

# Reservoir Simulation Applications

- History Matching
- Reservoir Forecasting
- Reservoir Performance optimization
- Sensitivity Analysis
- Risk Assessment through Stochastic Simulation
- Assessment of Uncertainty in Forecasting
- Value of Information Studies
- Reservoir Management

# Computational Complexity

- Geology/Reservoir characterization
- Physical property modeling
- EOR processes
- Computational tools



Complex Reservoir Simulators



CPU/Memory Consumption

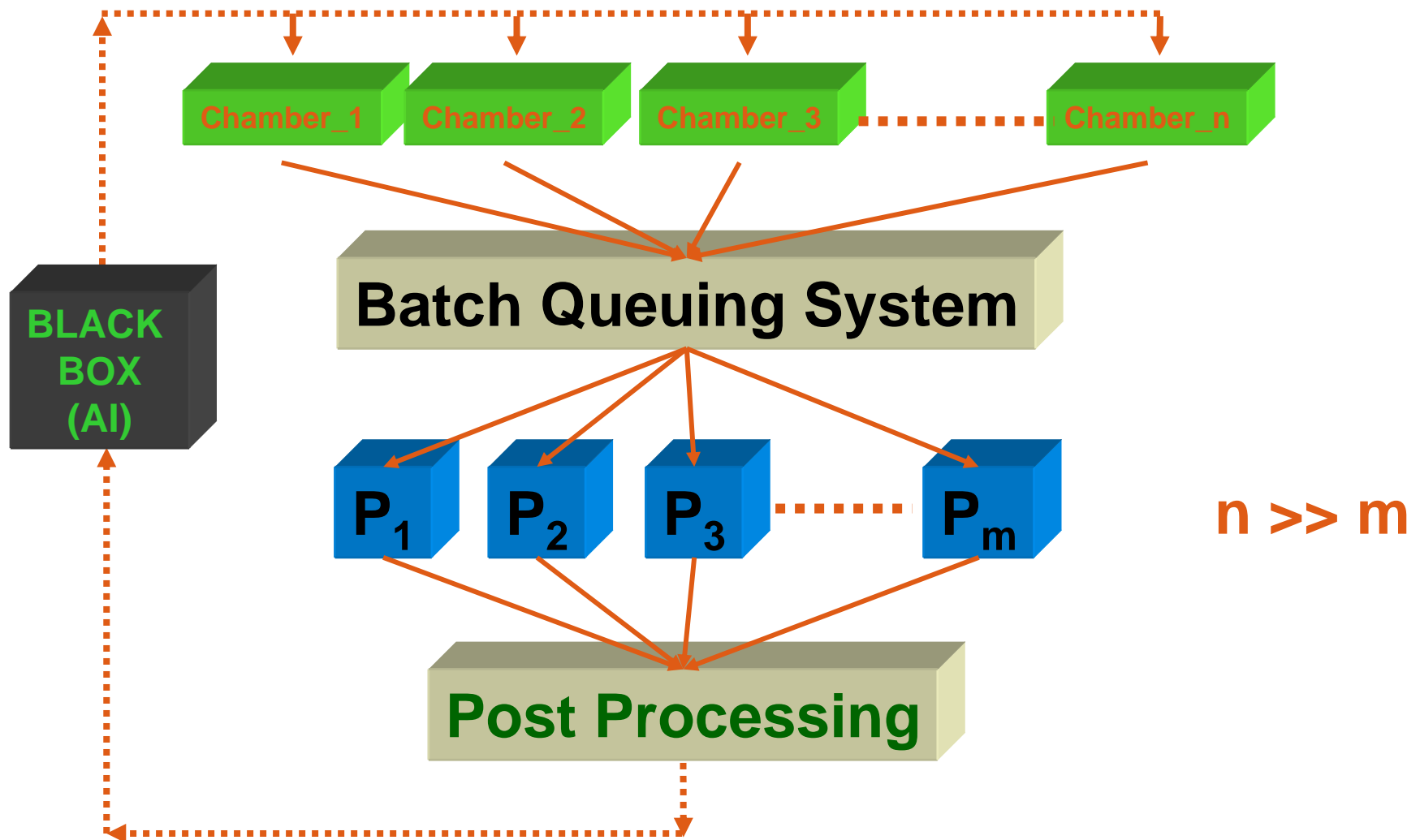
# Benefits of Clusters

- Scalability
- High Performance Computing
- Low Cost
- Availability

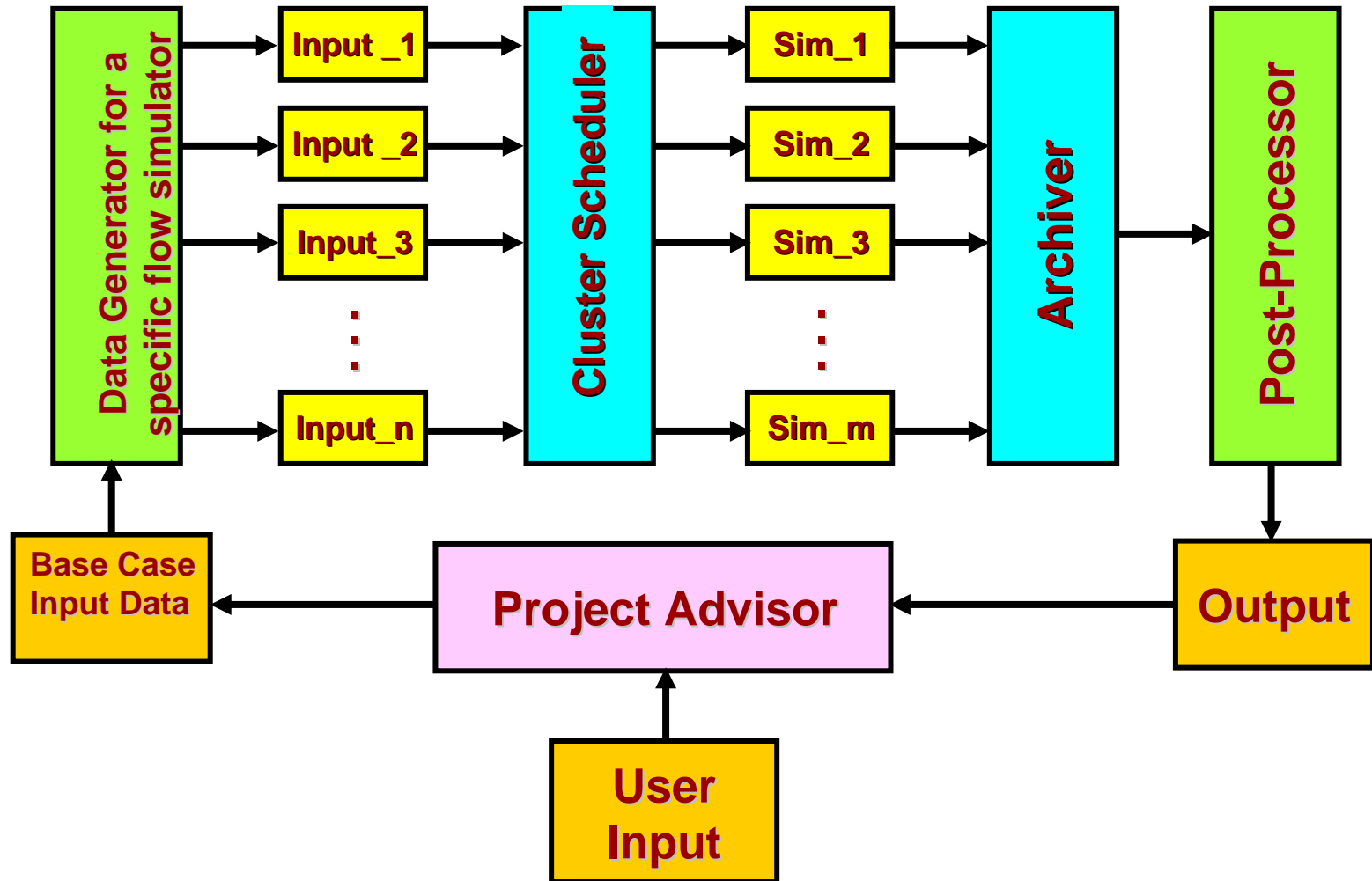
# Computational Mode

- Distributed processing
  - Multiple Data Set/Multiple Processors
- Parallel processing
  - Single Data Set/Multiple Processors

# Distributed Processing on Cluster of PCs



# Cluster Simulation System

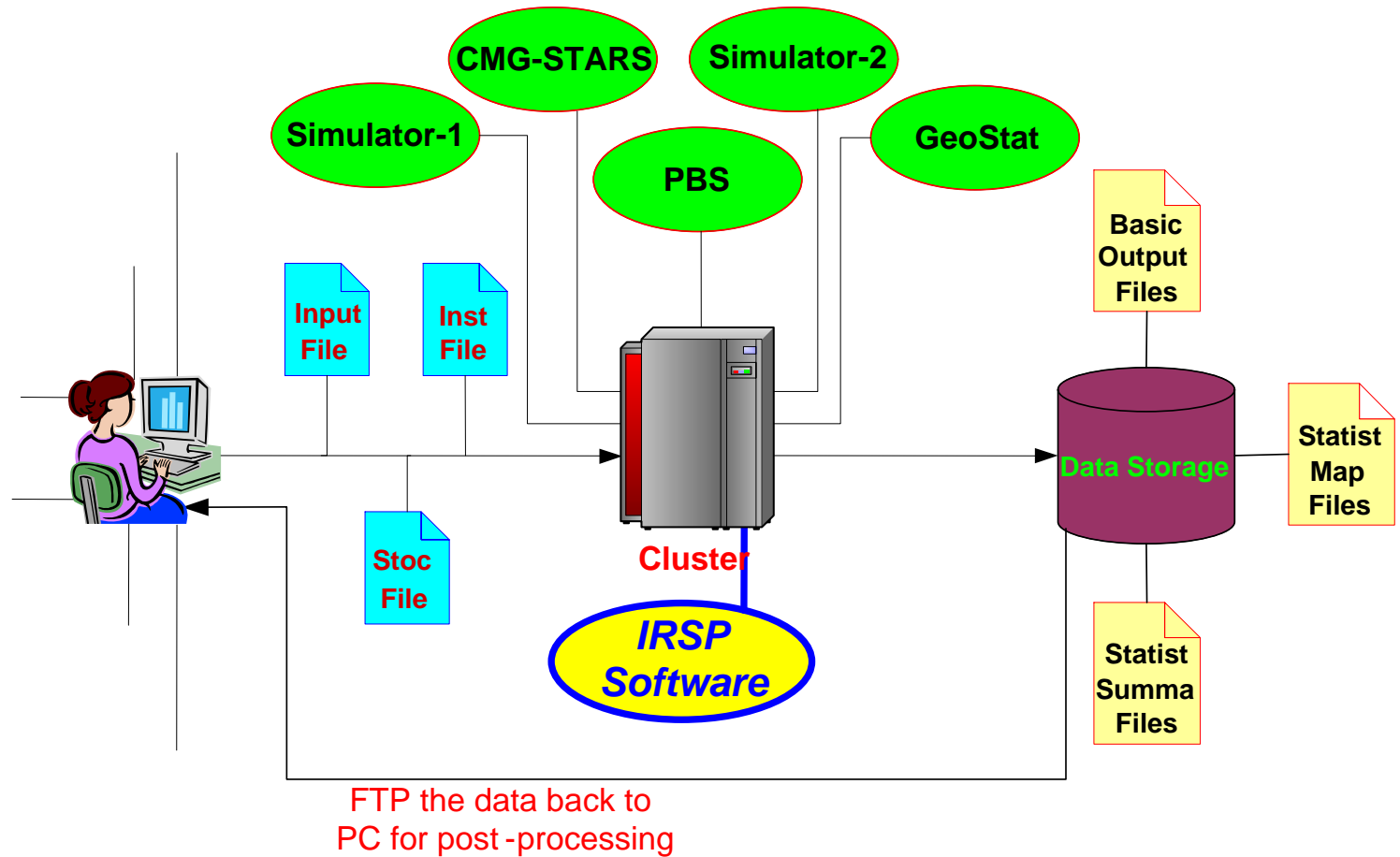


# IRSP - Integrated Reservoir Simulation Platform

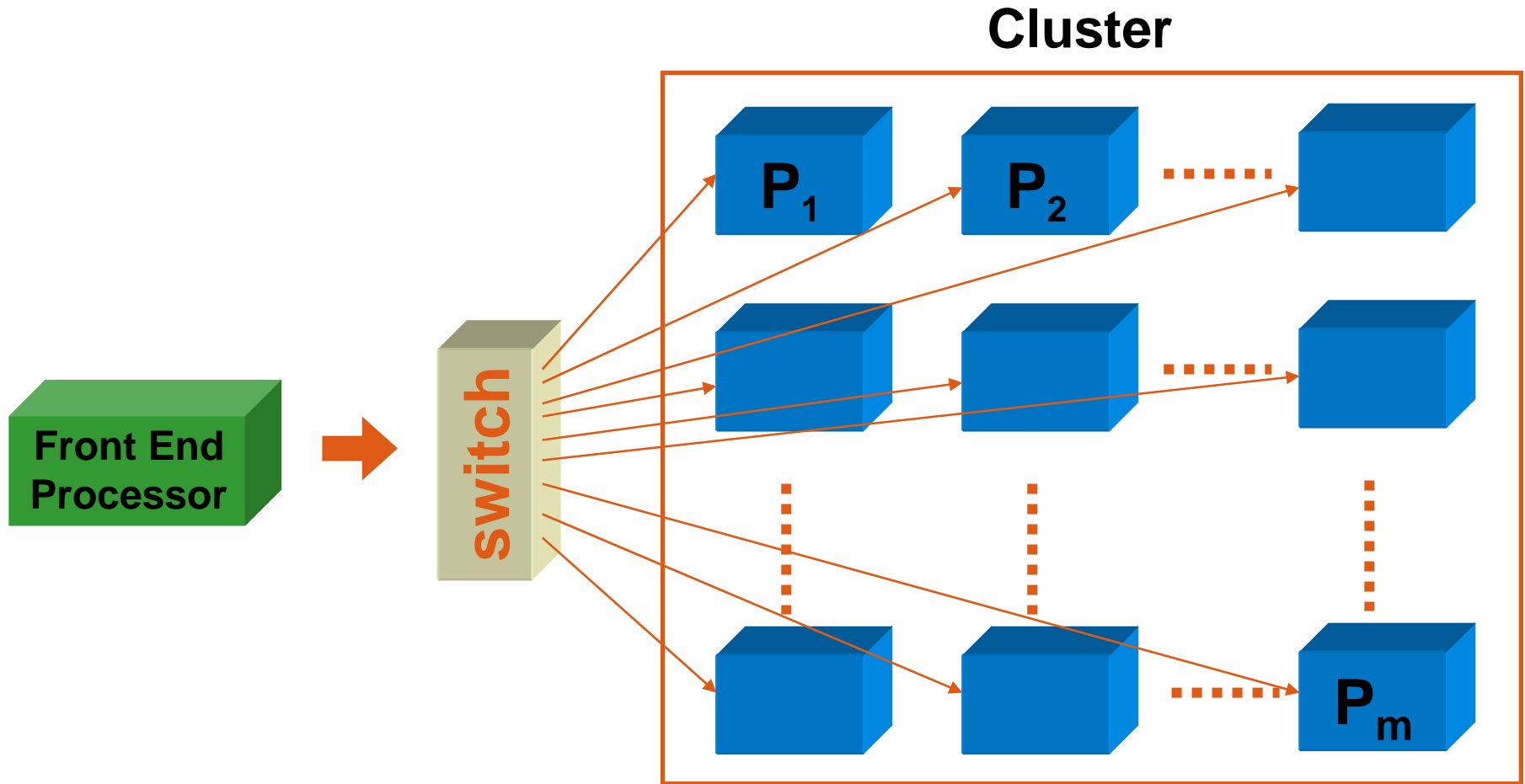
**Design and implement a platform to do:**

- **Stochastic Simulation (e.g. Monte Carlo)**
- **Sensitivity Study (Uncertainty Analysis)**
- **Optimization of Reservoir Parameters**
- **Research on:**
  - **Investigating and verifying simple models**
  - **Studying different methodologies**

# IRSP - Integrated Reservoir Simulation Platform



# System Operation



# CPGE-Alborz

- 8 Nodes / 16 Processors
- 3.06 GHz Intel Xeon processors
- 2048 MB of memory
- 100 Mbps switched  
Fast Ethernet and Giganet interconnects

