

# **Characterization and Benchmarking Methodology for Power in Networking Devices**

**draft-cprjgf-bmwg-powerbench-02**

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**IETF120 BMWG meeting**

# Background

- Technology trend is moving from power consumption monitoring toward energy efficiency observability and management
  - Allow optimizing energy usage on network devices based on capability while improving the overall network utilization
- The benchmarking methodology is important tools which help vendors to test energy efficiency of their devices
  - the data traffic per unit of energy consumption across the network
- The following objectives can be served as follows :
  - **Objective 1:** Assessing ``which system performs best'' over a set of well defined scenarios.
  - **Objective 2:** Measuring the contribution of sub-systems to the overall system's energy efficiency performance (also known as ``micro-benchmark'').
  - Objective 3: Measuring the contribution of sub-systems to the overall power consumption
- The benchmarking methodology outlined in this draft focuses on the first objective.
  - Specifically, it aims to compare the energy efficiency for individual devices.

# Document Status Update

- It was first introduced in IAB E-impact workshop (Feb 15~16)
  - Consider what is running on the device and which features are enabled besides selected throughput as weighted value (Marisol)
  - work with other type of equipment (Toerless)
  - Consider how long it take for transition among different traffic load level? (Alex)
- And then presented in BMWG in IETF 119
  - Thanks Luis Miguel Contreras Murillo for input in BMWG ML
    - Consider more realistic scenario besides what is documented in ETSI Spec
      - Taken  $T_i$  as the total \*installed\* capacity of all interfaces could not be representative of a real deployment scenario
- The latest update is v-(02), changes compared to the previous versions:
  - Add IANA section;
  - Move some references to information reference section;
  - Some other Editorial changes.

# The Relation with GREEN BOF Deliverable

- The proposed GREEN Working Group is tasked to explore the information to be exposed in the YANG model
  - Static Capability parameters
  - Dynamic Metrics such as
    - Maximum throughput, traffic load, Energy Efficiency ratio,
    - Power usage effectiveness, Cool load factor, Power load factor
    - Power gain,, Energy Proportion per component
- The proposed GREEN Working Group will closely collaborate with:
  - Working Groups that might have related work or expertise with defining and standardizing metrics and measurement frameworks (e.g., IPPM and BMWG).

# Next Step

- The latest version is a good basis and now ready for adoption.
- Your additional comments and input are welcome!
- Decide on open questions:
  - Align with a set of dynamics metrics exposed using YANG data model in GREEN WG and introduce additional metrics besides energy efficiency ratio metrics
    - Such as Power gain, Energy Proportion per component
  - Develop benchmarking methodology for these additional metrics.