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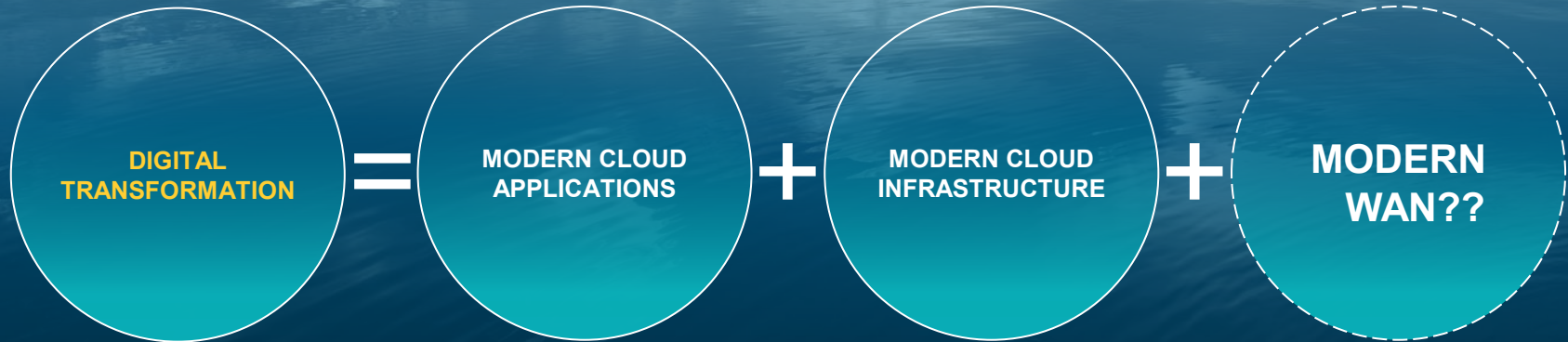# SILVERPEAK SD-WAN
A CATALYST IN DIGITAL TRANSFORMATION

Make your applications 10X faster and reduce MPLS costs by 80%

NEW ERA, NEW FOUNDATION

MODERN CLOUD, MODERN WAN

DIGITAL TRANSFORMATION = **MODERN CLOUD APPLICATIONS** + **MODERN CLOUD INFRASTRUCTURE** + **MODERN WAN??**

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MODERN APPLICATIONS, SAME OLD WAN

Application Performance Suffers on Legacy Networks
Inconsistent application performance, expensive backhauling

WAN Architectures Are Too Complex
Active-standby transport, multiple routing protocols

Branch Infrastructure Sprawl
Routers, FWs, WAN Opt, multiple operating systems

Total Lack of Automation
Manual configurations and device-by-device changes

High Infrastructure and Connectivity Costs
Infrastructure, support, personnel, connectivity, delays

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WHAT'S REQUIRED FOR WAN TRANSFORMATION

MAXIMIZE THE MULTIPLIER EFFECT

RETIRE LEGACY INFRASTRUCTURE

Eliminate the need for legacy routers, firewalls and costly MPLS and infrastructure, backhauling.

RUN ON ANY TRANSPORT

Confidently run your entire (digital) business on shared, public broadband – even voice & video.

REQUIRE NO SLA TRADEOFF

Deliver performance, quality experience and security for 1000's of cloud applications/services.

AUTOMATE EVERYTHING

Auto-deploy apps/policies to 1000's of remote locations, orchestrate change; keep up, never be a bottleneck.

ADVANCED SECURITY

Shift from hardware firewalls in the branch to cloud-delivered security. Segment your applications end to end to reduce attack surface.

OFFER FREEDOM OF CHOICE

Leverage best of breed partners with one-click integration, deliver a superior combined solution with highest QoEx.
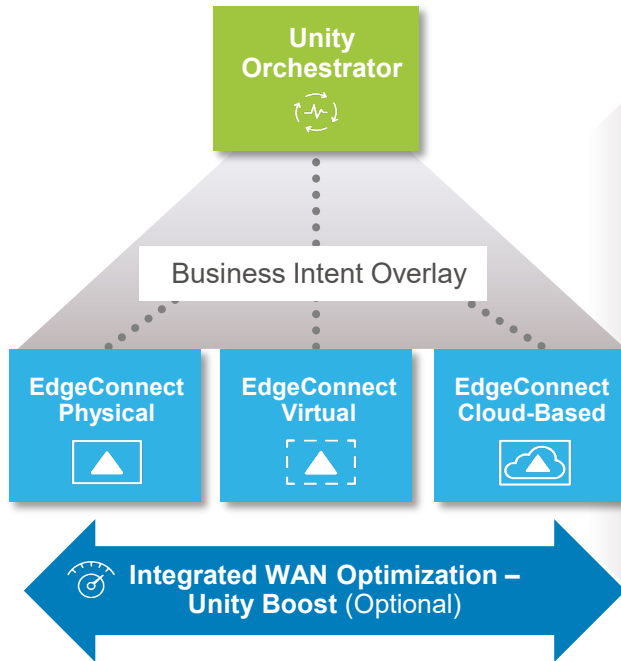
From a Partner with a Focused Heritage of Continuous Innovation

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THE SILVER PEAK SD-WAN PLATFORM
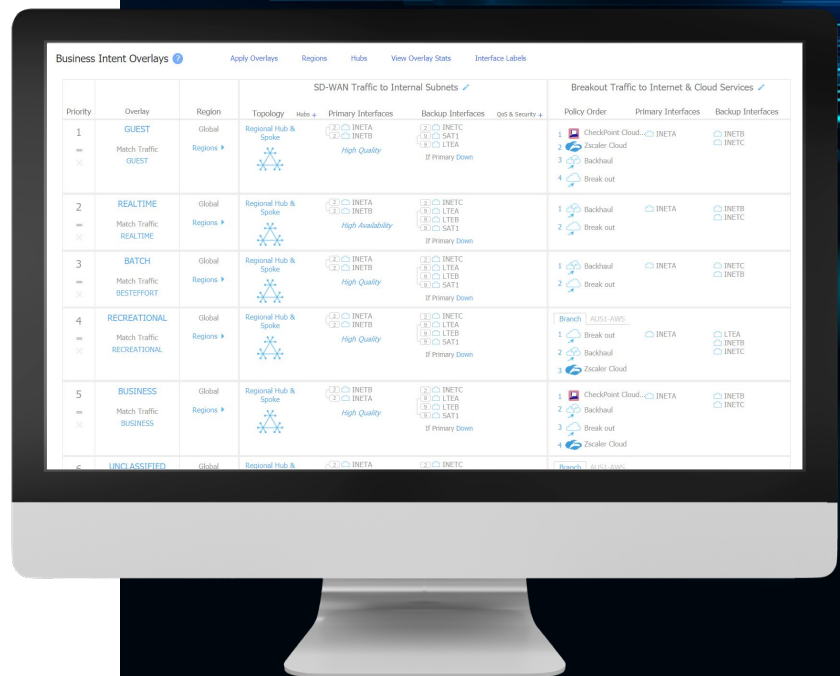
INTRODUCING UNITY EDGECONNECT

The industry's most complete WAN edge solution

Unity Orchestrator

Business Intent Overlay

EdgeConnect Physical

EdgeConnect Virtual

EdgeConnect Cloud-Based

Integrated WAN Optimization – Unity Boost (Optional)

Simplified configuration and orchestration

Underlay troubleshooting

Automated business intent overlays + policies

Single screen administration

Broadband QoS

Zero-touch branch deployments
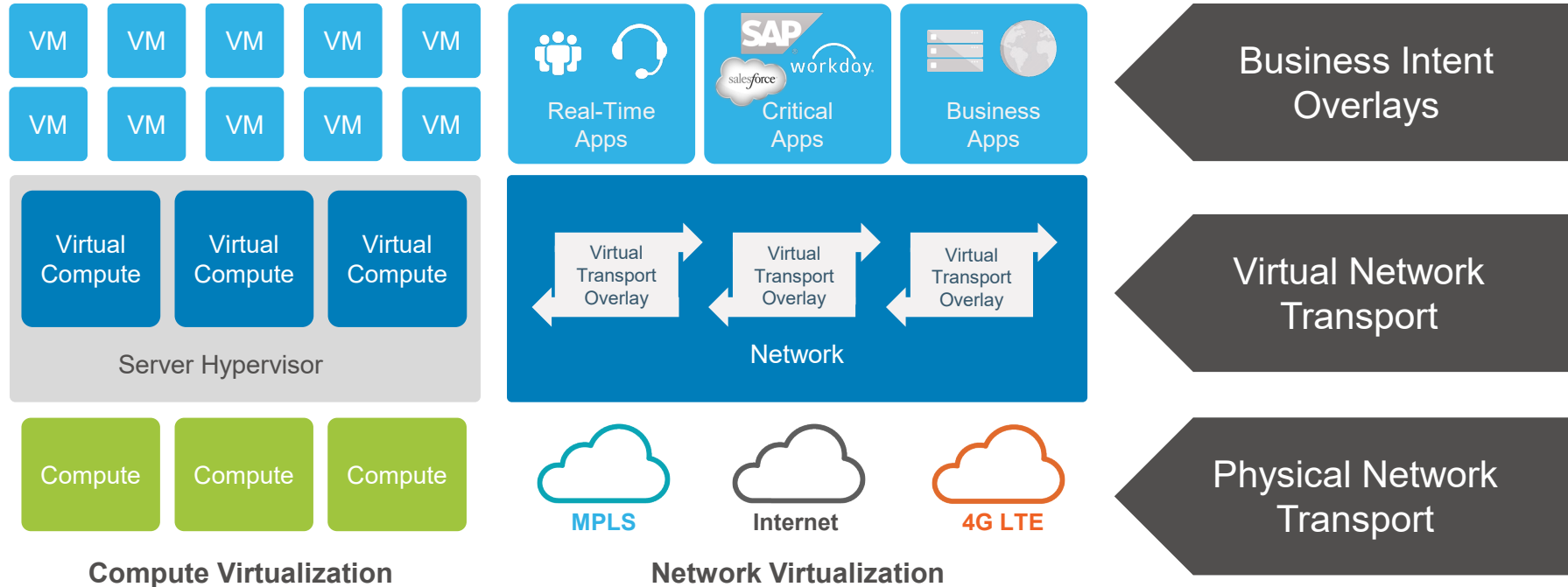
First-packet iQ for granular breakout

Integrated SD-WAN, routing, FW, WAN Opt.
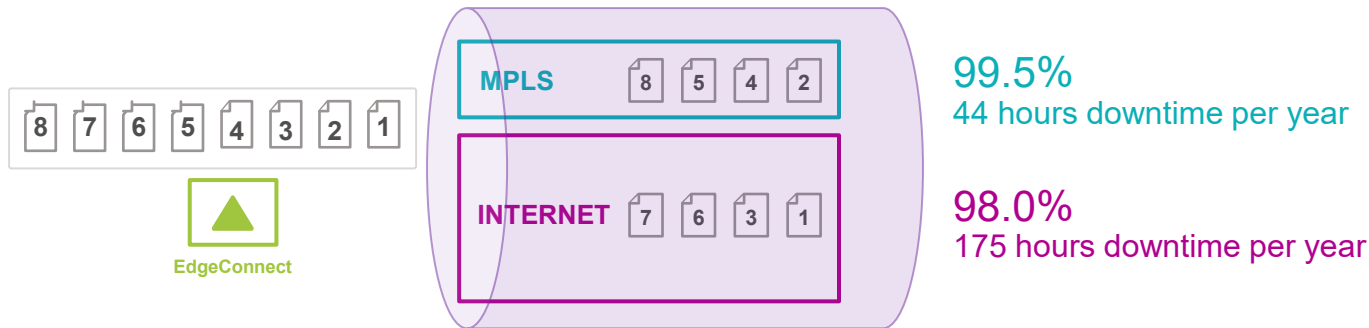
WAN hardening with 256-bit encryption

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SILVER PEAK VIRTUALIZES THE WAN

Enabling Business Intent Overlays

| VM | VM | VM | VM | VM |
| VM | VM | VM | VM | VM |

Real-Time Apps

Critical Apps

Business Apps

Business Intent Overlays

| Virtual Compute | Virtual Compute | Virtual Compute |

Server Hypervisor

Virtual Transport Overlay

Virtual Transport Overlay

Virtual Transport Overlay

Network

Virtual Network Transport

| Compute | Compute | Compute |

MPLS   **Internet**   **4G LTE**

Physical Network Transport

Compute Virtualization

Network Virtualization

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ENABLING APPLICATION SLAs

Tunnel bonding with sub-second failover improves app availability – significantly

| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |

EdgeConnect

MPLS | 8 | 5 | 4 | 2 |

99.5%
44 hours downtime per year

INTERNET | 7 | 6 | 3 | 1 |

98.0%
175 hours downtime per year

Statistical Availability Calculation

$$1 - (1 - 0.995) \times (1 - 0.98)$$

= 99.99% Availability, 52.56 *minutes* down time per year

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ENSURE PRIORITY FOR CRITICAL BUSINESS APPS
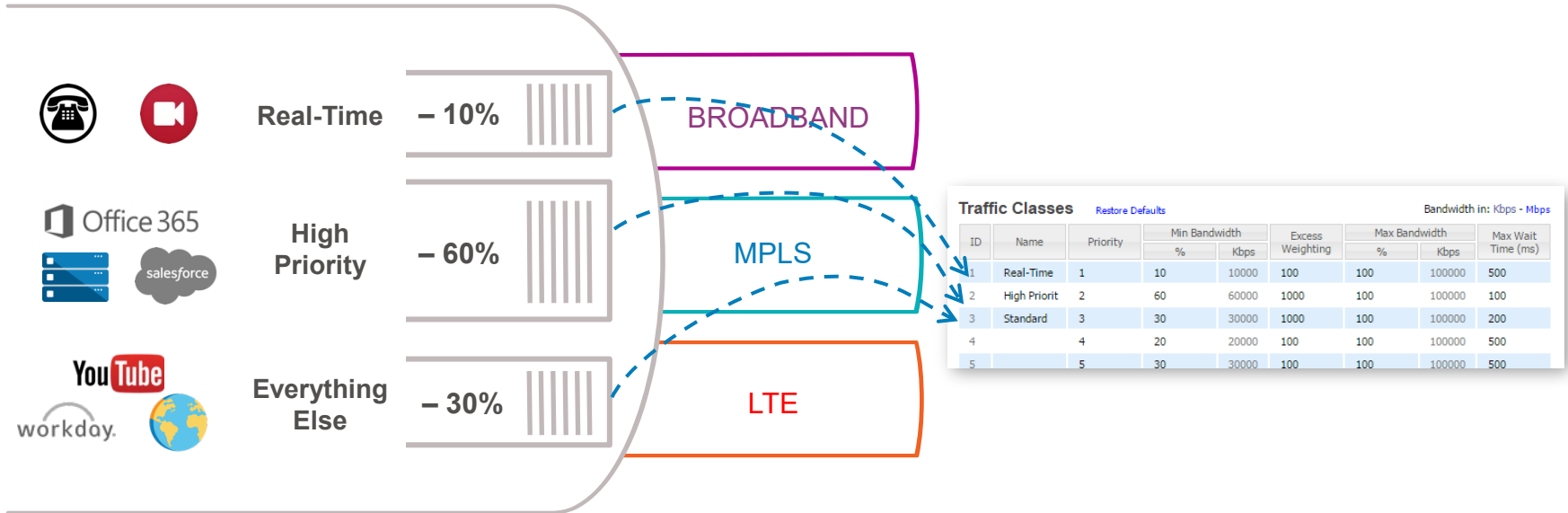
- Ingress shaping assures low priority apps do not compromise business critical apps
- Egress shaping assures no single app can consume all WAN bandwidth
- Up to 10 unique traffic classes (QoS profiles) may be defined

INTERNET QOS

Packet Loss Correction

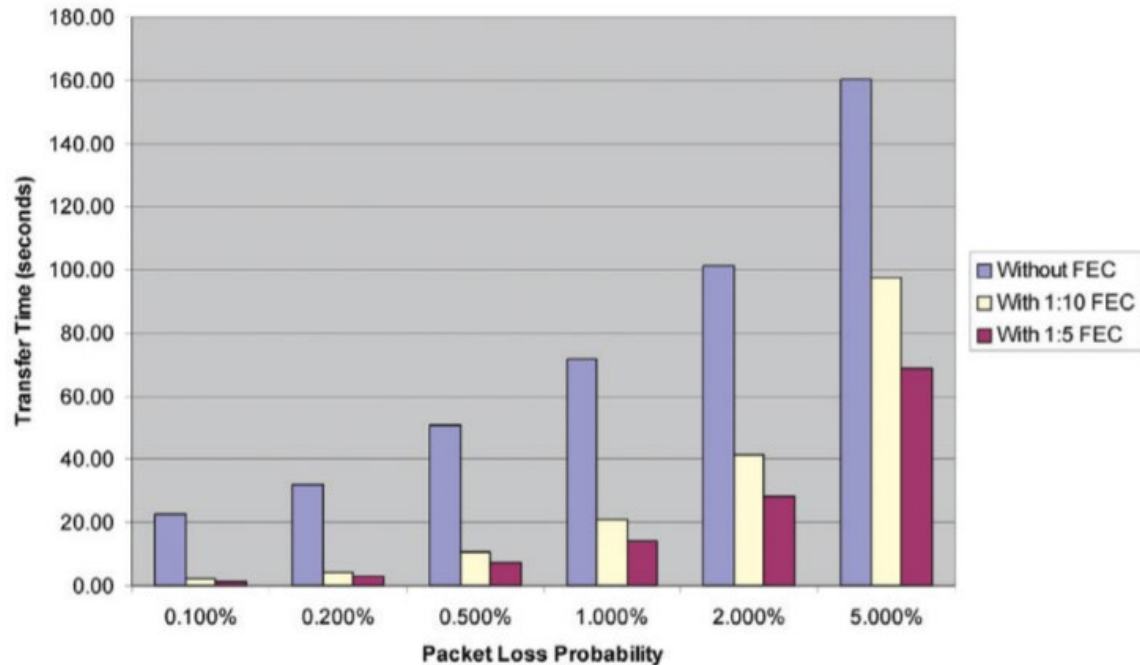Packets lost in transmit across the WAN are rebuilt.
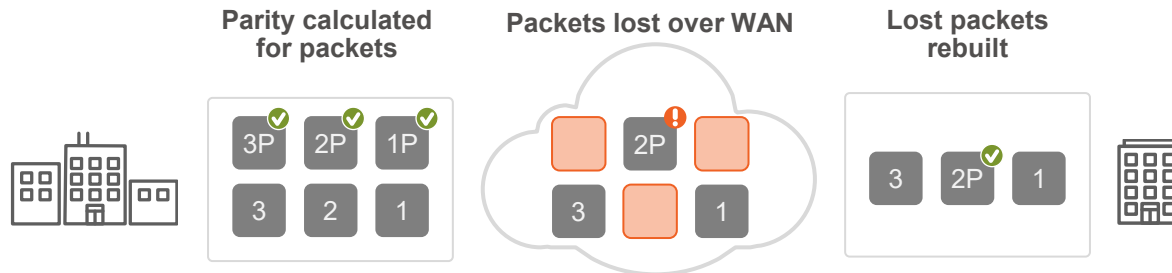
Out-of-Order Packet Correction

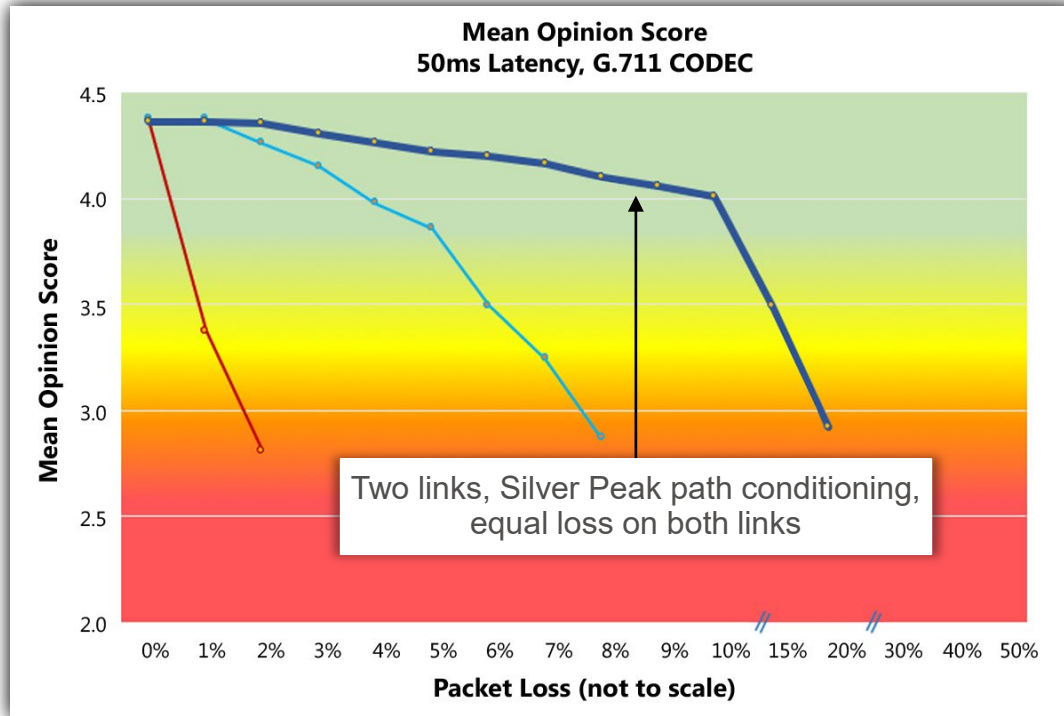Packets delivered out-of-order across the WAN are reordered into the correct order.
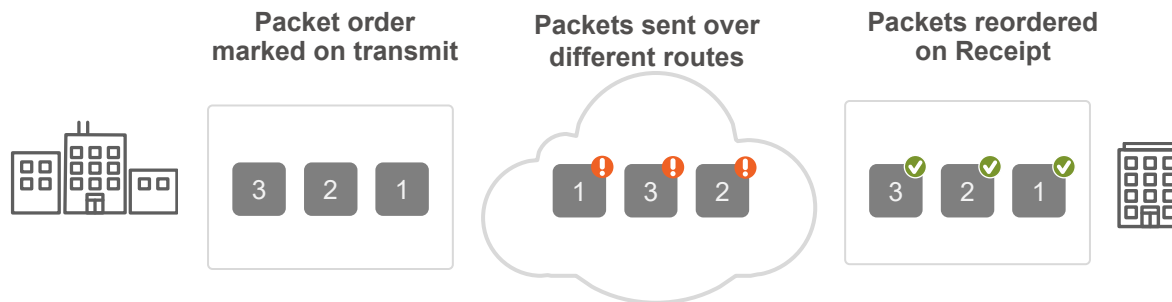
FEC – MITIGATE THE PACKET DROPS

1:5 FEC can even reduce a 5% loss to less than 1%

HIGH QUALITY VOIP OVER INTERNET

Mean Opinion Score
50ms Latency, G.711 CODEC

Two links, Silver Peak path conditioning, equal loss on both links

- Branch office with one active voice link
- Voice calls with a high voice quality
- Basic SD-WAN fail with only 1-2% loss even with 2 links
- Silver Peak handles 4x more packet loss than basic SD-WAN

FIRST-PACKET iQ APPLICATION CLASSIFICATION

INDUSTRY 1st

First-packet iQ	• Cloud-hosted Internet map and geolocation database • DNS response cache • HTTP get request cache • Real-time machine learning
Deep Packet Inspection	• Apps with ephemeral ports eg: RTSP, RTP, FTP • 2-6 packets typical for HTTP • 10-12 packets for HTTPS
IP / TCP / UDP Port	• Well-known port numbers, e.g. tcp port 80 for HTTP, tcp port 443 for HTTPS, ip 1 for icmp
IP Address	• IP addresses and subnets e.g: 216.58.192.0/24

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LATENCY MITIGATION: INCREASED WINDOW SIZE

Latency determined by distance, speed, congestion

Without Network Acceleration

Total time: 400ms

With Network Acceleration

Total time: 80ms

Transmit

Ack

Transmit

Ack

Latency 80ms

Latency 80ms

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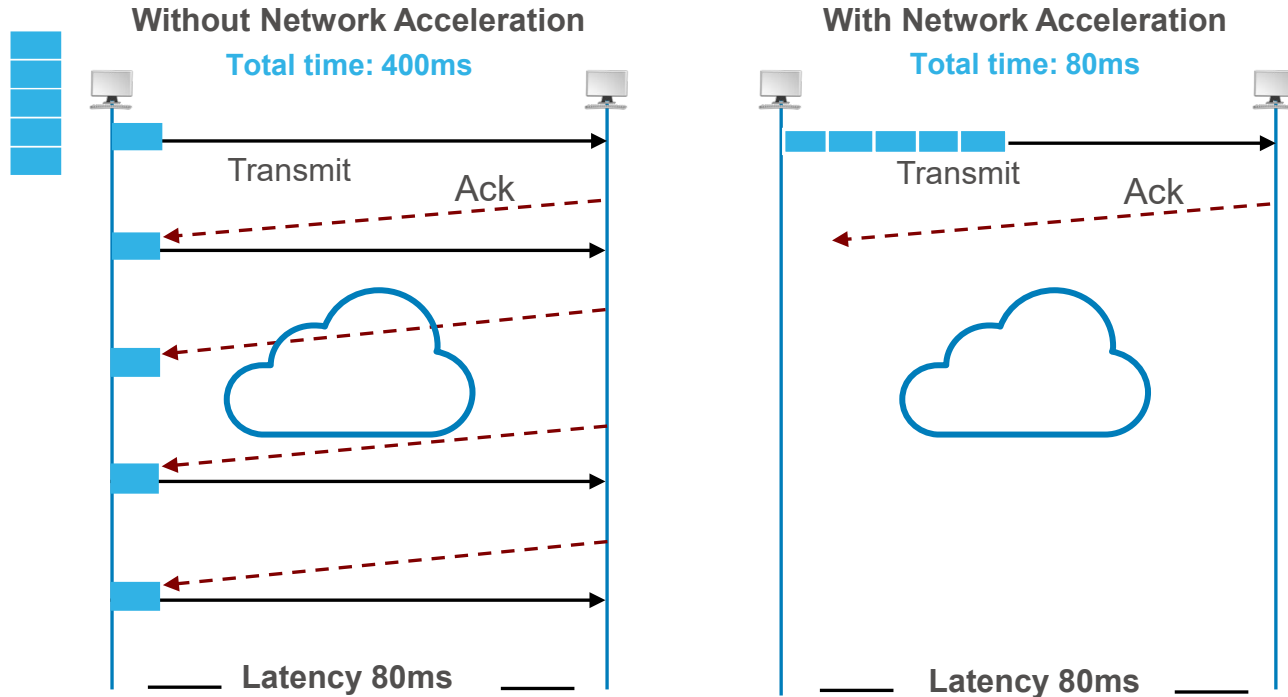
DATA REDUCTION REMOVES CONGESTION

Layer 3 byte-level deduplication
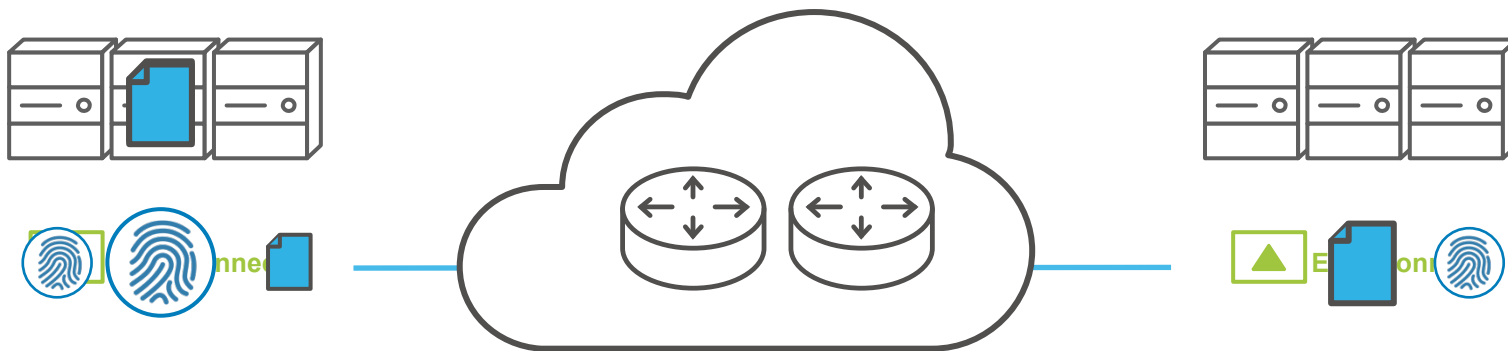
| First Pass | 1. Byte fingerprint and store | 3. Byte fingerprint and store |
| | 2. Compress + transmit | 4. Uncompress and deliver |

| >First Pass | 1. Byte fingerprint match | 3. Get local data from memory |
| | 2. Send retrieve instructions | 4. Deliver |

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APPLICATION OPTIMIZATION

		5x	10x	15x	20x+
Big Data					
CAD / CAM					
Collaboration					
Database (SQL)					
Email					
File Transfers (FTP)					
File Services (CIFS/SMB)					
File Services					
Industry-Specific Applications					
Imaging					
Replication					
Software as a Service (SaaS)					
Thin Clients					
Voice / Video					
Web Apps (HTTP / HTTPS)					

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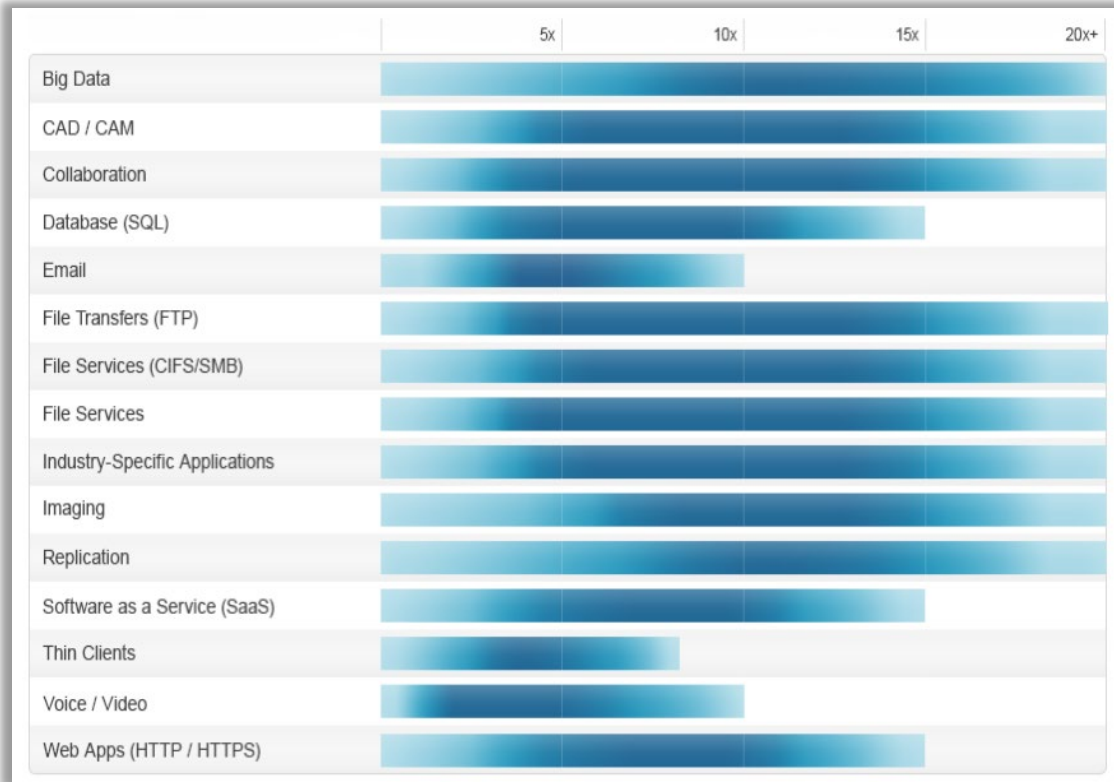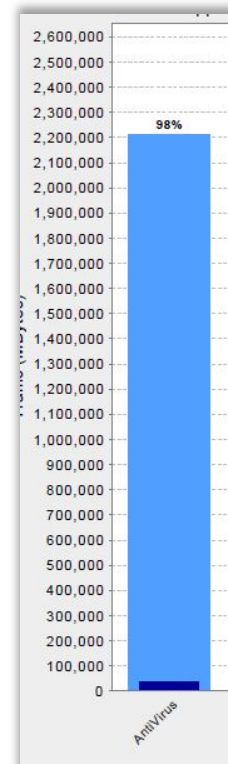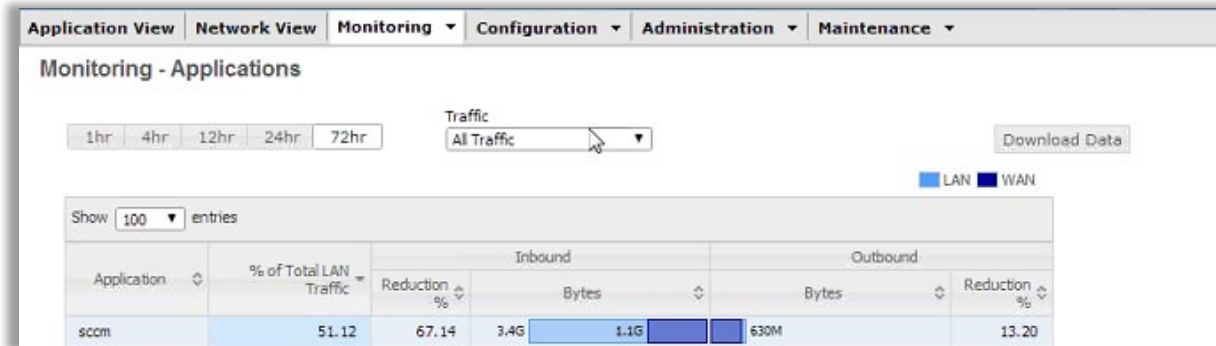
MAKING GLOBAL NETWORK CHANGES THE OLD WAY

Manual, Antiquated Routing Policy

Inability to Focus on the App

Insecure, Misunderstood Security

No Automation, Line by Line Configuration

Days

83

Deploy application to 1,000 locations

Office 365

1,000+ locations

Schedule changes @ 1,000 locations

2

Hours Per Site

Router # Login

Router # Config T
Router # Configure ACL
Router # Setup QoS
Router # Define routing, security
Router # Hundreds of lines of configuration

Router # Validate changes are working
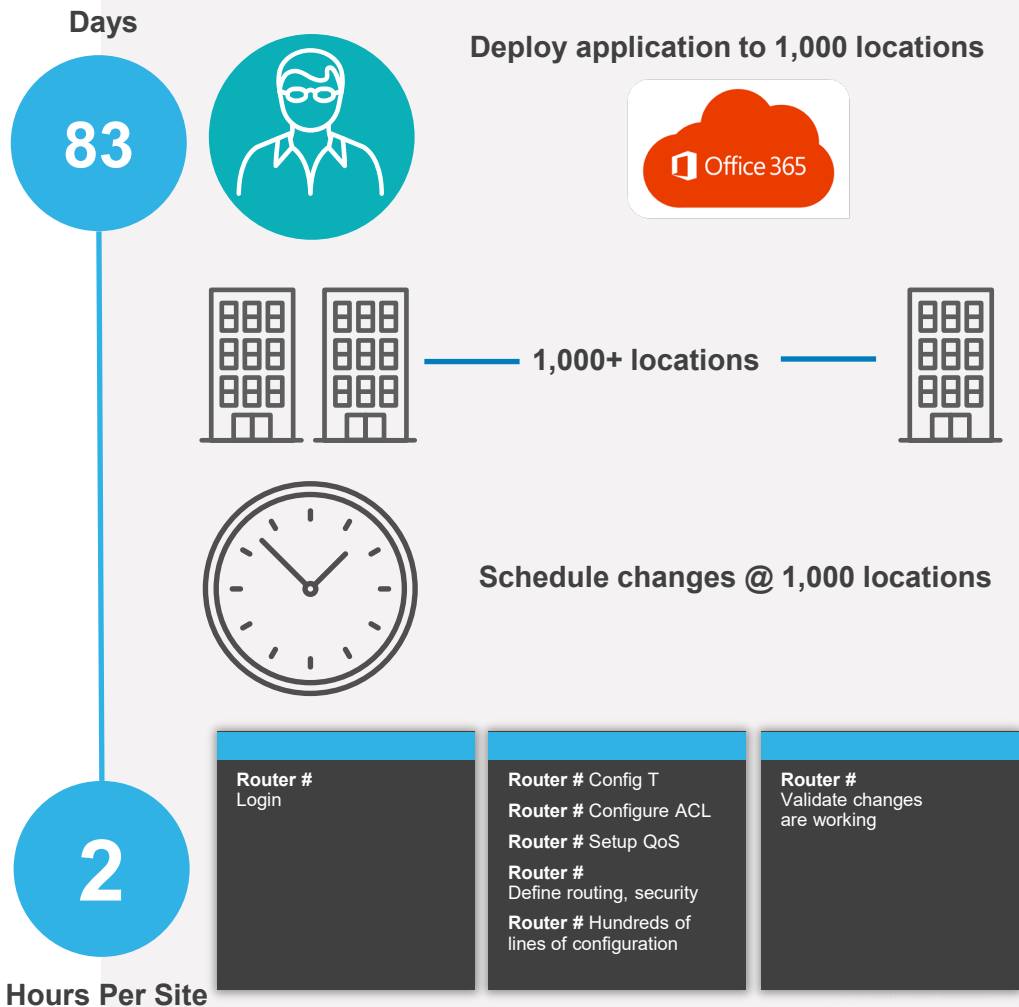
WITH SD-WAN, TEMPLATIZE AND AUTOMATE

Top-down approach, automating business intent policies
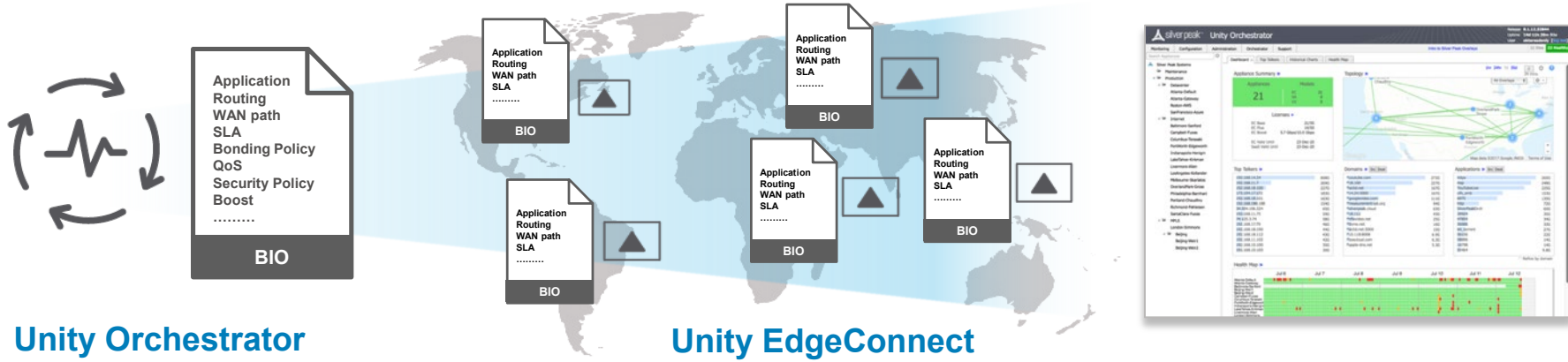
Unity Orchestrator

Unity EdgeConnect

1 Create Business Intent Overlay (BIO)

2 Push and Maintain Policies Globally

3 Unified Single Point of Management

WITH SILVER PEAK, DEPLOYING A NEW APPLICATION IS EASY

Drag + Drop Easy Routing

Application Focused Approach

Templatized, Easy Security

Fully Automated

Minute

1

Deploy application to 1,000 locations

Office 365

Orchestrator

Office 365

Overlay: SaaS

0

1,000+ locations

Minutes Per Site
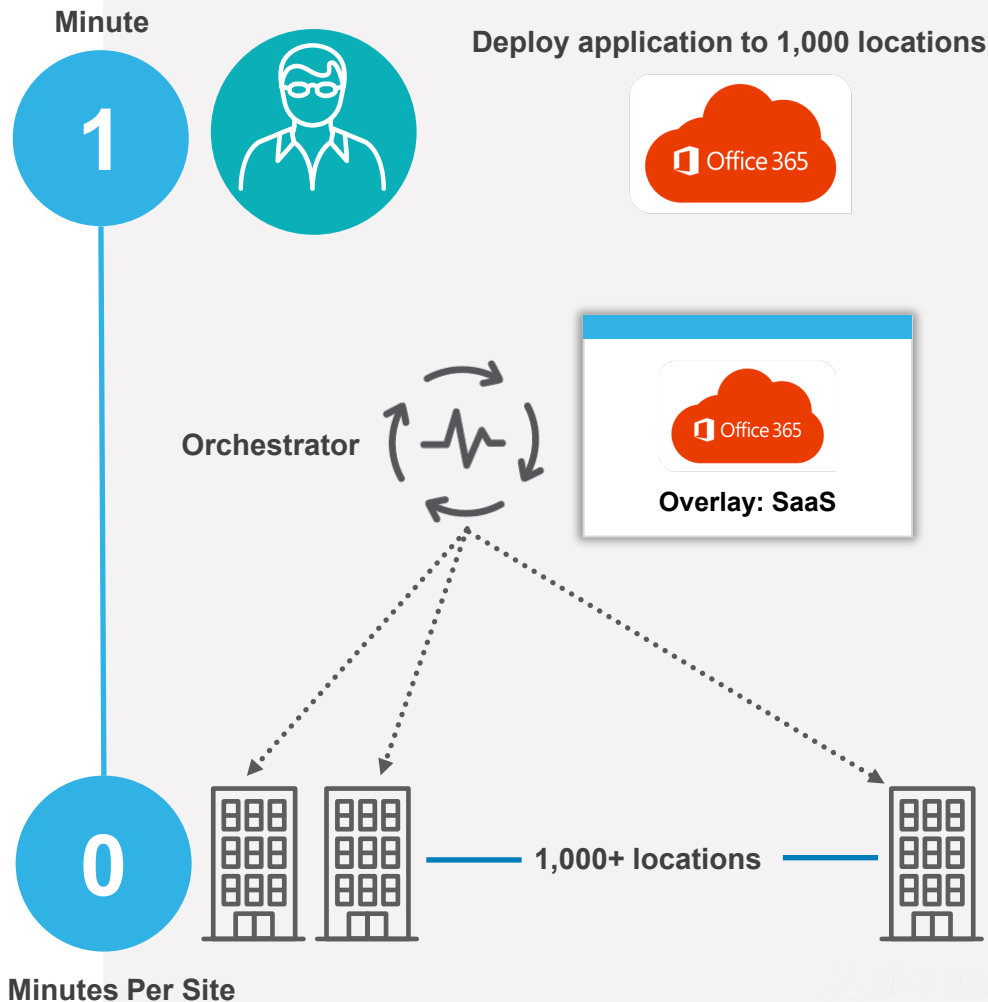
COMPREHENSIVE SD-WAN SECURITY

Multi-dimensional approach to securing applications and achieving compliance

EdgeConnect

Micro-Segmentation and VRF
Segment traffic based on application security, compliance and performance requirements according to business intent

Data & Control Plane Security
Secure traffic between sites, ensures data integrity based on AES-256 encryption and SHA-2 hashing; control plane security

Stateful Zone-based Firewall
Eliminate the requirement for a separate firewall at branches to streamline the WAN architecture

Automated Orchestration
Automated orchestration with leading cloud-delivered security

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MANAGEMENT PLANE SECURITY

Secure Zero-Touch Provisioning provided by Cloud Portal and Orchestrator

Two-step authentication authorization

- Silver Peak Cloud Portal
- Customer's Orchestrator
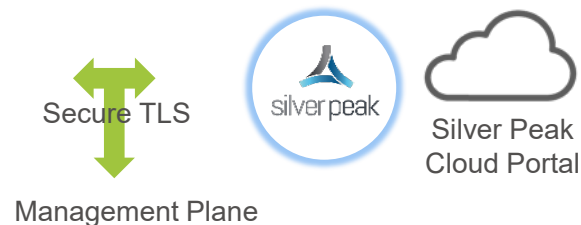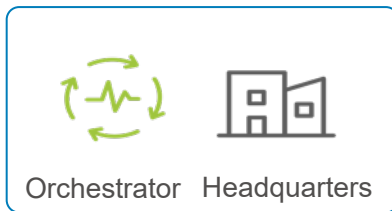
Rogue / Unauthorized devices

- Customer revokes access through the Orchestrator
- Drop all traffic
- Cannot download config
- Cannot join the SD-WAN

Orchestrator   Headquarters

Secure TLS

Management Plane

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Silver Peak Cloud Portal

Secure IPsec

Stolen / Unauthorized device

SD-WAN Network

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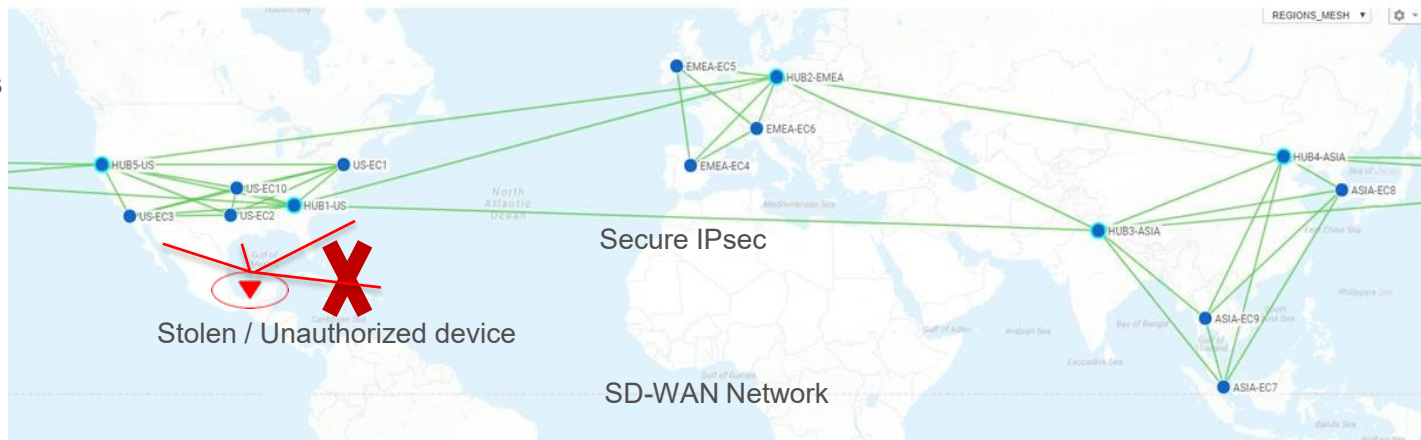
SECURE END-TO-END SEGMENTATION

LAN-WAN-Data Center and LAN-WAN-LAN Zones

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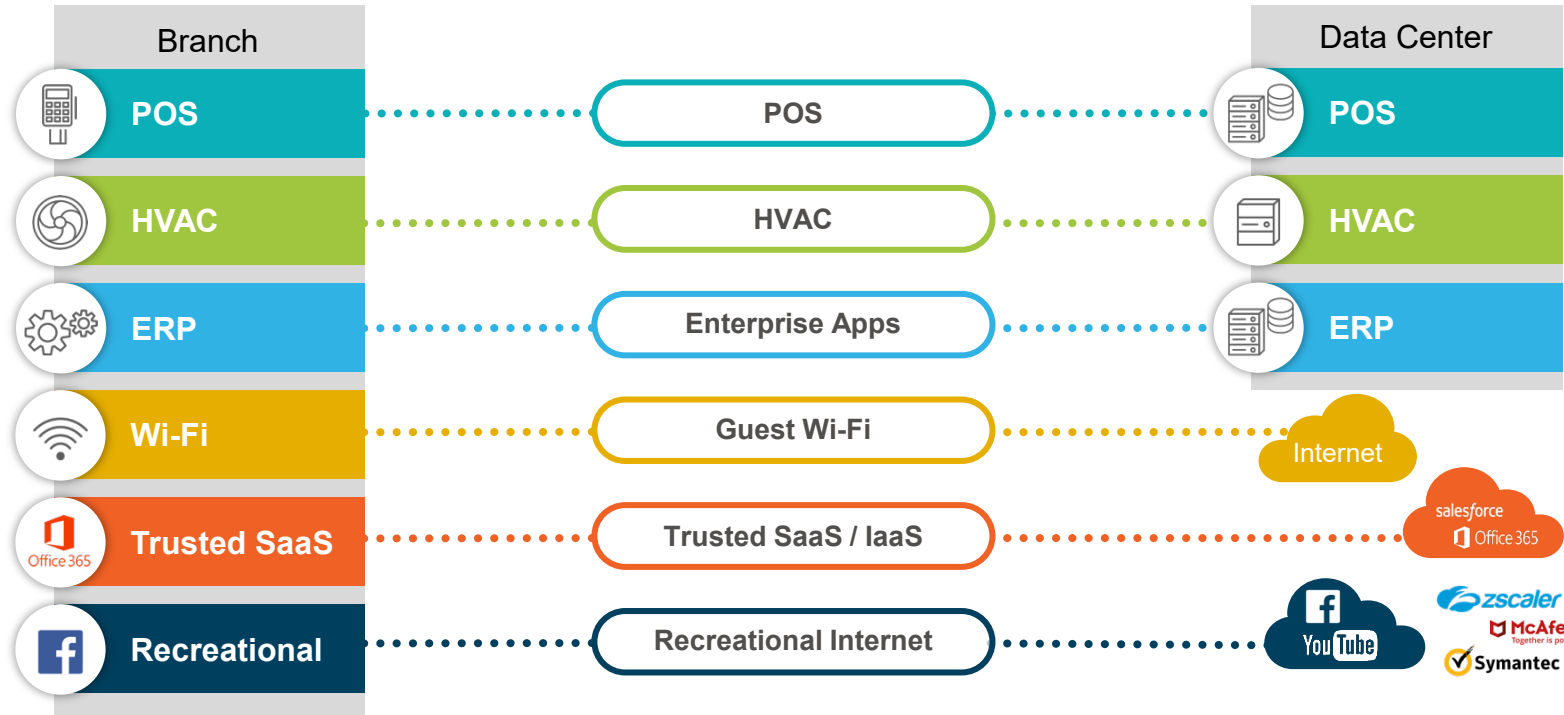
ADVANCED SEGMENTATION (VRF)

- Establish granular policies across the network; reduce attack surface
- Configure microsegments: separate business entities share the same applications and WAN infrastructure
- Eliminate overlapping IP address conflicts - no service disruptions
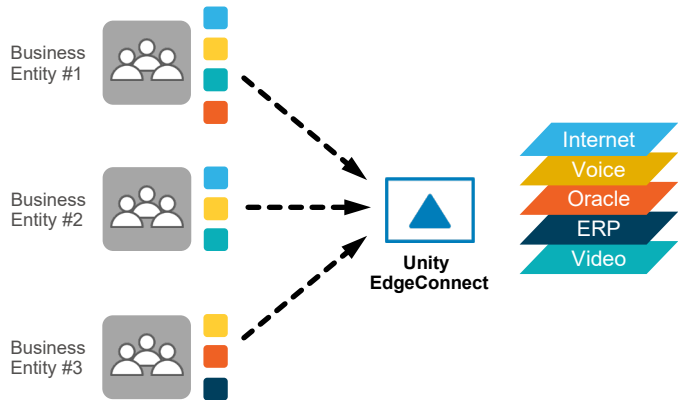
Overlays & Breakout Policies for VRFs

Segment Name: All

Segment Name	Internet	Voice	Oracle	ERP	Video
Default	Include	Include	Skip	Skip	Skip
Business Entity #1 (VRF1)	Include	Include	Include	Skip	Include
Business Entity #2 (VRF2)	Include	Include	Skip	Skip	Include
Business Entity #3 (VRF3)	Skip	Include	Include	Include	Skip

Save   Cancel

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EASY TO CONFIGURE ZONE BASED FIREWALL

Simplified Policy Creation, Templatized Across the Network

Security Policies ?

Matrix View | Table View   ○ Merge   ● Replace

To Zones ⇒ / ⬇ From Zones	To Default	To CorporateBranch	To GuestWifi	To BusinessCritical	To CorporateWAN
From Default	Allow All	Deny All	Deny All	Deny All	Deny All
From CorporateBranch	Allow: ACL Internet_Traffic / Deny: Everything	Allow All	Deny All	Allow: ACL BusinessCritical / Deny: Everything	Allow: ACL Corporate / Deny: Everything
From GuestWifi	Allow: ACL Internet_Traffic / Deny: Everything	Deny All	Allow All	Deny All	Deny All
From BusinessCritical	Deny All	Allow: ACL BusinessCritical / Deny: Everything	Deny All	Allow All	Deny All
From CorporateWAN	Deny All	Allow: ACL Corporate / Deny: Everything	Deny All	Deny All	Allow All

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BUSINESS INTENT OVERLAYS

Apps, IaaS, PaaS	Circuits	Bonding + SLA	Topology	SaaS, Cloud, Internet Apps	Internet Policy & Firewall	Overlay Defaults
Real Time Overlay						
	MPLS / Internet / LTE (Backup)	**High Availability** — Loss: 1%, Latency: 400ms, Jitter: 200ms	**Mesh**	WebEx, ZOOM Video Communications, Skype, Ring Central, 8x8	**Best Circuit + Local Firewall** — Local Firewall, Datacenter (Backup)	**FW Zone:** Real Time, **QoS:** Real Time, **Boost:** Disabled
Enterprise Apps Overlay						
amazon web services, SAP, Azure, ORACLE	MPLS / Internet / LTE (Backup)	**High Quality** — Loss: 2%, Latency: 600ms, Jitter: 300ms	**Hub & Spoke**	Office 365, box, salesforce, workday, slack	**Best Circuit + Firewall** — zscaler, Datacenter (Backup)	**FW Zone:** Restrict, **QoS:** Enterprise, **Boost:** Enabled
Default Overlay						
	MPLS / Internet / LTE (Backup)	**High Efficiency** — Loss: 5%, Latency: 800 ms, Jitter: 500 ms	**Hub & Spoke**	Facebook, YouTube	**Load Balance + Firewall** — CloudGuard, Datacenter (Backup)	**FW Zone:** Default, **QoS:** Best Effort, **Boost:** Disabled

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NETWORK VISIBILITY

Faster Application and Network Troubleshooting; Fewer Help Desk Tickets

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EDGECONNECT SD-WAN DASHBOARD
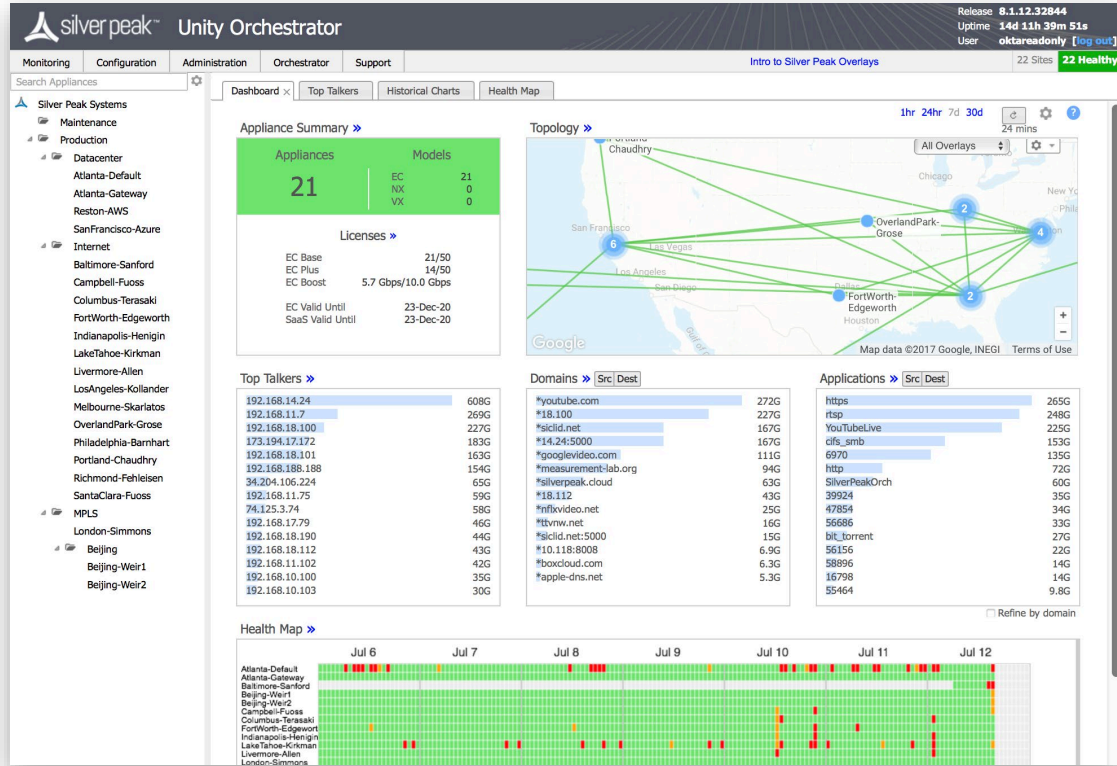
FASTER TROUBLESHOOTING

EdgeConnect health heat map reports status with ability to drill down to details

An appliance had an Issue for 12 hours….
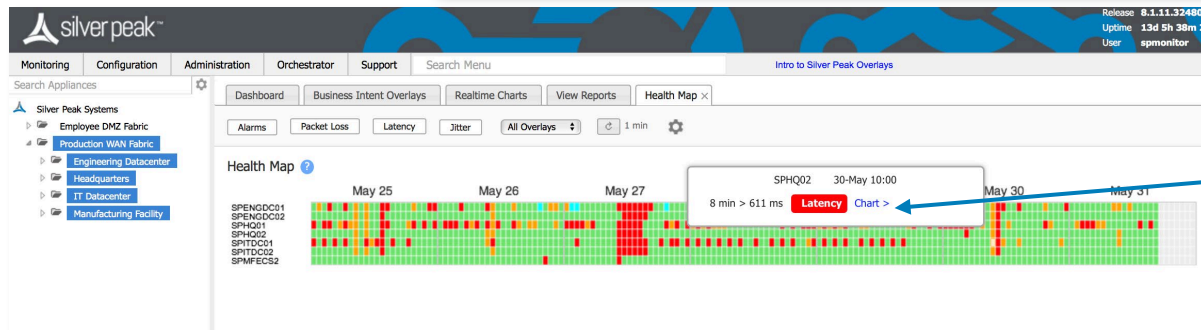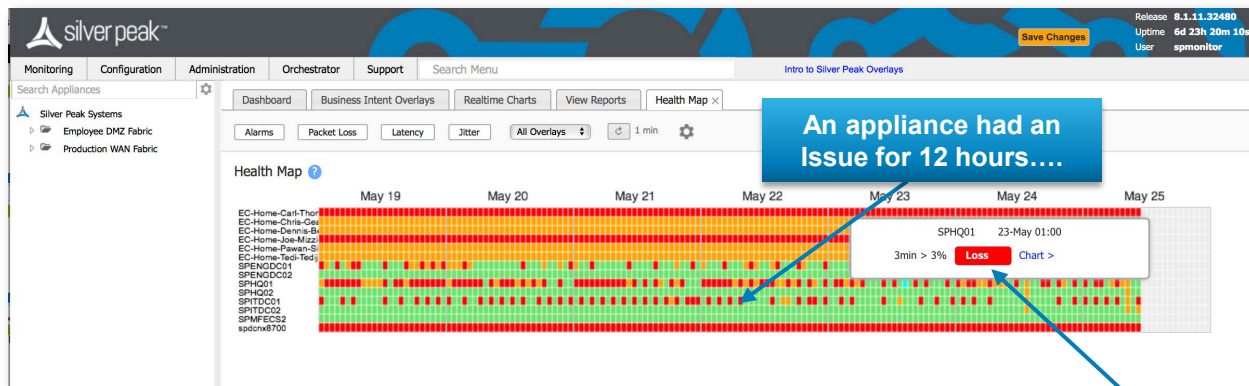
Packet loss detail

Latency threshold detail

FASTER TROUBLESHOOTING

Deep insight into SD-WAN health to speed troubleshooting
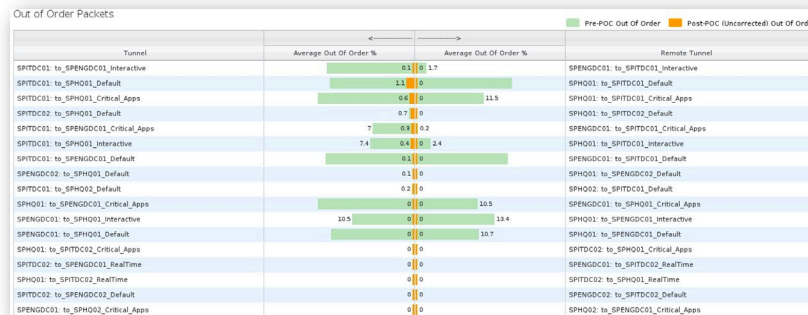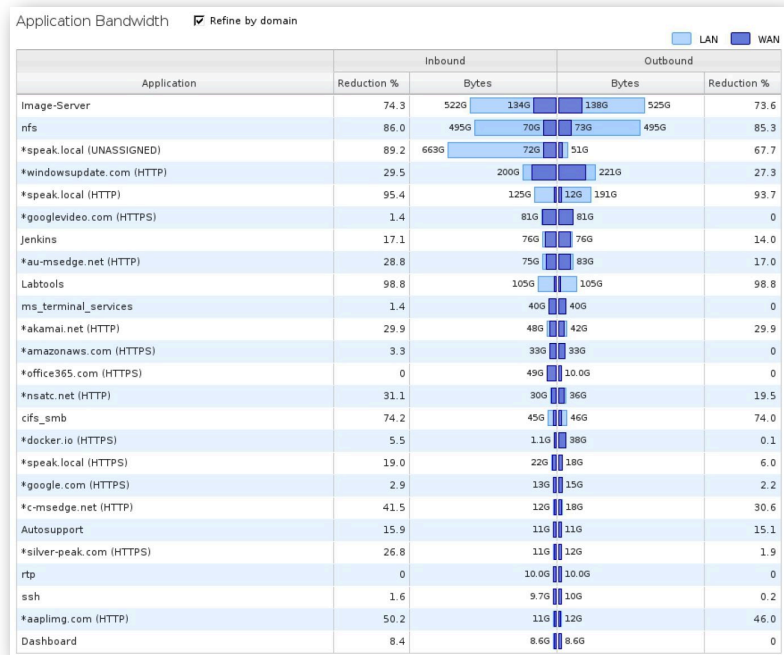
WAN HEALTH VISIBILITY AND REPORTING SPEEDS TROUBLESHOOTING

Detailed statistics for bandwidth, packet loss, latency, jitter

SIMPLIFY APPLICATION PERFORMANCE TROUBLESHOOTING

A full view of all applications accessing the WAN

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BUILDING OUT AN SD-WAN PLATFORM AND ECOSYSTEM

BEST OF BREED ECOSYSTEM & 'APP STORE'

Public Cloud	Security	Applications	Infrastructure	uCPE	Analytics
Azure	zscaler	Office 365	BEC TECHNOLOGIES	ciena	kentik
aws	Check Point SOFTWARE TECHNOLOGIES LTD.	RingCentral	ARISTA	ADVA	SevOne
Google Cloud	paloalto NETWORKS	Dialpad	opengear	DELL	servicenow
ORACLE Cloud Infrastructure	McAfee	8x8	Infoblox	Telco Systems A BATM Company	snowflake
	Symantec	NICE · inContact	NUTANIX	ONEACCESS an Ekinops company	splunk
	FORCEPOINT	Five9	ERICSSON	JUNIPER NETWORKS	
	OPAQ Networks	GENESYS moments connected			

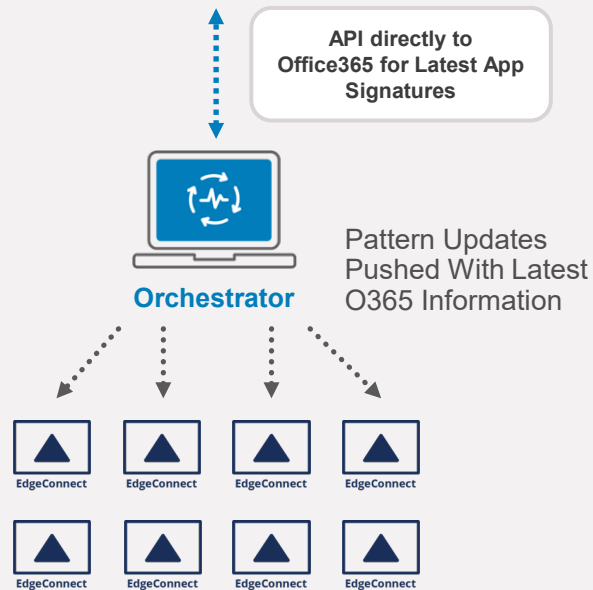silver peak

WORKS WITH OFFICE365 CERTIFICATION

100% Accurate O365 Identification

Differentiate between Exchange, Skype, SharePoint and Others

Local Breakout + Regional DNS Provide

Continuous and Automatic Updates

Office 365

API directly to Office365 for Latest App Signatures

Orchestrator

Pattern Updates Pushed With Latest O365 Information

EdgeConnect EdgeConnect EdgeConnect EdgeConnect
EdgeConnect EdgeConnect EdgeConnect EdgeConnect
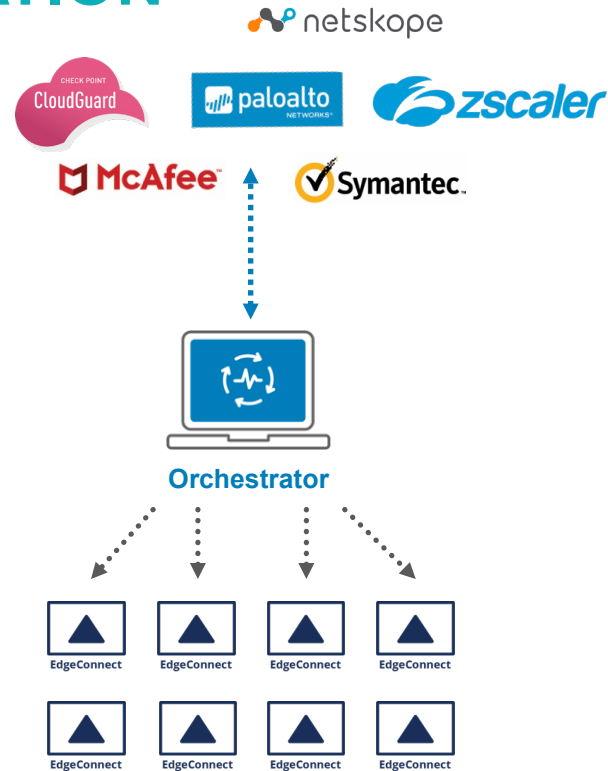
* Silver Peak is the only SD-WAN vendor with this certification

SECURITY PARTNER INTEGRATION

- Silver Peak Orchestrator is supports an ecosystem of Cloud Security Services

- Traffic is Easily Routed to Security Service VIA Drag + Drop in Overlays

- Support wide variety of connectivity and integration across a rapidly growing ecosystem
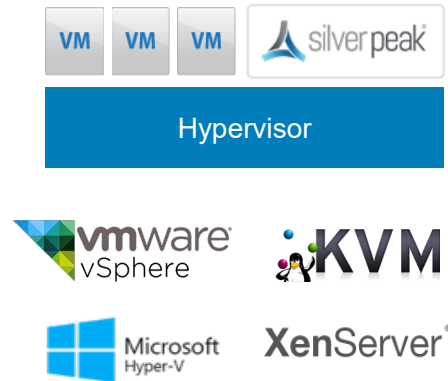
DEPLOY IN ANY ENVIRONMENT

Flexible deployment with critical functionality to meet business requirements

Physical

100Mbps – 10Gbps

Virtual

VM VM VM · silver peak

Hypervisor

vmware vSphere · KVM

Microsoft Hyper-V · XenServer

Cloud-native

Azure · aws

Google Cloud · ORACLE Cloud

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UNITY EDGECONNECT HARDWARE PLATFORMS

	EdgeConnect US	EdgeConnect XS	EdgeConnect S	EdgeConnect M*	EdgeConnect L*	EdgeConnect XL*
Model	EC-US	EC-XS	EC-S	EC-M	EC-L	EC-XL
Typical Deployment	Small Branch/ Home Office	Small Branch	Large Branch	Head Office Small Hub	Data Center Large Hub	Data Center Large Hub
Typical WAN Bandwidth	1–100 Mbps	2–200 Mbps	10–1000 Mbps	50–2000 Mbps	1–5 Gbps	2–10 Gbps
Simultaneous Connections	256,000	256,000	256,000	2,000,000	2,000,000	2,000,000
Recommended Boost up to	25 Mbps	50 Mbps	200 Mbps	500 Mbps	1 Gbps	5 Gbps
Redundancy/ FRUs	No	No	No	Power and SSD	Power and SSD	Power and SSD
Data Path Interfaces	3 x RJ45 10/100/1000	4 x RJ45 10/100/1000	6 x RJ45 2 x 1/10G Optical (option)	4 x RJ45 2 x 1/10G Optical	4 x RJ45 2 x 1/10G Optical	4 x 1/10G Optical

* EC-M, EC-L , EC-XL are available with the following optical interface options:
- EC-M-B, EC-L-B, EC-XL-B (Bypass) –Embedded optics; Fail-to-Glass
- EC-M-P, EC-L-P (Pluggable) – Optional pluggable optical transceivers (2 x SFP+)
- EC-XL-P (Pluggable) – Optional pluggable optical transceivers (4 x SFP+)

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EDGECONNECT TIERED ENTERPRISE LICENSING

Boost WAN Optimization
– Ordered in 100Mbps chunks
– Shared across SD-WAN fabric, consumed in kbps

EdgeConnect SD-WAN License
– Multi-function license (except WAN Optimization)
– 6 Bandwidth Tiers
– Upgradeability to any tier

Any EdgeConnect appliance
– physical or virtual or cloud

Boost (EC-BOOST)

SDWAN Bandwidth
(EC-BW-20/50/200/500/1G/2G/Unlimited)

1, 2, 3, 4 & 5 Year Term Licenses available

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WAN TRANSFORMATION JOURNEY

1 TABLE STAKES FEATURES
- Path selection
- Internet breakout/split tunneling
- Single management tool

2 BASIC SD-WAN
- Zero touch provisioning
- Internet breakout by app.
- Automated templates
- Fixed app. definitions, ACLs

3 ADVANCED SD-WAN
- Full orchestration and lifecycle automation
- Outcome oriented by app.
- Voice and video over broadband with SLAs

4 NEW WAN EDGE
- Unified platform [routing, FW, WANOP]
- Integrated and automated ecosystem
- Continuous, self learning
- Advanced security, edge-to-edge segmentation

5 SELF-DRIVING WAN
- Hands-off WAN
- Leverage AI and machine learning
- Automated troubleshooting
- Eliminate repetitive work patterns

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WHY TECHNICAL DECISION MAKERS CHOOSE US

Business driven workflows

Ease of Setup, Deployment, Management

Simple device which replaces Router , Firewall and WAN optimization

Reduce MPLS usage by 80% and critical applications becomes 10X faster

Run Voice, Video Reliably on Internet

WAN Optimization for Critical Applications

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Thank you

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