Data Ingestion Pipelines for Seismic Crew

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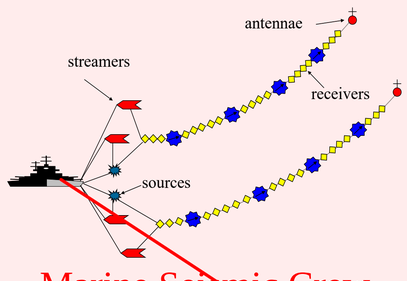
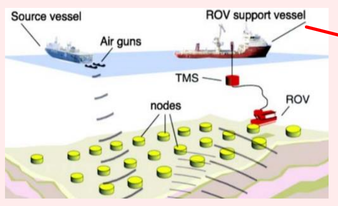
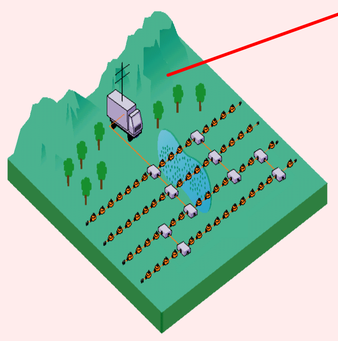


Marine Seismic Crew



Marine Automated Node Survey



Land Seismic Crew

1. Data Producer
1. Data Producer
1. Data Producer
2. Data Consumer - Polling
Field Data
5. Datasets
5. AI/ML
3. Field Data

Kafka
Topic Marine
Topic OBN
Topic Land

API
Dataset
Seismic Processing Software
API
AI/ML
SEGD
SEGY

Field

Processing Center in Cloud / On Premise DC

1. Data Ingestion with Kafka:

- Seismic data from field and marine sources is captured by a recorder, acting as a Kafka producer.
- The recording application publishes this data to specific Kafka topics, with each crew assigned a separate topic.
- Topics are divided into multiple partitions to enhance parallel processing and scalability.

2. Real-Time Data Access:

- A processing application, acting as a Kafka consumer, accesses real-time field data via APIs as soon as new data is ingested into Kafka.
- This enables immediate processing and reduces latency in data availability.

3. Data Storage and Direct Processing:

- Ingested data is stored for further processing; however, direct processing from Kafka topics is also possible, enabling the generation of datasets on-the-fly.

4. AI/ML Module Integration:

- The processing application dynamically loads necessary AI/ML/DL modules via APIs based on the field data received.
- This modular approach ensures the application is equipped with the right tools for each processing task.

5. Advanced Seismic Processing:

- AI/ML/DL modules are utilized to enhance seismic data processing, focusing on improving SNR, conducting velocity and attribute analysis, detecting faults, performing seismic inversion, and interpreting results.