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# Google Cloud Workflows

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- Cloud Workflows is a fully managed orchestration platform that executes services in an order that you define: a workflow.
- Cloud workflows provide a flexible and scalable solution for automating and orchestrating business processes across multiple platforms.
- Workflows can orchestrate and automate your API driven workflows.
- It is completely Serverless and no charges are incurred while idle.
- A Cloud Workflow contains no code or library dependencies, it does not require security patches.
- Workflows can combine services including custom services hosted on Cloud Run or Cloud Functions, Google Cloud services such as Cloud Vision AI and BigQuery, and any HTTP-based API.
- By incorporating Workflows into solutions, you can make service dependencies explicit and observable end-to-end.
- Workflows supports error handling and retries, ensuring reliable execution of your business processes.
- A workflow can hold state, retry, poll, or wait for up to a year.

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## Features of Cloud Workflows

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### Redundancy and fault-tolerance

- Replicated across multiple zones
- Checkpoint state after each step, ensuring executions continue even after outages.
- Failures in other services are handled through default and customizable retry policies, timeouts, and custom error handling.

## Self-documenting

- Specify workflows in YAML or JSON with named steps
- Easy to visualize, understand, and observe.

## Wait up to one year

- Wait time for a given period to implement polling.
- Connectors provide blocking steps for many Google Cloud services with long-running operations.

## Event-driven, scheduled and programmatic triggers

- Workflow executions are low-latency
- It supports both real-time and batch processing.

## HTTP callbacks

- Create unique callback URLs inside your workflow.

## Security

- Workflows run in a sandboxed environment and have no code dependencies that will require security patches.
- Store and retrieve secrets with Secret Manager.

## Seamless authentication within Google Cloud

- Orchestrate work of any Google Cloud product.

## Integrated logging and monitoring

- Out-of-the-box integration with Cloud Logging with automatic and custom entries provides insight into each workflow execution.
- Cloud Monitoring tracks execution volume, error rates, and execution time.

## Fast deploys

- Deploy in seconds to support a fast developer experience and quick production changes

## Low-latency execution

- Fast scheduling of workflow executions and transitions between steps.
- Predictable performance with no cold starts.

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## Cloud Workflows Pricing

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- Workflows pricing is calculated **monthly**, based on the number of workflow steps executed.
- Pay-per-use. Pay only for the executed steps in your workflow.
- Pay nothing if your workflow doesn't run.
- The following count toward the total of workflow steps executed:
  - Any step that executes successfully.
  - Any step that fails during execution.
  - Any step that is retried during a workflow execution. Each retry attempt counts as a step execution.

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## Use Cases

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1. Service Orchestration

- Create solutions by combining services—Perform a sequence of operations across multiple systems, waiting for all operations to complete.
- Can be event-driven.

## 2. Batch jobs

- Operate on multiple items—Perform operations on a set of items or batch data.
- Often scheduled.

## 3. Business processes

- Automate line-of-business workflows—Encode the steps in a business process, including conditions, actions, and human-in-the-loop events.

## 4. IT process automation

- Managed execution of service operations—Easily script sequences of Google Cloud service operation.