

# Power Management Challenges in Linux\*

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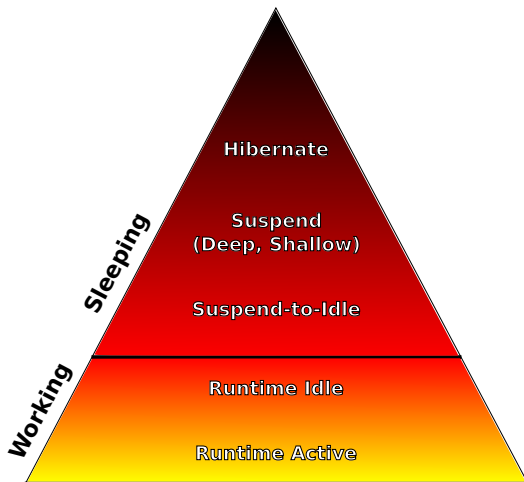
September 15, 2017

# What Power Management Is About

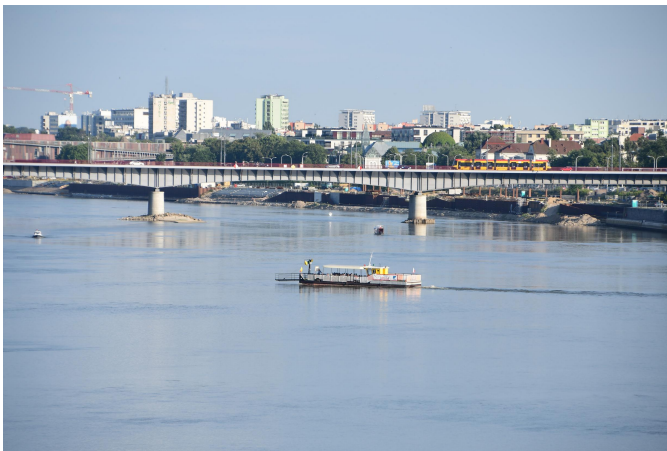


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# Linux Power Management Overview

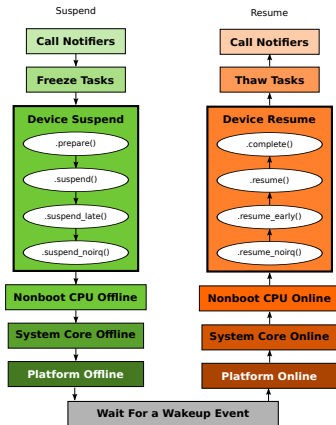


# System-Wide PM (Sleep States) and Working-State PM

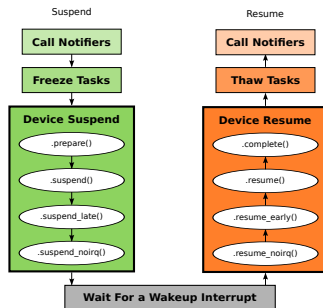


# System Suspend Control Flows

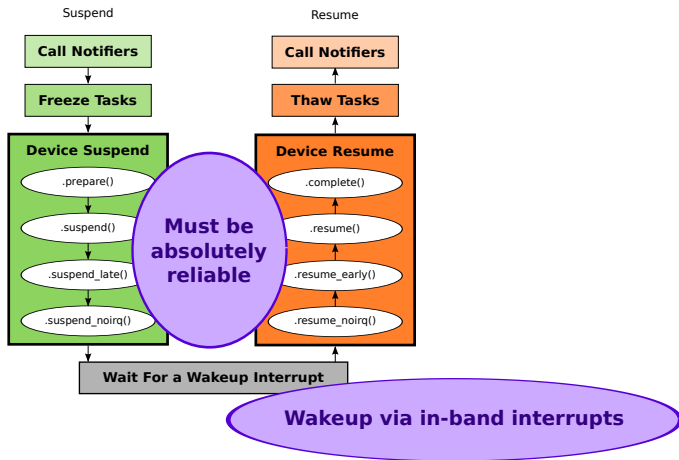
## Full Suspend



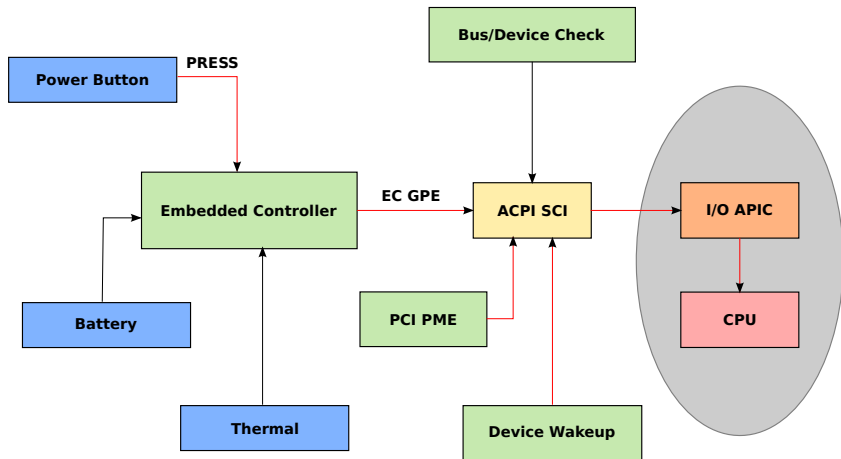
## Suspend to Idle



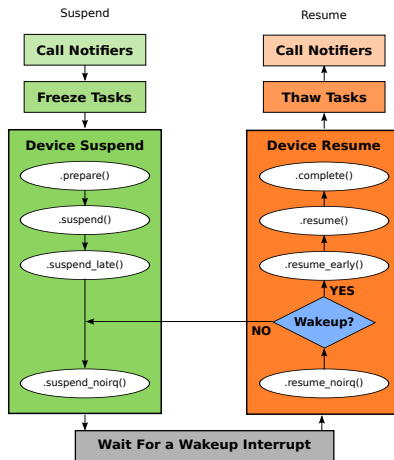
# Suspend-to-Idle Implementation Challenges



# Example: EC-Based Power Button Events Signaling



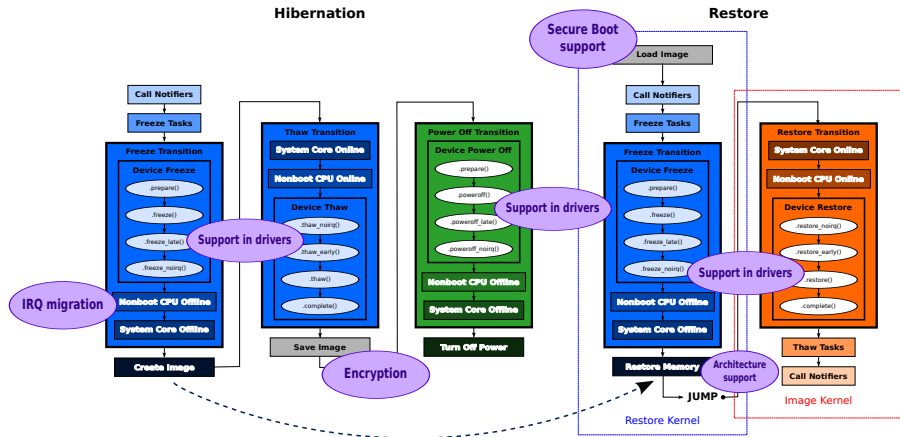
# Suspend-to-Idle With Detection of Spurious Wakeups



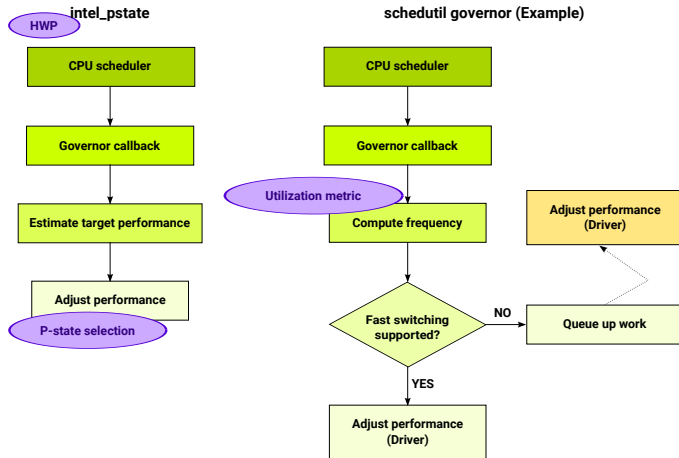


# Challenges Related to Hibernation

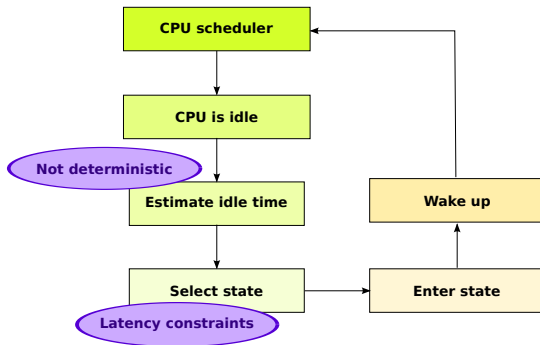
## Hibernation



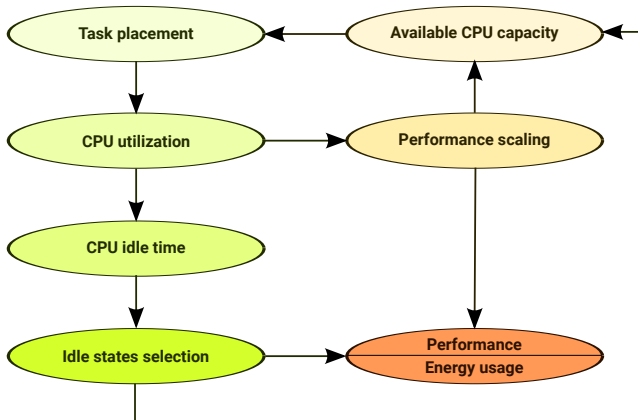
# CPU Performance Scaling



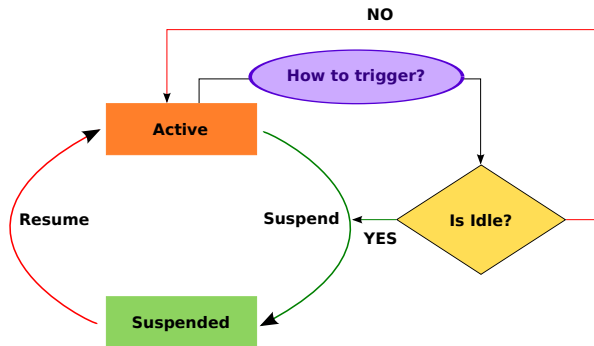
# CPU Idle Time Management



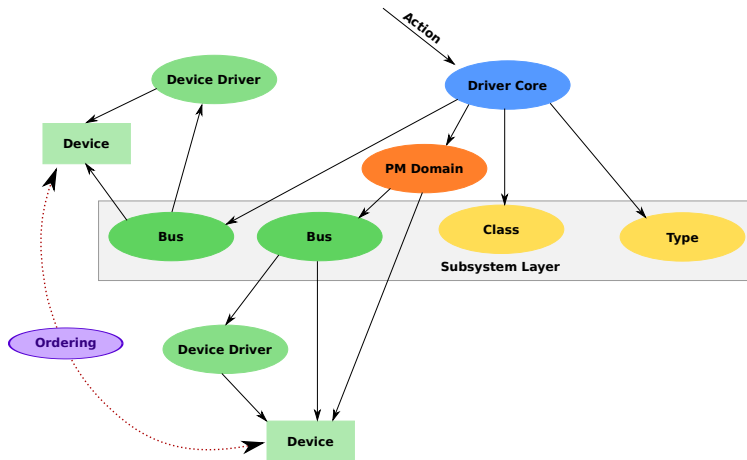
# Task Placement and CPU PM



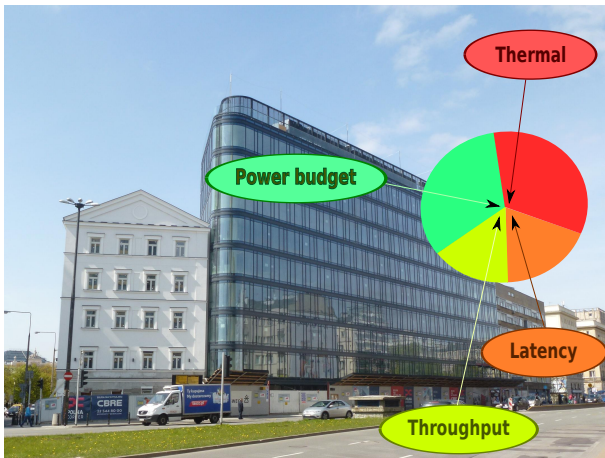
# Device Runtime PM Framework



# Driver Core and Device PM Operations



# Constraints and Requirements



# Questions?



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# References



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R. J. Wysocki, *Power Management in the Linux Kernel – Current Status and Future* ([http://events.linuxfoundation.org/sites/events/files/slides/kernel\\_PM\\_plain.pdf](http://events.linuxfoundation.org/sites/events/files/slides/kernel_PM_plain.pdf)).



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