将Apache Flink用作一体化的数据处理平台

Using Apache Flink as a Unified Data Processing Platform

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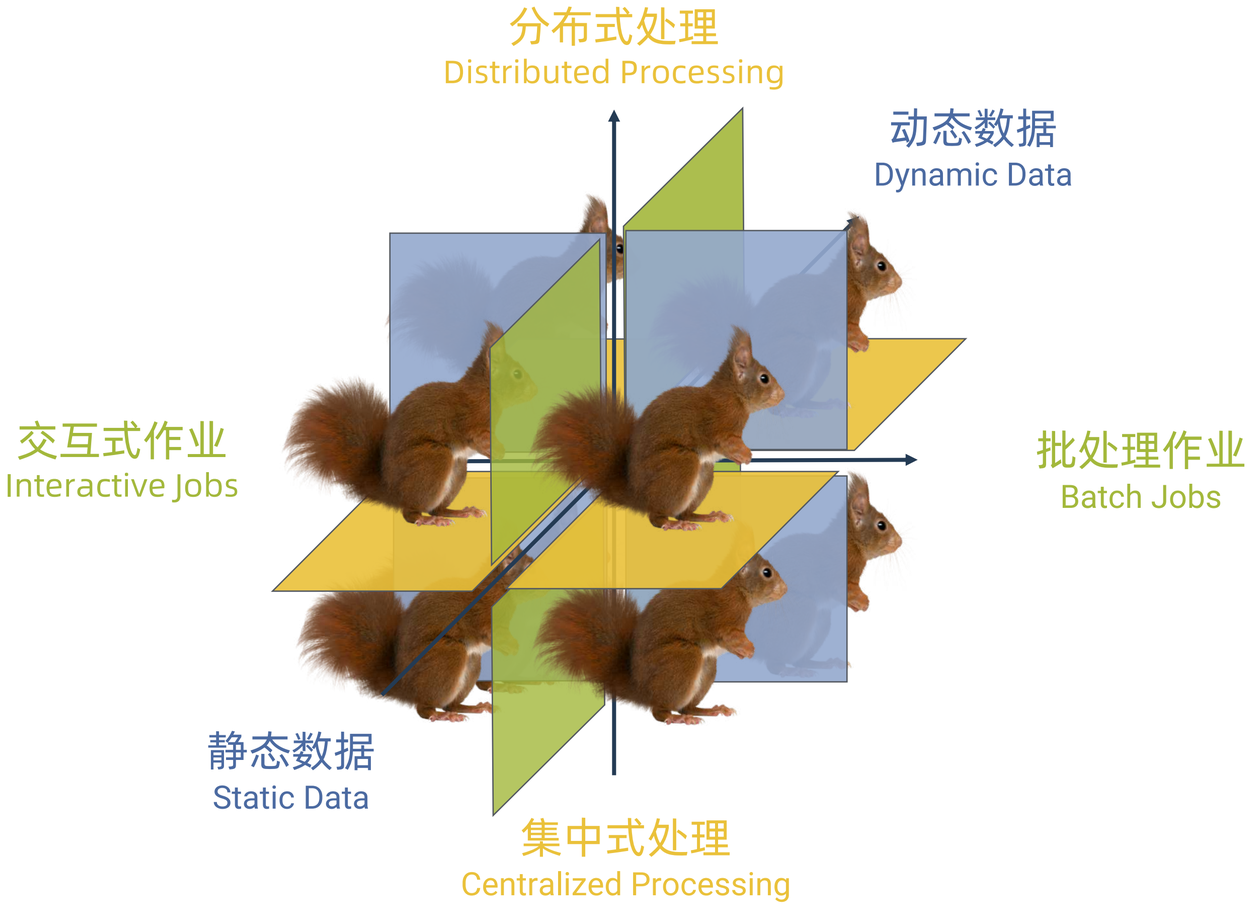
FLINK FORWARD # ASIA

实时即未来 # Real-time Is The Future

FLINK FORWARD

Apache Flink 的“定位”

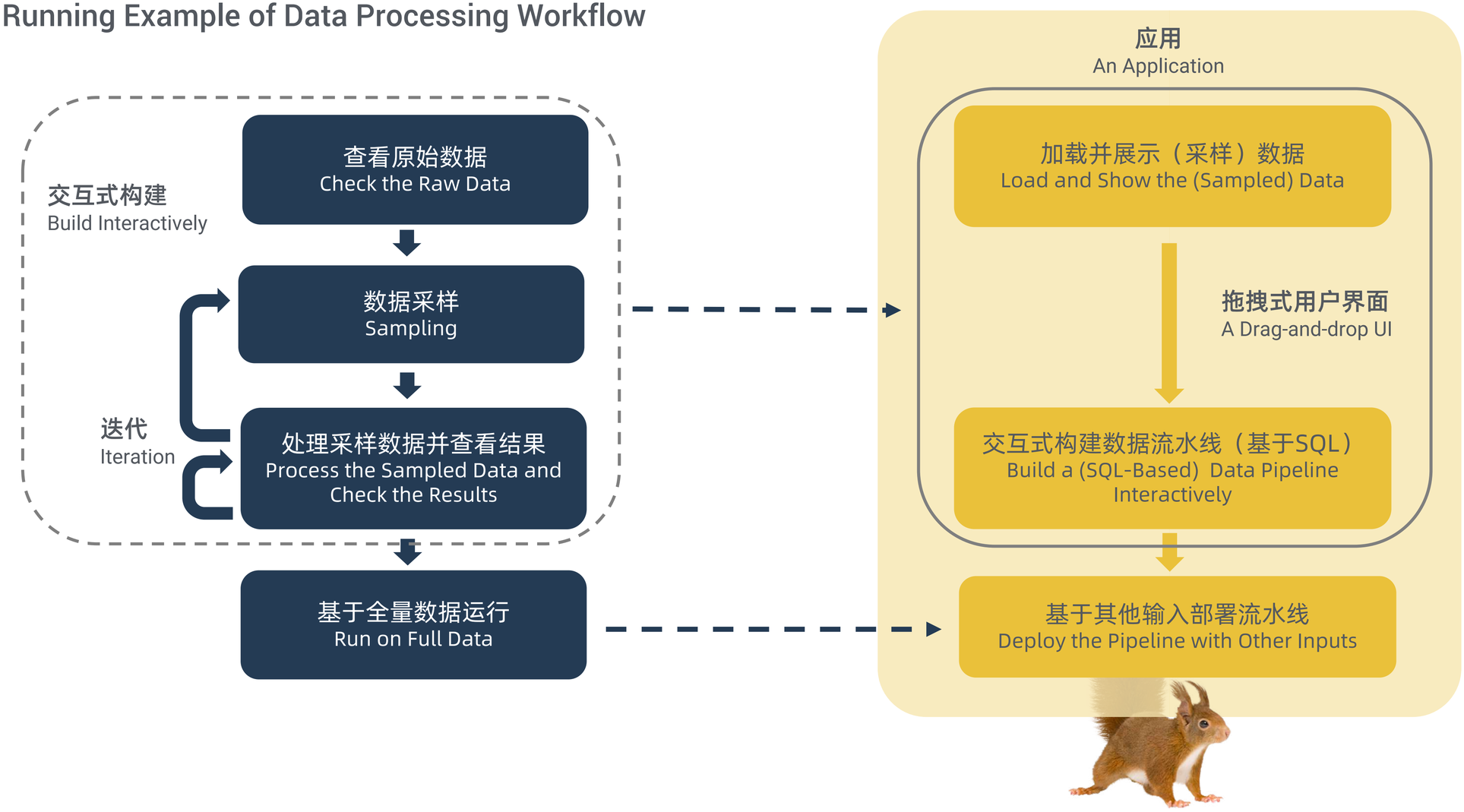
The “Position” of Apache Flink



Contents
目录

数据处理流程实例

A Running Example of Data Processing Workflow



流水线示例

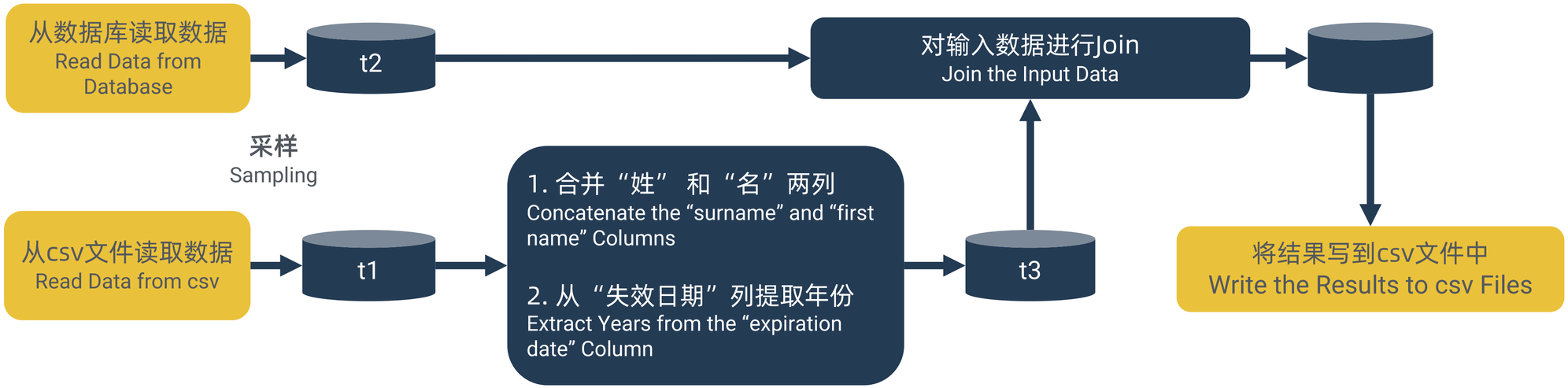
A Pipeline Example

输入/输出算子
Input/output Operators

处理算子
Processing Operators

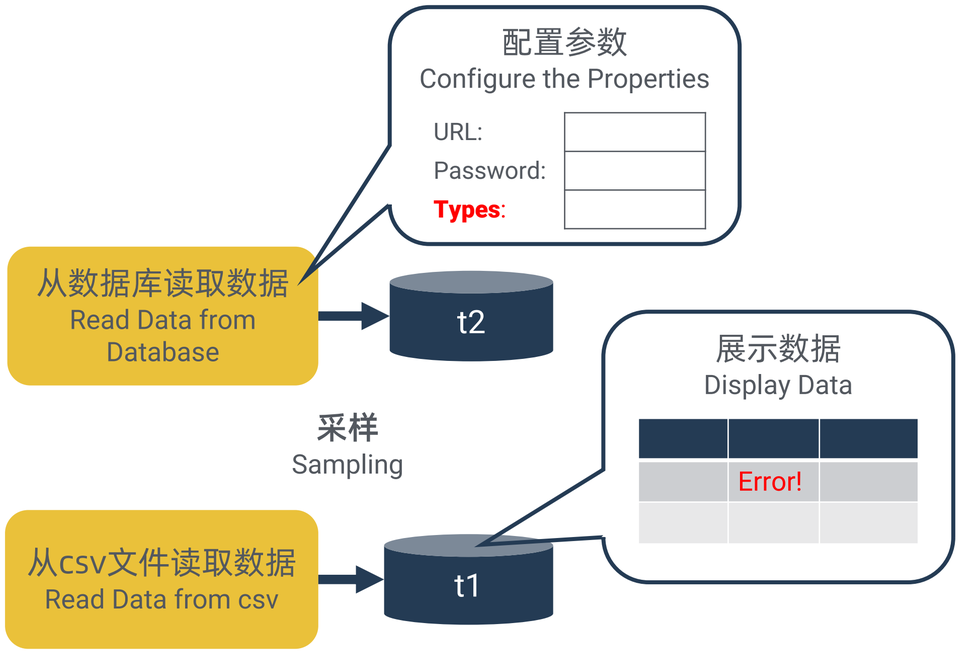
中间结果
Intermediate Results

```
INSERT INTO csv
(SELECT * FROM
(SELECT CONCAT(sname, fname) AS n, EXTRACT(exp_d) AS y FROM t1) AS t3
INNER JOIN t2
ON t2.year = y)
```



加载并展示数据

Load and Show the Data



Q1. 如何对流数据采样？
How to sample streaming data?

Q2. 如何提供类型信息（表模式）？
How to provide the type information (schema)?

Q3. 如何展示数据中错误？
How to show data errors?

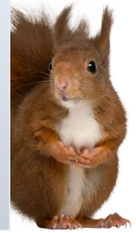
交互式构建流水线

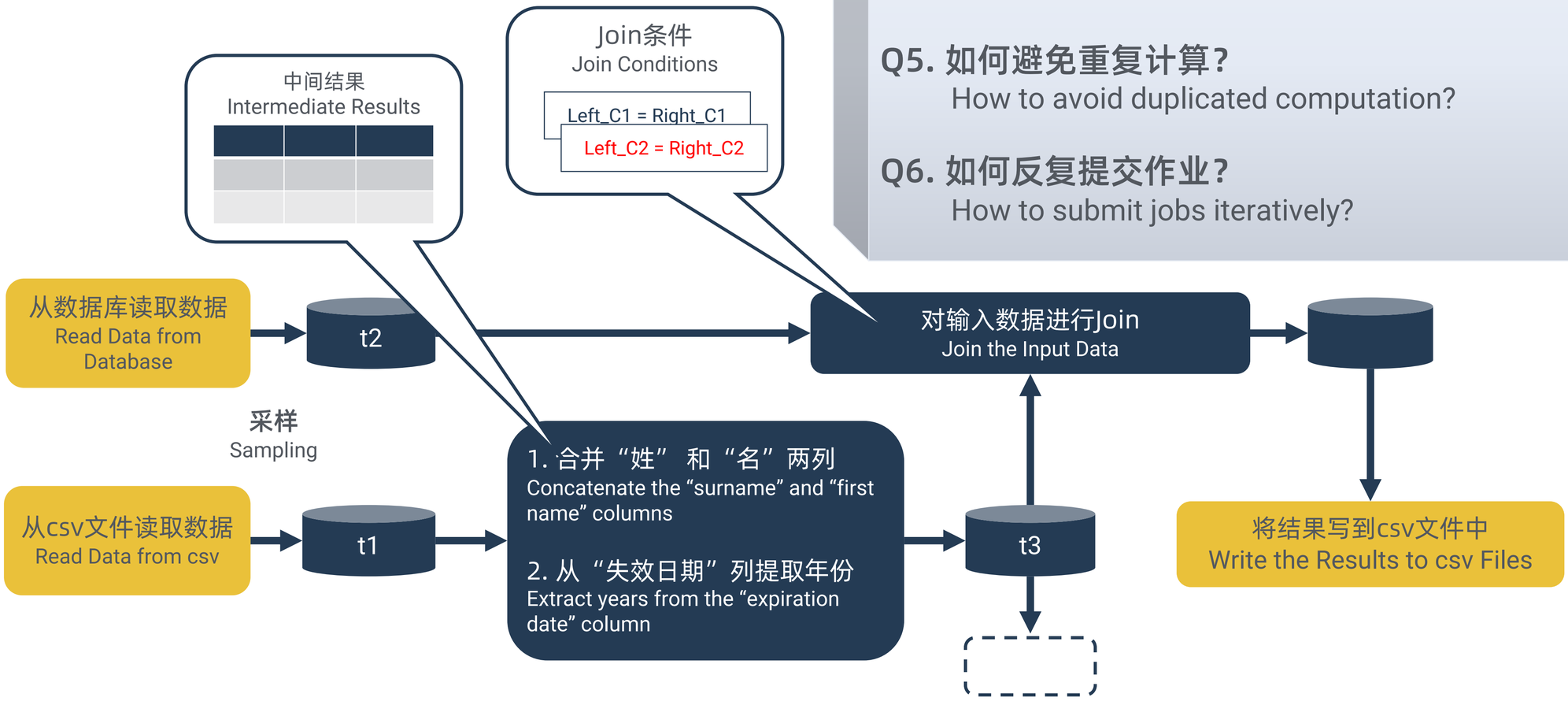
Create a Pipeline Interactively

Q4. 如何实时获取中间结果？
How to fetch the intermediate results in real time?

Q5. 如何避免重复计算？
How to avoid duplicated computation?

Q6. 如何反复提交作业？
How to submit jobs iteratively?





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对流数据采样

Sample Streaming Data

算法
Algorithms

- 伯努利采样（条数不固定）
  Bernoulli Sampling (Uncertain Size)
- 蓄水池采样（条数固定）
  Reservoir Sampling (Fixed Size)
- 分层采样
  Stratified Sampling
- 面向窗口的采样方法
  Window-based Sampling Algorithms

应用
Application

- 数据流的“一过性”、“动态性”和“无限性”
  The “One Pass”, “Dynamic” and “Unbounded” Characteristics of Streams
- 添加一个可停止的数据源函数
  Add a Stoppable Source Function
- 同时限制采样条数和采样时间
  Restrictions on Both Sample Size and Sampling Time

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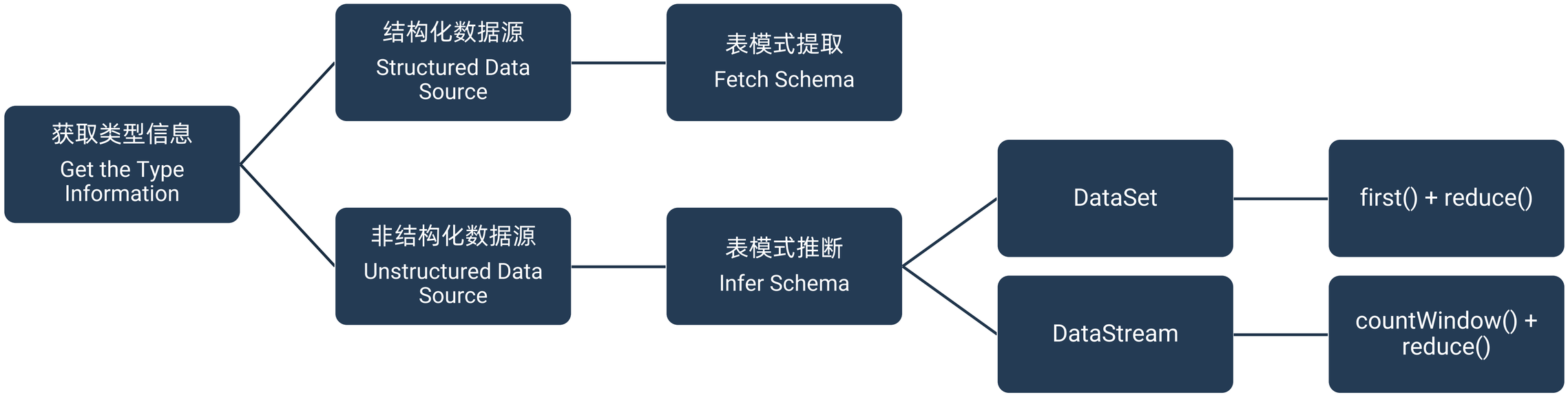
提供类型信息（表模式）

Provide the Type Information (Schema)



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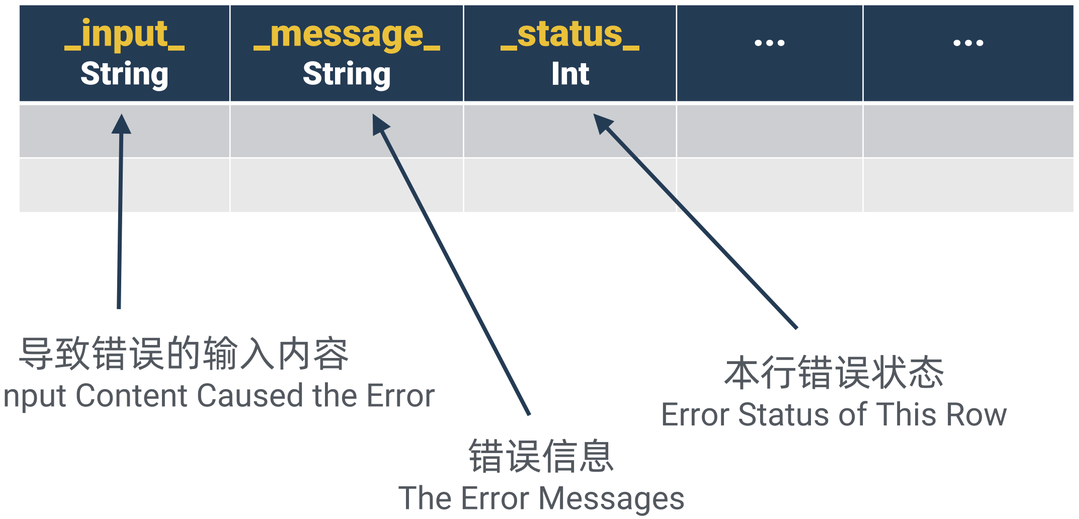
展示数据错误

Show Data Errors

org.apache.flink.runtime.client.JobExecutionException: Job execution failed.

系统列
System Columns




```
try {
        // the logic that may cause exceptions
        ...
} catch {
        row.setField(“_input_”, input.toString());
        row.setField(“_message_”, exception.getMessage());
        row.setField(“_status_”, 1);

        row.setField(“target”, null);
}
```

Csv读取示例

A Csv Reader Example

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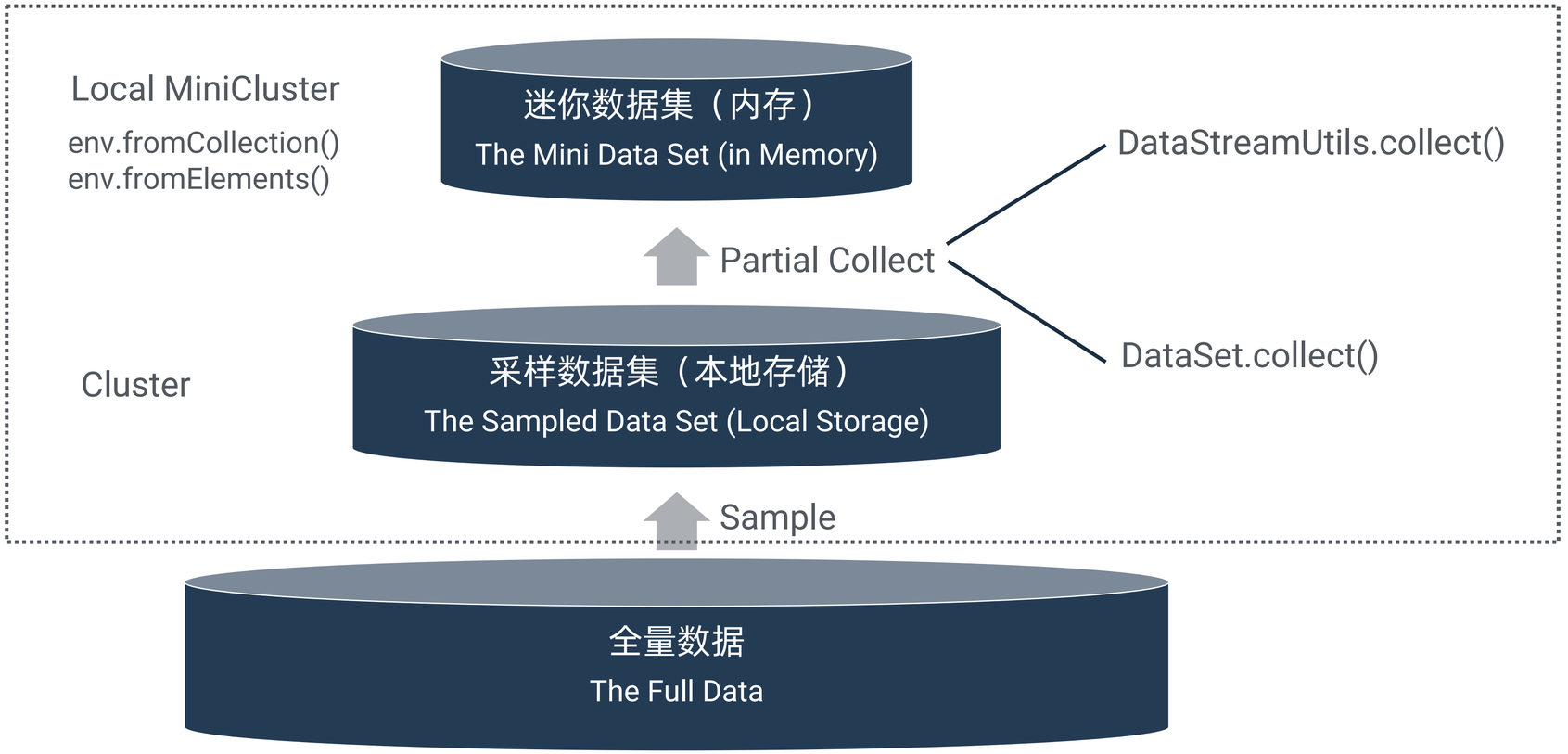
实时获取中间结果

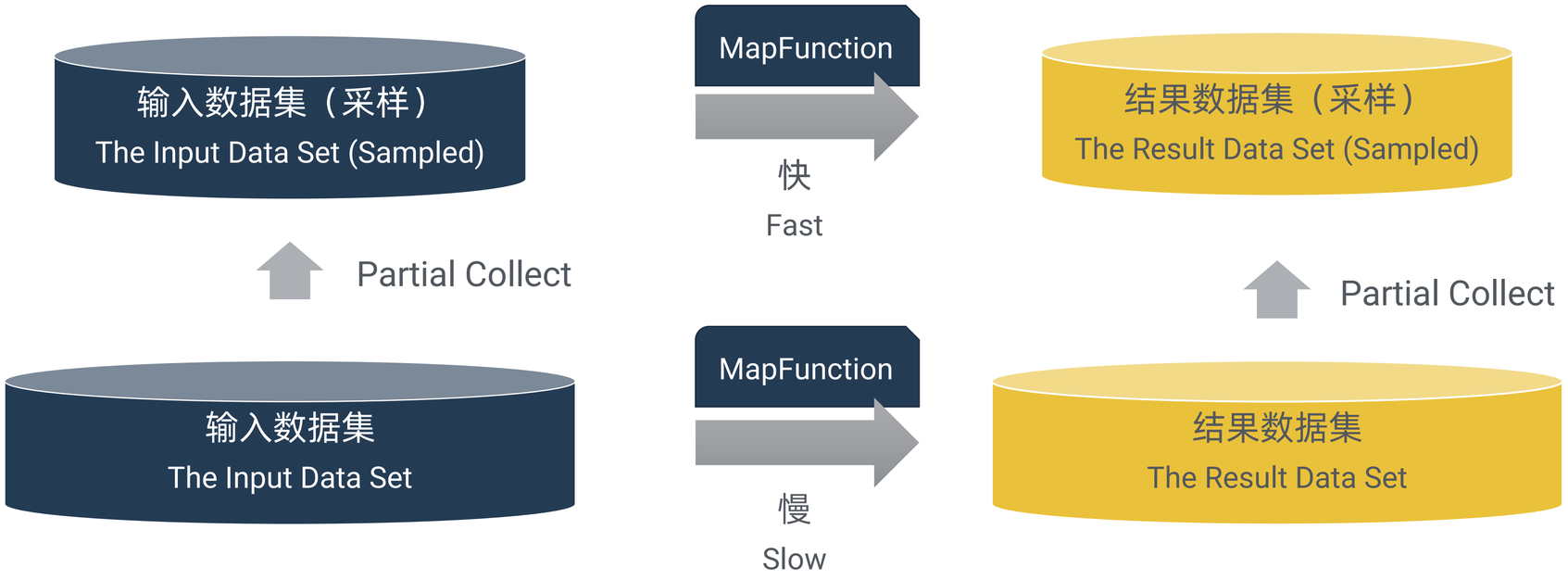
Fetch the Intermediate Results in Real Time

数据分层
Data Hierarchy



Map操作示例

A Map Example



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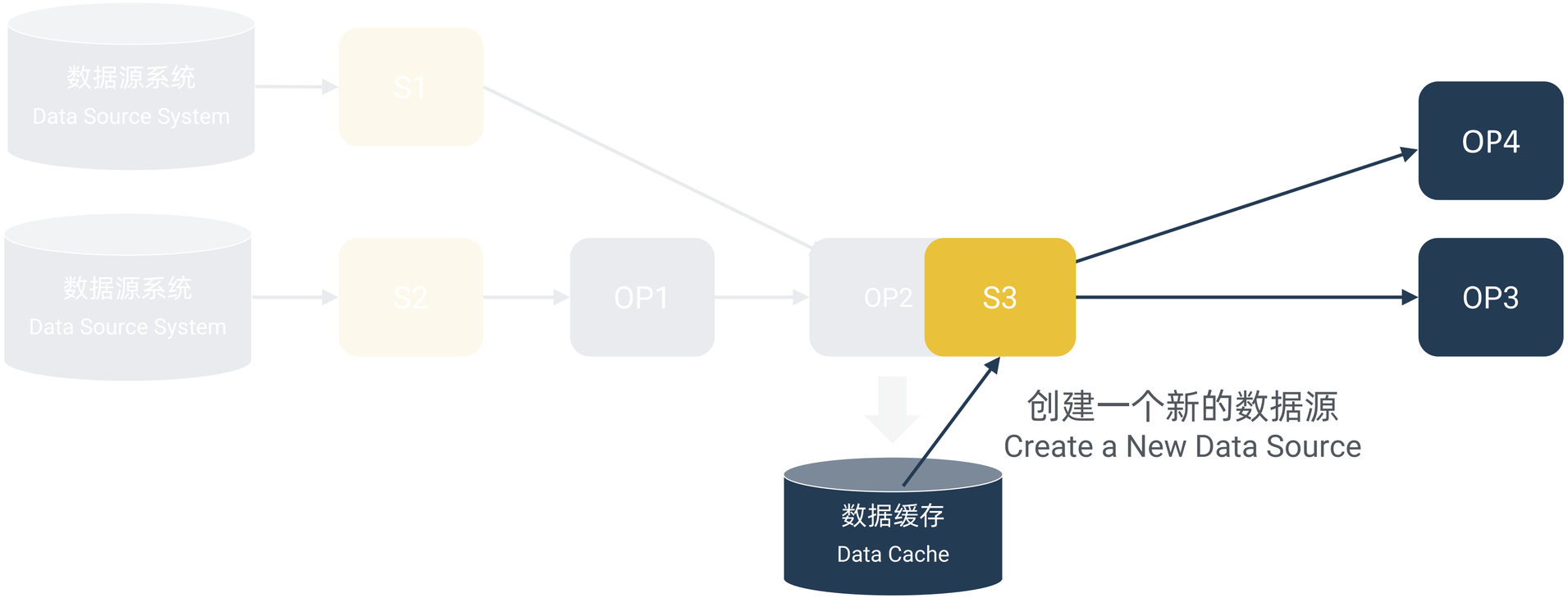
避免重复计算

Avoid Duplicated Computation



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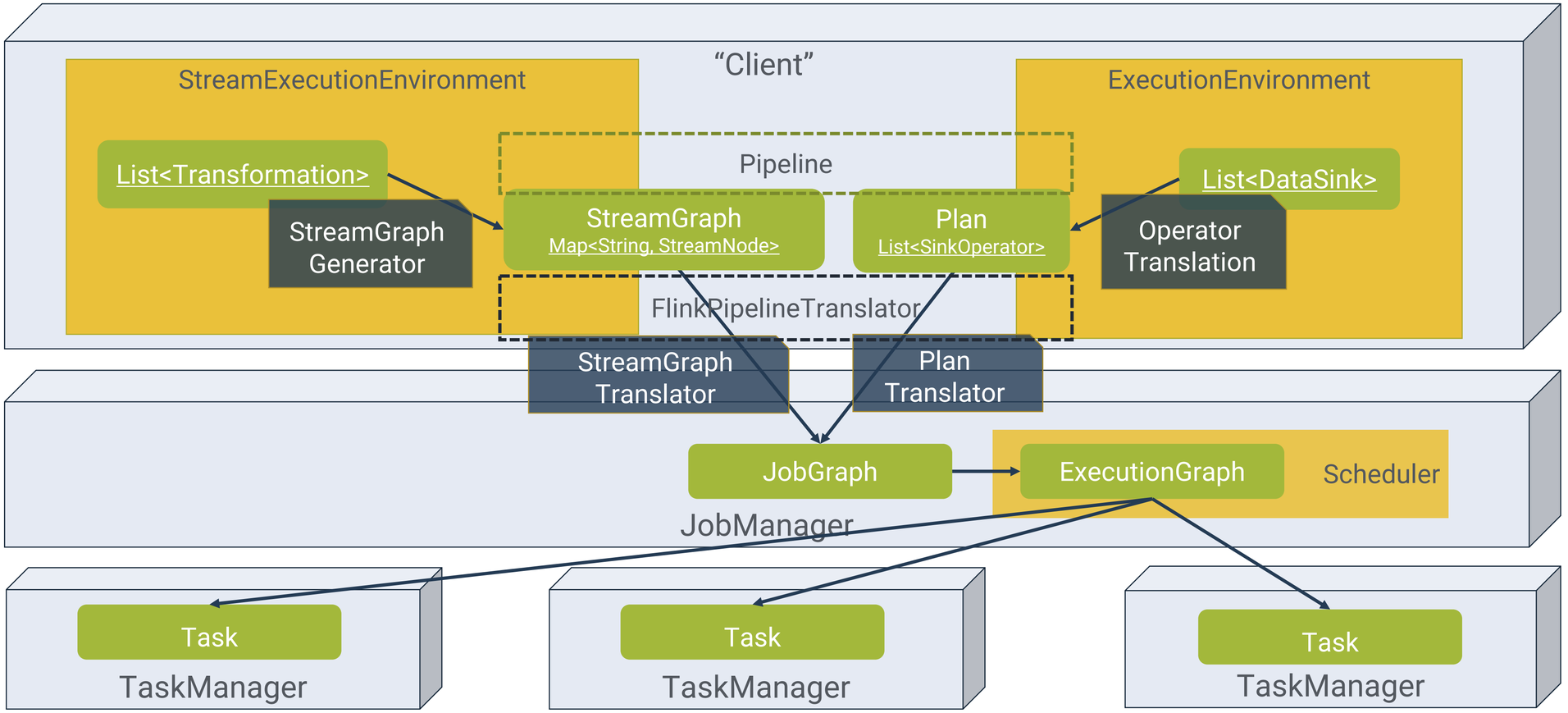
作业产生过程

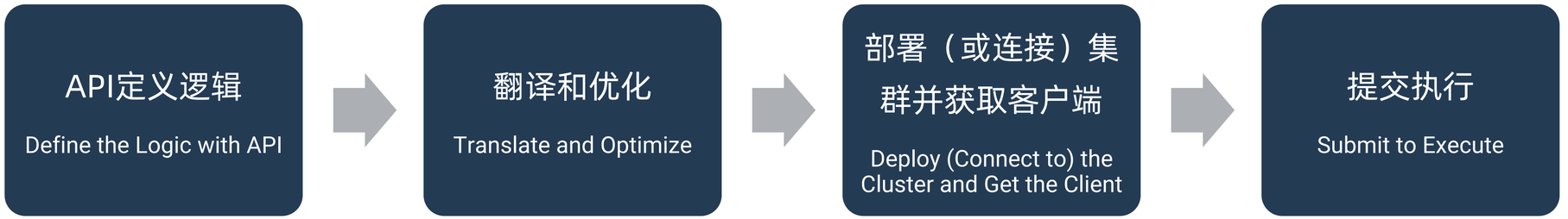
The Procedure of Generating a Job



反复提交作业

Submit Jobs Iteratively

- CLI
- Web UI
- 编程式
  Programmable



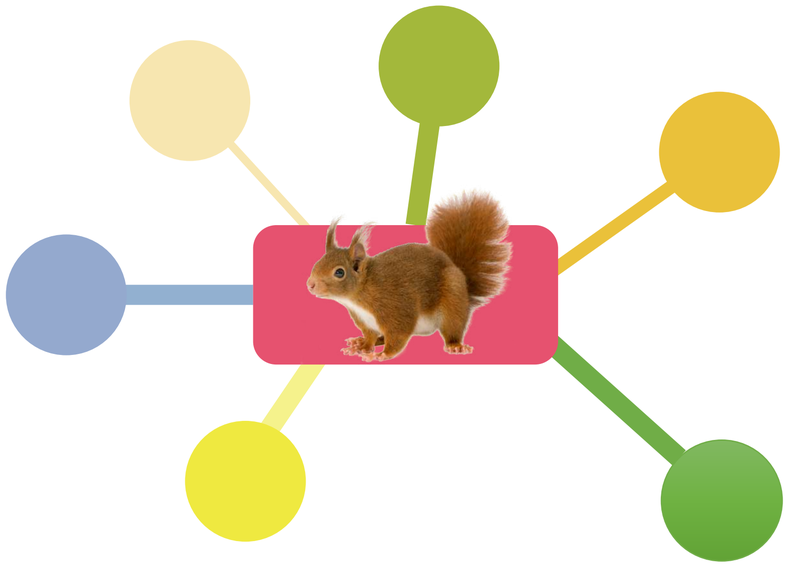

```
pipeline = ... // define the logic
jobGraph = translate(pipeline) // translate the pipeline to a job graph
client = ... // get the client object
submissinResult = client.submit(jobGraph, mode) // submit the job graph (in attach or detach mode)
```

Contents
目录

未来工作

Future Works

- 完善机器学习库
  Complete the Machine Learning Lib
- 批流融合
  Batch Streaming Unification
- 增强交互式编程
  Interactive Programming Improvement
- 与其他系统更好地集成
  Towards Better Integration with Other Systems



FLIP-27: Refactor Source Interface

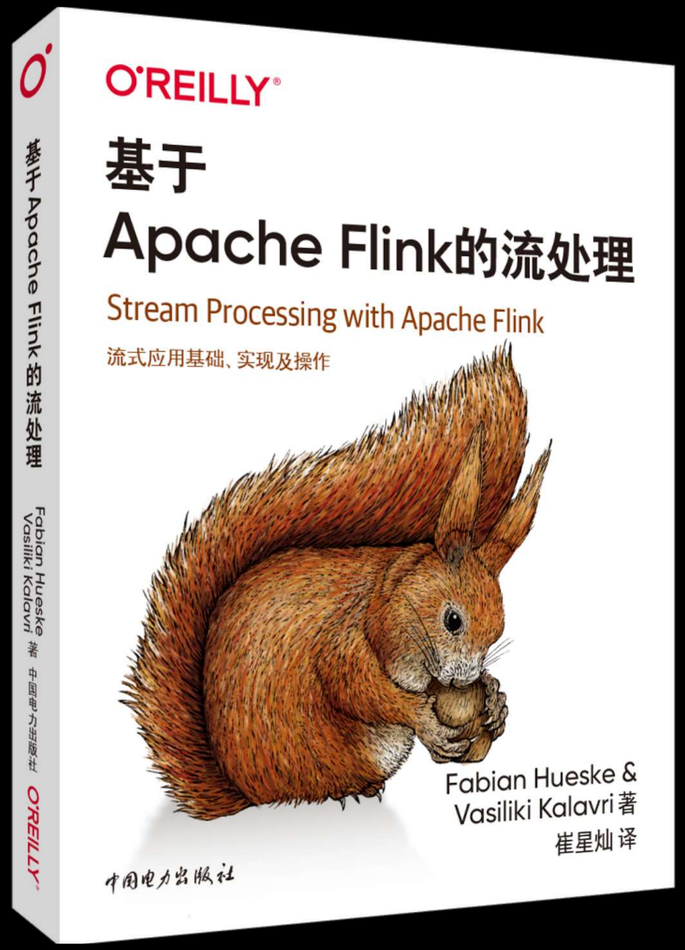
FLIP-36: Support Interactive Programming

FLIP-39: Flink ML pipeline and ML libs

FLIP-48: Pluggable Intermediate Result Storage

FLIP-73: Introducing Executors for Job Submission

FLINK FORWARD



THANKS