

# Restoring a Backup

Restoring ClickHouse backups is essential for disaster recovery, staging environment duplication, or rolling back to a known state. Elestio supports backup restoration both through its web dashboard and manually through Docker Compose and command-line methods. This guide explains how to restore ClickHouse backups from SQL-based snapshots or file-based archives, covering both full and partial restore scenarios, and includes solutions for common restoration issues.

## Restoring from a Backup via Terminal

This method applies when you have a backup created using ClickHouse's native BACKUP command or a direct copy of the data directory. To restore the backup, you must stop the running ClickHouse container, replace the data files, and restart the container to load the restored dataset.

### Stop the ClickHouse Container

Shut down the ClickHouse container cleanly to avoid issues with open file handles or inconsistent state:

```
docker-compose down
```

### Replace the Backup Files

If your backup was created using the native ClickHouse BACKUP command and saved to `/backups/backup_2025_06_09`, copy it into the appropriate path within the container or bind mount.

Example:

```
cp -r ./clickhouse_backup_2025_06_09 /opt/app/backups/backup_2025_06_09
```

Make sure this path corresponds to the volumes specified in your `docker-compose.yml`. For example:

```
volumes:  
  - ./backups:/backups  
  - ./data:/var/lib/clickhouse
```

If you're restoring from a tarball archive, extract it into the correct volume mount:

```
tar -xzf clickhouse_backup_2025_06_09.tar.gz -C /opt/app/data/
```

## Restart ClickHouse

Start the ClickHouse container again:

```
docker-compose up -d
```

ClickHouse will load the data either from the standard data directory or, if using the backup snapshot method, you can explicitly restore the database using SQL (next section).

# Restoring via Docker Compose Terminal

If you're using backups made with the SQL BACKUP command, ClickHouse also provides a built-in method to restore via the RESTORE command.

## Copy the Backup Directory into the Container

```
docker cp ./clickhouse_backup_2025_06_09 $(docker-compose ps -q clickhouse):/backups/backup_2025_06_09
```

## Restore with ClickHouse SQL

Enter the container terminal:

```
docker-compose exec clickhouse bash
```

Then run the restore command:

```
clickhouse-client --query="RESTORE DATABASE default FROM Disk('/backups/backup_2025_06_09')"
```

This will restore the default database and its contents from the previously created backup directory.

# Partial Restores in ClickHouse

ClickHouse supports more granular restore operations using SQL syntax. You can restore individual tables or databases if the backup was created using the native BACKUP command.

## Restore a Single Table

```
clickhouse-client --query="RESTORE TABLE default.events FROM
Disk('/backups/backup_2025_06_09')"
```

This restores just the events table from the default database without affecting other tables.

## Restore Specific Schemas or Data

You can also export and import CSV or TSV snapshots for partial data management:

```
clickhouse-client --query="SELECT * FROM default.events FORMAT CSV" > events.csv
clickhouse-client --query="INSERT INTO default.events FORMAT CSV" < events.csv
```

# Common Errors & How to Fix Them

Restoring ClickHouse data can occasionally fail due to permission issues, path mismatches, unsupported formats, or version conflicts. Here are some frequent issues and their solutions.

## 1. ClickHouse Fails to Start After Restore

### Error:

```
DB::Exception: Corrupted data part ...
```

**Cause:** The backup directory is incomplete or corrupted, or the file was not extracted properly.

### Resolution:

- Re-verify that the backup files were copied completely.
- Use `tar -tzf` to inspect archive contents before extracting.
- Make sure you're restoring on the same ClickHouse version that created the backup.

## 2. RESTORE Command Fails with Permission Denied

### Error:

```
DB::Exception: Cannot read from backup: Permission denied
```

**Cause:** The container cannot access the /backups/ directory due to permissions.

### Resolution:

- Ensure the backup directory is readable by the ClickHouse process.
- Use `chmod -R 755 /opt/app/backups/` to adjust permissions if needed.

## 3. Data Not Restored

**Cause:** The RESTORE command did not include the correct database/table name or no data existed in the backup path.

### Resolution:

- Use `clickhouse-client --query="SHOW DATABASES"` to confirm no restore happened.
- Run `ls /backups/backup_2025_06_09/` inside the container to verify backup contents.

## 4. Permission Denied When Copying Files

### Error:

```
cp: cannot create regular file '/opt/app/data/': Permission denied
```

### Resolution:

Ensure your terminal session or script has write access to the target directory. Use `sudo` if needed:

```
sudo cp -r ./clickhouse_backup_2025_06_09 /opt/app/data/
```

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