Case Study 5: Storage Optimized Instances

1. Overview of Recommended Instances

Storage Optimized instances are designed for workloads that require **high, fast, and low-latency access to large volumes of data**. These workloads typically involve **real-time processing** of **large datasets**, like **video files**, **logs**, **data warehousing**, or **analytics platforms**.

- **I-Series (I3, I4i)**: Built with **NVMe SSDs** for **ultra-fast storage throughput** and **low latency** — ideal for high IOPS (input/output operations per second).

- **D-Series (D3, D2)**: Offer **dense HDD storage** with high capacity but are more suited for **throughput-intensive** workloads.

2. Characteristics

Instance Series	Key Characteristics
I3	High IOPS, NVMe SSDs, great for transactional systems and media delivery.
I4i	Newer generation of I3 with better price-performance, lower latency, and faster NVMe SSDs.
D3	High storage capacity with HDDs; suitable for large-scale data storage and throughput-focused tasks.
D2	Older generation dense-storage instances, still effective for archival storage and batch processing.

3. Why They Are Suitable

Scenario A (Media Streaming Platform)

Media platforms need to deliver **high-res video** with **low-latency access** and **fast processing**.

- **I3/I4i** are perfect for **real-time video serving**, with **SSD-backed** storage that delivers **high IOPS**.
- Faster data access means smoother video playback and reduced buffering.

Scenario B (Log Analytics Platform)

Security platforms require **real-time indexing and analysis** of logs.

- **I4i** supports **fast reads/writes** and **low-latency queries**, critical for threat detection.
- **D3** can be used for **batch analysis** or storing **older logs** that are accessed less frequently.

4. Consideration Detailing the Instance Series

Series	Storage Type	Storage Size per Instance	Use Case Focus	Performance
I3	NVMe SSD	Up to 16 TB	High IOPS / low-latency storage	Better
I4i	NVMe SSD	Up to 30 TB	Real-time analytics & ML	Best
D3	HDD	Up to 48 TB	High-throughput storage	Ok
D2	HDD	Up to 48 TB	Archival, batch processing	No

5. Comparison and Selection

Use Case	I3	I4i	D3	D2
NVMe SSD Support	Better	Best	No	No
Latency (Low Read/Write Delay)	Better	Best	Ok	No
High Storage Capacity	Ok	Better	Best	Best
Real-time Log Processing	Better	Best	Ok	No
Video Streaming Performance	Better	Best	Ok	No
Cost Efficiency (per TB stored)	No	Ok	Better	Best
Modern Workload Readiness	Ok	Best	Ok	No

6. Key Considerations Supporting the Business Case

- **Performance-Driven Access**:
  For workloads like **video serving**, NVMe SSDs (I3/I4i) offer the **speed and reliability** needed for real-time media delivery.

- **Scalability**:
  I4i supports **larger SSDs**, **better network bandwidth**, and **Graviton support**, making it future-ready for **scalable platforms**.

- **Cost vs Throughput**:
  D3 is ideal when **bulk storage** is needed with **less real-time access**, making it good for older logs, backup video files, or offline analytics.

- **Data Intensity**:
  Real-time indexing (like in **Splunk or ELK stack**) needs I4i's **low latency** and **parallel access** capability to keep performance high.

7. Conclusion

- For **media streaming platforms**, **I4i** is the best choice with high-speed NVMe SSDs and fast delivery of large media files.

- For **log analytics**, **I4i** again stands out, with **I3** as a more budget-friendly option.

- Use **D3** when needing **huge storage capacity** but don't require instant speed (e.g., log archives).

- **D2** is suitable only for **legacy workloads** or archival purposes with less frequent access.