AI Model Deployment

Scalable AI Deployment Strategies

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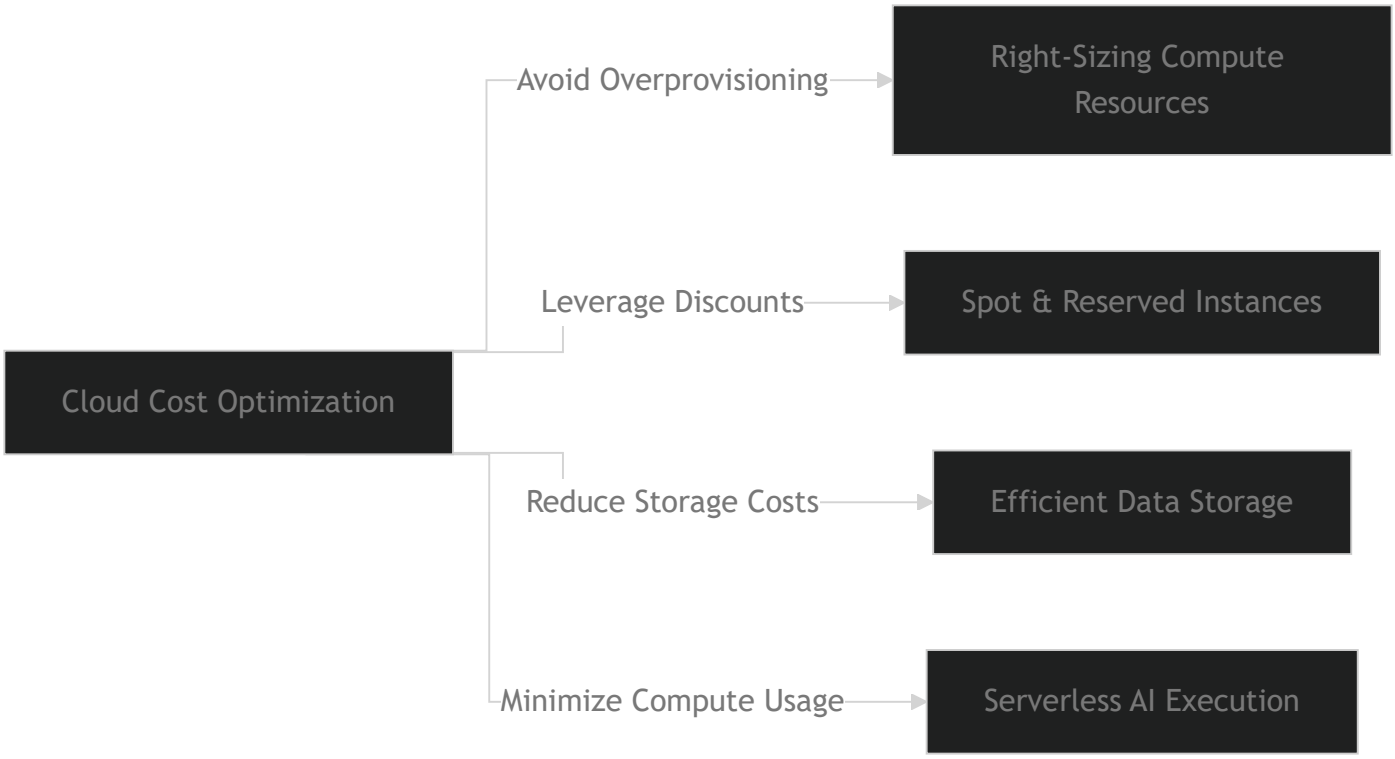
Cost Considerations in AI Deployment

Efficient AI deployment requires balancing cost and performance. Cloud costs are primarily influenced by:

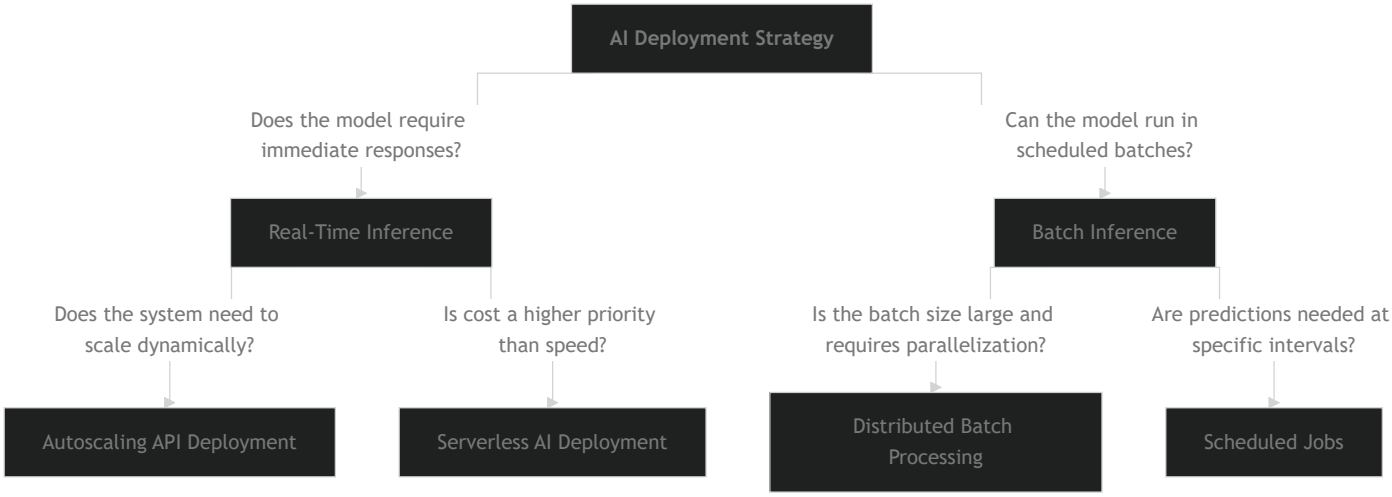
- **Compute:** GPU, TPU, or CPU resources required for inference.
- **Storage:** Model size, data retention, and real-time access needs.
- **Networking:** Data transfer between cloud services and external endpoints.
- **Operational Scaling:** Autoscaling policies, serverless pricing, and reserved instances.

Cloud Cost Optimization Strategies:

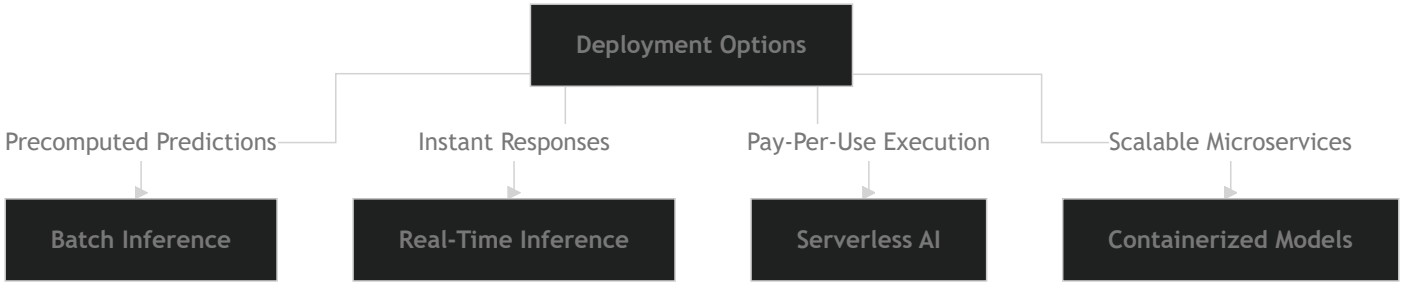


Scalable AI Deployment Strategies

Choosing the right deployment strategy depends on performance needs, cost, and operational complexity. Below is a **decision-making framework** for selecting an AI deployment strategy:



Deployment Options:



Hands-on Coding: Deployment & Cost Benchmarking

To make informed deployment decisions, AI architects must evaluate both **inference performance** and **cost efficiency**.

The following coding exercises will show some ways you can benchmark model inference times and estimate cloud costs, providing practical insights into optimizing AI deployment.

1. Benchmarking Model Inference Times

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```
import time
import tensorflow as tf

# Load a sample model (pre-trained MobileNetV2)
model = tf.keras.applications.MobileNetV2()
input_data = tf.random.normal([1, 224, 224, 3])

# Measure inference time
start_time = time.time()
prediction = model(input_data)
inference_time = time.time() - start_time

print(f"Inference Time: {inference_time:.4f} seconds")
```

***Think about it**: How does inference time change with different model sizes and hardware?*

2. Estimating Cloud Costs Using an API

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```
import requests

# Example: Query AWS Pricing API for EC2 GPU instances
response = requests.get("https://pricing.us-east-1.amazonaws.com/example-pricing-
data = response.json()

print("Sample Cost Estimate:", data['price'])
```

***Think about it**: How do different instance types affect cost-performance trade-offs?*

Key Takeaway

By understanding **cost optimization, scalable deployment strategies, and benchmarking AI performance**, you can design AI architectures that balance cost, performance, and operational complexity.

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