A Power Conserving Path Placement Strategy (PCPPS)

draft-many-teas-power-steering

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Introduction

- A robust network has enough capacity to satisfy demand during peak hours
- Many networks have daily utilization patterns
  - Sufficient capacity during peak hours
  - Excess capacity during non-peak hours
- Excess capacity increases energy costs and environmental impact

Power Conserving Path Placement Strategy (PCPPS)

- During low-demand periods
  - Concentrate traffic onto a small set of links
    - ***Supported by a small number of network resources***
  - Leave some network resources idle or nearly idle
  - Power down idle / nearly idle network resources until they are needed again

PCPPS and CSPF

- PCPPS leverages CSPF
- CSPF without PCPPS
  - Each link has a TE metric
  - CSPF computes a path that does not violate constraints and whose links have the lowest cumulative TE metric
- CSPF with PCPPS
  - Each link has a PCPPS metric
  - CSPF computes a path that does not violate constraints and whose links have the lowest cumulative PCPPS metric

PCPPS Metric

- Computed by each ingress node for each link in the topology
  - Influenced by power information
- The algorithm used to compute the PCPPS metric is beyond the scope of this draft
  - Not required to be identical on every node
  - Area for innovation and differentiation
- Power information
  - Local information is learned from the local platform and advertised in IGP
  - Remote information is learned from an IGP
  - Stored in the Traffic Engineering Data Base (TED)
  - Described in this draft

Power Information

- Power Save Capability
  - Indicates whether an interface can be powered down
- Power Groups
  - An abstraction of power consumption in router components (line cards, gear boxes, etc.)
    - Power consumed by each component
    - Dependency among components
    - See draft for details
  - An interface can belong to one or more Power Groups

Power Information (continued)

- Interface Power
  - Power consumed by an interface, not including the power consumed by the Power Groups to which it belongs
- Unidirectional Sleeping Bandwidth
  - Sleeping bandwidth on a link
  - Useful for LAGs
- Sleeping links

Ask

- Adopt as WG document
- Inform IGP work
  - draft-many-lsr-power-group