

# Repository Guide

## Repository Types & Performance Guide

Understand the differences between repository types and choose the best option for your needs

### About Repositories in Borgmatic Director UI

A **repository** is where your backups are stored. Borgmatic Director UI supports multiple repository types, each with different performance characteristics. The choice of repository type significantly impacts backup speed, resource usage, and reliability. Understanding these differences helps you make informed decisions for your backup strategy.

#### Direct Mode

Borg writes directly to the remote storage. This is the fastest method as there's no intermediate step.

#### Sync Mode

Borg writes locally first, then a sync tool (like Rclone) copies to cloud. This adds overhead and delay.

## Performance Comparison

| REPOSITORY TYPE | SPEED RATING | STORAGE MODE | BEST USE CASE |
|-----------------|--------------|--------------|---------------|
|-----------------|--------------|--------------|---------------|

|   |                                    |        |   |
|---|------------------------------------|--------|---|
| <p><b>Local Filesystem</b><br/>Direct filesystem access on the same machine or fast local network</p>         | <p><b>Fastest</b></p> <p>100%</p>  | Direct | <p>Same machine backups, fast local network storage</p> <p><b>⚠ Not recommended due to potential data loss in case of disk crash or malicious attacks</b></p> |
| <p><b>SSH (Native Borg)</b><br/>Borg's native SSH protocol with optimized deduplication and compression</p>   | <p><b>Very Fast</b></p> <p>90%</p> | Direct | Remote servers with Borg installed, production backups  |
| <p><b>S3 Direct (Native)</b><br/>Borg's native S3 support using boto3, optimized for cloud object storage</p> | <p><b>Fast</b></p> <p>75%</p>      | Direct | Cloud storage (AWS, Hetzner, Wasabi, Backblaze B2, MinIO)   |
| <p><b>SFTP</b><br/>SSH-based file transfer protocol, works without Borg on remote</p>                         | <p><b>Moderate</b></p> <p>60%</p>  | Direct | Remote servers without Borg installed   |

|  |  |                |  |
|--|--|----------------|--|
| <p><b>Rclone Direct (Mounted)</b><br/>Rclone FUSE mount for 100+ cloud providers</p> | <p><b>Moderate-Slow</b></p>  <p>50%</p> | Direct (FUSE)  | Cloud providers not natively supported (Google Drive, Dropbox, etc.) |
| <p><b>Network Mounts (NFS/SMB)</b><br/>Network filesystems like NFS, SMB/CIFS</p>    | <p><b>Slow</b></p>  <p>45%</p>          | Direct (mount) | Existing network storage infrastructure                              |
| <p><b>S3 Sync Mode</b><br/>Write locally first, then sync to S3 using Rclone</p>     | <p><b>Slow</b></p>  <p>40%</p>          | Sync           | When S3 direct mode is not available                                 |
| <p><b>Rclone Sync Mode</b><br/>Write locally first, then sync to cloud</p>           | <p><b>Slowest</b></p>  <p>35%</p>     | Sync           | When direct mounting is not possible                                 |

## Detailed Explanations

## Local Filesystem

Direct filesystem access on the same machine or fast local network

### ? Advantages

- Fastest performance
- No network overhead
- Lowest latency
- Simple setup

### ? Limitations

- Requires local storage
- No off-site backup
- Vulnerable to local disasters

## SSH (Native Borg)

Borg's native SSH protocol with optimized deduplication and compression

### ? Advantages

- Highly optimized
- Native Borg protocol
- Efficient deduplication
- Secure

### ? Limitations

- Requires Borg on remote server
- Needs SSH access

## S3 Direct (Native)

Borg's native S3 support using boto3, optimized for cloud object storage

### ? Advantages

- Native S3 support
- Optimized for cloud
- Scalable
- Works with many providers

### ? Limitations

- Network latency
- S3 API overhead
- Costs per request

## SFTP

SSH-based file transfer protocol, slower than native SSH but works without Borg on remote

### ? Advantages

- Works without Borg on remote
- Secure
- Standard protocol

### ? Limitations

- Protocol overhead
- Slower than native SSH
- Less optimized

## Quick Decision Guide

### Choose SSH (Native) if:

- You have a remote server with Borg installed

- You want the fastest remote backup performance
- You need production-grade reliability
- You have SSH access to the remote server

### **Choose S3 Direct if:**

- You're using cloud object storage (AWS, Hetzner, Wasabi, etc.)
- You want native cloud integration
- You need scalable storage

### **Choose Rclone Direct (Mounted) if:**

- You need providers not natively supported (Google Drive, Dropbox, etc.)
- You can accept moderate performance
- You need unified access to multiple providers

### **Avoid Sync Mode if possible:**

- It's the slowest option due to double write overhead
- Requires local storage space
- Adds complexity and potential failure points

## **Performance Tips**

- **SSH is fastest:** If you have a remote server, SSH (native Borg) is almost always the fastest option
- **Direct beats Sync:** Always prefer direct mode over sync mode when possible
- **Avoid double writes:** Sync mode writes data twice (locally + cloud), significantly slowing backups
- **Compression helps:** Enable compression (LZ4) to reduce data transfer over network
- **Deduplication is key:** Borg's deduplication works best with direct protocols like SSH

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