Developer Days
Automation

cisco
The bridge to possible

Optimize Power Consumption

with WAE and NSO

Guillaume Ladhuie
Technical Solutions Specialist
May 2023

Energy Management in Network Operations

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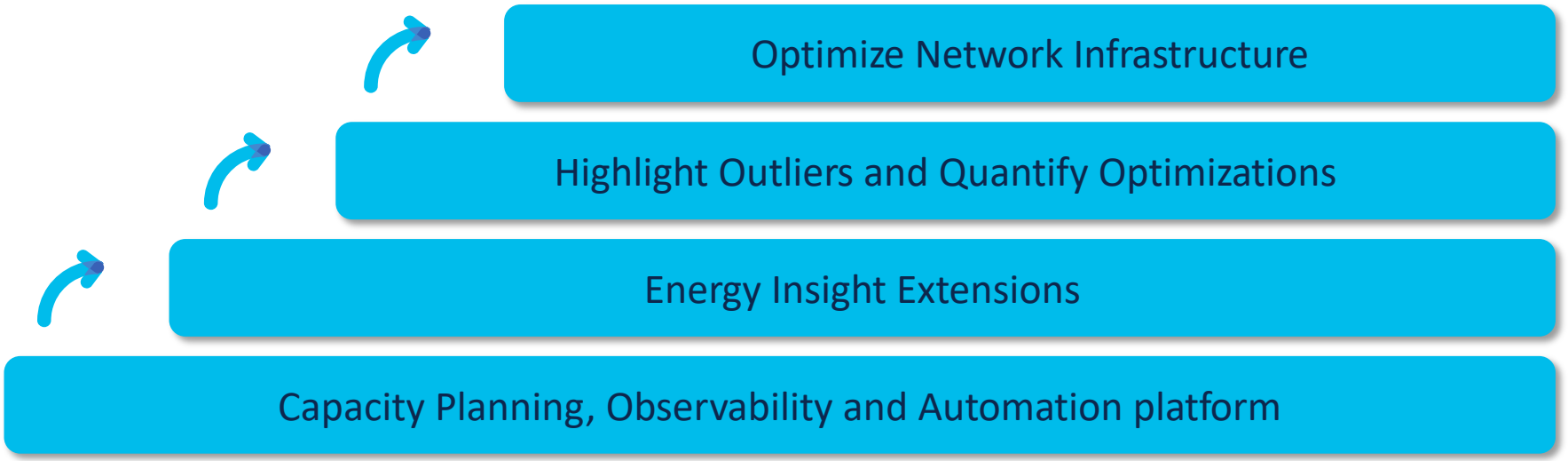
Energy Management in Network Operations



Without compromising performances and network resiliency

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Paradigm Switch

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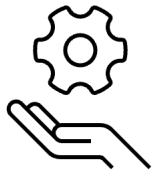
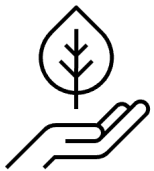
Paradigm Switch : Network Design

- Available, Reliable and Stable.
- Network capacity has been designed to be resilient to peak-hour traffic.
- Minimizing $/Gigabit



- Adaptative, Optimized and Efficient
- On-demand resources availability and Energy efficient network planning
- Minimizing Watt/Gigabit



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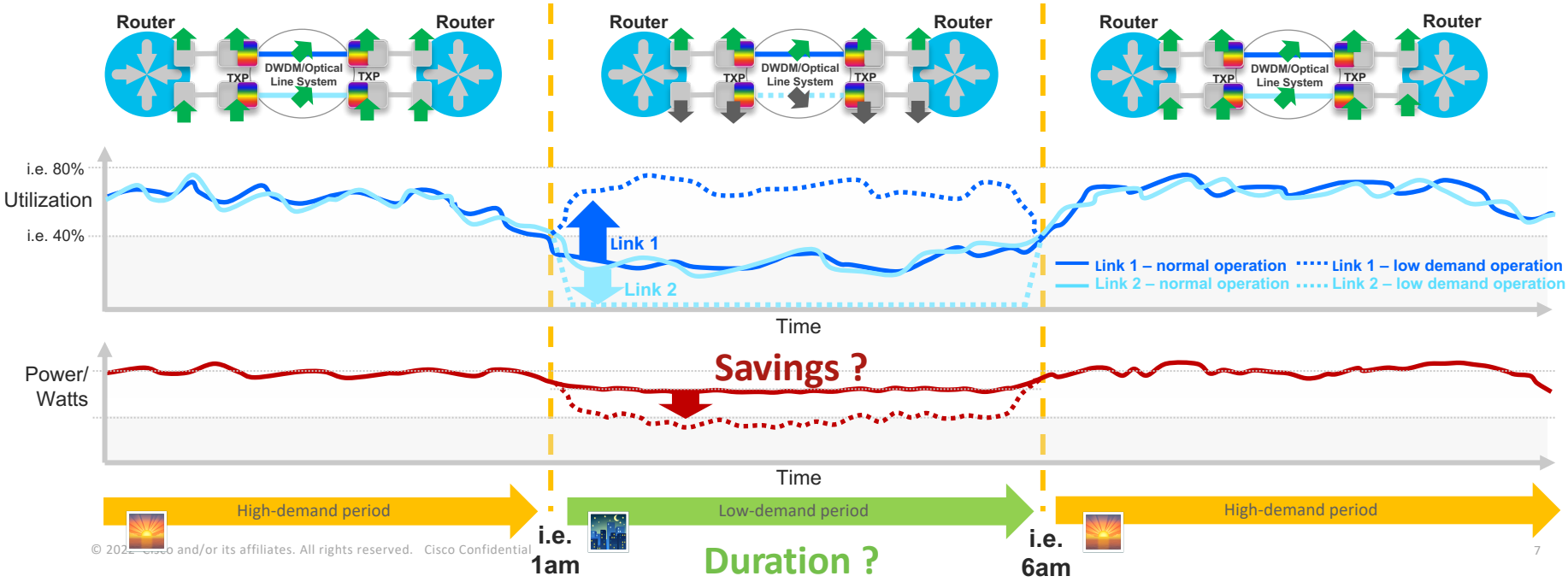
Demand-Based Energy Optimization

Demand-Based Energy Optimization Concept

- De-activate over-provisioned capacity during low-demand period
- Preserve resiliency & node adjacencies - Focus on parallel links and LAGs



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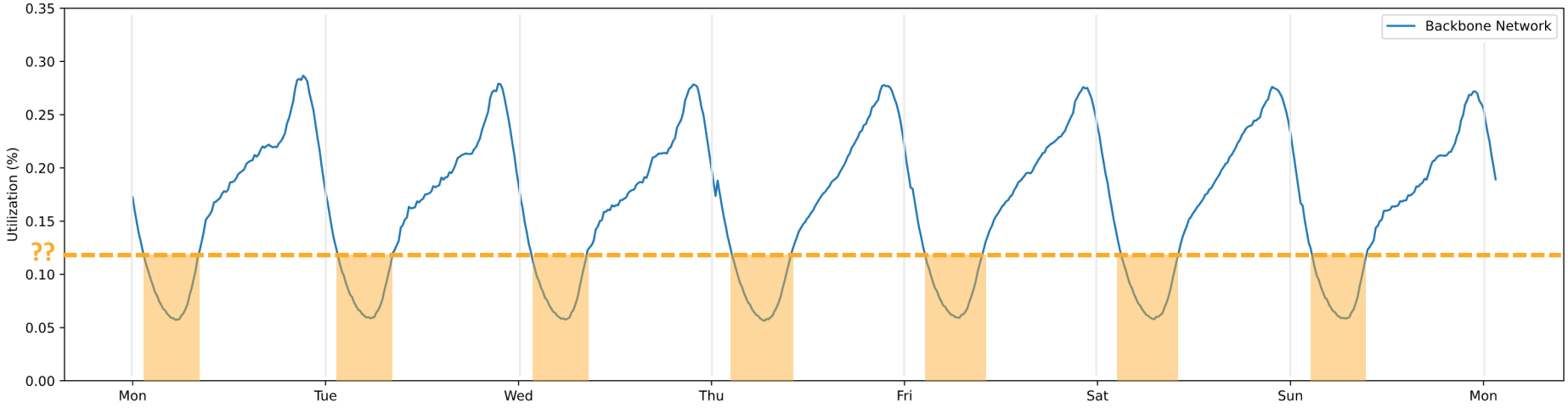
Demands Traffic Pattern



SP Backbone utilization pattern over an average week

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What does WAE do?

- Build an abstracted network model that includes topology and traffic
- Run simulations against network model

Multilayer Topology

Traffic Demand
(Demand Matrix)

WAE Network Model
“plan file”

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Demand-Based Energy Optimization in WAE

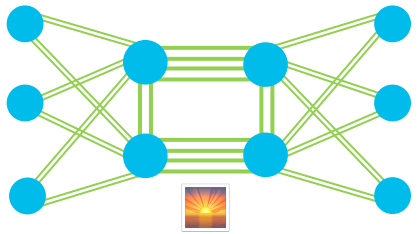
WAE Input Data: Topology, Demands, Interface Power

High-Demand Topology

Link Utilization

e.g., ≤50%

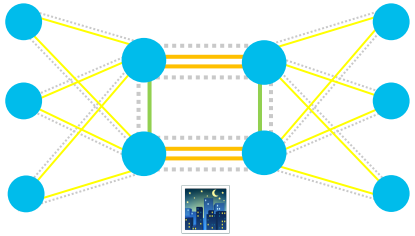
Low demand traffic profile



Power

Analysis Add on

Low-Demand Topology



Link Utilization

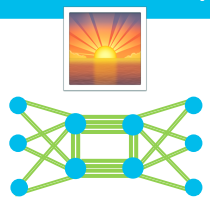
e.g., ≤80%

Low demand traffic profile

Output Data:

- Total interface power of High & Low Demand Topology
- Energy savings (High vs. Low Demand Topology)
- List of interfaces/ports to be de-activated

NSO Config Intent



e.g., 1am

e.g., 6am or unexpected event

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Demo

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Optimization of Today, Better design of Tomorrow

- Software Features for Energy Proportionality
- Energy Efficient Network Designs
- Carbon Traffic-Engineering
- Great Opportunity for Automation and Converged Architectures

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