STANDARD OPERATING PROCEDURE

Cloudflare Tunnel & Apache Downtime Resolution

Self-hosted Raspberry Pi web server
munyakazi.org

3 Fixes
Applied

Pi 4
Target System

2026-06-05
Date

1. Document Metadata

Title	Fixing Periodic Website Downtime on Self-Hosted Raspberry Pi
Author / Role	JC Munyakazi / IT System Administrator
Date Created	2026-06-05
Target Systems	Raspberry Pi 4 (Ubuntu), Apache2, Cloudflare Tunnel (cloudflared)
Affected URL	munyakazi.org

2. Problem Statement

Symptoms

- Browser shows Cloudflare Error 1033 (Tunnel Error)
- "Unable to reach the origin service" message
- Occurred 3 times over several weeks
- Full recovery only after physical Pi reboot

Impact

munyakazi.org fully unavailable

Portfolio & contact form inaccessible

Trigger

Periodic, approximately daily

Correlated with log rotation cycles

Error 1033 · Cloudflare Tunnel Error

The host (munyakazi.org) is configured as a Cloudflare Tunnel, and Cloudflare is currently unable to resolve it.

```
ERR  error="Unable to reach the origin service. The service may be down or it may not be responding."
```

3. Root Cause Analysis

1	**cloudflared status**	`sudo systemctl status cloudflared`	Active & running, 4 tunnel connections registered. Not the problem.
2	**Apache status**	`sudo systemctl status apache2`	Apache was STOPPED at time of error. Restarting it restored the site.
3	**Memory check**	`free -h  |  dmesg | grep -i 'killed'`	3.7GB RAM, 2.8GB available. No OOM kills. Memory ruled out.
4	**Apache error log**	`sudo grep -i 'caught signal' /var/log/apache2/error.log`	**Found: AH00170: caught SIGWINCH, shutting down gracefully**
5	**Source of SIGWINCH**	`sudo cat /etc/logrotate.d/apache2`	**CAUSE: invoke-rc.d apache2 reload sends SIGWINCH daily via logrotate.**

3. Root Cause — Underlying Flaw

Root Cause — /etc/logrotate.d/apache2 → postrotate

```
invoke-rc.d apache2 reload 2>&1 | logger -t apache2.logrotate
```

reload sends SIGWINCH to Apache → Apache shuts down gracefully but does NOT restart automatically

logrotate reload

Daily log rotation sent reload (SIGWINCH) - Apache shut down and did not recover without a full reboot

No Restart Policy

Apache had no systemd Restart= directive - a stopped service stayed down indefinitely

No Swap Space

Pi had 0B swap configured - a risk factor for memory-intensive workloads going forward

4. Fix 1 — Change logrotate reload → graceful

This is the primary fix that resolves the root cause. Daily log rotation will now reload Apache safely.

1	**Open the config**	`sudo nano /etc/logrotate.d/apache2`
2	**Find postrotate**	`# locate the postrotate { ... } block`
3	**Change the line**	`invoke-rc.d apache2 graceful 2>&1 | logger -t apache2.logrotate`
4	**Save & exit**	`Ctrl+O → Enter → Ctrl+X`

```
BEFORE:  invoke-rc.d apache2 reload 2>&1 | logger
```

```
AFTER:   invoke-rc.d apache2 graceful 2>&1 |
logger
```

4. Fix 2 — Add systemd Restart Policy

Ensures Apache auto-recovers from any future unexpected shutdown within 10 seconds.

1	**Open override editor**	`sudo systemctl edit apache2`

2	**Add between comments**	`[Service]`
		`Restart=always`
		`RestartSec=10`

3	**Save & exit**	`Ctrl+O → Enter → Ctrl+X`
4	**Reload daemon**	`sudo systemctl daemon-reload`

Verification: sudo systemctl status apache2 → Look for Drop-In: override.conf listed in the output

4. Fix 3 — Add Swap File (Preventive)

Adds 1GB virtual memory as a safety buffer. The Pi had 0B swap - a risk for memory-intensive workloads.

1	**Create swapfile**	`sudo fallocate -l 1G /swapfile`
2	**Set permissions**	`sudo chmod 600 /swapfile`
3	**Initialize**	`sudo mkswap /swapfile`
4	**Enable**	`sudo swapon /swapfile`
5	**Make permanent**	`echo '/swapfile none swap sw 0 0' | sudo tee -a /etc/fstab`

Verification: free -h → Swap line should show 1.0G total

4. Verification Steps

Verify logrotate fix

```
sudo logrotate --force /etc/logrotate.d/apache2
sudo systemctl status apache2
```

Apache still active (running) with same PID after forced rotation

Verify systemd override

```
sudo systemctl status apache2
```

Drop-In: /etc/systemd/system/apache2.service.d/override.conf is listed

Verify swap space

```
free -h
```

Swap line shows: 1.0G total (was 0B before)

5. Fix Summary

Problem	Root Cause	Fix Applied
Site goes down periodically	logrotate sends SIGWINCH (reload) - Apache shuts down and does not recover	Changed reload → graceful in /etc/logrotate.d/apache2
No auto-recovery when Apache fails	No Restart policy in Apache systemd unit	Added Restart=always via systemd override.conf
No memory safety buffer	0B swap space configured on Pi	Added 1GB swapfile, persisted in /etc/fstab

munyakazi.org now stays online without physical reboots - Apache survives daily logrotate and auto-restarts if it ever fails.

6. Rollback Plan

1. Revert logrotate

```
sudo nano /etc/logrotate.d/apache2
```

```
# Change  graceful  back to
reload  in postrotate
```

```
# Save and exit
```

2. Remove systemd override

```
sudo systemctl revert apache2
```

```
sudo systemctl daemon-reload
```

3. Remove swap file

```
sudo swapoff /swapfile
```

```
# Remove /swapfile line from
/etc/fstab
```

```
sudo rm /swapfile
```

Issue Resolved

munyakazi.org stays online.

Apache now survives daily logrotate cycles and auto-restarts if it ever stops unexpectedly.

Fix 1

logrotate graceful

Fix 2

Restart=always

Fix 3

1GB Swap added