macOS Power Management & System Stability Guide

MacBook Pro 13” (2020) Troubleshooting Reference

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1 Executive Summary

This document summarises the diagnosis and resolution of critical system issues on a MacBook Pro 16,2 (Intel, 2020) running macOS 26.2, including:

- WindowServer crashes due to thermal throttling
- Laptop overheating in bag (failure to sleep on lid close)
- Battery drain from sleep assertion blockers
- High CPU usage from iCloud and Spotlight processes
- Touch ID failures after power events

All issues were resolved through a combination of SMC reset, power management configuration, removal of problematic software, and installation of a persistent process throttling daemon.

2 Problems Identified

2.1 WindowServer Crash

Root Cause: Instagram web tab in Chrome consumed 101%+ CPU for an extended period, causing thermal throttling to 31% CPU speed. The Intel GPU driver stalled under thermal stress during Metal operations, causing WindowServer to hang.

Symptoms:

- GPU watchdog timeout during display state transition
- ThermalPressureLevelHeavy warnings
- System unresponsive, required force restart

2.2 Laptop Overheating in Bag

Root Cause: SMC setting `AppleClamshellCausesSleep` was set to `No`, preventing the system from sleeping when the lid was closed.

Discovery:

```
ioreg -r -k AppleClamshellCausesSleep | grep AppleClamshellCausesSleep
# Returned: "AppleClamshellCausesSleep" = No
```

2.3 Battery Drain (Lid Open)

Root Cause: Multiple processes holding `PreventUserIdleSystemSleep` assertions:

- **WhatsApp:** Held `cameracaptured-idleSleepPreventionForBWFigCaptureDevice` for 34+ minutes
- **coreaudiod:** Audio contexts from BlackHole driver, Teams audio driver, and Chrome
- **Various sync daemons:** cloudd, bird, contactsd, mds

2.4 iCloud Sync CPU Usage

Root Cause: 67 orphaned iCloud containers from uninstalled apps, causing `fileproviderd` to run at 174% CPU for hours.

2.5 Touch ID Failure

Root Cause: Biometric daemons lose synchronisation with the Secure Enclave after certain power events (battery exhaustion, problematic sleep/wake cycles).

3 Solutions Applied

3.1 SMC Reset (Critical)

The SMC reset fixed the clamshell sleep issue. For MacBook Pro with T2 chip:

1. Shut down the Mac completely
2. Press and hold **Control + Option + Shift** (left side) for 7 seconds
3. While holding those keys, press and hold the **Power button** for 7 seconds
4. Release all keys, wait a few seconds
5. Press Power to turn on

Verification:

```
ioreg -r -k AppleClamshellCausesSleep | grep AppleClamshellCausesSleep
# Should return: "AppleClamshellCausesSleep" = Yes
```

3.2 Power Management Settings

```
# Battery settings
sudo pmset -b sleep 15
sudo pmset -b displaysleep 10
sudo pmset -b disksleep 10

# AC power settings (never sleep with lid open)
sudo pmset -c sleep 0
sudo pmset -c displaysleep 10

# Both power sources
sudo pmset -a womp 0     # Disable network wake
sudo pmset -a proximitywake 0 # Disable proximity wake
sudo pmset -a tcpkeepalive 0 # Disable TCP keepalive
sudo pmset -a ttyskeepawake 0 # Disable terminal keepawake
sudo pmset -a standbydelayhigh 900
sudo pmset -a standbydelaylow 300
```

3.3 Software Removed

The following software was identified as problematic and removed:

Software	Issue	Impact
BlackHole 2ch	Phantom audio contexts	Battery drain
MSTeamsAudioDevice.driver	22+ hour sleep assertions	Prevents sleep
Adobe Acrobat DC	CGPDFService CPU usage	CPU/thermal
Adobe Creative Cloud	Finder sync overhead	CPU usage
Foxit PDF Editor	PDF rendering conflicts	CPU usage
Weather Widget	Stuck at 72% CPU	CPU/thermal
Adobe Chrome Extension	PDF rendering triggers	CPU usage

Table 1: Removed problematic software

3.4 iCloud Cache Reset

```
# Kill iCloud processes
killall -9 fileproviderd cloudd bird 2>/dev/null

# Clear sync caches
rm -rf ~/Library/Application\ Support/CloudDocs/session/
rm -rf ~/Library/Caches/CloudKit/
rm -rf ~/Library/Caches/com.apple.bird/
```

3.5 Spotlight Index Control

```
# Disable Spotlight temporarily
sudo mdutil -a -i off

# Re-enable Spotlight
sudo mdutil -a -i on

# Exclude folders with large PDFs
touch ~/Documents/Automotive/.metadata_never_index
```

3.6 Touch ID Reset

When Touch ID stops working after power events:

```
sudo killall biometrickitd BiomeAgent biomed TouchBarServer
```

4 Persistent Process Throttling

A launch daemon was created to automatically throttle iCloud and Spotlight processes, preventing them from consuming excessive CPU resources.

4.1 Throttler Script

Location: `/Users/ahmedal/bin/icloud-throttle.sh`

The script monitors and applies `renice 20` to:

- `fileproviderd` – iCloud file provider
- `cloudd` – CloudKit daemon

- `bird` – iCloud Drive daemon
- `mds` – Spotlight metadata server
- `mds_stores` – Spotlight storage

4.2 Launch Daemon

Location: `/Library/LaunchDaemons/com.user.icloud-throttle.plist`

The daemon:

- Starts at boot (before user login)
- Runs as root (required for Spotlight processes)
- Monitors every 30 seconds
- Re-throttles processes if they restart
- Logs to `/tmp/icloud-throttle.out`

5 Verification Commands

5.1 Check Sleep Blockers

```
pmset -g assertions
```

Look for `PreventUserIdleSystemSleep = 1` or `PreventSystemSleep = 1`.

5.2 Check Thermal Status

```
pmset -g therm
```

`CPU_Speed_Limit` should be 100 (no throttling).

5.3 Check Top CPU Consumers

```
ps aux | sort -nrk 3 | head -5
```

5.4 Check Sleep/Wake History

```
pmset -g log | grep -E "(Entering|Wake from)" | tail -10
```

5.5 Check Throttler Status

```
tail -f /tmp/icloud-throttle.out
```

5.6 Check Audio Assertions

```
pmset -g assertions | grep -i audio
```

Should return nothing when idle.

6 Before Leaving Mac Unattended on Battery

1. **Check for sleep blockers:**

```
pmset -g assertions | grep -E "Prevent|Sleep"
```

2. **Quit these apps properly (Cmd+Q):**
   - WhatsApp
   - Microsoft Teams
   - Close Chrome tabs with audio/video
3. **Or simply close the lid** – this now forces sleep regardless of any assertions.

7 File Locations

File	Purpose
`/Users/ahmedal/bin/icloud-throttle.sh`	Throttler script
`/Library/LaunchDaemons/com.user.icloud-throttle.plist`	Launch daemon
`/tmp/icloud-throttle.out`	Throttler log
`/tmp/icloud-throttle.log`	Throttler events

Table 2: Important file locations

8 Quick Reference

Problem	Quick Fix
Touch ID not working	`sysutil touchid`
Check sleep readiness	`sysutil sleep-check`
Check sleep blockers	`sysutil assertions`
Check thermal status	`sysutil thermal`
Disable charging chime	`sysutil chime off`
Monitor throttler	`sysutil monitor`
Throttle iCloud/Spotlight	`sysutil throttle`
Check why Mac woke	`sysutil wake-reason`
Reset iCloud sync	`sysutil icloud-reset`

Table 3: Quick reference commands

9 Known Hardware Quirks

9.1 Wake on AC Attach

On some MacBook Pro models (including 2020 13”), plugging in the USB-C charger while the lid is closed causes the Mac to wake briefly. This is due to the lid sensor (AppleACPILid)

detecting a phantom “lid event” when power is connected.

Symptoms:

- Charging chime plays when plugging in charger with lid closed
- Mac wakes to full power momentarily

Mitigation:

- Disable the chime: `sysutil chime off`
- Plug in charger before closing lid
- The Mac will return to sleep within $\sim$5 minutes automatically

This is a hardware/firmware behaviour that cannot be fully disabled in software.