# 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.

| ## 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** | |
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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 | | **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 |
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| **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 | |
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| ## 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. |

## 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 |

### 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.