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Selecting a low-power state for a flash-based storage device (NVMe/UFS/eMMC/SD)

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On battery driven platforms, flash-based storage devices like NVMe/UFS/eMMC/SD are being used in a combination with a carefully designed support for platform-power-management. Yet, a flash-based storage device typically contributes significantly to the energy-budget for a platform. That means it's highly important to manage them in an optimized way, otherwise we may waste a lot of energy or in worst case, if we get things wrong, we could even damage the device.

In this regards, it's highly problematic that we are lacking a common policy for how deal with low-power states for these storage devices. Especially since they are really sharing the same kind of problems, while their respective subsystems treats them quite differently. Some tends to pick the deepest possible low-power state, while others prefer leaving the device fully powered-on, even during a system-wide-sleep.

Let's discuss these problems in more detail and in particular let's see if we can find a way to start moving things into a more common ground.

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