TEPG: a traffic engineering based power-aware greedy routing algorithm in backbone networks with bundled links

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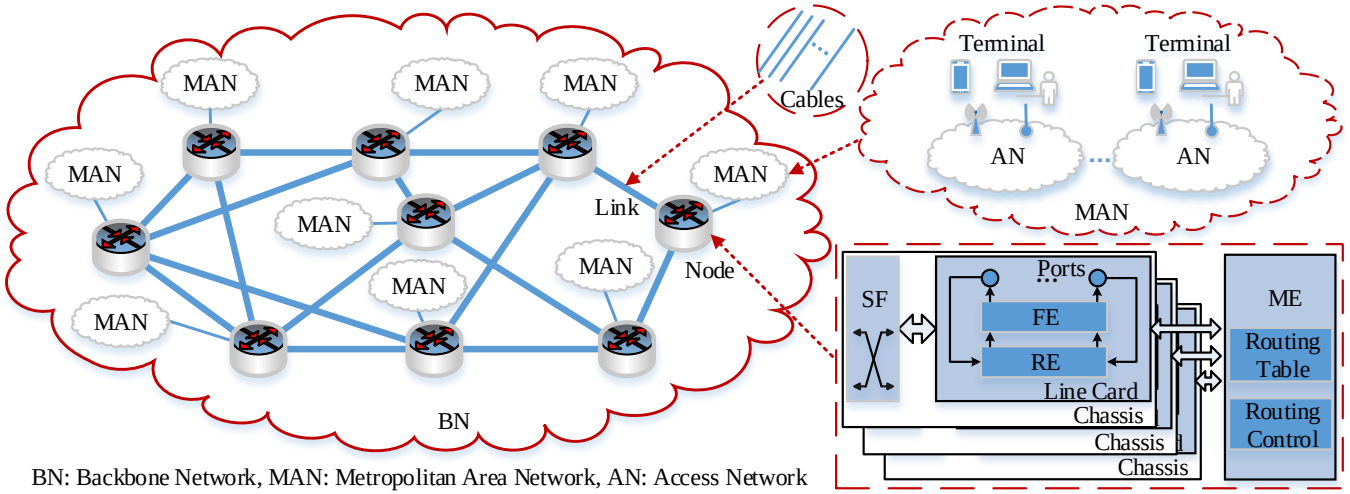
Problems & Ideas

- Problems of conventional power-aware solutions:
  - Most of the researches concentrated their efforts on power-aware networking under the non-bundled link scenarios
  - The routing oscillation was always caused by network topology change during state switching of network elements.
- Ideas: We investigate the power-saving potential of the Low Power Idle policy&Traffic Engineering-based green routing solution under the bundled link scenarios.

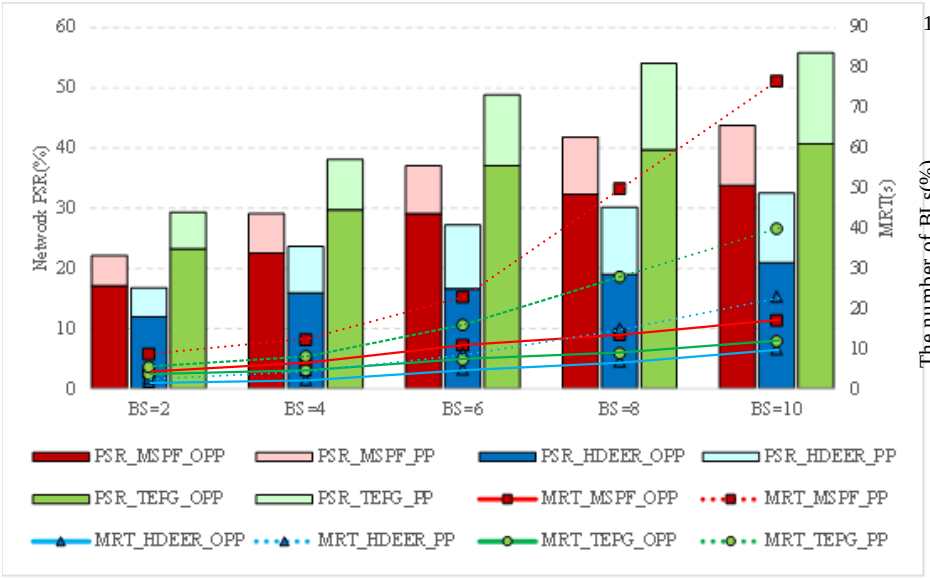


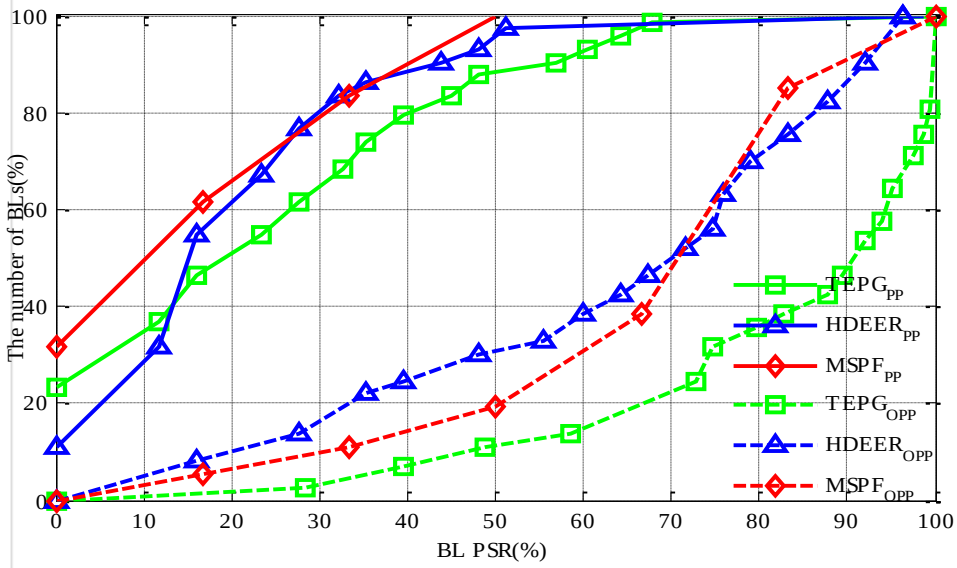
BN: Backbone Network, MAN: Metropolitan Area Network, AN: Access Network

We devise power-aware solutions from a view point of TE for green routing to achieve a substantial power saving in the bundled link based backbone networks.

Main Contributions

- Contributions:
  - A fine-grained port-level optimization to address the problem of optimizing the total power consumption of the bundled link-based backbone network under the QoS constraints;
  - A two-stage novel TE based Power-ware Greedy routing algorithm (TEPG) to solve the bundled link-based power-saving routing;
  - To elaborate greedy routing by an available capacity of neighbor nodes based hop-by-hop routing stage and a greedy pruning stage .





Left: PSR profiles & MRT under different BSs; Right: CDF of the BL PSRs.