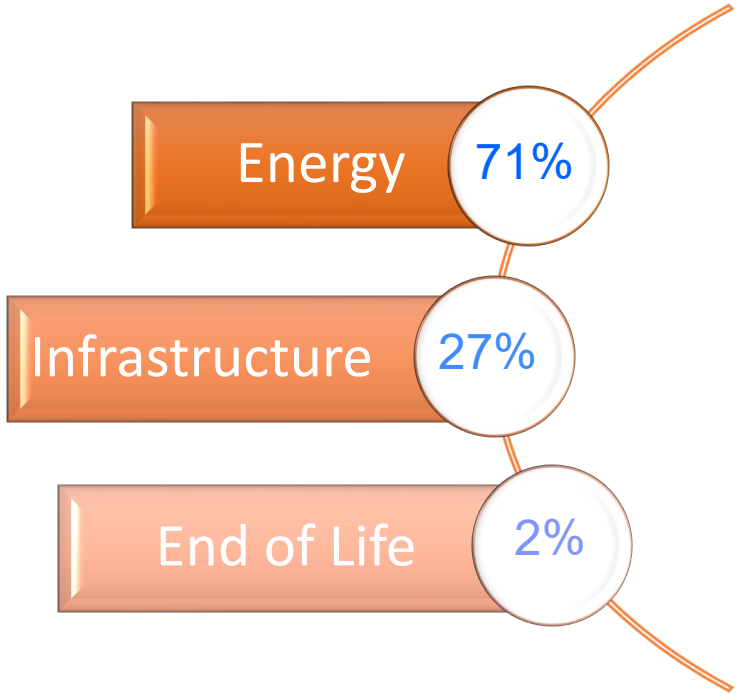
The Power of Tape



VS

Data Archives for SMB: 500TB HDD Compare

NetApp DS460C



10-Year

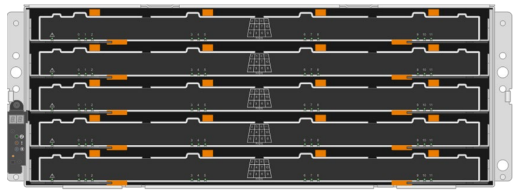
33.1

tons CO2e

5.2-Year

18.0

tons CO2e



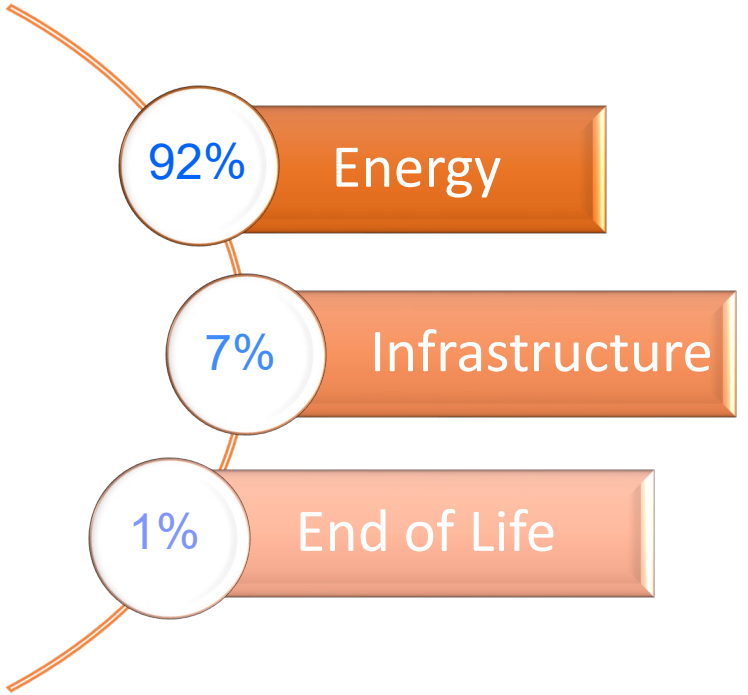
- 5.2-year life
- 60 - 16TB HDDs
- Distributed RAID
- Full replacement cycle
  - Assumes 20TB

IBM TS4300

10-Year

14.8

tons CO2e



5.2-Year

10.5

tons CO2e

- 3U
- 11-nines durability
- 3 - LTO9 Tape drives
- 48 – LTO9 Cartridges
  - No refresh

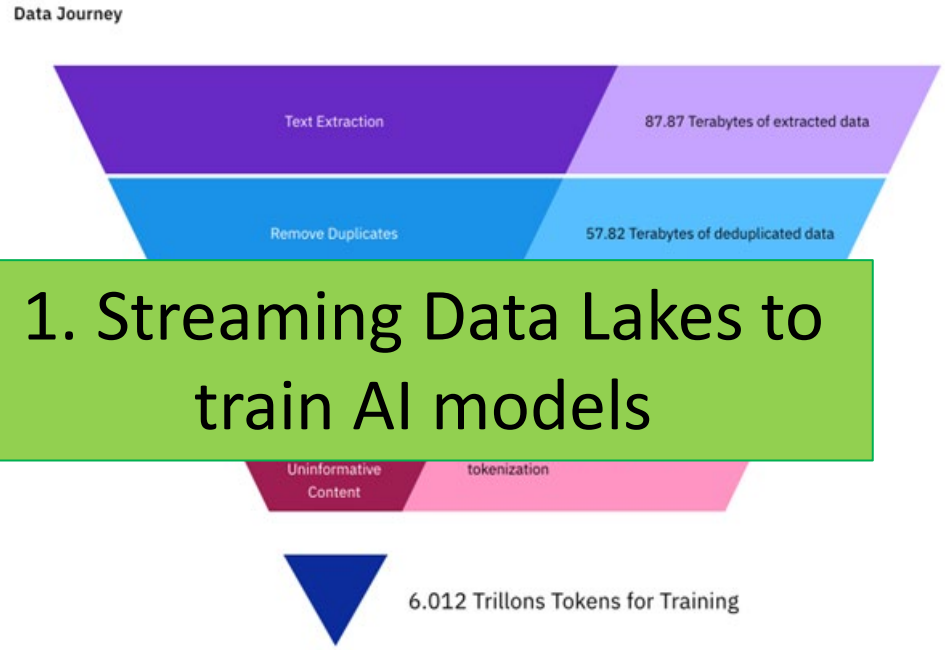
FMS the Future of Memory and Storage

https://www.netapp.com/data-storage/disk-shelves-storage-media/

Gen AI Opportunities for Tape

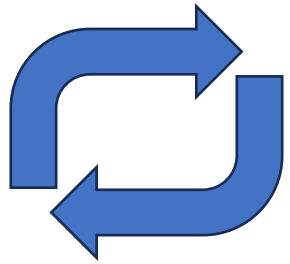
DMF platform: April 2023

watsonx.data | **watsonx.ai** | **watsonx.gov**



1. Streaming Data Lakes to train AI models

- Data used for training can be serialized as input into training
- Overall data should be archived
- Data is updated frequently



- Snapshots / checkpointing of model as it is

2. Long term retention of governance data

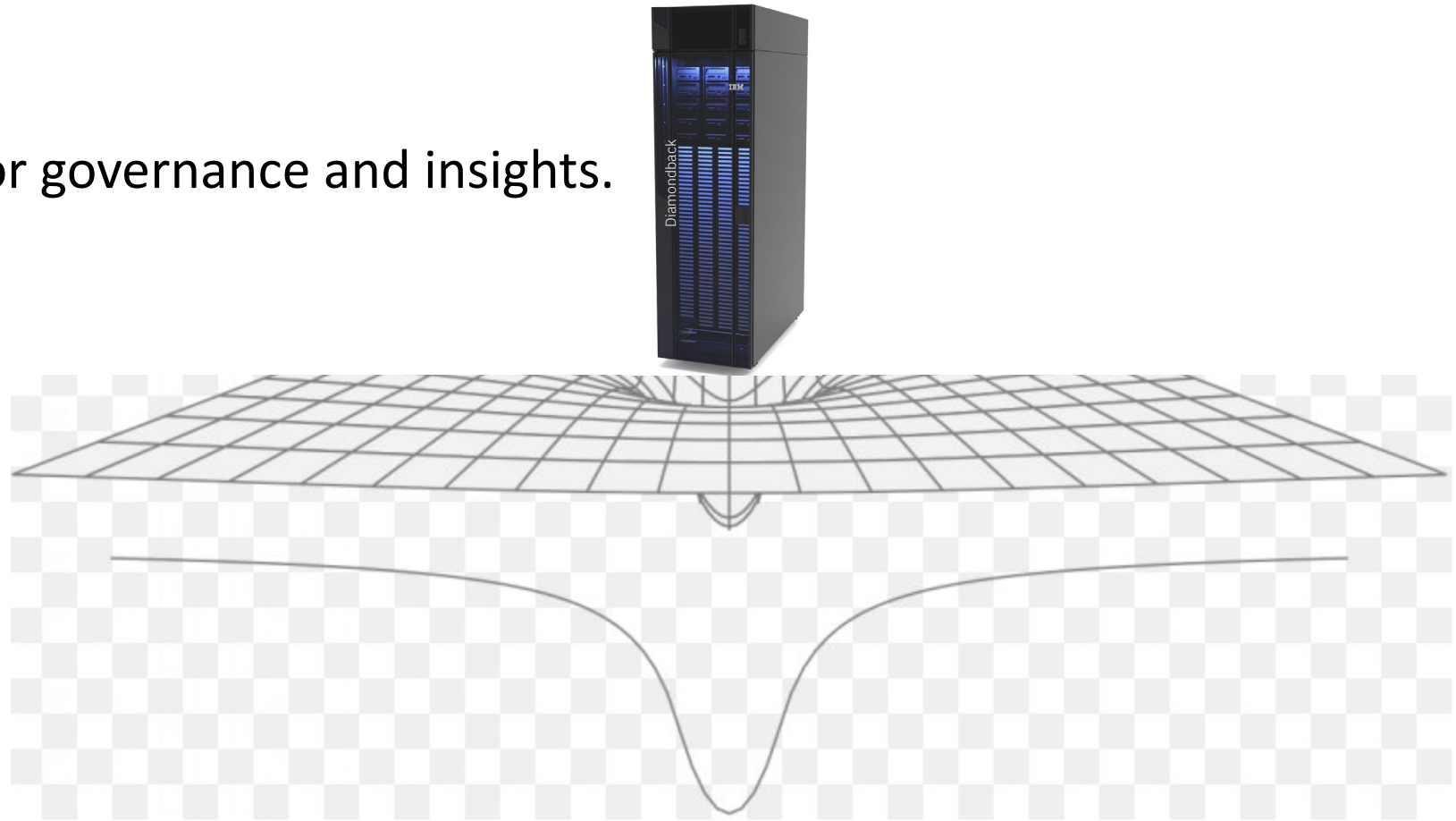
- Model monitoring
- Model risk management
- Regulatory compliance reporting

3. Storing Checkpoints of models during training

Gen AI Opportunities on Tape

Proposal:
AI on an archive

Logging data in an archive for governance and insights.



Thank You