CLOUD LEADERSHIP FORUM
Produced by IDC & IDG Enterprise

ENABLING THE PRIVATE CLOUD - THE NEW DATA CENTER NETWORK

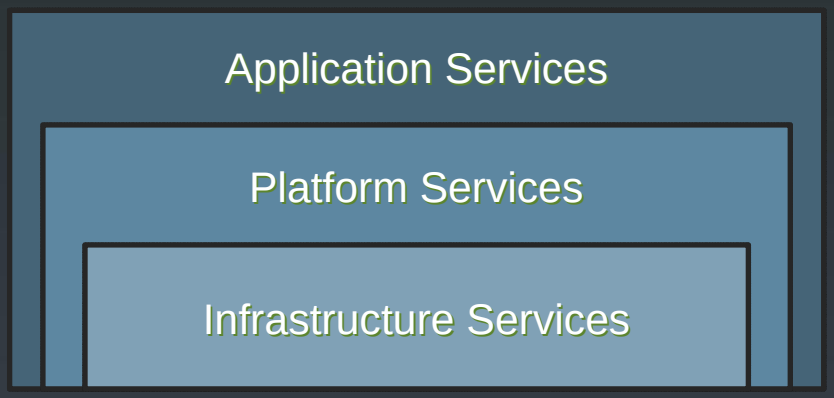
David Yen
EVP and GM, Fabric and Switching Technologies
Juniper Networks

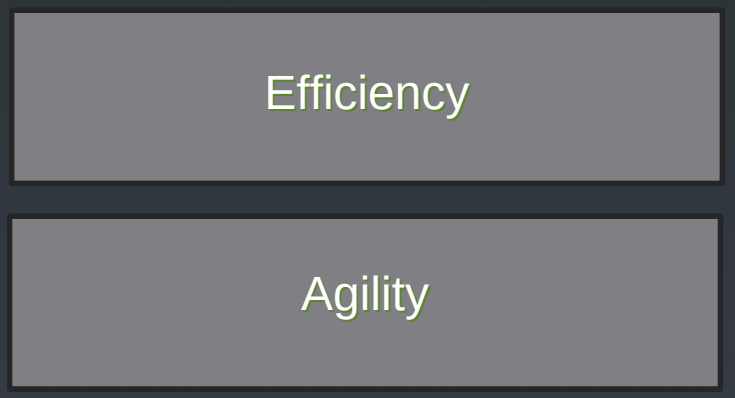
Cloud Computing

Cloud Infrastructure

Services delivered over the Network

Dynamically shared resource pools





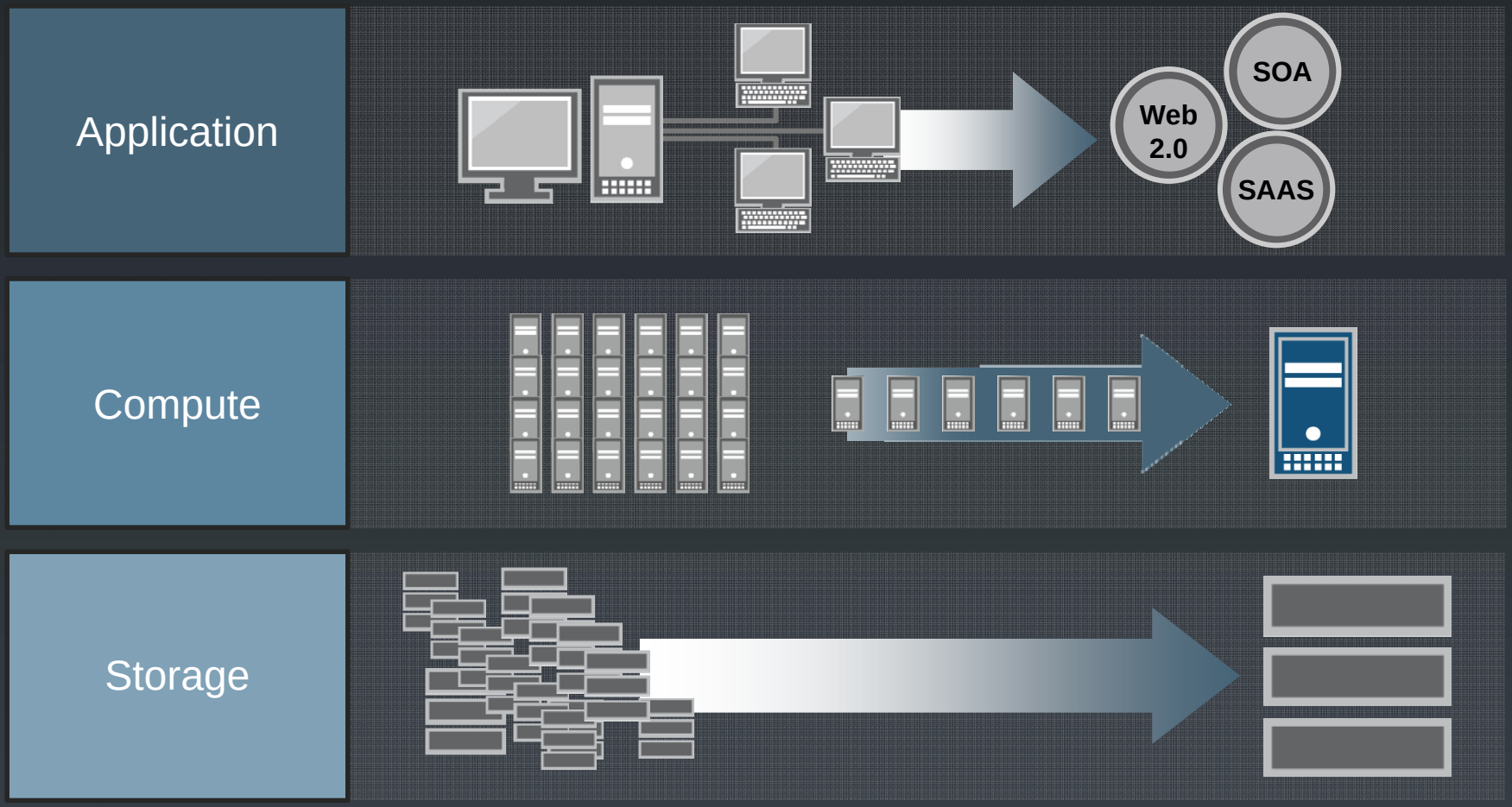
EXPERIENCE vs. ECONOMICS

Improve Performance and Scale

Drive Out Cost

Can the Cloud help?

TECHNOLOGY CHANGES IN DATA CENTER

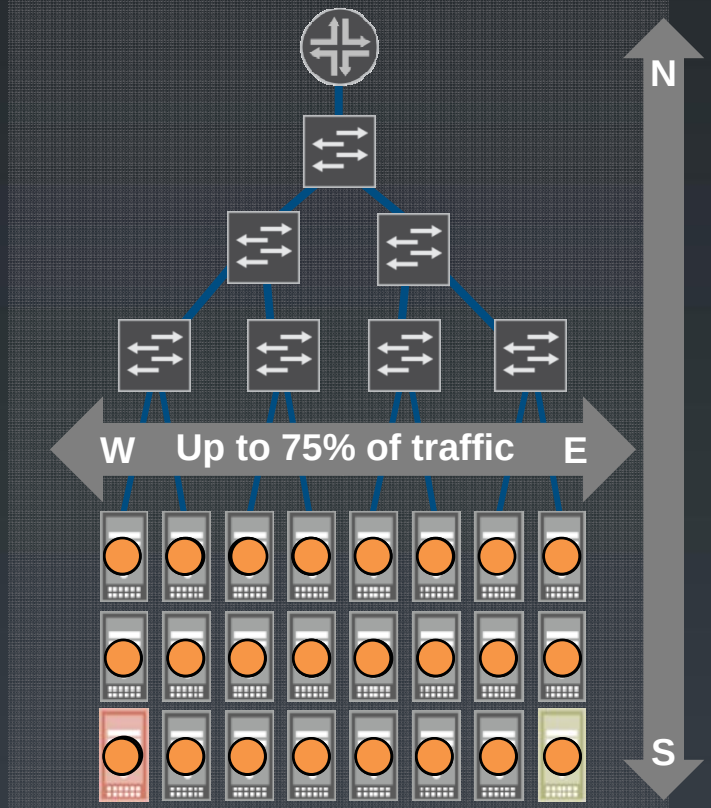


THE MULTI-TIER LEGACY NETWORK IS A BARRIER

The challenge

- Too complex
- Too slow
- Too expensive

Multi-tier legacy network



Unnecessary layers add hops and latency

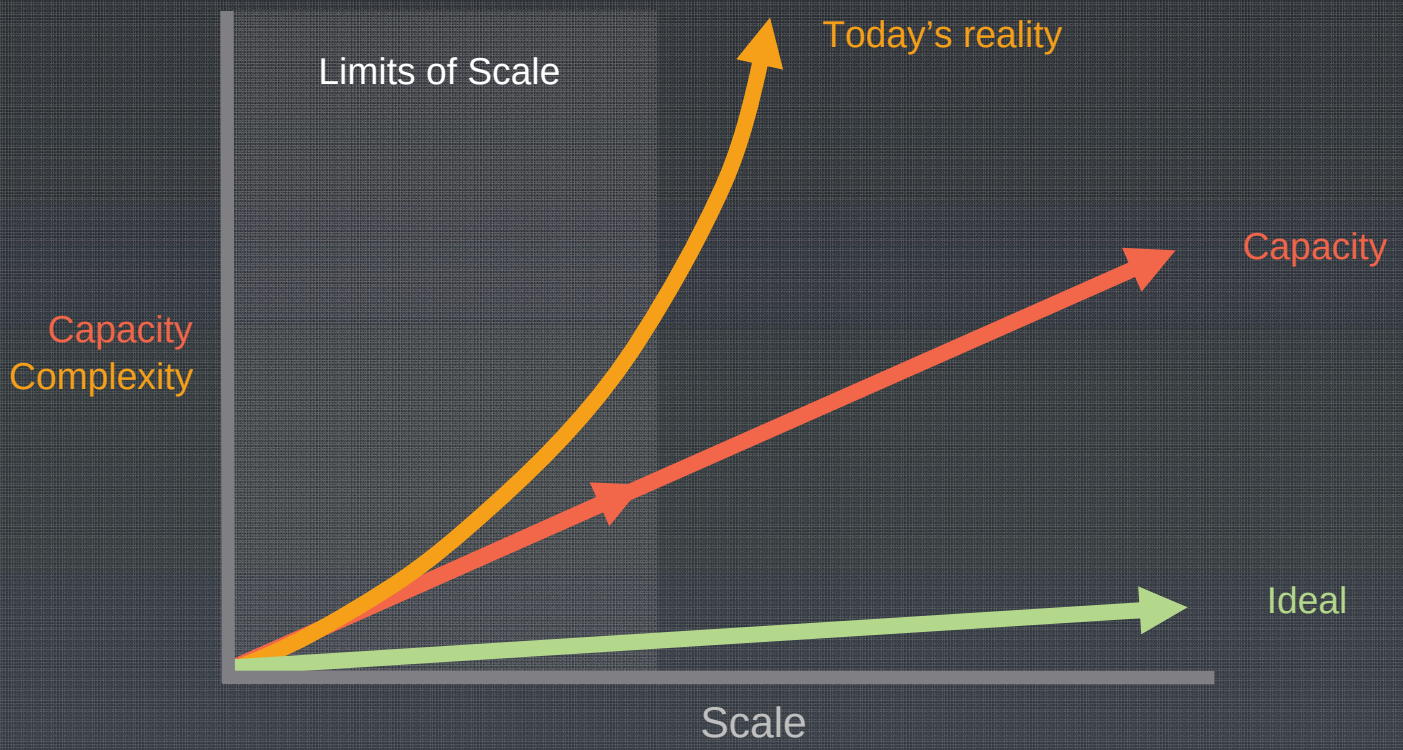
Up to 50% of the ports interconnect switches, not servers or storage

Spanning Tree disables up to 50% of bandwidth

JUNIPER NETWORKS

LIMITS TO SCALE

SCALABILITY: The ability to add capacity without adding complexity



COMPLEXITY – A FUNCTION OF DEVICES + INTERACTIONS

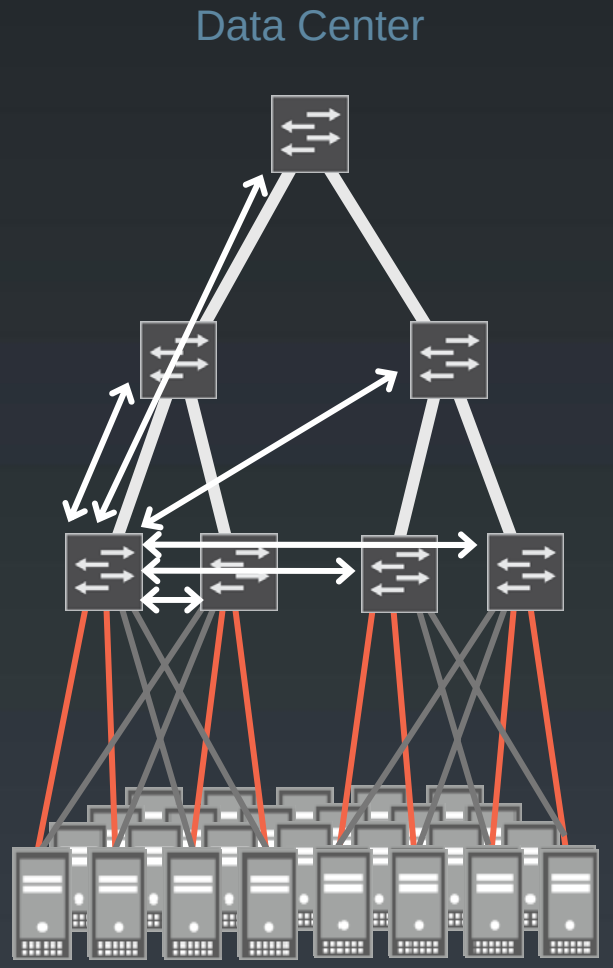
Operational Complexity

Number of managed devices
- Each switch is autonomous
- 7 managed devices

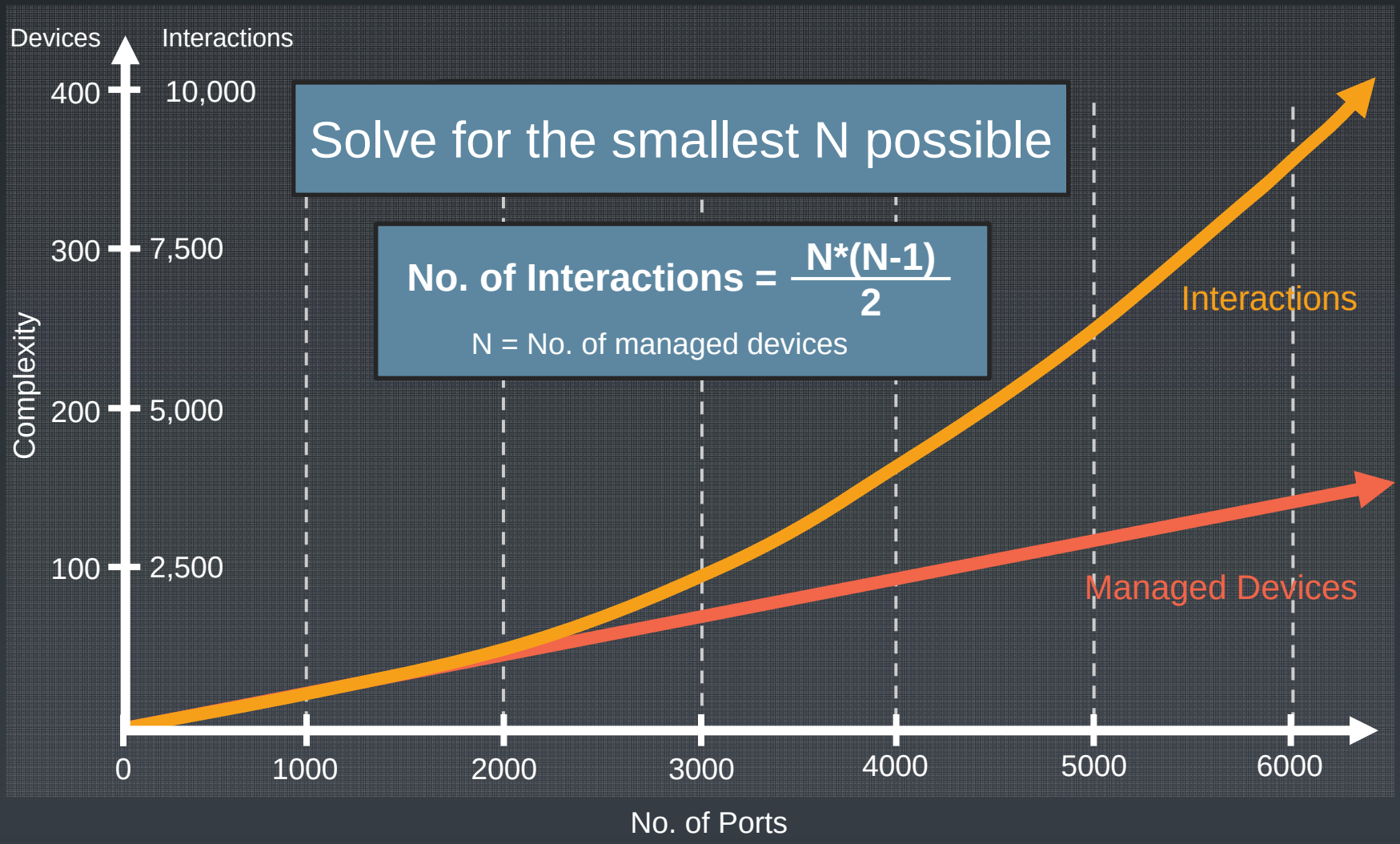
Number of potential interactions
- Shared protocols
- 21 potential interactions

$$\frac{N*(N-1)}{2}$$

N = no. of managed devices



COMPLEXITY – A FUNCTION OF DEVICES + INTERACTIONS



JUNIPER NETWORKS

CHALLENGES OF EFFICIENCY

Up to 50% of the ports interconnect switches, not servers or storage

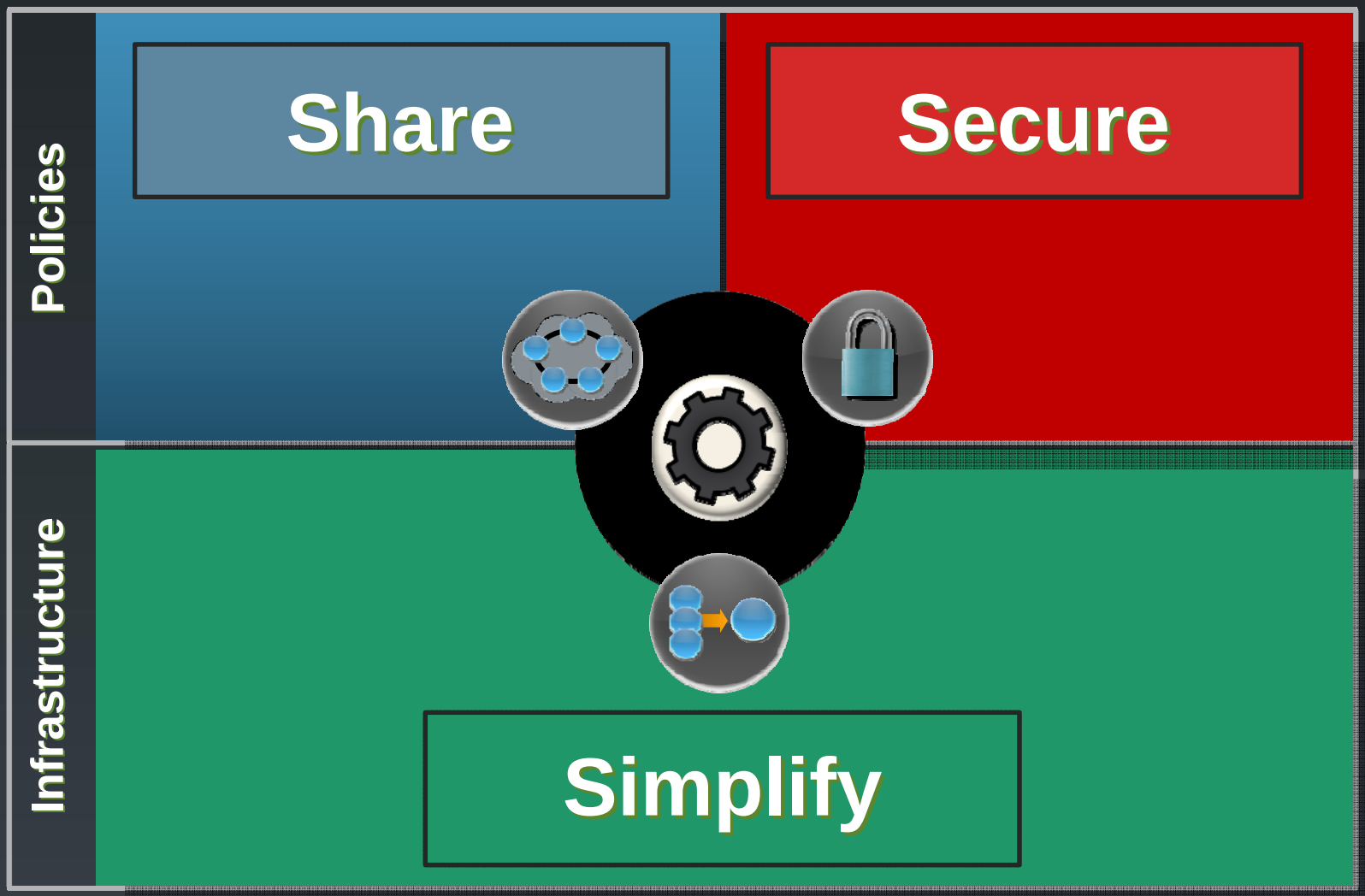
Up to 50% of the bandwidth is disabled by spanning tree

Too Expensive

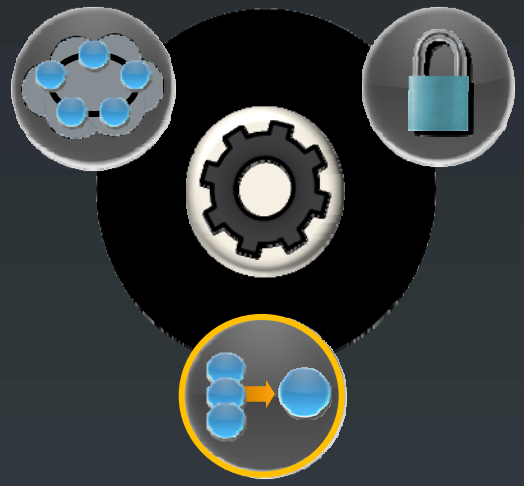
Up to 30% of the network spend can be avoided

- Eliminate $1B of annual spend world wide

STEPS TO A CLOUD READY DATA CENTER



JUNIPER NETWORKS



Simplify

APPROACHES TO SIMPLIFICATION

Better Tools

Tools to manage the complexity

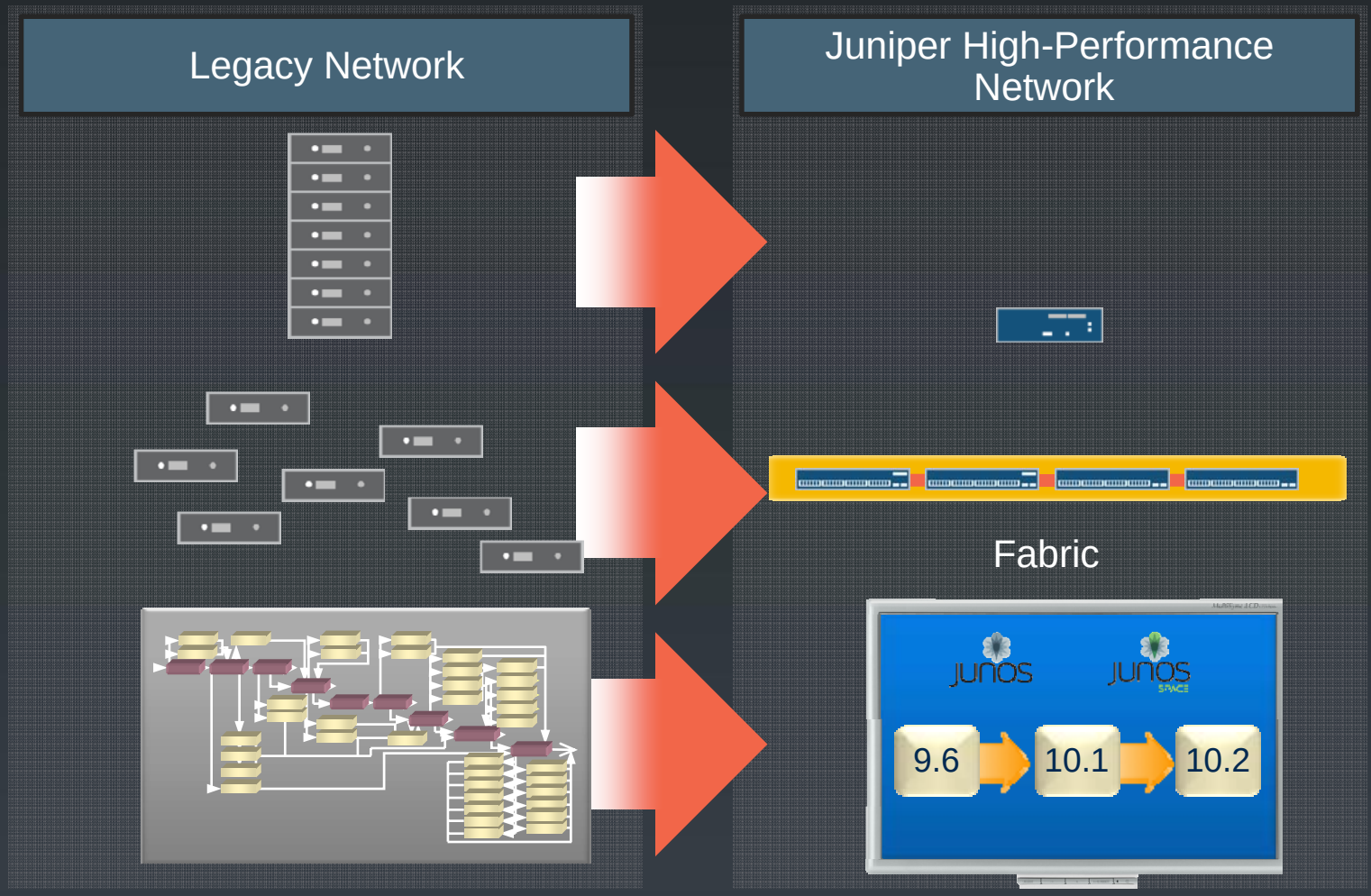
Automation

Hide the complexity

Eliminate Complexity

Design out complexity

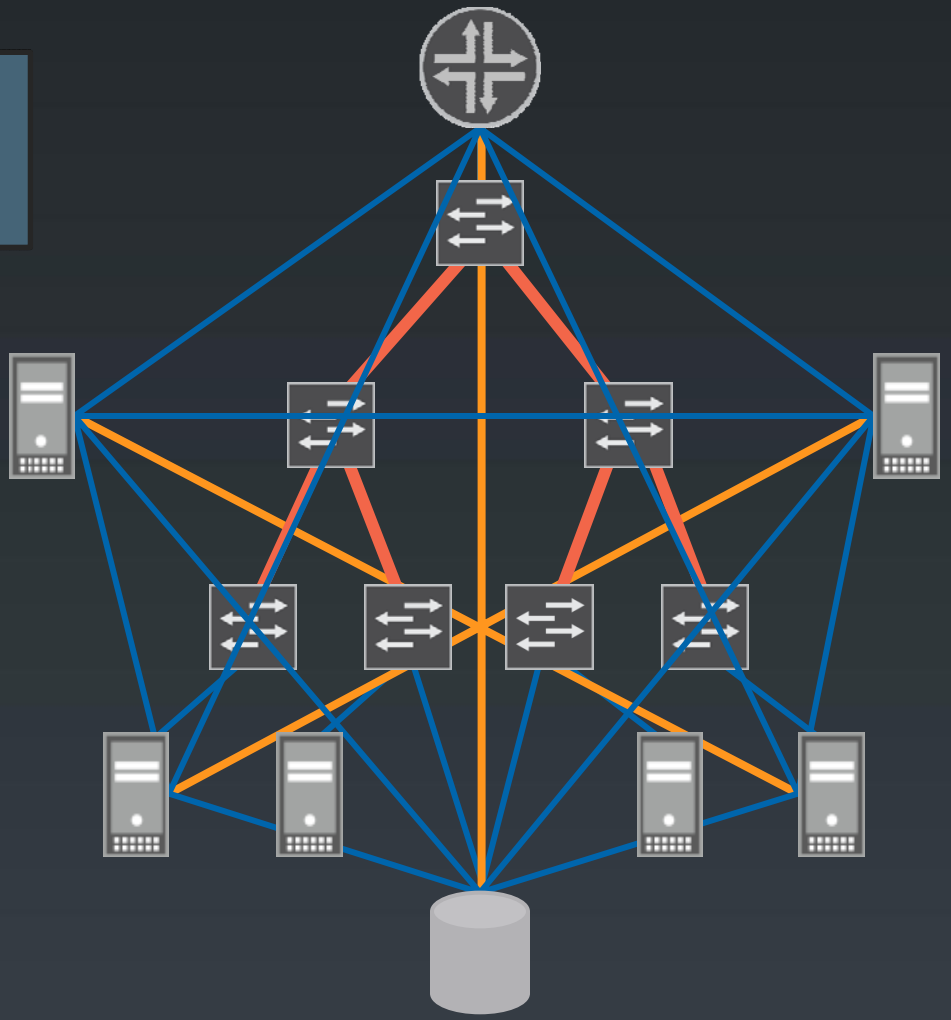
SIMPLIFY THE NETWORK



 www.juniper.net

DEFINING THE IDEAL NETWORK

Flat, any-to-any connectivity

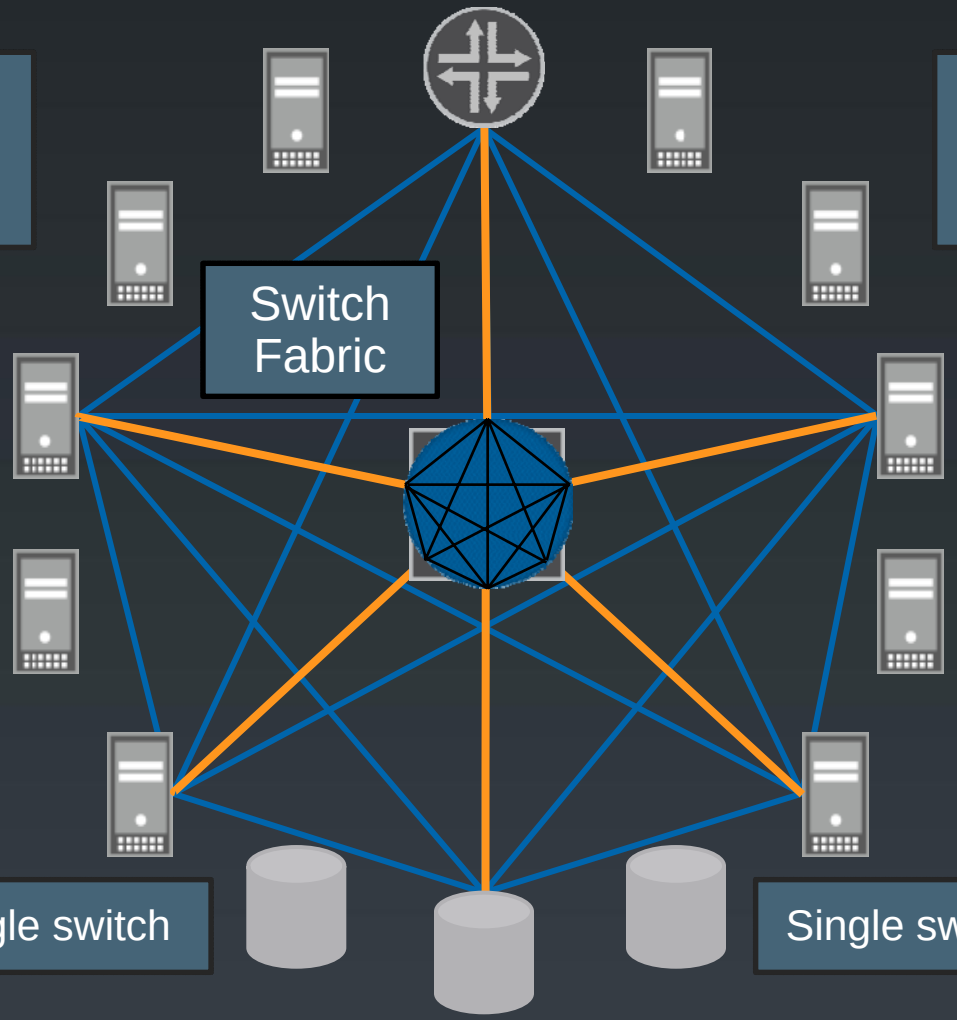


JUNIPER NETWORKS

DEFINING THE IDEAL NETWORK

Flat, any-to-any connectivity

Single device N=1



Switch Fabric

Data Plane

- Flat – single look up
- Any-to-any

Control Plane

- Single device
- Shared state

Simplicity of a single switch

Single switch does not scale

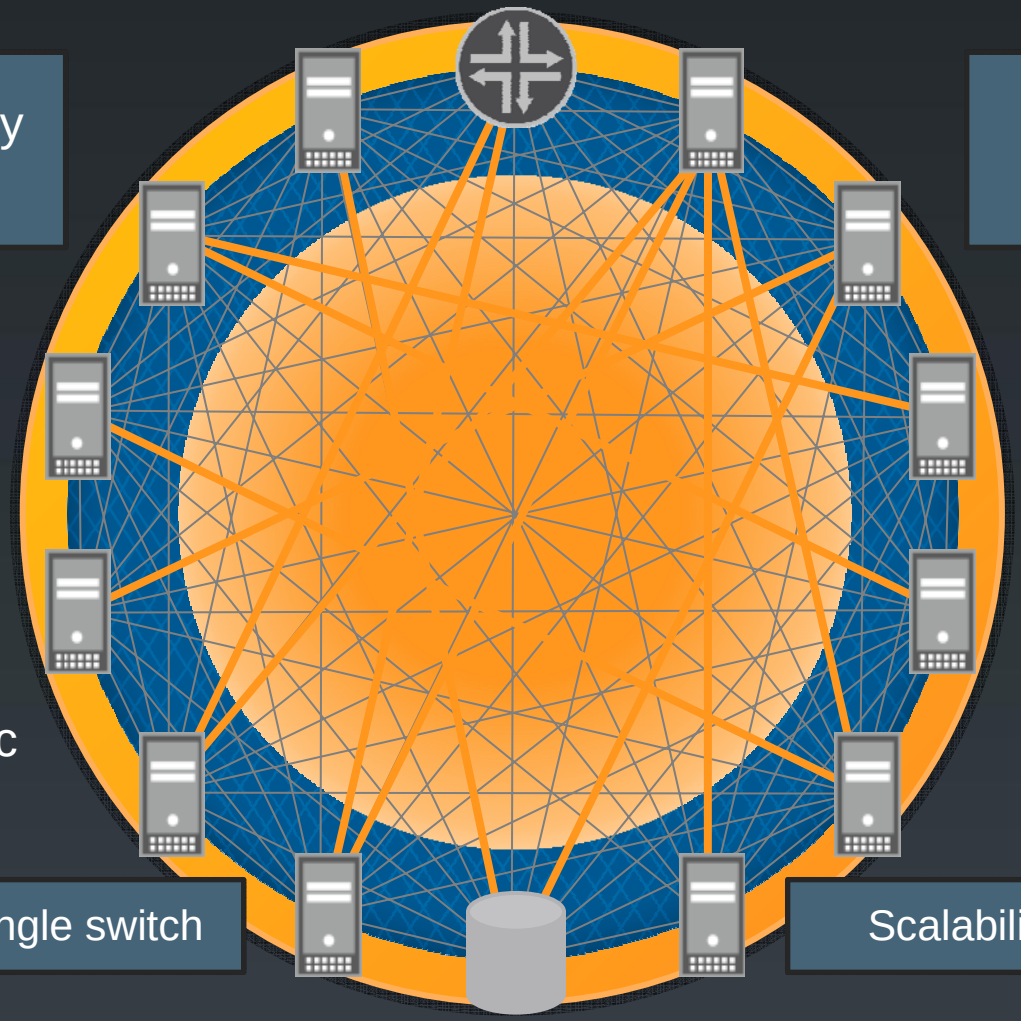
 www.juniper.net

JUNIPER NETWORKS

DEFINING THE IDEAL NETWORK – A FABRIC

Flat, any-to-any connectivity

Single device N=1



Network Fabric

Data Plane

- Flat – single look up
- Any-to-any

Control Plane

- Single device
- Shared state

A Network Fabric has the….

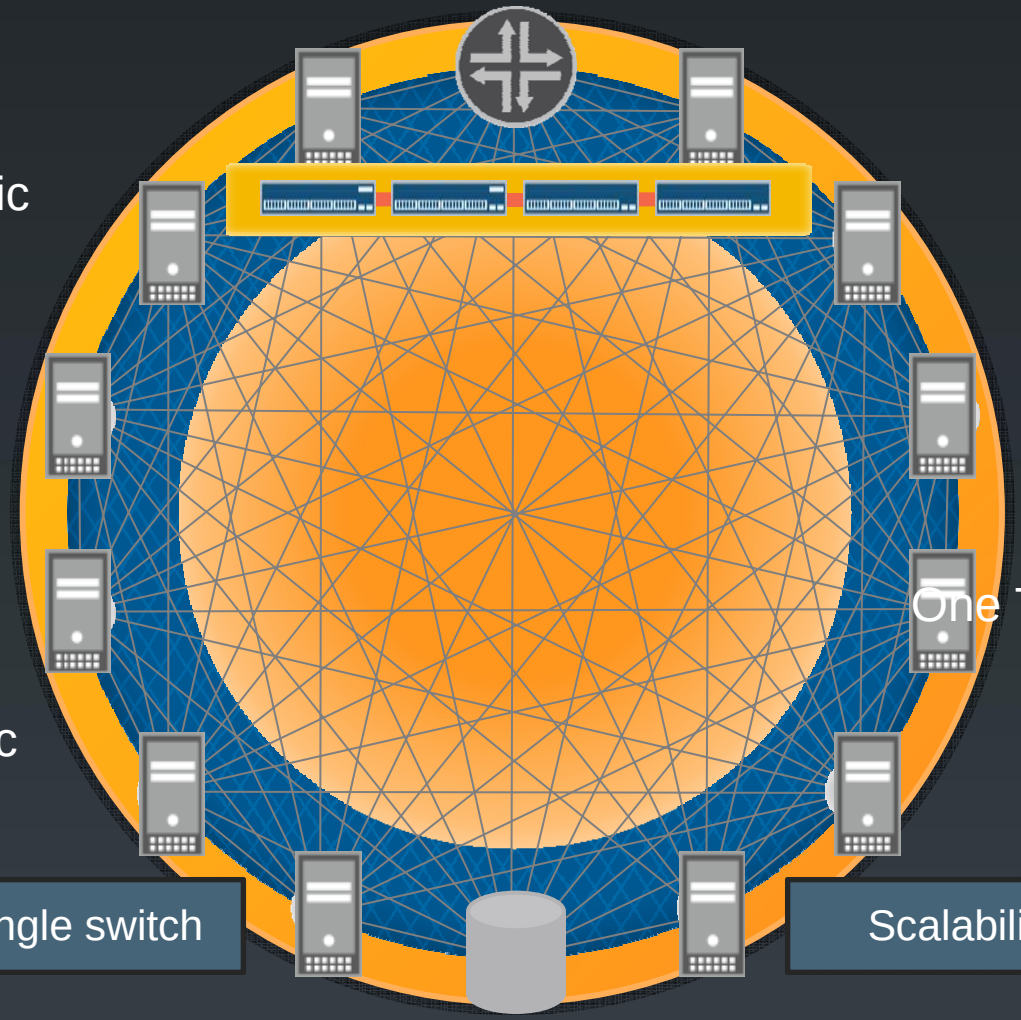
Simplicity of a single switch

Scalability of a network

JUNIPER NETWORKS

DEFINING THE IDEAL NETWORK – A FABRIC

Two Tier Fabric



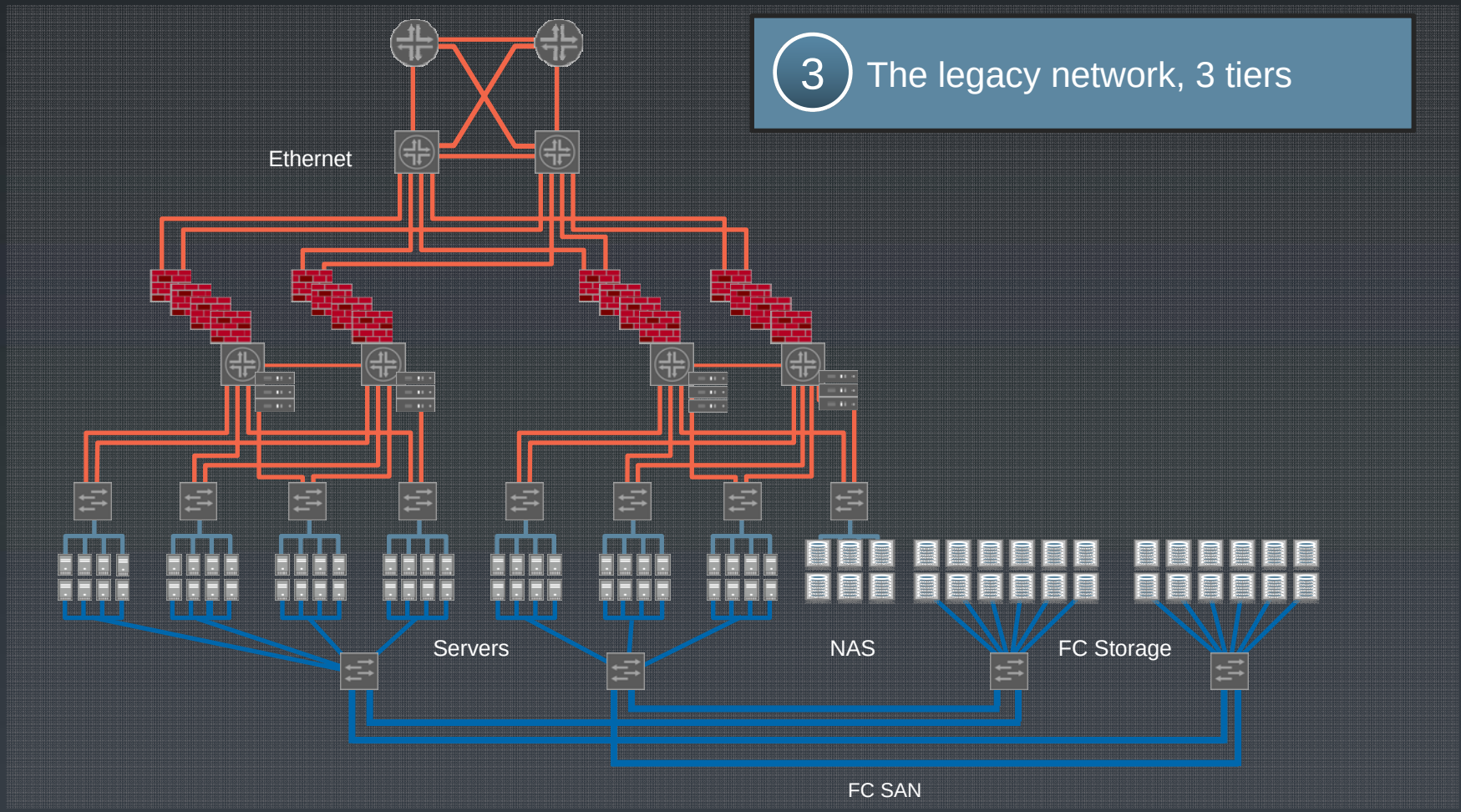
One Tier Fabric

A Network Fabric has the….

- Simplicity of a single switch
- Scalability of a network

SIMPLIFY THE NETWORK

3 — 2 — 1

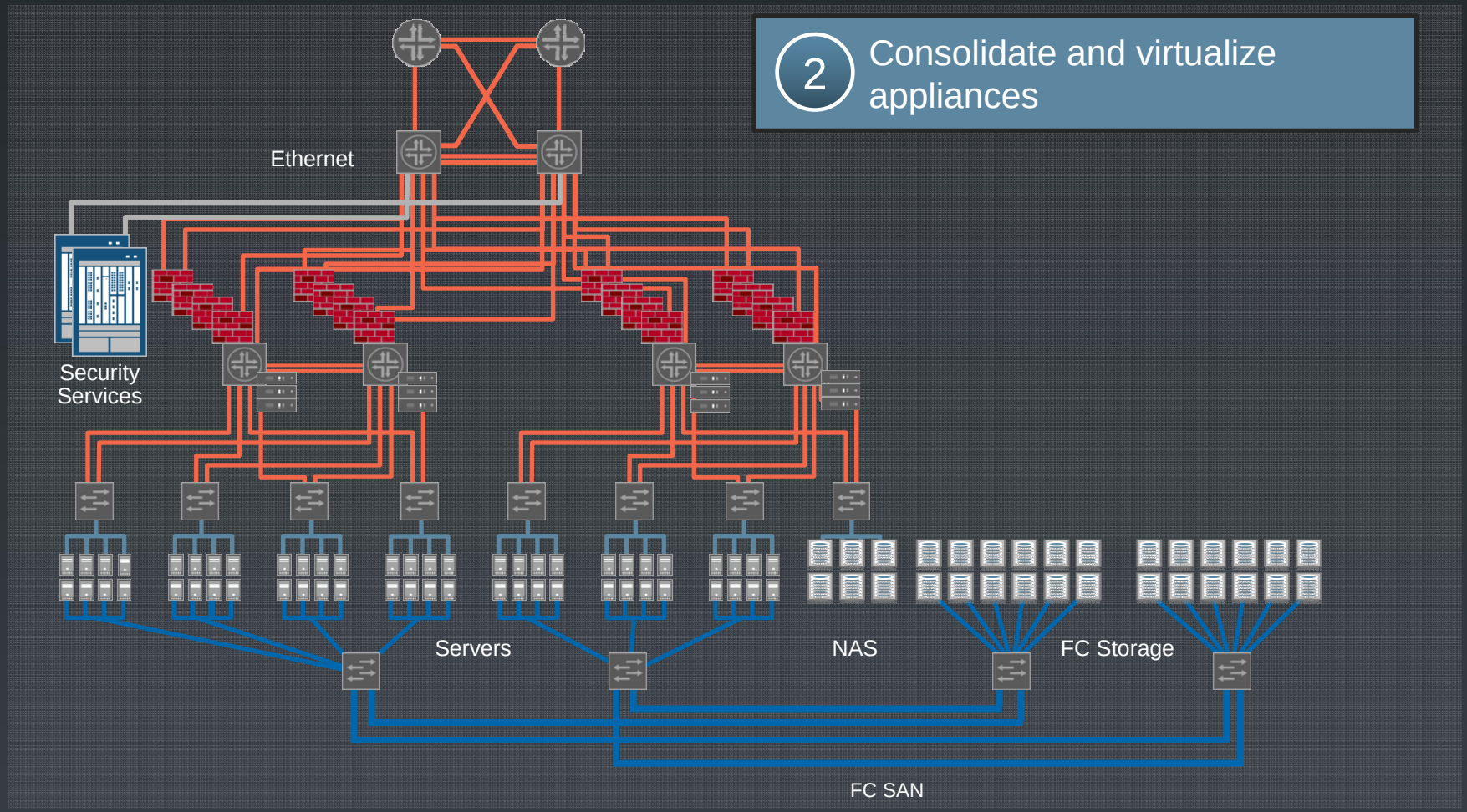


 www.juniper.net

JUNIPER NETWORKS

SIMPLIFY THE NETWORK

3 – 2 – 1

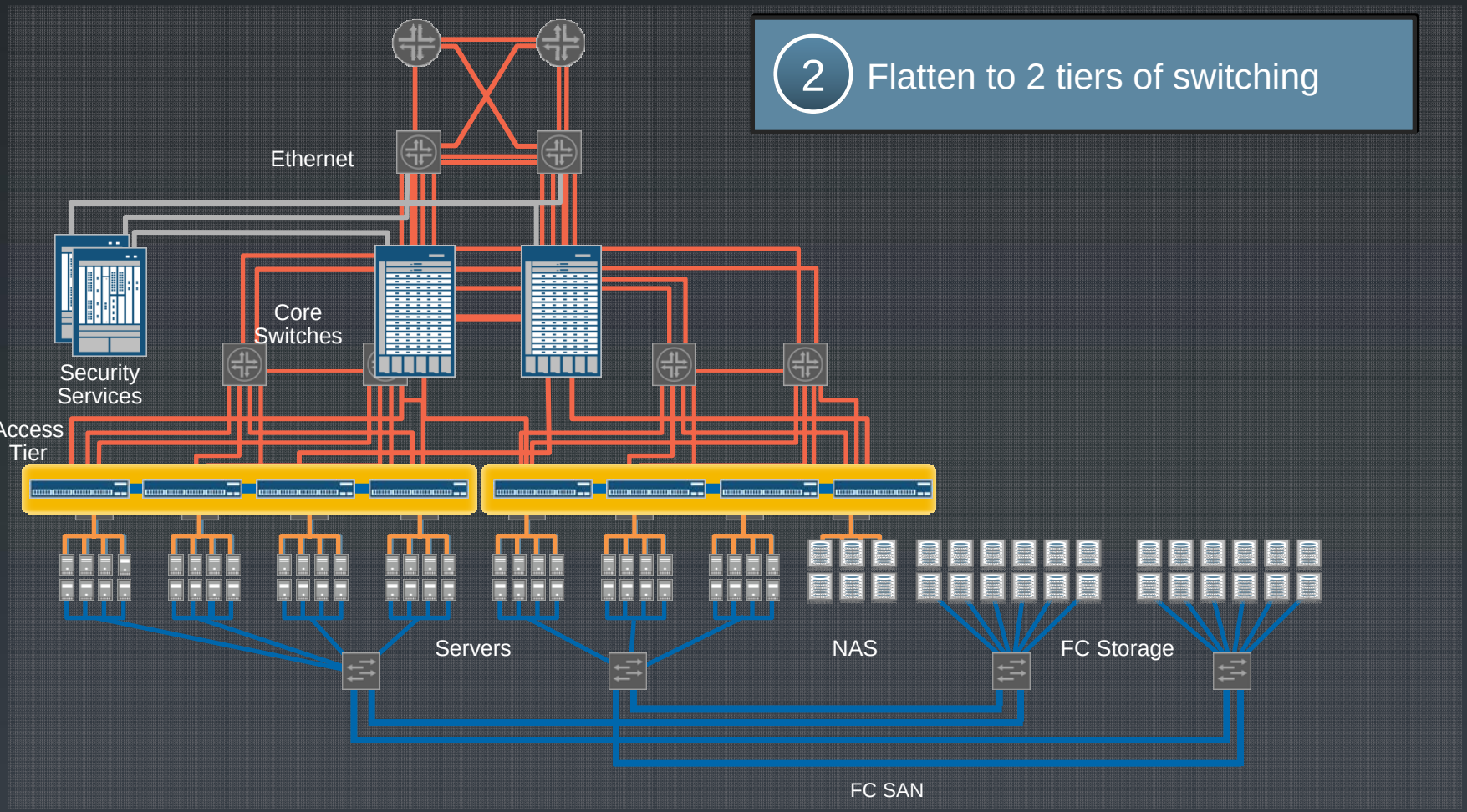


 www.juniper.net

JUNIPER NETWORKS

SIMPLIFY THE NETWORK

3 – 2 – 1

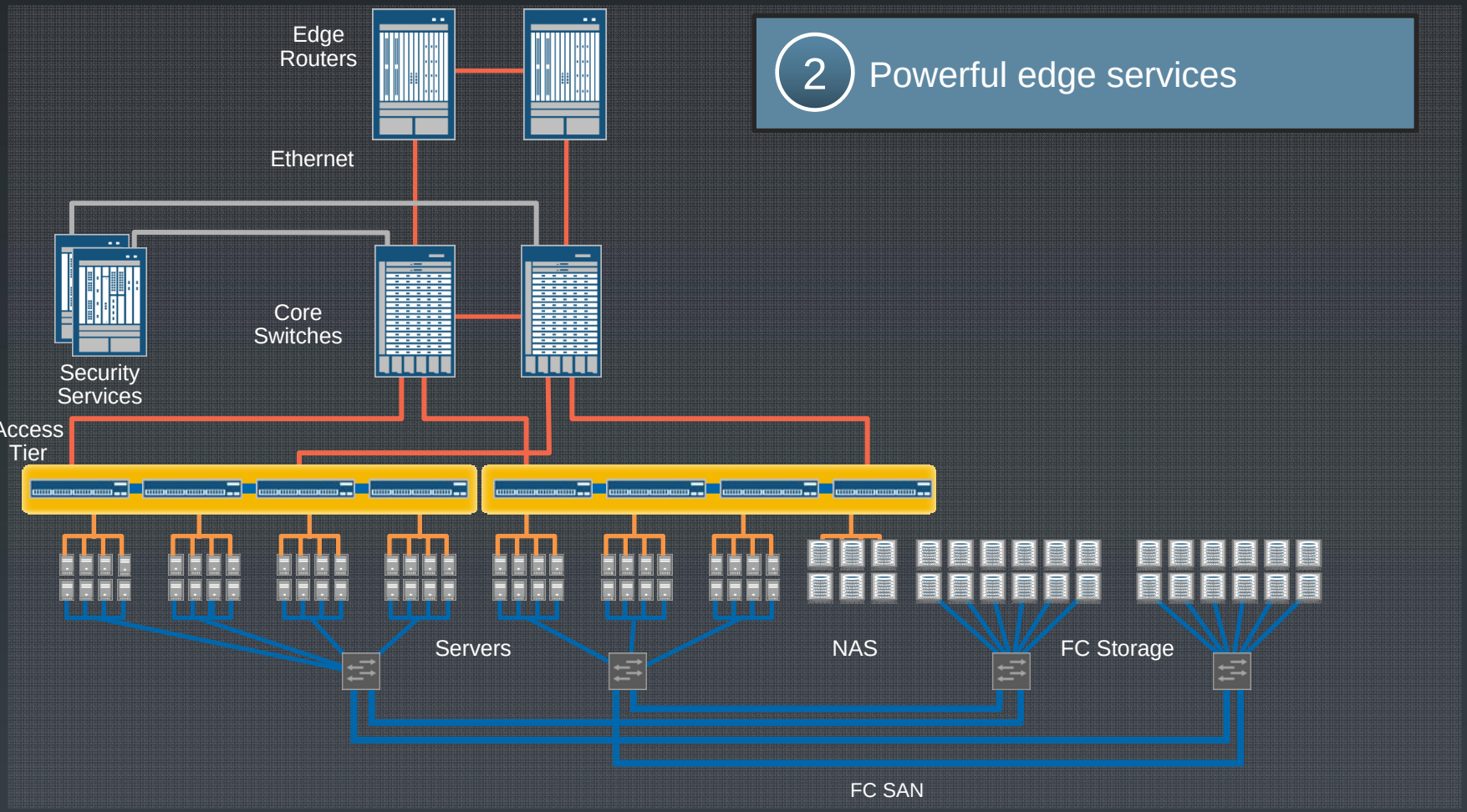


 www.juniper.net

JUNIPER NETWORKS

SIMPLIFY THE NETWORK

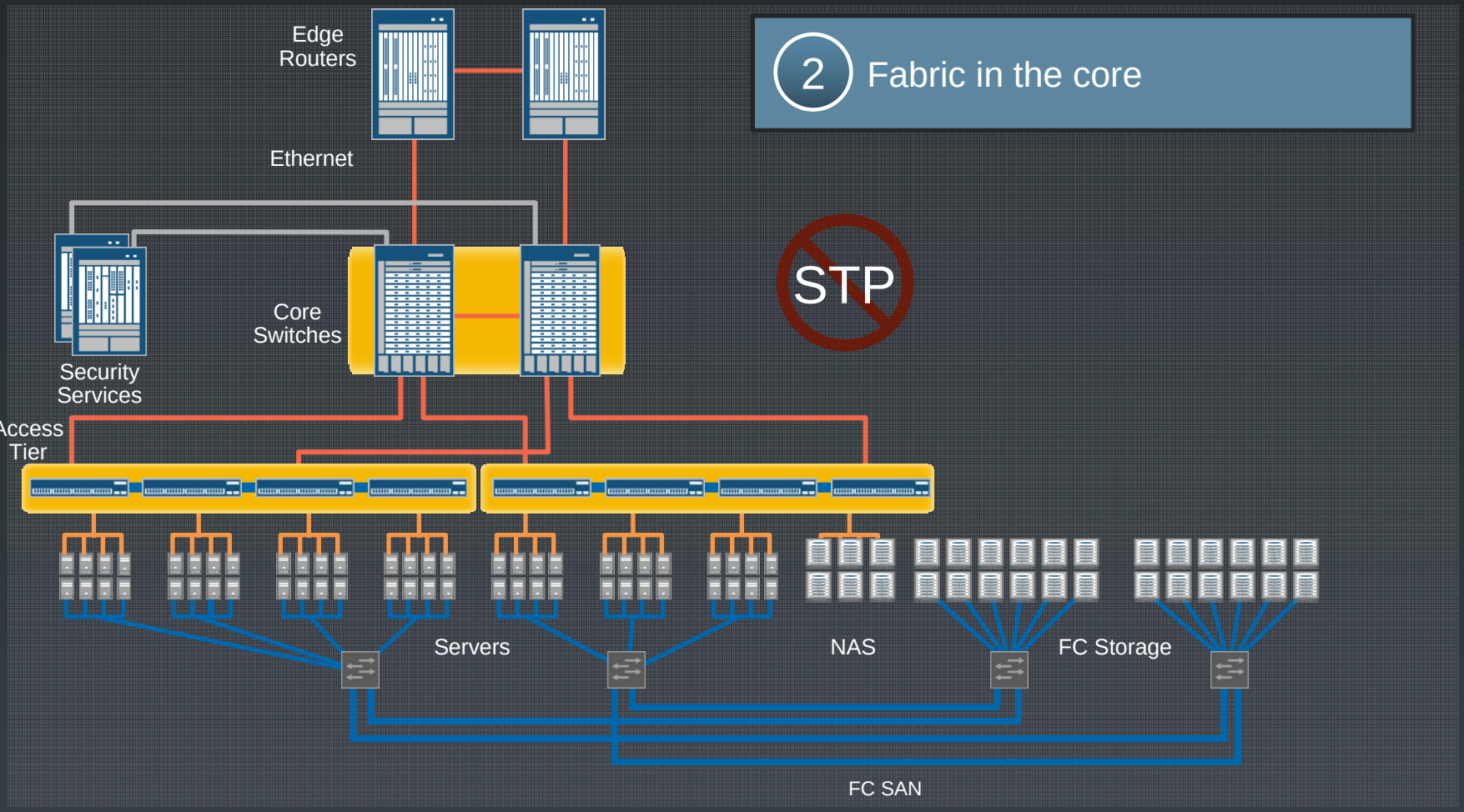
3 – 2 – 1



JUNIPER NETWORKS

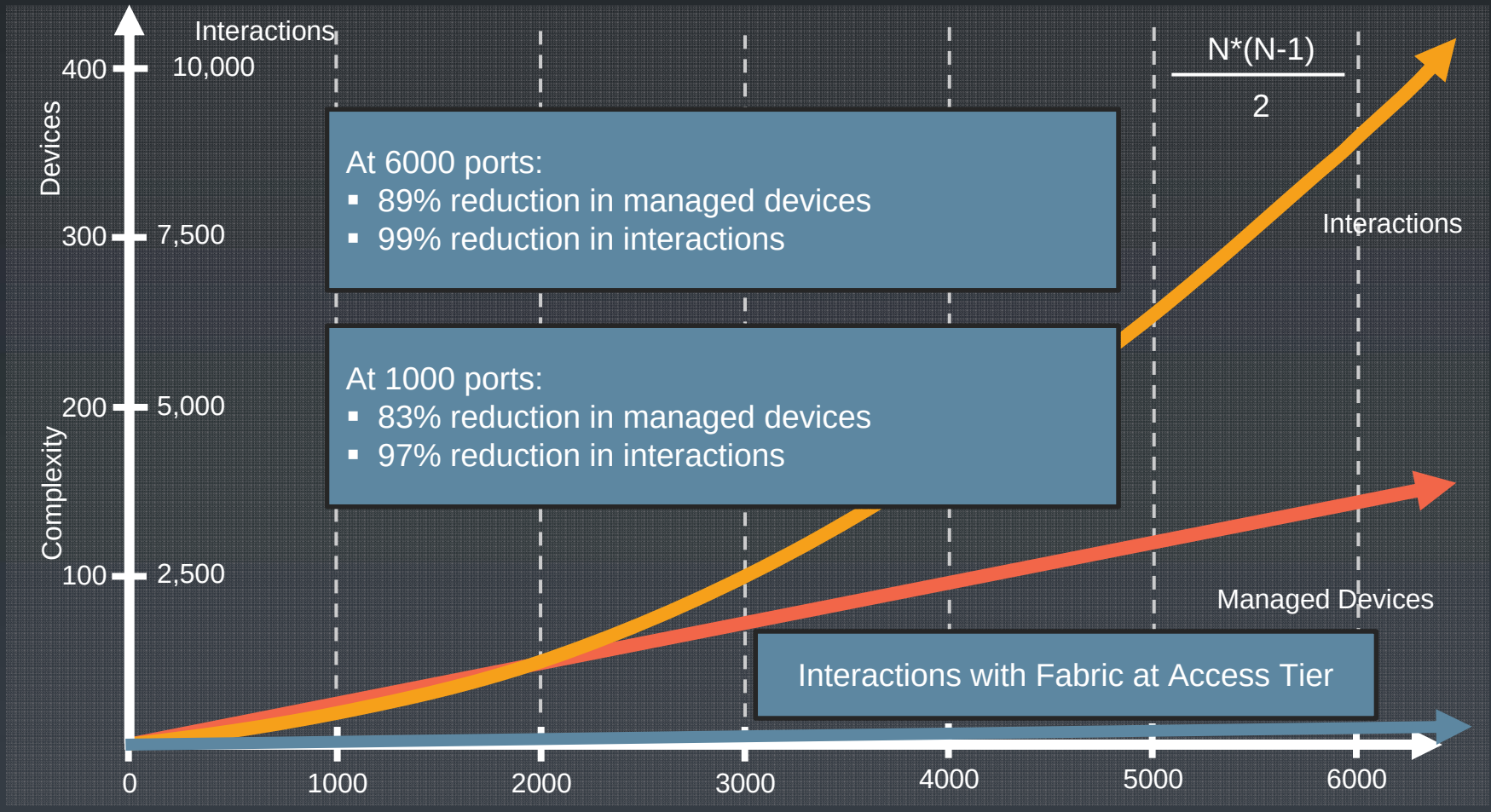
SIMPLIFY THE NETWORK

3 – 2 – 1



JUNIPER NETWORKS

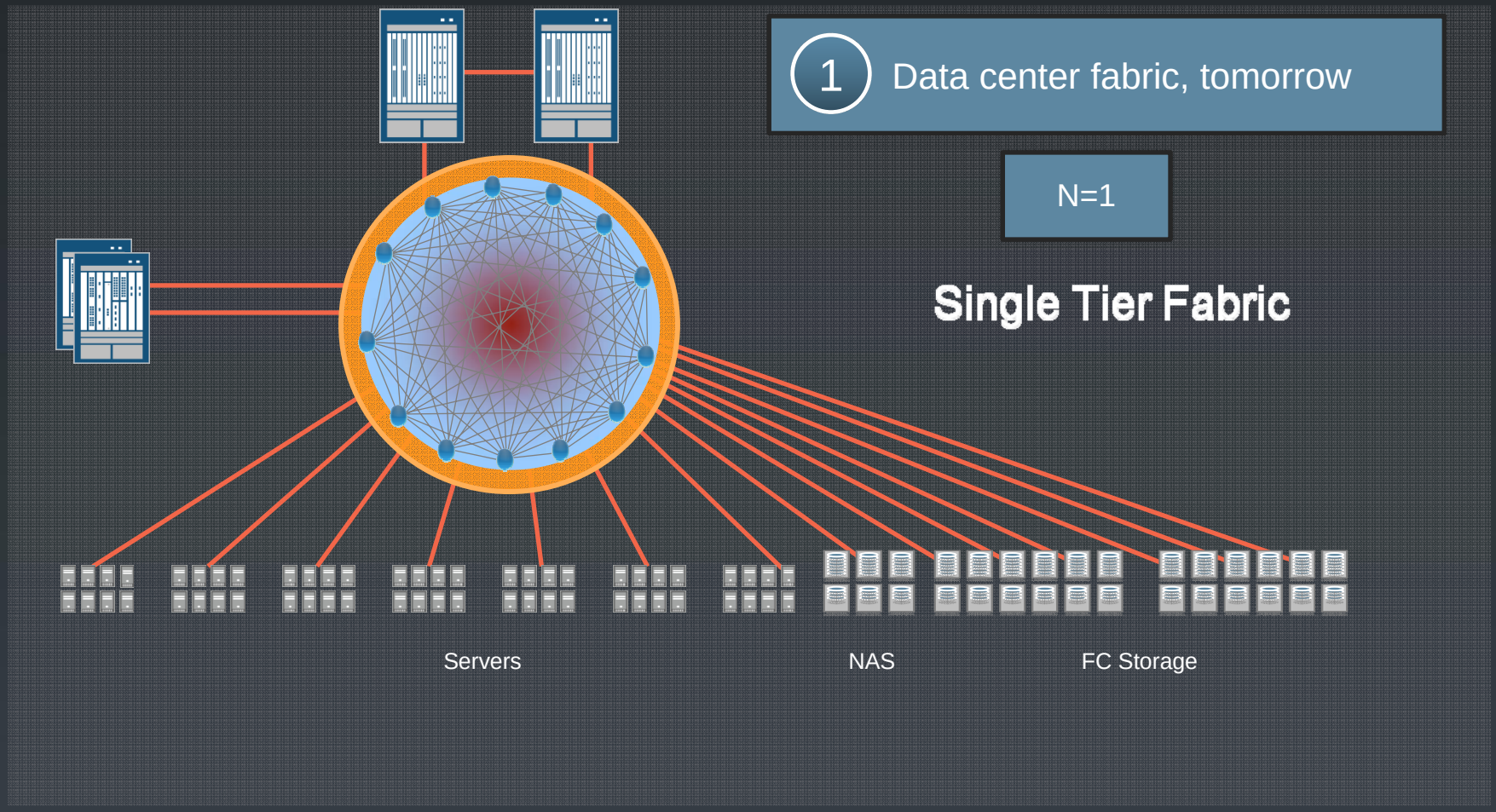
FABRICS REDUCE COMPLEXITY



JUNIPER NETWORKS

SINGLE FABRIC: SIMPLIFY!!!

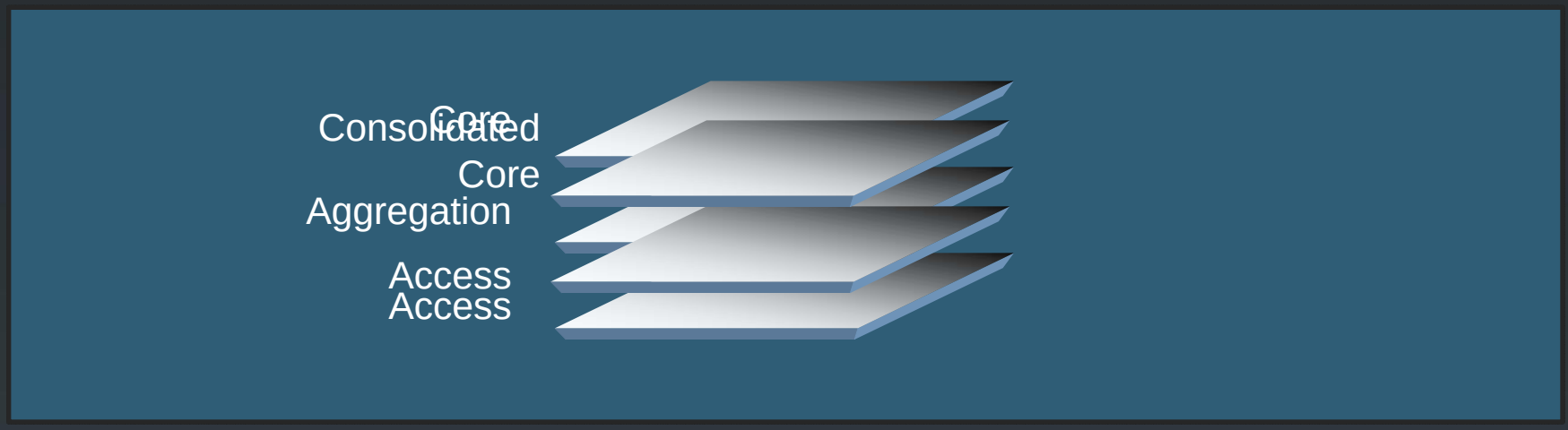
3 – 2 – 1



JUNIPER NETWORKS

SIMPLIFY THE NETWORK

3 – 2 – 1



Eliminate the Aggregation Layer
Simplify the Consolidated Core

JUNIPER NETWORKS

EXPERIENCE AND ECONOMICS

EXPERIENCE

COST

More Performance

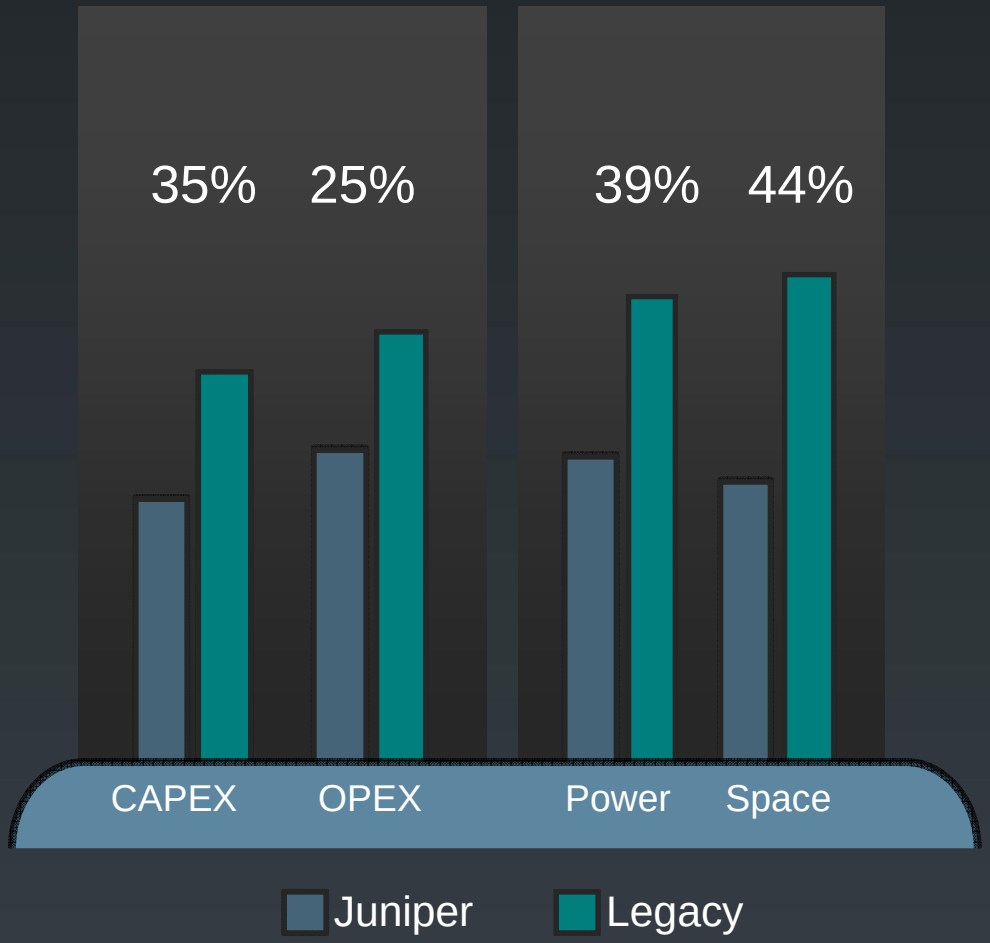
More Scalable

More Agile

More Secure

More Reliable

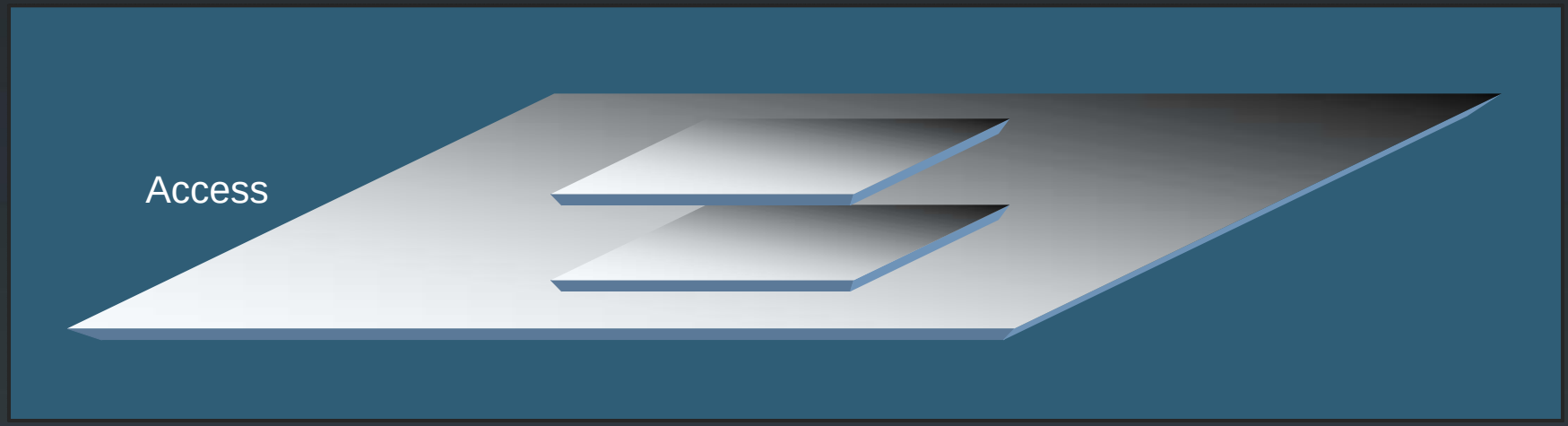
Lowest TCO



Source: Juniper's Financial Analysis Tool

SIMPLIFY THE NETWORK

3 – 2 – 1



Single Scalable Fabric

JUNIPER NETWORKS

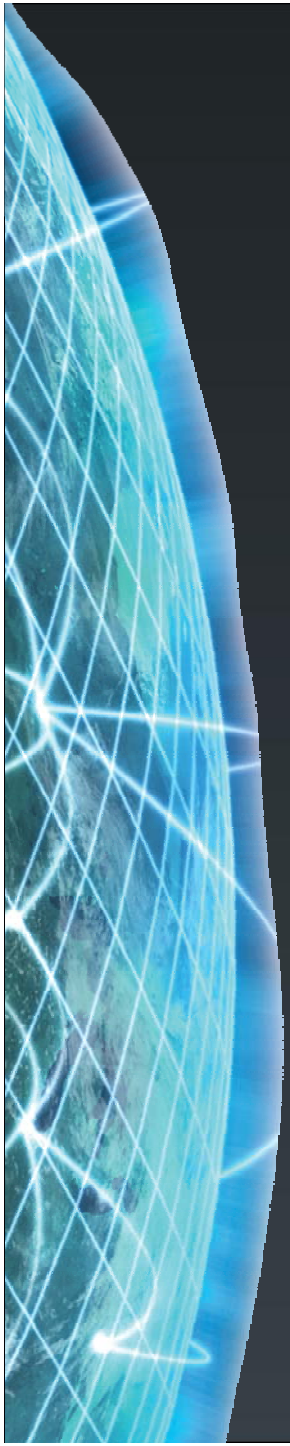
EXPERIENCE vs. ECONOMICS

Improve Performance and Scale

Drive Out Cost

Can the Cloud help?

JUNIPER NETWORKS



CLOUD
LEADERSHIP
FORUM
Produced by IDC & IDG Enterprise

everywhere