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Prediction Serving Scenarios: Embedded

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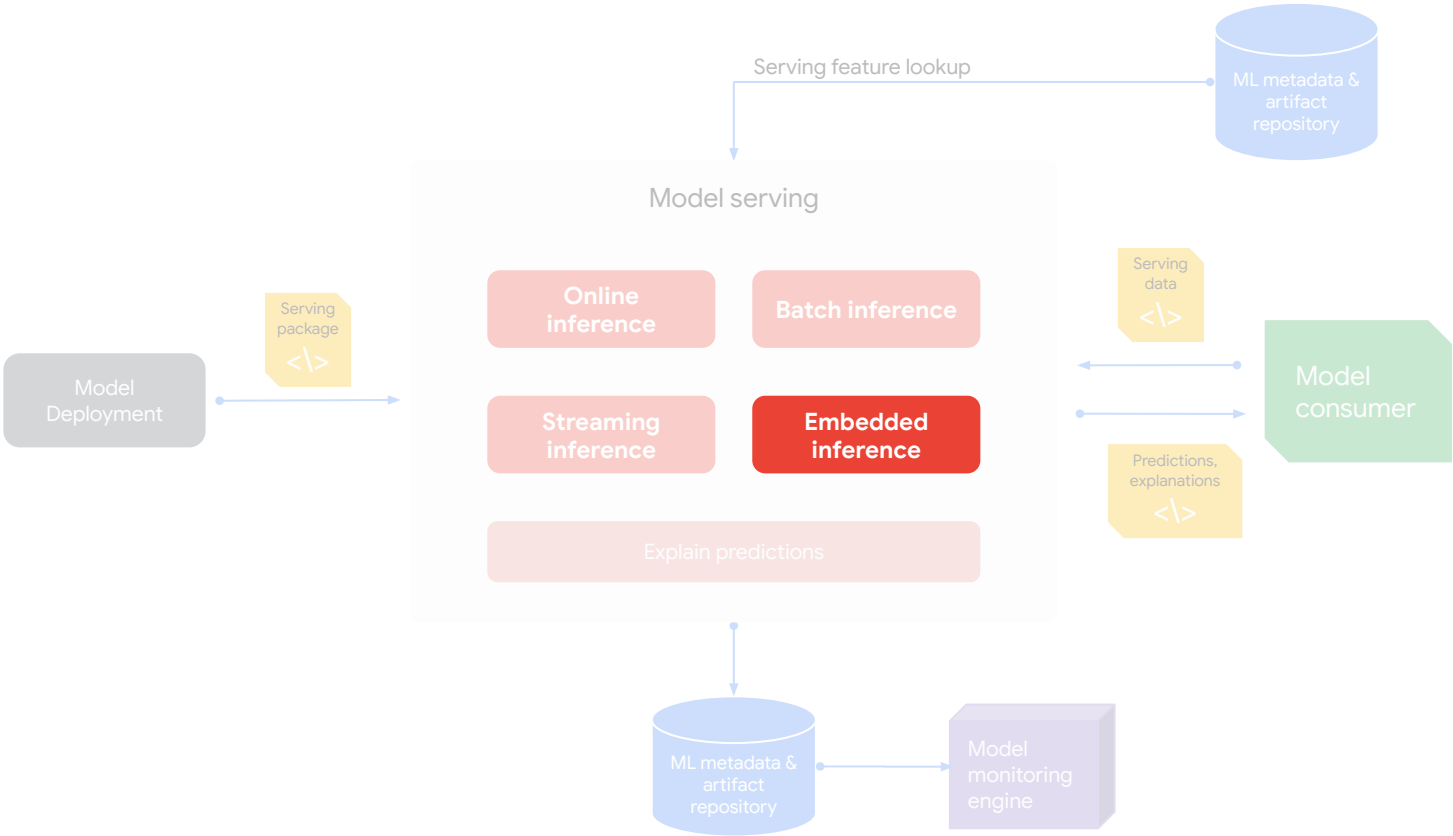
MLOps: Prediction Serving



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The MLOps **Personas**

ML Engineer

ML Researcher

Data Scientist

Data Engineer

Software Engineer

DevOps

Business Analyst

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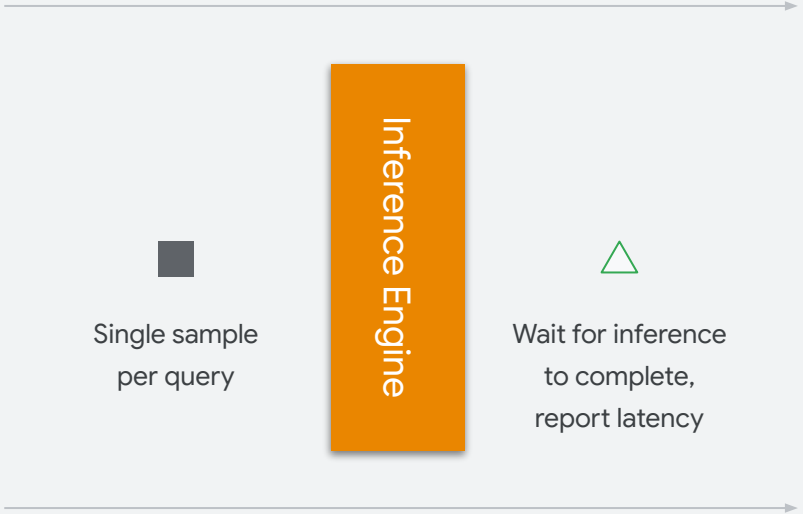
Embedded Inference: **What is it?**

- Predict **on-demand**



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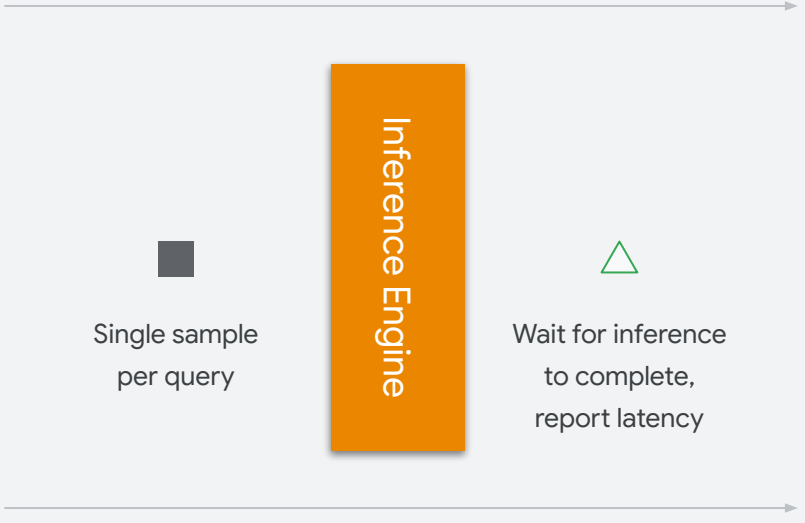
Embedded Inference: **What is it?**

- Predict **on-demand**
- Online inference in near real time for *low-frequency* **singleton** requests



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Embedded Inference: When is it useful?

- Smartphone camera
- TinyML use cases
- ...

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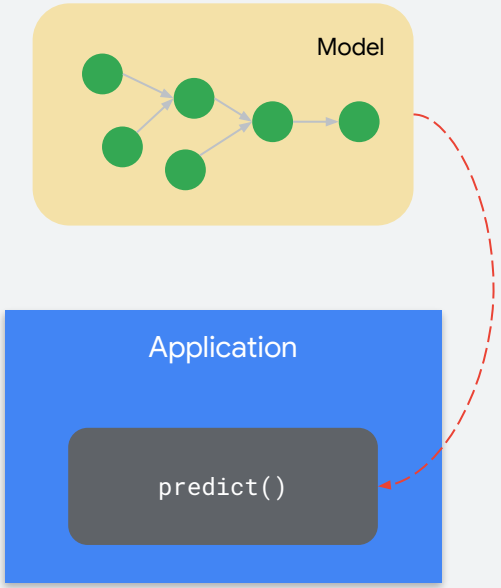
Embedded Inference: How it works?

Model is packaged into the application for easy deployment at the endpoint device



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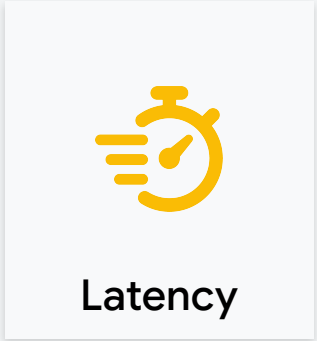
Embedded Inference: **What metrics?**

- Single-stream
- Latency metric



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Embedded Inference: Pros & Cons

Pros

+ Can make a **on-demand** predictions on items

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Embedded Inference: Pros & Cons

Pros

- \+ Can make a **on-demand** predictions on items
- \+ Great for
  - \+ **Bandwidth**
  - \+ **Latency**
  - \+ **Energy-efficiency**
  - \+ **Reliability**
  - \+ **Privacy**

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- Compute **intensive**

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Embedded Inference: Pros & Cons

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Cons

- Compute **intensive**
- Latency **sensitive**—may limit model complexity
- Monitoring needs are more **important** than for the other types of scenarios
- Embedded deployment makes scalability and flexibility **poor**

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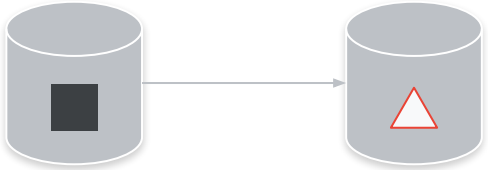
Scenario	Metric
 **Batch inference** (e.g. photo sorting app)	**Throughput**
 **Online inference** (e.g. translation app)	**QPS** subject to latency bound
 **Streaming inference** (e.g. multiple camera driving assistance)	**Number streams** subject to latency bound
 **Embedded inference** (e.g. cell phone augmented vision)	**Latency**

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