Performance improvements in power-sharing scenarios

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"Adaptive" CPU Performance Scaling Governors

- Avoid degrading performance. (!)
- Adjust the operating frequency to what is needed.
- Use the (frequency-invariant) utilization as an indicator.

What If The Utilization Is 100%?

Assume that the user needs maximum performance

But this need not be the case:

1. Memory-bound and similar workloads.
   - Increasing CPU frequency (beyond certain point) does not matter.
2. Workloads involving components sharing power with the processor.
   - Increasing CPU frequency (too much) causes performance to decrease.

References

Francisco Jerez, *GPU-bound energy efficiency improvements for the intel_pstate driver (v2.99)*, (https://lore.kernel.org/linux-pm/20200428032258.2518-1-currojerez@riseup.net/).

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