Use Cases for Power-Aware Networks

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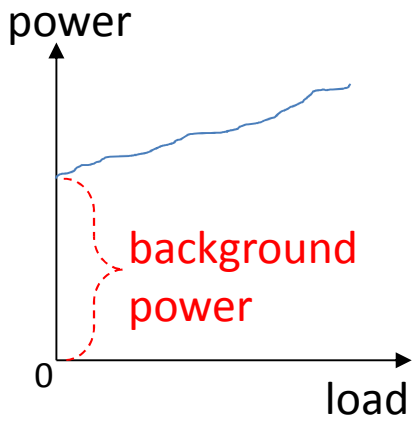
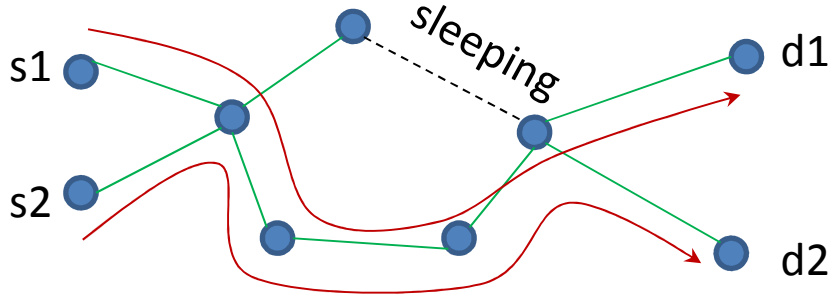
The ‘Background’ Power

- Even no load is carried, power-on network devices consume a great amount of ‘background’ power.
- Network devices should be put into sleeping state to save more power.
- The network should be power-aware of network devices.



1. Sleeping Links

- Traffic Aggregation through control plane (e.g., Traffic Engineering).
- Idle links are put into sleeping state safely.
- The energy consumption of the whole network is reduced.

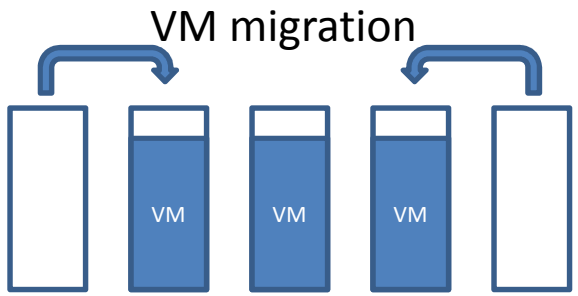


2. Composite Links

- When the traffic load is much lower than the overall bandwidth of a composite link, some component links can be put into sleep state.
- Keep at least one member link active.
- Advantage: the connectivity maintains.
- Use case 1&2 may be combined.

3. Server Consolidation

- Virtual Machines (VMs) are moved to a fraction of servers while others will be idle.
- Idle servers are put into sleeping state to save energy of the whole DCN.
- The workload and power parameters of servers should be monitored by the NMS.



4. Load Scheduling Among Sites

- One customer may have multiple DCNs which are geographically scattered.
- Power price for these DCNs varies. Being Power price Aware, the work load should be scheduled to the position with low power price.
- This use case aims to reduce the overall OPEX of the DC operators.

5. Elastic Network Infrastructure

- Network devices report their traffic load and power consumption profile to the Network Management System (NMS).
- The network infrastructure is elastic and can fit the traffic pattern with a subset that consumes the minimum power.
- Communication paths should be adjusted according to the subset.

Next Steps

- Welcome to comments on this draft.
- Contributions to PANET is desired.
- Please contact us if you feel interested.

Thanks!