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# High Performance Computing in the Venezuelan Industry

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INTESA

# Oil and Gas Main Challenge Areas

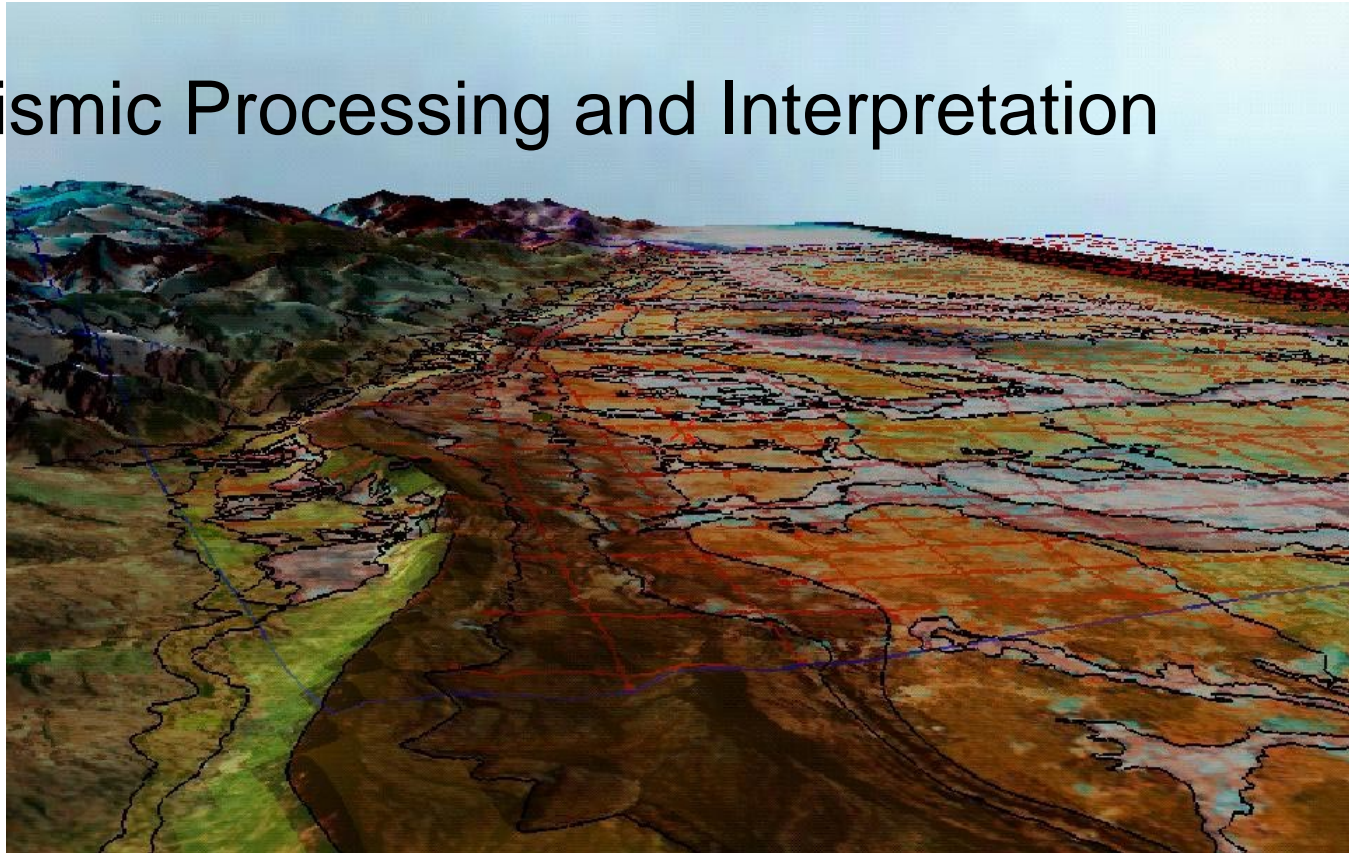
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- Exploration:
  - ◆ Seismic processing and Interpretation
- Production:
  - ◆ Reservoir Modeling
  - ◆ Reservoir Management



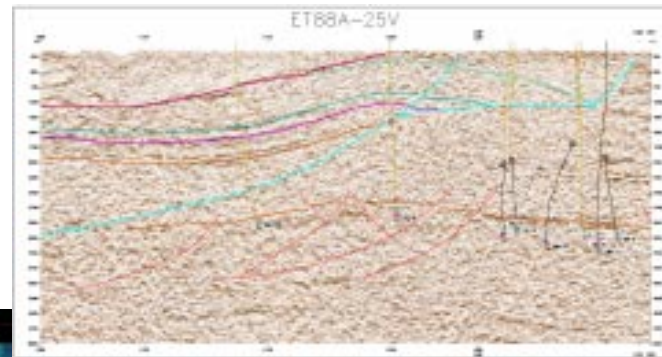
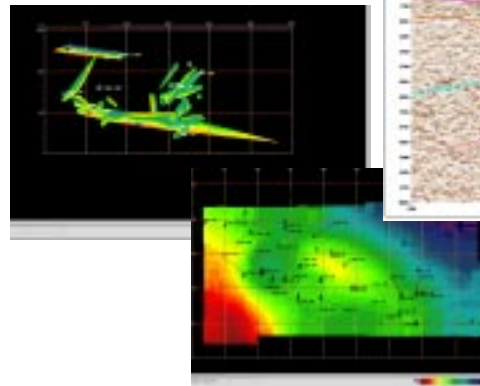
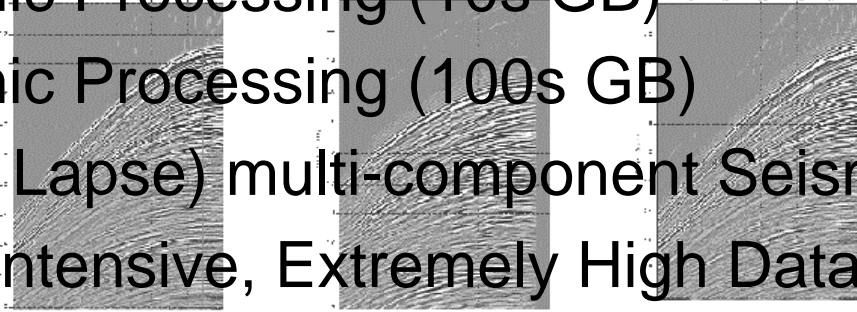
# Oil and Gas

- Seismic Processing and Interpretation



# Oil and Gas Seismic Processing

- ◆ 2D Seismic Processing (10s GB)
- ◆ 3D Seismic Processing (100s GB)
- ◆ 4D (Time Lapse) multi-component Seismic (TB)
- ◆ Very I/O Intensive, Extremely High Data Volume

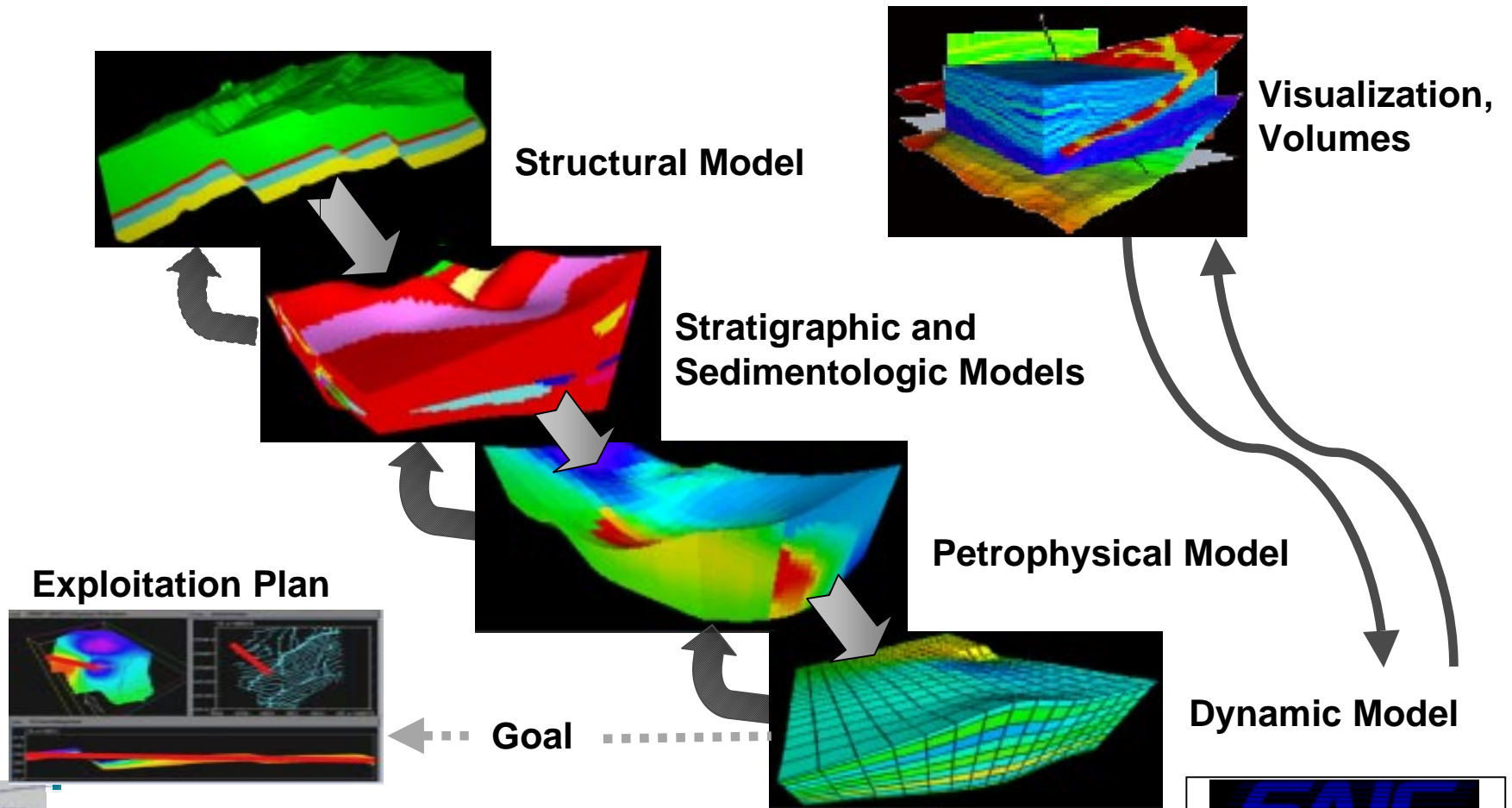


# Oil and Gas Seismic Processing

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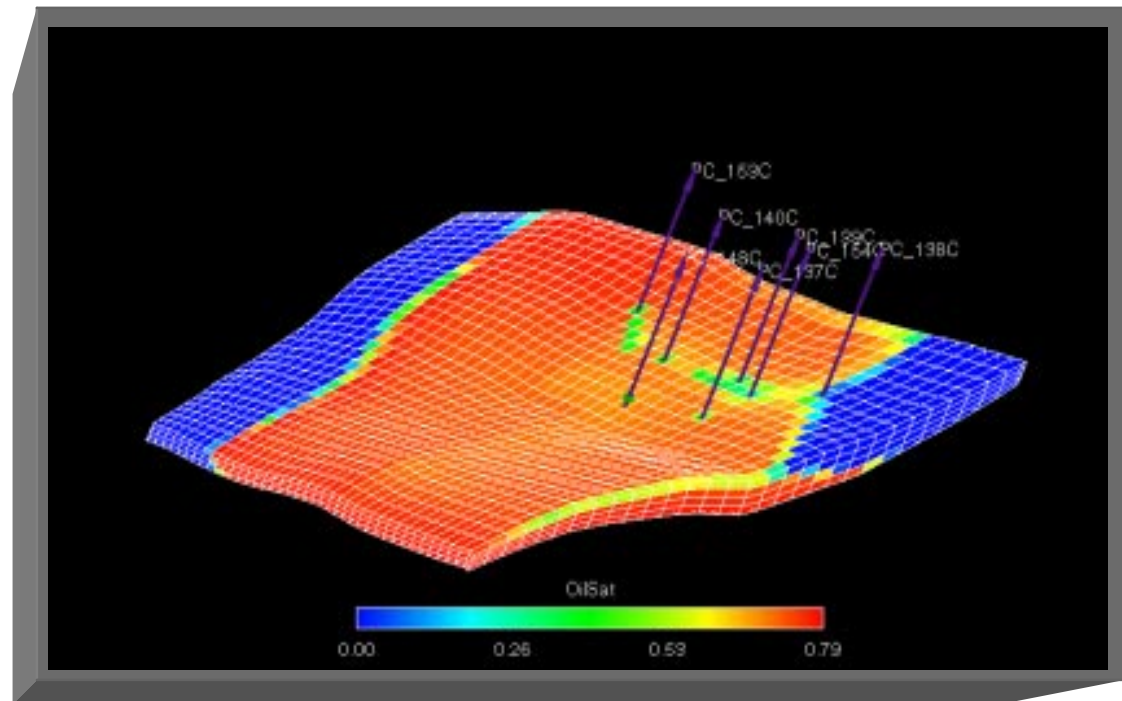
- Parallel Processing:
  - ◆ Current routine seismic processing is performed by external contractors.
    - IBM SP2, Origin2000, Big Beowulf
  - ◆ Quality control and specialized processing is done in-house
    - 32 processor Origin 2000 (INTEVEP)

# Oil and Gas Reservoir Modeling



# Oil and Gas Reservoir Modeling

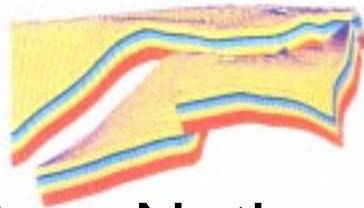
- Large oil field sizes
- Large number of variables
- Small time intervals
- Very CPU Intensive



# Oil and Gas Reservoir Modeling

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- All reservoir modeling is done in-house



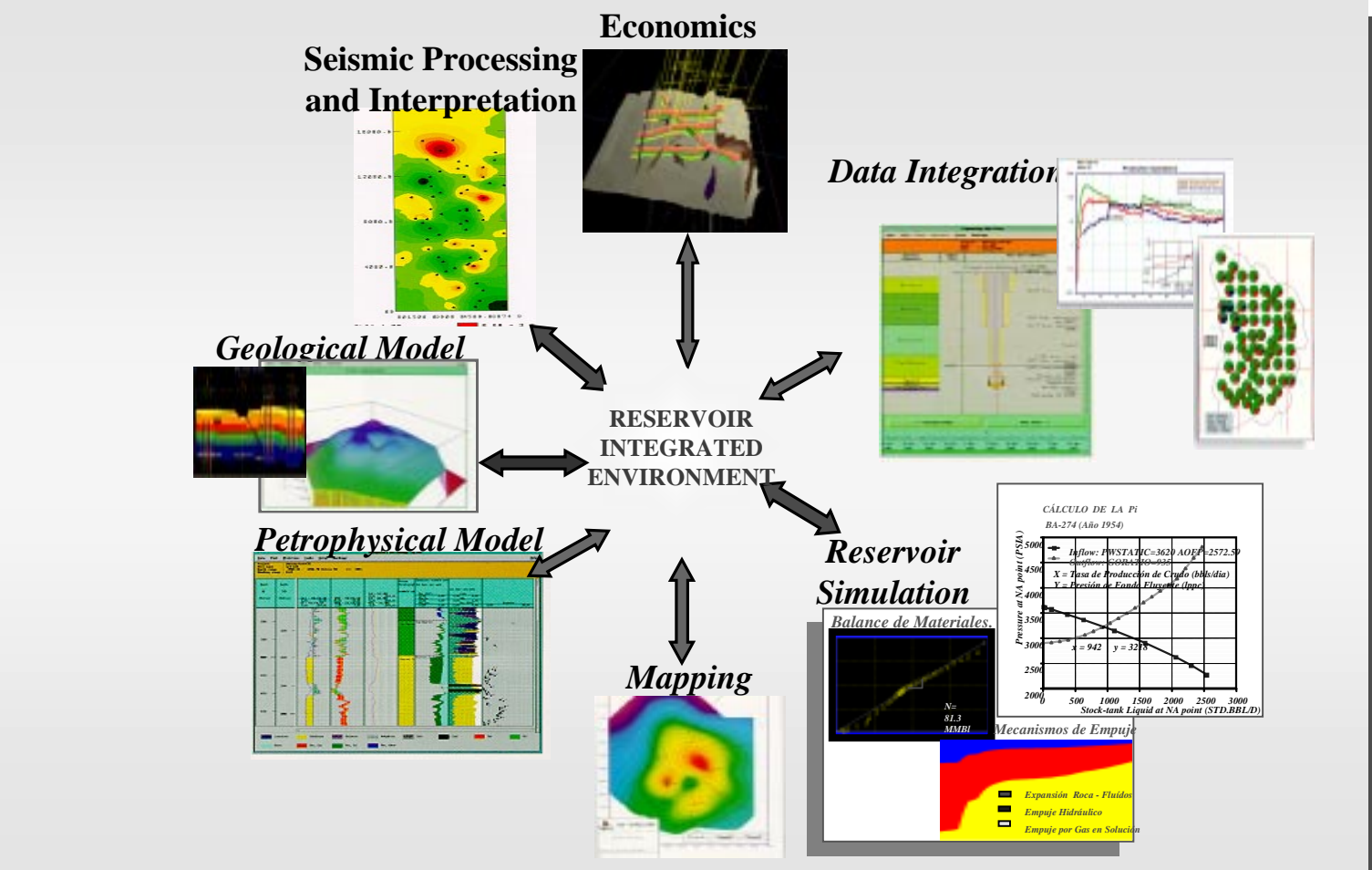
- Four Centers Nationwide



- IBM SP2 (9,9,14,22)



# Oil and Gas Challenges

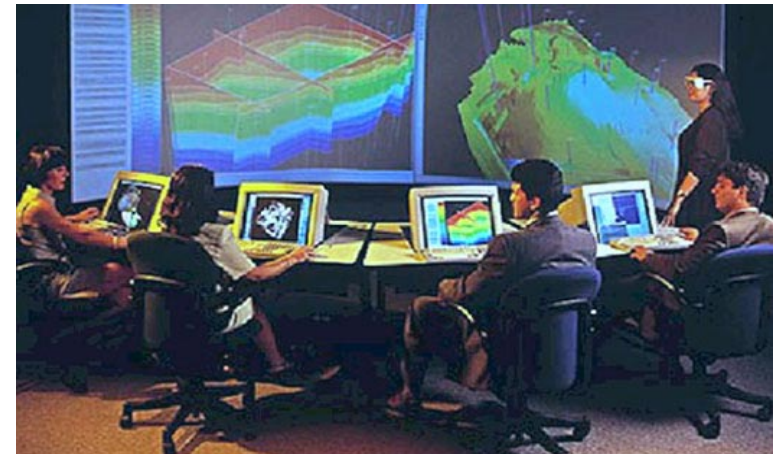


# Oil and Gas Integrated Reservoir Studies

- Nationwide integrated reservoir study rooms



- Immersive visualization center



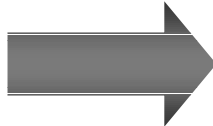
# Oil and Gas Challenges

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- Processing Techniques
  - ◆ Ability to process more data (3D, 4D Seismic) faster.
- Improvements in modeling accuracy and speed
- On-field processing and modeling

# Oil and Gas Challenges

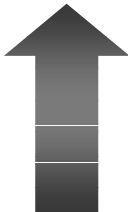
Instrumented Wells  
Continuous Data acquisition



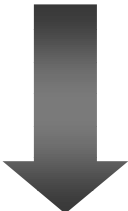
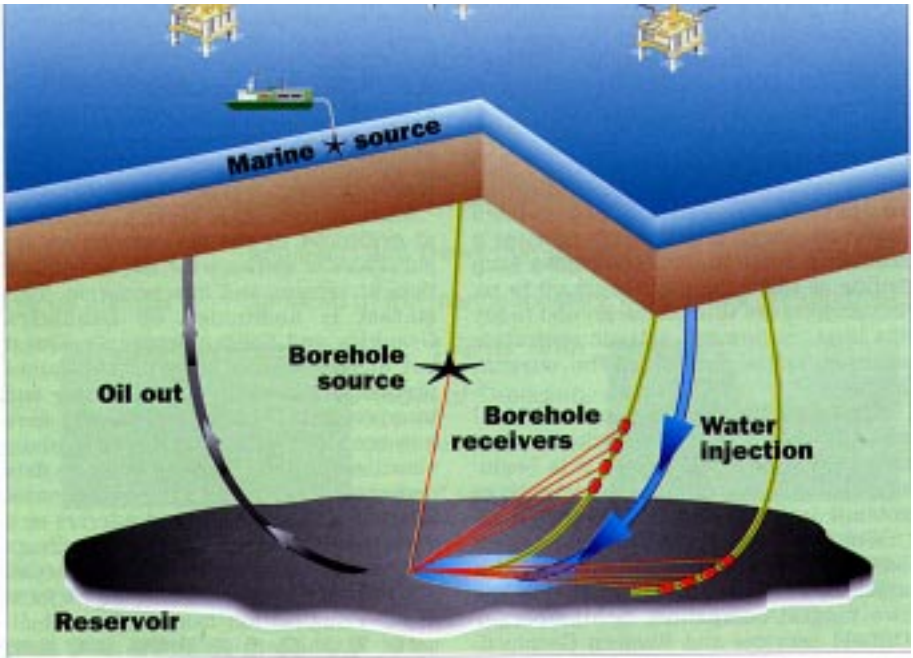
Near real time  
seismic processing



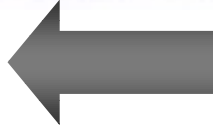
Production  
Adjustments



Continuous  
History Matching



Continuous Modeling



# Oil and Gas Economics

- When a field is shut down, more than 60% of the oil is still on the ground

