**⏱️ QuantumStream Scheduler – Task Automation Guide**

**📦 Feature:** Built-in Task Scheduler\ **🛠️ Available Since:** v2.5.0\ **📅 Last Updated:** July 2025\ **🎯 Objective:** *"Automate recurring data operations with precision and flexibility."*

**🧠 Overview**

The **QuantumStream Scheduler** is a native scheduling engine that allows users to automate recurring tasks such as data ingestion, model retraining, stream restarts, and report generation. Schedules are defined using standard **cron syntax** and stored in a centralized configuration file (scheduler.yaml), making it easy to manage and audit time-based operations.

This feature is ideal for teams looking to streamline workflows, reduce manual intervention, and ensure consistent execution of critical processes.

**📋 Key Capabilities**

* **⏳ Cron-Based Scheduling**\ Define tasks using familiar cron expressions (e.g., 0 2 \* \* \* for daily at 2 AM).
* **🔁 Task Types Supported**
  + Stream start/stop/restart
  + Data ingestion from external sources
  + Machine learning model retraining
  + Report generation and export
  + Custom plugin execution
* **📂 Centralized Configuration**\ All schedules are defined in scheduler.yaml at the root of your QuantumStream project.
* **📈 Execution Logging**\ Each scheduled task is logged with timestamps, status codes, and output summaries.

**🛠️ Defining a Schedule**

Example scheduler.yaml:

schedules:

- name: "daily\_ingestion"

cron: "0 1 \* \* \*"

task: "ingest"

params:

source: "s3://data-bucket/daily/"

stream: "daily\_sales\_stream"

- name: "weekly\_model\_retrain"

cron: "0 3 \* \* 1"

task: "retrain\_model"

params:

model\_id: "forecast\_v2"

dataset: "s3://models/training\_data.csv"

- name: "stream\_health\_check"

cron: "\*/15 \* \* \* \*"

task: "run\_plugin"

params:

plugin: "HealthMonitor"

**🚀 Supported Task Types**

| **Task** | **Description** |
| --- | --- |
| start\_stream | Starts a specified stream |
| stop\_stream | Stops a running stream |
| restart\_stream | Restarts a stream instance |
| ingest | Triggers a data ingestion job |
| retrain\_model | Launches a model retraining pipeline |
| generate\_report | Runs a report generation script |
| run\_plugin | Executes a registered plugin task |

**📊 Monitoring & Logs**

* Scheduled task executions are logged in logs/scheduler.log
* Use qs monitor to view upcoming tasks and recent executions
* Failed tasks trigger alerts via the configured notification system (e.g., Slack, email)

**🔐 Security & Permissions**

* Only users with scheduler\_admin role can modify scheduler.yaml
* Task execution is sandboxed and audited
* Secrets (e.g., API keys, credentials) should be referenced via environment variables or secret managers

**🧭 FAQs**

**Q: Can I disable a schedule without deleting it?**\ A: Yes. Add enabled: false to the schedule entry.

**Q: Does the scheduler support time zones?**\ A: Yes. You can specify a timezone field per task (e.g., timezone: "UTC").

**Q: Can I trigger a scheduled task manually?**\ A: Yes. Use qs scheduler run <task\_name> to execute it on demand.

**Q: Is there a UI for managing schedules?**\ A: A web-based scheduler dashboard is in beta and will be available in Q1 2026.

The QuantumStream Scheduler brings automation, reliability, and control to your data operations—so your pipelines run on time, every time.