

# **Nine things you should know about SD-WAN:** *but nobody told you*

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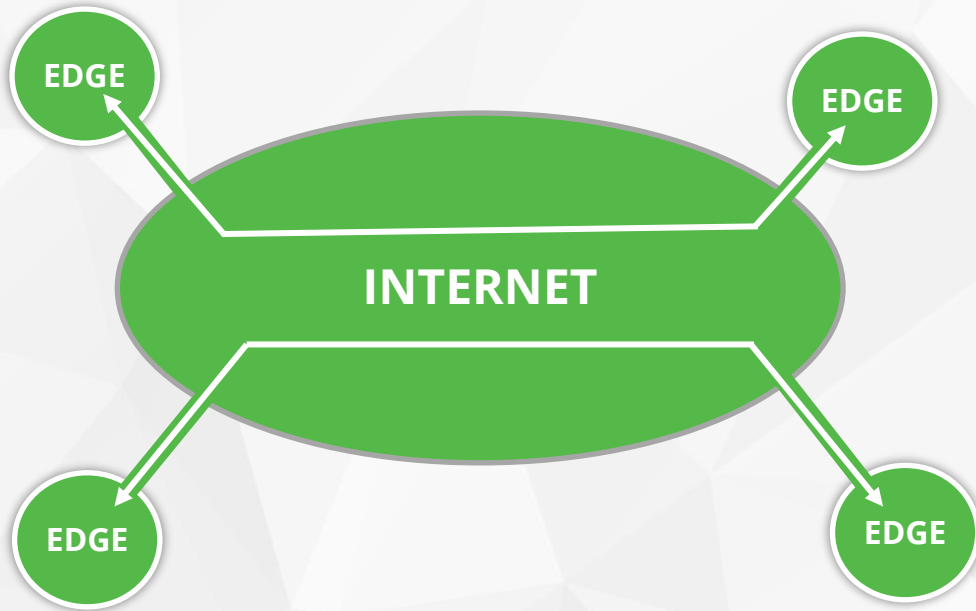
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2. SD-WAN is an evolving technology
3. SD-WAN as the additional layer
4. SD-WAN Edge Installation considerations
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# #1 What is SD-WAN ?

- An evolving technology
- Replacement for dedicated leased links between enterprise sites
- Substitute for MPLS connections (but can work in unison with them)
- Way to connect sites using secure VPN tunnels that go over the public Internet
- Allows the Enterprise to connect its remote locations with high availability to the DC / HUB locations (in theory)
- Makes this connectivity much cheaper than standard implementations
- LOVED by management !

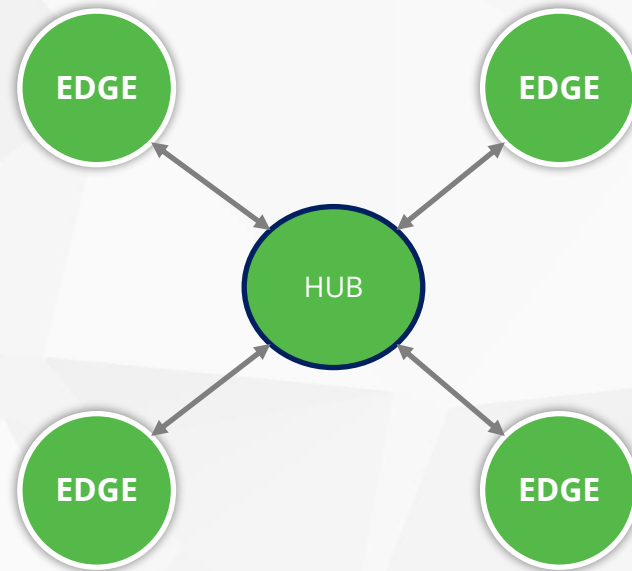
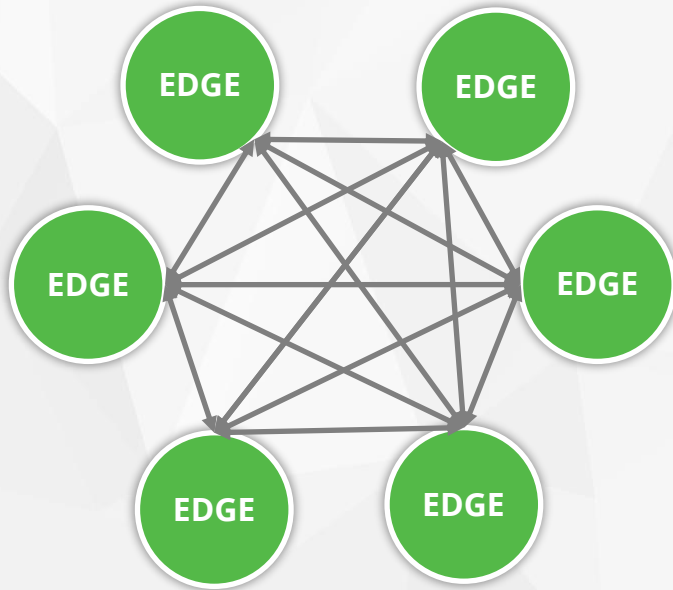
# #1 What is SD-WAN ?



- Software Defined – Wide Area Network
- Enterprise WAN network using VPN tunnels over public Internet
- “Overlay” customer visible WAN network
- “Underlay” physical connections that route traffic between sites

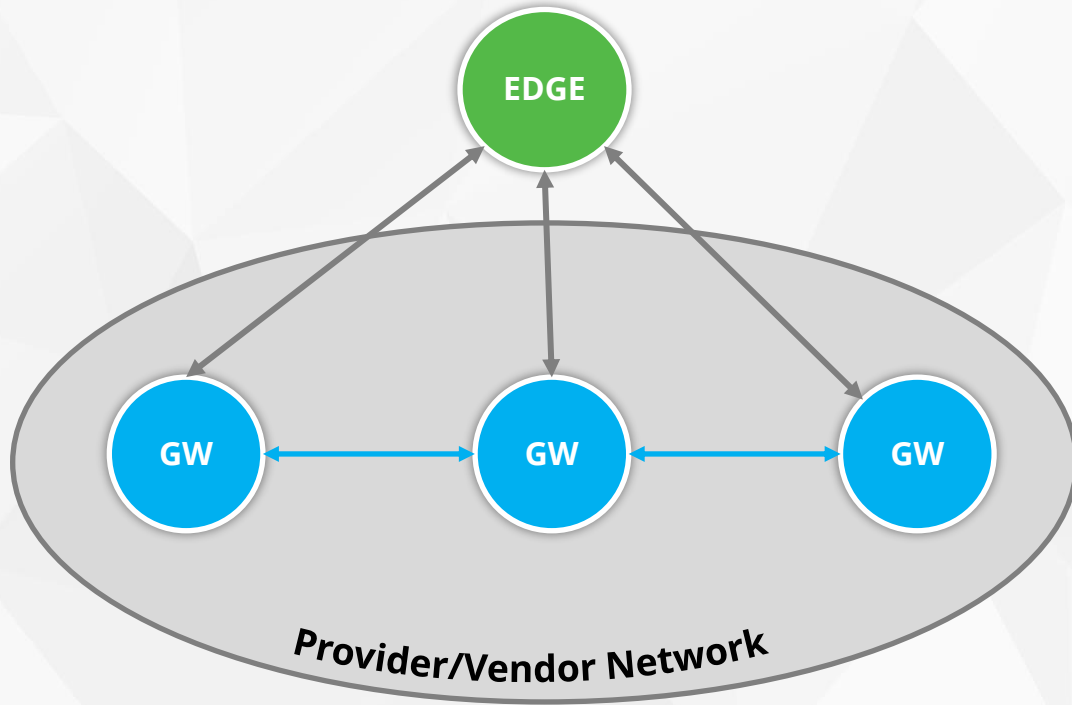
# #1 What is SD-WAN ?

Multiple deployment configurations can be supported



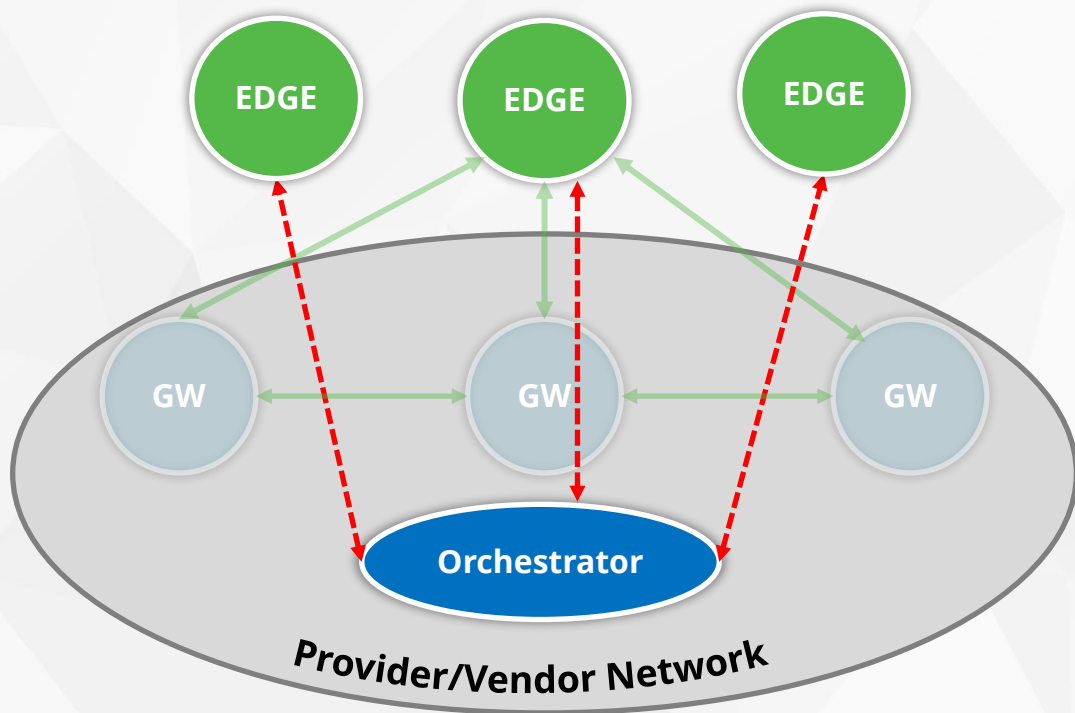
# #1 What is SD-WAN ?

Type of deployment unique for SD-WAN



- **EDGE** has multiple tunnels toward the multiple gateways
- **GATEWAY** is the SD-WAN provider device that serves as VPN concentrator
- **GATEWAYS** communicate between themselves over provider network

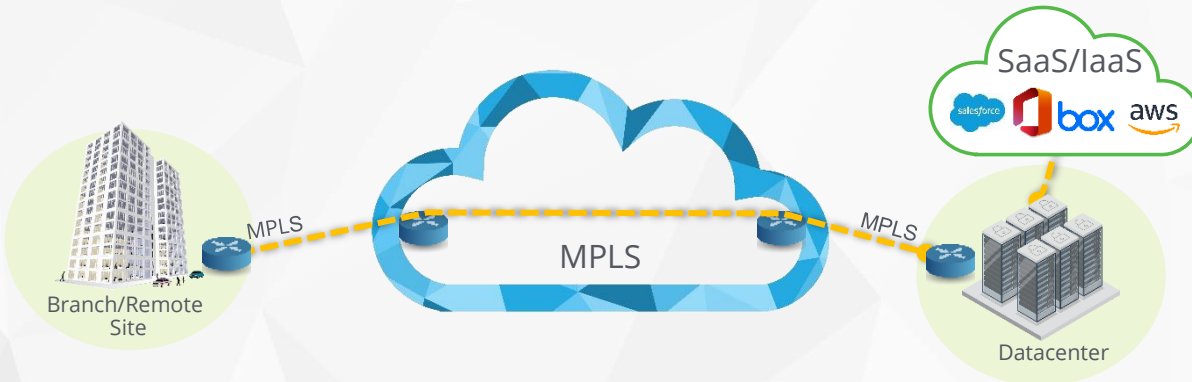
# #1 What is SD-WAN ?



- **ORCHESTRATOR** is the control plane concentrator of the SD-WAN
- **ORCHESTRATOR** is where all configuration, control and management functions are located.
- **EDGE** sends logs, traffic, and performance information to Orchestrator

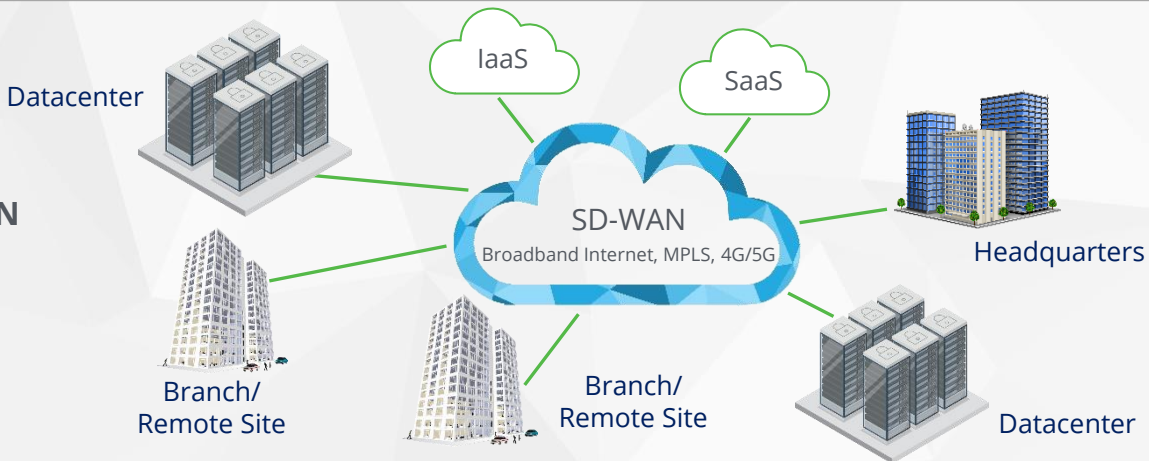
# #1 What is SD-WAN ?

## Traditional WAN (MPLS)



- Expensive
- Complex
- Difficult to Manage
- MPLS not available everywhere globally
- Sometimes Long Lead times

## SD-WAN



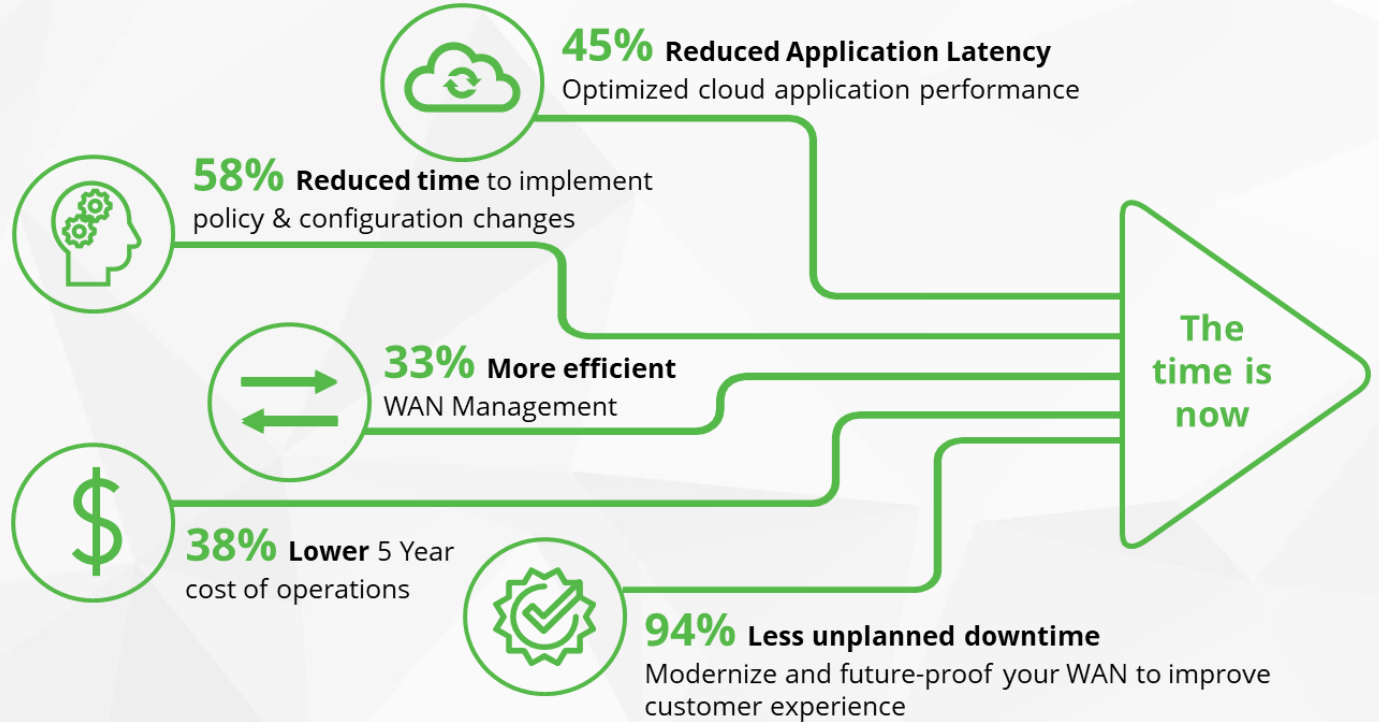
## CLOUD FIRST WAN

- Cost Optimized
- Flexible & Agile
- Better Visibility & Control (Central Mgt)
- Transport Agnostic
- Built for Cloud
- Improved Application Performance



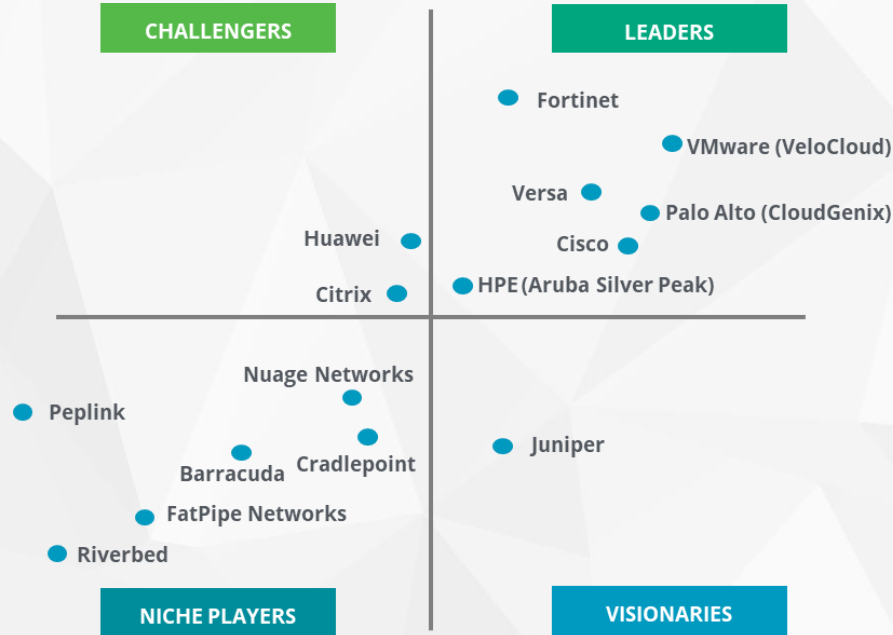
# #1 What is SD-WAN ?

**Why are customers migrating to SD-WAN ?**



# #2 SD-WAN is an evolving technology

## Gartner Magic Quadrant: WAN Edge Infrastructure



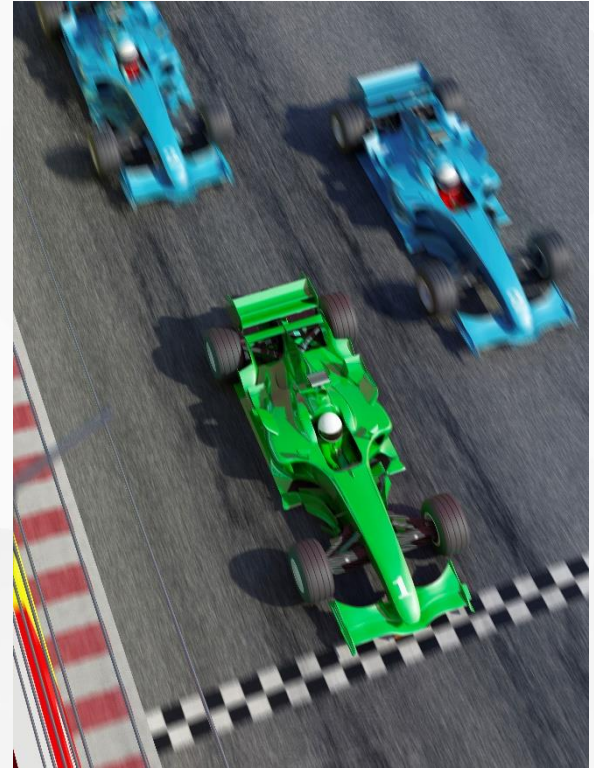
## SD-WAN Market Share 3Q21

1. Cisco	25.3%
2. VMware	13.0%
3. Versa Networks	11.8%
4. Fortinet	10.2%
5. HPE (Silver Peak)	7.5%
6. Huawei	4.6%
7. Palo Alto Networks	3.4%
8. Nuage Networks	3.1%
9. H3C	2.2%
10. Others	18.9%

■ Gartner Magic Quadrant for WAN Edge Infrastructure, Sept 2021  
 ■ Gartner Market Share: Enterprise Network Equipment by Market Segment, Worldwide 3Q21, Dec 2021

## #2 SD-WAN is an evolving technology

- Vendors raced to market with 'semi-finished' solutions
- Vendor specific standards / solutions / implementations (no RFC for SD-WAN!)
- Early deployments faced a lot of troubleshooting and features still "in production"
- Lack of training and documentation
- "Best Practices" still in development



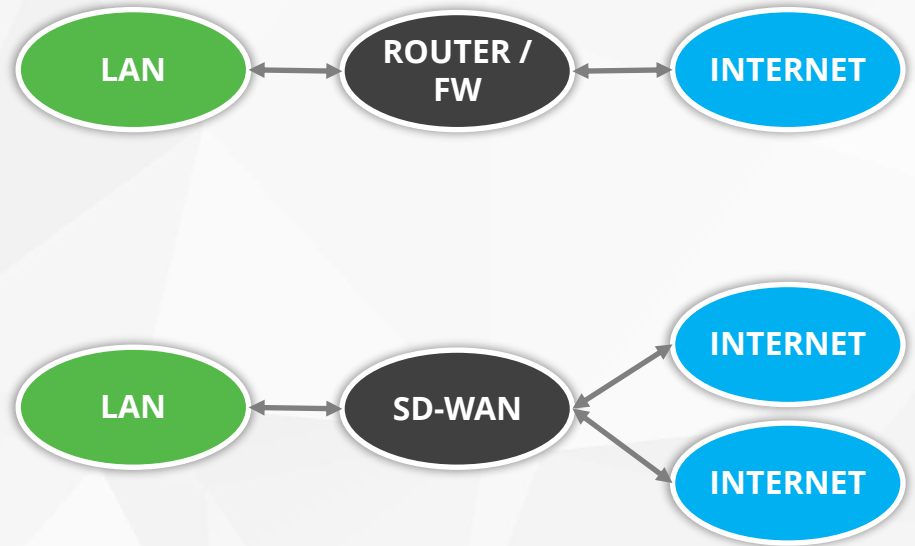
# #3 SD-WAN as additional layer

- SD-WAN is a connection between provider WAN/Internet and Enterprise LAN network
- Separate troubleshooting efforts are needed for SD-WAN
- Who is responsible for ISP communication (customer / SD-WAN provider)?
- Joint maintenance <-> joint responsibility



# #4 SD-WAN Edge installation considerations

- „Zero Touch Provisioning“
- ISP links
- ISP Firewall
- NAT / CNAT
- (Un)trained personnel on site
- Coordination with customer network specialists
- Coordination needed with customer network design team



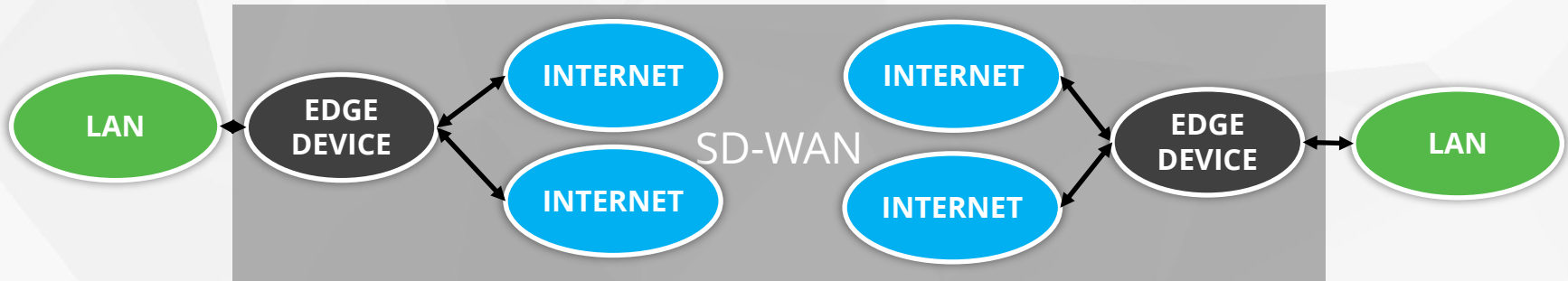
# #5 Underlay Troubleshooting

- Invisible for the customer
- ISP communication and troubleshooting
- SD-WAN uplinks are not MPLS (high SLA) !
- Internet access without SLA / with weak SLA
- Customer will only see the service

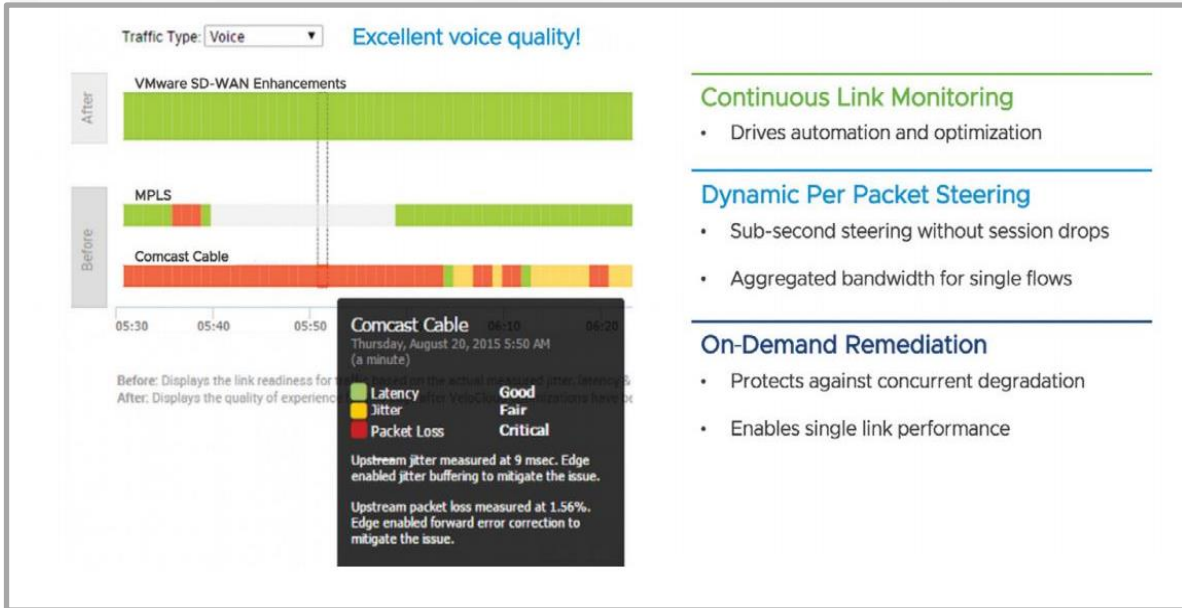


# #5 Underlay Troubleshooting

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- Internet access without SLA / with weak SLA
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# #6 „Masking“ of the underlay problems



- Dynamic Multipath Optimization
- Excellent feature with a “dark side”
- How do we know that the link failed ?
- When will the customer know the link failed ?



# #7 Overlay Troubleshooting

- Visible to customer
- Customer will only see the service
- SD-WAN is not WAN network
- SD-WAN holds prefixes and announces them to Edge Devices (and vice versa)
- Additional troubleshooting challenge
- Careful routing procedures need to be implemented to prevent routing loops

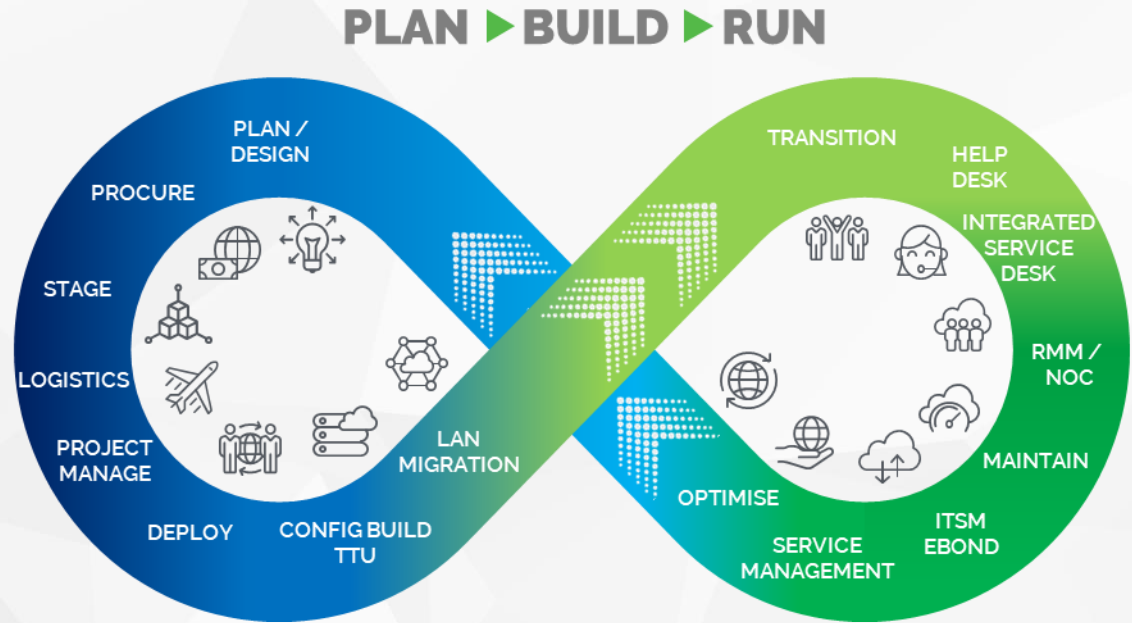
# #8 SD-WAN Operation and Maintenance

- Transition to SD-WAN from legacy infrastructure
- ISP communication and troubleshooting
- SD-WAN troubleshooting
- LAN troubleshooting
- Monitoring of all LAN / SD-WAN / WAN / ISP operation
- Field work at location
- What can be kept in-house – what needs to be outsourced

# #8 SD-WAN Operation and Maintenance

How can a Managed Services Provider (MSP) help?

- Extend your team's skillsets and technical expertise
- Share implementation and deployment best practices
- Provide insight and experience across the leading technology players
- Augment service and management capabilities



# #9 SD-WAN Evolving to SASE



CISCO Meraki

vmware FORTINET

VERSA NETWORKS silver peak

HUAWEI paloalto NETWORKS

nuagenetworks From today JUNIPER NETWORKS

Multiple Networking & Security Vendors Competing or Partnering

zscaler vmware CISCO FORTINET

netkope VERSA NETWORKS paloalto NETWORKS

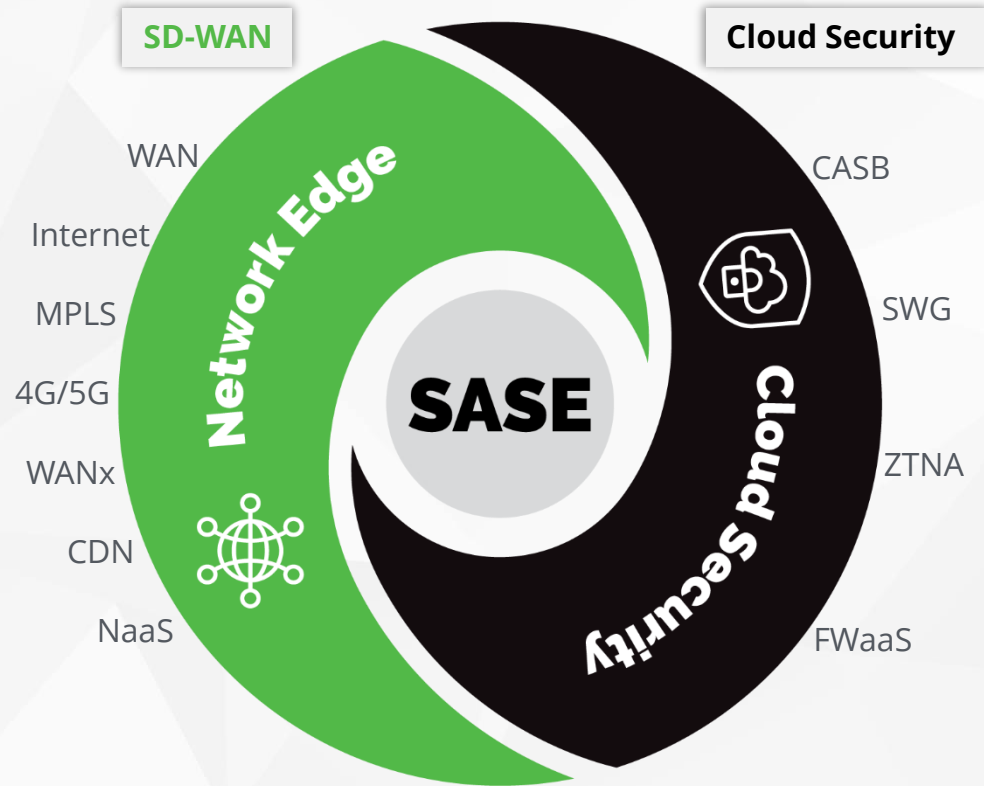
Forcepoint BROADCOM proofpoint Menlo Security

bitglass Akamai McAfee

Sample of Vendors Check Point SOFTWARE TECHNOLOGIES LTD. CLOUDFLARE CATO NETWORKS

# #9 Secure Access Service Edge (SASE)

- **SASE** convergences **WAN** and **Network Security services** into a **single unified cloud native service delivered model**.
- New package of technologies often including **SD-WAN** and **SWG, CASB, ZTNA, FWaaS** as core components.
- Delivered primarily '**aaS**' and based upon the identity of the entity, real time context & policies.
- Simplifies network infrastructure by **merging networking and security services** into a **unified architecture**.



# Conclusions

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1. SD-WAN represents an evolving technology
2. Vendor specific solutions are the only solutions available
3. A new SD-WAN implementation requires **careful planning** and **execution**, including:
  - A **clear design** and **strategy** for the new SD-WAN network
  - A **comprehensive redesign** of the existing infrastructure
  - A **detailed migration plan** to transform the enterprise network to SD-WAN
  - A **defined process** for ongoing troubleshooting, monitoring, and maintenance of the new SD-WAN network

# Conclusions

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- Need for either outsourcing or intensive and comprehensive training of the existing staff to handle the SD-WAN implementation, monitoring and operation.
- Managed Services Provider is not a “universal solution” to all SD-WAN issues
- Regulatory / legal concerns need to be addressed when implementing cloud-based solutions like SASE
- Despite the industry hype and marketing messages – there are no magical solutions in the SD-WAN implementation



# THANK YOU

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