# From Converging the Routing Architecture to Denial of Service:
## A deeper look at RON and DDoS

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Jun 2025

- Router Optical Networking **(RON)**
- **Secure Edge DDoS Protection**

# Router Optical Networking (**RON**)

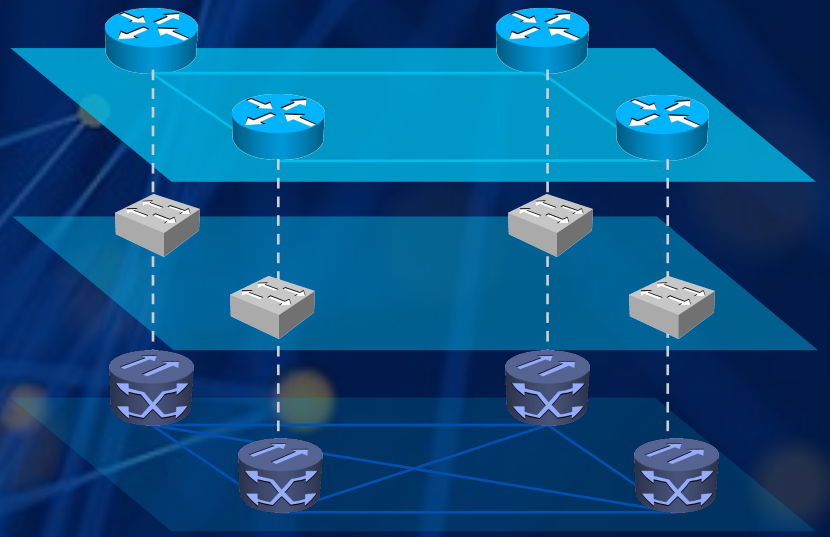
# The Complexity of Legacy Architecture

**Distinct IP and Optical Networks**
Engineered and operated by different internal organizations

**Legacy Burden**
Accumulation of new and old technologies over time

**Asset Utilization**
Medium to low utilization of network assets

**Mounting OpEx**
Automation of complex networks comes with inefficiencies



1 IP Routing

2 OTN

3 Optical (ROADMs)

redundant | complex | expensive

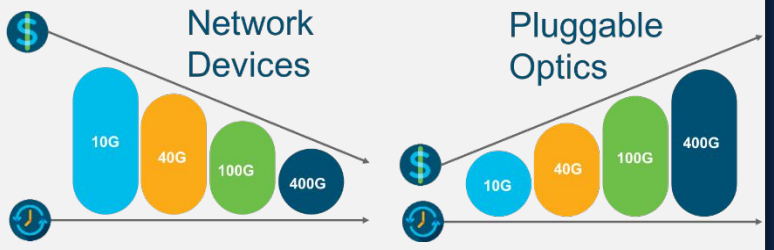
## Simplicity is the ultimate sophistication

Leonardo da Vinci

# Shift in Economics & Technology Evolution

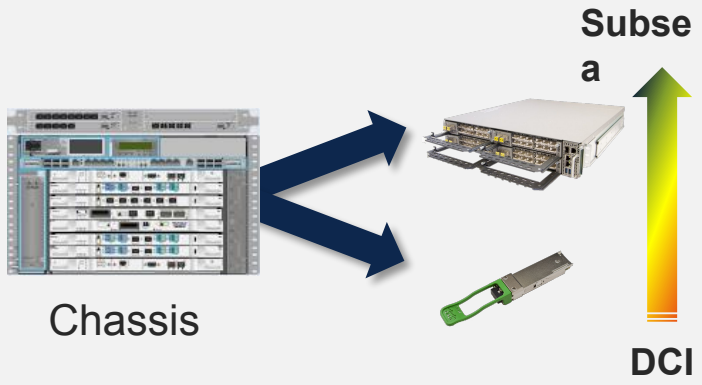
## Optics & Routing

### Shift in Economics



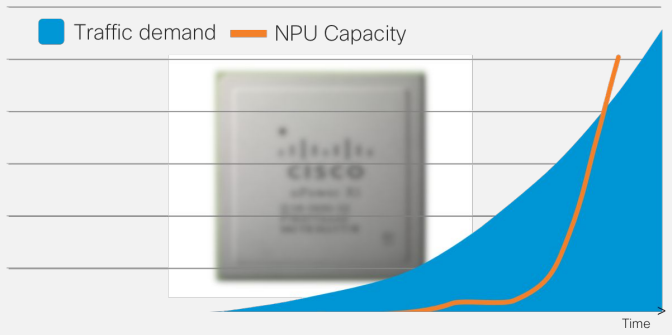

**Ratio: Router port cost < Optic cost**

### Optical Systems Evolution




**Chassis Based Solutions  Pluggables**

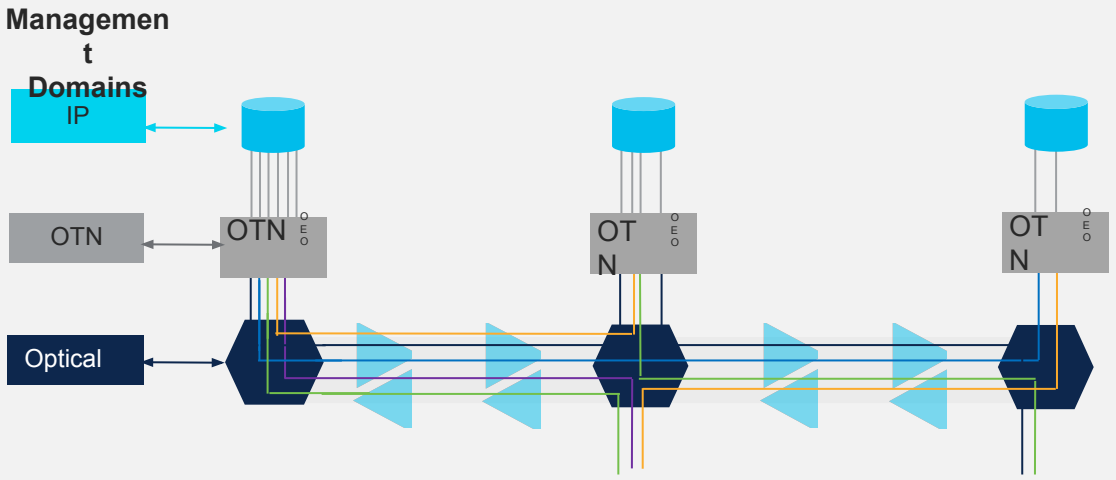
### Routing Bandwidth Scale



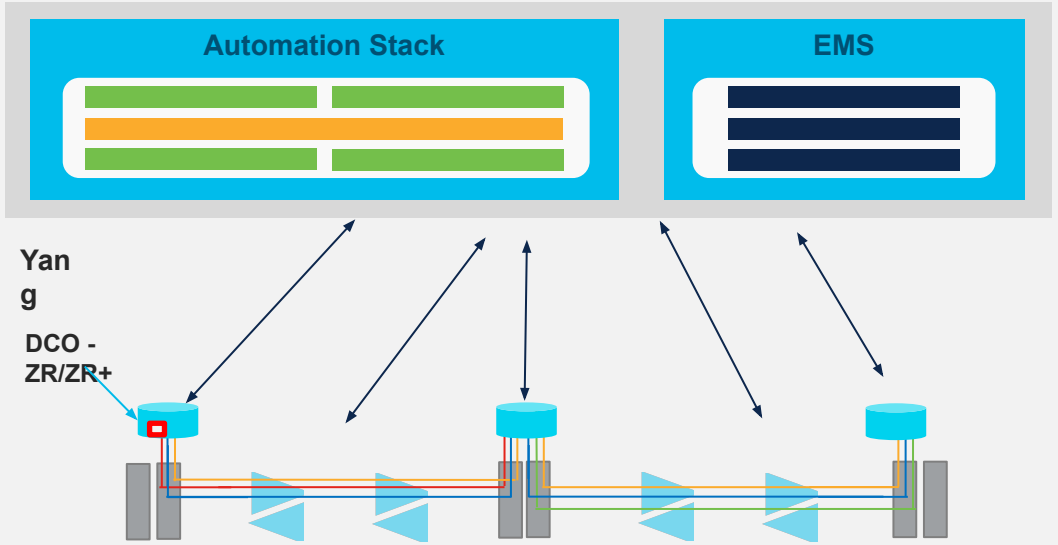

**NPU capacity> Projected Traffic Demand**

# Converging IP and Optical Networks

## Traditional




## RON with Operational Simplification

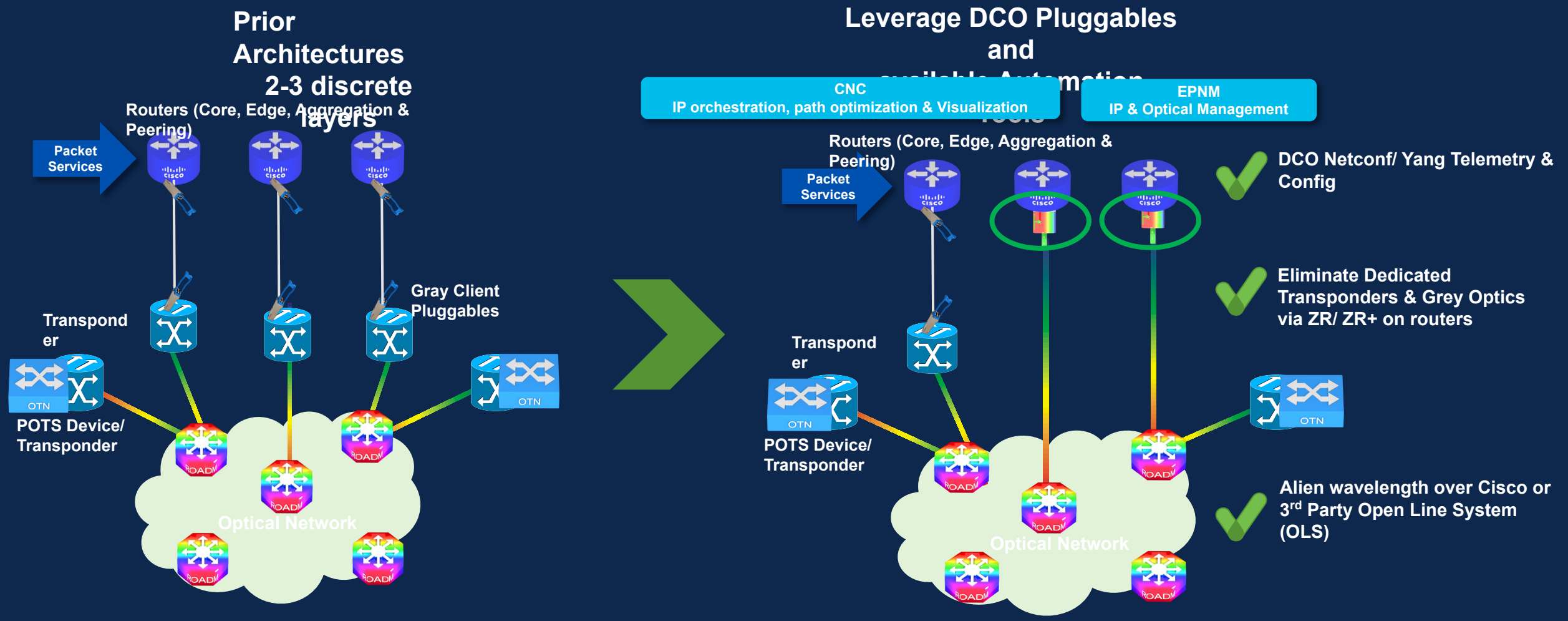



EMS E2E Management and FCAPS
E2E Automation with automation Stack Platform

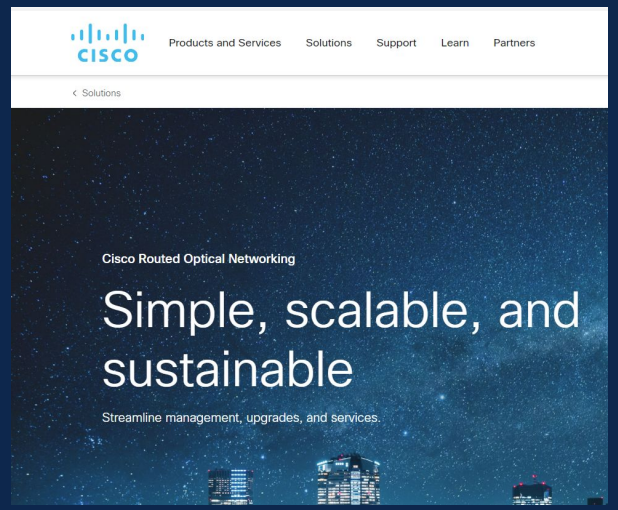
## Benefits

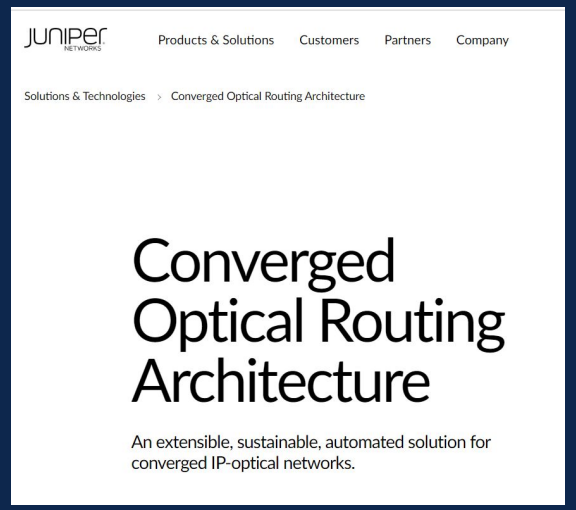
- Provides a single Interface
- Simplifies planning and feasibility
- Moves management and control closer to the service
- Reduces power and footprint
- Enables the sharing of network information for services
- Leverages industry standards

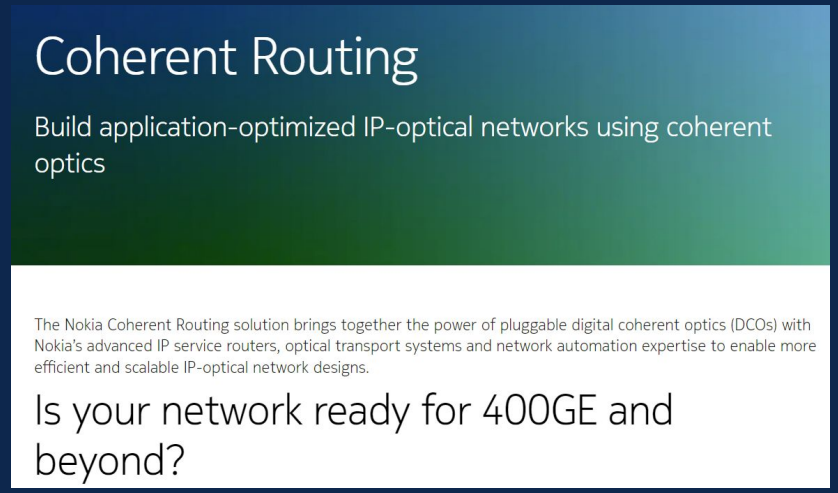
# Use Case Now – Replace Transponders with DCO Pluggables

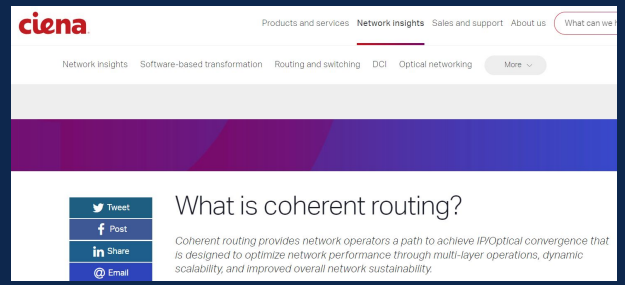


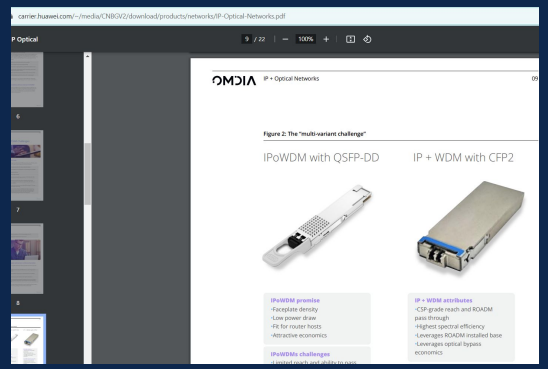
# Entire industry is following the trend..

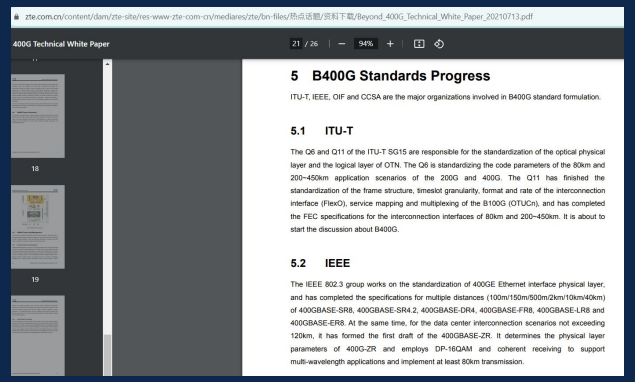


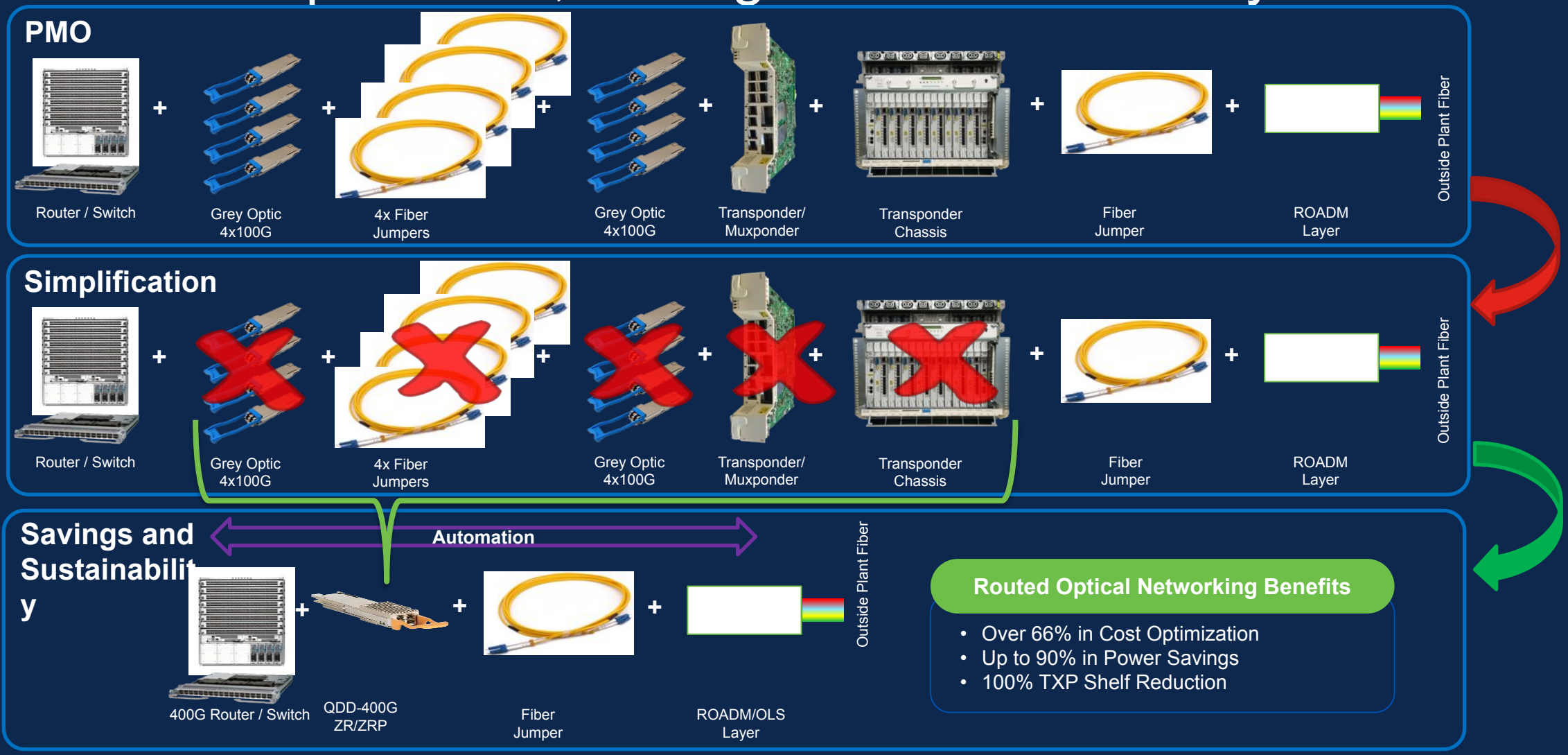



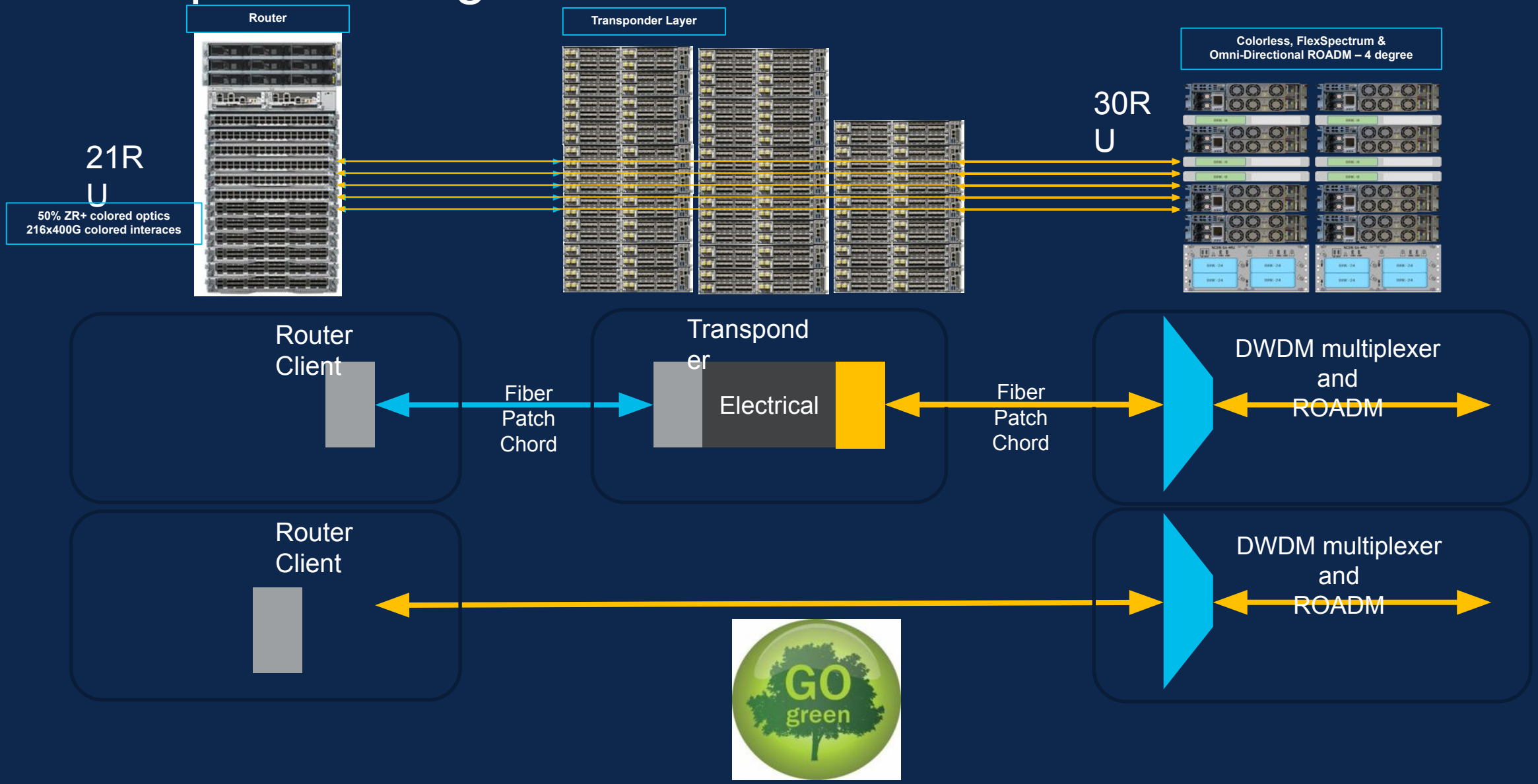




Architecture Link
https://www.cisco.com/site/us/en/solutions/routed-optical-networking/index.html
https://www.juniper.net/us/en/solutions/converged-optical-routing-architecture-cora.html
https://www.nokia.com/networks/ip-networks/coherent-routing/#:~:text=The%20Nokia%20Coherent%20Routing%20solution,scalable%20IP%2Doptical%20network%20designs.
https://www.ciena.com/insights/what-is/what-is-coherent-routing

# The 3 S's: Simplification, Savings and Sustainability

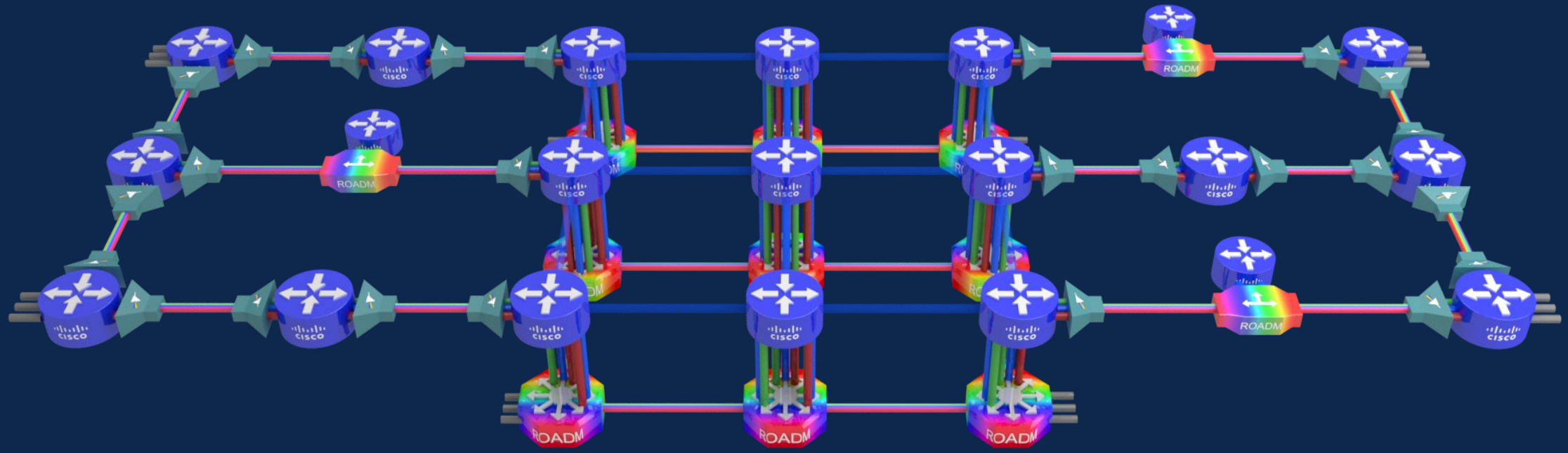


# Footprint Savings Consideratons



# Where Do I Start?

## Routed Optical Networking can be deployed in these three different scenarios




Greenfield

Existing DWDM Layer

Coherent optics over 3rd Party line systems

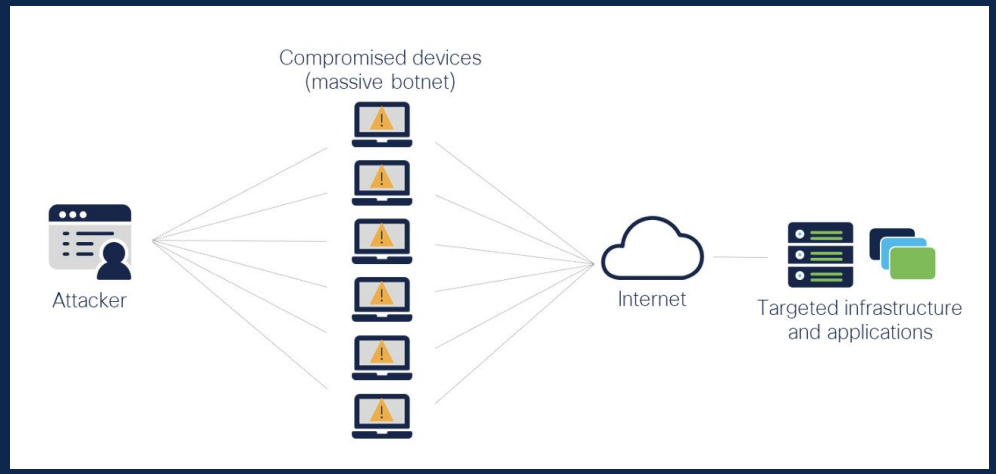
# Secure Edge DDoS Protection

# What is a DDoS Attack?

Distributed Denial of Service (DDoS) attacks:

- Overwhelm the network with high volumes of unwanted traffic (Anomalies).
- Disrupt access to network services and applications, sometimes knocking the network completely offline.
- Leverage IoT botnets, compromised laptops and handsets to launch crippling targeted and reflection attacks.
- Anomalies targeting Service Layer resources like DNS, IMS, UPF, BNG, SEPP, SeGW and exploiting networking functions by BW or PPS.

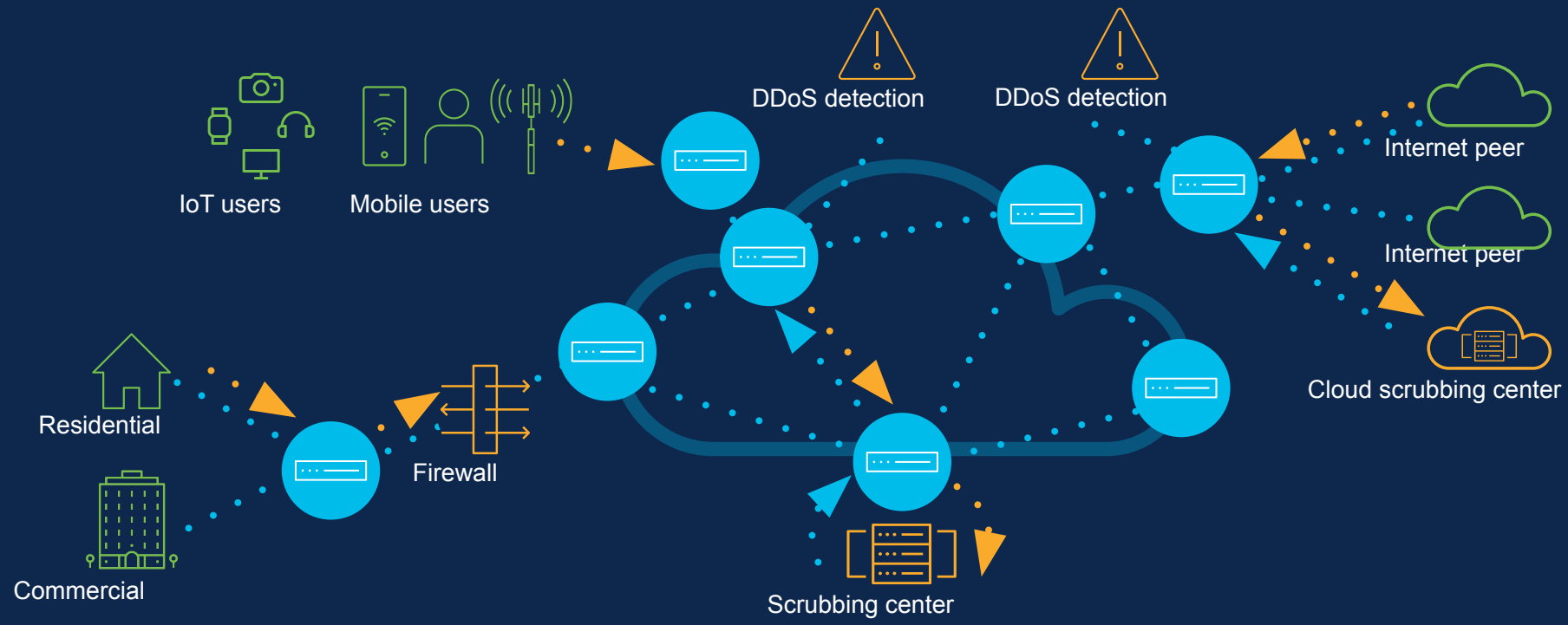
Attackers leverage distributed resources to degrade infrastructure and applications




Typical Goals:

- Disrupt services
- Damage the business
- Ransom extortion

# Traditional DDoS solutions



# Secure DDoS Edge Protection detects and mitigates DDoS attacks on your router in real-time