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# Next Generation Fraud Detection

## Kubeflow and OpenShift GPU Containers

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- **Federal Reserve 2017**

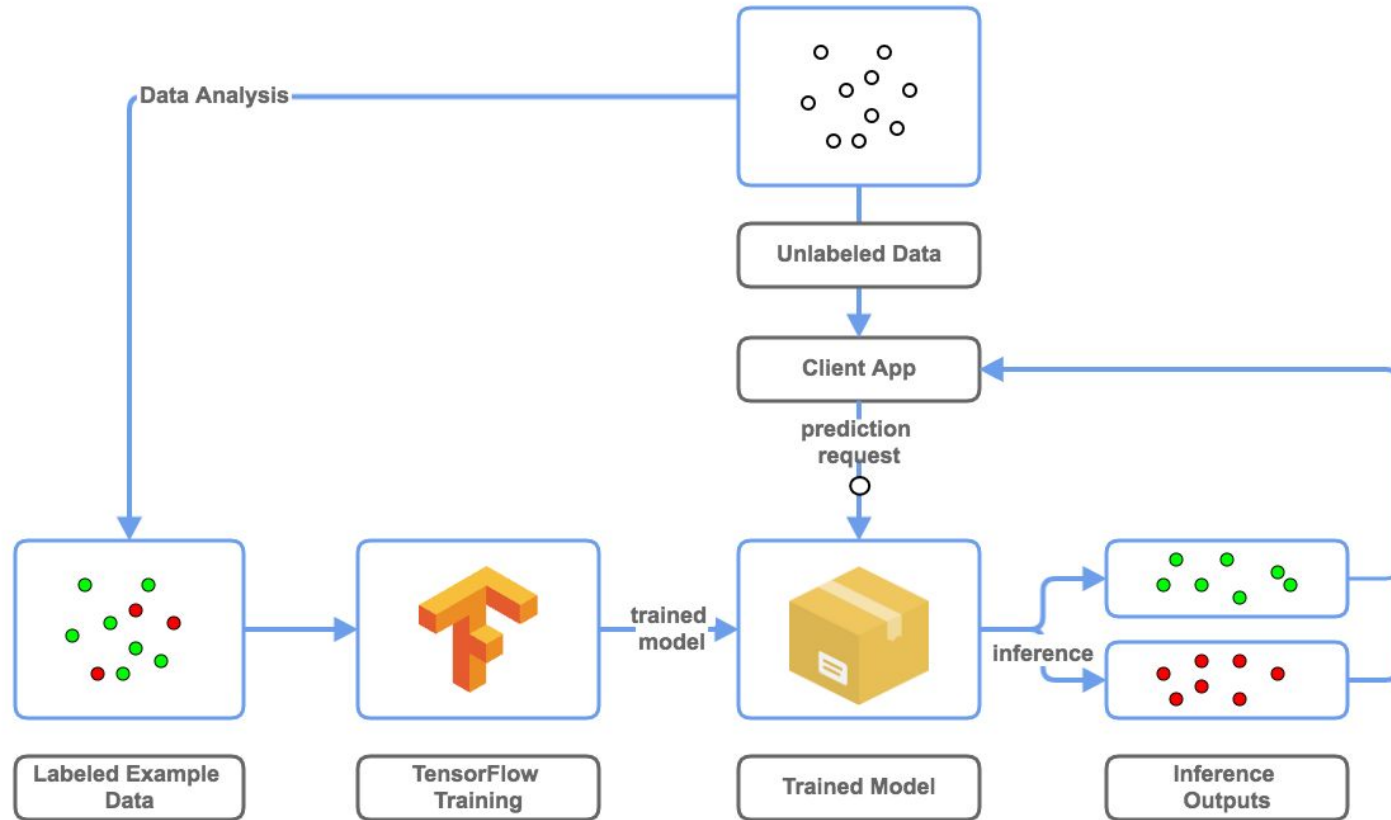
- US banks handled 123+ billion credit/debit card payments
- ~\$6.5 trillion total, ~\$6.45 billion fraudulent

- **Limitations of traditional payments fraud detection**

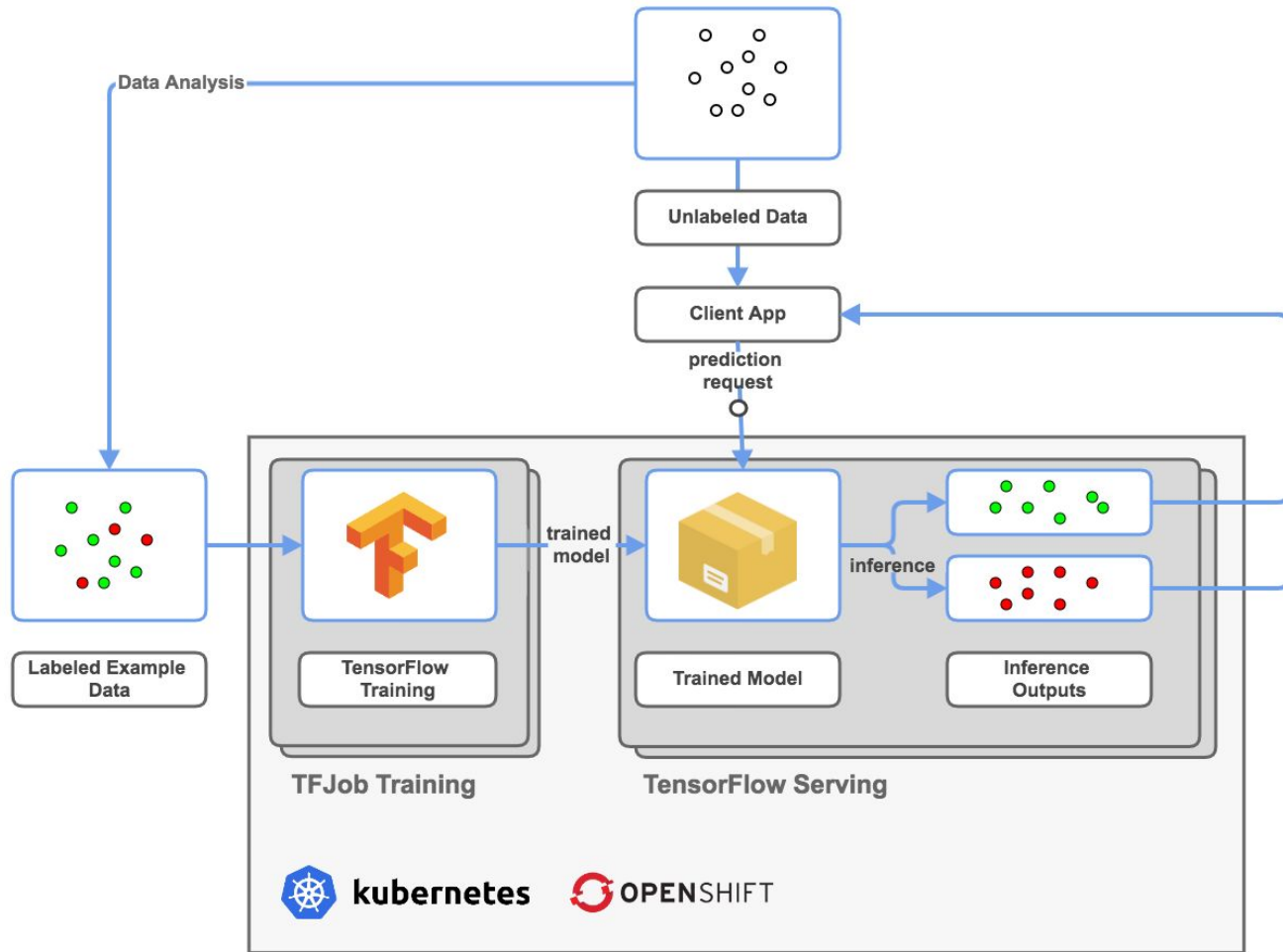
- **Static business rules:** Long analysis and dev cycles, missed data scenarios
- **Manual review:** Not practical for realtime applications, expensive in human capital, high rate of false positives

- **Can machine learning help?**

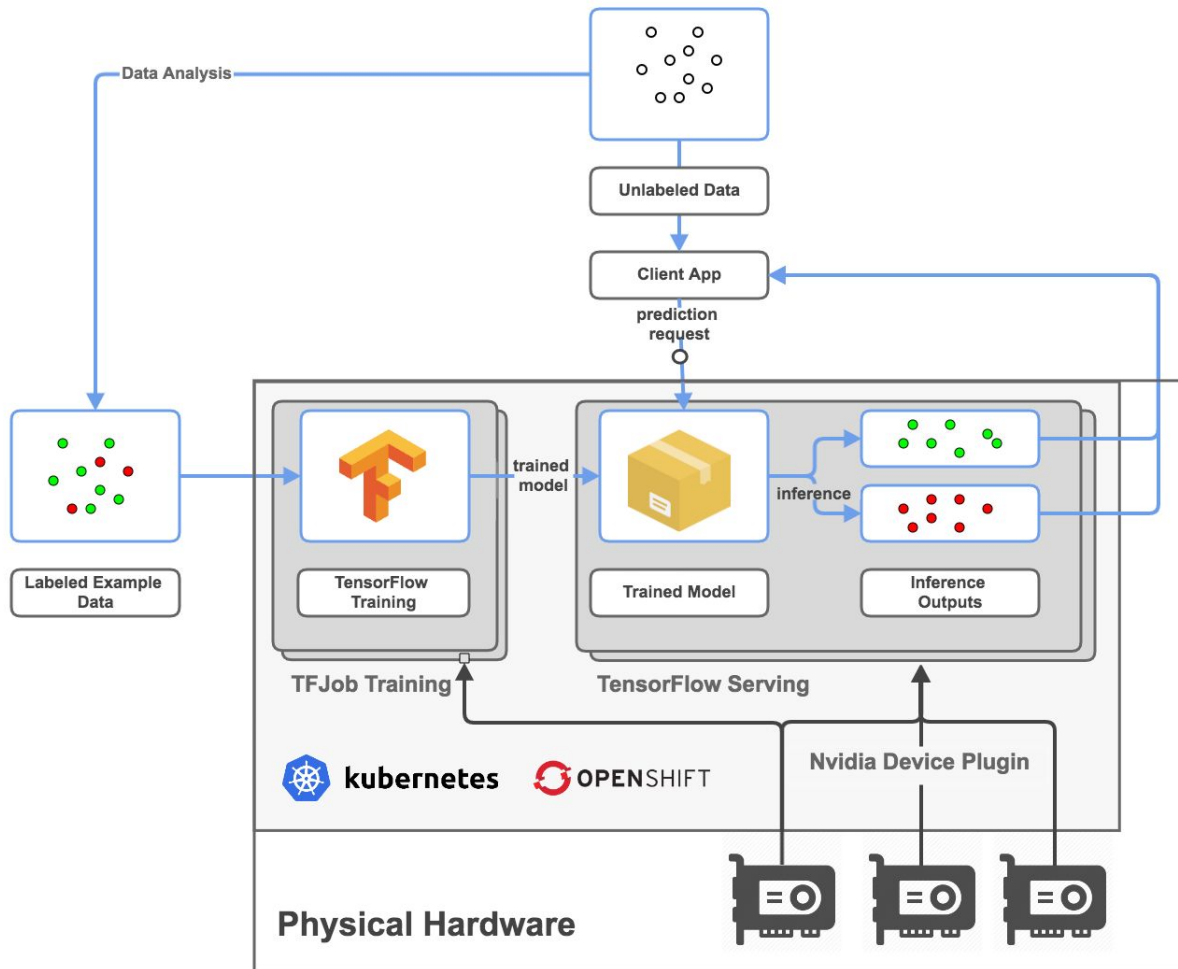
# What is TensorFlow and Supervised ML?



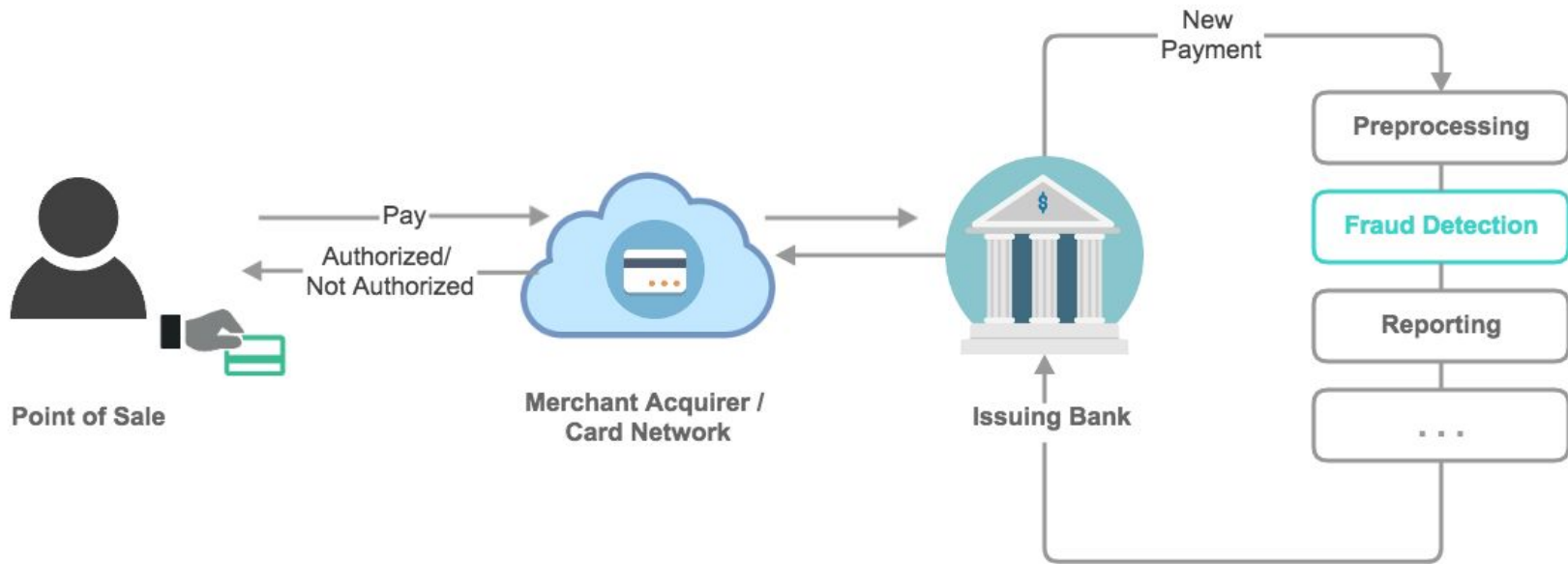
# What is Kubeflow?



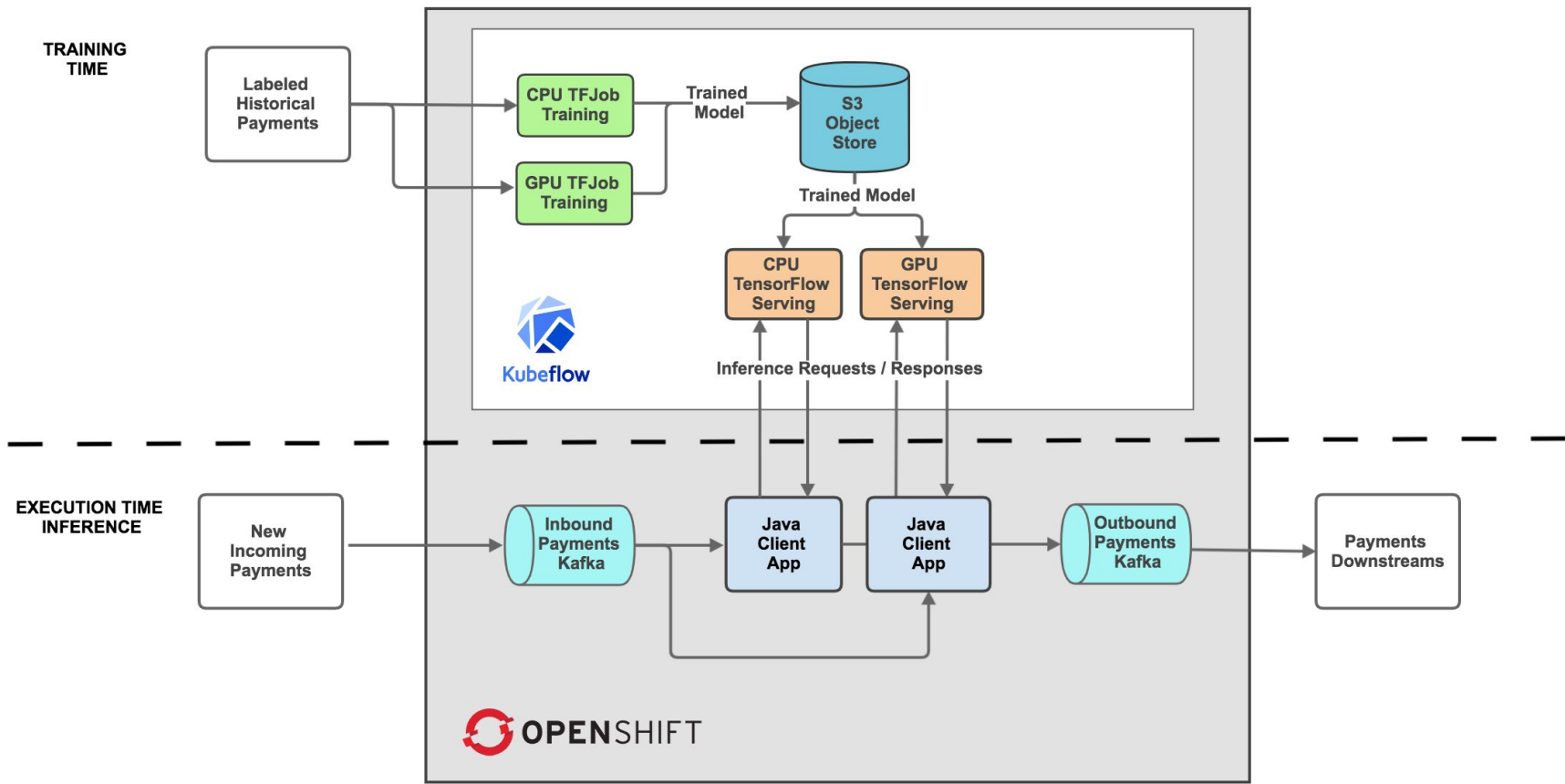
# Kubeflow, GPU Containers, OpenShift, and ML



# Payment Authorization Events



# Payments Fraud Detection Microservice



- Train payments fraud detection model
  - CPU vs GPU: Difference in training time?
- Serve trained model
- Run payments load through fraud detection service
  - CPU vs GPU: Difference in inference latency?



- **When and where does it make sense to use GPUs?**
  - **Training time:** Prototyping/testing different model versions
  - **Inference time:** Dependent on business case
- **Machine learning is not a silver bullet, but can be useful when the need is to analyze large data volumes**
  - Training a model for production still requires development/testing cycles and domain knowledge
  - Analysis can happen at scale, and account for more scenarios than business analysis alone
  - Prototype multiple model versions, tune for accuracy in a standardized and repeatable way

- **Kubeflow Project**

- <https://www.kubeflow.org>

- **OpenShift Device Plugin**

- [https://docs.openshift.com/container-platform/3.11/dev\\_guide/device\\_plugins.html](https://docs.openshift.com/container-platform/3.11/dev_guide/device_plugins.html)

- **Demo GitHub**

- <https://github.com/ecspangler/payments-fraud-detection-ml-demo>

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