PROBLEM STATEMENT 01:

Power Manager Telemetry

Category: Sustainability

Participants: 5th/6th Semester Students

Pre-requisites:

- Computer Systems Basics – CPU/Memory/Storage/NIC
- Good Hands-on Experience on Linux
- Programming Skills in Python and/or C
- Familiarity with Kubernetes/Docker

Description:

In the era of 5G and edge computing, the deployment of devices across different locations has increased, leading to a higher power consumption. To address this issue, the government is pushing enterprises and industries to reduce power usage. The goal is to achieve net-zero power consumption (https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1961797)). Additionally, the price of electricity is increasing, making it crucial to understand the total power drawn by system.

You will be responsible for:

1. Researching and identifying open-source tools for power measurement.
2. Identifying and documenting the available knobs in a system to measure power.
3. Collect power telemetry data from CPU, memory, NIC, and TDP etc.
4. Measure and record system power utilization for CPU, NIC, and TDP based on the input parameter of system utilization percentage.
5. Create a report on the power problem, technical approach, and results.

Expected Outcomes:

- Ability to get telemetry data of system (CPU, memory, NIC and TDP).
- Run a traffic to consume 100 % utilization of system using Container(s).
- Get the telemetry data.
- Create a solution to run utilize a system and get telemetry data.
  - Input: Percentage of system utilization as parameter.
  - Output: Measure system power utilization for CPU, NIC and TDP.

Deliverables:

- Detailed report on the power problem, technical approach taken, and results.