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Figure 1. Schematic diagram of the system architecture.

This section describes the system architecture and its components. The system is designed to handle complex data processing tasks. It consists of several key modules:

- Data Ingestion:** The system receives data from various sources, including sensors and databases.
- Processing Engine:** This module performs real-time data processing and analysis.
- Storage Layer:** Data is stored in a distributed storage system for long-term retention and retrieval.
- Reporting and Visualization:** The system generates reports and visualizations to help users understand the data.

The architecture is highly scalable and flexible, allowing it to adapt to changing requirements. It uses a microservices-based approach to ensure high availability and fault tolerance.

The system is designed to handle large volumes of data and provide fast response times. It uses advanced algorithms for data processing and analysis. The architecture is highly modular, allowing for easy integration with other systems.

The system is built using modern technologies and follows industry best practices for software development. It is designed to be secure and reliable, with regular updates and maintenance.

### EXERCISE 1

**Exercise 1: Data Processing and Analysis**

The goal of this exercise is to analyze the data processed by the system and identify trends and patterns. The data is organized into several categories:

- Category 1:** Data from the first set of sensors.
- Category 2:** Data from the second set of sensors.
- Category 3:** Data from the third set of sensors.

The analysis shows that there is a significant increase in data volume over time, particularly in the first category. This suggests that the system is handling more complex tasks or that the sensors are becoming more sensitive.

The results of the analysis are summarized in the following table:

Category	Volume (GB)	Frequency (Hz)
Category 1	150	10
Category 2	80	5
Category 3	30	2















