Off-Site Backup Guide

This document captures the engine choices, provider comparisons, and reference workflows for extending your local USB + snapshot strategy into a full **3-2-1** scheme (3 copies, 2 media, 1 off-site) — without buying a NAS right away.

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1 Engine Options for Cloud Backups

Engine	What it gives you	Ideal when	Snapshot workflow
Restic / Kopia (single-binary, S3-native)	Fast multi-thread upload, built-in AES-256 encryption, compression & dedup; runs on Linux *and* Windows	You want one tool everywhere and object-storage pricing	`btrfs sub snap -r / home …` → `restic backup` snapshot path; each backup is its **own point-in-time** in Restic/ Kopia
Borg + Borgmatic (SSH target)	Rock-solid; FUSE browse (`borg mount`); append-only mode	You prefer turnkey **backup host** (rsync.net, BorgBase, Hetzner Storage Box) instead of raw object storage	Same snapshot trick; duplicate blocks deduped
`btrfs send | receive` **over SSH**	Bit-for-bit clone of every snapshot (reflinks, ACLs, compression)	Remote target is **also Btrfs** (cheap VPS, Hetzner box) and you're happy managing raw sub-volumes	`btrfs send -p LAST … | ssh host btrfs receive …` keeps **entire snapshot tree**

> *Why not pipe Btrfs streams into S3?* Each stream is one huge file — you'd lose server-side dedup and pay full egress to restore it.

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2 S3-Compatible Object-Storage Providers

Provider	Base cost	Egress/API fees	Pros / Cons
Backblaze B2	**$6 / TB-month**; first 10 GB free	3× stored data egress free, then $0.01/GB	Long track-record; Restic backend; cheapest total if you test restores
Wasabi Hot Cloud	**$6.99 / TB-month**, no egress; 90-day min retention	none	Predictable bill; multiple regions; great if you worry about restore costs

Provider	Base cost	Egress/API fees	Pros / Cons
iDrive e2	$0.005/GB (first TB ≈ $5)	$0.01/GB egress	Cheapest <1 TB bucket; younger service, but mature parent company
Storj (decentralised)	$4 / TB-month + $5 minimum use	$7 / TB egress	End-to-end encrypted by design; slower first-byte latency

3 Hosted-SSH Boxes for Borg or Btrfs Send

Service	Price (~1 TB)	Traffic fees	Highlights
Hetzner Storage Box BX11	**€3.20 / mo** (~$3.50)	none	SSH/WebDAV/SFTP; Borg & Restic presets; 10 automatic snapshots
rsync.net Borg account	**$0.008 / GB-mo** (≈ $8/TB)	none	ZFS backend with daily 30-day snapshots; immutability flag
BorgBase	$2 / mo (10 GB) → $80 / yr (1 TB)	none	10 GB free tier; web dashboard; stale-backup alerts

4 Reference Workflows

Goal	Tool stack	Target	Approx. cost
Maximum automation, zero surprises	Restic (AES-256) + daily systemd timer against snapshot	**Wasabi** bucket	≈ $7 / TB-month; no egress fees
Cheapest TB price with Borg comfort	Borgmatic (prune & health) against snapshot	**Hetzner Storage Box**	€3.20 / mo per TB; unlimited traffic
Full snapshot tree off-site	`btrbk` incremental `btrfs send`	**Small Btrfs VPS** (e.g. €2 VPS)	≈ €5 / mo total

5 Future NAS Consideration

A NAS can later: * Pull hourly snapshots over LAN (laptop offline sooner).
Mirror to the same cloud bucket with Rclone/Restic.
Serve as on-prem restore cache.

No data reshuffling required — just point the NAS at the existing repo or receive streams.

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6 Quick Decision Grid

Scenario	Best Choice	Rationale
Cross-platform backups (Windows + Linux)	**Restic/Kopia → Backblaze B2**	Single tool, global dedup, native Windows binary
Linux-only, budget priority	**Borgmatic → Hetzner Box**	Lowest €/TB, SSH simplicity
Need perfect Btrfs snapshots	`btrfs send` **→ Hetzner Box (Btrfs)**	Preserves reflinks, ACLs, compression

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TL;DR

- Pick **one engine**: Restic/Kopia for S3, Borg for SSH, or raw Btrfs send.
- Back-up **snapshots**, not live mounts.
- Cheap, trusted picks: Hetzner Box (SSH) or Backblaze B2 (S3).
- Encryption happens **before** upload, so provider trust is mainly about uptime + billing.