

Deutsche Telekom Overlay Update

New SDN services, features, and processes

Sourcing Advisors & Analysts Days 2023 //
Breakout Session, June 29

Roland Jurkowski, Claus Heßberger, Gerd Müller



We carefully selected 7 SD-WAN vendors

There are more than 70 SD-WAN providers in the market



We have multiple vendors in our portfolio to ensure we can cover the specific needs of your network. Each vendor offers unique advantages across the following criteria:

 Performance

 Security

 Price

 Availability

 Cloud connectivity

 Features



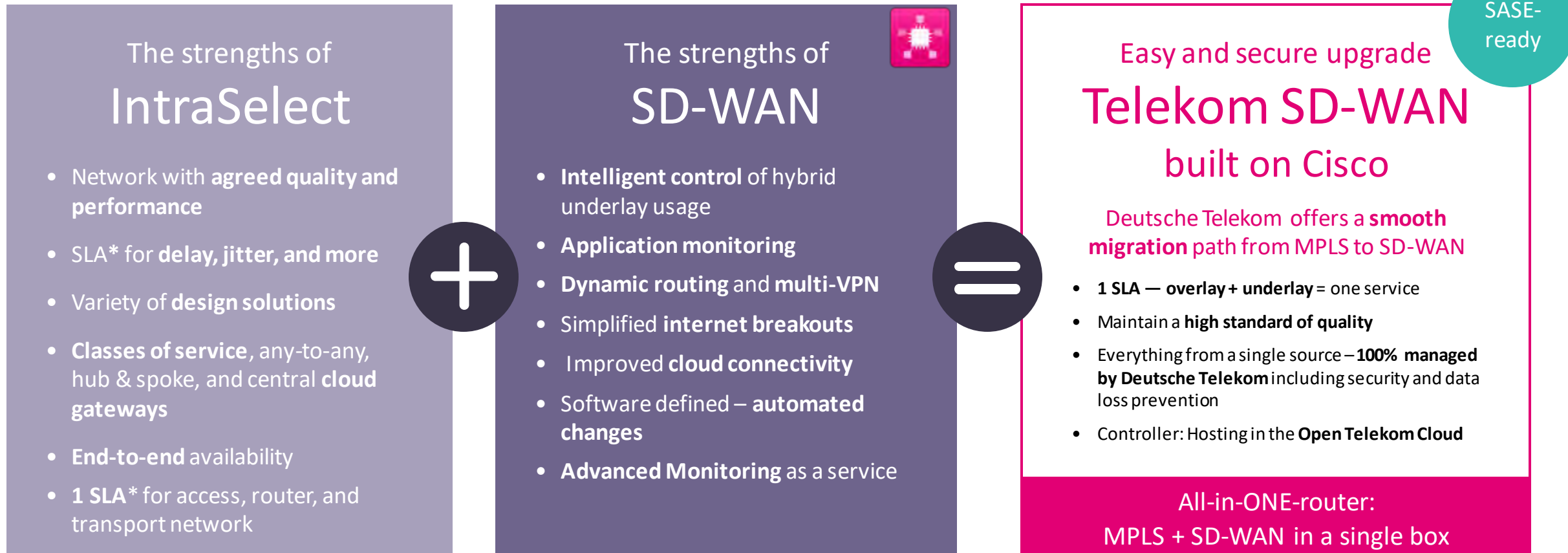
Telekom SD-WAN built on CISCO

IntraSelect Evolution

Roland Jurkowski

The evolution of IntraSelect

Telekom SD-WAN built on CISCO



Underlay and overlay — 100% Telekom-managed



Fortinet

Claus Heßberger

SDN-Projects never start on a greenfield, but security plays always a major role



Typical customer requirements



SD-WAN Service

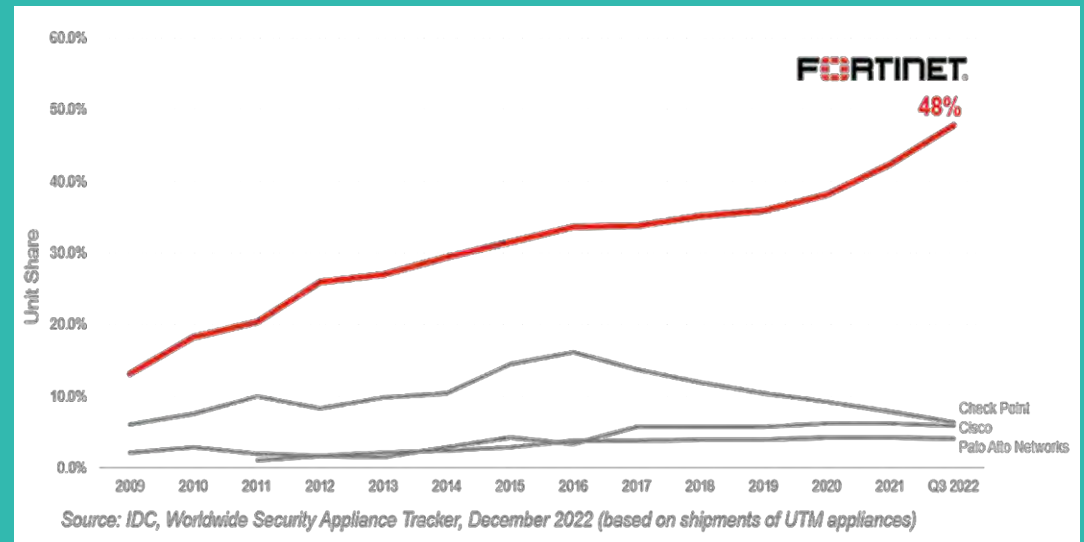
Remote Access
Service

NG Security
Solution

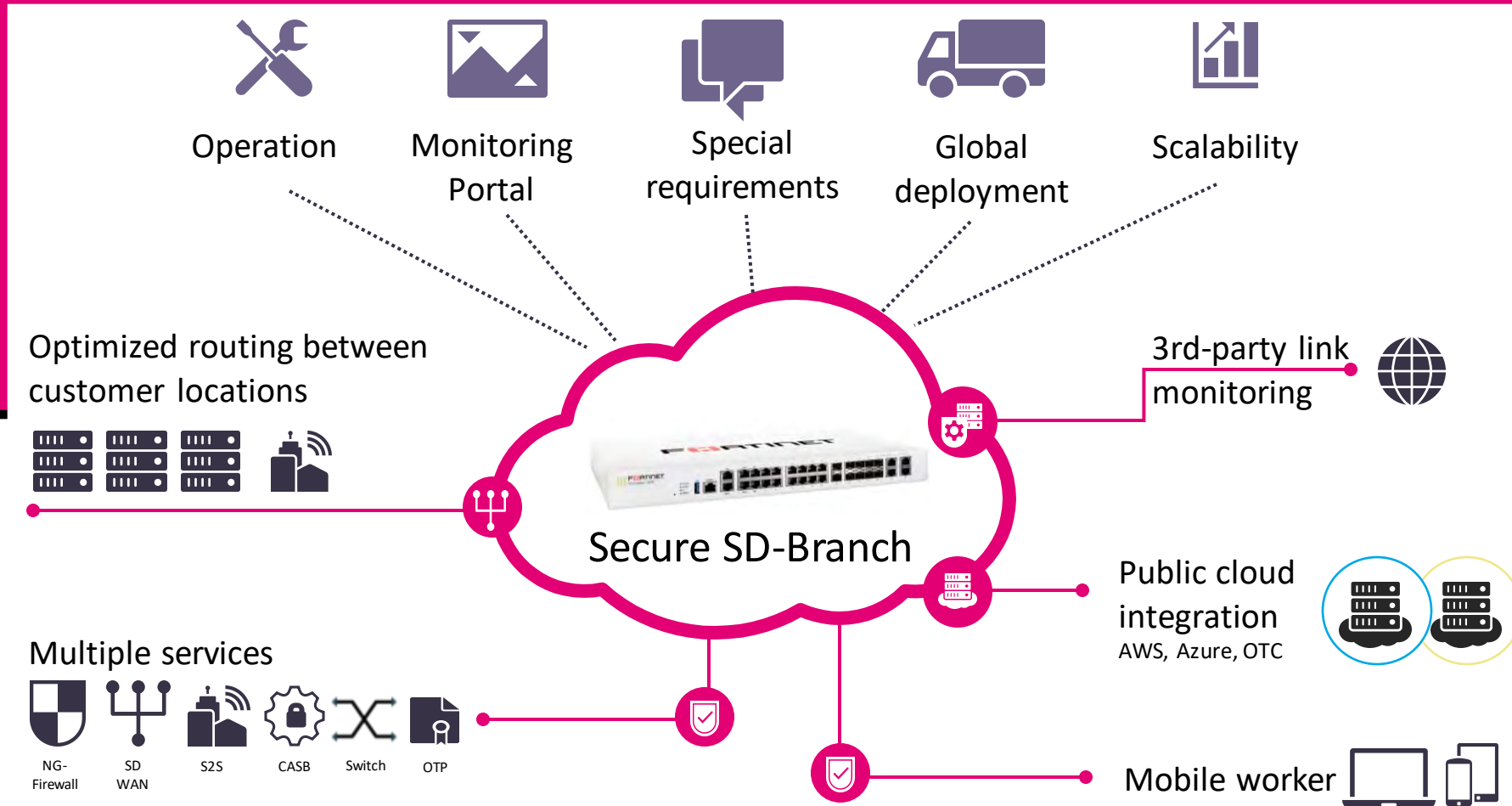
Secure Web
Gateway

DLP, XDR, AV, ...

Firewall shipments worldwide



Customer challenges in network & application optimization handled by one approach



Fortinet and Telekom live a strong partnership and are ready for future challenges

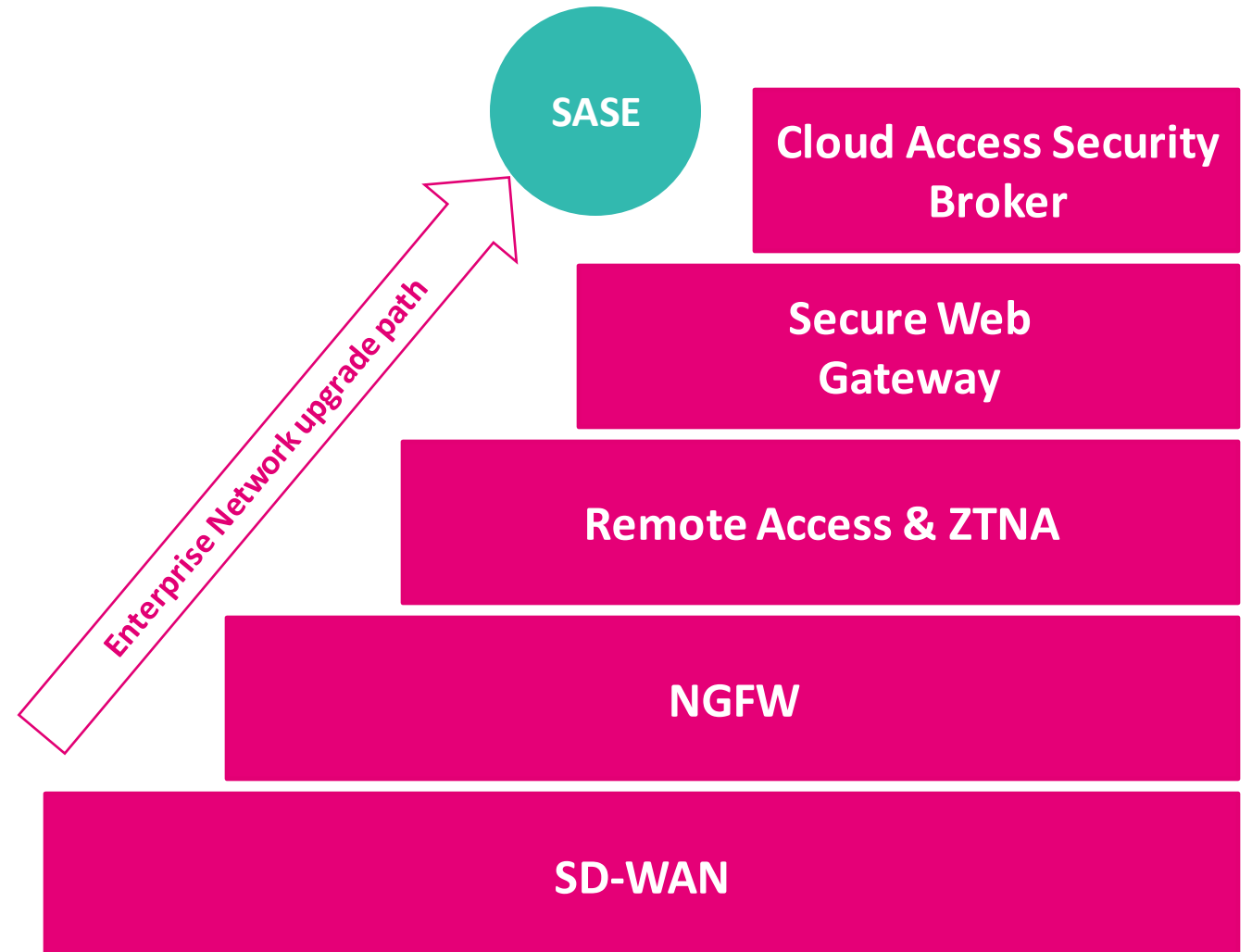


Highlights

Fortinet & Deutsche Telekom

- Co-Management
- Selfservice portal
- ISP agnostic approach
- Worldwide onsite support
- Zero touch deployment
- Integration in an existing environment
- Telekom customer Monitoring/ Reporting
- Using the whole power of FortiFabric
- One business process chain of multiple services and networks
- Integrated under- and overlays support
- Dedicated Fortinet team of specialist exclusive for DT

...and much more!



Three takeaways



The diagram consists of three circles arranged horizontally. The first and third circles have thick magenta borders, while the middle circle has a thick gray border. A dashed magenta line arches over the first and third circles, and a dashed gray line arches under the middle circle. Small magenta dots mark the start and end of these dashed lines.

***“There is no
Greenfield out
there”***

***“Integration and
Simplification is
Key”***

***“SD-WAN is just
the beginning and
always starts with
Security”***

Telekom is the best choice for Fortinet customer challenges



Juniper Solution

Presenter: Gerd Müller

Telekom SD-WAN built on Juniper

Underlay is agnostic regarding technology and provider

Supports a multi-cloud strategy

Low overhead and short failover times

Highly automated service core with customized service enhancements

Best fit for complex networks with advanced technology

Provides co-managed services



WHO IS IT
FOR?

Telekom SD-WAN built on Juniper — an all-inclusive solution

Juniper's solution — more than just SD-technology

Technology

Juniper SSR-SD-WAN

Juniper Session Smart Routing (SSR) is an innovative, session-oriented SD-WAN technology. By eliminating IPsec, SSR achieves higher net bandwidths and faster failover times.



Add-on software

Telekom software eco-system

We have developed a software ecosystem to fill in the gaps in the SSR technology and provide advanced monitoring, reporting, and co-management capabilities as well as faster rollouts.



Service

Tailored, professional service

Our architects and engineers who specialize in Juniper's solution can evaluate, design and implement functionality that goes beyond the standard product.



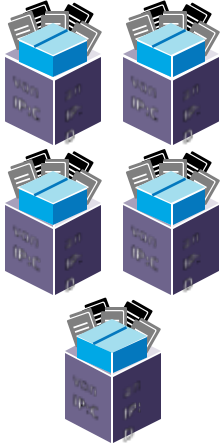
The advantages of SSR: an IPsec-free design

Customer requirement:

- Lower bandwidth use/waste especially for sites and connections with low/expensive bandwidth (poor DSL, mobile, satellite)
- Network must be flexible, upgradeable, fast, reliable, and secure

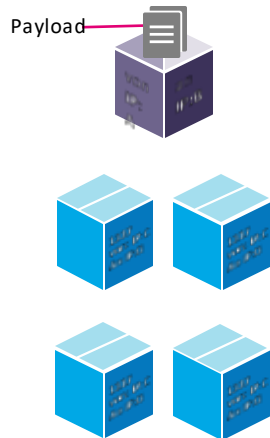
IPSec

Payload **160 bytes**
Packet size **324 bytes**

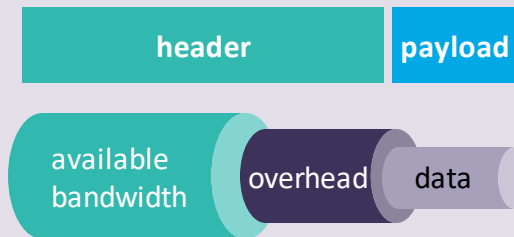


SVR (Session Vector Routing)

Payload **160 bytes**
Packet size **200 bytes**

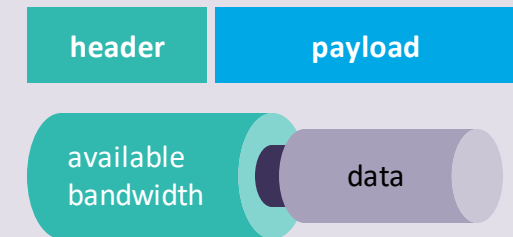


IPSec



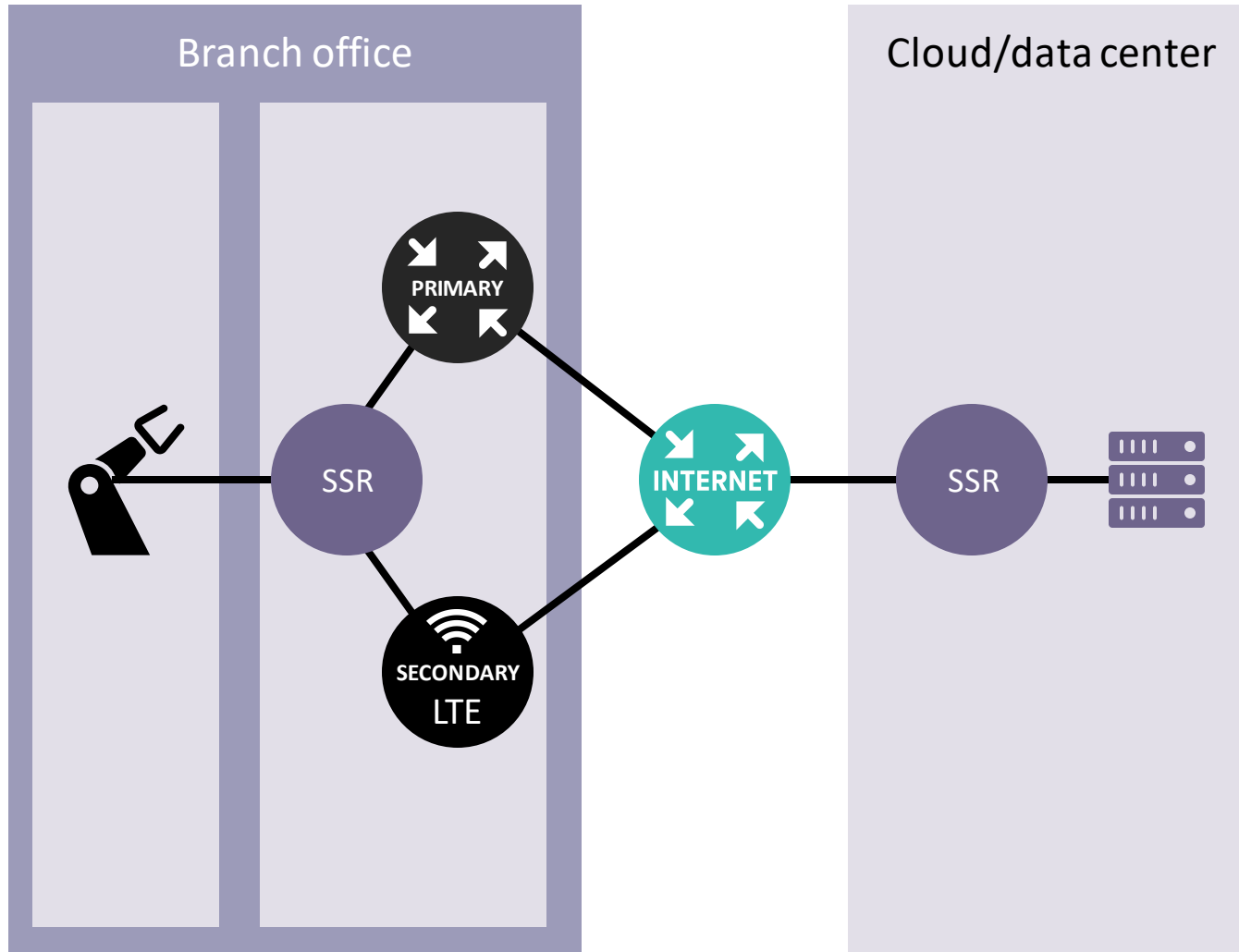
- Negative impact on usable bandwidth due to overlay
- 30–50% overhead from encapsulation
- Central control instance is a single point of failure
- Resource-intensive tunnel management
- Encryption and decryption use huge amounts of compute resources

Session Smart Routing (SSR)



- Improvement on usable bandwidth
- Saves significant portion of overhead
- Distributed architecture — a central control instance is only used for setup and changes
- Maximum flexibility (any-to-any communication) and optimized routing
- Adaptive encryption saves resources

The advantages of SSR: minimal failover time



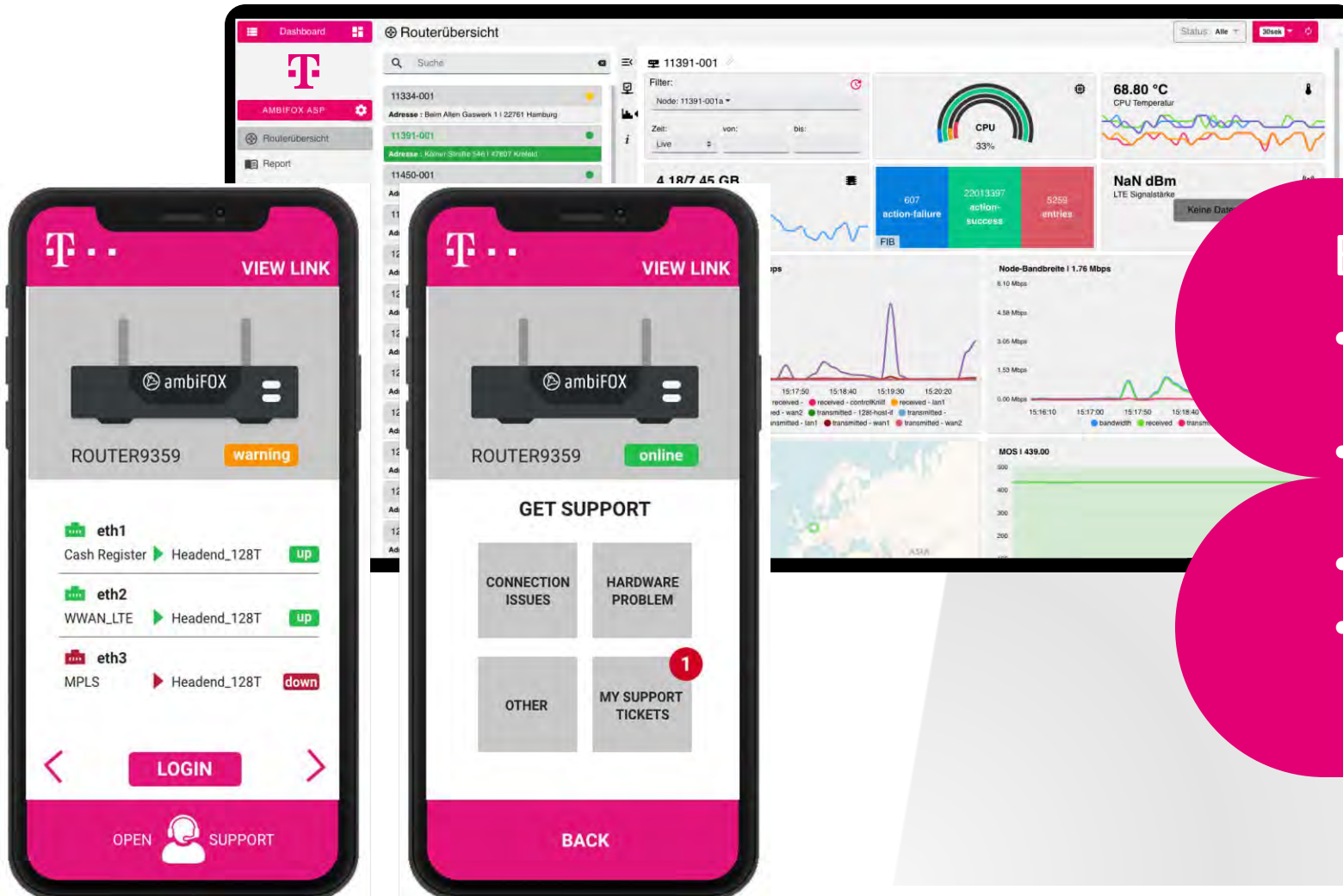
Advantages of the technology

- Detection of outages and SLA violations within milliseconds
- Switch over to secondary connections without interruptions or dropped sessions

Uses cases

- Use of business-critical applications via unreliable underlay connections possible
- You can use WAN connections in active-active mode or as backups
- Sessions without any interruptions due to SSR implementation

The advantages of Deutsche Telekom monitoring



Enhanced dashboard

- Integrated monitoring view for Juniper SD-WAN and third-party components
- View of xDSL synchronization bandwidth and LTE signal strength
- Customizable views
- Special mobile users view for sites using QR-code on CPE

Contact



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Backup

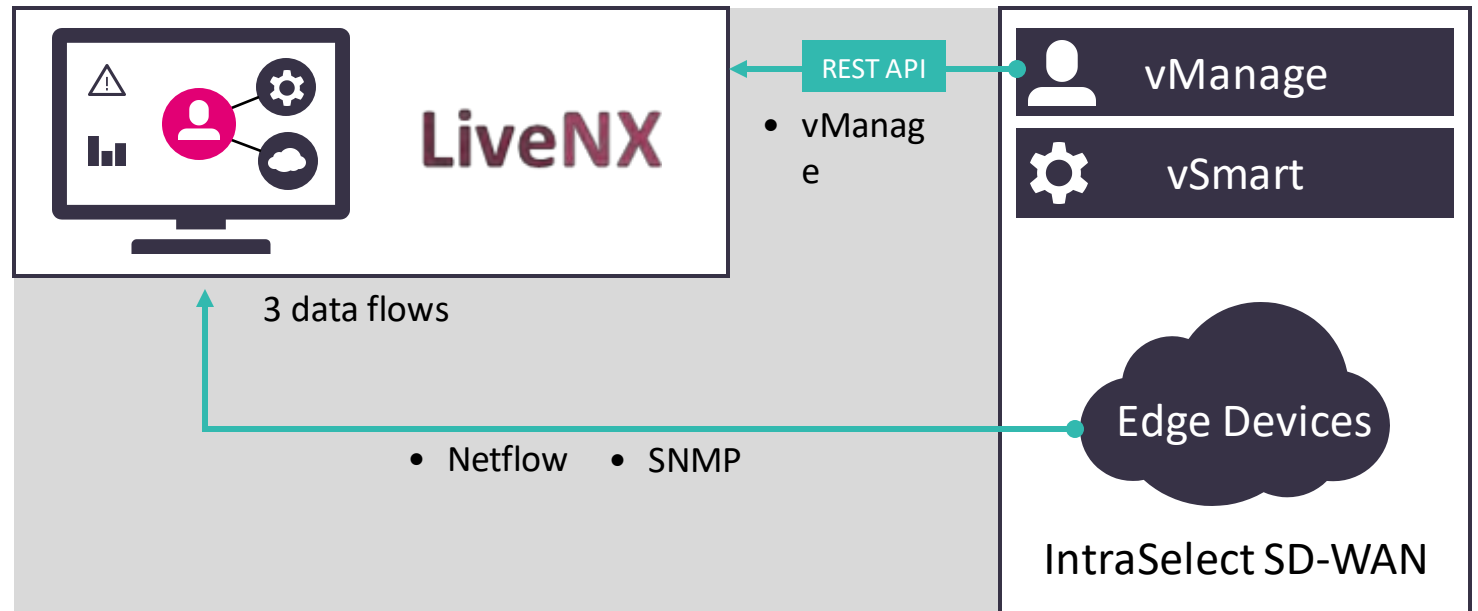
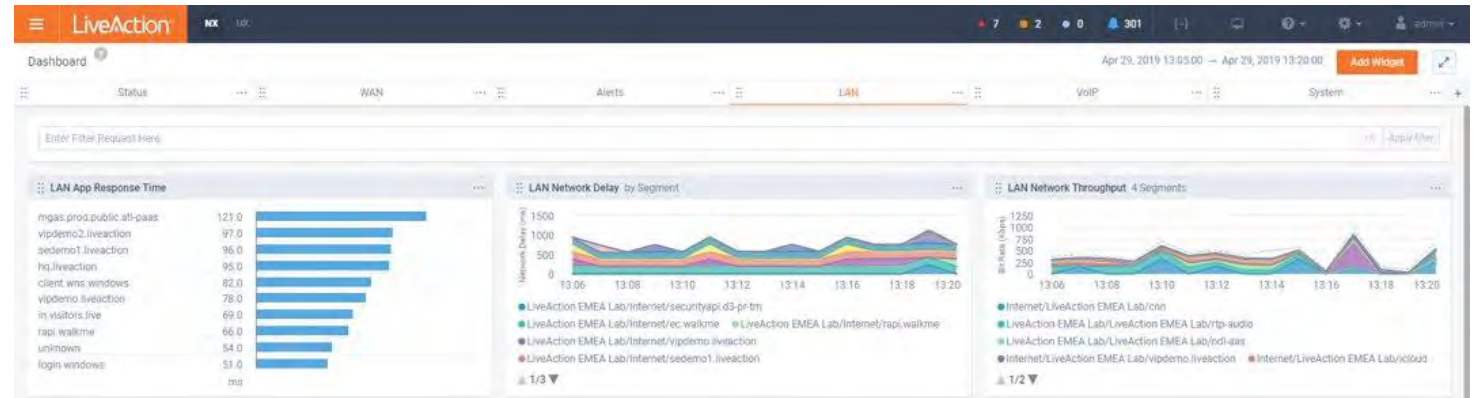


Telekom SD-WAN built on CISCO

Monitoring & reporting LiveNX — monitoring as a service

Standard dashboards come pre-configured

- **Advanced monitoring service** for end-to-end application-monitoring
- Dedicated platform, highly **scalable** with **flexible** storage and information security
- Data storage in **Germany**
- **Visualization** of application flows
- Default and custom **dashboards**
- **Automated** reporting
- **Customer access** to monitoring platform (co-management)



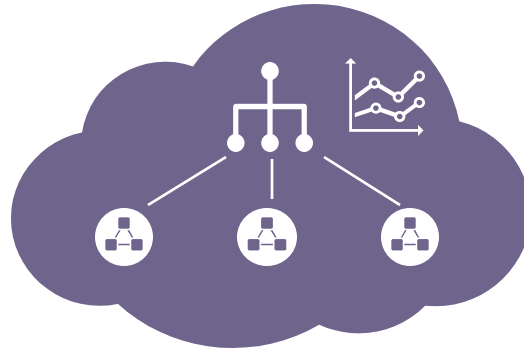
Telekom SD-WAN built on CISCO

Centralized orchestration of key SD-WAN components

© vManage

© vSmart

© vBond



- Centralized steering of WAN traffic
- High level of automation
- Centralized components are hosted in a German datacenter
 - Open Telekom Cloud
- Dedicated hardware, scalability
 - Cisco equipment
 - Network sizes S,M,L and XL

Advantages of Telekom SD-WAN built on Cisco

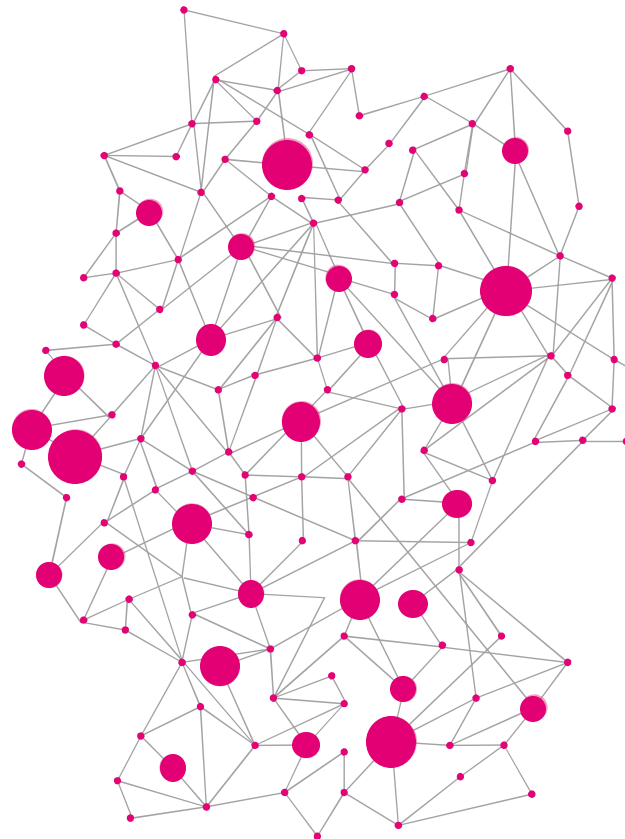
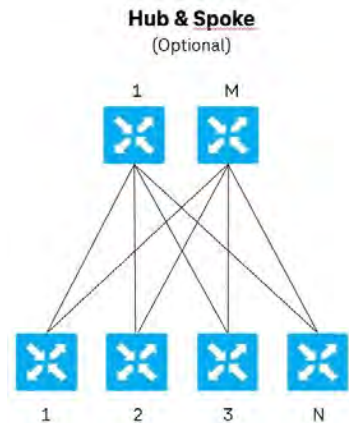
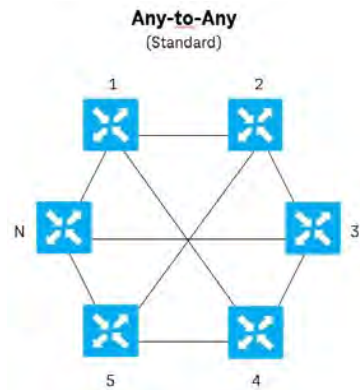


- Countless **underlay** solutions on **Telekom infrastructure**
- **MPLS** and **internet** (DSL/FTTH/4G/5G) with **CoS**
- **Cloud on-ramp**
- **SASE-ready**
- **End-to-end encryption**
- **Zero-touch deployment** and backend **automatization**
- Automated and **intelligent traffic control**
- Standardized **access design types**
- Overall responsibility **through service management**
- **Stable operation**
- Over 1,200 active service points (2,000 by end of year)
- Onboard **Zone Based Firewall**

Telekom SD-WAN built on CISCO

Routing & network options

Topology



APPQoE

Application quality of experience

- Automated dataflow steering
- Optimized usage of MPLS and internet access
- Automated application recognition (application-aware, policy-driven)
- SLA-based routing (delay, jitter, packet loss)
- AAR, FEC, TCP optimization, packet duplication
- Application performance monitoring
- E-2-E app path visualization

Telekom SD-WAN built on CISCO

Routing & network options: classes of service

Custom CoS mapping



Automatic application recognition (DPI – deep packet inspection)



Visualization of app performance in dashboards and automated reports



E-2-E app-performance



Operations



Overlay operations

- Proven technology, tested by DTAG, more than 1,200 service points in the field
- Certified engineering and operations
- Engineering in Germany and the EU

Underlay operations

- Zero Outage
- Use of DTAG-owned infrastructure (MPLS/DSL/4G5G)

Service integration

- One team & one SLA for overlay and underlay
- Established processes and tools
- ITIL-process for operations
- 1,200 service points (active)
- 2,000 service points by end of the year



Dynamic routing based on prioritization of app-performance according to business requirements



Depending on DSCP value, IP packets are assigned to different queues



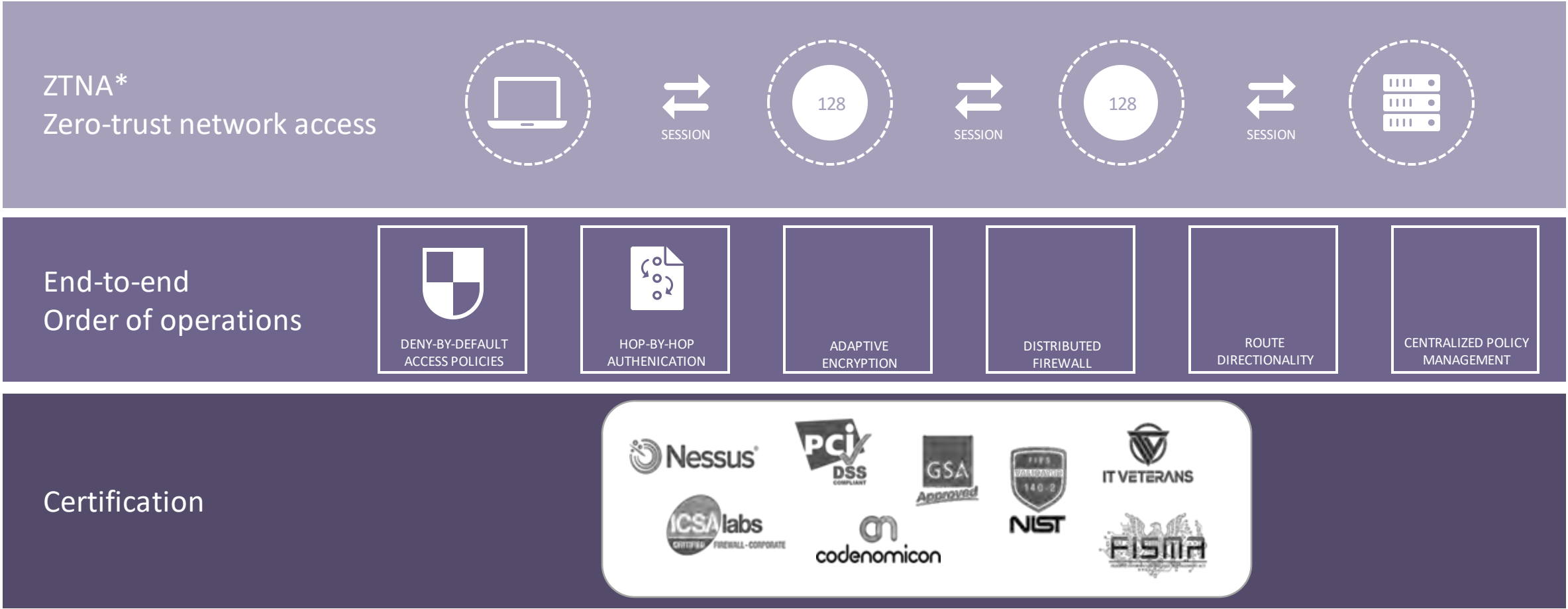
Up to 7 classes of service are available to customers



The service classes will be individually agreed with each customer

Juniper SSR Security

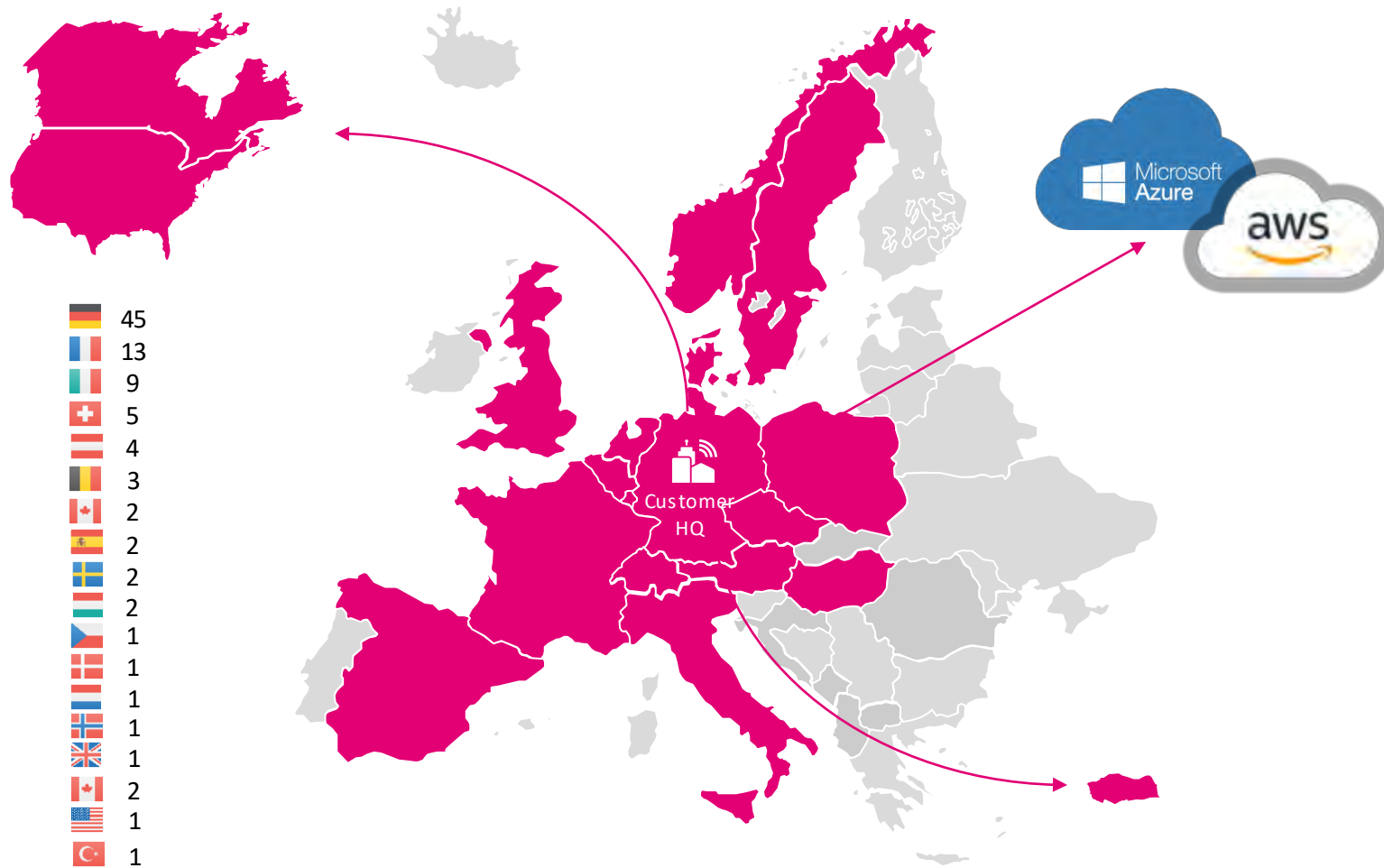
ZTNA* zero-trust network access



SSR is a FIPS 140-2 certified/ICSA approved Corporate Network Firewall

A unified approach for robust security

Customer success story



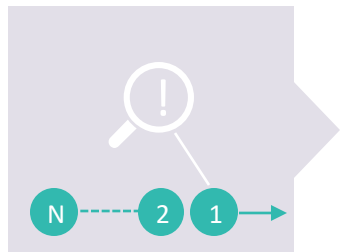
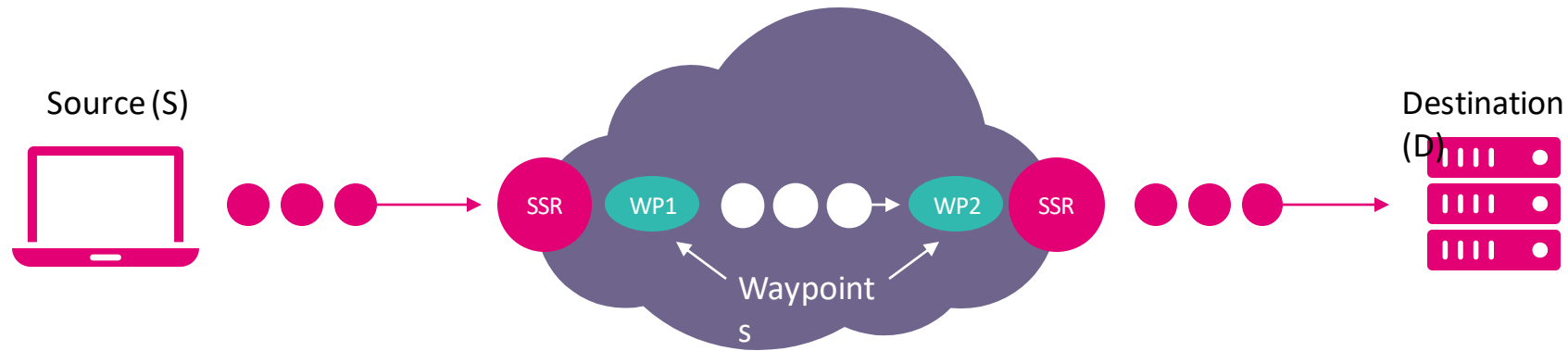
FORTINET.

- SD-WAN networking was built on Fortinet and NG Security
- 90+ locations connected via IPSEC, VDSL, IP Connect, LTE, or customer network
- DTAG manages the overlay and routing, while the customer manages the firewall
- Local internet breakout secured by a local firewall
- Connection to Google Cloud & Azure
- Integration of FortiSwitches
- Integration of FortiExtenders as backup links
- Extensive use of the FortiAnalyzer and Telekom EMP* Portal

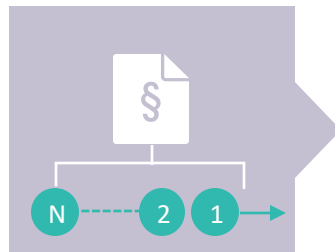
*EMP: Enterprise Management Platform

Juniper SSR

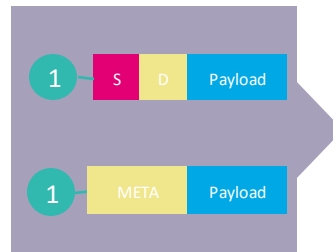
Session vector routing – how it works



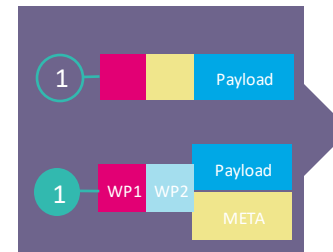
New session detected



Match with policies



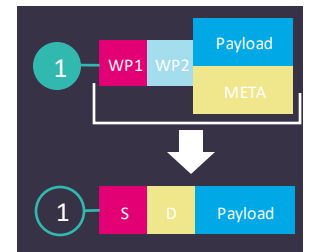
Original IP address stored in metadata



Assignment of SSR waypoint IP addresses



Choice of path based on current network performance and policy



Extraction/reconstruction of original packet