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Assuring the promise in Edge Computing

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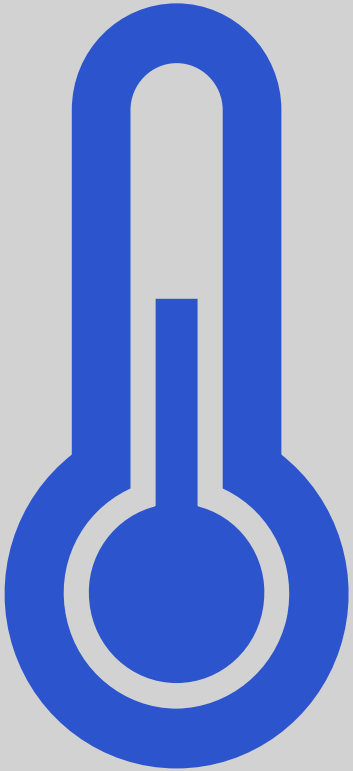
General considerations

Spirent's 5G thermometer



What's HOT

5G Core
First deployments

5G Edge Cloud
build outs starting.

Automation
Cost Savings then agility

5G Security
Risk assessment

What's WARM

Open RAN
& IAB

New Players
FAANGS | MSOs | Towers

Supply Chain & Security

Private
Networks

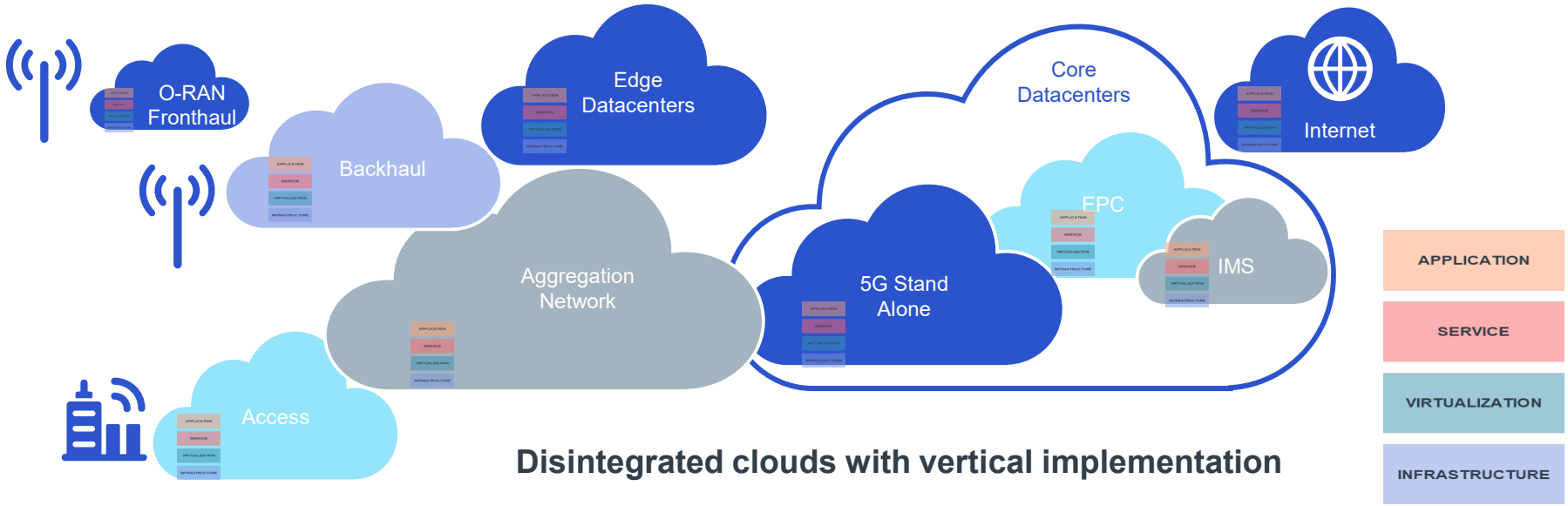
Non-Terrestrial
Networks

What's NOT

Consumer ARPU
Flat or low for 5G

Corona Virus
Supply chain

Today: Individual Clouds



Disintegrated clouds with vertical implementation

RAN Fronthaul Backhaul Edge DC Aggregation & Core DC

Challenges for Edge Compute deployment

Vertical clouds from Telco perspective

Core Cloud – Cloud architecture for the new Core including edge disaggregation. Mostly being built by the CSPs with partners like VMware

Private Edge Cloud (or Private MEC) – For private networks where the Core and relevant apps are hosted in the customer pre. This is a mixture of CSP self build and partnerships (i.e. Azure)

Public Edge Cloud (or Public MEC) – This is the most common in the media where the CSPs are partnering with the hyper-scalers. Telco network functions are not hosted in the Public MEC and the focus is mostly on apps including CDNs, AI/ML processing and content accelerators.

vRAN Edge Cloud Specialised design of the edge cloud for hosting the baseband unit and new splits. Currently the vRAN cloud is proprietary due to the need for hardware accelerators (i.e. FPGA, GPUs, smart-NICs) to handle the lower layer radio processing and due to no common industry architectures.

Enterprise Edge – Evolution of CSP enterprise offerings including vCPEs, vFW, vGi functions.

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Infrastructure validation

KICER PLACEHOLDER

Challenges

Need to accelerate market adoption of SD-WAN services

Lack of standardization in SD-WAN industry

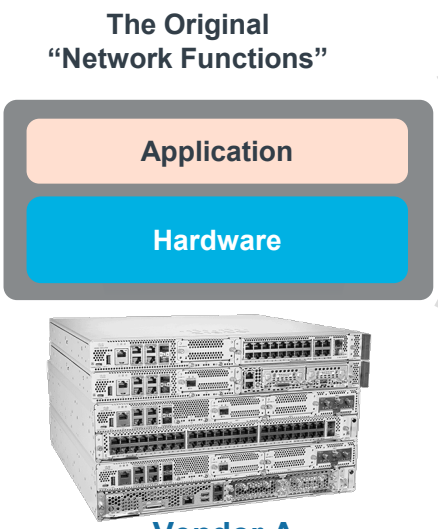
Rapidly evolving, complex technology, challenging to deploy

Migration into cloud and native services complexity

MEF addressing with standardization

Virtualization: Breaking Up Network Functions …

The Original "Network Functions"



Vendor A

Virtual Network Functions

APPLICATION

Virtual Machine
Application

or

Container
Application

SERVICE

VIRTUALIZATION

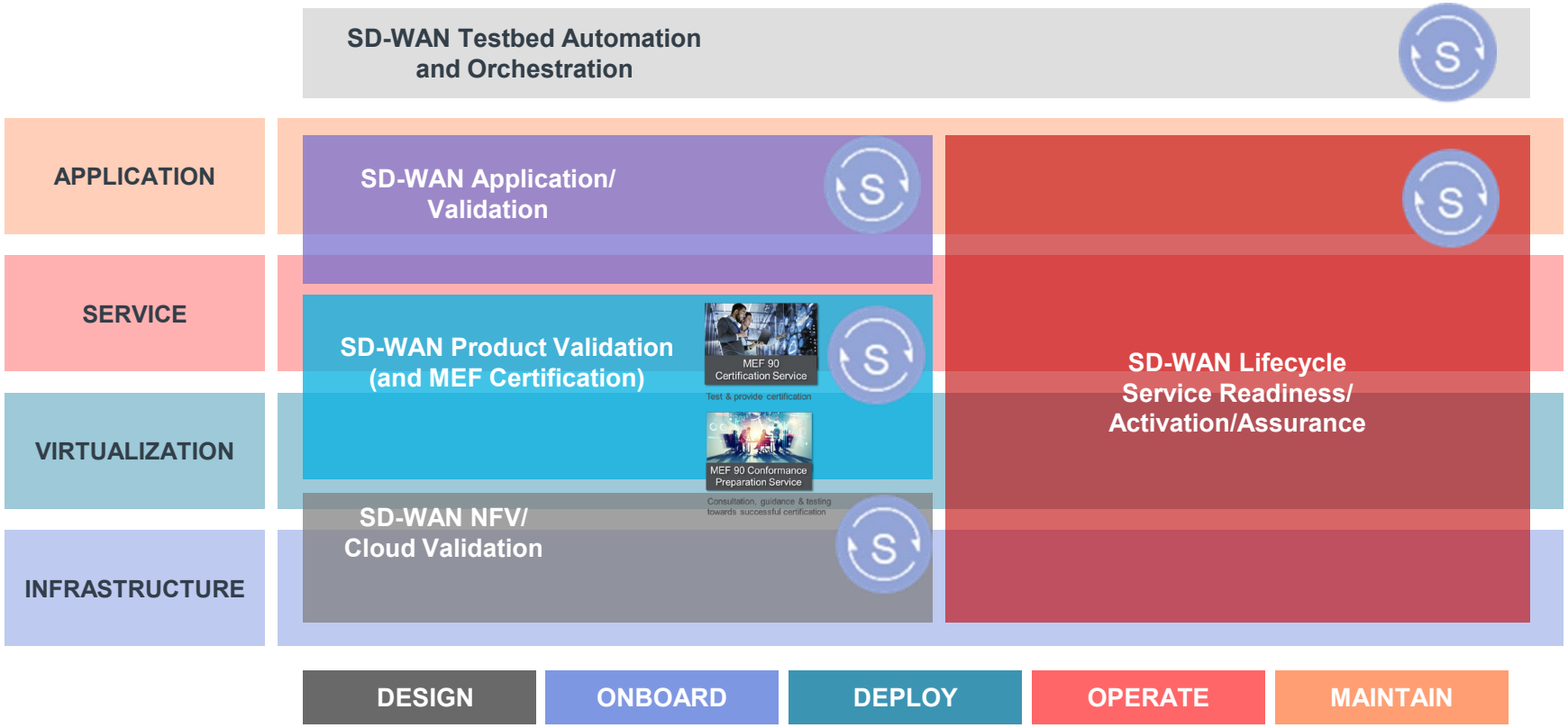
Cloud

INFRASTRUCTURE

Hardware | Hardware | Hardware | Hardware

Network Function Virtualization Infrastructure

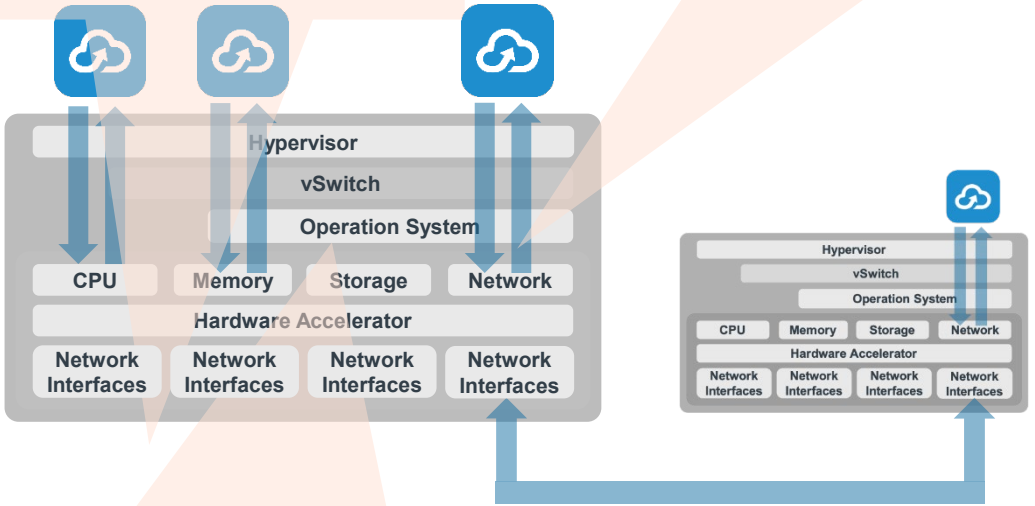
Spirent SD-WAN Solutions



NFVI Validation

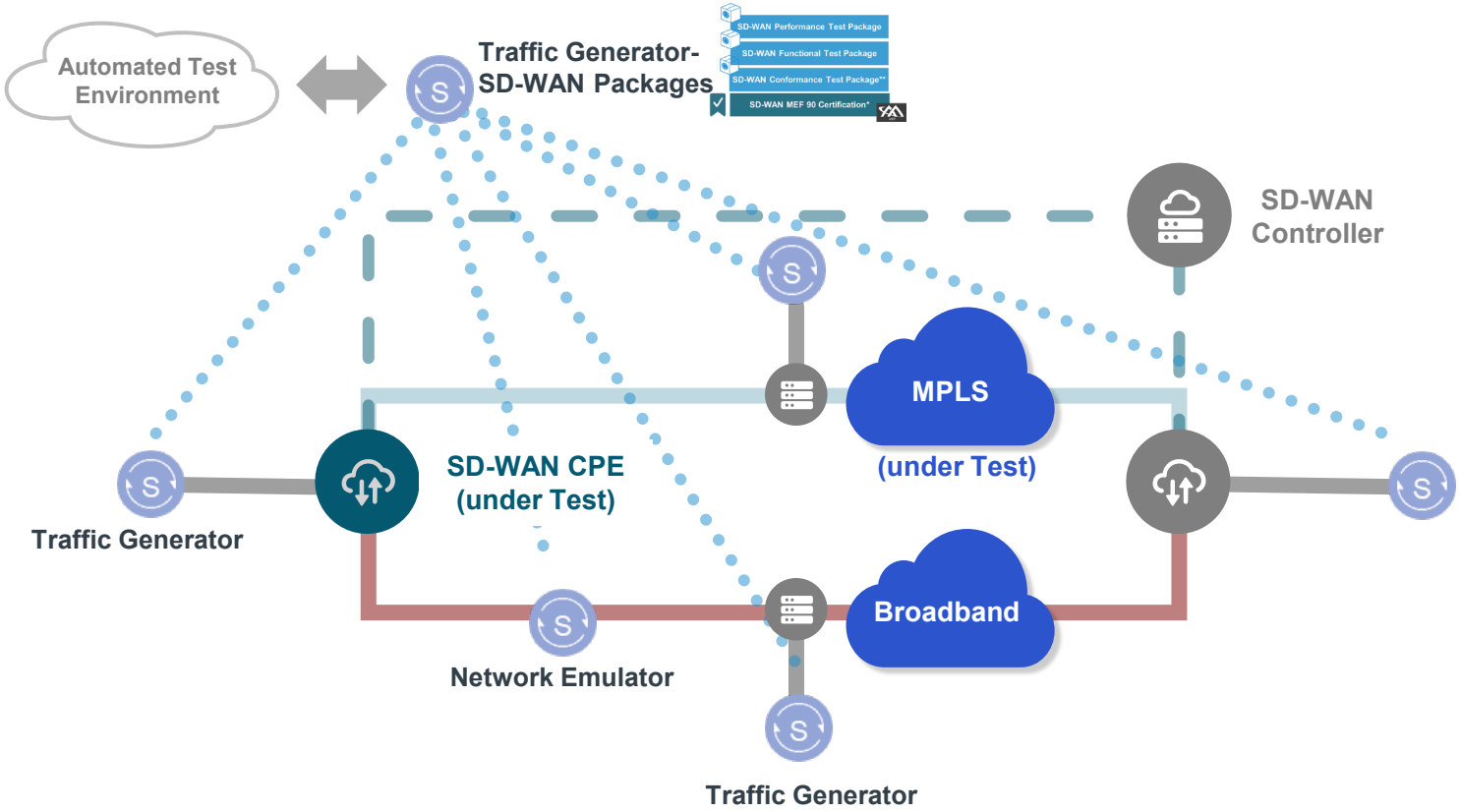
Determine maximum CPU work when compute host is filled to full capacity with a specified VM flavor.

Determine network data plane frame loss and latency between two compute hosts.



Determine aggregate memory bandwidth and latency when compute host with specified number of VMs of a specified flavor.

Spirent SD-WAN Test Package Testbed Configuration



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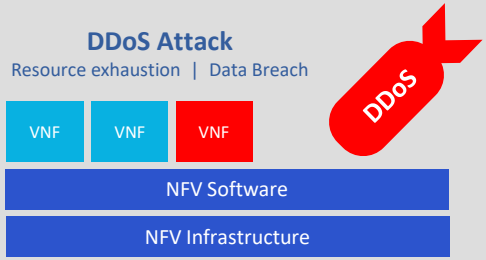
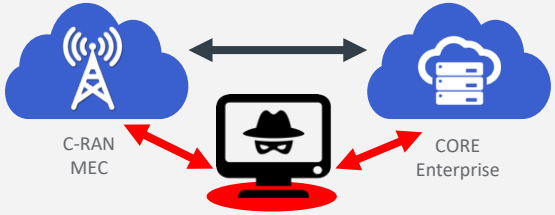
Security validation

Security Challenges 1/2

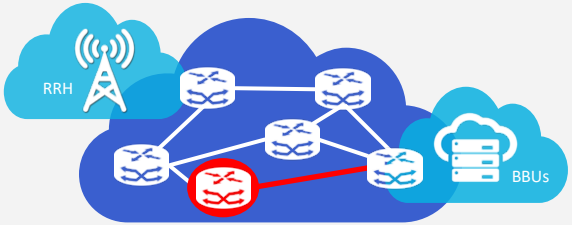


NFVi Attacks

Multi-Vendor Weakness



Edge Distribution Attacks

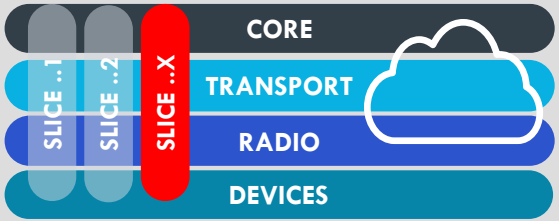


Ethernet Fronthaul Attacks

Security Gateway Attacks

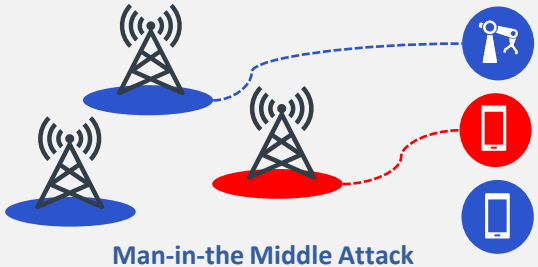
Massive IoT Attacks

Security Challenges 2/2



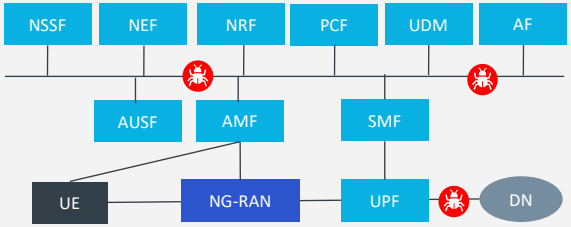
Slice Attack
Slice Faking | CUPS Hijacking

Network Slice Attacks



Man-in-the Middle Attack
DoS | Identity Theft | Spying

Rouge Base Station

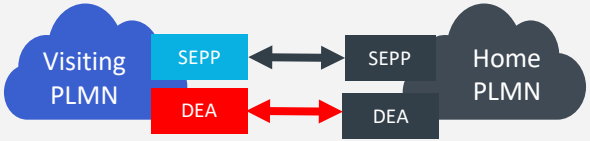


IP Attacks
DoS | Tunnel Flooding

New Core Attacks

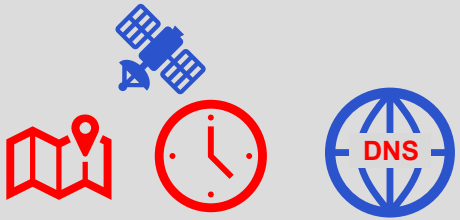
Orchestrator & Controller Attack
Command & Control

Subscription Attacks



Hybrid Network Attacks
SS7 & Diameter

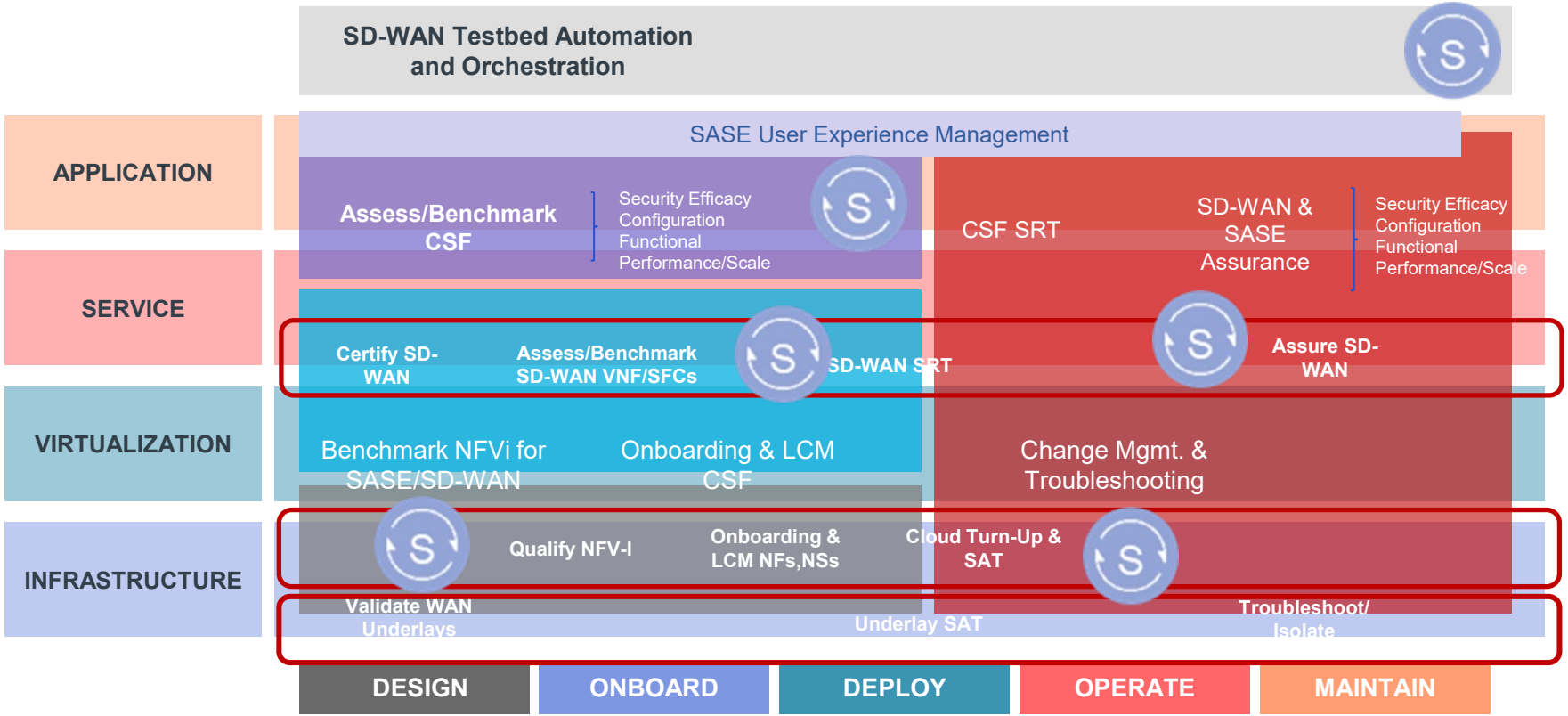
Roaming Threats



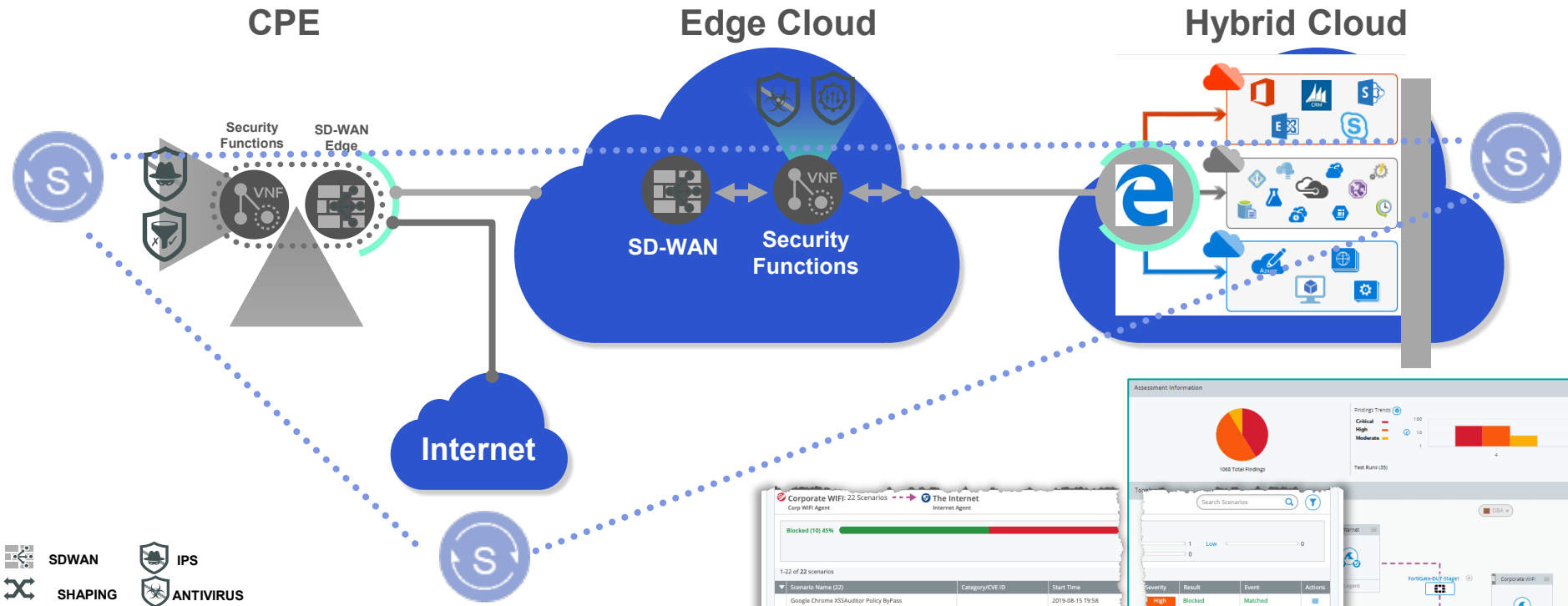
Time, Location & DNS Attacks
DoS | Spoofing | Hijack | Floods

Common Services

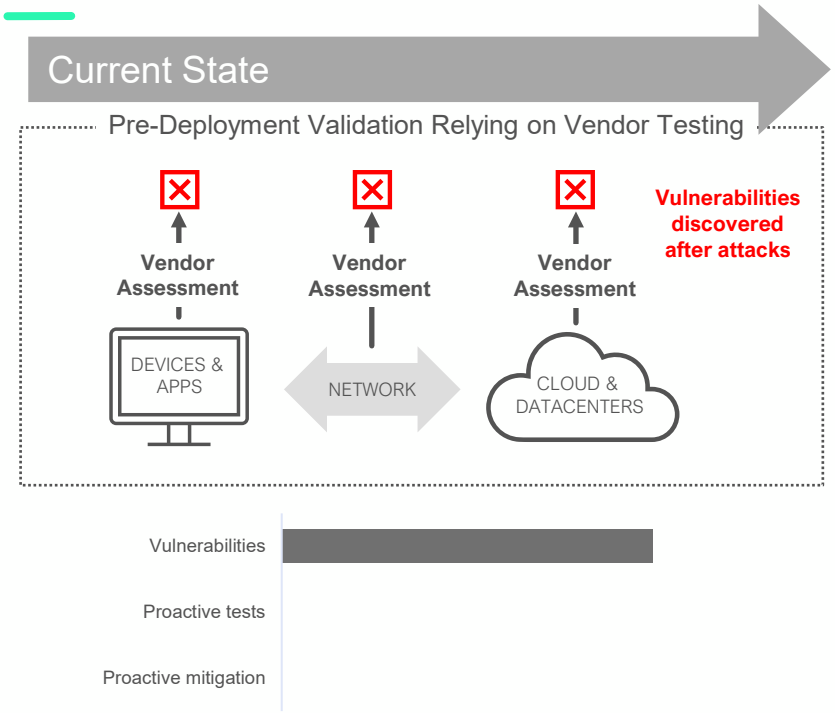
Security(SASE) Solutions

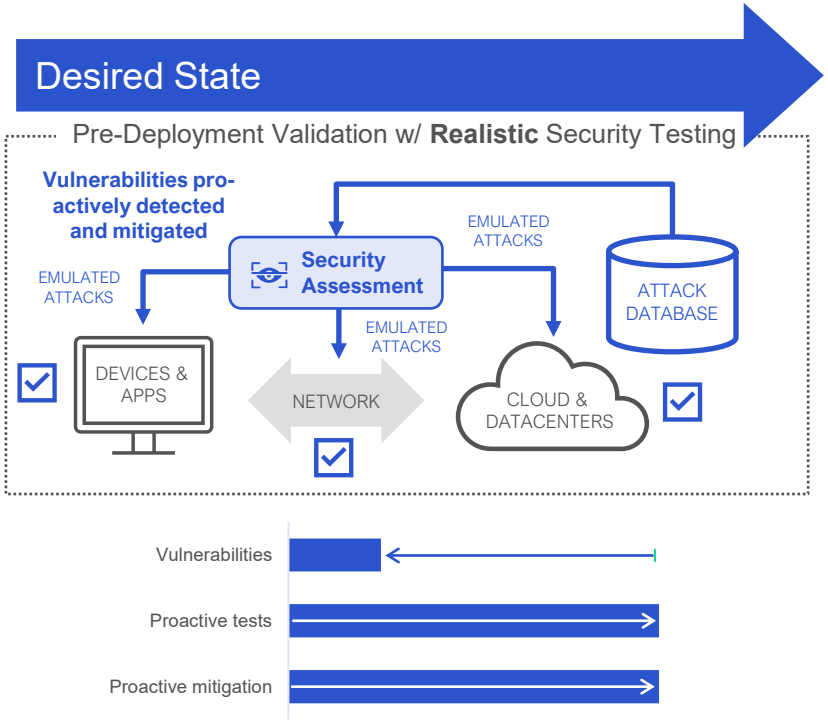


Assessing Security Efficiency in Cloud Environments



Validate Security





Goal: Improving security and proactive reducing risks

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Operational assurance

Challenges

Each network has own visibility and management

Missing easy and full overview

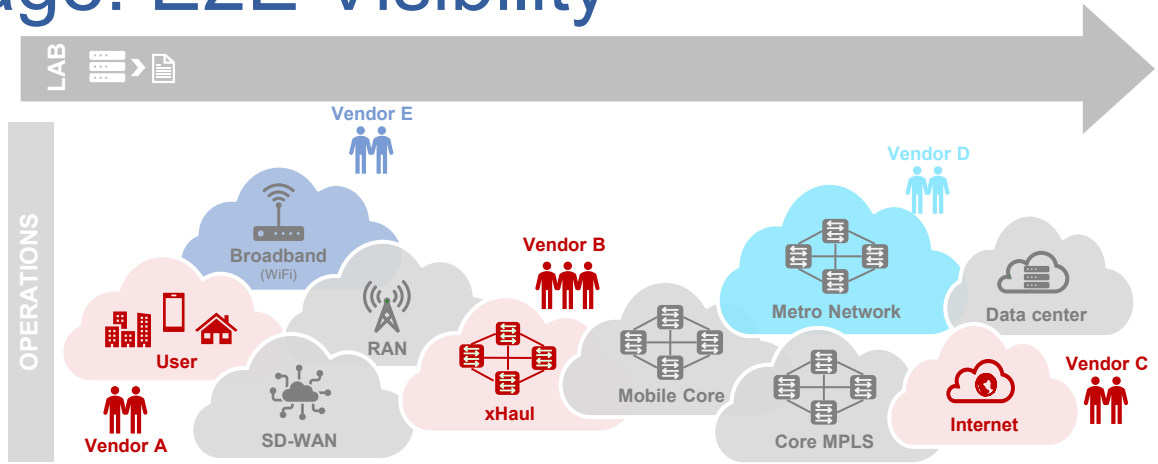
Difficult fault-finding localization and isolation

High complexity when changing architecture or introducing new

Coverage: E2E Visibility

spirent Promise. Assured.

Current State

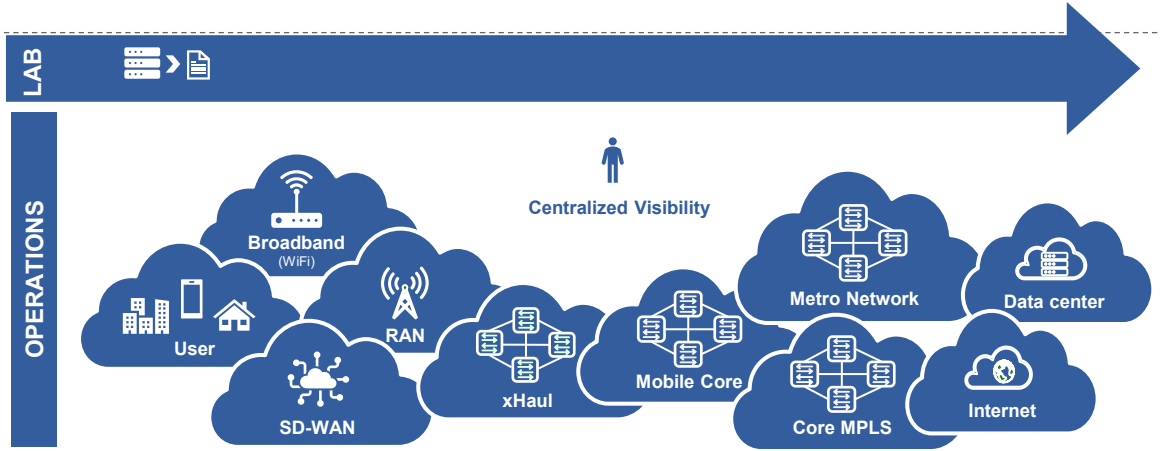


Individual networks
Own visibility and management

Disaggregated view as "island" solution

Difficult new service introduction

Desired State

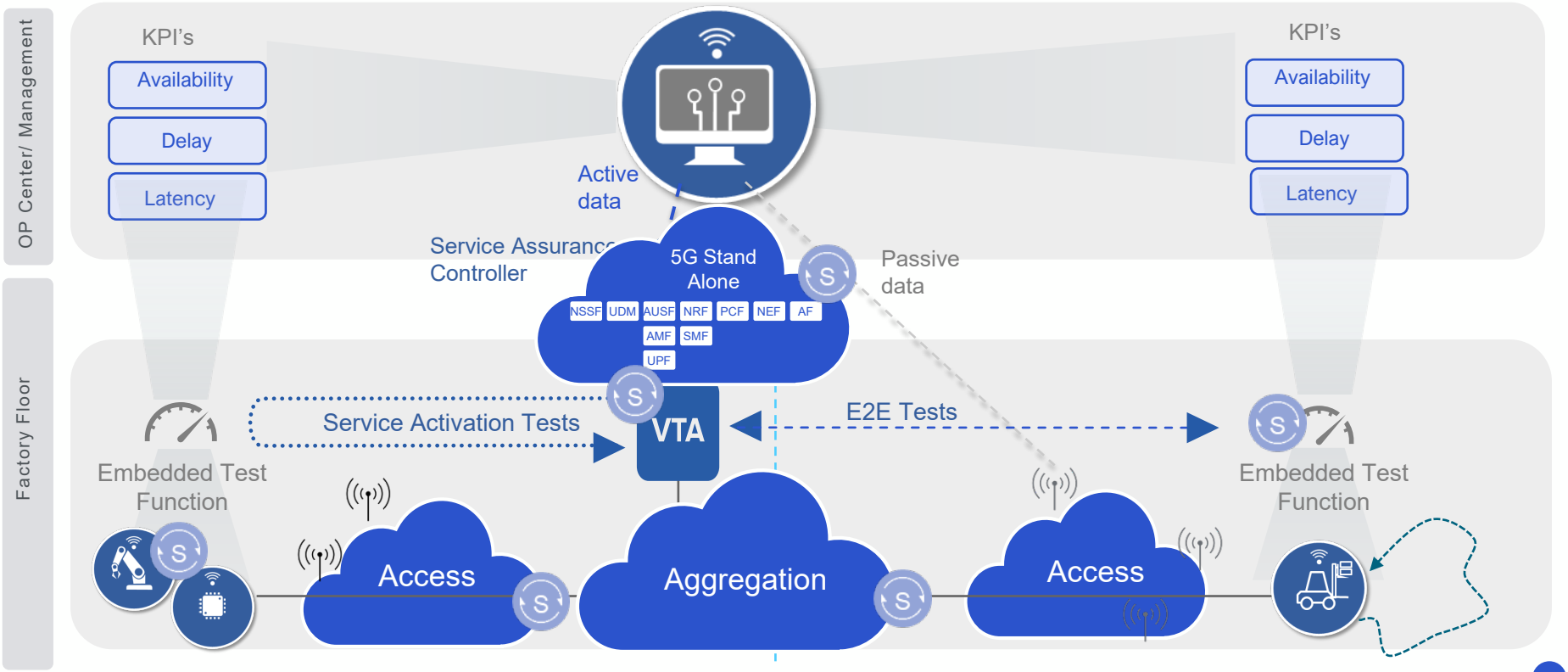


One network view

Automated operations

Decreasing complexity for changes or new service introduction

Network operations (live) concept

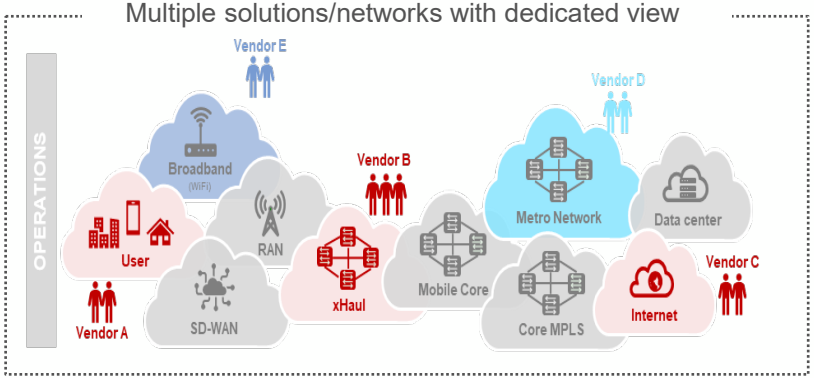


Spirent

Gaining E2E Visibility

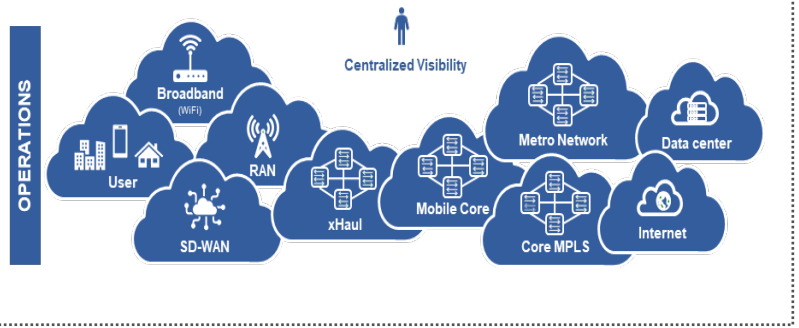
Current State

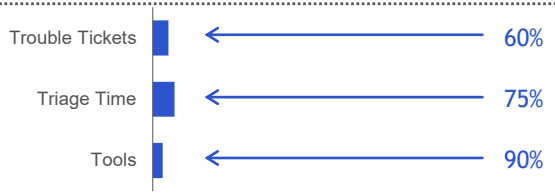
Multiple solutions/networks with dedicated view



Desired State

Aggregated visibility and operation





Goal: Reducing complexity, accelerating time-to-market and optimizing user experiences

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Summary

CASE STUDY

Unleashing the Flexibility of SD-WAN with Active Assurance

CHALLENGE

- Tier-1 service provider was preparing to launch SD-WAN
- Needed to activate services faster at significantly lower cost and ensure IP mesh network was ready for SD-WAN

SOLUTION

- Spirent Active Assurance for virtual and physical networks
- Deployed Ethernet & IP virtual test agents to more than a thousand of the client's points of presence

IMPACT

- Automated manual service activation, SLA monitoring and troubleshooting workflows, saving millions of dollars each year
- Provider saved $10 million by deploying virtual test agents in lieu of physical test heads as it upgraded 1G links to 10G

Challenges

What keeps you awake at night?

Network readiness

Will your network perform and avoid post-deployment problems w/ 5G, SD-WAN, cloud and Wi-Fi migrations?

Security threats

How can you stay ahead of threats and keep your network secure? Are you proactive or reacti

Improving resources

How do you security in-house talen

Solving the challenges and improving the outcome for successful Cloud deployments

Cloud migrations

How can you ensure your clouds will perform in real-world conditions while avoiding higher Opex?

Technology adoption

How can you be sure of a successful migration from various sources? Are end-users experiencing promised QoE?

Data ownership

Security and GDPR when using 3rd vendors for hosting and operationalizing company data.

Accelerate time to market

Reduce complexity and cost

Benefits we provide to our customers

We're with you every step of the way

Harden cybersecurity defenses

Optimize user experience