1. Storage Metrics

These metrics provide insights into disk and storage usage on the MinIO server.

- `minio_disk_storage_used_bytes`:
  - **Description**: Shows how much disk space is used by MinIO.
  - **Unit**: Bytes.
- `minio_disk_storage_available_bytes`:
  - **Description**: Displays the available storage on the disk.
  - **Unit**: Bytes.
- `minio_disk_storage_total_bytes`:
  - **Description**: Total disk space available for MinIO.
  - **Unit**: Bytes.

2. Network Metrics

These metrics show network-related statistics for data transfer in and out of the MinIO server.

- `minio_network_received_bytes_total`:
  - **Description**: Total bytes received by the MinIO server over the network.
  - **Unit**: Bytes.
- `minio_network_sent_bytes_total`:
  - **Description**: Total bytes sent by the MinIO server over the network.
  - **Unit**: Bytes.

3. HTTP Metrics

Metrics related to HTTP requests handled by MinIO.

- `minio_http_requests_total`:
  - **Description**: Total number of HTTP requests received by the server.
  - **Labels**: Includes `method` and `code` labels to differentiate between HTTP methods (GET, PUT, POST) and response codes (200, 500, etc.).
- `minio_http_requests_duration_seconds`:
  - **Description**: Histogram showing the duration of HTTP requests.
  - **Unit**: Seconds.

4. Object Metrics

These metrics give information about the objects stored and requests made to the MinIO server.

- `minio_objects_total`:
    - **Description**: Total number of objects stored in the MinIO server.

5. Process and System Metrics

These metrics provide insights into system resource consumption, such as CPU and memory usage.

- `minio_node_process_cpu_seconds_total`:
    - **Description**: Total CPU usage by the MinIO process.
    - **Unit**: CPU time in seconds.
- `minio_node_process_resident_memory_bytes`:
    - **Description**: Shows the current resident memory used by the MinIO server process.
    - **Unit**: Bytes.
    - **Resident memory** refers to the portion of a process's memory that is currently stored in **physical RAM** (Random Access Memory). It includes all the memory pages that the process is actively using and that are loaded into the physical memory.

      Key Characteristics:

        - **Actual memory in use**: Resident memory represents the actual physical memory being consumed by the process at any given time.
        - **Excludes swapped-out pages**: Pages that are not currently in RAM but are swapped to disk do not count as resident memory.
        - **Real-time footprint**: It provides a snapshot of how much of the system's RAM is being used by a specific process.
    - **Use Case**: Monitoring **resident memory** helps you see how much physical memory MinIO is using in real-time. If resident memory is too high, it could indicate that MinIO is consuming too much RAM, which could lead to performance degradation or system instability.

- `minio_node_process_virtual_memory_bytes`:
    - **Description**: Virtual memory usage by the MinIO server process.
    - **Unit**: Bytes.
    - **Virtual memory** refers to the total amount of memory a process can access, including both physical memory (RAM) and swap space on disk. Virtual memory is an abstraction provided by the operating system that allows a process to use more memory than what is available in the system's physical RAM by swapping less-used pages to disk
    - **Use Case in MinIO**: Monitoring **virtual memory** gives you an idea of the total memory footprint of MinIO, including memory that has been swapped out. If virtual memory is very high, it might indicate that MinIO has a large memory allocation, even if much of it is not in active use. This could be a sign that you need to tune the system or process configuration to prevent excessive swapping.

6. Disk I/O Metrics

- `minio_node_disk_io_time_seconds_total`:
    - **Description**: Total time spent on disk I/O operations.
    - **Unit**: Seconds.
- `minio_node_disk_io_read_bytes_total`:
    - **Description**: Total bytes read from the disk.
    - **Unit**: Bytes.
- `minio_node_disk_io_written_bytes_total`:
    - **Description**: Total bytes written to the disk.
    - **Unit**: Bytes.