PS-24. Dynamic Topology Reconfiguration for Energy Efficient Network with Link Power Control: MiDORi

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Introduction: What's "MiDORi" ?

MiDORi: Multi-(layer, path, and resources) Dynamically Optimized Routing

- Innovative network-sided approach for realizing green transport and data-center networks
- "midori" is a Japanese word which means "grass", "forest" and "green". 緑

Target: Reduce at least 10-30% of energy consumption of router/switch networks by Traffic Engineering (TE)

⇒ The physical network is optimized according to the amount of traffic transferred in the network.

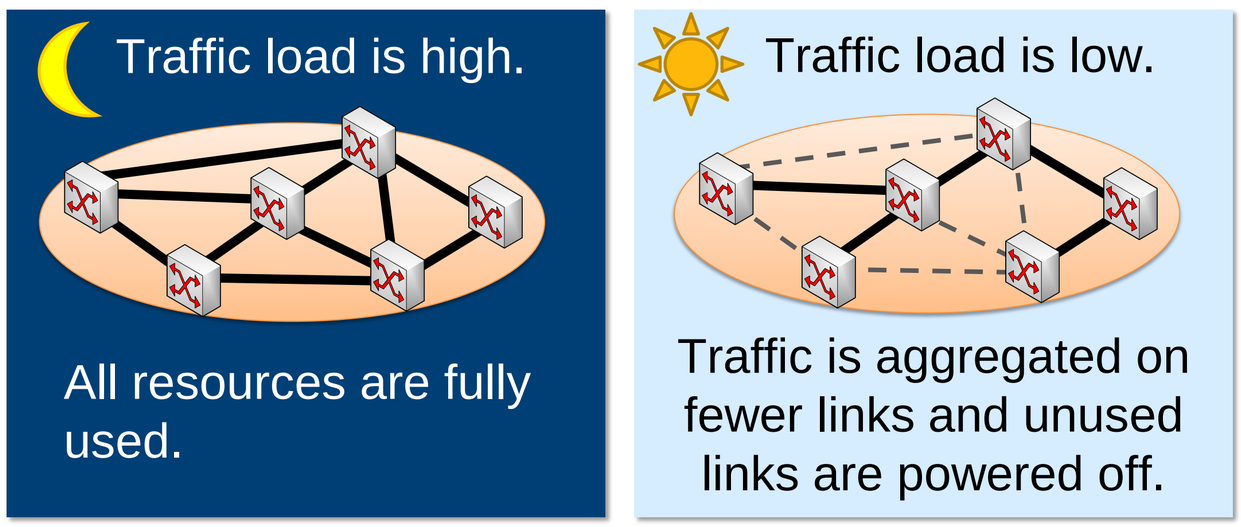
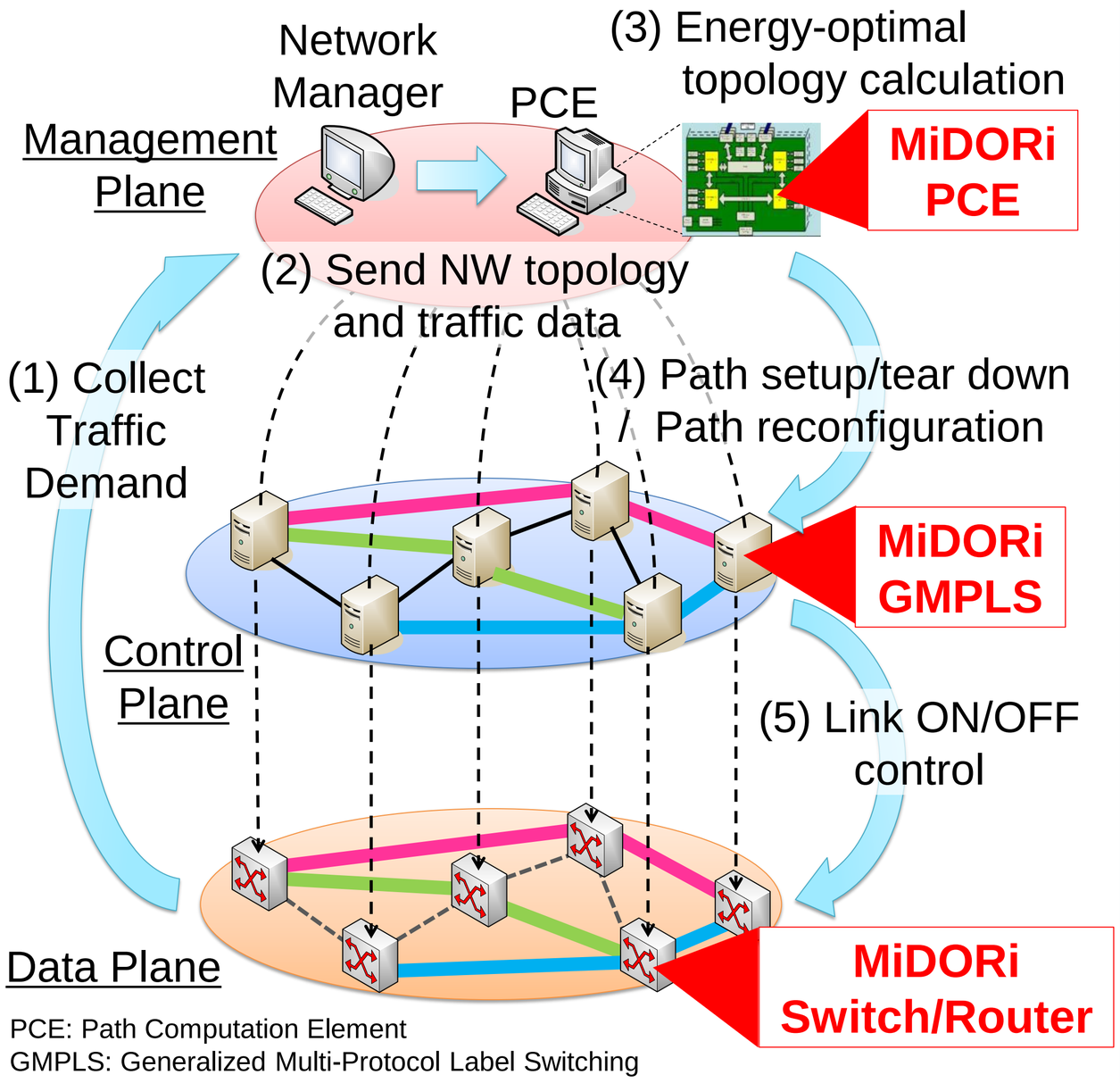


Fig. Reconfiguration of the physical network according to the amount of traffic.

MiDORi Network Architecture



PCE: Path Computation Element
GMPLS: Generalized Multi-Protocol Label Switching

Fig. MiDORi network architecture.

MiDORi PCE: Dynamic aggregation of traffic

MiDORi GMPLS: Extensions for MiDORi network

- OSPF: New link status "power off" is added.
- LMP: TE link power control by ChannelStatus message.
- RSVP: New LSP status flag "power off" is added

MiDORi Switch/Router: Port level power off

Experiment

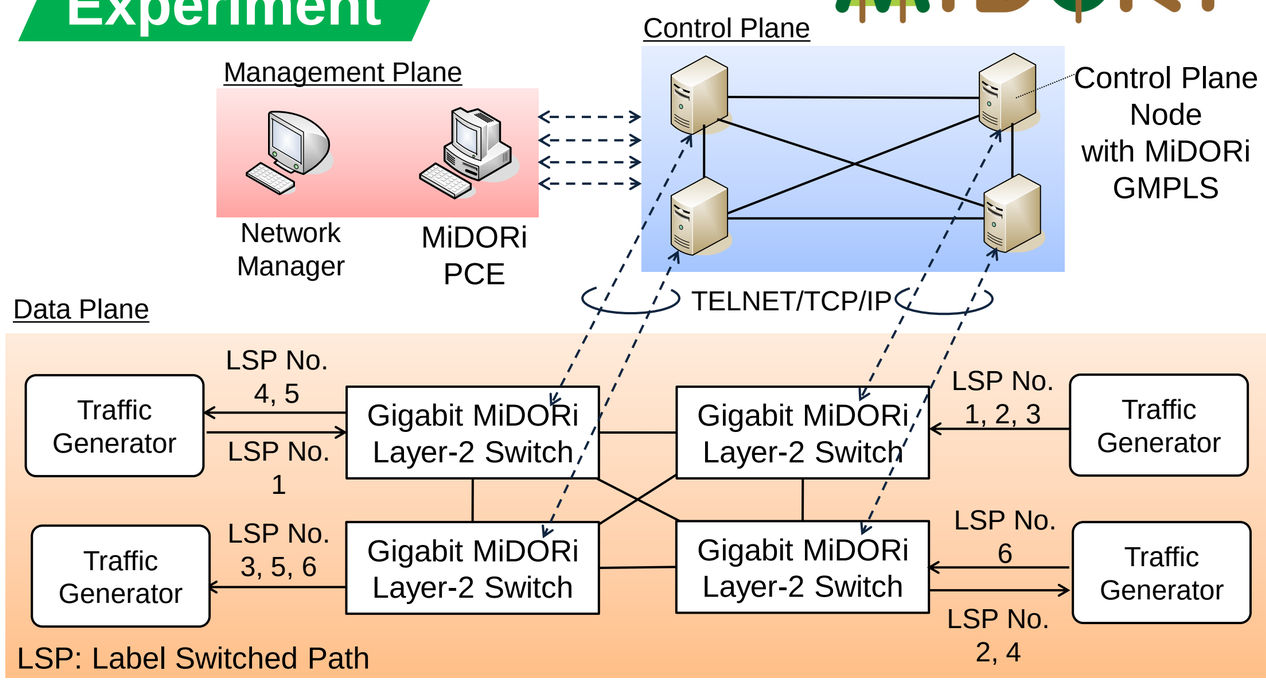


Fig. Topology of the demonstration system.

Algorithm: H. Yonezu, et al., Tu.3.D.4, ECOC2010, Sept., 2010.

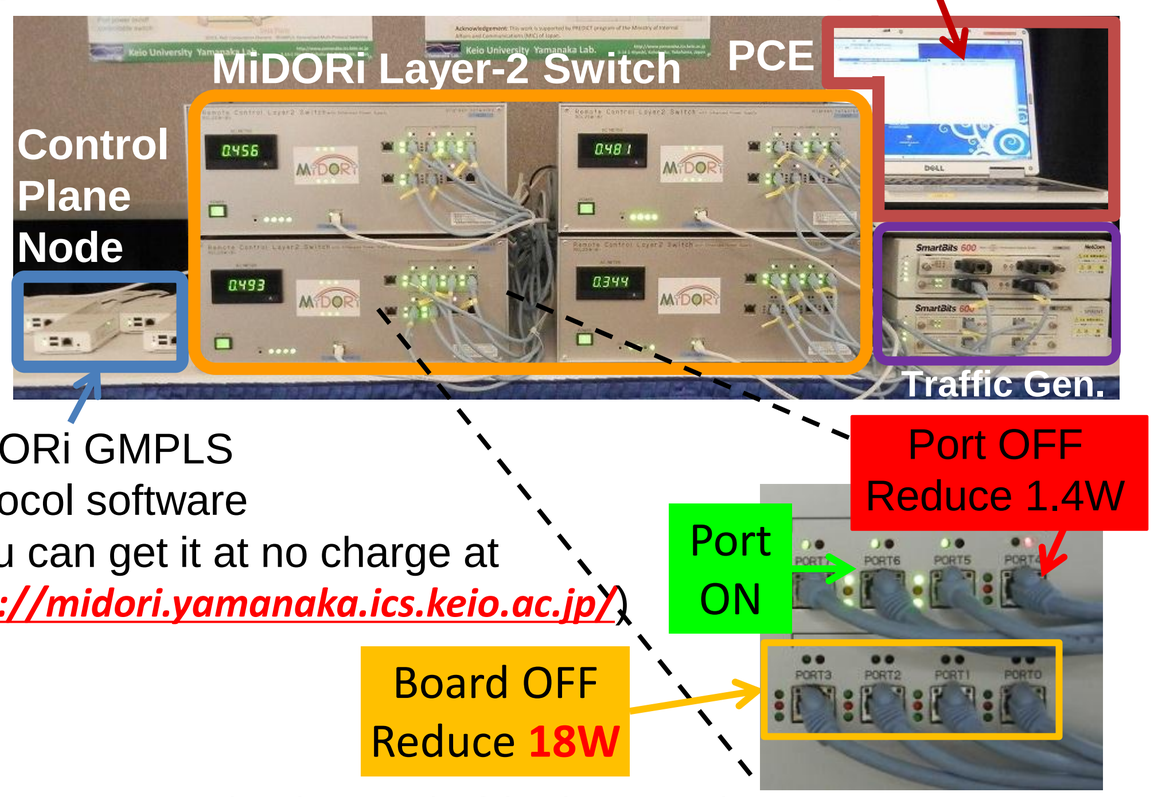


Fig. Photograph of the demonstration system.

Result: Power Consumption

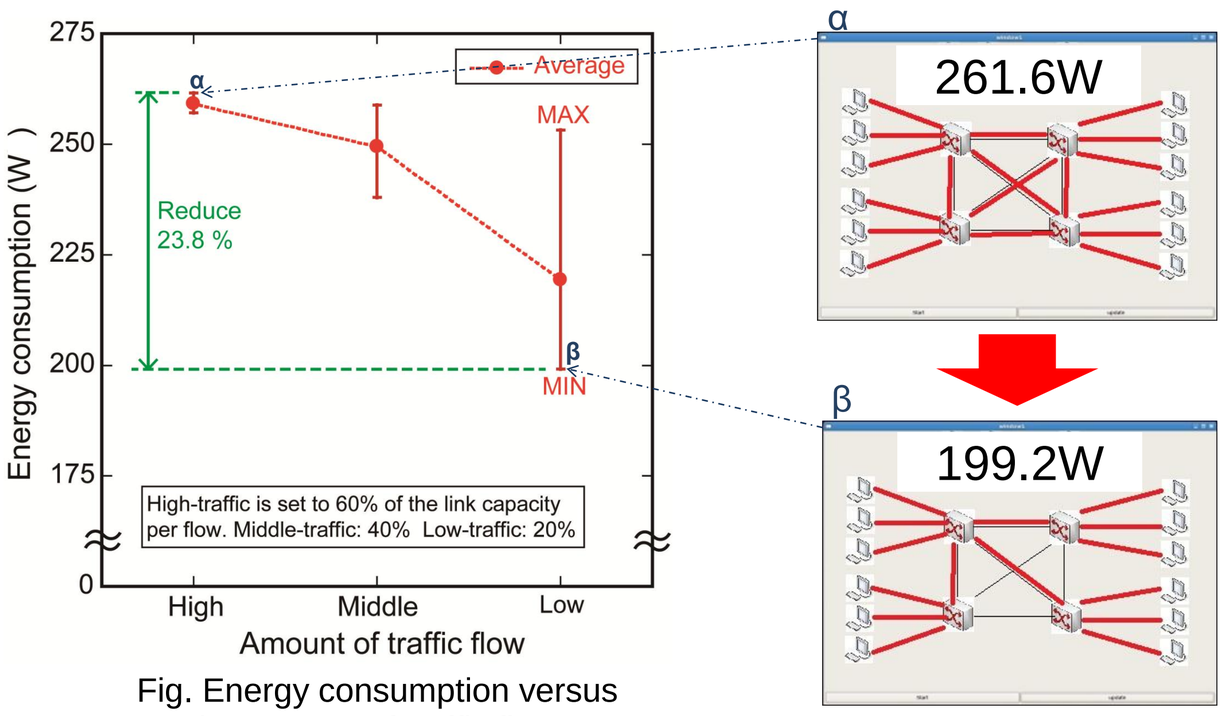


Fig. Energy consumption versus the amount of traffic flow.

Conclusion

Experiment of "MiDORi" network technology with four-node network

⇒ Reduce power consumption by up to 23.8%

Acknowledgements

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