

Teams vs Zoom Report

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1 Setup

Tabell 1: Test Platform

Laptop	ThinkPad X1 Carbon 7th
OS	Windows 11 Pro (Build 22621.ni release20506-1250)
CPU	Intel Core i7-8665U CPU @ 1.90GHz
GPU	integrated
RAM	16GB

The **laptop** under test was configured as follows:

- bluetooth, and most other background applications are turned off
- volume is set to 0
- brightness is set to minimum
- the laptop is running on battery power
- battery saver off, and all experiments starting with 100% battery.

The **meetings** were configured as follows:

- on the test laptop camera is on and the microphone unmuted
- one extra participant is present in the video conferencing tool with the camera on and microphone unmuted with voices in the background

Open windows on the computer aside from the conferencing tools:

- Google Chrome
- VS Code
- PowerShell (with Always on Top option enabled)

2 Experiment Design

The experiment is to measure the energy consumption of the laptop running on battery power while using Zoom and Microsoft Teams for video conferencing. The energy consumption is measured using the Intel Performance Counter Monitor (PCM)¹ tool.

¹<https://github.com/intel/pcm>

The experiment consists of 10 runs for each video conferencing tool, each run lasting for 10 minutes, with 5 minutes of idle time between each run. The sampling rate of the collection tools is 1 Hz. The laptop is charged back to 100% after the first 10 runs are finished.

All code and data artifacts are available here: <https://github.com/Raiduy/zoom-vs-teams>.

3 Results

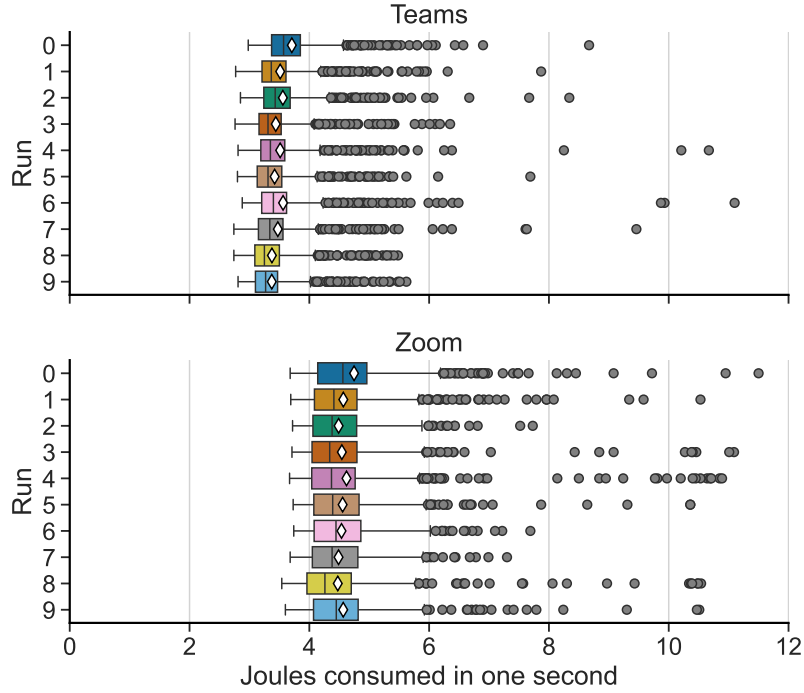


Figure 1: Boxplots per run of the energy consumed every second.

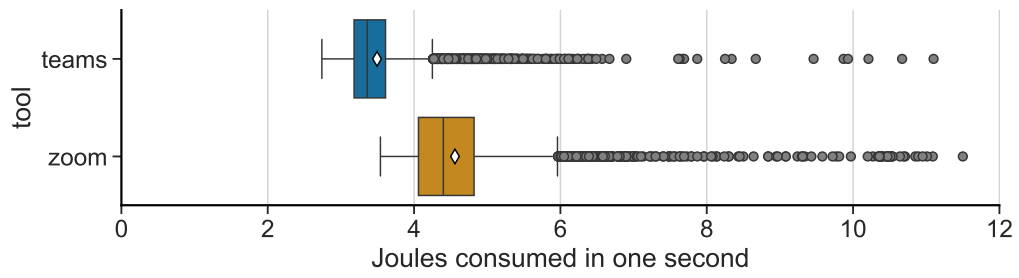
In Figure 1 we have the energy consumed every second for each run. The vertical axis shows the run number, and the horizontal axis shows the energy consumed over one second of the app running in Joules. We can see that across the runs there is little variation in terms of energy use, thus we can argue that the laptop did not enter any throttling phases across the runtime of the experiments.

Moreover, we can already see a clear difference in energy consumption for the two conferencing tools, with Teams consuming less energy than Zoom.

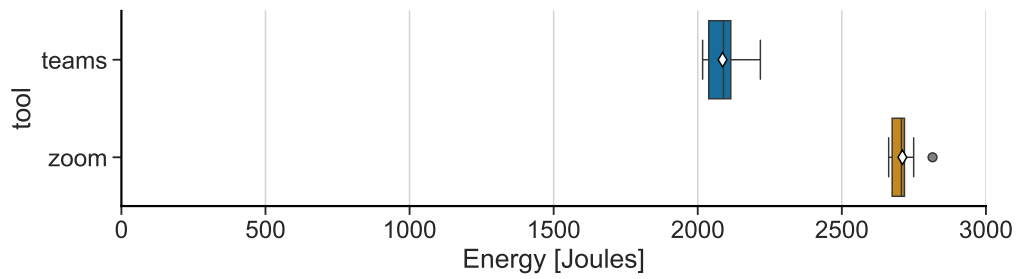
In Figure 2 we see the two tools compared directly in terms of energy consumed per second. Teams consumes on average 23% less energy than Zoom.

We also compare the total energy consumed over the duration of the 10-minute runs in Figure 3, and we see that the results are consistent in terms of the 23% average difference.

Finally, Figure 4 shows the energy consumption over time for each of the different runs. Here we notice that Zoom tends to have more energy spikes compared to Zoom.



Figur 2: Boxplots per tool of the energy consumed every second.



Figur 3: Boxplots per tool of the total energy consumed in a run.

4 Conclusion

In conclusion, for this experiment setup, Teams is the more energy-efficient tool to use for video conferencing.

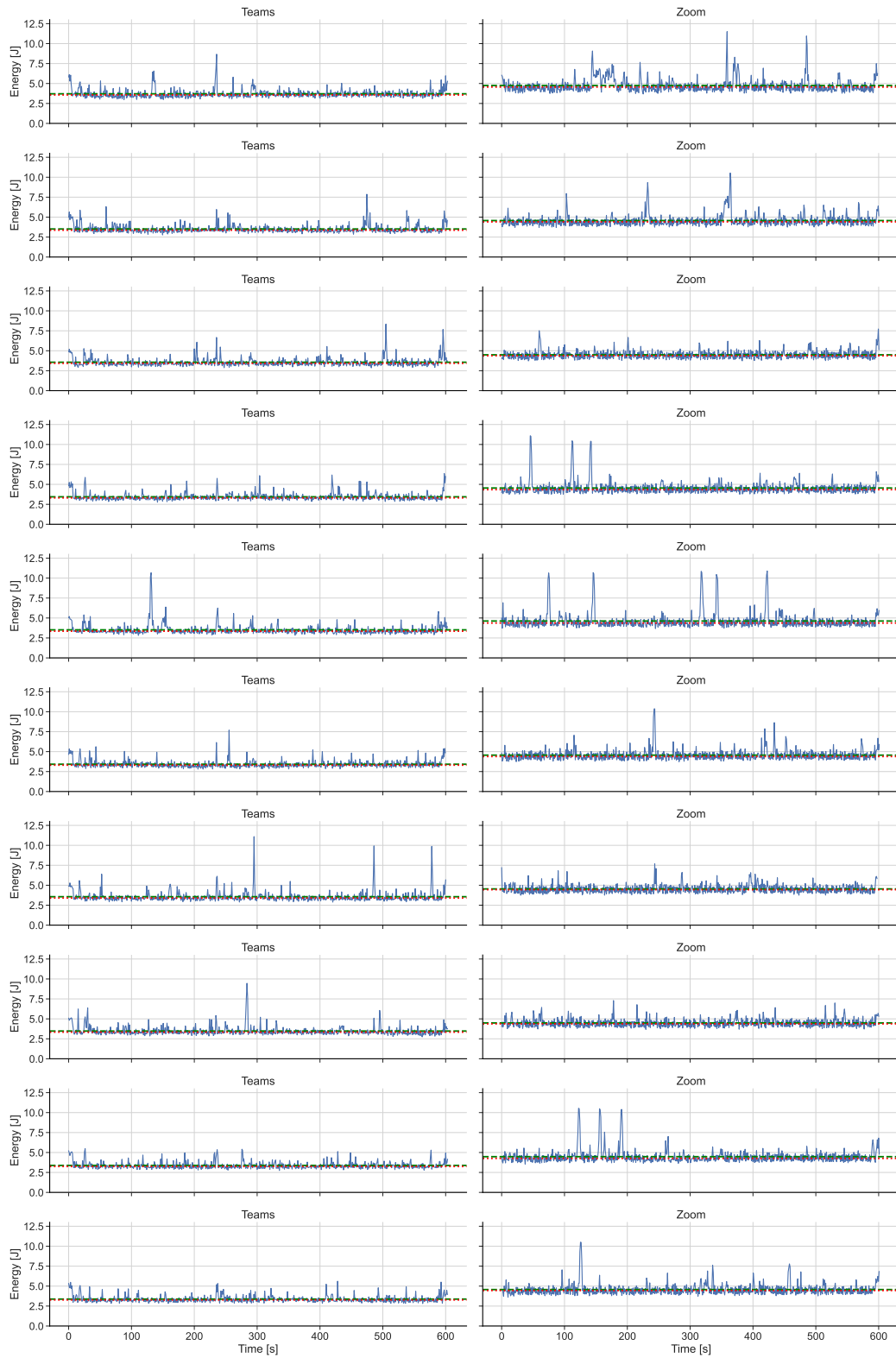


Figure 4: Lineplots for the energy consumption over time. Red, dotted line marks the median. Green, dashed line marks the average. Figure also available here: https://github.com/Raiduy/zoom-vs-teams/blob/main/figures/individual_runs_energy_over_time.pdf