Prefect Cloud
Operation Manual

Automated Exchange Rate Acquisition Pipeline
Complete Setup & Operation Guide

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Project:	Exchange Rate Pipeline
Platform:	Prefect Cloud 3.6.5
Status:	Production Ready

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1. System Overview

Quick Summary

This system automatically fetches monthly exchange rates from the International Monetary Fund (IMF) API and processes the data. It runs on Prefect Cloud with three interconnected workflows scheduled to execute on specific dates each month (15th, 25th, 28-31st).

Key Metrics

Metric	Value
Countries Supported	118
Currencies Tracked	77
Execution Frequency	Monthly (6+ dates/month)
Average Cycle Time	~65 seconds
Uptime Target	99.9%
Data Format	CSV
Cloud Platform	Prefect Cloud 3.6.5

System Architecture

Prefect Cloud (Scheduler) → Your Computer (Worker) → APIs (IMF, REST Countries)

Flow 1: currency-acquisition at 09:00 - Fetches FX rates
Flow 2: prepare-batch at 09:30 - Generates manifests
Flow 3: process-batch at 10:00 - Archives data

2. Initial Setup

Step 1: Verify Python Environment

Check Python version (must be 3.11+):

```
python --version
```

Step 2: Install Dependencies

Install required packages:

```
pip install -r requirements.txt
```

Step 3: Login to Prefect Cloud

Authenticate with Prefect Cloud:

```
prefect cloud login
```

Step 4: Deploy Flows

Deploy all three flows to Prefect Cloud:

```
prefect deploy
```

Verification

✓ All 3 deployments visible in Cloud UI
✓ Deployments assigned to 'Yichen_Test' pool
✓ No errors in deployment output

3. Schedule Configuration

Configure automatic monthly execution schedules in Prefect Cloud UI.

Cron Expressions by Flow

Flow	Time	Cron Expression	Dates
currency-acquisition	09:00	0 9 15,25,28,29,30,31 * *	15, 25, 28-31
prepare-batch	09:30	30 9 15,25,28,29,30,31 * *	15, 25, 28-31
process-batch	10:00	0 10 15,25,28,29,30,31 * *	15, 25, 28-31

Cloud UI Configuration Steps

For each flow: 1. Go to https://app.prefect.cloud 2. Deployments menu 3. Select flow 4. Schedules tab 5. Create Schedule 6. Enter Cron expression 7. Set timezone to Asia/Shanghai 8. Enable 9. Save

4. Worker Management

The Worker is a process that polls Prefect Cloud for scheduled flows and executes them on your computer.

Starting the Worker

Open PowerShell and run:

```
prefect worker start --pool Yichen_Test
```

Expected Output

```
Worker started successfully
Listening for flow runs...
[Waiting for runs...]
```

Important Notes

Keep terminal open: Worker must stay running
Keep computer on: During execution times
Network required: Must have internet
API key valid: Must be logged in

5. Daily Operations

Monitoring Execution

In Cloud UI: Deployments tab shows all running flows. Select flow to view run history and logs. In Terminal: Worker output shows run acceptance and completion.

Viewing Execution Logs

Cloud UI Logs: Deployments menu then select flow and view logs. Local Logs: Check 6_logs/ directory.

Manual Trigger (For Testing)

Run a flow immediately without waiting for schedule:

```
prefect deployment run currency-acquisition
```

6. Automatic Execution Guide

How Automatic Execution Works

Prefect Cloud monitors all schedules 24/7. At scheduled time, creates Flow Run. Your Worker polls Cloud every 3 seconds. When new run appears, accepts and executes it. Uploads results back to Cloud. Key requirement: Computer must be online when execution time arrives.

Recommended Setup

Option 1: Leave computer running 24/7. Option 2: Set reminders for trigger dates. Turn on 5 min before execution. Start Worker. Keep running until 10:15. Turn off after.

7. Troubleshooting

Problem: Run is Still QUEUED

Cause: Worker offline during execution. Solution: Start Worker now and manually trigger the flow.

Problem: CSV File Not Created

Check Cloud UI logs for errors. Verify API connectivity. Check directory permissions.

Problem: Worker Crashes

Check network connectivity. Re-login to Cloud. Restart Worker.

8. API Documentation

Exchange Rate Fetcher

Fetches FX rates from IMF SDMX API. Supports 118 countries and 77 currencies. Data is fresh daily. REST Countries API cached for 5 minutes.

Data Output Format

File: exchange_rates_YYYY_MM.csv. Location: data/ directory. Format: UTF-8 CSV. Columns: Country, Currency, Date, Exchange_Rate, Base_Currency, Timestamp

9. Support & Contacts

Available Resources

Internal Documentation: README_EN.md, QUICK_START_EN.md, SCHEDULE_SETUP_GUIDE_EN.md. External: Prefect Cloud UI at https://app.prefect.cloud, Prefect Docs at https://docs.prefect.io

When to Get Help

For Code Issues: Check error logs in Cloud UI. For Network Issues: Verify connectivity. For API Issues: Check API status. For Setup: Review QUICK_START_EN.md

10. Appendix - Reference

Common Commands

Command	Purpose
prefect cloud login	Login to Prefect Cloud
prefect deploy	Deploy all flows
prefect deployment ls	List all deployments
prefect worker start --pool Yichen_Test	Start Worker
prefect deployment run [NAME]	Manually trigger flow

Execution Timeline

Each trigger date: 09:00 currency-acquisition starts. 09:30 prepare-batch starts. 10:00 process-batch starts. 10:10 all complete.