

FUTURE OF INTELLIGENT CLOUD COMPUTING

- Real-time streaming of object access
- ML-powered tier classification [HOT / WARM / COLD]
- Dynamic storage optimization for cloud cost-saving

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Key capabilities

1

Feature 1

Explain what your product does. Give your audience an overview of the main features or capabilities.

2

Feature 2

Mention another feature. Think about what your audience might find uniquely interesting about your product.

3

Feature 3

Mention another feature. Explain how it helps users. What concrete, everyday benefit does it provide?

4

Feature 4

You can list everything your product does. But you might want to focus on what is newest, most impressive, etc.

5

Feature 5

Add as many features or capabilities as you want. You can duplicate this slide if you need more space.

Impact

- **High cloud bills**
- **Poor storage efficiency**
- **No real-time intelligence**
Need: Automated, intelligent, real-time tiering

Need

Automated, intelligent, real-time tiering

Storage Problem

- **Enterprises store millions of cloud objects**
- **70–80% become rarely accessed but stay on expensive HOT storage**
- **Manual tiering is slow, error-prone, and not scalable**

Smart Cloud Storage Optimizer

- Streams live access logs from objects
- Predicts best storage tier (HOT / WARM / COLD) using ML
- Shows real-time dashboard + cost and migration logs

Streaming Logs → FastAPI Backend
→ ML Model (joblib)



SQLite storage



Streamlit Dashboard

How It Works

Data Pipeline

- Generator simulates access events
- SQLite stores object history
- Backend aggregates:
 - `size_gb`
 - `reads_last_7d`
 - `recency_days`
 - `latency_requirement_ms`
 - `cost_per_gb`

Machine Learning

- Random Forest Classifier
- Predicts optimal tier per object
- Activity logs show movement (HOT → COLD, etc.)

Demo Highlights

- ✓ Real-time streaming (data refreshes as generator runs)
 - ✓ Tier distribution updates live
 - ✓ Activity Log mimics actual cloud migrations
 - ✓ Search any object by ID
 - ✓ Works now, no cloud dependency
- (Can plug into AWS S3, Azure Blob, or NetApp StorageGrid later)*

Why only ~1 HOT object?

- HOT requires high reads + low recency + high performance sensitivity
- Most objects quickly become WARM , realistic enterprise pattern



Results & Roadmap

Current Output (example)

- HOT: 1
- WARM: majority
- COLD: archival data
- Total objects update as logs stream

Value

- ✓ Removes manual storage decisions
- ✓ Reduces monthly storage cost
- ✓ Makes tiering intelligent & autonomous

Future Upgrade

- Add real AWS/Azure migration APIs
- Kafka streaming
- Online ML retraining

CONCLUSION:

A lightweight, scalable intelligent storage tiering system that saves cost and automates cloud data management.