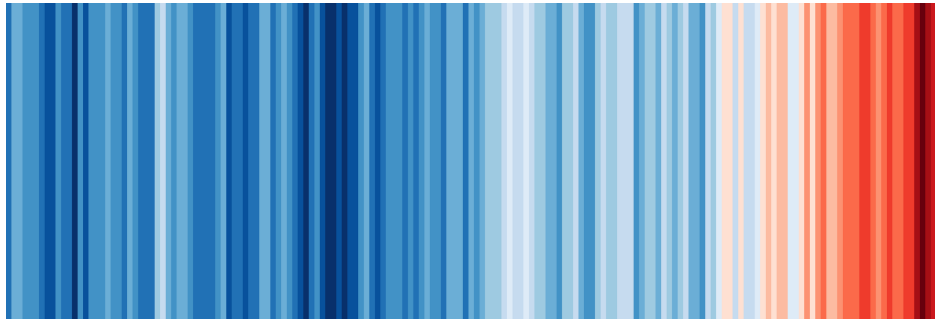
Benchmarking the Power Usage of Network Devices



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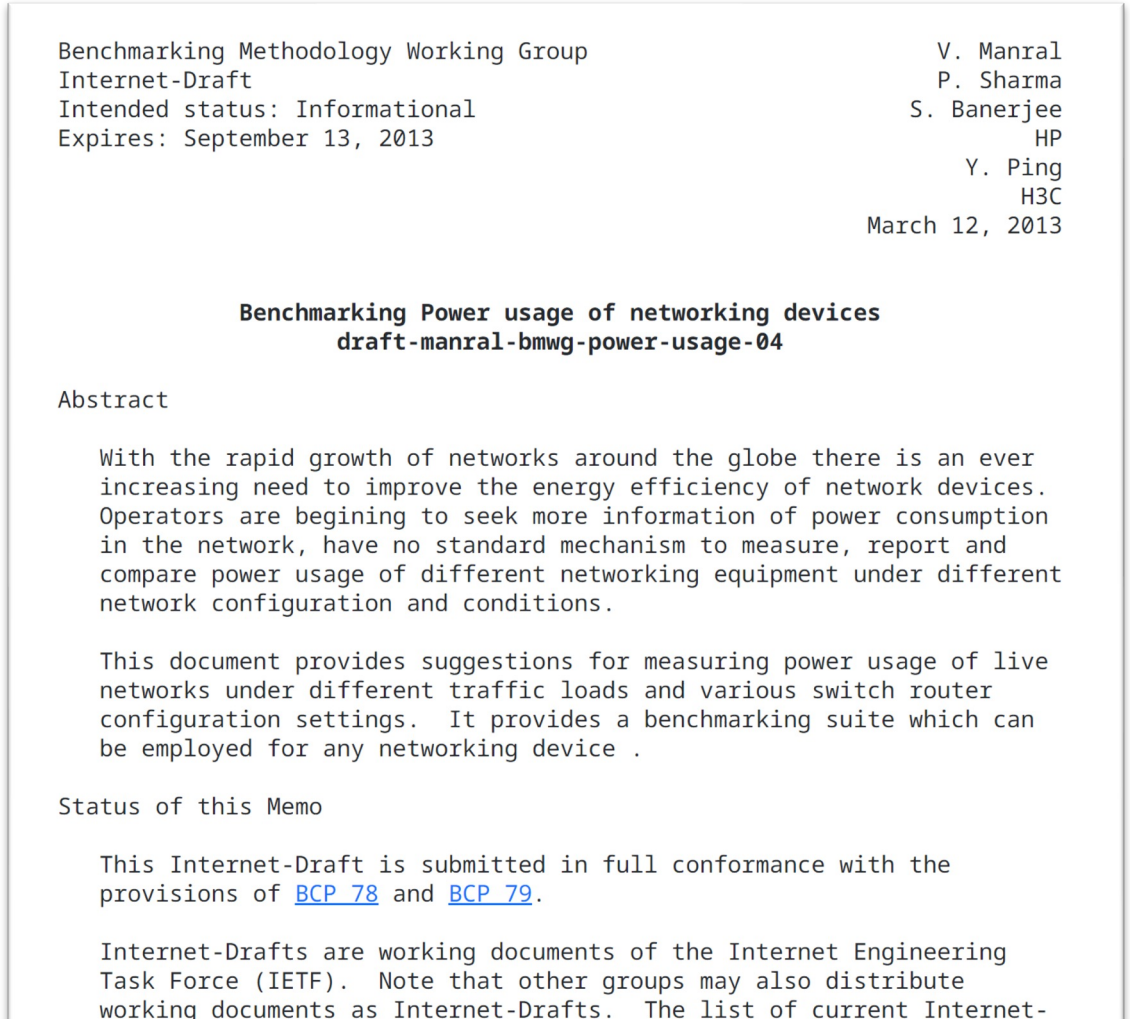
IETF 118 — Prague, Nov. 4 - 10, 2023

We started a draft 10 years ago, it's high time we finish it!



Benchmarking Methodology Working Group
Internet-Draft
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Benchmarking Power usage of networking devices
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Abstract

With the rapid growth of networks around the globe there is an ever increasing need to improve the energy efficiency of network devices. Operators are begining to seek more information of power consumption in the network, have no standard mechanism to measure, report and compare power usage of different networking equipment under different network configuration and conditions.

This document provides suggestions for measuring power usage of live networks under different traffic loads and various switch router configuration settings. It provides a benchmarking suite which can be employed for any networking device .

Status of this Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF). Note that other groups may also distribute working documents as Internet-Drafts. The list of current Internet-

- The only data we get from manufacturers is usually "max power"
- Hardly any device runs at its maximum capacity
- Few measurements are available, Most are 10+ years old

- We have a poor understanding of the "typical" power usage today

  Defining this is non-trivial!
  That's why we need a benchmark...

The high-level goal is to model power usage better. The challenge lies in the details...

What are the useful loads to measure?

- 100% idle
- Some in-between loads
- Fully loaded

- What does “idle” mean w.r.t.
  - Port configuration?
  - Control plane state?

What approach is best suited?

- Black-box measurement of the entire device
- Additive measurement of logical modules
- Mix of both

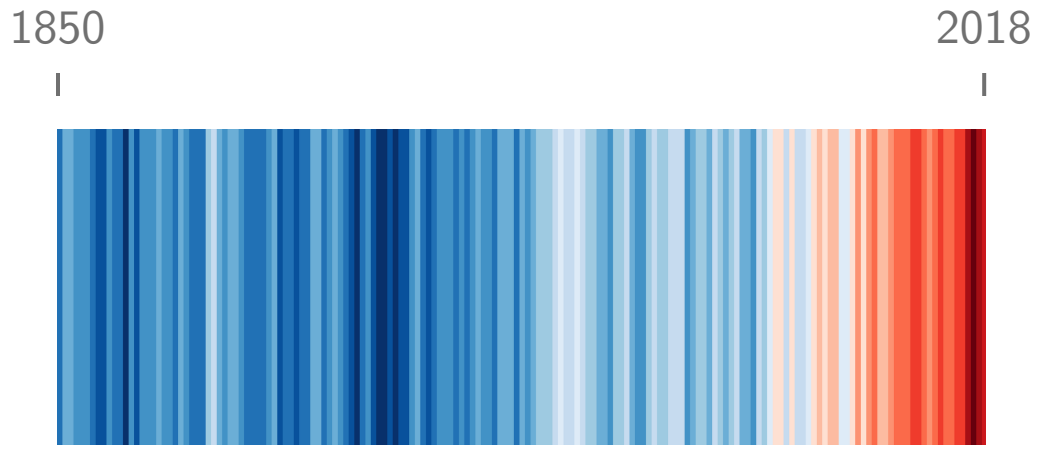
- The benchmark must strike a trade-off between
  - Feasibility of the measurements
  - Generality of the method
  - Accuracy of the resulting model

Feedback and contributors are more than welcome!

- Which benchmarking approach do you think is best?
- Do you think such a benchmark is useful for the e-impact work?
- Do you you have ideas / data / time to contribute to this project?

Help welcome!

Benchmarking the Power Usage of Network Devices



Climate stripes. Ed Hawkins, 2018
portrays the increase of average global temperature

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