

Solving Exploration & Production Data Challenges with WEKA

Challenges

- **Data Fragmentation:** Siloed data across departments hinders integration.
- **Inconsistent Data Quality:** Varying formats and outdated measurements reduce reliability.
- **Legacy Systems:** Older disk-optimized infrastructure limits modern data processing capabilities.

Solution

- **Unified Data Platform:** WEKA integrates data silos into a single high-performance platform with NVMe-optimized architecture and real-time analytics support.

Benefits

- **Enhanced Performance:** NVMe storage and parallel file systems deliver ultra-low latency and high throughput for large datasets.
- **Accelerated Insights:** Real-time data streaming and GPU direct storage enable rapid analytics and AI/ML workloads.
- **Operational Efficiency:** Seamless data integration and reduced simulation times optimize workflows and lower costs.

The Data Challenges in Exploration & Production

Energy exploration, particularly in the oil and gas industry, faces formidable data challenges that hinder operational efficiency and decision-making. These challenges include:

1. **Data Fragmentation:** Data is siloed across geology, drilling, and production departments, making integration difficult.
2. **Inconsistent Data Quality:** Varying data formats, missing values, and outdated measurements reduce reliability.
3. **Legacy Systems:** Older infrastructure limits processing capabilities and compatibility with modern technologies.
4. **Massive Data Volumes:** Seismic surveys, well logs, and sensor data generate petabytes of data, requiring robust management.
5. **Real-time Data Complexity:** Handling real-time streams from remote sensors is critical yet technically demanding.
6. **Lack of Standardization:** Diverse data collection methods complicate analysis across projects.
7. **Security Concerns:** Protecting sensitive data in geographically dispersed locations is a constant challenge.

These issues result in inefficient decision-making, increased operational costs, missed optimization opportunities, and elevated environmental risks.

How WEKA Solves These Challenges

WEKA's data platform is designed to address these complex challenges, transforming how energy companies manage and derive value from their data.

1. **Unified Data Platform:** WEKA consolidates fragmented data silos into a single, cohesive platform, enabling seamless access and integration across departments.
2. **High-Performance Data Processing:** With support for NVMe storage and parallel file systems, WEKA delivers unparalleled throughput and low-latency performance, essential for handling large seismic datasets and real-time sensor

data. WEKA leverages a POSIX-compliant parallel file system, optimized for flash storage, providing over 10 GB/s per client and ultra-low latency, which is critical for seismic data processing.

3. **Modernization of Legacy Workloads:** WEKA enhances performance for traditional applications by offloading metadata operations and optimizing small I/O performance, and removing other bottlenecks to significantly reduce simulation run times.
4. **Real-time Data Streaming:** WEKA supports real-time analytics, allowing energy companies to process and act on sensor data instantaneously for predictive maintenance and operational efficiency. Its architecture supports high-frequency data ingestion rates exceeding millions of IOPS, ensuring real-time insights.
5. **Advanced Analytics Integration:** WEKA's architecture supports AI and machine learning workloads, enabling advanced data analytics for better decision-making. With GPU direct storage capabilities, WEKA minimizes data movement latency, accelerating model training and inference cycles.
6. **Hybrid and Cloud Flexibility:** Whether on-premises or in the cloud, WEKA excels in performance at scale, supporting hybrid environments crucial for modern energy operations. WEKA's ability to scale linearly across hundreds of nodes ensures consistent performance for multi-petabyte datasets.
7. **Enhanced Security and Compliance:** WEKA provides robust data protection features, ensuring data security and compliance with industry regulations. Features like end-to-end encryption, role-based access control, and immutable snapshots secure sensitive exploration data.

Key Use Cases Where WEKA Excels

- **Seismic Data Processing:** Accelerates processing of terabytes to petabytes of seismic data, enhancing subsurface modeling.
- **Reservoir Simulation:** Improves performance for time-step-based simulations, facilitating better production forecasts.
- **Well Log Data Interpretation:** Optimizes integration of well logs with seismic data for accurate reservoir assessment.
- **Geophysical Modeling:** Enhances iterative processing for model calibration with high I/O throughput.
- **3D/4D Visualization:** Supports high-resolution seismic data visualization for dynamic reservoir management.

The WEKA Advantage

WEKA is the ultimate data platform for energy exploration, offering:

- Superior performance and scalability with NVMe-optimized architecture
- Seamless data integration and real-time analytics through high-throughput parallel file systems
- Enhanced support for AI and machine learning with GPU direct storage capabilities
- Flexibility across hybrid and cloud environments with linear scalability
- Robust data security and compliance features, including encryption and immutable snapshots

By overcoming data challenges, WEKA empowers energy companies to make faster, data-driven decisions, optimize operations, and reduce costs, driving success in the competitive energy landscape.

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