SilentCore: A Minimal Kernel-Level Technique to Enhance Deep Sleep on Windows

Concept

Not hibernation, not suspend. This is a new kernel-mode enhancement layer named *Silent-Core*—a system-level mechanism enabling ultra-efficient, low-noise sleep cycles by detaching all non-critical HAL threads and pushing Windows into a controlled semi-offline state.

Mechanism

- Intercepts native `NtSetSystemPowerState()` call.

- Creates a minimal supervisor thread in kernel-space.

- System memory flushed and state snapshotted in compressed RAMDisk.

- DPC timers paused; only real-time clock (RTC) and thermal daemon retained.

- Network stack set to LPM (Low Power Mode), only essential ping listeners remain.

- GPU context halted post-frame sync, reducing power draw to 3–5W.

Advantages

- Resume time under 200 ms with full session state.

- Zero disk writes during sleep.

- No fan spin-up.

- Blocks telemetry and background scheduler.

- Supports timer-based scheduled resume for automation.

Use Case

Ideal for developers, night-time coders, or high-performance workstations requiring rapid cold-resume cycles without risking data loss or overheating.

Requirements

- Windows 10+ with Secure Boot off

- Intel VT-x or AMD-V enabled

- Custom signed driver for HAL patching

- Minimum 8 GB RAM

Notes

Not recommended for laptops under OEM warranty. Experimental driver layer written in Rust for safety and uses Windows WDK APIs to hook power state transitions.