EN

Quick Reference Guide

High Availability & Backups

3-2-1 rule, snapshots and recovery

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1. The 3-2-1 Rule

- 3 copies of data (original + 2 backups)
- 2 different media (local SSD + NAS)
- 1 offsite copy (cloud: Backblaze B2, S3)
- Test restoration = only real validation

2. Proxmox Snapshots

```
# Create snapshot:
qm snapshot 101 before-upgrade --description "Before kernel 6.8"

# Restore (VM stopped):
qm stop 101
qm rollback 101 before-upgrade
qm start 101

# List / Delete:
qm listsnapshot 101
qm delsnapshot 101 before-upgrade

# Scheduled backup (Proxmox UI):
# Datacenter > Backup > Add
# Schedule: daily 02:00 | Retention: 7 daily
```

3. Proxmox Backup Server

- Install PBS on dedicated server (ISO from proxmox.com)
- Proxmox VE > Datacenter > Storage > Add > PBS
- Deduplication + compression + incremental backups
- Retention: 7 daily, 4 weekly, 3 monthly

4. Docker Volume Backups

```
#!/bin/bash
BACKUP_LOCAL="/mnt/nas/backups/docker/$(date +%Y-%m-%d)"
mkdir -p "$BACKUP_LOCAL"

backup_service() {
    tar czf "${BACKUP_LOCAL}/${1}-$(date +%Y%m%d).tar.gz" "$2"
}

backup_service "ghost" "/mnt/docker-data/ghost-blog/content"

docker stop vaultwarden
backup_service "vaultwarden" "$HOME/docker/vaultwarden/data"
docker start vaultwarden

backup_service "uptime-kuma" "$HOME/docker/uptime-kuma/data"
```

5. rclone to Backblaze B2

```
# Install rclone:
curl https://rclone.org/install.sh | sudo bash

# Configure B2:
rclone config
# > New remote (n)
# > Name: b2
# > Provider: Backblaze B2
# > application-key-id + application-key

# Sync to cloud:
rclone sync /backup/docker/ b2:my-bucket/docker/ --progress

# B2 cost: ~$0.006/GB/month
```

6. Restoration Testing

```
# Proxmox: restore to VM ID 999 (test)
# Datacenter > Backup > Restore > VM ID=999

# Docker (separate test VM):
mkdir -p /test/ghost-blog/content
tar xzf /backup/ghost-20260312.tar.gz \
    -C /test/ghost-blog/content/

mkdir -p /test/vaultwarden/data
cp /backup/vaultwarden-20260312.db \
    /test/vaultwarden/data/db.sqlite3

# Verify services start and work correctly
```

7. Backup Integrity Monitoring

```
#!/bin/bash
BACKUP_DIR="/mnt/nas/backups/docker"
MAX_AGE_HOURS=25

LAST=$(find "$BACKUP_DIR" -maxdepth 1 -type d -name "20*" | sort | tail -1)
AGE=$(( ($(date +%s) - $(stat -c %Y "$LAST")) / 3600 ))

if (( AGE > MAX_AGE_HOURS )); then
    echo "ALERT: Last backup is ${AGE}h old"
fi

for f in "$LAST"/*.tar.gz; do
    tar tzf "$f" > /dev/null 2>&1 || echo "CORRUPT: $f"
done
```

8. Proxmox HA Cluster

```
# Minimum: 3 nodes + shared storage (Ceph/NFS)

# Create cluster (main node):
pvecm create my-cluster

# Join cluster:
pvecm add MAIN-NODE-IP

# Cluster status:
pvecm status && pvecm nodes

# Enable HA for a VM:
# Datacenter > HA > Add > VM ID: 101
```

Full article: botum.ca/self-hosted-high-availability-backups/

Website: www.botum.ca -

- Canada